

PARKER TRANSAIR[®] PIPING SYSTEM SPECIFICATION SUBMITTAL



Date: ___/___/___

Project Information: _____

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Sections:

A. Submittal for Parker Transair®

1. About Parker Hannifin Corporation
 - 1.1 About Parker Transair®
2. Parker Transair® Aluminum System
 - 2.1 Parker Transair® Submittals
 - 2.2 Rigid Aluminum Pipe
 - 2.3 Fittings
 - 2.4 Flexible Hoses
 - 2.5 Fixing Clips
 - 2.6 Silicon Free
3. Performance Criteria
4. Certifications and Compliance
5. Engineering Standards
6. Parker Transair® Advantages
7. Parker Transair® Stainless Steel Drops
 - 7.1 Rigid Stainless-Steel Pipe
 - 7.2 Fittings
 - 7.3 Performance Criteria
 - 7.4 Silicon Free
 - 7.5 Applications
 - 7.6 Certifications and Compliance
8. Parker Transair Stainless Steel System
 - 8.1 Rigid Stainless-Steel Pipe
 - 8.2 Fittings
 - 8.3 Performance Criteria
 - 8.4 Certifications and Compliance

B. Submittal for Parker Condition Monitoring (TCM) System: Wireless Condition Monitoring System

1. Condition Monitoring
2. Software
 - 2.3. Cloud
 - 2.4. Edge
3. Hardware
 - 3.3. Sensors
 - 3.3.1. Pressure and Vacuum
 - 3.3.2. Humidity
 - 3.3.3. Temperature
 - 3.3.4. Power
 - 3.3.5. 4-20mA Transmitter
 - 3.3.6. Flow
 - 3.4. Communication Hardware
 - 3.4.1. Gateway
 - 3.4.2. Primary Receiver Node (PRN)
 - 3.5. Accessories
 - 3.5.1. Wired Power Supply
 - 3.5.2. M12 Connection Cable



A. SUBMITTAL FOR PARKER TRANSAIR®

1. About Parker Hannifin Corporation:

Transair® is part of the Parker Hannifin Corporation (NYSE: PH), which was founded in 1918. With annual sales exceeding \$12 billion, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems. Transair® has more than 750,000 installations worldwide.

1.1. About Transair®:

Parker Transair® is a fast, flexible, and easily modified pipe system for compressed air, vacuum, inert gas, water transfer, and chemical transfer applications. Durable and corrosion-resistant, Transair® lightweight construction outperforms traditional piping systems. End-users can quickly reconfigure production layouts and Transair® versatile, quick-connect system eliminates the need to thread or solder pipe. Transair® also reduces plant energy costs by increasing efficiency, reducing pressure drops, and eliminating leaks.

2. Parker Transair® Aluminum System:

The air distribution system shall be of the instant connection type (manufactured by Parker Hannifin) and shall be manufactured to the quality system of ISO 9001-2015 and TÜV Rheinland certified, comply with ASME B31.1 and ASME B31.3 standards (Power Piping – ASME Code for pressure piping), ISO 4414:2010 norm (Pneumatic Fluid Power - General rules relating to systems) and ISO 8573-1 (air quality). The product shall be recyclable and has a full-bore passage without diameter restriction for the fittings, to avoid high pressure, drop.

2.1. Parker Transair® Submittal

Parker Transair® products shall be shown on drawings and product submittals and shall be specifically identified with the name “Parker Transair®” or specific Parker Transair® part numbers.

2.2. Rigid Aluminum Pipe

The pipe shall be rigid and manufactured in Aluminum of AW-6060 T51 or AW-6063 T5 as defined in ASTM B241. It shall be extruded and calibrated within the tolerances for specific diameters of the Parker Transair® fittings. The pipe has been qualified, as defined by ISO 9001-2015, to warranty gripping and leak-tight performance of the system. The pipe shall be either blue powder coated in RAL 5012, grey powder coated in RAL 7001 or green powder coated in RAL 6029 with Qualicoat to warranty mechanical, physical, and chemical properties. Markings on the pipe will indicate the Transair® brand, the internal and external dimensions, batch number and Country of Origin. The pipe shall also have two marker lines at angle of 0° and 90° to indicate drilling positions for take-off connector. The pipe shall be available in the following diameters and lengths:

