ProCon® — P14C with NEXUS®
pH Sensor Transmitter

Industrial Analytical Equipment

ICON™ PROCESS CONTROLS — Corrosion-Free Instrumentation Equipment

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Direct D500 Controller with SimplCal® Auto Calibration

4.001 pH

Direct 4-Wire

Blue Glass Electrode

Nexus® Solid Reference

M12 Quick Connection

¾" NPT

- ✓ 4-20mA Output
- ✓ Temperature Compensated
- ✓ Nexus® Solid KCl Reference
- ✓ No Preamp Required
- ✓ High Accuracy
- ✓ Quick Response Time
- ✓ ¾" NPT Connection
- ✓ PP or PPS Body Materials
- ✓ RS 485 Modbus Communication

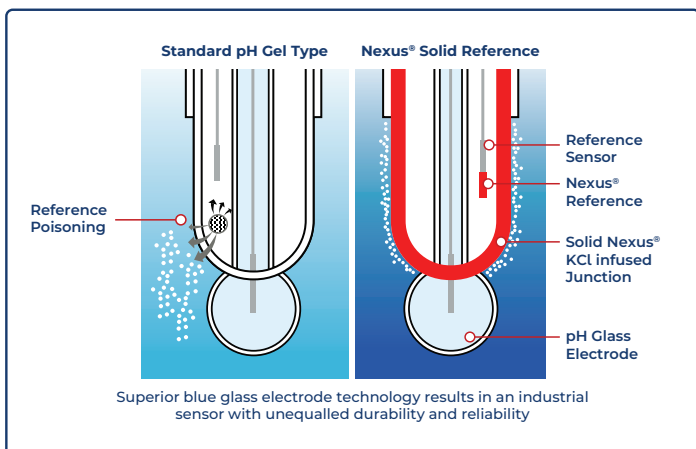### High performance industrial sensor transmitter for harsh applications

The ProCon® P14C Nexus® series offers the ultimate combination of durability, functionality and long-term performance; exactly what is required for industry's most complex applications. The Nexus® reference eliminates reference poisoning. The sensor transmitters are available in flat planar or bulb style design.

The double junction coupled with the solid Nexus® KCl infused reference makes the P14C pH sensor transmitter an excellent choice for complex 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.

- ✓ Double junction reference extends sensor life and protects against poisoning ions
- ✓ Durable crack resistant low ionic glass enhances performance and increased reliability
- ✓ Operates in sub-zero temperatures down to 14°F (-10°C)
- ✓ Advanced electronic diagnostics provides excellent repeatability and reliability

Standard pH Gel Type

Nexus® Solid Reference

Reference Poisoning

Reference Sensor

Nexus® Reference

Solid Nexus® KCl infused Junction

pH Glass Electrode

Superior blue glass electrode technology results in an industrial sensor with unequalled durability and reliability

Model Selection

P14C — Complex pH Sensor				
Part Number	Material	Output	Type	Connection
P14C-P-D-1-F-M	PP	4-wire (for ProCon® display)	Flat	M12
P14C-P-D-1-B-M	PP	4-wire (for ProCon® display)	Bulb	M12
P14C-P-M-1-F-M	PP	4-20mA (2-wire, std)	Flat	M12
P14C-P-M-1-B-M	PP	4-20mA (2-wire, std)	Bulb	M12
P14C-P-S-1-F-M	PP	RS485 + 4-20mA	Flat	M12
P14C-P-S-1-B-M	PP	RS485 + 4-20mA	Bulb	M12

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

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 pH 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
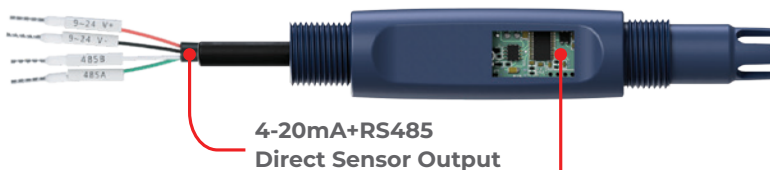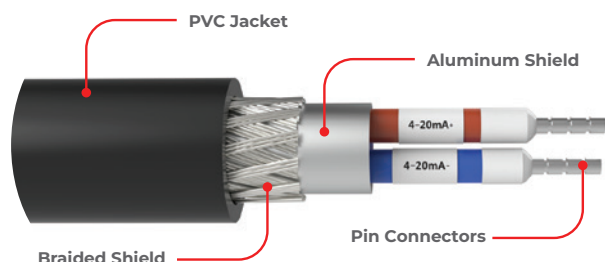
RS-485
Modbus RTU

