Hydraulic Valves
Industrial Standard

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

ENGINEERING YOUR SUCCESS.

© 2011 Copyright Parker Hannifin Corporation. All Rights Reserved

Content

Notes

Product Index

Product Index

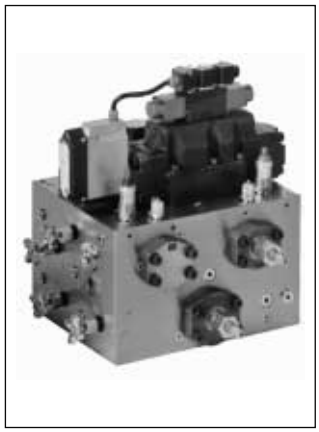
Notes

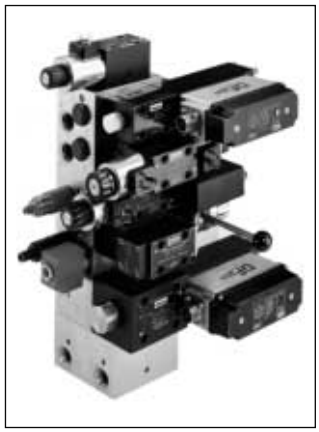
Systems Solutions

Parker is more than a supplier of excellent components. Together with our customers, we develop innovative systems solutions. In this industrial valves catalogue, we would like to point out to you our special competence in industrial control units. Our experienced, highly motivated team answers technical needs with complete, sound solutions.

Our performance spectrum comprises a complex understanding of the job, project management, design, and production, including final tests of control units on our modern, automated test beds. In addition we offer compact hydraulic axis controls.

When you entrust us with your system requirements, you can rely on getting an optimal solution from the Parker valves program with all components used in accordance with their characteristics. Furthermore you can rely on us taking full responsibility for all our valves, electronics and combined functions within the system.





In addition to customized solutions Parker also supplies standardized press controls (e.g. certified versions in nominal sizes NG 06 up to NG50) as shown in our brochure HY11-3235/UK "Hydraulics for Press Controls". Contact your Parker representation for information and offerings concerning your hydraulics.

Notes

Electro-Hydraulic Axes

Under the ordering code AXC Parker offers a range of configured standard closed loop axes for a wide range of applications such as

- Material handling and feed systems
- Wood working and plastics industries
- Machine tools (loading through vertical actuators)
- Paper industry (lifting and tensioning)
- Automotive industry (transport and feeding)

The electro-hydraulic axes consist of proven standard components and are mounted and tested as a unit. Combined with control electronics, the electro-hydraulic axes are ready for use, requiring only connection lines to the system.

With the 3 Parker electro-hydraulic linear drives, position accuracy can be achieved reliably and cost-effectively in all 3 performance classes:

Performance class 1: < ±1mm*

Performance class 2: < ±0.3mm*

Performance class 3: < ±0.05mm*

*without external load and friction

The standard axes catalogue HY11-3341/UK contains all information required to select and order a complete standard axis.

1

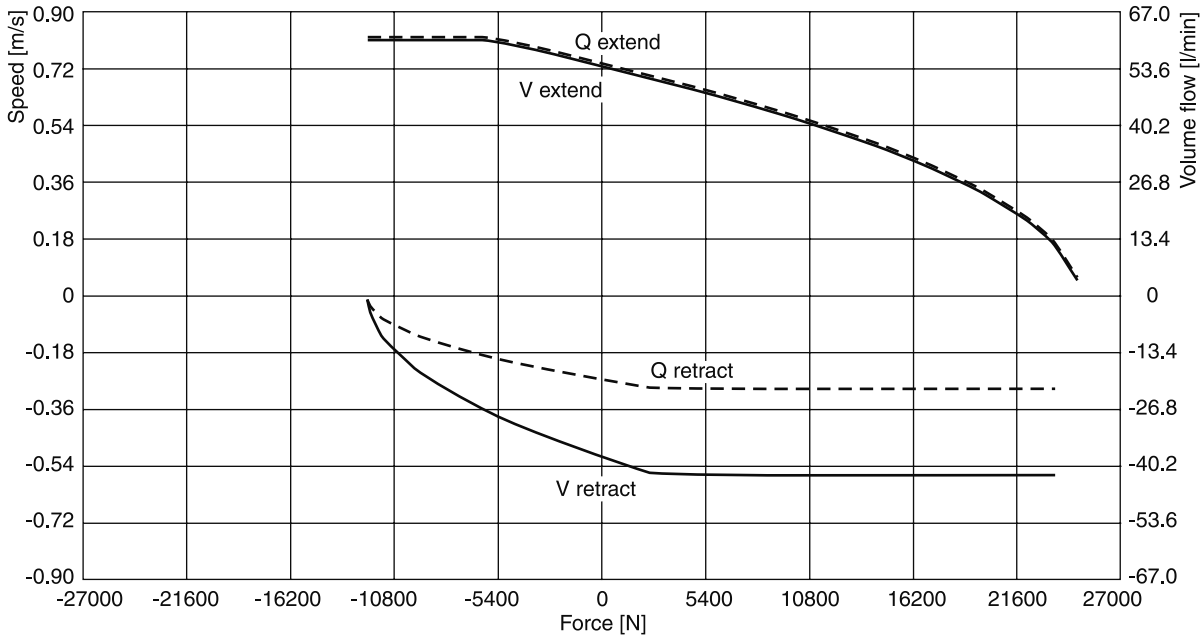
Technical features

- Stroke up to 3000mm
- Push force up to 620kN
- Pull force up to 320kN
- Position and force control
- Speed up to 1m/s
- Overload protection
- Integrated position feedback
- Long life time and low maintenance
- Only P and T need connections
- 8 sizes (40/28 up to 200/140)
- Axis controller (option)
- Blocking valves (option)
- Pressure overload protection (option)
- Standard axis ordering code

Performance diagrams

In addition to the basic technical data the standard axes catalogue provides easy to use information for the right configuration.

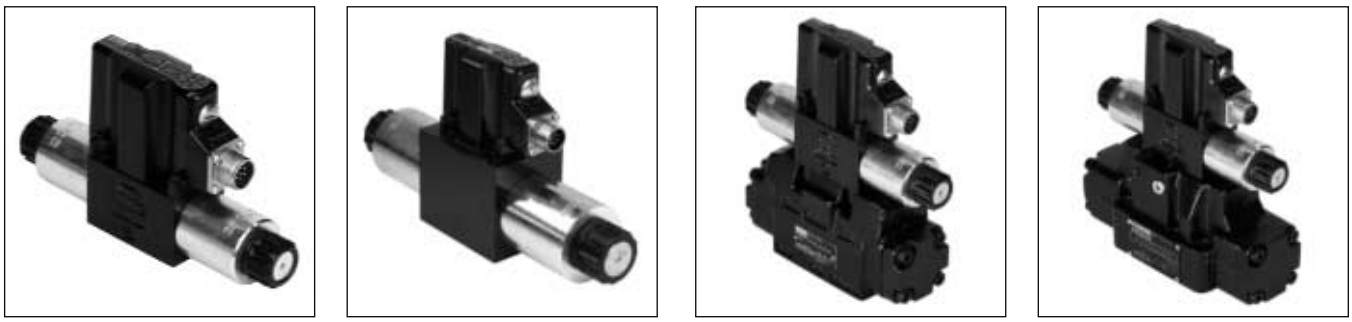
With individual diagrams for all cylinder and valve dimensions the axes can easily be selected according to the force and speed requirements.



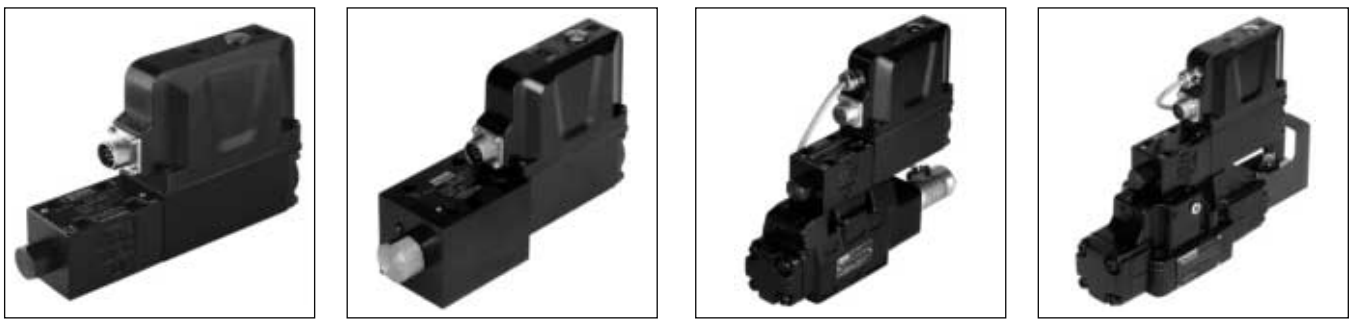
Control Valves

For the 3 performance classes different valve series are used. Starting with standard proportional valves for simple closed loop solutions to highly sophisticated DFplus valves in performance class 3.

Performance class 1: D*FB series



Performance class 2: D*FB OBE series



Performance class 3: D*FP series

Controllers

Optionally the axes can be ordered with controller. In performance class 1 the axes are controlled by Parker digital modules, in classes 2 and 3 the highly sophisticated Compax 3F controller is used.

Performance class 1: PWDXX digital module

Performance classes 2 and 3: Compax 3F axis controller

Position Paper of HCD regarding machinery directive 2006/42/EG DIN EN ISO 13849

Products made by the Hydraulic Controls Division (HCD) of Parker Hannifin GmbH are excluded from the scope of the machinery directive following the „*VDMA Position Paper on the Implementation of the Machinery Directive 2006/42/EC in the Fluid Power Industry*" (Rev. 29.07.2009).

The only exceptions are products that comply to the definition of a safety component, defined in article 2 c) of the machinery directive.

All HCD products are designed and manufactured considering the basic as well as the proven safety principles according to EN 13849-2:2008-09, C.2 and C.3, so that the machines in which the products are incorporated meet the essential health- and safety requirements.

Components that fall within the scope of DIN EN ISO 13849-1, *Safety of machinery – Safety related components of controls – part 1: General principles for design* do not necessarily have to be placed on the market as safety components in accordance with the machinery directive.
A component that is placed on the market but not as a safety component does not necessarily provide a lower safety level.

Confirmations for components to be proven components, e. g. for validation of hydraulic systems, can only be provided after an analysis of the specific application, as the fact to be a proven component mainly depends on the specific application.

$MTTF_d$ values for our products are part of the technical data within our catalogue.

$B10_d$, DC and CCF values depend on cycle time, running time and system design. Therefore they can only be provided application specific.

Position Paper Machinery Directive 2006/42/EG „safety components“

Parker Hannifin GmbH confirms, that our safety components comply with the machinery directive 2006/42/EC, as long as they are used as intended. The EC Declaration of conformity includes possible conformity to other directives as well.

Safety components are:

Pressure relief valves according to directive 97/23/EG

Type R4V*V , R4V*W
Type R6V*V, R6V*W
Type DSDU 578 P20E TÜV
Type DSDU 1078 E*E TÜV

Intended usage:

Pilot operated pressure relief valves to limit a maximum pressure, pre-adjusted unchangeable to this maximum pressure.
The intended usage is provided as long as the valves are integrated into the system as follows:

- P-port connected directly to the point where the pressure should be limited
- T-port connected directly to tank without any backpressure

Size of the valve and the pipes have to be matched to the maximum possible flow and pressure.

Clamping valves according to EN 201:1997

2-way-slip in cartridges	**Type C10-DEC 101-SC**
	Type C13-DEC 107-SC, C18-DEC 107-SC
Direct operated directional control valves NG6	**Type D1VW*-SC, D1DW*-SC;**
Direct operated directional control valves NG10	**Type D3W*-SC, D3DW*-SC**
Pilot operated directional control valves NG10	**Type D31DW*-SC**
Pilot operated directional control valves NG16	**Type D41VW*-SC**
Pilot operated directional control valves NG25	**Type D81VW*-SC, D91VW*-SC**

Intended usage:

For hydraulically operated clamping units of injection molding machines according to the manufacturer's declaration of incorporation.

Press controls according to DIN EN 693:2009

Press control NG06	**Type PADZ2780.3xx**
Press control NG10	**Type PADZ2781.3xx**
Press control NG16	**Type PADZ2782.3xx**
Press control NG25	**Type PADZ2783.3xx**
Press control NG50	**Type PADZ2784.3xx**

Intended usage:

To be incorporated into hydraulic presses according to DIN EN 693:2009.

Declaration of conformity is valid from 29.12.2009 for all new above listed products. For earlier delivered products conformity is not possible to declare.

The declaration of product conformity does not include a declaration of conformity for the machinery in which our product is incorporated. The conformity for the machinery only can be declared by the person who places the machinery on the market inside the EU for the first time.

If the listed components are incorporated in already used machinery (placed on the market before 1995) and if they do not change the function of this machinery significantly, the machinery must not be put into operation until the conformity of the machinery to national regulations, especially safety regulations, is declared.

If the function of the machinery is changed significantly, conformity to the machinery directive 2006/42/EC has to be declared.

A declaration of conformity according to machinery directive 2006/42/EC for other Parker products has to be proved depending on the special application.

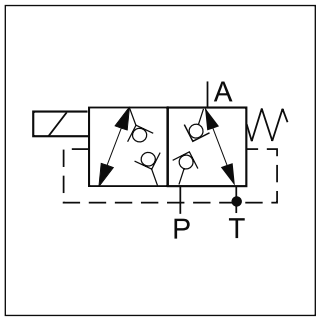
Notes

Notes

The directional valve type D1SE is equipped with a wet pin armature solenoid, drain free tapered poppet and compatible with the standards DIN NG06, CETOP 03, and NFPA D03. Due to the 3/2 way design, port A is either connected with P or discharged in the tank. The neutral position (solenoid not activated) is taken automatically by a return spring. This position remains until the solenoid is energized.

The valve poppet including activation lever and armature of the solenoid are located in the pressurized oil chamber of connection T. The valve poppet is designed such that there can be no differential area in its axial operational direction (opening, closing). Thus it is statically pressure-balanced so that the valve can be switched in both flow directions even under pressure.

The unit has an all-steel design, the important functional inner parts are hardened, the poppet and seat are grinded.



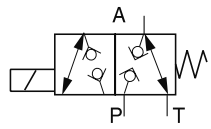
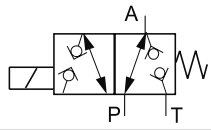
Technical data

General					
Design		Directional poppet valve			
Actuation		Solenoid			
Size		DIN NG6 / CETOP 03 / NFPA D03			
Mounting interface		DIN 24340 A6 / ISO 4401 / CETOP RP 121-H / NFPA D03			
Mounting position		Unrestricted			
Ambient temperature	[°C]	-25...+50, observe permissible duty cycle			
$MTTF_D$ value	[years]	150			
Weight	[kg]	1.5			
Hydraulic					
Max. operating pressure	[bar]	P, A, T: 350			
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525			
Fluid temperature	[°C]	-25 ... +70			
Viscosity permitted	[cSt] / [mm²/s]	10...500			
Viscosity recommended	[cSt] / [mm²/s]	30...80			
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)			
Flow max.	[l/min]	20			
Static / Dynamic					
Step response	[ms] [ms]	Energized: approx. 50 De-energized: approx. 60			
Electrical characteristics					
Duty ratio		See diagram			
Max. switching frequency	[1/h]	2000			
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
	Code	K	J	U	G
Supply voltage	[V]	12 V =	24 V =	98 V =	205 V =
Tolerance supply voltage	[%]	±10	±10	±10	±10
Current consumption	[A]	1.95	1.1	0.25	0.13
Power consumption	[W]	23.4	26.4	24.3	26.6
Solenoid connection		Connector as per EN 175301-803			
Wiring min.	[mm²]	3 x 1.5 recommended			
Wiring length max.	[m]	50 recommended			

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

2

D	1	S	E		B			W	
Directional control valve	**Size DIN NG06 CETOP 03 NPPA D03**	**Seat valve**	**Wet pin armature solenoid, flanged**	**Spool type**	**Style**	**Seals**	**Solenoid voltage**	**Connector as per EN 175301-803 without plug** [1]	**Design series** (not required for ordering)

Code	Spool type
30	
83	

Code	Seals
N	**NBR**
V	FPM

Code	Voltage
K	12V=
J	**24V=**
U [2]	98V=
G [2]	205V=

[2] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

[1] Please order plug separately.

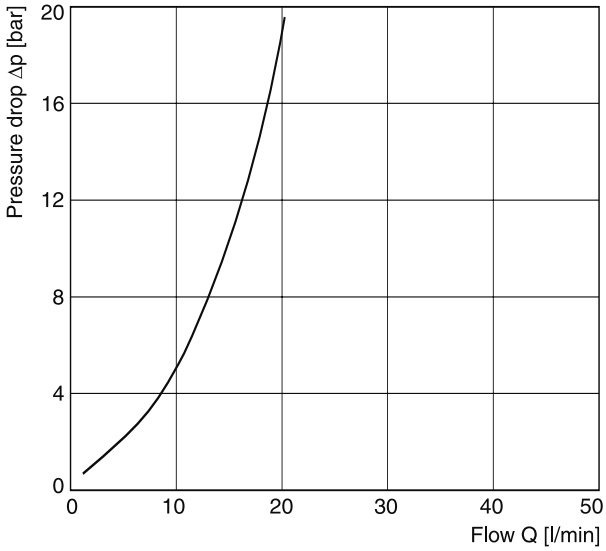
Bold letters =
Short-term availability

Solenoids for repair

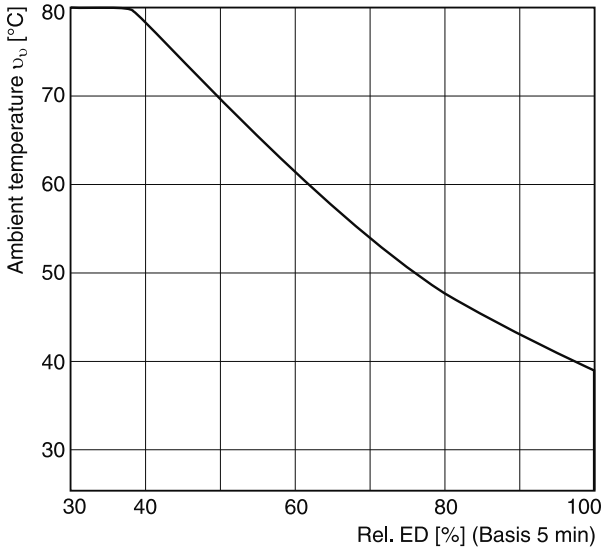
Voltage	Ordering code
12V=	7329700 - 12V
24V=	7329700 - 24V
98V=	7329700 - 98V
205V=	7329700 - 205V

2

Performance curve Δp-Q

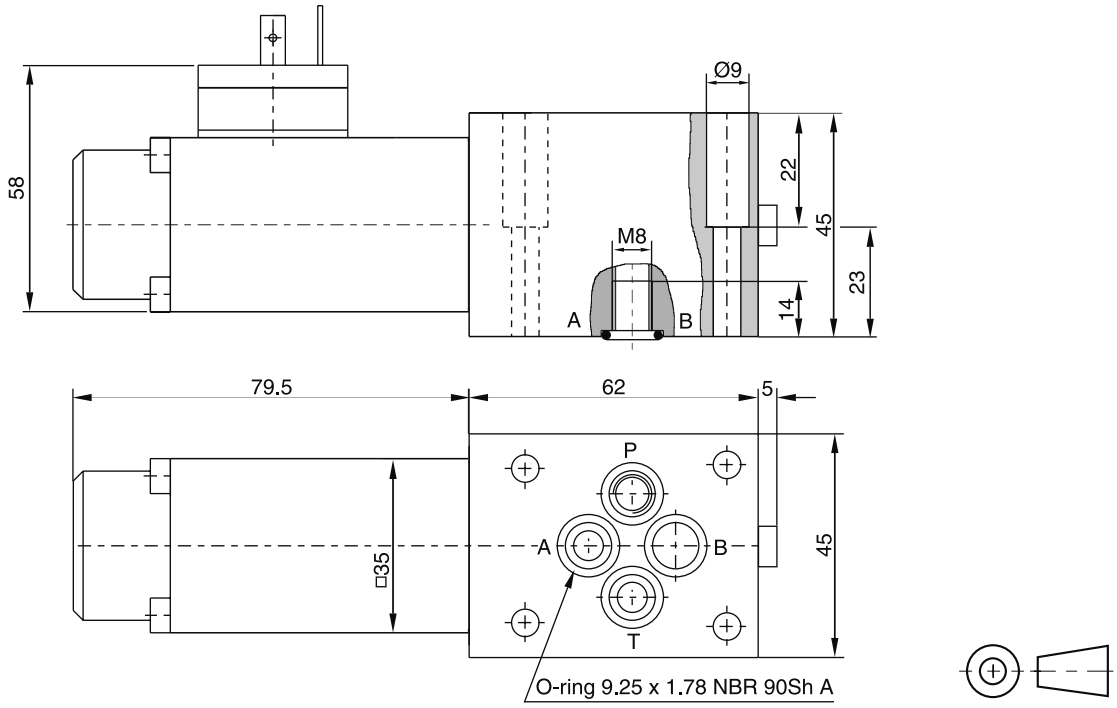


Duty cycle versus ambient temperature



All characteristic curves measured with HLP46 at 50°C.

Dimensions



Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	**NBR: SK-D1SE-70** FPM: DK-D1SE-V70

Subplates and manifolds see chapter 12.

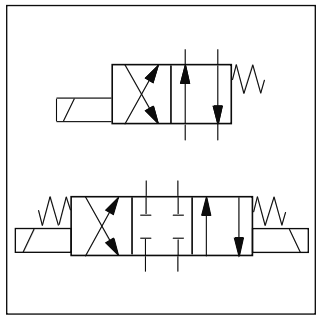
The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

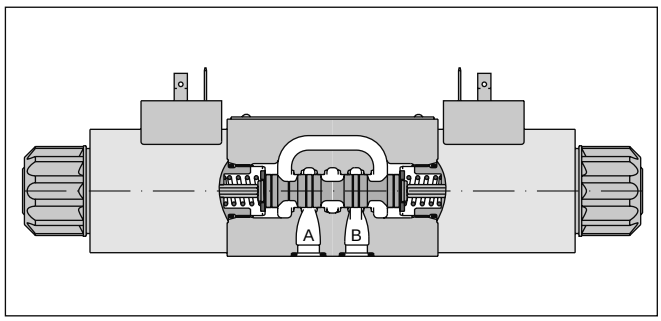
Notes

The NG06 directional control valve series D1VW provides high functional limits up to 80 l/min in combination with a very low, energy-saving pressure drop.

A wide variety of spool options allows to design an unlimited number of hydraulic circuits.

Versions with 8 watt coils, position control, Atex approval, surface protection and connector variants are shown in the following chapters.





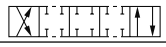
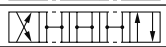
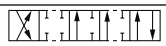
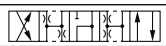
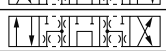
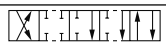
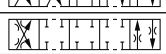
Technical data

General								
Design			Directional spool valve					
Actuation			Solenoid					
Nominal size			DIN NG06 / CETOP 03 / NFPA D03					
Mounting interface			DIN 24340 A6 / ISO 4401 / CETOP RP 121-H / NFPA D03					
Mounting position			unrestricted, preferably horizontal					
Ambient temperature		[°C]	-25...+50					
$MTTF_D$ value		[years]	150					
Weight		[kg]	1.5 (1 solenoid), 2.1 (2 solenoids)					
Hydraulic								
Max. operating pressure		[bar]	P, A, B: 350; T: 210 (DC), T: 140 (AC)					
Fluid			Hydraulic oil in accordance with DIN 51524 / 51525					
Fluid temperature		[°C]	-25 ... +70					
Viscosity permitted		[cSt] / [mm²/s]	2.8...400					
Viscosity recommended		[cSt] / [mm²/s]	30...80					
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Flow max.		[l/min]	80 (see shift limits)					
Leakage at 50 bar		[ml/min]	Up to 10 per flow path, depending on spool, up to 15 per flow path for spool type 008 + 009					
Static / Dynamic								
Step response			see table response time					
Electrical characteristics								
Duty ratio			100% ED; CAUTION: coil temperature up to 150 °C possible					
Max. switching frequency		[1/h]	15000 (not for soft shift)					
Protection class			IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)					
		Code	K	J	U	G	Y	T
Supply voltage		[V]	12 V =	24 V =	98 V =	205 V =	110V at 50Hz/ 120V at 60Hz	230V at 50Hz/ 240V at 60Hz
Tolerance supply voltage		[%]	±10	±10	±10	±10	±5	±5
Current consumption	hold	[A]	2.72	1.29	0.33	0.15	0.6 / 0.55	0.3 / 0.27
Current consumption	in rush	[A]	2.72	1.29	0.33	0.15	2.5 / 2.4	1.25 / 1.2
Power consumption	hold		32.7 W	31 W	31.9 W	30.2 W	70 / 70 VA	70 / 70 VA
Power consumption	in rush		32.7 W	31 W	31.9 W	30.2 W	280 / 290 VA	280 / 290 VA
Solenoid connection			Connector as per EN 175301-803, solenoid identification as per ISO 9461 (code W).					
Wiring min.		[mm²]	3 x 1.5 recommended					
Wiring length max.		[m]	50 recommended					

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

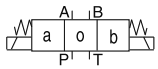
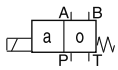
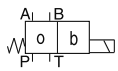
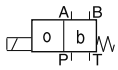
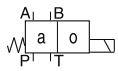
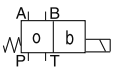
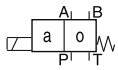
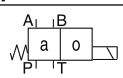
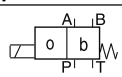
2

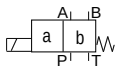
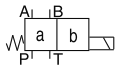
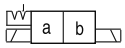
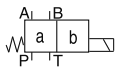
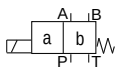
D	1	V	W		
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**3-chamber valve**	**Wet pin armature solenoid, threaded in tube**	**Spool type**	**Spool position**

3 position spools	
Code	Spool type a 0 b
001	
002	
003	
004	
005	
006	
007	
008 [1]	
009 [1]	
010	
011	
014	
015	
016	
021	
022	
031	
032	
034	
035	
061	
081	
082	
102	
204 [1]	
205 [1]	

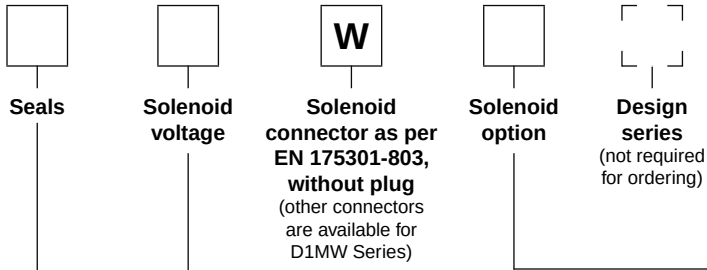
2 position spools	
Code	Spool type a b
020	
026	
030	
083 [1]	
101	
208	

[1] Consider specific spool position.

3 position spools			
Code	Spool position		
C			**3 positions.** **Spring offset in position “0“.** **Operated in position “a“ or “b“.**
	Standard	Spool type 008,009, 204, 205	
E	 **Operated in position “a“.**	 **Operated in position “b“.**	**2 positions.** **Spring offset in position “0“.**
F	 Spring offset in position “b“.	 Spring offset in position “a“.	2 positions. Operated in position “0“.
K	 **Operated in position “b“.**	 **Operated in position “a“.**	**2 positions.** **Spring offset in position “0“.**
M	 Spring offset in position “a“.	 Spring offset in position “b“.	2 positions. Operated in position “0“.

2 position spools			
Code	Spool position		
	Standard	Spool type 083	
B			**2 positions.** **Spring offset in position “b“.** **Operated in position “a“.**
D			**2 positions.** **Operated in position “a“ or “b“.** **No center or offset position.**
H			**2 positions.** **Spring offset in position “a“.** **Operated in position “b“.**

Bold letters =
Short-term availability



Code	Solenoid option
omit	**Standard solenoid with manual override**
T	without manual override
S2 [3]	Soft shift orifice size 0.5 mm.
S3 [3]	Soft shift orifice size 0.75 mm.
4N [3]	with lockable manual override

[3] DC only

Code	Voltage
K	**12V =**
J	**24V =**
U [2]	98V =
G [2]	205V =
Y	110V 50Hz / 120V 60Hz
T	230V 50Hz / 240V 60Hz

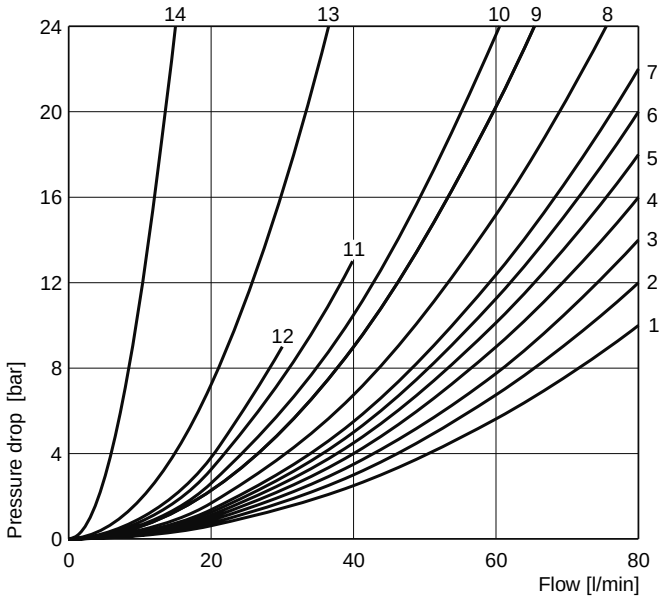
[2] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Seals
N	**NBR**
V	FPM

Further spool types, solenoid voltages and connectors on request.

2

Flow curve



All characteristic curves measured with HLP46 at 50°C.

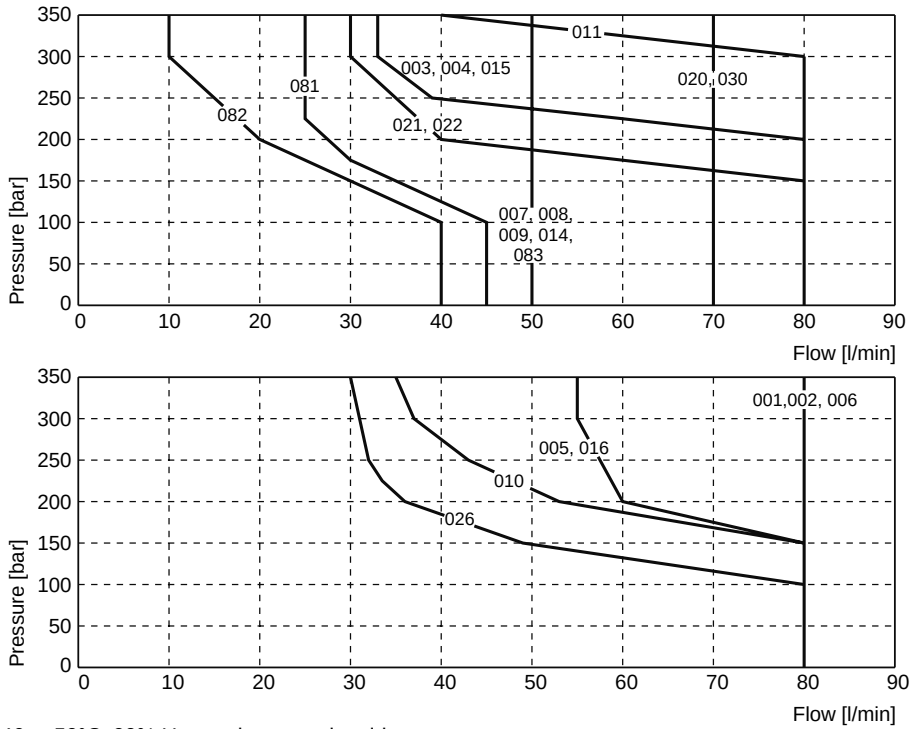
Spool	Position "b"			Position "a"			Position "0"				
	P-A	B-T	P-B	P-B	A-T	P-A	P-A	P-B	A-T	B-T	P-T
001	2	2		2	2						
002	1	4		1	4		1	1	5	5	2
003	3	4		3	6				7		
004	2	3		2	3				7	7	
005	2	2		2	2		12				
006	1	4		1	4		7	7			
007	3	2		2	2			3		2	7
010	3			3							
011	2	2		2	2				14	14	
014	3	2		2	2		3		2		7
015	3	6		3	4					7	
016	2	2		2	2			12			
020B	4	4		2	3						
026B	4			4							
030B	2	3		1	2						
034	4		8	3	3				5	7	
035	3	3		4		8			7	5	
081	13	13		13	13						
082	13	13		13	13				[1]	[1]	
101B	11	10		10	9						
102	1	4		1	4		5	5	8	8	6
61	1	3		1	3		3	2			
83H	5	2		5	2						
104	1			2	5		3		14		14
208	3			2							
	P-B	A-T		P-A	B-T		P-A	P-B	A-T	B-T	P-T
008	4	5		4	5						9
009	5	5		6	7						7
83B	5	2		5	2						
204	1	3		4	3		7		4		7
205	4	3		1	3			7		4	5

Spool	Position "b"			Position "a"		
	P-A	P-B	A-B	P-B	A-T	
021	2	4		4	2	
	P-A	B-T		P-A	P-B	A-B
022	6	2		5	2	
	2	2				
				2	2	

[1] Only for pressure compensation, no high flow possible.

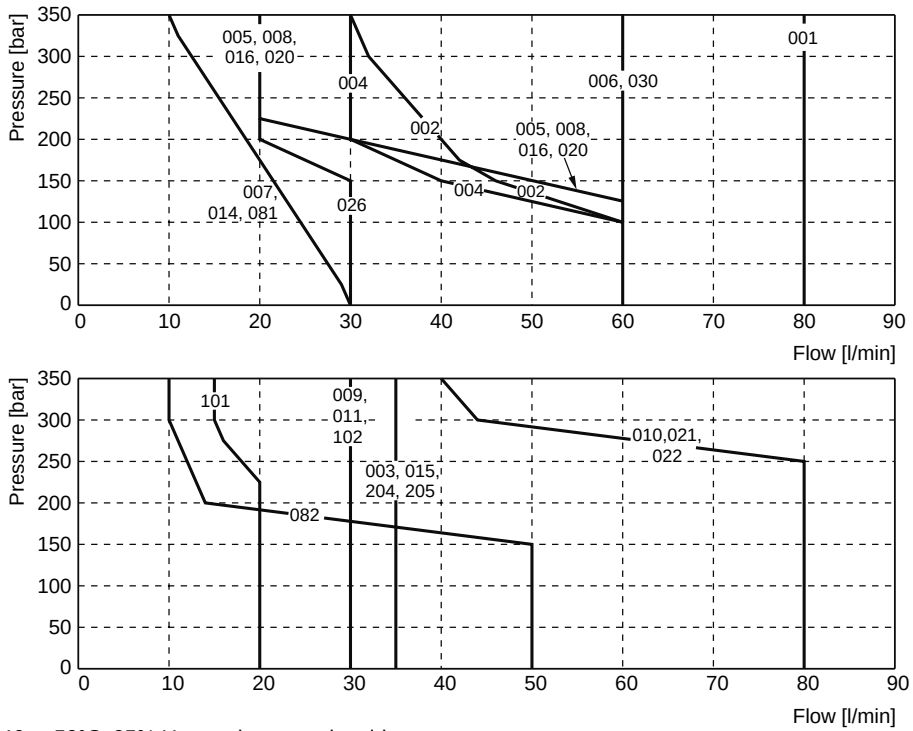
The diagram below specifies the shift limits for valves with DC solenoids. Valves with spool position “F” or “M” can only be operated up to 70% of the limits. The specifications apply to a viscosity of 40mm²/s and balanced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.

Valve with standard DC solenoid



Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids

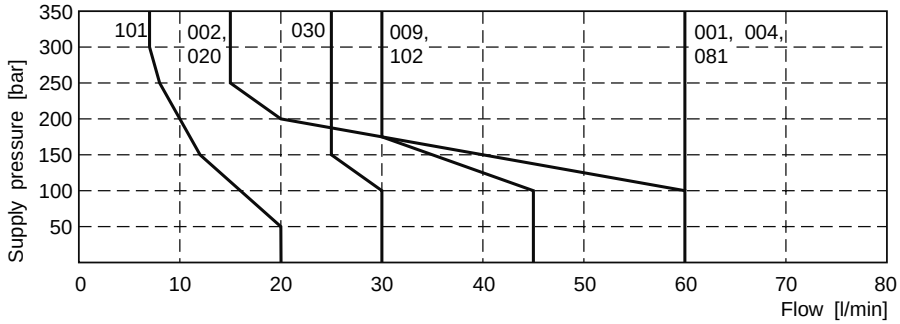
Valve with standard AC solenoid



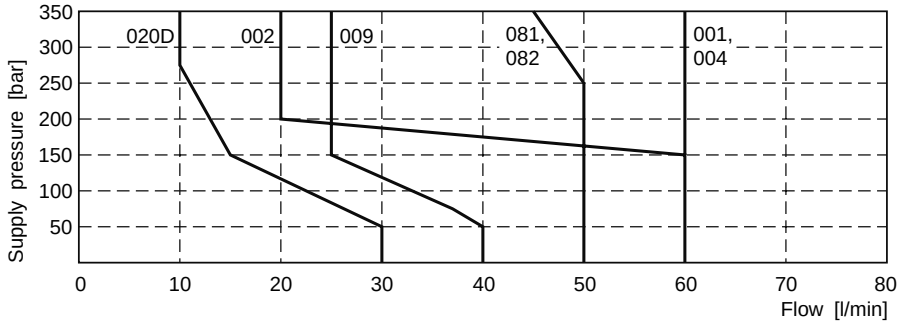
Measured with HLP46 at 50°C, 95% U_{nom} and warm solenoids

2

Shift limit diagram - Soft shift with 1 DC solenoid



Shift limit diagram - Soft shift with 2 DC solenoid



Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids

Response times D1VW Standard and Soft Shift

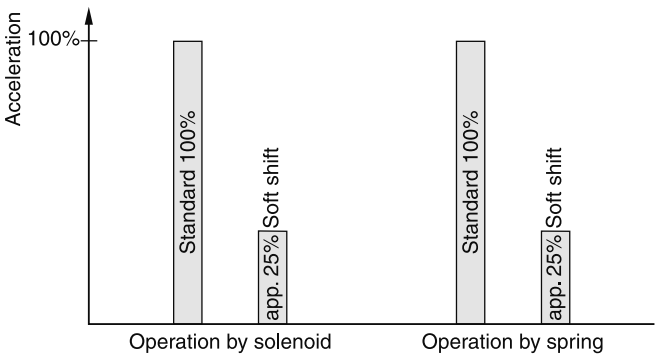
Standard solenoid	Orifice	Energize	De-energize
Standard DC	w/o	45 - 60	20 - 30
Standard AC	w/o	13	20
Standard DC with rectifier plug	w/o	60 -70	70- 90

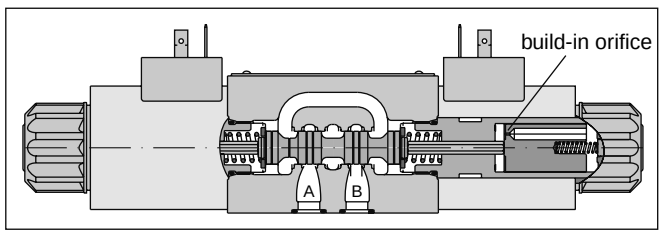
Response times Soft Shift	Orifice size	2 solenoid valve		2 solenoid valve		1 solenoid valve	
		3 positions		3 positions		2 positions	
Code		Center position: Closed		Center position: Open			
		Energize	De-energize	Energize	De-energize	Energize	De-energize
S2	0.50mm	200 - 750	310 - 650	220 - 400	350 - 750	90 - 350	160 - 500
S3	0.75mm	180 - 300	300 - 400	200 - 350	300 - 500	90 - 350	130 - 350

The lower value applies to small flow rates and low pressure, the upper value to high flow rates and high pressure

Step response times were obtained under the following conditions: HLP46 at 50°C with the valve operating at nominal pressure and flow. Published response times are nominal and may vary with spool, flow, pressure and temperature.

Acceleration for orifice size 0.75, code “S3” (measured against a standard valve)

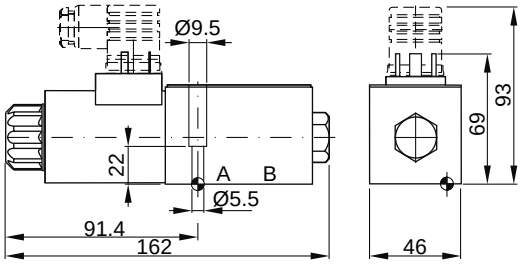




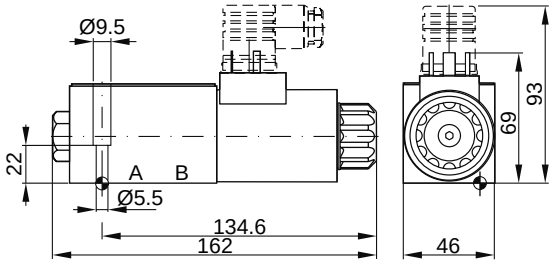
For even softer shifting, the proportional spools 081, 082, 101 and 102 can be used.

Interface EN 175301-803, DC solenoid

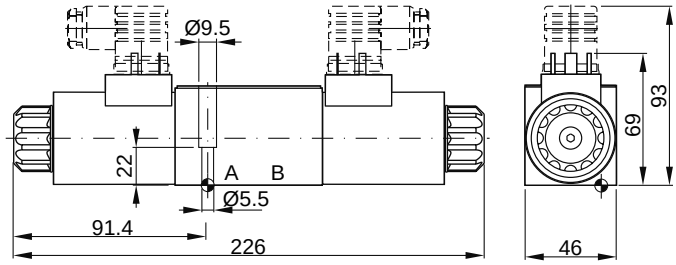
B, E, F -style



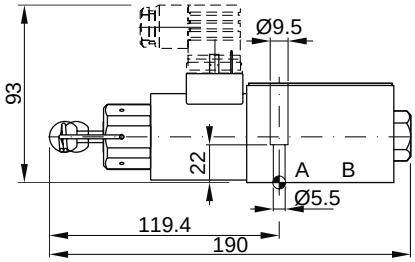
H, K, M -style



C, D -style

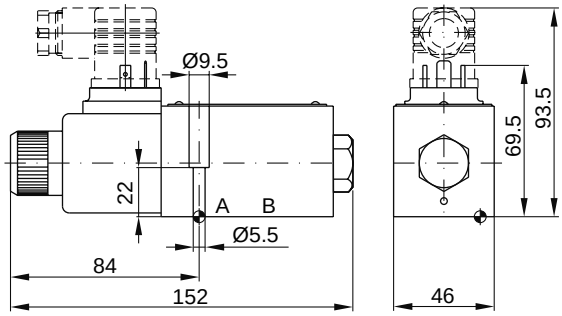


Option 4N, with lockable manual override (available for all styles, DC only)

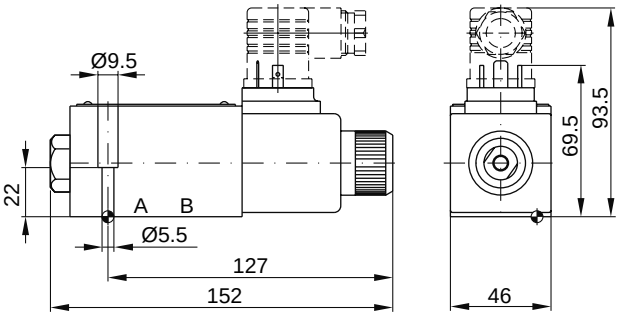


Interface EN 175301-803, AC solenoid

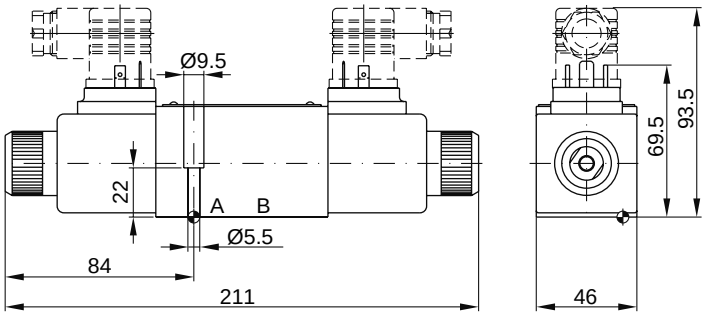
B, E, F -style



H, K, M -style



C, D -style



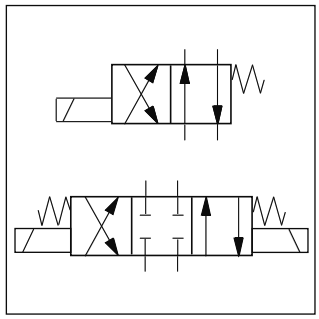
Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ ⏥ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	NBR: SK-D1VW-N-91 FPM: SK-D1VW-V-91

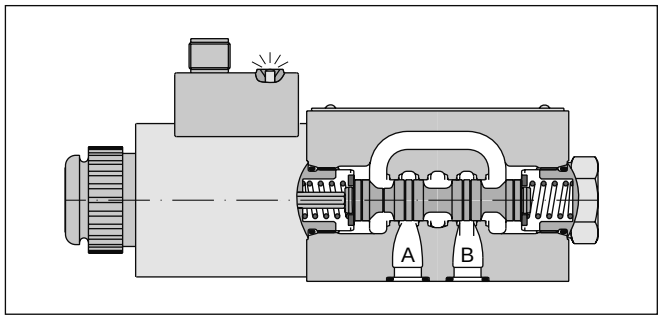
The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

D1VW UK.INDD RH 15.08.2011

Notes

The D1VW 8 Watt series is based on the standard D1VW design. The low watt, low current (<0.5 A) solenoid allows direct connection to a PLC or a bus knot. The valves are offered with standard solenoid connection (as per EN175301-803) and M12 x 1 connection. The version with M12 x 1 connection and LEDs are conform to the DESINA standard (**D**istribut**E**d and **S**tandardised **IN**st**A**l-lation technology) for machine tools and manufacturing systems.





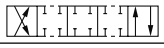
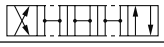
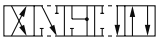
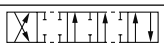
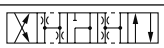
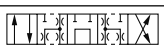
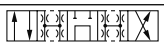
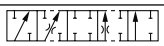
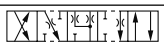
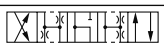
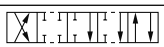
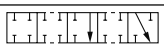
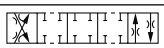
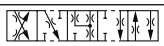
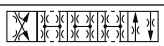
Technical data

General		
Design		Directional spool valve
Actuation		Solenoid
Size		DIN NG06 / CETOP 03 / NFPA D03
Mounting interface		DIN 24340 A6 / ISO 4401 / CETOP RP 121-H / NFPA D03
Mounting position		unrestricted, preferably horizontal
Ambient temperature	[°C]	-25...+50
$MTTF_D$ value	[years]	150
Weight	[kg]	1.5 (1 solenoid), 2.1 (2 solenoids)
Hydraulic		
Max. operating pressure	[bar]	P, A B: 350, T: 210
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525
Fluid temperature	[°C]	-25 ... +70
Viscosity permitted	[cSt] / [mm²/s]	2.8...400
Viscosity recommended	[cSt] / [mm²/s]	30...80
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)
Flow max.	[l/min]	60 (see shift limits)
Leakage at 50 bar	[ml/min]	Up to 10 per flow path, depending on spool
Static / Dynamic		
Step response at 95%	[ms]	Energized: 80...120; De-energized: 35...55
Electrical characteristics		
Duty ratio		100% ED; CAUTION: coil temperature up to 70 °C possible
Max. switching frequency	[1/h]	10000
Protection class		IP 65 in acc. with EN 60529, M12x1 IP67 (each with correctly mounted plug-in connector)
	Code	J
Supply voltage	[V]	24 V =
Tolerance supply voltage	[%]	±10
Current consumption	[A]	0.33
Power consumption	[W]	8
Solenoid connection		Connector as per EN 175301-803, solenoid identification as per ISO 9461 (code W). Plug M12x1 on coil as per IEC 61076-2-101 (code D).
Wiring min.	[mm²]	3 x 1.5 recommended
Wiring length max.	[m]	50 recommended

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

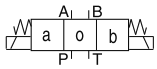
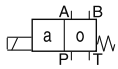
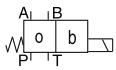
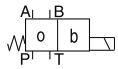
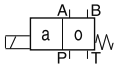
2

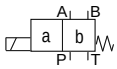
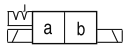
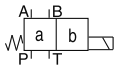
D	1	V	W		
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**3-chamber valve**	**Wet pin solenoid**	**Spool type**	**Spool position**

3 position spools	
Code	Spool type a 0 b
001	
002	
003	
004	
005	
006	
007	
008 [1]	
009 [1]	
010	
011	
014	
015	
016	
076	
078	
081	
082	
102	

2 position spools	
Code	Spool type a b
020	
026	
030	
101	

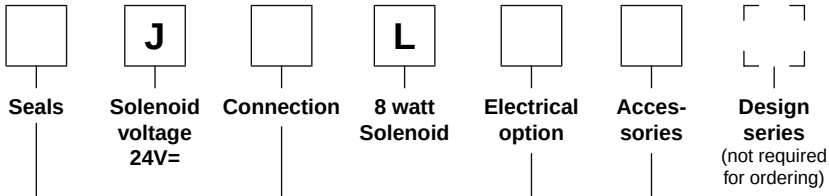
[1] Consider specific spool position.

3 position spools			
Code	all 3 position spools		
C			**3 positions.** **Spring offset in position “0“.** **Operated in position “a“ or “b“.**
	Standard	Spool type 008, 009	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.

2 position spools		
Code	Spool position	
B		**2 positions.** **Spring offset in position “b“.** **Operated in position “a“.**
D [2]		**2 positions.** **Operated in position “a“ or “b“.** **No center or offset position.**
H		**2 positions.** **Spring offset in position “a“.** **Operated in position “b“.**

[2] Only for spool 020 available.

Bold letters =
Short-term availability



Code	Accessories
omit	**Standard valve (in combination with solenoid connection "D" and "W")**
5	Only in combination with solenoid connection "D" and surge diode with LED "J"

Solenoid identification acc. to ISO 9461

Code	Electrical option
omit	**Standard valve (in combination with solenoid connection "D" and "W")**
J	Surge diode with LED, max. voltage peak 50V (only available in combination with solenoid connection "D")

Code	Connection
D [3]	M12x1 on coil as per IEC 61076-2-101
W [3]	**Connector as per EN 175301-803, without plug**

[3] Please order plug separately.

Code	Seals
N	**NBR**
V	FPM

Further spool types on request.

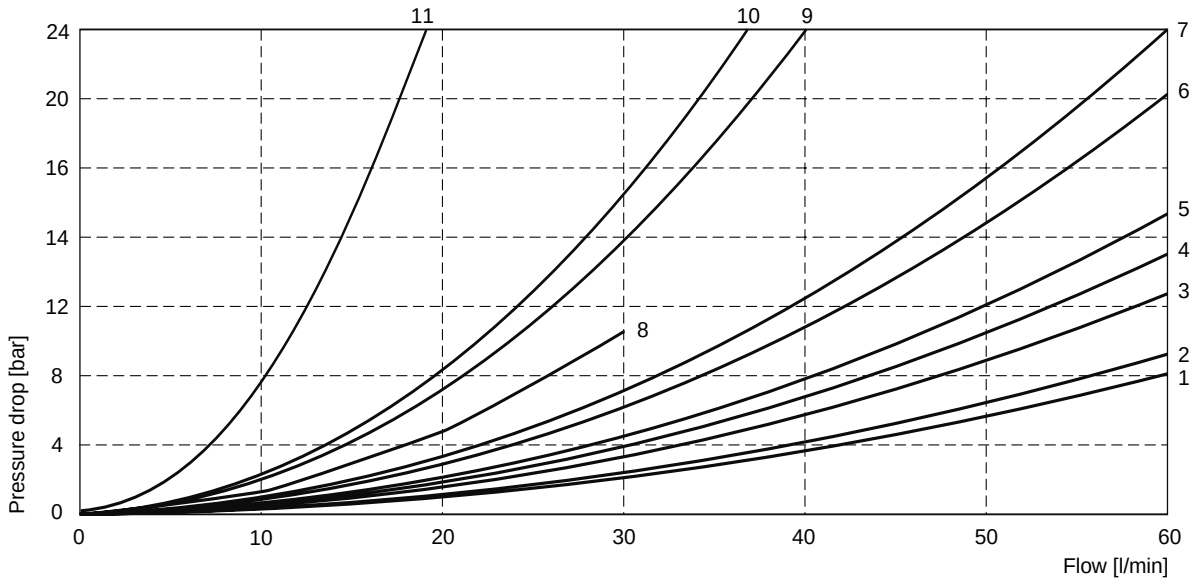
To get a DESINA valve, order the combination: JDLJ5

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

2

	Position „b“		Position „a“		Position „0“				
Spool	P ->A	B->T	P->B	A->T	P->A	P->B	A->T	B->T	P->T
001	3	3	3	3	–	–	–	–	–
002	3	4	3	4	1	1	3	3	1
003	4	4	4	5	–	–	4	–	–
004	3	4	3	4	–	–	4	4	–
005	3	3	3	3	8 (max. 30l)	–	–	–	–
006	3	4	3	4	4	4	–	–	–
007	4	3	3	3	–	2	–	1	4
010	4	–	4	–	–	–	–	–	–
011	3	3	3	3	–	–	11 (max. 25l)	11 (max. 25l)	–
014	4	3	3	3	2	–	1	–	4
015	4	5	4	4	–	–	–	4	–
016	3	3	3	3	–	8 (max. 30l)	–	–	–
020B	4	4	3	4	–	–	–	–	–
026B	4	–	4	–	–	–	–	–	–
030B	3	4	4	3	–	–	–	–	–
081	9	10	9	10	–	–	–	–	–
082	9	10	9	10	–	–	–	–	–
101B	4 (max. 40l)	7	7	6	–	–	–	–	–
102	3	4	3	4	3	3	5	5	3
	P->B	A->T	P->A	B->T	P->A	P->B	A->T	B->T	P->T
008	4	5	4	5	–	–	–	–	6
009	5	5	5	5	–	–	–	–	4

Flow curve diagram

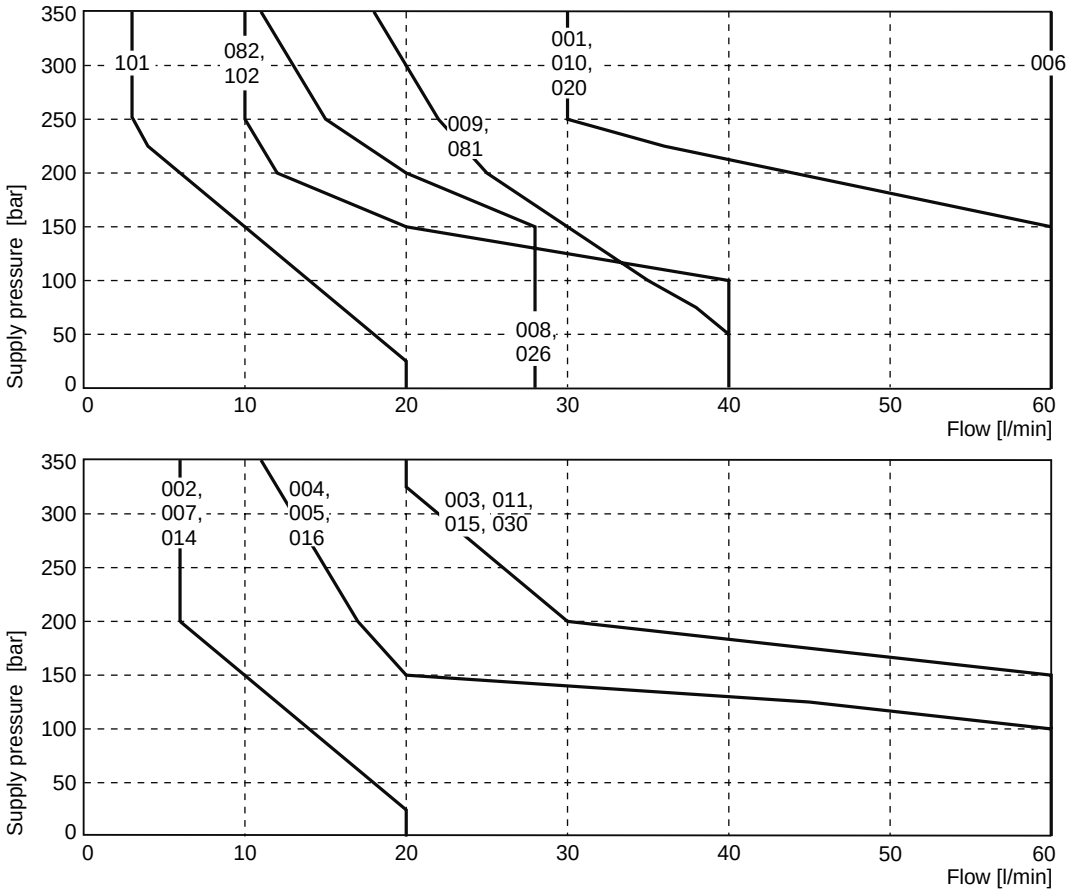


All characteristic curves measured with HLP46 at 50°C.

The diagram below specifies the shift limits. The specifications apply to balanced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions.

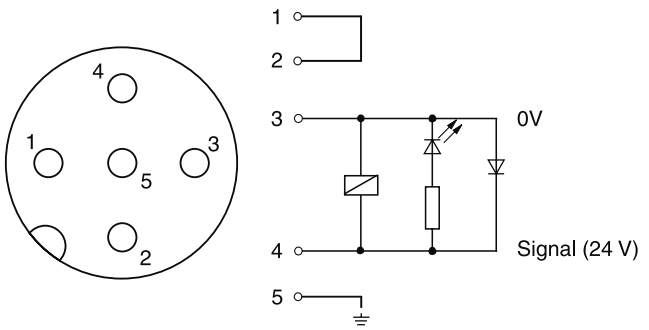
To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.

Shift limit

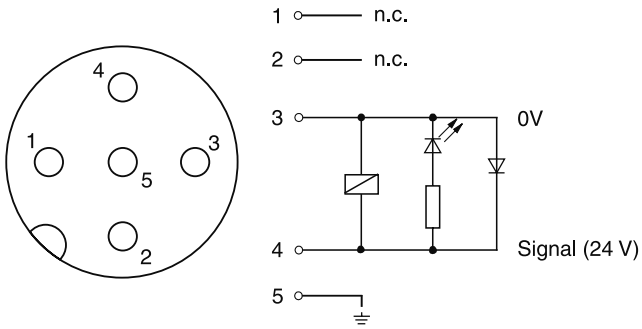


Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids

M12 pin assignment DESINA design (code „JDLJ5“), Pins 1 and 2 connected



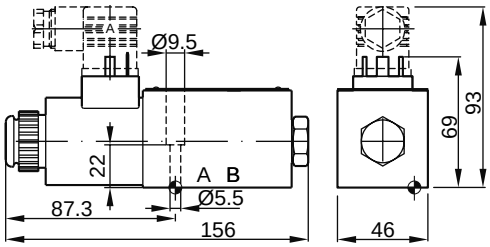
M12 pin assignment code “JDL“, Pins 1 and 2 not connected



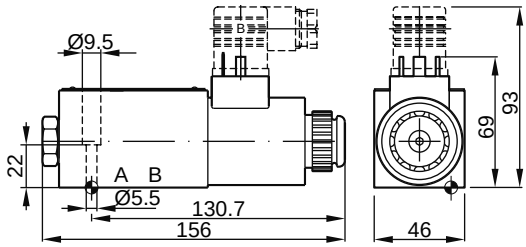
2

Interface EN 175301-803, DC solenoid, JWL

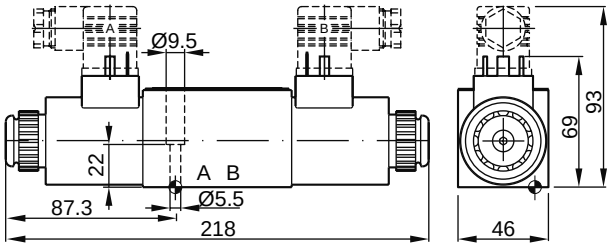
Style B, E



Style H, K

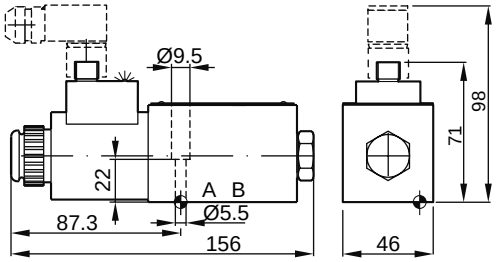


Style C, D

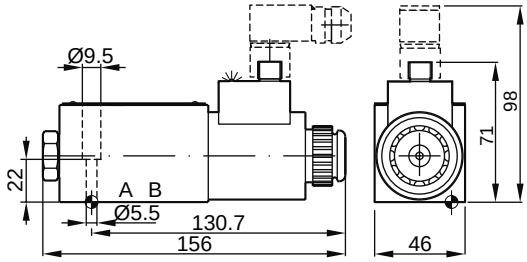


M12x1 connector, DC solenoid, JDLJ5 (DESINA) or JDL

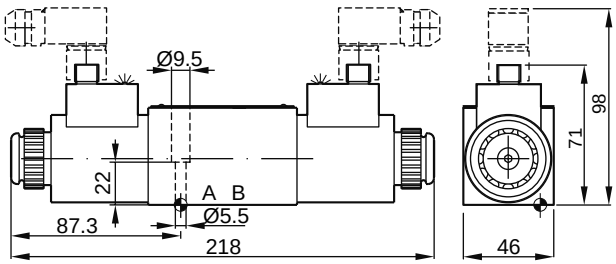
Style B, E



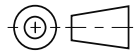
Style H, K



Style C, D



DESINA



Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ ⏥ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	**NBR: SK-D1VW-N-91** FPM: SK-D1VW-V-91

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

The direct operated directional valves with inductive position control are typically used in safety relevant applications. The start or end position can be monitored. The position control is available for single and double solenoid valves.

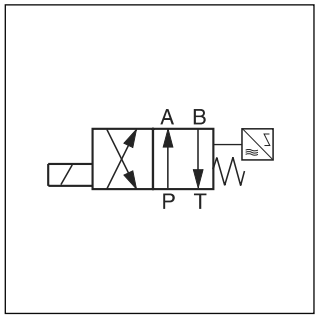
The fail-safe position of the directional valve during power failure is the spring offset or center position.

Please find detailed information on the machine directive in the position paper in chapter 1.

Attention

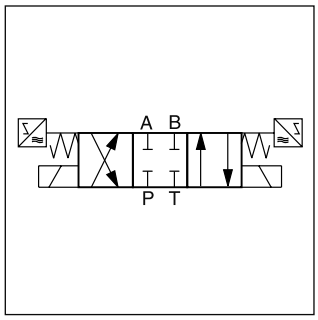
The adjustment of the position control is factory set and sealed. Replacement and repairs can only be undertaken by the manufacturer.

D1VW*B



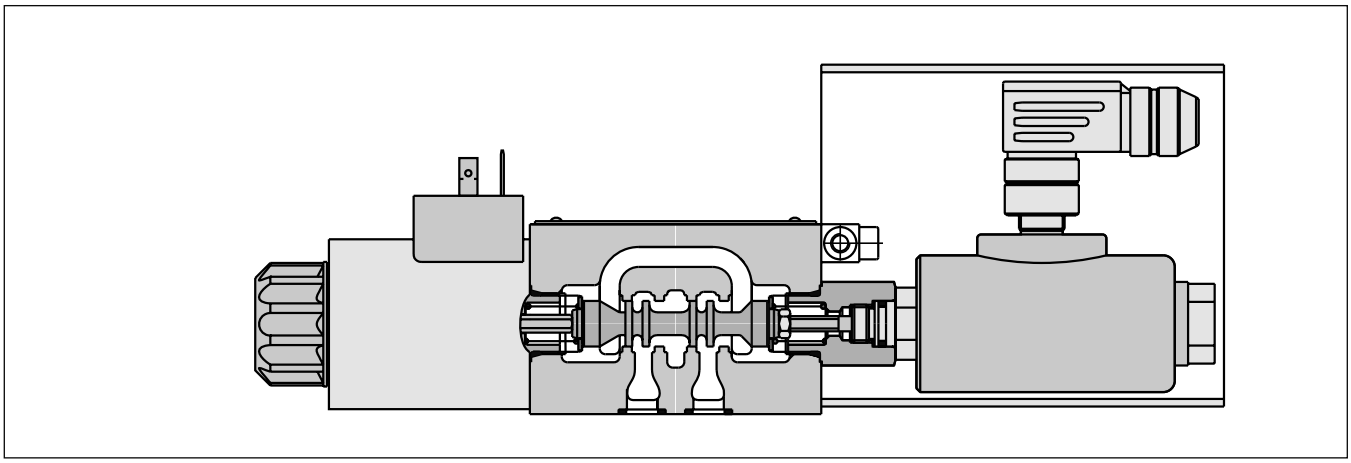
D1VW*B

D1VW*C

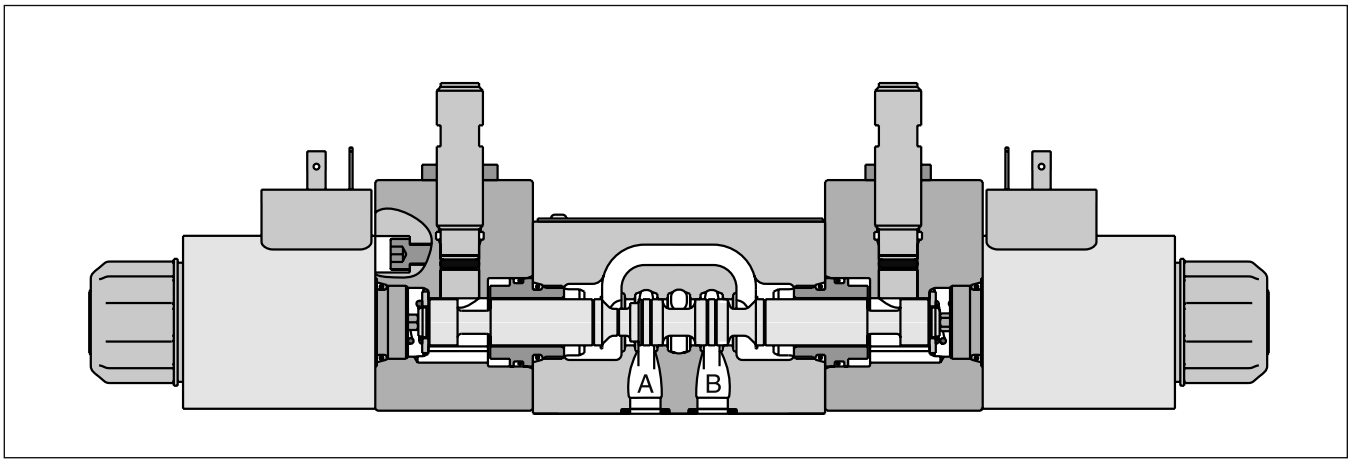


D1VW*C

D1VW*B

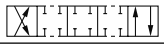
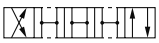
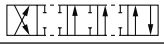
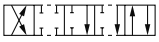
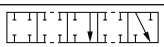


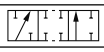
D1VW*C



2

D	1	V	W		
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**3-chamber valve**	**Wet pin solenoid**	**Spool type**	**Spool position**

3 position spools	
Code	Spool type
	a 0 b
001	
002	
003[1)2)]	
004	
005[1)]	
015[1)3)]	
016[1)]	
076[1)]	
078[1)]	

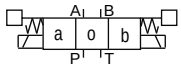
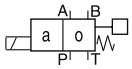
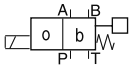
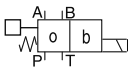
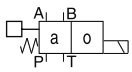
2 position spools	
Code	Spool type
	a b
020	
026[4)]	
030[4)]	

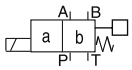
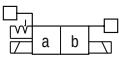
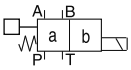
[1)] Spool types on request for spool position “C“.

[2)] Only available for spool position “E“ and “F“.

[3)] Only available for spool position “K“ and “M“.

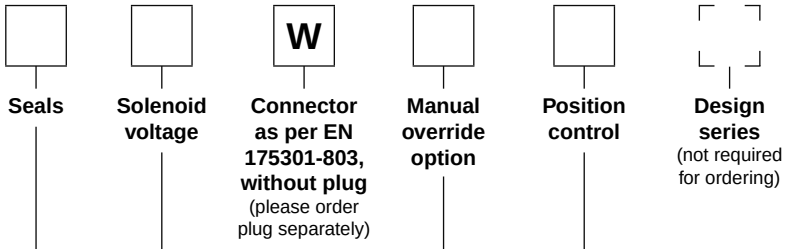
[4)] Only available for spool position “B“ and “H“.

3 position spools		
Code	Spool position	
C		3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.
E	 Operated in position “a“.	**2 positions.** **Spring offset in position “0“.**
F	 Spring offset in position “b“.	2 positions. Operated in position “0“.
K	 Operated in position “b“.	**2 positions.** **Spring offset in position “0“.**
M	 Spring offset in position “a“.	2 positions. Operated in position “0“.

2 position spools		
Code	Spool position	
B		**2 positions.** **Spring offset in position “b“.** **Operated in position “a“.**
D [5)]		**2 positions.** **Spring offset in position “a“.** **Operated in position “b“.**
H		**2 positions.** **Spring offset in position “a“.** **Operated in position “b“.**

[5)] Only for position control (code I3N)

Bold letters =
Short-term availability



Code	Position control	Spool position
I2N	End position monitored side B	E, F, B (Solenoid on a-side)
I5N[7)]	**Start position monitored side B**	
I1N	End position monitored side A	K, M, H (Solenoid on b-side)
I4N[7)]	**Start position monitored side A**	
I3N	End positions	C, D
I6N[7)]	Start positions	C

Code	Manual override
omit	**Standard valve with manual override**
T[7)]	without manual override

[7)] For hydraulic presses according to the safety regulations EN 693, solenoid option "T" (without manual override) and accessories "I4N", "I5N" or "I6N" (start position monitored) are required.

Code	Voltage
K	12V=
J	**24V=**
U[6)]	98V=
G[6)]	205V=

[6)] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Seals
N	**NBR**
V	FPM

Further spool types and voltages on request.

2

General					
Design		Directional spool valve			
Actuation		Solenoid			
Size		DIN NG06 / CETOP 03 / NFPA D03			
Mounting interface		DIN 24340 A6 / ISO 4401 / CETOP RP 121-H / NFPA D03			
Mounting position		unrestricted, preferably horizontal			
Ambient temperature	[°C]	0...+50			
$MTTF_D$ value	[years]	75			
Weight	[kg]	1.8 (1 solenoid) / 3.8 (2 solenoids)			
Hydraulic					
Max. operating pressure	[bar]	P, A B: 350 ; T: 210			
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525			
Fluid temperature	[°C]	-25 ... +70			
Viscosity permitted	[cSt] / [mm²/s]	2.8...400			
Viscosity recommended	[cSt] / [mm²/s]	30...80			
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)			
Flow max.	[l/min]	80 (see shift limits)			
Leakage at 50 bar	[ml/min]	Up to 10 per flow path, depending on spool			
Static / Dynamic					
Step response at 95%	[ms]	Energized: 32 ; De-energized: 40			
Electrical characteristics					
Duty ratio		100% ED; CAUTION: coil temperature up to 150 °C possible			
Max. switching frequency	[1/h]	15000			
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
	Code	K	J	U	G
Supply voltage	[V]	12 V =	24 V =	98 V =	205 V =
Tolerance supply voltage	[%]	±10	±10	±10	±10
Current consumption	[A]	2.72	1.29	0.33	0.15
Power consumption	[W]	32.7	31	31.9	30.2
Solenoid connection		Connector as per EN 175301-803, solenoid identification as per ISO 9461.			
Wiring min.	[mm²]	3 x 1.5 recommended			
Wiring length max.	[m]	50 recommended			

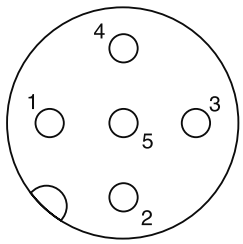
With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

Single solenoid valves

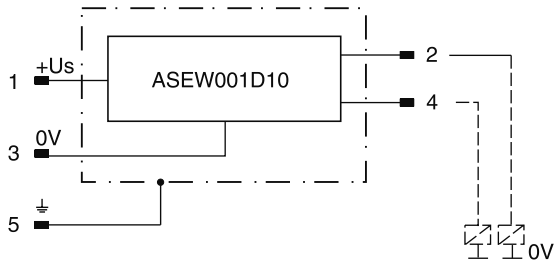
Electrical characteristics of position control as per IEC 61076-2-101 (M12x1)

Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Ambient temperature	[°C]	0...+50
Supply voltage Us / ripple	[V]	18...42 / 10%
Current consumption without load	[mA]	≤ 30
Max. output current per channel, ohmic	[mA]	400
Min. output load per channel, ohmic	[kOhm]	100
Max. output drop at 0.2A	[V]	≤ 1.1
Max. output drop at 0.4A	[V]	≤ 1.6
EMC		EN50081-1 / EN50082-2
Max. tolerance ambient field strength	[A/m]	<1200
Min. distance to next AC solenoid	[m]	>0.1
Interface		M12x1
Wiring min.	[mm²]	5 x 0.25 brad shield recommended
Wiring length max.	[m]	50 recommended

M12 pin assignment



1 Us 18...42V
2 Out B: normally open
3 0V
4 Out A: normally closed
5 Earth ground



Definitions

Start position monitored:

The valve is de-energized. The inductive switch gives a signal at the moment when the spool leaves the spring offset position (below 15% spool stroke).
At the switching point the spool is located within the closed position. It is secured that only the flow paths of the offset position are granted.

End position monitored:

The inductive switch gives a signal before the end position is reached (above 85% spool stroke).

The switch can only be located on the opposite side of the solenoid for direct operated valves.
Delivery includes plug M12 x 1 (see accessories, plug M12x1; order no.: 5004109).

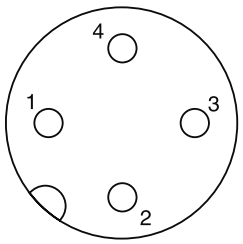
2

Double solenoid valves

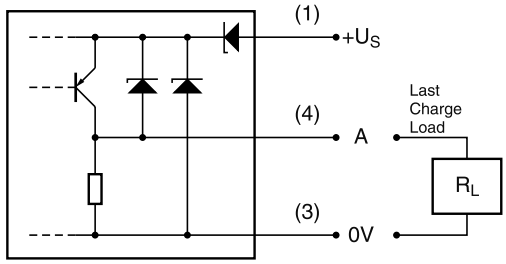
Electrical characteristics of position control as per IEC 61076-2-101 (M12x1)

Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Ambient temperature	[°C]	0...+50
Supply voltage Us / ripple	[V]	10...30 / ±10%
Current consumption without load	[mA]	≤ 10
Max. output current per channel, ohmic	[mA]	200
Min. output load per channel, ohmic	[kOhm]	100
Max. output drop at 0.2A	[V]	≤ 2
EMC		EN61000-6-4 / EN61000-6-2
Min. distance to next AC solenoid	[m]	>0.1
Interface		M12x1
Wiring min.	[mm²]	3 x 0.14 brad shield recommended
Wiring length max.	[m]	50 recommended

M12 pin assignment



1 Us 10...30V
2 not connected
3 0V
4 Out A: normally open



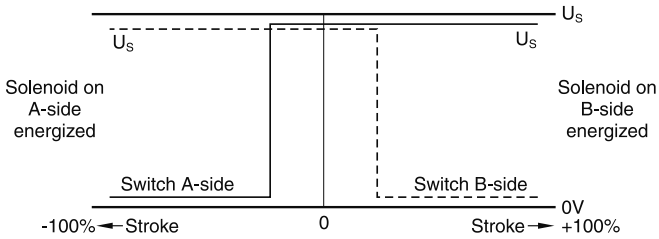
Definitions

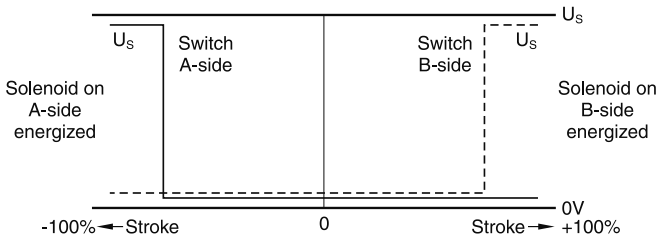
Start position monitored:

The valve is de-energized. The inductive switch gives a signal at the moment when the spool leaves the center position (below 15% spool stroke).
At the switching point the spool is located within the closed position. It is secured that only the flow paths of the offset position are granted.

End position monitored:

The inductive switch gives a signal before the end position is reached (above 85% spool stroke).



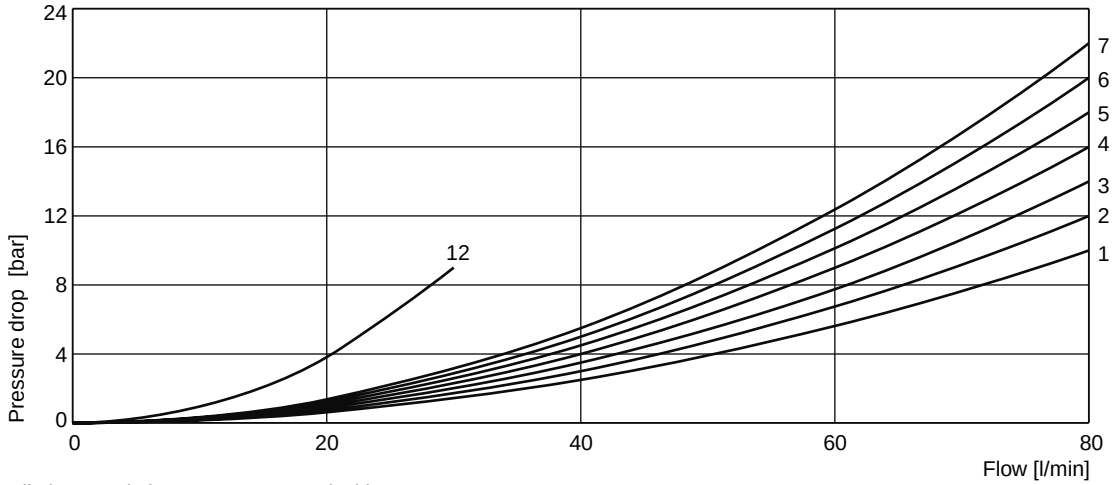


Please order plug M12 x 1 separately. Straight plug recommended – no defined position possible for angled plug.

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

Spool	Position „b“		Position „a“		Position „0“				
	P->A	B->T	P->B	A->T	P->A	P->B	A->T	B->T	P->T
001	2	2	2	2	–	–	–	–	–
002	1	4	1	4	1	1	5	5	2
003	3	4	3	6	–	–	7	–	–
004	2	3	2	3	–	–	7	7	–
005	2	2	2	2	12	–	–	–	–
015	3	6	3	4	–	–	–	7	–
016	2	2	2	2	–	12	–	–	–
020 B	4	4	2	3	–	–	–	–	–
026 B	4	–	4	–	–	–	–	–	–
030 B	2	3	1	2	–	–	–	–	–

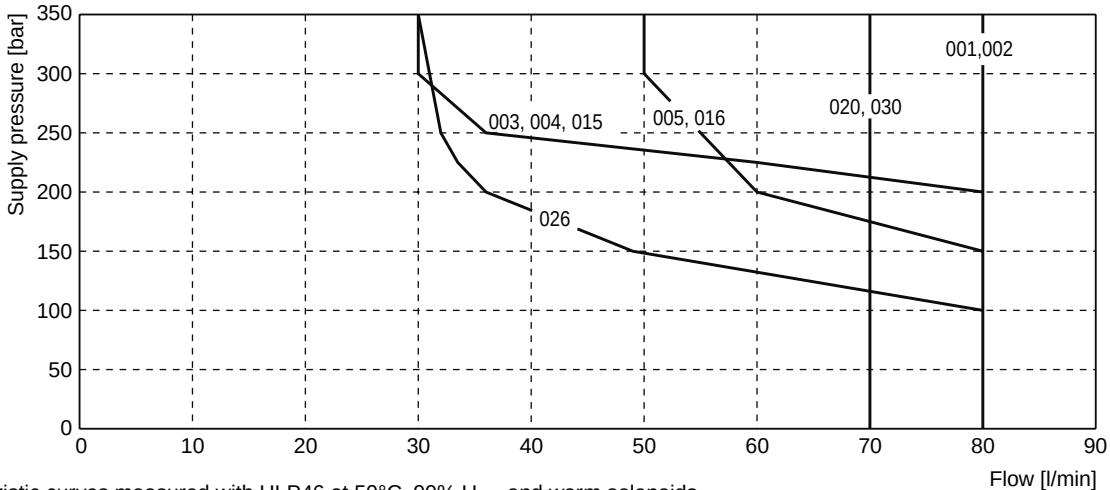
Flow curve diagram



All characteristic curves measured with HLP46 at 50°C.

Shift limit diagram

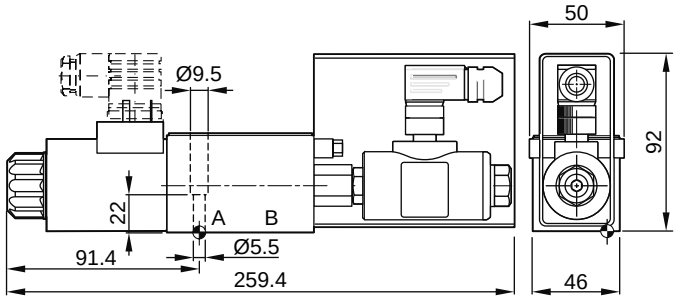
The diagram below specifies the shift limits. Valves with spool position “F” or “M” can only be operated up to 70% of the limits. The specifications apply to balanced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.



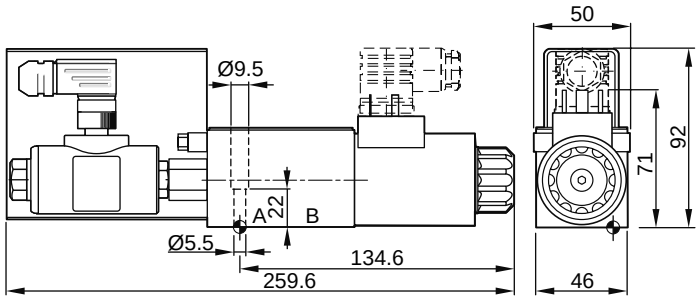
All characteristic curves measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids

2

Interface EN 175301-803, DC solenoid, with plug M12x1[1)]
B, E, F -style

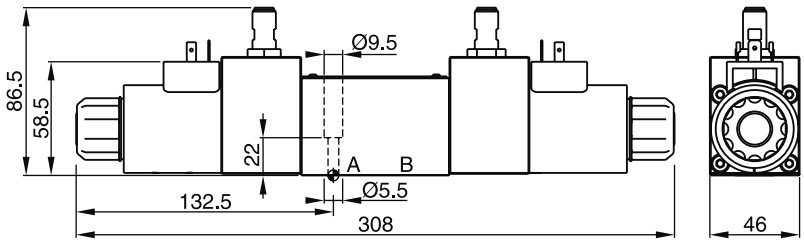


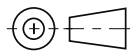
H, K, M -style



[1)] Delivery includes plug M12 x 1 (see accessories, plug M12x1; order no.: 5004109).

Interface EN 175301-803, DC solenoid, without plug M12x1[2)]
C -style





[2)] Please order plug M12 x 1 separately. Straight plug recommended – no defined position possible for angled plug.

Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ ⏥ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	**NBR: SK-D1VW-N-91** FPM: SK-D1VW-V-91

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

Attention

The adjustment of the position control is factory set and sealed. Replacement and repairs can only be undertaken by the manufacturer.

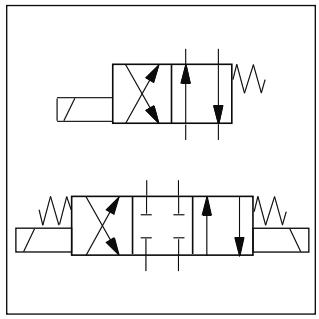
The D1VW with explosion proof solenoids is based on the standard D1VW series. The specific solenoid design allows the useage in hazardous environments.

The explosion proof class is

CE ⟨Ex⟩ II 2 G
Ex mbe II T4

for use in zone 1 (conform to ATEX).

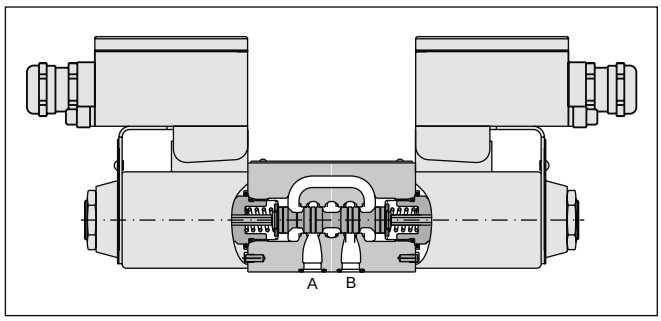
All explosion proof solenoids are DC design. The valves for AC operate with integrated rectifier.



Further ATEX conform valves please refer to catalogue HY11-3343.

Download:

www.parker.com/euro_hcd - see “Literature”



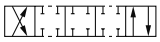
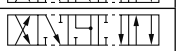
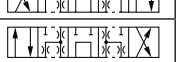
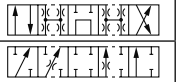
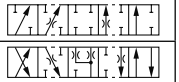
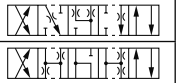
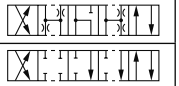
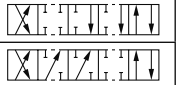
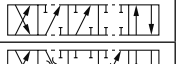
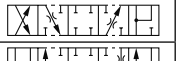
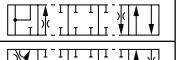
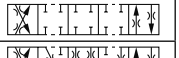
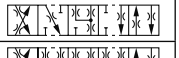
Technical data

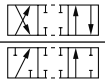
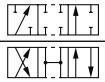
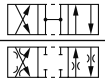
General				
Design		Directional spool valve		
Actuation		Solenoid		
Size		DIN NG06 / CETOP 03 / NFPA D03		
Mounting interface		DIN 24340 A6 / ISO 4401 / CETOP RP 121-H / NFPA D03		
Mounting position		unrestricted, preferably horizontal		
Ambient temperature	[°C]	-25...+60		
$MTTF_D$	[years]	150		
Weight	[kg]	1.8 (1 solenoid), 2.7 (2 solenoids)		
Hydraulic				
Max. operating pressure	[bar]	P, A B: 350 T: 140		
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525		
Fluid temperature	[°C]	-25 ... +60		
Viscosity permitted	[cSt] / [mm²/s]	2.8...400		
Viscosity recommended	[cSt] / [mm²/s]	30...80		
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)		
Flow max.	[l/min]	60 (see shift limits)		
Leakage at 50 bar	[ml/min]	Up to 10 per flow path, depending on spool		
Static / Dynamic				
Step response at 95%	[ms]	Energized: 32 (DC), 40 (AC) De-energized: 40 (DC), 75 (AC)		
Electrical characteristics				
Duty ratio		100% ED; CAUTION: coil temperature up to 135 °C possible		
Max. switching frequency	[1/h]	15000 (DC), 7200 (AC)		
Protection class		CE ⟨Ex⟩ II 2 G , Ex mbe II T4, IP66 (with correctly mounted plug-in connector)		
	Code	J	P	N
Supply voltage / ripple	[V]	24 V =	110/50Hz	230/50Hz
Tolerance supply voltage	[%]	-10	-5	-5
Current consumption	[A]	1.25	0.31	0.15
Power consumption	[W]	30	30	30
Solenoid connection		Box with M20x1.5 entry for cable glands. Solenoid identification as per ISO 9461.		
Wiring min.	[mm²]	3 x 1.5 recommended		
Wiring length max.	[m]	50 recommended		

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

2

D	1	V	W					E	E	
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**3-chamber valve**	**Wet pin solenoid**	**Spool type**	**Spool position**	**Seals**	**Solenoid voltage**	**Connection: Explosion proof with cable glands**	**Solenoid options: Explosion proof Ex mbe II**	**Design series** (not required for ordering)

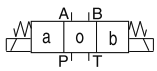
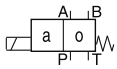
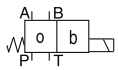
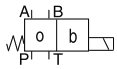
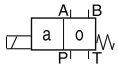
3 position spools		
Code	Spool type	
	a 0 b	
001		
002		
003		
004		
005		
006		
007		
008 [1]		
009 [1]		
010		
011		
014		
015		
016		
021		
022		
081		
082		
102		

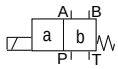
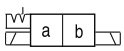
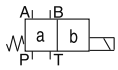
2 position spools	
Code	Spool type
	a b
020	
026	
030	
101	

[1] Consider specific spool position.

Code	Voltage
J	24V=
P	110V 50Hz
N	230V 50Hz

Code	Seals
N	NBR
V	FPM

3 position spools			
Code	all 3 position spools		
C			3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.
	Standard	Spool type 008, 009	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.

2 position spools		
Code	Spool position	
B		2 positions. Spring offset in position “b“. Operated in position “a“.
D		2 positions. Operated in position “a“ or “b“. No center or offset position.
H		2 positions. Spring offset in position “a“. Operated in position “b“.

Further spool types, styles,
and combinations on request.

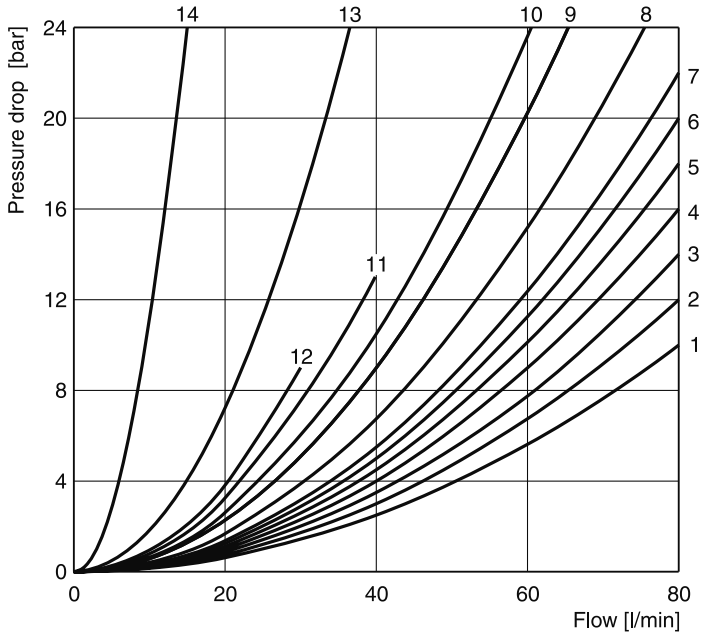
The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

Spool	Position "b"			Position "a"			Position "0"				
	P-A	B-T	P-B	P-B	A-T	P-A	P-A	P-B	A-T	B-T	P-T
001	2	2		2	2						
002	1	4		1	4		1	1	5	5	2
003	3	4		3	6				7		
004	2	3		2	3				7	7	
005	2	2		2	2		12				
006	1	4		1	4		7	7			
007	3	2		2	2			3		2	7
010	3			3							
011	2	2		2	2				14	14	
014	3	2		2	2		3		2		7
015	3	6		3	4					7	
016	2	2		2	2			12			
020B	4	4		2	3						
026B	4			4							
030B	2	3		1	2						
081	13	13		13	13						
082	13	13		13	13				[1]	[1]	
101B	11	10		10	9						
102	1	4		1	4		5	5	8	8	6
	P-B	A-T		P-A	B-T		P-A	P-B	A-T	B-T	P-T
008	4	5		4	5						9
009	5	5		6	7						7

Spool	Position "b"			Position "a"		
	P-A	P-B	A-B	P-B	A-T	
021	2	4		4	2	
	P-A	B-T		P-A	P-B	A-B
022	6	2		5	2	

[1] Only for pressure compensation, no high flow possible.

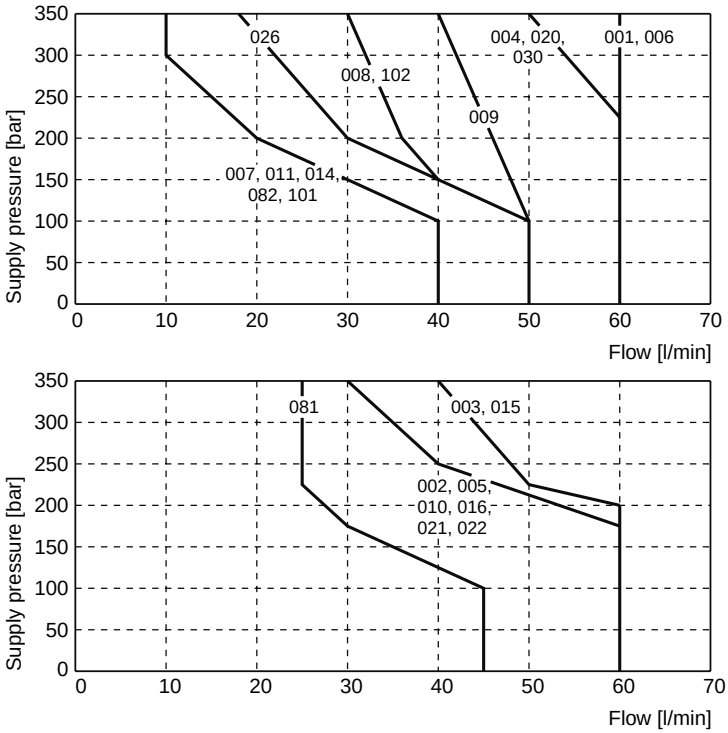
Flow curve diagram



All characteristic curves measured with HLP46 at 50°C.

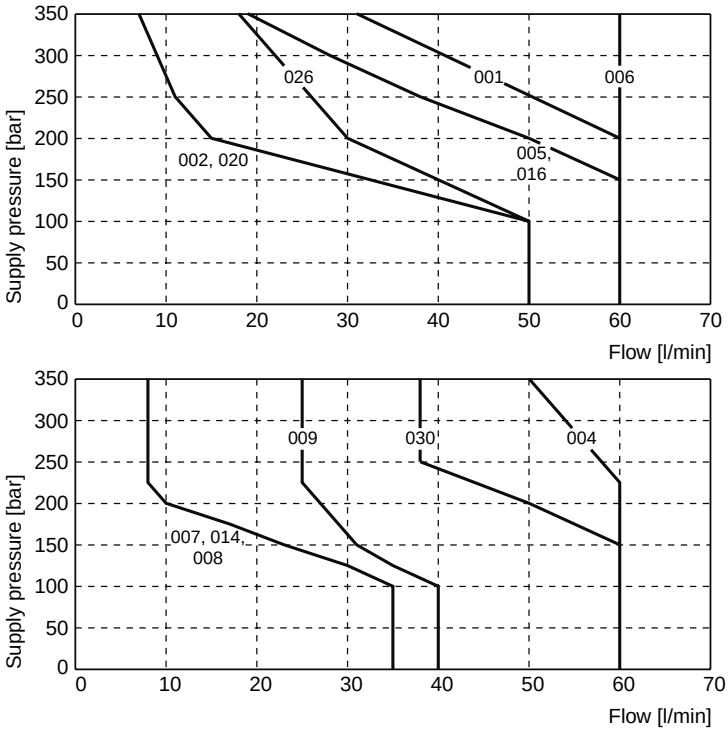
The diagram below specifies the shift limits for valves with AC and DC solenoids. The specifications apply to balanced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.

Shift limit diagram with DC solenoid



Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids

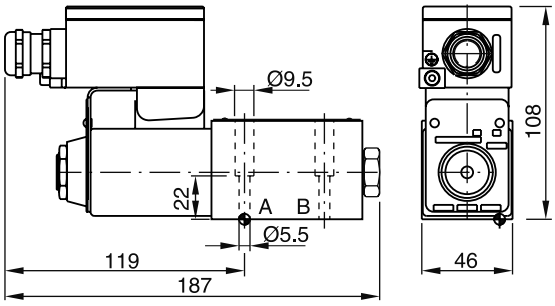
Shift limit diagram with AC solenoid



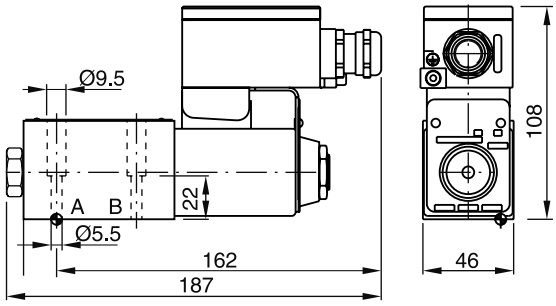
Measured with HLP46 at 50°C, 95% U_{nom} and warm solenoids

Dimensions

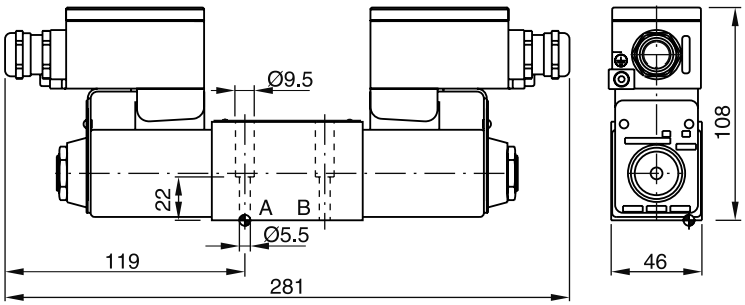
B, E -style

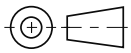


H, K -style



C, D -style

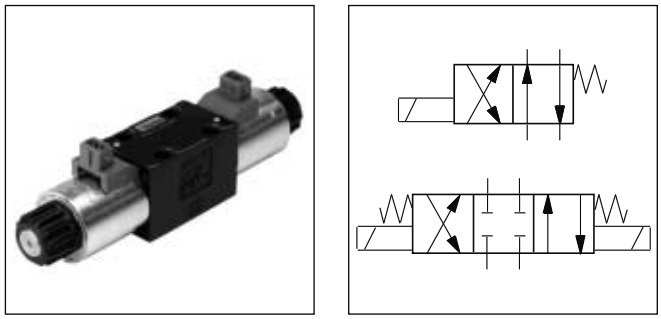




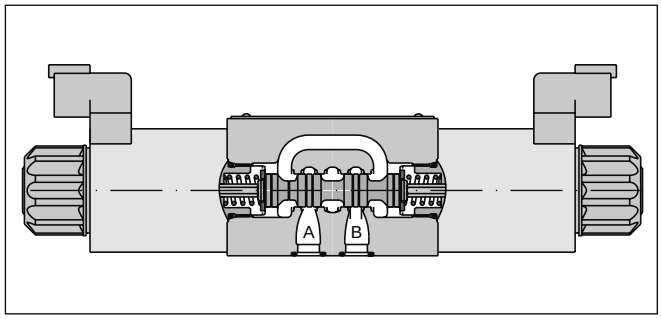
Surface finish	Kit			Kit NBR
$\sqrt{R_{max}6.3}$ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	**NBR: SK-D1VW-N-91** FPM: SK-D1VW-V-91

Notes

The D1MW is based on the D1VW series of directional control valves size NG06, but offers additional corrosion protection of the valve body, the solenoid coil and the anchor tube as well as the typical solenoid connections for the mobile market such as AMP Junior Timer and DT04-2P “Deutsch”.



With AMP Junior Timer



Connector DT04-2P “Deutsch”

Technical features

- High corrosion protection (optional)
- Solenoid connection:
  - Standard (as per EN175301-803)
  - AMP Junior Timer
  - DT04-2P “Deutsch”
- Robust design for rough applications
- Extended manual override with rubber cover (optional)

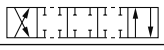
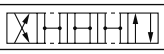
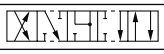
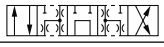
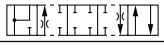
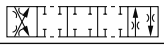
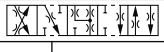
Technical data

General			
Design		Directional spool valve	
Actuation		Solenoid	
Size		DIN NG06 / CETOP 03 / NFPA D03	
Mounting interface		DIN 24340 A6 / ISO 4401 / CETOP RP 121-H / NFPA D03	
Mounting position		Unrestricted, preferably horizontal	
Ambient temperature	[°C]	-25...+50	
$MTTF_D$ value	[years]	150	
Weight	[kg]	1.5 (1 solenoid), 2.1 (2 solenoids)	
Hydraulic			
Max. operating pressure	[bar]	P, A B: 350; T: 210	
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525	
Fluid temperature	[°C]	-25 ... +70	
Viscosity permitted	[cSt] / [mm²/s]	2.8...400	
Viscosity recommended	[cSt] / [mm²/s]	30...80	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)	
Flow max.	[l/min]	80 (see shift limits)	
Leakage at 50 bar	[ml/min]	Up to 10 per flow path, depending on spool	
Static / Dynamic			
Step response at 95%	[ms]	Energized: 32 De-energized: 40	
Electrical characteristics			
Duty ratio		100% ED; CAUTION: coil temperature up to 150 °C possible	
Max. switching frequency	[1/h]	15000	
Protection class		Standard (as per EN175301-803) IP65 in acc. with EN60529 (with correctly mounted plug-in connector) AMP Junior Timer IP67 in acc. with EN60529 (with correctly mounted plug-in connector) DT04-2P “Deutsch” IP69K (with correctly mounted plug-in connector)	
	Code	K	J
Supply voltage	[V]	12 V =	24 V =
Tolerance supply voltage	[%]	±10	±10
Current consumption hold	[A]	2.72	1.29
Power consumption hold	[W]	32.7	31
Solenoid connection		Connector as per EN 175301-803 (code W), AMP Junior Timer (code A), DT04-2P “Deutsch“ connector (code J). Solenoid identification as per ISO 9461.	
Wiring min.	[mm²]	3 x 1.5 recommended	
Wiring length max.	[m]	50 recommended	

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

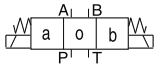
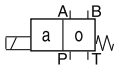
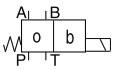
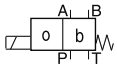
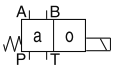
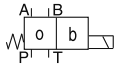
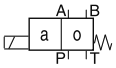
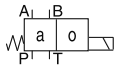
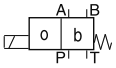
2

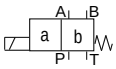
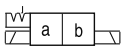
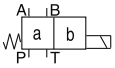
D	1	M	W		
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**3-chamber valve for mobile and marine applications**	**Wet pin armature solenoid, threaded in tube**	**Spool type**	**Spool position**

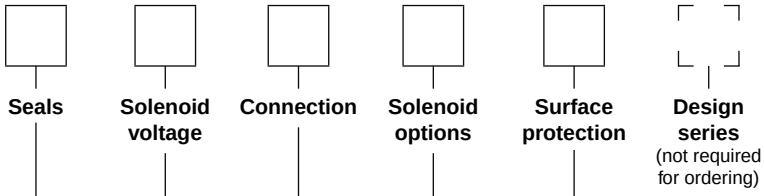
3 position spools	
Code	Spool type
	a 0 b
001	
002	
004	
006	
008 [1]	
011	
021	
022	
081	
082	

2 position spools	
Code	Spool type
	a b
020	
030	

[1] Consider specific spool position.

3 position spools			
Code	all 3 position spools		
C			3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.
	Standard	Spool type 008	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
F	 Spring offset in position “b“.	 Spring offset in position “a“.	2 positions. Operated in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.
M	 Spring offset in position “a“.	 Spring offset in position “b“.	2 positions. Operated in position “0“.

2 position spools		
Code	Spool position	
B		2 positions. Spring offset in position “b“. Operated in position “a“.
D		2 positions. Operated in position “a“ or “b“. No center or offset position.
H		2 positions. Spring offset in position “a“. Operated in position “b“.



Code	Surface protection
omit	Standard, only for connection “J“ and “A“
1P [3]	Anti corrosion coating acc. to DIN 50021SS, 200h for extreme conditions. For all connection options

[3] Only in combination with connection “J” and “W”

Code	Solenoid option
omit	Standard solenoid
T	without manual override
W	extended manual override with rubber cover

Code	Connection
W [2]	Connector as per EN 175301-803
J [2]	Connector DT04-2P “Deutsch“
A [2]	2-pin AMP Junior Timer

[2] Please order plug separately.

Code	Solenoid voltage
K	12V =
J	24V =

Code	Seals
N	NBR
V	FPM

Other spool types on request.

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

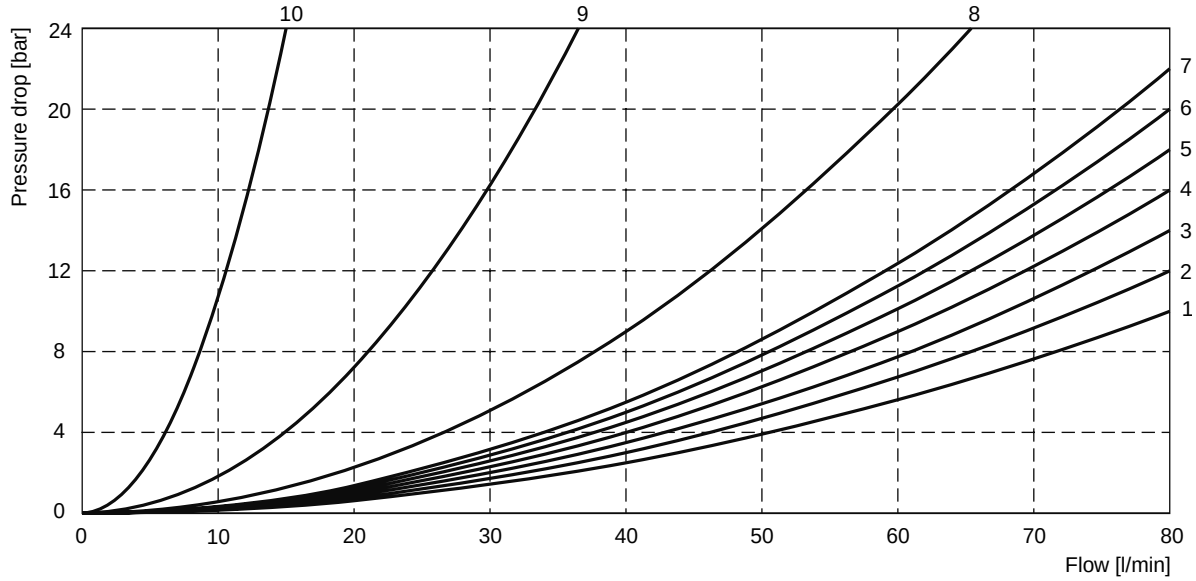
2

	Position „b“		Position „a“		Position „0“				
Spool	P ->A	B->T	P->B	A->T	P->A	P->B	A->T	B->T	P->T
001	2	2	2	2	–	–	–	–	–
002	1	4	1	4	1	1	5	5	2
004	2	3	2	3	–	–	7	7	–
006	1	4	1	4	7	7	–	–	–
011	2	2	2	2	–	–	10	10	–
020B	4	4	2	3	–	–	–	–	–
030B	2	3	1	2	–	–	–	–	–
081	9	9	9	9	–	–	–	–	–
082	9	9	9	9	–	–	[1]	[1]	–
	P->B	A->T	P->A	B->T	P->A	P->B	A->T	B->T	P->T
008	4	5	4	5	–	–			8

	Position „b“			Position „a“		
	P ->A	P->B	A->B	P->B	A->T	
021	2	4	–	4	2	–
	P ->A	B->T		P ->A	P->B	A->B
022	6	2		5	2	–

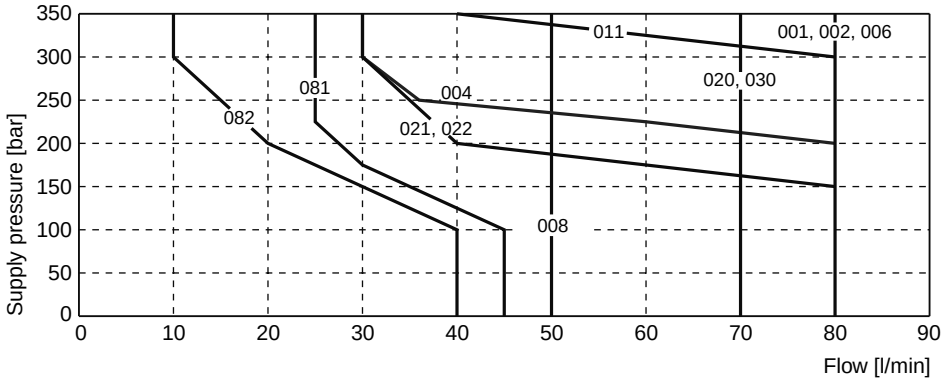
[1] Only for pressure compensation, no higher flow possible.

Flow curve diagram



All characteristic curves measured with HLP46 at 50°C.

The diagram below specifies the shift limits. Valves with spool position “F” or “M” can only be operated up to 70% of the limits. The specifications apply to balanced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P port.

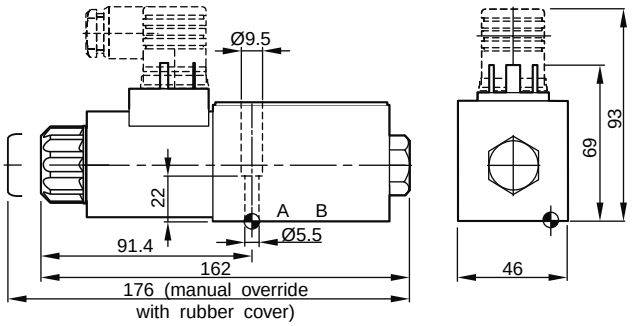


Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids

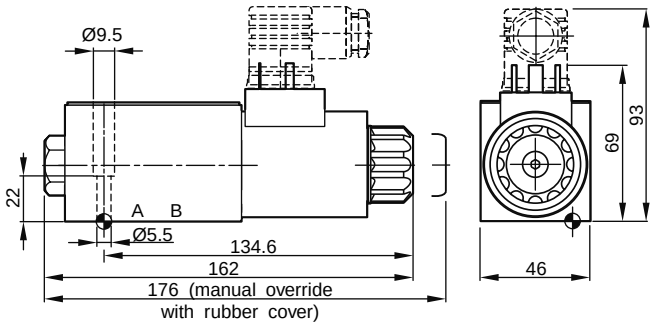
2

Dimensions with EN 175301-803 Connector

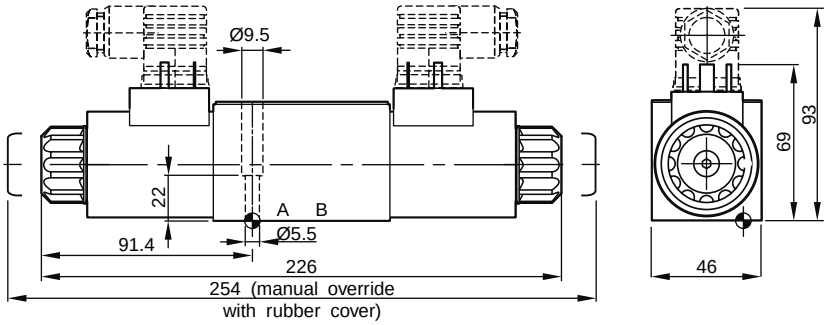
B, E, F -style



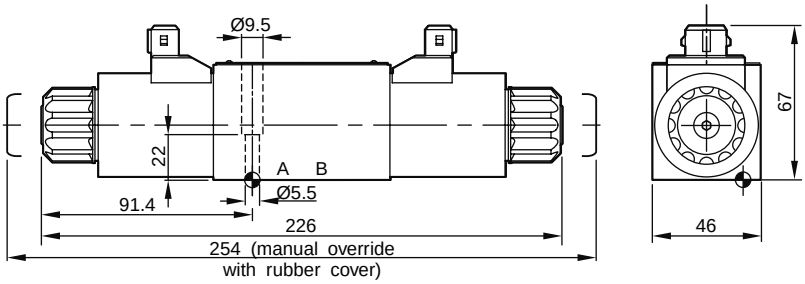
H, K, M -style



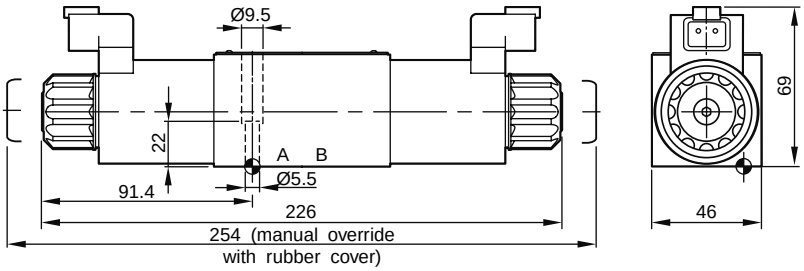
C and D -style



Dimensions with 2pin AMP Junior Timer Connector (only C and D -style shown)



Dimensions with "Deutsch" DT04-2P Connector (only C and D -style shown)



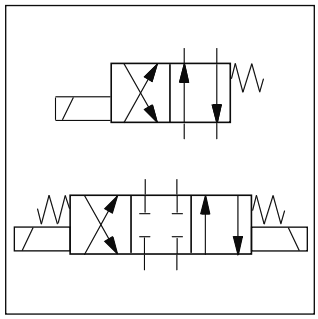
Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	**NBR: SK-D1VW-N-91** FPM: SK-D1VW-V-91

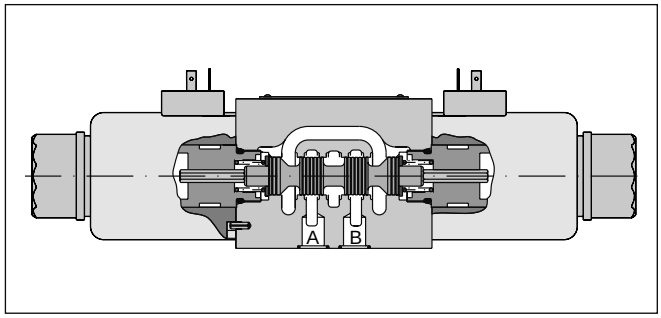
The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

The new NG10 direct operated directional control valve series D3W provides high functional limits up to 150 l/min in combination with a low, energy saving pressure drop.

The wide variety of options includes soft shift anchor tubes for smooth operation.

Versions with position control, additional surface protection and connector variants are shown in the following chapters.





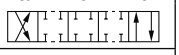
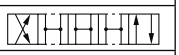
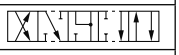
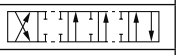
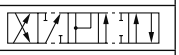
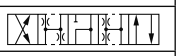
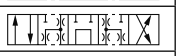
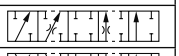
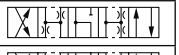
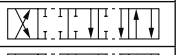
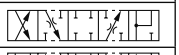
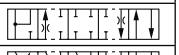
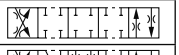
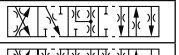
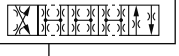
Technical data

General							
Design		Directional spool valve					
Actuation		Solenoid					
Size		DIN NG10 / CETOP 05 / NFPA D05					
Mounting interface		DIN 24340 A10 / ISO 4401 / CETOP RP 121-H / NFPA D05					
Mounting position		unrestricted, preferably horizontal					
Ambient temperature	[°C]	-25...+50					
$MTTF_D$ value	[years]	150					
Weight	[kg]	4.8 (1 solenoid), 6.3 (2 solenoids)					
Hydraulic							
Max. operating pressure	[bar]	P, A B: 350; T: 210 (DC), 105 (AC)					
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525					
Fluid temperature	[°C]	-25 ... +70					
Viscosity permitted	[cSt] / [mm²/s]	2.8...400					
Viscosity recommended	[cSt] / [mm²/s]	30...80					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Flow max.	[l/min]	150 (DC); 115 (AC) (see shift limits)					
Leakage at 50 bar	[ml/min]	Up to 20 per flow path, depending on spool					
Static / Dynamic							
Step response		see table response time					
Electrical characteristics							
Duty ratio		100% ED; CAUTION: coil temperature up to 150 °C possible					
Max. switching frequency	[1/h]	10000					
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)					
	Code	K	J	U	G	Y	T
Supply voltage / ripple	[V]	12 V =	24 V =	98 V =	205 V =	110V at 50Hz/ 120V at 60Hz	230V at 50Hz/ 240V at 60Hz
Tolerance supply voltage	[%]	±10	±10	±10	±10	±5	±5
Current consumption hold	[A]	3	1.5	0.35	0.18	0.8 / 0.72	0.4 / 0.36
Current consumption in rush	[A]	3	1.5	0.35	0.18	3.41 / 3.31	1.75 / 1.7
Power consumption hold	[W]	36	36	34	36	88 / 86	88 / 86
Power consumption in rush	[W]	36	36	34	36	375 / 397	385 / 408
Solenoid connection		Connector as per EN 175301-803, solenoid identification as per ISO 9461.					
Wiring min.	[mm²]	3 x 1.5 recommended					
Wiring length max.	[m]	50 recommended					

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

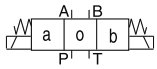
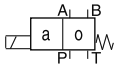
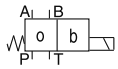
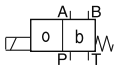
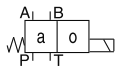
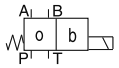
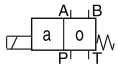
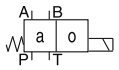
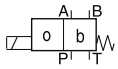
2

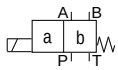
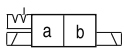
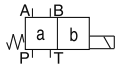
D	3	W		
Directional control valve	**Size DIN NG10 CETOP 05 NFPA D05**	**Wet pin solenoid**	**Spool type**	**Spool position**

3 position spools	
Code	Spool type a 0 b
001	
002	
003	
004	
005	
006	
007	
008	
009	
010 [1]	
011	
012	
014	
015	
016	
021 [1]	
022 [1]	
031 [1]	
032 [1]	
081 [1]	
082 [1]	
102 [1]	

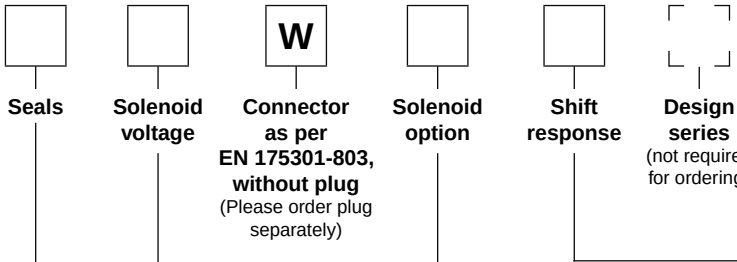
2 position spools	
Code	Spool type a b
020	
026	
030	
101 [1]	

[1] Only available for DC voltage.

3 position spools			
Code	all 3 position spools		
C			**3 positions.** **Spring offset in position “0“.** **Operated in position “a“ or “b“.**
	Standard	Spool type 008 and 009	
E	 Operated in position “a“.	 Operated in position “b“.	**2 positions.** **Spring offset in position “0“.**
F	 Spring offset in position “b“.	 Spring offset in position “a“.	2 positions. Operated in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	**2 positions.** **Spring offset in position “0“.**
M	 Spring offset in position “a“.	 Spring offset in position “b“.	2 positions. Operated in position “0“.

2 position spools		
Code	Spool position	
B		**2 positions.** **Spring offset in position “b“.** **Operated in position “a“.**
D		**2 positions.** **Operated in position “a“ or “b“.** **No center or offset position.**
H		**2 positions.** **Spring offset in position “a“.** **Operated in position “b“.**

Bold letters =
Short-term availability



Code	Shift response
omit	Standard response
S4 [3]	orifice diameter 1.0 mm
S7 [3]	orifice diameter 1.75 mm

[3] DC only

Code	Solenoid option
omit	**Standard solenoid with manual override**
T	without manual override

Code	Solenoid voltage
K	**12V =**
J	**24V =**
U [2]	98V =
G [2]	205V =
Y	110V 50Hz / 120V 60Hz
T	230V 50Hz / 240V 60Hz

[2] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Seals
N	**NBR**
V	FPM

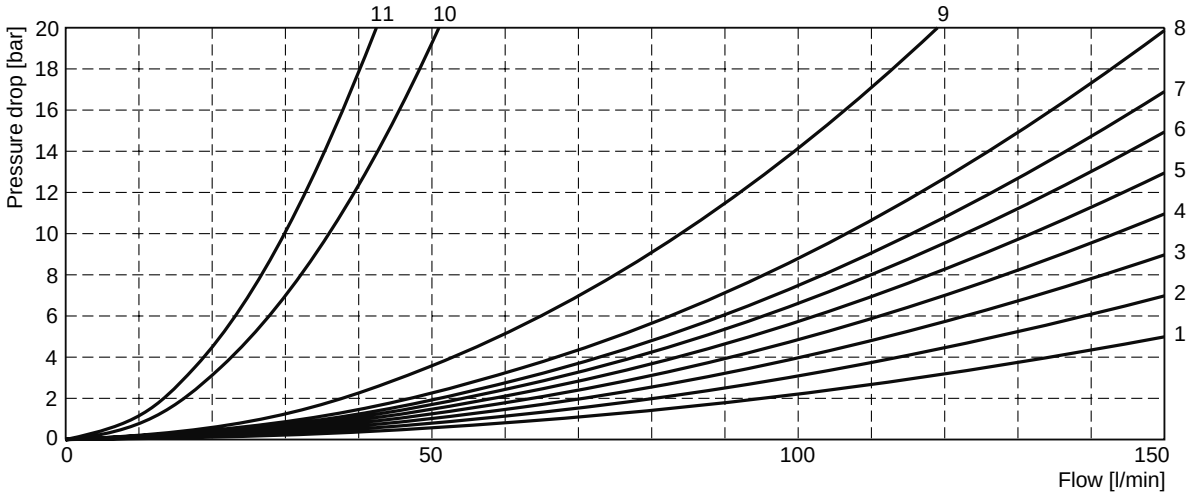
Further spool types and solenoid voltages on request.

The flow curve diagram shows the flow versus pressure drop curves for all spool types. For each spool type, operating position and flow direction the relevant curve number is given in the table below.

Spool	Position b		Position a		Position 0					
	P->A	B->T	P->B	A->T	P->A	P->B	A->T	B->T	P->T	A->B
001	6	5	6	6	–	–	–	–	–	–
002	3	5	3	3	1	1	4	5	1	6
003	2	2	3	1	–	–	3	–	–	–
004	5	4	4	4	–	–	8	8	–	9
005	2	2	2	2	3	–	–	–	–	–
006	1	2	1	3	2	2	–	–	–	3
007	2	1	2	2	–	1	–	2	3	–
010	2	–	2	–	–	–	–	–	–	–
011	2	2	2	2	–	–	11	11	–	11
012	1	2	2	2	10	10	10	10	11	11
014	1	2	2	2	1	–	2	–	3	–
015	2	1	2	2	–	–	–	3	–	–
016	2	2	1	2	–	2	–	–	–	–
020	6	6	5	7	–	–	–	–	–	–
026	5	–	5	–	–	–	–	–	–	–
030	4	5	3	5	–	–	–	–	–	–
	P->B	A->T	P->A	B->T	P->A	P->B	A->T	B->T	P->T	A->B
008	8	7	7	6	–	–	–	–	9	–
009	4	4	5	8	–	–	–	–	9	–

	Position b			Position a		
	P->A	P->B	A->B	P->B	A->T	
021	2	4	8	3	2	
	P->A	B->T		P->A	P->B	A->B
022	3	2		3	2	8

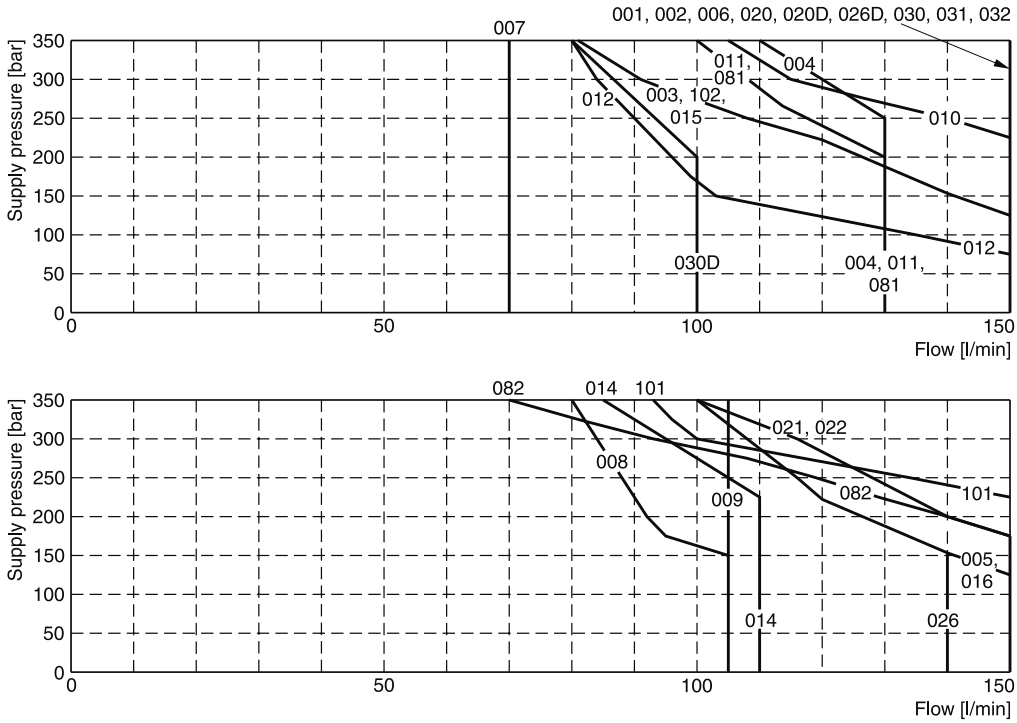
Flow curve diagram



All characteristic curves measured with HLP46 at 50°C.

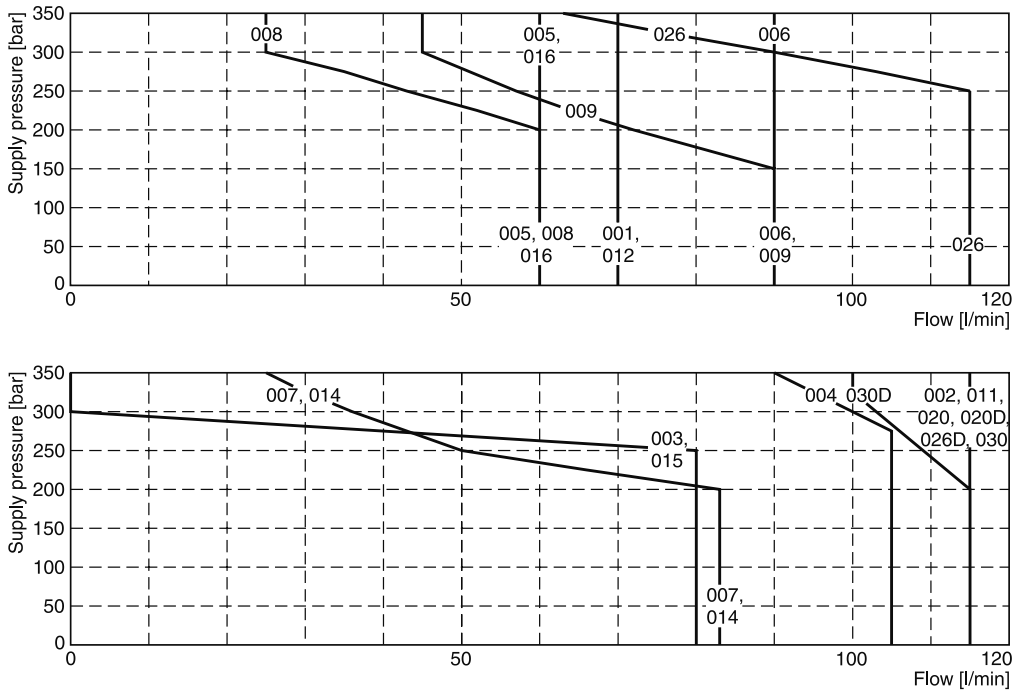
The diagram below specifies the shift limits for valves with DC and AC solenoids. Valves with spool position “F” or “M” can only be operated up to 70% of the limits. The specifications apply to balanced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.

Shift limits, DC voltage *



Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids.

Shift limits, AC voltage *



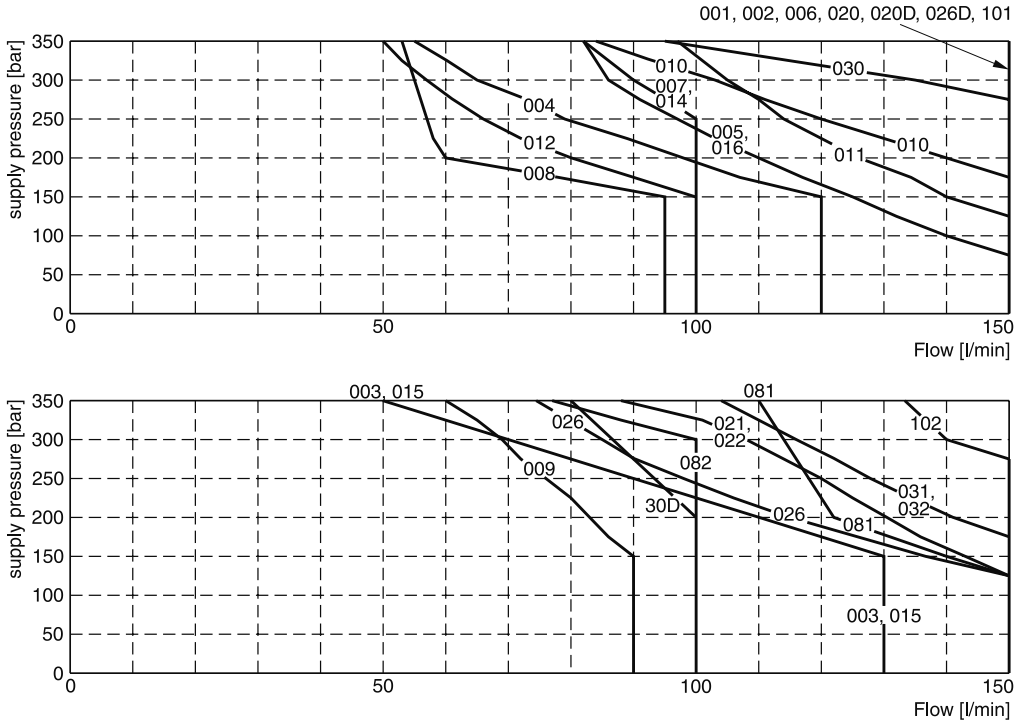
Measured with HLP46 at 50°C, 95% U_{nom} and warm solenoids.

* For spool code 4Do2 see flow chart.

2

Shift limits soft shift

The diagram below specifies the shift limits. Valves with spool position “F” or “M” can only be operated up to 70% of the limits. The specifications apply to balanced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.



Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids.

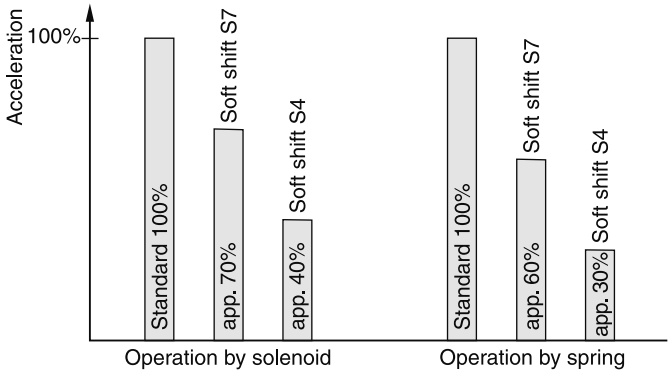
Response times D3W Soft Shift

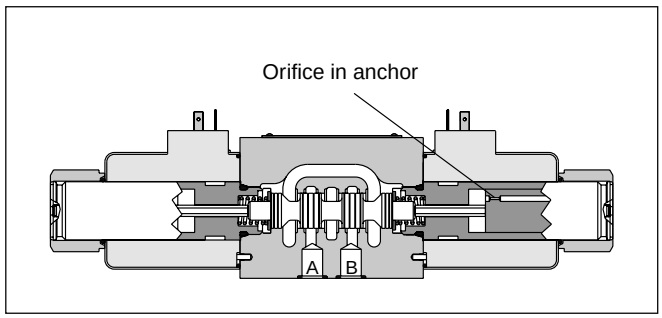
Code	Orifice size	Energize	De-energize
(Standard)	–	105 ms (DC) 21 ms (AC)*	85 ms (DC) 35 ms (AC)*
S4	1.0 mm	320 ms	550 ms
S7	1.75 mm	160 ms	370 ms

Step response times were obtained under the following conditions: HLP46 at 50°C with the valve operating at 175 bar and 65 l/min. Published response times are nominal and may vary with spool, flow, pressure and temperature.

* For AC input and soft shift use rectifier plug.

Acceleration for different orifice sizes (archived against a valve without soft shift)



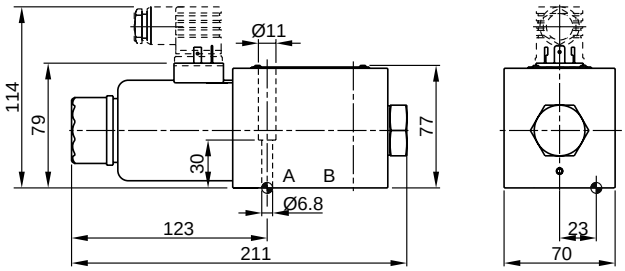


For even softer shifting, the proportional spools 081, 082, 101 and 102 can be used.

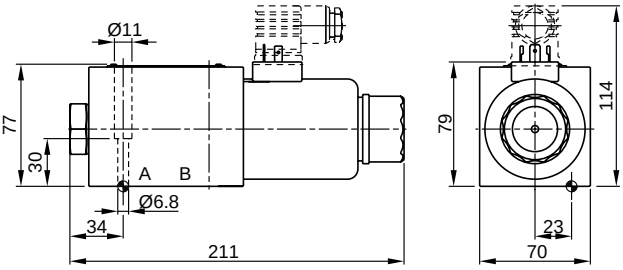
D3W UK.INDD RH 06.09.2011

Interface EN 175301-803, DC solenoid

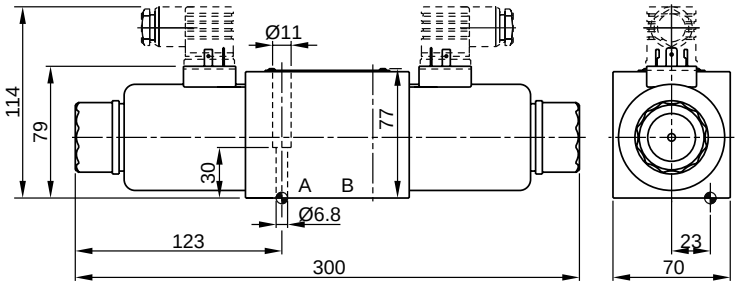
B, E, F -style



H, K, M -style

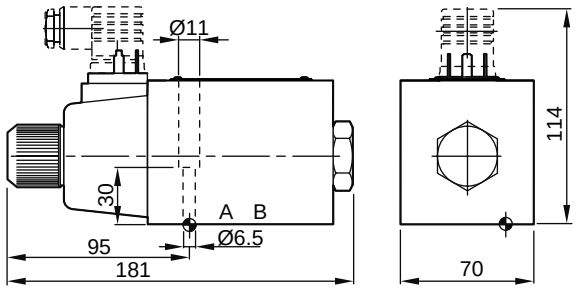


C, D -style

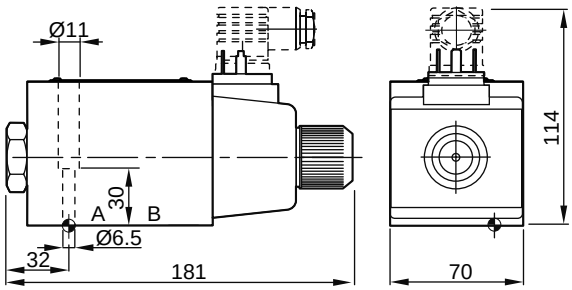


Interface EN 175301-803, AC solenoid

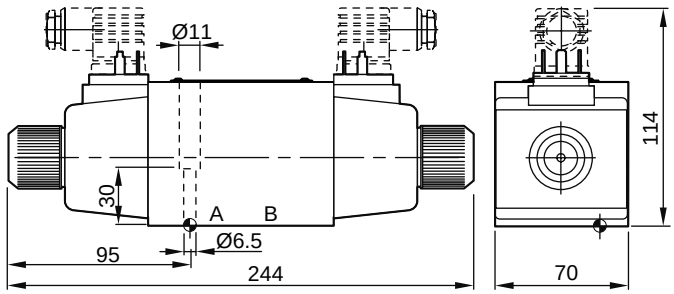
B, E, F -style



H, K, M -style



C, D -style



Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	**NBR: SK-D3W-42** FPM: SK-D3W-V42

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

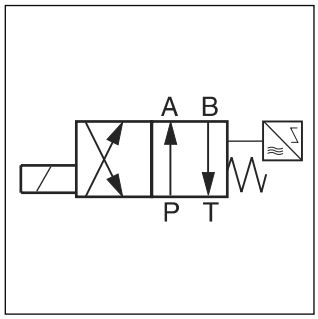
Notes

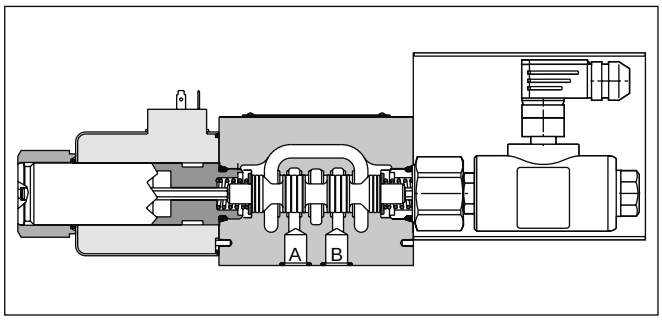
The direct operated valves with inductive position control are typically used in safety relevant applications. The start or the end position can be monitored.

The position control is available for single solenoid valves only.

The fail-safe position of the directional valve during power failure is the spring offset position.

Please find detailed information on the machine directive in the position paper in chapter 1.





Attention

The adjustment of the position control is factory set and sealed. Replacement and repairs can only be undertaken by the manufacturer.

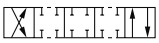
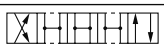
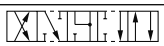
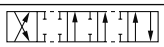
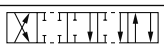
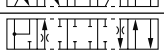
Technical data

General					
Design		Directional spool valve			
Actuation		Solenoid			
Size		DIN NG10 / CETOP 05 / NFPA D05			
Mounting interface		DIN 24340 A10 / ISO 4401 / CETOP RP 121-H / NFPA D05			
Mounting position		unrestricted, preferably horizontal			
Ambient temperature	[°C]	0...+50			
$MTTF_D$ value	[years]	75			
Weight	[kg]	5.2			
Hydraulic					
Max. operating pressure	[bar]	P, A, B: 350; T: 210			
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525			
Fluid temperature	[°C]	0 ... +70			
Viscosity permitted	[cSt] / [mm²/s]	2.8...400			
Viscosity recommended	[cSt] / [mm²/s]	30...80			
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)			
Flow max.	[l/min]	150 (see shift limits)			
Leakage at 50 bar	[ml/min]	Up to 20 per flow path, depending on spool			
Static / Dynamic					
Step response at 95%		Energized: 105; De-energized: 85			
Electrical characteristics					
Duty ratio		100% ED; CAUTION: coil temperature up to 150 °C possible			
Max. switching frequency	[1/h]	10000			
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
	Code	K	J	U	G
Supply voltage / ripple	[V]	12 V =	24 V =	98 V =	205 V =
Tolerance supply voltage	[%]	±10	±10	±10	±10
Current consumption hold	[A]	3	1.5	0.35	0.18
Power consumption hold	[W]	36	36	34	36
Solenoid connection		Connector as per EN 175301-803, solenoid identification as per ISO 9461.			
Wiring min.	[mm²]	3 x 1.5 recommended			
Wiring length max.	[m]	50 recommended			

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

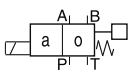
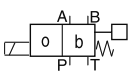
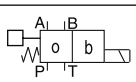
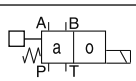
2

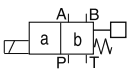
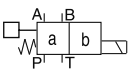
D	3	W		
Directional control valve	**Size DIN NG10 CETOP 05 NFPA D05**	**Wet pin solenoid**	**Spool type**	**Spool position**

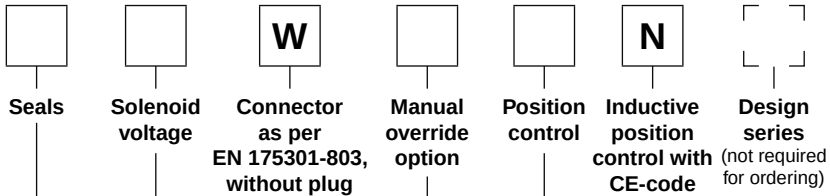
3 position spools	
Code	Spool type
	a 0 b
001	
002	
003 [1]	
004	
005 [2]	
015 [2]	
016 [1]	
021 [1]	
022 [2]	

2 position spools	
Code	Spool type
	a b
020	
026	
030	

[1] Only available for spool pos. “K“ and “M“
[2] Only available for spool pos. “E“ and “F“

Code	3 position spools	
E		2 positions. Spring offset in position “0“. Operated in position “a“.
F		2 positions. Spring offset in position “b“. Operated in position “0“.
K		2 positions. Spring offset in position “0“. Operated in position “b“.
M		2 positions. Spring offset in position “a“. Operated in position “0“.

2 position spools		
Code	Spool position	
B		2 positions. Spring offset in position “b“. Operated in position “a“.
H		2 positions. Spring offset in position “a“. Operated in position “b“.



Code	Position control	Spool position
I2	End position monitored side B	E, F, B (Solenoid on a-side)
I5 [4]	Start position monitored side B	
I1	End position monitored side A	K, M, H (Solenoid on b-side)
I4 [4]	Start position monitored side A	

Code	Solenoid option
omit	Standard valve without options
T [4]	without manual override

[4] For hydraulic presses according to the safety regulations EN 693, solenoid option “T” (without manual override) and accessories “I4” or “I5” (start position monitored) are required.

Code	Solenoid voltage
K	12V =
J	24V =
U [3]	98V =
G [3]	205V =

[3] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Seals
N	NBR
V	FPM

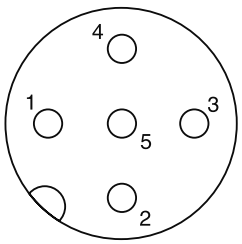
Further spool types and solenoid voltages on request.

2

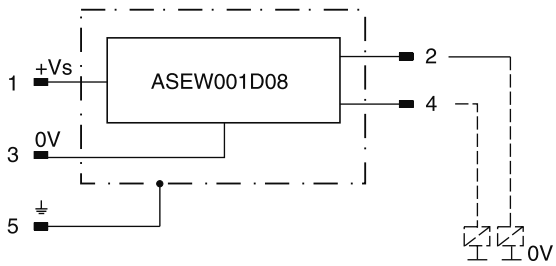
Electrical characteristics of position control as per IEC 61076-2-101 (M12x1)

Protection class		IP 65 in accordance with EN 60529 (plugged and mounted)
Ambient temperature	[°C]	0...+50
Supply voltage Us / ripple	[V]	18...42 / 10%
Current consumption without load	[mA]	≤ 30
Max. output current per channel, ohmic	[mA]	400
Min. output load per channel, ohmic	[kOhm]	100
Max. output drop at 0.2A	[V]	≤ 1.1
Max. output drop at 0.4A	[V]	≤ 1.6
EMC		EN50081-1 / EN50082-2
Max. tolerance ambient field strength	[A/m]	<1200
Min. distance to next AC solenoid	[m]	>0.1
Interface		M12x1
Wiring min.	[mm²]	5 x 0.25 brad shield recommended
Wiring length max.	[m]	50 recommended

M12 pin assignment



1 Us 18...42V
2 Out B: normally open
3 0V
4 Out A: normally closed
5 Earth ground



Definitions

Start position monitored:

The valve is de-energized. The inductive switch gives a signal at the moment when the spool leaves the spring offset position (below 15% spool stroke).
At the switching point the spool is located within the closed position. It is secured that only the flow paths of the offset position are granted.

End position monitored:

The inductive switch gives a signal before the end position is reached (above 85% spool stroke).

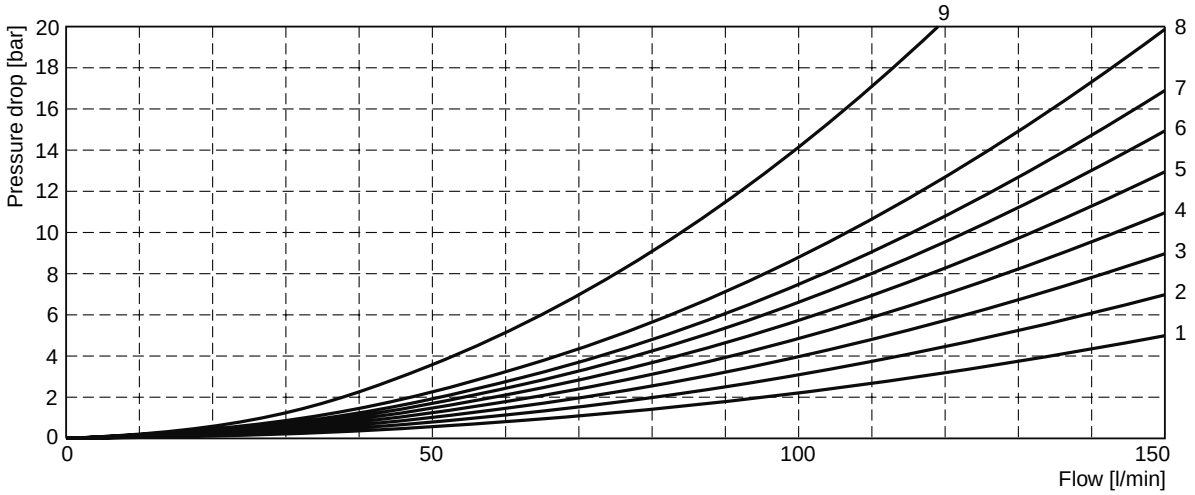
The switch can only be located on the opposite side of the solenoid for direct operated valves.
Delivery includes plug M12 x 1 (see accessories, plug M12x1; order no.: 5004109).

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

	Position b		Position a		Position 0					
Spool	P->A	B->T	P->B	A->T	P->A	P->B	A->T	B->T	P->T	A->B
001	6	5	6	6	–	–	–	–	–	–
002	3	5	3	3	1	1	4	5	1	6
003	2	2	3	1	–	–	3	–	–	
004	5	4	4	4	–	–	8	8	–	9
005	2	2	2	2	3	–	–	–	–	–
015	2	1	2	2	–	–	–	3	–	–
016	2	2	1	2	–	2	–	–	–	–
020	6	6	5	7	–	–	–	–	–	–
026	5	–	5	–	–	–	–	–	–	–
030	4	5	3	5	–	–	–	–	–	–

	Position b			Position a		
	P->A	P->B	A->B	P->B	A->T	
021	2	4	8	3	2	
	P->A	B->T		P->A	P->B	A->B
022	3	2		3	2	8

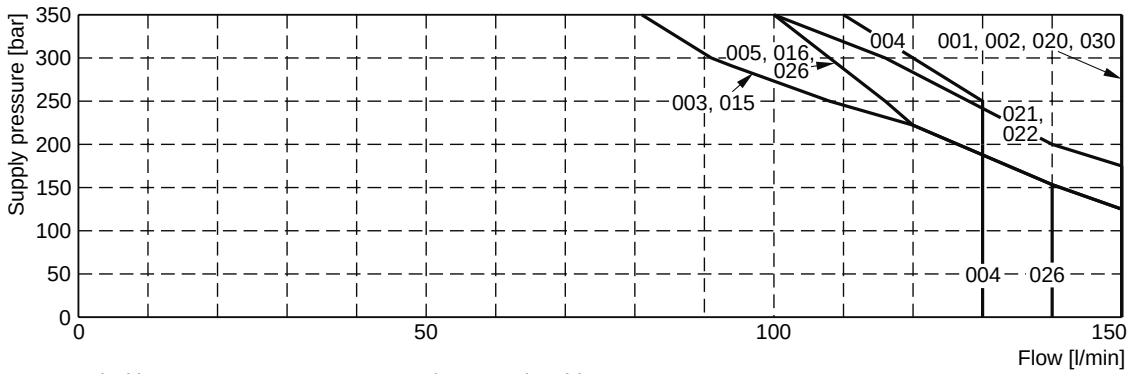
Flow curve diagram



All characteristic curves measured with HLP46 at 50°C.

Shift limit diagram

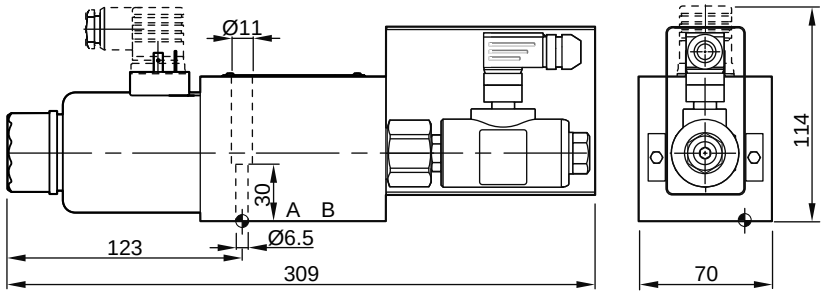
The diagram below specifies the shift limits. Valves with spool position “F” or “M” can only be operated up to 70% of the limits. The specifications apply to balanced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.



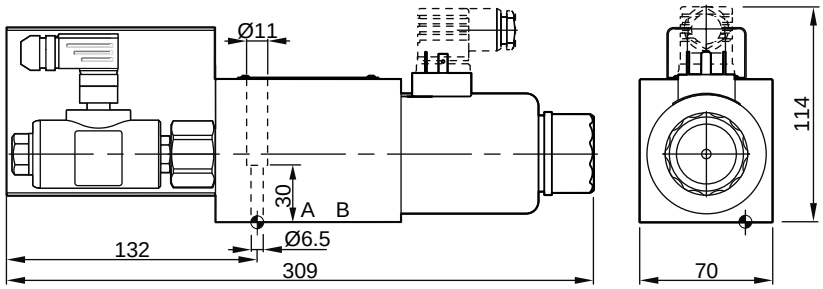
Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids

2

Interface EN 175301-803, DC solenoid, with plug M12x1*
B, E, F -style



H, K, M -style



* Delivery includes plug M12 x 1 (see accessories, plug M12x1; order no.: 5004109).

Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ ▱ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	**NBR: SK-D3W-42** FPM: SK-D3W-V42

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

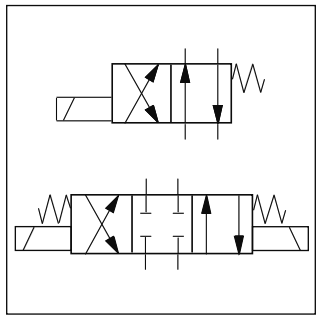
Attention

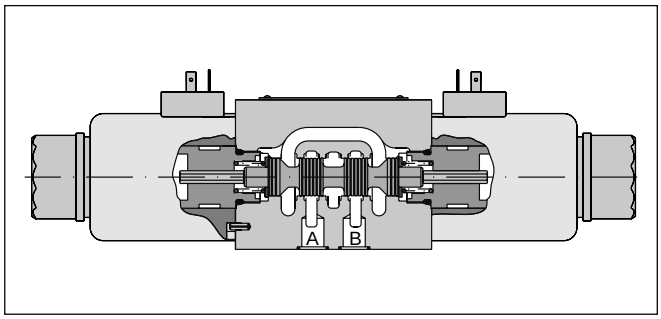
The adjustment of the position control is factory set and sealed. Replacement and repairs can only be undertaken by the manufacturer.

The D3MW is a solenoid operated directional control valve size NG10 in 3-chamber design. It is direct operated by wet pin solenoids.

The D3MW is designed for mobile and marine applications.

It is based on the D3W series, but offers additional corrosion protection of the valve body, the solenoid coil and the anchor tube as well as the typical solenoid connections for the mobile market such as AMP Junior Timer.





Technical features:

- High corrosion protection
- Solenoid connection:
  - Standard (as per EN175301-803)
  - AMP Junior Timer
- Robust design for rough applications

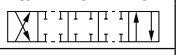
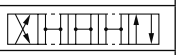
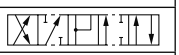
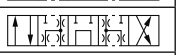
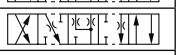
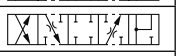
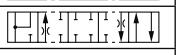
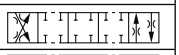
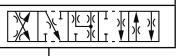
Technical data

General			
Design		Directional spool valve	
Actuation		Solenoid	
Size		DIN NG10 / CETOP 05 / NFPA D05	
Mounting interface		DIN 24340 A10 / ISO 4401 / CETOP RP 121-H / NFPA D05	
Mounting position		unrestricted, preferably horizontal	
Ambient temperature	[°C]	-25...+50	
$MTTF_D$ value	[years]	150	
Weight	[kg]	4.8 (1 solenoid), 6.3 (2 solenoids)	
Hydraulic			
Max. operating pressure	[bar]	P, A B: 350; T: 210	
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525	
Fluid temperature	[°C]	-25 ... +70	
Viscosity permitted	[cSt] / [mm²/s]	2.8...400	
Viscosity recommended	[cSt] / [mm²/s]	30...80	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)	
Flow max.	[l/min]	150 (see shift limits)	
Leakage at 50 bar	[ml/min]	Up to 20 per flow path, depending on spool	
Static / Dynamic			
Step response at 95%	[ms]	Energized: 105 De-energized: 85	
Electrical characteristics			
Duty ratio		100% ED; CAUTION: coil temperature up to 150 °C possible	
Max. switching frequency	[1/h]	10000	
Protection class		Standard (as per EN175301-803) IP 65 in acc. with EN60529 (with correctly mounted plug-in connector) AMP Junior Timer IP67 in acc. with EN60529 (with correctly mounted plug-in connector)	
	Code	K	J
Supply voltage / ripple	[V]	12 V =	24 V =
Tolerance supply voltage	[%]	±10	±10
Current consumption	[A]	3	1.5
Power consumption	[W]	36	36
Solenoid connection		Connector as per EN 175301-803, AMP Junior Timer, Solenoid ident. as per ISO 9461.	
Wiring min.	[mm²]	3 x 1.5 recommended	
Wiring length max.	[m]	50 recommended	

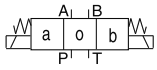
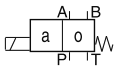
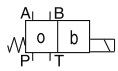
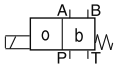
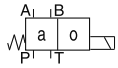
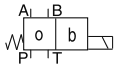
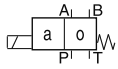
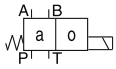
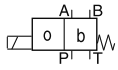
With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

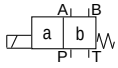
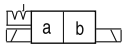
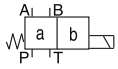
2

D	3	M	W		
Directional control valve	**Size DIN NG 10 CETOP 05 NFPA D05**	**3-chamber valve for mobile and marine applications**	**Wet pin solenoid**	**Spool type**	**Spool position**

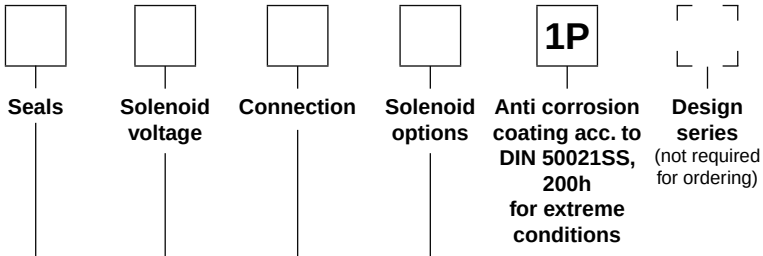
3 position spools	
Code	Spool type
	a 0 b
001	
002	
004	
006	
008	
011	
021	
022	
081	
082	

2 position spools	
Code	Spool type
	a b
020	
030	

3 position spools			
Code	all 3 position spools		
C			3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.
	Standard	Spool type 008 and 009	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
F	 Spring offset in position “b“.	 Spring offset in position “a“.	2 positions. Operated in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.
M	 Spring offset in position “a“.	 Spring offset in position “b“.	2 positions. Operated in position “0“.

2 position spools		
Code	Spool position	
B		2 positions. Spring offset in position “b“. Operated in position “a“.
D		2 positions. Operated in position “a“ or “b“. No center or offset position.
H		2 positions. Spring offset in position “a“. Operated in position “b“.

Bold letters =
Short-term availability



Code	Solenoid option
omit	Standard solenoid
T	without manual override

Code	Connection
W [1]	Connector as per EN 175301-803
A [1]	2-pin AMP Junior Timer

[1] Please order plug separately.

Code	Voltage
K	12V =
J	24V =

Code	Seals
N	**NBR**
V	FPM

Further spool types on request.

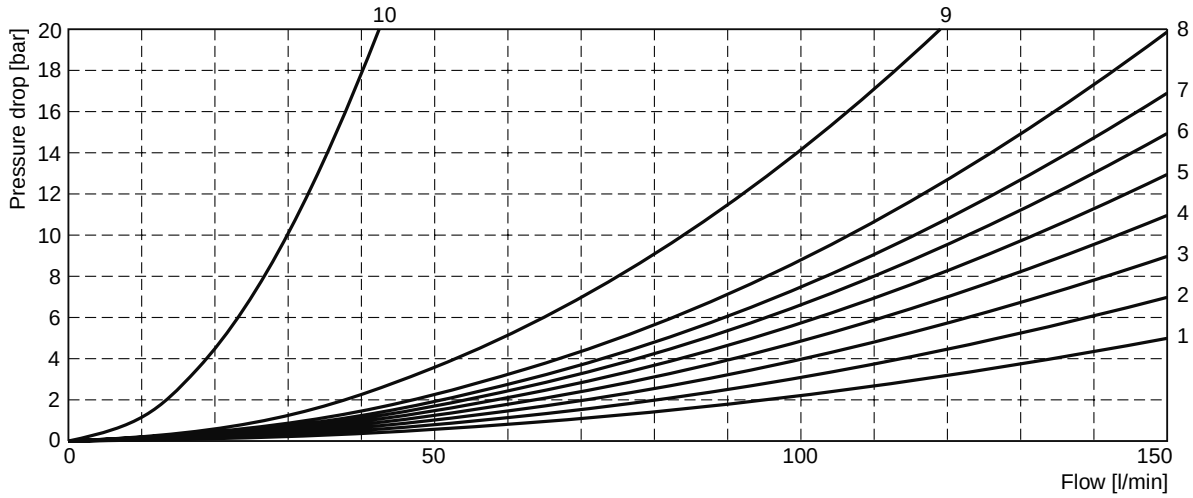
The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

2

	Position b		Position a		Position 0					
Spool	P->A	B->T	P->B	A->T	P->A	P->B	A->T	B->T	P->T	A->B
001	6	5	6	6	–	–	–	–	–	–
002	3	5	3	3	1	1	4	5	1	6
004	5	4	4	4	–	–	8	8	–	9
006	1	2	1	3	2	2	–	–	–	3
011	2	2	2	2	–	–	10	10	–	10
020	6	6	5	7	–	–	–	–	–	–
030	4	5	3	5	–	–	–	–	–	–
	P->B	A->T	P->A	B->T	P->A	P->B	A->T	B->T	P->T	A->B
008	8	7	7	6	–	–	–	–	9	–

	Position b			Position a		
	P->A	P->B	A->B	P->B	A->T	
021	2	4	8	3	2	
	P->A	B->T		P->A	P->B	A->B
022	3	2		3	2	8

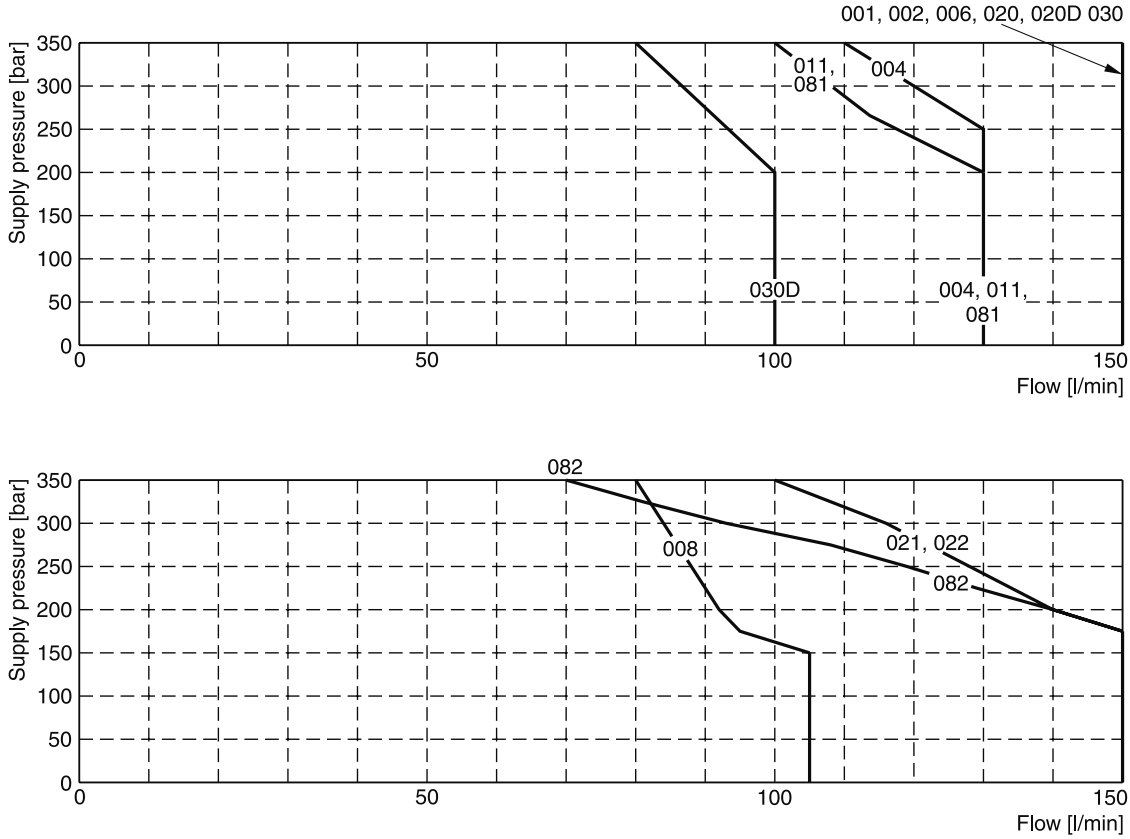
Flow curve diagram



All characteristic curves measured with HLP46 at 50°C.

The diagram below specifies the shift limits for valves with DC solenoids. Valves with spool position “F” or “M” can only be operated up to 70% of the limits. The specifications apply to balanced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.

Shift limits, DC voltage

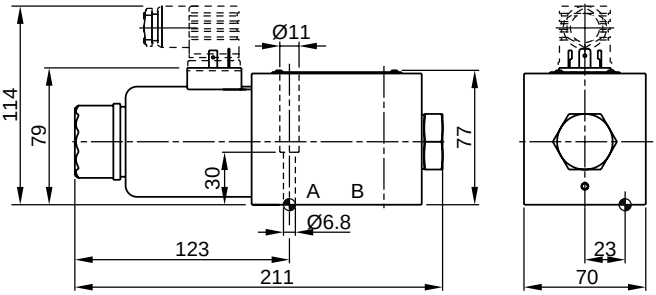


Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids

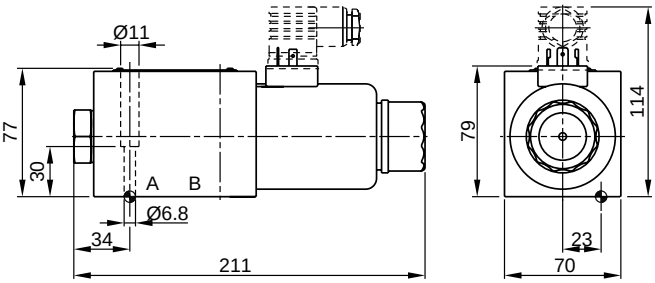
2

Interface EN 175301-803, DC solenoid

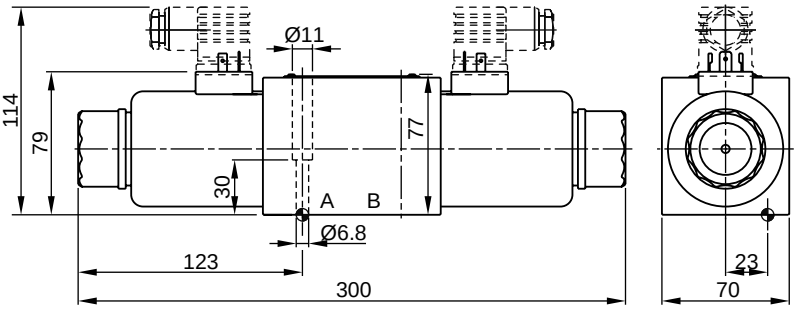
B, E, F -style



H, K, M -style

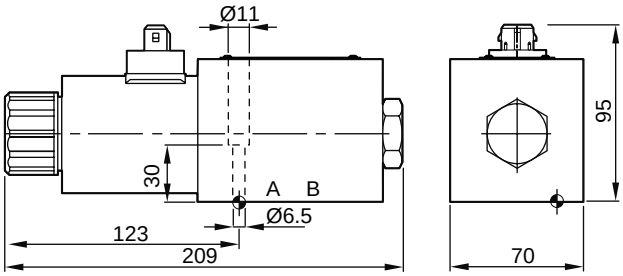


C, D -style

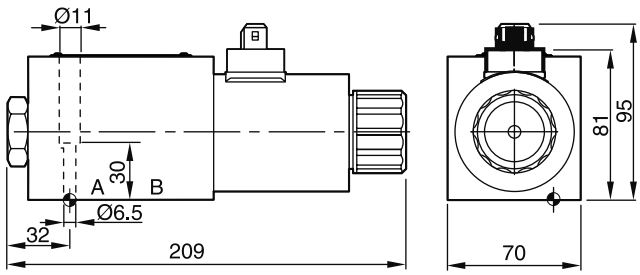


Dimensions with AMP Connector

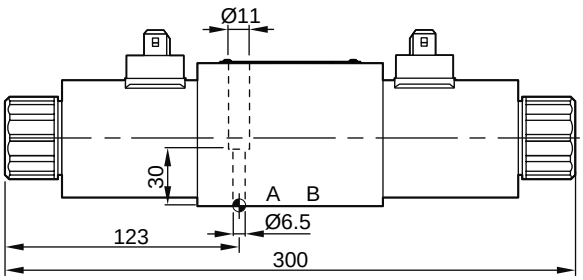
B, E, F -style



H, K, M -style



C, D -style



Surface finish	Kit			Kit
R_{max}6.3 ▱ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	**NBR: SK-D3W-42** FPM: SK-D3W-V42

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

D3MW UK.INDD RH 06.09.2011

The pilot operated valves are available in 4 sizes:

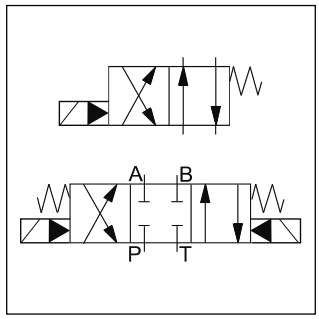
D31DW	NG10 (standard)
D31NW	NG10 (high flow)
D41VW	NG16
D81VW	NG25 (for port diameter up to 26 mm)
D91VW	NG25 (for port diameter up to 32 mm)
D111VW	NG32

All valves are piloted by a D1VW valve. The valves can be ordered with position control. Please see the separate ordering code.

The minimum pilot pressure must be ensured for all operating conditions of the directional valve.

Additionally spools with a P to T connection in the de-energized position need an external pressure supply (external inlet) or an integral check valve.

D31DW



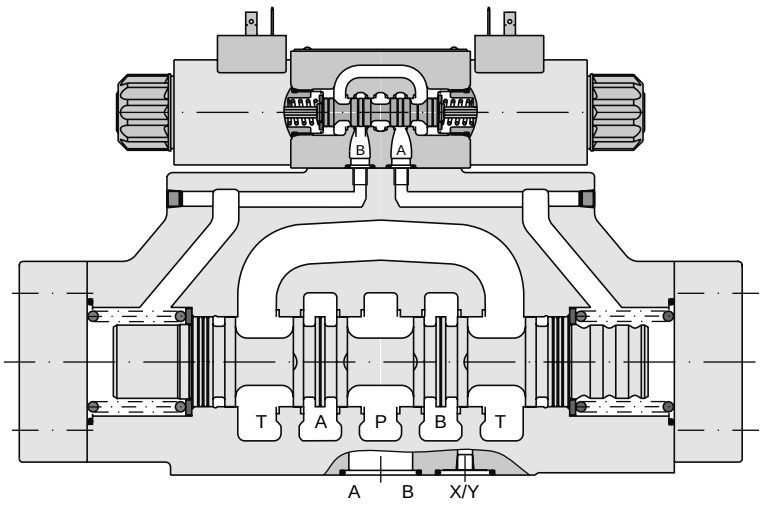
D31NW

D41VW

D81VW

D111VW

D81VW



2

Series | **Spool type** | **Spool position**

Code	Bore	Size	Feature
D31DW	Ø11mm	NG10	
D31NW	Ø11mm	NG10	High flow
D41VW	Ø20mm	NG16	
D81VW	Ø26mm	NG25	
D91VW	Ø32mm	NG25	High flow
D111VW	Ø50mm	NG32	

3 position spools		D31D	D31N	D41	D81/91	D111
Code	Spool type					
001	a 0 b	•	•	•	•	•
002		•	•	•	•	•
003		•	•	•	•	
004		•	•	•	•	
005		•	•	•	•	
006		•	•	•	•	
007			•	•	•	
009[1]		•	•	•	•	•
011		•	•	•	•	
014			•	•	•	
015		•	•	•	•	
016		•	•	•	•	
021		•	•	•	•	
022		•	•	•	•	
031			•		•	
032			•		•	
054				•	•	•
081		•	•	•	•	•
082			•	•	•	•

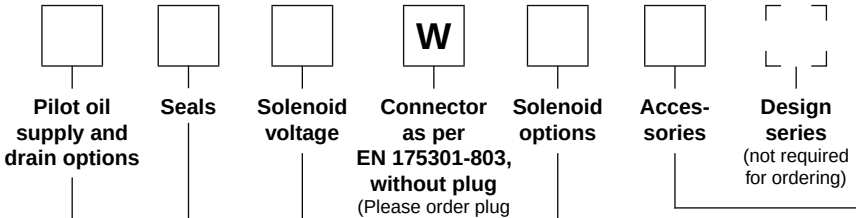
2 position spools						
Code	Spool type					
020	a b	•	•	•	•	•
026		•		•	•	
030		•	•	•	•	•

3 position spools			
Code	all 3 position spools		
C			**3 positions.** **Spring offset in position “0“.** **Operated in position “a“ or “b“.**
	Standard	Spool type 009	
E	Operated in position “a“.	Operated in position “b“.	2 positions. Spring offset in position “0“.
F [2]	Spring offset in position “b“.	Spring offset in position “a“.	2 positions. Operated in position “0“.
K [2]	Operated in position “b“.	Operated in position “a“.	2 positions. Spring offset in position “0“.
M [2]	Spring offset in position “a“.	Spring offset in position “b“.	2 positions. Operated in position “0“.
R [3]	No center in offset position.	No center in offset position.	2 positions, detent. Operated in position “0“ or “b“.
S [3]	No center in offset position.	No center in offset position.	2 positions, detent. Operated in position “0“ or “a“. No center in offset position.

2 position spools		
Code	Spool position	
B		**Spring offset in position “b“.** **Operated in position “a“.**
D [4]		Detent, operated in position “a“ or “b“. No center or offset position.
H		Spring offset in position “a“. Operated in position “b“.

[1] Consider specific spool position.
[2] Not for D31NW available
[3] Not for D31NW and D111VW available
[4] For D31NW and D111VW only pilot valve with detent available

Bold letters =
Short-term availability



Code	Accessories
omit	**Standard valve w/o accessories**
3A	Pilot choke, meter-out
3B	Pilot choke, meter-in
3C	Pilot with pressure reducing valve
3D [8]	Stroke adjustment side B
3E [8]	Stroke adjustment side A
3F [8]	Stroke adjustment side A and B
3R	meter-out + pressure reducing valve
1T	meter-in + pressure reducing valve

[8] Only D31, D41, D81, D91 available.

Code	Solenoid option
omit	**Standard solenoid without options**
T	without manual override

Code	Solenoid voltage
K	12V =
J	**24V =**
U [7]	98V =
G [7]	205V =
Y	110V 50Hz / 120V 60Hz
T	230V 50Hz / 240V 60Hz

[7] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Seals
N	**NBR**
V	FPM

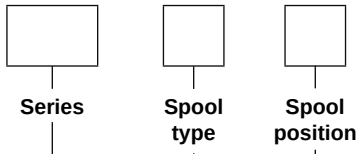
Code	Inlet	Outlet
1	**Internal**	**External**
2	External	External
3 [5]	Integral check valve	External
4 [6]	**Internal**	**Internal**
5	External	Internal
6 [5]	Integral check valve	Internal

[5] Not for D31DW, D91VW and D111VW available.
[6] Not for spools 002, 007, 009, 014, 030, 031, 032, 054 available.

Further spool types and solenoid voltages on request.
Explosion proof solenoids EEx me ll see catalogue HY11-3343.
Download:
www.parker.com/euro_hcd - see “Literature”

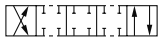
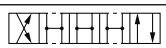
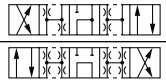
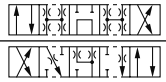
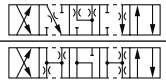
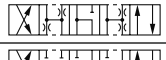
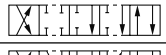
D3-D11 UK.INDD RH 06.09.2011

With inductive position control



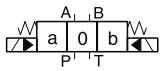
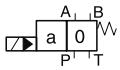
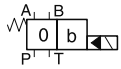
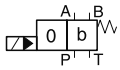
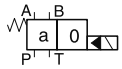
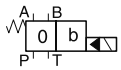
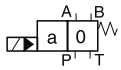
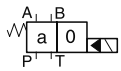
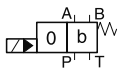
2

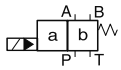
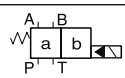
Code	Bore	Size	Feature
D31DW	Ø11mm	NG10	
D41VW	Ø20mm	NG16	
D81VW	Ø26mm	NG25	
D91VW	Ø32mm	NG25	High flow
D111VW	Ø50mm	NG32	

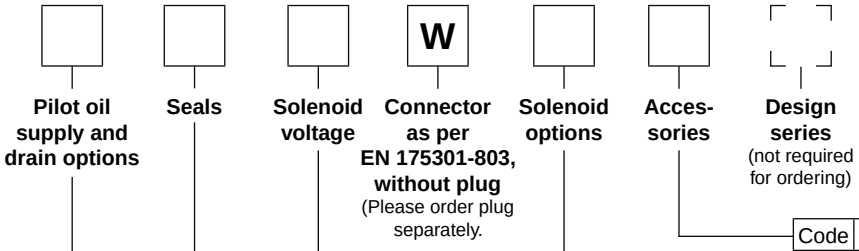
3 position spools		D31D	D41	D81/91	D111
Code	Spool type				
	a 0 b				
001		•	•	•	•
002		•	•	•	•
003		•	•	•	
004		•	•	•	
007			•	•	
009[1)]		•	•	•	•
011		•	•	•	
014			•	•	
015		•	•	•	
021		•	•	•	
022		•	•	•	

2 position spools					
Code	Spool type				
	a b				
020		•	•	•	•
026		•	•	•	
030		•	•	•	•

[1)] Consider specific spool position.

3 position spools			
Code	all 3 position spools		
C			3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.
	Standard	Spool type 009	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
F	 Spring offset in position “b“.	 Spring offset in position “a“.	2 positions. Operated in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.
M	 Spring offset in position “a“.	 Spring offset in position “b“.	2 positions. Operated in position “0“.

2 position spools		
Code	Spool position	
B		Spring offset in position “b“. Operated in position “a“.
H		Spring offset in position “a“. Operated in position “b“.



Code	Spool position	Position control
I3N	C	End position monitored, side A and B
I6N [6]		Start position monitored, side A and B
I2N	C, B, E, F (all spools) C, K, M (spool 9)	End position monitored, side B
I5N [6]		Start position monitored, side B
I1N	C, H, K, M (all spools) C, E, F (spool 9)	End position monitored, side A
I4N [6]		Start position monitored, side A

[6] The plug M12 x 1 for the position control is included. The monitor switch has to be located on the side to which the spool moves from the spring offset position. For 4/3-way valves two switches are used.

Code	Solenoid option
omit	Standard solenoid without options
T [5]	without manual override

[5] For hydraulic presses according to the safety regulations EN 693, solenoid option “T“ (without manual override) and accessories “I4N“, “I5N“ or “I6N“ (start position monitored) are required.

Code	Solenoid voltage
K	12V =
J	24V =
U [4]	98V =
G [4]	205V =

[4] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Seals
N	NBR
V	FPM

Code	Inlet	Outlet
1	Internal	External
2	External	External
3 [2]	Integral check valve	External
4 [3]	Internal	Internal
5	External	Internal
6 [2]	Integral check valve	Internal

[2] Not for D31DW, D91VW and D111VW available..
[3] Not for spools 002, 007, 009, 014, 030 available.

Attention

The adjustment of the position control is factory set and sealed.
Replacement and repairs can only be undertaken by the manufacturer.

2

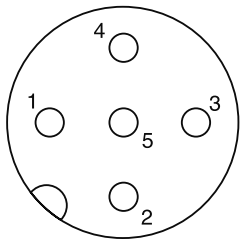
General							
Design			Directional spool valve				
Actuation			Solenoid				
Series			D31DW	D31NW	D41VW	D81/91VW	D111VW
Size			NG10	NG10	NG16	NG25	NG32
Weight (1/ 2 solenoids)		[kg]	6.0 / 6.6	7.6 / 8.1	9.7 / 10.3	17.9 / 18.6	67.4 / 68.0
Mounting interface			DIN 24340 A10 ISO 4401 NFPA D05	DIN 24340 A10 ISO 4401 NFPA D05	DIN 24340 A16 ISO 4401 NFPA D07	DIN 24340 A25 ISO 4401 NFPA D08	DIN 24340 A32 ISO 4401 NFPA D10
			CETOP RP 121-H				
Mounting position			unrestricted, preferably horizontal				
Ambient temperature		[°C] [°C]	-25...+50 (without inductive position control) 0...+50 (with inductive position control)				
$MTTF_D$ value		[years]	75 (50 with inductive position control)				
Hydraulic							
Max. operating pressure		[bar] [bar]	Pilot drain internal: P, A B, X: 350; T, Y: 105 (D31NW: P, A, B, X: 315; T, Y: 140) Pilot drain external: P, A B, T, X: 350; Y: 105 (D31NW: P, A, B, T, X: 315; Y:140)				
Fluid			Hydraulic oil in accordance with DIN 51524 / 51525				
Fluid temperature		[°C]	-25 ... +70				
Viscosity permitted		[cSt] / [mm²/s]	2.8...400				
Viscosity recommended		[cSt] / [mm²/s]	30...80				
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)				
Flow max.		[l/min]	150	170	300	700	2000
Leakage at 350 bar (per flow path) *depending on spool		[ml/min]	up to 100*	72...422*	up to 200*	up to 800*	up to 5000*
Opening pressure integral check valve		[bar]	n.a.	see p/Q diagram	see p/Q diagram	see p/Q diagram	n.a.
Minimum pilot supply pressure		[bar]	5	7	5		
Static / Dynamic							
Step response at 95%		[ms]	Energized / De-energized				
DC solenoids	Pilot pressure	50 bar	60 / 40	50 / 60	95 / 65	150 / 170	470 / 390
		100 bar	55 / 40	50 / 60	75 / 65	110 / 170	320 / 390
		250 bar	55 / 40	50 / 50	60 / 65	90 / 170	210 / 390
		350 bar	55 / 40	50 / 50	60 / 65	85 / 170	200 / 390
AC solenoids	Pilot pressure	50 bar	40 / 30	30 / 50	75 / 55	130 / 155	450 / 375
		100 bar	35 / 30	30 / 50	65 / 55	90 / 155	300 / 375
		250 bar	35 / 30	30 / 50	40 / 55	70 / 155	190 / 375
		350 bar	35 / 30	30 / 50	40 / 55	65 / 155	180 / 375
Electrical characteristics							
Duty ratio			100% ED; CAUTION: coil temperature up to 150 °C possible				
Protection class			IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)				
		Code	K	J	U	G	Y	T
Supply voltage / ripple		[V]	12 V =	24 V =	98 V =	205 V =	110V at 50Hz/ 120V at 60Hz	230V at 50Hz/ 240V at 60Hz
Tolerance supply voltage		[%]	±10	±10	±10	±10	±5	±5
Current consumption	hold	[A]	2.72	1.29	0.33	0.15	0.58 / 0.49	0.31 / 0.26
Current consumption	in rush	[A]	2.72	1.29	0.33	0.15	2.1 / 2.0	1.05 / 1.0
Power consumption	hold	[W]	32.7	31	31.9	30.2	64 / 59 VA	68 / 62 VA
Power consumption	in rush	[W]	32.7	31	31.9	30.2	231 / 240 VA	231 / 240 VA
Solenoid connection			Connector as per EN 175301-803, solenoid identification as per ISO 9461.					
Wiring min.		[mm²]	3 x 1.5 recommended					
Wiring length max.		[m]	50 recommended					

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

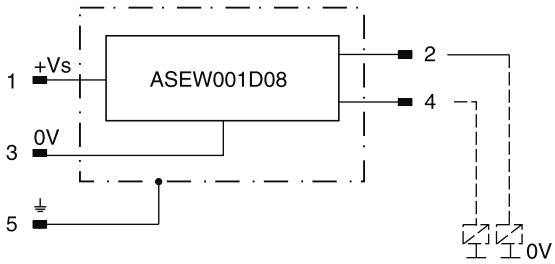
Electrical characteristics of position control M12x1

Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Ambient temperature	[°C]	0...+50
Supply voltage Us / ripple	[V]	18...42 / 10%
Current consumption without load	[mA]	≤ 30
Max. output current per channel, ohmic	[mA]	400
Min. output load per channel, ohmic	[kOhm]	100
Max. output drop at 0.2A	[V]	≤ 1.1
Max. output drop at 0.4A	[V]	≤ 1.6
EMC		EN50081-1 / EN50082-2
Max. tolerance ambient field strength	[A/m]	<1200
Min. distance to next AC solenoid	[m]	>0.1
Interface		M12x1 acc. to IEC 61076-2-101
Wiring min.	[mm²]	5 x 0.25 brad shield recommended
Wiring length max.	[m]	50 recommended

M12 pin assignment



1 Us 18...42V
2 Out B: normally open
3 0V
4 Out A. normally closed
5 Earth ground



Definitions

Start position monitored:

The valve is de-energized. The inductive switch gives a signal at the moment when the spool leaves the spring offset position (below 15% spool stroke).
At the switching point the spool is located within the closed position. It is secured that only the flow paths of the offset position are granted.

End position monitored:

The inductive switch gives a signal before the end position is reached (above 85% spool stroke).

The switch can only be located on the opposite side of the solenoid for direct operated valves.
Delivery includes plug M12 x 1 (see accessories, plug M12x1; order no.: 5004109).

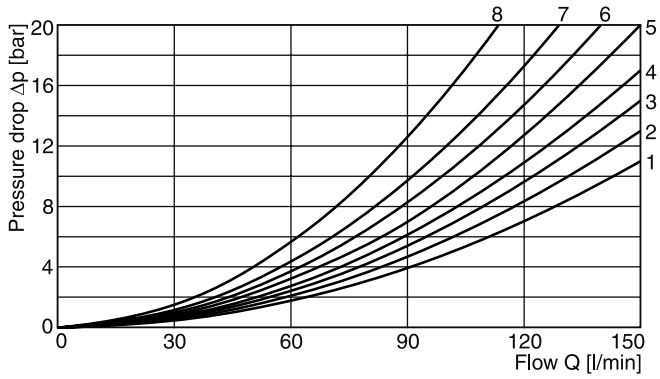
2

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

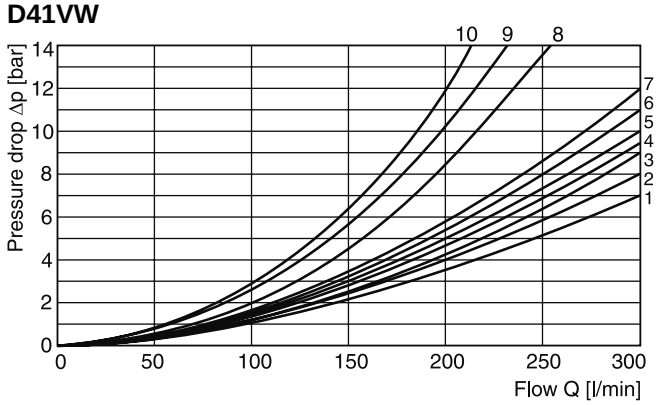
D31DW and D41VW

Spool Code	Curve number									
	P-A		P-B		P-T		A-T		B-T	
	D3	D4	D3	D4	D3	D4	D3	D4	D3	D4
001	4	1	4	1	–	–	3	4	3	5
002	2	1	3	2	3	6	3	4	4	6
003	2	1	4	2	–	–	1	5	2	6
004	4	1	3	1	–	–	2	5	3	5
005	1	2	4	2	–	–	2	3	3	5
006	2	1	3	2	–	–	3	3	4	6
007	4	1	2	1	5	6	2	4	2	5
009	2	2	2	9	8	8	5	7	6	10
011	3	1	2	1	–	–	3	4	3	5
014	2	1	4	1	5	6	2	4	3	5
015	4	1	2	2	–	–	2	4	2	6
016	4	2	1	2	–	–	1	3	2	5
020	4	3	4	5	–	–	4	3	4	5
021	3	2	4	8	–	–	2	2	–	–
022	5	8	2	2	–	–	–	–	4	3
026	3	3	3	5	–	–	–	–	–	–
030	4	2	3	3	–	–	3	6	3	7
031	3	–	4	–	–	–	1	–	–	–
032	5	–	2	–	–	–	–	–	2	–
054	–	2	–	3	–	–	–	6	–	7
081	6	–	6	–	–	–	7	–	7	–
082	7	–	6	–	–	–	5	–	7	–

D31DW



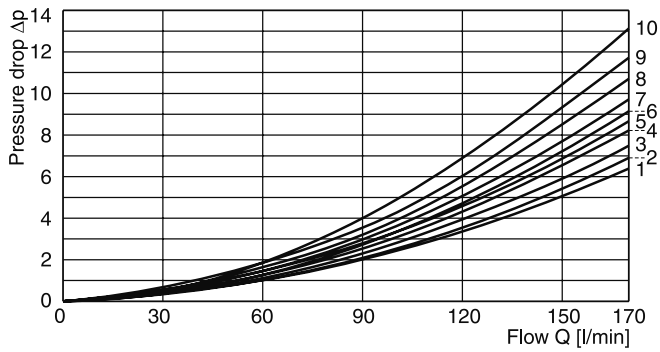
D41VW



D31NW

Spool Code	Curve number				
	P-A	P-B	P-T	A-T	B-T
001	3	3	–	2	5
002	3	3	7	4	3
003	2	3	–	4	4
004	2	3	–	4	4
005	2	4	–	1	4
006	8	9	–	7	9
009	4	6	6	4	10
011	3	3	–	2	4
015	2	2	–	1	4
016	4	3	–	2	4
020	6	4	–	3	6
021	–	7	–	8	–
022	4	–	–	9	–
030	5	3	–	2	5

D31NW

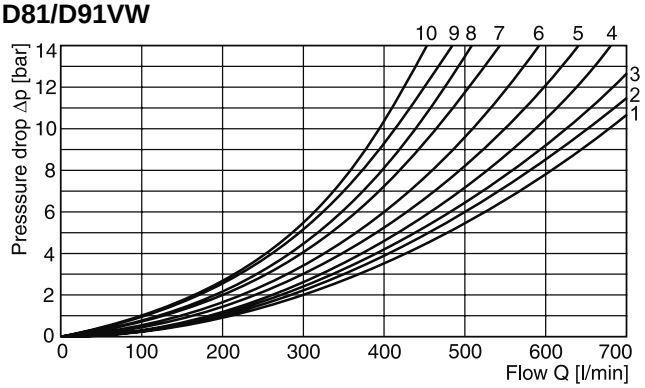


All characteristic curves measured with HLP46 at 50°C.

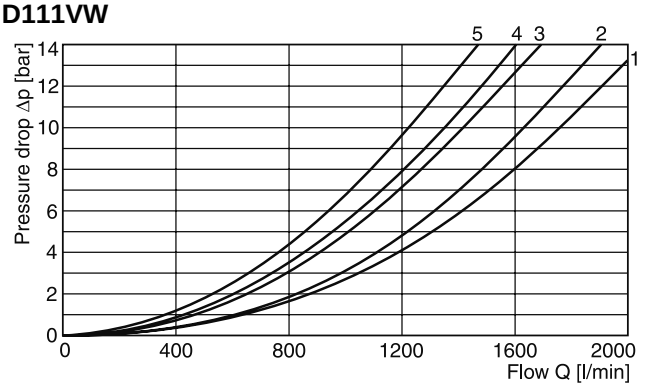
D81/D91VW and D111VW

Spool Code	Curve number									
	P-A		P-B		P-T		A-T		B-T	
	D8/9	D11	D8/9	D11	D8/9	D11	D8/9	D11	D8/9	D11
001	3	5	2	5	–	–	3	4	5	1
002	2	5	1	5	1	5	3	4	5	1
003	4	–	2	–	–	–	3	–	6	–
004	4	–	3	–	–	–	3	–	5	–
005	1	–	2	–	–	–	4	–	5	–
006	2	–	2	–	–	–	4	–	6	–
007	3	–	1	–	7	–	3	–	5	–
009	4	3	8	3	9	2	4	3	10	1
011	3	–	2	–	–	–	3	–	5	–
014	1	–	2	–	8	–	3	–	5	–
015	3	–	3	–	–	–	4	–	5	–
016	3	–	3	–	–	–	4	–	5	–
020	6	5	5	5	–	–	6	3	8	1
021	5	–	10	–	–	–	3	–	–	–
022	10	–	5	–	–	–	–	–	5	–
026	6	–	5	–	–	–	–	–	–	–
030	3	5	2	5	–	–	3	4	5	1
054	4	5	3	5	–	–	3	4	5	1

D81/D91VW



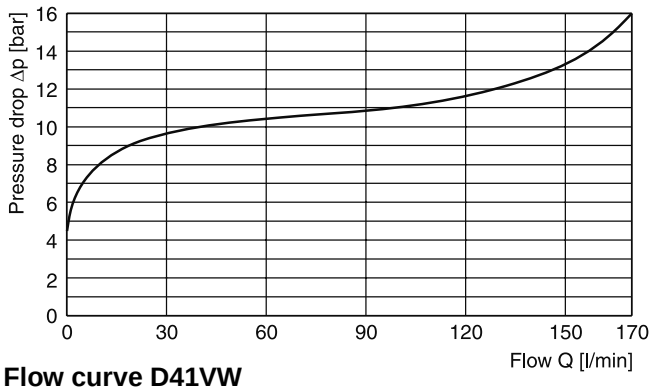
D111VW



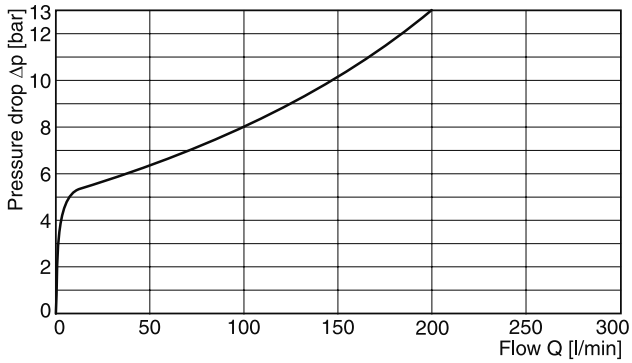
Integral check valve in the P port

Mounting an integral check valve in the P port is necessary to build up pilot pressure for valves with P to T connection and internal pilot oil supply. The pressure difference at the integral check valve (see performance curves) is to be added to all flow curves of the P-port of the main valve. Directional valves with an integral check valve are available for the series D31NW, D41VW and D81VW.

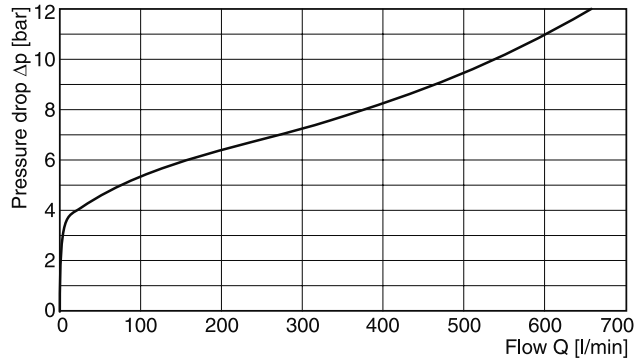
Flow curve D31NW



Flow curve D41VW



Flow curve D81VW

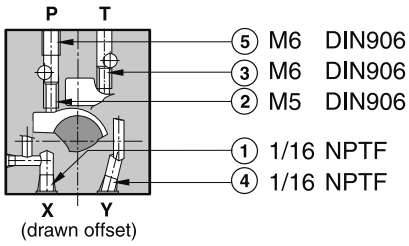


All characteristic curves measured with HLP46 at 50°C.

2

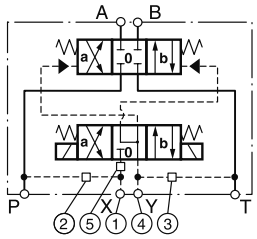
Pilot oil inlet (supply) and outlet (drain)

Series D31DW

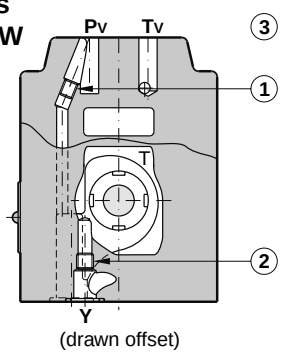


○ open, ● closed

Pilot oil Inlet	Outlet	1	2	3	4	5
internal	external	●	○	●	○	Orifice Ø1.2
external	external	○	●	●	○	Orifice Ø1.2
internal	internal	●	○	○	●	Orifice Ø1.2
external	internal	○	●	○	●	Orifice Ø1.2



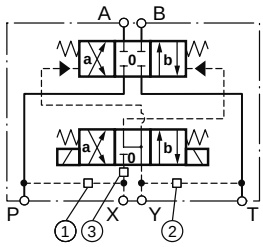
Series D31NW



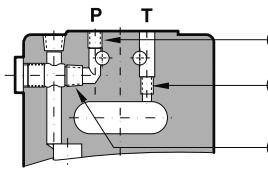
3 Slip-in orifice in pilot p-port
1 M6 DIN906
2 M6 DIN906

○ open, ● closed

Pilot oil Inlet	Outlet	1	2	3
internal	external	○	●	Orifice Ø1.0
external	external	●	●	Orifice Ø1.0
internal	internal	○	○	Orifice Ø1.0
external	internal	●	○	Orifice Ø1.0



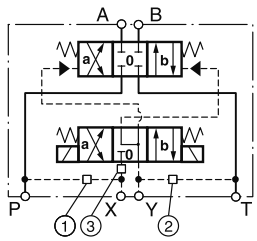
Series D41VW



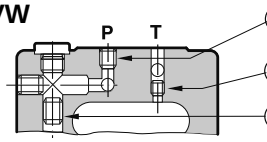
3 M6 DIN906
2 M6 DIN906
1 1/16 NPTF

○ open, ● closed

Pilot oil Inlet	Outlet	1	2	3
internal	external	○	●	Orifice Ø1.5
external	external	●	●	Orifice Ø1.5
internal	internal	○	○	Orifice Ø1.5
external	internal	●	○	Orifice Ø1.5



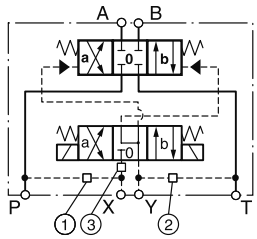
Series D81/91VW



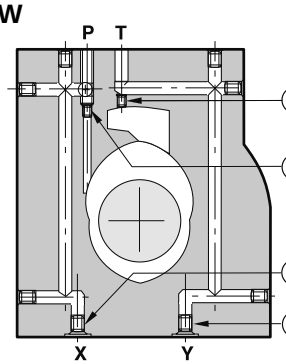
3 M6 DIN906
2 M6 DIN906
1 1/16 NPTF

○ open, ● closed

Pilot oil Inlet	Outlet	1	2	3
internal	external	○	●	Orifice Ø1.5
external	external	●	●	Orifice Ø1.5
internal	internal	○	○	Orifice Ø1.5
external	internal	●	○	Orifice Ø1.5



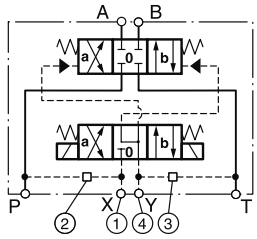
Series D111VW



3 1/16 NPTF
2 1/16 NPTF
1 1/8 NPTF
4 1/8 NPTF

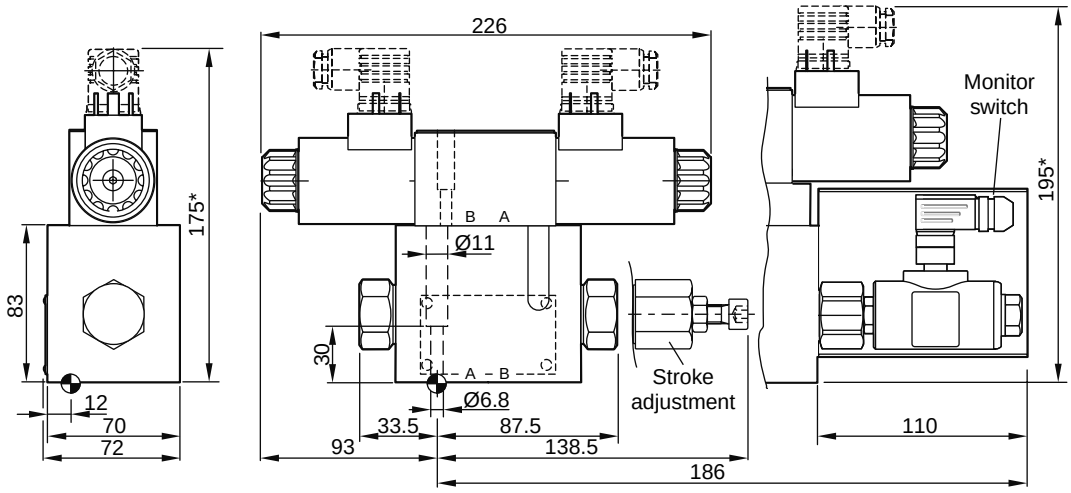
○ open, ● closed

Pilot oil Inlet	Outlet	1	2	3	4
internal	external	●	Orifice Ø1.5	●	○
external	external	Orifice Ø1.5	●	●	○
internal	internal	●	Orifice Ø1.5	○	●
external	internal	Orifice Ø1.5	●	○	●



All orifice sizes for standard valves

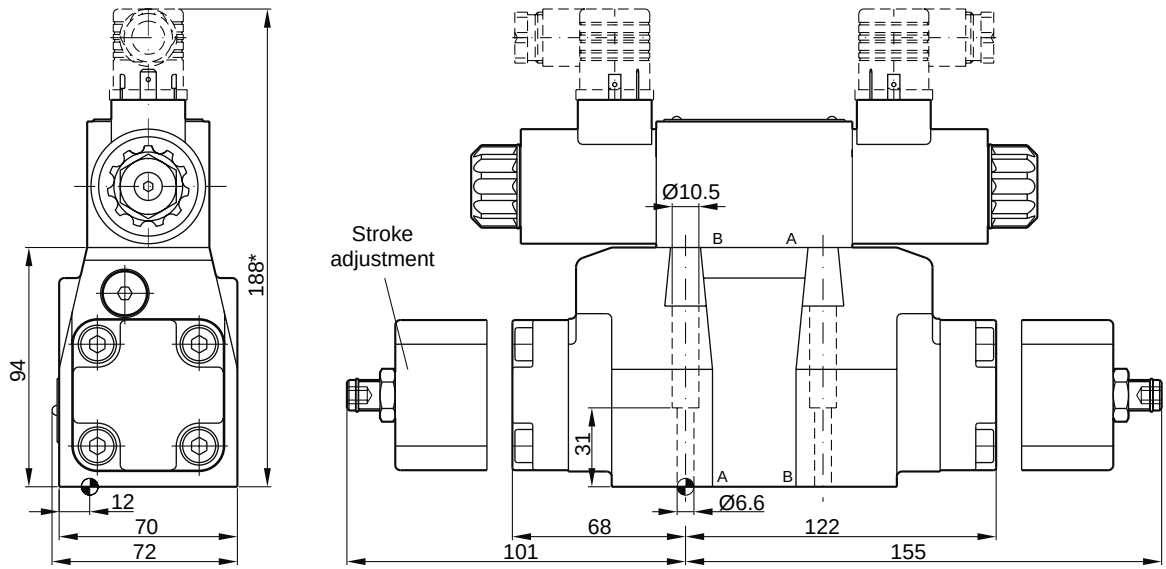
D31DW



* Please add for each sandwich plate +40mm (pressure reducing valve, choke valve meter-in/-out).

Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	**NBR: SK-D31DW-N-91** FPM: SK-D31DW-V-91

D31NW



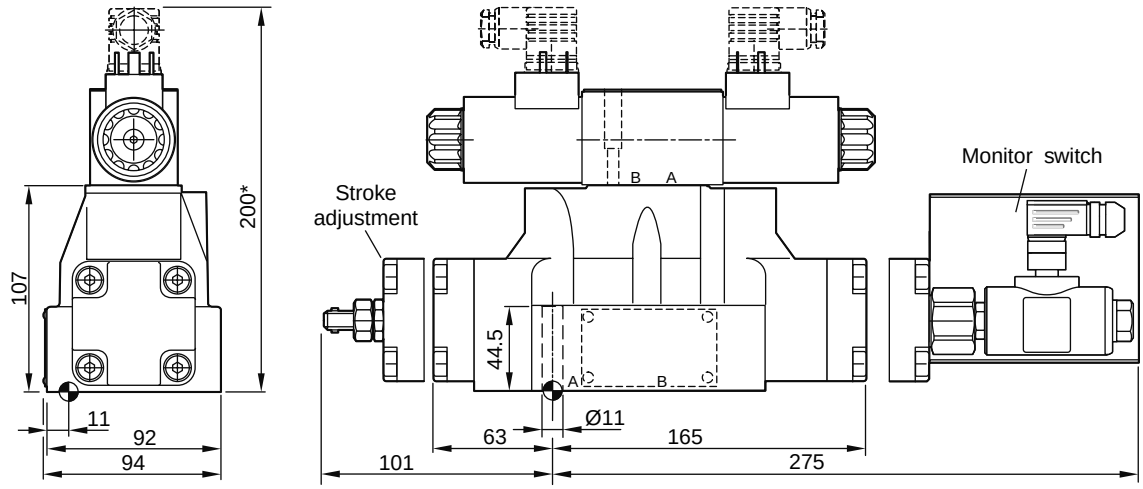
* Please add for each sandwich plate +40mm (pressure reducing valve, choke valve meter-in/-out).

Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm	NBR: SK-D31NW-N-91 FPM: SK-D31NW-V-91

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

2

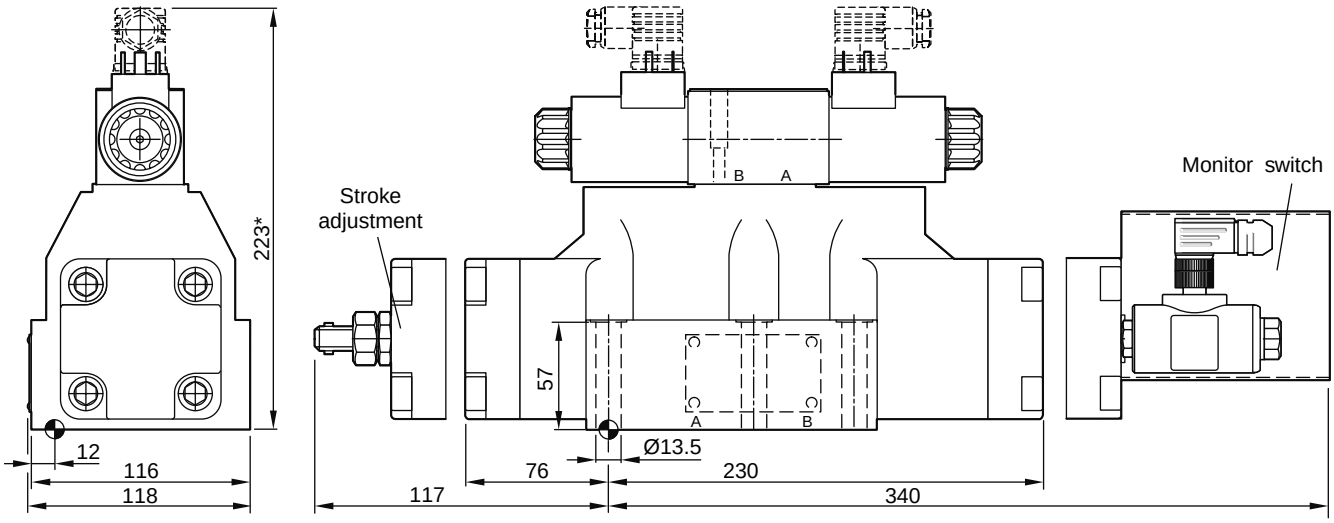
D41VW



* Please add for each sandwich plate +40mm (pressure reducing valve, choke valve meter-in/-out).

Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK320	4x M10x60 2x M6x55 DIN 912 12.9	63 Nm ±15% 13.2 Nm ±15%	**NBR: SK-D41VW-N-91** FPM: SK-D41VW-V-91

D81VW, D91VW



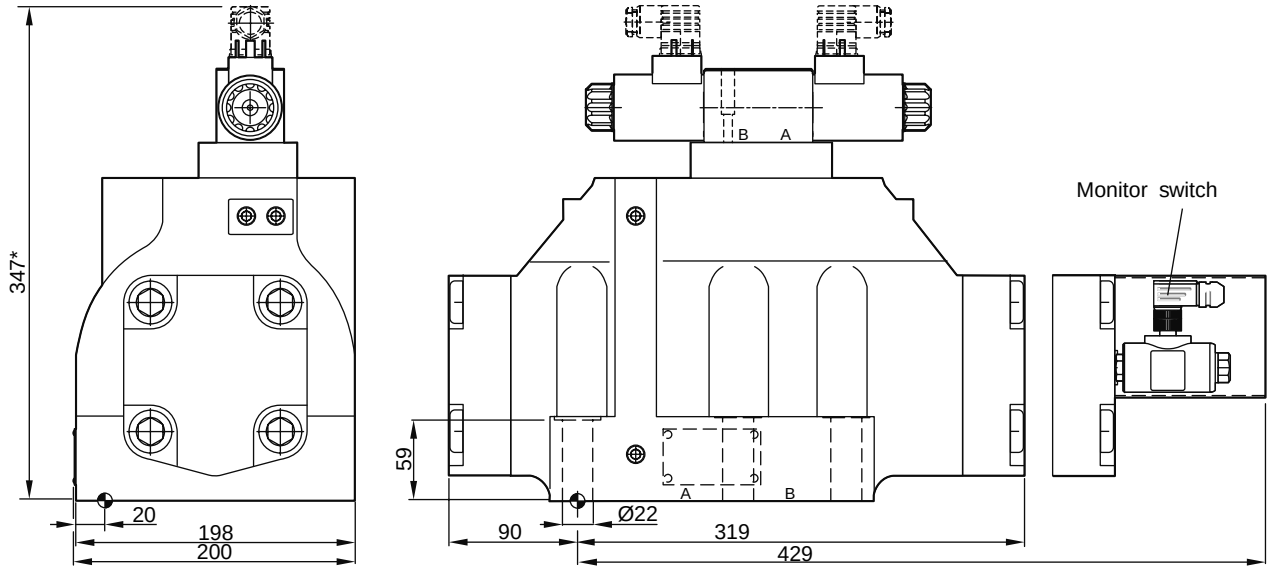
* Please add for each sandwich plate +40mm (pressure reducing valve, choke valve meter-in/-out).

Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK360	6x M12x75 DIN 912 12.9	108 Nm ±15%	**NBR: SK-D81VW-N-91 / SK-D91VW-N-91** FPM: SK-D81VW-V-91 / SK-D91VW-V-91

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

2

D111VW



* Please add for each sandwich plate +40mm (pressure reducing valve, choke valve meter-in/-out).

Surface finish	Kit			Kit
R_{max}6.3 0.01/100	BK386	6x M20x90 DIN 912 12.9	517 Nm ±15%	**NBR: SK-D111VW-N-91** FPM: SK-D111VW-V-91

The space necessary to remove the plug as per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

Notes

The new series of regenerative and hybrid directional control valves are available in four sizes:

D31NWR	NG10	Hybrid function with adaptor plate (see chapter 12)
D41VWR, D41VWZ	NG16	
D91VWR, D91VWZ	NG25	
D111VWR, D111VWZ	NG32	

The innovative integrated regenerative function in the A-line (optional) allows new energy saving circuits with differential cylinders. The hybrid version can switch between regenerative mode and standard mode at any time.

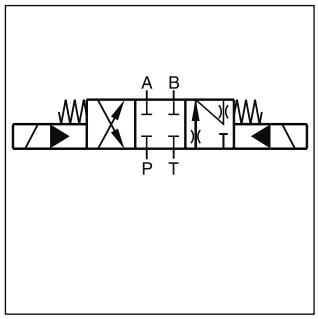
Features

- Energy saving A-regeneration optionally integrated
- Switchable hybrid version

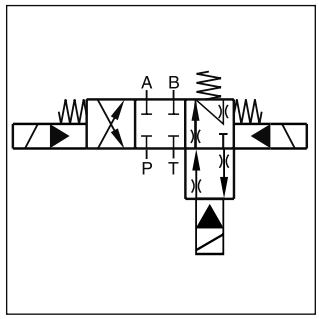
Further literature about the opportunities of energy savings and more functional details of the integrated regeneration is available on request.

D41VWR

D41VWZ

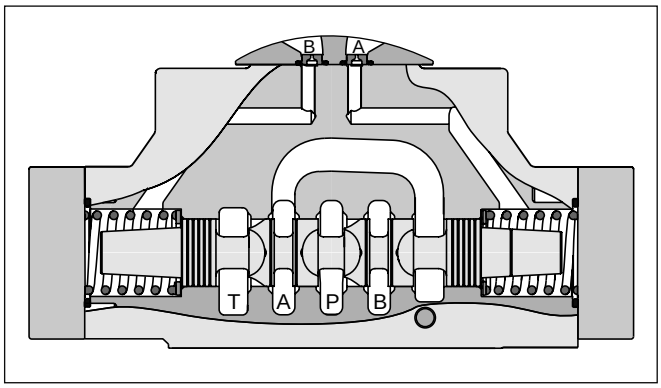


Regenerative D*1VWR

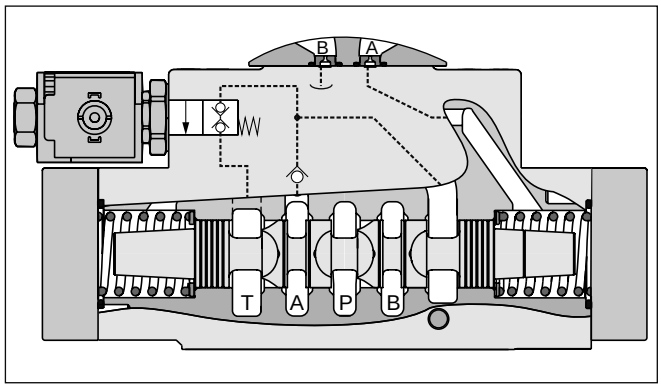


Hybrid D*1VWZ

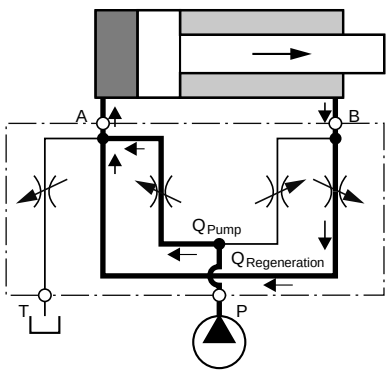
Regenerative valve D*1VWR



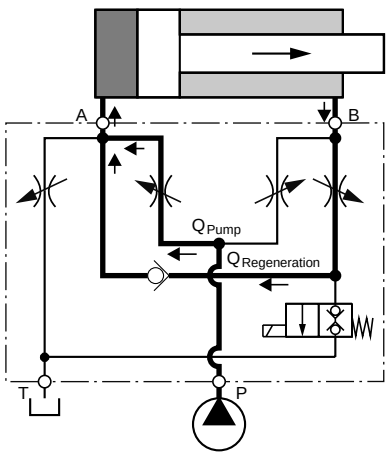
Hybrid valve D*1VWZ



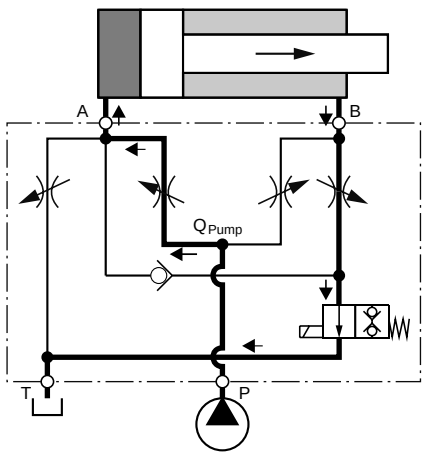
D*1VWR (regenerative valve)
Cylinder extending



D*1VWZ (hybrid valve)
Cylinder extending
regenerative mode
(high speed)

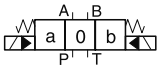


Cylinder extending
standard mode
(high force)

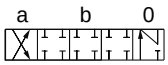
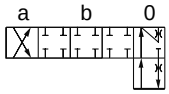
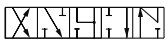
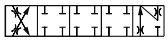
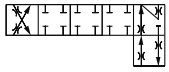
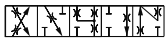
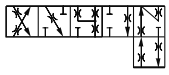


2

		C			J	W			
Series	**Spool type**	**3 spool position** Spring offset in position “0“. Operated in position “a“ or “b“.	**Pilot oil supply and drain options**	**Seals**	**Solenoid voltage 24V =**	**Connector as per EN 175301-803, without connector** (Please order plug separately)	**Solenoid options**	**Acces-sories**	**Design series** (not required for ordering)

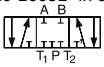
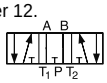


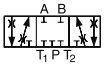
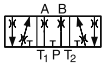
Code	Bore	Size
D31NW	Ø11mm	NG10
D41VW	Ø20mm	NG16
D91VW	Ø32mm	NG25
D111VW	Ø50mm	NG32

Regenerative function		Hybrid function [1] [2]	
Code	Spool type	Code	Spool type
R01		Z01	
R04		Z04	
R81		Z81	
R82		Z82	

[1] not for D31NW

[2] For regenerative and hybrid function for D31NW (NG10) please refer solutions with sandwich- and adaptor plates "H10-1666L / H10-1662 / A10-1664 / A10-1665L" in chapter 12.

D31NW spool type: R01  R04 

R81  R82 

Code	Inlet	Outlet
1	**Internal**	**External**
2	External	External
4	**Internal**	**Internal**
5	External	Internal

Code	Accessories
omit	**Standard valve w/o accessories**
3A	Pilot choke, meter-out
3B	Pilot choke, meter-in
3C	Pilot with pressure reducing valve
3D [3]	Stroke adjustment side B
3E [3]	Stroke adjustment side A
3F [3]	Stroke adjustment side A and B
3R	meter-out + pressure reducing valve
1T	meter-in + pressure reducing valve

[3] not for D111VW

Code	Solenoid option
omit	**Standard solenoid**
T	without manual override

Code	Seals
N	**NBR**
V	FPM

Bold letters =
Short-term availability

General						
Design			Directional spool valve			
Actuation			Solenoid			
Series			D31NW	D41VW	D81/91VW	D111VW
Size			NG10	NG16	NG25	NG32
Weight		[kg]	8.1	10.3	18.6	68.0
Mounting interface			DIN 24340 A10 ISO 4401 NFPA D05	DIN 24340 A16 ISO 4401 NFPA D07	DIN 24340 A25 ISO 4401 NFPA D08	DIN 24340 A32 ISO 4401 NFPA D10
			CETOP RP 121-H			
Mounting position			unrestricted, preferably horizontal			
Ambient temperature		[°C]	-25...+50			
$MTTF_D$ value		[years]	75			
Hydraulic						
Max. operating pressure		[bar]	Pilot drain internal: P, A B, X: 350; T, Y: 105 (D31NW: P, A, B, X: 315; T, Y: 140)			
		[bar]	Pilot drain external: P, A B, T, X: 350; Y: 105 (D31NW: P, A, B, T, X: 315; Y:140)			
Fluid			Hydraulic oil in accordance with DIN 51524 / 51525			
Fluid temperature		[°C]	-25 ... +70			
Viscosity permitted		[cSt] / [mm²/s]	2.8...400			
Viscosity recommended		[cSt] / [mm²/s]	30...80			
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)			
Flow max.		[l/min]	170	300	700	2000
Leakage at 350 bar (per flow path) *depending on spool		[ml/min]	72...422*	up to 200*	up to 800*	up to 5000*
Minimum pilot supply pressure		[bar]	7	5		
Static / Dynamic						
Step response at 95%		[ms]	Energized / De-energized			
DC solenoids	Pilot pressure	50 bar	50 / 60	95 / 65	150 / 170	470 / 390
		100 bar	50 / 60	75 / 65	110 / 170	320 / 390
		250 bar	50 / 50	60 / 65	90 / 170	210 / 390
		350 bar	50 / 50	60 / 65	85 / 170	200 / 390
AC solenoids	Pilot pressure	50 bar	30 / 50	75 / 55	130 / 155	450 / 375
		100 bar	30 / 50	65 / 55	90 / 155	300 / 375
		250 bar	30 / 50	40 / 55	70 / 155	190 / 375
		350 bar	30 / 50	40 / 55	65 / 155	180 / 375
Electrical characteristics						
Duty ratio			100% ED; CAUTION: coil temperature up to 150 °C possible			
Protection class			IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
Supply voltage / ripple		[V]	24 V =			
Tolerance supply voltage		[%]	±10			
Current consumption	hold	[A]	1.29			
Current consumption	in rush	[A]	1.29			
Power consumption	hold	[W]	31			
Power consumption	in rush	[W]	31			
Solenoid connection			Connector as per EN 175301-803, solenoid identification as per ISO 9461.			
Wiring min.		[mm²]	3 x 1.5 recommended			
Wiring length max.		[m]	50 recommended			

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

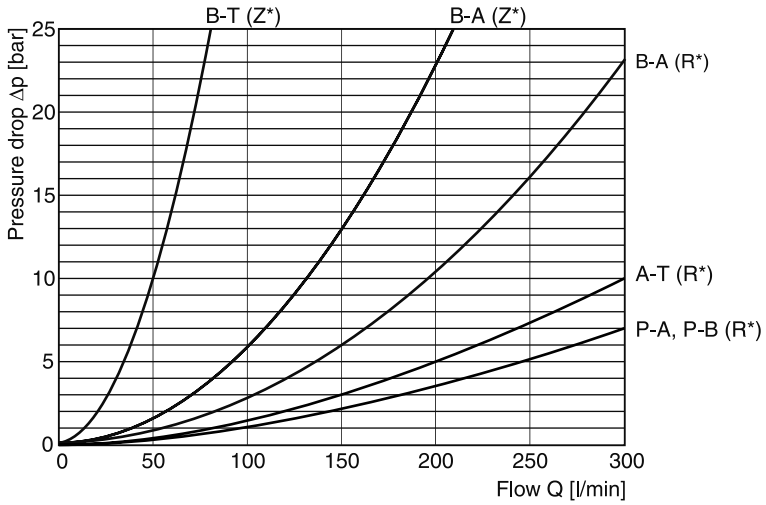
Electrical characteristics hybrid option

Duty ratio		100%		
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
		D41	D91	D111
Supply voltage	[V]	24	24	24
Tolernace supply voltage	[%]	±10	±10	±10
Current consumption	[A]	1.21	0.96	1.29
Power consumption	[W]	29	23	31
Solenoid connection		Connector as per EN 175301-803		
Wiring min.	[mm²]	3 x 1.5 recommended		
Wiring length max.	[m]	50 recommended		

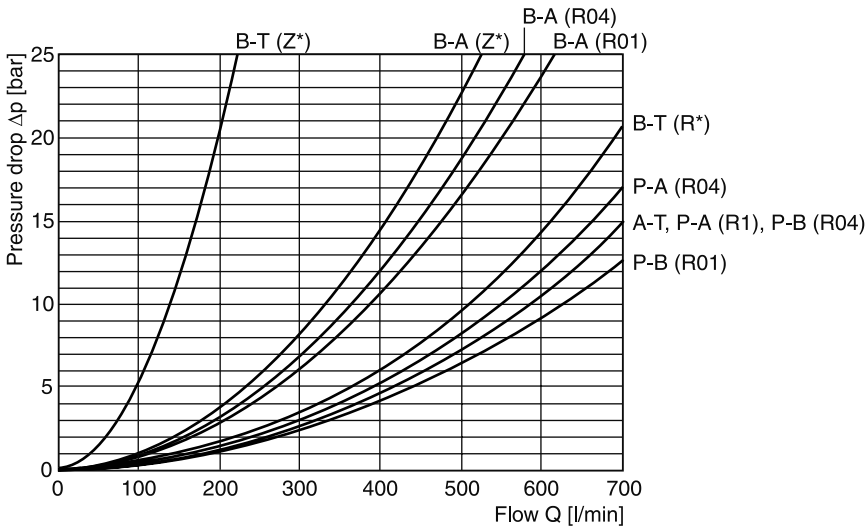
With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

2

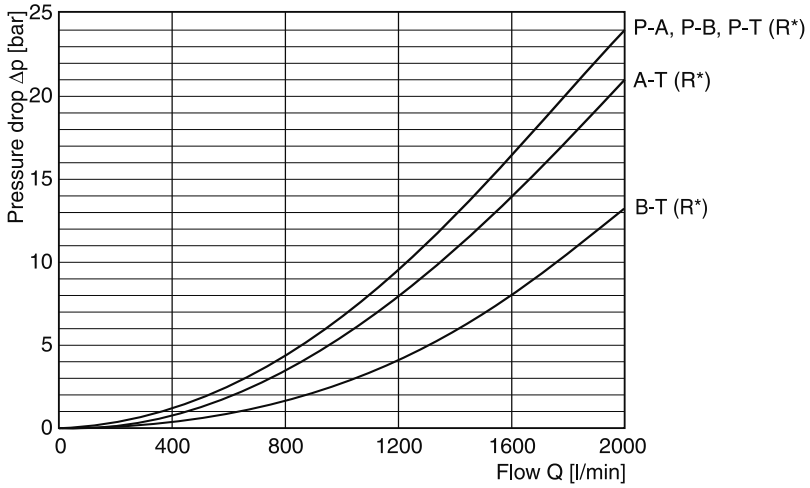
D41VW



D91VW



D111VW



Spool Z* on request

D31NW on request

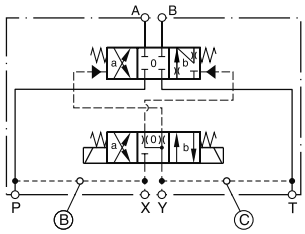
Flow curves measured with spool R01, R04, Z01, Z04

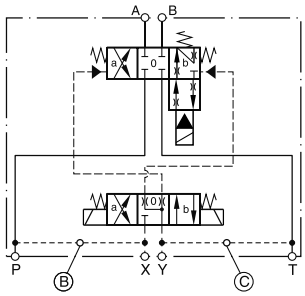
2

Pilot oil inlet (supply) and outlet (drain)

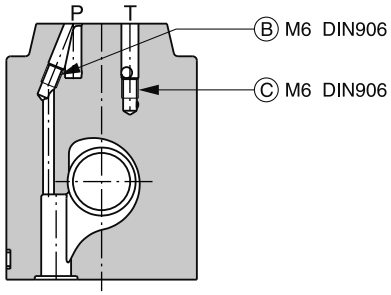
○ **open,** ● **closed**

Pilot oil Inlet	Pilot oil Drain	B	C
internal	external	○	●
external	external	●	●
internal	internal	○	○
external	internal	●	○

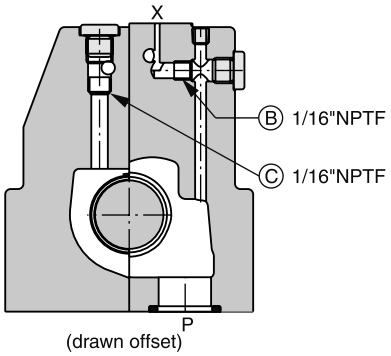




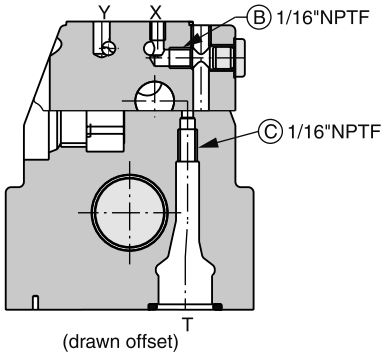
D31NWR



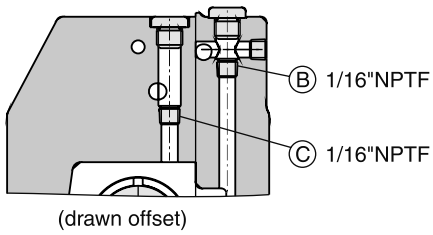
D41VWR



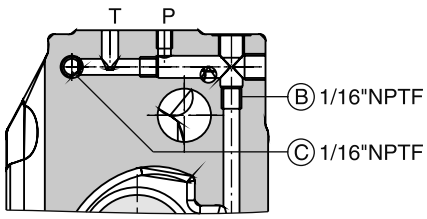
D41VWZ



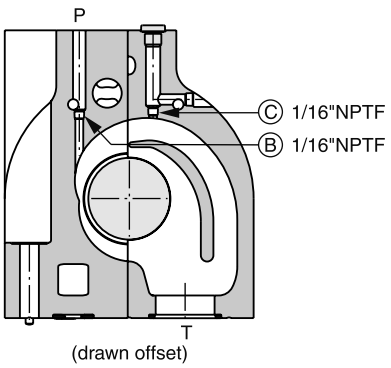
D91VWR



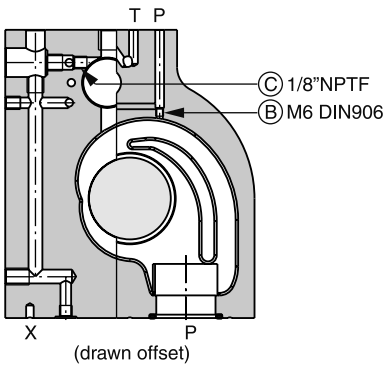
D91VWZ



D111VWR



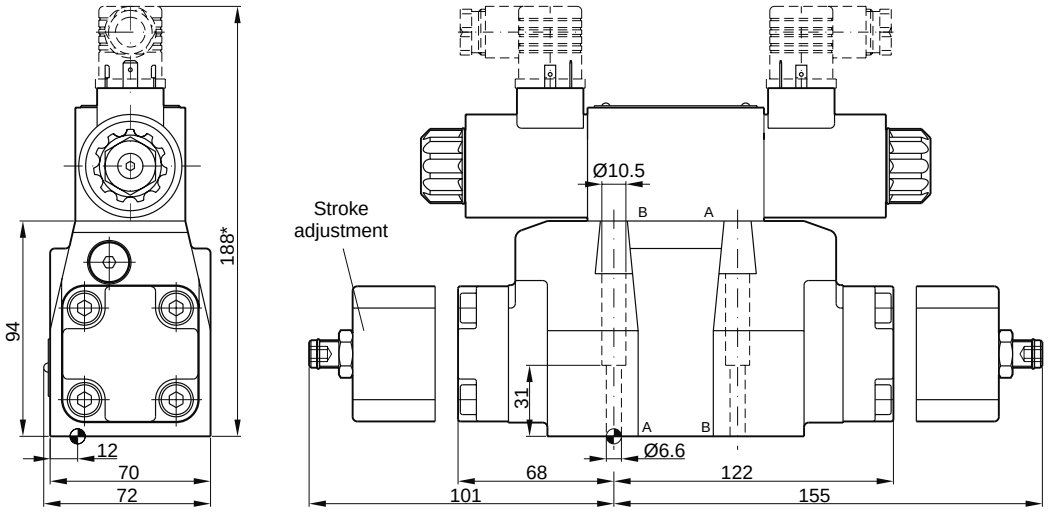
D111VWZ



2

D31NWR

Regenerative and hybrid function with additional plate ”H10-1666L / H10-1662 / A10-1664 / A10-1665L“, see chapter 12

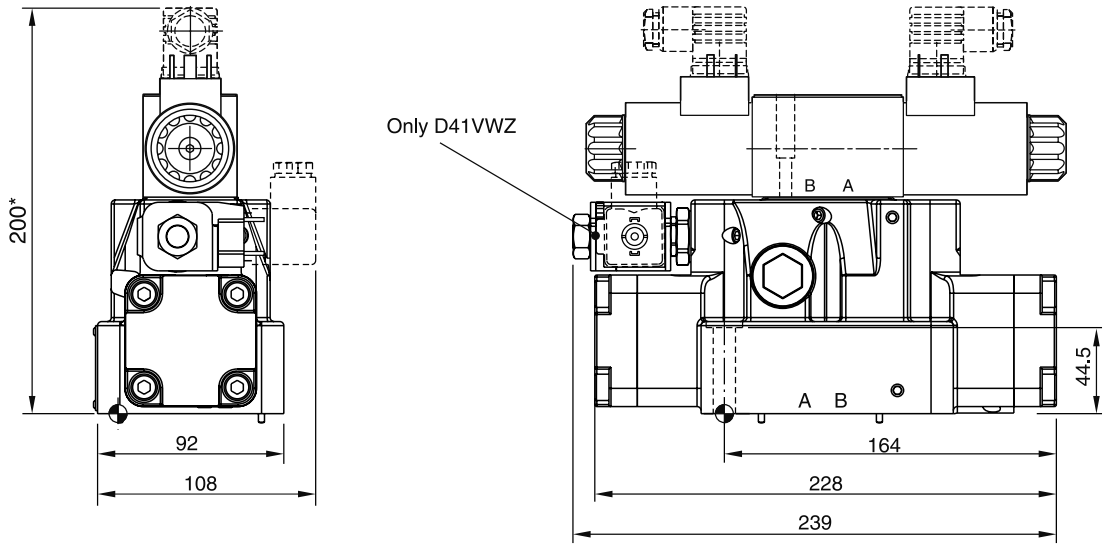


* Please add for each sandwich plate +40mm (pressure reducing valve, choke valve meter-in/-out).

Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm	**NBR: SK-D31NW-N-91** FPM: SK-D31NW-V-91

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

D41VWR/Z

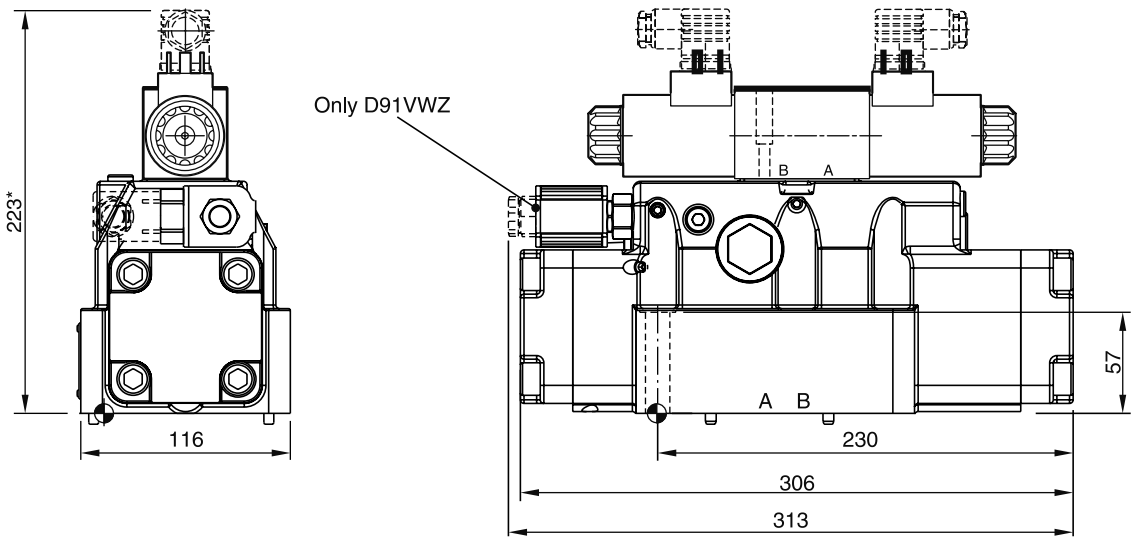


* Please add for each sandwich plate +40mm (pressure reducing valve, choke valve meter-in/-out).

Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK320	4x M10x60 2x M6x55 DIN 912 12.9	63 Nm ±15% 13.2 Nm ±15%	**NBR: SK-D41VW-N-91** FPM: SK-D41VW-V-91

2

D91VWR/Z

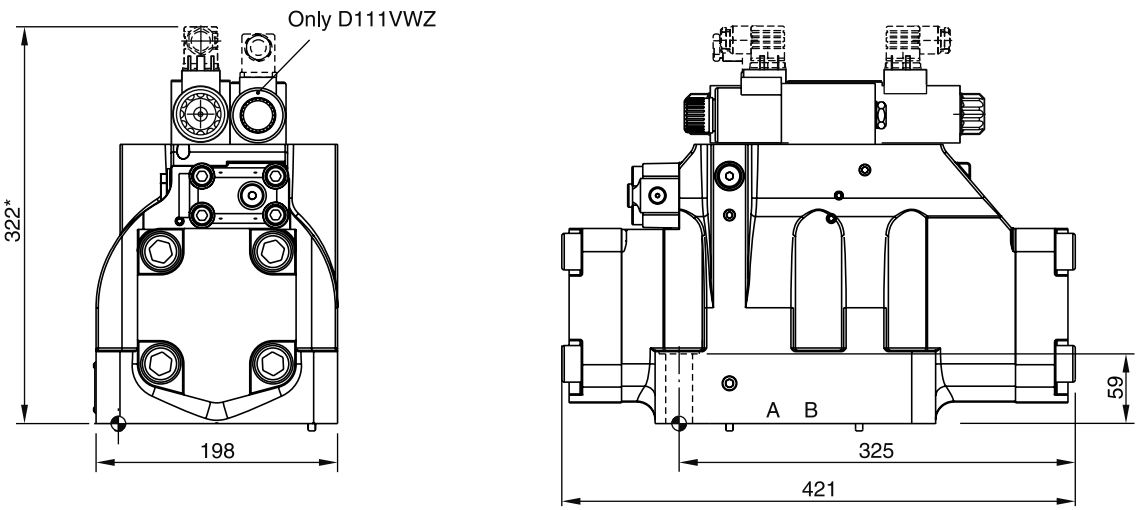


* Please add for each sandwich plate +40mm (pressure reducing valve, choke valve meter-in/-out).

Surface finish	Kit			Kit
$R_{max}6.3$ 0.01/100	BK360	6x M12x75 DIN 912 12.9	108 Nm ±15%	**NBR: SK-D81VW-N-91 / SK-D91VW-N-91** FPM: SK-D81VW-V-91 / SK-D91VW-V-91

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

D111VW



* Please add for each sandwich plate +40mm (pressure reducing valve, choke valve meter-in/-out).

Surface finish	Kit			Kit
$R_{max}6.3$ 0.01/100	BK386	6x M20x90 DIN 912 12.9	517 Nm ±15%	**NBR: SK-D111VW-N-91** FPM: SK-D111VW-V-91

The space necessary to remove the plug as per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

Notes

Hydraulically operated directional control valves are available in 5 sizes:

D1VP*4L NG06 – operated via end caps
D1VP*90 NG06 – operated via end caps and mounting interface (X, Y)
D3DP NG10 – operated via mounting interface (X, Y)
D4P NG16 – operated via mounting interface (X, Y)
D9P NG25 – operated via mounting interface (X, Y)
D11P NG32 – operated via mounting interface (X, Y)

Size NG06 (D1VP) is available in two different designs:

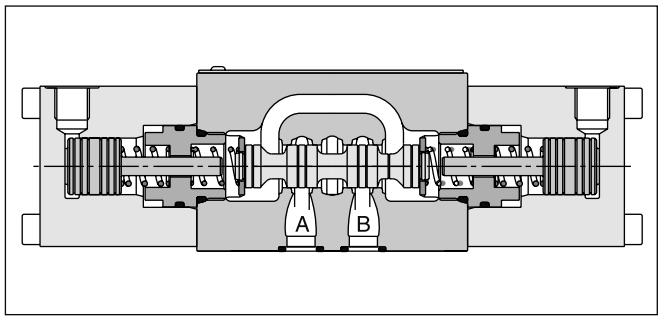
- D1VP*4L for operating pressure >10bar (over tank pressure) with control ports in the end caps.
- D1VP*90 for operating pressure >15bar with control ports in the end caps and mounting interface (X, Y).

All other series are operated only via mounting interface (X, Y).

The shifting time is depending on the pilot pressure. For safe operation the minimum pilot pressure has to be ensured in all operating conditions. The maximum pilot pressure varies from the maximum operating pressure in some sizes.

D1VP*B*4L

D1VP*90



D1VP*C*4L

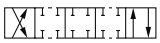
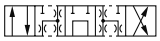
Technical data

General							
Design		Directional spool valve					
Actuation		Hydraulic					
Series		D1VP*4L	D1VP*90	D3DP	D4P	D9P	D11P
Size		NG06	NG06	NG10	NG16	NG25	NG32
Weight	[kg]	1.3	1.3	3.7	9.0	17.0	66.0
Mounting interface		DIN 24340 A06 ISO 4401 NFPA D03	DIN 24340 A06 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05	DIN 24340 A16 ISO 4401 NFPA D07	DIN 24340 A25 ISO 4401 NFPA D08	DIN 24340 A32 ISO 4401 NFPA D10
		CETOP RP 121-H					
Mounting position		unrestricted, preferably horizontal					
Ambient temperature	[°C]	-25...+50					
$MTTF_D$ value	[years]	150					
Hydraulic							
Max. operating pressure	[bar]	P, A B: 350; T: 140	P, A B; T: 350; X, Y: 210	P, A B, T: 350; X, Y: 210	P, A B, T: 350; X, Y: 350 [1)]	P, A B, T: 350; X, Y: 350 [1)]	P, A B, T: 350; X, Y: 350 [1)]
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525					
Fluid temperature	[°C]	-25 ... +70					
Viscosity permitted	[cSt] / [mm²/s]	2.8...400					
Viscosity recommended	[cSt] / [mm²/s]	30...80					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Flow max. * depending on spool, see shift limits	[l/min]	60*	60*	130	300	700	2000
Leakage at 350 bar (per flow path) * depending on spool		up to 60*	up to 60*	up to 100*	up to 200*	up to 800*	up to 5000*
Operating pressure (min/max) * >tank pressure	[bar]	10* / 210	15 /210	15 /210	5 / 350 [1)]	5 / 350 [1)]	5 / 350 [1)]
Pilot volume	[cm³]	1.2	0.7				
Pilot flow	[l/min]	10	10				
Static / Dynamic							
Step response		The response times depend on the pilot oil pressure and on the speed of the increase / decrease of the pilot pressure.					

* with monitor switch: 105 bar

2

D	1	V	P					
Directional control valve	**Size DIN NG 06 CETOP 03 NFPA D03**	**3-chamber design**	**Hydraulically operated**	**Spool type**	**Spool position**	**Seals**	**Pilot port G1/8**	**Design series** (not required for ordering)

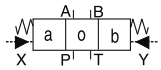
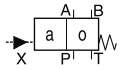
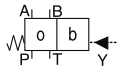
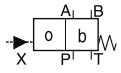
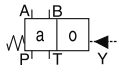
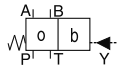
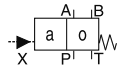
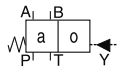
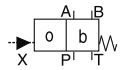
3 position spools	
Code	Spool type a 0 b
001	
002	
004	
006	
008 *	
009 *	

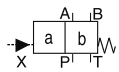
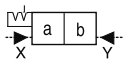
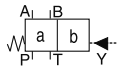
2 position spools	
Code	Spool type a b
020	
026	
030	

* Consider specific spool position.

Code	Pilot port G1/8
4L	High tank pressure, indirect via pilot spool
90	Direct via X, Y port or pipe thread G1/8

Code	Seals
N	**NBR**
V	FPM

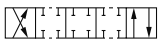
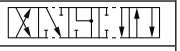
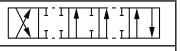
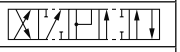
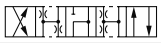
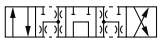
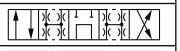
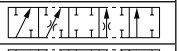
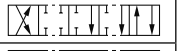
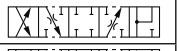
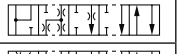
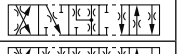
3 position spools			
Code	all 3 position spools		
C			**3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.**
	Standard	Spool type 008 and 009	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
F	 Spring offset in position “b“.	 Spring offset in position “a“.	2 positions. Operated in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.
M	 Spring offset in position “a“.	 Spring offset in position “b“.	2 positions. Operated in position “0“.

2 position spools		
Code	Spool position	
B		**Spring offset in position “b“. Operated in position “a“.**
D		**Detent, operated in position “a“ or “b“. No centre or offset position.**
H		**Spring offset in position “a“. Operated in position “b“.**

Further spool types and styles on request.

Bold letters =
Short-term availability

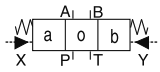
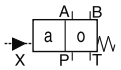
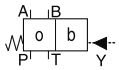
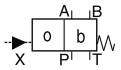
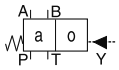
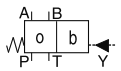
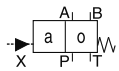
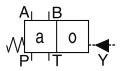
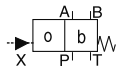
D	3	D	P			2		
Directional control valve	**Size DIN NG 10 CETOP 05 NFPA D05**	**5-chamber design**	**Hydraulically operated**	**Spool type**	**Spool position**	**Pilot oil supply and drain external/ external**	**Seals**	**Design series** (not required for ordering)

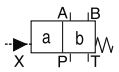
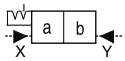
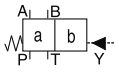
3 position spools	
Code	Spool type
	a 0 b
001	
002	
003	
004	
005	
006	
007	
008 *	
009 *	
010	
011	
014	
015	
016	
021	
022	
031	
032	
081	
082	
102	

2 position spools	
Code	Spool type
	a b
020	
026	
030	
101	

* Consider specific spool position.

Code	Seals
N	NBR
V	FPM

3 position spools			
Code	all 3 position spools		
C			3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.
	Standard	Spool type 008 and 009	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
F	 Spring offset in position “b“.	 Spring offset in position “a“.	2 positions. Operated in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.
M	 Spring offset in position “a“.	 Spring offset in position “b“.	2 positions. Operated in position “0“.

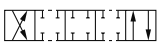
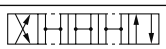
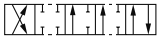
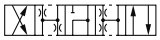
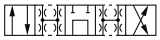
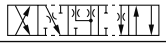
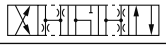
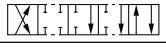
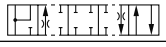
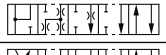
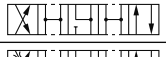
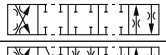
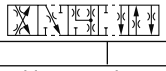
2 position spools		
Code	Spool position	
B		Spring offset in position “b“. Operated in position “a“.
D		Detent, operated in position “a“ or “b“. No center or offset position.
H		Spring offset in position “a“. Operated in position “b“.

Further spool types and styles on request.

2

D		P		
Directional control valve	**Size**	**Hydraulically operated**	**Spool type**	**Spool position**

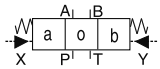
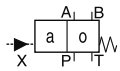
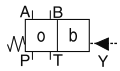
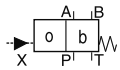
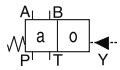
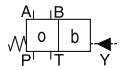
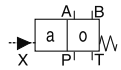
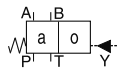
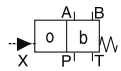
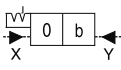
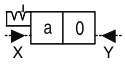
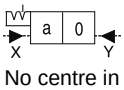
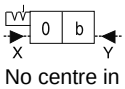
Code	Bore	Size
4	Ø20mm	NG16
9	Ø32mm	NG25
11	Ø50mm	NG32

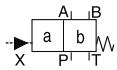
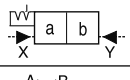
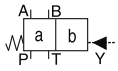
3 position spools		D4	D9	D11
Code	Spool type			
	a 0 b			
1		•	•	•
2		•	•	•
3		•	•	
4		•	•	
5		•	•	
6		•	•	
7		•	•	
9 [1]		•	•	•
11		•	•	
14		•	•	
15		•	•	
16		•	•	
21		•	•	
22		•	•	
31			•	
32			•	
54		•	•	•
81		•	•	•
82		•	•	•

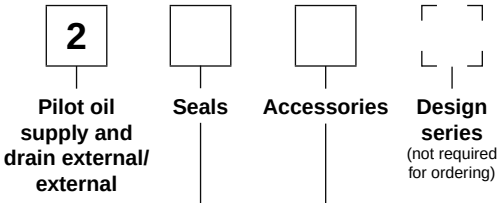
2 position spools		D4	D9	D11
Code	Spool type			
	a b			
20		•	•	•
26		•	•	
30		•	•	•

[1] Consider specific spool position
[2] Only D4 and D9 available

Further spool types and position control on request.

3 position spools			
Code	all 3 position spools		
C			3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.
	Standard	Spool type 9	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
F	 Spring offset in position “b“.	 Spring offset in position “a“.	2 positions. Operated in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.
M	 Spring offset in position “a“.	 Spring offset in position “b“.	2 positions. Operated in position “0“.
R [2]	 No centre in offset position.	 No centre in offset position.	2 positions, detent. Operated in position “0“ or “b“.
S [2]	 No centre in offset position.	 No centre in offset position.	2 positions, detent. Operated in position “0“ or “a“. No center in offset position.

2 position spools		
Code	Spool position	
B		Spring offset in position “b“. Operated in position “a“.
D [2]		Detent, operated in position “a“ or “b“. No center or offset position.
H		Spring offset in position “a“. Operated in position “b“.



Code	Accessories
omit	Standard valve w/o accessories
7	Pilot choke, meter-out
8 [2)]	Stroke adjustment side B
9 [2)]	Stroke adjustment side A
60	Pilot choke, meter-in
89 [2)]	Stroke adjustment side A and B

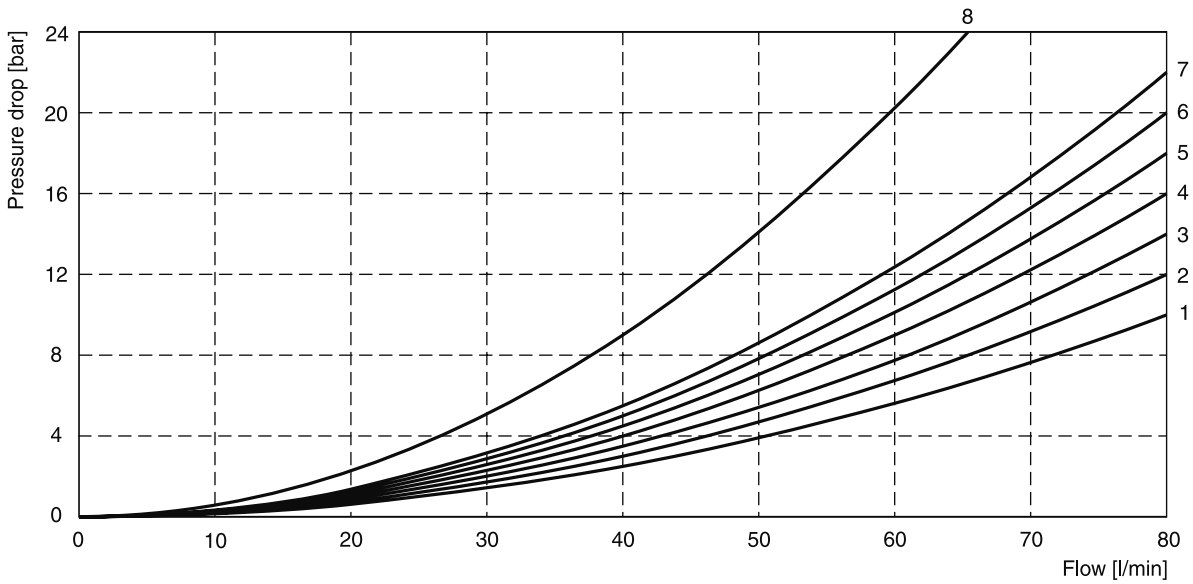
Code	Seals
N	NBR
V	FPM

2

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

	Position „b“		Position „a“		Position „0“				
Spool	**P->A**	**B->T**	**P->B**	**A->T**	**P->A**	**P->B**	**A->T**	**B->T**	**P->T**
001	2	2	2	2	–	–	–	–	–
002	1	4	1	4	1	1	5	5	2
004	2	3	2	3	–	–	7	7	–
006	1	4	1	4	7	7	–	–	–
020	4	4	2	3	–	–	–	–	–
026	4	–	4	–	–	–	–	–	–
030	2	3	1	2	–	–	–	–	–
	P->B	A->T	P->A	B->T	P->A	P->B	A->T	B->T	P->T
008	4	5	4	5	–	–	–	–	8
009	5	5	6	7	–	–	–	–	7

Flow curve



All characteristic curves measured with HLP46 at 50°C.

Shift limits

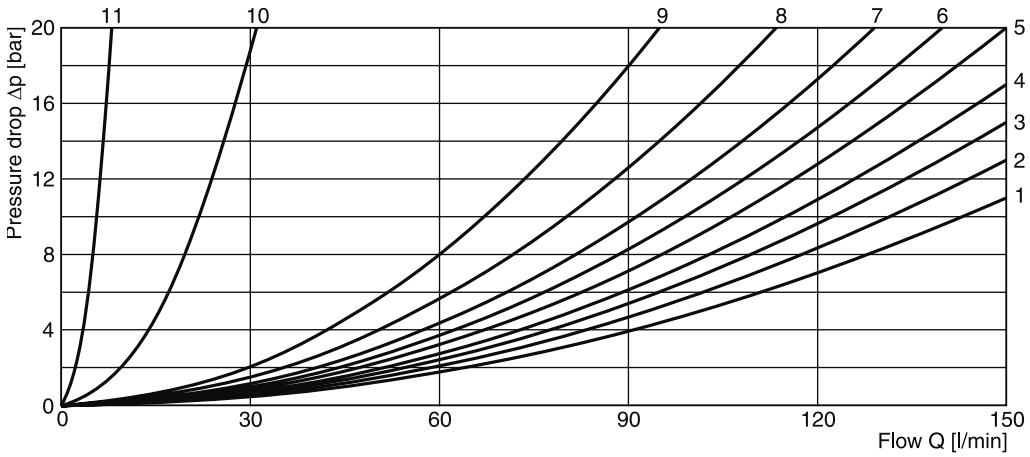
Spool	Shift limit [l/min]
001 002 004 006 020 030	60
08 09	40
026	20

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

Spool	Position „b“		Position „a“		Position „0“					
	P-A	B-T	P-B	A-T	P-A	P-B	A-T	B-T	P-T	A-B
001	4	3	4	3	–	–	–	–	–	–
002	2	4	3	3	2	2	1	2	3	4
003	2	2	4	1	–	–	5	–	–	–
004	4	3	3	2	–	–	5	5	–	6
005	1	3	4	2	4	–	–	–	–	–
006	2	4	3	3	5	5	–	–	–	6
007	4	2	2	2	–	2	–	2	5	–
010	2	–	2	–	–	–	–	–	–	–
011	3	3	2	3	–	–	10	10	–	11
014	2	3	4	2	2	–	2	–	5	–
015	4	2	2	2	–	–	–	4	–	–
016	4	2	1	1	–	4	–	–	–	–
020	4	4	4	4	–	–	–	–	–	–
026	3	–	3	–	–	–	–	–	–	–
030	4	3	3	3	–	–	–	–	–	–
081	6	7	6	7	–	–	–	–	–	–
082	7	7	6	5	–	–	11	11	–	11
101	9	9	9	9	–	–	–	–	–	–
102	2	2	2	1	6	6	3	5	6	6
	P-B	A-T	P-A	B-T	P-A	P-B	A-T	B-T	P-T	A-B
008	4	2	5	6					8	
009	2	5	2	6	–	–	–	–	8	–

	Position „b“			Position „a“			Position „0“	
	P-A	B-T	A-B	P-B	A-T		A-T	
021	3	5	6	4	2	–	–	–
031	3	5	6	4	1	–	9	–
	P-A	B-T		P-A	P-B	A-B		B-T
022	5	4	–	5	2	6	–	–
032	5	2	–	5	2	6	–	9

Flow curve



All characteristic curves measured with HLP46 at 50°C.

D_P UK.INDD RH 06.09.2011

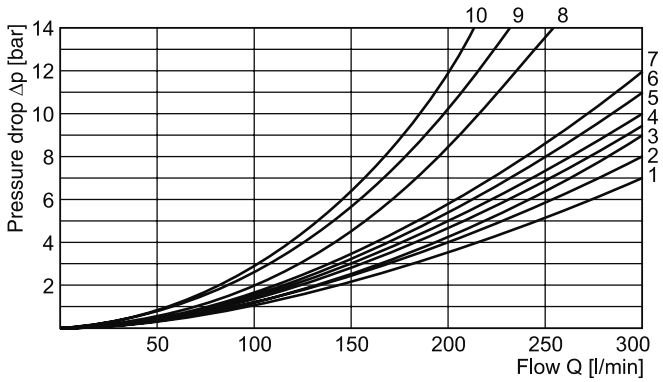
2

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

D4P

Spool Code	Curve number				
	P-A	P-B	P-T	A-T	B-T
1	1	1	–	4	5
2	1	2	6	4	6
3	1	2	–	5	6
4	1	1	–	5	5
5	2	2	–	3	5
6	1	2	–	3	6
7	1	1	6	4	5
9	2	9	8	7	10
11	1	1	–	4	5
14	1	1	6	4	5
15	1	2	–	4	6
16	2	2	–	3	5
20	3	5	–	3	5
21	2	8	–	2	–
22	8	2	–	–	3
26	3	5	–	–	–
30	2	3	–	6	7
54	2	3	–	6	7

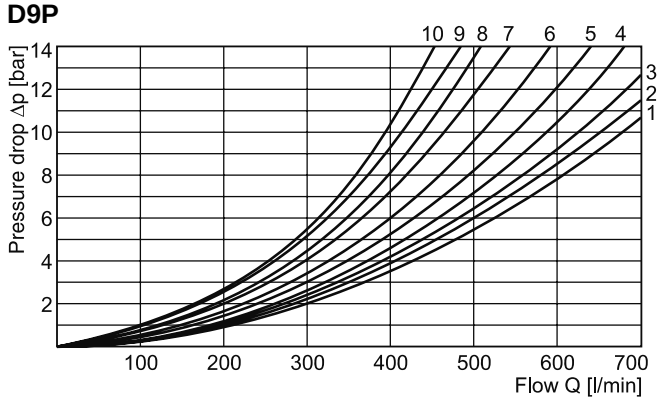
D4P



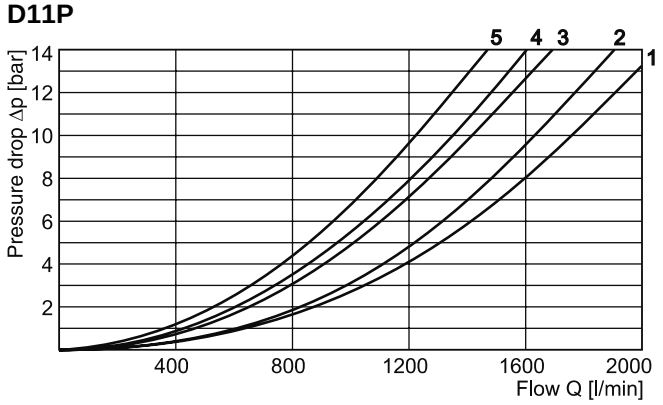
D9P and D11P

Spool Code	Curve number									
	P-A		P-B		P-T		A-T		B-T	
	D9	D11	D9	D11	D9	D11	D9	D11	D9	D11
1	3	5	2	5	–	–	3	4	5	1
2	2	5	1	5	1	5	3	4	5	1
3	4	–	2	–	–	–	3	–	6	–
4	4	–	3	–	–	–	3	–	5	–
5	1	–	2	–	–	–	4	–	5	–
6	2	–	2	–	–	–	4	–	6	–
7	3	–	1	–	7	–	3	–	5	–
9	4	3	8	3	9	2	4	3	10	1
11	3	–	2	–	–	–	3	–	5	–
14	1	–	2	–	8	–	3	–	5	–
15	3	–	3	–	–	–	4	–	5	–
16	3	–	3	–	–	–	4	–	5	–
20	6	5	5	5	–	–	6	3	8	–
21	5	–	10	–	–	–	3	–	–	–
22	10	–	5	–	–	–	–	–	5	–
26	6	–	5	–	–	–	–	–	–	–
30	3	5	2	5	–	–	3	4	5	1
54	–	5	–	5	–	–	–	4	–	1

D9P



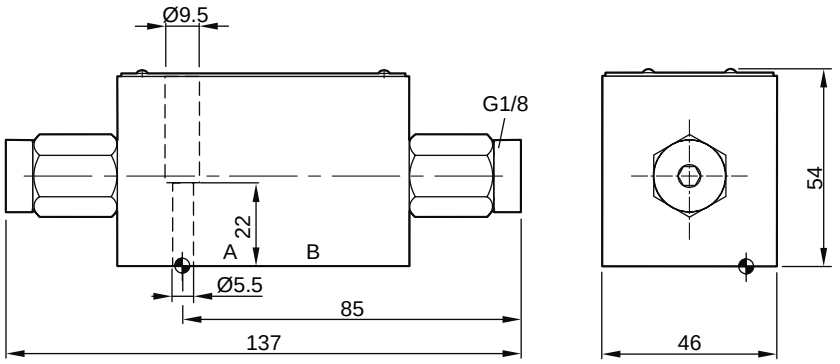
D11P



All characteristic curves measured with HLP46 at 50°C.

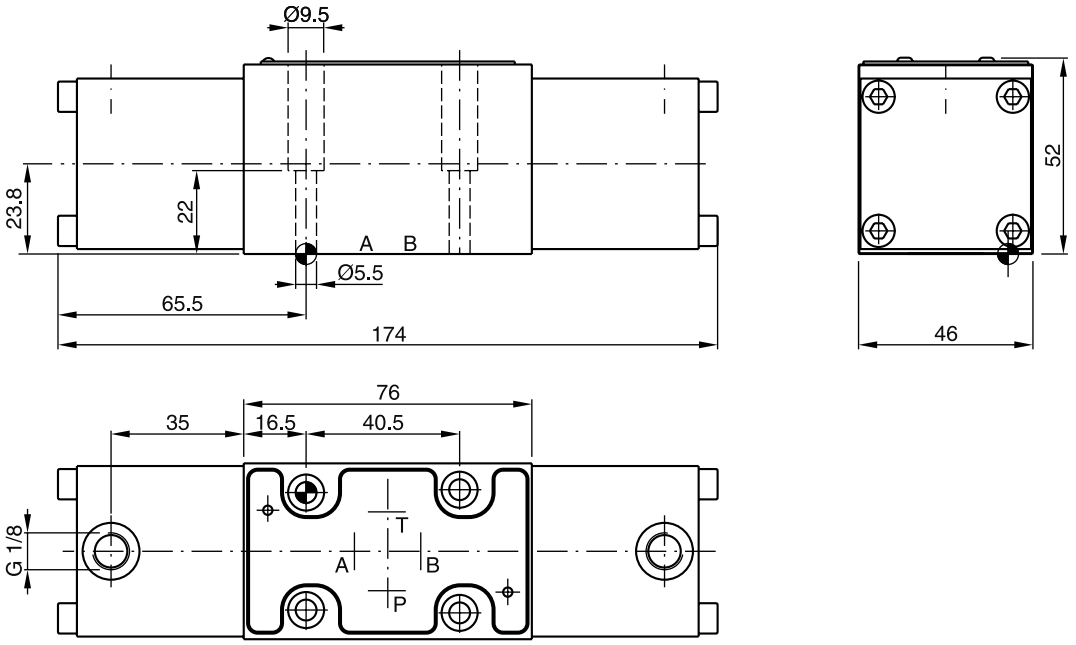
2

D1VP*90



Surface finish	Kit			Kit
$R_{max}6.3$ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	**NBR: SK-D1VP-N-87** FPM: SK-D1VP-V-87

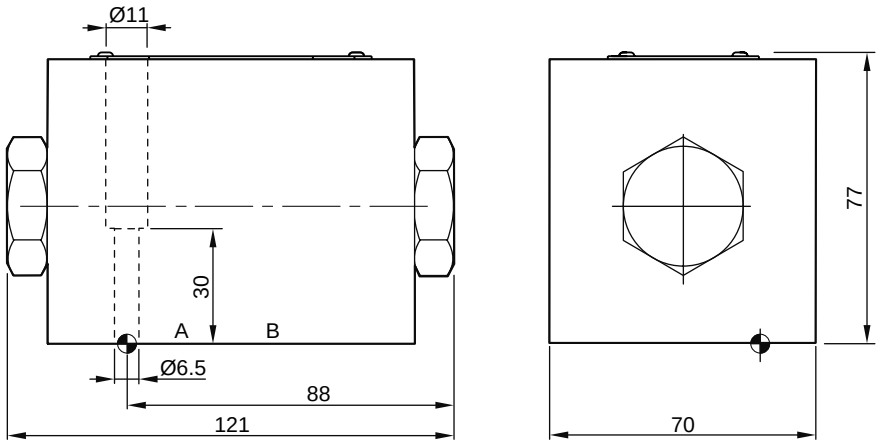
D1VP*4L



Surface finish	Kit			Kit
$R_{max}6.3$ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	**NBR: SK-D1VP-N4L-91** FPM: SK-D1VP-V4L-91

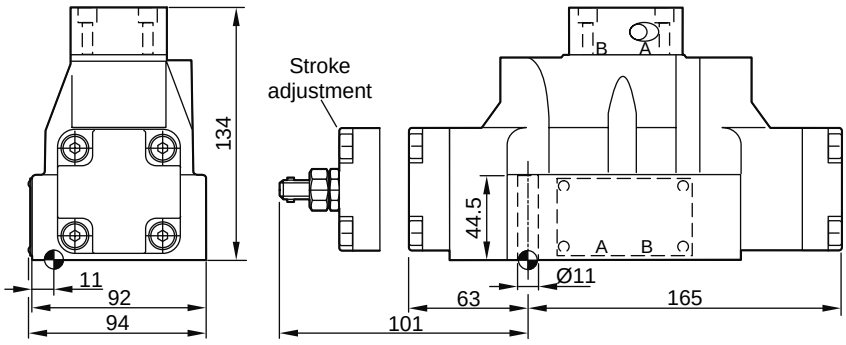
2

D3DP



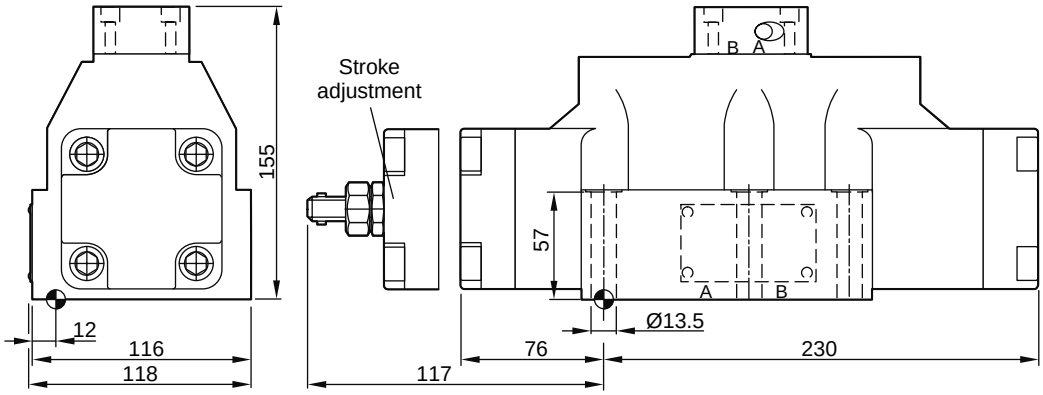
Surface finish	Kit			Kit
R_{max}6.3 ▱ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	**NBR: SK-D3DP-42** FPM: SK-D3DP-V42

D4P



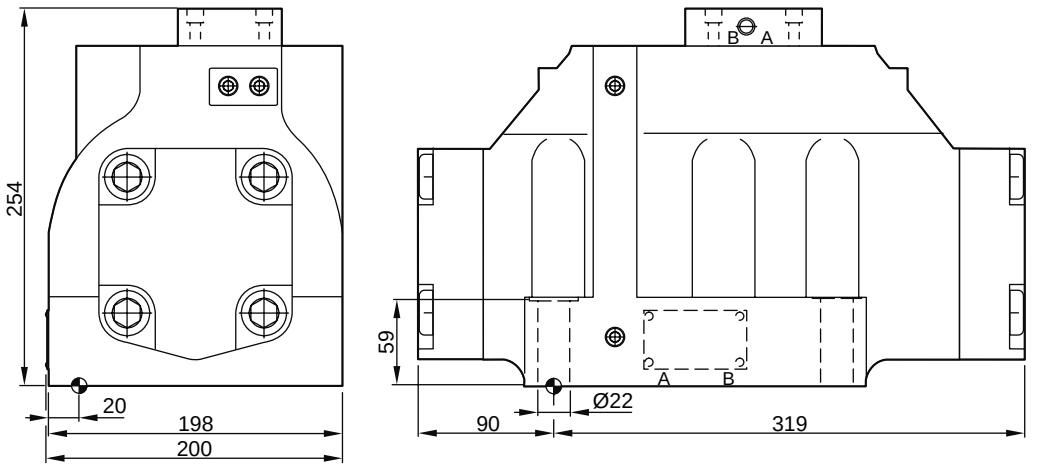
Surface finish	Kit			Kit
R_{max}6.3 ▱ 0.01/100	BK320	4x M10x60 2 x M6x55 DIN 912 12.9	63 Nm ±15% 13.2 Nm ±15%	**NBR: SK-D41VW-70** FPM: SK-D41VW-V70

D9P



Surface finish	Kit			Kit
R_{max}6.3 0.01/100	BK360	6x M12x75 DIN 912 12.9	108 Nm ±15%	**NBR: SK-D91VW-70** FPM: SK-D91VW-V70

D11P



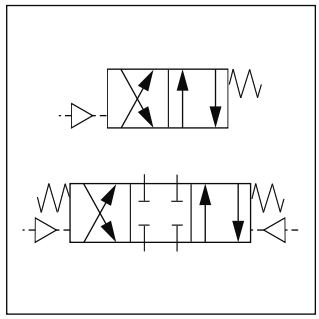
Surface finish	Kit			Kit
R_{max}6.3 0.01/100	BK386	6x M20x90 DIN 912 12.9	517 Nm ±15%	**NBR: SK-D111VW-70** FPM: SK-D111VW-V70

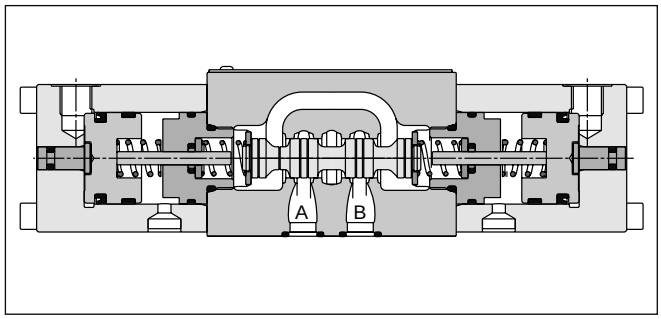
Notes

Pneumatically controlled directional control valves of series D1VA are based on the standard D1VW design.

The main spool is operated via an auxiliary spool of lager diameter. Thus enables low operating pressures from 3 to 5 bar.

Pneumatic connection via thread G1/8 in the end caps.





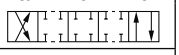
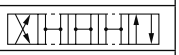
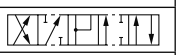
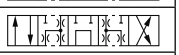
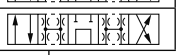
Technical data

General		
Design		Directional spool valve
Actuation		Pneumatic
Series		**D1VA**
Size		DIN NG06 / CETOP 03 / NFPA D03
Mounting interface		DIN 24340 A06, ISO 4401, NFPA D03, CETOP RP 121-H
Mounting position		unrestricted, preferably horizontal
Ambient temperature	[°C]	-25...+50
$MTTF_D$ value	[years]	150
Weight	[kg]	1.3
Hydraulic		
Max. operating pressure	[bar]	P, A B: 350; T: 105
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525
Fluid temperature	[°C]	-25 ... +70
Viscosity permitted	[cSt] / [mm²/s]	2.8...400
Viscosity recommended	[cSt] / [mm²/s]	30...80
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)
Flow max.	[l/min]	60 [1)]
Leakage at 350 bar (per flow path)	[ml/min]	up to 60 [1)]
Operating pressure w/o tank pressure with max tank	[bar] [bar]	min. 3 min. 5
Static / Dynamic		
Step response		The response times depend on the pilot oil pressure and on the speed of the increase / decrease of the pilot pressure.
Recommended values are (act./deact.) depending on pilot pressure and pipe length	[ms]	13/28

[1)] depending on spool

2

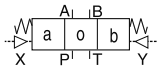
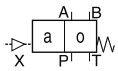
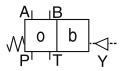
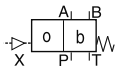
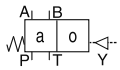
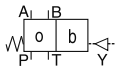
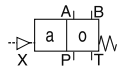
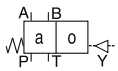
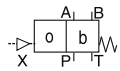
D	1	V	A				4L	
Directional control valve	**Size DIN NG 06 CETOP 03 NFPA D03**	**3-chamber design**	**Pneumatically operated**	**Spool type**	**Spool position**	**Seals**	**Indirect actuation via pilot spool; G1/8**	**Design series** (not required for ordering)

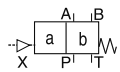
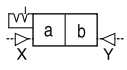
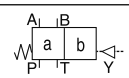
3 position spools		
Code	Spool type	
	a 0 b	
001		
002		
004		
006		
008 *		
009 *		

2 position spools		
Code	Spool type	
	a b	
020		
026		
030		

* Consider specific spool position.

Code	Seals
N	**NBR**
V	FPM

3 position spools			
Code	all 3 position spools		
C			**3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.**
	Standard	Spool type 008, 009	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
F	 Spring offset in position “b“.	 Spring offset in position “a“.	2 positions. Operated in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.
M	 Spring offset in position “a“.	 Spring offset in position “b“.	2 positions. Operated in position “0“.

2 position spools		
Code	Spool position	
B		**Spring offset in position “b“. Operated in position “a“.**
D		**Detent, operated in position “a“ or “b“. No centre or offset position.**
H		**Spring offset in position “a“. Operated in position “b“.**

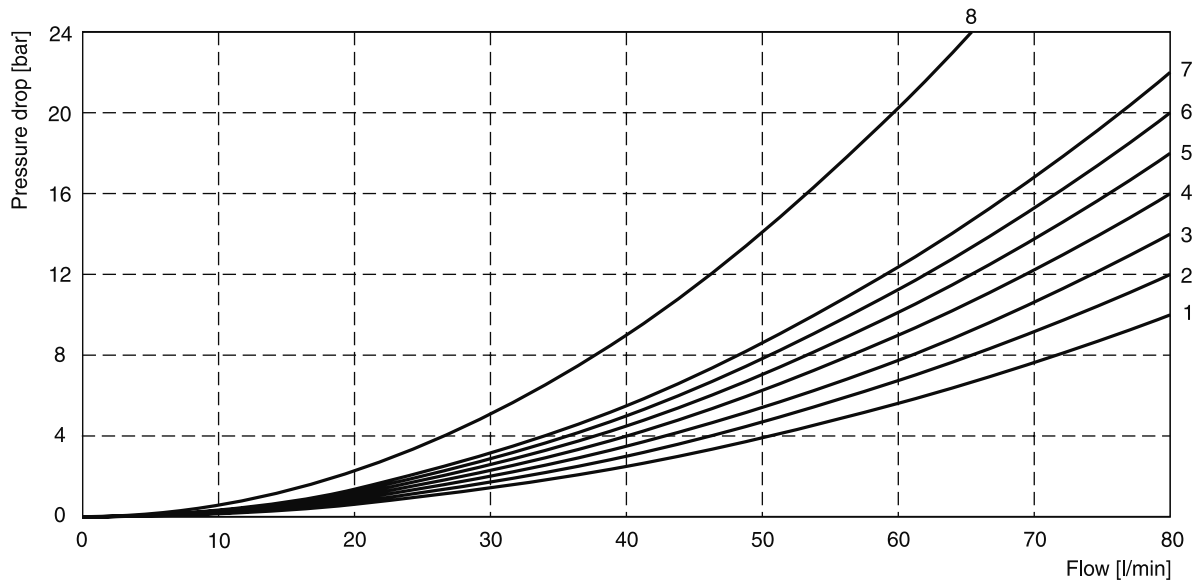
Further spool types and styles on request.

Bold letters =
Short-term availability

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

	Position „b“		Position „a“		Position „0“				
Spool	**P->A**	**B->T**	**P->B**	**A->T**	**P->A**	**P->B**	**A->T**	**B->T**	**P->T**
001	2	2	2	2	–	–	–	–	–
002	1	4	1	4	1	1	5	5	2
004	2	3	2	3	–	–	7	7	–
006	1	4	1	4	7	7	–	–	–
020	4	4	2	3	–	–	–	–	–
026	4	–	4	–	–	–	–	–	–
030	2	3	1	2	–	–	–	–	–
	P->B	**A->T**	**P->A**	**B->T**	**P->A**	**P->B**	**A->T**	**B->T**	**P->T**
008	2	2	2	2	–	–	–	–	8
009	3	3	3	3	–	–	–	–	7

Flow curve



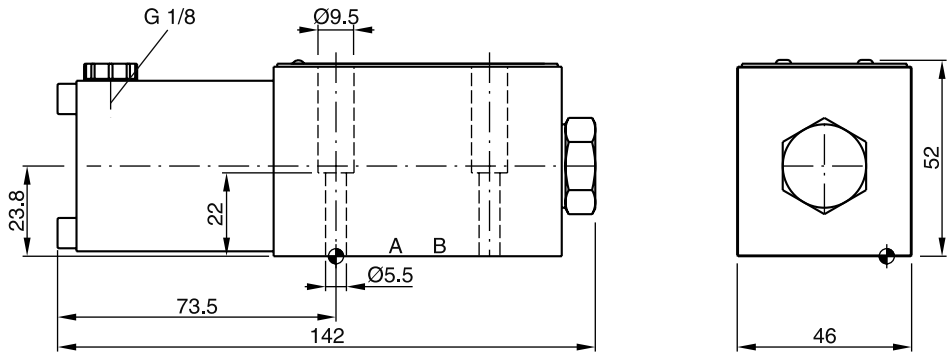
All characteristic curves measured with HLP46 at 50°C.

Shift limits

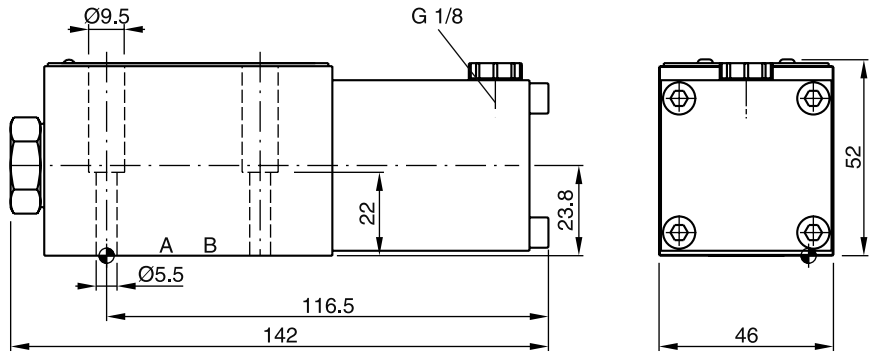
Spool	Shift limit [l/min]
001 002 004 006 020 030	60
08 09	40
026	20

2

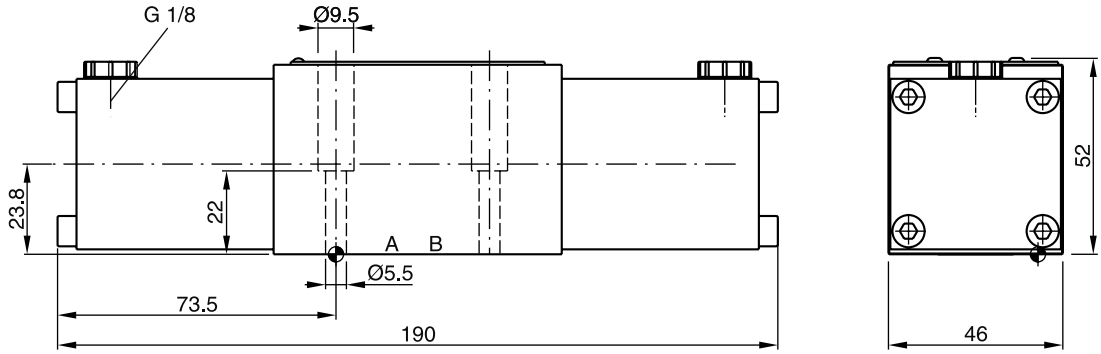
B, E, F -style



H, K, M -style



C, D -style



Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	**NBR: SK-D1VA-N-91** FPM: SK-D1VA-V-91

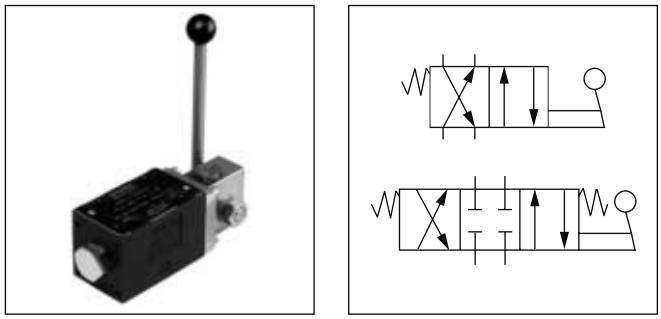
The D1VL is 3 chamber, D3DL, D4L and D9L are 5 chamber 4/3 or 4/2 way directional control valves. The hand lever is directly connected to the spool and can be located either on the A or B side. Spring offset and detent designs are available.

Directional control valves with hand lever are available in 4 sizes:

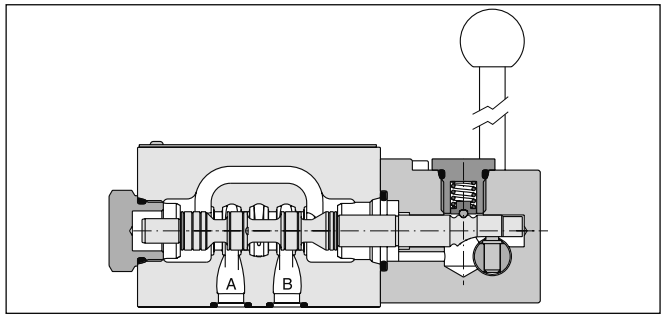
- D1VL NG06
- D3DL NG10
- D4L NG16
- D9L NG25

Technical features

- All hand lever parts stainless steel



D1VL



D1VL

Technical data

General					
Design		Directional spool valve			
Actuation		Lever			
Series		**D1VL**	**D3DL**	**D4L**	**D9L**
Size		NG06	NG10	NG16	NG25
Weight	[kg]	1.4	3.7	9.0	17.0
Mounting interface		DIN 24340 A06 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05	DIN 24340 A16 ISO 4401 NFPA D07	DIN 24340 A25 ISO 4401 NFPA D08
		CETOP RP 121-H			
Mounting position		unrestricted, preferably horizontal			
Ambient temperature	[°C]	-25...+50			
Hydraulic					
Max. operating pressure	[bar]	P, A B: 350; T: 140	P, A B: 350; T: 10	external drain P, A B, T: 350; X, Y: 10 internal drain P, A B: 350; T, X, Y: 10	external drain P, A B, T: 350; X, Y: 10 internal drain P, A B: 350; T, X, Y: 10
Fluid		Hydraulic oil in accordance with DIN 51524 / 51525			
Fluid temperature	[°C]	-25 ... +70			
Viscosity permitted	[cSt] / [mm²/s]	2.8...400			
Viscosity recommended	[cSt] / [mm²/s]	30...80			
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)			
Flow max.	[l/min]	80	130	300	700
Leakage at 350 bar (per flow path)	[ml/min]	–	up to 100*	up to 200*	up to 800*
Leakage at 50 bar (per flow path)	[ml/min]	up to 10*	–	–	–

* depending on spool

2

D	1	V						
Directional control valve	**Size DIN NG06, CETOP03 NFPA D03**	**3-chamber valve**	**Actuation**	**Spool type**	**Spool position**	**Seals**	**Switching logic**	**Design series** (not required for ordering)

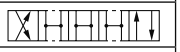
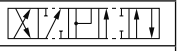
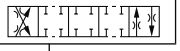
Code	Actuation
L	**Hand lever side B**
LB	**Hand lever side A**

Code	Switching logic
4J [2]	Center of rotation below spool axis (Parker style)
4K [2]	Center of rotation above spool axis (Denison style)

[2] Details see dimensions

Code	Seals
N	**NBR**
V	FPM

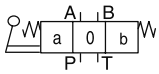
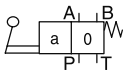
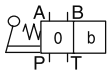
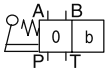
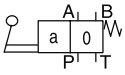
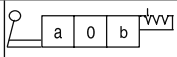
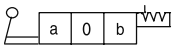
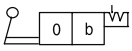
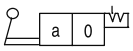
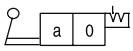
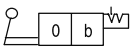
3 position spools

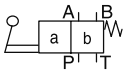
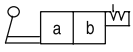
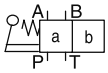
Code	Spool type a 0 b
001	
002	
004	
006	
009 [1]	
042	

2 position spools

Code	Spool type a b
020	

[1] Consider specific spool position.

3 position spools			
Code	all 3 position spools		
C			**3 positions.** **Spring offset in position “0“.** **Operated in position “a“ or “b“.**
	Standard	Spool type 009	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.
N	 No centre in offset position.	 No centre in offset position.	3 positions, detent. Operated in position “a“, “0“or “b“.
R	 No centre in offset position.	 No centre in offset position.	2 positions, detent. Operated in position “0“ or “b“.
S	 No centre in offset position.	 No centre in offset position.	2 positions, detent. Operated in position “0“ or “a“. No center in offset position.

2 position spools		
Code	Spool position	
B		**Spring offset in position “b“.** **Operated in position “a“.**
D		Detent, operated in position “a“ or “b“. No center or offset position.
H		Spring offset in position “a“. Operated in position “b“.

Further spool types on request.

Bold letters =
Short-term availability

D_L UK.INDD RH 06.09.2011

D	3	D						
Directional control valve	**Size DIN NG10, CETOP05 NFPA D05**	**5-chamber valve**	**Actuation**	**Spool type**	**Spool position**	**Seals**	**Switching logic**	**Design series** (not required for ordering)

2

Code	Actuation
L	**Hand lever side B**
LB	**Hand lever side A**

Code	Switching logic
4J [2]	Center of rotation below spool axis (Parker style)
4K [2]	Center of rotation above spool axis (Denison style)

[2] Details see dimensions

Code	Seals
N	**NBR**
V	FPM

3 position spools

Code	Spool type a 0 b
001	
002	
004	
006	
009 [1]	
010	

2 position spools

Code	Spool type a b
020	

[1] Consider specific spool position.

3 position spools

Code	all 3 position spools		
C			**3 positions.** **Spring offset in position “0“.** **Operated in position “a“ or “b“.**
	Standard	Spool type 009	
E	Operated in position “a“.	Operated in position “b“.	2 positions. Spring offset in position “0“.
K	Operated in position “b“.	Operated in position “a“.	2 positions. Spring offset in position “0“.
N	No centre in offset position.	No centre in offset position.	3 positions, detent. Operated in position “a“, “0“or “b“.
R	No centre in offset position.	No centre in offset position.	2 positions, detent. Operated in position “0“ or “b“.
S	No centre in offset position.	No centre in offset position.	2 positions, detent. Operated in position “0“ or “a“. No center in offset position.

2 position spools

Code	Spool position	
B		**Spring offset in position “b“.** **Operated in position “a“.**
D		Detent, operated in position “a“ or “b“. No center or offset position.
H		Spring offset in position “a“. Operated in position “b“.

Further spool types on request.

Bold letters =
Short-term availability

D_L UK.INDD RH 06.09.2011

2

D							
Directional control valve	**Size**	**Actuation**	**Spool type**	**Spool position**	**Pilot oil drain**	**Seals**	**Design series** (not required for ordering)

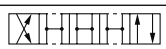
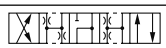
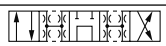
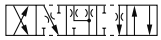
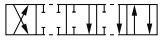
Code	Bore	Size
4	Ø20mm	NG16
9	Ø32mm	NG25

Code	Seals
N	NBR
V	FPM

Code	Actuation
L	Lever side B
LB	Lever side A

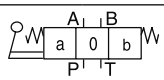
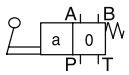
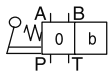
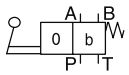
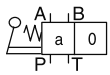
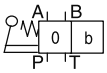
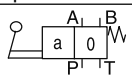
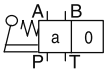
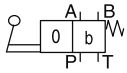
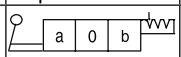
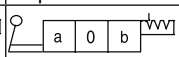
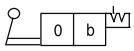
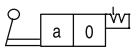
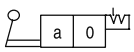
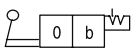
Code	Outlet
2 [2]	External
5 [3]	Internal

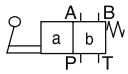
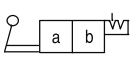
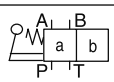
[2] Pressure T-port > 10 bar
[3] Pressure T-port < 10 bar

3 position spools			
Code	Spool type a 0 b	D4	D9
1		•	•
2		•	•
3		•	•
4		•	•
6		•	
7		•	•
9 [1]		•	•
11		•	•
14		•	•
15		•	•

2 position spools			
Code	Spool type a b		
20		•	•
30		•	•

[1] Consider specific spool position.

3 position spools			
Code	all 3 position spools		
C			3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.
	Standard	Spool type 9	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
F	 Operated in position “0“.	 Operated in position “0“.	2 positions. Spring offset in position “b“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.
M	 Operated in position “0“.	 Operated in position “0“.	2 positions. Spring offset in position “a“.
N	 No centre in offset position.	 No centre in offset position.	3 positions, detent. Operated in position “a“, “0“or “b“.
R	 No centre in offset position.	 No centre in offset position.	2 positions, detent. Operated in position “0“ or “b“.
S	 No centre in offset position.	 No centre in offset position.	2 positions, detent. Operated in position “0“ or “a“. No center in offset position.

2 position spools		
Code	Spool position	
B		Spring offset in position “b“. Operated in position “a“.
D		Detent, operated in position “a“ or “b“. No center or offset position.
H		Spring offset in position “a“. Operated in position “b“.

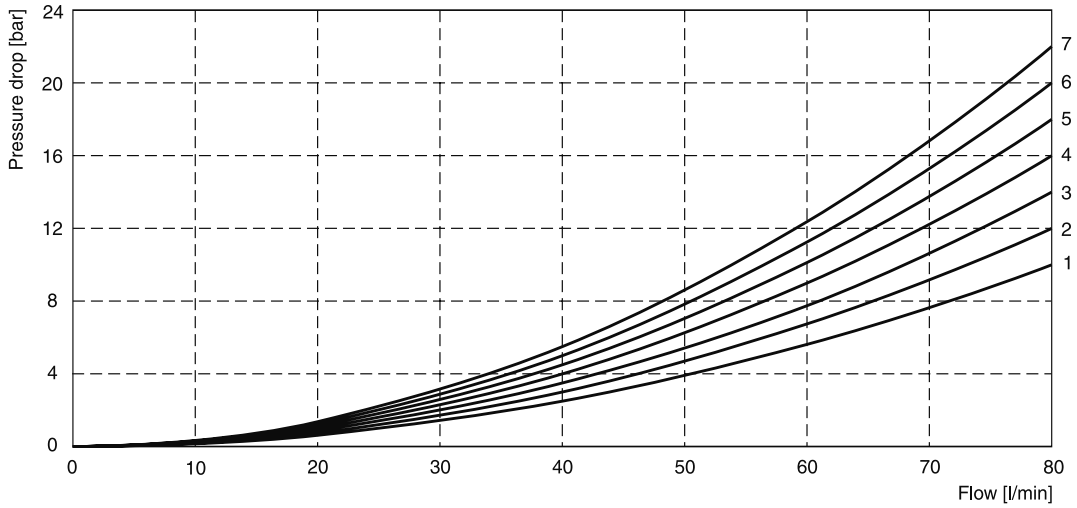
Further spool types on request.

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

D1VL

	Position „b“		Position „a“		Position „0“				
Spool	P->A	B->T	P->B	A->T	P->A	P->B	A->T	B->T	P->T
001	2	2	2	2	–	–	–	–	–
002	1	4	1	4	1	1	5	5	2
004	2	3	2	3	–	–	7	7	–
006	1	4	1	4	7	7	–	–	–
020	4	4	2	3	–	–	–	–	–
	P->B	A->T	P->A	B->T	P->A	P->B	A->T	B->T	P->T
009	5	5	6	7	–	–	–	–	7

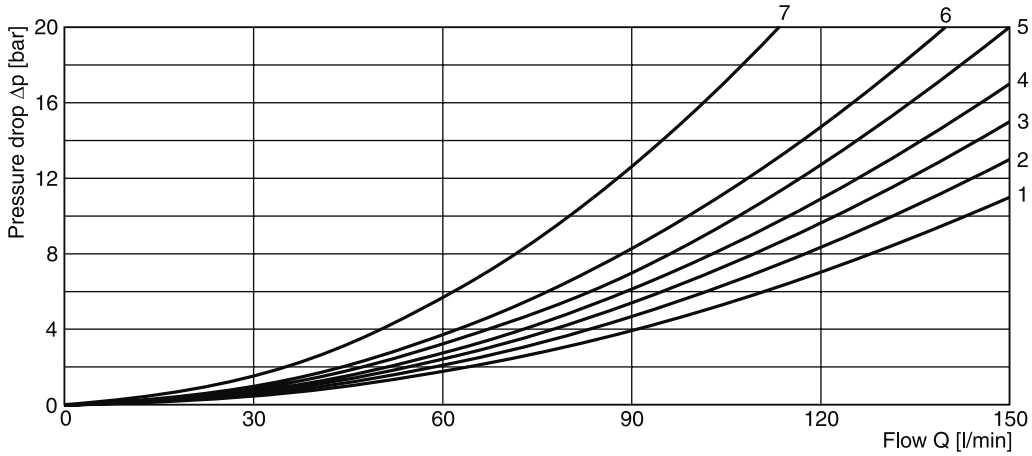
Flow curve diagram D1VL



D3DL

Spool	Position „b“		Position „a“		Position „0“					
	P-A	B-T	P-B	A-T	P-A	P-B	A-T	B-T	P-T	A-B
001	4	3	4	3	–	–	–	–	–	–
002	2	4	3	3	2	2	1	2	3	4
004	4	3	3	2	–	–	5	5	–	6
006	2	4	3	3	5	5			–	6
020	4	4	4	4	–	–	–	–	–	–
	P-B	A-T	P-A	B-T	P-A	P-B	A-T	B-T	P-T	A-B
009	2	5	2	6	–	–	–	–	7	–

Flow curve diagram D3DL

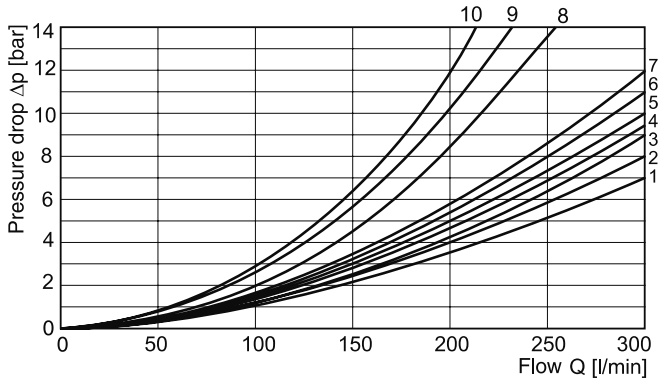


All characteristic curves measured with HLP46 at 50°C.

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

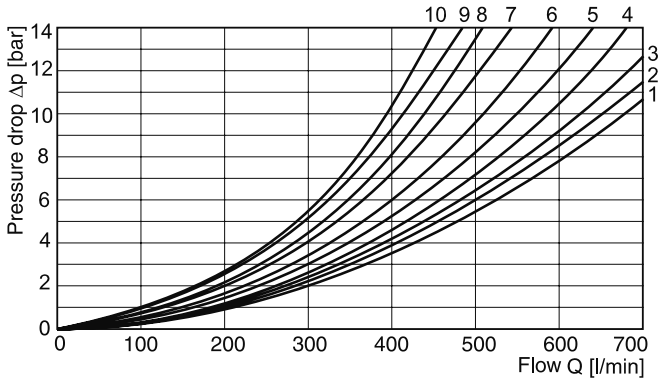
D4L

Spool Code	Curve number				
	P-A	P-B	P-T	A-T	B-T
1	1	1	–	4	5
2	1	2	6	4	6
3	1	2	–	5	6
4	1	1	–	5	5
6	1	2	–	3	6
7	1	1	6	4	5
9	2	9	8	7	10
11	1	1	–	4	5
14	1	1	6	5	4
15	2	1	–	6	5
20	3	5	–	3	5
30	2	3	–	6	7



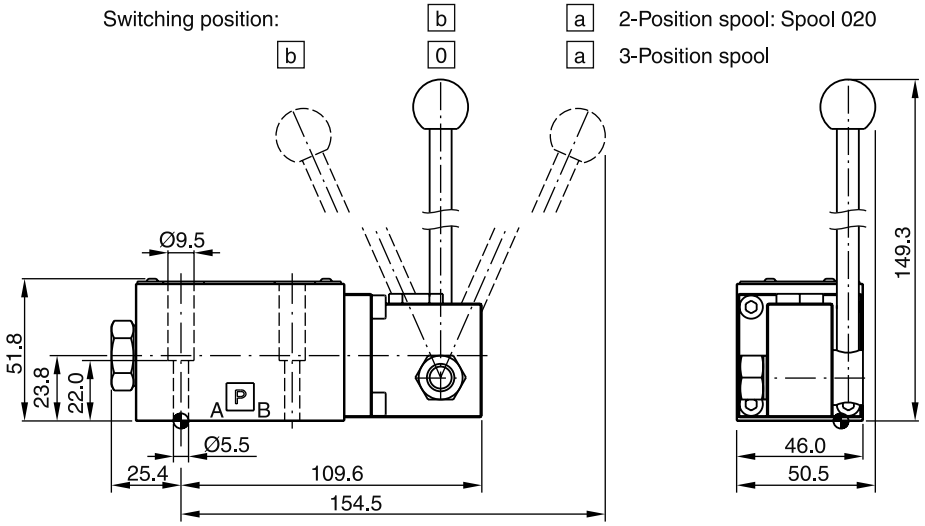
D9L

Spool Code	Curve number				
	P-A	P-B	P-T	A-T	B-T
1	3	2	-	3	5
2	2	1	1	3	5
3	4	2	-	3	6
4	4	3	-	3	5
7	3	1	7	3	5
9	4	8	9	4	10
14	1	3	7	5	3
15	2	4	-	5	3
20	6	5	-	6	8
30	3	2	-	3	5

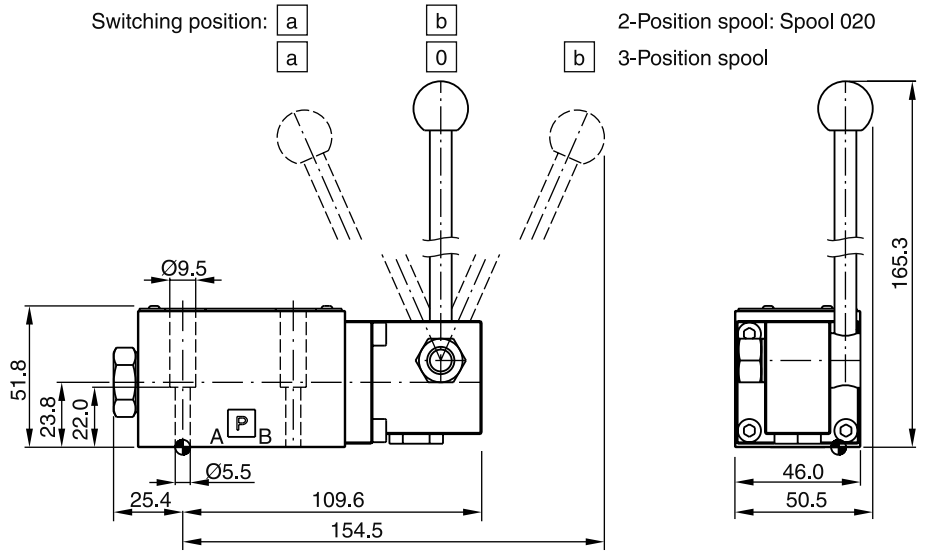


All characteristic curves measured with HLP46 at 50°C.

D1VL*4J



D1VL*4K

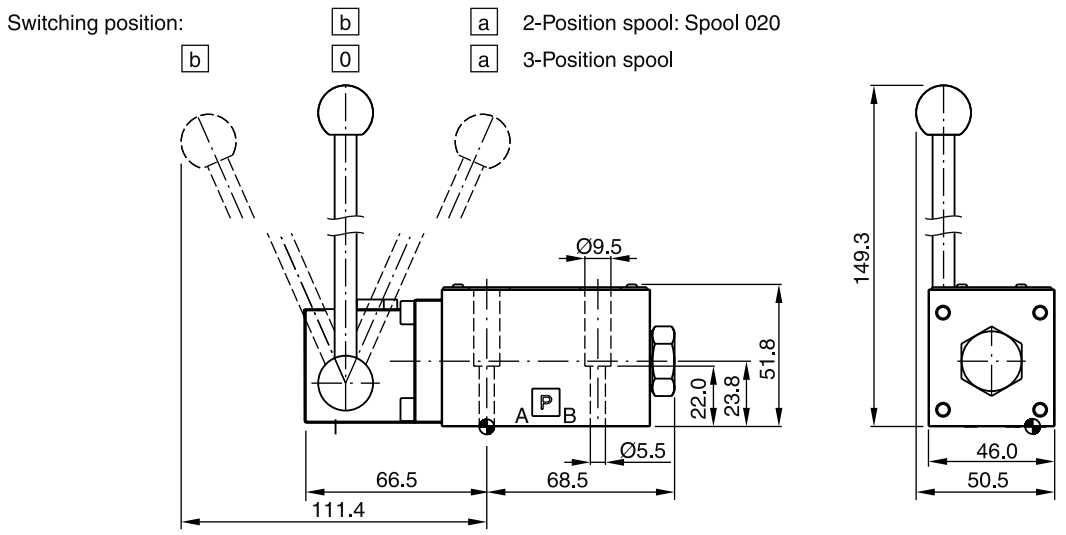


Valid for all styles. Switching position see ordering code.

Surface finish	Kit			Kit
R_{max}6.3 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	**NBR: SK-D1VL-N-91** FPM: SK-D1VL-V-91

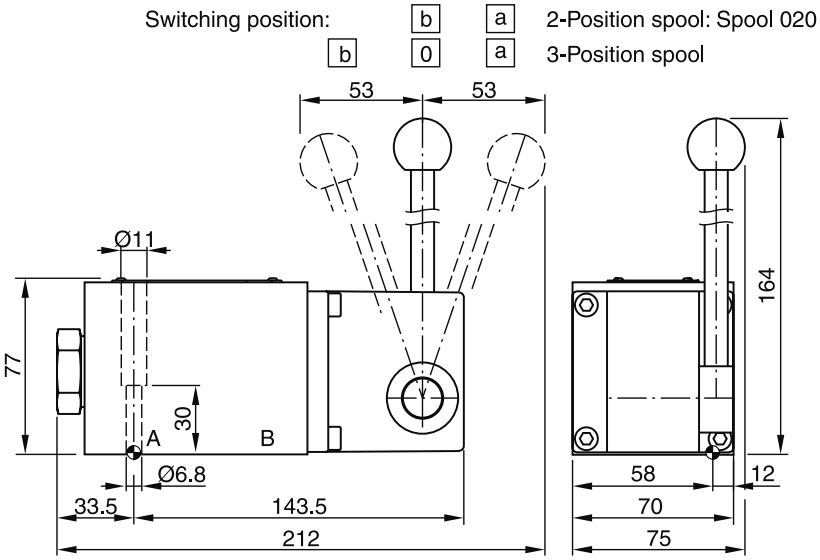
2

D1VLB*4J



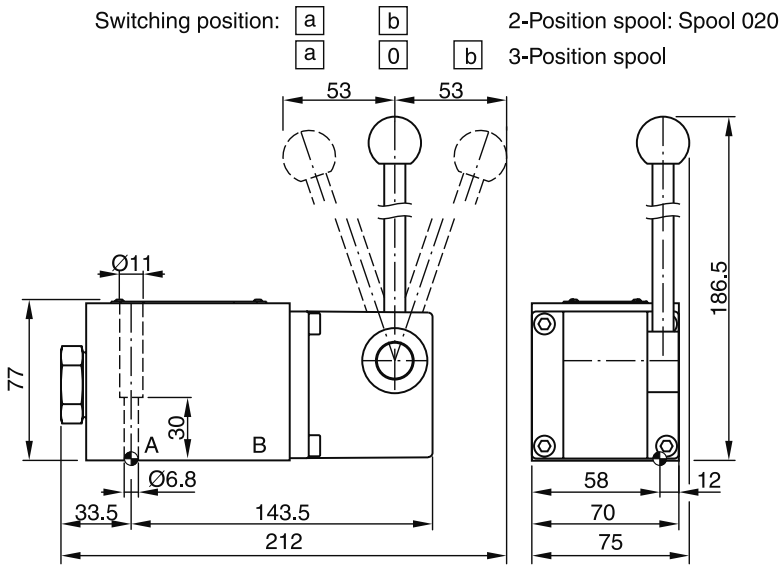
Surface finish	Kit			Kit
R_{max}6.3 / 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	**NBR: SK-D1VL-N-91** FPM: SK-D1VL-V-91

D3DL*4J

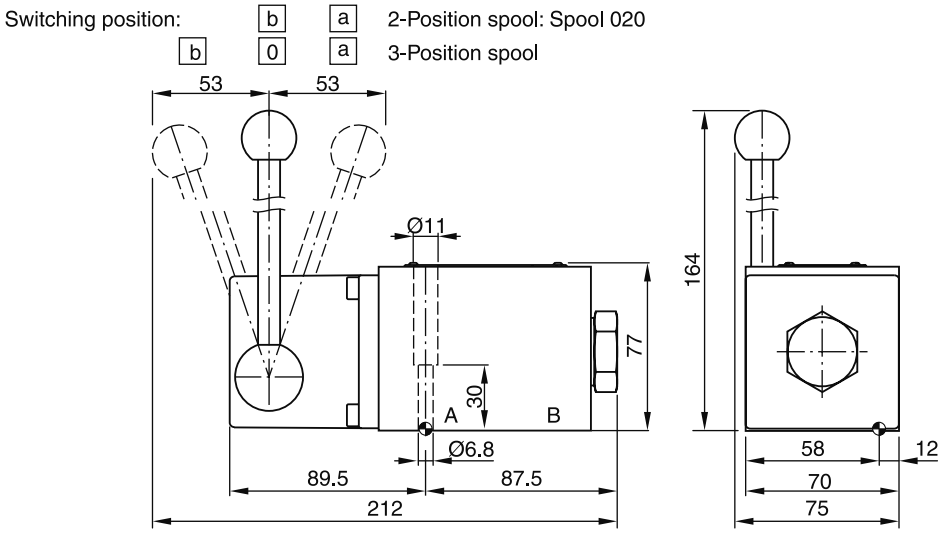


Surface finish	Kit			Kit
R_{max}6.3 / 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	**NBR: SK-D3DL-42** FPM: SK-D3DL-V42

D3DL*4K



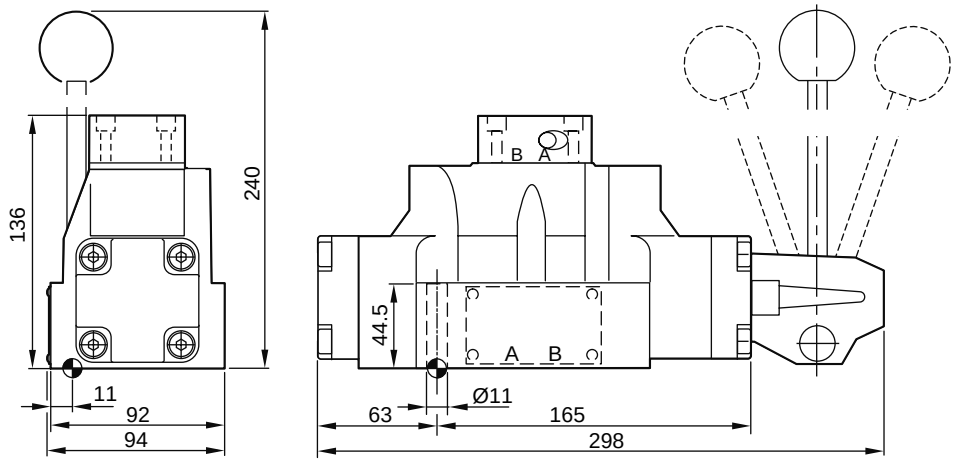
D3DLB*4J



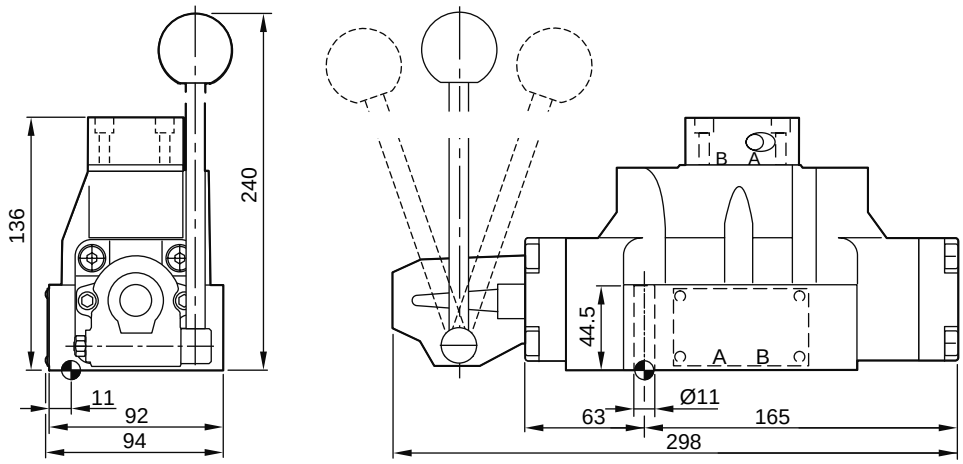
Surface finish	Kit			Kit
R_{max}6.3 ▱ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	**NBR: SK-D3DL-42** FPM: SK-D3DL-V42

2

D4L



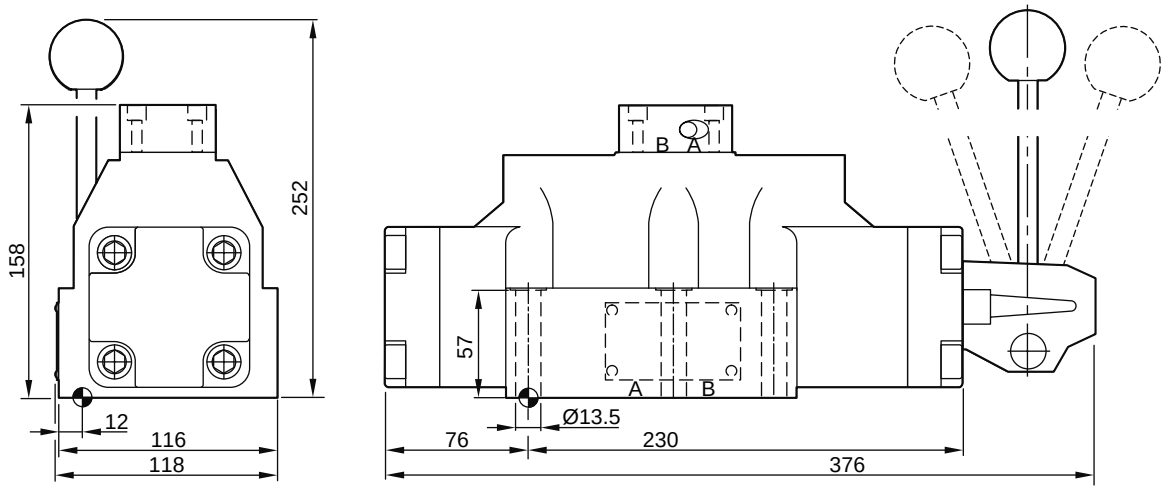
D4LB



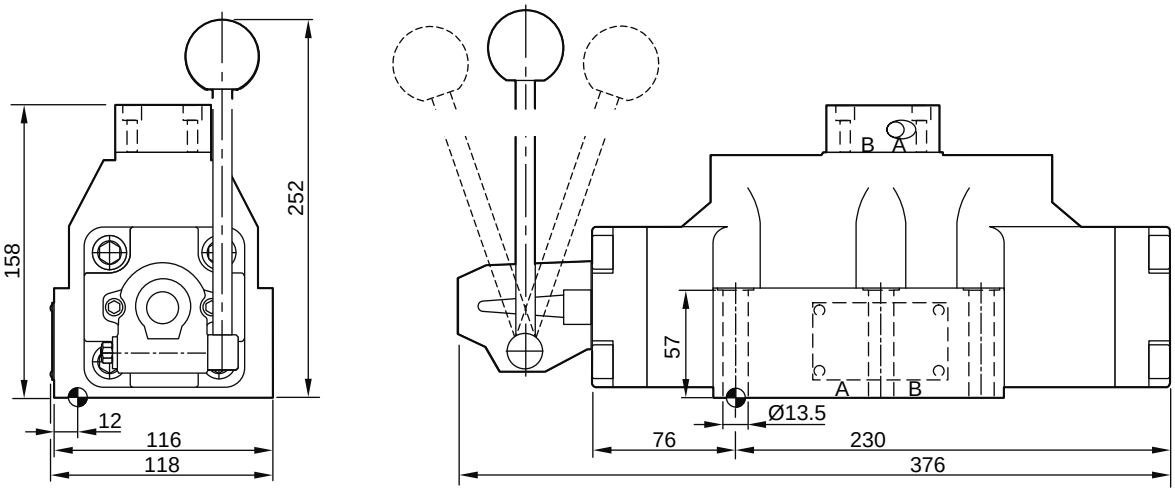
Surface finish	Kit			Kit
R_{max}6.3 0.01/100	BK320	4x M10x60 2x M6x55 DIN 912 12.9	63 Nm 13.2 Nm ±15%	**NBR: SK-D4L-60** FPM: SK-D4L-V60

D_L UK.INDD RH 06.09.2011

D9L



D9LB



Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK360	6x M12x75 DIN 912 12.9	108 Nm ±15%	**NBR: SK-D9L-70** FPM: SK-D9L-V70

Notes

Description	Cable connection	Figure circuit	Order No. black (B)	Order No. grey (A)
Plug EN 175301-803 *, style AF Protection class IP 65 for voltages up to 250V	PG 9 PG 11	Fig. 1	5001710 5001716	5001711 5001717
Plug with LED 24V DC	PG 11	Fig. 1 and 3	5001571	5001572
Plug with lamp insert 120V AC Plug with lamp insert 230V AC		Fig. 1 and 4	5001573 5001575	5001574 5001576
Plug with LED 24 V DC and suppressing circuit		Fig. 1 and 5	5001708	5001709
Plug with rectifier: Bridge-type rectifier with silicon diodes. Varistors are used to protect the diodes against power surges from the power supply up to 250V AC.	PG 11	Fig. 1 and 6	5001737	5001738
Plug with cable strain relief and transparent cover		Fig. 2	5001723	5001724
Inserts for plug 5001723 and 5001724		Cicuit	Order No.	
Bridge-type rectifier up to 250V AC 7		7	5001727	
Bridge-type rectifier with lamp 250V AC		8	5001734	

* (New) EN 175301-803 corresponds to (old) DIN 43650.

Fig. 1

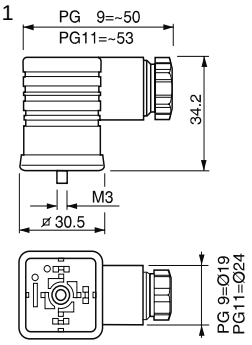


Fig. 2

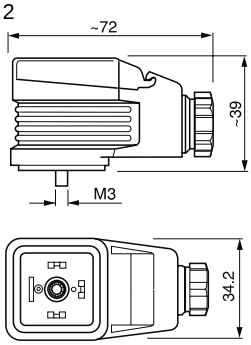


Fig. 3

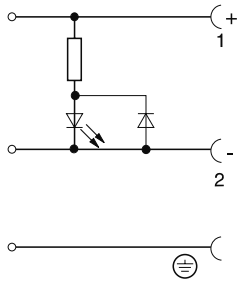


Fig. 4

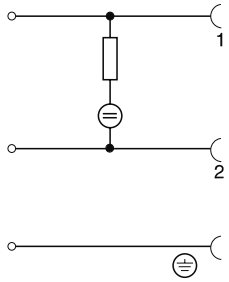


Fig. 5

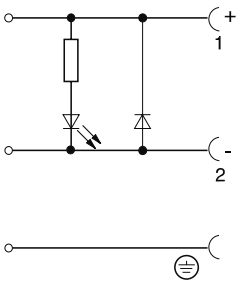


Fig. 6

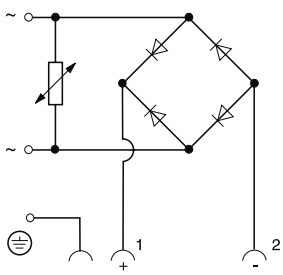


Fig. 7

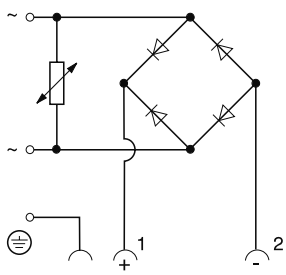
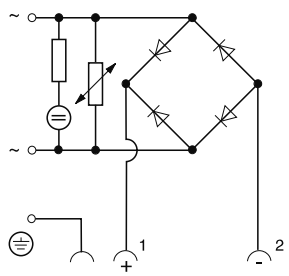
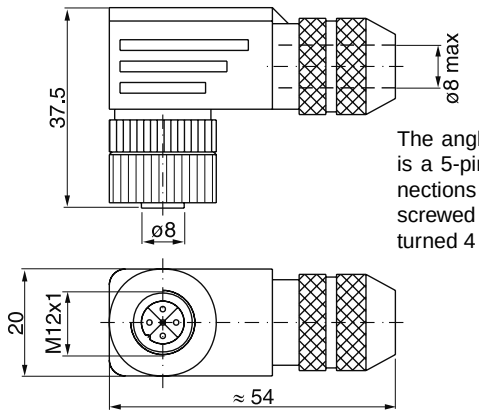


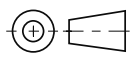
Fig. 8



Plug M12x1, Order No.: 5004109



The angled plug for M12x1 is a 5-pin design. The connections in the plug can be screwed in. The plug can be turned 4 x 90°.

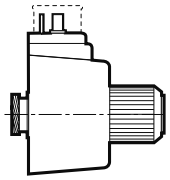


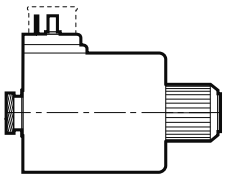
Plug kit 2-pin Junior Timer (AMP)

Order no.	Number of plugs in 1 kit
393 000 K822	1
393 000 K825	10
393 000 K826	50
393 000 K827	100

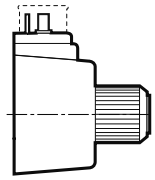
2

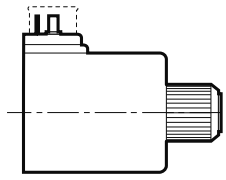
Solenoid kit (displayed: **EN plug**)
A solenoid kit contains tube, coil, retainer and seals for the solenoid.


AC


DC

Coil kit
A coil kit contains coil, retainer and seals for the coil.


AC


DC

For D1VW standard

Solenoid kits: **AK-D1VW-S-...** (Soft shift on request)			(Example: **AK-D1VW-S-JW-91**)
Voltage Volt/Hertz	Voltage Code	EN plug D1VW	EN plug without manual override (Code „T“) D1VW
12V=	K	**KW-91**	KWT-91
24V=	J	**JW-91**	JWT-91
98V=	U	UW-91	UWT-91
205V=	G	GW-91	GWT-91
110V/50Hz / 120V/60Hz	Y	**YW-91**	–
230V/50Hz / 240V/60Hz	T	**TW-91**	–

Coil kits: **AK-D1VW-C-...**	(Example: **AK-D1VW-C-JW-91**)	
Voltage Volt/Hertz	Voltage Code	EN plug D1VW
12V=	K	**KW-91**
24V=	J	**JW-91**
98V=	U	UW-91
205V=	G	GW-91
110V/50Hz / 120V/60Hz	Y	**YW-91**
230V/50Hz / 240V/60Hz	T	**TW-91**

D1VW 8 Watt

Solenoid kits: **AK-D1VW-S-...**				Coil kits: **AK-D1VW-C-...**	
Voltage Volt/Hertz	Voltage Code	EN plug D1VW	M12x1 „DESINA“ (Code „DLJ5“) D1VW	EN plug D1VW	M12x1 „DESINA“ (Code „DLJ5“) D1VW
24V=	J	JWL-91	JDLJ5-91	**JWL-91**	JDLJ5-91

D3W

Solenoid kits: **AK-D3W-S-...** (Soft shift on request) (Example: **AK-D3W-S-JW-30**)					Coil kits: **AK-D3W-C-...**	
Voltage Volt/Hertz	Voltage Code	EN plug D3W	EN plug without manual override (Code „T“) D3W	EN plug with 210bar tank pressure (Code „H“) D3W	EN plug D3W	EN plug without manual override (Code „T“) D3W
12V=	K	KW-42	KWT-42	KW-42	KW-42	KWT-42
24V=	J	**JW-42**	JWT-42	JW-42	**JW-42**	JWT-42
98V=	U	UW-42	UWT-42	UW-42	UW-42	UWT-42
205V=	G	GW-42	GWT-42	GW-42	GW-42	GWT-42
110V/50Hz 120V/60Hz	Y	**YW-42**	–	YWH-42	**YW-42**	–
230V/50Hz 240V/60Hz	T	**TW-42**	–	TWH-42	**TW-42**	–

Other solenoids, coil kits and tube kits on request.

Bold letters =
Short-term availability

Access02.INDD RH 15.08.2011

O-rings to seal between valve and mounting surface

Valve size	Valve series	Ports	Dimensions inner Ø x section Ø	Quantity [1]
DIN NG 6	**D1**	P, A, B, T X, Y	9.25 x 1.78 4.47 x 1.78	4 2
DIN NG10	**D3**	P, A, B, T X, Y	12.42 x 1.78 10.82 x 1.78	5 2
DIN NG 16	**D4**	P, A, B, T X, Y	21.89 x 2.62 10.82 x 1.78	4 2
DIN NG 25	**D8**	P, A, B, T X, Y	29.82 x 2.62 20.29 x 2.62	4 2
DIN NG 25	**D9**	P, A, B, T X, Y	34.59 x 2.62 20.29 x 2.62	4 2
DIN NG 32	**D11**	P, A, B, T X, Y	53.57 x 3.53 14.00 x 1.78	4 2

[1] Number per set

Seal kits (connecting surface and inner seals)
Spool valves

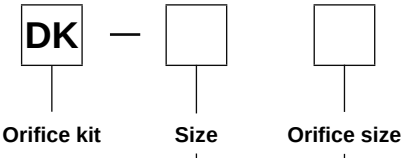
Valve series	Material	Order code for valve size						
		D1	**D3**	**D31**	**D4**	**D8**	**D9**	**D11**
D**W Solenoid	NBR	SK-D1VW-N-91	SK-D3W-42	–	SK-D41VW-N-91	SK-D81VW-N-91	SK-D91VW-N-91	SK-D111VW-N-91
	FPM	SK-D1VW-V-91	SK-D3W-V42	–	SK-D41VW-V-91	SK-D81VW-V-91	SK-D91VW-V-91	SK-D111VW-V-91
D*DW Solenoid	NBR	–		SK-D31DW-N-91	–			
	FPM			SK-D31DW-V-91				
D*NW Solenoid	NBR			SK-D31NW-N-91				
	FPM			SK-D31NW-V-91				
D**P Hydr.	NBR	–	SK-D3DP-42	–	SK-D41VW-70	–	SK-D91VW-70	SK-D111VW-70
	FPM	–	SK-D3DP-V42	–	SK-D41VW-V70	–	SK-D91VW-V70	SK-D111VW-V70
D1VP*90 Hydr.	NBR	SK-D1VP-N-87	–					
	FPM	SK-D1VP-V-87						
D1VP*4L Hydr.	NBR	SK-D1VP-N4L-91						
	FPM	SK-D1VP-V4L-91						
D*L/LB Hand lever	NBR	SK-D1VL-N-91	SK-D3DL-42	–	SK-D4L-60	–	SK-D9L-60	–
	FPM	SK-D1VL-V-91	SK-D3DL-V42	–	SK-D4L-V60	–	SK-D9L-V60	–

Seated valve

Valve series	Material	D1SE
D1SE Solenoid	NBR	SK-D1SE-70
	FPM	SK-D1SE-V70

2

Slip-in orifice for P, A, B port of directional control valves NG6 and NG10



Code	Size
D1VW91	NG6
D3W31	NG10

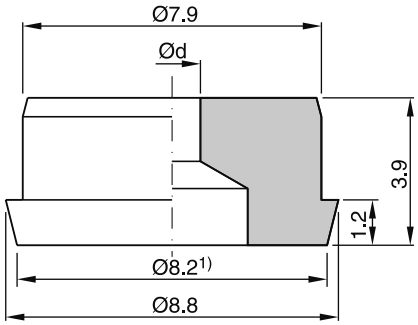
Code	Orifice Ø	NG6	NG10
00	without orifice	x	x
06	0.6 mm	x	
08	0.8 mm	x	x
09	0.9 mm	x	
10	1.0 mm	x	x
11	1.1 mm	x	
12	1.2 mm	x	x
14	1.4 mm	x	x
15	1.5 mm	x	x
18	1.8 mm	x	
20	2.0 mm	x	x
25	2.5 mm	x	x
30	3.0 mm		x
45	4.5 mm		x

The orifice kit DK-D1VW91 includes special O-rings (NBR - black and FPM - green) which have to be used with the orifice.

Package size: Each kit contains 10 orifice of the same size.