Outside ø	Outside ø (mm)	Inside ø	Inside ø (mm)	Wall Thickness	Lengths (feet)
5/8"	16.5	1/2"	13	1/16"	9 or 15
1"	25	13/16"	21	1/16"	9 or 20
1-1/2"	40	1-7/16"	37	1/16"	9 or 20
2"	50	1-13/16"	46	1/16"	9 or 20
2-1/2"	63	2-5/16"	59	1/16"	9 or 20
3"	76	2-13/16"	72	1/16"	20
4"	101	3-13/16"	97	1/16"	20
6-5/8"	168	6-3/8"	161.2	1/8"	20

2.3. Fittings

- **16.5mm (1/2"), 25mm (1") and 40mm (1-1/2")**

All connectors shall be instant connection by means of a gripping ring technology with a half turn release nut mechanism. They must have a visual torque indicator to guarantee the correct installation of the fittings. They shall incorporate a lateral dismantling feature for the rigid pipe. The connectors shall be manufactured in engineering grade polymer (PA 6.6 or PA 12; both with 30% fiberglass reinforcement) with gripping teeth manufactured in stainless steel Z10 CN 17-7E2 (AISI 301) and with seals of NBR70 nitrile with an IRHD50.

- **50mm (2") and 63mm (2-1/2")**

All connectors use a Snap Ring technology with a threaded release nut mechanism. They shall incorporate a lateral dismantling feature for the rigid pipe. The connectors shall be manufactured in black cathodized aluminum AS9U3 with a snap ring manufactured in PA 6.6 or PA 12; both with 50% fiberglass reinforcement.

- **76mm (3") and 101mm (4")**

All connectors fittings shall be formed from 304 Stainless Steel and conform to ASTM A774 specifications. All fittings shall be connected using clamshell and cartridge technology with a reusable mechanical connection. The clamshell shall be manufactured of Zinc treated steel with the seal cartridge manufactured in engineering grade polymer with seals of NBR70 nitrile IRHD50.

- **168mm (6")**

All connectors shall be formed from cast aluminum and conform to ASME B31 specifications. All fittings shall be connected using clamshell and cartridge technology with a reusable mechanical connection. The clamshell shall be manufactured of cast aluminum with the seal cartridge manufactured in engineering grade polymer with seals of NBR70 nitrile IRHD50.

- **Drop Brackets**

Have a patented technology can be quick to install by drilling one hole on the rigid pipe. Designed on a single body, the brackets shall incorporate a compact swan neck water retention system, and with an outlet that gives the 46 mm center to center required by the pipe. They shall be manufactured in engineering grade polymer (PA 6.6 or PA 12; both with 30% fiberglass reinforcement).

- **Wall Brackets**

Male stud couplings and wall brackets shall be black nickel-plated brass.

2.4. Flexible Hoses

Flexible hose shall consist of a nitrile inner tube and textile exterior. Hoses are compatible with compressor oils. Hoses are available in the following diameters:

Outside Diameter	Inside Diameter	Min. Bend Radius	Length
1 1/2"	7/8"	4"	1' 10"
1 1/2"	7/8"	4"	5'
1 1/2"	7/8"	4"	6' 7"
2 1/8"	1 1/2"	16"	3' 3"
2 1/8"	1 1/2"	16"	6' 7"
2 1/8"	1 1/2"	16"	9' 10"
2 1/2"	2	11"	3' 3"
2 1/2"	2	11"	6' 6"
3 1/8"	2 1/2"	12"	4' 7"
3 1/8"	2 1/2"	25"	9' 10"
3 1/8"	2 1/2"	25"	13' 1"
3 9/16"	3	14"	4' 11"
3 9/16"	3	14"	6' 6"
4 1/2"	4	20"	6' 6"
4 1/2"	4	20"	9' 10"

2.5. Fixing Clips

- The system shall be installed using fixing clips manufactured in engineering grade polymer (PA 6.6 or PA 12; both with 30% fiberglass reinforcement) in sizes suitable for pipe diameters OD 16.5mm, OD 25mm, OD 40mm OD 50mm, and OD 63mm. Center to center dimension to the wall shall be 46mm for (OD 16.5 mm, OD 25 mm, and OD 40 mm) and 90 mm for (OD 50 mm and OD 63 mm).
- The fixing clips shall allow an axial movement of the pipe to consider expansion and contraction.
- The clips shall be with a quick to close system without the use of a screw. They shall be equipped with a 1/4" easy to release nut (for OD 16.5 mm, OD 25 mm and OD 40 mm) and 3/8" easy to release nut (for OD 50 mm and OD 63 mm) for mounting under threaded rods or screws.