9~24 V+
9~24 V-
485B
485A

4-20mA+RS485 Direct Sensor Output

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

Enhanced chip technology allows for remote calibration as well as diagnostic data

Data analysis and direct 4-20mA signal or RS485 Digital outputs

Integral Preamp

2-wire 4-20mA + RS485 Modbus direct sensor to controller connection eliminates the requirement for a preamp.

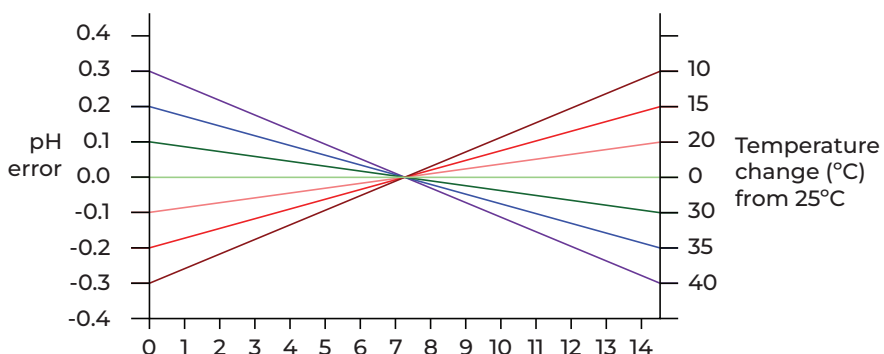**Digital output removes the need for high impedance cable — longer distances without compromising accuracy.**

PVC Jacket
Aluminum Shield
4-20mA+
4-20mA-
Pin Connectors
Braided Shield

Nexus® technology

- Solid KCl infused reference junction
- Eliminates reference poisoning/leaching
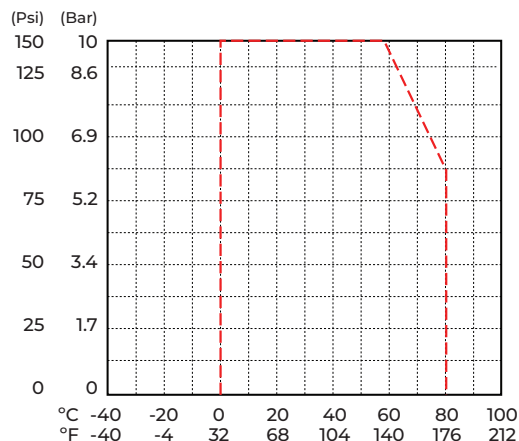- Extended life expectancy

PREEMPT THE PREAMP
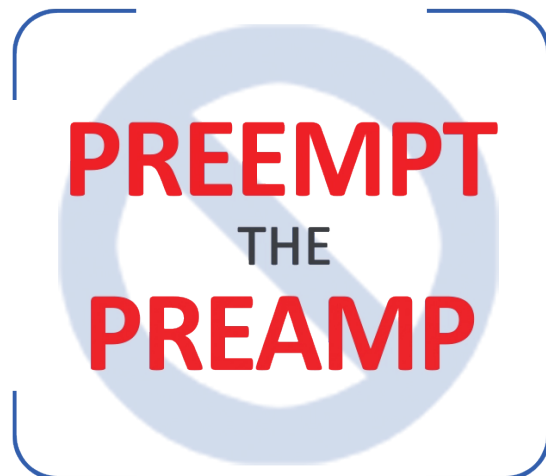
Specifications

Measurement Range	
pH	0 – 14
Output Signal — No Preamp Required	
2 Wire Loop Powered | 4-20mA + RS 485 Direct Sensor Output	
Accuracy	
7.00 ± 0.25	
Operating Temperature	
14 to 176°F | -10 to 80°C | Automatic Temperature Compensation	
Maximum Pressure	
150 Psi at 140°F (60°C) — See Pressure vs. Temp Graph	
Design	
Sensor body	PP Polypropylene (std) | Ryton® | PPS
Reference System	3.3 Mol Ag / AgCl / KCl Double Junction
pH electrode	Blue Glass | Bulb | Flat
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	

