ProCon® — R7 Series with NEXUS®
ORP Sensor Transmitter

Industrial Analytical Equipment
ICON™ PROCESS CONTROLS Corrosion-Free Instrumentation Equipment

- 4-20mA Output
- Temperature Compensated
- Nexus® Solid KCl Reference
- Gold/Platinum Electrode
- No Preamp Required
- Quick Response Time
- RS 485 Modbus Communication

The gold standard of high performance industrial ORP sensor transmitters for complex applications

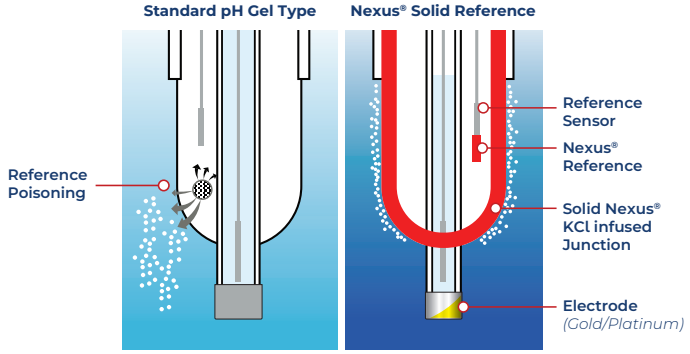
The ProCon® R7 Series with Nexus® has been engineered for ruggedness, longevity and accuracy, and features a choice between gold and platinum electrodes for enhanced accuracy.

The double junction coupled with the solid Nexus® KCl infused reference makes the R7 Series ORP sensor transmitter an excellent choice for wide range of process media applications.

All measurement functions are combined in one compact body — measuring electrode, temperature sensor and an inner reference chamber.

The 2-wire 4-20mA, 4-wire or 4-20mA + RS485 output options simplify calibration and communication with remote displays and controllers.

- Solid Nexus® reference extends sensor life and protects against poisoning ions
- Operates in sub-zero temperatures down to 14°F (-10°C)
- Advanced electronics provide excellent repeatability and reliability using cutting edge algorithmic diagnostics



Gold/Platinum electrode technology results in an industrial sensor with unequalled durability and reliability
(Gold: -2000mV – 500mV, Platinum: 500mV – 2000mV)

Typical Applications

R7C (Gold)

- Highly Acidic
- Reducing Environments (Cyanide)
- Below 500mV

R7G (Platinum)

- High Oxidation
- Chlorinated (Pools, Spas)
- Potable Water
- Above 500mV

Model Selection

R7G: General Purpose | R7C: Complex Environment ORP Sensor				
Part Number	**Material**	**Output**	**Type**	**Connection**
R7G-P-D-1-F-M	PP	4-wire (for ProCon® display)	Flat	M12
R7G-P-M-1-F-M	PP	4-20mA (2-wire, std)	Flat	M12
R7G-P-S-1-F-M	PP	RS485 + 4-20mA	Flat	M12
R7C-P-D-1-F-M	PP	4-wire (for ProCon® display)	Flat	M12
R7C-P-M-1-F-M	PP	4-20mA (2-wire, std)	Flat	M12
R7C-P-S-1-F-M	PP	RS485 + 4-20mA	Flat	M12

Last digit: "M" for M12 Connection (std), "F" Flying Lead - consult factory

NEXUS® Solid Reference Technology

PP RoHS Compliant CE

Smart Sensor Technology

Advanced electronic circuity stores pH data for automatic sensor recognition and trouble-free calibration when connected to the ProCon® Controller.

Outputs

1. 4-20mA 2-Wire
2. 4-20mA + RS485

Both the measuring and reference electrodes are encapsulated within the non-porous advanced KCl infused polymer known as Nexus®.

Less Calibration and Maintenance

Most sensors require on-going recalibration and are prone to premature failure due to what is known as gradient drift, or sensor drift.