2.6. Silicon Free

The Parker Transair® Products are guaranteed Silicon Free, which is mandatory for premium air purity applications such as painting.

3. Performance Criteria

Approved for compressed air (dry, wet, lubricated), vacuum, and inert gases (Argon, Helium, Nitrogen, CO2 mixes).

- **Working Pressure/Temperature:**
 - 188* psi from -4°F (-20°C) to +140°F (+60°C)
 - 232 psi from -4°F (-20°C) to +115°F (+45°C)
 - Vacuum: - 29.6" Hg vacuum
 - *Max. working pressure for 6" is 188 psi
- **Storage temperature:** -40°F (-40°C) to +176°F (+80°C)
- **Resistant to:**
 - Corrosion
 - Mechanical shocks
 - Ultraviolet (U.V.)
 - Aggressive environments
 - Thermal variations
 - Compressor oil carry over (minerals/synthetic)
- **Safety:** Components are non-flammable with no propagation of flame. The fittings in PA 6.6 (OD 16.5mm, OD 25mm and OD 40mm) conform to UL94HB. The fixing clips conform to UL94V-2. The fire resistance of the compressed air flexible hose conforms to NFM82271 and the vacuum version conforms to EN12115 flame resistance section.
- **Air Quality:** The international standard used for compressed air quality is ISO 8573 Series. Specifically, ISO 8573-1:2010, which is used to specify the purity of air required at a particular point of use. Parker Transair® meets Class 1.1.1 of this standard. Parker Transair® is qualified for use with Class D breathing air applications.
- **Recyclability:** The material used to manufacture the pipe and fittings are 100% recyclable. Parker Transair® pipe is manufactured from 60% post-consumer recycled material.

4. Certifications and Compliance

- **ISO 9001-2015:** Parker Hannifin is certified ISO 9001-2015 and operates a Quality Management System to ensure the level of quality and service that is expected by its customers.
- **ISO 8573-1:2010:** This international standard establishes the different quality classes of compressed air. Parker Transair® has been successfully tested to reach the highest expectation of this standard. A Parker Transair® distribution network will not contaminate the fluid with solid particles, water, moisture, or oil.
- **TÜV certification:** TÜV Rhineland certifies that Parker Transair® fulfills regulatory requirements for pipes under pressure according to the German AD-2000 Merkblatt technical rules and to the European Pressure Equipment Directive 97/23/CE.
- **QUALICOAT compliance:** Parker Transair® complies with the QUALICOAT label which guarantee the quality of the painting process, the chemicals used, the finished quality and the coating resistance on the aluminum pipes.
- **Technical Standards & Safety Authority (TSSA):** Parker Transair® products are approved and registered under the Canadian registration procedure (CRN). This allows the installation of Parker Transair® products in Canada.

5. Engineering Standards

- **ASME B31.1:** Parker Transair® meets the requirements of ASME B31.1 for non-boiler external piping. Which stipulates the minimum requirements for the design, materials, fabrication, erection, test, and inspection of power and auxiliary piping systems for industrial institutional plants.
- **ASME B31.3:** Parker Transair® meets the requirements of ASME B31.3 piping typically found in petroleum refineries; chemical, pharmaceutical, textile, paper, semiconductor, and cryogenic plants; and related processing plants and terminals. It covers materials and components, design, fabrication, assembly, erection, examination, inspection, and testing of piping.
- **UL 94 HB:** Parker Transair® Pipe-to-pipe and stud connectors, ball valves and butterfly valves conform.
- **UL 94 V-0:** Parker Transair® Mounting clips conform.
- **ASTM B241:** Extruded aluminum pipe conform.

6. Parker Transair® Advantages

- Energy efficient
- Simple installation
- Quick connect technology
- Immediate pressurization
- Removable and reusable
- Modular design
- No corrosion
- Leak-free guarantee



- “Full Bore” Design

7. Parker Transair® Stainless Steel Drops

7.1. Rigid Stainless-Steel Pipe

The pipe shall be rigid and manufactured in Stainless Steel AISI 316L Grade. The pipe shall have been qualified, as defined by ISO 9001:2015, to warranty gripping and bubble-tight performance of the system. The pipe shall be Stainless Steel Natural Finish. The pipe shall be available in the following diameter size and length OD 22mm (19.6mm inside) / 20ft long.

