truflo®

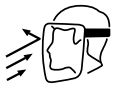
TIW SERIES
INSTRUCTION MANUAL

ICON™ PROCESS CONTROLS Corrosion-Free Instrumentation Equipment

Read the User's Manual Carefully.
Manufacturer Reserves the Right to Implement Changes Without Prior Notice.

Safety Information

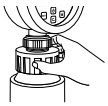
1. De-pressurize and Vent System Prior to Installation or Removal.
2. Confirm Chemical Compatibility Before Use.
3. DO NOT Exceed Maximum Temperature or Pressure Specifications.
4. ALWAYS Wear Safety Goggles or Face-Shield During Installation and/or Service.
5. DO NOT Alter Product Construction.



Warning | Caution | Danger
Indicates a potential hazard. Failure to follow all warnings may lead to equipment damage, injury, or death

Hand Tighten Only
Overtightening may permanently damage product threads and lead to failure of the retaining nut.

Note | Technical Notes
Highlights additional information or detailed procedure.



Do Not Use Tools
Use of tool(s) may damage product beyond repair and potentially void product warranty.

WARNING!

Failure to follow these instructions may result in the sensor being ejected from the pipe!

If leaking is observed from the retaining cap, it indicates defective or worn o-rings on the sensor. Do not attempt to correct by further tightening.

Do Not Remove Under Pressure

General Data

Specification	Description
Operating Voltage	10 - 30VDC
Current Consumption	10mA max.
Pulse Output	NPN | PNP
Fluid	H_2O | Liquid Chemicals
Accuracy	± 0.5% of F.S. @ 25°C
Response Frequency	5K Hz
Max Flow Rate	10m/s | 33ft/s
Min Flow Rate	0.1m/s | 0.3ft/s
O-Ring Material	Viton (std) | EPDM*
Operating Temperature	PVC < 60°C | PP < 80°C | PF < 100°C
Protection Class	IP-65 | General Purpose
Material of Tube	Paddle | Tefzel® Rotor | Busings | Zirconium Ceramic Sensor Body | PVC | PP | PVDF
Approval	CE | RoHS

*Optional

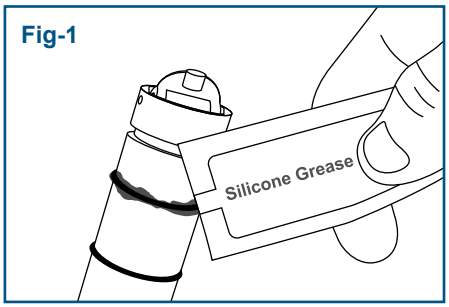
Installation

Very Important

- **Lubricate O-rings with a Viscous Lubricant Compatible with the Materials of Construction.**
- **Using an Alternating | Twisting Motion Carefully Lower the Sensor into the Fitting. | Do Not Force | Fig 5**
- **Ensure Tab | Notch are Parallel to Flow Direction | Fig-2**

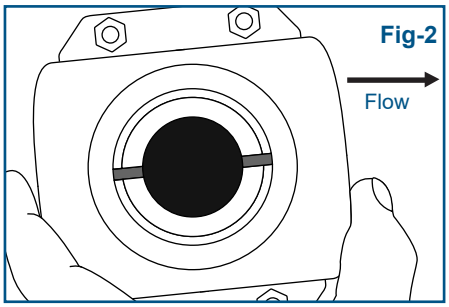
Hand Tighten the Sensor Cap. **DO NOT** use any tools on the sensor cap or the cap threads or fitting threads may be damaged. | Fig-5