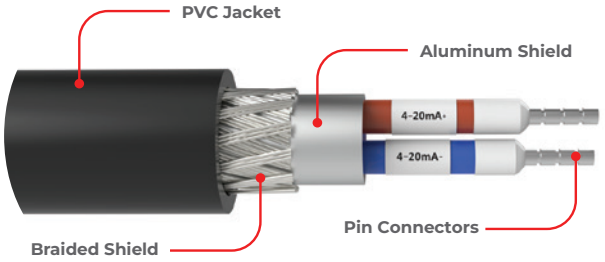
The Nexus® series is a solid reference material. Poisoning or leaching of the reference electrolyte that occurs in standard sensor is greatly reduced.

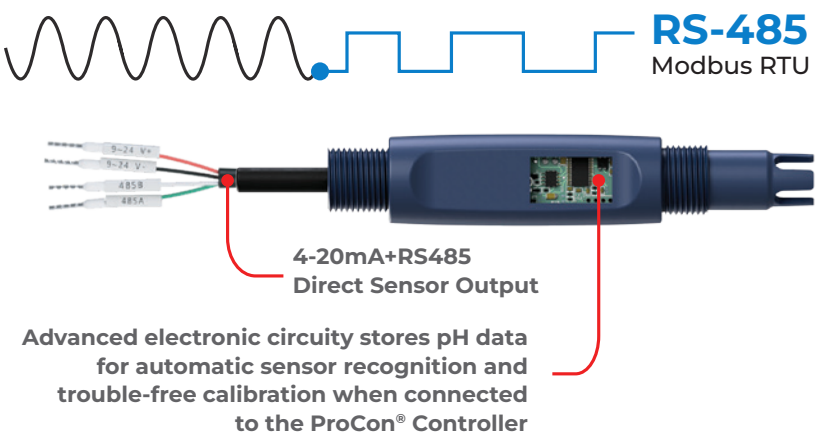
The Nexus reference helps to eliminate the need for ongoing maintenance or cleaning requirement due to fouling or film build up removal which occurs with many process applications with traditional ORP sensors.