ProCon® — P14C with NEXUS®
pH Sensor Transmitter

Industrial
Analytical
Equipment

ICON PROCESS CONTROLS

Corrosion-Free
Instrumentation Equipment

Temperature Control

pH error

Temperature change (°C) from 25°C

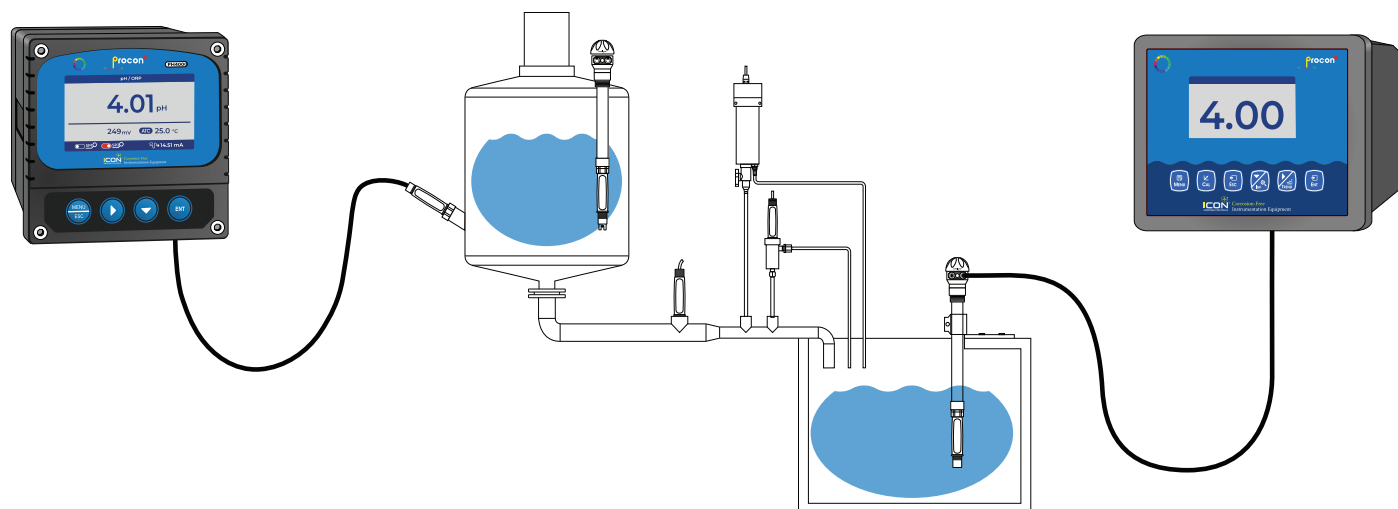## Temperature vs. Pressure

(Psi) (Bar)

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)
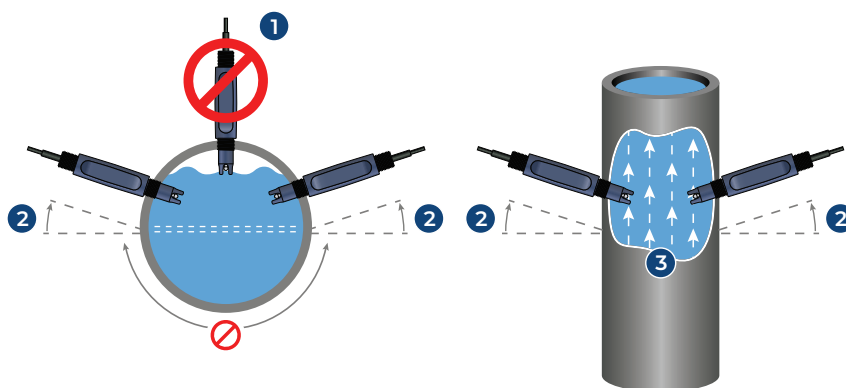
Typical Application

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.