Fig-1



Ensure Amble Silicon Grease (Supplied) is Applied Prior to Insertion

Fig-2



Ensure Location Tabs Are Parallel to Direction of Flow

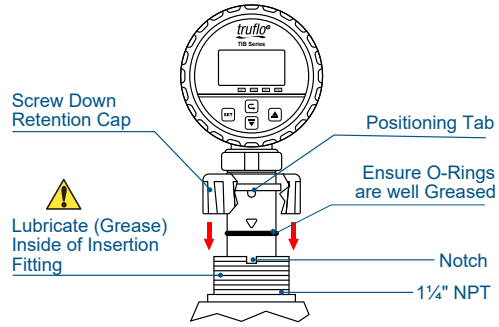


Fig-3

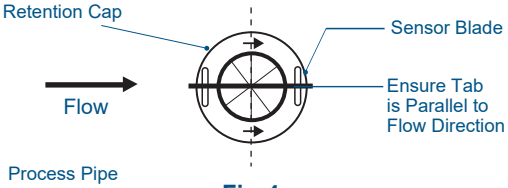


Fig-4

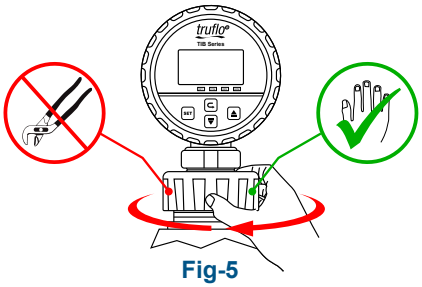
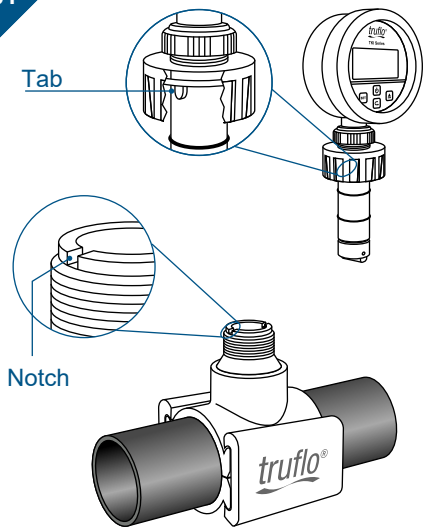


Fig-5

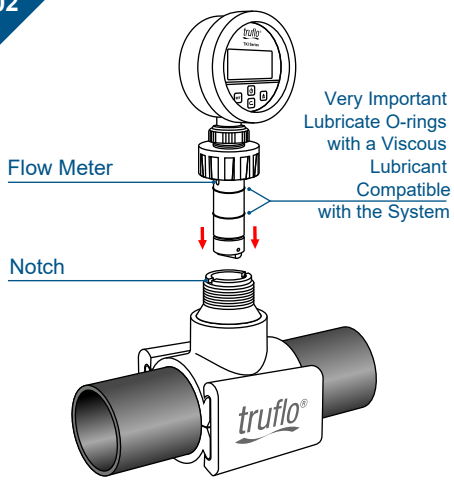
Correct Sensor Installation

01



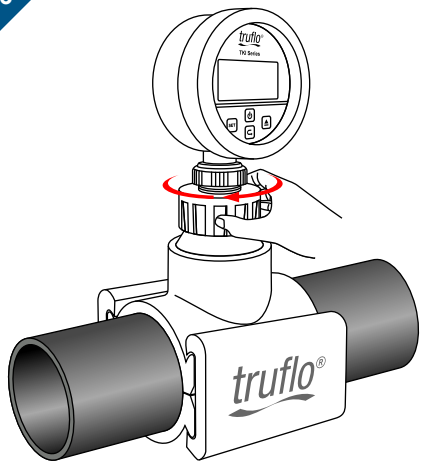
Flow Meter Positioning Tab and Clamp Saddle Notch

02



Engage one Thread of the Sensor Cap then turn the Sensor until the Alignment Tab is Seated in the Fitting Notch, Ensure Tab is Parallel to Flow Direction.

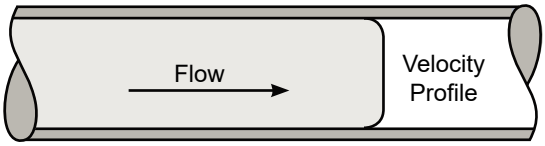
03



- Hand Tighten the Screw Cap.
- DO NOT use any Tools, Threads may be Damaged.
- Ensure Meter is Firmly in Place

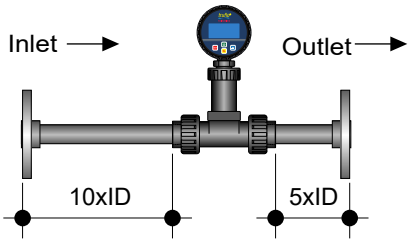
Correct Sensor Positioning

TIWSeries Flow Meters measure liquids only. No air bubbles should be present and the pipe **must always be full.** The sensors are not effective in laminar or transitional flow applications. Minimum Reynolds number required is 4500. For accurate flow measurement there must be a developed turbulent velocity profile at the sensor location. This requires a straight run pipe with a minimum number of pipe diameters distance upstream and downstream of the flow sensor. These distances depend on the type of piping element (i.e. valves, elbows, reducers etc.) causing the disturbance. To ensure maximum accuracy, the following guidelines need to be observed when installing.