7.2. Fittings

All OD 22 mm connectors shall be instant connection using a gripping ring technology with a turn release nut mechanism. The connectors shall be manufactured in Stainless Steel 316L with gripping teeth manufactured in stainless steel and with seals of FKM.

7.3. Performance Criteria

Approved for compressed air (dry, wet, lubricated), vacuum, and inert gases (Argon, Helium, Nitrogen, CO2 mixes)

- **Working Pressure/Temperature:**
 - 145 psi from -4°F (-20°C) to +140°F (+60°C)
 - Vacuum: 0.29” Hg
- **Resistant to:**
 - Corrosion
 - Mechanical shocks
 - Ultraviolet (U.V.)
 - Aggressive environments
 - Thermal variations
 - Compressor oil carry over (minerals/synthetic)
- **Air Quality:** The international standard used for compressed air quality is ISO 8573 Series. Specifically, ISO 8573-1:2010, which is used to specify the purity of air required at a particular point of use. Parker Transair® meets Class 1.1.1 of this standard. Parker Transair® is qualified for use with Class D breathing air applications.

7.4. Silicon Free

The Parker Transair® Products are guaranteed Silicon Free, which is mandatory for premium air purity applications such as painting.

7.5. Applications

The Parker Transair® 316L Stainless Steel drops are designed to meet requirements of compressed air and vacuum applications in harsh environments, the drops can be used in food or splash zones as they are compatible with permanent food contact.

7.6. Certifications and Compliance

- **FDA-CFR21:** The Parker Transair® 316L Stainless Steel drops comply with requirements for food contact applications.

8. Parker Transair® Stainless Steel System

8.1 Rigid Stainless Steel Pipe

The pipe shall be rigid and manufactured in Stainless Steel AISI 316L Grade for sizes 22mm and 28mm and Stainless Steel AISI 304 Grade for sizes 42mm, 60mm, 76mm and 100mm. The pipe shall have been qualified, as defined by ISO 9001:2015, to warranty gripping and bubble-tight performance of the system. The pipe shall be Stainless Steel Natural Finish. The pipe shall be available in the following diameter sizes and lengths:

Outside ø	Outside ø (mm)	Inside ø (mm)	Length (ft)
3/4"	22	19.6	20
1"	28	25.6	20
1 1/2"	42	39.1	20
2"	60	57.1	20
3"	76	72.9	20
4"	101	97.6	20

8.2 Fittings

22mm (3/4") and 28mm (1")

All connectors shall be instant connection by means of a gripping ring technology with a release nut mechanism. The connectors shall be manufactured in brass with release nut manufactured in polyamide with fiberglass assembled with gripping teeth manufactured in stainless steel Z10 CN 17-7E2 (AISI 301) and with seals manufactured in EPDM or FKM.

42mm (1 1/2") and 60mm (2")

All connectors use a Clamp Ring technology with a threaded release nut mechanism. They shall incorporate a lateral dismantling feature for the rigid pipe. The connectors shall be manufactured in black polyamide (HR polymer) assembled with seals manufactured in EPDM or FKM.

76mm (3") and 101mm (4")

All connectors fittings shall be formed from 304 Stainless Steel and conform to ASTM A774 specifications. All fittings shall be connected using clamshell and cartridge technology with a reusable mechanical connection. The clamshell shall be manufactured of treated steel with a reinforced silver treatment with the seal cartridge manufactured in engineering grade polymer assembled with seals of EPDM or FKM.