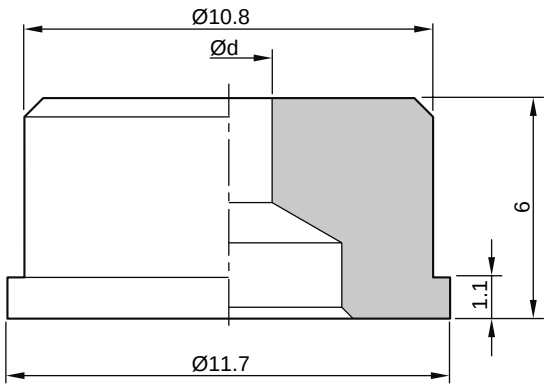
Dimensions

NG6

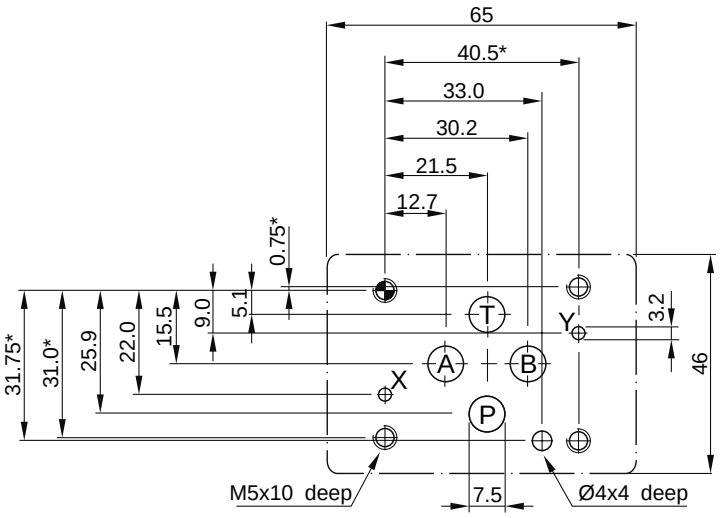


[1)] only for ports P, A, B with max. dia. 7.5mm

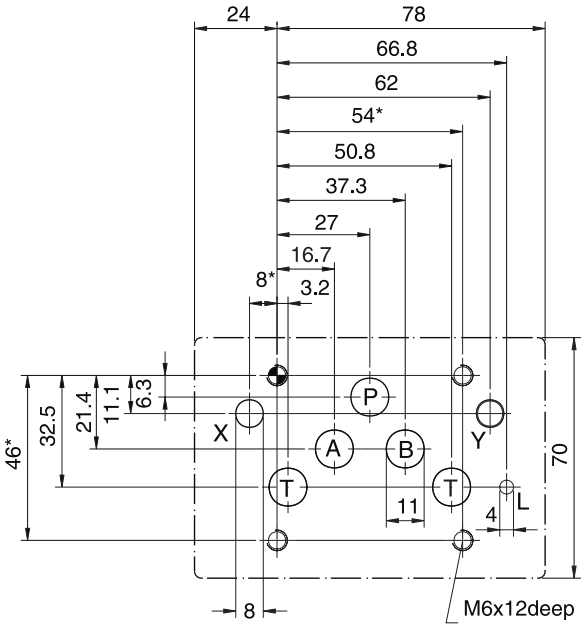
NG10



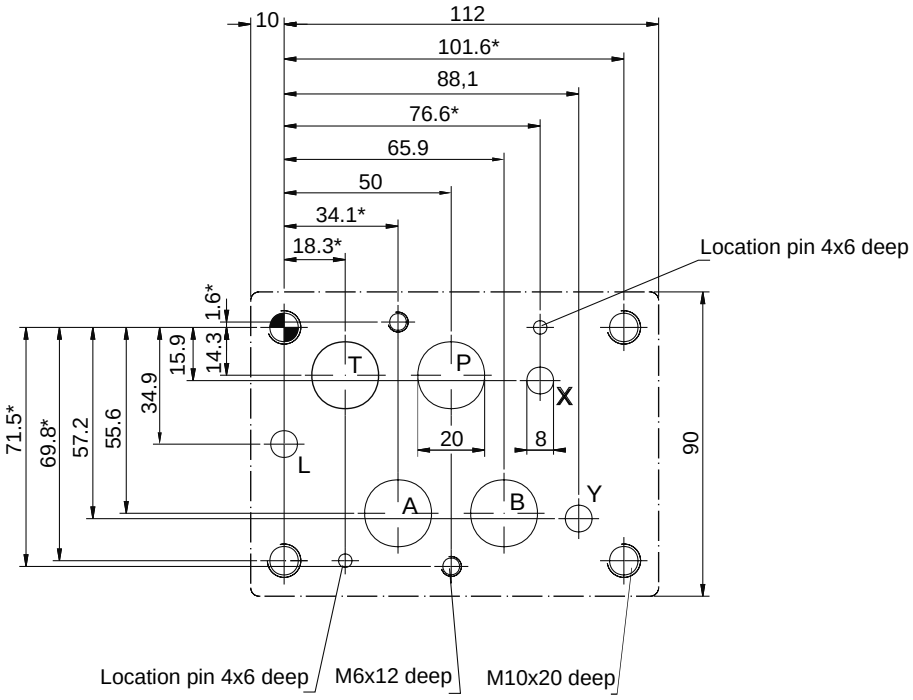
Size 6, mounting pattern to DIN 24340-A6



Size 10, mounting pattern to DIN 24340-A10



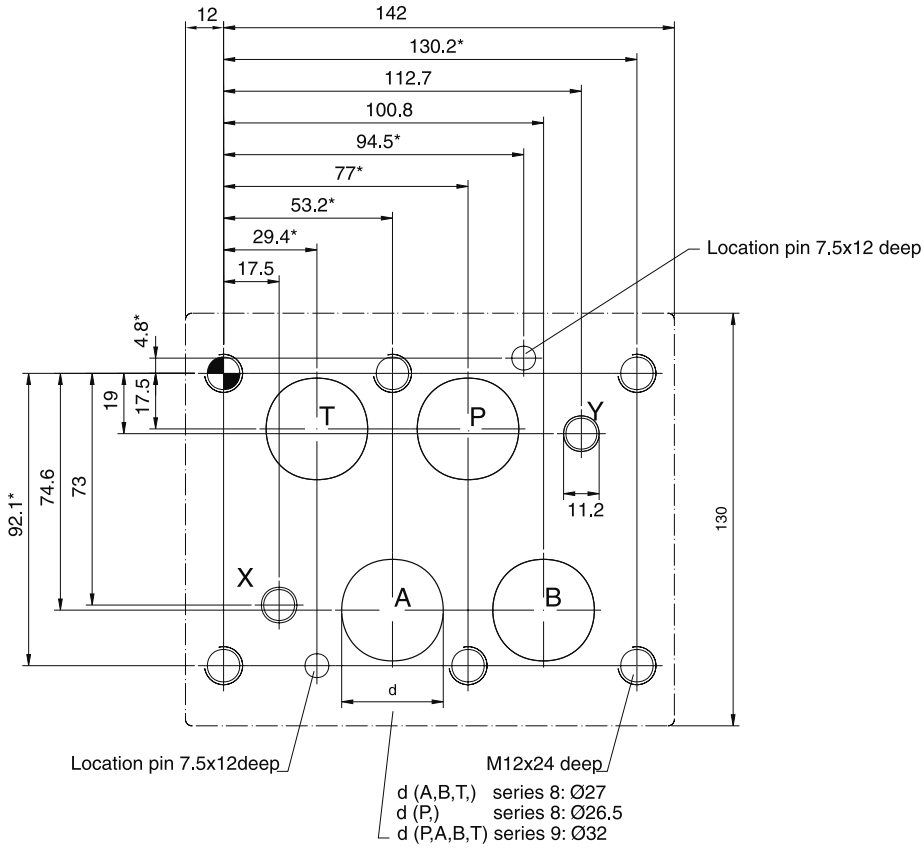
Size 16, mounting pattern to DIN 24340-A16



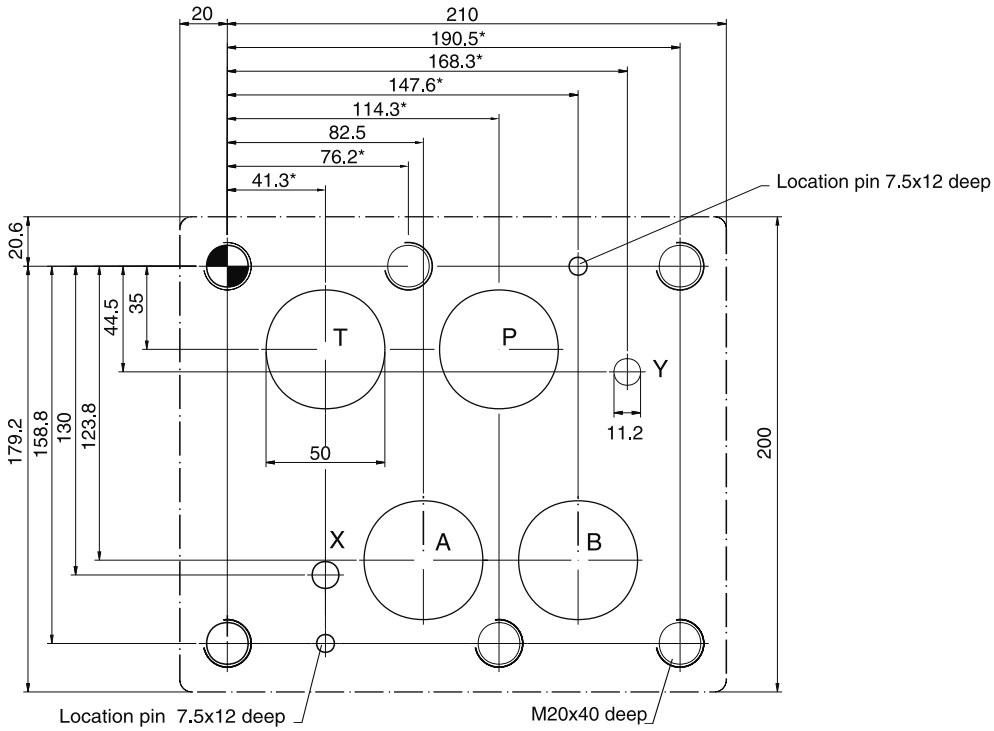
With * marked dimensions ± 0.1mm. All other dimensions ± 0.2mm.

Subplates and manifolds see chapter 12.

Size 25, mounting pattern to DIN 24340-A25



Size 32, mounting pattern to DIN 24340-A32



With * marked dimensions ± 0.1mm. All other dimensions ± 0.2mm.

Subplates and manifolds see chapter 12.

Access02.INDD RH 15.08.2011

* VCD® = Voice Coil Drive technology

3

Introduction: Proportional DC Valves

Proportional valves and servo proportional valves are characterized by a number of design features that determine their quality to fit into different applications. The main features are listed below.

Solenoid drive (proportional valves):
Solenoids operate unidirectionally against a spring, provide high force and are - because of high inductance - limited in their dynamics.

Voice Coil Drive® :
A moving coil in the field of a static permanent magnet operates bi-directionally. Springs are only needed to ensure the power-down position. The low inductance allows highest dynamics.

External electronics:
Valves without integrated electronics are less sensitive to vibration and high temperature. LVDTs always include integrated electronics.

Integrated electronics (onboard electronics - OBE):
Onboard electronics simplifies the installation and improves the repeatability from valve to valve.

LVDT (spool position feedback):
Closed loop control of the spool position improves the sensitivity and accuracy.

Direct operated (d.o.):
High hydraulic output can be achieved with low electric power input.

Pilot operated (p.o.):
Beyond the functional limits of direct operated valves hydraulic amplification is required.

Positive spool overlap:
To avoid load drifting in the zero position, spools with positive overlap are used.

Zero lap spools:
In closed loop circuits zero lap spools are used for an effective control of the spool at low position errors.

Spool/Sleeve design:
For minimal hysteresis, high precision, and better wear resistance, the spool/sleeve design is preferred over the spool/body design.

Regenerative Valves:
In applications with differential cylinders it is common to feed the return flow from the rod side of the cylinder back to the piston side to achieve higher velocity or lower pump flow. Parker differentiates between regeneration to the pressure level of the pump (P-regeneration) or directly to the piston area respectively the A-port of the valve (A-regeneration). The Parker regenerative valves use the advantageous A-regeneration.

Hybrid Valves:
Regenerative valves with an integrated solenoid valve - to switch to the standard mode - are called Hybrid Valves at Parker. The regenerative mode is used for maximum velocity, the standard mode for maximum force.

Regenerative and hybrid valves are also available as on/off directional control valves.

The proportional directional valves D1FB (NG06) are available with and without onboard electronics (OBE).

D1FB OBE:

The digital onboard electronics is situated in a robust metal housing, which allows the usage under rough environmental conditions.

The nominal values are factory set. The cable connection to a serial RS232 interface is available as accessory.

D1FB for external electronics:

The parameters can be saved, changed and duplicated in combination with the digital power amplifier PWD00A-400.

The valve parameters can be edited with the common ProPxD software for both versions.

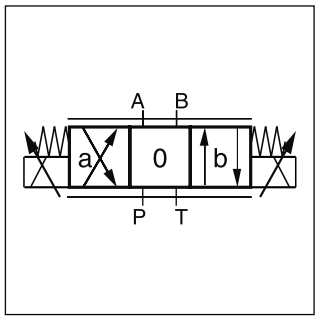
The D1FB valves can be ordered with spool/sleeve design (D1FB*0) for maximum precision as well as spool/body design (D1FB*3) for high nominal flow - see functional limit curves for maximum flow capability.

Technical Features

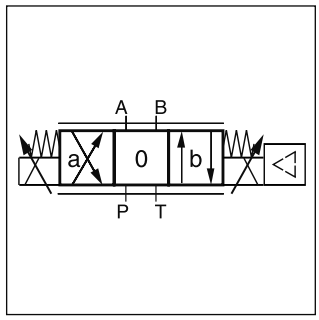
- Spool/sleeve and spool/body
- 3 command options for D1FB OBE: +/- 10V, 4…20mA, +/- 20mA
- High repeatability from valve to valve
- Low hysteresis
- Manual override
- Digital onboard electronics
- Zero lap spools for the usage of simple closed loop systems

D1FB

D1FB OBE



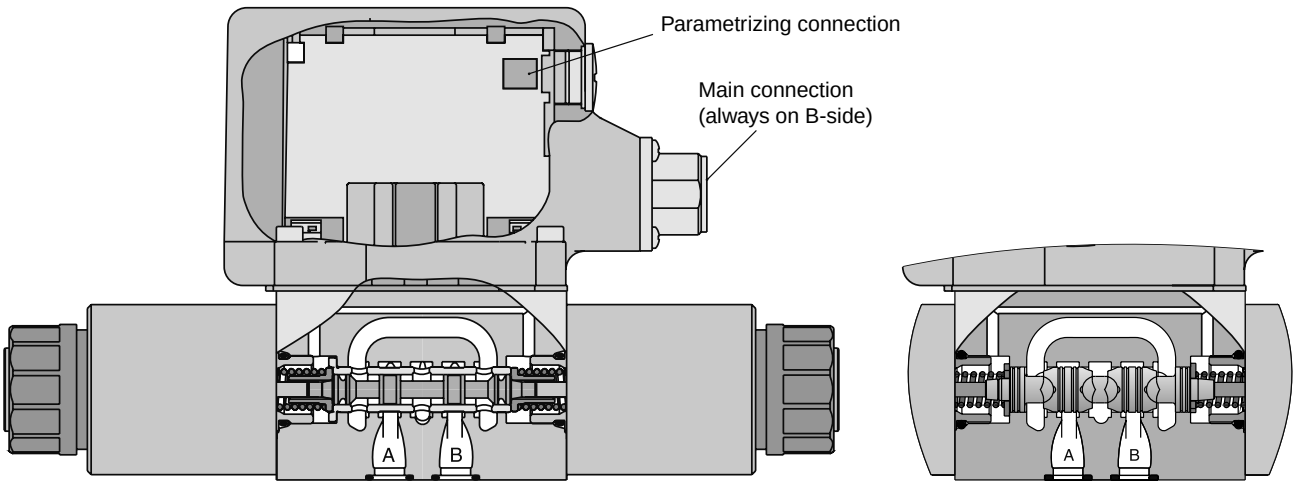
D1FB



D1FB OBE

D1FB*0 OBE
Spool/sleeve design

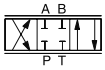
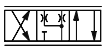
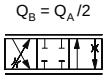
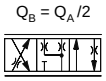
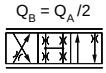
D1FB*3 OBE
Spool/body design

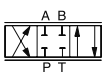


D1FB

D	1	F	B			0	N				
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**Proportional control**	**Standard dynamics standard repeatability**	**Spool type**	**Spool position**		**Seals NBR** (other seal compounds on request)	**Solenoid**	**Connector**	**Design**	**Design series** (not required for ordering)

3

D1FB*0: Spool/sleeve design		
Overlap		
Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01H E01F E01C		**20 12 6**
E02H E02F E02C		**20 12 6**
E03H E03F E03C		**20 12 6**
B31H B31F	$Q_B = Q_A/2$ 	**20 / 10 12 / 6**
B32H B32F	$Q_B = Q_A/2$ 	**20 / 10 12 / 6**
Zero lap [1]		
Code	Spool type	Flow [l/min] at Δp 35bar per metering edge
E50H E50F E50C		**20 12 6**
B60H B60F	$Q_B = Q_A/2$ 	**20 / 10 12 / 6**

D1FB*3: Spool/body design		
Overlap		
Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01K E01H E01F		**30 20 10**
E02K E02H E02F		**30 20 10**

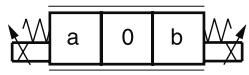
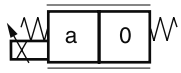
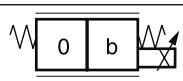
[1] only for spool position code C
No defined spool positioning at power down

Code	Design
0	Spool/sleeve design
3	Spool/body design

Code	Connector
W*	**Connector as per EN 175301-803**
J*	Connector DT04-2P "Deutsch"

D1FB*0: Spool/sleeve design	
Code	Solenoid
M	9V/2.7A
J	24V/0.8A

D1FB*3: Spool/body design	
Code	Solenoid
K	**12V / 2.2A**
J	**24V / 1.1A**

Code	Spool position
C	
E	
K	

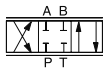
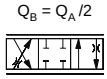
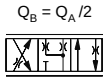
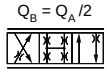
* Please order connector separately.
See chapter 3 accessories.

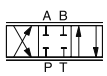
Bold letters =
Short-term availability

D1FB OBE (with onboard electronics)

D	1	F	B			0	N				
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**Proportional control**	**Standard dynamics standard repeatability**	**Spool type**	**Spool position**		**Seals NBR** (other seal compounds on request)	**Input signal**	**Options**	**Design**	**Design series** (not required for ordering)

Code	Design
0	Spool/sleeve design
3	Spool/body design

D1FB*0: Spool/sleeve design		
Overlap		
Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01H **E01F** **E01C**		**20** **12** **6**
E02H **E02F** **E02C**		**20** **12** **6**
E03H **E03F** **E03C**		**20** **12** **6**
B31H **B31F**	$Q_B = Q_A/2$ 	**20 / 10** **12 / 6**
B32H **B32F**	$Q_B = Q_A/2$ 	**20 / 10** **12 / 6**
Zero lap [1]		
Code	Spool type	Flow [l/min] at Δp 35bar per metering edge
E50H **E50F** **E50C**		**20** **12** **6**
B60H **B60F**	$Q_B = Q_A/2$ 	**20 / 10** **12 / 6**

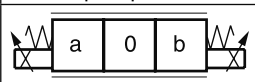
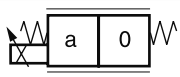
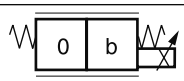
D1FB*3: Spool/body design		
Overlap		
Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01K **E01H** **E01F**		**30** **20** **10**
E02K **E02H** **E02F**		**30** **20** **10**

[1] only for spool position code C
No defined spool positioning at power down

Code	Input signal [1]	Function	Port	Options
F0	**0...+/-10V**	**0...+10V > P-A**	**6 + PE**	**Potentiometer supply**
G0	**0...+/-20mA**	**0...+20mA > P-A**	**6 + PE**	**—**
S0	**4...20mA**	**12...20mA > P-A**	**6 + PE**	**—**
W5 [2]	**0...+/-10V** **4...20mA**	**0...+10V > P-A** **12...20mA > P-A**	**11 + PE**	**Potentiometer supply & command preset channel**

[1] single solenoid always 0...+10V respectively 4...20 mA

[2] Factory set ± 10V on delivery

Code	Spool position
C	
E	
K	

Please order connector separately.
See chapter 3 accessories.

Parametrizing cable OBE → RS232
Item no. 40982923

Bold letters =
Short-term availability

D1FB UK.INDD RH 07.09.2011

3

General				
Design		Direct operated proportional DC valve		
Actuation		Proportional solenoid		
Size		NG06/CETOP 03/NFPA D03		
Mounting interface		DIN 24340 / ISO 4401 / CETOP RP121 / NFPA		
Mounting position		unrestricted		
Ambient temperature	[°C]	-20...+60		
$MTTF_D$ value (OBE)	[years]	150 (75)		
Weight (OBE)	[kg]	2.2 (2.9)		
Vibration resistance	[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27		
Hydraulic				
Max. operating pressure	[bar]	Ports P, A, B 350; Port T 210		
Max. pressure drop PABT / PBAT	[bar]	350		
Fluid		Hydraulic oil as per DIN 51524...535, other on request		
Fluid temperature	[°C]	-20...+60		
Viscosity permitted recommended	[cSt] / [mm^2/s] [cSt] / [mm^2/s]	20...380 30...80		
Filtration		ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)		
Nominal flow at Δp=5bar per control edge *	[l/min]	**D1FB*0 (Spool/sleeve)** 6 / 12 / 20	**D1FB*3 (Spool/body)** 10 / 20 / 30	
Leakage at 100 bar	[ml/min]	<50 (overlapped spool); <400 (zerolapped spool)	<60	
Overlap	[%]	25, electrically normalized at 10 (see flow characteristics)		
Static / Dynamic				
Step response at 100% step	[ms]	30	30	
Hysteresis	[%]	<4	<6	
Temperature drift solenoid current	[%/K]	<0.02		
Electrical characteristics				
Duty ratio	[%]	100		
Protection class		Standard (as per EN175301-803) IP65 in accordance with EN60529 (with correctly mounted plug-in connector) DT04-2P "Deutsch" IP69K (with correctly mounted plug-in connector)		
Solenoid		**Code "M"**	**Code "K"**	**Code "J" (Spool/sleeve)**
Supply voltage	[V]	9	12	24
Current consumption	[A]	2.7	2.2	1.1 (0.8)
Resistance	[Ohm]	2.7	4.4	18.6
Coil insulation class		F (155 °C)		
Solenoid connection		Connector as per EN 175301-803 (code W), DT04-2P "Deutsch" connector (code J). Solenoid identification as per ISO 9461.		
Wiring min.	[mm^2]	3x1.5 (AWG 16) overall braid shield (Code W), "Deutsch" connector DP4 2-Pin (Code J)		
Wiring lenght max.	[m]	50		

* Flow rate for different Δp per control edge:

$$Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$$

Electrical characteristics OBE		
Duty ratio	[%]	100
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Supply voltage/ripple DC	[V]	18...30, ripple < 5% eff., surge free
Current consumption max.	[A]	2.0
Pre fusing medium lag	[A]	2.5
Input signal Codes F0 & W5 voltage	[V]	+10...0...-10, ripple < 0.01 % eff., surge free, Ri = 100kOhm, 0...+10V ⇒ P -> A
Codes S0 & W5 current	[mA]	4...12...20, ripple < 0.01 % eff., surge free, Ri = 200Ohm, 12...20mA ⇒ P -> A < 3.6 mA = enable off, > 3.8 mA = enable on (acc. to NAMUR NE43)
Code G0	[mA]	+20...0...-20, ripple < 0.01 % eff., surge free, Ri = 200Ohm, 0...+20mA ⇒ P -> A
Differential input max. Codes F0, G0 & S0	[V]	30 for terminal D and E against PE (terminal G) 11 for terminal D and E against 0V (terminal B)
Code W5	[V]	30 for terminal 4 and 5 against PE (terminal PE) 11 for terminal 4 and 5 against 0V (terminal 2)
Channel recall signal	[V]	0...2.5: off / 5...30: on / Ri = 100 kOhm
Adjustment ranges Min	[%]	0...50
Max	[%]	50...100
Ramp	[s]	0...32.5
Interface		RS 232, parametrizing connection 5pole
EMC		EN 61000-6-2, EN 61000-6-4
Central connection Codes F0, G0 & S0 Code W5		 6 + PE acc. to EN 175201-804 11 + PE acc. to EN 175201-804
Wiring min. Codes F0, G0 & S0 Code W5	 [mm²] [mm²]	 7 x 1.0 (AWG16) overall braid shield 11 x 1.0 (AWG16) overall braid shield
Wiring length max.		50

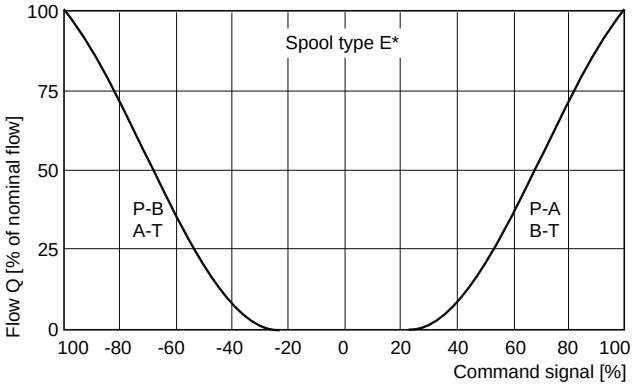
3

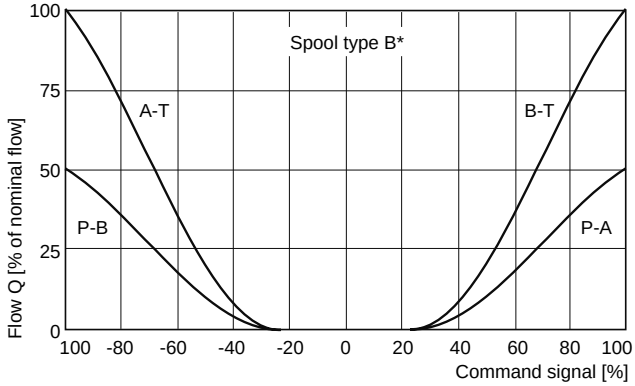
3

Flow characteristics

D1FB*0

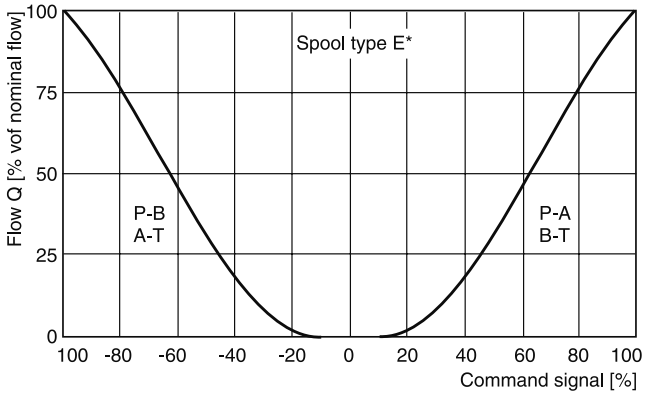
at Δp = 5 bar per metering edge
Spool type E01/02/03, B31/32

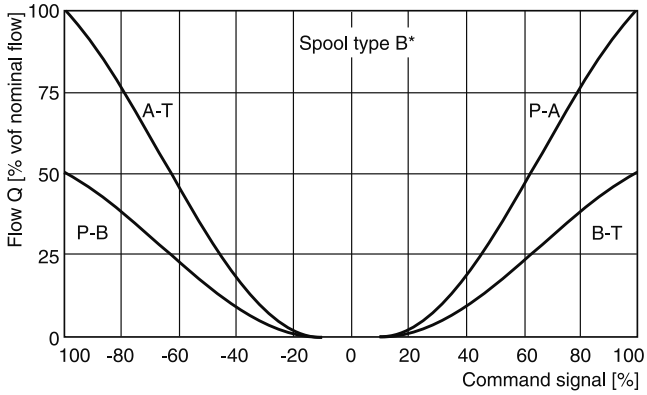




D1FB*0 OBE

(electrically set to opening point 10%)
at Δp = 5 bar per metering edge
Spool type E01/02/03, B31/32





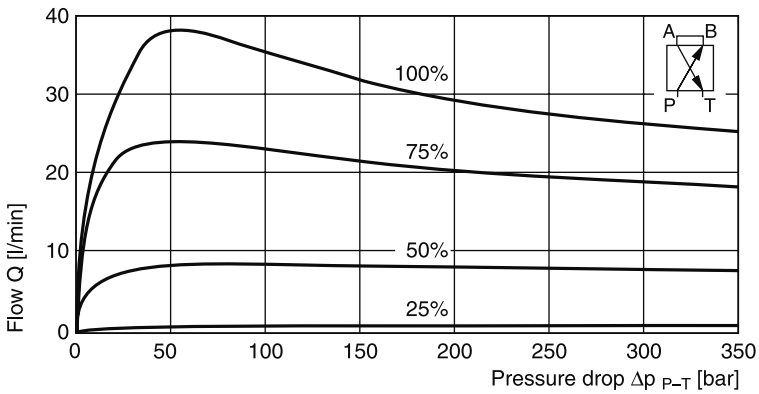
All characteristic curves measured with HLP46 at 50°C.

Functional limits

at 25%, 50%, 75% and 100% command signal (symmetric flow)

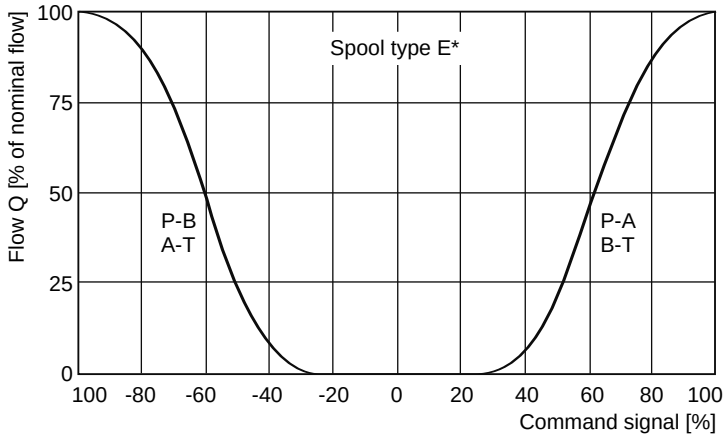
At asymmetric flow a reduced flow limit has to be considered – typically approx. 10% lower.

Spool type E01H

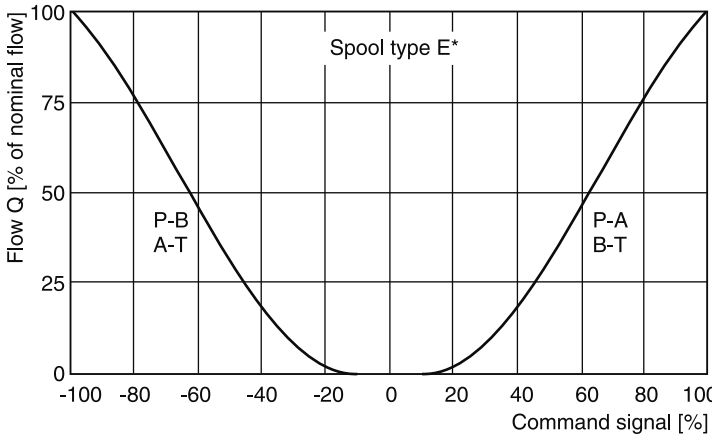


All characteristic curves measured with HLP46 at 50°C.

Flow characteristics
D1FB*3
at Δp = 5 bar per metering edge
Spool type E01/02



D1FB*3 OBE
(Electrically set to opening point 10%)
at Δp = 5 bar per metering edge
Spool type E01/02

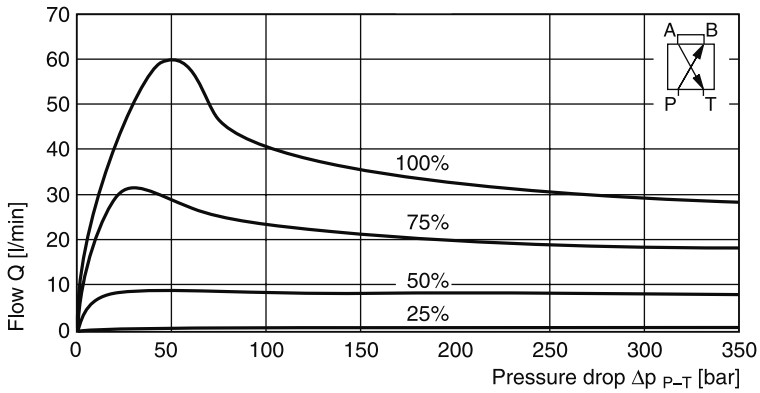


All characteristic curves measured with HLP46 at 50°C.

Functional limits
at 25%, 50%, 75% and 100% command signal (symmetric flow)

At asymmetric flow a reduced flow limit has to be considered – typically approx. 10% lower.

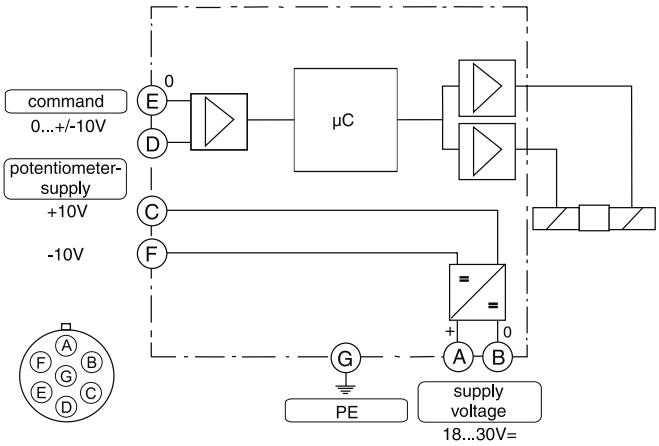
Spool type E01K



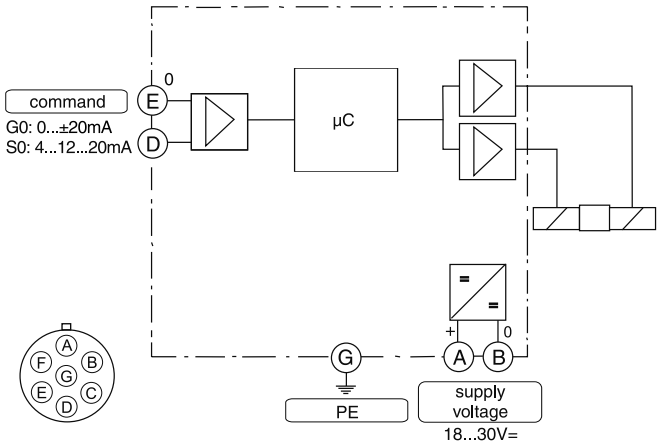
All characteristic curves measured with HLP46 at 50°C.

3

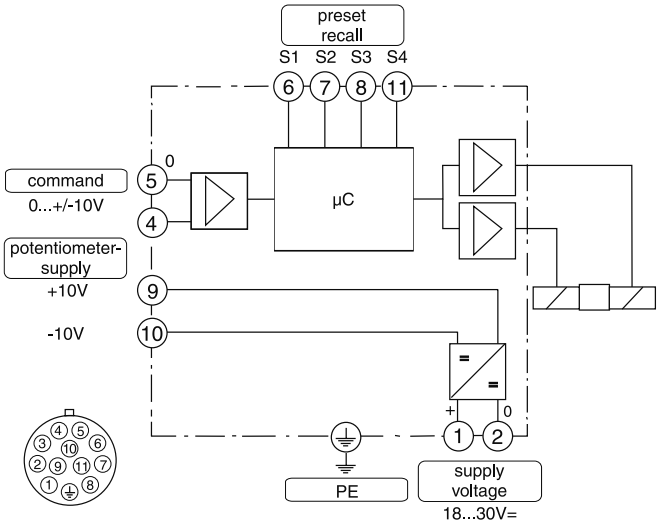
Code F0
6 + PE acc. to EN 175201-804



Code G0, S0
6 + PE acc. to EN 175201-804



Code W5
11 + PE acc. to EN 175201-804



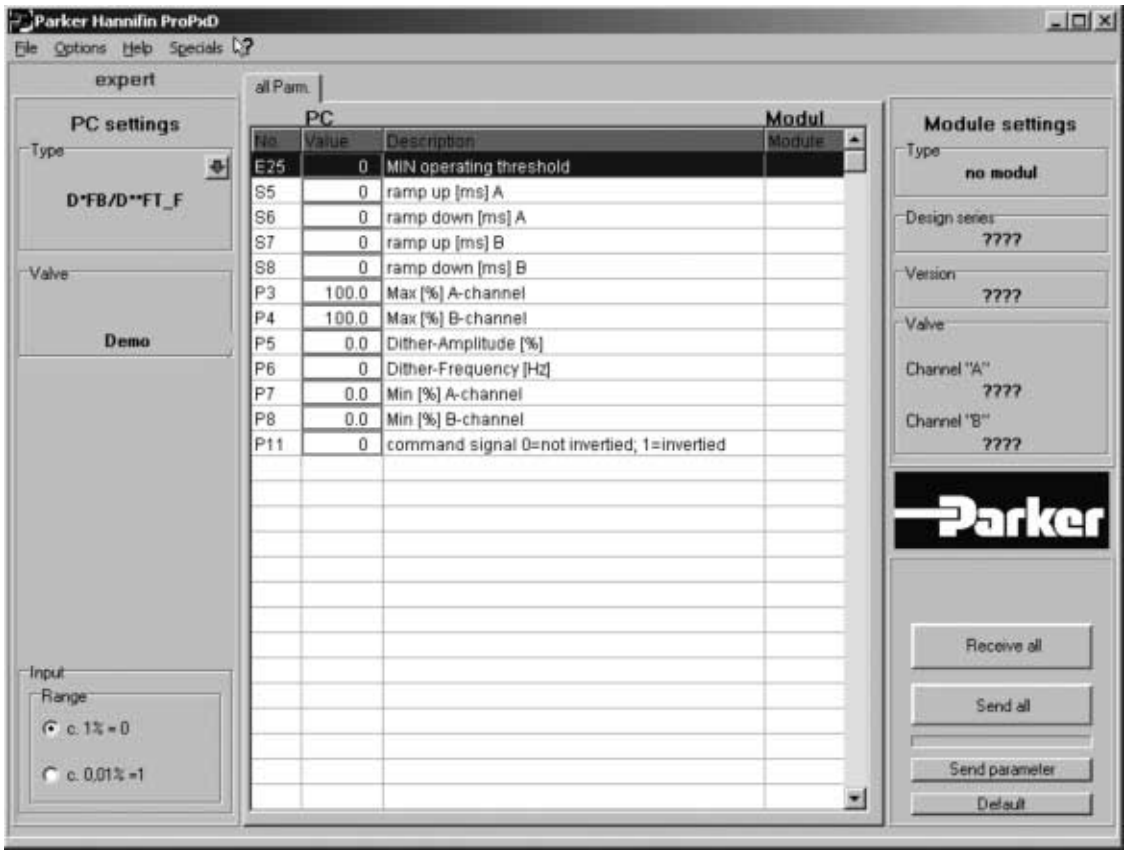
D1FB OBE

ProPxD interface program

The ProPxD software permits comfortable parameter setting for the module electronics. Via the clearly arranged entry mask the parameters can be noticed and modified. Storage of complete parameter sets is possible as well as printout or record as a text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to other valves. Inside the electronics a non-volatile memory stores the data with the option for recalling or modification.

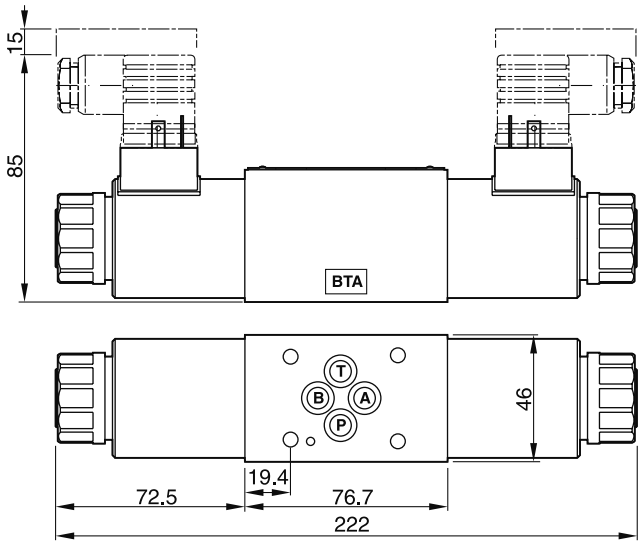
Features

- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows ® operating systems from Windows ® 95 upwards
- Plain communication between PC and electronics via serial interface RS-232.
- Comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"

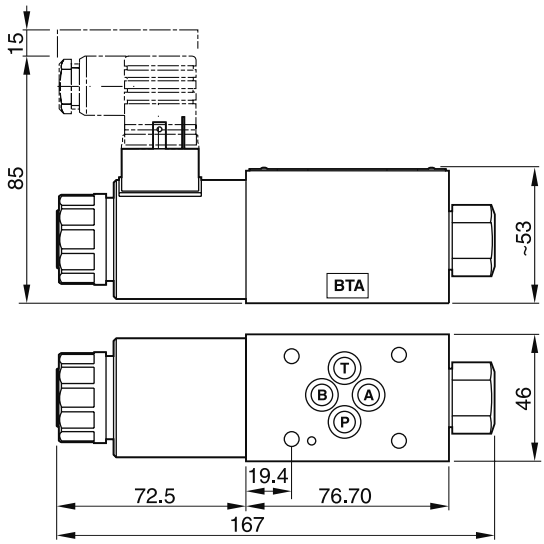


The parametrizing cable may be ordered under item no. 40982923.

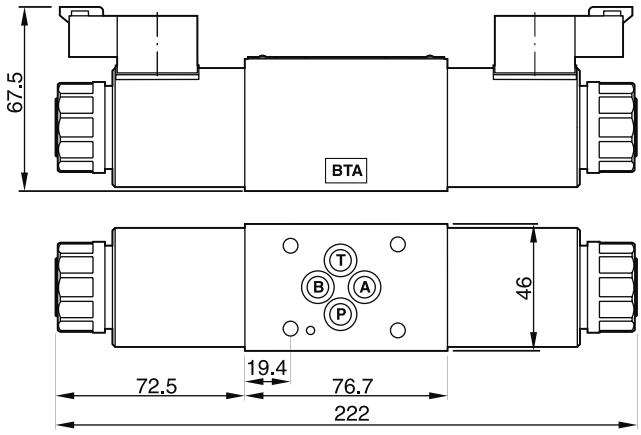
D1FB*C



D1FB*K



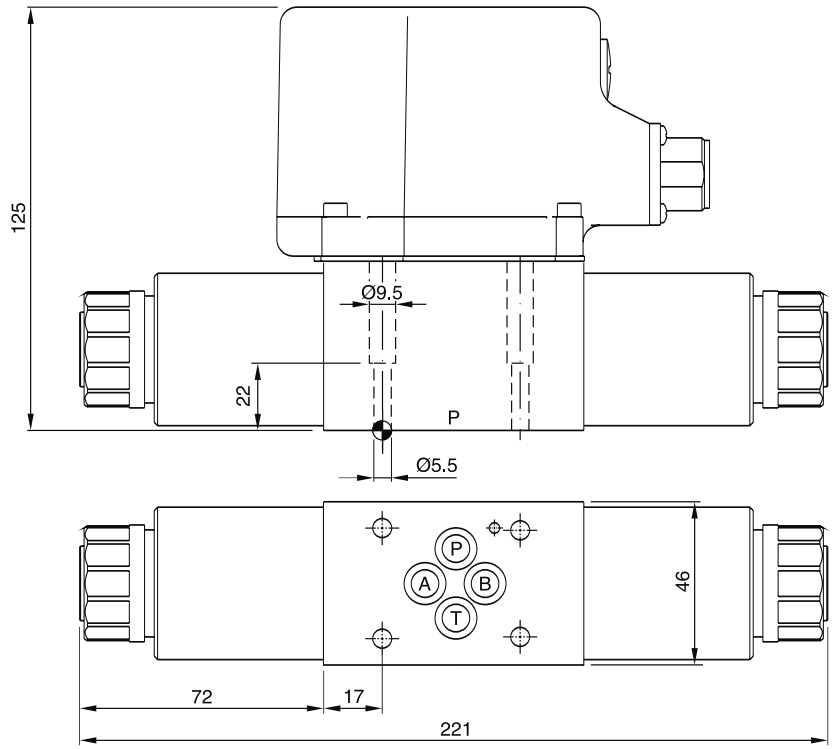
D1FB*C with DT04-2P "Deutsch" connector
(only C style shown)



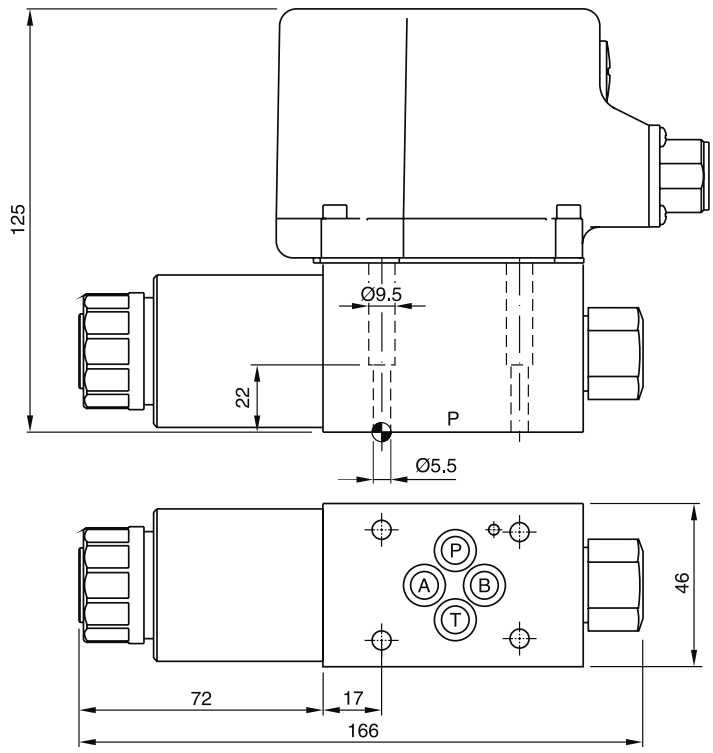
Surface finish	Kit			Kit NBR
R_{max}6.3 ⏥ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-D1FB-N

D1FB UK.INDD RH 07.09.2011

D1FB*C OBE



D1FB*E OBE



Surface finish	Kit			Kit NBR
R_{max}6.3 ⏥ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-D1FB-N

Notes

The proportional directional valves D3FB (NG10) are available with and without onboard electronics (OBE).

D3FB OBE:

The digital onboard electronics is situated in a robust metal housing, which allows the usage under rough environmental conditions.

The nominal values are factory set. The cable connection to a serial RS232 interface is available as accessory.

D3FB for external electronics:

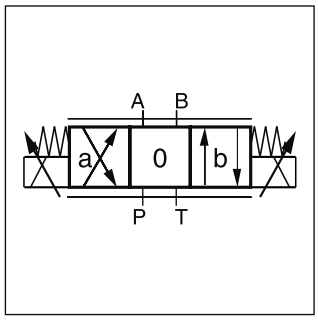
The parameters can be saved, changed and duplicated in combination with the digital power amplifier PWD00A-400.

The valve parameters can be edited with the common ProPxD software for both versions.

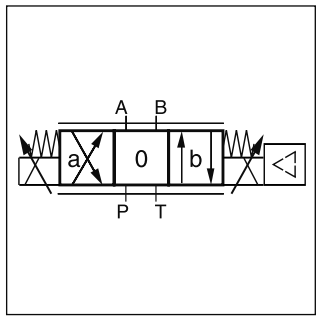
The D3FB valves can be ordered with spool/sleeve design (D3FB*0) for maximum precision as well as spool/body design (D3FB*3) for high nominal flow - see functional limit curves for maximum flow capability.

D3FB

D3FB OBE



D3FB



D3FB OBE

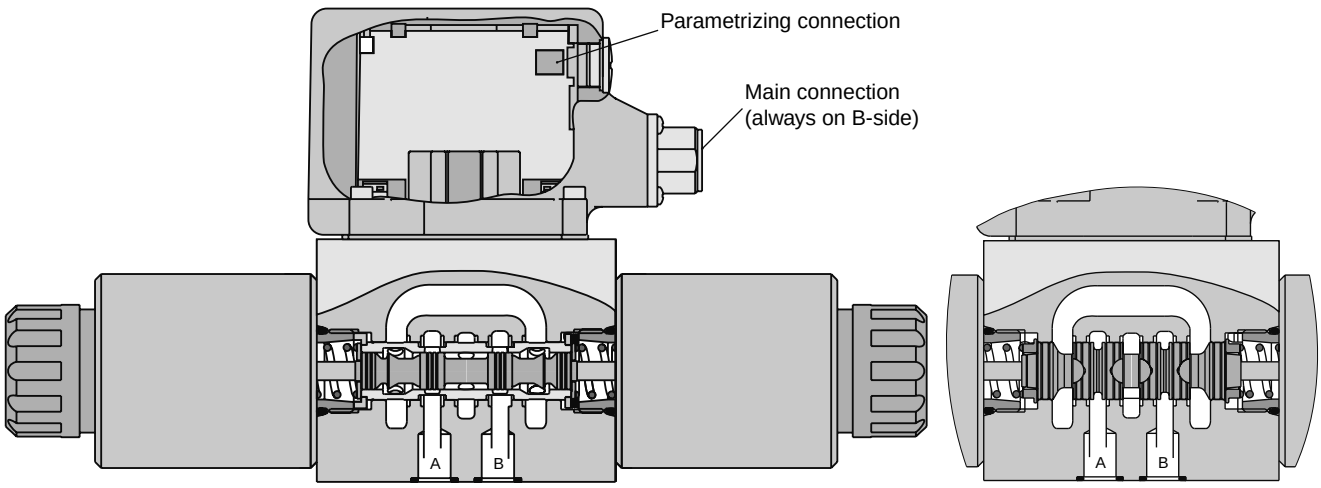
Technical Features

- Spool/sleeve and spool/body
- 3 command options for D3FB OBE:
  +/- 10V, 4…20mA, +/- 20mA
- High repeatability from valve to valve
- Low hysteresis
- Manual override
- Digital onboard electronics

CE

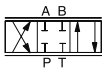
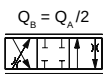
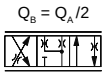
D3FB*0 OBE
Spool/sleeve design

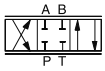
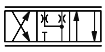
D3FB*3 OBE
Spool/body design



D3FB

D	3	F	B			0	N		W		
DC valve	**Size DIN NG10 CETOP 05 NFPA D05**	**Flow control**		**Spool type**	**Spool position**		**Seal NBR** (other seal compounds on request)	**Solenoid**	**Connector as per EN 175301-803 without plug**	**Design**	**Design series** (not required for ordering)

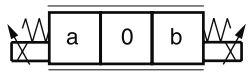
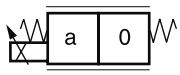
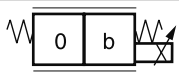
D3FB*0: Spool/sleeve design		
Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01M **E01S**		**40** **60**
E02M **E02S**		**40** **60**
B31M **B31S**		**40 / 20** **60 / 30**
B32M **B32S**		**40 / 20** **60 / 30**

D3FB*3: Spool/body design		
Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01M **E01S** **E01U**		**40** **60** **80**
E02M **E02S** **E02U**		**40** **60** **80**

Code	Design
0	**Spool/sleeve design**
3	**Spool/body design**

D3FB*0: Spool/sleeve design	
Code	Solenoid
K	**12V/2.95A**

D3FB*3: Spool/body design	
Code	Solenoid
K	**12V / 2.95A**
J	**24V / 1.5A**

Code	Design
C	
E	
K	

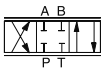
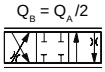
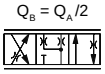
Please order connector separately.
See chapter 3 accessories.

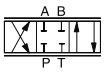
Bold letters =
Short-term availability

D3FB OBE (with onboard electronics)

D	3	F	B			0	N				
Directional control valve	**Size DIN NG10 CETOP 05 NFPA D05**	**Proportional control**	**Standard dynamics standard repeatability**	**Spool type**	**Spool position**		**Seals NBR** (other seal compounds on request)	**Input signal**	**Options**	**Design**	**Design series** (not required for ordering)

Code	Design
0	**Spool/sleeve design**
3	**Spool/body design**

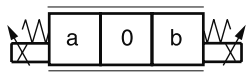
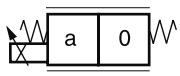
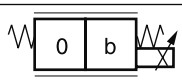
D3FB*0: Spool/sleeve design		
Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01M **E01S**		**40** **60**
E02M **E02S**		**40** **60**
B31M **B31S**		**40 / 20** **60 / 30**
B32M **B32S**		**40 / 20** **60 / 30**

D3FB*3: Spool/body design		
Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01M **E01S** **E01U**		**40** **60** **80**
E02M **E02S** **E02U**		**40** **60** **80**

Code	Input signal [1]	Function	Port	Options
F0	**0...+/-10V**	**0...+10V > P-A**	**6 + PE**	**Potentiometer supply**
G0	**0...+/-20mA**	**0...+20mA > P-A**	**6 + PE**	**—**
S0	**4...20mA**	**12...20mA > P-A**	**6 + PE**	**—**
W5 [2]	**0...+/-10V** **4...20mA**	**0...+10V > P-A** **12...20mA > P-A**	**11 + PE**	**Potentiometer supply & command preset channel**

[1] single solenoid always 0...+10V respectively 4...20 mA

[2] Factory set ± 10V on delivery

Code	Spool position
C	
E	
K	

Please order connector separately.
See chapter 3 accessories.

Parametrizing cable OBE → RS232
Item no. 40982923

Bold letters =
Short-term availability

3

General			
Design		Direct operated proportional DC valve	
Actuation		Proportional solenoid	
Size		NG10 / CETOP 05 / NFPA D05	
Mounting interface		DIN 24340 / ISO 4401 / CETOP RP121 / NFPA	
Mounting position		unrestricted	
Ambient temperature	[°C]	-20...+60	
$MTTF_D$ value (OBE)	[years]	150 (75)	
Weight (OBE)	[kg]	6.5 (7.2)	
Vibration resistance	[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27	
Hydraulic			
Max. operating pressure	[bar]	Ports P, A, B 350, T 210	
Max. pressure drop PABT / PBAT	[bar]	350	
Fluid		Hydraulic oil as per DIN 51524...535, other on request	
Fluid temperature	[°C]	-20...+60	
Viscosity permitted	[cSt] / [mm^2/s]	20...380	
Viscosity recommended	[cSt] / [mm^2/s]	30...80	
Filtration		ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)	
		D3FB*0 (Spool/sleeve)	D3FB*3 (Spool/body)
Nominal flow at Δp=5bar per control edge *	[l/min]	40 / 60	40 / 60 / 80
Leakage at 100 bar	[ml/min]	<100	<100
Overlap		25, electrically normalized at 10 (see flow characteristics)	
Static / Dynamic			
Step response at 100% step	[ms]	40	
Hysteresis	[%]	<4	<5
Temperature drift solenoid current	[%/K]	<0.02	
Electrical characteristics			
Duty ratio	[%]	100 ED; CAUTION: Coil temperature up to 155°C possible	
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)	
Solenoid		Code “K“	Code “J“
Supply voltage	[V]	12	24
Current consumption	[A]	2.95	1.5
Resistance	[Ohm]	3.84	16.25
Solenoid connection		Connector as per EN 175301-803	
Wiring min.	[mm^2]	3 x 1.5 recommended	
Wiring lenght max.	[m]	50 recommended	

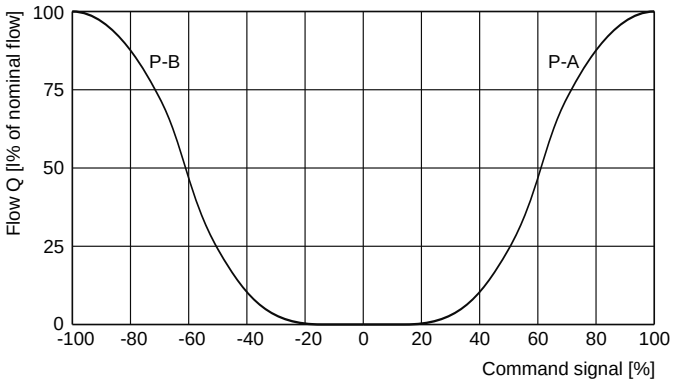
* Flow rate for different Δp per control edge:

$$Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$$

Electrical characteristics OBE		
Duty ratio	[%]	100
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Supply voltage/ripple DC	[V]	18...30, ripple < 5% eff., surge free
Current consumption max.	[A]	3.5
Pre fusing medium lag	[A]	4.0
Input signal		
Codes F0 & W5 voltage	[V]	+10...0...-10, ripple < 0.01 % eff., surge free, Ri = 100kOhm, 0...+10V ⇒ P -> A
Codes S0 & W5 current	[mA]	4...12...20, ripple < 0.01 % eff., surge free, Ri = 200Ohm, 12...20mA ⇒ P -> A < 3.6 mA = enable off, > 3.8 mA = enable on (acc. to NAMUR NE43)
Code G0	[mA]	+20...0...-20, ripple < 0.01 % eff., surge free, Ri = 200Ohm, 0...+20mA ⇒ P -> A
Differential input max.		
Codes F0, G0 & S0	[V]	30 for terminal D and E against PE (terminal G) 11 for terminal D and E against 0V (terminal B)
Code W5	[V]	30 for terminal 4 and 5 against PE (terminal PE) 11 for terminal 4 and 5 against 0V (terminal 2)
Channel recall signal	[V]	0...2.5: off / 5...30: on / Ri = 100 kOhm
Min	[%]	0...50
Adjustment ranges Max	[%]	50...100
Ramp	[s]	0...32.5
Interface		RS 232, parametrizing connection 5pole
EMC		EN 61000-6-2, EN 61000-6-4
Central connection		
Codes F0, G0 & S0		6 + PE acc. to EN 175201-804
Code W5		11 + PE acc. to EN 175201-804
Wiring min.		
Codes F0, G0 & S0	[mm²]	7 x 1.0 (AWG16) overall braid shield
Code W5	[mm²]	11 x 1.0 (AWG16) overall braid shield
Wiring length max.		50

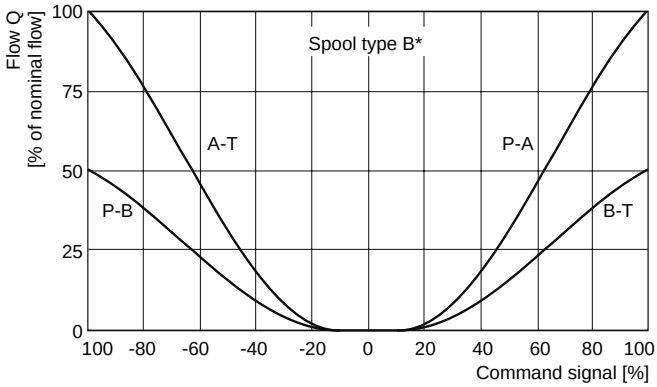
3

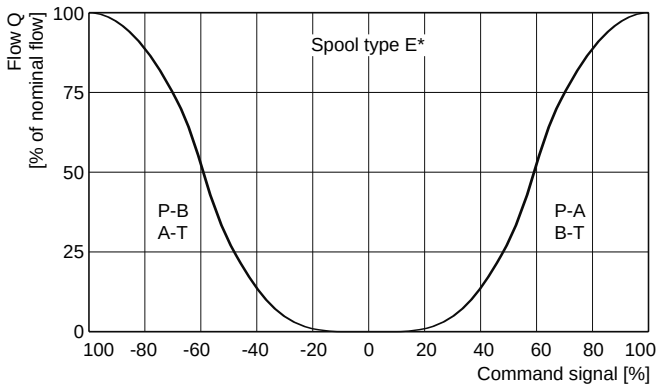
Flow characteristics
D3FB
at Δp = 5 bar per metering edge



All characteristic curves measured with HLP46 at 50°C.

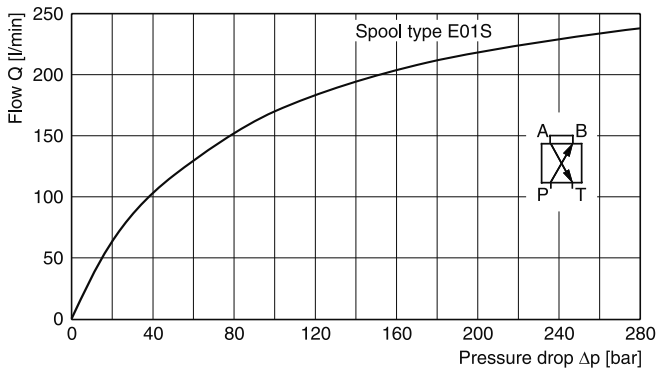
D3FB OBE
(Electrically set to opening point 10%)
at Δp = 5 bar per metering edge
Spool type E01/02, B31/32



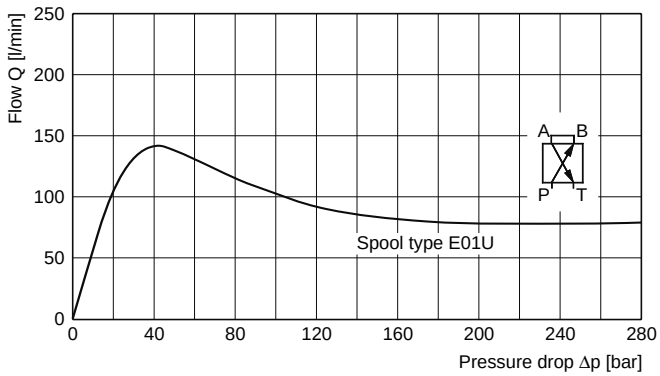


All characteristic curves measured with HLP46 at 50°C.

Functional limits
100% command signal (symmetric flow)

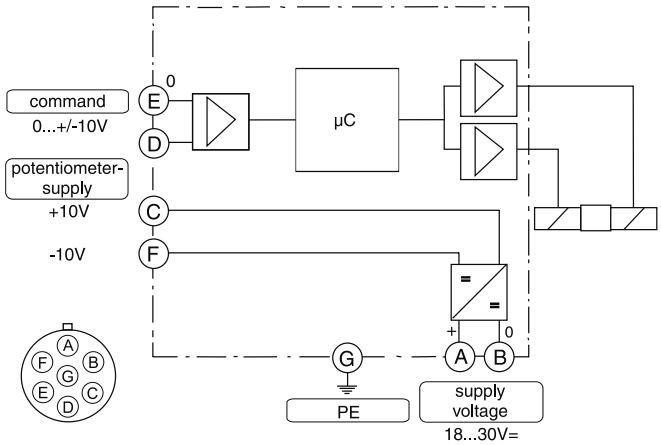


At asymmetric flow a reduced flow limit has to be considered – typically approx. 10% lower.

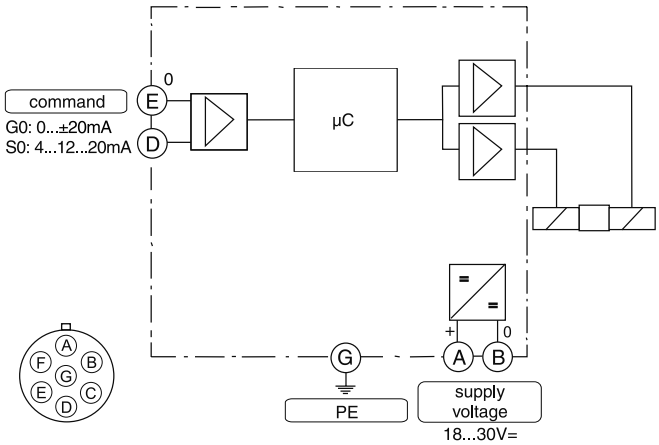


All characteristic curves measured with HLP46 at 50°C.

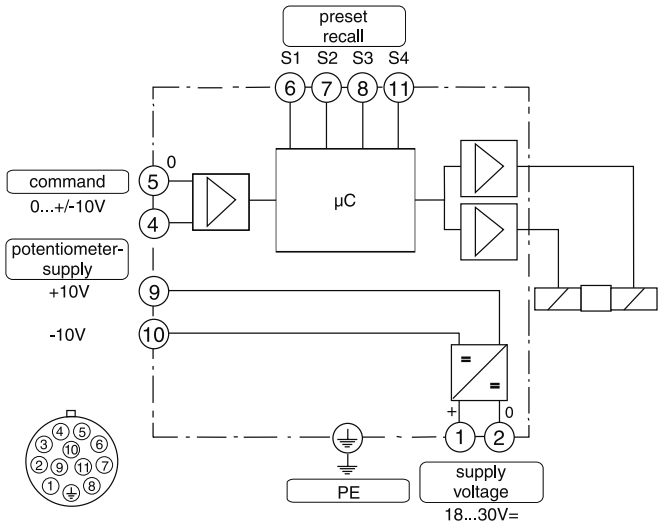
Code F0
6 + PE acc. to EN 175201-804



Code G0, S0
6 + PE acc. to EN 175201-804



Code W5
11 + PE acc. to EN 175201-804



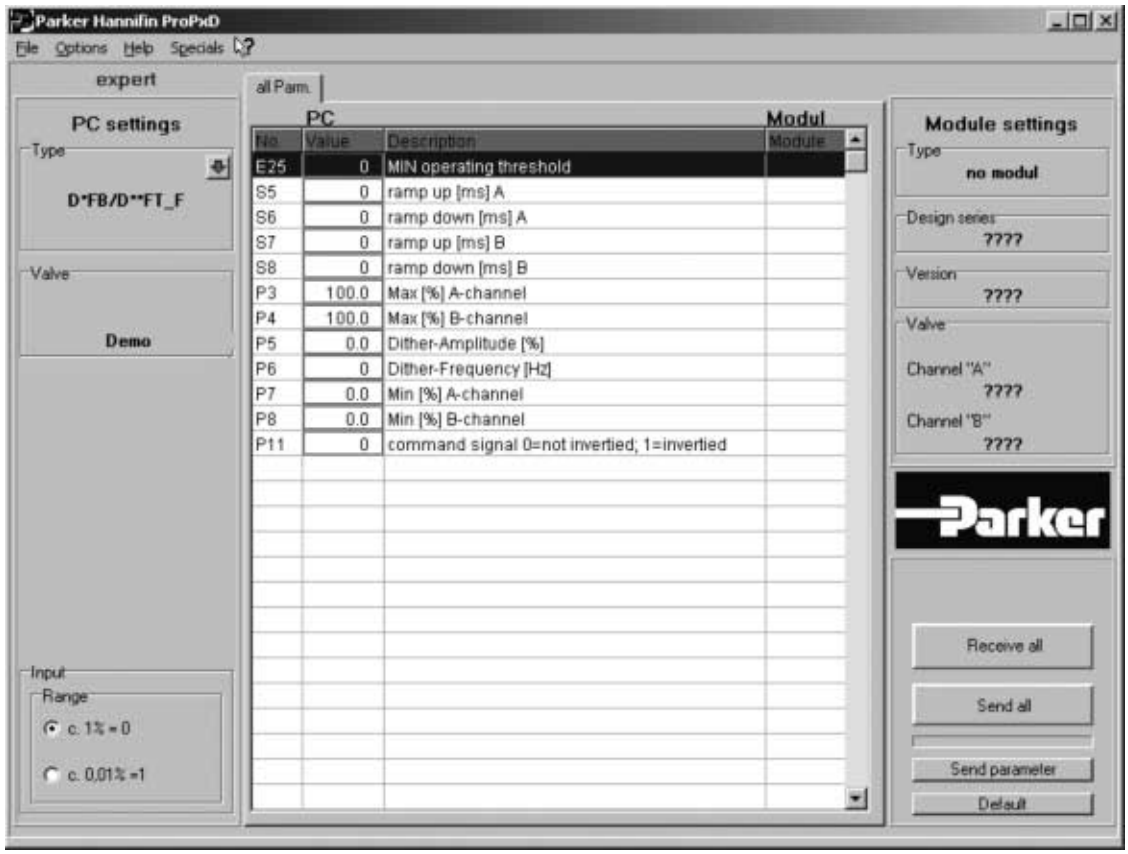
D3FB OBE

ProPxD interface program

The ProPxD software permits comfortable parameter setting for the module electronics. Via the clearly arranged entry mask the parameters can be noticed and modified. Storage of complete parameter sets is possible as well as printout or record as a text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to other valves. Inside the electronics a non-volatile memory stores the data with the option for recalling or modification.

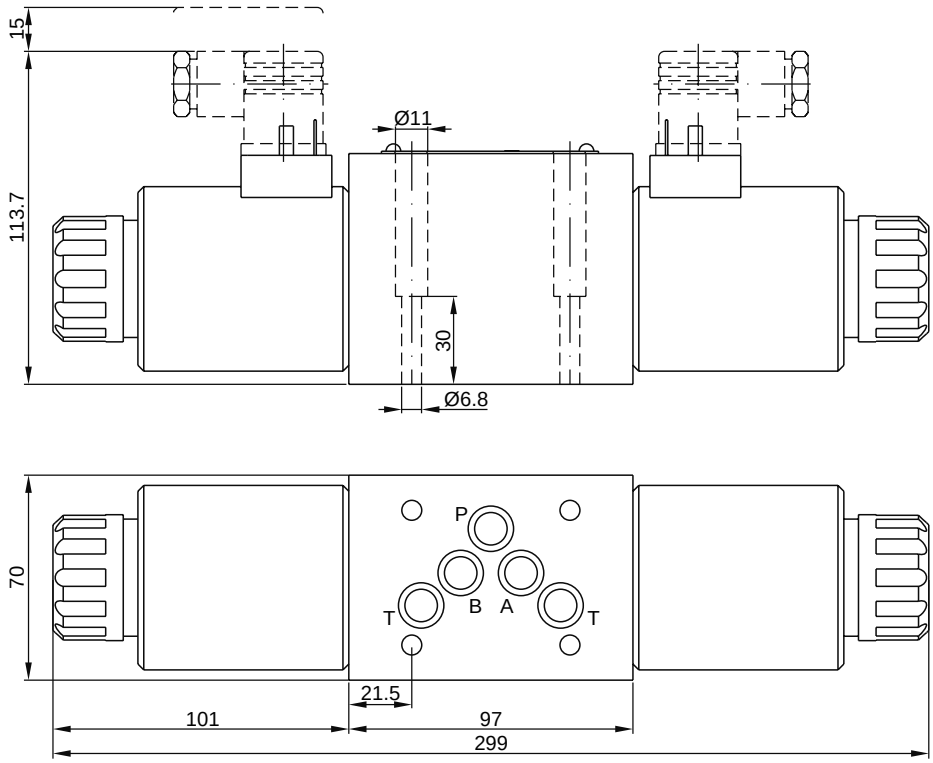
Features

- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows ® operating systems from Windows ® 95 upwards
- Plain communication between PC and electronics via serial interface RS232C.
- Comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"

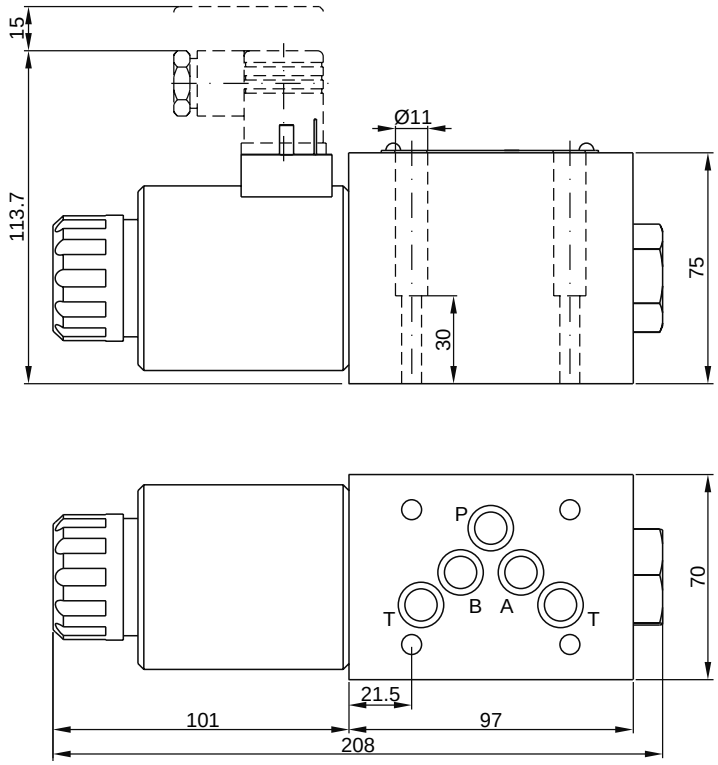


The parametrizing cable may be ordered under item no. 40982923.

D3FB*C



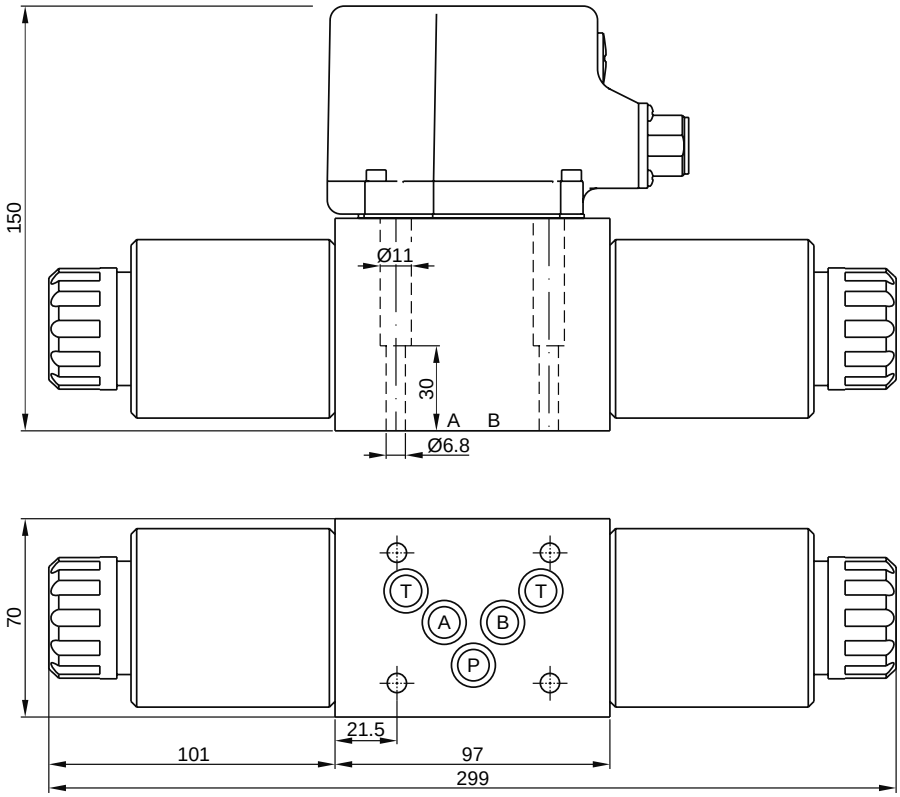
D3FB*K



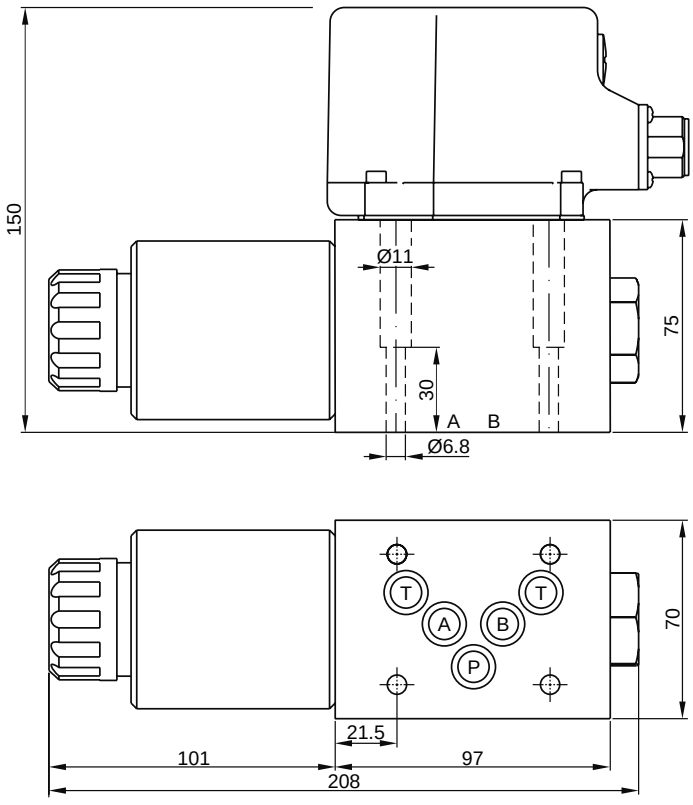
Surface finish	Kit			Kit NBR
$R_{max}6.3$ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	SK-D3FB-N

3

D3FB*C OBE



D3FB*E OBE



Surface finish	Kit			Kit NBR
R_{max}6.3 ⏥ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	SK-D3FB-N

D3FB UK.INDD RH 07.09.2011

The proportional directional valves D1FB (NG06) and D3FB (NG10) with CANopen interface are based on the series for standard digital electronics of the same name.

CANopen-Profile

CANopen Application Layer and Communication Layer
CiA DS - 301 Version 4.01

CANopen Layer Setting Services (LSS) and Protocols
CiA DS – 305 Version 2.0

Device Profile in accordance with
CiA DSP – 408 Version 1.5.2

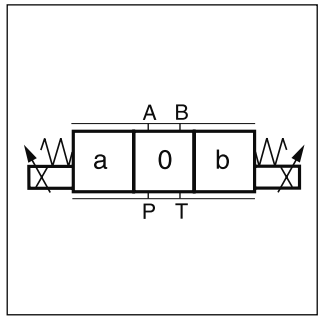
The baud rate and node ID can be set by dip switches or Layer Setting Service (LSS).

The valve parameters are factory set. Additionally the ProPxD software permits the editing of all parameters via the separate communication port. The software is also used for the valves with digital onboard electronics and the electronics modules. The cable for connection to a serial RS232 interface is available as accessory.

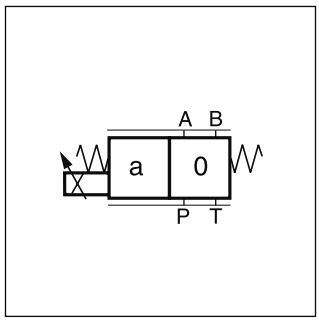
The digital onboard electronics is situated in a robust metal housing and can be used in rough environments.

The series D1FB and D3FB are available with spool/sleeve design as well as with spool/body design.

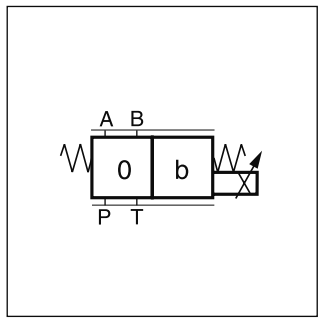
D3FB*C



D*FB*C



D*FB*E

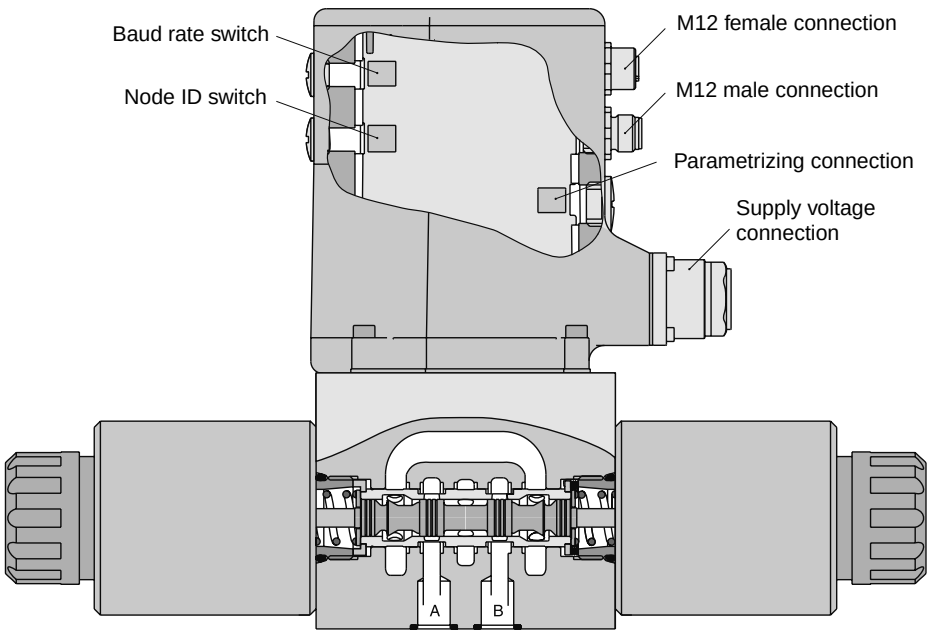


D*FB*K

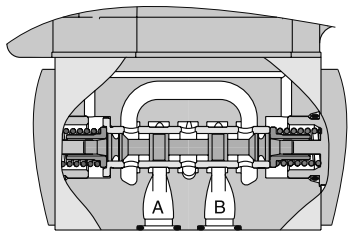
Technical Features

- CANopen interface
- Spool/sleeve design and spool/body design
- High repeatability from valve to valve
- Low hysteresis
- Manual override
- Failsafe center position

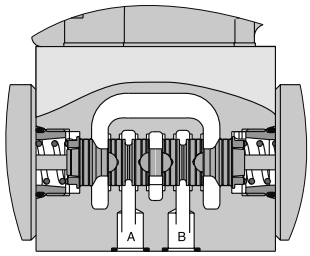
D3FB*C*0
Spool/sleeve design



D1FB*C*0
Spool/sleeve design

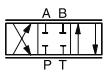


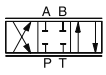
D3FB*C*3
Spool/body design



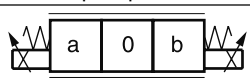
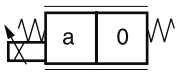
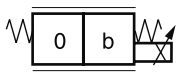
D1FB

D	1	F	B			0	N	U	0		
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**Proportional control**	**Standard dynamics standard repeatability**	**Spool type**	**Spool position**		**Seals NBR** (other seal compounds on request)	**Communication interface CANopen DSP 408, 6+PE, 1xM12 male 1xM12 female**	**Options**	**Design**	**Design series** (not required for ordering)

D1FB*0: Spool/sleeve design		
Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01H **E01F** **E01C**		**20** **12** **6**
E02H **E02F** **E02C**		**20** **12** **6**
E03H **E03F** **E03C**		**20** **12** **6**
B31H **B31F**	$Q_B = Q_A /2$ 	**20 / 10** **12 / 6**
B32H **B32F**	$Q_B = Q_A /2$ 	**20 / 10** **12 / 6**

D1FB*3: Spool/body design		
Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01K **E01H** **E01F**		**30** **20** **10**
E02K **E02H** **E02F**		**30** **20** **10**

Code	Design
0	Spool/sleeve design
3	Spool/body design

Code	Spool position
C	
E	
K	

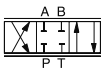
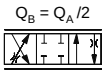
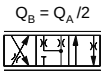
Please order connector separately.
See chapter 3 accessories.

Parametrizing cable OBE → RS232
Item no. 40982923

Bold letters =
Short-term availability

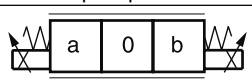
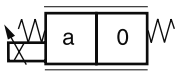
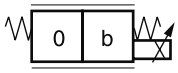
D3FB

D	3	F	B			0	N	U	0		
Directional control valve	**Size DIN NG10 CETOP 05 NFPA D05**	**Proportional control**	**Standard dynamics standard repeatability**	**Spool type**	**Spool position**		**Seals NBR** (other seal compounds on request)	**Communication interface CANopen DSP 408, 6+PE, 1xM12 male 1xM12 female**	**Options**	**Design**	**Design series** (not required for ordering)

Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
E01M **E01S** **E01U**[1]		**40** **60** **80**
E02M **E02S** **E02U**[1]		**40** **60** **80**
B31M[2] **B31S**[2]		**40 / 20** **60 / 30**
B32M[2] **B32S**[2]		**40 / 20** **60 / 30**

[1] only for Code 3 Spool/sleeve design
[2] only for Code 0 Spool/body design

Code	Design
0	Spool/sleeve design
3	Spool/body design

Code	Spool position
C	
E	
K	

Please order connector separately.
See chapter 3 accessories.

Parametrizing cable OBE → RS232
Item no. 40982923

Bold letters =
Short-term availability

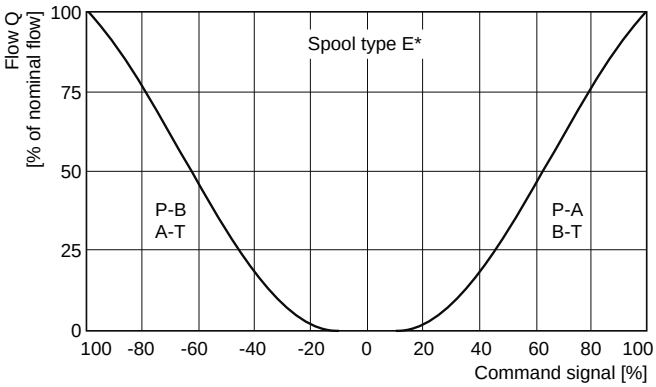
3

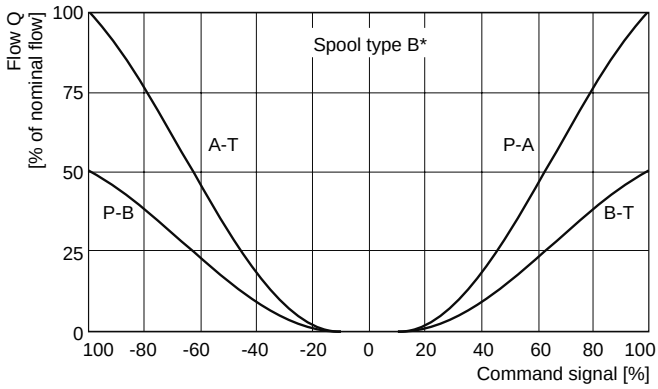
General				
Design		Direct operated proportional DC valve		
Actuation		Proportional solenoid		
Size		NG06/CETOP 03/NFPA D03		NG10/CETOP 05/NFPA D05
Mounting interface		DIN 24340 / ISO 4401 / CETOP RP121 / NFPA		
Mounting position		unrestricted		
Ambient temperature	[°C]	-20...+60		
$MTTF_D$ value	[years]	75		
Weight	[kg]	2.5		7
Vibration resistance	[g]	10 Sinus 5...2000Hz acc. IEC 68-2-6 30 Random noise 20...2000Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27		
Hydraulic				
Max. operating pressure	[bar]	Ports P, A, B 350; Port T 210		
Max. Pressure drop PABT / PBAT	[bar]	350		
Fluid		Hydraulic oil as per DIN 51524...535, other on request		
Fluid temperature	[°C]	-20...+60		
Viscosity permitted	[cSt]/[mm^2/s]	20...380		
Viscosity recommended	[cSt]/[mm^2/s]	30...80		
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)		
		D1FB*0	**D1FB*3**	**D3FB*0/3**
Nominal flow at Δp=5bar per control edge *	[l/min]	6 / 12 / 20	10 / 20 / 30	40 / 60 / 80
Leakage at 100 bar	[ml/min]	<50	<60	<100
Overlap	[%]	25, electrically normalized at 10 (see flow characteristics)		
Static / Dynamic				
Step response at 100% step	[ms]	30	30	40
Hysteresis	[%]	<4	<6	<5
Temperature drift solenoid current	[%/K]	<0.02		
Electrical characteristics				
Duty ratio	[%]	100		
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
Supply voltage/ripple DC	[V]	18...30, ripple < 5% eff., surge free		
Current consumption max.	[A]	2.0		3.0
Pre fusing medium lag	[A]	2.5		4.0
EMC		EN 61000-6-2, EN 61000-6-4		
Connection supply voltage		6 + PE acc. to EN 175201-804		
Connection CANopen		1 x Male M12x1: 5p 1 x Female M12x1: 5p acc. to IEC61076-2-101		
Wiring supply voltage min.	[mm^2]	3 x 1.0 (AWG16) overall braid shield		
Wiring length supply voltage max.	[m]	50		
Wiring CANopen		acc. to CiA DS-301 Version 4 / Twisted pair cable acc. to ISO11898		
CANopen				
Profiles		Communication Layer CIA DS - 301 Version 4 Device Profile in accordance with CIA DS - 408 Version 1.5.2 Layer Setting Service CIA DS - 305 Version 2		
Functionality		CANopen slave One PDO (Receive) One PDO (Transmit) One SDO (not useable for valve parameterizing) Emergency object Sync object Node guarding Life guarding Heartbeat time (producer/consumer) Minimum boot - up Node - ID - adjustment by DIP switch and LSS Baud Rate - adjustment by DIP switch and LSS		
Parameterization				
Interface		RS 232, parametrizing cable order code 40982923		
Interface program		ProPxD (see www.parker.com/euro_hcd)		
Adjustment ranges Min	[%]	0...50		
Adjustment ranges Max	[%]	50...100		
Adjustment ranges Ramp	[s]	0...32.5		

* Flow rate for different Δp per control edge: $Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$

D_FB CANopen UK.INDD RH 07.09.2011

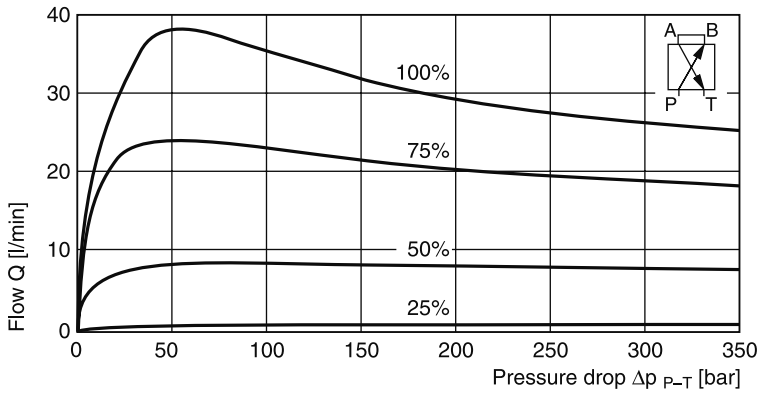
Flow characteristics
D1FB*0
at Δp = 5 bar per metering edge





Flow limit
at 25%, 50%, 75% and 100% command signal
(symmetric flow)

Spool type E01H

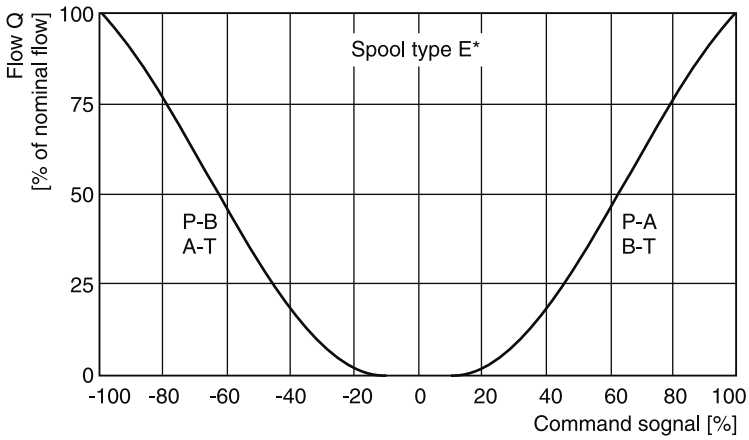


At asymmetric flow typically a lower flow limit has to be considered.

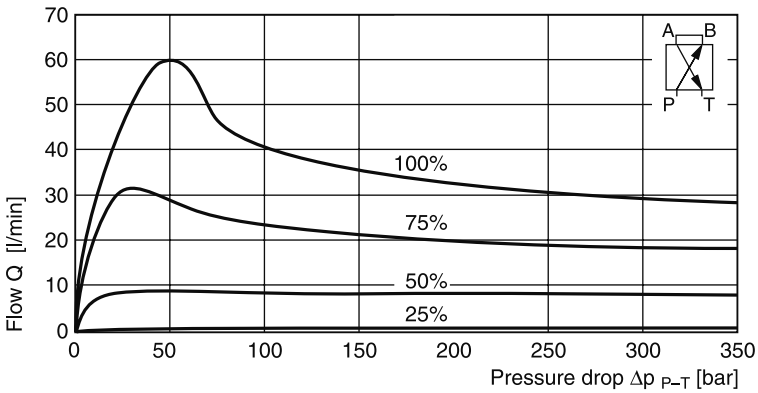
All characteristic curves measured with HLP46 at 50°C.

3

Flow characteristics
D1FB*3
at Δp = 5 bar per metering edge



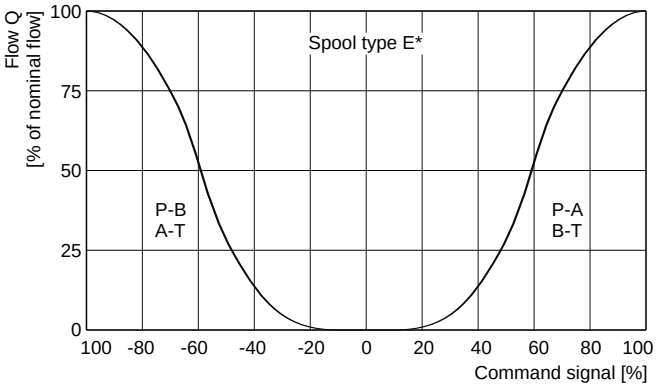
Flow limit
at 25%, 50%, 75% and 100% command signal
(symmetric flow)
Spool type E01K

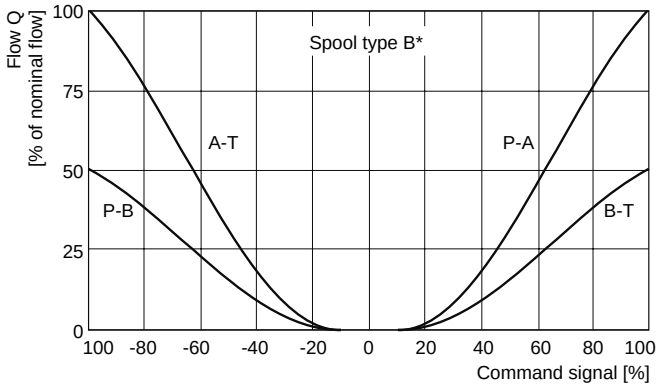


At asymmetric flow typically a lower flow limit has to be considered.

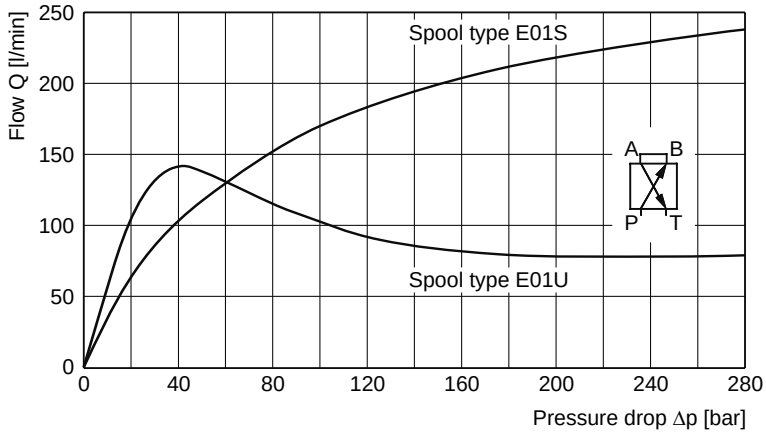
All characteristic curves measured with HLP46 at 50°C.

Flow characteristics
D3FB
at Δp = 5 bar per metering edge





Flow limit
100% command signal (symmetric flow)



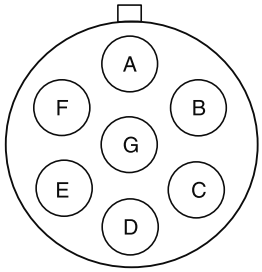
At asymmetric flow typically a lower flow limit has to be considered.

All characteristic curves measured with HLP46 at 50°C.

3

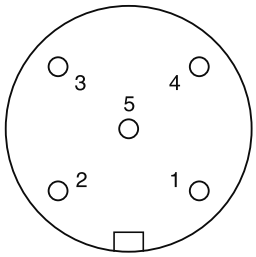
Supply voltage connection

6 + PE



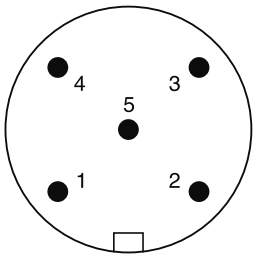
A Supply voltage 18...30V
B Supply voltage 0V
C nc
D nc
E nc
F nc
G PE

CANopen connection



CAN in: M12, 5 pole male terminals.
Pin 1: CAN_SHLD
Pin 2: nc
Pin 3: CAN_GND
Pin 4: CAN_H
Pin 5: CAN_L

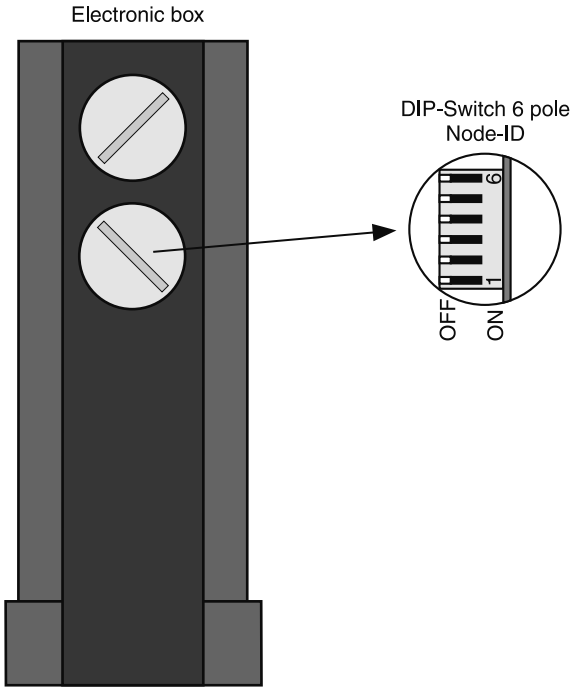
Shield is CAN_GND.



CAN out: M12, 5 pole female terminals.
Pin 1: CAN_SHLD
Pin 2: nc
Pin 3: CAN_GND
Pin 4: CAN_H
Pin 5: CAN_L

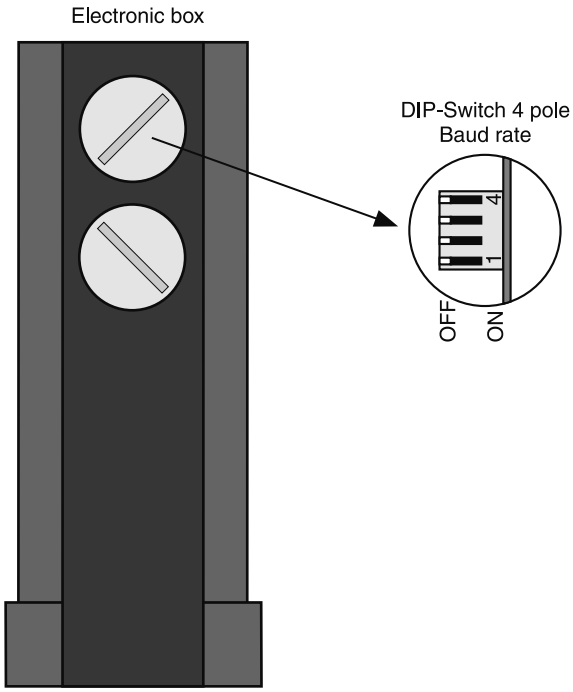
Shield is CAN_GND.

Node–ID adjustment with DIP switches



Node-ID	DIP switch setting					
	1	2	3	4	5	6
0 LSS -priority	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**
1	**ON**	OFF	OFF	OFF	OFF	OFF
2	OFF	**ON**	OFF	OFF	OFF	OFF
3	**ON**	**ON**	OFF	OFF	OFF	OFF
…						
61	**ON**	OFF	**ON**	**ON**	**ON**	**ON**
62	OFF	**ON**	**ON**	**ON**	**ON**	**ON**
63	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**
	1	2	3	4	5	6
	value					

Baud Rate adjustment with DIP switches



Baud Rate	DIP switch setting			
	1	2	3	4
0 LSS -priority	**OFF**	**OFF**	**OFF**	valve parameterization and diagnostics ON/OFF
10 kBit/s	**ON**	OFF	OFF	
20 kBit/s	OFF	**ON**	OFF	
50 kBit/s	**ON**	**ON**	OFF	
125 kBit/s	OFF	OFF	**ON**	
250 kBit/s	**ON**	OFF	**ON**	
500 kBit/s	OFF	**ON**	**ON**	
1 MBit/s	**ON**	**ON**	**ON**	

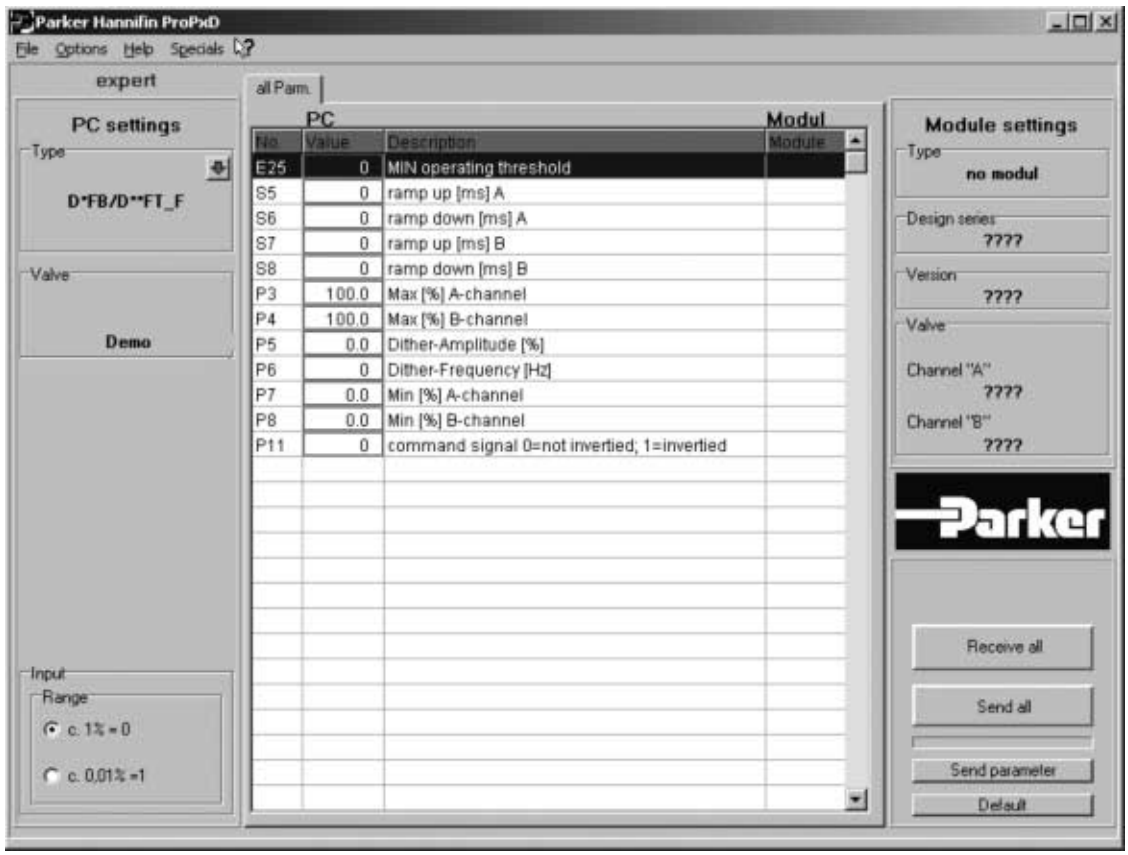
3

ProPxD interface program

The ProPxD software permits comfortable parameter setting for the module electronic. Via the clearly arranged entry mask the parameters can be noticed and modified. Storage of complete parameter sets is possible as well as printout or record as a text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to other valves. Inside the electronic a non-volatile memory stores the data with the option for recalling or modification.

Features

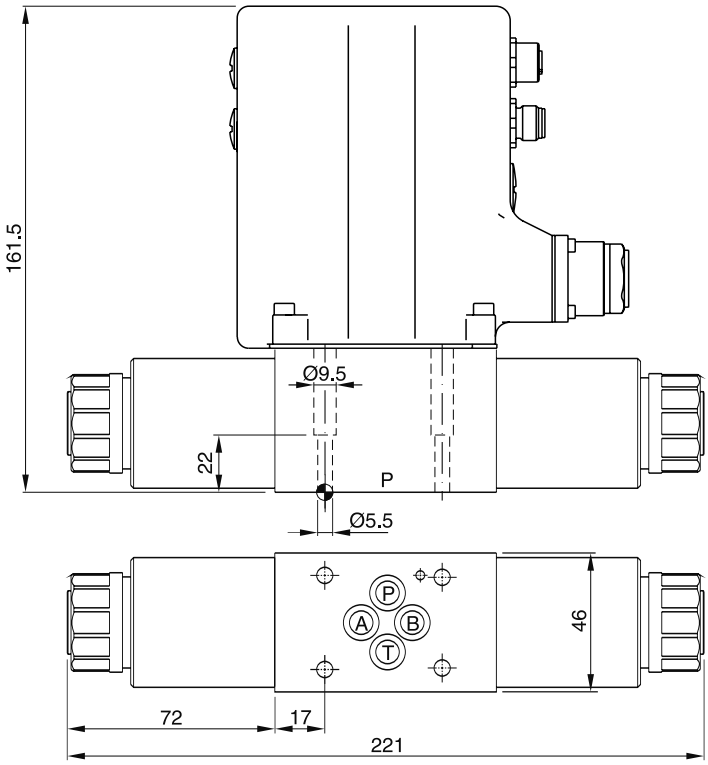
- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows ® operating systems from Windows ® 95 upwards
- Plain communication between PC and electronic via serial interface RS232C.
- Comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"



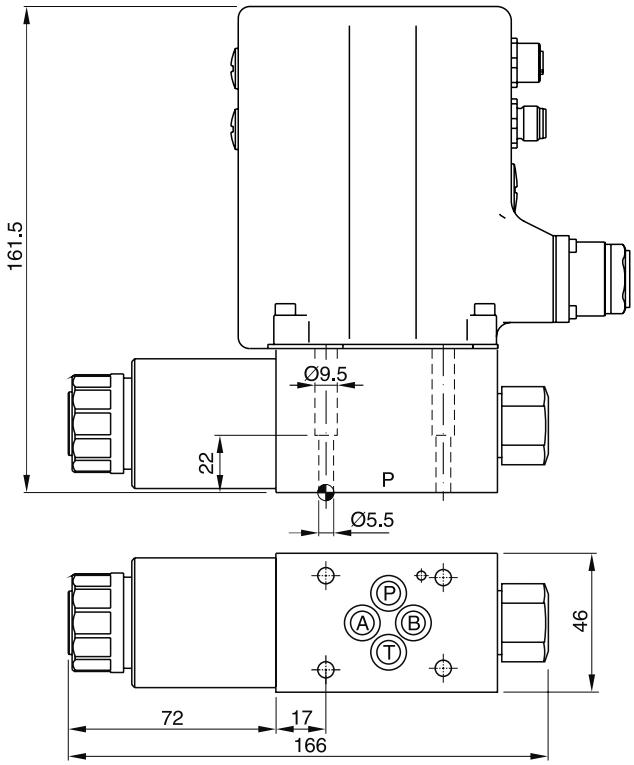
The parametrizing cable may be ordered under item no. 40982923.

3

D1FB*C



D1FB*E

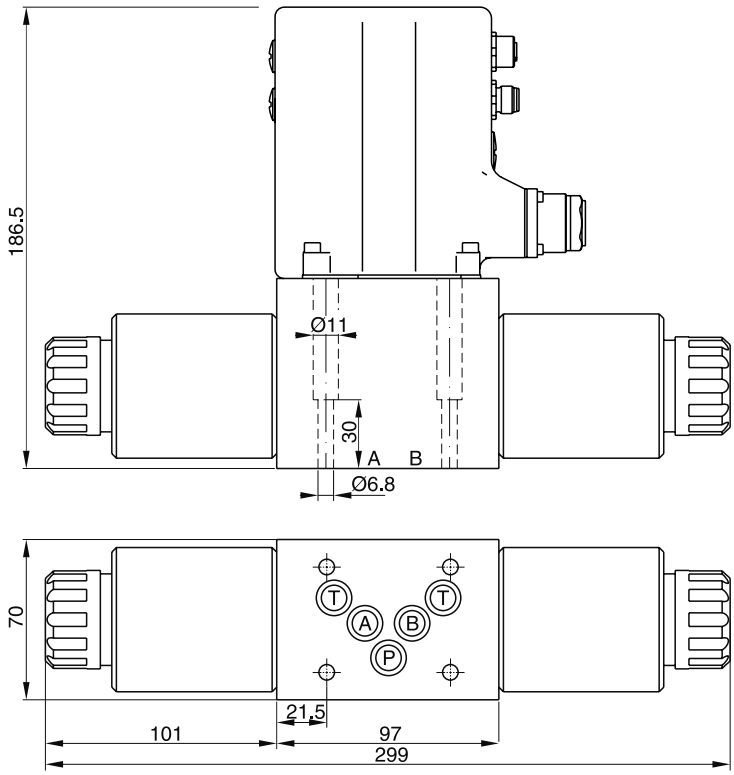


Surface finish	Kit			Kit NBR
$\sqrt{R_{max}6.3}$ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-D1FB-N

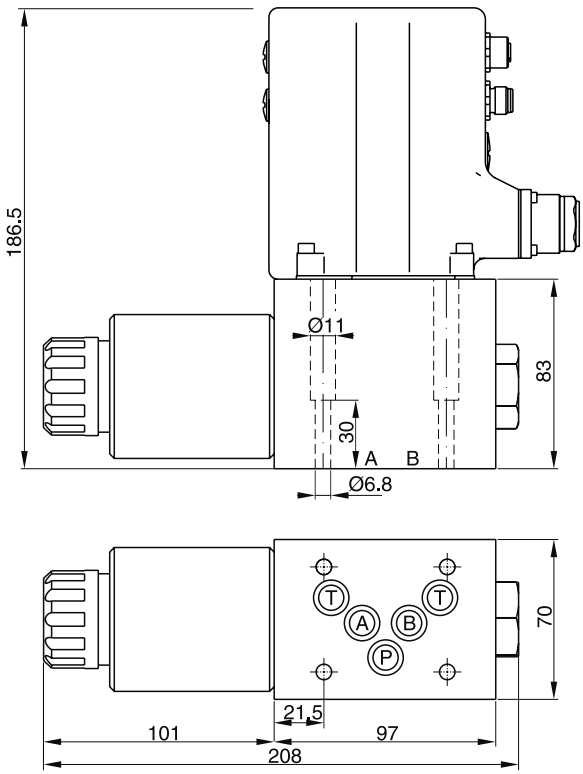
D_FB CANopen UK.INDD RH 07.09.2011

3

D3FB*C



D3FB*E



Surface finish	Kit			Kit NBR
$\sqrt{R_{max}6.3}$ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	SK-D3FB-N

D_FB CANopen UK.INDD RH 07.09.2011

The pilot operated proportional directional valves D*1FB are available in 4 sizes:

D31FB - NG10 (CETOP 05)
D41FB - NG16 (CETOP 07)
D91FB - NG25 (CETOP 08)
D111FB - NG32 (CETOP 10)

The valves are available with and without onboard electronics (OBE).

D*1FB OBE

The digital onboard electronics is situated in a robust metal housing, which allows the usage under rough environmental conditions.

The nominal values are factory set. The cable connection to a serial RS232 interface is available as accessory.

D*1FB for external electronics

The parameters can be saved, changed and duplicated in combination with the digital power amplifier PWD00A-400.

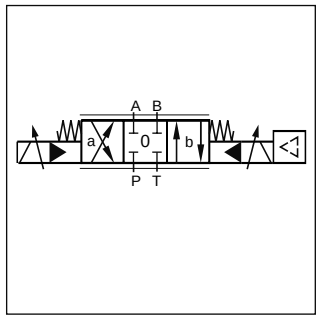
The valve parameters can be edited with the common ProPxD software for both versions.

The D*1FB valves work with barometric feedback of the main stage to the pressure reducing pilot valve. The pilot control pressure of 25bar allows high flow rates at maximum stability.

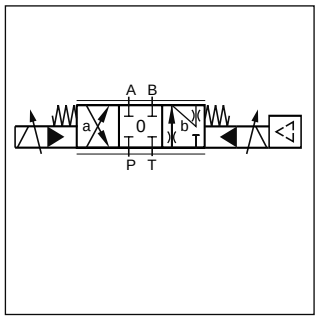
The innovative integrated regenerative function into the A-line (optional) allows new energy saving circuits for differential cylinders. The hybrid version can be switched between regenerative mode and standard mode at any time.

Further literature about the opportunities of energy savings and more functional details of the integrated regeneration is available on request.

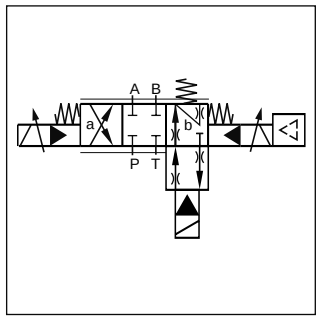
D91FB OBE



Standard D*1FB OBE



NEW: A-regeneration D*1FBR OBE

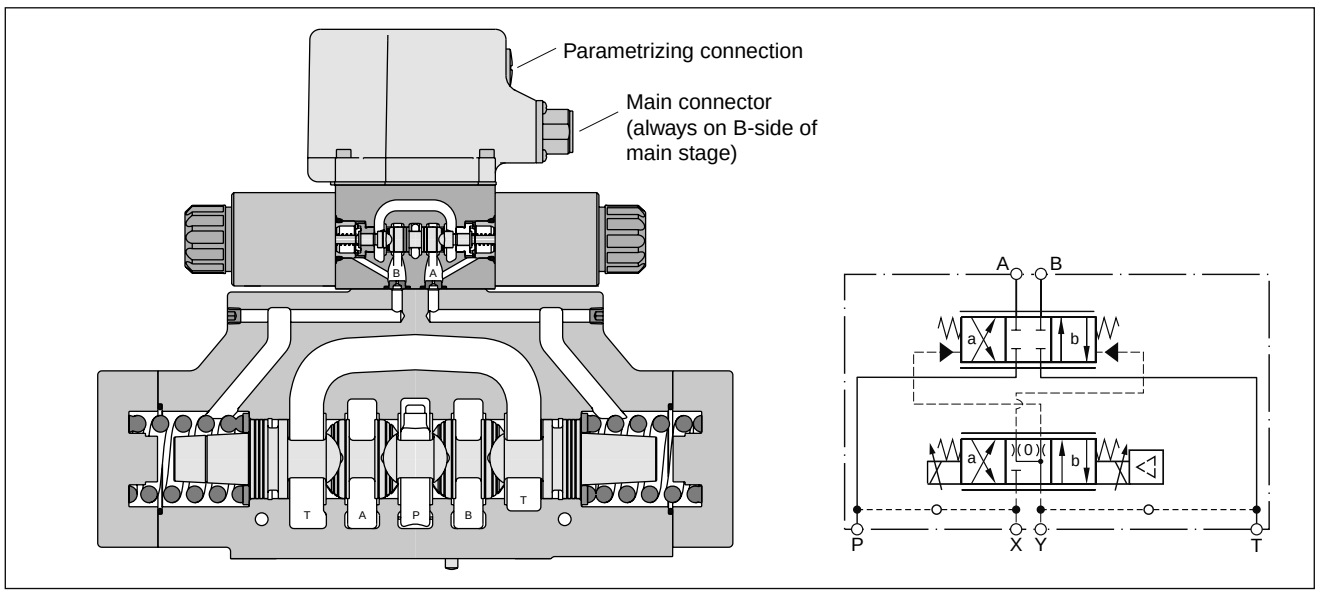


NEW: Hybrid D*1FBZ OBE

Technical Features

- Progressive flow characteristics for sensitive adjustment of flow rate
- High flow capacity
- Digital onboard electronics
- Centre position monitoring optional
- **NEW**: Energy saving A-regeneration
- **NEW**: Switchable hybrid version

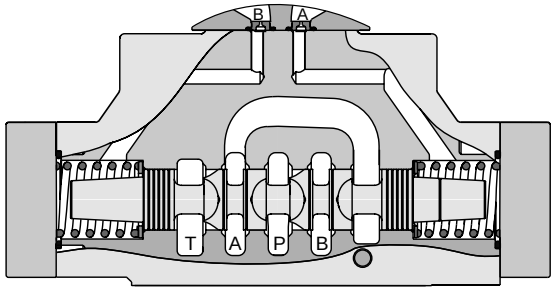
D91FB OBE

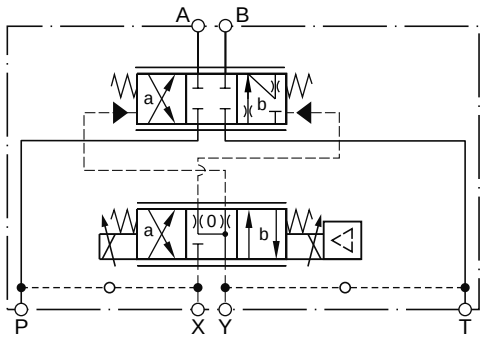


3

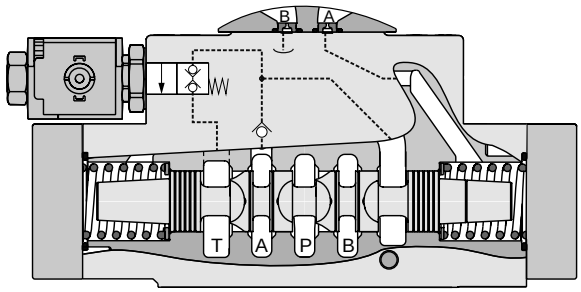
D*1FBR and D*1FBZ

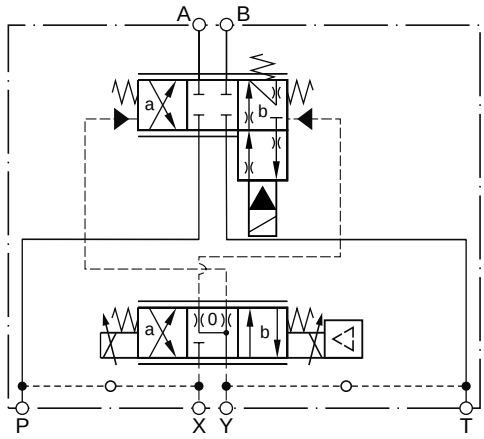
Regenerative valve D*1FBR



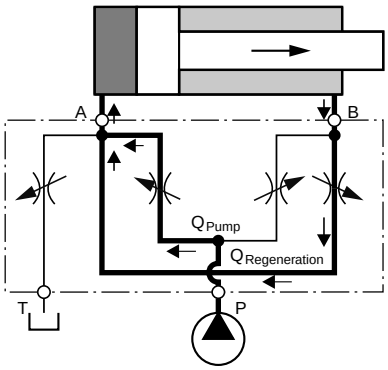


Hybrid valve D*1FBZ

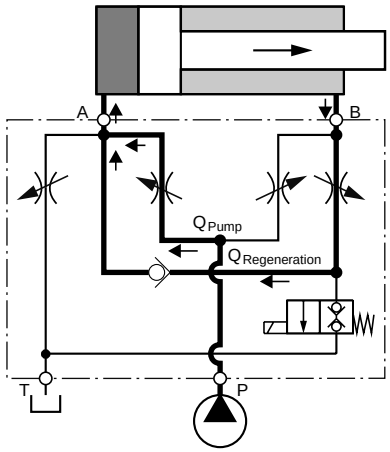




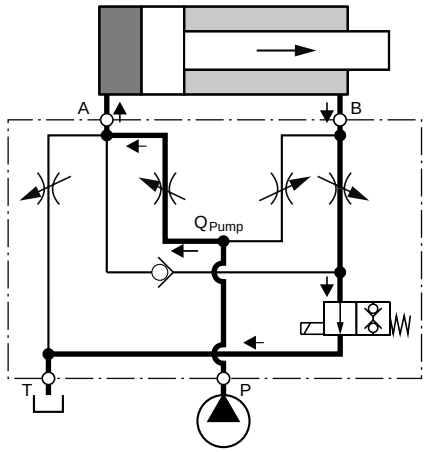
D*1FBR (regenerative valve)
Cylinder extending



D*1FBZ (hybrid valve)
Cylinder extending
regenerative mode
(high speed)



Cylinder extending
standard mode
(high force)



Flow rate in % of nominal flow

Size [1]	spool	Port					
		A-T	P-A	P-B	B-A (R-valve)	B-A (hybrid)	B-T (hybrid)
D41FBR/Z	31/32	100%	50%	100%	50%	45%	20%
D91FBR/Z	31/32	100%	50%	100%	50%	50%	25%
D111FBR/Z	31/32	on request					

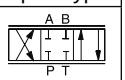
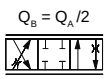
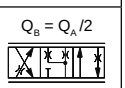
[1] D31FB: For size NG10 please refer solution with sandwich- and adaptor plates "H10-1666L / H10-1662 / A10-1664 / A10-1665L" in chapter 12.

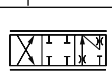
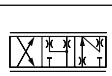
D*1FB

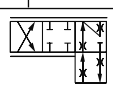
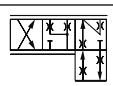
D		1	F	B									
Directional control valve	Size	NG06 pilot	Proportional control	Dynamics standard	Function	Flow	Spool position	Pilot connection	Seal	Solenoid description (other voltage on request)	Connector	Valve options	Design series (not required for ordering)

Code	Nominal size
3	**NG10 / CETOP05**
4	**NG16 / CETOP07**
9 [1]	**NG25 / CETOP08**
11	**NG32 / CETOP10**

[1] with enlarged connections Ø 32 mm

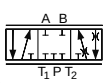
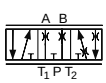
Standard	
Code	Spool type
E01	
E02	
B31	
B32	

NEW: Regenerative function [2]	
Code	Spool type
R31	
R32	

NEW: Hybrid function [2] [3]	
Code	Spool type
Z31	
Z32	

Code	Flow [l/min] at Δp = 5bar per metering edge			
	D31	D41	D91	D111
B	**–**	**100** [4] [5]	**–**	**–**
C	**75** [5]	**130** [4] [5]	**–**	**–**
D	**90** [5]	**–**	**–**	**–**
E	**120**	**–**	**250** [4] [5]	**–**
F	**–**	**200**	**-**	**–**
H	**–**	**–**	**400**	**–**
L	**–**	**–**	**–**	**1000**

[2] For regenerative and hybrid function at code 3 (NG10) please refer solutions with sandwich- and adaptor plates "H10-1666L / H10-1662 / A10-1664 / A10-1665L" in chapter 12.

D31FB spool type: R31  R32 

[3] not for valve size code 3
[4] not for spool type B31 und B32
[5] not for regenerative and hybrid function

Code	Valve options
0	**Standard**
8	**Monitor switch**
L [8]	Hybrid valve 24V normaly closed for spool type Z

[8] see page "regenerative and hybrid function" (not for valve size code 3)

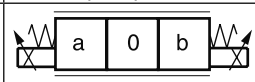
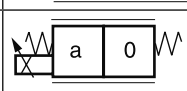
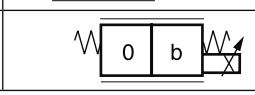
Code	Connector
W [6]	EN 175301-803
J [7]	DT04-2P "Deutsch"

[6] Please order plugs separately. See accessories.
[7] not for hybrid function

Code	Solenoid voltage
J	**24 V/1,1A**
K	**12 V/2,5A**

Code	Seal
N	**NBR**
V	**FPM**

Code	Inlet	Drain
1	**Internal**	**External**
2	**External**	**External**
4	**Internal**	**Internal**
5	**External**	**Internal**

Code	Spool position
C	
E [5]	
K [5]	

Bold letters =
Short-term availability

D*1FB OBE

D		1	F	B										
Directional control valve	Size	NG06 pilot	Proportional control	Onboard electronics	Function	Flow	Spool position	Pilot connection	Seal	Command signal	Option	Valve options	Design series (not required for ordering)	

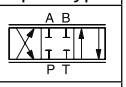
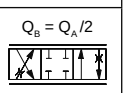
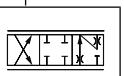
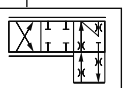
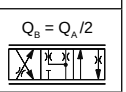
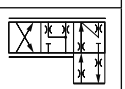
3

Code	Nominal size
3	**NG10 / CETOP05**
4	**NG16 / CETOP07**
9 [1]	**NG25 / CETOP08**
11	**NG32 / CETOP10**

[1] with enlarged connections Ø 32 mm

Code	Valve options
0	**Standard**
8	**Monitor switch**
L [9]	Hybrid valve 24V normaly closed for spool type Z

[9] see page "regenerative and hybrid function" (not for valve size code 3)

Standard		**NEW:** Regenerative function [2]		**NEW:** Hybrid function [2] [3]	
Code	Spool type	Code	Spool type	Code	Spool type
E01					
E02					
B31		R31		Z31	
B32		R32		Z32	

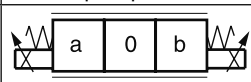
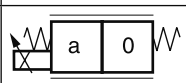
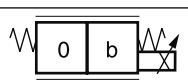
Code	Command signal [7]	Function	Connection [6]
F0	0...±10V	0...+10V > P-B	6 + PE
G0 [8]	0...±20mA	0...+20mA > P-B	6 + PE
M0 [8]	0...±10V	0...+10V > P-A	6 + PE
S0	4...20mA	12...20mA > P-A	6 + PE
W5 [8]	0...±10V 4...20mA	0...+10V > P-A 12...20mA > P-A	11 + PE

[6] Please order plugs seperately, see accessories
[7] For 1 solenoid 0...+10V respectively 4...20mA
[8] Not for spool position E and K

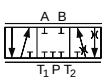
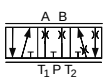
Code	Seal
N	**NBR**
V	**FPM**

Code	Inlet	Drain
1	**Internal**	**External**
2	**External**	**External**
4	**Internal**	**Internal**
5	**External**	**Internal**

Code	Flow [l/min] at Δp = 5bar per metering edge			
	D31	D41	D91	D111
B	–	**100** [4] [5]	–	–
C	**75** [5]	**130** [4] [5]	–	–
D	**90** [5]	–	–	–
E	**120**	–	**250** [4] [5]	–
F	–	**200**	-	–
H	–	–	**400**	–
L	–	–	–	**1000**

Code	Spool position
C	
E [5]	
K [5]	

[2] For regenerative and hybrid function at code 3 (NG10) please refer solutions with sandwich- and adaptor plates "H10-1666L / H10-1662 / A10-1664 / A10-1665L" in chapter 12.

D31FB spool type: R31  R32 

[3] not for valve size code 3
[4] not for spool type B31 und B32
[5] not for regenerative and hybrid function

Parametrizing cable OBE → RS232
item no. 40982923

Bold letters =
Short-term availability

D_1FB UK.INDD RH 06.09.11

General					
Design		Pilot operated DC valve			
Actuation		Proportional solenoid			
Size		NG10 (CETOP05)	NG16 (CETOP07)	NG25 (CETOP08)	NG32 (CETOP10)
Mounting interface		DIN 24340 / ISO 4401 / CETOP RP121 / NFPA			
Mounting position		unrestriced			
Ambient temperature	[°C]	-20...+60			
$MTTF_D$ value (OBE)	[years]	75 (50)			
Weight (OBE)	[kg]	8.6 (9.3)	11.9 (12.6)	20.4 (21.1)	68 (68.7)
Vibration resistance	[g]	10Sinus 5...200Hz acc. IEC 68-2-6 30 Random noise 20...20Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27			
Hydraulic					
Max. operating pressure	[bar] [bar]	Pilot drain internal: P, A, B, X 350; T, Y 185 (NG10: T, Y 15) Pilot drain external: P, A, B, T, X 350; Y 185 (NG10: Y 15)			
Fluid		Hydraulic oil as per DIN 51524...535, other on request			
Fluid temperature	[°C]	-20...+60			
Viscosity permitted recommended	[cSt] / [mm^2/s] [cSt] / [mm^2/s]	20...380 30...80			
Filtration		ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)			
Nominal flow at Δp=5 bar per control edge *	[l/min]	75/90/120	130/200	250/400	1000
Leakage at 100 bar	[ml/min]	100	200	600	1000
Pilot supply pressure	[bar] [bar] [bar]	min. 30 (+ T/Y pressure) max. 350 optimal dynamics at 50			
Pilot flow at 100bar	[l/min]	<0.5	<1.2	<1.2	<1.2
Pilot flow, step response	[l/min]	2.0	1.9	4.5	18
Static / Dynamic					
Step response at 100% step	[ms]	50	75	100	180
Hysteresis	[%]	<5			
Electrical characteristics					
Duty ratio	[%]	100			
Protection class		Standard (as per EN175301-803) IP65 in accordance with EN 60529 DT04-2P "Deutsch" IP69K (with correctly mounted plug-in connector)			
Solenoid	Code	K		J	
Supply voltage	[V]	12		24	
Current consumption	[A]	2.5		1.1	
Resistance	[Ohm]	4.4		18.6	
Coil insulation class		F (155 °C)			
Solenoid connection		Connector as per EN 175301-803 (code W), DT04-2P "Deutsch" connector (code J). Solenoid identification as per ISO 9461.			
Wiring min.	[mm^2]	3x1.5 (AWG 16) overall braid shield			
Wiring lenght max.	[m]	50			
Electrical monitor switch					
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
Ambient temperature	[°C]	0-70			
Supply voltage/ripple	[V]	18...42, ripple <10% eff.			
Current consumption without load	[mA]	<30			
Max. output current per channel, ohmic	[mA]	400			
Min. output load per channel, ohmic	[kOhm]	100			
Max. output drop at 0.2A Max. output drop at 0.4A	[V] [V]	<1.1 <1.6			
EMV		EN 61000-6-2 / EN 61000-6-4			
Max. tol. ambient field strength	[A/m]	1200			
Min. distance to next AC solenoid	[m]	0.1			
Interface		4+PE acc. IEC 61076-2-101 (M12)			
Wiring min.	[mm^2]	5x0.5 (AWG 20) overall braid shield			
Wiring lenght max.	[m]	50			

* Flow rate for different Δp per control edge: $Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$

3

Electrical characteristics OBE		
Duty ratio	[%]	100
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Supply voltage/ripple DC	[V]	18...30, ripple < 5% eff., surge free
Current consumption max.	[A]	2.0
Pre fusing medium lag	[A]	2.5
Input signal voltage		
Codes F0, M0, W5	[V]	+10...0...-10, ripple < 0.01 % eff., surge free, Ri = 100 kOhm
Code G0	[V]	+20...0...-20, ripple < 0.01 % eff., surge free, Ri = 200 Ohm
Codes S0 & W5 current	[mA]	4...12...20, ripple < 0.01 % eff., surge free, Ri = 200 Ohm < 3.6 mA = enable off, > 3.8 mA = enable on (acc. to NAMUR NE43)
Differential input max.		
Codes F0, M0 G0 & S0	[V]	30 for terminal D and E against PE (terminal G)
	[V]	11 for terminal D and E against 0V (terminal B)
Code W5	[V]	30 for terminal 4 and 5 against PE (terminal PE)
	[V]	11 for terminal 4 and 5 against 0V (terminal 2)
Channel recall signal	[V]	0...2.5: off / 5...30: on / Ri = 100 kOhm
Adjustment ranges Min	[%]	0...50
Max	[%]	50...100
Ramp	[s]	0...32.5
Interface		RS 232, parametrizing connection 5pole
EMC		EN 61000-6-2, EN 61000-6-4
Central connection		
Codes F0, M0 G0 & S0		6 + PE acc. to EN 175201-804
Code W5		11 + PE acc. to EN 175201-804
Wiring min.		
Codes F0, M0 G0 & S0	[mm²]	7 x 1.0 (AWG16) overall braid shield
Code W5	[mm²]	11 x 1.0 (AWG16) overall braid shield
Wiring length max.		50

Electrical characteristics hybrid option

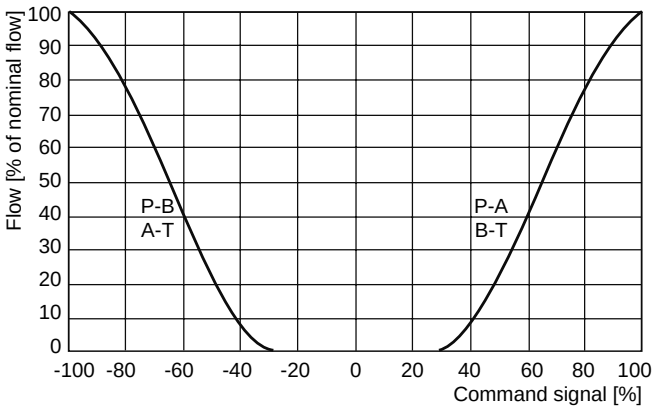
Duty ratio		100%		
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
		D41	**D91**	**D111**
Supply voltage	[V]	24	24	24
Tolernace supply voltage	[%]	±10	±10	±10
Current consumption	[A]	1.21	0.96	1.29
Power consumption	[W]	29	23	31
Solenoid connection		Connector as per EN 175301-803		
Wiring min.	[mm²]	3 x 1.5 recommended		
Wiring length max.	[m]	50 recommended		

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

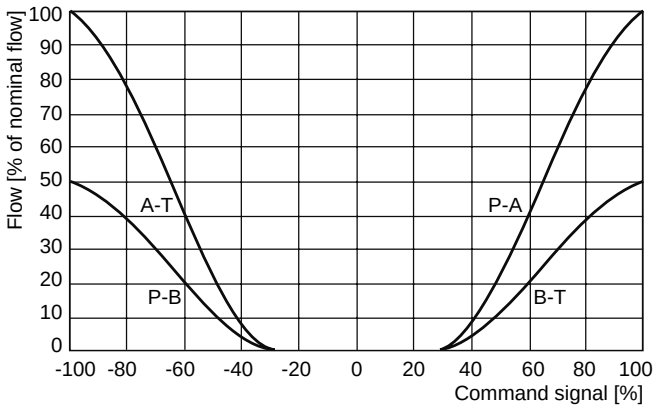
D*1FB B/E Flow characteristics

at Δp = 5 bar per metering edge

Spool code **E01/02**



Spool code **B31/32***

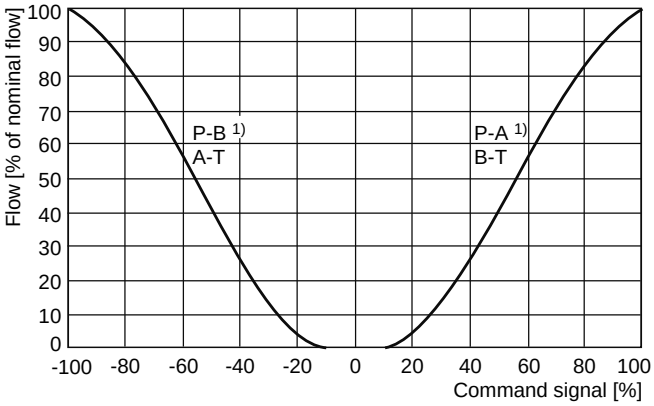


All characteristic curves measured with HLP46 at 50°C.

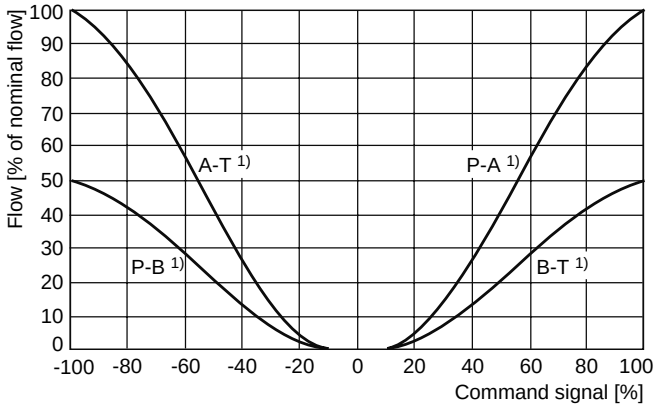
D_1FB UK.INDD RH 06.09.11

D*1FB B/E OBE
Flow characteristics
(Electrically set to opening point 10%)
at Δp = 5bar per metering edge

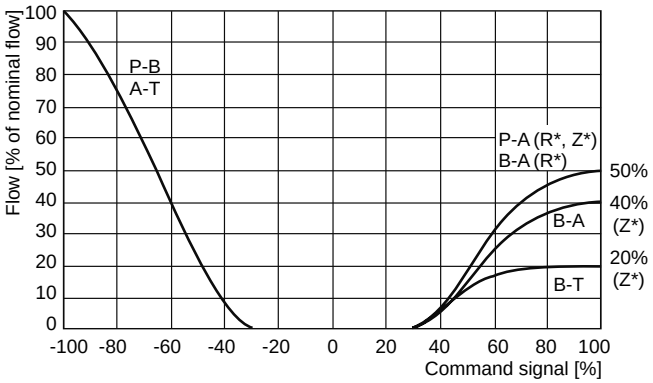
Spool code **E01/02**



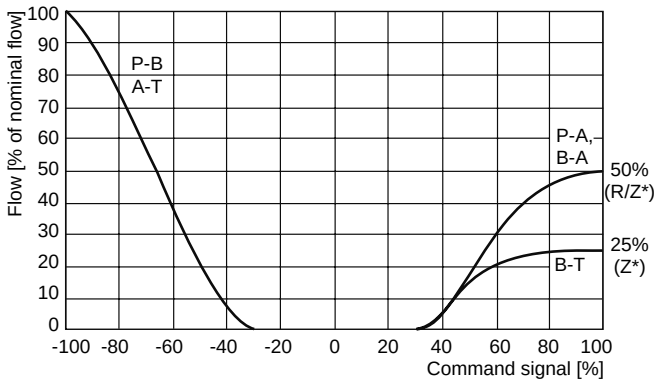
Spool code **B31/32**



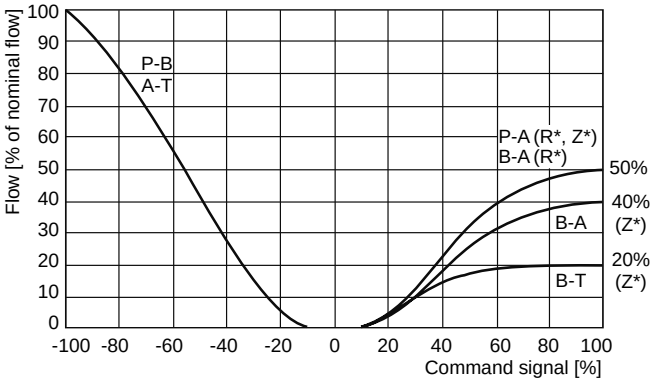
D*1FB R/Z (regenerative and hybrid)
D41FB R/Z
Spool code **R/Z31/32**



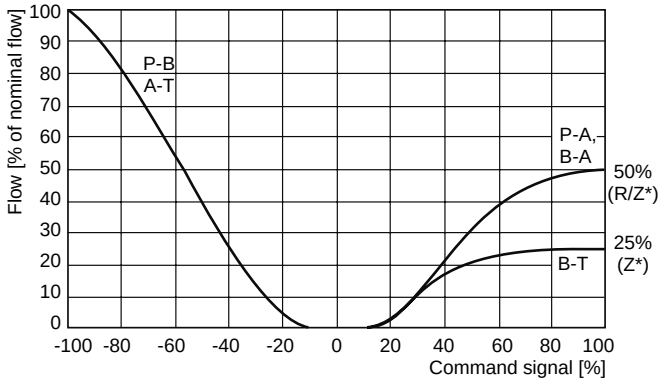
D91FB R/Z
Spool code R/Z**31/32**



D41FB R/Z OBE
Spool code **R/Z31/32**



D91FB R/Z OBE
Spool code R/Z**31/32**

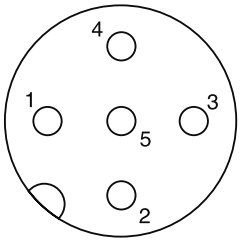


All characteristic curves measured with HLP46 at 50°C.

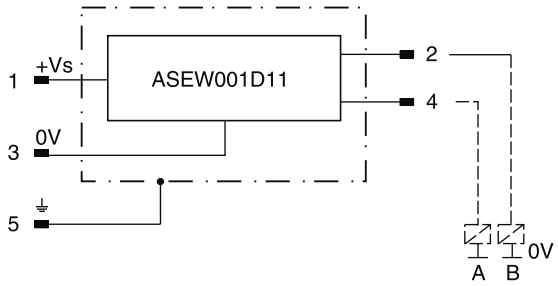
[1] Flow direction depending on ordering code

D_1FB UK.INDD RH 06.09.11

Monitor switch M12x1 pin assignment



1 + Supply 18...42V
2 output B (normally closed)
3 0V
4 output A (normally closed)
5 Earth ground



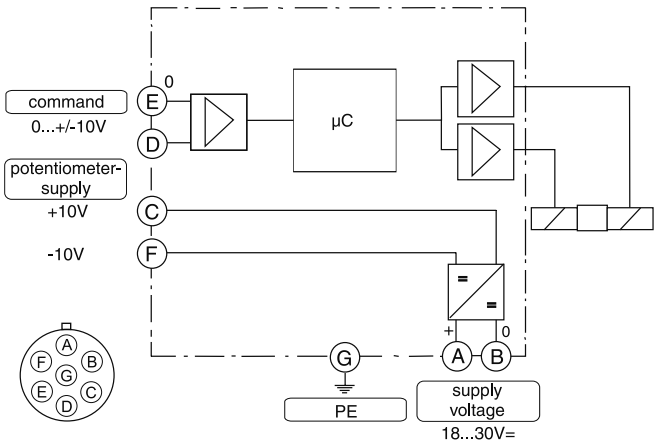
Signal	Output A (pin 4)	Output B (pin 2)
neutral	closed	closed
	open	closed
	closed	open

The neutral position is monitored. The signal changes after less than 10% of the spool stroke.

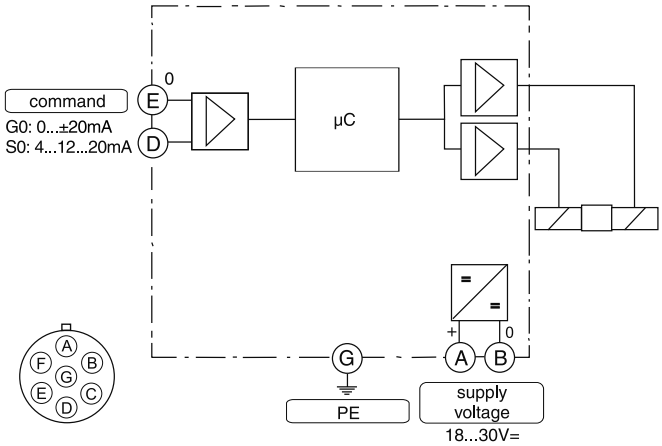
Electrical monitor switch

Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Ambient temperature	[°C]	0-70
Supply voltage/ripple	[V]	18...42, ripple < 10% eff.
Current consumption without load	[mA]	< 30
Max. output current per channel, ohmic	[mA]	400
Min. output load per channel, ohmic	[kOhm]	100
Max. output drop at 0.2A	[V]	< 1.1
Max. output drop at 0.4A	[V]	< 1.6
EMC		EN61000-6-2, EN61000-6-4
Max. tol. ambient field strength	[A/m]	1200
Min. distance to next AC solenoid	[m]	0.1
Interface		4+PE acc. IEC 61076-2-101 (M12)
Wiring min.	[mm²]	5x0.5 (AWG 20) overall braid shield
Wiring lenght max.	[m]	50

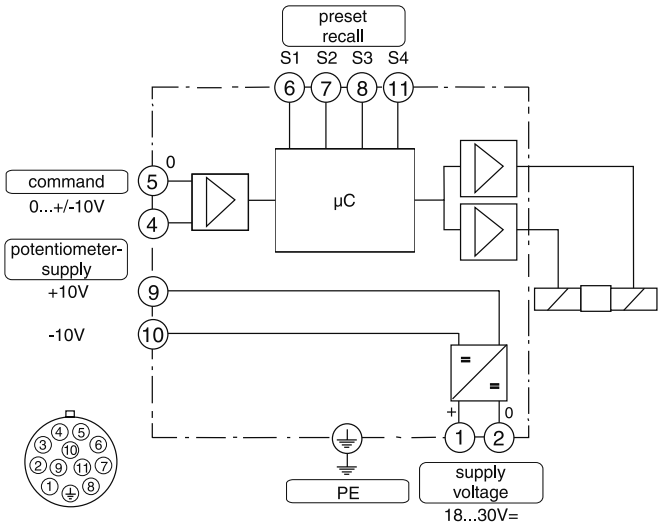
Code F0, M0
6 + PE acc. to EN 175201-804



Code G0, S0
6 + PE acc. to EN 175201-804



Code W5
11 + PE acc. to EN 175201-804



3

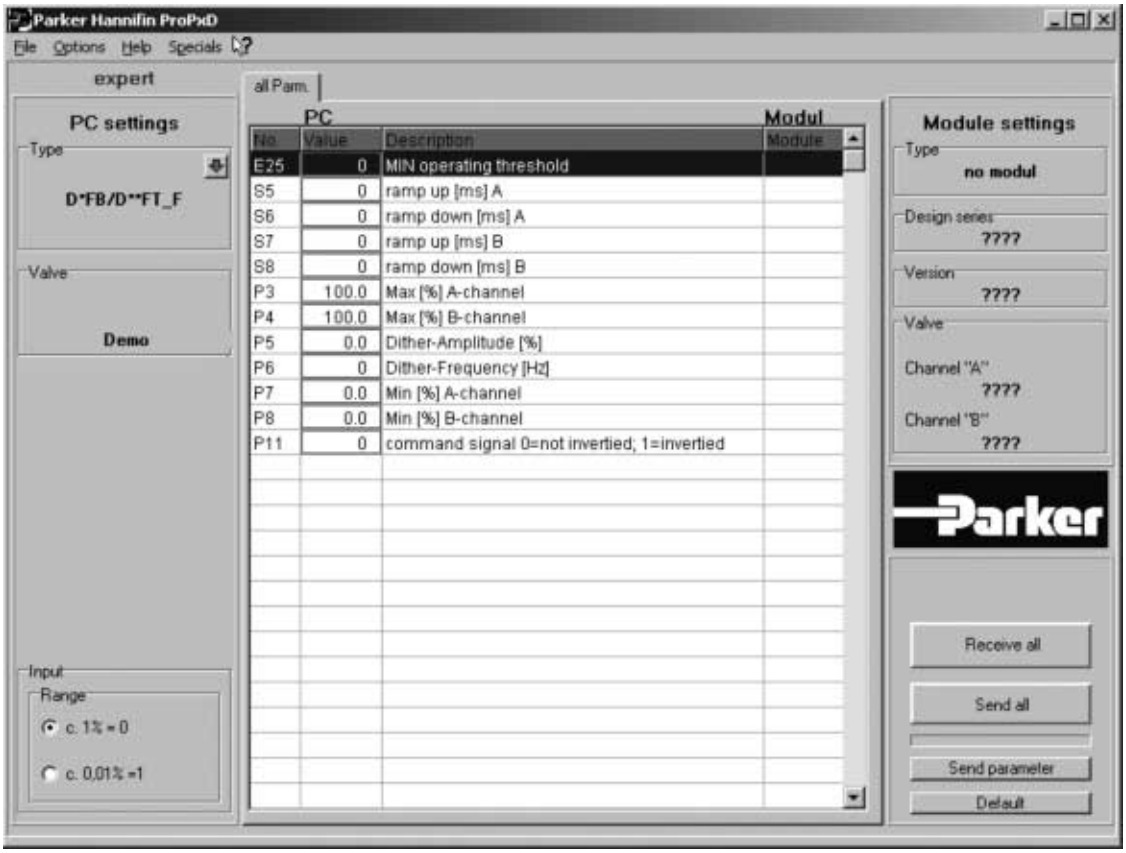
3

ProPxD interface program

The ProPxD software permits comfortable parameter setting for the module electronics. Via the clearly arranged entry mask the parameters can be noticed and modified. Storage of complete parameter sets is possible as well as printout or record as a text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to other valves. Inside the electronics a non-volatile memory stores the data with the option for recalling or modification.

Features

- comfortable editing of all parameters
- depiction and documentation of parameter sets
- storage and loading of optimized parameter adjustments
- executable with all actual Windows ® operating systems from Windows ® 95 upwards
- plain communication between PC and electronics via serial interface RS232C.
- comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"

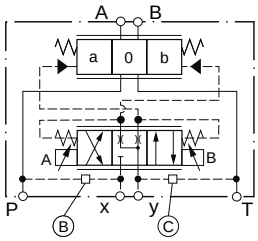


The parametrizing cable may be ordered under item no. 40982923.

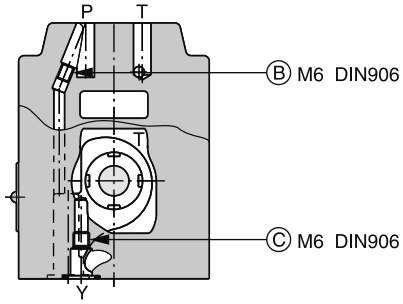
Pilot oil inlet (supply) and outlet (drain)

○ **open,** ● **closed**

Pilot oil Inlet	Pilot oil Drain	B	C
internal	external	○	●
external	external	●	●
internal	internal	○	○
external	internal	●	○

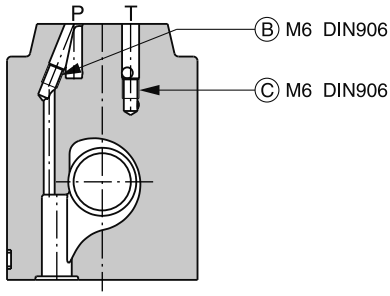


D31FBB/E

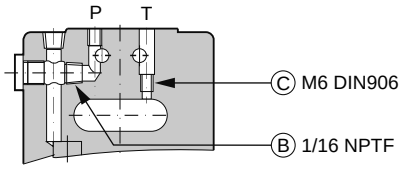


(drawn offset)

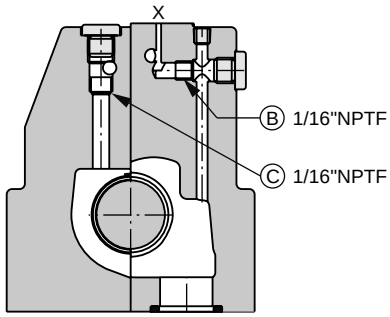
D31FBR



D41FBB/E

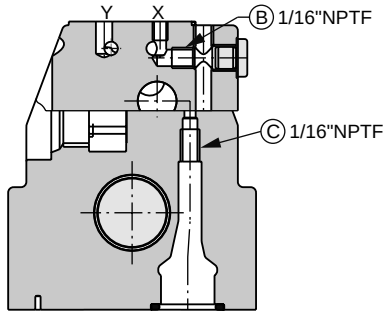


D41FBR



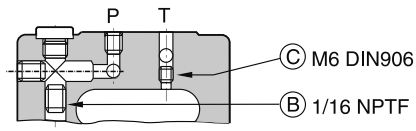
(drawn offset)

D41FBZ

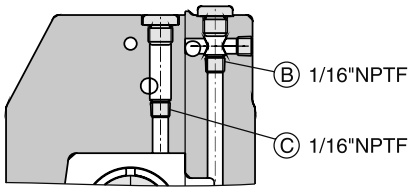


(drawn offset)

D91FBB/E

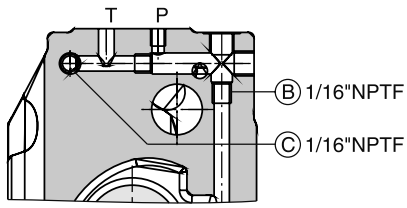


D91FBR

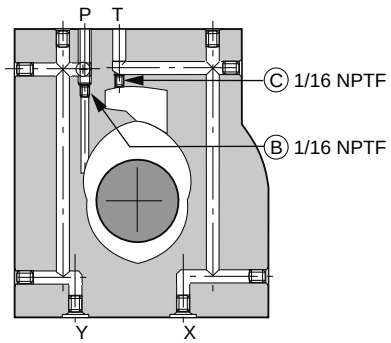


(drawn offset)

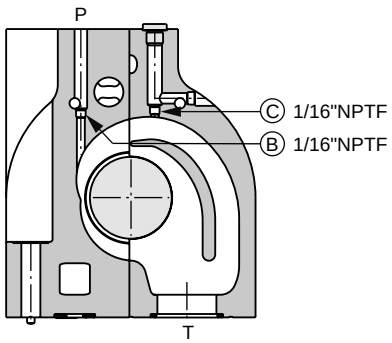
D91FBZ



D111FBB/E

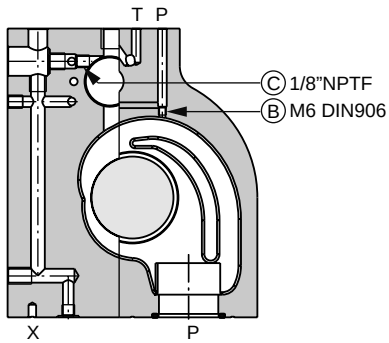


D111FBR



(drawn offset)

D111FBZ

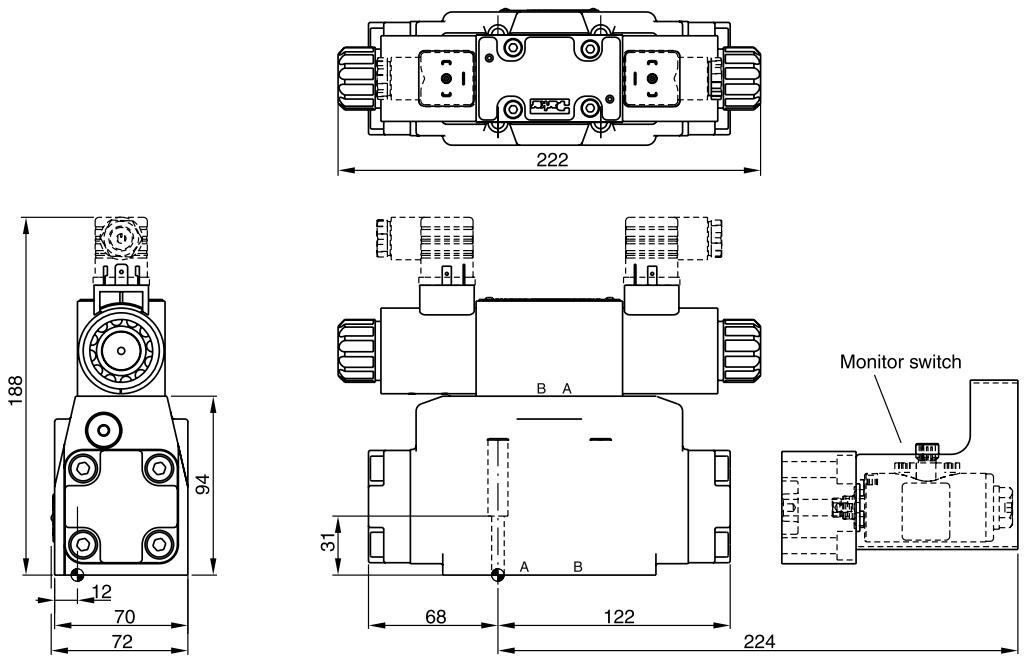


(drawn offset)

D_1FB UK.INDD RH 06.09.11

3

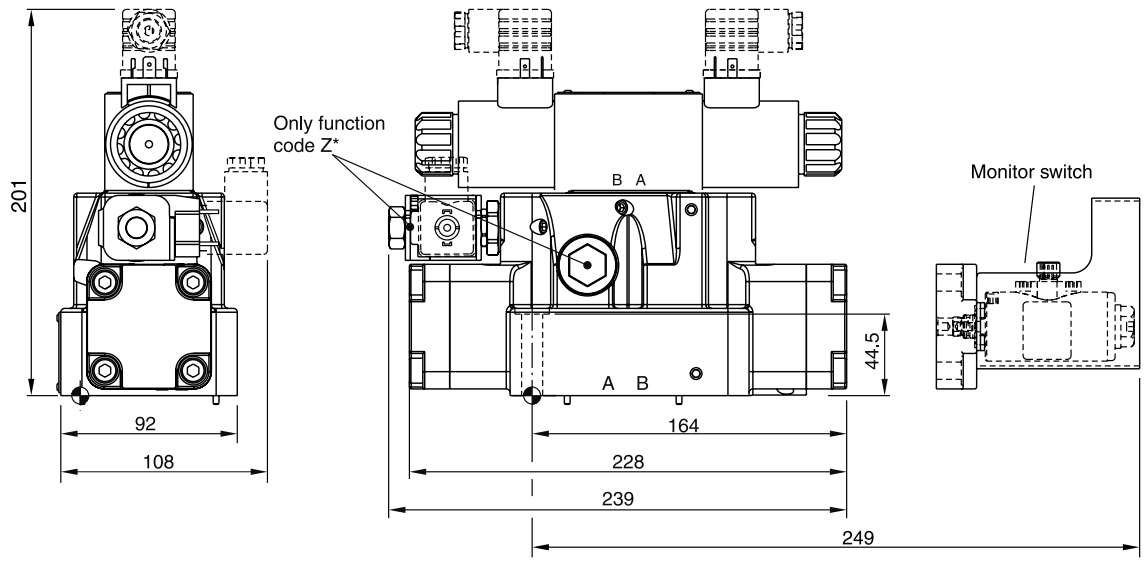
D31FB



Regenerative and hybrid function with additional plate "H10-1666L / H10-1662 / A10-1664 / A10-1665L", see chapter 12.

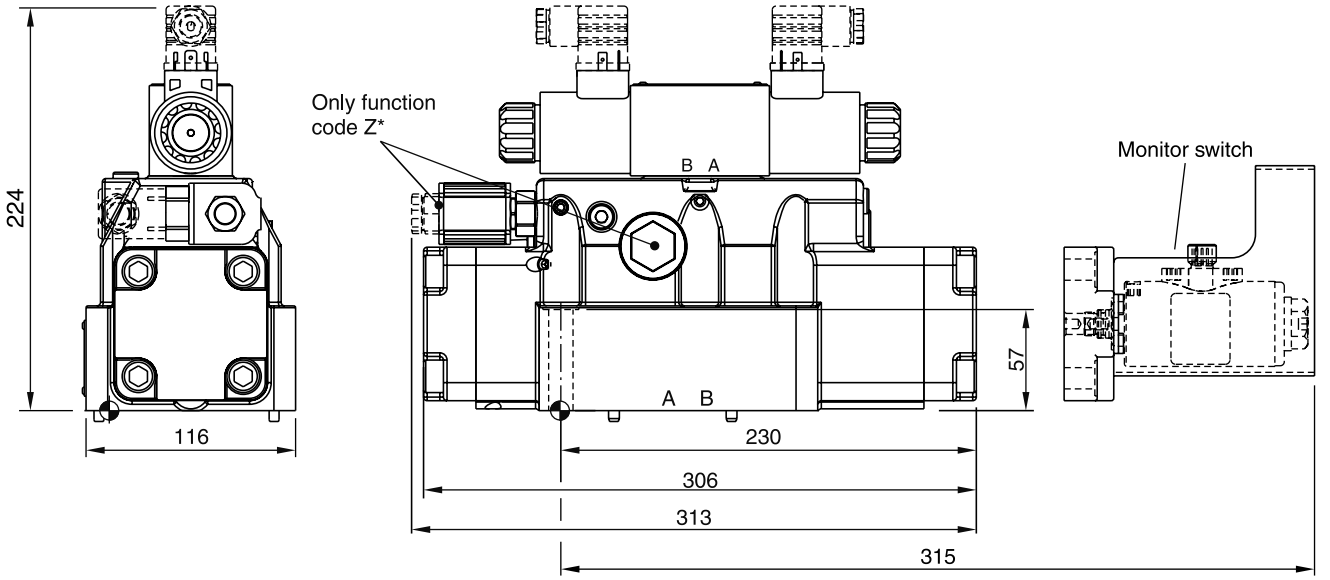
Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	NBR: SK-D31FB FPM: SK-D31FB-V

D41FB



Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK320	2x M6x55 4x M10x60 DIN 912 12.9	13.2 Nm ±15% 63 Nm ±15%	NBR: SK-D41FB FPM: SK-D41FB-V

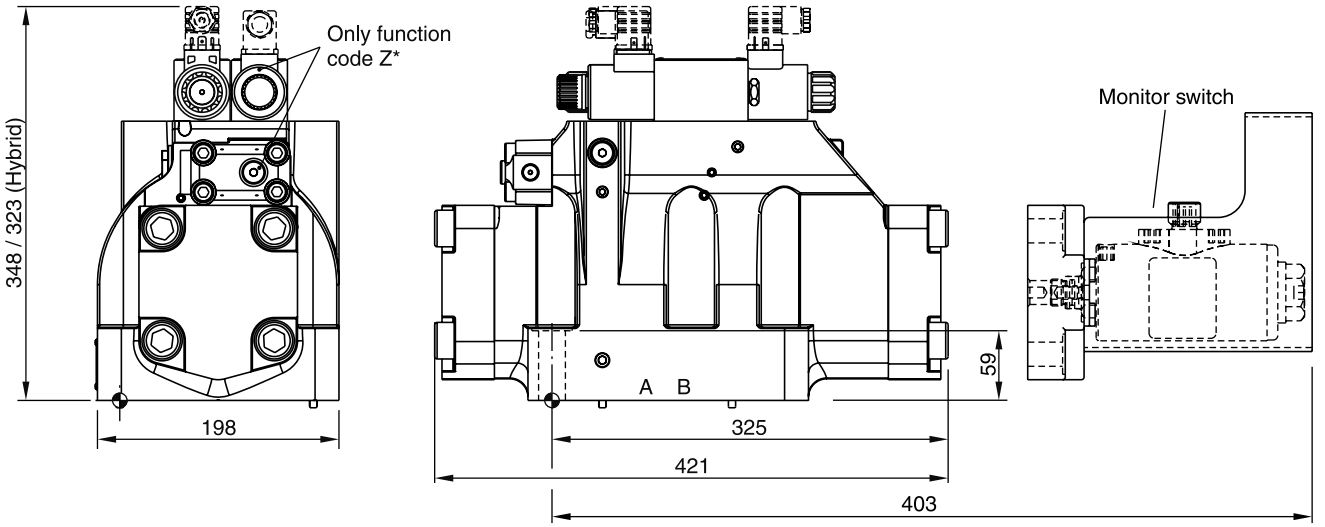
D91FB



Surface finish	Kit			Kit
$\sqrt{R_{max}}6.3$ 0.01/100	BK360	6x M12x75 DIN 912 12.9	108 Nm ±15%	NBR: SK-D91FB FPM: SK-D91FB-V

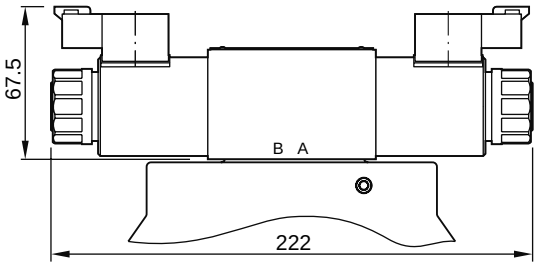
3

D111FB

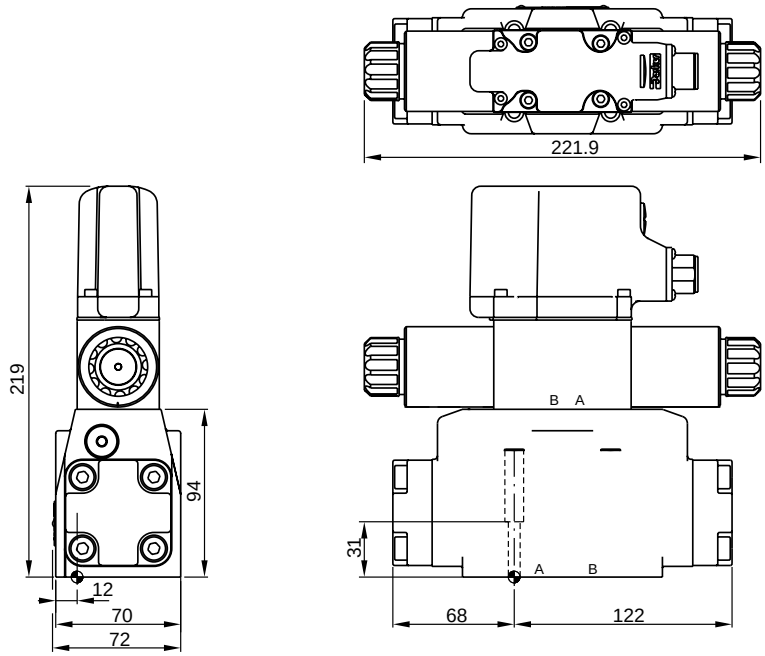


Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK386	6x M20x90 DIN 912 12.9	517 Nm ±15%	NBR: SK-D111FB FPM: SK-D111FB-V

Dimension with DT04-2P "Deutsch" Connector



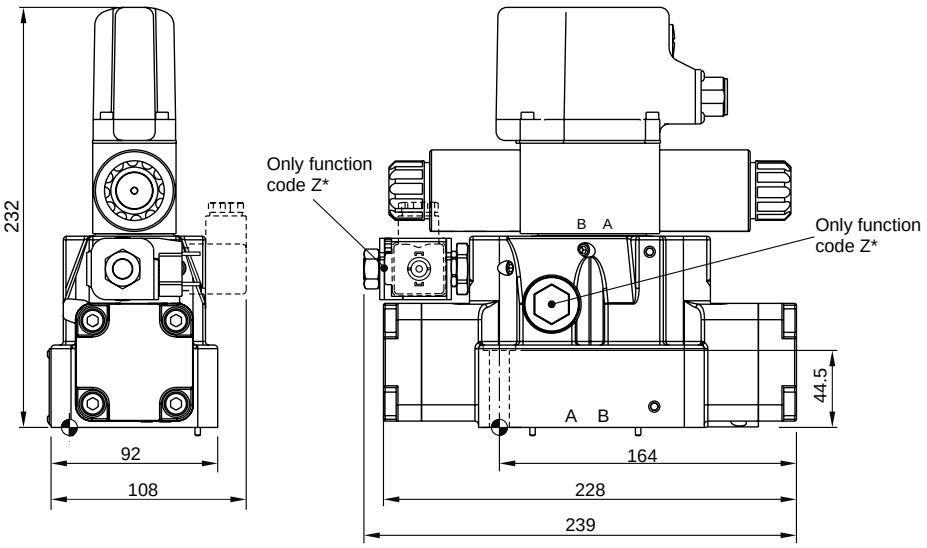
D31FB OBE



Regenerative and hybrid function with additional plate "H10-1666L / H10-1662 / A10-1664 / A10-1665L", see chapter 12.

Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	NBR: SK-D31FB FPM: SK-D31FB-V

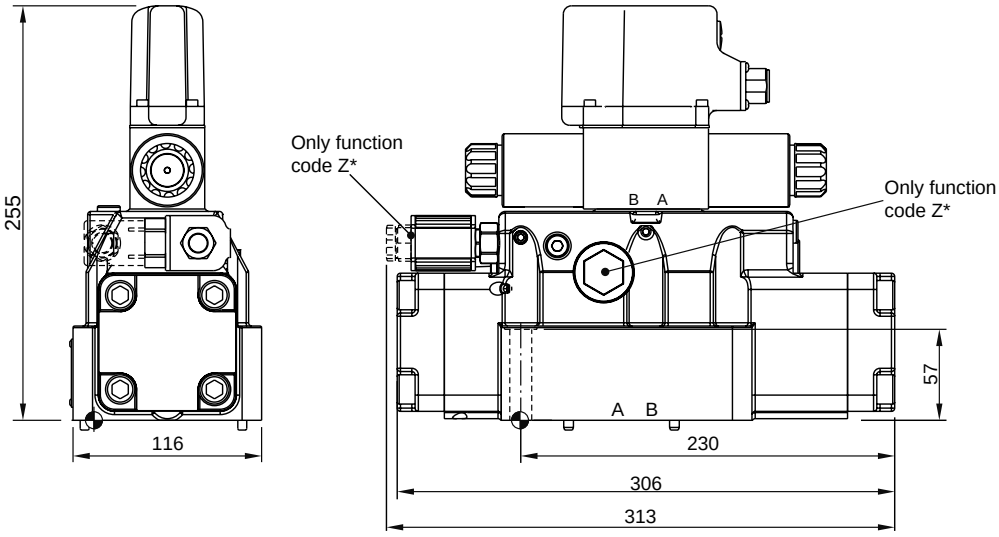
D41FB OBE



Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK320	2x M6x55 4x M10x60 DIN 912 12.9	13.2 Nm ±15% 63 Nm ±15%	NBR: SK-D41FB FPM: SK-D41FB-V

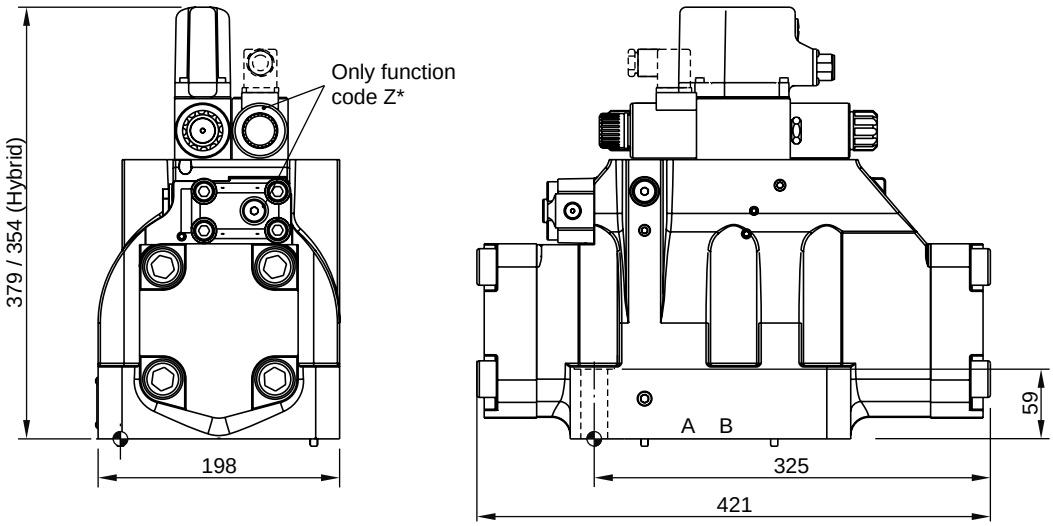
3

D91FB OBE



Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK360	6x M12x75 DIN 912 12.9	108 Nm ±15%	NBR: SK-D91FB FPM: SK-D91FB-V

D111FB OBE



Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK386	6x M20x90 DIN 912 12.9	517 Nm ±15%	NBR: SK-D111FB FPM: SK-D111FB-V

The proportional pressure reducing valves series D1FV are available with and without onboard electronics (OBE).

D1FV OBE

The digital onboard electronics is situated in a robust metal housing, which allows the usage under rough environmental conditions.

The nominal values are factory set. The cable for connection to a serial RS232 interface is available as accessory.

D1FV for external electronics

The parameters can be saved, changed and duplicated in combination with the digital power amplifier PWD00A-400. The value parameters can be edited with the common ProPxD software for both versions.

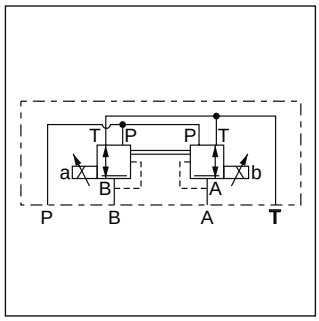
The D1FV values control the pressure in the A- or B-ports using the barometric feedback principle.

Technical Features

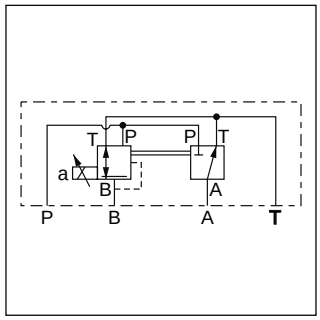
- Barometric feedback
- 3 command options for D1FV OBE: ±10V, 4...20mA, ±20mA
- High repeatability from valve to valve
- Low hysteresis
- Manual override
- Pressure stages 25 bar and 45 bar

D1FV

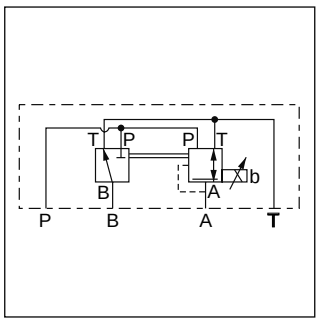
D1FV OBE



Function C

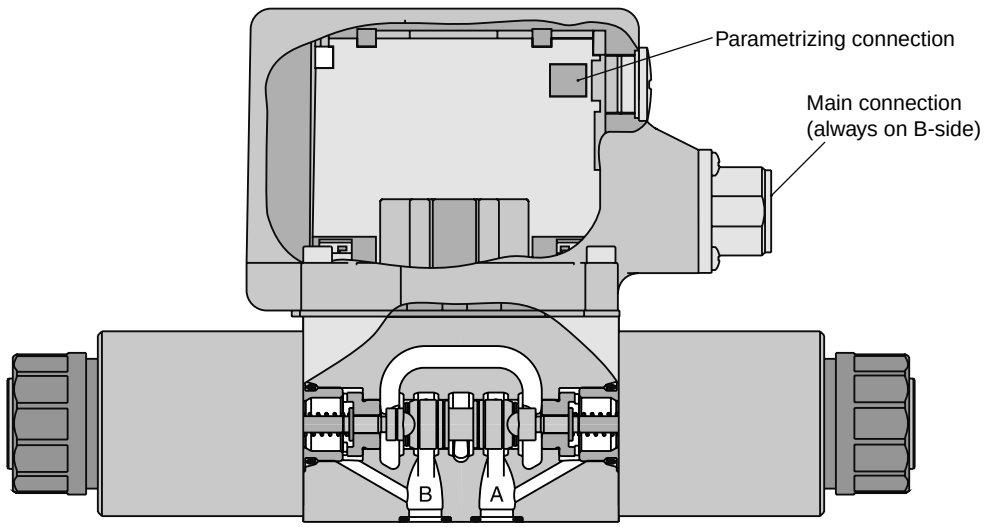


Function E



Function K

D1FV*3 OBE

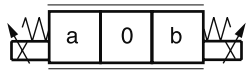
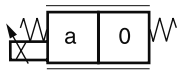
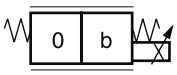


D1FV

D	1	F	V	E02			0		K		3	
Proportional pressure reducing valve	**Size DIN NG06 CETOP 03 NFPA D03**	**Proportional control**		**Spool type**	**Pressure range**	**Control function**		**Seals**	**Solenoid 12V / 2.2A**	**Connector**	**Spool/ body design**	**Design series** (not required for ordering)

Code	Pressure range
C	25 bar
D	45 bar

Code	Connector
W*	Connector as per EN 175301-803
J*	Connector DT04-2P "Deutsch"

Code	Control function
C	
E	
K	

Code	Seals
N	NBR
V	FPM

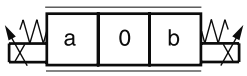
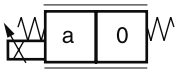
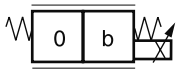
* Please order connector separately.
See chapter 3 accessories.

Bold letters =
Short-term availability

D1FV OBE (with onboard electronics)

D	1	F	V	E02			0				3	
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**Proportional control**		**Spool type**	**Pressure range**	**Control function**		**Seals**	**Input signal**	**Electronic attachment**	**Spool/ body design**	**Design series** (not required for ordering)

Code	Pressure range
C	25 bar
D	45 bar

Code	Control function
C	
E	
K	

Code	Seals
N	NBR
V	FPM

Spool position				
Code	Input signal [1]	Function	Port	Options
F0	**0...+/-10V**	**0...+10V > P-A**	**6 + PE**	**Potentiometer supply**
G0	**0...+/-20mA**	**0...+20mA > P-A**	**6 + PE**	**—**
M0	**0...+/-10V**	**0...+10V > P-B**	**6 + PE**	**Potentiometer supply**
S0	**4...20mA**	**12...20mA > P-A**	**6 + PE**	**—**
W5 [2]	**0...+/-10V** **4...20mA** **0...+/-20mA**	**0...+10V > P-A** **12...20mA > P-A** **0...+20mA > P-A**	**11 + PE**	**Potentiometer supply & command preset channel**

[1] Single solenoid always 0...+10V respectively 4...20mA

[2] Factory set ±10V on delivery

Please order connector separately.
See chapter 3 accessories.

Parametrizing cable OBE → RS232
Item no. 40982923

Bold letters =
Short-term availability

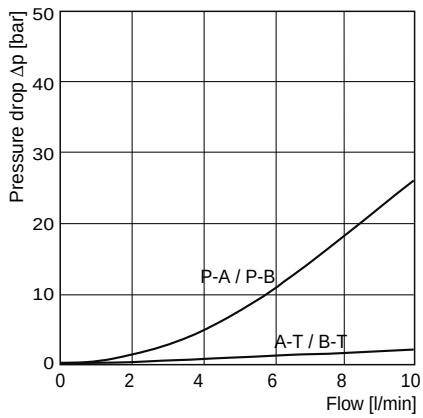
3

General		
Design		Direct operated proportional pressure reducing valve
Actuation		Proportional solenoid
Size		NG06/CETOP 03/NFPA D03
Mounting interface		DIN 24340 / ISO 4401 / CETOP RP121 / NFPA
Mounting position		unrestricted
Ambient temperature	[°C]	-20...+40
$MTTF_D$ value (OBE)	[years]	150 (75)
Weight (OBE)	[kg]	2.2 (2.9)
Vibration resistance	[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27
Hydraulic		
Max. operating pressure	[bar]	Ports P, A, B 350; Port T 185
Max. pressure drop PABT / PBAT	[bar]	350
Fluid		Hydraulic oil as per DIN 51524...535, other on request
Fluid temperature	[°C]	-20...+40
Viscosity permitted recommended	[cSt] / [mm^2/s] [cSt] / [mm^2/s]	20...380 30...80
Filtration		ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)
Max. flow	[l/min]	10
Min. primary pressure	[bar]	30
Static / Dynamic		
Hysteresis	[%]	<4
Temperature drift solenoid current	[%/K]	<0.02
Electrical characteristics		
Duty ratio	[%]	100
Protection class		Standard (as per EN175301-803) IP65 in accordance with EN60529 (with correctly mounted plug-in connector); DT04-2P “Deutsch“ IP69K (with correctly mounted plug-in connector)
Supply voltage	[V]	12
Current consumption	[A]	2.2
Resistance	[Ohm]	4.4
Coil insulation class		F (155 °C)
Solenoid connection		Connector as per EN 175301-803 (code W), DT04-2P “Deutsch“ connector (code J). Solenoid identification as per ISO 9461.
Wiring min.	[mm^2]	3x1.5 (AWG 16) overall braid shield (code W), "Deutsch" connector DP4 2 Pin (code J)
Wiring lenght max.	[m]	50 recommended

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

Electrical characteristics OBE		
Duty ratio	[%]	100
Protection class		IP65 in accordance with EN 60529 (plugged and mounted)
Supply voltage/ripple DC	[V]	18...30, ripple < 5% eff., surge free
Current consumption max.	[A]	2.0
Pre fusing medium lag	[A]	2.5
Input signal		
Codes F0 & W5		
voltage	[V]	+10...0...-10, ripple < 0.01 % eff., surge free, Ri = 100kOhm, 0...+10V ⇒ P -> A
Codes M0		
voltage	[V]	+10...0...-10, ripple < 0.01 % eff., surge free, Ri = 100kOhm, 0...+10V ⇒ P -> B
Codes S0 & W5	[mA]	4...12...20, ripple < 0.01 % eff., surge free, Ri = 200Ohm, 12...20mA ⇒ P -> A
current		< 3.6 mA = enable off, > 3.8 mA = enable on (acc. to NAMUR NE43)
Code G0	[mA]	+20...0...-20, ripple < 0.01 % eff., surge free, Ri = 200Ohm, 0...+20mA ⇒ P -> A
Differential input max.		
Codes F0, G0, M0 & S0	[V]	30 for terminal D and E against PE (terminal G) 11 for terminal D and E against 0V (terminal B)
Code W5	[V]	30 for terminal 4 and 5 against PE (terminal PE) 11 for terminal 4 and 5 against 0V (terminal 2)
Channel recall signal	[V]	0...2.5: off / 5...30: on / Ri = 100 kOhm
Min	[%]	0...50
Adjustment ranges Max	[%]	50...100
Ramp	[s]	0...32.5
Interface		RS 232, parametrizing connection 5pole
EMC		EN 61000-6-2, EN 61000-6-4
Central connection		
Codes F0, G0, M0 & S0		6 + PE acc. to EN 175201-804
Code W5		11 + PE acc. to EN 175201-804
Wiring min.		
Codes F0, G0, M0 & S0	[mm²]	7 x 1.0 (AWG16) overall braid shield
Code W5	[mm²]	11 x 1.0 (AWG16) overall braid shield
Wiring length max.		50

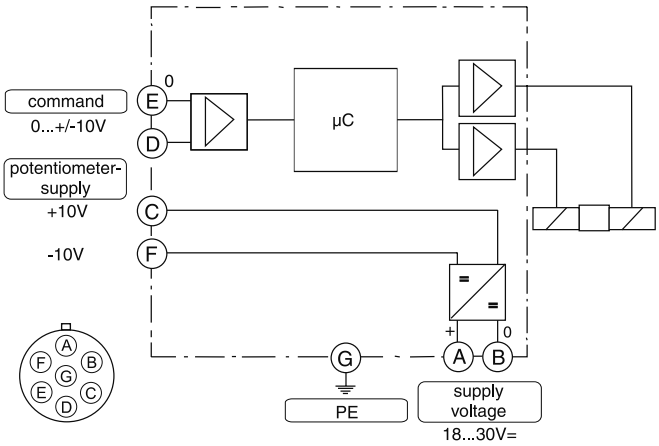
Flow characteristics



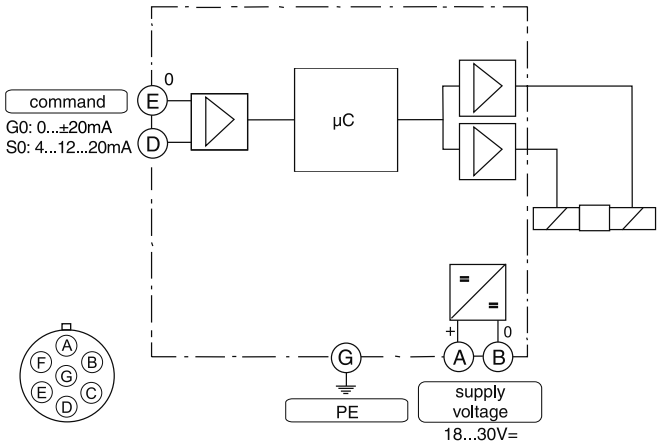
All characteristic curves measured with HLP46 at 50°C.

3

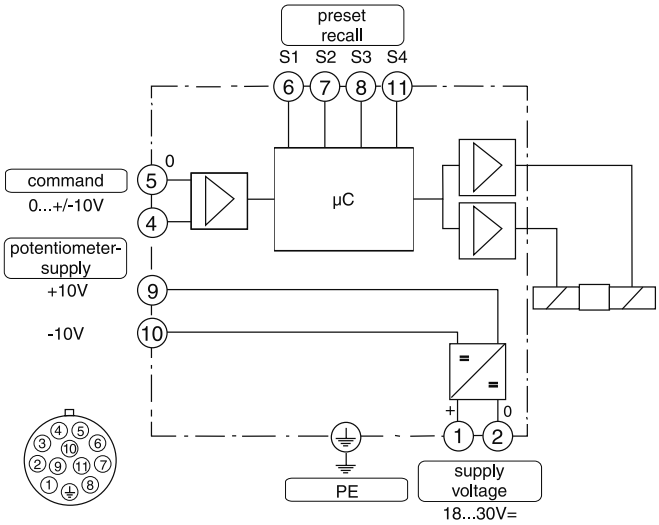
Code F0
6 + PE acc. to EN 175201-804



Code G0, S0
6 + PE acc. to EN 175201-804



Code W5
11 + PE acc. to EN 175201-804

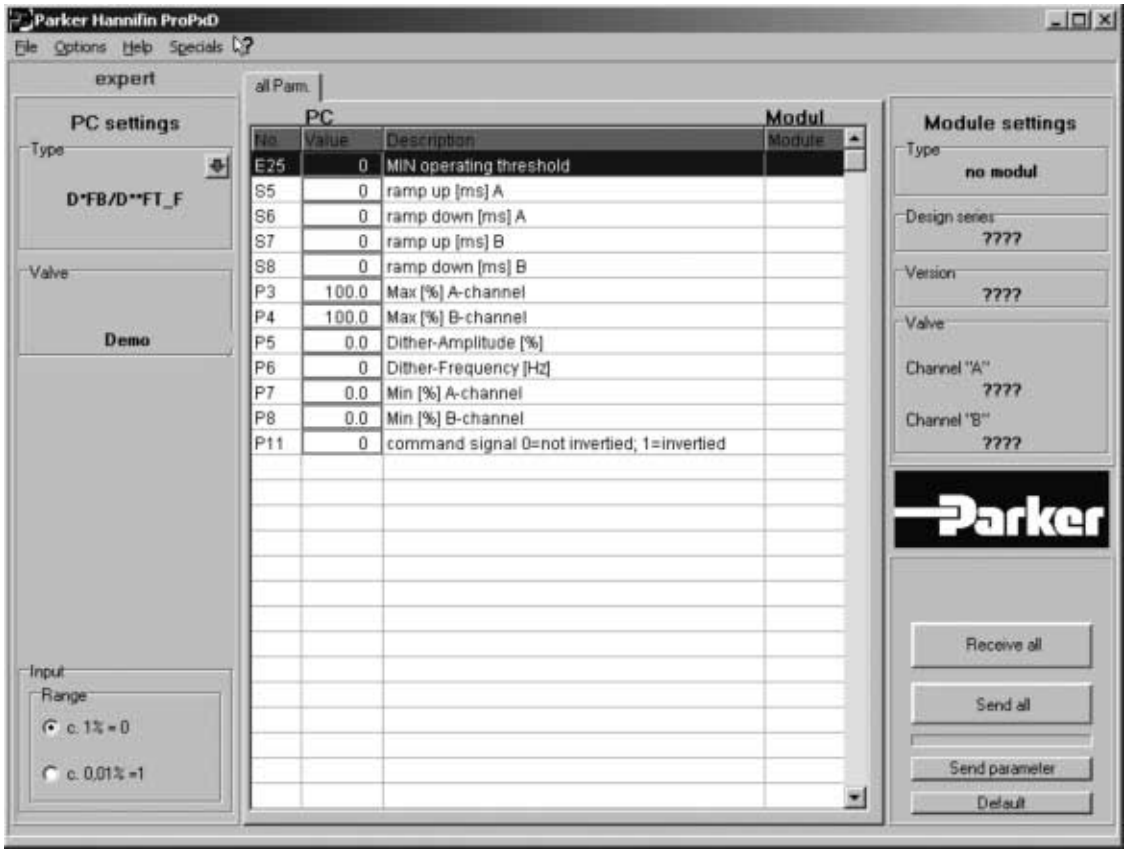


ProPxD interface program

The ProPxD software permits comfortable parameter setting for the module electronics. Via the clearly arranged entry mask the parameters can be noticed and modified. Storage of complete parameter sets is possible as well as printout or record as a text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to other valves. Inside the electronics a non-volatile memory stores the data with the option for recalling or modification.

Features

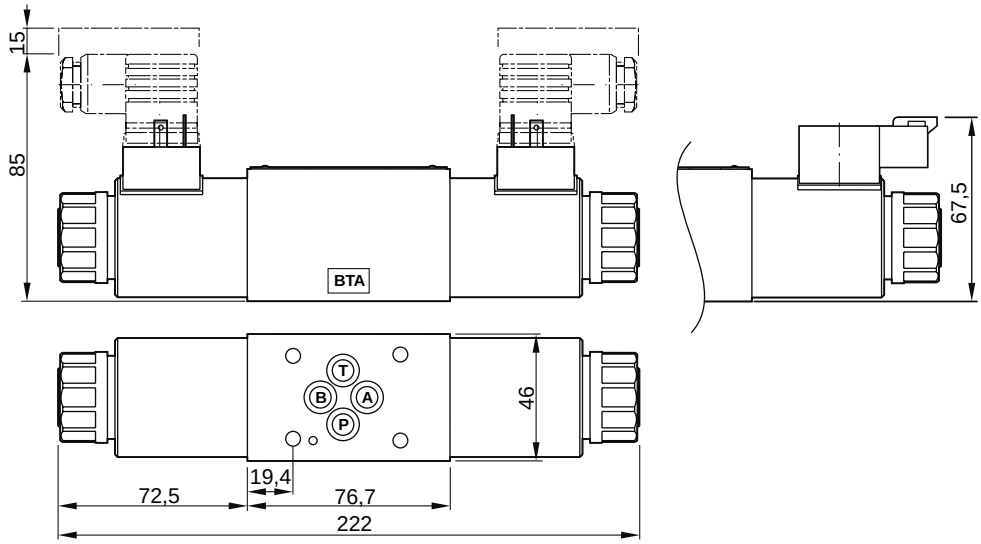
- comfortable editing of all parameters
- depiction and documentation of parameter sets
- storage and loading of optimized parameter adjustments
- executable with all actual Windows ® operating systems from Windows ® 95 upwards
- plain communication between PC and electronics via serial interface RS232C.
- comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"



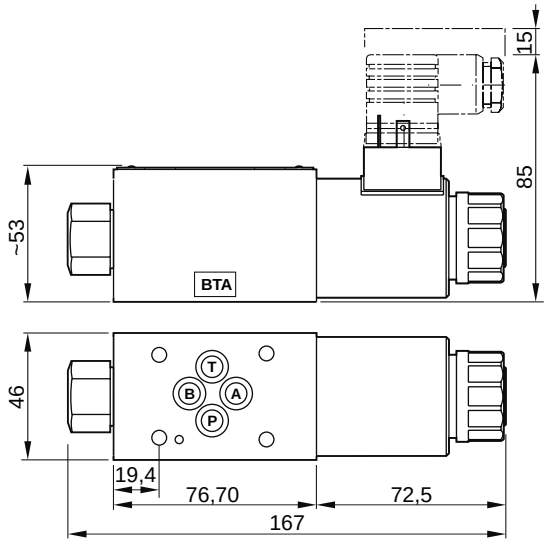
The parametrizing cable may be ordered under item no. 40982923.

3

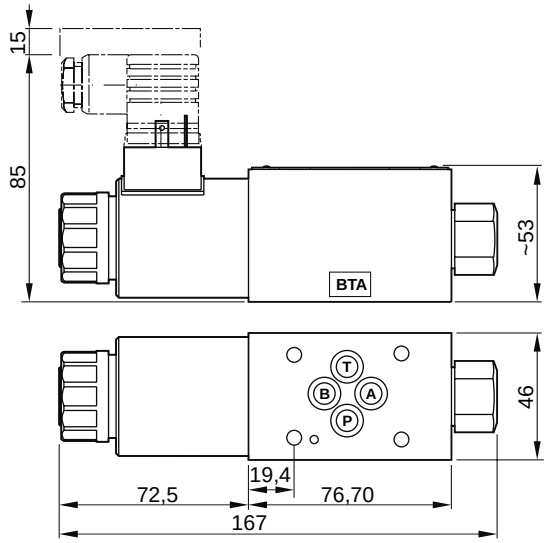
D1FV*C



D1FV*E



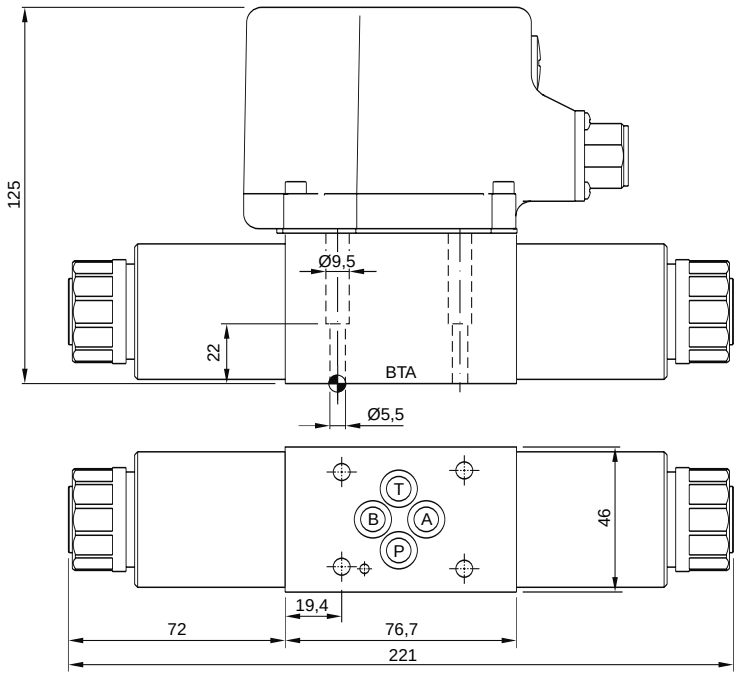
D1FV*K



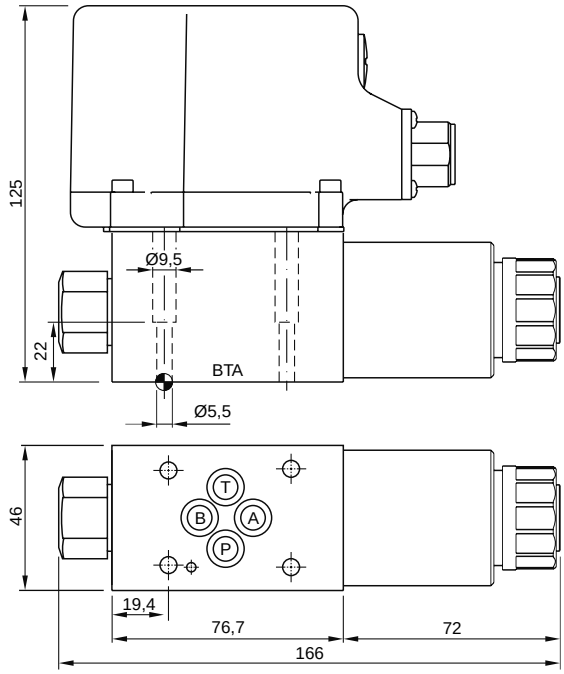
Surface finish	Kit			Kit NBR
R_{max}6.3 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-D1FB-N

D1FV UK.INDD RH 07.09.11

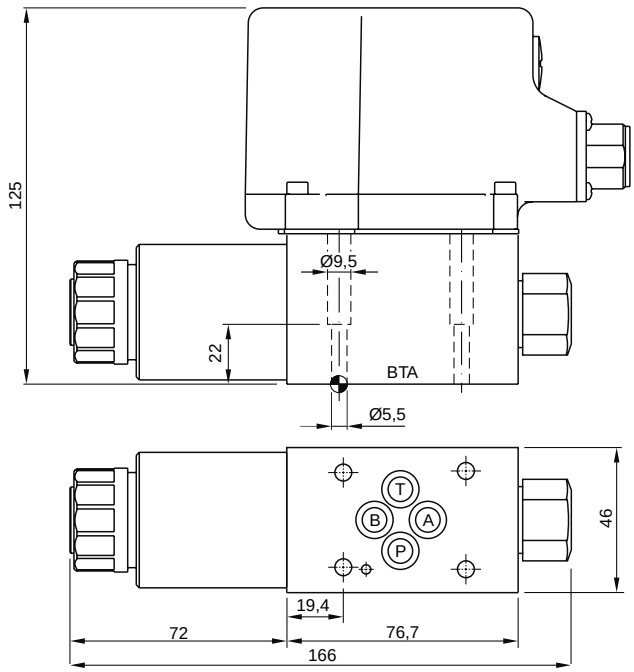
D1FV*C OBE

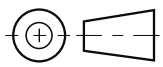


D1FV*E OBE



D1FV*K OBE

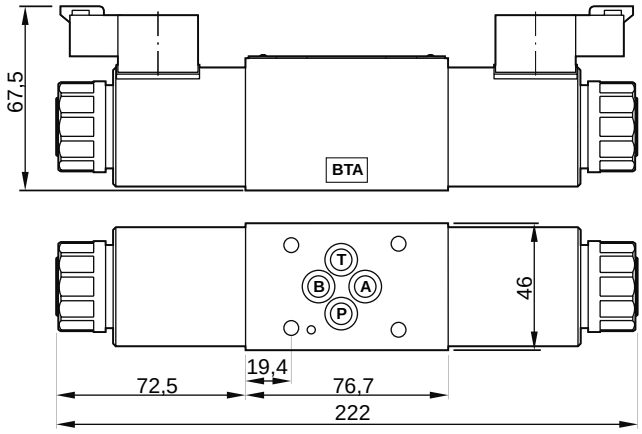




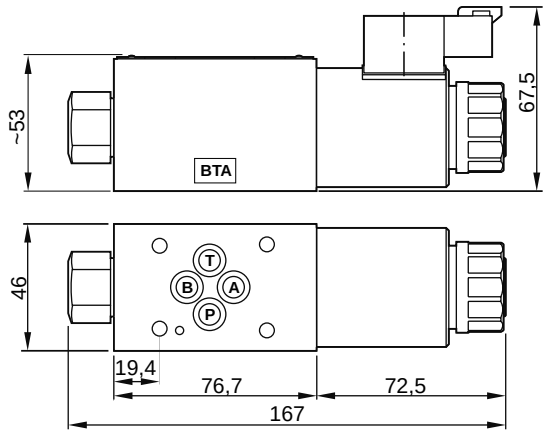
Surface finish	Kit			Kit NBR
R_{max}6.3 ⏥ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-D1FB-N

3

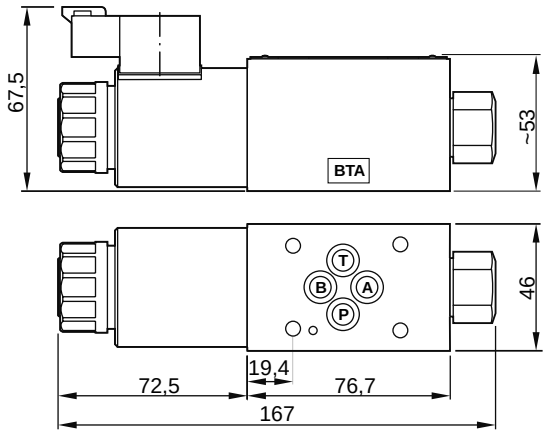
Dimensions with DT04-2P "Deutsch" connector
D1FV*C



D1FV*E



D1FV*K



Surface finish	Kit			Kit NBR
R_{max}6.3 ▱ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-D1FB-N

D1FV UK.INDD RH 07.09.11

The pilot operated proportional DC valves series D*1FH are high-performance valves with electronic spool position feedback. These valves are available in sizes NG10 to NG32 (CETOP05 to CETOP10).

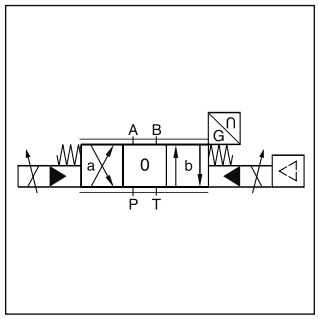
The D*1FH series is available in 5 sizes:

D31FH NG10 (CETOP05)
D41FH NG16 (CETOP07)
D81FP NG25 (CETOP08) for port diam. up to 26 mm
D91FP NG25 (CETOP08) for port diam. up to 32 mm
D111FP NG32 (CETOP10)

Typical applications are:

High precision and reproducible adjustment of flow rates, applications in rapid / creep speed with spool position monitoring for presses and dynamic position and p/Q closed loop systems.

D41FH



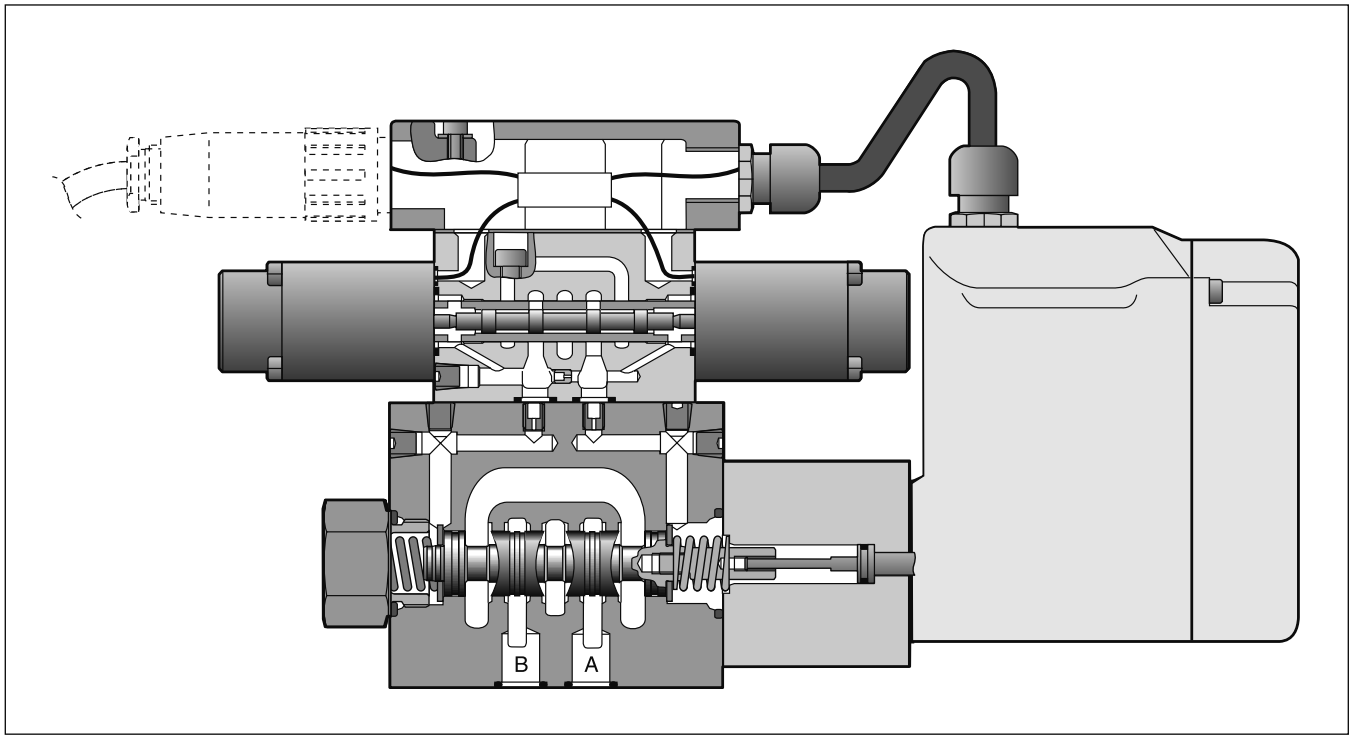
3

Technical features

- Very low hysteresis
- High repeatability
- Spool position feedback
- Center position monitoring optional

CE

D31FH



D		1	F	H				N		0		
Directional control valve	Size	NG06 pilot	Proportional control	High repeatability	Spool type	Flow	Pilot connection	Seal NBR (other seal compound on request)	Command signal	Electronic accessories	Valve accessories	Design series (not required for ordering)

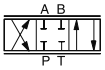
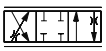
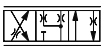
3

Code	Size
3	**NG10 / CETOP05**
4	**NG16 / CETOP07**
8	**NG25 / CETOP08**
9 [1)]	**NG25 / CETOP08**
11	**NG32 / CETOP10**

[1)] with enlarged connections Ø 32 mm

Code	Valve accessories
0	**Standard**
8	**Monitor switch**

Code	Signal	Function
B	**0...±10V standard**	**0...+10V P -> B**
E	**0...±20mA**	**0...+20mA P -> B**
S	**4...20mA**	**12...20mA P -> A**

Code	Spool type
	overlap
E01	
E02	
B31	$Q_B = Q_A/2$ 
B32	$Q_B = Q_A/2$ 

Code	Inlet	Drain
1	**Internal**	**External**
2	**External**	**External**
4	**Internal**	**Internal**
5	**External**	**Internal**

Code	Flow [l/min] at Δp = 5bar per metering edge				
	D31	D41	D81	D91	D111
A	**55**	—	—	—	—
B	**—**	**105**	—	—	—
C	**80**	**140**	—	—	—
E	—	**190**	**250**	**250**	—
F	—	**240**	**310**	**310**	—
H	—	—	**400**	**400**	**500**
L	—	—	—	—	**1000**

Please order connector separately.
See chapter 3 accessories.

Bold letters =
Short-term availability

General					
Design		Pilot operated DC valve with onboard electronics			
Actuation		Proportional solenoid			
Size		**NG10 (CETOP05)**	**NG16 (CETOP07)**	**NG25 (CETOP08)**	**NG32 (CETOP10)**
Mounting interface		DIN 24340 / ISO 4401 / CETOP RP121 / NFPA			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+60			
$MTTF_D$ value	[years]	50			
Weight	[kg]	8.1	11.6	20.7	62
Hydraulic					
Max. operating pressure	[bar]	Ports P, A, B, T, X 350; Port Y 10			
Fluid		Hydraulic oil as per DIN 51524...535, other on request			
Fluid temperature	[°C]	-20...+60			
Viscosity					
permitted	[cSt] / [mm²/s]	20...380			
recommended	[cSt] / [mm²/s]	30...80			
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			
Nominal flow at Δp=5bar per control edge [1]	[l/min]	55/80	105/140/190/240	250/310/400	500/1000
Leakage at 100 bar	[ml/min]	100	200	600	1000
Pilot supply pressure	[bar]	20-350 (optimal dynamics at 50)			
Pilot flow	[l/min]	<1.2			
Pilot flow, step response	[l/min]	2.0	4.1	9.0	18.0
Static / Dynamic					
Step response at 100% step	[ms]	25	45	65	150
Hysteresis	[%]	<0.1			
Sensitivity	[%]	<0.05			
Electrical characteristics					
Duty ratio	[%]	100			
Protection class		IP65 in accordance with EN 60529 (plugged and mounted)			
Supply voltage/ripple	[V]	18 ... 30, ripple <5% eff., surge free			
Current consumption max.	[A]	2.0			
Input signal [2]					
Voltage	[V]	10...0...-10, ripple <0.01% eff., surge free, 0...+10V P—>B			
Impedance	[kOhm]	100			
Current	[mA]	20...0...-20, ripple <0.01% eff., surge free, 0...+20mA P—>B			
Impedance	[Ohm]	500			
Current	[mA]	4...12...20, ripple <0.01% eff., surge free, 12...20mA P—>A			
Impedance	[Ohm]	500			
Differential input max.	[V]	30 for terminal D and E against PE			
Pre-fusing	[A]	2.5 medium lag			
EMC		EN 50081-2 / EN50082-2			
Coil insulation class		F (155 °C)			
Electrical connection		6+PE acc. EN 175201-804			
Wiring min.	[mm²]	7x1.0 (AWG 18) overall braid shield			
Wiring lenght max.	[m]	50			
Electrical monitor switch					
Protection class		IP65 in accordance with EN 60529 (plugged and mounted)			
Ambient temperature	[°C]	0-70			
Supply voltage/ripple	[V]	18...42, ripple <10% eff.			
Current consumption without load	[mA]	<30			
Max. output current per channel, ohmic	[mA]	400			
Min. output load per channel, ohmic	[kOhm]	100			
Max. output drop at 0.2A	[V]	<1.1			
Max. output drop at 0.4A	[V]	<1.6			
EMC		EN 50081-1 / EN50082-2			
Max. tol. ambient field strength	[A/m]	1200			
Min. distance to next AC solenoid	[m]	0.1			
Interface		4+PE acc. IEC 61076-2-101 (M12)			
Wiring min.	[mm²]	4x0.5 (AWG 20) overall braid shield			
Wiring lenght max.	[m]	50			

[1] Flow rate for different Δp per control edge:

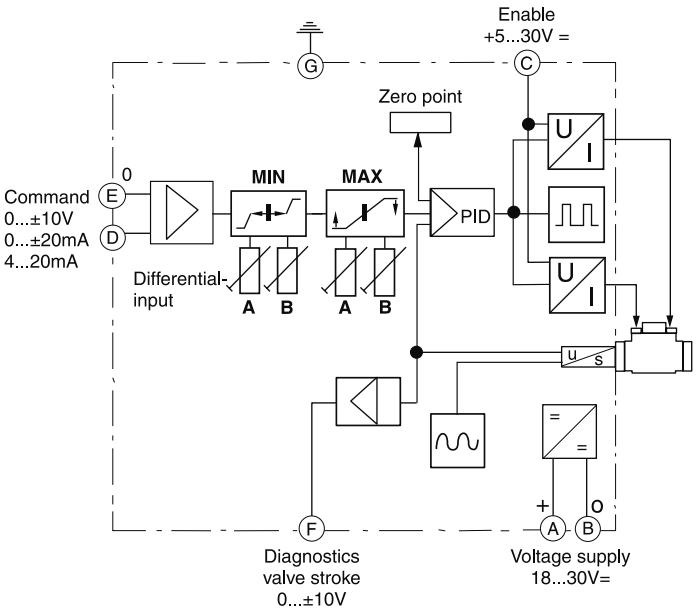
$$Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$$

[2] Inverse polarity on request

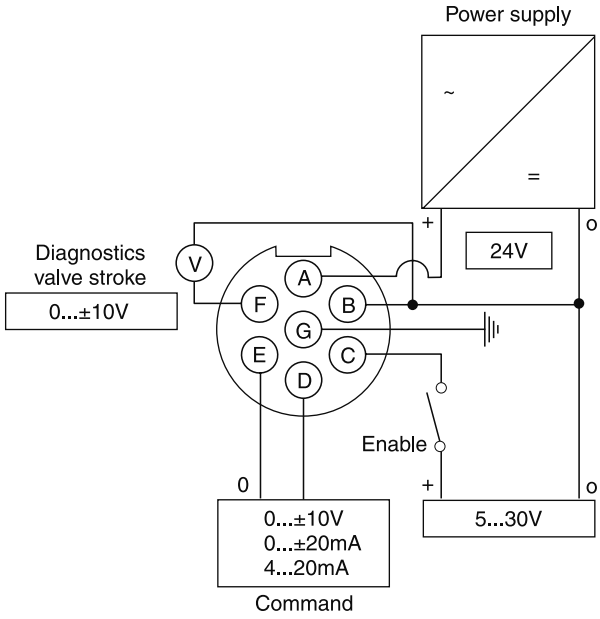
D_1FH UK.INDD RH 07.09.2011

3

Control system flow chart, valve electronics



Wiring



Enable input

The power stage is activated via pin C (enable input).

Supply voltage monitoring

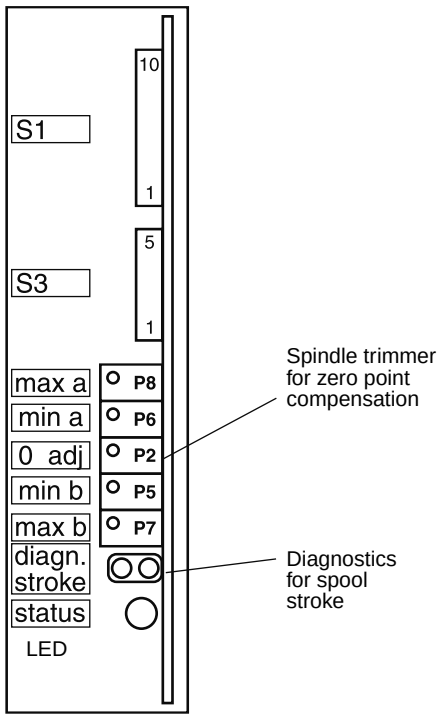
If the minimal supply voltage drops below, it is internally monitored and displayed via the status LED.

Control monitoring

A control error is indicated if there is an error in the control circuit of the valve.

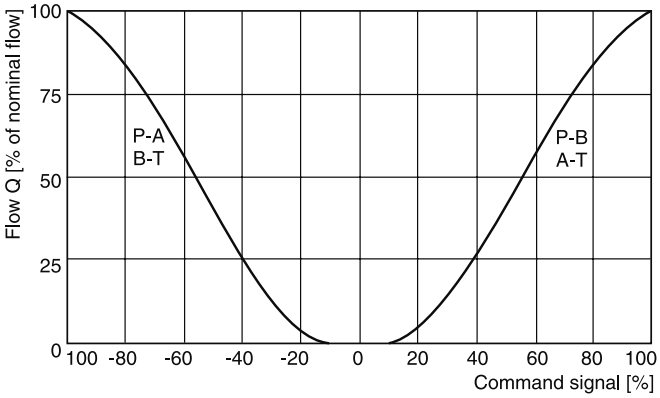
Display is green	Normal operation
Display off	Supply voltage is outside the permissible range of 18 ... 30V
Display is red	Control error

Arrangement of the potentiometers

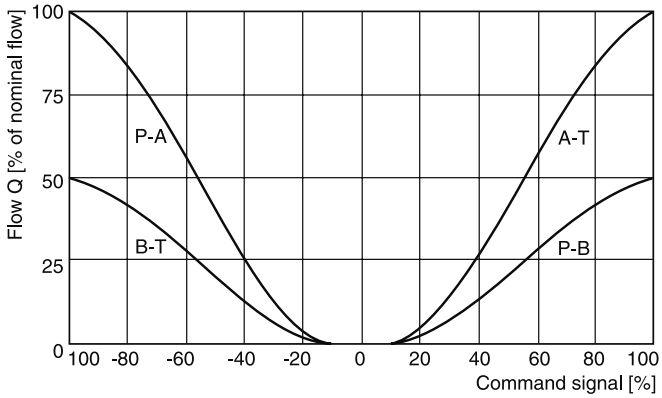


Flow characteristics
at Δp = 5bar per metering edge

Spool types **E01, E02**

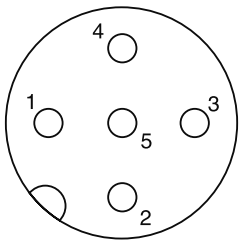


Spool types **B31, B32**

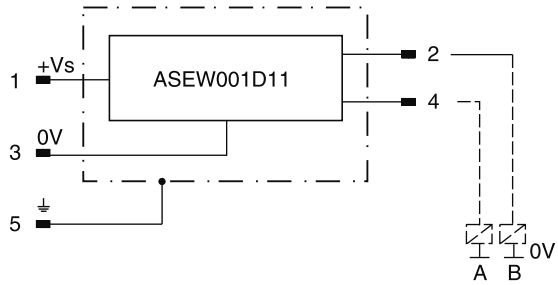


All characteristic curves measured with HLP46 at 50°C.

Monitor switch M12x1 pin assignment



1 + Supply 18...42V
2 output B (normally closed)
3 0V
4 output A (normally closed)
5 Earth ground



Signal	Output A (pin 4)	Output B (pin 2)
neutral	closed	closed
	open	closed
	closed	open

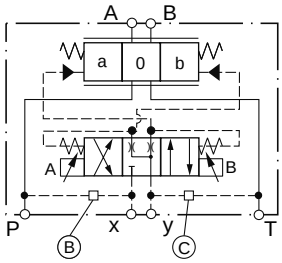
The neutral position is monitored. The signal changes after less than 10% of the spool stroke.

3

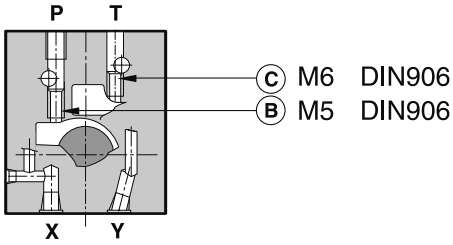
Pilot oil inlet (supply) and outlet (drain)

○ open, ● closed

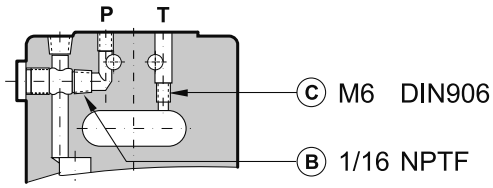
Pilot oil Inlet	Pilot oil Drain	B	C
internal	external	○	●
external	external	●	●
internal	internal	○	○
external	internal	●	○



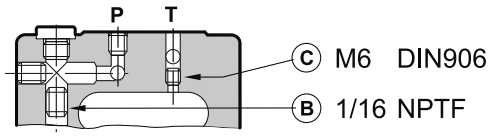
D31FH



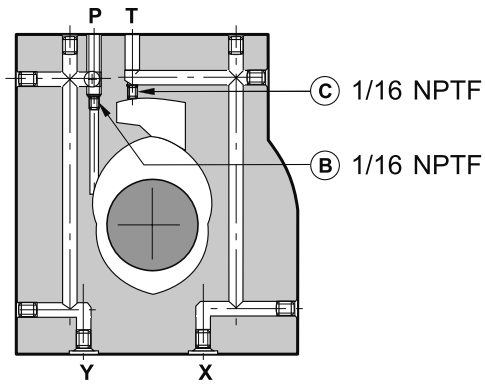
D41FH



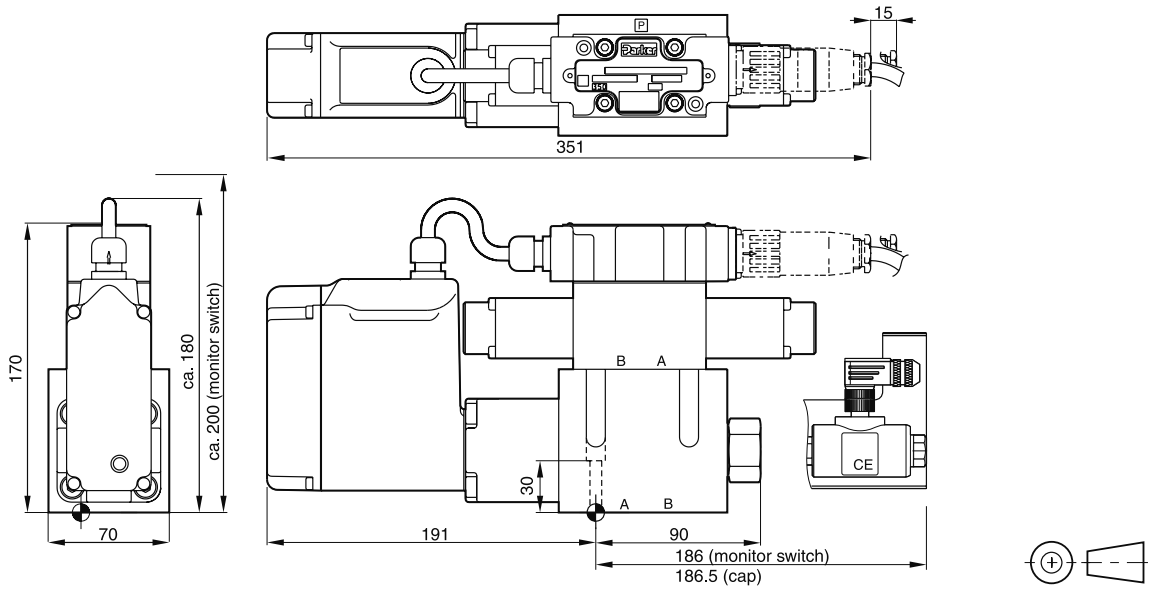
D81/91FH



D111FH

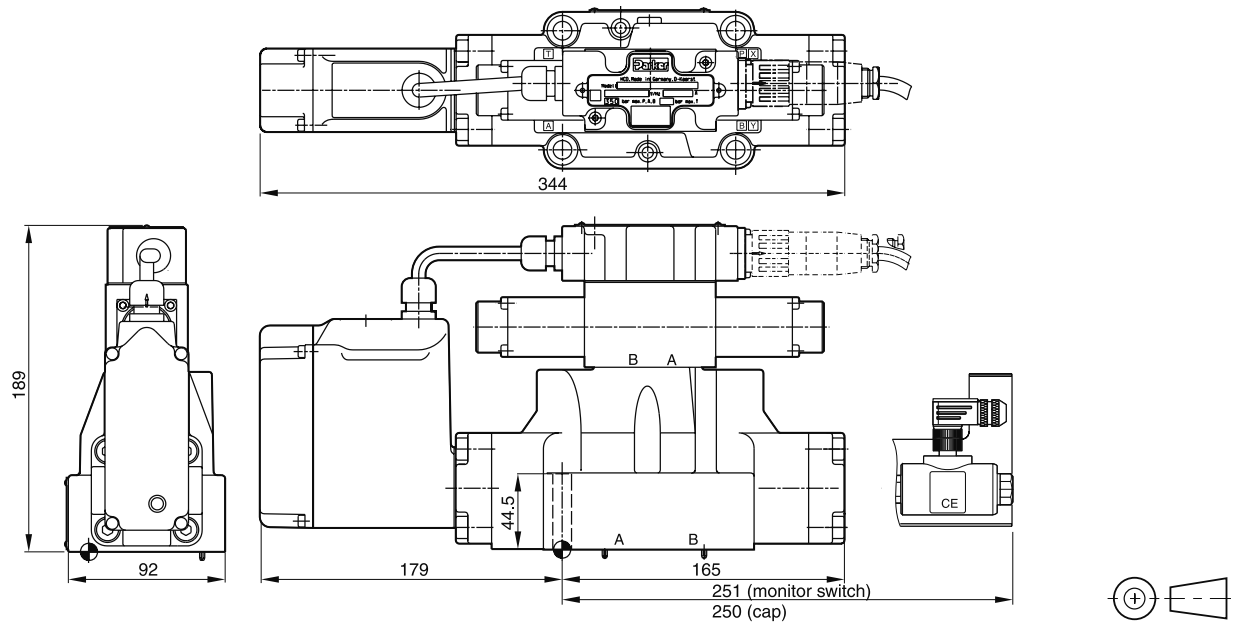


D31FH



Surface finish	Kit			Kit NBR
$R_{max}6.3$ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	SK-D31FHN

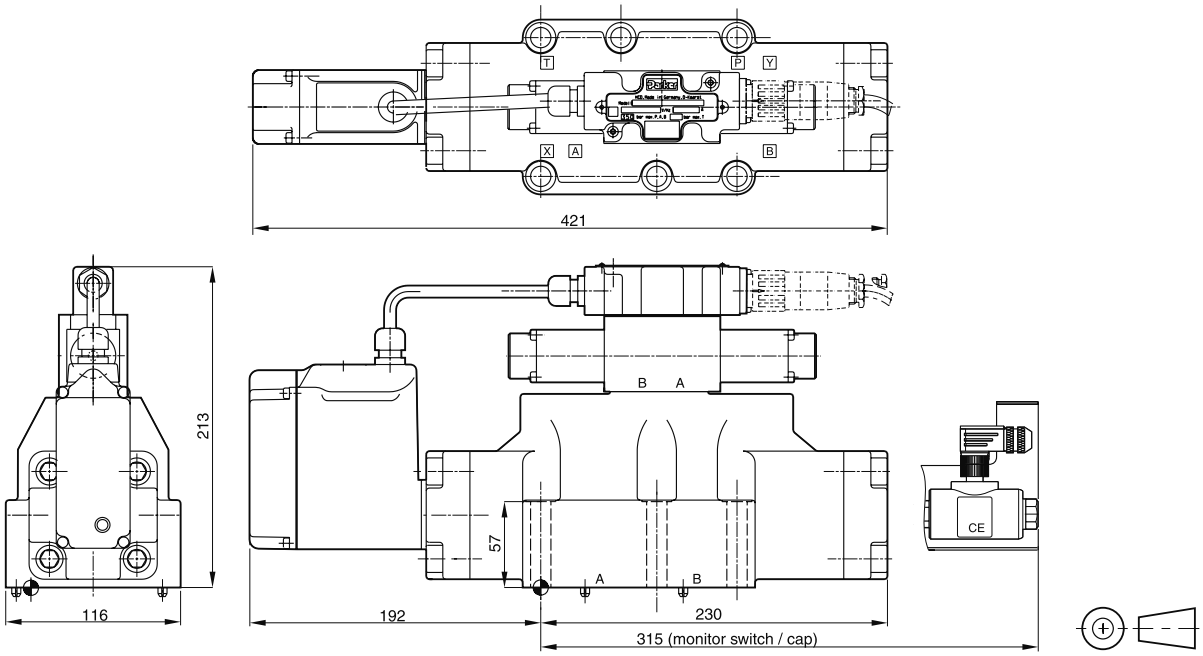
D41FH



Surface finish	Kit			Kit NBR
$R_{max}6.3$ 0.01/100	BK320	2x M6x55 4x M10x60 DIN 912 12.9	13.2 Nm ±15% 63 Nm ±15%	SK-D41FHN

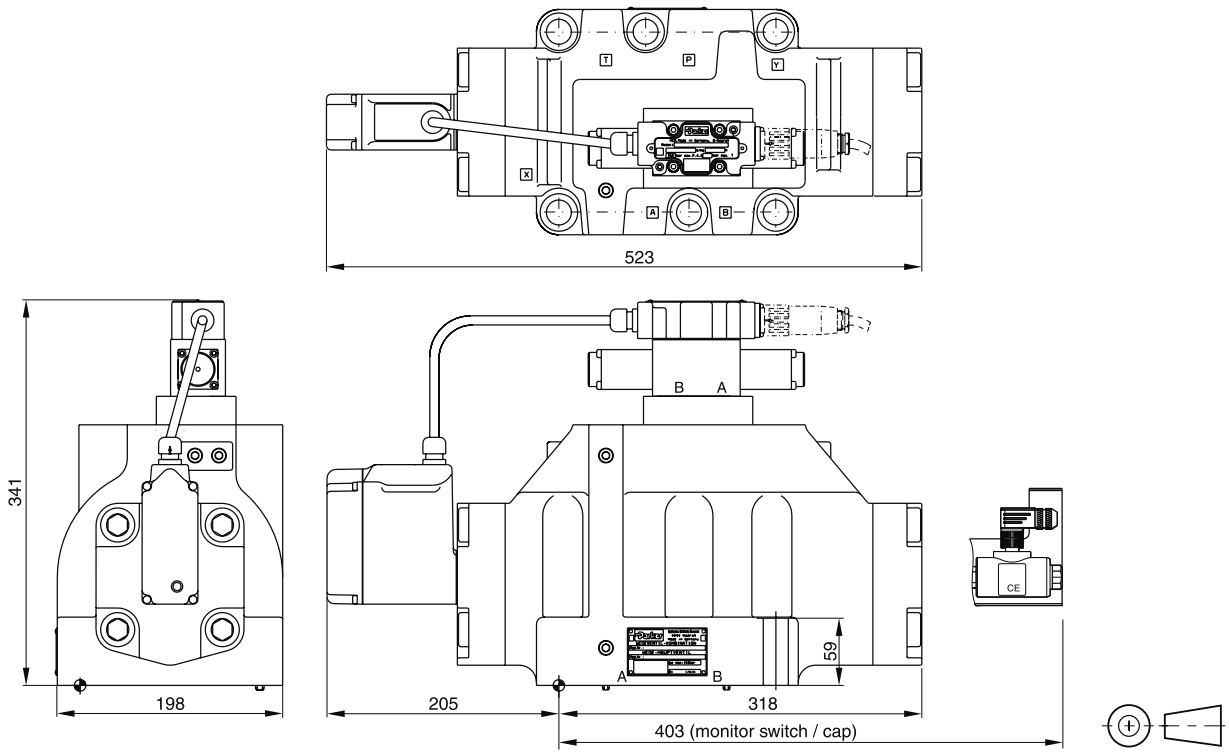
3

D81/91FH



Surface finish	Kit			Kit NBR
R_{max}6.3 ▽ 0.01/100	BK360	6x M12x75 DIN 912 12.9	108 Nm ±15%	SK-D91FHN

D111FH



Surface finish	Kit			Kit NBR
R_{max}6.3 ▽ 0.01/100	BK386	6x M20x90 DIN 912 12.9	517 Nm ±15%	SK-D111FHN

D_1FH UK.INDD RH 07.09.2011

The new series of pilot operated proportional valves D*1FE is designed for high precision applications that require a safe middle position of the main spool at power down.

The pilot is a 3-position valve with an overlapped middle position. This ensures that the main stage spring pushes the spool into the middle position at power down without an unintended jerk of the actuator.

The D*1FE series is available in 5 sizes:

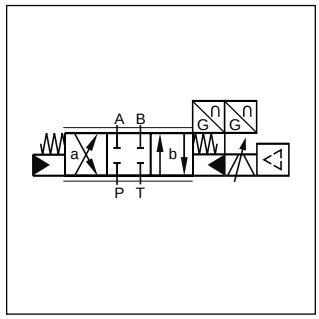
D31FE NG10 (CETOP05)
D41FE NG16 (CETOP07)
D81FE NG25 (CETOP08) for port diam. up to 26 mm
D91FE NG25 (CETOP08) for port diam. up to 32 mm
D111FE NG32 (CETOP10)

The innovative integrated regenerative function in the A-line (optional) allows new energy saving circuits with differential cylinders. The hybrid version can switch between regenerative mode and standard mode at any time.

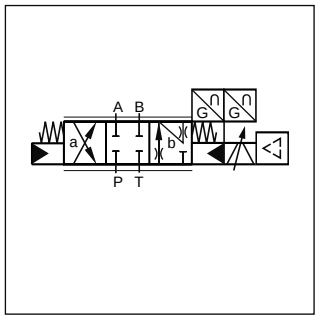
Technical features

- High dynamics
- High flow
- Defined spool positioning at power-down
- Onboard electronics
- **NEW:** Energy saving A-regeneration optionally integrated
- **NEW:** Switchable hybrid version

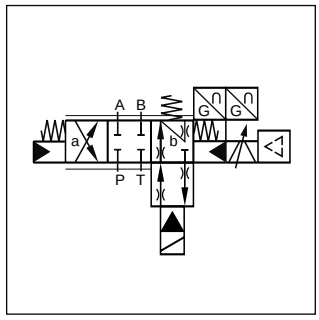
D41FE Standard



Standard D*1FE



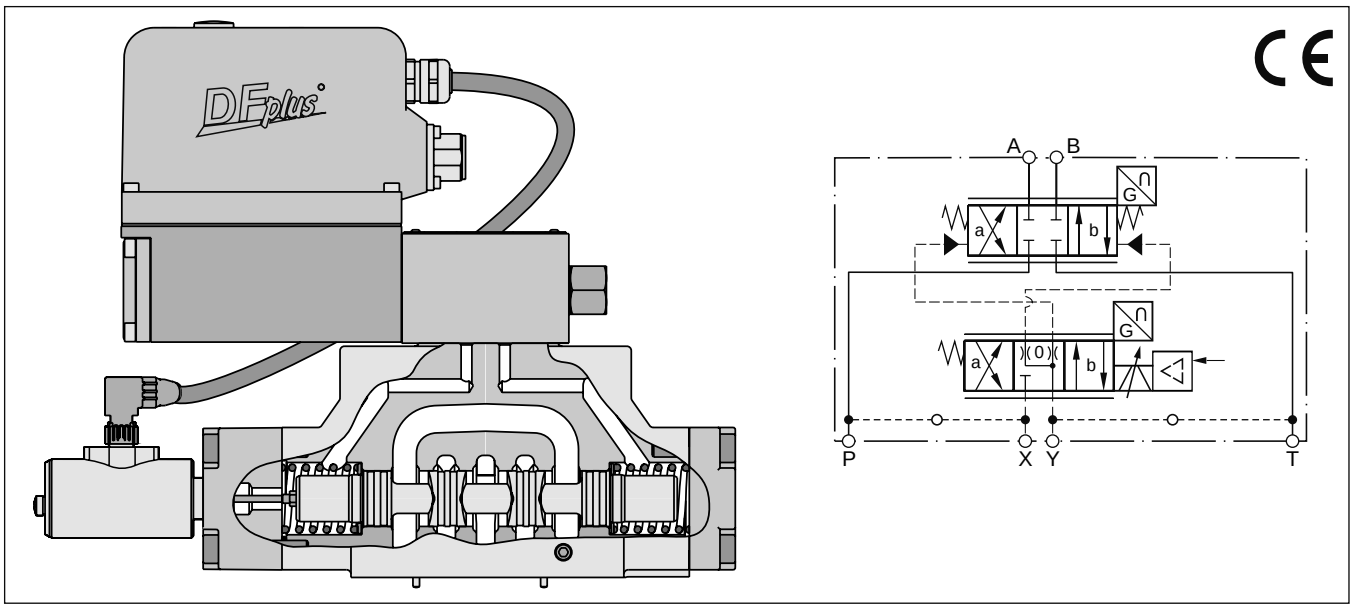
NEW: A-regeneration D*1FER



NEW: Hybrid D*1FEZ

Further literature about the opportunities of energy savings and more functional details of the integrated regeneration is available on request.

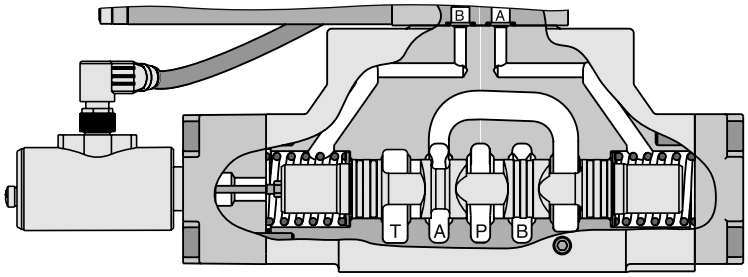
D41FEE52 (Standard)

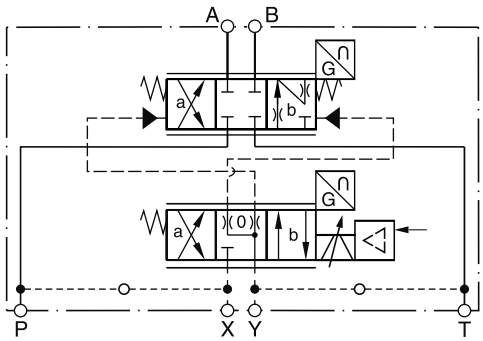


3

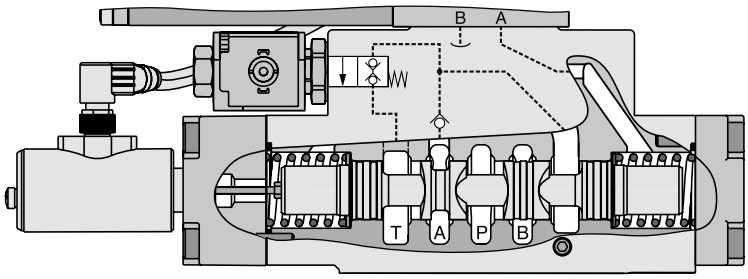
D*1FER and D*1FEZ

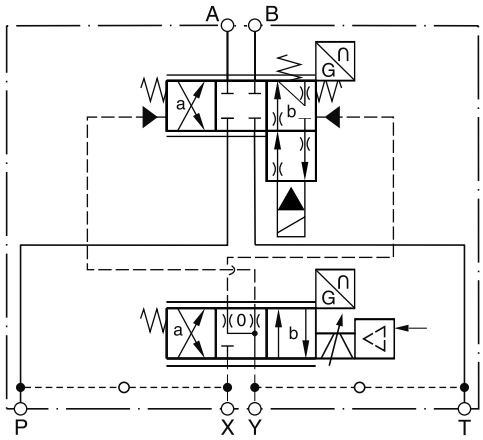
Regenerative valve D*1FER



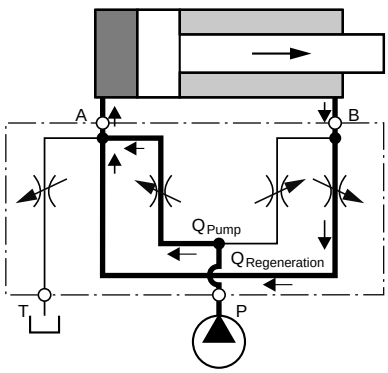


Hybrid valve D*1FEZ

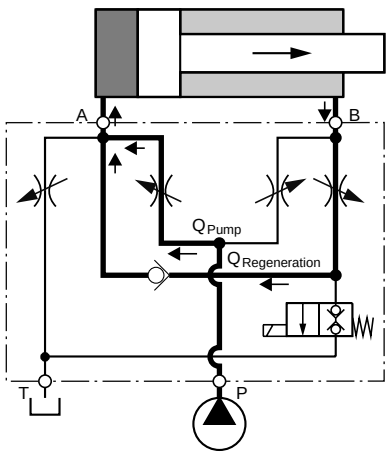




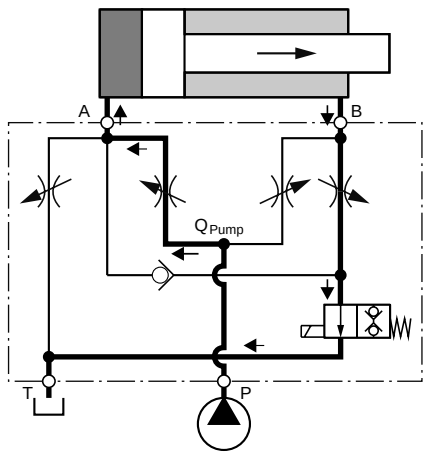
D*1FER (regenerative valve)
Cylinder extending



D*1FEZ (hybrid valve)
Cylinder extending
in regenerative mode (high speed)



Cylinder extending
in standard mode (high force)



Flow rate in % of nominal flow

Size [1]	Spool	Port					
		A-T	P-A	P-B	B-A (R-Valve)	B-A (Hybrid)	B-T (Hybrid)
D41FER/Z	31/32	100%	50%	100%	50%	40%	20%
D91FER/Z	31/32	100%	50%	100%	50%	50%	25%
D111FER/Z	31/32	on request					

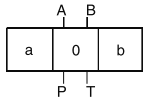
[1] D31FE: For size NG10 please refer solution with sandwich- and adaptor plates "H10-1666L / H10-1662 / A10-1664 / A10-1665L" in chapter 12.

D_1FE UK.INDD RH 01.09.2011

D		1	F	E			C							
Directional control valve	**Size**	**NG06 pilot**	**Proportional control**	**High response**	**Function**	**Flow**	**Spool position on power down**	**Pilot connections**	**Seals**	**Command signal**	**Valve options**	**Hybrid option**	**Design series** (not required for ordering)	

Code	Size
3	NG10 / CETOP05
4	NG16 / CETOP07
8	NG25 / CETOP08
9 [1]	NG25 / CETOP08
11	NG32 / CETOP10

[1] for enlarged connections Ø 32 mm

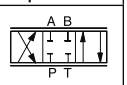
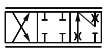
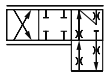
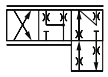
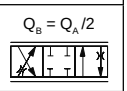
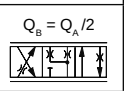


Code	Hybrid option
0	Standard for spool code B, E, R
L [5]	Hybrid valve 24V normaly closed for spool code Z

[5] see page "Regenerative and hybrid function" (not for D31FE)

Code	Valve options
0	6+PE acc. EN175201-804
5	11+PE acc. EN175201-804
7	6+PE + Enable

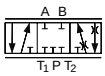
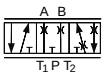
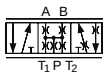
Code	Signal	Function
B	0...±10V	0...+10V P -> B
E	0...±20mA	0...+20mA P -> B
K	0...±10V	0...+10V P -> A
S	4...20mA	12...20mA P -> A

Standard		**NEW:** regenerative function [2] [3]		**NEW:** hybrid function [3] [4]	
Code	Spool type	Code	Spool type	Code	Spool type
overlap 10%		overlap 10%		overlap 10%	
E01		R31		Z31	
E02		R32		Z32	
B31	$Q_B = Q_A/2$ 				
B32	$Q_B = Q_A/2$ 				

Code	Flow [l/min] at Δp = 5bar per metering edge				
	D31	D41	D81	D91	D111
D	90	—	—	—	—
E	120	—	—	—	—
F	—	200	—	—	—
H	—	—	400	450	—
L	—	—	—	—	1000

[2] not for size code 8.

[3] for regenerative and hybrid function at code 3 (NG10) please refer to solutions with sandwich and adaptor plates "H10-1666L / H10-1662 / A10-1664 / A10-1665L" in chapter 12.

D31FE spooltype: R31  R32  R61 

[4] nor for D31FE and D81FE

Code	Seals
N	NBR
V	FPM
H	for HFC fluid

Code	Inlet	Drain
1	internal	external
2	external	external
4	internal	internal
5	external	internal

Please order connector separately.
See chapter 3 accessories.

D_1FE UK.INDD RH 01.09.2011

3

General						
Design			Proportional directional control valve, pilot operated			
Actuation			VCD®-actuator			
Size			**NG10 (CETOP 05)**	**NG16 (CETOP 07)**	**NG25 (CETOP 08)**	**NG32 (CETOP 10)**
			D31	**D41**	**D81 / D91**	**D111**
Mounting Interface			DIN 24340 / ISO 4401 / CETOP RP121 / NFPA			
Mounting position			unrestricted			
Ambient temperature		[°C]	-20...+60			
$MTTF_D$ value		[years]	50			
Weight		[kg]	11.3	14.2	23.5	64.5
Vibration resistance		[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27			
Hydraulic						
Max. operating pressure		[bar]	Internal Pilot Drain P, A, B, X 350; T, Y 35 External Pilot Drain P, A, B, T, X 350; Y 35			
Fluid			Hydraulic oil acc. DIN 51524...535, other on request			
Fluid temperature		[°C]	-20...+60			
Viscosity	permitted	[cSt] / [mm2/s]	20...380			
	recommended	[cSt] / [mm2/s]	30...80			
Filtration			ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)			
Nominal flow at Δp = 5 bar per control edge [1]		[l/min]	120	200	400/450	1000
Max. recommended Flow (Standard)		[l/min]	250	600	1000	3000
Regenerative B-A / B-T			depending on application, see flow curves			
Leakage at 100 bar		[ml/min]	200	200	600	1000
Pilot		[ml/min]	< 100			
Pilot supply pressure		[bar]	20...350			
Pilot flow, during step response at 210 bar		[l/min]	9	10	18	30
Static / Dynamic						
Step response at 100% stroke [2]		[ms]	13	19	24	60
Frequency response						
Amplitude ±5 % at 210 bar		[Hz]	180	80	65	38
Phase ±5 % at 210 bar		[Hz]	130	100	75	64
Hysteresis		[%]	< 0.1			
Sensitivity		[%]	< 0.05			
Temperature drift of Center Position		[%/K]	< 0.025			
Electrical						
Duty ratio		[%]	100			
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
Supply voltage / ripple		[V]	22...30, ripple < 5% eff., surge free			
Current consumption max.		[A]	3.5			
Pre-fusing		[A]	4.0 A medium lag			
Input signal	Code K (B)	voltage [V]	+10...0...-10, ripple < 0.01 % eff., surge free, 0...+10V P–>A (P–>B)			
		Impedance [kOhm]	100			
	Code E	voltage [mA]	+20...0...-20, ripple < 0.01 % eff., surge free, 0...+20mA P–>B			
		Impedance [Ohm]	250			
	Code S	current [mA]	4...12...20, ripple < 0.01 % eff., surge free, 12...20 mA P–>A			
		Impedance [Ohm]	250			
			< 3.6 mA = enable off, > 3.8 mA = enable on acc. NAMUR NE43			
Input Capacitance typ.		[nF]	1			
Differential input max.	Code 0	[V]	30 for terminal D and E against PE (terminal G) 11 for terminal D and E against 0V (terminal B)			
	Code 5	[V]	30 for terminal 4 and 5 against PE (terminal ⏚) 11 for terminal 4 and 5 against 0V (terminal 2)			
	Code 7	[V]	30 for terminal D and E against PE (terminal G)			
Enable signal	Code 5/7	[V]	5...30, Ri = 9 kOhm			
Diagnostic signal		[V]	+10...0...-10 / +Ub, rated max. 5 mA			
EMC			EN 61000-6-2, EN 61000-6-4			
Electrical connection	Code 0/7		6 + PE acc. EN 175201-804			
	Code 5		11 + PE acc. EN 175201-804			
Wiring min.	Code 0/7		7 x 1.0 AWG16 overall braid shield			
	Code 5		8 x 1.0 AWG16 overall braid shield			
Wiring lenght max.		[m]	50			

[1] Flow rate for different Δp per control edge: $Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$

[2] Measured with load (210 bar pressure drop/two control edges)

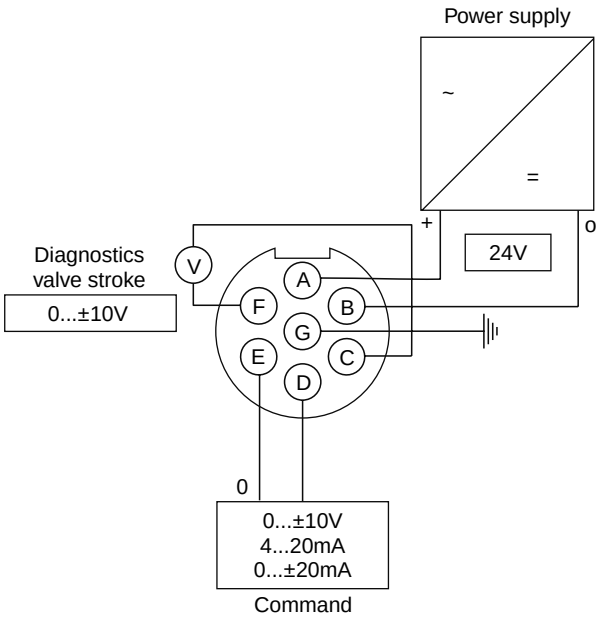
Electrical characterisrics hybrid option

Duty ratio		100%		
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
		D41	D91	D111
Supply voltage	[V]	24	24	24
Tolernace supply voltage	[%]	±10	±10	±10
Current consumption	[A]	1.21	0.96	1.29
Power consumption	[W]	29	23	31
Solenoid connection		Connector as per EN 175301-803		
Wiring min.	[mm²]	3 x 1.5 recommended		
Wiring length max.	[m]	50 recommended		

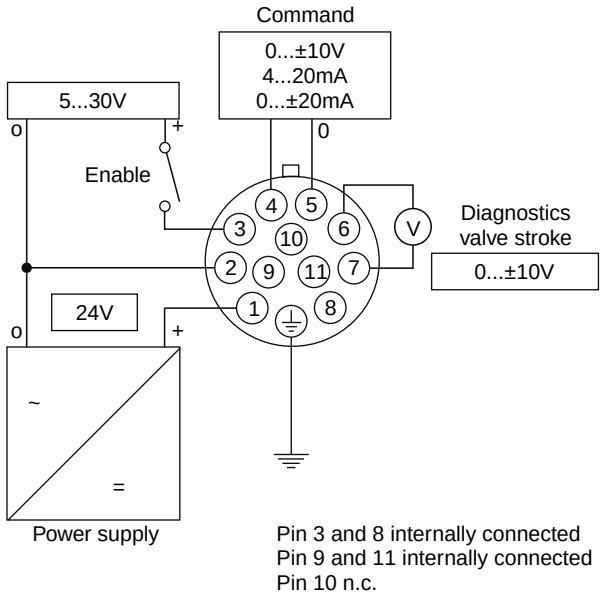
With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

Wiring

Code 0, 6 + PE acc. EN 175201-804

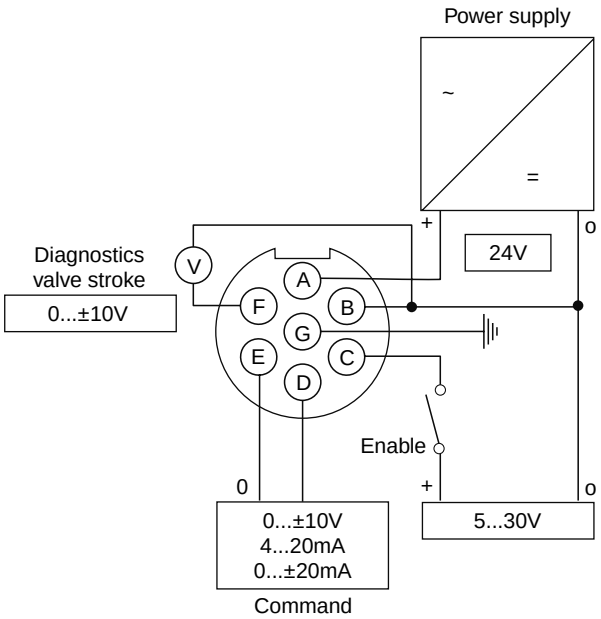


Code 5, 11 + PE acc. EN 175201-804



Pin 3 and 8 internally connected
Pin 9 and 11 internally connected
Pin 10 n.c.

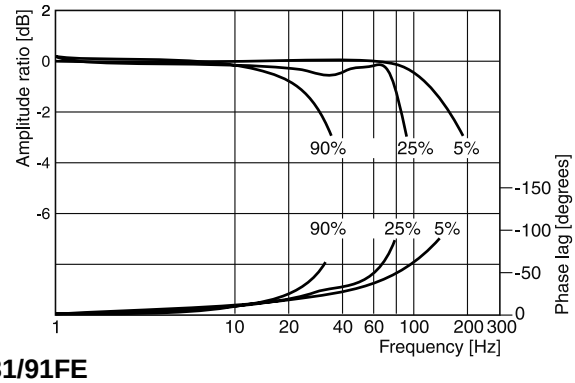
Code 7, 6 + PE acc. EN 175201-804 + enable



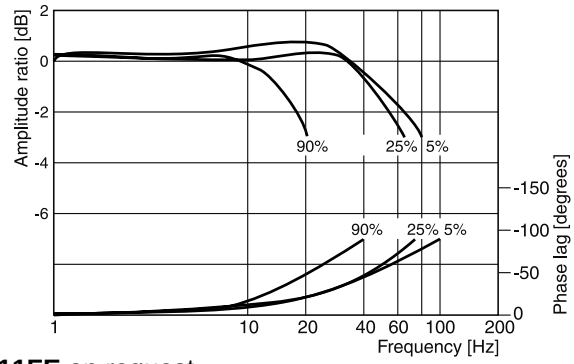
3

Frequency response
±5% / ±25% / ±90% command signal
Dynamics at 210 bar pilot supply pressure

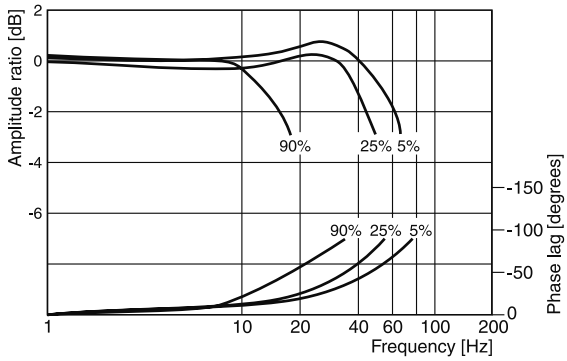
D31FE



D41FE



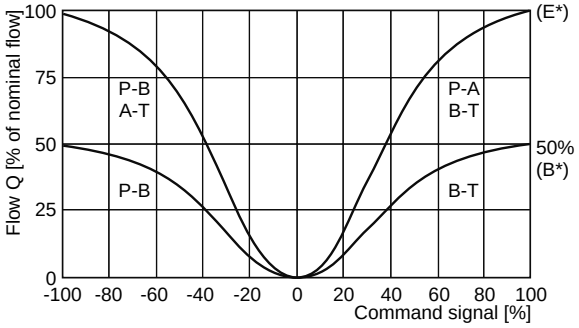
D81/91FE



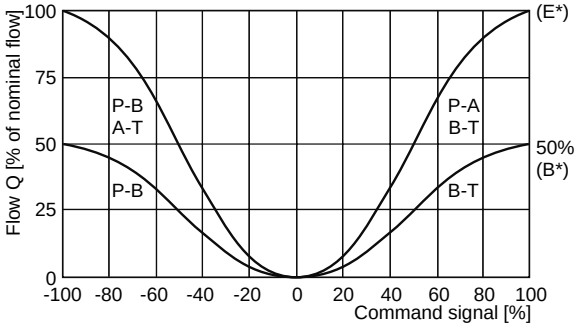
D111FE on request

D*1FEB/E flow curves
at Δp = 5 bar per metering edge

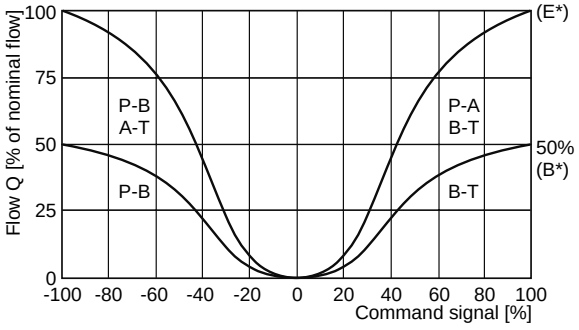
D31FE
spool type E01/02, B31/32



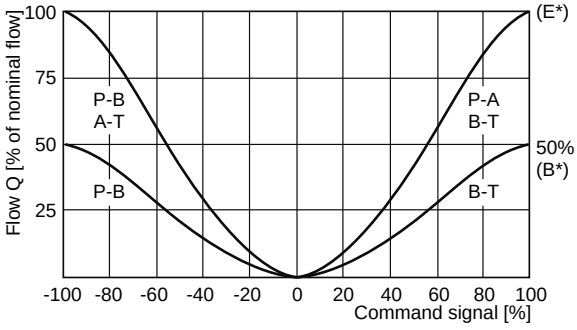
D41FE
spool type E01/02, B31/32



D81/91FE
Spool type E01/02, B31/32



D111FE
Spool type E01/02, B31/32



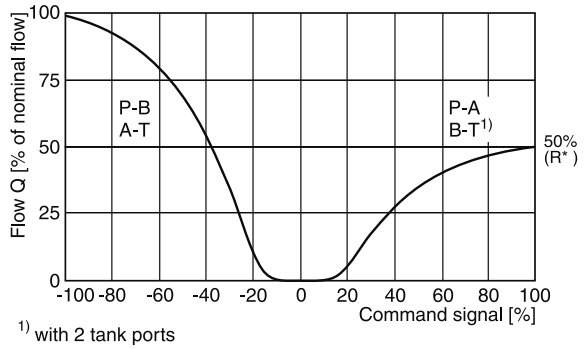
All characteristic curves measured with HLP46 at 50°C.

D*1FER/Z flow curves

at Δp = 5 bar per metering edge

D31FE

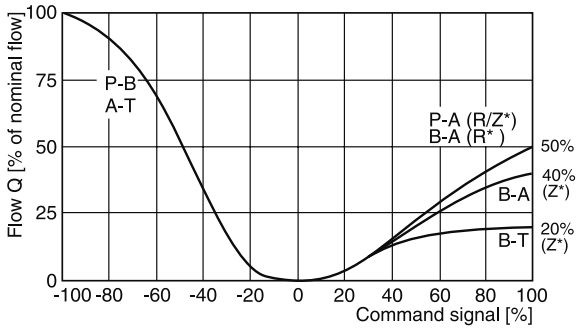
spool type R31/32



1) with 2 tank ports

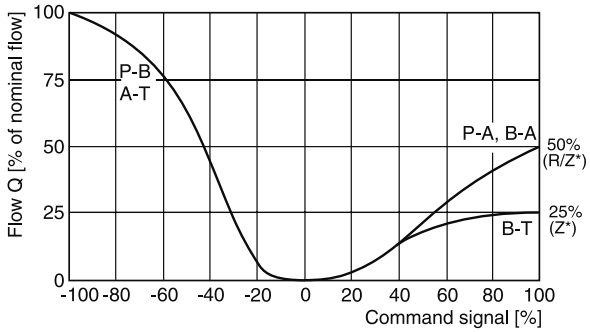
D41FE

spool type R/Z31/32



D91FE

Spool type R/Z31/32



D111FE

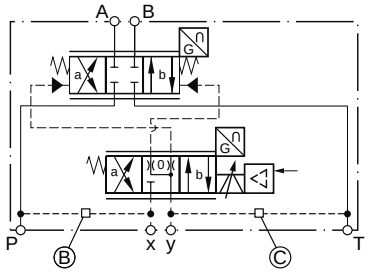
Spool type R/Z* on request

All characteristic curves measured with HLP46 at 50°C.

Pilot oil inlet (supply) and outlet (drain)

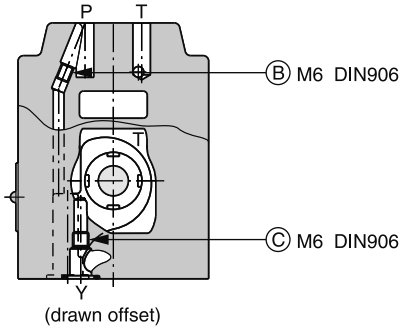
○ **open,** ● **closed**

Pilot oil Inlet	Pilot oil Drain	B	C
internal	external	○	●
external	external	●	●
internal	internal	○	○
external	internal	●	○



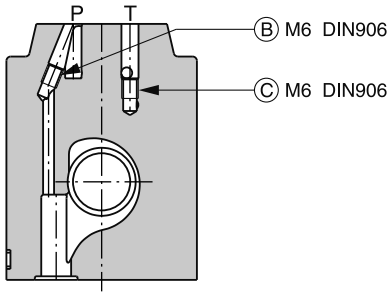
3

D31FEB/E

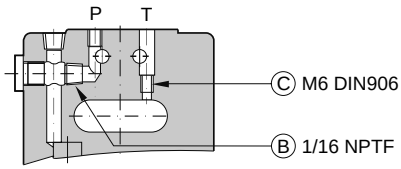


(drawn offset)

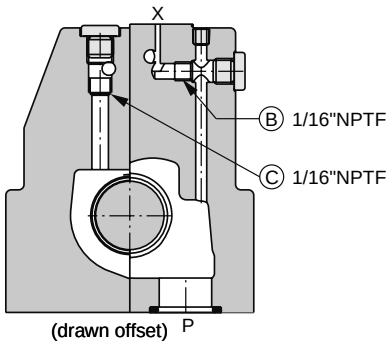
D31FER



D41FEB/E

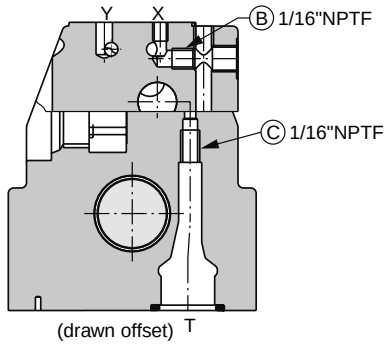


D41FER



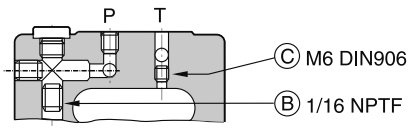
(drawn offset)

D41FEZ

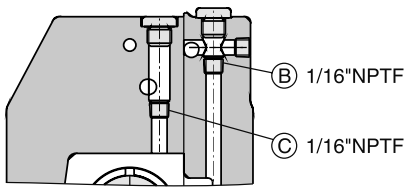


(drawn offset)

D81/91FEB/E

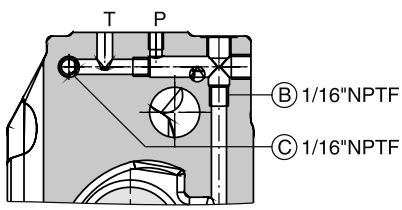


D91FER

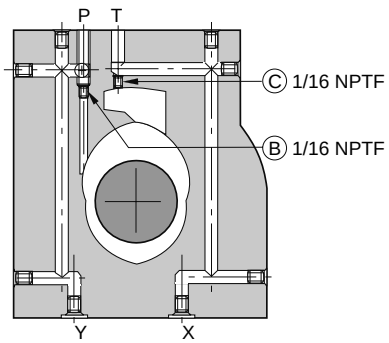


(drawn offset)

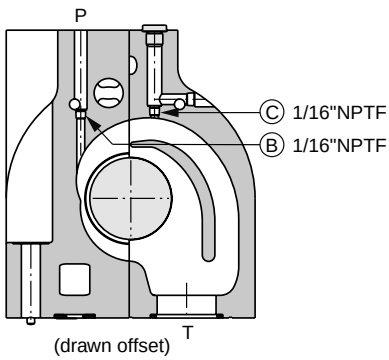
D91FEZ



D111FEB/E

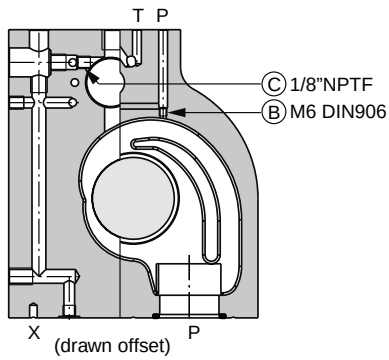


D111FER



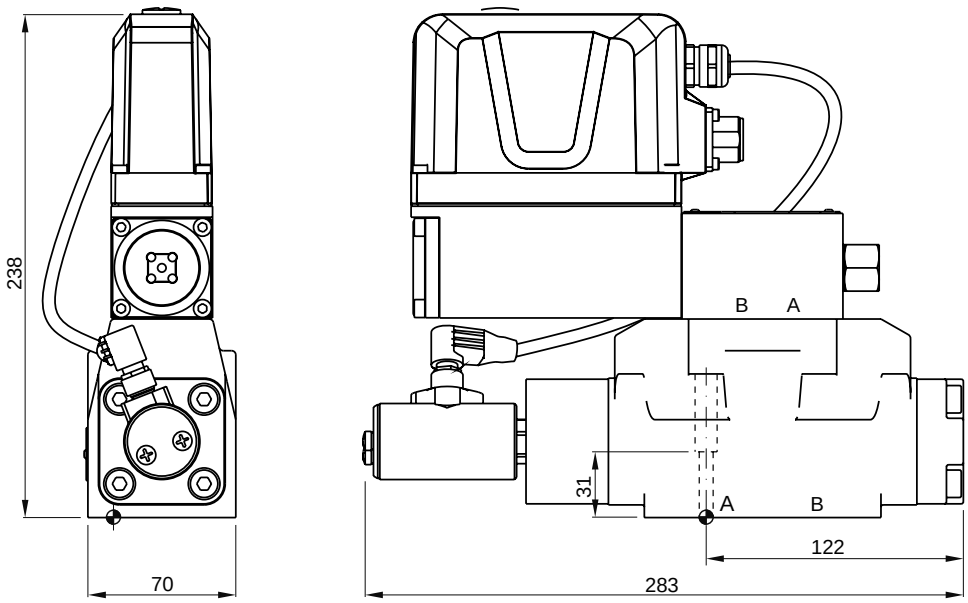
(drawn offset)

D111FEZ



(drawn offset)

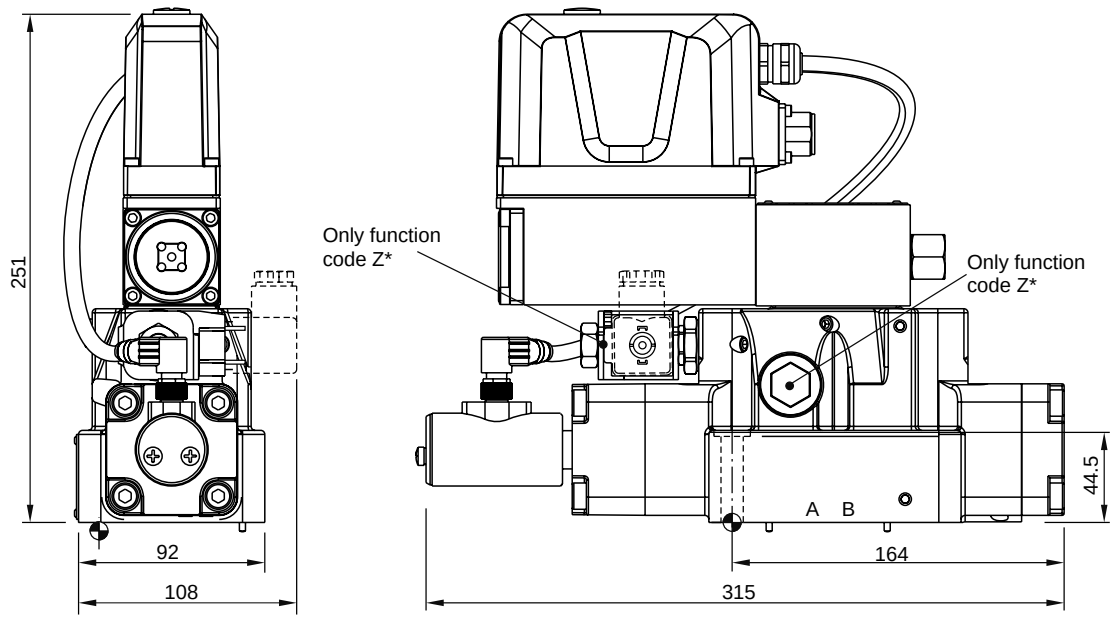
D31FE



Regenerative and hybrid function with additional plate "H10-1666L / H10-1662 / A10-1664 / A10-1665L", see chapter 12.

Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	NBR: SK-D31FP FPM: SK-D31FP-V

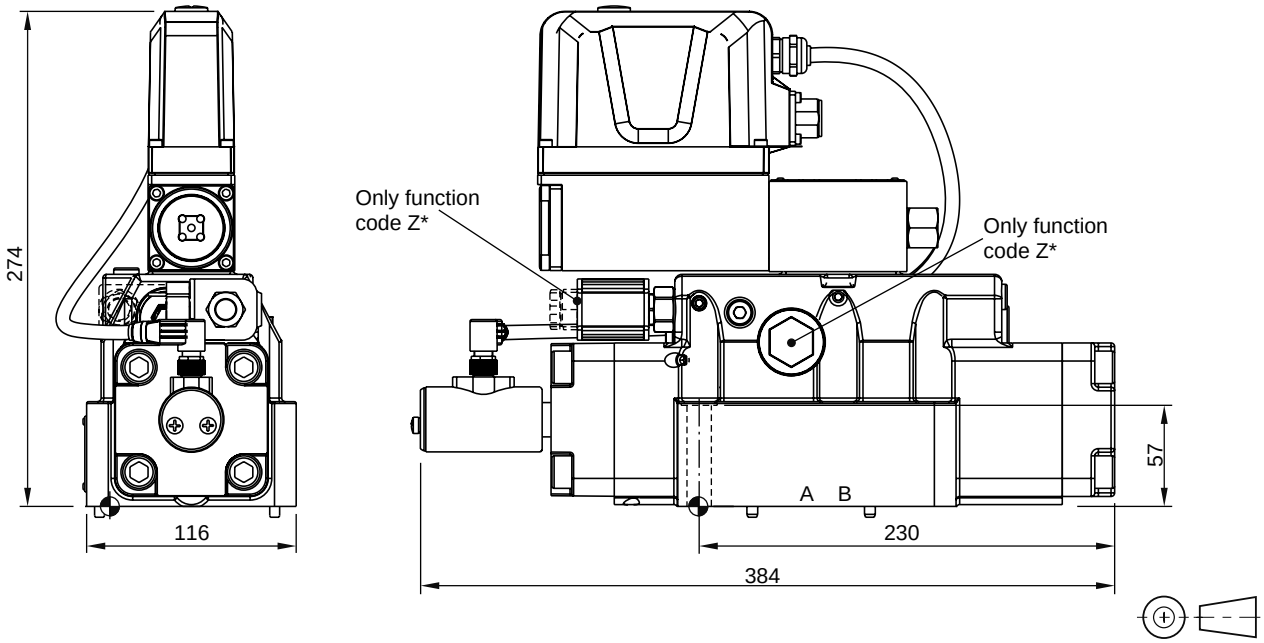
D41FE



Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK320	2x M6x55 4x M6x60 DIN 912 12.9	13.2 Nm ±15% 63 Nm ±15%	NBR: SK-D41FP FPM: SK-D41FP-V

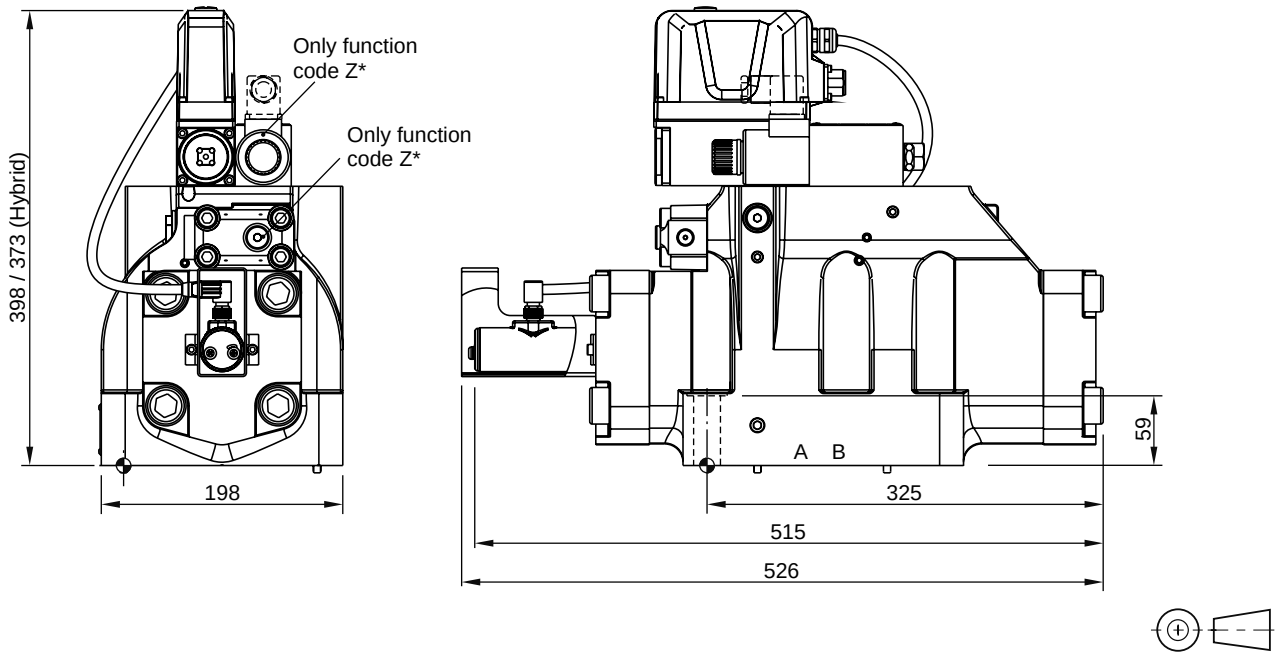
3

D81/91FE



Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK360	6x M12x75 DIN 912 12.9	108 Nm ±15%	NBR: SK-D81/D91FP FPM: SK-D81/D91FP-V

D111FE

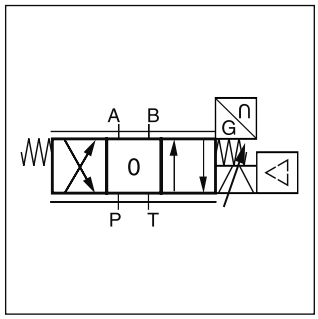


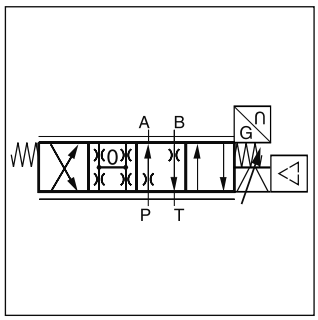
Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK386	6x M20x90 DIN 912 12.9	517 Nm ±15%	NBR: SK-D111FP FPM: SK-D111FP-V

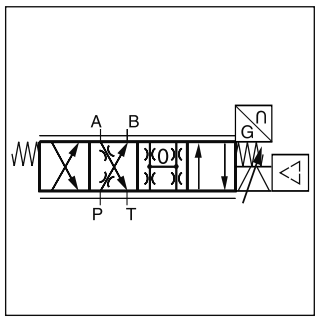
The direct operated control valve D1FP of the nominal size NG06 (CETOP03) shows extremly high dynamics combined with maximum flow. First of all it is used for highest accuracy in positioning of hydraulic axis and controlling of pressure and velocity.

Driven by the new patented VCD® actuator the D1FP reaches the frequency response of real servovalves. Compared with solenoid driven valves the D1FP can also be used in applications with pressure drops up to 350bar across the valve. Because of the high flow capability the D1FP can be a substitute for NG10 valves in some cases.

At power-down the spool moves in a defined position. All common input signals are available.



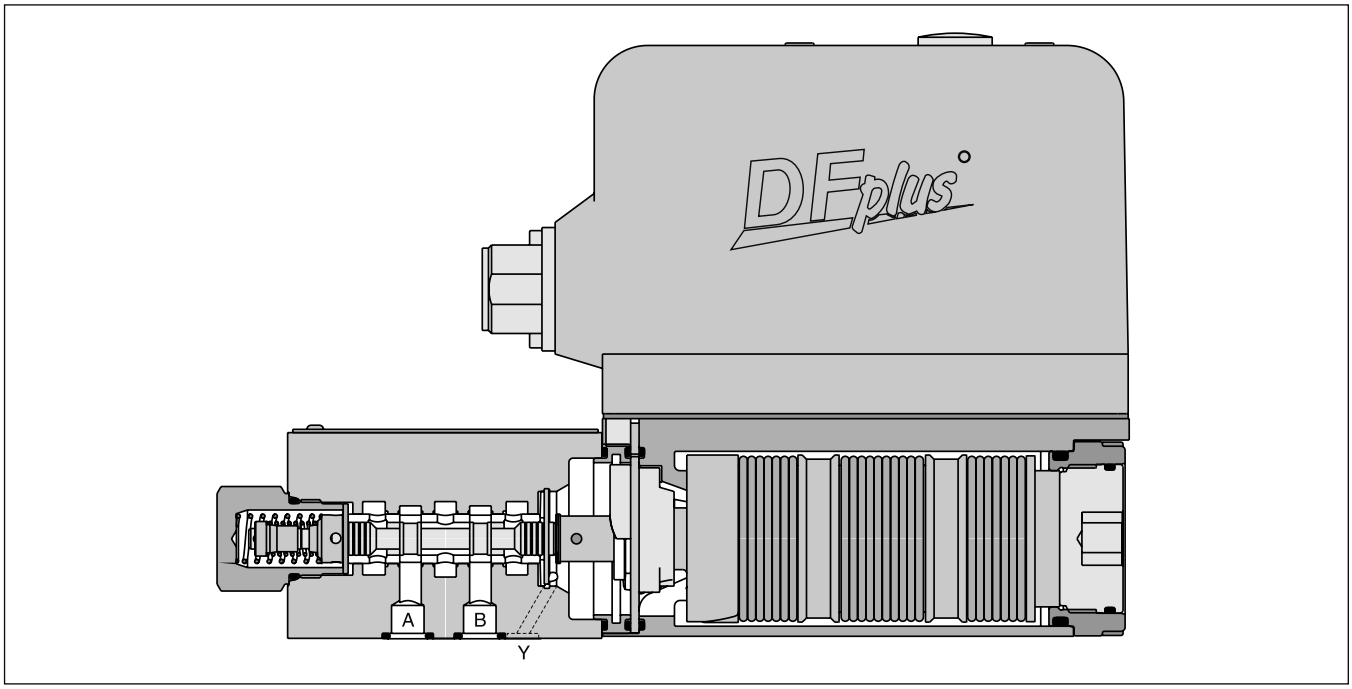




Technical features

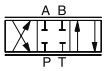
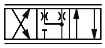
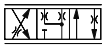
- Real servovalve dynamics (-3dB/350Hz at ±5% input signal)
- No flow limit up to 350 bar pressure drop through the valve
- Max. tank pressure 350 bar (with external drain port y)
- High flow
- Defined spool positioning at power-down - optional P-A/B-T or P-B/A-T or center position (for overlapped spools)
- Onboard electronics

CE



D	1	F	P			9				0	
Directional control valve	**Size DIN NG06 CETOP03 NFPA D03**	**Proportional control**	**VCD**	**Spool type**	**Spool position on power down [1]**	**Y-port (plugged) [5]**	**Seals**	**Command-signal**	**Acces-sories**	**Spool/ sleeve design**	**Design series** (not required for ordering)

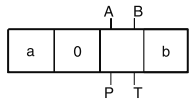
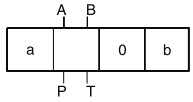
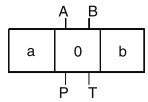
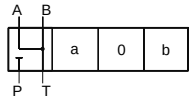
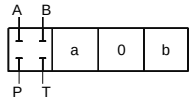
3

Code	Spool type	Flow [l/min] at Δp 35bar per metering edge
Zerolap		
E50M		**40**
E50H		**25**
E50G		**16**
E50F		**12**
E50C		**6**
E50B		**3**
B60M	$Q_B = Q_A/2$ 	**40 / 20**
B60H		**25 / 12.5**
B60G		**16 / 8**
B60F		**12 / 6**
B60C		**6 / 3**
Underlap approx. -0.5%		
E55M		**40**
E55H		**25**
E55G		**16**
E55F		**12**
E55C		**6**
E55B		**3**
Overlap 25%		
E01M		**40**
E01H		**25**
E01G		**16**
E01F		**12**
E01C		**6**
E01B		**3**
B31M	$Q_B = Q_A/2$ 	**40 / 20**
B31H		**25 / 12.5**
B31G		**16 / 8**
B31F		**12 / 6**
B31C		**6 / 3**
E02M		**40**
E02H		**25**
E02G		**16**
E02F		**12**
E02C		**6**
E02B		**3**
B32M	$Q_B = Q_A/2$ 	**40 / 20**
B32H		**25 / 12.5**
B32G		**16 / 8**
B32F		**12 / 6**
B32C		**6 / 3**

Code	Connection type
0	**6 + PE acc. EN175201-804**
5	**11 + PE acc. EN175201-804**
7	**6 + PE + Enable**

Code	Signal	Function
B	**+/- 10V**	**0...+10V -> P-A**
E	**+/- 20mA**	**0...+20mA -> P-A**
S	**4...20mA**	**12...20mA -> P-A**

Code	Seals
N	NBR
V	FPM
H	for HFC fluid

Code	Spool pos. at power down
A [2]	
B [2]	
C [3]	
H [4]	
J [4]	

[4] not for flow code M (40 l/min)

[1] On power down the spool moves in a defined position. This cannot be guaranteed in case of single flow path on the control edge A – T resp. B – T with pressure drops above 120 bar or contamination in the hydraulic fluid.

[2] approx. 10% opening, only zero lapped spools and underlap spools

[3] only for overlapped spools

[5] needs to be removed at tank pressure >35 bar

Note:

Adapter plate for ISO 4401 to ISO 10372 size 04
Ordering code HAP04WV06-1661

Please order connector separately.
See chapter 3 accessories.

Bold letters =
Short-term availability

General			
Design			Direct operated proportional DC valve
Actuation			VCD® actuator
Size			NG06/CETOP03/NFPA D03
Mounting interface			DIN 24340 / ISO 4401 / CETOP RP121 / NFPA
Mounting position			unrestricted
Ambient temperature		[°C]	-20...+50
$MTTF_D$ value		[years]	75
Weight		[kg]	5.0
Vibration resistance		[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27
Hydraulic			
Max. operating pressure		[bar]	Ports P, A, B 350
		[bar]	Port T max. 35, port Y max. 35 [1]
Fluid			Hydraulic oil as per DIN 51524...535, other on request
Fluid temperature		[°C]	-20...+60
Viscosity	permitted	[cSt] / [mm²/s]	20...380
	recommended	[cSt] / [mm²/s]	30...80
Filtration			ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)
Nominal flow at Δp=35bar per control edge [2]		[l/min]	3 / 6 / 12 / 16 / 25 / 40
Flow maximum		[l/min]	90 (at Δp=350bar over two control edges)
Leakage at 100 bar		[ml/min]	<400 (zero lapped spool); <50 (over lapped spool)
Static / Dynamic			
Step response at 100% step [3]		[ms]	<3.5
Frequency response (±5% signal) [3]		[Hz]	350 (amplitude ratio -3dB), 350 (phase lag -90°)
Hysteresis		[%]	<0.05
Sensitivity		[%]	<0.03
Temperature drift		[%/K]	<0.025
Electrical characteristics			
Duty ratio		[%]	100
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Supply voltage/ripple		[V]	DC 22 ... 30, ripple <5% eff., surge free
Current consumption max.		[A]	3.5
Pre-fusing		[A]	4.0 medium lag
Input signal			
	Voltage	[V]	10...0...-10, ripple <0.01% eff., surge free, 0...+10V P->A
	Impedance	[kOhm]	100
	Current	[mA]	20...0...-20, ripple <0.01% eff., surge free, 0...+20mA P->A
	Impedance	[Ohm]	250
	Current	[mA]	4...12...20, ripple <0.01% eff., surge free, 12...20mA P->A <3.6 mA = disable, >3.8 mA = according to NAMUR NE43
	Impedance	[Ohm]	250
Differential input max.			
	Code 0	[V]	30 for terminal D and E against PE (terminal G)
	Code 5	[V]	30 for terminal 4 and 5 against PE (terminal ⏚)
	Code 7	[V]	30 for terminal D and E against PE (terminal G)
Enable signal (only code 5/7)		[V]	5...30, Ri = 9 kOhm
Diagnostic signal		[V]	+10...0...-10 / +Ub, rated max. 5mA
EMC			EN 61000-6-2, EN 61000-6-4
Electrical connection		Code 0/7	6 + PE acc. EN 175201-804
		Code 5	11 + PE acc. EN 175201-804
Wiring min.	Code 0/7	[mm²]	7x1.0 (AWG 18) overall braid shield
	Code 5	[mm²]	8x1.0 (AWG 18) overall braid shield
Wiring lenght max.		[m]	50

[1] For applications with p_T>35 bar the Y-port has to be connected and the plug in the Y-port has to be removed.

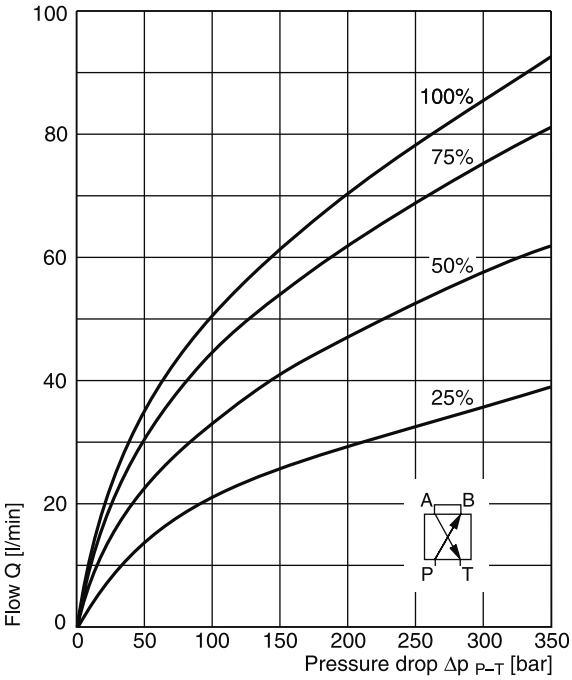
[2] Flow rate for different Δp per control edge: $Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$

[3] Measured with load (100 bar pressure drop/two control edges)

3

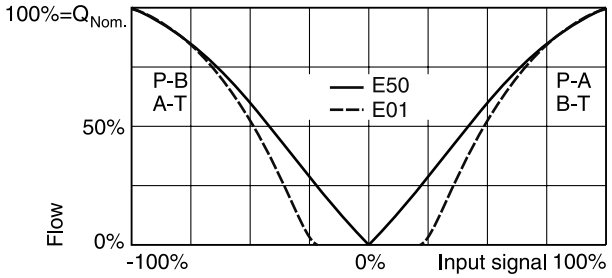
Functional limits
at 25%, 50%, 75% and 100% command signal

Spool type **E50M**

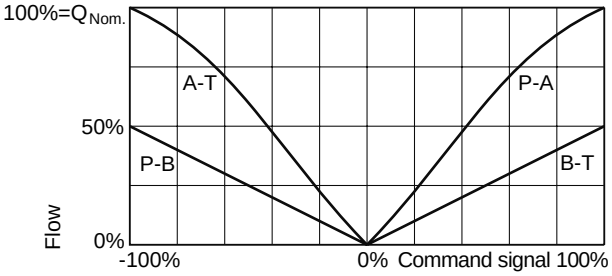


Flow curves
at Δp = 35 bar per metering edge

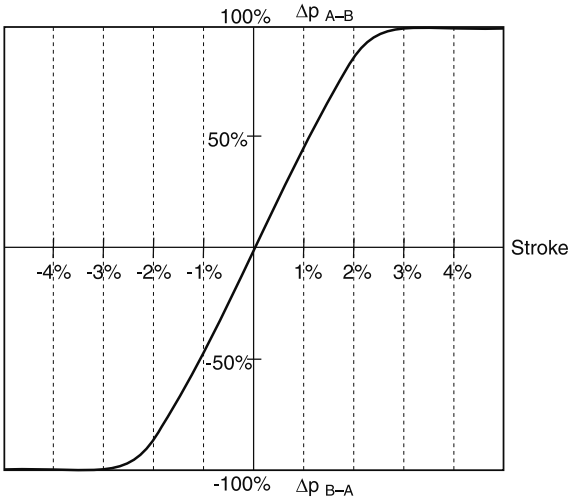
Spool type **E01/E50**



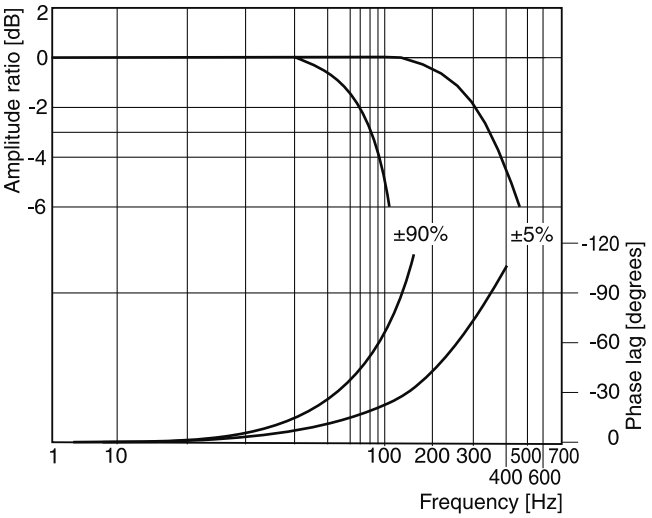
Spool type **B60**



Pressure gain

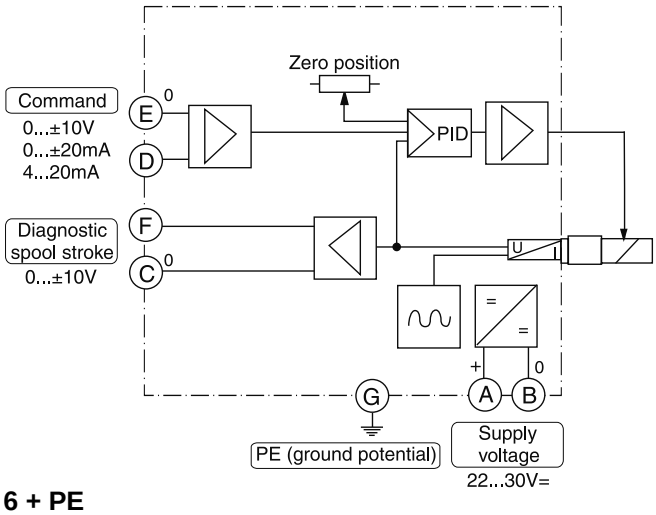


Frequency response
±5% command signal
±90% command signal

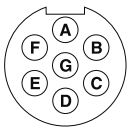


All characteristic curves measured with HLP46 at 50°C.

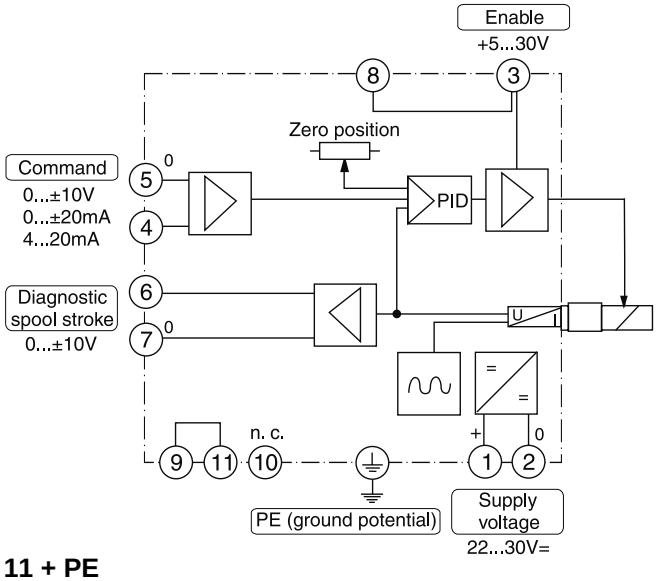
Code 0



6 + PE

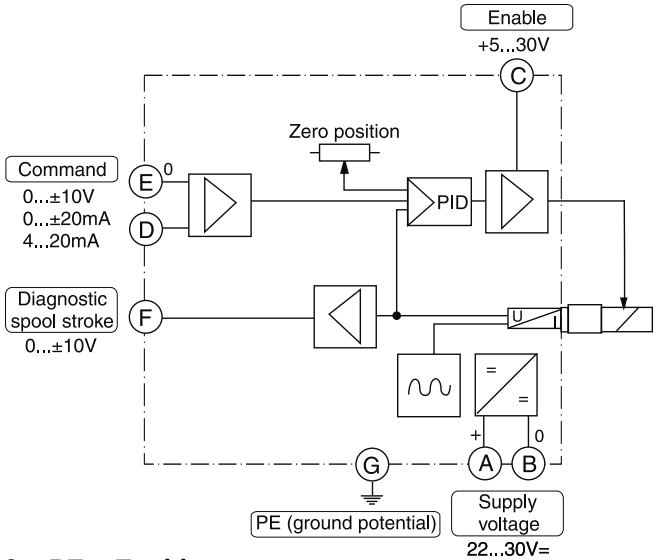


Code 5

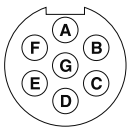


11 + PE

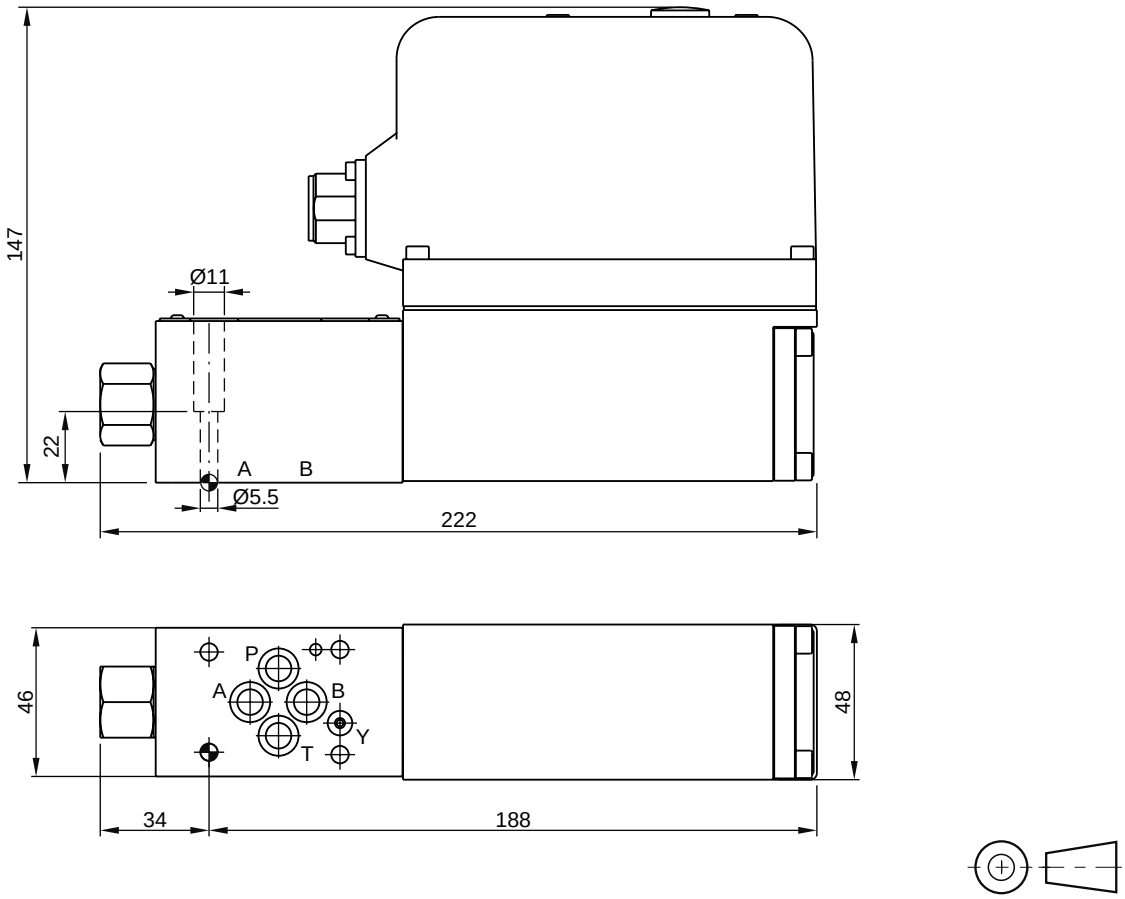
Code 7



6 + PE + Enable



3

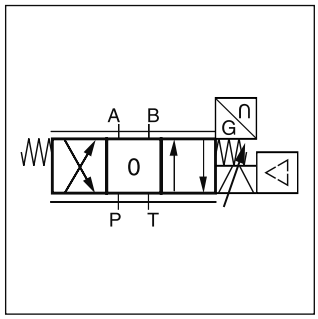


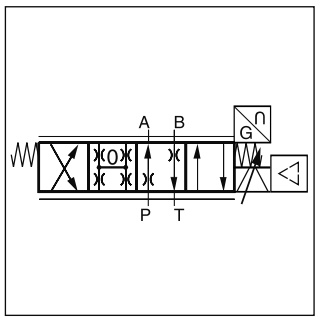
Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	NBR: SK-D1FP FPM: SK-D1FP-V HFC: SK-D1FP-H

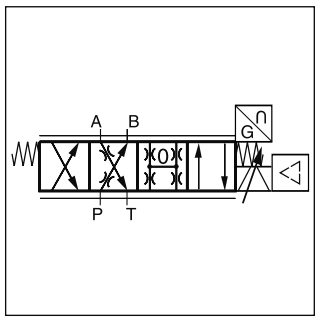
The direct operated control valve D3FP of the nominal size NG10 (CETOP05) shows extremly high dynamics combined with high flow. First of all it is used for highest accuracy in positioning of hydraulic axis and controlling of pressure and velocity.

Driven by the new patented VCD® actuator the D3FP reaches the frequency response of real servovalves.

At power-down the spool moves in a defined position. All common input signals are available.



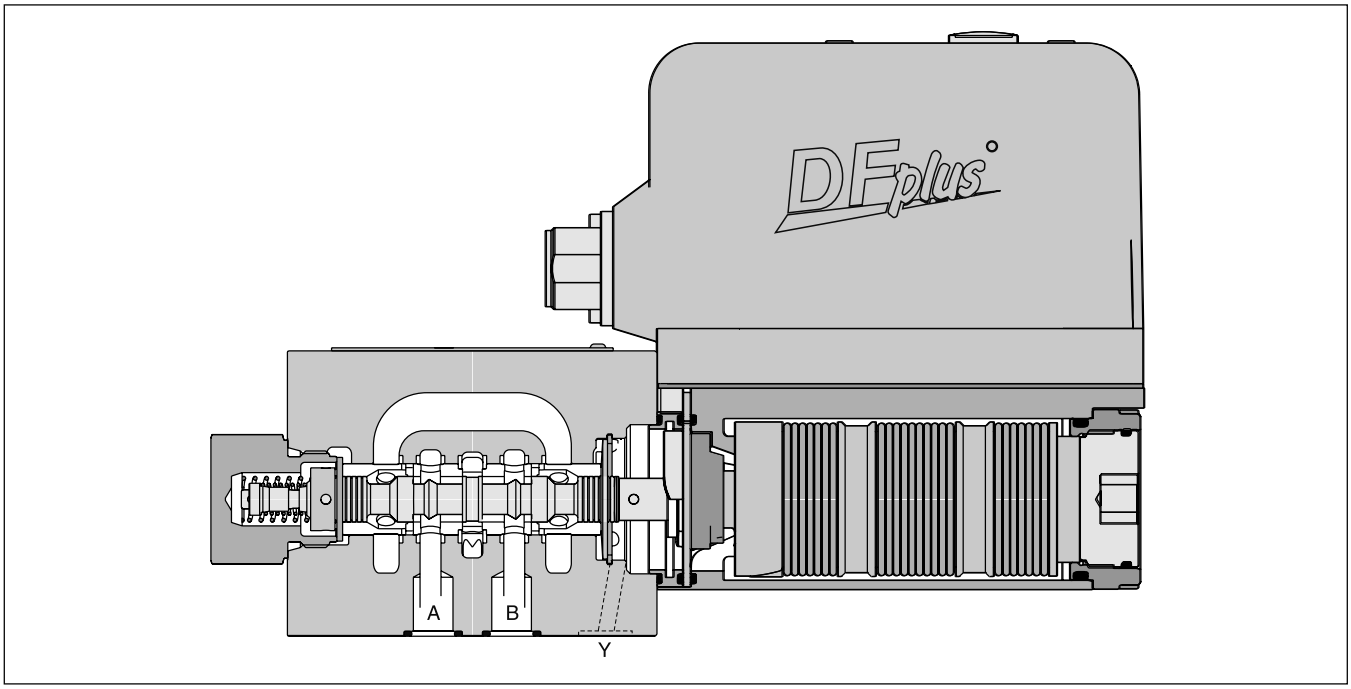




Technical features

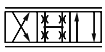
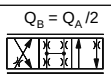
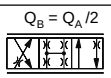
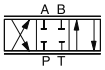
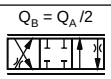
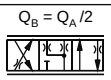
- Real servovalve dynamics (-3dB/350Hz at ±5% input signal)
- Max. tank pressure 350 bar (with external drain port Y)
- Defined spool positioning at power-down - optional P-A/B-T or P-B/A-T or center position (for overlapped spools)
- Onboard electronics
- Spool / sleeve design

CE



D	3	F	P			9				0	
Direct. control valve	**Size DIN NG10 CETOP05 NFPA D05**	**Proportional control**	**VCD**	**Spool type**	**Spool position on power down [1]**	**Y-port (plugged) [4]**	**Seals**	**Command-signal**	**Acces-sories**	**Spool/ sleeve design**	**Design series** (not required for ordering)

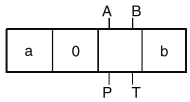
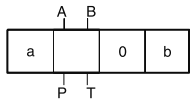
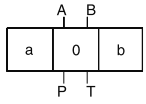
3

Code	Spool type	Flow [l/min] at Δp 35bar per metering edge
Zerolap		
E50Y		**100**
E50P		**50**
B60Y	$Q_B = Q_A /2$ 	**100**
B60P	$Q_B = Q_A /2$ 	**50**
Underlap approx. -0.5%		
E55Y		**100**
E55P		**50**
Overlap 18%		
E01Y **E01P**		**100** **50**
E02Y **E02P**		**100** **50**
B31Y **B31P**	$Q_B = Q_A /2$ 	**100 / 50** **50 / 25**
B32Y **B32P**	$Q_B = Q_A /2$ 	**100 / 50** **50 / 25**

Code	Connection type
0	**6 + PE acc. EN175201-804**
5	**11 + PE acc. EN175201-804**
7	**6 + PE + Enable**

Code	Signal	Function
B	**+/- 10V**	**0...+10V -> P-A**
E	**+/- 20mA**	**0...+20mA -> P-A**
S	**4...20mA**	**12...20mA -> P-A**

Code	Seals
N	NBR
V	FPM
H	for HFC fluid

Code	Spool pos. at power down
A [2]	
B [2]	
C [3]	

[1] On power down the spool moves in a defined position. This cannot be guaranteed in case of single flow path on the control edge A – T resp. B – T with pressure drops above 120 bar or contamination in the hydraulic fluid.

[2] approx. 10% opening, only zerolapped spools and underlapped spools.

[3] only for overlapped spools

[4] needs to be removed at tank pressure >35 bar

Please order connector separately.
See chapter 3 accessories.

Bold letters =
Short-term availability

General			
Design			Direct operated proportional DC valve
Actuation			VCD® actuator
Size			NG10/CETOP05/NFPA D05
Mounting interface			DIN 24340 / ISO 4401 / CETOP RP121 / NFPA
Mounting position			unrestricted
Ambient temperature		[°C]	-20...+50
$MTTF_D$ value		[years]	75
Weight		[kg]	6.5
Vibration resistance		[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27
Hydraulic			
Max. operating pressure		[bar] [bar]	Ports P, A, B 350 Port T max. 35, port Y max. 35 [1]
Fluid			Hydraulic oil as per DIN 51524...535, other on request
Fluid temperature		[°C]	-20...+60
Viscosity	permitted	[cSt] / [mm^2/s]	20...380
	recommended	[cSt] / [mm^2/s]	30...80
Filtration			ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)
Flow nominal at Δp=35bar per control edge [2]		[l/min]	50 / 100
Flow maximum		[l/min]	150
Leakage at 100 bar		[ml/min]	<400 (Zerolap spool); <100 (Overlap spool)
Static / Dynamic			
Step response at 100% step [3]		[ms]	<6
Frequency response (±5% signal) [3]		[Hz]	200 (amplitude ratio -3dB), 200 (phase lag -90°)
Hysteresis		[%]	<0.05
Sensitivity		[%]	<0.03
Temperature drift		[%/K]	<0.025
Electrical characteristics			
Duty ratio		[%]	100
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Supply voltage/ripple		[V]	22 ... 30, ripple <5% eff., surge free
Current consumption max.		[A]	3.5
Pre-fusing		[A]	4.0 medium lag
Input signal			
	Voltage	[V]	10...0...-10, ripple <0.01% eff., surge free, 0...+10V P->A
	Impedance	[kOhm]	100
	Current	[mA]	20...0...-20, ripple <0.01% eff., surge free, 0...+20mA P->A
	Impedance	[Ohm]	250
	Current	[mA]	4...12...20, ripple <0.01% eff., surge free, 12...20mA P->A <3.6 mA = disable, >3.8 mA = according to NAMUR NE43
	Impedance	[Ohm]	250
Differential input max.			
	Code 0	[V]	30 for terminal D and E against PE (terminal G)
	Code 5	[V]	30 for terminal 4 and 5 against PE (terminal ⏚)
	Code 7	[V]	30 for terminal D and E against PE (terminal G)
Enable signal	(only code 5/7)	[V]	5...30, Ri = 9 kOhm
Diagnostic signal		[V]	+10...0...-10 / +Ub, rated max. 5mA
EMC			EN 61000-6-2, EN 61000-6-4
Electrical connection		Code 0/7 Code 5	6 + PE acc. EN 175201-804 11 + PE acc. EN 175201-804
Wiring min.	Code 0/7	[mm^2]	7 x 1.0 (AWG 18) overall braid shield
	Code 5	[mm^2]	8 x 1.0 (AWG 18) overall braid shield
Wiring lenght max.		[m]	50

[1] For applications with p_T>35 bar the Y-port has to be connected and the plug in the Y-port has to be removed.

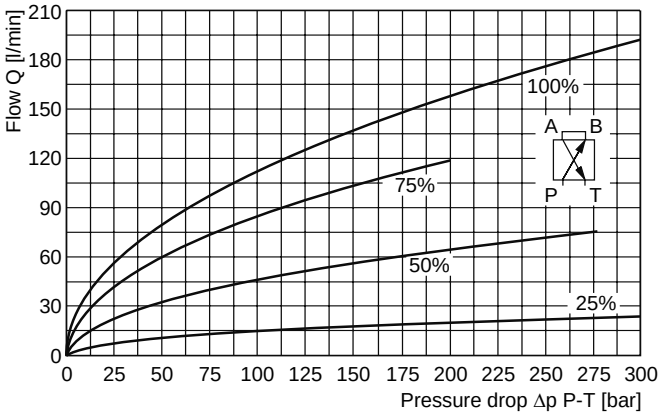
[2] Flow rate for different Δp per control edge: $Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$

[3] Measured with load (100 bar pressure drop/two control edges)

3

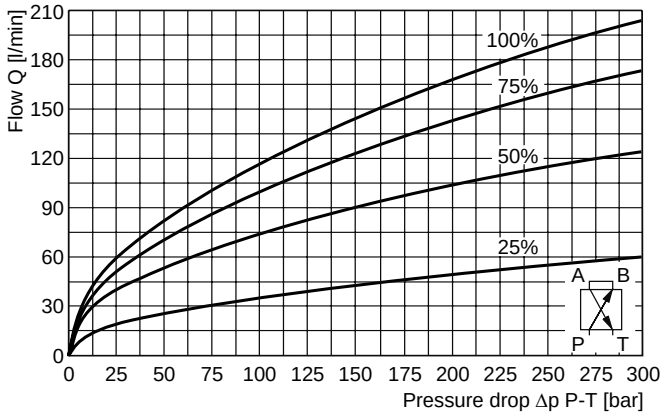
Functional limits*
at 25%, 50%, 75% and 100% command signal

Spool type **E01/E02**



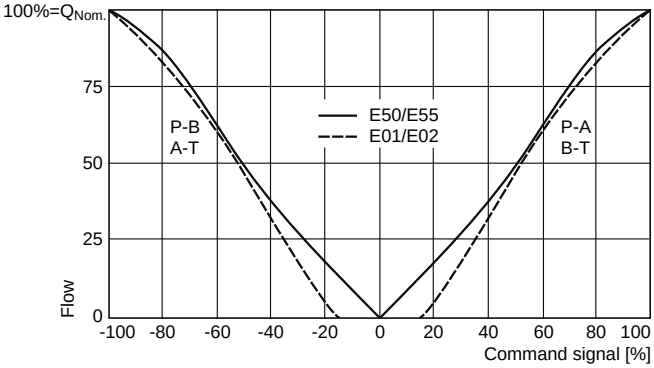
Functional limits*
at 25%, 50%, 75% and 100% command signal

Spool type **E50/E55**



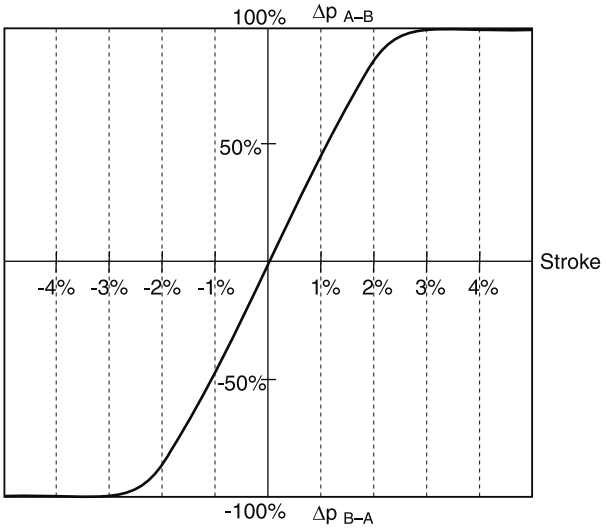
Flow curves
at Δp = 35 bar per metering edge

Spool type **E50/E55, E01/E02**



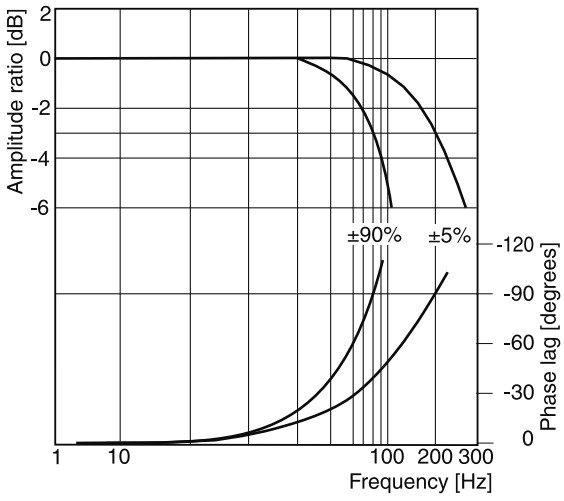
*** When exceeding the functional limits, for a period of time the valve will go into fail safe and power supply needs to be switched off/on to re-enable the valve.**

Pressure gain

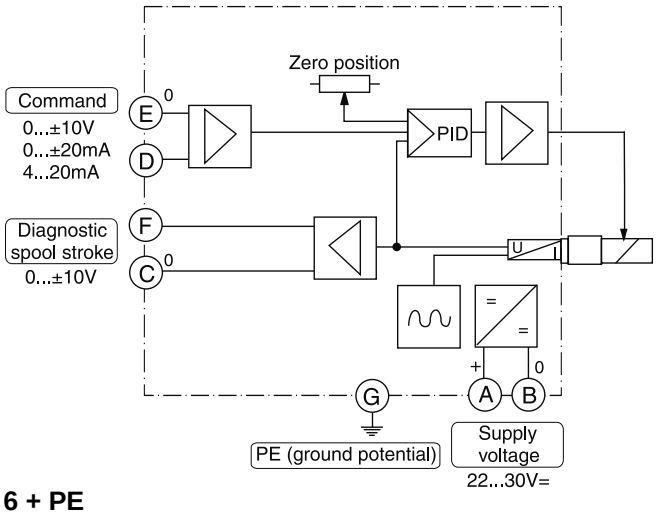


Frequency response
±5% command signal

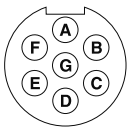
±90% command signal



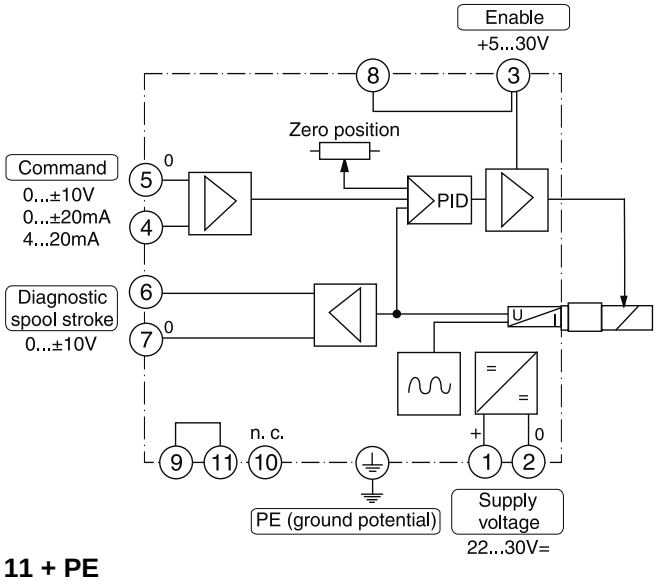
Code 0



6 + PE

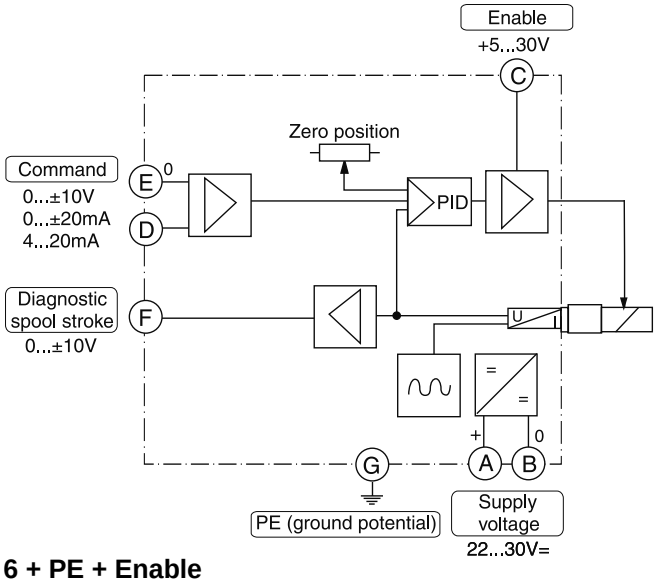


Code 5

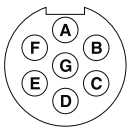


11 + PE

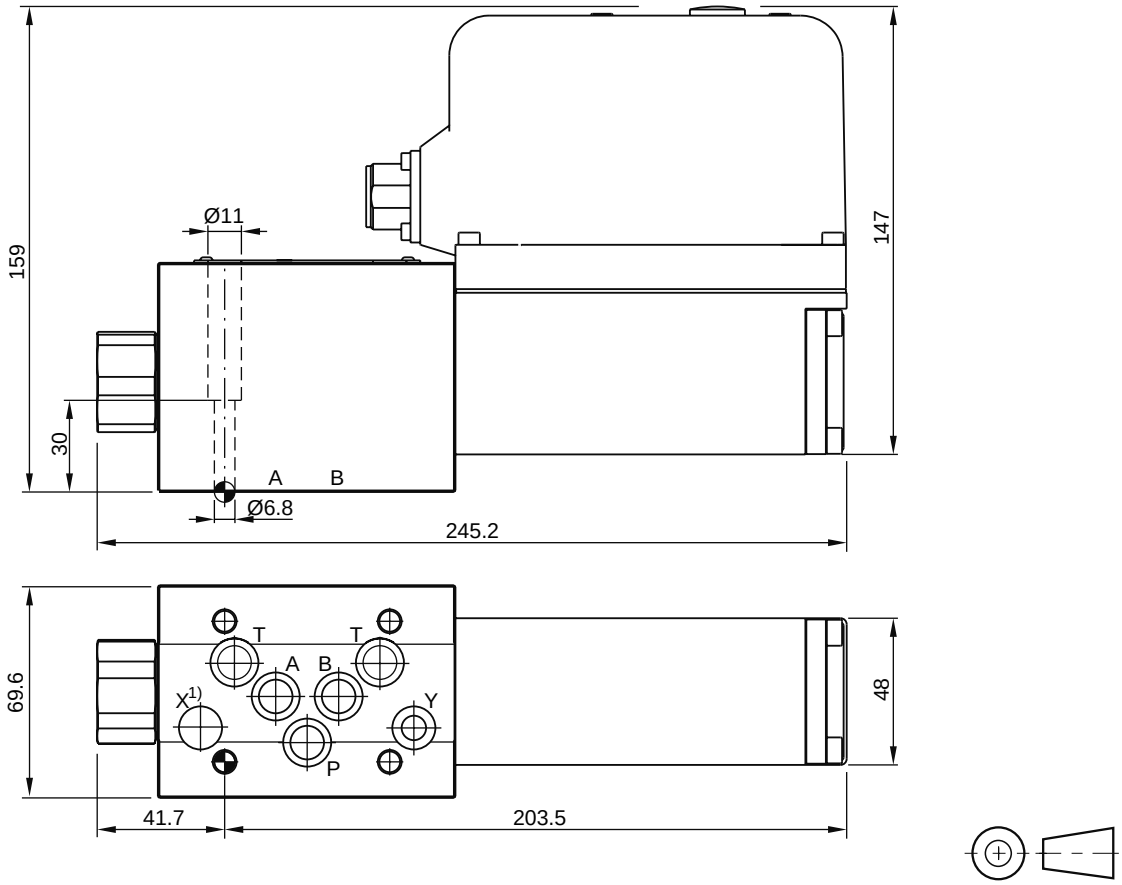
Code 7



6 + PE + Enable



3



1) O-ring recess diameter on valve body.

Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ ⏥ 0.01/100	BK385	4xM6x40 DIN 912 12.9	13.2 Nm ±15%	NBR: SK-D3FP FPM: SK-D3FP-V HFC: SK-D3FP-H

The new series of pilot operated control valves D30FP closes the gap between the direct operated D3FP valves and the conventional pilot operated D31FP valves.

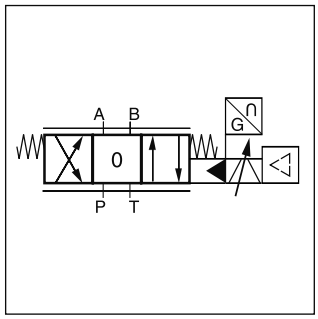
Providing high flow capacity and practically no flow limits like D31FP in the envelope size of the D3FP.

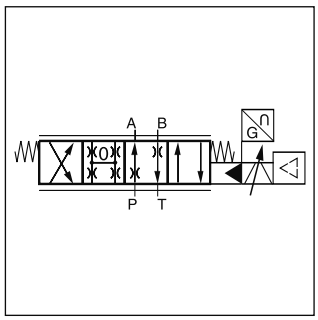
The valve works with the hydraulic follower principle, with a moving sleeve as main spool.

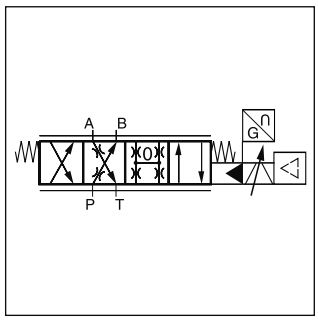
Technical features

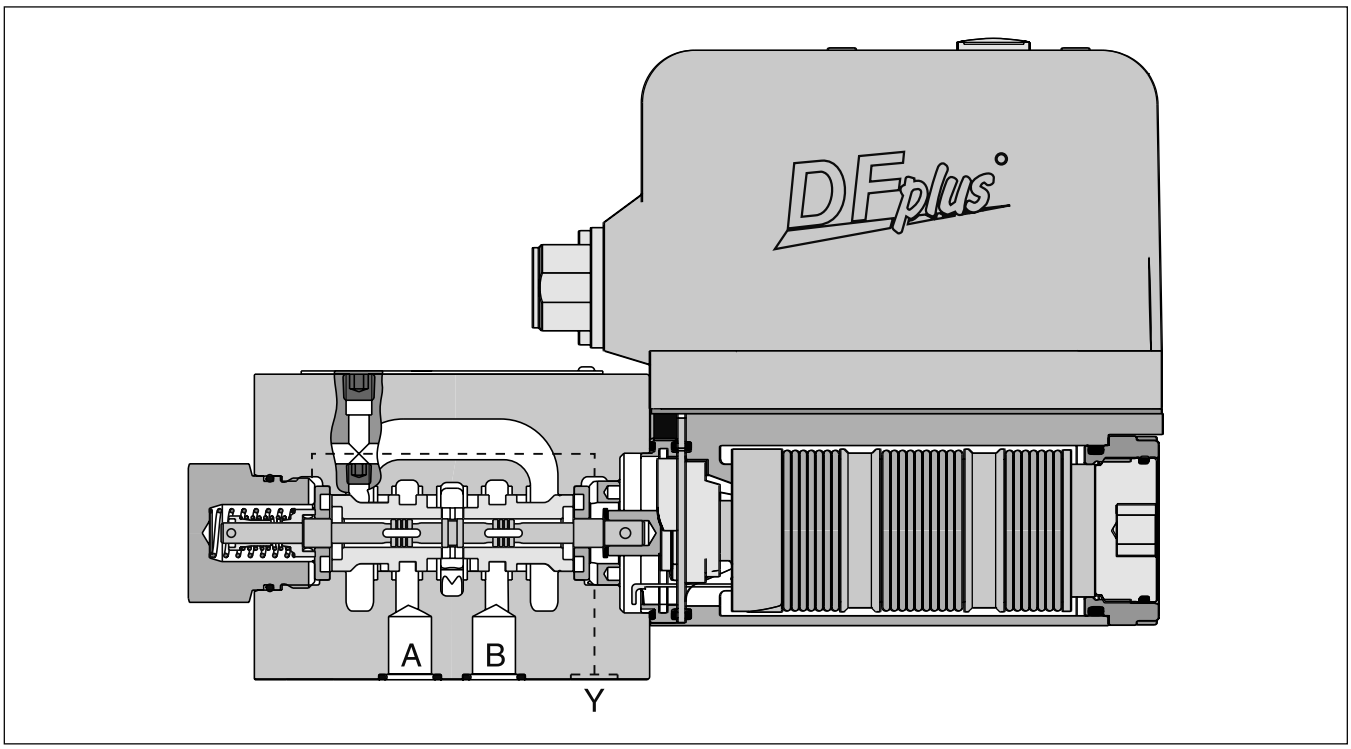
- Pilot operated with hydraulic follower sleeve
- No flow limit up to 350 bar through the valve
- Defined spool positioning at power-down

CE

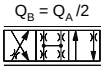
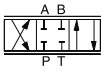
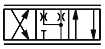
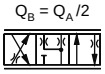


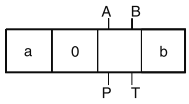
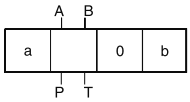
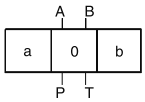






D	30	F	P							3	
Direct. control valve	**Size DIN NG10 CETOP05 NFPA D05**	**Proportional control**	**VCD**	**Spool type**	**Spool position on power down**	**Pilot connection**	**Seals**	**Command-signal**	**Acces-sories**	**Spool/ body design**	**Design series** (not required for ordering)

Code	Spool type	Flow [l/min] at Δp 5bar per metering edge
	Zerolap	
E50U		**80**
B60U	$Q_B = Q_A /2$ 	**80**
	Overlap	
E01U		**80**
E02U		**80**
B31U	$Q_B = Q_A /2$ 	**80**
B32U	$Q_B = Q_A /2$ 	**80**

Code	Spool pos. at power down
A [2]	
B [2]	
C [3]	

Code	Connection type
0	**6 + PE acc. EN175201-804**
5	**11 + PE acc. EN175201-804**

Code	Signal	Function
B	**+/- 10V**	**0...+10V -> P-A**
E	**+/- 20mA**	**0...+20mA -> P-A**
S	**4...20mA**	**12...20mA -> P-A**

Code	Seals
N	NBR
V	FPM

Code	Inlet	Drain
1 [1]	internal	external
4	internal	internal

Bold letters =
Short-term availability

[1] for tank pressure >35 bar
[2] approx. 10% opening, only zerolapped spools
[3] only for overlapped spools

Please order plugs separately.
See chapter 3 accessories.

General			
Design			Pilot operated proportional DC valve
Actuation			VCD® actuator
Size			NG10/CETOP05/NFPA D05
Mounting interface			DIN 24340 / ISO 4401 / CETOP RP121 / NFPA
Mounting position			unrestricted
Ambient temperature		[°C]	-20...+50
$MTTF_D$ value		[years]	50
Weight		[kg]	6.5
Vibration resistance		[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27
Hydraulic			
Max. operating pressure		[bar] [bar]	Ports P, A, B 350; Port T 35 for internal drain, 315 for external drain Port Y 35
Fluid			Hydraulic oil as per DIN 51524...535, other on request
Fluid temperature		[°C]	-20...+60
Viscosity	permitted recommended	[cSt] / [mm^2/s] [cSt] / [mm^2/s]	20...380 30...80
Filtration			ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)
Flow nominal at Δp=5bar per control edge [1]		[l/min]	80
Flow maximum		[l/min]	250
Leakage at 100 bar		[ml/min]	<1800 (Zerolap spool); <1000 (Overlap spool)
Pilot supply pressure		[bar]	>5 higher than tank pressure (only internal pilot oil supply)
Static / Dynamic			
Step response at 100% step [2]		[ms]	<7
Frequency response (±5% signal) [2]		[Hz]	120 (amplitude ratio -3dB), 120 (phase lag -90°)
Hysteresis		[%]	<0.05
Sensitivity		[%]	<0.03
Temperature drift		[%/K]	<0.025
Electrical characteristics			
Duty ratio		[%]	100
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Supply voltage/ripple		[V]	22 ... 30, ripple <5% eff., surge free
Current consumption max.		[A]	3.5
Pre-fusing		[A]	4.0 medium lag
Input signal			
	Voltage	[V]	10...0...-10, ripple <0.01% eff., surge free, 0...+10V P->A
	Impedance	[kOhm]	100
	Current	[mA]	20...0...-20, ripple <0.01% eff., surge free, 0...+20mA P->A
	Impedance	[Ohm]	250
	Current	[mA]	4...12...20, ripple <0.01% eff., surge free, 12...20mA P->A
	Impedance	[Ohm]	<3.6 mA = disable, >3.8 mA = according to NAMUR NE43 250
Differential input max.		[V]	30 for terminal D and E against PE (terminal G) 30 for terminal 4 and 5 against PE (terminal ⏚)
Enable signal (only code 5)		[V]	5...30, Ri = 9 kOhm
Diagnostic signal		[V]	+10...0...-10 / +Ub, rated max. 5mA
EMC			EN 61000-6-2, EN 61000-6-4
Electrical connection		Code 0 Code 5	6 + PE acc. EN 175201-804 11 + PE acc. EN 175201-804
Wiring min.			
	Code 0	[mm^2]	7 x 1.0 (AWG 18) overall braid shield
	Code 5	[mm^2]	12 x 1.0 (AWG 18) overall braid shield
Wiring lenght max.		[m]	50

[1] Flow rate for different Δp per control edge:

$$Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$$

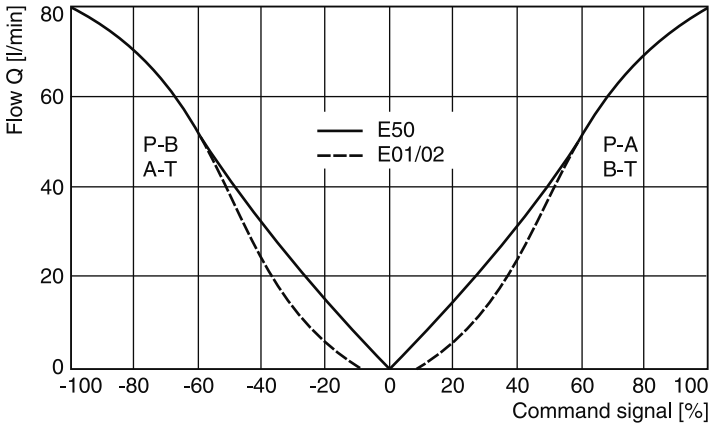
[2] Measured with load (100 bar pressure drop/two control edges)

3

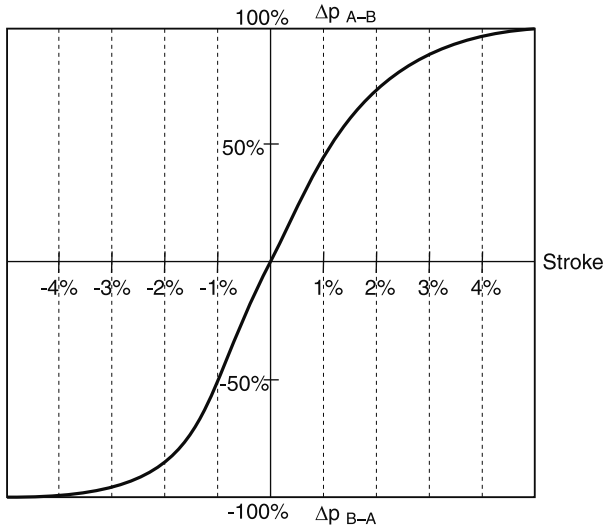
Flow curves

at Δp = 5 bar per metering edge

Spool type **E01/02, E50**



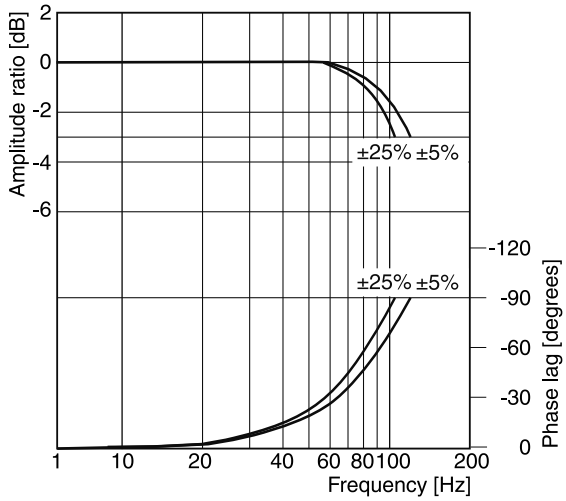
Pressure gain



Frequency response

±5% command signal

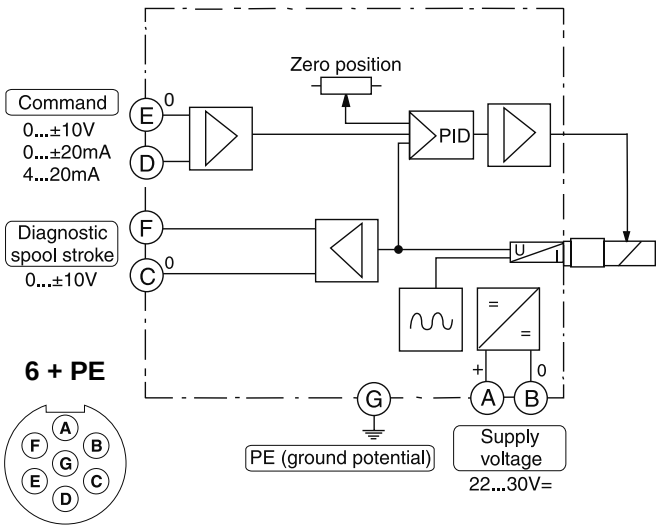
±25% command signal



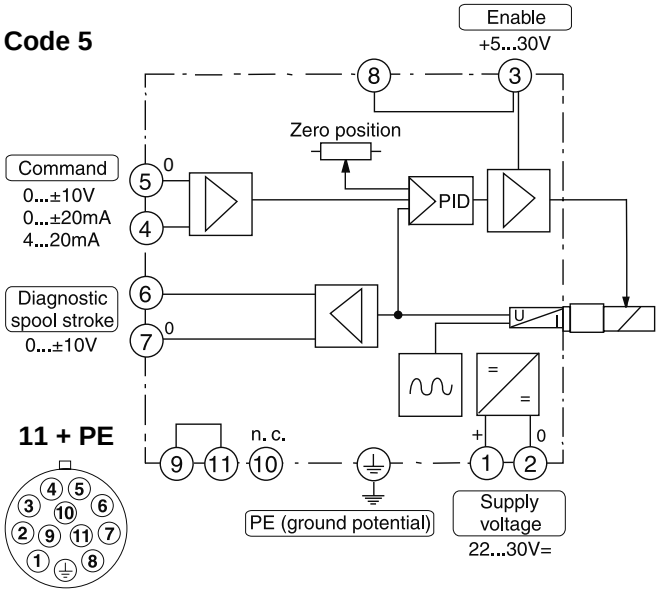
3

Block diagrams

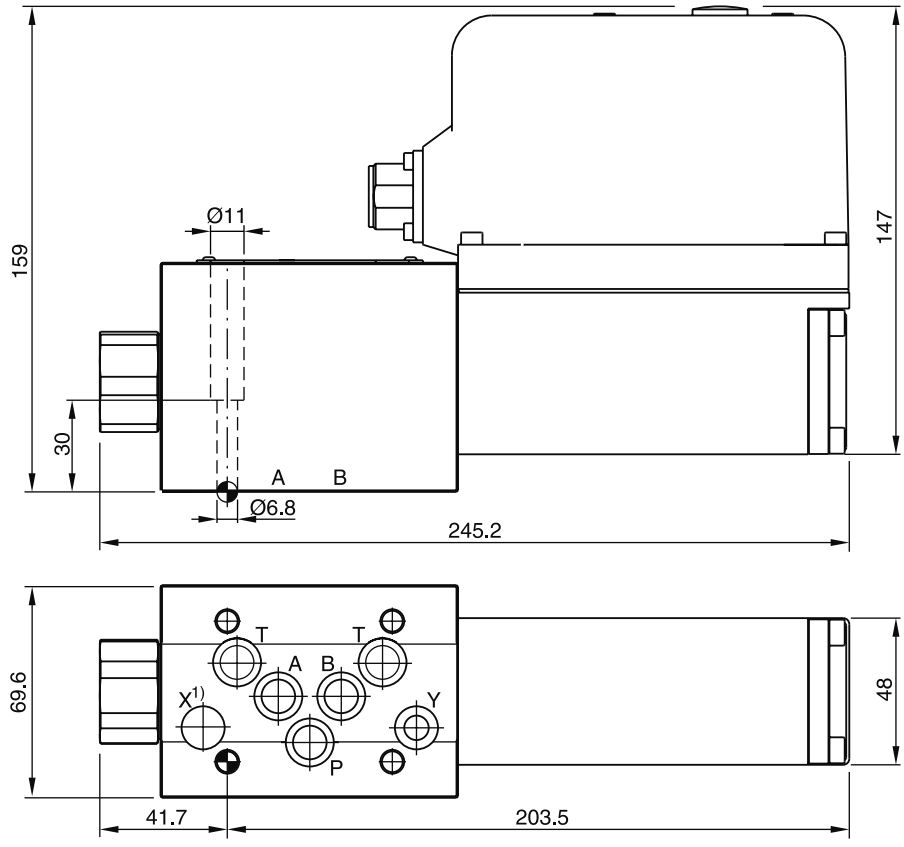
Code 0



Code 5



Dimensions



1) O-ring recess diameter on valve body.

Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK385	4xM6x40 DIN 912 12.9	13.2 Nm ±15%	NBR: SK-D3FP FPM: SK-D3FP-V

Notes

The series of pilot operated servo proportional valves D*1FP transfers the advantages of the Parker patented Voice Coil Drive (VCD®) to larger frame sizes and thus high flow rates. The high dynamics / high precision drive of the pilot valve allows the optimum control of the main spool and results in servo class performance of the complete valves.

The D*1FP series is available in 5 sizes:

D31FP NG10 (CETOP05)
D41FP NG16 (CETOP07)
D81FP NG25 (CETOP08) for port diam. up to 26 mm
D91FP NG25 (CETOP08) for port diam. up to 32 mm
D111FP NG32 (CETOP10)

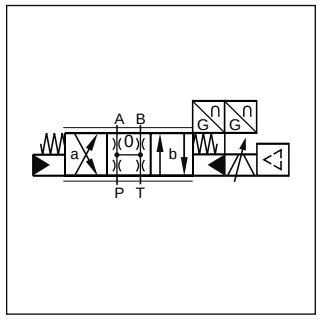
The safety concept works with a safe 4th position at the D1FP pilot valve. This ensures that the main stage is hydraulically balanced at power down and allows to have the main spool spring centered (for overlapped spools) or approximately 10% spring offset to spool position A or B (for zerolap spools).

The innovative integrated regenerative function into the A-line (optional) allows new energy saving circuits for differential cylinders. The hybrid version can be switched between regenerative mode and standard mode at any time.

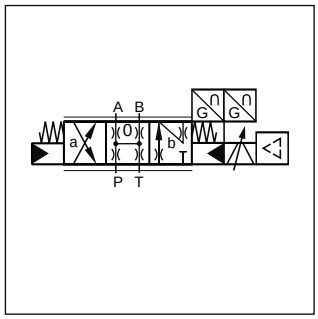
Technical features

- High dynamics
- High flow
- Defined spool positioning at power-down - optional P-A/B-T or P-B/A-T or center position (for overlapped spools)
- Onboard electronics
- **NEW:** Energy saving A-regeneration
- **NEW:** Switchable hybrid version

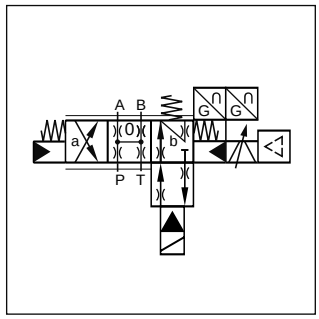
D41FP Standard



Standard D*1FPE



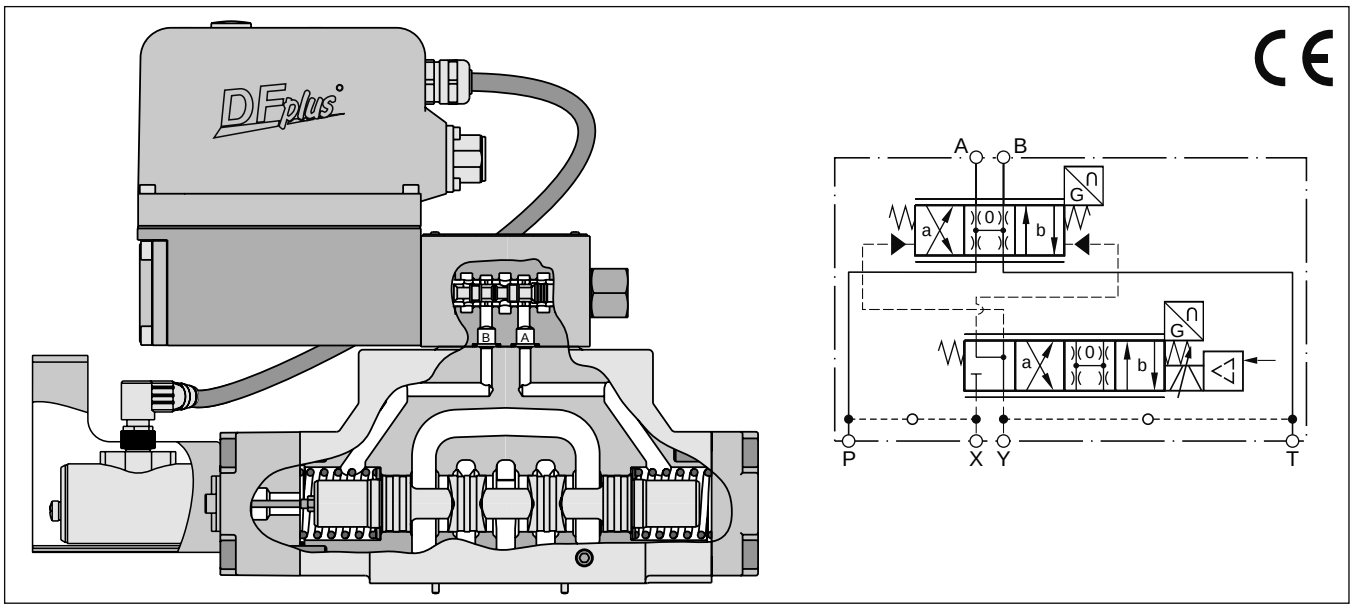
NEW: A-regeneration D*1FPR



NEW: Hybrid D*1FPZ

Further literature about the opportunities of energy savings and more functional details of the integrated regeneration is available on request.

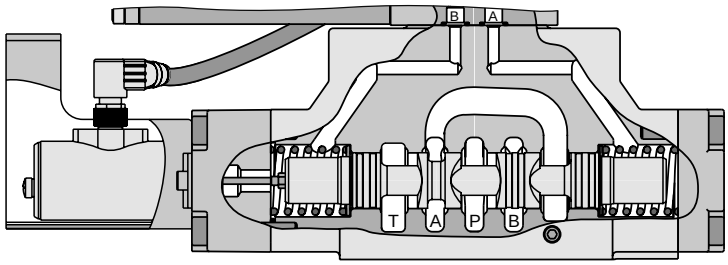
D41FPE52 (Standard)

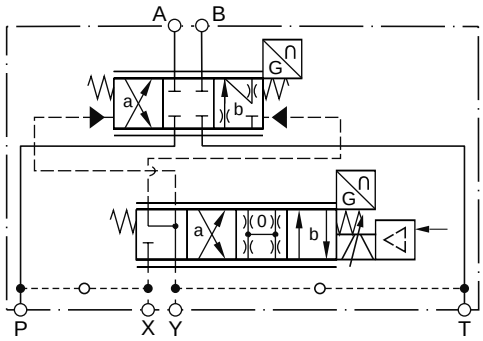


3

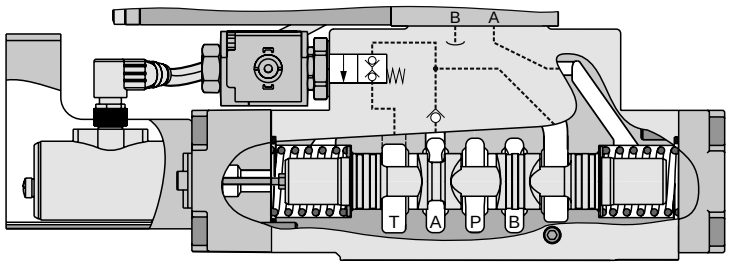
D*1FPR and D*1FPZ

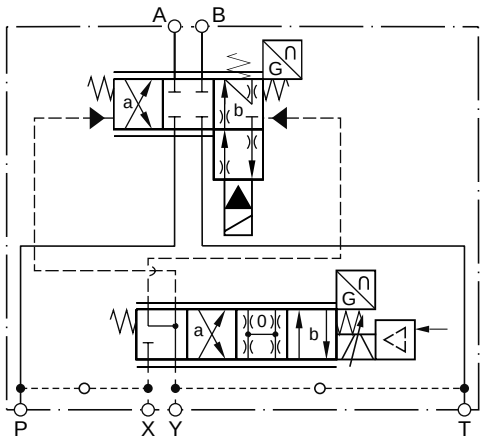
Regenerative valve D*1FPR



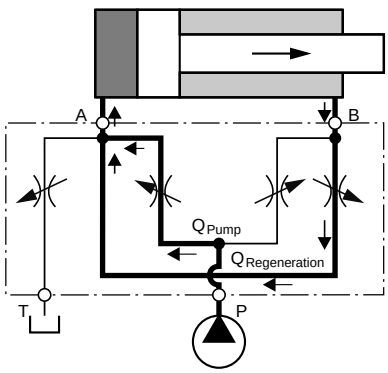


Hybrid valve D*1FPZ

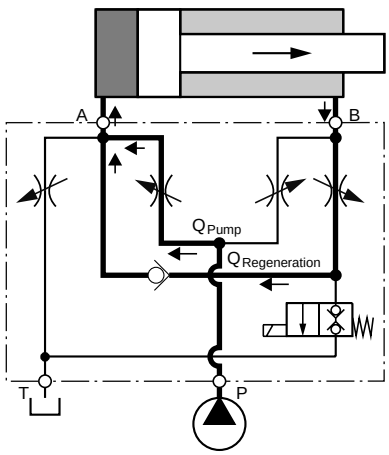




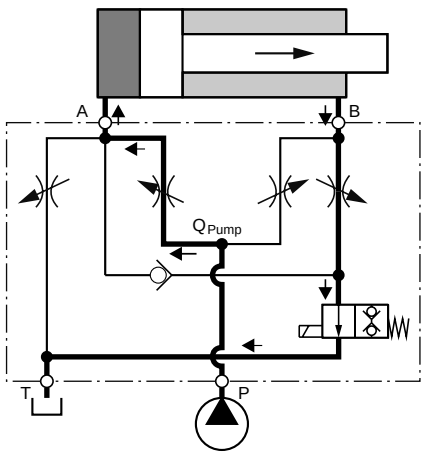
D*1FPR (regenerative valve)
Cylinder extending



D*1FPZ (hybrid valve)
Cylinder extending
in regenerative mode (high speed)



Cylinder extending
in standard mode (high force)



Flow rate in % of nominal flow

Size [1]	Spool	Port					
		A-T	P-A	P-B	B-A (R-Valve)	B-A (Hybrid)	B-T (Hybrid)
D41FPR/Z	31/32/61	100%	50%	100%	50%	40%	20%
D91FPR/Z	31/32/61	100%	50%	100%	50%	50%	25%
D111FPR/Z	31/32/61	on request					

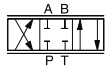
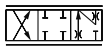
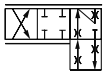
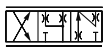
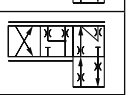
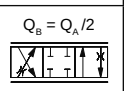
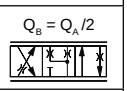
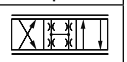
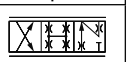
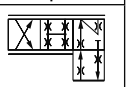
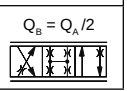
[1] D31FP: For size NG10 please refer solution with sandwich- and adaptor plates "H10-1666L / H10-1662 / A10-1664 / A10-1665L" in chapter 12.

D_1FP UK.INDD RH 17.08.2011

D		1	F	P									
Directional control valve	Size	NG06 pilot	Proportional control	High response	Function	Flow	Spool position on power down	Pilot connections	Seals	Command signal	Valve options	Hybrid option	Design series

Code	Size
3	NG10 / CETOP05
4	NG16 / CETOP07
8	NG25 / CETOP08
9 [1]	NG25 / CETOP08
11	NG32 / CETOP10

[1] for enlarged connections Ø 32 mm

Standard		NEW: regenerative function [4] [5]		NEW: hybrid function [5] [6]	
Code	Spool type	Code	Spool type	Code	Spool type
overlap 10%		overlap 10%		overlap 10%	
E01		R31		Z31	
E02		R32		Z32	
B31					
B32					
zerolap		zerolap		zerolap	
E52		R61		Z61	
B61					

Code	Hybrid option
0	Standard for spool code B, E, R
L [7]	Hybrid valve 24V normaly closed for spool code Z

[7] see page "Regenerative and hybrid function" (not for D31FP)

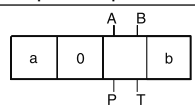
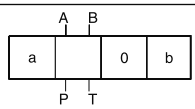
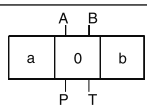
Code	Valve options
0	6+PE acc. EN175201-804
5	11+PE acc. EN175201-804
7	6+PE + Enable

Code	Signal	Function
B	0...±10V	0...+10V P -> B
E	0...±20mA	0...+20mA P -> B
K	0...±10V	0...+10V P -> A
S	4...20mA	12...20mA P -> A

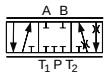
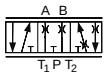
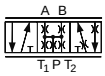
Code	Seals
N	NBR
V	FPM
H	for HFC fluid

Code	Inlet	Drain
1	internal	external
2	external	external
4	internal	internal
5	external	internal

Code	Flow [l/min] at Δp = 5bar per metering edge				
	D31	D41	D81	D91	D111
D	90	—	—	—	—
E	120	—	—	—	—
F	—	200	—	—	—
H	—	—	400	450	—
L	—	—	—	—	1000

Code	Spool pos. on power down
A [2]	
B [2]	
C [3]	

[2] approx. 10% opening, only zero lapped spools.
[3] for overlapped spools.
[4] not for size code 8.
[5] for regenerative and hybrid function at code 3 (NG10) please refer to solutions with sandwich and adaptor plates "H10-1666L / H10-1662 / A10-1664 / A10-1665L" in chapter 12.

D31FP spooltype: R31  R32  R61 

[6] nor for valve D31FP and D81FP

Please order connector separately.

3

General						
Design			Servo Proportional directional control valve, pilot operated			
Actuation			VCD®-actuator			
Size			**NG10 (CETOP 05)**	**NG16 (CETOP 07)**	**NG25 (CETOP 08)**	**NG32 (CETOP 10)**
			D31	**D41**	**D81 / D91**	**D111**
Mounting Interface			DIN 24340 / ISO 4401 / CETOP RP121 / NFPA			
Mounting position			unrestricted			
Ambient temperature		[°C]	-20...+60			
$MTTF_D$ value		[years]	50			
Weight		[kg]	11.3	14.2	23.5	64.5
Vibration resistance		[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27			
Hydraulic						
Max. operating pressure		[bar]	Internal Pilot Drain P, A, B, X 350; T, Y 35 External Pilot Drain P, A, B, T, X 350; Y 35			
Fluid			Hydraulic oil acc. DIN 51524...535, other on request			
Fluid temperature		[°C]	-20...+60			
Viscosity	permitted	[cSt] / [mm2/s]	20...380			
	recommended	[cSt] / [mm2/s]	30...80			
Filtration			ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)			
Nominal flow at Δp = 5 bar per control edge [1]		[l/min]	120	200	400 / 450	1000
Max. recommended Flow (Standard)		[l/min]	250	600	1000	3000
Regenerative B-A / B-T			depending on application, see flow curves			
Leakage at 100 bar						
	Overlapped spool	[ml/min]	200	200	600	1000
	Zerolapped spool	[ml/min]	900	900	1000	5000
	Pilot	[ml/min]	< 1000			
Pilot supply pressure		[bar]	20...350			
Pilot flow during step response at 210 bar		[l/min]	10	12	24	40
Static / Dynamic						
Step response at 100% stroke [2]		[ms]	10	13	19	45
Frequency response						
	Amplitude ±5 % at 210 bar	[Hz]	128	95	95	40
	Phase ±5 % at 210 bar	[Hz]	118	95	90	75
Hysteresis		[%]	< 0.1			
Sensitivity		[%]	< 0.05			
Temperature drift of Center Position		[%/K]	< 0.025			
Electrical						
Duty ratio		[%]	100			
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
Supply voltage / ripple		[V]	22...30, ripple < 5% eff., surge free			
Current consumption max.		[A]	3.5			
Pre-fusing		[A]	4.0 A medium lag			
Input signal	Code K (B) voltage	[V]	+10...0...-10, ripple < 0.01 % eff., surge free, 0...+10V P–>A (P–>B)			
	Impedance	[kOhm]	100			
	Code E voltage	[mA]	+20...0...-20, ripple < 0.01 % eff., surge free, 0...+20mA P–>B			
	Impedance	[Ohm]	250			
	Code S current	[mA]	4...12...20, ripple < 0.01 % eff., surge free, 12...20 mA P–>A			
	Impedance	[Ohm]	250			
			< 3.6 mA = enable off, > 3.8 mA = enable on acc. NAMUR NE43			
Input Capacitance typ.		[nF]	1			
Differential input max.	Code 0	[V]	30 for terminal D and E against PE (terminal G) 11 for terminal D and E against 0V (terminal B)			
	Code 5	[V]	30 for terminal 4 and 5 against PE (terminal ⏚) 11 for terminal 4 and 5 against 0V (terminal 2)			
	Code 7	[V]	30 for terminal D and E against PE (terminal G)			
Enable signal	Code 5/7	[V]	5...30, Ri = 9 kOhm			
Diagnostic signal		[V]	+10...0...-10 / +Ub, rated max. 5 mA			
EMC			EN 61000-6-2, EN 61000-6-4			
Electrical connection	Code 0/7		6 + PE acc. EN 175201-804			
	Code 5		11 + PE acc. EN 175201-804			
Wiring min.	Code 0/7	[mm²]	7 x 1.0 (AWG16) overall braid shield			
	Code 5	[mm²]	8 x 1.0 (AWG16) overall braid shield			
Wiring lenght max.		[m]	50			

[1] Flow rate for different Δp per control edge:

$$Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$$

[2] Measured with load (210 bar pressure drop/two control edges)

Electrical characterisrics hybrid option

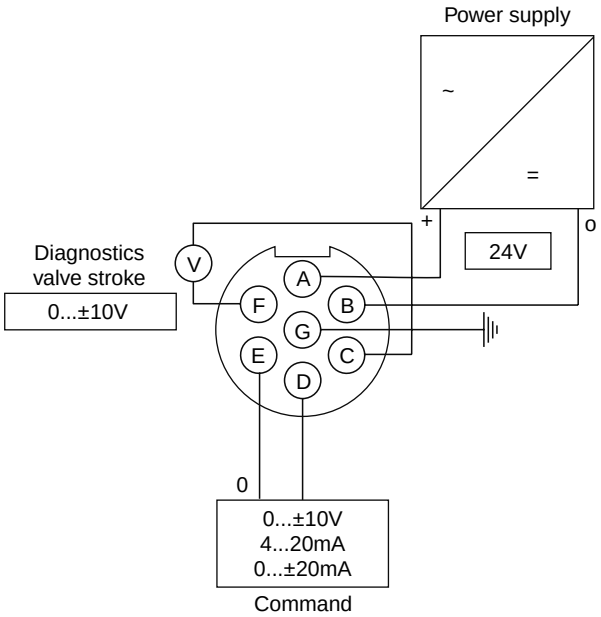
Duty ratio		100%		
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
		D41	D91	D111
Supply voltage	[V]	24	24	24
Tolernace supply voltage	[%]	±10	±10	±10
Current consumption	[A]	1.21	0.96	1.29
Power consumption	[W]	29	23	31
Solenoid connection		Connector as per EN 175301-803		
Wiring min.	[mm²]	3 x 1.5 recommended		
Wiring length max.	[m]	50 recommended		

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

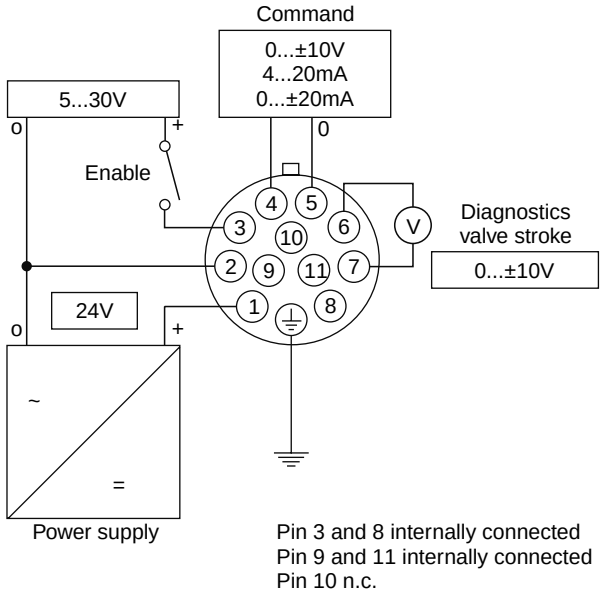
3

Wiring

Code 0, 6 + PE acc. EN 175201-804

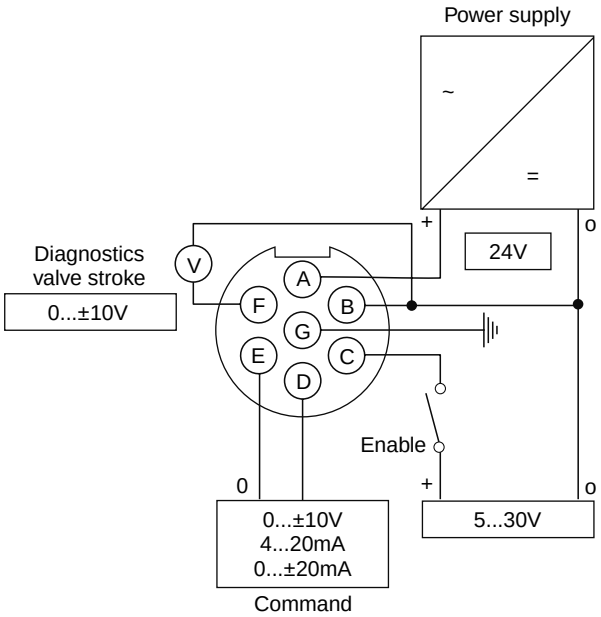


Code 5, 11 + PE acc. EN 175201-804



Pin 3 and 8 internally connected
Pin 9 and 11 internally connected
Pin 10 n.c.

Code 7, 6 + PE acc. EN 175201-804 + enable

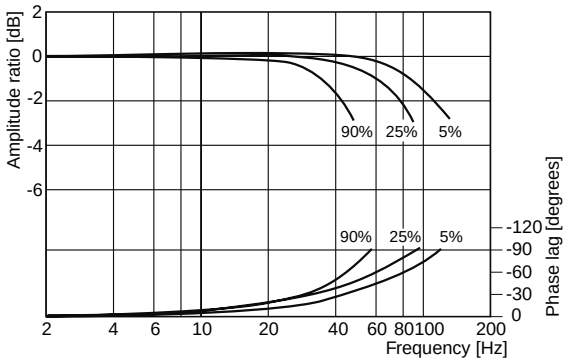


D_1FP UK.INDD RH 17.08.2011

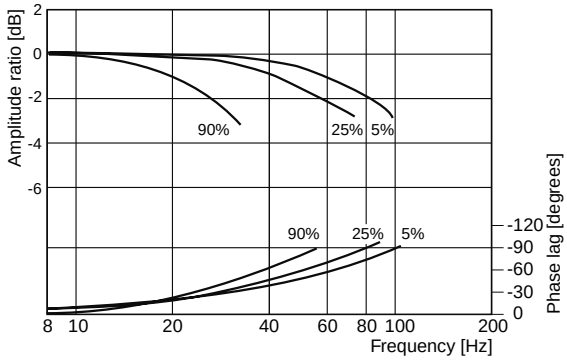
3

Frequency response
±5 % / ±25 % / ±90 % command signal
Dynamics at 210 bar pilot supply pressure

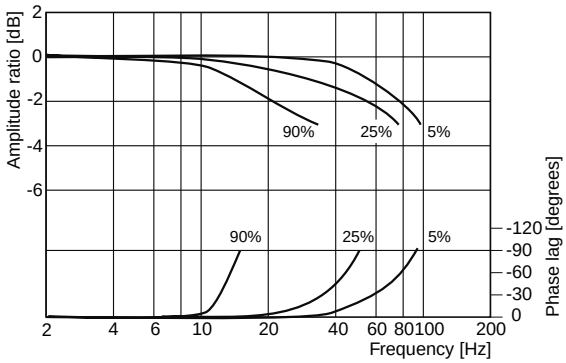
D31FP



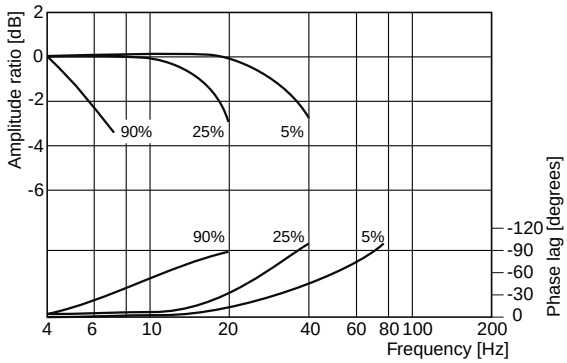
D41FP



D81/91FP

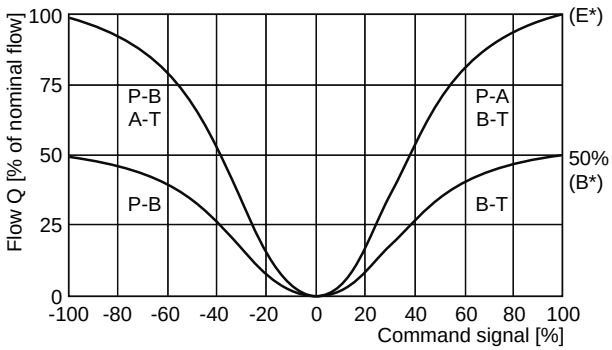


D111FP

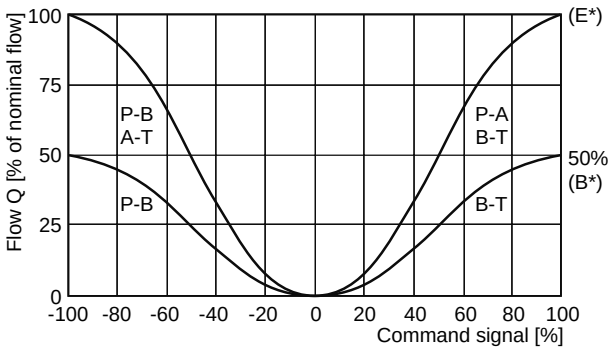


D*1FPB/E flow curves
at Δp = 5 bar per metering edge

D31FP
spool type E01/02/52, B31/32/61



D41FP
spool type E01/02/52, B31/32/61

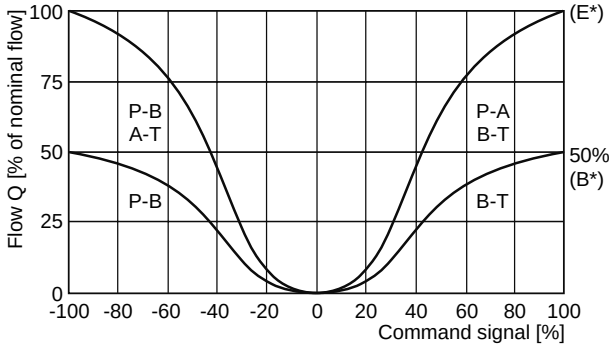


All characteristic curves measured with HLP46 at 50°C.

Flow curves

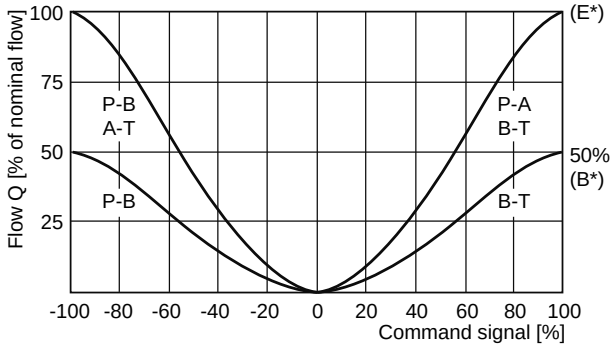
D81/91FP

Spool type E01/02/52, B31/32/61



D111FP

Spool type E01/02/52, B31/32/61

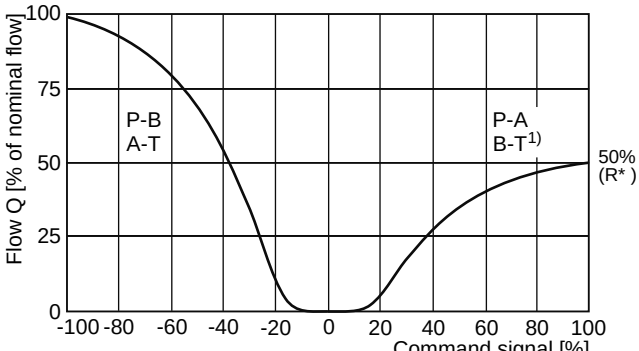


D*1FPR/Z flow curves

at Δp = 5 bar per metering edge

D31FP

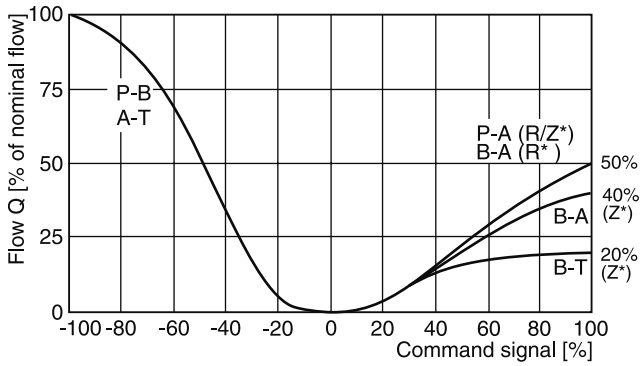
Spool type R31/32/61



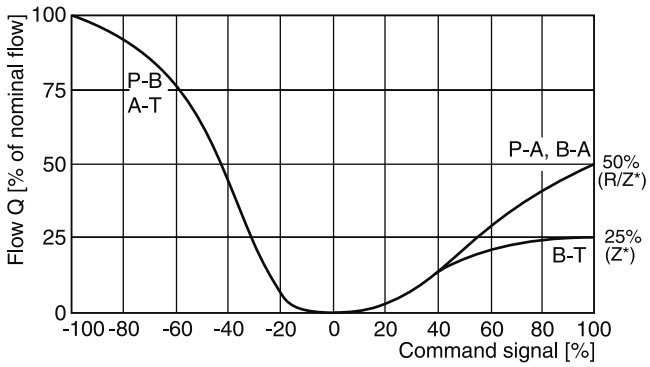
1) with 2 tank ports

D41FP

Spool type R/Z 31/32/61



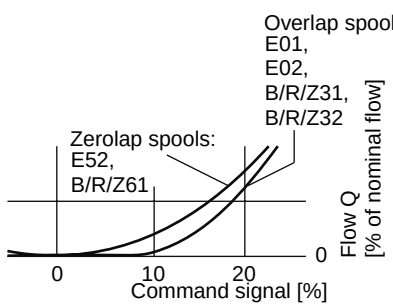
D91FP spool type R/Z 31/32/61



D111FP

spool type R/Z* on request

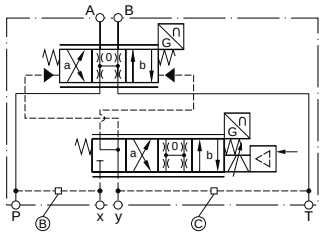
Detail:
Standard, regenerative and hybrid flow curves



Pilot oil inlet (supply) and outlet (drain)

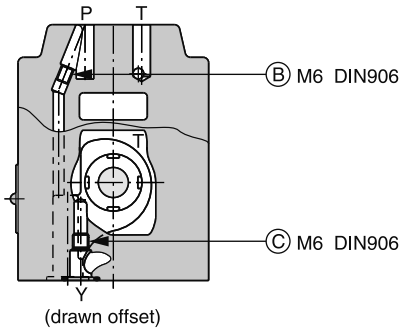
○ **open,** ● **closed**

Pilot oil Inlet	Pilot oil Drain	B	C
internal	external	○	●
external	external	●	●
internal	internal	○	○
external	internal	●	○

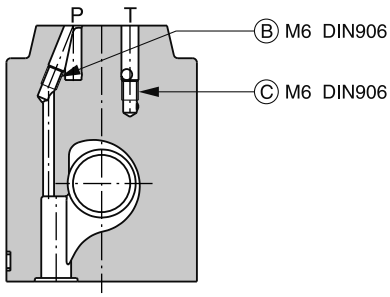


3

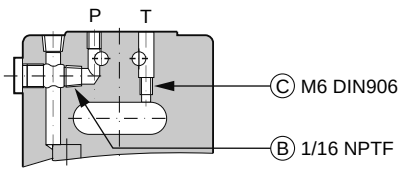
D31FPB/E



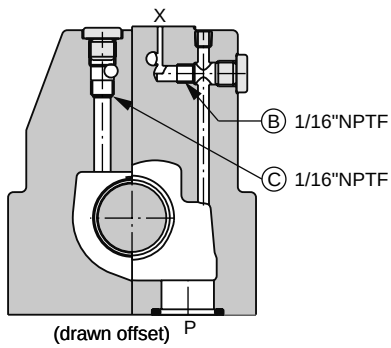
D31FPR



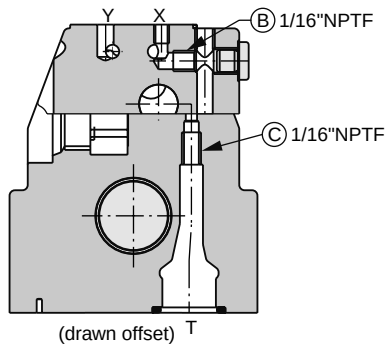
D41FPB/E



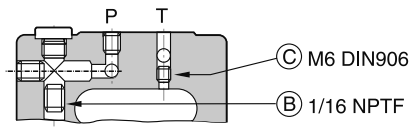
D41FPR



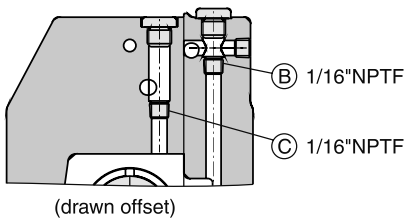
D41FPZ



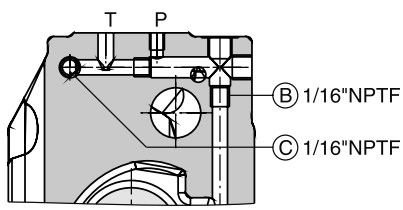
D91FPB/E



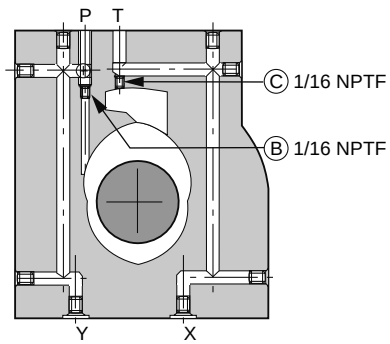
D91FPR



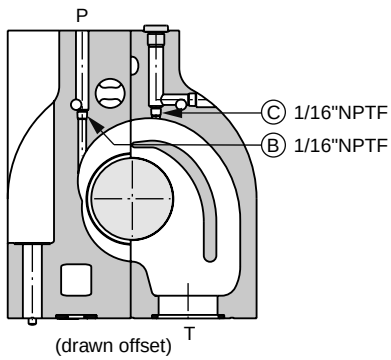
D91FPZ



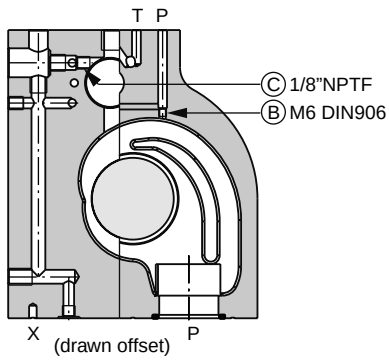
D111FPB/E



D111FPR

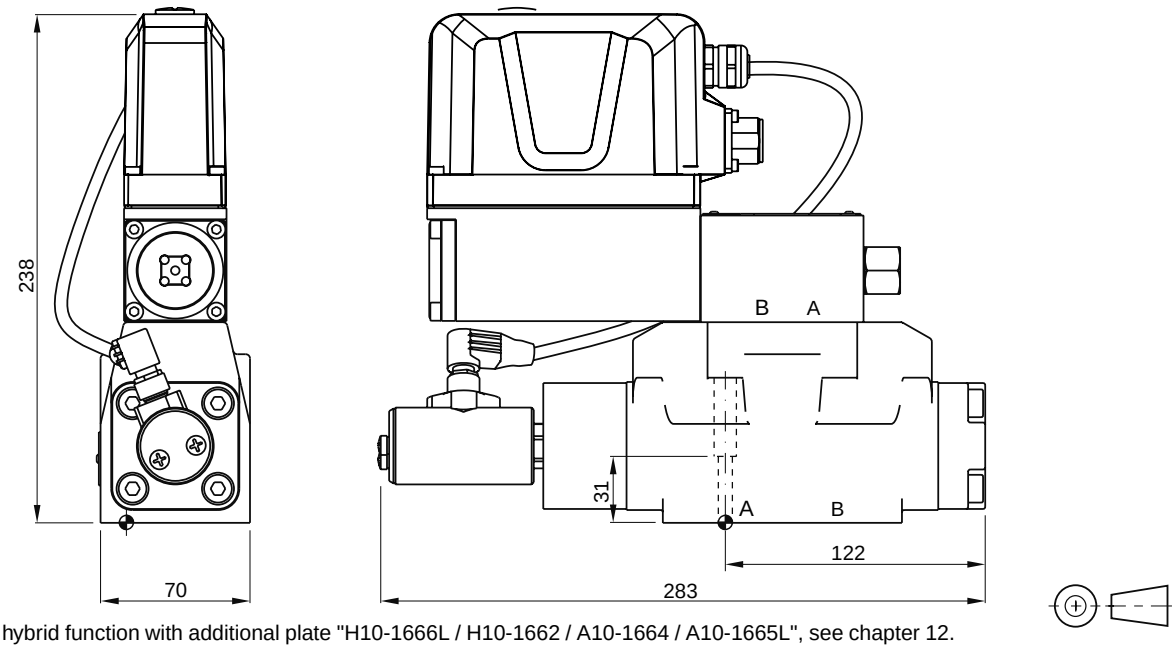


D111FPZ



D_1FP UK.INDD RH 17.08.2011

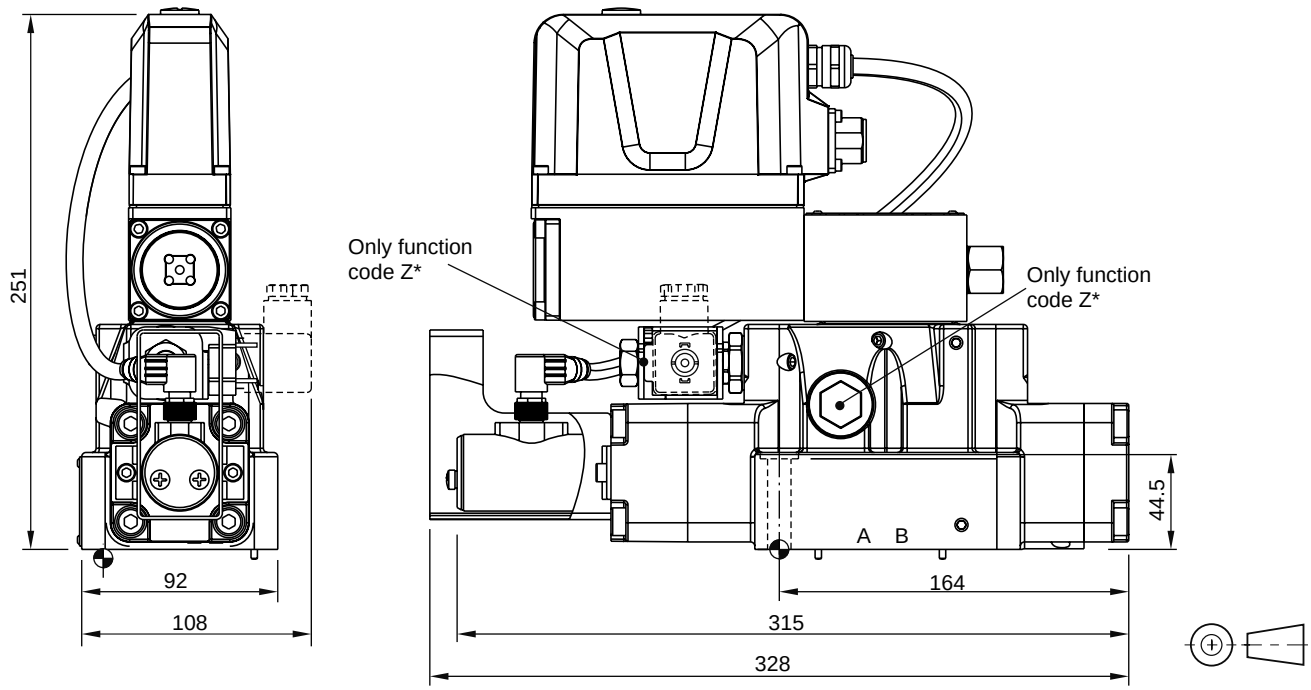
D31FP



Regenerative and hybrid function with additional plate "H10-1666L / H10-1662 / A10-1664 / A10-1665L", see chapter 12.

Surface finish	Kit			Kit
$R_{max}6.3$ 0.01/100	BK385	4x M6x40 DIN 912 12.9	13.2 Nm ±15%	NBR: SK-D31FP FPM: SK-D31FP-V

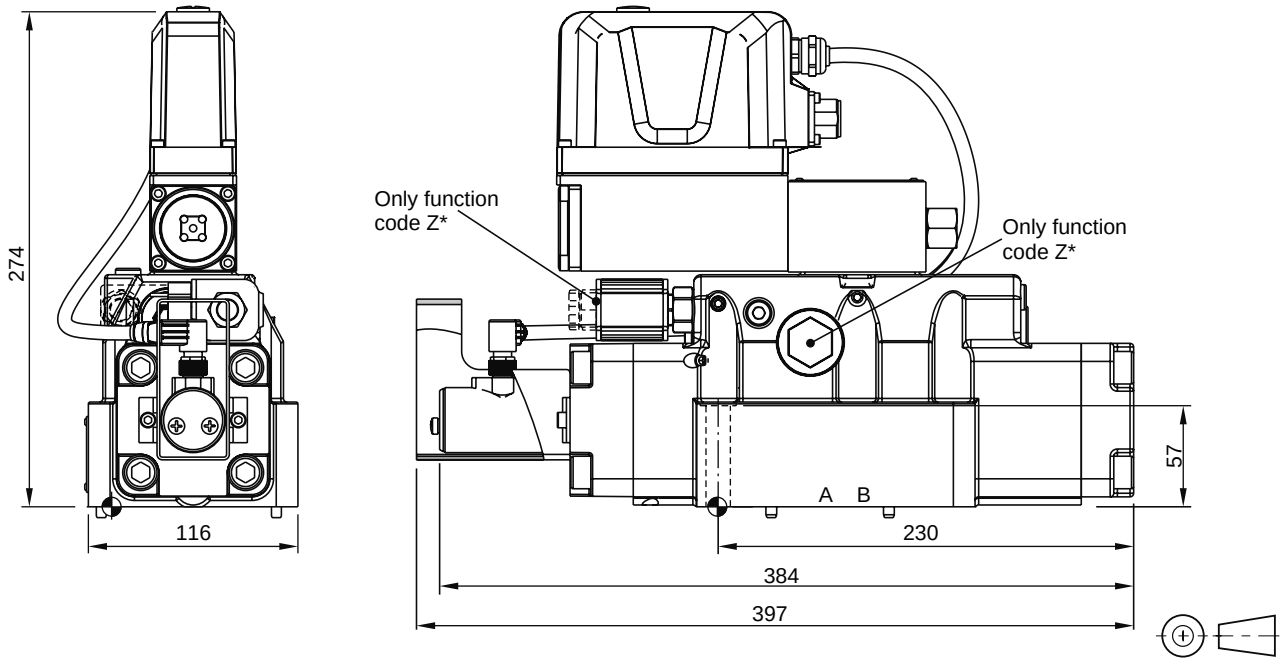
D41FP



Surface finish	Kit			Kit
$R_{max}6.3$ 0.01/100	BK320	2x M6x55 4x M10x60 DIN 912 12.9	13.2 Nm ±15% 63 Nm ±15%	NBR: SK-D41FP FPM: SK-D41FP-V

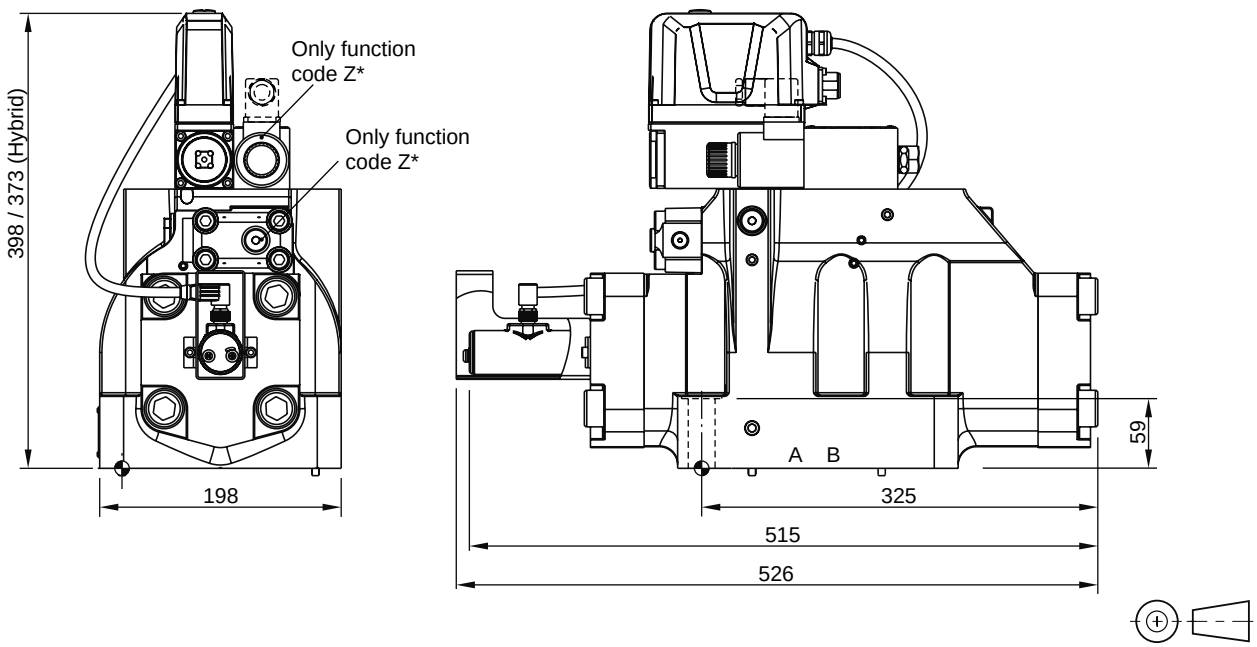
3

D81/91FP



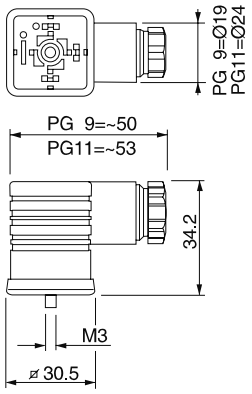
Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK360	6x M12x75 DIN 912 12.9	108 Nm ±15%	NBR: SK-D81/D91FP FPM: SK-D81/D91FP-V

D111FP



Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK386	6x M20x90 DIN 912 12.9	517 Nm ±15%	NBR: SK-D111FP FPM: SK-D111FP-V

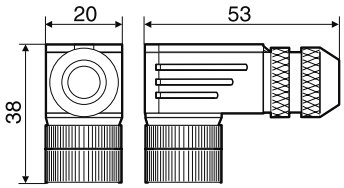
Solenoid connector
D*FB, D*1FB



Description	Variation	Order No.
EN 175301-803 2+PE	PG 9 black B	5001710
EN 175301-803 2+PE	PG 9 grey A	5001711
EN 175301-803 2+PE	PG 11 black B	5001716
EN 175301-803 2+PE	PG 11 grey A	5001717

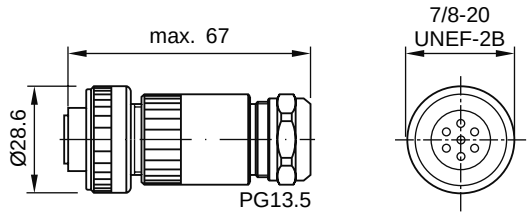
3

Monitor switch connector
D*1FB / D*1FH



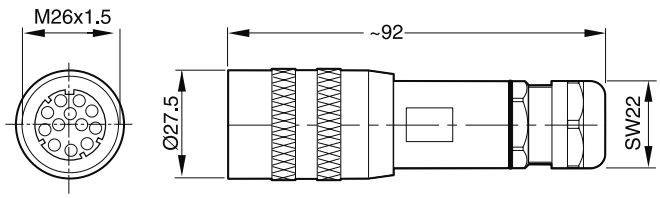
Description	Order No.
IEC 61076-2-101 M12 / 4 + PE	5004109

Central connector
D*FB OBE / D*1FB OBE / D*1FH / D*FP*0 / D*1FP*0 / D*1FP*7



Description	Order No.
EN 175201-804 6 + PE	5004072

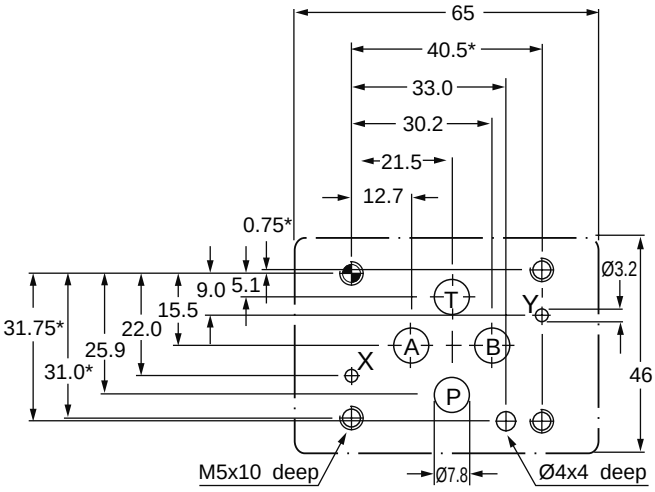
Central connector
D*FP*5 / D*1FP*5



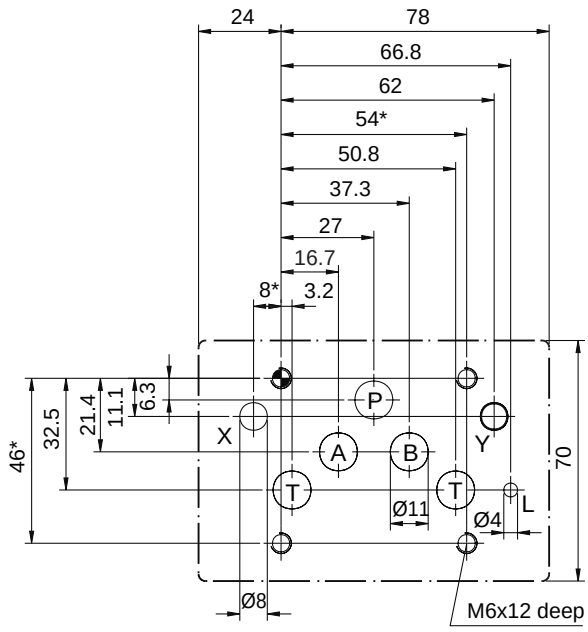
Description	Order No.
EN 175201-804 11 + PE	5004711

3

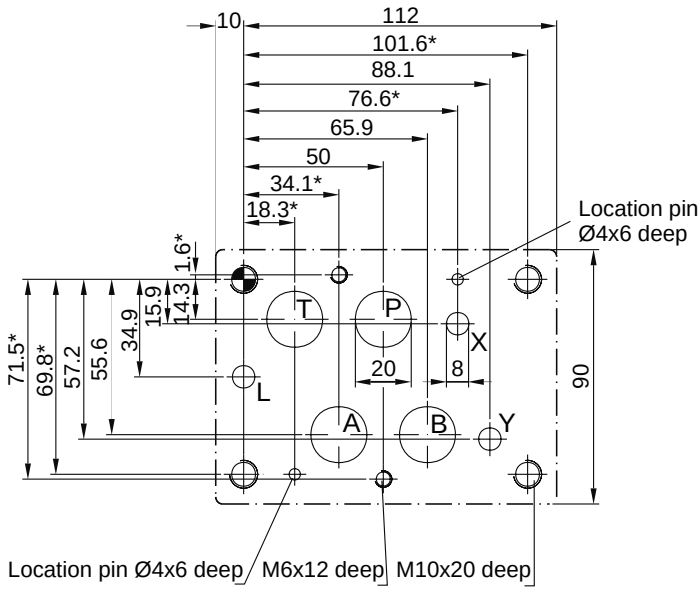
to DIN 24340-A6, size NG06/CETOP03



to DIN 24340-A10, size NG10/CETOP05



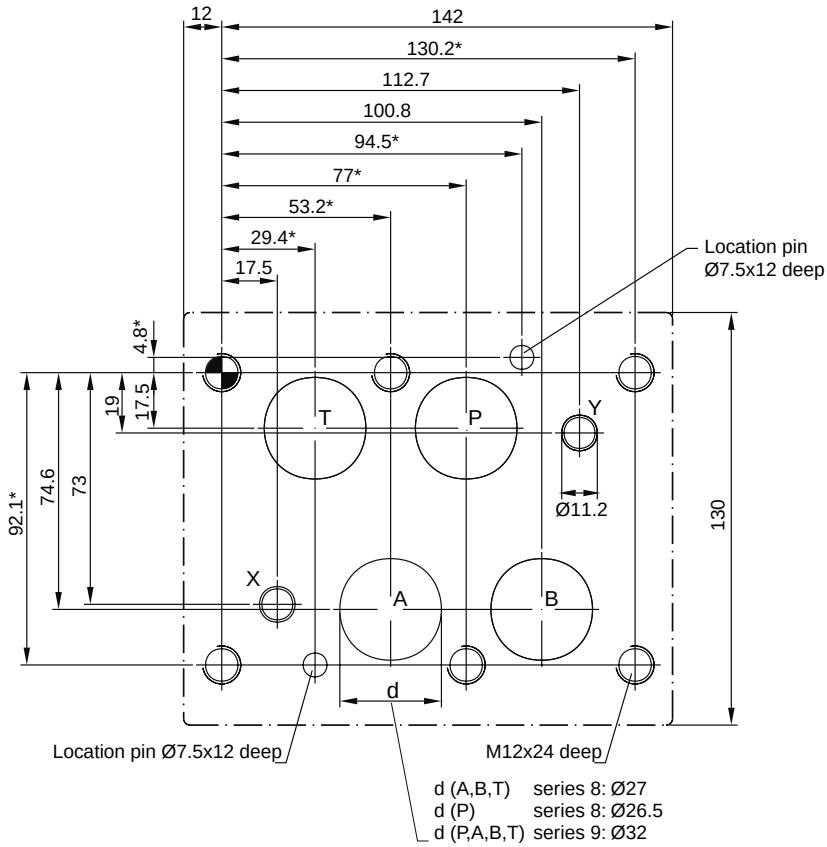
to DIN 24340-A16, size NG16/CETOP07



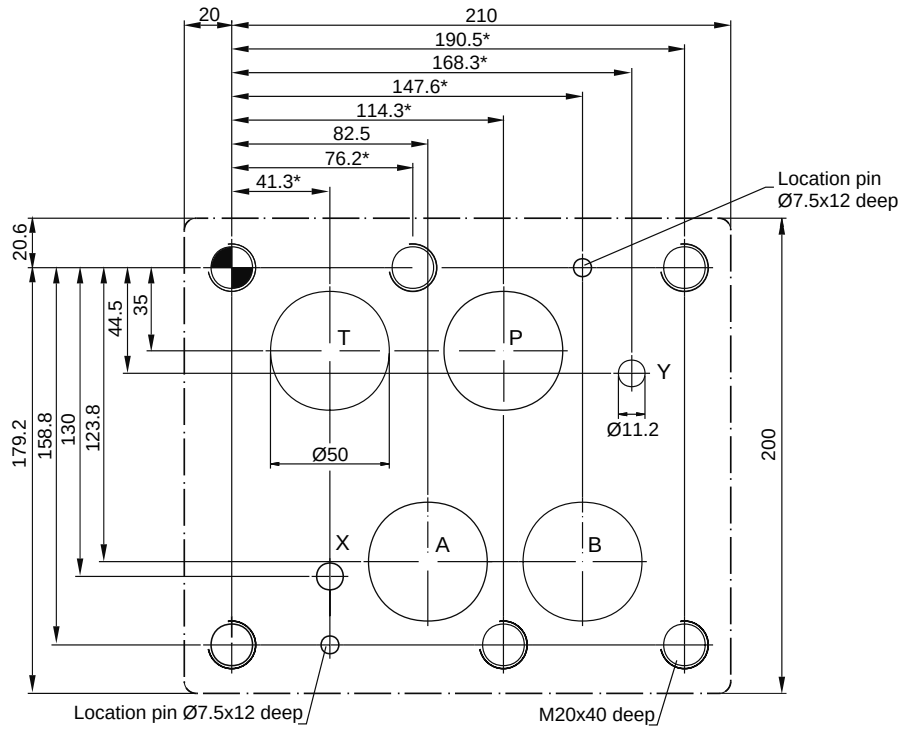
With * marked dimensions ± 0.1mm.
All other dimensions ± 0.2mm.

Subplates and manifolds see chapter 12.

to DIN 24340-A25, size NG25/CETOP08



to DIN 24340-A32, size NG32/CETOP10



With * marked dimensions ± 0.1mm.
All other dimensions ± 0.2mm.

Subplates and manifolds see chapter 12.

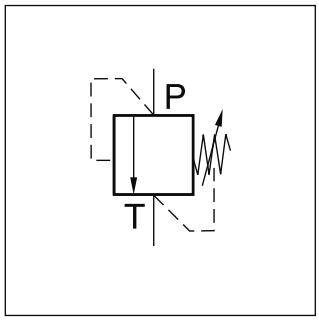
Access03.INDD RH 15.08.2011

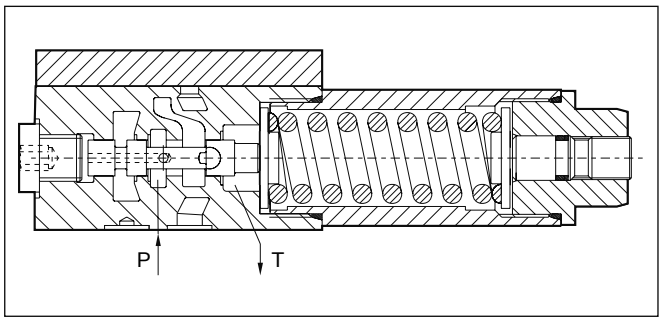
Notes

More pressure valves are presented in the following chapters:
Chapter 7: Sandwich Valves
Chapter 8: Slip-In Cartridge Valves
Chapter 9: SAE Flange Valves
Chapter 10: Valves for Pipe Mounting

Notes

The pressure relief valve VS is a direct operated spool valve for subplate mounting. The connection and function is according to ISO 6264.





Function

- Spool type valve
- Subplate mounting according to ISO 6264
- 5 pressure stages
- 2 adjustment modes
- Gauge port

Ordering code

VS		A	06	V	G		
Pressure relief valve	**Pressure stages**	**Adjustment screw with hexagon socket**	**Nominal size**	**FPM Seals**	**Gauge port G1/4“**	**Lock**	**Design series** (not required for ordering)

Code	Pressure stages
025	up to 25 bar
064	**up to 64 bar**
160	**up to 160 bar**
210	**up to 210 bar**
350	up to 350 bar

Code	Lock
omit	**Normal**
Z	Key lock

Bold letters =
Short-term availability

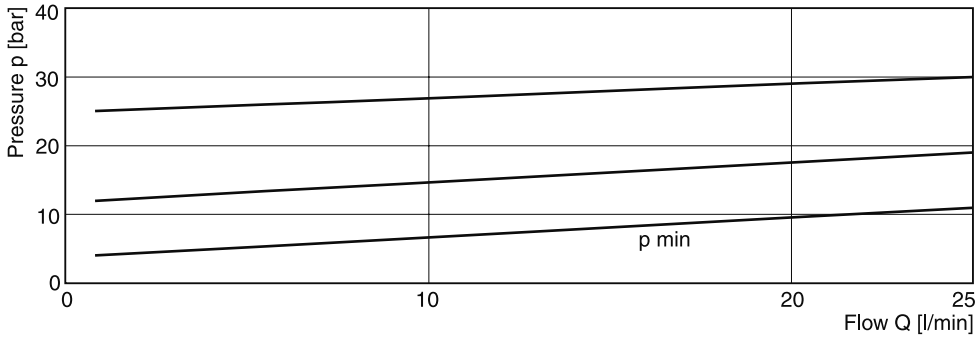
Technical data

General		
Design		Direct operated relief valves spool type
Nominal size		DIN NG06 / CETOP03 / NFPA D03
Interface		Subplate mounting according to ISO 6264
Mounting position		unrestricted
Ambient temperature	[°C]	-20...+80
$MTTF_D$ value	[years]	150
Weight	[kg]	1.3
Hydraulic		
Max. operating pressure	[bar]	Port P 350, Port T depressurized
Pressure stages	[bar]	25, 64, 160, 210, 350
Nominal flow	[l/min]	25
Fluid		Hydraulic oil according to DIN 51524...51525
Fluid temperature	[°C]	Recommended +30...+50, permitted -20...+70
Viscosity permitted recommended	[cSt] / [mm²/s] [cSt] / [mm²/s]	20...380 30...50
Filtration		ISO 4406 (1999); 18/16/13 (acc. NAS 1638:7)

VS UK.INDD RH 06.09.2011

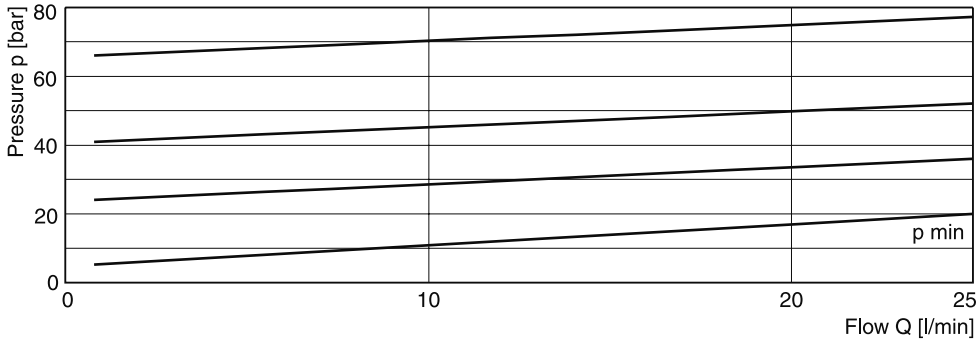
p/Q performance curves

Pressure stage 25 bar

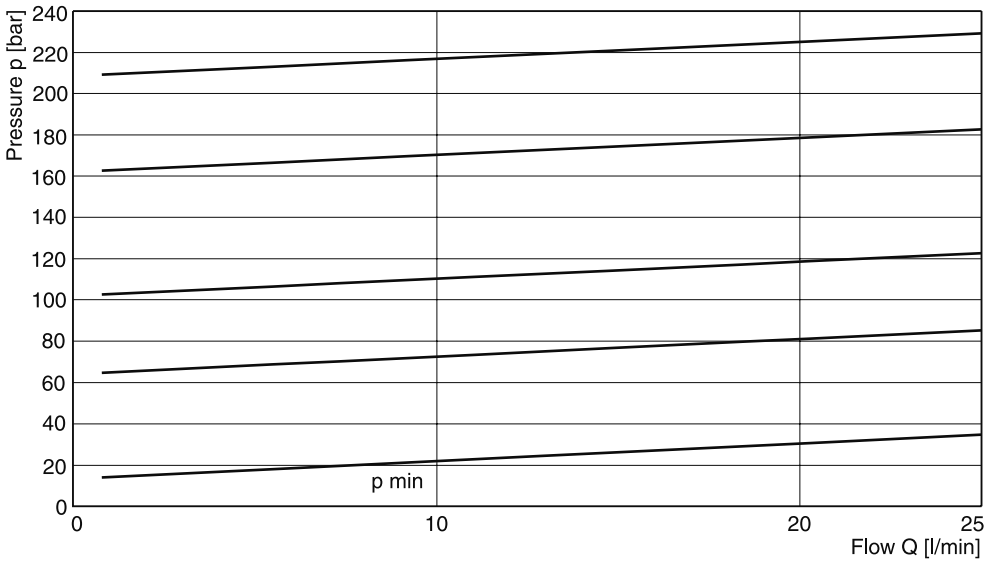


4

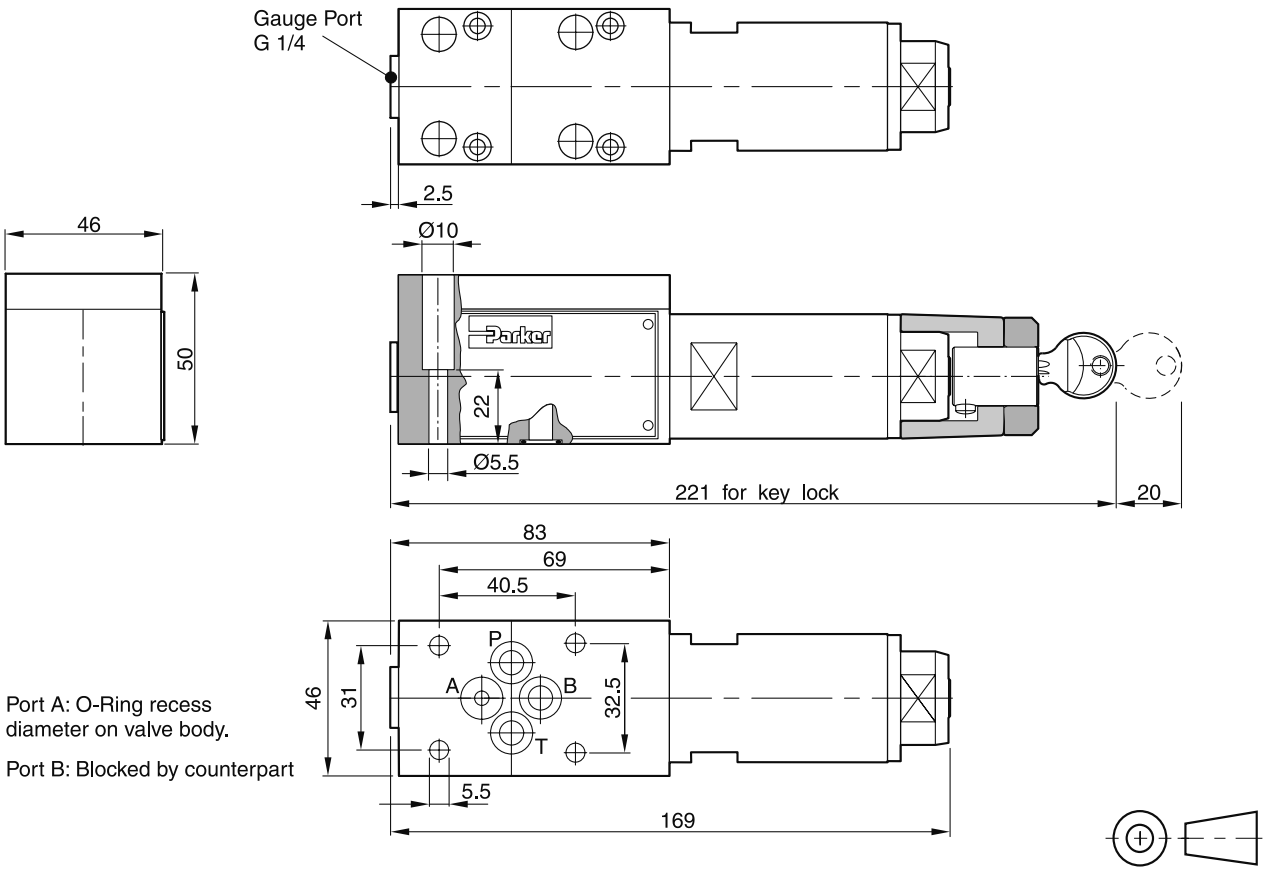
Pressure stage 64 bar



Pressure stage 160, 210 and 350 bar

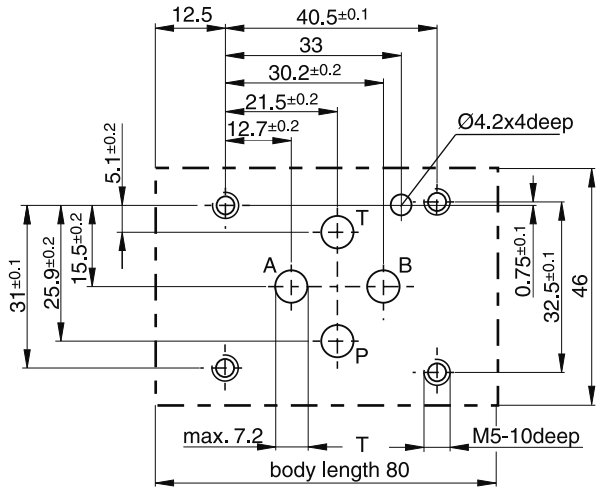


All characteristic curves measured with HLP46 at 50°C.



Surface finish	Bolt kit			Kit FPM
$\sqrt{R_{max}6.3}$ 0.01/100	BK375	4xM5x30 DIN 912 12.9	7.6 Nm ±15%	SK-VB/VM/VS-A06V

Mounting pattern ISO 6264, code 6264-03-04-*-97



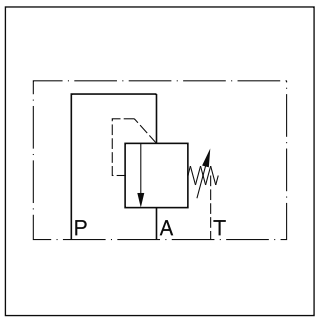
Notes

Direct operated pressure relief valve with manual adjustment. The series VB can also be used as a pressure sequence valve, because of the high pressure capability in the outlet port and the external drain port.

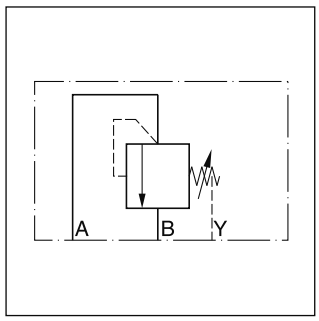
VB*A10

Features

- Spool type valve
- Subplate mounting according to ISO 5781
- 5 pressure stages at NG06
- 3 pressure stages at NG10
- 2 adjustment modes

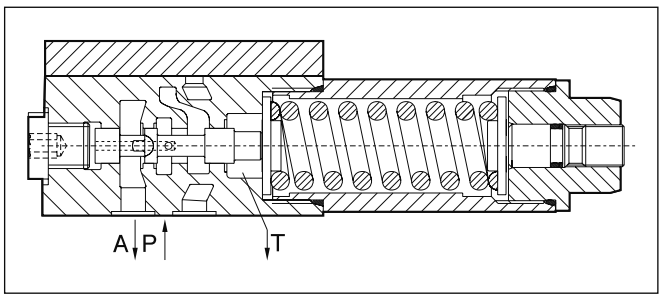


VB*A06

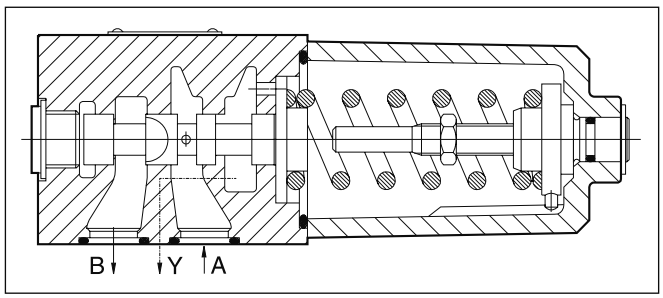


VB*A10

VB*A06



VB*A10



Ordering code

VB		A		V				
Pressure relief valve	Pressure stages	Adjustment screw with hexagon socket	Nominal size	FPM Seals	Gauge port	Lock	Design series (not required for ordering)	

Code	Pressure stages
025 [1]	up to 25 bar
064	**up to 64 bar**
125 [2]	**up to 125 bar**
160 [1]	**up to 160 bar**
210	**up to 210 bar**
350 [1]	up to 350 bar

[1] only NG 06
[2] only NG 10

Code	Lock
omit	**Normal**
Z	Key lock

Code	Gauge port
G [1]	**G 1/4”**
M [2]	**M18x1.5**

Code	Nominal size
06	**NG 06**
10	**NG 10**

Bold letters =
Short-term availability

Technical data

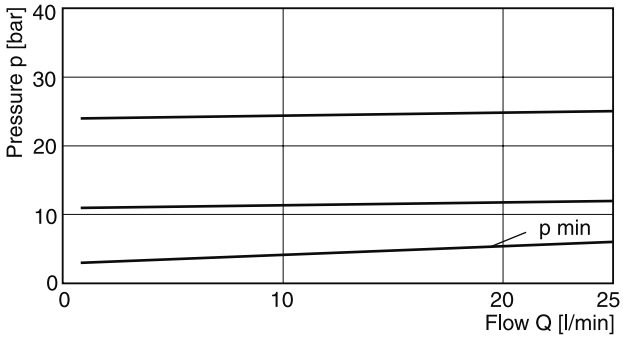
General			
Design		Direct operated pressure relief valve, spool type	
Nominal size		NG 06 (CETOP 03 / NFPA D03)	NG 10 (CETOP 05 / NFPA D05)
Interface		Subplate mounting according to ISO 5781	
Mounting position		unrestricted	
Ambient temperature	[°C]	-20...+80	
$MTTF_D$ value	[years]	150	
Weight	[kg]	1.3	3.7
Hydraulic			
Max. operating pressure	[bar]	Port P and A 350 Port T depressurized	Port A and B 315 Port Y depressurized
Pressure stages	[bar]	25, 64, 160, 210, 350	64, 125, 210
Nominal flow	[l/min]	25	60
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature	[°C]	-20...+70	
Viscosity recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30...50 20...380	
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)	

4

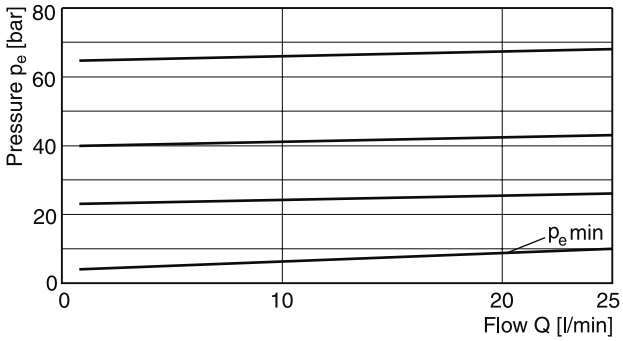
p/Q performance curves

VB*06

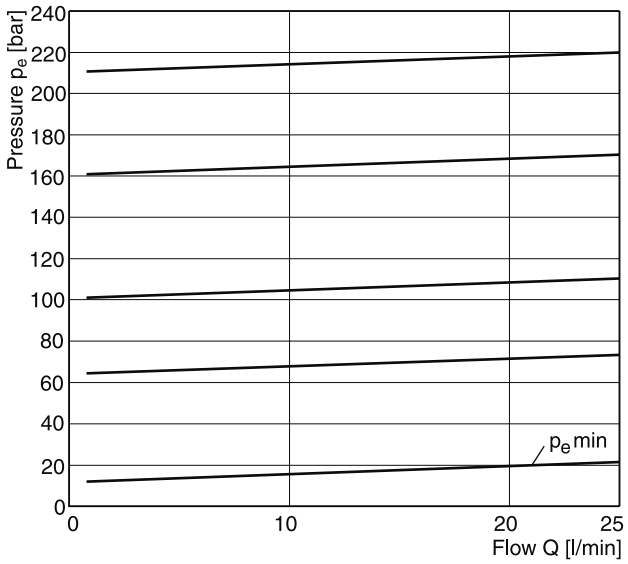
Setting pressure max. 25 bar



Setting pressure max. 64 bar

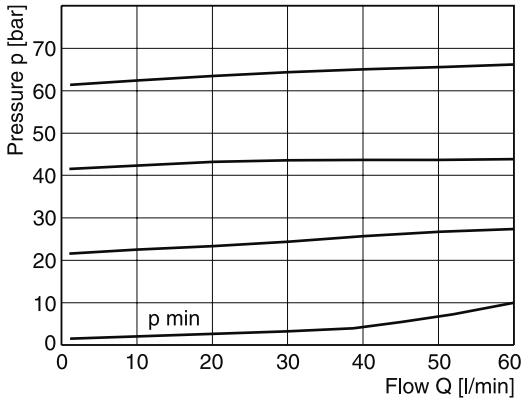


Setting pressure max. 160 or 210 bar

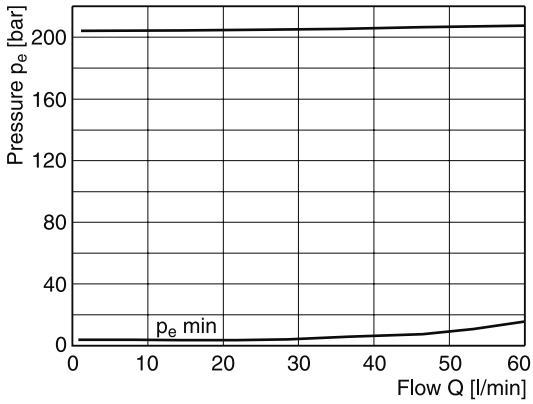


VB*10

Setting pressure max. 64 bar

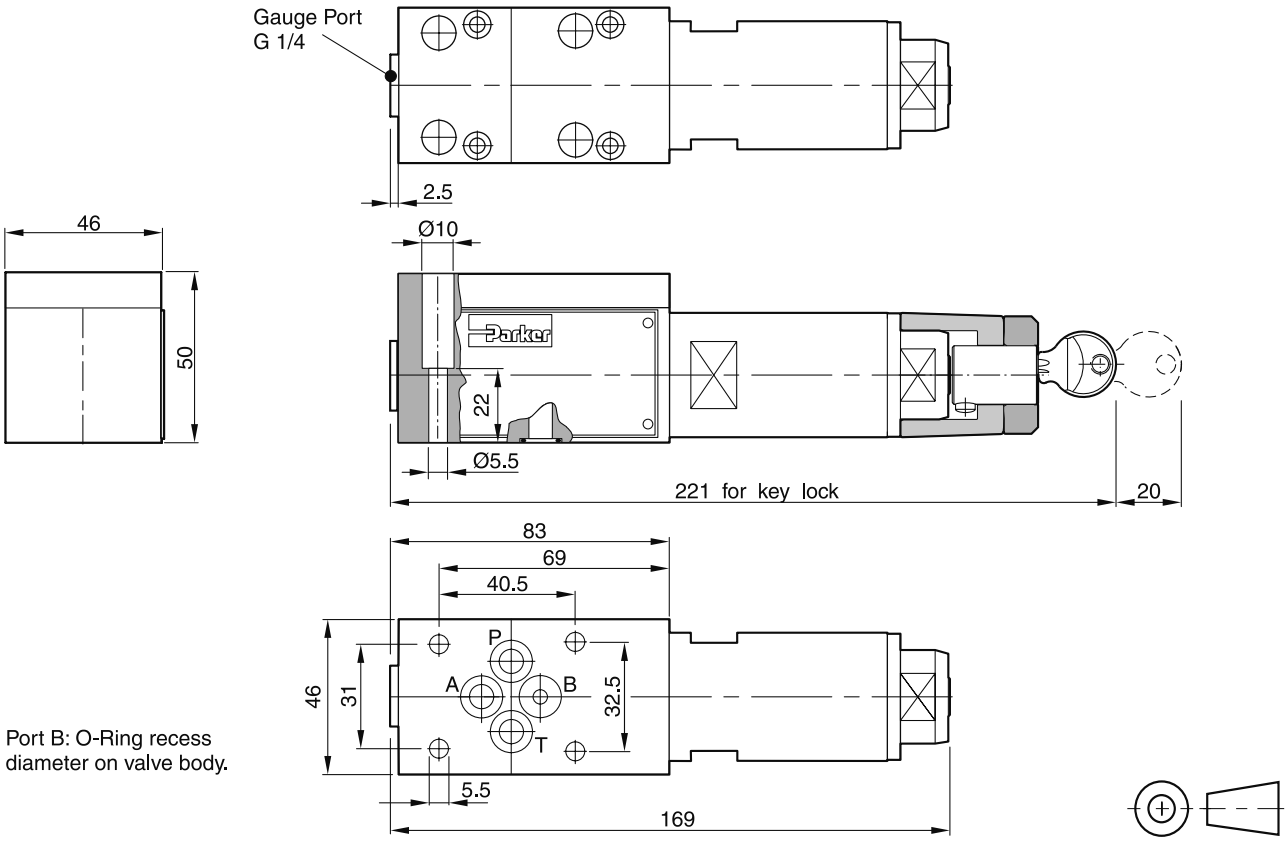


Setting pressure max. 210 bar



All characteristic curves measured with HLP46 at 50°C.

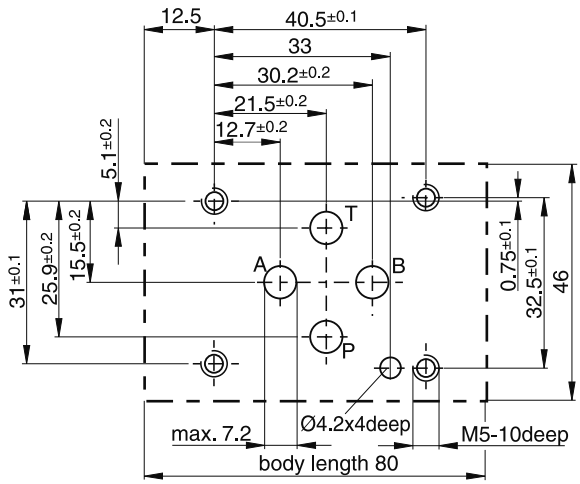
NG06



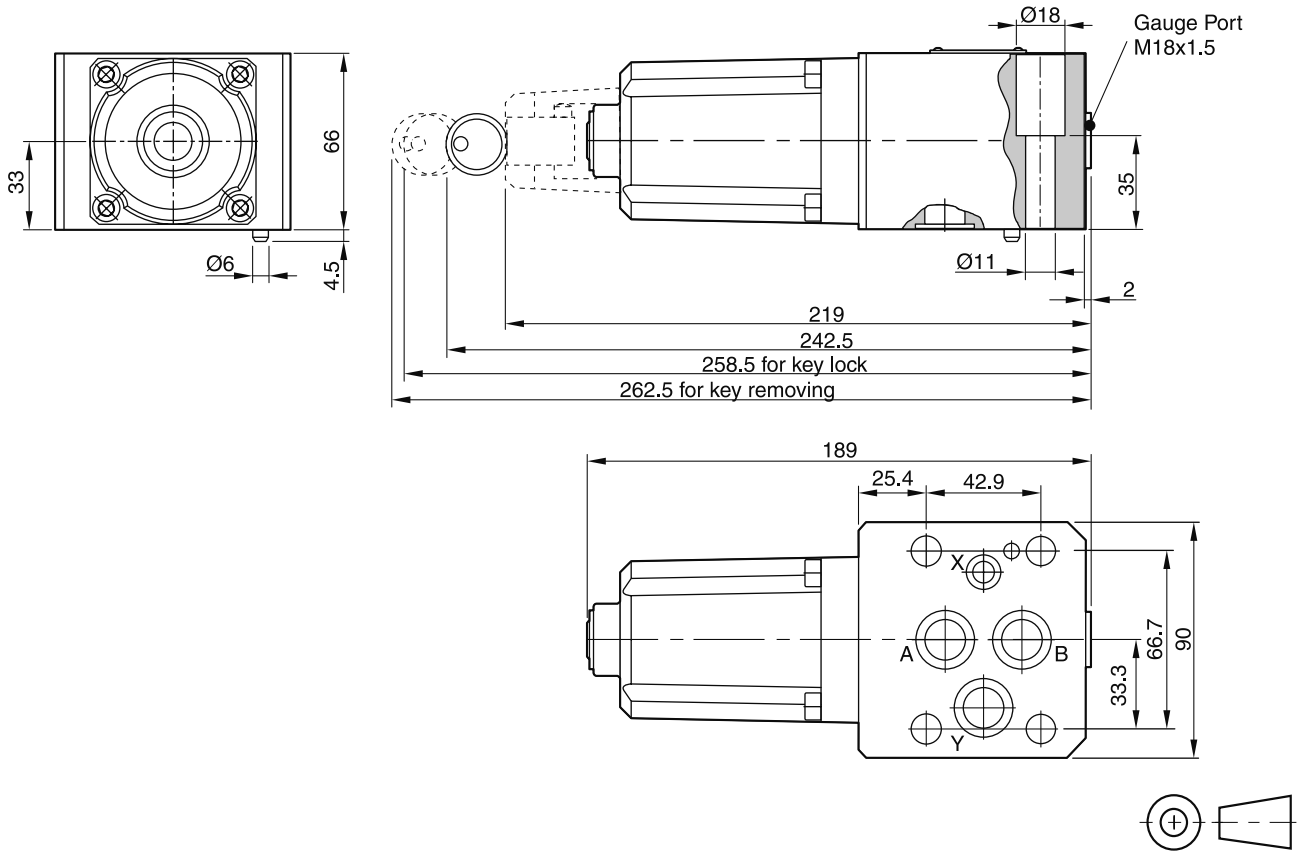
Port B: O-Ring recess diameter on valve body.

Surface finish	Bolt kit			Kit FPM
R_{max}6.3 ▱ 0.01/100	BK375	4xM5x30 DIN 912 12.9	7.6 Nm ±15%	SK-VB/VM/VS-A06V

Mounting pattern ISO 5781-03-04-0-00

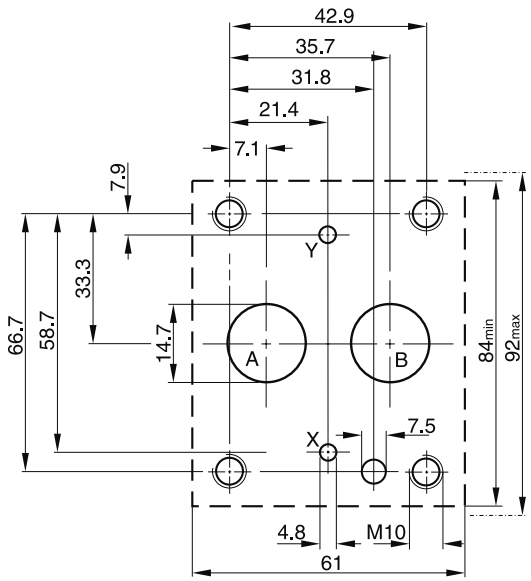


NG10



Surface finish	Bolt kit			Kit FPM
R_{max}6.3 0.01/100	BK389	4xM10x50 DIN 912 12.9	63 Nm ±15%	SK-VB/VM-A10V

Mounting pattern ISO 5781-06-07-0-00



Notes

Pilot operated relief valves of the series VBY consist of a pilot with manual adjustment and a spool type main stage. The valves need to be externally drained.

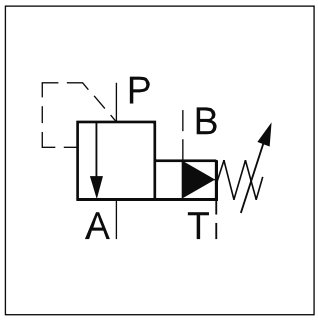
The series VBY can also be used as pressure sequence valve, because of the high pressure capability in the outlet port and the external drain port.

Features

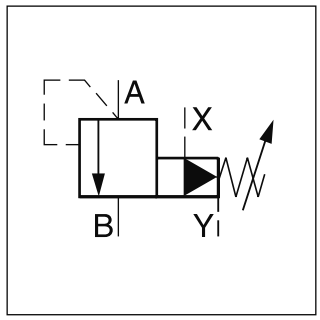
- Subplate mounting acc. to ISO 5781
- Main stage spool type
- Pilot stage seated type
- 4 pressure stages
- 2 adjustment modes
  - screw with hexagon socket
  - Key lock

VBY*A06

VBY*A10

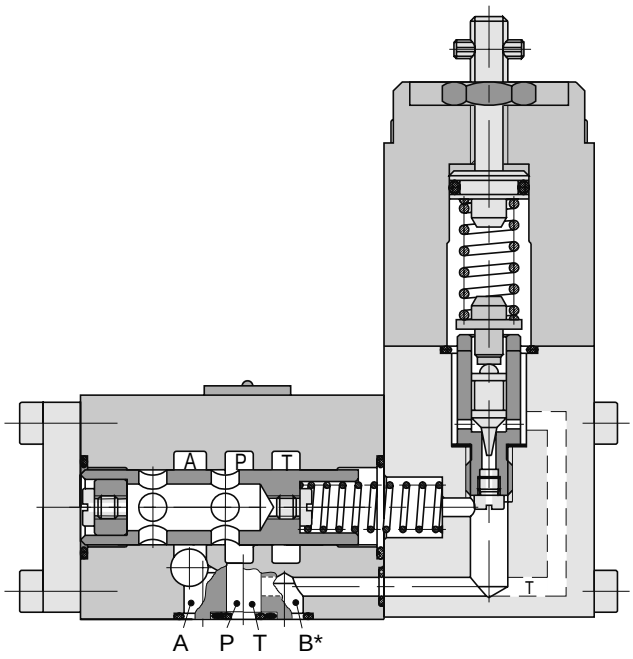


VBY*A06



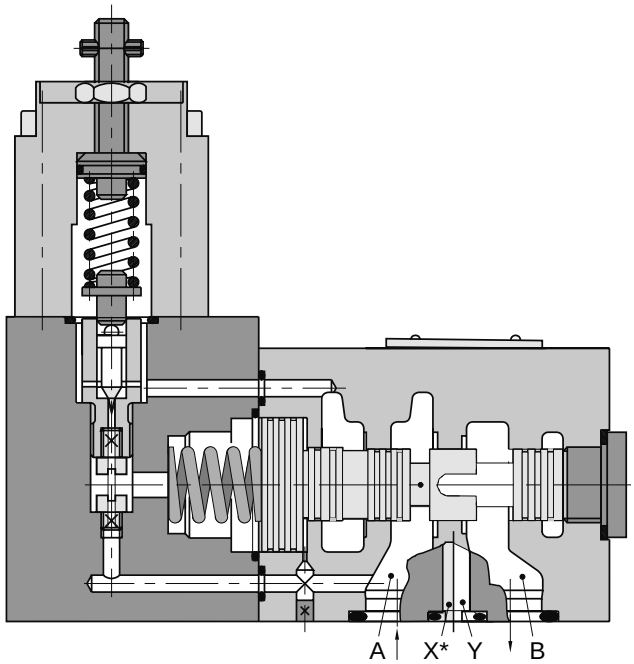
VBY*A10

VBY*A06



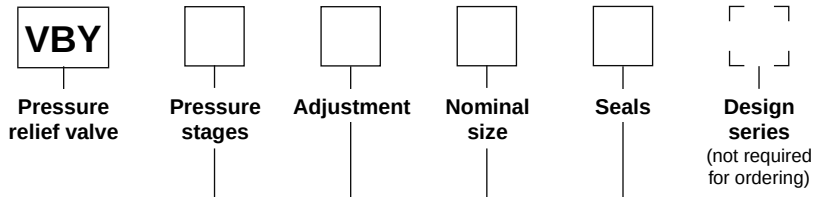
* Port B for remote control, otherwise to be blocked

VBY*A10



* Port X for remote control, otherwise to be blocked

Ordering code



Code	Pressure stages
064	**up to 64 bar**
160	**up to 160 bar**
210	**up to 210 bar**
315	up to 315 bar

Code	Adjustment
A	**Screw with hexagon socket**
H	Key lock

Code	Seals
N	**NBR**
V	FPM

Code	Nominal size
06	**NG06**
10	**NG10**

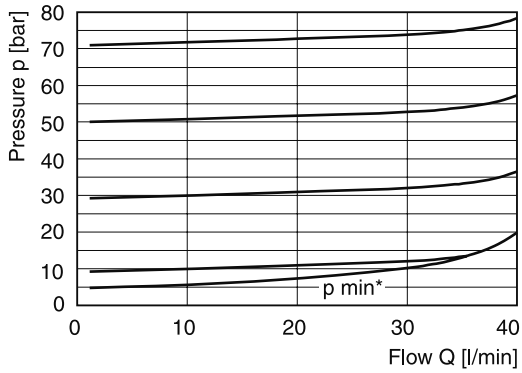
Bold letters =
Short-term availability

Technical data

General			
Design		Pilot operated pressure relief valve, spool type	
Nominal size		NG06	NG10
Interface		Subplate mounting according to ISO 5781	
Mounting position		unrestricted	
Ambient temperature	[°C]	-20...+80	
$MTTF_D$ value	[years]	75	
Weight	[kg]	2.4	4.5
Hydraulic			
Max. operating pressure	[bar]	P, A, B 315	A, B, X 315
External drain port pressure	[bar]	T 100	Y 100
Pressure stages	[bar]	64, 160, 210, 315	
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature	[°C]	-20...+70	
Viscosity, recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30...50 20...380	
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)	
Nominal flow	[l/min]	See p/Q curves	
Pilot oil flow	[cm³/min]	approx. 500	approx. 1000

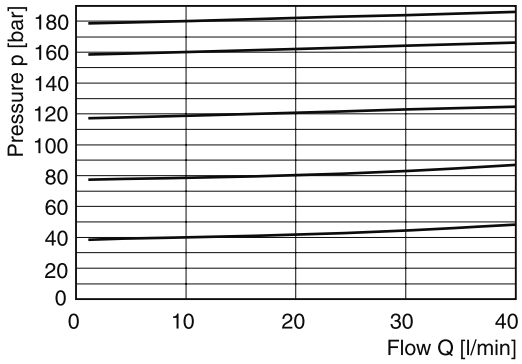
p/Q performance curves NG06

Max. 64 bar

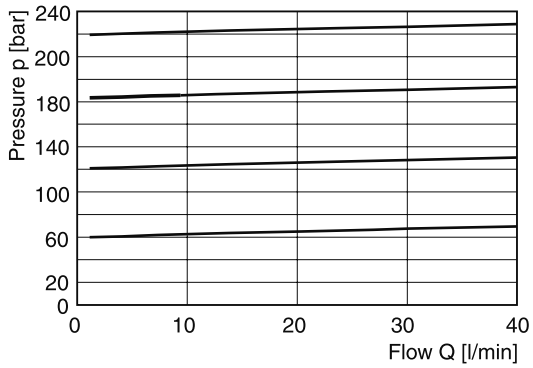


* for all pressure stages

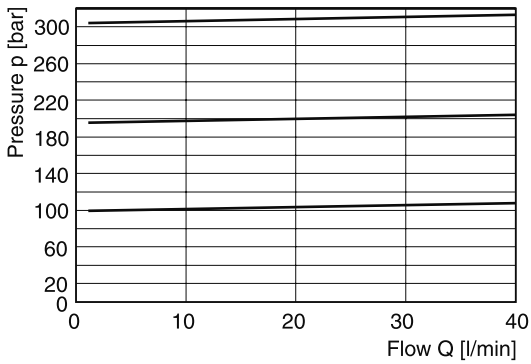
Max. 160 bar



Max. 210 bar

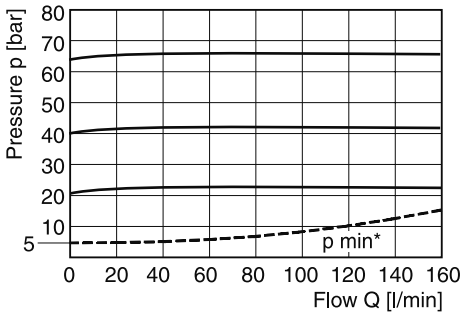


Max. 315 bar



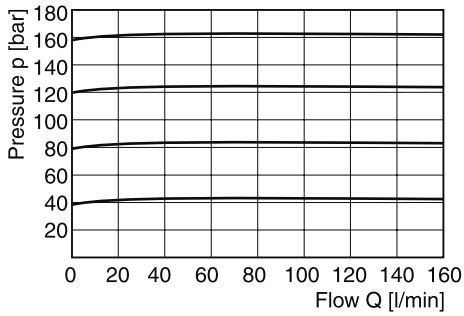
p/Q performance curves NG10

Max. 64 bar

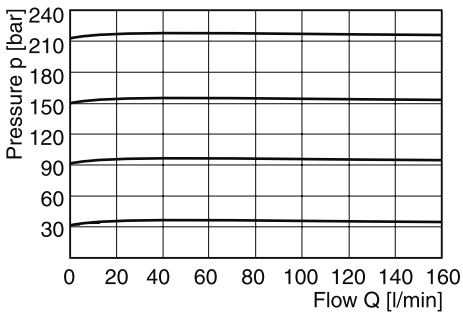


* for all pressure stages

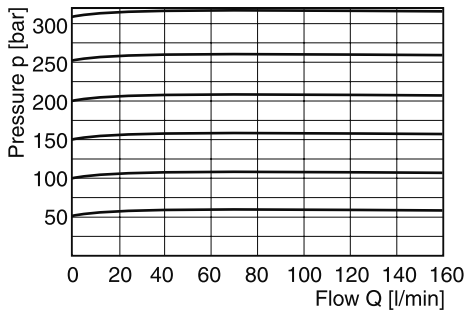
Max. 160 bar



Max. 210 bar



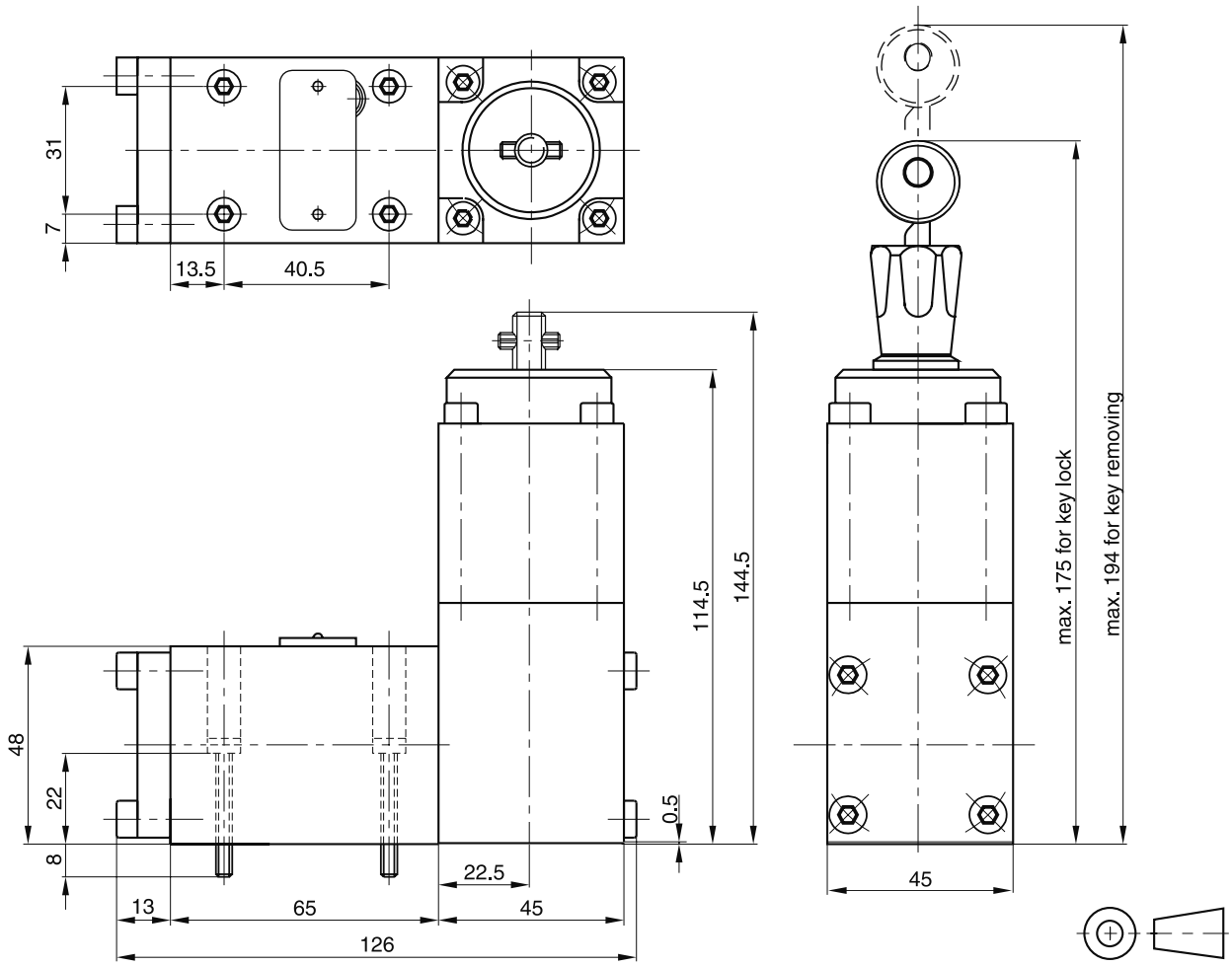
Max. 315 bar



All characteristic curves measured with HLP46 at 50°C.

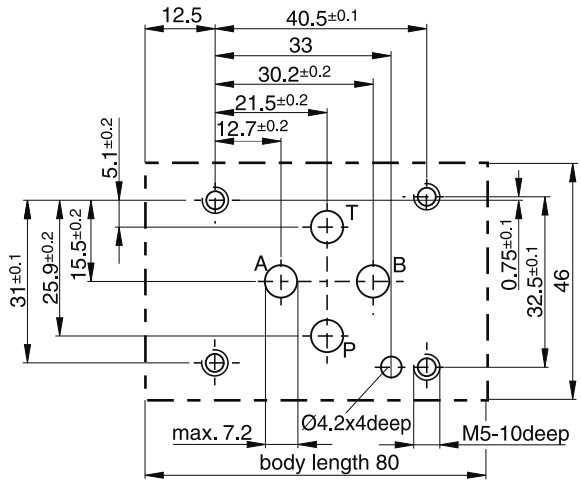
VBY UK.INDD RH 06.09.2011

NG06

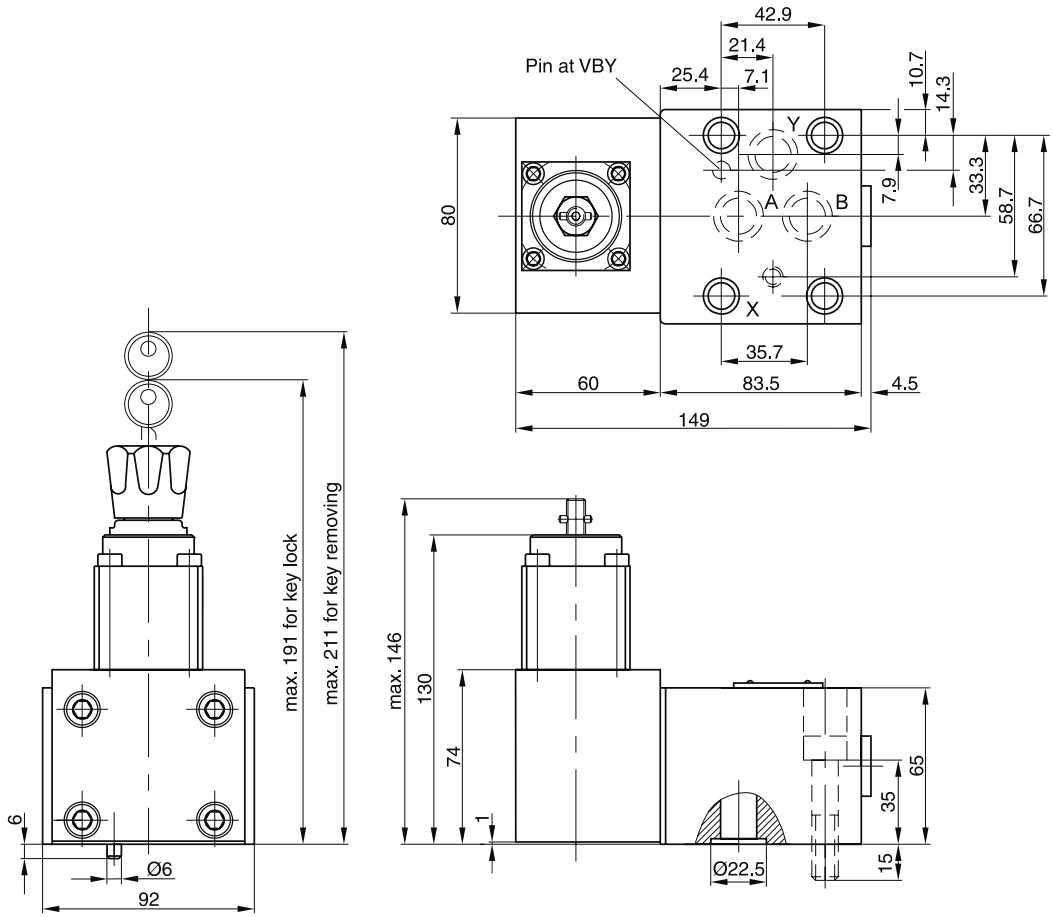


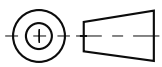
Surface finish	Bolt kit			Kit FPM
$\sqrt{R_{max}}6.3$ 0.01/100	BK375	4xM5x30 DIN 912 12.9	7.6 Nm ±15%	SK-VBY-A06V

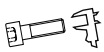
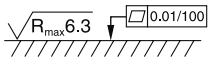
Mounting pattern ISO 5781-03-04-0-00



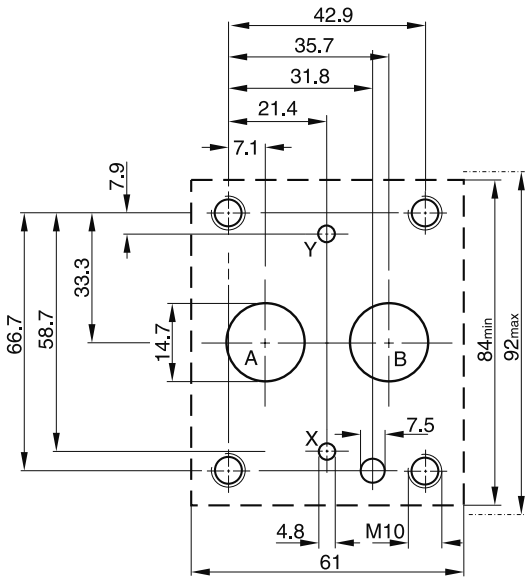
NG10





Surface finish	Bolt kit			Kit FPM
	BK389	4xM10x50 DIN 912 12.9	63 Nm ±15%	SK-VB/VM-A10V

Mounting pattern ISO 5781-06-07-0-00



Notes

The direct operated pressure relief valve series EVSA is a seated type valve for screw-in mounting. It is available in two sizes and three pressure stages.

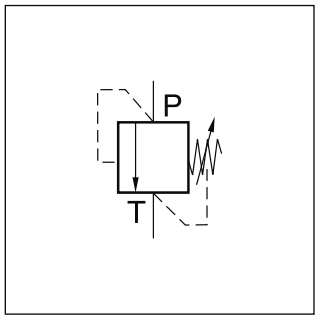
Function

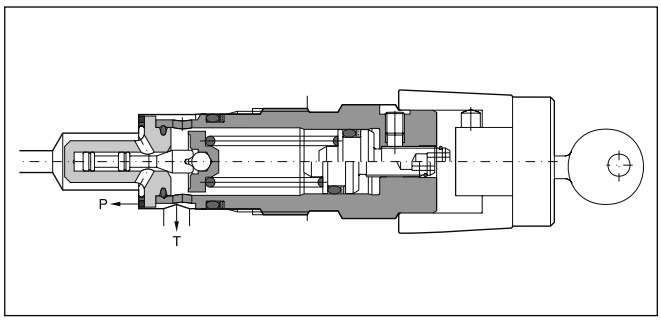
When the pressure in port P exceeds the setting pressure the cone opens to port T and thus limits the pressure in port P to the adjusted level.

The integrated damping spool prevents pressure fluctuations in the transition region. The pressure is set by the adjusting screw, which is locked by the clamping screw. The setting can optionally be secured by a cylinder lock (key lock).

Features

- Seated type valve
- Screw-in mounting
- 3 pressure stages
- 2 adjustment modes
  - screw with hexagon socket
  - key lock





Note

The spring must be unloaded when the EVSA is screwed out of the manifold.

4

Technical data

General			
Design		Direct operated relief valve, seated type	
Nominal size		NG06	NG10
Interface		Screw-in mounting	
Mounting position		unrestricted	
Ambient temperature	[°C]	-20...+80	
$MTTF_D$ value	[years]	150	
Weight	[kg]	0.3	0.45
Hydraulics			
Max. operating pressure	[bar]	Port P 315, Port T depressurized	
Pressure stages	[bar]	64, 160, 315	
Nominal flow	[l/min]	40 (NG06), 80 (NG10)	
Fluid		Hydraulic oil according to DIN 51524...525	
Fluid temperature	[°C]	Recommended +30...+50, permitted -20...+70	
Viscosity permitted	[cSt] / [mm²/s]	20...380	
recommended	[cSt] / [mm²/s]	30...50	
Filtration		ISO 4406 (1999); 18/16/13 (acc. NAS 1638:7)	

Ordering code

EVSA		A		1		
Pressure relief valve	Pressure stages	Adjustment screw with hex. socket	Nominal size / thread type	FPM Seals	Design series (not required for ordering)	Lock

Code	Pressure stages
064	**up to 64 bar**
160	**up to 160 bar**
315	**up to 315 bar**

Code	Lock
omit	**Normal**
Z	Key lock

Code	Nominal size
06	**NG06, M28x1.5**
10	**NG10, M35x1.5**

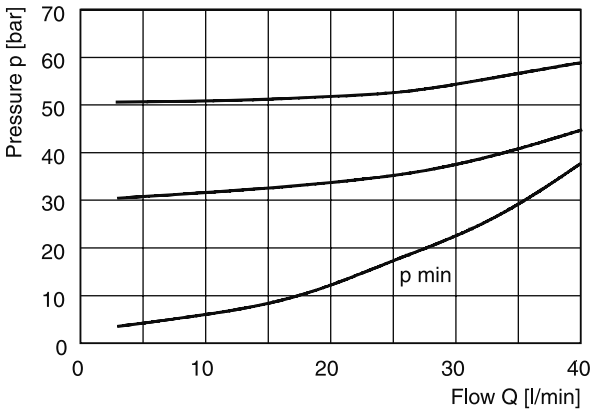
Bold letters =
Short-term availability

4

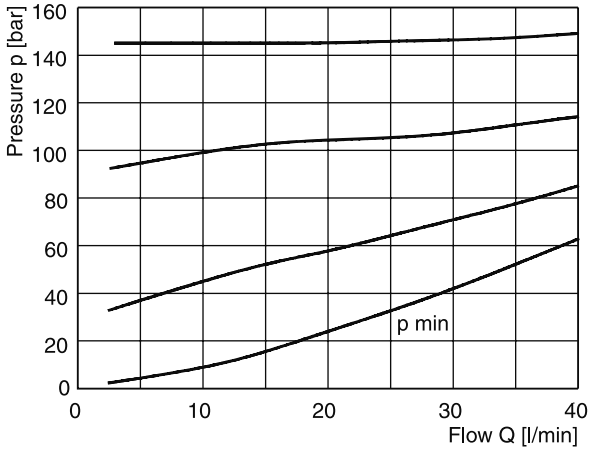
Δp/Q performance curves

NG06

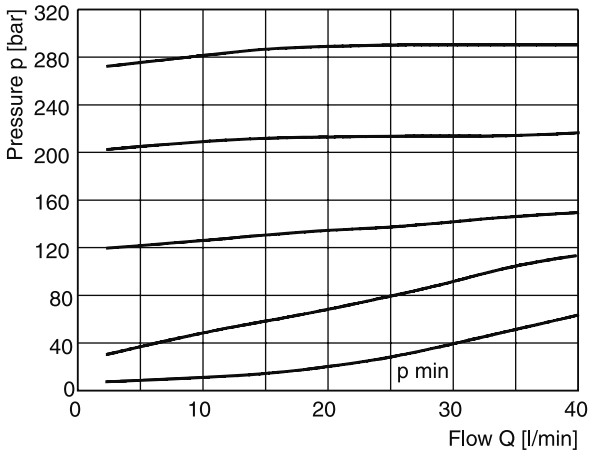
Pressure stage 64 bar



Pressure stage 160 bar

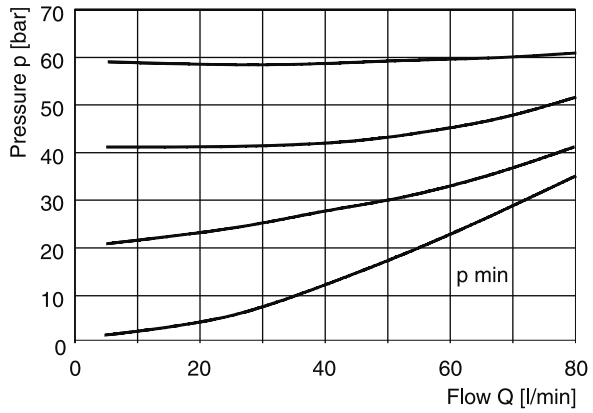


Pressure stage 315 bar

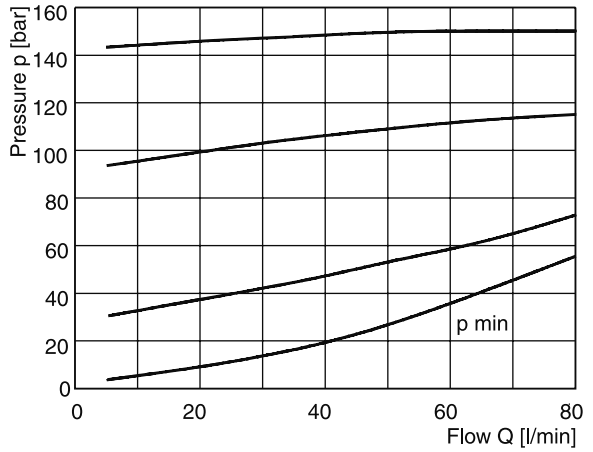


NG10

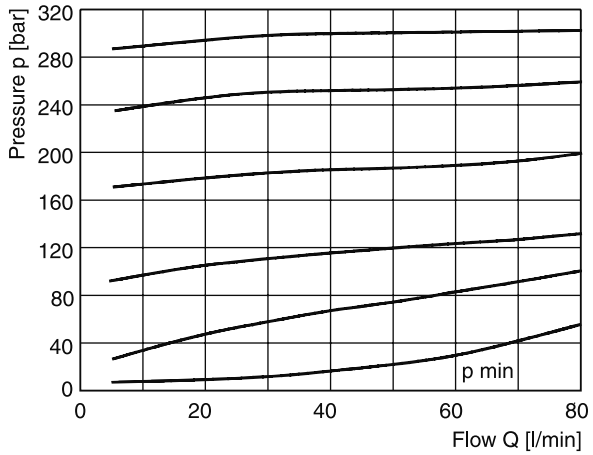
Pressure stage 64 bar



Pressure stage 160 bar

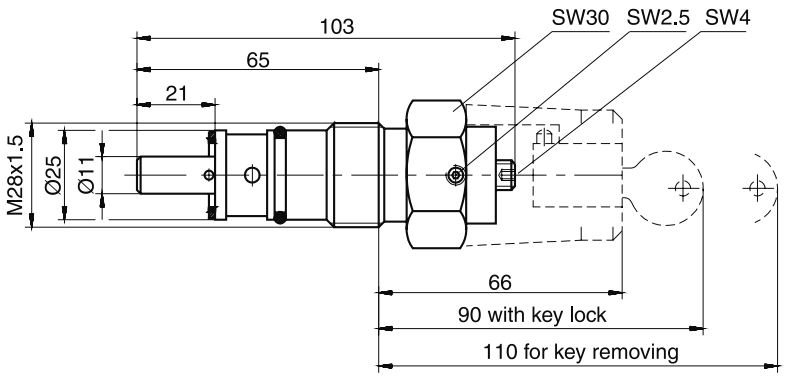


Pressure stage 315 bar



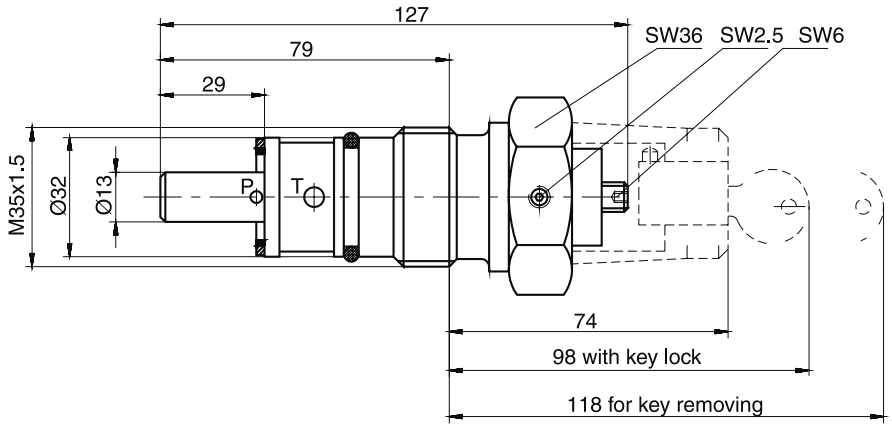
All characteristic curves measured with HLP46 at 50°C.

EVSA NG06



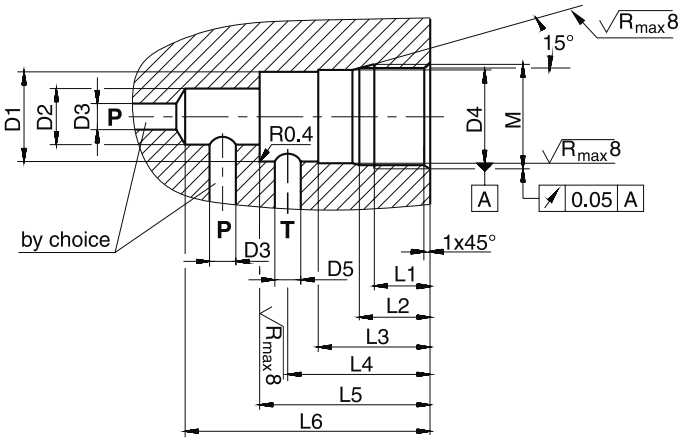
Kit
SK-EVSAA0613

EVSA NG10



Kit
SK-EVSAA1013

Installation dimensions



Size	M	D_1	D_2	D_3	D_4	D_5	L_1	L_2	L_3	L_4	L_5	L_6
NG06	M28 x 1.5	Ø24.8	Ø15	Ø6.8	$Ø25^{H9}$	Ø6.8	15	19	30	35	45	65
NG10	M35 x 1.5	Ø31.8	Ø18.5	Ø10	$Ø32^{H9}$	Ø10	18	23	35	41 - 46	52	80

Notes

Direct operated pressure relief valves series R1E02 are seated type valves typically used for remote control of pilot operated pressure valves or compensators of variable pumps. In applications where the reliability and simplicity of a hydraulic remote control are preferred to an electro-hydraulic system the R1E02 series is an ideal solution.

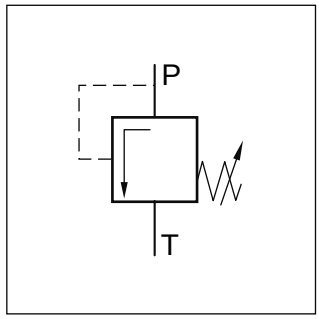
Features

- Seated type valve
- 3 body variants:
  - foot mounting
  - front panel mounting
  - subplate mounting
- 3 pressure stages
- 3 adjustment modes
  - hand knob
  - acorn nut with lead seal
  - adjusting with lock

Foot mounting

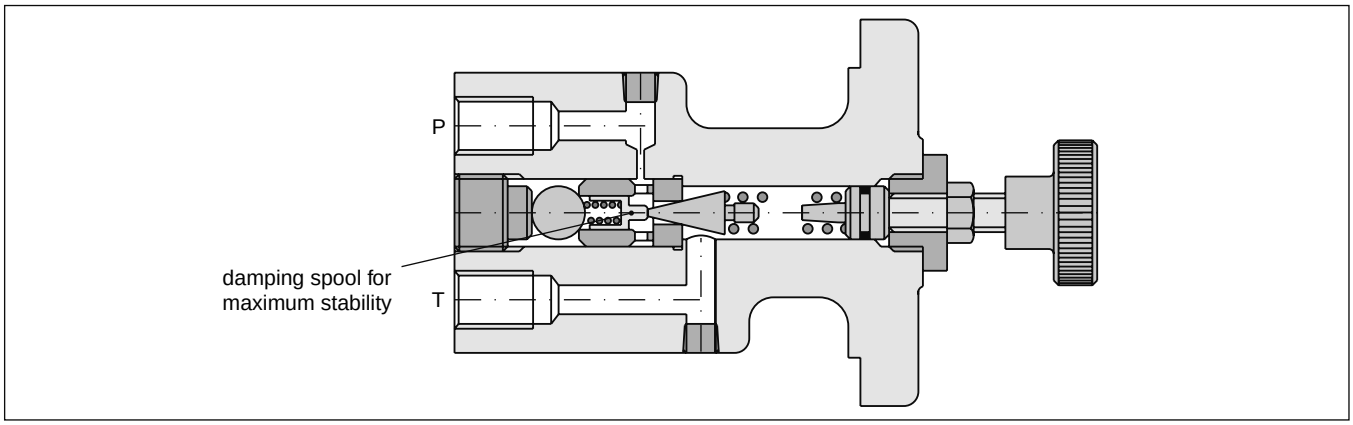
Front panel mounting

Subplate mounting

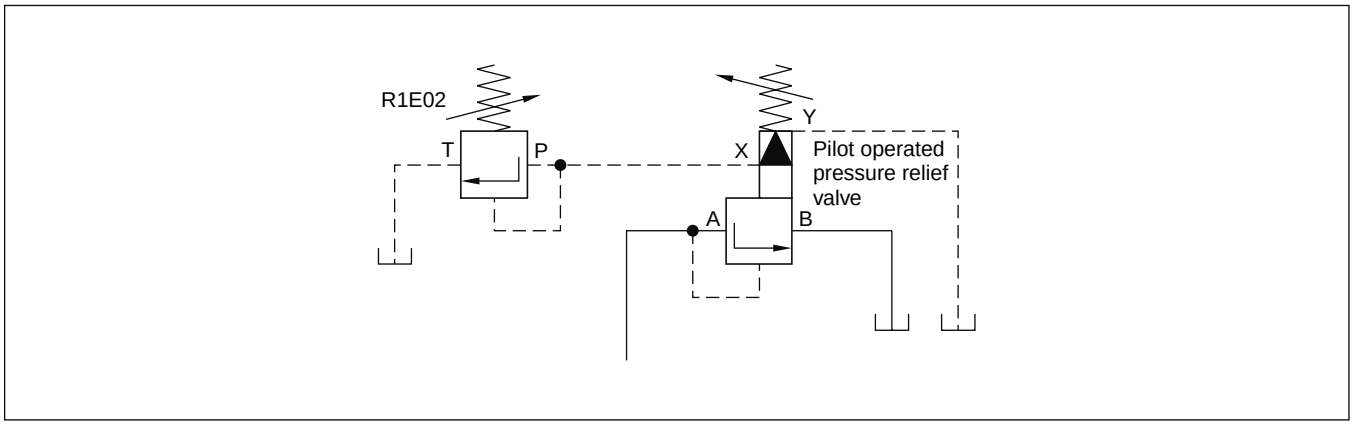


4

R1E02, front panel mounting



Typical application as remote pilot valve



Ordering code

R1E02	–	☐	☐	2	☐	A	1	☐
Pressure relief valve		Body	Pressure stages	Connections G1/4“	Adjust-ment	Design series	Seals NBR	Options

Code	Body
1	foot mounting
2	front panel mounting
3	subplate mounting

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

Code	Adjustment
1	Hand knob Ø 32 mm
3	Acorn nut with lead seal
4 [1)]	Key lock

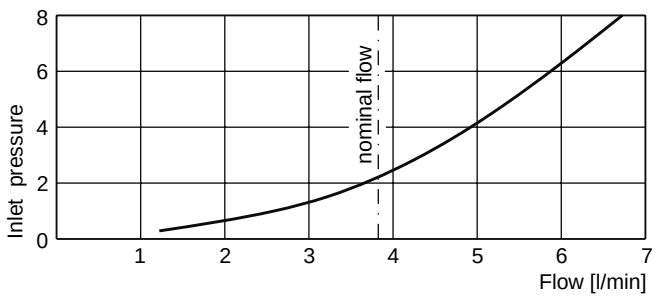
[1)] on bodies for subplate mounting use plate S16-64188 if necassary.

4

Technical data

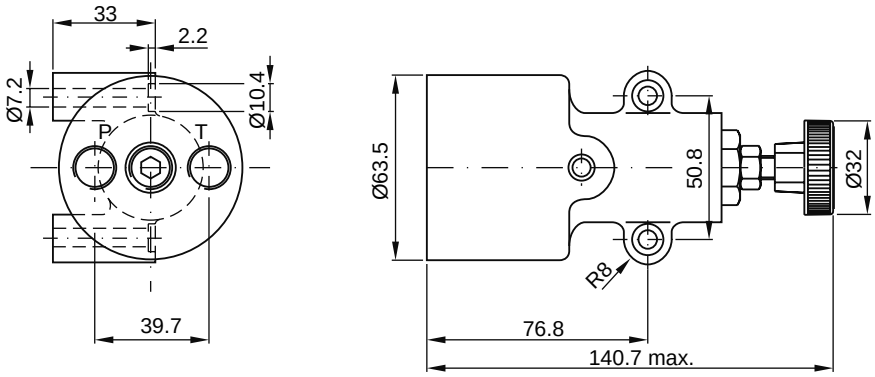
General				
Design		Direct operated relief valve, seated type		
Nominal size		1/4”		
Body variants		foot mounting	front panel mounting	subplate mounting
Mounting position		unrestricted		
Ambient temperature	[°C]	-20...+60		
$MTTF_D$ value	[years]	150		
Weight	[kg]	2.1	2.1	1.0
Hydraulics				
Max. operating pressure	[bar]	Port P 350, Port T depressurized		
Pressure stages	[bar]	105, 210, 350		
Fluid temperature	[°C]	-20...+70		
Nominal flow	[l/min]	3.8		
Fluid		Hydraulic oil according to DIN 51524...525		
Minimum setting pressure	[bar]	7		
Viscosity permitted	[cSt] / [mm²/s]	10...650		
recommended	[cSt] / [mm²/s]	30		
Filtration		ISO 4406 (1999); 18/16/13 (acc. NAS 1638:7)		

Typical system pressure in relation to flow



Measured with HLP46 at 50°C.

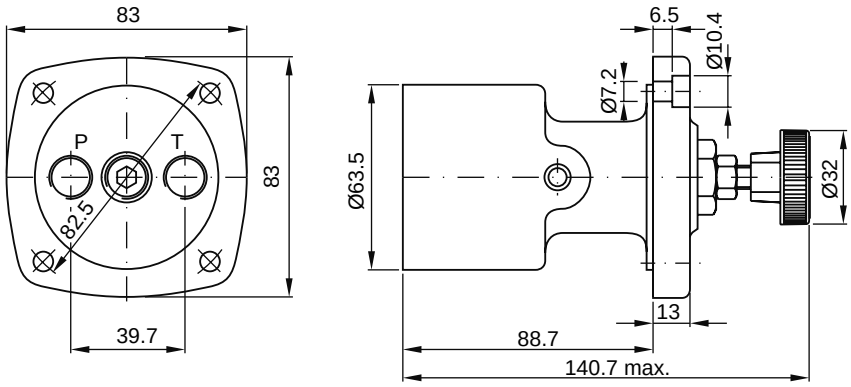
Foot mounting



Ports P and T: G1/4”

Kit
S26-58466-0

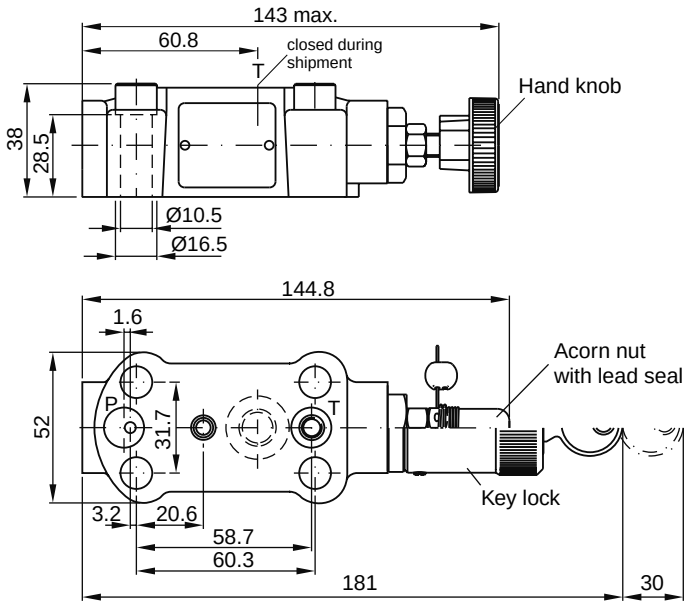
Front panel mounting



Ports P and T: G1/4”

Kit
S26-58466-0

Subplate mounting



Kit
S16-91963-0

Notes

Pilot operated pressure relief valves series R4V (DIN 24340 Form D) and R6V (DIN 24340 Form E) consist of a manually adjusted pilot stage and a seated type main stage.

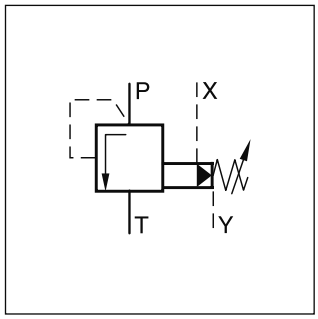
A vent function with a solenoid operated directional valve is available for circulation at minimum pressure.

Features

- Pilot operated with manual adjustment
- 2 interfaces
  - R4V Subplate ISO 6264 (DIN 24340 Form D) with VV01 vent valve
  - R6V Subplate ISO 6264 (DIN 24340 Form E) with Cetop 03 vent valve
- 3 pressure stages
- 3 adjustment modes
  - hand knob
  - acorn nut with lead seal
  - key lock
- Remote control via port X

R6V06

R6V06 with vent valve



R4V06 with vent valve

Function:

Series R4V/R6V

System pressure in port P is applied via the X gallery to the spring loaded cone in the pilot head. The pilot head controls the pressure in the Z area on top of the main cartridge which is additionally kept close by the main spring.

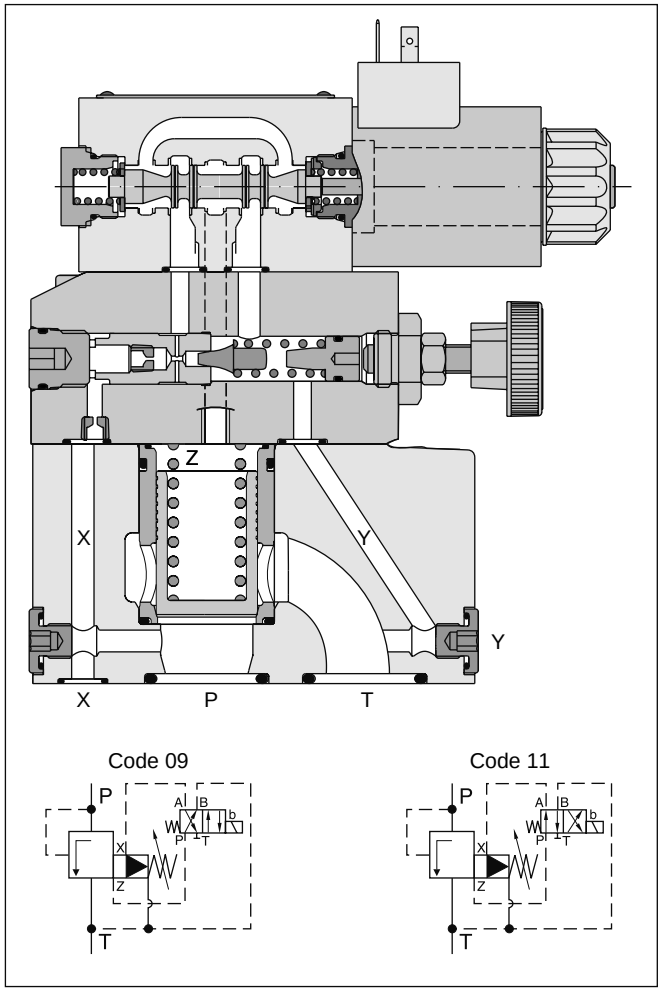
If the pilot pressure exceeds the setting pressure the pilot cone opens and thus limits the pilot pressure.

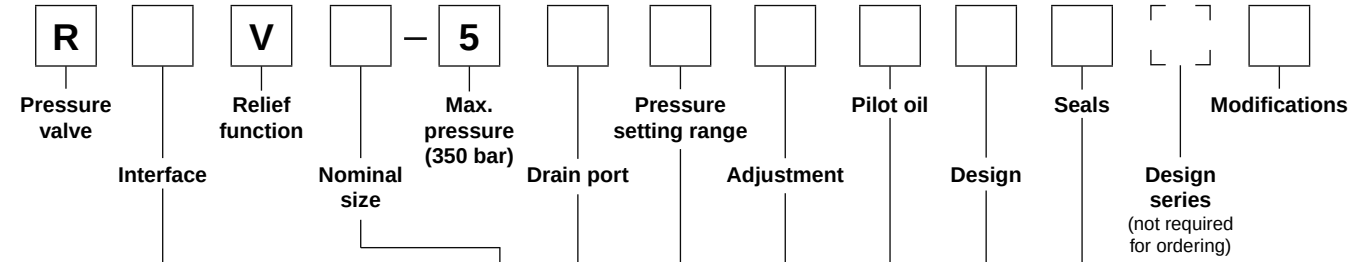
When the system pressure exceeds the pilot pressure plus the spring force, the main cartridge opens to port T and limits the pressure in port P to the adjusted level.

Series R4V/R6V with vent function

Additionally to the relief function of series R, a solenoid operated vent valve connects the Z area to tank. This allows oil circulation from P to T at minimum pressure drop. The vent valve can either be a standard Cetop 03 valves (mounting form E) or a sandwich unit (mounting form D). For both types the vent position can be either at the energized or de-energized solenoid.

R6V06 with vent valve





Code	Interface	
4	Subplate mounting ISO 6264	NG 10 and 25 / NG 32
6		

Code	Seals
1	NBR
5	FPM

Code	Design
A	R4V
B	R6V

Code	Nominal size
03	NG10
06	NG25
10	NG32

Pilot oil	
Code	Drain line
0	internal
1 [2]	external from subplate
2 [3]	external from valve body (Y-port)

[2] R4V only
[3] R6V only

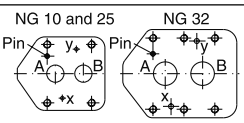
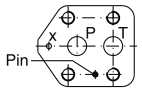
Code	Interface	Drain port
3	R4V	Y port in mounting pattern
9	R6V	Y-port = G 1/8“

Code	Adjustment
1	Hand knob 32mm dia. (Standard)
3	Acorn nut with lead seal
4	Key lock

Code	Pressure stages [1]
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

[1] Other pressure stages on request.

R		V		–	5											
Pressure valve	**Interface**	**Relief function**	**Nominal size**		**Max.pressure (350 bar)**	**Drain port**	**Pressure setting range**	**Adjustment**	**Pilot oil**	**Vent valve function**	**Solenoid voltage**	**Design**	**Seals**	**Design series** (not required for ordering)	**Modifications**

Code	Interface	
4	Subplate mounting ISO 6264	
6		

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Interface	Drain port
3	R4V	Y port in mounting pattern
9	R6V	Y-port = G 1/8“

Code	Pressure stages [1]
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

[1] Other pressure stages on request.

Code	Adjustment
1	Hand knob (Standard)
3	Acorn nut with lead seal
4	Key lock

Code	Modification
031[2]	Vent function with slow unloading
VFM[3]	Vent function with slow unloading

Code	Seals
1	NBR
5	FPM

Code	Design
A	R4V
B	R6V

Code	Voltage
G0R	12V =
G0Q	24V =
GAR	98V =
GAG	205V =
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

Code	Vent valve
09	Solenoid not activ. unpress. circulation
11	Solenoid activated unpress. circulation

Pilot oil	
Code	Drain line
0	internal
1 [2]	external from subplate
2 [3]	external from valve body (Y-port)

[2] R4V only
[3] R6V only

4

R4V/R6V

General				
Nominal size		10	25	32
Interface		Subplate mounting acc. ISO 6264 (DIN 24340)		
Mounting position		as desired, horizontal mounting prefered		
Ambient temperature	[°C]	-20...+80		
$MTTF_D$ value	[years]	75		
Weight Series R6V	[kg]	4.5	5.8	7.8
Series R4V	[kg]	2.7	4.5	6.0
Hydraulic				
Max. operating pressure	[bar]	Ports P (or A) and X up to 350, Port T (or B) and Y 30		
Pressure stages	[bar]	105, 210, 350		
Nominal flow	[l/min]	250	500	650
Fluid		Hydraulic oil according to DIN 51524 ... 51525		
Viscosity, recommended	[cSt] / [mm²/s]	30 ... 50		
permitted	[cSt] / [mm²/s]	20 ... 380		
Fluid temperature	[°C]	-20 ... +70		
Filtration		ISO 4406 - (1999) ; 18/16/13 (acc. NAS 1638:7)		

4

R4V/R6V with vent function

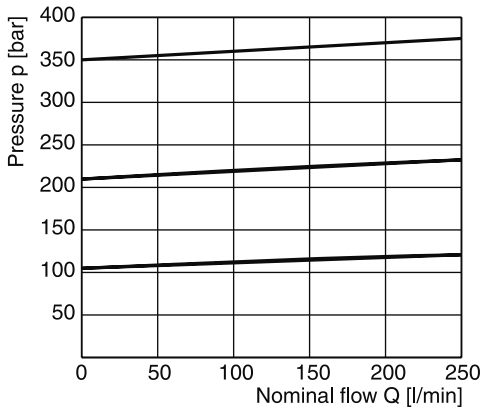
General				
Nominal size		10	25	32
Interface		Subplate mounting acc. ISO 6264 (DIN 24340)		
Mounting position		as desired, horizontal mounting prefered		
Ambient temperature	[°C]	-20...+80		
$MTTF_D$ value	[years]	75		
Weight Series R6V	[kg]	5.9	7.2	9.2
Series R4V	[kg]	4.4	6.2	7.7
Hydraulic				
Max. operating pressure	[bar]	Ports P (or A) and X up to 350, port T (or B) and Y 30		
Pressure stages	[bar]	105, 210, 350		
Nominal flow	[l/min]	250	500	650
Fluid		Hydraulic oil according to DIN 51524 ... 51525		
Viscosity, recommended	[cSt] / [mm²/s]	30 ... 50		
permitted	[cSt] / [mm²/s]	20 ... 380		
Fluid temperature	[°C]	-20 ... +70		
Filtration		ISO 4406 - (1999) ; 18/16/13 (acc. NAS 1638:7)		
Electrical				
Duty ratio	[%]	100 ED; CAUTION: coil temperature up to 180 °C possible		
Max. switching frequency	[1/h]	16000 (DC), 7200 (AC)		
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)		

Code			G0R	G0Q	GAR	GAG	W30	W31
Supply voltage		[V]	12V =	24V =	98V =	205V =	110V/50Hz 120V/60Hz	230V/50Hz 240V/60Hz
Tolerance supply voltage		[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption	hold	[W]	31	31	31	31	78	78
	in rush	[W]	31	31	31	31	264	264
Solenoid connection			Connector as per EN 175301-803					
Wiring min.		[mm²]	3 x 1.5 recommended					
Wiring length max.		[m]	50 recommended					

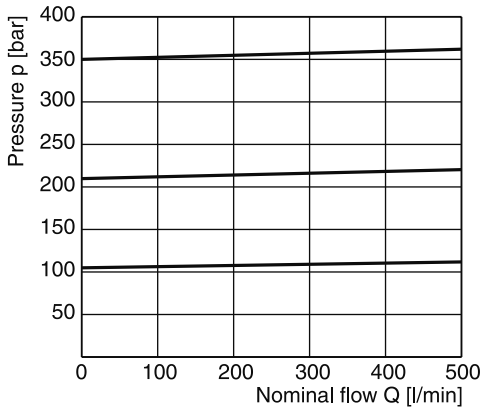
G0R	G0Q	GAR	GAG	W30	W31
12V =	24V =	98V =	205V =	110V/50Hz 120V/60Hz	230V/50Hz 240V/60Hz

p/Q performance curves [1)]

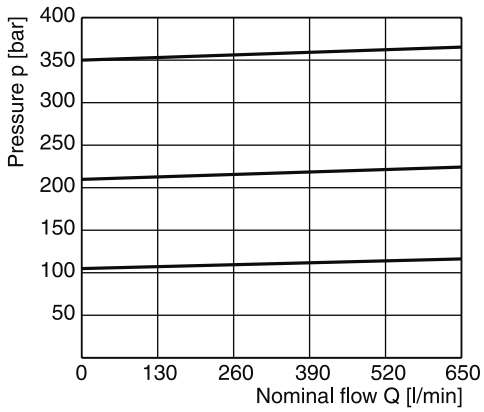
NG10



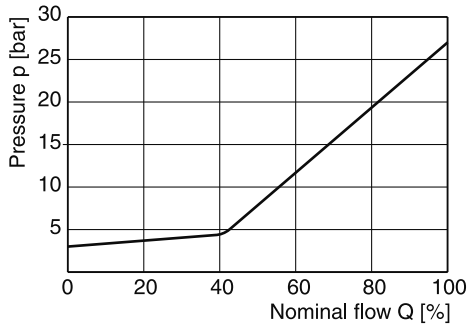
NG25



NG32



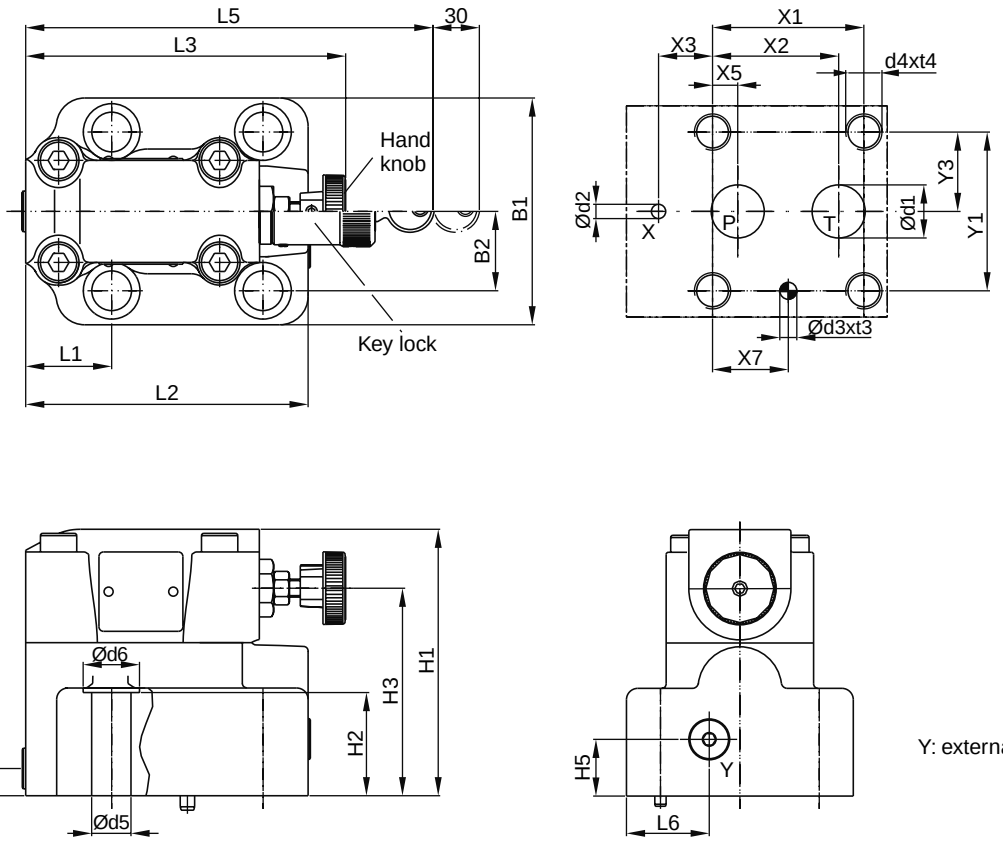
Minimum pressure curve



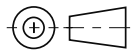
1) The performance curves are measured with external drain.
For internal drain the tank pressure has to be added to curve.

All characteristic curves measured with HLP46 at 50°C.

R6V



Y: external drain port G 1/8“



NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-09-*-97	53.8	47.5	0	–	22.1	–	22.1	53.8	–	26.9	–	–	–
25	6264-08-13-*-97	66.7	55.6	23.8	–	11.1	–	33.4	70	–	35	–	–	–
32	6264-10-17-*-97	88.9	76.2	31.8	–	12.7	–	44.5	82.6	–	41.3	–	–	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

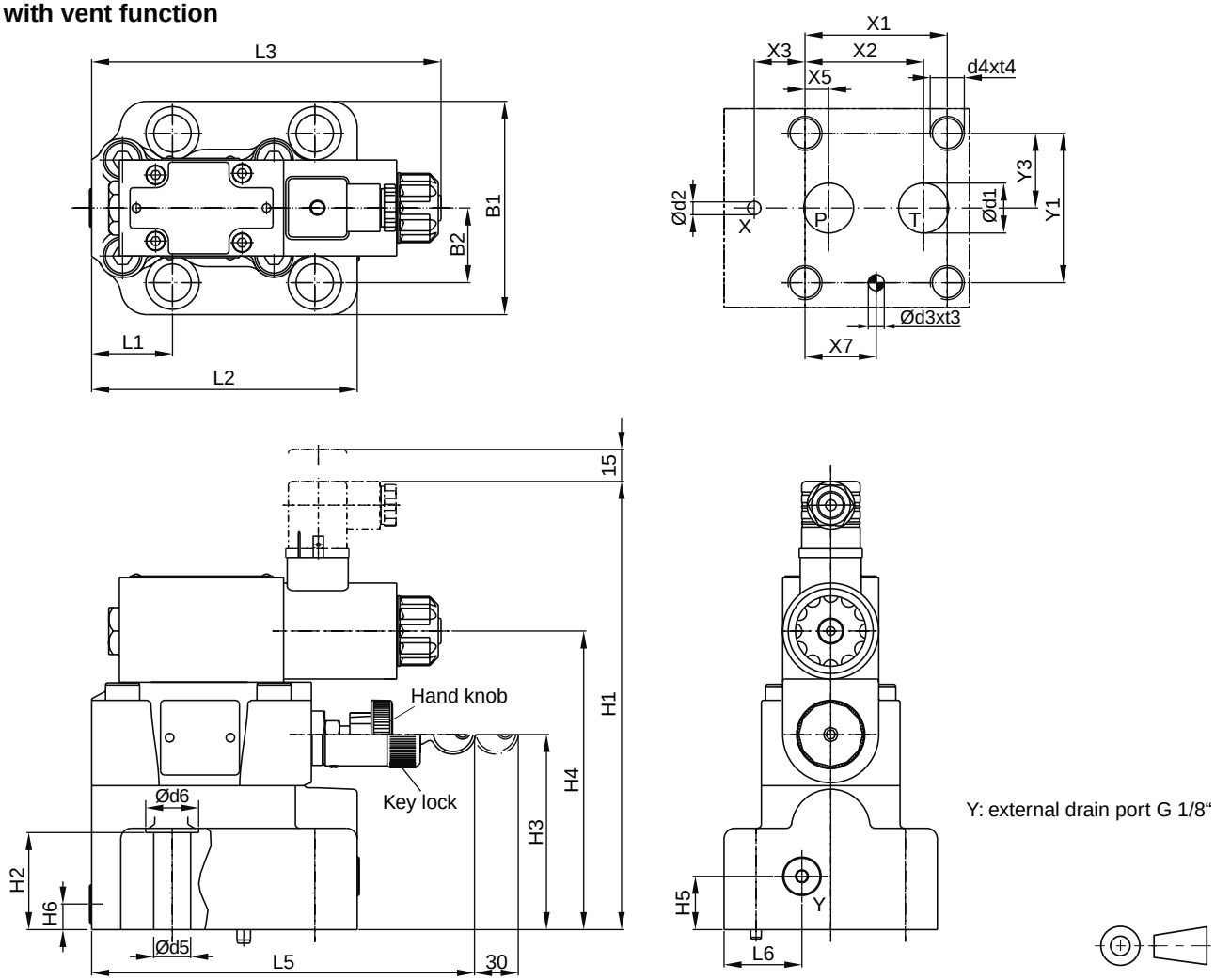
NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	6264-06-09-*-97	80	26.9	114	27	88		20.5	25	52.5	118.5	141		180	29.5
25	6264-08-13-*-97	100	35	117.5	45.5	91.5	–	25	12	37.9	124.5	141	–	180	36.5
32	6264-10-17-*-97	120	41.3	123	52	97		26.5	13.5	45	153	141		180	46.5

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-09-*-97	14.7	4.8	7.5	10	M12	20	13.5	20	SPP 3R6B 910
25	6264-08-13-*-97	23.4	6.3	7.5	10	M16	27	17.5	25	SPP 6R10B 910
32	6264-10-17-*-97	32	6.3	7.5	10	M18	28	20	30	SPP 10R12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	6264-06-09-*-97	BK 494	4xM12 x 45 DIN 912 12.9	108 Nm ±15%	S26-96396-0	S26-96396-5	
25	6264-08-13-*-97	BK 366	4xM16 x 70 DIN 912 12.9	264 Nm ±15%	S26-98589-0	S26-98589-5	
32	6264-10-17-*-97	BK 507	4xM18 x 75 DIN 912 12.9	398 Nm ±15%	S26-96392-0	S26-96392-5	

R6V with vent function



NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-09-*-97	53.8	47.5	0	–	22.1	–	22.1	53.8	–	26.9	–	–	–
25	6264-08-13-*-97	66.7	55.6	23.8	–	11.1	–	33.4	70	–	35	–	–	–
32	6264-10-17-*-97	88.9	76.2	31.8	–	12.7	–	44.5	82.6	–	41.3	–	–	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

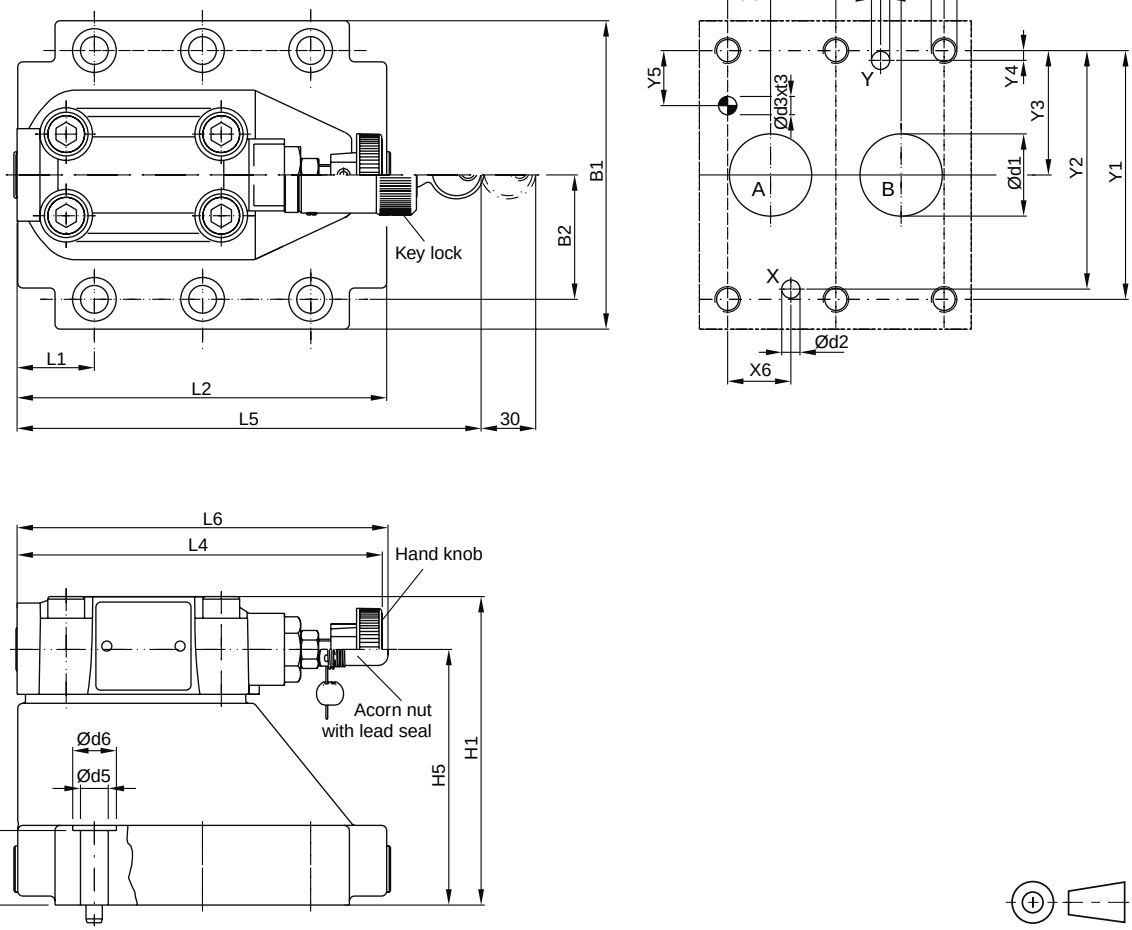
NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	6264-06-09-*-97	80	26.9	206	27	88	136.5	25	12	52.5	118.5	163.8		180	36.5
25	6264-08-13-*-97	100	35	210	45.5	91.5	140	25	12	37.9	124.5	163.8	–	180	36.5
32	6264-10-17-*-97	120	41.3	215.5	52	97	145.5	25	12	45	153	163.8		180	36.5

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-09-*-97	14.7	4.8	7.5	10	M12	20	13.5	20	SPP 3R6B 910
25	6264-08-13-*-97	23.4	6.3	7.5	10	M16	27	17.5	25	SPP 6R10B 910
32	6264-10-17-*-97	32	6.3	7.5	10	M18	28	20	30	SPP 10R12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	6264-06-09-*-97	BK 494	4xM12 x 45 DIN 912 12.9	108 Nm ±15%	S26-96396-0	S26-96396-5	
25	6264-08-13-*-97	BK 366	4xM16 x 70 DIN 912 12.9	264 Nm ±15%	S26-98589-0	S26-98589-5	
32	6264-10-17-*-97	BK 507	4xM18 x 75 DIN 912 12.9	398 Nm ±15%	S26-96392-0	S26-96392-5	

R4V



NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-07-*-97	42.9	35.8	21.5	–	7.2	21.5	0	66.7	58.8	33.4	7.9	14.3	–
25	6264-08-11-*-97	60.3	49.2	39.7	–	11.1	20.6	0	79.4	73	39.7	6.4	15.9	–
32	6264-10-15-*-97	84.2	67.5	59.5	42.1	16.7	24.6	0	96.8	92.8	48.4	3.8	21.4	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	6264-06-07-*-97	87.3	33.35	83	21	–	–	62.5	–	29	94.8	–	143	181	144.8
25	6264-08-11-*-97	105	39.7	109.5	29	–	–	89	–	34.7	126.8	–	143	181	144.8
32	6264-10-15-*-97	120	48.4	120	29	–	–	99.5	–	30.6	144.3	–	143	181	144.8

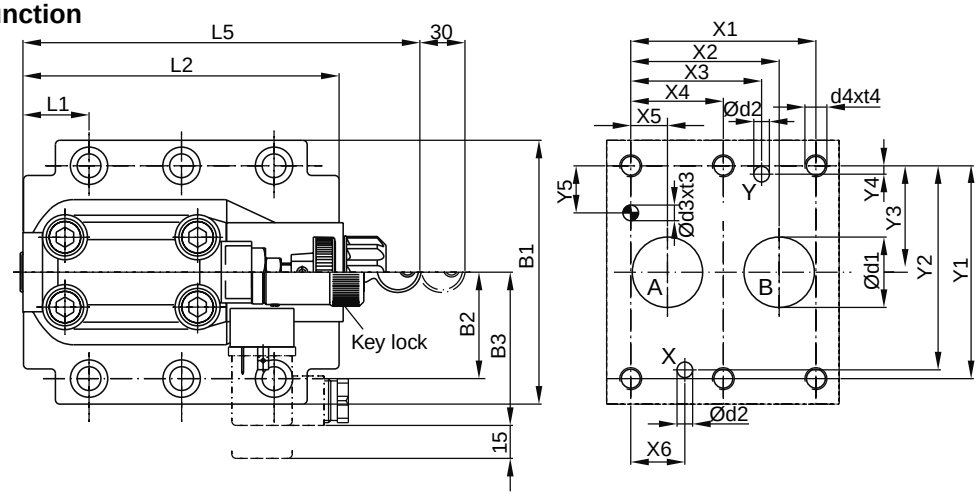
NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-07-*-97	15	7	7.1	8	M10	16	10.8	17	SPP 3M6B 910
25	6264-08-11-*-97	23.4	7.1	7.1	8	M10	18	10.8	17	SPP 6M8B 910
32	6264-10-15-*-97	32	7.1	7.1	8	M10	20	10.8	17	SPP 10M12B 910

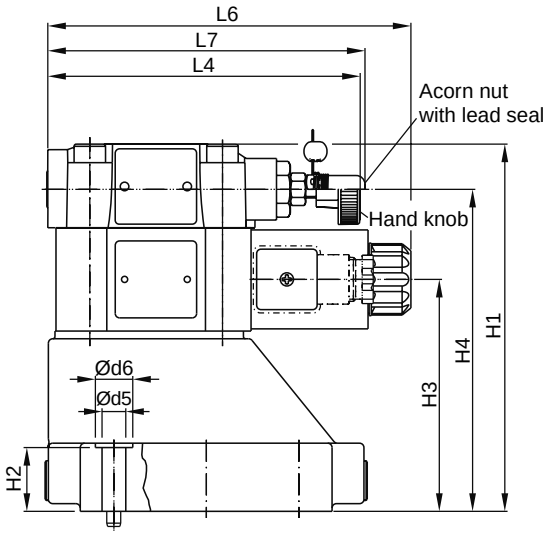
[1] Details see chapter 12, series SPP

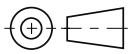
NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	6264-06-07-*-97	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S26-58507-0	S26-58507-5	R_{max}6.3 ⏥ 0.01/100
25	6264-08-11-*-97	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58475-0	S26-58475-5	
32	6264-10-15-*-97	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58508-0	S26-58508-5	

R4V-R6V UK.INDD RH 06.09.2011

R4V with vent function







NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-07-*-97	42.9	35.8	21.5	–	7.2	21.5	0	66.7	58.8	33.4	7.9	14.3	–
25	6264-08-11-*-97	60.3	49.2	39.7	–	11.1	20.6	0	79.4	73	39.7	6.4	15.9	–
32	6264-10-15-*-97	84.2	67.5	59.5	42.1	16.7	24.6	0	96.8	92.8	48.4	3.8	21.4	–

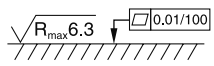
Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

NG	ISO-code	B1	B2	B3	H1	H2	H3	H4	H6	L1	L2	L3	L4	L5	L6	L7
10	6264-06-07-*-97	87.3	33.35	70	130	21	68.5	109.5	–	29	94.8	–	143	181	165.6	144.8
25	6264-08-11-*-97	105	39.7	70	156.5	29	95	136	–	34.7	126.8	–	143	181	165.6	144.8
32	6264-10-15-*-97	120	48.4	70	167	29	105.5	146.5	–	30.6	144.3	–	143	181	165.6	144.8

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-07-*-97	15	7	7.1	8	M10	16	10.8	17	SPP 3M6B 910
25	6264-08-11-*-97	23.4	7.1	7.1	8	M10	18	10.8	17	SPP 6M8B 910
32	6264-10-15-*-97	32	7.1	7.1	8	M10	20	10.8	17	SPP 10M12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	6264-06-07-*-97	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S26-58507-0*	S26-58507-5*	
25	6264-08-11-*-97	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58475-0*	S26-58475-5*	
32	6264-10-15-*-97	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58508-0*	S26-58508-5*	
VV01					S56-40609-0	S56-40609-5	



* Please combine seal kit of one size with seal kit of VV01 solenoid for complete seal kit

R4V-R6V UK.INDD RH 06.09.2011

Notes

Pilot operated pressure relief valves series R4V (TÜV) (DIN 24340 Form D) and R6V (TÜV) (DIN 24340 Form E) include a certification according to directive 97/23/EG for the usage for safety-related appliocations.

The valve is set and sealed by the German technical inspection association TÜV. The valve delivery includes the TÜV certificate of conformity.

For series R6V a vent function with a solenoid operated directional valve is available for circulation at minimum pressure.

Features

- TÜV certificate
- Pilot operated with manual adjustment
- 2 interfaces
  - R4V Subplate ISO 6264 (DIN 24340 Form D) with VV01 vent valve
  - R6V Subplate ISO 6264 (DIN 24340 Form E) with Cetop 03 vent valve
- Adjustment leaded (code W)
- Adjustment leaded to maximum pressure, lower pressure possible (code V)

R6V06

R6V06 with vent valve

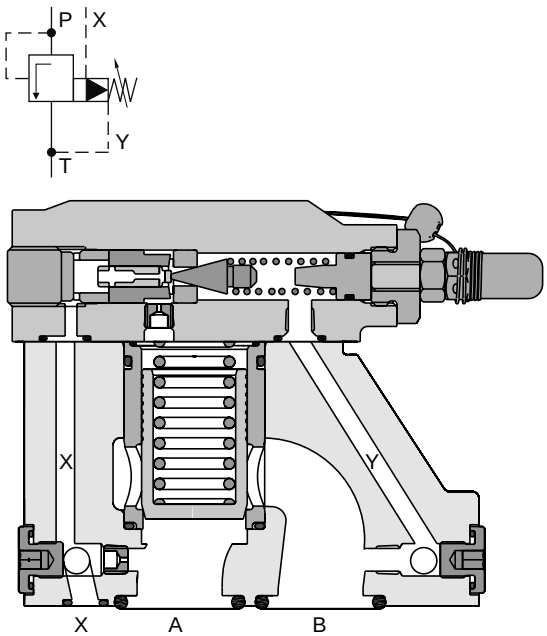
R4V06

Name plate data

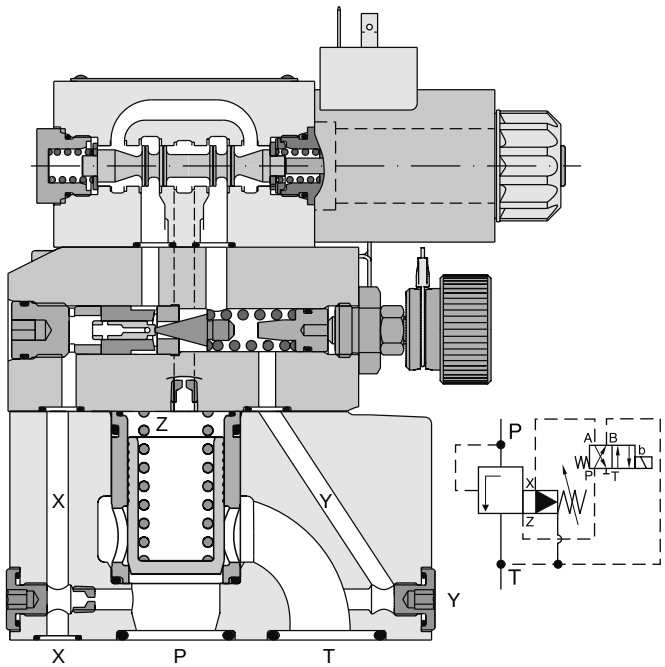
Example R4V06

415 mm² :	minimum opening width
L220 l/min :	max. flow
70 bar :	set pressure (compare p/Q curves)
7,3 mm :	cartridge stroke
10% :	permitted pressure increase of the flow range

R4V06

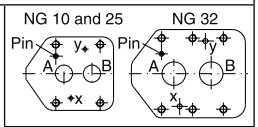
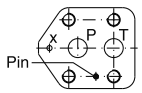


R6V06 with vent valve



R4V / R6V

R		V		-	5		5		0			
Pressure valve	Interface	Relief function	Nominal size		Max. pressure (350 bar)	Body	Pressure setting range 350bar max.	Adjustment leaded (TÜV)	Pilot oil internal	Design series	Seals	Pressure stage

Code	Interface	
4	Subplate mounting ISO 6264	NG 10 and 25 / NG 32 
6		

Code	Pressure stage [1]
P10	100 bar
P20	200 bar
P30	300 bar
P35	350 bar

[1] Further pressure stages on request (in 10bar steps).

Code	Seals
1	NBR
5	FPM

Code	Nominal size
03	NG10
06	NG25
10	NG32

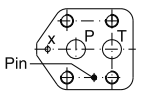
Code	Design
A	R4V
B	R6V

Code	Body
3	R4V
9	R6V

Code	Adjustment
V	Hand knob leaded (lower pressure adjustment possible)
W	Acorn nut leaded

R6V with vent valve

R	6	V		-	5	9	5	V	0	09		B		
Pressure valve	Interface	Relief function	Nominal size		Max. pressure (350 bar)	Body Y-port = G 1/8"	Pressure setting range 350bar max.	Adjustment leaded (TÜV) Hand knob leaded (lower pressure adjustment possible)	Pilot oil internal	Vent valve function solenoid not activ, un-pressurized circulation	Solenoid voltage	Design series	Seals	Pressure stage

Code	Interface	
6	Subplate mounting ISO 6264	

Code	Pressure stage [1]
P10	100 bar
P20	200 bar
P30	300 bar
P35	350 bar

[1] Further pressure stages on request (in 10bar steps).

Code	Seals
1	NBR
5	FPM

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Voltage
G0R	12V =
G0Q	24 V =

R4V/R6V

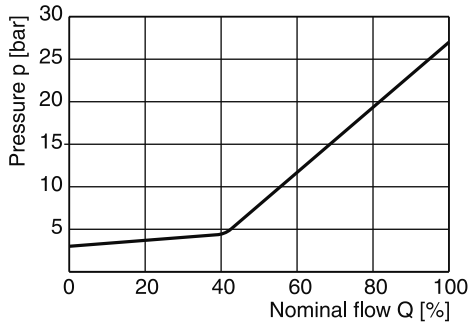
General					
Nominal size			10	25	32
Interface			Subplate mounting acc. ISO 6264 (DIN 24340)		
Mounting position			as desired, horizontal mounting prefered		
Ambient temperature		[°C]	-20...+80		
$MTTF_D$ value		[years]	75		
Weight	Series R6V	[kg]	4.5	5.8	7.8
	Series R4V	[kg]	2.7	4.5	6.0
Hydraulic					
Max. operating pressure		[bar]	Ports P (or A) up to 350, Port T (or B) 30		
Pressure stages		[bar]	350 (pressure setting see ordering code)		
Nominal flow	R6V	[l/min]	250	500	500
	R4V	[l/min]	110	450	500
Fluid			Hydraulic oil according to DIN 51524 ... 51525		
Viscosity, recommended		[cSt] / [mm²/s]	30 ... 50		
permitted		[cSt] / [mm²/s]	20 ... 380		
Fluid temperature		[°C]	-20 ... +70		
Filtration			ISO 4406 - (1999) ; 18/16/13 (acc. NAS 1638:7)		

R6V with vent function

General					
Nominal size			10	25	32
Interface			Subplate mounting acc. ISO 6264 (DIN 24340)		
Mounting position			as desired, horizontal mounting prefered		
Ambient temperature		[°C]	-20...+80		
$MTTF_D$ value		[years]	75		
Weight		[kg]	5.9	7.2	9.2
Hydraulic					
Max. operating pressure		[bar]	Ports P (or A) up to 350, port T (or B) 30		
Pressure stages		[bar]	350 (pressure setting see ordering code)		
Nominal flow		[l/min]	250	500	500
Fluid			Hydraulic oil according to DIN 51524 ... 51525		
Viscosity, recommended		[cSt] / [mm²/s]	30 ... 50		
permitted		[cSt] / [mm²/s]	20 ... 380		
Fluid temperature		[°C]	-20 ... +70		
Filtration			ISO 4406 - (1999) ; 18/16/13 (acc. NAS 1638:7)		
Electrical					
Duty ratio		[%]	100 ED; CAUTION: coil temperature up to 180 °C possible		
Max. switching frequency		[1/h]	16000 (DC), 7200 (AC)		
Protection class			IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
Code			G0R	G0Q	
Supply voltage		[V]	12V =	24V =	
Tolerance supply voltage		[%]	+5...-10	+5...-10	
Power consumption	hold	[W]	31	31	
	in rush	[W]	31	31	
Solenoid connection			Connector as per EN 175301-803		
Wiring min.		[mm^2]	3 x 1.5 recommended		
Wiring length max.		[m]	50 recommended		

Minimum pressure curve [1)]

R4V/ R6V



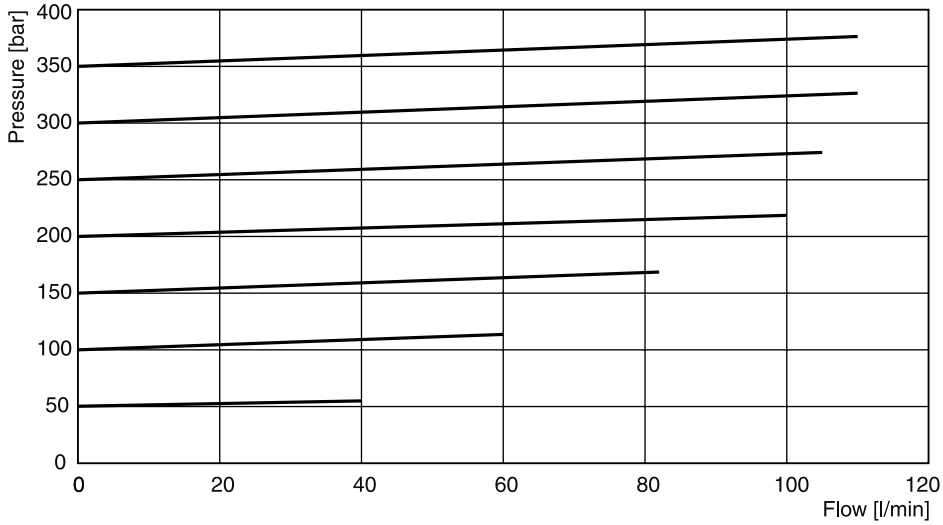
4

1) The performance curves are measured with external drain.
For internal drain the tank pressure has to be added to curve.

All characteristic curves measured with HLP46 at 50°C.

p/Q performance curves

R4V03

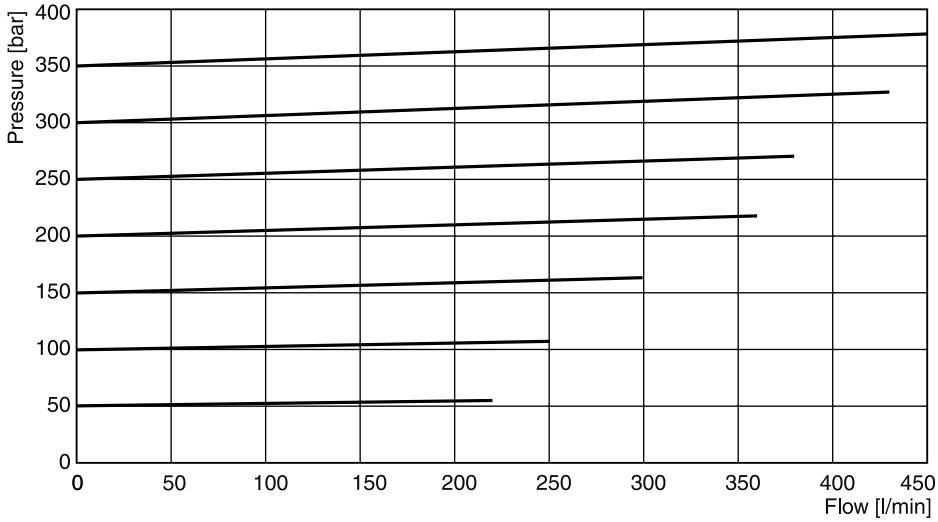


R4V03 nameplate data

Pressure stage	Q_{max}	min. opening width	Cartridge stroke	Permitted pressure increase
50- 70 bar	40 l/min	154 mm²	4.4 mm	10%
80- 120 bar	60 l/min	154 mm²	4.4 mm	10%
130- 170 bar	82 l/min	154 mm²	4.4 mm	10%
180- 200 bar	100 l/min	154 mm²	4.4 mm	10%
210- 250 bar	105 l/min	154 mm²	4.4 mm	10%
260- 300 bar	110 l/min	154 mm²	4.4 mm	10%
310- 350 bar	110 l/min	154 mm²	4.4 mm	10%

p/Q performance curves

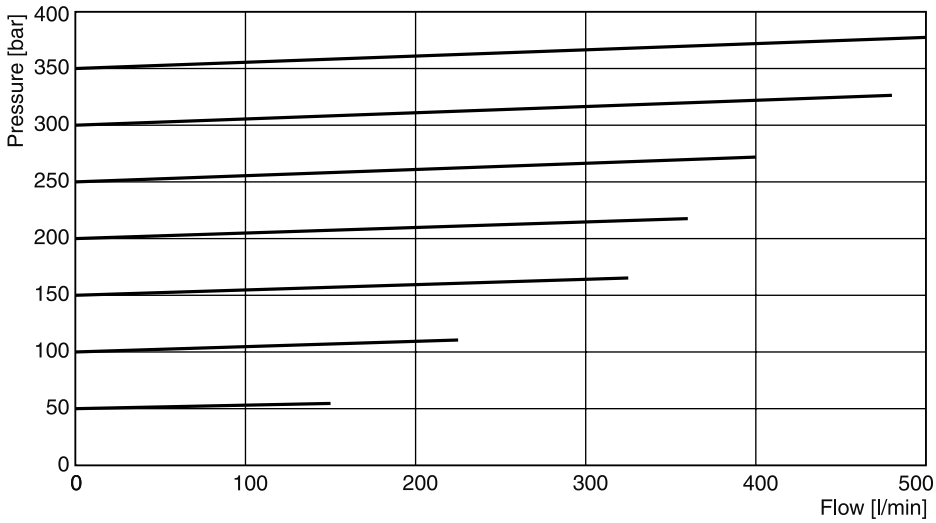
R4V06



R4V06 nameplate data

Pressure stage	Q_{max}	min. opening width	Cartridge stroke	Permitted pressure increase
50- 70 bar	220 l/min	415 mm²	7.3 mm	10%
80- 120 bar	250 l/min	415 mm²	7.3 mm	10%
130- 170 bar	300 l/min	415 mm²	7.3 mm	10%
180- 200 bar	360 l/min	415 mm²	7.3 mm	10%
210- 250 bar	380 l/min	415 mm²	7.3 mm	10%
260- 300 bar	430 l/min	415 mm²	7.3 mm	10%
310- 350 bar	450 l/min	415 mm²	7.3 mm	10%

R4V10

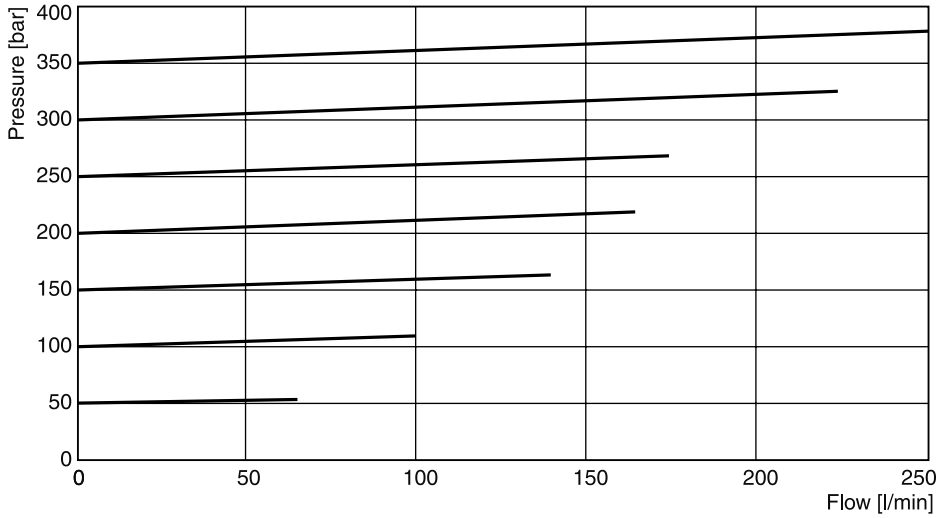


R4V10 nameplate data

Pressure stage	Q_{max}	min. opening width	Cartridge stroke	Permitted pressure increase
50- 70 bar	150 l/min	607 mm²	7.3 mm	10%
80- 120 bar	225 l/min	607 mm²	7.3 mm	10%
130- 170 bar	325 l/min	607 mm²	7.3 mm	10%
180- 200 bar	360 l/min	607 mm²	7.3 mm	10%
210- 250 bar	400 l/min	607 mm²	7.3 mm	10%
260- 300 bar	480 l/min	607 mm²	7.3 mm	10%
310- 350 bar	500 l/min	607 mm²	7.3 mm	10%

p/Q performance curves

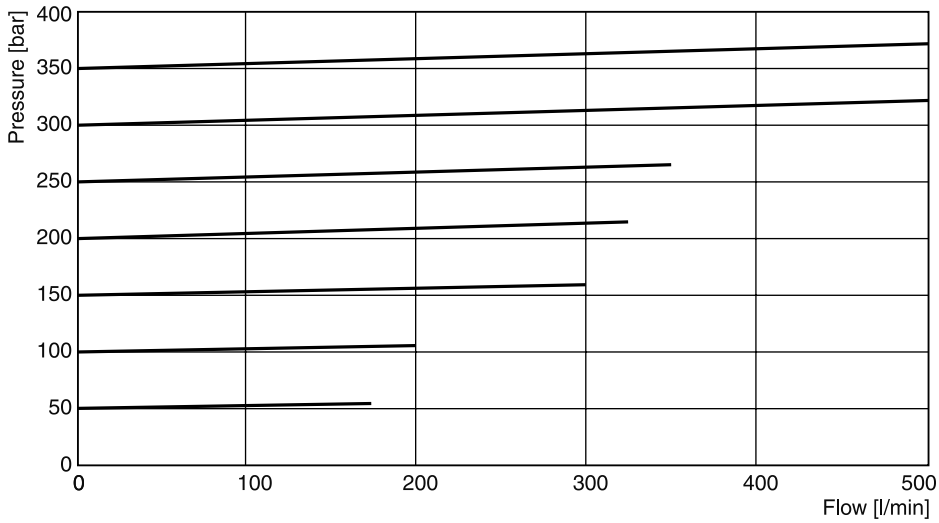
R6V03



R6V03 nameplate data

Pressure stage	Q_{max}	min. opening width	Cartridge stroke	Permitted pressure increase
50- 70 bar	65 l/min	154 mm²	4.4 mm	10%
80- 120 bar	100 l/min	154 mm²	4.4 mm	10%
130- 170 bar	140 l/min	154 mm²	4.4 mm	10%
180- 200 bar	165 l/min	154 mm²	4.4 mm	10%
210- 250 bar	170 l/min	154 mm²	4.4 mm	10%
260- 300 bar	225 l/min	154 mm²	4.4 mm	10%
310- 350 bar	250 l/min	154 mm²	4.4 mm	10%

R6V06

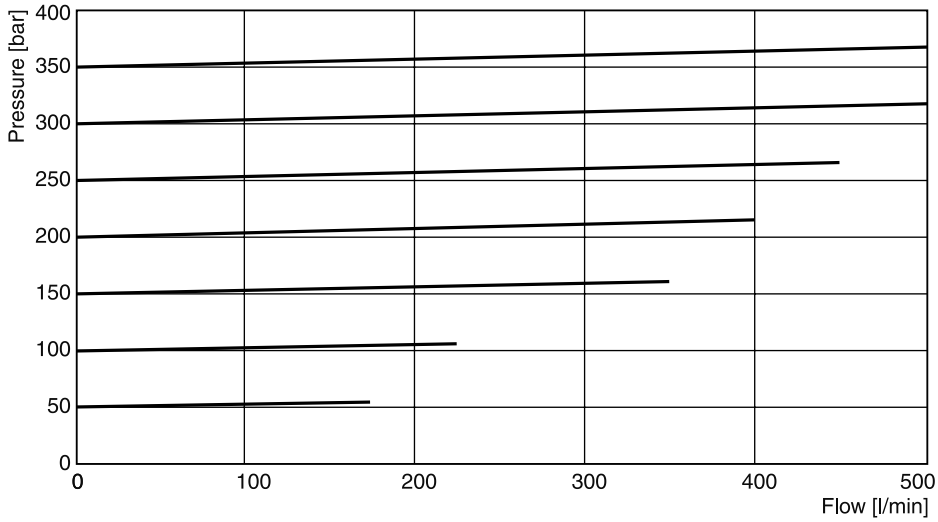


R6V06 nameplate data

Druckstufe	Qmax	min. Öffnungs-querschnitt	Kolbenhub	Zul. Druck-erhöhung
50- 70 bar	170 l/min	415 mm²	7.3 mm	10%
80- 120 bar	200 l/min	415 mm²	7.3 mm	10%
130- 170 bar	300 l/min	415 mm²	7.3 mm	10%
180- 200 bar	325 l/min	415 mm²	7.3 mm	10%
210- 250 bar	350 l/min	415 mm²	7.3 mm	10%
260- 300 bar	500 l/min	415 mm²	7.3 mm	10%
310- 350 bar	500 l/min	415 mm²	7.3 mm	10%

p/Q performance curves

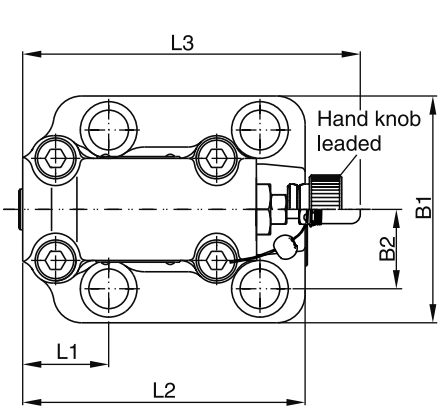
R6V10

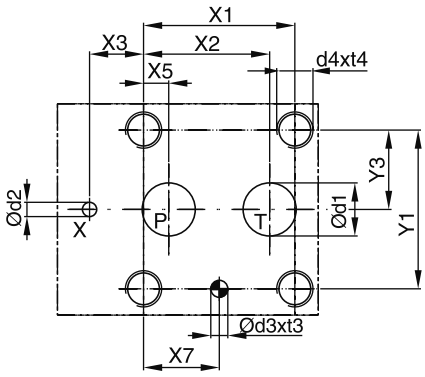


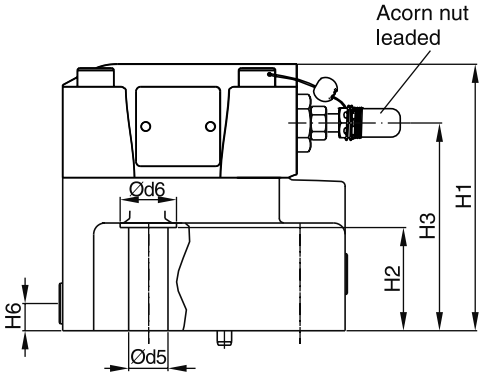
R6V10 nameplate data

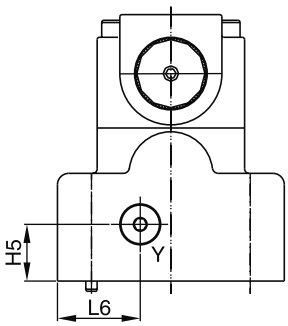
Pressure stage	Q_{max}	min. opening width	Cartridge stroke	Permitted pressure increase
50- 70 bar	170 l/min	607 mm²	7,3 mm	10%
80- 120 bar	225 l/min	607 mm²	7,3 mm	10%
130- 170 bar	350 l/min	607 mm²	7,3 mm	10%
180- 200 bar	400 l/min	607 mm²	7,3 mm	10%
210- 250 bar	450 l/min	607 mm²	7,3 mm	10%
260- 300 bar	500 l/min	607 mm²	7,3 mm	10%
310- 350 bar	500 l/min	607 mm²	7,3 mm	10%

R6V









Y: external drain port G 1/8“

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-09-*-97	53.8	47.5	0	–	22.1	–	22.1	53.8	–	26.9	–	–	–
25	6264-08-13-*-97	66.7	55.6	23.8	–	11.1	–	33.4	70	–	35	–	–	–
32	6264-10-17-*-97	88.9	76.2	31.8	–	12.7	–	44.5	82.6	–	41.3	–	–	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

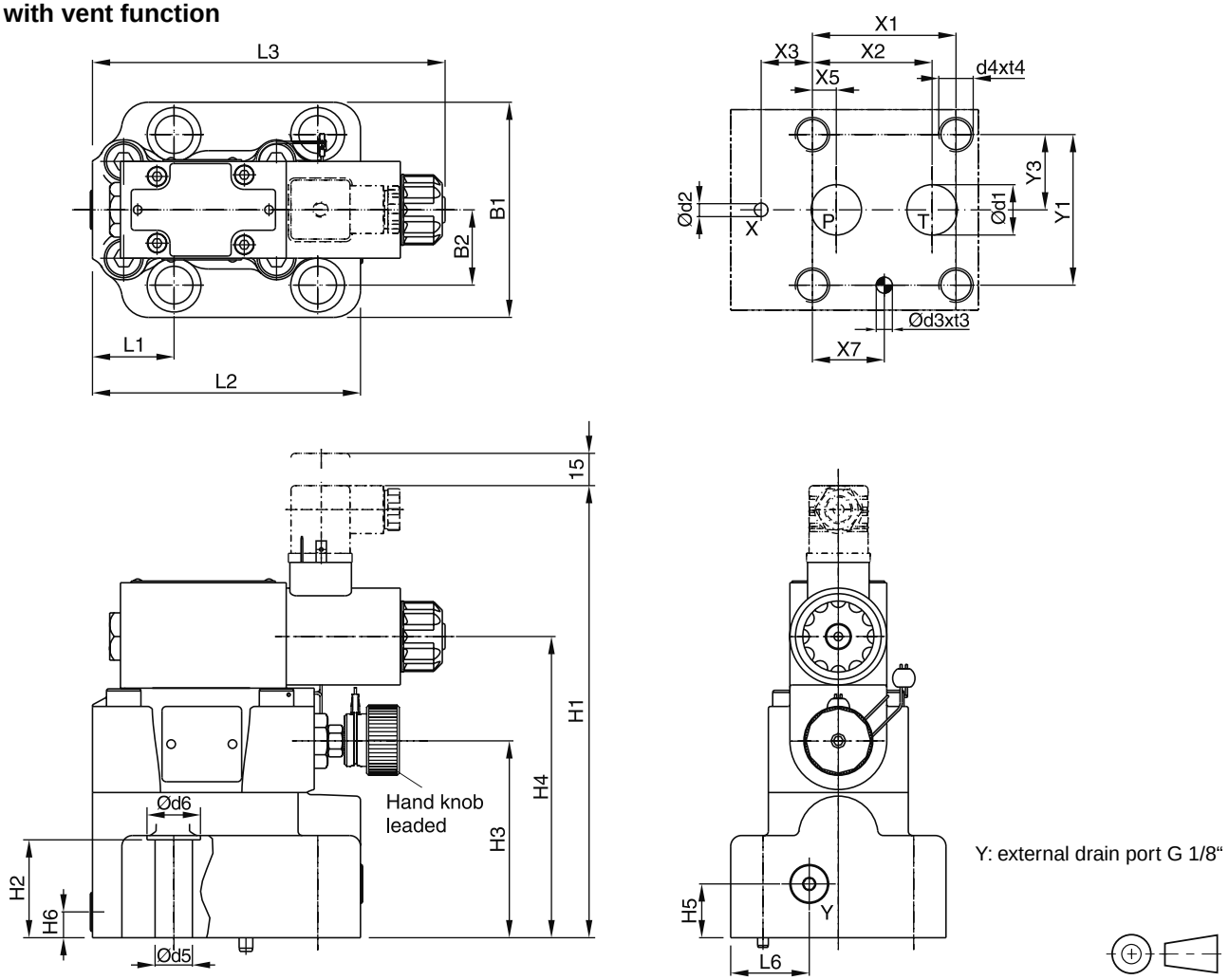
NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L6
10	6264-06-09-*-97	80	26.9	114	27	88		20.5	25	52.5	118.5	148.3		29.5
25	6264-08-13-*-97	100	35	117.5	45.5	91.5	–	25	12	37.9	124.5	148.3	–	36.5
32	6264-10-17-*-97	120	41.3	123	52	97		26.5	13.5	45	153	148.3		46.5

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-09-*-97	14.7	4.8	7.5	10	M12	20	13.5	20	SPP 3R6B 910
25	6264-08-13-*-97	23.4	6.3	7.5	10	M16	27	17.5	25	SPP 6R10B 910
32	6264-10-17-*-97	32	6.3	7.5	10	M18	28	20	30	SPP 10R12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	6264-06-09-*-97	BK 494	4xM12 x 45 DIN 912 12.9	108 Nm ±15%	S26-96396-0	S26-96396-5	
25	6264-08-13-*-97	BK 366	4xM16 x 70 DIN 912 12.9	264 Nm ±15%	S26-98589-0	S26-98589-5	
32	6264-10-17-*-97	BK 507	4xM18 x 75 DIN 912 12.9	398 Nm ±15%	S26-96392-0	S26-96392-5	

R6V with vent function



NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-09-*-97	53.8	47.5	0	–	22.1	–	22.1	53.8	–	26.9	–	–	–
25	6264-08-13-*-97	66.7	55.6	23.8	–	11.1	–	33.4	70	–	35	–	–	–
32	6264-10-17-*-97	88.9	76.2	31.8	–	12.7	–	44.5	82.6	–	41.3	–	–	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

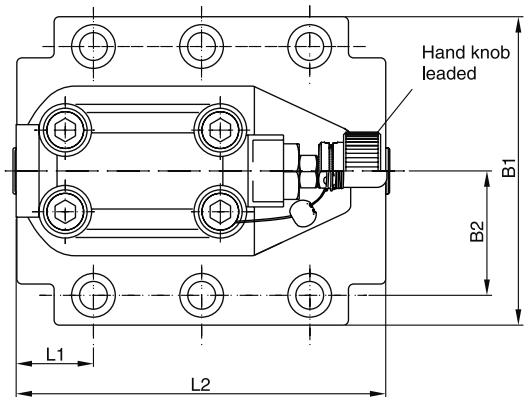
NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L6
10	6264-06-09-*-97	80	26.9	206	27	88	136.5	25	12	52.5	118.5	163.8		36.5
25	6264-08-13-*-97	100	35	210	45.5	91.5	140	25	12	37.9	124.5	163.8	–	36.5
32	6264-10-17-*-97	120	41.3	215.5	52	97	145.5	25	12	45	153	163.8		36.5

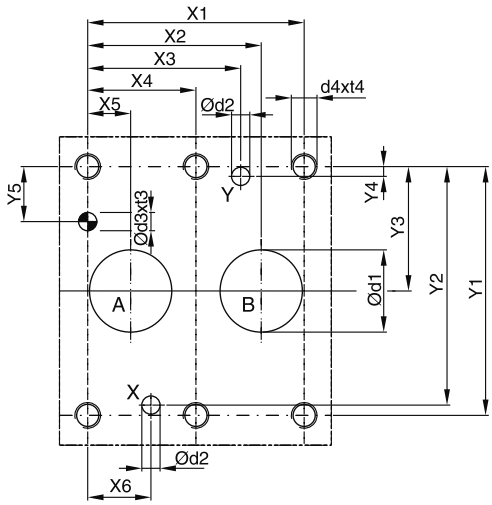
NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-09-*-97	14.7	4.8	7.5	10	M12	20	13.5	20	SPP 3R6B 910
25	6264-08-13-*-97	23.4	6.3	7.5	10	M16	27	17.5	25	SPP 6R10B 910
32	6264-10-17-*-97	32	6.3	7.5	10	M18	28	20	30	SPP 10R12B 910

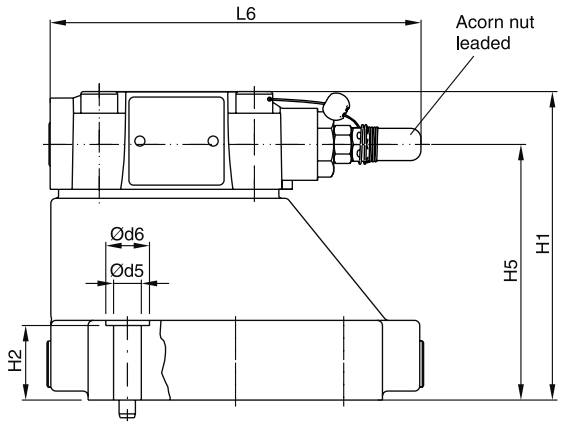
[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	6264-06-09-*-97	BK 494	4xM12 x 45 DIN 912 12.9	108 Nm ±15%	S26-96396-0	S26-96396-5	
25	6264-08-13-*-97	BK 366	4xM16 x 70 DIN 912 12.9	264 Nm ±15%	S26-98589-0	S26-98589-5	
32	6264-10-17-*-97	BK 507	4xM18 x 75 DIN 912 12.9	398 Nm ±15%	S26-96392-0	S26-96392-5	

R4V







NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-07-*-97	42.9	35.8	21.5	–	7.2	21.5	0	66.7	58.8	33.4	7.9	14.3	–
25	6264-08-11-*-97	60.3	49.2	39.7	–	11.1	20.6	0	79.4	73	39.7	6.4	15.9	–
32	6264-10-15-*-97	84.2	67.5	59.5	42.1	16.7	24.6	0	96.8	92.8	48.4	3.8	21.4	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

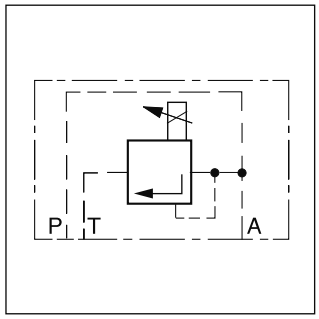
NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L6
10	6264-06-07-*-97	87.3	33.35	83	21	–	–	62.5	–	29	94.8	–	144.8
25	6264-08-11-*-97	105	39.7	109.5	29	–	–	89	–	34.7	126.8	–	144.8
32	6264-10-15-*-97	120	48.4	120	29	–	–	99.5	–	30.6	144.3	–	144.8

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-07-*-97	15	7	7.1	8	M10	16	10.8	17	SPP 3M6B 910
25	6264-08-11-*-97	23.4	7.1	7.1	8	M10	18	10.8	17	SPP 6M8B 910
32	6264-10-15-*-97	32	7.1	7.1	8	M10	20	10.8	17	SPP 10M12B 910

[1] Details see chapter 12, series SPP

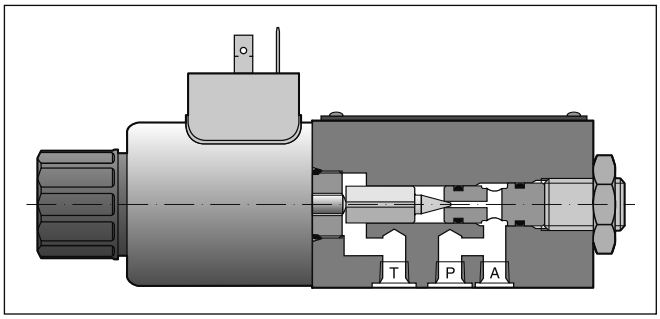
NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	6264-06-07-*-97	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S26-58507-0	S26-58507-5	R_{max}6.3 ▱ 0.01/100
25	6264-08-11-*-97	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58475-0	S26-58475-5	
32	6264-10-15-*-97	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58508-0	S26-58508-5	

Pressure relief valves of the series RE06M*W are direct operated proportional valves typically used as remote control valves for flow rates below 3 l/min.



Function

When the pressure in port P or A exeeds the pressure setting at the solenoid, the cone opens to port T and limits the pressure in port P to the adjusted level.
The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.



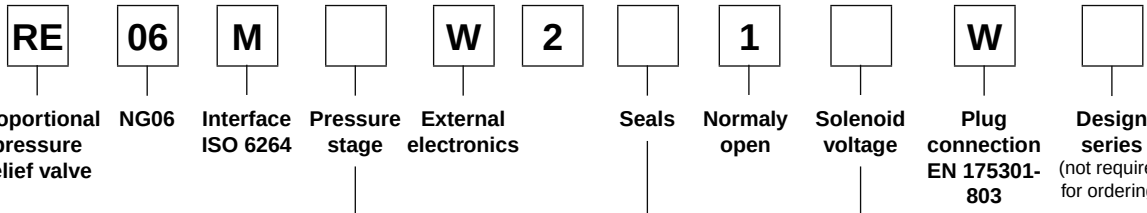
Features

- Direct operated with proportional solenoid
- Very low pressure adjustment of p_{min}
- 2 pressure ports, A and P
- Subplate mounting according to ISO 6264
- 4 pressure stages

4

Technical data

General		
Nominal size		DIN NG06 / CETOP03 / NFPA D03
Interface		Subplate mounting according to ISO 6264
Mounting position		as desired, horizontale mounting prefered
Ambient temperature	[°C]	-20 ... +70
$MTTF_D$ value	[years]	150
Weight	[kg]	1.8
Hydraulic		
Max. operating pressure	[bar]	Ports P and A up to 350; port T 30
Pressure stages	[bar]	105, 175, 250, 350
Nominal flow	[l/min]	See p/Q curves
Fluid		Hydraulic oil as per DIN 51524 ... 51525
Viscosity, recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 80 12 ... 380
Fluid temperature	[°C]	-20 ... +60
Filtration		ISO 4406 (1999), 18/16/13 (acc. NAS 1638:7)
Linearity	[%]	±2.8
Repeatability	[%]	<±1
Hysteresis	[%]	±1.5 of p_{max}
Electrical		
Duty ratio	[%]	100 ED
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Nominal voltage	[V]	12 (2.3 A max. current), 16 (1.3 A max. current)
Coil resistance	[Ohm]	4 at 20°C
Solenoid connection		Connector as per EN 175301-803
Power amplifier, recommended		PCD00A-400



Code	Pressure stage
10	up to 105 bar
17	**up to 175 bar**
25	up to 250 bar
35	**up to 350 bar**

Code	Solenoid voltage
K	**12 V, 2.3 A**
X	16 V, 1.3 A

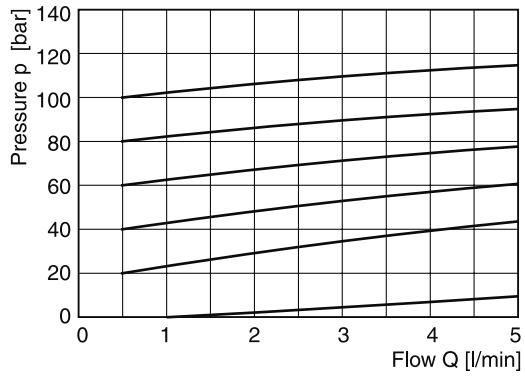
Code	Seals
N	NBR
V	**FPM**

Bold letters =
Short-term availability

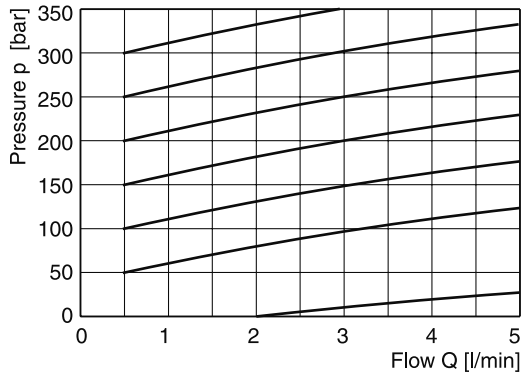
4

p/Q curves

Pressure stage 105bar

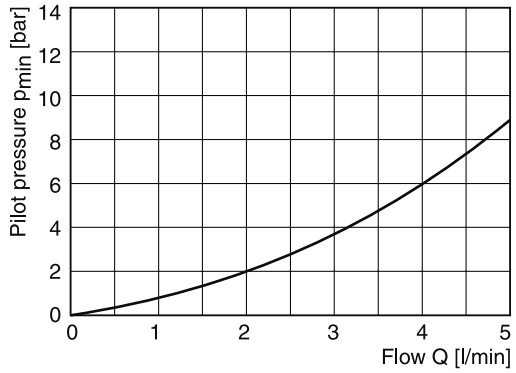


Pressure stage 350bar

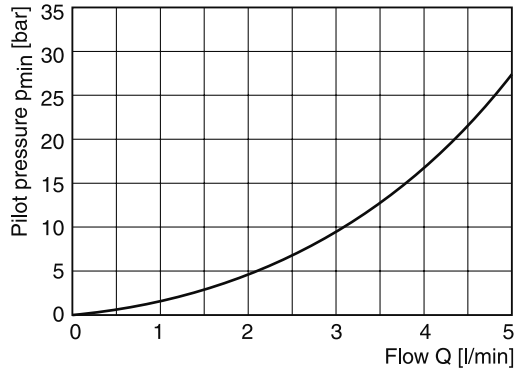


Min. adjusted pressure

Pressure stage 105bar

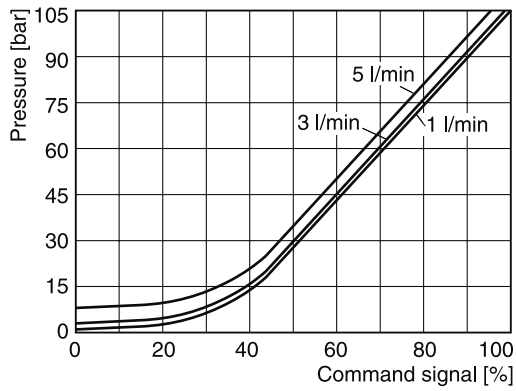


Pressure stage 350bar

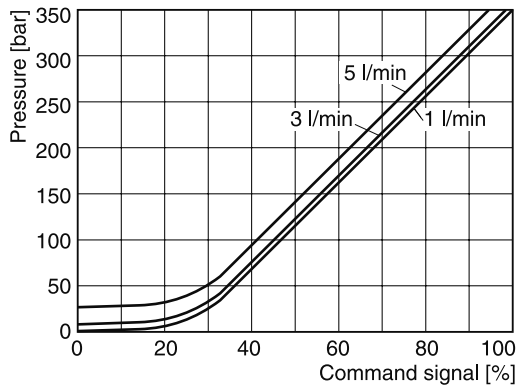


Pressure/signal curve

Pressure stage 105bar

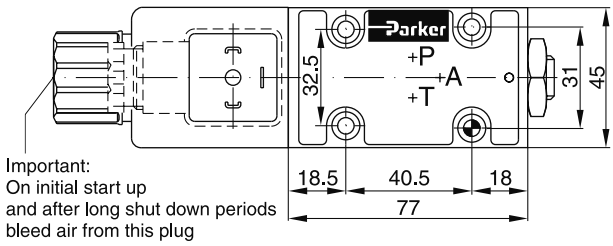


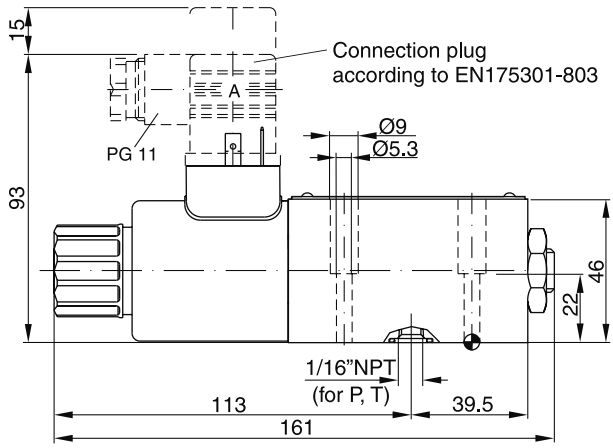
Pressure stage 350bar

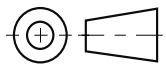


All characteristic curves measured with HLP46 at 50°C.

RE06M*W

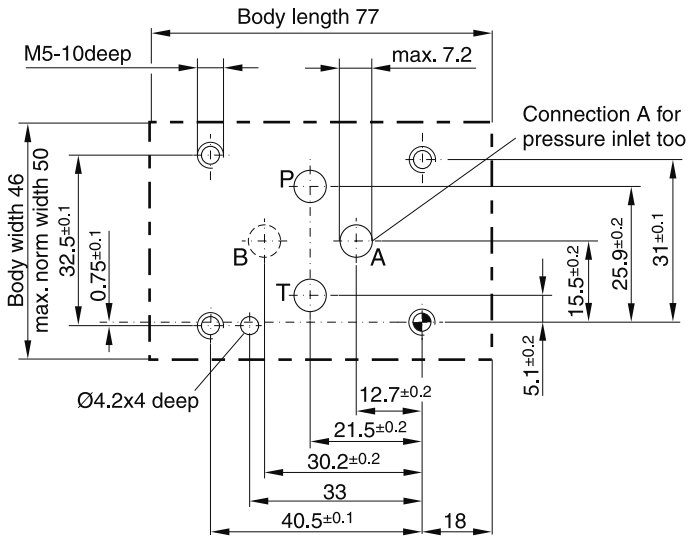






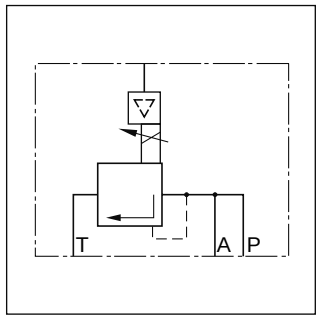
Surface finish	Bolt kit			Kit NBR	Kit FPM
R_{max}6.3 ▱ 0.01/100	BK 375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-RE06MNW	SK-RE06MVW

Mounting pattern ISO 6264-03-04-*-97

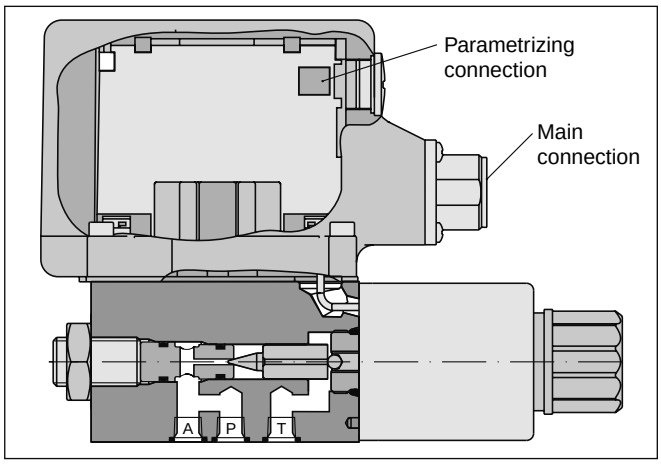


Port B: O-ring recess diameter on valve body.

The proportional pressure relief valve series RE06M*T (NG06) with onboard electronics is based on the functionality of the digital amplifier PCD00.
The digital onboard electronic is situated in a robust metal housing and can be used in rough environments. The nominal values of the valves are factory set. Additionally the ProPxD software permits the editing of all parameters. The software is also used for the digital electronic modules. The cable for connection to a serial RS232C interface is available as accessory.



The electrical connection is available in 2 options:
Code F: 6 + PE central connection
+/- 10V command signal (preset)
+10V reference voltage output
Code R: 6 + PE central connection
4…20mA command signal (preset)



4

Function

When the pressure in port P or A exeeds the pressure setting at the solenoid, the cone opens to port T and limits the inlet pressure to the adjusted level.

The pressure adjustment is effected by applying current to the solenoid. The control signal is modulated to the solenoid current by the electronics.

Features

- Direct operated with proportional solenoid
- Onboard electronics
- Very low pressure adjustment of p_{min}
- Subplate mounting acc. to ISO 6264
- 6 pressure stages
- 2 pressure inlet ports A and P

Ordering code

RE	06	M		T	2		1		0	
Proportional pressure relief valve	**NG06**	**Interface ISO 6264**	**Pressure stages**	**Onboard electronics**		**Seals**	**Normaly open**	**Command signal**	**Electronic attachment**	**Design series** (not required for ordering)

Code	Pressure stages
05	50 bar
10	105 bar
17	**175 bar**
21	**210 bar**
25	250 bar
35	**350 bar**

Code	Command signal
F	**Voltage input 0...+10V with reference output +10V**
R	Current input 4...20mA

Code	Seals
N	NBR
V	**FPM**

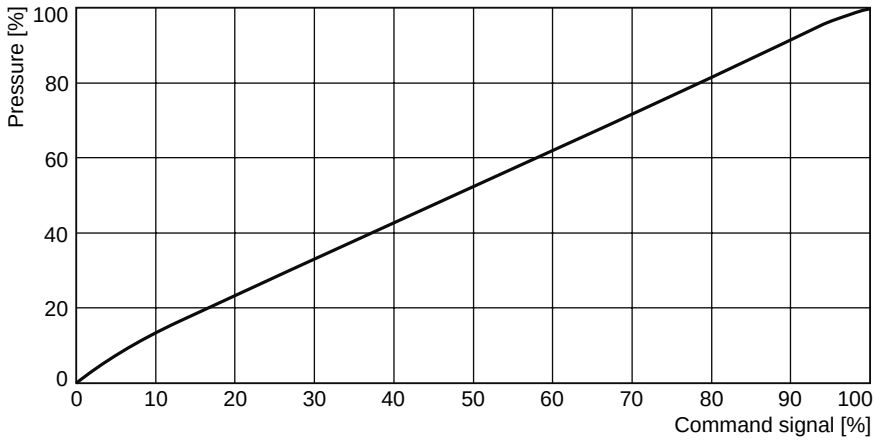
Bold letters =
Short-term availability

Please order plugs separately, see chapter 4, accessories.

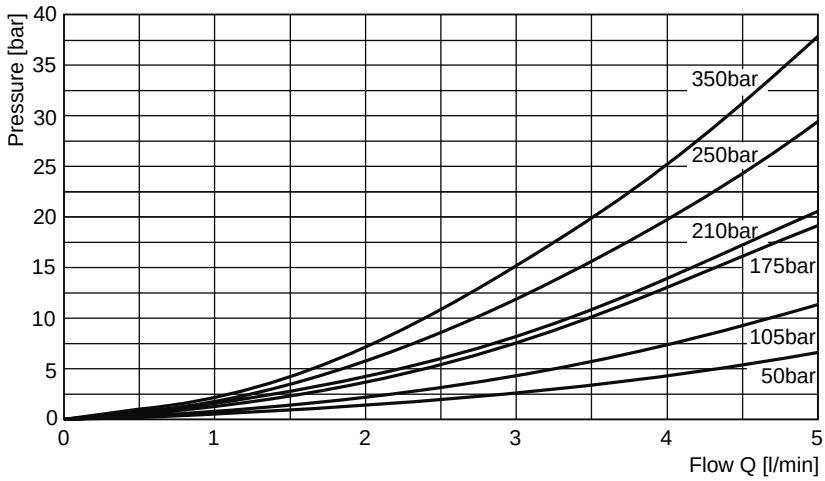
Parametrizing cable OBE → RS232
Item no. 40982923

General			
Nominal size			DIN NG06 / CETOP03 / NFPA D03
Interface			Subplate mounting according to ISO 6264
Mounting position			as desired, horizontal mounting prefered
Ambient temperature		[°C]	-20...+60
$MTTF_D$ value		[years]	75
Weight		[kg]	2.2
Vibration strength		[g]	10 sinus 5...2000 Hz acc. to IEC 68-2-6 30 noise 20...2000 Hz acc. to IEC 68-2-36 15 shock acc. to IEC 68-2-27
Hydraulic			
Max. operating pressure		[bar]	Ports A and P 350, connection T 30
Pressure stages		[bar]	50, 105, 175, 210, 250, 350
Nominal flow		[l/min]	See p/Q curves
Fluid			Hydraulic oil according to DIN 51524 ... 51525
Viscosity,	recommended	[cSt] / [mm²/s]	30 ... 80
	permitted	[cSt] / [mm²/s]	12 ... 380
Fluid temperature		[°C]	-20 ... +60
Filtration			ISO 4406 (1999), 18/16/13 (acc. NAS 1638:7)
Linearity		[%]	See curve
Repeatability		[%]	<±1
Hysteresis		[%]	±1.5 of p_{max}
Elektrical			
Duty ratio ED		[%]	100
Supply voltage		[VDC]	18...30, ripple < 5% eff., surge free
Current consumption max.		[A]	2.0
Pre-fusing		[A]	2.5 medium lag
Potentiometer supply		[V]	+10 / ±5% max. 10mA
Command signal		[V]	0...+10, ripple < 0.01 % eff., surge free, Ri = 100 kOhm
Code F voltage Code R current		[mA]	4...20, ripple < 0.01 % eff., surge free, Ri = 200 Ohm < 3.6 mA = enable off, > 3.8 mA = enable on (acc. NAMUR NE43)
Differential input voltage max.		[V]	30 for terminal D and E against PE (terminal G)
		[V]	11 for terminal D and E against 0V (terminal B)
Adjustment ranges	Min current	[%]	0...50
	Max current	[%]	50...100
	Ramp	[s]	0...32.5
Interface			RS 232C, parametrizing connection 5polig
EMC			EN 61000-6-2, EN 61000-6-4
Central connection			6 + PE acc. EN 175201-804
Cable specification		[mm²]	7 x 1.0 overall braid shield
Cable length max.		[m]	50

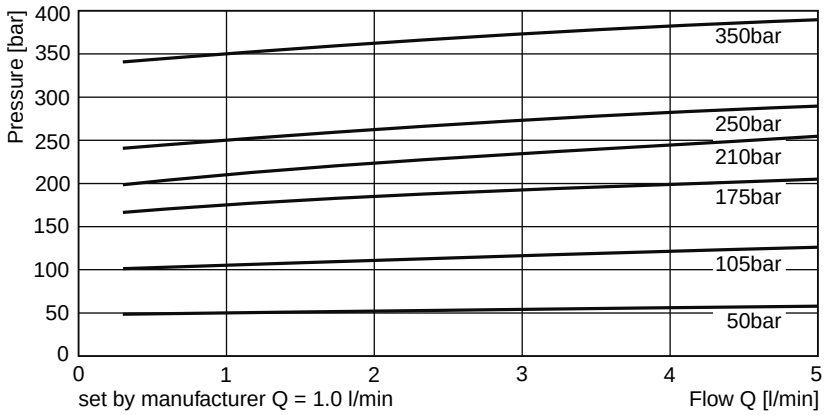
Signal/pressure curve



Min. adjusted pressure



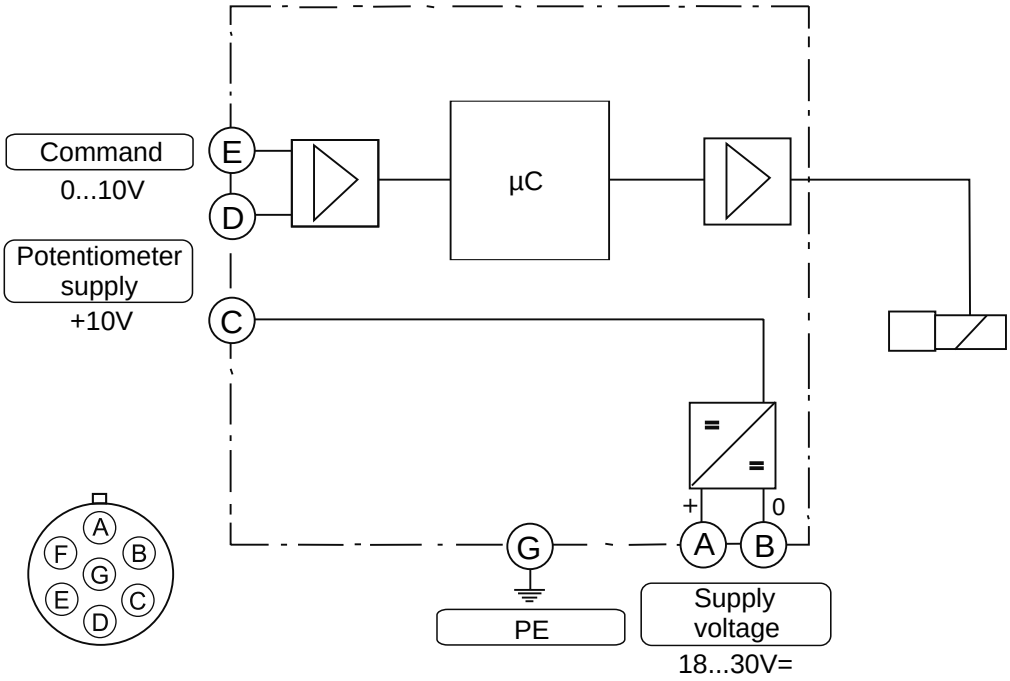
p/Q curve



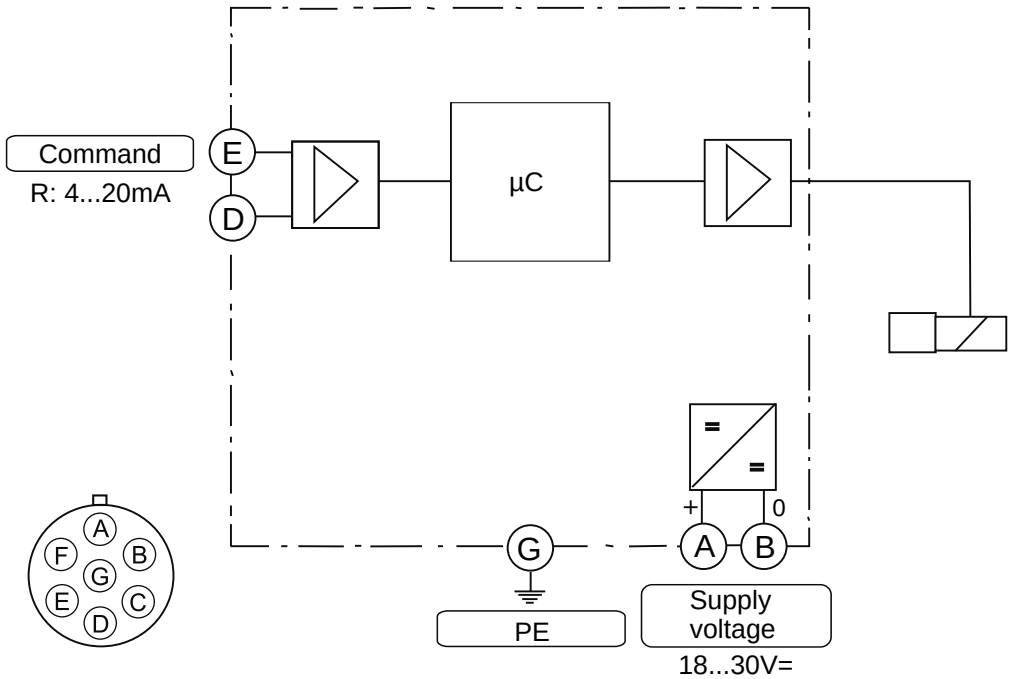
All characteristic curves measured with HLP46 bei 50°C.

Block diagram

Code F
6 + PE acc. EN 175201-804



Code R
6 + PE acc. EN 175201-804



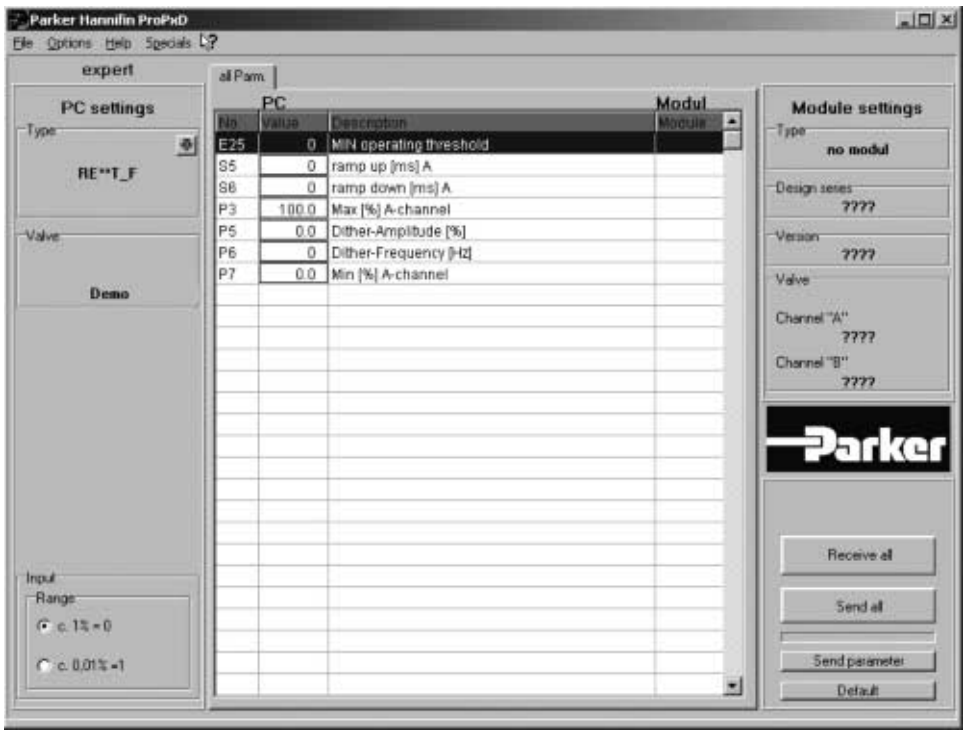
ProPxD interface program

The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

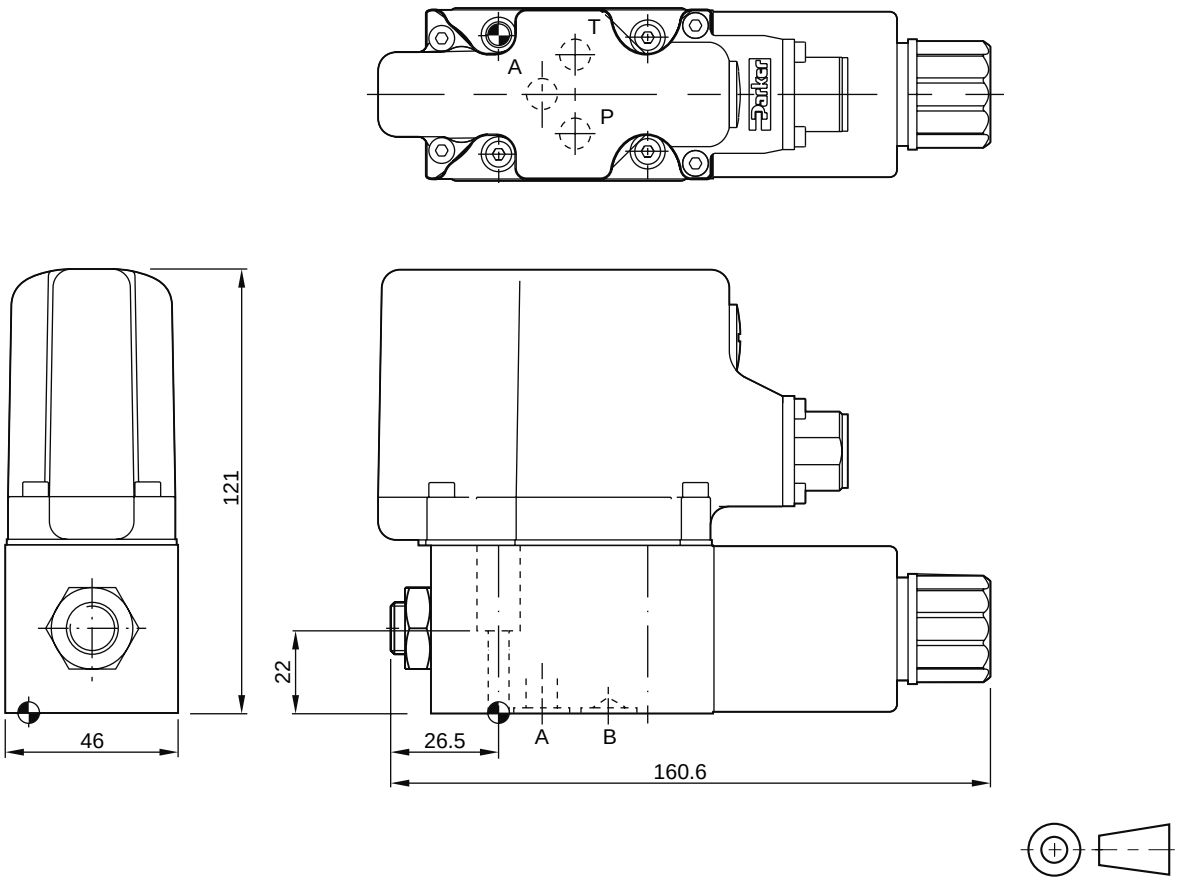
Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

Features

- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows® operating systems from Windows® 95 upwards
- Plain communication between PC and electronic via serial interface RS232C and null modem cable
- Comfortable PC user software, free of charge: www.parker.com/euro_hcd - see “Support“

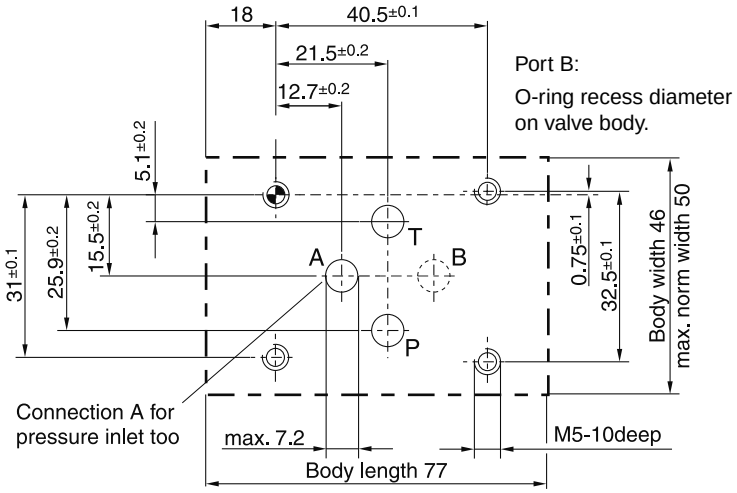


The parametrizing cable may be ordered under item no. 40982923.



Surface finish	Bolt kit			Kit NBR	Kit FPM
R_{max}6.3 ⊡ 0.01/100	BK 375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-RE06MNT	SK-RE06MVT

Mounting pattern ISO 6264-03-04-*-97

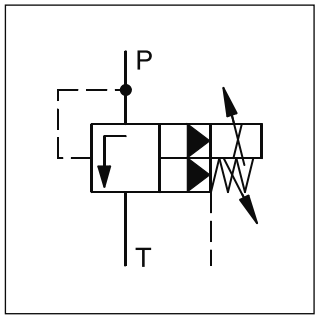


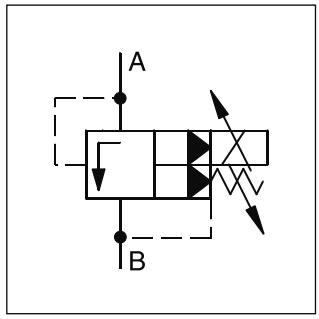
Pilot operated proportional pressure relief valves series R4V (DIN 24340 Form D) and R6V (DIN 24340 Form E) consist of a proportionally adjusted pilot stage and a seated type main stage.

The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.

R6V06

R4V06

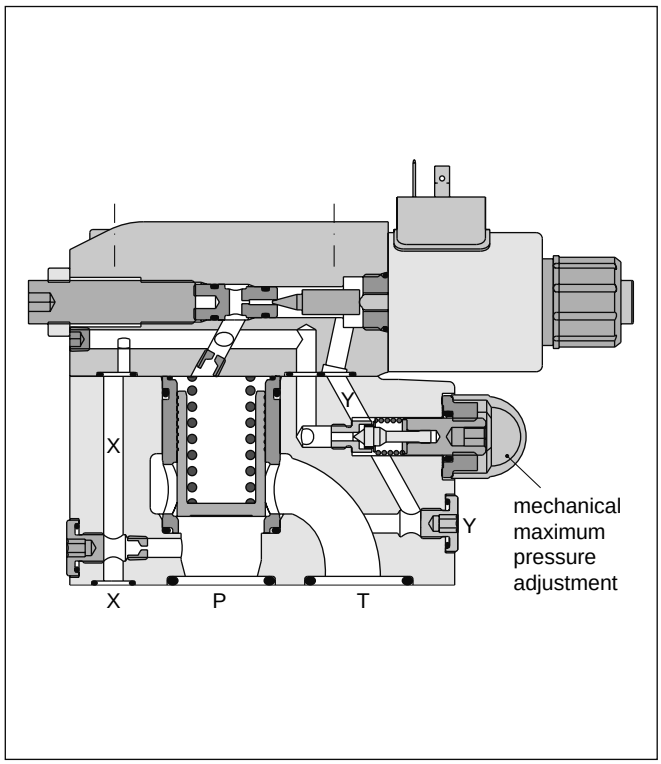




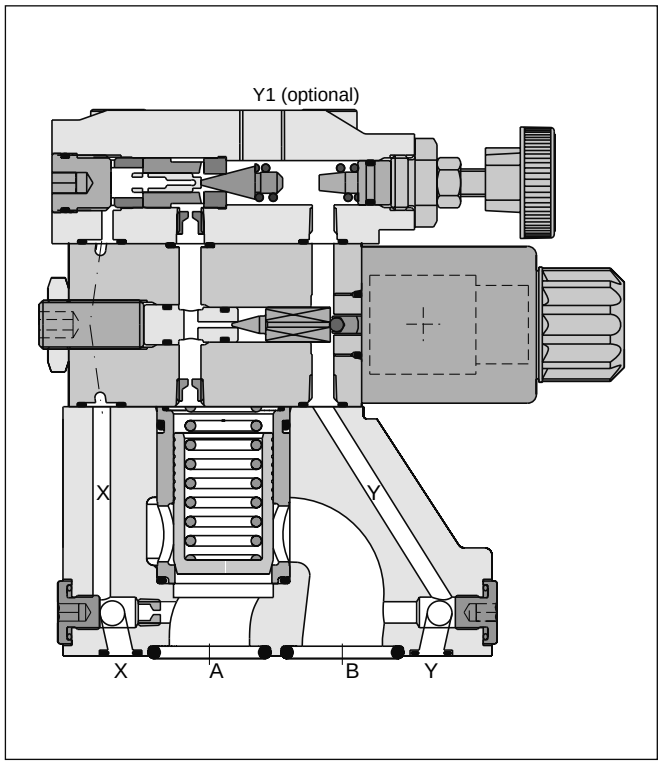
Features

- Continuous adjustment by proportional solenoid
- 2 interfaces
  - R4V Subplate ISO 6264 (DIN 24340 Form D)
  - R6V Subplate ISO 6264 (DIN 24340 Form E)
- 3 pressure stages
- Optional mechanical maximum pressure adjustment (for R6V)

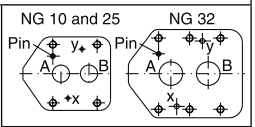
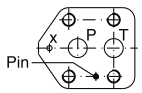
R6V06



R4V06



R		V		–	5							GOR				
Pressure valve		**Relief function**			**Max. Pressure (350 bar)**		**Pressure stages**	**Mechanical adjustment**	**Pilot oil**	**Options**		**Solenoid voltage 12V/2.3A**	**Design**	**Seals**	**Design series** (not required for ordering)	**Modifi-cations**
	Interface		**Nominal size**			**Drain port**										

Code	Interface	
4	Subplate mounting ISO 6264	NG 10 and 25 / NG 32 
6		

Code	Seals
1	NBR
5	FPM

Code	Design
A	R4V
B	R6V

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Options
P2	With mech. max. adjustment
PS [5]	w/o mech. max. adjustment

[5] not for R4V

Code	Interface	Drain port
3	R4V	Y port in mounting pattern
9	R6V	Y-port = G 1/8“

Pilot oil	
Code	Drain line
0	internal
1 [3]	external from subplate
2 [4]	external from valve body (Y-port)

[3] R4V only
[4] R6V only

Code	Pressure stages [1]
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

[1] Other pressure stages on request.

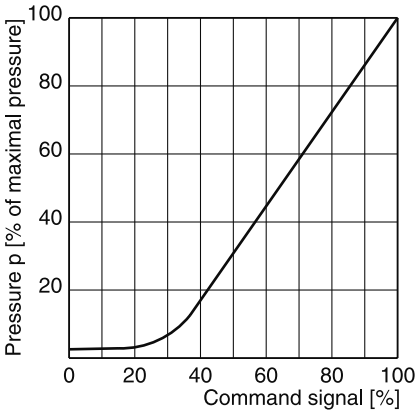
Code	Interface	Mechanical adjustment
P [2]	R6V	Hexagon screw with lock nut
1	R4V	Hand knob
3	R4V	Acorn nut with lead seal

[2] Use code P also for valve w/o mechanical adjustment

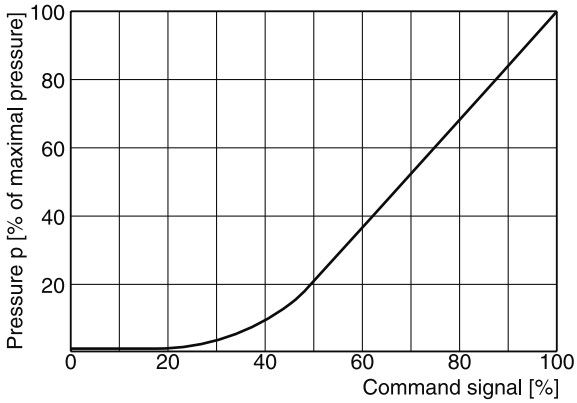
General					
Nominal size			10	25	32
Interface			Subplate mounting acc. ISO 6264		
Mounting position			as desired, horizontal mounting prefered		
Ambient temperature		[°C]	-20...+80		
$MTTF_D$ value		[years]	75		
Weight	Series R6V	[kg]	5.2	6.4	8.3
	Series R4V	[kg]	4.5	6.3	7.8
Hydraulic					
Max. operating pressure		[bar]	Ports P (or A) and X up to 350, port T (or B) and Y 30		
Pressure stages		[bar]	105, 210, 350		
Nominal flow		[l/min]	250	500	650
Fluid			Hydraulic oil according to DIN 51524 ... 51525		
Viscosity, recommended		[cSt] / [mm²/s]	30 ... 50		
permitted		[cSt] / [mm²/s]	20 ... 380		
Fluid temperature		[°C]	-20 ... +70		
Filtration			ISO 4406 (1999); 18/16/13 (acc. NAS 1638:7)		
Electrical (prop. solenoid)					
Duty ratio		[%]	100 ED		
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
Nominal voltage		[V]	12 (max. current 2.3A), 16 (max. current 1.3A)		
Coil resistance		[Ohm]	4 at 20°C		
Solenoid connectors			Connector as per EN 175301-803		
Power amplifier, recommended			PCD00A-400		

4

R6V Signal/pressure curve

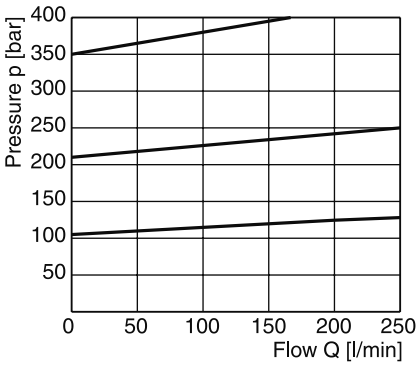


R4V Signal/pressure curve

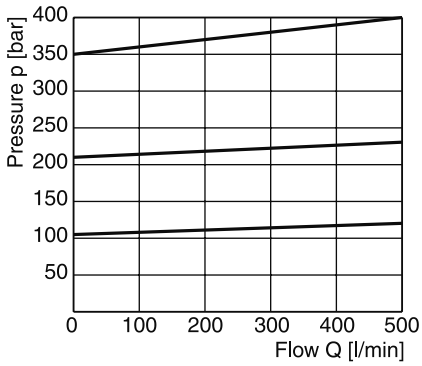


p/Q performance curves [1)]

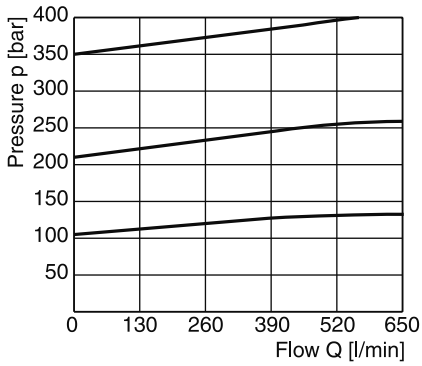
R4V / R6V03



R4V / R6V06

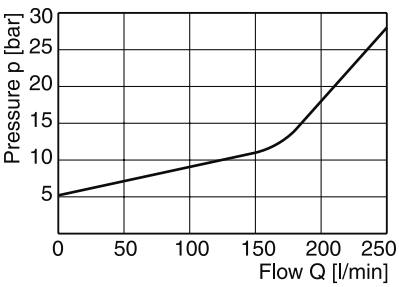


R4V / R6V10

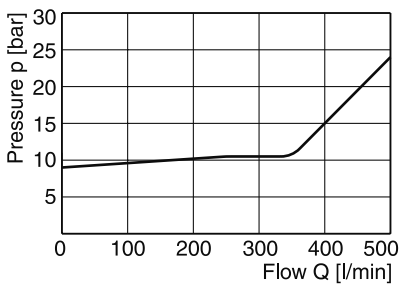


Minimum pressure curves [1)]

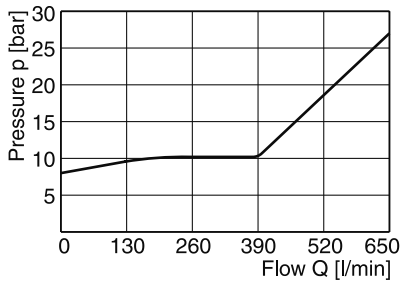
R4V / R6V03



R4V / R6V06



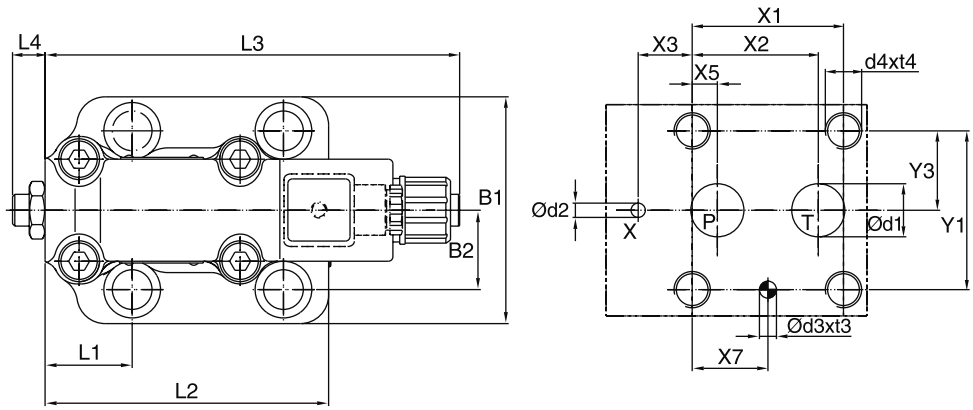
R4V / R6V10

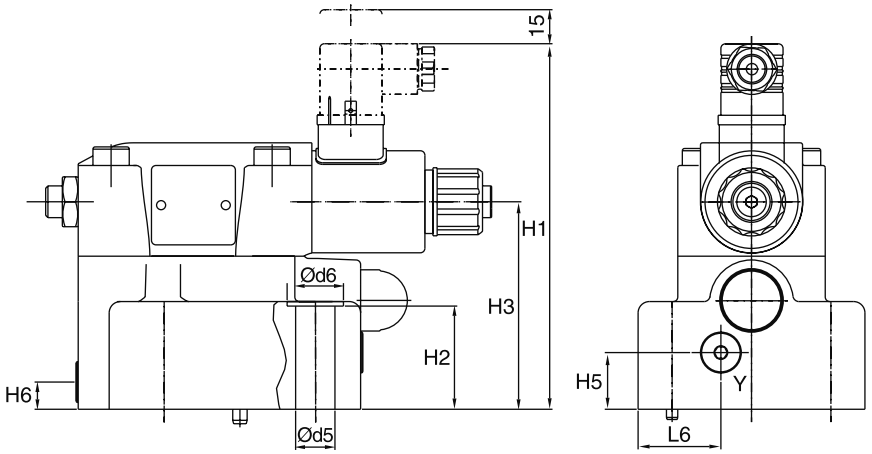


[1)] The performance curves are measured with external drain.
For internal drain the tank pressure has to be added to curve.

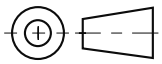
All characteristic curves measured with HLP46 at 50°C.

R6V





Y: external drain port G 1/8“



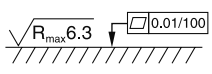
NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-09-*-97	53.8	47.5	0	–	22.1	–	22.1	53.8	–	26.9	–	–	–
25	6264-08-13-*-97	66.7	55.6	23.8	–	11.1	–	33.4	70	–	35	–	–	–
32	6264-10-17-*-97	88.9	76.2	31.8	–	12.7	–	44.5	82.6	–	41.3	–	–	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

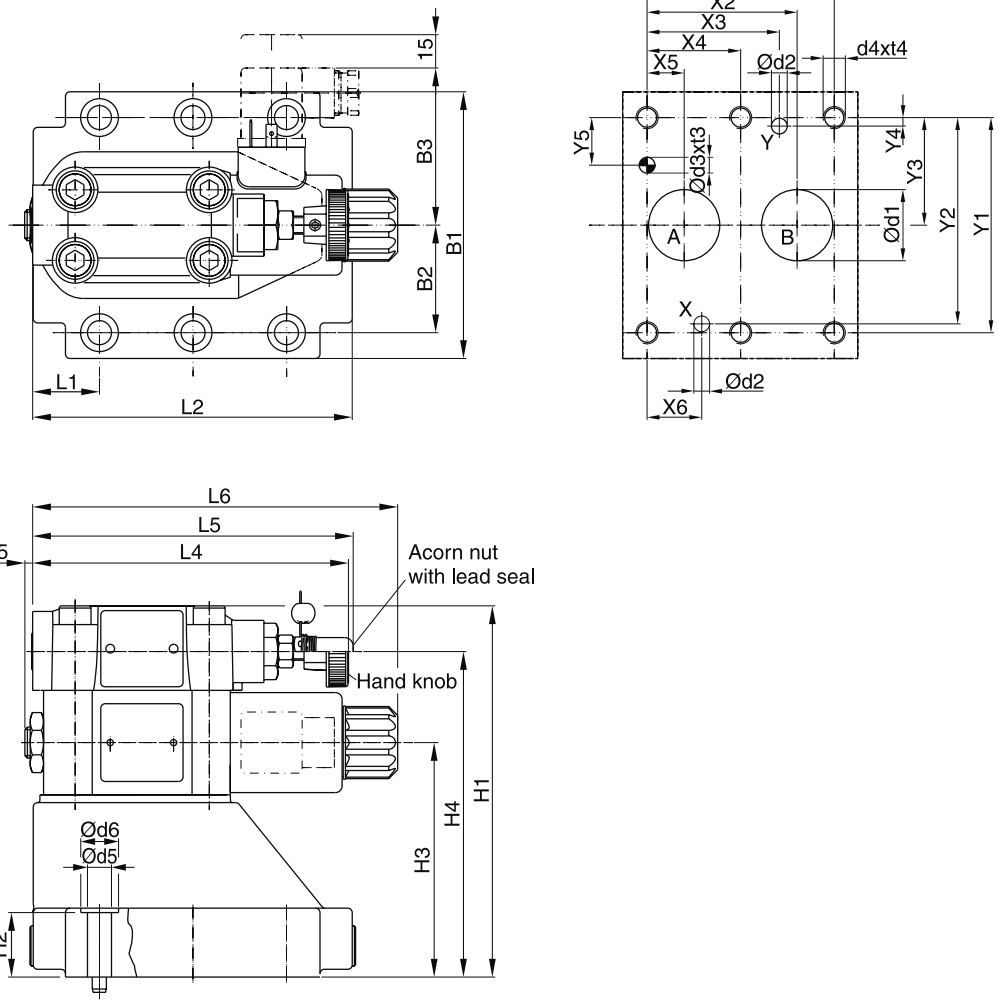
NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	6264-06-09-*-97	80	26.9	158.7	27	88	–	20.5	25	52.5	118.5	182.3	14.4		29.5
25	6264-08-13-*-97	100	35	161.2	45.5	91.5	–	25	12	37.9	124.5	182.3	14.4	–	36.5
32	6264-10-17-*-97	120	41.3	166.7	52	97	–	26.5	13.5	45	153	182.3	14.4		46.5

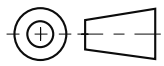
NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-09-*-97	14.7	4.8	7.5	10	M12	20	13.5	20	SPP 3R6B 910
25	6264-08-13-*-97	23.4	6.3	7.5	10	M16	27	17.5	25	SPP 6R10B 910
32	6264-10-17-*-97	32	6.3	7.5	10	M18	28	20	30	SPP 10R12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	6264-06-09-*-97	BK 494	4x M12 x 45 DIN 912 12.9	108 Nm ±15%	S26-96396-0	S26-96396-5	
25	6264-08-13-*-97	BK 366	4x M16 x 70 DIN 912 12.9	264 Nm ±15%	S26-98589-0	S26-98589-5	
32	6264-10-17-*-97	BK 507	4x M18 x 75 DIN 912 12.9	398 Nm ±15%	S26-96392-0	S26-96392-5	

R4V





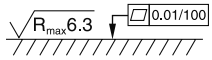
NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-07-*-97	42.9	35.8	21.5	–	7.2	21.5	0	66.7	58.8	33.4	7.9	14.3	–
25	6264-08-11-*-97	60.3	49.2	39.7	–	11.1	20.6	0	79.4	73	39.7	6.4	15.9	–
32	6264-10-15-*-97	84.2	67.5	59.5	42.1	16.7	24.6	0	96.8	92.8	48.4	3.8	21.4	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

NG	ISO-code	B1	B2	B3	H1	H2	H3	H4	H6	L1	L2	L3	L4	L5	L6
10	6264-06-07-*-97	87.3	33.35	71	130	21	68.5	109.5	–	29	94.8	–	143	144.8	164.8
25	6264-08-11-*-97	105	39.7	71	156.5	29	95	136	–	34.7	126.8	–	143	144.8	164.8
32	6264-10-15-*-97	120	48.4	71	167	29	105.5	146.5	–	30.6	144.3	–	143	144.8	164.8

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-07-*-97	15	7	7.1	8	M10	16	10.8	17	SPP 3M6B 910
25	6264-08-11-*-97	23.4	7.1	7.1	8	M10	18	10.8	17	SPP 6M8B 910
32	6264-10-15-*-97	32	7.1	7.1	8	M10	20	10.8	17	SPP 10M12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit NBR	Kit FPM	Surface finish
10	6264-06-07-*-97	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S26-58507-0*	S26-58507-5*	
25	6264-08-11-*-97	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58475-0*	S26-58475-5*	
32	6264-10-15-*-97	BK 506	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58508-0*	S26-58508-5*	
Prop. section P2					S26-58473-0	S26-58473-5	

* Please combine seal kit of one size with seal kit of Prop. section P2 for complete seal kit

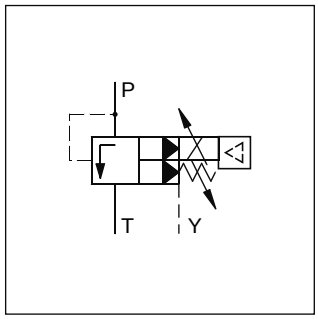
R4V-R6V PROP UK.INDD RH 06.09.2011

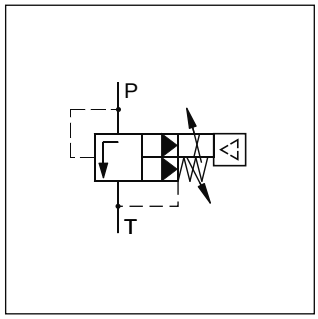
The onboard electronics of the proportional pressure relief valves is based on the functionality of the digital amplifier PCD00.
The digital onboard electronic is situated in a robust metal housing and can be used in rough environments.
The nominal values of the valves are factory set. Additionally the ProPxD software permits the editing of all parameters. The software is also used for the digital electronic modules. The cable for connection to a serial RS232C interface is available as accessory.
The electrical connection is available in 2 options:

Code 10V: 6 + PE central connection
0...+10V command signal (preset)
+10V reference voltage output

Code 4MA: 6 + PE central connection
4…20mA command signal (preset)

The proportional solenoid operated pilot stage with integrated electronics controls a seated type main stage. The valves are optional available with a mechanical maximum pressure adjustment.



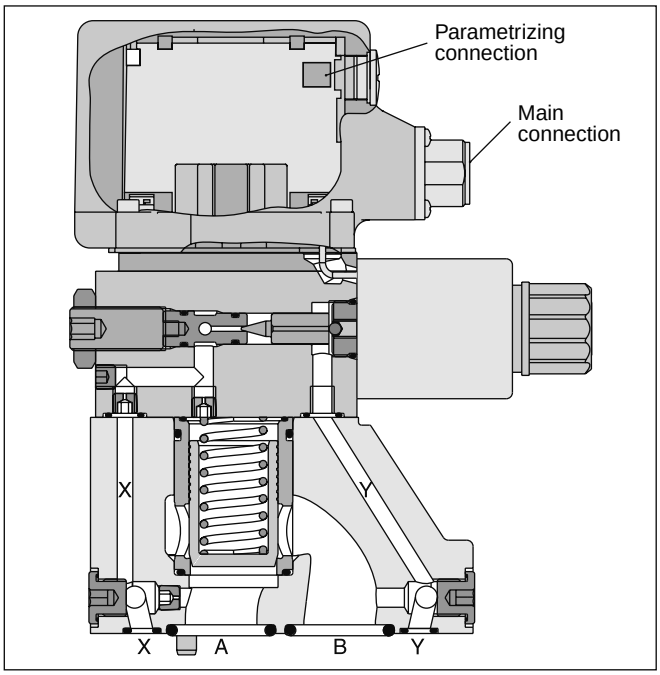


4

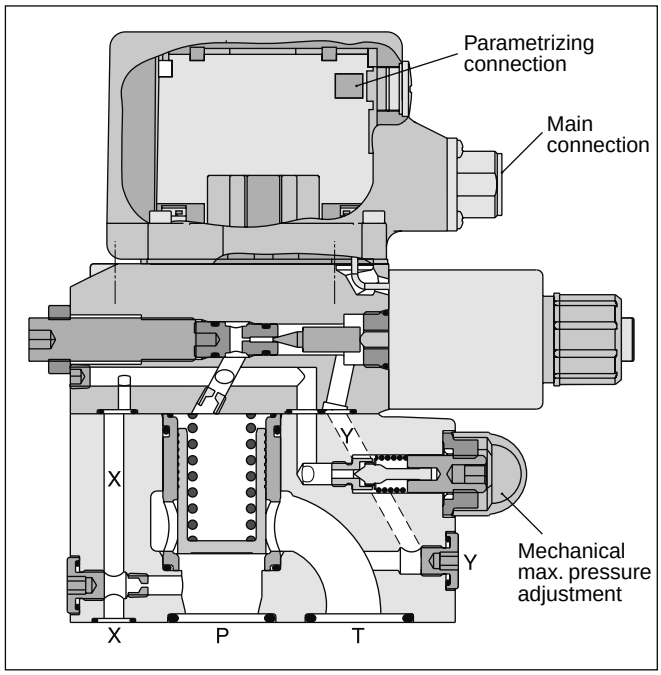
Features

- Pilot operated with proportional solenoid
- Onboard electronics
- Factory set
- Ramp time adjustment
- Linearized characteristics
- 3 pressure stages
- 2 interfaces
  - R4V Subplate ISO 6264 (DIN 24340 Form D)
  - R6V Subplate ISO 6264 (DIN 24340 Form E)
- Optional mechanical maximum pressure adjustment

R4V06

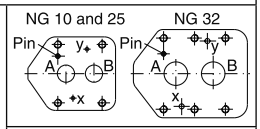
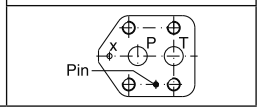


R6V06



R4V-R6V OBE UK.INDD RH 06.09.2011

R		V		5			P							
Pressure valve	**Interface**	**Relief function**	**Nominal size**	**Max. Pressure (350 bar)**	**Drain port**	**Pressure setting range**	**Proportional operation**	**Pilot oil**	**Options**	**Command signal**	**Design**	**Seals**	**Design series** (not required for ordering)	**Modifi-cations**

Code	Interface
4	Subplate mounting ISO 6264 
6 [1]	Subplate mounting ISO 6264 

[1] external drain with pipe only

Code	Seals
1	NBR
5	FPM

Code	Design
A	R4V
B	R6V

Code	Command signal
10V	0...10V (ref. output +10V)
4MA	4...20mA

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Options
PN	w/o mech. max. adjustment
PM [5]	With mech. max. adjustment

[5] R4V: Adjustment with acorn nut

Code	Interface	Drain port
3	R4V	Y from subplate
9	R6V	Y-port = G 1/8“

Code	Pressure stages [2]
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

[2] Other pressure stages on request.

Pilot oil	
Code	Drain line
0	internal
1 [3]	external from subplate
2 [4]	external from valve body (Y-port)

[3] R4V only
[4] R6V only

Please order plugs separately,
see chapter 4, accessories.

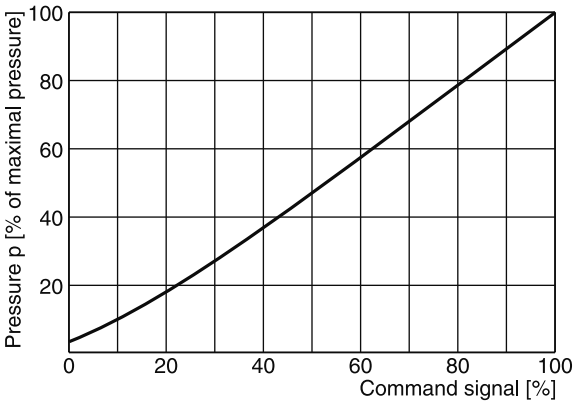
Parametrizing cable OBE → RS232
Item no. 40982923

General					
Nominal size			10	25	32
Interface			Subplate mounting acc. ISO 6264		
Mounting position			as desired, horizontal mounting prefered		
Ambient temperature		[°C]	-20...+60		
$MTTF_D$ value		[years]	50		
Weight	Series R6V	[kg]	5.4	6.6	8.6
	Series R4V	[kg]	4.5	6.3	7.8
Vibration strength		[g]	10 sinus 5...2000 Hz acc. to IEC 68-2-6 30 noise 20...2000 Hz acc. to IEC 68-2-36 15 shock acc. to IEC 68-2-27		
Hydraulic					
Max. operating pressure		[bar]	Ports P (or A) and X up to 350, port T (or B) and Y 30		
Pressure stages		[bar]	105, 210, 350		
Nominal flow		[l/min]	250	500	650
Fluid			Hydraulic oil according to DIN 51524 ... 51525		
Viscosity, recommended		[cSt] / [mm²/s]	30 ... 50		
permitted		[cSt] / [mm²/s]	20 ... 380		
Fluid temperature		[°C]	-20 ... +60		
Filtration			ISO 4406 (1999); 18/16/13 (acc. NAS 1638:7)		
Hysteresis		[%]	< 1.5		
Electrical					
Duty ratio ED		[%]	100		
Supply voltage		VDC	18...30, ripple < 5% eff., surge free		
Current consumption max.		[A]	2.0		
Pre-fusing		[A]	2.5 medium lag		
Potentiometer supply		[V]	+10 / ±5% max. 10mA		
Command signal Code 10V voltage Code 4MA current		 [V] [mA]	 0...+10, ripple < 0.01 % eff., surge free, Ri = 100 kOhm 4...20, ripple < 0.01 % eff., surge free, Ri = 200 Ohm < 3.6 mA = enable off, > 3.8 mA = enable on (acc. NAMUR NE43)		
Differential input voltage max.		[V]	30 for terminal D and E against PE (terminal G)		
		[V]	11 for terminal D and E against 0V (terminal B)		
Adjustment ranges	Min current	[%]	0...50		
	Max current	[%]	50...100		
	Ramp	[s]	0...32.5		
Interface			RS 232C, parametrizing connection 5polig		
EMC			EN 61000-6-2, EN 61000-6-4		
Central connection			6 + PE acc. EN 175201-804		
Cable specification		[mm²]	7 x 1.0 overall braid shield		
Cable length max.		[m]	50		

4

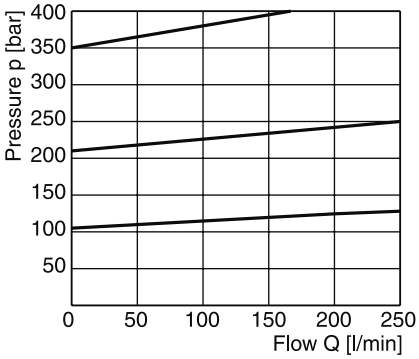
R4V/R6V

Command/pressure curve

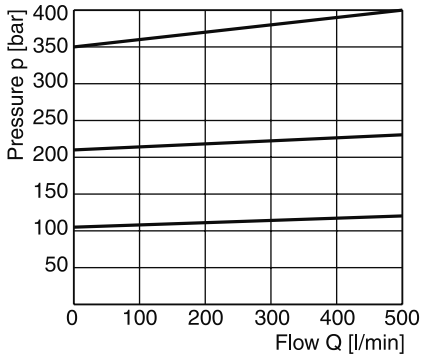


p/Q performance curves [1)]

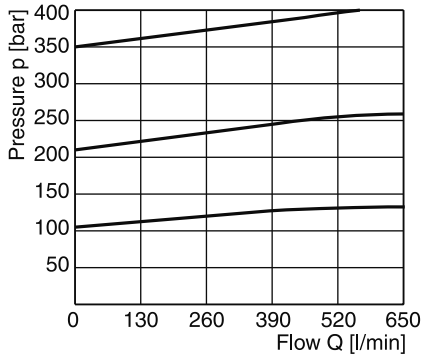
R4V / R6V03



R4V / R6V06

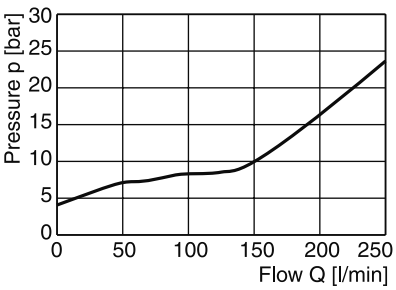


R4V / R6V10

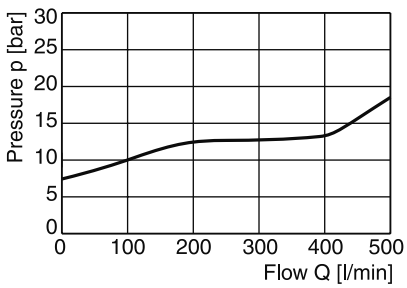


Minimum pressure curves [1)]

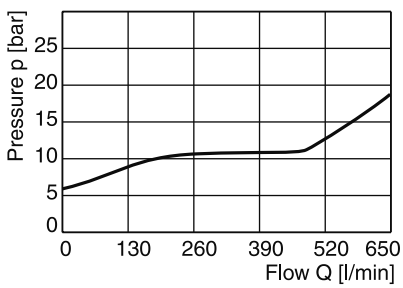
R4V / R6V03



R4V / R6V06



R4V / R6V10

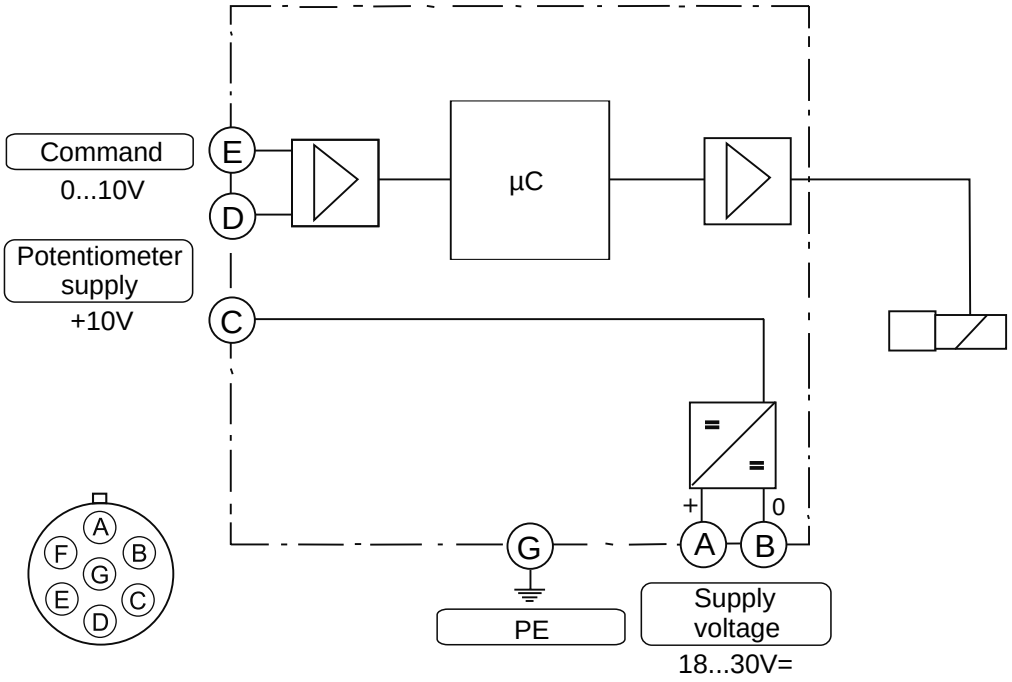


[1)] The performance curves are measured with external drain.
For internal drain the tank pressure has to be added to curve.

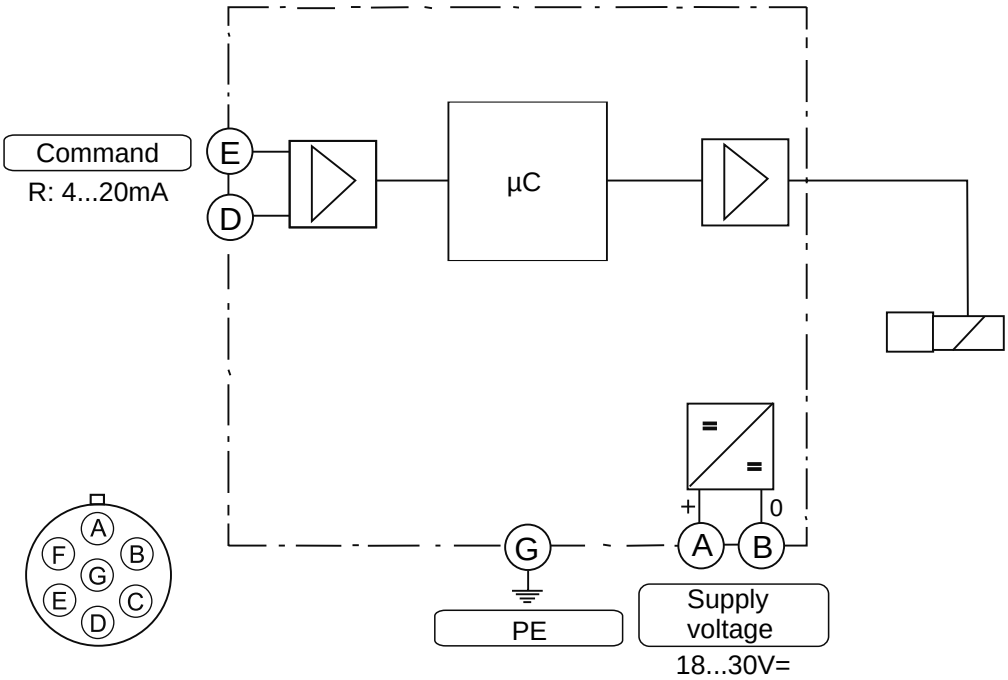
All characteristic curves measured with HLP46 bei 50°C.

Block diagram

Code 10V
6 + PE acc. EN 175201-804



Code 4MA
6 + PE acc. EN 175201-804



ProPxD interface program

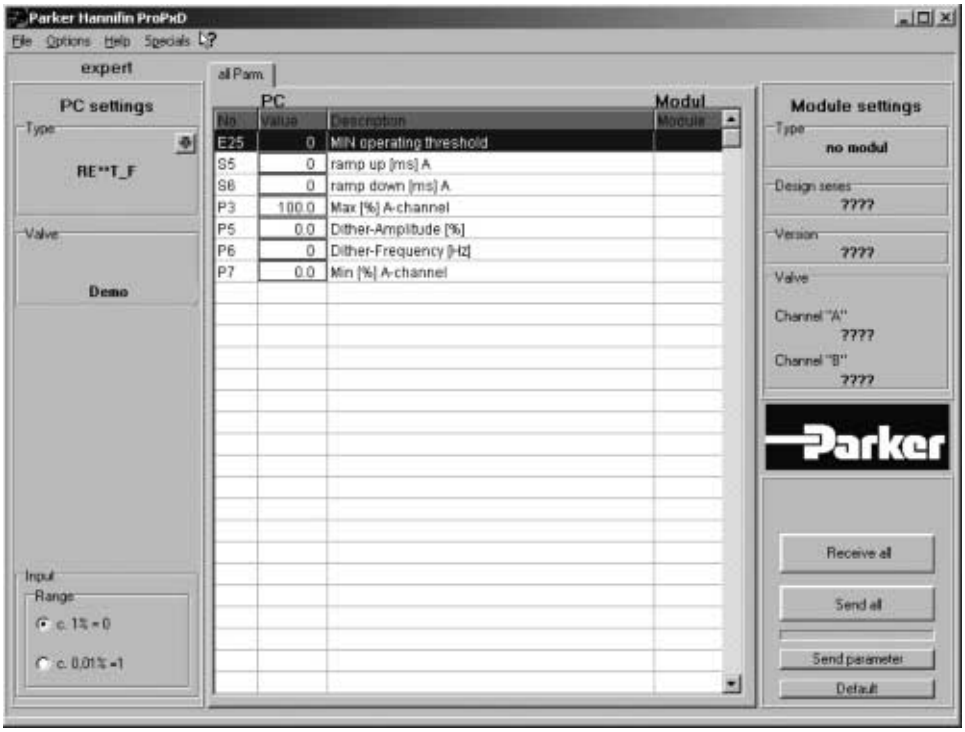
The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

Features

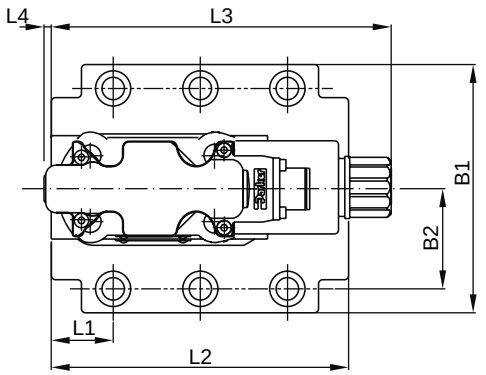
- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows® operating systems from Windows® 95 upwards
- Plain communication between PC and electronic via serial interface RS232C and null modem cable
- Comfortable PC user software, free of charge: www.parker.com/euro_hcd - see “Support“

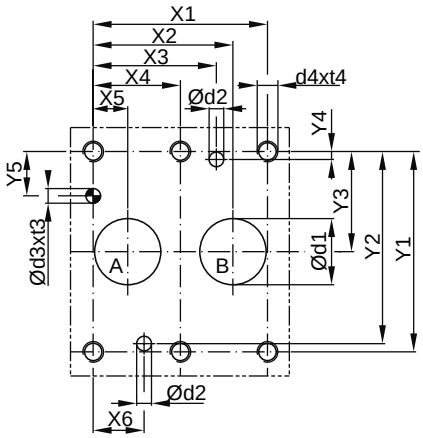
4

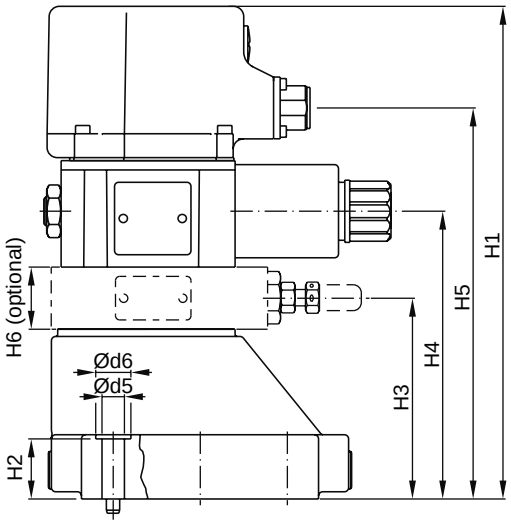


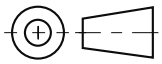
The parametrizing cable may be ordered under item no. 40982923.

R4V









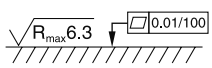
NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-07-*-97	42.9	35.8	21.5	–	7.2	21.5	0	66.7	58.8	33.4	7.9	14.3	–
25	6264-08-11-*-97	60.3	49.2	39.7	–	11.1	20.6	0	79.4	73	39.7	6.4	15.9	–
32	6264-10-15-*-97	84.2	67.5	59.5	42.1	16.7	24.6	0	96.8	92.8	48.4	3.8	21.4	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	6264-06-07-*-97	87.3	33.35	200.3	21	60	102	151	30	28.3	94.1	164.2	4.5	–	–
25	6264-08-11-*-97	105	39.7	226.8	29	86.5	128.5	184	30	34	126.1	164.2	4.5	–	–
32	6264-10-15-*-97	120	48.4	237.3	29	97	139	194.5	30	29.9	143.6	164.2	4.5	–	–

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-07-*-97	15	7	7.1	8	M10	16	10.8	17	SPP 3M6B 910
25	6264-08-11-*-97	23.4	7.1	7.1	8	M10	18	10.8	17	SPP 6M8B 910
32	6264-10-15-*-97	32	7.1	7.1	8	M10	20	10.8	17	SPP 10M12B 910

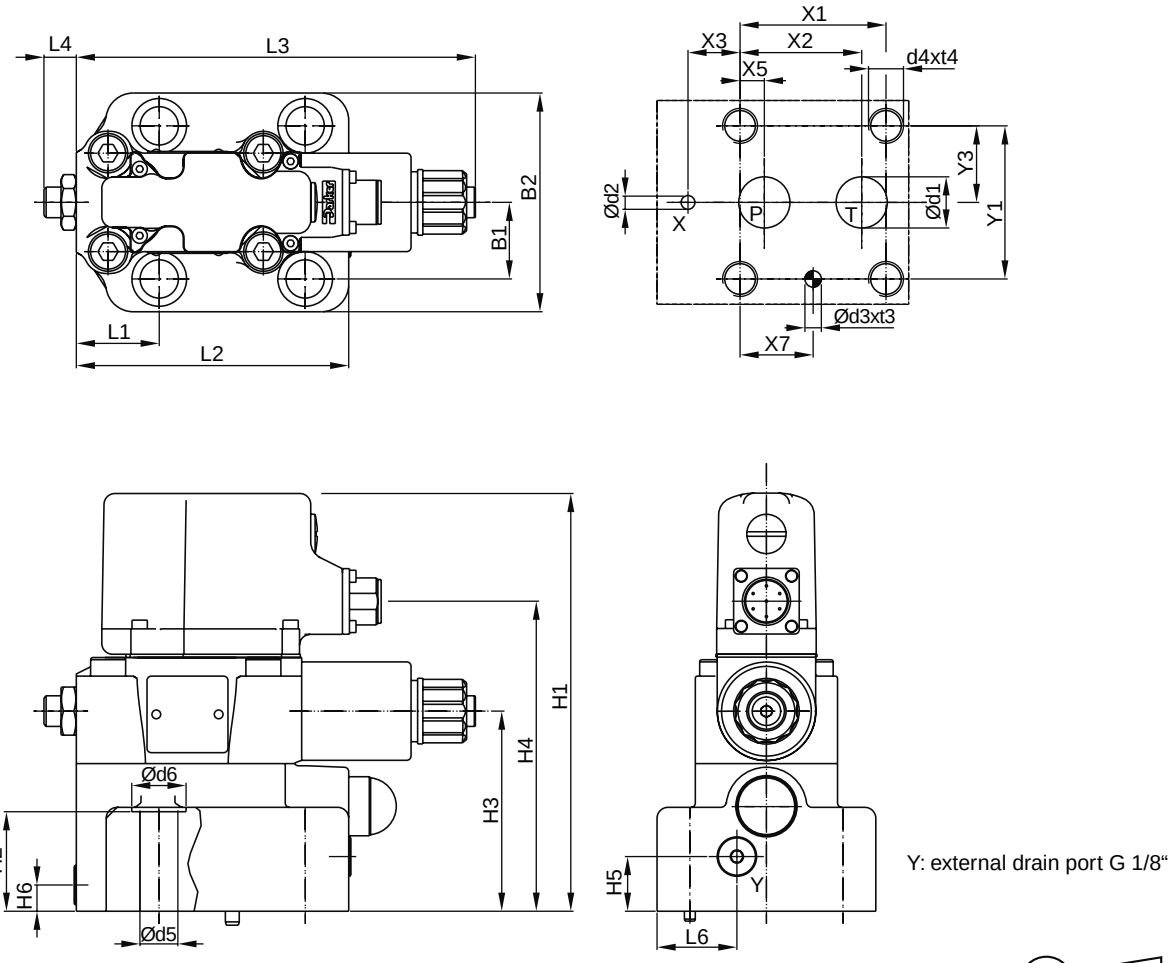
[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit - DIN912 12.9		Kit		Surface finish
				NBR	FPM	
10	6264-06-07-*-97	BK-M10 x 35-4pcs	63 Nm ±15%	S26-58507-0*	S26-58507-5*	
25	6264-08-11-*-97	BK-M10 x 45-4pcs	63 Nm ±15%	S26-58475-0*	S26-58475-5*	
32	6264-10-15-*-97	BK-M10 x 45-6pcs	63 Nm ±15%	S26-58508-0*	S26-58508-5*	
Prop. section P2				S26-58473-0	S26-58473-5	

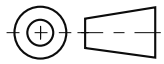
* Please combine seal kit of one size with seal kit of Prop. section P2 for complete seal kit

R4V-R6V OBE UK.INDD RH 06.09.2011

R6V



Y: external drain port G 1/8“



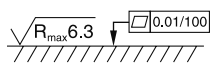
NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	6264-06-09-*-97	53.8	47.5	0	–	22.1	–	22.1	53.8	–	26.9	–	–	–
25	6264-08-13-*-97	66.7	55.6	23.8	–	11.1	–	33.4	70	–	35	–	–	–
32	6264-10-17-*-97	88.9	76.2	31.8	–	12.7	–	44.5	82.6	–	41.3	–	–	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	6264-06-09-*-97	80	26.9	185.1	27	88	135.8	20.5	25	52.5	118.5	182.3	14.4	–	29.5
25	6264-08-13-*-97	100	35	188.6	45.5	91.5	139.8	25	12	37.9	124.5	182.3	14.4	–	36.5
32	6264-10-17-*-97	120	41.3	194.1	52	97	144.8	26.5	13.5	45	153	182.3	14.4	–	46.5

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	6264-06-09-*-97	14.7	4.8	7.5	10	M12	20	13.5	20	SPP 3R6B 910
25	6264-08-13-*-97	23.4	6.3	7.5	10	M16	27	17.5	25	SPP 6R10B 910
32	6264-10-17-*-97	32	6.3	7.5	10	M18	28	20	30	SPP 10R12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit - DIN912 12.9		Kit		Surface finish
				NBR	FPM	
10	6264-06-09-*-97	BK-M12 x 45-4pcs	108 Nm ±15%	S26-96396-0	S26-96396-5	
25	6264-08-13-*-97	BK-M16 x 70-4pcs	264 Nm ±15%	S26-98589-0	S26-98589-5	
32	6264-10-17-*-97	BK-M18 x 75-4pcs	398 Nm ±15%	S26-96392-0	S26-96392-5	

Pilot operated relief valve with proportional adjustment. Series VBY*K is a pilot operated pressure valve with external drain. The external drain allows an application as sequence and as pressure relief valve. For use as pressure relief valve observe hydraulic connection.

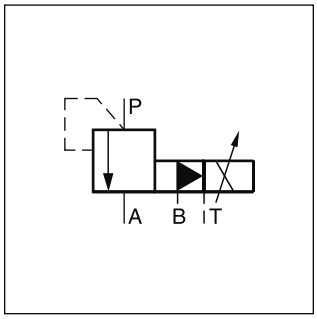
The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.

Features

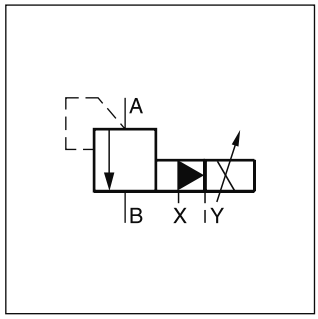
- Proportional adjustment
- Subplate mounting acc. to ISO 5781
- External drain
- Main stage spool type valve
- Pilot stage seated type valve

VBY*K06

VBY*K10



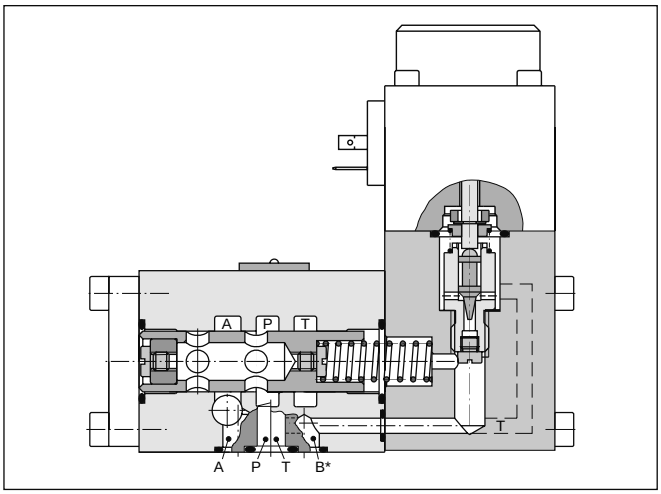
VBY*K06



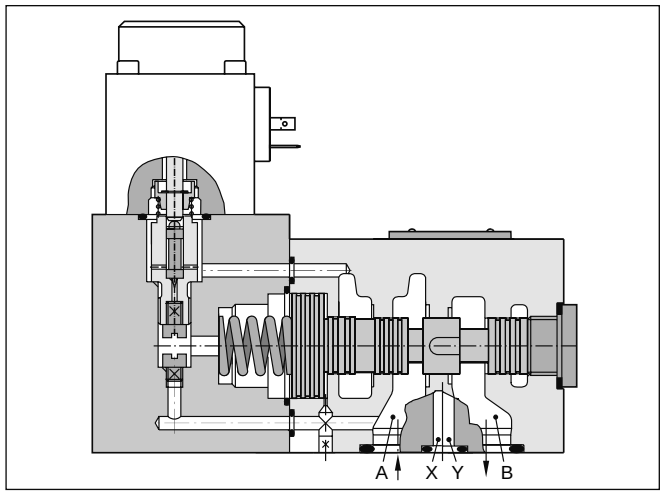
VBY*K10

4

VBY*K06



VBY*K10



Ordering code

VBY		K			
Sequence valve	**Max. setting range**	**Proportional solenoid 9 VDC/2.5A**	**Nominal size**	**Seals**	**Design series** (not required for ordering)

Code	Max. setting range
064	**64 bar**
100	100 bar
160	**160 bar**
210	210 bar
315	315 bar

Code	Seals
N	**NBR**
V	FPM

Code	Nominal size
06	**NG06**
10	**NG10**

Bold letters =
Short-term availability

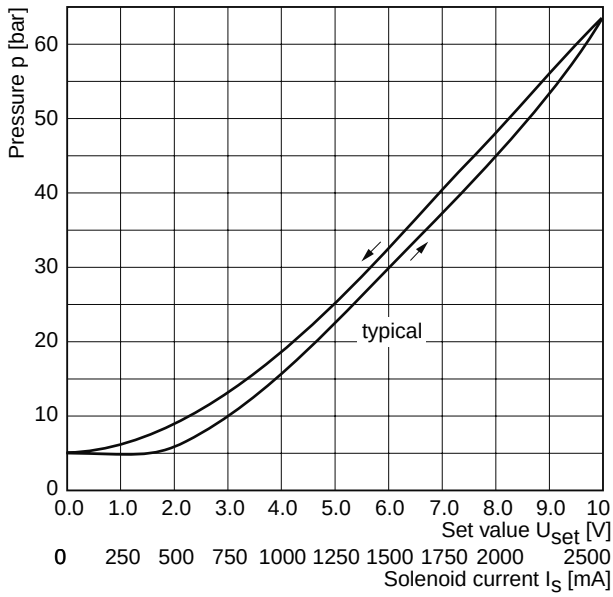
4

Technical data

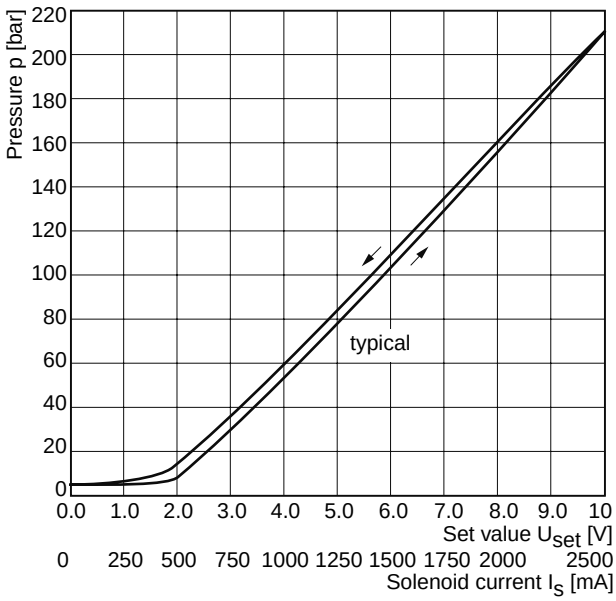
General				
Design			Proportional pressure relief valve	
Nominal size			NG06	NG10
Interface			Subplate mounting according to ISO 5781	
Actuation			Proportional solenoid	
Mounting position			unrestricted	
Ambient temperature		[°C]	-20 ... +70	
$MTTF_D$ value		[years]	75	
Weight		[kg]	2.4	4.5
Hydraulics				
Max. operating pressure		[bar]	Ports P and A 315; Port T depressurized	Ports A and B 315; Port Y depressurized
Nominal flow		[l/min]	40	160
Adjustment range		[bar]	up to 64, 100, 160, 210, 315	
Fluid			Hydraulic oil as per DIN 51 524 ... 51525	
Viscosity	recommended	[cSt] / [mm²/s]	30 ... 50	
	maximum	[cSt] / [mm²/s]	20 ... 380	
Pressure medium temperature				
	recommended	[°C]	30 ... 50	
	maximum	[°C]	-20 ... +70	
Filtration			ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)	
Linearity		[%]	±3.5 at > 15% pnom.	
Repeatability		[%]	<±2	
Hysteresis		[%]	<3	
Response time		[ms]	<150	<200
Electrical				
Duty ratio		[%]	100 ED	
Protection class			IP65 at EN 60529 (with correctly mounted plug-in connector)	
Nominal voltage		[VDC]	9	
Max. current		[A]	2.7	
Nom. current		[A]	2.5	
Ambient temperature		[°C]	-20...+70	
Coil resistance		[Ohm]	21 at 20°C	
Solenoid connection			Connector as per EN 175301-803	
Power amplifier			PCD00A-400	

Characteristic pressure curves for NG06 p = f (U_{set})

Setting range max. 64 bar



Setting range max. 210 bar

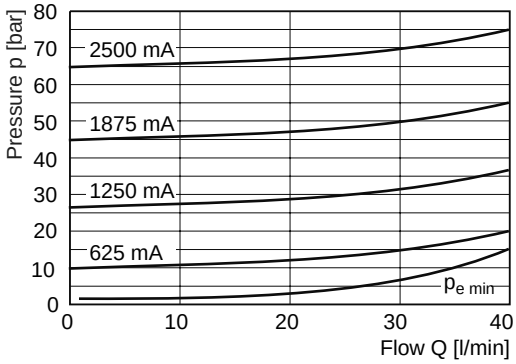


All characteristic curves measured with HLP46 bei 50°C.

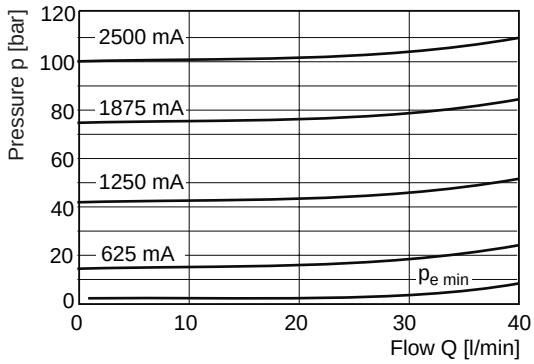
p/Q characteristics

NG06

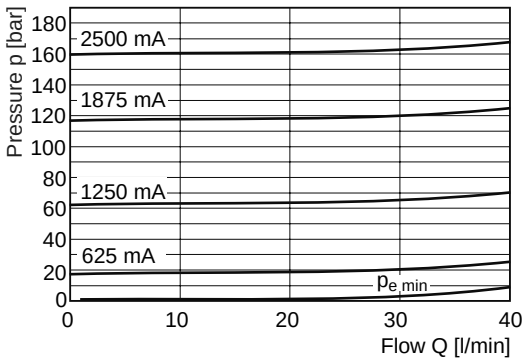
Setting range max. 64 bar



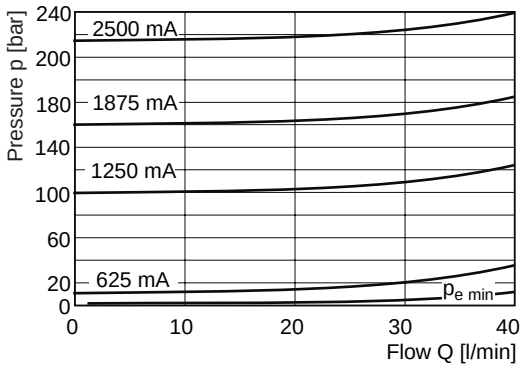
Setting range max. 100 bar



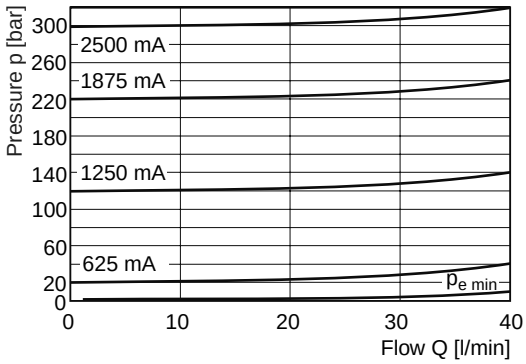
Setting range max. 160 bar



Setting range max. 210 bar



Setting range max. 315 bar

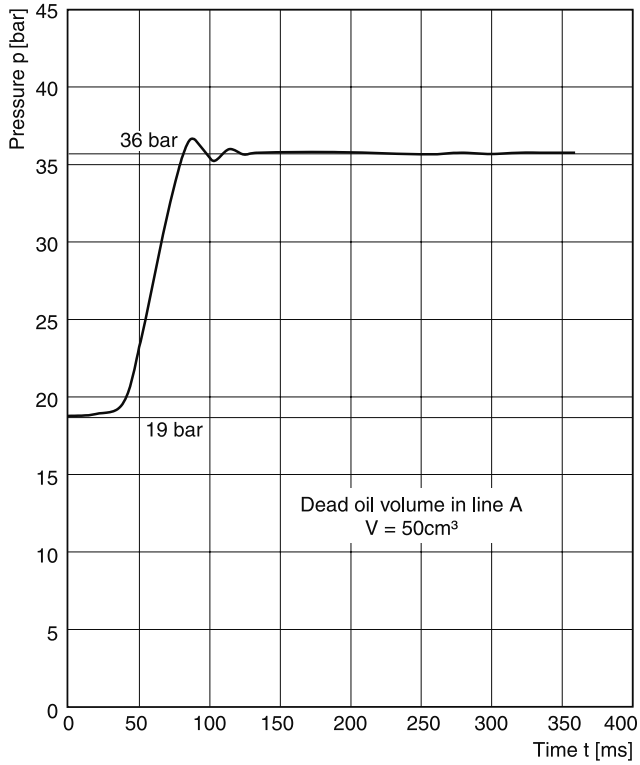


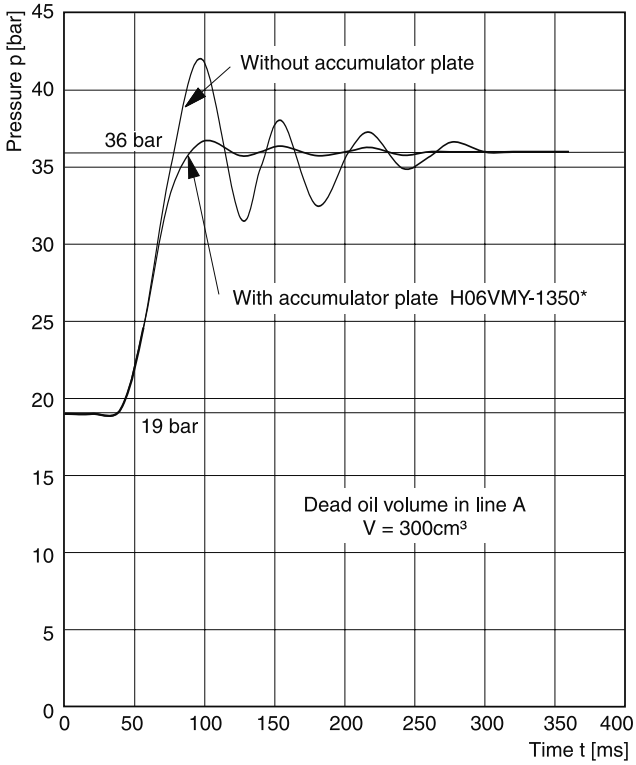
All characteristic curves measured with HLP46 bei 50°C.

4

4

NG06 step response signal, setting range max. 210 bar



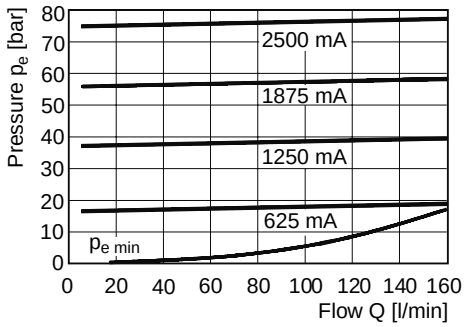


* see series VMY for details

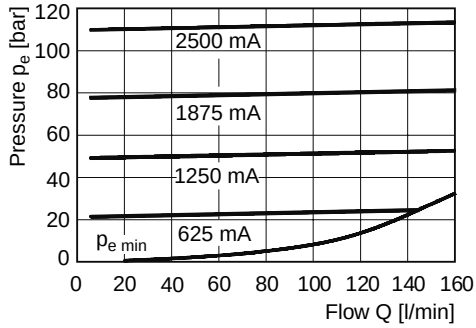
p/Q characteristics

NG10

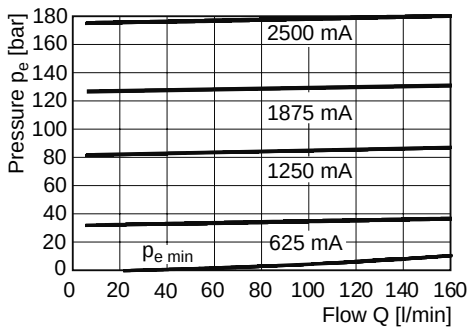
Setting range max. 64 bar



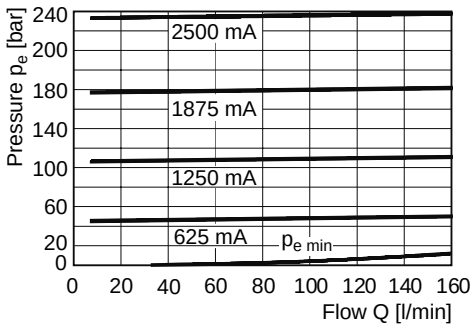
Setting range max. 100 bar



Setting range max. 160 bar

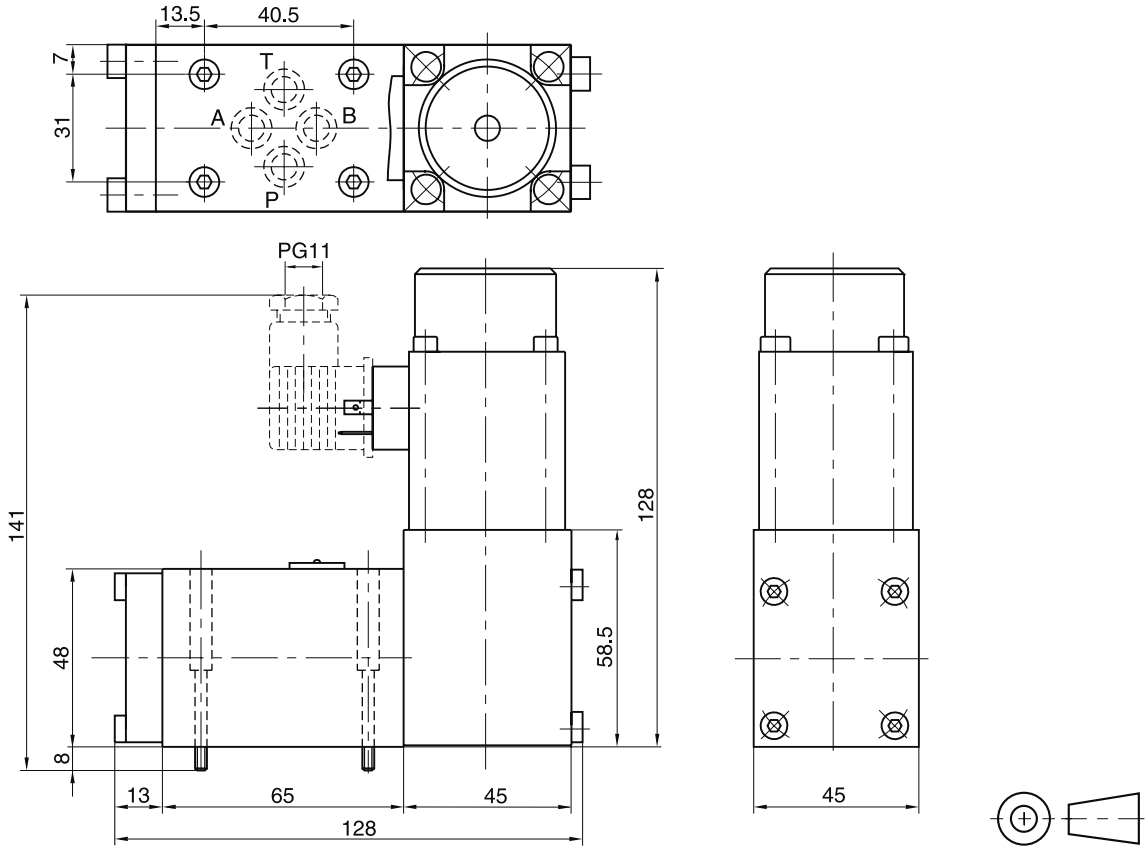


Setting range max. 210 bar



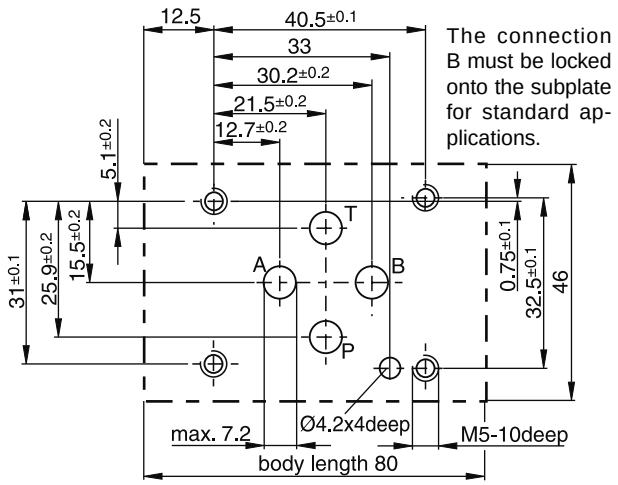
All characteristic curves measured with HLP46 bei 50°C.

NG06



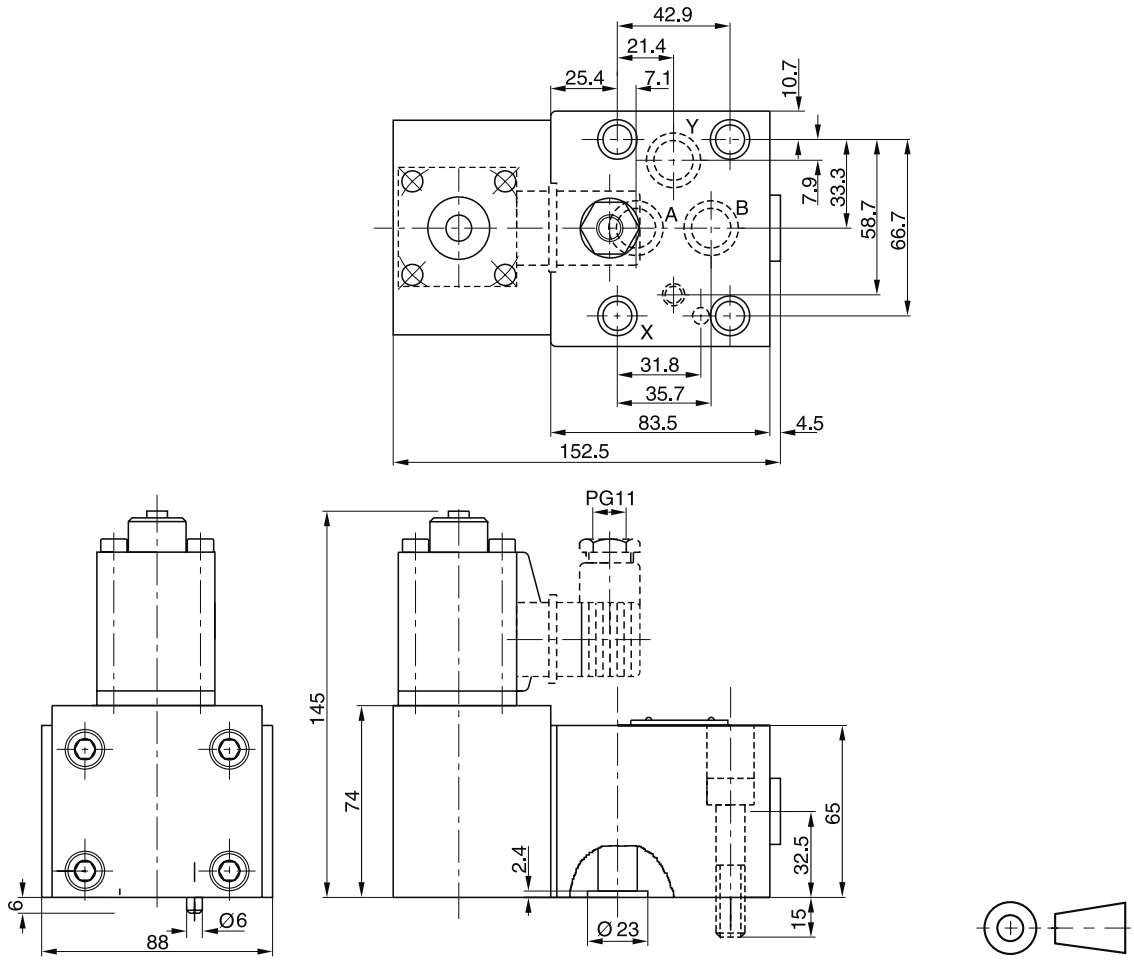
Surface finish	Bolt kit			Kit NBR	Kit FPM
R_{max}6.3 ⏥ 0.01/100	BK 375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-VMY-L06-N	SK-VMY-L06-V

Mounting pattern ISO 5781-03-04-0-00



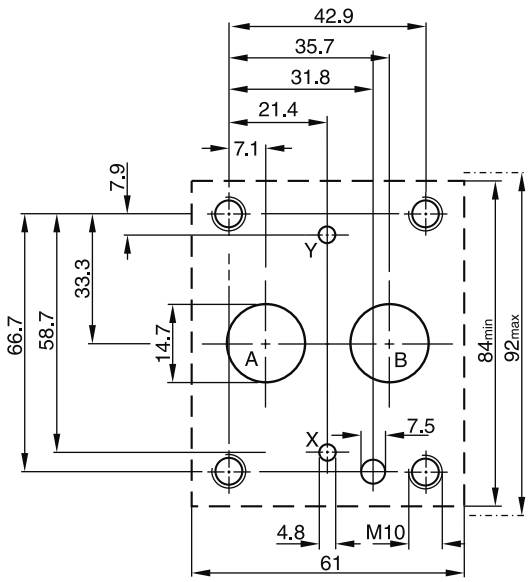
The connection B must be locked onto the subplate for standard applications.

NG10



Surface finish	Bolt kit			Kit FPM
R_{max}6.3 ⏥ 0.01/100	BK 389	4x M10x50 DIN 912 12.9	63 Nm ±15%	SK-VB/VM-A10V

Mounting pattern ISO 5781-06-07-0-00



Subplate mounted unloading valves series R4U are used to unload a circuit at low pressure. The mechanically adjustable pressure signal to unload the main stage has to be applied to port X. The pressure differential between opening and closing is nominal 15 or 28 % of the setting pressure.

28 % for pressure stages bar 105, 210

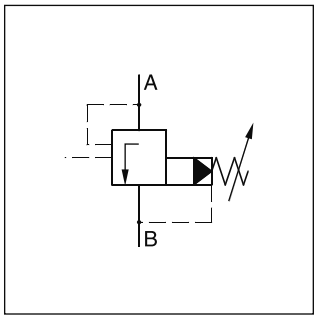
15 % for pressure stages bar 350

Typical applications are unloading of pumps in an accumulator circuit or unloading of the low pressure stage of a double pump.

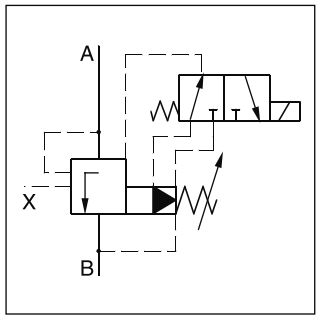
The R4U is available with an electrical vent valve for unpressurized circulation.

Features

- Pilot operated unloading valve
- Interface
  - subplate mounting to ISO 5781
- 3 pressure stages
- 2 vent valve functions
- 3 adjustment modes
  - hand knob
  - acorn nut with lead seal
  - Key lock

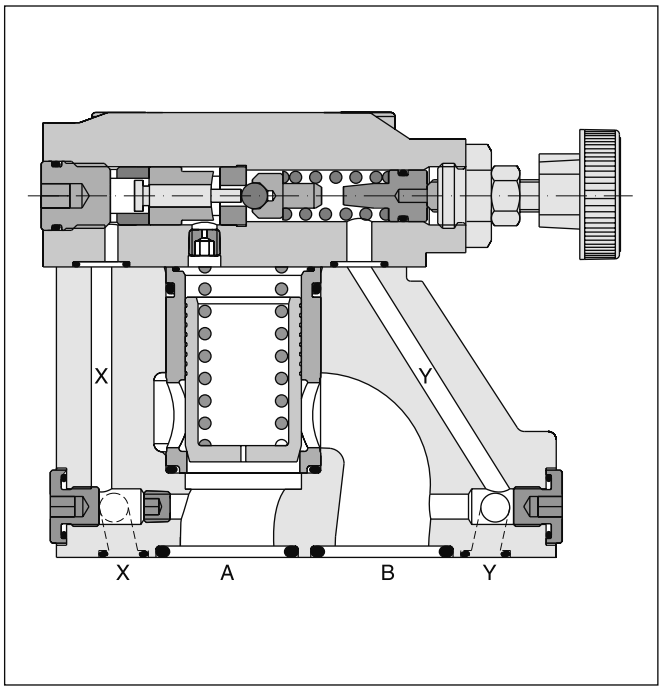


R4U

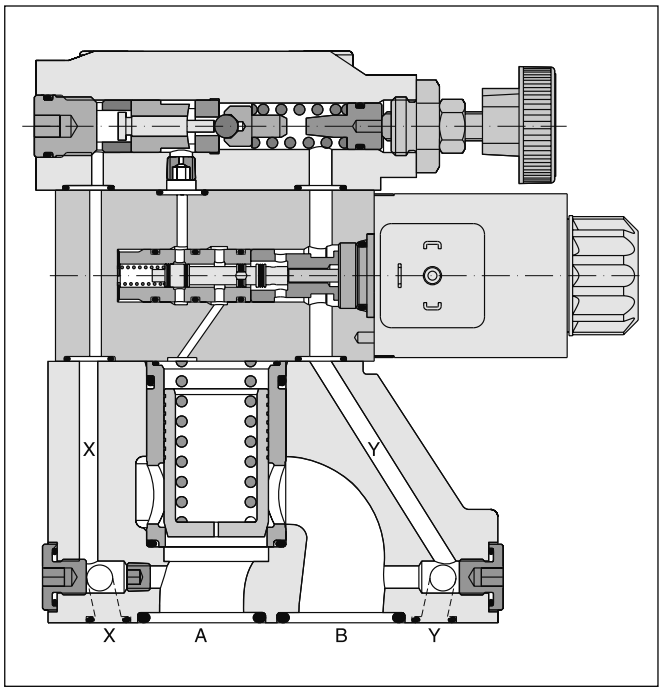


R4U with vent function

R4U06

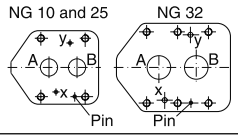


R4U06 with vent function



R	4	U		–	5	3				A		
Pressure valve	Interface	Unloading function	Nominal size		Max.pressure (350 bar)	Body design	Pressure stages	Adjust-ment	Pilot oil	Design series	Seals	Modifi-cations

4

Code	Interface	
4	Subplate mounting ISO 5781	NG 10 and 25 / NG 32 

Code	Nominal size
03	NG10
06	NG25
10	NG32

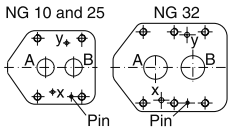
Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

Code	Seals
1	NBR
5	FPM

Pilot oil	
Code	Drain line
0	Internal
1	External from subplate

Code	Adjustment
1	Hand knob 32mm dia. (Standard)
3	Acorn nut with lead seal
4	Key lock

R	4	U		–	5	3									
Pressure valve	**Interface**	**Relief function**	**Nominal size**		**Max. pressure (350 bar)**	**Body design**	**Pressure stages**	**Adjust-ment**	**Pilot oil**	**Vent valve function**	**Solenoid voltage**	**Design series**	**Seals**	**Modifi-cations**

Code	Interface	
4	Subplate mounting ISO 5781	NG 10 and 25 / NG 32 

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

Code	Adjustment
1	Hand knob (Standard)
3	Acorn nut with lead seal
4	Key lock

Code	Vent valve
09	Solenoid not activ. unpress. circulation
11	Solenoid activated unpress. circulation

Pilot oil	
Code	Drain line
0	internal
1	external from subplate

Code	Voltage
G0R	12V =
G0Q	24V =
GAR	98V =
GAG	205V =
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

Code	Seals
1	NBR
5	FPM

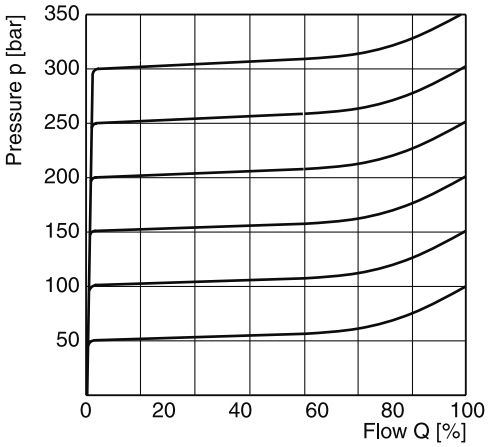
R4U

General				
Nominal size		10	25	32
Interface		Subplate mounting acc. ISO 5781		
Mounting position		as desired, horizontal mounting prefered		
Ambient temperature	[°C]	-20...+80		
$MTTF_D$ value	[years]	75		
Weight	[kg]	2.7	4.5	6.0
Hydraulic				
Max. operating pressure	[bar]	Ports A and X 350, Ports B and Y depressurized		
Pressure stages	[bar]	105, 210, 350		
Pressure differential		28 % (for pressure stages 105 bar and 210 bar); 15% (for pressure stages 350 bar)		
Nominal flow	[l/min]	150	350	650
Fluid		Hydraulic oil according to DIN 51524 ... 51525		
Viscosity,				
recommended	[cSt] / [mm²/s]	30 ... 50		
permitted	[cSt] / [mm²/s]	20...380		
	[mm²/s]	20 ... 380		
Fluid temperature	[°C]	-20 ... +70		
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)		

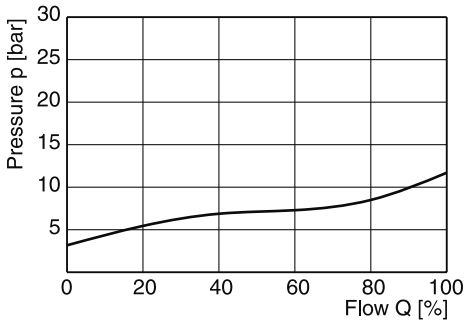
R4U with vent function

General							
Nominal size		10		25		32	
Interface		Subplate mounting acc. ISO 5781					
Mounting position		as desired, horizontal mounting prefered					
Ambient temperature	[°C]	-20...+80					
$MTTF_D$ value	[years]	75					
Weight	[kg]	4.4		6.2		7.7	
Hydraulic							
Max. operating pressure	[bar]	Ports A and X 350, Ports B and Y depressurized					
Pressure stages	[bar]	105, 210, 350					
Pressure differential		28 % (for pressure stages 105 bar and 210 bar); 15% (for pressure stages 350 bar)					
Nominal flow	[l/min]	150		350		650	
Fluid		Hydraulic oil according to DIN 51524 ... 51525					
Viscosity,							
recommended	[cSt] / [mm²/s]	30 ... 50					
permitted	[cSt] / [mm²/s]	20...380					
Fluid temperature	[°C]	-20 ... +70					
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)					
Electrical (solenoid)							
Duty ratio	[%]	100 ED; CAUTION: coil temperature up to 180 °C possible					
Max. switching frequency		160000 (DC), 7200 (AC)					
Protection class		IP65 in according with EN 60529 (with correctly mounted plug-in connector)					
	Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage	[V]	12V =	24V =	98V =	205V =	110V/50Hz 120V/60Hz	230V/50Hz 240V/60Hz
Tolerance supply voltage	[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption hold	[W]	31	31	31	31	78	78
in rush	[W]	31	31	31	31	264	264
Solenoid connection		Connector as per EN 175301-803					
Wiring min.	[mm²]	3 x 1.5 recommended					
Wiring length max.	[m]	50 recommended					

p/Q performance curve [1)]



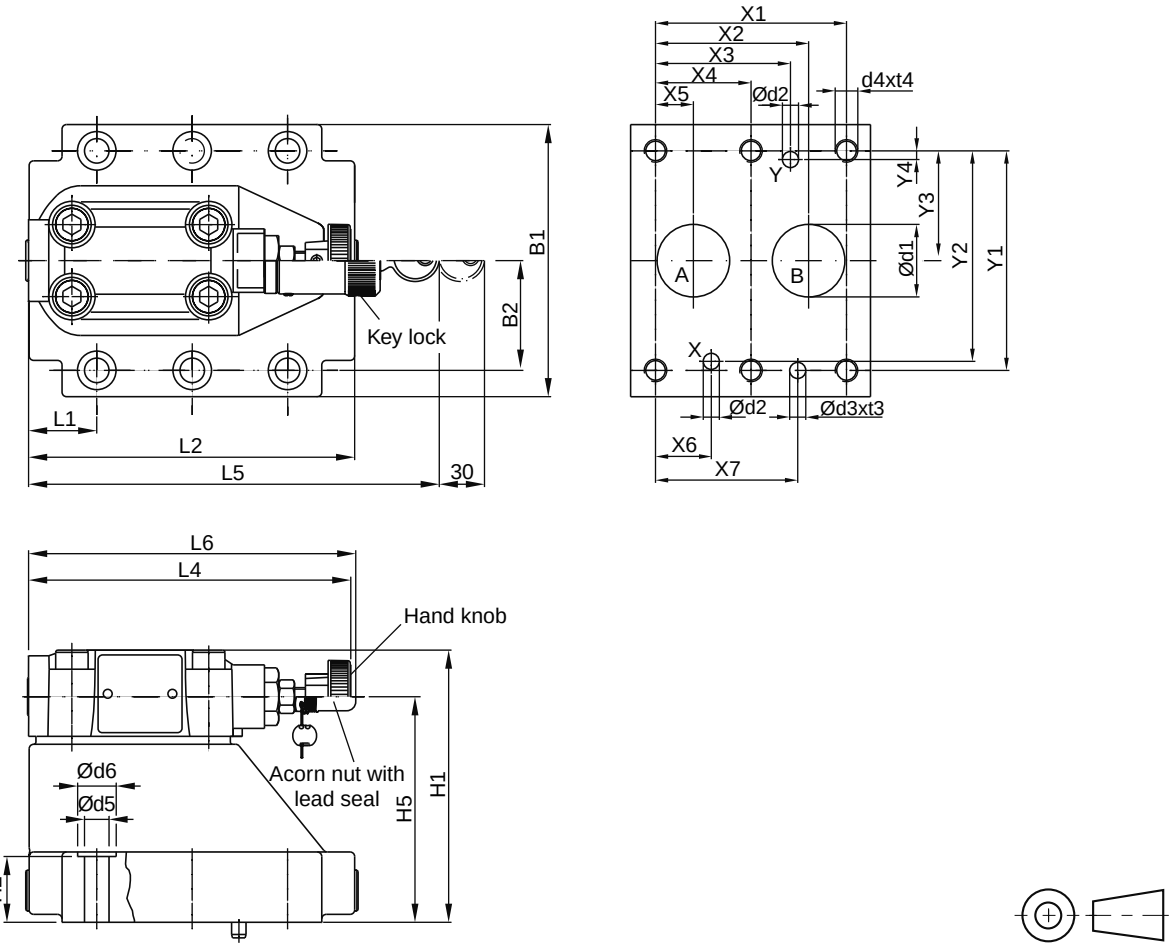
Minimum pressure curve



[1)] The performance curves are measured with external drain.
For internal drain the tank pressure has to be added to curve.

All characteristic curves measured with HLP46 bei 50°C.

R4U



NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9	35.8	21.5	–	7.2	21.5	31.8	66.7	58.8	33.4	7.9	–	–
25	5781-08-10-0-00	60.3	49.2	39.7	–	11.1	20.6	44.5	79.4	73	39.7	6.4	–	–
32	5781-10-13-0-00	84.2	67.5	59.5	42.1	16.7	24.6	62.7	96.8	92.8	48.4	3.8	–	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

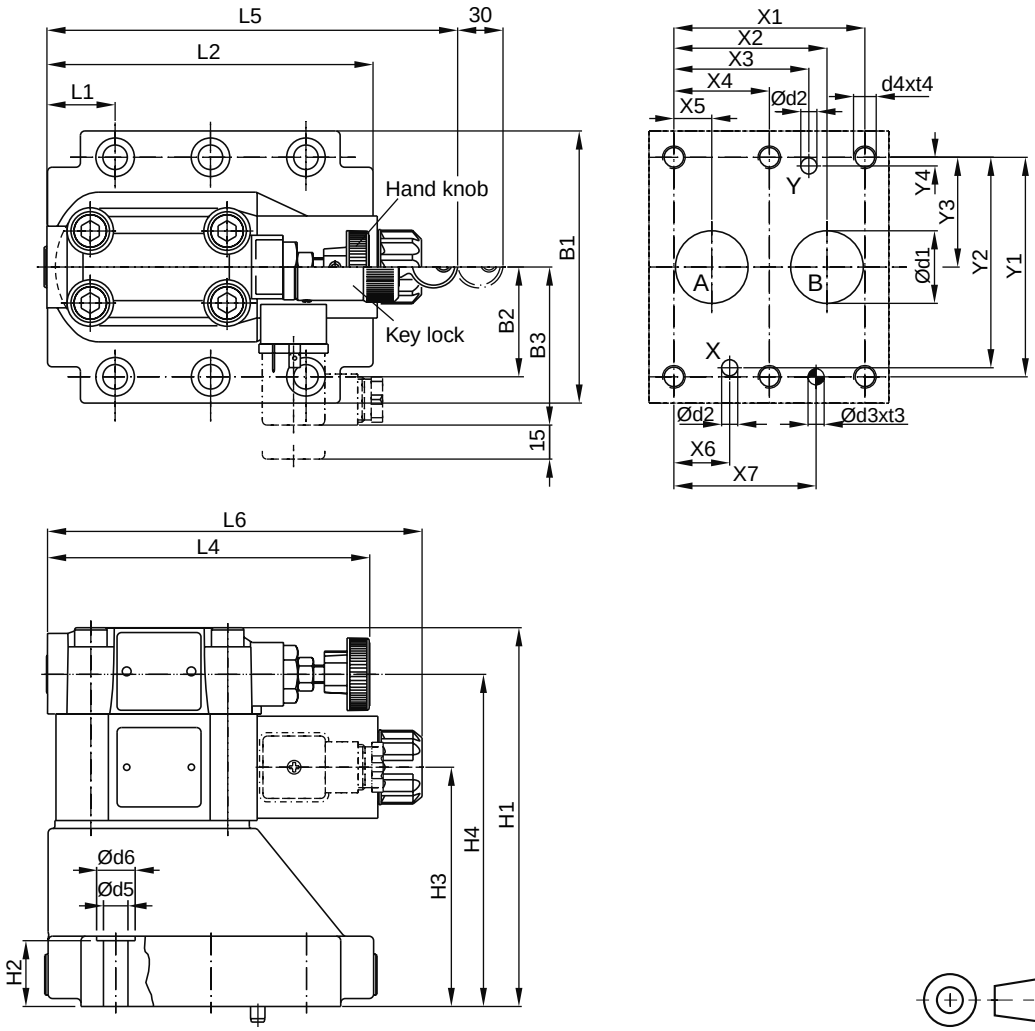
NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	5781-06-07-0-00	87.3	33.35	83	21	62.5	–	–	–	29	94.8	–	143	181	144.8
25	5781-08-10-0-00	105	39.7	109.5	29	89	–	–	–	34.7	126.8	–	143	181	144.8
32	5781-10-13-0-00	120	48.4	120	29	99.5	–	–	–	30.6	144.3	–	143	181	144.8

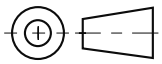
NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	5781-06-07-0-00	15	7	7.1	8	M10	16	10.8	17	SPP 3M6B 910
25	5781-08-10-0-00	23.4	7.1	7.1	8	M10	18	10.8	17	SPP 6M8B 910
32	5781-10-13-0-00	32	7.1	7.1	8	M10	20	10.8	17	SPP 10M12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	5781-06-07-0-00	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S26-58507-0	S26-58507-5	
25	5781-08-10-0-00	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58475-0	S26-58475-5	
32	5781-10-13-0-00	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58508-0	S26-58508-5	

R4U
with vent function





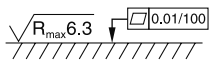
NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9	35.8	21.5	–	7.2	21.5	31.8	66.7	58.8	33.4	7.9	–	–
25	5781-08-10-0-00	60.3	49.2	39.7	–	11.1	20.6	44.5	79.4	73	39.7	6.4	–	–
32	5781-10-13-0-00	84.2	67.5	59.5	42.1	16.7	24.6	62.7	96.8	92.8	48.4	3.8	–	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

NG	ISO-code	B1	B2	B3	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	5781-06-07-0-00	87.3	33.35	70	130	21	68.5	109.5	–	–	29	94.8	–	143	181	165.6
25	5781-08-10-0-00	105	39.7	70	156.5	29	95	136	–	–	34.7	126.8	–	143	181	165.6
32	5781-10-13-0-00	120	48.4	70	167	29	105.5	146.5	–	–	30.6	144.3	–	143	181	165.6

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	5781-06-07-0-00	15	7	7.1	8	M10	16	10.8	17	SPP 3M6B 910
25	5781-08-10-0-00	23.4	7.1	7.1	8	M10	18	10.8	17	SPP 6M8B 910
32	5781-10-13-0-00	32	7.1	7.1	8	M10	20	10.8	17	SPP 10M12B 910

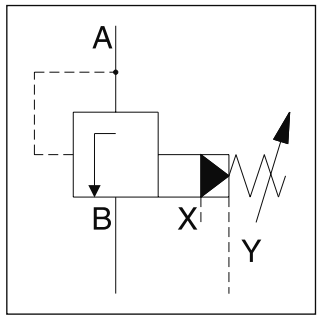
[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	5781-06-07-0-00	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S26-58507-0*	S26-58507-5*	
25	5781-08-10-0-00	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58475-0*	S26-58475-5*	
32	5781-10-13-0-00	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58508-0*	S26-58508-5*	
VV01					S56-40609-0	S56-40609-5	

* Please combine seal kit of one size with seal kit of VV01 DC / AC solenoid for complete seal kit

Notes

Subplate mounted sequence valves series R4S enable a hydraulic system to operate in a pressure sequence. When the system pressure reaches the setting pressure the valve opens and permits flow to the secondary sub-system.

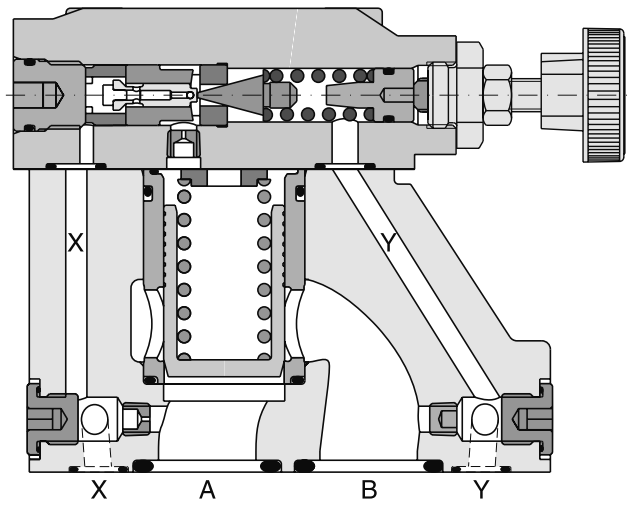


Features

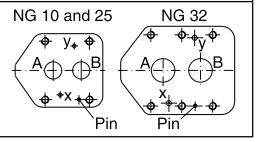
- Pilot operated sequence valve
- Subplate mounting acc. to ISO 5781
- 3 pressure stages
- 3 adjustment modes
  - hand knob
  - acorn nut with lead seal
  - Key knob

Technical data R4S

General				
Nominal size		10	25	32
Interface		Subplate mounting acc. ISO 5781		
Mounting position		as desired, horizontal mounting prefered		
Ambient temperature	[°C]	-20...+80		
$MTTF_D$ value	[years]	75		
Weight Series R4S	[kg]	2.7	4.5	6.0
Hydraulic				
Max. operating pressure	[bar]	Ports A, B and X 350, port Y depressurized		
Pressure stages	[bar]	105, 210, 350		
Nominal flow	[l/min]	150	350	650
Fluid		Hydraulic oil according to DIN 51524 ... 51525		
Viscosity, recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 50 20 ... 380		
Fluid temperature	[°C]	-20 ... +70		
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)		



R	4	S		–	5	3			1	A	
Pressure valve	Interface	Relief function	Nominal size		Max. pressure (350 bar)	Plain cap	Pressure stages	Adjust-ment	External drain from subplate	Design series	Seals

Code	Interface	
4	Subplate mounting ISO 5781	NG 10 and 25 / NG 32 

Code	Seals
1	NBR
5	FPM

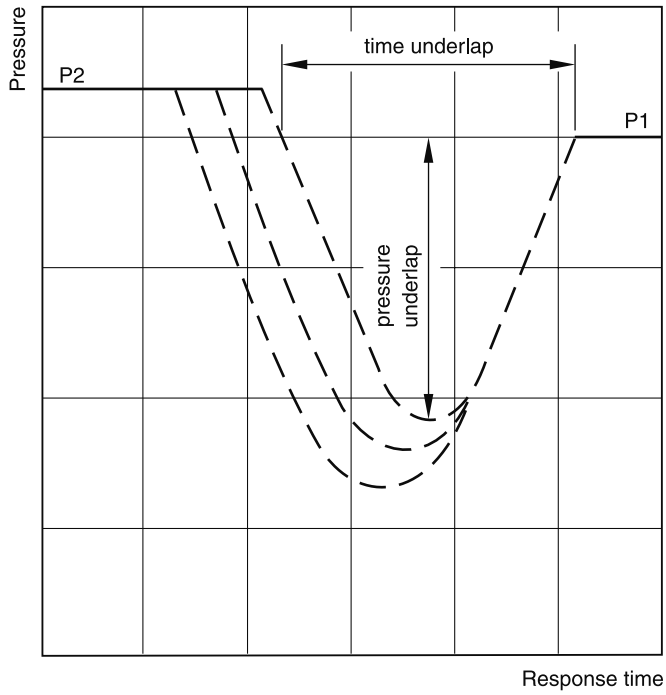
Code	Adjustment
1	Hand knob 32mm dia. (Standard)
3	Acorn nut with lead seal
4	key lock

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

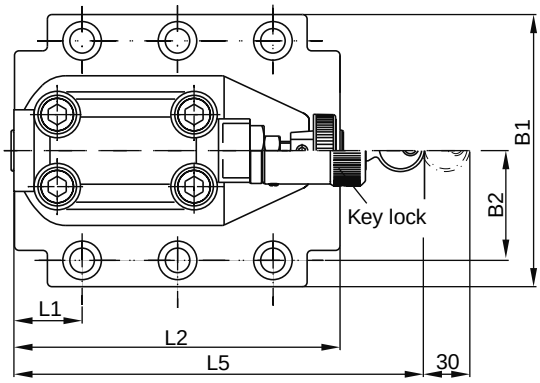
4

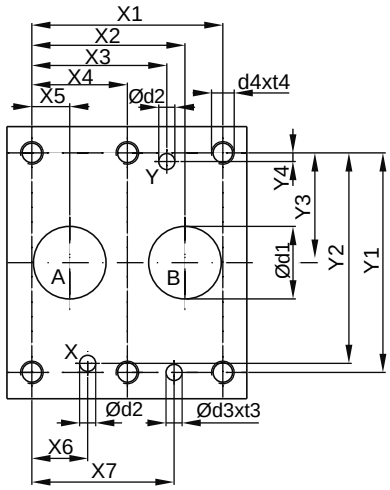
Typical pressure characteristics at closing point

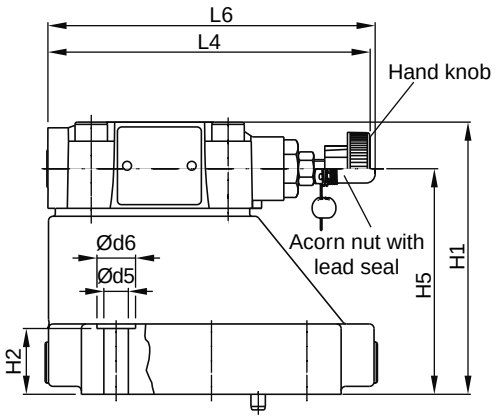


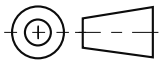
P1 = setting pressure
P2 = operating pressure

Time and pressure underlap depend on the characteristics of the specific system.









NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9	35.8	21.5	–	7.2	21.5	31.8	66.7	58.8	33.4	7.9	–	–
25	5781-08-10-0-00	60.3	49.2	39.7	–	11.1	20.6	44.5	79.4	73	39.7	6.4	–	–
32	5781-10-13-0-00	84.2	67.5	59.5	42.1	16.7	24.6	62.7	96.8	92.8	48.4	3.8	–	–

Tolerance at X and Y pin holes and screw holes ±0.1, at port holes ±0.2.

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	5781-06-07-0-00	87.3	33.35	83	21	62.5	–	–	–	29	94.8	–	143	181	144.8
25	5781-08-10-0-00	105	39.7	109.5	29	89	–	–	–	34.7	126.8	–	143	181	144.8
32	5781-10-13-0-00	120	48.4	120	29	99.5	–	–	–	30.6	144.3	–	143	181	144.8

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	5781-06-07-0-00	15	7	7.1	8	M10	16	10.8	17	SPP 3M6B 910
25	5781-08-10-0-00	23.4	7.1	7.1	8	M10	18	10.8	17	SPP 6M8B 910
32	5781-10-13-0-00	32	7.1	7.1	8	M10	20	10.8	17	SPP 10M12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	5781-06-07-0-00	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S26-58507-0	S26-58507-5	
25	5781-08-10-0-00	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58475-0	S26-58475-5	
32	5781-10-13-0-00	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58508-0	S26-58508-5	

Notes

Direct operated pressure reducing valve with manual adjustment. Series VM is a direct-controlled, spring loaded 3 way pressure reducing valve, that is open in neutral position. The valve closes the connection when the pre-set pressure is exceeded.

Primary port: NG06 -P, NG10 - B

Secondary port: NG06 - A, NG10 - A

Tank port: NG06 - T, NG10 - Y

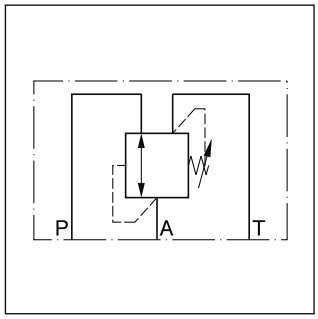
If the pressure increases due to an external influence the spool opens to port T until the pre-set pressure is reached.

Features

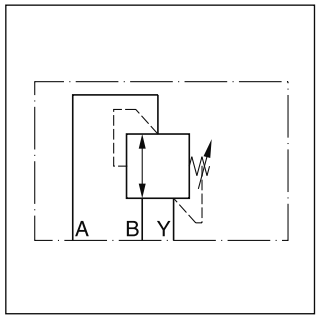
- Spool type valve
- Subplate mounting acc. to ISO 5781
- 5 pressure stages at NG06
- 3 pressure stages at NG10
- 2 adjustment modes

NG06

NG10

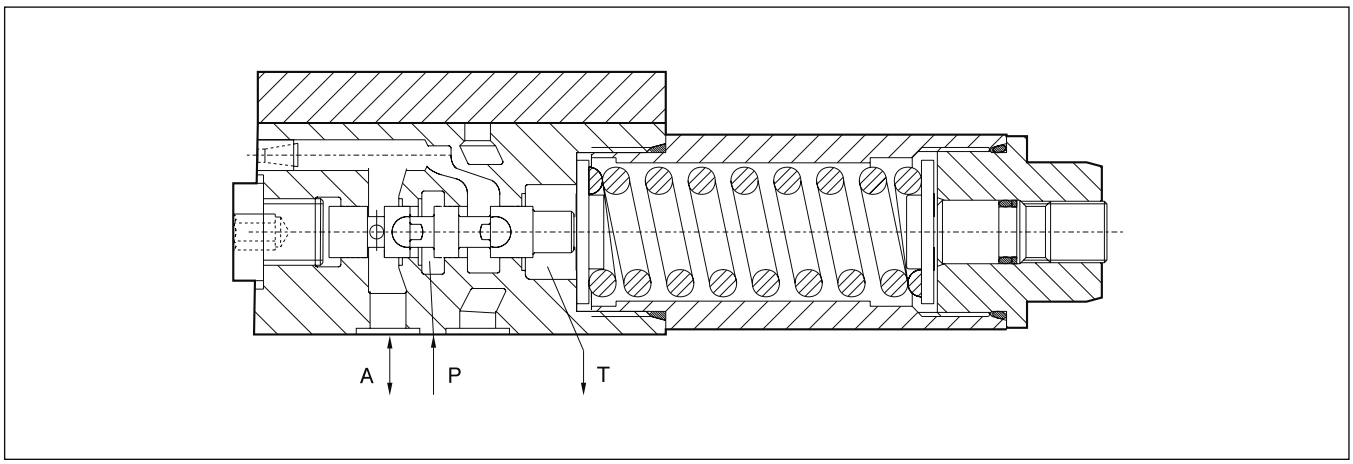


NG06

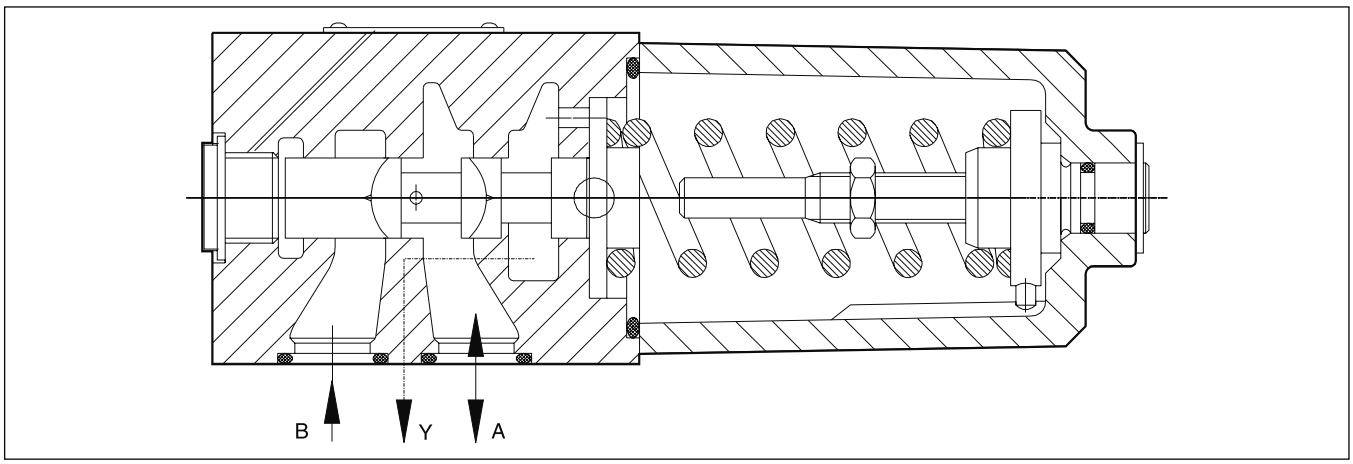


NG10

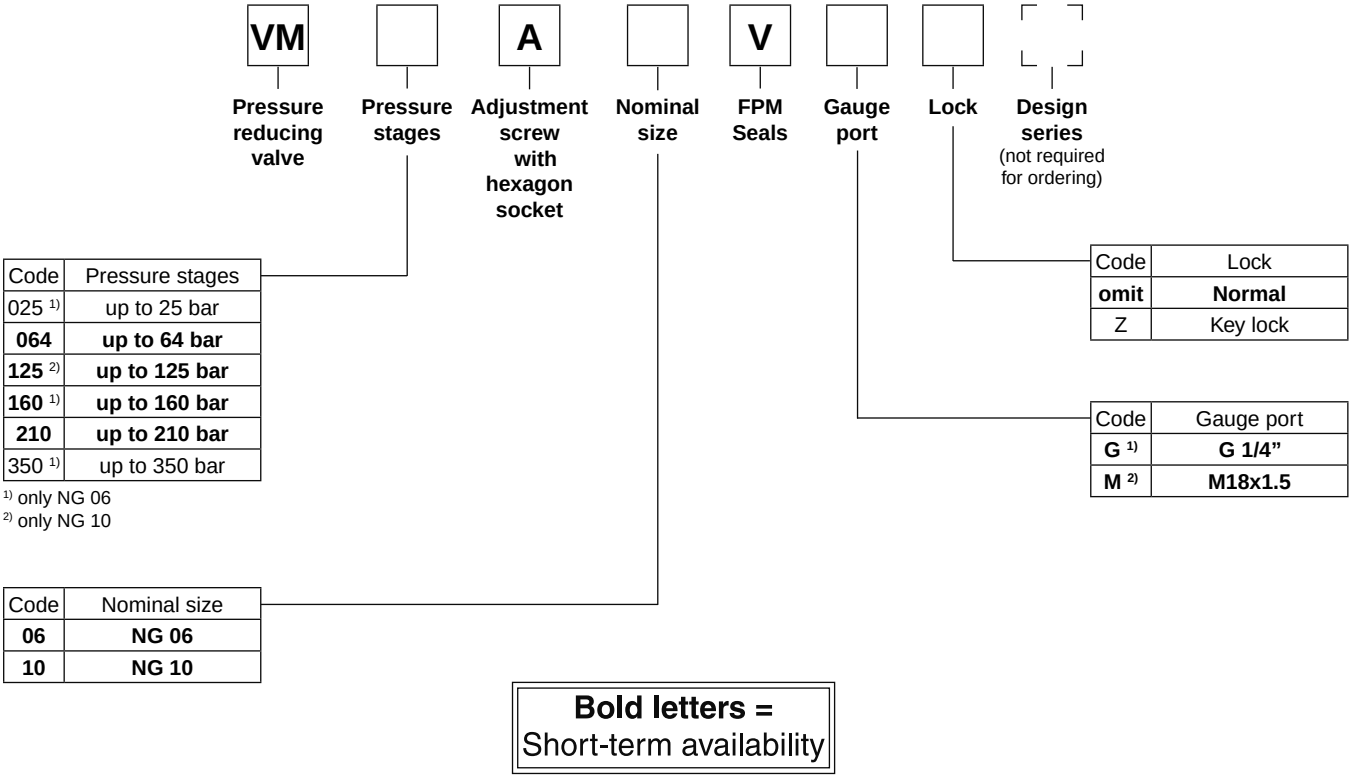
NG06



NG10



Ordering code



Code	Pressure stages
025 [1]	up to 25 bar
064	**up to 64 bar**
125 [2]	**up to 125 bar**
160 [1]	**up to 160 bar**
210	**up to 210 bar**
350 [1]	up to 350 bar

[1] only NG 06
[2] only NG 10

Code	Lock
omit	**Normal**
Z	Key lock

Code	Gauge port
G [1]	**G 1/4”**
M [2]	**M18x1.5**

Code	Nominal size
06	**NG 06**
10	**NG 10**

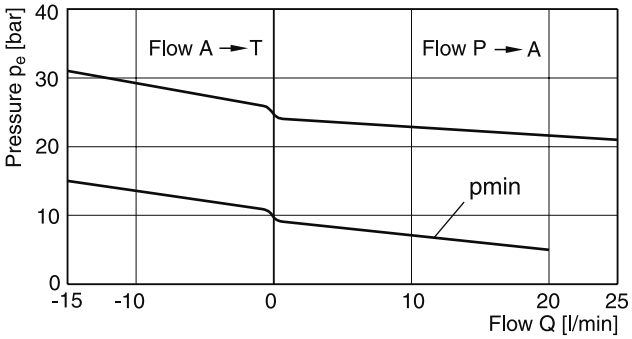
Bold letters =
Short-term availability

Technical data

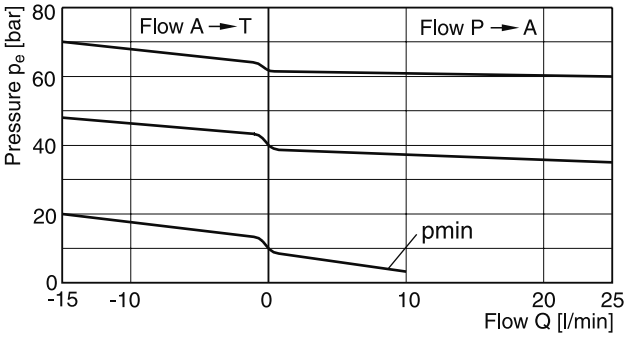
General			
Design		Pressure reducing valve, direct operated, spool type	
Nominal size		NG 06 (CETOP 03 / NFPA D03)	NG 10 (CETOP 05 / NFPA D05)
Interface		Subplate mounting according to ISO 5781	
Mounting position		unrestricted	
Ambient temperature	[°C]	-20...+80	
$MTTF_D$ value	[years]	150	
Weight	[kg]	1.3	3.7
Hydraulics			
Max. operating pressure	[bar]	Port P and A 350 Port T depressurized	Port A and B 210 Port Y depressurized
Pressure stages	[bar]	25; 64; 160; 210; 350	64; 125; 210
Nominal flow	[l/min]	25	60
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature	[°C]	-20...+70	
Viscosity recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30...50 20...380	
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)	

NG06

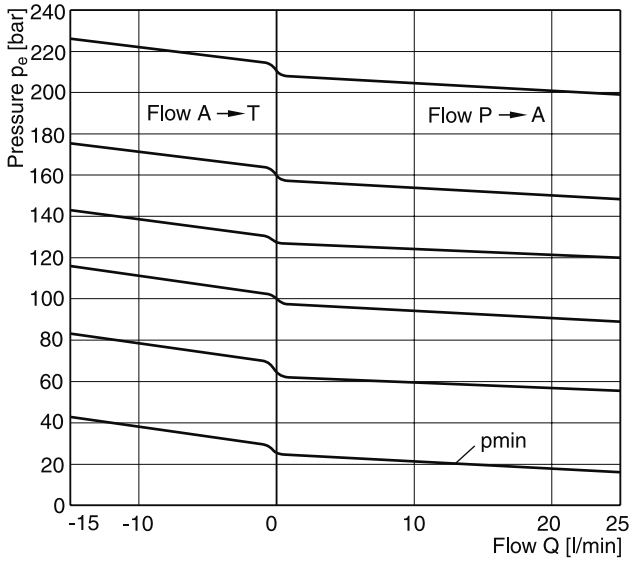
Setting pressure max. 25 bar



Setting pressure max. 64 bar

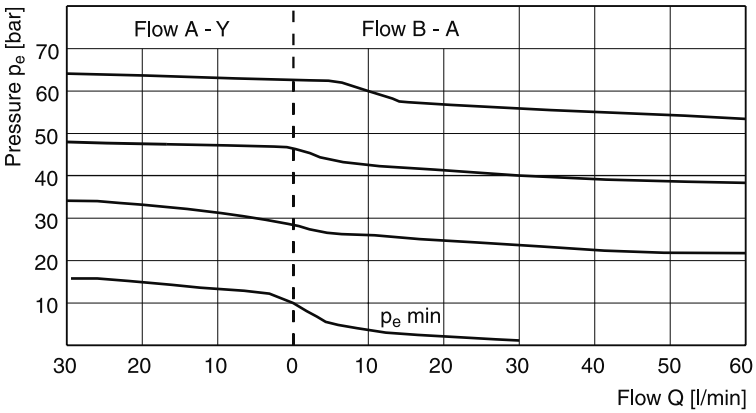


Setting pressure max. 160 or 210 bar

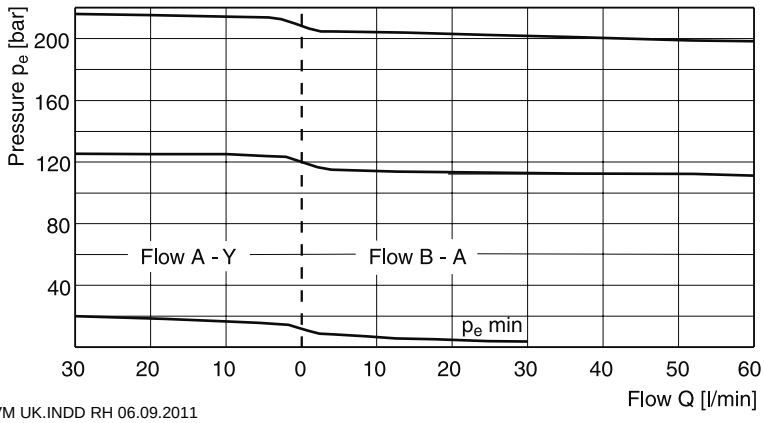


NG10

Setting pressure max. 64 bar

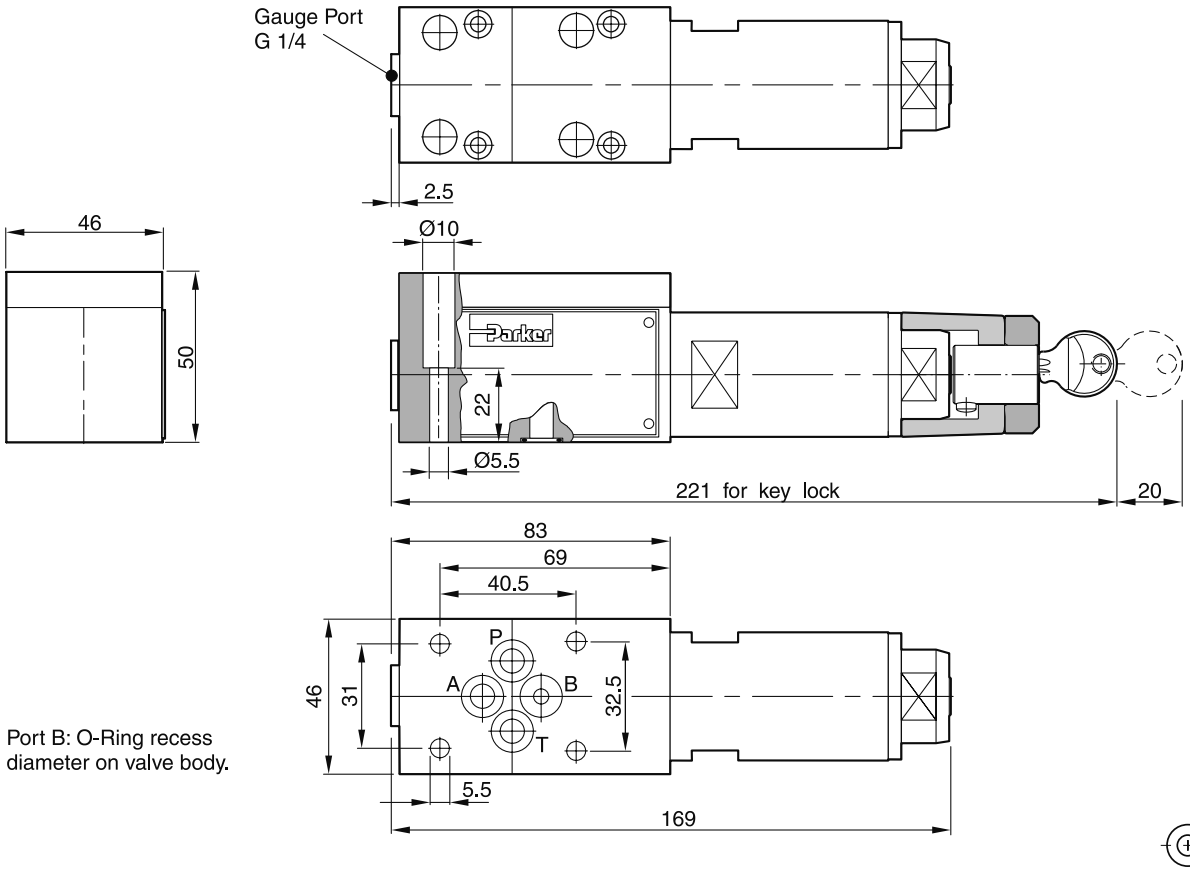


Setting pressure max. 210 bar



All characteristic curves measured with HLP46 bei 50°C.

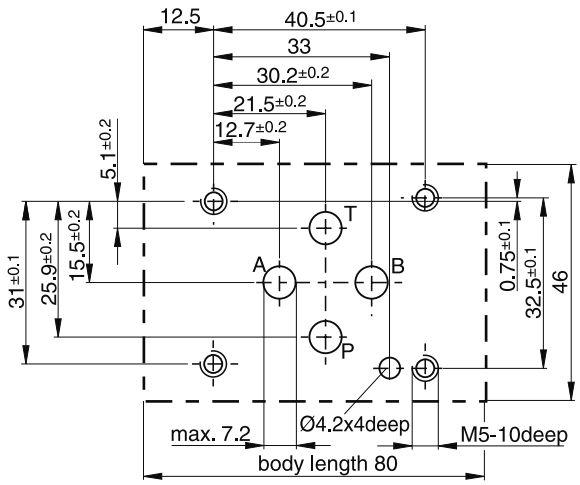
NG06



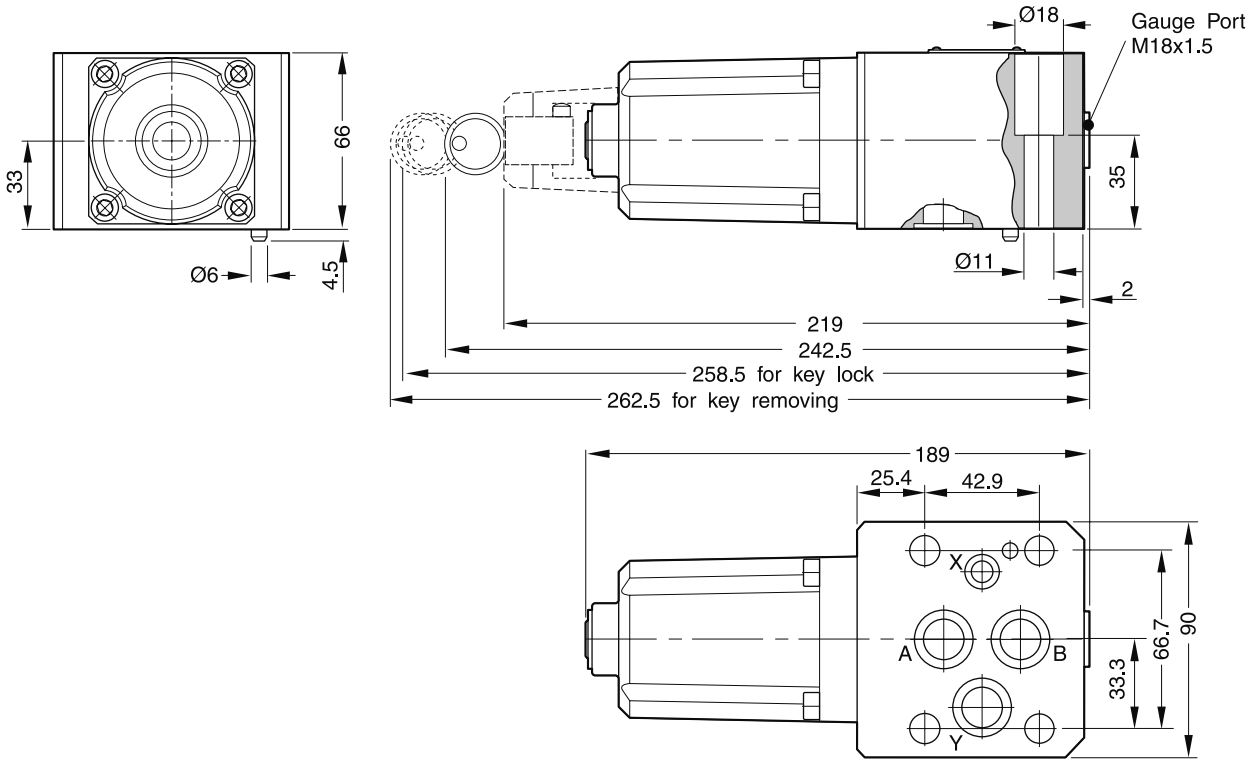
Port B: O-Ring recess diameter on valve body.

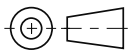
Surface finish	Bolt kit			Kit FPM
R_{max}6.3 ⏥ 0.01/100	BK 375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-VB/VM/VS-A06V

Mounting pattern ISO 5781-03-04-0-00



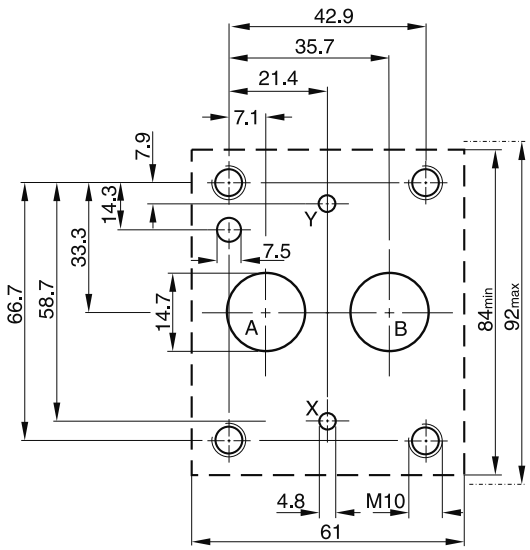
NG10





Surface finish	Bolt kit			Kit FPM
R_{max}6.3 ⏥ 0.01/100	BK 389	4x M10x50 DIN 912 12.9	63 Nm ±15%	SK-VB/VM-A10V

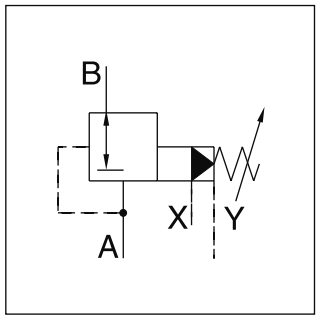
Mounting pattern ISO 5781-06-07-0-00



VM UK.INDD RH 06.09.2011

Notes

Subplate mounted pressure reducing valves series R4R are used to control the pressure in the secondary part of the hydraulic system. Independent of the primary pressure the secondary pressure is reduced to the pressure setting. In order to avoid undesired motion the valves are normally closed.

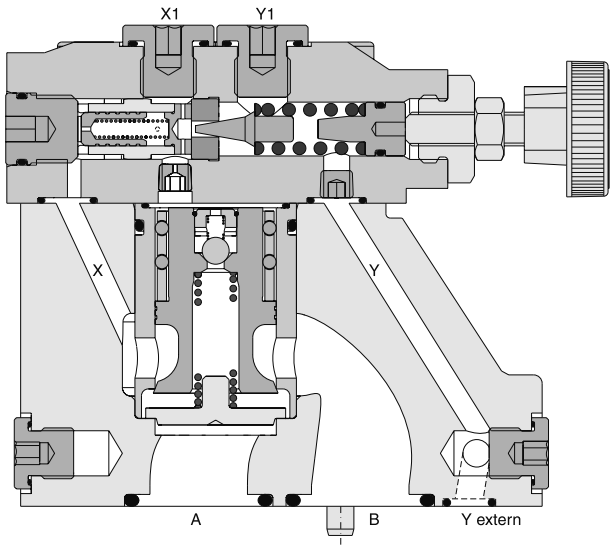


Features

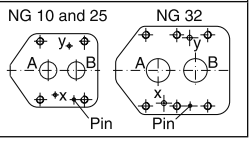
- Pilot operated with manual adjustment
- Subplate mounting acc. to ISO 5781
- Normally closed to avoid unintended motion
- 3 pressure stages
- 3 adjustment modes
  - hand knob
  - acorn nut with lead seal
  - Key lock

Technical data

General				
Nominal size		10	25	32
Interface		Subplate mounting acc. ISO 5781		
Mounting position		as desired, horizontal mounting prefered		
Ambient temperature	[°C]	-20...+80		
$MTTF_D$ value	[years]	75		
Weight	[kg]	4.8	7.2	13.5
Hydraulic				
Max. operating pressure	[bar]	Ports A, B and X 350, port Y depressurized		
Pressure stages	[bar]	105, 210, 350		
Nominal flow	[l/min]	150	350	500
Fluid		Hydraulic oil according to DIN 51524 ... 51525		
Viscosity, recommended	[cSt] / [mm²/s]	30 ... 50		
permitted	[cSt] / [mm²/s]	20 ... 380		
Fluid temperature	[°C]	-20 ... +70		
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)		



R	4	R		–	5	9				B		
Pressure valve	**Interface**	**Reducing function**	**Nominal size**		**Max. pressure (350 bar)**	**Pilot ports G1/4“**	**Pressure stages**	**Adjust-ment**	**Pilot oil**	**Design series**	**Seals**	**Modifi-cations**

Code	Interface	
4	Subplate mounting ISO 5781	

Code	Seals
1	NBR
5	FPM

Code	Nominal size
03	NG10
06	NG25
10	NG32

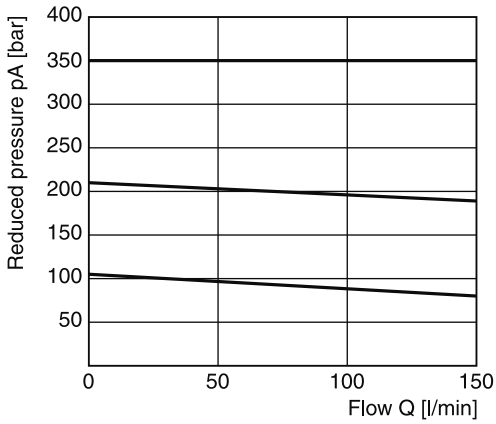
Pilot oil		
Code	Pilot	Drain
1	Internal	External from Y
2	Internal	External from Y1

Code	Pressure stages[1)]
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

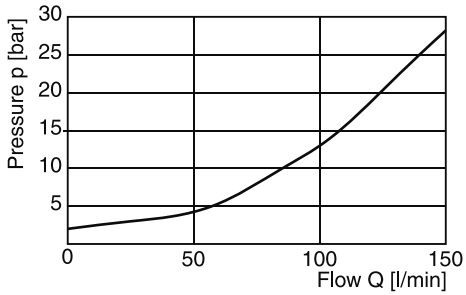
[1)] Other pressure stages on request.

Code	Adjustment
1	Hand knob 32mm dia. (Standard)
3	Acorn nut with lead seal
4	key lock

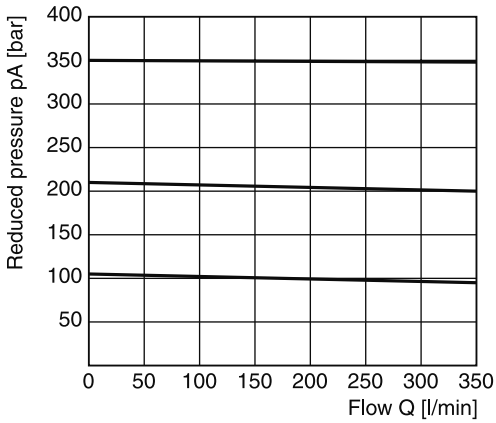
Reduced pressure pA versus flow Q
R4R03 [1)]



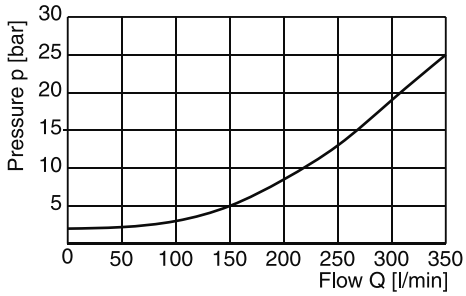
Minimum pressure curve



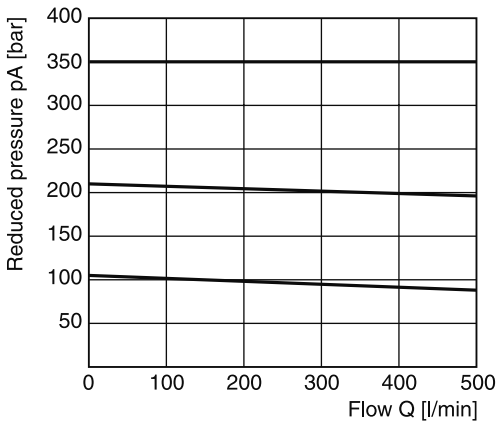
Reduced pressure pA versus flow Q
R4R06 [1)]



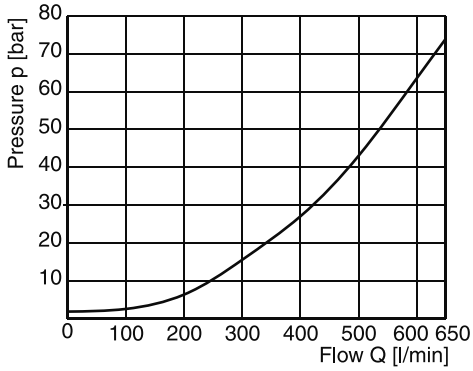
Minimum pressure curve



Reduced pressure pA versus flow Q
R4R10 [1)]



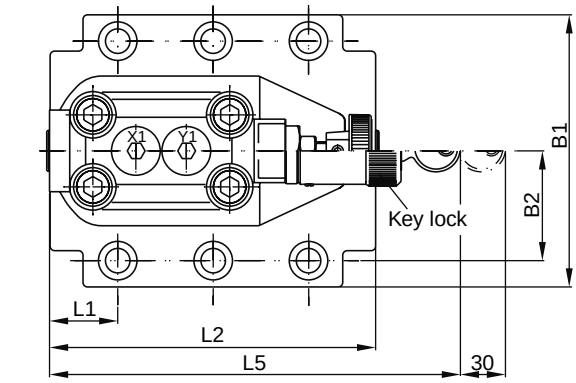
Minimum pressure curve

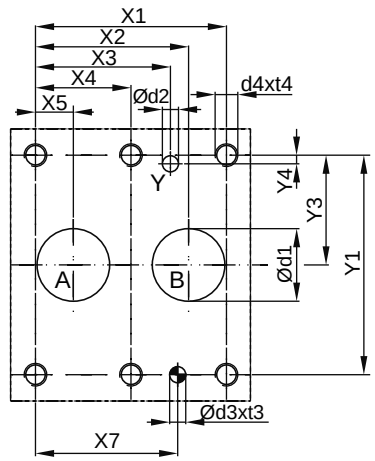


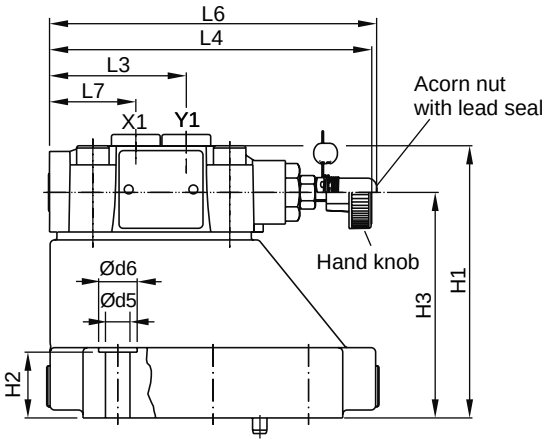
[1)] Measured at 350 bar primary pressure pB.

All characteristic curves measured with HLP46 bei 50°C.

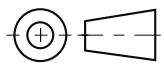
4







X1: G 1/4“
Y1: G 1/4“



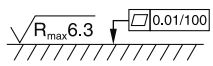
NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9	35.8	21.5	–	7.2	–	31.8	66.7	–	33.4	7.9	–	–
25	5781-08-10-0-00	60.3	49.2	39.7	–	11.1	–	44.5	79.4	–	39.7	6.4	–	–
32	5781-10-13-0-00	84.2	67.5	59.5	42.1	16.7	–	62.7	96.8	–	48.4	3.8	–	–

Tolerance for all dimensions ±0.2

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6	L7
10	5781-06-07-0-00	87.3	33.35	83	21	62.5	–	–	–	29	94.8	60.8	143	181	144.8	38.6
25	5781-08-10-0-00	105	39.7	109.5	29	89	–	–	–	34.7	126.8	60.8	143	181	144.8	38.6
32	5781-10-13-0-00	120	48.4	120	29	99.5	–	–	–	30.6	144.3	60.8	143	181	144.8	38.6

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	5781-06-07-0-00	15	7	7.1	8	M10	16	10.8	17	SPP 3M6B 910
25	5781-08-10-0-00	23.4	7.1	7.1	8	M10	18	10.8	17	SPP 6M8B 910
32	5781-10-13-0-00	32	7.1	7.1	8	M10	20	10.8	17	SPP 10M12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit NBR	Kit FPM	Surface finish
10	5781-06-07-0-00	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S26-58507-0	S26-58507-5	
25	5781-08-10-0-00	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58475-0	S26-58475-5	
32	5781-10-13-0-00	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58508-0	S26-58508-5	

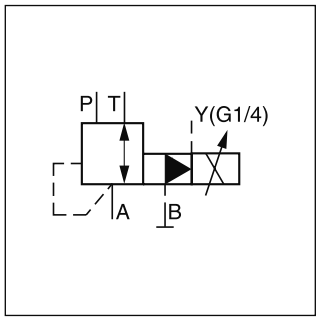
Proportional pressure reducing valves of the series VMY allow the variable adjustment of the reduced pressure from 0 bar up to the nominal pressure.

The valve consists of a spool type main stage and a proportionally operated pilot stage. The desired pressure can be variably set corresponding to the command signal specified on the amplifier. The proportional solenoid converts the current of the amplifier into force on the valve poppet of the pilot stage.

Typical applications are pressure systems, test equipment, or counterweight systems.

The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400 for open loop systems or with PWDXXA-40* for closed loop systems.

VMY*K06



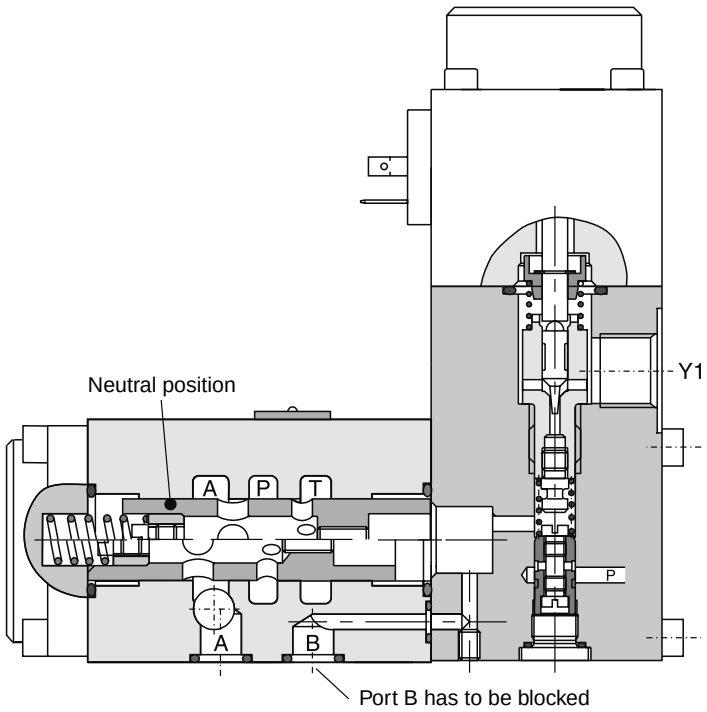
4

Function

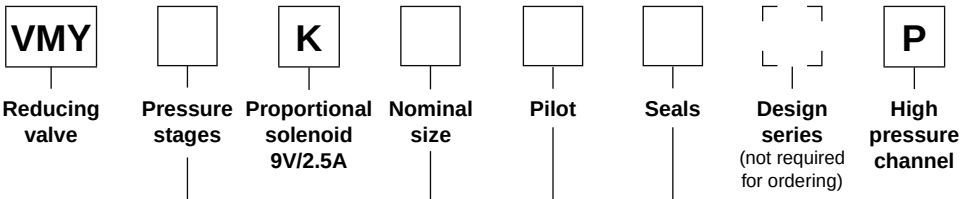
With the proportional solenoids de-energized the main spring forces the main spool into the neutral position. Port A is connected to port T. Thus the reduced pressure only depends on the back pressure in the external drain pipe and/or the tank pressure and can accordingly be reduced down to 0 bar. The pressure present in the P line delivers the pilot oil to the pilot stage via a flow control valve.

When the proportional solenoid is energized, the pilot pressure is increased in the pilot pressure area, and the main spool moves against the spring until the connection P - A opens. The regulation of the reduced pressure on connection A takes place by the constant comparison of the actual pressure and the reference pressure of the pilot stage.

VMY*K06N



Ordering code



Code	Pressure stages
064	**up to 64 bar**
100	**up to 100 bar**
160	**up to 160 bar**
210	**up to 210 bar**
315	up to 315 bar

Code	Seals
N [3]	**NBR**
V	FPM

[3] not for NG06

Code	Nominal size
06	**NG06**
10	**NG10**

Pilot oil			
Code	Size	Pilot	Drain
omit	**10**	**Internal**	**Internal**
N [1]	**06**	**Internal**	**External** [2]
T	**06**	**Internal**	**Internal**

[1] connection on port Y
[2] pmin = 0 bar possible

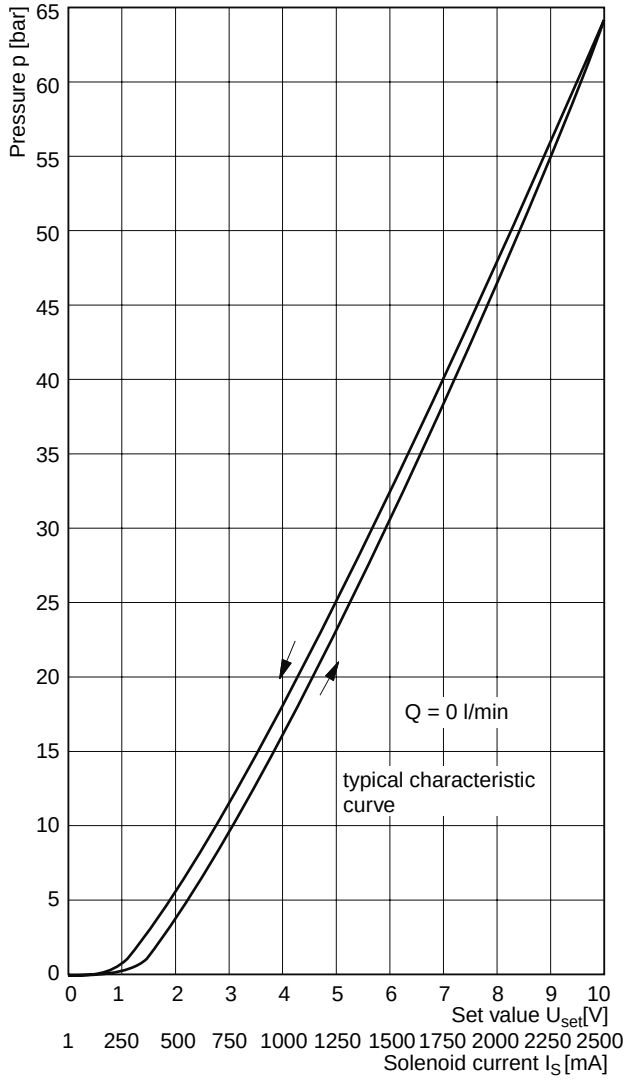
Bold letters =
Short-term availability

Ordering code

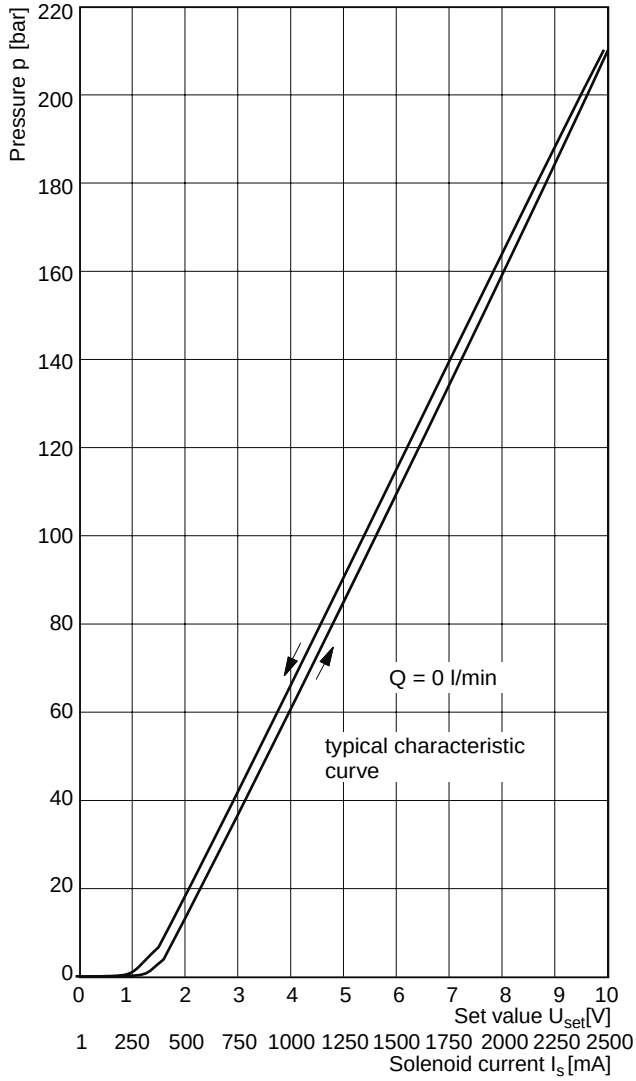
General			
Design		3 way proportional reducing valve, pilot operated, spool design	
Nominal size		06 (DIN NG06/CETOP03/NFPA D03)	10 (DIN NG10/CETOP05/NFPA D05)
Interface		Subplate mounting according to ISO 5781	
Actuation		Proportional solenoid	
Mounting position		unrestricted	
Ambient temperature	[°C]	-20 ... +80	
$MTTF_D$ value	[years]	75	
Weight	[kg]	2.8	5
Hydraulics			
Max. operating pressure	[bar]	Ports P, A 315; Port T, Y depressurized; port B has to be blocked	
Pressure stages	[bar]	64, 100, 160, 210, 315	
Nominal flow	[l/min]	40 (NG06)	160 (NG10)
Fluid		Hydraulic oil as per DIN 51 524 ... 51535	
Viscosity recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 50 20 ... 380	
Fluid temperature	[°C]	-20 ... +70	
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)	
Linearity	[%]	See characteristic pressure curves	±3.5 at > 15% $p_{nom.}$
Repeatability	[%]	<±2	
Hysteresis	[%]	<3	
Response time	[ms]	<150	<200
Electrical			
Duty ratio	[%]	100 ED	
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)	
Nominal voltage	[VDC]	9	
Max. current	[A]	2.7	
Nom. current	[A]	2.5	
Ambient temperature	[°C]	-20...+70	
Coil resistance	[Ohm]	-2.1 (at 20°C)	
Solenoid connection		Connector as per EN 175301-803	
Power amplifier, recommended		PCD00A-400	

NG06 Characteristic pressure lines p = f (U_{set})

Setting range max. 64 bar

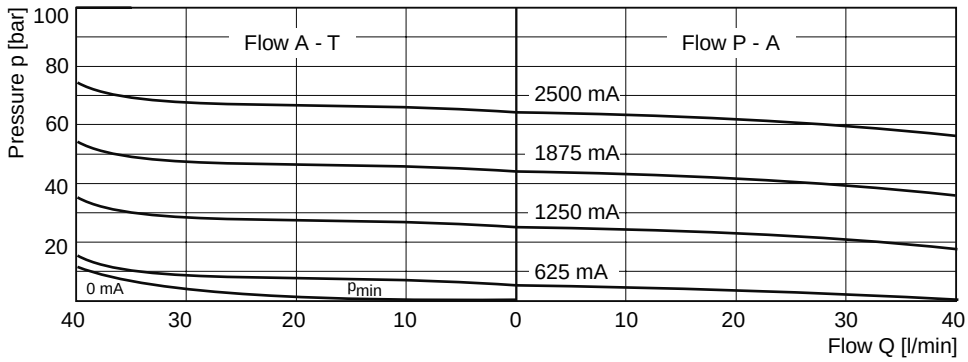


Setting range max. 210 bar



NG06 p/Q characteristics

Setting range max. 64 bar

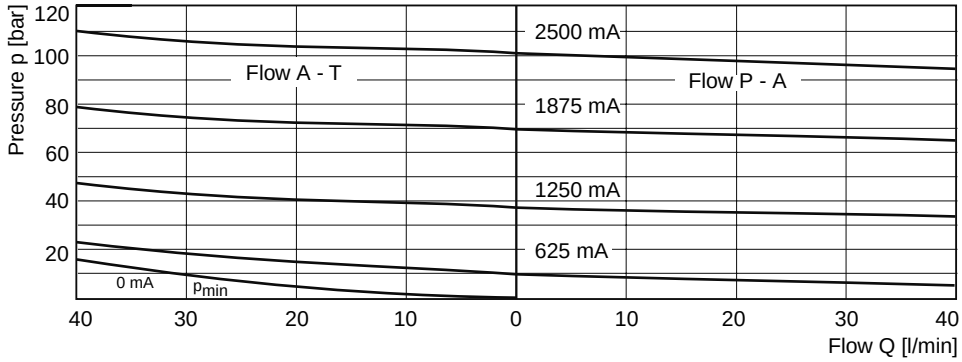


All characteristic curves measured with HLP46 bei 50°C.

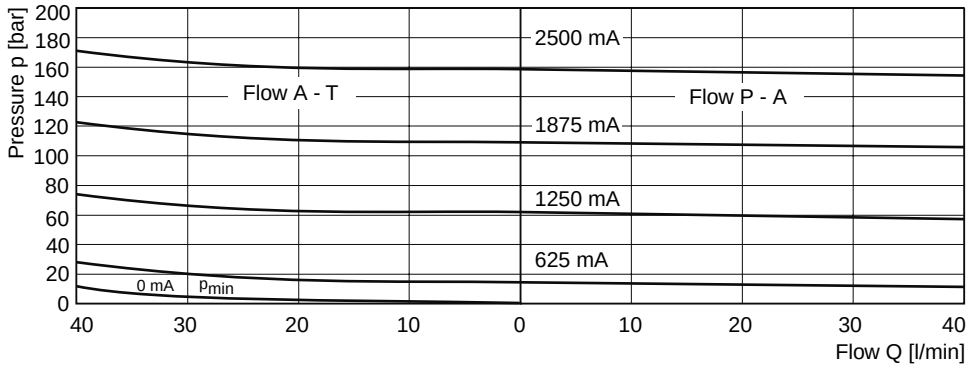
4

NG06 p/Q characteristics

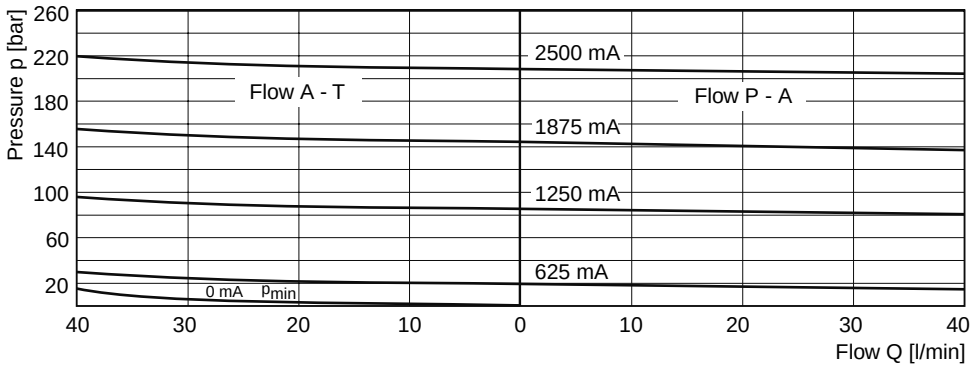
Setting range max. 100 bar



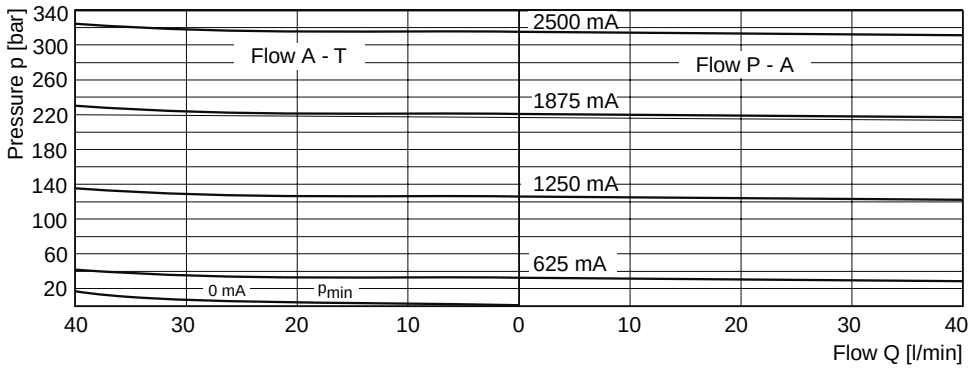
Setting range max. 160 bar



Setting range max. 210 bar



Setting range max. 315 bar

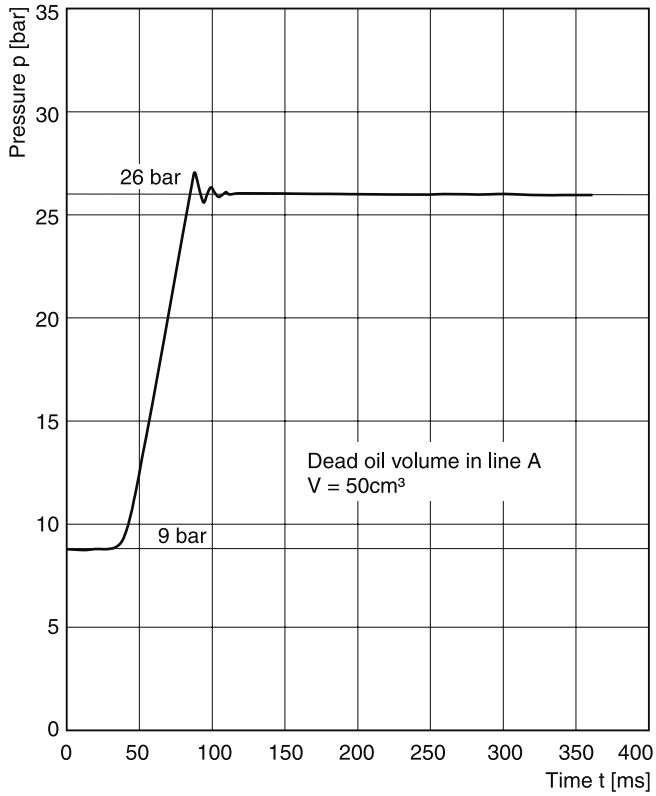


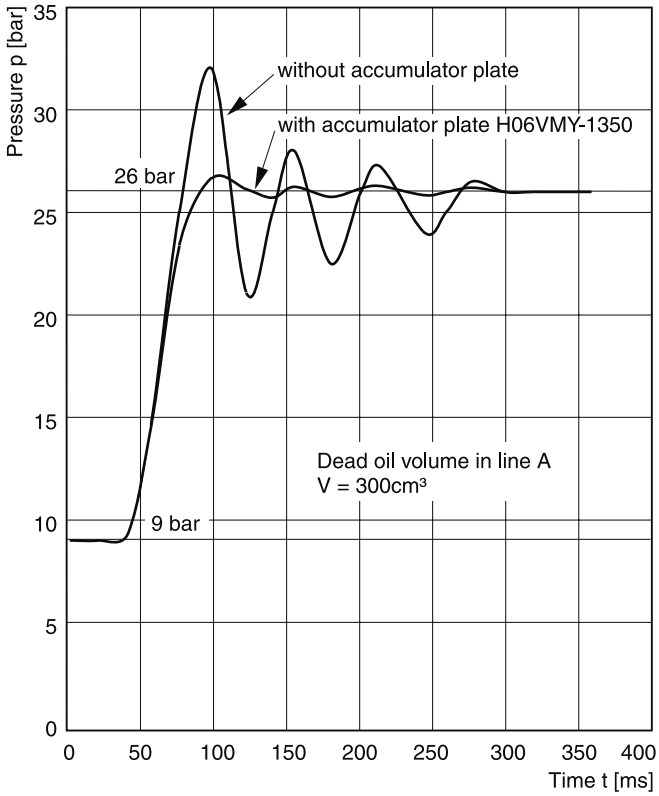
All characteristic curves measured with HLP46 bei 50°C.

VMY UK.INDD RH 06.09.2011

Step response

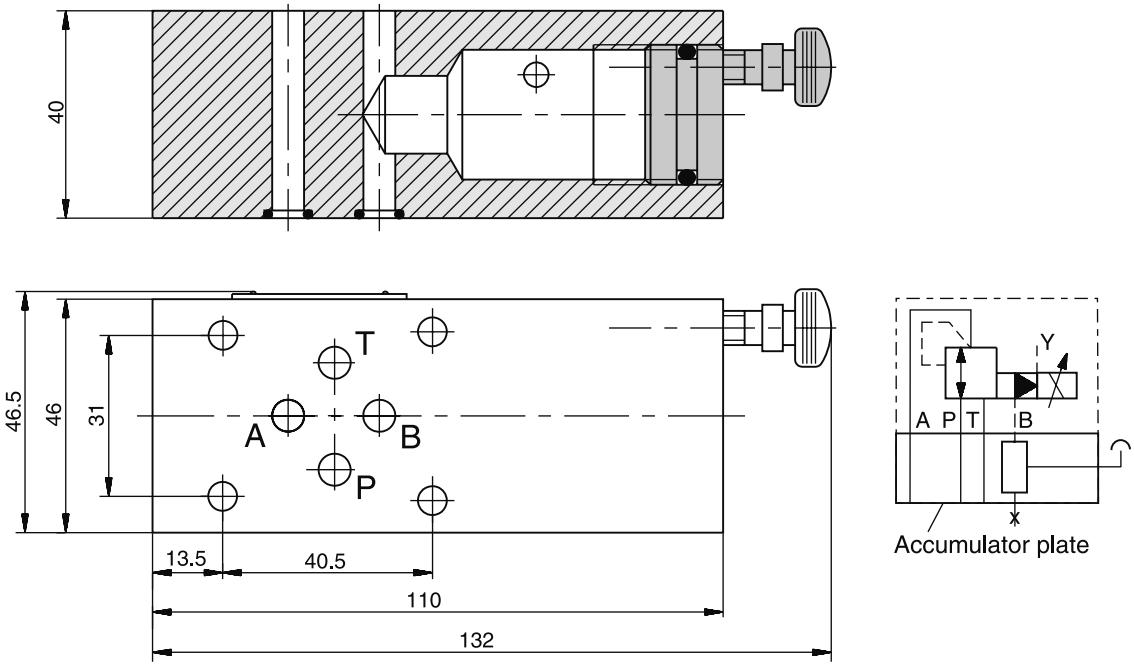
Typical curve





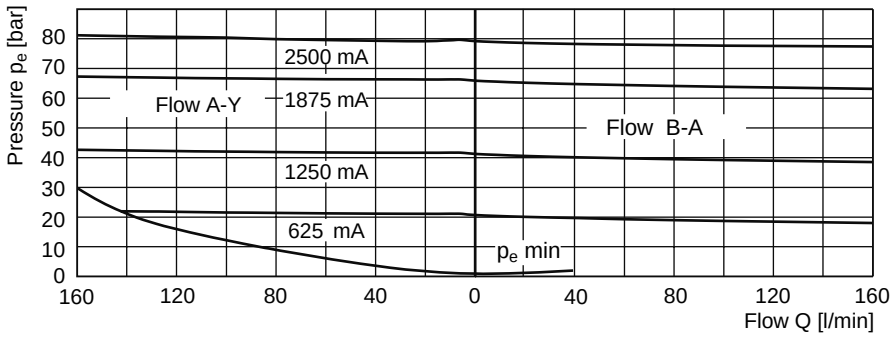
All characteristic curves measured with HLP46 bei 50°C.

Accumulator plate H06VMY-1350

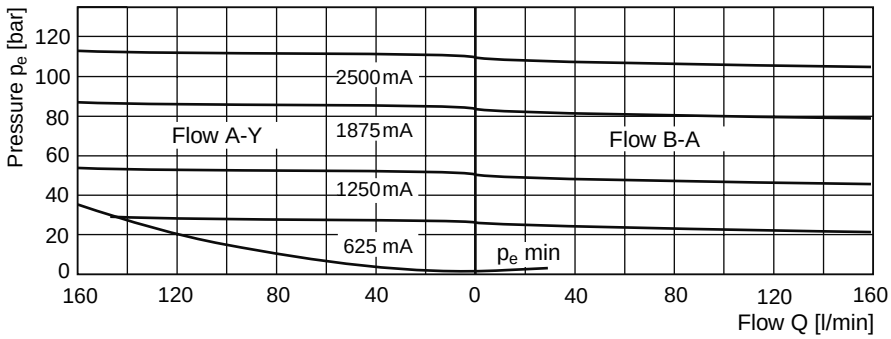


NG10 p/Q characteristics
for pilot oil supply from high pressure channel P, measured with HLP46 at 50°C.

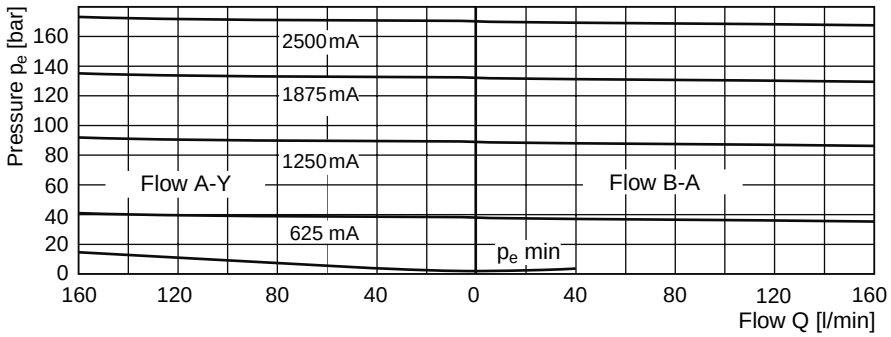
Setting range max. 64 bar



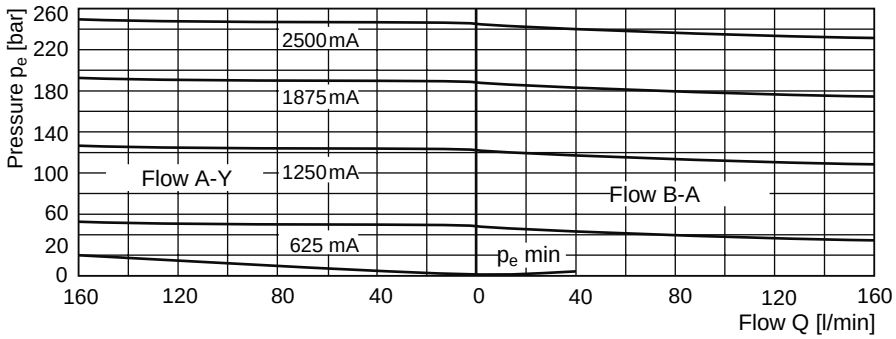
Setting range max. 100 bar



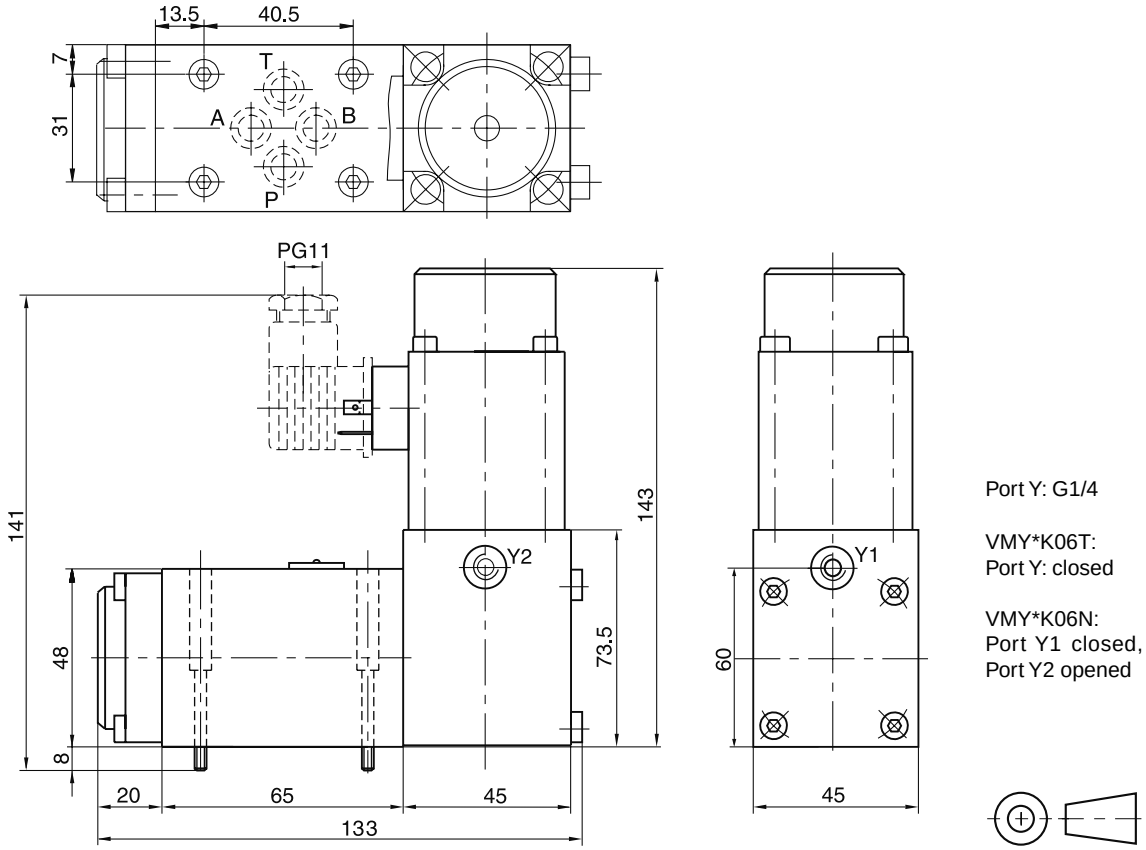
Setting range max. 160 bar



Setting range max. 210 bar



NG06



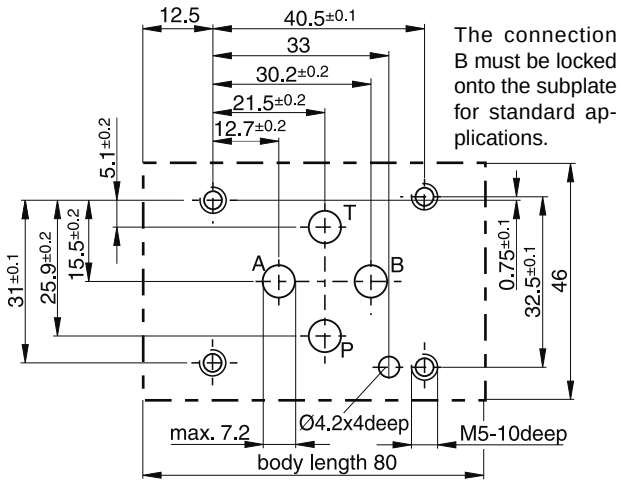
Port Y: G1/4

VMY*K06T:
Port Y: closed

VMY*K06N:
Port Y1 closed,
Port Y2 opened

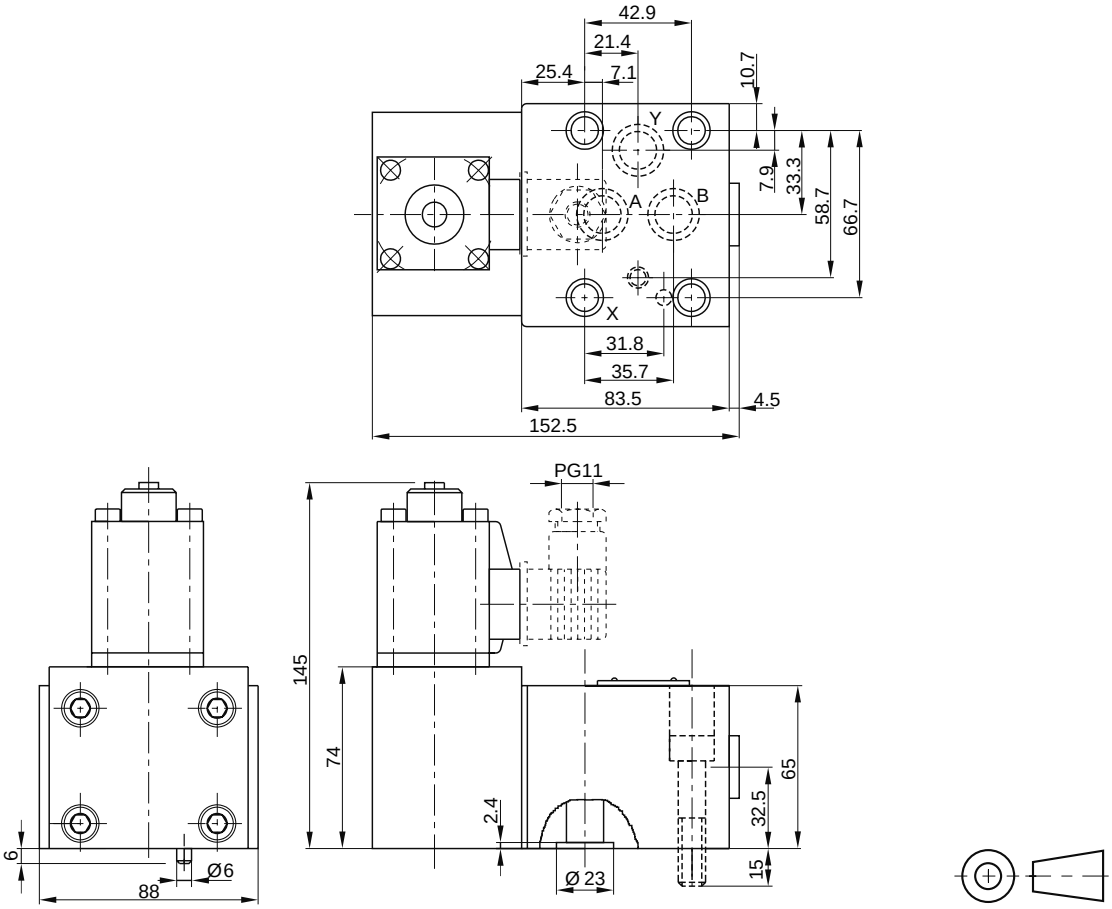
Surface finish	Bolt kit			Kit FPM
$\sqrt{R_{max}6.3}$ 0.01/100	BK 375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	SK-VMY-L06-V

Mounting pattern ISO 5781-03-04-0-00



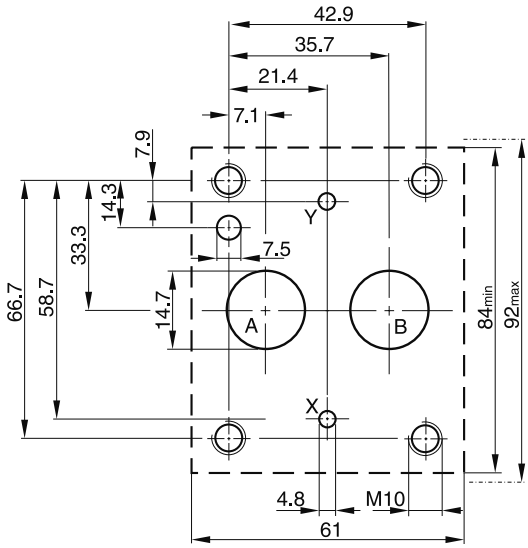
The connection B must be locked onto the subplate for standard applications.

NG10



Surface finish	Bolt kit			Kit FPM
$\sqrt{R_{max}6.3}$ 0.01/100	BK 389	4x M10x50 DIN 912 12.9	63 Nm ±15%	SK-VB/VM-A10V

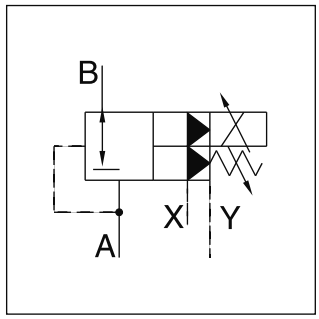
Mounting pattern ISO 5781-06-07-0-00



VMY UK.INDD RH 06.09.2011

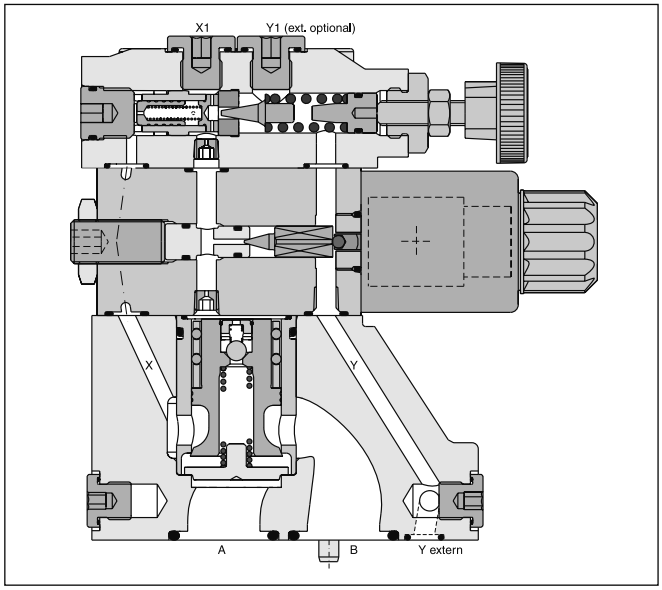
Subplate mounted proportional pressure reducing valves series R4R have a proportional solenoid operated pilot stage and a cartridge main stage.

The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.



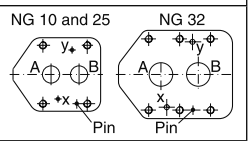
Features

- Continuous adjustment by proportional solenoid
- Subplate mounting according to ISO 5781
- 3 pressure stages
- With mechanical maximum pressure adjustment



4

R	4	R		–	5	9					P2	G0R	B		
Pressure valve	Interface	Reducing function	Nominal size		Max. pressure 350 bar	Pilot ports G1/4“	Pressure stages	Adjustment	Pilot oil		Prop. operation	Solenoid voltage 12V, 2.3A	Design series	Seals	Modifi-cations

Code	Interface	
4	Subplate mounting ISO 5781	NG 10 and 25 / NG 32 

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

Code	Seals
1	NBR
5	FPM

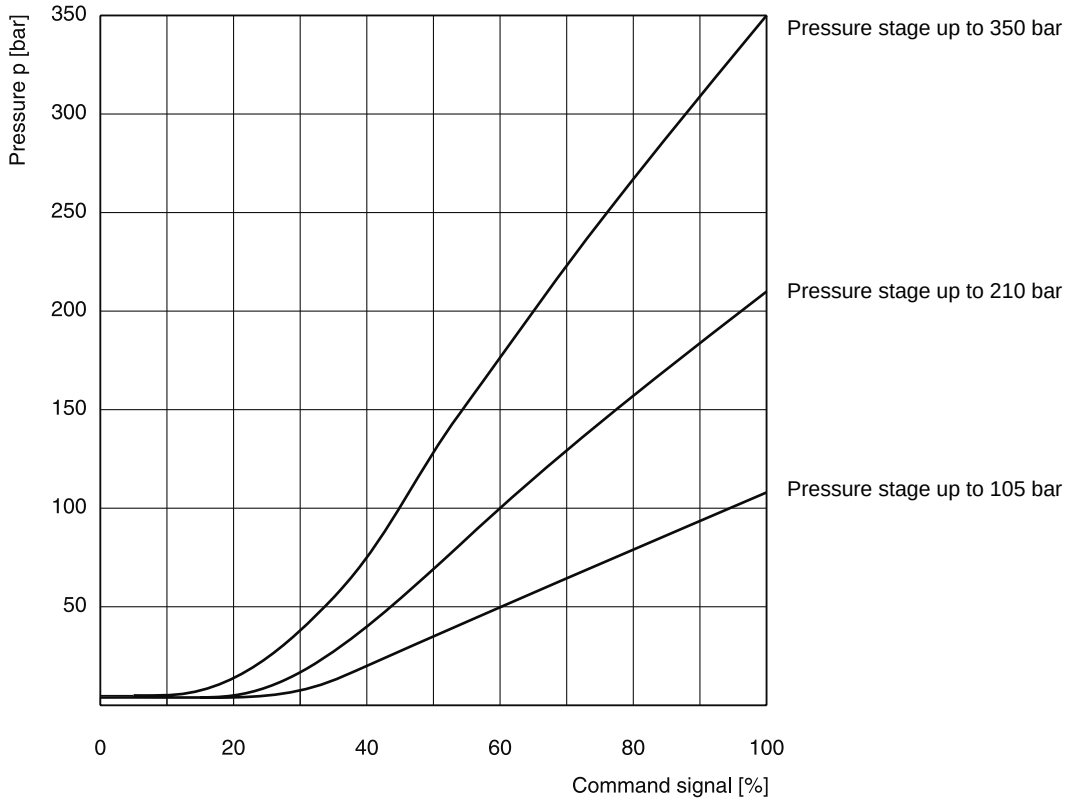
Pilot oil		
Code	Pilot	Drain
1	Internal	External from Y
2	Internal	External from Y1

Code	Adjustment
1	Hand knob 32mm diameter (Standard)
3	Acorn nut with lead seal

Technical data

General				
Nominal size		10	25	32
Interface		Subplate mounting acc. ISO 5781		
Mounting position		as desired, horizontal mounting prefered		
Ambient temperature	[°C]	-20...+80		
$MTTF_D$ value	[years]	75		
Weight	[kg]	2.7	4.5	6.0
Hydraulic				
Max. operating pressure	[bar]	Ports A, B and X 350, port Y depressurized		
Pressure stages	[bar]	105, 250, 350		
Nominal flow	[l/min]	150	350	500
Fluid		Hydraulic oil according to DIN 51524 ... 51525		
Viscosity recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 50 20 ... 380		
Fluid temperature	[°C]	-20 ... +70		
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638:7)		
Electrical				
Duty ratio	[%]	100 ED		
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
Nominal voltage	[V]	12		
Max. current	[A]	2.3		
Coil resistance	[Ohm]	4 at 20°C		
Solenoid connection		Connector as per EN 175301-803		
Power amplifier, recommended		PCD00A-400		

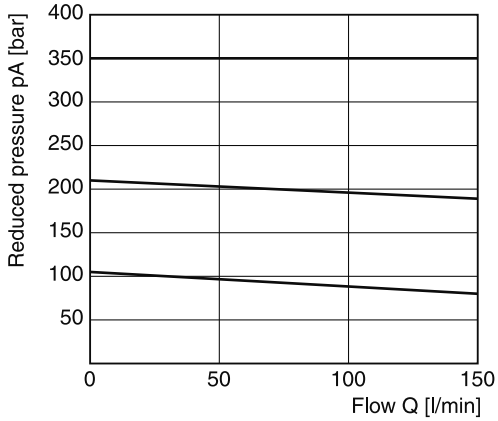
Command/pressure curves



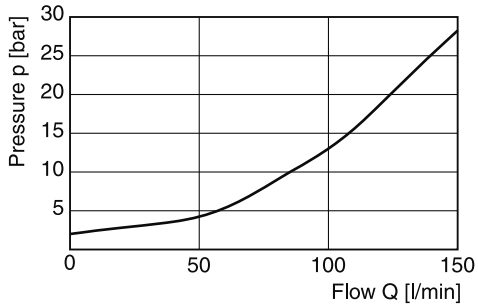
All characteristic curves measured with HLP46 bei 50°C.

Reduced pressure pA versus flow Q

R4R03 [1)]

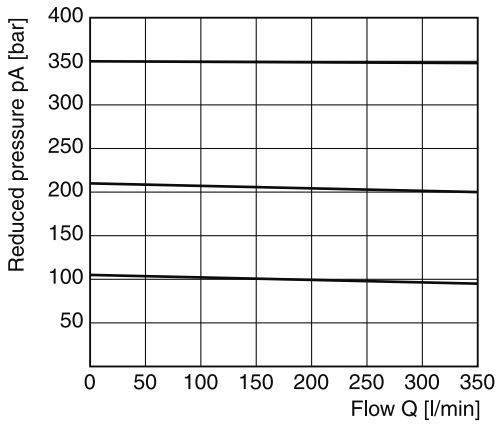


Minimum pressure curve

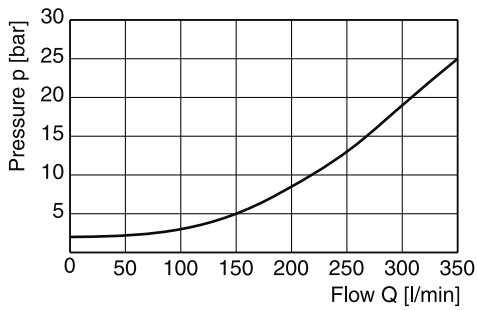


Reduced pressure pA versus flow Q

R4R06 [1)]

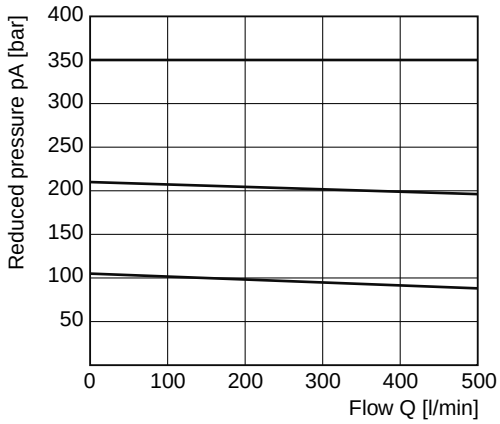


Minimum pressure curve

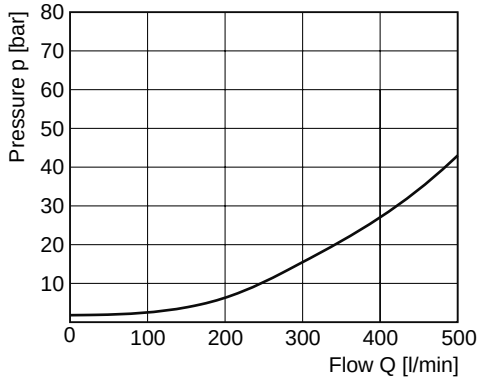


Reduced pressure pA versus flow Q

R4R10 [1)]



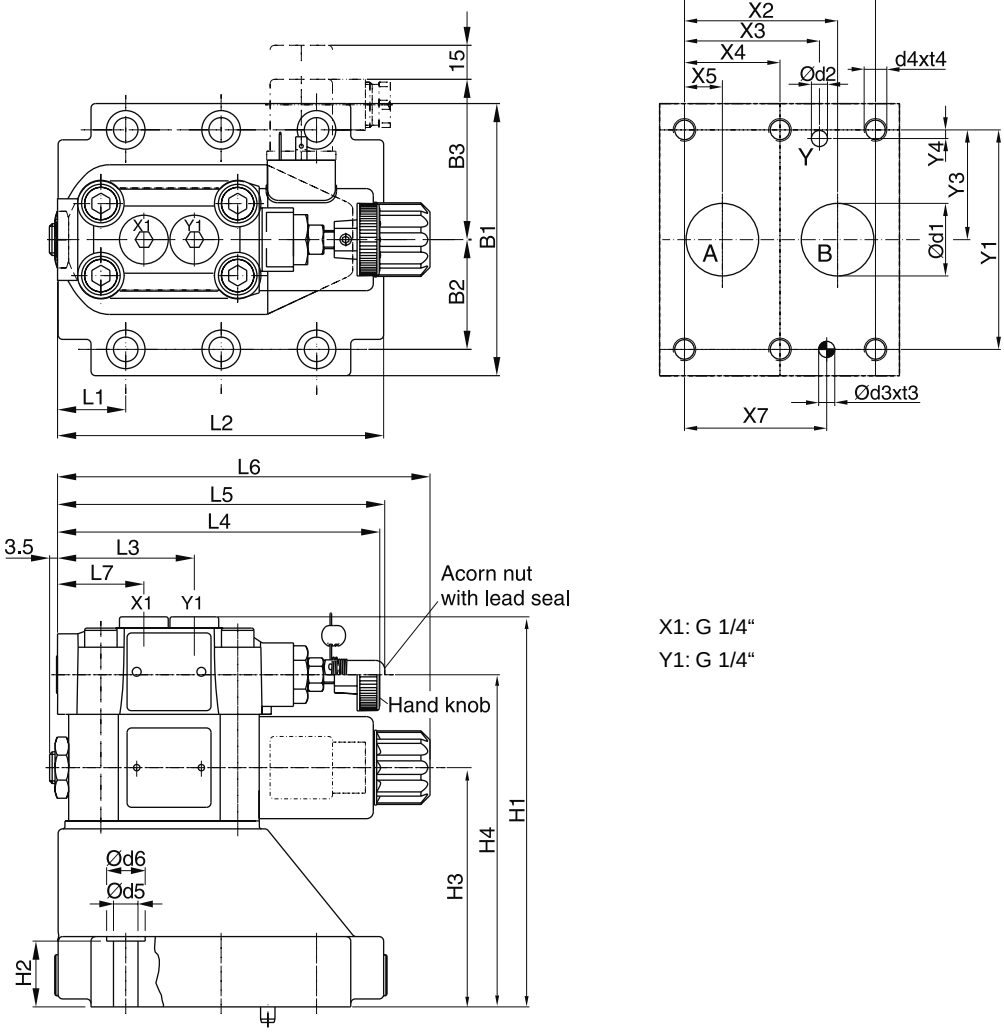
Minimum pressure curve



[1)] Measured at 350 bar primary pressure pB.

All characteristic curves measured with HLP46 bei 50°C.

4



X1: G 1/4“
Y1: G 1/4“

NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9	35.8	21.5	–	7.2	–	31.8	66.7	–	33.4	7.9	–	–
25	5781-08-10-0-00	60.3	49.2	39.7	–	11.1	–	44.5	79.4	–	39.7	6.4	–	–
32	5781-10-13-0-00	84.2	67.5	59.5	42.1	16.7	–	62.7	96.8	–	48.4	3.8	–	–

Tolerance for all dimensions ±0.2

NG	ISO-code	B1	B2	B3	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7
10	5781-06-07-0-00	87.3	33.35	71	134	21	68.5	109.5	29	94.8	60.8	143	144.8	164.8	38.6
25	5781-08-10-0-00	105	39.7	71	160.5	29	95	136	34.7	126.8	60.8	143	144.8	164.8	38.6
32	5781-10-13-0-00	120	48.4	71	171	29	105.5	146.5	30.6	144.3	60.8	143	144.8	164.8	38.6

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6	Subplate [1]
10	5781-06-07-0-00	15	7	7.1	8	M10	16	10.8	17	SPP 3M6B 910
25	5781-08-10-0-00	23.4	7.1	7.1	8	M10	18	10.8	17	SPP 6M8B 910
32	5781-10-13-0-00	32	7.1	7.1	8	M10	20	10.8	17	SPP 10M12B 910

[1] Details see chapter 12, series SPP

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	5781-06-07-0-00	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S26-58507-0*	S26-58507-5*	R_{max}6.3 0.01/100
25	5781-08-10-0-00	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58475-0*	S26-58475-5*	
32	5781-10-13-0-00	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58508-0*	S26-58508-5*	
Prop. section P2					S26-58473-0	S26-58473-5	

* Please combine seal kit of one size with seal kit of Prop. section P2 for complete seal kit

R4R PROP UK.INDD RH 06.09.2011

Description	Threaded cable joint	Body colour coding	Figures switching	Order no.
Plug DIN 43650, design type AF, protection class IP 65 Voltages up to 250 V	PG 9	black, B grey, A	Fig. 1	**5001710** **5001711**
	PG11	black, B grey, A	Fig. 1	**5001716*** **5001717***
Plug with LED insert 24 V	PG11	black, B grey, A	Fig.1 and Fig. 3	**5001571** **5001572**
Plug with lamp insert 110 V	PG11	black, B grey, A	Fig.1 and Fig. 4	**5001573** **5001574**
Plug with lamp insert 220 V	PG11	black, B grey, A	Fig.1 and Fig. 4	**5001575** **5001576**
Plug with LED insert 24V and suppressing circuitry	PG11	black, B grey, A	Fig.1 and Fig. 5	**5001708** **5001709**
Plug with rectifier. Rectifier with 4 silicon diodes in bridge circuit. Varistor in alternating current side to protect the diodes against power peaks	PG11	black, B grey, A	Fig.1 and Fig. 6	**5001737** **5001738**
Plug with pull relief and translucent cover	PG11	black, B grey, A	Fig. 2	**5001723** **5001724**
Application with bridge rectifier suitable for 5001723 and 5001724	—	—	Fig. 2 and Fig. 7	**5001727**
Application with bridge rectifier and lamp suitable for 5001723 and 5001724	—	—	Fig. 2 and Fig. 8	**5001734**

* If not ordered otherwise, valves with code P are supplied with these connectors.

Fig. 1

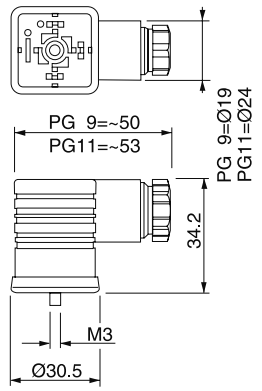


Fig. 3

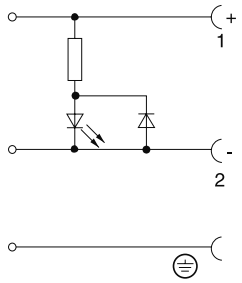


Fig. 5

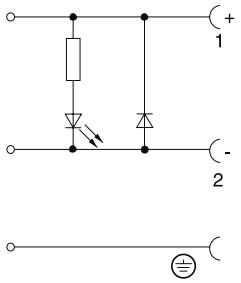


Fig. 7

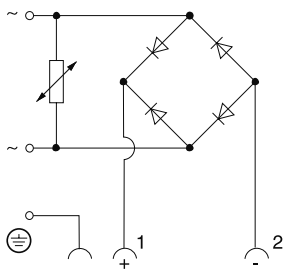


Fig. 2

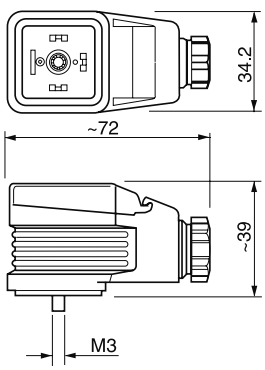


Fig. 4

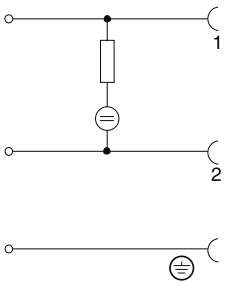


Fig. 6

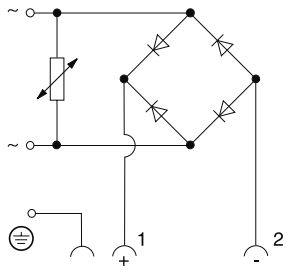
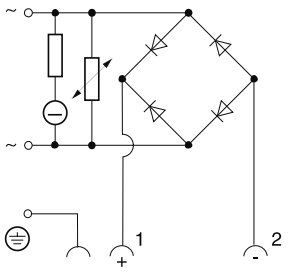
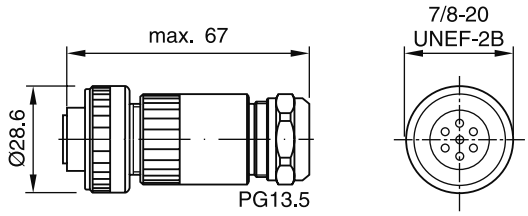


Fig. 8



Input voltage
max. 240 V~
Output voltage
max. 213 V=

Central connector



Description	Order No.
DIN 43563 6+PE	5004072

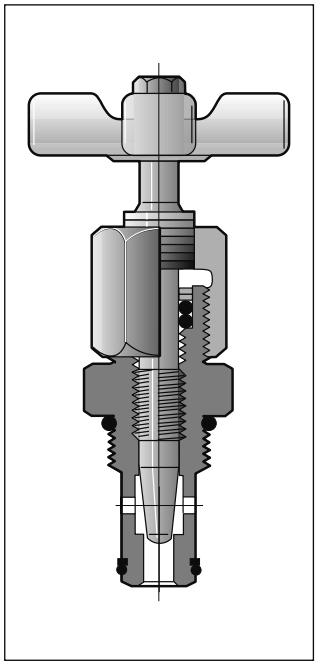
4

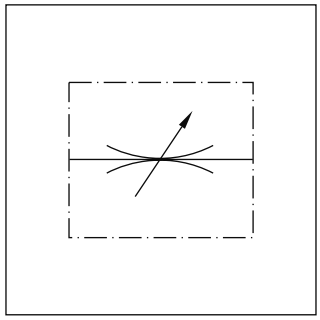
Series	Description	Size								Mounting		Page
	Parker Standard DIN / ISO	1/4	3/8	1/2	3/4	1	06	10	16	Subplate	Screw-in	
	Throttle valves, manual adjustment											
MVI		•	•	•	•						•	5-3
NS		•	•	•	•	•				•		5-5
FS	With free return flow	•	•	•	•	•				•		5-7
	Flow control valves, manual adjustment											
PC*MS		•	•	•	•	•				•		5-9
GFG2							•			•		5-11
2F1C								•	•	•		5-15
	Flow control valves, proportional adjustment											
DUR*L							•			•		5-21

More flow valves are presented in the following chapters:
Chapter 7: Sandwich Valves
Chapter 8: Slip-In Cartridge Valves
Chapter 9: SAE Flange Valves
Chapter 10: Valves for Pipe Mounting

Notes

Manatrol needle valve with steel body as screw-in valve for block insertion, optionally with a 30° taper-fine, V-notch or micro-fine rectangular slot. The form of the metering opening influences the accuracy of the flow adjustment, which is pressure and viscosity dependent. The needle is made of stainless steel and fits into a ring gap in the valve cartridge. For details of cutting tools for reaming the block bore, see 'Accessories' at the end of this chapter.





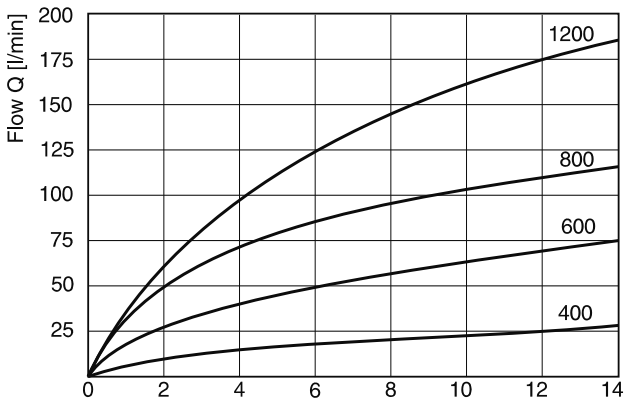
Characteristic values

Size	Operating press. [bar]	Flow [l/min] Δp 10bar	Max. orifice area [cm²]	Kv factor valve	Weight [kg]
400	350	25	0.14	6.3	0.18
600	350	65	0.37	18.5	0.32
800	350	105	0.55	27.5	0.59
1200	350	160	0.90	45.7	0.95
Needle size					
400-2		11	0.52		
400-3		2	0.012		

$$\text{Flow rate } Q\ [l/min] = Kv \cdot \sqrt{\frac{\Delta p}{\gamma}}$$

Kv — see table
Δp [bar]
γ [kg/dm³] = specific gravity of fluid
(γ for mineral oil = 0.85 – 0.9)

Δp/Q curves



All characteristic curves measured with HLP46 at 50°C.

Ordering code

MVI	☐	S	☐	☐
Cartridge-type needle valve	Size and screw-in threads	Steel body	Needle	Seal

Code	Size	Threads
400	**1/4"**	**3/4 - 16 UNF-2B**
600	**3/8"**	**7/8 -14 UNF-2B**
800	**1/2"**	**1 1/16 - 12 UN-2B**
1200	**3/4"**	**1 5/16 - 12 UN-2B**

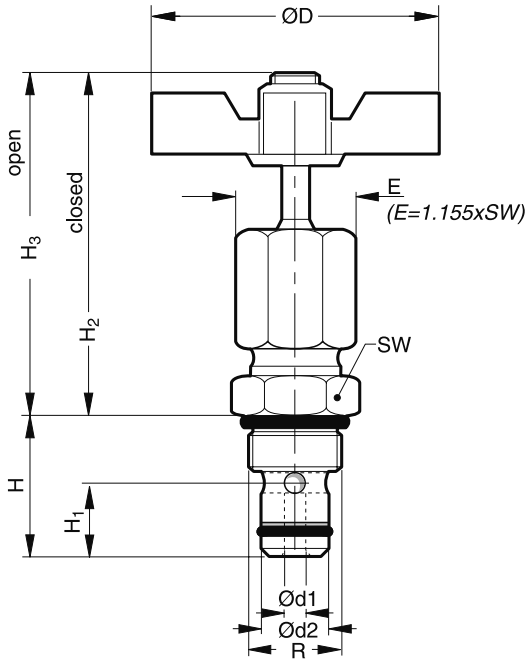
Code	Seal
omit	**NBR**
V	FPM

Code	Needle
omit	**Standard 30° taper**
2*	Fine V-notch
3*	Micro-fine slotted

* only for size 400

Bold letters =
Short-term availability

Threaded cartridge valve

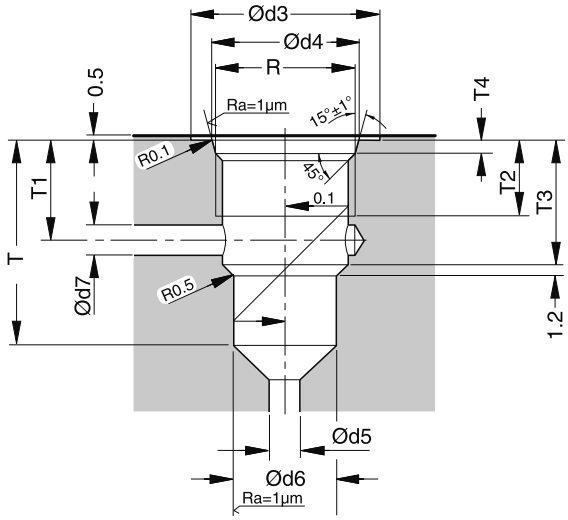


Size	H	H3	H2	H1	Ød1	Ød2	R (Threads)	ØD	SW
MVI 400	25.4	65	60	10.9	4.6	14.22	3/4 - 16 UNF-2	51	22.1
MVI 600	30	81	73	13.5	7.9	15.8	7/8 - 14 UNF-2	64	25.4
MVI 800	39.6	91	79	15.2	9.4	20.55	1 1/16 - 12 UN-2	83	31.8
MVI 1200	43.4	102	88	19.1	11.7	26.92	1 5/16 - 12 UN-2	98	38.1

Drills for MVI valves

Material	Valve sizes and ordering code		
	400	600	800 and 1200
Cutting alloy	SE 1062	SE 567	on request
Steel	SE 1063	SE 1061	

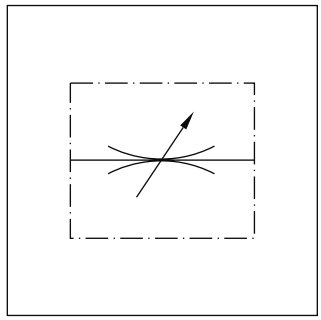
Mounting cavity

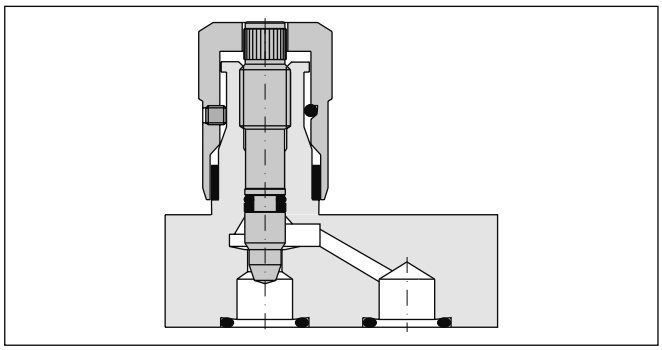


Size	Ød3	Ød4$^{+0.12}$	Ød5 (min)	Ød6$^{+0.05}$	Ød7	T4$^{+0.38}$	T2	T3	T	T1
MVI 400	26	20.6	5.3	14.275	5.3	2.54	15	17.8	27	14.2
MVI 600	30	23.93	8.1	15.85	8.1	2.54	17	21.6	32	16.5
MVI 800	37	29.16	10.2	20.6	10.2	3.3	19	30	42	24.1
MVI 1200	44	35.54	12.7	26.975	12.7	3.3	19	31.8	46	24.6

Manatrol shut-off and metering valves with 2 stage needle cone. Fine adjustment for the first stage can be achieved with 3 rotations of the adjustment knob. The second stage with normal throttle characteristics is achieved with 3 further rotations.

A cylindrical needle with a rectangular slot is provided to reduce the viscosity effect for sizes 400 and 600. The flow is dependent on pressure and viscosity.





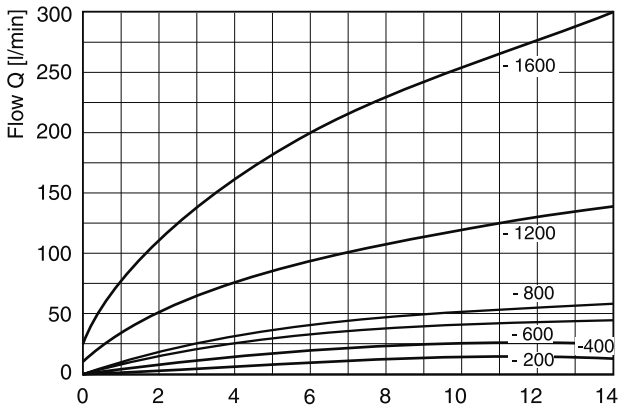
Characteristic values
(only for standard 2 stage needle)

Size	Press. [bar] steel	Press. [bar] brass	Flow [l/min] Δp 10bar	Max. cross-section [cm²]	Kv factor valve open	Weight [kg]
400	210	140	25	0.13	6.3	0.4
600	210	140	40	0.22	11.2	0.6
800	210	140	50	0.28	13.9	1.0
1200	210	140	120	0.70	35.4	2.0
1600	210	35	250	1.48	75	4.0

$$\text{Flow rate } Q\ [l/min] = Kv \cdot \sqrt{\frac{\Delta p}{\gamma}}$$

Kv — from the table
Δp [bar]
γ [kg/dm³] = specific weight of the medium
(γ for mineral oil = 0.85 – 0.9)

Δp/Q curves



All characteristic curves measured with HLP46 at 50°C.

Ordering code

N	S		S			
Needle valve	Manifold mounting	Size	Steel body	Needle	Clamping screw	Seal

Code	Size
400	**400**
600	**600**
800	**800**
1200	**1200**
1600	1600

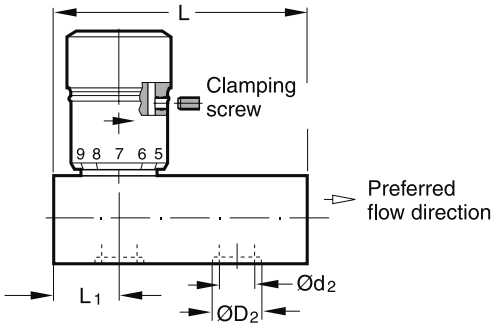
Code	Needle
omit	**Standard 2 stage needle**
4*	Micro-fine hollow needle with slot

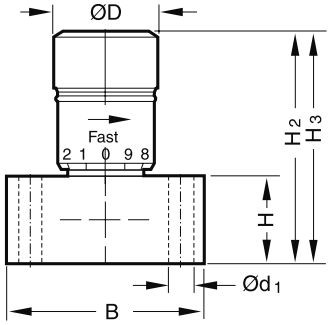
* only for sizes 400 to 600

Code	Seal
omit	**NBR**
V	FPM

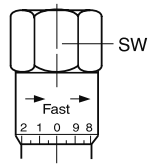
Code	Clamping screw
omit	**Hexagon socket**
F	With knurled knob

Bold letters =
Short-term availability

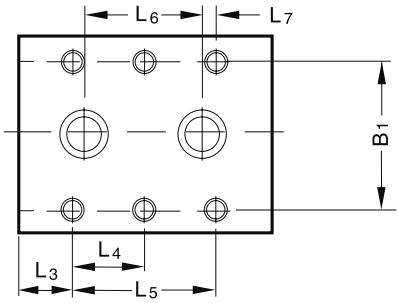


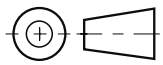


H_2 = closed
H_3 = open



Hexagon adjusting knob, standard for size 1600

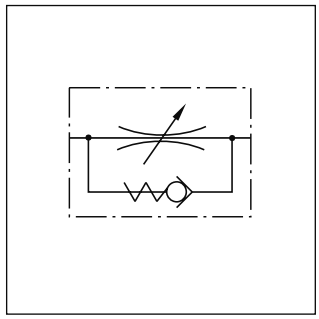


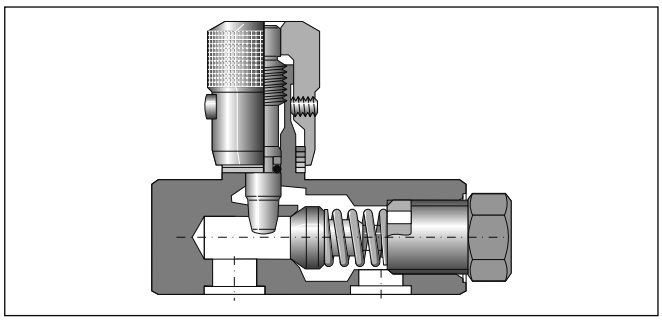


Size	L	L5	L4	L3	L7	L6	ØD2	Ød2	B1	B	H3	H2	H	Ød1	ØD	SW	L1
400	47.5	34.8	–	6.4	4.5	25.4	13.3	7	33.5	44.5	55	50	21	6.8	21	–	11
600	51	33.3	–	8.6	4.1	25.4	16	10	38.1	51	67	61	25.4	7	25	–	13
800	75	38.1	–	18.5	4.1	30	19.1	13	44.5	57.5	77	70	25.4	7	30	–	23
1200	93.5	76.2	38.1	8.6	11.2	54.4	24	17	54	70	95	80	29	9.5	35	–	20
1600	111	95.3	47.5	7.9	19	57.2	32	22	60.2	76.5	140	123	45	9.5	–	47.8	27

Manatrol throttle check valves of series FS allow the adjustment of the flow for a defined direction.

A 2 stage needle allows for very exact setting of smaller flow rates with the first 3 rotations of the adjustment knob. After 3 more rotations, the valve is completely open. The valve setting can be locked by a locking screw.





Flow rate Q [l/min] = Kv · $\sqrt{\frac{\Delta p}{\gamma}}$

Kv	from the table
Δp [bar]	
γ [kg/dm³]	= specific gravity of fluid
(γ for mineral oil	= 0.85 – 0.9)

5

Characteristic values

Size	Pressure [bar]	Max. flow [l/min Δp10bar]	Opening [cm²]	Check Kv factor	Throttle surface [cm²]	Throttle v. open Kv factor	Weight [kg]
400*	210	25	0.37	18.6	0.13	6.3	0.23
600*	210	40	0.62	30.4	0.22	11.2	0.31
800*	210	50	0.86	43.4	0.28	14	0.67
1200*	210	120	1.18	60	0.70	35.4	1.17
1600*	210	250	2.23	111	1.48	75	2.31

* $MTTF_D$ value 150 years

Ordering code

F	S		S			
Throttle and check valve	Subplate mounting	Size	Steel body	Needle	Clamping screw	Seal

Code	Size
400	**400**
600	**600**
800	**800**
1200	**1200**
1600	1600

Code	Needle
omit	**Standard 2 stage needle**
4*	Micro-fine hollow needle with slot

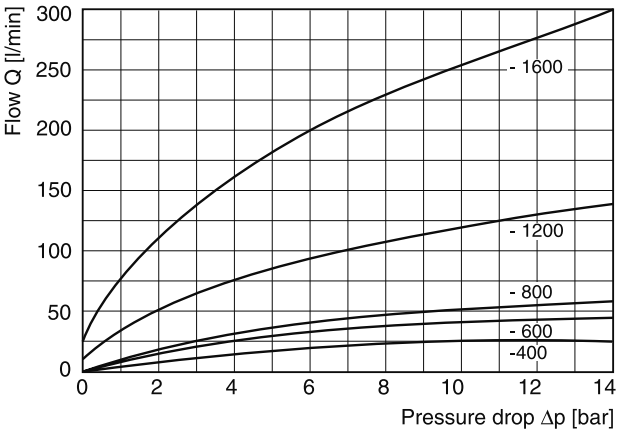
* only for sizes 400 to 600

Code	Seal
omit	**NBR**
V	FPM

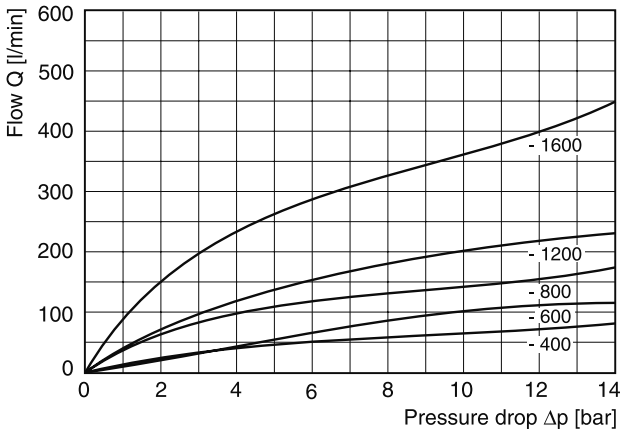
Code	Clamping screw
omit	**Hexagon socket**
F	With knurled knob

Bold letters =
Short-term availability

Δp/Q performance curves



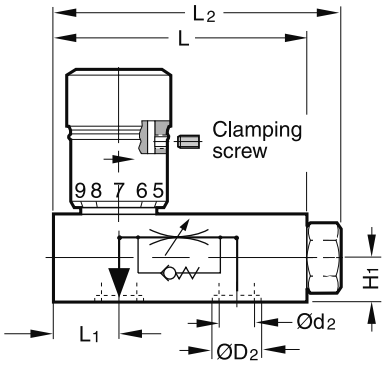
Δp/Q performance curves free flow

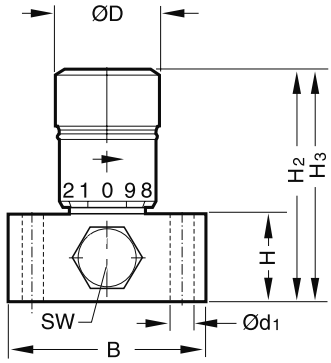


All characteristic curves measured with HLP46 at 50°C.

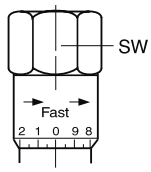
5

Dimensions

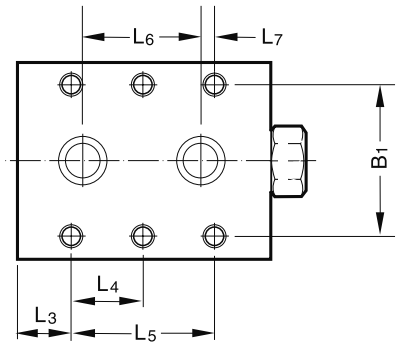


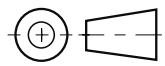


H_2 = closed
H_3 = open



Hex head adjusting knob Standard for Size 1600

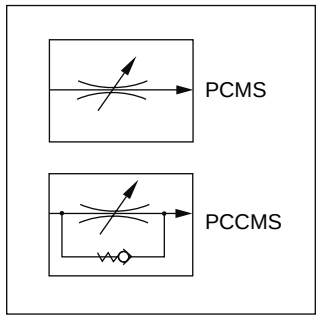


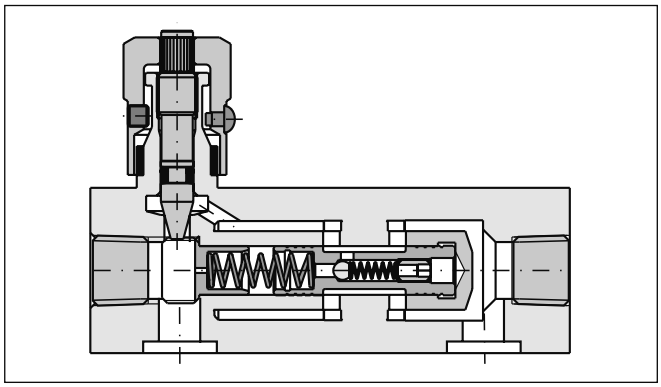


Size	L2	L5	L4	L3	L7	L6	ØD2	Ød2	B1	B	H3	H2	H	Ød1	H1	ØD	SW	W1	L1	L
400	71	34.8	–	14.2	4.8	25.5	13.3	7	33.5	44.5	56.5	51	22	6.8	11	21	–	17.5	21.5	63
600	78	33.5	–	18	4.0	25.5	16	10	38.1	51	67.5	61	25.5	7	12.2	25	–	22.2	25.5	70
800	89	38.1	–	21.3	4.0	30	19.1	13	44.5	57.5	84	76	32	7	16	30	–	25.5	24.5	81
1200	114	76.2	38.1	13.7	11.4	54.1	24	14	54	70	111	96	45	9	22.5	35	–	31.8	38.5	104
1600	138	95.2	47.7	15.8	19	57.2	32	22	60.2	76.5	146.5	130	51	9	25.5	–	47.8	38.1	44.5	127

Manatrol 2 way flow control valves for pressure compensated regulation of the flow. As a consequence of pressure changes, the set value can vary by ± 5% within the tolerance range. Changes in viscosity and in temperature have the same effect and are to be observed.

The series PCCMS is addionally equipped with a built-in ckeck valve for the return flow.





5

Characteristic values

Size	Max. press. [bar]	Flow control		Check valve		Weight [kg]
		Q* [l/min]	Δp [bar]	Q_{max} [l/min]	Δp [bar]	
400	210	1 - 10	7	20	3	0.77
600	210	2 - 25	7	30	3	1.23
800	210	6 - 60	11	75	8	2.50
1200	210	10 - 100	11	130	8	3.18
1600	210	19 - 190	11	250	10	7.41

* Min. and max. flow rate

Ordering code

PC		M	S		S			
Pressure compens. flow control valvel	Check valve	Manual adjustment	Subplate mounting	Size	Steel body	Clamping screw	Seal	Design series (not required for ordering)

Code	Check valve
omit	**Without check valve**
C	With check valve

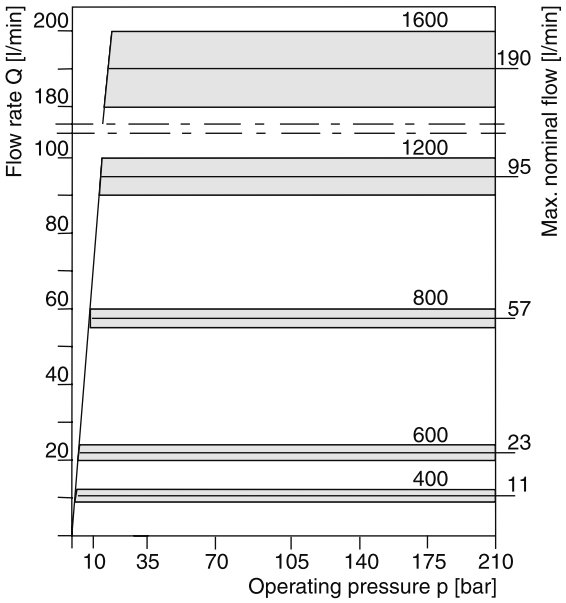
Code	Seal
omit	**NBR**
V	FPM

Code	Clamping screw
omit	**Hexagon socket**
F	With knurled knob

Code	Nominal size
400	400
600	**600**
800	**800**
1200	1200
1600	1600

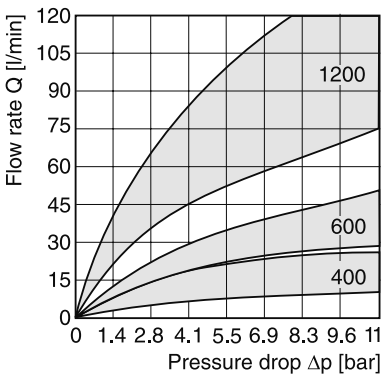
Bold letters =
Short-term availability

Controlled flow vs. pressure drop

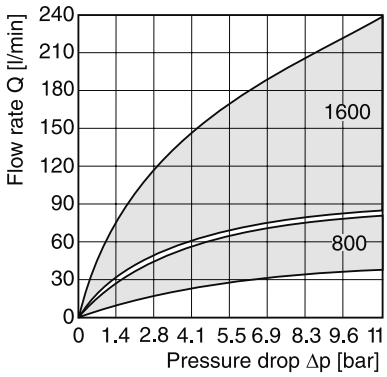


All characteristic curves measured with HLP46 at 50°C.

Reverse flow vs. pressure drop at minimum and maximum settings

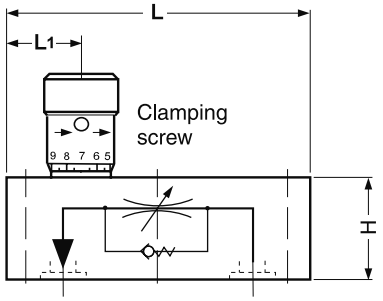


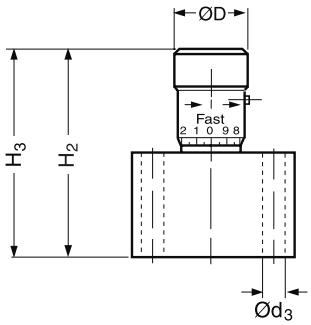
Sizes 400, 600 and 1200



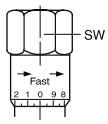
Sizes 800 and 1600

Dimensions

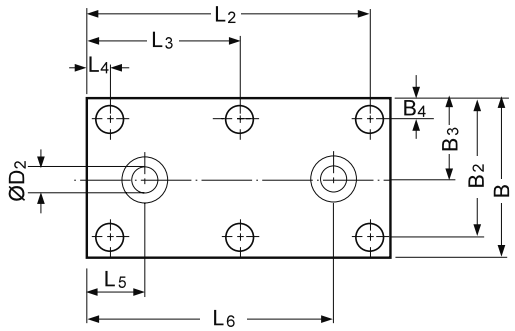


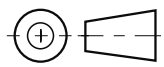


H_2 = closed
H_3 = open



Hexagon adjusting knob, standard for size 1600



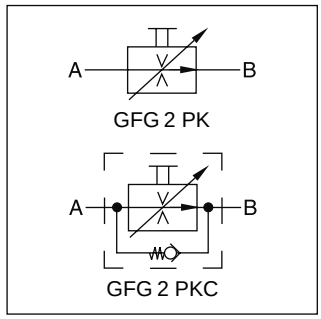


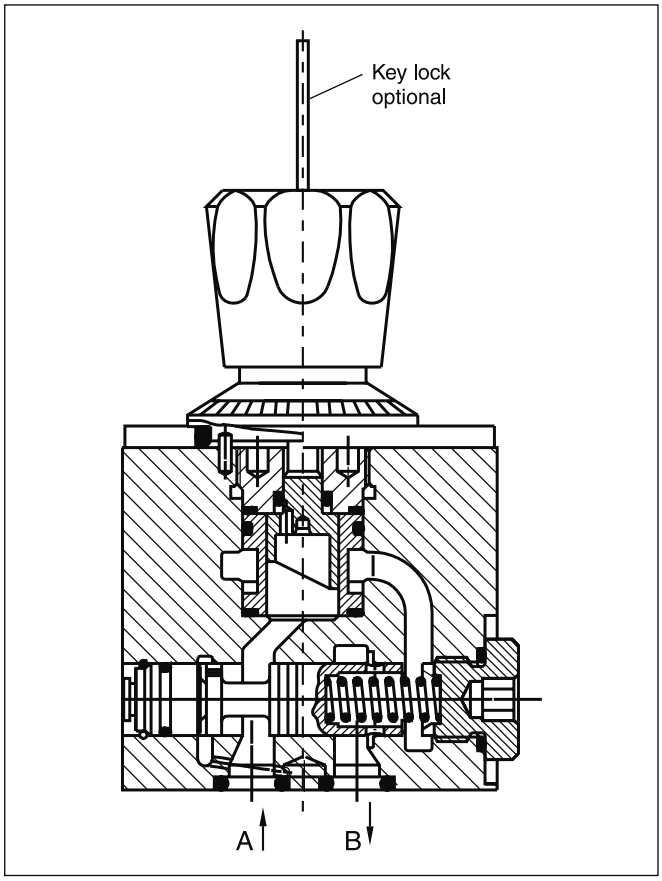
Size	B	B2	B3	B4	L4	L5	L6	L2	L	H	Ød3	H3	H2	ØD2	ØD	L1	L3	SW
400	45	38.9	22.4	5.6	6.4	15.7	69.9	79.2	86	29	6.8	63	58	7.1	21	21	–	–
600	51	44.5	25.4	6.4	6.4	16.8	84.8	95.3	102	32	7	73	68	8.6	25	25	–	–
800	58	50.8	28.4	6.4	6.7	19.1	98.6	111.3	117	45	7	103	95	11.9	30	45	–	–
1200	70	62.0	35.1	7.9	9.7	25.4	117.3	133.4	143	57	9.5	129	116	16.8	35	41	71.4	–
1600	76	68.3	38.1	7.9	12.7	31.7	139.7	158.7	172	70	9.5	175	158	22.3	–	49	85.8	47.8

2 way flow control valves are used to provide pressure compensated flow. The valve design compensates temperature variations to a certain extent.

Optionally the flow from A to B can be blocked by external pilot pressure applied to port P (option X). This can be used to avoid unintended initial movements of actuators.

The GFG is optionally equipped with a built-in check valve for the return flow.





Design

The 2 way flow control valves are fitted with a triangular flow restrictor and a subsequent pressure compensator. The setting of the flow rate can be locked by a key lock in the adjusting knob against unauthorised adjustment (option C).

Function

The fluid enters through port A through the flow restrictor. Downstream of the flow restrictor the pressure compensator is located. The control edges are provided by four radial bores in the poppet, which are fully open to port B in the neutral position.

This can cause a short non-compensated flow when the valve is initialized.

Optionally the compensator spool can be held in closed position by external pilot pressure in port P (option X).

The flow adjustment is done via the flow resistor which is adjusted by the hand knob. The adjusting angle of the hand knob is 270°.

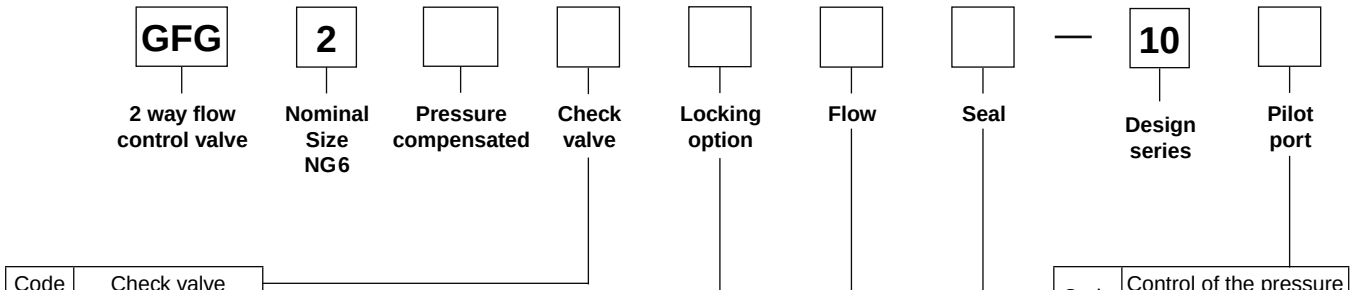
Features

- Flow rate independent of pressure and temperature
- Available for 7 different flow rates
- Good fine adjustment
- Optional reverse flow check valve
- Turn knob with key lock (option C)

Note

Rectifier plate and subplates see 'Accessories' at the end of this chapter.

Ordering code



Code	Check valve
omit	**Without check valve**
C	**With check valve**

Code	Control of the pressure differential valve
omit	**Standard internal**
X*	External

* only in combination with integrated check valve.

Code	Locking option
omit	**Standard without lock**
S	**With 2H (E10) lock**

Code	Seal
omit	**NBR**
V	FPM

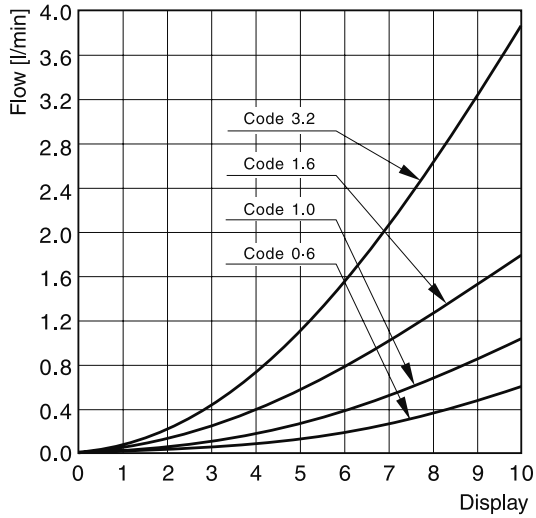
Code	Flow [l/min]
0.6	**0.015 to 0.6**
1.0	**0.015 to 1.0**
1.6	**0.015 to 1.6**
3.2	**0.025 to 3.2**
6.3	**0.025 to 6.3**
12.0	**0.080 to 12.0**
18.0	**0.080 to 18.0**

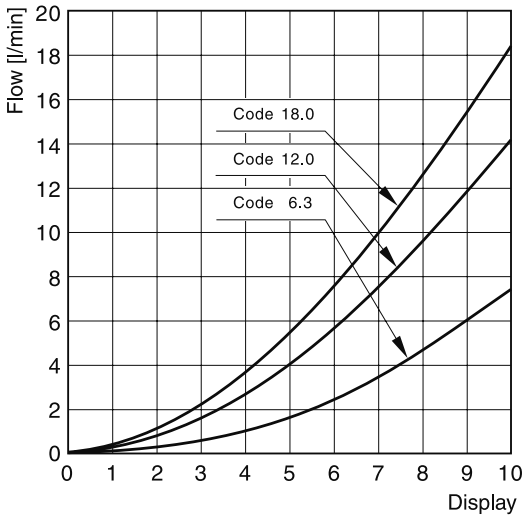
Bold letters =
Short-term availability

Technical data

General		
Design		Orifice, infinitely variable, pressure-compensated
Actuator		Manual flow rate adjustment
Mounting type		ISO 6263 code: ISO 6263-AB-03-4-B
Mounting position		unrestricted
$MTTF_D$ value	[years]	150
Weight	[kg]	1.1 (without subplate)
Fluid		Hydraulic oil according to DIN 51524/525
Fluid temperature	[°C]	Max. 70
Ambient temperature	[°C]	-25...+50
Viscosity range	[cSt] / [mm²/s]	2.8...400
Filtering	[µm]	ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)
Min. pressure difference	[bar]	5 (GFG*1.6/3.2), 8.5 (GFG*6.3/12/18)
Operating pressure	[bar]	A; B = 315 , P = 5 (GFG*, GFG*C), A, B, P = 160 (GFG*X)
Effect of pressure on Q_{max} at p = 160 bar	[%]	± 2 (GFG*1.6/3.2/6.3/12), ± 2.5 (GFG*18)
Flow direction A → B B → A		 Flow control function Throttle function or free flow through check valve

Performance curves

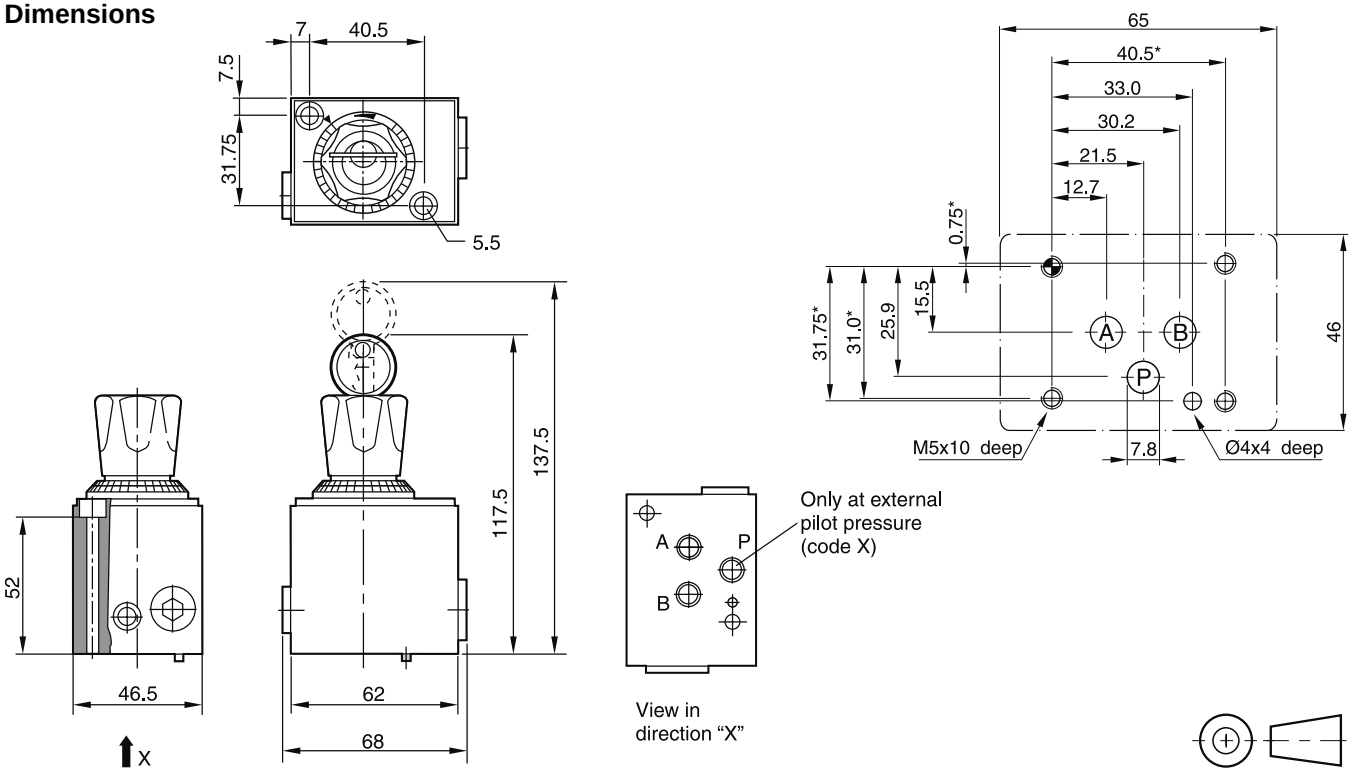




All characteristic curves measured with HLP46 at 50°C.

Changes in pressure cause a change of pre-set flow rate.
Flow rate deviations a Q_{max}: ± 2%

Dimensions



Bolt kits (Cylinder head DIN 912-12.9 not included)

Nominal size Valve	Valve model	Quantity	Tightening torque [Nm]	Valve without rectifier plate		Valve with rectifier plate	
				Dimensions	Order No.	Dimensions	Order No.
NG 6	GFG2	2	8.1Nm	2xM5x60	BK380	2xM5x100	BK466

O-rings for sealing the connecting surface

Nominal size Valve	Valve model	Ports	Dimensions Ø-inner x cord thickness	Quantity	Seal kits	
					NBR	FPM
NG 6	GFG2	A and B	9x1.5	3	SK-GFG2	SK-GFG2 FPM

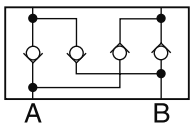
GFG2 UK.INDD CM 07.09.2011

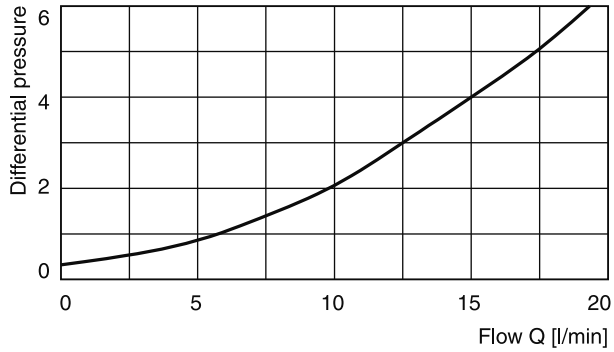
Sandwich rectifier plate

If a 2 way flow control valve is used in combination with a rectifier plate the valve can be used for meter-in and meter-out flow control of an actuator.

Design

The intermediate rectifier plate is designed with 4 identical, symmetrically arranged check valves. Thus the differential pressure is the same in both flow directions.

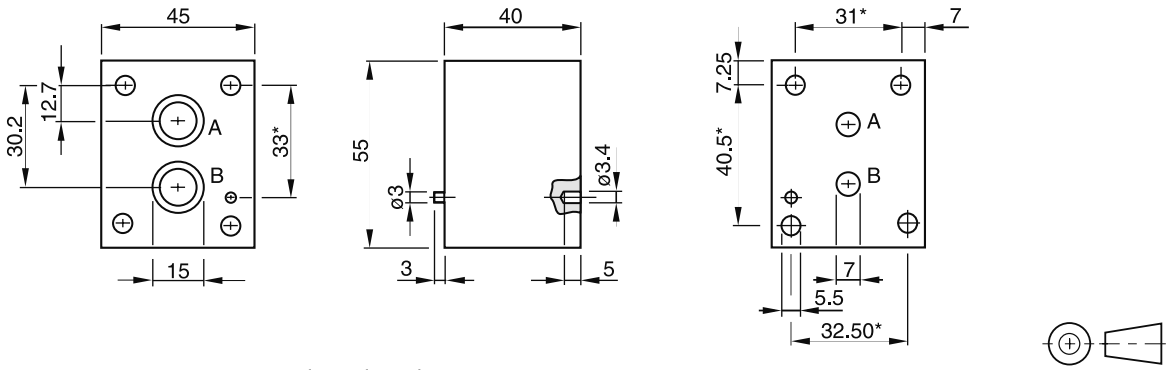




Measured with HLP46 at 50°C.

5

Dimensions



Dimension tolerances
* : ± 0.1mm
others : ± 0.2 mm
holes and silhouette of
valve body : untoleranced dimension

Ordering code: HR OA 06 C

O-ring for sealing the connecting surface

(not included)

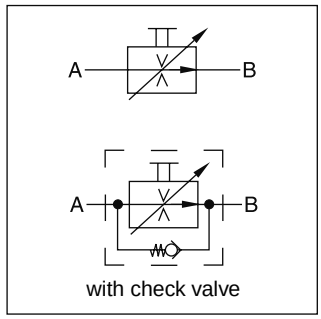
Connections	Dimensions	required units
A, B	12 x 1.5	2

Subplates [1)]

Ordering code	
SPD 22 B 910	P, A, B and T = G1/4
SPD 23 B 910	P, A, B and T = G1/8

[1)] Details see chapter 12, series SPD

2 way flow control valves series 2F1C provide pressure and viscosity compensated flow from port A to port B. The counter direction is blocked (standard) or can be open via an integral reverse flow check valve (optional).



Function

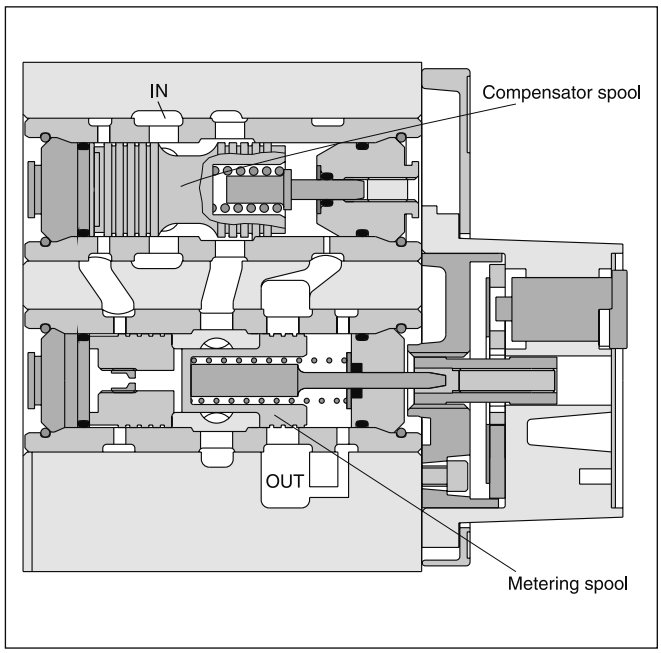
The compensator spool is located in front of the metering spool. The metering spool is closed in the neutral position to avoid undesired initial actuator motion. The oil flow to open the metering spool has to pass a needle valve (not shown in the sectional drawing). The needle valve can be adjusted from the front panel to set the response time of the 2F1C.

The metering spool is adjusted by the main control knob. The key lock has three positions:

Lock: Adjustment is locked.

Adjust: Full adjustment is permitted.

Trim: Fine adjustment of +/- 5% is possible.



Features

- 2 way flow control valve
- Subplate mounting according to ISO 6263
- Excellent fine adjustment
- Adjustable response time
- Closed in neutral position
- Optional reverse flow check valve
- 2 sizes, NG10 (3/8“), NG16 (3/4“)

Ordering code

2F1C	☐	—	01	B	5	☐	☐
2 way flow control valve	Size		Adjustment knob with lock	Design series	Seal FPM	Reverse flow check	Options

Code	Size
02	NG10 (3/8”)
03	NG16 (3/4”)

Code	Check valve
0	without check
C	with check

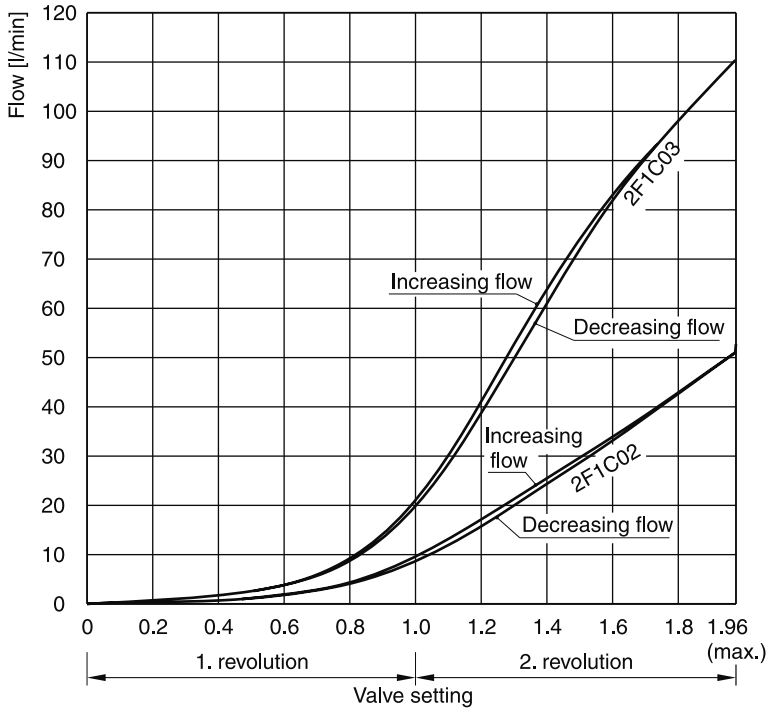
Technical data

General			
Design		Orifice, infinitely variable, pressure-compensated	
Actuator		Manual flow rate adjustment	
Mounting type		ISO 6263	
$MTTF_D$ value	[years]	150	
Mounting position		unrestricted	
Weight	[kg]	6.0 (2F1C02), 9.0 (2F1C03)	
Fluid		Hydraulic oil according to DIN 51524/525	
Fluid temperature	[°C]	Max. 70	
Ambient temperature	[°C]	-25...+50	
Viscosity range	[cSt] / [mm²/s]	2.8...400	
Filtering		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)	
Min. pressure difference	[bar]	see diagram	
Max. operating pressure		2F1C02	2F1C03
	Port A [bar]	14...280	14...350
	Port B [bar]	0...270	0...340
Flow direction A → B B → A		Flow control function blocked or free flow through check valve	

5

Performance curves

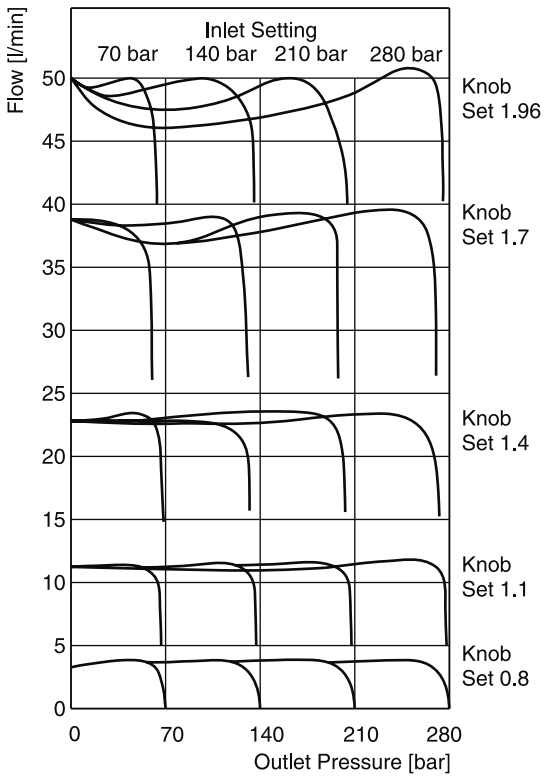
Flow / knob adjustment characteristics at 210 bar



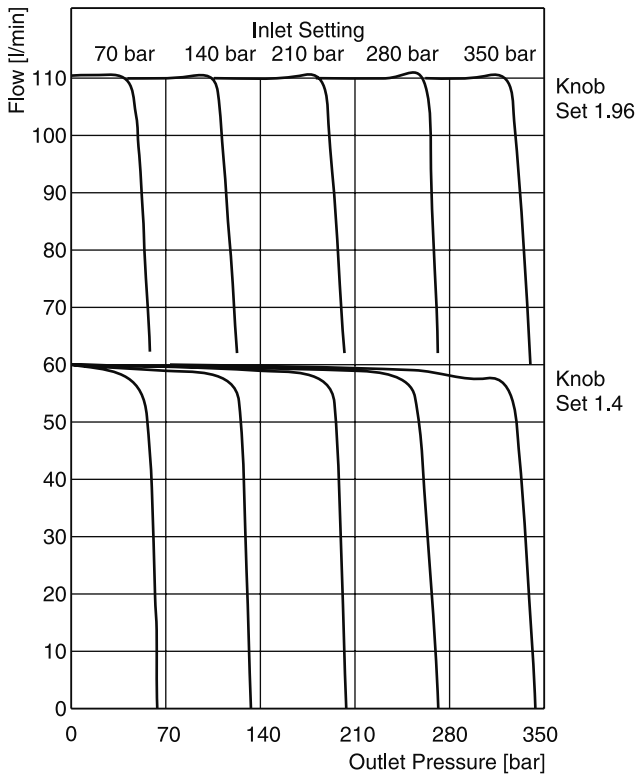
Flow / pressure drop curves

Constant inlet pressure – variable outlet pressure

2F1C02



2F1C03



All characteristic curves measured with HLP46 at 50°C.

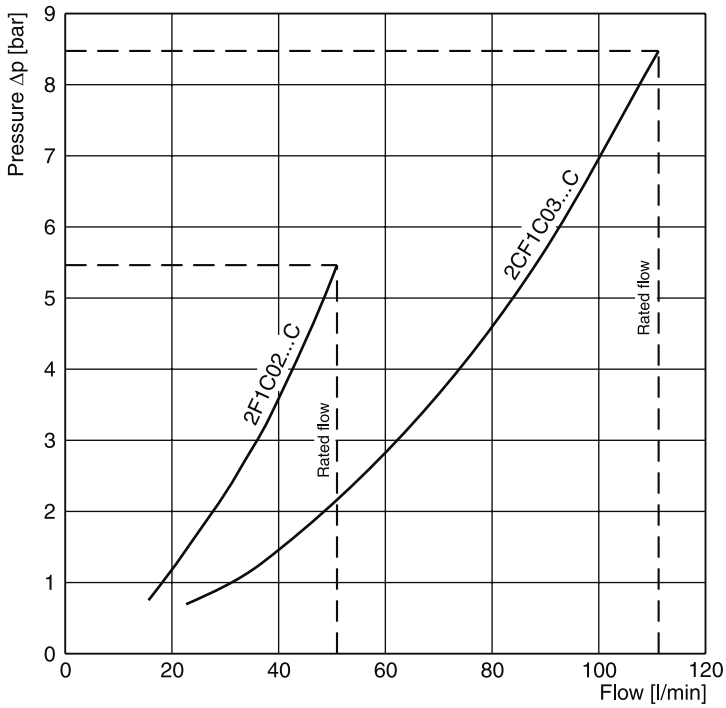
5

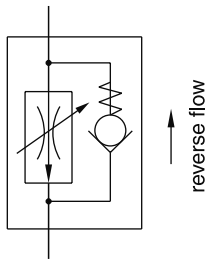
Δp/Q performance curves

for reverse flow direction

2F1C02 at 280 bar

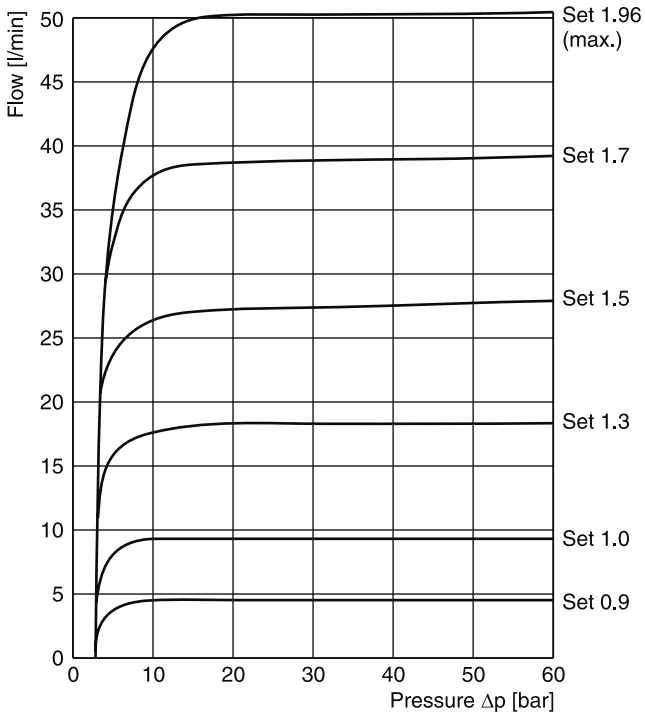
2F1C03 at 350 bar



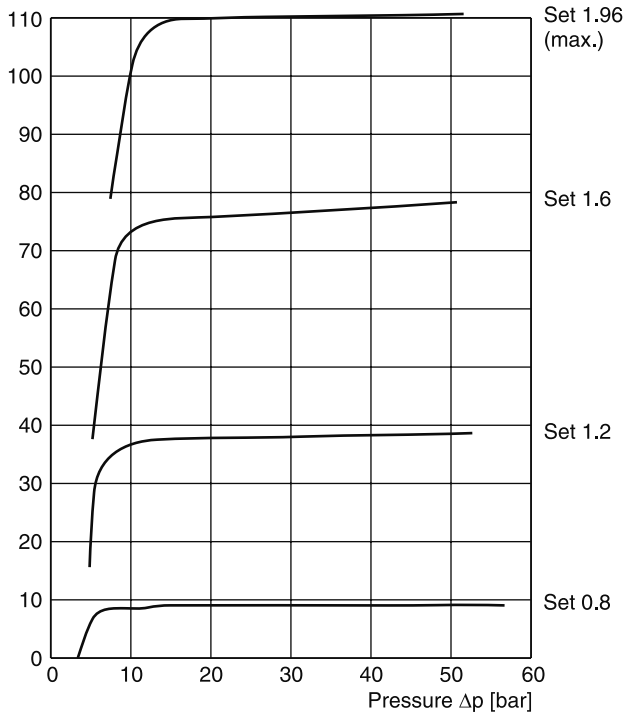


Minimum pressure difference curves

2F1C02

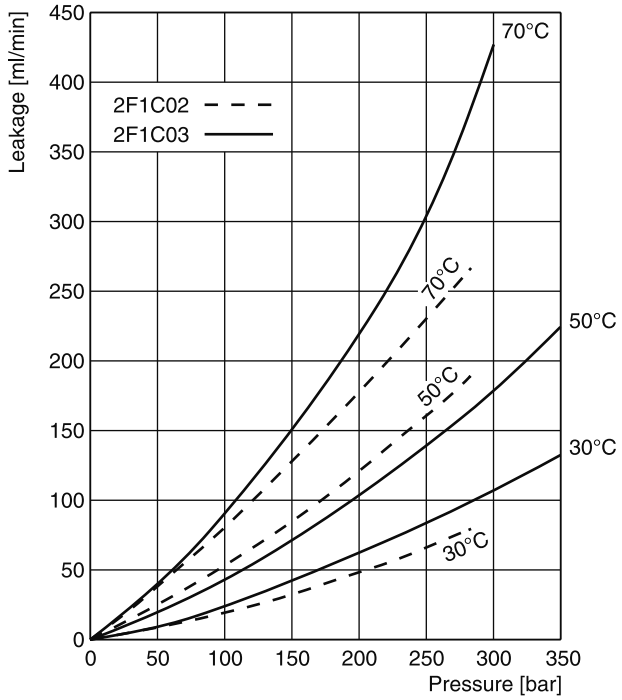


2F1C03



All characteristic curves measured with HLP46 at 50°C.

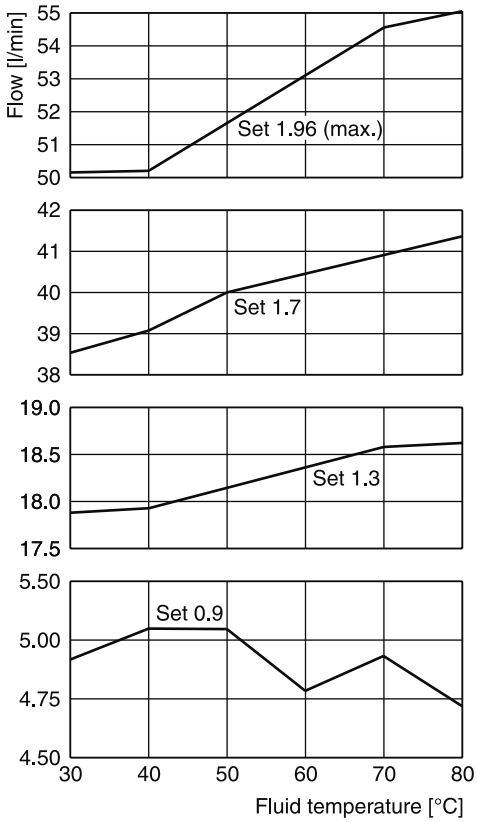
Leakage / pressure curves



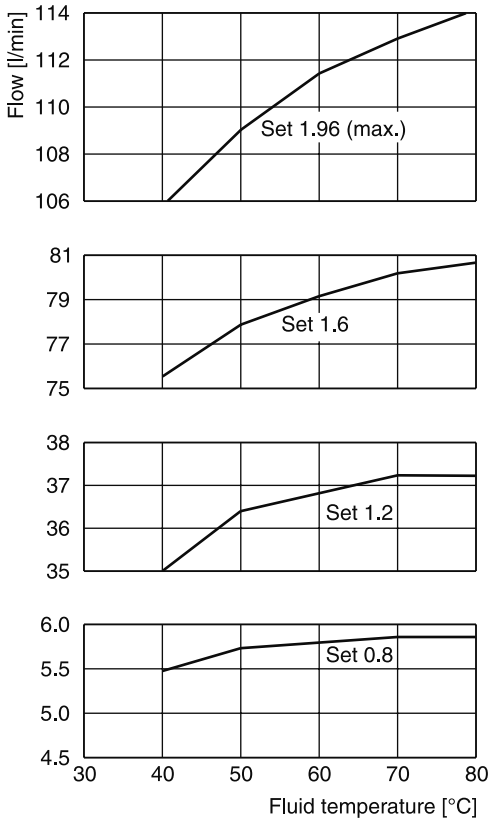
Flow / temperature curves

at 210 bar

2F1C02

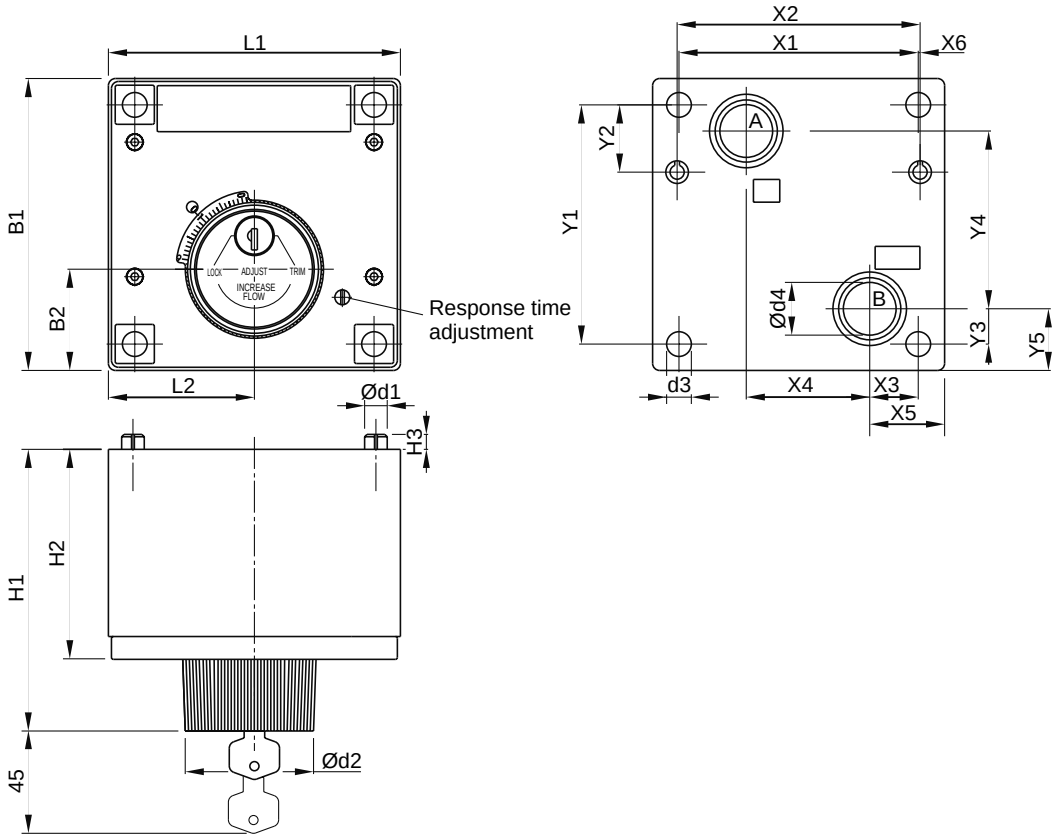


2F1C03



All characteristic curves measured with HLP46 at 50°C.

2F1C UK.INDD CM 07.09.2011



5

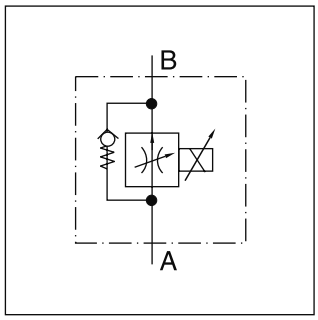
Size	ISO-code	x1	x2	x3	x4	x5	x6	y1	y2	y3	y4	y5
02	6263-AM-07-2-A	76.2	79.4	9.5	44.5	19	–	82.5	23.8	30.2	41.3	39.7
03	6263-AK-06-2-A	101.6	103.2	20.6	52.4	31.8	0.8	101.6	28.6	15.1	75.4	26.2

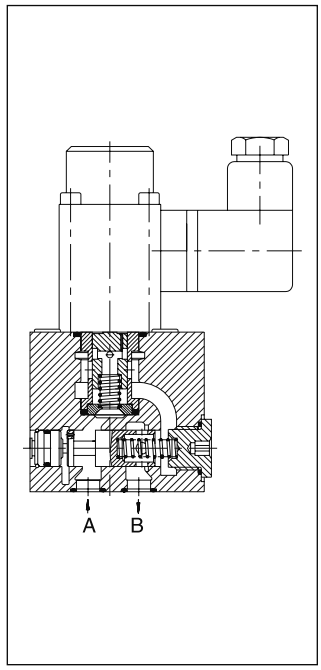
Size	ISO-code	B1	B2	H1	H2	H3	L1	L2	d1	d2	d3	d4
02	6263-AM-07-2-A	101.6	38.1	119.6	87.4	6.4	95.2	47.6	6.4	57.2	8.7	14.2
03	6263-AK-06-2-A	124	42.9	121.4	89.2	6.4	124	62	9.5	57.2	10.5	22.4

NG	ISO-code	Bolt kit - DIN912 12.9		Kit	Surface finish
02	6263-AM-07-2-A	BK-700-70842-8 4xM8x100	31.8 Nm ±15%	on request	R_{max}6.3 ⏥ 0.01/100
03	6263-AK-06-2-A	BK395 4xM10x100	63 Nm ±15%		

Proportional flow control valves of the series DUR*L06 are used to generate pressure-compensated flow from A to B. The valve is equipped with a built-in check valve for the return flow.

For meter-in and meter-out control of an actuator a rectifier plate can be used.





Function

When solenoid current is applied, the metering spool opens against the reset spring and the flow is regulated by the pressure compensating spool to port B.

With the aid of the pressure compensating spool, the pressure drop is held constant on the metering window. Thus pressure load changes are compensated, and the oil flow remains constant.

In combination with the digital electronic module PC-D00A-400 the valve parameters can be saved changed and duplicated.

Technical features

- Low hysteresis
- High reproducibility
- Load-independent oil flow
- Bypass check valve
- Mounting pattern to ISO 6263
- 5 flow rates

Note

Rectifier plate and subplates see ‘Accessories’ at the end of this chapter.

Ordering code

DUR		L	06	P	K		
2 way flow control valve with bypass check valvel	Nominal flow	Linear solenoid 24V/0.68A	Size NG06	Progressive performance curve		Seal	Design series (not required for ordering)

Code	Flow [l/min]
1,6	1.6
3,2	3.2
6,3	6.3
12	12.0
18	18.0

Code	Seal
A	NBR
1	FPM

Seal kits

NBR	FPM
SK-DUR***L	SK-DUR***L FPM

Technical data

General		
Design		Electrically adjustable orifice valve with load sensing
Mounting type		Subplate NG06, Interface DIN 24340, ISO, CETOP
Mounting position		unrestricted, preferably horizontal
Ambient temperature	[°C]	-20°C...+50
$MTTF_D$ value	[years]	150
Weight	[kg]	1.6
Type of voltage	[V]	24
Solenoid nominal current	[mA]	680
Duty cycle		100% ED
Solenoid connection		Connector as per EN 175301-803
Protection class		IP 65 in accordance with EH60529 (with correctly mounted plug-in connenctor)
Amplifier module		PCD00A-400
Operating pressure	[bar]	Max. 210
Fluid		Hydraulic oil according to DIN 51524/525
Fluid temperature	[°C]	+20 up to max. +70
Viscosity range	[cSt] / [mm²/s]	12...230
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)
Min. pressure difference	[bar]	DUR 1.6/3.2: 3; DUR 6.3/12: 5; DUR 18: 8
Hysteresis at Q_{nom}	[%]	6
Hysteresis at $Q \leq 20\% \bullet Q_{nom}$	[%]	6
Repeatability at ΔU_{set} = 5V	[%]	2

5

Performance curves

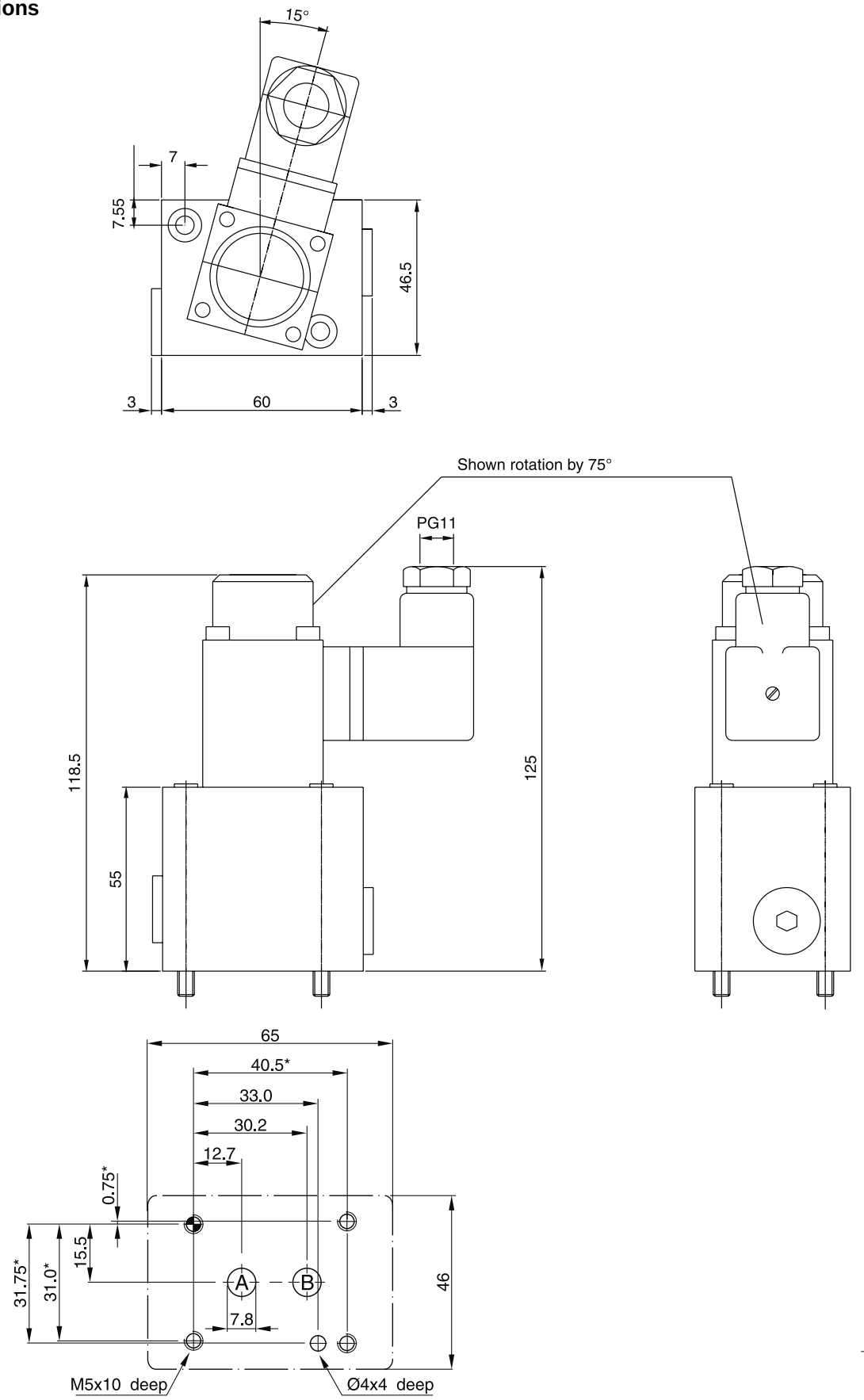
DUR 1.6 L 06 PK*

DUR 12 L 06 PK* / DUR 18 L 06 PK*

DUR 3.2 L 06 PK* / DUR 6.3 L 06 PK*

All characteristic curves measured with HLP46 at 50°C.

Dimensions



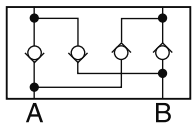
DUR_L06 UK.INDD CM 07.09.2011

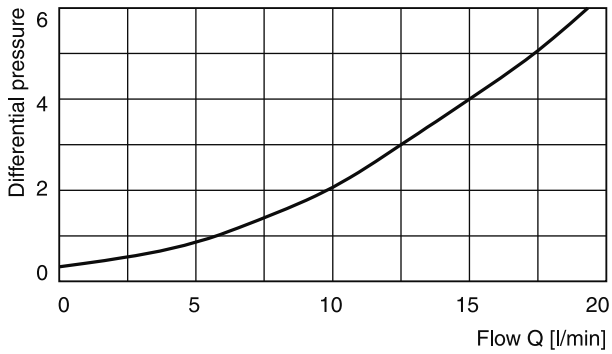
Sandwich rectifier plate

If a 2 way flow control valve is used in combination with a rectifier plate the valve can be used for meter-in and meter-out flow control of an actuator.

Design

The intermediate rectifier plate is designed with 4 identical, symmetrically arranged check valves. Thus the differential pressure is the same in both flow directions.

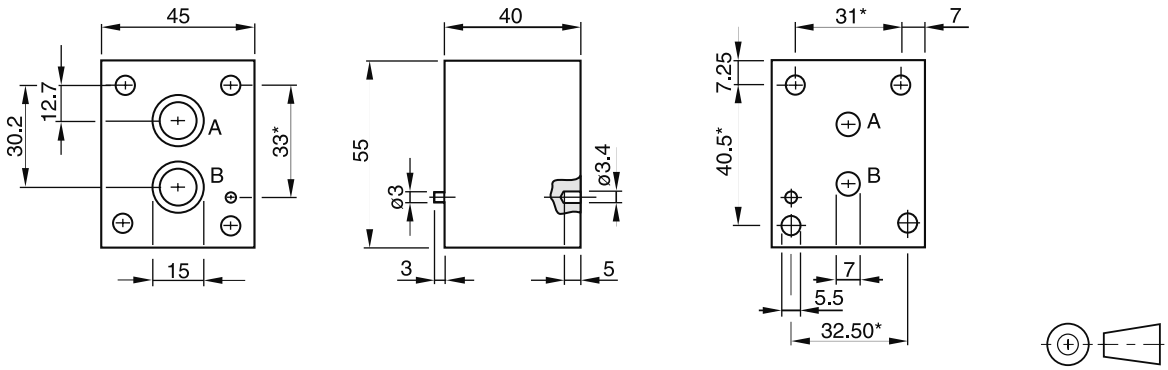




Measured with HLP46 at 50°C.

5

Dimensions



Dimension tolerances
* : ± 0.1mm
others : ± 0.2 mm
holes and silhouette of
valve body : untoleranced dimension

Ordering code: HR OA 06 C

O-ring for sealing the connecting surface
(not included)

Connections	Dimensions	required units
A, B	12 x 1.5	2

Subplates [1)]

Ordering code	
SPD 22 B 910	P, A, B and T = G1/4
SPD 23 B 910	P, A, B and T = G1/8

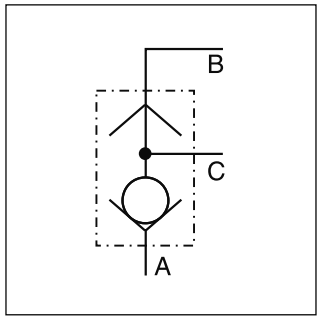
[1)] Details see chapter 12, series SPD

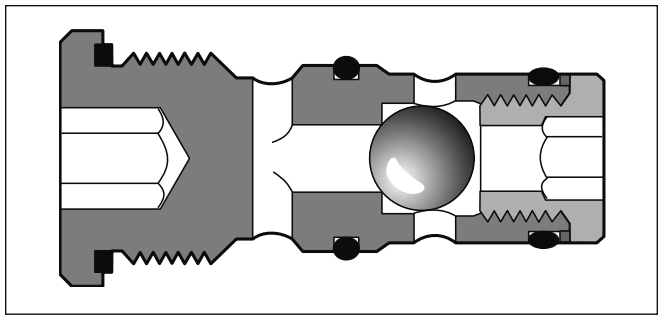
Series	Description	Size											Mounting			Page
	Parker Standard DIN / ISO	1/8	1/4	3/8	1/2	3/4	1	06	10	16	25	32	Subplate	Screw-in	Slip-in	
	Shuttle valves															
SSR								•	•					•		6-3
	Check valves, direct operated															
RK / RB		•	•	•	•									•		6-5
CS			•	•	•	•	•						•			6-9
SPZBE										•	•	•			•	6-11
SPV / SPZ								•	•					•		6-13
C4V									•		•	•	•			6-15
	Check valves, pilot operated															
CPS				•									•			6-19
C4V									•		•	•	•			6-21
	2/2 way seat valves															
D4S									•		•	•	•			6-25
	Accessories															
	Plugs															6-35

More check valves are presented in the following chapters:
Chapter 7: Sandwich Valves
Chapter 8: Slip-In Cartridge Valves
Chapter 9: SAE Flange Valves
Chapter 10: Valves for Pipe Mounting

Notes

The shuttle valve series SSR is designed as a threaded cartridge valve. All parts are assembled in one unit and easy to mount.





Features

- Little space required
- Leak-free
- Easy assembly

Ordering code

☐	–	SSR	B	080	E	☐
Seal		Shuttle valve	Design series	Factory norm, direct operated	Threaded cartridge	Valve size

Code	Seal
omit	**NBR**
V	FPM

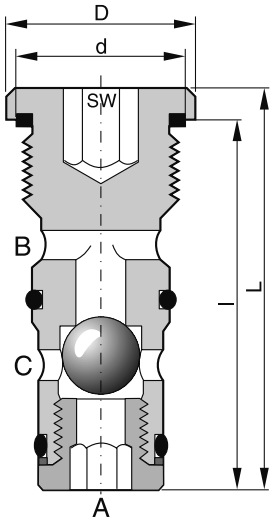
Code	Size
06	**NG06**
10	**NG10**

Bold letters =
Short-term availability

Technical data

General				
Design			Threaded cartridge valve	
Mounting position			Unrestricted	
Ambient temperature		[°C]	-40 ... +60	
Nominal size			NG06	NG10
Weight		[kg]	0.5	0.8
Hydraulic				
Flow direction			See symbols	
Fluid			Hydraulic oil as per DIN 51 524 ... 525	
Viscosity	recommended	[cSt] / [mm²/s]	30 ... 80	
	permitted	[cSt] / [mm²/s]	20 ... 380	
Fluid temperature		[°C]	-20 ... +60	
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	
Nominal pressure		[bar]	350	
Flow		[l/min]	40	60

SSR UK.INDD CM 16.11.07



Dimensions	NG06	NG10
D	24	34
L	50	74
d	M18x1.5	M24x1.5
l	45	66
SW	8	12
Tightening torque [1] [Nm] ± 15%	40	65

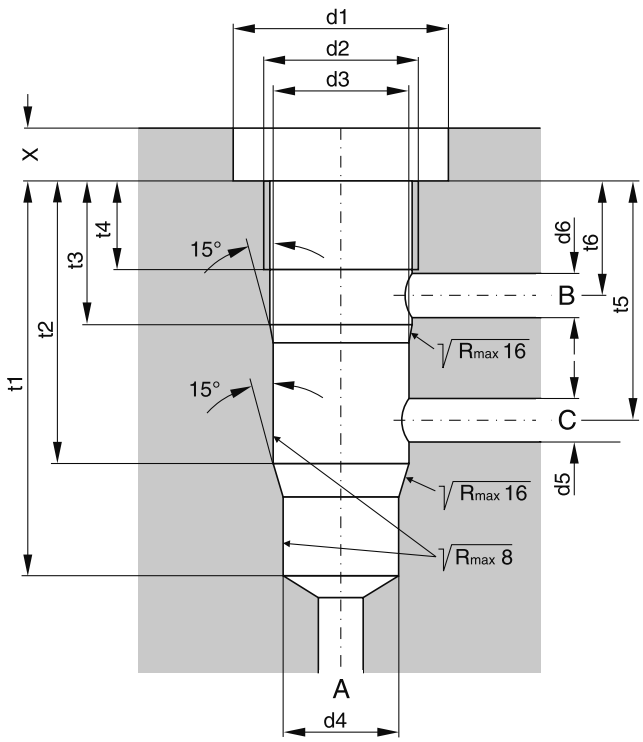
[1] Please note the material specification for tightening torque in chapter 12, "accessories"

6

Seal kits

NG	NBR seals	FPM seals
06	SK-SSRB0E06	SK-SSRB0E06V
10	SK-SSRB0E10	SK-SSRB0E10V

Mounting cavity



Dimensions	NG06	NG10
d1	25	35
d2	M18 x 1.5	M24 x 1.5
$d3^{H7}$	16	22
$d4^{H7}$	14	20
$d5_{max.}$	6	9
$d6_{max.}$	6	9
t1	45	68
t2	32	51
t3	16	20
t4	10	15
t5	27.5	40
t6	12	13.5

The check valves are designed to go into simple, threaded cavities. The connection is O-ring sealed on the 118° shoulder in the mounting cavity.

Type RK

Type RB

Ordering code

R		
Check valve, screwable	**Mounting direction**	**Size**

Code	Mounting direction
K	**in the blocked direction**
B	**in open flow direction**

Code	Flow [l/min]	Thread
0*	**10**	**G1/8A**
1	**20**	**G1/4A**
2	**50**	**G3/8A**
3	**80**	**G1/2A**

* only series RK available

Bold letters =
Short-term availability

Technical data

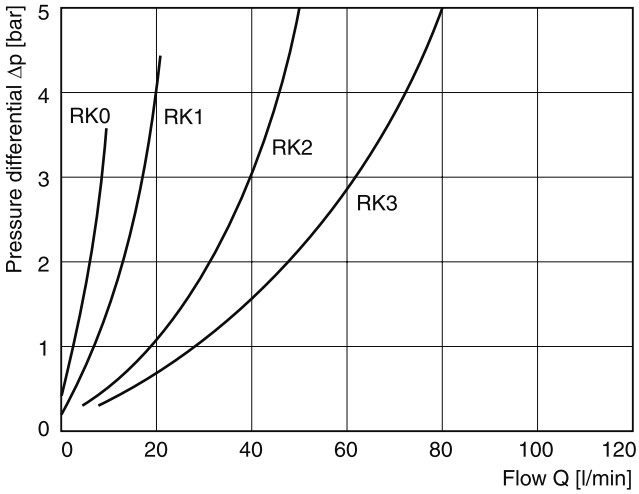
Series design with pipe thread

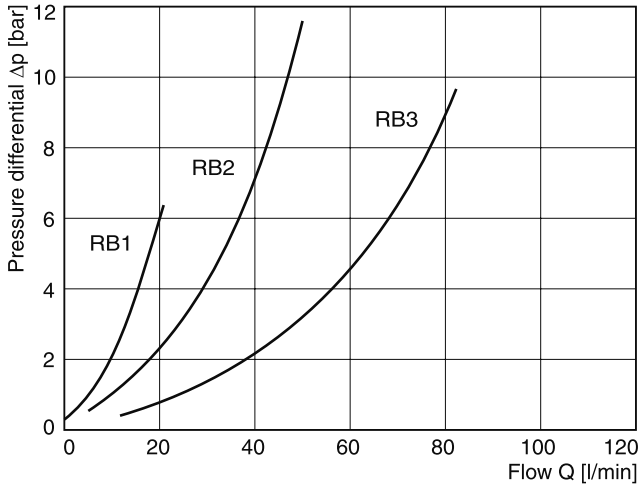
Code		RK0	RK1	RK2	RK3	RB1	RB2	RB3
Flow	[l/min]	10	20	50	80	20	50	80
Operating pressure	[bar]	700	700	700	500	700	700	500
Opening pressure	[bar]	0.15	0.18	0.2	0.25	0.15	0.07	0.17
Thread (DIN ISO 228/1)		G1/8A	G1/4A	G3/8A	G1/2A	G1/4A	G3/8A	G1/2A
Tightening torque* ±20%	[Nm]	10	15	20	40	15	20	40
Weigh	[g]	5	5	15	15	5	15	20
Mounting position		unrestricted						
Fluid		Hydraulic oil in accordance with DIN 51524/51525						
Viscosity permitted	[cSt]/[mm²/s]	4...1500 ; opt. 10...500 viscosity recommended						
Temperatures	[°C]	Ambient and oil -40...+80, observe viscosity range.						

* In case of strong vibration, it is recommended to secure the mounting threads.

Δp/Q perfomance curves

Oil viscosity during measurement 50mm²/s



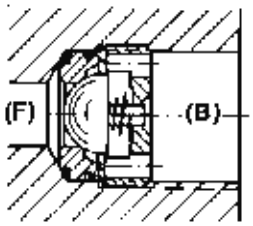


All characteristic curves measured with HLP46 at 50°C.

6

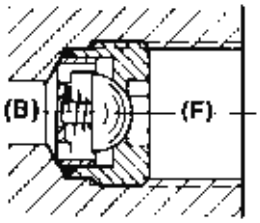
Mounting direction

Type RK



Screwed in,
in the blocked direction

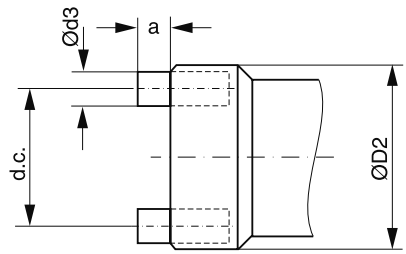
Type RB



Screwed in,
in the open flow direction

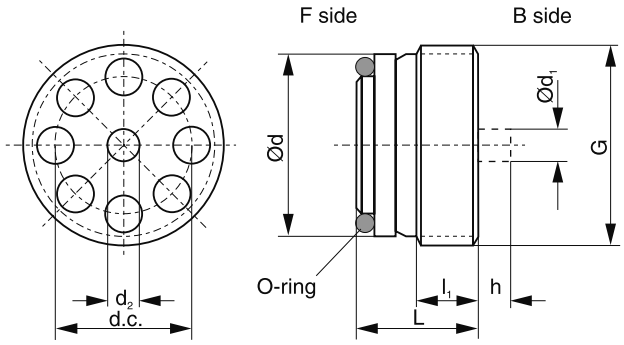
Mounting tool

Type RK



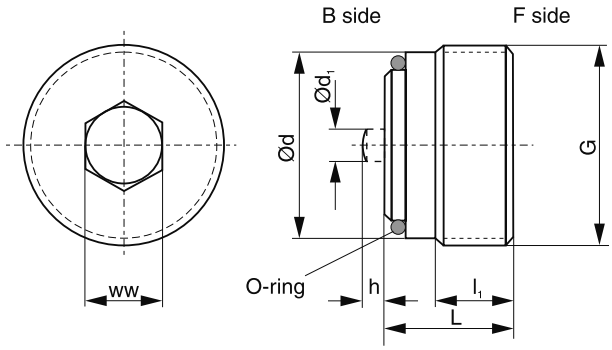
Type	D_2	a	d_3
RK0	8.6	2	1.5
RK1	11.5	2.5	2
RK2	15	2	2.5
RK3	18.8	4	3.5

Type RK



Type	Thread	L	l_1	d	d_1	d_2	h	d.c.	O-ring
RK0	G1/8A	7.2	4	8.6	1.8	1.6	1.3	6.8	6x1
RK1	G1/4A	9	4.5	11.5	2.4	2.2	1.5	$8.8_{-0.1}$	9x1
RK2	G3/8A	11	6	15	3.2	3	2.5	11	11x1.5
RK3	G1/2A	13	7.5	18.5	4	3.8	3	$14.2_{-0.1}$	14x1.5

Type RB

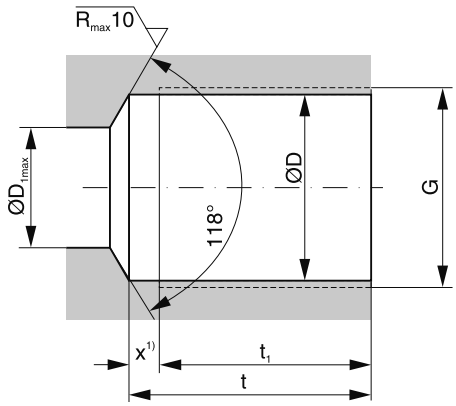


Type	Thread	L	l_1	d	d_1	h	ww	O-ring
RB1	G1/4A	9.8	5	11.6	2	1.3	5	9x1
RB2	G3/8A	11.5	7.0	15	2.8	2	6	11x1.5
RB3	G1/2A	13.15	7.5	18.5	3.2	2.5	8	14x1.5

6

Mounting cavity

- for connecting in combination with tube fitting

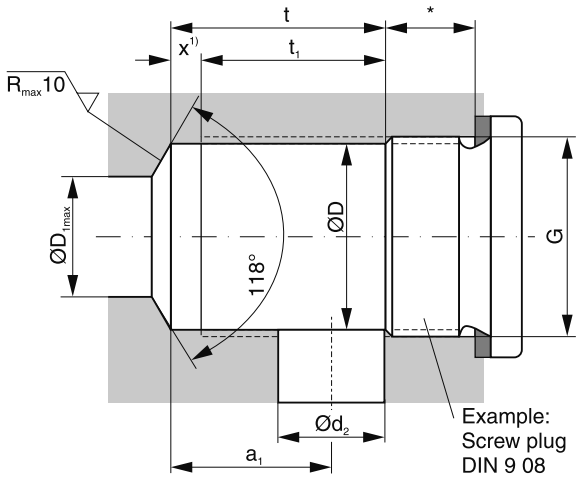


Type	Thread	D	D_1	t	t_1 2)	x 1)
RK0	G1/8	8.7	5	16	13.7	2.3
RK1 and RB1	G1/4	11.8	8	22	19	3
RK2 and RB2	G3/8	15.25	9	24.5	21.5	3
RK3 and RB3	G1/2	19	12	29	25.5	3.5

1) Thread runout x must be maintained. It may be smaller, but not larger (requirement for a perfect seal using the O-ring).

2) Fully cut-out thread

- for internal line channels



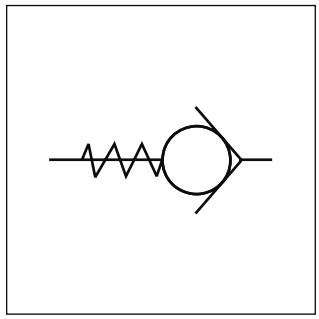
* Required depth depending on type of screw plug, connecting plate, etc. used.

Type	Thread	D	D_1	t	t_1 2)	x 1)	a_1	d_2
RK0	G1/8	8.7	5	12.3	10	2.3	9.5	5
RK1 and RB1	G1/4	11.8	8	14	11	3	11	6
RK2 and RB2	G3/8	15.25	9	17	14	3	13	8
RK3 and RB3	G1/2	19	12	22	18.5	3.5	16	12

Notes

Manatrol check valves of the series CS for subplate mounting provide free flow in one direction and block flow in the counter direction.

Specific Manatrol poppets and poppet guides ensure reliable functional integrity even at high flow rates and/ or pulsations.



Ordering code

CS		S		
Manifold design	**Nominal size**	**Steel body**	**Opening pressure**	**Seal**

Code	Size
400	**400 (1/4)**
600	**600 (3/8)**
800	**800 (1/2)**
1200	**1200 (3/4)**
1600	1600 (1)

Code	Seal
omit	**NBR**
V	FPM

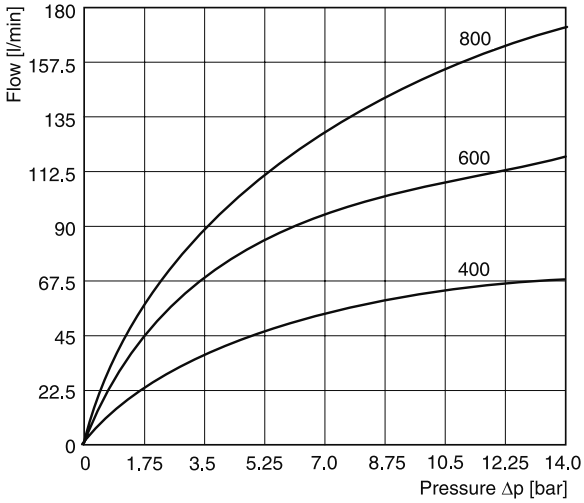
Code	Pressure [bar]
omit	**0.35**
65	4.5

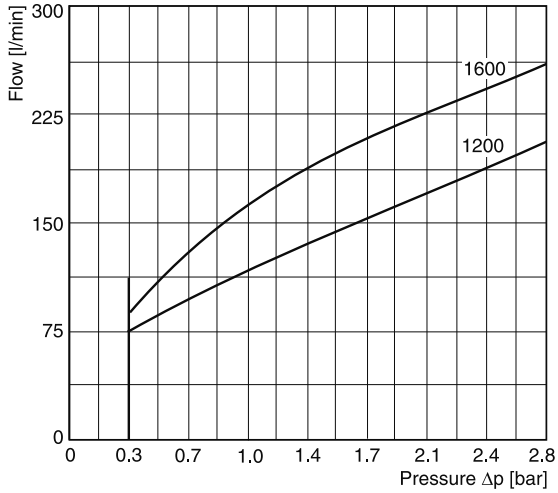
Bold letters =
Short-term availability

Technical data

Size		400	600	800	1200	1600
Operating pressure	[bar]	210	210	210	210	210
Pressure drop Δp	[bar]	10	10	10	1	1
Flow	[l/min]	65	110	155	112	160
$MTTF_D$ value	[years]	150				

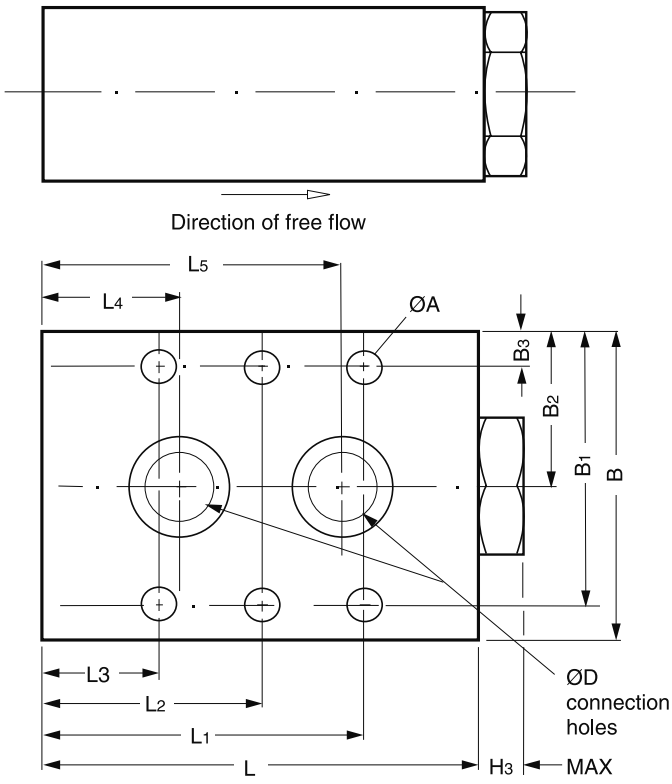
Δp/Q performance curves

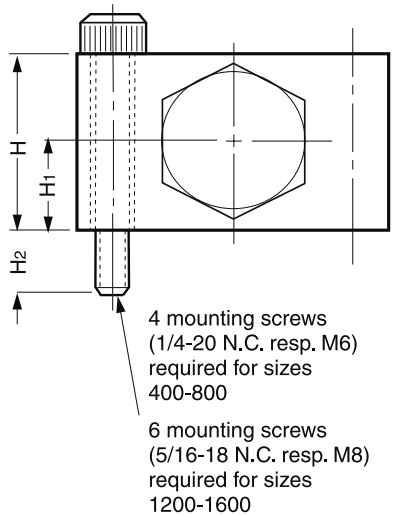


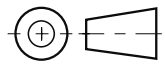


All characteristic curves measured with HLP46 at 50°C.

6



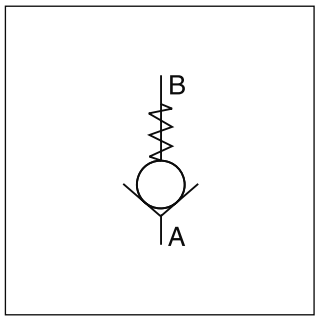


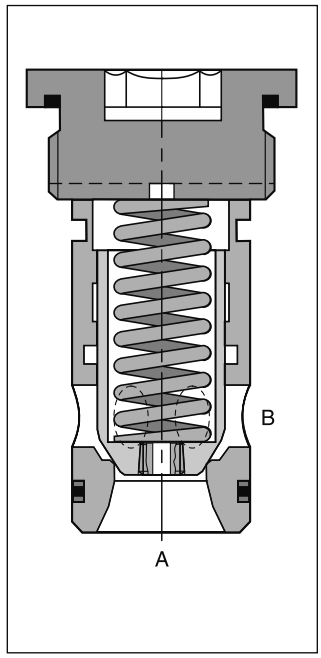


Size	ØD	ØA	L	L1	L2	L3	L4	L5	B3	B2	B1	B	H	H1	H2	H3	Weight [kg]
CS 400S	7.1	6.35	63.5	49.0	–	14.2	19.1	44.5	5.3	22.1	38.9	44.5	22.1	10.9	9.9	7.9	0.5
CS 600S	10.2	6.35	69.9	51.6	–	18.0	22.1	47.5	6.4	25.4	44.5	50.8	25.4	12.7	13.0	8.1	0.7
CS 800S	11.9	6.35	80.7	59.4	–	21.3	25.4	55.6	6.4	28.4	50.8	57.2	31.8	15.7	13.2	8.1	1.0
CS 1200S	17.3	8.5	103.9	89.9	51.8	13.7	25.1	79.2	7.9	34.8	61.7	69.9	44.5	22.1	14.5	10.7	2.3
CS 1600S	22.1	8.5	127.0	111.0	63.5	15.7	34.8	91.9	7.9	38.1	68.1	76.2	50.8	25.4	14.5	10.7	3.5

The check valves series SPZBE are slip-in cartridge valves. The function unit is fixed inside the manifold by a hexagonal plug with slot.

The design is based on CE series with same poppet and sleeve. The different mounting cavity has to be considered.





Features

- Little space required
- Leak-free from port B to A
- 4 different opening pressures

Ordering code

☐	– **SP**	**Z**	**BE**	**1010**	**E**	☐	☐
Seal	**Check valve**	**Flow direction A to B**	**Design series, screwed cover**	**Factory norm, poppet, direct operated**	**Slip-in valve**	**Valve size**	**Opening pressure**

Code	Seal
omit	**NBR**
V	FPM

Code	Size
16	**NG16**
25	**NG25**
32	**NG32**

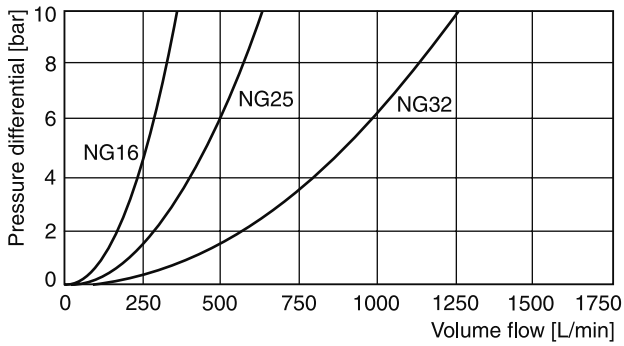
Code	Pressure [bar]
L	0.1
N	**0.5**
S	1.6
U	4.0

Bold letters =
Short-term availability

Technical data

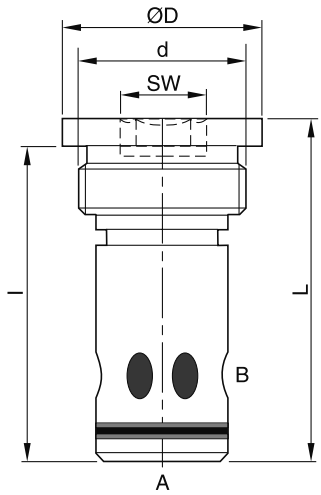
General				
Design		Threaded cartridge valve		
Nominal size		NG16	NG25	NG32
Mounting position		Optional		
Ambient temperature	[°C]	-40 ... +60		
$MTTF_D$ value	[years]	150		
Weight	[kg]	0.25	0.5	1.2
Hydraulic				
Flow direction		Port A to B		
Fluid		Hydraulic oil according to DIN 51524 ...51536		
Viscosity recommended	[cSt] / [mm²/s]	30 ... 80		
permitted	[cSt] / [mm²/s]	20 ... 380		
Fluid temperature	[°C]	-20 ... +60		
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)		
Nominal pressure	[bar]	350		
Opening pressure	[bar]	0.1; 0.5; 1.6 and 4.0		
Flow	[l/min]	250	450	900

Δp/Q performance curves



All characteristic curves measured with HLP46 at 50°C.

Dimensions



Dimensions	NG16	NG25	NG32
D	40	55	72
L	72.5	89	109.5
d	M33x2	G1½"	G2"
l	66	80.5	99.5
SW	17	24	32
Tightening torque [1] [Nm] ± 15%	225	300	550

[1] Please note the material specification for tightening torque in chapter 12, "accessories"

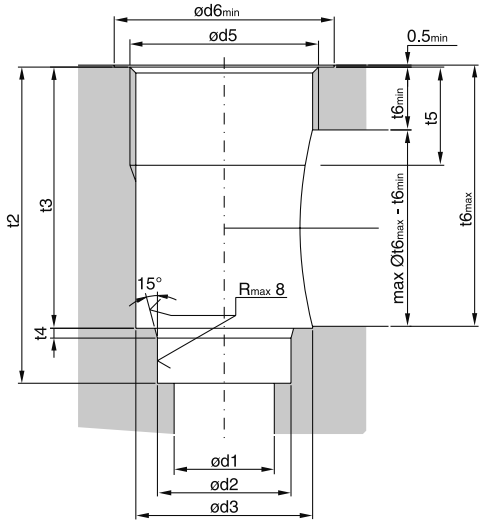
Seal kits

NG	NBR seals	FPM seals
16	SK-SPZBE10E16	SK-SPZBE10E16V
25	SK-SPZBE10E25	SK-SPZBE10E25V
32	SK-SPZBE10E32	SK-SPZBE10E32V

Springs

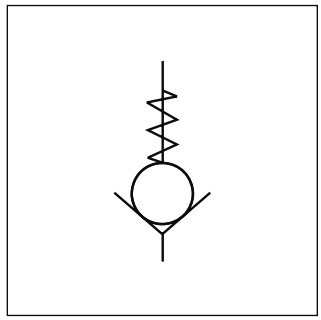
Spring Type	Ordering Number		
	NG16	NG25	NG32
L 0.1 bar	45051368	45051375	45051376
N 0.5 bar	45051369	45051374	45051377
S 1.6 bar	45051370	45051372	45051378
U 4.0 bar	45051371	45051373	45051379

Mounting cavity



Size	NG16	NG25	NG32
d1	18	25.5	36
$d2^{H7}$	25	34	45
d3	31	45	57
d5	M33x2	G1½"	G2"
$d6_{min}$	41	56	73
$t2^{+0.1}$	66	80.5	99.5
t3	53	66.5	84.5
t4	2	2.5	2.5
t5	21	25	30
$t6_{min}$	16	16	24
$t6_{max}$	52.5	66	84
t7	6.5	6.5	10

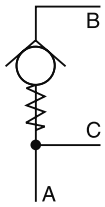
The check valve series SPV and SPZ are designed as a threaded cartridge valve. All parts are assembled in one unit and easy to mount.



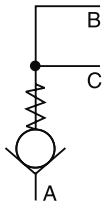
Features

- Little space required
- Leak-free
- Easy assembly

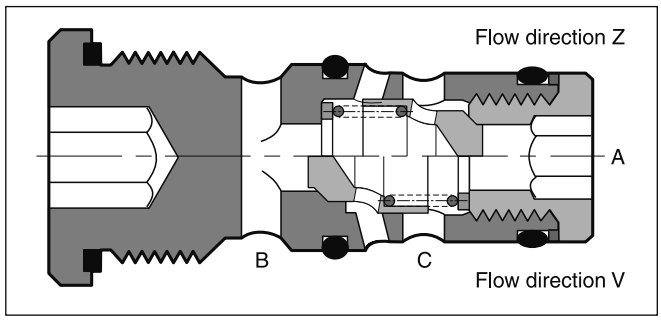
Ports



Flow direction V



Flow direction Z



6

Ordering code

	—	SP		B	030	E		M
Seal		Check valve	Flow direction	Design series	Factory norm, direct operated	Threaded cartridge	Valve size	Spring 0.3 bar

Code	Seal
omit	**NBR**
V	FPM

Code	Size
06	**NG06**
10	**NG10**

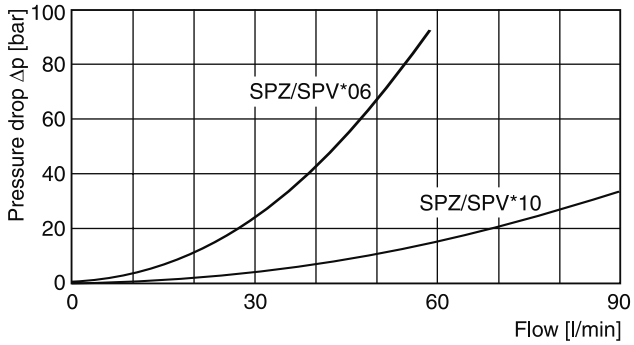
Code	Flow direction
V	**Port B -> A and C**
Z	**Port A -> B and C**

Bold letters =
Short-term availability

Technical data

General				
Design			Threaded cartridge valve	
Nominal size			NG06	NG10
Mounting position			Unrestricted	
Ambient temperature		[°C]	-40 ... +60	
Weight		[kg]	0.5	0.8
Hydraulic				
Flow direction			See symbols	
Fluid			Hydraulic oil according to DIN 51524...51536	
Viscosity	permitted	[cSt] / [mm²/s]	20 ... 380	
	recommended	[cSt] / [mm²/s]	30 ... 80	
Fluid temperature		[°C]	-20 ... +60	
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	
Nominal pressure		[bar]	350	
Opening pressure		[bar]	0.3	
Flow		[l/min]	40	60

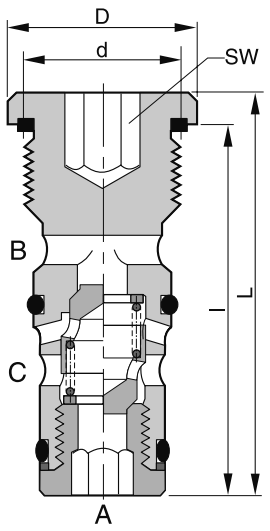
Δp/Q performance curve



Characteristic curve measured with HLP46 at 50°C.

Seal kits

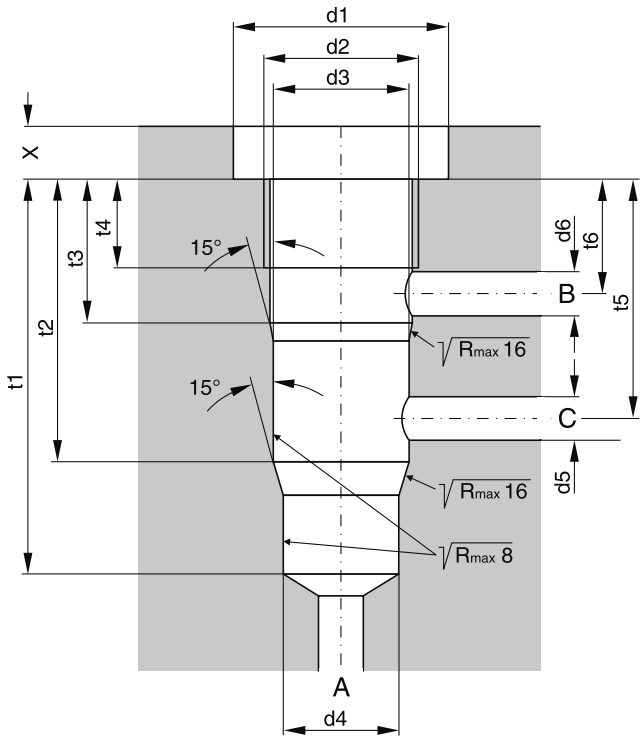
NG	NBR seals	FPM seals
06	SK-SPV/ZB0E06	SK-SPV/ZB0E06V
10	SK-SPV/ZB0E10	SK-SPV/ZB0E10V



Dimensions	NG06	NG10
D	24	34
L	50	74
d	M18x1.5	M24x1.5
l	45	66
SW	8	12
Tightening torque [1] [Nm] ± 15%	40	65

[1] Please note the material specification for tightening torque in chapter 12, "accessories"

Mounting cavity

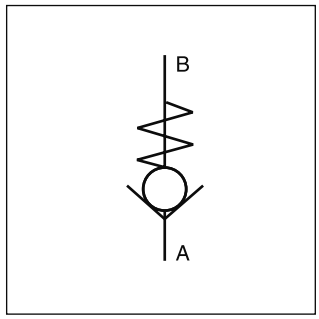


Dimensions	NG06	NG10
d1	25	35
d2	M18 x 1.5	M24 x 1.5
$d3^{H7}$	16	22
$d4^{H7}$	14	20
$d5_{max.}$	6	9
$d6_{max.}$	6	9
t1	45	68
t2	32	51
t3	16	20
t4	10	15
t5	27.5	40
t6	12	13.5

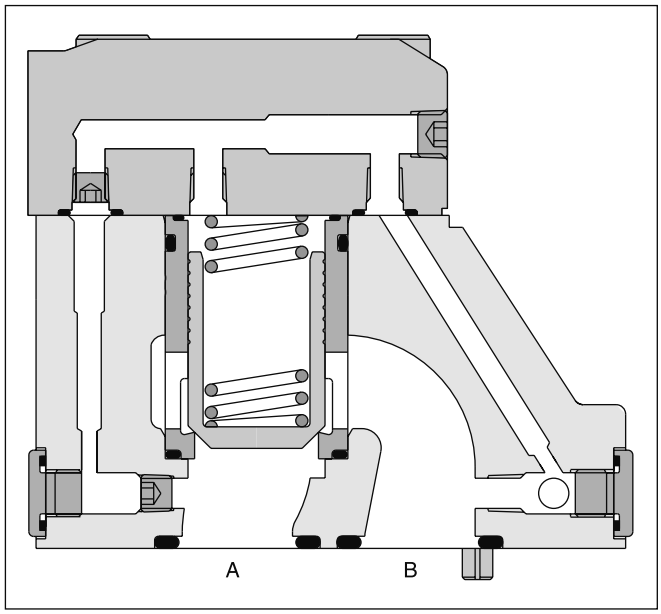
Direct operated check valves C4V allow free flow from A to B. The counter direction is blocked. The C4V series are equipped with a leak-free seat type cartridge.

Function

The pressure arising in port A lifts the poppet from the valve seat and releases the flow to B. In the counter direction, the spring and the pressure on top of the cartridge hold the poppet onto the seat and block the flow.



C4V06



C4V10

Ordering code

C4V	☐	–	5	3	0	☐	B	☐	☐
Check valve direct operated	Nominal size		Max. pressure 350 bar	Subplate mounting		Approx. cracking pressure	Design series	Seal	Options

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Seal
1	NBR
5	FPM

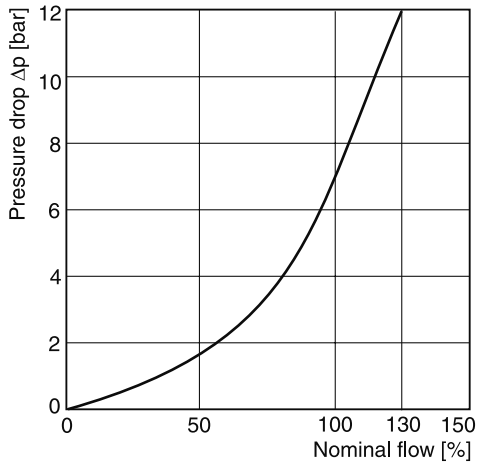
Code	Approx. cracking pressure [bar]	
	C4V03	C4V06/10
1	2.8	3.5
2	0.5	0.5
3	0.3	0.3
4	2.2	2.2
5	—	9.0
6	1.2	1.2
7	3.0	—

Technical data

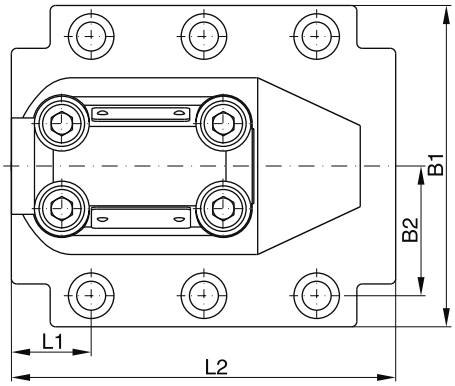
General					
Nominal size			NG10	NG25	NG32
Subplate mounting			ISO 5781		
Mounting position			unrestricted		
Ambient temperature		[°C]	-20...+80		
$MTTF_D$ value		[years]	150		
Weight		[kg]	2.8	4.6	6.1
Hydraulic					
Max. operating pressure		[bar]	350		
Nominal flow		[l/min]	150	270	450
Fluid			Hydraulic oil according to DIN 51524		
Viscosity	permitted	[cSt] / [mm²/s]	20...380		
	recommended	[cSt] / [mm²/s]	30...50		
Fluid temperature	permitted	[mm²/s]	-20...+70		
	recommended	[mm²/s]	30...50		
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)		

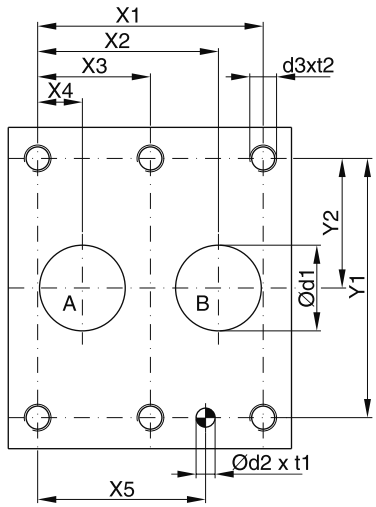
6

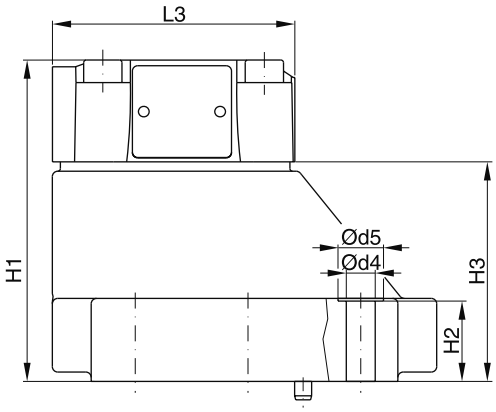
Δp/Q performance curve

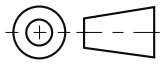


Characteristic curve measured with HLP46 at 50°C.







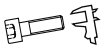
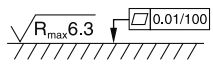


6

NG	ISO-code	x1	x2	x3	x4	x5	y1	y2	B1	B2	H1	H2	H3	L1	L2
10	5781-06-07-0-00	42.9	35.8	–	7.2	31.8	66.7	33.4	87.3	33.4	83	21	45	29	94.8
25	5781-08-10-0-00	60.3	49.2	–	11.1	44.5	79.4	39.7	105	39.7	109.5	29	71.5	34.7	126.8
32	5781-10-13-0-00	84.2	67.5	42.1	16.7	62.7	96.8	48.4	120	48.4	120	29	82	30.6	144.3

Tolerance for all dimensions ±0.2

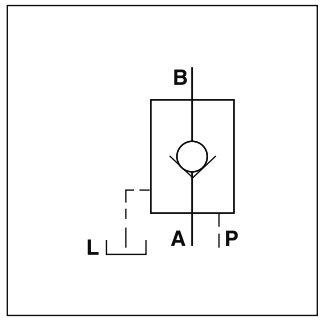
NG	ISO-code	d1max	d2	t1	d3	t2	d4	d5
10	5781-06-07-0-00	15	7.1	8	M10	16	10.8	17
25	5781-08-10-0-00	23.4	7.1	8	M10	18	10.8	17
32	5781-10-13-0-00	32	7.1	8	M10	20	10.8	17

NG	ISO-code	Bolt kit			Kit NBR	Kit FPM	Surface finish
10	5781-06-07-0-00	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S16-39362-0	S16-39362-5	
25	5781-08-10-0-00	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S16-39364-0	S16-39364-5	
32	5781-10-13-0-00	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S16-39366-0	S16-39366-5	

Notes

Pilot operated check valves of the series CPS allow free flow in one direction (A to B).

The counter-flow direction (B to A) is blocked. By applying pilot pressure, the poppet can be lifted from its seat against the pressure in port B. Thus flow in the counter-direction is also possible. There are 1 and 2 stage poppets available with pilot ratios of 5 : 1 and 40 : 1, to suit different operating conditions. The CPS needs to be externally drained via port L.

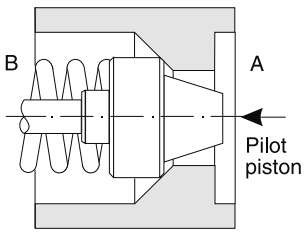


Technical data

Size		600	1200
Max. operating pressure	[bar]	210	210
Max. pilot pressure	[bar]	210	70
Flow Q_{max} at Δp 2,7bar	[l/min]	30	95
Nominal size		3/8	3/4
Weight	[kg]	4	7

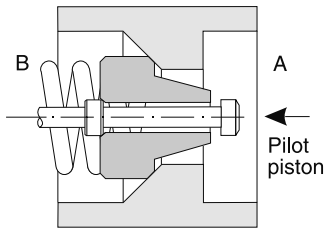
Pilot ratios

Poppet 1 stage



Surface ratio 5 : 1 (pilot spool: poppet surface) for quick response time without decompression.

Poppet 2 stage



Surface ratio 40 : 1 (pilot spool: decompression pin surface) for low shock or oscillation performance from decompression.

Ordering code

CP	S		S		M	
Pilot operated check valve	Manifold mounting	Port size	Steel body	Pilot ratio	Steel poppet	Seal

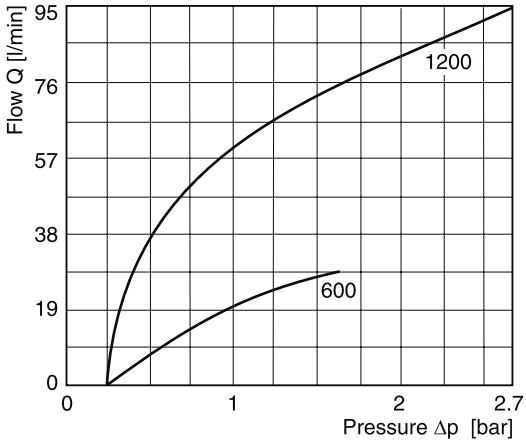
Code	Port size
600	**NG06**
1200	**NG10**

Code	Seal
omit	**NBR**
V	FPM

Code	Ratio	Stage
5	**5:1**	**1**
40	40:1	2

Bold letters =
Short-term availability

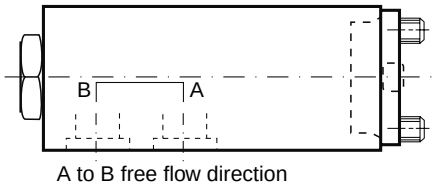
∆p/Q performance curves

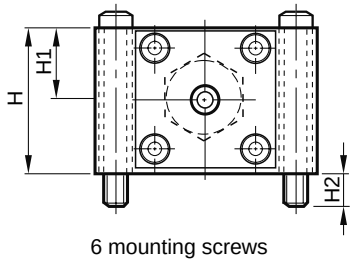


All characteristic curves measured with HLP46 at 50°C.

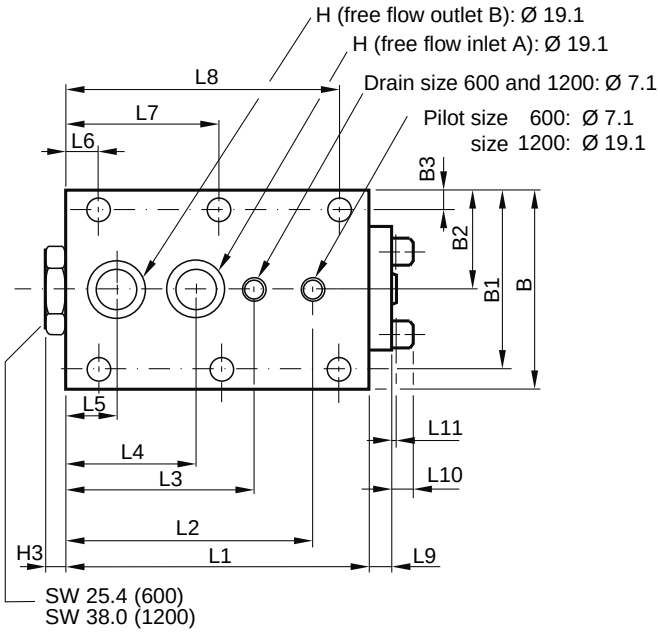
Dimensions

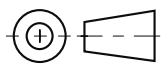
6





6 mounting screws
M8 for size 600
6 mounting screws
M10 for size 1200



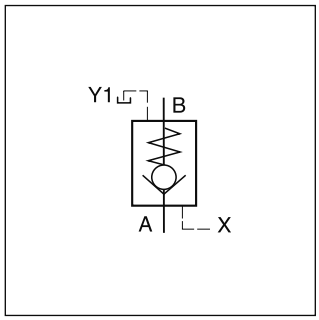


Size	L3	L2	L1	L9	L11	H	H1	H2	H3	L10	L8	L7	L6	B3	B2	B1	B	ØH	L5	L4
CPS600S	76.2	101.6	120.7	10.7	1.0	50.8	25.4	12.7	7.9	-	108.0	60.2	12.7	8.6	38.1	67.3	76.2	11.2	21.3	53.3
CPS1200S	93.7	127.0	152.4	11.4	1.0	63.5	31.8	12.7	10.2	7.9	136.4	76.2	15.7	10.2	50.8	91.2	101.6	19.1	25.4	63.5

Hydraulically pilot operated check valves C4V allow free flow from A to B. The counter-flow direction is blocked.

When pressure is applied to control port X, the ring chamber flow from B to A is released.

Up to four different pilot control ratios are available (see ordering code).



Function

When no pressure is applied to the X-port, the flow from B to A is blocked, because the pressure in B is also in effect on top of the poppet.

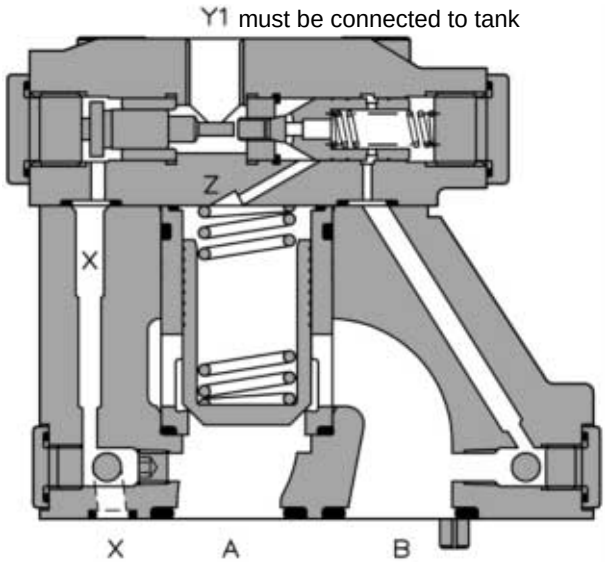
Pressurizing the X port relieves the area on top of the poppet to the drain port and allows flow from B to A.

The seat design of the SVL valve series provides leak-free separation of port A and B in the closed position.

Features

- Valves with position control are available on request

6



Ordering code

C4V	□	–	5	9	□	□	B	□	□
Check valve pilot operated	Nominal size		Max. pressure 350 bar	Y1-port G¼"	Opening ratio	Approx. cracking pressure	Design series	Seal	Options

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Opening ratio
1	1 : 1
3	3 : 1
8	8 : 1
9	10 : 1

Code	Seal
1	NBR
5	FPM

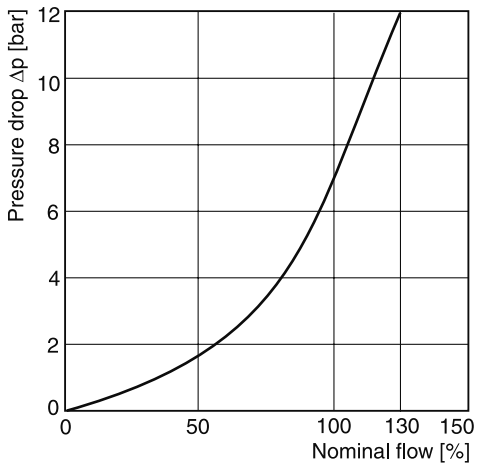
Code	Approx. cracking pressure [bar]			
	Flow A to B		Flow B to A	
	C4V03	C4V06/10	C4V03	C4V06/10
2	1.0	1.0	1.5	1.7
4	4.0	3.5	5.5	6.0
6	2.0	2.2	3.0	3.8

6

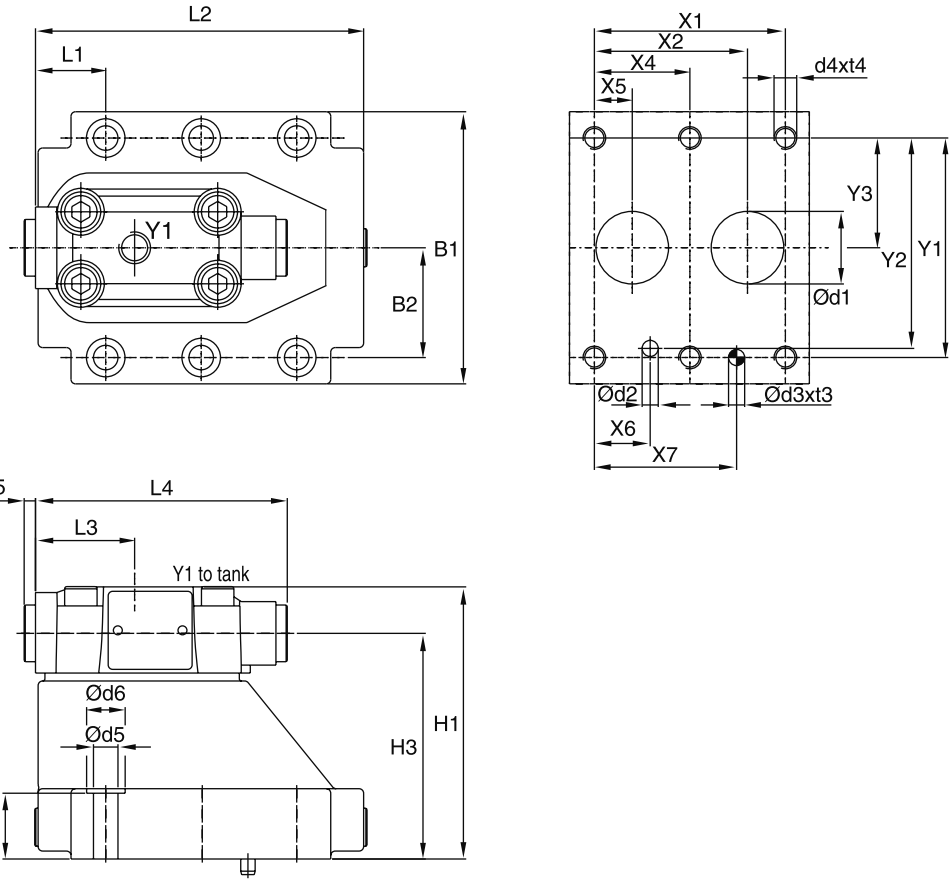
Technical data

General					
Nominal size			NG10	NG25	NG32
Subplate mounting			ISO 5781		
Mounting position			Unrestricted		
Ambient temperature		[°C]	-20...+80		
$MTTF_D$ value		[years]	150		
Weight		[kg]	2.8	4.6	6.1
Hydraulic					
Max. operating pressure		[bar]	350		
Nominal flow		[l/min]	150	270	450
Fluid			Hydraulic oil according to DIN 51524		
Viscosity	recommended	[cSt] / [mm²/s]	30...50		
	permitted	[cSt] / [mm²/s]	20...380		
Fluid temperature	recommended	[°C]	30...50		
	permitted	[°C]	-20...+70		
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)		

Δp/Q flow curve



Characteristic curve measured with HLP46 at 50°C.



NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9	35.8	–	–	7.2	21.5	31.8	66.7	58.8	33.4	–	–	–
25	5781-08-10-0-00	60.3	49.2	–	–	11.1	20.6	44.5	79.4	73	39.7	–	–	–
32	5781-10-13-0-00	84.2	67.5	–	42.1	16.7	24.6	62.7	96.8	92.8	48.4	–	–	–

Tolerance for all dimensions ±0.2

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	5781-06-07-0-00	87.3	33.4	83	21	62.5	–	–	–	29.4	95.2	43.7	111	5	–
25	5781-08-0-0-00	105	39.7	109.5	29	89	–	–	–	35.1	127.2	43.7	111	5	–
32	5781-10-13-0-00	120	48.4	120	29	99.5	–	–	–	31	144.7	43.7	111	5	–

NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	5781-06-07-0-00	15	7	7.1	8	M10	16	10.8	17
25	5781-08-10-0-00	23.4	7.1	7.1	8	M10	18	10.8	17
32	5781-10-13-0-00	32	7.1	7.1	8	M10	20	10.8	17

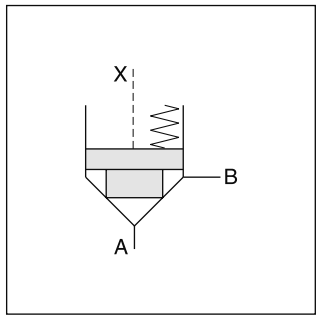
NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	5781-06-07-0-00	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S16-39362-0	S16-39362-5	
25	5781-08-10-0-00	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S16-39364-0	S16-39364-5	
32	5781-10-13-0-00	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S16-39366-0	S16-39366-5	

Notes

Seat valves series D4S are designed for directional control functions. A large variety of poppets, springs and covers - including shuttle valves, stroke limiters, solenoid valves (VV01) and position control - allow to design individual hydraulic solutions for nominal flow up to 600 l/min.

A complete program of 2/2-way seat valves is offered under Parker brand:

subplate mounted valves	series D4S	chapter 6
SAE flange valves	series D5S	chapter 9
slip-in cartridges	series CAR	on request

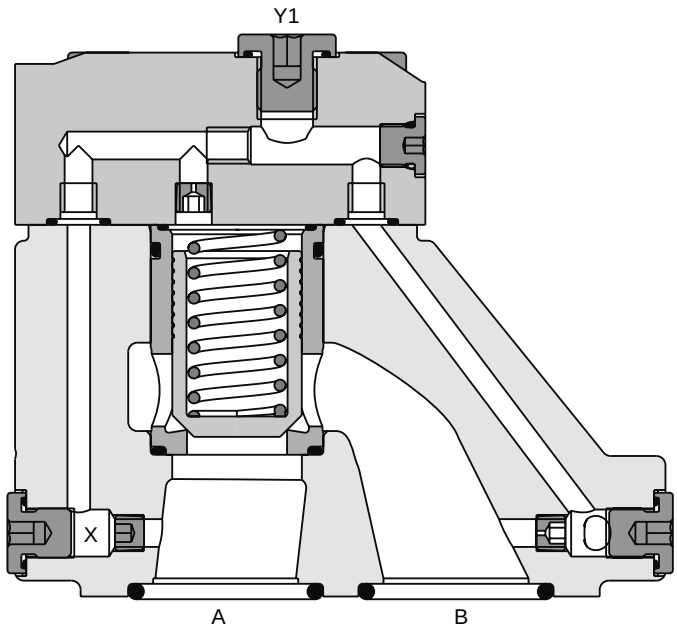


Features

- Subplate mounting according to ISO 5781
- Leak-free seat valve design
- Numerous pilot options
- 6 poppet types
- D4S03 - NG10
  D4S06 - NG25
  D4S10 - NG32

6

D4S10



D4S	[ ]	–	9	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	B	[ ]	[ ]
Seat valve	Nominal size		Subplate mounting ISO 6264, Y1 port G¼"	Pilot connection	Cap version	Sleeve	Spool type	Spring	Switching type	Solenoid voltage	Design series	Seals	Options	

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Pilot oil line in body	A-X	B-Y
1	internal from A	⊖	○
2	external from X	●	○
A[1)]	internal from A	⊖	●
B[1)]	external from X	●	●
C	internal from A + B	⊖	⊖
D	internal from B	●	⊖
G	external from Y	●	●

[1)] With VV01 only

Code	Ports	X	Y	Z	X-Y	Y1	VV01
	Standard						
1	Pilot oil = pilot drain	○	●	⊖	○	●	—
C	Pilot oil = pilot drain	●	○	⊖	○	●	—
	With solenoid valve (VV01)						
2	Ext. PD from cap	○	○	⊖	●	○	●
5	Ext. to subplate	○	○	⊖	●	●	○
6	Internal pilot drain	○	○	⊖	●	●	○
	With stroke limiter (not for D4S03)						
3	Pilot oil = pilot drain	⊖	●	—	—	—	—
4	Pilot oil = pilot drain	●	⊖	—	—	—	—

○ open bore ● closed bore ⊖ orifice Ø 1.2

Code	Sleeve
1	AA=95%, AB=5%
3	AA=60%, AB=40%

Code	Size	Poppet type	Sleeve
1	03, 06,10	With closed bottom and 15° chamfer (pZ max. = pA +20bar	1
2	03	With 0.8 dia. orifice at the bottom and 15° chamfer	1
	06, 10	With 1.2 dia. orifice at the bottom and 15° chamfer	1
4	03, 06,10	With closed bottom and 45° chamfer	1, 3
A [2)]	06, 10	Safety spool (for position control only)	3
B [2)]	06, 10	Throttle spool, 10° chamfer	3
C [2)]	06, 10	Throttle spool, 3° chamfer	3

[2)] springs 2, 3 and 6 only

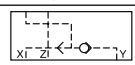
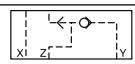
Code	Spring (approx. cracking pressure [bar])					
	Sleeve Code 1		Sleeve Code 3			
	A -> B		A -> B		B -> A	
	D5S03	D5S06/10	D5S03	D5S06/10	D5S03	D5S06/10
1	2.8	3.5	6.5	6.5	9.5	11.0
2	0.5	0.5	1.0	1.0	1.5	1.7
3	0.3	0.3	0.6	0.6	0.9	1.0
4	2.2	2.2	4.0	3.5	5.5	6.0
5	—	9.0	—	16.0	—	28.0
6	1.2	1.2	2.0	2.2	3.0	3.8
7	3.0	—	8.0	—	12.0	—

Code	Options
omit	Standard
013	Cover for end position control

Code	Seals
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR [4)]	98V=
GAG [4)]	205V=
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

[4)] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Switching type	
omit	Standard w/o vent function	
09	VV01 with manual override	de-energized: power comp. open
10	VV01 without manual override	
11	VV01 with manual override	de-energized: power comp. closed
12	VV01 without manual override	
CA	Shuttle valve	
DA	Shuttle valve	
CB	VV01 code 09 and shuttle valve code CA	
CD	VV01 code 11 and shuttle valve code CA	
DB	VV01 code 09 and shuttle valve code DA	
DD	VV01 code 11 and shuttle valve code DA	
BH	VV01 code 10 and shuttle valve code CA and position control [3)] with amplifier	
BK	VV01 code 12 and shuttle valve code CA and position control [3)] with amplifier	
BN	VV01 code 10 and shuttle valve code DA and position control [3)] with amplifier	
BQ	VV01 code 12 and shuttle valve code DA and position control [3)] with amplifier	
BC	VV01 code 10 and position control [3)] with amplifier	
BE	VV01 code 12 and position control [3)] with amplifier	
BA	Position control [3)] with amplifier	
BF	Position control [3)] with amplifier and shuttle valve code CA	
BL	Position control [3)] with amplifier and shuttle valve code DA	

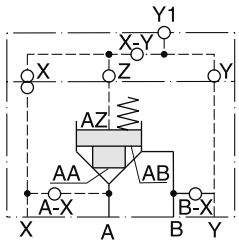
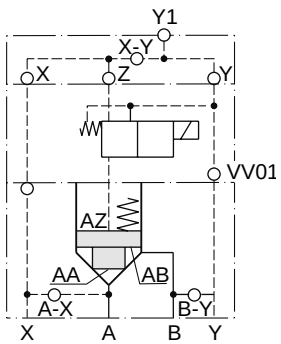
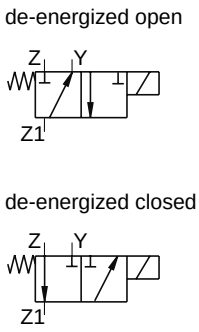
[3)] Position control for D4S06/10 only.
Spring 2 or 4. Spool A and sleeve 3.
Valve open: proximity switch damped.

Examples see end of chapter

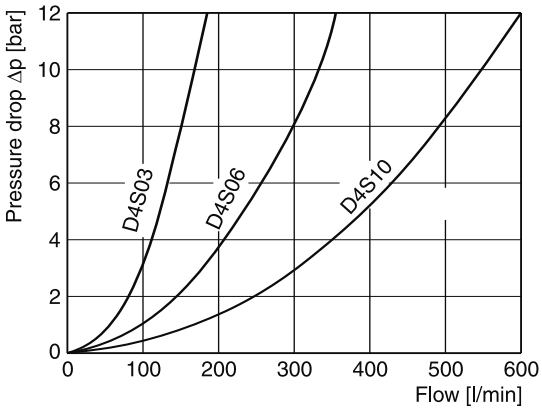
General							
Size			NG03	NG06	NG10		
Mounting interface			Subplate mounting according to ISO 6264				
Mounting position			unrestricted				
Ambient temperature		[°C]	-20...+50				
$MTTF_D$ value		[years]	150				
Weight		[kg]	2.7	4.5	6.0		
Hydraulic							
Operating pressure		[bar]	Ports A, B up to 350; Port Y 140 (with VV01)				
Nominal flow		[l/min]	180	360	600		
Fluid			Hydraulic oil according to DIN 51524...51525				
Fluid temperature		[°C]	-20...+80				
Viscosity	permitted	[cSt] / [mm^2/s]	10...650				
Viscosity	recommended	[cSt] / [mm^2/s]	30				
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)				
Electrical (solenoid)							
Duty ratio		[%]	100				
Response time		[ms]	Energized / de-energized AC: 20/18 , DC: 46/27				
		Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage		[V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage		[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption, hold		[W]	31	31	31	31	78	78
Power consumption, in rush		[W]	31	31	31	31	264	264
Max. switching frequency		[1/h]	AC: up to 7.200, DC: up to 16.000					
Solenoid connection			Connector as per EN175301-803					
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)					
Coil insulation class			H (180 °C)					

6

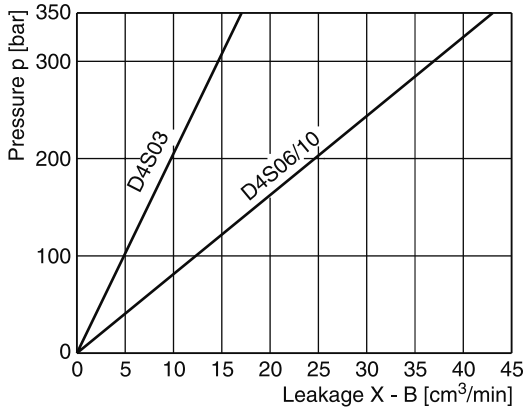
D4S pilot configuration

D4S direct operated	D4S with vent valve VV01	VV01
		

Δp/Q performance curves



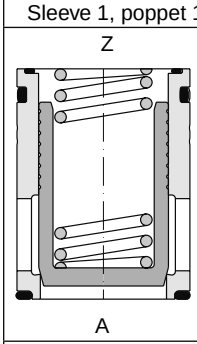
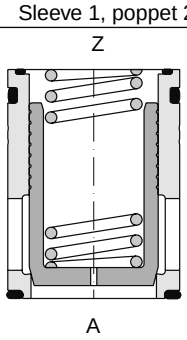
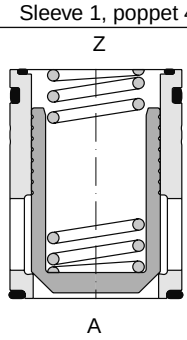
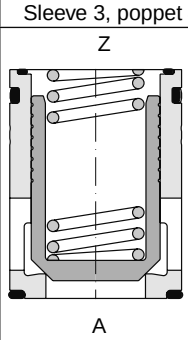
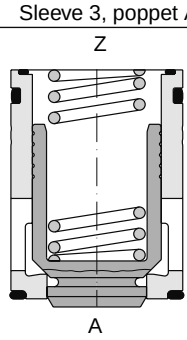
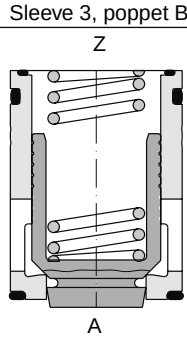
Leackage

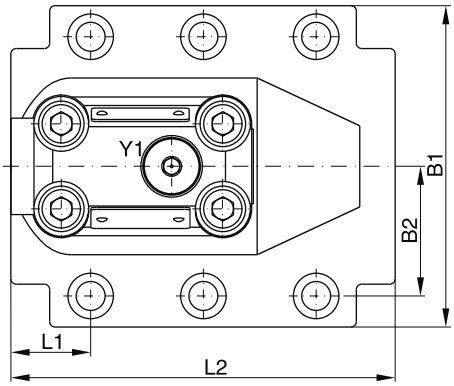


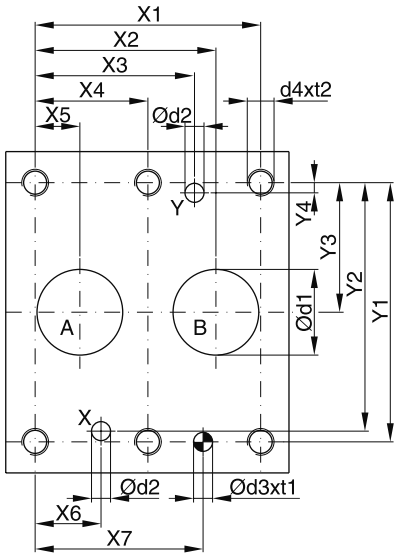
All characteristic curves measured with HLP46 at 50°C.

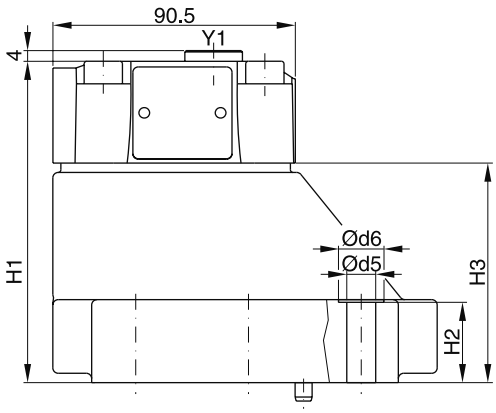
6

Selection of Cartridges

Sleeve 1, poppet 1	Sleeve 1, poppet 2	Sleeve 1, poppet 4	Sleeve 3, poppet 4	Sleeve 3, poppet A	Sleeve 3, poppet B/C
					
1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 15° chamfer	1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 15° chamfer orifice	1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 45° chamfer	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer safety spool	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer throttle spool







6

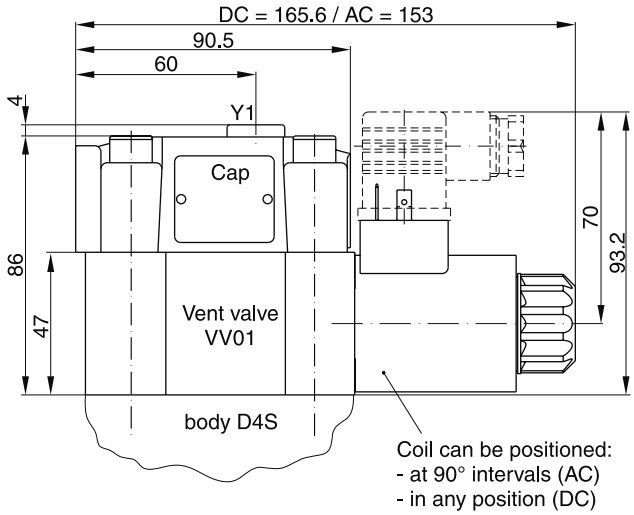
NG	ISO-code	X1	X2	X3	X4	X5	X6	X7	Y1	Y2	Y3	Y4
10	6264-06-09-*-97	42.9	35.8	21.5	–	7.2	21.5	31.8	66.7	58.8	33.4	7.9
25	6264-08-13-*-97	60.3	49.2	39.7	–	11.1	20.6	44.5	79.4	73	39.7	6.4
32	6264-10-17-*-97	84.2	67.5	59.5	42.1	16.7	24.6	62.7	96.8	92.8	48.4	3.8

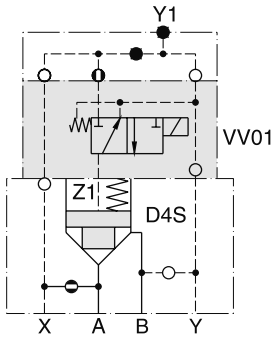
NG	ISO-code	B1	B2	H1	H2	H3	L1	L2	D1	D2	D3	t1	D4	t2	D5	D6
10	6264-06-09-*-97	87.3	33.35	83	21	45	29	94.8	15	7	7.1	8	M10	16	10.8	17
25	6264-08-13-*-97	105	39.7	109.5	29	71.5	34.7	126.8	23.4	7.1	7.1	8	M10	18	10.8	17
32	6264-10-17-*-97	120	48.4	120	29	82	30.6	144.3	32	7.1	7.1	8	M10	20	10.8	17

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	6264-06-07-*-97	BK 505	4x M10 x 35 DIN 912 12.9	63 Nm ±15%	S26-58507-0	S26-58507-5	R_{max}6.3 0.01/100
25	6264-08-11-*-97	BK 485	4x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58475-0	S26-58475-5	
32	6264-10-15-*-97	BK 506	6x M10 x 45 DIN 912 12.9	63 Nm ±15%	S26-58508-0	S26-58508-5	

D4S UK.INDD CM 07.09.11

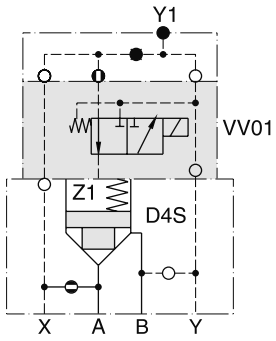
Dimensions D4S with VV01





with manual override / without manual override

D4S..-.....09/10
Solenoid energized:
D4S blocked
Solenoid de-energized:
Flow from A-B or B-A

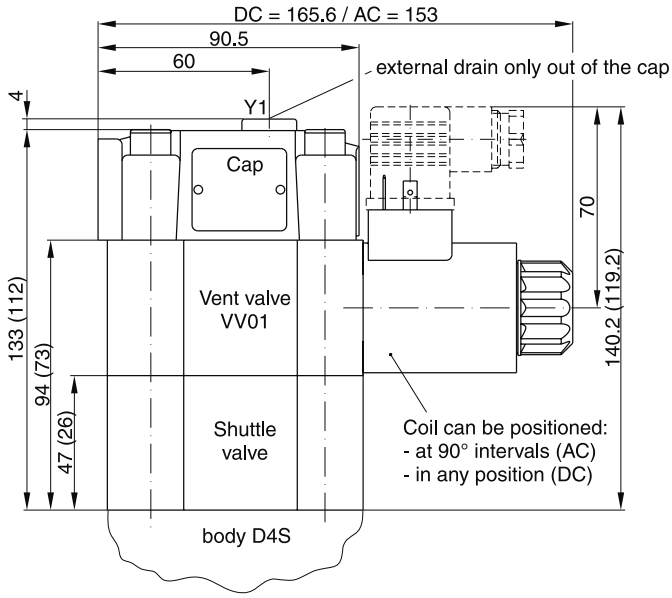


with manual override / without manual override

D4S..-.....11/12
Solenoid energized:
Flow from A-B or B-A
Solenoid de-energized:
D4S Blocked

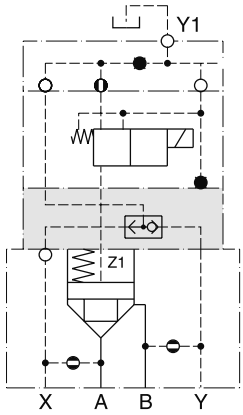
6

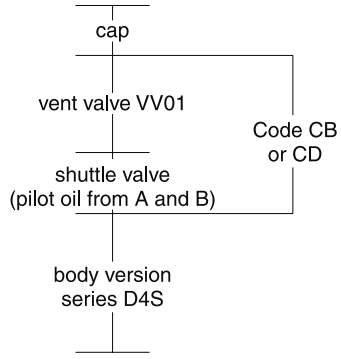
Dimensions D4S with shuttle valve

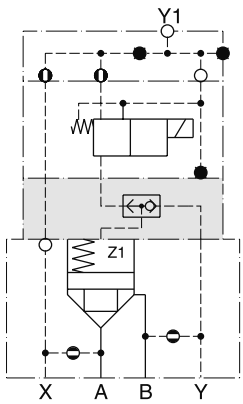


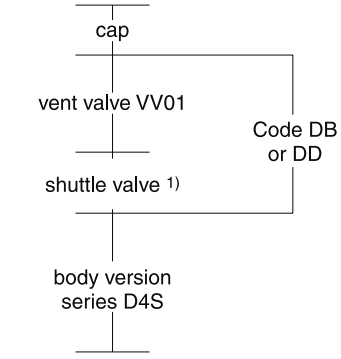
() Dimensions in brackets are for version VV01with shuttle valve code DB or DD.

Note: Shuttle valves only use in connection with vent valve VV01.



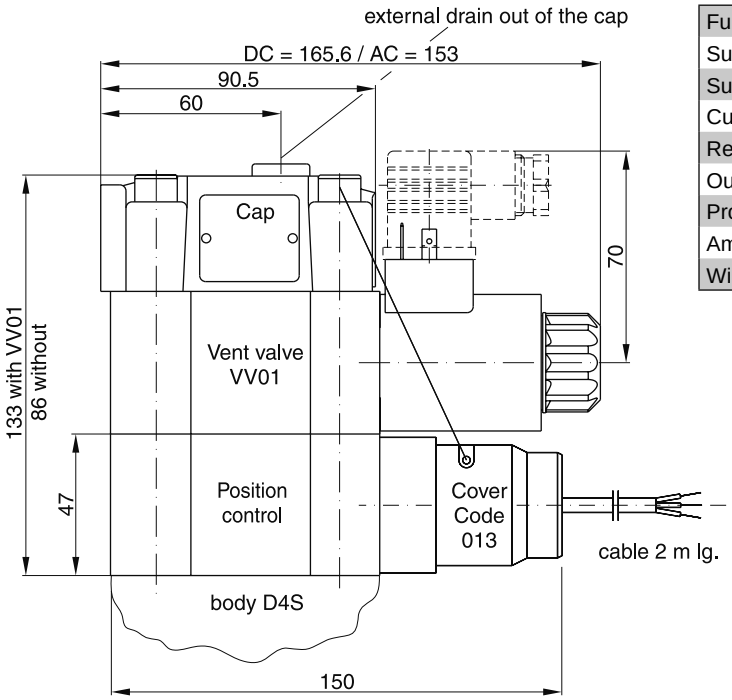






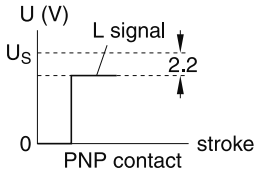
1) pilot oil from A and B,
from B to A check valve function

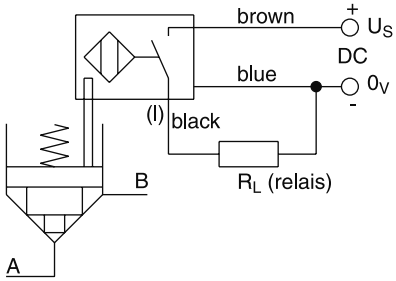
Dimensions D4S position control



Technical data (proximity switch)

Function		PNP, contact
Supply voltage (Us)	[VDC]	10...30
Supply voltage ripple	[%]	≤ 10
Current consumption	[mA]	max. 8
Residual voltage L-signal	[V]	Us - 2.2 at I_{max}
Output current (I)	[mA]	≤ 200
Protection class		IP67
Ambient temperature	[C°]	-25...+70
Wire cross section	[mm^2]	3 x 0.5





Position control by proximity switch (incl. amplifier)

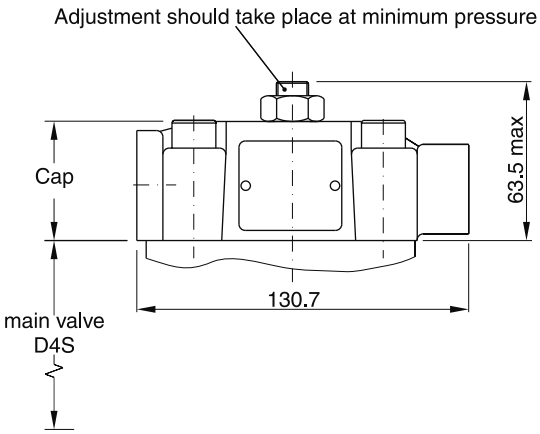
Valve open: proximity switch activated.

This proximity switch is pressure proof and has no wearing parts.

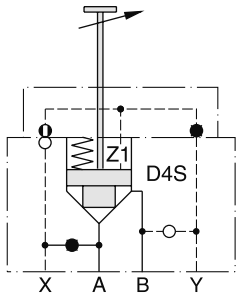
Note

Position control for D4S06 and D4S10 only.

Dimensions D4S stroke limiter



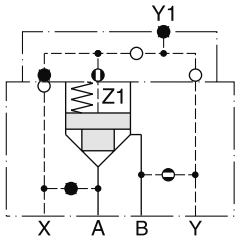
Example: D4S$^{06}_{10}$-.233B.



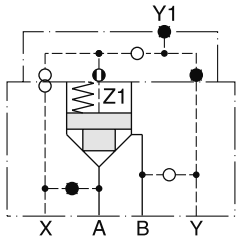
Note:

Stroke limiter not for use with D4S03, vent valve VV01, shuttle valve and positon control.

D4S direct operated

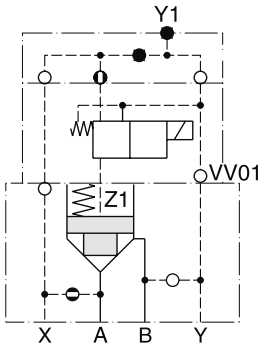


D4S..-.DC
Pilot oil Y = internal from B

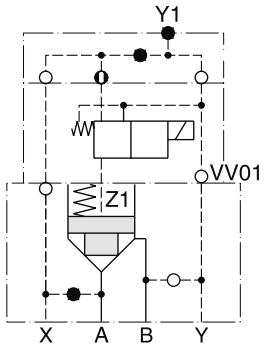


D4S..-.21
Pilot oil X = external

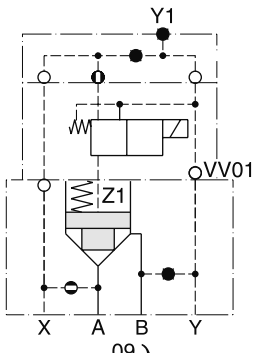
D4S with VV01



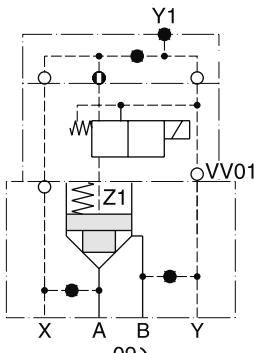
D4S..-.16... 09 10 11 12 } with VV01
Pilot oil X = internal from A
Drain Y = internal to B



D4S..-.26... 09 10 11 12 } with VV01
Pilot oil X = external
Drain Y = internal to B

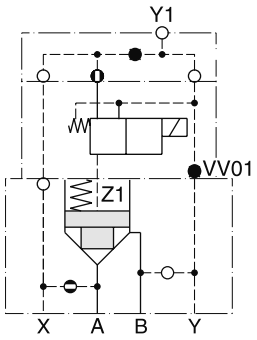


D4S..-.A5... 09 10 11 12 } with VV01
Pilot oil X = internal from A
Drain Y = external to subplate



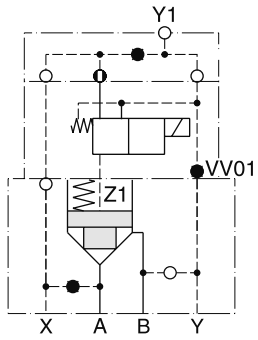
D4S..-.B5... 09 10 11 12 } with VV01
Pilot oil X = external
Drain Y = external to subplate

D4S with VV01



D4S..-.12... 09 / 10 / 11 / 12 } with VV01

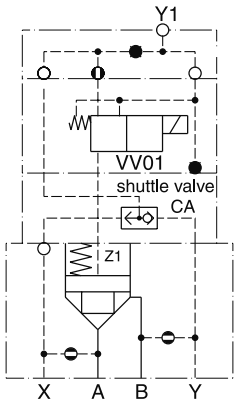
Pilot oil X = internal from A
Drain Y1 = external out of the cap



D4S..-.22... 09 / 10 / 11 / 12 } with VV01

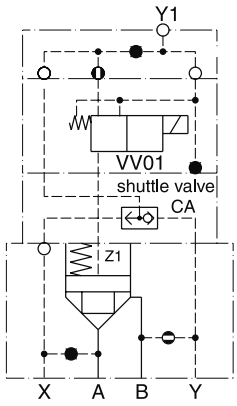
Pilot oil X = external
Drain Y1 = external out of the cap

D4S with shuttle valve



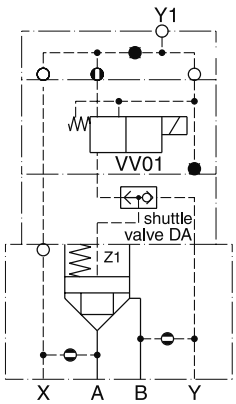
D4S..-.C2... CB / CD } with shuttle valve CA and VV01

Pilot oil = internal from A and B
Drain Y1 = external out of the cap



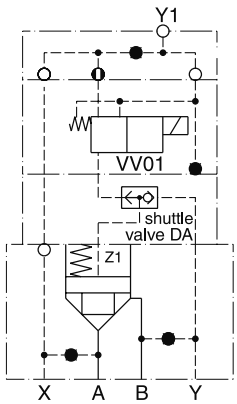
D4S..-.D2... CB / CD } with shuttle valve CA and VV01

Pilot oil = internal from B and external from X
Drain Y1 = external out of the cap



D4S..-.C2... DB / DD } with shuttle valve DA and VV01

Pilot oil = internal from A and B
(B-A = Check valve function)
Drain Y1 = external out of the cap

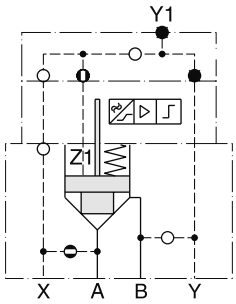


D4S..-.B2... DB / DD } with shuttle valve DA and VV01

Pilot oil = external from X and Y
Drain Y1 = external out of the cap

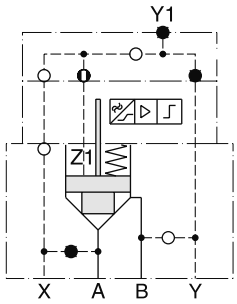
6

D4S with position control



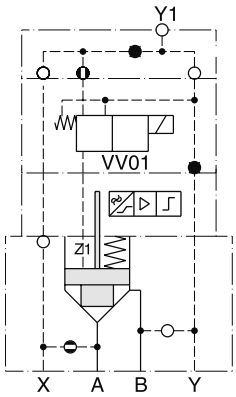
D4S..-.113A.BA
(with position control)

Pilot oil X = internal from A



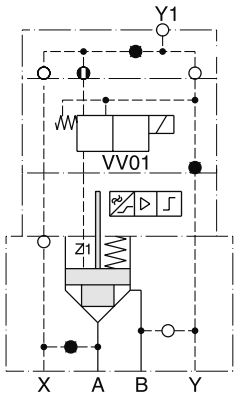
D4S..-.213A.BA
(with position control)

Pilot oil X = external



D4S..-.123A. BC / BE } with position control and VV01

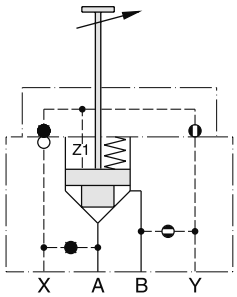
Pilot oil X = internal from A
Drain Y1 = external out of the cap



D4S..-.223A. BC / BE } with position control and VV01

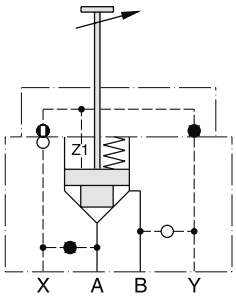
Pilot oil X = external
Drain Y1 = external out of the cap

D4S with stroke limiter



D4S..-.D434. with stroke limiter
Pilot oil Y = internal from B

Note: for D4S06 and D4S10 only



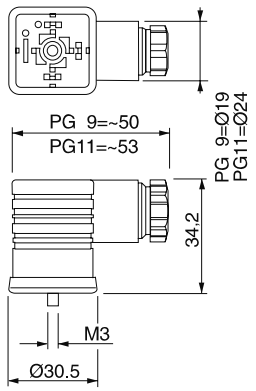
D4S..-.233B. with stroke limiter
Pilot oil X = external

Note: for D4S06 and D4S10 only

Description	Threaded cable joint	Body colour coding	Figures switching	Order no.
Plug DIN 43650, design type AF, protection class IP 65 Voltages up to 250 V	PG 9	black, B grey, A	Fig. 1	**5001710** **5001711**
	PG11	black, B grey, A	Fig. 1	**5001716** **5001717**

For other plugs see chapter 2, "Accessories"

Fig. 1



6

Notes

Notes

Pressure relief valves series RDM are direct operated piston type valves with low hysteresis. They can be used as P-T relief or as T-T controlled counter balance valve. The valve body is equipped with a preesure gauge port.

Function

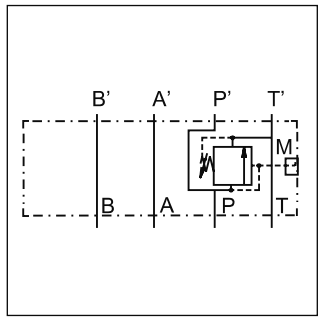
PT... pressure is relieved from P to T at the adjusted value.

TT... pressure is relieved from T' to T at the adjusted pressure.

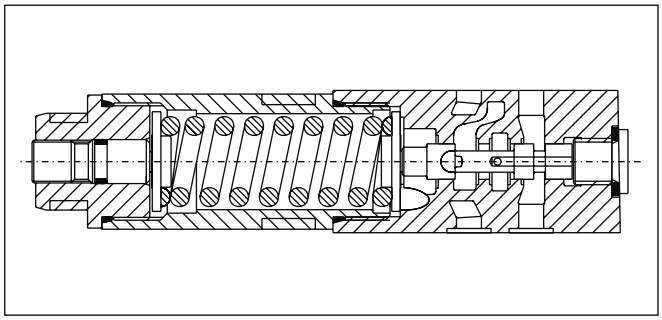
Features

- The direct operated, cushioned piston design results in fast response, low leakage and minimal hysteresis.
- Up to 5 pressure adjustment ranges are available with max. pressure settings of:
  bar 25, 64, 160, 210, 350 for RDM2,
  bar 19, 50, 100, 150, 210 for RDM3.
- Adjustment modes:
  - Slotted head with lock nut
  - Key lock
  - Turning knob
- RDM2 - NG06 (CETOP3)
  RDM3 - NG10 (CETOP5)

RDM2



Example PT



RDM2

7

Ordering code

RD	M					V		
Pressure relief valve, direct operated	Manapak	Size	Pressure relief	Pressure range	Adjustment	Seal FPM	Gauge port	Design series (not required for ordering)

Code	Size
2	**NG06**
3	**NG10**

Code	Gauge port
G [2]	**G¼**
C	Coupling M16

[2] Standard in housing

Code	Pressure relief
PT	**P**
TT [1]	T

[1] NG06 only, max. 160 bar

Code	Adjustment
S	**Hexagon socket**
L	Key lock
K	Turning knob [3]

[3] NG06 only

Pressure range			
Code	RDM2	Code	RDM3
02	1.5 to 25 bar	01	1.5 to 19 bar
06	**1.5 to 64 bar**	05	1.5 to 50 bar
16	**3 to 160 bar**	10	3 to 100 bar
21	**3 to 210 bar**	15	3 to 150 bar
35	5 to 350 bar	21	3 to 210 bar

Bold letters =
Short-term availability

RDM UK.INDD CM 07.09.11

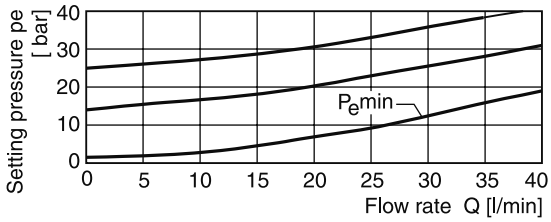
Technical data

General				
Series			RDM2	RDM3
Size			NG06	NG10
Mounting interface			ISO 4401	
Weight		[kg]	1.3	2.6
$MTTF_D$ value		[years]	150	
Ambient temperature		[°C]	-20...+50	
Hydraulic				
Max. operating pressure	P, A, B	[bar]	350	315
	T	[bar]	50	10
Fluid			Hydraulic oil according to DIN 51524...525	
Fluid temperature		[°C]	-20...+80	
Viscosity		[cSt] / [mm²/s]	12...230	
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	
Max. Flow		[l/min]	40	80

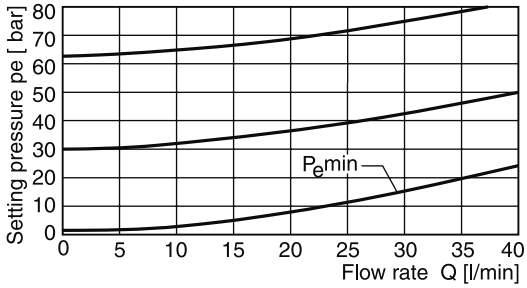
Max. leakage P - A: 5ml/min.

Performance curves

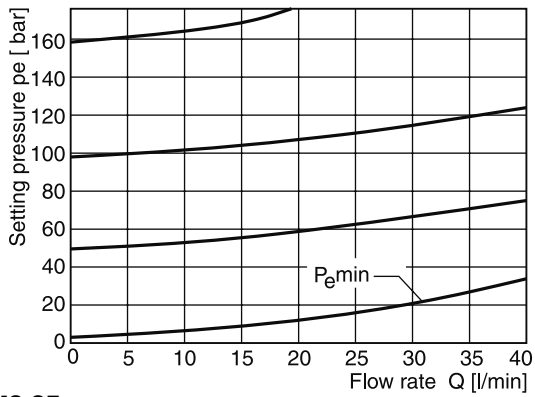
RDM2 02



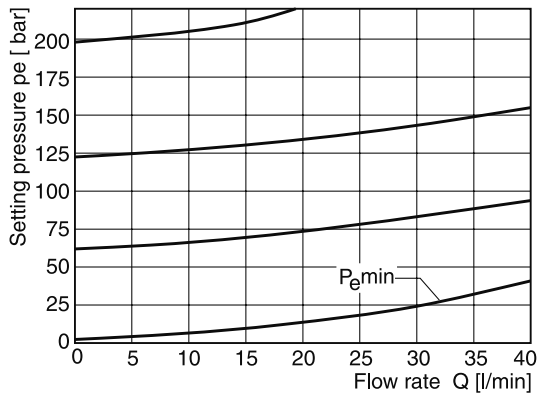
RDM2 06



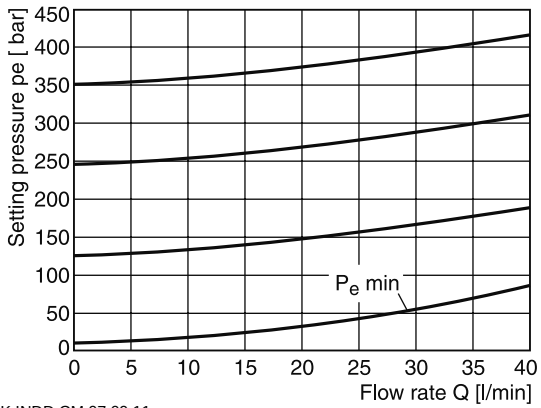
RDM2 16



RDM2 21



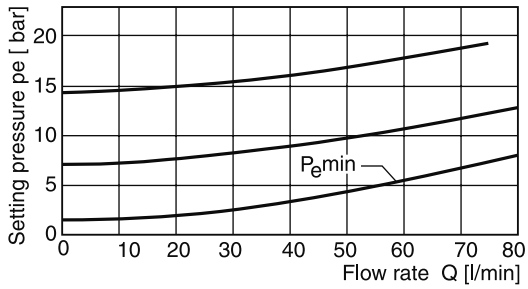
RDM2 35



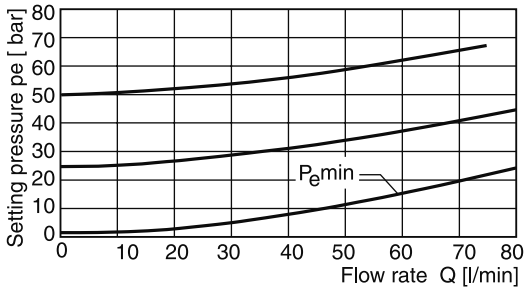
All characteristic curves measured with HLP46 at 50°C.

RDM UK.INDD CM 07.09.11

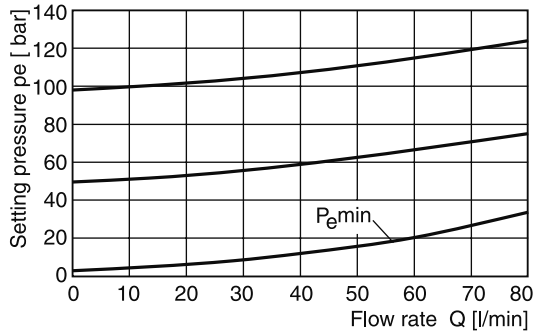
RDM3 01



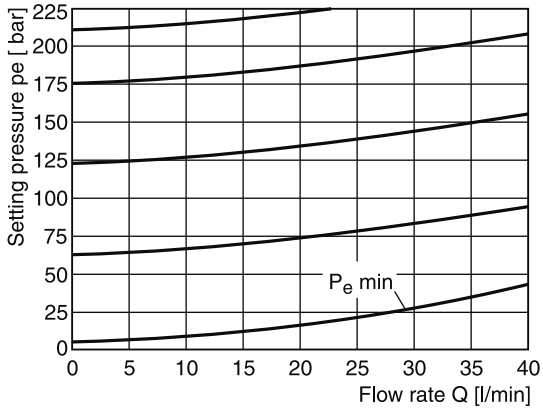
RDM3 05



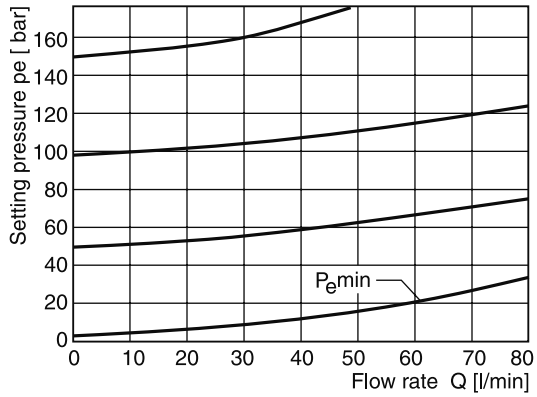
RDM3 10



RDM3 21



RDM3 15

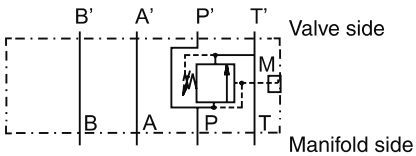


All characteristic curves measured with HLP46 at 50°C.

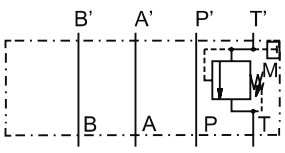
7

Schematics

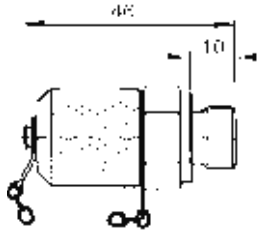
RDM*PT



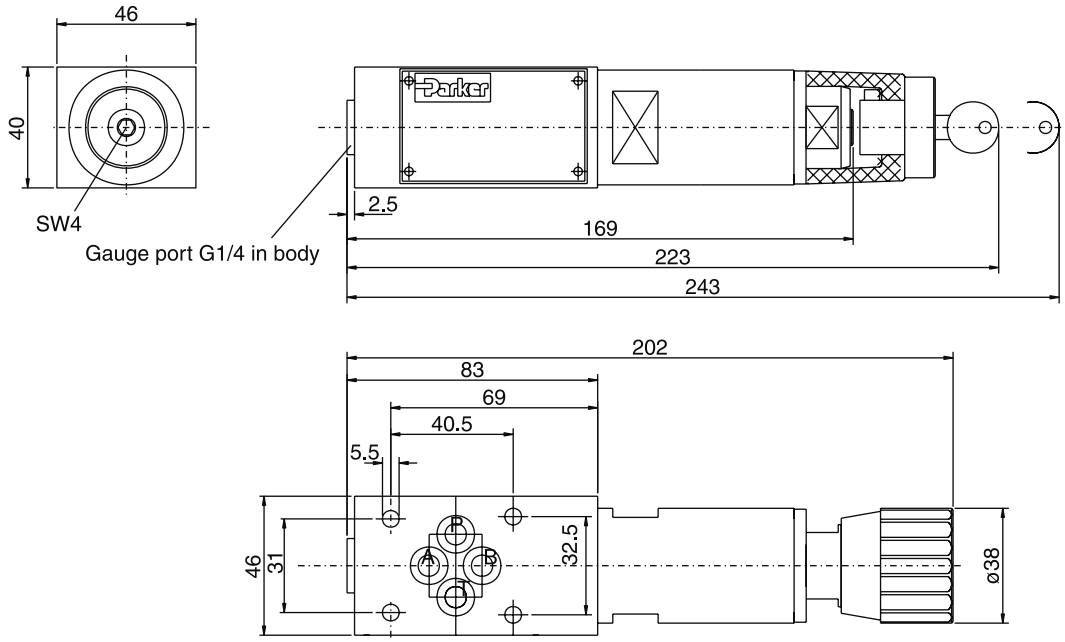
RDM*TT



Gauge port option C

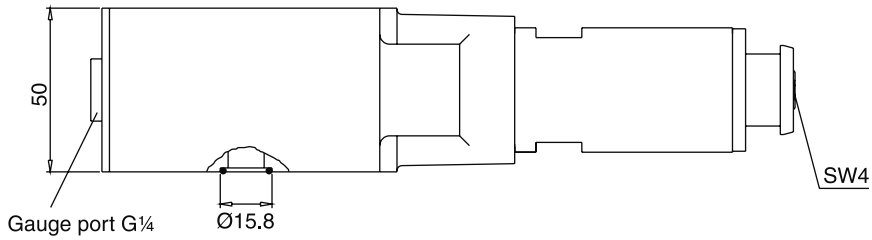


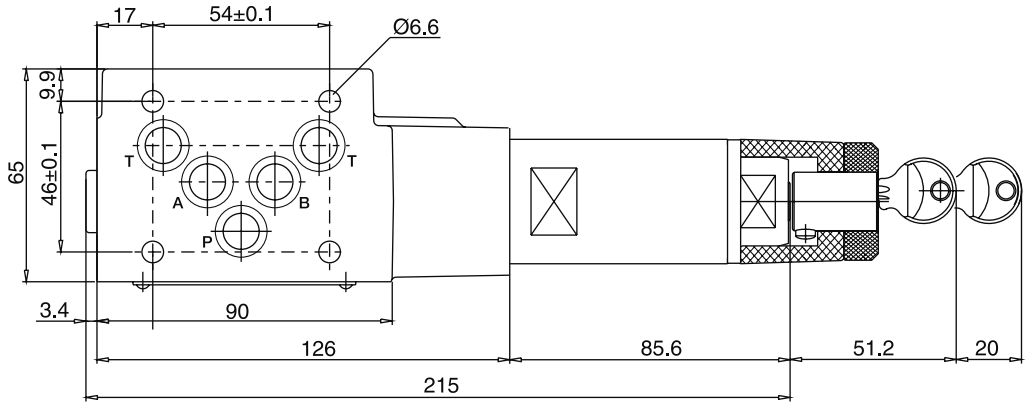
RDM2



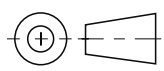
7

RDM3





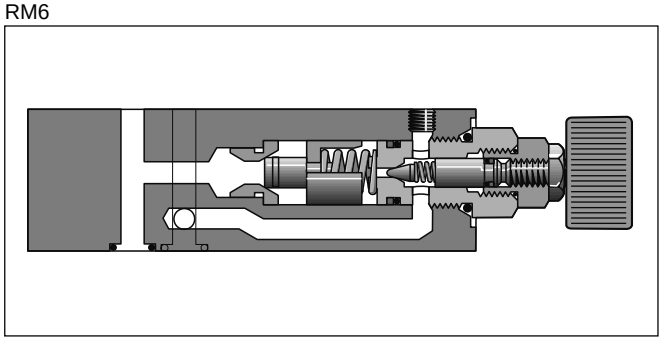
Seal kit order code		
Seal	RDM2	RDM3
V	SK-RDM2-V	SK-RDM3-V



The pilot operated pressure relief valves from the Parker Manapak series RM are in sandwich design for easy configuration of stack systems. Depending on type, pressure limiting can be achieved in ports P, A or B with unloading to port T.

RM valves may only be mounted in the defined mounting position.

RM6



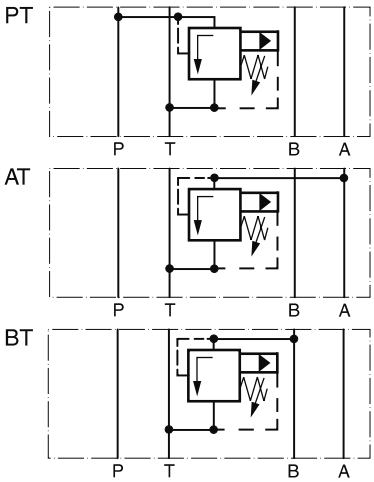
RM3

Features

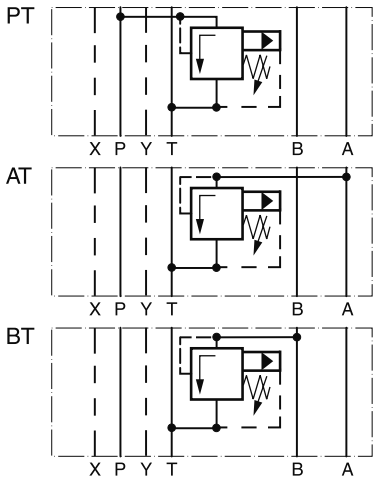
- The valve bodies of the Parker Manapak valve series RM are made of steel.
- The pressure can be set by slotted head screw, knob, or knob with DIN-lock.
- Piloting results in a flat p/Q performance curve.
- The orifices located in the main spool limit the pilot oil flow.

Schematics

RM3-NG10



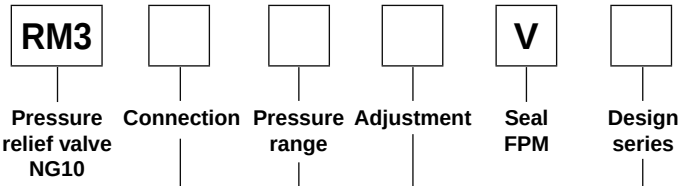
RM4-NG16
RM6-NG25 (only PT)



Technical data

General				
Design		Pilot operated pressure relief valve		
Actuation		hydraulic		
Size		NG10	NG16	NG25
Mounting interface		ISO 4401		
Mounting position		unrestricted		
Ambient temperature	[°C]	-40...+50		
$MTTF_D$ value	[years]	150		
Weight	[kg]	3.7	4.9	5.9
Hydraulic				
Max. operating pressue	[bar]	350		
Fluid		Hydraulic oil according to DIN 51524...525		
Fluid temperature	[°C]	-20...+80		
Viscosity recommended	[cSt]/[mm²/s]	30...80		
permitted	[cSt]/[mm²/s]	20...380		
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)		

RM UK.INDD CM 07.09.11



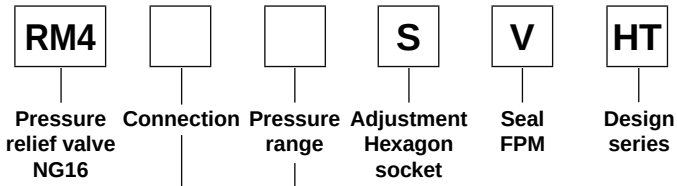
Code	Connection
PT	**P to T**
AT	A to T
BT	B to T

Code	Connection
omit	P to T
HT	A to T
omit	B to T

Code	Pressure range	Type		
		P-T	A-T	B-T
07 [1]	4 to 70 bar	•	•	•
17	**10 to 175 bar**	•		•
21	**10 to 210 bar**		•	
25	**10 to 250 bar**	•		•
35	10 to 350 bar	•	•	•

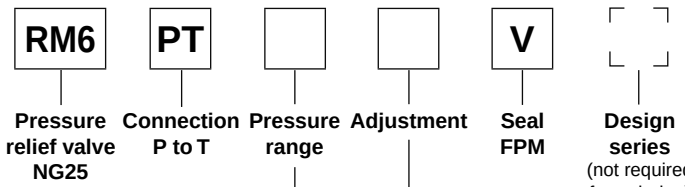
Code	Adjustment
S	**Hexagon socket**
L	Key lock
K	Turning knob

[1] Type AT = 5-65 bar



Code	Connection
PT	P to T
AT	A to T
BT	B to T

Code	Pressure range
07	5 to 65 bar
25	**10 to 250 bar**
35	10 to 350 bar



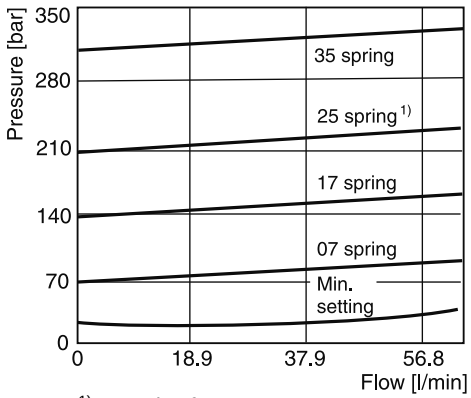
Code	Pressure range
07	5 to 70 bar
17	10 to 175 bar
25	**10 to 250 bar**
35	10 to 350 bar

Code	Adjustment
S	**Hexagon socket**
L	Key lock

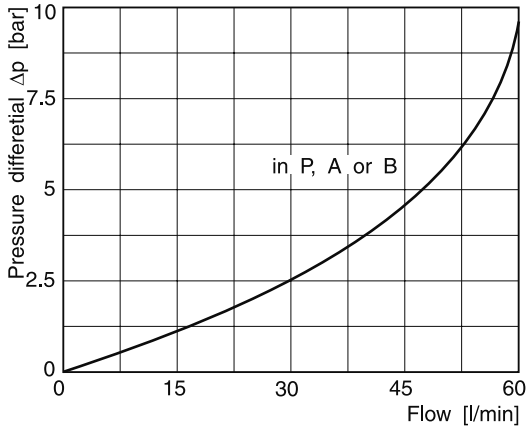
Bold letters =
Short-term availability

p/Q performance curves

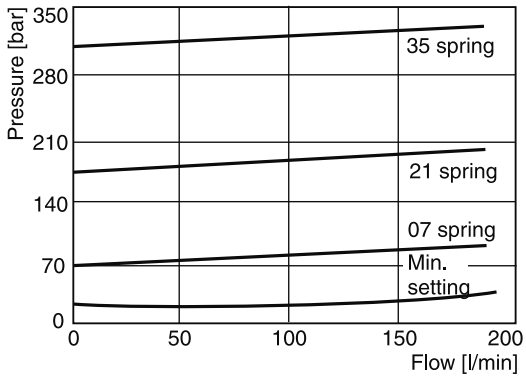
RM3

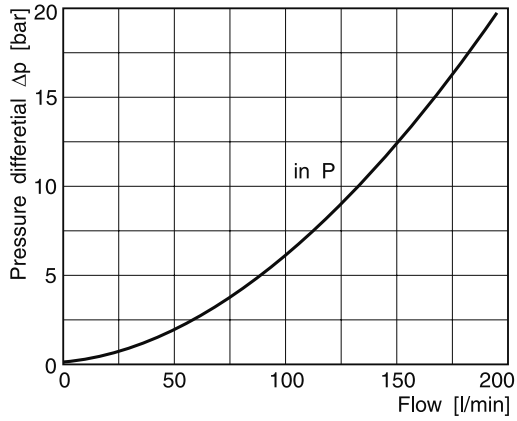


1) 21 spring for AT

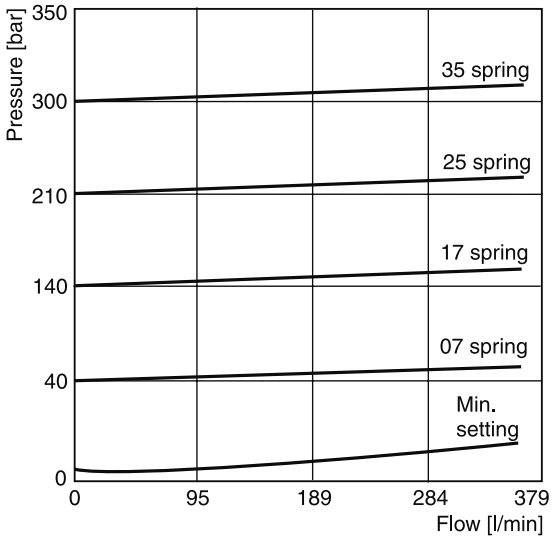


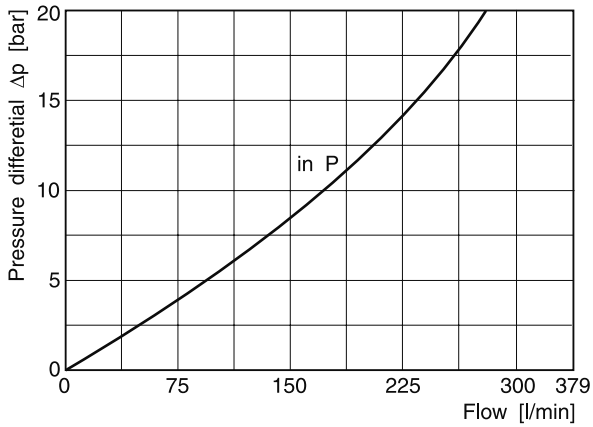
RM4





RM6

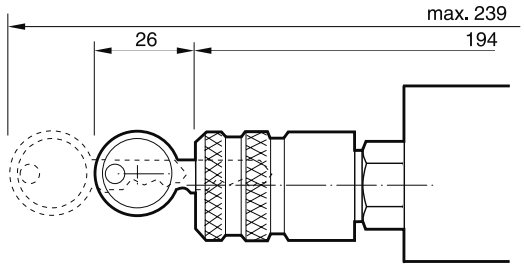




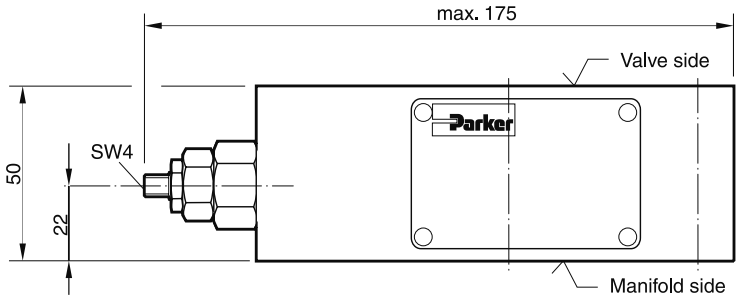
All characteristic curves measured with HLP46 at 50°C.

RM3 PT/BT

Adjustment code L



Adjustment code S

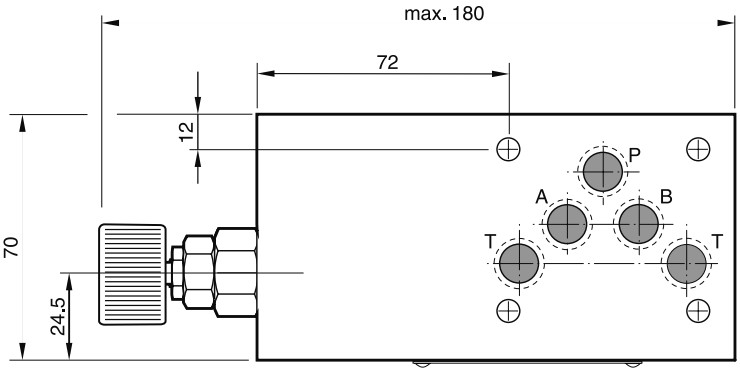


Seal kit RM3	
Seal	Order code
V	SK-RM3-V-11

Note:

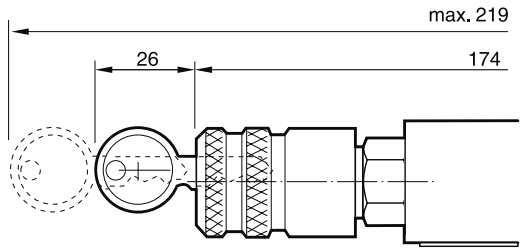
The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

Adjustment code K

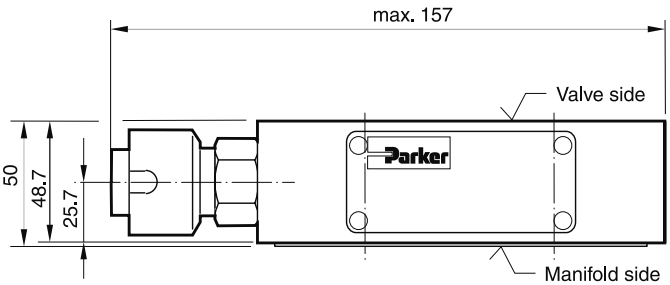


RM3 AT*HT

Adjustment code L



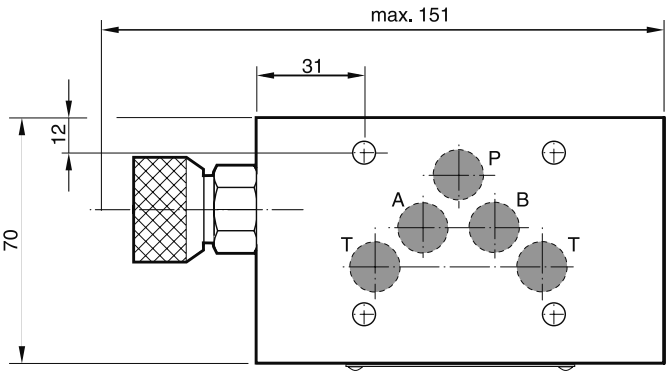
Adjustment code S



Note:

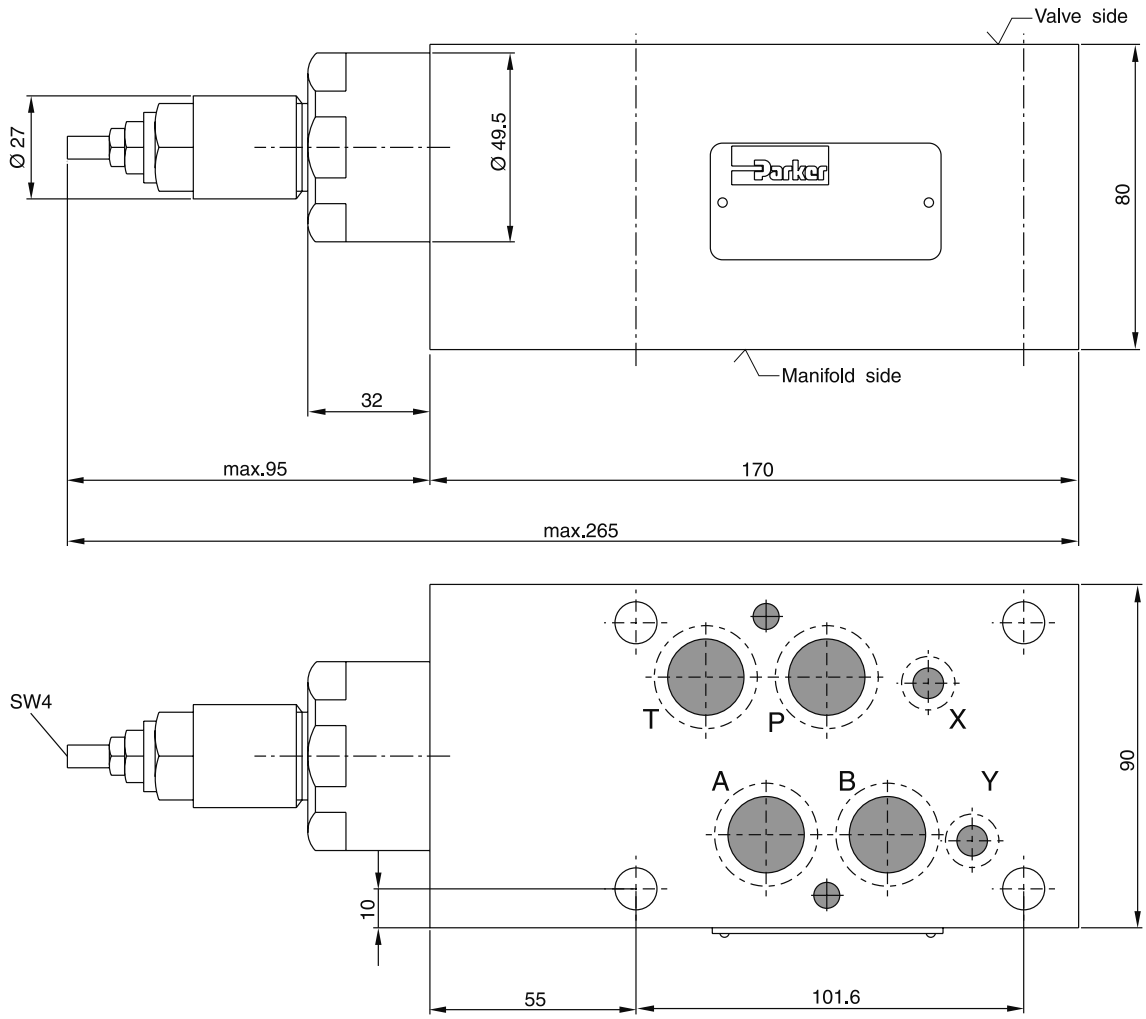
The seal plate and the O-rings for sealing the connecting surface of the manifold side are included with the HT model.

Adjustment code K



RM4

Adjustment code S



Seal kit RM4	
Seal	Order code
V	SK-RM4-V-10

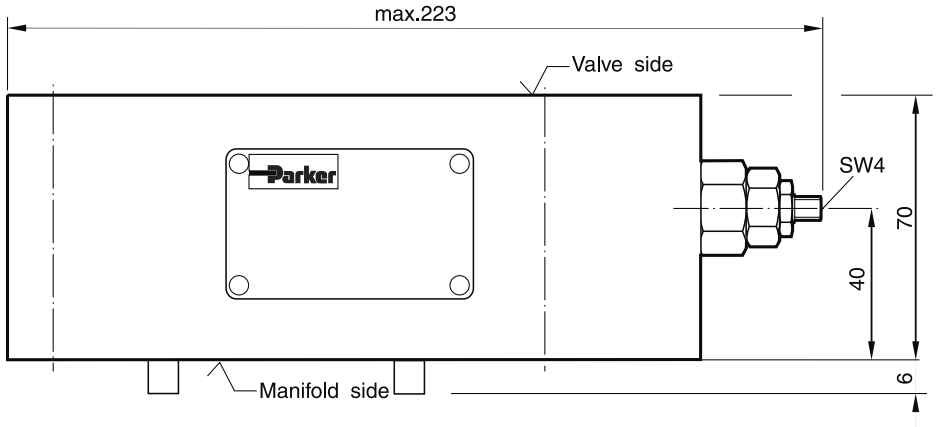
Note:

The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

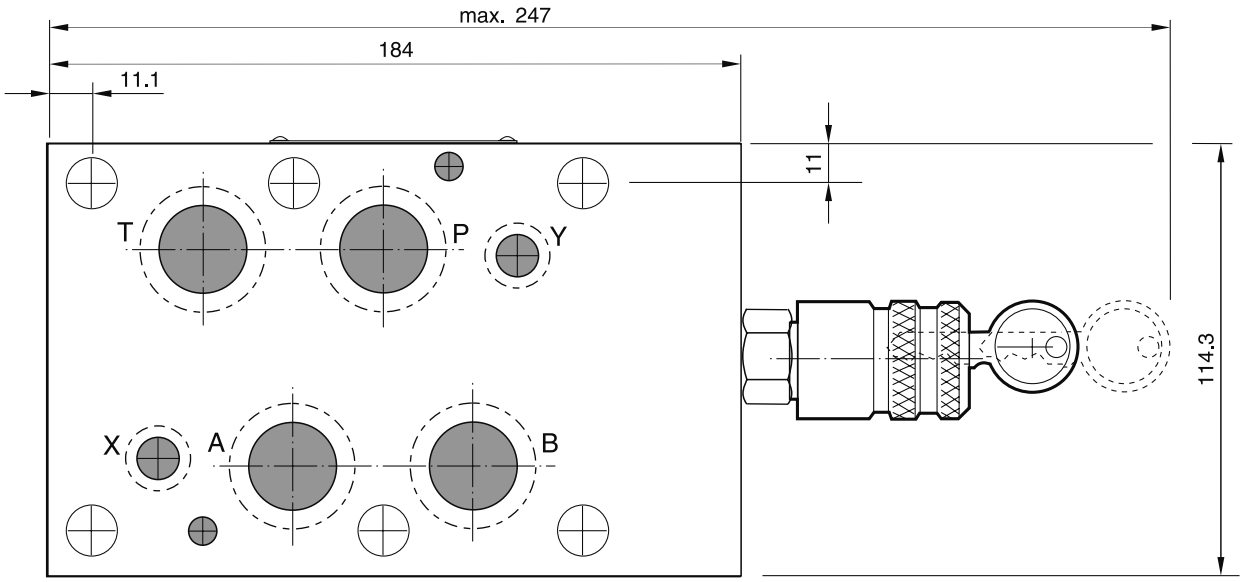
7

RM6

Adjustment Code S



Adjustment Code L



Seal kit RM6	
Seal	Order code
V	SK-RM6-V-11

Note:

The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

Pilot operated pressure relief valves series ZDV are designed for maximum flow rates.

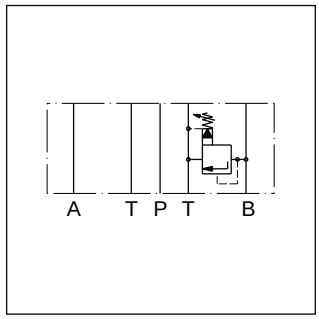
The relief function can be located between P and T, A and T, B and T or A and T + B and T for typical pressure relief functions.

For a pre-charge function the ZDV can be ordered with pressure function between A and B + B and A.

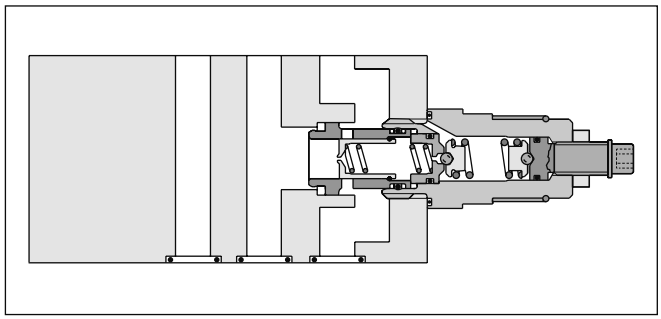
Features

- High flow capacity
- Pressure function in P, A, B or A + B
- Sizes
  ZDV01 - NG06 (CETOP3)
  ZDV02 - NG10 (CETOP5)

ZDV-P01



ZDV-B02



ZDV-B02

Ordering code

ZDV – ☐ ☐ – ☐ **S0** – **D** ☐

Pressure relief valve	Pressure control	Nominal size	Pressure stages	Hexagon screw with lock nut	Design series	Seal

Code	Size	Pressure control
P	NG06/10	P - T
A	NG06/10	A - T
B	NG06/10	B - T
AB	NG06/10	A - T & B - T
ABS	NG06/10	A - B & B - A

Code	Nominal size
01	NG06
02	NG10

Code	Seal
1	NBR
5	FPM

Code	Pressure stages
1	up to 70 bar
5 [1)]	up to 350 bar

[1)] Code ABS and size 10 up to 315 bar

Ordering code details see end of chapter.

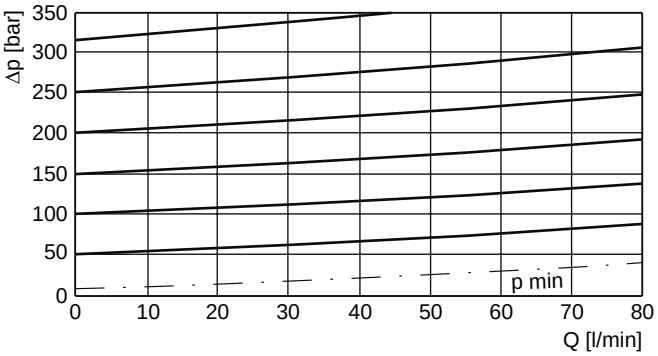
Technical data

General				
Size			NG06	NG10
Mounting interface			DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
			CETOP RP 121	
Mounting position			unrestricted	
Ambient temperature		[°C]	-20...+50	
$MTTF_D$ value		[years]	150	
Weight	1 cartridge	[kg]	1.6	3.0
	2 cartridges	[kg]	2.5	3.7
Hydraulic				
Max. operating pressure		[bar]	350 (ZDV-ABS 315)	315
Nominal flow		[l/min]	80	140
Fluid			Hydraulic oil as per DIN 51524...51525	
Fluid temperature		[°C]	-20...+80	
Viscosity	permitted	[cSt]/ [mm²/s]	10...650	
	recommended	[cSt]/ [mm²/s]	30	
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

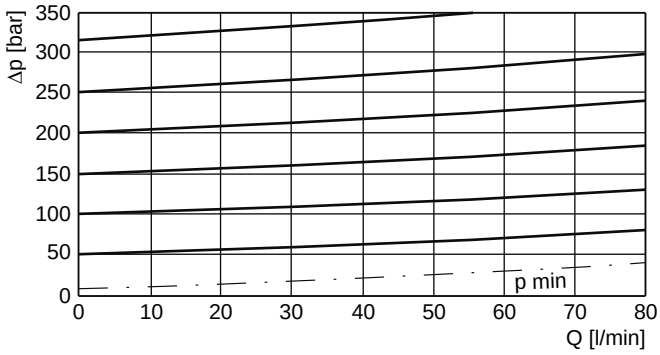
ZDV UK.INDD CM 07.09.11

p/Q performance curves

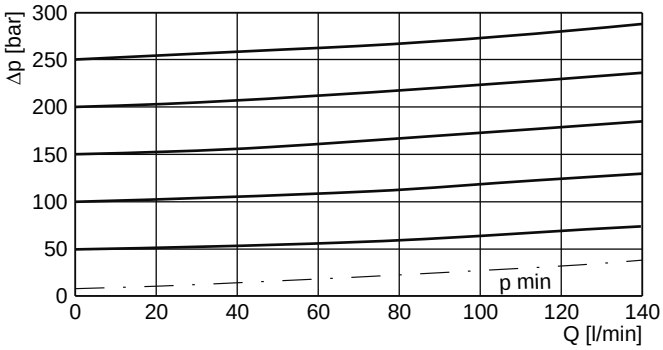
ZDV-P/A/B/ABS01



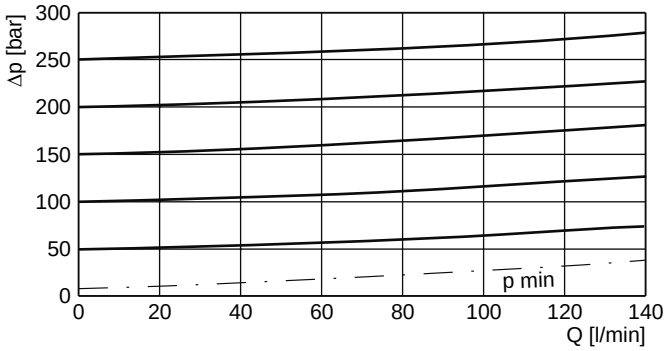
ZDV-AB01



ZDV-P/A/B/AB02



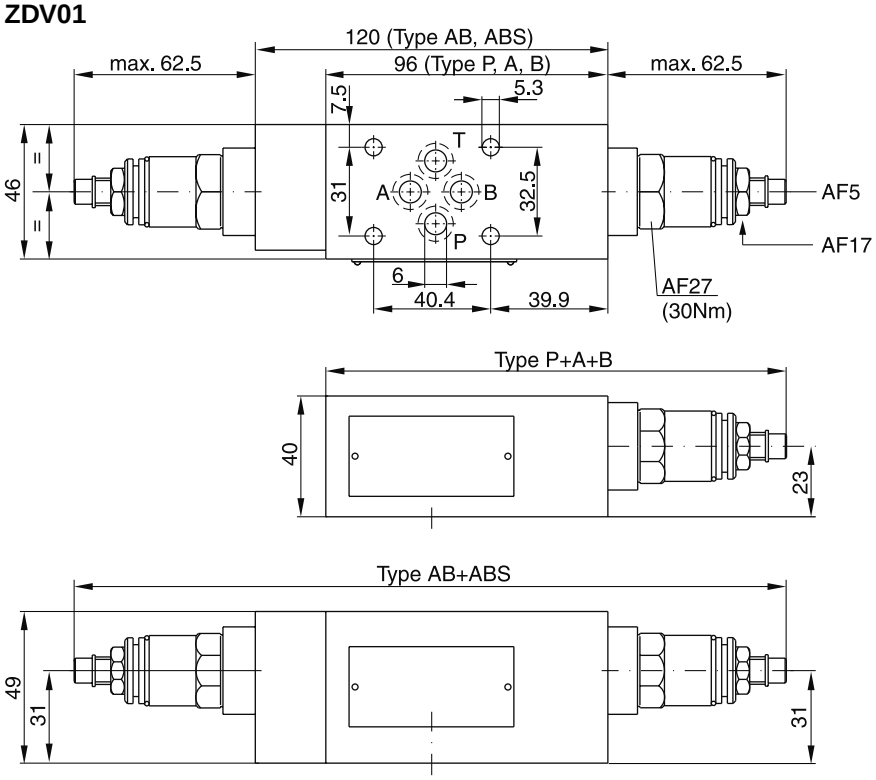
ZDV-ABS02



All characteristic curves measured with HLP46 at 50°C.

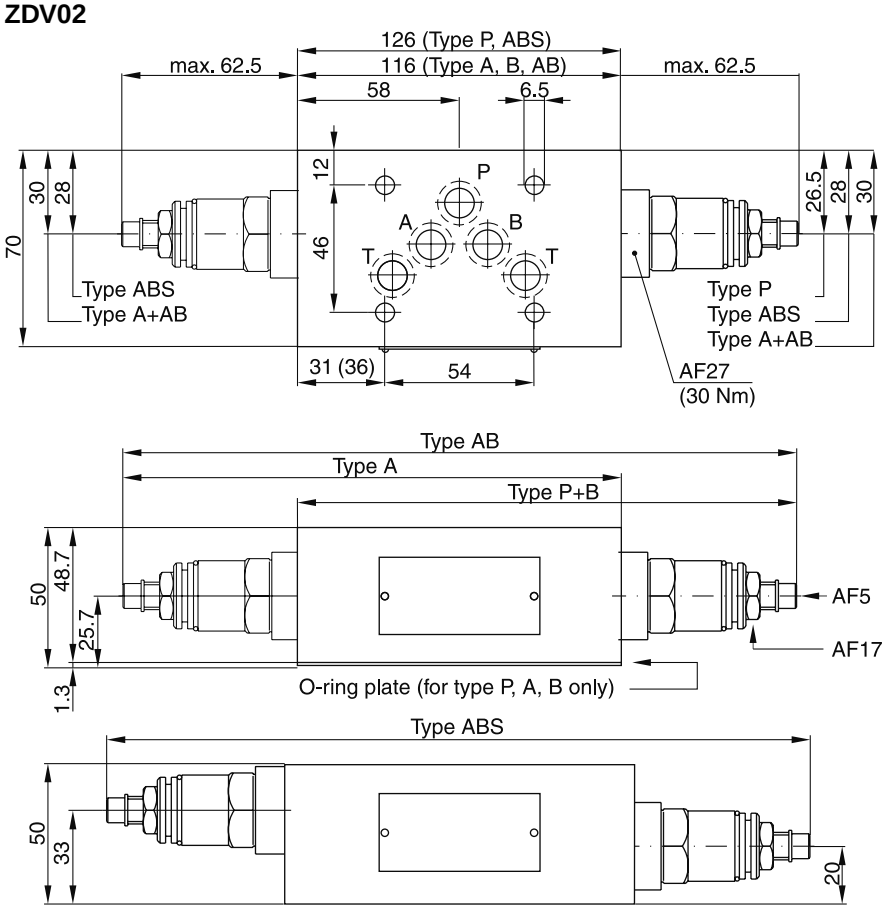
7

ZDV01



Seal kit	
Seal	Order code
1	098-91182-0
5	098-91183-0
Complete cartridge	
Pressure stage	Order code
1	098-91116-0
5	098-91117-0

ZDV02



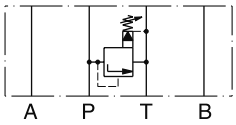
Seal kit	
Seal	Order code
1	098-91076-0
5	098-91077-0
Complete cartridge	
Pressure stage	Order code
1	098-91116-0
5	098-91117-0

7

ZDV UK.INDD CM 07.09.11

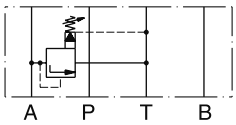
ZDV01

Pressure control P-T



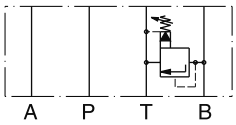
Series	Order No.
ZDV-P01-1-S0-D1	098-91201-0
ZDV-P01-5-S0-D1	098-91202-0

Pressure control A-T



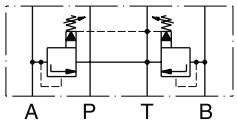
Series	Order No.
ZDV-A01-1-S0-D1	098-91203-0
ZDV-A01-5-S0-D1	098-91204-0

Pressure control B-T



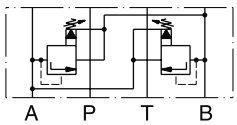
Series	Order No.
ZDV-B01-1-S0-D1	098-91205-0
ZDV-B01-5-S0-D1	098-91206-0

Pressure control A-T & B-T



Series	Order No.
ZDV-AB01-1-S0-D1	098-91207-0
ZDV-AB01-5-S0-D1	098-91208-0

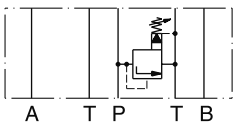
Pressure control A-B & B-A



Series	Order No.
ZDV-ABS01-1-S0-D1	098-91209-0
ZDV-ABS01-5-S0-D1	098-91210-0

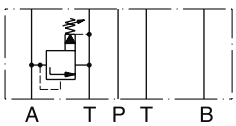
ZDV02

Pressure control P-T



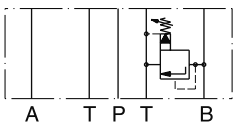
Series	Order No.
ZDV-P02-1-S0-D1	098-91034-0
ZDV-P02-5-S0-D1	098-91035-0

Pressure control A-T



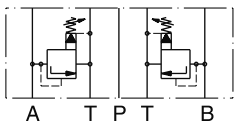
Series	Order No.
ZDV-A02-1-S0-D1	098-91036-0
ZDV-A02-5-S0-D1	098-91037-0

Pressure control B-T



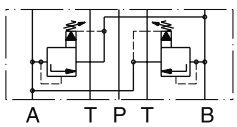
Series	Order No.
ZDV-B02-1-S0-D1	098-91038-0
ZDV-B02-5-S0-D1	098-91039-0

Pressure control A-T & B-T



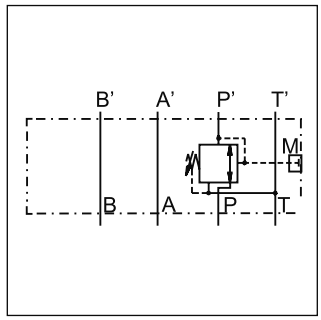
Series	Order No.
ZDV-AB02-1-S0-D1	098-91040-0
ZDV-AB02-5-S0-D1	098-91041-0

Pressure control A-B & B-A

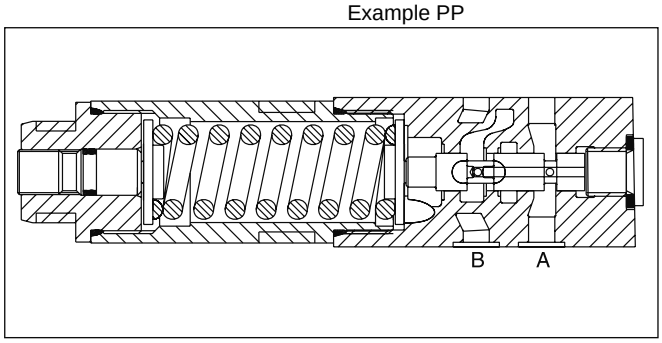


Series	Order No.
ZDV-ABS02-1-S0-D1	098-91042-0
ZDV-ABS02-5-S0-D1	098-91043-0

Series PRDM are direct operated pressure reducing valves to regulate pressure in one area of a hydraulic circuit at a predetermined level below normal system pressure. Additionally, an integral pressure relieving function for the secondary reduced pressure circuit is incorporated into the design.



Example PP



Funtion

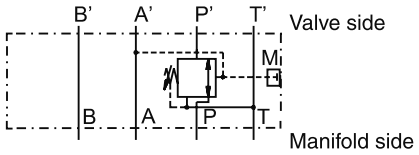
These valves are "normally open" devices that allow fluid to flow trough the controlled port during their non-actuated or "at rest" condition. When downstream pressure exceeds the value set by the spring force, the control piston moves off its seat, closing off the flow path and thus reducing the fluid passing through from the main system. The cushioned piston modulates to maintain the preset pressure in this branch of the hydraulic circuit. If, due to external forces, the pressure continues to rise in this branch circuit, the piston will keep moving against the spring force allowing fluid to be drained to the tank, thereby limiting maximum pressure to the valve's setting.

Features

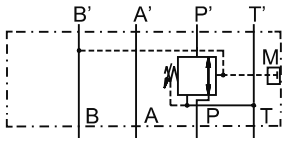
- 3-way design for pressure relieving of the secondary side
- The direct operated, cushioned piston design results in fast response, low leakage and minimal hysteresis.
- Reduced pressure in the 'P', 'A' or 'B' port.
- Pressure settings
- bar 25, 70, 160, 210, 350 for PRDM2,
- bar 19, 50, 100, 150, 210 for PRDM3.
- Gauge port
- PRDM2 - NG06 (CETOP 3)
  PRDM3 - NG10 (CETOP 5)

Schematics

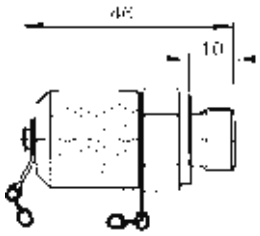
PRDM*AA



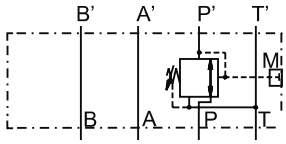
PRDM*BB



Gauge port option C

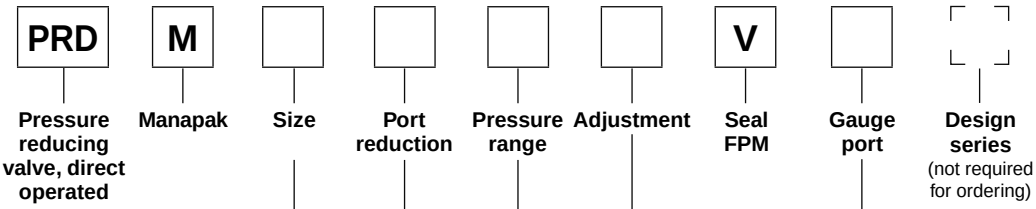


PRDM*PP



7

Ordering code



Code	Size
2	**NG06**
3	**NG10**

Code	Gauge port
G	**G¼**
C	Coupling M16

Code	Connection
PP	**P**
AA	**A**
BB	**B**

Code	Adjustment
S	**Hexagon socket**
L	Key lock
K	Turning knob [2]

[2] NG06 only

Pressure range [1]			
Code	PRDM2	Code	PRDM3
02	up to 25 bar	**01**	**up to 19 bar**
06	**up to 64 bar**	**05**	**up to 50 bar**
16	**up to 160 bar**	10	up to 100 bar
21	**up to 210 bar**	**15**	**up to 150 bar**
35	up to 350 bar	**21**	**up to 210 bar**

[1] For optimum performance it is recommended to use the appropriate pressure stage, e.g. for 150 bar reduced pressure use code 16 - 160 bar.

Bold letters =
Short-term availability

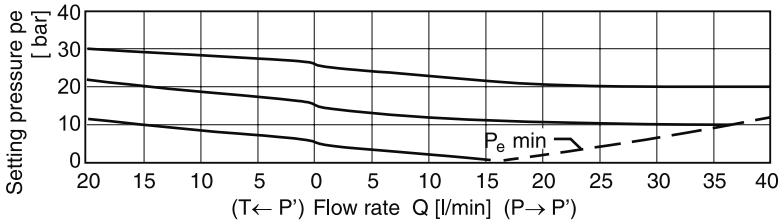
7

Technical data

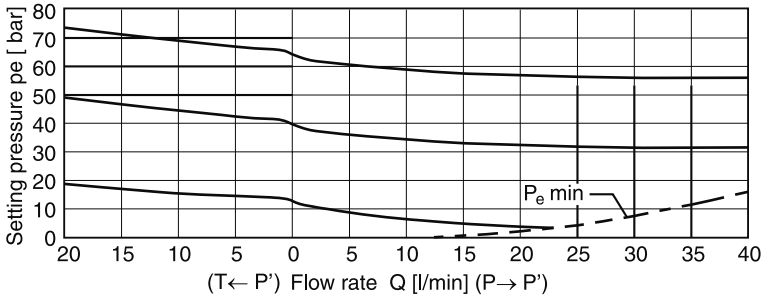
General			
Series		PRDM2	PRDM3
Size		NG06	NG10
Mounting interface		ISO 4401	
Ambient temperature	[°C]	-20...+50	
Weight	[kg]	1.3	2.6
$MTTF_D$ value	[years]	150	
Hydraulic			
Max. operating pressure	P, A, B	350	315
	T [bar]	50	50
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature	[°C]	-20...+80	
Viscosity range	[cSt] [mm²/s]	12...230	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

Max. leakage P - A: max. 15 ml/min

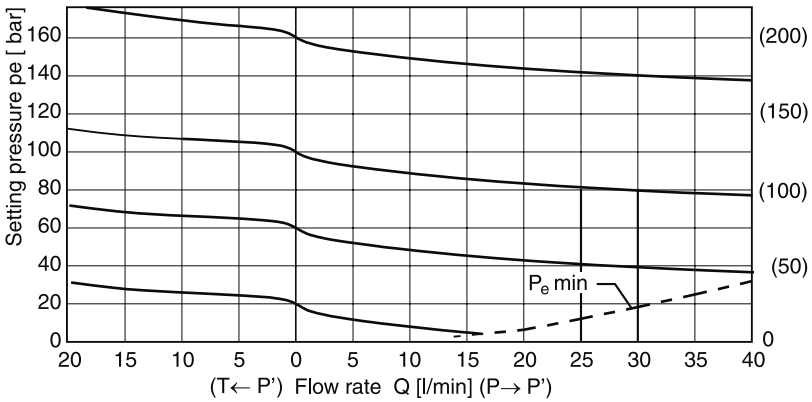
PRDM2 02



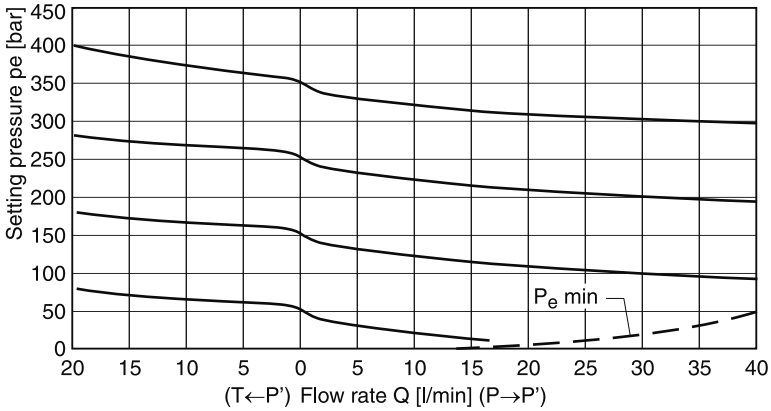
PRDM2 06



PRDM2 16/21



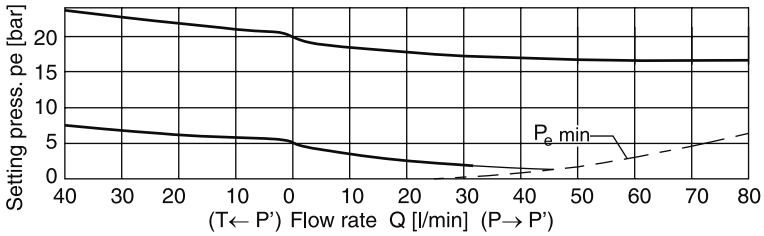
PRDM2 35



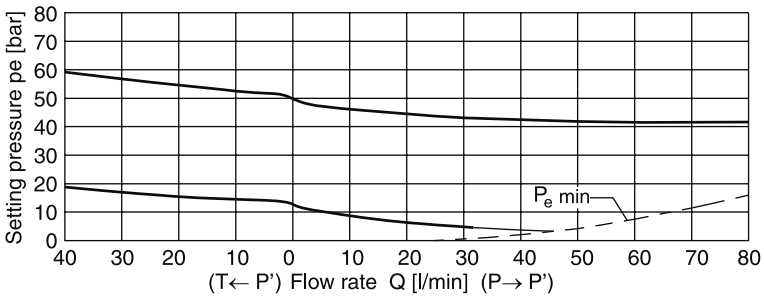
All characteristic curves measured with HLP46 at 50°C.

7

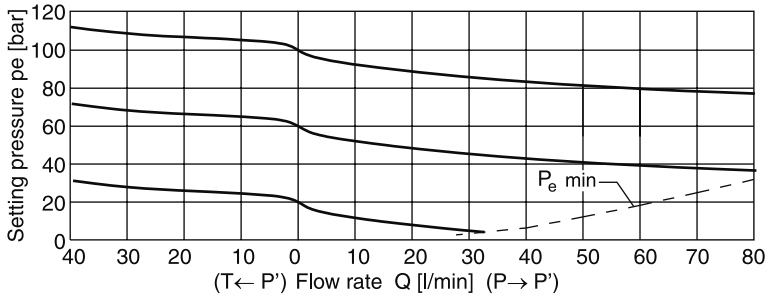
PRDM3 01



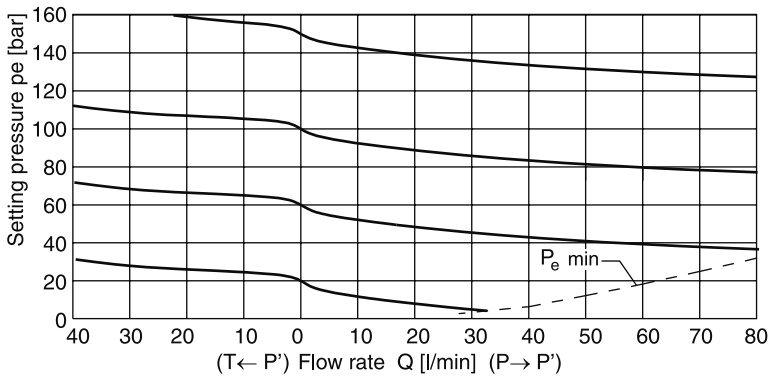
PRDM3 05



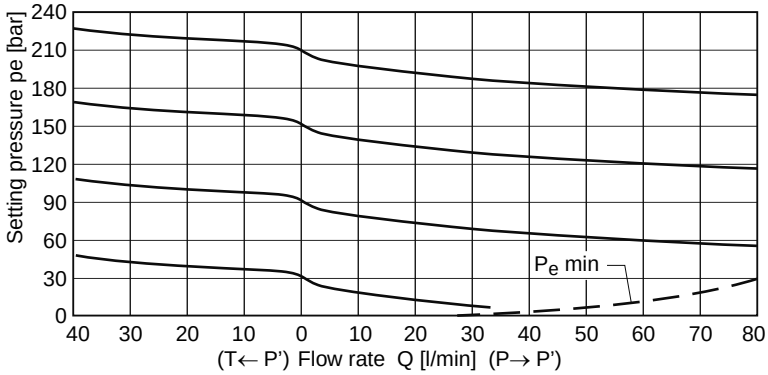
PRDM3 10



PRDM3 15

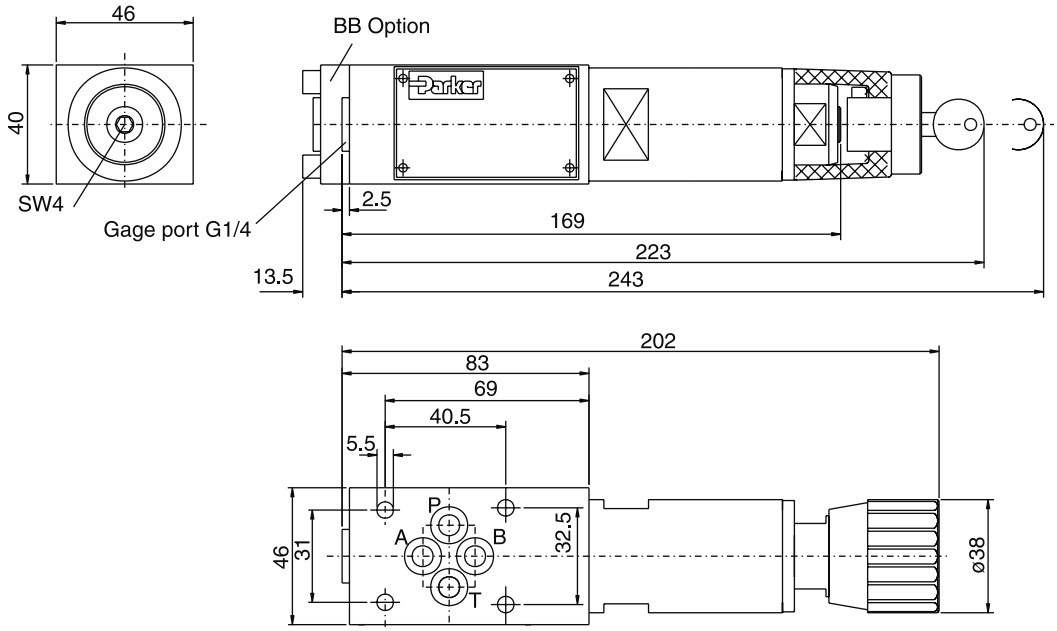


PRDM3 21

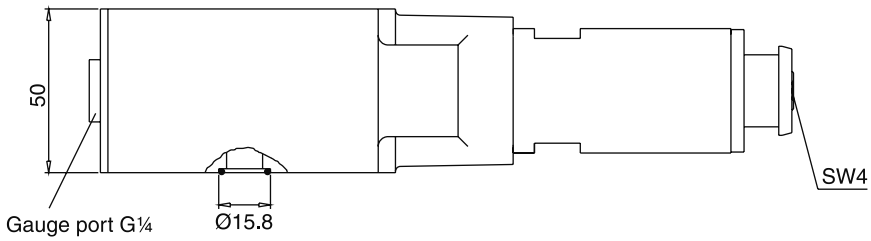


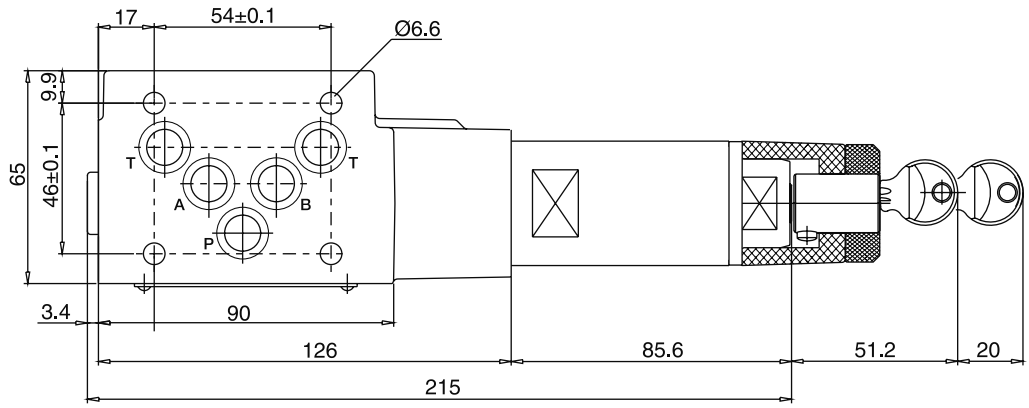
All characteristic curves measured with HLP46 at 50°C.

PRDM2



PRDM3





Seal kit order code		
Seal	PRDM2	PRDM3
V	SK-PRDM2-V	SK-PRDM3-V

Notes

The pilot operated pressure relief valves from the Parker Manapak series PRM are in sandwich design for easy configuration of stack systems. The reducing function is located in port P except for size NG10 (PRM3 AA and BB, see ordering code).

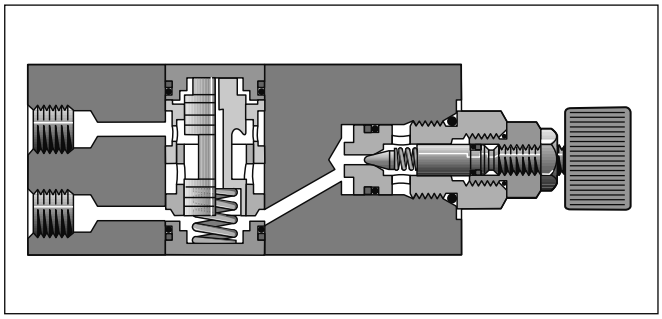
The pressure reduction for the desired connecting port is achieved by internal connections of the pilot and drain lines with the corresponding channels.