Temperature Compensator

Typical Installations

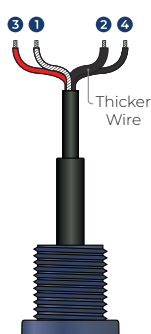Sample Inlet

Sample Outlet

¾" Tee
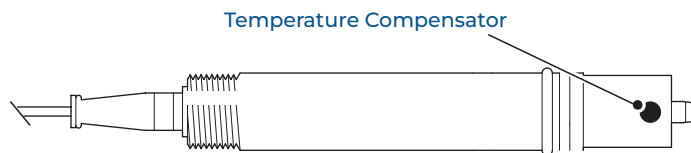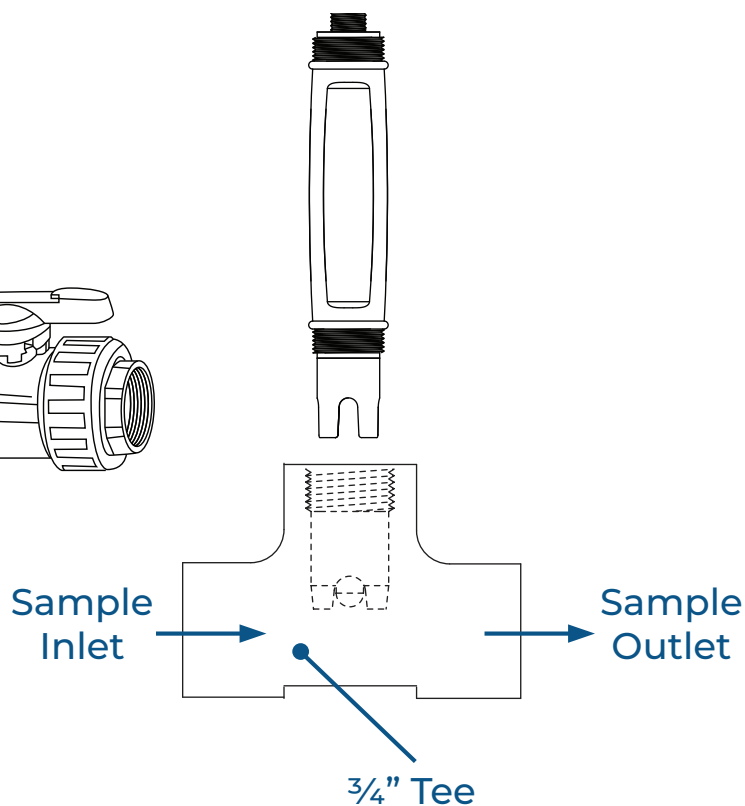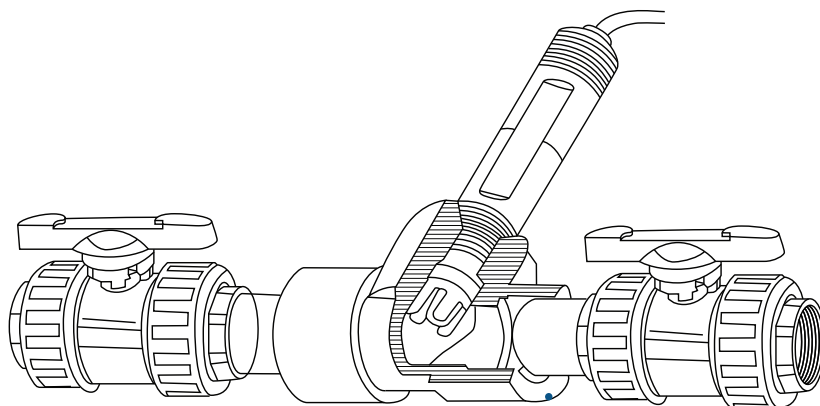
Wiring — Flying Lead