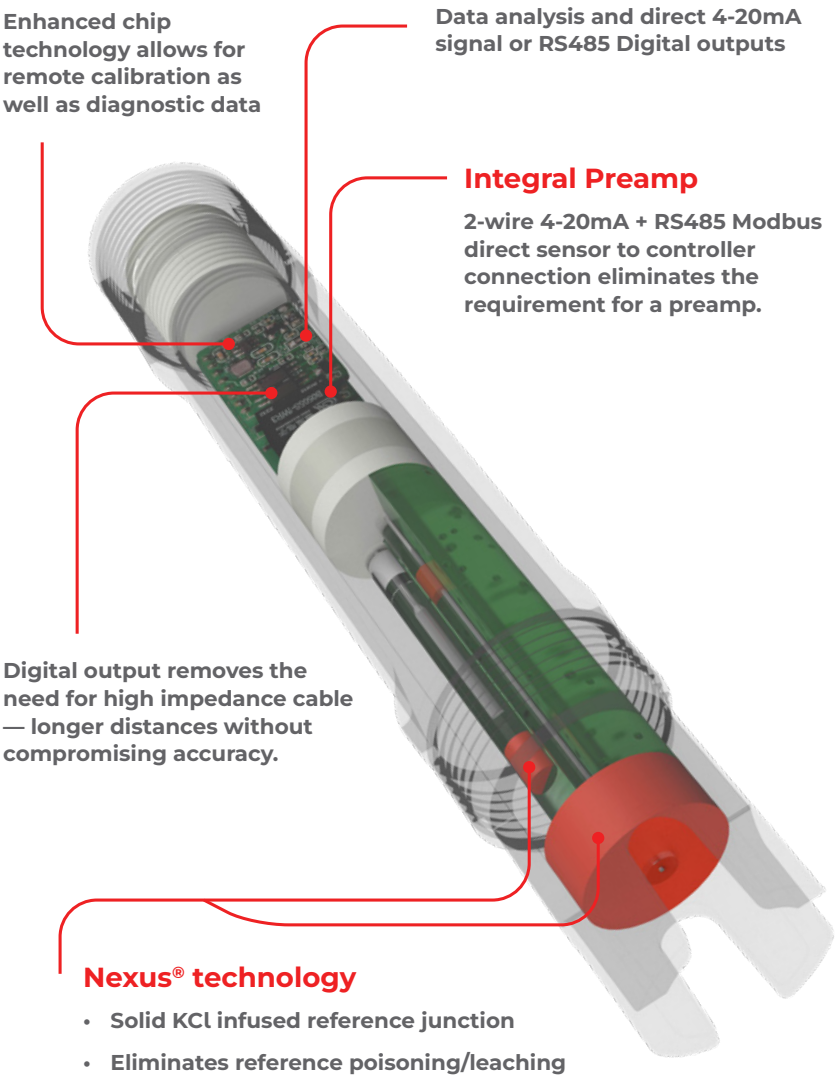
Faster Response — Longer Lasting

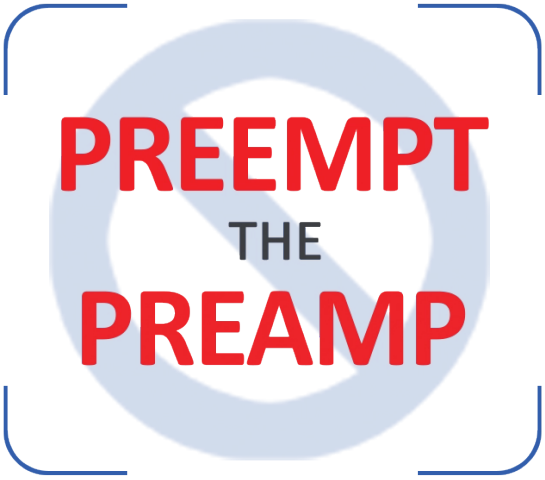
The solid Nexus® reference provides for faster response time to changing pH values since there is no requirement for a junction.

- ✓ No Costly Preamps Required
- ✓ Direct 4-20mA & RS485 Outputs







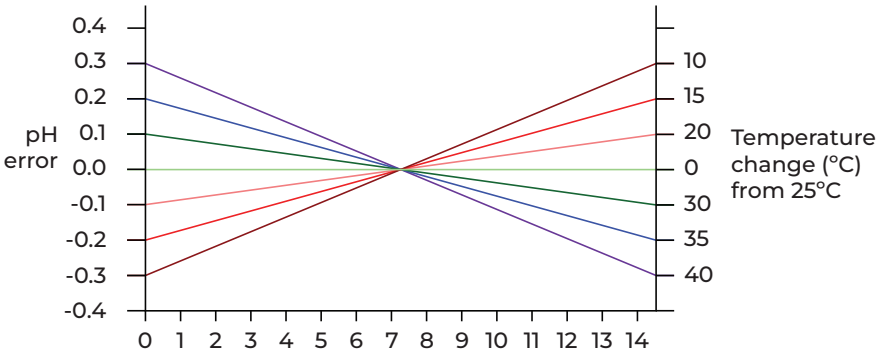


Specifications

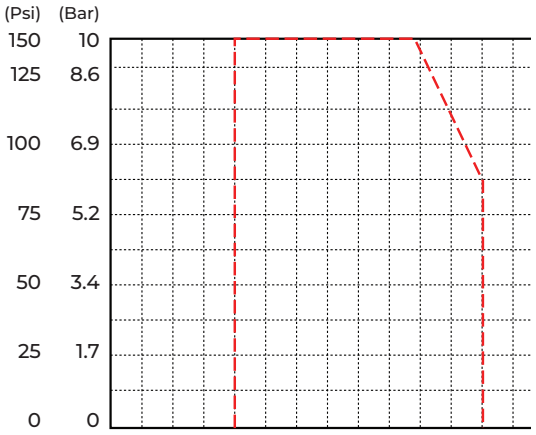
Measurement Range	
ORP	-2000mV – 2000mV*
Output Signal — No Preamp Required	
2 Wire Loop Powered | 4-20mA + RS 485 Direct Sensor Output	
Accuracy	
± 1mV	
Operating Temperature	
14 to 176°F | -10 to 80°C | Automatic Temperature Compensation	
Maximum Pressure	
145 Psi | 10 bar	
Design	
Sensor body	PP Polypropylene (std) | Ryton® | PPS
Reference System	3.3 Mol Ag / AgCl / KCl Double Junction
pH electrode	Gold (R7C) | Platinum (R7G)
Reference	Solid Nexus®
Connection	3/4" NPT
Measuring Electrode Resistance	< 500 MΩ
Impedance Range	102 – 675 MΩ
Temperature Compensation/Output- 4-20 + RS485 Model	
Pt-1000 (Std)	
Pt-100	