Features

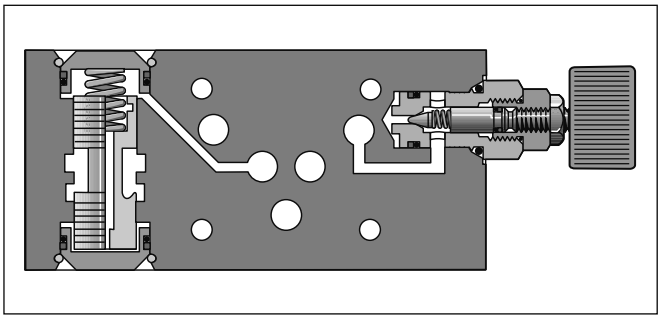
- The valve bodies of the Parker Manapak valve series PRM are made of steel.
- The control pressure range can be set by slotted head screw, knob, or knob with Key lock.
- Pressure gauge/measuring connections are available in the valve body.
- Piloting results in a flat p/Q performance curve.
- PRM3 - NG10 (CETOP 5)
  PRM4 - NG16 (CETOP 7)
  PRM6 - NG25 (CETOP 8)

PRM3PP

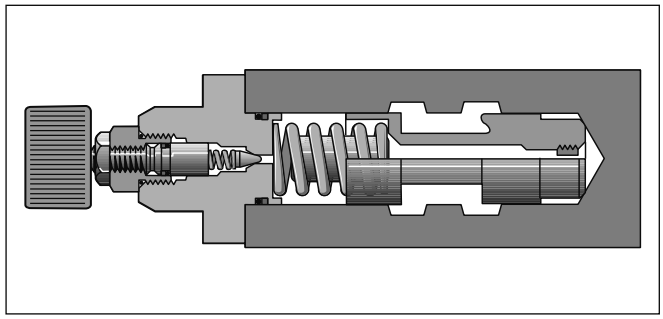
PRM6



PRM3PP



PRM3AA or PRM3BB

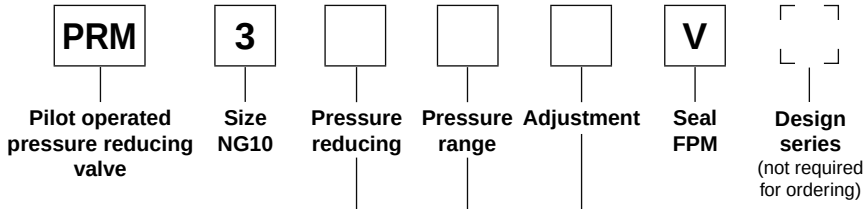


PRM4 and PRM6

7

Technical data

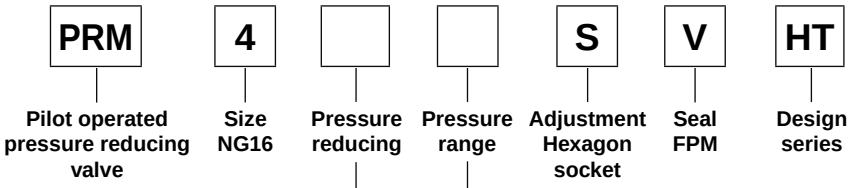
General				
Series		PRM3	PRM4	PRM6
Size		NG10	NG16	NG25
Mounting interface		ISO 4401		
Ambient temperature	[°C]	-20...+50		
Weight	[kg]	2.7	5.0	5.6
$MTTF_D$ value	[years]	75		
Hydraulic				
Max. operating pressure	[bar]	350	350	250
Pressure reduction in channel		P, A, B	P	P, A
Fluid		Hydraulic oil according to DIN 51524...51525		
Fluid temperature	[°C]	-20...+80		
Viscosity range	[cSt] / [mm²/s]	20...380		
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)		



Code	Connection
PP	P
AA	A
BB	B

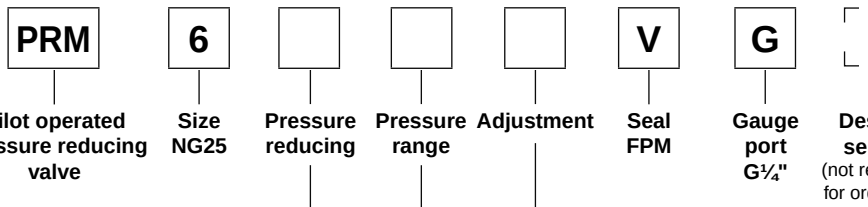
Code	Adjustment
S	**Hexagon socket**
L	Key lock
K	Turning knob

Code	Pressure range
07	4 to 70 bar
17	**10 to 175 bar**
25	**10 to 250 bar**
35	10 to 350 bar



Code	Pressure reducing
PP	Reducing in port P
PA	Reducing in port A
PB	Reducing in port B

Code	Pressure range
07	4 to 70 bar
25	**10 to 250 bar**
35	10 to 350 bar



Code	Connection
PA	P
AP	A

Code	Adjustment
L	Key lock
K	Turning knob

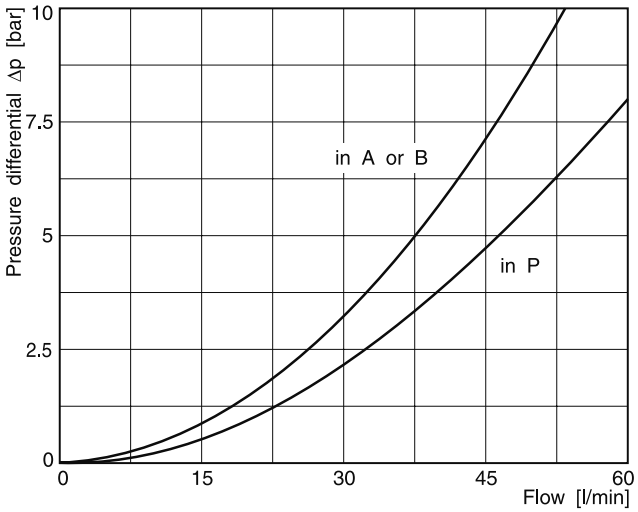
Code	Pressure range
07	10 to 70 bar
17	**10 to 175 bar**
25	**10 to 250 bar**

Bold letters =
Short-term availability

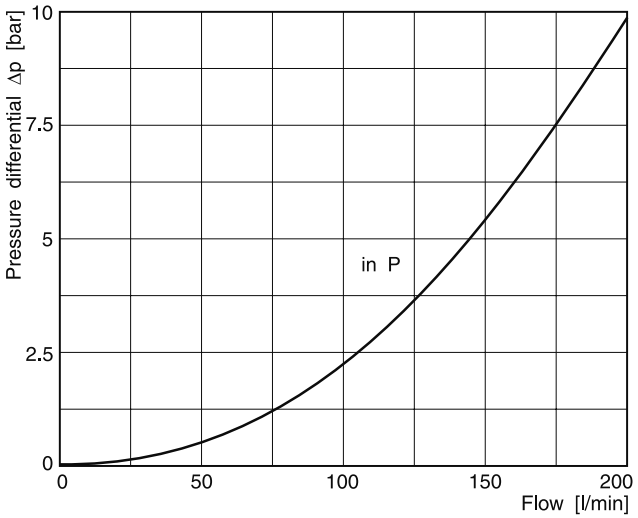
PRM UK.INDD CM 07.09.11

Δp/Q performance curves

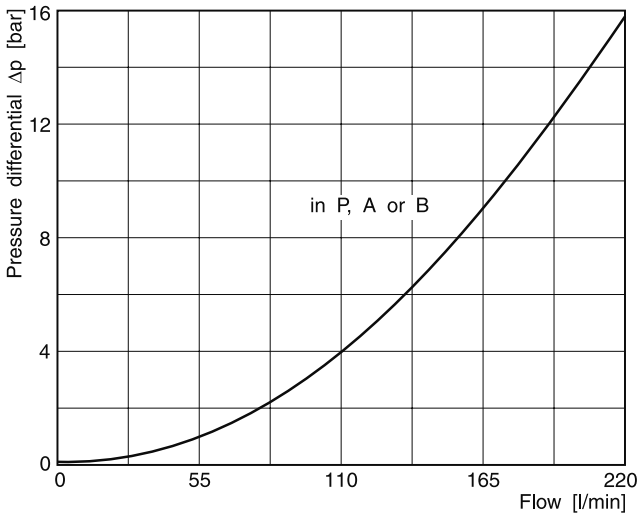
PRM3



PRM4



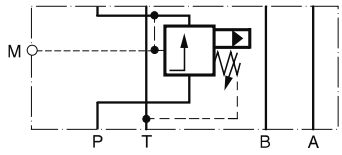
PRM6



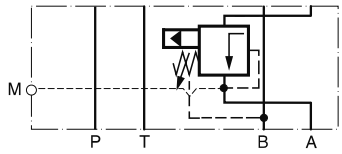
All characteristic curves measured with HLP46 at 50°C.

Schematics

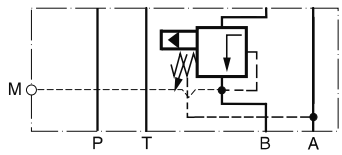
PRM3PP



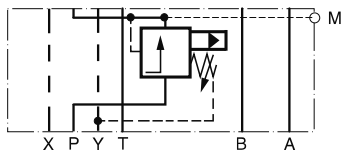
PRM3AA



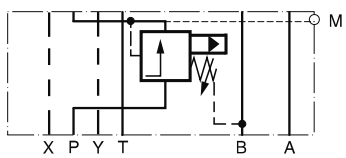
PRM3BB



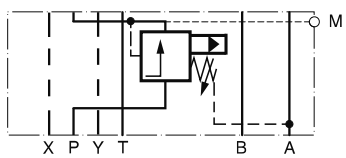
PRM4PP
PRM4PA
PRM6PA



PRM6AP



PRM4PB

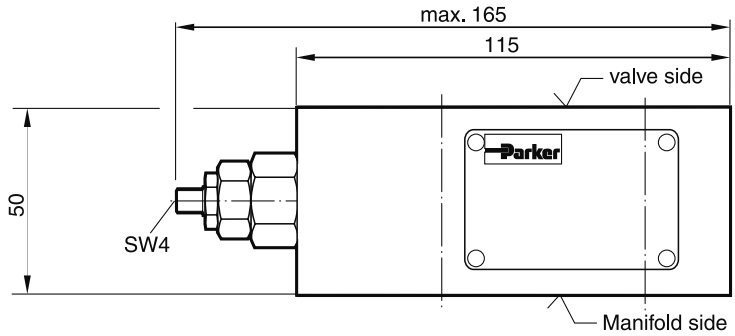


7

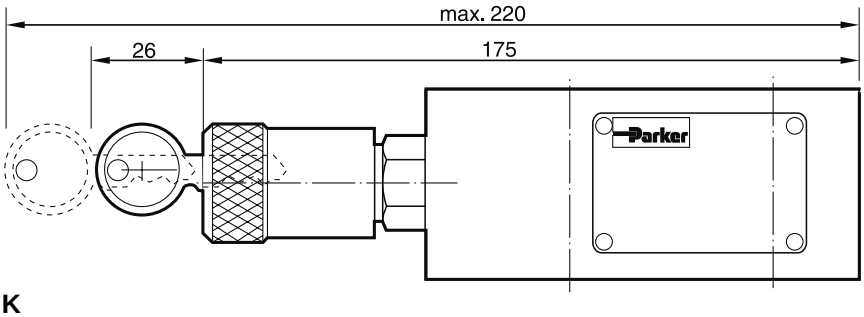
PRM UK.INDD CM 07.09.11

PRM3PP

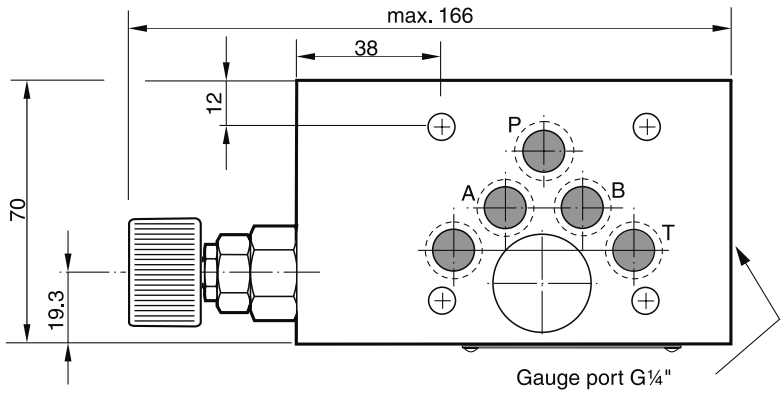
Adjustment code S



Adjustment code L



Adjustment code K



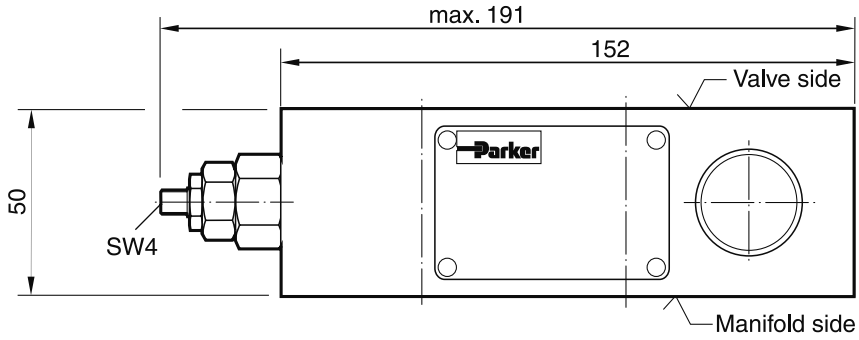
Seal kit PRM3PP	
Seal	Order code
V	SK-PRM3-V-30

Note:

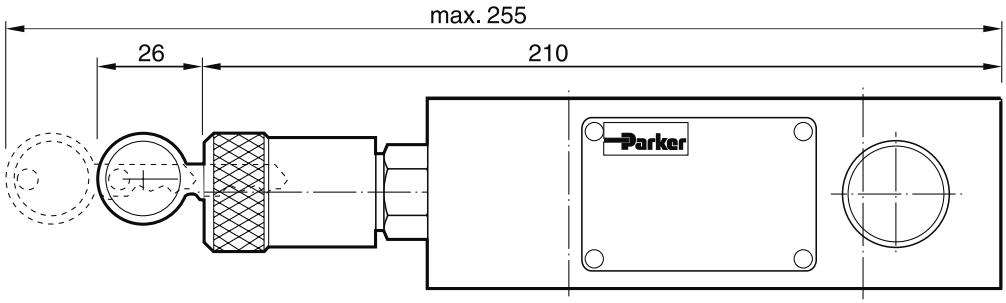
The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

PRM3AA

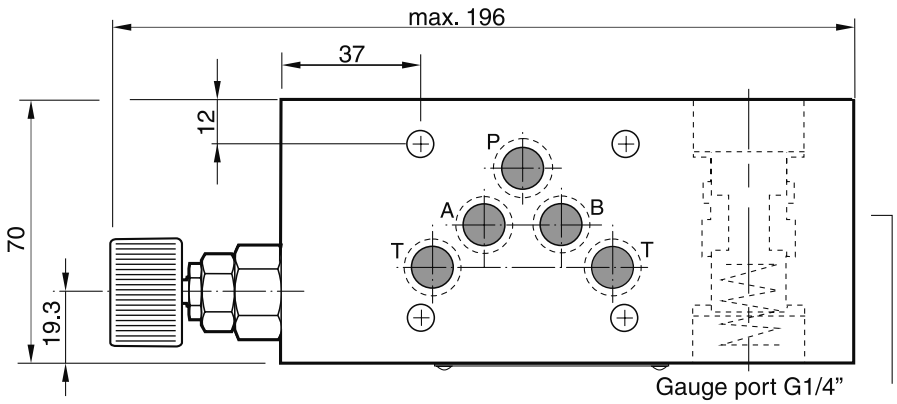
Adjustment code S



Adjustment code L



Adjustment code K



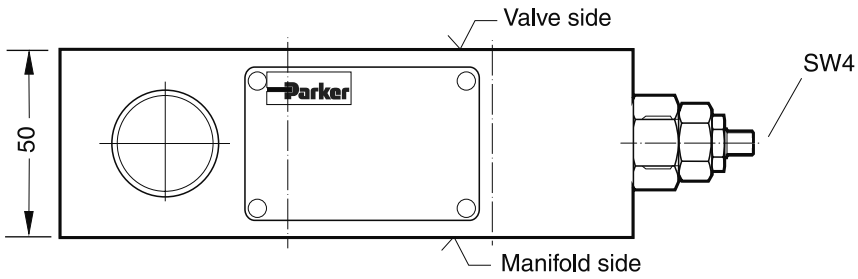
Seal kit PRM3AA	
Seal	Order code
V	SK-PRM3-V-11

Note:

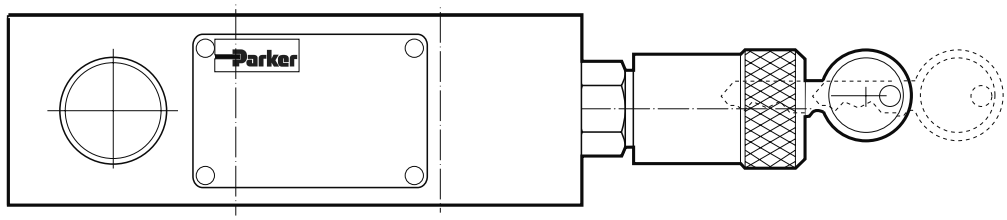
The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

PRM3BB

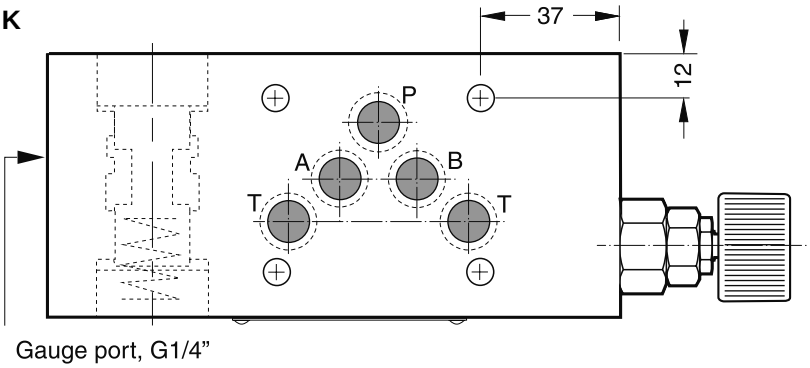
Adjustment code S



Adjustment code L



Adjustment code K



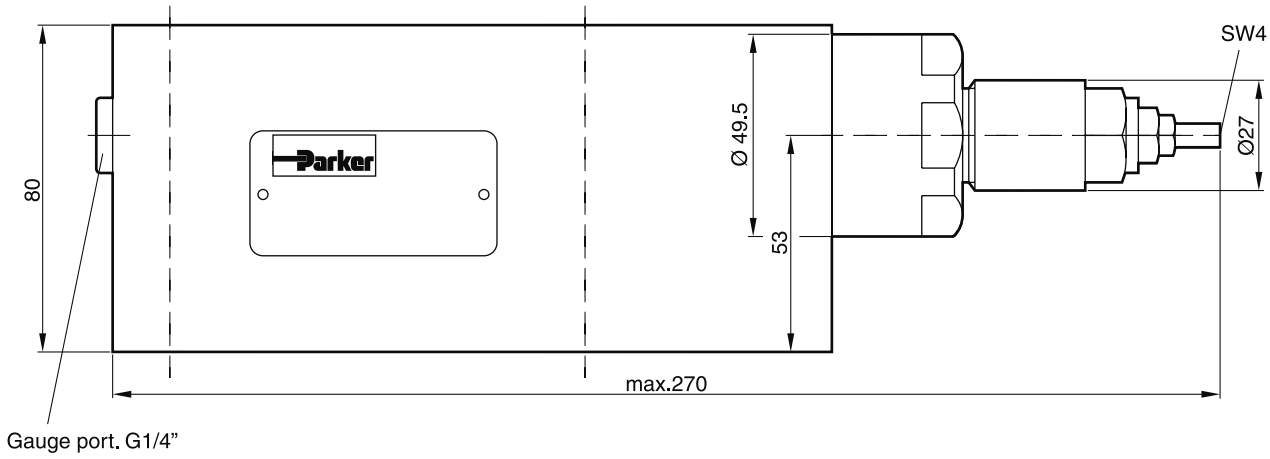
Seal kit PRM3BB	
Seal	Order code
V	SK-PRM3-V-11

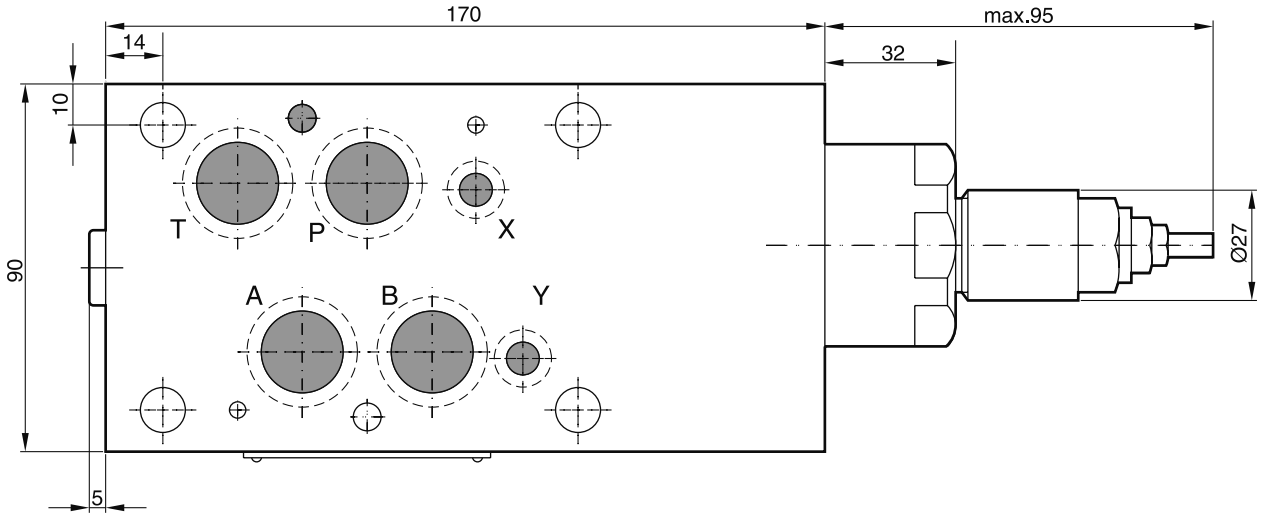
Note:

The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

PRM4PP

Adjustment code S





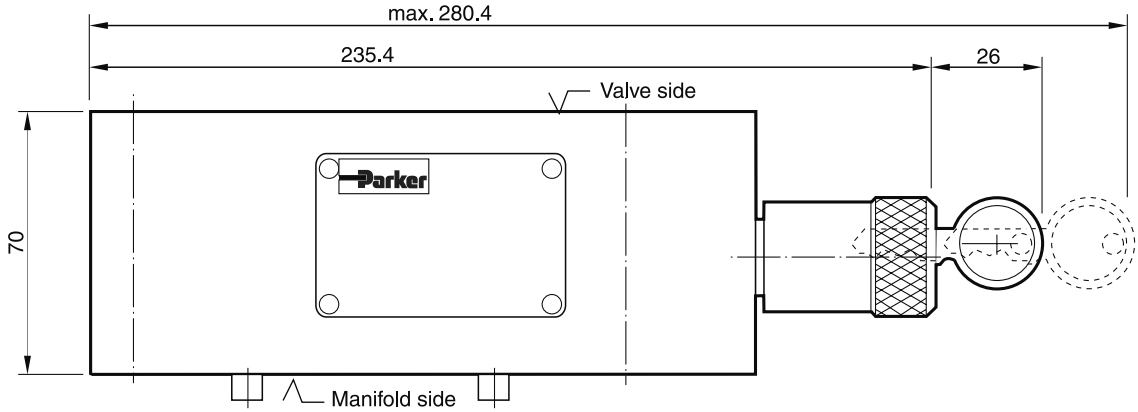
Seal kit PRM4	
Seal	Order code
V	SK-PRM4-V-10

Note:

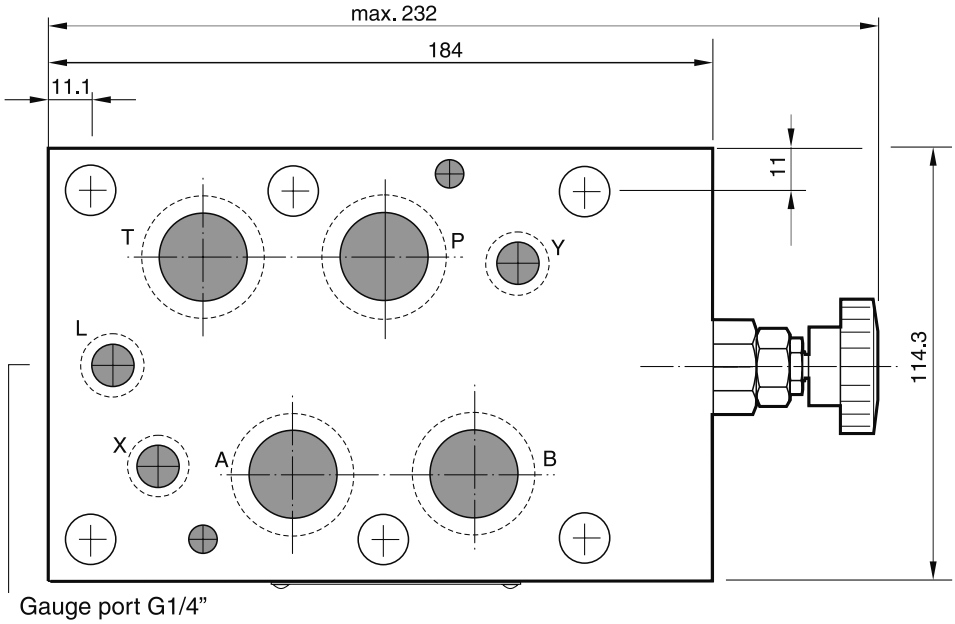
The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

PRM6

Adjustment code L



Adjustment code K



Seal kit PRM6	
Seal	Order code
V	SK-PRM6-V-25

Note:

The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

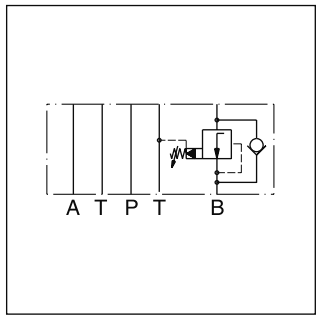
Pilot operated pressure reducing valves series ZDR are designed for maximum flow rates.

The reducing function can be located in the ports P, A or B. The sizes NG06 and NG10 are equipped with an integral return flow check valve (reducing function in A or B).

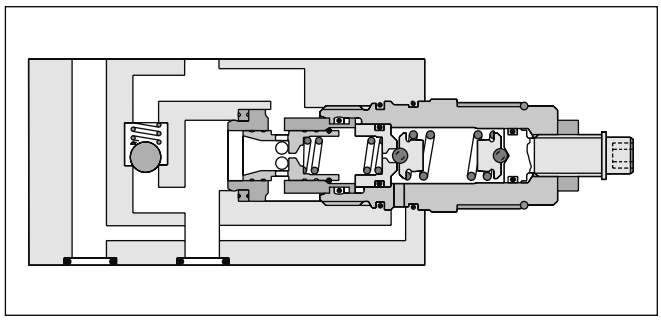
Features

- High flow capacity
- Pressure function in P, A or B
- With integral return flow check valve
- Sizes
  ZDR01 - NG06 (CETOP3)
  ZDR02 - NG10 (CETOP5)

ZDR-P01



ZDR-B02



ZDR-B02

Ordering code

ZDR	–	☐	☐	–	☐	S0	–	D	☐
Pilot operated pressure reducing valve		Pressure control	Nominal size		Pressure stages	Hexagon screw with lock nut		Design series NG06/10	Seal

Code	Size	Pressure control
P	NG06/10	Pressure reducing in P with pressure gauge port M
AR	NG06/10	Pressure reducing in A with check valve
BR	NG06/10	Pressure reducing in B with check valve

Code	Nominal size
01	NG06
02	NG10

Code	Seal
1	NBR
5	FPM

Code	Pressure stages
1	up to 70 bar
5 [1)]	up to 350 bar

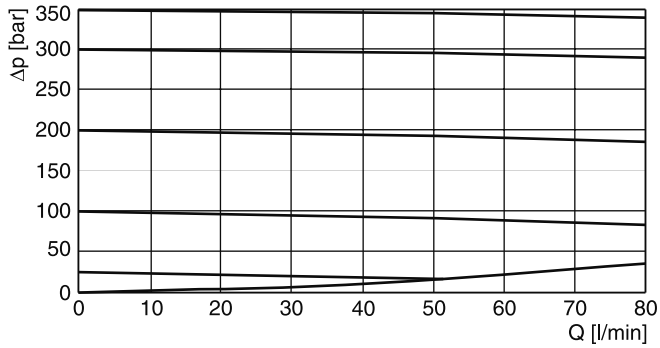
[1)] Code AR, BR and size 10 up to 315 bar

Ordering code details see end of chapter.

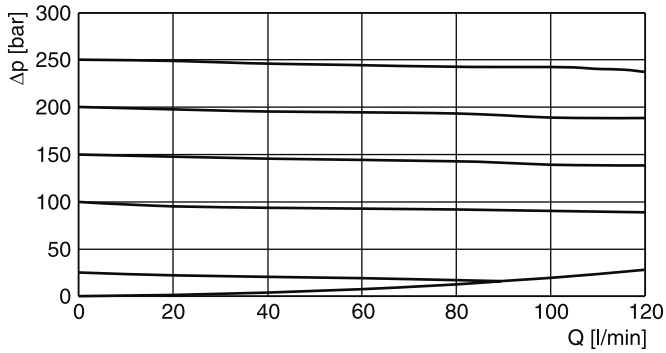
General				
Size			NG06	NG10
Mounting interface			DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
			CETOP RP 121	
Mounting position			unrestricted	
Ambient temperature		[°C]	-20...+50	
$MTTF_D$ value		[years]	150	
Weight	ZDR-P	[kg]	1.6	2.9
	ZDR-AR / BR	[kg]	1.8	3.0
Hydraulic				
Max. operating pressure		[bar]	350 (ZDR-AR / BR 315)	315
Nominal flow		[l/min]	80	120
Pilot oil		[l/min]	0.3	0.3
Fluid			Hydraulic oil according to DIN 51524...51525	
Fluid temperature		[°C]	-20...+80	
Viscosity	permitted	[cSt] / [mm^2/s]	10...650	
	recommended	[cSt] / [mm^2/s]	30	
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

p/Q performance curves

ZDR-P/AR/BR01

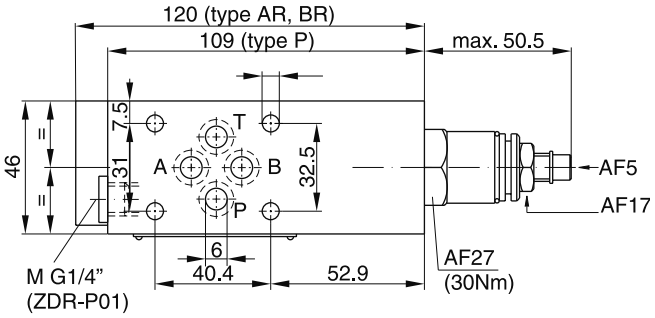


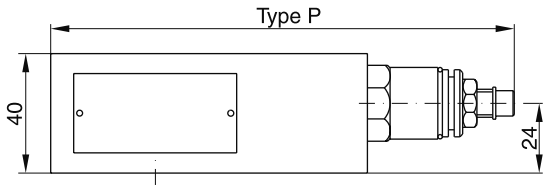
ZDR-P/AR/BR02

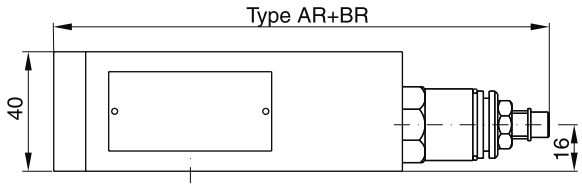


All characteristic curves measured with HLP46 at 50°C.

ZDR01

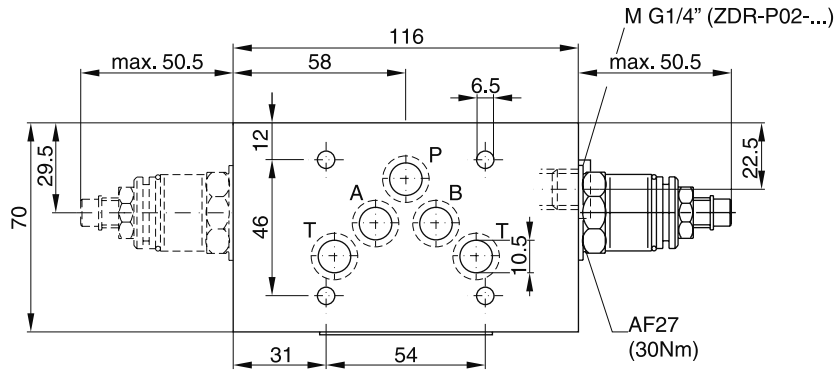


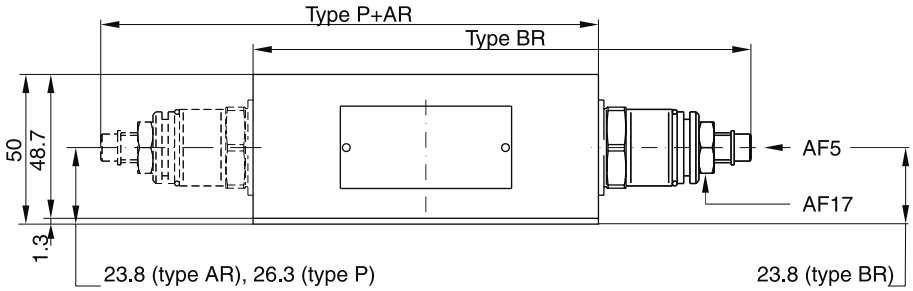




Seal kit	
Seal	Order code
1	098-91184-0
5	098-91185-0
Complete cartridge	
Pressure stage	Order code
1	098-91102-0
5	098-91103-0

ZDR02

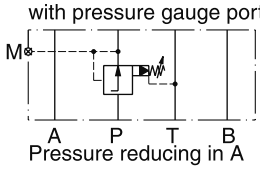




Seal kit	
Seal	Order code
1	098-91182-0
5	098-91183-0
Complete cartridge	
Pressure stage	Order code
1	098-91102-0
5	098-91103-0

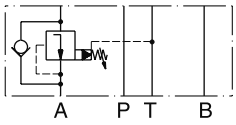
ZDR01

Pressure reducing in P
with pressure gauge port M



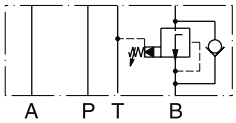
Series	Order No.
ZDR-P01-1-S0-D1	098-91179-0
ZDR-P01-5-S0-D1	098-91211-0

Pressure reducing in A
with check valve



Series	Order No.
ZDR-AR01-1-S0-D1	098-91212-0
ZDR-AR01-5-S0-D1	098-91213-0

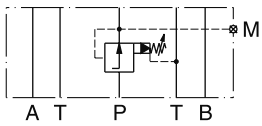
Pressure reducing in B
with check valve



Series	Order No.
ZDR-BR01-1-S0-D1	098-91214-0
ZDR-BR01-5-S0-D1	098-91215-0

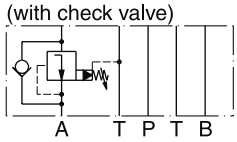
ZDR02

Pressure reducing at P
(with pressure gauge port M)



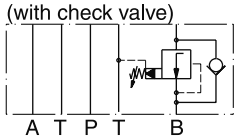
Series	Order No.
ZDR-P02-1-S0-D1	098-91050-0
ZDR-P02-5-S0-D1	098-91051-0

Pressure reducing at A
(with check valve)



Series	Order No.
ZDR-AR02-1-S0-D1	098-91052-0
ZDR-AR02-5-S0-D1	098-91053-0

Pressure reducing at B
(with check valve)



Series	Order No.
ZDR-BR02-1-S0-D1	098-91054-0
ZDR-BR02-5-S0-D1	098-91055-0

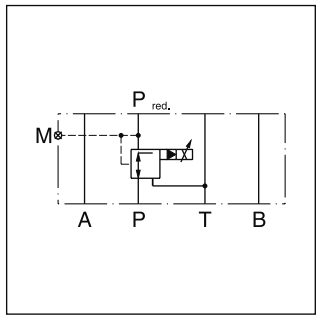
7

Proportional pressure reducing valves keep a constant pressure p_{red} on the secondary side - independent of pressure fluctuations on the primary side. The integrated pressure relief function obviates the need for an additional pressure relief valve on the secondary side and reliefs to tank, if the reduced pressure rises above the setting pressure.

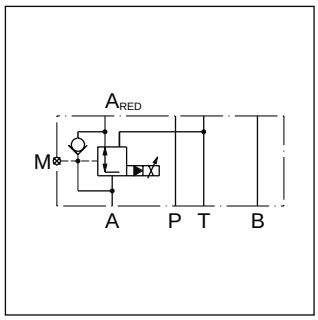
The proportional pressure reducing valve reduces the pressure in output port p_{red} in proportion to the solenoid current. The PRPM works practically independent of the inlet pressure. In non-activated mode, the connection to the tank is fully open with a min. pressure corresponding to the spring force.

The gauge port is connected to the secondary side. Types A and B have an integrated bypass check valve. The PRPM provides optimum performance in combination with a digital amplifier module PCD00A-400.

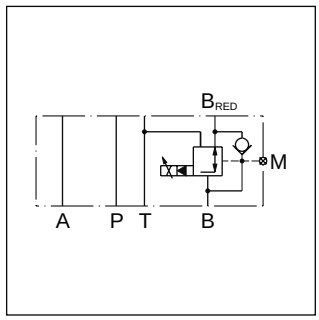
PRPM2PP



PRPM*PP



PRPM*AA



PRPM*BB

7

Ordering code

PRP	M				K	V
Proportional pressure reducing valve	Manapak	Nominal size	Reducing port	Pressure stage	Solenoid voltage 12V, 1250mA	Seal FPM

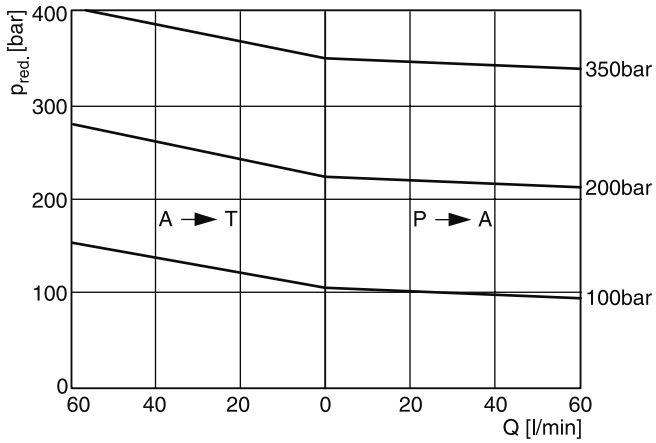
Code	Nominal size
2	NG06
3	NG10

Code	Port
AA	A
BB	B
PP	P

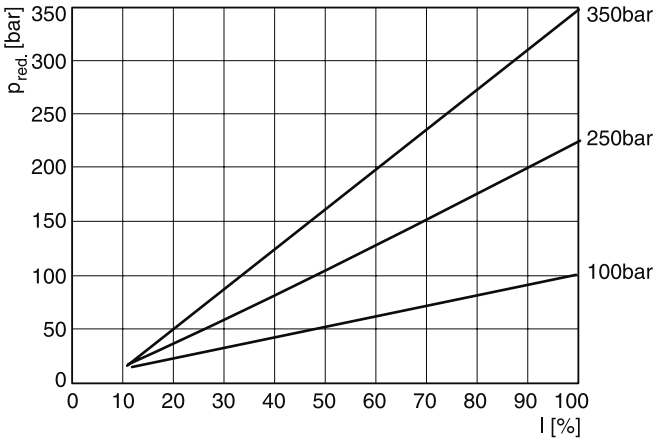
Code	Pressure stage [bar]
10	100
20	200
35	350

General			
Design		pilot operated proportional pressure reducing valve	
Construction		sandwich type	
Operation		proportional solenoid	
Size		NG06	NG10
Mounting interface		ISO 4401	
Mounting position		unrestricted	
Ambient temperature	[°C]	-20 ... +50	
$MTTF_D$ value	[years]	75	
Weight	[kg]	2.0	3.2
Hydraulic			
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature	[°C]	-20 ... +80	
Viscosity range	[cSt] / [mm²/s]	12 to 320	
Max. operating pressure	[bar]	350	
Reduced nom. pressure	[bar]	100; 200; 350	
Max. Flow	[l/min]	60	60
Pilot Flow		see performance curves	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	
Resolution	[mA]	1 mA	
Repeatability	[%]	≤1 (with optimal dither signal)	
Hysteresis	[%]	≤4 (with optimal dither signal)	
Electrical			
Solenoid		proportional solenoid, wet-pin push type, pressure tight	
Duty ratio	[%]	100 ED	
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)	
Supply voltage	[V]	12 (1320mA)	
Solenoid connection		Connector as per EN 175301-803	
Amplifier		PCD00A-400	

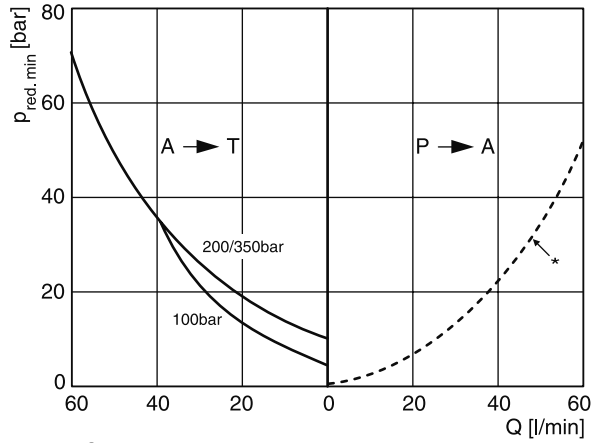
Pressure/flow NG06/NG10



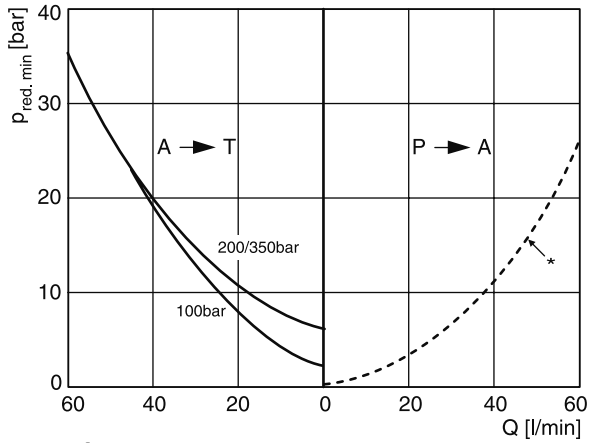
Pressure/adjustment at Q=0l/min (static)



Pressure/flow NG06 (min. adjustable)

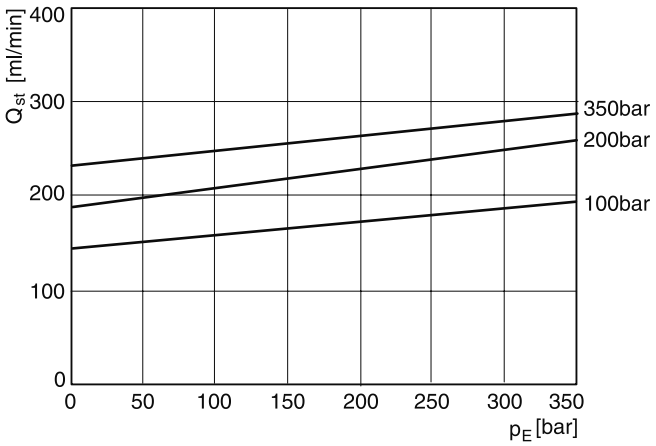


* Consumption resistance depends on system

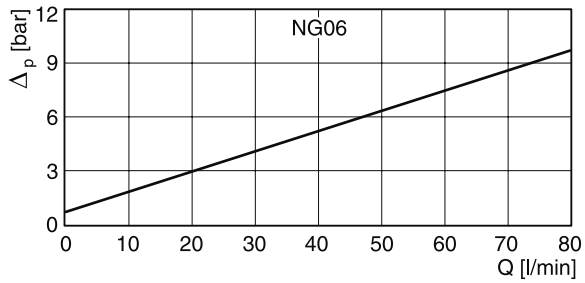


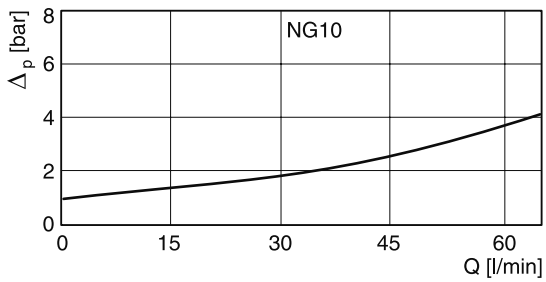
* Consumption resistance depends on system

Pilot flow NG06/NG10



Pressure drop/flow over check valve

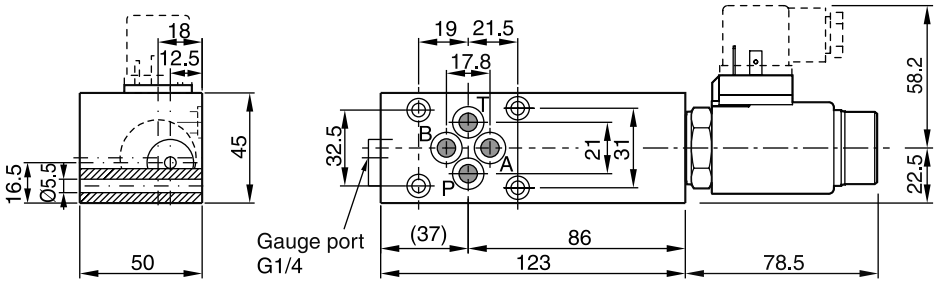




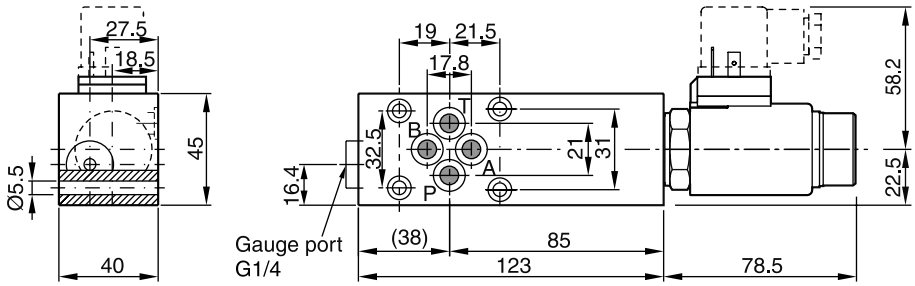
All characteristic curves measured with HLP46 at 50°C.

7

PRPM2AA*, BB**

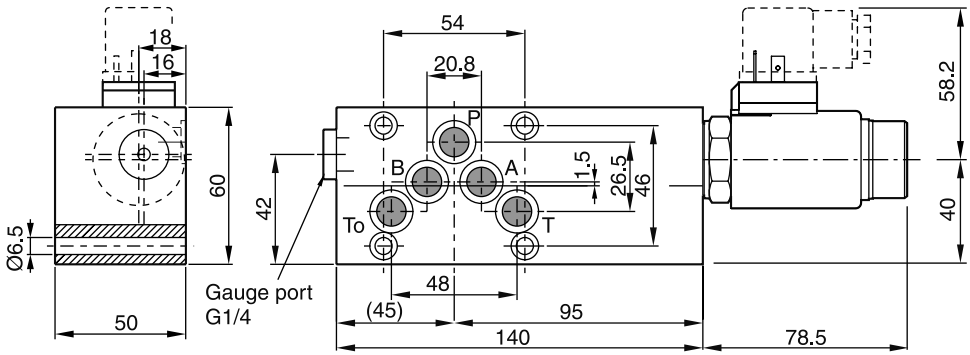


PRPM2PP*

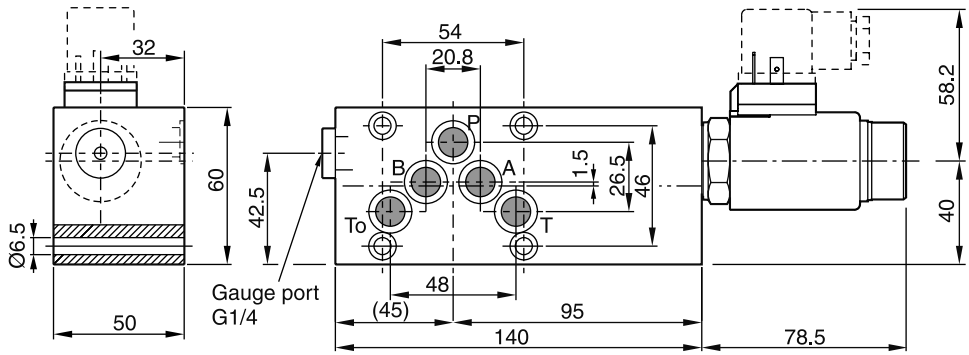


7

PRPM3AA*, BB**



PRPM3PP*

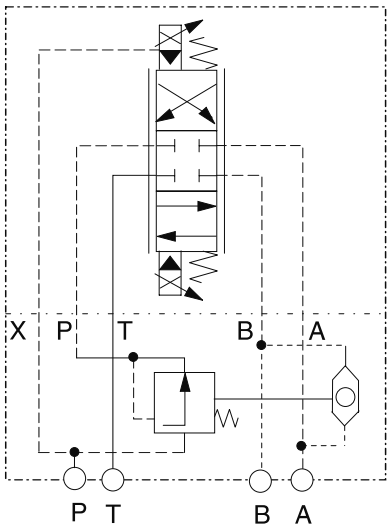


2-way pressure compensators series LCM are sandwich plate valves designed for stacking beneath a proportional directional control valve with a standardised mounting pattern.

The valve maintains a constant pressure differential between ports P and A or P and B across the directional valve. When the cross sectional opening of the directional valves is held steady, a constant flow rate is achieved, regardless of consumer load fluctuations.

The control pressure applied to the spring side of the compensator spool is supplied from port A or B via a shuttle valve. Flow rate regulation is automatically effective in the port with the highest pressure.

Application example



Proportional DC valve model D31FB with 2 way pressure compensator LCM3 maintains a constant flow rate.

The diagram shows the design according to code X.

7

Ordering Code

LCM		PP		02	V	
Pressure compensator	**Size**	**Control connection**	**Pilot oil**	**Differential pressure 10 bar**	**Seal FPM**	**Design series** (not required for ordering)

Code	Size
2	NG06
3	NG10

Code	Pilot oil
omit	internal
X [1]	external

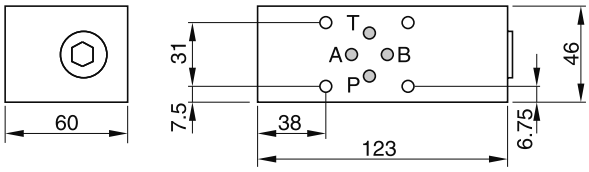
[1] NG10 only

Technical data

General			
Series		LCM2	LCM3
Size		NG06	NG10
Mounting interface		NFPA D03 CETOP 3	NFPA D05 CETOP 5
Ambient temperature	[°C]	-20...+50	
$MTTF_D$ value	[years]	150	
Hydraulic			
Max. operating pressure	[bar]	350	350
Pressure differential	[bar]	10	10
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature	[°C]	-20...+80	
Viscosity range	[cSt] / [mm²/s]	12...230	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

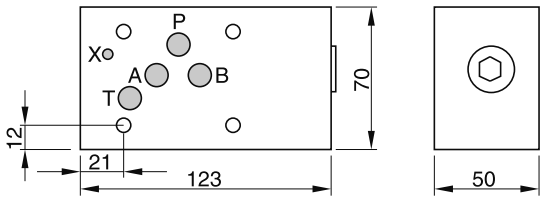
Dimensions

LCM2



Mounting screws: BK 403 (4 x M5 x 90)
For mounting screws connected with the directional valves D1 or D31.

LCM3



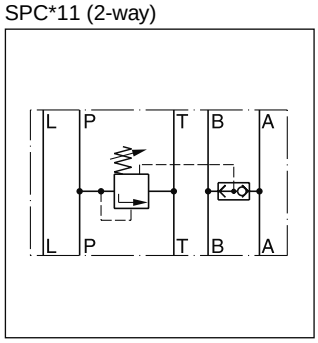
Mounting screws: BK 412 (4 x M6x 90)
The views show the mounting surface for the directional valve.

The sandwich type pressure compensators series SPC are typically used in combination with proportional directional control valves. The compensator keeps the pressure drop over the directional valve constant and thus provides load-independent flow to the actuator.

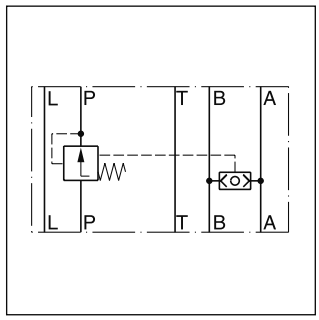
Features

- 2-way or 3-way pressure compensators
- Standard pressure differential 5 bar
- Adjustable differential (2...5 bar) and 10 bar - optional
- SPC01 - NG06 (CETOP 3)
  SPC02 - NG10 (CETOP 5)
  SPC03 - NG16 (CETOP 7)
  SPC06 - NG25 (CETOP 8)

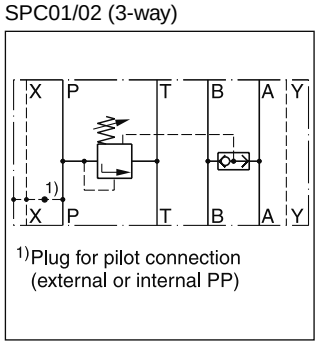
SPC*11 (2-way)



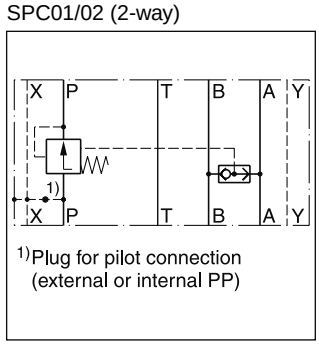
SPC01/02 (3-way)



SPC01/02 (2-way)



SPC03/06 (3-way)



SPC03/06 (2-way)

7

Technical data

General						
Design			Direct operated pressure compensator			
Size			NG06	NG10	NG16	NG25
Mounting interface			DIN 24340 A6 ISO 4401 NFPA D03 CETOP 03	DIN 24340 A10 ISO 4401 NFPA D05 CETOP 05	DIN 24340 A16 ISO 4401 NFPA D07 CETOP 07	DIN 24340 A25 ISO 4401 NFPA D08 CETOP 08
Mounting position			unrestricted			
Ambient temperature		[°C]	-20...+50			
$MTTF_D$ value		[years]	150			
Weight	2-way pressure compensator	[kg]	1.5	3.1	8.3	11.9
	3-way pressure compensator	[kg]	1.6	3.5	8.3	11.9
Hydraulic						
Max. operating pressure	drain port L connected	[bar]	P, A, B: 350; T: 210; L: 10	P, A, B: 315; T: 210; L: 10	–	–
	without drain port	[bar]	P, A, B: 350; T: 160; L: 160	P, A, B: 315; T: 210; L: 210	P, A, B, X: 350; T, Y: 105	P, A, B, X: 350; T, Y: 105
Nominal flow		[l/min]	30	80	200	400
Fluid			Hydraulic oil according to DIN 51524...51525			
Fluid temperature		[°C]	-20...+80			
Viscosity	permitted	[cSt] / [mm^2/s]	10...650			
	recommended	[cSt] / [mm^2/s]	30			
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)			

SPC UK.INDD CM 14.07.11

SPC01/02

SPC				1	C	5	A	
Direct operated pressure compensator	Nominal size	Function	Pressure differential	Circuit type	Load sensing port	Steel body	Design series	Seal

Code	Nominal size
01	NG06
02	NG10

Code	Function
01	3-way pressure compensation
11	2-way pressure compensation

Code	Pressure differential
04 [1]	2...5 bar adjustable
05	5 bar
10 [1]	10 bar

Code	Seal
1	NBR
5	FPM

[1] for 3-way compensator only

SPC01

Type	Model no.	Order no.
3-way compensators with shuttle valve P-A/B	SPC 01 01 041C5A	026-42583-0
	SPC 01 01 051C5A	026-42584-0
	SPC 01 01 101C5A	026-42585-0
2-way compensators with shuttle valve P-A/B	SPC 01 11 051C5A	026-42560-0

SPC02

Type	Model no.	Order no.
3-way compensators with shuttle valve P-A/B	SPC 02 01 041C5A	026-42589-0
	SPC 02 01 051C5A	026-42590-0
	SPC 02 01 101C5A	026-42591-0
2-way compensators with shuttle valve P-A/B	SPC 02 11 051C5A	026-42566-0

7

SPC03/06

SPC					C	B	
Direct operated pressure compensator	Nominal size	Function	Pilot connection	Pressure differential	Load sensing port	Design series	Seal

Code	Nominal size
03	NG16
06	NG25

Code	Function
01	3-way pressure compensation
11	2-way pressure compensation

Code	Pressure differential
05	5 bar (Standard)
10	10 bar

Code	Pilot connection
P	internal pilot pressure
X	external pilot pressure

Code	Seal
1	NBR
5	FPM

SPC03

Type	Model no.	Order no.
3-way compensator with shuttle valve P-A/B	SPC 03 01 P05CB1	S26-59683-0
	SPC 03 01 X05CB1	S26-59709-0
2-way compensator with shuttle valve P-A/B	SPC 03 11 P05CB1	S26-59682-0
	SPC 03 11 P10CB1	S26-59677-0
	SPC 03 11 X05CB1	S26-59710-0
	SPC 03 11X10CB1	S26-59882-0

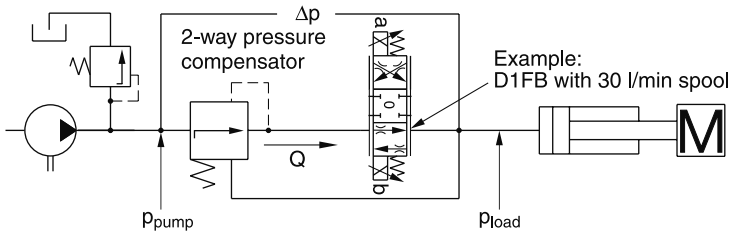
SPC06

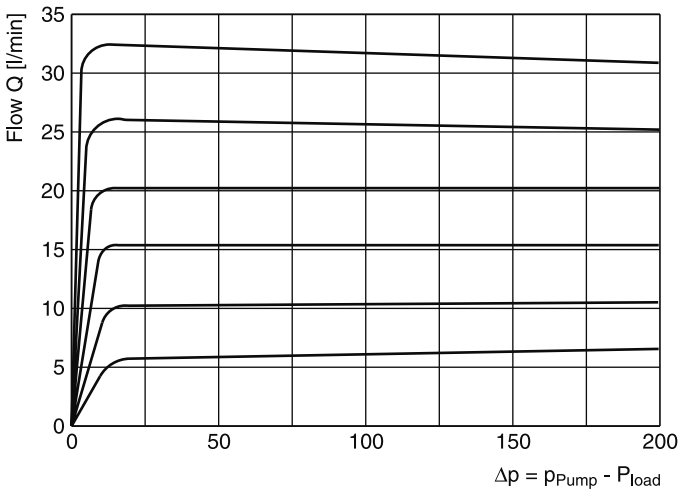
Type	Model no.	Order no.
3-way compensator with shuttle valve P-A/B	SPC 06 01 P05CB1	S26-59685-0
	SPC 06 01 X05CB1	S26-59808-0
2-way compensator with shuttle valve P-A/B	SPC 06 11 P05CB1	S26-59684-0
	SPC 06 11 P10CB1	S26-59678-0
	SPC 06 11 X05CB1	S26-59711-0
	SPC 06 11 X10CB1	S26-59884-0

SPC UK.INDD CM 14.07.11

SPC01

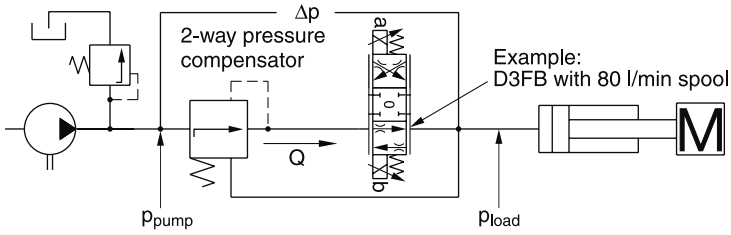
Flow regulation example: 2-way pressure compensator at Δp = 5 bar

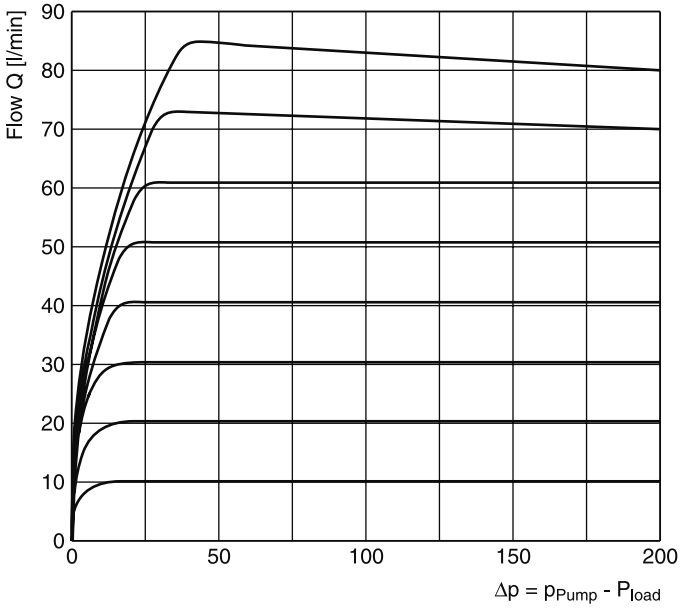




SPC02

Flow regulation example: 2-way pressure compensator at Δp = 5 bar



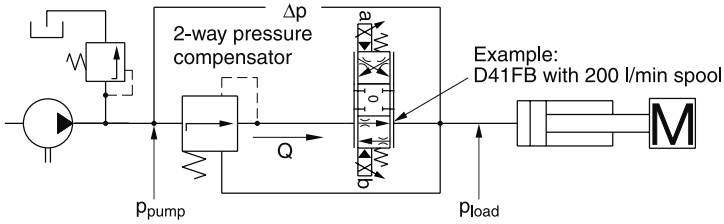


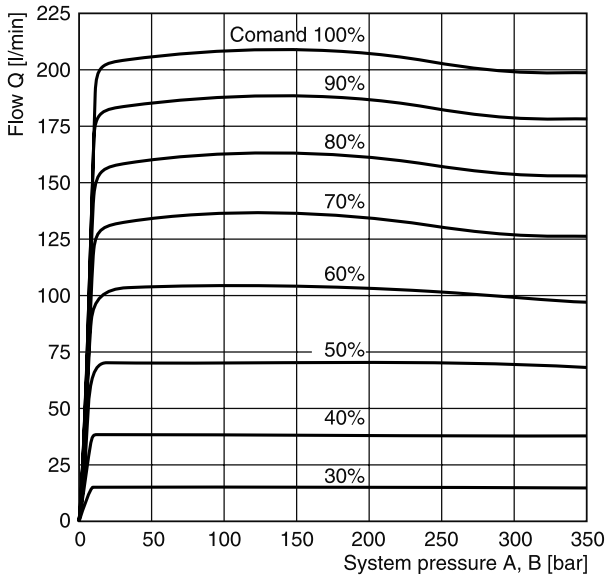
All characteristic curves measured with HLP46 at 50°C.

7

SPC03

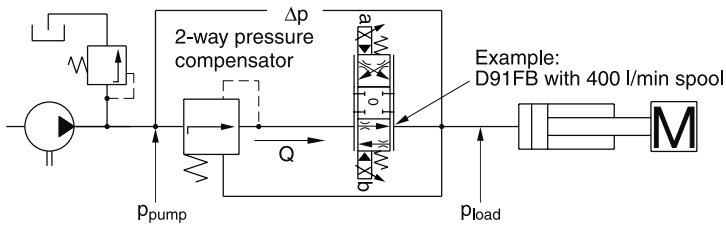
Flow regulation example: 2-way pressure compensator at Δp = 5 bar

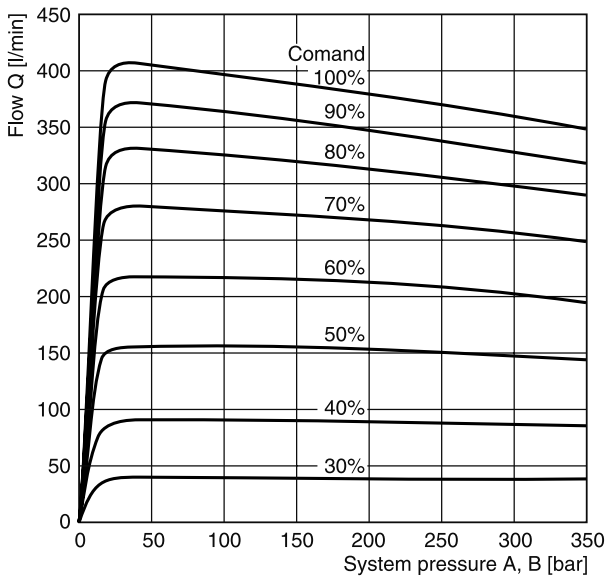




SPC06

Flow regulation example: 2-way pressure compensator at Δp = 5 bar

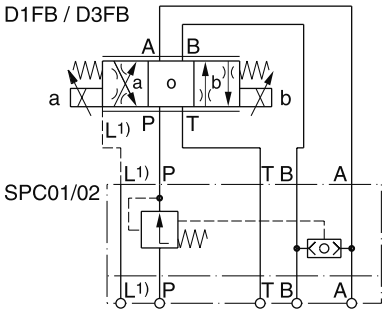




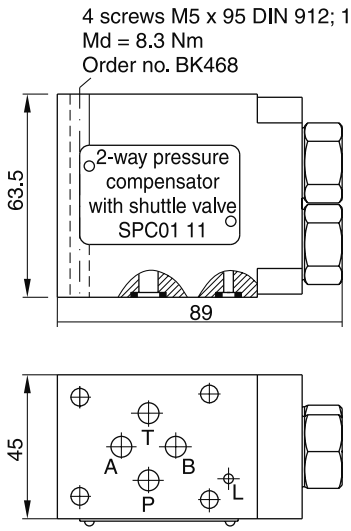
All characteristic curves measured with HLP46 at 50°C.

7

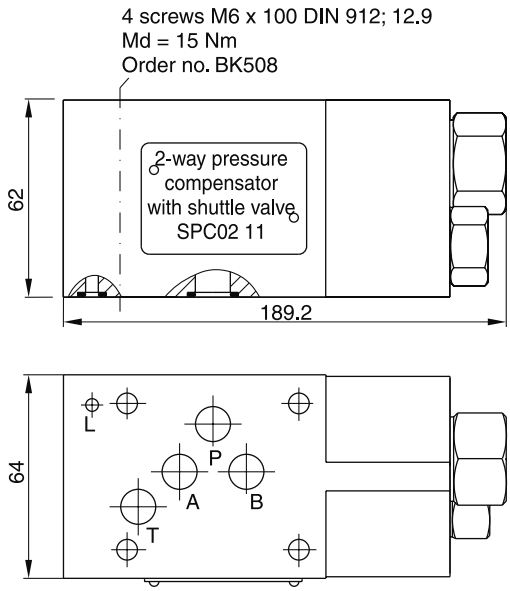
2-way pressure compensator



SPC01



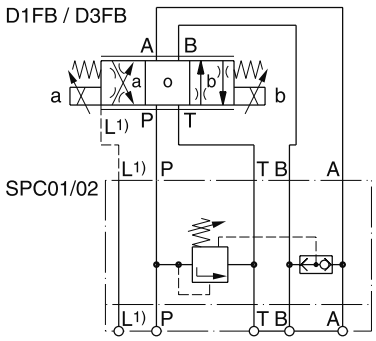
SPC02



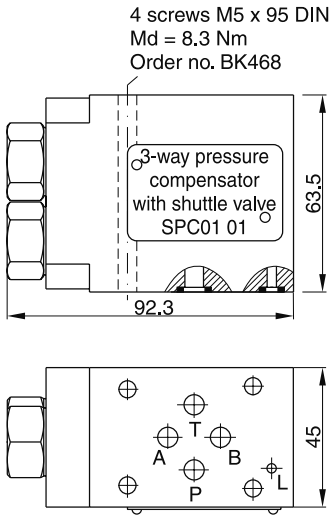
1) Always connect L to tank when
SPC01 T > 160 bar
SPC02 T > 210 bar

7

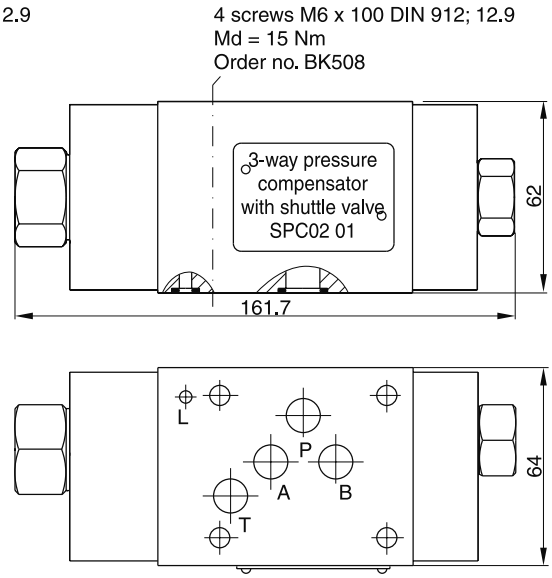
3-way pressure compensator



SPC01

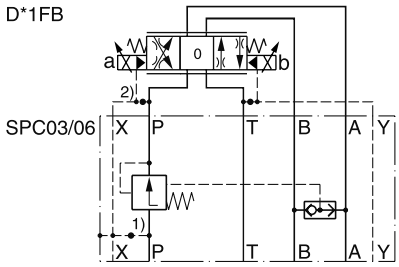


SPC02



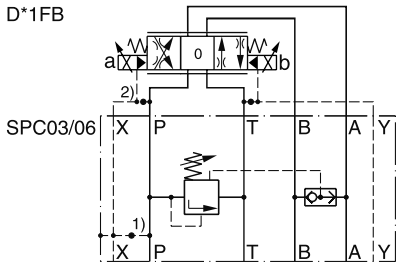
1) Always connect L to tank when
SPC01 T > 160 bar
SPC02 T > 210 bar

2-way pressure compensator



2)Plug in PX (obligatory for the use with pressure compensator)
1)Plug for pilot connection (external or internal PP)

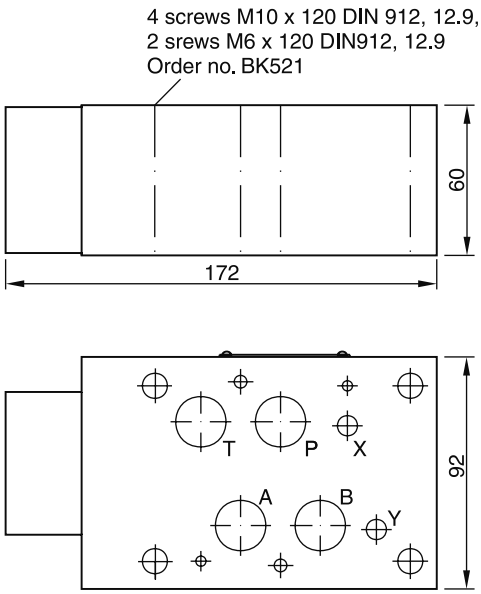
3-way pressure compensator



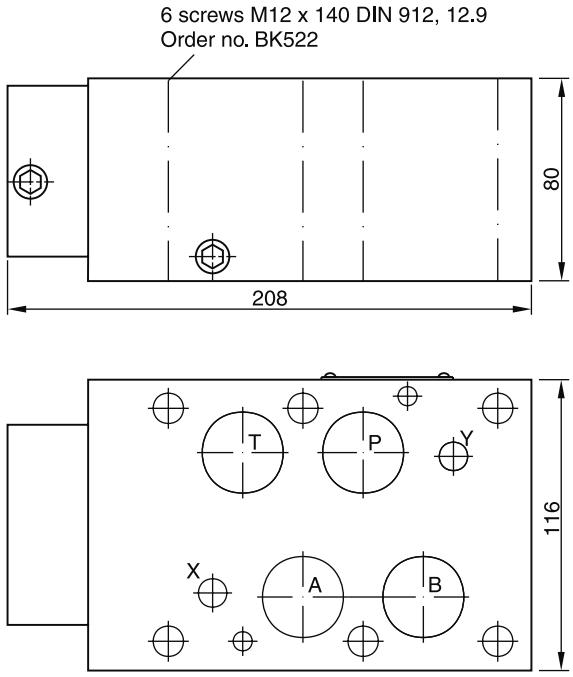
2)Plug in PX (obligatory for the use with pressure compensator)
1)Plug for pilot connection (external or internal PP)

7

SPC03



SPC06



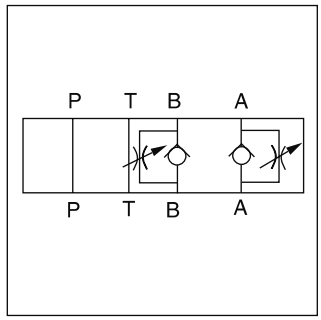
SPC UK.INDD CM 14.07.11

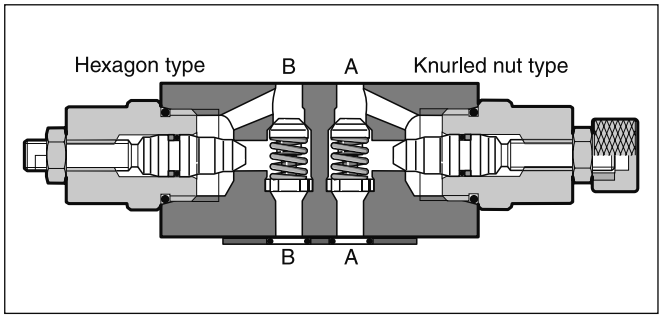
Double-throttle check valves from the Parker Manapak series FM are in sandwich design for easy configuration of stack systems. Throttle and check valves are located in ports A and B.

FM2 and FM3 can be used as meter-in or meter-out throttle by changing the mounting position.

FM4 can be selected by ordering code as meter-in or meter-out throttle. FM6 is only available as meter-out control.

The throttle check valve can also be used to influence the switching time of pilot operated directional valves. In this case, the valve is positioned between the pilot stage (CETOP03, NG06) and the main stage (CETOP05, NG10 up to CETOP10, NG32).





Features

- Two types of metering needle design can be selected when ordering FM2 and FM3 valves to achieve the throttle characteristics required to suit the application.
- Large bypass check valves allow high flow at low pressure drop.
- NG06 - FM2 (CETOP 3)
  NG10 - FM3 (CETOP 5)
  NG16 - FM4 (CETOP 7)
  NG25 - FM6 (CETOP 8)

7

Technical data

General					
Series		FM2	FM3	FM4	FM6
Size		NG06	NG10	NG16	NG25
Mounting interface		NFPA D03 CETOP 03	NFPA D05 CETOP 05	NFPA D07 CETOP07	NFPA D08 CETOP 08
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+50			
$MTTF_D$ value	[years]	150			
Weight	[kg]	1.3	2.4	5.4	7.9
Hydraulic					
Max. operating pressure	[bar]	350	350	350	210
Max. Flow	[l/min]	53	76	200	341
Opening pressure	[bar]	0.3	0.3	0.3	0.3
Meter-in throttle		•	•	•	—
Meter-out throttle		•	•	•	•
Fluid		Hydraulic oil according to DIN 51524...51525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt] / [mm²/s]	10...650			
recommended	[cSt] / [mm²/s]	30			
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)			

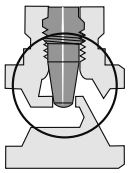
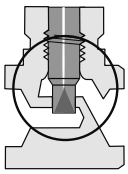
FM		DD			V	
Throttle valve	**Valve size**	**Throttle check valve in the working port A and B**	**Needle design**	**Adjustment**	**Seal FPM**	**Design series** (not required for ordering)

Code	Size
2	**NG06**
3	**NG10**

Code	Adjustment
K	**Knob**
S	**Hexagon socket**

Code	Needle
omit	**Standard conical**
D	Fine, cylindrical Hollow bored with V notch

Bold letters =
Short-term availability

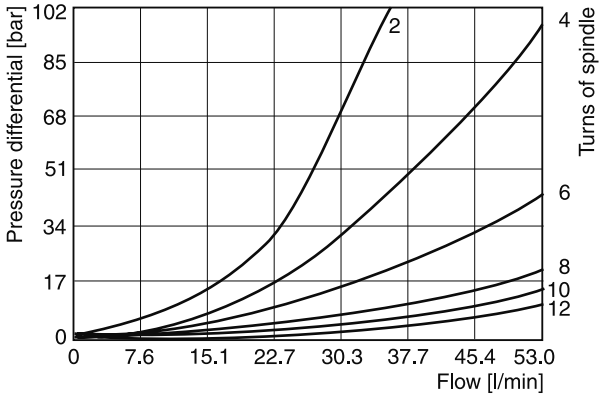
	A two-stage needle provides fine adjustment in the lower flow range with 3 adjustment rotations. After 3 more rotations, the valve is completely open.
	Design "D" A cylindrical needle with a V notch allows the fine adjustment over the entire setting range.

FM	4	DD		V	HT
Throttle valve	**Valve size NG16**	**Throttle check valve in the working port A and B**	**Meter-out / meter-in throttling**	**Seal FPM**	**Design series**

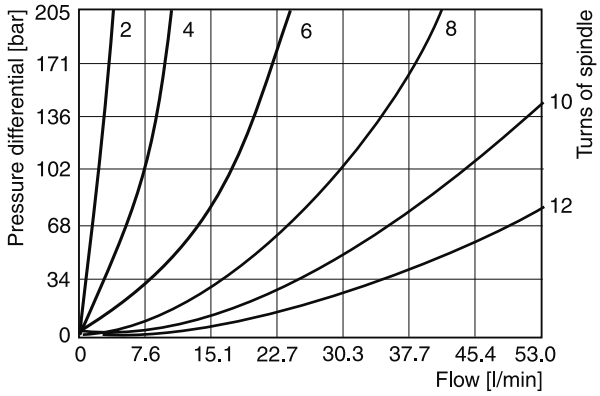
Code	Description
T	Meter-in
F	Meter-out

FM	6	DD	K	V	
Throttle valve	**Valve size NG25**	**Throttle check valve in the working port A and B**	**Adjusting knob**	**Seal FPM**	**Design series** (not required for ordering)

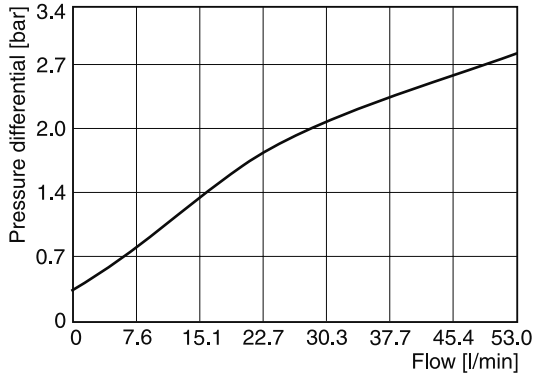
FM2 standard needle



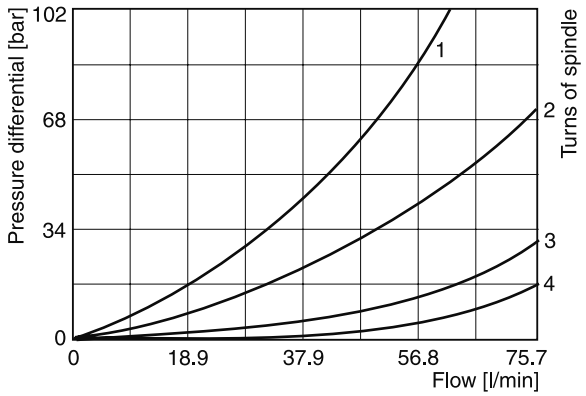
FM2D needle with V notch



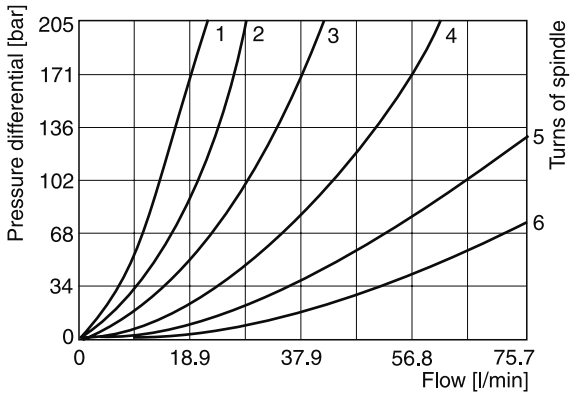
FM2 flow, check valve



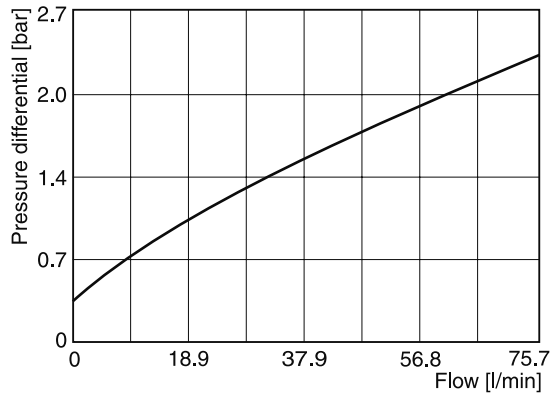
FM3 standard needle



FM3D needle with V notch



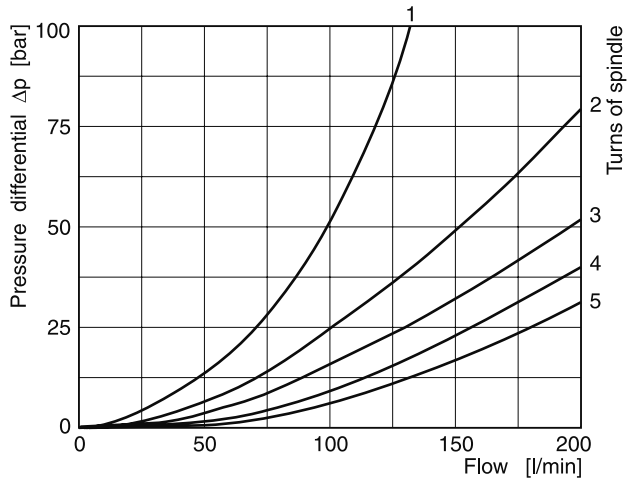
FM3 flow, check valve



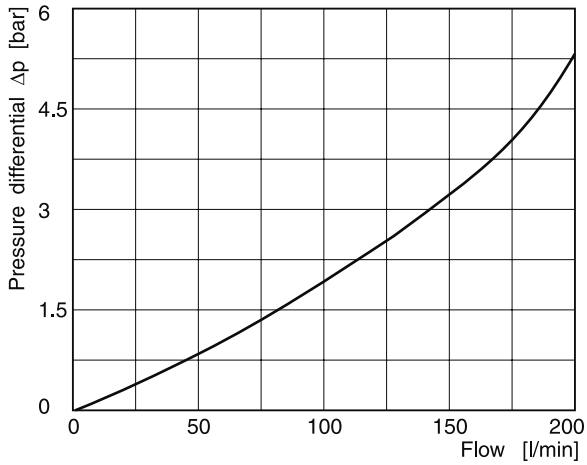
All characteristic curves measured with HLP46 at 50°C.

FM4 with standard needle

1 to 5 number of needle rotations

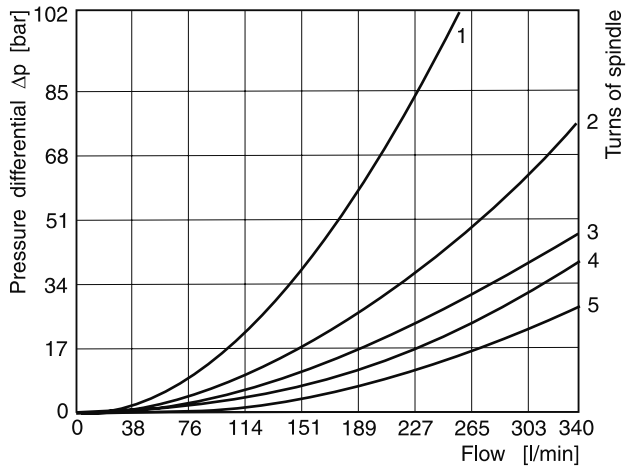


FM4 flow, check valve

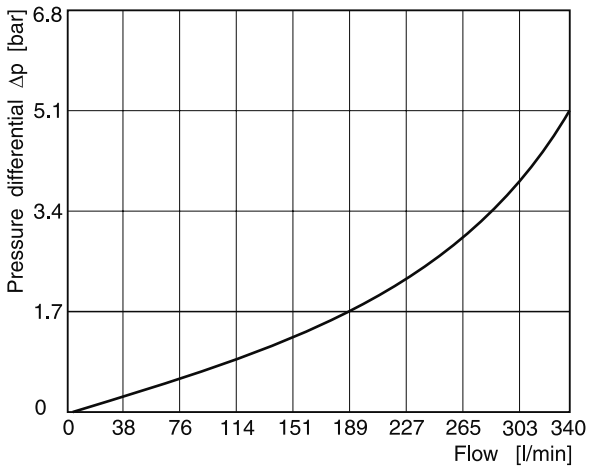


FM6 with standard needle

1 to 5 number of needle rotations



FM6 flow, check valve

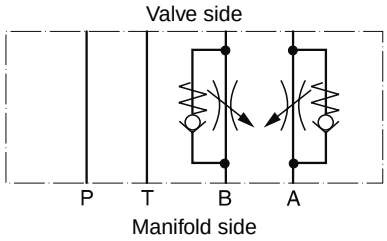


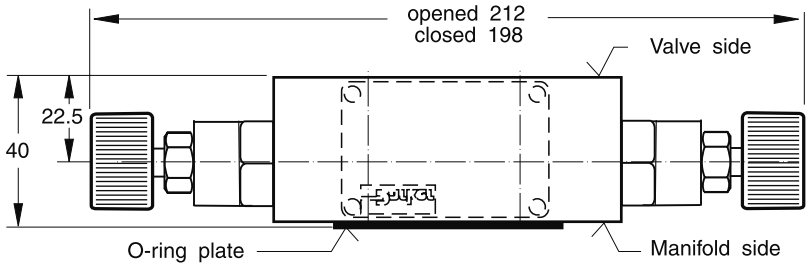
All characteristic curves measured with HLP46 at 50°C.

7

FM2

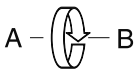
Meter-in

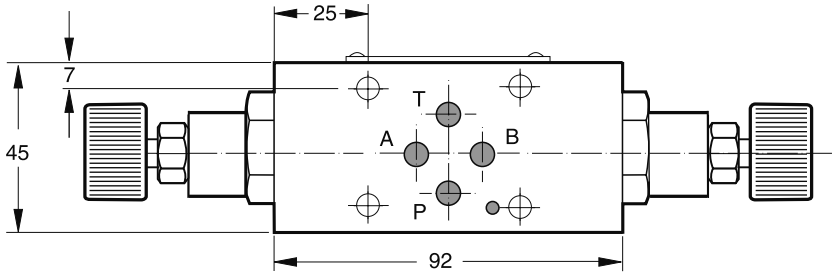




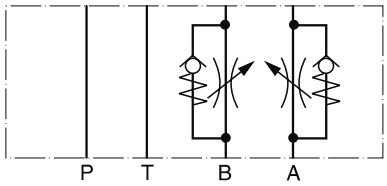
Meter-in or meter-out

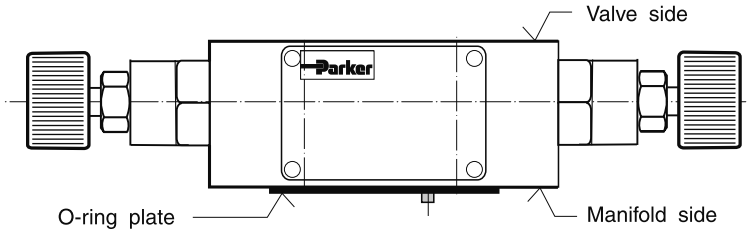
A functional change is achieved by rotating the mounting position of the valve 180° about the longitudinal axis (A-B).





Meter-out





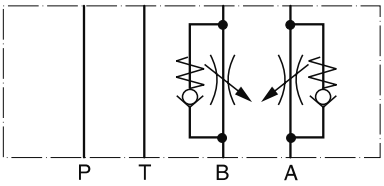
Seal kit FM2	
Seal	Order code
V	SK-FM2-V-20

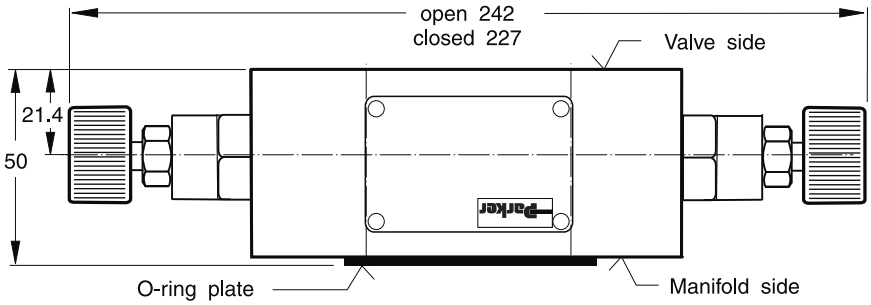
Note:

The O-ring plate (with O-rings) for sealing the connecting surface of the manifold side is included. The O-ring and positioning pin are always mounted on the manifold side.

FM3

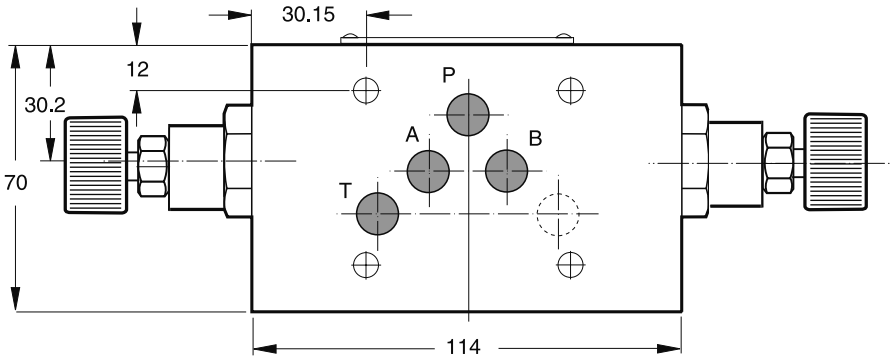
Meter-in



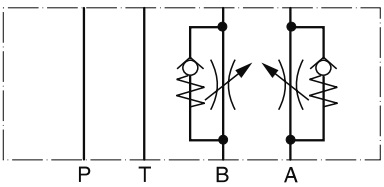


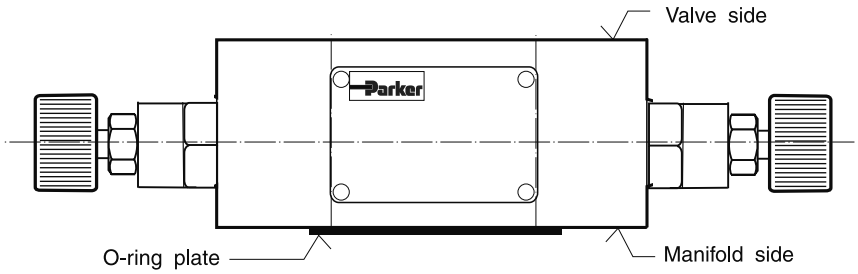
Meter-in or meter-out

A functional change is achieved by rotating the mounting position of the valve 180° about the transverse axis (P).



Meter-out



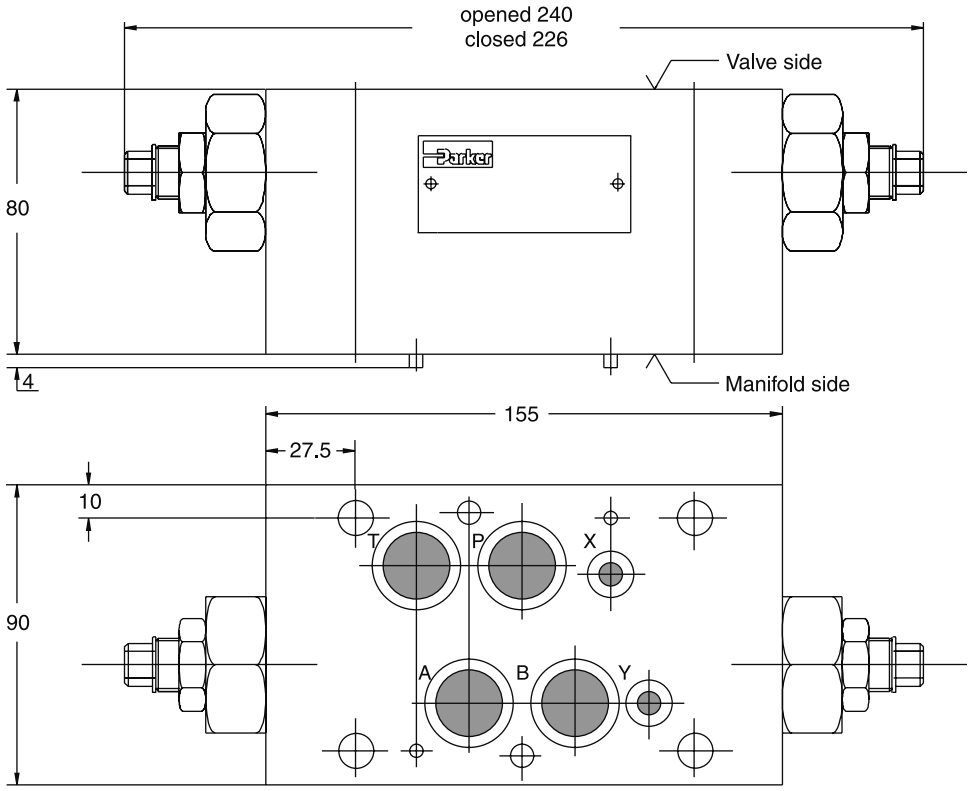


Seal kit FM3	
Seal	Order code
V	SK-FM3-V-20

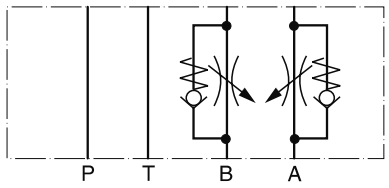
Note:

The O-ring plate (with O-rings) for sealing the connecting surface of the manifold side is included. The O-ring and positioning pin are always mounted on the manifold side.

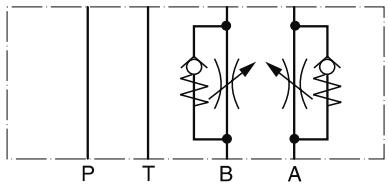
FM4



Meter-in

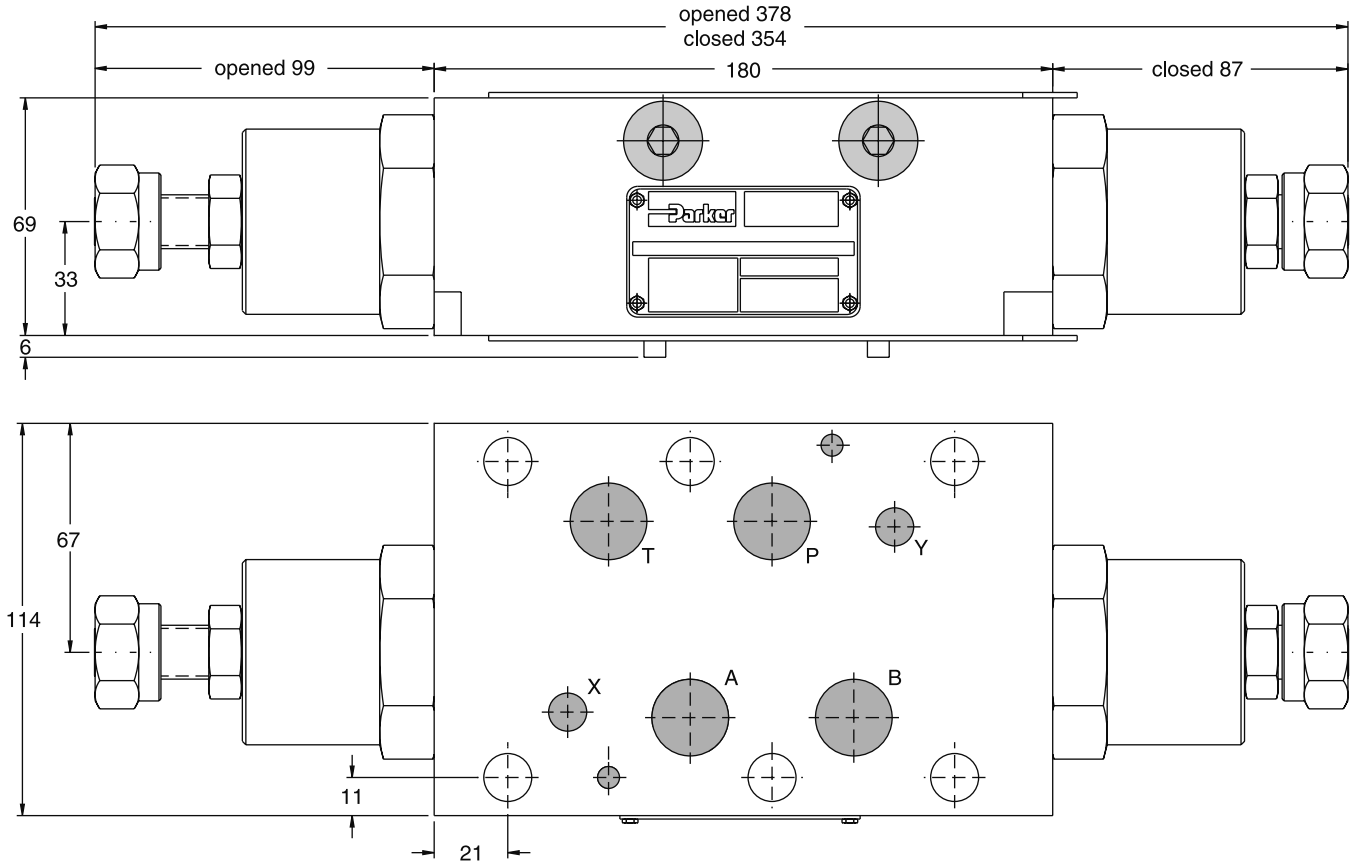


Meter-out



Seal kit FM4	
Seal	Order code
V	SK-FM4VHT

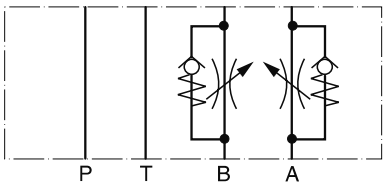
FM6



Meter-out

Adjustment: knob

Meter-in is not available for FM6



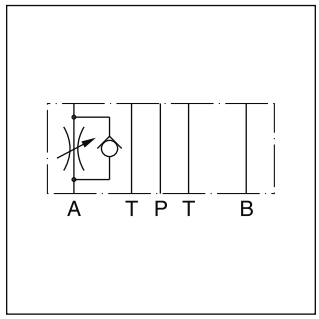
Seal kit FM6	
Seal	Order code
V	SK-FM6-V-12

Throttle check valves series ZRD are designed for maximum flow rates.

The throttle check function can be located in port A or B as well as in A + B. Meter-in or meter-out functionality can be selected by model code.

A low flow / high resolution version in NG06 for sensitive shifting time adjustment of pilot operated directional control valves is available on request.

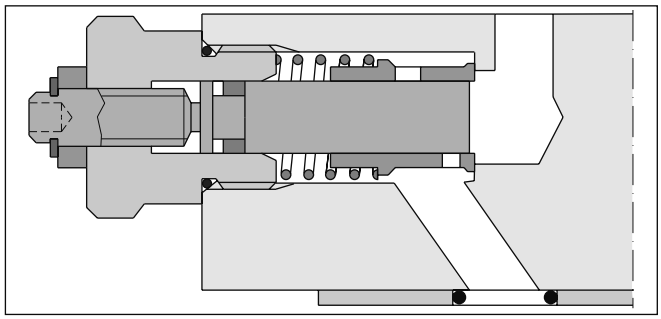
ZRD-ABZ01



ZRD-AA02

Features

- High flow capacity
- Various functional arrangements
- ZRD01 - NG06 (CETOP3)
  ZRD02 - NG10 (CETOP5)



ZRD-AA02

7

Ordering code

ZRD – ☐ ☐ – **S0** – **D** ☐

Throttle valve with check	Pressure control	Nominal size	Hexagon screw with lock nut	Design series NG06/10	Seal

Code	Pressure control
AA	Meter-out control in A
AZ	Meter-in control in A
BA	Meter-out control in B
BZ	Meter-in control in B
ABA	Meter-out control in A and B
ABZ	Meter-in control in A and B

Code	Seal
1	NBR
5	FPM

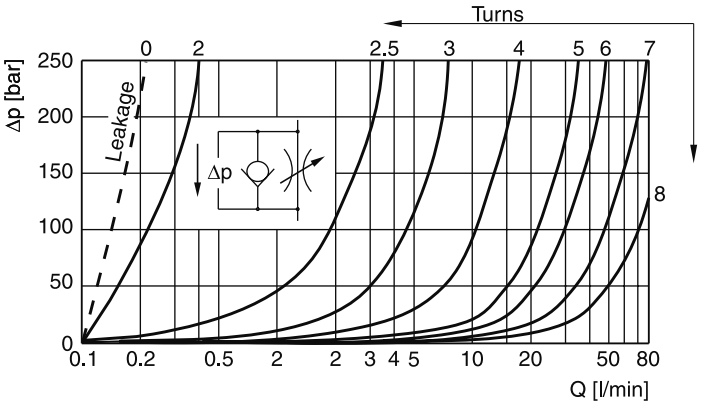
Code	Nominal size
01	NG06
02	NG10

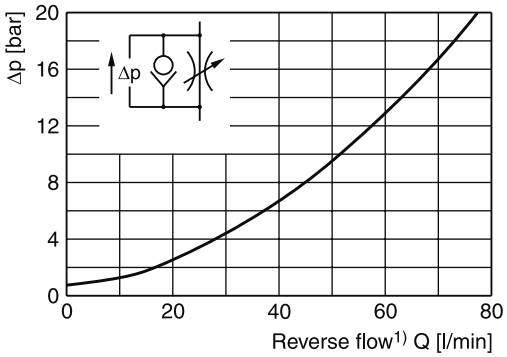
Ordering code details see end of chapter.

General				
Size			NG06	NG10
Mounting interface			DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
			CETOP RP 121	
Mounting position			unrestricted	
Ambient temperature		[°C]	-20...+50	
$MTTF_D$ value		[years]	150	
Weight	1 cartridge	[kg]	1.2	2.8
	2 cartridges	[kg]	1.3	2.9
Hydraulic				
Max. operating pressure		[bar]	350	315
Nominal flow		[cSt] / [l/min]	80	160
Leakage		[cSt] / [l/min]	0.1...0.2 (at closed throttle)	0.1...0.2 (at closed throttle)
Opening pressure		[bar]	0.7	0.7
Fluid			Hydraulic oil according to DIN 51524...51525	
Fluid temperature		[°C]	-20...+80	
Viscosity	permitted	[cSt] / [mm^2/s]	10...650	
	recommended	[cSt] / [mm^2/s]	30	
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

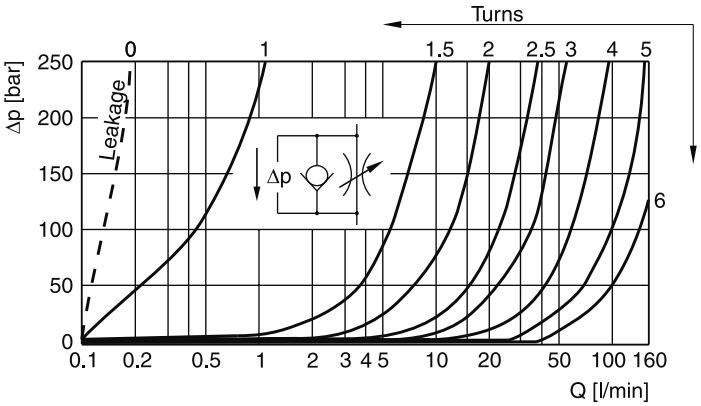
p/Q performance curves

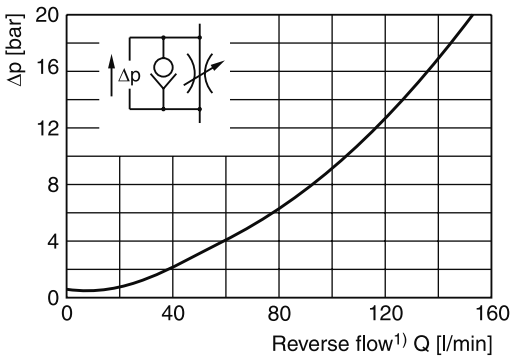
ZRD*01





ZRD*02



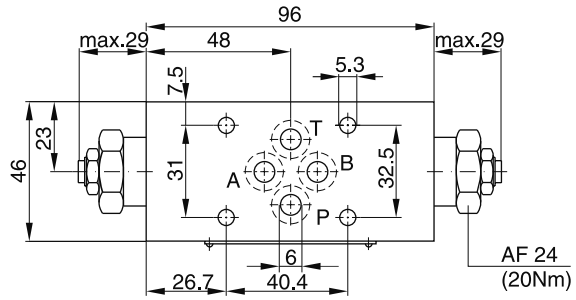


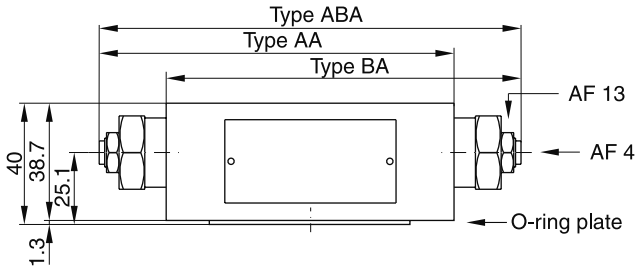
All characteristic curves measured with HLP46 at 50°C.

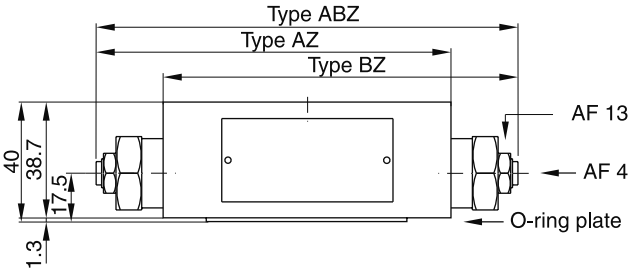
1) Throttle closed

ZRD*01

Seal kit	
Seal	Order code
1	098-91096-0
5	098-91097-0
Complete cartridge Order code 098-91119-0	
O-ring plate Order code S26-27553-0	



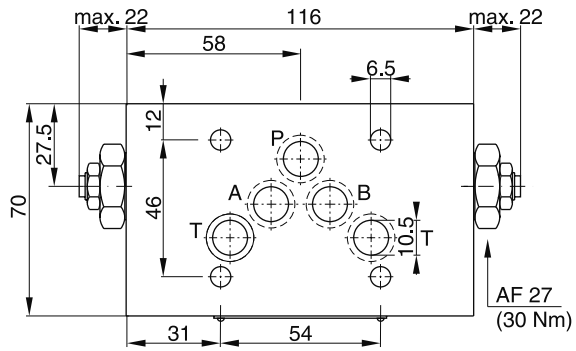


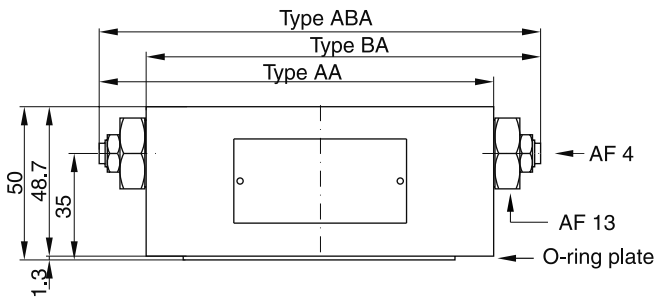


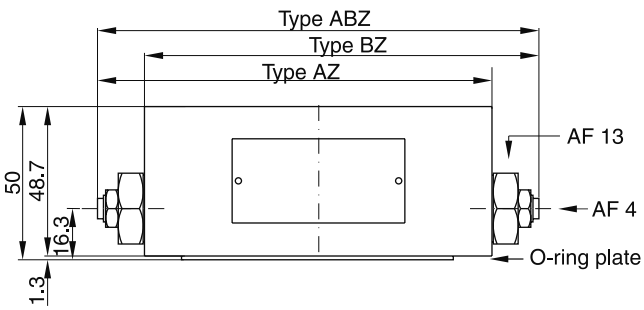
7

ZRD*02

Seal kit	
Seal	Order code
1	098-91098-0
5	098-91099-0
Complete cartridge Order code 098-91120-0	
O-ring plate Order code S16-85742-0	

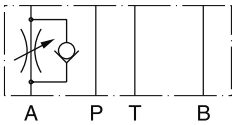






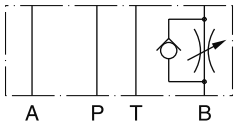
ZRD*01

Meter-in control in A



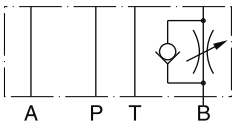
Series ZRD-AZ01-S0-D1 Order No. 098-91056-0

Meter-out control in B



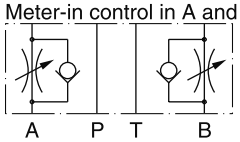
Series ZRD-BA01-S0-D1 Order No. 098-91013-0

Meter-in control in B



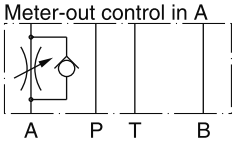
Series ZRD-BZ01-S0-D1 Order No. 098-91057-0

Meter-in control in A and B



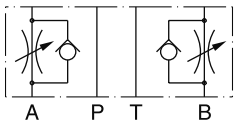
Series ZRD-ABZ01-S0-D1 Order No. 098-91058-0

Meter-out control in A



Series ZRD-AA01-S0-D1 Order No. 098-91012-0

Meter-out control in A and B

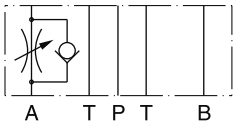


Series ZRD-ABA01-S0-D1 Order No. 098-91014-0

ZRD*02

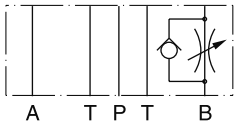
7

Meter-in control in A



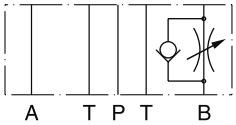
Series ZRD-AZ02-S0-D1 Order No. 098-91059-0

Meter-out control in B



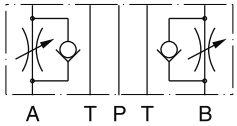
Series ZRD-BA02-S0-D1 Order no. 098-91016-0

Meter-in control in B



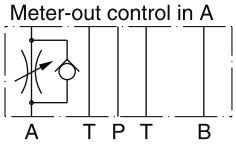
Series ZRD-BZ02-S0-D1 Order No. 098-91060-0

Meter-in control in A and B



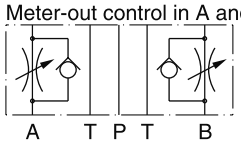
Series ZRD-ABZ02-S0-D1 Order no. 098-91061-0

Meter-out control in A



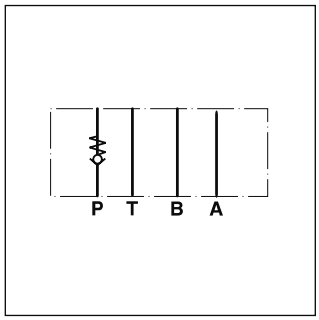
Series ZRD-AA02-S0-D1 Order no. 098-91015-0

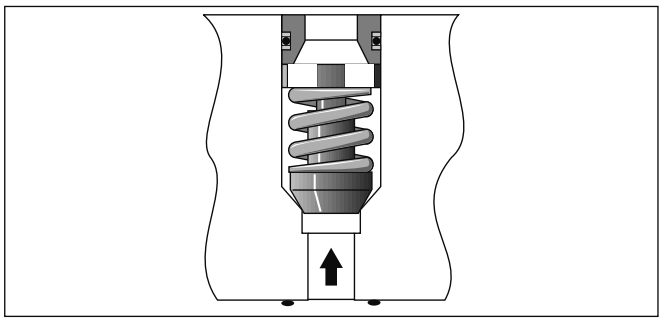
Meter-out control in A and B



Series ZRD-ABA02-S0-D1 Order no. 098-91017-0

Check valves from the Parker Manapak series CM are in sandwich design for easy configuration of stack systems. Depending on the function required, one or two check valves are arranged in ports P, T, A, and B. Number and flow direction can be selected from the ordering code.





Features

- The valve bodies of the Parker Manapak valve series CM are made of steel.
- Eight options for the arrangement of the check valve in the body offer a multitude of uses for hydraulic switching.
- The function can be changed by turning the valve.
- CM2 - NG06 (CETOP3)
  CM3 - NG10 (CETOP5)

Ordering code

CM			V	
Check valve	**Nominal size**	**Port**	**Seal FPM**	**Design series** (not required for ordering)

Code	Nominal size
2	**Intermediate plate DIN NG06**
3	**Intermediate plate DIN NG10**

Code	Free flow polarity	Check valve in channel
AA	**From directional valve to manifold**	**A**
BB	**From directional valve to manifold**	**B**
DD	**From directional valve to manifold**	**A and B**
PP	**From manifold to directional valve**	**P**
TT	**From directional valve to manifold**	**T**
AAF	From manifold to directional valve	A
BBF	From manifold to directional valve	B
DDF	From manifold to directional valve	A and B

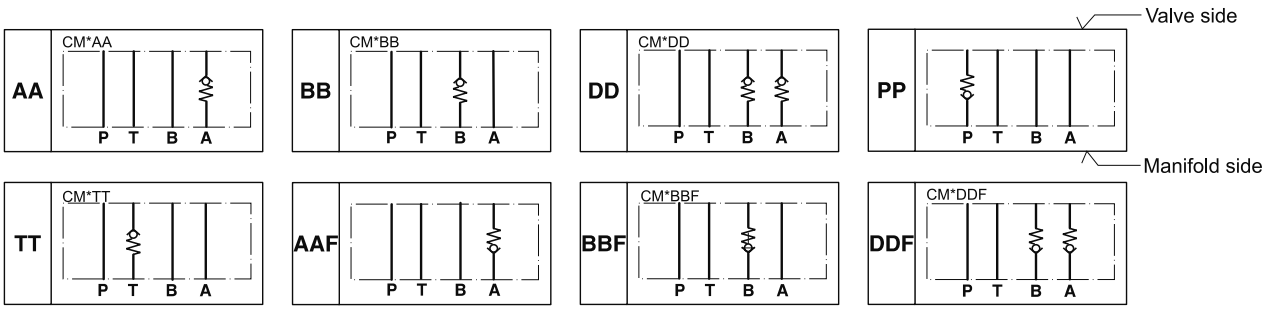
Bold letters =
Short-term availability

Technical data

General				
Series			CM2	CM3
Mounting interface			ISO 4401-03-02-0-94	ISO 4401-05-04-0-94
Mounting position			unrestricted	
Ambient temperature		[°C]	-20...+50	
$MTTF_D$ value		[years]	150	
Weight		[kg]	0.9	1.7
Hydraulic				
Max. operating pressure		[bar]	350	350
Max. Flow		[l/min]	53	76
Opening pressure		[bar]	0.3	0.3
Fluid			Hydraulic oil according to DIN 51524...51525	
Fluid temperature		[°C]	-20...+80	
Viscosity	permitted	[cSt] / [mm²/s]	10...650	
	recommended	[cSt] / [mm²/s]	30	
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

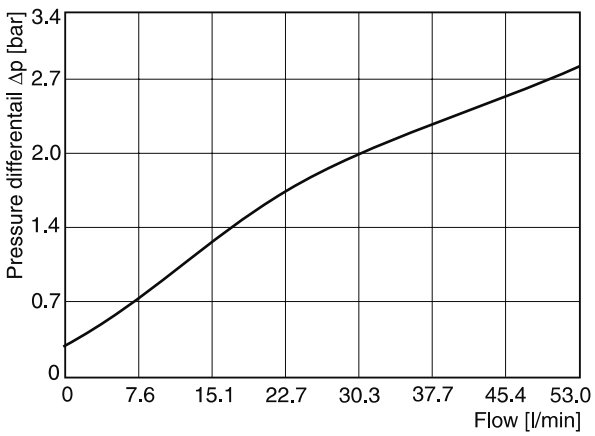
Schematics

The valve side is shown at the top of the symbols, the manifold side with channel designation is shown on the bottom.

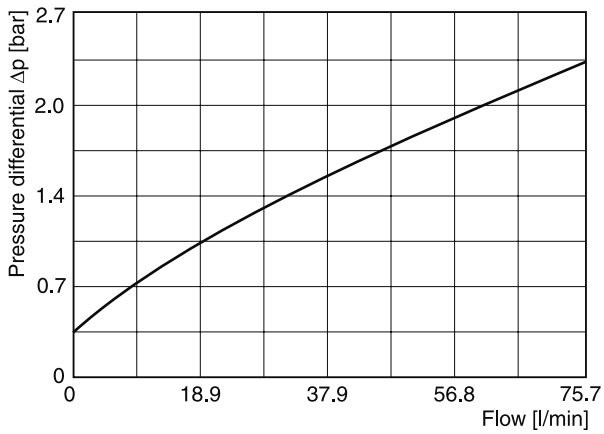


Δp/Q performance curves

CM2



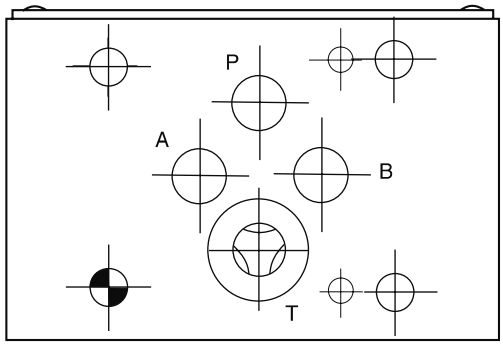
CM3



All characteristic curves measured with HLP46 at 50°C.

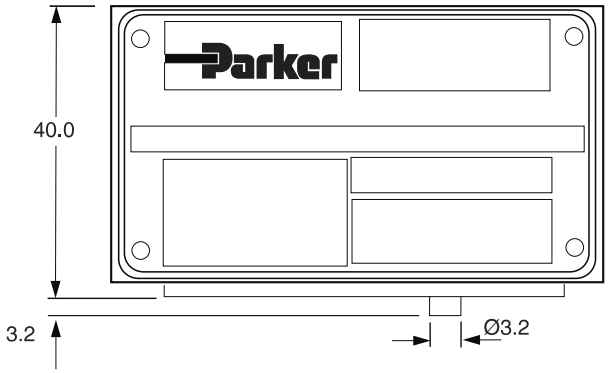
CM2

Bottom view*

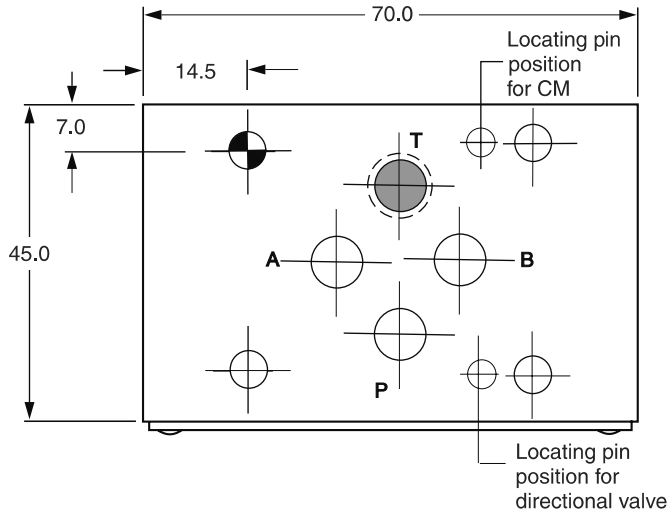


(manifold side) *O-Ring plate is not shown!
This view shows the TT model.

Front side



Top view



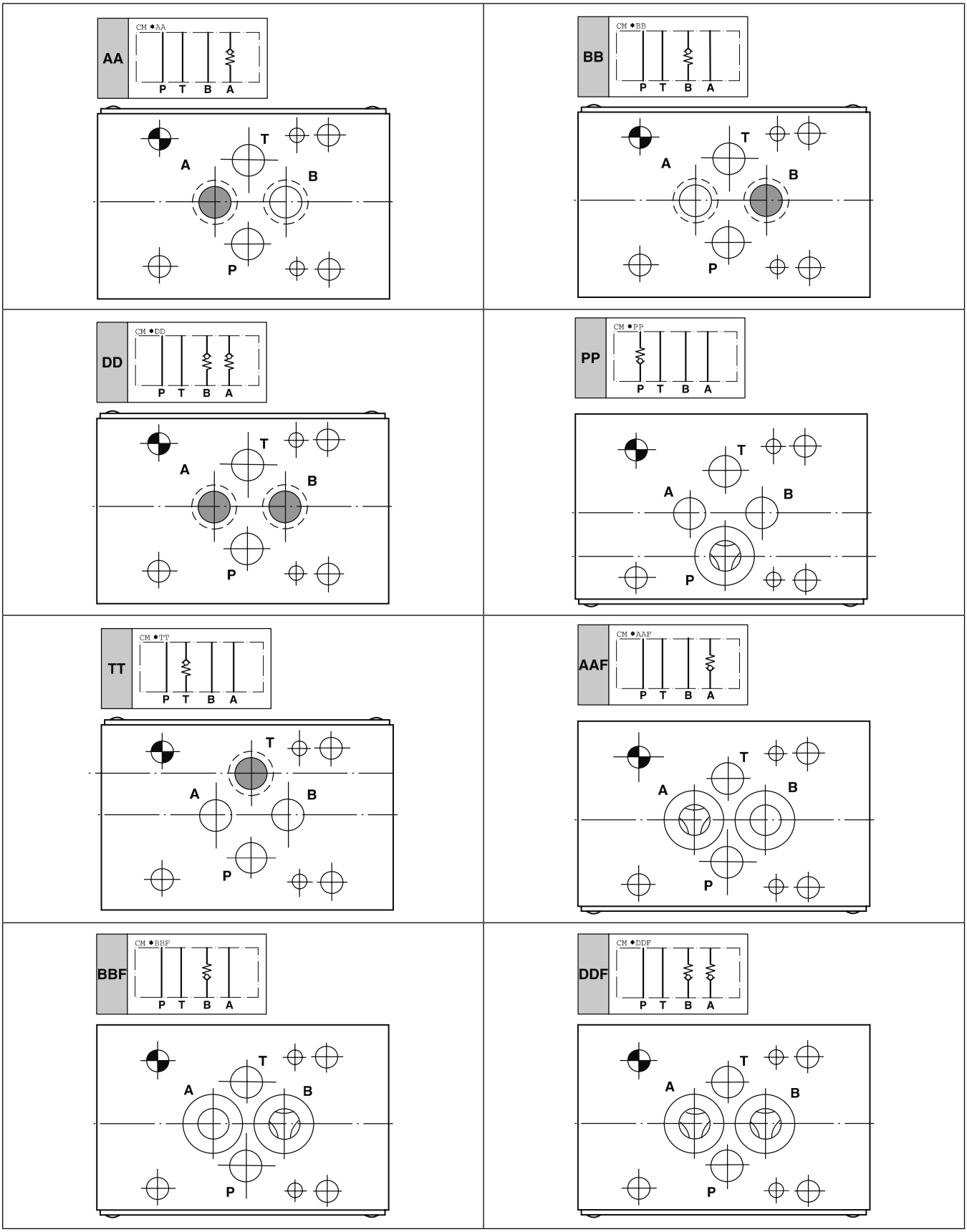
Seal kit CM2	
Seal	Order code
V	SK-CM2-V

Note:

The O-ring plate for sealing the connecting surface of the manifold side is included. The O-ring plate and the positioning pin are always mounted on the manifold side.

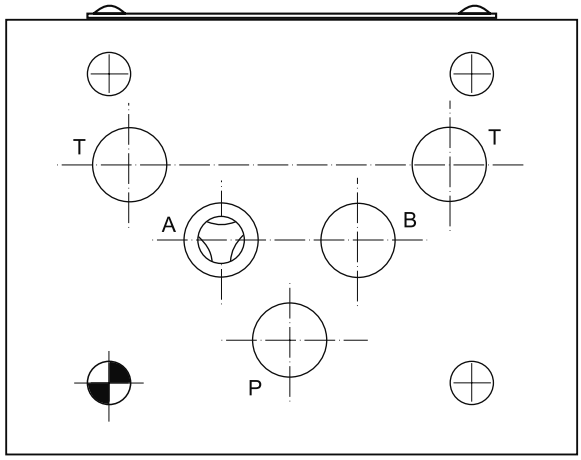
7

CM2 top views (from directional valve side)



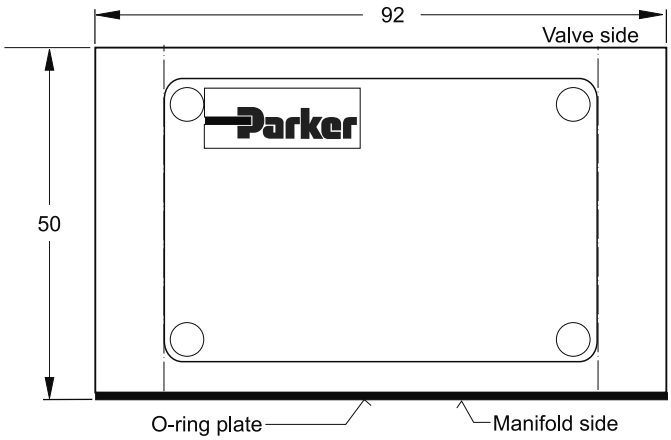
CM3

Bottom view*

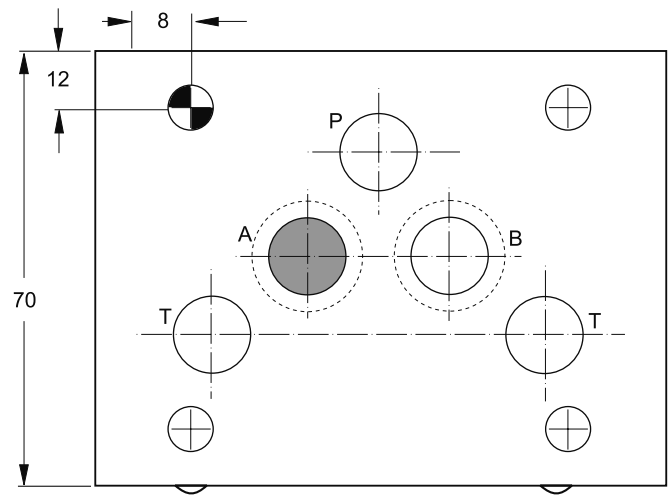


*O-ring plate is not shown!
This view shows the AA model.

Front side



Top view



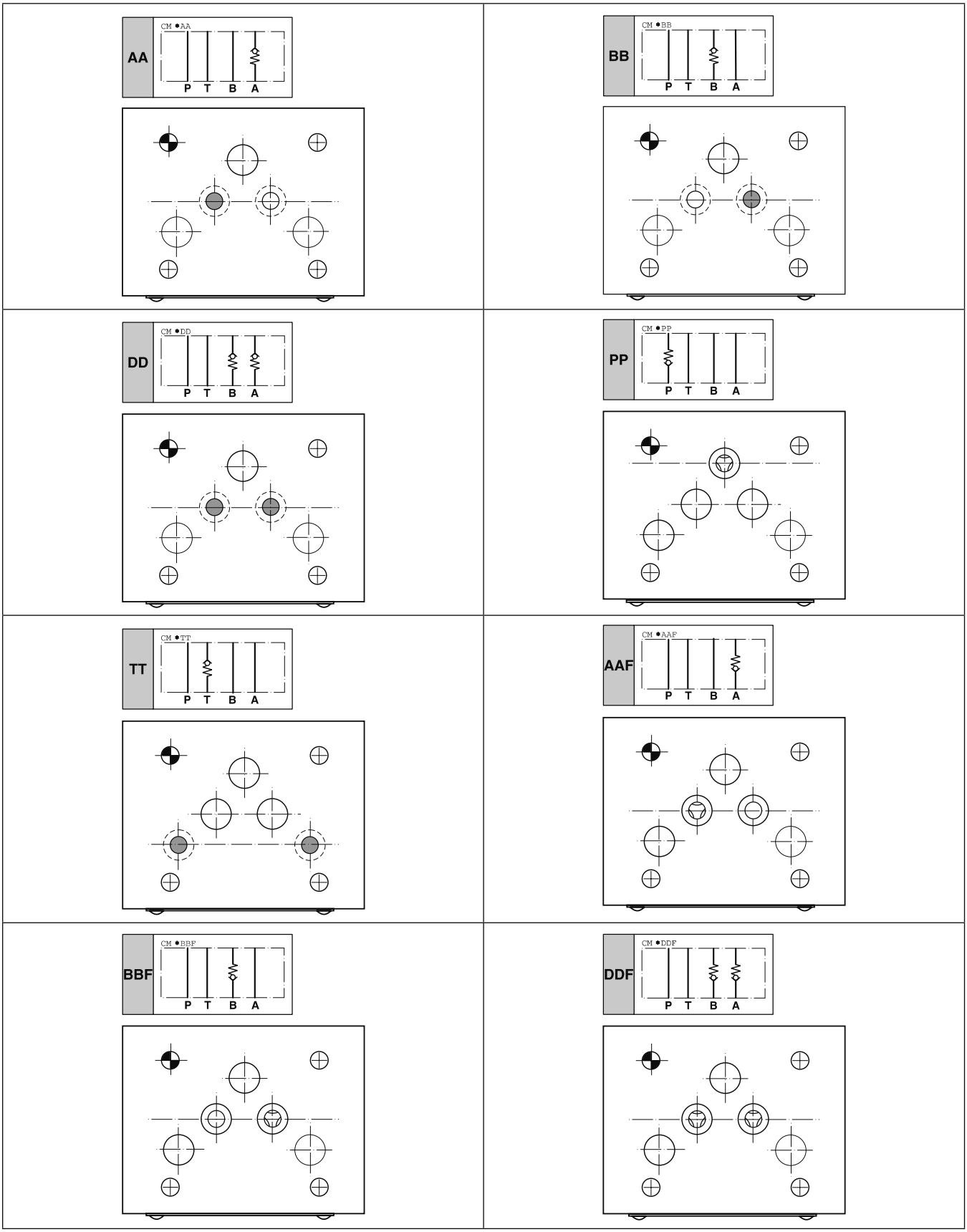
Seal kit CM3	
Seal	Order code
V	SK-CM3-V

Note:

The O-ring plate for sealing the connecting surface of the manifold side is included. The O-ring plate and the positioning pin are always mounted on the manifold side.

CM UK.INDD CM 07.09.11

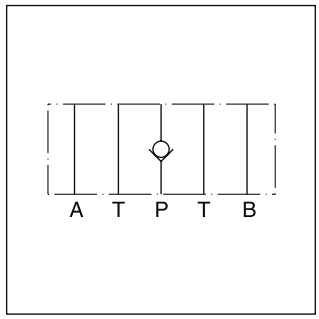
CM3 top views (from directional valve side)



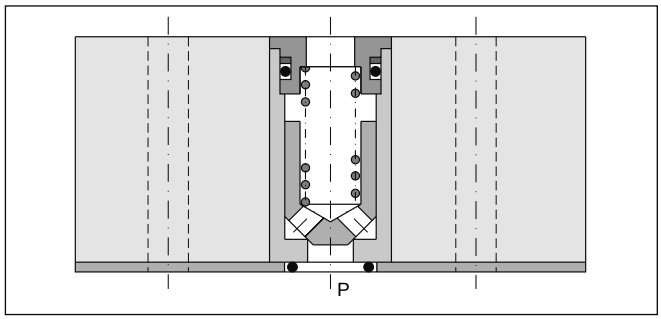
Direct operated check valves series ZRV have a cartridge type insert to provide zero leakage and high life time.

The check function can be located in the P- or in the T-port.

ZRV-P02



ZRV-P02



ZRV-P02

Features

- Leakage-free seat
- High life time
- Opening pressure 0.5 bar
- ZRV01 - NG06 (CETOP3)
  ZRV02 - NG10 (CETOP5)

Ordering code

ZRV – □ □

Check valve, direct operated | **Pressure control** | **Nominal size**

Code	Pressure control
P	Blocked in P
T	Blocked in T

Code	Nominal size
01	NG06
02	NG10

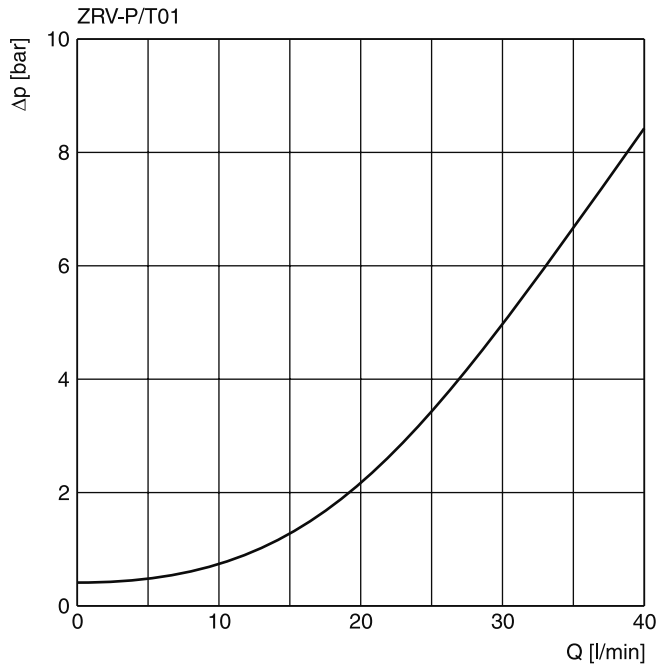
Ordering code details see end of chapter.

Technical data

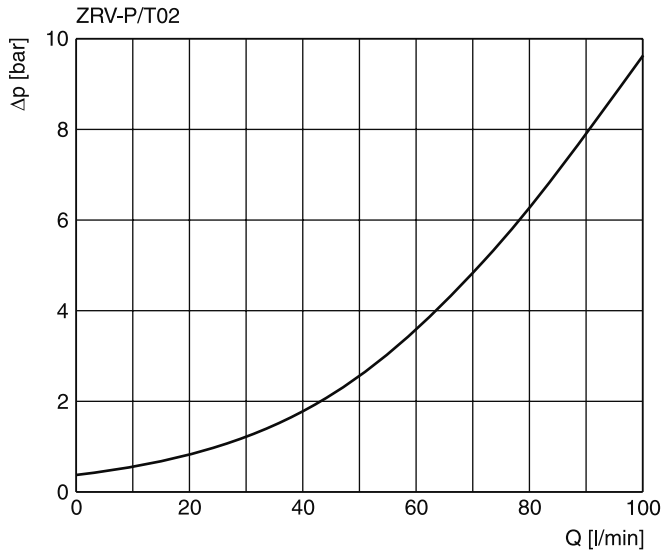
General				
Size			NG06	NG10
Mounting interface			DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
			CETOP RP 121	
Mounting position			unrestricted	
Ambient temperature		[°C]	-20...+50	
$MTTF_D$ value		[years]	150	
Weight		[kg]	0.7	2.0
Hydraulic				
Max. operating pressure		[bar]	350	315
Nominal flow		[l/min]	40	100
Opening pressure		[bar]	0.5	0.5
Fluid			Hydraulic oil according to DIN 51524...51525	
Fluid temperature		[°C]	-20...+80	
Viscosity	permitted	[cSt] / [mm^2/s]	10...650	
	recommended	[cSt] / [mm^2/s]	30	
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

p/Q performance curves

ZRV*01

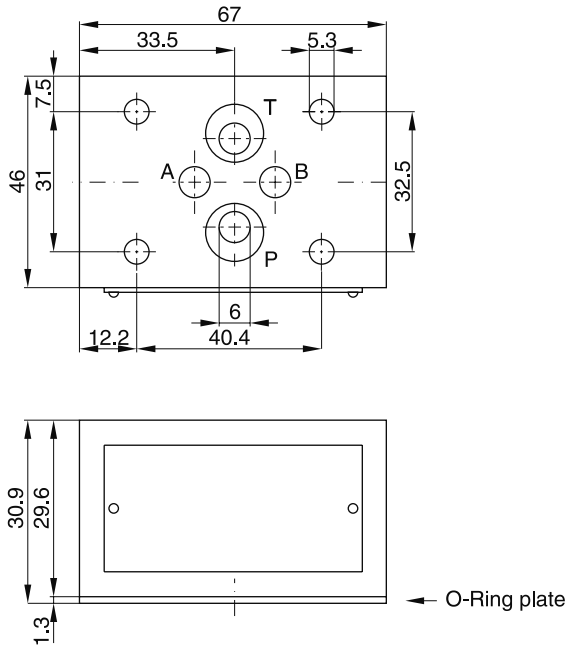


ZRV*02



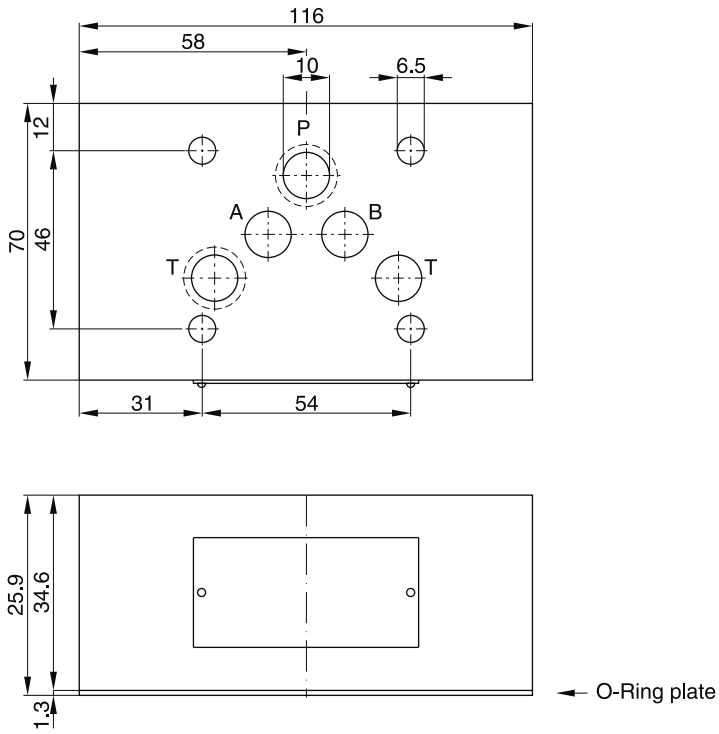
All characteristic curves measured with HLP46 at 50°C.

ZRV01



Seal kit	
Seal	Order code
NBR	SK-CM2-10
FPM	SK-CM2-V-10

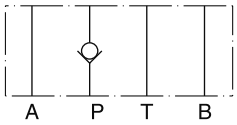
ZRV02



Seal kit	
Seal	Order code
NBR	SK-CM3-10
FPM	SK-CM3-V-50

ZRV01

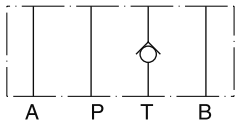
blocked in P



Series ZRV-P01

Order No. 098-90025-0

blocked in T

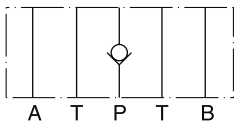


Series ZRV-T01

Order No. 098-90026-0

ZRV02

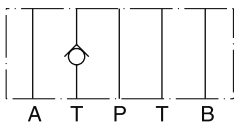
blocked in P



Series ZRV-P02

Order No. 098-90043-0

blocked in T



Series ZRV-T02

Order No. 098-90044-0

7

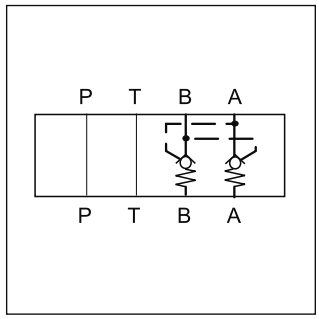
Pilot operated check valves from the Parker Manapak series CPOM are in sandwich design for easy configuration of stack systems. Depending on the function required, one or two pilot operated check valves are arranged in the ports A and/or B. The free flow direction is always from the valve side to the manifold side.

Function

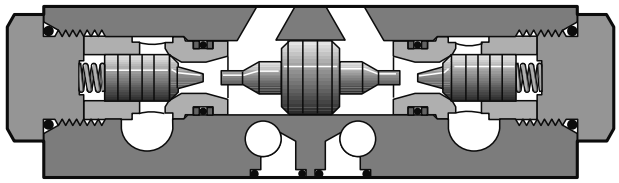
The check valves open when flowing to the consumer side, where the opposing check valve is hydraulically-mechanically pilot operated simultaneously by a control spool, and thus the return flow is enabled from other consumer sides.

Features

- The valve bodies of the Parker Manapak valve series CPOM are made of steel.
- The valve poppet is precisely guided into the steel sleeve and ensures a good seal on the seat.
- When the valve poppet is open, the large cross-section allows high flow rates at low differential pressure.
- Different control ratios can be chosen with the NG6 and NG10 valves.
- Pre-opening for CPOM*HT to achieve smooth opening.



CPOM3



Ordering code

Without pre-opening

CPOM				V	
Hydraulically operated check valve pilot ratio 3 : 1	**Size**	**Poppet style**	**Opening pressure**	**Seal FPM**	**Design series** (not required for ordering)

Code	Size
2	**NG06**
3	**NG10**
6	NG25

Code	Pressure	Size
omit	1.0 bar	NG06/10/25
25	2.5 bar	NG06
50	5.0 bar	NG06
70	7.0 bar	NG06

Code	Connection
AA	**only A**
BB	**only B**
DD	**A and B**

With pre-opening

CPOM	4		HT	V	
Hydraulically operated check valve	**Size NG16**	**Poppet style**	**Pilot ratio 13:1**	**Seal FPM**	**Design series** (not required for ordering)

Code	Connection
AA	**only A**
BB	**only B**
DD	**A and B**

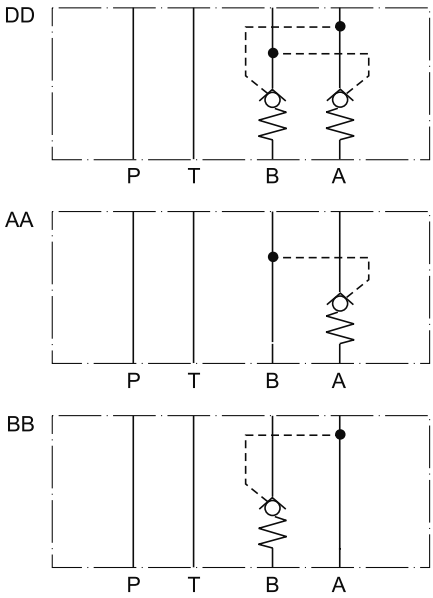
Bold letters =
Short-term availability

CPOM UK.INDD CM 07.09.11

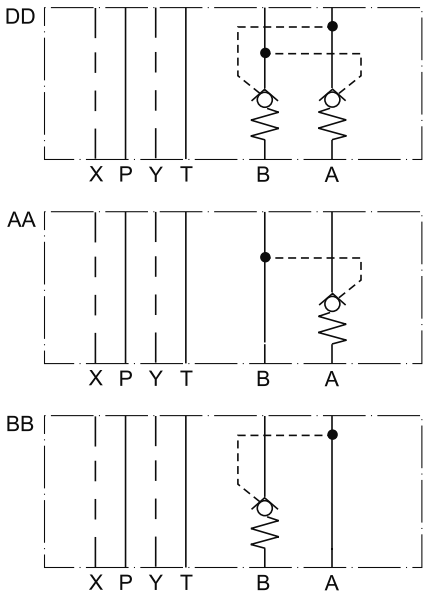
General					
Series		CPOM2	CPOM3	CPOM4	CPOM6
Nominal size		NG06	NG10	NG16	NG25
Mounting interface		ISO 4401			
Ambient temperature	[°C]	-20...+50			
$MTTF_D$ value	[years]	150			
Weight	[kg]	1.8	4.0	7.65	9.5
Hydraulic					
Max. operating pressure	[bar]	350	350	350	210
Opening pressure	[bar]	1.0	0.8	2.0	0.4
Opening ratio		1 : 3	1 : 3	1 : 13	1 : 3
Leakage		on request			
Fluid		Hydraulic oil according to DIN 51524...51525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt] / [mm²/s]	10...650			
recommended	[cSt] / [mm²/s]	30			
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)			

Schematics

CPOM2 / CPOM3

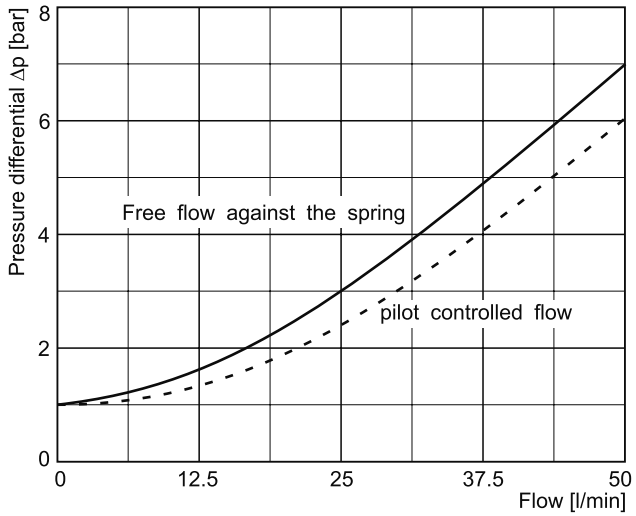


CPOM4 / CPOM6

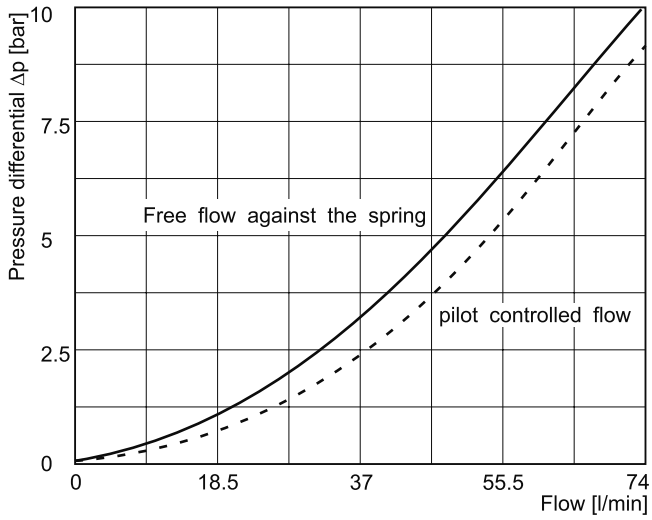


Δp/Q performance curves

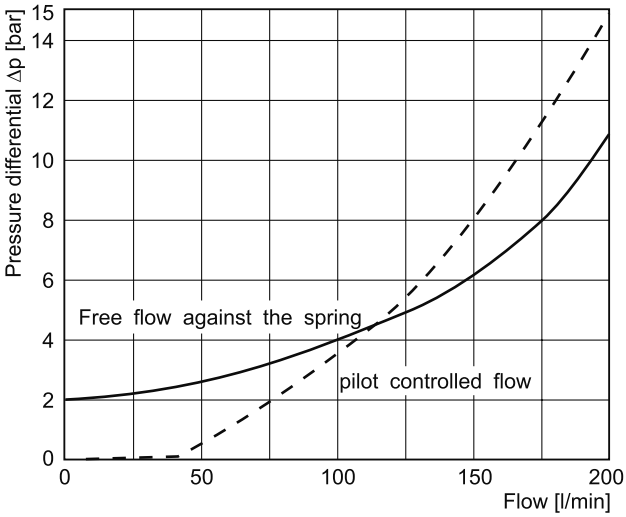
CPOM2



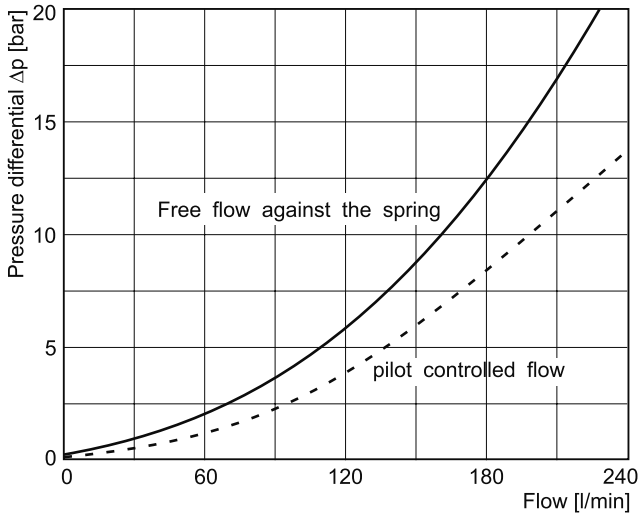
CPOM3



CPOM4 (type HT)



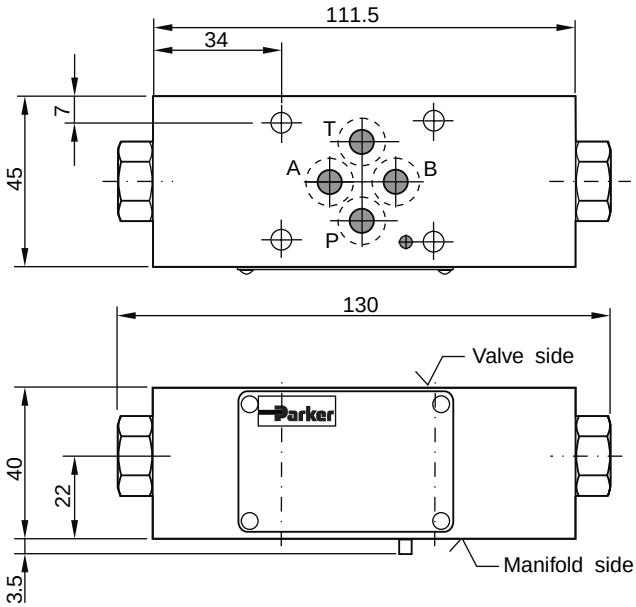
CPOM6



All characteristic curves measured with HLP46 at 50°C.

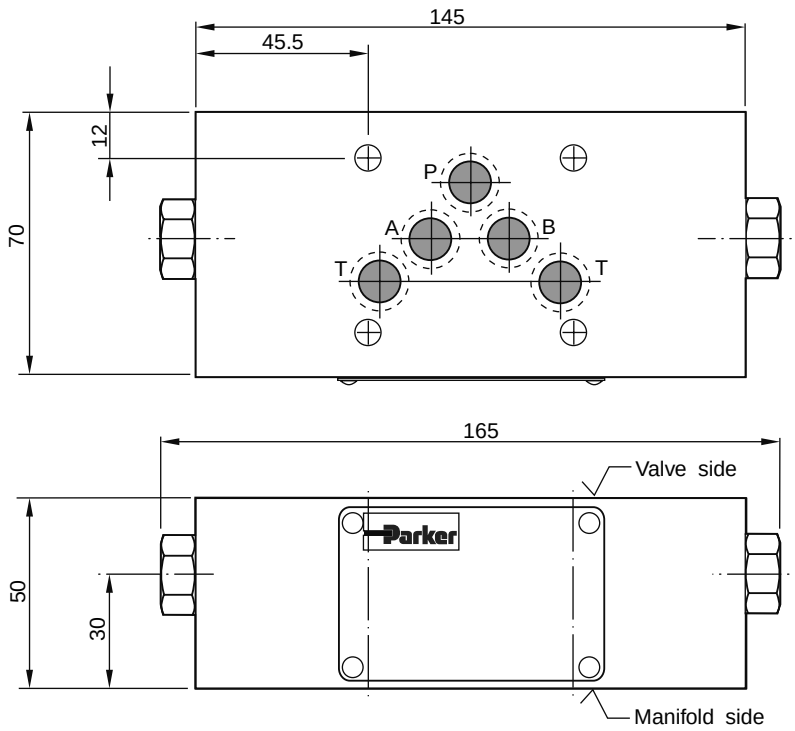
7

CPOM2



Seal kit CPOM2	
Seal	Order code
V	SK-CPOM2-V-11

CPOM3

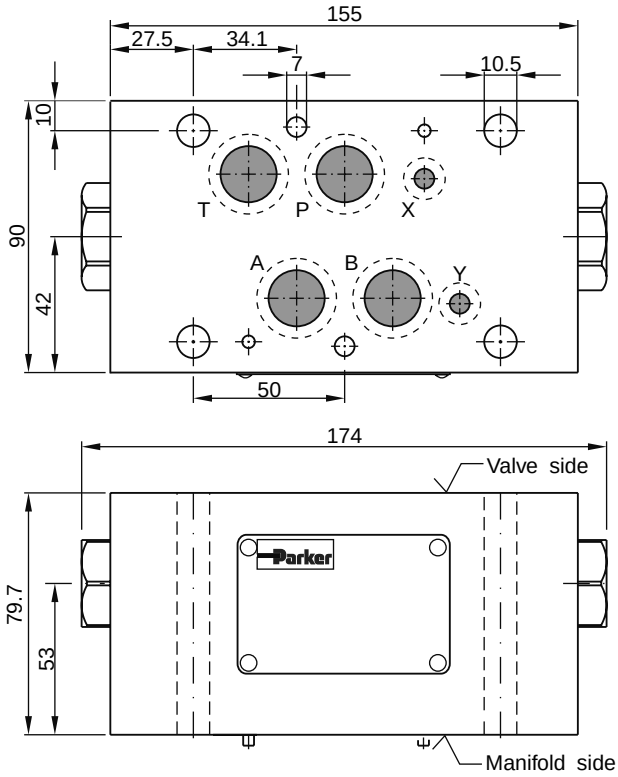


Seal kit CPOM3	
Seal	Order code
V	SK-CPOM3-V-11

Note:

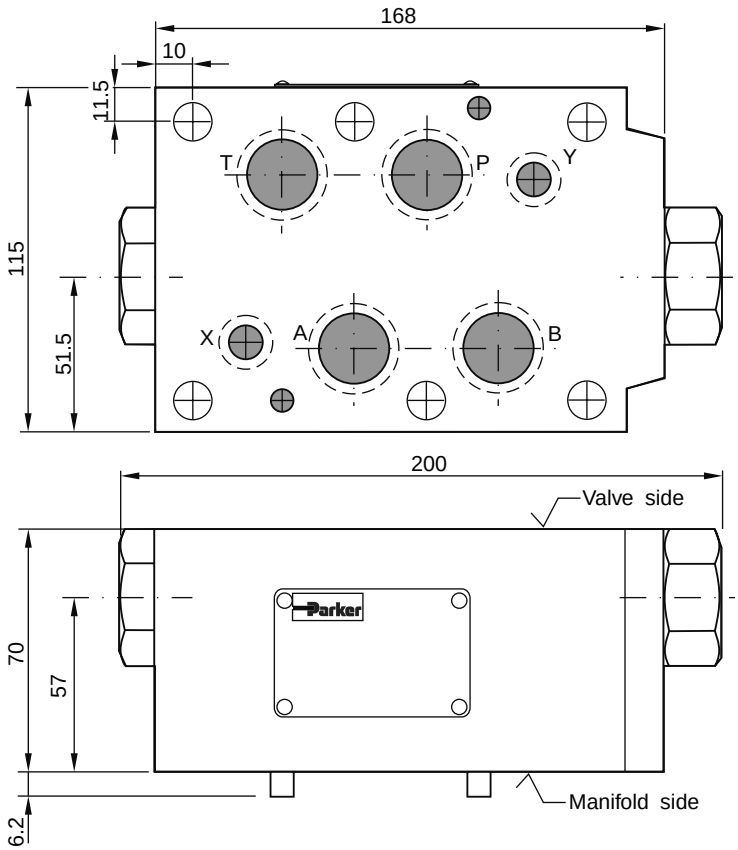
The O-ring plate for sealing the connecting surface of the manifold side is included. The O-ring plate and the positioning pin are always mounted on the manifold side.

CPOM4



Seal kit CPOM4	
Seal	Order code
V	SK-CPOM4HTV

CPOM6



Seal kit CPOM6	
Seal	Order code
V	SK-CPOM6-V-20

Note:

The O-ring plate for sealing the connecting surface of the manifold side is included. The O-ring plate and the positioning pin are always mounted on the manifold side.

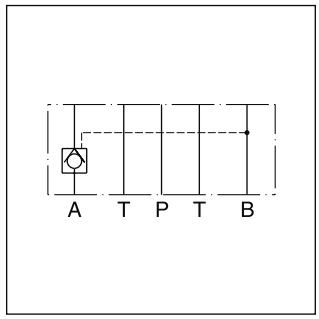
Notes

Pilot operated check valves series ZRE are designed for maximum flow rates and long life time.

The valves are typically used in combination with spool type directional control valves to ensure nearly leak free positioning of the actuator.

The inlet flow is free while the outlet flow is blocked. Pressure in the inlet line opens the check valve and allows free outlet flow.

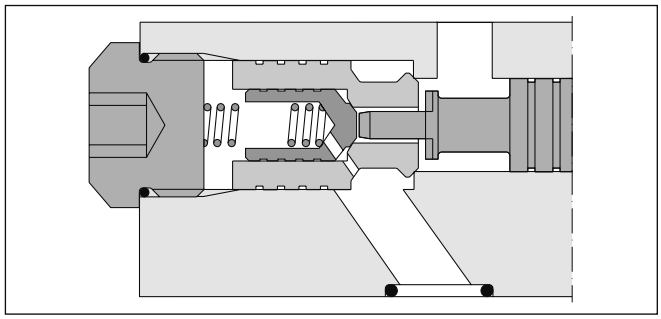
ZRE-B01



ZRE-A02

Features

- High flow capacity
- High life time
- Check function in A, B or A + B
- ZRE01 - NG06 (CETOP3)
  ZRE02 - NG10 (CETOP5)



ZRE-A02

Ordering code

ZRE – ☐ ☐ – ☐ ☐

Check valve pilot operated	Pressure control	Nominal size	Design series	Seal

Code	Pressure control
A	Blocked in A
B	Blocked in B
AB	Blocked in A and B

Code	Nominal size
01	NG06
02	NG10

Code	Seal
1	NBR
5	FPM

Code	Design series
D	NG06
E	NG10

Ordering code details see end of chapter.

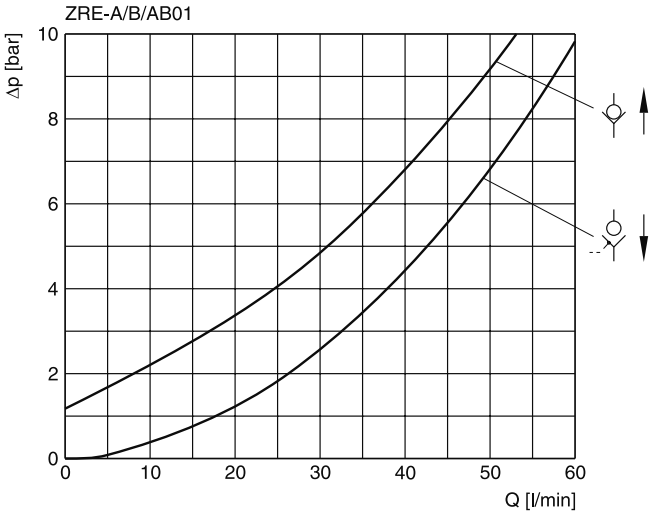
Technical data

General				
Size			NG06	NG10
Mounting interface			DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
			CETOP RP 121	
Mounting position			unrestricted	
Ambient temperature		[°C]	-20...+50	
$MTTF_D$ value		[years]	150	
Weight		[kg]	1.2	3.1
Hydraulic				
Max. operating pressure		[bar]	up to 350	315
Nominal flow		[l/min]	60	120
Opening ratio (pilot cone / main cone)			1:6	1:6
Opening pressure		[bar]	1.2	2.0
Leakage			on request	
Fluid			Hydraulic oil according to DIN 51524...51525	
Fluid temperature		[°C]	-20...+80	
Viscosity	permitted	[cSt]/[mm^2/s]	10...650	
	recommended	[cSt]/[mm^2/s]	30	
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

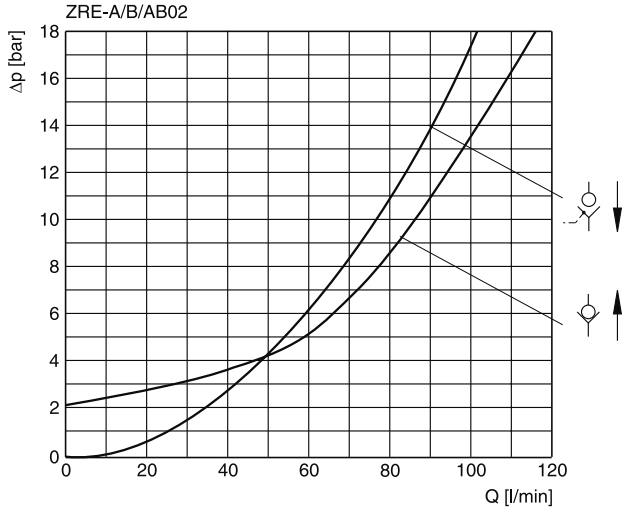
ZRE UK.INDD CM 15.07.11

p/Q performance curves

ZRE*01



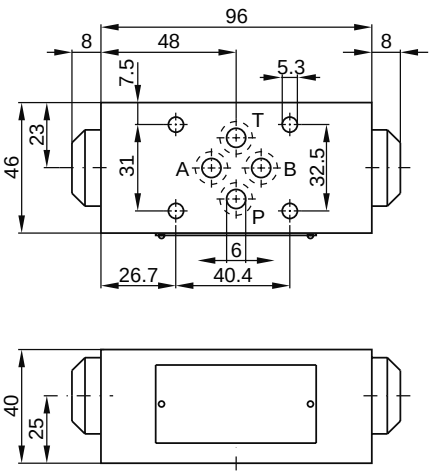
ZRE*02



All characteristic curves measured with HLP46 at 50°C.

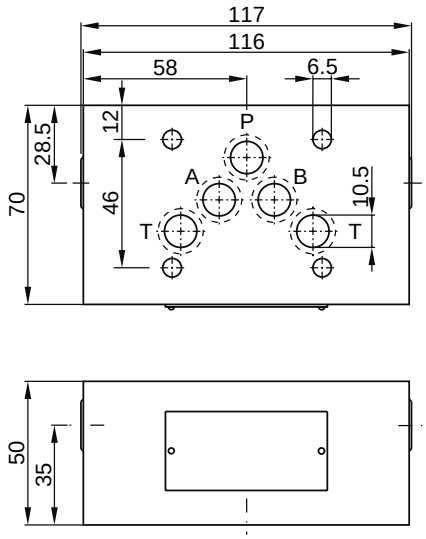
Dimensions

ZRE*01



Seal kit	
Seal	Order code
1	098-91088-0
5	098-91089-0

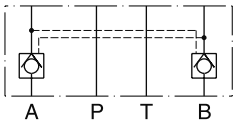
ZRE*02



Seal kit	
Seal	Order code
1	098-91090-0
5	098-91091-0

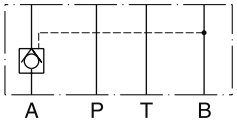
ZRE*01

blocked in A and B



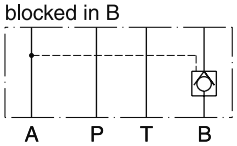
Series ZRE-AB01-D1 — Order No. 098-91020-0

blocked in A



Series ZRE-A01-D1 — Order No. 098-91018-0

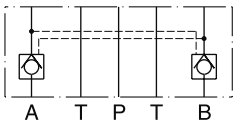
blocked in B



Series ZRE-B01-D1 — Order No. 098-91019-0

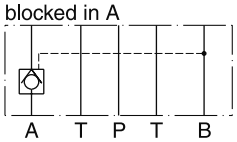
ZRE*02

blocked in A and B



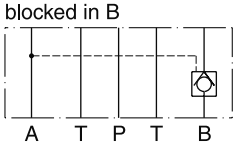
Series ZRE-AB02-E1 — Order No. 098-91300-0

blocked in A



Series ZRE-A02-E1 — Order No. 098-91298-0

blocked in B



Series ZRE-B02-E1 — Order No. 098-91304-0

7

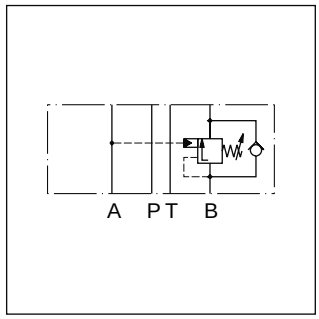
Notes

The counterbalance valve series ZNS controls the actuator movement at overrunning loads.

The return flow from the actuator is piloted and controlled by the inlet flow to the actuator, ensuring a cavitation-free lowering of the load.

The counter balance valve operates as a pressure relief valve. The setting pressure is lowered by the pressure in the inlet line. To ensure safe load holding the setting pressure should be approximately 30% higher than the max. load pressure.

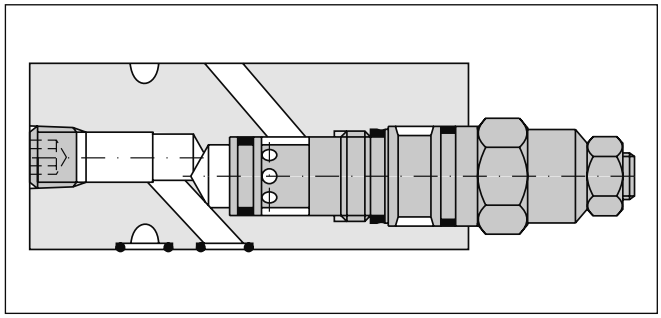
ZNS-AB01



ZNS-B01

Features

- Controlled movement loads
- Load holding via leak-free poppet valve
- Secondary relief protection for the actuator
- ZNS*01 – NG06 (CETOP3)
  ZNS*02 – NG10 (CETOP5)



ZNS-B01

Ordering code

ZNS				S0	D	
Counterbalance valve	Pressure control	Nominal size	Pressure stages	Hexagon-screw with lock nut	Design series	Seal

Code	Pressure control
A	in A
B	in B
AB	in A and B

Code	Nominal size
01	NG06
02	NG10

Code	Seal
1	NBR
5	FPM

Code	Pressure stages
2	70 - 175 bar
5 [1)]	140 - 350 bar

[1)] NG10 to 315 bar

Ordering code details see end of chapter.

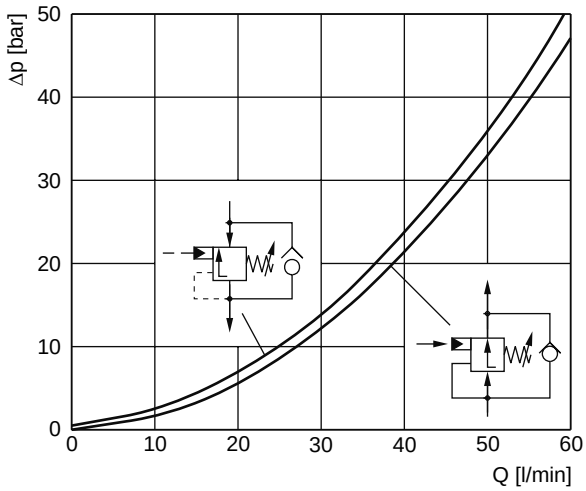
Technical data

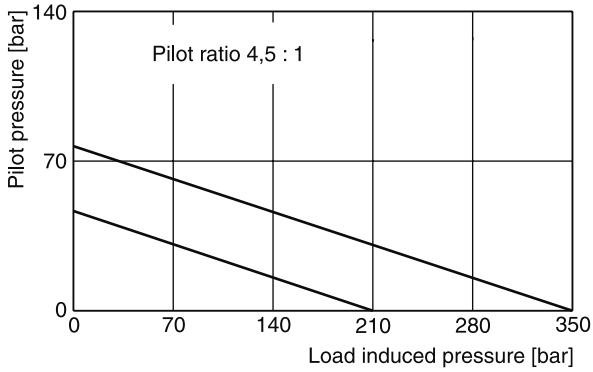
General				
Size			NG06	NG10
Mounting interface			DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
Mounting position			unrestricted	
Ambient temperature		[°C]	-20...+50	
Weight	1 cartridge	[kg]	1.3	1.6
	2 cartridges	[kg]	3.0	3.9
Hydraulic				
Max. operating pressure		[bar]	350	315
Pressure stages		[bar]	175, 350	
Pilot ratio			4.5 : 1	
Leakage			on request	
Nominal flow		[l/min]	60	120
Opening pressure		[bar]	0.3	0.3
Fluid			Hydraulic oil according DIN 51524...51525	
Fluid temperature		[°C]	-20...+80	
Viscosity	permitted	[cSt] / [mm²/s]	10...650	
	recommended	[cSt] / [mm²/s]	30	
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

ZNS UK.INDD CM 15.07.11

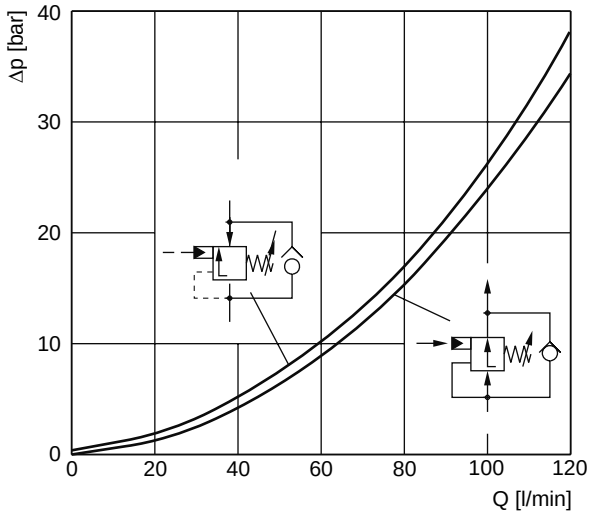
p/Q performance curves

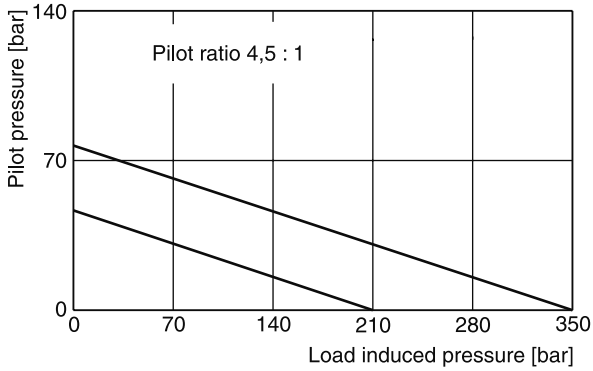
ZNS*01





ZNS*02

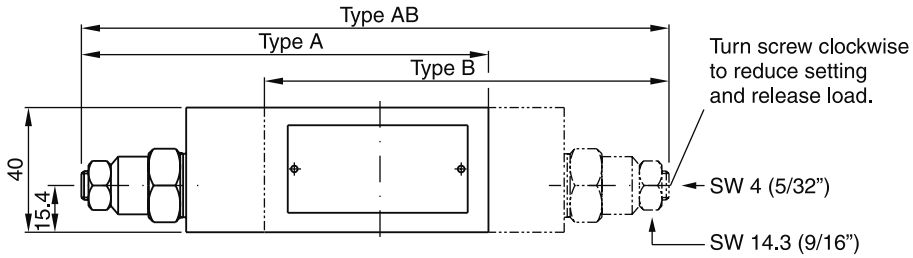


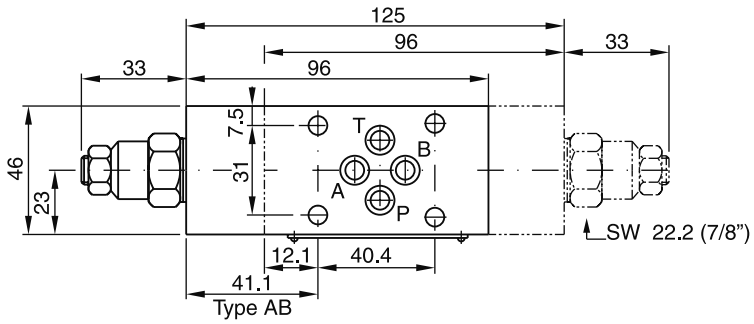


All characteristic curves measured with HLP46 at 50°C.

7

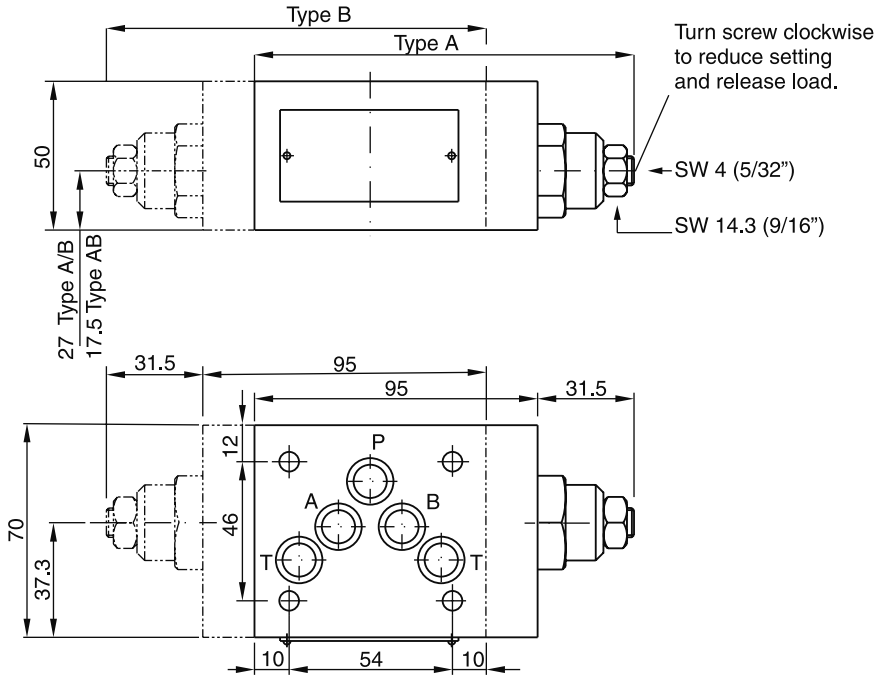
ZNS*01

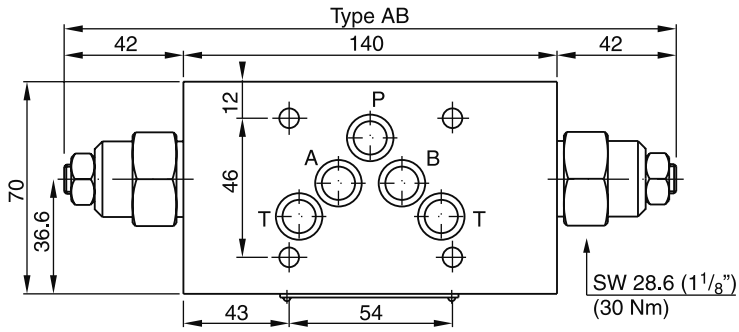




Seal kit ZNS*01	
Seal	Order code
NBR	098-91153-0
FPM	098-91154-0
Complete cartridge ZNS*01	
Pressure stage	Order code
2	517-01017-2
5	517-00448-8

ZNS*02

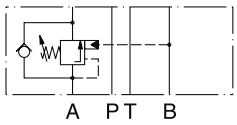
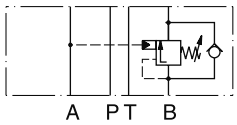
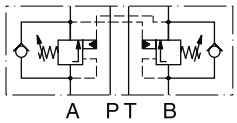




Seal kit ZNS*02	
Seal	Order code
NBR	098-91155-0
FPM	098-91156-0
Complete cartridge ZNS*02	
Pressure stage	Order code
2	517-00449-8
5	517-00450-8

7

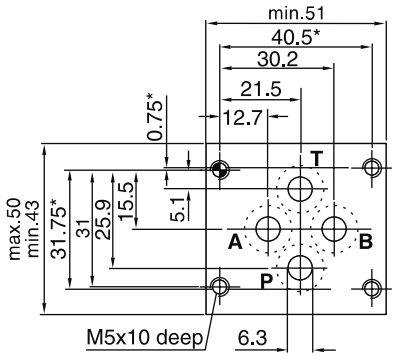
ZNS UK.INDD CM 15.07.11

	ZNS*01		ZNS*02	
Counterbalance in A 	Series	Order no.	Series	Order no.
	ZNS-A01-2-S0-D1	098-91126-0	ZNS-A02-2-S0-D1	098-91132-0
	ZNS-A01-5-S0-D1	098-91127-0	ZNS-A02-5-S0-D1	098-91133-0
Counterbalance in B 	Series	Order no.	Series	Order no.
	ZNS-B01-1-S0-D1	098-91128-0	ZNS-B02-1-S0-D1	098-91134-0
	ZNS-B01-5-S0-D1	098-91129-0	ZNS-B02-5-S0-D1	098-91135-0
Counterbalance in A and B 	Series	Order no.	Series	Order no.
	ZNS-AB01-1-S0-D1	098-91130-0	ZNS-AB02-1-S0-D1	098-91136-0
	ZNS-AB01-5-S0-D1	098-91131-0	ZNS-AB02-5-S0-D1	098-91137-0
	2 = 70 ... 175 bar 5 = 140… 350 bar		2 = 70 ... 175 bar 5 = 140 …315 bar	

7

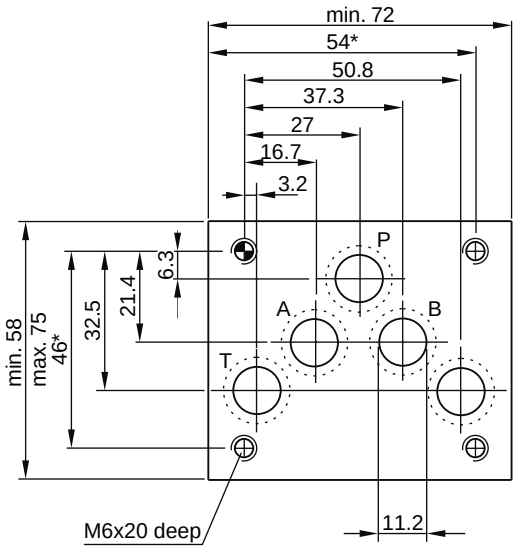
NG06

Code: ISO 4401-03-02-0-94



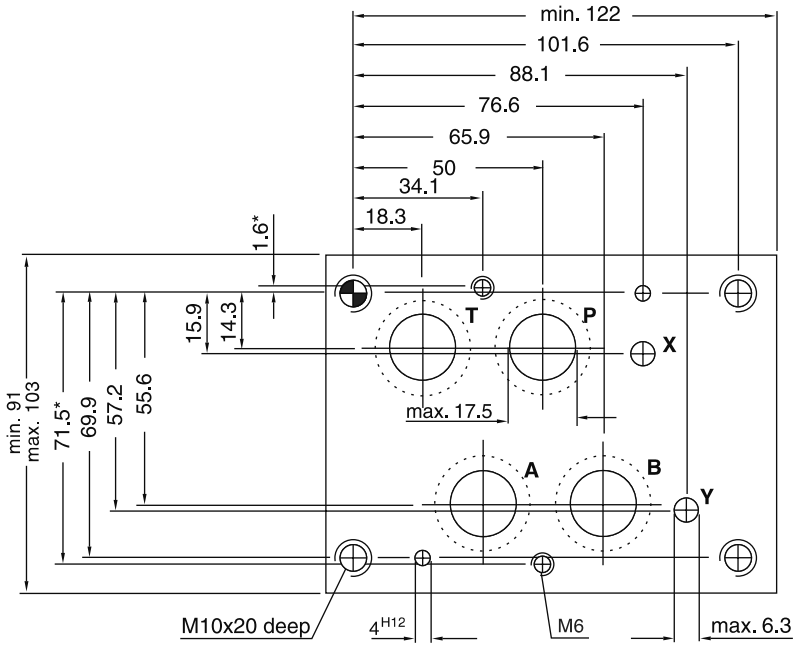
NG10

Code: ISO 4401-05-05-0-94



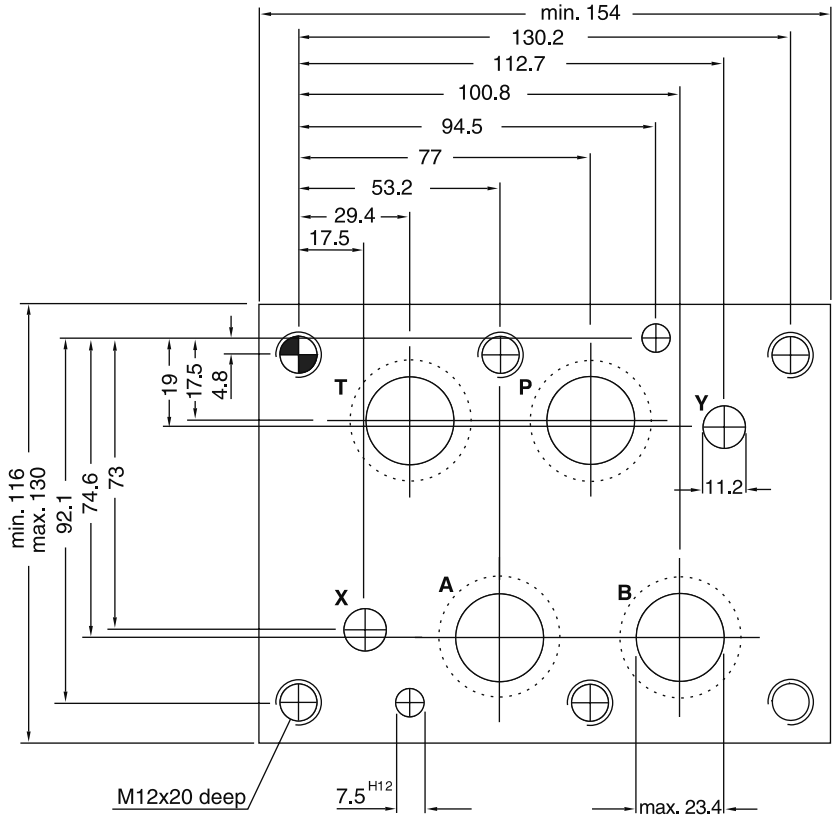
NG16

Code: ISO 4401-07-06-0-94



NG25

Code: ISO 4401-08-07-0-94 (Port diameter acc. to NFPA)



Dimensions marked with*: ± 0.1mm.
All other dimensions: ± 0.2mm.

Information07.INDD CM 07.09.11

Mounting

Parker and Denison sandwich valves can be installed as desired. Each has a mounting pattern, whose dimensions correspond to the following standards.

ISO 4401
DIN 24430
CETOP RP121
NFPA

Mounting screws

Cylinder head bolts as per DIN 912/12.9, or studs as per DIN 835 10.9 with cylindrical nuts are used to mount the height stacking Manapak sandwich valves.

Bolt kits and tie rods see chapter 12, "Accessories".

Length of the mounting screws

The screw length is the sum of the engagement depth plus the stacking length. The stud length is the sum of the stacking length plus the thread depth of the nut.

Torques

The mounting screws or studs must be tightened with the prescribed tightening torque so that safety and proper seal are ensured.

See chapter 12 “Accessories“ for BK bolt kits and TK tie rod kits.

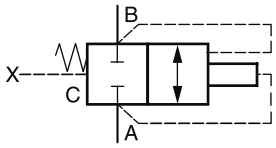
Threads length

Threads	M5	M6	M10	M12
thread length	1.5 x Ø thread			

8

Notes

Port identifications - graphics



Description

Depending on valve function and design, power ports A and B can be used for inlet or outlet.

The control port C is the connection between cover and cartridge unit.

Further control ports

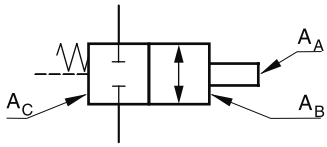
X control oil connection, inlet

Y control oil connection, outlet

Z_1 control oil connection, preferred inlet

Z_2 control oil connection, preferred outlet

Control surfaces - graphics



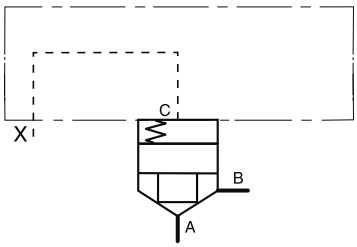
Description

A_A Area, which is subjected to the pressure at port A

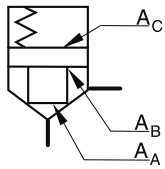
A_B Area, which is subjected to the pressure at port B

A_C Area, which is subjected to the pressure at port C

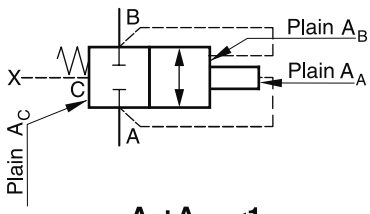
Port identifications - schematics

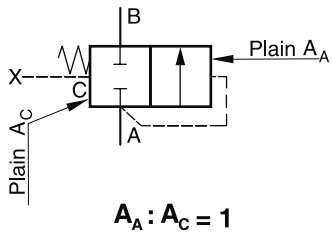


Control surfaces - schematics

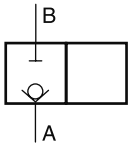


Area representation

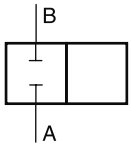




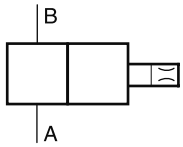
Design representation



Seat design



Spool design

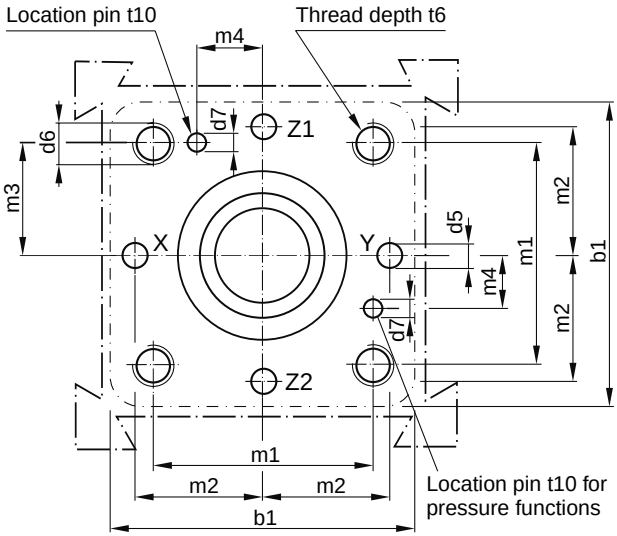


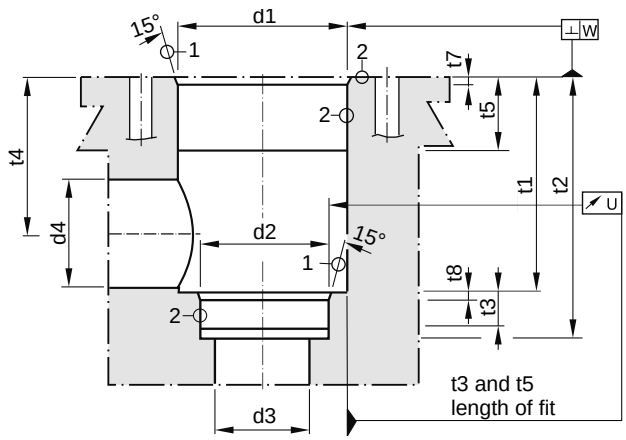
Dampening poppet

8

Code: ISO 7368-B*-*-2-A/B

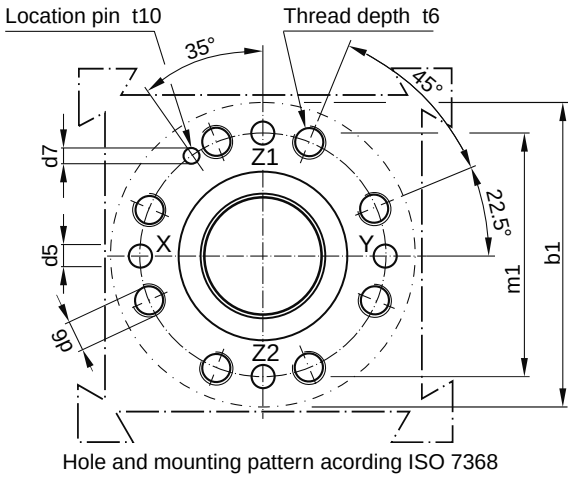
NG 16 to NG 63





Code: ISO 7368-B*-*-2-A

NG 80 to NG 100



Hole and mounting pattern acording ISO 7368

Required surface finish:

$\textcircled{1} = \sqrt{R_{max}16}, \textcircled{2} = \sqrt{R_{max}8}$

Cartridge manifold block series CB see chapter 12.

Nom. size	b1	d1 H7	d2 H7	d3	d3 max	d4	d4 max*	d5 max	d6	d7 H13	m1±0.2	m2±0.2	m3±0.2
16	65	32	25	16	18	16	25	4	M 8	4	46	25	23
25	85	45	34	25	25.5	25	32	6	M 12	6	58	33	29
32	102	60	45	32	36	32	40	8	M 16	6	70	41	35
40	125	75	55	40	43	40	50	10	M 20	6	85	50	42.5
50	140	90	68	50	56	50	63	10	M 20	8	100	58	50
63	180	120	90	63	74	63	80	12	M 30	8	125	75	62.5
80	250	145	110	80	93	80	100	16	M 24	10	200	–	–
100	300	180	135	100	115	100	125	20	M 30	10	245	–	–

Nom. size	m4±0.2	t1+0.1	t2+0.1	t3	t4	t4 max*	t5	t6	t7	t8	t10	U	W
16	10.5	43	56	11	34	29.5	20	20	2	2	10	0.03	0.05
25	16	58	72	12	44	40.5	30	25	2.5	2.5	10	0.03	0.05
32	17	70	85	13	52	48.0	30	35	2.5	2.5	10	0.03	0.1
40	23	87	105	15	64	59.0	30	45	3	3	10	0.05	0.1
50	30	100	122	17	72	65.5	35	45	4	3	10	0.05	0.1
63	38	130	155	20	95	86.5	40	65	4	4	10	0.05	0.2
80	–	175	205	25	130	120	40	50	5	5	10	0.05	0.2
100	–	210	245	29	155	142	50	53	5	5	10	0.05	0.2

* only together with $d4_{max}$ and $t4_{max}$

2 way slip-in cartridge valves are hydraulically controlled seat valves that are designed for compact block installation. Slip-in cartridge, cover, and pilot system are valve elements that permit single and combined functions.

Series CE offers poppet and sleeve combinations for directional functions. Series CP offers a cartridge for pressure functions and has to be combined with corresponding covers.

Features

- Installation cavity and mounting pattern according to ISO 7368
- 5 poppet shapes
- 5 poppet springs
- Optional seal between ports B and C
- Cover with adjustable stroke limitation
- Cover with mounting pattern for pilot valve assembly
- Combinations for complex functions
- Normally open cartridge (CE*F04)

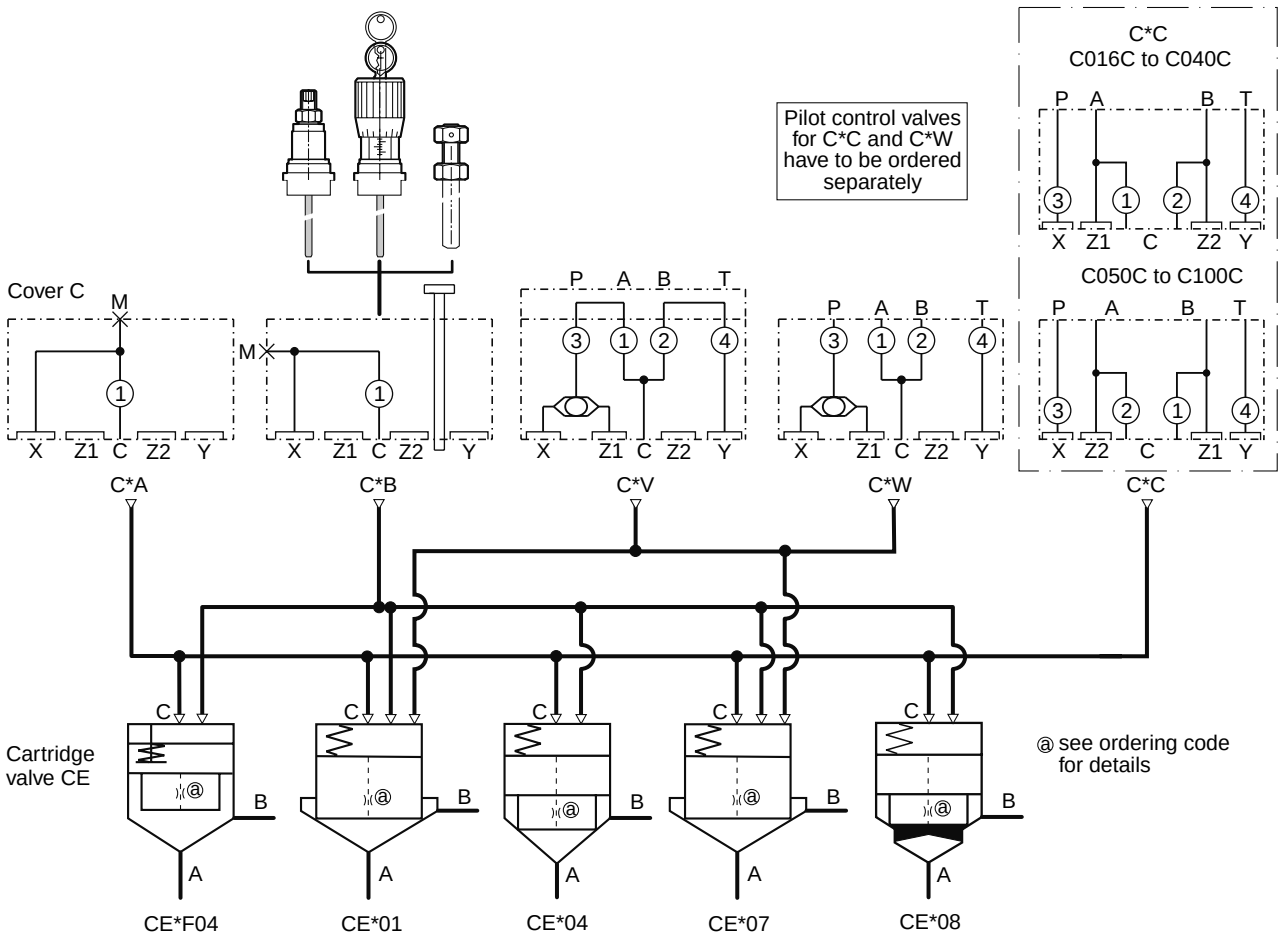
CE

C*B

C*A

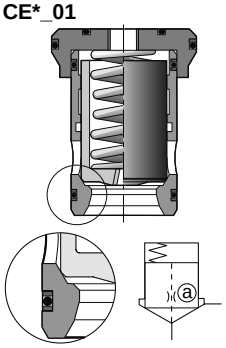
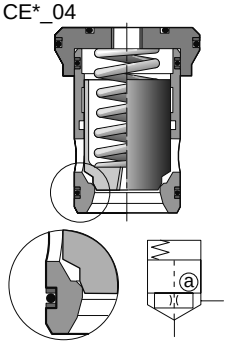
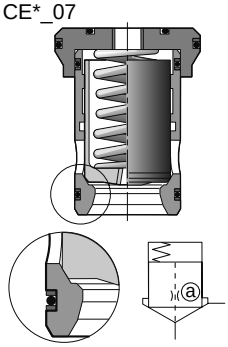
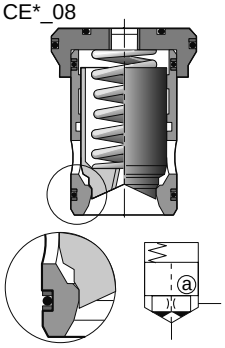
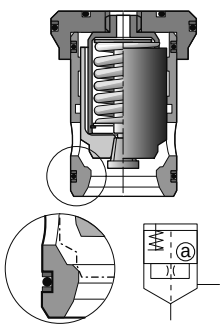
C*C

Pilot control for directional functions



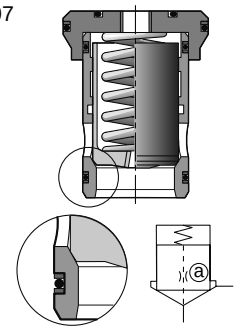
8

Cartridge valve for directional function

CE*_01	CE*_04	CE*_07	CE*_08	CE*F04
				
1 : 1 $A_A = A_C$	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$	1 : 1.04 $A_A = 0.96\ A_C$	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ dampening poppet	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ normaly open

Cartridge valve for pressure function

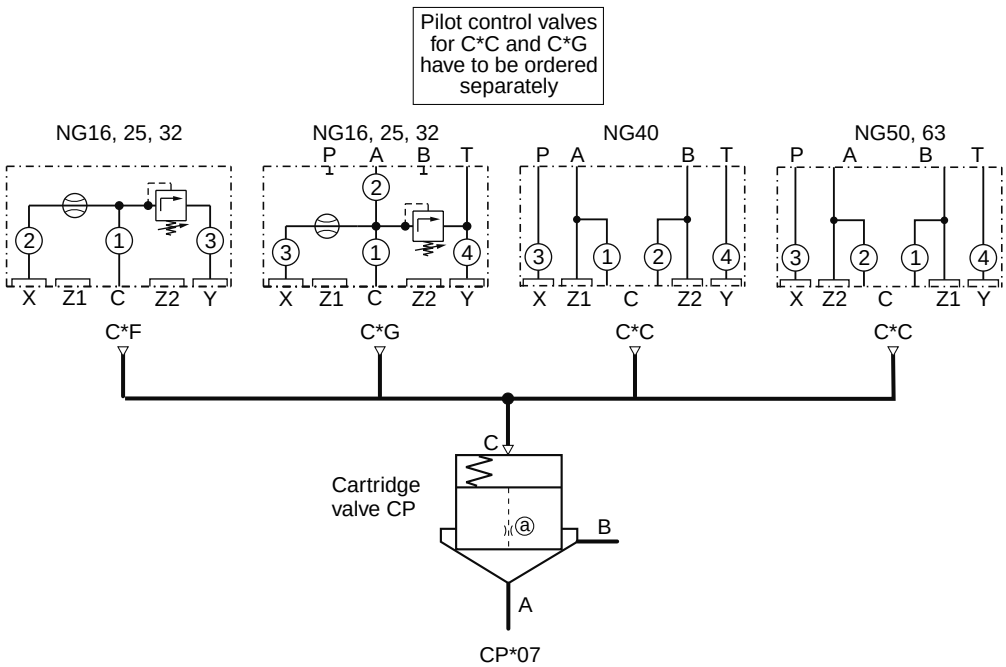
CP*_C07



1 : 1.04
$A_A = 0.96\ A_C$

Characteristic curves see complete valves pressure function

Pilot control for pressure function



CE □ □ □ □ □ □ □

Cartridge | **Nominal size** | **Design** | **Poppet area ratio** | **Spring** | **Orifice** | **Seal** | **Design series** (not required for ordering)

Code	Size
016	**NG16**
025	**NG25**
032	**NG32**
040	**NG40**
050	**NG50**
063	**NG63**
080	**NG80**
100	**NG100**

Code	Normal position	Description
C	**Closed**	**No poppet sealing**
S [1]	Closed	With poppet sealing
F [2]	Open	No poppet sealing

[1] Only for spring S, T and U. Not for poppet code 01 (NG16 to NG63).

[2] Only with spring code L

Code	Poppet area ratio
01	**$A_A = A_C$**
04	**$A_A = 0.6A_C$, $A_B = 0.4A_C$**
07 [3]	$A_A = 0.96A_C$
08	**$A_A = 0.6A_C$, $A_B = 0.4A_C$ with dampening**

[3] Not for NG80 and NG100

Code	Seal
N	**NBR**
V	FPM

Code	Size	Poppet	Orifice [4]
99	all	all	without orifice, open
00	NG16-NG50	01, 04	closed bottom
00	NG16-NG50	07, 08	plug
00	NG63-NG100	all	plug

[4] Orifice size in 1/10 mm, eg. 1.2 mm orifice - code 12
Thread size 1/16 NPTF

Code	Spring
L	Opening pressure 0.1 bar
N	Opening pressure 0.5 bar
S	**Opening pressure 1.6 bar**
T	Opening pressure 2.5 bar
U	Opening pressure 4.0 bar

CP □ □ **07** □ □ □ □

Cartridge | **Nominal size** | **Design** | **Poppet area ratio $A_A = 0.96A_C$** | **Spring** | **Orifice** | **Seal** | **Design series** (not required for ordering)

Code	Size
016	**NG16**
025	**NG25**
032	**NG32**
040	**NG40**
050	**NG50**
063	**NG63**

Code	Normal position	Description
C	**Closed**	**No poppet sealing**
S	Closed	With poppet sealing

Code	Spring
S	**Opening pressure 1.6 bar**
T	Opening pressure 2.5 bar
U	Opening pressure 4.0 bar

Code	Seal
N	**NBR**
V	FPM

Code	Orifice [1]
00	**Plug**
09	0.9 mm for NG16
11	1.1 mm for NG25
12	1.2 mm for NG32
13	1.3 mm for NG40
14	1.4 mm for NG50
15	1.5 mm for NG63

[1] recommended diameter

Bold letters =
Short-term availability

For spare parts see "Accessories" in this chapter.
For orifice recommendations see "Combination Examples" in this chapter.

8

CE-C UK.INDD CM 07.09.11

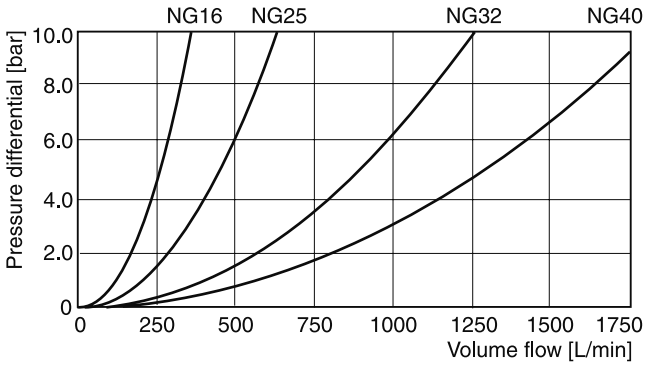
Technical data

General									
Design type			2 way slip-in cartridge valves according to ISO 7368						
Actuation			Hydraulic						
Mounting position			unrestricted						
Ambient temperature		[C°]	-40....+60						
$MTTF_D$ value		[years]	150						
Nominal size			NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
Weight	cartridge	[kg]	0.3	0.6	1.1	1.7	3.7	7.1	12.8	27
Hydraulic									
Fluid			Hydraulic fluid according to DIN 51524...51525						
Viscosity	recommended	[mm^2/s]	30...80						
	max. permitted	[mm^2/s]	20...380						
Fluid temperature		[C°]	-20...+60						
Max. contamination			ISO 4406 1999; 18/16/13 (meet NAS 1638: 7)						
Operating pressure	without pilot valve	[bar]	420						
	port A, B, X, Z1, Z2	[bar]	350, 420 (depending on p_{max} of pilot valves)						
	port Y	[bar]	According to pilot system, max. 350 (depending on p_{max} of pilot valves)						
Nominal flow at Δp 5 bar	poppet 01, 04, 07	[l/min]	250	450	900	1350	1800	3600	5250	8000
	poppet 08	[l/min]	230	400	800	1250	1625	3400	5000	7500
Pilot volume requirement	at poppet 01	[cm^3]	2.0	6.5	10.2	17.4	34.5	77.4	190.1	342.6
	at poppet 04		2.0	6.5	12.2	20.3	39.4	94.6	190.1	363.4
	at poppet 07		2.0	6.5	10.2	17.4	34.5	77.4	—	—
	at poppet 08		2.0	7.4	15.3	23.2	49.2	111.8	217.3	415.3
Opening pressure	flow direction A → B	[bar]	Poppet 01 / 07		spring:	L = 0.1	N = 0.5	S = 1.6	T = 2.5	U = 4.0
			Poppet 04 / 08		spring:	L = 0.2	N = 0.9	S = 2.7	T = 4	U = 6.6
Opening pressure	flow direction B → A	[bar]	Poppet 01 / 07		not possible					
			Poppet 04 / 08		spring:	L = 0.3	N = 1.3	S = 4.0	T = 6.3	U = 10.0

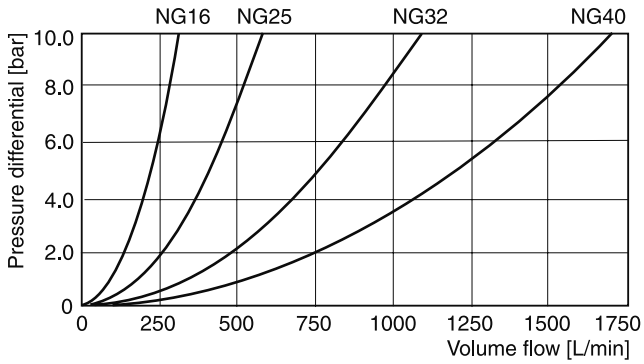
Performance curves (without spring and poppet seal, C-chamber unloaded)

8

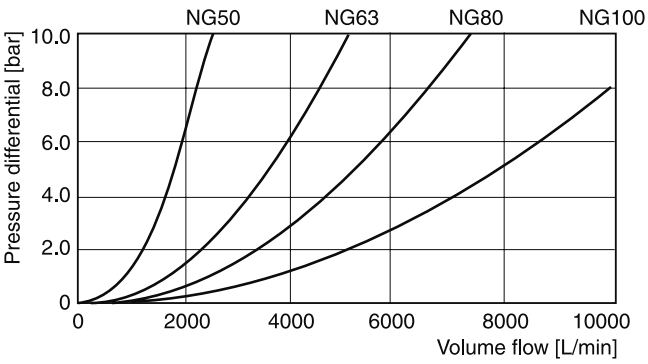
Poppet 01, 04, 07



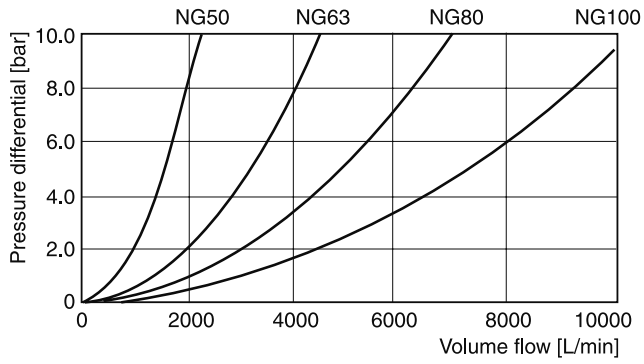
Poppet 08



Poppet 01, 04, 07



Poppet 08



All characteristic curves measured with HLP46 at 50°C.

CE-C UK.INDD CM 07.09.11

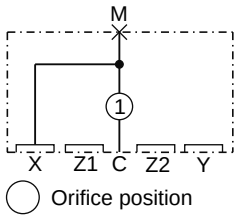
C		A	A			
Cover	**Nominal size**	**Cover with X-connection and gauge port G¼"**	**Without auxilliary function**	**Orifice**	**Seal**	**Design series** (not required for ordering)

Code	Size
016	**NG16**
025	**NG25**
032	**NG32**
040	**NG40**
050	**NG50**
063	**NG63**
080	**NG80**
100	**NG100**

Bold letters =
Short-term availability

Code	Seal
N	**NBR**
V	FPM

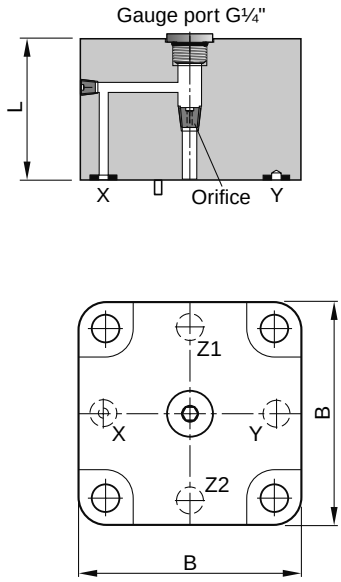
Code	Orifice
99	**Without orifice, open**



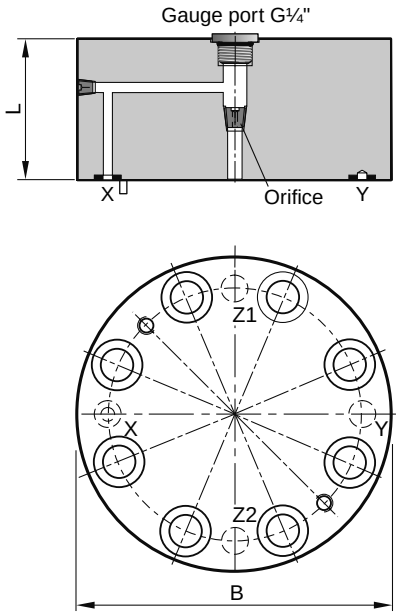
For orifice recommendations, bolt and seal kits see "Accessories" in this chapter.

Dimensions

NG16 to NG63



NG80 to NG100



Ports Y, Z1 and Z2: O-ring recess diameter on valve body

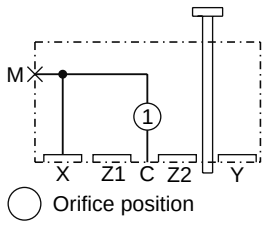
Size	B	L	Orifice thread	Weight [kg]
NG16	65	36	1/16 NPT	0.9
NG25	85	45	1/16 NPT	1.9
NG32	102	50	1/16 NPT	2.9
NG40	125	60	1/8 NPT	5.3
NG50	140	70	1/8 NPT	8.5
NG63	180	85	1/8 NPT	15.5
NG80	Ø250	105	1/8 NPT	34
NG100	Ø300	120	1/8 NPT	58

C		B	N			
Cover	**Nominal size**	**Cover with X-connection and stroke limiter**	**Adjustment Screw/ spindle**	**Orifice**	**Seal**	**Design series** (not required for ordering)

Code	Size
016	**NG16**
025	**NG25**
032	**NG32**
040	**NG40**
050	**NG50**
063	**NG63**
080	**NG80**
100	**NG100**

Code	Seal
N	**NBR**
V	FPM

Code	Orifice
99	**Without orifice, open**

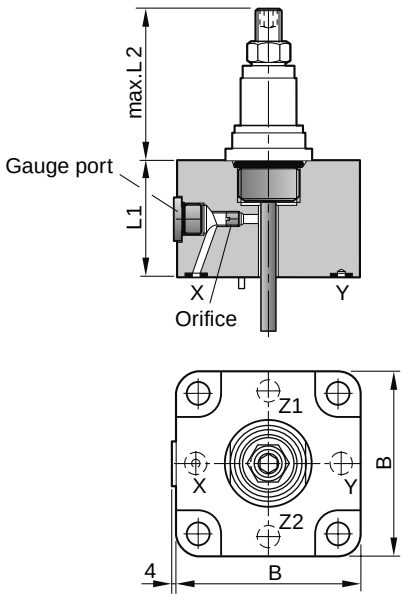


Bold letters =
Short-term availability

For orifice recommendations, bolt and seal kits see "Accessories" in this chapter.

8

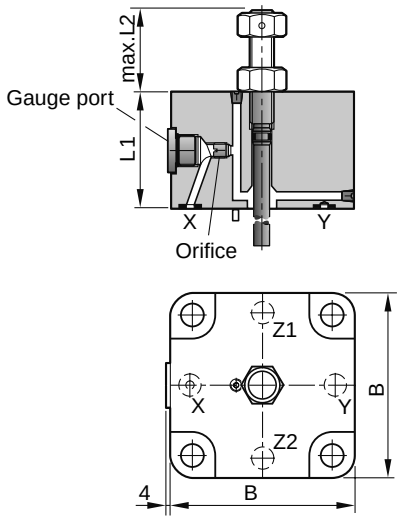
Dimensions NG16 - NG25



Ports Y, Z1 and Z2: O-ring recess diameter on valve body

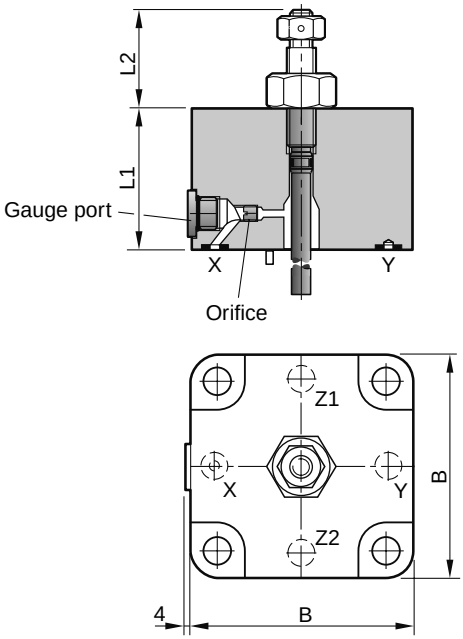
Size	B	L1	L2 max.	L4 max.	Gauge port	Orifice thread	Weight [kg]
NG16	65	36	72	100	G 1/4"	M6	0.9
NG25	85	45	72	100			1.9

Dimensions NG32 - NG50

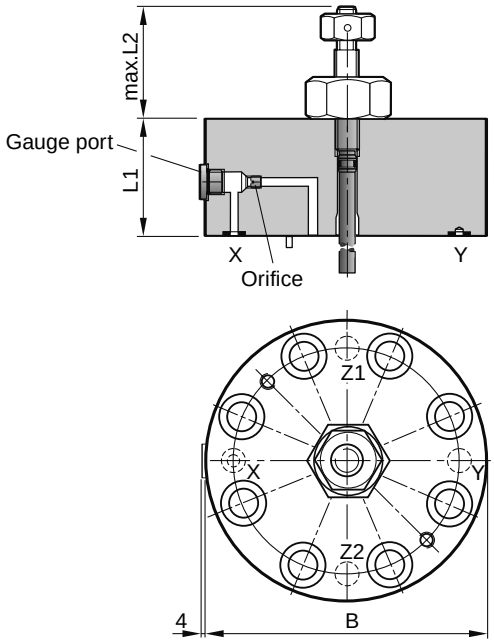


Ports Y, Z1 and Z2: O-ring recess diameter on valve body

Dimensions NG63



Dimensions NG80-100



Ports Y, Z1 and Z2: O-ring recess diameter on valve body

Size	B	L1	L2 max.	L3	L4 max.	Gauge port	Orifice thread	Weight [kg]
NG32	102	50	48	—	141	G¼"	1/16 NPT	2.91
NG40	125	60	50	123	—	G¼"	1/16 NPT	5.39
NG50	140	70	50	127	—	G¼"	1/16 NPT	8.41
NG63	180	85	65	—	—	G¼"	1/8 NPT	15.1
NG80	Ø250	105	95	—	—	G¼"	1/8 NPT	34.0
NG100	Ø300	120	120	—	—	G¼"	1/8 NPT	60.0

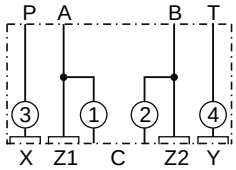
C		C	A						
				1	2	3	4		
Cover	**Nominal size**	**Cover for pilot system mounting**	**Without auxilliary function**	**Orifice / choke**				**Seal**	**Design series** (not required for ordering)

Code	Size
016	**NG16**
025	**NG25**
032	**NG32**
040	**NG40**
050	**NG50**
063	**NG63**
080	**NG80**
100	**NG100**

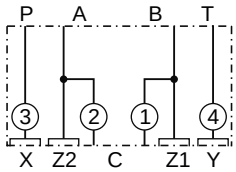
Code	Seal
N	**NBR**
V	FPM

Code	Orifice
99	**Without orifice, open**
00	**Plug**

NG16 to NG40



NG50 to NG100



Orifice position

Attention:

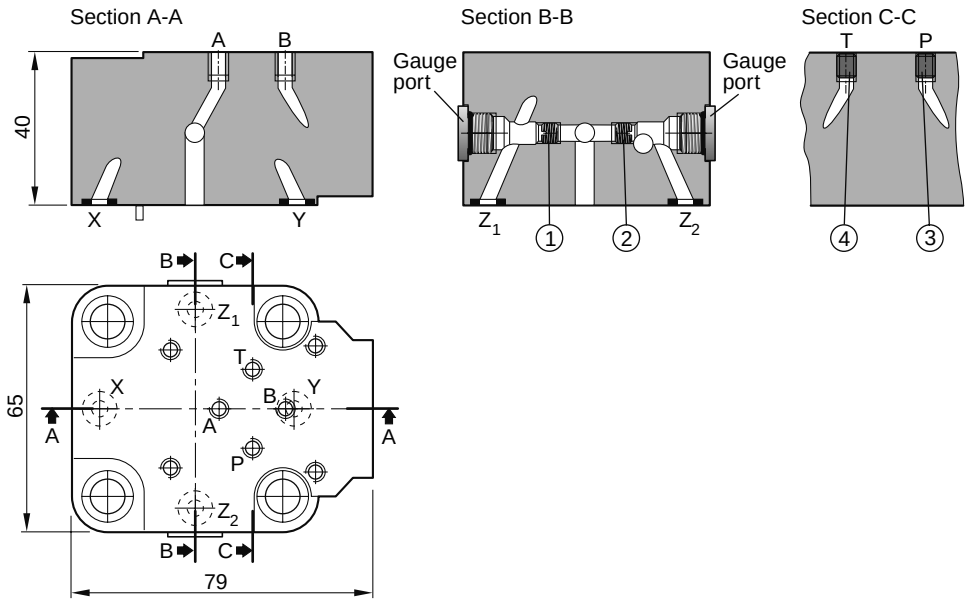
For NG50 and larger:
If pilot system NG06 should be used, mount adapter plate PADA 1007/A-B/B-A or PADA 1007/A-A/B-B (NG10 to NG06) see chapter 12.

For orifice recommendations, bolt and seal kits see "Accessories" in this chapter.

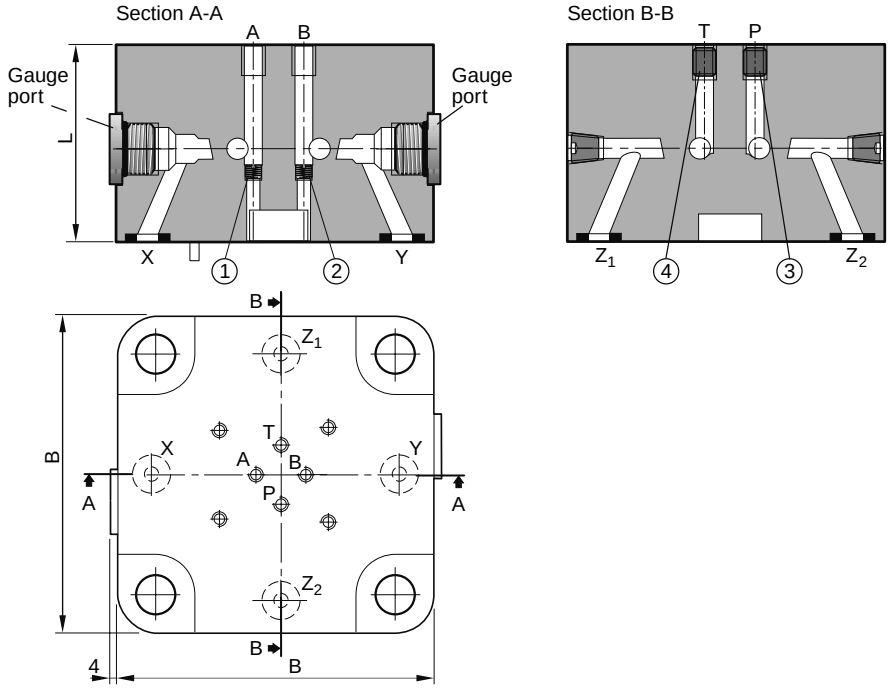
Bold letters =
Short-term availability

8

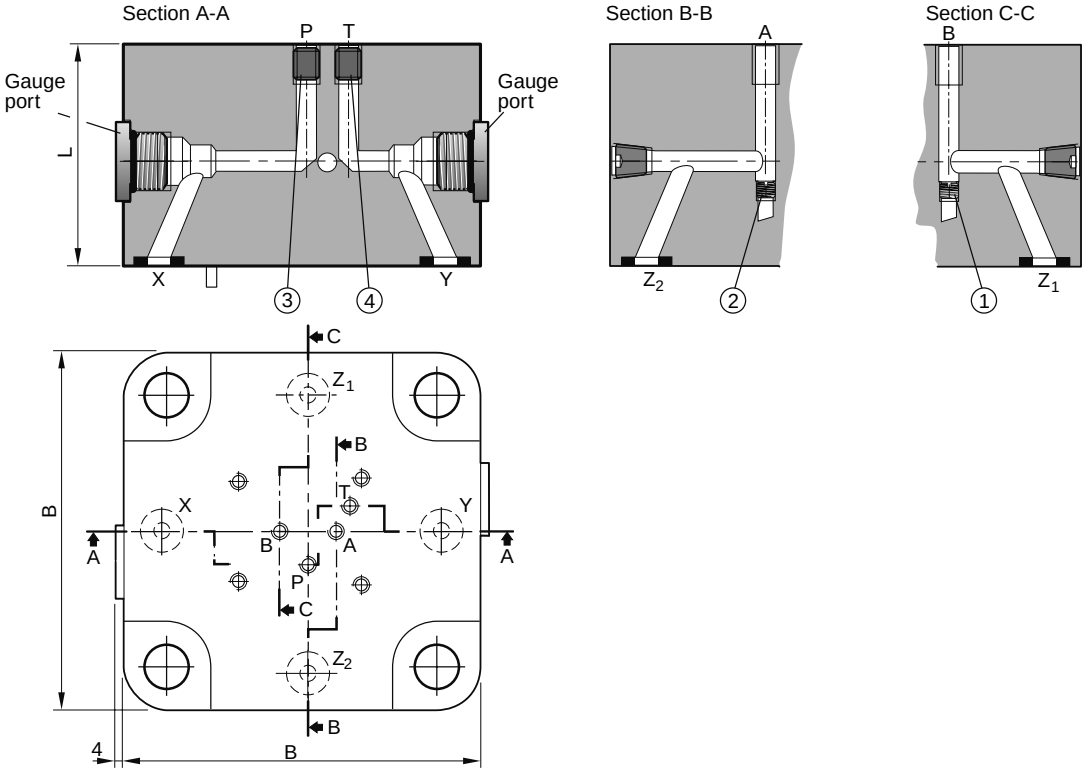
Dimensions NG16



Dimensions NG25 to NG40



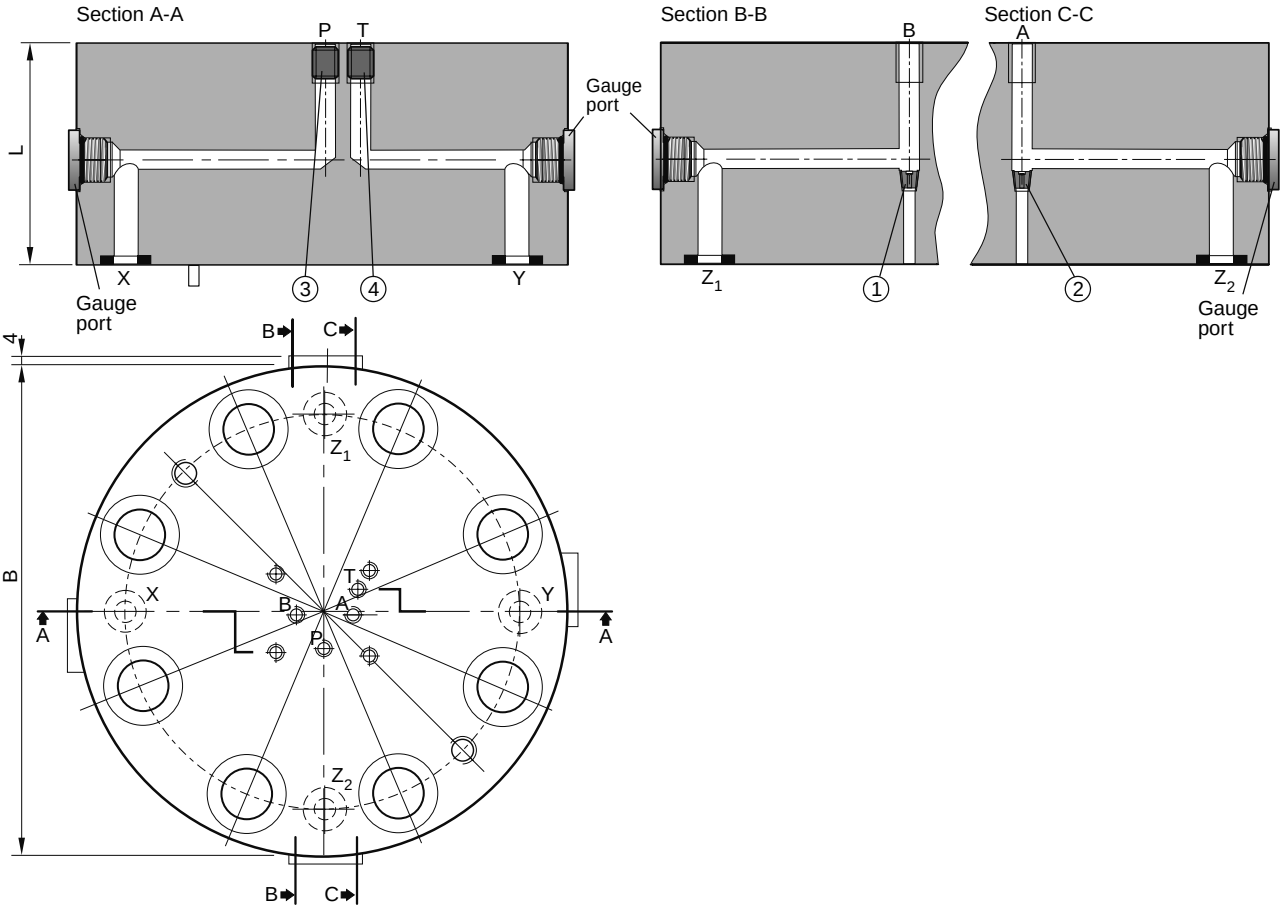
Dimensions NG50 to NG63



8

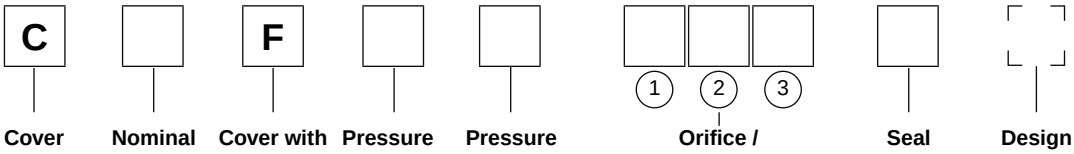
CE-C UK.INDD CM 07.09.11

Dimensions NG80 to NG100



Size	B	L	Gauge port	Weight [kg]	Orifice thread ①	②	③	④
NG16	79 [1)]	40	G¼"	1.0	M5	M5	M5	M5
NG25	85	45	G¼"	1.9	M5	M5	M6	M6
NG32	102	50	G¼"	2.9	M5	M5	M6	M6
NG40	125	60	G¼"	5.3	M5	M5	M6	M6
NG50	140	70	G¼"	8.5	M6	M6	M8	M8
NG63	180	85	G¼"	15.3	M6	M6	M8	M8
NG80	Ø250	105	G¼"	34	1/16 NPT	1/16 NPT	1/8 NPT	1/8 NPT
NG100	Ø300	120	G¼"	60	1/16 NPT	1/16 NPT	1/8 NPT	1/8 NPT

[1)] Width 65mm

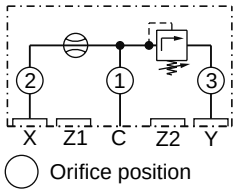


Code	Size
016	**NG16**
025	**NG25**
032	**NG32**

Code	Seal
N	**NBR**
V	FPM

Code	Pressure range [bar]
07	**75**
10	**105**
17	**175**
21	**210**
25	**250**
35	**350**

Code	Orifice
99	**Without orifice, open**

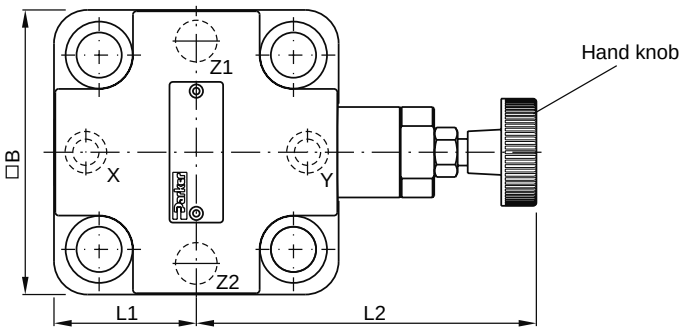


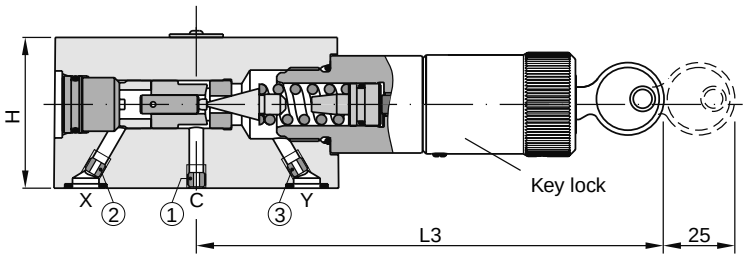
Code	Adjustment
S	**Hand knob (standard)**
L	Key lock

Bold letters =
Short-term availability

For orifice recommendations, bolt and seal kits see "Accessories" in this chapter.

Dimensions



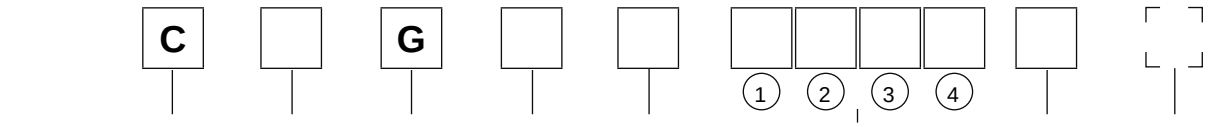


Ports Z1 and Z2: O-ring recess diameter on valve body

Size	B	H	L1	L2 max.	L3 max.	Orifice thread ①	②	③
NG16	65 [1)]	40	32.5	114	125.5	M5	M4	M5
NG25	85	45	42.5	102	114	M5	M5	M5
NG32	102	50	51	95	106	M6	M6	M6

[1)] Width 79 mm

CE-C UK.INDD CM 07.09.11



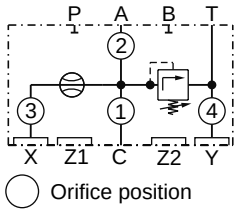
Cover | **Nominal size** | **Cover with pressure relief valve and pilot system mounting** | **Pressure range** | **Pressure adjustment** | **Orifice / choke** | **Seal** | **Design series** (not required for ordering)

Code	Size
016	**NG16**
025	**NG25**
032	**NG32**

Code	Seal
N	**NBR**
V	FPM

Code	Pressure range [bar]
07	**75**
10	**105**
17	**175**
21	**210**
25	**250**
35	**350**

Code	Orifice
99	**Without orifice, open**



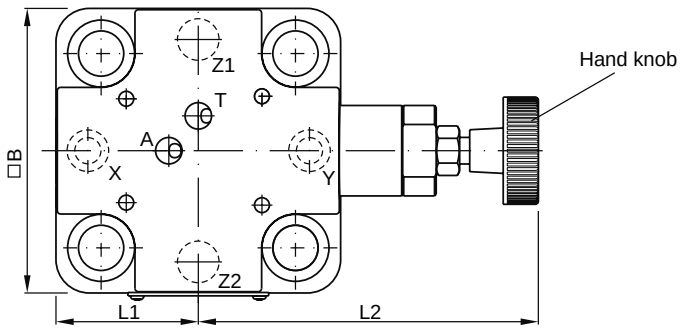
Orifice position

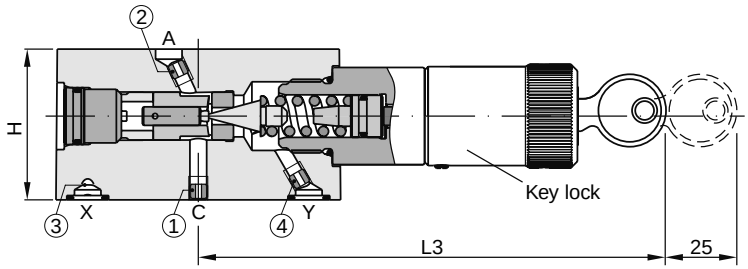
Code	Adjustment
S	**Hand knob (standard)**
L	Key lock

Bold letters =
Short-term availability

For orifice recommendations, bolt and seal kits see "Accessories" in this chapter.

Dimensions





Ports Z1 and Z2: O-ring recess diameter on valve body

Size	B	H	L1	L2 max.	L3 max.	Orifice thread ①	②	③	④
NG16	65 [1)]	40	32.5	114	125.5	M5	M5	M4	M5
NG25	85	45	42.5	102	114	M5	M5	M5	M5
NG32	102	50	51	95	106	M6	M6	M6	M6

[1)] Width 79 mm

CE-C UK.INDD CM 07.09.11

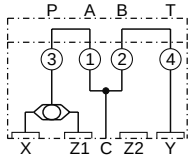
C		V	A						
				①	②	③	④		
Cover	**Nominal size**	**Cover with shuttle valve**	**w/o additional option**	**Orifice / choke**				**Seal**	**Design series** (not required for ordering)

Code	Size
016	**NG16**
025	**NG25**
032	**NG32**
040	**NG40**
050	**NG50**
063	**NG63**

Bold letters =
Short-term availability

Code	Seal
N	**NBR**
V	FPM

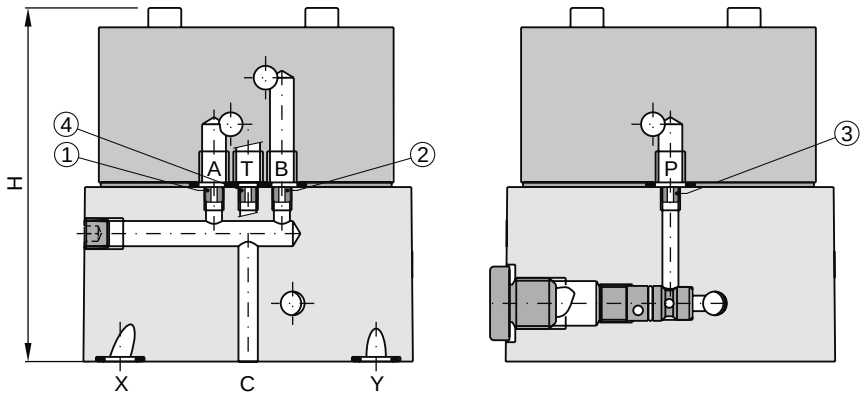
Code	Orifice
99	**Without orifice, open**

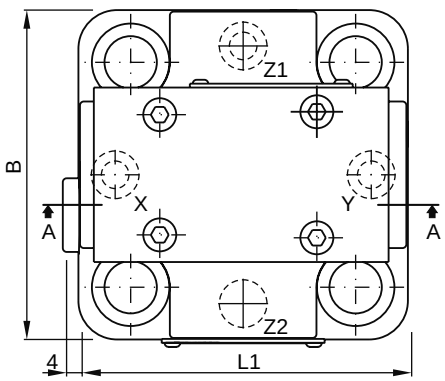


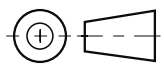
Orifice position

For orifice recommendations, bolt and seal kits see "Accessories" in this chapter.

Dimensions

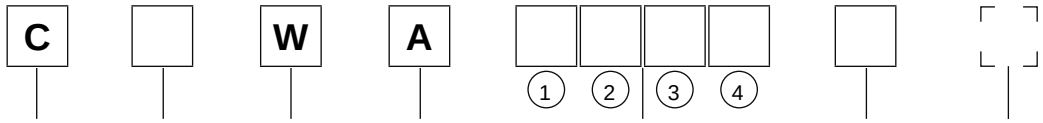






Port Z2: O-ring recess diameter on valve body

Size	B	H	L1	Orifice thread ①	②	③	④
NG16	65	86.5	85	M5	M5	M5	M5
NG25	85	91.5	85	M5	M5	M5	M5
NG32	102	96.5	102	M5	M5	M5	M5
NG40	125	106.5	125	M6	M6	M6	M6
NG50	140	126.5	140	M8	M8	M8	M8
NG63	180	141	180	M8	M8	M8	M8



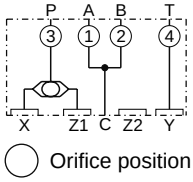
Cover | **Nominal size** | **Cover with shuttle valve and pilot system mounting** | **w/o additional option** | **Orifice / Choke** | **Seal** | **Design series** (not required for ordering)

Code	Size
016	**NG16**
025	**NG25**
032	**NG32**
040	**NG40**
050	**NG50**
063	**NG63**

Bold letters =
Short-term availability

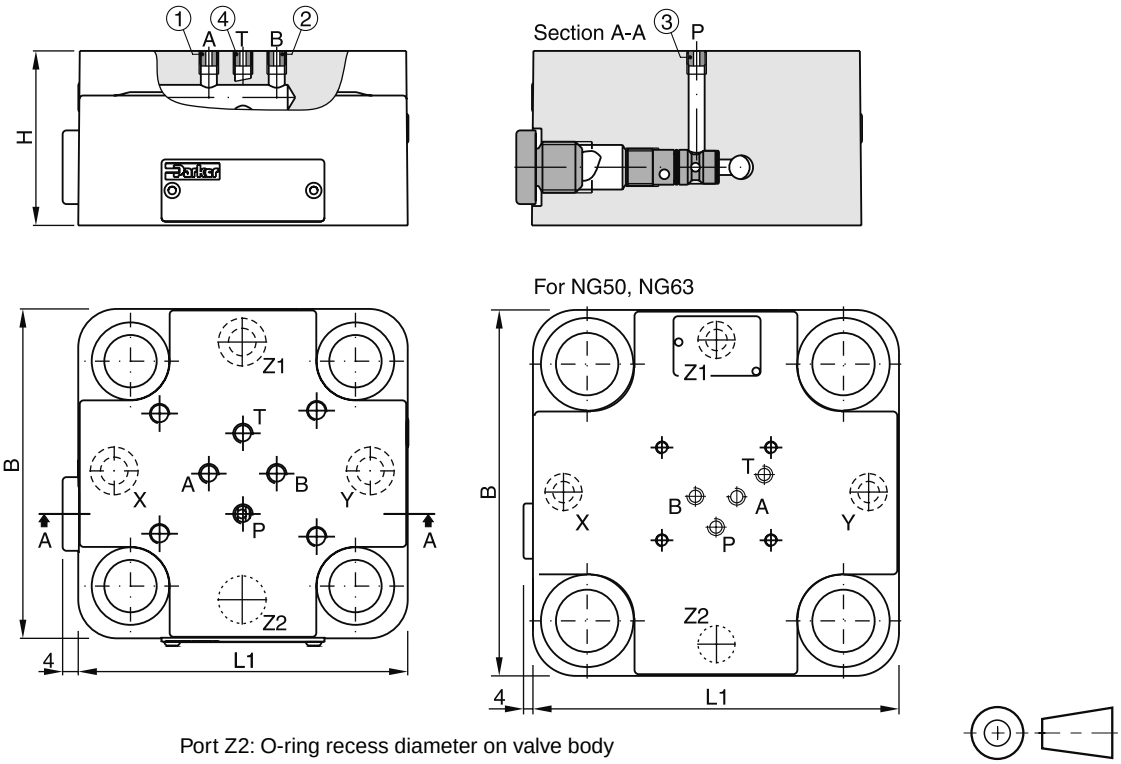
Code	Seal
N	**NBR**
V	FPM

Code	Orifice
99	**Without orifice, open**



For orifice recommendations, bolt and seal kits see "Accessories" in this chapter.

Dimensions

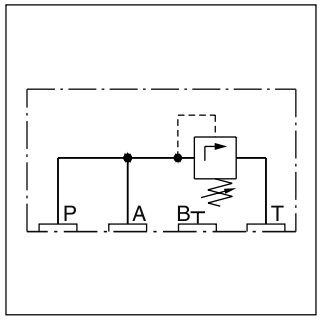


Port Z2: O-ring recess diameter on valve body

Size	B	H	L1	Orifice thread ①	②	③	④
NG16	65	40	79	M5	M5	M5	M5
NG25	85	45	85	M5	M5	M5	M5
NG32	102	50	102	M5	M5	M5	M5
NG40	125	60	125	M6	M6	M6	M6
NG50	140	70	140	M8	M8	M8	M8
NG63	180	85	180	M8	M8	M8	M8

Pilot valve with pressure relief function R06M, sub-plate mounting NG06, see combination examples.

$MTTF_D$ value 150years



Ordering code R06M

R06M | ☐ | ☐ | **4** | ☐ | ☐

Pressure range | **Pressure adjustment** | **Pilot oil** | **Seal** | **Design series** (not required for ordering)

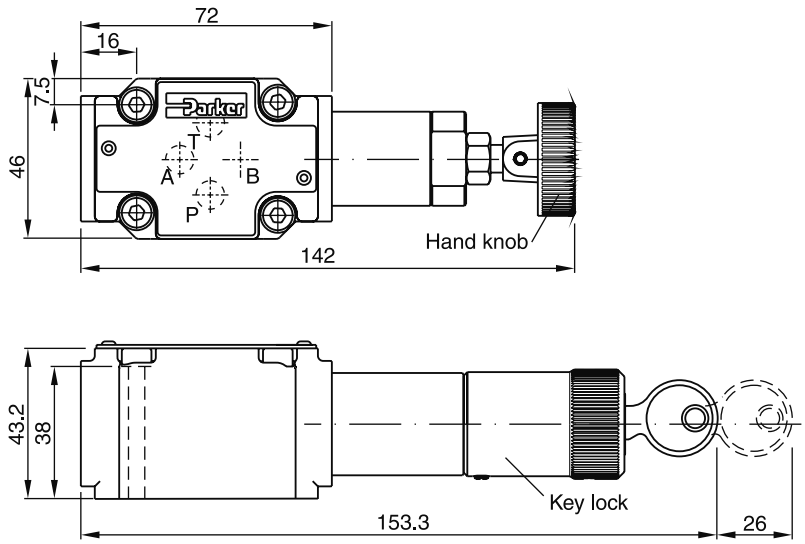
Code	Pressure range [bar]
10	**105**
17	**175**
21	**210**
25	**250**
35	**350**

Code	Seal
N	**NBR**
V	FPM

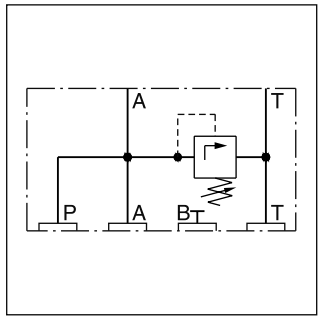
Code	Adjustment
S	**Hand knob (standard)**
L	Key lock

Bold letters =
Short-term availability

Dimensions R06M



Pilot valve with pressure relief function RS06M, sandwich plate mounting NG06, see combination examples.
$MTTF_D$ value 150 years.



Ordering code RS06M

RS06M □ □ **4** □ ⌜ ⌝

Pressure range | **Pressure adjustment** | **Pilot oil** | **Seal** | **Design series** (not required for ordering)

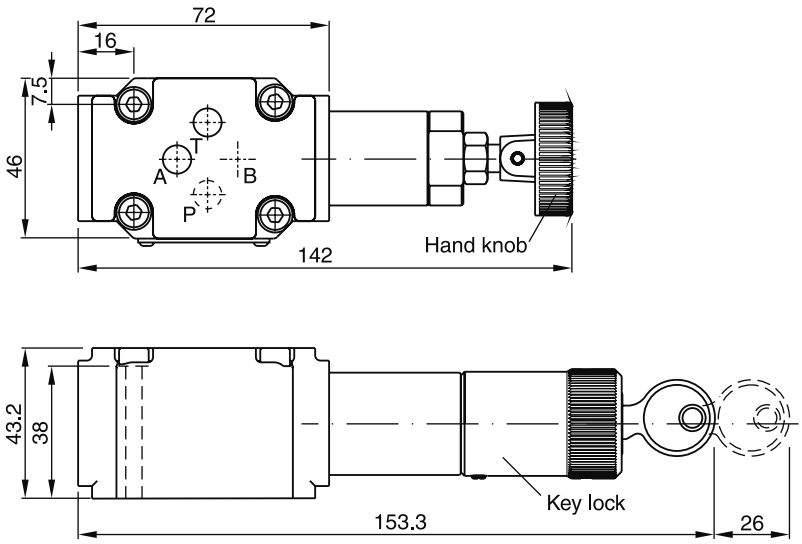
Code	Pressure range [bar]
10	**105**
17	**175**
21	**210**
25	**250**
35	**350**

Code	Seal
N	**NBR**
V	FPM

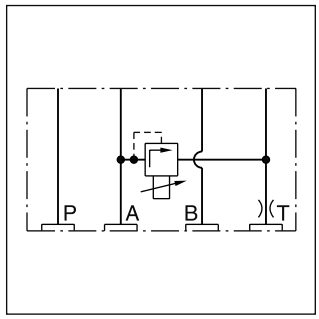
Code	Adjustment
S	**Hand knob (standard)**
L	Key lock

Bold letters =
Short-term availability

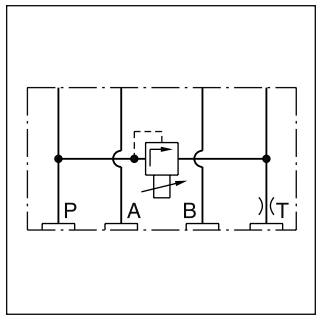
Dimensions RS06M



Pilot valve with proportional relief function RPDM2*,
sandwich mounting NG06. $MTTF_D$ value 150 years
*For technical details see series RE06M*W.



RPDM2AT



RPDM2PT

Ordering code

RPDM	2				V	
	Pressure adjustment	**Pressure relief**	**Pressure range**	**Solenoid voltage**	**Seal FPM**	**Design series** (not required for ordering)

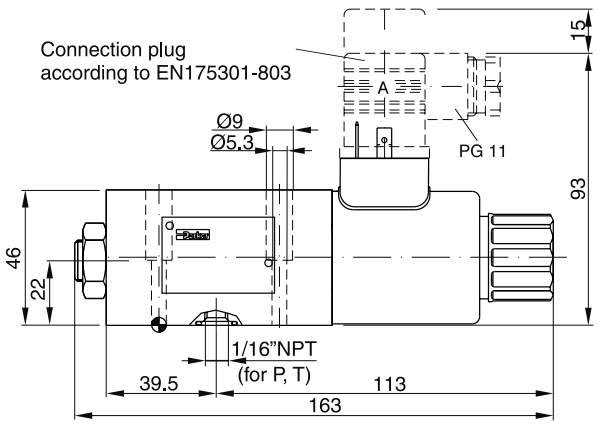
Code	Adjustment
AT	A to T
PT	P to T

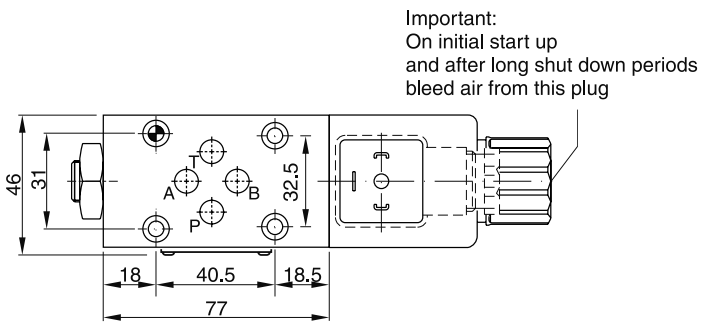
Code	Solenoid voltage
K	**12V, 2.3A**
X	16V, 1.3A

Code	Pressure range [bar]
10	105
17	175
25	250
35	350

Bold letters =
Short-term availability

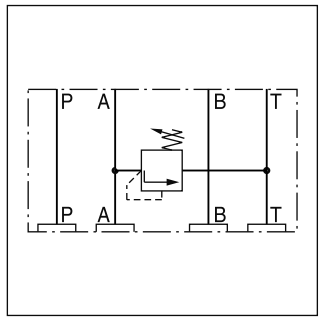
Dimensions





access08.INDD CM 07.09.11

Sandwich valve with pressure relief function ZUD*AT*Z*, sandwich plate mounting NG06, see combination examples. $MTTF_D$ value 150 years.



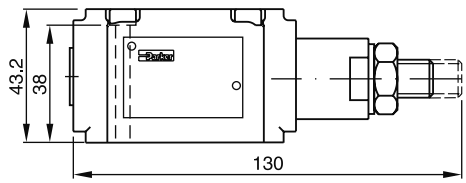
□ – **ZUDB1AT** □ **Z07** □

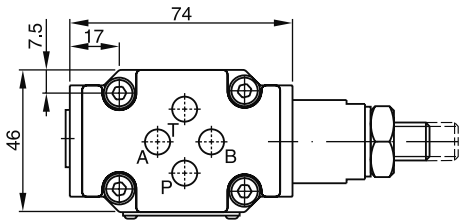
Seal | **Pressure adjustment** | **Pressure range**

Code	Seal
omit	**NBR**
V	FPM

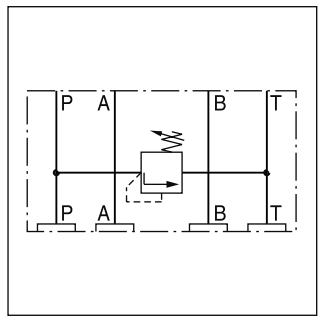
Code	Adjustment
2	**Hexagon screw with lock nut**
61	Knob E10 lock

Code	Pressure range [bar]
B	**70**
E	**175**
G	**250**
K	**350**





Sandwich valve with pressure relief function ZUD*PT*Z*, sandwich plate mounting NG06, see combination examples. $MTTF_D$ value 150 years.



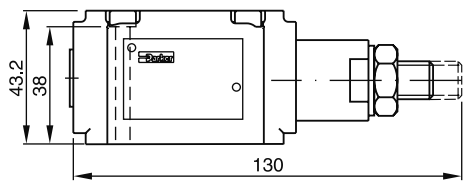
□ – **ZUDB1PT** □ **Z07** □

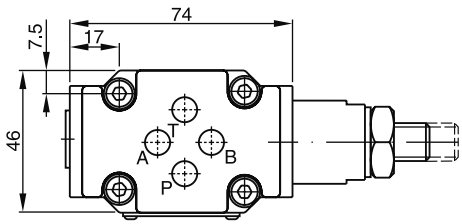
Seal | **Pressure adjustment** | **Pressure range**

Code	Seal
omit	**NBR**
V	FPM

Code	Adjustment
2	**Hexagon screw with lock nut**
61	Knob E10 lock

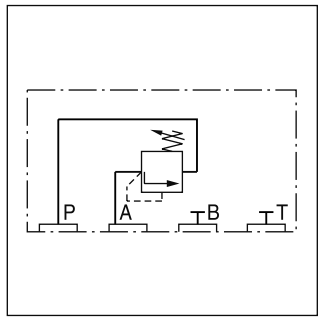
Code	Pressure range [bar]
B	**70**
E	**175**
G	**250**
K	**350**





Bold letters =
Short-term availability

Pilot valve with preload function DSB*P*, subplate mounting NG06, see combination examples.
$MTTF_D$ value 150 years.



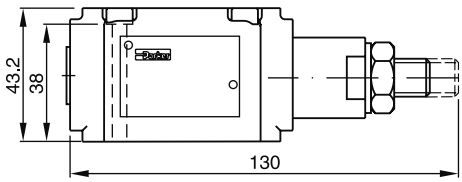
□ – **DSBA100** □ **P07** □

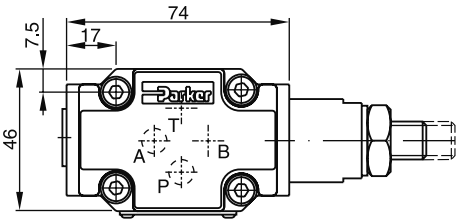
Seal | **Pressure adjustment** | **Pressure range**

Code	Seal
omit	**NBR**
V	FPM

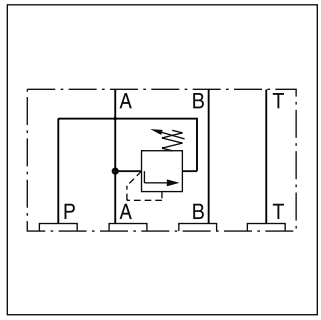
Code	Pressure range [bar]
B	**70**
E	**175**
G	**250**
K	**350**

Code	Adjustment
2	**Hexagon screw with lock nut**
61	Knob E10 lock





Pilot valve with preload function DSB*Z*, sandwich plate mounting NG06, see combination examples.
$MTTF_D$ value 150 years.



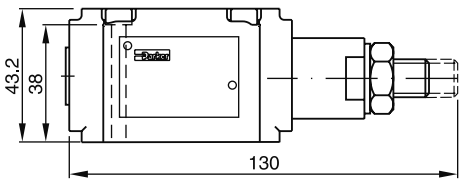
□ – **DSBA100** □ **Z07** □

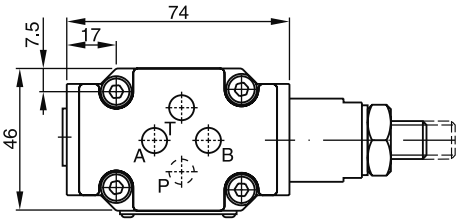
Seal | **Pressure adjustment** | **Pressure range**

Code	Seal
omit	**NBR**
V	FPM

Code	Pressure range [bar]
B	**70**
E	**175**
G	**250**
K	**350**

Code	Adjustment
2	**Hexagon screw with lock nut**
61	Knob E10 lock





Bold letters =
Short-term availability

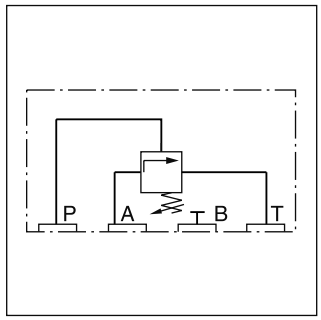
access08.INDD CM 07.09.11

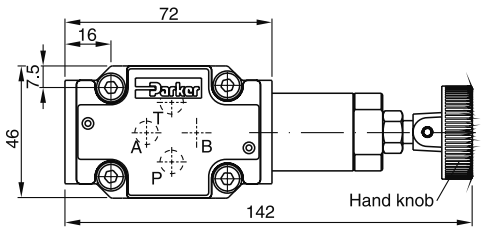
Pilot valve with unloading function UR06M, subplate mounting NG06, see combination examples. $MTTF_D$ value 150 years.

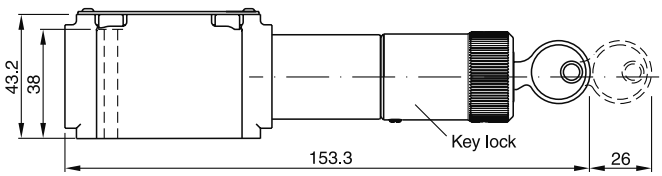
Code	Pressure range [bar]
07	70
17	175
25	250
35	350

Code	Seal
N	NBR
V	FPM

Code	Adjustment
S	Hand knob
L	Key lock

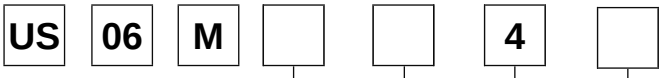






8

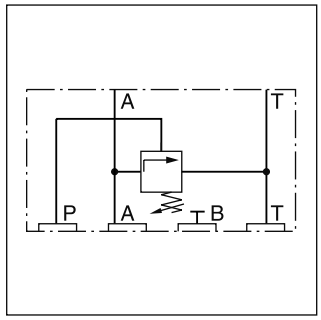
Pilot valve with unloading function US06M, subplate mounting NG06, see combination examples. $MTTF_D$ value 150 years.

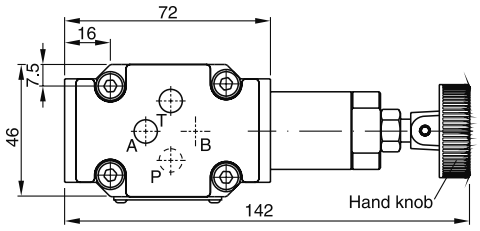


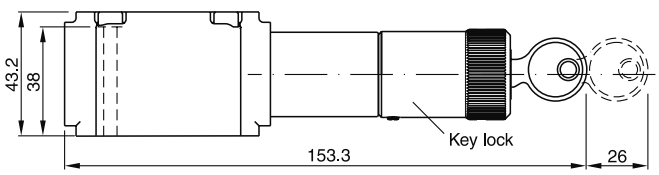
Code	Pressure range [bar]
07	70
17	175
25	250
35	350

Code	Seal
N	NBR
V	FPM

Code	Adjustment
S	Hand knob
L	Key lock

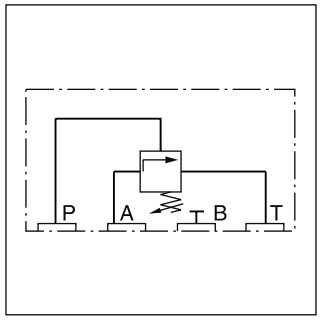






Pilot valve for pressure sequence function S06M, subplate mounting NG06, see combination examples.

$MTTF_D$ value 150years



Ordering code S06M

S06M | ☐ | ☐ | **4** | ☐ | ☐

- ☐ **Pressure range**
- ☐ **Pressure adjustment**
- **4** **Pilot oil inlet internal/ outlet internal**
- ☐ **Seal**
- ☐ **Design series** (not required for ordering)

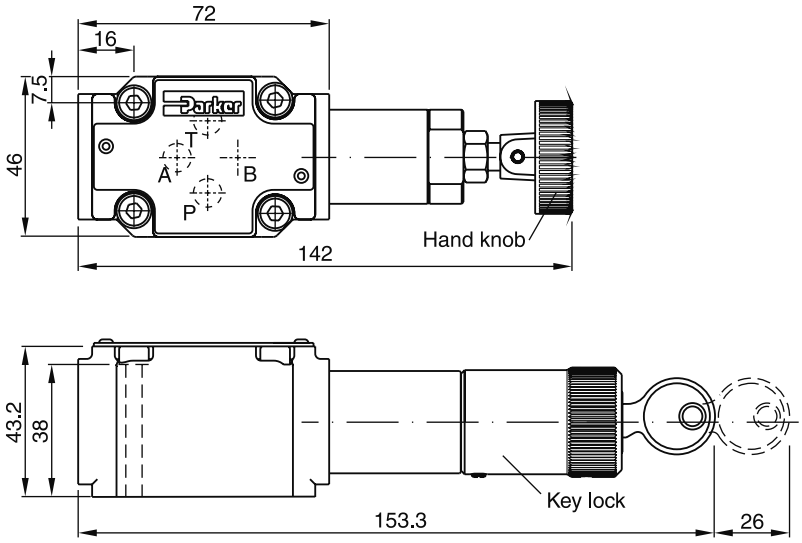
Code	Pressure range [bar]
10	**105**
17	**175**
21	**210**
25	**250**
35	**350**

Code	Seal
N	**NBR**
V	FPM

Code	Adjustment
S	**Hand knob (standard)**
L	Key lock

Bold letters =
Short-term availability

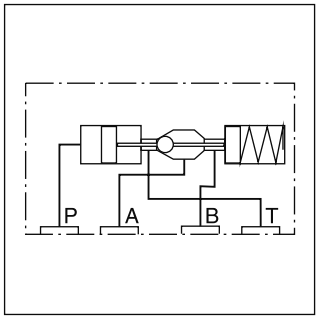
Dimensions S06M

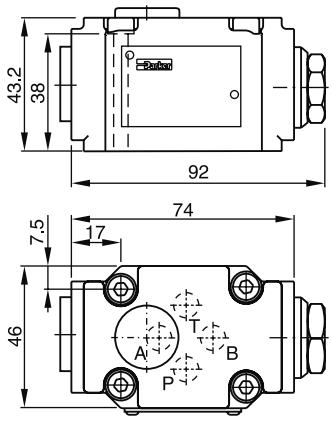


Check valve, hydraulically pilot operated NG06
with pilot control, for subplate mounting. $MTTF_D$ value 75 years

Ordering code

SVLA1006P07

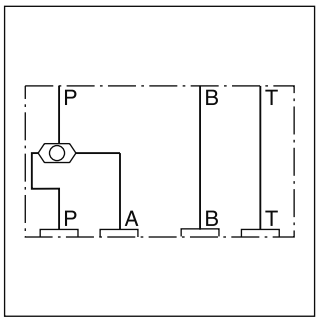


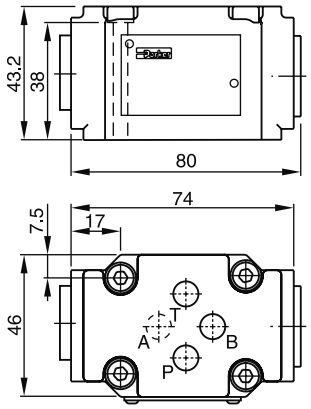


Shuttle valve - sandwich plate mounting NG06
$MTTF_D$ value 150 years

Ordering code

ZSRA1PP0Z07

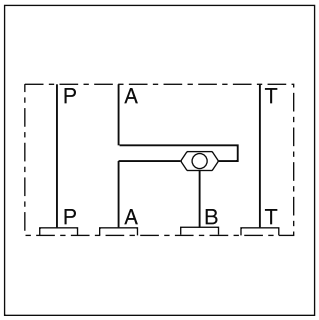


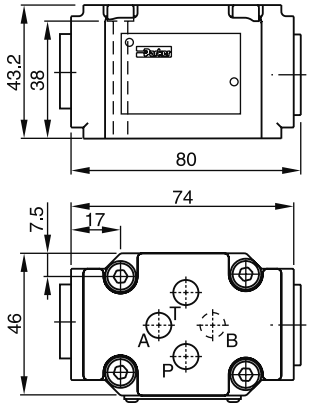


Shuttle valve - sandwich plate mounting NG06
$MTTF_D$ value 150 years

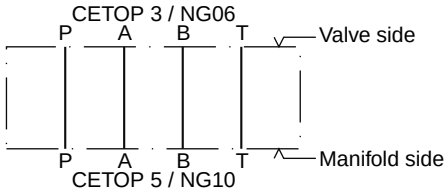
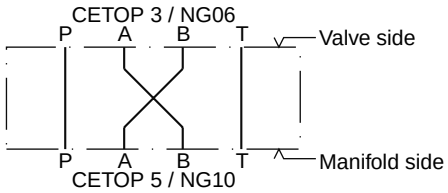
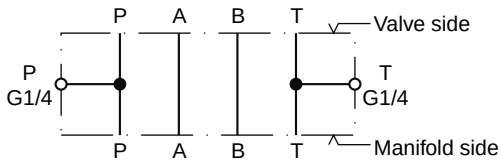
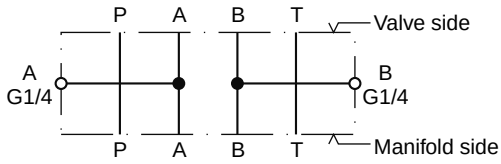
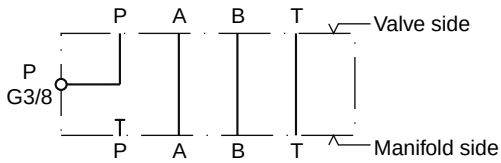
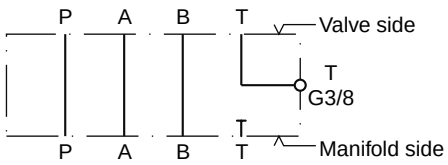
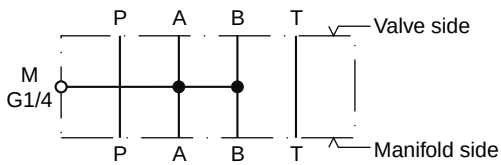
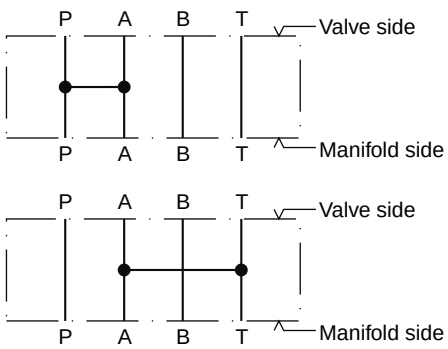
Ordering code

ZSRB1AA0Z07



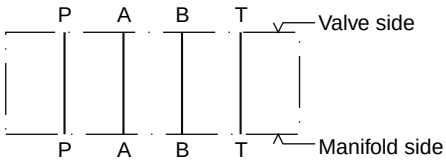
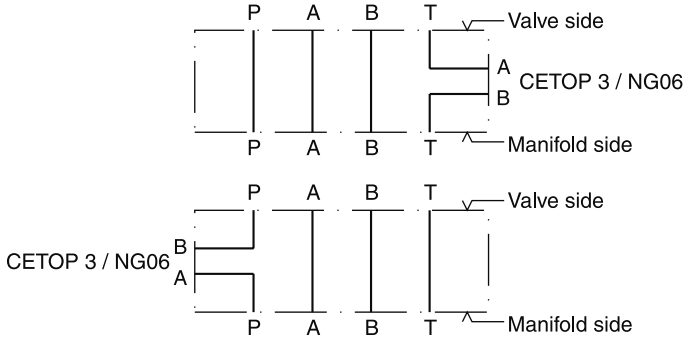
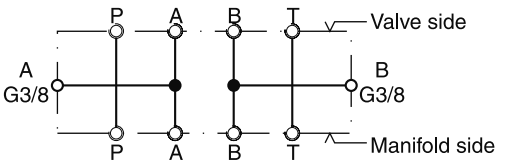
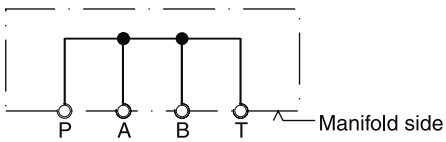
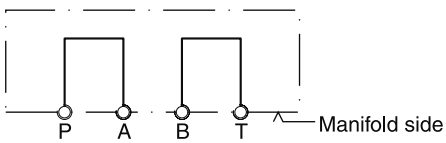
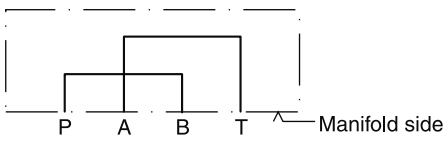
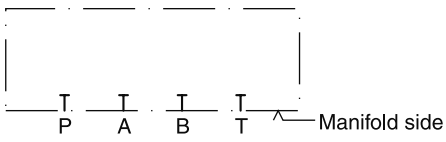


8

Symbol	Type	Size	Hight
	**PADA 1007-AA-BB**	NG10-NG06	25
	**PADA 1007/A-B/B-A**	NG10-NG06	25
	H06-1044	NG06	30
	**H06-1039**	NG06	30
	**H06-504**	NG06	30
	**H06-711**	NG06	30
	H06-1274	NG06	30
	**H06-1040**	NG06	30

Attention:
Details for cover-, sandwich- and adaptor plates see chapter 12.

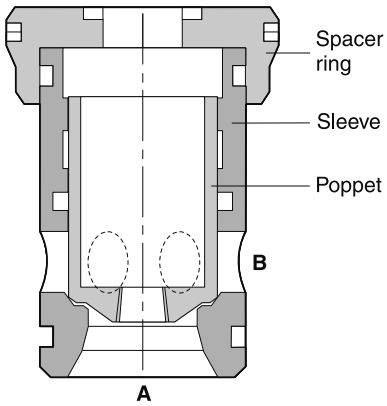
access08.INDD CM 07.09.11

Symbol	Type	Size	Hight
	**H06DO-1291**	NG06	10
	H06DU-814	NG06	71.3
 All ports can be equiped with orifices or plugs (1/16NPT)	CS06040N	NG06	40.3
 All ports can be equiped with orifices or plugs (1/16NPT)	CS06082N	NG06	40.3
 All ports can be equiped with orifices or plugs (1/16NPT)	CS06080N	NG06	40.3
	**D51DC071D**	NG06	26.3
	**D51VP071C** **D51VP101D**	NG06 NG10	26.3 26.9

Attention:
Details for cover-, sandwich- and adaptor plates see chapter 12.

Bold letters =
Short-term availability

Poppets, cages, spacer rings



Size	16	25	32	40	50	63	80	100
Poppet 01	RK-45036369	RK-45036379	RK-45036392	RK-45036409	RK-45036421	RK-45036437	RK-35036449	RK-35036467
Poppet 04	RK-45036370	RK-45036380	RK-45036395	RK-45036406	RK-45036422	RK-45036436	RK-35036460	RK-35036468
Poppet 07	RK-35037531	RK-45036964	RK-45036965	RK-45036966	RK-45036967	RK-45036968	—	—
Poppet 08	RK-45036368	RK-45036381	RK-45036391	RK-45036408	RK-45036424	RK-45036438	RK-35036459	RK-35036469
CE-sleeve	RK-35038871	RK-35038872	RK-35038873	RK-35036403	RK-35036417	RK-35036432	RK-25036452	RK-25036470
CP-sleeve	RK-35039384	RK-35039385	RK-35039386	RK-35039387	RK-35039388	RK-35039389	—	—
Spacer ring	RK-35036364	RK-35036375	RK-45036393	RK-35036402	RK-35036416	RK-35036435	RK-25036453	RK-25036471

8

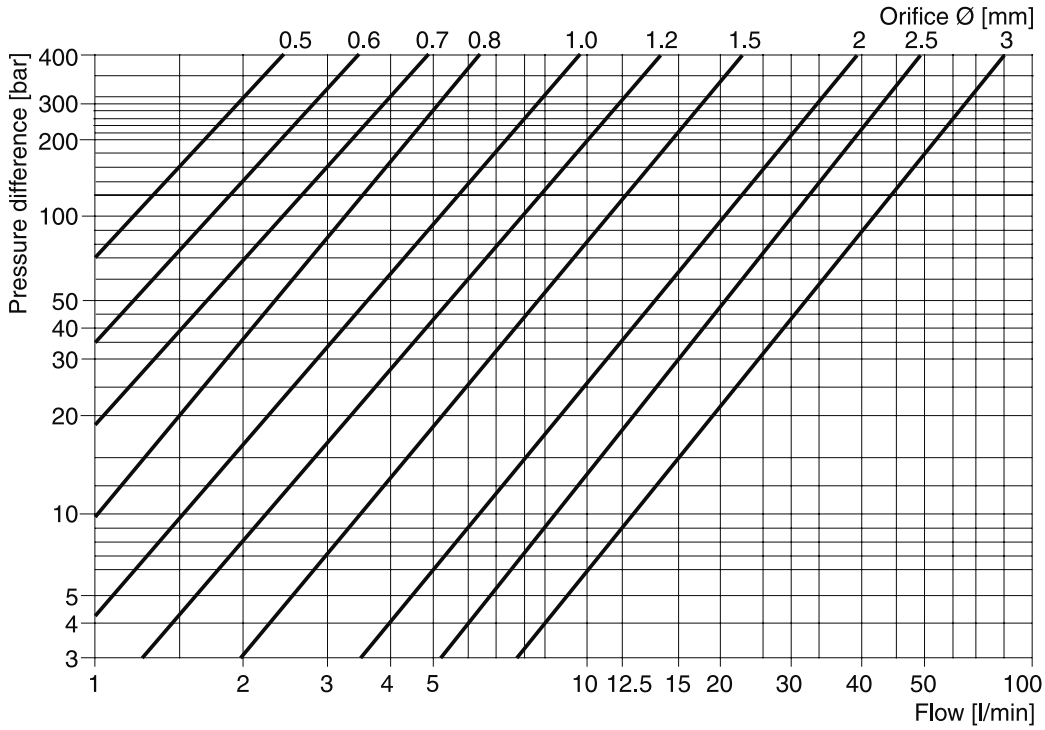
Springs, seals, fitting bolts

Size / Spring [1)]	16	25	32	40	50	63	80	100
Type L; 0.1 bar	FK-CE016-L	FK-CE025-L	FK-CE032-L	FK-CE040-L	FK-CE050-L	FK-CE063-L	FK-CE080-L	FK-CE100-L
Type N; 0.5 bar	FK-CE016-N	FK-CE025-N	FK-CE032-N	FK-CE040-N	FK-CE050-N	FK-CE063-N	FK-CE080-N	FK-CE100-N
Type S; 1.6 bar	FK-CE016-S	FK-CE025-S	FK-CE032-S	FK-CE040-S	FK-CE050-S	FK-CE063-S	FK-CE080-S	FK-CE100-S
Type T; 2.5 bar	FK-CE016-T	FK-CE025-T	FK-CE032-T	FK-CE040-T	FK-CE050-T	FK-CE063-T	FK-CE080-T	FK-CE100-T
Type U; 4.0 bar	FK-CE016-U	FK-CE025-U	FK-CE032-U	FK-CE040-U	FK-CE050-U	FK-CE063-U	FK-CE080-U	FK-CE100-U
Seal kits FPM NBR	SK-CBE160V SK-CBE160	SK-CBE250V SK-CBE250	SK-CBE320V SK-CBE320	SK-CBE400V SK-CBE400	SK-CBE500V SK-CBE500	SK-CBE630V SK-CBE630	SK-CBE800V SK-CBE800	SK-CBE1000V SK-CBE1000
Bolt kits (DIN 912 12.9)	BK414 4x M8x40	BK391 4x M12x50	BK415 4x M16x55	BK416 4x M20x70	BK417 4x M20x75	BK418 4x M30x100	BK419 8x M24x120	BK509 8x M30x130
Recommended torque [Nm]	27	94	234	460	460	1570	790	1570

[1)] 1 spring kit contains 10 springs.

Ordering code example:
FK-CE016-U Þ 10 pcs., spring for NG16, type U

Diagram to choose the orifice Ø



Values measured at a viscosity of 40 cST and a temperature of 50°C.

Orifices

There are different orifices available to realize different opening / closing velocities.
The control volume of each nominal valve size can be found at the CE series.

8

Orifice kits, sorted by thread with different diameters

Orifice kit	Orifice kit, sorted by thread with different diameters, consisting of 2 pieces of each marked diameter												
Ø	0.0	0.8	0.9	1.0	1.1	1.2	1.3	1.5	1.8	2.0	2.2	2.5	3.0
DK-M4	x	x	x	x	x	x	x	x	–	x	–	–	–
DK-M5	x	x	x	x	x	x	x	x	–	x	–	–	–
DK-M6	x	x	x	x	x	x	x	x	–	x	–	–	–
DK-M8	x	–	–	x	–	x	–	x	x	x	x	x	–
DK-M10x1	x	–	–	x	–	x	–	x	x	x	–	x	x
DK-1/16NPT	x	x	x	x	x	x	x	x	–	x	–	–	–
DK-1/8NPT	x	–	–	x	–	x	–	x	x	x	–	x	x

Orifice kits, thread with one defined diameter 20pcs per box

Orifice kits of one size:
Ordering Code Examples

DK-M4-08 ⇒ 20 pcs, orifice size 0.8mm

DK-M5-10 ⇒ 20 pcs, orifice size 1.0mm

DK-M8-12 ⇒ 20 pcs, orifice size 1.2mm

Orifice gauge: Order no. DK-05-30

Removal CE016 to CE063

The extracting tools consist of tee bar, slide hammer, support handle, and expanding collet (fig. 1).

At first the spacer ring is removed. Next, spring and poppet are withdrawn. Finally, the expanding collet is inserted into the sleeve and braced by means of the tee bar. Using the slide hammer, collet and sleeve are extracted from the cavity.

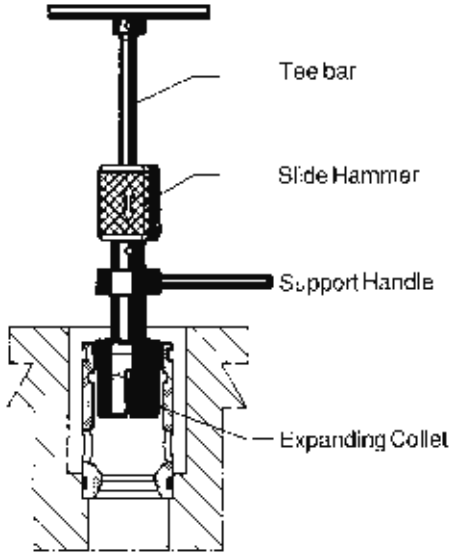


Figure 1

Ordering Code

Valve size	Order no.:
CE016 *	090 4600 09779
CE025 *	090 4600 09780
CE032 *	090 4600 09781
CE040 *	090 4600 09782
CE050 *	090 4600 09783
CE063 *	090 4600 09784
CE016 to CE063 *	090 4600 09785

* CE/CP respectively

Removal CE080 toCE100

The extracting tools consist of spacer ring puller (fig. 4), puller (fig. 3), and puller thrust plate. At first the spacer ring is removed. Next the puller is inserted into the sleeve and aligned by the puller thrust plate. Tightening the nut then extracts the sleeve from the cavity.

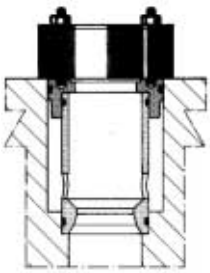


Figure 2

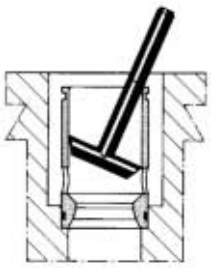


Figure 3

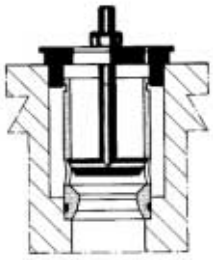


Figure 4

Ordering Code

Valve size	Order no.:
CE080	090 4600 10628
CE100	090 4600 10629

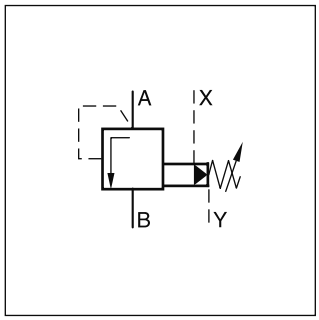
Notes

The pressure relief valve series R consists of a manual adjustment pilot stage and a cartridge main stage.

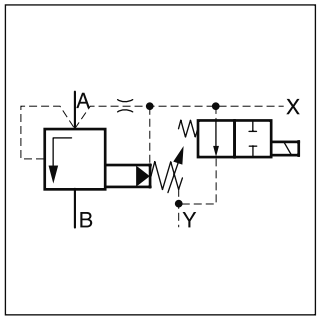
The pressure relief valve series RS consists of a manual adjusted pilot stage with a directional valve for an electrically controlled vent function and a cartridge main part.

The R/RS*E model codes embrace the pilot valves, covers and cartridges that are also offered as seperate items. See combination examples for details.

RS*E



R*E



RS*E (simplified symbol)

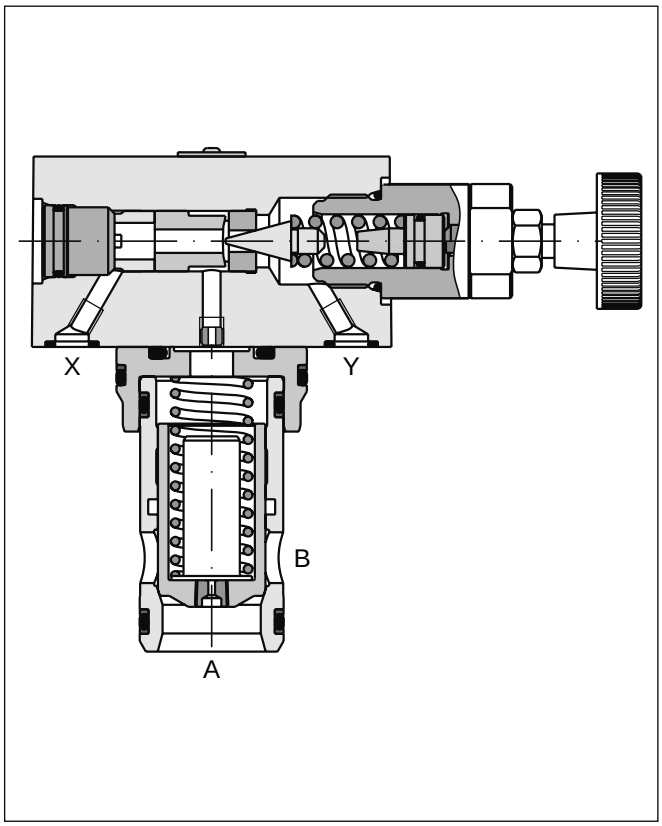
Features

- Pilot operated with manual adjustment
- Cavity and mounting pattern according to ISO 7368
- 4 pressure stages
- 2 switching types (series RS*E)
- 2 adjustment modes
  - Hand knob
  - Key lock
- Remote control via port X
- 6 sizes, NG16 to NG63

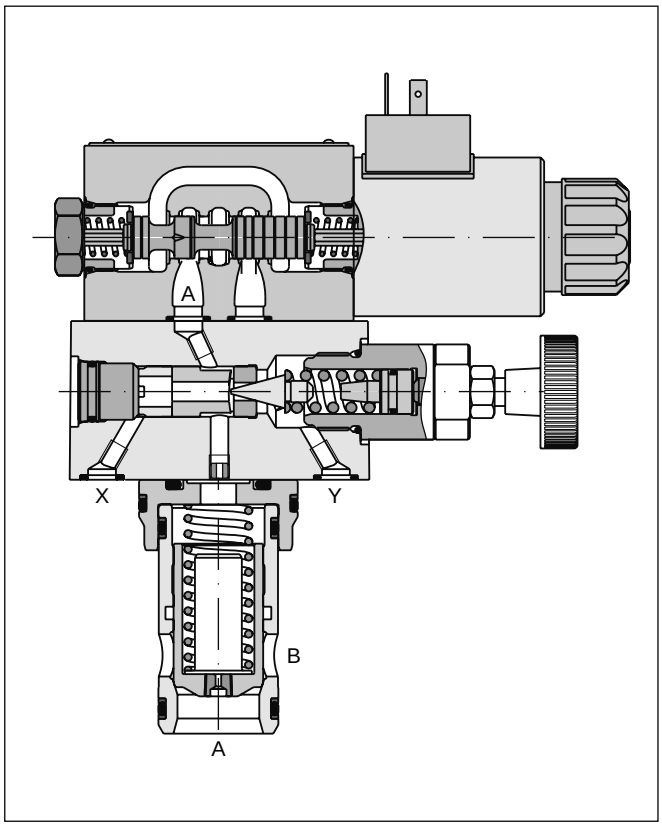
Note

Port X only usable for remote vent function

R*E



RS*E



8

R*E

R		E			1	S			
Pressure relief valve	**Nominal size**	**Slip-in mounting ISO 7368**	**Pressure stages**	**Adjust-ment**	**Pilot oil** (Pilot internal, Drain external)	**Poppet spring**	**Seal**	**Design series** (not required for ordering)	**Spool type**

Code	Nominal size
16	NG16
25	NG25
32	NG32
40	NG40
50	NG50
63	NG63

Code	Pressure stages
07	up to 70 bar
10	up to 105 bar
17	up to 175 bar
21	up to 210 bar
25	up to 250 bar
35	up to 350 bar

Code	Spool type
omit	Standard
S07	with poppet seals

Code	Seal
N	NBR
V	FPM

Code	Adjustment
S	Hand knob (standard)
L	Key lock

RS*E

RS		E			1	S				W			
Pressure relief valve with elec. un-loading	**Nominal size**	**Slip-in mounting ISO 7368**	**Pressure stages**	**Adjust-ment**	**Pilot oil** (Pilot int., Drain ext.)	**Poppet spring**	**Seal**	**Switching type**	**Solenoid**	**Without plug**	**Options**	**Design series** (not required for ordering)	**Spool type**

Code	Nominal size
16	NG16
25	NG25
32	NG32
40	NG40
50	NG50
63	NG63

Code	Pressure stages
07	up to 70 bar
10	up to 105 bar
17	up to 175 bar
21	up to 210 bar
25	up to 250 bar
35	up to 350 bar

Code	Adjustment
S	Hand knob (standard)
L	Key lock

Code	Seal
N	NBR
V	FPM

Code	Spool type
omit	Standard
S07	with poppet seals

Code	Options
omit	Standard
S	with slow unloading

Code	Solenoid
K	12V
J	24V
U [1)]	98V
G [1)]	205V

[1)] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Switching type
1	Solenoid not activated, unpress. circulation
9	Solenoid activated, unpress. circulation

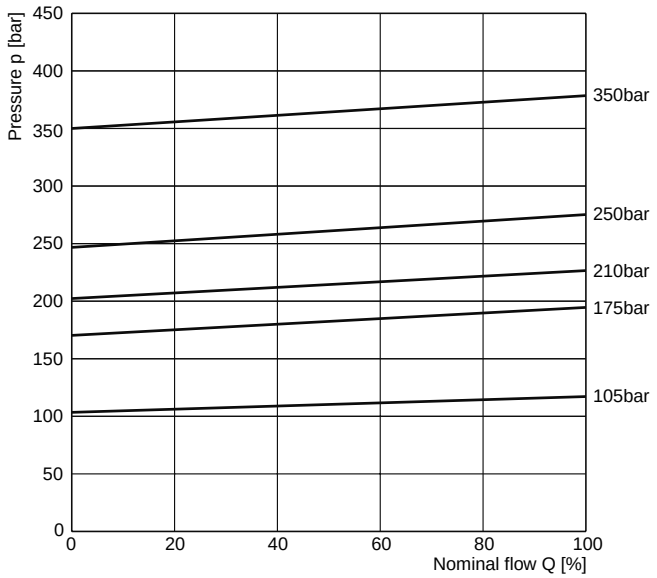
R*E

General							
Nominal size		NG16	NG25	NG32	NG40	NG50	NG63
Interface		Slip-in mounting acc. ISO 7368					
Mounting position		as desired, horizontal mounting prefered					
Ambient temperature	[°C]	-20...+80					
$MTTF_D$ value	[years]	75					
Weight	[kg]	2.2	3.5	4.9	8.0	13.7	22.8
Hydraulic							
Max. operating pressure	[bar]	Ports A and X up to 350, Ports B and Y depressurized					
Pressure stages	[bar]	75, 105, 175, 210, 250, 350					
Nominal flow	[l/min]	220	500	950	1400	2300	4000
Fluid		Hydraulic oil according to DIN 51524 ...51525					
Viscosity, recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 50 20 ... 380					
Fluid temperature	[°C]	-20 ... +70					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					

RS*E

General							
Nominal size		NG16	NG25	NG32	NG40	NG50	NG63
Interface		Slip-in mounting acc. ISO 7368					
Mounting position		as desired, horizontal mounting prefered					
Ambient temperature	[°C]	-20...+80					
$MTTF_D$ value	[years]	75					
Weight	[kg]	2.7	5.2	6.4	9.5	15.2	24.3
Hydraulic							
Max. operating pressure	[bar]	Ports A and X 350, ports B and Y depressurized					
Pressure stages	[bar]	75, 105, 175, 210, 250, 350					
Nominal flow	[l/min]	220	500	950	1400	2300	4000
Fluid		Hydraulic oil according to DIN 51524 ...51525					
Viscosity, recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 50 20 ... 380					
Fluid temperature	[°C]	-20 ... +70					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Electrical (solenoid)							
Duty ratio	[%]	100 ED; CAUTION: coil temperature up to 180 °C possible					
Max. switching frequency	[1/h]	16000					
Protection class		IP 65 in according with EN 60529 (with correctly mounted plug-in connector)					
Direct current	Code	K	J		U	G	
Supply voltage	[V]	12	24		98	205	
Power	[W]	31	31		31	31	
Current	[A]	2.5	1.25		0.31	0.15	
Solenoid connection		Connector as per EN 175301-803					
Wiring min.	[mm²]	3 x 1.5 recommended					
Wiring length max.	[m]	50 recommended					

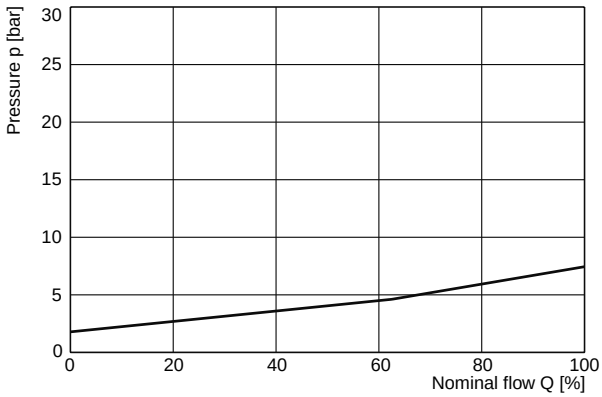
p/Q performance curve [1)]



[1)] The performance curves are measured with external drain. For internal drain the tank pressure has to be added to curve.

All characteristic curves measured with HLP46 at 50°C.

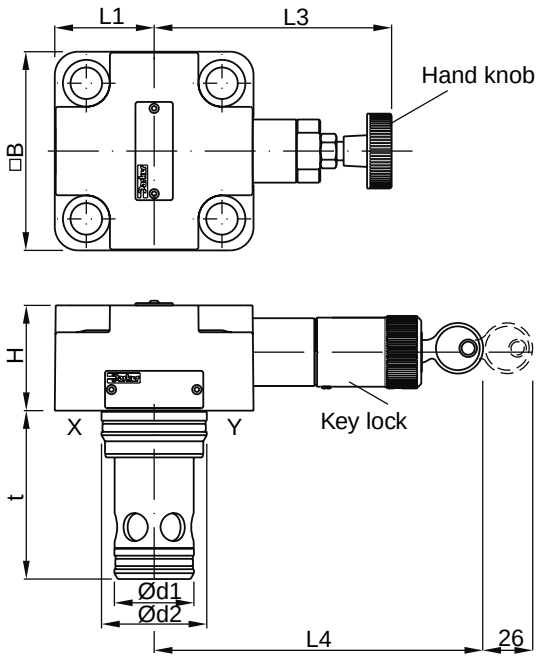
Minimum pressure curve



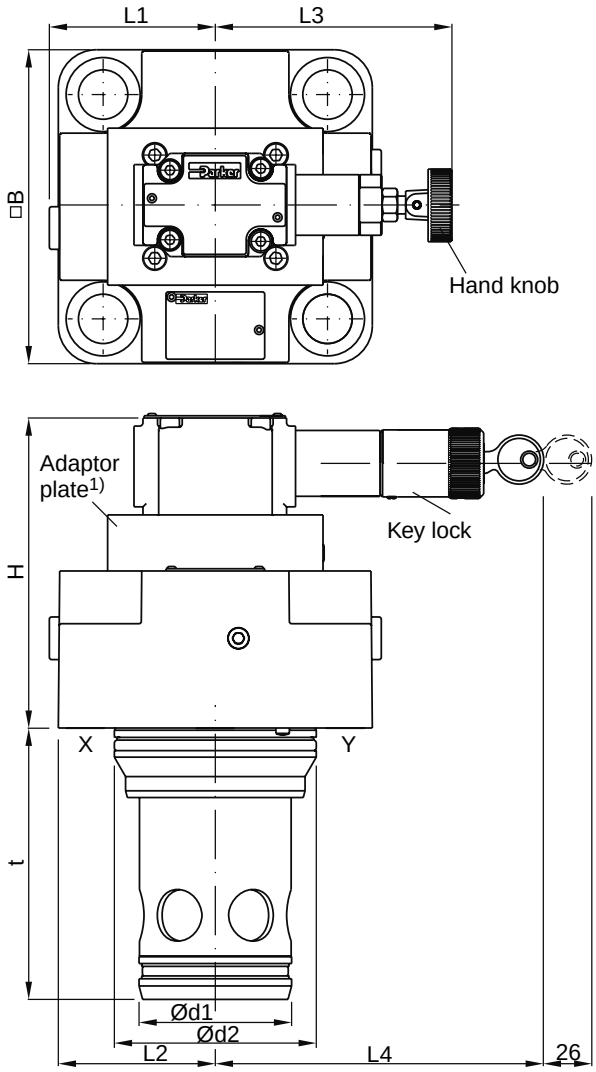
8

Dimensions R*E

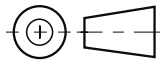
NG16 - NG32



NG40 - NG63 [1)]



[1)] NG40 without adaptor plate



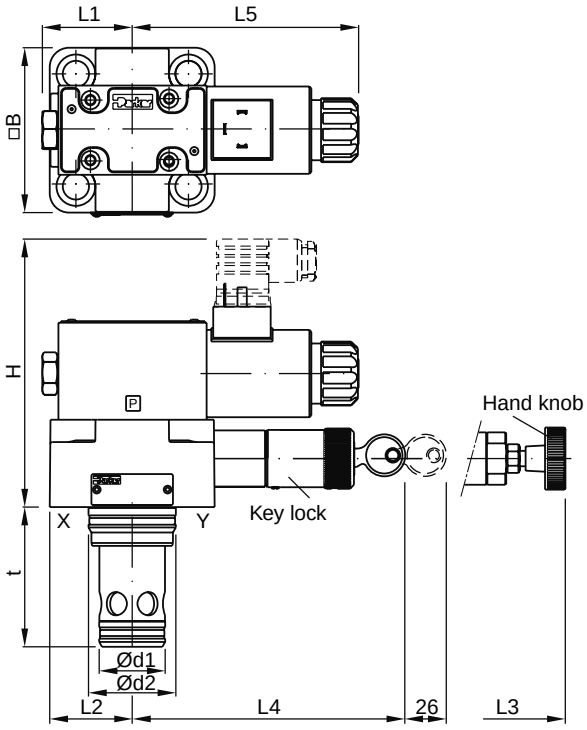
Size	H	B	L1	L2	L3	L4	d1	d2	t
NG16	40	65 [2)]	32.5	-	114	125.5	32	25	56
NG25	47	85	42.5	-	102	114	45	34	71
NG32	50	102	51	-	95	106	60	45	85
NG40	106	125	62.5	66.5	106	144	75	55	105
NG50	141	140	70	74	106	144	90	68	121
NG63	155	180	90	94	106	144	120	90	155

[2)] Width 79mm

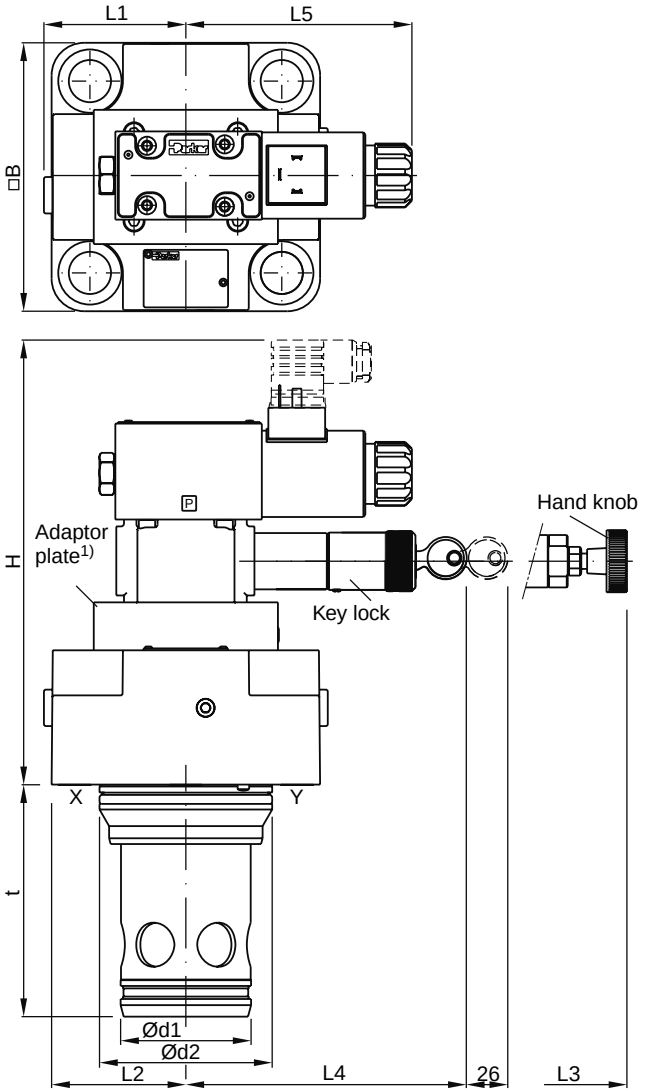
NG	Kit	DIN912 12.9	[Nm]	Kit NBR	Kit FPM
16	BK414	4 x M8x40	33	SK-R16E25	SK-R16EV25
25	BK391	4 x M12x50	115	SK-R25E25	SK-R25EV25
32	BK415	4 x M16x55	281	SK-R32E25	SK-R32EV25
40	BK416	4 x M20x70	553	SK-R40E25	SK-R40EV25
50	BK417	4 x M20x75	553	SK-R50E25	SK-R50EV25
63	BK418	4 x M30x100	1910	SK-R63E25	SK-R63EV25

Dimensions RS*E

NG16 - NG32



NG40 - NG63 [1)]



[1)] NG40 without adaptor plate

Size	H	B	L1	L2	L3	L4	L5	d1	d2	t
NG16	133	65 [1)]	32.5	-	114	125.5	117	32	25	56
NG25	137	85	42.5	-	102	114	117	45	34	71
NG32	143	102	51	-	95	106	117	60	45	85
NG40	196	125	62.5	66.5	106	144	117	75	55	105
NG50	231	140	70	74	106	144	117	90	68	121
NG63	246	180	90	94	106	144	117	120	90	155

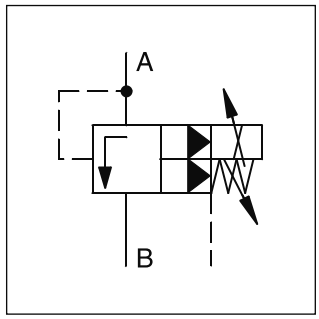
[1)] Width 79mm

NG	Kit	DIN912 12.9	[Nm]	Kit NBR	Kit FPM
16	BK414	4 x M8x40	33	SK-RS16E25	SK-RS16EV25
25	BK391	4 x M12x50	115	SK-RS25E25	SK-RS25EV25
32	BK415	4 x M16x55	281	SK-RS32E25	SK-RS32EV25
40	BK416	4 x M20x70	553	SK-RS40E25	SK-RS40EV25
50	BK417	4 x M20x75	553	SK-RS50E25	SK-RS50EV25
63	BK418	4 x M30x100	1910	SK-RS63E25	SK-RS63EV25

The proportional pressure relief valve series RE*E*W consists of a proportional pilot stage and a slip-in cartridge main stage. A mechanical maximum pressure stage is optionally available. For sizes NG25 and NG32 a screw-in cartridge is used, for sizes NG40, NG50 and NG63 an additional sandwich unit.

The RE*W model code embraces the pilot valves, covers and cartridges that are also offered as separate items. See combination examples for details.

In combination with the digital power amplifier PC-D00A-400 the valve parameters can be saved, changed and duplicated.

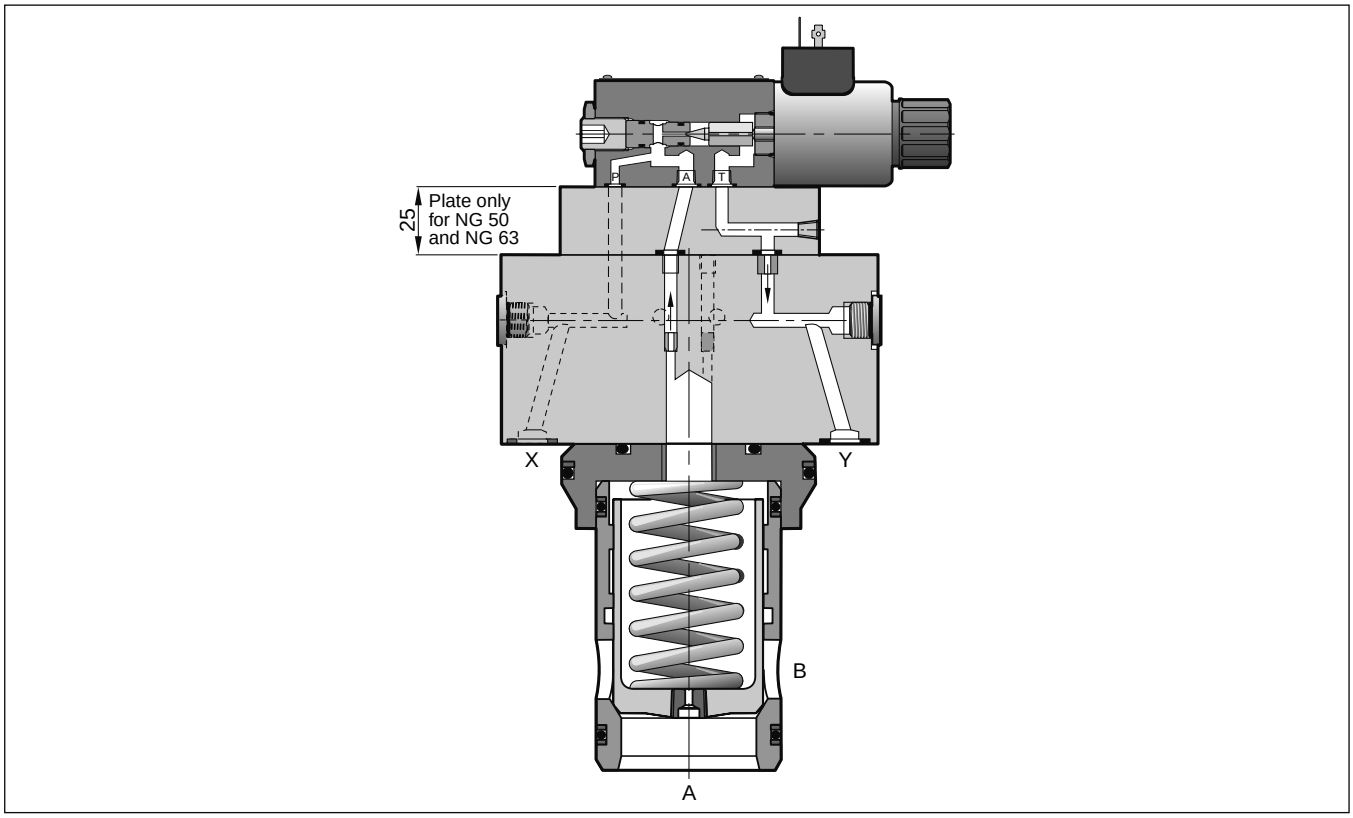


Features

- Pilot operated with proportional solenoid
- Continuous adjustment by proportional solenoid
- Optional mechanical max. pressure stage
- Cavity and mounting pattern according to ISO 7368
- 4 pressure stages
- 6 sizes, NG16 to NG63

Note

Port X only usable for remote vent function



Ordering code

RE		E		W	1	S		1		W			
Prop. pressure relief valve	**Nominal size**	**Slip-in mounting ISO 7368**	**Pressure stages**	**Off-board electronics**	**Pilot oil** (Pilot int., Drain ext.)	**Poppet spring**	**Seal**	**Normaly open**	**Solenoid**	**Without plug**	**Options**	**Design series**	**Spool type**

Code	Nominal size
16	NG16
25	NG25
32	NG32
40 *	NG40
50 *	NG50
63 *	NG63

* with poppet seal

Code	Pressure stages
10	up to 105 bar
17	up to 175 bar
25	up to 250 bar
35	up to 350 bar

Code	Spool type
omit	Standard
S07	with poppet seals

Code	Options
omit	Standard
M	Mech. max. adjustment

Code	Solenoid
K	12V, 2.3A
X	16V, 1.3A

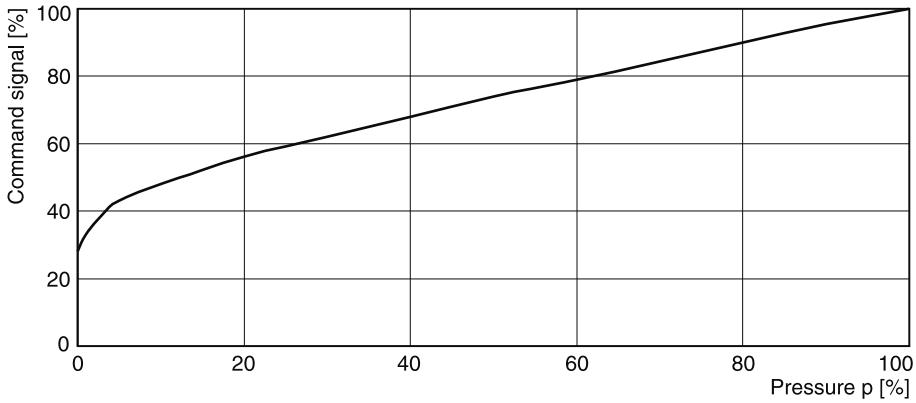
Code	Seal
N	NBR
V	FPM

8

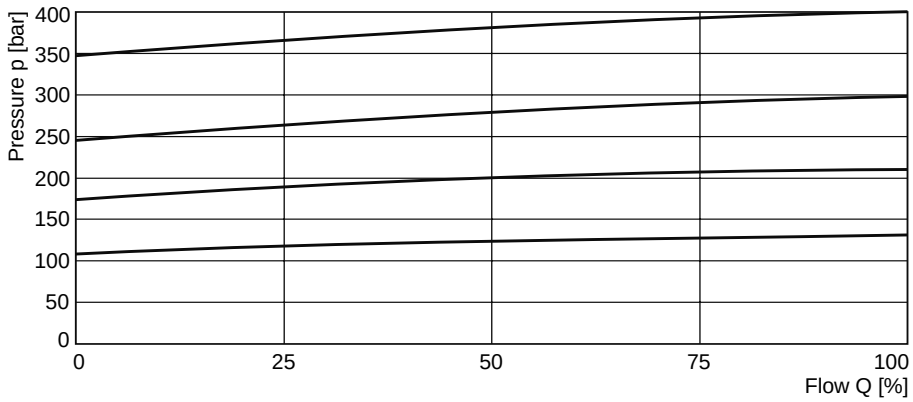
Technical data

General							
Nominal size		NG16	NG25	NG32	NG40	NG50	NG63
Interface		Slip-in mounting acc. ISO 7368					
Mounting position		as desired, horizontal mounting prefered					
Ambient temperature	[°C]	-20...+80					
$MTTF_D$ value	[years]	75					
Weight	[kg]	2.7	5.2	6.4	9.5	15.2	24.3
Hydraulic							
Max. operating pressure	[bar]	Ports A and X 350, ports B and Y depressurized					
Pressure stages	[bar]	105, 175, 250, 350					
Nominal flow	[l/min]	220	500	950	1400	2300	4000
Fluid		Hydraulic oil according to DIN 51524 ...51525					
Viscosity, recommended	[cSt] / [mm²/s]	30 ... 50					
permitted	[cSt] / [mm²/s]	20 ... 380					
Fluid temperature	[°C]	-20 ... +70					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Electrical (prop. solenoid)							
Duty ratio	[%]	100 ED					
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)					
Nominal voltage	[V]	12 (max. current 2.3A), 16 (max. current 1.3A)					
Coil resistance	[Ohm]	4 at 20°C					
Solenoid connectors		Connector as per EN 175301-803					
Power amplifier, recommended		PCD00A-400					

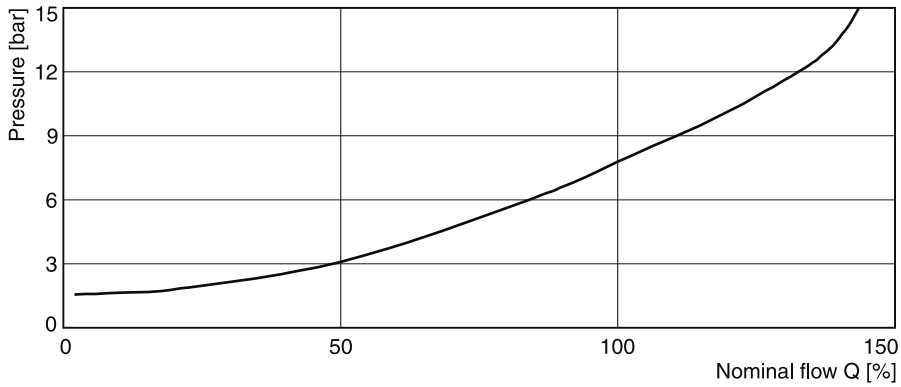
Signal/pressure curve



p/Q performance curve



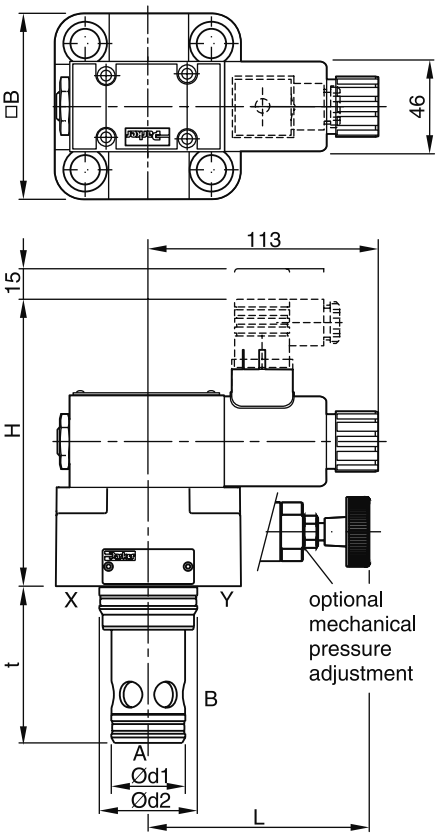
Minimum pressure curve



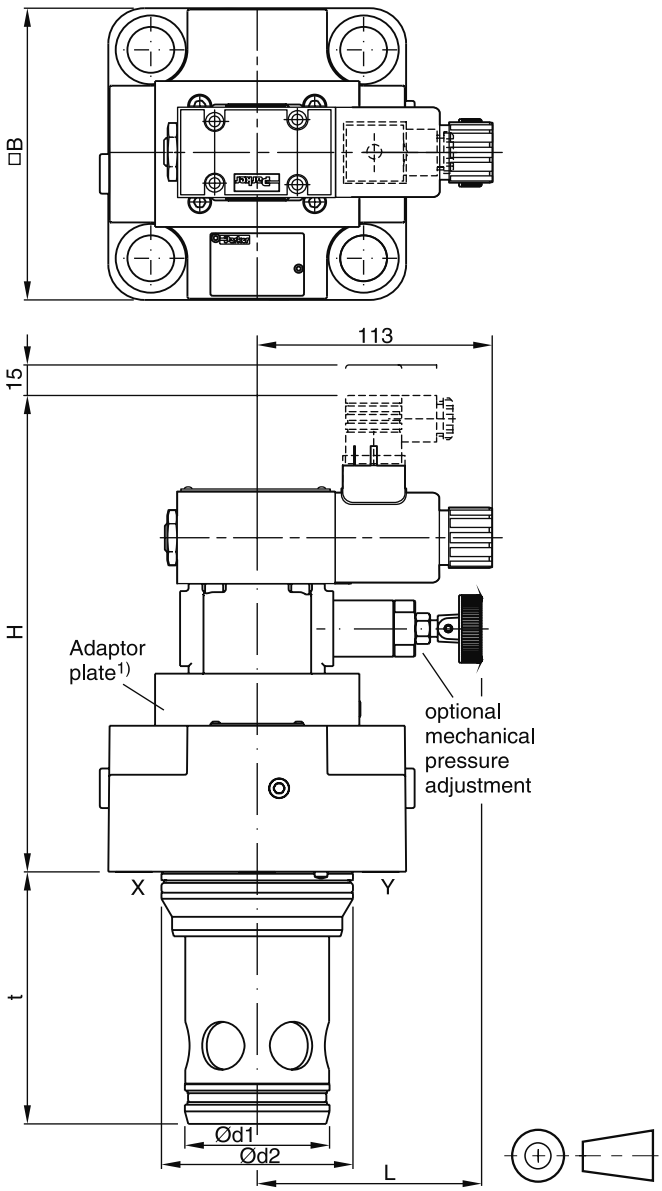
All characteristic curves measured with HLP46 at 50°C.

The performance curves are measured with external drain. For internal drain the tank pressure has to be added to curve.

NG16 - NG32



NG40 - NG63 [1)]



[1)] NG40 without adaptor plate

Size	H	B	d_1	d_2	t	L
NG16	135	79 [1)]	32	25	56	114
NG25	140	85	45	34	72	102
NG32	145	102	60	45	85	95
NG40	137 (180.2) [2)]	125	75	55	105	106
NG50	172 (215.2) [2)]	140	90	68	122	106
NG63	187 (230.2) [2)]	180	120	90	155	106

[1)] Width 65 mm
[2)] With mechanical pressure adjustment

NG	Kit	DIN912 12.9	[Nm]	Kit NBR	Kit FPM
16	BK414	4 x M8x40	33	SK-RE16E	SK-RE16EV
25	BK391	4 x M12x50	115	SK-RE25E	SK-RE25EV
32	BK415	4 x M16x55	281	SK-RE32E	SK-RE32EV
40	BK416	4 x M20x70	553	SK-RE40E	SK-RE40EV
50	BK417	4 x M20x75	553	SK-RE50E	SK-RE50EV
63	BK418	4 x M30x100	1910	SK-RE63E	SK-RE63EV

RE_E_W UK.INDD CM 07.09.11

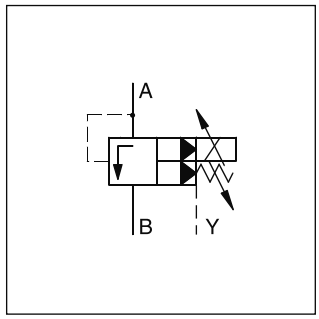
The proportional pressure relief valves series RE*E*T with onboard electronics and a slip-in cartridge main stage is electronically based on the functionality of the digital amplifier PCD00.

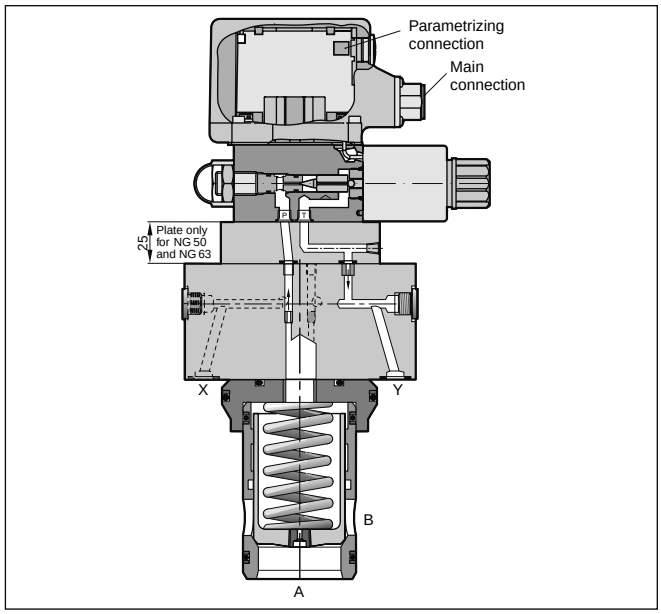
The digital onboard electronic is situated in a robust metal housing and can be used in rough environments.

The nominal values of the valves are factory set. Additionally the ProPxD software permits the editing of all parameters. The software is also used for the digital electronic modules. The cable for connection to a serial RS232C interface is available as accessory.

The valves are optionally available with a mechanical maximum pressure adjustment.

The RE*T model code embraces the pilot valves, covers and cartridges that are also offered as separate items.





Features

- Pilot operated pressure relief valve
- Onboard electronics
- Optional mechanical max. pressure stage
- Factory setting
- Ramp time adjustment
- Linearized characteristics
- 4 pressure stages
- Cavity and mounting pattern according to ISO 7368
- 6 sizes, NG16 to NG63

Note

Port X only usable for remote vent function.

8

Ordering code

RE		E		T	1	S		1		0				
Prop. pressure relief valve with elec. unloading	**Nominal size**	**Slip-in mounting ISO 7368**	**Pressure stages**	**On-board electronics**	**Pilot oil** (Pilot int., Drain ext.)	**Poppet spring**	**Seal**	**Normaly open**	**Command signal**	**Electr. attach-ments**	**Options**	**Design series** (not required for ordering)	**Spool type**

Code	Nominal size
16	NG16
25	NG25
32	NG32
40	NG40
50	NG50
63	NG63

Code	Pressure stages
10	up to 105 bar
17	up to 175 bar
25	up to 250 bar
35	up to 350 bar

Code	Spool type
omit	Standard
S07 [1]	with poppet seals

[1] not for NG16

Code	Options
omit	Standard
M	Mechanical max. adjustment

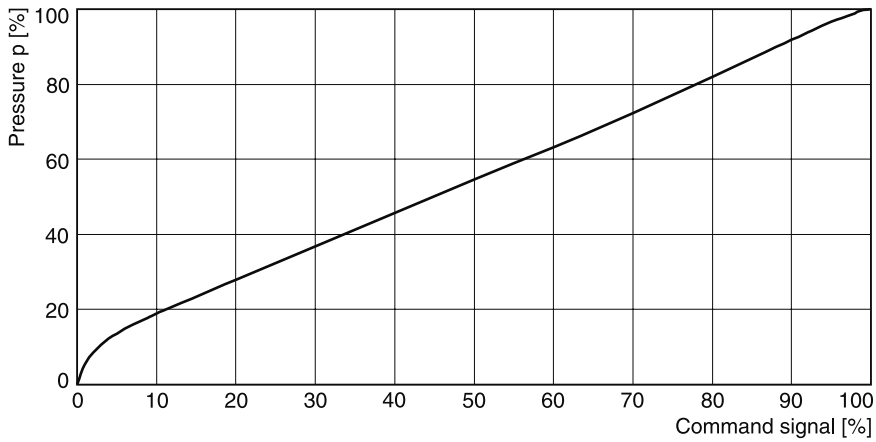
Code	Command signal
F	Voltage input 0...+10V with ref. output +10V
R	Current input 4...20mA

Code	Seal
N	NBR
V	FPM

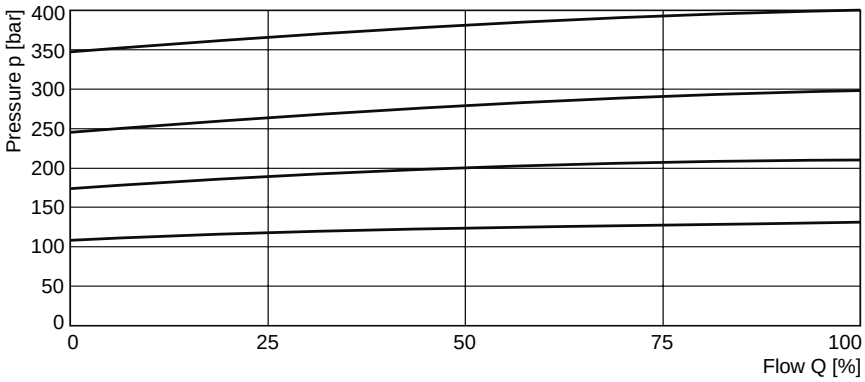
Please order plugs separately, 6+PE EN175201-804 item no. 5004072
Parametrizing cable OBE -> RS-232: item no. 40982923

General							
Nominal size		NG16	NG25	NG32	NG40	NG50	NG63
Interface		Slip-in mounting acc. ISO 7368					
Mounting position		as desired, horizontal mounting prefered					
Ambient temperature	[°C]	-20...+60					
$MTTF_D$ value	[years]	50					
Weight	[kg]	2.7	5.2	6.4	9.5	15.2	24.3
Vibration strength	[g]	10 sinus 5...2000 Hz acc. to IEC 68-2-6 30 noise 20...2000 Hz acc. to IEC 68-2-36 15 shock acc. to IEC 68-2-27					
Hydraulic							
Max. operating pressure	[bar]	Ports A and X 350, ports B and Y depressurized					
Pressure stages	[bar]	105, 175, 250, 350					
Nominal flow	[l/min]	220	500	950	1400	2300	4000
Fluid		Hydraulic oil according to DIN 51524 ... 525					
Viscosity, recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 50 20 ... 380					
Fluid temperature	[°C]	-20 ... +60					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS1638: 7)					
Electrical							
Duty ratio ED	[%]	100					
Supply voltage	VDC	18...30, ripple < 5% eff., surge free					
Current consumption max.	[A]	2.0					
Pre-fusing	[A]	2.5 medium lag					
Potentiometer supply	[V]	+10 / ±5% max. 10mA					
Command signal Code F voltage Code R current	[V] [mA]	0...+10, ripple < 0.01 % eff., surge free, Ri = 100 kOhm 4...20, ripple < 0.01 % eff., surge free, Ri = 200 Ohm < 3.6 mA = enable off, > 3.8 mA = enable on (acc. NAMUR NE43)					
Differential input voltage max.	[V]	30 for terminal D and E against PE (terminal G)					
	[V]	11 for terminal D and E against 0V (terminal B)					
Adjustment ranges Min current	[%]	0...50					
Max current	[%]	50...100					
Ramp	[s]	0...32.5					
Interface		RS 232C, parametrizing connection 5polig					
EMC		EN 61000-6-2, EN 61000-6-4					
Central connection		6 + PE acc. EN 175201-804					
Cable specification	[mm²]	7 x 1.0 overall braid shield					
Cable length max.	[m]	50					

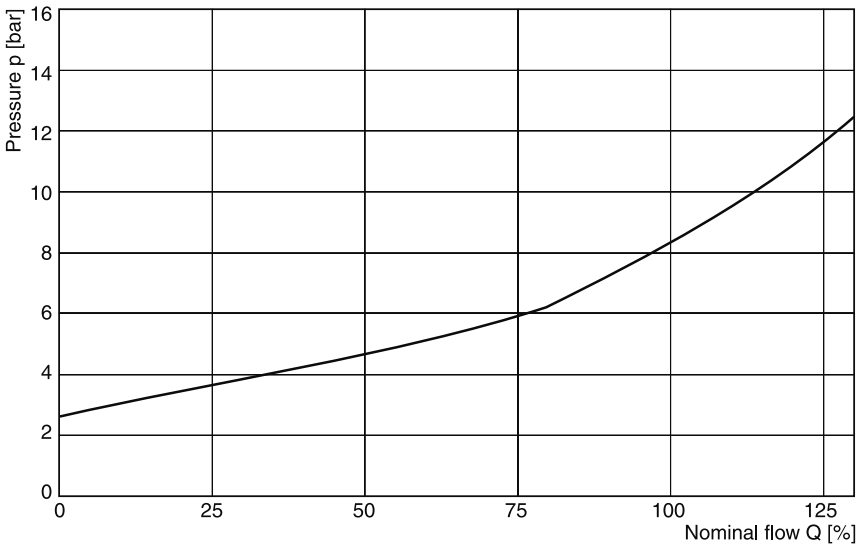
Command pressure curve RE*E*T



p/Q performance curve RE*E*T



Minimum pressure curve RE*E*T

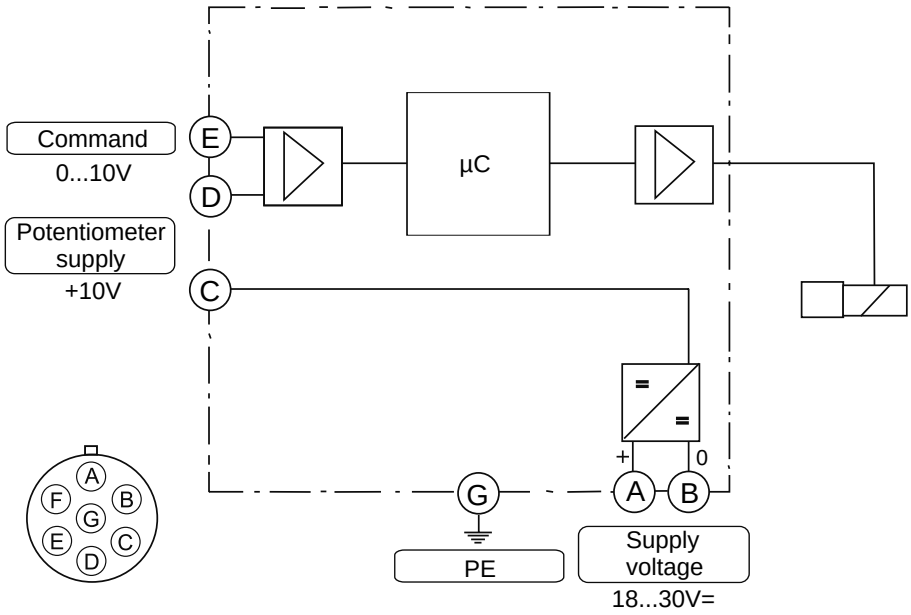


All characteristic curves measured with HLP46 at 50°C.

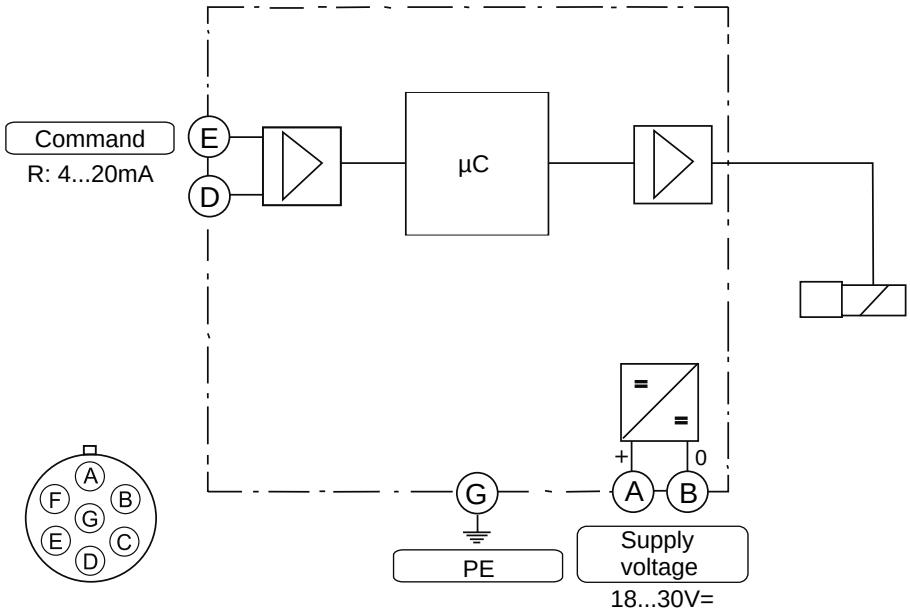
The performance curves are measured with external drain. For internal drain the tank pressure has to be added to curve.