8.3 Performance Criteria

Approved for process water, compressed air (dry, wet, lubricated), vacuum, inert gases, liquid fluids (please check chemical compatibility chart in catalog or consult with factory)

- **Working Pressure/Temperature:**
 - 145 psi from -4°F (-20°C) to +194°F (+90°C)
 - Vacuum: 29.6" Hg vacuum
- **Storage temperature:** -40°F (-40°C) to +194°F (+90°C)
- **Resistant to:**
 - Corrosion
 - Mechanical shocks
 - Ultraviolet (U.V.)
 - Aggressive environments
 - Thermal variations
- **Safety:** Components are non-flammable with no propagation of flame. The fittings in HR Polymer (OD 42mm and OD 60mm) conform to UL94HB.
- **Air Quality:** The international standard used for compressed air quality is ISO 8573 Series. Specifically, ISO 8573-1:2010, which is used to specify the purity of air required at a particular point of use. Parker Transair® meets Class 1.1.1 of this standard. Parker Transair® is qualified for use with Class D breathing air applications.
- **Recyclability:** The material used to manufacture the pipe and fittings are 100% recyclable. Parker Transair® pipe is manufactured from 60% post-consumer recycled material.

8.4 Certifications and Compliance

	22mm to 28mm	42mm to 60mm	76mm to 101mm
Manufacturing Standards	EN 10217-17	EN 10217-17	EN 10217-17
Grade	EN1088-2, 4404, AISI 316L	1.4301 / AISI 304	1.4301 / AISI 304
Welding Standard	DIN 17 457, EN 10217-17	DIN 17 457, EN 10217-17	DIN 17 457, EN 10217-17
Tolerances	DVGW-W541	EN 1127D4/T3	EN 1127D4/T3

B. SUBMITTAL FOR PARKER TCM SYSTEM: WIRELESS CONDITION MONITORING SYSTEM

1. **Condition Monitoring (TCM):** The way compressed air systems are monitored and maintained is changing with advanced IoT Technologies. Parker's IoT wireless condition monitoring solution ensures data is gathered on dozens of critical parameters; such as flow, humidity, temperature, power, and pressure of your compressed air system. With compared and analyzed, customers are provided with a quick snapshot and a complete-in-depth analysis of the compressed air system. The benefits of this are:
 - Reduce your risk, maintenance costs and unplanned downtime
 - Uncover operational and performance improvements
 - Make smarter, more confident and enjoy greater peace of mind
 - Leverage Parker's expertise to employ easy, cost-effective strategies

2. **Software:**
 - 2.3. **Cloud:** This Parker web-based interface provides alerts, status, and analytics for increased awareness of your compressed air system. Why Cloud?
 - Access to data anytime, anywhere
 - No software download – no updates
 - Receive alert notifications – email, text message or in-system
 - Customize alerts, trend charts, and dashboards
 - Support continuous improvement efforts with trend data
 - Remotely monitor multiple sites and sensors
 - 2.4. **Edge:** This interface is designed to work seamlessly with a web-browser-based user interface. Data is ingested from virtually any industrial asset. The software allows you to run various applications utilizing your data at the Edge or send it securely to the Cloud for seamless enterprise integration. Why Edge?
 - App & Industrial Driver Marketplace
 - Security Monitoring
 - Remote Device Management
 - 3rd Party Cloud Integration
 - Industrial Device Connectivity
 - Application Deployment

3. **Hardware:**
 - 3.3. **Sensors:** These wireless sensors are developed for continuous monitoring via the cloud or edge. The sensors are small, simple to install, and provide accurate measurements. All sensors report battery voltage and signal strength. The battery life is good for 3 years using the standard report rate of 1/minute. The radio range can be up to 1,000 feet, but a site survey by a qualified, trained Parker individual or representative determines the effective range. The sensors transmit at 902MHz to 928MHz. Common technical information:
 - Pressure Range: 0 to 150 PSI
 - Ambient Temperature range: -4°F to +158°F (Battery dependent)
 - Body Material: Polycarbonate
 - Body Seals: Nitrile
 - Certifications: FCC, IC
 - Battery: CR123A (Panasonic suggested brand)
 - IP Rating: IP65