*Contact factory for alternate ranges

Temperature Control

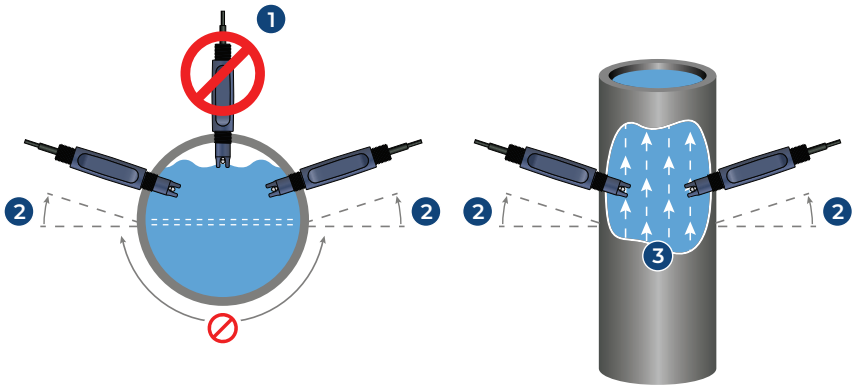


Temperature vs. Pressure

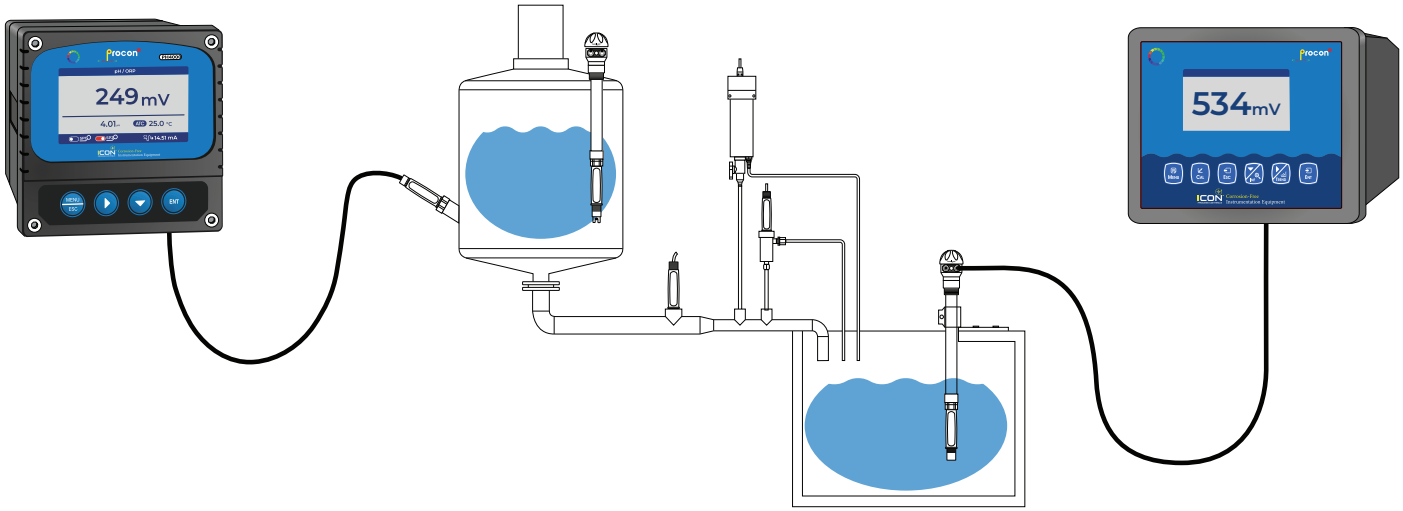


In-line Mounting

1. Avoid vertical installation. (air may be present)
2. Optimum installation 15° above horizontal.
3. Process liquid should flow upward. (for downward flow ensure backpressure is present in order to avoid air within pipe)



Typical Application



Cable Options

The ProCon® series offer complete flexibility of cabling options throughout the range. All cables are shielded against spurious EMF and are potted inside the sensor ensuring environmental protection.