Block diagram

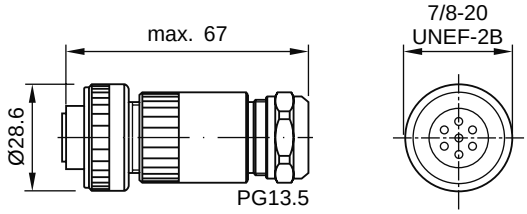
Code F
6 + PE acc. EN 175201-804



Code R
6 + PE acc. EN 175201-804



Female connector (EMC conform)



Please order plugs separately,
ID no. 5004072

ProPxD interface program

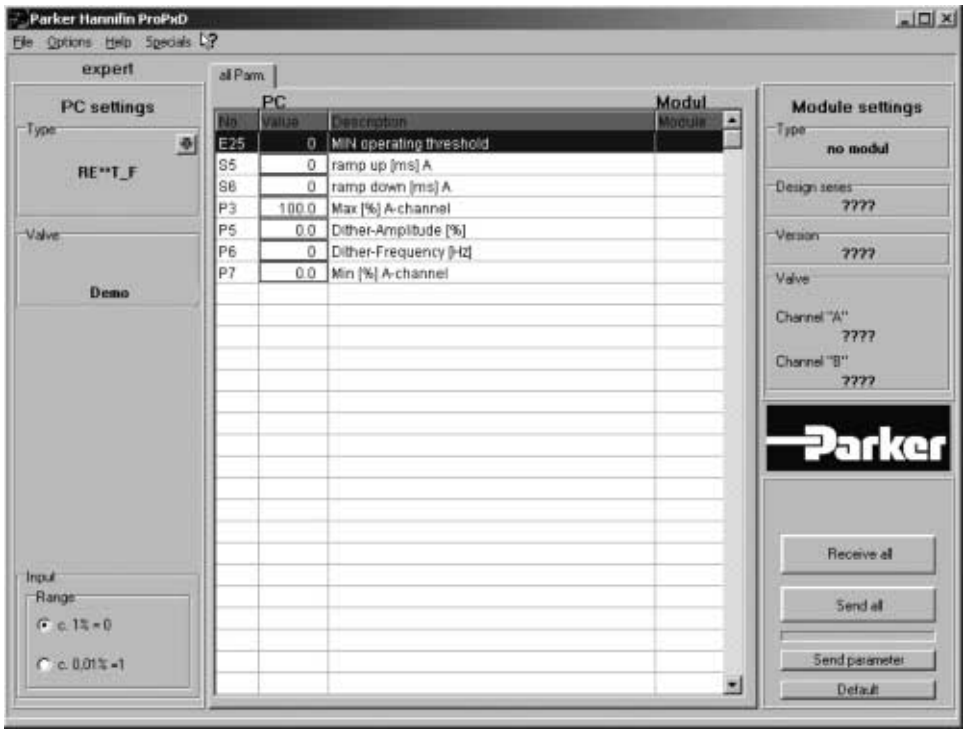
The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

Features

- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows® operating systems from Windows® 95 upwards
- Plain communication between PC and electronic via serial interface RS232C and null modem cable

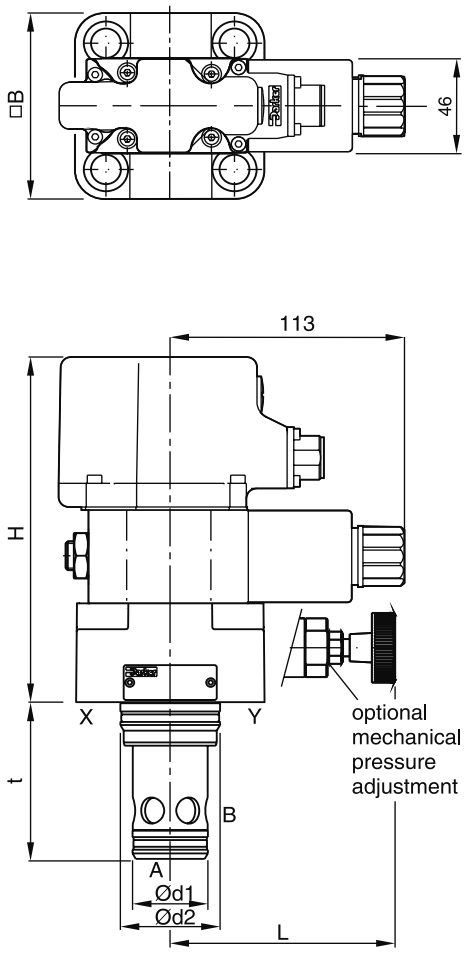
Comfortable PC user software, free of charge:
www.parker.com/euro_hcd - see “Support“



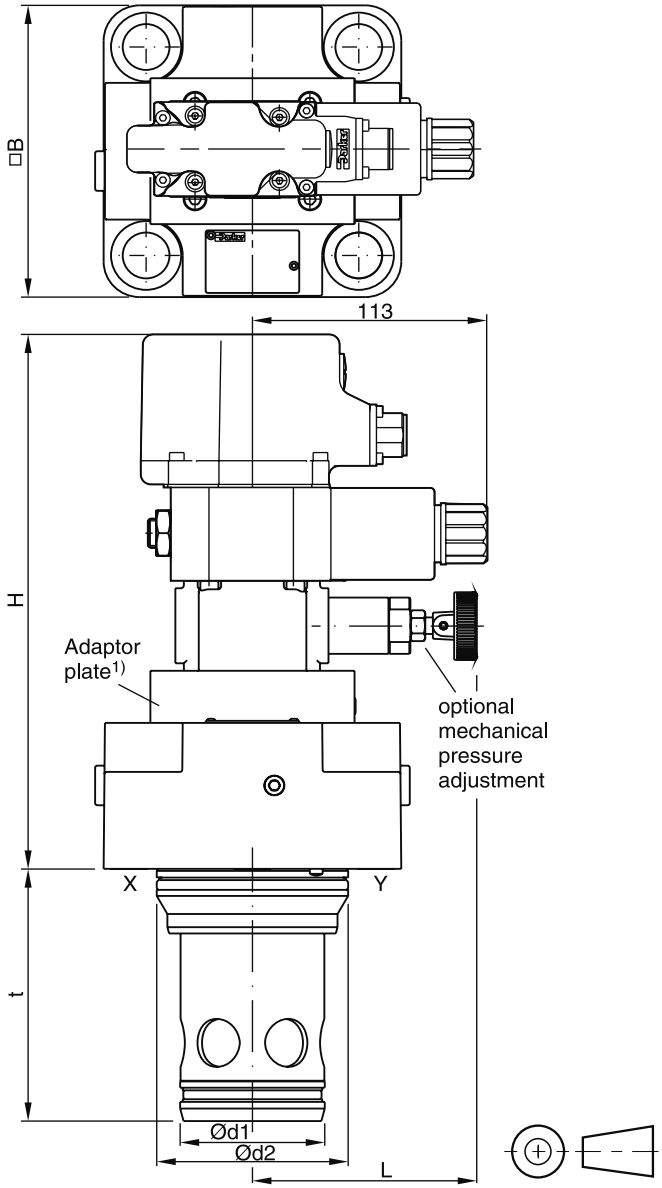
The parametrizing cable may be ordered under item no. 40982923.

8

NG16 - NG32



NG40 - NG63 [1)]



[1)] NG40 without adaptor plate

Size	H	B	d_1	d_2	t	L
NG16	179	79 [1)]	32	25	56	114
NG25	124	85	45	34	72	102
NG32	129	102	60	45	85	95
NG40	139 (182.2) [2)]	125	75	55	105	106
NG50	174 (217.2) [2)]	140	90	68	122	106
NG63	189 (232.2) [2)]	180	120	90	155	106

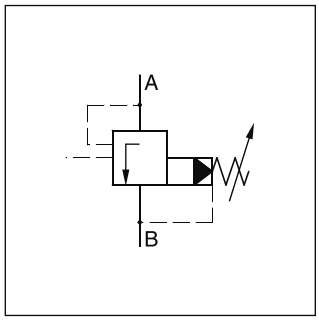
[1)] Width 65 mm
[2)] With mechanical pressure adjustment

NG	Kit	DIN912 12.9	[Nm]	Kit NBR	Kit FPM
16	BK414	4 x M8x40	33	SK-RE16E25	SK-RE16EV25
25	BK391	4 x M12x50	115	SK-RE25E25	SK-RE25EV25
32	BK415	4 x M16x55	281	SK-RE32E25	SK-RE32EV25
40	BK416	4 x M20x70	553	SK-RE40E25	SK-RE40EV25
50	BK417	4 x M20x75	553	SK-RE50E25	SK-RE50EV25
63	BK418	4 x M30x100	1910	SK-RE63E25	SK-RE63EV25

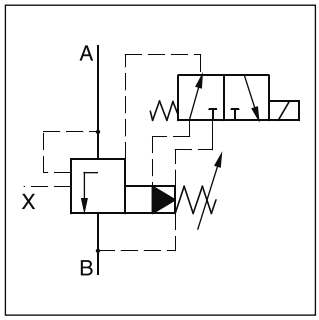
The unloading valve series UR*E consists of a mechanical pilot stage and a slip-in cartridge main stage. These valves are used to unload a circuit at low pressure. The mechanically adjustable pressure signal to unload the main stage has to be applied to port X. The nominal pressure differential between opening and closing is 15%.

In addition the series US*E is vented by electrical operation. The UR*E/US*E model codes embrace the pilot valves, covers and cartridges that are also offered as separate items. See combination examples for details.

US25E



UR*E



US*E

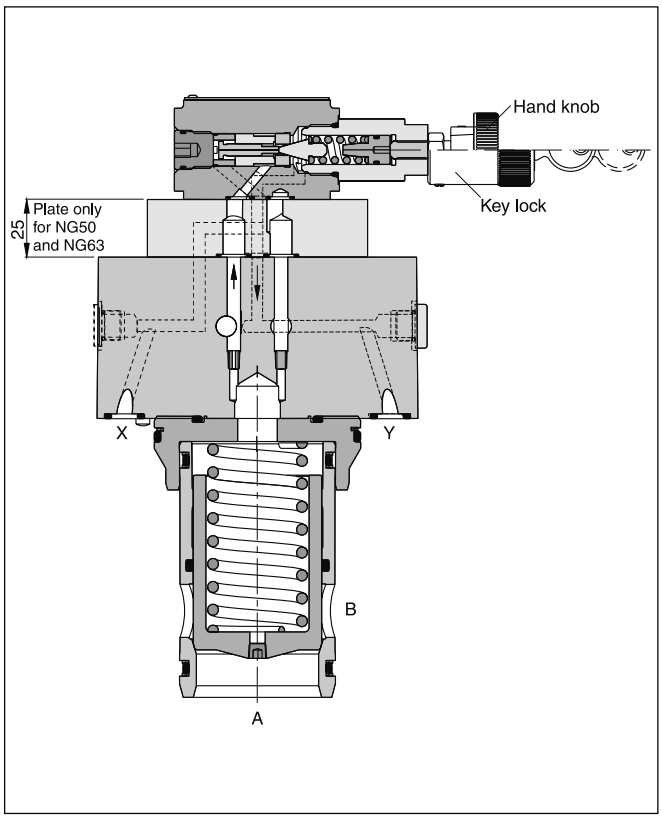
Features

- Pilot operated unloading valve
- Cavity and mounting pattern according to ISO 7368
- 4 pressure stages
- 2 switching types (series US*E)
- 2 adjustment modes
  - Hand knob
  - Key lock
- 6 sizes NG16 to NG63

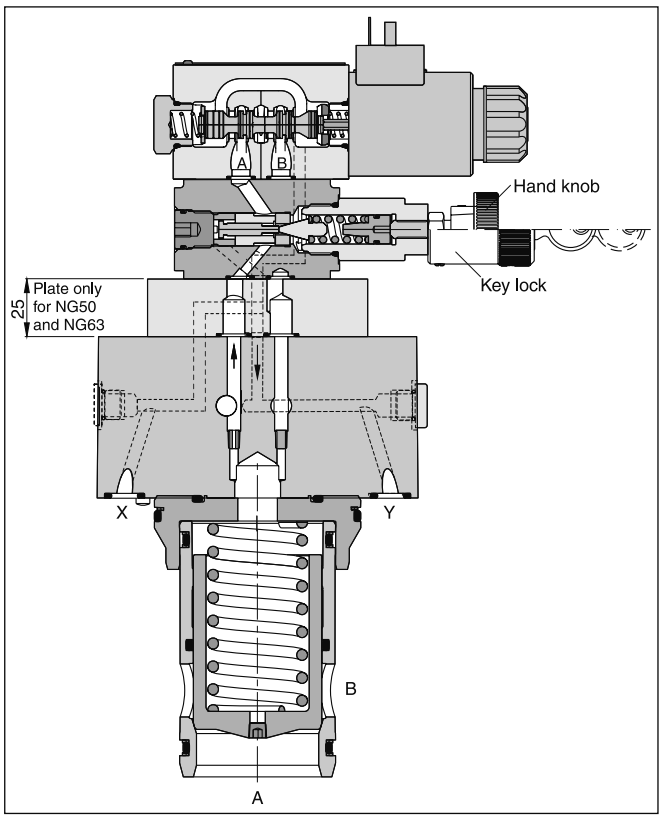
Note

Port X only usable for remote vent function

UR*E



US*E



8

UR*E

UR		E			1	S		
Unloading valve	**Nominal size**	**Slip-in mounting ISO 7368**	**Pressure stages**	**Adjust-ment**	**Pilot oil** (Pilot internal, Drain external)	**Poppet spring**	**Seal**	**Design series** (not required for ordering)

Code	Nominal size
16	NG16
25	NG25
32	NG32
40	NG40
50	NG50
63	NG63

Code	Pressure stages
07	up to 70 bar
17	up to 175 bar
25	up to 250 bar
35	up to 350 bar

Code	Seal
N	NBR
V	FPM

Code	Adjustment
L	Key lock
S	Hand knob (standard)

US*E

US		E			1	S					W		
Unloading valve with elec. un-loading	**Nominal size**	**Slip-in mounting ISO 7368**	**Pressure stages**	**Adjust-ment**	**Pilot oil** (Pilot int., Drain ext.)	**Poppet spring**	**Seal**	**Switching type**	**Solenoid**	**Without plug**	**Options**	**Design series** (not required for ordering)

Code	Nominal size
16	NG16
25	NG25
32	NG32
40	NG40
50	NG50
63	NG63

Code	Pressure stages
07	up to 70 bar
17	up to 175 bar
25	up to 250 bar
35	up to 350 bar

Code	Adjustment
L	Key lock
S	Hand knob (standard)

Code	Spool type
omit	Standard
S	with slow unloading

Code	Solenoid
K	12V
J	24V
U [1]	98V
G [1]	205V

[1] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Switching type
1	Solenoid not activated, unpress. circulation
9	Solenoid activated, unpress. circulation

Code	Seal
N	NBR
V	FPM

8

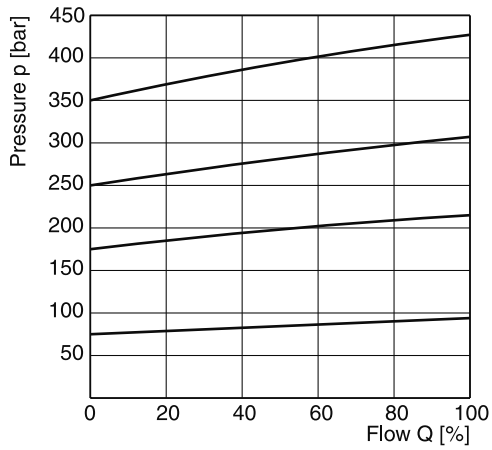
UR*E

General							
Nominal size		NG16	NG25	NG32	NG40	NG50	NG63
Interface		Slip-in mounting acc. ISO 7368					
Mounting position		as desired, horizontal mounting prefered					
Ambient temperature	[°C]	-20...+80					
$MTTF_D$ value	[years]	75					
Weight	[kg]	2.2	3.5	4.9	8.0	13.7	22.8
Hydraulic							
Max. operating pressure	[bar]	Ports A and X up to 350, Ports B and Y depressurized					
Pressure stages	[bar]	75, 175, 250, 350					
Pressure differential, nominal	[%]	15					
Nominal flow	[l/min]	220	500	950	1400	2300	4000
Fluid		Hydraulic oil according to DIN 51524 ...51525					
Viscosity, recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 50 20 ... 380					
Fluid temperature	[°C]	-20 ... +70					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					

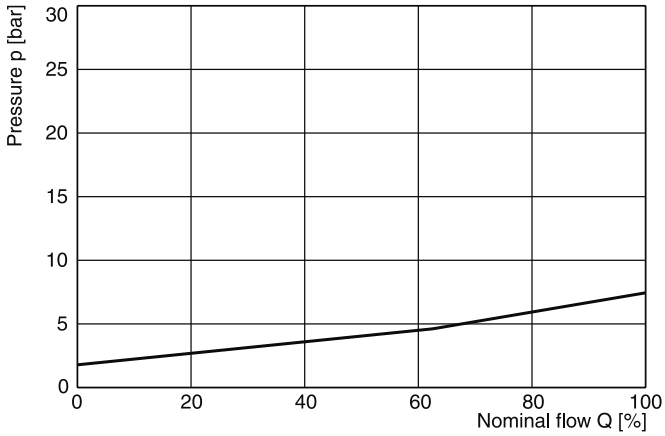
US*E

General							
Nominal size		NG16	NG25	NG32	NG40	NG50	NG63
Interface		Slip-in mounting acc. ISO 7368					
Mounting position		as desired, horizontal mounting prefered					
Ambient temperature	[°C]	-20...+80					
$MTTF_D$ value	[years]	75					
Weight	[kg]	2.7	5.2	6.4	9.5	15.2	24.3
Hydraulic							
Max. operating pressure	[bar]	Ports A and X 350, ports B and Y depressurized					
Pressure stages	[bar]	75, 175, 250, 350					
Pressure differential, nominal	[%]	15					
Nominal flow	[l/min]	220	500	950	1400	2300	4000
Fluid		Hydraulic oil according to DIN 51524 ...51525					
Viscosity, recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 50 20 ... 380					
Fluid temperature	[°C]	-20 ... +70					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Electrical (solenoid)							
Duty ratio	[%]	100 ED; CAUTION: coil temperature up to 180 °C possible					
Max. switching frequency	[1/h]	16000					
Protection class		IP 65 in according with EN 60529 (with correctly mounted plug-in connector)					
Direct current	Code	K		J		U	G
Supply voltage	[V]	12		24		98	205
Power	[W]	31		31		31	31
Current	[A]	2.5		1.25		0.31	0.15
Solenoid connection		Connector as per EN 175301-803					
Wiring min.	[mm²]	3 x 1.5 recommended					
Wiring length max.	[m]	50 recommended					

p/Q performance curve [1)]



Minimum pressure curve

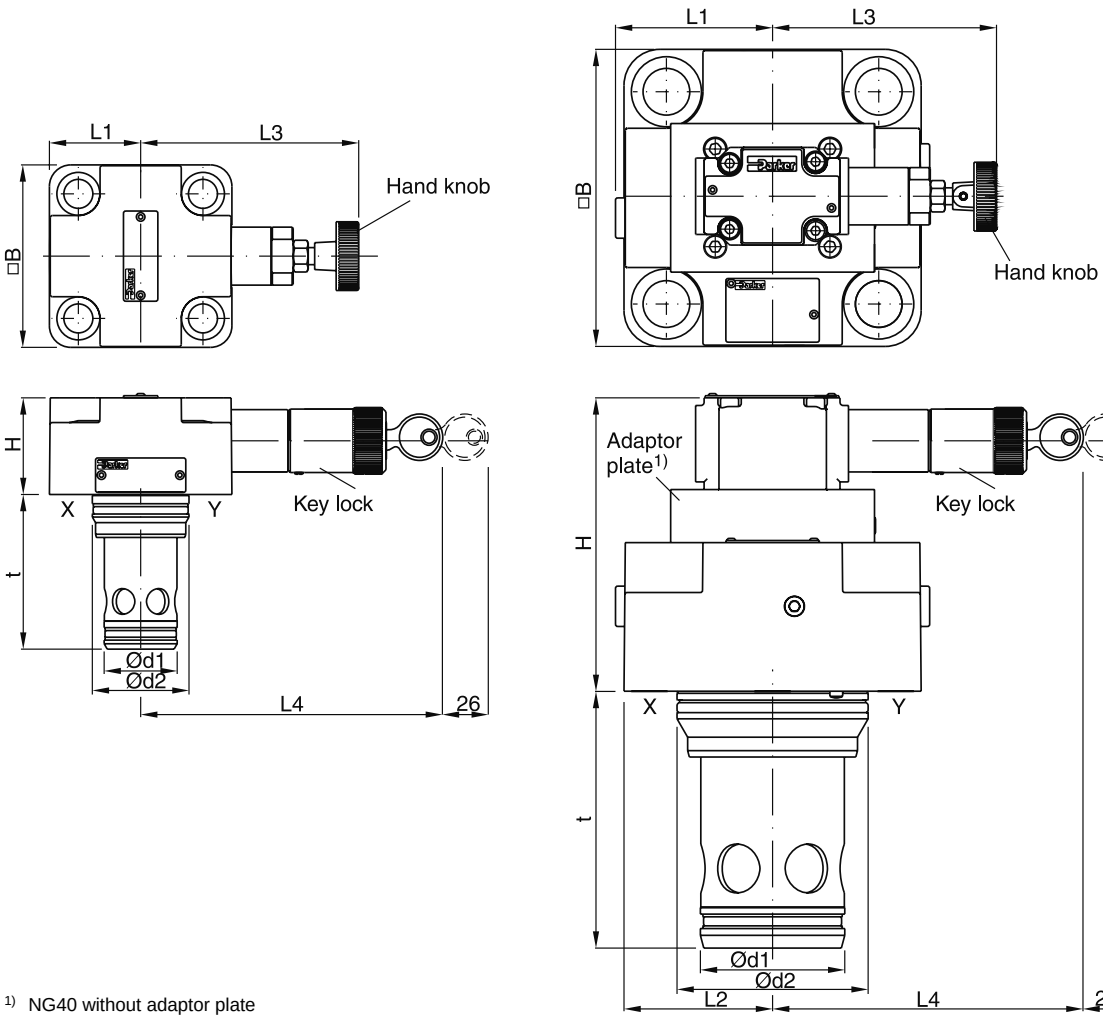


[1)] The performance curves are measured with external drain.
For internal drain the tank pressure has to be added to curve.

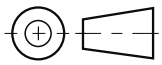
All characteristic curves measured with HLP46 at 50°C.

8

UR*E



1) NG40 without adaptor plate

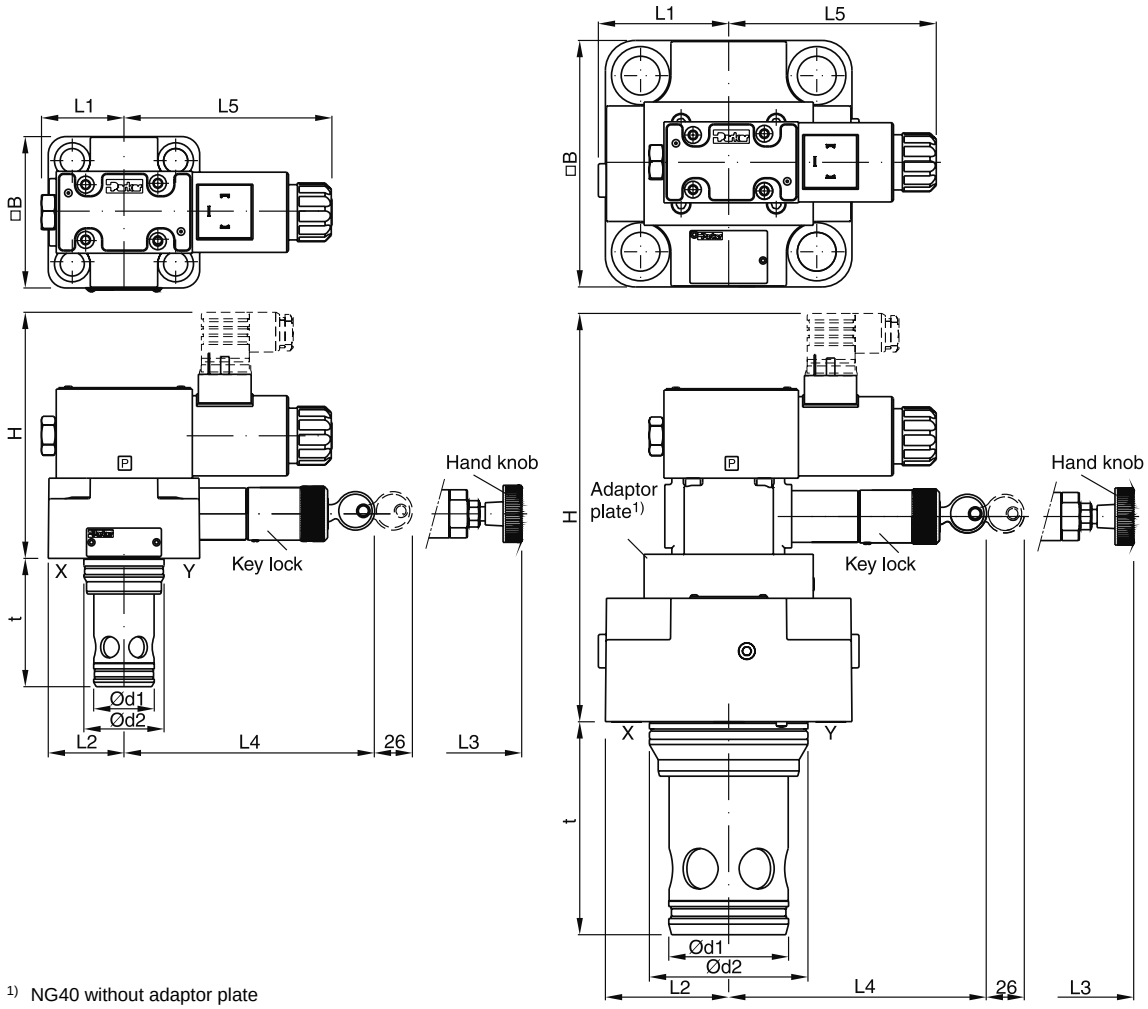


Size	H	B	L1	L2	L3	L4	d1	d2	t
NG16	40	65 1)	32.5	—	114	125.5	32	25	56
NG 25	47	85	42.5	—	102	114	45	34	71
NG32	50	102	51	—	95	106	60	45	85
NG40	106	125	62.5	66.5	106	144	75	55	105
NG50	141	140	70	74	106	144	90	68	121
NG63	155	180	90	94	106	144	120	90	155

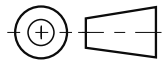
1) width 79 mm

NG	Kit	DIN912 12.9	[Nm]	Kit NBR	Kit FPM
16	BK414	4 x M8x40	33	SK-R16E25	SK-R16EV25
25	BK391	4 x M12x50	115	SK-R25E25	SK-R25EV25
32	BK415	4 x M16x55	281	SK-R32E25	SK-R32EV25
40	BK416	4 x M20x70	553	SK-R40E25	SK-R40EV25
50	BK417	4 x M20x75	553	SK-R50E25	SK-R50EV25
63	BK418	4 x M30x100	1910	SK-R63E25	SK-R63EV25

US*E



1) NG40 without adaptor plate

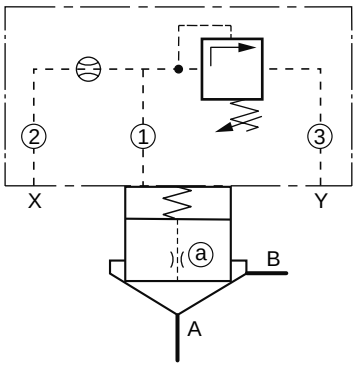


Size	H	B	L1	L2	L3	L4	d1	d2	t
NG16	40	65 1)	32.5	—	114	125.5	32	25	56
NG25	47	85	42.5	—	102	114	45	34	71
NG32	50	102	51	—	95	106	60	45	85
NG40	106	125	62.5	66.5	106	144	75	55	105
NG50	141	140	70	74	106	144	90	68	121
NG63	155	180	90	94	106	144	120	90	155

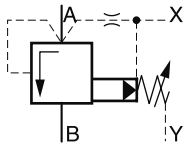
1) width 79 mm

NG	Kit	DIN912 12.9	[Nm]	Kit NBR	Kit FPM
16	BK414	4 x M8x40	33	SK-RS16E25	SK-RS16EV25
25	BK391	4 x M12x50	115	SK-RS25E25	SK-RS25EV25
32	BK415	4 x M16x55	281	SK-RS32E25	SK-RS32EV25
40	BK416	4 x M20x70	553	SK-RS40E25	SK-RS40EV25
50	BK417	4 x M20x75	553	SK-RS50E25	SK-RS50EV25
63	BK418	4 x M30x100	1910	SK-RS63E25	SK-RS63EV25

Pressure relief valve with cover with integrated pressure relief function



NG16 - NG32



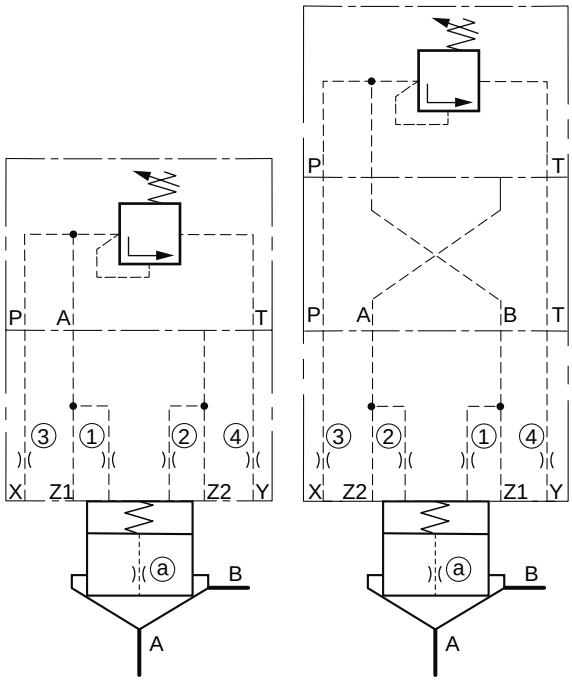
Description	Type NG16	NG25	NG32
Cover incl. pressure valve [1]	C016Fxxxxxxxxxx	C025Fxxxxxxxxxx	C032Fxxxxxxxxxx
Cover orifice ①	M5xØ1.0	M5xØ1.1	M6xØ1.2
Cover orifice ②	M4xØ0.8	M5xØ0.9	M6xØ1.0
Cover orifice ③	M5xØ99	M5xØ99	M6xØ99
Cartridge [2]	CP016C07S00X	CP025C07S00X	CP032C07S00X
Poppet orifice ⓐ	1/16NPT x 00 (plug)		
Spring	1.6 bar, typ S (order no. see spare parts)		
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

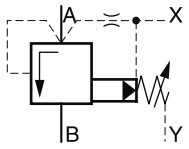
[1] Complete type see ordering code C*F
[2] Complete type see ordering code CP*

8

Pressure relief valve with separate pilot



NG16 - NG40 Flow A → B NG50 - NG63



8

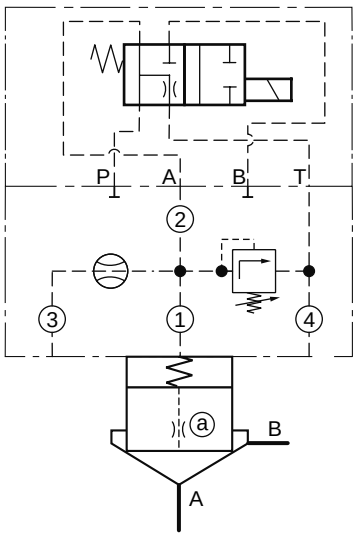
Adaptor plates see chapter 12

Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
Pressure valve [1]	R06Mxxx4x					
Adaptor plate [2]	without				PADA1007/A-B/B-A	
Cover [3]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3	M5xØ1.4	M5xØ1.5	M6xØ1.6	M6xØ1.7
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ99	M6xØ99			M8xØ99	
Cover orifice ④	M5xØ1.3	M6xØ1.5	M6xØ1.7	M6xØ1.8	M8xØ2.0	M8xØ2.2
Cartridge [4]	CP016C07*	CP025C07*	CP032C07*	CP040C07*	CP050C07*	CP063C07*
Poppet orifice ⓐ	1/16NPT x Ø0.9	1/16NPT x Ø1.1	1/16NPT x Ø1.2	1/16NPT x Ø1.3	1/16NPT x Ø1.4	1/16NPT x Ø1.5
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	BK443, 4x M5x45					

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

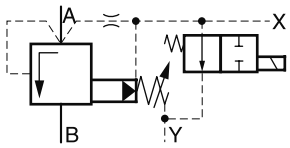
[1] Complete type see pilot valves
[2] Included O-rings and mounting bolts
[3] Complete type see ordering code C*C
[4] Complete type see ordering code CP*

Pressure relief valve with electrical vent function, normally open and cover with integrated pressure relief function



NG16 - NG32

Flow A → B



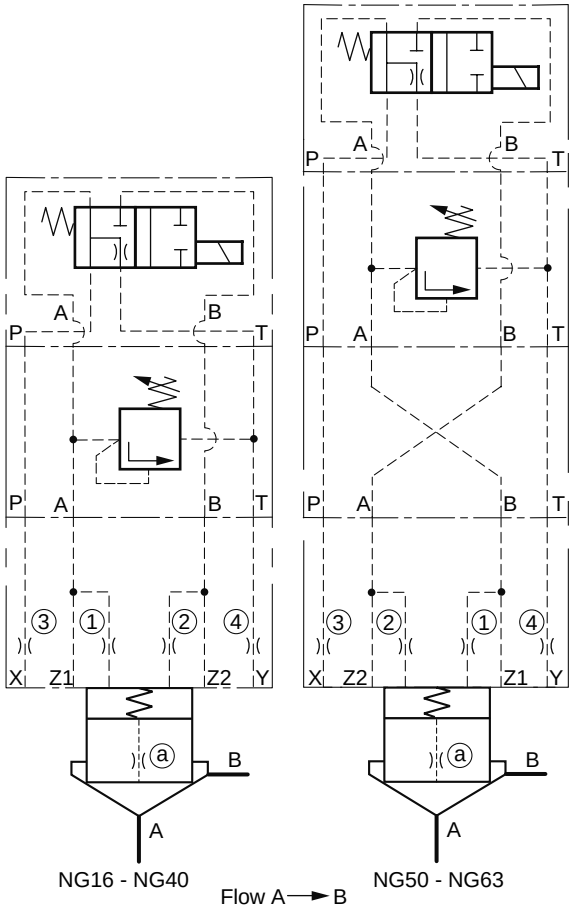
8

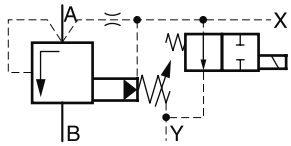
Description	Type NG16	NG25	NG32
4/2 DC valve [1]	D1VW104K*		
Cover incl. pressure valve [2]	C016Gxxxxxxxxx	C025Gxxxxxxxxx	C032Gxxxxxxxxx
Cover orifice ①	M5xØ1.0	M5xØ1.1	M6xØ1.2
Cover orifice ②	M5xØ99	M5xØ99	M6xØ99
Cover orifice ③	M4xØ00	M5xØ00	M6xØ00
Cover orifice ④	M5xØ1.2	M5xØ1.3	M6xØ1.4
Cartridge [3]	CP016C07*	CP025C07*	CP032C07*
Poppet orifice ⓐ	1/16NPT x Ø0.8	1/16NPT x Ø0.8	1/16NPT x Ø1.0
Spring	1.6 bar, type S (order no. see spare parts)		
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55
Bolt kit 4/2 DC valve	BK375, 4x M5x30		

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete type see chapter “Directional Control Valves“, series D1VW.
[2] Complete type see ordering code C*G
[3] Complete type see ordering code CP*

Pressure relief valve with electrical vent function, normally open and pilot in sandwich design





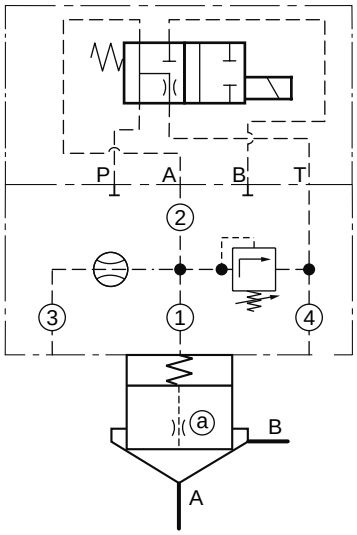
Adaptor plates see chapter 12

Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
4/2 DC valve [1]	D1VW104K*					
Pressure valve [2]	V-ZUDB1ATxZ07x					
Adaptor plate [3] NG10-NG06	without				PADA1007/A-B/B-A	
Cover [4]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3	M5xØ1.4	M5xØ1.5	M6xØ1.6	M6xØ1.7
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ99	M6xØ99			M8xØ99	
Cover orifice ④	M5xØ1.3	M6xØ1.5	M6xØ1.5	M6xØ1.8	M8xØ2.0	M8xØ2.2
Cartridge [5]	CP016C07*	CP025C07*	CP032C07*	CP040C07*	CP050C07*	CP063C07*
Poppet orifice ⓐ	1/16NPT x Ø0.9	1/16NPT x Ø1.1	1/16NPT x Ø1.2	1/16NPT x Ø1.3	1/16NPT x Ø1.4	1/16NPT x Ø1.5
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	TK1482					

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

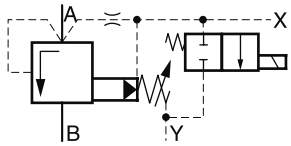
[1] Complete type see chapter "Directional Control Valves", series D1VW.
[2] Complete types see pilot valves
[3] Included O-rings and mounting bolts
[4] Complete type see ordering code C*C
[5] Complete type see ordering code CP*

Pressure relief valve with electrical vent function, normally closed and cover with integrated pressure relief function



NG16 - NG32

Flow A → B



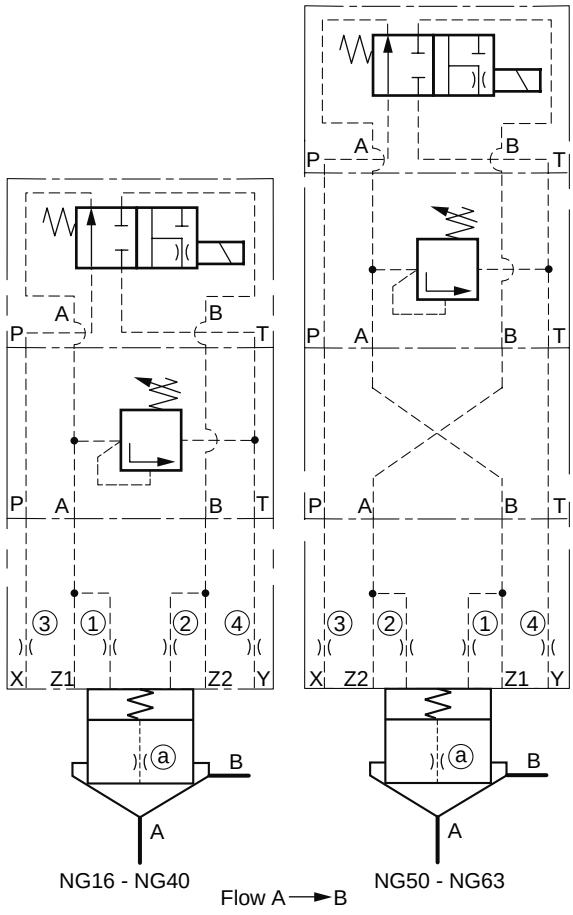
8

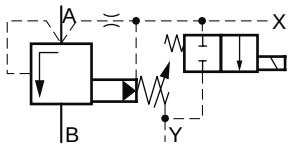
Description	Type NG16	NG25	NG32
4/2 DC valve [1]	D1VW105K*		
Cover incl. pressure valve [2]	C016Gxxxxxxxxxxx	C025Gxxxxxxxxxxx	C032Gxxxxxxxxxxx
Cover orifice ①	M5xØ1.0	M5xØ1.1	M6xØ1.4
Cover orifice ②	M5xØ99	M5xØ99	M6xØ99
Cover orifice ③	M4xØ00	M5xØ00	M6xØ00
Cover orifice ④	M5xØ1.2	M5xØ1.3	M6xØ1.4
Cartridge [3]	CP016C07*	CP025C07*	CP032C07*
Poppet orifice ⓐ	1/16NPT x Ø0.8	1/16NPT x Ø0.8	1/16NPT x Ø1.0
Spring	1.6 bar, type S (order no. see spare parts)		
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55
Bolt kit 4/2 DC valve	BK375, 4x M5x30		

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete type see chapter “Directional Control Valves“, series D1VW.
[2] Complete type see ordering code C*G
[3] Complete type see ordering code CP*

Pressure relief valve with electrical vent function, normally closed and pilot in sandwich design





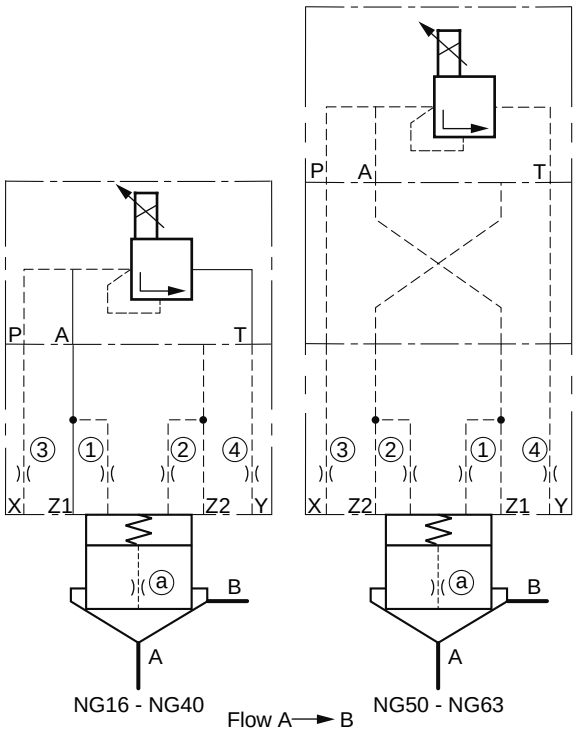
Adaptor plates see chapter 12

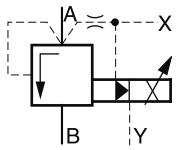
Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
4/2 DC valve [1]	D1VW105K*					
Pressure valve [2]	V-ZUDB1ATxZ07x					
Adaptor plate [3]	without				PADA1007/A-B/B-A	
Cover [4]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3	M5xØ1.4	M5xØ1.5	M6xØ1.6	M6xØ1.7
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ99	M6xØ99			M8xØ99	
Cover orifice ④	M5xØ1.3	M6xØ1.5	M6xØ1.7	M6xØ1.8	M8xØ2.0	M8xØ2.2
Cartridge [5]	CP016C07*	CP025C07*	CP032C07*	CP040C07*	CP050C07*	CP063C07*
Poppet orifice ⓐ	1/16NPT x Ø0.9	1/16NPT x Ø1.1	1/16NPT x Ø1.2	1/16NPT x Ø1.3	1/16NPT x Ø1.4	1/16NPT x Ø1.5
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	TK1482					

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete type see chapter “Directional Control Valves“, series D1VW.
[2] Complete types see pilot valves
[3] Included O-rings and mounting bolts
[4] Complete type see ordering code C*C
[5] Complete type see ordering code CP*

Proportional pressure relief valve





Adaptor plates see chapter 12

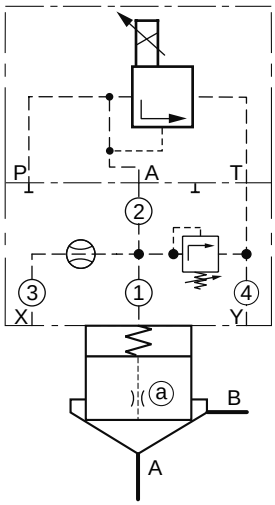
8

Description	Type NG16	NG25	NG32	NG40	NG50	NG63
Pressure valve [1]	RE06MxW2V1KW					
Adaptor plate [2]	without				PADA1007/A-B/B-A	
Cover [3]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3	M5xØ1.4	M5xØ1.4	M6xØ1.5	
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ99	M6xØ99			M8xØ99	
Cover orifice ④	M5xØ1.2	M6xØ1.4	M6xØ1.5	M6xØ1.5	M8xØ1.6	
Cartridge [4]	CP016C07*	CP025C07*	CP032C07*	CP040S07*	CP050S07*	CP063S07*
Poppet orifice ⓐ	1/16NPT x Ø0.9	1/16NPT x Ø1.1	1/16NPT x Ø1.2	1/16NPT x Ø1.3	1/16NPT x Ø1.4	
Spring	0.5 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	BK375, 4x M5x30					

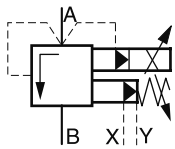
Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete type see chapter "Pressure Valves", series RE06M*W.
[2] Inclusive O-Ringe and mounting bolts
[3] Complete type see ordering code C*C
[4] Complete type see ordering code CP*

Proportional pressure relief valve with mechanical maximum pressure protection and cover with integrated pressure relief function



Flow A ⟶ B



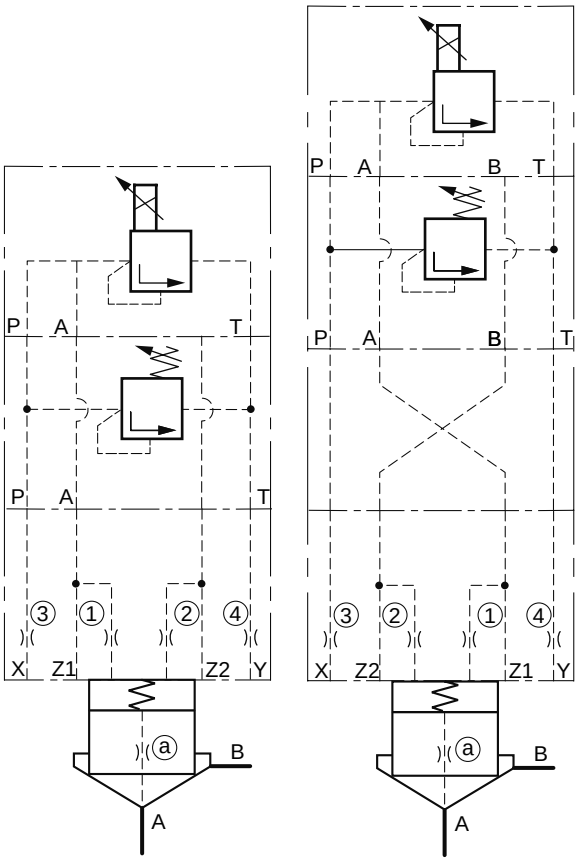
8

Description	Type NG16	NG25	NG32
Prop. DC valve [1]	RE06MxW2V1xW		
Cover incl. pressure valve [2]	C016Gxxxxxxxxxxx	C025Gxxxxxxxxxxx	C032Gxxxxxxxxxxx
Cover orifice ①	M5xØ1.0	M5xØ1.1	M6xØ1.4
Cover orifice ②	M5xØ99	M5xØ99	M6xØ99
Cover orifice ③	M4xØ00	M5xØ00	M6xØ00
Cover orifice ④	M5xØ1.2	M5xØ1.3	M6xØ1.7
Cartridge [3]	CP016C07*	CP025C07*	CP032C07*
Poppet orifice ⓐ	1/16NPT x Ø0.8	1/16NPT x Ø0.9	1/16NPT x Ø1.2
Spring	1.6 bar, type S (order no. see spare parts)		
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55
Bolt kit 4/2 DC valve	BK375, 4x M5x30		

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete type see chapter “Pressure Valves“, series RE06M*W.
[2] Complete type see ordering code C*G
[3] Complete type see ordering code CP*

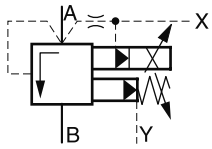
Proportional pressure relief valve with mechanical maximum pressure protection in sandwich design



NG16 - NG40

Flow A → B

NG50 - NG63



Adaptor plates see chapter 12

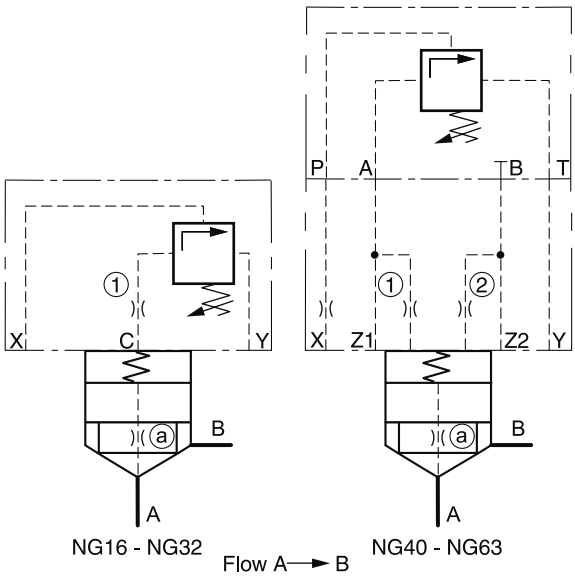
8

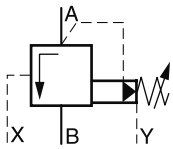
Description	Type NG16	NG25	NG32	NG40	NG50	NG63
Pressure valve [1]	RE06MxW2V1KW					
Max. pressure valve [2]	V-ZUDB1PTxZ07x					
Adaptor plate [3] NG10-NG06	without				PADA1007/A-B/B-A	
Cover [4]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3		M5xØ1.4	M6xØ1.6	
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ99	M6xØ99			M8xØ99	
Cover orifice ④	M5xØ1.2	M6xØ1.4		M6xØ1.5	M8xØ1.6	
Cartridge [5]	CP016C07*	CP025C07*	CP032C07*	CP040S07*	CP050S07*	CP063S07*
Poppet orifice ⓐ	1/16NPT x Ø0.9	1/16NPT x Ø1.1	1/16NPT x Ø1.2	1/16NPT x Ø1.3	1/16NPT x Ø1.4	
Spring	0.5 bar, type N (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	TK1482					

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete type see chapter "Pressure Valves", series RE06*W.
[2] Complete types see pilot valves
[3] Included O-rings and mounting bolts
[4] Complete type see ordering code C*C
[5] Complete type see ordering code CP*

Unloading valve





8

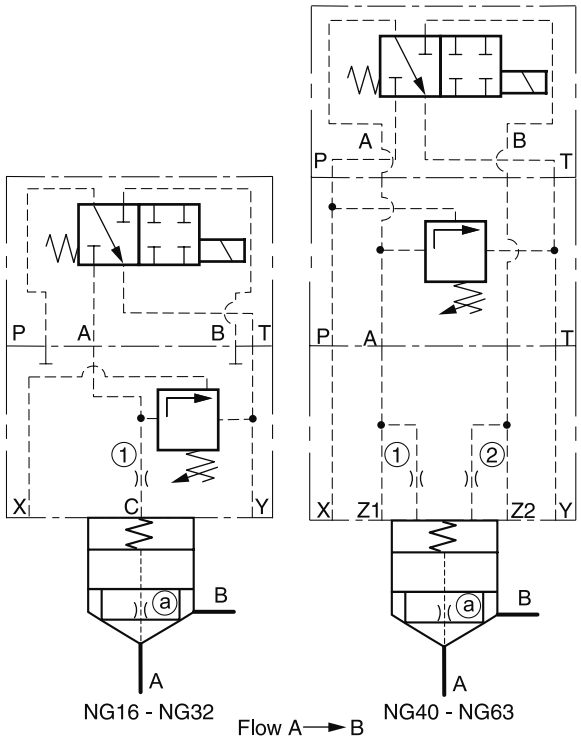
Adaptor plates see chapter 12

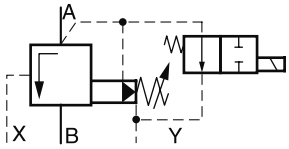
Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
Unloading valve [1]	UR06Mxxx4x					
Adaptor plate [2] NG10-NG06	–	–	–	–	PADA1007/A-B/B-A	
Cover [3]	on request			C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.4				M6xØ1.4	
Cover orifice ②	M5xØ00				M6xØ00	
Cartridge [4]	CP16C07*	CP25C07*	CP032C07*	CP040S07*	CP050S07*	CP063S07*
Poppet orifice ⓐ	1/16NPT x Ø1.2					
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	BK443, 4x M5x45					

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete types see pilot valves
[2] Included O-rings and mounting bolts
[3] Complete type see ordering code C*C
[4] Complete type see ordering code CP*

Unloading valve with electrical vent function, normally open





8

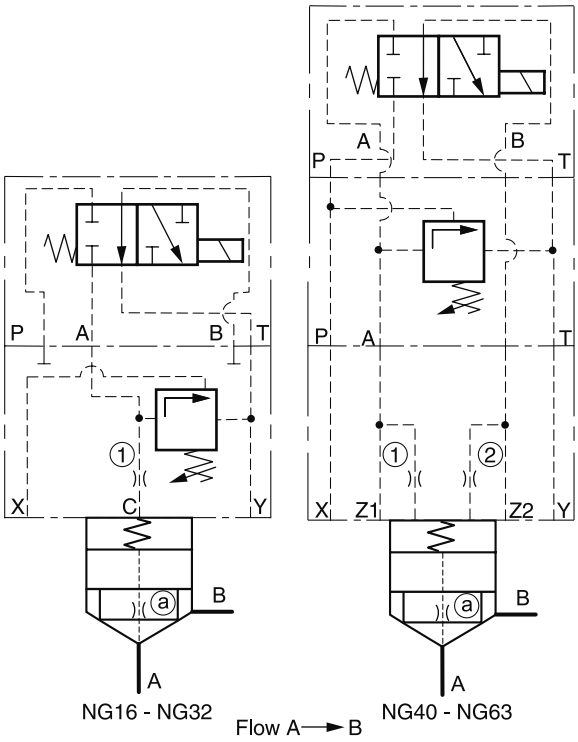
Adaptor plates see chapter 12

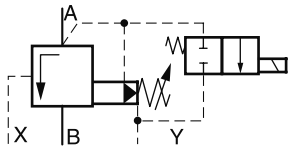
Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
4/2 DC valve [1]				D1VW076K*		
Pressure valve [2]	US06Mxxx4x					
Adaptor plate [3] NG10-NG06	–	–	–	–	PADA1007/A-B/B-A	
Cover [4]	on request			C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.4				M6xØ1.4	
Cover orifice ②	M5xØ00				M6xØ00	
Cartridge [5]	CP016C07*	CP025C07*	CP032C07*	CP040S07*	CP050S07*	CP063S07*
Poppet orifice ⓐ	1/16NPT x Ø1.2					
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	BK401, 4x M5x75					

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete type see chapter "Directional Control Valves", series D1VW.
[2] Complete types see pilot valves
[3] Included O-rings and mounting bolts
[4] Complete type see ordering code C*C
[5] Complete type see ordering code CP*

Unloading valve with electrical vent function, normally closed





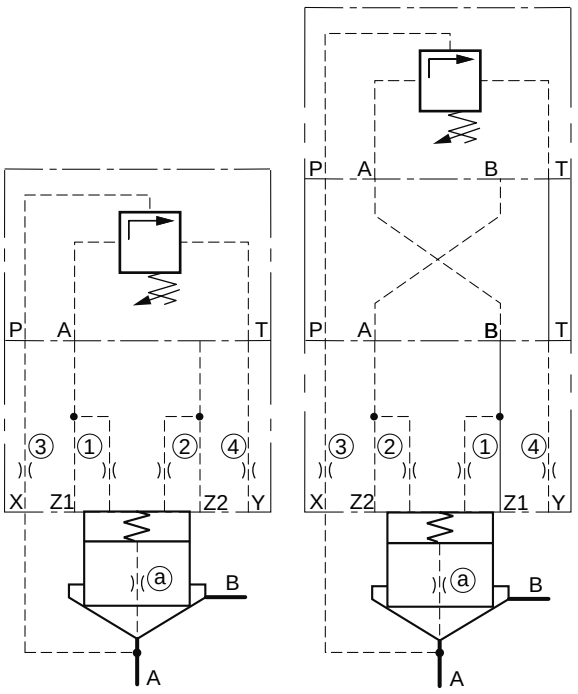
Adaptor plates see chapter 12

Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
4/2 DC valve [1]	D1VW078K*					
Pressure valve [2]				US06Mxxx4x		
Adaptor plate [3] NG10-NG06	–	–	–	–	PADA1007/A-B/B-A	
Cover [4]	on request			C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.4				M6xØ1.4	
Cover orifice ②	M5xØ00				M6xØ00	
Cartridge [5]	CP016C07*	CP025C07*	CP032C07*	CP040S07*	CP050S07*	CP063S07*
Poppet orifice ⓐ	1/16NPT x Ø1.2					
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	BK401, 4x M5x75					

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

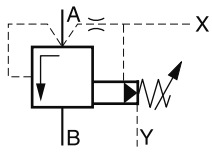
[1] Complete type see chapter "Directional Control Valves", series D1VW.
[2] Complete types see pilot valves
[3] Included O-rings and mounting bolts
[4] Complete type see ordering code C*C
[5] Complete type see ordering code CP*

Pressure sequence valve



NG16 - NG40 NG50 - NG63

Flow A → B



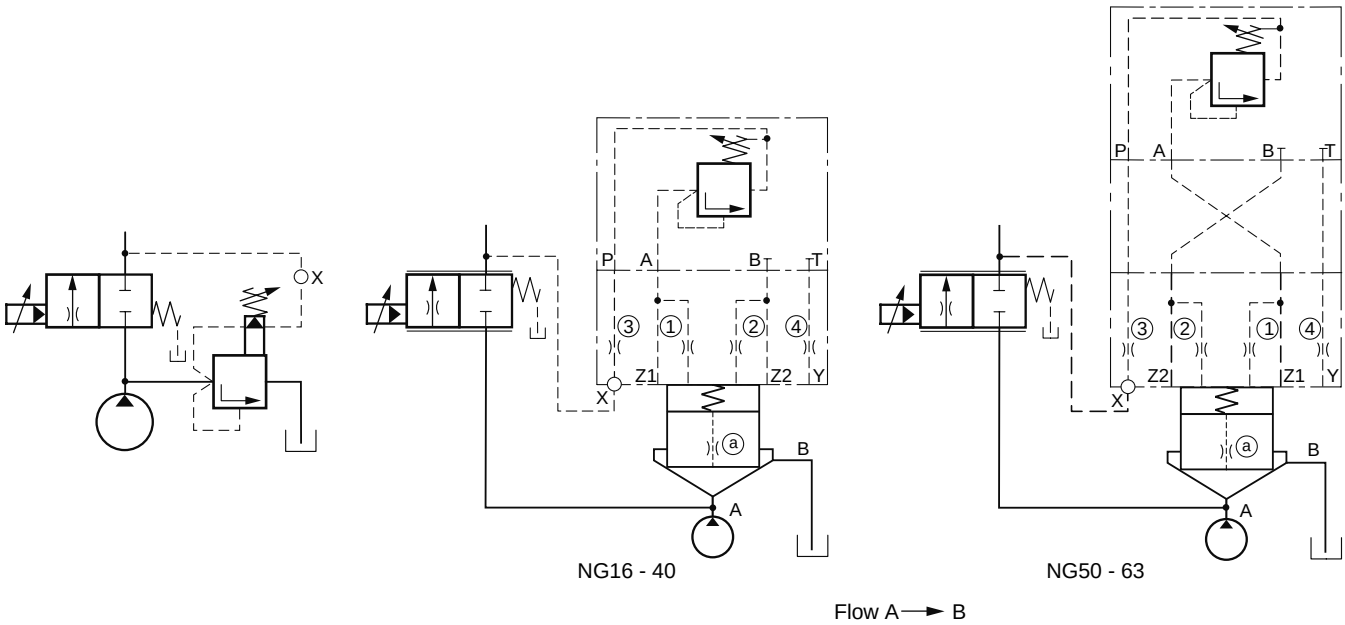
Adaptor plates see chapter 12

Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
Press. sequ. valve [1]	S06Mxxx4x					
Adaptor plate [2] NG10-NG06	without				PADA1007/A-B/B-A	
Cover [3]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3	M5xØ1.4	M5xØ1.5	M6xØ1.6	M6xØ1.7
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ0.9	M6xØ1.1	M6xØ1.2	M6xØ1.3	M8xØ1.4	M8xØ1.5
Cover orifice ④	M5xØ1.3	M6xØ1.5	M6xØ1.7	M6xØ1.8	M8xØ2.0	M8xØ2.2
Cartridge [4]	CE016C01*	CE025C01*	CE032C01*	CE040C01*	CE050C01*	CE063C01*
Poppet orifice ⓐ	1/16NPT x Ø00					
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	BK443, 4x M5x45					

Shown orifice Ø and springs are recommendations.
xxØ00 = closed bottom NG16 - NG50, plug NG63
xxØ99 = open

[1] Complete types see pilot valves
[2] Included O-rings and mounting bolts
[3] Complete type see ordering code C*C
[4] Complete type see ordering code CE*

3 way compensator (in combination with proportional throttle valve)



8

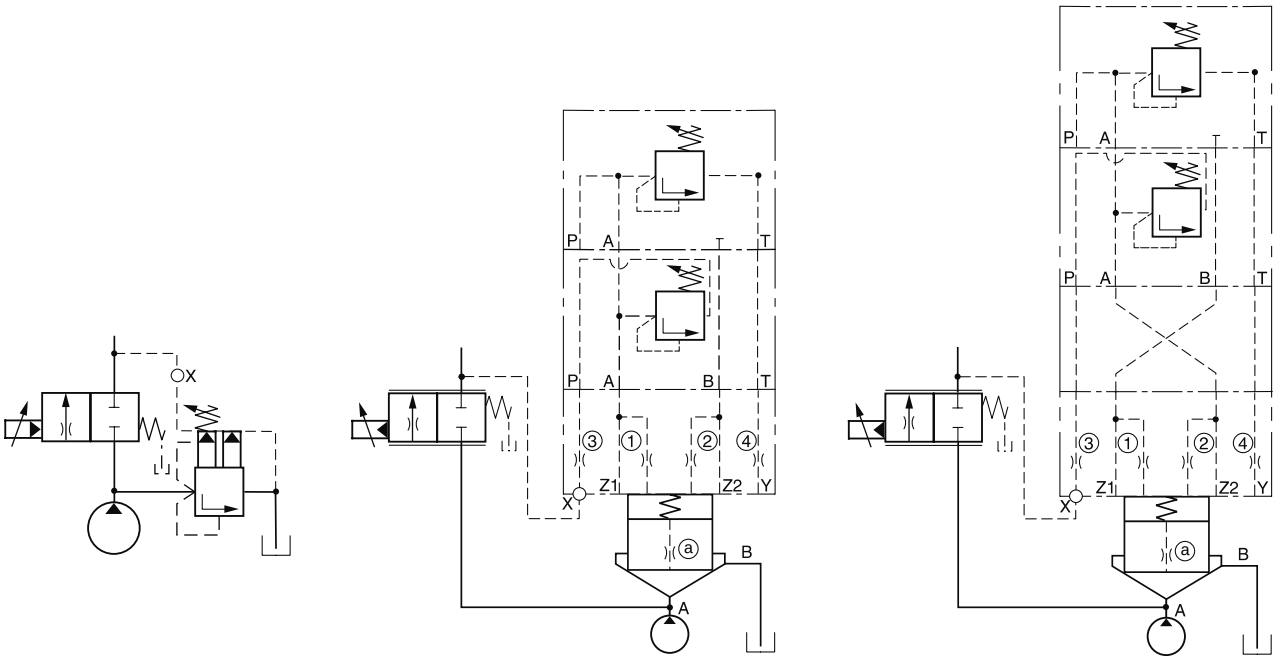
Adaptor plates see chapter 12

Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
Preload valve [1]	DSBA100xP07x					
Adaptor plate [2] NG10-NG06	without				PADA1007/A-B/B-A	
Cover [3]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3	M5xØ1.4	M5xØ1.5	M6xØ1.6	M6xØ1.7
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ99	M6xØ99			M8xØ99	
Cover orifice ④	M5xØ1.3	M6xØ1.5	M6xØ1.7	M6xØ1.8	M8xØ2.0	M8xØ2.2
Cartridge [4]	CE016C01*	CE025C01*	CE032C01*	CE040C01*	CE050C01*	CE063C01*
Poppet orifice ⓐ	1/16NPT x Ø0.9	1/16NPT x Ø1.1	1/16NPT x Ø1.2	1/16NPT x Ø1.3	1/16NPT x Ø1.4	1/16NPT x Ø1.5
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	BK443, 4x M5x45					

Shown orifice Ø and springs are recommendations.
xxØ00 = closed bottom NG16 - NG50, plug NG63
xxØ99 = open

[1] Complete type see pilot valves
[2] Included O-rings and mounting bolts
[3] Complete type see ordering code C*C
[4] Complete type see ordering code CE*

3 way compensator with mechanical maximum pressure protection (in combination with proportional throttle valve)



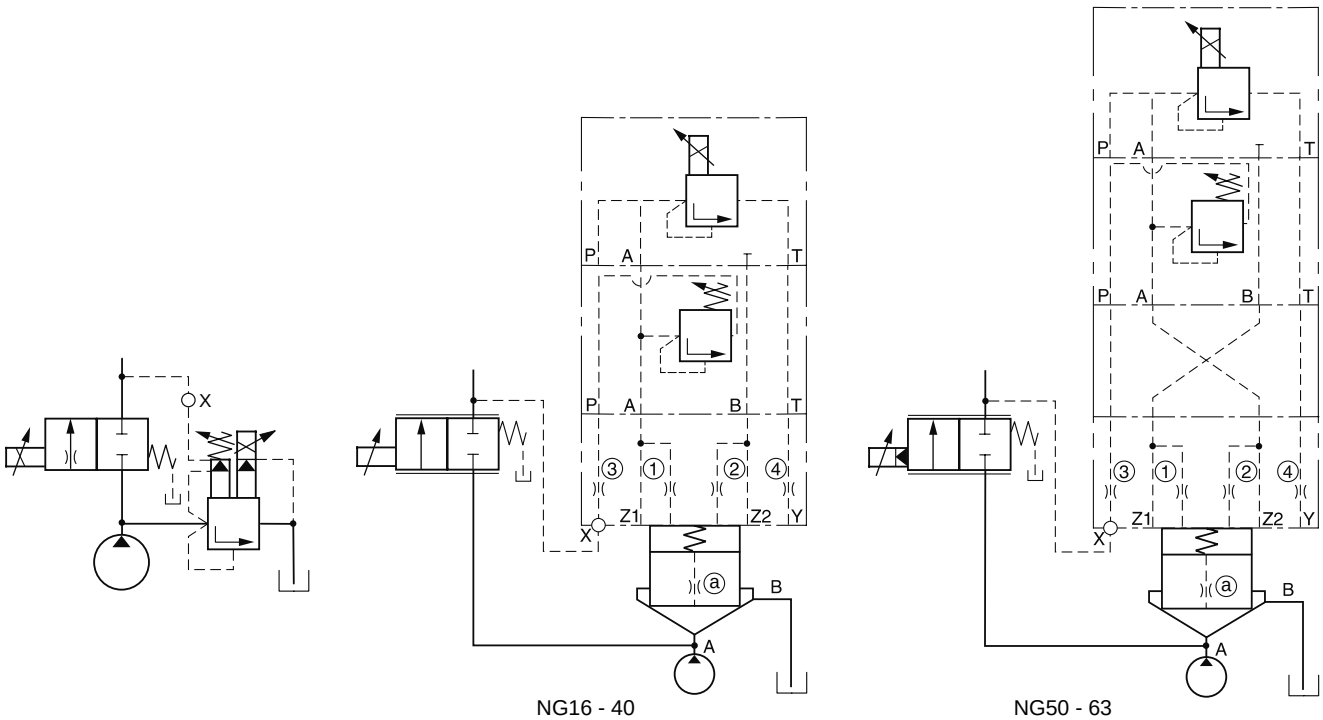
Adaptor plates see chapter 12

Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
Pressure valve [1]	R06Mxxx4x					
Preload valve [1]	DSBA100xZ07x					
Adaptor plate [2] NG10-NG06	without				PADA1007/A-B/B-A	
Cover [3]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3	M5xØ1.4	M5xØ1.5	M6xØ1.6	M6xØ1.7
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ99	M6xØ99			M8xØ99	
Cover orifice ④	M5xØ1.3	M6xØ1.5	M6xØ1.7	M6xØ1.8	M8xØ2.0	M8xØ2.2
Cartridge [4]	CE016C01*	CE025C01*	CE032C01*	CE040C01*	CE050C01*	CE063C01*
Poppet orifice ⓐ	1/16NPT x Ø0.9	1/16NPT x Ø1.1	1/16NPT x Ø1.2	1/16NPT x Ø1.3	1/16NPT x Ø1.4	1/16NPT x Ø1.5
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	TK1482					

Shown orifice Ø and springs are recommendations.
xxØ00 = closed bottom NG16 - NG50, plug NG63
xxØ99 = open

[1] Complete type see examples pilot valve
[2] Included O-rings and mounting bolts
[3] Complete type see ordering code C*C
[4] Complete type see ordering code CE*

3 way compensator with proportional pressure relief function (in combination with proportional throttle valve)



8

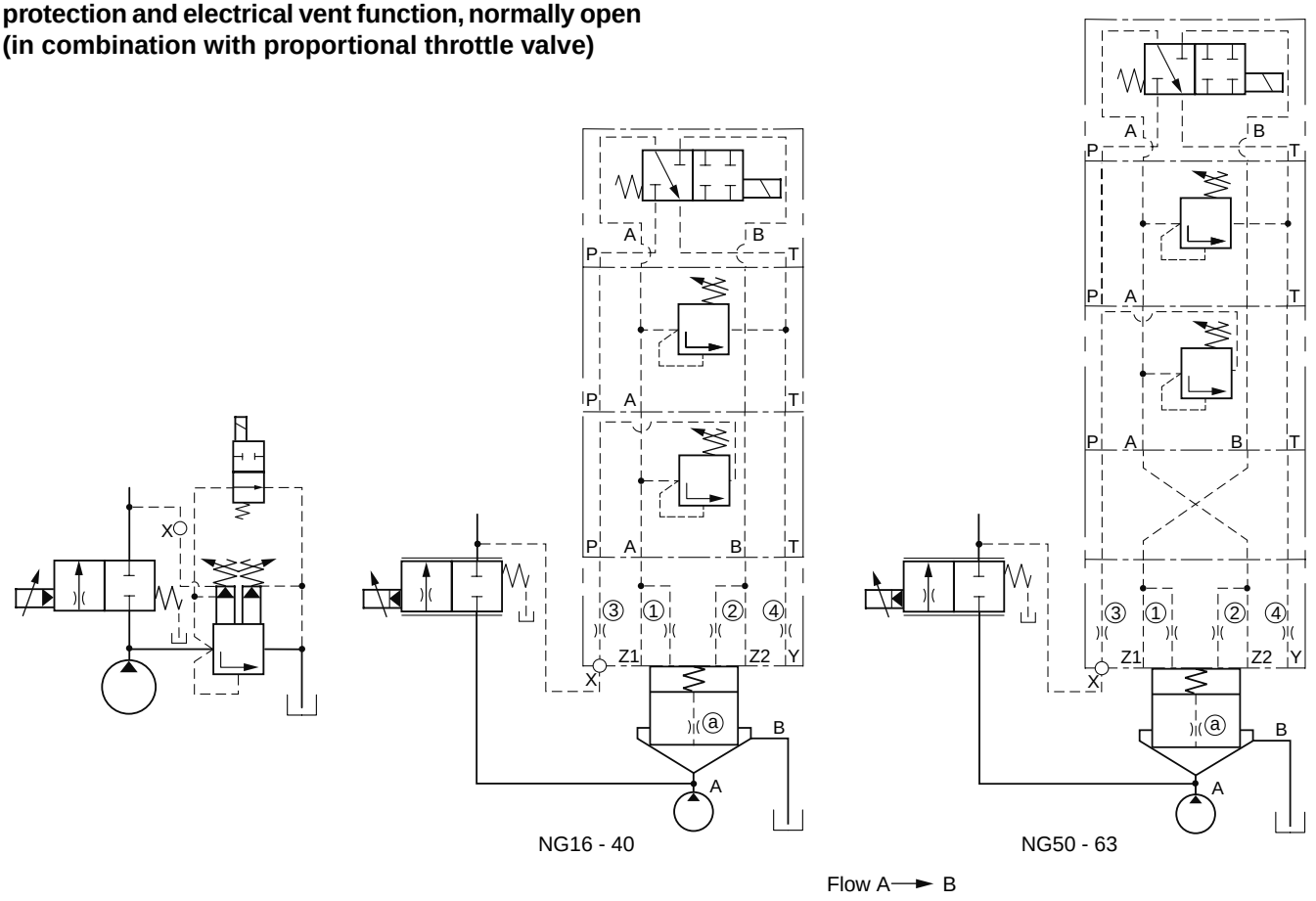
Adaptor plates see chapter 12

Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
Prop. press. valve [1]	RE06MxW2V1KW*					
Preload valve [2]	DSBA100xZ07x					
Adaptor plate [3] NG10-NG06	without				PADA1007/A-B/B-A	
Cover [4]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3	M5xØ1.4	M5xØ1.5	M6xØ1.6	M6xØ1.7
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ99	M6xØ99			M8xØ99	
Cover orifice ④	M5xØ1.3	M6xØ1.5	M6xØ1.7	M6xØ1.8	M8xØ2.0	M8xØ2.2
Cartridge [5]	CE016C01*	CE025C01*	CE032C01*	CE040C01*	CE050C01*	CE063C01*
Poppet orifice ⓐ	1/16NPT x Ø0.9	1/16NPT x Ø1.1	1/16NPT x Ø1.2	1/16NPT x Ø1.3	1/16NPT x Ø1.4	1/16NPT x Ø1.5
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	TK1482					

Shown orifice Ø and springs are recommendations.
xxØ00 = closed bottom NG16 - NG50, plug NG63
xxØ99 = open

[1] Complete type see chapter "Pressure Valves", series RE06W.
[2] Complete type see pilot valves
[3] Included O-rings and mounting bolts
[4] Complete type see ordering code C*C
[5] Complete type see ordering code CE*

3 way compensator with mechanical max. pressure protection and electrical vent function, normally open (in combination with proportional throttle valve)



8

Adaptor plates see chapter 12

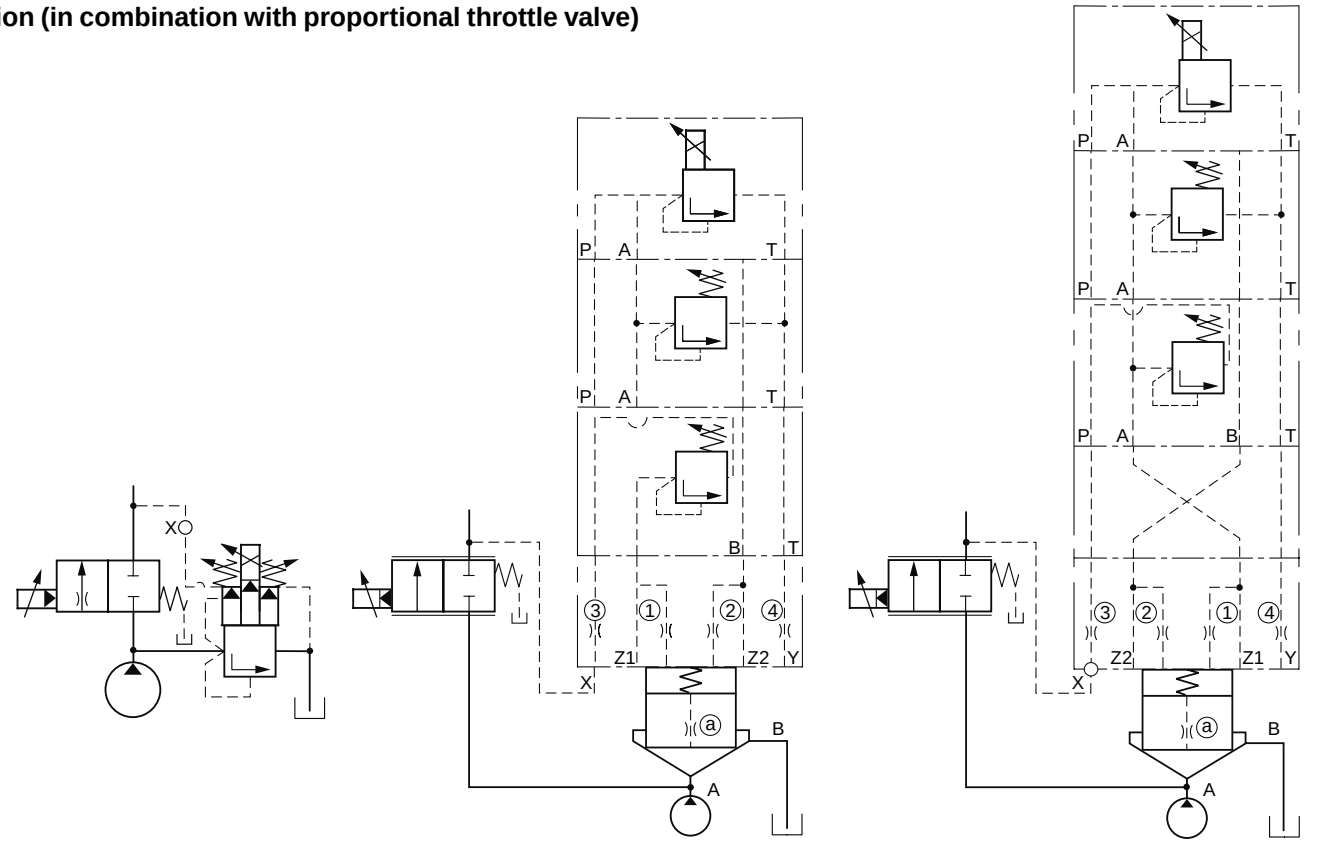
Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
4/2 DC valve [1]	D1VW076K*					
Press. valve [2]	ZUDB1ATxZ07x					
Preload valve [2]	DSBA100xZ07x					
Adaptor plate [3] NG10-NG06	without				PADA1007/A-B/B-A	
Cover [4]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3	M5xØ1.4	M5xØ1.5	M6xØ1.6	M6xØ1.7
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ99	M6xØ99			M8xØ99	
Cover orifice ④	M5xØ1.3	M6xØ1.5	M6xØ1.7	M6xØ1.8	M8xØ2.0	M8xØ2.2
Cartridge [5]	CE016C01*	CE025C01*	CE032C01*	CE040C01*	CE050C01*	CE063C01*
Poppet orifice ⓐ	1/16NPT x Ø0.9	1/16NPT x Ø1.1	1/16NPT x Ø1.2	1/16NPT x Ø1.3	1/16NPT x Ø1.4	1/16NPT x Ø1.5
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	TK1473					

Shown orifice Ø and springs are recommendations.
xxØ00 = closed bottom NG16 - NG50, plug NG63
xxØ99 = open

[1] Complete type see chapter "Directional Control Valves", series D1VW.
[2] Complete type see pilot valves
[3] Included O-rings and mounting bolts
[4] Complete type see ordering code C*C
[5] Complete type see ordering code CE*

Examples pressure.INDD CM 30.08.11

3 way compensator with proportional pressure relief function and mechanical maximum pressure protection (in combination with proportional throttle valve)



Adaptor plates see chapter 12

Description	Type					
	NG16	NG25	NG32	NG40	NG50	NG63
Prop. press. valve [1]	RE06MxW2V1KW*					
Press. valve [2]	ZUDB1ATxZ07x					
Preload valve [2]	DSBA100xZ07x					
Adaptor plate [3] NG10-NG06	without				PADA1007/A-B/B-A	
Cover [4]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*
Cover orifice ①	M5xØ1.1	M5xØ1.3	M5xØ1.4	M5xØ1.5	M6xØ1.6	M6xØ1.7
Cover orifice ②	M5xØ00				M6xØ00	
Cover orifice ③	M5xØ99	M6xØ99			M8xØ99	
Cover orifice ④	M5xØ1.3	M6xØ1.5	M6xØ1.7	M6xØ1.8	M8xØ2.0	M8xØ2.2
Cartridge [5]	CE016C01*	CE025C01*	CE032C01*	CE040C01*	CE050C01*	CE063C01*
Poppet orifice ⓐ	1/16NPT x Ø0.9	1/16NPT x Ø1.1	1/16NPT x Ø1.2	1/16NPT x Ø1.3	1/16NPT x Ø1.4	1/16NPT x Ø1.5
Spring	1.6 bar, type S (order no. see spare parts)					
Bolt kit cover	BK414, 4x M8x40	BK391, 4x M12x50	BK415, 4x M16x55	BK416, 4x M20x70	BK417, 4x M20x75	BK418, 4x M30x100
Bolt kit pilot	TK1473					

Shown orifice Ø and springs are recommendations.
xxØ00 = closed bottom NG16 - NG50, plug NG63
xxØ99 = open

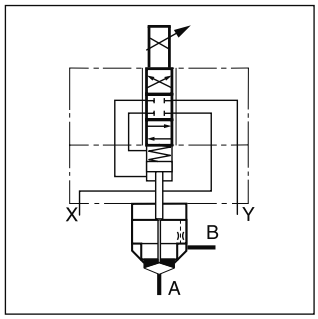
[1] Complete type see chapter "Pressure Valves", series RE06W*.
[2] Complete type see pilot valves
[3] Included O-rings and mounting bolts
[4] Complete type see ordering code C*C
[5] Complete type see ordering code CE*

Examples pressure.INDD CM 30.08.11

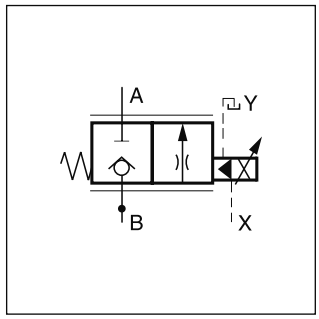
The 2/2 way proportional throttle valves series TDA are used to control large oil flows.

Features

- Cavity and mounting pattern according to ISO 7368
- Fail-safe function at power failure
- Leak-free from port B to A
- Pressure differential up to 350 bar possible
- 8 sizes NG16 up to NG100



Function symbol

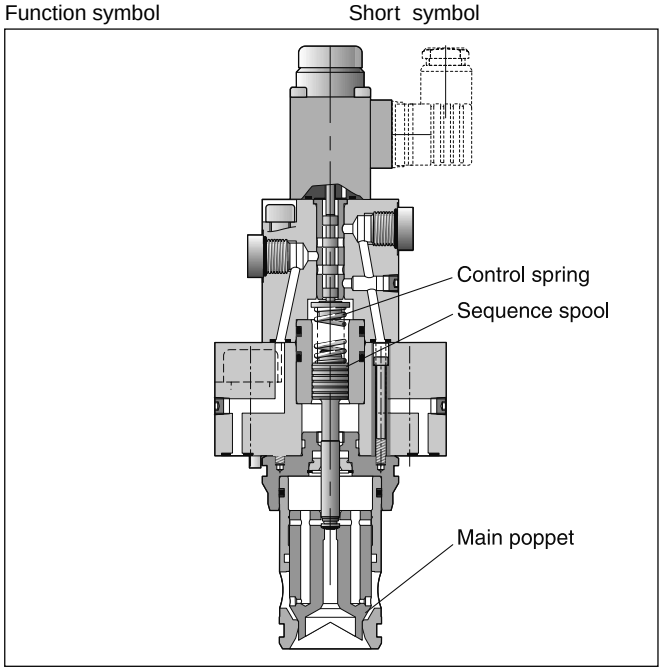


Short symbol

Function

The TDA valve has a 3-stage design consisting of the first solenoid operated pilot stage with a spool in sleeve design, the second pilot stage with the control spring and the sequence spool and as main stage the poppet in the sleeve. The proportional solenoid operates the pilot spool against the feedback of the control spring and controls the position of the sequence spool. The main poppet follows the position of the sequence spool and provides an open area for flow from B to A (optional A to B) in proportion to the solenoid current. The poppet is positioned independently of the differential pressure, which can become as high as the maximum working pressure.

In combination with the digital power amplifier PC-D00A-400 the valve parameters can be saved, changed and duplicated.



8

Ordering Code

TDA		E	W	0			2				W	
Proportional throttle valve	**Nominal size**	**Slip-in valve DIN ISO 7368**	**Design**	**Poppet shape**	**Nominal flow**	**Flow direction**	**Piloting**	**Seal**	**Solenoid voltage**	**Plug socket without plug**	**Design series** (not required for ordering)

Code	Nominal size
016	NG16
025	**NG25**
032	**NG32**
040	**NG40**
050	**NG50**
063	NG63
080	NG80
100	NG100

Code	Solenoid voltage
X	**16 VDC**
L	6 VDC

Code	Seal
N	**NBR**
V	FPM

Code	Flow direction
A	A to B
B	**B to A**

Code	Nominal flow
9	**Nominal flow**
6 [1)]	50% of nominal flow

[1)] only for NG16 and NG25

Bold letters =
Short-term availability

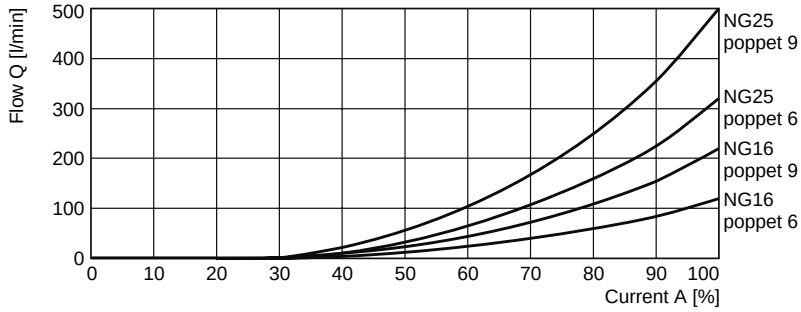
TDA UK.INDD CM 09.08.11

General									
Design		Proportional throttle valve, slip-in cartridge according to ISO 7368							
Nominal size		NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
Mounting position		unrestricted							
Ambient temperature	[°C]	-20...+80							
$MTTF_D$ value	[years]	75							
Weight	[kg]	3.1	4.3	5.8	9.2	15	33	63	87
Extracting tool		see accessories							
Hydraulics									
Max. operating pressure	[bar]	Ports A, B and X up to 350, port Y: max. 10							
Fluid		Hydraulic oil acc. to DIN 51524...51525							
Fluid temperature	[°C]	0 ... +60							
Viscosity recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 80 20 ... 380							
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)							
Nominal flow at Δp=10bar	[l/min]	220	500	950	1400	2300	4000	6000	9500
Flow direction		see ordering code							
Pilot pressure, min.	[bar]	> 25% of system pressure							
Min. operating pressure	[bar]	Port A → B approx. 10; Port B → A approx. 15							
Pilot oil supply drain		Depending on flow direction A or B using X or external X External using Y max. 10bar							
Pilot oil at p = 100bar	[l/min]	Port X → Y <1.5							
Opening point		At 30% of nominal current							
Manufacturing tolerance	[%]	±5 of Qnom							
Static/dynamic									
Hysteresis	[%]	< 3							
Repeatabiltity	[%]	< 1							
Response time at px=50bar	[ms]	20	25	30	35	45	55	65	80
Electrical (proportional solenoid)									
Duty ratio		100% ED							
Protection class		IP65 according to EN 60529 (with correctly mounted plug-in connector)							
Solenoid	Code	L				X			
	at size	16-50		63-100		16-50		63-100	
Solenoid voltage	[V]	6				16			
Nominal current (100% ED)	[A]	2.6				1.05			
Nominal resistance	[Ohm]	2.2		2.5		11.3		14	
Power amplifier, recommended		PCD 00A-400							
Solenoid connection		Connector as per EN 175301-803							

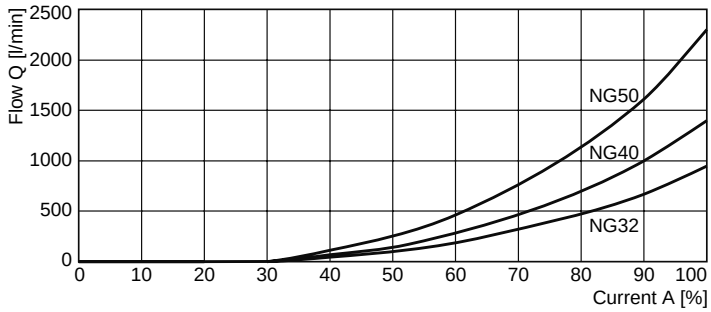
The pilot pressure in X-line must be at least 25% (NG16-40) or 45% (NG50-100) of the pressure in the draining-off line of the cartridge to make sure that the main poppet closes safely without malfunction.

Solenoid current / flow curves

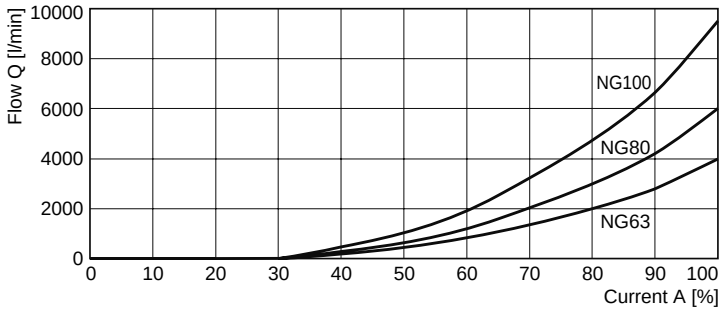
NG16-25 (Δp=10bar)



NG32-50 (Δp=10bar)

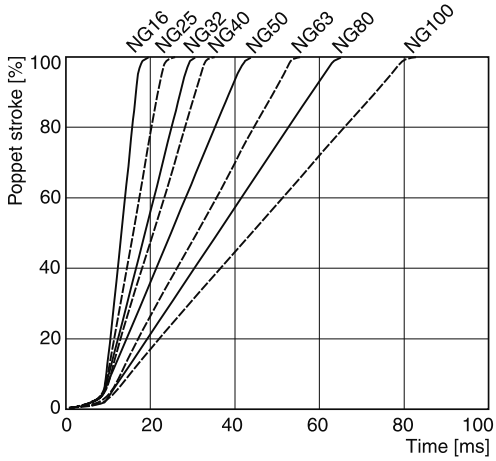


NG63-100 (Δp=10bar)



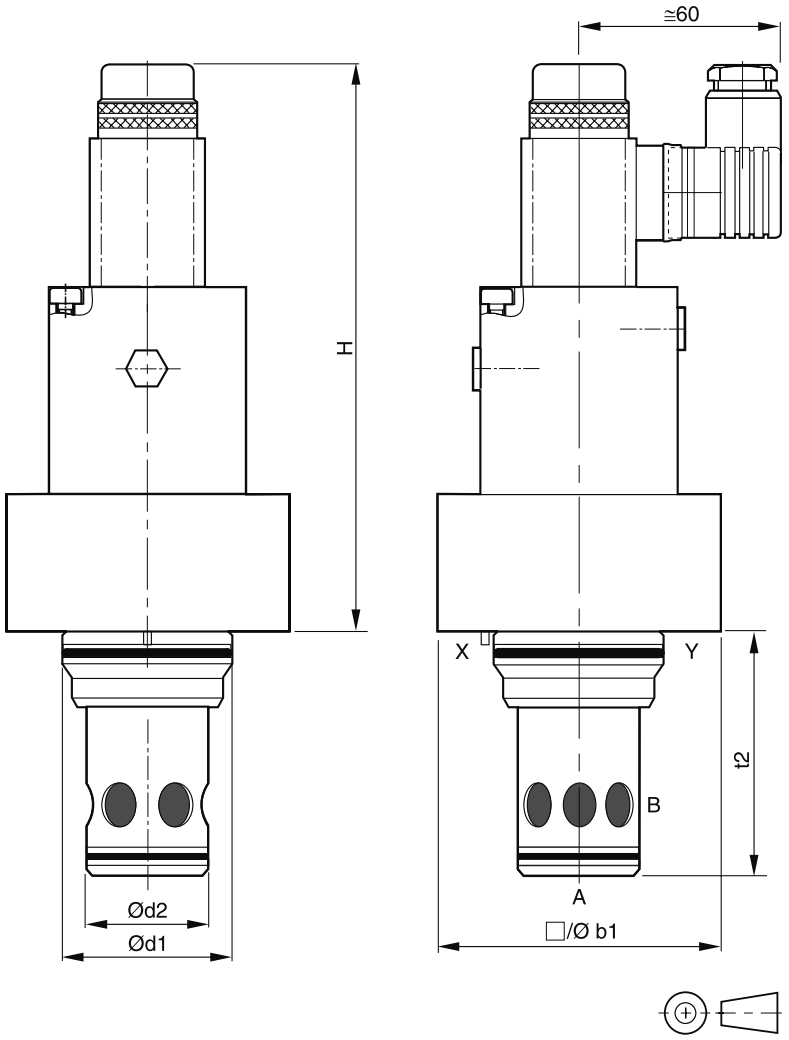
$$\Delta p_{actual} = \left(\frac{Q_{actual}}{Q_{nominal}}\right)^2 \bullet \Delta p_{nominal}$$

Poppet stroke / time curve

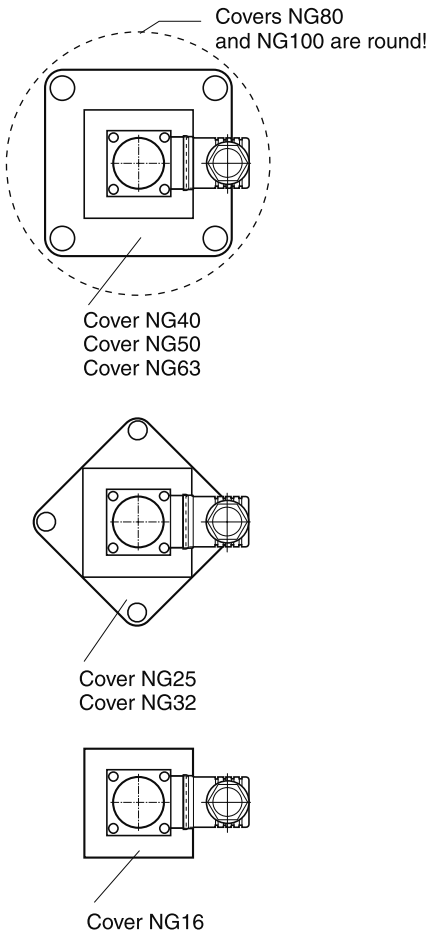


All characteristic curves measured with HLP46 at 50°C.

Valves



Valve covers



8

Size	16	25	32	40	50	63	80	100
H	168	177	182	192	202	304	324	339
b1	65	85	102	125	140	180	Ø250	Ø300
$d1^{H7}$	32	45	60	75	90	120	145	180
$d2^{H7}$	25	34	45	55	68	90	110	135
$t2^{+0.1}$	56	72	85	105	122	155	205	245

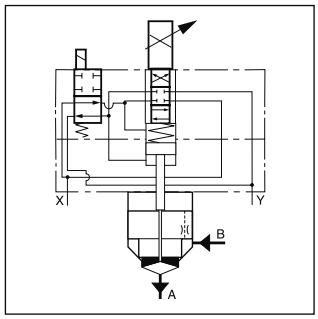
NG	Kit	DIN912 12.9		Kit NBR	Kit FPM
16	BK510	4x M8x100	33 Nm	SK-TDA016EN	SK-TDA016EV
25	BK391	4x M12x50	115 Nm	SK-TDA025EN	SK-TDA025EV
32	BK415	4x M16x55	281 Nm	SK-TDA032EN	SK-TDA032EV
40	BK416	4x M20x70	553 Nm	SK-TDA040EN	SK-TDA040EV
50	BK417	4x M20x75	553 Nm	SK-TDA050EN	SK-TDA050EV
63	BK418	4x M30x100	1910 Nm	SK-TDA063EN	SK-TDA063EV
80	BK419	8x M24x120	935 Nm	SK-TDA080EN	SK-TDA080EV
100	BK420	8x M30x140	1910 Nm	SK-TDA100EN	SK-TDA100EV

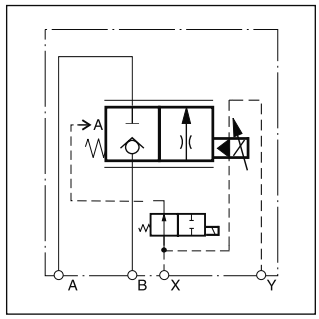
Accumulator discharge valves are preferably used in hydraulic systems where high flow rates are discharged from hydraulic accumulators over a short operating period (in the range of milliseconds).

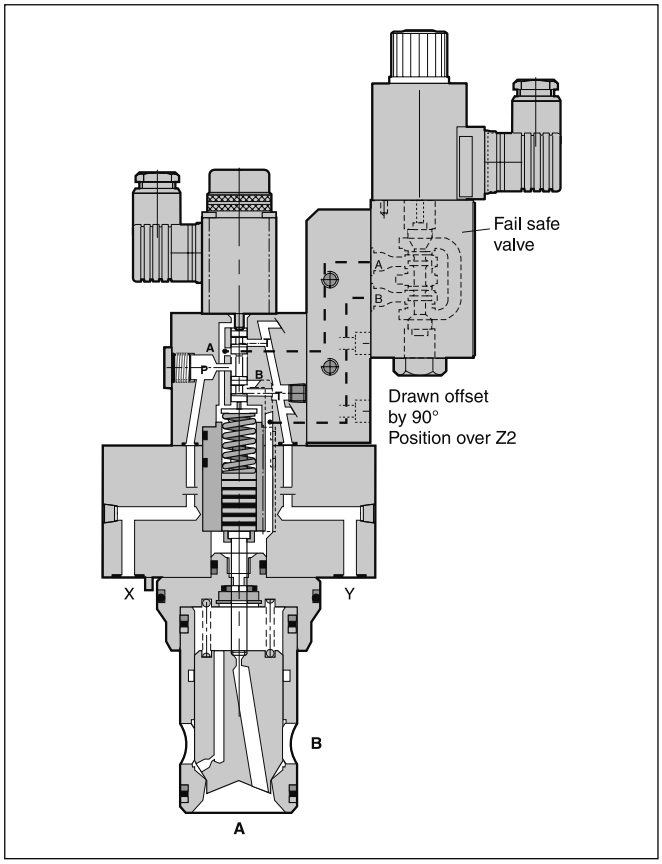
Typical applications are injection molding and die casting machines as well as hydraulic presses.

Basically the function of an accumulator discharge valve corresponds to the function of a TDA throttle valve. In addition a directional valve is integrated in the pilot circuit to meet the relevant safety regulations.

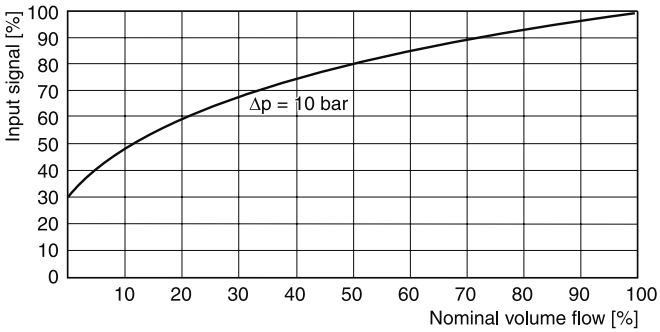
The directional valve provides the safety function. When the solenoid is deenergized and the spring is in end position, pilot pressure from X presses the control piston into lower end position and, the main poppet is closed. As a result the flow from B to A or from the reservoir system to the machine is blocked.





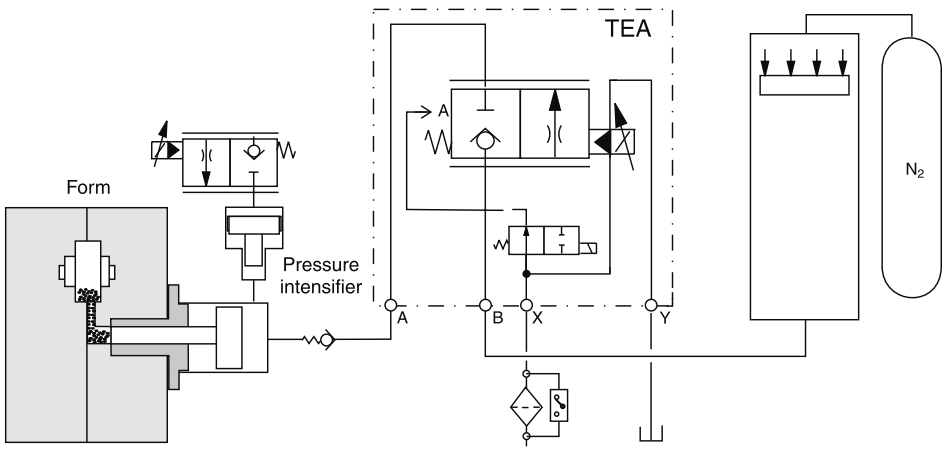


Characteristic curve



Characteristic curve measured with HLP46 at 50°C.

Example accumulator system in a die casting machine



Ordering code

TEA		E	W	0	9		2			W		
Prop. throttle valve with shut-off function	**Nominal size**	**Cartridge valve ISO 7368**	**Design**	**Spool form**	**Flow code**	**Flow direction**	**Pilot oil guide**	**Seals**	**Prop. solenoid voltage**	**Plug socket without plug**	**Solenoid voltage**	**Design series** (not required for ordering)

Code	Nominal size
032	NG32
040	**NG40**
050	**NG50**
063	**NG63**
080	NG80
100	NG100

Code	Flow direction
A	A to B
B	**B to A**

Code	Solenoid
J	**24V= / 1.25A**
U [1]	98V= / 0.31A
G [1]	205V= / 0.15A

[1] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Proportional solenoid voltage
L	6 VDC
X	16 VDC

Code	Seal
N	**NBR**
V	FPM

Bold letters =
Short-term availability

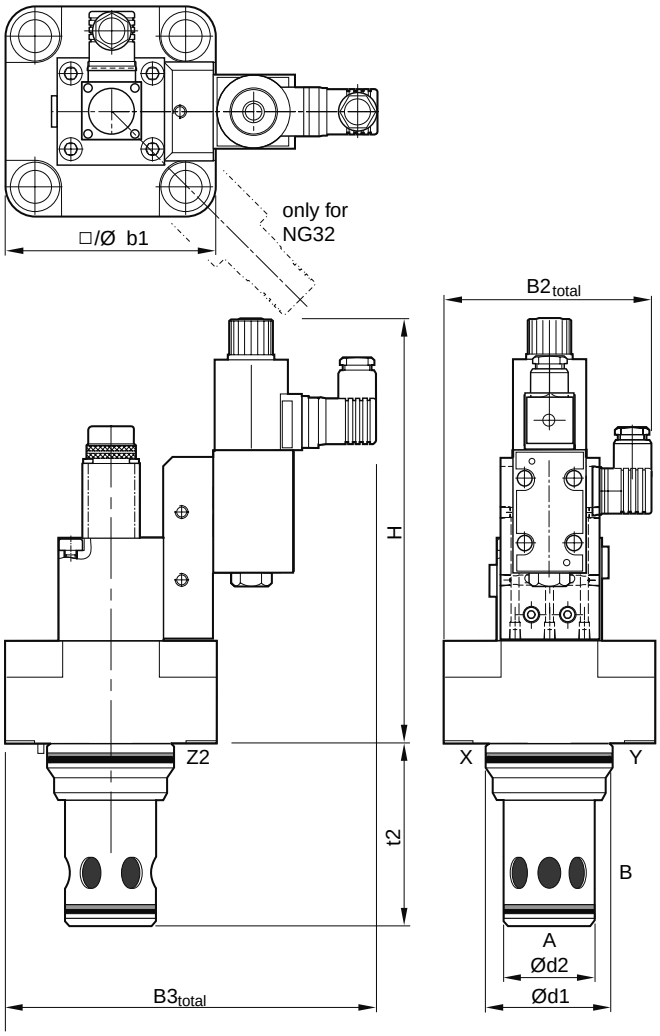
Technical data

General							
Design		Proportional throttle valve, slip-in cartridge according to ISO 7368					
Nominal size		NG32	NG40	NG50	NG63	NG80	NG100
Mounting position		unrestricted					
Ambient temperature	[°C]	-20...+80					
$MTTF_D$ value	[years]	75					
Weight	[kg]	9	13	22	38	62	85
Extracting tools		See accessories					
Hydraulics							
Max. operating pressure	[bar]	Ports A, B and X up to 350, port Y: max 10					
Fluid		Hydraulic oil according to DIN 51524...51525					
Fluid temperature	[°C]	0...+60					
Viscosity, recommended	[cSt]/[mm²/s]	30...80					
permitted	[cSt]/[mm²/s]	20...380					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Nominal flow Δp= 10 bar	[l/min]	950	1400	2300	4000	6000	9500
Pilot pressure, min.	[bar]	> 25% of system pressure					
Pilot oil	supply	Depending on flow direction A or B using X or external X					
Pilot oil at p = 100bar	[l/min]	Port X → Y <1.5					
Opening point		At 30% of nominal current					
Manufacturing tolerance	[%]	±5 of Qnom					
Hysteresis	[%]	< 3					
Repeatabiltity	[%]	< 1					
Response time at px=50bar	[ms]	30	35	45	55	65	80
Electrical (proportional solenoid)							
Duty ratio		100% ED					
Protection class		IP65 according to EN 60529 (with correctly mounted plug-in connector)					
Solenoid	Code	L			X		
at size		16-50	63-100		16-50	63-100	
Solenoid voltage	[V]	6			16		
Nominal current (100% ED)	[A]	2.6			1.05		
Nominal resistance	[Ohm]	2.2	2.5		11.3	14	
Power amplifier, recommended		PCD 00A-400 Connector as per EN 175301-803					
Solenoid connection Pilot valve		4/2 flow control valve, see chapter 2					
		Type D1DW			Type D3W		

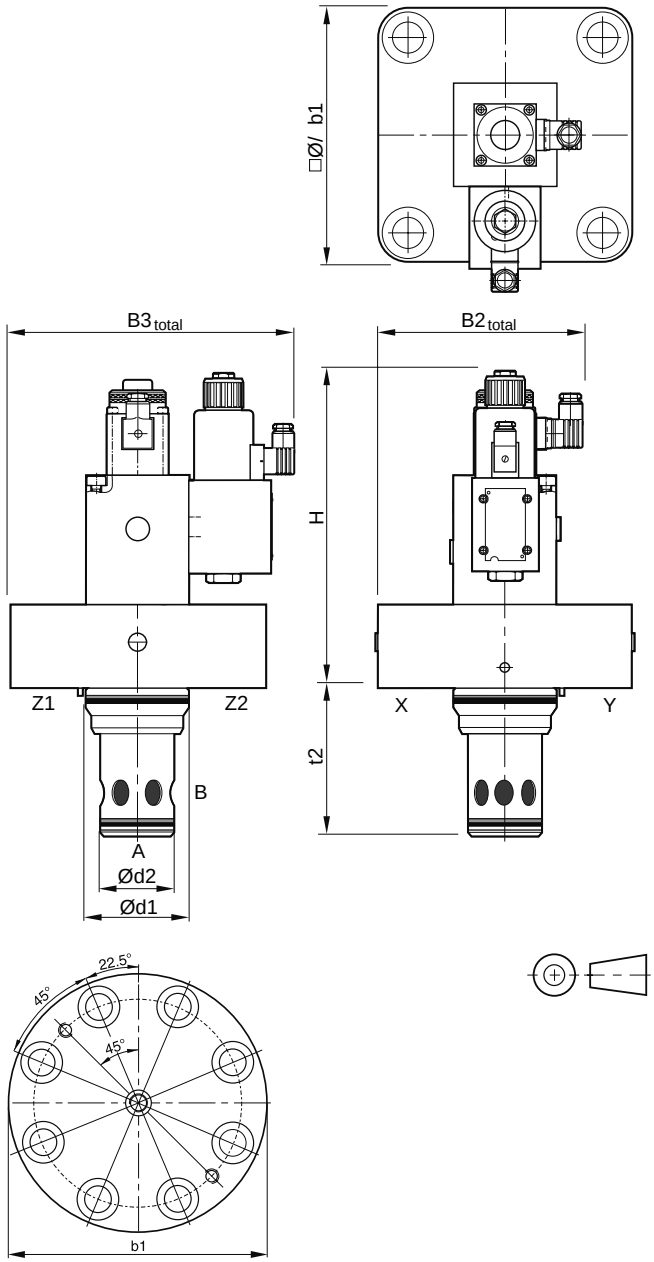
8

TEA UK.INDD CM 07.09.11

TEA NG32...50



TEA NG63...100



Size	32	40	50	63	80	100
H	250	260	270	312	337	352
b1	102	125	140	180	Ø250	Ø300
$d1^{H7}$	60	75	90	120	145	180
$d2^{H7}$	45	55	68	90	110	135
$t2^{+0.1}$	85	105	122	155	205	245
$B2_{total}$	106	118	125	158	193	218
$B3_{total}$	205	216	224	255	290	315

NG	Kit	DIN912 12.9		Kit NBR	Kit FPM
32	BK415	4x M16x55	281 Nm	SK-TEA032 EN	SK-TEA032 EV
40	BK416	4x M20x70	553 Nm	SK-TEA040 EN	SK-TEA040 EV
50	BK417	4x M20x75	553 Nm	SK-TEA050 EN	SK-TEA050 EV
63	BK418	4x M30x100	1910 Nm	SK-TEA063 EN	SK-TEA063 EV
80	BK419	8x M24x120	935 Nm	SK-TEA080 EN	SK-TEA080 EV
100	BK420	8x M30x140	1910 Nm	SK-TEA100 EN	SK-TEA100 EV

Notes

8

The 2/2 way proportional throttle valves series TDP are used in applications where high flow has to be precisely controlled at maximum dynamics. Typical applications are die casting, injection moulding and hydraulic presses.

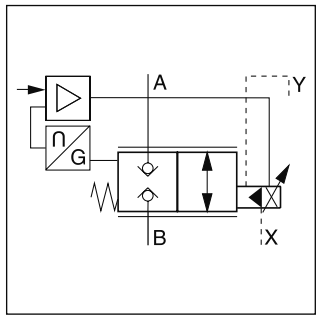
Function

The TDP valve has a 2-stage design consisting of a DF-plus pilot valve and a main stage with poppet and LVDT.

With the DFplus pilot valve the TDP achieves extremely fast response times: from 12ms (NG32) up to 28ms (NG100) with an accuracy of <0.1% of the nominal flow. The pilot valve actively contols the poppet - independent of the pressure conditions in the main ports.

It is basically required that the pilot pressure is at the level of the system pressure. At low system pressure the pilot pressure should be min. 140 bar, when high valve dynamics are desired.

The TDP has integrated electronics controlling both the position of the main poppet and the spool position of the DFplus pilot valve.

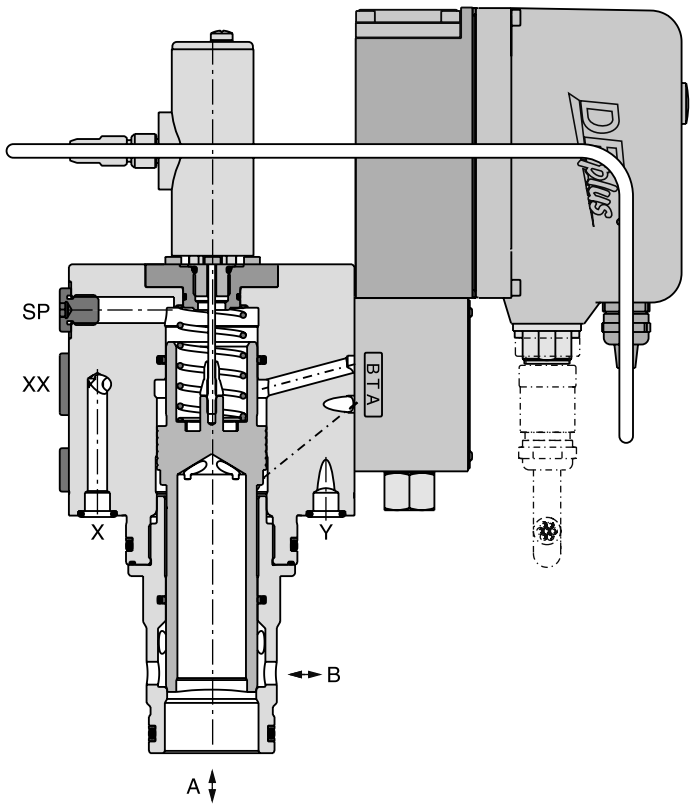


TDP040

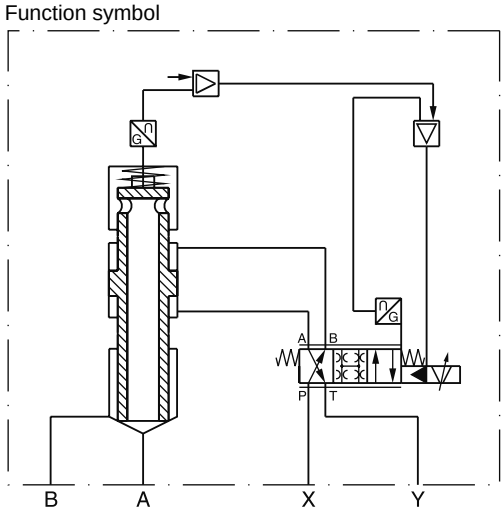
Features

- Active pilot operated 2/2 way proportional throttle valve
- Cavity and mounting pattern according to ISO 7368
- Fast step response
- Flow direction B to A and A to B
- Completely mounted and adapted unit with integrated electronics
- Fail save position in case of electrical and/or hydraulic power down
- 6 sizes NG32 up to NG100

TDP040



Function symbol



8

Ordering code

TDP		E	H	9	9	C	2		B	0	
Proportional throttle valve with LVDT	**Nominal size**	**Slip-in cartridge**	**Closed pilot loop, fast valve type, integrated electronics**	**Sinus poppet**	**Nominal flow**	**Flow direction B → A A → B**	**Pilot oil supply external, drain external**	**Seal**	**Command signal 0...+10V**	**Standard electronics**	**Design series** (not required for ordering)

Code	Nominal size
032	**NG32**
040	**NG40**
050	**NG50**
063	**NG63**
080	NG80
100	NG100

Code	Seal
N*	NBR
V	**FPM**

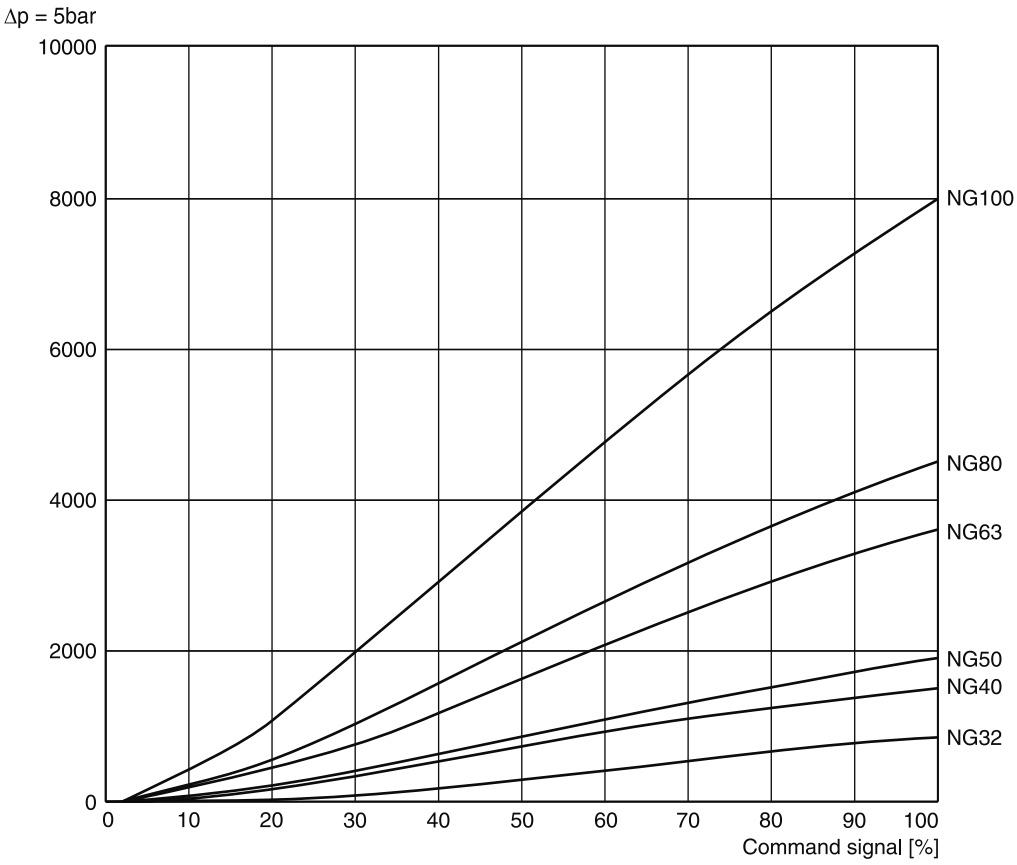
* HFC fluids suitable

Bold letters =
Short-term availability

Please order connector seperately

Performance curves

Characteristic flow/signal line
(measured with HLP46 at 50°C)



Opening point factory set to 3%

Flow at different Δp $Q_{actual} = Q_{nominal} \cdot \sqrt{\Delta p_{actual} / \Delta p_{nominal}}$

Characteristic curve measured with HLP46 at 50°C.

TDP UK.INDD CM 30.08.11

General							
Design		Proportional throttle valve, slip-in cartridge according to ISO 7368					
Nominal size	DIN	NG32	NG40	NG50	NG63	NG80	NG100
Mounting position		unrestricted					
Ambient temperature	[°C]	-20...+50					
Weight	[kg]	13	15	26	52	105	157
$MTTF_D$ value	[years]	50					
Vibration resistance	[g]	10 sinus 5...2000 Hz acc. IEC 68-2-6 30 random noise 20...2000 Hz acc. IEC 68-2-36 15 shock acc. IEC 68-2-27					
Hydraulic							
Max. operating pressure	[bar]	Ports A, B, X, XX and SP up to 350, port Y: max. 35					
Fluid		Hydraulic oil according to DIN 51524...51525					
Fluid temperature	[°C]	-20 ... +60					
Viscosity recommended permitted	[cSt] / [mm²/s] [cSt] / [mm²/s]	30 ... 80 20 ... 380					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Nominal flow at Δp=5 bar	[l/min]	850	1500	1900	3600	4500	8000
Recommended max. flow	[l/min]	2000	3000	4500	8000	13000	20000
Flow direction		B to A and A to B					
Pilot pressue	[bar]	must be as high as system pressure					
Pilot oil supply		external via X					
drain		external via Y					
Leakage in pilot valve at 100bar	[ml/min]	<400					
Pilot valve size		NG06			NG10		
Max. pilot flow at 140bar pilot pr.	[l/min]	30	40	40	70	80	100
Static/dynamic							
(for optimal dynamics see installation recommendation)							
Step response at pilot press. >140bar	[ms]	12	14	20	17	23	28
Frequency response at pilot press. >140bar							
Amplitude -3dB; 10% ±5%	[Hz]	80	74	66	52	46	41
Phase -90°; 10% +5%	[Hz]	63	59	52	56	51	47
Hysteresis	[%]	< 0.1					
Sensitivity	[%]	< 0.05					
Temperature drift	[%/K]	< 0.025					

Electrical		
Duty ratio	[%]	100
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Supply voltage / ripple	[V]	22...30, ripple < 5% eff., surge free
Current consumption max.	[A]	3.5
Pre-fusing	[A]	4.0 A medium lag
Input signal voltage	[V]	0...+10, ripple < 0.01 % eff., surge free
Impedance	[kOhm]	100
Input Capacitance typ.	[nF]	1
Differential input max.	[V]	30 for terminal D and E against PE (terminal G) 11 for terminal D and E against 0V (terminal B)
Enable signal	[V]	5...30, Ri = 9 kOhm
Diagnostic signal	[V]	0...+10, rated max. 5mA
EMC		EN 61000-6-2, EN 61000-6-4
Electrical connection		6 + PE acc. EN 175201-804
Wiring min.	[mm²]	7 x 1.0 (AWG16) overall braid shield
Wiring lenght max.	[m]	50

Installation recommendations

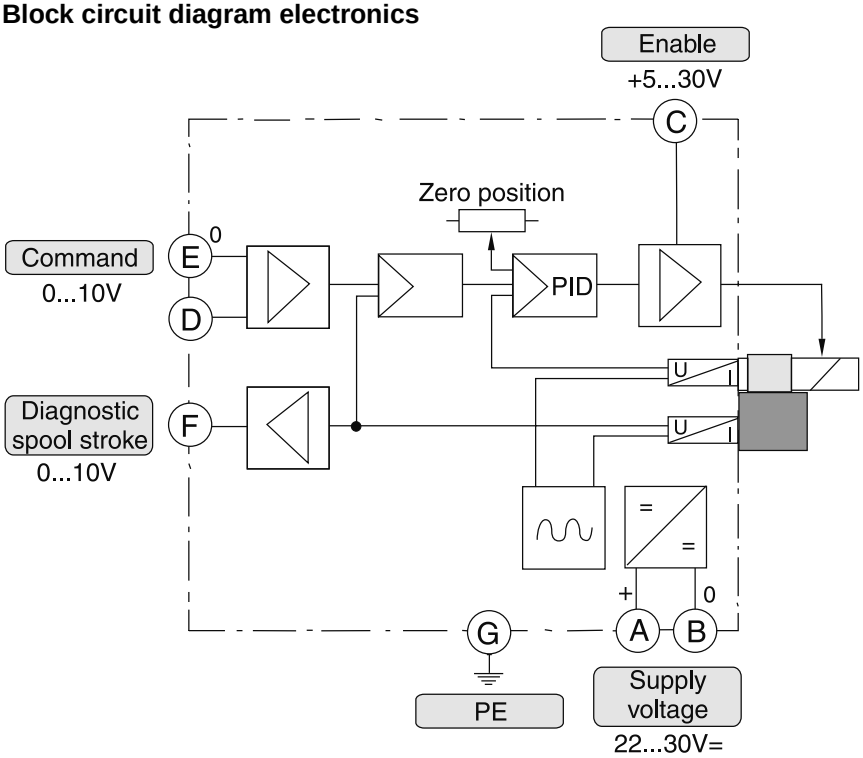
The maximum pilot flow is given in the technical data. At insufficient pilot oil supply - e.g. because of long distances and/or small diameters - an accumulator can be connected to port XX. See selection guide for correct dimensions.

Selection guide

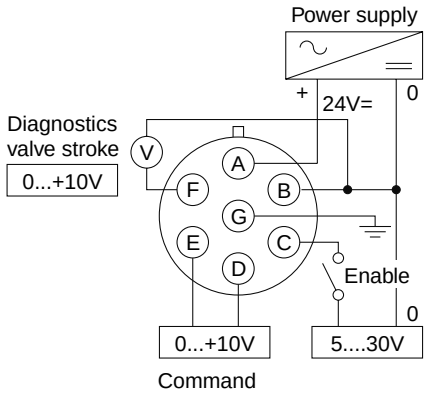
Size	Capacity [l]	Product type	Pressure rating [bar]	Accu port XX
NG40	0.162	ADE016-25R	126	G 1/2
NG50	0.243	ADE032-21R	126	G 1/2
NG63	0.405	ADE050-21R	126	G 1
NG80	0.647	ADE075-21R	126	G 3/4
NG100	0.944	ADE100-21R	126	G 3/4

Suction port SP: Contact Parker for installation recommendation.

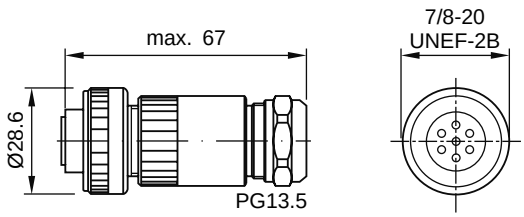
Block circuit diagram electronics



Connection diagrams electronics code B

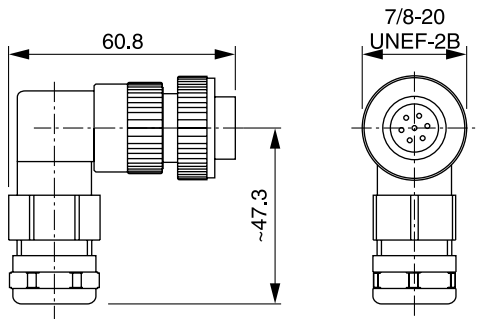


Female Connector
(EMC conform)



ID no. 5004072

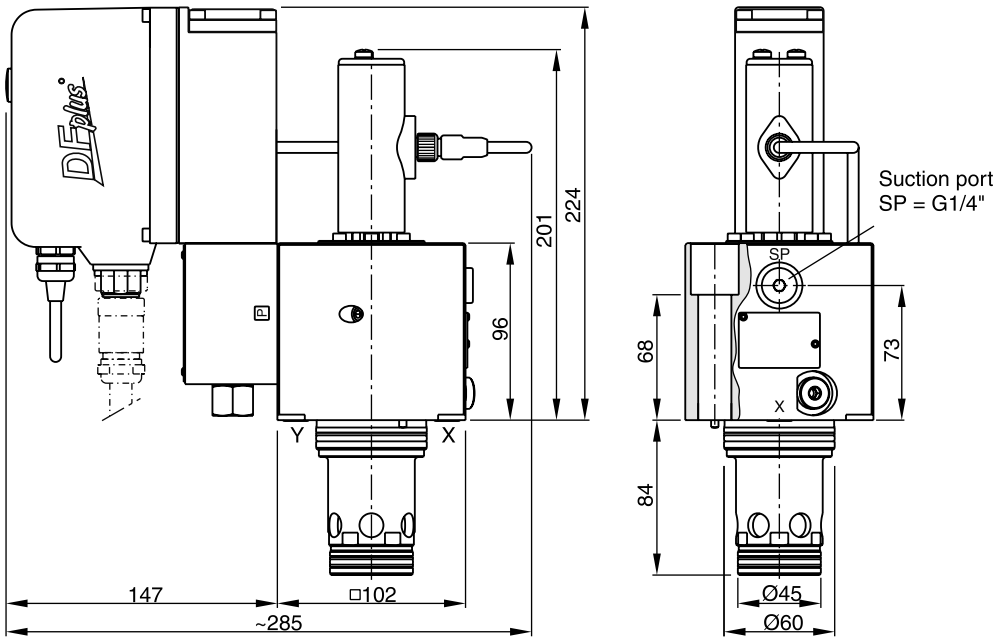
Angle female connector
(EMC conform)



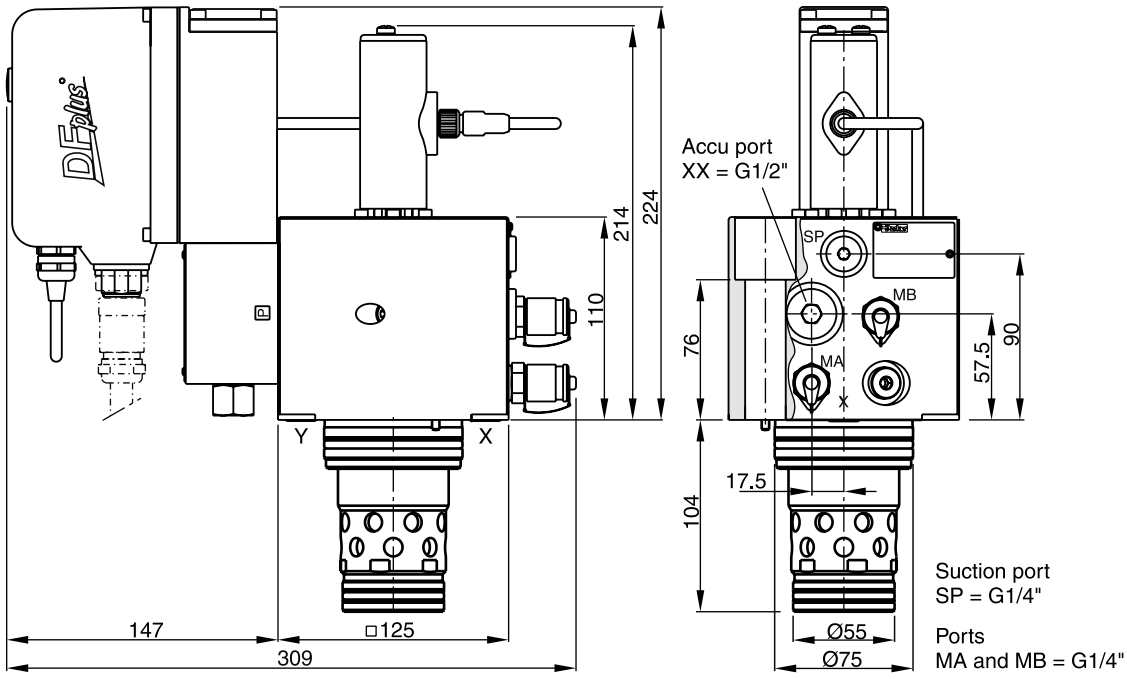
ID no. 5005160

Please order plugs seperately.

NG32



NG40

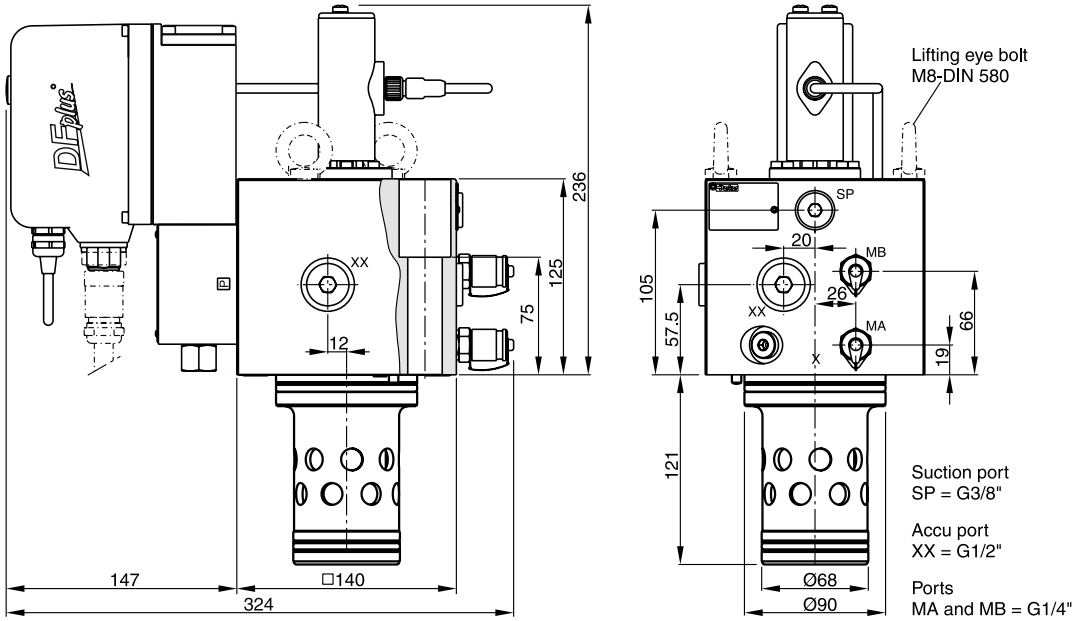


8

NG	Bolt kit -		Kit NBR	Kit FPM
32	BK529 4 x M16x100 DIN 912 12.8	281 Nm	SK-TDP032EN	SK-TDP032EV
40	BK513 4 x M20x120 DIN 912 12.8	553 Nm	SK-TDP040EN	SK-TDP040EV

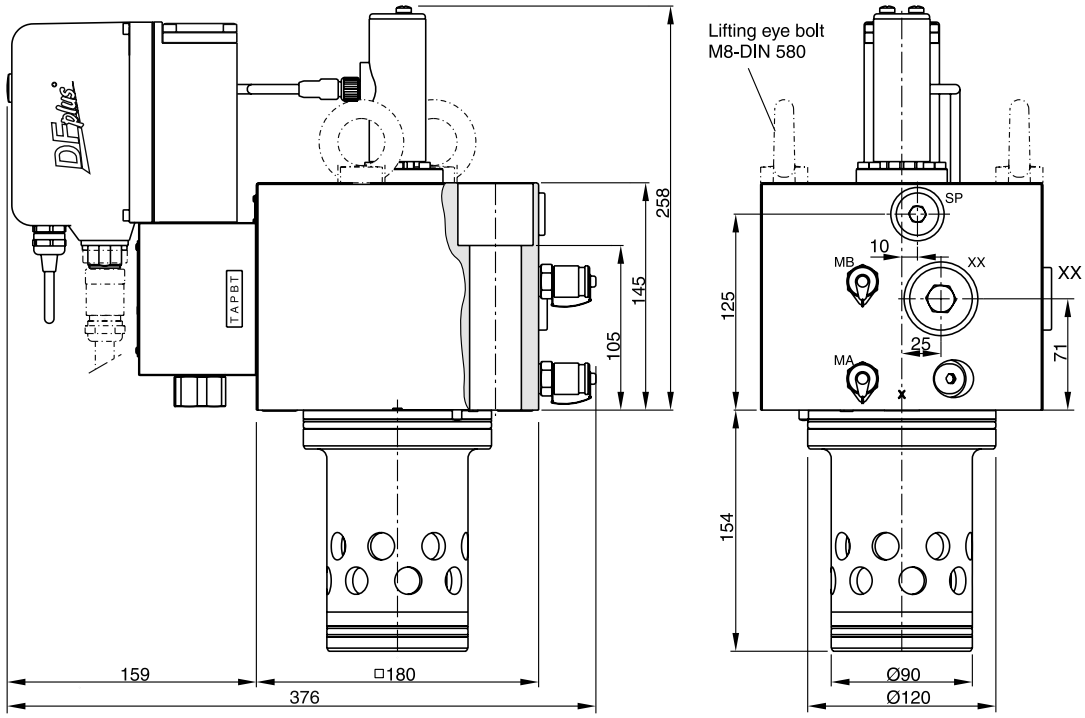
TDP UK.INDD CM 30.08.11

NG50



Lifting thread for disassembly M12

NG63



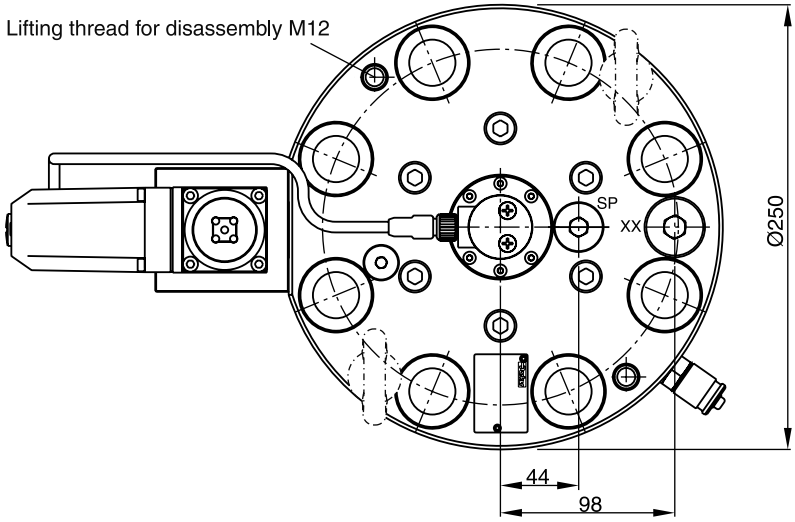
Suction port SP = G1/2"
Accu port XX = G1"
Ports MA and MB = G1/4"

Lifting thread for disassembly M12

NG	Bolt kit - DIN912 12.9		Kit NBR	Kit FPM
50	BK513 4 x M20x120 DIN 912 12.8	553 Nm	SK-TDP050EN	SK-TDP050EV
63	BK420 4 x M30x140 DIN 912 12.9	1910 Nm	SK-TDP063EN	SK-TDP063EV

TDP UK.INDD CM 30.08.11

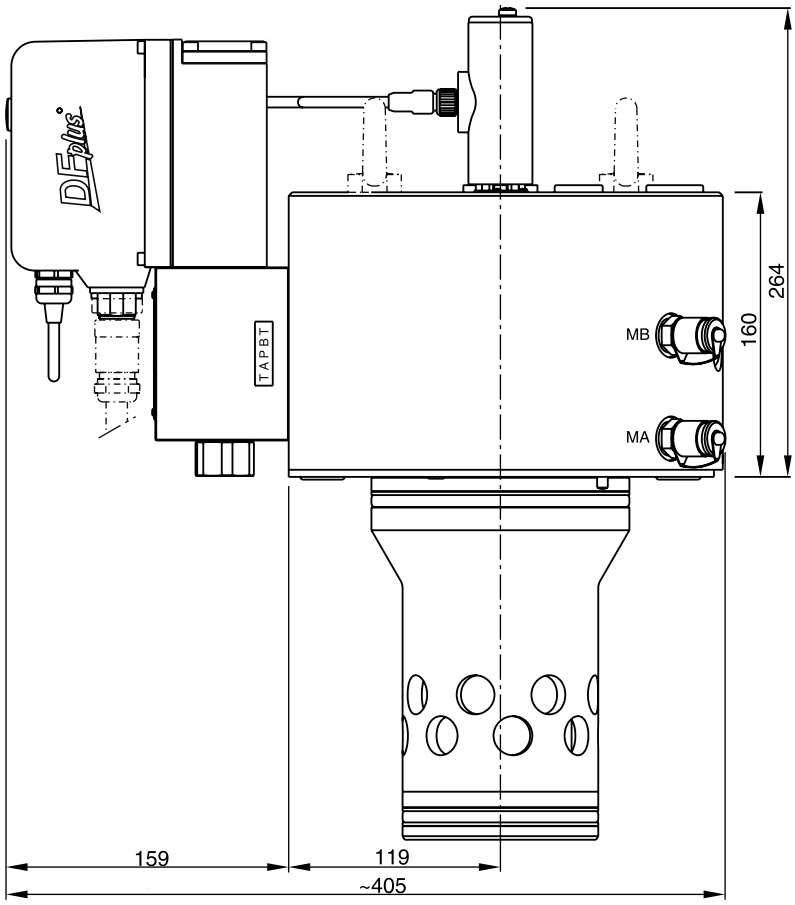
NG80

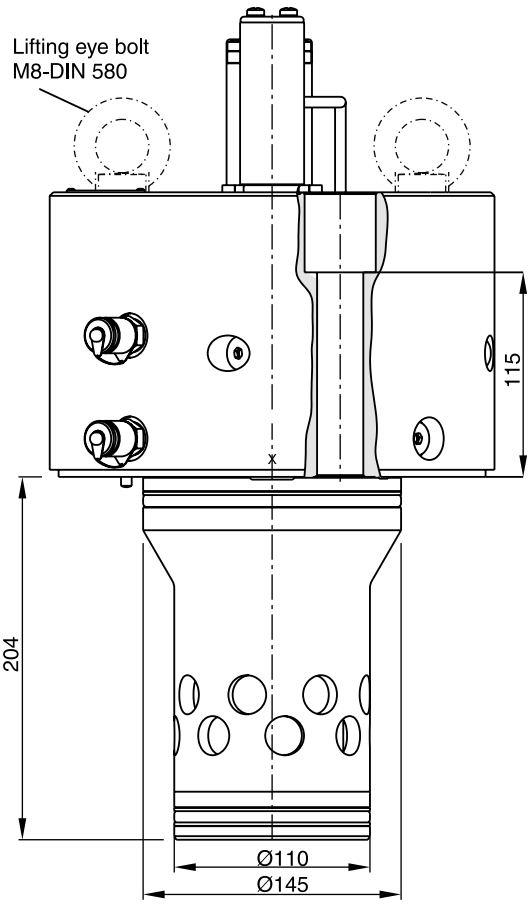


Accu port
XX = G3/4"

Suction port
SP = G1/2"

Ports
MA and MB = G1/4"

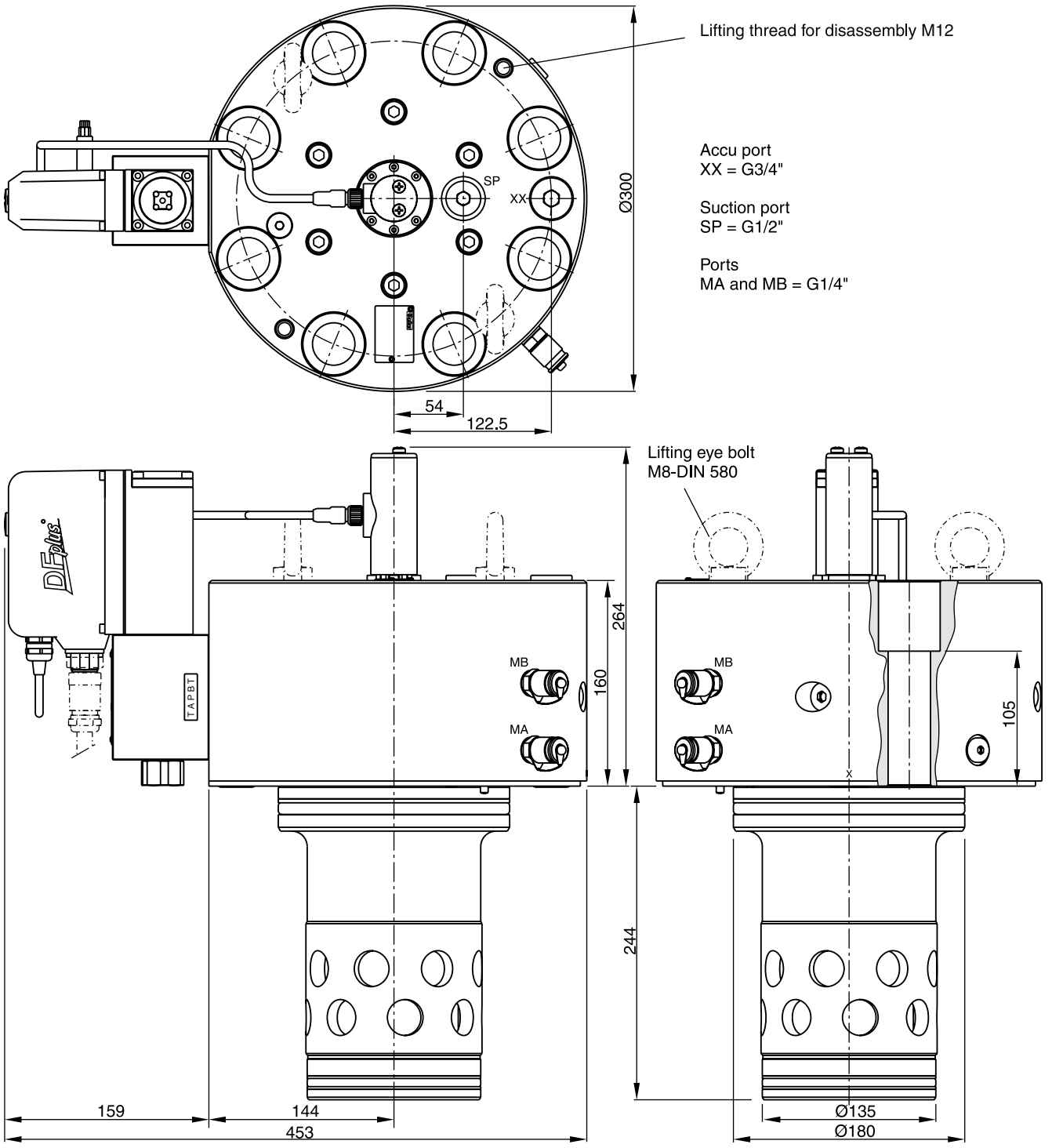




NG	Bolt kit - DIN912 12.9		Kit NBR	Kit FPM
80	BK530 8x M24x160 DIN 912 12.9	955 Nm	SK-TDP080EN	SK-TDP080EV

TDP UK.INDD CM 30.08.11

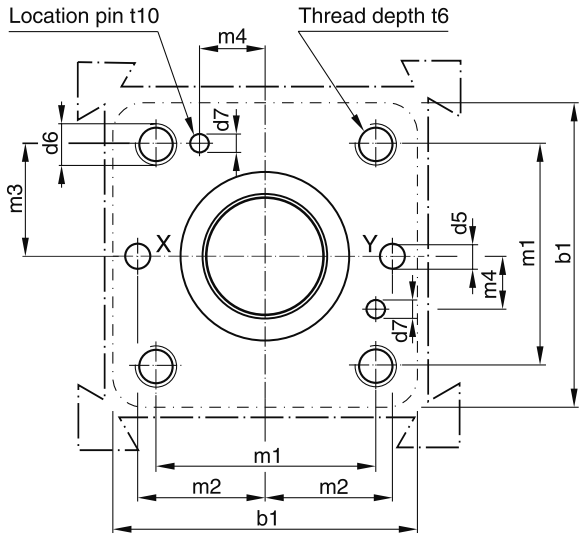
NG100



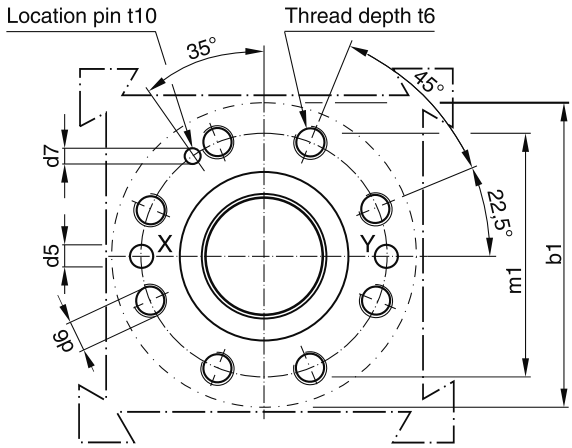
NG	Bolt kit - DIN912 12.9		Kit NBR	Kit FPM
100	BK517 8x M30x150 DIN 912 12.9	1910 Nm	SK-TDP100EN	SK-TDP100EV

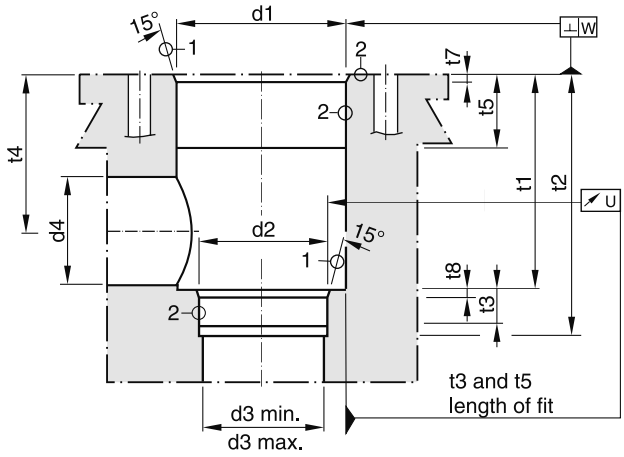
TDP UK.INDD CM 30.08.11

Code: ISO 7368-B*-*-2-A/B
NG 32 to NG 63



Code: ISO 7368-B*-*-2-A
NG 80 to NG 100





Required surface finish:

$\textcircled{1} = \sqrt{R_{max}16}, \textcircled{2} = \sqrt{R_{max}8}$

Deviating from ISO 7368 it is advisable to increase the diameters d3, d4 and d5.

8

Size	b1	d1 H7	d2 H7	d3	d3 max	d4 max*	d5 max	d6	d7 H13	m1±0.2	m2±0.2	m3±0.2
32	102	60	45	32	44	50	8	M 16	6	70	41	35
40	125	75	55	40	54	63	10	M 20	6	85	50	42.5
50	140	90	68	50	67	80	10	M 20	8	100	58	50
63	180	120	90	63	89	100	12	M 30	8	125	75	62.5
80	250	145	110	80	109	110	16	M 24	10	200	–	–
100	300	180	135	100	134	150	20	M 30	10	245	–	–

Size	m4±0.2	t1+0.5	t2+1	t3	t4	t4 max*	t5	t6	t7	t8	t10	U	W
32	17	70	85	13	52	44	15	35	2.5	2.5	10	0.03	0.1
40	23	87	105	15	64	54	15	45	3	3	10	0.05	0.1
50	30	100	122	17	72	59	17	45	4	3	10	0.05	0.1
63	38	130	155	20	95	78	19	65	4	4	10	0.05	0.2
80	–	175	205	25	130	115	32	50	5	5	10	0.05	0.2
100	–	210	245	29	155	133	32	53	5	5	10	0.05	0.2

* only in combination with d4max and t4max

TDP UK.INDD CM 30.08.11

Notes

The 3/2 way proportional throttle valves series TPQ are used in applications where high flow has to be precisely controlled at maximum dynamics. Typical applications are die casting, injection moulding and hydraulic presses.

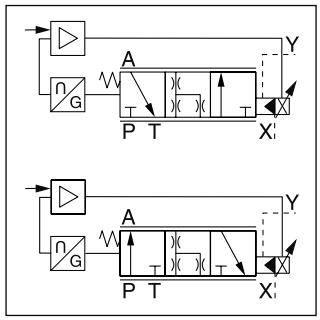
Function

TPQ has a 2-stage design consisting of a DFplus pilot valve and a main stage with spool and LVDT.

With the DFplus pilot valve the TPQ achieves extremely fast response times: from 9ms (NG32) up to 23ms (NG80) with an accuracy of <0.1% of the nominal flow. The pilot valve actively contols the poppet - independent of the pressure conditions in the main ports.

It is basically required that the pilot pressure is at the level of the system pressure. At low system pressure the pilot pressure should be min. 140 bar, when high valve dynamics is desired.

The TPQ has integrated electronics controlling both the position of the main poppet and the spool position of the DFplus pilot valve.

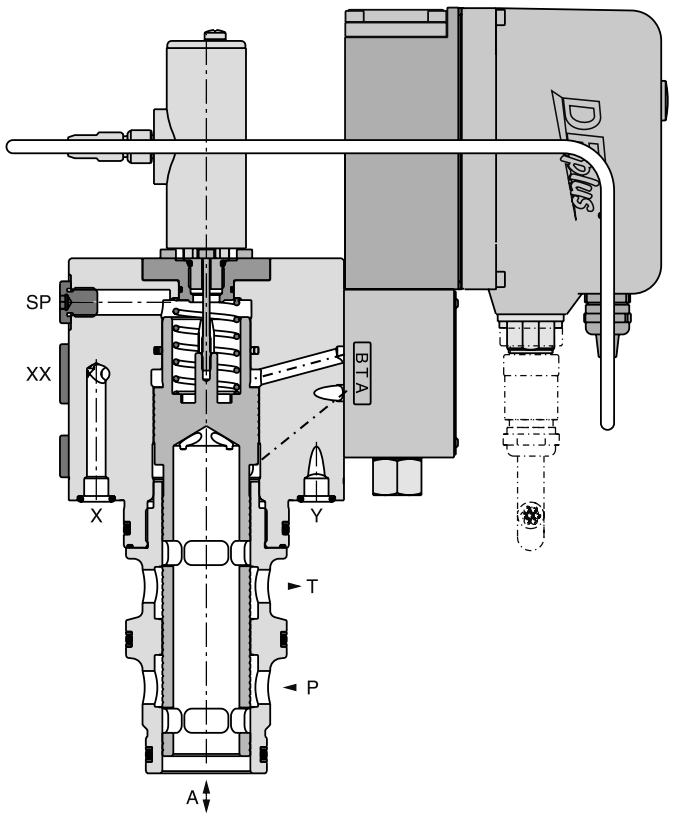


TPQ 040

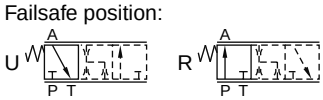
Features

- Active pilot operated 3/2 way proportional throttle valve
- Cavity according to Parker house norm
- Mounting pattern according to ISO 7368
- Fast step response
- Flow direction A to T and P to A
- Completely mounted adapted unit with integrated electronics
- Fail safe position in case of electrical and/or hydraulic power down
- 5 sizes NG32 up to NG80

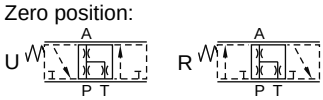
TPQ 040



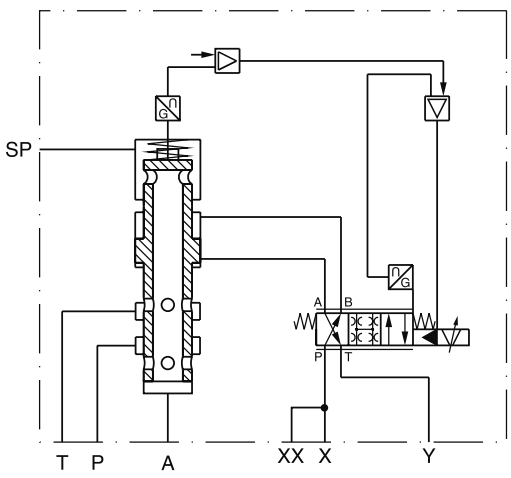
Failsafe position:



Zero position:



Function symbol
Fail safe position spool type U



8

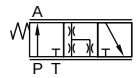
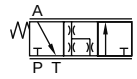
Ordering code

TPQ		W	H	2	5		2			0	
Proportional throttle valve with LVDT	**Nominal size**	**Parker Slip-in cartridge**	**Closed pilot loop, fast valve type, integrated electronics**	**Linear spool**	**Nominal flow**	**Spool type**	**Pilot oil supply external, drain external**	**Seal**	**Input signal**	**Standard electronics**	**Design series** (not required for ordering)

Code	Nominal size
032	**NG32**
040	**NG40**
050	**NG50**
063	**NG63**
080	NG80

Code	Signal range
B	**0...±10V**
S	4...+20mA

Code	Seal
N	**NBR**
V	FPM
H	for HFC fluid

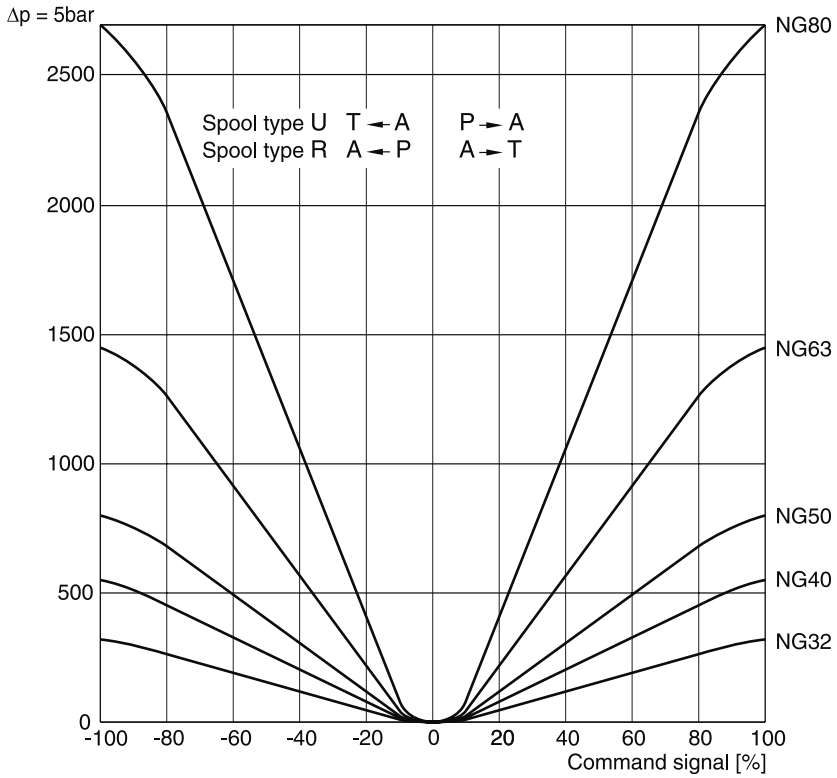
Zerolap		
Code	Spool type / Input signal - 0 +	Fail save
R		P → A
U		A → T

Bold letters =
Short-term availability

Please order connector seperately

Performance curves

Characteristic flow/signal line
(measured with HLP46 at 50°C)



Flow at different Δp $Q_{actual} = Q_{nominal} \cdot \sqrt{\Delta p_{actual} / \Delta p_{nominal}}$

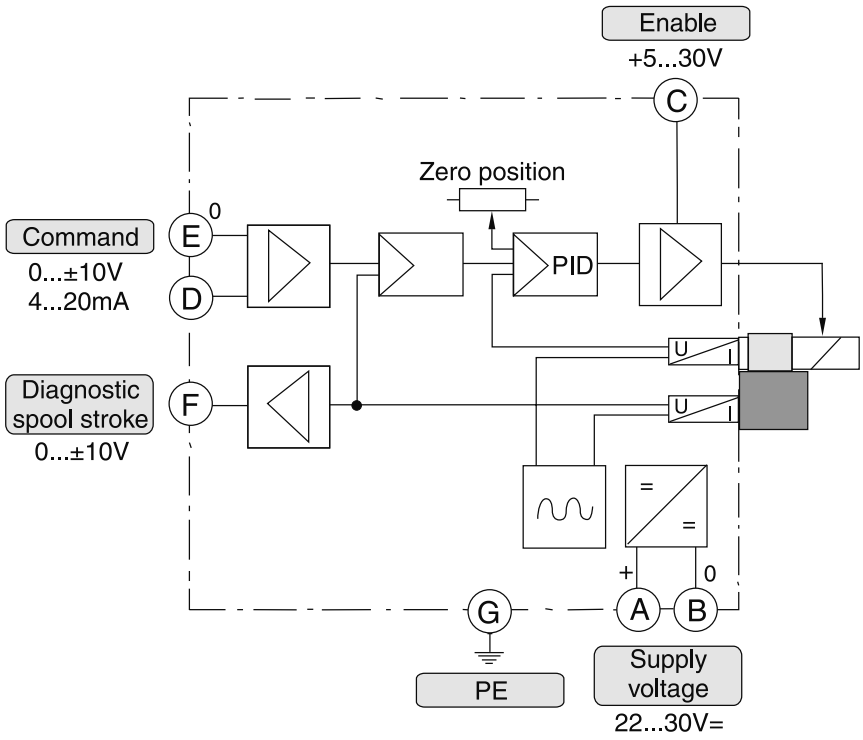
Characteristic curve measured with HLP46 at 50°C.

General						
Design		Proportional throttle valve, slip-in cartridge according to ISO 7368				
Nominal size	DIN	NG32	NG40	NG50	NG63	NG80
Mounting position		unrestricted				
Ambient temperature	[°C]	-20...+50				
Weight	[kg]	13	15	26	52	105
$MTTF_D$ value	[years]	50				
Vibration resistance	[g]	10 sinus 5...2000 Hz acc. IEC 68-2-6 30 random noise 20...2000 Hz acc. IEC 68-2-36 15 shock acc. IEC 68-2-27				
Hydraulic						
Max. operating pressure	[bar]	Ports A, P, T, X, XX[1] and SP[1] up to 350, port Y: max. 35				
Fluid		Hydraulic oil according to DIN 51524...51525				
Fluid temperature	[°C]	-20 ... +60				
Viscosity recommended	[cSt]/[mm²/s]	30 ... 80				
Viscosity permitted	[cSt]/[mm²/s]	20 ... 380				
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)				
Nominal flow at Δp = 5 bar	[l/min]	320	550	800	1450	2700
Recommended max. flow	[l/min]	1000	1600	2250	3500	6500
Nominal overlap	[%]	< 1.5				
Flow direction		A to T or P to A				
Pilot pressue	[bar]	must be as high as system pressure				
Pilot oil supply		external via X				
Pilot oil drain		external via Y				
Leakage in pilot valve at 100bar	[ml/min]	< 400				
Leakage in main stage at 100bar	[l/min]	NG32 to 63 <2.5; NG80 <4.0				
Pilot valve size			NG06		NG10	
Max. pilot flow at 140bar pilot press.	[l/min]	25	25	25	50	60
Static/dynamic						
(for optimal dynamics see installation recommendation)						
Step response at pilot press. >140bar	[ms]	9	11	18	15	23
Frequency response at pilot press. >140bar						
Amplitude -3dB; ±5%	[Hz]	105	95	54	30	34
Phase -90°; ±5%	[Hz]	90	82	72	62	56
Hysteresis	[%]	< 0.1				
Sensitivity	[%]	< 0.05				
Temperature drift of center position	[%/°K]	< 0.025				
Electrical						
Duty ratio	[%]	100				
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)				
Supply voltage / ripple	[V]	22...30, ripple < 5% eff., surge free				
Current consumption max.	[A]	3.5				
Pre-fusing	[A]	4.0 A medium lag				
Input signal voltage	[V]	+10...0...-10, ripple < 0.01% eff., surge free				
Impedance	[kOhm]	100				
Input Capacitance typ.	[nF]	1				
Current	[mA]	4...12...20, ripple < 0.01% eff., surge free < 3.6 mA = enable off, > 3.8 mA = enable on acc. NAMUR NE43				
Impedance	[Ohm]	250				
Differential input max.	[V]	30 for terminal D and E against PE (terminal G),				
	[V]	11 for terminal D and E against 0V (terminal B)				
Diagnostic signal	[V]	0...±10 rated max. 5mA				
Enable signal	[V]	5...30, Ri = 9 kOhm				
EMC		EN 61000-6-2, EN 61000-6-4				
Electrical connection		6 + PE acc. EN 175201-804				
Wiring min.	[mm²]	7x1.0 (AWG16) overall braid shield				
Wiring length	[m]	50				

1) Suction port SP and accu port XX: Please contact Parker for installation recommendation.

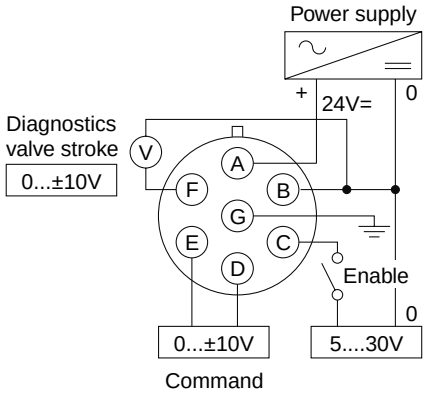
8

Block circuit diagram electronics

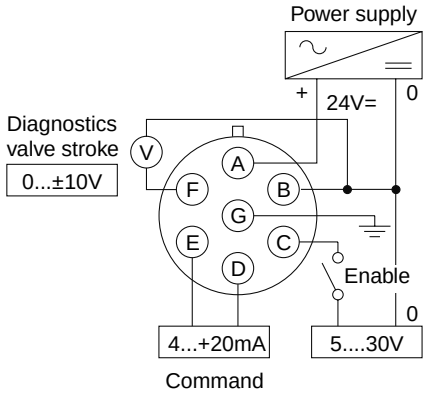


Connection diagrams

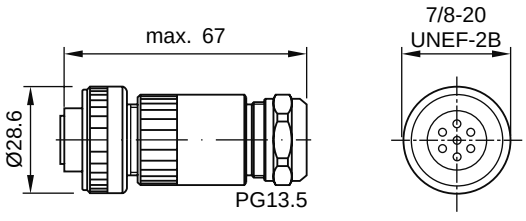
Electronics code B



Electronics code S



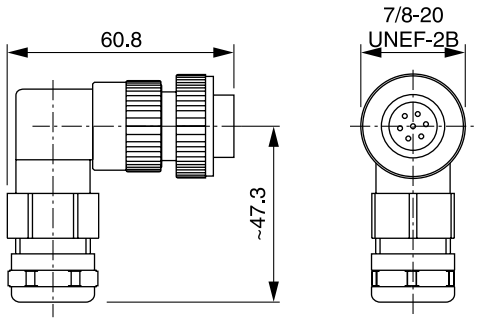
Female Connector
(EMC conforming)



ID no. 5004072

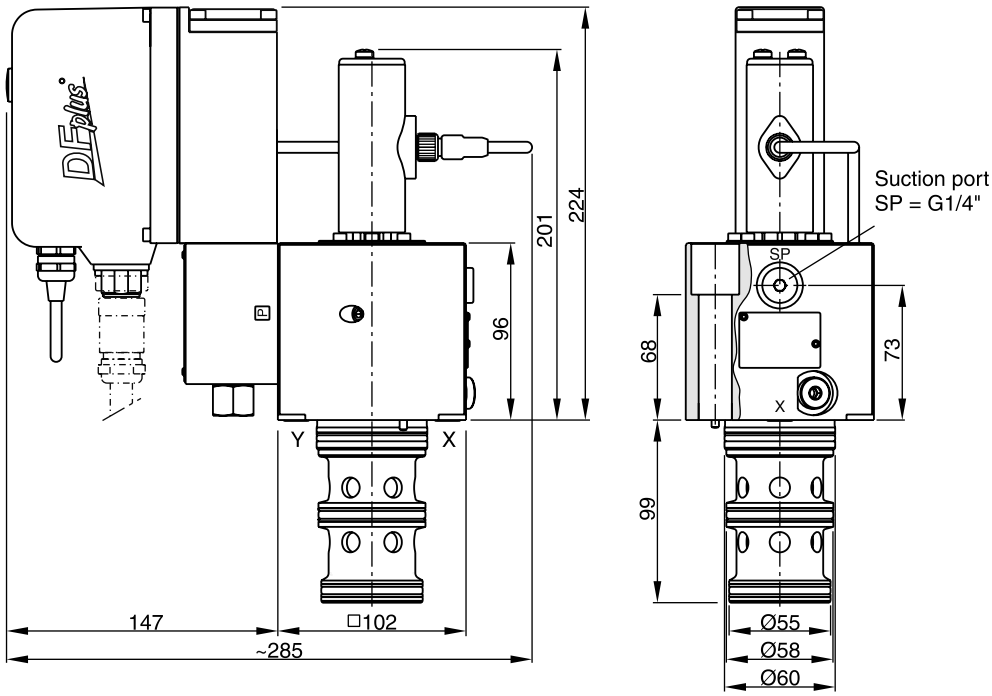
Please order plugs seperately

Angle female connector
(EMC conform)

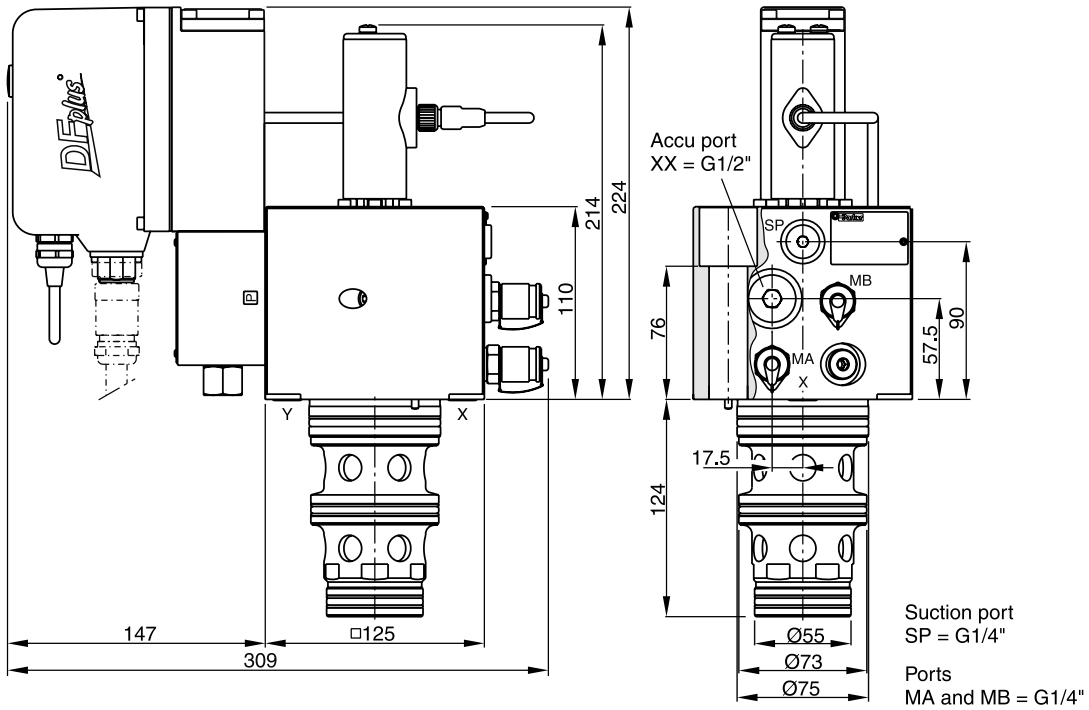


ID no. 5005160

NG32



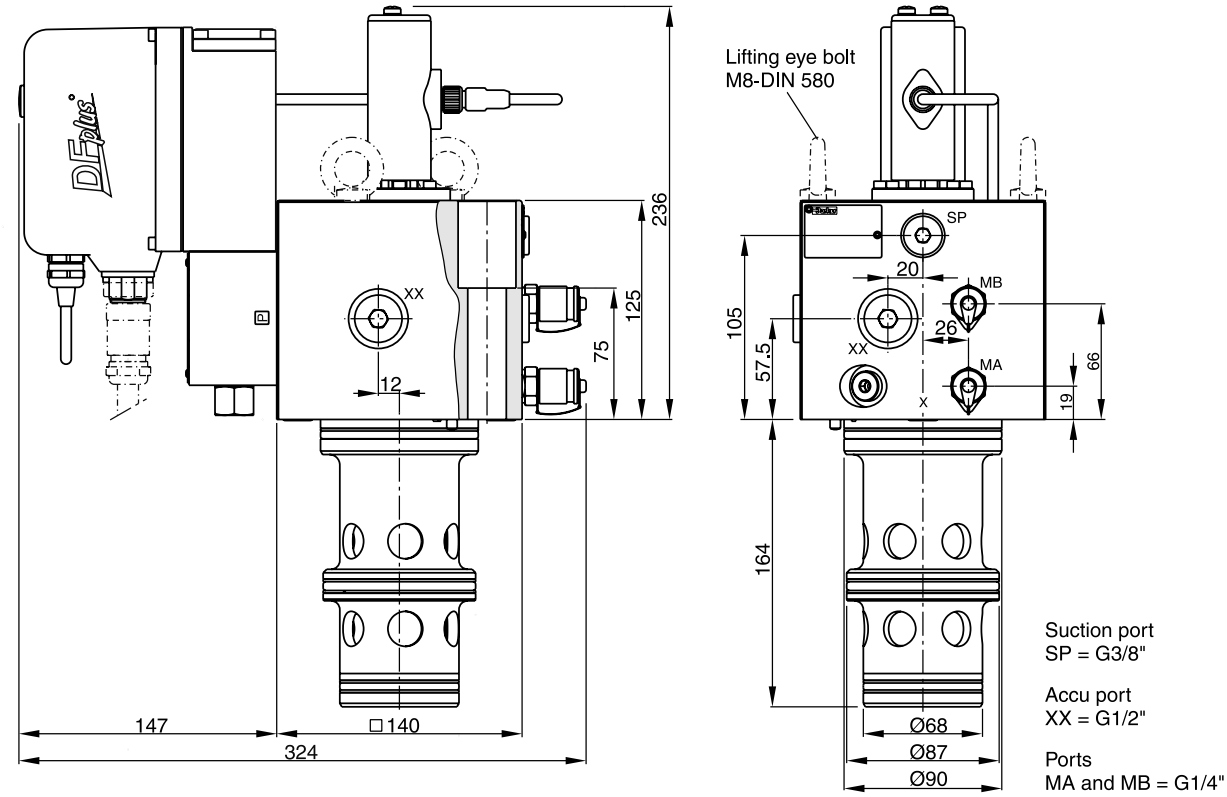
NG40



NG	Bolt kit -		Kit NBR	Kit FPM
32	BK529 4x M16x100 DIN 912 12.8	281 Nm	SK-TPQ032EN	SK-TPQ032EV
40	BK513 4 x M20x120 DIN 912 12.8	553 Nm	SK-TPQ040EN	SK-TPQ040EV

TPQ UK.INDD CM 07.09.11

NG50

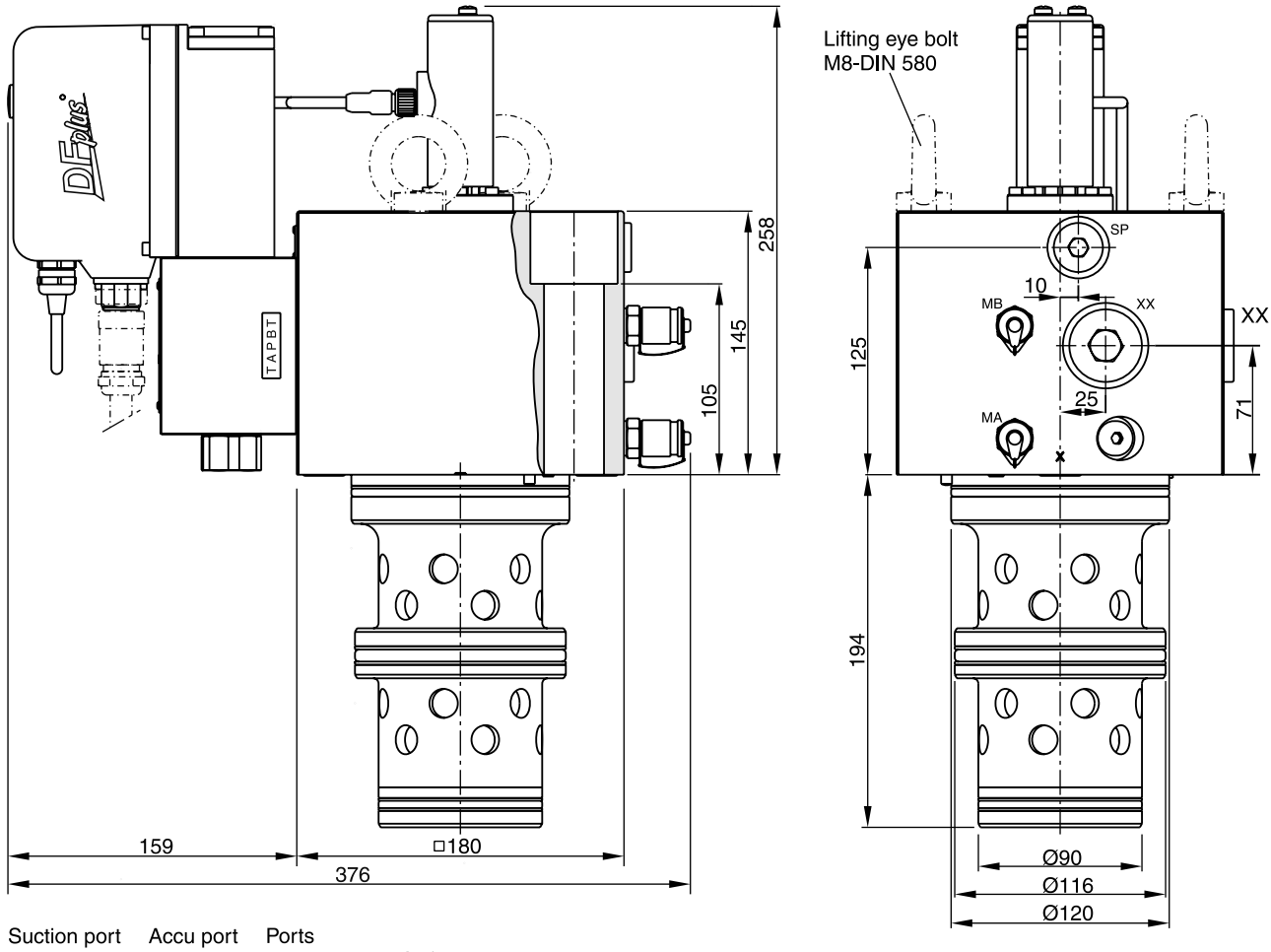


Lifting thread for disassembly M12

8

NG	Bolt kit -		Kit NBR	Kit FPM
50	BK513 4 x M20x120 DIN 912 12.8	553 Nm	SK-TPQ050EN	SK-TPQ050EV

NG63



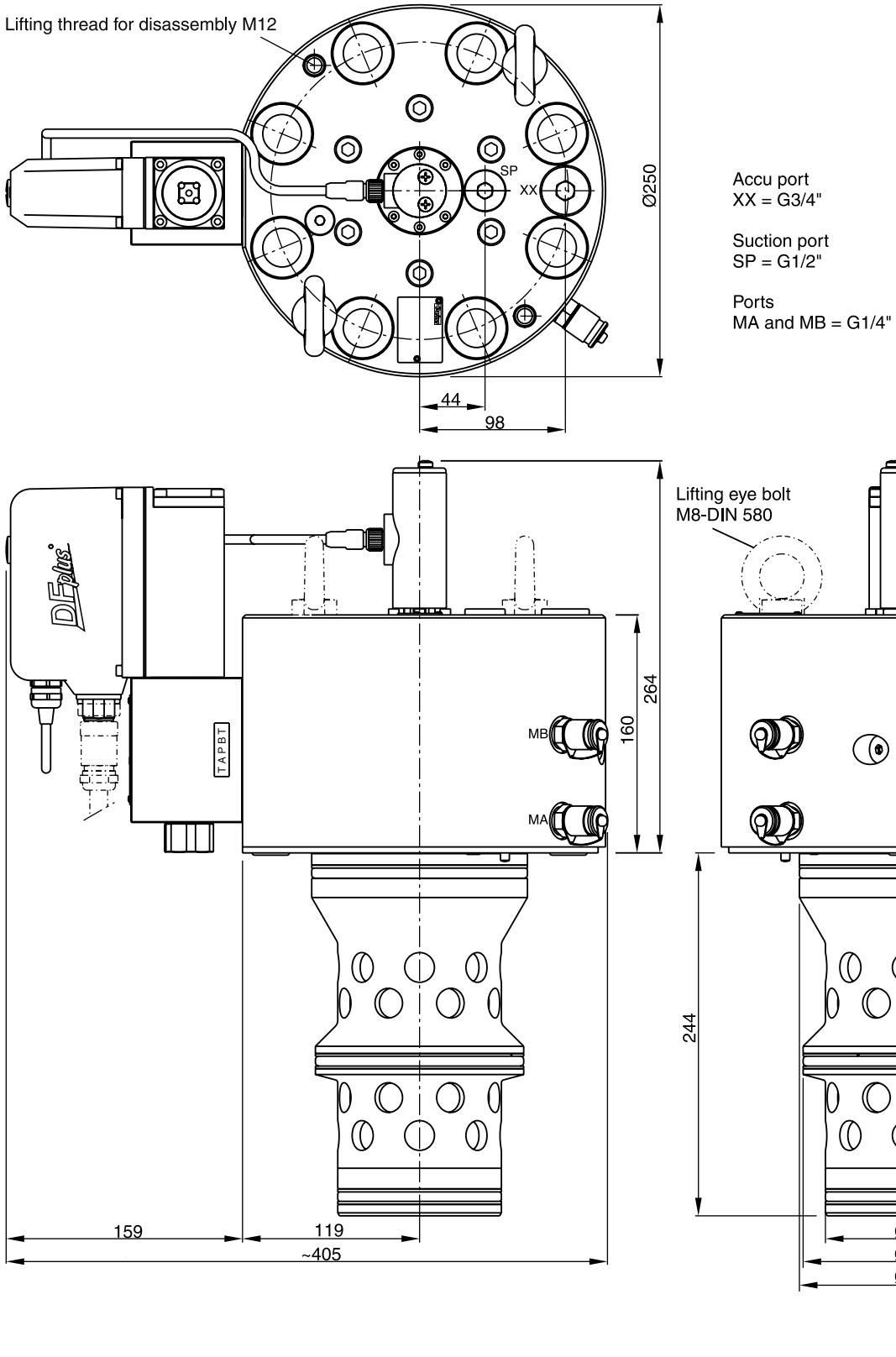
Suction port SP = G1/2"
Accu port XX = G1"
Ports MA and MB = G1/4"

Lifting thread for disassembly M12

8

NG	Bolt kit - DIN912 12.9		Kit NBR	Kit FPM
63	BK420 4x M30x140 DIN 912 12.9	1910 Nm	SK-TPQ063EN	SK-TPQ063EV

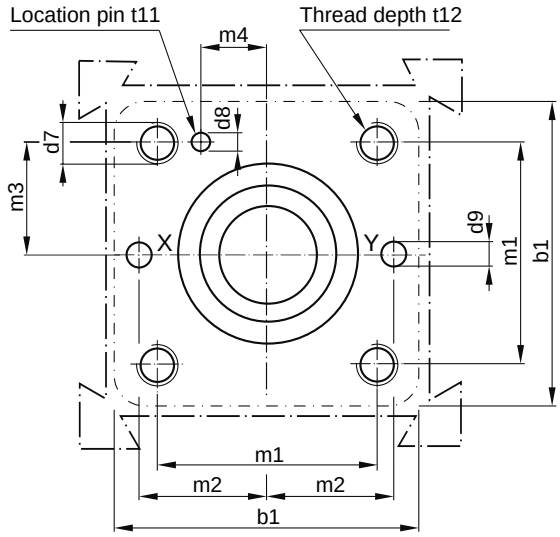
NG80

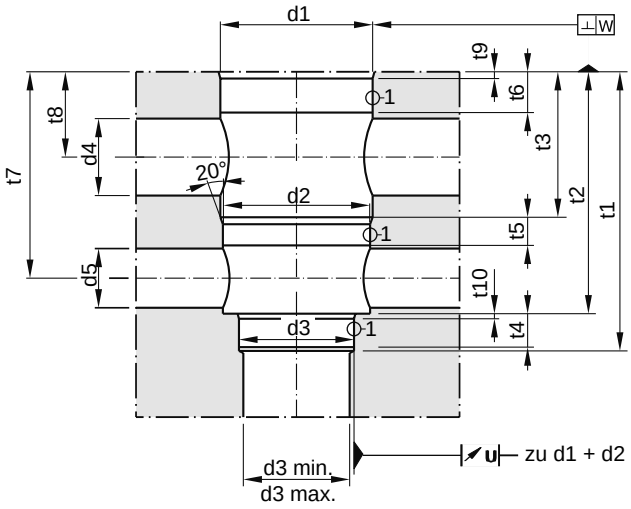


NG	Bolt kit - DIN912 12.9		Kit NBR	Kit FPM
80	BK530 8x M24x160 DIN 912 12.9	955 Nm	SK-TPQ080EN	SK-TPQ080EV

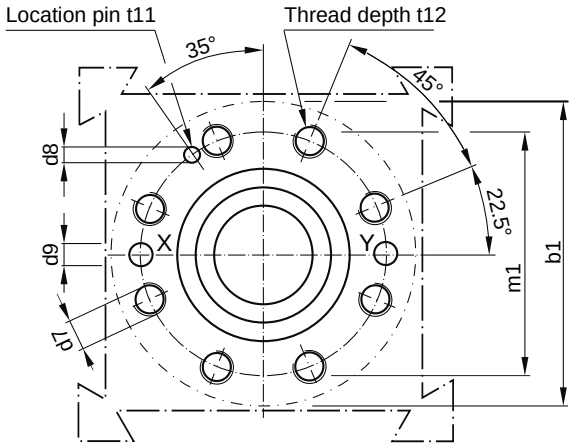
TPQ UK.INDD CM 07.09.11

NG 32 to NG 63





NG 80



Required surface finish:

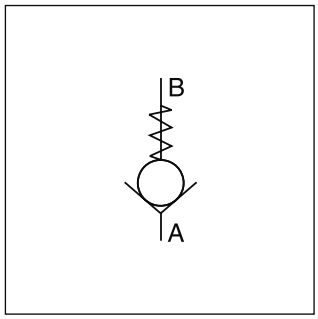
$\sqrt{R_{max}25}, (1) = \sqrt{R_{max}8}$

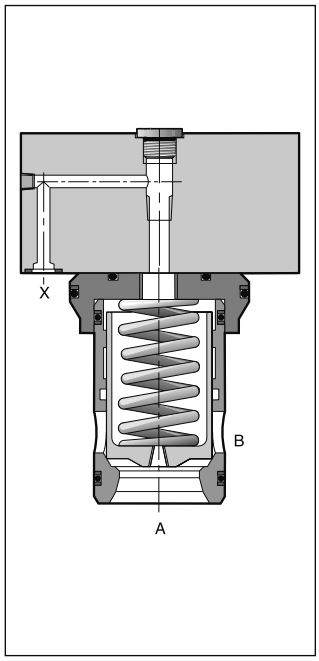
Size	b1	d1 H7	d2 H7	d3 H7	d3 min.	d3 max.	d4	d5	d7	d8 H13	d9
32	102	60	58	55	32	54	28	28	M 16	6	8
40	125	75	73	55	40	54	38	32	M 20	6	10
50	140	90	87	68	50	67	63	38	M 20	8	10
63	180	120	116	90	63	89	64	52	M 30	8	12
80	250	145	140	110	80	109	70	66	M 24	10	16

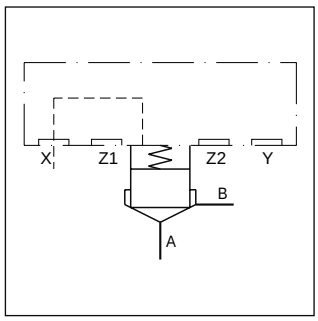
Size	m1 ±0.2	m2 ±0.2	m3 ±0.2	m4 ±0.2	t1 +3 +1	t2 ±0.2	t3 ±0.2	t4	t5	t6	t7 ±0.2	t8 ±0.2	t9	t10	t11	t12
32	70	41	35	17	100	85	43	13.5	16	18	71	28.5	2.5x15°	2.5x15°	10	35
40	85	50	42.5	23	125	105	54	15	18	21	88	34	3x15°	3x15°	10	45
50	100	58	50	30	165	143	86	22	18	21	122	53	4x15°	3x15°	10	45
63	125	75	62.5	38	195	165	83.5	20	29.5	33	138.5	50	4x15°	4x15°	10	65
80	200	-	-	-	245	215	123	25	27	60	181	87	5x15°	5x15°	10	50

Notes

Check valves of the series C1DB consist of a slip-in valve, that is designed for a compact block installation.







Features

- Installation hole and mounting pattern according to ISO 7368
- 4 different springs
- 8 sizes NG16 to NG100

Ordering code

☐	**C1DB**	**101**	**E**	☐	/ **0**	☐	**99**	**00**
Seal	Check valve	Cover	Slip-in valve	Nominal size	Design series	Closing spring		

Code	Seal
omit	**NBR**
V	FPM

Code	Nominal size
16	**NG16**
25	**NG25**
32	**NG32**
40	**NG40**
50	**NG50**
63	**NG63**
80	NG80
100	NG100

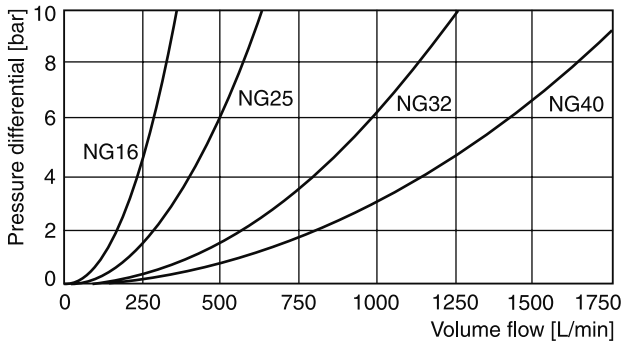
Code	Spring
L	0.1 bar
N	0.5 bar
S	**1.6 bar**
T	2.5 bar
U	4.0 bar

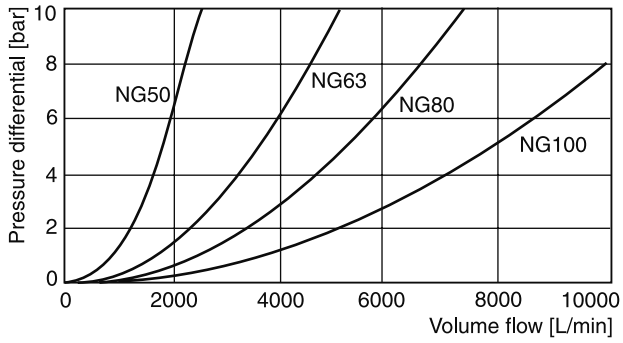
Bold letters =
Short-term availability

Technical data

Design			2 way cartridge valve, according to ISO 7368 : 1989						
Actuation			Hydraulical						
Mounting position			unrestricted						
Environmental temperature		[°C]	-40 ... +60						
$MTTF_D$ value		[years]	150						
Nominal size			NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
Weight		[kg]	1.2	2.5	3.9	7	11.4	21.8	45	74
Hydraulics									
Flow direction			See symbols						
Pressure medium			Hydraulic oil as per DIN 51 524 ... 536						
Viscosity	recommended	[cSt] / [mm²/s]	30 ... 80						
	permitted	[cSt] / [mm²/s]	20 ... 380						
Pressure fluid temperature		[°C]	-20 ... +60						
Permissible contamination			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)						
Nominal pressure		[bar]	350						
Flow		[l/min]	250	450	900	1300	1800	3600	5250	8000
Opening pressure, spring		[bar]	L = 0.1; N = 0.5; S = 1.6; U = 4.0						

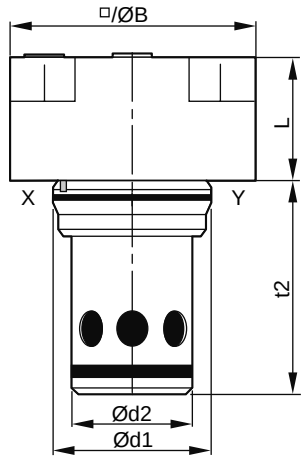
Performance curves





All characteristic curves measured with HLP46 at 50°C.

Dimensions



NG	L	B	d1	d2	t2
16	36	65	32	25	56
25	45	85	45	34	72
32	50	102	60	45	85
40	60	125	75	55	105
50	70	140	90	68	122
63	85	180	120	90	155
80	105	Ø 250	145	110	205
100	120	Ø 300	180	135	245

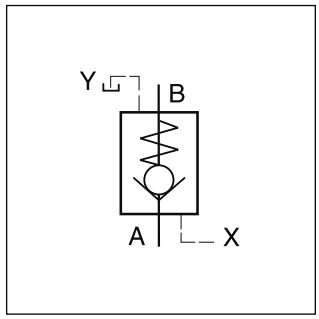
NG	Kit	DIN912 12.9	[Nm]	Kit NBR	Kit FPM	Orifice thread
16	BK441	4x M8x50	33	SK-CB-E160	SK-CB-E160V	1/16 NPT
25	BK391	4x M12x50	115	SK-CB-E250	SK-CB-E250V	1/16 NPT
32	BK415	4x M16x55	281	SK-CB-E320	SK-CB-E320V	1/16 NPT
40	BK416	4x M20x70	553	SK-CB-E400	SK-CB-E400V	1/8 NPT
50	BK417	4x M20x75	553	SK-CB-E500	SK-CB-E500V	1/8 NPT
63	BK418	4x M30x100	1910	SK-CB-E630	SK-CB-E630V	1/8 NPT
80	BK419	8x M24x120	935	SK-CB-E630	SK-CB-E630V	1/8 NPT
100	BK420	8x M30x140	1910	SK-CB-E630	SK-CB-E630V	1/8 NPT

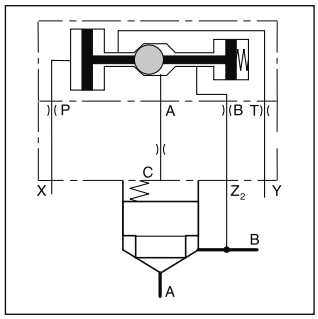
Springs

Spring Type	Ordering Number							
	NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
L (0.1 bar)	45051368	45051375	45051376	45051382	45051384	45051388	45051395	45051400
N (0.5 bar)	45051369	45051374	45051377	45051381	45051385	45051389	45051396	45051401
S (1.6 bar)	45051370	45051372	45051378	45051380	45051386	45051390	45051397	45051402
U (4.0 bar)	45051371	45051373	45051379	45051383	45051387	45051391	45051398	45051403

Hydraulically pilot operated check valves allow free flow from A to B. The counter-flow direction is blocked.

When pressure is applied to control port X, the ring chamber flow from B to A is released. The pilot control ratio is 6:1.





Function

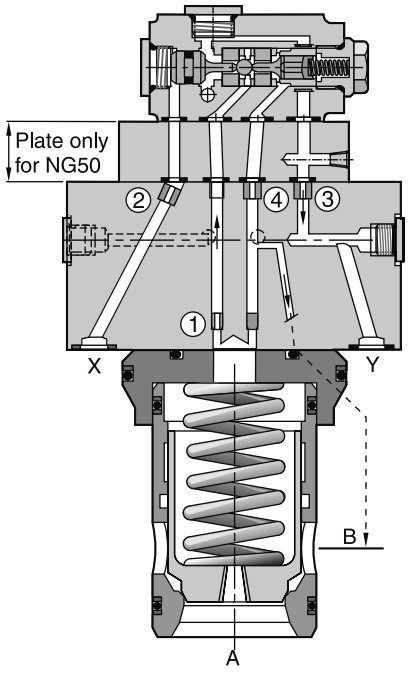
When no pressure is applied to the X-port, the flow from B to A is blocked, because the pressure in B is also effective on top of the poppet.

Pressurizing the X-port relieves the area on top of the poppet to the drain port and allows flow from B to A.

The seat design of the SVLB valve series provides leak-free separation of port A and B in the closed position.

Features

- Pilot operated check valve
- Cavity and mounting pattern acc. to ISO 7368
- Dampening poppet optional
- 5 sizes NG16 to NG50



8

Ordering code

	SVL	B	10		6	E			
Seal	**Hydr. operated check valve**	**Slip-in mounting**	**Design style acc. to ISO 7368**	**Poppet type**	**Pilot control ratio 6:1**	**Slip-in cartridge valve**	**Valve size**	**Closing spring**	**Design series** (not required for ordering)

Code	Seal
omit	**NBR**
V	FPM

Code	Poppet type
4	**04**
8 [1]	08

[1] with damping nose

Code	Spring
N	0.5 bar
S	**1.6 bar**
T	2.5 bar
U	4.0 bar

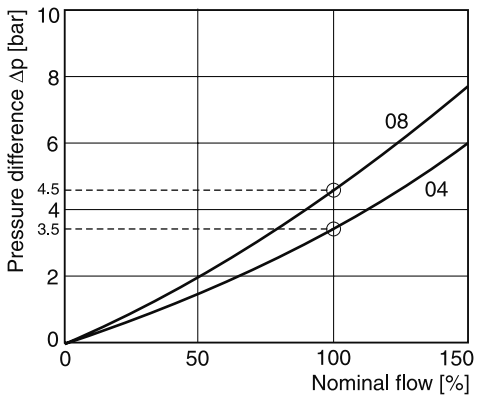
Code	Size
16	NG16
25	NG25
32	NG32
40	NG40
50	NG50

Bold letters =
Short-term availability

Technical data

General						
Nominal size		NG16	NG25	NG32	NG40	NG50
Interface		Slip-in mounting acc. ISO 7368				
Mounting position		unrestricted				
Ambient temperature	[°C]	-20...+80				
$MTTF_D$ value	[years]	75				
Weight	[kg]	2.3	3.2	4.6	7.8	12.0
Hydraulics						
Max. operating pressure	[bar]	350				
Nominal flow	[l/min]	250	450	900	1300	1800
Fluid		Hydraulic oil acc. to DIN 51524...525				
Viscosity recommended	[cSt] / [mm²/s]	30...50				
Viscosity permitted	[cSt] / [mm²/s]	20...380				
Fluid temperature	[C°]	-20...+70				
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)				

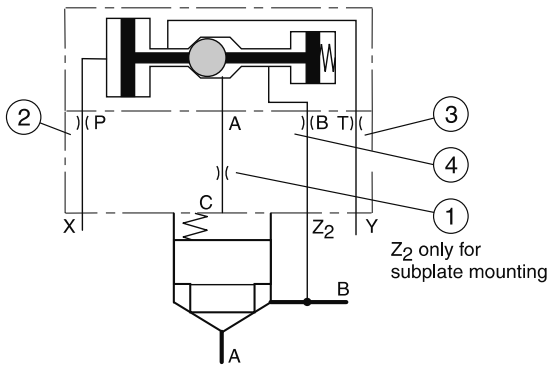
Δp/Q flow curve



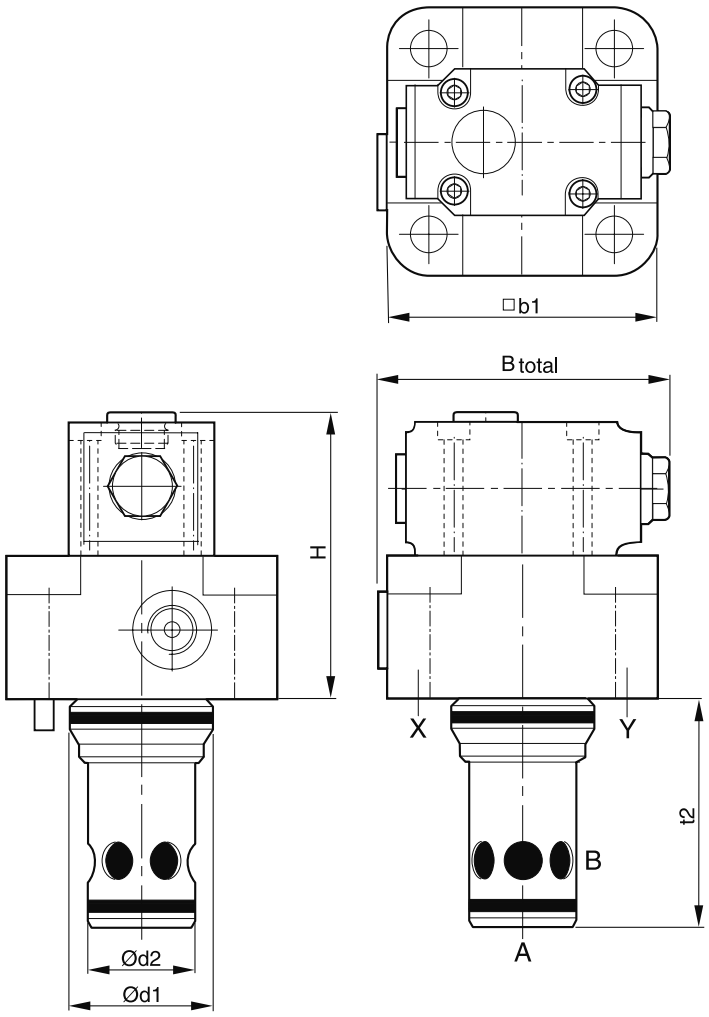
Poppet type 04, 08, without spring

All characteristic curves measured with HLP46 at 50°C.

Standard orifices



Pos.	E16	E25	E32	E40	E50
1	open (M5)	open (M5)	open (M5)	open (M5)	open (M6)
2	Ø1.2 (M5)	Ø1.2 (M6)	Ø1.2 (M6)	Ø1.2 (M6)	Ø1.2 (M8)
3	open (M5)	open (M6)	open (M6)	open (M6)	open (M8)
4	Ø1.0 (M5)	Ø1.2 (M5)	Ø1.3 (M5)	Ø1.5 (M5)	Ø2.0 (M6)



Size	16	25	32	40	50
H	84	88	93	103	138
b1	79*	85	102	125	140
$d1^{H7}$	32	45	60	75	90
$d2^{H7}$	25	34	45	55	68
$t2^{+0.1}$	56	72	85	105	122
Bges.	99	94	103	125	140

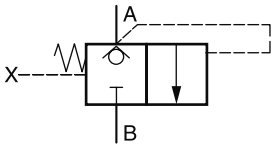
* width 65mm

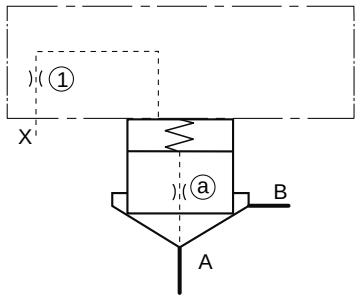
NG	Kit	DIN912 12.9	[Nm]	Kit NBR	Kit FPM
16	BK441	4x M8x50	33	SK-SVLB10-E16	SK-SVLB10-E16V
25	BK391	4x M12x50	115	SK-SVLB10-E25	SK-SVLB10-E25V
32	BK415	4x M16x55	281	SK-SVLB10-E32	SK-SVLB10-E32V
40	BK416	4x M20x70	553	SK-SVLB10-E40	SK-SVLB10-E40V
50	BK417	4x M20x75	553	SK-SVLB10-E50	SK-SVLB10-E50V

SVLB UK.INDD CM 07.09.11

Notes

2 way seat valve, flow A ⇒ B



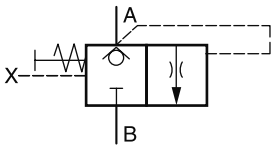


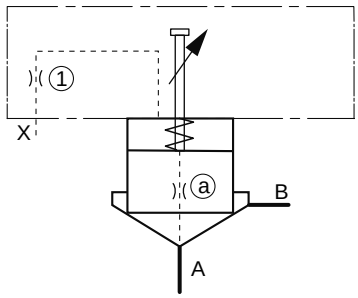
Description	Type							
	NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
Cover [1]	C016AA*	C025AA*	C032AA*	C040AA*	C050AA*	C063AA*	C080AA*	C100AA*
Cover orifice ①	1/16xØ0.8	1/16xØ1.0	1/16xØ1.2	1/8xØ1.5	1/8xØ1.8	1/8xØ2.0	1/8xØ2.2	1/8xØ2.5
Cartridge [2]	CE016C01*	CE025C01*	CE032C01*	CE040C01*	CE050C01*	CE063C01*	CE080C01*	CE100C01*
Poppet orifice ⓐ	1/16xØ00							
Spring	1.6 bar, type S (Order no. see spare parts)							
Bolt kit cover	BK414 4x M8x40	BK391 4x M12x50	BK415 4x M16x55	BK416 4x M20x70	BK417 4x M20x75	BK418 4x M30x100	BK419 8x M24x120	BK509 8x M30x130

Shown orifice Ø and springs are recommendations.
xxØ00 = closed bottom NG16 - NG50, plug NG63 - NG100
xxØ99 = open

[1] Complete type see ordering code C*A
[2] Complete type see ordering code CE*

2 way seat valve with stroke limiter, flow A ⇒ B





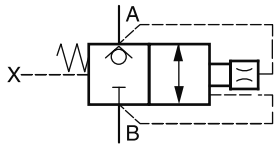
Description	Type							
	NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
Cover [1]	C016B**	C025B**	C032B**	C040B**	C050B**	C063B**	C080B**	C100B**
Cover orifice ①	M6xØ0.8	M6xØ1.0	1/16xØ1.2	1/16xØ1.5	1/16xØ1.8	1/8xØ2.0	1/8xØ2.2	1/8xØ2.5
Cartridge [2]	CE016C01*	CE025C01*	CE032C01*	CE040C01*	CE050C01*	CE063C01*	CE080C01*	CE100C01*
Poppet orifice ⓐ	1/16xØ00							
Spring	1.6 bar, type S (Order no. see spare parts)							
Bolt kit cover	BK414 4x M8x40	BK391 4x M12x50	BK415 4x M16x55	BK416 4x M20x70	BK417 4x M20x75	BK418 4x M30x100	BK419 8x M24x120	BK509 8x M30x130

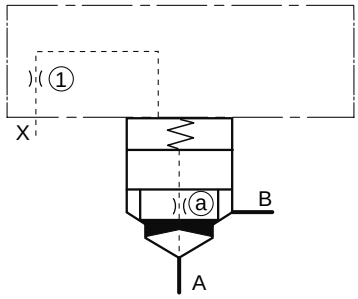
Shown orifice Ø and springs are recommendations.
xxØ00 = closed bottom NG16 - NG50, plug NG63 - NG100
xxØ99 = open

[1] Complete type see ordering code C*B
[2] Complete type see ordering code CE*

Adaptor plates see chapter 12

2 way functions with dampening poppet, flow A ⇔ B





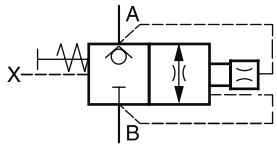
Description	Type							
	NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
Cover [1]	C016AA*	C025B*	C032AA*	C040AA*	C050AA*	C063AA*	C080AA*	C100AA*
Cover orifice ①	1/16xØ0.8	1/16xØ1.0	1/16xØ1.2	1/8xØ1.5	1/8xØ1.8	1/8xØ2.0	1/8xØ2.2	1/8xØ2.5
Cartridge [2]	CE016C08*	CE025C08*	CE032C08*	CE040C08*	CE050C08*	CE063C08*	CE080C08*	CE100C08*
Poppet orifice ⓐ	1/16xØ00							
Spring	1.6 bar, type S (Order no. see spare parts)							
Bolt kit cover	BK414 4x M8x40	BK391 4x M12x50	BK415 4x M16x55	BK416 4x M20x70	BK417 4x M20x75	BK418 4x M30x100	BK419 8x M24x120	BK509 8x M30x130

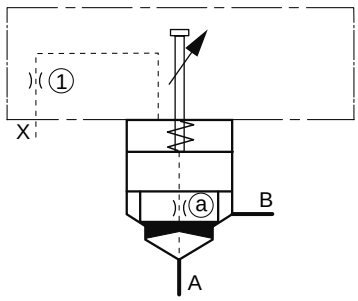
Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete type see ordering code C*A
[2] Complete type see ordering code CE*

8

2 way functions with stroke limiter and dampening poppet, flow A ⇔ B





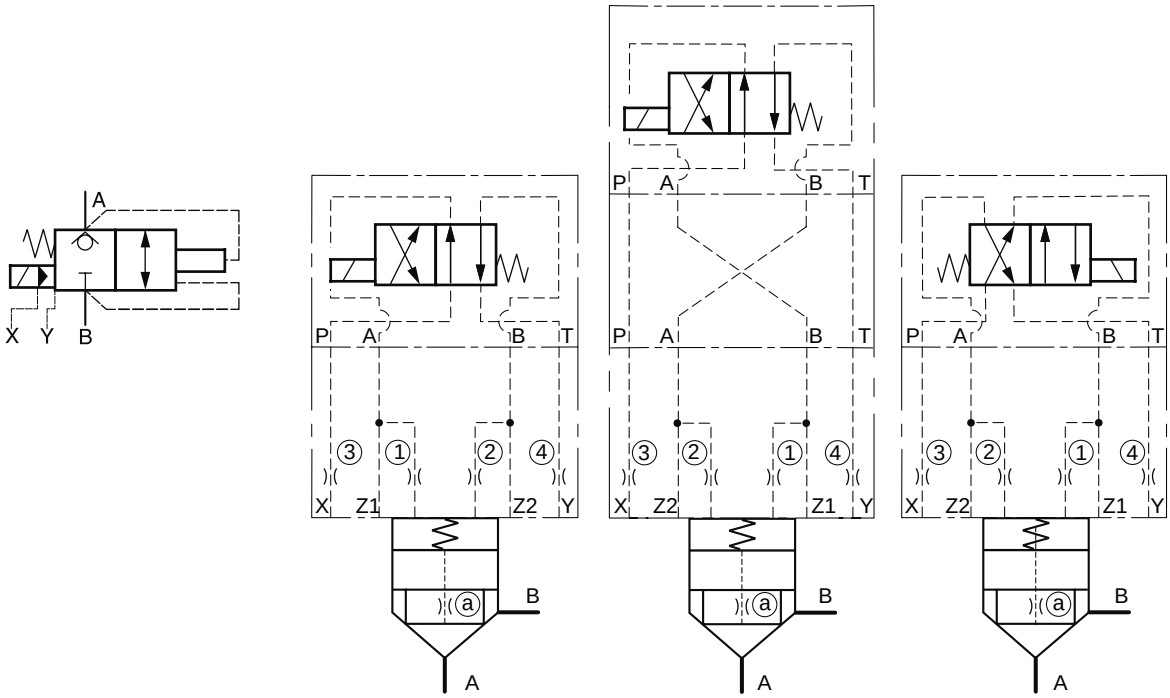
Description	Type							
	NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
Cover [1]	C016B*	C025B*	C032B*	C040B*	C050B*	C063B*	C080B*	C100B*
Cover orifice ①	M6xØ0.8	M6xØ1.0	1/16xØ1.2	1/16xØ1.5	1/16xØ1.8	1/8xØ2.0	1/8xØ2.2	1/8xØ2.5
Cartridge [2]	CE016C08*	CE025C08*	CE032C08*	CE040C08*	CE050C08*	CE063C08*	CE080C08*	CE100C08*
Poppet orifice ⓐ	1/16xØ00							
Spring	1.6 bar, type S (Order no. see spare parts)							
Bolt kit cover	BK414 4x M8x40	BK391 4x M12x50	BK415 4x M16x55	BK416 4x M20x70	BK417 4x M20x75	BK418 4x M30x100	BK419 8x M24x120	BK509 8x M30x130

Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete type see ordering code C*B
[2] Complete type see ordering code CE*

Adaptor plates see chapter 12

2 way seat valve with pilot normally closed, flow A ⇔ B



NG16 - 40 with pilot NG06

NG50 - 63 with pilot NG06

NG50 - 100 with pilot NG10

8

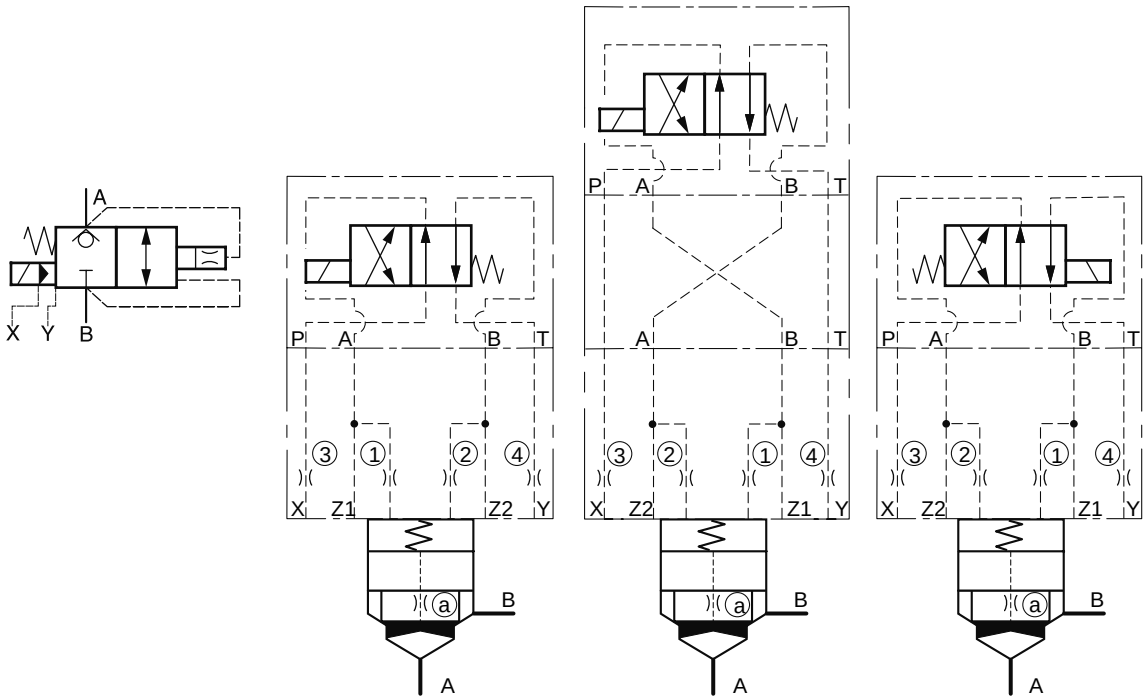
Description	Type									
	Pilot NG06						Pilot NG10			
	NG16	NG25	NG32	NG40	NG50	NG63	NG50	NG63	NG80	NG100
4/2-DC valve [1]	D1VW20B*						D3W20H*			
Adaptor plate [2]	without				PADA1007/A-B/B-A		without			
Cover [3]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*	C050CA*	C063CA*	C080CA*	C100CA*
Cover orifice ①	M5xØ0.8	M5xØ1.0	M5xØ1.2	M5xØ1.5	M6xØ1.8	M6xØ2.0	M6xØ1.8	M6xØ2.0	1/16xØ2.2	1/16xØ2.5
Cover orifice ②	M5xØ00				M6xØ00				1/16xØ00	
Cover orifice ③	M5xØ1.0	M6xØ1.2	M6xØ1.5	M6xØ1.8	M8xØ2.0	M8xØ2.2	M8xØ2.0	M8xØ2.2	M10x1xØ2.5	M10x1xØ3.0
Cover orifice ④	M5xØ99	M6xØ99			M8xØ99C				M10x1xØ99	
Cartridge [4]	CE016C04*	CE025C04*	CE032C04*	CE040C04*	CE050C04*	CE063C04*	CE050C04*	CE063C04*	CE080C04*	CE100C04*
Poppet orifice ⓐ	1/16NPTxØ00									
Spring	1.6 bar, type S (Order no. see spare parts)									
Bolt kit cover	BK414 4x M8x40	BK391 4x M12x50	BK415 4x M16x55	BK416 4x M20x70	BK417 4x M20x75	BK418 4x M30x100	BK419 8x M24x120	BK509 8x M30x130	BK419 8x M24x120	BK420 8x M30x140
Bolt kit pilot	BK375 4x M5x30						BK385 4x M6x40			

Shown orifice Ø and springs are recommendations.
xxØ00 = closed bottom NG16 - NG50, plug NG63 - NG100
xxØ99 = open

[1] Complete type see chapter "Directional Control Valves", series D1VW, D3W.
[2] NG10-NG06 inclusive O-rings and mounting bolts
[3] Complete type see ordering code C*C
[4] Complete type see ordering code CE*

Adaptor plates see chapter 12

2 way seat valve with pilot and dampening poppet, normally closed, flow A ⇔ B



NG16 - 40 with pilot NG06

NG50 - 63 with pilot NG06

NG50 - 100 with pilot NG10

8

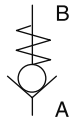
Description	Type									
	Pilot NG06						Pilot NG10			
	NG16	NG25	NG32	NG40	NG50	NG63	NG50	NG63	NG80	NG100
4/2-DC valve [1]	D1VW20B*						D3W20H*			
Adaptor plate [2]	without				PADA1007/A-B/B-A		without			
Cover [3]	C016CA*	C025CA*	C032CA*	C040CA*	C050CA*	C063CA*	C050CA*	C063CA*	C080CA*	C100CA*
Cover orifice ①	M5xØ0.8	M5xØ1.0	M5xØ1.2	M5xØ1.5	M6xØ1.8	M6xØ2.0	M6xØ1.8	M6xØ2.0	1/16xØ2.2	1/16xØ2.5
Cover orifice ②	M5xØ00				M6xØ00				1/16xØ00	
Cover orifice ③	M5xØ1.0	M6xØ1.2	M6xØ1.5	M6xØ1.8	M8xØ2.0	M8xØ2.2	M8xØ2.0	M8xØ2.2	M10x1xØ2.5	M10x1xØ3.0
Cover orifice ④	M5xØ99	M6xØ99			M8xØ99C				M10x1xØ99	
Cartridge [4]	CE016C08*	CE025C08*	CE032C08*	CE040C08*	CE050C08*	CE063C08*	CE050C08*	CE063C08*	CE080C08*	CE100C08*
Poppet orifice ⓐ	1/16NPTxØ00									
Spring	1.6 bar, type S (Order no. see spare parts)									
Bolt kit cover	BK414 4x M8x40	BK391 4x M12x50	BK415 4x M16x55	BK416 4x M20x70	BK417 4x M20x75	BK418 4x M30x100	BK419 8x M24x120	BK509 8x M30x130	BK419 8x M24x120	BK420 8x M30x140
Bolt kit pilot	BK375 4x M5x30						BK385 4x M6x40			

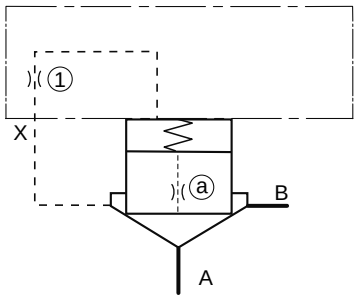
Shown orifice Ø and springs are recommendations.
xxØ00 = plug
xxØ99 = open

[1] Complete type see chapter "Directional Control Valves", series D1VW, D3W.
[2] NG10-NG06 inclusive O-rings and mounting bolts
[3] Complete type see ordering code C*C
[4] Complete type see ordering code CE*

Adaptor plates see chapter 12

Check valve, flow A ⇒ B





Description	Type							
	NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
Cover [1]	C016AA*	C025AA*	C032AA*	C040AA*	C050AA*	C063AA*	C080AA*	C100AA*
Cover orifice ①	M5xØ99				M6xØ99		1/16xØ99	
Cartridge [2]	CE016C01*	CE025C01*	CE032C01*	CE040C01*	CE050C01*	CE063C01*	CE080C01*	CE100C01*
Poppet orifice ⓐ	1/16NPTxØ00							
Spring	1.6 bar, type S (Order no. see spare parts)							
Bolt kit cover	BK414 4x M8x40	BK391 4x M12x50	BK415 4x M16x55	BK416 4x M20x70	BK417 4x M20x75	BK418 4x M30x100	BK419 8x M24x120	BK509 8x M30x130

Shown orifice Ø and springs are recommendations.
xxØ00 = closed bottom NG16 - NG50, plug NG63 - NG100
xxØ99 = open

[1] Complete type see ordering code C*A
[2] Complete type see ordering code CE*

Adaptor plates see chapter 12

Notes

The 2/2 way seat valves series C10 D*C are equipped with an inductive switch to monitor the closed position

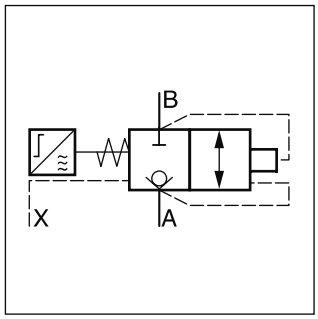
The poppet has a 60/40 area ratio (AA = 0.6 AC, AB = 0.4 AC) and is capable for flow in both directions.

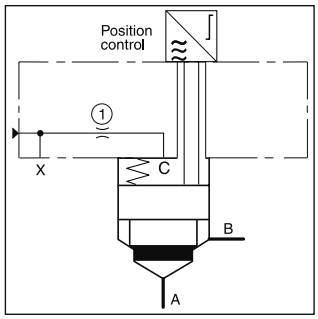
The safety overlap of the poppet avoids dangerous opening of the valve before the signal of the inductive switch has changed.

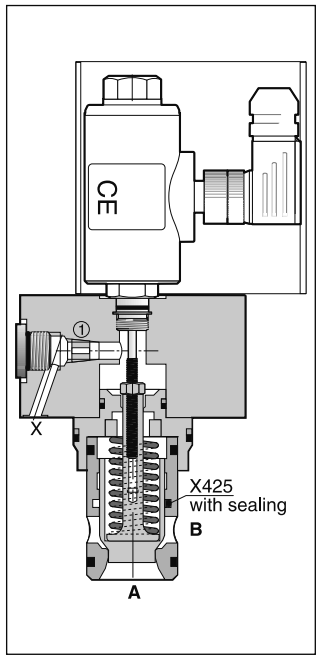
For Sizes NG80 and NG100 a proximity switch vertical to the poppet is used.

Features

- German trade association certificate, No. 00 077 for NG16 to NG63
- Cavity and mounting pattern acc. to ISO 7368
- Monitored closed position
- Inductive switch CE conform
- Optional poppet sealing
- 8 sizes NG16 up to NG100





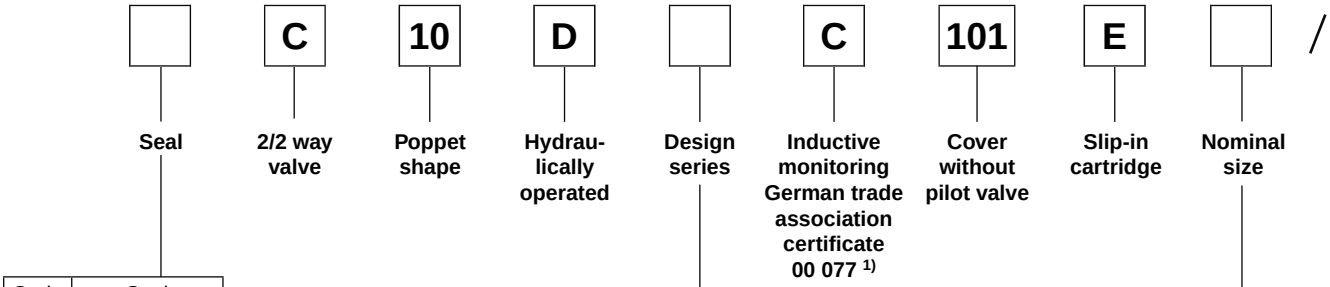


C10 DEC 101 E25

Technical data

General									
Size			NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
Interface			2 way slip-in cartridge valves DIN ISO 7368							
Mounting position			unrestricted							
Operation			Hydraulic							
Ambient temperature		[C°]	-40...+60							
$MTTF_D$ value		[years]	150							
Weight		[kg]	1.5	2.7	4.3	7.4	12	23	53	89
Hydraulic										
Max. operating pressure		[bar]	350, connection A, B, X							
Nominal flow Δp 5 bar		[l/min]	230	400	800	1250	1625	3400	5000	7500
Fluid			Hydraulic oil according to DIN 51524...51525							
Fluid temperature,	recommended	[C°]	+30...+50							
	permitted	[C°]	-20...+60							
Viscosity	recommended	[cSt] / [mm²/s]	30...80							
	permitted	[cSt] / [mm²/s]	20...380							
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)							
Control volume at max. stroke		[cm³]	2.03	6.45	12.21	20.32	39.40	94.56	950	1300
Control surface (surface C = 100%) A/B		[%]	approx. 60 / 40 related on surface C							
Opening pressure										
	flow direction B—>A	[bar]	Spring: L = 0.25; N = 1.25; S = 4.0; U = 10.0							
	flow direction A—>B	[bar]	Spring: L = 0.16; N = 0.85; S = 2.7; U = 6.6							
Electrical (Inductive switch)			See position control							

8



Code	Seal
omit	NBR
V	FPM

Code	Design Series
E	NG16 - NG63
F	NG80 - NG100

Code	Nominal size
16	NG16
25	NG25
32	NG32
40	NG40
50	NG50
63	NG63
80	NG80
100	NG100

8

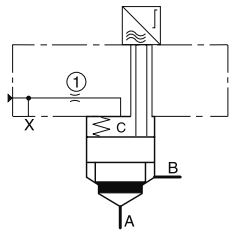
1) Certificate only for NG16 to NG63.

0			00	
		1		
Cavity and mounting pattern DIN ISO 7368	**Spring**	**Orifice**		**Poppet seal**

Code	Poppet seal
omit	—
X425	Only with spring code S and U

Code	Orifice
00	Plug
99	Without orifice, open

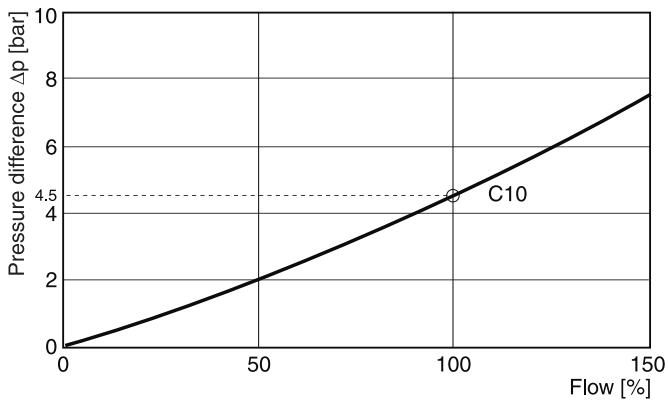
Cover 101



Code	Spring
L	Opening pressure 0.1 bar
N	Opening pressure 0.5 bar
S	Opening pressure 1.6 bar
U	Opening pressure 4.0 bar

8

Flow diagram



Characteristic curve measured with HLP46 at 50°C.

8

Orifice thread

Orifice	Cover	NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
①	101	*1/16”	*1/16”	*1/16”	*1/8”	*1/8”	*1/8”	*1/8”	*1/8”

* thread in NPT

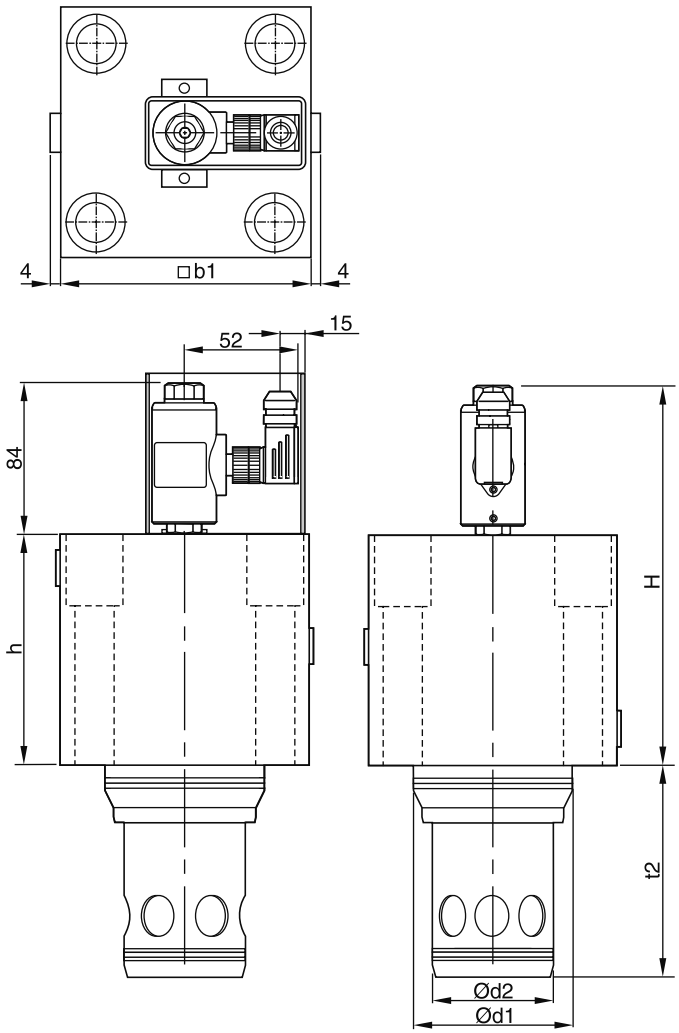
Recommended orifice diameter

Orifice	Cover	NG16	NG25	NG32	NG40	NG50	NG63	NG80	NG100
①	101	Ø 0.8	Ø 1.2	Ø 1.5	Ø 2.0	Ø 2.5	Ø 3.0	Ø 3.0	Ø 3.0

Depending on function, plugs must be used (code00).

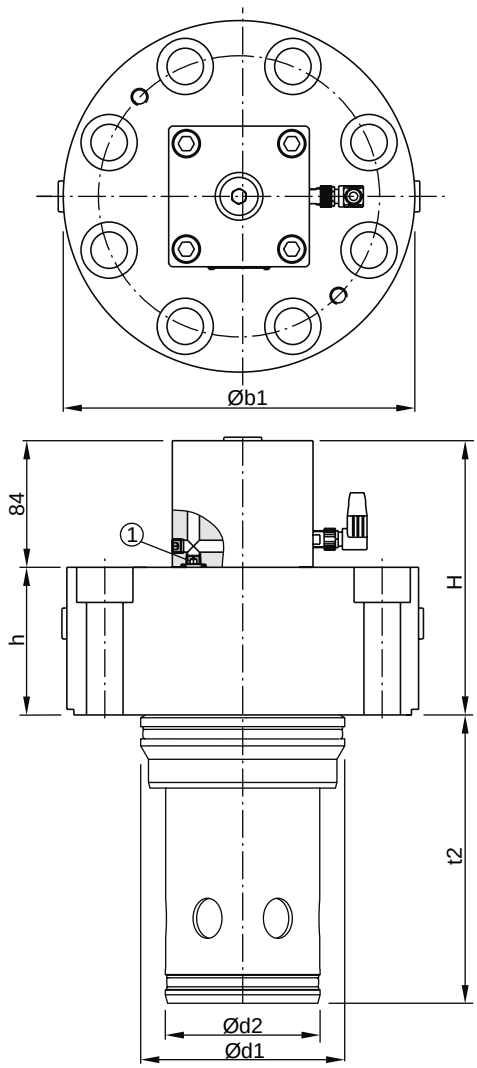
Dimensions C10D*C101

NG16 to NG63

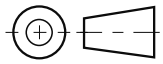


Cavity and mounting pattern acc. to ISO 7368

NG80 to NG100



NG	H	h	b1	d1	d2	t2 +0.1
16	130	40	65	32	25	56
25	135	45	85	45	34	72
32	140	50	102	60	45	85
40	150	60	125	75	55	105
50	160	70	140	90	68	122
63	175	85	180	120	90	155
80	195	105	250	145	110	205
100	210	120	300	180	135	245



Seal and bolt kits

Nominal size		16	25	32	40	50	63	80	100
Seal kit	FPM	SK-CBE16V	SK-CBE25V	SK-CBE32V	SK-CBE40V	SK-CBE50V	SK-CBE63V	SK-CBE80V	SK-CBE63V
	NBR	SK-CBE16	SK-CBE25	SK-CBE32	SK-CBE40	SK-CBE50	SK-CBE63	SK-CBE80	SK-CBE63
Bolt kit[DIN 912 12.9]		BK414 4x M8x40	BK391 4x M12x50	BK415 4x M16x55	BK416 4x M20x70	BK417 4x M20x75	BK418 4x M30x100	BK419 8x M24x120	BK420 8x M30x140
Recommended torque [Nm]		27	94	234	460	460	1570	935	1910

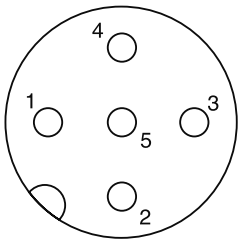
Attention!
The switch may only be adjusted by the valve manufacturer. The exchange of individual modules is not permitted.

C10 UK.INDD CM 07.09.11

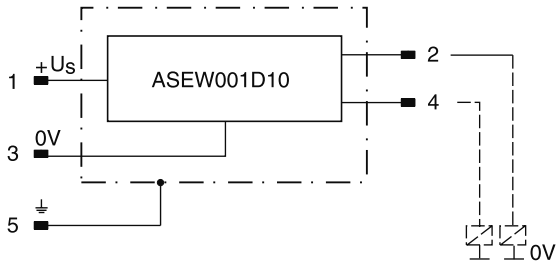
Electrical characteristics of position control as per IEC 61076-2-101 (M12x1), NG16 to NG63

Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Ambient temperature	[°C]	0...+50
Supply voltage U_S / ripple	[V]	18...42 / 10%
Current consumption without load	[mA]	≤ 30
Max. output current per channel, ohmic	[mA]	400
Min. output load per channel, ohmic	[kOhm]	100
Max. output drop at 0.2A	[V]	≤ 1.1
Max. output drop at 0.4A	[V]	≤ 1.6
EMC		EN50081-1 / EN50082-2
Max. tolerance ambient field strength	[A/m]	<1200
Min. distance to next AC solenoid	[m]	>0.1
Interface		M12x1
Wiring min.	[mm²]	5 x 0.25 brad shield recommended
Wiring length max.	[m]	50 recommended

M12 pin assignment



1 + U_S 18...42V
2 Normally open
3 0V
4 Normally closed
5 Earth ground



8

Extract from the German trade association certificate

Fachausschuss Maschinenbau, Hebezeuge, Hütten- und Walzwerksanlagen
Prüf- und Zertifizierungsstelle
im BG-PRÜFZERT

Hauptverband der gewerblichen Berufsgenossenschaften

00 077
Bescheinigungs-Nummer

Name und Anschrift des Bescheinigungsinhabers: (Auftraggeber)	**Parker Hannifin GmbH** Hydraulic Controls Division Gutenbergstr. 38 - 40, D- 41564 Kaarst
Name und Anschrift des Herstellers:	**Parker Hannifin GmbH** Hydraulic Controls Division Gutenbergstr. 38 - 40, D- 41564 Kaarst
Zeichen des Auftraggebers:	Zeichen der Prüf- und Zertifizierungsstelle: MHHW 612.1:612.28-UB Gb/bt
Produktbezeichnung:	**2/2- Wegesitzventil mit Überwachung** **Einbauventil nach DIN 24342 (entspricht DIN ISO 7368)**
Typ:	C10 DEC 101.....

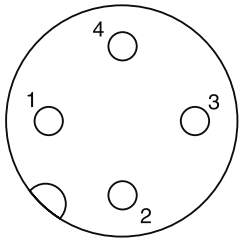
Das geprüfte Baumuster entspricht den einschlägigen Bestimmungen der EG-Maschinenrichtline 2006/42/EG.

C10 UK.INDD CM 07.09.11

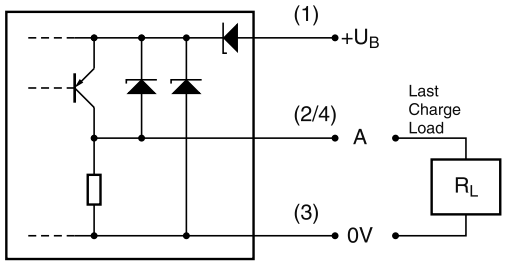
Electrical characteristics of position control M12x1 as per IEC 61076-2-101, NG80 to NG100

Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Ambient temperature	[°C]	0...+50
Supply voltage U_S / ripple	[V]	10...30 / 10%
Current consumption without load	[mA]	≤ 10
Max. output current per channel, ohmic	[mA]	200
Min. output load per channel, ohmic	[kOhm]	100
Max. output drop at 0.2A	[V]	≤ 2
EMC		EN61000-6-4 / EN61000-6-2
Min. distance to next AC solenoid	[m]	>0.1
Interface		M12x1
Wiring min.	[mm²]	3 x 0.14 brad shield recommended
Wiring length max.	[m]	50 recommended

M12 pin assignment



1 + U_S 10...30V
2 Out A: not connected
3 0V
4 Out A: normaly closed



8

Definition

Start position monitored:

The switching point of the inductive switch is within the closed position of the poppet.

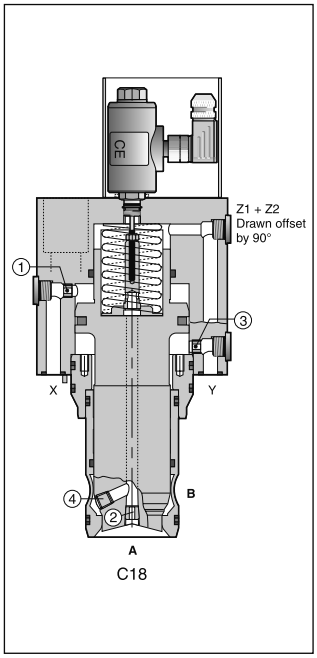
After the inductive switch changes the signal the valve opens.

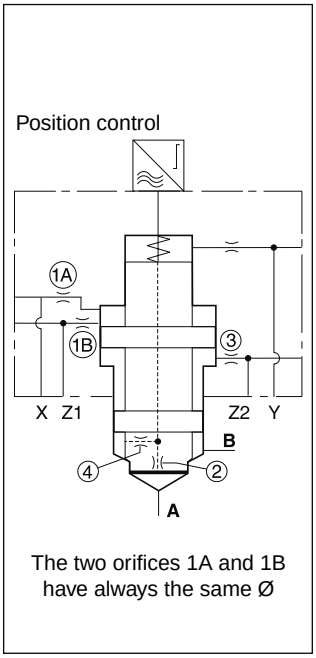
Notes

Active 2/2 way monitored seat valves with cartridge design according to ISO 7368 are preferably used for safety circuits: mainly for safety guards, mould form tools and locking mechanisms for presses and injection moulding machines. Pilot pressure actively opens and closes the main poppet - independently of the pressure in the main ports.

Features

- German trade association certificate, No. 00 078
- Cavity and mounting pattern acc. to ISO 7368
- Monitored closed position
- Inductive switch CE conform
- Active design with separate control surfaces
- Sealing between control surfaces and connection B
- 5 sizes NG25 up to NG63





The two orifices 1A and 1B have always the same Ø

Ordering code

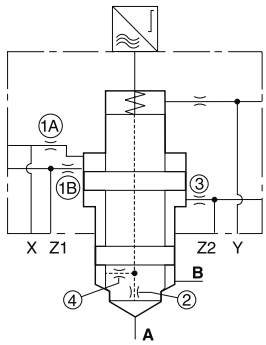
	C	18	D	E	C	107	E		/ 0					
												1	2	3	4
Seal	**2/2 way valve**	**Poppet shape**	**Hydraulically operated**	**Design series**	**Inductive monitoring German trade association certificate 00 077**	**Cover**	**Slip-in cartridge**	**Nominal size**	**Cavity and mounting pattern DIN ISO 7368**	**Spring**	**Orifice**			

Code	Seal
omit	NBR
V	FPM

Code	Size
25	NG25
32	NG32
40	NG40
50	NG50
63	NG63

Code	Spring
S	Opening pressure 1.6 bar
U	Opening pressure 4.0 bar

Code	Orifice
99	Without orifice, open



◯ Orifice (see accessories)

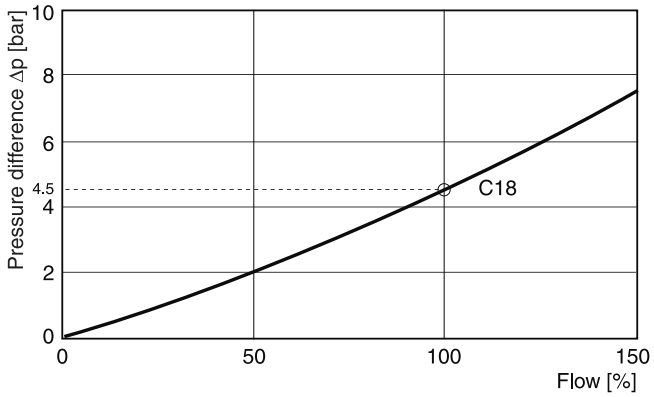
8

Technical data

General							
Size			NG25	NG32	NG40	NG50	NG63
Interface			2 way slip-in cartridge valves DIN ISO 7368				
Mounting position			unrestricted				
Operation			Hydraulic				
Ambient temperature		[C°]	-40...+60				
$MTTF_D$ value		[years]	150				
Weight		[kg]	3.2	6.7	8.7	13.8	26.3
Hydraulic							
Max. operating pressure, all connections		[bar]	350				
Nominal flow, Δp 5 bar		[L/min]	400	800	1250	1625	3400
Fluid			Hydraulic oil acc. to DIN 51 524...525				
Fluid temperature	recommended	[C°]	+30...+50				
	permitted	[C°]	-20...+60				
Viscosity	recommended	[cSt] / [mm²/s]	30...80				
	permitted	[cSt] / [mm²/s]	20...380				
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)				
Control volume spring chamber, surface C		[cm^3]	6.45	12.21	20.32	39.40	94.56
Control surface	FC	[%]	100				
	FSt	[%]	123.8	108.6	121.5	117	121
	FA/B	[%]	approx. 60 / 40 related on surface C				
Opening pressure	flow direction B—>A	[bar]	Spring: L = 0.25; N = 1.25; S = 4.0; U = 10.0				
	flow direction A—>B	[bar]	Spring: L = 0.16; N = 0.85; S = 2.7; U = 6.6				
Electrical (inductive switch)			See position control				

8

Flow diagram



Characteristic curve measured with HLP46 at 50°C.

Orifice thread

Orifice	NG25	NG32	NG40	NG50	NG63
①	M6	M6	M6	*1/16	*1/8
②	M6	M6	M6	*1/16	*1/16
③	M6	M6	M6	*1/16	*1/8
④	M6	M6	M6	*1/16	*1/16

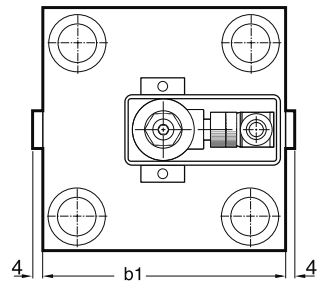
*Thread in NPT

Recommended orifice diameter

Orifice	NG25	NG32	NG40	NG50	NG63
①-④	Ø 1.2	Ø 1.5	Ø 2.0	Ø 2.5	Ø 3.0

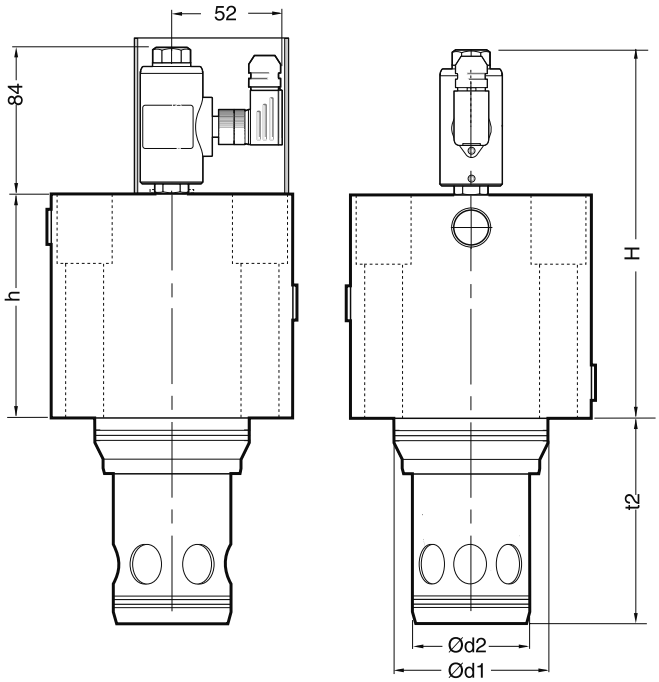
Depending on function, plugs must be used.

Dimensions

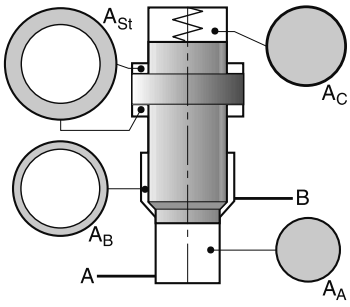


Cavity hole and mounting pattern acc. to ISO 7368.
See series CE and C.

Nominal size	25	32	40	50	63
H	174	174	194	214	234
h	90	90	110	130	150
b1	85	102	125	140	180
d1	45	60	75	90	120
d2	34	45	55	68	90
t2 +0.1	72	85	105	122	155



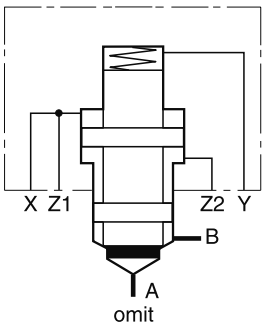
Control surfaces

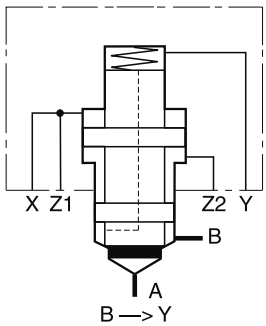


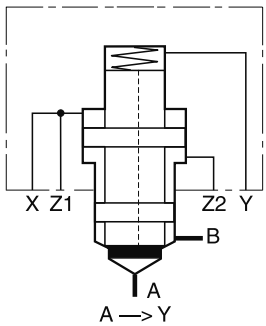
NG	A_A [%]	A_B [%]	A_C [%]	A_{St} [%]
25	60	40	100	124
32	60	40	100	109
40	60	40	100	121
50	60	40	100	117
63	60	40	100	121

8

Pilot guide inside the poppet







Seal and bolt kits

Nominal size		25	32	40	50	63
Seal kit	FPM	SK-C13DB10-E25V	SK-C13DB10-32V	SK-C13DB-E40V	SK-C13DB10-E50V	SK-C13DB10-E63V
	NBR	SK-C13DB10-E25	SK-C13DB10-32	SK-C13DB10-E40	SK-C13DB10-E50	SK-C13DB10-E63
Bolt kit	[DIN 912 12.9]	BK523, 4x M12x90	BK511, 4x M16x90	BK481, 4x M20x110	BK513, 4x M20x120	BK518,4x M30x160
Recommemded torque	[Nm]	94	234	460	460	1570

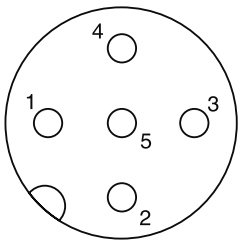
Attention!
The switch may only be adjusted by the valve manufacturer. The exchange of individual modules is not permitted.

C18D_C UK.INDD CM 07.09.11

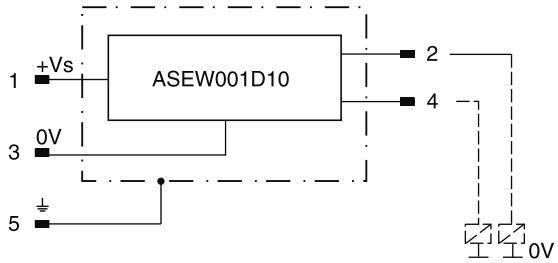
Electrical characteristics of position control as per IEC 61076-2-101 (M12x1)

Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Ambient temperature	[°C]	0...+50
Supply voltage / ripple	[V]	18...42 / 10%
Current consumption without load	[mA]	≤ 30
Max. output current per channel, ohmic	[mA]	400
Min. output load per channel, ohmic	[kOhm]	100
Max. output drop at 0.2A	[V]	≤ 1.1
Max. output drop at 0.4A	[V]	≤ 1.6
EMC		EN50081-1 / EN50082-2
Max. tolerance ambient field strength	[A/m]	<1200
Min. distance to next AC solenoid	[m]	>0.1
Interface		M12x1
Wiring min.	[mm²]	5 x 0.25 brad shield recommended
Wiring length max.	[m]	50 recommended

M12 pin assignment



1 + Supply 18...42V
2 Normally open
3 0V
4 Normally closed
5 Earth ground



8

Extract from the German trade association certificate

Fachausschuss Maschinenbau, Hebezeuge, Hütten- und Walzwerksanlagen
Prüf- und Zertifizierungsstelle
im BG-PRÜFZERT

Hauptverband der gewerblichen Berufsgenossenschaften

00 078
Bescheinigungs-Nummer

Name und Anschrift des Bescheinigungsinhabers: (Auftraggeber)	**Parker Hannifin GmbH** Hydraulic Controls Division Gutenbergstr. 38 - 40, D- 41564 Kaarst
Name und Anschrift des Herstellers:	**Parker Hannifin GmbH** Hydraulic Controls Division Gutenbergstr. 38 - 40, D- 41564 Kaarst
Zeichen des Auftraggebers:	Zeichen der Prüf- und Zertifizierungsstelle: MHHW 612.1:612.28-UB Gb/bt
Produktbezeichnung:	**2/2- Wegesitzventil mit Überwachung** **aktiv gesteuerte Einbauventile nach DIN 24342 (entspricht DIN ISO 7368)**
Typ:	C18 DEC 107.....

Das geprüfte Baumuster entspricht den einschlägigen Bestimmungen der EG-Maschinenrichtline 2006/42/EG.

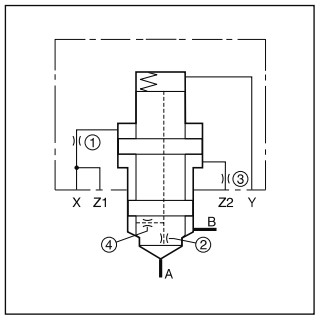
C18D_C UK.INDD CM 07.09.11

Active 2/2 way seat valves with cartridge design according to ISO 7368 are preferably used where opening and closing should be controlled by pilot pressure only - independently of the pressure in the main ports.

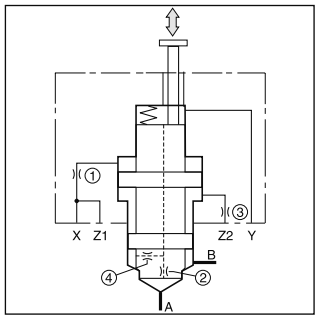
The C18 DB series is offered as hydraulically controlled valve (C18 DB 107), with additional stroke limiter (C18 DBN 112) and with the mounting pattern for a pilot valve (C18 DB 121).

Features

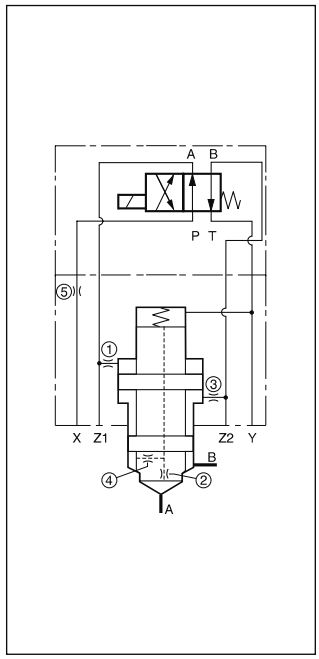
- Cavity and mounting pattern acc. to ISO 7368
- Active design with separate control areas
- Sealing between control surfaces and connection B
- Up to 5 sizes:
  - C18 DB 107 5 sizes NG25 up to NG63
  - C18 DBN 112 3 sizes NG25 up to NG40
  - C18 DB 121 2 sizes NG32 up to NG40



C18DB107

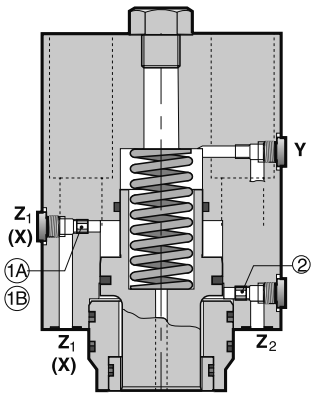


C18DBN112

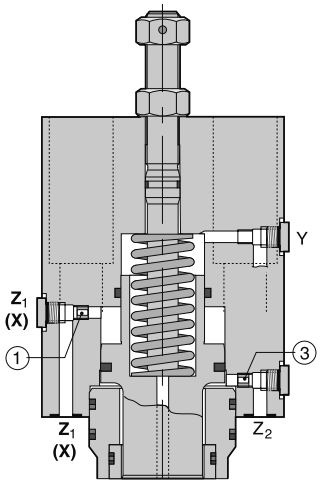


C18DB121

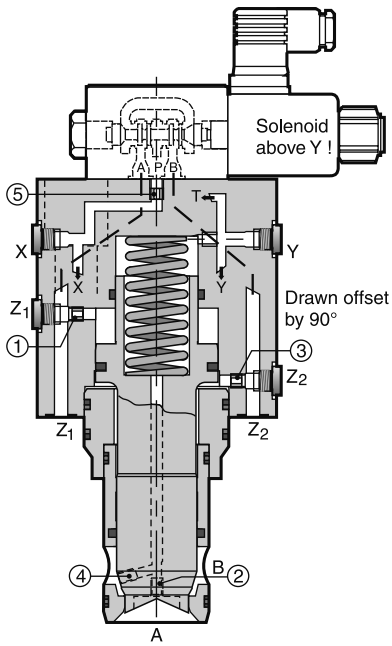
8



C18DB107



C18DBN112



C18DB121

	C	18	D	B			E		/ 0						
											1	2	3	4	5 [1]
Seal	**2/2 way valve**	**Poppet with damping**	**Hydrau-lically operated**	**Design series**	**Stroke limiter**	**Cover**	**Slip-in cartridge**	**Nominal size**	**Cavity and mounting pattern DIN ISO 7368**	**Spring**	**Orifice**				

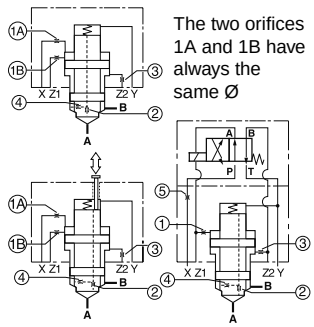
Code	Seal
omit	NBR
V	FPM

Code	Stroke limiter
omit	Cover 107 and 121, no stroke limiter
N	Cover 112, with stroke limiter, adjustment spindle and lock nut

Code	Cover
107	Standard, without add. function
112	With stroke limiter, only NG25, 32 and 40
121	Designed for DC pilot valves only NG32 and 40

Code	Size
25	NG25
32	NG32
40	NG40
50	NG50
63	NG63

Code	Orifice
99	Without orifice, open



The two orifices 1A and 1B have always the same Ø

◯ Orifice (see accessories)

Code	Spring
S	Opening pressure 1.6 bar
U	Opening pressure 4.0 bar

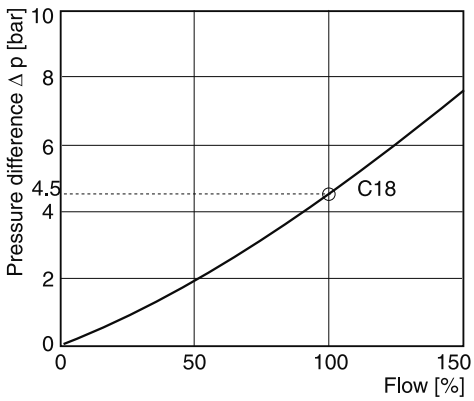
[1] only for code 121

8

Technical data

General							
Size			NG25	NG32	NG40	NG50	NG63
Design type			2 way slip-in cartridge valves DIN ISO 7368				
Mounting position			unrestricted				
Operation			Hydraulic				
Ambient temperature		[C°]	-40...+60				
$MTTF_D$ value		[years]	150				
Weight		[kg]	3.2	6.7	8.7	13.8	26.3
Hydraulic							
Operating pressure, all connections		[bar]	350				
Nominal flow, Δp 5 bar		[L/min]	450	900	1300	1800	3600
Fluid			Hydraulic oil according to DIN 51524...51525				
Fluid temperature	recommended	[C°]	+30...+50				
	permitted	[C°]	-20...+60				
Viscosity	recommended	[cSt] / [mm²/s]	30...80				
	permitted	[cSt] / [mm²/s]	20...380				
Contamination			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)				
Control volume spring chamber, surface C		[cm³]	6.45	12.21	20.32	39.40	94.56
Control surface	FC	[%]	100				
	FSt	[%]	123.8	108.6	121.5	117	121
	FA/B	[%]	approx. 60 / 40 related on surface C				
Opening pressure	flow direction B—>A	[bar]	Spring: L = 0.25; N = 1.25; S = 4.0; U = 10.0				
	flow direction A—>B	[bar]	Spring: L = 0.16; N = 0.85; S = 2.7; U = 6.6				

Flow diagram



Characteristic curve measured with HLP46 at 50°C.

Orifice thread

Orifice	NG25	NG32	NG40	NG50	NG63
①	M6	M6	M6	*1/16	*1/8
②	M6	M6	M6	*1/16	*1/16
③	M6	M6	M6	*1/16	*1/8
④	M6	M6	M6	*1/16	*1/16
⑤	—	M6	M6	—	—

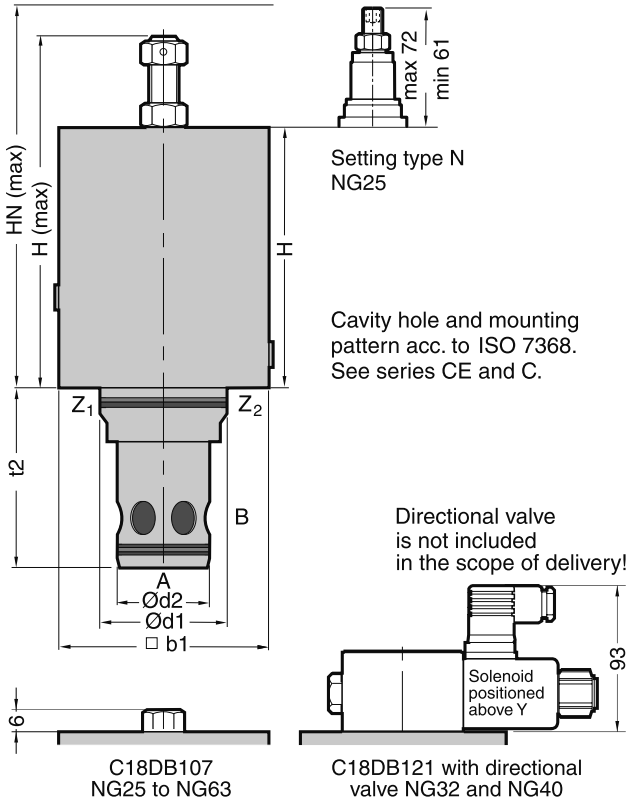
*Thread in NPT

Recommended orifice diameter

Orifice	NG25	NG32	NG40	NG50	NG63
①-⑤	Ø 1.2	Ø 1.5	Ø 2.0	Ø 2.5	Ø 3.0

Depending on function, plugs and orifices must be used (code 00).

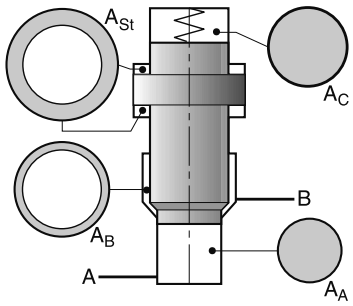
Dimensions



Nominal size	25	32	40	50	63
H max	234	142	208	189	241
HN max	162	197	227	202	222
h	90	125	140	130	150
b1	85	102	125	140	180
d1	45	60	75	90	120
d2	34	45	55	68	90
t2 + 0.1	72	85	105	122	155

8

Control surfaces



NG	A_A [%]	A_B [%]	A_C [%]	A_{St} [%]
25	60	40	100	124
32	60	40	100	109
40	60	40	100	121
50	60	40	100	117
63	60	40	100	121

Seal kits

Nominal size		25	32	40	50	63
Seal kit	FPM	SK-C13DB10-E25V	SK-C13DB10-32V	SK-C13DB-E40V	SK-C13DB10-E50V	SK-C13DB10-E63V
	NBR	SK-C13DB10-E25	SK-C13DB10-32	SK-C13DB10-E40	SK-C13DB10-E50	SK-C13DB10-E63

Mounting kits

Nominal size		25	32	40	50	63
Cover code 107 consisting of:	[DIN 912 12.9]	BK523, 4x M12x90-	BK529, 4x M16x100	BK481, 4x M20x110	BK513, 4x M20x120	BK518, 4x M30x160
Cover code 112 consisting of:	[DIN 912 12.9]	BK523, 4x M12x90-	BK529, 4x M16x100	BK481, 4x M20x110	—	—
Cover code 121 consisting of:	[DIN 912 12.9]	—	BK529, 4x M16x100	BK481, 4x M20x110	—	—
Recommended torque	[Nm]	94	234	460	460	1570

Series	Description	Size				Mounting		Configuration		Page
	DIN / ISO	¾	1	1¼	1½	SAE61	SAE62	2-port	3-port	
	Pressure valves, manual operation									
R5V	Pressure relief function	•	•	•	•	•	•	•	•	9-3
R5U	Pressure unloading function	•	•	•	•	•			•	9-9
R5S	Pressure sequence function	•	•	•		•			•	9-15
R5R	Pressure reducing function	•	•	•		•		•		9-19
	Pressure valves, proportional operation									
R5V*P2	Pressure relief function	•	•	•	•	•	•	•	•	9-25
R5R*P2	Pressure reducing function	•	•	•		•		•		9-31
	Directional seat valves									
D5S		•	•	•	•	•		•	•	9-35
	Flow valves									
F5C	Throttle valves, proportional	•	•	•		•		•		9-49
R5A	2-way pressure compensator	•	•	•		•		•		9-53
R5P	3-way pressure compensator	•	•	•	•	•			•	9-55
	Check valves									
C5V	Direct operated	•	•	•	•	•	•	•		9-63
C5P	Pilot and direct operated	•	•	•		•		•		9-67
	Accessories									
	Bolt kits, flanges, plugs									9-71

9

Notes

Pilot operated pressure relief valves series R5V have a similar design to the subplate mounted R4V series. The SAE flanges allow to mount the valves directly on the outlet flanges of pumps or inlet flanges of actuators to achieve a very compact design.

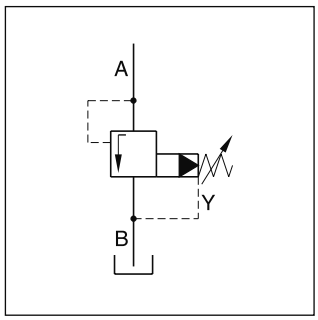
Valves with SAE flanges can also be bolted together to combine functions without the need of a manifold block.

Features

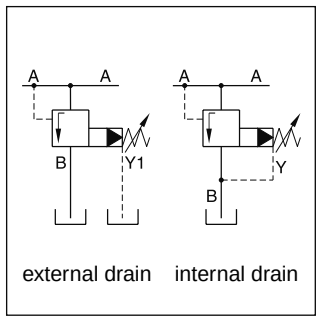
- Pilot operated with manual adjustment
- R5V with 2-port body
  - 3 sizes (SAE ¾", 1", 1¼")
  - SAE61 flange
- R5V with 3-port body
  - 4 sizes (SAE ¾", 1", 1¼", 1½")
  - SAE61 and SAE62 flange
- 3 pressure stages
- 3 adjustment modes
  - Hand knob
  - Acorn nut with lead seal
  - Key lock
- With optional vent function

R5V 2-port

R5V 3-port

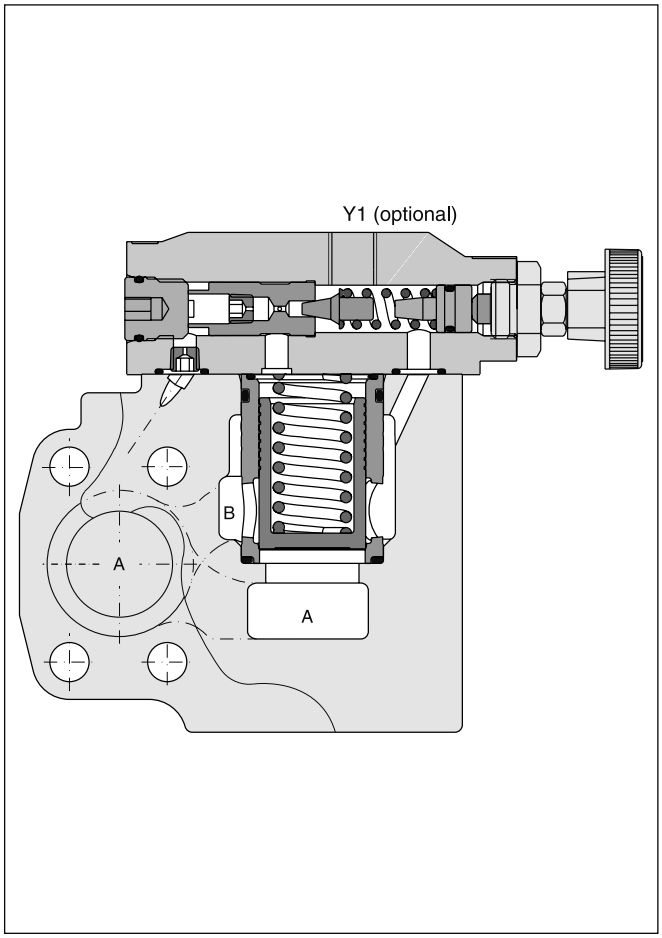


R5V 2-port

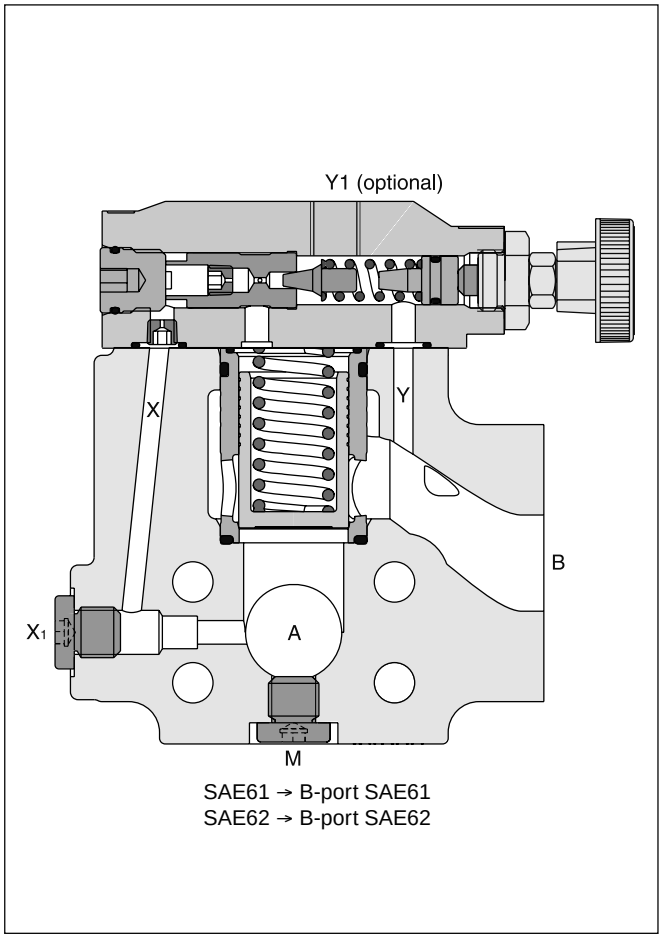


R5V 3-port

R5V 2-port



R5V 3-port



SAE61 → B-port SAE61
SAE62 → B-port SAE62

9

R5V	□	–	□	□	□	□	□	□	A	□	□	□
Pressure relief valve	**Nominal size**		**SAE Interface**	**Pilot ports**	**Pressure stages**	**Adjust-ment**	**Pilot oil**	**Switching type**	**Solenoid voltage**	**Design**	**Seals**	**Design series** (not required for ordering)	**Options**

Code	Port size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"
12 [1]	SAE 1½"

[1] only R5V 3-port

SAE 61		
Code	Size	Max. pressure [bar]
3	12	210
4	10	280
5	06/08	350
SAE 62		
Code	Size	Max. pressure [bar]
6 [2]	06/08/10/12	350

[2] only R5V 3-port

2-port body	
Code	pilot ports
7	Y1 = G¼" [3]
3-port body	
Code	pilot ports
9	Y1 [2], X1, M = G¼"

[3] Y1 only available at external drain (pilot oil code 6)

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5 [4]	up to 350 bar

[4] R5V10-4*5 up to 280 bar

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal
4	Key lock

Further options on request

Code	Options
008	Vent function with slow unloading
070	Metric 3-port body for R5V10 SAE62: Pressure ports (A): SAE62 with 15 mm through holes (for M14), Tank port: SAE61 (M12)
152 [6]	3-port body with metric threads

[6] R5V08 SAE62: Tank port SAE61 (M10)

Code	Seals
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR [5]	98V=
GAG [5]	205V=
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

[5] To be used in combination with rectifier plugs at 120VAC/230VAC power supply.

Code	Switching type
omit	Standard w/o vent function
09	Solenoid not activ. unpress. circulation
11	Solenoid activated unpress. circulation

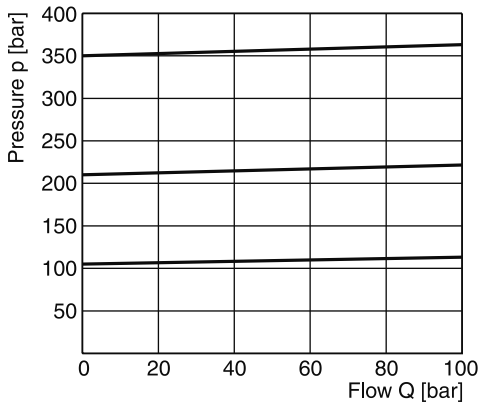
Pilot oil	
Code	Drain line
2	internal
6	external from Y1-port

Technical data

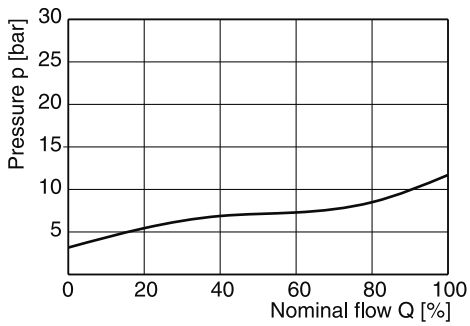
General						
Size			06 (¾")	08 (1")	10 (1¼")	12 (1½")
Mounting			Flanged according to SAE 61 and SAE 62			
Mounting position			unrestricted			
Ambient temperature		[°C]	-20...+50			
$MTTF_D$ value		[years]	75			
Weight	R5V 2port	[kg]	4.0	4.6	5.9	—
	R5V 3port	[kg]	3.6	4.6	5.2	8.0
Hydraulic						
Max. operating pressure		[bar]				
	SAE61 Ports A, B		350	350	280	210
	Port Y1		30	30	30	30
	SAE62 Ports A, B		350	350	350	350
	Port Y1		30	30	30	30
Pressure stages		[bar]	105, 210, 350			
Nominal flow		[l/min]	90	300	600	600
Fluid			Hydraulic oil according to DIN 51524...51525			
Fluid temperature		[°C]	-20...+80			
Viscosity,	permitted	[cSt] / [mm^2/s]	10...650			
	recommended	[cSt] / [mm^2/s]	30			
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)			
Electrical (solenoid)						
Duty ratio		[%]	100			
Solenoid connection			Connector as per EN175301-803			
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
		Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage		[V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage		[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption	hold	[W]	31	31	31	31	78	78
	in rush	[W]	31	31	31	31	264	264
Response time		[ms]	Energized / De-energized AC: 20/18 , DC: 46/27					
Max. switching frequency			AC: up to 7200, DC: up to 16000 switchings/hour					
Coil insulation class			H (180 °C)					

9

p/Q performance curve



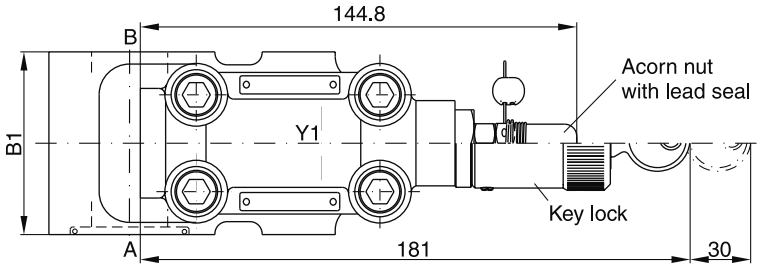
Minimum pressure curve

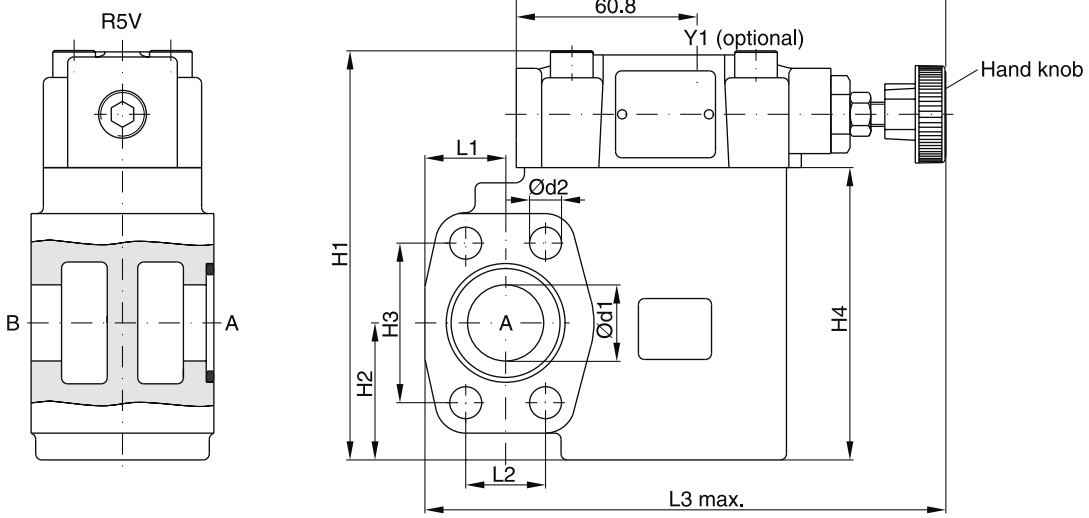


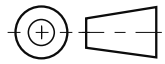
All characteristic curves measured with HLP46 at 50°C.

The performance curves are measured with external drain.
For internal drain the tank pressure has to be added to curve.

Dimensions R5V 2-port







9

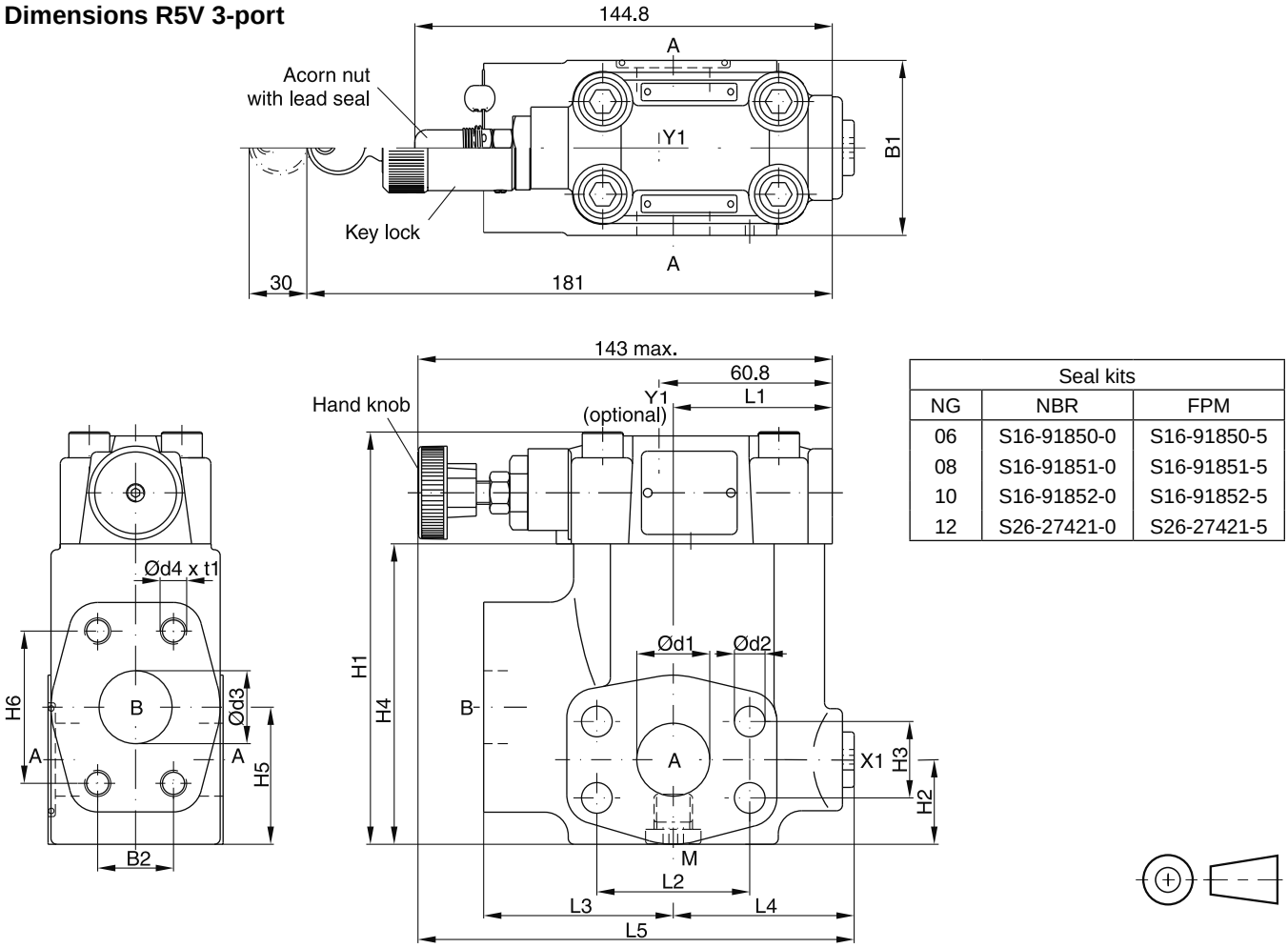
SAE61

Seal kits		
NG	NBR	FPM
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5

NG	B1	H1	H2	H3	H4	L1	L2	L3	d1	d2
06	60	131.6	37	47.6	90	24.6	22.2	152	19	10.5
08	60	137.6	45	52.4	96	26.5	26.2	171	25	10.5
10	75	150.6	48	58.7	109	34.0	30.2	179	32	12.5

Port	Function	Port size		
		R5V06	R5V08	R5V10
A	Pressure	¾" SAE61	1" SAE61	1¼" SAE61
B	Tank	¾" SAE61	1" SAE61	1¼" SAE61
Y1	External drain	G¼"		

Dimensions R5V 3-port



Seal kits		
NG	NBR	FPM
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5
12	S26-27421-0	S26-27421-5

9

SAE61

NG	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	d1	d2	d3	d4 (option 152)	t1
06	60	22.2	119	29.5	22.2	81	41.6	47.6	50.3	47.6	63	56	152	19	10.5	19	3/8”-16 UNC (M10)	20
08	60	26.2	141	30.5	26.2	103	47	52.4	55.8	52.4	65	58	149	25	10.5	25	3/8”-16 UNC (M10)	23
10	75	30.2	151	37.5	30.2	113	64	58.7	57.8	58.7	61	62	150.5	32	12.5	32	7/16”-14 UNC (M12)	22
12	80	35.7	178	35.5	35.7	140	73	69.8	37.3	69.8	92.5	55.2	171.2	38	13.5	38	1/2”-13 UNC (M12)	27

SAE62

NG	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	d1	d2	d3	d4 (option 152)	t1
06	60	23.8	119	29.5	23.8	81	41.6	50.8	50.3	50.8	63	56	152	19	10.5	19	3/8”-16 UNF (M10)	20
08	60	27.8	141	30.5	27.8	103	47	57.2	55.8	57.2	65	58	149	25	12.5	25	7/16”-14 UNC (M10)[1]	22
10	75	31.8	151	37.5	31.8	113	64	66.7	57.8	66.7	61	62	150.5	32	13.5	32	1/2”-13 UNC (M12)	24
12	80	36.5	178	35.5	36.5	140	73	79.4	37.3	79.4	92.5	55.2	171.2	38	17	38	5/8”-11 UNC (M16)	33

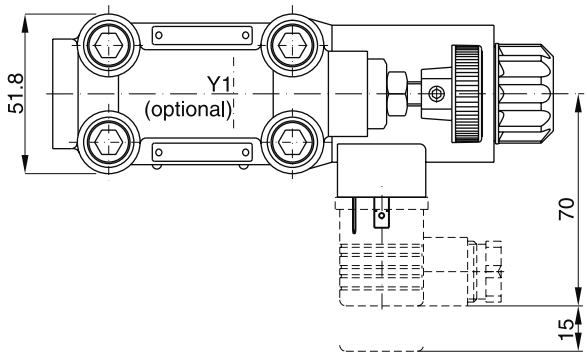
[1] T-port SAE61

Port	Function	Port size			
		R5V06	R5V08	R5V10	R5V12
A (2)	Pressure	¾" SAE61/62	1" SAE61/62	1¼" SAE61/62	1½" SAE61/62
B	Tank	¾" SAE61/62	1" SAE61/62	1¼" SAE61/62	1½" SAE61/62
X1	External pilot port [2]	G¼"			
Y1	External drain	G¼"			
M	Pressure gauge	G¼"			

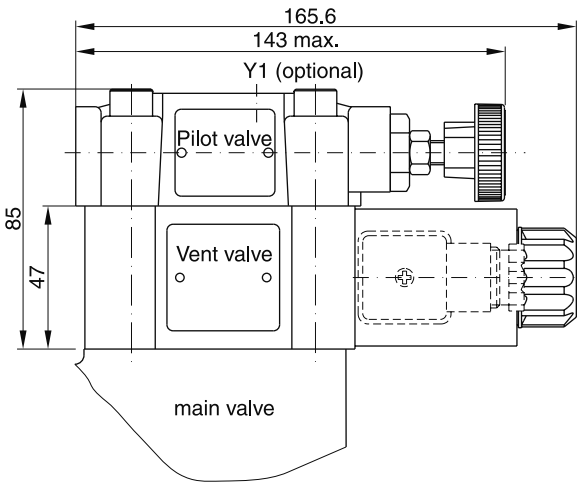
[2] closed when supplied

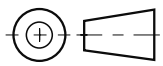
R5V UK.INDD CM 09.08.11

Dimensions R5V with vent function

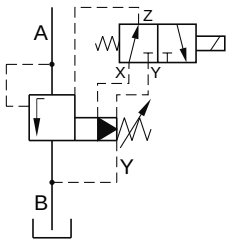
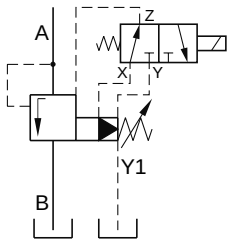
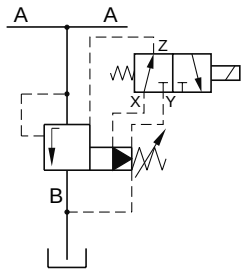
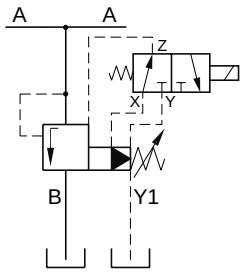
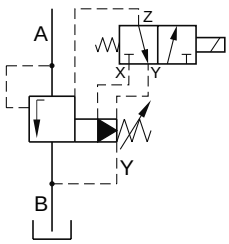
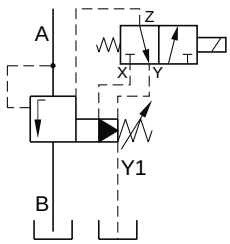
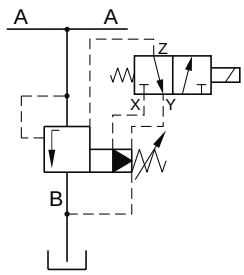
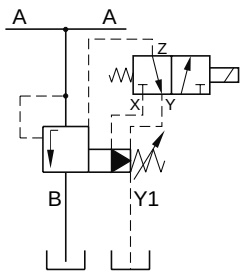


Seal kits	
NBR	FPM
DC solenoid	
S26-58515-0	S26-58515-5
AC solenoid	
S26-35237-0	S26-35237-5





9

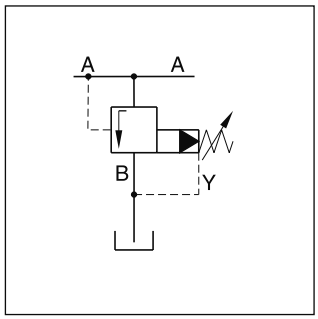
	R5V 2-port		R5V 3-port	
Code	Internal drain	External drain	Internal drain	External drain
11				
09				

Pilot operated pressure unloading valves series R5U have a similar design to the subplate mounted R4U series. The SAE flanges allow to mount the valve directly on the outlet flanges of pumps.

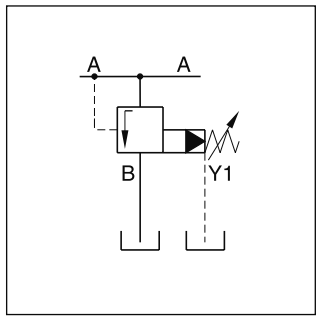
A typical application is the unloading of a pump in an accumulator circuit. The combination of an R5U, C5V and R5V on a double pump generates a high pressure / low pressure pump system without the need of a manifold block or piping between the valves.

Features

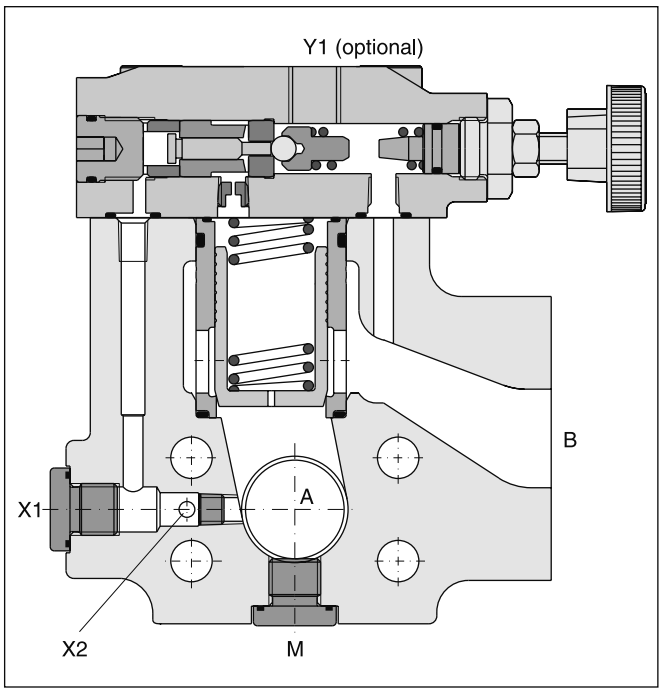
- Pilot operated unloading valve
- 3-port body with SAE61 flange
- 4 sizes (SAE ¾", 1", 1¼", 1½")
- 3 pressure stages
- 3 adjustment modes
  - Hand knob
  - Acorn nut with lead seal
  - Key lock
- With optional vent function



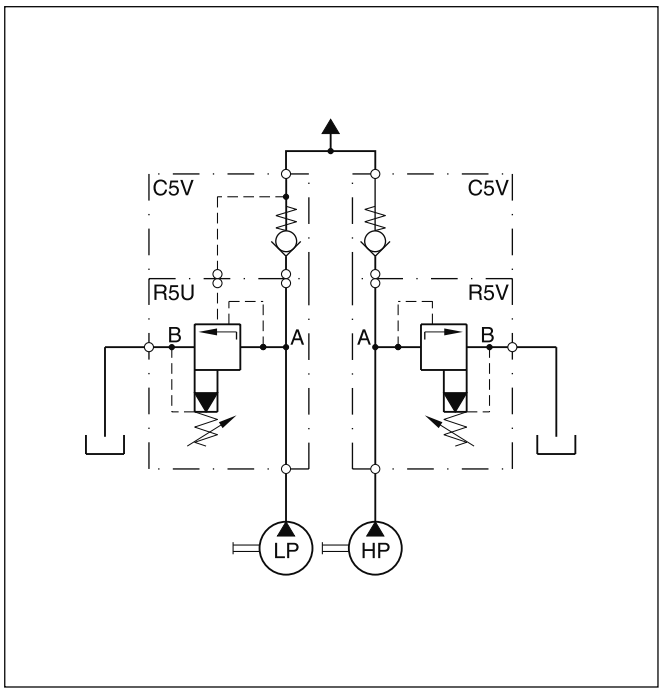
R5U 3-port internal drain



R5U 3-port external drain



High pressure / low pressure system



9

R5U		–		9							A		
Pressure unloading valve	**Nominal size**		**SAE61 interface**	**3-port body M, Y1, X = G¼"**	**Pressure stages**	**Adjust-ment**	**Pilot oil**	**Switching type**	**Solenoid voltage**		**Design series**	**Seals**	**Options**

Code	Port size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"
12	SAE 1½"

SAE 61		
Code	Size	Max. pressure [bar]
3	12	210
4	10	280
5	06/08	350

Code	Pressure stages [bar]	Pressure differential
1	up to 105	28%
3	up to 210	28%
5 [1]	up to 350	15%

[1] R5U10-4*5 up to 280 bar

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal
4	Key lock

Code	Seals
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR [2]	98V=
GAG [2]	205V=
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

[2] To be used in combination with rectifier plugs at 120VAC/230VAC power supply.

Code	Switching type
omit	Standard w/o vent function
09	Solenoid not activ. unpress. circulation
11	Solenoid activated unpress. circulation

Pilot oil		
Code	Pilot	Drain
4	External via port X1 or X2	External
5	External via port X1 or X2	Internal

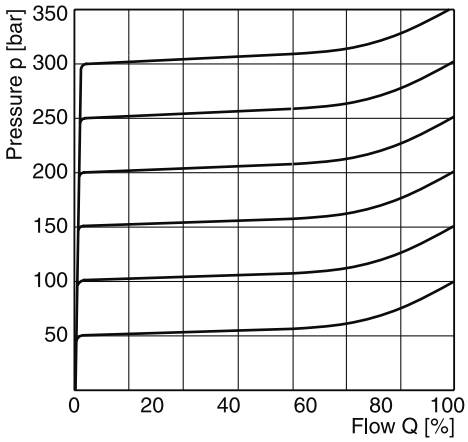
Further options on request

Technical data

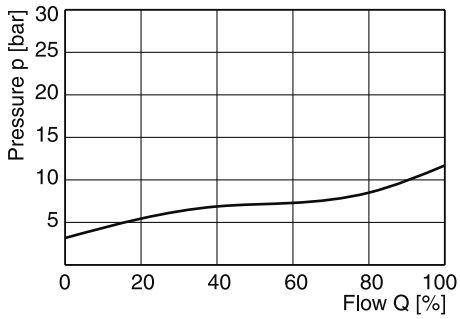
General							
Size			06 (¾")	08 (1")	10 (1¼")	12 (1½")	
Mounting			Flanged according to SAE 61				
Mounting position			unrestricted				
Ambient temperature		[°C]	-20...+50				
$MTTF_D$ value		[years]	75				
Weight		[kg]	3.6	4.6	5.2	8.0	
Hydraulic							
Max. operating pressure		[bar]					
	Ports A, B, X		350	350	280	210	
	Ports Y, Y1		30	30	30	30	
Pressure stages		[bar]	105, 210, 350				
Nominal flow		[l/min]	90	300	600	600	
Fluid			Hydraulic oil according to DIN 51524...51525				
Fluid temperature		[°C]	-20...+80				
Viscosity	permitted	[cSt] / [mm^2/s]	10...650				
	recommended	[cSt] / [mm^2/s]	30				
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)				
Electrical							
Duty ratio		[%]	100				
Solenoid connection			Connector as per EN175301-803				
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)				
		Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage		[V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage		[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption	hold	[W]	31	31	31	31	78	78
	in rush	[W]	31	31	31	31	264	264
Response time		[ms]	Energized / De-energized AC: 20/18 , DC: 46/27					
Max. switching frequency			AC: up to 7200, DC: up to 16000 switchings/hour					
Coil insulation class			H (180 °C)					

9

p/Q performance curve



Minimum pressure curve

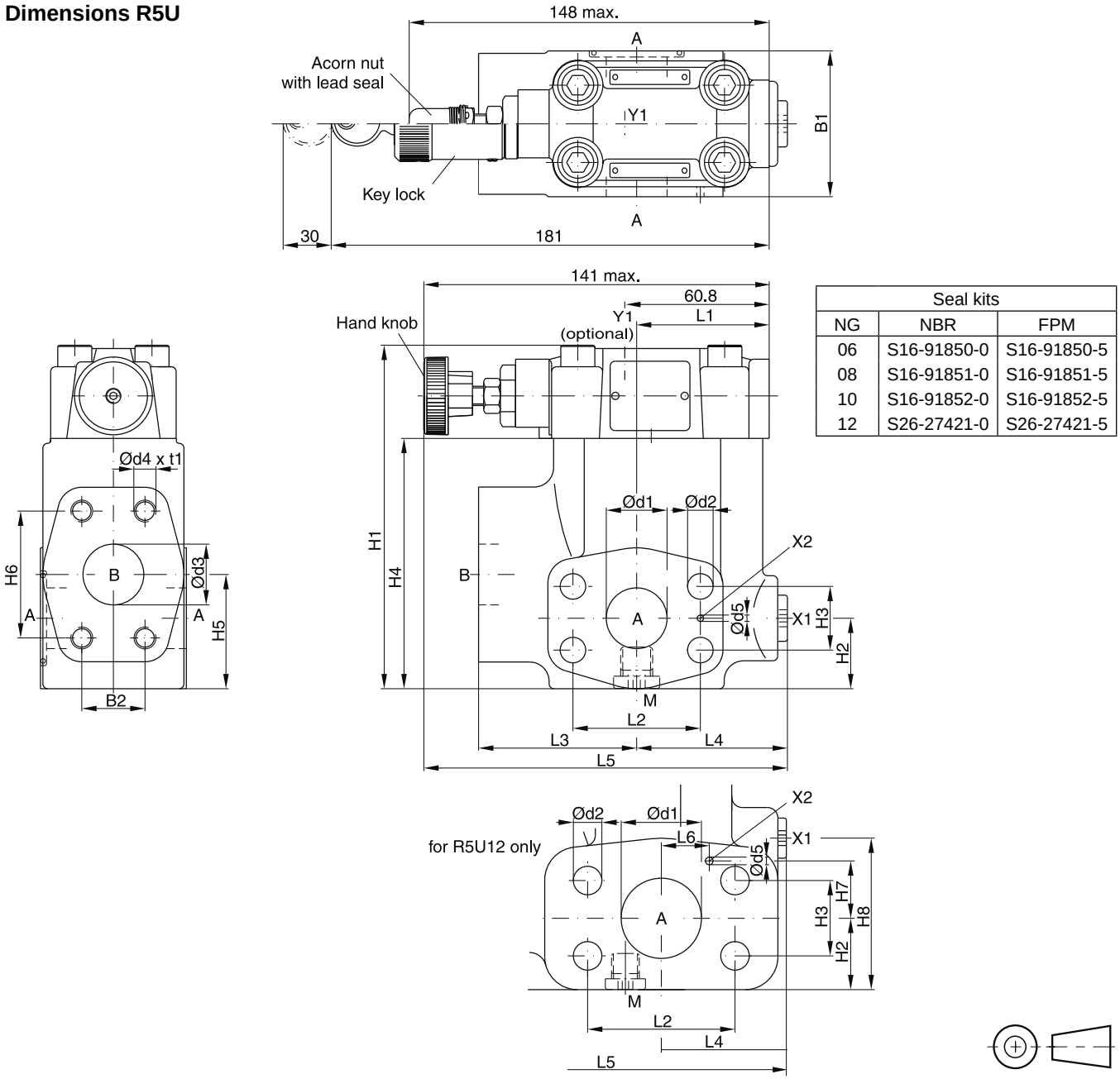


All characteristic curves measured with HLP46 at 50°C.

The performance curves are measured with external drain.
For internal drain the tank pressure has to be added to curve.

R5U UK.INDD CM 02.08.11

Dimensions R5U



Seal kits		
NG	NBR	FPM
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5
12	S26-27421-0	S26-27421-5

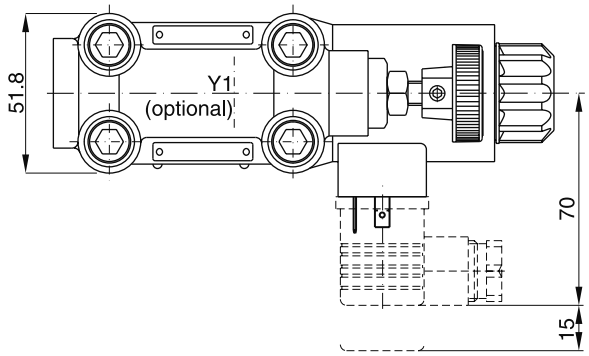
NG	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	d1	d2	d3	d4	t1	d5	L6	H7	H8
06	60	22.2	119	29.5	22.2	81	41.6	47.6	50.3	47.6	63	56	152	19	10.5	19	3/8”-16 UNC	20	3.0	–	–	–
08	60	26.2	141	30.5	26.2	103	47	52.4	55.8	52.4	65	58	149	25	10.5	25	3/8”-16 UNC	23	3.0	–	–	–
10	75	30.2	151	37.5	30.2	113	64	58.7	57.8	58.7	61	62	150.5	32	12.5	32	7/16”-14 UNC	22	3.0	–	–	–
12	80	35.7	178	35.5	35.7	140	73	69.8	37.3	69.8	92.5	55.2	171.2	38	13.5	38	1/2”-13 UNC	27	3.0	22.4	27.2	73

Port	Function	Port size			
		R5U06	R5U08	R5U10	R5U12
A (2)	Pressure	¾" SAE61	1" SAE61	1¼" SAE61	1½" SAE61
B	Tank	¾" SAE61	1" SAE61	1¼" SAE61	1½" SAE61
X1	External pilot port [1]	G¼"			
Y1	External drain	G¼"			
M	Pressure gauge	G¼"			

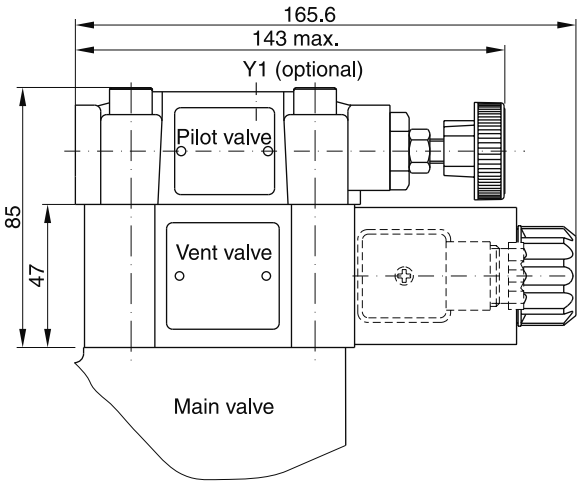
[1] closed when supplied

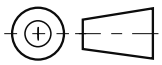
R5U UK.INDD CM 02.08.11

Dimensions R5U with vent function

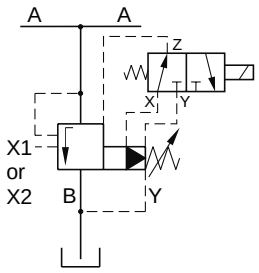
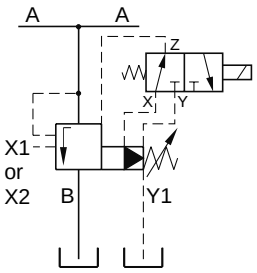
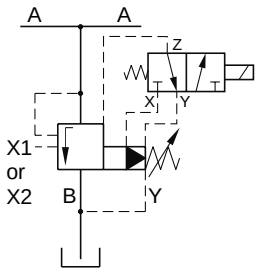
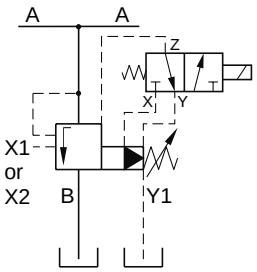


Seal kits	
NBR	FPM
DC solenoid	
S26-58515-0	S26-58515-5
AC solenoid	
S26-35237-0	S26-35237-5



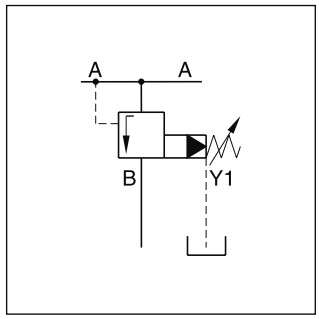


9

Code	Internal drain	External drain
11		
09		

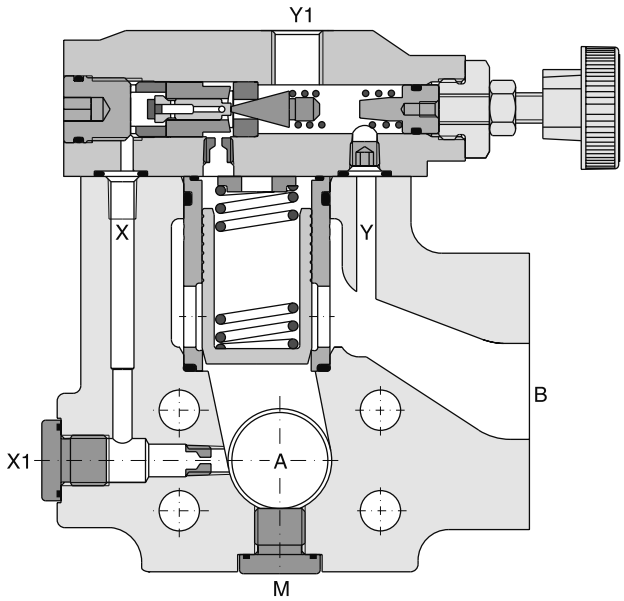
Notes

Pilot operated sequence valves series R5S have a similar design to the subplate mounted R4S series. The SAE flanges allow to mount the valve directly on the inlet flanges of actuators or outlet flanges of pumps to achieve a very compact design.



Features

- Pilot operated with manual adjustment
- 3-port body with SAE61 flange
- 3 sizes (SAE ¾", 1", 1¼")
- 3 pressure stages
- 2 adjustment modes
  - Hand knob
  - Acorn nut with lead seal
- Optional with vent function (on request)



Ordering code

R5S		–		9			6	A		
Pressure sequence valve	Nominal size		SAE61 interface	3-port body (Y1, M = G¼")	Pressure stages	Adjust-ment	External drain from Y1 port	Design series	Seals	Options

Code	Port size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"

SAE 61		
Code	Size	Max. pressure [bar]
4	10	280
5	06/08	350

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5 [1)]	up to 350 bar

[1)] R5S10-495 up to 280 bar

Code	Seals
1	NBR
5	FPM

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal

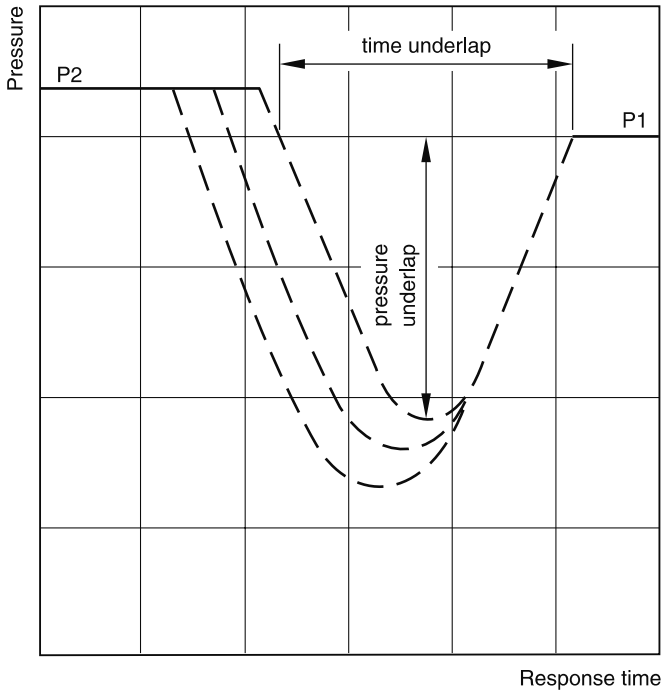
Further options on request

9

Technical Data

General				
Size		06 (¾")	08 (1")	10 (1¼")
Mounting		Flanged according to SAE 61		
Mounting position		unrestricted		
Ambient temperature	[°C]	-20...+50		
$MTTF_D$ value	[years]	75		
Weight	[kg]	3.6	4.6	5.2
Hydraulic				
Max. operating pressure	[bar]			
Ports A, B		350	350	280
Ports Y, Y1		30	30	30
Pressure stages	[bar]	105, 210, 350		
Nominal flow	[l/min]	90	300	600
Fluid		Hydraulic oil according to DIN 51524...51525		
Fluid temperature	[°C]	-20...+80		
Viscosity permitted	[cSt] / [mm^2/s]	10...650		
Viscosity recommended	[cSt] / [mm^2/s]	30		
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)		

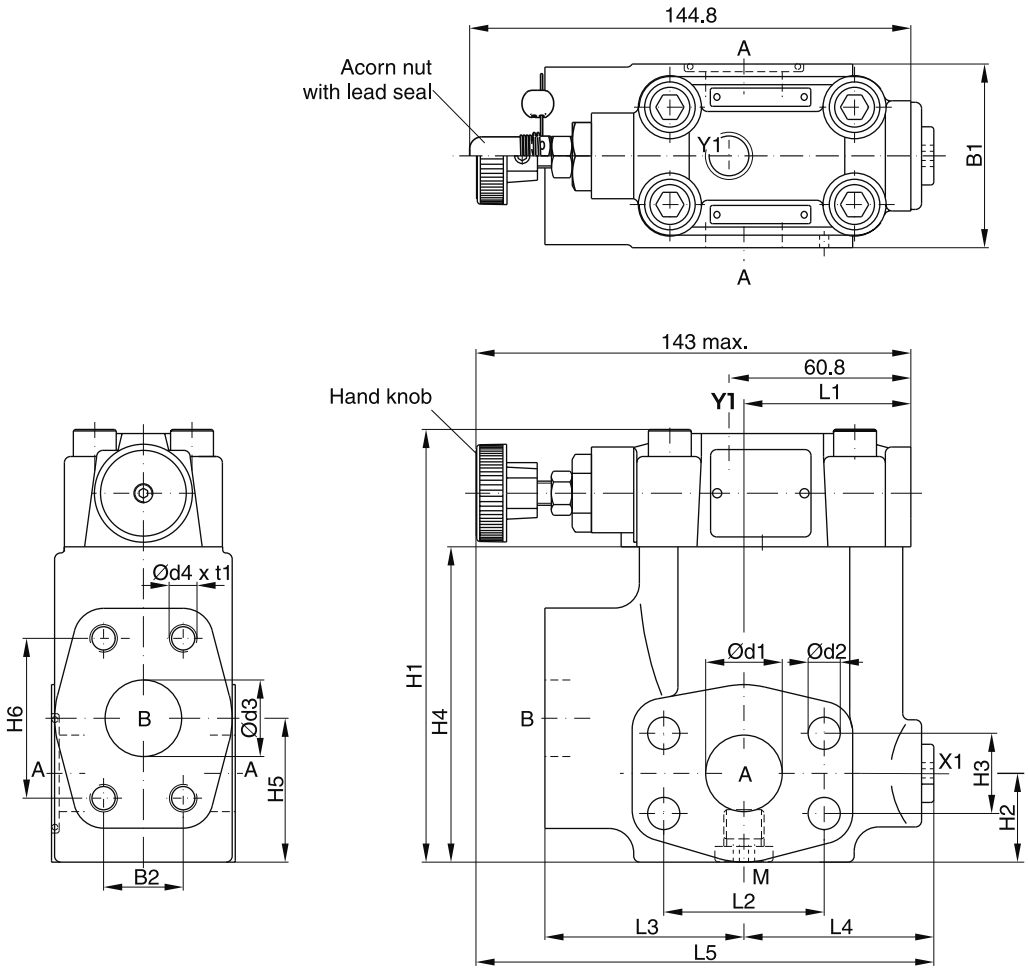
Typical pressure characteristics at closing point



P1 = setting pressure
P2 = operating pressure

Time and pressure underlap depend on the characteristics of the specific system.

9



SAE61

Seal kits		
NG	NBR	FPM
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5

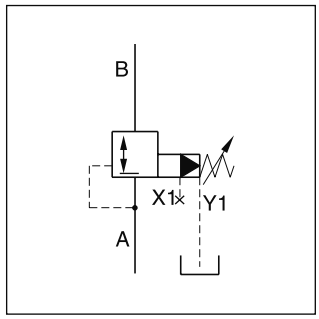
NG	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	d1	d2	d3	d4 (option 152)	t1
06	60	22.2	119	29.5	22.2	81	41.6	47.6	50.3	47.6	63	56	152	19	10.5	19	3/8”-16 UNC (M10)	20
08	60	26.2	141	30.5	26.2	103	47	52.4	55.8	52.4	65	58	149	25	10.5	25	3/8”-16 UNC (M10)	23
10	75	30.2	151	37.5	30.2	113	64	58.7	57.8	58.7	61	62	150.5	32	12.5	32	7/16”-14 UNC (M12)	22

Port	Function	Port size		
		R5S06	R5S08	R5S10
A (2)	Pressure	¾" SAE61	1" SAE61	1¼" SAE61
B	Secondary port	¾" SAE61	1" SAE61	1¼" SAE61
X1	External pilot port [1]	G¼"		
Y1	External drain	G¼"		
M	Pressure gauge	G¼"		

[1] closed when supplied

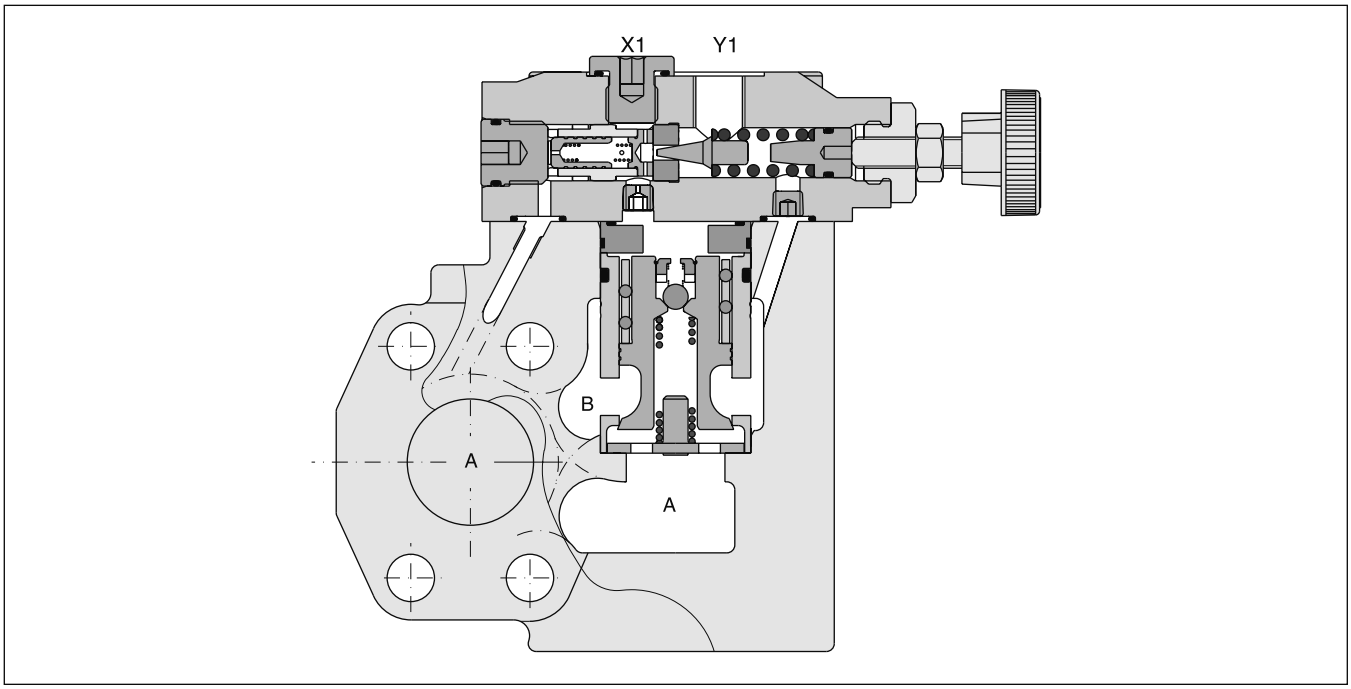
R5S UK.INDD CM 02.08.11

Pilot operated pressure reducing valves series R5R have a similar design as the subplate mounted R4R series. The SAE flanges allow to mount the valves directly on the inlet flanges of actuators to achieve a very compact design.



Features

- Pilot operated with manual adjustment
- Normally closed to avoid unintended motion
- 2-port body with SAE61 flange
- 3 sizes (SAE ¾", 1", 1¼")
- 3 pressure stages
- 3 adjustment modes
  - Hand knob
  - Acorn nut with lead seal
  - Key lock
- With optional vent function
- Flow direction B → A



R5R		–		8			6			A		
Pressure reducing valve	**Nominal size**		**SAE61 Interface**	**2-port body (X1, Y1 = G¼")**	**Pressure stages**	**Adjust-ment**	**External drain from Y1 port**	**Switching type**	**Solenoid voltage**	**Design series**	**Seals**	**Options**

Code	Port size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"

SAE 61		
Code	Size	Max. pressure [bar]
4	10	280
5	06/08	350

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5 [1]	up to 350 bar

[1] R5R10-485 up to 280 bar

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal
4	Key lock

Further options on request

Code	Seals
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR [2]	98V=
GAG [2]	205V=
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

[2] To be used in combination with rectifier plugs at 120VAC/230VAC power supply.

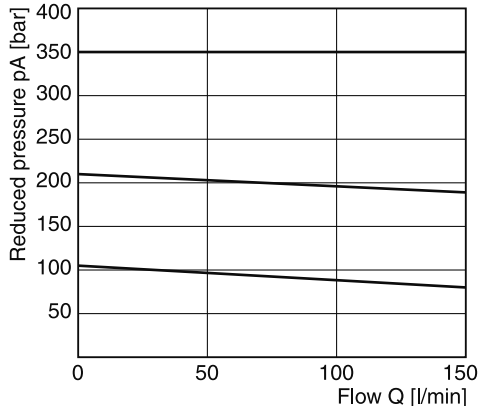
Code	Switching type
omit	Standard w/o vent function
09	Solenoid not activ. unpress. circulation
11	Solenoid activated unpress. circulation

9

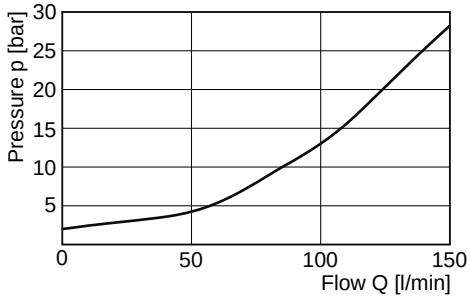
General								
Size			06		08		10	
Mounting			Flanged according to SAE 61					
Mounting position			unrestricted					
Ambient temperature		[°C]	-20...+50					
$MTTF_D$ value		[years]	75					
Weight		[kg]	4.0		4.6		5.9	
Hydraulic								
Max. operating pressure		[bar]						
	Ports A, B, X1		350		350		280	
	Port Y1		30		30		30	
Flow direction			B → A					
Pressure stages		[bar]	105, 210, 350					
Nominal flow		[l/min]	90		300		500	
Fluid			Hydraulic oil according to DIN 51524...51525					
Fluid temperature		[°C]	-20...+80					
Viscosity	permitted	[cSt] / [mm^2/s]	10...650					
	recommended	[cSt] / [mm^2/s]	30					
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Electrical								
Duty ratio		[%]	100					
Solenoid connection			Connector as per EN175301-803					
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)					
		Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage		[V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage		[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption	hold	[W]	31	31	31	31	78	78
	in rush	[W]	31	31	31	31	264	264
Response time		[ms]	Energized / De-energized AC: 20/18, DC: 46/27					
Max. switching frequency			AC: up to 7200, DC: up to 16000 switchings/hour					
Coil insulation class			H (180 °C)					

9

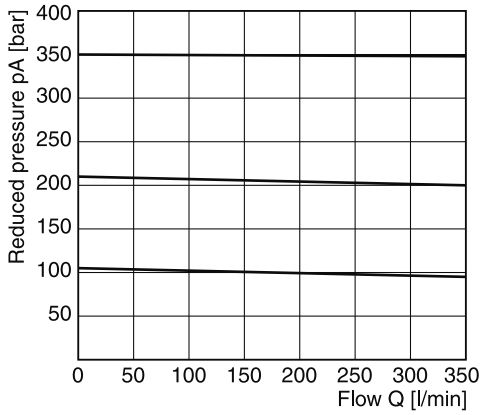
Reduced pressure pA versus flow Q
Series R5R06 [1)]



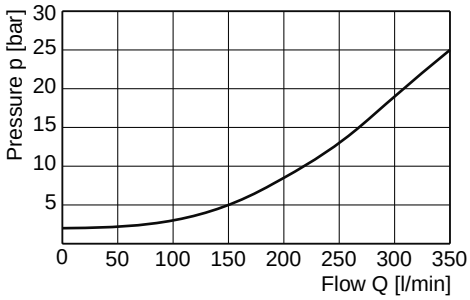
Minimum pressure curve



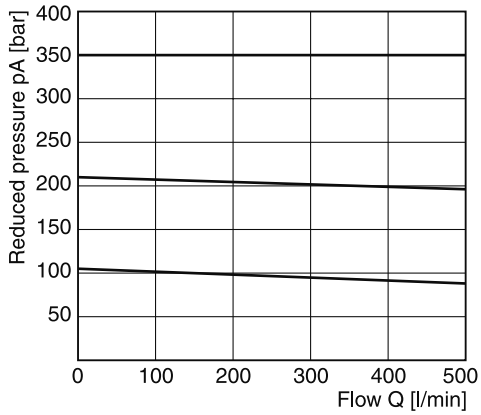
Reduced pressure pA versus flow Q
Series R5R08 [1)]



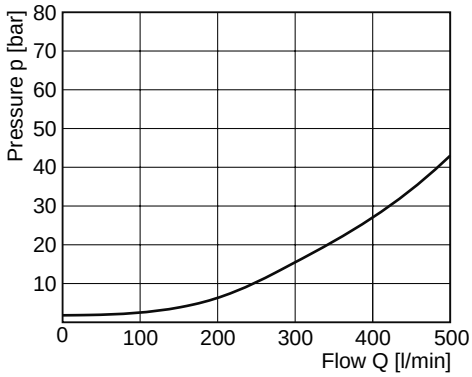
Minimum pressure curve



Reduced pressure pA versus flow Q
Series R5R10 [1)]

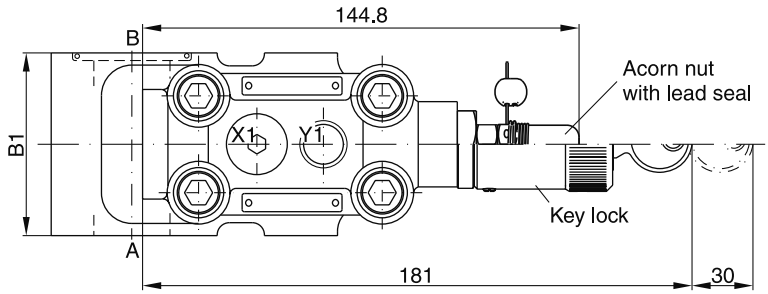


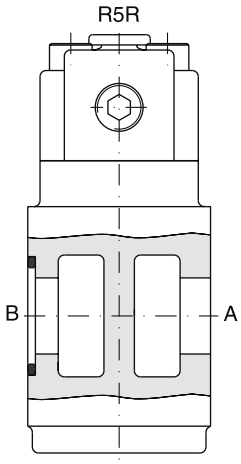
Minimum pressure curve

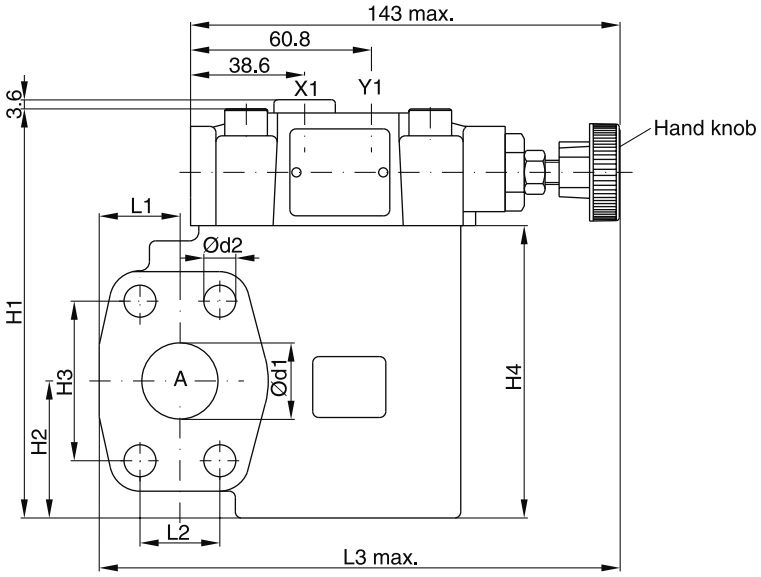


[1)] Measured at 350 bar primary pressure pB.

All characteristic curves measured with HLP46 at 50°C.







9

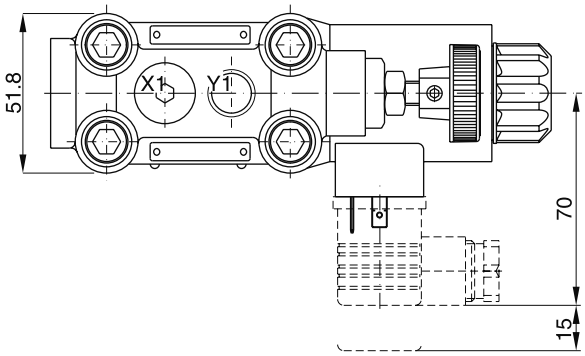
Seal kits		
NG	**NBR**	**FPM**
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5

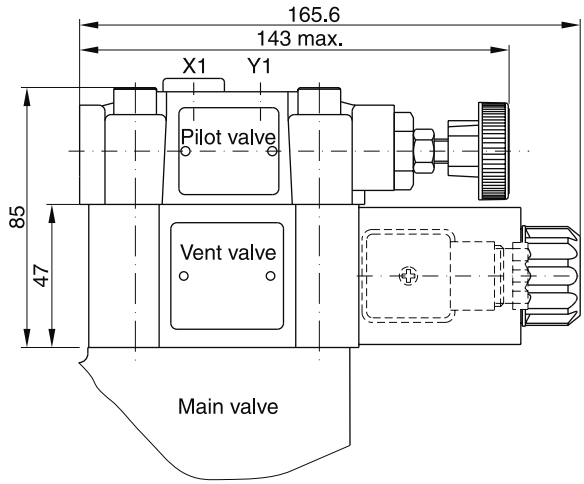
NG	B1	H1	H2	H3	H4	L1	L2	L3	d1	d2
06	60	131.6	37	47.6	90	24.6	22.2	152	19	10.5
08	60	137.6	45	52.4	96	26.5	26.2	171	25	10.5
10	75	150.6	48	58.7	109	34.0	30.2	179	32	12.5

Port	Function	Port size		
		R5R06	**R5R08**	**R5R10**
B	Inlet pressure	¾" SAE61	1" SAE61	1¼" SAE61
A	Reduced outlet pressure	¾" SAE61	1" SAE61	1¼" SAE61
Y1	External drain	G¼"		
X1	Pressure gauge	G¼"		

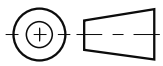
R5R UK.INDD CM 02.08.11

Dimensions R5R with vent function

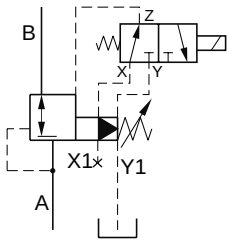
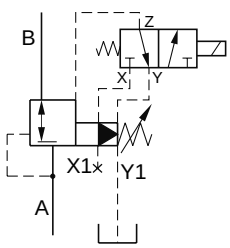




Seal kits	
NBR	FPM
DC solenoid	
S26-58515-0	S26-58515-5
AC solenoid	
S26-35237-0	S26-35237-5



9

Code	External drain
11	
09	

Proportional pressure relief valves series R5V*P2 are based on the mechanical adjusted series R5V. The additional proportional unit between the mechanical pilot valve and the main stage allows continuous pressure adjustment.

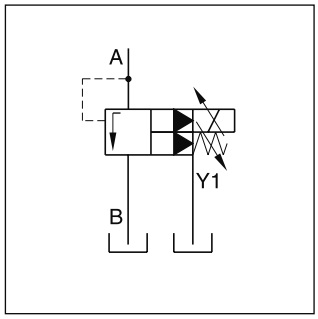
The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.

Features

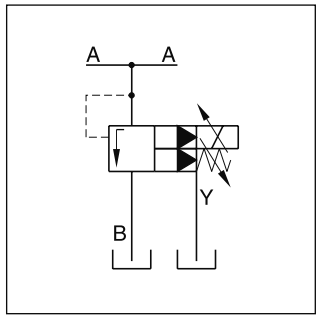
- Continuous adjustment by proportional solenoid
- R5V with 2-port body
  - 3 sizes (SAE ¾", 1", 1¼")
  - SAE61 flange
- R5V with 3-port body
  - 4 sizes (SAE ¾", 1", 1¼", 1½")
  - SAE61 and SAE62 flange
- 3 pressure stages
- With mechanical maximum pressure adjustment

R5V*P2 2-port

R5V*P2 3-port

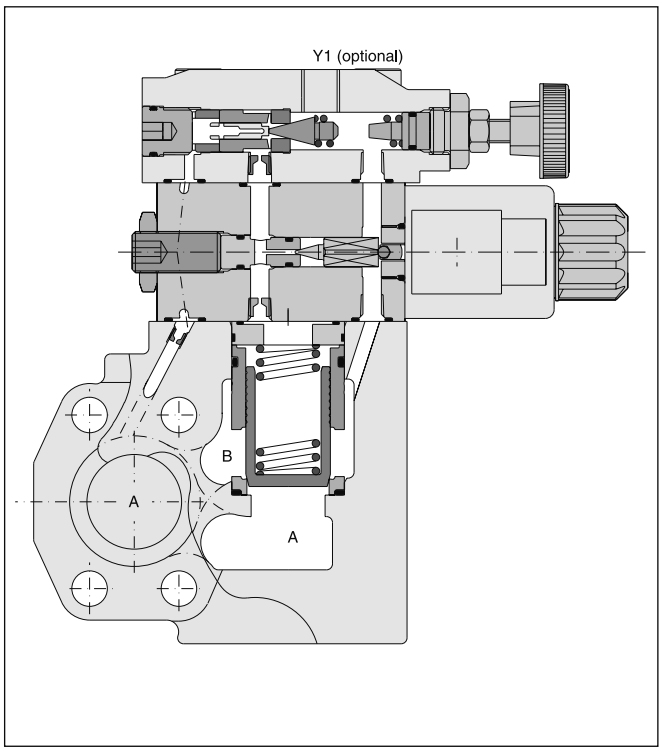


R5V*P2 2-port

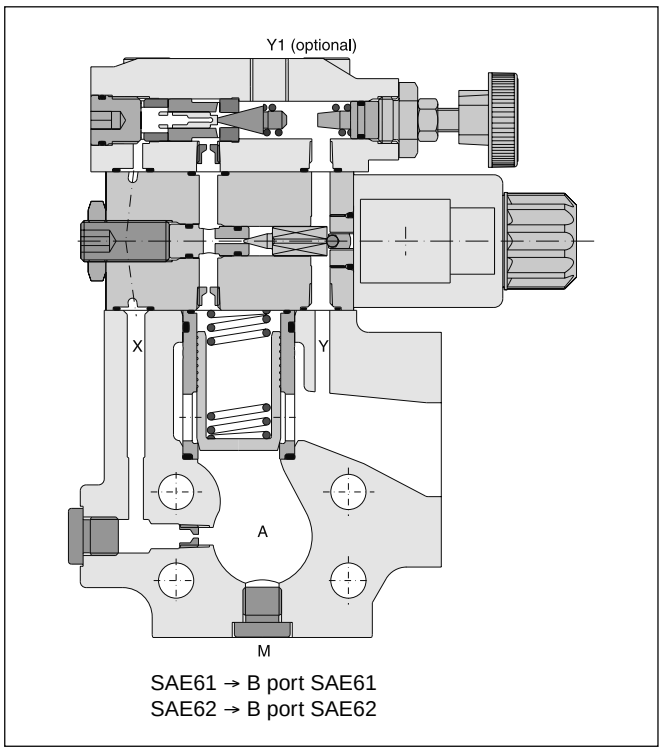


R5V*P2 3-port

R5V*P2 2-port



R5V*P2 3-port



SAE61 → B port SAE61
SAE62 → B port SAE62

9

R5V	□	–	□	□	□	□	□	P2	G0R	A	□	□	□
Proportional pressure relief valve	**Nominal size**		**SAE interface**	**Pilot ports**	**Pressure stages**	**Adjust-ment**	**Pilot oil**	**Propor-tional pressure control**	**Solenoid voltage 12V 2.3A** [5]	**Design**	**Seals**	**Design series** (not required for ordering)	**Options**

Code	Port size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"
12 [1]	SAE 1½"

[1] only R5V 3port

SAE 61		
Code	Size	Max. pressure [bar]
3	12	210
4	10	280
5	06/08	350
SAE 62		
Code	Size	Max. pressure [bar]
6 [2]	06/08/10/12	350

[2] only R5V 3port

2-port body	
Code	pilot ports
7	Y1 = G¼" [2]
3-port body	
Code	pilot ports
9	Y1 [3], X1, M = G¼"

[3] Y1 only available at external drain (pilot oil code 6)

Code	Options
008	Vent function with slow unloading
070	Metric 3-port body for R5V10 SAE62: Pressure ports (A): SAE62 with 15mm through holes (for M14), Tank port: SAE61 (M12)
152 [6]	3-port body with metric threads

[6] R5V08 SAE62: Tank port SAE61 (M10)

Code	Seals
1	NBR
5	FPM

Pilot oil	
Code	Drain line
2	internal
6	external from Y1-port

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5 [4]	up to 350 bar

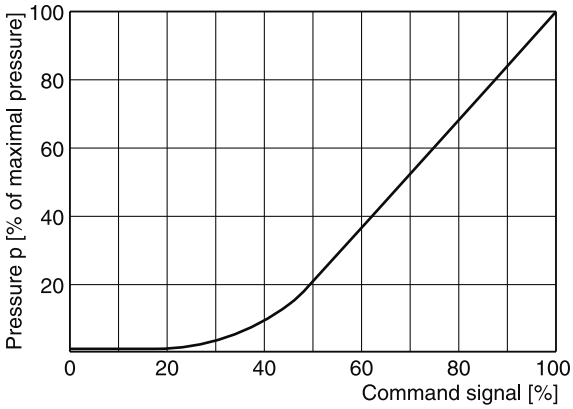
[4] R5V10-4*5 up to 280 bar

[5] onboard electronics on request

9

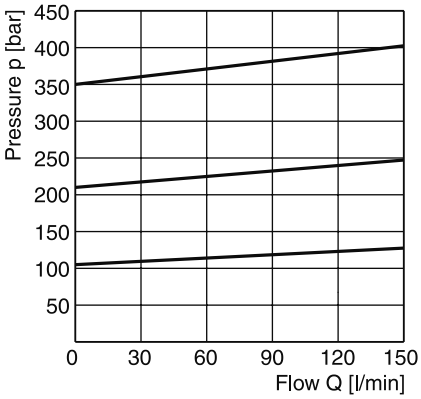
General						
Size			06 (¾")	08 (1")	10 (1¼")	12 (1½")
Mounting			Flanged according to SAE 61 (size 12 = SAE 62)			
Mounting position			unrestricted			
Ambient temperature		[°C]	-20...+50			
$MTTF_D$ value		[years]	75			
Weight	R5V 2port	[kg]	5.8	6.4	7.7	—
	R5V 3port	[kg]	5.4	6.4	7.0	9.8
Hydraulic						
Max. operating pressure		[bar]				
	SAE61 Ports A, B		350	350	280	210
	Port Y1		30	30	30	30
	SAE62 Ports A, B		350	350	350	350
	Port Y1		30	30	30	30
Pressure stages		[bar]	105, 210, 350			
Nominal flow		[l/min]	90	300	600	600
Fluid			Hydraulic oil according to DIN 51524...51525			
Fluid temperature		[°C]	-20...+80			
Viscosity permitted		[cSt] / [mm^2/s]	10...650			
Viscosity recommended		[cSt] / [mm^2/s]	30			
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)			
Electrical (proportional solenoid)						
Duty ratio		[%]	100			
Nominal voltage		[V]	12			
Max. current		[A]	2.3			
Coil resistance		[Ohm]	4 at 20°C			
Solenoid connection			Connector as per EN175301-803			
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
Power amplifier			PCD00A-400			

Signal/pressure curve R5V*P2

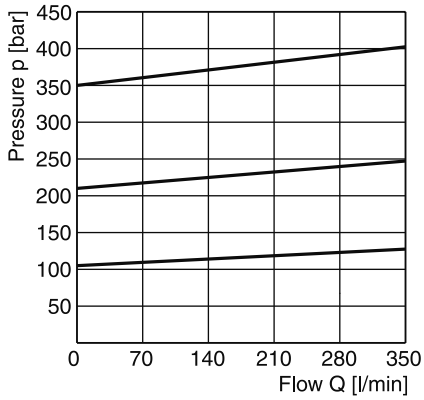


p/Q performance curve [1)]

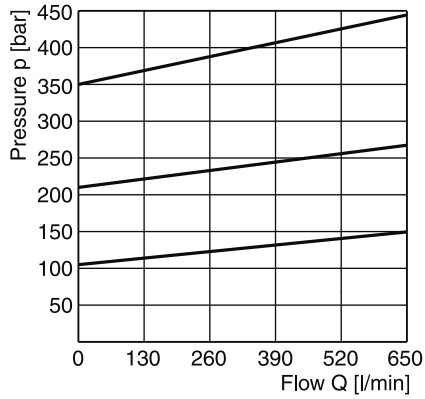
R5V06*P2



R5V08*P2



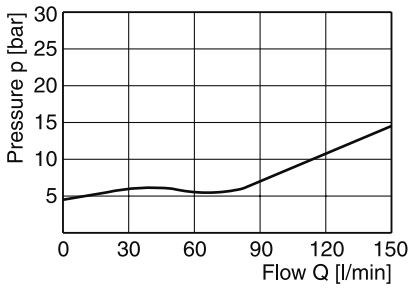
R5V10*P2



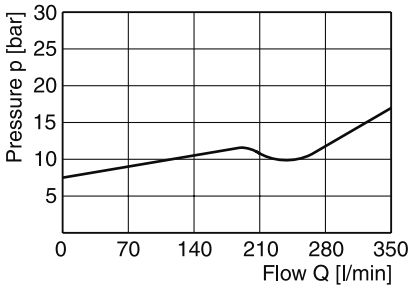
9

Minimum pressure curve [1)]

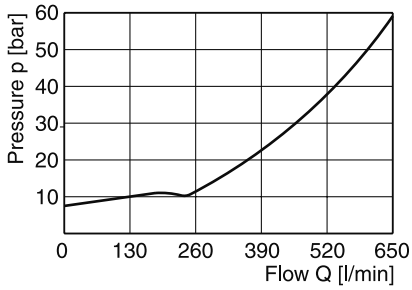
R5V06*P2



R5V08*P2



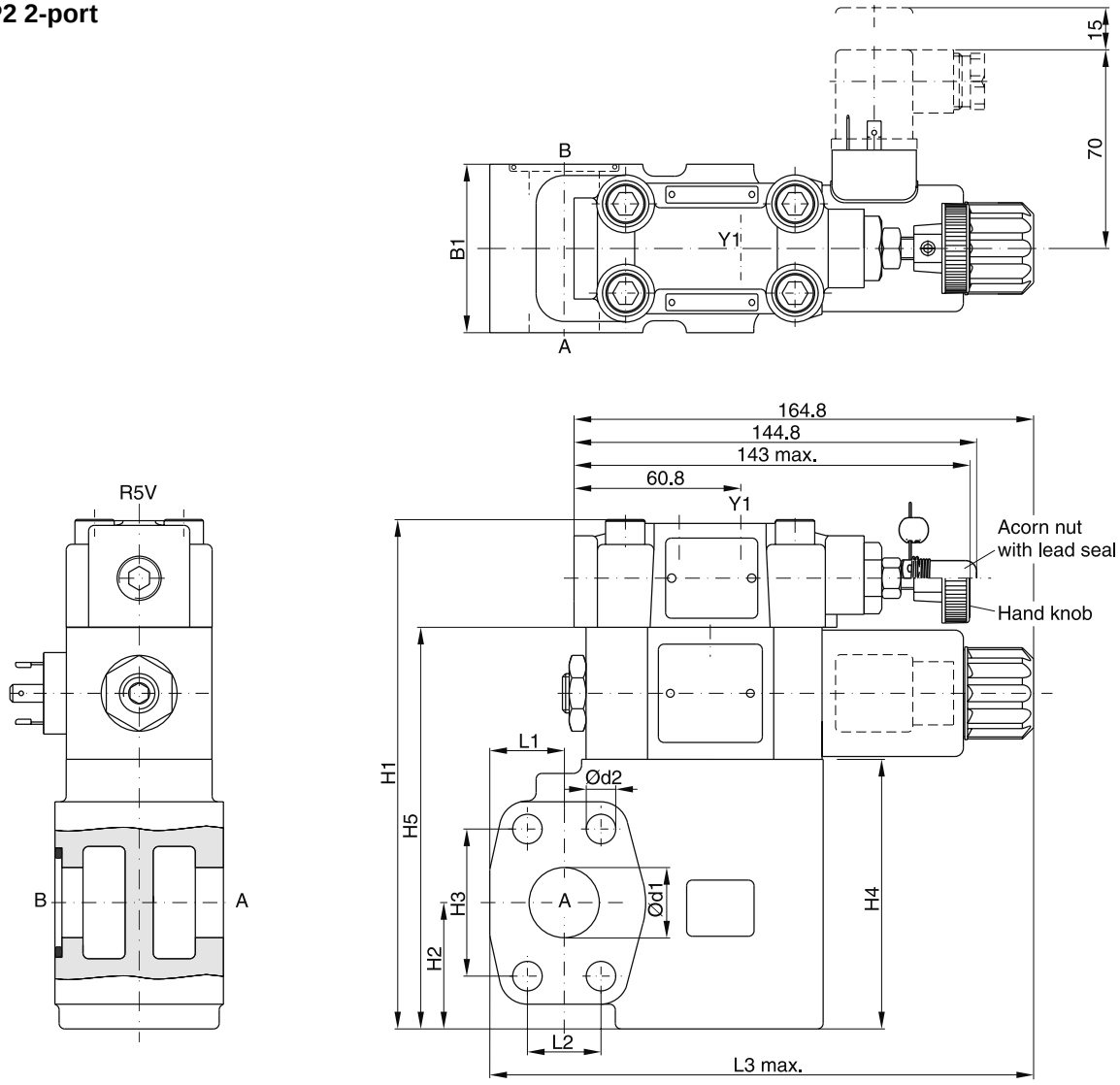
R5V10*P2



[1)] The performance curves are measured with external drain.
For internal drain the tank pressure has to be added to curve.