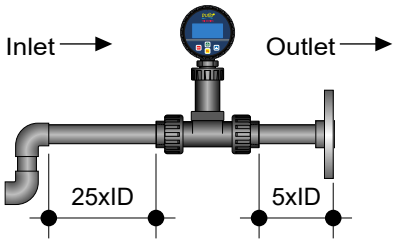


Developed Turbulent Flow

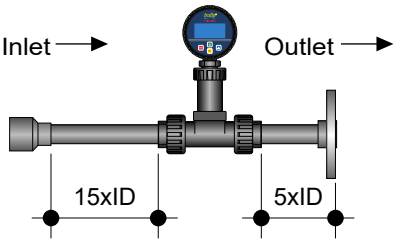
Flange



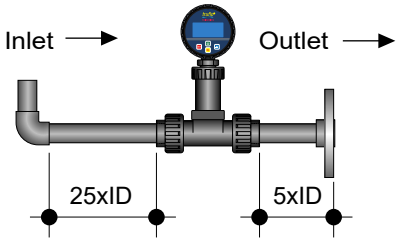
2 X 90° Elbow



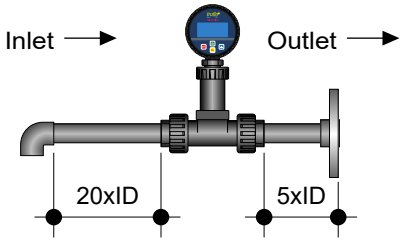
Reducer



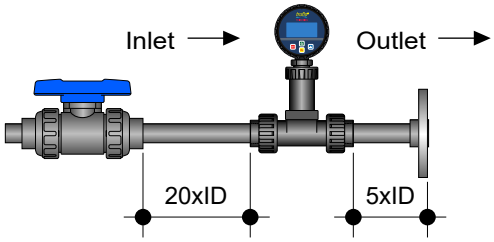
90° Elbow | Flow Downward



90° Elbow | Flow Upward

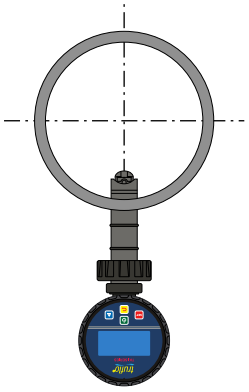


Ball Valve



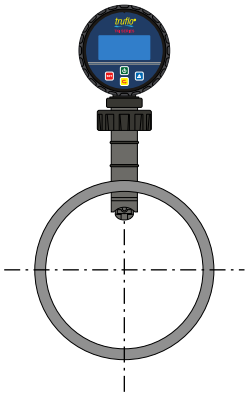
Installation Positions

Figure 1



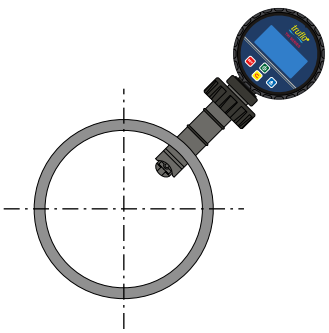
Good if NO
Sediment Present

Figure 2



Good if NO Air
Bubbles Present

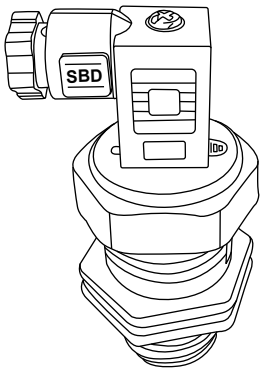
Figure 3



Preferred Installation if Sediment* or Air
Bubbles may be Present

* Maximum % Solids: 10% with particle size not exceeding 0.5 mm cross section or length.

01



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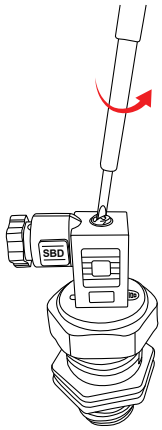

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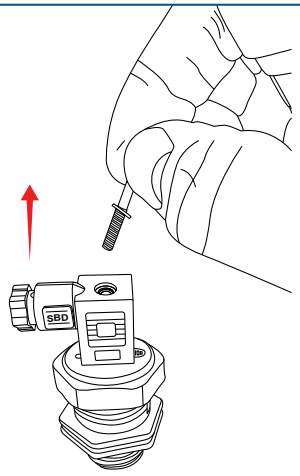