The standard cable length for most sensors is 5m (15 ft). However, cables can be supplied as any continuous size up to 20m (66 ft).

Standard accessories include jsubmersion couplers, typically used with extension cables for direct connection to the ProCon® Controllers.

Extension cables also permit distances between sensor and instrument of up to 30 m (100 ft.) without external preamplifier.

M12
Quick
Connection

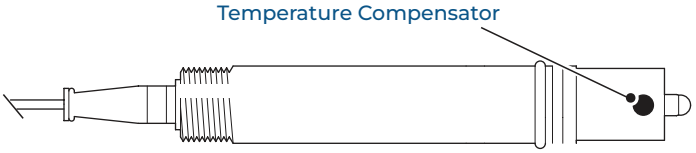
Temperature compensation

The temperature compensator enables sensor to adjust for temperature effects on the glass pH electrode output.

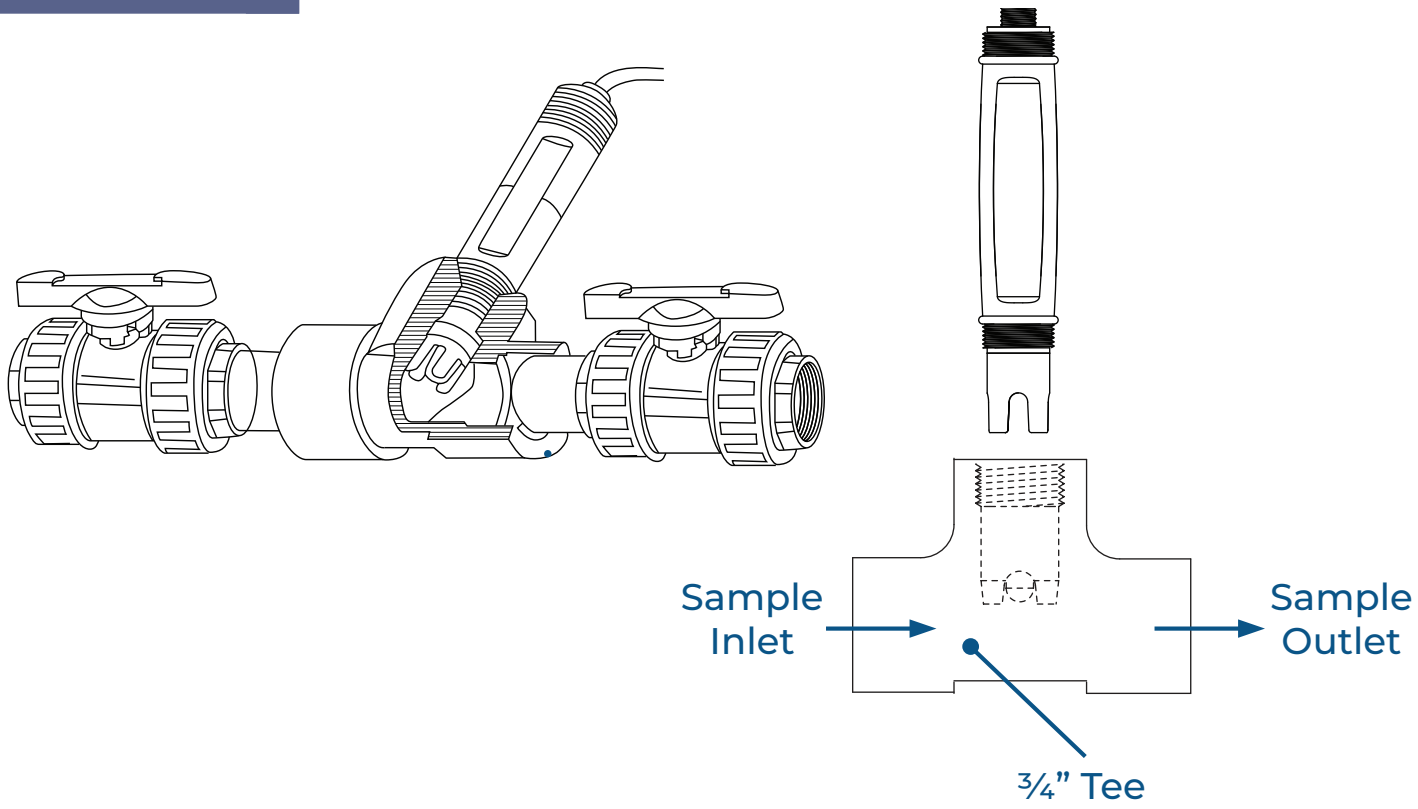
The sensor can also use this measurement to compensate for solution pH temperature effects.