All characteristic curves measured with HLP46 at 50°C.

R5V*P2 2-port



SAE61

Seal kits		
NG	NBR	FPM
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5
Prop. section P2	S26-58473-0	S26-58473-5

* Please combine seal kit of one size with seal kit of Prop. section for complete seal kit

NG	B1	H1	H2	H3	H4	H5	L1	L2	L3	d1	d2
06	60	175	37	47.6	90	137	24.6	22.2	174	19	10.5
08	60	181	45	52.4	96	143	26.5	26.2	193.6	25	10.5
10	75	194	48	58.7	109	156	34.0	30.2	201	32	12.5

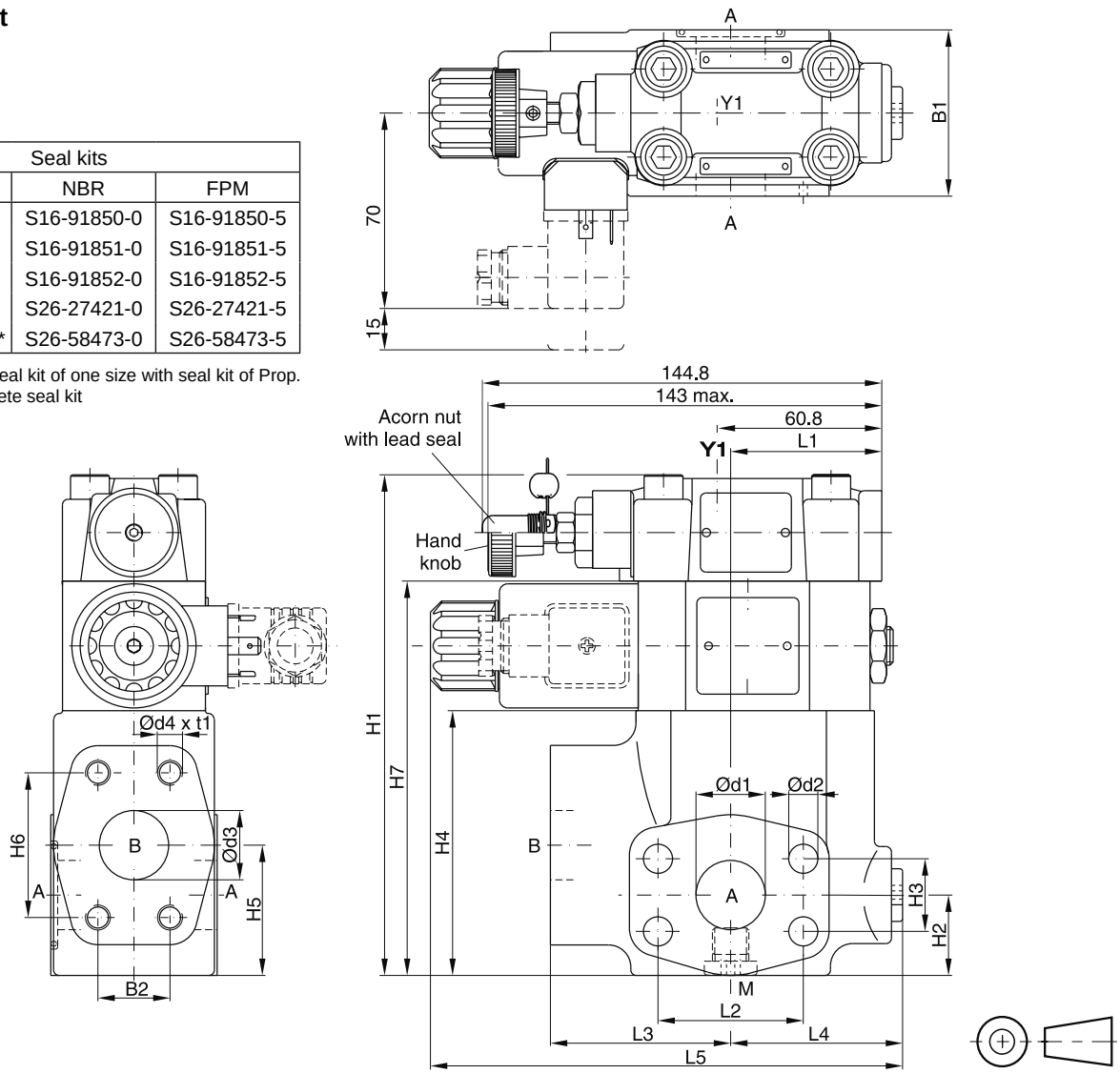
Port	Function	Port size		
		R5V06	R5V08	R5V10
A	Pressure	¾" SAE61	1" SAE61	1¼" SAE61
B	Tank	¾" SAE61	1" SAE61	1¼" SAE61
Y1	External drain	G¼"		

R5VP2 UK.INDD CM 09.08.11

R5V*P2 3-port

Seal kits		
NG	NBR	FPM
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5
12	S26-27421-0	S26-27421-5
Prop. section P2 *	S26-58473-0	S26-58473-5

* Please combine seal kit of one size with seal kit of Prop. section for complete seal kit



9

SAE61

NG	B1	B2	H1	H2	H3	H4	H5	H6	H7	L1	L2	L3	L4	L5	d1	d2	d3	d4 (option 152)	t1
06	60	22.2	166	29.5	22.2	81	41.6	47.6	128	50.3	47.6	63	56	174.6	19	10.5	19	3/8”-16 UNC (M10)	20
08	60	26.2	188	30.5	26.2	103	47	52.4	150	55.8	52.4	65	58	177	25	10.5	25	3/8”-16 UNC (M10)	23
10	75	30.2	198	37.5	30.2	113	64	58.7	160	57.8	58.7	61	62	179.1	32	12.5	32	7/16”-14 UNC (M12)	22
12	80	35.7	225	35.5	35.7	140	73	69.8	187	37.3	69.8	92.5	55.2	186.8	38	13.5	38	1/2”-13 UNC (M12)	27

SAE62

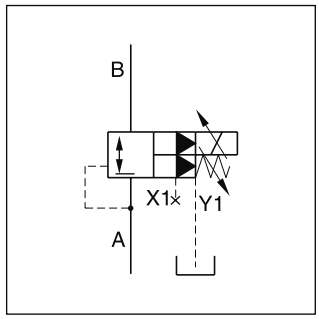
NG	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	d1	d2	d3	d4 (option 152)	t1
06	60	23.8	119	29.5	23.8	81	41.6	50.8	50.3	50.8	63	56	152	19	10.5	19	3/8”-16 UNF (M10)	20
08	60	27.8	141	30.5	27.8	103	47	57.2	55.8	57.2	65	58	149	25	12.5	25	7/16”-14 UNC (M10)[1)]	22
10	75	31.8	151	37.5	31.8	113	64	66.7	57.8	66.7	61	62	150.5	32	13.5	32	1/2”-13 UNC (M12)	24
12	80	36.5	178	35.5	36.5	140	73	79.4	37.3	79.4	92.5	55.2	171.2	38	17	38	5/8”-11 UNC (M16)	33

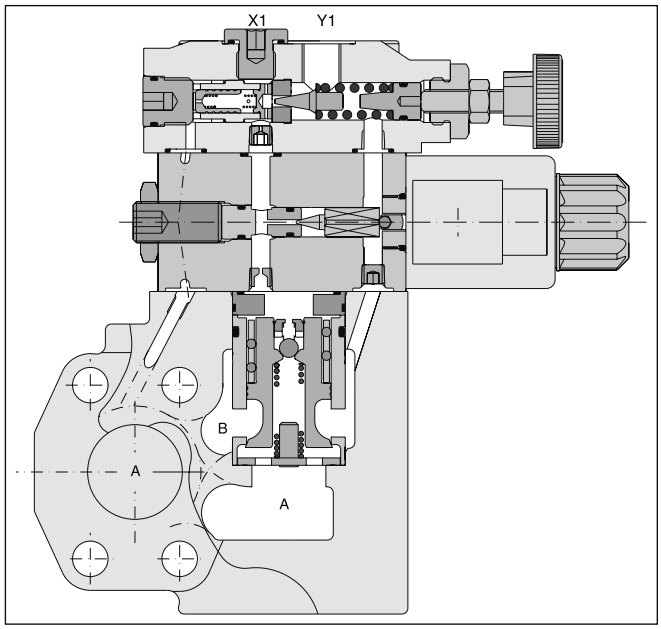
[1)] T-port SAE61

Port	Function	Port size			
		R5V06	R5V08	R5V10	R5V12
A (2)	Pressure	¾" SAE61/62	1" SAE61/62	1¼" SAE61/62	1½" SAE61/62
B	Tank	¾" SAE61/62	1" SAE61/62	1¼" SAE61/62	1½" SAE61/62
Y1	External drain	G¼"			
M	Pressure gauge	G¼"			

R5VP2 UK.INDD CM 09.08.11

Proportional pressure reducing valves series R5R*P2 are based on the mechanical adjusted series R5R. The additional proportional unit between the mechanical pilot valve and the main stage allows continuous pressure adjustment. The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.





Features

- Continuous adjustment by proportional solenoid
- 2-port body with SAE-61 flange
- 3 sizes (SAE ¾", 1", 1¼")
- 3 pressure stages
- With mechanical maximum pressure adjustment

Ordering code

R5R		–		8			6	P2	G0R	A		
Pressure reducing valve	Nominal size		SAE61 interface	Body 2-port (X1, Y1 = G¼")	Pressure stages	Adjust-ment	External drain from Y1-port	Propor-tional pressure control	Solenoid voltage 12V 2.3A	Design series	Seals	Options

Code	Port size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"

SAE 61		
Code	Size	Max. pressure [bar]
4	10	280
5	06/08	350

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5 *	up to 350 bar

* R5R10-485 up to 280 bar

Code	Seals
1	NBR
5	FPM

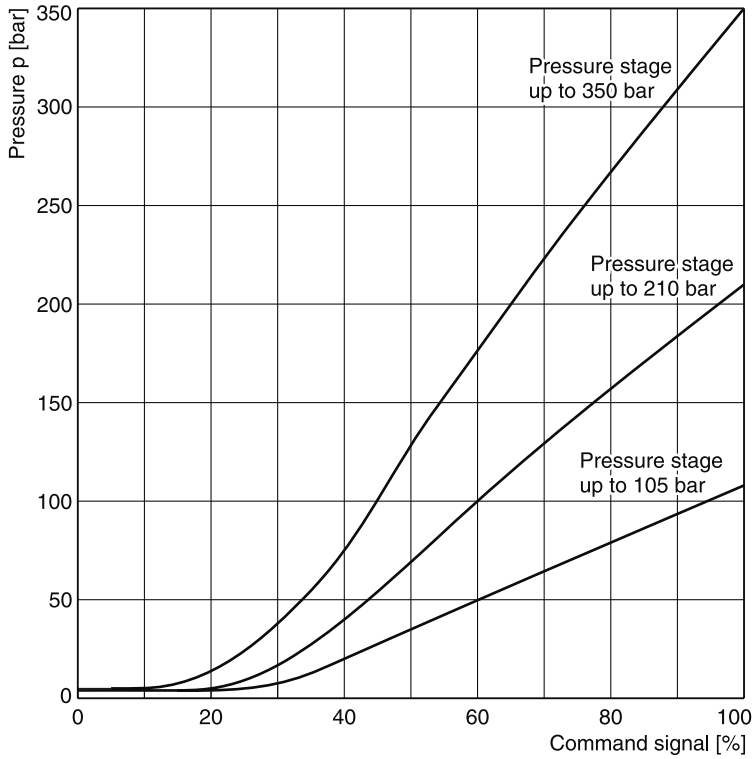
Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal

Further options on request

Technical data

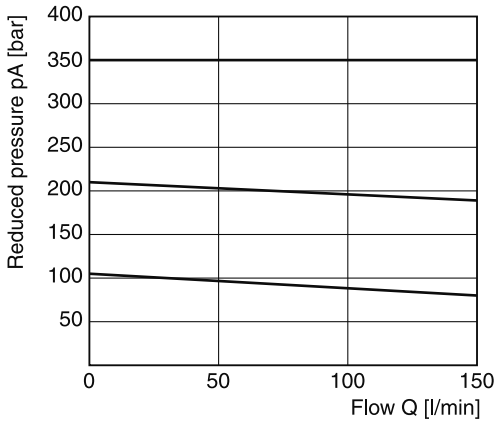
General					
Size			06	08	10
Mounting			Flanged according to SAE 61		
Mounting position			unrestricted		
Ambient temperature		[°C]	-20...+50		
$MTTF_D$ value		[years]	75		
Weight		[kg]	5.8	6.4	7.7
Hydraulic					
Max. operating pressure	Ports A, B, X1	[bar]	350	350	280
	Port Y1	[bar]	30	30	30
Pressure stages		[bar]	105, 210, 350		
Nominal flow		[l/min]	90	300	500
Fluid			Hydraulic oil according to DIN 51524...51525		
Fluid temperature		[°C]	-20...+80		
Viscosity	permitted	[cSt] / [mm^2/s]	10...650		
	recommended	[cSt] / [mm^2/s]	30		
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)		
Electrical					
Duty ratio		[%]	100		
Nominal voltage		[V]	12		
Max. current		[A]	2.3		
Coil resistance		[Ohm]	4 at 20°C		
Solenoid connection			Connector as per EN175301-803		
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
Power amplifier			PCD00A-400		

Command / pressure curve

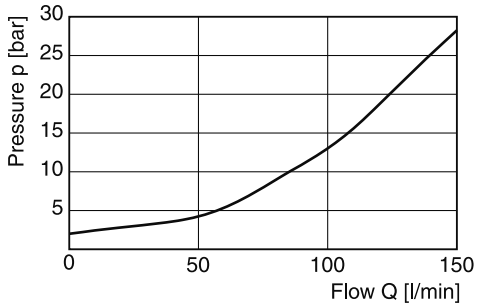


All characteristic curves measured with HLP46 at 50°C.

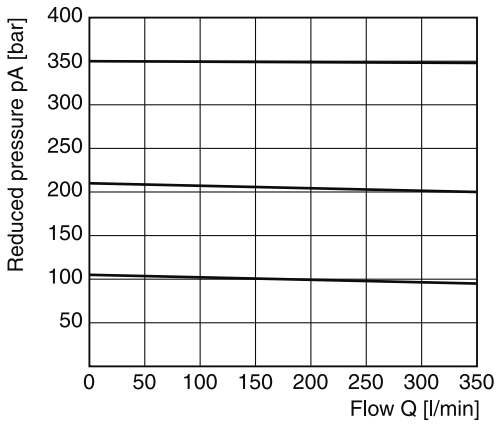
Reduced pressure pA vs. flow Q
Series R5R06*P2 [1)]



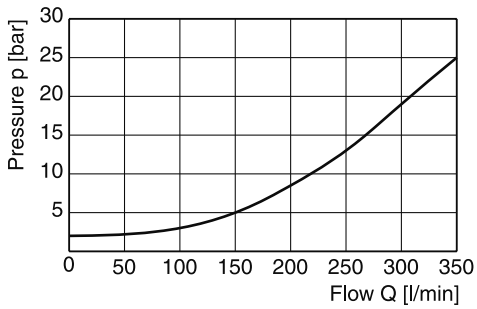
Minimum pressure curve



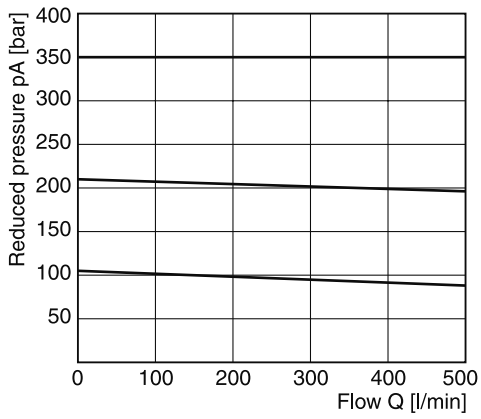
Reduced pressure pA vs. flow Q
Series R5R08*P2 [1)]



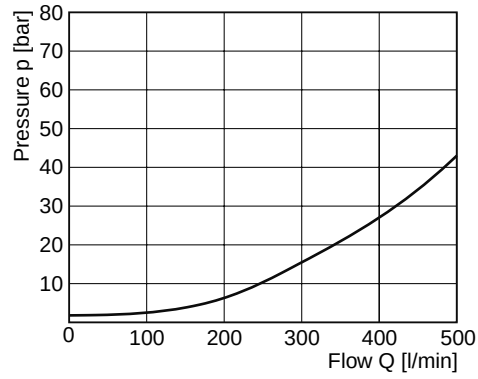
Minimum pressure curve



Reduced pressure pA vs. flow Q
Series R5R10*P2 [1)]

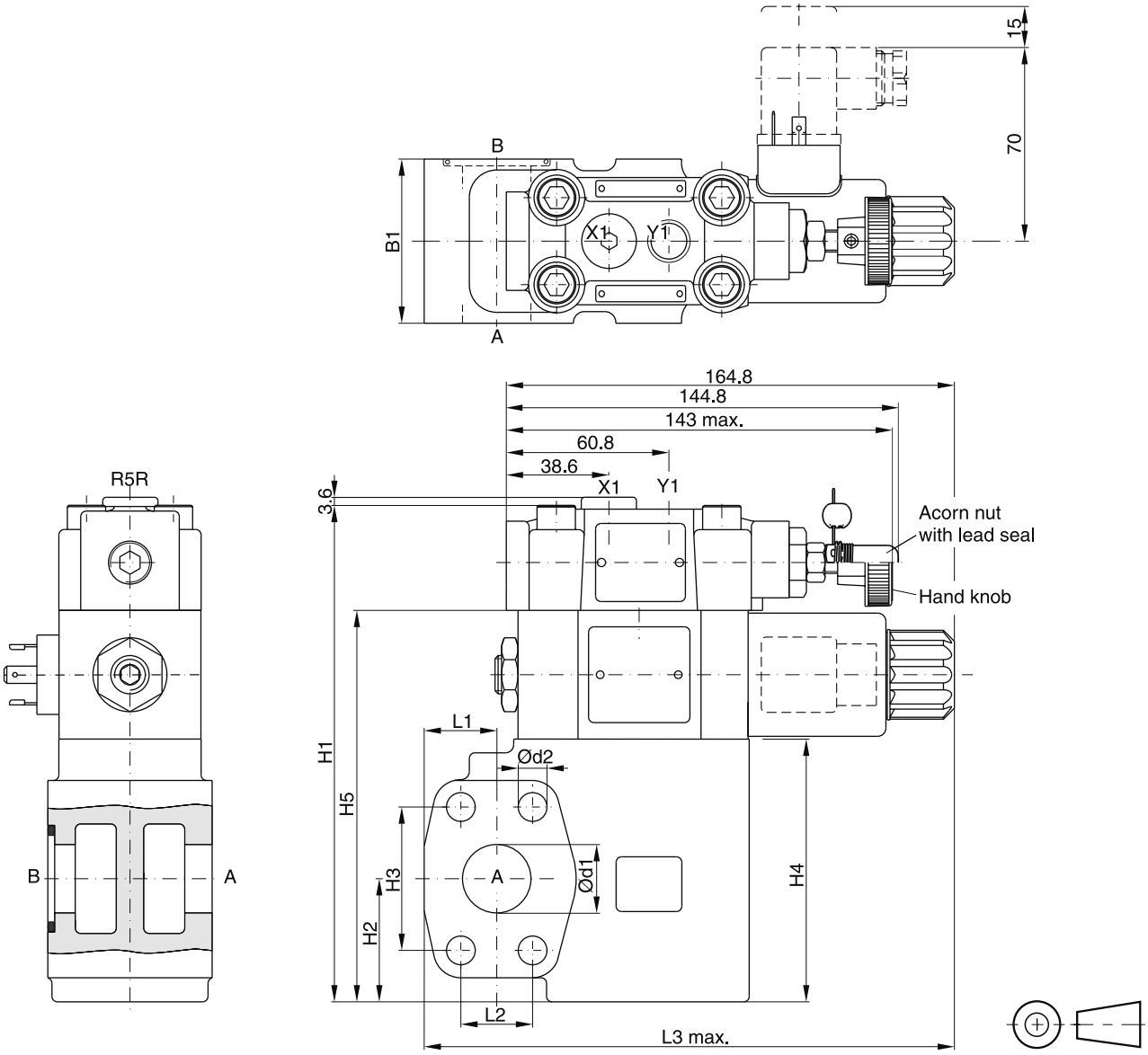


Minimum pressure curve



[1)] Measured at 350 bar primary pressure pB.

All characteristic curves measured with HLP46 at 50°C.



Seal kits		
NG	NBR	FPM
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5
Prop. section P2 *	S26-58473-0	S26-58473-5

* Please combine seal kit of one size with seal kit of Prop. section for complete seal kit

NG	B1	H1	H2	H3	H4	H5	L1	L2	L3	d1	d2
06	60	175	37	47.6	90	137	24.6	22.2	174	19	10.5
08	60	181	45	52.4	96	143	26.5	26.2	193.6	25	10.5
10	75	194	48	58.7	109	156	34.0	30.2	201	32	12.5

Port	Function	Port size		
		R5R06	R5R08	R5R10
B	Inlet pressure	¾" SAE61	1" SAE61	1¼" SAE61
A	Reduced outlet pressure	¾" SAE61	1" SAE61	1¼" SAE61
Y1	External drain	G¼"		
X1	Pressure gauge	G¼"		

R5RP2 UK.INDD CM 02.08.11

Seat valves series D5S are designed for directional control functions. They enable individual hydraulic solutions for nominal flow up to 800 l/min due to a large variety of poppets, springs and covers, including shuttle valves, stroke limiters, solenoid valves (VV01) and position control.

A complete program is offered under the Parker brand:

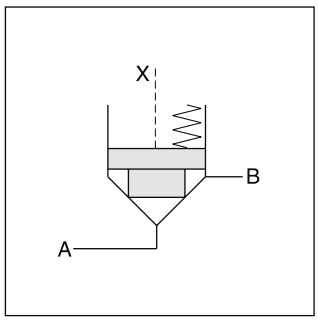
subplate mounted valves	(Series D4S - chapter 6)
SAE flange valves	(Series D5S - chapter 9)
pipe mounted valves	(Series D4S - chapter 10)
slip-in cartridges	(Series CAR - on request)

Features

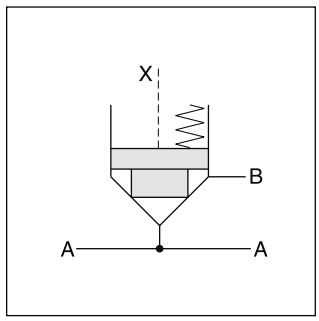
- Leak-free seat valve design
- 2- and 3-port bodies
- SAE61 flange
- Numerous pilot options
- 6 poppet types
- 4 sizes, SAE 3/4“, 1“, 1 1/4“, 1 1/2“

D5S 2-port

D5S 3-port

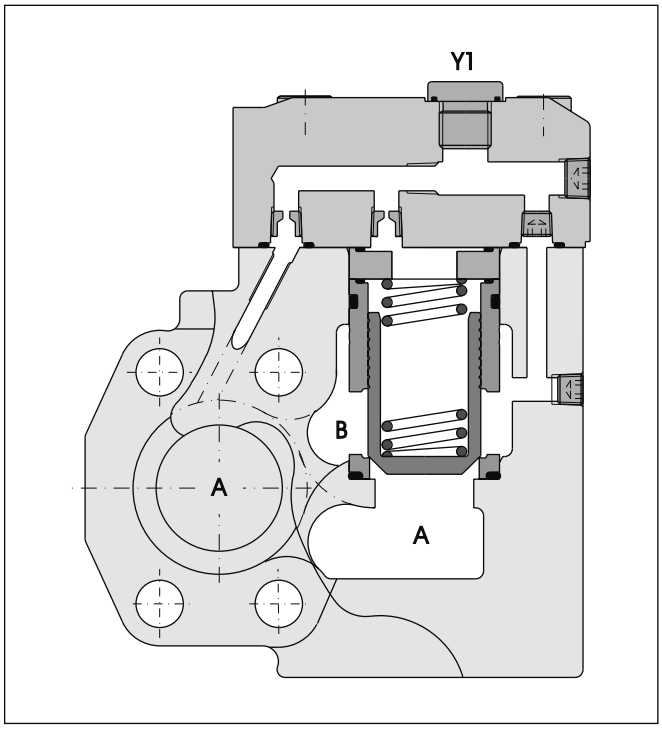


D5S 2-port

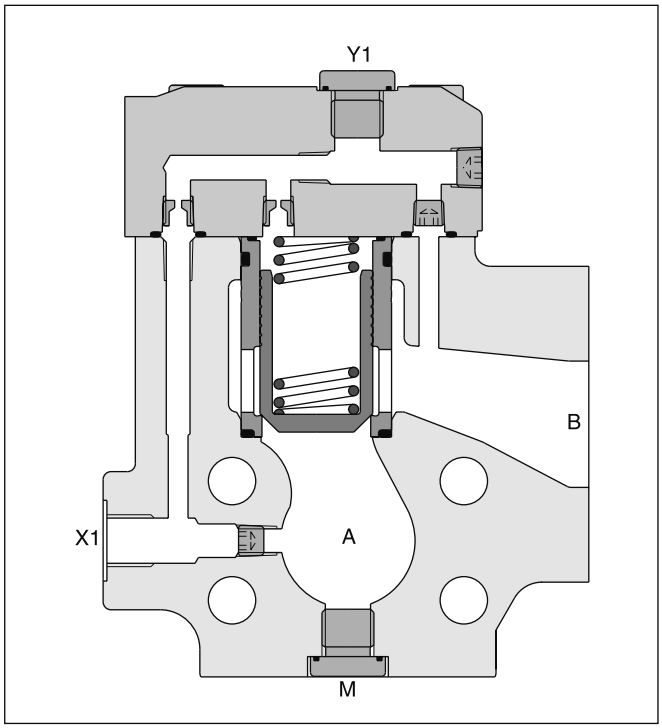


D5S 3-port

D5S 2-port



D5S 3-port



9

D5S [ ] – [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] **B** [ ] [ ]

Seat valve | **Nominal size** | **Body** | **Pilot body configuration** | **Pilot cap** | **Sleeve** | **Spool type** | **Spring** | **Switching type** | **Solenoid voltage** | **Design series** | **Seals** | **Options**

Code	Port size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"
12 [1]	SAE 1½"

[1] D5S 3-port only

Code	Body	Ports
5	3-port	Seat entry, A; X1, Y1, M = G¼"
7	2-port	Seat entry, A; X1, Y1 = G¼"
8	2-port	Annular entry, B; X1, Y1 = G¼"

Code	Pilot oil line in body
1	internal from A
2	internal from B
3	internal from A and B
4	external from X1
5	internal from B, external from X1

Code	Body	Ports	X	Y	Z	X-Y	X1	Y1	VV01
Standard									
1	2-/3-port	Pilot oil = pilot drain	⊖	●	⊖	○	—	●	—
2	2-/3-port	Pilot oil = pilot drain	●	⊖	⊖	○	—	●	—
3	2-port	Pilot oil = pilot drain	●	●	⊖	○	○	●	—
With solenoid valve (VV01)									
4	2-/3-port	Internal to B	⊖	○	⊖	●	—	●	○
5	2-port	Internal to B	●	○	⊖	●	○	●	○
6	2-/3-port	Ext. out of cap	⊖	○	⊖	●	—	○	●
7	2-port	Ext. out of cap	●	○	⊖	●	○	○	●
With stroke limiter (not for D5S06)									
A	2-/3-port	Pilot oil = pilot drain	⊖	●	⊖	—	●	—	—
B	2-/3-port	Pilot oil = pilot drain	●	⊖	—	—	●	—	—
C	2-port	Pilot oil = pilot drain	●	●	⊖	—	○	—	—

○ open bore ● closed bore ⊖ orifice Ø 1.2

Code	Sleeve
1	AA=95%, AB=5%
3	AA=60%, AB=40%

Code	Size	Poppet type	Sleeve
1	06, 08,10,12	With closed bottom and 15° chamfer (p_Z max. = p_A +20bar	1
2	06	With 0.8 dia. orifice at the bottom and 15°chamfer	1
	08, 10	With 1.2 dia. orifice at the bottom and 15°chamfer	1
4	06, 08,10,12	With closed bottom and 45° chamfer	1, 3
A [2]	08, 10, 12	Safety spool (for end position control only)	3
B [2]	08, 10, 12	Throttle spool, 10° chamfer	3
C [2]	08, 10, 12	Throttle spool, 3° chamfer	3

[2] Springs 2, 3 and 6 only

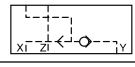
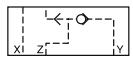
Examples see end of chapter.

Code	Options
omit	Standard
013	Position control with protection

Code	Seals
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR [4]	98V=
GAG [4]	205V=
W30	110V / 50Hz ; 120V / 60Hz
W31	230V / 50Hz ; 240V / 60Hz

[4] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Switching type	
omit	Standard w/o vent function	
09	VV01 with manual override	de-energized: open
10	VV01 without manual override	
11	VV01 with manual override	de-energized: closed
12	VV01 without manual override	
CA	Shuttle valve	
DA	Shuttle valve	
CB	VV01 code 09 and shuttle valve code CA	
CD	VV01 code 11 and shuttle valve code CA	
DB	VV01 code 09 and shuttle valve code DA	
DD	VV01 code 11 and shuttle valve code DA	
BH	VV01 code 10 and shuttle valve code CA and position control [3] with amplifier	
BK	VV01 code 12 and shuttle valve code CA and position control [3] with amplifier	
BN	VV01 code 10 and shuttle valve code DA and position control [3] with amplifier	
BQ	VV01 code 12 and shuttle valve code DA and position control [3] with amplifier	
BC	VV01 code 10 and position control [3] with amplifier	
BE	VV01 code 12 and position control [3] with amplifier	
BA	Position control [3] with amplifier	
BF	Position control [3] with amplifier and shuttle valve code CA	
BL	Position control [3] with amplifier and shuttle valve code DA	

[3] Position control for D5S08/10 only.
Spring 2 or 4. Spool A and sleeve 3.

Code	Spring (approx. cracking pressure [bar])					
	Sleeve Code 1		Sleeve Code 3			
	A -> B		A -> B		B -> A	
	D5S06	D5S08/12	D5S06	D5S08/12	D5S06	D5S08/12
1	2.8	3.5	6.5	6.5	9.5	11.0
2	0.5	0.5	1.0	1.0	1.5	1.7
3	0.3	0.3	0.6	0.6	0.9	1.0
4	2.2	2.2	4.0	3.5	5.5	6.0
5	—	9.0	—	16.0	—	28.0
6	1.2	1.2	2.0	2.2	3.0	3.8
7	3.0	—	8.0	—	12.0	—

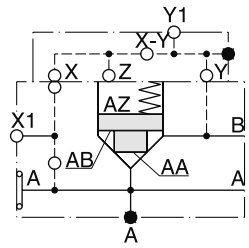
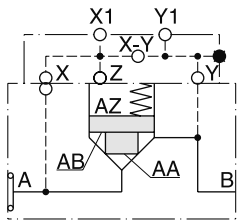
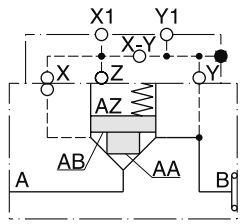
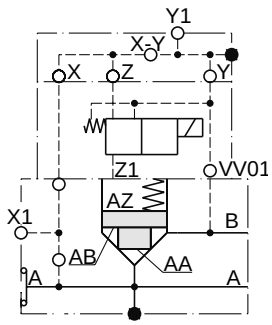
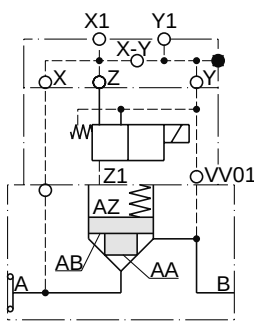
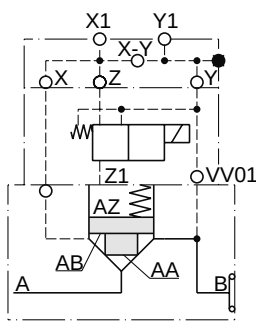
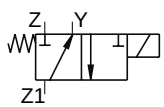
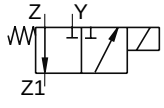
9

Technical data

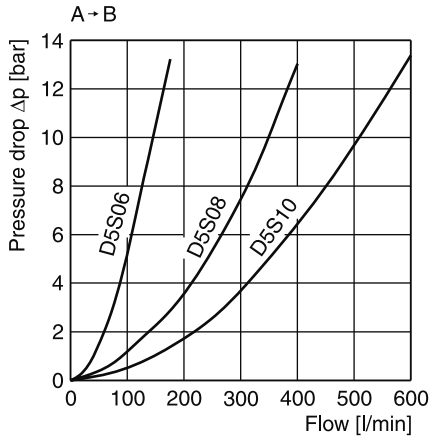
General						
Size			06	08	10	12
Mounting			Flanged according to SAE 61			
Mounting position			unrestricted			
Ambient temperature		[°C]	-20...+50			
$MTTF_D$ value		[years]	150			
Weight	D5S 2port	[kg]	3.6	4.1	5.4	—
	D5S 3port	[kg]	3.4	4.4	5.0	7.8
Hydraulic						
Max. operating pressure		[bar]				
	SAE61 Ports A, B		350	350	280	210
	Port Y1		30	30	30	30
Nominal flow		[l/min]	180	360	600	800
Fluid			Hydraulic oil according to DIN 51524...51525			
Fluid temperature		[°C]	-20...+80			
Viscosity	permitted	[cSt] / [mm^2/s]	10...650			
	recommended	[cSt] / [mm^2/s]	30			
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)			

Electrical (solenoid)								
Duty ratio		[%]	100					
Response time		[ms]	Energized / De-energized AC: 20/18 , DC: 46/27					
		Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage		[V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage		[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption	hold	[W]	31	31	31	31	78	78
	in rush	[W]	31	31	31	31	264	264
Max. switching frequency			AC: up to 7200, DC: up to 16000 switchings/hour					
Solenoid connection			Connector as per EN175301-803					
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)					
Coil insulation class			H (180 °C)					

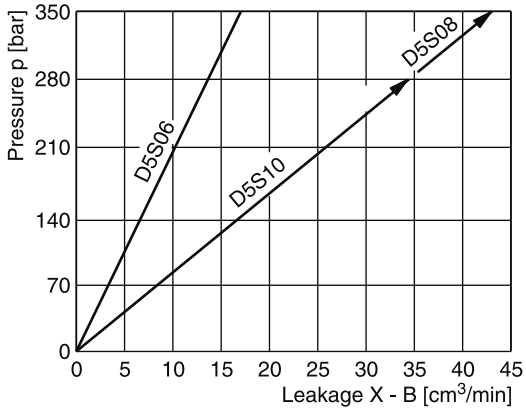
D5S pilot configuration

3-port	2-port: Seat Entry	2-port: Annular Entry	
Standard			
			
with vent valve VV01			**VV01**
			de-energized: open  de-energized: closed 

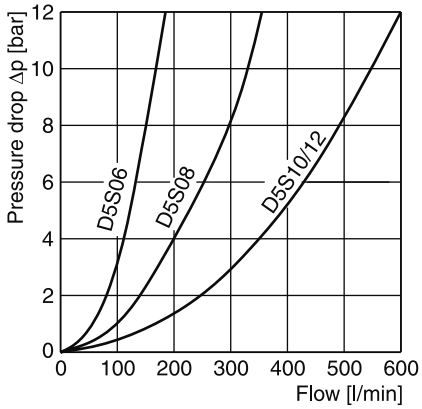
D5S 2-port

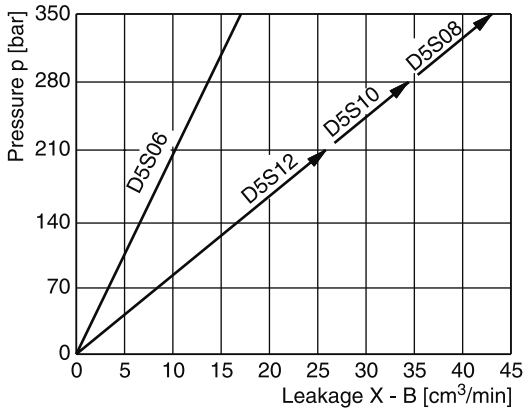


Leakage



D5S 3-port

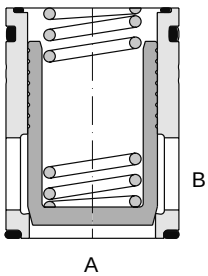
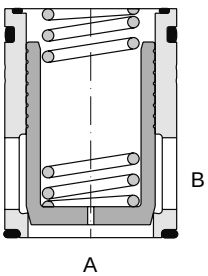
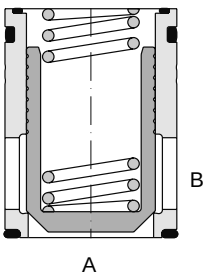
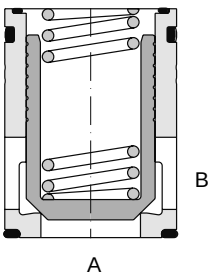
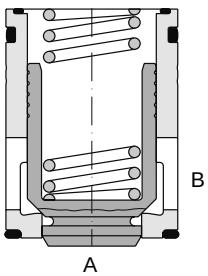
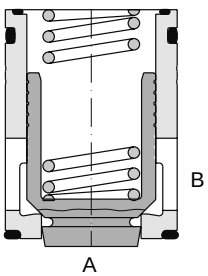




All characteristic curves measured with HLP46 at 50°C.

9

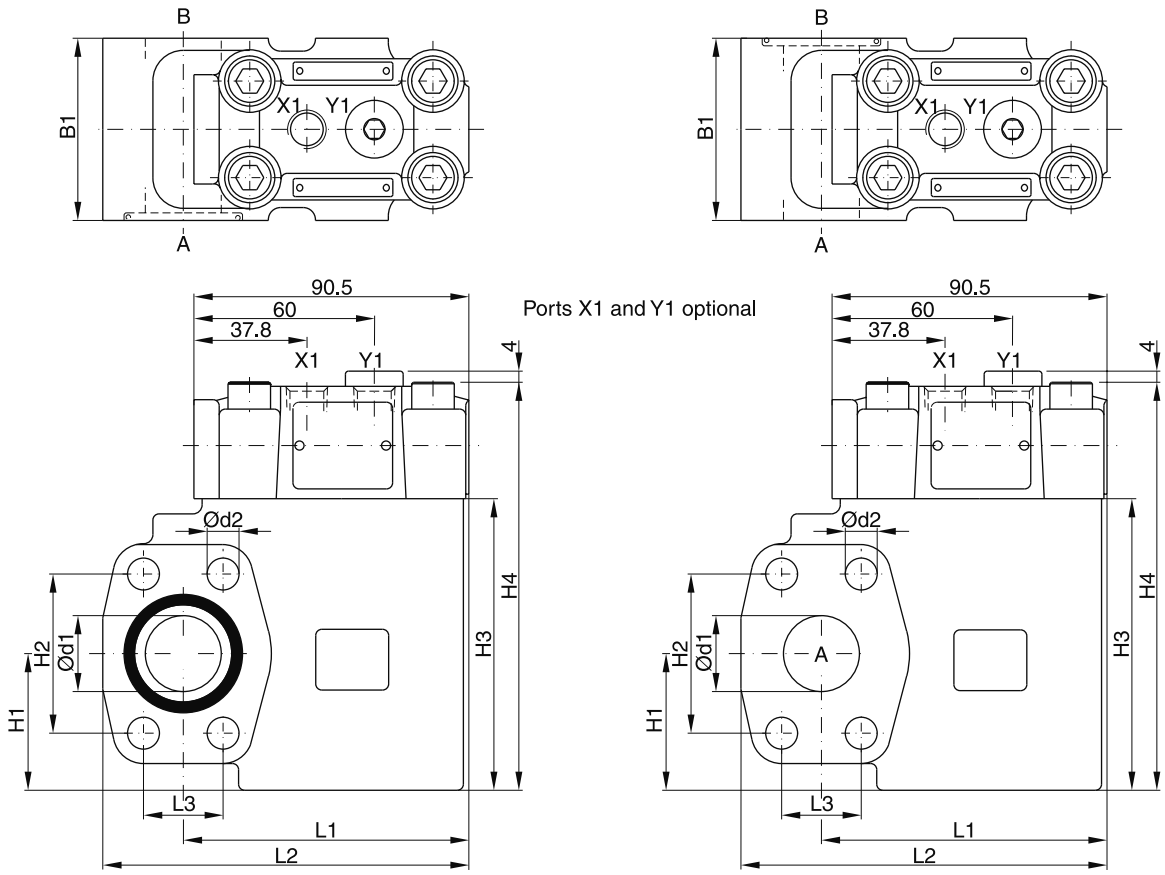
Selection of Cartridges

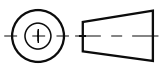
Sleeve 1, poppet 1	Sleeve 1, poppet 2	Sleeve 1, poppet 4	Sleeve 3, poppet 4	Sleeve 3, poppet A	Sleeve 3, poppet B/C
					
1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 15° chamfer	1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 15° chamfer orifice	1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 45° chamfer	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer safety spool	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer throttle spool

D5S 2-port

Seat entry

Annular entry





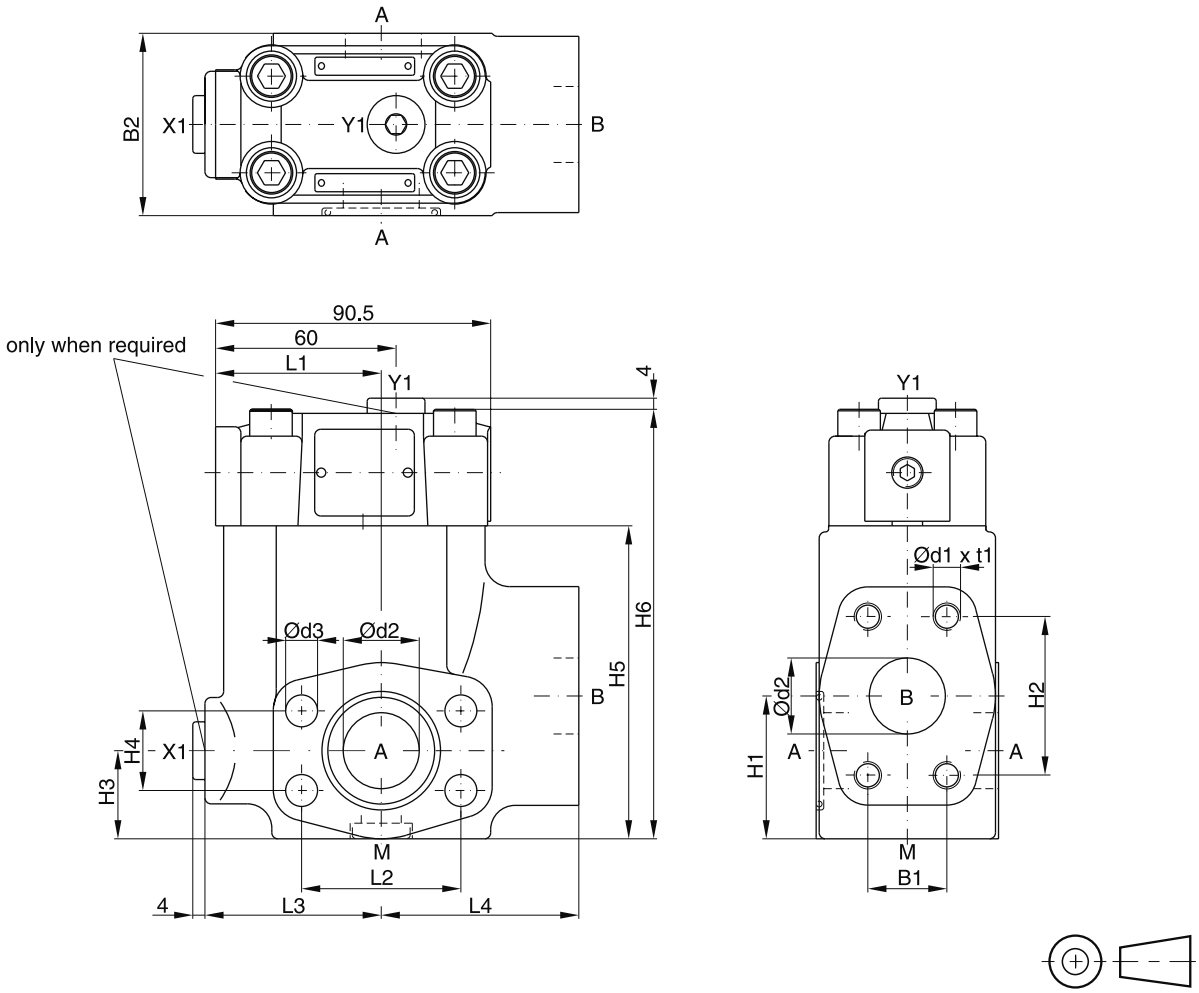
9

Seal kits		
NG	NBR	FPM
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5

NG	l1	l2	l3	b1	h1	h2	h3	h4	d1	d2
06	77	101.0	22.2	60	37	47.6	90	127.6	19	10.5
08	94	120.5	26.2	60	45	52.4	96	133.6	25	10.5
10	94	128.0	30.2	75	48	58.7	109	146.6	32	12.5

Ports	Function	Port size		
		D5S06	D5S08	D5S10
A	Inlet or outlet	¾" SAE-61	1" SAE-61	1¼" SAE-61
B	Outlet or inlet	¾" SAE-61	1" SAE-61	1¼" SAE-61
X1	External pilot port	G¼"		
Y1	External pilot drain			

Dimensions D5S 3-port



9

Seal kits		
NG	NBR	FPM
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5
12	S26-27421-0	S26-27421-5

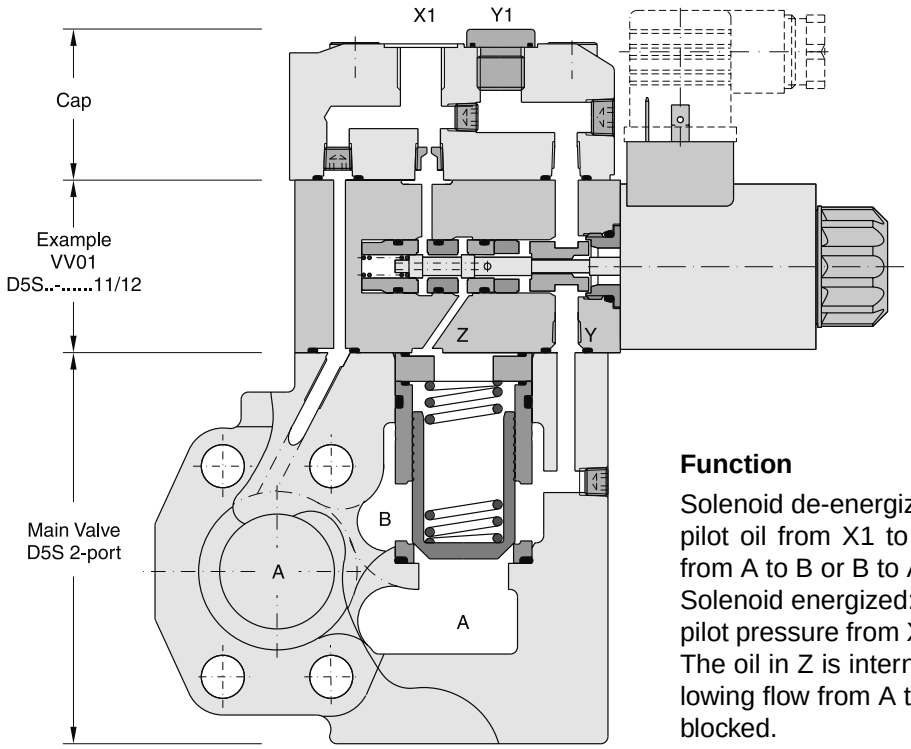
NG	l1	l2	l3	l4	b1	b2	h1	h2	h3	h4	h5	h6	d1	t1	d2	d3
06	49	47.6	56	63	22.2	60	41	47.6	29.5	22.2	82	119	3/8" UNC	20	19	10.5
08	55	52.4	58	65	26.2	60	47	52.4	30.5	26.2	103	141	3/8" UNC	23	25	10.5
10	57	58.7	64	61	30.2	75	65	58.7	37.5	30.2	113	150	7/16" UNC	22	32	12.5
12	37	69.8	55	93	35.7	80	73	69.8	35.5	35.7	140	178	1/2" UNC	27	38	13.5

Ports	Function	Port size			
		D5S06	D5S08	D5S10	D5S12
A (2x)	Inlet or outlet	¾" SAE-61	1" SAE-61	1¼" SAE-61	1½" SAE-61
B	Outlet or inlet	¾" SAE-61	1" SAE-61	1¼" SAE-61	1½" SAE-61
X1 [1]	External pilot port	G¼"			
Y1	External pilot drain				
M	Pressure gauge				

[1] closed when supplied

D5S UK.INDD CM 07.09.11

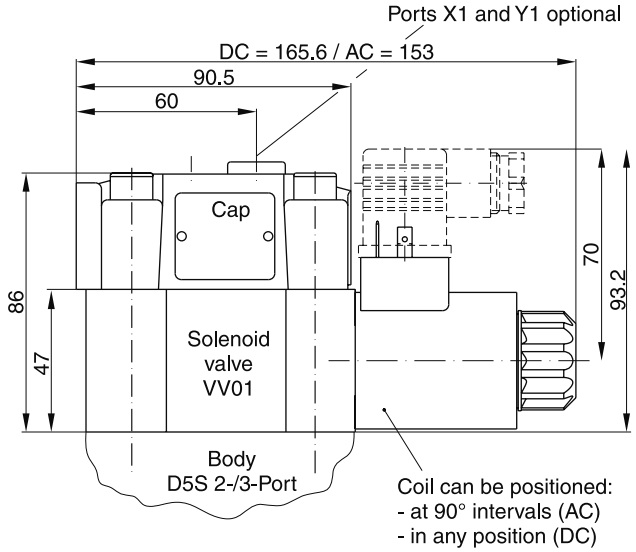
Example pilot oil external from X1, pilot drain internal out of B

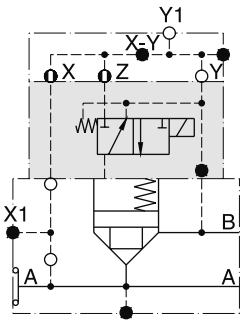


Function

Solenoid de-energized:
pilot oil from X1 to Z blocks the connection from A to B or B to A.
Solenoid energized:
pilot pressure from X1 is blocked in the VV01. The oil in Z is internally drained to port B. Allowing flow from A to B, while B to A remains blocked.

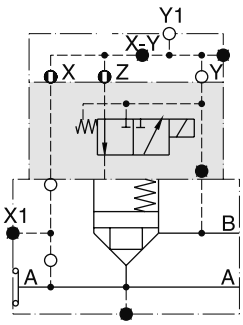
D5S with VV01 dimensions





with manual override | without manual override

D5S..-.....09/10
Solenoid energized:
Blocked flow from A to B or B to A.
Solenoid de-energized:
Free flow from A to B or B to A.



with manual override | without manual override

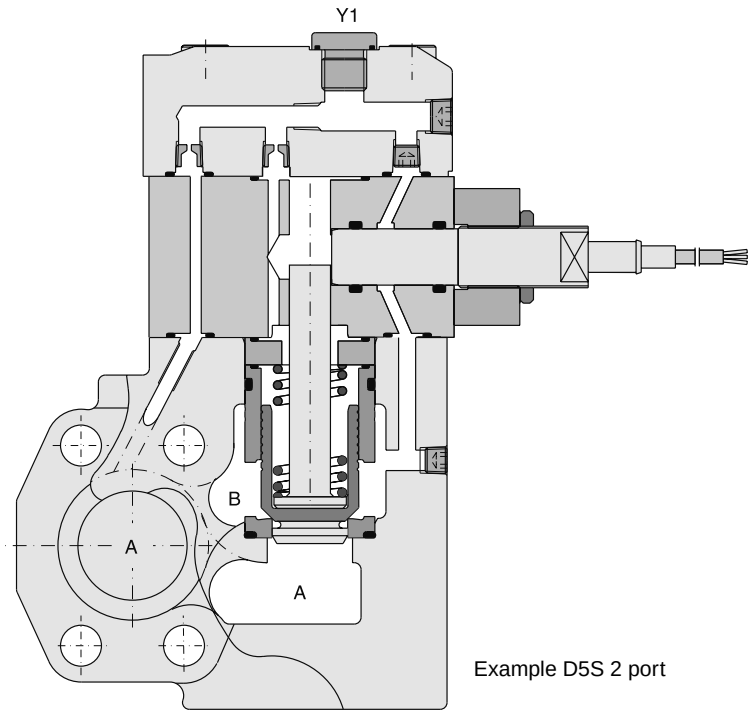
D5S..-.....11/12
Solenoid energized:
Free flow from A to B or B to A.
Solenoid de-energized:
Blocked flow from A to B or B to A.

Seal kits	
NBR	FPM
DC solenoid	
S26-58515-0	S26-58515-5
AC solenoid	
S26-35237-0	S26-35237-5

D5S with position control

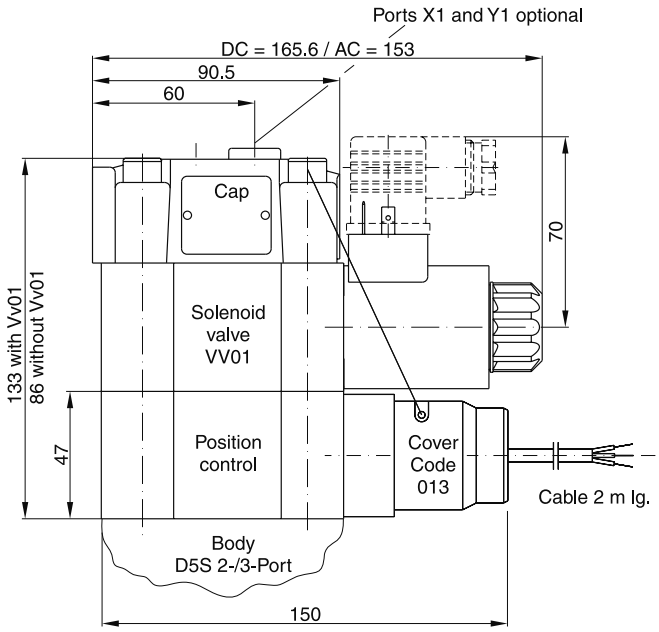
Position control by proximity switch (incl. amplifier). Valve open: proximity switch activated. This proximity switch is pressure proof and has no wearing parts.

Note: Position control for D5S08 and D5S10 only.



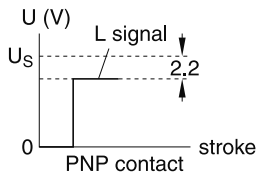
Example D5S 2 port

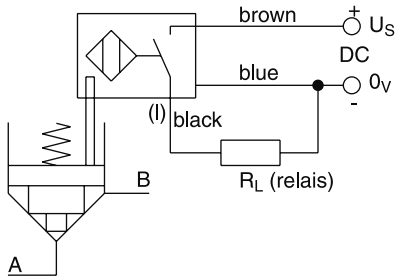
D5S with position control dimensions



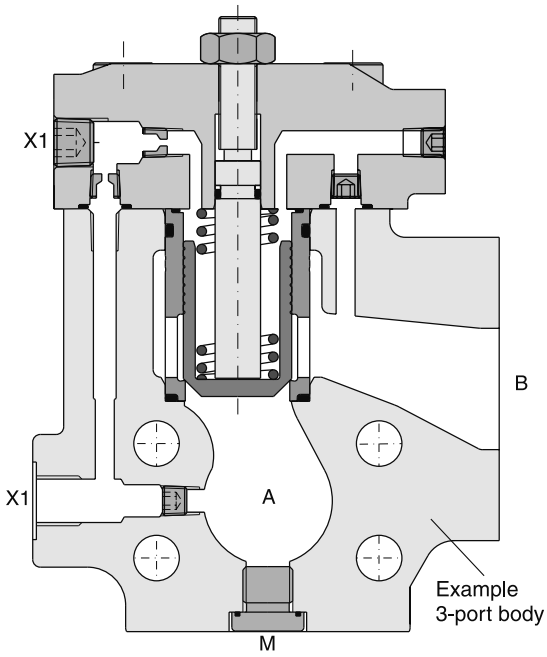
Technical data (proximity switch)

Function		PNP, contact
Supply voltage (Us)	[VDC]	10...30
Supply voltage ripple	[%]	≤ 10
Current consumption	[mA]	max. 8
Residual voltage L-signal	[V]	Us - 2.2 at I_{max}
Output current (I)	[mA]	≤ 200
Protection class		IP67
Ambient temperature	[C°]	-25...+70
Wire cross section	[mm^2]	3 x 0.5





D5S stroke limiter

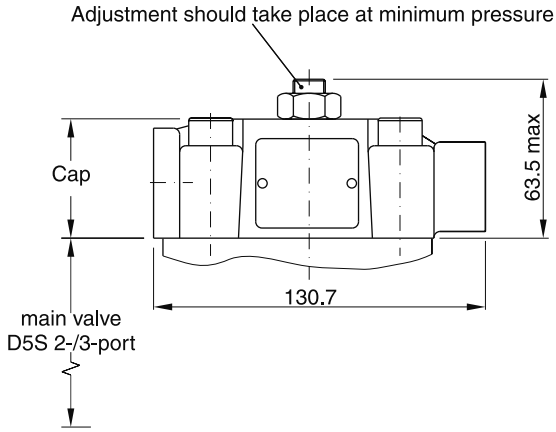


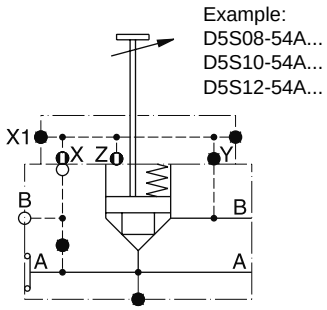
X1 = external pilot-oil (optional)

Note:

Stroke limiter not for use with D5S06, solenoid valve VV01, shuttle valve and position control.

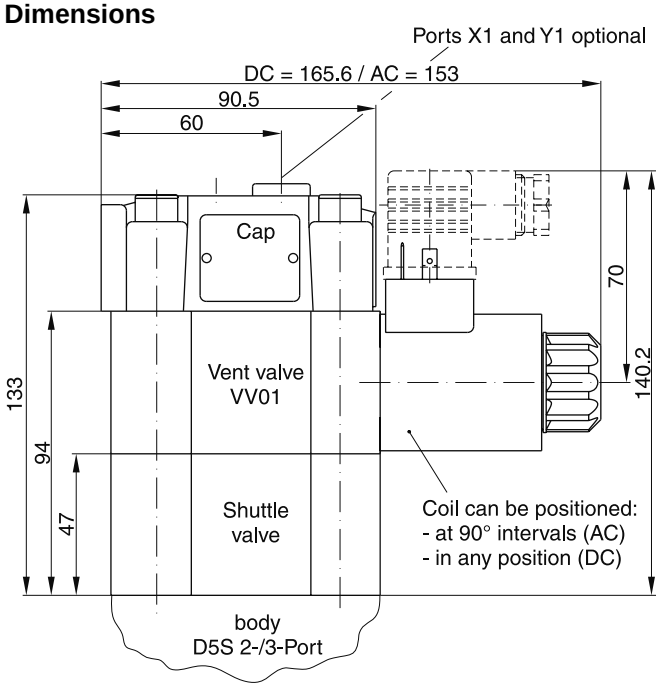
Stroke limiter dimensions



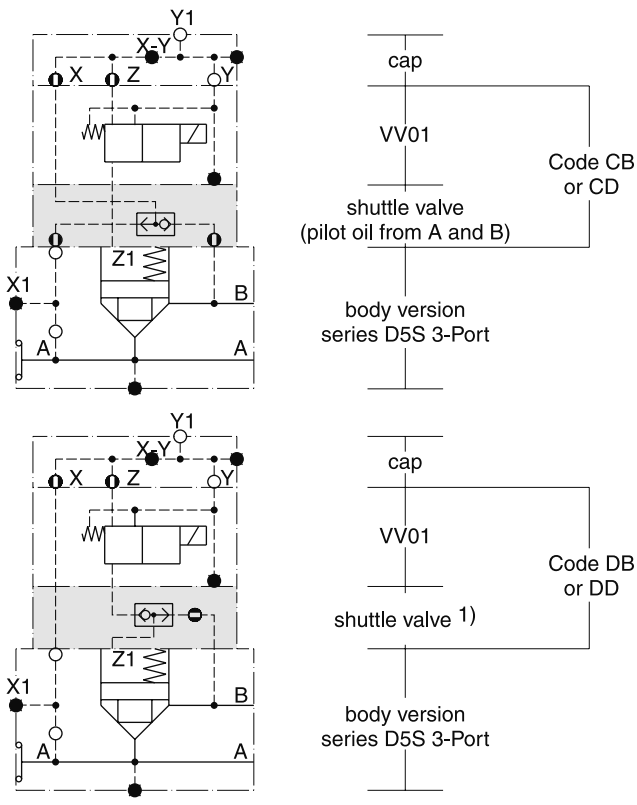


D5S with shuttle valve

Dimensions



Shuttle valve only in connection with vent valve VV01.

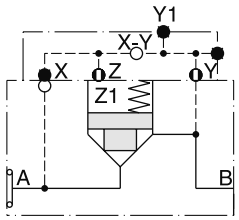


1) pilot oil from A and B, from B to A check valve function

9

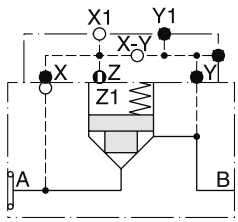
D5S 2-port

Seat entry



D5S..-722

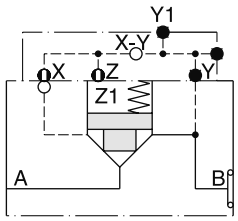
Pilot oil: internal from B



D5S..-743

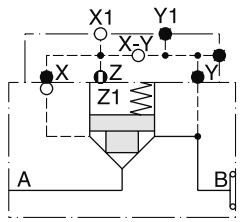
Pilot oil: external from X1

Annular entry



D5S..-821

Pilot oil: internal from B

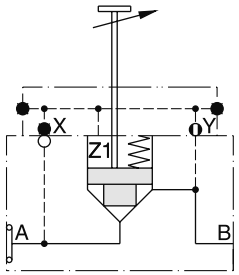


D5S..-843

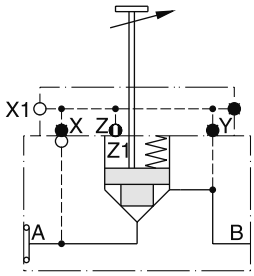
Pilot oil: external from X1

Stroke limiter D5S 2-port

Seat entry

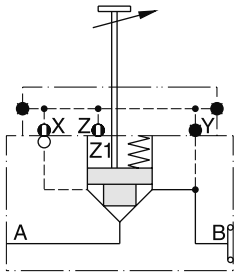


D5S08-72B
10
Pilot oil: internal from B

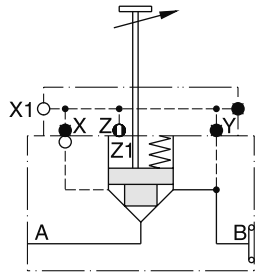


D5S08-74C
10
Pilot oil: external from X1

Annular entry

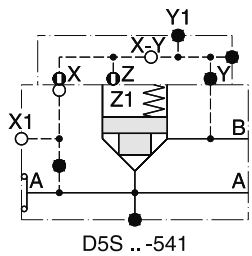


D5S08-82A
10
Pilot oil: internal from B



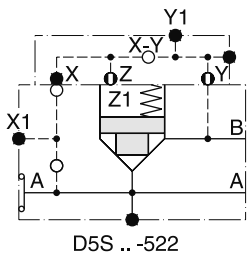
D5S08-84C
10
Pilot oil: external from X1

D5S 3-port



D5S .. -541

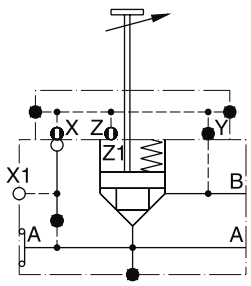
Pilot oil: external from X1



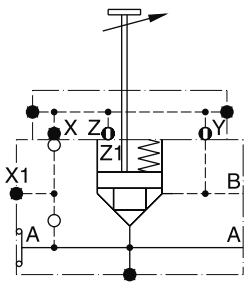
D5S .. -522

Pilot oil: internal from B

Stroke limiter D5S 3-port



D5S08-54A
10
12
Pilot oil: external from X1

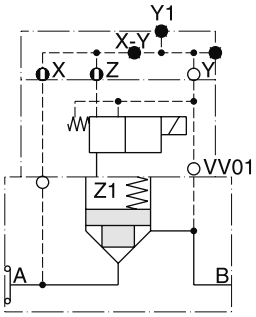


D5S08-52B
10
12
Pilot oil: internal from B

9

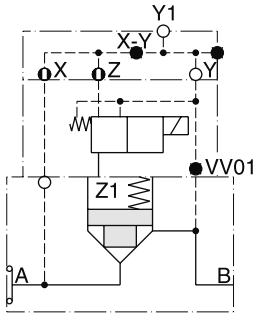
D5S 2-port with solenoid valve VV01

Seat entry



D5S..-714...09
10
11
12

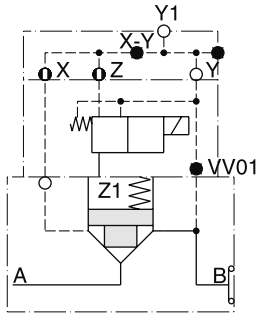
Pilot oil: internal from A
Pilot drain: internal to B



D5S..-716...09
10
11
12

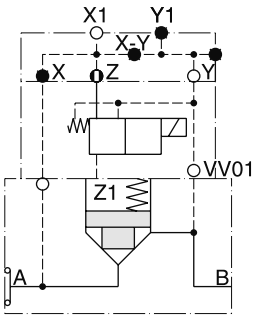
Pilot oil: internal from A
Pilot drain: external out of Y1

Annular entry



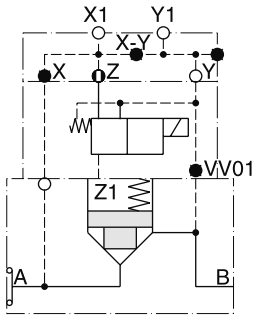
D5S..-826...09
10
11
12

Pilot oil: internal from B
Pilot drain: external out of Y1



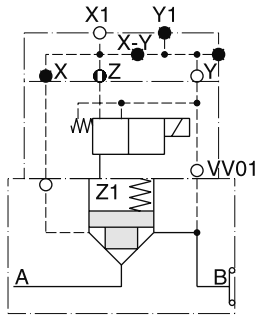
D5S..-745...09
10
11
12

Pilot oil: internal from X1
Pilot drain: internal to B



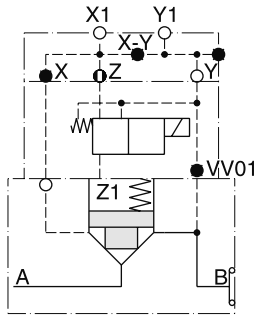
D5S..-747...09
10
11
12

Pilot oil: internal from X1
Pilot drain: external out of Y1



D5S..-845...09
10
11
12

Pilot oil: internal from X1
Pilot drain: internal to B



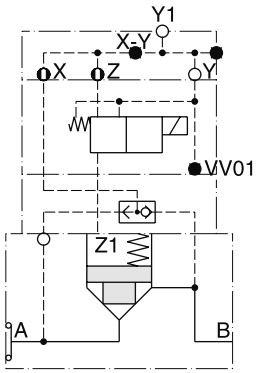
D5S..-847...09
10
11
12

Pilot oil: internal from X1
Pilot drain: external out of Y1

9

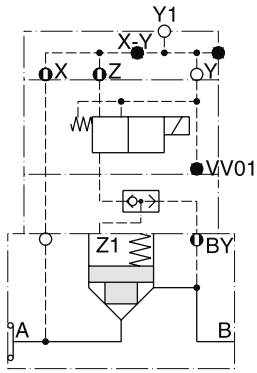
D5S 2-port with with solenoid valve VV01 and shuttle valve

Seat entry



D5S..-736...CB
CD

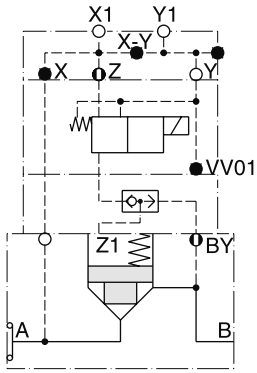
Pilot oil: internal from A + internal from B
Pilot drain: external out of Y1



D5S..-736...DB
DD

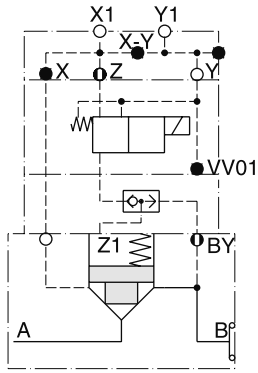
Pilot oil: internal from A + internal from B
Pilot drain: external out of Y1

Annular entry



D5S..-757...DB
DD

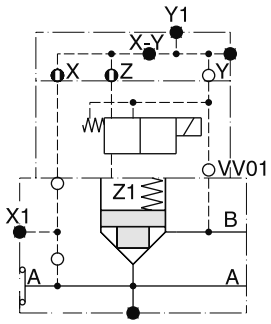
Pilot oil: external from X1 + internal from B
Pilot drain: external out of Y1



D5S..-857...DB
DD

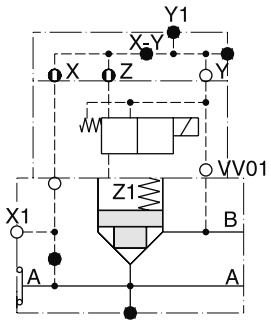
Pilot oil: external from X1 + internal from B
Pilot drain: external out of Y1

D5S 3-port with solenoid valve VV01



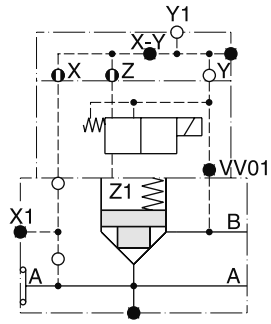
D5S .. -514...09
10
11
12

Pilot oil: internal from A
Pilot drain: internal to B



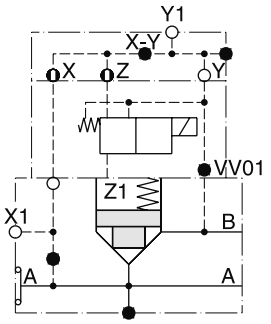
D5S .. -544...09
10
11
12

Pilot oil: external from X1
Pilot drain: internal to B



D5S .. -516...09
10
11
12

Pilot oil: internal from A
Pilot drain: external out of Y1

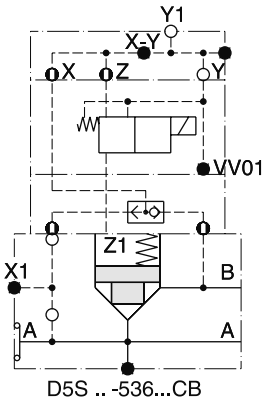


D5S .. -546...09
10
11
12

Pilot oil: external from X1
Pilot drain: external out of Y1

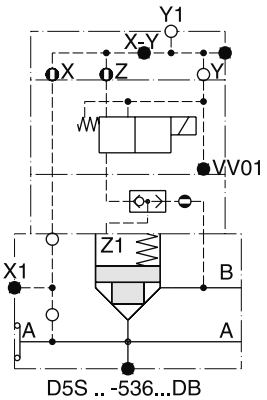
9

D5S 3-port with with solenoid valve VV01 and shuttle valve



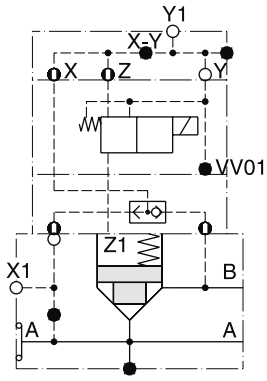
D5S .. -536...CB
CD

Pilot oil: internal from A + internal from B
Pilot drain: external out of Y1



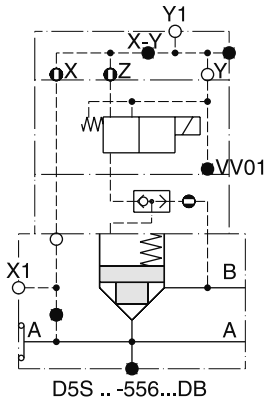
D5S .. -536...DB
DD

Pilot oil: internal from A + internal from B
Pilot drain: external out of Y1



D5S .. -556...CB
CD

Pilot oil: internal from X1 + internal from B
Pilot drain: external out of Y1

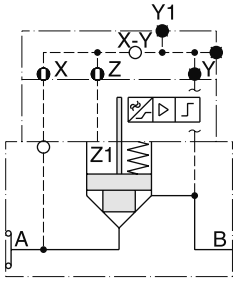


D5S .. -556...DB
DD

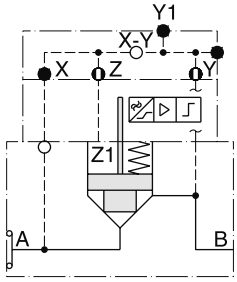
Pilot oil: external from X1 + internal from B
Pilot drain: external out of Y1

D5S 2-port position control

Seat entry

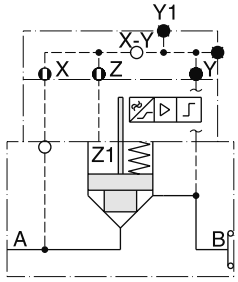


D5S08-7113A.BA
D5S10
Pilot oil: internal from A

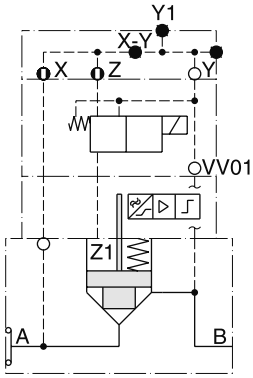


D5S08-7223A.BA
D5S10
Pilot oil: internal from B

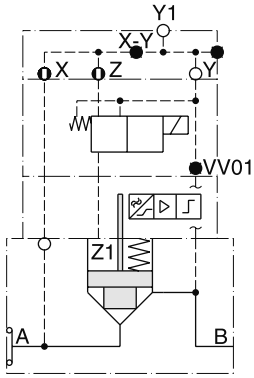
Annular entry



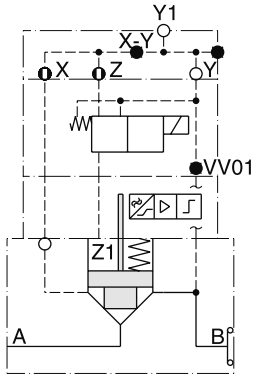
D5S08-8213A.BA
D5S10
Pilot oil: internal from B



D5S08-7143A.BC
D5S10 BE
Pilot oil: internal from A
Pilot drain: internal to B



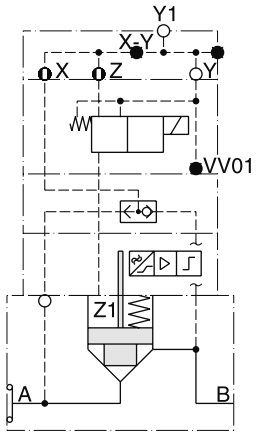
D5S08-7163A.BC
D5S10 BE
Pilot oil: internal from A
Pilot drain: external out of Y1



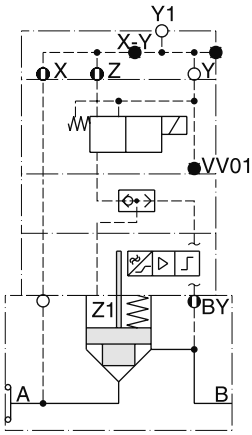
D5S08-8263A.BC
D5S10 BE
Pilot oil: internal from B
Pilot drain: external out of Y1

9

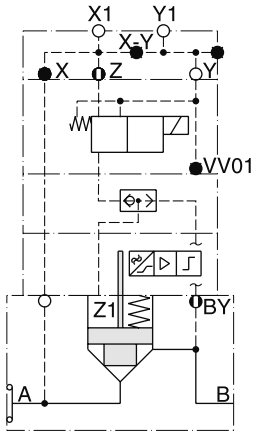
Seat entry



D5S..-736...BH
BK
Pilot oil: internal from A + internal from B
Pilot drain: external out of Y1

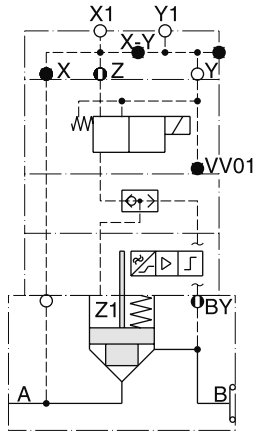


D5S..-736...BN
BQ
Pilot oil: internal from A + internal from B
Pilot drain: external out of Y1



D5S..-757...BN
BQ
Pilot oil: external from X1 + internal from B
Pilot drain: external out of Y1

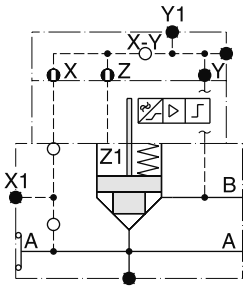
Annular entry



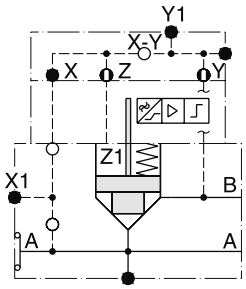
D5S..-857...BN
BQ
Pilot oil: external from X1 + internal from B
Pilot drain: external out of Y1

D5S 3-port position control

Seat entry

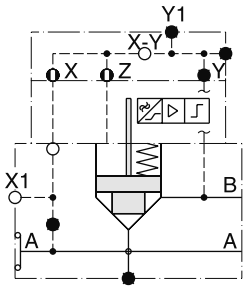


D5S08-5113A.BA
10
12
Pilot oil: internal from A

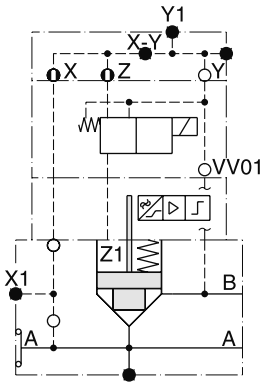


D5S08-5223A.BA
10
12
Pilot oil: internal from B

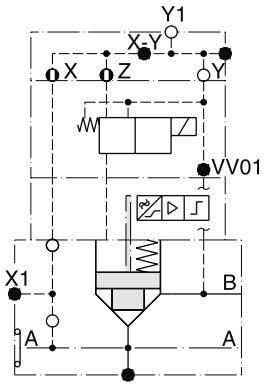
Annular entry



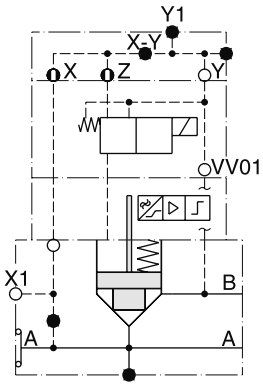
D5S08-5213A.BA
10
12
Pilot oil: external from X1



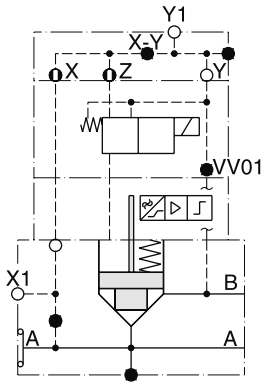
D5S08-5143A.BC
10 BE
12
Pilot oil: internal from A
Pilot drain: internal to B



D5S08-5163A.BC
10 BE
12
Pilot oil: internal from A
Pilot drain: external out of Y1



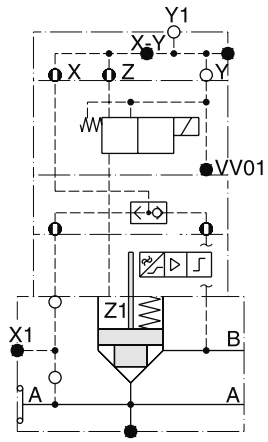
D5S08-5443A.BC
10 BE
12
Pilot oil: external from X1
Pilot drain: internal to B



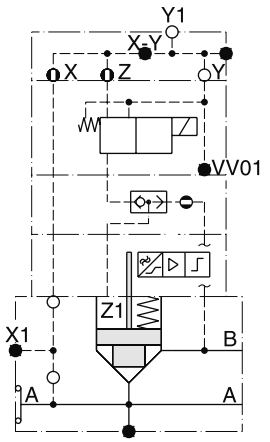
D5S08-5463A.BC
10 BE
12
Pilot oil: external from X1
Pilot drain: external out of Y1

9

Seat entry

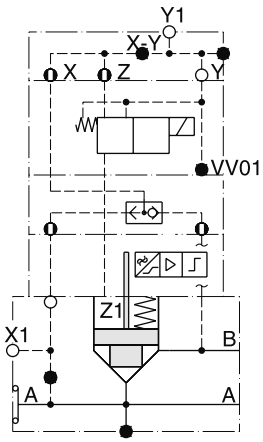


D5S08-5363A.BH
10 BE
12
Pilot oil: internal from A +
internal from B
Pilot drain: external out of Y1

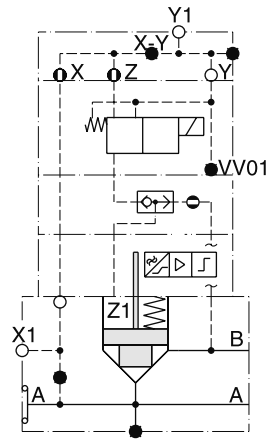


D5S08-5363A.BN
10 BQ
12
Pilot oil: internal from A +
internal from B
Pilot drain: external out of Y1

Annular entry



D5S08-5563A.BH
10 BK
12
Pilot oil: external from X1 +
internal from B
Pilot drain: external out of Y1



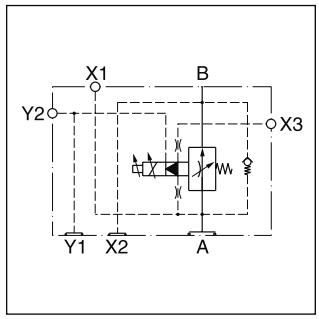
D5S08-5563A.BN
10 BQ
12
Pilot oil: external from X1 +
internal from B
Pilot drain: external out of Y1

Proportional throttle valves series F5C allow to adjust the flow in proportion to the input signal. The combination of the F5C with pressure compensators R5A or R5P serves as a flow control valve - providing load compensated flow.

The F5C is offered with two types of response time:

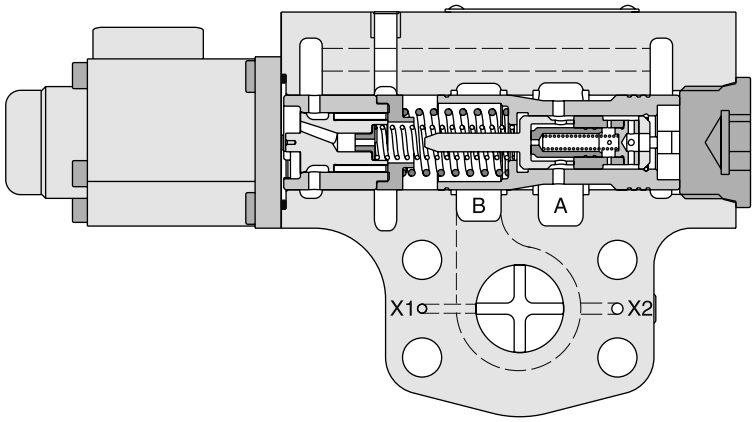
standard 350 ms at 1 l/min pilot flow

code A 250 ms at 2 l/min pilot flow



Features

- Spool type proportional throttle valve
- SAE61 flange
- Maximum flow 380 l/min
- 3 sizes, SAE 3/4“, 1“, 1 1/4“
- Load compensated flow in combination with R5A and R5P



Ordering Code

F5C			4	3		X		0	C			
Proportional throttle valve	Nominal size	Pilot flow and response	SAE61 interface	Pilot ports G¼"	Spool type	Proportional solenoid 16V/1.05A	Pilot connection	Accessories	Design	Seals	Design series (not required for ordering)	Options

Code	Nominal size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"

Code	Pilot flow	Max. response
—	1 l/min	350 ms
A	2 l/min	250 ms

Spool type		
Code	Size	Max. flow [1]
A	06	23 l/min
B	06/08	45 l/min
1	06/08/10	95 l/min
2	08/10	190 l/min
3	10	380 l/min

[1] At nominal pressure drop (Δp = 8.4bar)

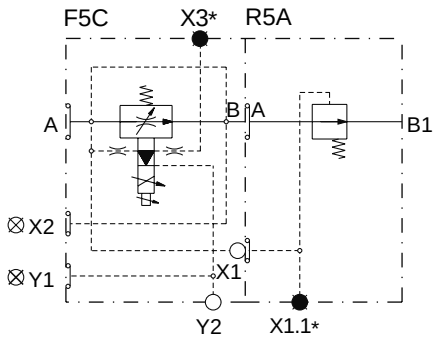
Code	Seals
1	NBR
5	FPM

Code	Pilot connections	F5C without compensators R5A, R5P		F5C for combination with R5A		F5C for combination with R5P	
2	internal PD (Y)	—		—		X1, X3, Y2	●
	internal PP (X)					X2, Y1	○
						X2, Y1	○
3	external PD (Y)	—		X1, X3, Y2	○	—	
	external PP (X)			X2, Y1	⊗		
4	external PD (Y)	X3, Y2	○	—		X2, X3, Y1, Y2	○
	external PP (X)	X1	●			X1	●
		X2, Y1	⊗				
5	external PD (Y)	—		X1, Y2	○	—	
	internal PP (X)			X3	●		
				X2, Y1	⊗		
6	external PD (Y)	X1, X3	●	—		X1, X3	●
	internal PP (X)	X2, Y1	⊗			X2, Y1, Y2	○
		Y2	○				

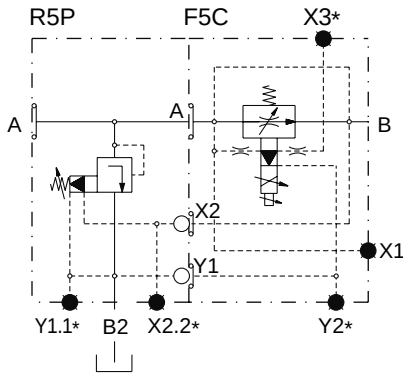
9

Pilot connection explanation

F5C with R5A



F5C with R5P

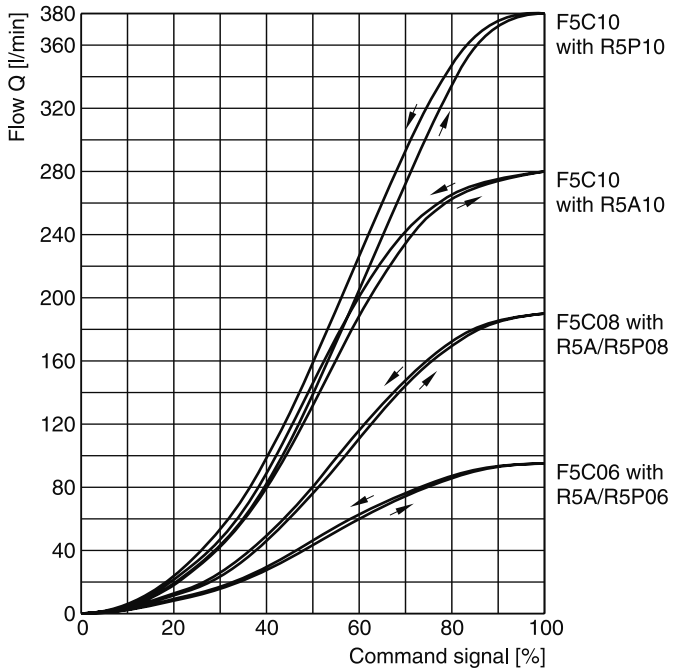


* optional ○ open ● closed ⊗ closed by counterpart

Technical data

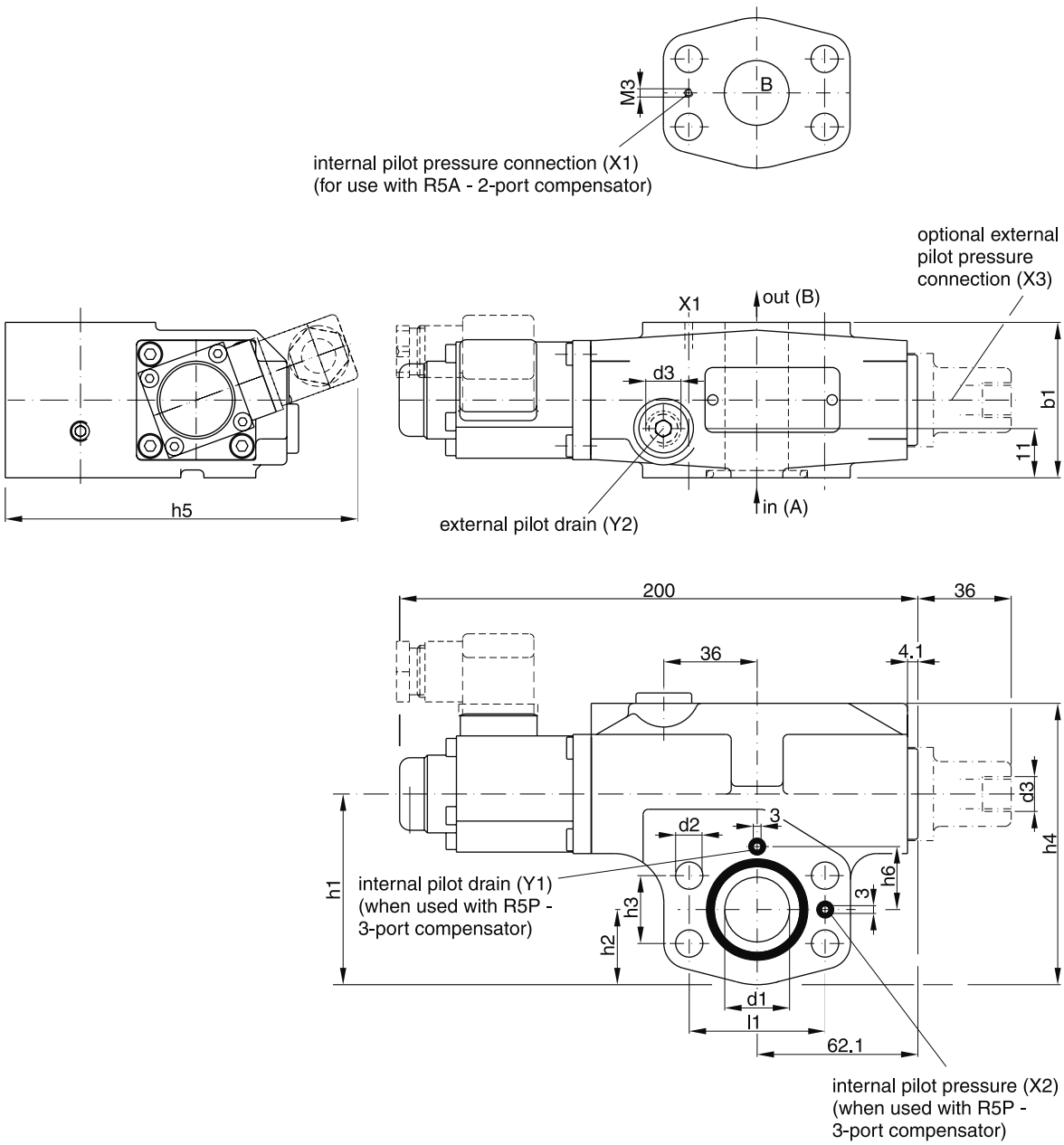
General				
Size		06 (¾")	08 (1")	10 (1¼")
Mounting		Flanged according to SAE 61		
Mounting position		unrestricted		
Ambient temperature	[°C]	-20...+50		
Weight	[kg]	3.9	4.1	5.8
Hydraulic				
Max. operating pressure				
Ports A, B, X1, X2, X3	[bar]	350	300	280
Ports Y1, Y2	[bar]	70		
Max. pressure drop (from A to B)	[bar]	21		
Nominal flow	[l/min]	95	190	380
Fluid		Hydraulic oil according to DIN 51524...51525		
Fluid temperature	[°C]	-20...+80		
Viscosity permitted	[cSt] / [mm²/s]	10...650		
recommended	[cSt] / [mm²/s]	30		
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)		
Electrical characteristics				
Duty ratio	[%]	100		
Solenoid connection		Connector as per EN175301-803		
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
Supply voltage	[V]	16		
Current consumption	[A]	1.05		
Resistance	[Ohm]	11.3		
Response time	[ms]	see ordering code		
Coil insulation class		H (180 °C)		

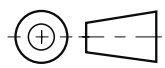
Characteristic curves



All characteristic curves measured with HLP46 at 50°C.

9

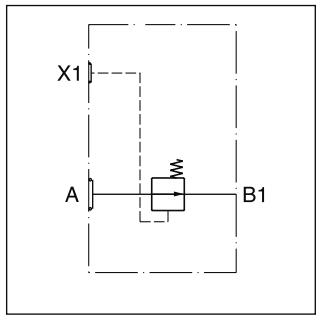




Seal kits		
NG	NBR	FPM
06 / 08 / 10	S16-91850-0	S16-91850-5

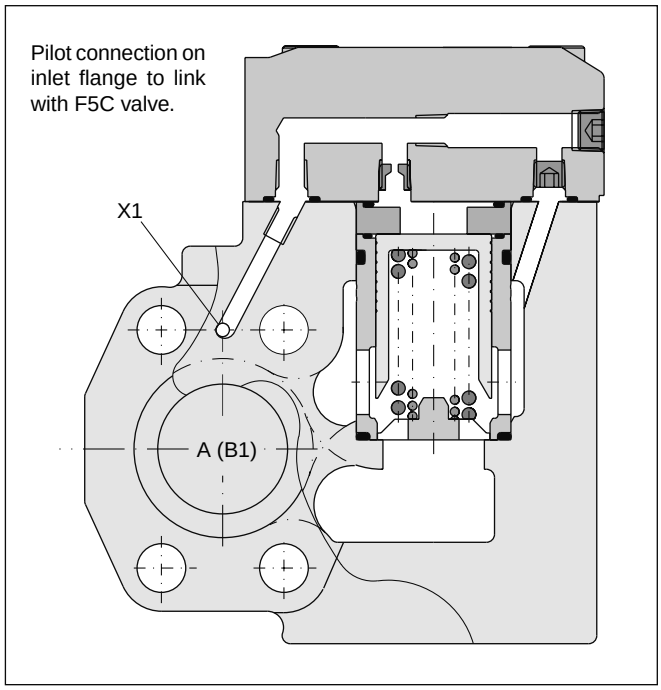
	l1	b1	h1	h2	h3	h4	h5	h6	d1	d2	d3
F5C06	47.6	60	68.2	26	22.2	103.2	183	20.8	19	10.5	G¼"
F5C08	52.4	60	73.6	29	26.2	108.6	187	24.3	25	10.5	G¼"
F5C10	58.7	75	83.5	36.5	30.2	118.5	198	29.3	32	12.5	G¼"

Direct operated 2 way pressure compensators series R5A can be combined with any type of fixed or adjustable flow resistor (throttle) to provide a load compensated flow. The combination with the proportional throttle valve F5C serves as a compact 2 way flow control unit in SAE flange design. The R5A is typically used as meter-out compensator behind the flow resistor.



Features

- Seated type 2 way pressure compensator
- SAE61 flange
- 8.4 bar control pressure
- 3 sizes, SAE 3/4“, 1“, 1 1/4“
- Load compensated flow in combination with F5C



Ordering code

R5A		–		4	1	01	B		
2-port compensator	Nominal size		SAE61 interface	2-port body	Plain cap	Pilot connection thru port X1	Design series	Seals	Options

Code	Nominal size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"

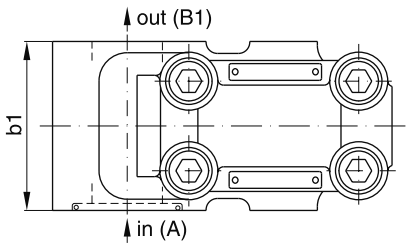
Code	Seals
1	NBR
5	FPM

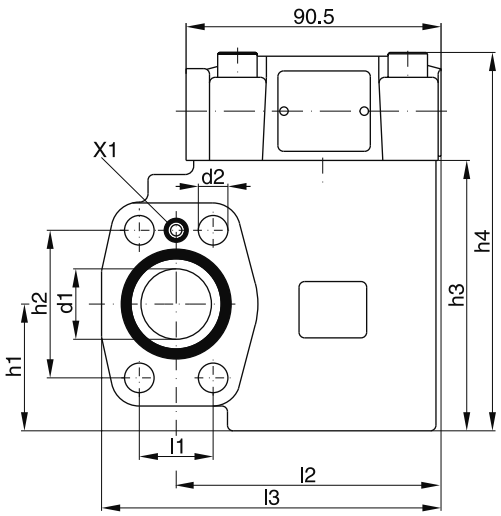
SAE 61 interface		
Code	Size	Max. pressure [bar]
4	10	280
5	06/08	350

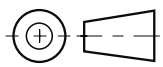
Technical data

General				
Size		06 (¾")	08 (1")	10 (1¼")
Mounting		Flanged according to SAE 61		
Mounting position		unrestricted		
Ambient temperature	[°C]	-20...+50		
$MTTF_D$ value	[years]	150		
Weight	[kg]	3.6	4.3	5.6
Hydraulic				
Max. operating pressure	[bar]			
Ports A, B, X1		350	350	280
Control pressure	[bar]	8.4		
Nominal flow	[l/min]	90	300	600
Fluid		Hydraulic oil according to DIN 51524...51525		
Fluid temperature	[°C]	-20...+80		
Viscosity permitted	[cSt] / [mm^2/s]	10...650		
recommended	[cSt] / [mm^2/s]	30		
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)		

Dimensions





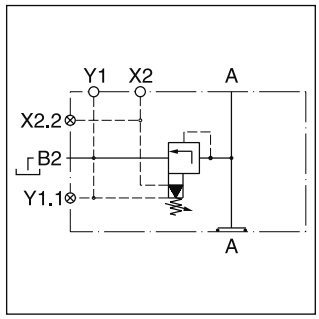


Seal kits		
NG	NBR	FPM
06	S16-91458-0	S16-91458-5
08	S16-91457-0	S16-91457-5
10	S16-91456-0	S16-91456-5

	l1	**l2**	**l3**	**b1**	**h1**	**h2**	**h3**	**h4**	**d1**	**d2**
R5A06	22.2	84	108	60	37	47.6	90	128	19	10.5
R5A08	26.2	101	128	60	45	52.4	96	134	25	10.5
R5A10	30.2	101	135	75	48	58.7	109	147	32	12.5

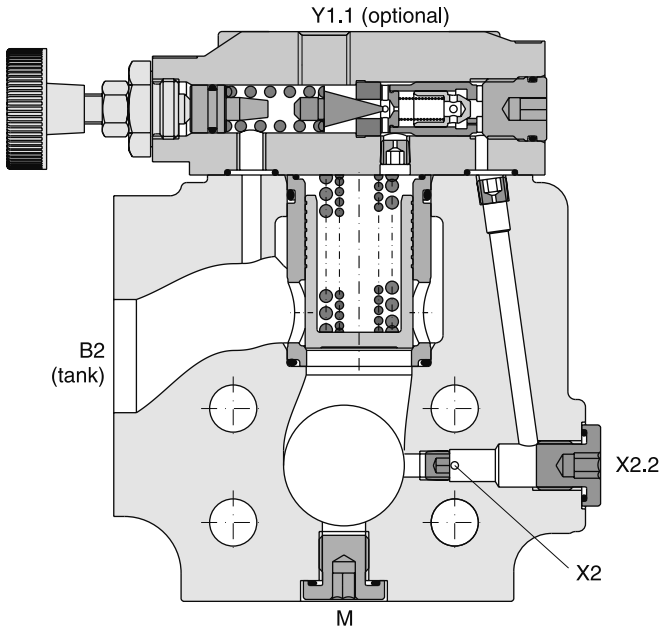
Direct operated 3 way pressure compensators series R5P can be combined with any type of fixed or adjustable flow resistor (throttle) to provide a load compensated flow. The combination with the proportional throttle valve F5C serves as a compact 3 way flow control unit in SAE flange design. The R5P is typically used as meter-in compensator in front of the flow resistor.

The R5P is additionally equipped with a pressure relief pilot, that controls the compensator cartridge and operates a system pressure relief valve. The R5P*P2 provides a proportional relief function.



Features

- Seated type 3 way pressure compensator
- SAE61 flange
- 8.4 bar control pressure
- Pressure relief function (optionally proportional)
- With optional vent function
- 3 sizes, SAE 3/4“, 1“, 1 1/4“
- Load compensated flow in combination with F5C



R5P	□	–	□	□	□	□	□	□	□	A	□	□
3-port compensator	Nominal size		SAE 61 Interface	Pilot ports	Pressure stages	Adjust-ment	Pilot connection	Switching type	Solenoid voltage	Design series	Seals	Options

Code	Port size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"

Code	Seals [6]
1	NBR
5	FPM

[6] Further seals on request

SAE 61 interface		
Code	Size	Max. pressure [bar]
4	10	280
5	06/08	350

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR [5]	98V=
GAG [5]	205V=
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

[5] To be used in combination with rectifier plugs at 120VAC/230VAC power supply.

Code	Pilot ports	Port Y1 [1]
9	G¼"	plugged
P		open

[1] Y1 port is used in combination with F5C, when the F5C should be drained through the R5P (internal or external drain)

Code	Pressure stages
1	7...105 bar
3	7...210 bar
5 [2]	7...350 bar

[2] R5P10-4*5 up to 280 bar

Code	Switching type
omit	Standard w/o vent function
09	Solenoid not activated unpressure circulation
11	Solenoid activated unpressure circulation

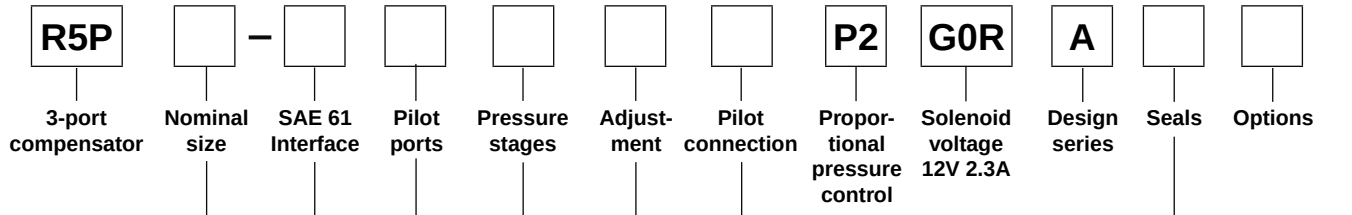
Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal

Code	Pilot connection
2	internal PD internal PP [4]
6	external PD [3] internal PP [4]

[3] Through port Y1.1

[4] PP through port X1 in outlet flange

9



Code	Port size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"

Code	Seals [5]
1	NBR
5	FPM

[5] Further seals on request

SAE 61 interface		
Code	Size	Max. pressure [bar]
4	10	280
5	06/08	350

Code	Pilot connection
2	internal PD internal PP [4]
6	external PD [3] internal PP [4]

[3] Through port Y1.1

[4] PP through port X1 in outlet flange

Code	Pilot ports	Port Y1 [1]
9	G¼"	plugged
P		open

[1] Y1 port is used in combination with F5C, when the F5C should be drained through the R5P (internal or external drain)

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal

Code	Pressure stages
1	7...105 bar
3	7...210 bar
5 [2]	7...350 bar

[2] R5P10-4*5 up to 280 bar

9

R5P

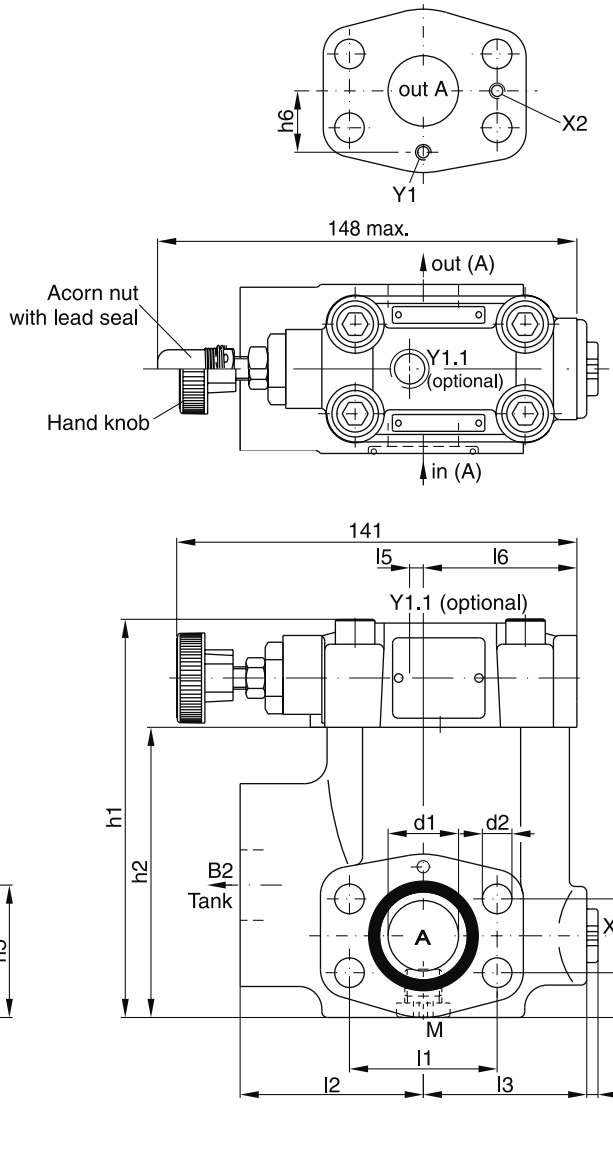
General							
Size			06 (¾")	08 (1")	10 (1¼")		
Mounting			Flanged according to SAE 61				
Mounting position			unrestricted				
Ambient temperature		[°C]	-20...+50				
$MTTF_D$ value		[years]	150				
Weight	R5P	[kg]	3.7	4.4	5.3		
	R5P with VV01	[kg]	5.4	6.1	7.0		
Hydraulic							
Max. operating pressure		[bar]					
		Ports A, B	350	350	280		
Pressure stages		[bar]	105, 210, 350				
Nominal flow		[l/min]	90	300	600		
Fluid			Hydraulic oil according to DIN 51524...51525				
Fluid temperature		[°C]	-20...+80				
Viscosity	permitted	[cSt] / [mm^2/s]	10...650				
	recommended	[cSt] / [mm^2/s]	30				
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)				
Electrical (solenoid) R5P with VV01							
Duty ratio		[%]	100				
Solenoid connection			Connector as per EN175301-803				
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)				
		Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage		[V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage		[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption	hold	[W]	31	31	31	31	78	78
	in rush		31	31	31	31	264	264
Response time		[ms]	Energized / De-energized AC: 20/18 , DC: 46/27					
Max. switching frequency			AC: up to 7200, DC: up to 16000 switchings/hour					
Coil insulation class			H (180 °C)					

9

R5P*P2

General					
Size		06 (¾")	08 (1")	10 (1¼")	
Mounting		Flanged according to SAE 61			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+50			
$MTTF_D$ value	[years]	75			
Weight	[kg]	5.5	6.2	7.1	
Hydraulic					
Max. operating pressure	Ports A, B [bar]	350	350	280	
Pressure stages	[bar]	105, 210, 350			
Nominal flow	[l/min]	90	300	600	
Fluid		Hydraulic oil according to DIN 51524...51525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt] / [mm^2/s]	10...650			
recommended	[cSt] / [mm^2/s]	30			
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)			
Electrical (proportional solenoid)					
Duty ratio	[%]	100			
Nominal voltage	[V]	12			
Max. current	[A]	2.3			
Coil resistance	[Ohm]	4 at 20°C			
Solenoid connection		Connector as per EN175301-803			
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
Power amplifier		PCD00A-400			

R5P



Seal kits		
NG	NBR	FPM
06	S16-91461-0	S16-91461-5
08	S16-91460-0	S16-91460-5
10	S16-91459-0	S16-91459-5

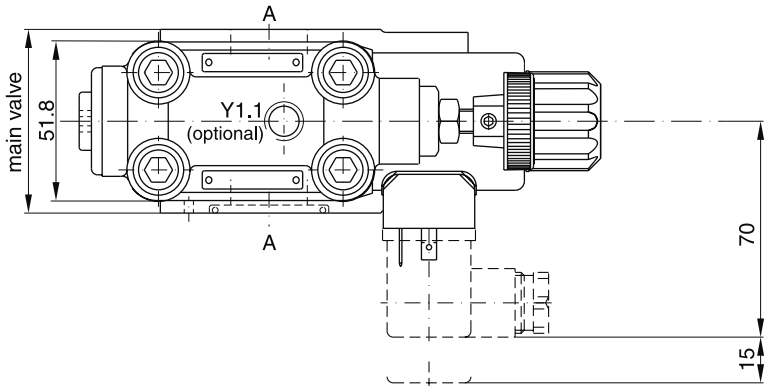
	l1	l2	l3	l4	l5	l6	b1	b2	h1	h2	h3	h4	h5	h6	d1	d2	d3
R5P06	47.6	63	56	148	1	49	60	20	119	81.6	29.5	22.2	41.6	20.8	19	10.5	3/8" UNC
R5P08	52.4	65	58	144.6	5	54.5	60	23	142	103	30.5	26.2	48.6	24.3	25	10.5	3/8" UNC
R5P10	58.7	61	62	146.6	3	56.5	75	22	149	111.5	37.5	30.2	64.1	29.3	32	12.5	7/16" UNC

Ports

Port	Function	Port size		
		R5P06	R5P08	R5P10
A	Inlet/outlet	¾"	1"	1¼"
B2	Tank	¾"	1"	1¼"
X2	Internal pilot pressure	M3		
X2.2	External pilot pressure	G¼"		
Y1	Internal pilot drain	M3		
Y1.1	External pilot drain	G¼"		
M	Pressure gauge	G¼"		

R5P UK.INDD CM 02.08.11

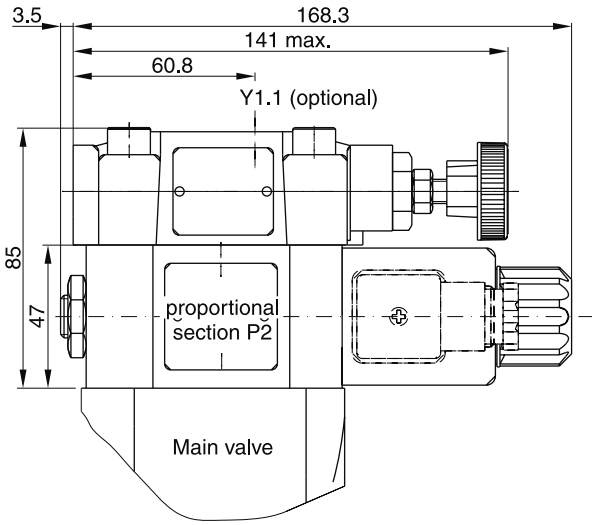
R5P*P2



Drain line only external from the pilot head (Y1.1).

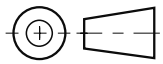
The pilot drain port must be connected to a stable low pressure tank line. Pressure variations in the drain port should be avoided.

Space for plug removal



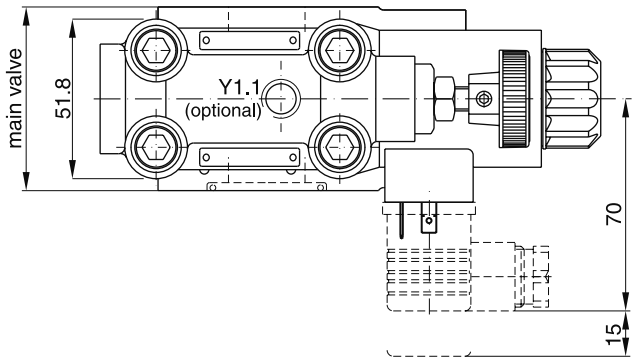
Note

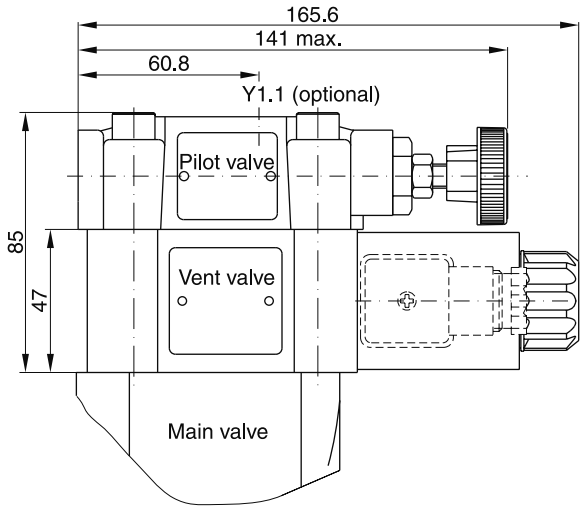
On initial start up and after long shut down periods bleed air from this plug.



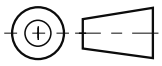
	Kit	
	NBR	**FPM**
Prop. section P2	S26-58473-0	S26-58473-5

R5P with vent function

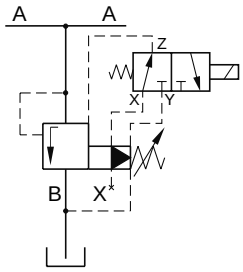
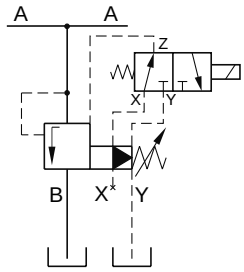
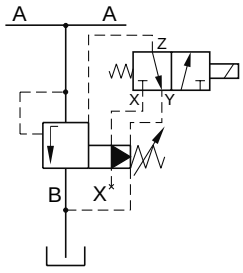
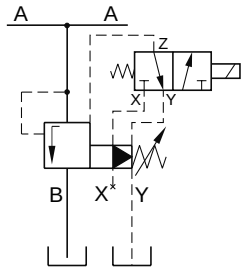




Seal kits	
NBR	FPM
DC solenoid	
S26-58515-0	S26-58515-5
AC solenoid	
S26-35237-0	S26-35237-5



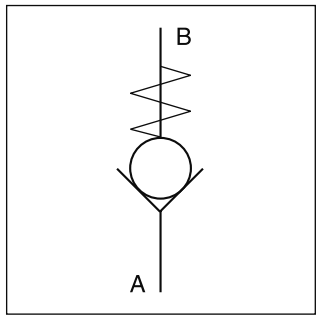
9

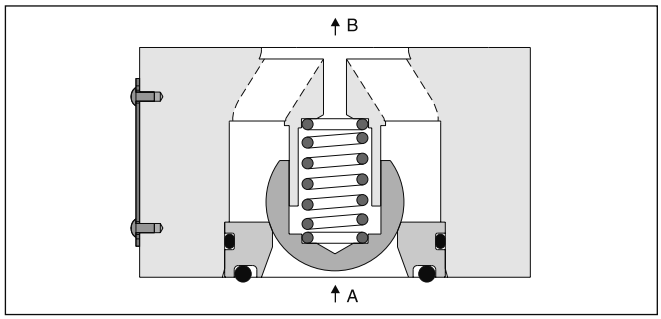
Code	Internal drain	External drain
11		
09		

Notes

Direct operated check valves series C5V provide free flow in one direction and block the flow in the counter direction.

The SAE flanges allow to mount the C5V directly on the pressure port of pumps for protection against pressure shocks from the system.





Features

- Direct operated check valve
- SAE61 and SAE62 flange
- 4 sizes (SAE ¾", 1", 1¼", 1½")
- 3 springs
- 5 options for body sealing

Ordering Code

C5V	☐	–	☐	☐	☐	B	☐	☐
Direct operated check valve	Nominal size		Flange	Body sealing	Cracking pressure	Design series	Seals	Options

Code	Port size
06	SAE ¾"
08	SAE 1"
10	SAE 1¼"
12 [1]	SAE 1½"

Code	Flange
3	SAE 61
6	SAE 62

Code	Body sealing
1	sealing for port A
2 [1]	sealing for port A and X
3	without sealing
4	sealing for port B
5	sealing for port A and B

[1] For combination with R5U unloading valve (SAE61 only)

Code	Options
omit	Standard
019 [2]	M14 mounting screws

[2] Only for C5V10-6 (SAE62)

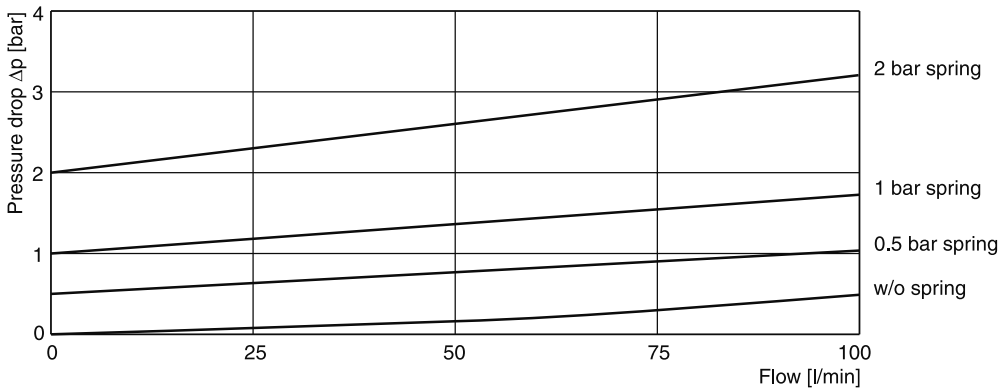
Code	Seals
1	NBR
5	FPM

Code	Cracking pressure
0	0.5 bar
1	1.0 bar
2	2.0 bar

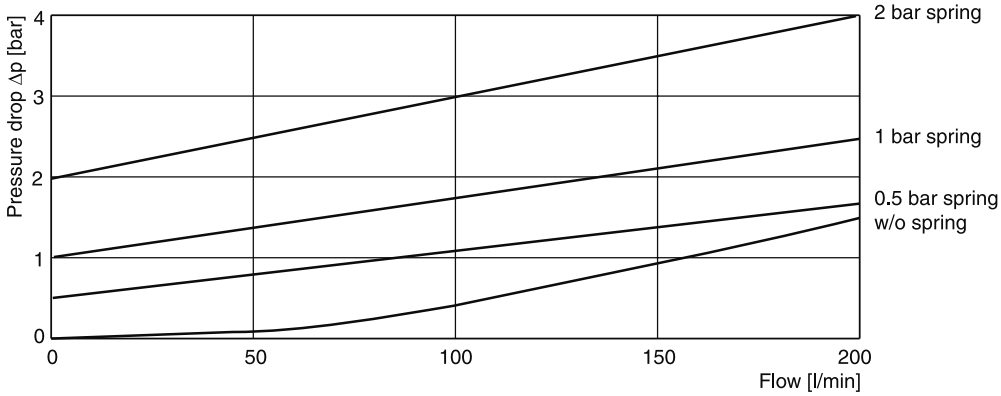
General						
Size			06 (¾")	08 (1")	10 (1¼")	12 (1½")
Mounting			2-port inline flange (SAE61 and 62)			
Mounting position			unrestricted			
Ambient temperature		[°C]	-20...+50			
$MTTF_D$ value		[years]	150			
Weight		[kg]	0.6	0.9	1.3	1.8
Hydraulic						
Max. operating pressure	SAE61	[bar]	350	350	280	210
	SAE62	[bar]	420	420	420	420
Nominal flow		[l/min]	100	200	400	750
Fluid			Hydraulic oil according to DIN 51524...51525			
Fluid temperature		[°C]	-20...+80			
Viscosity permitted		[cSt] / [mm^2/s]	10...650			
recommended		[cSt] / [mm^2/s]	30			
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)			

9

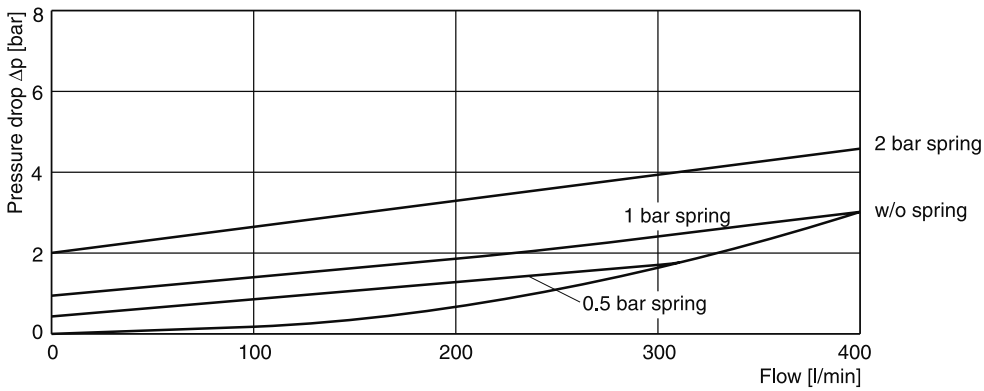
C5V06



C5V08



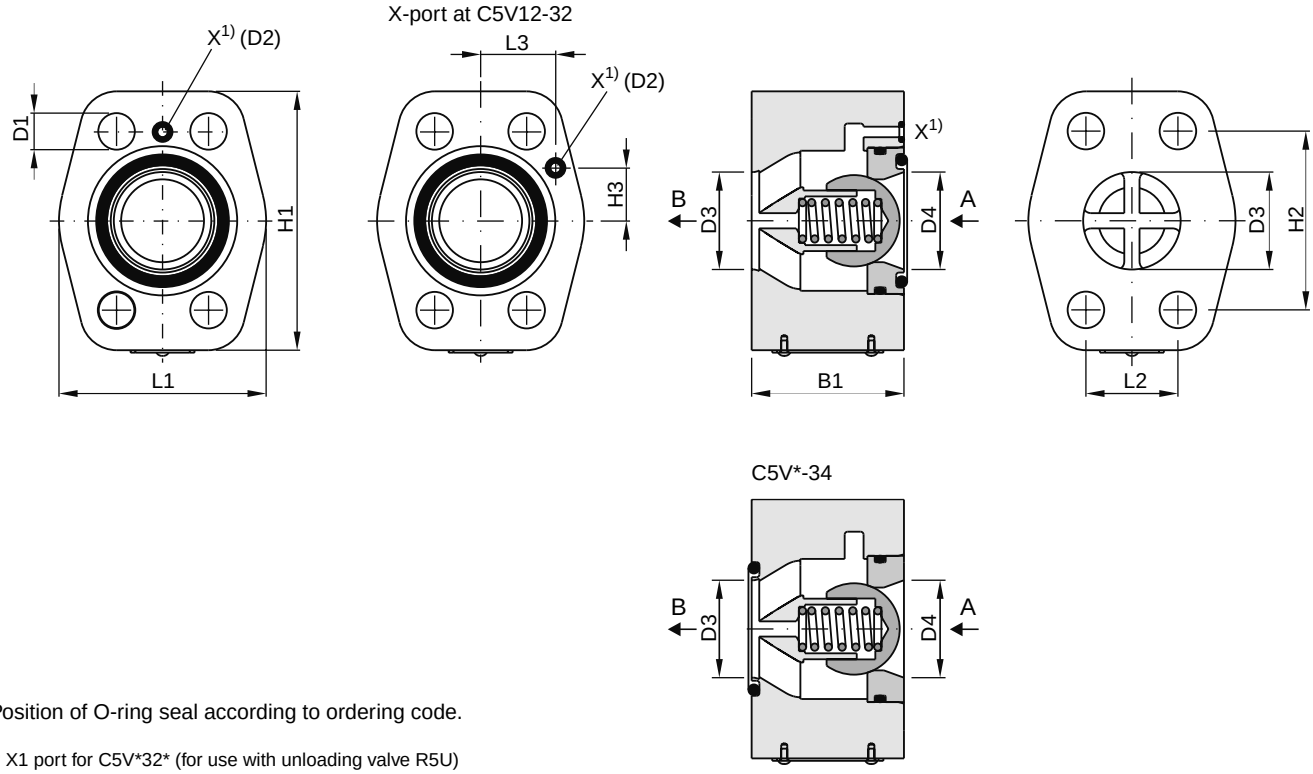
C5V10



C5V12

All characteristic curves measured with HLP46 at 50°C.

9



Position of O-ring seal according to ordering code.

1) X1 port for C5V*32* (for use with unloading valve R5U)

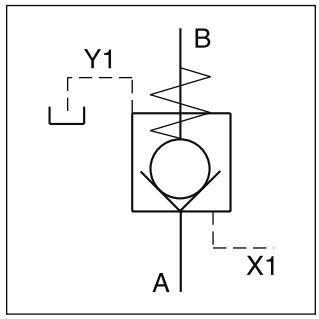
9

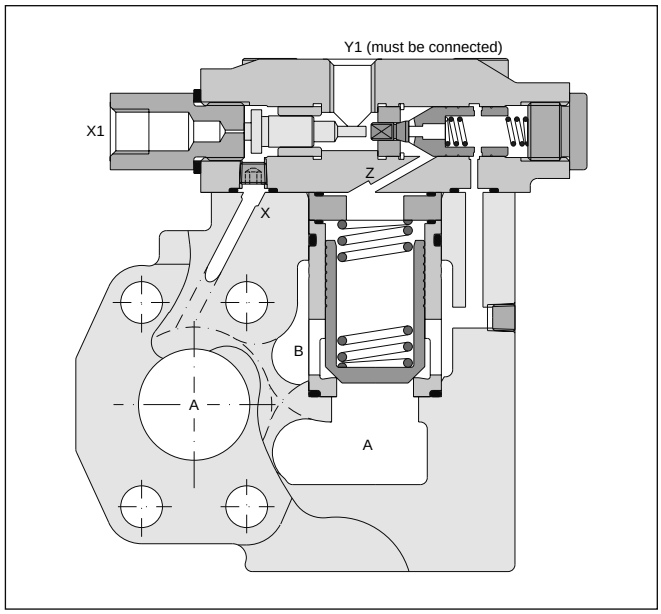
Seal kits		
NG	NBR	FPM
06	S26-75409-0	S26-75409-5
08	S26-75410-0	S26-75410-5
10	S26-75411-0	S26-75411-5
12	S26-75412-0	S26-75412-5

Series	Nominal Size		L1	L2	L3	H1	H2	H3	B1	D1	D2	D3 + 0.8	D4
C5V06	3/4“	SAE61	48	22.2	27.2	64	47.6	22.4	45	10.5	Ø3	19	19
		SAE62	48	23.8	27.2	64	50.8	22.4	45	10.5	–	19	19
C5V08	1“	SAE61	60	26.2	27.2	74	52.4	22.4	45	10.5	Ø3	25	25
		SAE62	60	27.8	27.2	74	57.2	22.4	45	12.5	–	25	25
C5V10	1 1/4“	SAE61	68	30.2	27.2	85	58.7	22.4	50	12.5	Ø3	32	32
		SAE62	68	31.8	27.2	85	66.7	22.4	50	13.5 2)	–	32	32
C5V12	1 1/2“	SAE61	80	35.7	27.2	104	69.8	22.4	50	13.5	Ø3	42	38
		SAE62	80	36.5	27.2	104	79.4	22.4	50	17	–	42	38

2) D1 = 15 at option code 019 for M14 mounting screws

Pilot operated check valves series C5P have a similar design to the subplate mounted C4V series. The SAE flanges allow to mount directly on the flanges of actuators to achieve a very compact design.





Features

- Pilot operated check valve
- 2-port body with SAE61 flange
- 3 sizes (SAE ¾", 1", 1¼")
- 4 opening ratios
- Valves with position control are available on request

Ordering code

C5P		–		8			A		
Pilot operated check valve	Nominal size		SAE61 interface	Pilot ports X1 and Y1=G¼"	Opening ratio	Cracking pressure	Design series	Seals	Options

Code	Nominal size
06	¾"
08	1"
10	1¼"

SAE61		
Code	Max. pressure	Size
4	280 bar	10 (SAE61)
5	350 bar	06/08 (SAE61)

Code	Opening ratio
1	1 : 1
3	3 : 1
8	8 : 1
9	10 : 1

Code	Seals
1	NBR
5	FPM

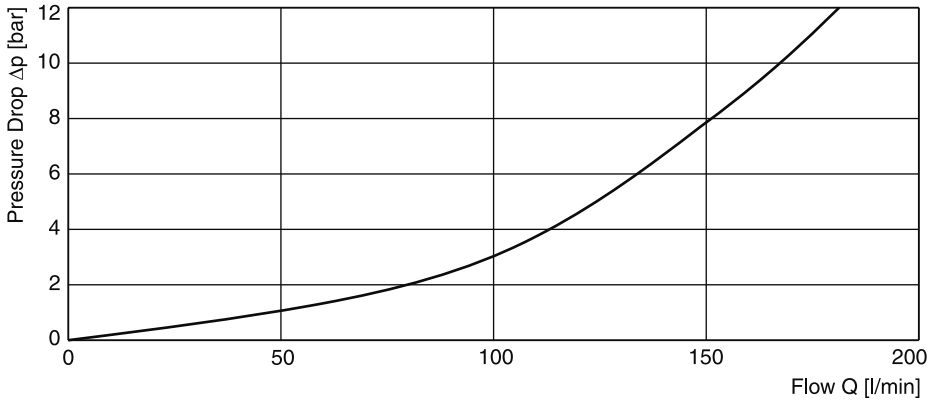
Code	Size	Flow A → B	Flow B → A
2	06	1.0 bar	1.5 bar
	08/10	1.0 bar	1.7 bar
4	06	4.0 bar	5.5 bar
	08/10	3.5 bar	6.0 bar
6	06	2.0 bar	3.0 bar
	08/10	2.2 bar	3.8 bar

General					
Size			06 (¾")	08 (1")	10 (1¼")
Mounting			2-port inline flange (SAE61)		
Mounting position			unrestricted		
Ambient temperature		[°C]	-20...+50		
$MTTF_D$ value		[years]	150		
Weight		[kg]	3.9	4.4	5.7
Hydraulic					
Max. operating pressure	Ports A, B	[bar]	350	350	280
	Port Y1	[bar]	30	30	30
Nominal flow		[l/min]	180	360	600
Fluid			Hydraulic oil according to DIN 51524...51525		
Fluid temperature		[°C]	-20...+80		
Viscosity	permitted	[cSt] / [mm^2/s]	10...650		
	recommended	[cSt] / [mm^2/s]	30		
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)		

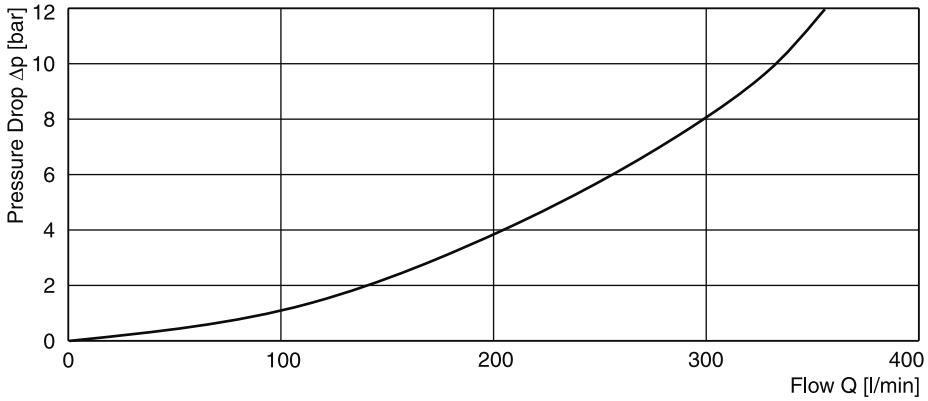
9

p/Q-performance curves

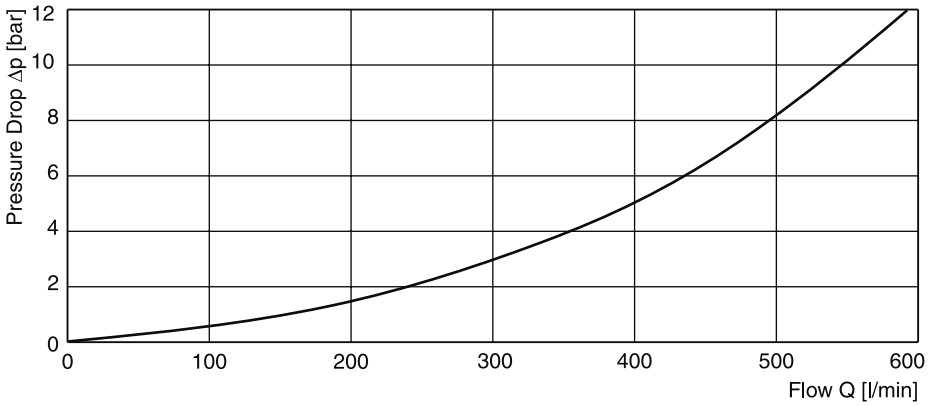
C5P06



C5P08

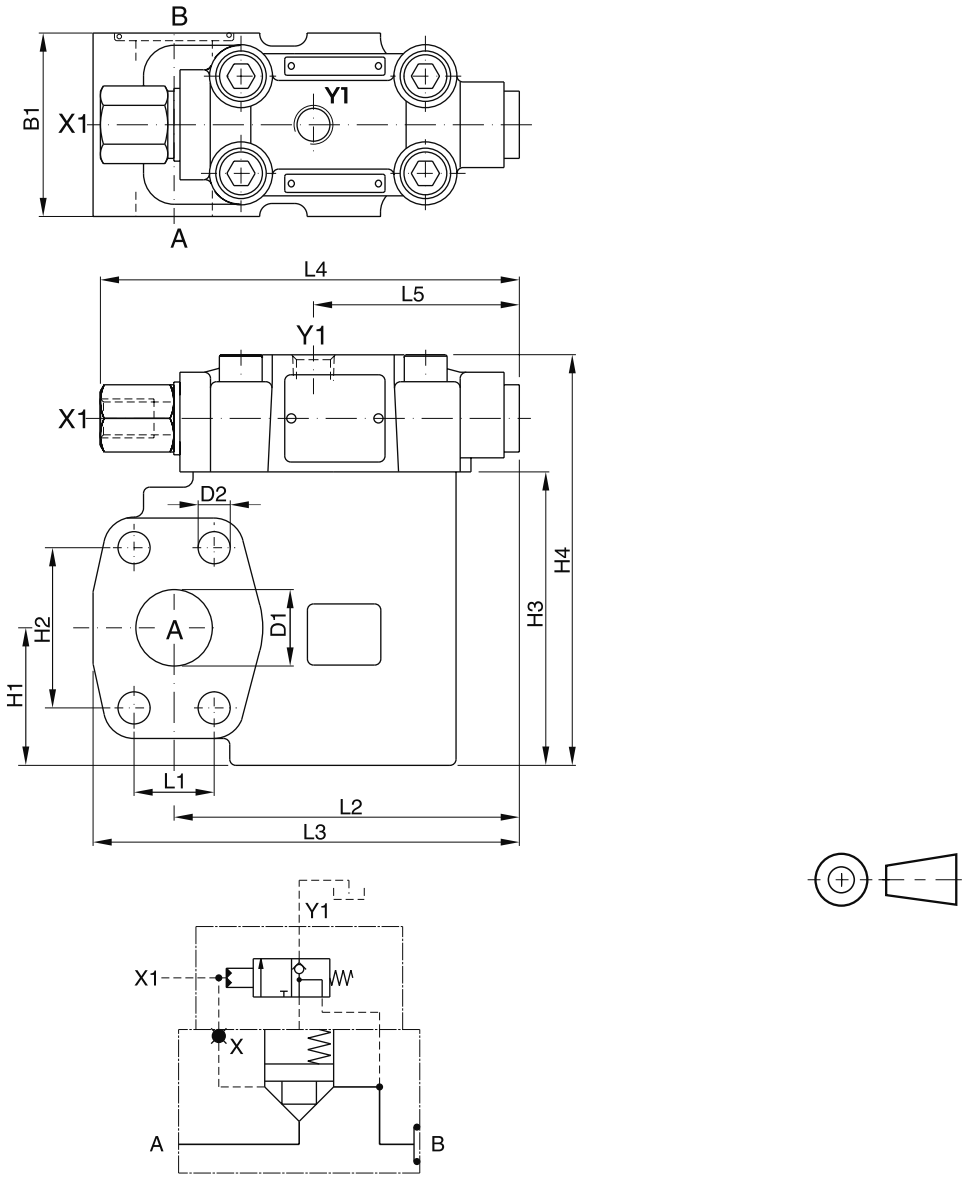


C5P10



All characteristic curves measured with HLP46 at 50°C.

9



9

Seal kits		
NG	NBR	FPM
06	S26-59404-0	S26-59404-5
08	S26-59405-0	S26-59405-5
10	S26-59406-0	S26-59406-5

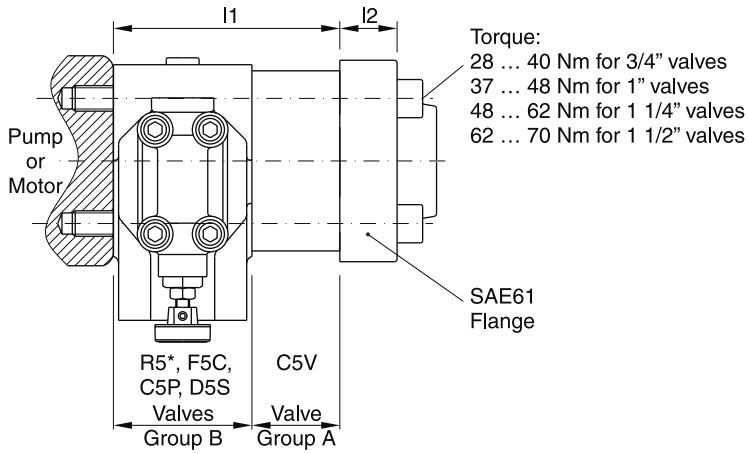
Dimensions

Type	L1	L2	L3	L4	L5	B1	H1	H2	H3	H4	D1	D2
C5P06	22.2	95.8	119.8	137	67.3	60	37	47.6	90	128	19	10.5
C5P08	26.2	112.9	139.4	137	67.3	60	45	52.4	96	134	25	10.5
C5P10	30.2	112.9	146.9	137	67.3	75	48	58.7	109	147	32	12.5

Ports

Port	Function	Port size		
		C5P06	C5P08	C5P10
A	Inlet or outlet	¾" SAE61	1" SAE61	1¼" SAE61
B	Outlet or inlet	¾" SAE61	1" SAE61	1¼" SAE61
X1	External pilot port	G¼"		
Y1	External pilot drain	G¼"		

BK bolt kits for SAE61 valves



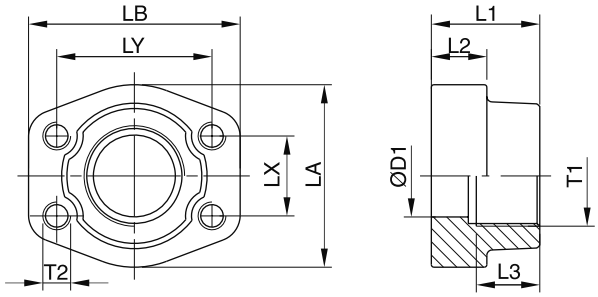
Port	Qty. of valves and group for each stack	I1	I2	UNC screws (12.9)	
				Dimension	Ordering code
¾" SAE61	1 x A	45	16...22	3/8"-16 x 3¼"	BK-358-16330-0
	1 x B	60		3/8"-16 x 3¾"	BK-358-16350-0
	(1 x A) + (1 x B)	105		3/8"-16 x 5½"	BK-358-16420-0
	2 x B	120		3/8"-16 x 6"	BK-358-16440-0
1" SAE61	1 x A	45	18...24	3/8"-16 x 3¼"	BK-358-16330-0
	1 x B	60		3/8"-16 x 3¾"	BK-358-16350-0
	(1 x A) + (1 x B)	105		3/8"-16 x 5¾"	BK-358-16430-0
	2 x B	120		3/8"-16 x 6¼"	BK-358-16450-0
1¼" SAE61	1 x A	50	21...25	7/16"-14 x 3½"	BK-358-18340-0
	1 x B	75		7/16"-14 x 4½"	BK-358-18380-0
	(1 x A) + (1 x B)	125		7/16"-14 x 6½"	BK-358-18460-0
	2 x B	150		7/16"-14 x 7½"	BK-358-18500-0
1½" SAE61	1 x A	50	25...27	1/2"-13 x 3¾"	BK-358-20350-0
	1 x B	80		1/2"-13 x 5"	BK-358-20400-0
	(1 x A) + (1 x B)	130		1/2"-13 x 6¾"	BK-358-20470-0
	2 x B	160		1/2"-13 x 8"	BK-358-20520-0

1 bolt kit contains 4 screws.

BK bolt kits for SAE62 valves

Series	Nominal size	I1	I2	UNC screws (12.9)	
				Dimension	Ordering code
C5V06	¾"	45	21	3/8"-16 x 3¼"	BK-358-16330-0
C5V08	1"	45	25	7/16"-14 x 3½"	BK-358-18340-0
C5V10	1¼"	50	27	1/2"-13 x 3¾"	BK-358-20350-0
R5V06-6	¾"	60	21	3/8"-16 x 3¾"	BK-358-16350-0
R5V08-6	1"	60	25	7/16"-14 x 3¾"	BK-358-18350-0
R5V10-6	1¼"	75	27	1/2"-13 x 4½"	BK-358-20380-0
R5V12-6	1½"	80	30	5/8"-11 x 5¼"	BK-358-24410-0

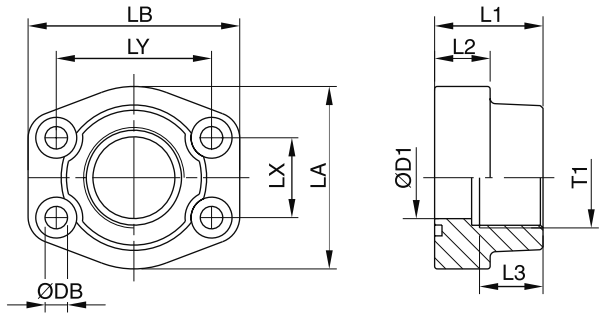
Inlet flange



Port size	Order no. [1]	Inlet flange								
		D1	L1	L2	L3	LA	LB	LX	LY	T2
SAE61										
G¾"	PCFF33GSU	19	36	18	19	49	66	22.3	47.6	3/8" UNC
G1"	PCFF34GSU	25	38	18	19	53	71	26.2	52.4	3/8" UNC
G1¼"	PCFF35GSU	31	41	21	22	69	80	30.2	58.7	7/16" UNC
G1½"	PCFF36GSU	38	44	25	24	77	94	35.7	69.9	1/2" UNC
SAE62										
G¾"	PCFF63GSU	19	36	19	22	53	71	23.8	50.8	3/8" UNC
G1"	PCFF64GSU	25	44	24	24	69	80	27.8	57.2	7/16" UNC
G1¼"	PCFF65GSU	31	44	27	25	77	94	31.8	66.6	1/2" UNC
G1½"	PCFF66GSU	38	51	30	28	89	106	36.5	79.3	5/8" UNC

[1] 4-bolt flange with UNC threads

Outlet and tank port flange

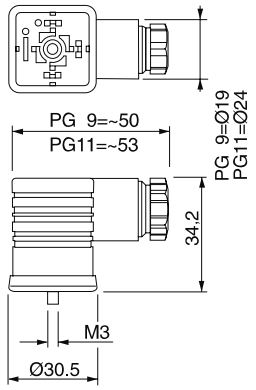


Port size	Order no. [2]	Outlet and tank port flange									Srews
		D1	L1	L2	L3	LA	LB	LX	LY	DB	
SAE61											
G¾"	PFF33GSU	19	36	18	18	49	66	22.3	47.6	10.5	3/8" x 1 1/2 UNC
G1"	PFF34GSU	25	38	18	20	53	71	26.2	52.4	10.5	3/8" x 1 1/2 UNC
G1¼"	PFF35GSU	31	41	21	22	69	80	30.2	58.7	11.5	7/16" x 1 1/2 UNC
G1½"	PFF36GSU	38	44	25	24	77	94	35.7	69.9	13.5	1/2" x 1 3/4 UNC
SAE62											
G¾"	PFF63GSU	19	36	19	18	53	71	23.8	50.8	10.5	3/8" x 1 1/2 UNC
G1"	PFF64GSU	25	44	24	20	69	80	27,8	57,2	11.5	7/16" x 1 1/2 UNC
G1¼"	PFF65GSU	31	44	27	22	77	94	31.8	66.6	15.0	1/2" x 1 3/4 UNC
G1½"	PFF66GSU	38	51	30	24	89	106	36.5	79.3	17.0	5/8" x 2 1/4 UNC

[2] 4-bolt flange including UNC screws and O-ring

Description	Threaded cable joint	Body colour coding	Figures switching	Order no.
Plug DIN 43650, design type AF, protection class IP 65 Voltages up to 250 V	PG 9	black, B grey, A	Fig. 1	**5001710** **5001711**
	PG11	black, B grey, A	Fig. 1	**5001716** **5001717**

Fig. 1



Other plugs on request

9

Notes

Series	Description	Size									Body		Page
	DIN / ISO	1/8	1/4	3/8	1/2	3/4	1	1¼	1½	2	L-port	T-port	
	Pressure valves, manual operation												
R4V	Pressure relief function				•	•	•	•			•	•	10-3
R4R	Pressure reducing function				•	•	•	•			•	•	10-9
	Pressure valves, proportional operation												
R4V*P2	Pressure relief function				•	•	•	•			•	•	10-15
R4R*P2	Pressure reducing function				•	•	•	•			•	•	10-21
	Directional seat valves												
D4S	In-line mounted				•	•	•	•			•	•	10-27
	Flow valves												
MV / 9MV	Throttle valve, with handle	•	•	•	•	•	•						10-37
N / 9N	Throttle valve, with knob	•	•	•	•	•	•						10-39
F / 9F	Throttle check valve, with knob	•	•	•	•	•	•	•	•	•			10-41
PCM / 9PCM	Flow control valve, with knob		•	•	•	•	•						10-43
	Check valves												
C / 9C	Direct operated	•	•	•	•	•	•						10-45
CP / 9CP	Pilot operated			•		•							10-47
RH	Pilot operated		•	•	•	•							10-49
	Accessories												
	Plug-in connectors												10-53

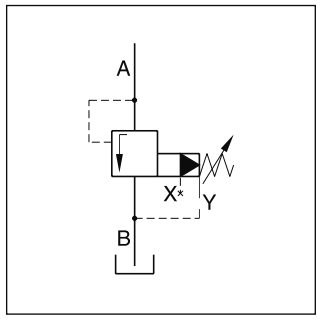
10

Notes

Pilot operated pressure relief valves for in-line mounting series R4V have a similar design to the subplate mounted R4V series. For single functions - where no manifold blocks are used - the valves can be directly placed in the pipework.

The R4V valves are available with 2 ports (L-body) for in-line relief function or with 3 ports (T-body) for relief functions in the bypass.

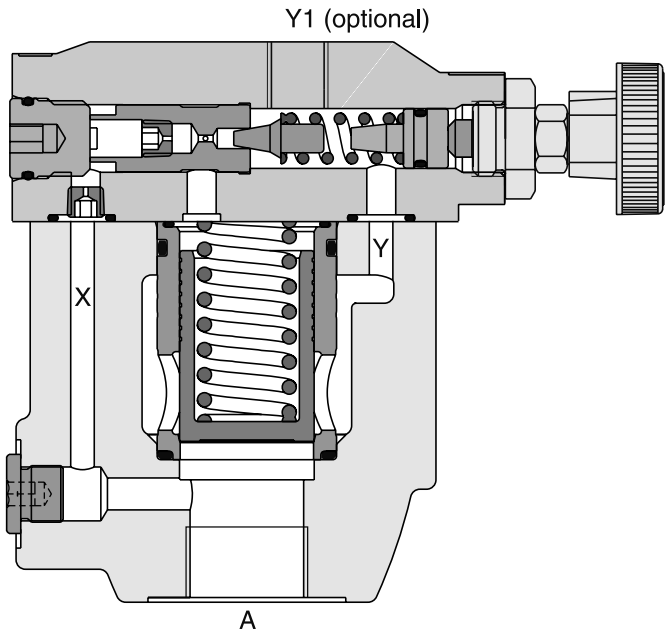
R4V10 L-body



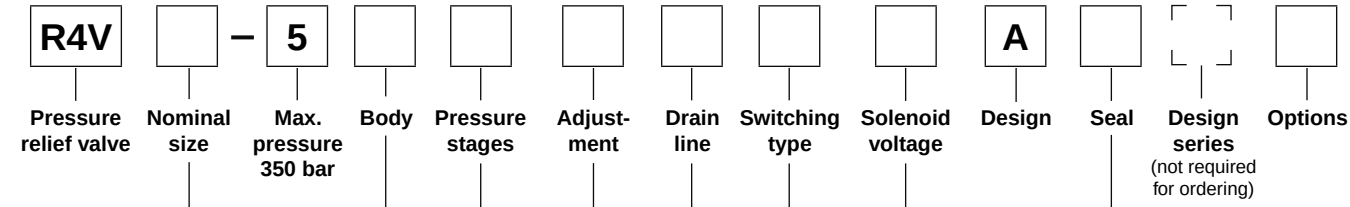
Features

- Pilot operated with manual adjustment
- 2 interfaces
- - L-body (R4V06-G¾", R4V10-G1¼")
- - T-body (R4V03-G½", R4V06-G1")
- 3 pressure stages
- 3 adjustment modes
  - Hand knob
  - Acorn nut with lead seal
  - Key lock
- With optional vent function

R4V06 L-body



10



Code	Nominal size
03	NG10 (G½")
06	NG25 (G1" - T-body, G¾" - L-body)
10	NG32 (G1¼")

Code	Body
6	R4V03 T-body R4V06 T-body
D	R4V06 L-body R4V10 L-body

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal
4	Key lock

Code	Seal
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR*	98V=
GAG*	205V=
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

* To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Switching type
omit	Standard w/o vent function
09	Solenoid not activated unpressure circulation
11	Solenoid activated unpressure circulation

Code	Drain line
0	internal
2	external from pilot head (Y1)

10

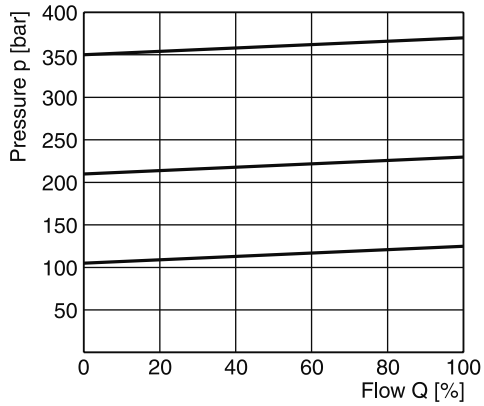
R4V

General						
Design		**T-body**		**L-body**		
Size		**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**	
Mounting		Threaded body				
Mounting position		unrestricted				
Ambient temperature	[°C]	-20...+50				
$MTTF_D$ value	[years]	75				
Weight	[kg]	3.2	6.6	3.3	5.6	
Hydraulic						
Max. operating pressure	[bar]	Ports A and X up to 350; Ports B and Y 30 bar				
Pressure stages	[bar]	105, 210, 350				
Nominal flow	[l/min]	60	200	200	450	
Fluid		Hydraulic oil according to DIN 51524...51525				
Fluid temperature	[°C]	-20...+80				
Viscosity permitted	[cSt] / [mm^2/s]	10...650				
Viscosity recommended	[cSt] / [mm^2/s]	30				
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)				

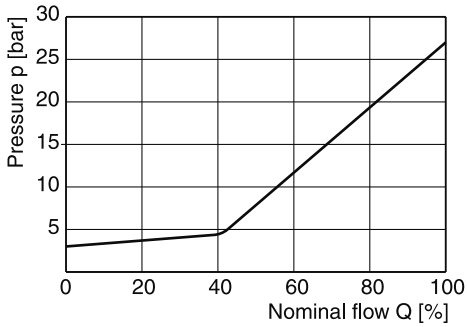
R4V with vent function

General							
Design		**T-body**		**L-body**			
Size		**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**		
Mounting		Threaded body					
Mounting position		unrestricted					
Ambient temperature	[°C]	-20...+50					
$MTTF_D$ value	[years]	75					
Weight	[kg]	4.9	8.3	5.0	7.3		
Hydraulic							
Max. operating pressure	[bar]	Ports A and X up to 350; Ports B and Y 30					
Pressure stages	[bar]	105, 210, 350					
Nominal flow	[l/min]	60	200	200	450		
Fluid		Hydraulic oil according to DIN 51524...51525					
Fluid temperature	[°C]	-20...+80					
Viscosity permitted	[cSt] / [mm^2/s]	10...650					
Viscosity recommended	[cSt] / [mm^2/s]	30					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Electrical (solenoid)							
Duty ratio	[%]	100					
Response time	[ms]	Energized / de-energized AC: 20/18 , DC: 46/27					
	Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage	[V] [V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage	[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption hold	[W]	31	31	31	31	78	78
in rush	[W]	31	31	31	31	264	264
Max. switching frequency		AC: up to 7.200, DC: up to 16.000 switchings/hour					
Solenoid connection		Connector as per EN175301-803					
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)					
Coil insulation class		H (180 °C)					

p/Q performance curve [1)]



Minimum pressure curve

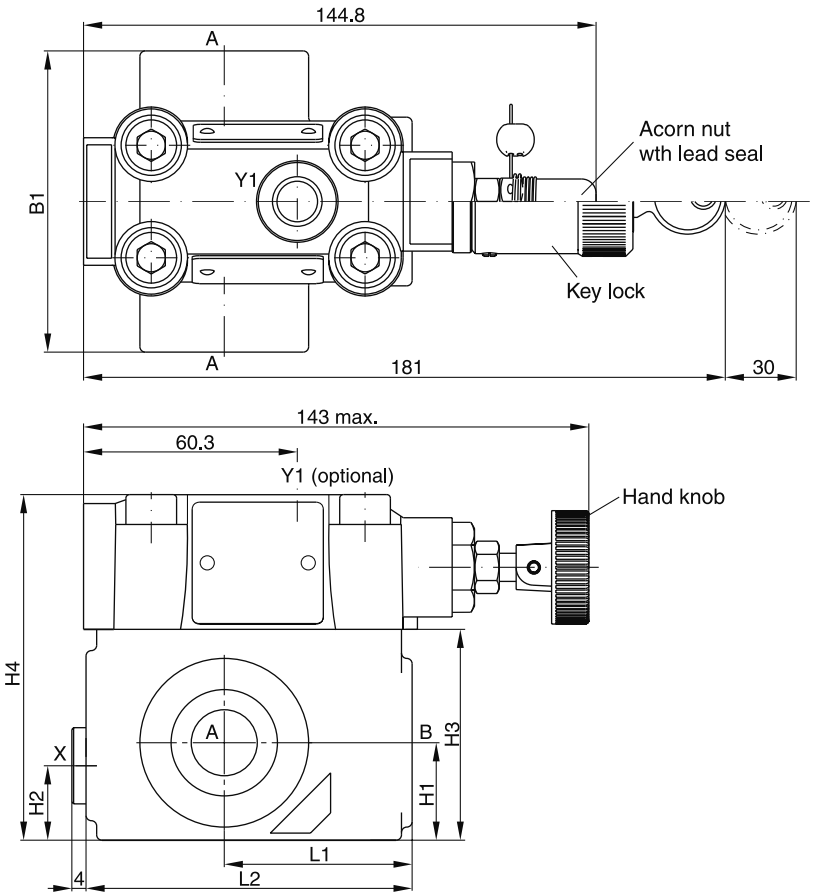


[1)] The performance curves are measured with external drain. For internal drain the tank pressure has to be added to curve.

All characteristic curves measured with HLP46 at 50°C.

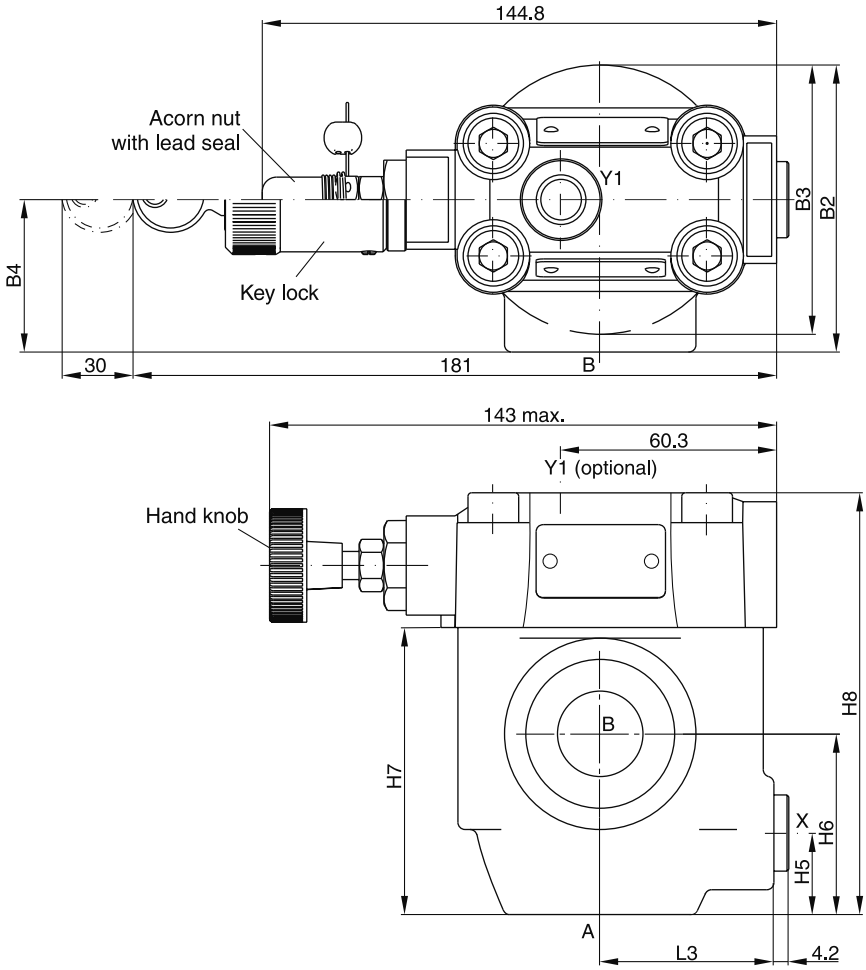
Dimensions

T-body



10

L-body



Seal kits		
NG	**NBR**	**FPM**
03	S26-58507-0	S26-58507-5
06	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5

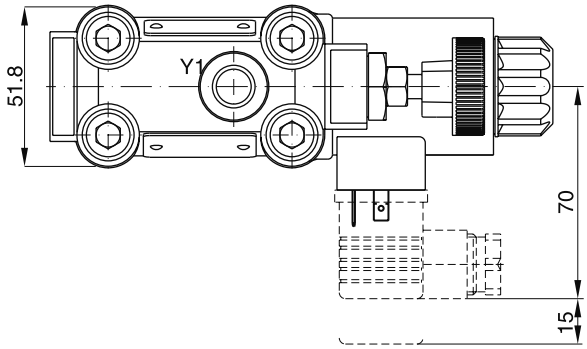
NG	**Body**	**B1**	**B2**	**B3**	**B4**	**H1**	**H2**	**H3**	**H4**	**H5**	**H6**	**H7**	**H8**	**L1**	**L2**	**L3**
03	T-body	85	–	–	–	27.5	21	59.5	97.5	–	–	–	–	53	92	–
06	T-body	136	–	–	–	38	28	93	131	–	–	–	–	66.5	117.5	–
06	L-body	–	81	76	43	–	–	–	–	23	51	81	119	–	–	49
10	L-body	–	120.7	85.8	77.8	–	–	–	–	31.8	50.8	96	134	–	–	49.8

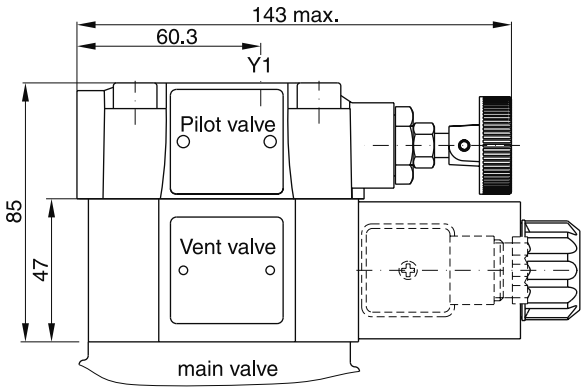
Ports	**Function**	**Port size**			
		R4V03 T-body	**R4V06 L-body**	**R4V06 T-body**	**R4V10 L-body**
A	pressure (inlet)	G½ "	G¾ "	G1 "	G1¼ "
B	tank (outlet)	G½ "	G¾ "	G1 "	G1¼ "
X [1)]	external remote control or vent connection	G¼ "			
Y1 [2)]	external drain	G¼ "			

[1)] closed when supplied

[2)] port Y1 is only available at drain line (code2) external from the pilot head

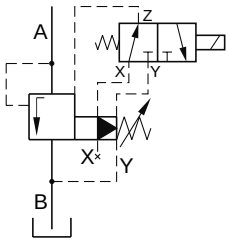
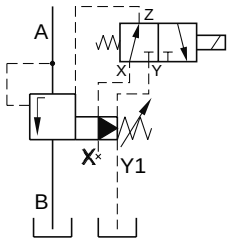
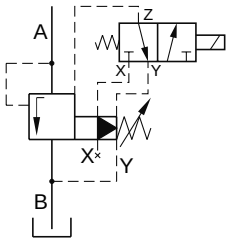
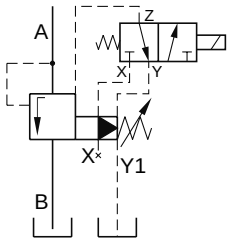
R4V with vent function





Seal kits	
NBR	**FPM**
DC solenoid	
S26-58515-0	S26-58515-5
AC solenoid	
S26-35237-0	S26-35237-5

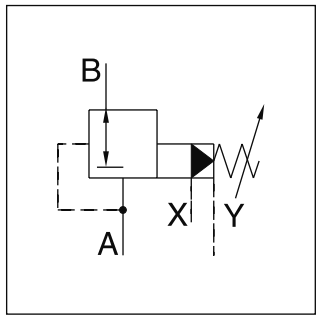
10

Code	Internal drain	External drain
11		
09		

Pilot operated pressure reducing valves for in-line mounting series R4R have a similar design to the subplate mounted R4R series. For single functions - where no manifold blocks are used - the valves can be directly placed in the pipework.

The valves are available with 2 ports (L-body) or with 3 ports (T-body).

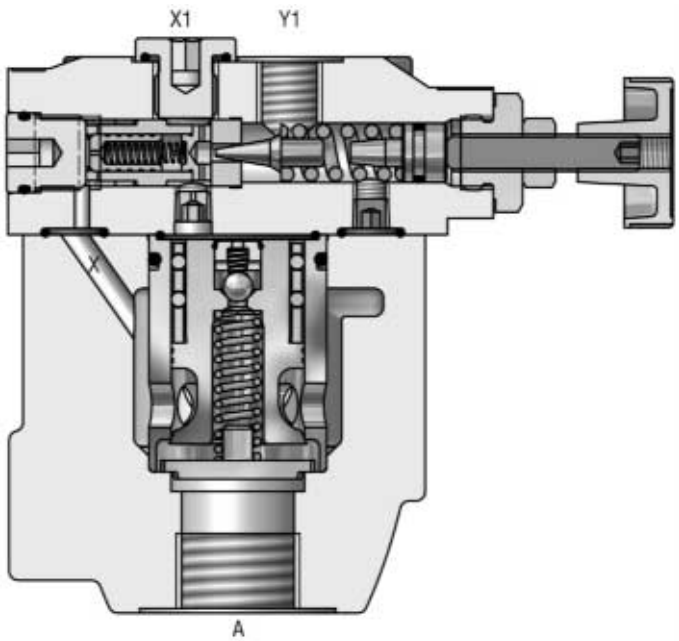
R4R10 L-body



Features

- Pilot operated with manual adjustment
- Normally closed to avoid undesired motion
- 2 interfaces
  - L-body (R4R06-G¾", R4R10-G1¼")
  - T-body (R4R03-G½", R4R06-G1")
- 3 pressure stages
- 3 adjustment modes
  - Hand knob
  - Acorn nut with lead seal
  - Key lock
- With optional vent function

R4R06 L-body



10

R4R		–	5					2				B		
Pressure reducing valve	**Nominal size**		**Max. pressure 350 bar**	**Body**	**Pressure stages**	**Adjust-ment**		**Drain line ext. from pilot head (Y1)**	**Switching type**	**Solenoid voltage**		**Design series**	**Seal**	**Options**

Code	Nominal size
03	NG10 (G½")
06	NG25 (G1" - T-body, G¾" - L-body)
10	NG32 (G1¼")

Code	Body
6	R4R03 T-body R4R06 T-body
D	R4R06 L-body R4R10 L-body

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal
4	Key lock

Code	Seal
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR*	98V=
GAG*	205V=
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

* To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Switching type
omit	Standard w/o vent function
09	Solenoid not activated unpressure circulation
11	Solenoid activated unpressure circulation

10

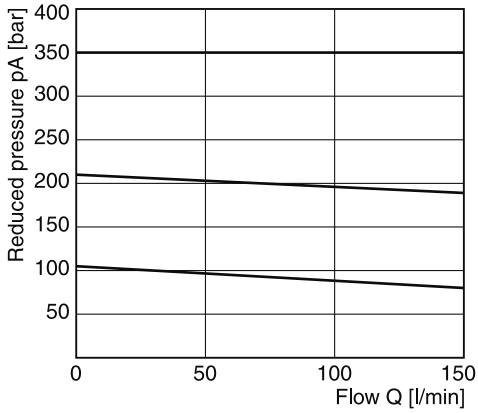
R4R

General						
Design		**T-body**		**L-body**		
Size		**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**	
Mounting		Threaded body				
Mounting position		unrestricted				
Ambient temperature	[°C]	-20...+50				
$MTTF_D$ value	[years]	75				
Weight	[kg]	3.2	3.3	5.6	6.6	
Hydraulic						
Max. operating pressure	[bar]	Ports A, B and X: 350; Port Y depressurized				
Pressure stages	[bar]	105, 210, 350				
Nominal flow	[l/min]	60	200	200	450	
Fluid		Hydraulic oil as per DIN 51524...51525				
Fluid temperature	[°C]	-20...+80				
Viscosity permitted	[cSt]/[mm^2/s]	10...650				
Viscosity recommended	[cSt]/[mm^2/s]	30				
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)				

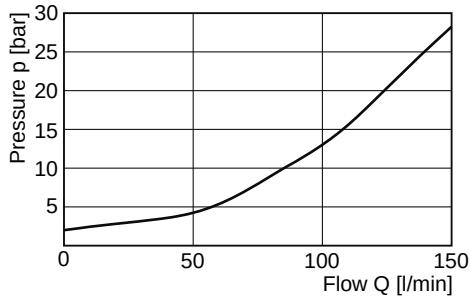
R4R with vent function

General							
Design		**T-body**		**L-body**			
Size		**03 (½")**	**06 (¾")**	**06 (1")**	**10 (1¼")**		
Mounting		Threaded body					
Mounting position		unrestricted					
Ambient temperature	[°C]	-20...+50					
$MTTF_D$ value	[years]	75					
Weight	[kg]	4.9	5.0	7.3	8.3		
Hydraulic							
Max. operating pressure	[bar]	Ports A and X up to 350; Ports B and Y depressurized					
Pressure stages	[bar]	105, 210, 350					
Nominal flow	[l/min]	60	200	200	450		
Fluid		Hydraulic oil according to DIN 51524...51525					
Fluid temperature	[°C]	-20...+80					
Viscosity permitted	[cSt] / [mm^2/s]	10...650					
Viscosity recommended	[cSt] / [mm^2/s]	30					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)					
Electrical (solenoid)							
Duty ratio	[%]	100					
Response time	[ms]	Energized / de-energized AC: 20/18 , DC: 46/27					
	Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage	[V] [V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage	[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption hold	[W]	31	31	31	31	78	78
in rush	[W]	31	31	31	31	264	264
Max. switching frequency		AC: up to 7.200, DC: up to 16.000 switchings/hour					
Solenoid connection		Connector as per EN175301-803					
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)					
Coil insulation class		H (180 °C)					

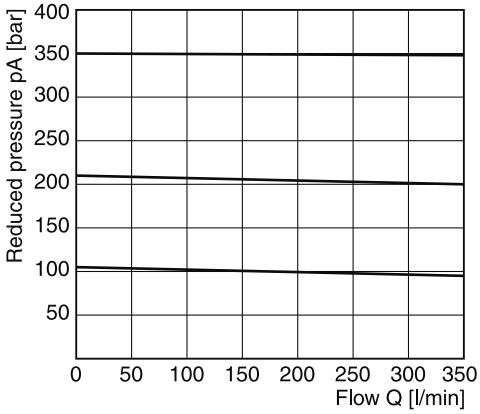
Reduced pressure pA versus flow Q
R4R03 [1)]



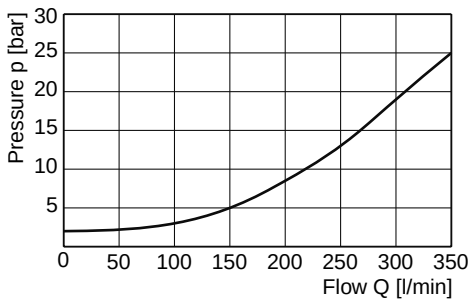
Minimum pressure curve



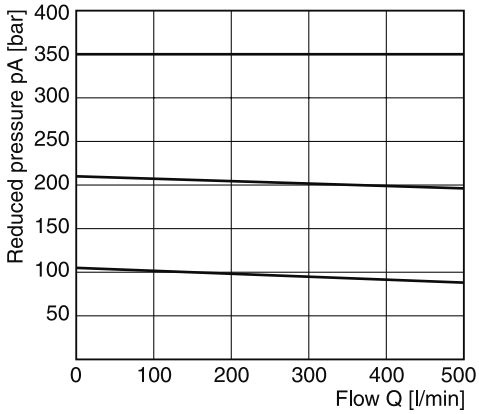
Reduced pressure pA versus flow Q
R4R06 [1)]



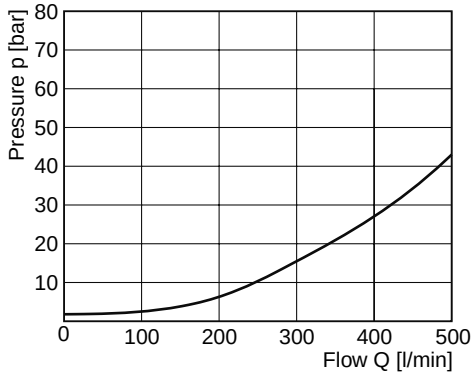
Minimum pressure curve



Reduced pressure pA versus flow Q
R4R10 [1)]



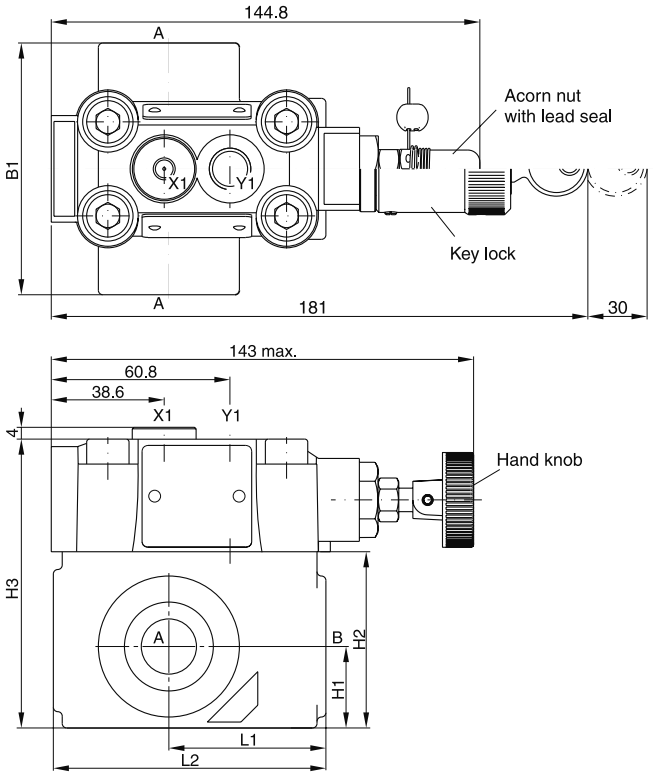
Minimum pressure curve



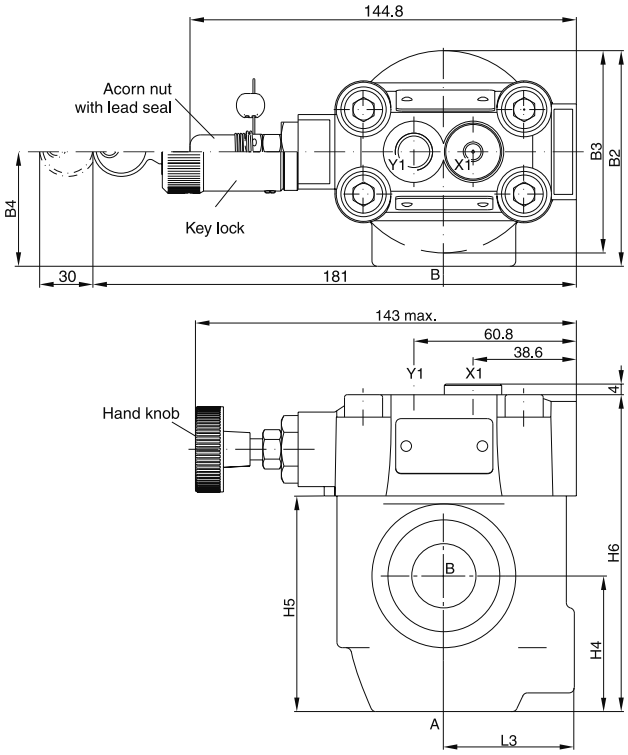
[1)] Measured at 350 bar primary pressure pB.

All characteristic curves measured with HLP46 at 50°C.

T-body



L-body

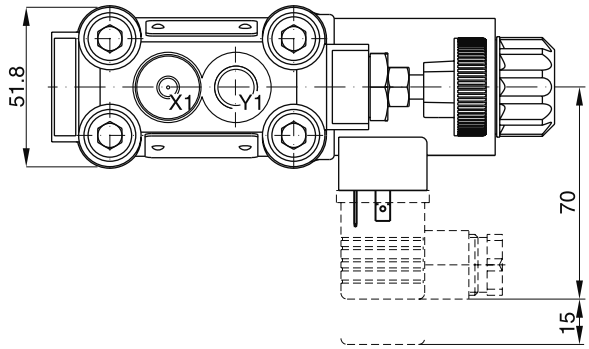


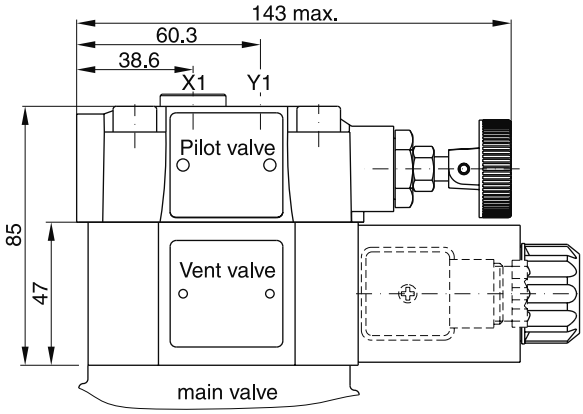
Seal kits		
NG	**NBR**	**FPM**
03	S26-58507-0	S26-58507-5
06	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5

NG	Body	B1	B2	B3	B4	H1	H2	H3	H4	H5	H6	L1	L2	L3
03	T-body	85	–	–	–	27.5	59.5	97.5	–	–	–	53	92	–
06	T-body	136	–	–	–	38	93	131	–	–	–	66.5	117.5	–
06	L-body	–	81	76	43	–	–	–	51	81	119	–	–	49
10	L-body	–	120.7	85.8	77.8	–	–	–	50.8	96	134	–	–	49.8

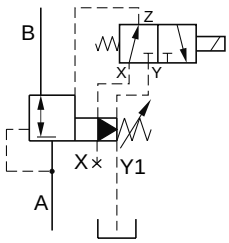
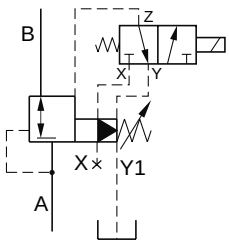
Ports	Function	Port size			
		R4V03 T-body	**R4V06 L-body**	**R4V06 T-body**	**R4V10 L-body**
B	pressure (inlet)	G½ "	G¾ "	G1 "	G1¼ "
A	pressure (outlet)	G½ "	G¾ "	G1 "	G1¼ "
X1	external remote control or vent connection	G¼ "			
Y1	external drain	G¼ "			

R4R with vent function





Seal kits	
NBR	**FPM**
DC solenoid	
S26-58515-0	S26-58515-5
AC solenoid	
S26-35237-0	S26-35237-5

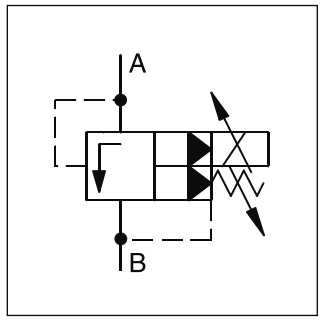
Code	External drain
11	
09	

10

Proportional pressure relief valves series R4V*P2 are based on the mechanically adjusted series R4V. The additional proportional unit between the mechanical pilot valve and the main stage allows continuous pressure adjustment.

The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.

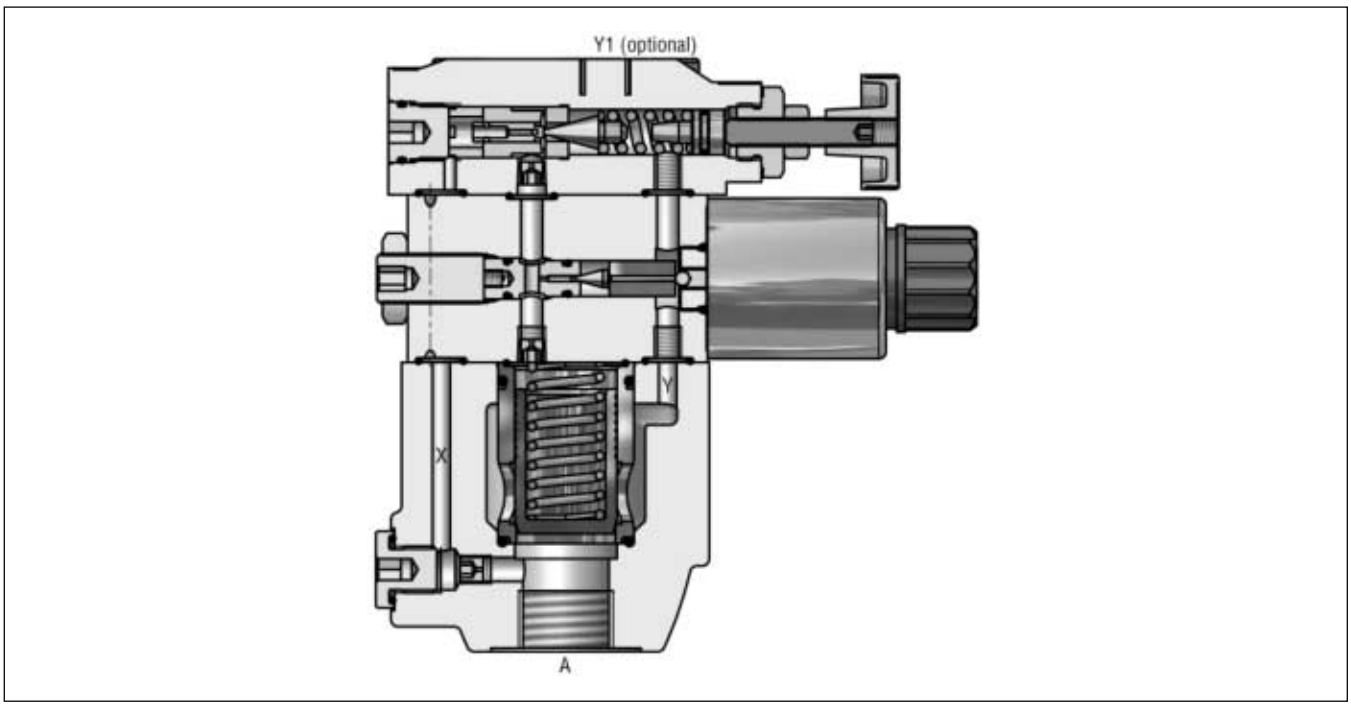
R4V10*P2 L-body



Features

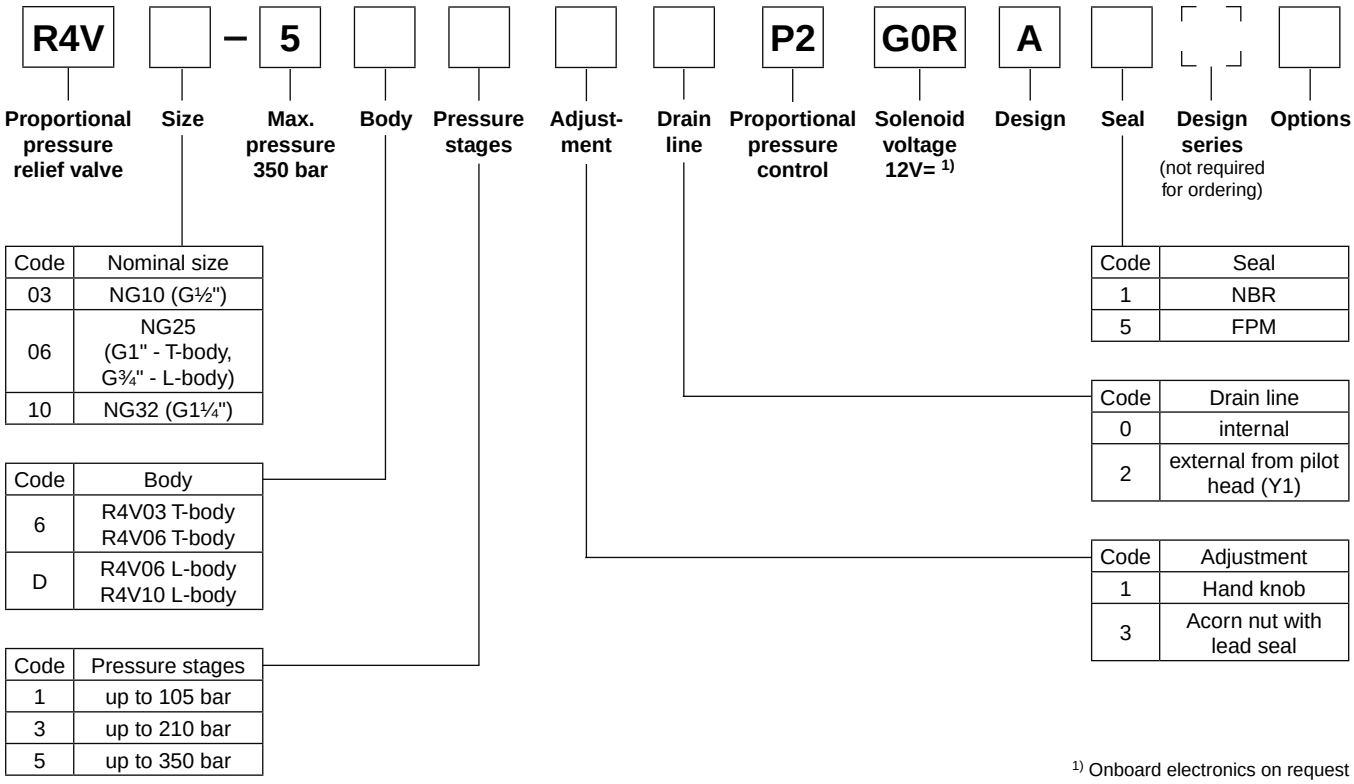
- Continuous adjustment by proportional solenoid
- 2 interfaces
  - L-body (R4V06-G¾", R4V10-G1¼")
  - T-body (R4V03-G½", R4V06-G1")
- 3 pressure stages
- With mechanical maximum pressure adjustment

R4V06*P2 L-body



10

Ordering code



Code	Nominal size
03	NG10 (G½")
06	NG25 (G1" - T-body, G¾" - L-body)
10	NG32 (G1¼")

Code	Body
6	R4V03 T-body R4V06 T-body
D	R4V06 L-body R4V10 L-body

Code	Pressure stages
1	up to 105 bar
3	up to 210 bar
5	up to 350 bar

Code	Seal
1	NBR
5	FPM

Code	Drain line
0	internal
2	external from pilot head (Y1)

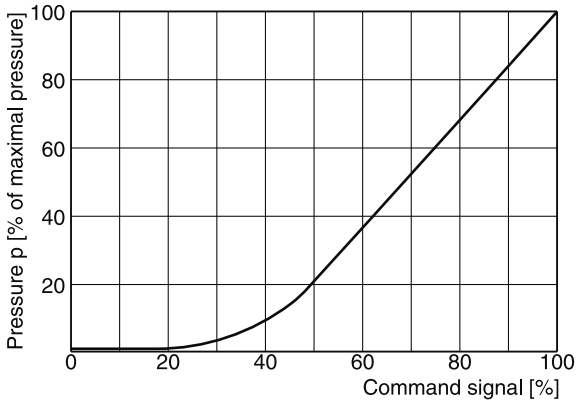
Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal

1) Onboard electronics on request

Technical data R4V*P2

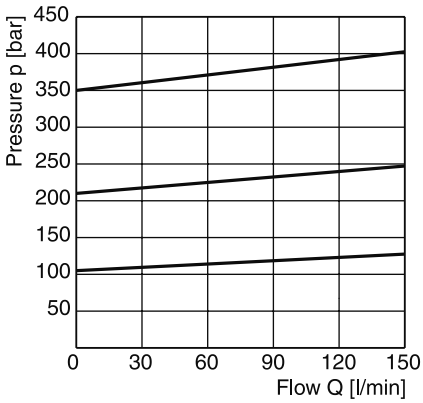
General					
Design		**T-body**		**L-body**	
Size		**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**
Mounting		Threaded body			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+50			
$MTTF_D$ value	[years]	75			
Weight	[kg]	5.0	5.1	7.4	8.4
Hydraulic					
Max. operating pressure	[bar]	Ports A and X up to 350; Ports B and Y 30 bar			
Pressure stages	[bar]	105, 210, 350			
Nominal flow	[l/min]	60	200	200	450
Fluid		Hydraulic oil according to DIN 51524...51525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt] / [mm^2/s]	20...380			
Viscosity recommended	[cSt] / [mm^2/s]	30			
Filtration		ISO 4406 (1999), 18/16/13 (meet NAS 1638: 7)			
Electrical (prop. solenoid)					
Duty ratio	[%]	100			
Nominal voltage	[V]	12=			
Max. current	[A]	2.3			
Coil resistance	[Ohm]	4 at 20°C			
Solenoid connection		Connector as per EN175301-803			
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
Power amplifier		PCD00A-400			

Signal/pressure curve R4V

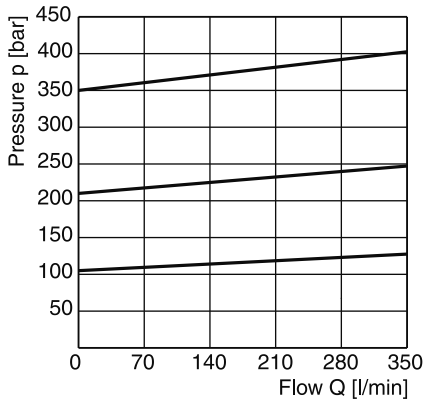


p/Q performance curves [1)]

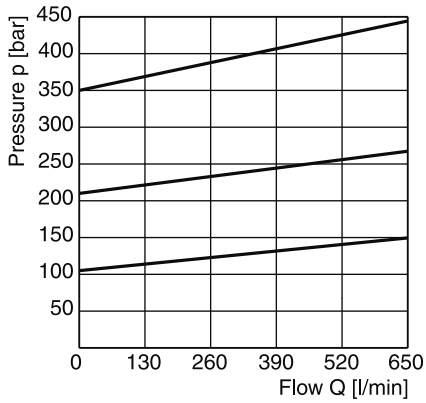
R4V03



R4V06

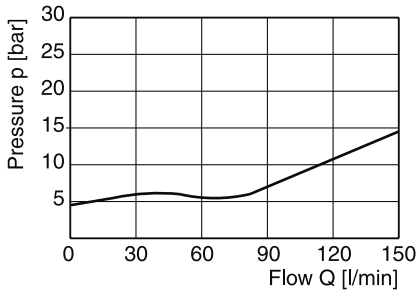


R4V10

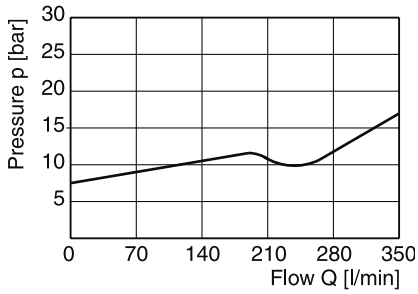


Minimum pressure curve [1)]

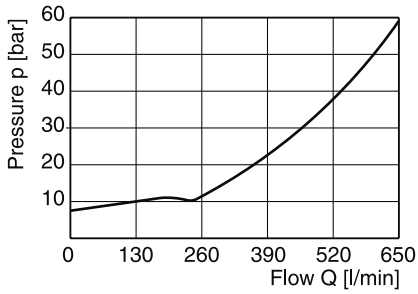
R4V03



R4V06



R4V10

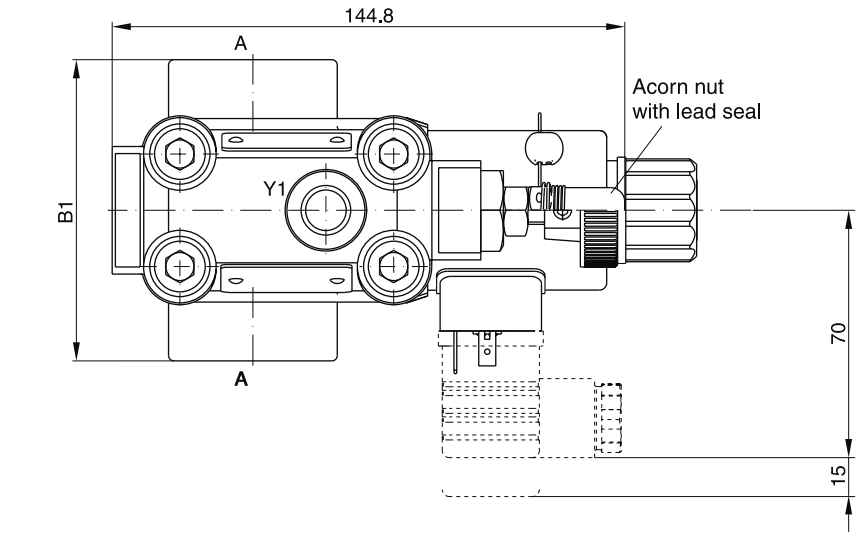


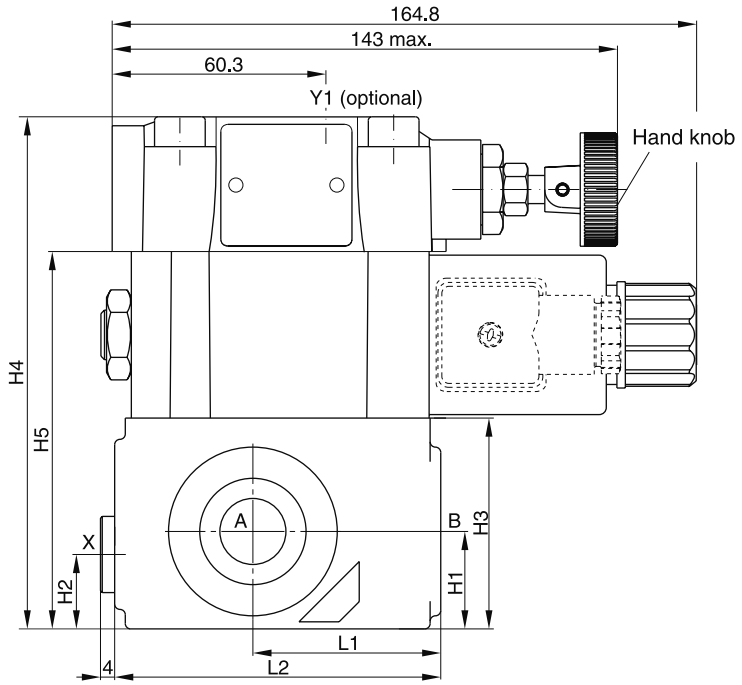
10

[1)] The performance curves are measured with external drain. For internal drain the tank pressure has to be added to curve.

All characteristic curves measured with HLP46 at 50°C.

T-body





NG	Body	B1	H1	H2	H3	H4	H5	L1	L2
03	T-body	85	27.5	21	59.5	144.5	106.5	53	92
06	T-body	136	38	28	93	178	140	66.5	117.5

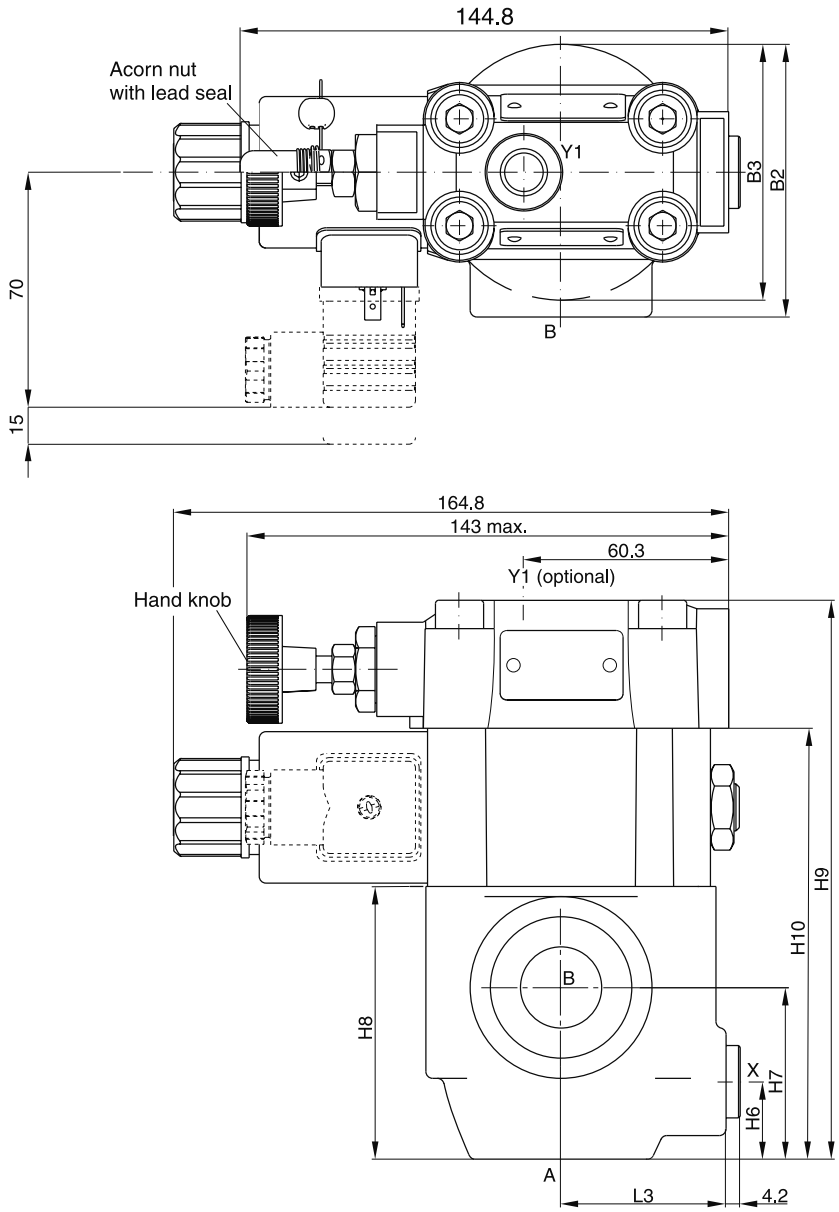
Ports	Function	Port size	
		R4V03*P2 T-body	R4V06*P2 T-body
A	pressure (inlet)	G½ "	G1 "
B	tank (outlet)	G½ "	G1 "
X[1)]	ext. remote control or vent connection	G¼ "	
Y1[2)]	external drain	G¼ "	

[1)] closed when supplied
[2)] port Y1 is only available at drain line (code2) external from the pilot head

Seal kits		
NG	NBR	FPM
03	S26-58507-0	S26-58507-5
06	S26-58475-0	S26-58475-5
Prop. section P2*	S26-58473-0	S26-58473-5

*Please combine seal kit of one size with seal kit of prop. section for complete seal kit

L-body



NG	Body	B2	B3	H6	H7	H8	H9	H10	L3
06	L-body	81	76	23	51	81	166	128	49
10	L-body	120.7	85.8	31.8	50.8	96	181	143	49.8

Ports	Function	Port size	
		R4V06 L-body	R4V10 L-body
A	pressure (inlet)	G¾ "	G1¼ "
B	tank (outlet)	G¾ "	G1¼ "
X[1)]	ext. remote control or vent connection	G¼ "	
Y1[2)]	external drain	G¼ "	

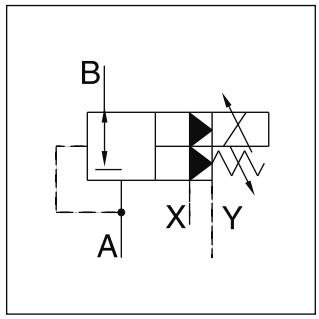
1) closed when supplied
2) port Y1 is only available at drain line (code2) external from the pilot head

Seal kits		
NG	NBR	FPM
06	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5
Prop. section P2*	S26-58473-0	S26-58473-5

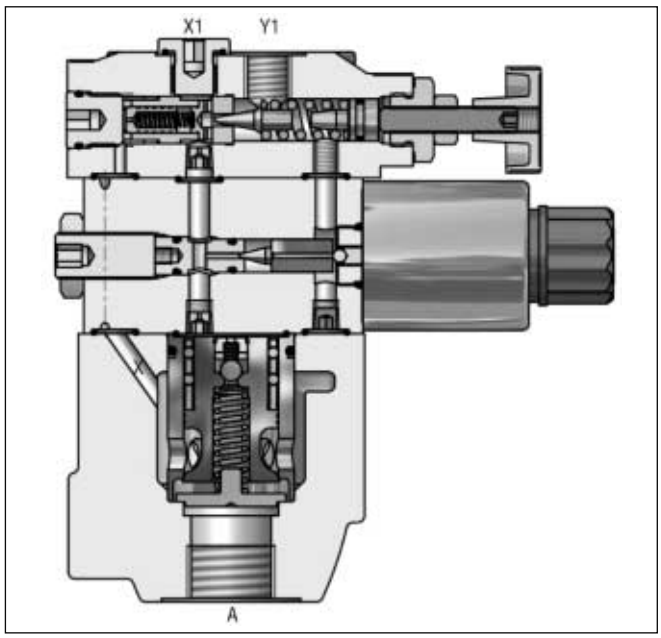
*Please combine seal kit of one size with seal kit of prop. section for complete seal kit

Notes

Proportional pressure reducing valves series R4R*P2 are based on the mechanically adjusted series R4R. The additional proportional unit between the mechanical pilot valve and the main stage allows continuous pressure adjustment.
The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.



R4R10*P2 L-body



R4R06*P2 L-body

Features

- Normally closed to avoid undesired motion
- Continuous adjustment by proportional solenoid
- 2 interfaces
  - L-body (R4R06-G¾", R4R10-G1¼")
  - T-body (R4R03-G½", R4R06-G1")
- 3 pressure stages
- With mechanical maximum pressure adjustment

Ordering code

R4R		–	5				2	P2	G0R	B		
Pressure reducing valve	Nominal size		Max. pressure 350 bar	Body	Pressure stages	Adjust-ment	Drain line ext. from pilot head (Y1)	Proportional pressure control	Solenoid voltage 12V=	Design series	Seal	Options

Code	Nominal size
03	NG10 (G½")
06	NG25 (G1" - T-body, G¾" - L-body)
10	NG32 (G1¼")

Code	Body
6	R4R03 T-body R4R06 T-body
D	R4R06 L-body R4R10 L-body

Code	Seal
1	NBR
5	FPM

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal

Code	Pressure stages
1	up to 105bar
3	up to 210bar
5	up to 350bar

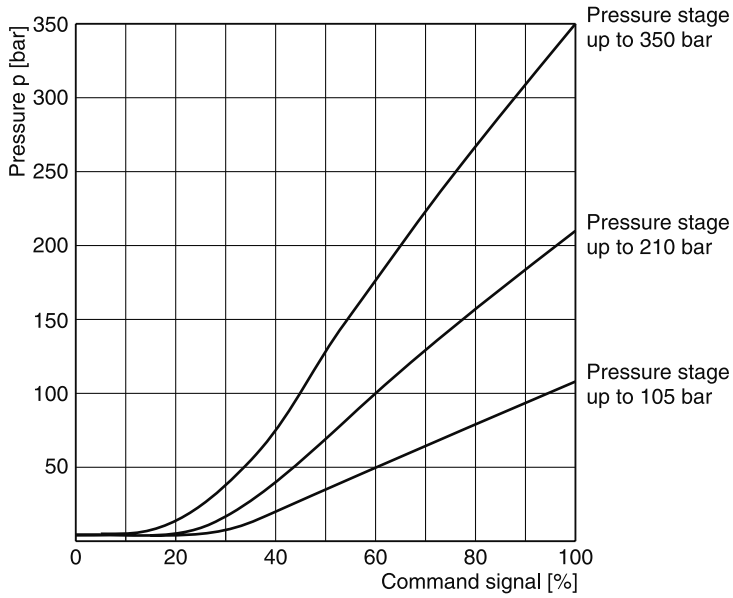
10

Technical data R4R

General					
Design		T-body		L-body	
Size		**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**
Mounting		Threaded body			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+50			
$MTTF_D$ value	[years]	75			
Weight	[kg]	5.0	5.1	7.4	8.4
Hydraulic					
Max. operating pressure	[bar]	Ports A, B and X up to 350; Port Y depressurized			
Pressure stages	[bar]	105, 210, 350			
Nominal flow	[l/min]	60	200	200	450
Fluid		Hydraulic oil as per DIN 51524...51525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt]/[mm²/s]	20...380			
Viscosity recommended	[cSt]/[mm²/s]	30			
Filtration		ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)			

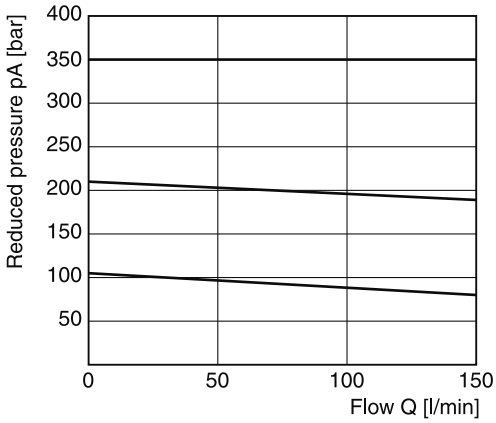
Electrical (prop. solenoid)		
Duty ratio	[%]	100
Nominal voltage	[V]	12=
Max. current	[A]	2.3
Coil resistance	[Ohm]	4 at 20°C
Solenoid connection		Connector as per EN175301-803
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Power amplifier		PCD00A-400

Command/pressure curve

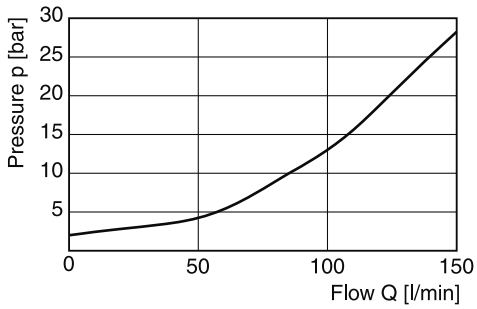


All characteristic curves measured with HLP46 at 50°C.

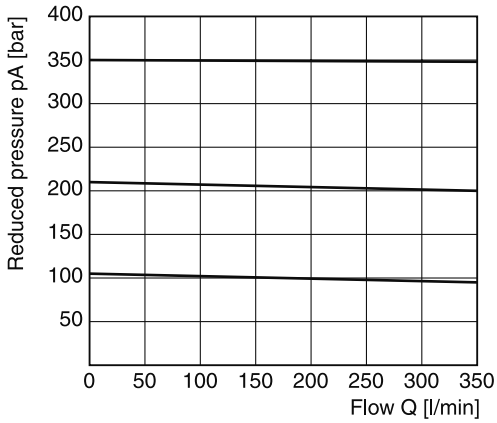
Reduced pressure pA versus flow Q
R4R03 [1)]



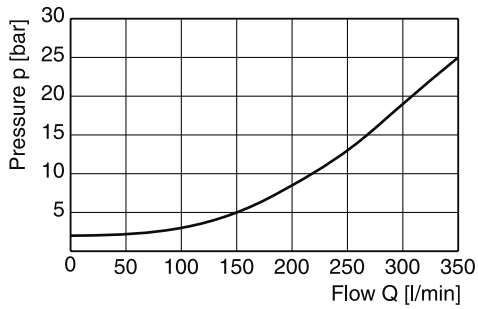
Minimum pressure curve



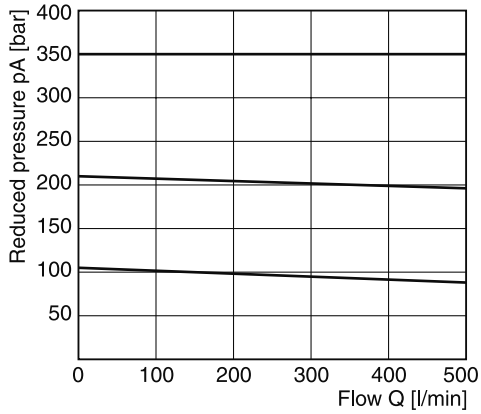
Reduced pressure pA versus flow Q
R4R06 [1)]



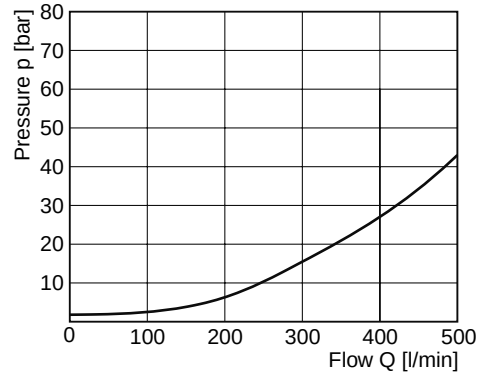
Minimum pressure curve



Reduced pressure pA versus flow Q
R4R10 [1)]



Minimum pressure curve

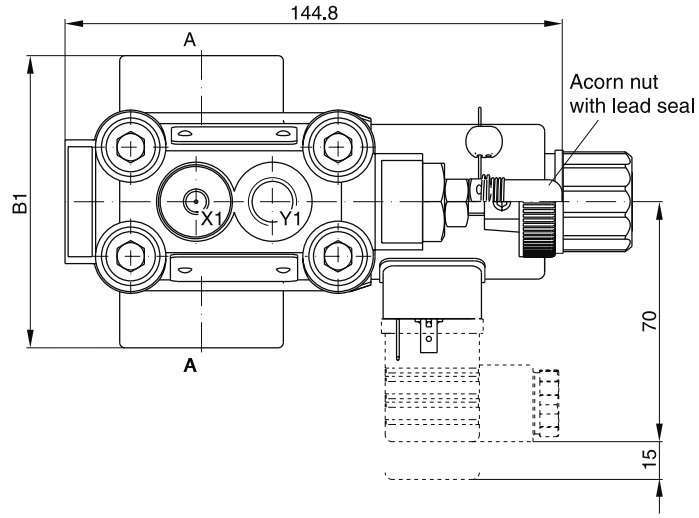


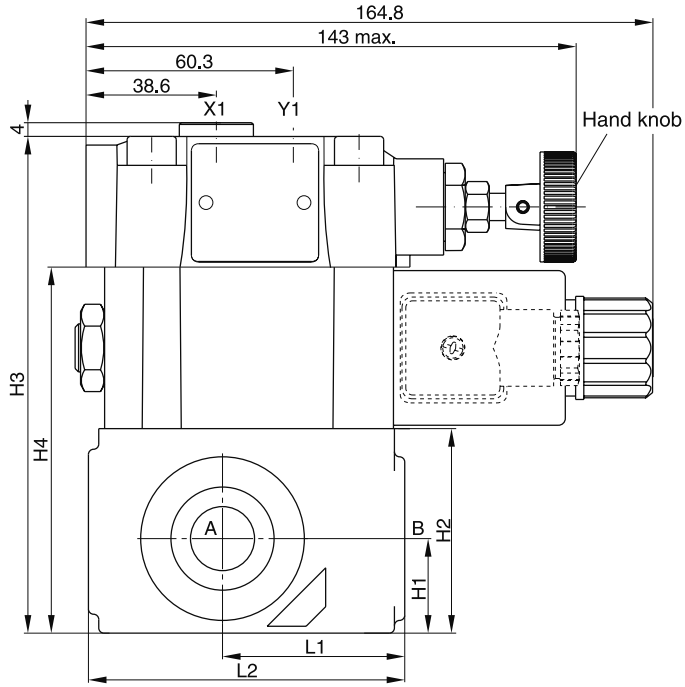
10

[1)] Measured at 350 bar primary pressure pB.
All characteristic curves measured with HLP46 at 50°C.

R4RP2 UK.INDD RH 11.08.11

T-body





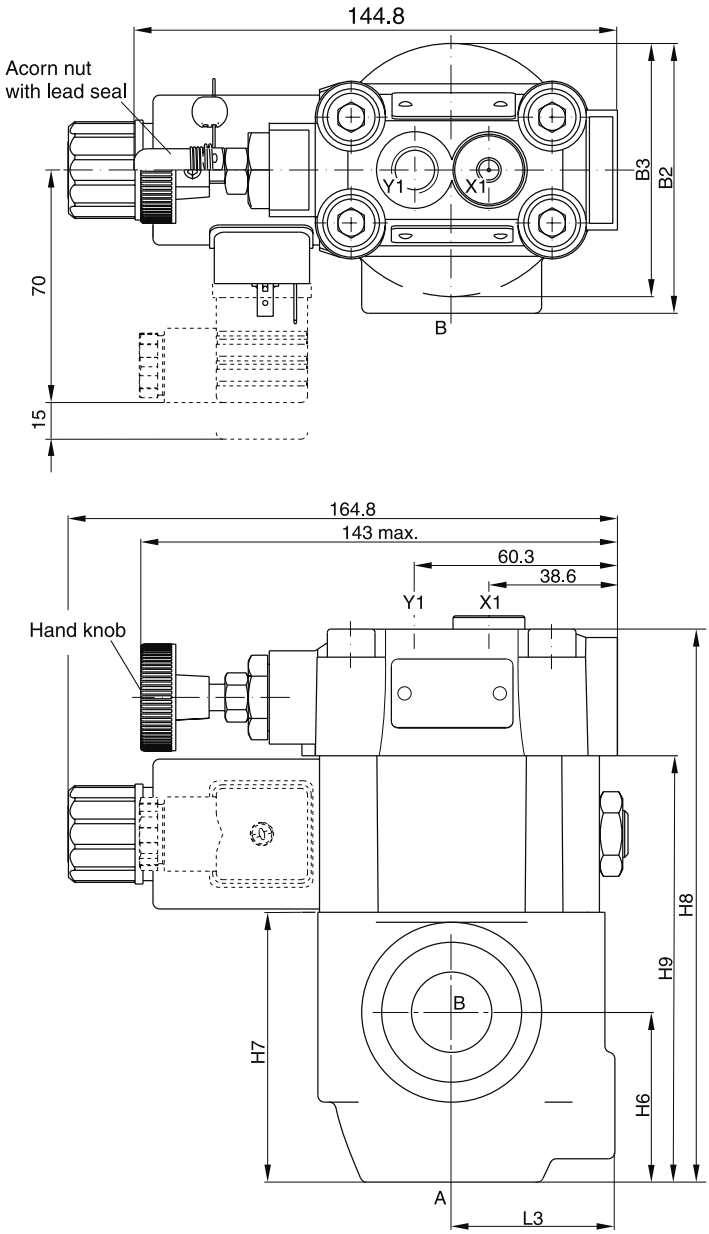
NG	Body	B1	H1	H2	H3	H4	L1	L2
03	T-body	85	27.5	59.5	144.5	106.5	53	92
06	T-body	136	38	93	178	140	66.5	117.5

Ports	Function	Port size	
		R4V03*P2 T-body	R4V06*P2 T-body
B	pressure (inlet)	G½ "	G1 "
A	pressure (outlet)	G½ "	G1 "
X1	ext. remote control or vent connection	G¼ "	
Y1	external drain	G¼ "	

Seal kits		
NG	NBR	FPM
03	S26-58507-0	S26-58507-5
06	S26-58475-0	S26-58475-5
Prop. section P2*	S26-58473-0	S26-58473-5

*Please combine seal kit of one size with seal kit of prop. section for complete seal kit

L-body



NG	Body	B2	B3	H6	H7	H8	H9	L3
06	L-body	81	76	51	81	166	128	49
10	L-body	120.7	85.8	50.8	96	181	143	49.8

Ports	Function	Port size	
		R4V06*P2 L-body	R4V10*P2 L-body
B	pressure (inlet)	G¾ "	G1¼ "
A	pressure (outlet)	G¾ "	G1¼ "
X1	ext. remote control or vent connection	G¼ "	
Y1	external drain	G¼ "	

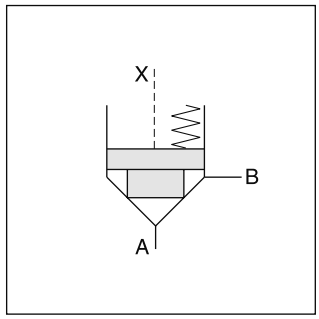
Seal kits		
NG	NBR	FPM
06	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5
Prop. section P2*	S26-58473-0	S26-58473-5

*Please combine seal kit of one size with seal kit of prop. section for complete seal kit

Notes

Seat valves series D4S are designed for directional control functions. A large variety of poppets, springs and covers - including shuttle valves, stroke limiters, solenoid valves (VV01) and position control - allow to design individual hydraulic solutions for nominal flow up-to 600 l/min.

A complete program is offered under the Parker brand:
subplate mounted valves (D4S - chapter 6),
SAE flange valves (D5S - chapter 9),
pipe mounted valves (D4S - chapter 10),
slip-in cartridges (CAR - on request).

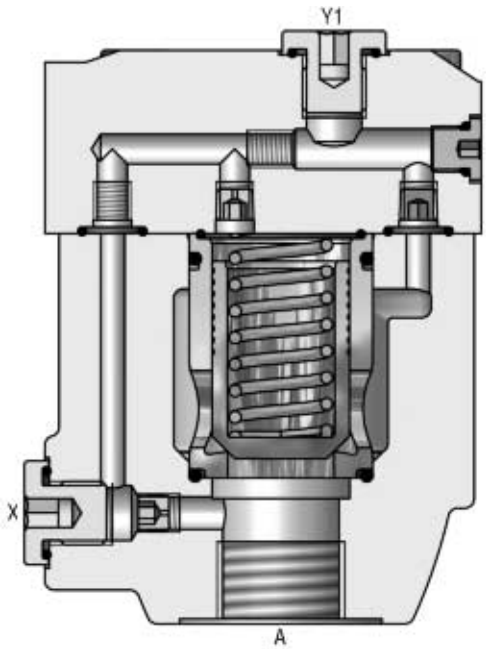


D4S10 L-body

Features

- Leak-free seat valve design
- 2 body designs
  - L-body (2-port)
  - T-body (3-port)
- Numerous pilot options
- 6 poppet types
- 4 port sizes
  - G 1/2“, G1“ for T-body
  - G 3/4“, G 1 1/4“ for L-body

D4S06 L-body



10

D4S [ ] – [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] **B** [ ] [ ]

Seat valve | **Nominal size** | **Body** | **Pilot connection** | **Cap version** | **Sleeve** | **Spool type** | **Spring** | **Switching type** | **Solenoid voltage** | **Design series** | **Seals** | **Options**

Code	Port size
03	NG10 (CAR4 build-in)
06	NG25 (CAR2 build-in)
10	NG32 (CAR2 build-in)

Code	Body	Ports
6	D4S03 T-body D4S06 T-body	A, B = G½"; X, Y1 = G¼" A, B = G1"; X, Y1 = G¼"
D	D4S06 L-body D4S10 L-body	A, B = G¾"; X, Y1 = G¼" A, B = G1¼"; X, Y1 = G¼"

Code	Pilot oil line in body		
		A-X	B-Y
1	internal from A	⊖	○
2	internal from X	●	○

Code	Ports	X	Y	Z	X-Y	Y1	VV01
	Standard						
1	Pilot oil = pilot drain	○	●	⊖	○	●	—
C	Pilot oil = pilot drain	●	○	⊖	○	●	—
	With solenoid valve (VV01)						
2	Ext. PD from cap	○	○	⊖	●	○	●
6	Internal pilot drain	○	○	⊖	●	●	○
	With stroke limiter (not for D4S03)						
3	Pilot oil = pilot drain	⊖	●	—	—	—	—
4	Pilot oil = pilot drain	●	⊖	—	—	—	—

○ open bore ● closed bore ⊖ orifice Ø 1.2

Note: Combination examples at the end of chapter

Code	Sleeve
1	AA=95%, AB=5%
3	AA=60%, AB=40%

Code	Size	Poppet type	Sleeve
1	03, 06,10	With closed bottom and 15° chamfer (pZ max. = pA +20bar	1
2	03	With 0.8 dia. orifice at the bottom and 15° chamfer	1
	06, 10	With 1.2 dia. orifice at the bottom and 15° chamfer	1
4	03, 06,10	With closed bottom and 45° chamfer	1, 3
A[1)]	06, 10	Safety spool (for position control only)	3
B[1)]	06, 10	Throttle spool, 10° chamfer	3
C[1)]	06, 10	Throttle spool, 3° chamfer	3

[1)] Springs 2, 3 and 6 only

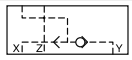
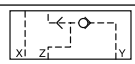
Code	Spring (approx. cracking pressure [bar])					
	Sleeve Code 1		Sleeve Code 3			
	A -> B		A -> B		B -> A	
	D5S03	D5S06/10	D5S03	D5S06/10	D5S03	D5S06/10
1	2.8	3.5	6.5	6.5	9.5	11.0
2	0.5	0.5	1.0	1.0	1.5	1.7
3	0.3	0.3	0.6	0.6	0.9	1.0
4	2.2	2.2	4.0	3.5	5.5	6.0
5	—	9.0	—	16.0	—	28.0
6	1.2	1.2	2.0	2.2	3.0	3.8
7	3.0	—	8.0	—	12.0	—

Code	Options
omit	Standard
013	Cover for position control

Code	Seals
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR [3)]	98V=
GAG [3)]	205V=
W30	110V / 50Hz ; 120V / 60Hz
W31	230V / 50Hz ; 240V / 60Hz

[3)] To be used in combination with rectifier plugs at 120VAC / 230VAC power supply.

Code	Switching type	
omit	Standard w/o vent function	
09	VV01 with manual override	de-energized: open
10	VV01 without manual override	
11	VV01 with manual override	de-energized: closed
12	VV01 without manual override	
CA	Shuttle valve	
DA	Shuttle valve	
CB	VV01 code 09 and shuttle valve code CA	
CD	VV01 code 11 and shuttle valve code CA	
DB	VV01 code 09 and shuttle valve code DA	
DD	VV01 code 11 and shuttle valve code DA	
BH	VV01 code 10 and shuttle valve code CA and position control [2)] with amplifier	
BK	VV01 code 12 and shuttle valve code CA and position control [2)] with amplifier	
BN	VV01 code 10 and shuttle valve code DA and position control [2)] with amplifier	
BQ	VV01 code 12 and shuttle valve code DA and position control [2)] with amplifier	
BC	VV01 code 10 and position control [2)] with amplifier	
BE	VV01 code 12 and position control [2)] with amplifier	
BA	Position control [2)] with amplifier	
BF	Position control [2)] with amplifier and shuttle valve code CA	
BL	Position control [2)] with amplifier and shuttle valve code DA	

[2)] Position control for D4S06/10 only.
Spring 2 or 4. Spool A and sleeve 3.
Valve open: proximity switch damped

Examples see end of chapter

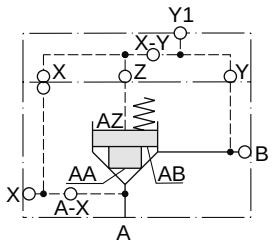
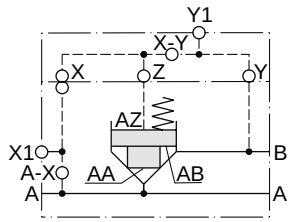
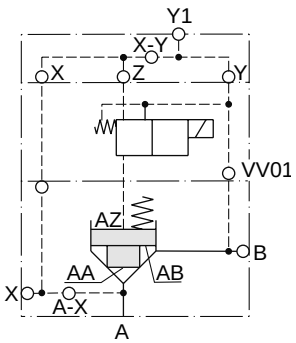
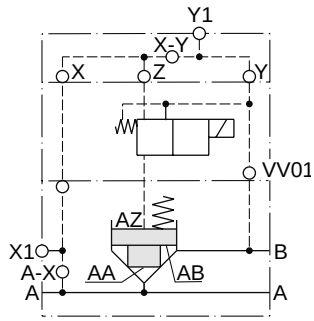
10

Technical data

General						
Design			T-body		L-body	
Size			**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**
Mounting			Threaded body			
Mounting position			unrestricted			
Ambient temperature		[°C]	-20...+50			
$MTTF_D$ value		[years]	150			
Weight	D4S T-body	[kg]	3.2	6.6	—	—
	D4S L-body	[kg]	—	—	3.3	5.6
Hydraulic						
Max. operating pressure		[bar]	Ports A, B up to 350; Port Y 140 (with VV01)			
Nominal flow		[l/min]	180	360	360	600
Fluid			Hydraulic oil as per DIN 51524...51525			
Fluid temperature		[°C]	-20...+80			
Viscosity permitted		[cSt]/[mm²/s]	10...650			
Viscosity recommended		[cSt]/[mm²/s]	30			
Filtration			ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)			

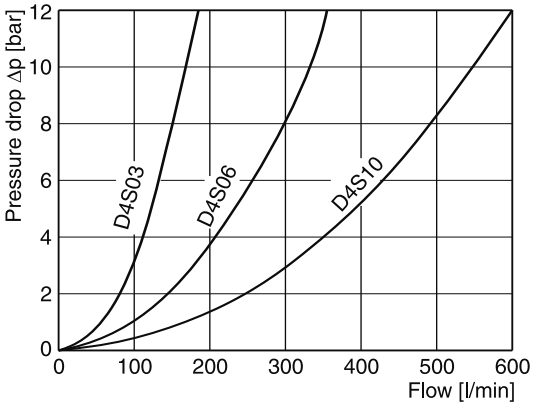
Electrical (solenoid)							
Duty ratio	[%]	100					
Response time	[ms]	Energized / de-energized AC: 20/18 , DC: 46/27					
	Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage	[V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage	[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption, hold	[W]	31	31	31	31	78	78
Power consumption, in rush	[W]	31	31	31	31	264	264
Max. switching frequency	[1/h]	AC: up to 7.200, DC: up to 16.000 switchings/hour					
Solenoid connection		Connector as per EN175301-803					
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)					
Coil insulation class		H (180 °C)					

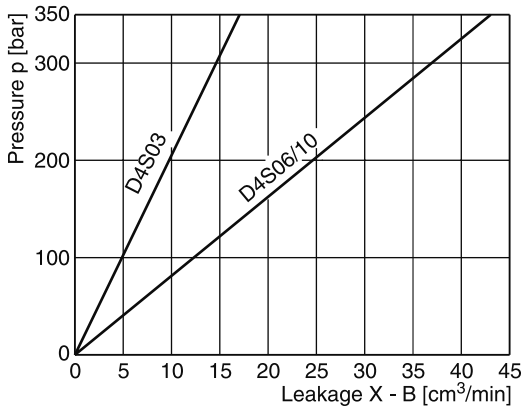
D4S pilot configuration

L-body (2-port)	**T-body (3-port)**
Standard	
	
with vent valve VV01	
	

10

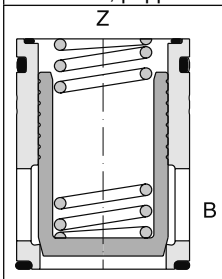
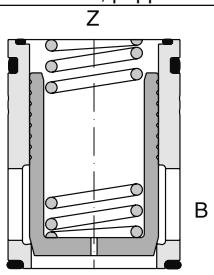
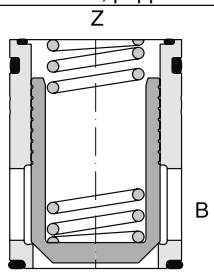
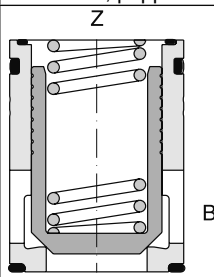
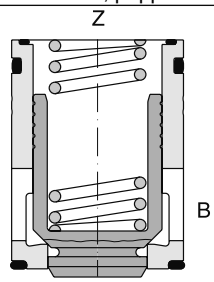
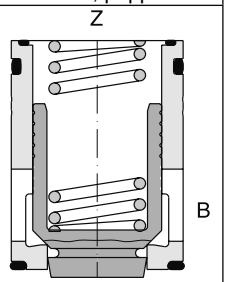
Δp/Q performance curves





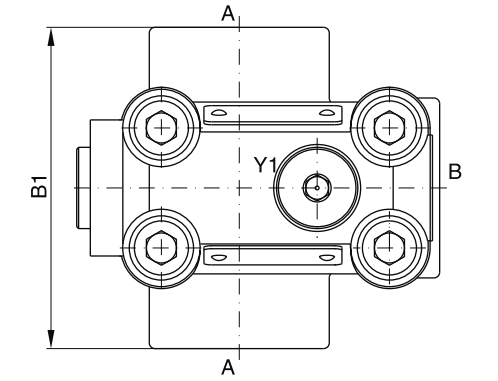
All characteristic curves measured with HLP46 at 50°C.

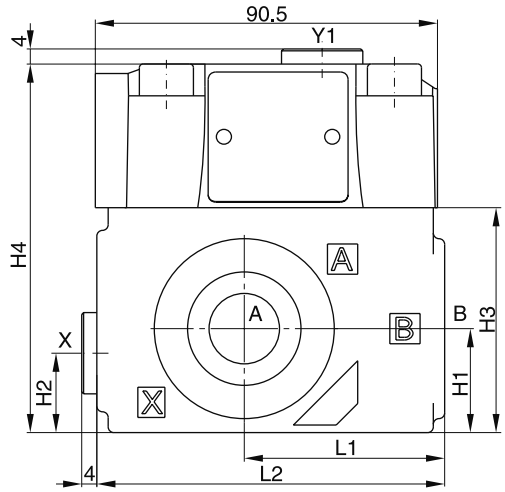
Selection of Cartridges

Sleeve 1, poppet 1	Sleeve 1, poppet 2	Sleeve 1, poppet 4	Sleeve 3, poppet 4	Sleeve 3, poppet A	Sleeve 3, poppet B/C
					
1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 15° chamfer	1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 15° chamfer orifice	1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 45° chamfer	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer safety spool	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer throttle spool

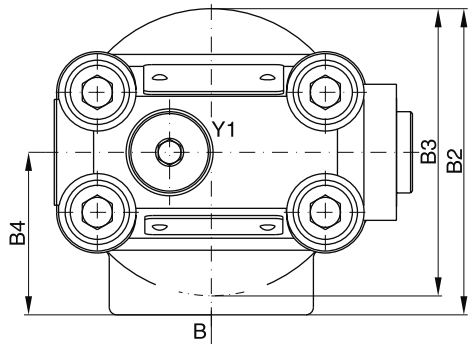
10

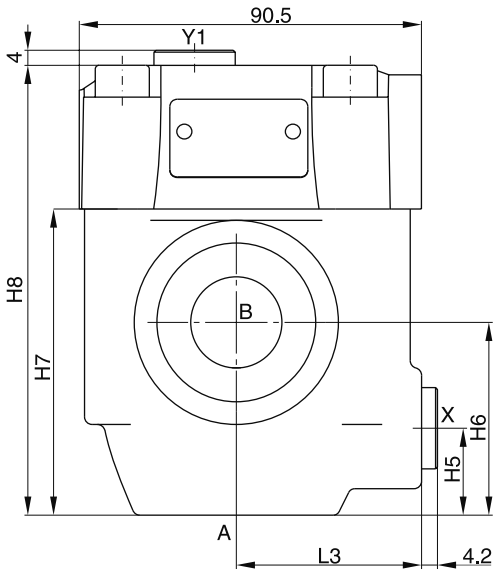
D4S 03/06 T-body





D4S 06/10 L-body





10

Size	L1	L2	B1	H1	H2	H3	H4
03 (T-body)	53	92	85	27.5	21	59.5	97.5
06 (T-body)	66.5	117.5	136	38	28	93	131

Size	L3	B2	B3	B4	H5	H6	H7	H8
06 (L-body)	49	81	76	43	23	51	81	119
10 (L-body)	49.8	120.7	85.6	77.8	38.1	50.8	96	134

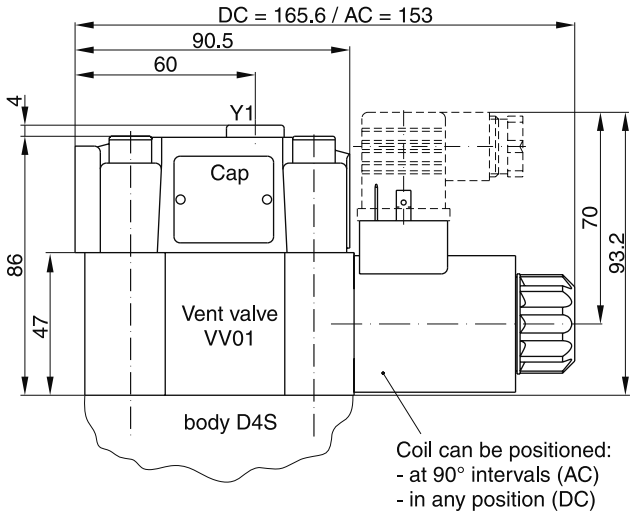
Ports	Function	Port size			
		D4S03 T-body	D4S06 L-body	D4S06 T-body	D4S10 L-body
A	inlet or outlet	G½"	G¾"	G1"	G1¼"
B	outlet or inlet	G½"	G¾"	G1"	G1¼"
X1	external pilot port	G¼"			
Y1	external drain [1]	G¼"			

[1] With VV01 only

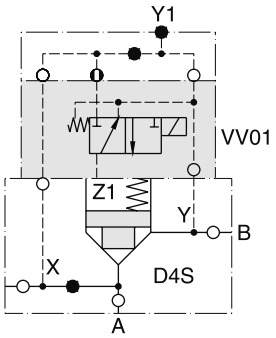
Seal kits		
NG	NBR	FPM
03	S26-58507-0	S26-58507-5
06	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5

D4S UK.INDD RH 11.08.11

D4S with VV01

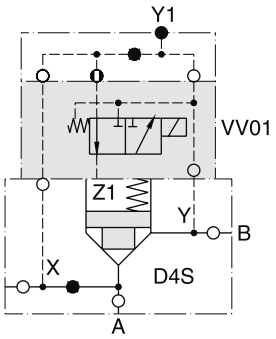


Seal kits	
NBR	**FPM**
DC solenoid	
S26-58515-0	S26-58515-5
AC solenoid	
S26-35237-0	S26-35237-5



with manual override | without manual override

D4S..-.....09/10
Solenoid energized:
D4S blocked
Solenoid deenergized:
Flow from A-B or B-A

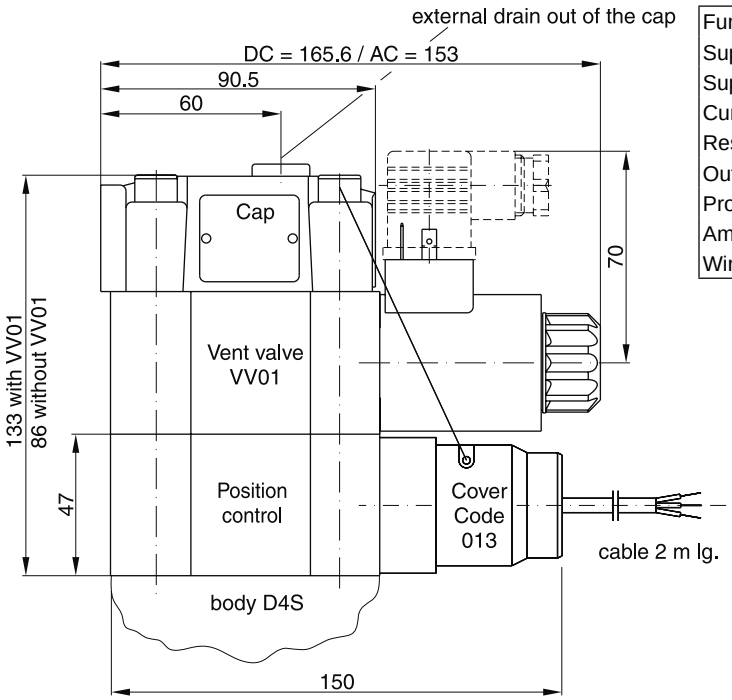


with manual override | without manual override

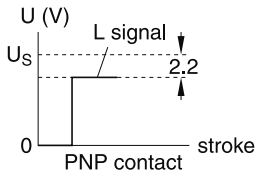
D4S..-.....11/12
Solenoid energized:
Flow from A-B or B-A
Solenoid deenergized:
D4S Blocked

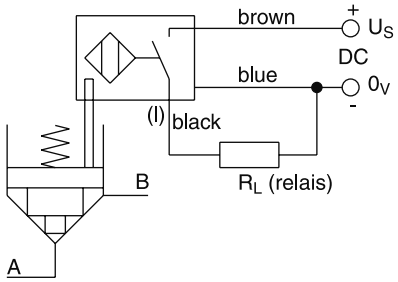
10

D4S position control



Function		PNP, contact
Supply voltage (Us)	[VDC]	10...30
Supply voltage ripple	[%]	≤ 10
Current consumption	[mA]	max. 8
Residual voltage L-signal	[V]	Us - 2.2 at I_{max}
Output current (I)	[mA]	≤ 200
Protection class		IP67
Ambient temperature	[C°]	-25...+70
Wire cross section	[mm²]	3 x 0.5





Position control by proximity switch (incl. amplifier)

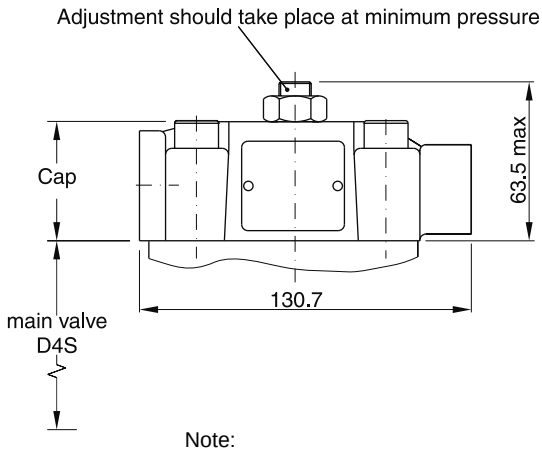
Valve open: proximity switch activated.

This proximity switch is pressure proof and has no wearing parts.

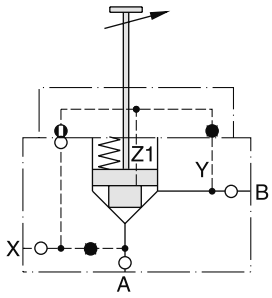
Note

Position control for D4S06 and D4S10 only.

D4S stroke limiter



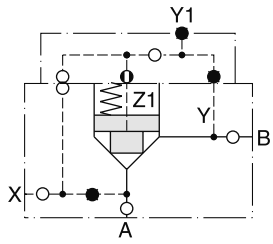
Example: $D4S^{06}_{10}$-.233B.



Note:
Stroke limiter not for use with D4S03, VV01, shuttle valve and positon control.

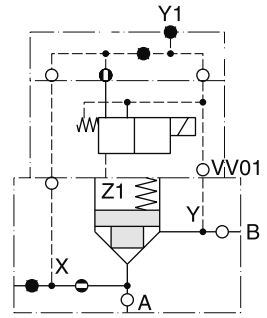
10

D4S direct operated

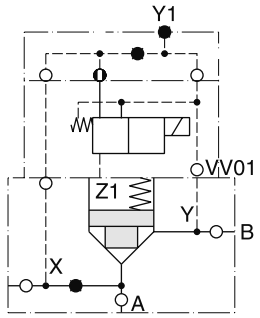


D4S..-.21
Pilot oil X = external

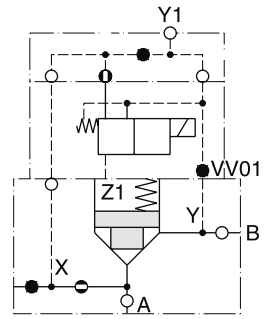
D4S with solenoid valve VV01



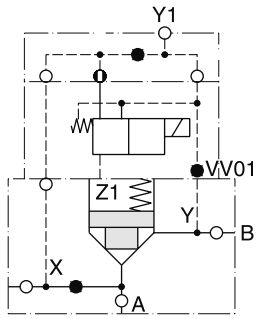
D4S..-.16... 09 10 11 12 with VV01
Pilot oil X = internal from A
Drain Y = internal to B



D4S..-.26... 09 10 11 12 with VV01
Pilot oil X = external
Drain Y = internal to B



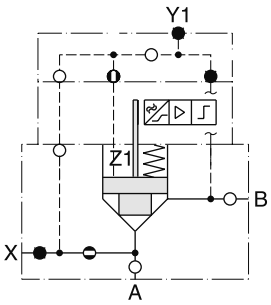
D4S..-.12... 09 10 11 12 with VV01
Pilot oil X = internal from A
Drain Y1 = external out of cap



D4S..-.22... 09 10 11 12 with VV01
Pilot oil X = external
Drain Y1 = external out of cap

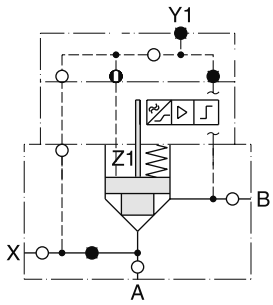
10

D4S with position control



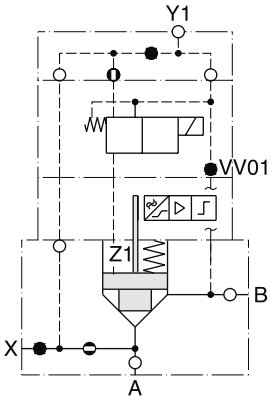
D4S..-.113A.BA
(with position control)

Pilot oil X = intern from A



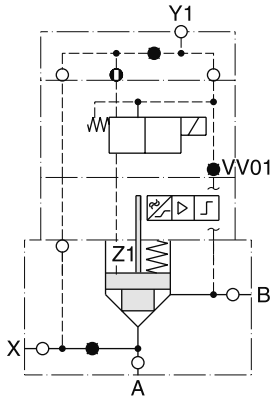
D4S..-.213A.BA
(with position control)

Pilot oil X = external



D4S..-.123A. BC / BE } with position control and VV01

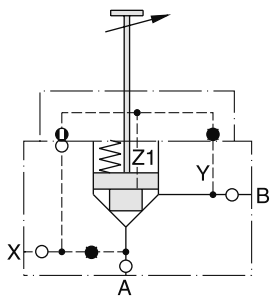
Pilot oil X = intern from A
Drain Y1 = external out of cap



D4S..-.223A. BC / BE } with position control and VV01

Pilot oil X = external
Drain Y1 = external out of cap

D4S with stroke limiter

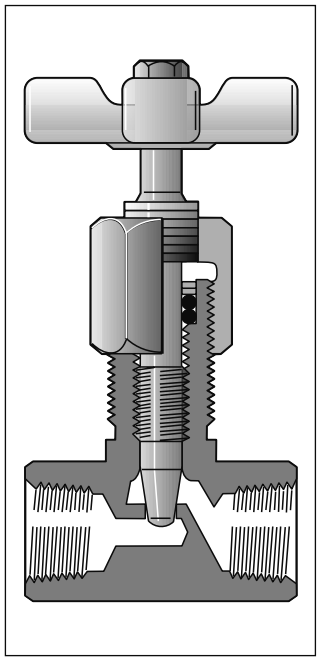


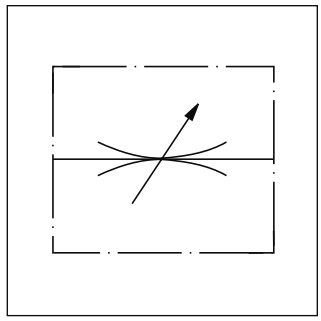
D4S..-.233B. with stroke limiter
Pilot oil X = external
(Note: for D4S06 and D4S10 only)

10

Notes

Manatrol needle valve, optional with 30° poppet, V-notch, or rectangular slot. The form of the throttle opening influences the accuracy of the flow setting, which depends on the pressure and viscosity. The needle is made of stainless steel and corresponds to a ring gap in the valve body.





Flow rate Q [l/min] $= Kv \cdot \sqrt{\frac{\Delta p}{\gamma}}$

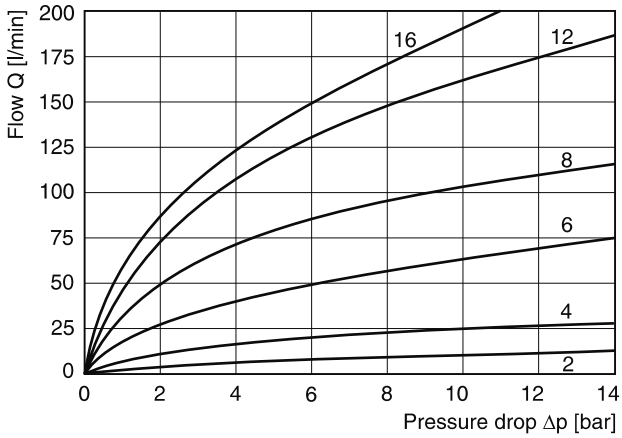
Kv	from the table
Δp [bar]	
γ [kg/dm³]	= spezific weight of the medium
(γ for mineral oil	= 0.85 - 0.9)

Technical data

Size	Max.pressure [bar]		Flow [l/min]	Max. cross. sect. [cm²]	Kv factor valve	Weight [kg]
	steel	brass	Δp 10bar	Δp 10bar	open	
200	350	140	11	0.07	3.5	0.13
400	350	140	25	0.14	6.3	0.31
600	350	140	65	0.37	18.5	0.54
800	350	140	105	0.55	27.5	0.95
1200	350	-	160	0.90	45.7	1.58
1600	210	-	190	1.10	54.6	1.9

Size and needle type	
200-2	7
200-3	2
400-2	11

Δp/Q curves



All characteristic curves measured with HLP46 at 50°C.

Ordering code

Thread type	Needle valve	Size and design	Body	Needle	Seal
☐	MV	☐	☐	☐	☐

Code	Thread
omit	NPTF
9	**BSPP**

Straight way valve code	Size	Angle valve code
200	1/8	261
400	1/4	461
600	3/8	661
800	1/2	861
1200	3/4	1261
1600	1	—

Code	Body
S	**Steel**
B [1]	Brass

[1] not for models MV 1200/1600 and design „61"

Code	Seal
omit	**NBR**
V	FPM

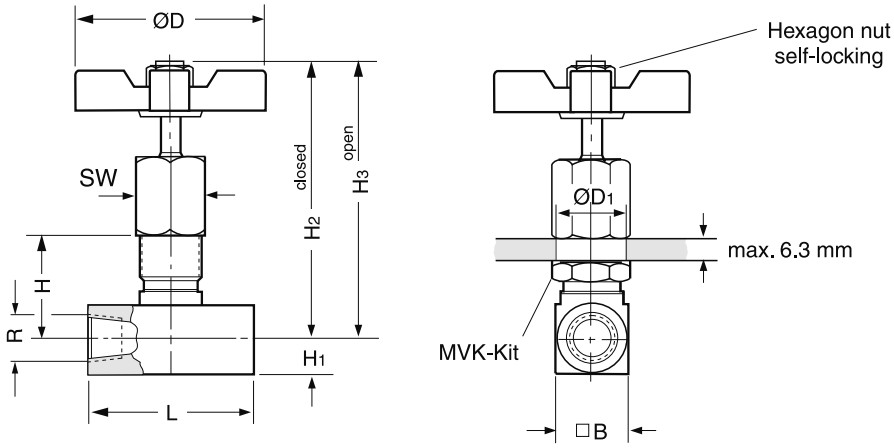
Code	Needle
omit	**Standard with 30° taper**
2 [2]	Fine due to V-notch
3 [2]	Micro-fine due to rect. slot

[2] only for size 400

Bold letters =
Short-term availability

10

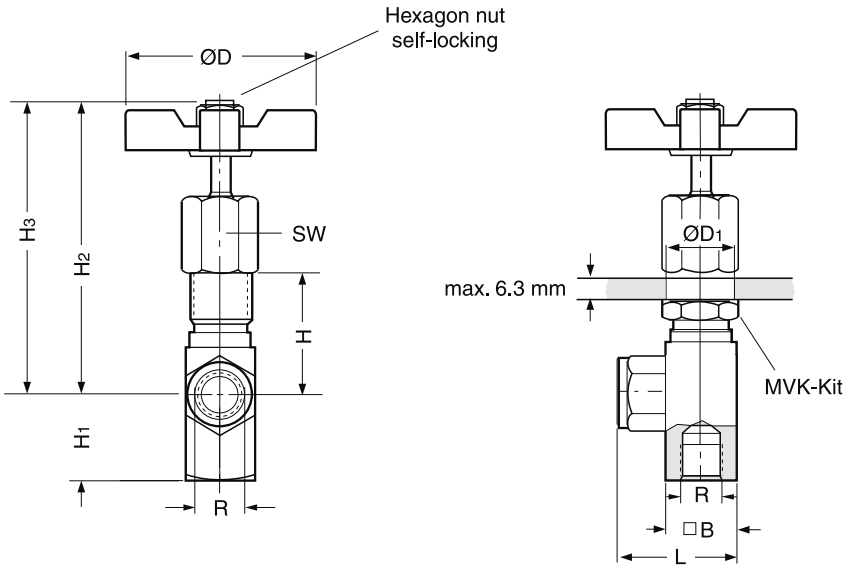
MV*00 valve with connecting thread in-line



Size	R*	H	H3	H2	H1	B	ØD1	L	ØD	SW	MVK sets
2	1/8	24	69	64	8	16	15	38	45	15.7	MVK 2
4	1/4	33	86	81	10.5	21	20	51	51	22.1	MVK 4
6	3/8	38	108	100	13	26	23	64	64	25.4	MVK 6
8	1/2	51	130	117	16	32	29	67	83	31.8	MVK 8
12	3/4	54	142	128	19	38	36	83	98	41.2	MVK 12
16	1	60	147	133	22.5	45	36	108	98	41.2	MVK 16

* Pipe thread G or NPTF

MV*61 angle valve with connections at 90° angle



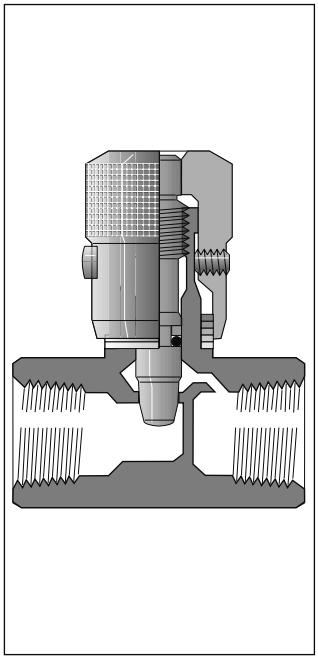
Size	R*	H	H3	H2	H1	B	ØD1	L	ØD	SW
2	1/8	27	72	67	20.6	16	15	27	45	15.7
4	1/4	36	90	85	27.7	21	20	38	51	22.1
6	3/8	42	111	103	34.8	26	23	45	64	25.4
8	1/2	55	134	121	42.7	32	29	53	83	31.8
12	3/4	59	147	133	41.1	38	36	64	98	41.2

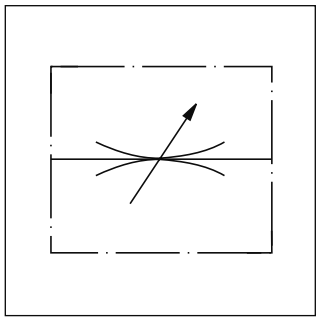
* Pipe thread G or NPTF

Manatrol stop and throttle valves with 2-stage needle cone. Fine adjustment for the first stage can be achieved with 3 rotations of the adjustment knob. The second stage with normal throttle characteristics is achieved with 3 further rotations. A cylindrical needle with a rectangular slot is provided to reduce the viscosity effect for sizes 200 up to 600. The flow is dependent on pressure and viscosity.

$$\text{Flow rate } Q\ [\text{l/min}] = Kv \cdot \sqrt{\frac{\Delta p}{\gamma}}$$

Kv	from the table
Δp [bar]	
γ [kg/dm³]	= spezific weight of the medium
(γ for mineral oil	= 0.85 - 0.9)





Specifications

Return check poppet Nominal cracking pressure	0.4 bar
Operating temperature	-40°C to +121°C

Technical data (only for standard 2 stage needle)

Size	Pressure [bar]		Flow [l/min]	Max. cross section	Kv factor valve	Weight [kg]
	Steel	Brass				
200	350	140	11	0.066	3.3	0.15
400	350	140	25	0.13	6.3	0.22
600	350	140	40	0.22	11.2	0.6
800	350	140	50	0.28	13.9	0.63
1200	350	140	120	0.70	35.4	1.04
1600	210	35	250	1.48	75	2.13

Ordering code

		N					
Thread type		Needle valve	Thread size	Body	Needle	Clamping screw	Seal

Code	Thread
omit	NPTF
9	**BSPP**

Code	Size
200	**1/8**
400	**1/4**
600	**3/8**
800	**1/2**
1200	**3/4**
1600	1

Code	Body
S	**Steel**
B	Brass

Code	Seal
omit	**NBR**
V	FPM

Code	Clamping screw
omit	**Hexagon socket**
F	With knurled knob
T	Tamper-proof

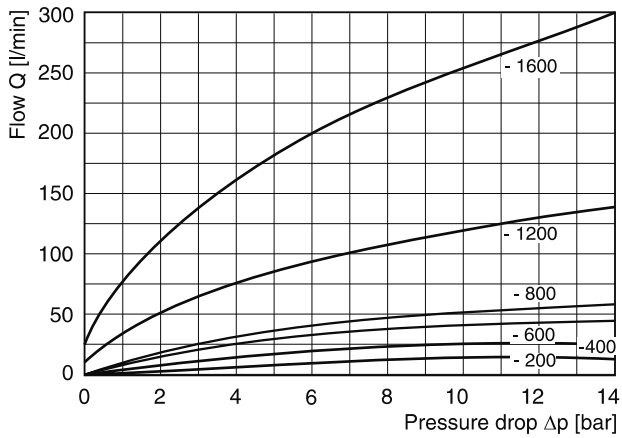
Code	Needle
omit	**Standard 2-stage needle**
4 *	Micro-fine hollow needle with slot

* only for sizes 200 to 600

Bold letters =
Short-term availability

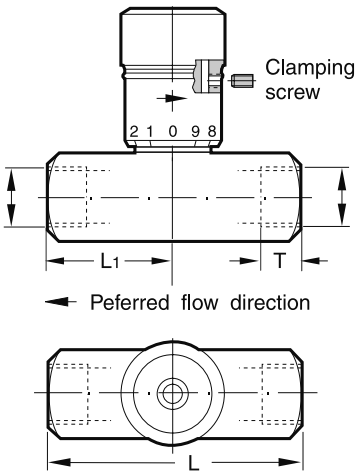
10

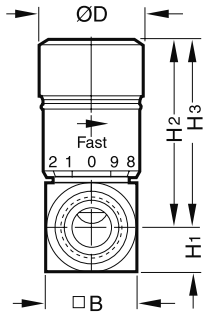
p/Q curves



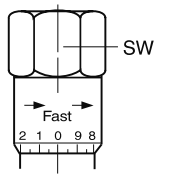
All characteristic curves measured with HLP46 at 50°C.

Dimensions

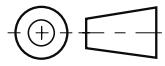




H2 = closed
H3 = open



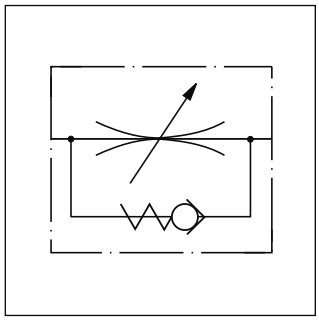
Hexagon adjusting knob, standard for size 1600



Size	R* Threads	H3	H2	H1	B	L1	L	ØD	SW
200	1/8	39	35	8	16	16	38	19	-
400	1/4	46	40	10.5	21	25	51	21	-
600	3/8	55	49	13	26	32	64	25	-
800	1/2	69	61	16	32	33	67	30	-
1200	3/4	86	71	19	38	41	83	35	-
1600	1	124	107	22.5	45	54	108	-	47.8

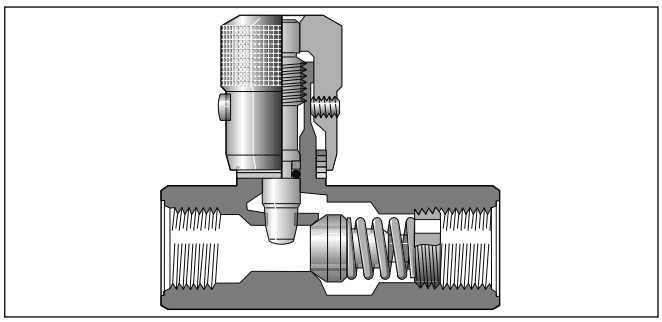
* G or NPTF

Manatrol throttle check valves of series F with fine adjustment of the flow rate for a defined flow direction. The built-in check valve allows free flow in the counter direction with little flow resistance. A 2-stage needle provides very exact setting of smaller flow rates with the first three rotations of the adjustment knob. After 3 more rotations, the valve is completely open. The valve setting can be locked using a locking screw.



$$\text{Flow rate } Q \text{ [l/min]} = Kv \cdot \sqrt{\frac{\Delta p}{\gamma}}$$

Kv — from the table
Δp [bar]
γ [kg/dm³] = spezific weight of the medium
(γ for mineral oil = 0.85 - 0.9)



Specifications

Return check poppet Nominal cracking pressure	0.4 bar
Operating temperature	-40°C to +121°C

Technical data

Size	Pressure [bar]		Max. flow [l/min Δp10bar]	Throttle surface [cm²]	Throttle v. open Kv factor	Weight [kg]	
	Steel	Brass				Steel	Brass
200	350	140	11	0.066	3.3	0.13	0.13
400	350	140	25	0.13	6.3	0.23	0.23
600	350	140	40	0.22	11.2	0.31	0.31
800	350	140	50	0.28	14	0.67	0.68
1200	210	140	120	0.70	35.4	1.17	1.18
1600	210	35	250	1.48	75	2.31	2.32
2000	210	–	250	1.48	75	3.67	–
2400	210	–	250	1.48	75	4.62	–
3200	210	–	250	1.48	75	7.78	–

Ordering code

		F					
Thread type		Throttle check valve	Thread size	Body	Needle	Clamping screw	Seal

Code	Thread
omit	NPTF
9	**BSPP**

Code	Size
200	**1/8**
400	**1/4**
600	**3/8**
800	**1/2**
1200	**3/4**
1600	**1**
2000	1¼
2400	1½
3200	2

Code	Body
S	**Steel**
B [1)]	Brass

Code	Seal
omit	**NBR**
V	FPM

Code	Clamping screw
omit	**Hexagon socket**
F	With knurled knob
T	Tamper-proof

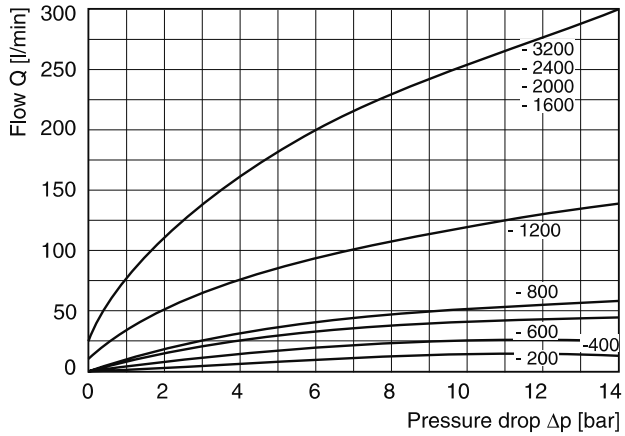
Code	Needle
omit	**Standard 2-stage needle**
4 *	Micro-fine hollow needle with slot

* only for sizes 200 to 600

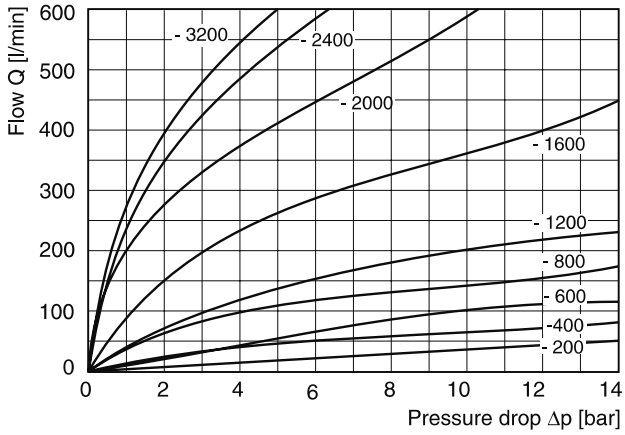
Bold letters =
Short-term availability

10

Controlled flow vs. pressure drop needle fully open

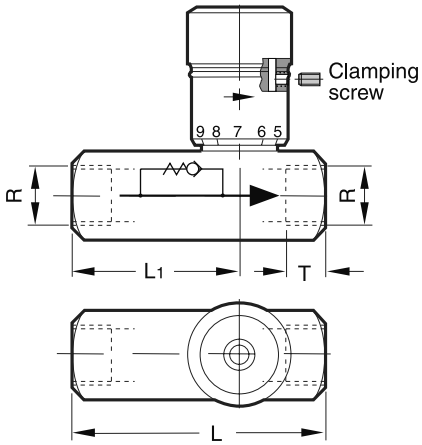


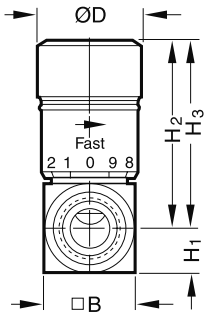
Free flow vs. pressure drop needle fully open



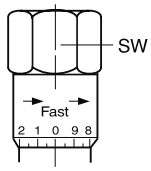
All characteristic curves measured with HLP46 at 50°C.

Dimensions

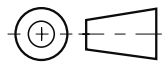




H_2 = closed
H_3 = open



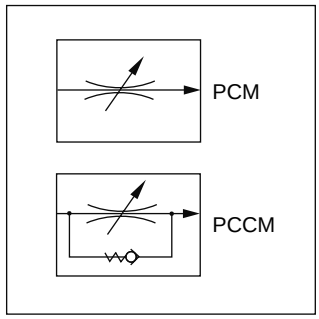
Hexagon adjusting knob, standard for sizes 1600 to 3200



Size	R*	H3	H2	H1	B	L1	L	ØD	SW	T
200	1/8	39	35	8	16	36	51	19	-	9
400	1/4	46	40	10.5	21	43	67	21	-	13
600	3/8	55	49	13	26	45	70	25	-	13
800	1/2	69	61	16	32	57	87	30	-	16
1200	3/4	86	71	19	38	65	99	35	-	17
1600	1	124	107	22.5	45	83	127	-	47.8	20
2000	1 1/4	130	114	29	58	99	143	-	-	21.5
2400	1 1/2	137	120	35	70	114	143	-	-	23.5
3200	2	146	130	44.5	89	134	165	-	-	25

* Pipe thread G or NPTF

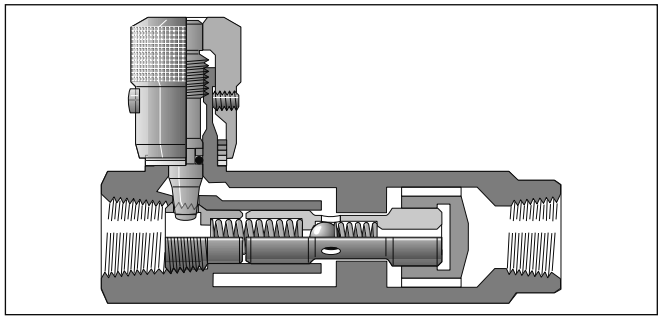
Manatrol 2 way flow control valves for pressure compensated regulation of the flow rate. As a consequence of pressure changes, the set value can vary by ± 5% within the tolerance range. Viscosity changes have the same effect and are to be observed.



Technical data

Size	Max. press. [bar]	Flow control		Check valve		Weight [kg]
		Q* [l/min]	Δp [bar]	Q_{max} [l/min]	Δp [bar]	
400	210	1 - 10	7	20	3	0.82
600	210	2 - 25	7	30	3	1.05
800	210	6 - 60	11	75	8	1.68
1200	210	10 - 100	11	130	8	3.64
1600	210	19 - 190	11	250	10	6.59

* Min. and max. flow rate



Ordering code

☐	PC	☐	M	☐	S	☐	☐	⌜⌝
Thread type	**Press. comp. flow control valve**	**Design**		**Thread size**	**Steel body**	**Clamping screw**	**Seal**	**Design series** (not required for ordering)

Code	Thread
omit	NPTF
9	**BSPP**

Code	Design
omit	**Without check valve**
C	With check valve

Code	Size
400	**1/4**
600	**3/8**
800	**1/2**
1200	**3/4**
1600	**1**

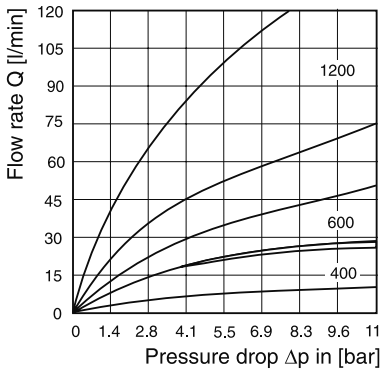
Code	Seal
omit	**NBR**
V	FPM

Code	Clamping screw
omit	**Hexagon socket**
F	With knurled knob
T *	Tamper-proof

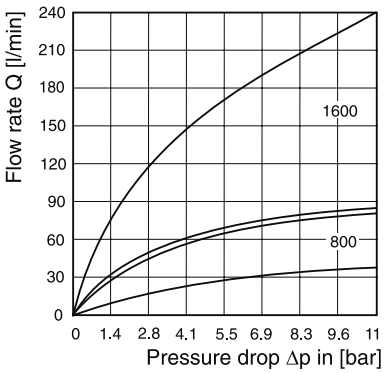
* not available above size 1200

Bold letters =
Short-term availability

Δp/Q curves

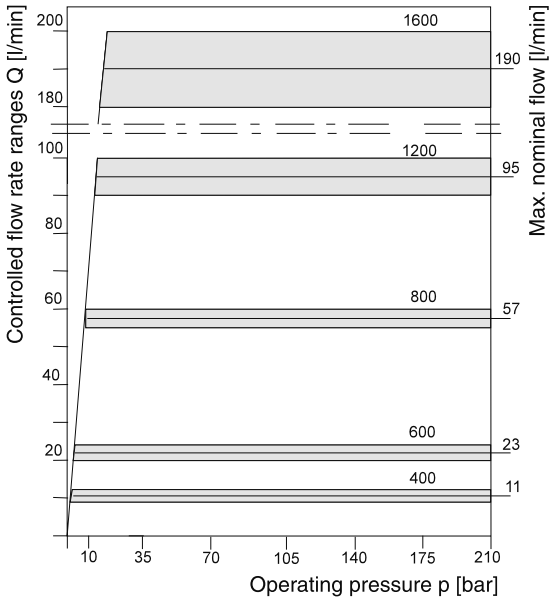


Sizes 400, 600 and 1200: Pressure drop Δp for flow through check valve in range Q_{max} / Q_{min} with each size



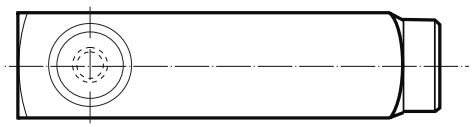
Sizes 800 and 1600: Pressure drop Δp for flow through check valve in range Q_{max} / Q_{min} with each size

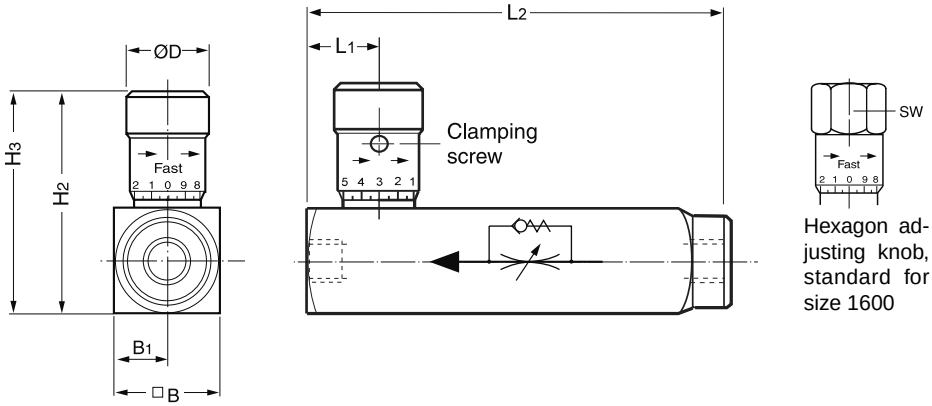
Size 400 - 1600 p/Q control characteristic



All characteristic curves measured with HLP46 at 50°C.

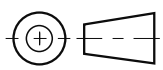
Dimensions





Hexagon adjusting knob, standard for size 1600

H_2 = closed
H_3 = open

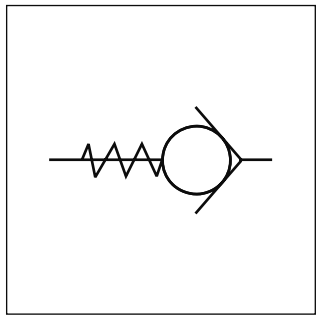


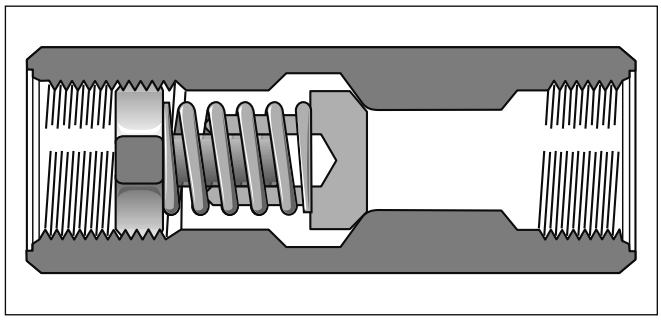
Size	R*	H3	H2	B	L1	B1	L2	ØD	SW
400	1/4	69	64	35	16	18	92	21	-
600	3/8	80	74	38	18	19	106	25	-
800	1/2	103	95	44	22	22	125	30	-
1200	3/4	128	116	57	28	29	149	35	-
1600	1	175	158	70	33	35	176	-	47.8

* Pipe thread G or NPTF

Manatrol check valves of series C for pipe mounting provide free flow in one direction and block flow in the counter direction. Depending on material specification, these valves are suited for use in hydraulic and pneumatic systems.

Specific poppets and poppet guides ensure reliable functional integrity even at high flow rates and/or pulsations.





Technical data

Size			200	400	600	800	1200	1600
Max. operating pressure	steel	[bar]	350	350	350	350	350	210
	brass	[bar]	140	140	140	140	140	34
Pressure drop Δp		[bar]	10	10	10	10	1	1
Flow Q		[l/min]	40	65	110	155	112	160

Ordering code

		C				
Thread type		**Pipe mounting**	**Port size**		**Body**	**Opening pressure**

Code	Thread
omit	NPTF
9	**BSPP**

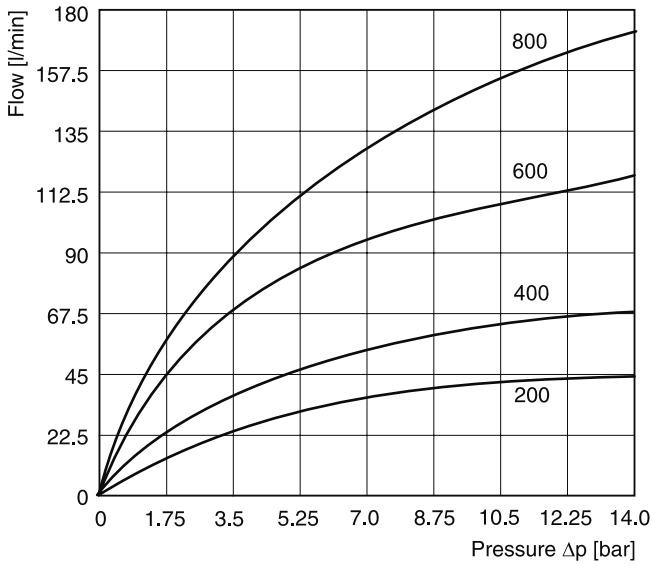
Code	Size
200	1/8
400	**1/4**
600	**3/8**
800	**1/2**
1200	**3/4**
1600	**1**

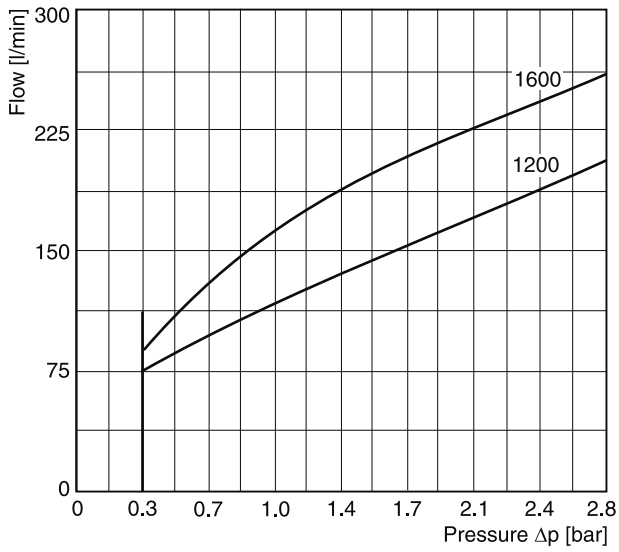
Code	Body
S	**Steel**
B	Brass

Code	Pressure [bar]
omit	**0.35**
65	4.5

Bold letters =
Short-term availability

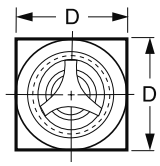
Δp/Q performance curves

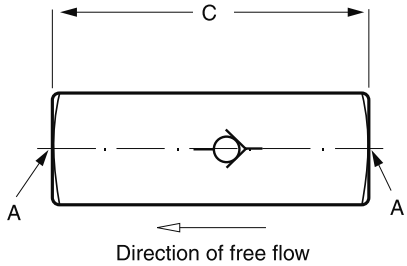


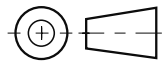


All characteristic curves measured with HLP46 at 50°C.

Dimensions





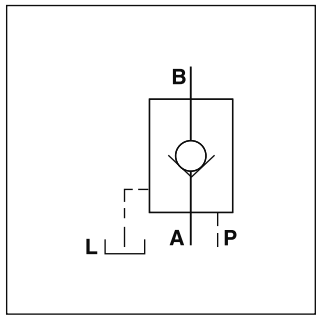


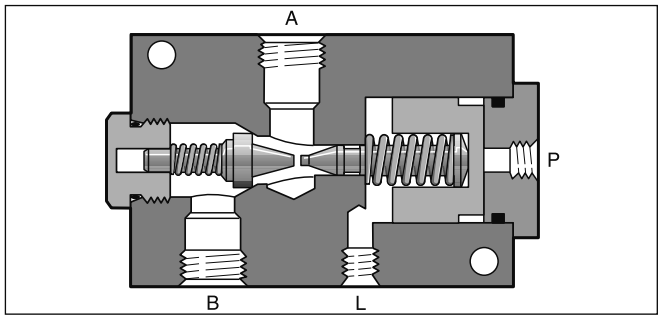
Size	Threaded connection R*		Dimensions [mm]		Weight [kg]
	G thread	NPTF thread	B	L	
C 200	R 1/8"	1/8-27 NPTF	16	51	0.05
C 400	R 1/4"	1/4-18 NPTF	21	66	0.2
C 600	R 3/8"	3/8-18 NPTF	25	70	0.2
C 800	R 1/2"	1/2-14 NPTF	32	87	0.6
C 1200	R 3/4"	3/4-14 NPTF	38	99	0.9
C 1600	R 1"	1-11-1/2 NPTF	45	127	1.5

* For alternative thread design, see ordering code.

Pilot operated check valves of the series CP allow free flow in one direction (A to B).

The counter direction (B to A) is blocked. By applying pilot pressure, the poppet can be lifted from its seat against the pressure in port B. Thus flow in the counter direction is also possible. There are 1 and 2 stage poppets available with pilot ratios of 1 : 5 and 1 : 40, to suit different operating conditions.



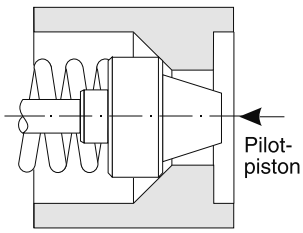


Technical data

Size		600	1200
Max. operating pressure	[bar]	210	210
Max. pilot pressure	[bar]	210	70
Flow Q_{max} at Δp 2.7bar	[l/min]	30	95
Nominal size		3/8	3/4
Weight	[kg]	4	7

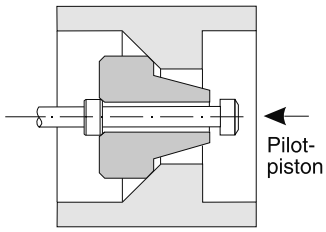
Pilot ratios

Poppet 1 stage



Surface ratio 5 : 1 (pilot spool-poppet surface) for quick response time without decompression.

Poppet 2 stage



Surface ratio 40 : 1 (pilot spool decompression pin surface) for low shock or oscillation performance from decompression.

Ordering code

	CP		S		M	
Thread type	Check valve, pilot operated	Port size	Steel body	Pilot ratio	Steel poppet	Seal

Code	Thread
omit	NPTF
9	**BSPP**

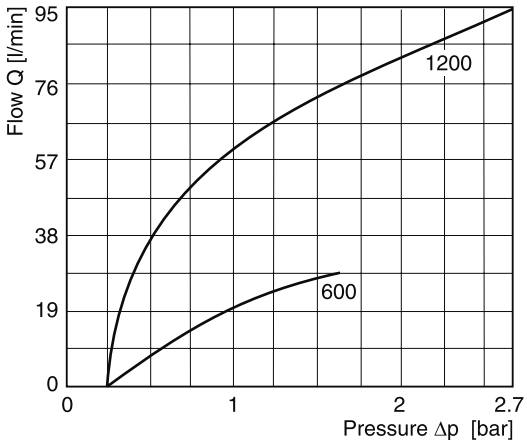
Code	Size
600	**3/8**
1200	**3/4**

Code	Seal
omit	**NBR**
V	FPM

Code	Pilot ratio	Stage
5	**5 : 1**	**1**
40	40 : 1	2

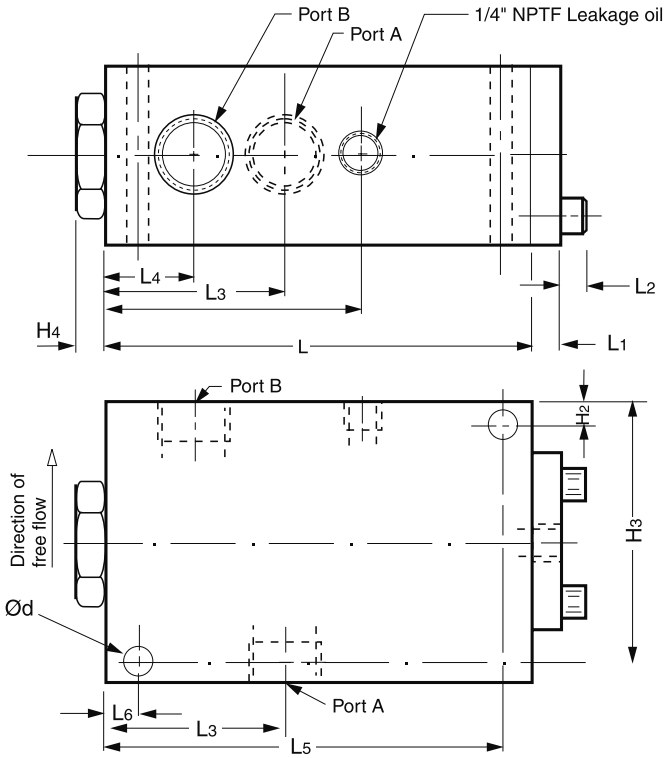
Bold letters =
Short-term availability

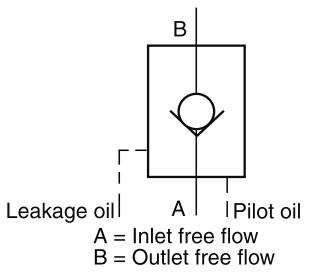
∆p/Q performance curves

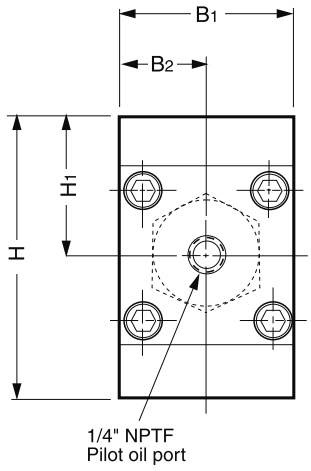


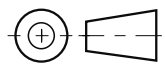
All characteristic curves measured with HLP46 at 50°C.

Dimensions









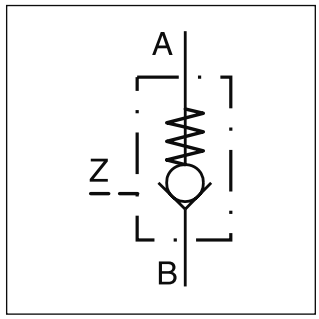
Size	A, B	L_3	B_1	B_2	H_1	H	L_4	L_7	H_4	L	L_1	H_2	H_3	L_6	L_5	Ød	W
9CP600S	G3/8	53.3	50.8	25.4	38.1	76.2	25.4	76.2	10.4	120.7	10.7	9.4	66.5	9.4	111	9.1	-
9CP1200S	G3/4	63.5	63.5	31.8	50.8	101.6	31.8	91.2	10.7	152.4	11.43	11.2	90.4	11.2	141.2	10.7	7.9

Pilot operated check valves series RH allow free flow in one direction (B to A). The counter flow is blocked (A to B). By applying pilot pressure the ball can be lifted from its seat and allow flow from A to B.

Most common use:

- Keeping cylinders leak-free in position, when spool type directional control valves are used
- Return line discharge, when return flow exceeds functional limits of directional control valve at differential cylinders
- As hydraulically activated drain or circulation valve

The valves are available without and with hydraulic pre-discharging.

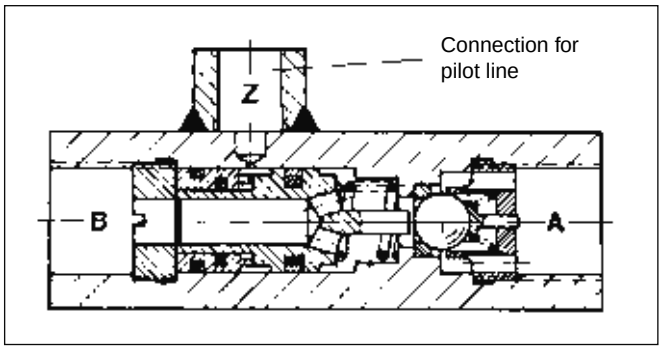


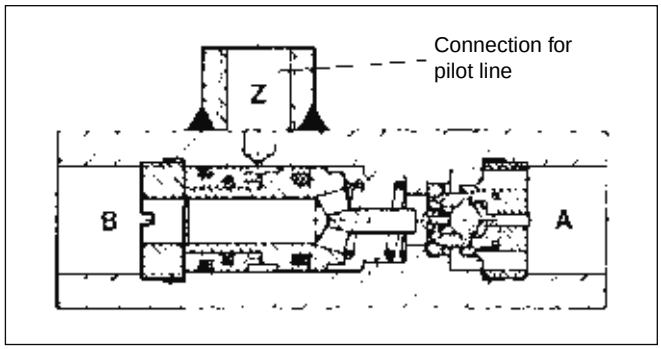
Without pre-discharging

These valves have a ball as valve element, which quickly enables the full flow cross-section proportionally during pilot operation. A metering position in the pilot port dampens the control movement of the pilot spool so that pressure shocks (unloading shocks) are mostly suppressed.

With pre-discharging

For valves with pre-discharging a spherical polished valve spool (seat valve function) is built-in instead of a ball. The additional check valve achieves a pre-opening which provides shock-free unloading of the fluid, especially at high working pressure and large volumes.





10

Technical data

Code	RH	1	2	3 / 3V	4 / 4V
Max. operating pressure	[bar]	700	700	500	500
Flow approx.	[l/min]	15	35	55	100
Pilot flow volume	[cm³]	0.15	0.22	0.4	1
Pipe connections DIN ISO 228/1 A, B		G 1/4	G 3/8	G 1/2	G 3/4
Pipe connections DIN ISO 228/1 Z		G 1/4	G 1/4	G 1/4	G 1/4
Weight	[kg]	0.4	0.4	0.6	1.3
Mounting		Freely suspended in the pipeline			
Mounting position		unrestricted			
Fluid		Hydraulic oil 10...68 mm²/s (ISO VG 10 to 68 as per DIN 51 519)			
Viscosity recommended	[cSt]/[mm²/s]	10...500			
Viscosity permitted	[cSt]/[mm²/s]	4...500			
Temperatures	[°C]	Fluid and ambient: -20...+80; observe viscosity range!			
$MTTF_D$ value	[years]	150			

Ordering code

RH		
Check valve, hydr. pilot operated	Flow	Pre-discharging

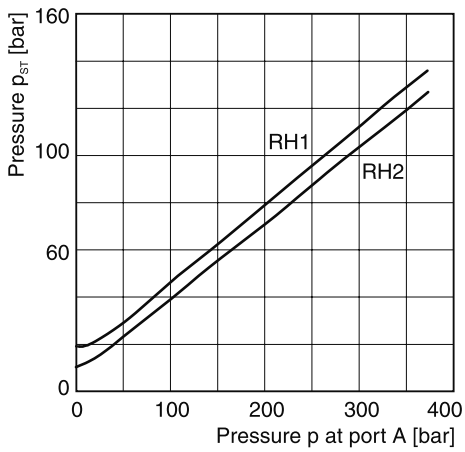
Code	Flow [l/min]
1	15
2	**35**
3	**55**
4	100

Code	Pre-discharging
V*	**with**
omit	**without**

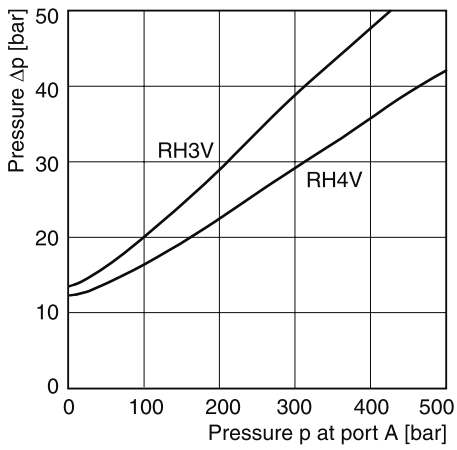
* only for sizes 3 and 4

Bold letters =
Short-term availability

Pilot pressure p_{St} for pilot operation of the main valve
(p_B = 0 bar)



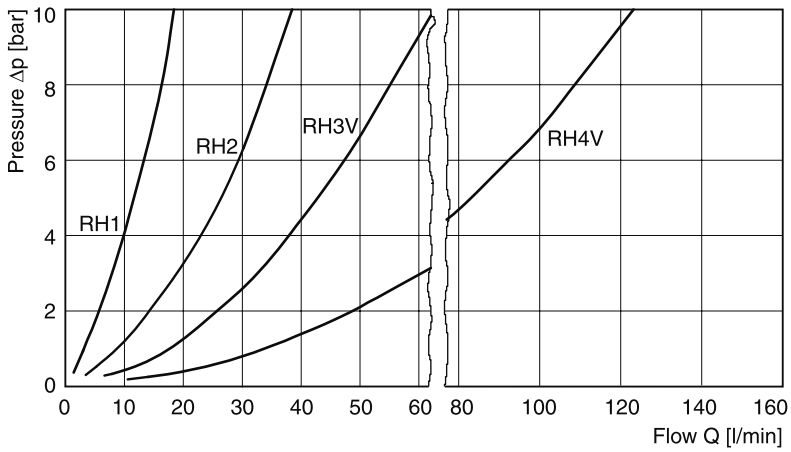
Pilot pressure p_{St} for pilot operation of pre-discharging



for keeping open		
p_{St}		$p_B + \Delta p + k$
p_B	[bar]	pressure on side B
Δp	[bar]	flow resistance A to B as per $\Delta p/Q$ performance curve
k		10 at RH 1 and RH 2 7 at RH 3 V 8 at RH 4 V

10

Performance curves $\Delta p/Q$ (valid for flow polarity B to A and pilot operated direction A to B)

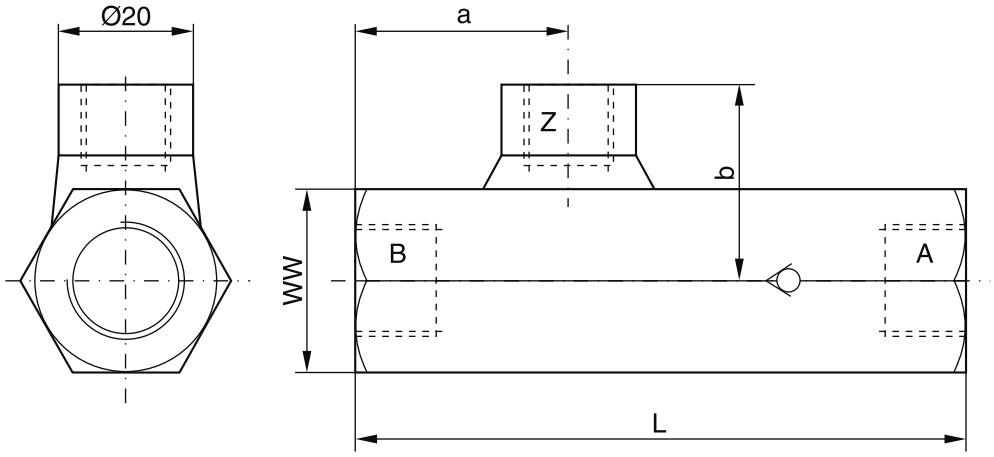


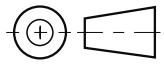
Opening pressure B to A 0.2...0.3 bar

Oil viscosity during the measurement, 60 mm²/s

For viscosities over approx. 500 mm²/s, a strong Δp-increase is to be expected for smaller types (RH1...RH3).

RH UK.INDD RH 12.08.11





Type	Port *		L	a	b	SW
	A, B	Z				
RH 1	G 1/4	G 1/4	84	31.5	27	24
RH 2	G 3/8	G 1/4	90	32	28.5	27
RH 3 V	G 1/2	G 1/4	100	36.5	31	32
RH 4 V	G 3/4	G 1/4	126	45	35.5	41

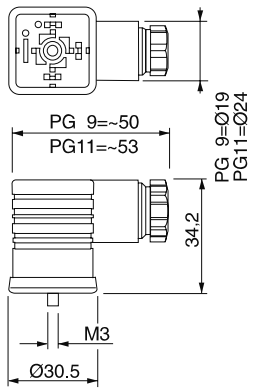
* as per DIN 228/1, suitable for pipe connections with thread studs form B as per DIN 3852 page 2.

Notes

Description	Threaded cable joint	Body colour coding	Figures switching	Order no.
Plug DIN 43650, design type AF, protection class IP 65 Voltages up to 250 V	PG 9	black, B grey, A	Fig. 1	**5001710** **5001711**
	PG11	black, B grey, A	Fig. 1	**5001716** **5001717**

Other plugs on request

Fig. 1



10

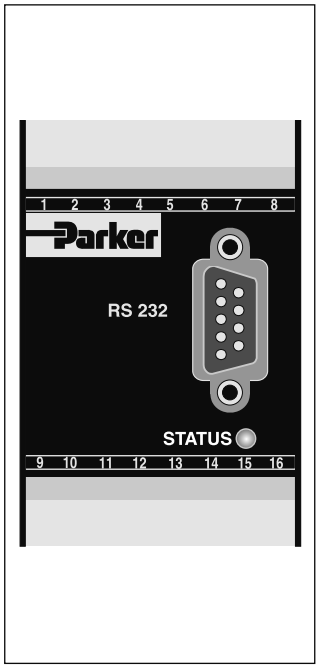
Notes

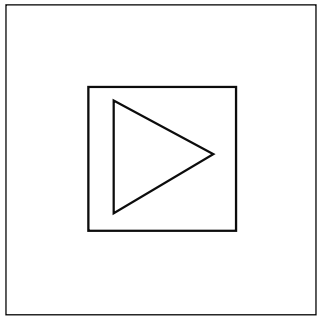
Series	Description	For use with															Page
		D*FB, D*1FB	D*FB, D*1FB OBE	D*1FH, D*1FE	D*FP, D*1FP	R4V, R6V, R4R	R4V, R6V OBE	RE06M*W	RE06M*T	VMY, VBY	DUR*L	PRPM	TDA, TEA	TDP, TPQ	RE*E*W	RE*E*T	R5V, R5R	
	Amplifiers for proportional valves																	
PWD00	For valves w/o position transducer	•																11-3
PWDXX	For valves with position transducer or valves in closed loop systems	•				•		•		•	•	•	•		•		•	11-7
PCD00	For up to 2 single solenoid valves w/o transducer					•		•		•	•	•	•		•		•	11-11
	Electronics for command signal processing																	
PZD00	Min/Max adjustment, 6 command channels, 6+1 ramps		•	•	•		•		•					•		•		11-15
	Axis controller																	
PID00	For position, pressure and speed control in closed loop systems		•	•	•		•		•					•		•		11-19
Compax 3F	Multifunctional axis controller for basic and high end applications		•		•									•				11-23
Compax 3F Zubehör	Terminal strips, cables, PIOs																	11-37
	Accessories																	
EX-N08	Power supply																	11-41
EX-M05	Test unit for items with integrated electronics																	11-43

11

Notes

Parker electronic modules PWD00A-400 for rail mounting are compact, easy to install and provide time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for proportional directional control valves by a comfortable interface program.





CE

Features

The described electronic unit combines all necessary functions for the optimal operation of proportional directional control valves without position sensor (series D*FB, D*1FB). The most important features are:

- Digital circuit design
- Four parameterizable preset recall channels
- Constant current control
- Differential input stage
- Status output
- Four-quadrant ramp function
- Enable input for solenoid driver
- Status indicator
- Parametering by serial interface RS232C
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"

Ordering code

PWD	00	A	–	400	–	
Electronic module directional control valves	**Universal**			**Amplifier min/max adjustment accel/decel ramps command input**		**Design series** (not required for ordering)

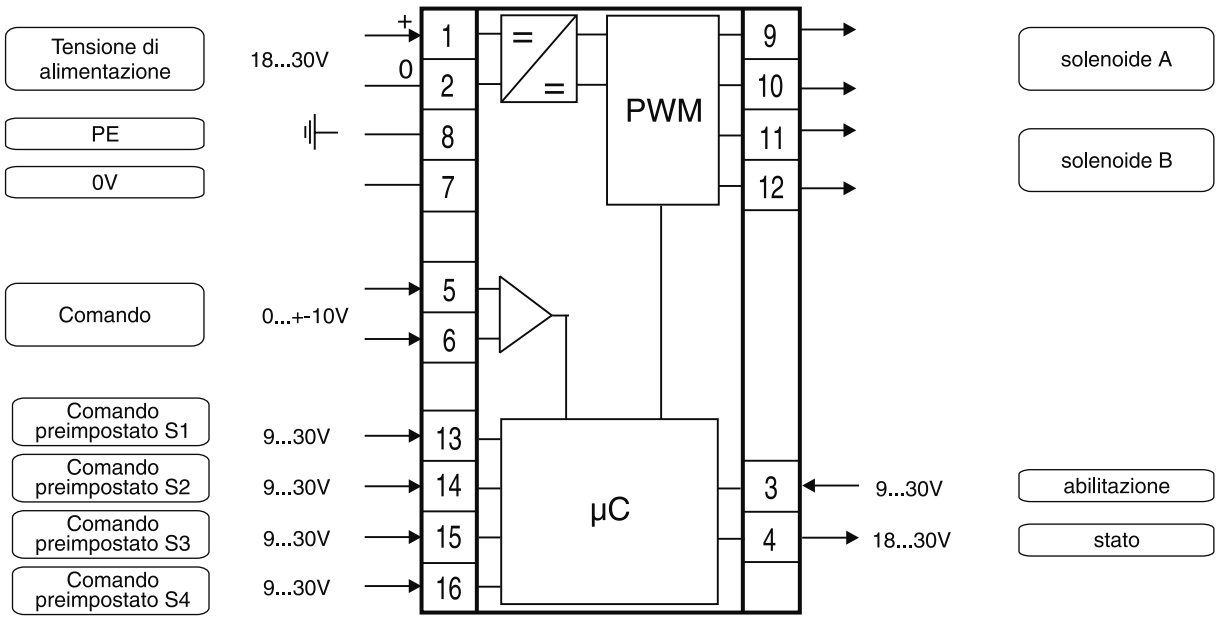
11

Technical data

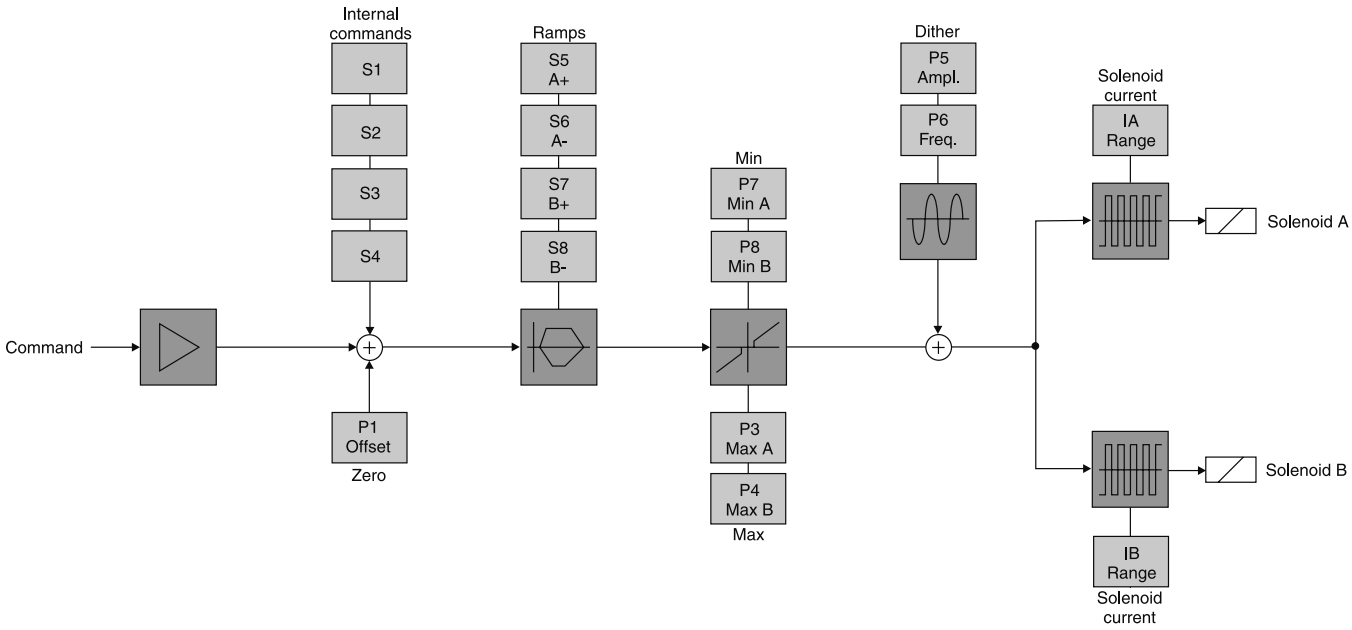
General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V0 acc. UL 94
Installation position		Any
Ambient temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
$MTTF_D$ value	[years]	150
Weight	[g]	160
Electrical		
Duty ratio	[%]	100
Supply voltage	[VDC]	18...30, ripple < 5% eff., surge free *
Current consumption max.	[A]	2.2
Pre-fusing	[A]	2.5 A medium lag
Command signal	[V]	+10...0...-10, ripple < 0.01 % eff., surge free, Ri = 150 kOhm
Input signal resolution	[%]	0.025
Differential input voltage max.	[V]	30 for terminals 5 und 6 against PE (terminal 8)
Enable signal	[V]	0...4.0: Off / 9.0...30: On / Ri = 30 kOhm
Channel recall signal	[V]	0...4.0: Off / 9.0...30: On / Ri = 30 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Adjustment ranges		
Min	[%]	0...50
Max	[%]	50...100
Ramp	[s]	0...32.5
Zero offset	[%]	+100...-100
Current	[A]	0.8/1.3/1.8/2.7/3.5
Interface		RS 232C, DSub 9p. male for null modem cable
EMC		EN 50081-2, EN 50082-2
Connection		Screw terminals 0.2...2.5 mm², disconnectable
Cable specification	[AWG] [AWG]	16 overall braid shield for supply voltage and solenoids 20 overall braid shield for sensor and signal
Cable length	[m]	50

* If solenoids with a nominal voltage of 24V are connected, the supply voltage has to be raised to 29V.

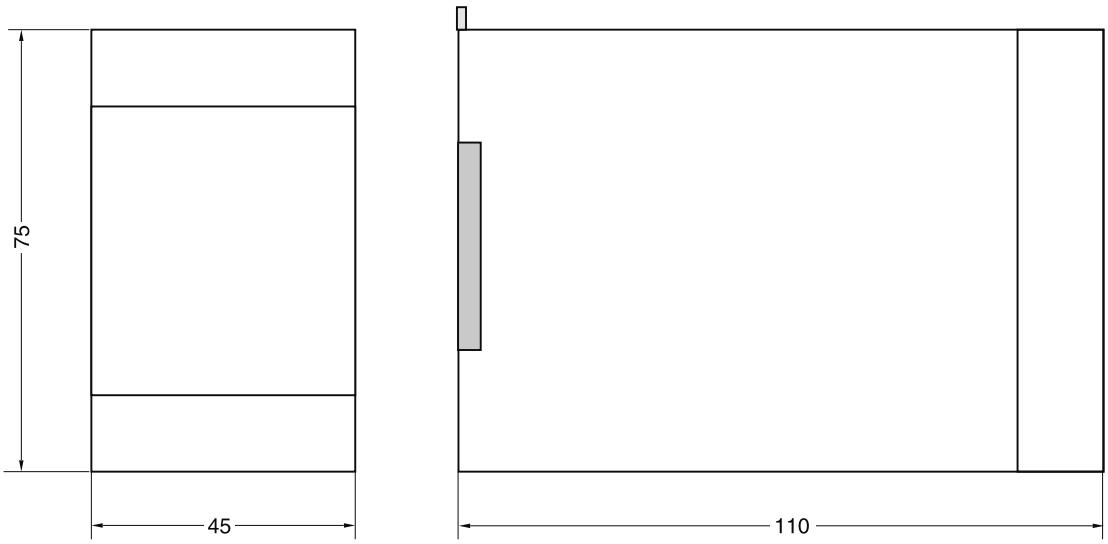
Block diagram



Signal flow diagram



Dimensions



11

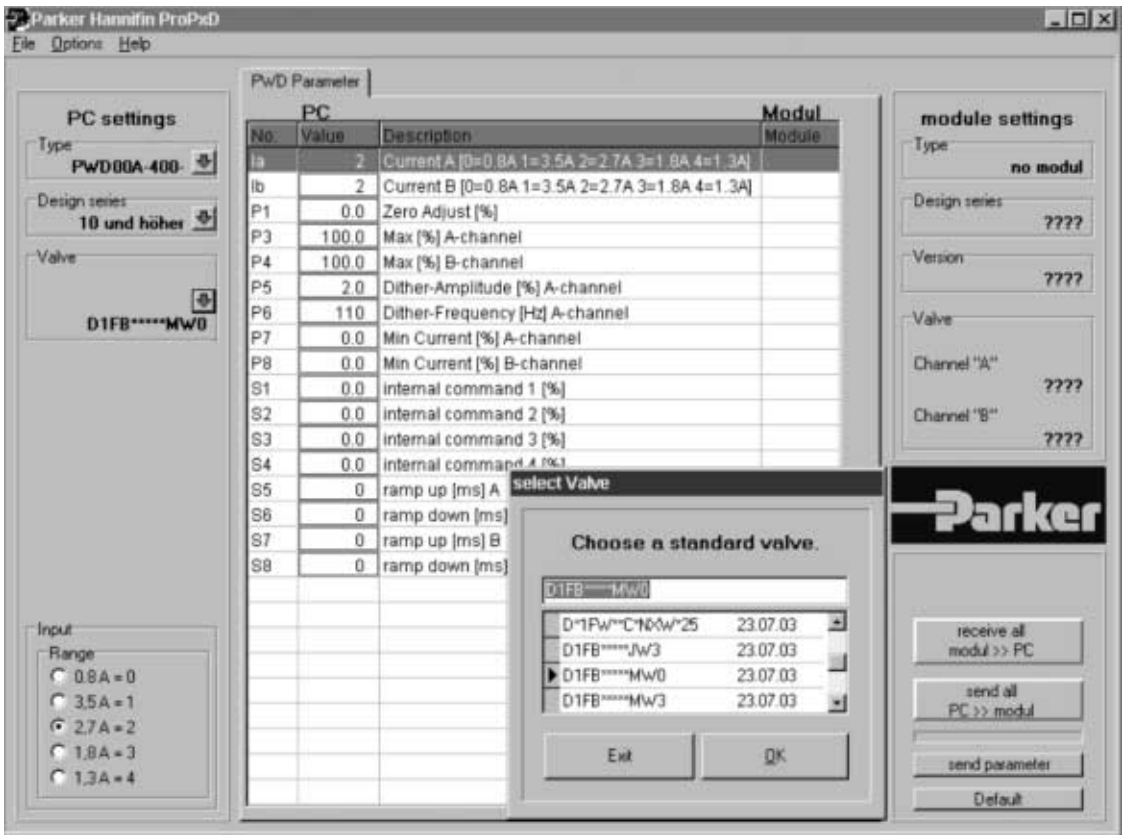
ProPxD interface program

The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

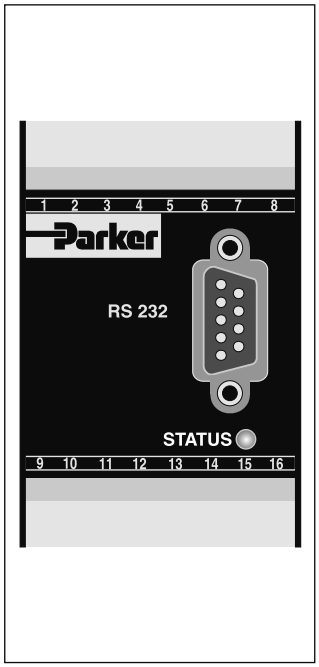
Features

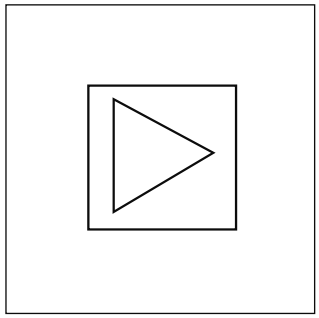
- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows® operating systems from Windows® 95 upwards
- Plain communication between PC and electronic via serial interface RS232C and null modem cable
- comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"



11

Parker electronic modules PWDXXA-40* for rail mounting are compact, easy to install and provide time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for proportional directional control valves with position sensor by a comfortable interface program.





Features

The described electronic unit combines all necessary functions for the optimal operation of proportional directional control valves with position transducer or valves in closed loop systems. The most important features are:

- Digital circuit design
- Parameterizable position control of valve spool
- Constant current control
- Differential input stage with different signal options
- Monitor output for spool stroke
- Four-quadrant ramp function
- Enable input for solenoid driver
- Status indicator
- Parametering by serial interface RS232C
- Connection by disconnectable terminals
- In combination with valves without spool feedback
  - Pressure control with proportional pressure valve and pressure sensor
  - Position control with proportional DC valve and actuator position transducer
- Optional technology function "linearization"
- Comfortable PC user software, free of change: www.parker.com/euro_hcd
  – see "Support"

Ordering code

PWD	XX	A	–	40	–		–	
Electronic module proportional valves	**Closed loop control universal**			**Amplifier min/max adjustment accel/decel ramps command input**		**Technology function**		**Design series** (not required for ordering)

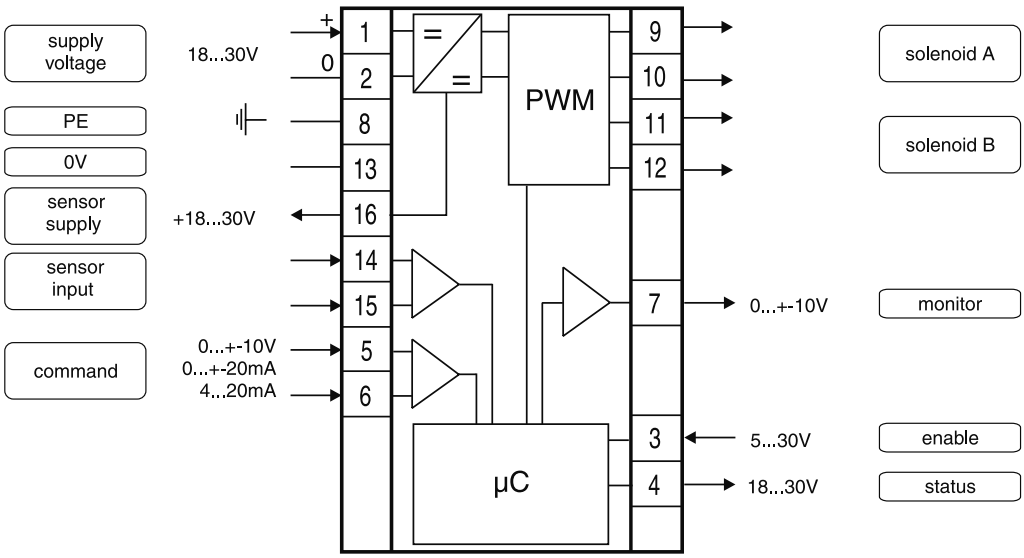
Code	Function
0	Standard
1	Linearization option

11

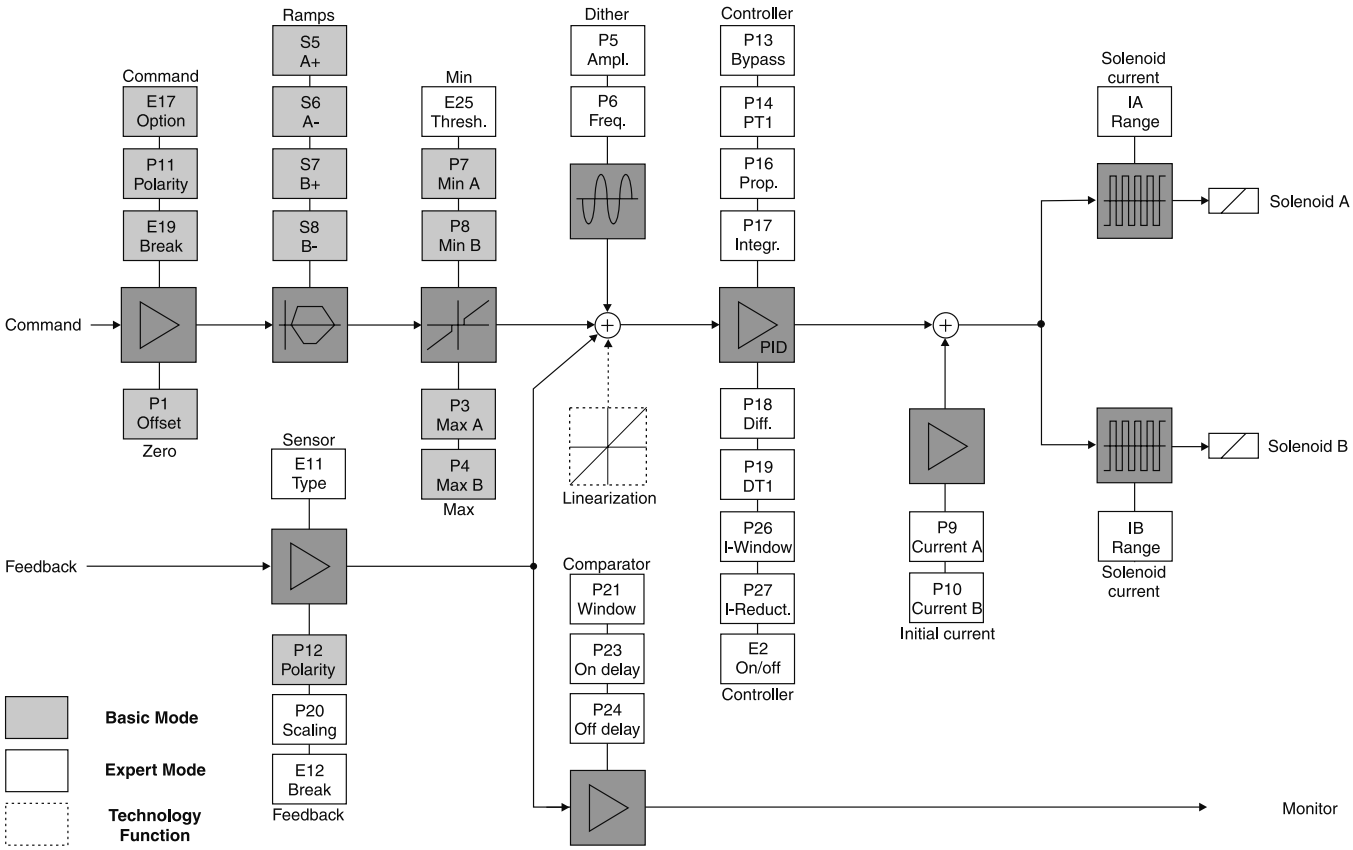
Technical data

General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V0 acc. UL 94
Installation position		Any
Ambient temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
$MTTF_D$ value	[years]	150
Weight	[g]	160
Electrical		
Duty ratio	[%]	100
Supply voltage	[VDC]	18...30, ripple < 5% eff., surge free
Switch-on current typ.	[A]	22 for 0.2 ms
Current consumption max.	[A]	2.0
Pre-fusing	[A]	2.5 A medium lag
Command signal options	[V]	+10...0...-10, ripple <0.01 % eff., surge free, Ri = 100 kOhm
	[mA]	+20...0...-20, ripple <0.01 % eff., surge free, Ri = 200 Ohm
	[mA]	4...12...20, ripple <0.01 % eff., surge free, Ri = 200 Ohm
		<3.6 mA = solenoid output off,
		>3.8 mA = solenoid output on (acc. NAMUR NE43)
Input signal resolution	[%]	0.025
Differential input voltage max.	[V]	30 for terminals 5 and 6 against PE (terminal 8)
	[V]	11 for terminals 5 and 6 against 0V (terminal 2)
Sensor supply	[V]	18...30 (Us), max. current <100 mA
Enable signal	[V]	0...2.5: Off / 5...30: On / Ri = 100 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Monitor signal	[V]	+10...0...-10, rated max. 5 mA, signal resolution 0.4 %
Adjustment ranges		
Min	[%]	0...50
Max	[%]	50...100
Ramp	[s]	0...32.5
Zero offset	[%]	+100...-100
Current	[A]	1.3 / 2.7 / 3.5
Initial current	[%]	0...25
Interface		RS 232C, DSub 9p. male for null modem cable
EMC		EN 61000-6-2
Connection		Screw terminals 0.2...2.5 mm², disconnectable
Cable specification	[AWG]	16 overall braid shield for supply voltage and solenoids
	[AWG]	20 overall braid shield for sensor and signal
Cable length	[m]	50
Options		
Technology function	Code1	Software adjustable transfer function with 10 compensation points for linearization of valve behaviour.

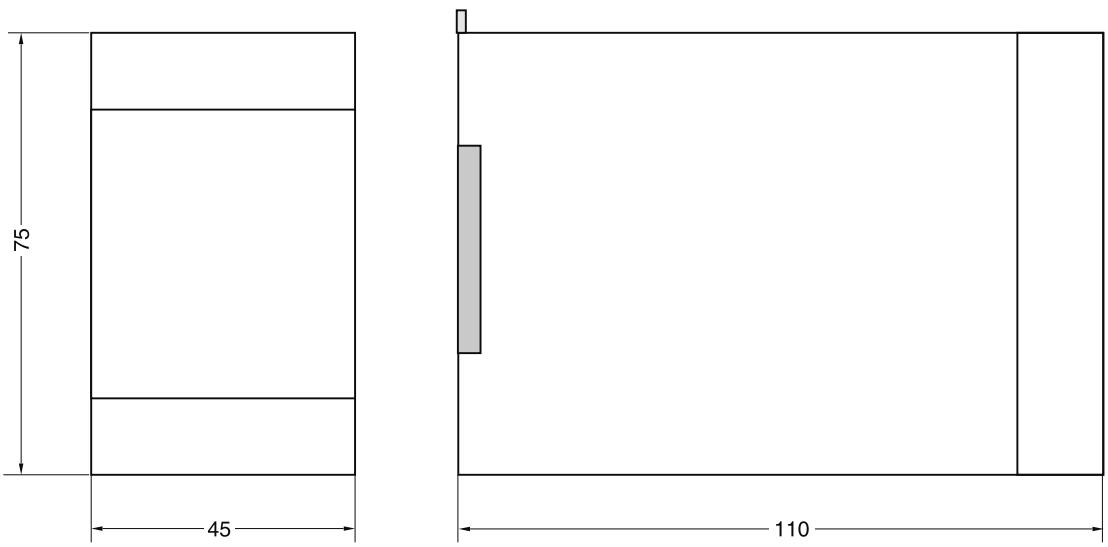
Block diagram



Signal flow diagram



Dimensions



11

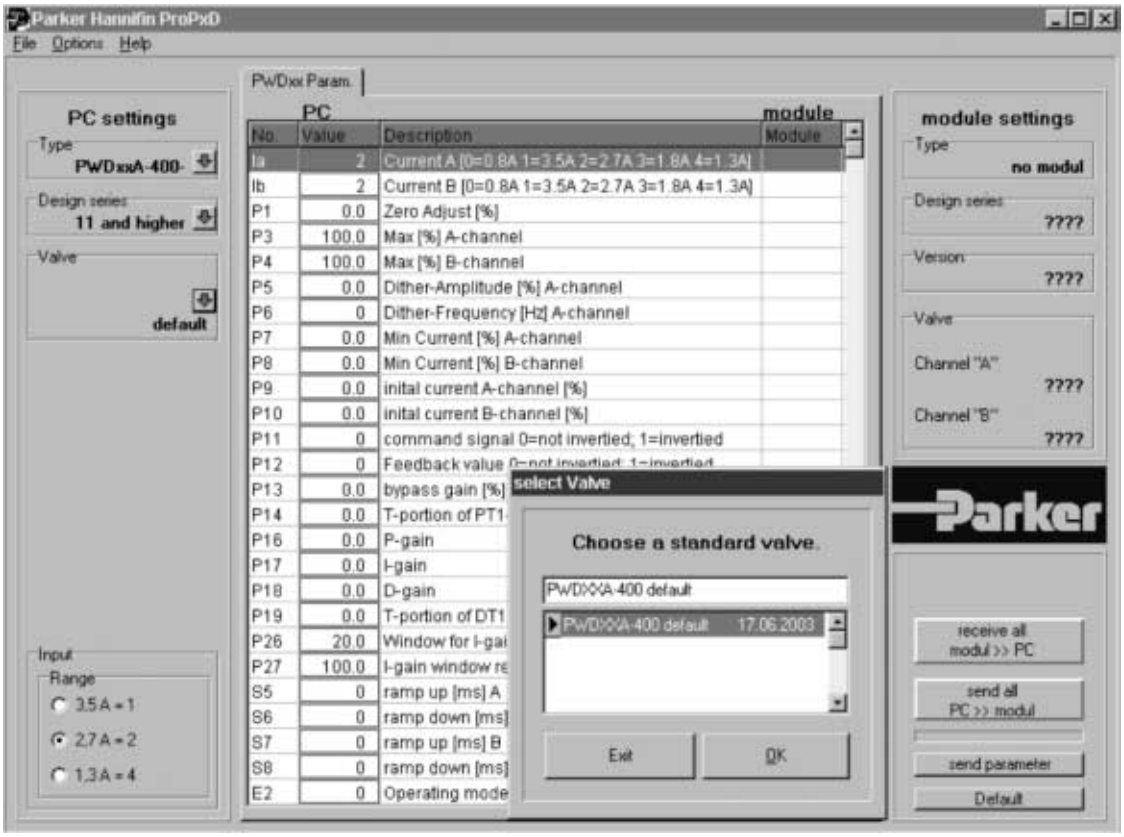
ProPxD interface program

The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

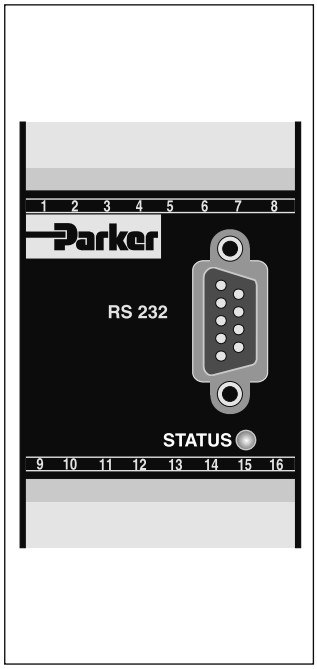
Features

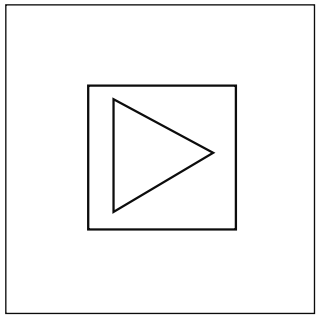
- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows® operating systems from Windows® 95 upwards
- Plain communication between PC and electronic via serial interface RS232C and null modem cable
- Comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"



11

Parker electronic modules series PCD00A-400 for rail mounting are compact, easy to install and provide time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for proportional pressure/flow control valves by a comfortable interface program.





CE

Features

The described electronic unit combines all necessary functions for the optimal operation of two proportional pressure/flow control valves (series R*V, RE*E*W, RE06M*W, DUR, PRPM, VBY, VMY, TDA, TEA).