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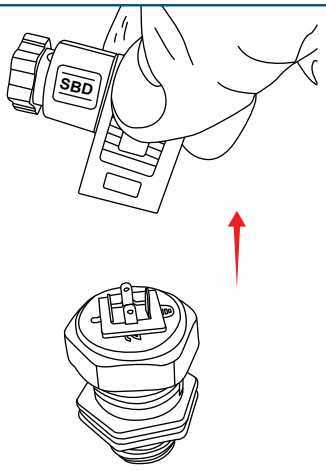

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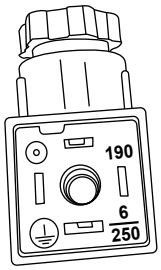

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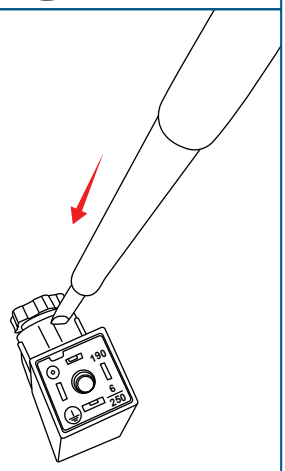

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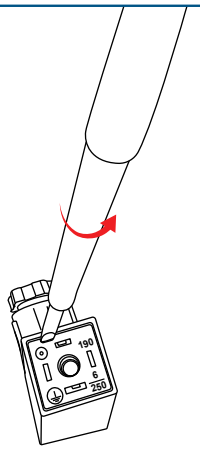

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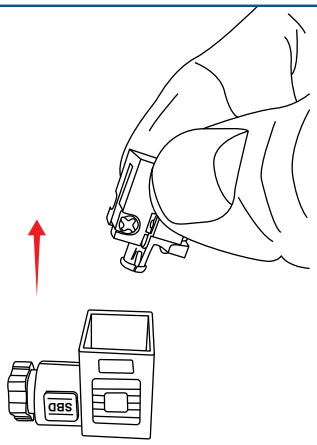

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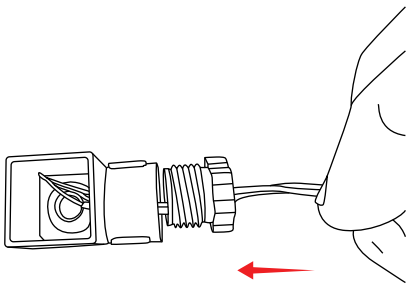

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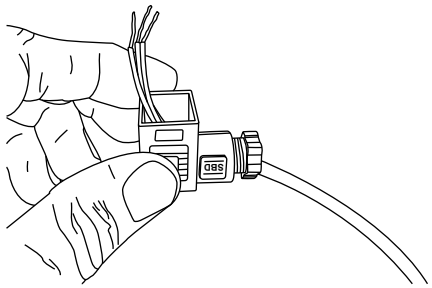

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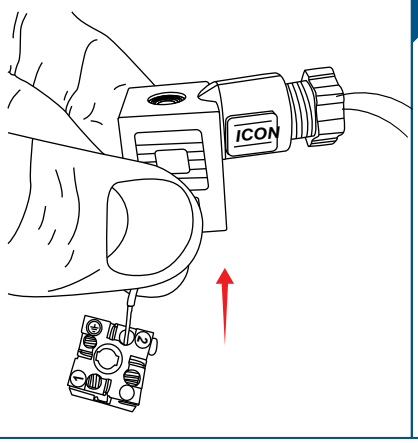
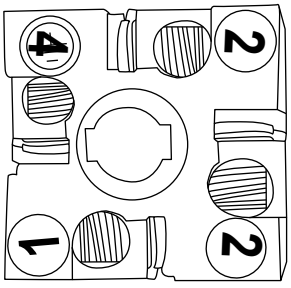