Sensors can be ordered with integral temperature sensors. The integral temperature compensator is available in two outputs — Pt 1000 (std) and Pt 100.

* *Temperature outputs on 4 and 6 wire versions only.*



Typical Installations



Wiring

4-20mA 2-wire

1. Blue: mA-
2. Brown: mA+

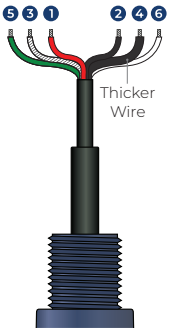
4-20mA 4-wire

1. Transparent: 4-20mA
2. Black (thick): Ref
3. White: Temperature
4. Green: Temperature

Connects directly to ProCon® controller

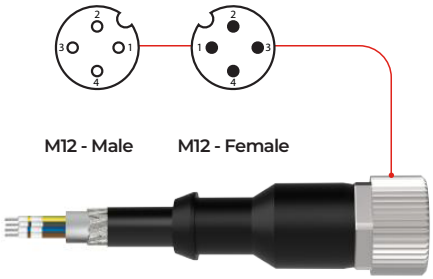
4-20mA + RS485 Output

1. Red: 9-24VDC +
2. Black: 9-24VDC -
3. Transparent: 4-20mA
4. Black (thick): Ref
5. Green: RS 485 A
6. White : RS 485 B

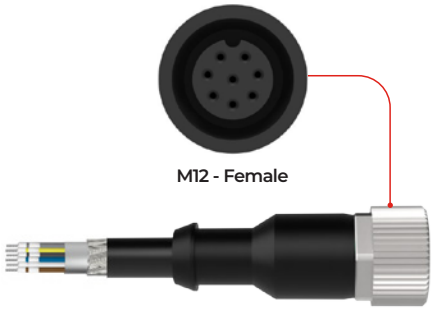


Wiring — M12

4 Pin M12 Connection



8 Pin M12 Connection



4-20mA | 4 Pin

Color	Description
Pin 1 – Brown	4-20mA +
Pin 2 – Blue	4-20mA -

4-20mA + Controller | 4 Pin

Color	Description
Red	Temperature
Black	Temperature
Black (Thick)	Reference
Transparent	4-20mA

4-20mA + RS485 | 8 Pin

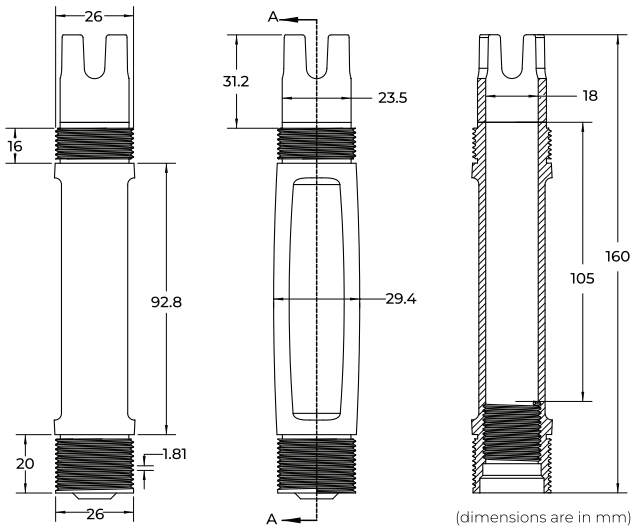
Color	Description
Red	9-24 VDC +
Black	9-24 VDC -
Transparent	4-20mA
Black (Thick)	Reference
Green	RS485 A
White	RS485 B