The most important features are:

- Digital circuit design
- Two independent operable amplifiers
- Four parameterizable preset recall channels
- Constant current control
- Two input stages 0...10V
- Status output
- Two up/down ramp functions
- Enable input for solenoid driver
- Status indicator
- Parametering by serial interface RS232C
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- Comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"

Ordering code

PCD	00	A	–	400	–	
Electronic module pressure/flow valves	**Without position control universal**			**2 Amplifiers min/max adjustment accel/decel ramps command inputs 4 command signal presets**		**Design series** (not required for ordering)

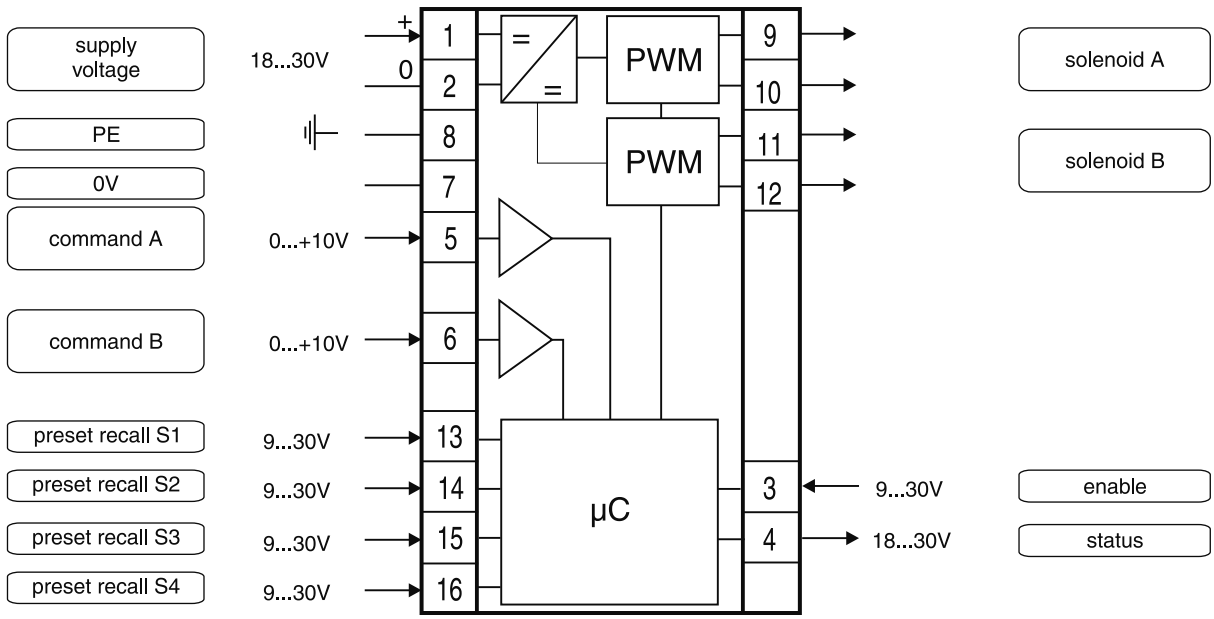
11

Technical data

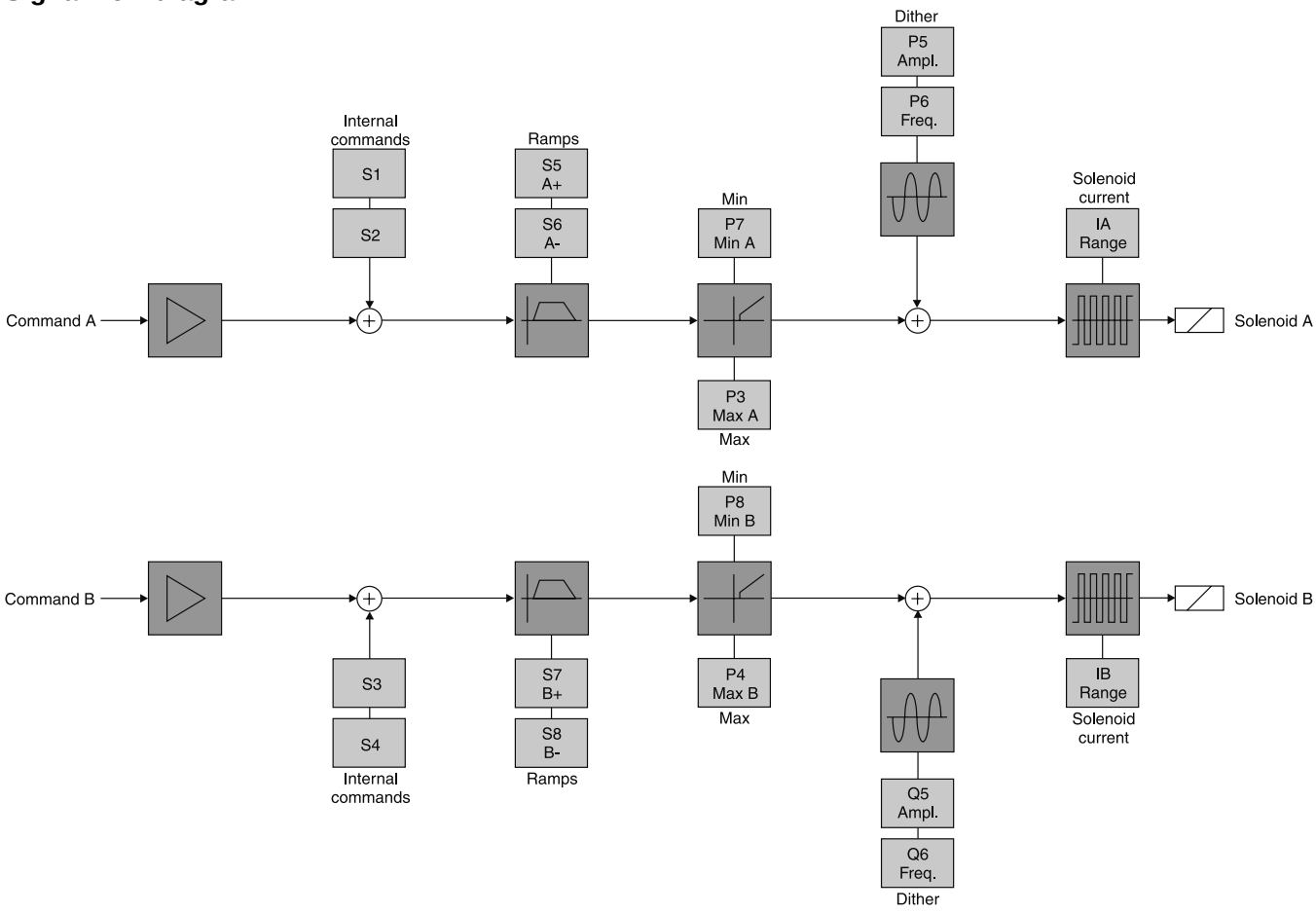
General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V0 acc. UL 94
Installation position		Any
Ambient temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
$MTTF_D$ value	[years]	150
Weight	[g]	160
Electrical		
Duty ratio	[%]	100
Supply voltage	[VDC]	18...30, ripple < 5% eff., surge free *
Current consumption max.	[A]	5.0
Pre-fusing	[A]	6.3 A medium lag
Command signal	[V]	0...+10, ripple < 0.01 % eff., surge free, Ri = 150 kOhm
Input signal resolution	[%]	0.025
Differential input voltage max.	[V]	30 for terminals 5 und 6 against PE (terminal 8)
Enable signal	[V]	0...4.0: Off / 9.0...30: On / Ri = 30 kOhm
Channel recall signal	[V]	0...4.0: Off / 9.0...30: On / Ri = 30 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Adjustment ranges		
Min	[%]	0...50
Max	[%]	50...100
Ramp	[s]	0...32.5
Current	[A]	0.8/1.3/1.8/2.7/3.5
Interface		RS 232C, DSub 9p. male for null modem cable
EMC		EN 50081-2, EN 50082-2
Connection		Screw terminals 0.2...2.5 mm², disconnectable
Cable specification	[AWG] [AWG]	16 overall braid shield for supply voltage and solenoids 20 overall braid shield for sensor and signal
Cable length	[m]	50

* If solenoids with a nominal voltage of 24V are connected, the supply voltage has to be raised to 29V.

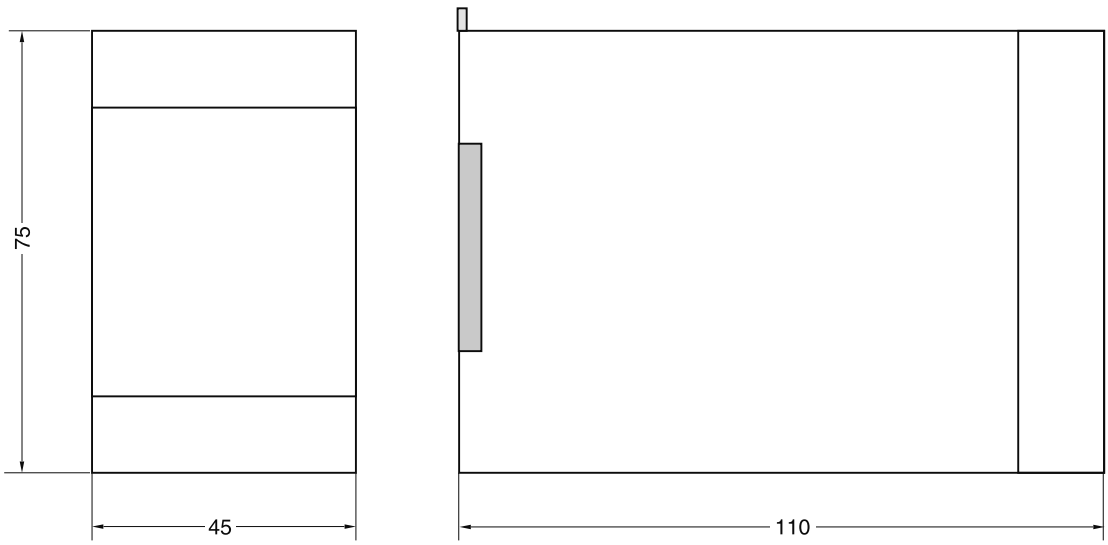
Block diagram



Signal flow diagram



Dimensions



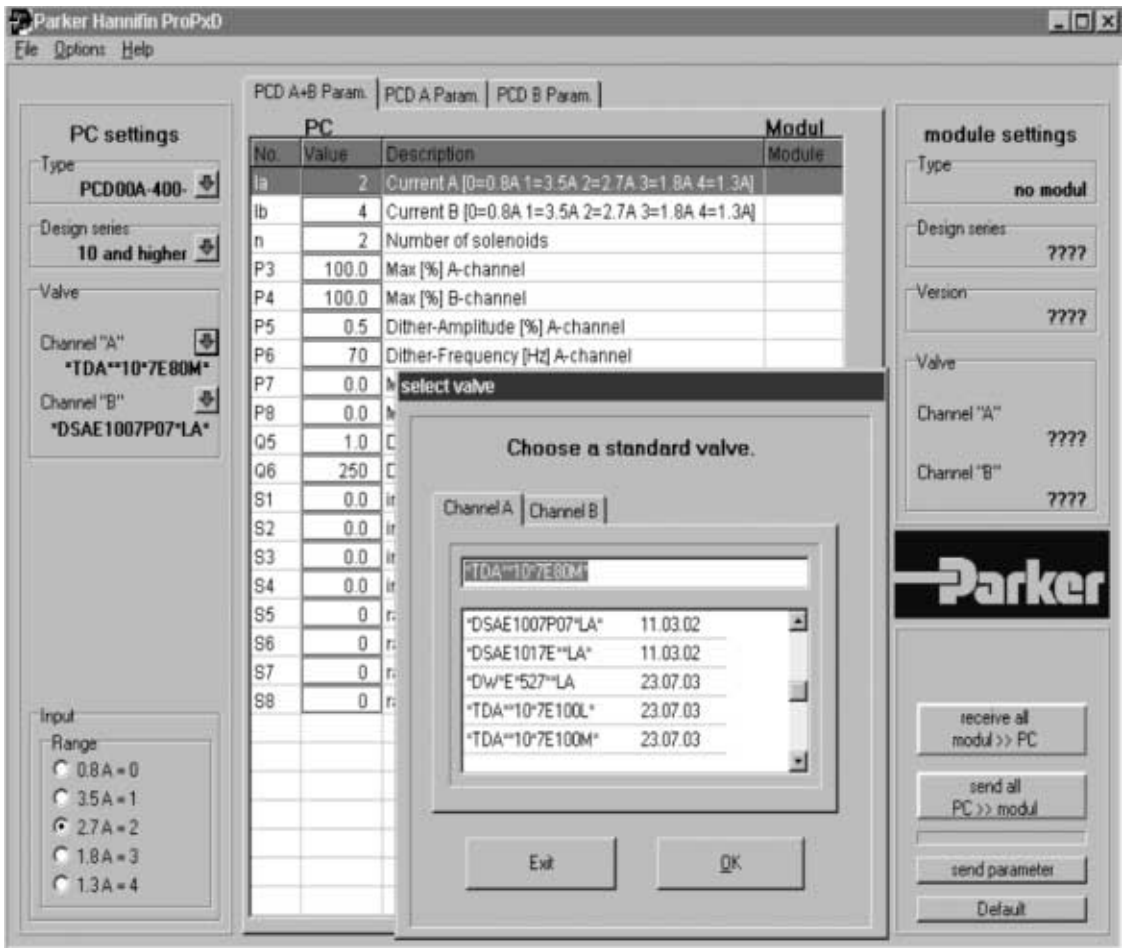
ProPxD interface program

The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

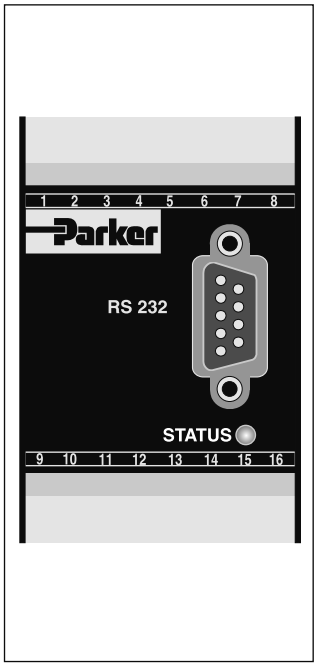
Features

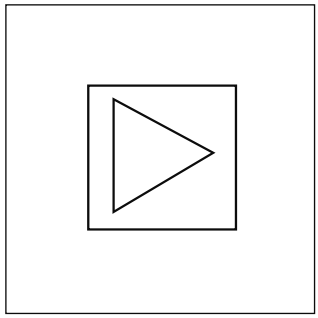
- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows® operating systems from Windows® 95 upwards
- Plain communication between PC and electronic via serial interface RS232C and null modem cable
- Comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"



11

Parker electronic modules PZD00A-40* for rail mounting are compact, easy to install and provide time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for command signal processing by a comfortable interface program. The electronic unit may be connected in series to proportional valves with onboard electronic as well as to amplifier modules P*D.





Features

- Digital circuit design
- Six parameterizable preset recall channels with optional additive or priority dependent signal processing
- Output stage with different signal options
- Input stage with different signal options
- Status output
- Four-quadrant ramp function
- Reference output for potentiometer supply
- Status indicator
- Parametering by serial interface RS-232C
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- Optional technology function "linearization"
- Comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"

Ordering code

PZD	00	A	–	40	–		–	
Electronic module auxiliary function	**Universal**			**6 Command signal presets command input accel/decel ramps**		**Technology function**		**Design series** (not required for ordering)

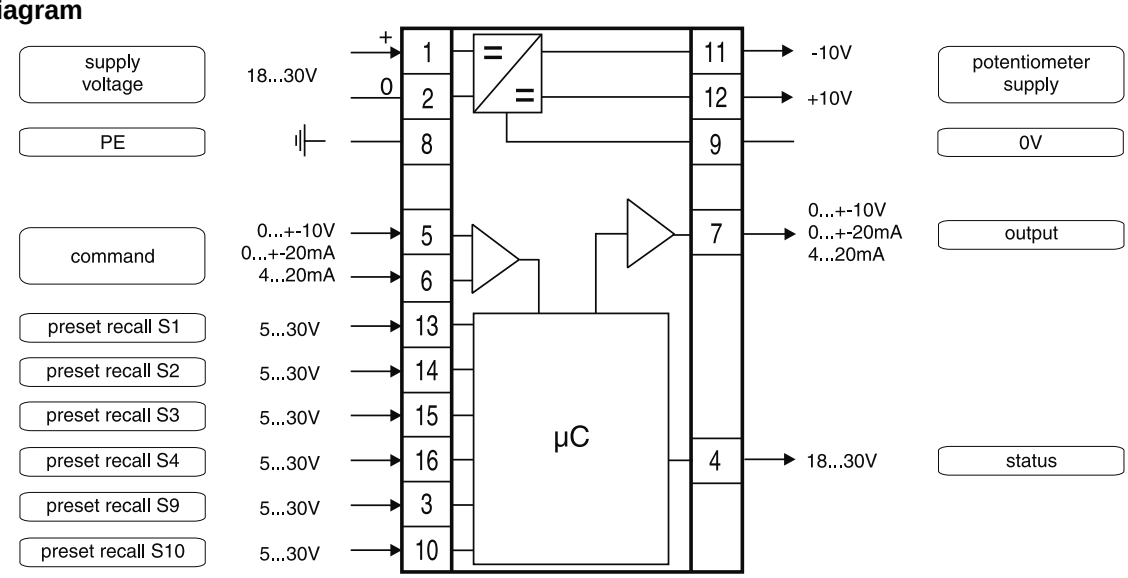
Code	Function
0	Standard
1	Linearization option

11

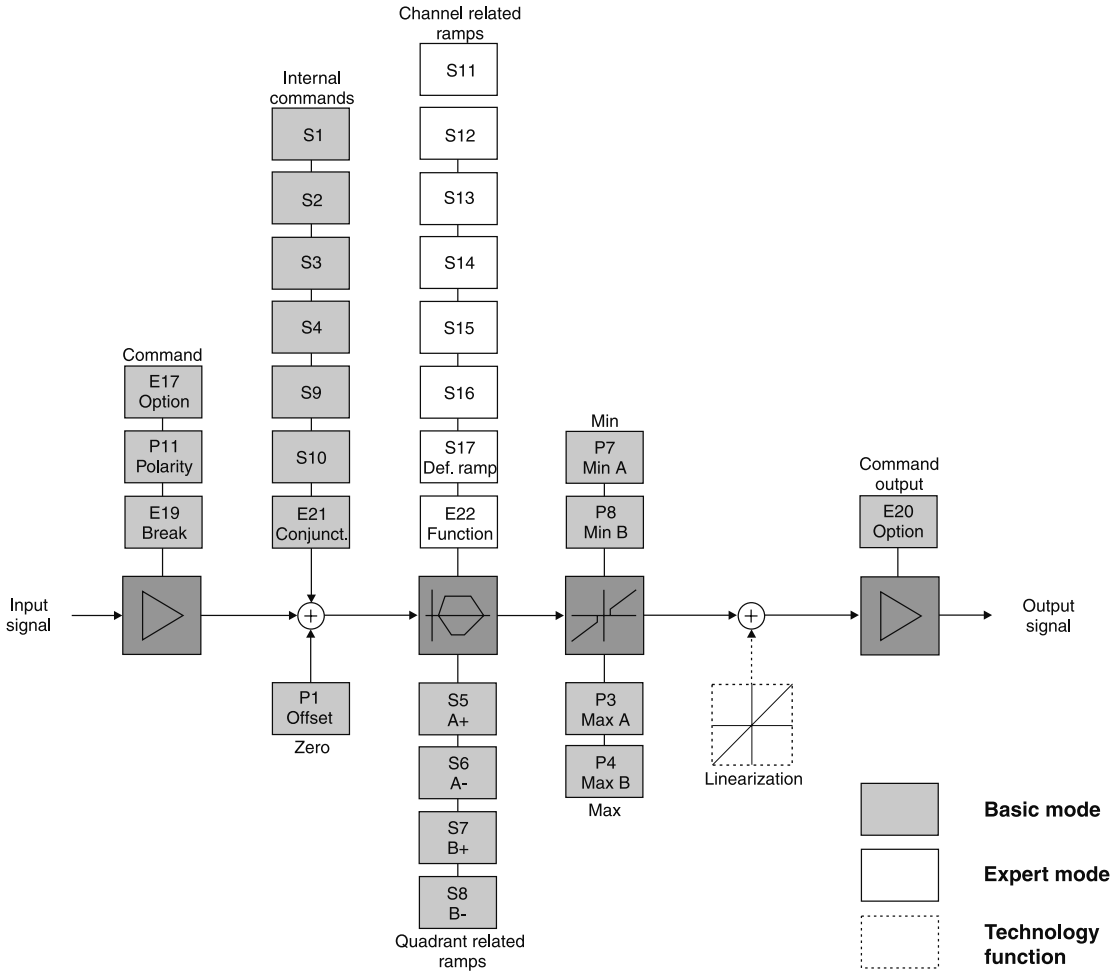
Technical data

General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V0 acc. UL 94
Installation position		Any
Amb. temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
$MTTF_D$ value	[years]	150
Weight	[g]	160
Electrical		
Duty ratio	[%]	100
Supply voltage	[VDC]	18...30, ripple < 5% eff., surge free
Current consumption max.	[mA]	100
Pre-fusing	[mA]	500 medium lag
Command signal options	[V] [mA] [mA]	+10...0...-10, ripple <0.01 % eff., surge free, Ri = 100 kOhm +20...0...-20, ripple <0.01 % eff., surge free, Ri = 200 Ohm 4...12...20, ripple <0.01 % eff., surge free, Ri = 200 Ohm <3.6 mA = output signal 0 V / 0 mA / 12 mA acc. to output option >3.8 mA = output signal on (acc. NAMUR NE43)
Input signal resolution	[%]	0.025
Differential input max.	[V]	30 for terminals 5 und 6 against PE (terminal 8)
Channel recall signal	[V]	0...1.0: Off / 5...30: On / Ri = 100 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Output signal options	[V] [mA] [mA]	+10...0...-10, rated max. 15 mA +20...0...-20, Ro < 500 Ohm 4...12...20, Ro < 500 Ohm
Output signal resolution	[%]	0.025
Reference output	[V]	+10 / -10, 2 %, rated max. 15 mA
Adjustment ranges		
Min	[%]	0...50
Max	[%]	50...100
Cmd channels	[%]	+100...-100
Ramp	[s]	0...32.5
Zero offset	[%]	+100...-100
Interface		RS 232C, DSub 9p. male for null modem cable
EMC		EN 50081-2, EN 50082-2
Connection		Screw terminals 0.2...2.5 mm², disconnectable
Cable specification	[AWG]	20 overall braid shield
Cable length	[m]	50
Options		
Technology function	Code1	Software adjustable transfer function with 10 compensation points for linearization of valve behaviour.

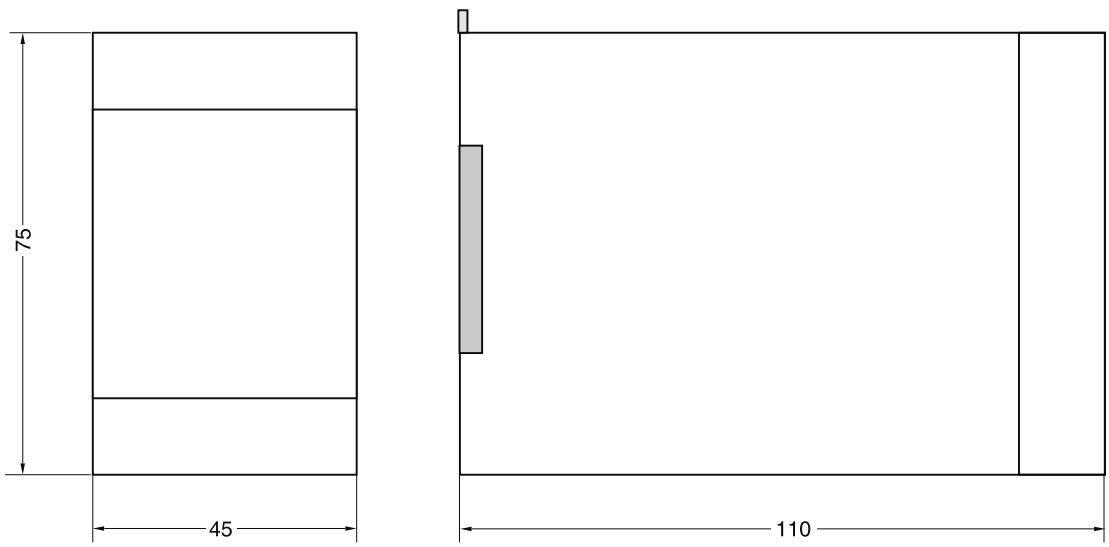
Block diagram



Signal flow diagram



Dimensions



PZD00A UK.INDD RH 06.09.2011

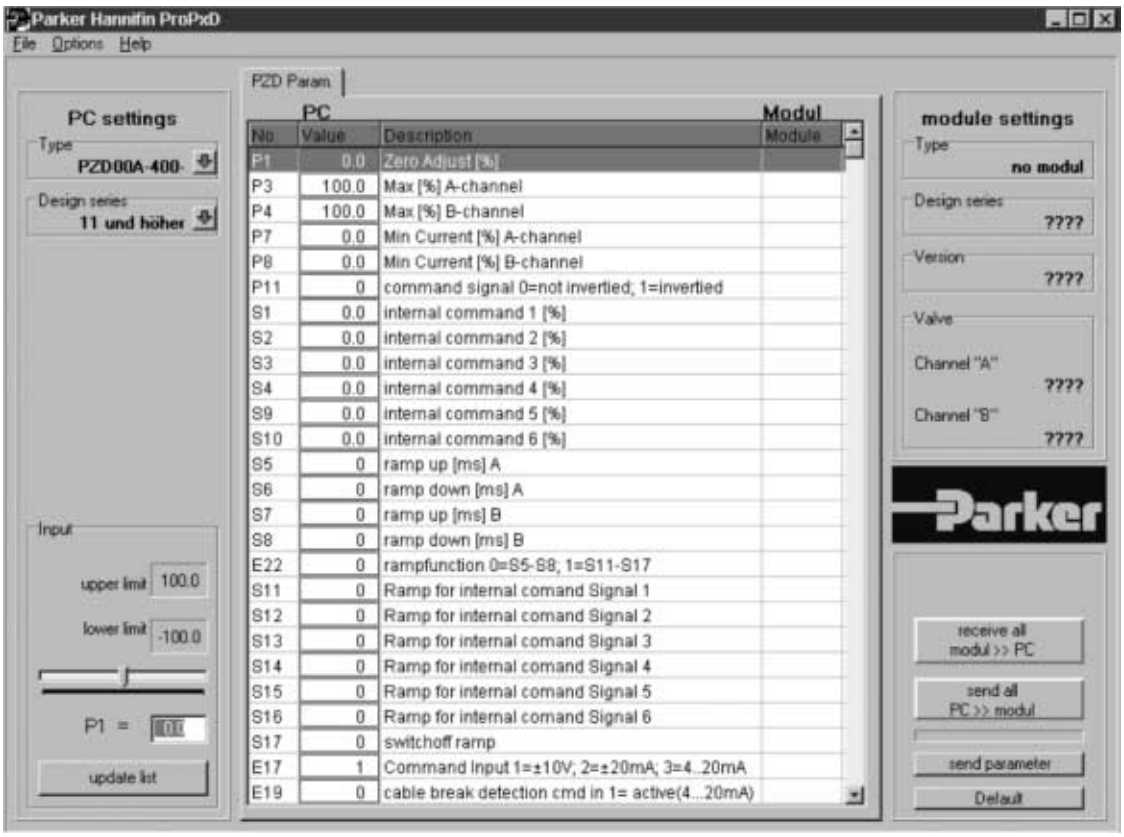
ProPxD interface program

The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD, PID and PWDXX.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

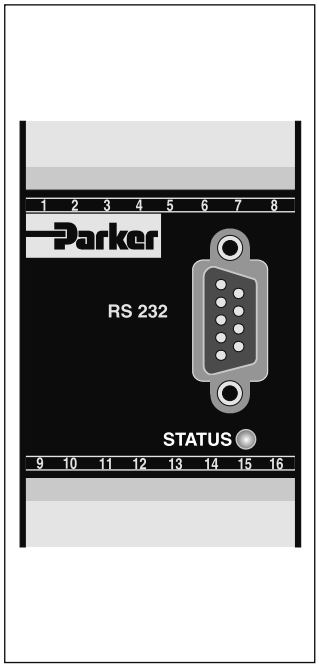
Features

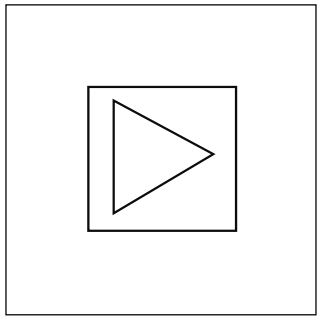
- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows® operating systems from Windows® 95 upwards
- Plain communication between PC and electronic via serial interface RS232C and null modem cable
- Comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"



11

Parker electronic modules PID00A-40* for rail mounting are compact, easy to install and provide time-saving wiring by disconnectable terminals. The digital design of the circuit results in good accuracy and optimal adaption for closed loop controls by a comfortable interface program.





CE

Features

The described electronic unit combines all necessary functions for the optimal operation of closed loop controls. The most important features are:

- Extended PID controls
- Speed control with position feedback
- Differential input stage with different signal options
- Output stage with different output options
- Four-quadrant ramp function
- Status indicator
- Digital circuit design
- Parametering by serial interface RS-232C
- Connection by disconnectable terminals
- Compatible to the relevant European EMC standards
- Optional technology function "linearization"
- Comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"

Ordering code

PID	00	A	–	40	–		–	
Electronic module closed loop control	**Universal**			**Min/Max adjustment accel/decel ramps command input**		**Technology function**		**Design series** (not required for ordering)

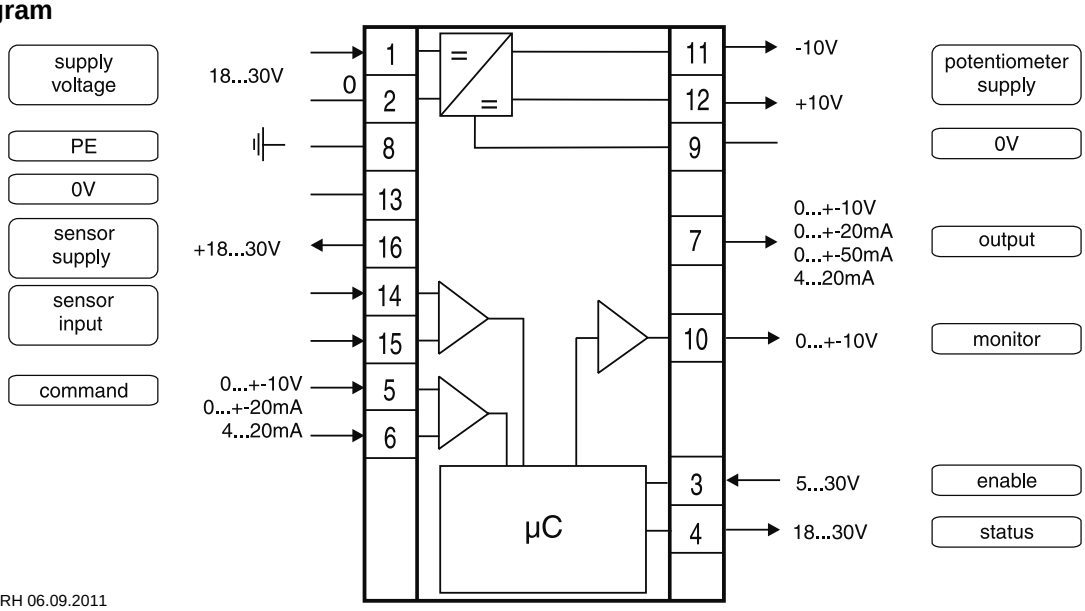
Code	Function
0	Standard
1	Linearization option

11

Technical data

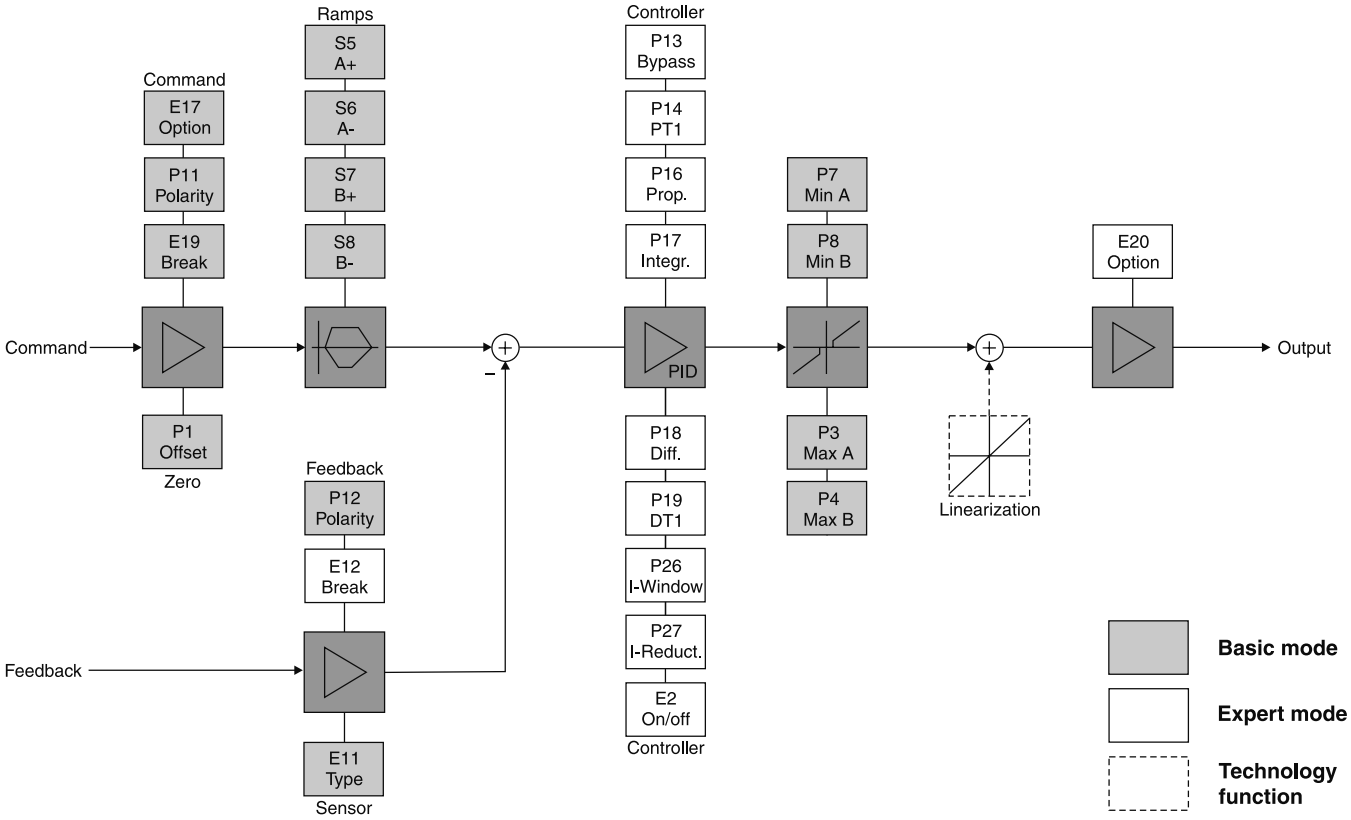
General		
Model		Module package for snap-on mounting on EN 50022 rail
Package material		Polycarbonate
Inflammability class		V0 acc. UL 94
Installation position		Any
Ambient temperature range	[°C]	-20...+60
Protection class		IP 20 acc. EN 60529
$MTTF_D$ value	[years]	150
Weight	[g]	160
Electrical		
Duty ratio	[%]	100
Supply voltage	[VDC]	18...30, ripple < 5% eff., surge free
Current consumption max.	[mA]	100
Pre-fusing	[mA]	500
Command signal options	[V]	+10...0...-10, ripple <0.01 % eff., surge free, Ri = 100 kOhm
	[mA]	+20...0...-20, ripple <0.01 % eff., surge free, Ri = 200 Ohm
	[mA]	4...12...20, ripple <0.01 % eff., surge free, Ri = 200 Ohm <3.6 mA = solenoid output off, >3.8 mA = solenoid output on (acc. NAMUR NE43)
Input signal resolution	[%]	0.025
Differential input voltage max.	[V]	30 for terminals 5 und 6 against PE (terminal 8)
Enable signal	[V]	0...1: Off / 5...30: On / Ri = 100 kOhm
Status signal	[V]	0...0.5: Off / Us: On / rated max. 15 mA
Monitor signal	[V]	+10...0...-10, rated max. 5 mA, signal resolution 0.4 %
Output signal options	[V]	+10...0...-10, rated max. 15 mA
	[mA]	+20...0...-20, Ro < 500 Ohm
	[mA]	+50...0...-50, Ro < 200 Ohm
	[mA]	4...12...20, Ro < 500 Ohm
Output signal resolution	[%]	0.025
Potentiometer supply	[V]	+10...0...-10 2%, rated max. 15 mA
Sensor supply	[V]	18...30 (Us), rated max. 100 mA
Adjustment ranges Min	[%]	0...50
Max	[%]	50...100
Ramp	[s]	0...32.5
Zero offset	[%]	+100...-100
Interface		RS 232C, DSub 9p. male for null modem cable
EMC		EN 50081-2, EN 50082-2
Connection		Screw terminals 0.2...2.5 mm², disconnectable
Cable specification	[AWG]	20 overall braid shield
Cable length	[m]	50
Options		
Technology function	Code1	Software adjustable transfer function with 10 compensation points for linearization of valve behaviour.

Block diagram

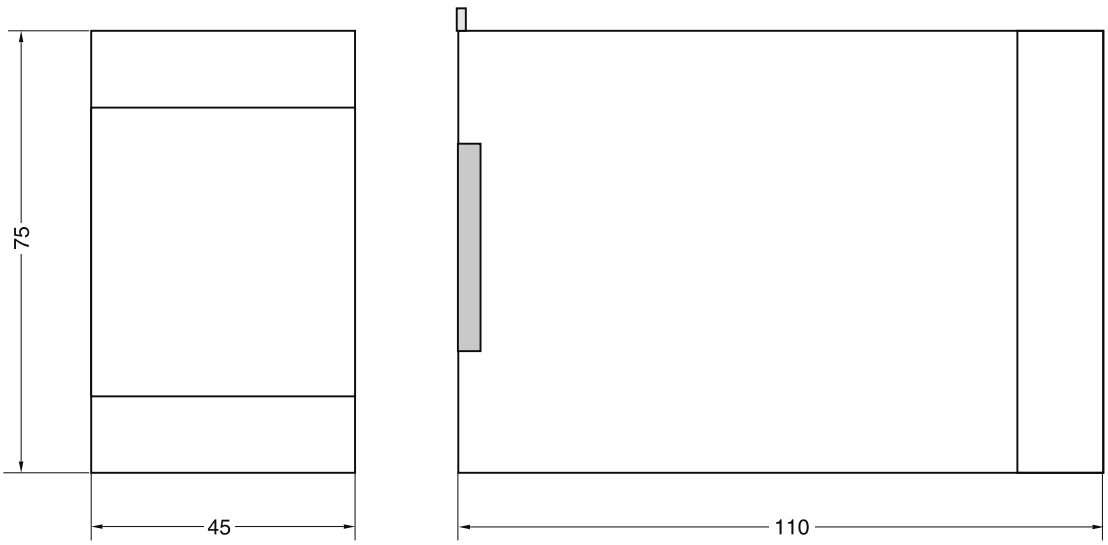


11

Signal flow diagram



Dimensions



11

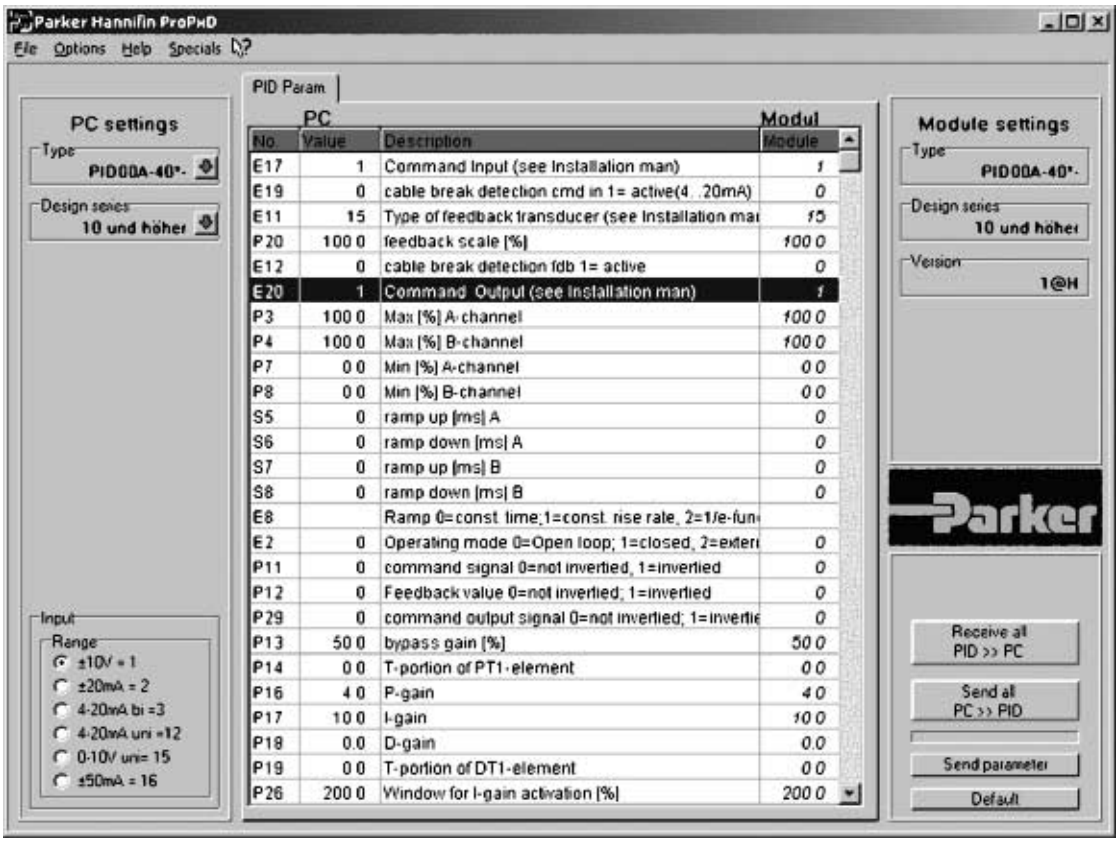
ProPxD interface program

The new ProPxD software permits comfortable parameter setting for the electronic module series PCD, PWD, PZD and PID.

Via the clearly arranged entry mask the parameters can be displayed and modified. Storage of complete parameter sets is possible as well as print-out or record as text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to the electronic module in the same manner as the basic parameters which are available for all usable valve series. Inside the electronic a nonvolatile memory stores the data with the option for recalling or modification.

Features

- Comfortable editing of all parameters
- Depiction and documentation of parameter sets
- Storage and loading of optimized parameter adjustments
- Executable with all actual Windows® operating systems from Windows® 95 upwards
- Plain communication between PC and electronic via serial interface RS232C and null modem cable
- Comfortable PC user software, free of change: www.parker.com/euro_hcd – see "Support"



11

The Compax3F is the new member of the servo drive family of Parker Hannifin. It is especially designed for the requirements of electrohydraulic systems and in particular for position und force control of electrohydraulic axis.

Attention:

For application support and customized software, please contact your local Parker representative.

Large drive range

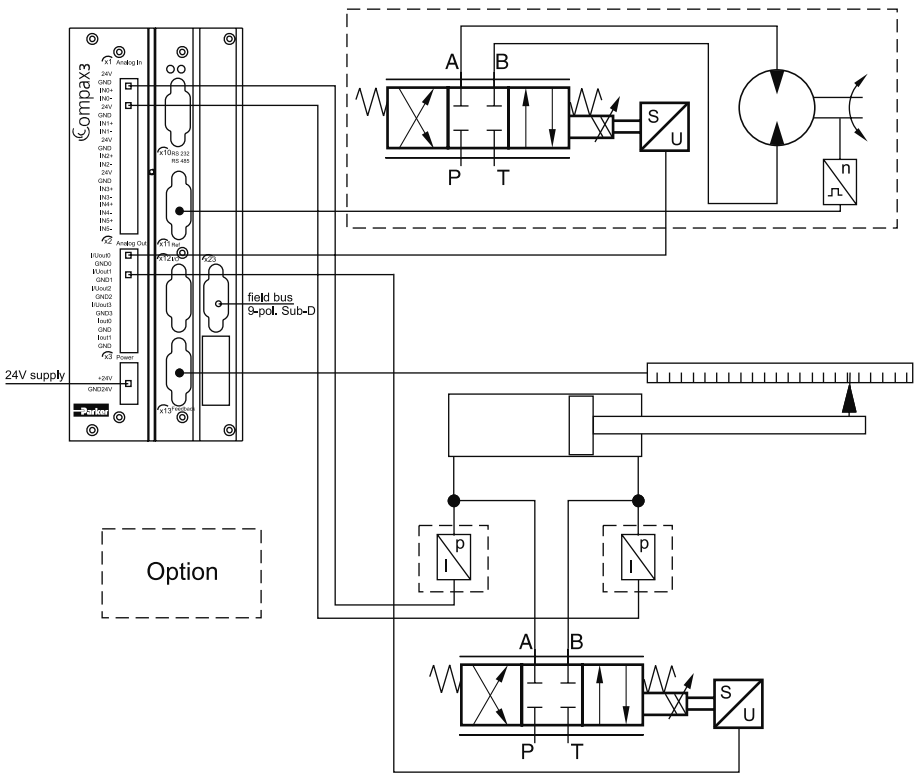
- Valves:
  - Proportional direction control valves
  - Proportional pressure relief- and pressure reducing valves
  - Flow valves
- Drives:
  - Cylinders
  - Rotary drives
  - Motors

Range of application

- Closed loop position and force control of linear cylinders and rotary drives
- Switching between position and force control
- Synchronous run with up to 64 axes

Typical applications

- Feeder axis
- Position and force control of press cylinders in material forming machines
- Roller clearance control in roller presses
- Die casting machines
- Custom-designed software packages on request



Applications example

11

Ordering Code

C3	F001	D2	F12			
Series				Interface	Technology functions	Options

Code	Interface	T11	T30	T40
I11	Digital inputs/outputs		•	•
I12	Digital inputs/outputs	•		
I20	Profibus DP V0/V1/V2 (12Mbit/s)	•	•	•
I21	CANopen		•	•
I22	DeviceNet		•	•
I30	PowerLink		•	•
I31	EtherCAT		•	•
I32	Profinet	•	•	•

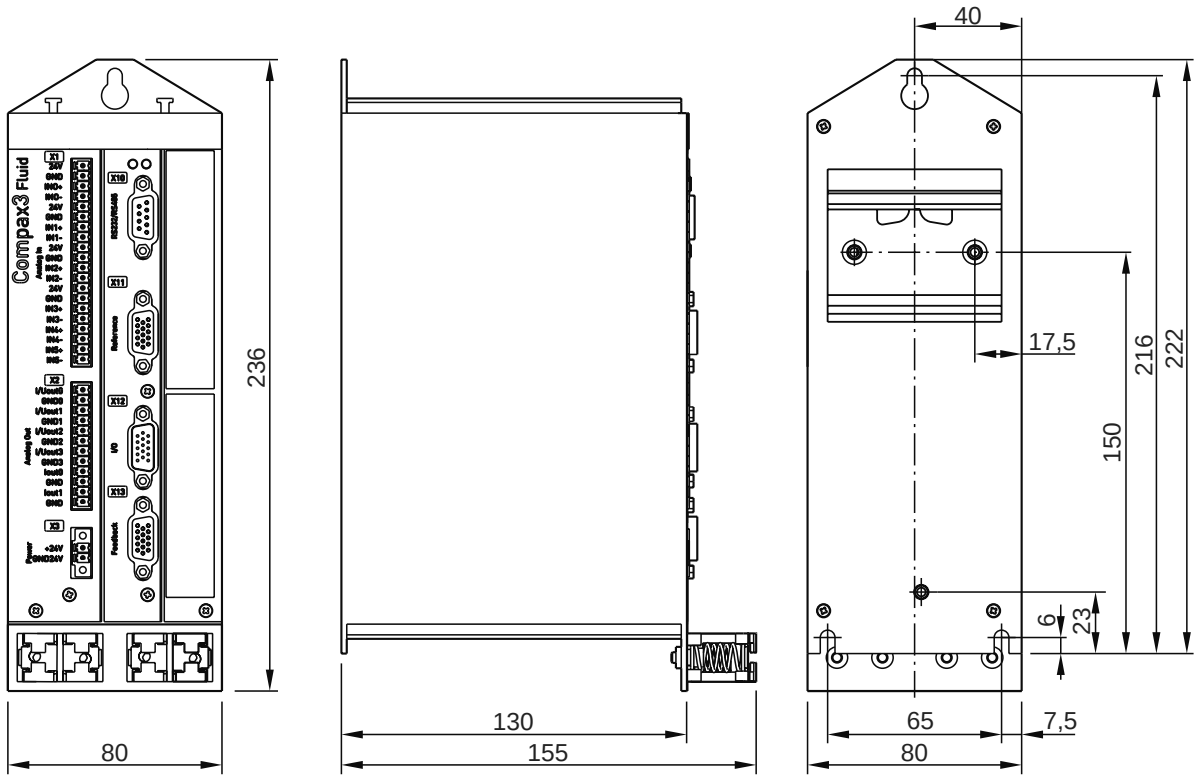
Code	Options
M00	Standards
M10	Extension 12 digital I/Os & HEDA (motion bus)
M11	HEDA (motionbus)
M12	Extension 12 digital I/Os

Code	Technology functions
T11	Positioning/pressure and force control
T30	Programmable motion control according to IEC61131
T40	Electronic Cam

Connection set for Compax 3F included in delivery.

Complete kit with mating plug connectors (X1, X2 and X3) for Compax3 connectors, special shield connecting terminal and snap-on foot for mounting rail

Dimensions



11

Function	Motion control with motion profils. Suitable for position and force/pressure control
Housing / protection class	closed metal housing, isolation according to VDE 0160 / IP 20
Supply voltage [VDC] Current requirements [A]	21...27VDC, ripple <1VSS 0,8 for the device, digital outputs 100mA each
Supported feedback-Systems	• Analog 0..20mA, 4..20mA, ±10V • Start-Stop-Interface • SSI-Interface • EnDat2.1-Interface • 1VSS (max. 400kHz) Interface, 13.5Bit / Distance coding • TTL (RS422) (max. 5MHz), internal post-quadrature resolution
Set point generator	• Jerk-limited ramps • Travel data in increments, mm, inches or variable by scale factor • Specification of speed, acceleration, delay and jerk factor • Force/pressure inputs in N, psi, etc. variable by scale factor
Monitoring functions	• Power/auxiliary supply range • Following error monitoring • Hard- and Software switches
Inputs and Outputs	• 8 control inputs: 24V DC / 10kOhm. • 4 control inputs Active HIGH / short-circuit protected / 24V / 100mA. • 4 analog current input (14Bit). • 2 analog voltage input (14Bit). • 4 analog output (16Bit, current or voltage) switchable in pairs.
RS232 / RS485 (switchable) RS232: RS485 (2 or 4-wire):	 • 115200Baud • Word length 8 bits, 1 start bit, 1 stop bit • Hardware handshake XON, XOFF • 9600, 19200, 38400, 57600 or 115200 Baud • Word length 7/8Bit, 1 Start-, 1 Stop bit • Parity (switchable) even/odd
Bus systems	• Profibus DP V0-V2 (I20), 12Mbit/s, PROFIdrive-Profil Drive technology • CANopen (CiADS402) (I21) • DeviceNet (I22) • PowerLink (I30) • EtherCAT (I31) • Profinet (I32)
CE Compliance	• EMC interference emission/limit values for industrial utilization according to EN61 800-3 first environment (commercial and residential area), class A via integrated mains filter for up to 10mCable length, otherwise with external mains filter • EMC immunity/limit values for industrial utilization according to EN61 800-3
Insulation requirements	• Protection class I according to EN 50178 (VDE 0160 part 1) • Contact protection: according to DIN VDE 0106, part 100 • Overvoltage: Voltage class III according to HD 625 (VDE 0110-1) • Degree of contamination 2 according to HD 625 (VDE 0110 part 1) and EN 50178 (VDE 0160 part 1)
Environmental conditions General environmental conditions acc. to EN 60 721-3-1 to 3-3	 • Climate (temperature / humidity / barometric pressure) • Class 3K3
Permissible ambient temperature	• Operation: 0 to +45 °C class 3K3 • Storage: -25 to +70 °C class 2K3 • Transport: -25 to +70 °C class 2K3
Tolerated humidity: non condensing	• Operation: <= 85% class 2K3 • Storage: <= 95% class 3K3 (relative humidity) • Transport: <= 95% class 2K3
Elevation of operating site: <=1000m above sea level for 100% load ratings	• Please inquire for greater elevations • Protection class IP20 according EN 60 529
EMC directives and harmonised EC norms	• EC low voltage directive 73/23/EEC and RL 93/68/EEC: EN 50 178, General industrial safety norm Equipping electric power systems with electronic operating equipment HD 625, general electrical safety. Insulation principles for electrical operating equipment EN 60 204-1, Machinery norm, partly applied • EC-EMC directive 89/336/EEC: EN 61 800-3, EMC norm Product standard for variable speed drives EN 50 081-2 ... 50 082-2, EN 61 000-4-2 ...61 000-4-5
UL-Certification	USL according to UL508 (listed) / CNL according to C22.2 No: 142-M1987 (listed) Certified: E-File-No: E198563
Weight [kg]	2.0

Project development, commissioning and programming

- Compax3 ServoManager
  - Intuitively understandable user interface
  - Wizard technology
  - Online help
  - Oscilloscope function
  - Optimized co-ordination of complete mechatronic systems
- Valve and Drive manager
  - All technical data of Parker valves, cylinders and drives available
  - Additionally support through the Compax3F Hydraulics-Manager by configuration of user defined valves and drives.

Software download, free of change:
www.compax3.com

Operator Panels

Control equipment for all text and graphics applications in industrial environments, from two-line displays to touch-panels using field busses:

- Profibus DP
- CANopen
- DeviceNET
- Interbus-S

For further information please refer to POP: "Parker Operator Panels". Download: www.parker-eme.com/pop.

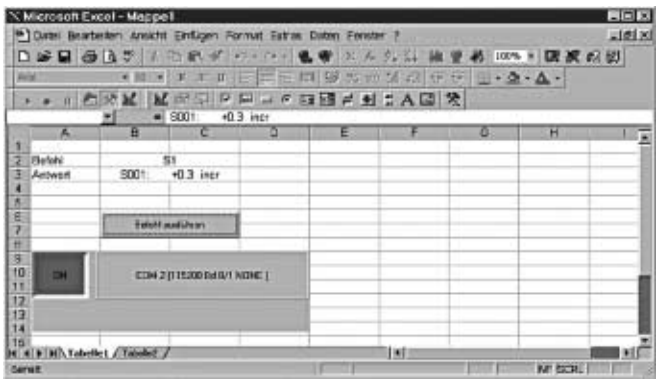
In addition to drivers for Compax3/Compax3 powerPLmC, drivers for other PLC products can be integrated on request.

Service module

- Backlit plug-in module, text display with two sixteen-character lines
- Simple menu navigation with 4 keys
  - Display of status values and
  - clear text error messages
- Used for changing parameters and manual operation

ActiveX plug-in for Integration with the Office enviroment

- Office and industrial environments are constantly growing closer together.
- The use of ActiveX technology allows simple integration into Office application.



Interface - Field bus

- Profibus DP
- CANopen (CiADS402)
- DeviceNet
- PowerLink
- EtherCAT
- Profinet
- Address configurable via Dip switch

Connection of external inputs/outputs with Parker E/A-System (PIO)

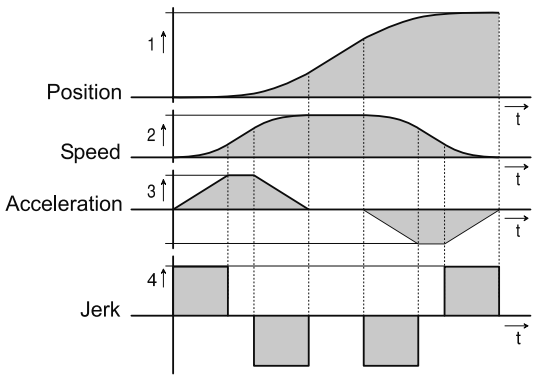
Additional external digital and analog inputs and outputs can be integrated via the CANopen.

International standards in programming

- Programming system
  - CoDeSys
- Programming language
  - IEC61131-3
  - Function modules based on PLCopen

Jerk-limited set point generation, resulting in

- Gentle handling of the items being moved
- Increased service life of mechanical components
- Overshoot-free positioning
- Reduced excitation of mechanical resonance frequencies



Control

a) General

- 2 control loops for each axis for combined position and force/pressure control

b) Position control

- Automatic controller design for position control
  - User-oriented optimization of parameters
- Feed forward control of speed and acceleration which results in:
  - Optimization of the response behaviour
  - Minimization of the following error

c) Force/Pressure controller

- PID controller with feed forward control of speed

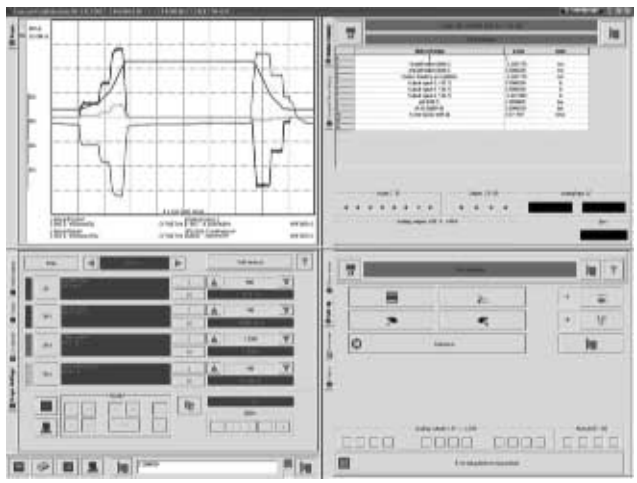
d) 2-axis synchronous run and hydraulic specific functions

- Realization of many different circuit concepts with up to 4 proportional valves possible
- Linearization functions:
  - Consideration of the area of differential cylinders
  - Inverting of the valve set value
  - Compensation of the load pressure (additional pressure sensors necessary)
  - Correction of the nonlinear flow characteristic of the valve
  - Overlap compensation
  - Valve zero point correction
  - Valve set value filters
  - Valve set value limitation
  - All functions for each valve individually available
  - Automatic configuration by component selection in the Compax3 ServoManager

e) Custom-designed software packages on request

Set up controller optimization

- Compax3F HydraulicsManager
  - All necessary technical data of Parker valves and drives are available
  - additional supported
- Test movement for automatic controller attitude
- Optimization with integrated oscilloscope function
- Automatic pre-setting of the controller for position control possible



11

Overview technology functions

	T11	T30	T40
Set tables for up to 31 motion profiles	x		
Absolute or relative positioning	x	x	x
Force/pressure control	x	x	x
Electronic Gearbox	x	x	x
Dynamic positioning	x	x	x
Hydraulic specific control technology	x	x	x
Reg-related positioning	x	x	x
Programmable according to IEC61131-3		x	x
Programming system DoDeSys		x	x
Up to 6000 instructions		x	x
Recipe table with 288 variables		x	x
PLCopen		x	x
Mark synchronization			x
Cam switching mechanism			x
Cam profiles			x
Coupling and decoupling function			x
Custom-designed software packages*		O	O
Digital I/Os (RS232/485)	x	x	x
Profibus	O	O	O
CANopen		O	O
DeviceNet		O	O
Ethernet Powerlink		O	O
EtherCAT		O	O
Profinet	O	O	O

x = Standard
O = Optional
* on request

Benefits

- No programming skills necessary
- Set table with various motion
- Full controller range available
- an ideal basis for many applications in high-performance motion automation

Function range T11

- Set tables for positioning, pressure and force control up to 31 motion profiles:
  - Absolute or relative positioning
  - Force/pressure control
  - speed control
  - electronic gearing
- superimposed force and pressure control
- Controller switching between position and force/pressure control

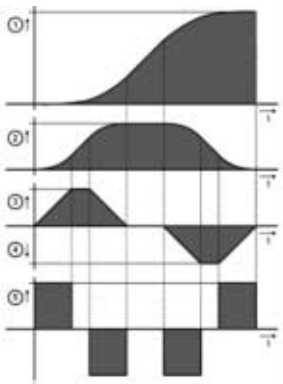
Extended Function range

- Absolute force control
- superimposed force and pressure control
- Controller switching between position and force/pressure control
- 2-axis synchronous

Absolute or relative positioning

A motion set defines a complete motion with all settable parameters

1. Target position
2. Travel speed
3. Maximum acceleration
4. Maximum deceleration
5. Maximum jerk



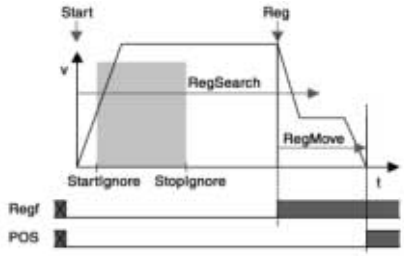
Stop movement

The Stop set interrupts the current motion set

Reg-related positioning

For registration mark-related positioning, 2 motions are defined:

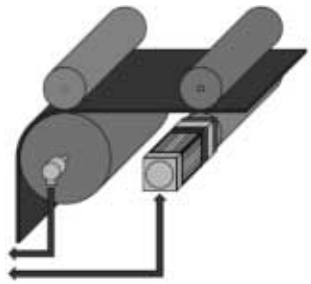
- RegSearch: Search of an external signal, e.g. a registration mark on a product
- RegMove: The external signal interrupts the search movement and the second movement by an offset follows without transition
- Precision of the registration mark detection: <1µs



Electronic Gearbox:

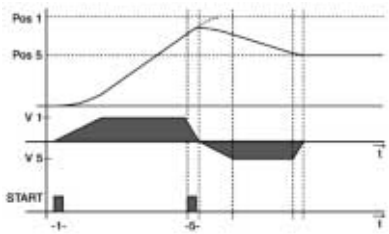
Motion synchronized to a master axis with any transmission ratio. The position of a master axis can be detected via:

- +/-10V analog input
- Step/direction command Input
- the encoder input or
- HEDA, with Compax3 Master



Dynamic positioning

A new motion profile can be selected during a positioning sequence - a smooth transition takes place



11

General

Due to its high flexibility and efficiency the Compax3 motion control according to PLCopen is for most applications the optimal basis for decentralized motion control.

Positioning with function modules based on PLCopen

- Programmable based on IEC61131-3
- Programming system: CoDeSys
- Up to 6000 instructions
- 500 16-bit variables / 150 32-bit variables
- Recipe table with 288 variables
- 3 16-bit saved variables (power failure protected) / 3 32-bit saved variables (power failure protected)
- PLCopen-function modules:
  - Positioning: absolute, relative, additive and continuous
  - Machine Zero.
  - Stop, energizing the power stage, quit
  - Position, device status, reading axis error
  - Electronic gearbox (Mc_GearIn)
- IEC61131-3-standard modules:
  - Up to 8 timers (TON, TOF, TP)
  - Trigger (R_TRIG, F_TRIG)
  - Flip-flops (RS, SR)
  - Counters (CTU, CTD, CTUD)
- Device-specific function modules:
  - C3_Input: reading digital inputs
  - C3_Output: writing digital inputs
  - C3_ReadArray: access to recipe table
- Inputs/outputs:
  - 8 digital inputs (24V level)
  - 4 digital outputs (24V level)
  - 6 analog inputs (14 bits)
  - 4 analog outputs (16 bits)
  - Optional addition of 12 digital inputs/outputs

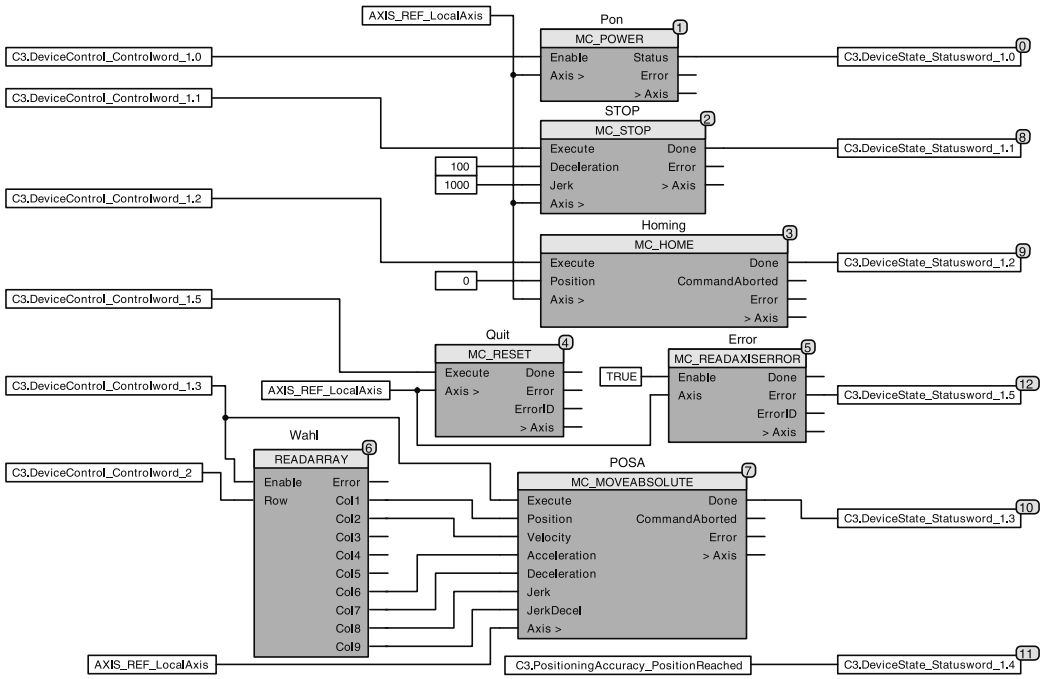
PLCopen function blocks

- Absolute positioning
- Relative positioning
- Additive positioning
- Continuous positioning
- Stop
- Machine zero
- Energizing the power output stage
- Reading device status
- Reading axis error
- Acknowledging errors
- Reading the current position
- Electronic gearbox (gearing)

Example of an field bus interface controlled IEC61131-application

- 2 control words are placed on the cyclic channel of the bus.
- The position data records (position, speed, acceleration etc.) are stored in a table (array).
- The desired position data record is selected with Controlword_2.
- The individual bits of Controlword_1 control positioning.
- A return message is sent via a status word on the cyclic channel of the bus.

Example of a bus interface controlled IEC61131 application



General

Compax3 T40 is able to simulate mechanical cams and cam switching mechanisms electronically. The T40 electronic cam was especially optimized for:

- The packaging machine industry
- For the printing industry
- All applications, where a mechanical cam is to be replaced by a flexible, cyclic electronic solution

This helps to solve discontinuous material supply, flying-knive and similar drive applications using distributed drive technology.

Compax3 T40 supports both real and virtual master movements. In addition, the user can switch to other cam profiles or cam segments ‚on the fly'.

Programming is carried out in the well-known IEC61131-3 environment.

With the aid of the cam function modules and CamDesigner, cam applications can be implemented very easily.

Function T40

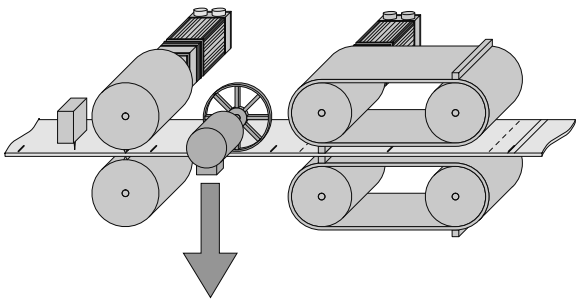
- Technology functions of the T30 version fully integrated and available
- Master position acquisition
- Mark synchronization
- Cam switching mechanism
- Coupling and decoupling function
- Cam profiles
- Cam memory
- Cam creation with CamDesigner

Master position acquisition

- Acquisition by incremental encoder
- Acquisition by the HEDA real-time bus

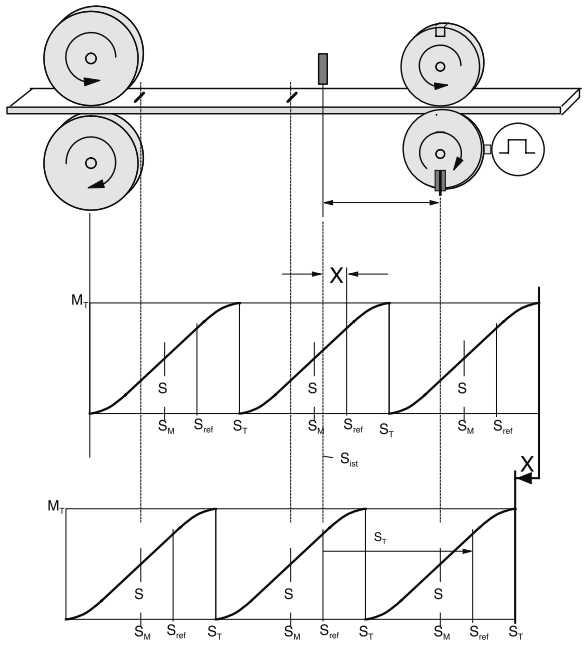
Virtual Master:

A second axis in the IEC program can be used to program a motion profile, which serves as a master for one or several axes.



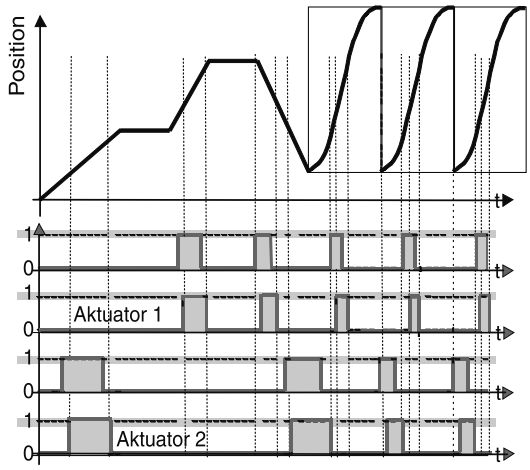
Mark synchronization

- Master or slave oriented (simultaneous, cam-independent)
- Highly-precise mark recognition (accuracy <1µs; Touch-probe)



Cam switching mechanism

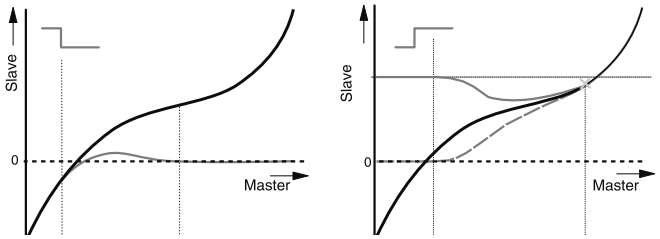
- 36 cams with individual profiles
- 4 fast cams (125µs per cam) standard: 500µs
- 32 serial cams, 16ms/cam cycle (0.5ms/cam)
- Delay-time compensated cams: Compax3 can advance the cam to compensate for delays in switching elements.



11

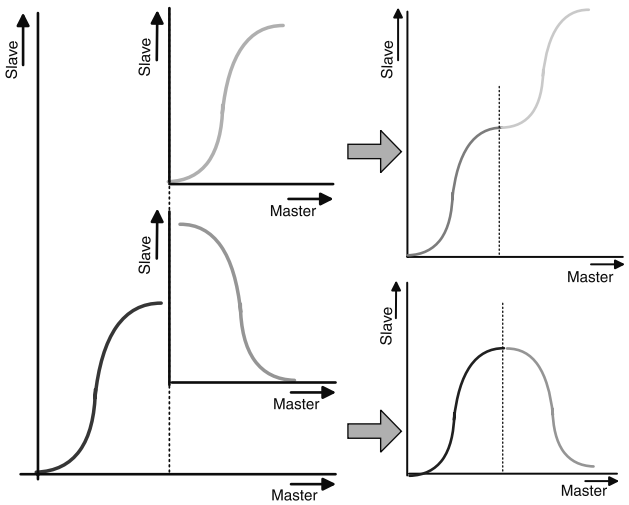
Coupling and decoupling functions

- By means of a set point generator
- By means of a change-over function
- Without overspeeding by coupling over several master cycles
- Virtually free set-up of the coupling and decoupling movement
- Master-guided coupling movement
- Random standstill position



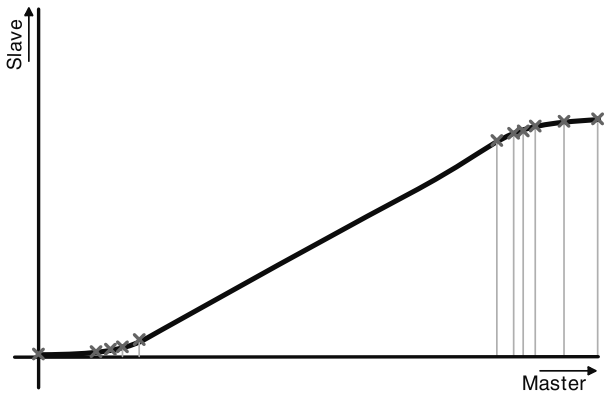
Cam profiles

- Up to 20 cam segments can be produced by:
- Virtually random cam links (forwards and backwards)
- Freely programmable event-controlled cam branches
- Scalable cam segments and complete cam profiles



Cam memory

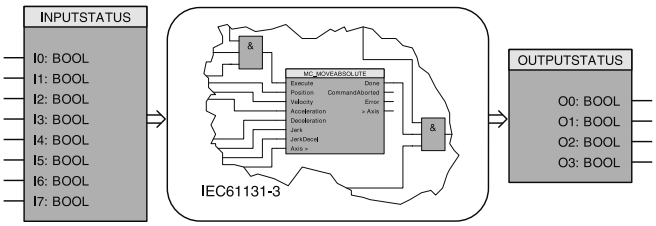
- 10,000 points (Master/Slave) in 24-bit format
- High-precision profile generation:
  - Variable point spacing with full backup of the current-master and slave coordinates (even if the power fails)
  - Linear interpolation between points
- Cam memory for up to 20 curves



11

Connection of high-level controllers

a) Control via digital inputs/outputs Compax3 I11T30 / I11T40 / I12T11



The digital I/Os can be optionally extended by 12 I/Os (M10 and M12 option).

b) Control via Profibus, Compax3 I20T11 / I20T30 / I20T40

Profibus-ratings	
DP-Versions	DPV0 / DPV1
Baud rate [MBit/s]	up to 12
Profibus ID	C320

c) Control via CANopen, Compax3 I21T30 / I21T40

CANopen-ratings	
Baud rate [kBit/s]	20, 50, 100, 125, 250, 500, 800, 1000
Service-Data-Object	SDO1
Process-Data-Objects	PDO1, ... PDO4

d) Control via DeviceNet, Compax3 I22T30 / I22T40

DeviceNet-ratings	
I/O - data	up to 32 bytes
Baud rate [kBit/s]	125...500
Nodes	up to 63 Slaves

e) Control via Ethernet Powerlink, Compax3 I30T30 / I30T40

Ethernet Powerlink ratings	
Baud rate	100Mbits (FastEthernet)
Cycle time	<200µs; to 240 nodes

f) Control via EtherCAT Compax3 I31T30 / I31T40

EtherCAT-ratings	
Bau drate	100Mbits (FastEthernet)
Cycle time	<200µs; to 240 nodes

g) Control via Profinet I32T11 / I32T30 / I32T40

Profinet ratings	
Profinet version	Profinet IO (RT)
Transmission mode	100 BASE-TX (Full Duplex)
Profinet ID	C332

h) Decentralized control via CANopen, I21T30 / I21T40 With external inputs/outputs (PIO)

Additional external digital and analog inputs and outputs can be integrated via the CANopen master function. For this purpose we offer the Parker I/O system (PIO):

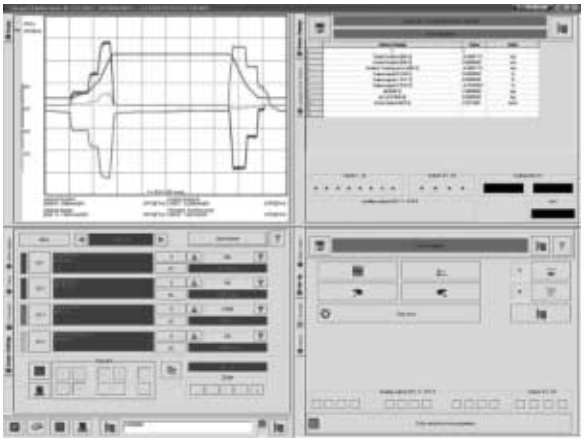
- CANopen field bus coupler: 650mA/5V, 1650mA/5V
- Digital input terminals: 2-, 4-, and 8-channel
- Analog input terminals: 2-channel (0-10V), 4-channel (0-20mA)
- Digital output terminals: 2-, 4-, and 8-channel
- Analog output terminals: 2-channel (0-10V, 0-20mA, +/-10V)

11

Software Tool C3 ServoManager

Configuration is carried out on a PC using the Compax3 ServoManager.

- Wizard-guided configuration
  - Automatic querying of all necessary entries
  - Graphically supported selection
- Setup mode
  - Moving individual axes
  - Predefined profiles
  - Convenient operation
  - Storage of defined profiles
  - Controller pre-setting possible
- Integrated 4-channel oscilloscope
  - Signal tracing directly on the PC
  - Various modes (single/normal/auto/roll)
  - Zoom function
  - Export as image or table (for example to Excel)



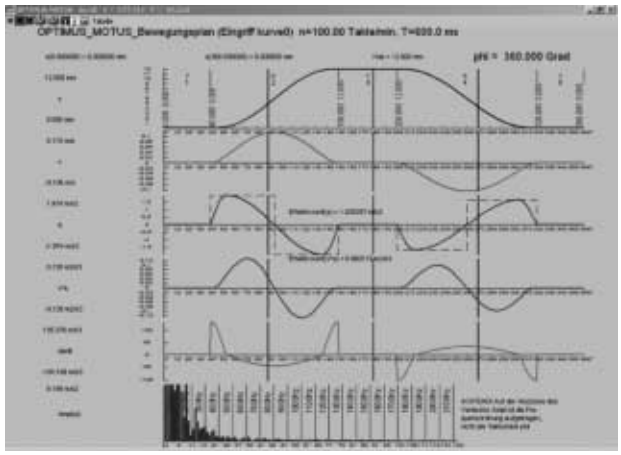
Software Tool HydraulicsManager

- Simple set up of customer valves, cylinders and drives.
- Technical data of all Parker valves, cylinders and drives available.

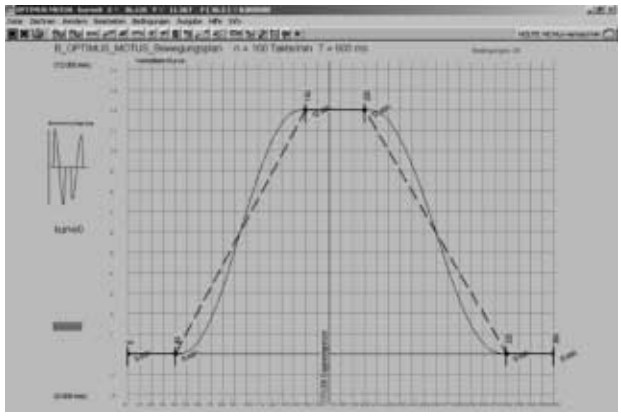
C3 HydraulicsManager valve database

Software Tool CamDesigner

- Standardized Nolte cam generating tool with:
  - Standard or extended range of functions
  - Evaluation of the motion profiles
  - Verification of the drive sizing
- Transition laws from VDI directive 2143:
  - Selection of motion laws
  - The CamDesigner basic version features 15 motion laws (based on the dwell-to-dwell (interpolation method)



Evaluation of the motion profile



Cam generation with the integrated CamEditor

11

IEC61131-3 Programming language

IEC61131-3 is the only company- and product-independent programming language with worldwide support for industrial automation devices.

- IEC61131-3 includes graphical and textual programming languages:
  - Instruction list
  - Structured text
  - Ladder diagram
  - Sequential function chart
  - Function block diagram

Integrated standards offer:
- A trusted programming environment
- Standardized programming

Integrated standards reduce:
- The overhead of development
- Maintenance costs
- Software upkeep
- Training overhead

Integrated standards increase:
- Productivity
- Software quality
- Concentration on core competence

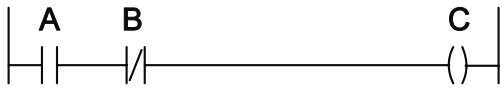
Examples

- Program development in IL

- Instruction list (IL)

LD	A
ANDN	B
ST	C

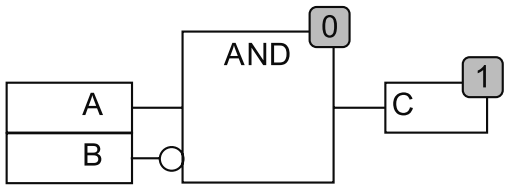
- Ladder diagram



- Structured text

C := A AND NOT B

- Function plan



11

Function modules based on PLCopen

PLCopen is a product- and company independent organization that plays a significant role in supporting the IEC61131-3 programming language. Its specific tasks also include defining basic processes relevant to motion. The PLCopen organization consists of both users and manufacturers of automation components.

Parker Hannifin is an active member of the “Motion Control“ task force. This is a great advantage for the users of Parker drive technology, since they are constantly able to profit directly from the latest developments in PLCopen.

Professional development tool CoDeSys

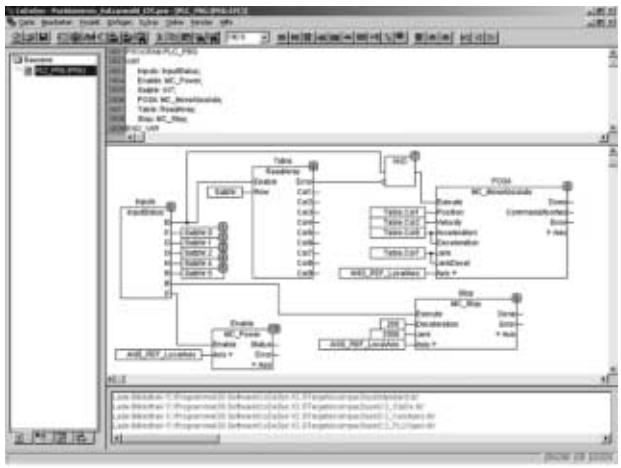
CoDeSys is a development environment for programming that saves a significant amount of time as applications are created.

- One of the most powerful development environments available, established world-wide
- Universal programming platform for various devices
- Visual elements
- Library management for user-defined applications
- Context-sensitive help wizard
- Data exchange between devices from different manufacturers
- Complete online functionality
- Sophisticated technological features
- Standard function modules deposited

. . . and all this for no additional cost

Parker is a member of the “CoDeSys Automation Alliance“.

Program development in CFC



Project management

Saving an entire project (source file) including symbols and comments to make service calls easier, because there is no need for any project data on the device itself

- Archiving projects as ZIP files
- Creating user-specific libraries that can be reused as tested sections of programs
  - These libraries can be protected
  - Examples include winders, synchronization components etc.
- Various user levels make it possible to lock sections of the program with passwords
- Depending on the task at hand, users can select from among 5 IEC languages plus CFC. These languages can also be mixed

Connection set ZBH../.. (included in delivery)

Complete kit with mating plug connectors (X1, X2 and X3) for Compax3 connectors, special shield connecting terminal and snap-on foot for mounting rail.

Feedback cable GBK../..

Connection to the Motor:

Under the designation “REK.. + GBK..“ (Feedback cable) we can deliver feedback connecting cables in various lengths to order.

- Prefabricated with plug and cable eye
- The plugs of the Parker motor and feedback cables contain a special surface area screening.
- Cable plans, if you wish to make up your own cables

Terminal block EAM06/..

For additional wiring of the inputs and outputs:

- Available with or without LED display
- Can be mounted in the control cabinet on a supporting rail
- Connection EAM06/.. via SSK23/..to X11, SSK24/.. to X12

RS232 cable SSK01/..

(in various lengths).

Configuration:

Via a PC with the aid of the Compax3 ServoManager.

Communication:

Communication with Compax3 either via RS232 or via RS485 in order to read or write into objects.

Profibus plug BUS08/01

- BUS08/01 with 2 cable inputs (1x BUS08/01 incoming, 1x BUS08/01 continuing) and screw terminals, as well as a switch for activating the terminating resistor. Set to ON for first and last bus node terminating resistor activated.

Profibus cable: SSL01/.. not prefabricated

- Special cable in any length for Profibus wiring (colors according to DESINA).

Operating module BDM01/01

For display and diagnosis purposes:

- Can be plugged in during operation
- Power supply via Compax3 servo control
- For displaying and changing values

HEDA Bus

HEDA bus terminal connector (RJ45) BUS07/01:

- For the first and last Compax3 in the HEDA bus.

HEDA cable: SSK28/.. prefabricated in various lengths:

- Cable for HEDA bus wiring from Compax3-to-Compax3 or PC-to-Compax3 powerPLmC or wiring of
  - Ethernet Powerlink (I30)
  - EtherCAT (I51)
  - Profinet (I32)

CANbus plug BUS10/01

- BUS10/01 with 2 cable inputs (1x BUS10/01 incoming, 1x BUS10/01 continuing) and screw terminals, as well as a switch for activating the terminating resistor. Set to ON for first and last bus node terminating resistor activated

CANbus cable SSL02/.. not prefabricated

- Special cable in any length for CANbus wiring (colours according to DESINA)

External Inputs/Outputs PIO...

For Compax3 I21 from technology function T30 onwards via CANopen:

- Integration of additional external input and output modules (digital and analog)

Connection set for Compax 3										
for C3F001 D2 F12xxx	ZBH 02/04	Z	B	H	0	2	/		0	4
Operating module										
Operating module		B	D	M	0	1	/		0	1
Terminal block										
for I/Os without luminous indicator	for X11, X12	E	A	M	0	6	/		0	1
for I/Os with luminous indicator	for X12	E	A	M	0	6	/		0	2
Interface cables and connectors										
PC-Compax3 (RS232)		S	S	K	0	1	/		...	...[1]
on X11/X13 (Transducer)	With flying leads	S	S	K	2	1	/		...	...[1]
on X12 (I/O digital)	With flying leads	S	S	K	2	2	/		...	...[1]
on X11(Ref/Analog)	For I/O terminal	S	S	K	2	3	/		...	...[1]
on X12 (I/Os digital)	For I/O terminal	S	S	K	2	4	/		...	...[1]
PC - POP (RS232)		S	S	K	2	5	/		...	...[1]
Compax3 - POP (RS485)		S	S	K	2	7	/	../	...	...[3]
Compax3 HEDA - Compax3 HEDA										
or PC - C3powerPLmC										
or Ethernet Powerlink (I30), EtherCAT (I31), Profinet (I32)		S	S	K	2	8	/		...	...[2]
Compax3 X11 - Compax3 X11 (Encoder coupling of 2 axes)		S	S	K	2	9	/		...	...[1]
HEDA bus terminal connector (for the 1st and the last Compax3 in the HEDA Bus)		B	U	S	0	7	/		0	1
Feedback cable for Balluff SSI transducer and start/stop		G	B	K	4	0	/		...	...[1]
Feedback cable for SSI transducer and start/stop	With flying leads	G	B	K	5	3	/		...	...[1]
Profibus cable [4]	Not prefabricated	S	S	L	0	1	/		...	...[1]
Profibus connector		B	U	S	0	8	/		0	1
CAN-Bus cable [4]	Not prefabricated	S	S	L	0	2	/		...	...[1]
CAN-Bus connector		B	U	S	1	0	/		0	1

[1] Length code

Length code 1 (Example: SSK01/09: Length 25m)

Length [m]	1.0	2.5	5.0	7.5	10.0	12.5	15	20	25	30	50
Code	01	02	03	04	05	06	07	08	09	10	14

[2] Length code for SSK28

Length code 2 (Example: SSK28/22: Length 3m)

Length [m]	0.25	0.5	1.0	3.0	5.0	10.0
Code	20	21	01	22	03	05

[3] Length code for SSK27

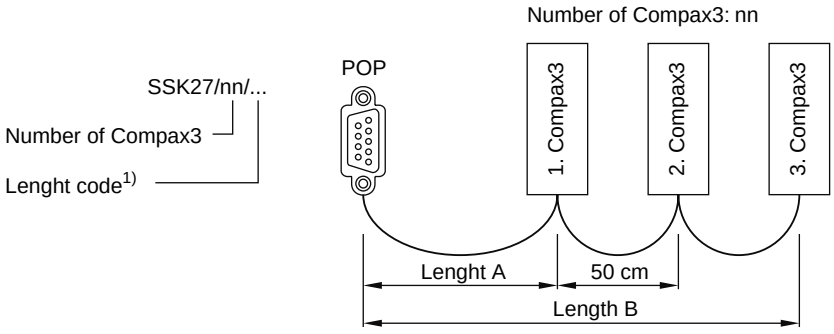
Length A: Cable or connection from POP with **one** Compax3 (POP - 1.Compax3), variable length according to length code[1]
(Example: SSK27/01/01: Length 1.0m)

Length B: Cable or connection from POP with **more than one** Compax3 (nn > 01) (1.Compax3 - 2.Compax3 - …), length between Compax connectors is fixed to 50cm, variable length A from POP with first Compax according to length code[1]
(Example: SSK27/03/01: Length 1.0m)

[4] Colours according to DESINA

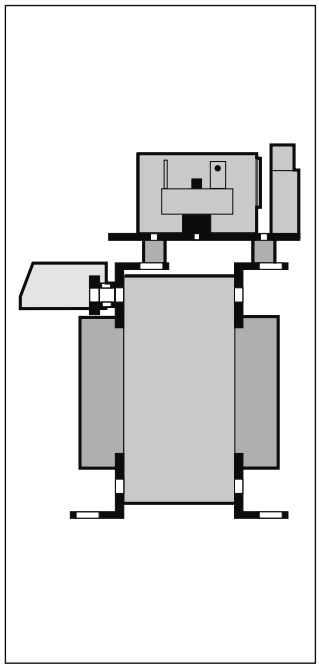
11

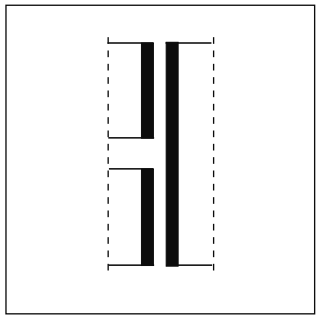
Length code for SSK27



Decentralized Input terminals								
PIO 2DI 24V DC 3.0ms	2-Channel Digital-Input terminal		P	I	O	4	0	0
PIO 4DI 24V DC 3.0ms	4-Channel Digital-Input terminal		P	I	O	4	0	2
PIO 8DI 24V DC 3.0ms	8-Channel Digital-Input terminal		P	I	O	4	3	0
PIO 2AI DC ±10V	2-Channel Analog-Input terminal	(± 10V Differential input)	P	I	O	4	5	6
PIO 4AI 0-10V DC S.E.	4-Channel Analog-Input terminal	(0-10V Signal voltage)	P	I	O	4	6	8
PIO 2AI 0-20mA	2-Channel Analog-Input terminal	(0 - 20mA Differential input)	P	I	O	4	8	0
Decentralized Output terminals								
PIO 2DO 24V DC 0.5A	2-Channel Digital-Output terminal	(Output current 0.5A)	P	I	O	5	0	1
PIO 4DO 24V DC 0.5A	4-Channel Digital-Output terminal	(Output current 0.5A)	P	I	O	5	0	4
PIO 8DO 24V DC 0.5A	8-Channel Digital-Output terminal	(Output current 0.5A)	P	I	O	5	3	0
PIO 2AO 0-10V DC	2-Channel Analog-Output terminal	(0-10V Signal voltage)	P	I	O	5	5	0
PIO 4AO 0-20mA	2-Channel Analog-Output terminal	(0-20mA Signal voltage)	P	I	O	5	5	2
PIO 2AO DC ±10V	2-Channel Analog-Output terminal	(±10V Signal voltage)	P	I	O	5	5	6
CANopen Fieldbus coupler								
CANopen Standard			P	I	O	3	3	7
CANopen ECO			P	I	O	3	4	7

Single-phase power units providing direct current are preferable and suitable for the power supply to electronic modules and proportional valves. The windings of these transformers are separated for safety and provided with isolated screened windings with earthing.





Features

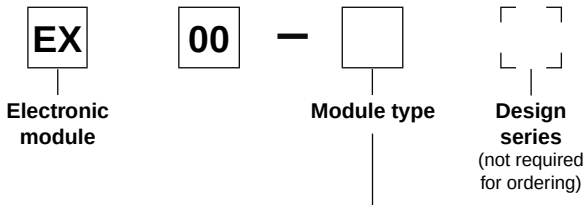
- Safety transformer to EN 60742 with integrated fuse
- Primary and secondary windings fitted with shielded windings with earth connection
- Optimal voltage accommodation with ±10V tappings
- Low ripple of 5% at full load
- Integrated LED operational indicator of output voltage

CE

Characteristics

Nominal input voltage	[VAC]	110/230
Regulation/Tappings at	[V]	+/-10
Frequency	[Hz]	50/60
Operating temperature	[°C]	-20 to +60
Nominal output voltage	[VDC]	24
Output voltage at zero load	[VDC]	30.5
Output voltage at full load	[VDC]	22.4
Ripple	[%]	below 5
Protection		IP 00
Construction		VBG 4
Regulations / Test voltages		EN 60742

Ordering code



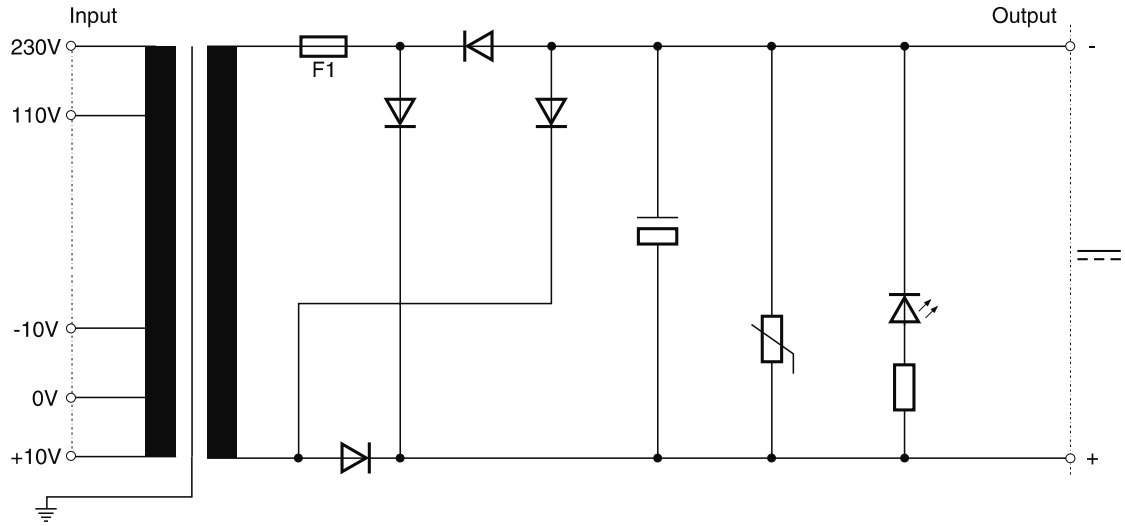
Code	Power (VA)	Nominal current/ In (A) AC [1]	Nominal current/ Out (A) DC
N08	**240VA**	**3.4/1.6**	**10.0**

[1] at 110/230V AC

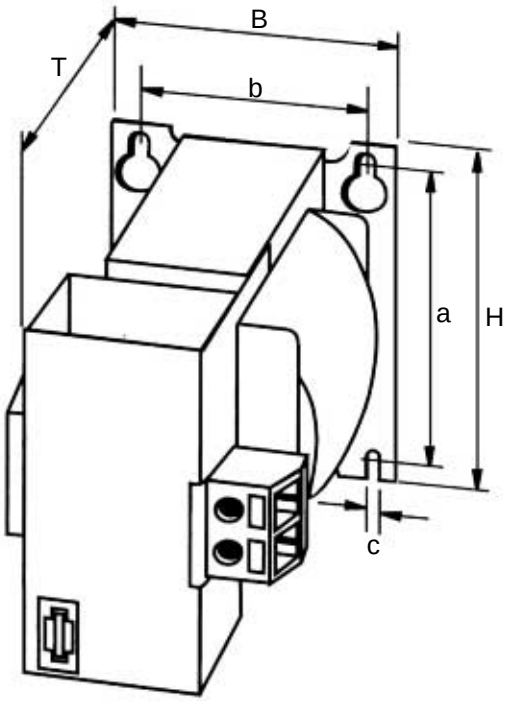
Bold letters =
Short-term availability

11

Block diagram



Dimensions



Code	H	B	T	a	b	c	kg
EX00-N08	120	113	173	90	94.5	5.8	6.3

Note

To guarantee air convection the module has to be mounted in a hanging position.

The new test unit EX00-M05 is suitable for testing and commissioning of all proportional and servo proportional valves with onboard electronics that are offered in this catalogue.
For easy on-site service all necessary cables are securely located inside of the rugged case. The test unit provides all command signal sources and measuring ports for concerted and time saving control and diagnosis of the valves. For operation of the new hybrid regenerative valves an additional switchable 24V output is available.

Features

- Control of valves incorporating integrated electronics and central plug acc. DIN 43563 (6p.+PE)
- Built-in fuses
- Cable set included
- lockable rugged box

Ordering code

EX **00** – **M05** [ ]

Test unit

Design series (not required for ordering)

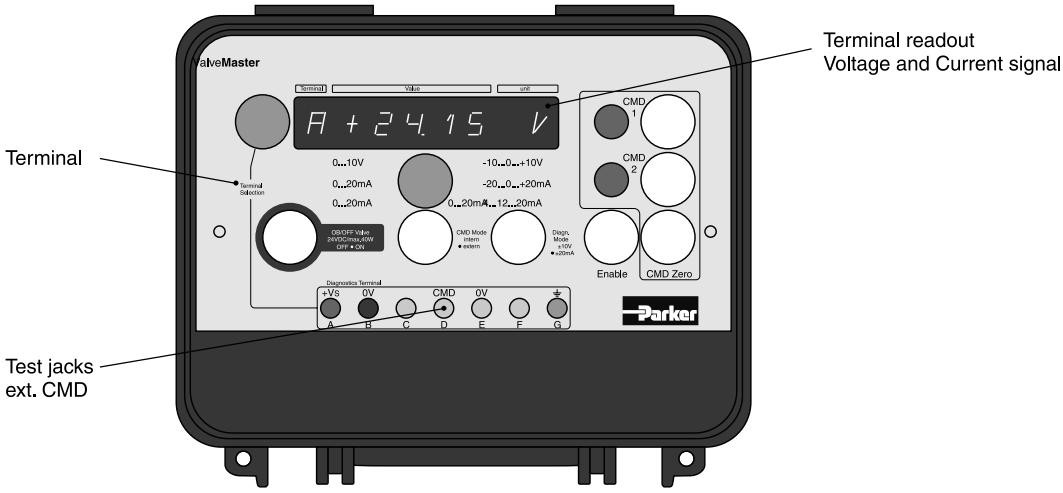
CE

Technical data

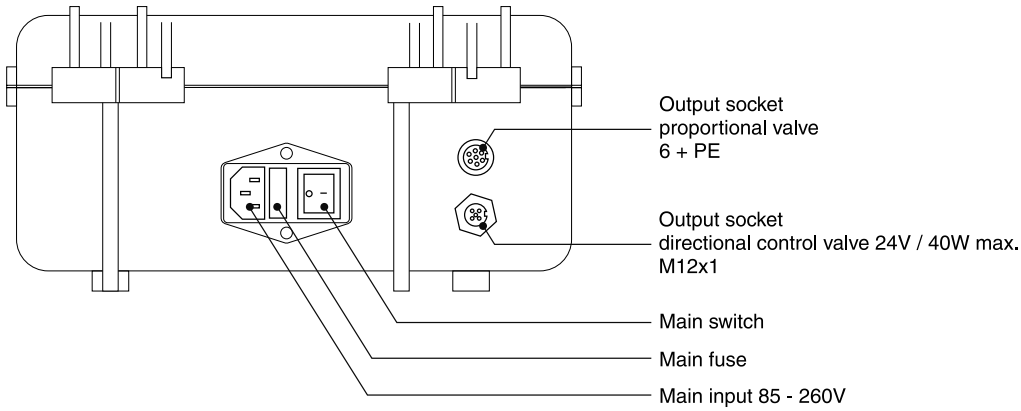
Design			Lockable rugged box, polypropylene (break proof)	
Supply voltage		[V]	85...260, 50...60Hz	
Power consumption		[VA]	max. 160	
Current consumption max.		[A]	1.3 at 230V	
Main input fuse		[A]	3.15 time lag	
Required main supply fuse		[A]	16	
Protection class			IP40	
EMC			EN 61000-6-2	
Valve central connection	Valve supply	[V]	24 (±5%)	
	Command voltage	[V]	0...±10 (±1%), 0...10, 0...±20mA, 0...20mA, 4...12...20mA, 4...20mA	
	Diagnostic output		0...±10V / 0...±20mA	
	Enable signal	[V]	7.5 (±10%)	
Measurement terminals			For multimeter with Ri min = 10kOhm	
Display	Display digits		4	
	Resolution		10mV / 10mA ; 1digit	
Main cord	Unit site		Cable inlet connector IEC320	
	Main site		CEE 7/7 plug	
	Cable length	[m]	2	
Valve cords			A - control valves	B - DC valves
	Unit site		Connector Amphenol SV70 DIN 40040	Connector 6+PE acc. EN175201-834
	Valve site		Connector DIN 43563	M12x1 as per IEC61076-2-101
	Cable length	[m]	3	
Ambient temperature		[°C]	0...40	
Weight		[kg]	3.9	
Dimensions		[mm]	L 305 x B 270 x H 144	

Operator panel

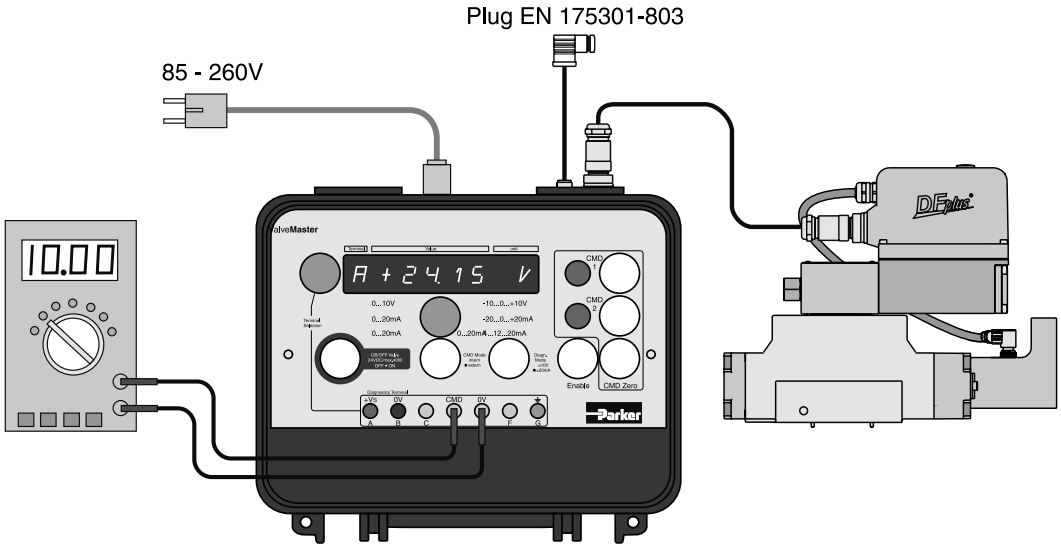
Front



Rear



Wiring configuration

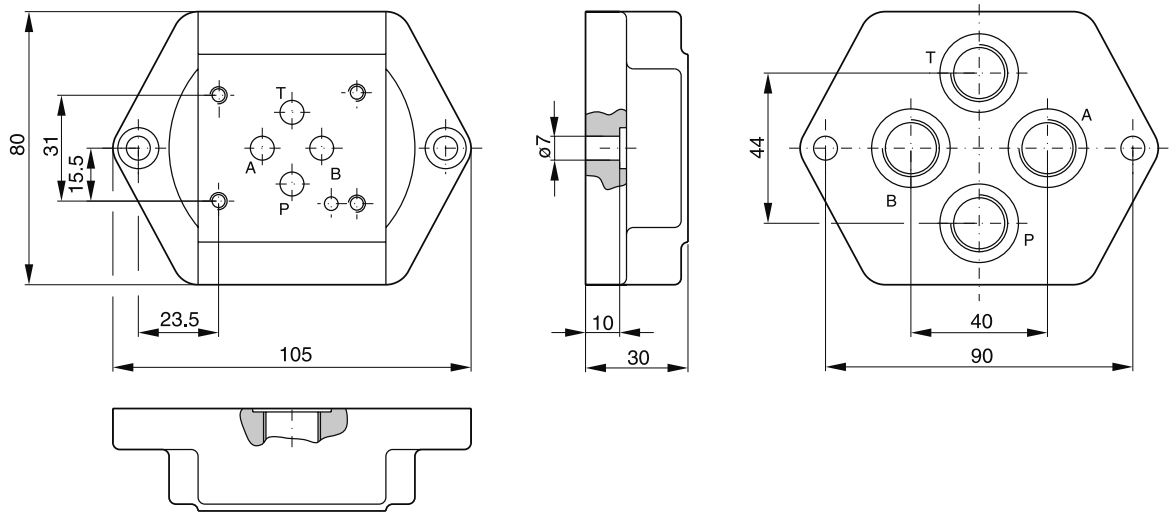


11

12

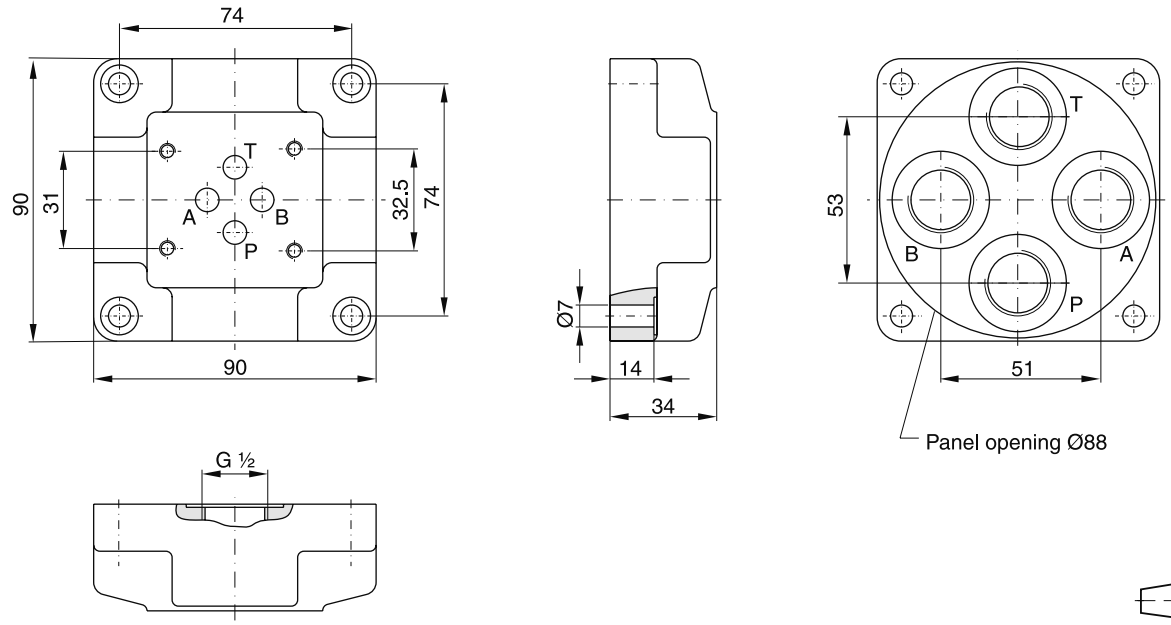
Notes

Valve size DIN NG06, CETOP 03, NFPA D03



Ordering code	
SPD 22 B 910	P, A, B and T = G 1/4
SPD 23 B 910	P, A, B and T = G 3/8

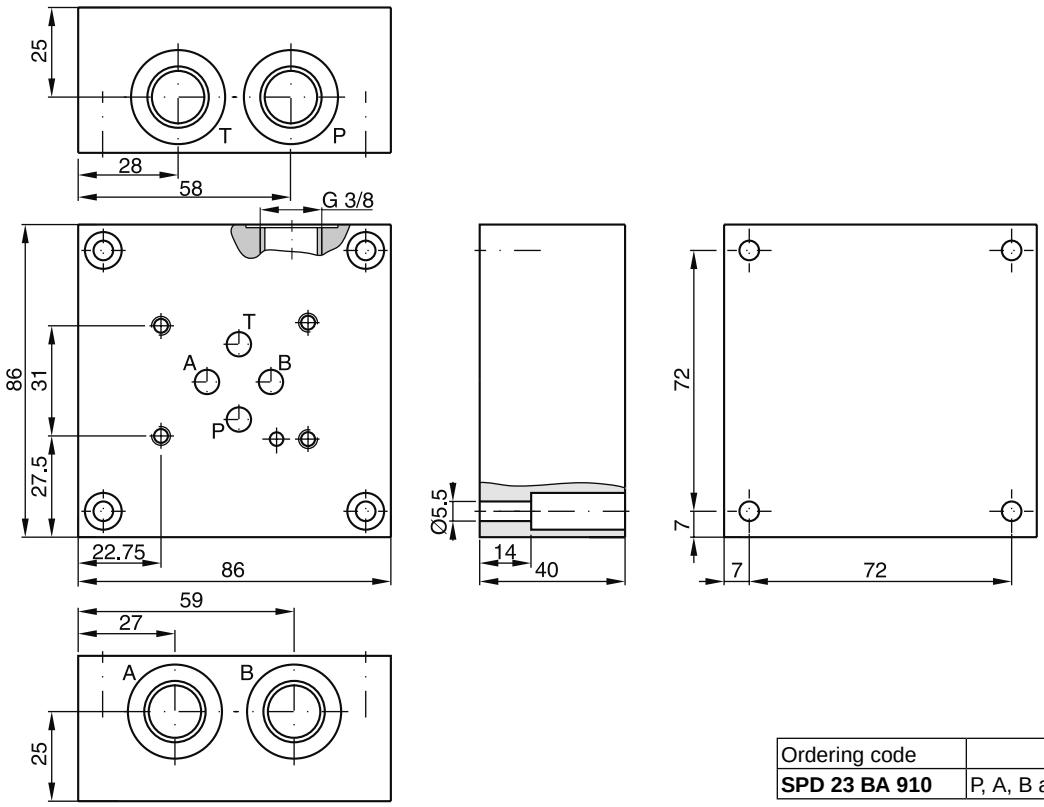
Valve size DIN NG06, CETOP 03, NFPA D03



Ordering code	
SPD 24 B 910	P, A, B and T = G 1/2

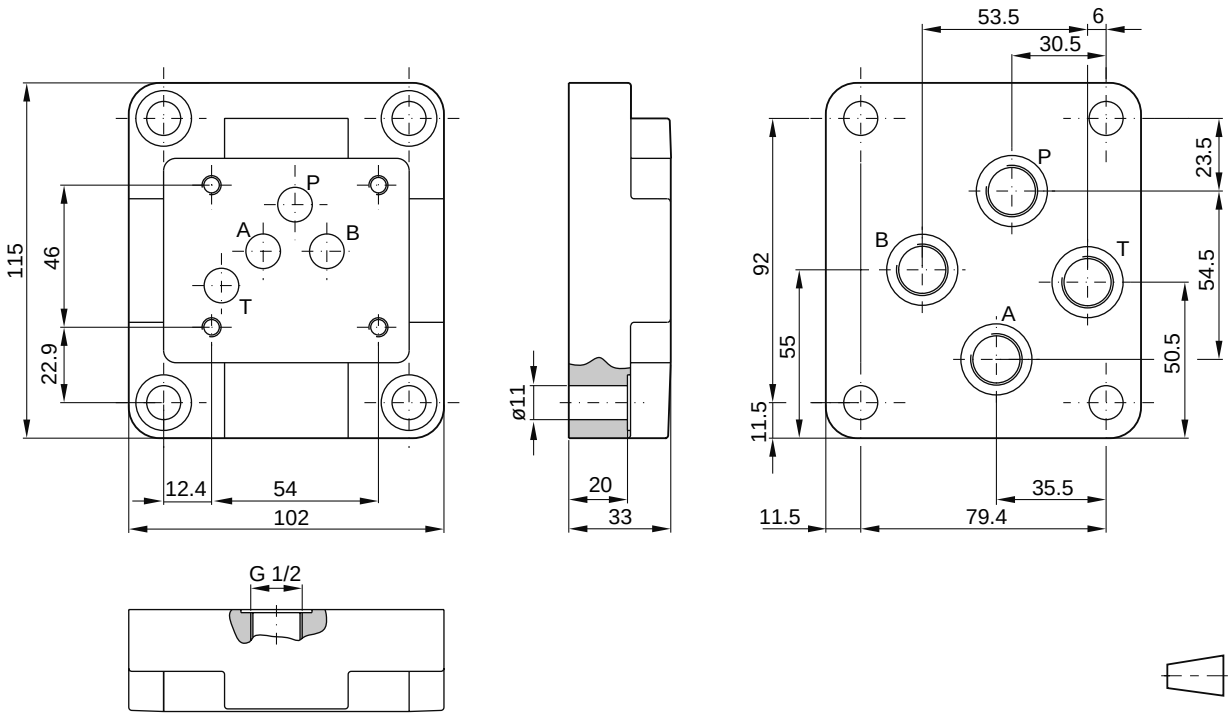
Bold letters =
Short-term availability

Valve size DIN NG06, CETOP 03, NFPA D03



Ordering code	
SPD 23 BA 910	P, A, B and T = G 3/8

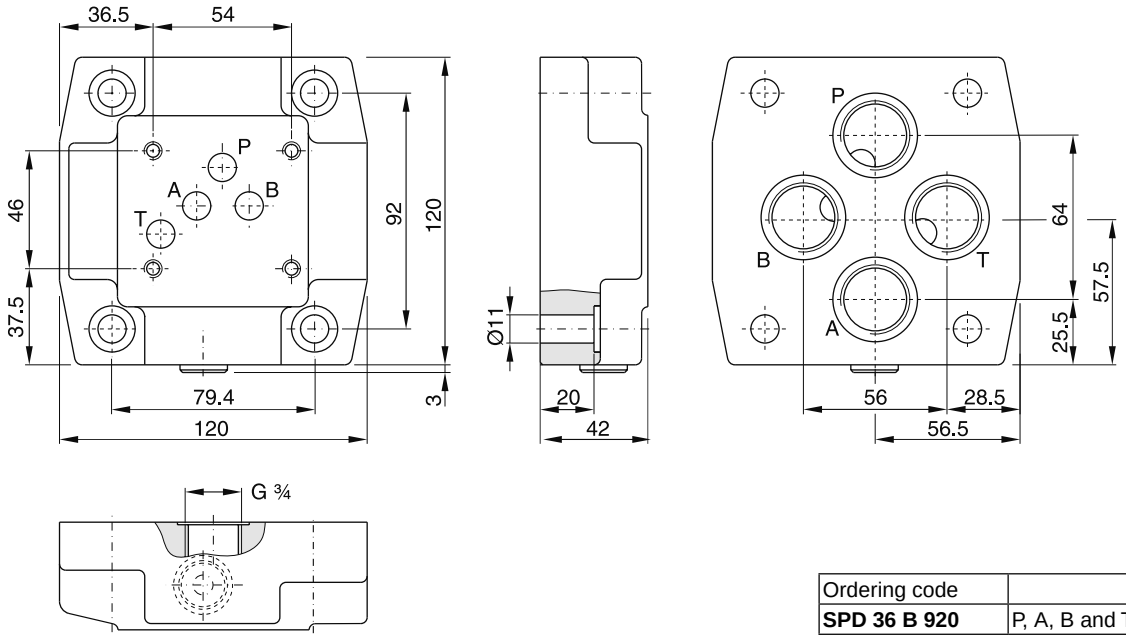
Valve size DIN NG10, CETOP 05, NFPA D05



Ordering code	
SPD 34 B 920	P, A, B and T = G 1/2

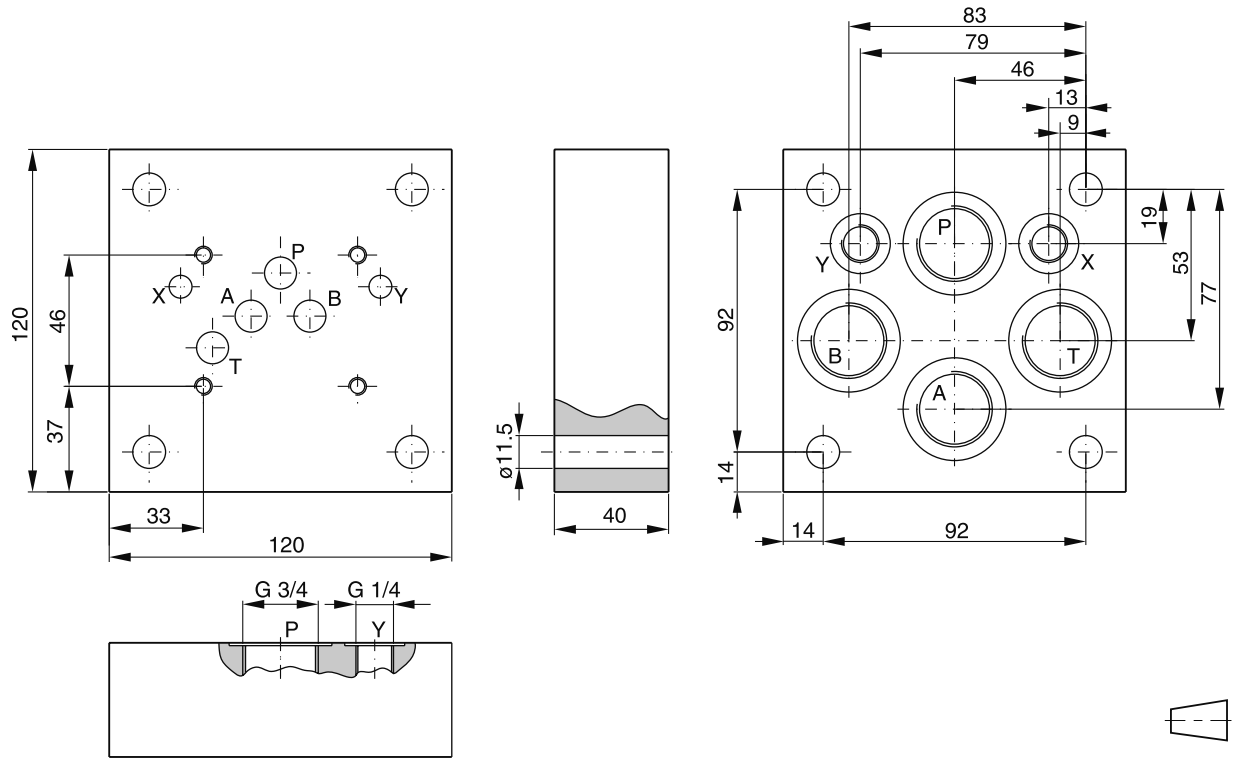
Bold letters =
Short-term availability

Valve size DIN NG10, CETOP 05, NFPA D05



Ordering code	
SPD 36 B 920	P, A, B and T = G 3/4

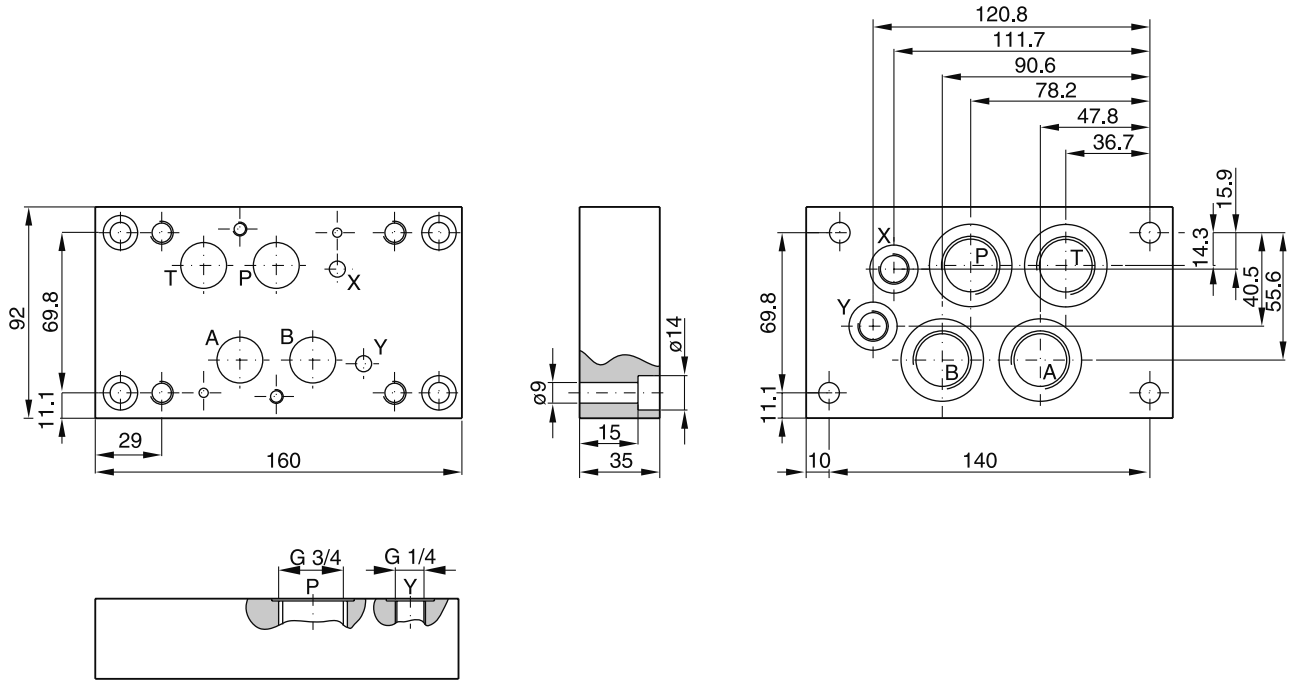
Valve size DIN NG10, CETOP 05, NFPA D05



Ordering code	
SPD 316 B 960	P, A, B and T = G 3/4 X and Y = G 1/4

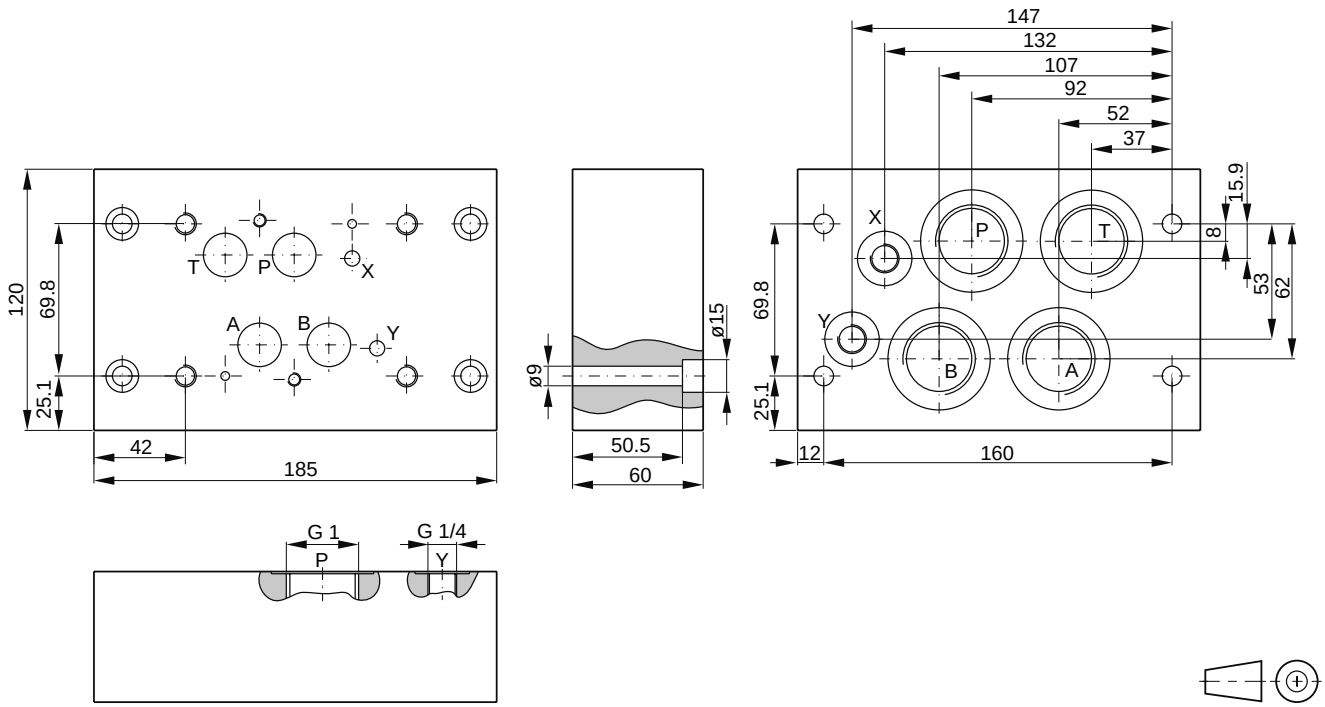
Bold letters =
Short-term availability

Valve size DIN NG16, CETOP 07, NFPA D07



Ordering code	
SPD 46 B 910	P, A, B and T = G 3/4 X and Y = G 1/4

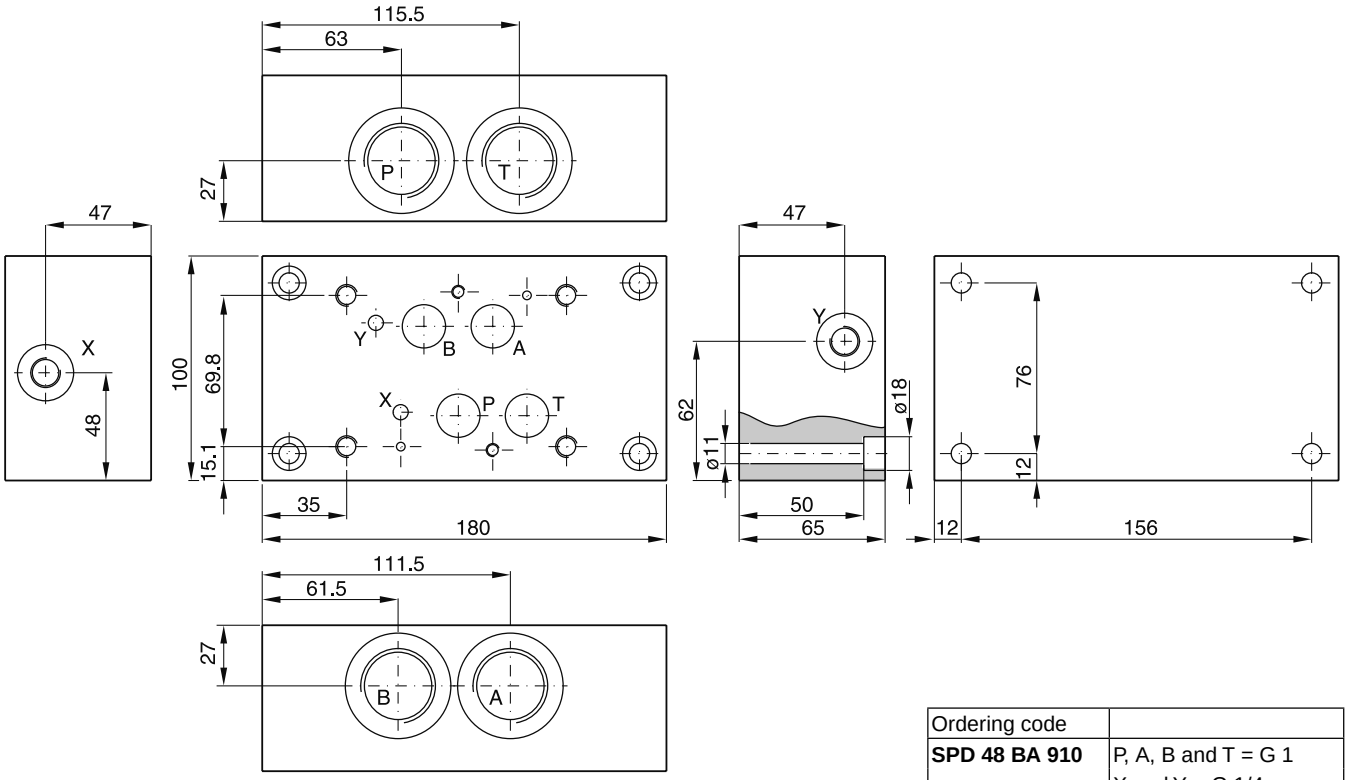
Valve size DIN NG16, CETOP 07, NFPA D07



Ordering code	
SPD 48 B 910	P, A, B and T = G 1 X and Y = G 1/4

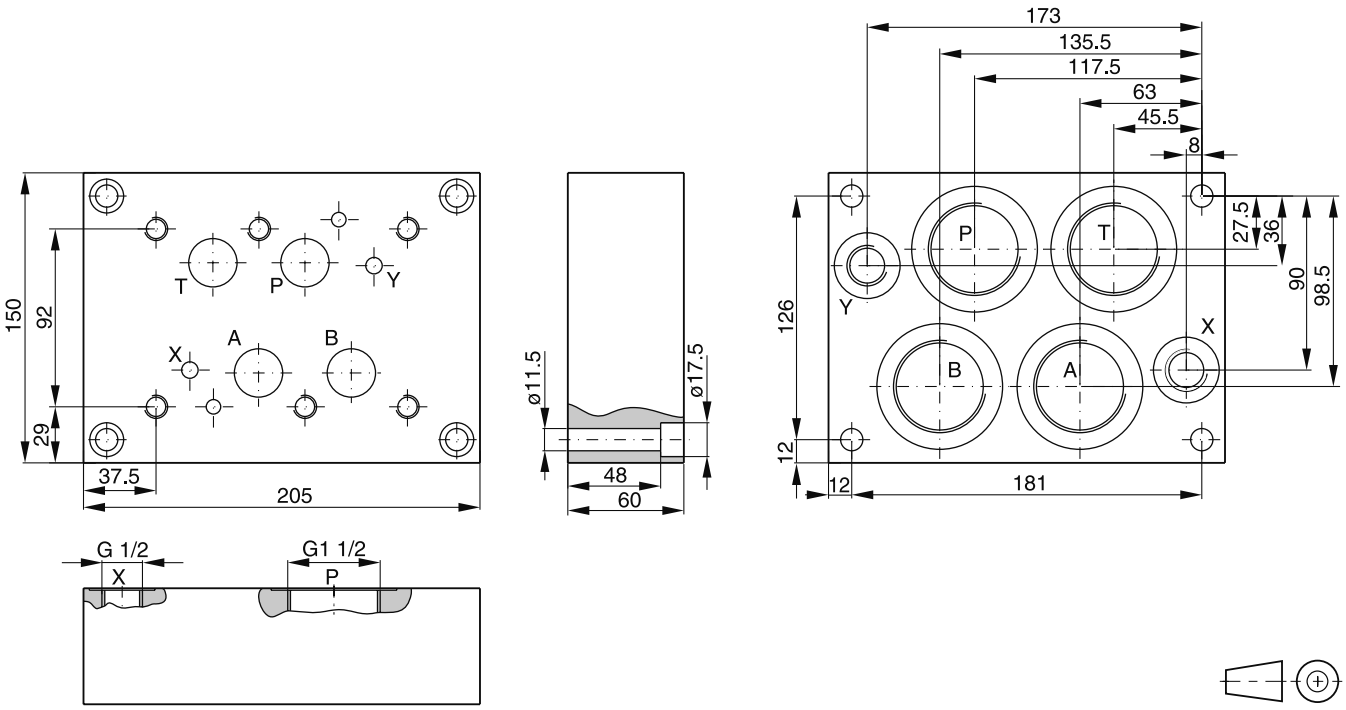
Bold letters =
Short-term availability

Valve size DIN NG16, CETOP 07, NFPA D07



Ordering code	
SPD 48 BA 910	P, A, B and T = G 1 X and Y = G 1/4

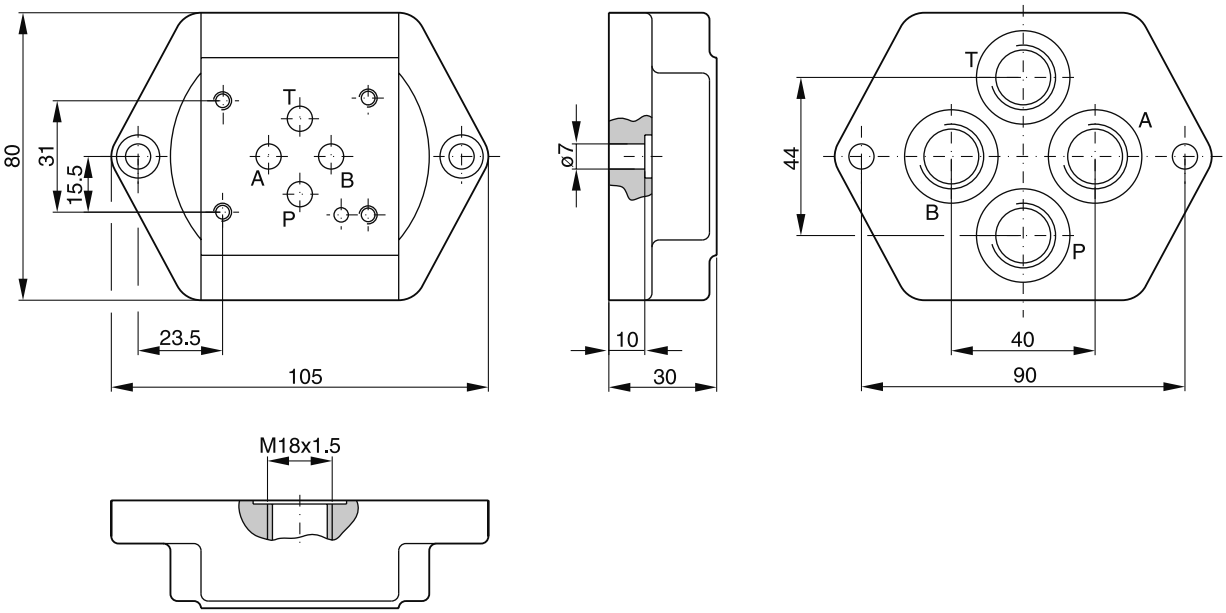
Valve size DIN NG25, CETOP 08, NFPA D08



Ordering code	
SPD 612 B 930	P, A, B and T = G 1 1/2 X and Y = G 1/2

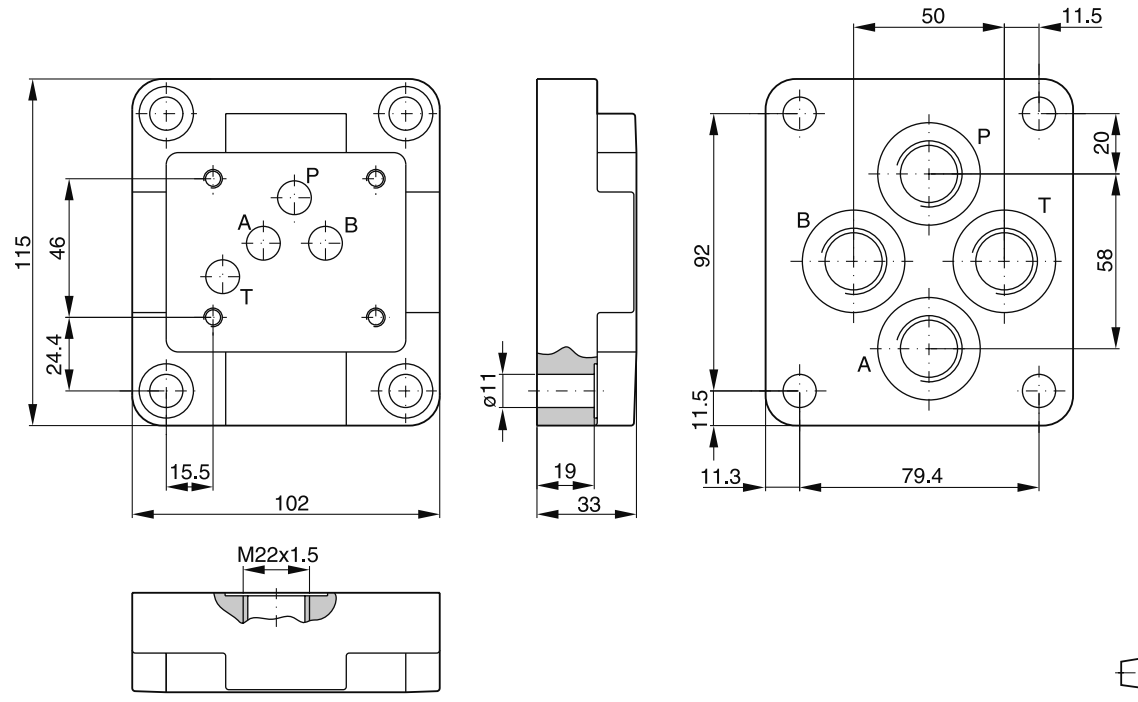
Bold letters =
Short-term availability

Valve size DIN NG06, CETOP 03, NFPA D03



Order. code	
A 064 M	P, A, B and T = M18x1.5 as per ISO 6149

Valve size DIN NG10, CETOP 05, NFPA D05

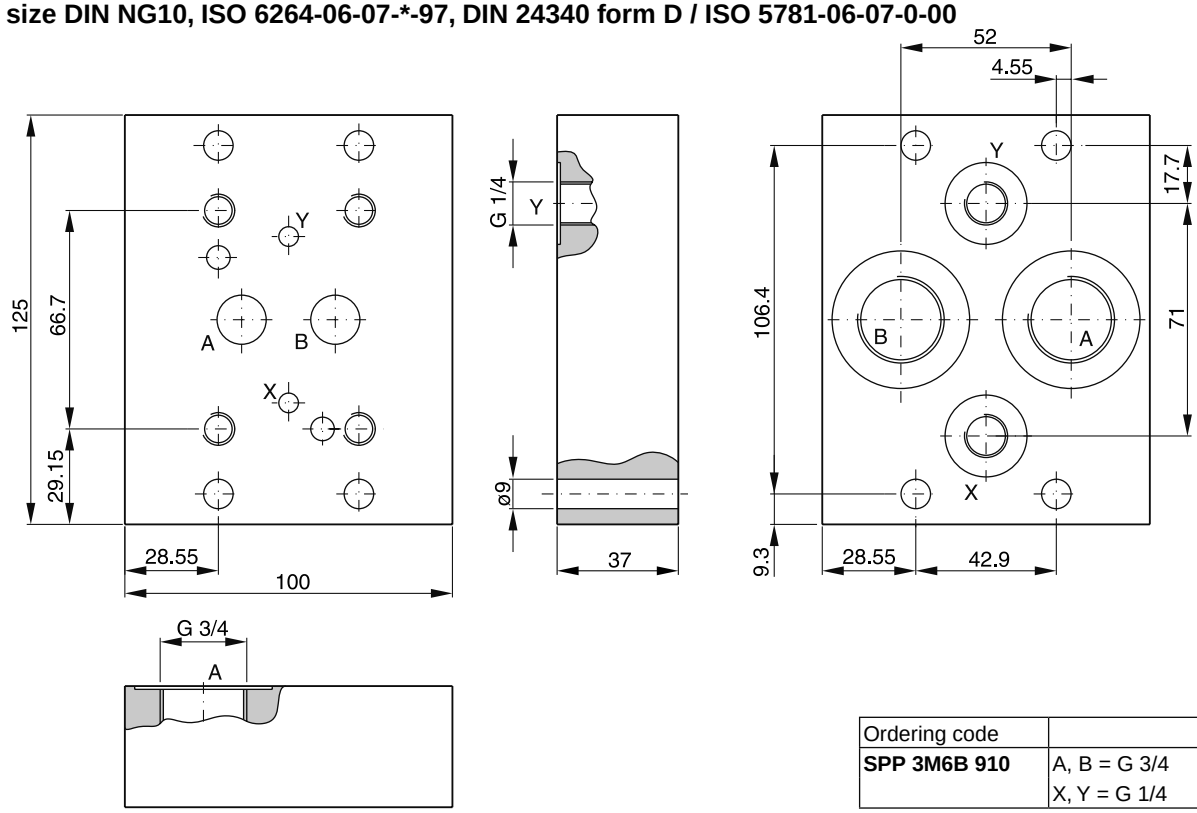


Order. code	
A 104 M	P, A, B and T = M22x1.5 as per ISO 6149

Bold letters =
Short-term availability

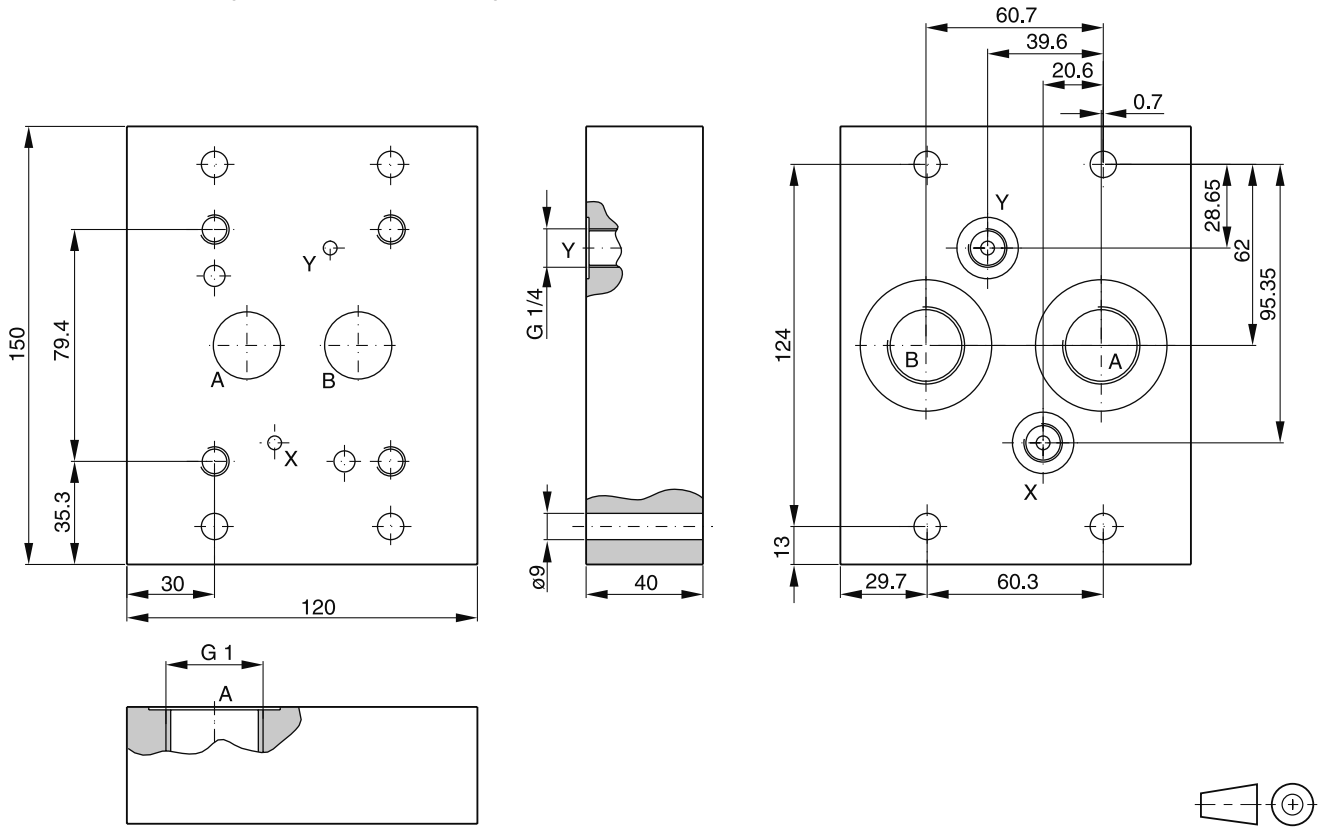
12

Valve size DIN NG10, ISO 6264-06-07-*-97, DIN 24340 form D / ISO 5781-06-07-0-00



Ordering code	
SPP 3M6B 910	A, B = G 3/4 X, Y = G 1/4

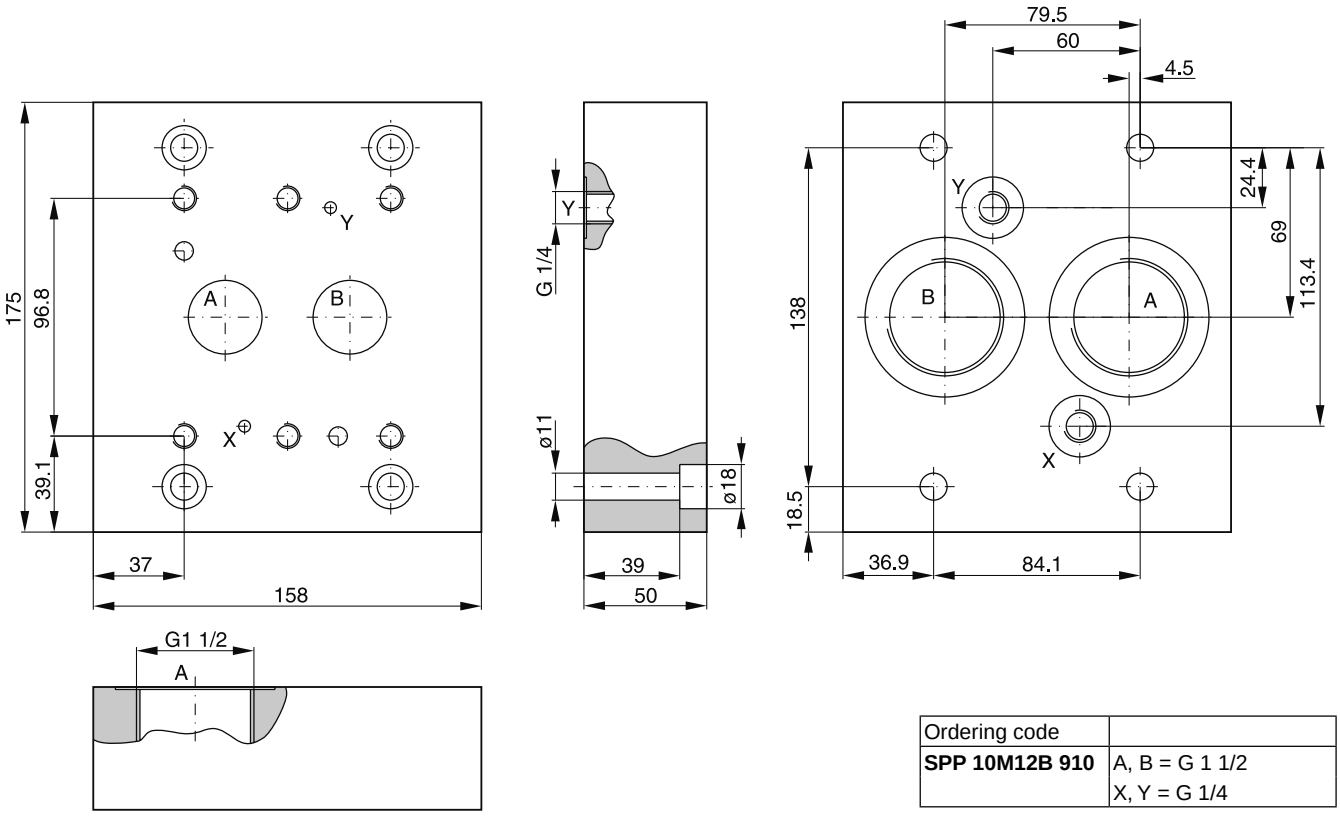
Valve size DIN NG25, ISO 6264-08-11-*-97, DIN 24340 form D / ISO 5781-08-10-0-00



Bold letters =
Short-term availability

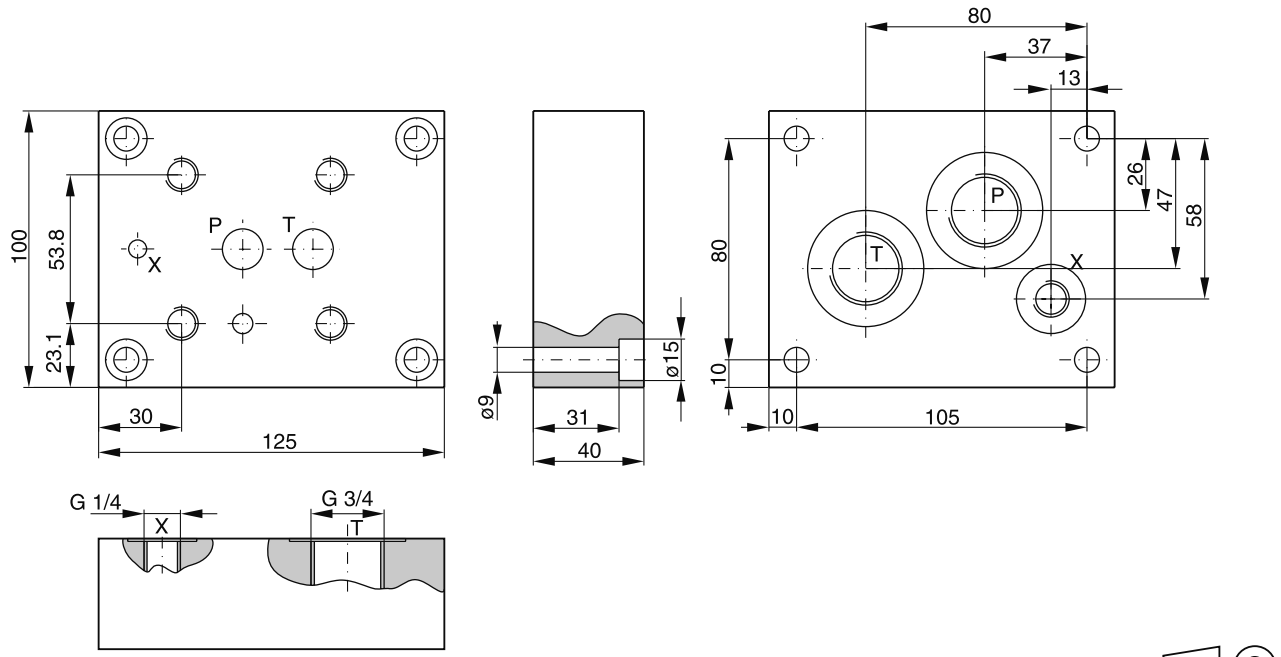
Ordering code	
SPP 6M8B 910	A, B = G 1 X, Y = G 1/4

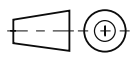
Valve size DIN NG32, ISO 6264-10-15-*-97, DIN 24340 form D / ISO 5781-10-13-0-00



Ordering code	
SPP 10M12B 910	A, B = G 1 1/2 X, Y = G 1/4

Valve size DIN NG10, ISO 6264-06-09-*-97, DIN 24340 form E

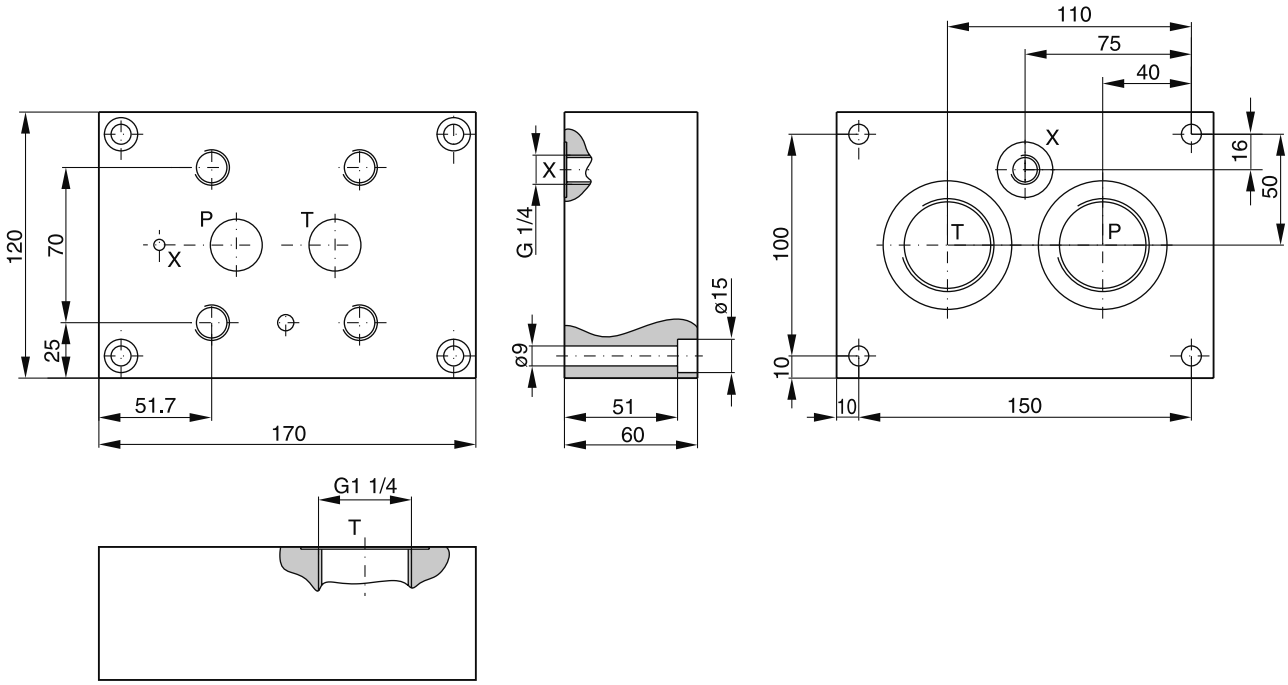




Ordering code	
SPP 3R6B 910	P, T = G 3/4 X = G 1/4

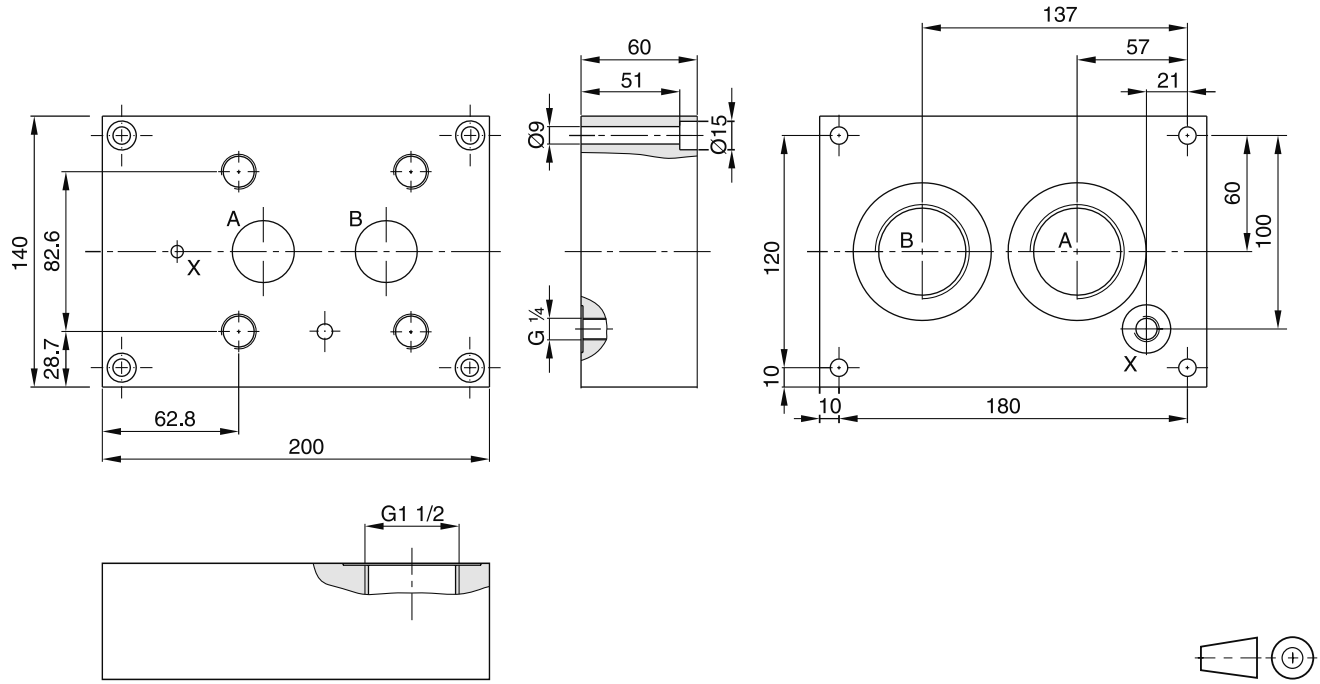
Bold letters =
Short-term availability

Valve size DIN NG25, ISO 6264-08-13-*-97, DIN 24340 form E



Ordering code	
SPP 6R10B 910	P, T = G 1 1/4 X = G 1/4

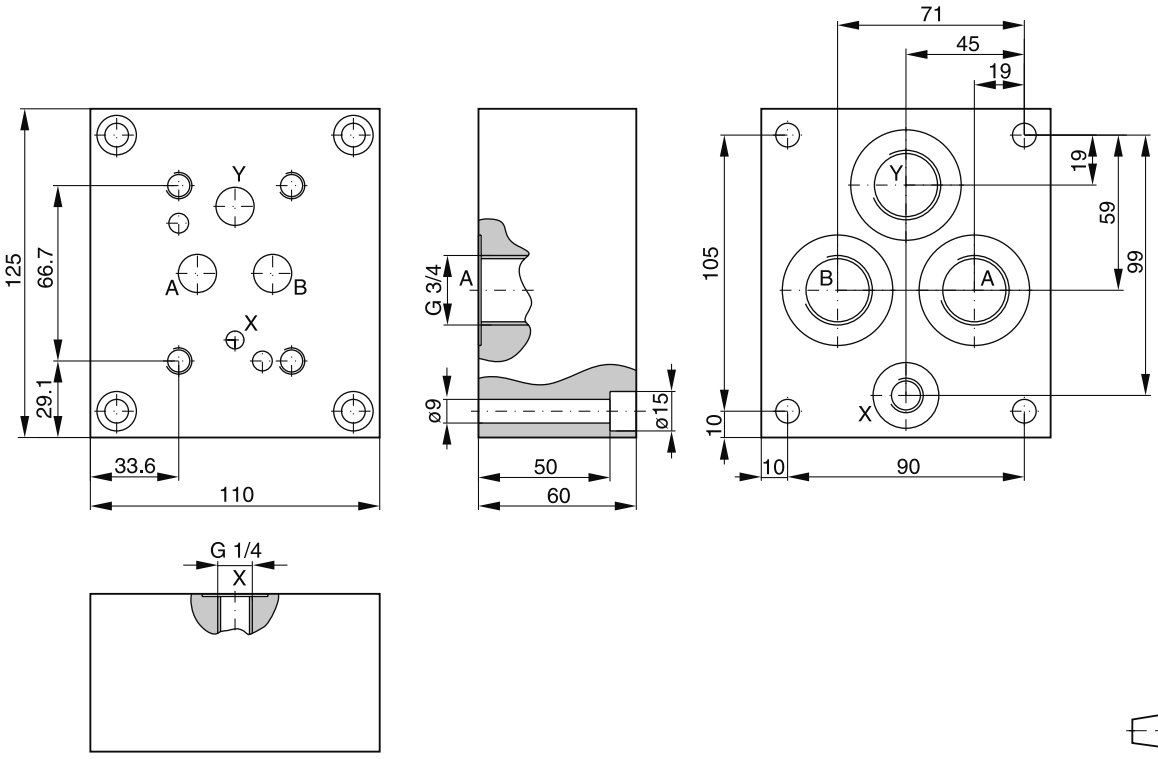
Valve size DIN NG32, ISO 6264-10-17-*-97, DIN 24340 form E



Ordering code	
SPP 10R12B 910	A, B = G 1 1/2 X = G 1/4

Bold letters =
Short-term availability

Valve size DIN NG10, for pressure valves VB and VM



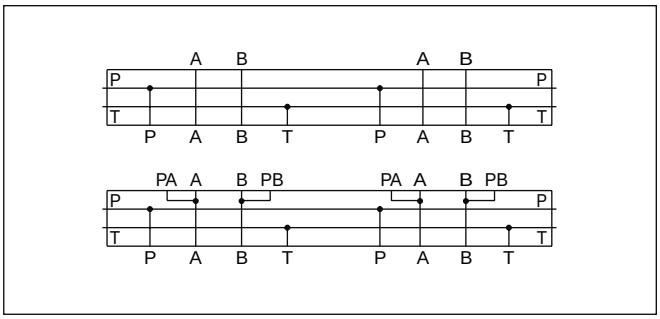
Ordering code	
A102 R3/4-OD1	A, B, Y = G 3/4 X = 1/4

Bold letters =
Short-term availability

12

Multi-station manifolds are used to save space when connecting several directional control valves to a common pressure and return line.

Diverse switching arrangements are possible in combination with sandwich and directional control valves. Plugs without designations must not be removed.



Features

- Very low pressure drop due to large drilling parameters
- P- and T-ports on both faces
- Also available with gauge ports G¼
- Separation in P or T channel optional - please consult your distributor

Ordering code

MSP	☐	☐	☐	B	☐	9	☐	☐
Multiple subplate, standard	Stations	Nominal size	Port size	BSPP Port thread	Port location	Metric fastening screws	Design series	Gauge port

Code	Stations
1	**1**
2	**2**
3	**3**
4	**4**
5	**5**
6	**6**
7	**7**
8	**8**

Code	Size
D2	**NG06 / CETOP 03**
D3	**NG10 / CETOP 05**

Code	Gauge port
omit	**without**
C	Port G¼

Code	Design series
10	**CETOP 03, NG06**
30	**CETOP 05, NG10**

Code	Port location
omit	**A + B rear**
A	**A + B side**

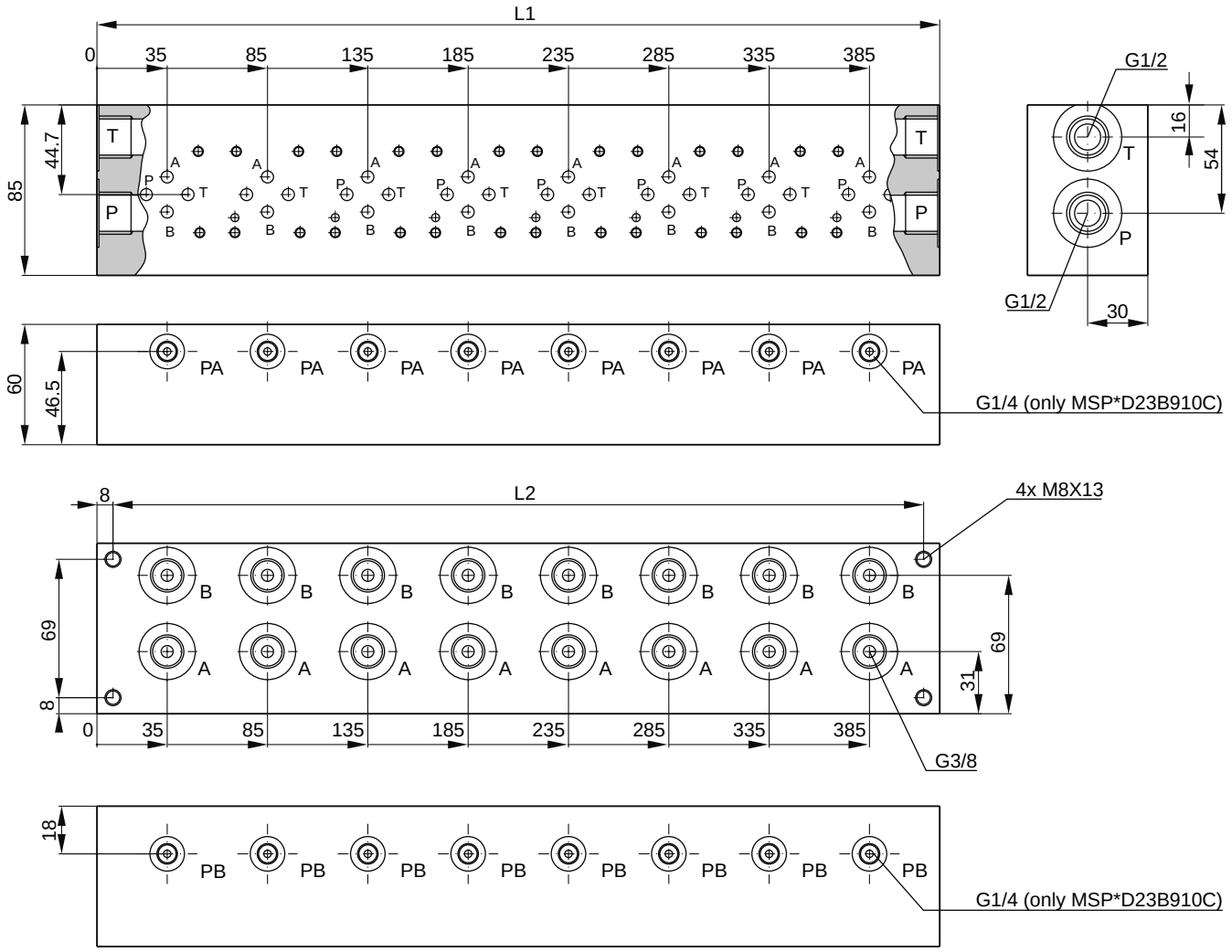
Code	Port size
3	**CETOP 03** **A + B = G 3/8** **P + T = G 1/2**
4	**CETOP 05** **A + B = G 1/2** **P = G 3/4** **T = G1**

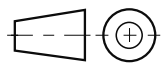
Bold letters =
Short-term availability

Technical data

Interface		DIN 24340, Form A, CETOP, ISO
Mounting position		unrestricted (valve axis preferably horizontal)
Working pressure	[bar]	max. 350

MSP*D23 B910*

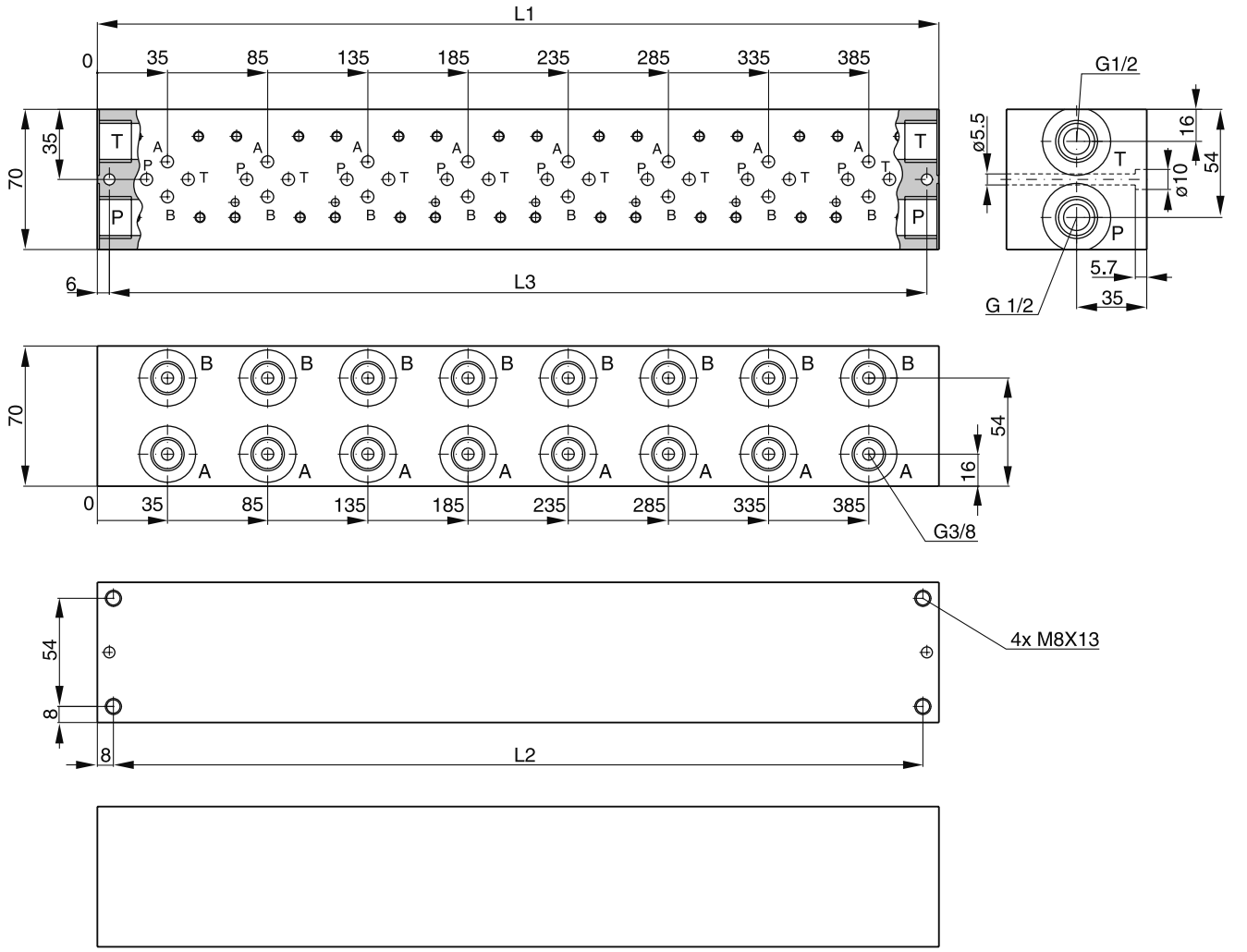




12

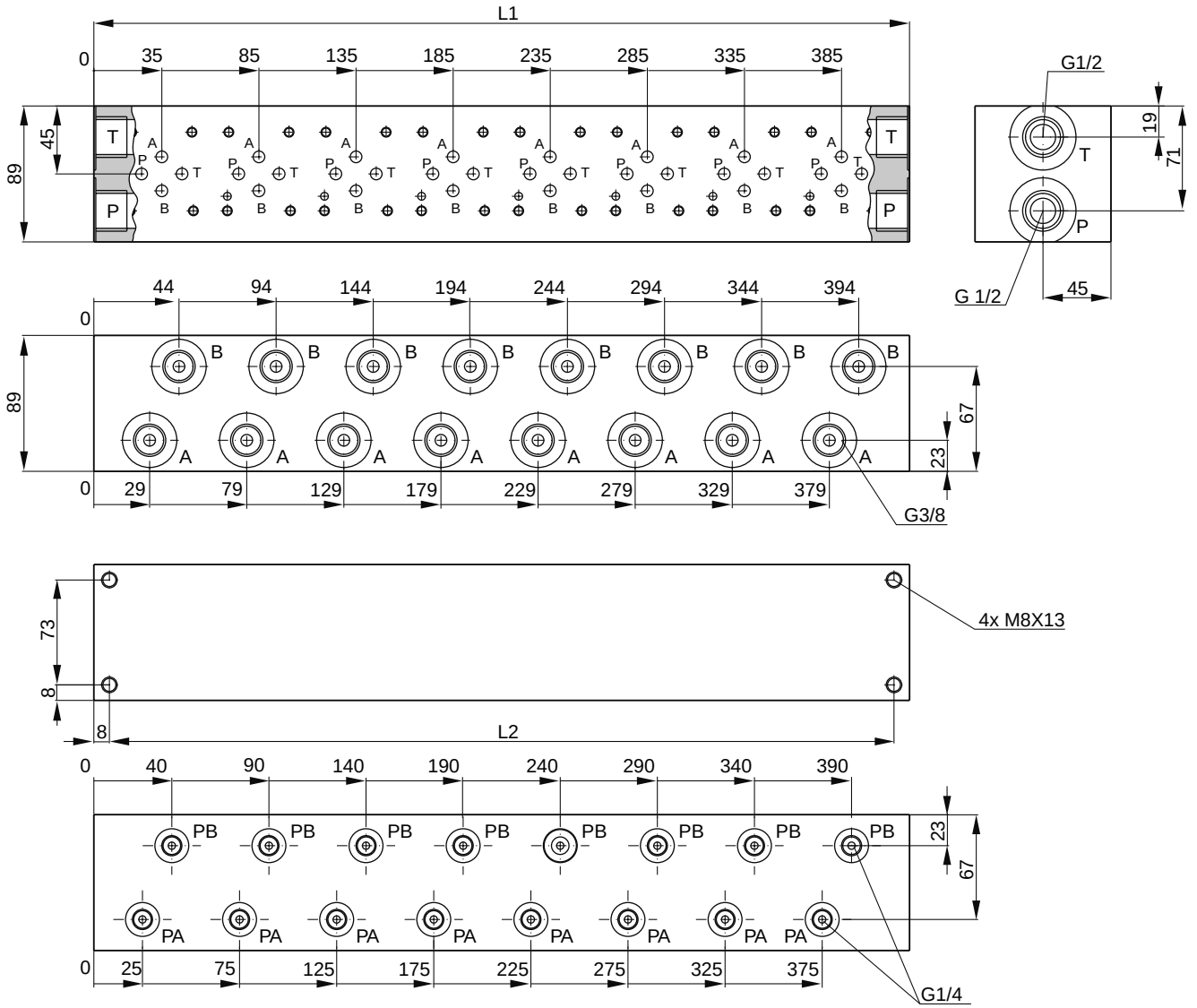
Code	Nominal size	Stations	L1 [mm]	L2 [mm]	Port		Gauge port	Weight [kg]
					P, T	A, B		
MSP1 D23 B910*	NG06 CETOP 03	1	70	54	G1/2	G3/8	G¼ (only MSP*D23B910C)	2.4
MSP2 D23 B910*		2	120	104				4.0
MSP3 D23 B910*		3	170	154				5.8
MSP4 D23 B910*		4	220	204				7.5
MSP5 D23 B910*		5	270	254				9.2
MSP6 D23 B910*		6	320	304				10.9
MSP7 D23 B910*		7	370	354				12.6
MSP8 D23 B910*		8	420	404				14.3

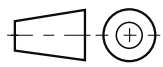
MSP*D23 BA910



Code	Nominal size	Stations	L1 [mm]	L2 [mm]	L3 [mm]	Port		Gauge port	Weight [kg]
						P, T	A, B		
MSP1 D23 BA910	NG06 CETOP 3	1	70	54	58	G1/2	G3/8	—	2.3
MSP2 D23 BA910		2	120	104	108				3.9
MSP3 D23 BA910		3	170	154	158				5.5
MSP4 D23 BA910		4	220	204	208				7.2
MSP5 D23 BA910		5	270	254	258				8.8
MSP6 D23 BA910		6	320	304	308				10.5
MSP7 D23 BA910		7	370	354	358				12.1
MSP8 D23 BA910		8	420	404	408				13.7

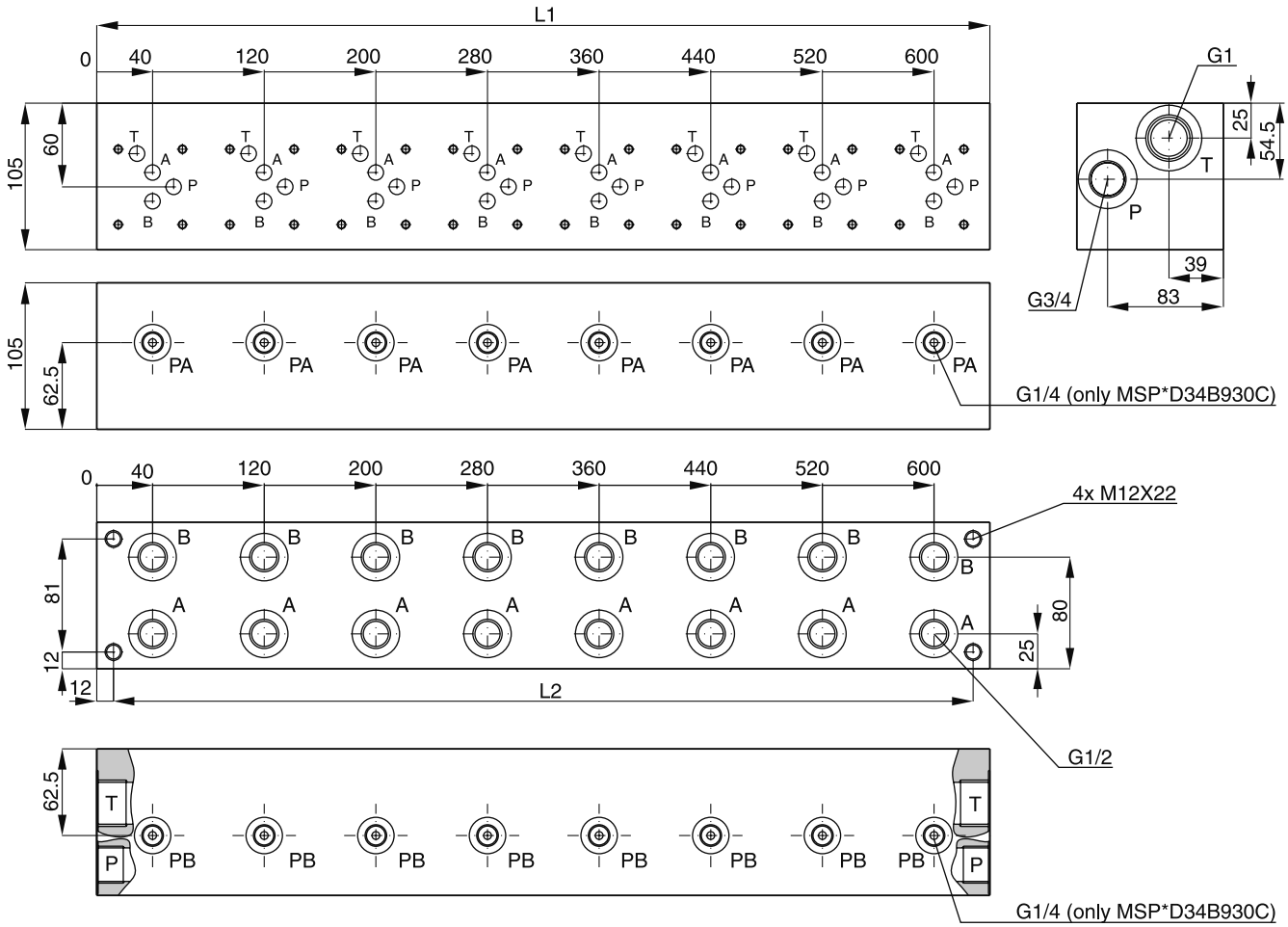
MSP*D23 BA910C





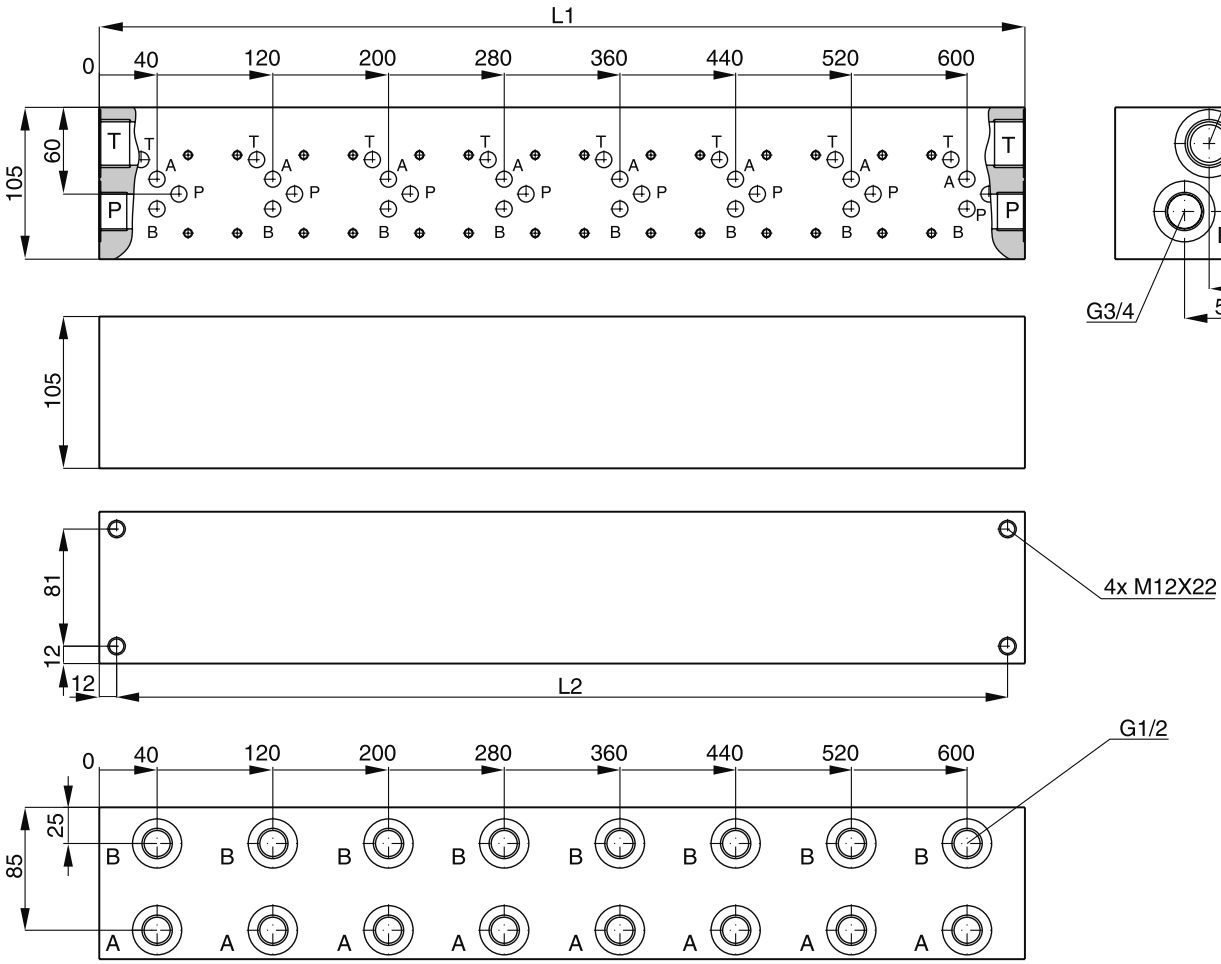
Code	Nominal size	Stations	L1 [mm]	L2 [mm]	Port		Gauge port	Weight [kg]
					P, T	A, B		
MSP1 D23 BA910C	NG06 CETOP 3	1	70	54	G1/2	G3/8	G¼	3.5
MSP2 D23 BA910C		2	120	104				6.0
MSP3 D23 BA910C		3	170	154				8.5
MSP4 D23 BA910C		4	220	204				11.0
MSP5 D23 BA910C		5	270	254				13.5
MSP6 D23 BA910C		6	320	304				16.0
MSP7 D23 BA910C		7	370	354				18.5
MSP8 D23 BA910C		8	420	404				21.0

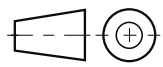
MSP*D34 B930*



Code	Nominal size	Stations	L1 [mm]	L2 [mm]	Port			Gauge port	Weight [kg]
					P	T	A, B		
MSP1 D34 B930*	NG10 CETOP 5	1	80	56	G3/4	G1	G1/2	G¼ (only MSP*D34B930C)	5.9
MSP2 D34 B930*		2	160	136					11.8
MSP3 D34 B930*		3	240	216					17.7
MSP4 D34 B930*		4	320	296					23.5
MSP5 D34 B930*		5	400	376					29.4
MSP6 D34 B930*		6	480	456					35.3
MSP7 D34 B930*		7	560	536					41.2
MSP8 D34 B930*		8	640	616					47.1

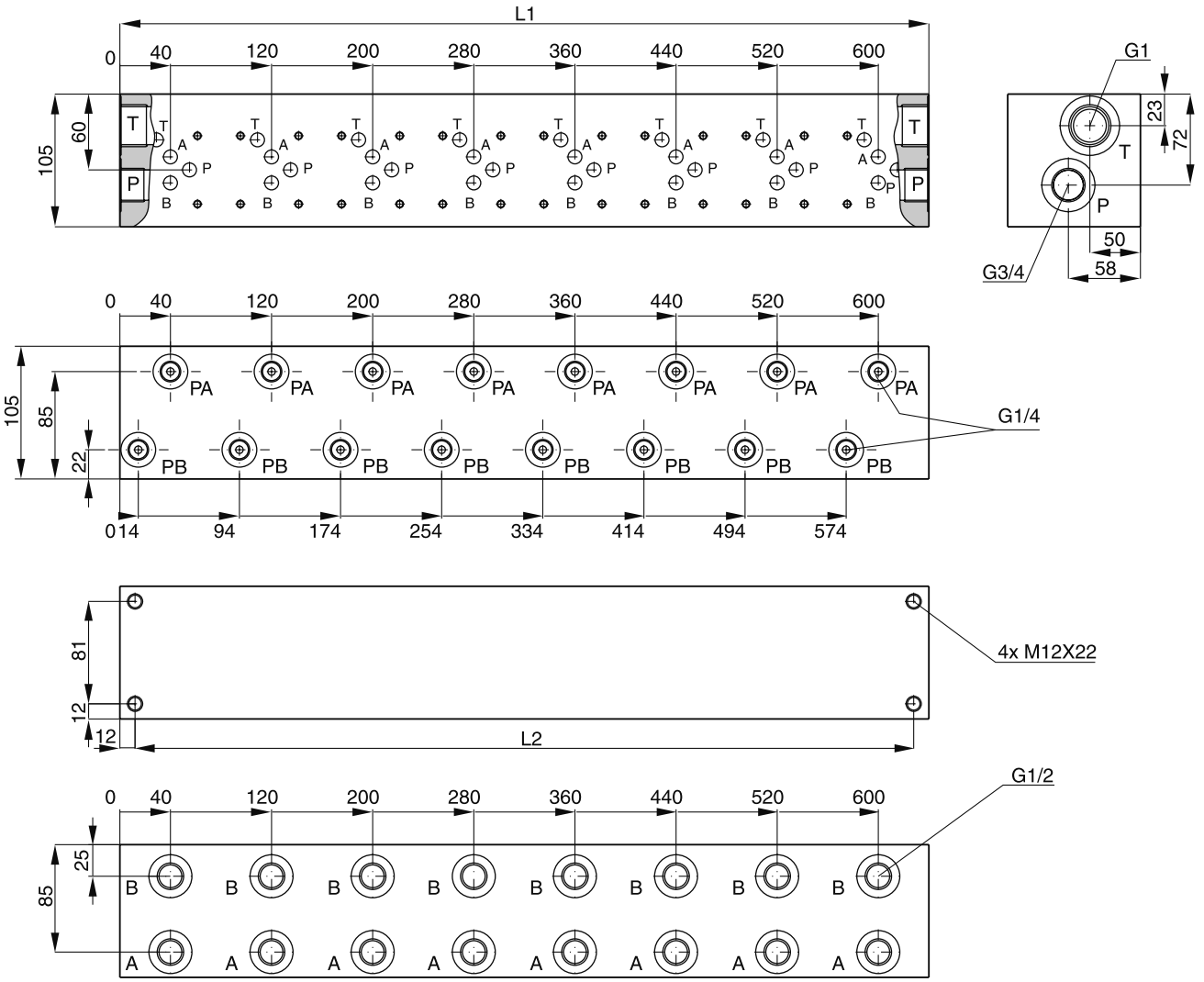
MSP*D34 BA930





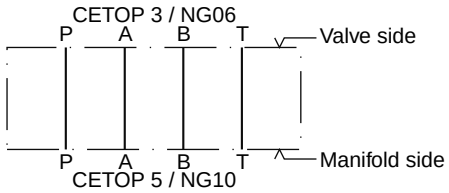
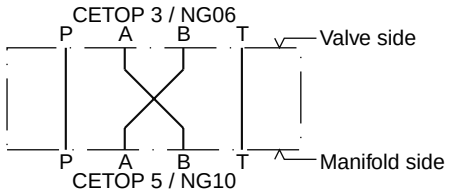
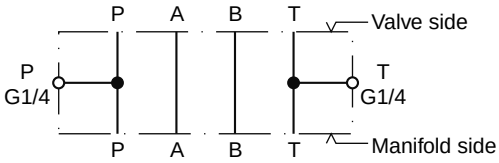
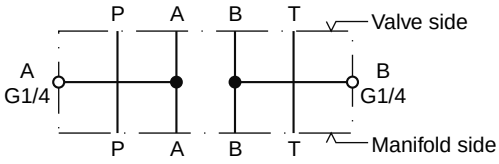
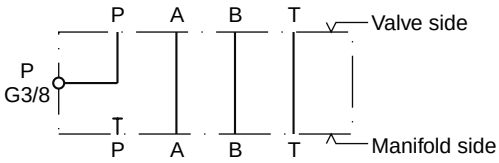
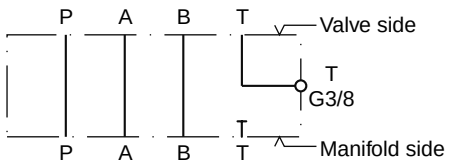
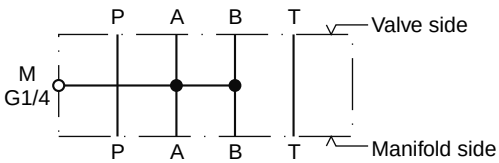
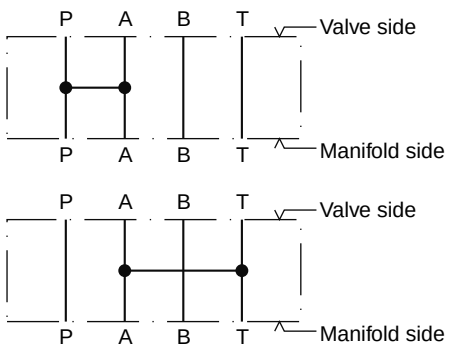
Code	Nominal size	Stations	L1 [mm]	L2 [mm]	Port			Gauge port	Weight [kg]
					P	T	A, B		
MSP1 D34 BA930	NG10 CETOP 5	1	80	56	G3/4	G1	G1/2	—	5.9
MSP2 D34 BA930		2	160	136					11.8
MSP3 D34 BA930		3	240	216					17.7
MSP4 D34 BA930		4	320	296					23.5
MSP5 D34 BA930		5	400	376					29.4
MSP6 D34 BA930		6	480	456					35.3
MSP7 D34 BA930		7	560	536					41.2
MSP8 D34 BA930		8	640	616					47.1

MSP*D34 BA930C

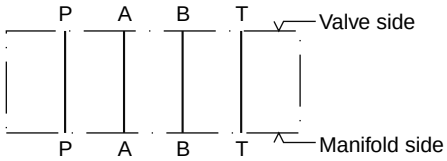
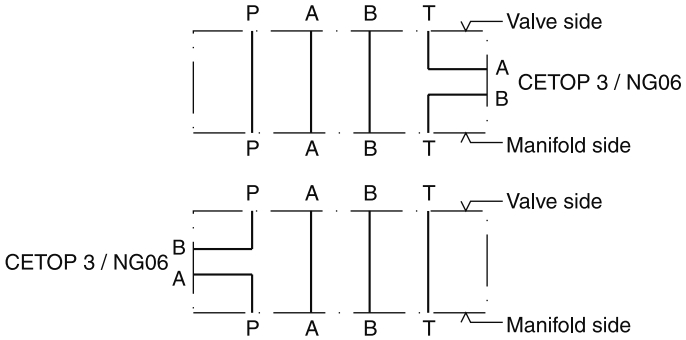
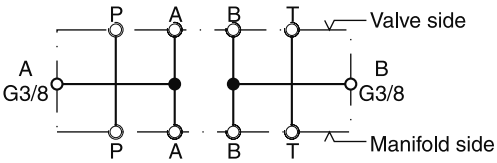
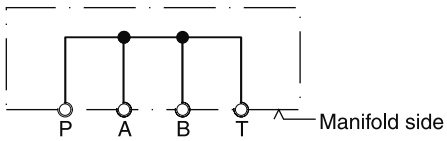
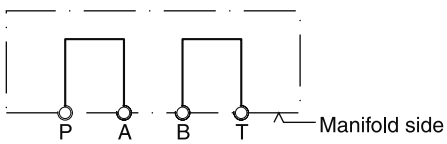
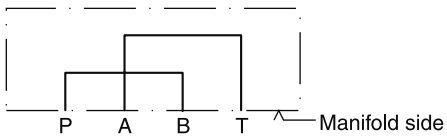
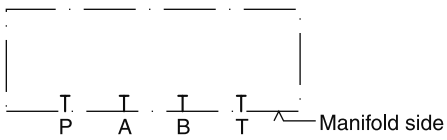


Code	Nominal size	Stations	L1 [mm]	L2 [mm]	Port			Gauge port	Weight [kg]
					P	T	A, B		
MSP1 D34 BA930C	NG10 CETOP 5	1	80	56	G¾	G1	G½	G¼	5.9
MSP2 D34 BA930C		2	160	136					11.8
MSP3 D34 BA930C		3	240	216					17.7
MSP4 D34 BA930C		4	320	296					23.5
MSP5 D34 BA930C		5	400	376					29.4
MSP6 D34 BA930C		6	480	456					35.3
MSP7 D34 BA930C		7	560	536					41.2
MSP8 D34 BA930C		8	640	616					47.1

Notes

Symbol	Type	Size	Hight
	**PADA 1007-AA-BB**	NG10-NG06	25
	**PADA 1007/A-B/B-A**	NG10-NG06	25
	H06-1044	NG06	30
	**H06-1039**	NG06	30
	**H06-504**	NG06	30
	**H06-711**	NG06	30
	H06-1274	NG06	30
	**H06-1040**	NG06	30

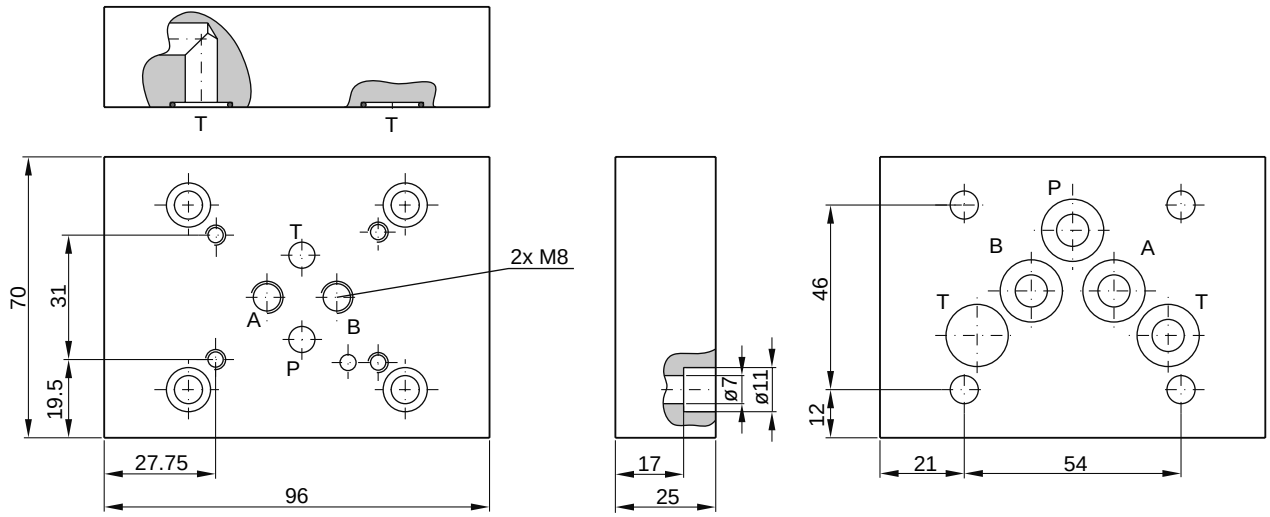
12

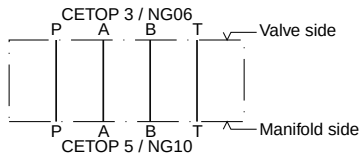
Symbol	Type	Size	Hight
	**H06DO-1291**	NG06	10
	H06DU-814	NG06	71.3
 All ports can be equiped with orifices or plugs (1/16NPT)	CS06040N	NG06	40.3
 All ports can be equiped with orifices or plugs (1/16NPT)	CS06082N	NG06	40.3
 All ports can be equiped with orifices or plugs (1/16NPT)	CS06080N	NG06	40.3
	**D51DC071D**	NG06	26.3
	**D51VP071C** **D51VP101D**	NG06 NG10	26.3 26.9

12

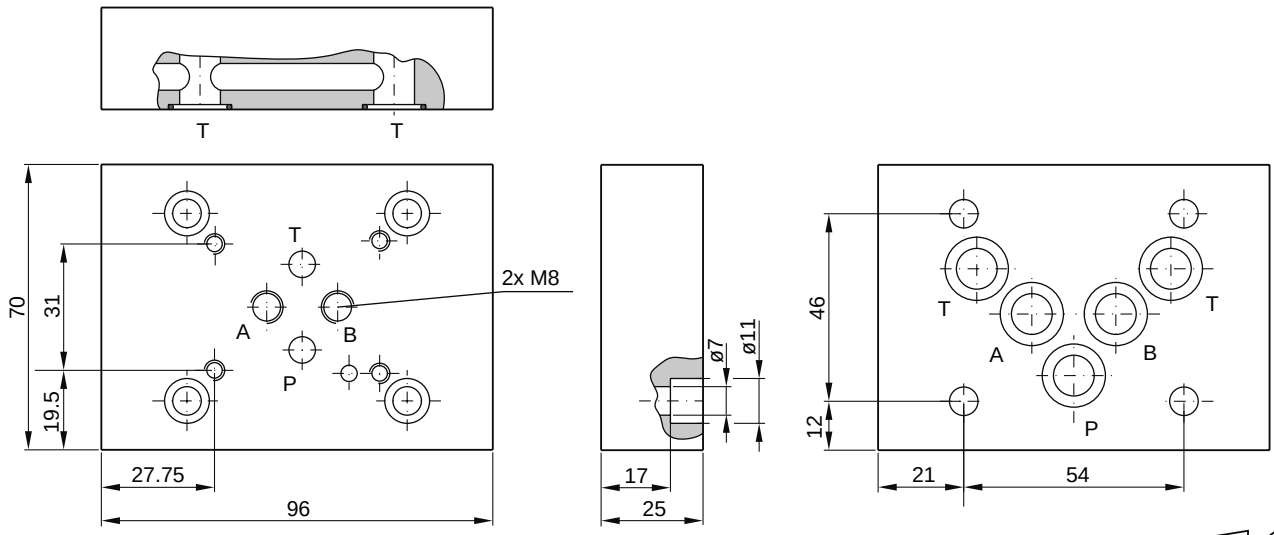
Bold letters =
Short-term availability

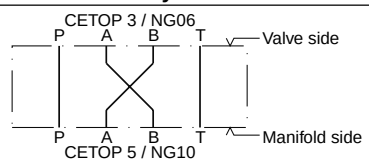
Adaptor plate PADA 1007-AA-BB, CETOP 5/3, nominal size NG10 to NG06



Symbol	Ordering code	Bolt Kit	Bolt dimensions	Torque
	**PADA1007-AA-BB** CETOP 3 / 5 (O-rings included in delivery)	BK 408	4x M6x25 DIN 912 12.9	13.2 Nm ±15%

Adaptor plate PADA 1007/A-B/B-A, CETOP 3/5, nominal size NG10 to NG06



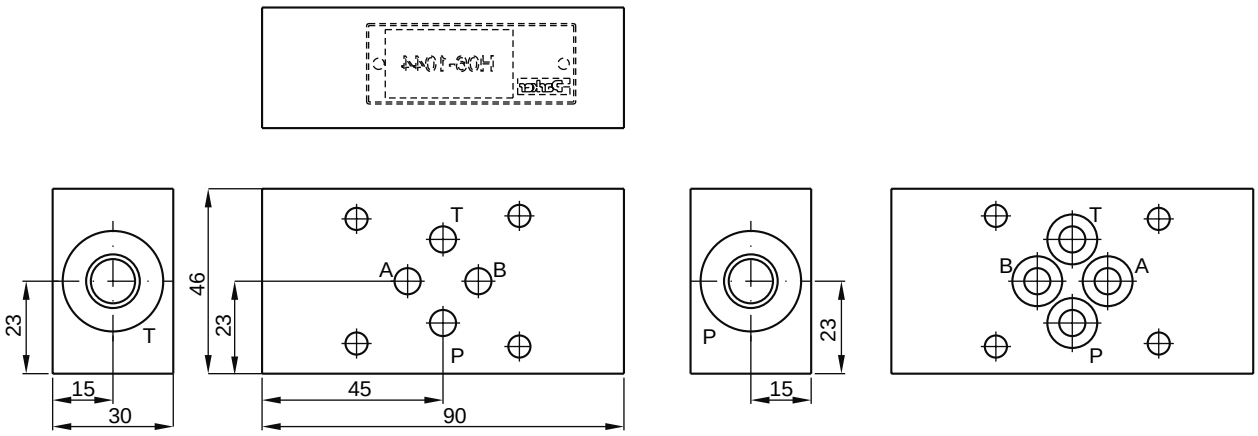
Symbol	Ordering code	Bolt Kit	Bolt dimensions	Torque
	**PADA1007/A-B/B-A** CETOP 3 / 5 (O-rings included in delivery)	BK 408	4x M6x25 DIN 912 12.9	13.2 Nm ±15%

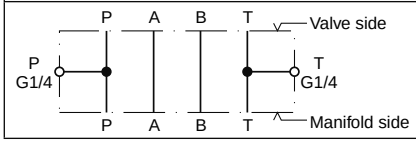
Bold letters =
Short-term availability

PADA UK.INDD CM 07.09.11

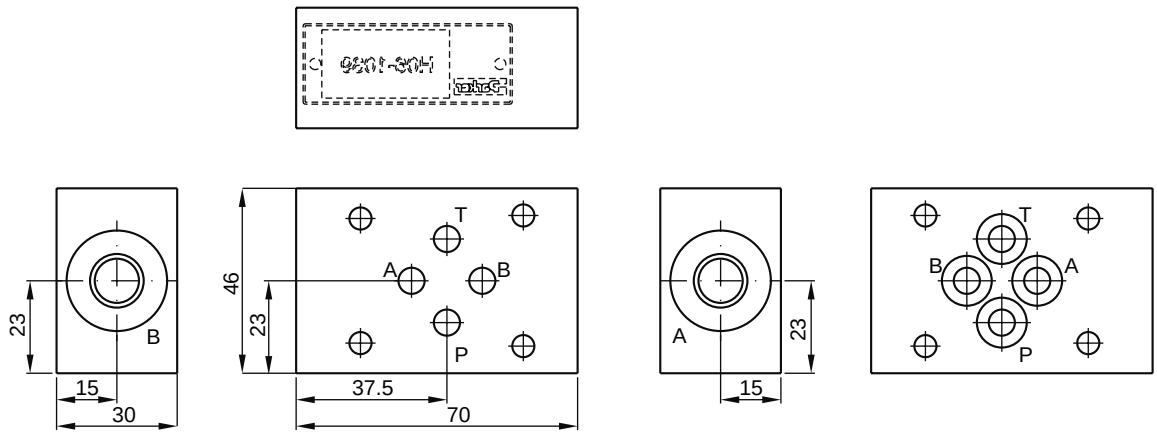
Notes

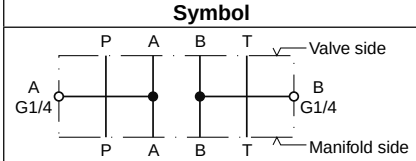
Sandwich plate H06-1044, CETOP 3 / NG06



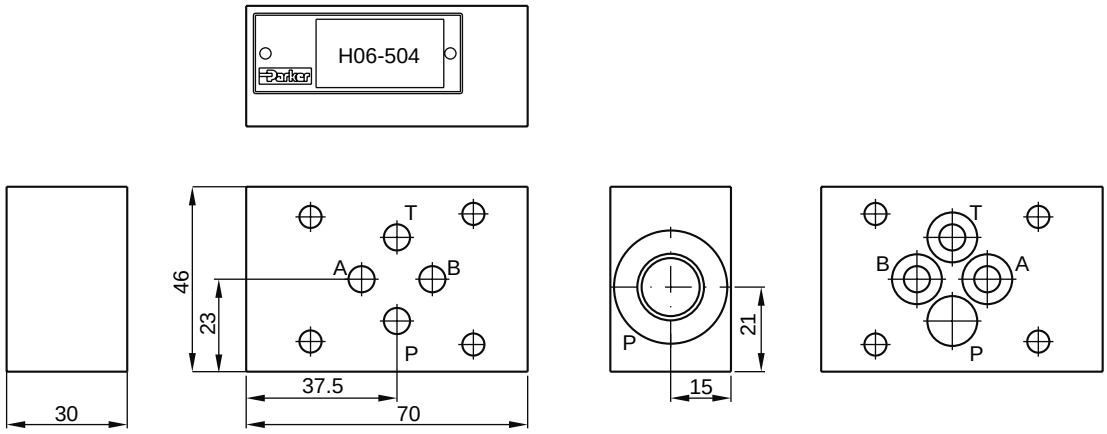
Symbol	Ordering code
	**H06-1044** CETOP 3 (O-rings included in delivery)

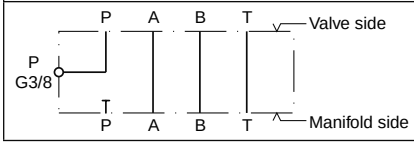
Sandwich plate H06-1039, CETOP 3 / NG06



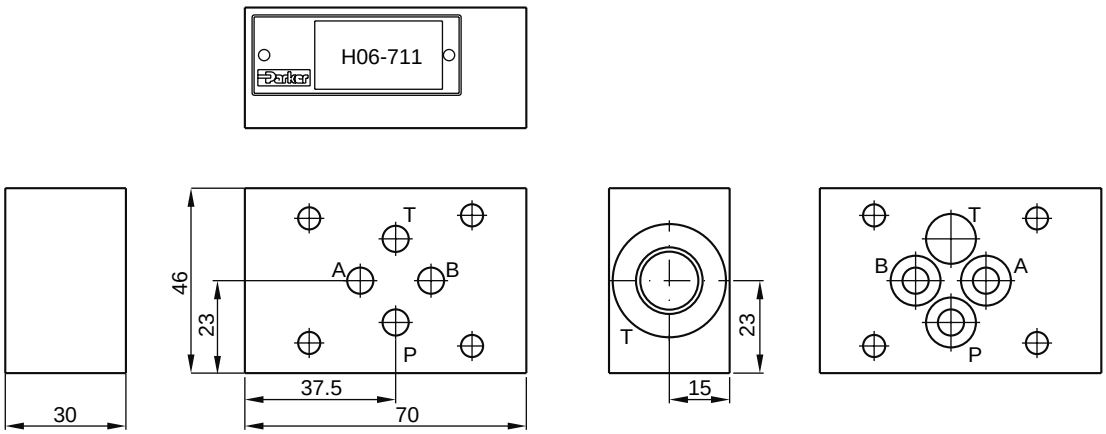
Symbol	Ordering code
	**H06-1039** CETOP 3 (O-rings included in delivery)

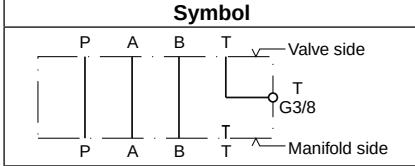
Sandwich plate H06-504, CETOP 3 / NG06



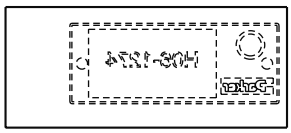
Symbol	Ordering code
	**H06-504** CETOP 3 (O-rings included in delivery)

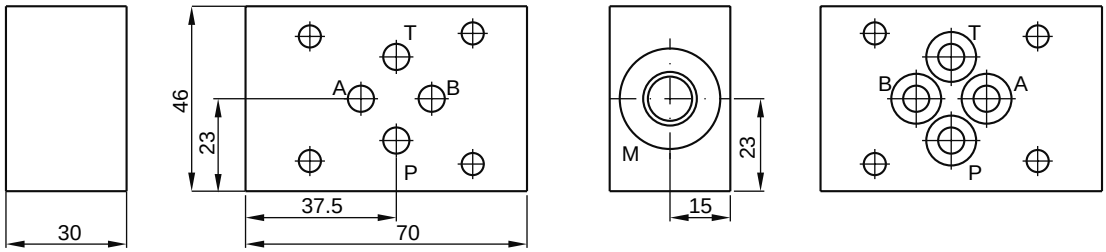
Sandwich plate H06-711, CETOP 3 / NG06

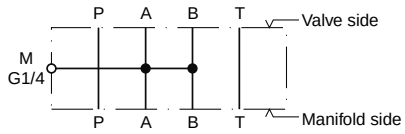


Symbol	Ordering code
	**H06-711** CETOP 3 (O-rings included in delivery)

Sandwich plate H06-1274, CETOP 3 / NG06

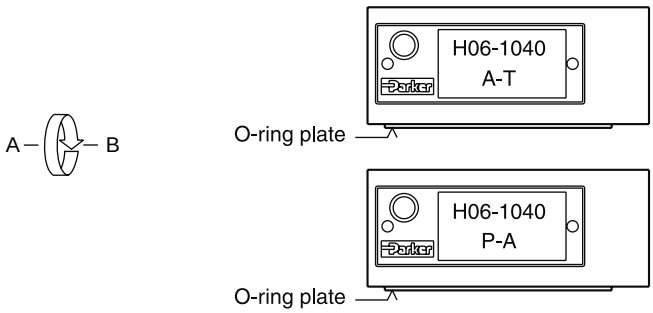


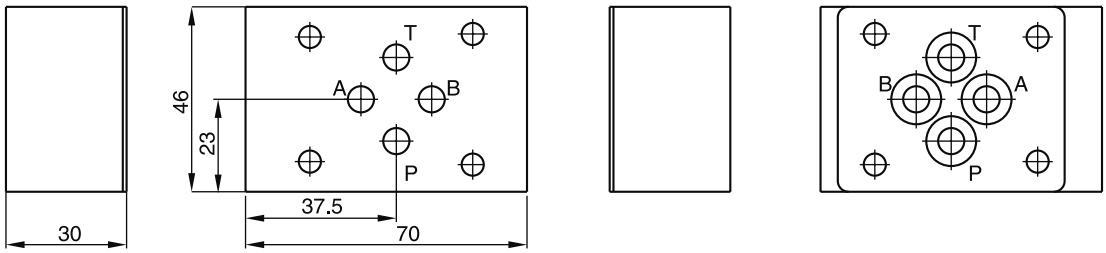


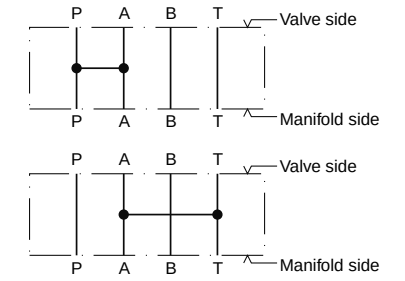
Symbol	Ordering code
	**H06-1274** CETOP 3 (O-rings included in delivery)

Sandwich plate H06-1040, CETOP 3 / NG06

The functional change is achieved by rotating the mounting position of the valve 180° about axis A-B

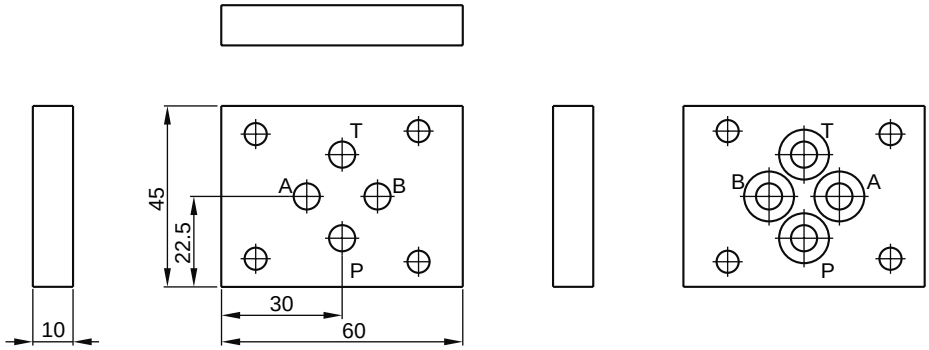


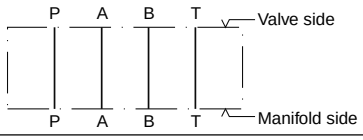


Symbol	Ordering code
	**H06-1040** CETOP 3 (O-rings and O-ring plate included in delivery)

H06.INDD CM 07.09.11

Sandwich plate H06DO-1291, CETOP 3 / NG06



Symbol	Ordering code
	**H06DO-1291** CETOP 3 (O-rings included in delivery)

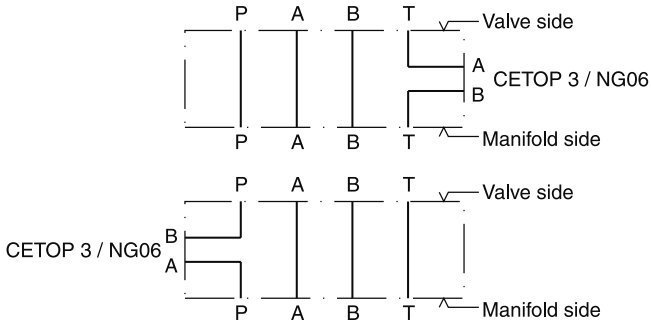
Sandwich plate H06DU-814, CETOP 3 / NG06

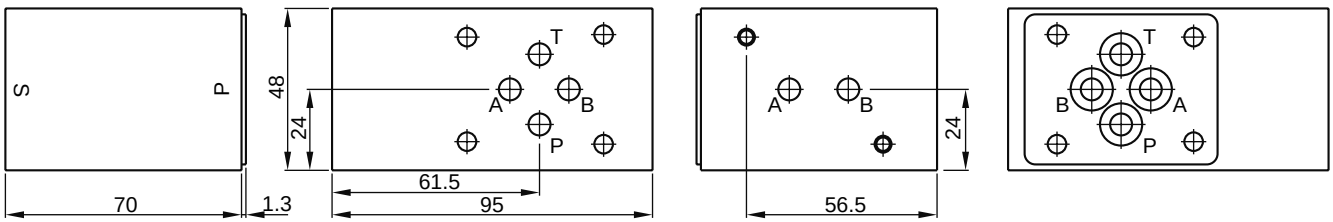
To mount a flow control valve GFG for meter-in (code P) or meter-out (code S) control.

The functional change is achieved by rotating the mounting position of the valve 180° about axis A-B.

For use as secondary control please observe the permitted tank pressure.

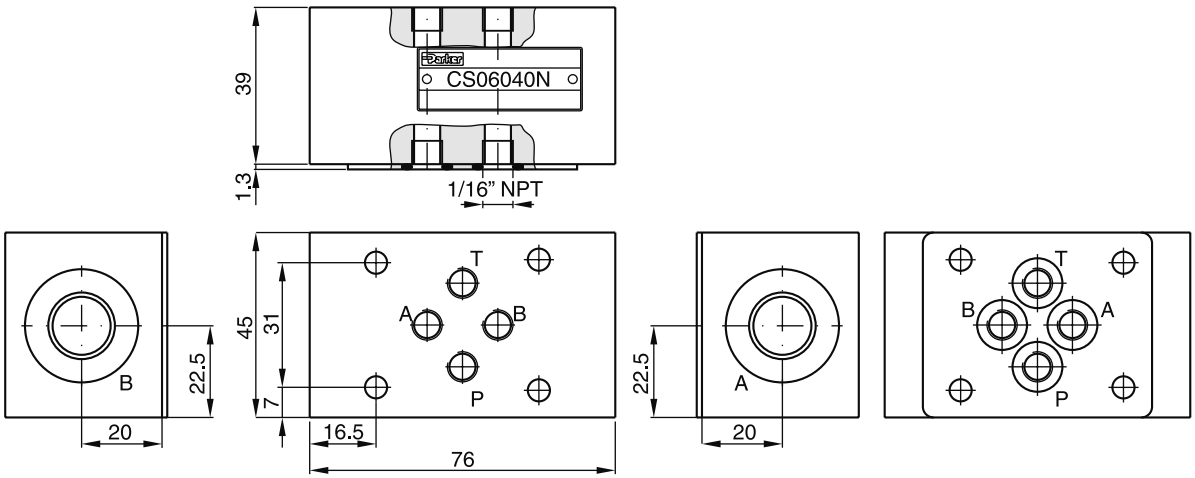
Ordering code
H06DU-814 CETOP 3 (O-rings and O-ring plate included in delivery)



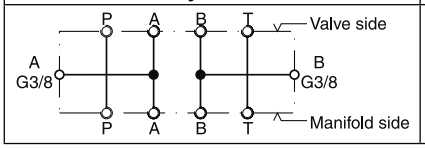


12

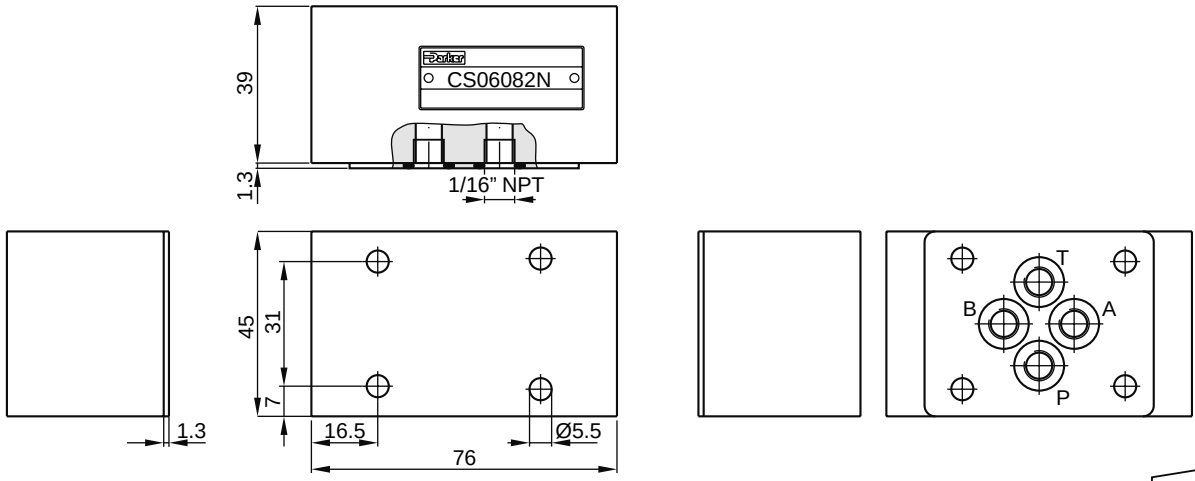
Sandwich plate CS06040N, CETOP 3 / NG06



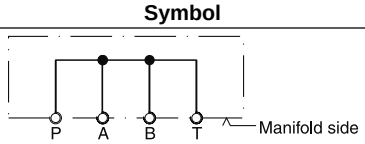
All ports on valve side and manifold side can be equiped with orifices or plugs (1/16 NPT)
For orifice kits see "Accessories" in chapter 8.

Symbol	Ordering code
	**CS06040N** CETOP 3 (O-rings and O-ring plate included in delivery)

Cover plate CS06082N, CETOP 3 / NG06

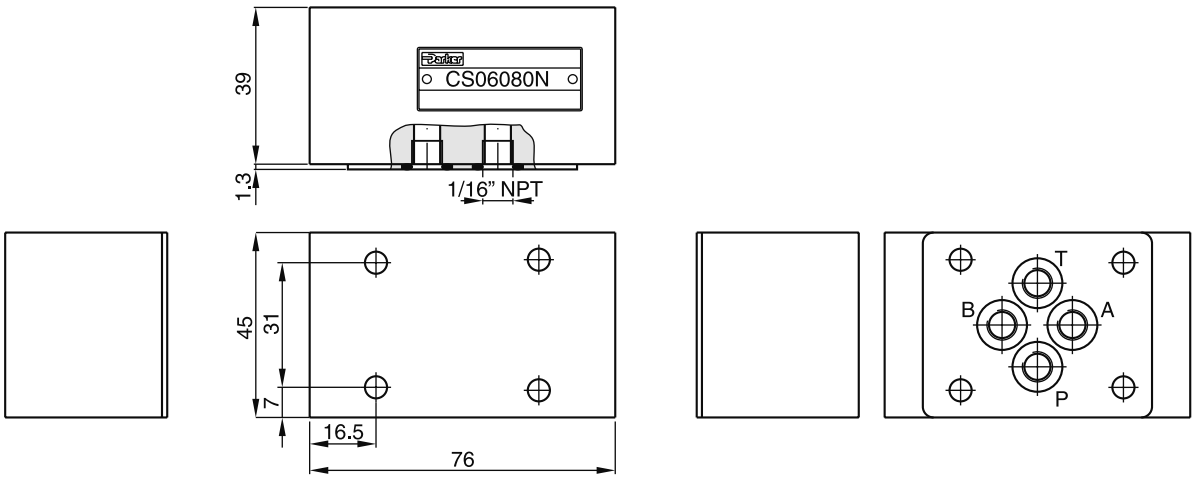


All ports on manifold side can be equiped with orifices or plugs (1/16 NPT)
For orifice kits see "Accessories" in chapter 8.

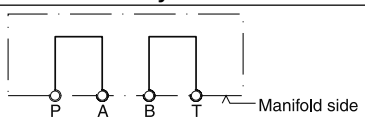
Symbol	Ordering code	Bolt Kit	Bolt dimensions	Torque
	**CS06082N** CETOP 3 (O-rings and O-ring plate included in delivery)	BK 300	4x M5x50	7.6 Nm ±15%

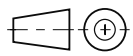
CS.INDD CM 07.09.11

Cover plate CS06080N, CETOP 3 / NG06



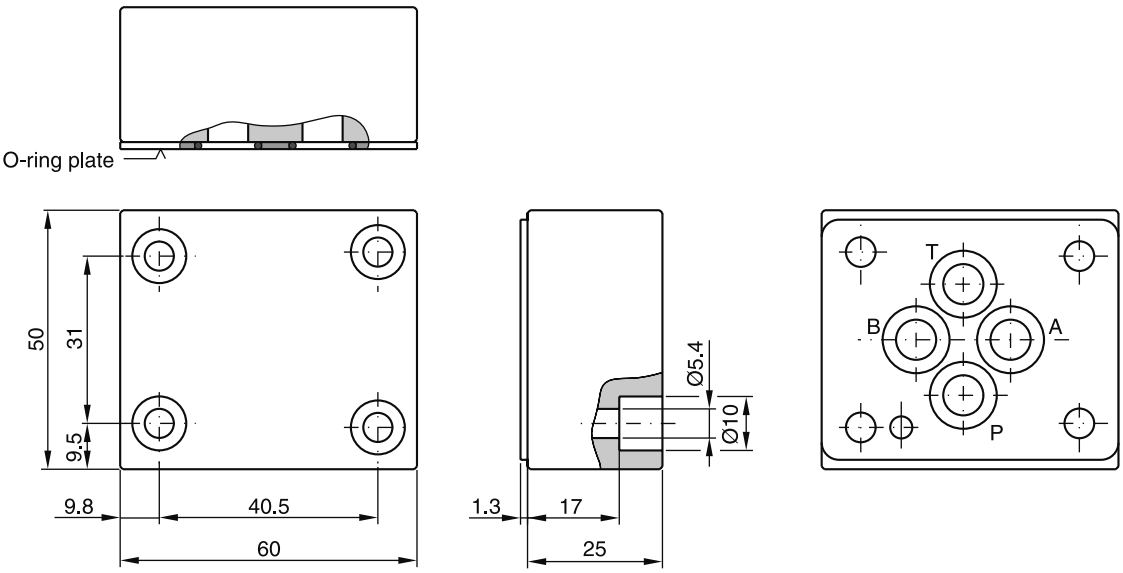
All ports on manifold side can be equiped with orifices or plugs (1/16 NPT)
For orifice kits see "Accessories" in chapter 8.

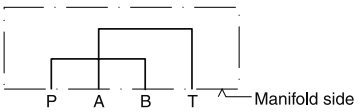
Symbol	Ordering code	Bolt Kit	Bolt dimensions	Torque
	**CS06080N** CETOP 3 (O-rings and O-ring plate included in delivery)	BK 300	4x M5x50	7.6 Nm ±15%



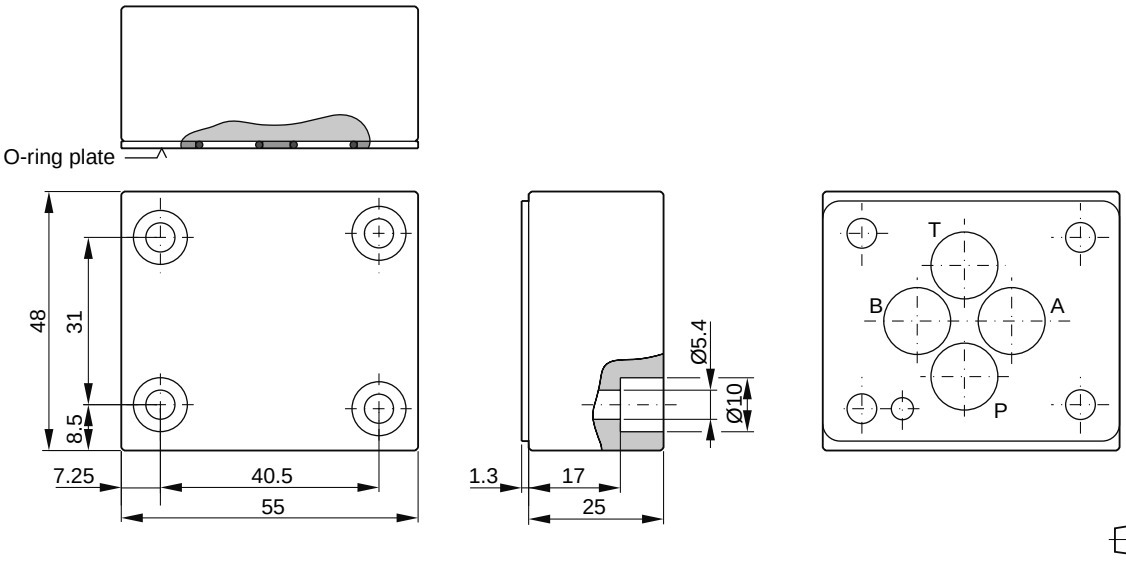
12

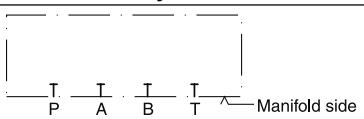
Cover plate D51DC071D, CETOP 3 / NG06



Symbol	Ordering code	Bolt Kit	Bolt dimensions	Torque
	**D51DC071D** CETOP 3 (O-rings and O-ring plate included in delivery)	BK 399	M5x25 DIN 912 12.9	7.6 Nm ±15%

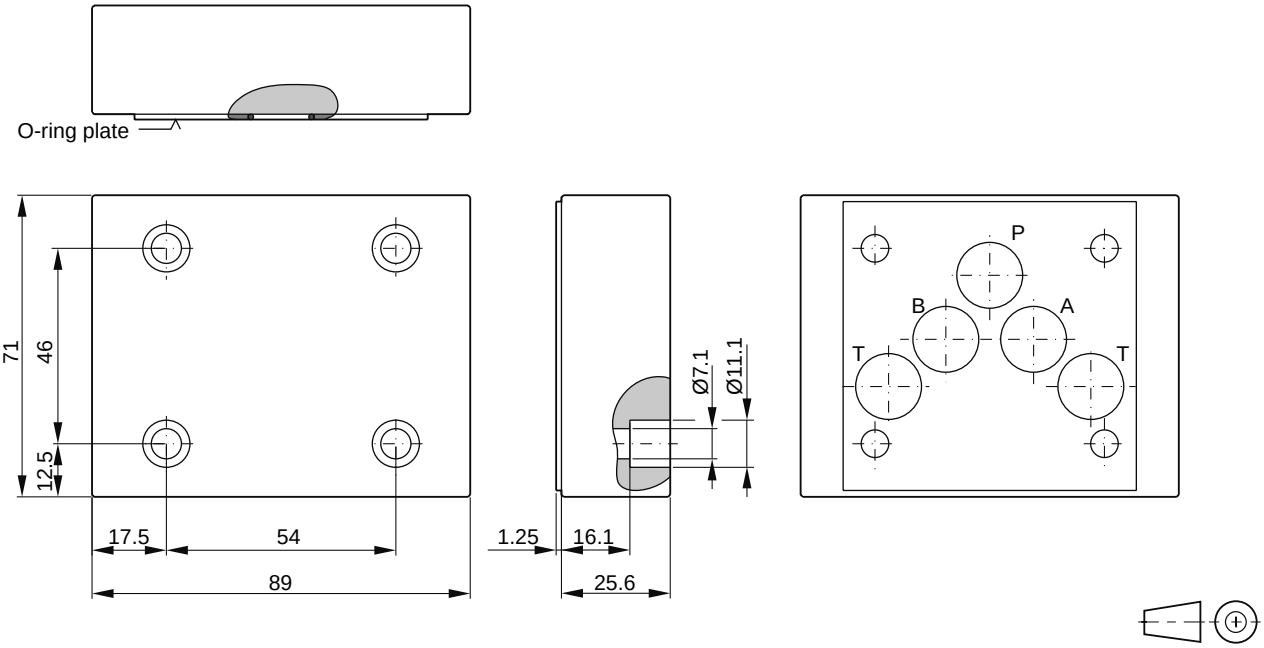
Cover plate D51VP071C, CETOP 3 / NG06

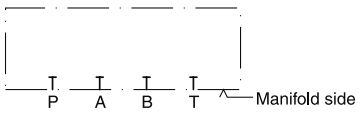


Symbol	Ordering code	Bolt Kit	Bolt dimensions	Torque
	**D51VP071C** CETOP 3 (O-rings and O-ring plate included in delivery)	BK 399	M5x25 DIN 912 12.9	7.6 Nm ±15%

12

Cover plate D51VP101D, CETOP 5 / NG10



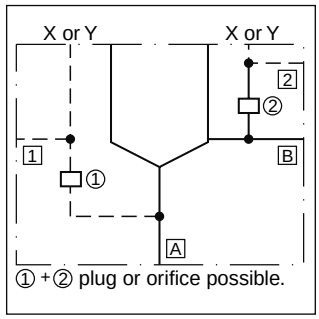
Symbol	Ordering code	Bolt Kit	Bolt dimensions	Torque
	**D51VP101D** CETOP 5 (O-rings and O-ring plate included in delivery)	BK 408	4x M6x25 DIN 912 12.9	13.2 Nm ±15%

12

Cartridge manifold blocks are bodies for 2/2-way slip-in cartridge valves. They are used in systems with only one cartridge valve without the need to design a specific manifold block.

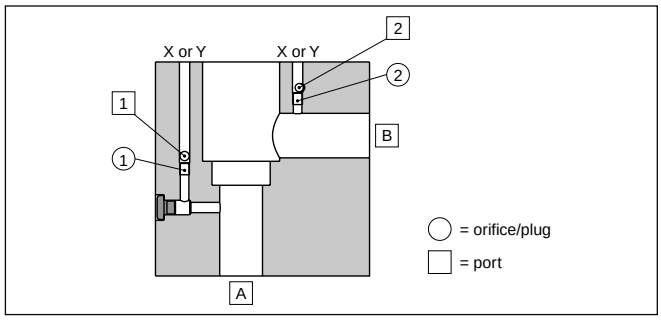
The pilot ports X and Y can either be connected to A and B or vice versa by changing the mounting position of the cartridge cover.

The wide range of Parker slip-in cartridge valves allows to design solutions for all hydraulic requirements.



Features

- Flanges SAE61 or SAE62 respectively CETOP square flange
- 2 options for pilot oil supply and drain
- 7 sizes



Ordering code

CB		A	1		10	W
Cartridge manifold block	Nominal size	Function In - Out	Manifold for 1 cartridge	Flange size	Design series	Without assembly

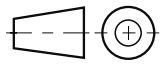
Code	Size
016	NG16
025	NG25
032	NG32
040	NG40
050	NG50
063	NG63
080	NG80

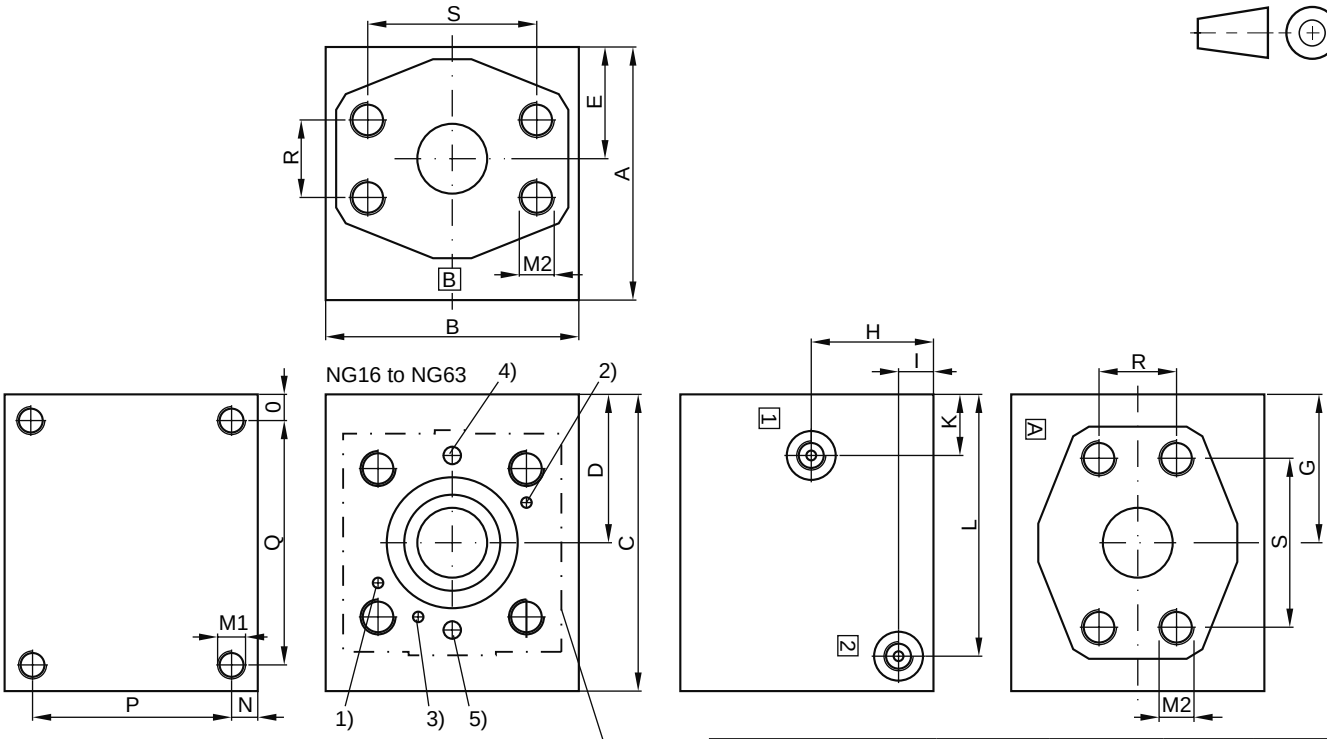
Code	Size	Flange
34	016	1" SAE61
35	025	1 1/4" SAE61
36	032	1 1/2" SAE61
38	040	2" SAE61
310	050	2 1/2" SAE61
312	063	3" SAE61
64	016	1" SAE62
65	025	1 1/4" SAE62
66	032	1 1/2" SAE62
68	040/050	2" SAE62
70	063	3 1/2" PN400
80	080	4" PN400

12

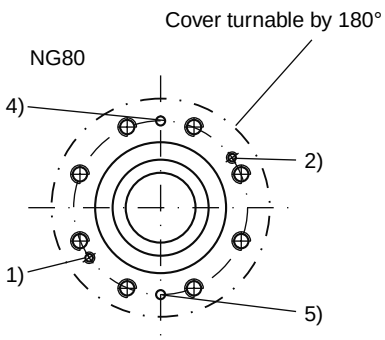
Technical data

Mounting interface		ISO 7368-B*-*-2-A/B
Mounting position		unrestricted
Max. operating pressure	[bar]	138 to 420 (depending on p_{max} of flanges)
Flanges		SAE61 (3000 PSI series), SAE62 (6000 PSI series) ISO 6162, CETOP-square flange (400 bar series)





1) Location pin for X connected to [B] and [2], Y connected to [A] and [1]
2) Location pin for X connected to [A] and [1], Y connected to [B] and [2]
3) Location pin for pressure functions
4) X or Y, orifice/plug ① (connected to [A] and [1])
5) X or Y, orifice/plug ② (connected to [B] and [2])



Ordering code	M1	M2	R	S
CB 016 A 1 34 10 W	M8 x 16	M10x20	26.2	52.4
CB 016 A 1 64 10 W	M8 x 16	M12x19	27.8	57.2
CB 025 A 1 35 10 W	M10 x 18	M10x20	30.2	58.7
CB 025 A 1 65 10 W	M10 x 18	M14x22	31.8	66.6
CB 032 A 1 36 10 W	M16 x 30	M12x24	35.7	69.9
CB 032 A 1 66 10 W	M16 x 30	M16x32	36.5	79.3
CB 040 A 1 38 10 W	M16 x 30	M12x24	42.9	77.8
CB 040 A 1 68 10 W	M16 x 30	M20x40	44.5	96.8
CB 050 A 1 310 10 W	M16 x 30	M12x24	50.8	88.9
CB 050 A 1 68 10 W	M16 x 30	M20x40	44.5	96.8
CB 063 A 1 312 10 W	M16 x 30	M16x30	61.9	106.4
CB 063 A 1 70 10 W	M16 x 30	M20x33	102.5	102.5
CB 080 A 1 80 10 W	M16 x 30	M24x50	113.2	113.2

Ordering code	Max. operating pressure [bar]	A	B	C	D	E	G	H	I	K	L	N	O	P	Q	Port [A] and [B]	Port [1] and [2]	Orifice thread ① and ②	Weight [kg]
CB 016 A 1 34 10 W	350	105	80	105	38.5	34	38.5	45	13	13.5	75.5	10	10	85	85	1“ SAE 61	G1/4	M5	6
CB 016 A 1 64 10 W	420	105	80	105	38.5	34	38.5	45	13	13.5	75.5	10	10	85	85	1“ SAE 62	G1/4	M5	6
CB 025 A 1 35 10 W	280	125	100	125	50	43	50	55	15	17	94.5	10	10	105	105	1-1/4“ SAE 61	G1/4	M6	11
CB 025 A 1 65 10 W	420	125	100	125	50	43	50	55	15	17	94.5	10	10	105	105	1-1/4“ SAE 62	G1/4	M6	11
CB 032 A 1 36 10 W	210	125	125	145	72.5	51	72.5	55	15	31.5	125	15	15	95	115	1-1/2“ SAE 61	G1/4	M6	16
CB 032 A 1 66 10 W	420	125	125	145	72.5	51	72.5	55	15	31.5	125	15	15	95	115	1-1/2“ SAE 62	G1/4	M6	16
CB 040 A 1 38 10 W	210	145	145	170	85	65	85	70	20	35	150	15	15	115	140	2“ SAE 61	G3/8	M8	25
CB 040 A 1 68 10 W	420	145	145	170	85	65	85	70	20	35	150	15	15	115	140	2“ SAE 62	G3/8	M8	25
CB 050 A 1 310 10 W	172	155	155	190	95	70	95	70	20	37	170	15	15	125	160	2-1/2“ SAE 61	G3/8	M8	32
CB 050 A 1 68 10 W	420	155	155	190	95	70	95	70	20	37	170	15	15	125	160	2“ SAE 62	G3/8	M8	32
CB 063 A 1 312 10 W	138	192	192	240	120	86.5	120	86.5	20	45	220	15	15	165	210	3“ SAE 61	G3/8	M8	63
CB 063 A 1 70 10 W	400	192	192	240	120	86.5	120	86.5	20	45	220	15	15	162	210	3-1/2“ PN 400	G3/8	M8	63
CB 080 A 1 80 10 W	400	270	270	270	135	120	135	120	20	35	250	15	15	240	240	4“ PN 400	G3/8	M8	139

Cartridge manifold blocks are supplied with a set of plugs and orifices

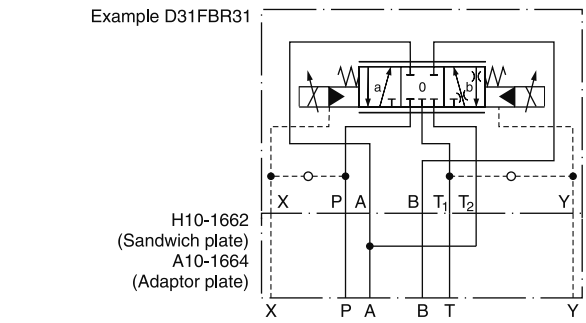
Valves with new compact and energy saving designs are shown in chapters 2 and 3. For NG10 an adaptor plate (A10) or a sandwich plate (H10) is needed to achieve a regenerative or hybrid function.

D31NWR D31FER
D31FBR D31FPR

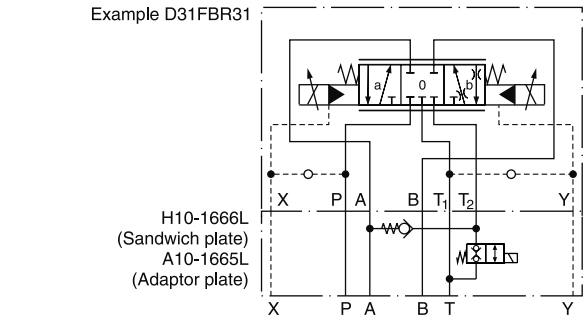
Features

- The valves comes without tank bridge and are shown in chapter 2 and 3 in Series D31NW/D31FB/D31FE and D31FP.
- Port T1 is used as single tank port of the valves. Port T2 is separated from port T1 and is used for re-generation into the A port.
- The circuit conception can be integrated into the manifold block.

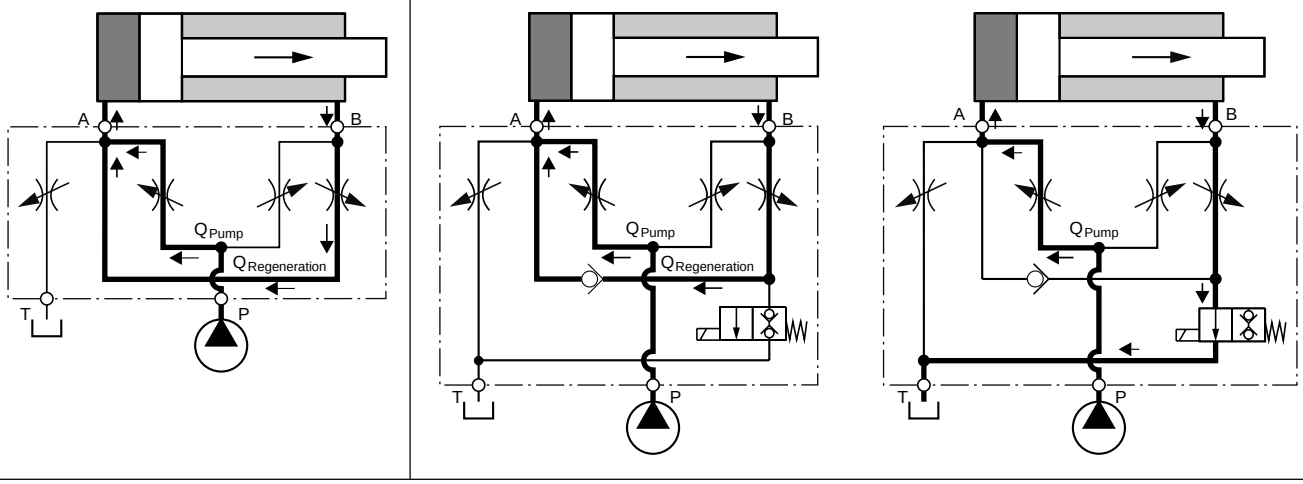
Regenerative function



Hybrid function



Regenerative function	Hybrid function



NEW Energy saving A-regeneration and switchable hybrid version for NG10 valves

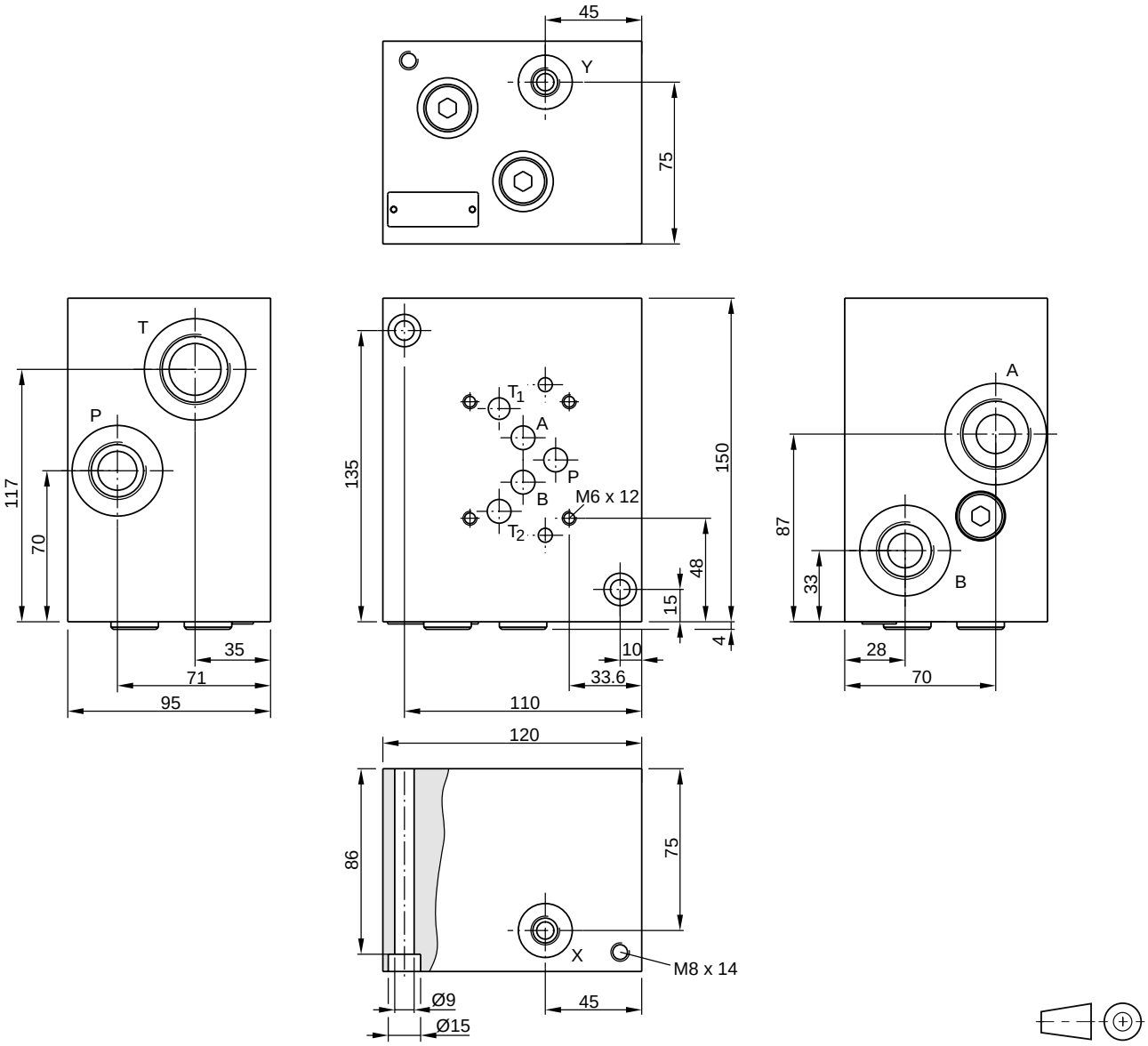
12

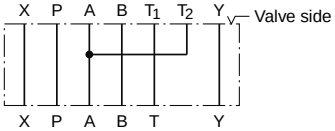
General						
Actuation			Solenoid (only A10-1665L and H10-1666L)			
Size			DIN NG10 / CETOP 05			
Mounting interface			DIN 24340 A10 / ISO 4401 / CETOP RP 121-H / NFPA D05			
Mounting position			unrestricted			
Ambient temperature		[°C]	-25...+50			
$MTTF_D$ value		[years]	150			
			A10-1664	A10-1665L	H10-1662	H10-1666L
Weight		[kg]	11.9	14.4	2.8	4.9
Hydraulic						
Ma. Operating pressure		[bar]	350			
Fluid			Hydraulic oil in accordance with DIN 51524 / 51525			
Fluid temperature		[°C]	-25 ... +70			
Viscosity	permitted	[cSt] / [mm²/s]	2.8...400			
	recommended	[cSt] / [mm²/s]	30...80			
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)			
			A10*		H10*	
Flow max.		[l/min]	150		250	
	Regeneration B-A	[l/min]	see diagram			
	Regeneration B-T	[l/min]	75		75	
Electrical characteristics						
Duty ratio			100%			
Protection class			IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
Supply vltage		[V]	24			
Tolerance supply voltage		[%]	±10			
Current consumption		[A]	1.21			
Power consumption		[W]	29			
Solenoid connection			Connector as per EN 175301-803			
Wiring min.		[mm²]	3 x 1.5 recommended			
Wiring length max.		[m]	50 recommended			

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

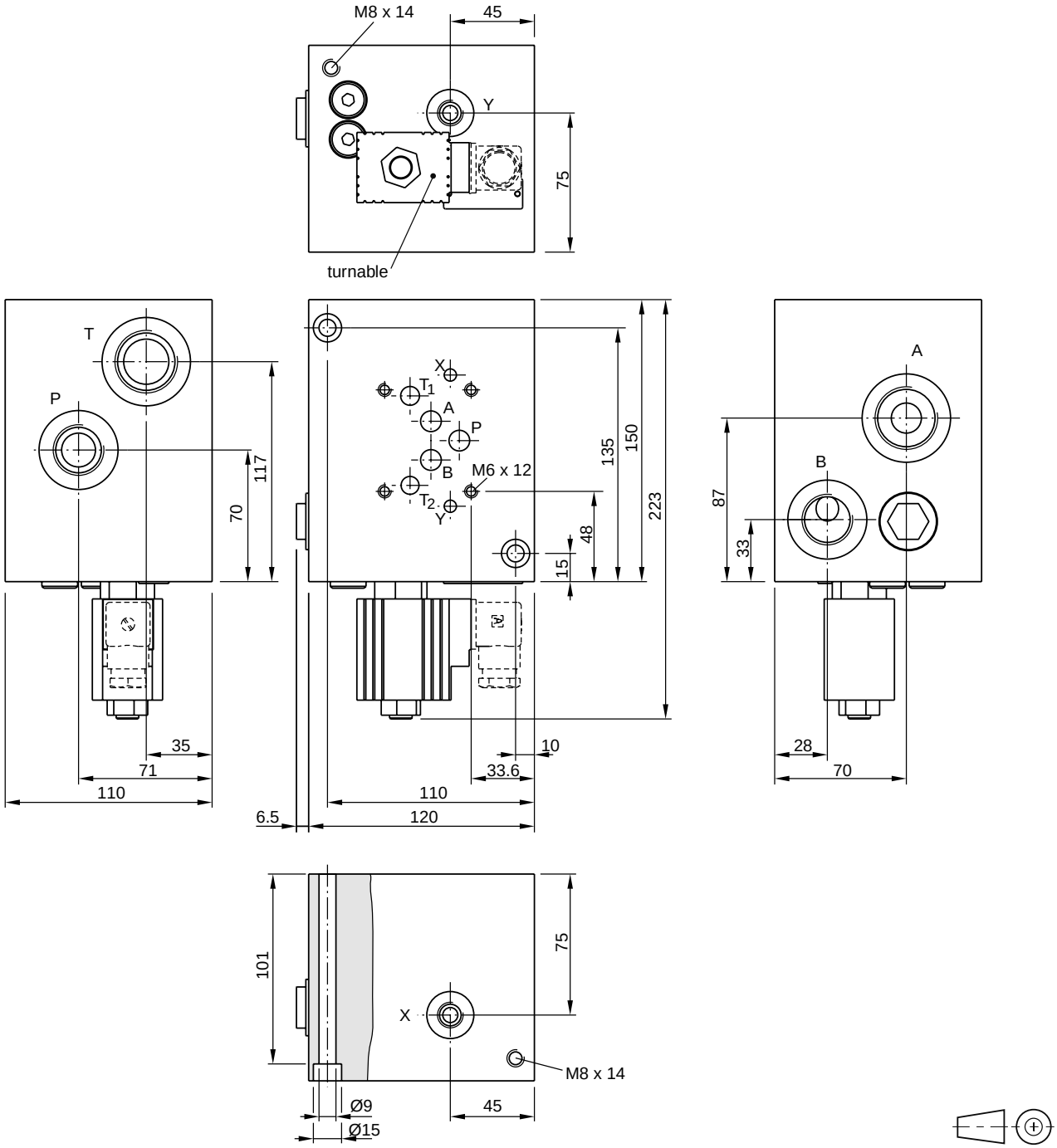
12

Adaptor plate A10-1664, Mounting interface acc. DIN 24340-A10, CETOP 05 / NG10
for A-regeneration

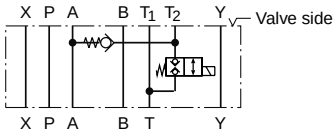


Symbol	Ordering code	Port
	**A10-1664** CETOP 05	A, T = G1 B, P = G¾ X, Y = G¼

Adaptor plate A10-1665L, Mounting interface acc. DIN 24340-A10, CETOP 05 / NG10 for hybrid function



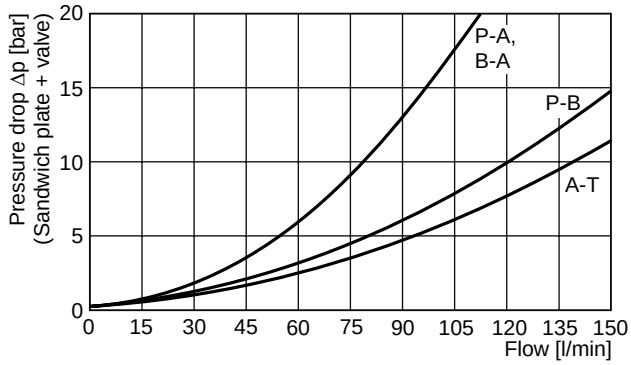
12

Symbol	Ordering code	Port	Kit
	**A10-1665L** CETOP 05	A, T = G1 B, P = G¾ X, Y = G¼	NBR: SK-A10-1665

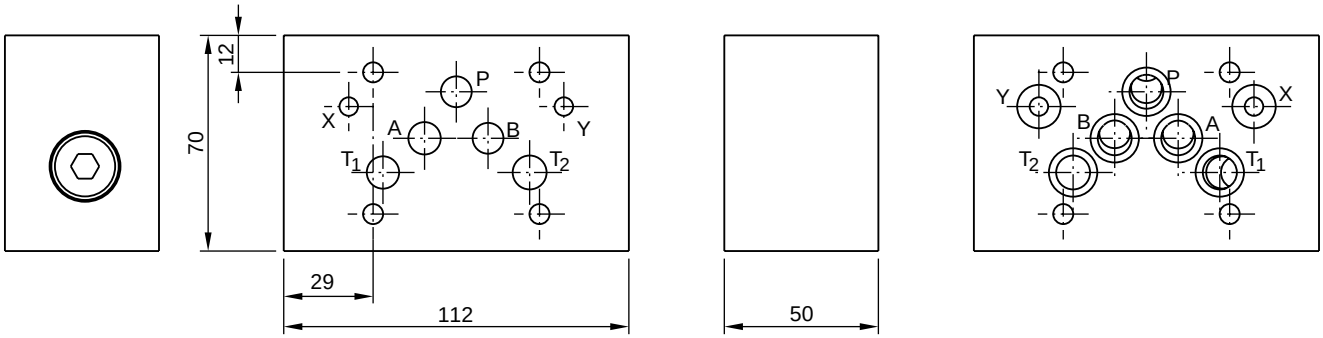
Sandwich plate H10-1662, Mounting interface acc. DIN 24340-A10, CETOP 05 / NG10 for A-regeneration

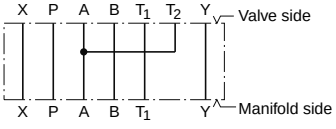
p/Q performance Curves

D31FP/FE/FB*



measured with spool Z31 at command signal 100%.

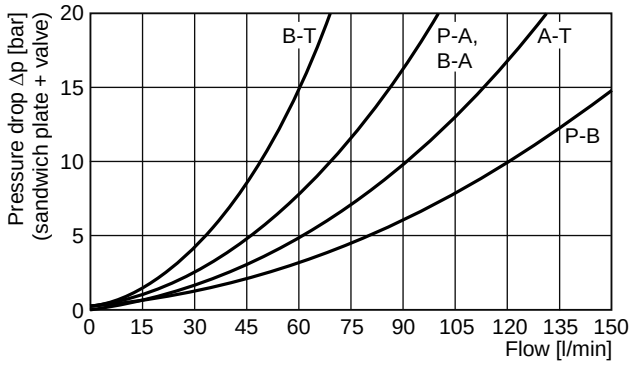


Symbol	Ordering code	Kit		Torque	Kit
	**H10-1662** CETOP 05 (O-rings included in delivery)	BK412	4x M6x90 DIN 912 12.9	13.2 Nm ±15%	NBR: SK-H10-1662

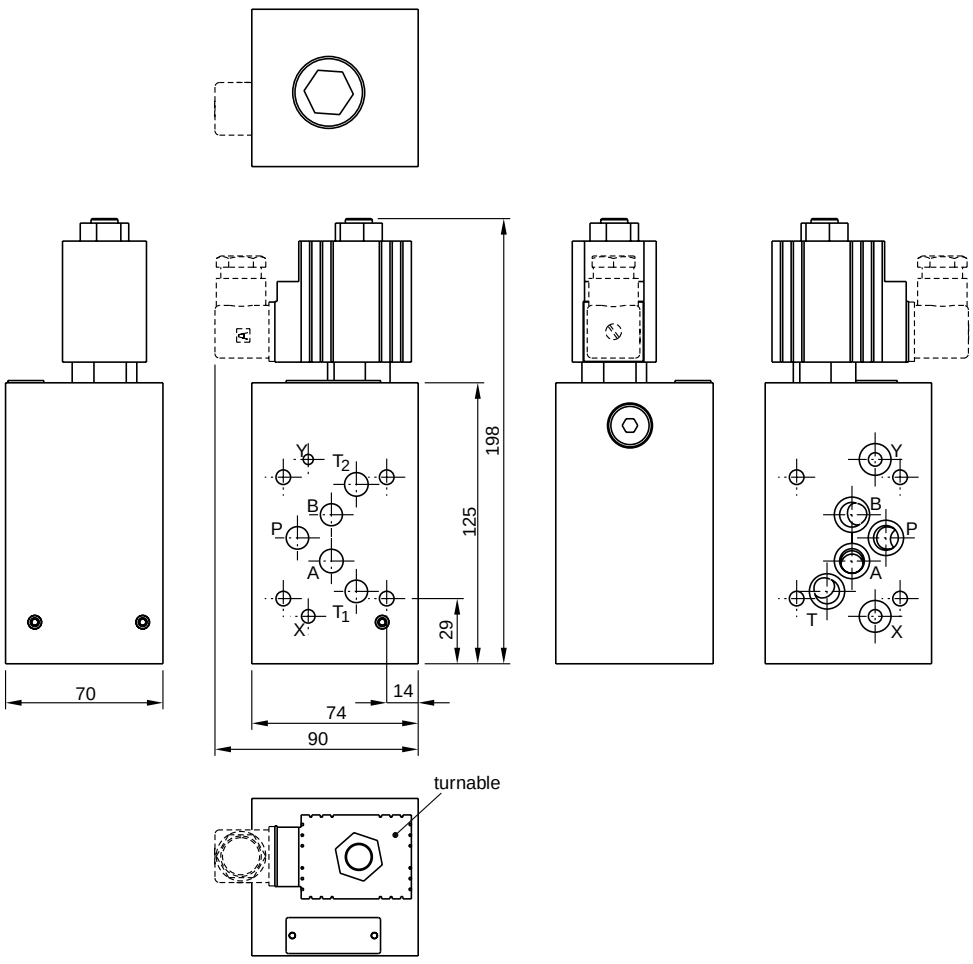
Sandwich plate H10-1666L, Mounting interface acc. DIN 24340-A10, CETOP 05 / NG10 for hybrid function

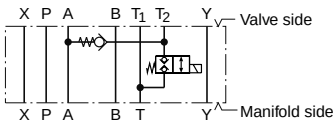
p/Q performance Curves

D31FP/FE/FB*



measured with spool Z31 at command signal 100%.



Symbol	Ordering code	Kit		Torque	Kit
	**H10-1666L** CETOP 05 (O-rings included in delivery)	BK528	4x M6x110 DIN 912 12.9	13.2 Nm ±15%	NBR: SK-H10-1666

H10 UK.INDD CM 05.08.11

BK bolt kits

Socket head cap screws as per DIN 912-12.9

Ordering code	Description
BK 399	**Bolt kit M5x25**
BK 375	**Bolt kit M5x30**
BK 443	**Bolt kit M5x45**
BK 300	**Bolt kit M5x50**
BK 380	**Bolt kit M5x60**
BK 421	**Bolt kit M5x65**
BK 400	**Bolt kit M5x70**
BK 401	**Bolt kit M5x75**
BK 402	**Bolt kit M5x80**
BK 444	Bolt kit M5x85
BK 471	Bolt kit M5x85
BK 403	**Bolt kit M5x90**
BK 468	Bolt kit M5x95
BK 404	**Bolt kit M5x100**
BK 466	Bolt kit M5x100 2 pcs.
BK 405	**Bolt kit M5x110**
BK 406	**Bolt kit M5x115**
BK 424	**Bolt kit M5x130**
BK 408	**Bolt kit M6x25**
BK 385	**Bolt kit M6x40**
BK 310	**Bolt kit M6x55**
BK 422	Bolt kit M6x75
BK 412	**Bolt kit M6x90**
BK 508	Bolt kit M6x100
BK 311	**Bolt kit M6x105**
BK 528	**Bolt kit M6x110**
BK 414	**Bolt kit M8x40**
BK 441	Bolt kit M8x50
BK 510	Bolt kit M8x100
BK 505	Bolt kit M10x35
BK 388	**Bolt kit M10x40**
BK 485	**Bolt kit M10x45**
BK 506	Bolt kit M10x45 6 pcs.
BK 389	**Bolt kit M10x50**
BK 390	**Bolt kit M10x50 6 pcs.**
BK 320	**Bolt kit M10x60 4 pcs. / M6x55 2 pcs.**
BK 484	**Bolt kit M10x65**
BK 395	**Bolt kit M10x100**
BK 521	Bolt kit M10x120 4 pcs. / M6x120 2 pcs.
BK 494	Bolt kit M12x45
BK 391	**Bolt kit M12x50**
BK 486	Bolt kit M12x70
BK 525	Bolt kit M12x75
BK 504	Bolt kit M12x100
BK 360	**Bolt kit M12x75 6 pcs.**
BK 522	Bolt kit M12x140 6 pcs.
BK 460	Bolt kit M12x145 6 pcs.
BK 415	**Bolt kit M16x55**
BK 366	Bolt kit M16x70
BK 526	Bolt kit M16x80
BK 511	Bolt kit M16x90
BK 487	Bolt kit M16x110
BK 512	Bolt kit M16x150
BK 529	Bolt kit M16x100

Ordering code	Description
BK 507	Bolt kit M18x75
BK416	Bolt kit M20x70
BK 417	Bolt kit M20x75
BK 527	Bolt kit M20x80
BK 386	Bolt kit M20x90 6 pcs.
BK 481	Bolt kit M20x110
BK 513	Bolt kit M20x120
BK 514	Bolt kit M20x150
BK 515	Bolt kit M20x160
BK419	Bolt kit M24x120 8 pcs.
BK 516	Bolt kit M24x150 8 pcs.
BK 530	Bolt kit M24x160 8 pcs.
BK418	Bolt kit M30x100
BK509	Bolt kit M30x130 8 pcs.
BK 420	Bolt kit M30x140 8 pcs.
BK 520	Bolt kit M30x150
BK 517	Bolt kit M30x150 8 pcs.
BK 518	Bolt kit M30x160
BK 519	Bolt kit M30x180

If no other specification is indicated. 1 bolt kit contains 4 screws.

Thread length

Threads	M5	M6	M10	M12
Thread length	1.5 x Ø thread			

Note

The torque for bolt kits or tie rod kits is according to valve type/product. Consult product chapters.

Torque for plugs

(Angaben ±15 %) [1)]

Metric	[Nm]
M10 x 1	15
M12 x 1.5	25
M14 x 1.5	25
M18 x 1.5	40
M20 x 1.5	50
M22 x 1.5	60
M24 x 1.5	65
M27 x 2	90
M33 x 2	140
M42 x 2	240
M48 x 2	300

BSPP	[Nm]
1/8	15
1/4	25
3/8	40
1/2	60
3/4	90
1	140
1 1/4	240
1 1/2	300
2	550

UNF	[Nm]
5/16	6.9
3/8	6.9
7/16	25
1/2	25
9/16	40
3/4	40
7/8	60
1 1/16	90
1 3/16	140
1 5/16	240
1 5/8	300

[1)] The tightening torques refer to counter material steel, cast iron and SG iron by useage of impact wrenchs (with torsion bar) and impulse tools. The plugs have to be screwed in slightly oiled in bodys respectively blocks.
For aluminium plugs the specified torque above has to be reduced to one third.
For aluminium blocks should be used 75% of specified above.

Bold letters =
Short-term availability

TK tie rod kits

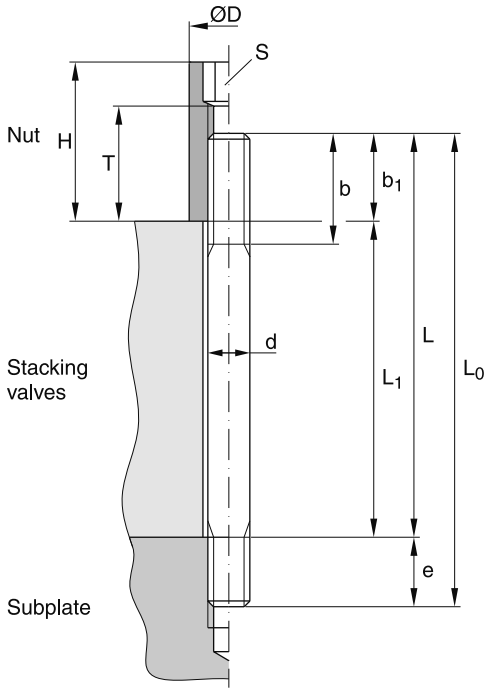
Tie rod kits as per DIN 835-10.9

Ordering code	Description	recommended stacking length	
		min.	max.
TK 1455	**Tie rod kit M5x70**	**56**	**62**
TK 1482	**Tie rod kit M5x80**	**66**	**72**
TK 1453	Tie rod kit M5x90	76	82
TK 1484	**Tie rod kit M5x100**	**86**	**92**
TK 1446	**Tie rod kit M5x110**	**96**	**102**
TK 1473	**Tie rod kit M5x120**	**106**	**112**
TK 1474	**Tie rod kit M5x130**	**112**	**122**
TK 1405	**Tie rod kit M5x140**	**122**	**132**
TK 1450	**Tie rod kit M5x150**	**132**	**142**
TK 1409	**Tie rod kit M5x160**	**142**	**152**
TK 1411	**Tie rod kit M5x170**	**152**	**162**
TK 1454	**Tie rod kit M5x180**	**162**	**172**
TK 1415	**Tie rod kit M5x190**	**172**	**182**
TK 1416	**Tie rod kit M5x200**	**182**	**192**
TK 1475	**Tie rod kit M5x210**	**192**	**202**
TK 1407	Tie rod kit M5x220	202	212
TK 1413	Tie rod kit M5x230	212	222
TK 1434	Tie rod kit M5x240	222	232
TK 1436	Tie rod kit M5x250	232	242
TK 1438	Tie rod kit M5x260	242	252
TK 1476	Tie rod kit M5x270	252	262
TK 1485	Tie rod kit M6x80	66	71
TK 1486	**Tie rod kit M6x90**	**76**	**81**
TK 1487	**Tie rod kit M6x100**	**86**	**91**
TK 1418	**Tie rod kit M6x110**	**96**	**101**
TK 1488	Tie rod kit M6x120	106	111
TK 1489	**Tie rod kit M6x130**	**112**	**121**
TK 1490	**Tie rod kit M6x140**	**122**	**131**
TK 1422	**Tie rod kit M6x150**	**132**	**141**
TK 1491	**Tie rod kit M6x160**	**142**	**151**
TK 1423	**Tie rod kit M6x170**	**152**	**161**
TK 1492	**Tie rod kit M6x180**	**162**	**171**
TK 1493	**Tie rod kit M6x190**	**172**	**181**
TK 1427	**Tie rod kit M6x200**	**182**	**191**
TK 1494	**Tie rod kit M6x210**	**192**	**201**
TK 1428	Tie rod kit M6x220	202	211
TK 1460	Tie rod kit M6x230	212	221
TK 1495	Tie rod kit M6x240	222	231
TK 1432	Tie rod kit M6x250	232	241
TK 1496	**Tie rod kit M6x260**	**242**	**251**
TK 1497	Tie rod kit M6x270	252	261
TK 1469	Tie rod kit 4 x M10x170 / 2 x M6x170	152	155
TK 1478	Tie rod kit 4 x M10x190 / 2 x M6x190	172	175
TK 1470	Tie rod kit 4 x M10x220 / 2 x M6x220	202	205
TK 1479	Tie rod kit 4 x M10x250 / 2 x M6x250	232	235

TK-M5 NUT	Nut M5 (10 pcs.)
TK-M6 NUT	Nut M6 (10 pcs.)
TK-M10 NUT	Nut M10 (10 pcs.)

If no other specification is indicated. 1 tie rod kit contains 4 bolts and 4 nuts.

$b_1 \geq 1.5d$
$b_1 < b$
$b_1 < T$



d	D	S	H	T	e	b 1)	b 2)	b 3)
M5	9	5	25	20	10	16	22	22
M6	10	6	25	20	12	18	24	24
M10	17	10	25	15	15	26	32	45

b 1) $L \leq 120$ mm
b 2) 130 mm $\leq L \leq$ 200 mm
b 3) 200 mm $< L$

Example:

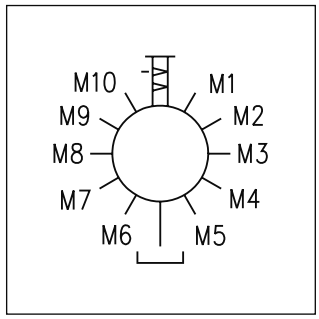
TK1411: M5 x 170 DIN835 =
nominal stud length L = 170mm.
stacking length L_1 = 160mm
total stud length L_0 = 180mm

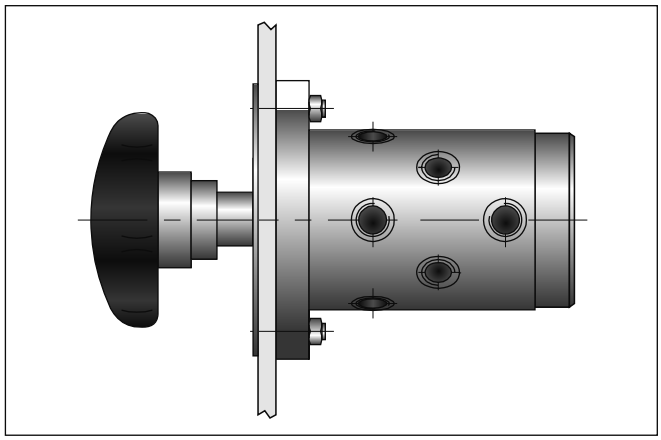
Note

The torque for bolt kits or tie rod kits is according to valve type/product. Consult product chapters.

Bold letters =
Short-term availability

By using the pressure gauge selector valve in hydraulic systems, up to 5 or 10 measuring points can be connected to one pressure gauge. When measuring is completed, the gauge is pressure-relieved to prevent it from being damaged by pressure surges. The accuracy and life of the pressure gauge are thus increased considerably.





Design

Pressure gauge selector valve with locking, pressure-relieving piston. Measuring point selection by marked rotary handle and graduated dial.

Function

To select one of the measuring points from 1 to 5 or 1 to 10, the rotary handle is pulled out fully, and turned to the left or right. When the measuring point is selected by means of the handle marking and the dial, the handle is pushed in and the pressure gauge loaded with the pressure present. The piston is locked in the measuring position by a catch. When measuring is completed, the handle is pulled out, to relieve the pressure gauge via the drain line.

Features

- 5 or 10 measuring positions optional
- Extends the service life of the manometer by unloading the pressure.

Ordering code

WM		A	
Pressure gauge selector valve	Measuring points	Design	Design series

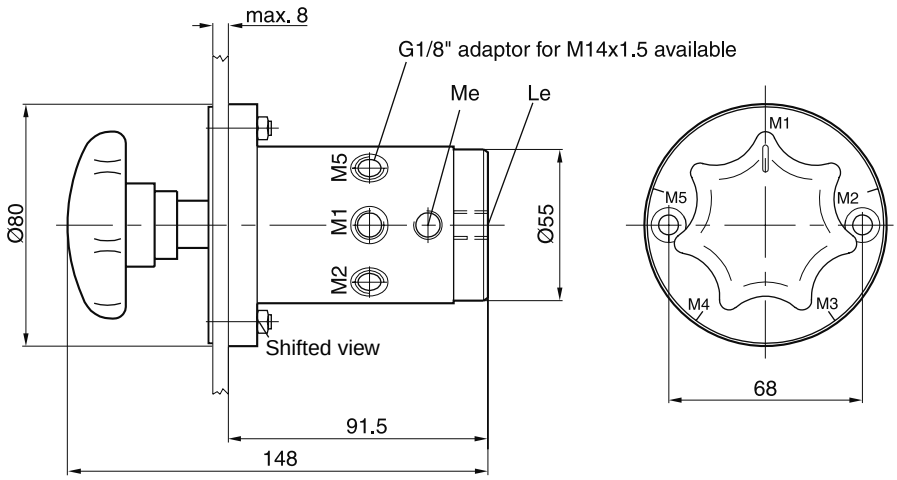
Code	Measuring
5	**5 points**
10	**10 points**

Bold letters =
Short-term availability

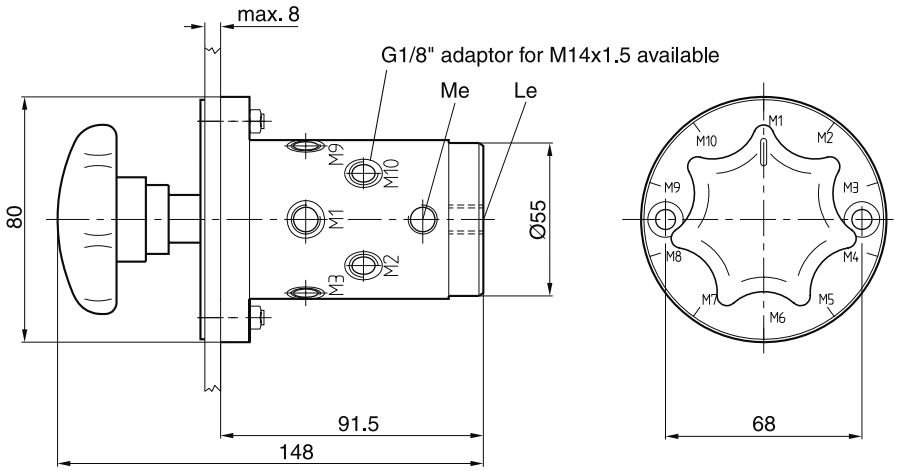
Technical data

General		
Mounting position		unrestricted
Mounting		panel mounted
Connections		G1/8
Operation		by hand
Seals		fluorocarbon
Measuring position selection		by turning handle
Weight	[kg]	1.8
Max. operating pressure	[bar]	315
Viscosity range	[cSt]/[mm²/s]	12...230
Max. pressure in drain port Le	[bar]	1.0

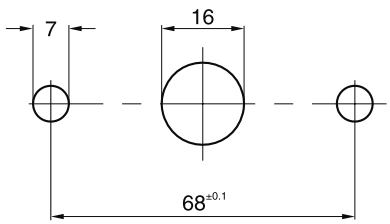
WM 5 A *



WM 10 A *

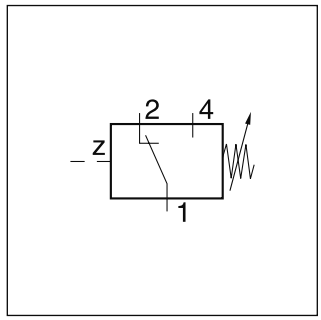


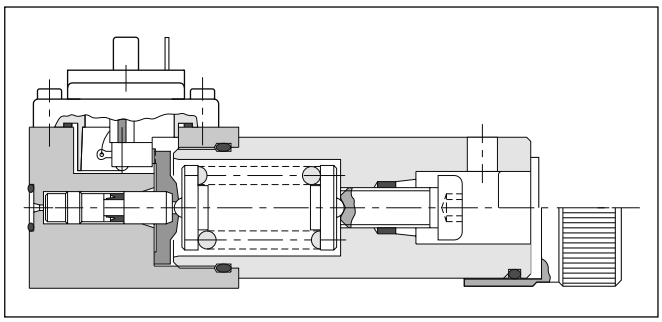
Mounting opening



12

The electro-hydraulic pressure switch provides an electric signal when the sensed pressure goes above or below the selected setting.





Function

The spring loaded piston is hydraulically dampened. The PSB provides a very accurate hysteresis between the switching points (see diagram).

The required operating pressure is adjusted by the set-screw. Unauthorised adjustments can be prevented by the optional cylinder lock. The electric element is a micro switch with snap-action contact. Three terminals permit application as "On", "Off" or "Changeover" switch.

The electrical connection is made with a 3-pole plug-in connector to EN 175301-803 with ground.

Note

For inductive DC loads a spark discharger should be used to increase service life.

Features

- Flange or pipe mounting
- 4 pressure ranges
- Can be used as opener or closer
- Cylinder lock optional

Ordering Code

PSB	□	□	□	□	□	□
Pressure switch with manual switching point adjustment	**Switching pressure range**	**Adjustment**	**Connection**	**Seal**	**Design series** (not required for ordering)	**Lock**

Code	Switching pressure range
040	**3 to 40 bar**
100	**10 to 100 bar**
160	**10 to 160 bar**
250	**20 to 250 bar**

Code	Adjustment
A	**Hexagon socket**
S	Knob with scale

Code	Connection
F1	**Flange (front face)**
V1	**Fitting (front face, tube Ø6)**

Code	Lock
–	**without lock**
Z	Cylinder lock (not for scale knob)

Code	Seal
A	**NBR**
1	FPM

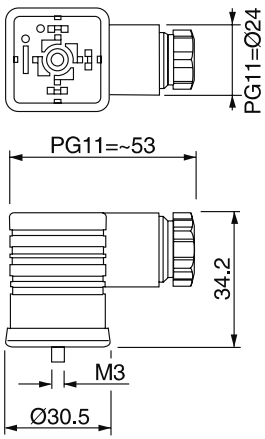
Bold letters =
Short-term availability

Technical data

General		
Symbol		DIN 24340
Design		plunger type switch
Mounting		PSB*F1* flange (front face)
		PSB*V1 pipe mounting
Mounting position		as desired
Weight	[kg]	1.0
Operating pressure	[bar]	to 315
Actuating pressure difference		see diagram
Duty cycle		max. 1/s
Fluid		Hydraulic oil according to DIN51524...51525
Temperature range	[°C]	-20...80
Viscosity range	[mm²/s]	12...400
Filtration		ISO 4406 (1999) 18/16/13
Electrical connection		plug-in connector to EN 175301-803
Insulation		IP65 as per EN 60529 (with correctly mounted plug-in connector)
Contact load carrying capacity		5A at 250VAC; 1A at 50VDC; 0.2A at 250VDC

Plug EN 175301-803

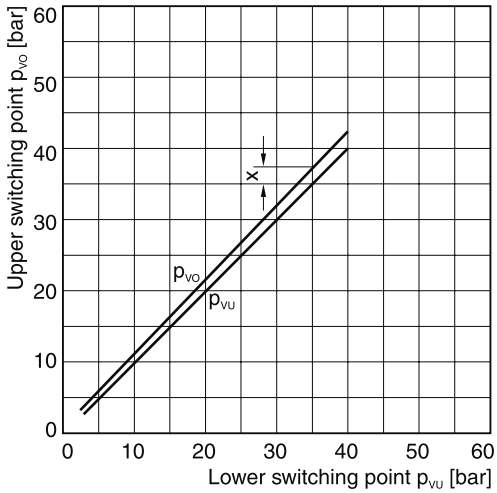
Description	Threaded cable joint	Ordering code
Plug EN 175301-803, design type AF, protection class IP 65	PG11	**HR 21500157**
Plug with LED, 12...230V AC/DC, protection class IP 65	PG11	**HR 21502321**



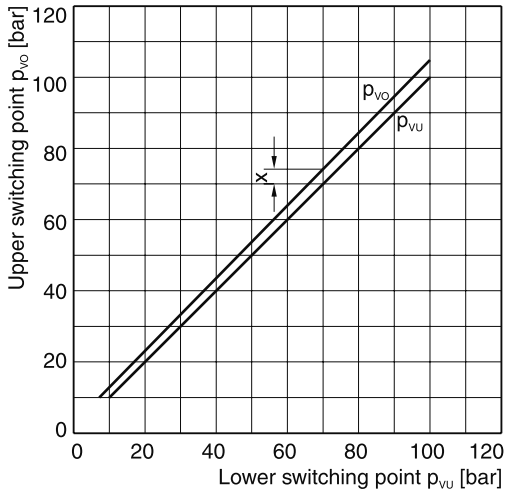
12

Switching pressure difference

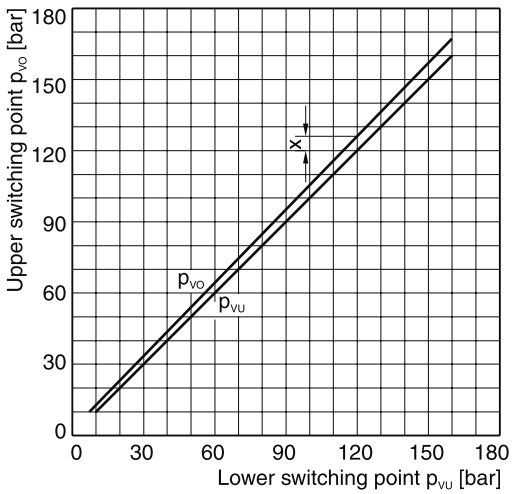
PSB040



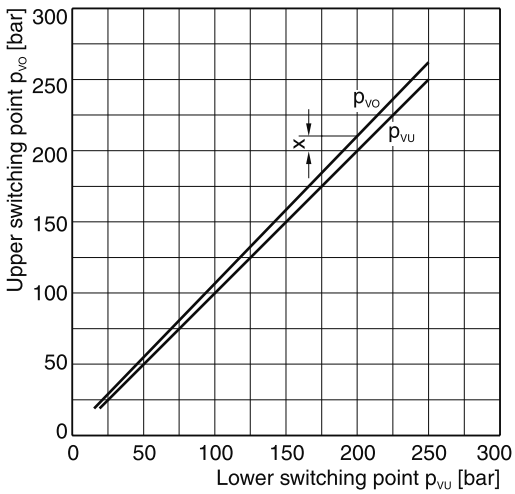
PSB100



PSB160



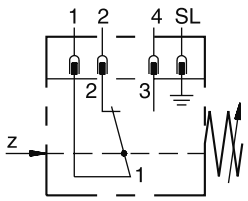
PSB250



X = switching differential

All characteristic curves measured with HLP46 at 50°C.

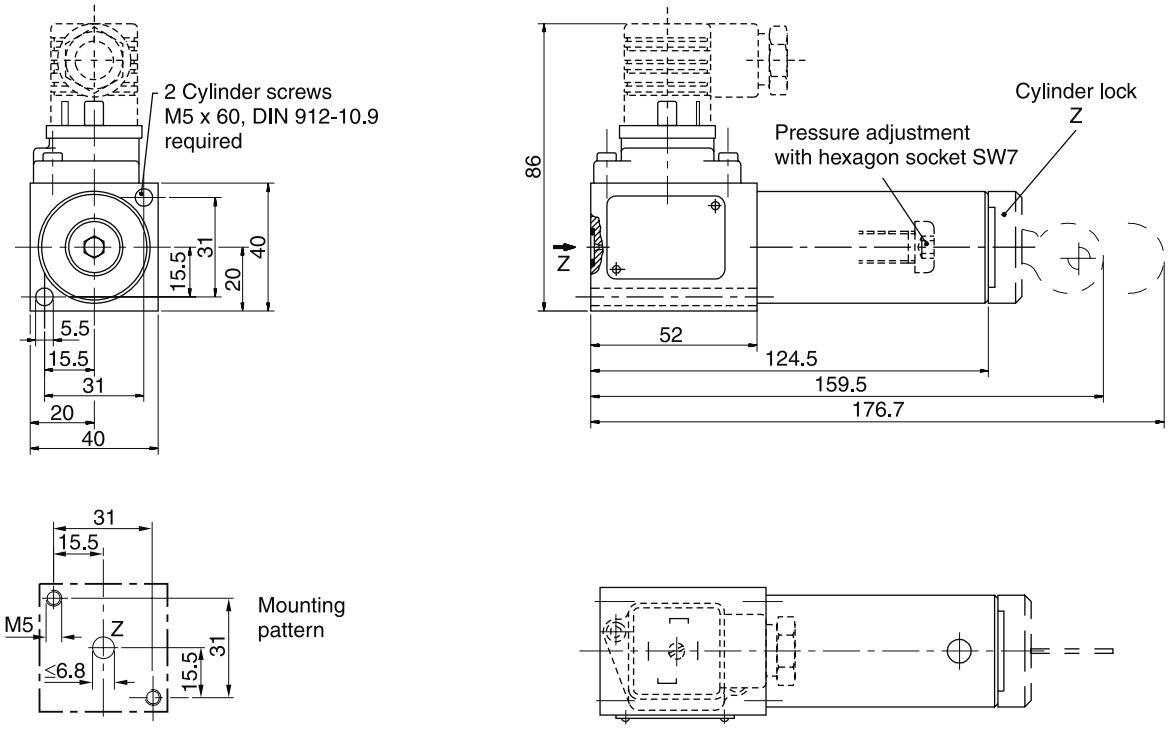
Electrical connections



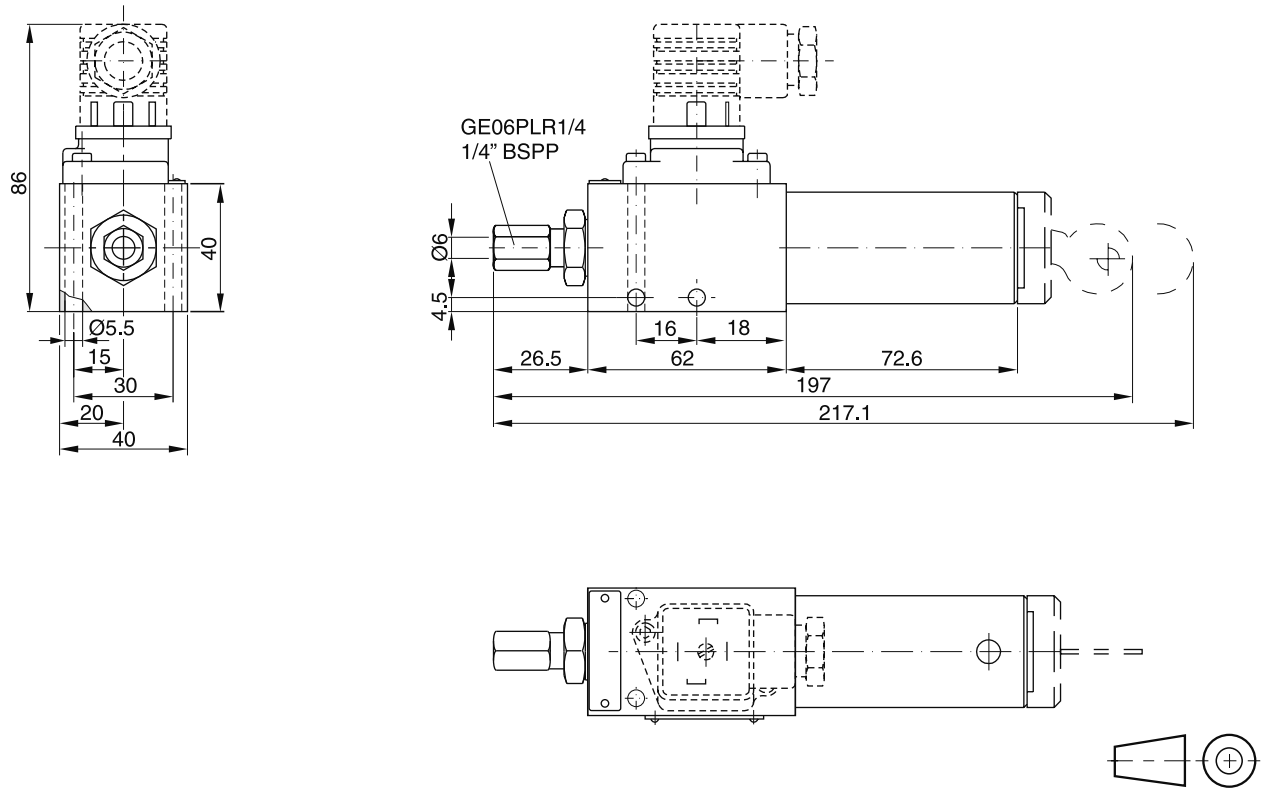
Electrical connection EN175301-803

12

Type PSB*F1*

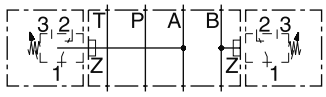
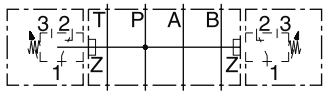


Type PSB*V1*



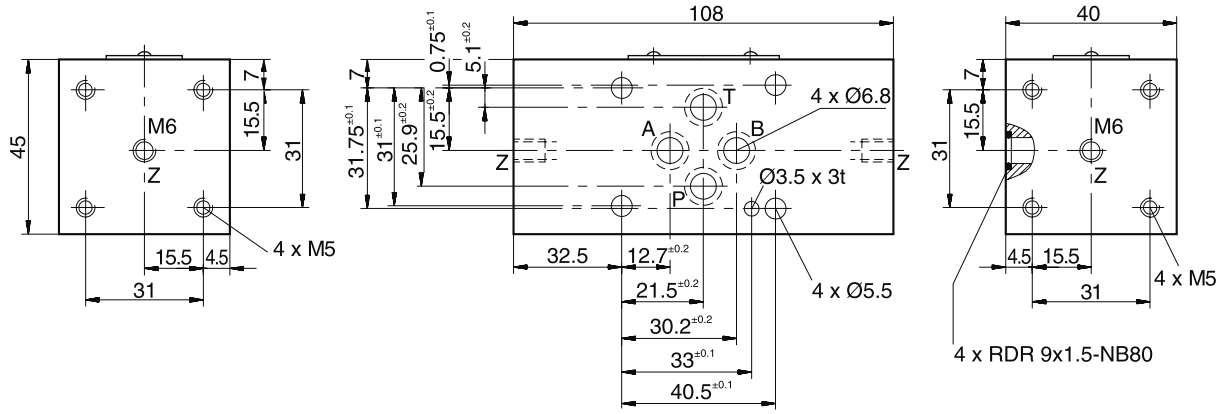
12

Technical Data

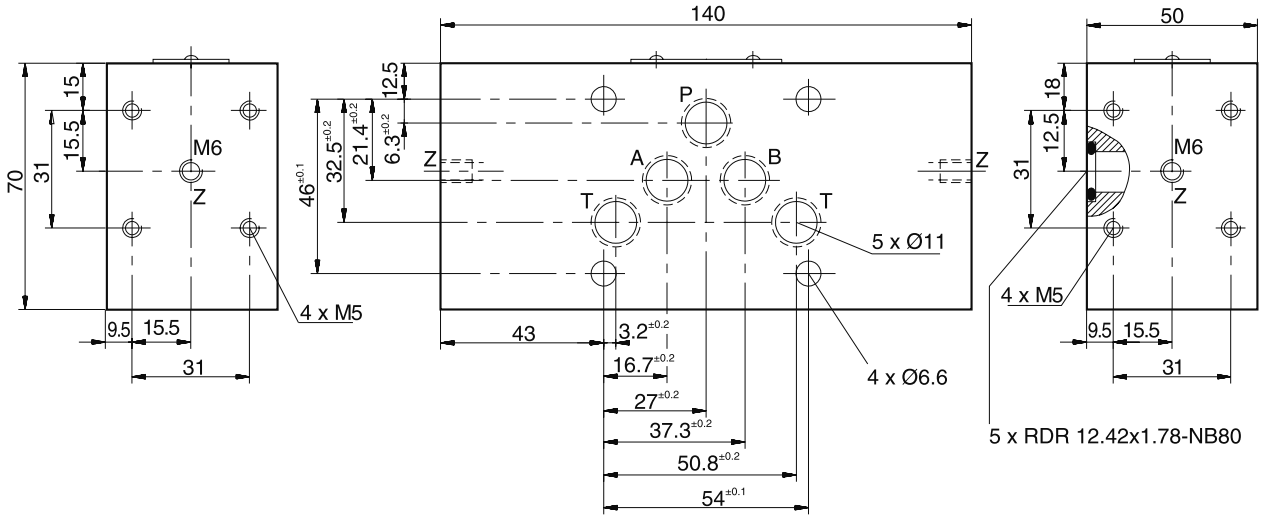
Switch code	Ordering code	Nominal size	Function
	**H06PSB-994**	**06**	**Pressure switch connection to A or B or A and B: Connections not used are closed by plug.**
	H10PSB-996	**10**	
	H06PSB-993	06	Pressure switch connection to P (left or right mounting is possible). Connection not used is closed by plug.
	H10PSB-995	10	

Bold letters =
Short-term availability

Dimensions NG06



Dimensions NG10



Notes

- Compact
- Rugged
- Reliable
- Easy operation
- Long-term stability
- Excellent interference resistance
- Metal housing
- High protection class
- Many variants
- Rotatable
- Analogue output
- Password
- MPa, bar, psi

The Pressure Controller combines the functions of a pressure switch, a pressure sensor and a display instrument:

- Pressure display (manometer)
- Switching outputs
- Analogue signal

Simple operation, compact design and high reliability are the most important features of the SCPSD. The Pressure Controller offers excellent technical performance and optimum pressure management. It is ideal for permanent use in industrial applications.

Easy to operate

Parameter setting is carried out via the keys or with a programming module.

High functionality

Every switching output can be set individually:

- Normally closed/normally open contacts
- On and off switching pressures
- Delay times
- Hysteresis/window function
- Damping

Intelligent settings which are not possible with a mechanical switch can be achieved with these convenient switch functions. Several switches can be replaced by a single controller.

The analogue output is individually settable

- 0/4…20 mA switchable
- Settable initial pressure
- Settable final pressure

Reliable/safe

Pressure is captured by a measuring cell with long-term stability. Any functional error is monitored and can be processed in accordance with DESINA. Thanks to a password, unauthorised change of parameters is prevented.

Rugged

The housing is made of metal and is resistant to humidity, shock and vibrations. The electronics are protected from reverse polarity, overvoltage and short circuits.

Everything within view

The large illuminated display is readable even from a considerable distance. Pressures are shown in MPa, bar or psi.

Optimum installation possibilities

With its compact design and excellent interference resistance the SCPSD is suitable for installation under critical conditions.

With its directionally settable housing, the display can always be read very easily.

Universal

Many versions are available to suit a wide variety of applications.

- Optical interface
- Switch status display

Everything in view
- Chamfered display
- Digital display
- Large
- Luminescent
- Display
- psi/bar/Mpa
- Actual pressure
- Minimum pressure
- Maximum pressure
- Switching points

Easy to operate
- 3 large keys
- Display of units

Pressure connection
- Stainless steel
- Measuring cell stable long-term
- Wide media tolerance

Rugged
- Metal housing
- Watertight
- High interference resistance
- Vibration resistant
- Shockproof

Flexible installation
- Compact
- Rotatable 290°

Thread
- Internal thread
- External thread

Tube clamp
- Safe mounting with a rugged SCSD-S27 clamp

Programming module
- Can be set with ControllerWIN software

12

SCPSD	004	010	016	060	100	250	400	600
pressure range P_n (bar)	-1...4	-1…10	-1...16	0…60	0…100	0…250	0…400	0…600
overload pressure P_{max} (bar)	10	20	40	120	200	500	800	1200
burst pressure P_{burst} (bar)	12	25	50	550	800	1200	1700	2200
measuring element	ceramic low pressure			DMS thin film high pressure				

Input quantities	
reversing cycles	≥ 100 Mio.
scanning rate	≥ 5 ms
connecting thread	G1/4 BSPP; ED soft seal NBR [1)] (DIN 3852 T2, form X); ED (DIN3852 T11, form E)
torque	35 Nm
parts in contact with media	low pressure: 1.4404 stainless steel; AL2O3 ceramic; NBR high pressure: stainless steels 1.4404; 1.4542
temperature range of medium	-20 …+85 °C
weight	approx. 300 g
Output quantities	
accuracy	± 0.5 % FS typ.; ± 1 % FS max.
temperature drift	± 0.02 % FS/°K typ. (at -20…+85 °C) ± 0.03 % FS/°K max.
long-term stability	± 0.2 % FS/a
repeat accuracy	± 0.25 % FS
switching point accuracy	± 0.5 % FS typ.; ± 1 % FS max.
display accuracy	± 0.5 % FS typ. ± 1 Digit ± 1 % FS max. ± 1 Digit
Response speed	
switching output	≤ 10 ms
analogue output	≤ 10 ms
Electrical connection	
power supply	15…30 VDC nominal 24 VDC; protection class 3
electrical connection	M12x1; 4-pole; 5-pole with gold-plated contacts. appliance inlet connector DIN EN 175301-803 form A (formerly DIN43650)
short circuit protection	yes
reverse polarity protection	yes
overload protection	yes
current consumption	< 100 mA

Housing	
	directionally adjustable up to 290°
material	pressure die-casting Z 410; painted
foil material	polyester
display	4-figure 7-segment LED; red; digit height 9 mm
protection class	IP67 DIN EN 60529; IP65 with plug-in connector DIN EN 175301-803 form A (formerly DIN43650)
Environmental conditions	
environmental temperature range	-20…+85 °C
storage temperature range	-40…+100 °C
vibration resistance	20 g; 10…500 Hz IEC60068-2-6 [2)]
shock resistance	50 g; 11 ms IEC60068-2-29 [2)]
EM compatibility	
interference emissions	EN 61000-6-3
interference resistance	EN 61000-6-2
Outputs	
switching outputs	2 MOSFET high side switches (PNP)
contact functions	normally open/normally closed; window/hysteresis; freely settable function
switching voltage	power supply - 1.5 VDC
switching current max.	0.5 A per switch
short circuit current	2.4 A per switch
analogue output	0/4…20 mA; programmable; freely scalable; RL ≤ (power supply - 8 V)/ 20 mA (≤ 500 Ω)

1) other sealing materials (FPM, EPDM etc.) on request

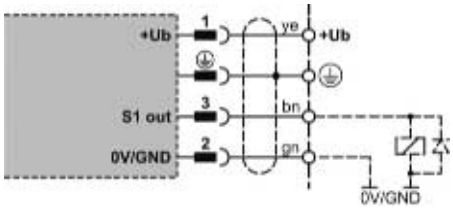
2) Does not apply to DIN EN 175301-803 form A (formerly DIN43650) version

12

Connection designation

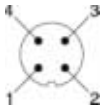
SCPSD-xxx-04-x6

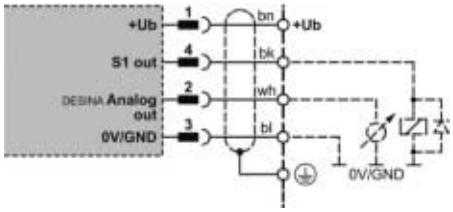
1 switching output;
DIN EN 175301-803 form A (formerly DIN43650)



SCPSD-xxx-04-x7

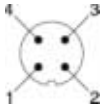
2 switching outputs;
M12x1; 4-pole

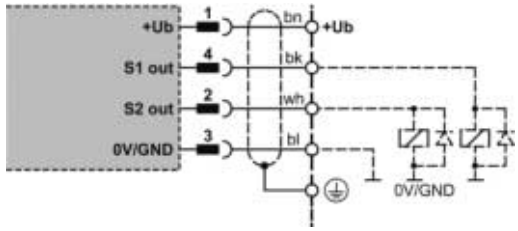




SCPSD-xxx-14-x7

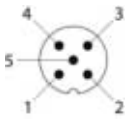
1 switching output;
1 analogue output;
M12x1; 4-pole

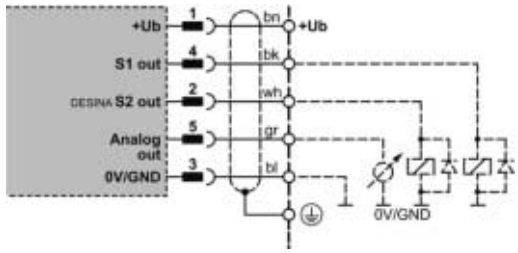




SCPSD-xxx-14-x5

2 switching outputs;
1 analogue output;
M12x1; 5-pole





ye = yellow gn = green wh = white gr = grey
bn = brown bk = black bl = blue

Measurement range (bar)	Display resolution increment (bar)	Smallest reverse switch value RSP	Greatest switch value SP	Smallest settable difference between SP and RSP (SP-RSP)
-1…4	0.01	-1	4	0.08
-1…10	0.01	-1	10	0.05
-1…16	0.01	-1	16	0.09
0…60	0.1	0	60	0.3
0…100	0.1	0	100	0.6
0…250	1	0	250	2
0…400	1	0	400	3
0…600	1	0	600	3

12

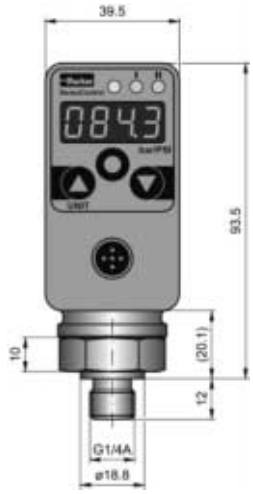
Pressure range selection

With pressure switches the settable pressure is very relevant.

Because a 400 bar pressure switch shows the same resolution (1 bar) as a 600 bar pressure switch (also 1 bar), a 600 bar pressure switch can be deployed even at a smaller nominal pressure (eg. 315 bar).

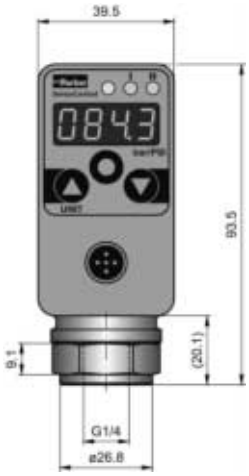
The positive effects of this are the same accuracy with higher safety and fewer product variants.

External thread
SCPSD-xxx-x4-1x

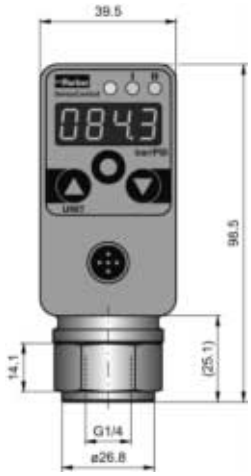


High and low pressure
DMS/ceramic

Internal thread
SCPSD-xxx-x4-2x

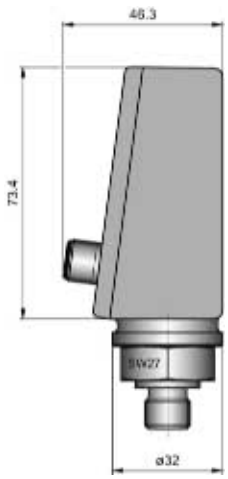


High pressure (from 60 bar)
DMS

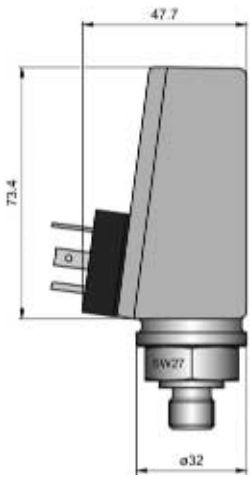


Low pressure (up to 16 bar)
Ceramic

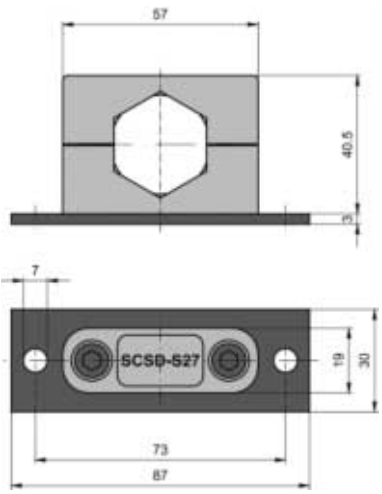
M12 plug-in connector
SCPSD-xxx-x4-x5



DIN EN 175301-803 form A
(formerly DIN43650))
SCPSD-xxx-04-x6



Accessories
Clamp



12

SCPSD digital pressure switch

Pressure range
004; 010; 016; 060; 100; 160, 400; 600 bar

1 switching output; without analogue output
DIN EN 175301-803 form A
(formerly DIN 43650) plug-in connector
SCPSD - xxx - 04 - x 6

2 switching outputs; without analogue output
M12x1 plug-in connector; 4-pole
SCPSD - xxx - 04 - x 7

1 switching output; with analogue output
M12x1 plug-in connector; 4-pole
SCPSD - xxx - 14 - x 7

2 switching outputs; with analogue output
M12x1 plug-in connector; 5-pole
SCPSD - xxx - 14 - x 5

Type
G1/4 BSPP external thread = 1
G1/4 BSPP internal thread = 2

Ordering examples

SCPSD-100-04-27
Pressure range 100 bar
2 switching outputs
G1/4 BSPP internal thread
M12 plug-in connector

SCPSD-60-14-27
Pressure range 60 bar
1 switching output
1 analogue output
G1/4 BSPP internal thread
M12 plug-in connector

SCPSD-004-14-17
Pressure range 4 bar
2 switching outputs
1 analogue output
G1/4 BSPP external thread
M12 plug-in connector

Accessories

PC programming kit	SCSD-PRG-KIT
Fixing clamp	SCSD-S27
Reducing adaptor M22x1,5	SCA-1/4-M22x1.5-ED
Reducing adaptor G1/2 BSPP	SCA-1/4-ED-1/2-ED
Damping adaptor	SCA-1/X-EDX-1/X-D
Flange adaptor for mechanical pressure switch	SCAF-1/4-40

Connecting cable and separate plugs

Connecting cable, ready-made SCK-400-xx-xx
(open cable end)

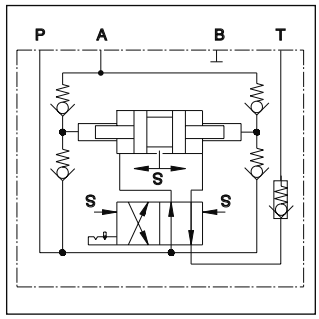
Cable length in m
02 2 m
05 5 m
10 10 m

Plug-in connector
45 M12 cable socket; straight
55 M12 cable socket; 90° angled
56 DIN EN 175301-803 form A plug connector
(formerly DIN 43650)

Separate plugs

M12 cable socket; straight	SCK-145
M12 cable socket; 90° angled	SCK-155
DIN EN 175301-803 Form A plug connector (formerly DIN 43650)	SCK-006

Pressure intensifiers are used wherever a particular section of a hydraulic system has to be pressurised to a substantially higher pressure than the available primary pressure allows (clamping functions). With an intensification ratio of 1 : 4 (1 : 2, 1 : 6) it enables a cost-effective system solution especially in clamping applications, with primary pressures up to 125 bar. A pilot operated check valve can be flanged underneath the pressure intensifier for quick filling and decompression of the high pressure section.



Design

Main functional parts of the pressure intensifier:
piston, rocker mechanism, slide valve with lock,
4 check valves which separate the high pressure section from the low pressure section,
check valve in the tank port to partition of the tank section from the primary pressure.

Features

- Mounting pattern NG6, DIN 24 340 Design A, CETOP, ISO
- Check valve attachable to bottom flange
- High pressure up to 500 bar
- Volume flow formed with low pulsation
- Compact design

Function

After the high pressure section is filled with oil, (e.g. extension of a clamping cylinder), the pressure intensifier begins operation: The low pressure moves the intensifier piston because of the surface ratio and compresses the oil column in the high pressure section.

At the end of the intensifier's piston stroke, the rocker mechanism switches the directional slide valve to the crossed switching position, and the intensifier piston pumps oil from the piston rod area into the high pressure section. The process repeats itself until the pressure ratio corresponding to the surface ratio has lead to a balance of force on the intensifier piston.

The pressure intensifier switches itself off and immediately on again when the high pressure (e.g. due to external leakage) begins to drop (pay attention to the flow characteristic). The switching speed of the slide valve is dependent on the operating speed of the intensifier piston.

Note

- To avoid exceeding the admissible maximum pressure, a pressure relief or pressure control valve must be fitted on the primary side (pressure setting, max. 125 bar / 1 : 4, max. 250 bar / 1 : 2 or max. 83 bar / 1 : 6).
- There must be no pressure peak on the primary side when operating in the maximum pressure range.
- It is recommended to mount a 10µm filter on the primary side to ensure damage-free operation.

Ordering code

SD	**500**		**06**	**V**	
Pressure intensifier	**Working pressure 500 bar (max. pressure)**	**Intensification ratio**	**Nominal size (pressure intensifier) Interface DIN 24 340 Design A, CETOP, ISO**	**Seals FPM**	**Design series** (not required for ordering)

Code	Intensification ratio
A	**1 : 4**
B	**1 : 2**
C	**1 : 6**

Bold letters =
Short-term availability

Technical data

General		
Symbol		DIN 24 300
Design		piston and poppet valve in body
Mounting type		NG6, DIN 24 340, design A, CETOP, ISO
Ports		subplate
Mounting position		as desired
Ambient temperature	[°C]	max. 50
$MTTF_D$ value	[years]	150
Weight	[kg]	3.0 kg
Hydraulic		
Max. operating pressure		
Port A	[bar]	500,
Port P, B, T	[bar]	125 (ratio 1:4), 250 (ratio 1:2)
Pressure fluid temperature	[°C]	+ 10°C...+70
Viscosity range	[mm^2/s]	12....230
Filtration		ISO 4406 (1999) 18/16/13 (meet NAS 1638:7)
Flow		see performance curve
Intensification ratio		$p_P : p_A$ = 1 : 4, 1 : 2, 1 : 6
Flow volume		$Q_P : Q_A$ = 4 : 1, 2: 1, 6 : 1
Stroke volume	[cm^3]	3 (per double stroke)
Operating		hydraulic-mechanic automatic control

Accessories

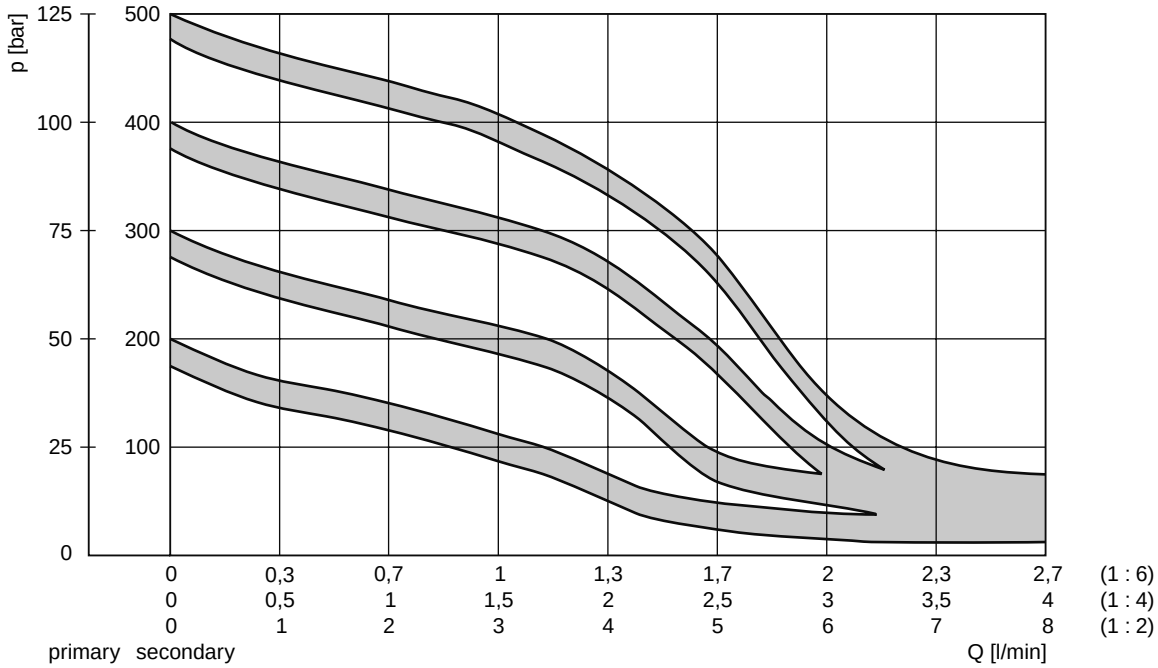
Type	Description	Number
SD 500*06V	Seals	
	9.25 x 1.78	3
	10.82 x 1.78	1
	M5 x 75-12.9 DIN 912	4

Seals are included in delivery.
Mounting screws are not included in delivery.

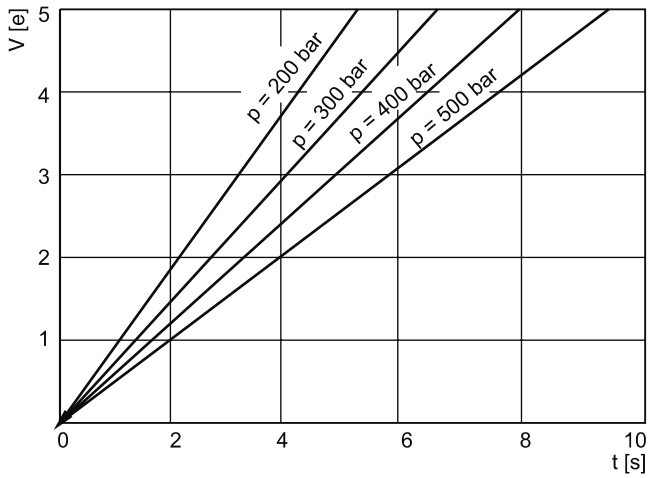
12

Surface finish	Kit		
$R_{max}6.3$ 0.01/100	BK401	DIN 912 12.9	9.0 Nm

Flow characteristics

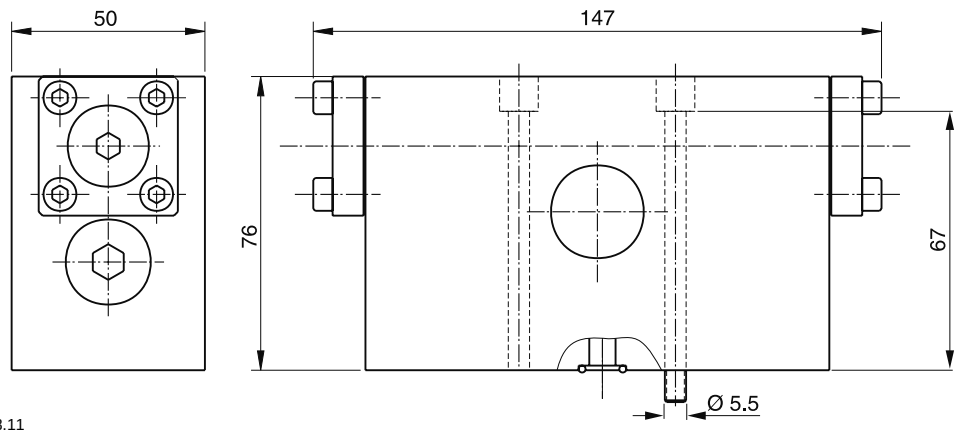


Approximate values of the compression time for compressing a filled volume to target pressure (1 : 4)



All characteristic curves measured with HLP46 at 50°C.

Dimensions



Pilot operated check valve plate NG06

Description

Pilot operated check valve plates are flanged under the pressure intensifier for quick filling and decompression.

Design

The check valve plate is equipped with a hydraulic, pilot operated check valve.

Opening ratio: Main valve 2.5 : 1

Pilot ratio 10 : 1

Ordering code

H06 SDV

Bold letters =
Short-term availability

Accessories

Type	Description	Number
H06SDV	Seals	
	9.25 x 1.78	4
	M5 x 115-12.9 DIN 912	4

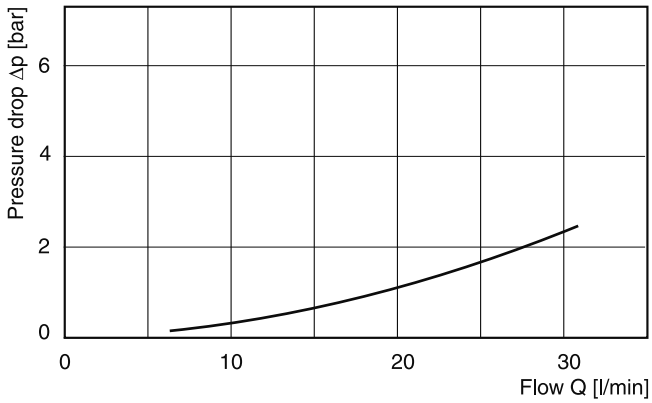
Seals are included in delivery.
Mounting screws are not included in delivery.

Technical data

General		
Design		spring loaded ball seat valve
Mounting type		flange
Mounting position		any
Ambient temp.	[°C]	max. 50
Weight	[kg]	1.3
Hydraulic		
Operating pressure range		
Port A Port P, B, T	[bar]	max. 500, max. 125 / 1:4 and 250 / 1:2
Fluid temperature	[°C]	+ 10...+70
Viscosity range	[mm^2/s]	12....230
Flow		see characteristic curve
Pilot ratio		main valve 2.5:1, pre-discharge 10:1
Opening pressure	[bar]	approx. 0.5

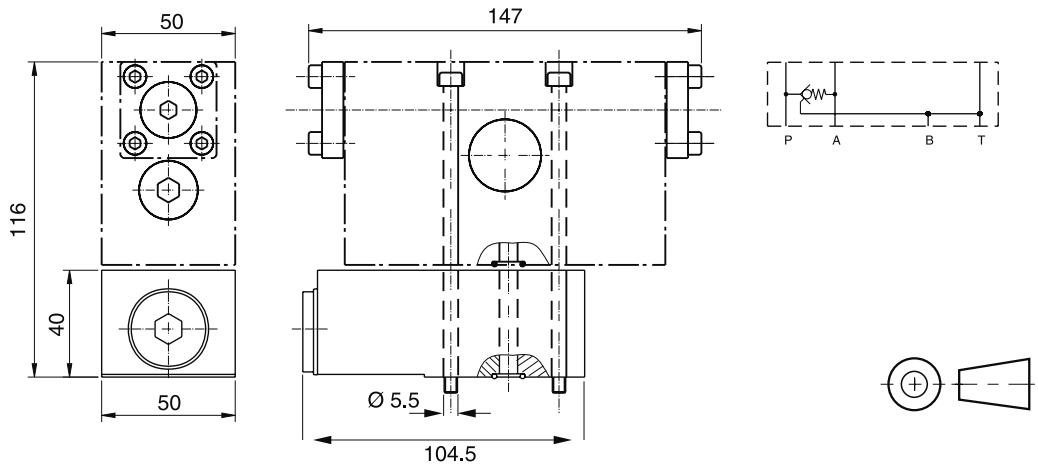
Characteristic Curve

Pilot operated check valve



Curve measured with HLP46 at 50°C.

Dimensions



Surface finish	Kit		
R_{max}6.3 ⏥ 0.01/100	BK401	DIN 912 12.9	9.0 Nm

SD500 UK.INDD CM 03.08.11

Pilot operated check valve plate NG10

Description

Pilot operated check valve plates are flanged under the pressure intensifier for quick filling and decompression.

Design

The check valve plate is equipped with a hydraulic, pilot operated check valve.

Opening ratio: Main valve 2.5 : 1

Pilot ratio 10 : 1

Ordering code

H10 SDV

Accessories

Type	Description	Number
H10SDV	Seals	
	12.24 x 1.78	4
	M5 x 75-12.9 DIN 912	4
	M6 x 50-12.9 DIN 912	4

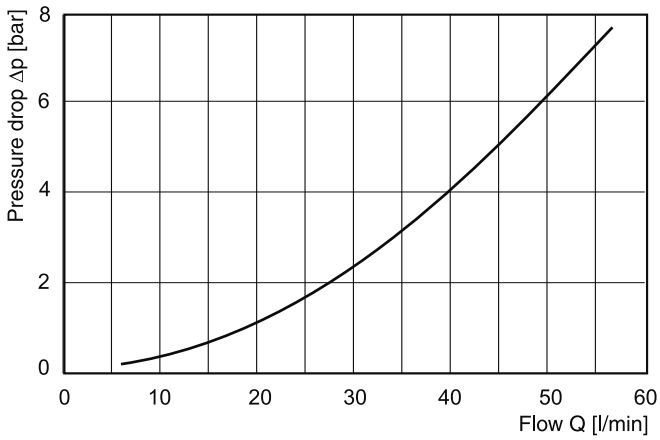
Seals are included in delivery.
Mounting screws are not included in delivery.

Technical data

General		
Design		spring loaded ball seat valve
Mounting type		flange
Mounting position		any
Ambient temperature	[°C]	max. 50
Weight	[kg]	2.3
Hydraulic		
Operating pressure range		
Port A Port P, B, T	[bar]	max. 500, max. 125 / 1:4 and 250 / 1:2
Fluid temperature	[°C]	+ 10...+70
Viscosity range	[mm²/s]	12....230
Flow		see characteristic curve
Pilot ratio		main valve 2.5:1, pre-discharge 10:1
Opening pressure	[bar]	approx. 0.5

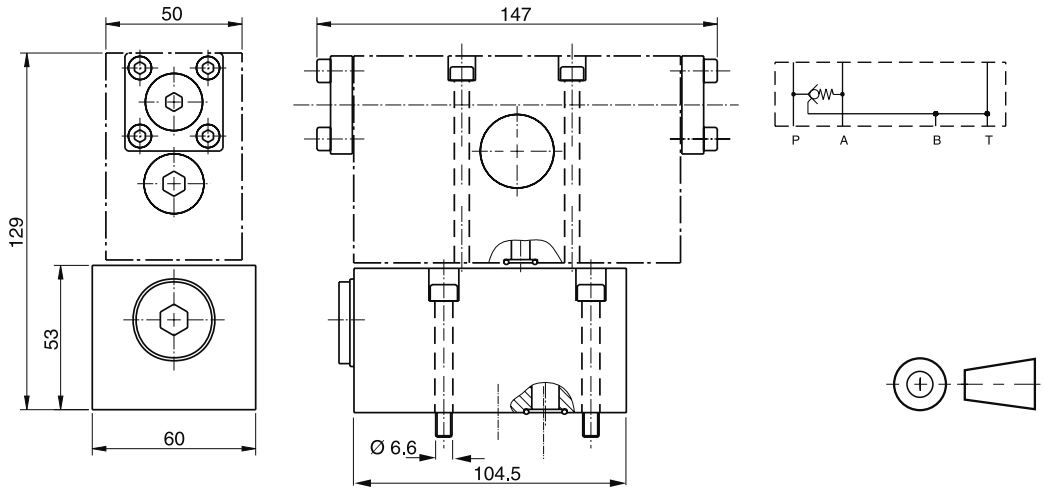
Characteristic curve

Pilot operated check valve



Curve measured with HLP46 at 50°C.

Dimensions



Surface finish	Kit		
R_{max}6.3 0.01/100	BK490	DIN 912 12.9	9.0 Nm 18.0 Nm

Notes

Parker Worldwide

Europe, Middle East, Africa

AE – United Arab Emirates,
Dubai
Tel: +971 4 8127100
parker.me@parker.com

AT – Austria, Wiener Neustadt
Tel: +43 (0)2622 23501-0
parker.austria@parker.com

AT – Eastern Europe, Wiener Neustadt
Tel: +43 (0)2622 23501 900
parker.easteurope@parker.com

AZ – Azerbaijan, Baku
Tel: +994 50 2233 458
parker.azerbaijan@parker.com

BE/LU – Belgium, Nivelles
Tel: +32 (0)67 280 900
parker.belgium@parker.com

BY – Belarus, Minsk
Tel: +375 17 209 9399
parker.belarus@parker.com

CH – Switzerland, Etoy
Tel: +41 (0)21 821 87 00
parker.switzerland@parker.com

CZ – Czech Republic, Klecany
Tel: +420 284 083 111
parker.czechrepublic@parker.com

DE – Germany, Kaarst
Tel: +49 (0)2131 4016 0
parker.germany@parker.com

DK – Denmark, Ballerup
Tel: +45 43 56 04 00
parker.denmark@parker.com

ES – Spain, Madrid
Tel: +34 902 330 001
parker.spain@parker.com

FI – Finland, Vantaa
Tel: +358 (0)20 753 2500
parker.finland@parker.com

FR – France, Contamine s/Arve
Tel: +33 (0)4 50 25 80 25
parker.france@parker.com

GR – Greece, Athens
Tel: +30 210 933 6450
parker.greece@parker.com

HU – Hungary, Budapest
Tel: +36 1 220 4155
parker.hungary@parker.com

IE – Ireland, Dublin
Tel: +353 (0)1 466 6370
parker.ireland@parker.com

IT – Italy, Corsico (MI)
Tel: +39 02 45 19 21
parker.italy@parker.com

KZ – Kazakhstan, Almaty
Tel: +7 7272 505 800
parker.easteurope@parker.com

NL – The Netherlands, Oldenzaal
Tel: +31 (0)541 585 000
parker.nl@parker.com

NO – Norway, Asker
Tel: +47 66 75 34 00
parker.norway@parker.com

PL – Poland, Warsaw
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

PT – Portugal, Leca da Palmeira
Tel: +351 22 999 7360
parker.portugal@parker.com

RO – Romania, Bucharest
Tel: +40 21 252 1382
parker.romania@parker.com

RU – Russia, Moscow
Tel: +7 495 645-2156
parker.russia@parker.com

SE – Sweden, Spånga
Tel: +46 (0)8 59 79 50 00
parker.sweden@parker.com

SK – Slovakia, Banská Bystrica
Tel: +421 484 162 252
parker.slovakia@parker.com

SL – Slovenia, Novo Mesto
Tel: +386 7 337 6650
parker.slovenia@parker.com

TR – Turkey, Istanbul
Tel: +90 216 4997081
parker.turkey@parker.com

UA – Ukraine, Kiev
Tel +380 44 494 2731
parker.ukraine@parker.com

UK – United Kingdom, Warwick
Tel: +44 (0)1926 317 878
parker.uk@parker.com

ZA – South Africa, Kempton Park
Tel: +27 (0)11 961 0700
parker.southafrica@parker.com

North America

CA – Canada, Milton, Ontario
Tel: +1 905 693 3000

US – USA, Cleveland (industrial)
Tel: +1 216 896 3000

US – USA, Elk Grove Village (mobile)
Tel: +1 847 258 6200

Asia Pacific

AU – Australia, Castle Hill
Tel: +61 (0)2-9634 7777

CN – China, Shanghai
Tel: +86 21 2899 5000

HK – Hong Kong
Tel: +852 2428 8008

IN – India, Mumbai
Tel: +91 22 6513 7081-85

JP – Japan, Fujisawa
Tel: +81 (0)4 6635 3050

KR – South Korea, Seoul
Tel: +82 2 559 0400

MY – Malaysia, Shah Alam
Tel: +60 3 7849 0800

NZ – New Zealand, Mt Wellington
Tel: +64 9 574 1744

SG – Singapore
Tel: +65 6887 6300

TH – Thailand, Bangkok
Tel: +662 717 8140

TW – Taiwan, Taipei
Tel: +886 2 2298 8987

South America

AR – Argentina, Buenos Aires
Tel: +54 3327 44 4129

BR – Brazil, Cachoeirinha RS
Tel: +55 51 3470 9144

CL – Chile, Santiago
Tel: +56 2 623 1216

MX – Mexico, Apodaca
Tel: +52 81 8156 6000

© 2011 Parker Hannifin Corporation. All rights reserved.

Catalogue HY11-3500/UK, 2.5M, 10/2011, LB

EMEA Product Information Centre
Free phone: 00 800 27 27 5374
(from AT, BE, CH, CZ, DE, DK, EE, ES, FI, FR, IE, IL, IS, IT, LU, MT, NL, NO, PL, PT, RU, SE, SK, UK, ZA)

US Product Information Centre
Toll-free number: 1-800-27 27 537

www.parker.com

Your local authorized Parker distributor