4-20mA 2-wire
❶ Blue: mA-
❷ Brown: mA+

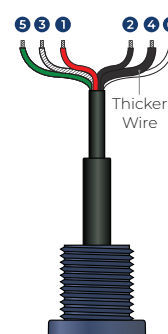### 4-20mA 4-wire
❶ Transparent: 4-20mA
❷ Black (thick): Ref
❸ Red: Temperature
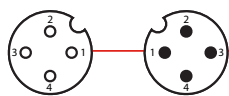❹ Black: Temperature

Connects directly to ProCon® controller

Thicker Wire

4-20mA + RS485 Output
❶ Red: 9-24VDC +
❷ Black: 9-24VDC -
❸ Transparent: 4-20mA
❹ Black (thick): Ref
❺ Green: RS 485 A
❻ White : RS 485 B

Thicker Wire

Wiring — M12

4 Pin M12 Connection

M12 - Male   M12 - Female

8 Pin M12 Connection

M12 - Female

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

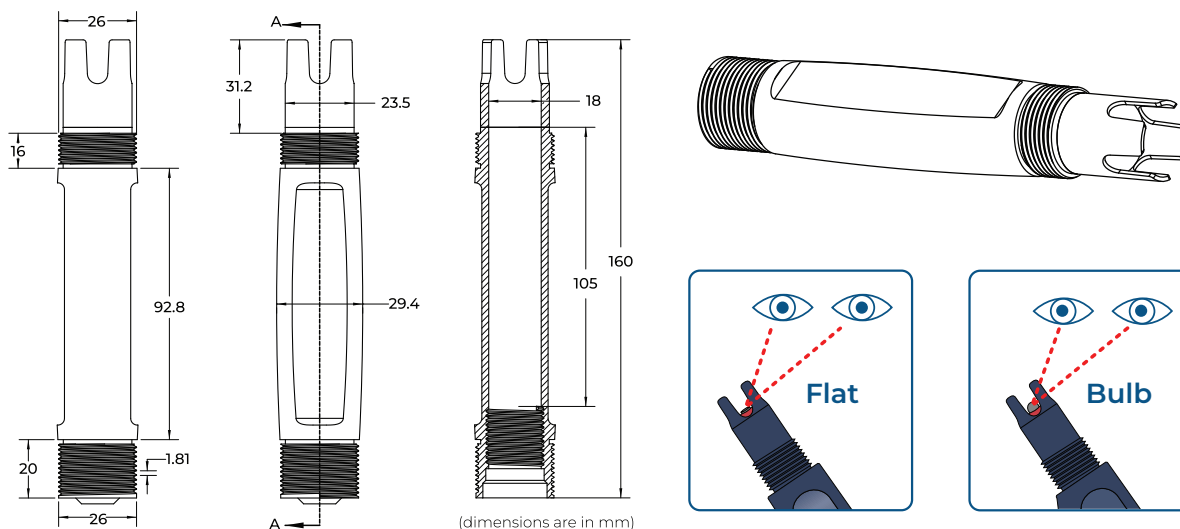| Color	Description
Red	9-24 VDC +
Black	9-24 VDC -
Transparent	4-20mA
Black (Thick)	Reference
Green	RS485 A
White	RS485 B

4 Pin IO - Link Connection

I-O Link | 4 Pin

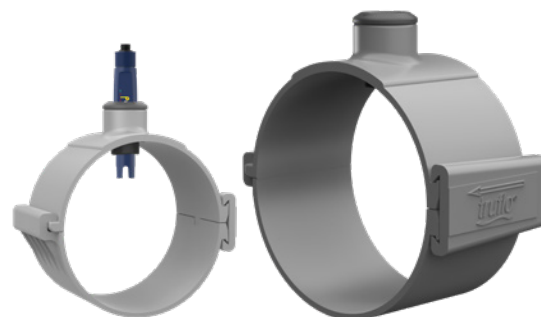| Pin	Description
Pin 1	24 VDC +
Pin 2	
Pin 3	GND
Pin 4	4-20mA

Dimension

26
31.2
23.5
18
16
160
105
92.8
29.4
20
1.81
26
A
A
(dimensions are in mm)

Flat | Bulb

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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