4 Pin IO - Link Connection

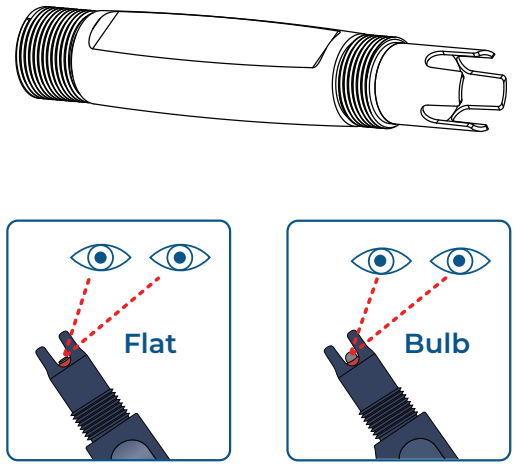
I-O Link | 4 Pin

Pin	Description
Pin 1	24 VDC +
Pin 2	
Pin 3	GND
Pin 4	4-20mA

Dimension

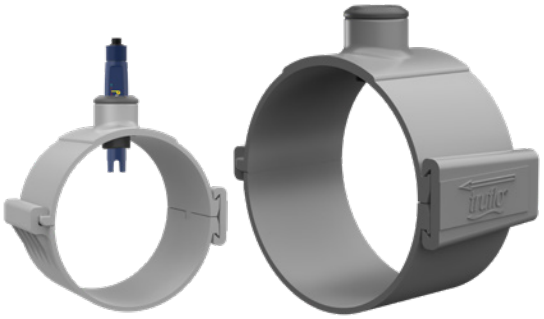


(dimensions are in mm)



Fittings

Easy Install Clamp On Pipe Saddles					
Part Number	Material	Size	Seal	Thread	Connection
PSA-2	PVC	2"	FPM	¾" NPT	PVC
PSA-3	PVC	3"	FPM	¾" NPT	PVC
PSA-4	PVC	4"	FPM	¾" NPT	PVC
PSA-6	PVC	6"	FPM	¾" NPT	PVC
PSA-8	PVC	8"	FPM	¾" NPT	PVC



True Union Tee Fitting					
Part Number	Material	Size	Seal	Thread	Connection
TUPA-PV-5	PVC	1/2"	FPM (std) | EPDM	¾" NPT	Socket | NPT
TUPA-PP-5	PP	1/2"	FPM (std) | EPDM	¾" NPT	Butt | NPT
TUPA-PF-5	PVDF	1/2"	FPM (std) | EPDM	¾" NPT	Butt| NPT
TUPA-PV-7	PVC	3/4"	FPM (std) | EPDM	¾" NPT	Socket | NPT
TUPA-PP-7	PP	3/4"	FPM (std) | EPDM	¾" NPT	Butt | NPT
TUPA-PF-7	PVDF	3/4"	FPM (std) | EPDM	¾" NPT	Butt| NPT
TUPA-PV-1	PVC	1"	FPM (std) | EPDM	¾" NPT	Socket | NPT
TUPA-PP-1	PP	1"	FPM (std) | EPDM	¾" NPT	Butt | NPT
TUPA-PF-1	PVDF	1"	FPM (std) | EPDM	¾" NPT	Butt| NPT
TUPA-PV-15	PVC	1 1/2"	FPM (std) | EPDM	¾" NPT	Socket | NPT
TUPA-PP-15	PP	1 1/2"	FPM (std) | EPDM	¾" NPT	Butt | NPT
TUPA-PF-15	PVDF	1 1/2"	FPM (std) | EPDM	¾" NPT	Butt| NPT
TUPA-PV-2	PVC	2"	FPM (std) | EPDM	¾" NPT	Socket | NPT
TUPA-PP-2	PP	2"	FPM (std) | EPDM	¾" NPT	Butt | NPT
TUPA-PF-2	PVDF	2"	FPM (std) | EPDM	¾" NPT	Butt| NPT

ProCon® Sensing Tomorrow's Innovations Today by ICON™ PROCESS CONTROLS Corrosion-Free Instrumentation Equipment

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