- 3.3.1. Pressure and Vacuum:** Parker's pressure sensors can report both pressure and temperature. This flexibility allows for monitoring of critical applications such as compressor room filters, feed rings and point-of-use on priority equipment. The sensors have either a 1/4" male NPT or male -4 SAE thread connection for installation. Common technical information:
- Wetted Parts Material: 17-4 Stainless
 - Measurement Range: -14.5 to 1,500 PSI
 - Accuracy @ +77°F: 1.5%
 - Fluid Media Temperature Range: -40° to +185°F
- 3.3.2. Humidity:** Parker's humidity sensors can report relative humidity, temperature, and dew point. These data points allow for monitoring of critical applications such as painting, food packaging, and point-of-use on priority equipment. The sensors have a 1/4" male NPT thread connection for installation. Common technical information:
- Wetted Parts Material: Brass, Nitrile and Urethane
 - Measurement Range (Humidity): 0 to 100% Relative Humidity (RH)
 - Measurement Range (Temperature): -40° to +257°F
 - Accuracy @ +77°F, 20% to 80% RH, @ Ambient Pressure: ±5% RH Max.
 - Temperature Accuracy +14° to +185°F: ±1.0°F
- 3.3.3. Temperature:** Parker's temperature sensors can report temperature. This allows for monitoring of critical applications such as storage tanks, compressor discharge or ambient temperature of a room. The sensors have either 1/4" male NPT (probe) thread or foot connection for installation. Common technical information:
- Wetted Parts Material: 17-4 Stainless
 - Measurement Range (Fluid): -40° to +257°F
 - Accuracy @ +77°F:
 - Probe: ±3.0%
 - Foot: ±5.0%
- 3.3.4. Power:** Parker's power sensors can report power and amperage which allows the user to monitor key pieces of equipment such as compressors. The sensors have a 1/2-14 male NPSM thread connection for mounting to standard conduit box. The current transformer is split core which allows installation on pre-run electrical wiring. Common technical information:
- Measurement Range (Amperes): 13 to 600 Amps
 - Accuracy: 5% (Full Span)
- 3.3.5. 4-20mA Transmitter:** Parker's 4-20mA transmitter sensors allow data from existing 4-20mA sensors to be sent to the Parker monitoring system. The report data is customizable and allows for monitoring of critical features such as differential pressure, pH level and voltage. The sensor requires a connection cable, DIN M12 5-Pin, in conjunction with transmitter and 4-20mA sensor. The sensor has a magnetic base for tool free mounting. Common technical information:
- Accuracy: 0.5% (Additive to source)
- 3.3.6. Flow:** Parker's flow sensors can report flow rate, differential pressure, and temperature. These data points allow for monitoring of compressor outputs and system loops for users to see demand of their systems. The sensors shall be installed on Transair® Aluminum pipe and are calibrated with treated compressed air. Common technical information:
- Pipe Diameters: 1" (25mm) to 4" (101mm)
 - Maximum Calibrated Measurement Range: 60 to 1,100 SCFM (Pipe size dependent)
 - Wetted Material: Stainless Steel 304
 - Seal Material: Nitrile
 - Port: Transair® Reducing Bracket

3.4. Communication Hardware: The gateway and primary receiver node (PRN) are used to collect data from the sensors and send data via cellular or ethernet to Parker's Cloud or Edge software. It can support up to 500 sensors.

3.4.1. Gateway: The gateway is specifically designed for Machine-to-Machine (M2M) communication and IoT applications. The system has an Intel processor. It has WLAN (802.11 b/g/n), Bluetooth (4.0 module), Cellular (4G/LTE) and RF Module wireless communication. Additional technical information:

- Power Input: 9-36V
- Enclosure Material: Aluminum Alloy w/ Black Color
- Operating Temperature: -4° to +140°F
- Operating Humidity: 5 to 95% RH (Non-Condensation)
- Cooling Mode: Fanless, Heat Sink
- Approvals: UL, FCC Class B, CE

3.4.2. Primary Receiver Node (PRN): The PRN is specifically designed to extend the wireless range between the gateway and sensors. The PRN shall only be used at one hop. It connects to power source via a 2-meter USB cable. It has a robust over molded design for harsh environments.

3.5. Accessories:

3.5.1. Wired Power Supply: This is meant to replace the battery in the sensor by supplying continuous power. The upgrade eliminates the need for battery replacement. Using wired power supply extends temperature range over batteries. Additional technical information:

- Wire Length: 9.8 feet
- Temperature Range: -40° to +185°F
- Input Power: 5-36 VDC
- Output Power: 3 VDC
- Connection: Flying lead 24 AWG Wires
- Form: CR123A Battery

3.5.2. M12 Connection Cable: This shall be used with the 4-20mA transmitter. The plug-in connector is a M12 socket, 5-Pin either straight or 90° configuration. The 5 wires are bundled with the white meant for 4-20mA signal-in and blue for 4-20mA signal-out. The remaining wires are not necessary. The cable lengths are available in 6.5 feet to 32.5 feet.