12

Pin (1) 5-30VDC

Pin (2) - VDC

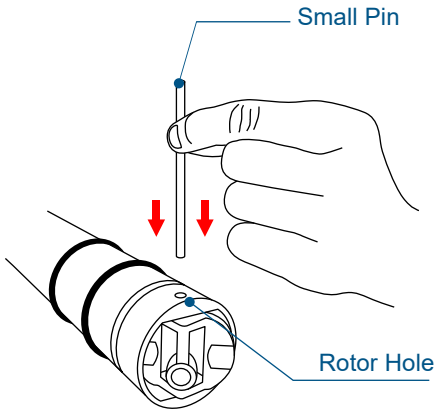


Pin (3) PNP Output

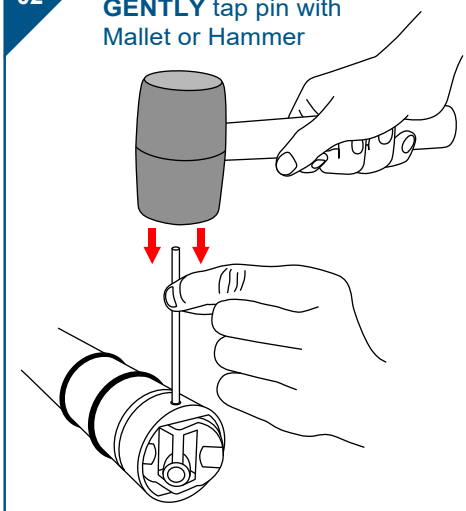
Pin (4) NPN Output

Rotor Pin | Paddle Replacement Procedure

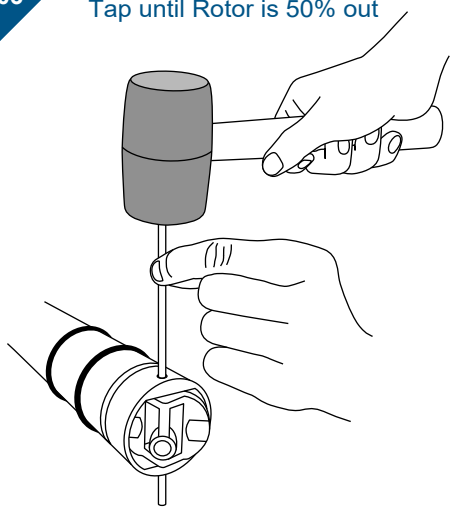
01 Line up Pin with Rotor Hole



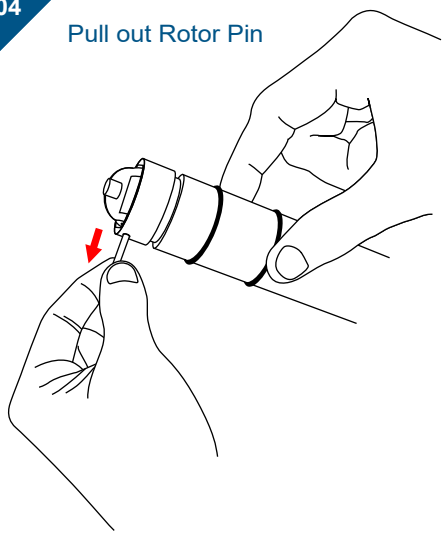
02 **GENTLY** tap pin with Mallet or Hammer



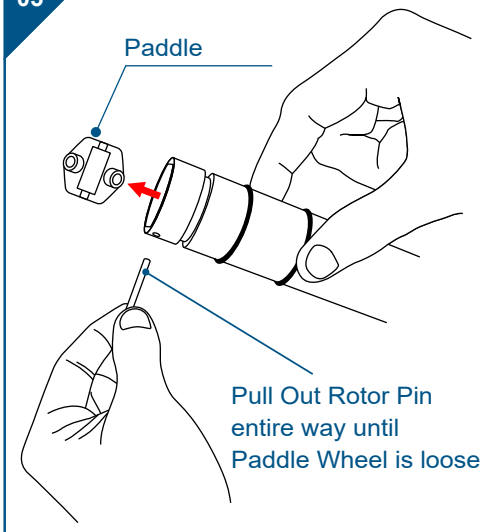
03 Tap until Rotor is 50% out



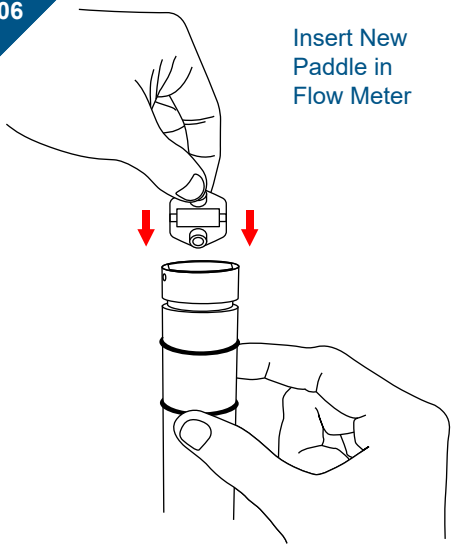
04 Pull out Rotor Pin



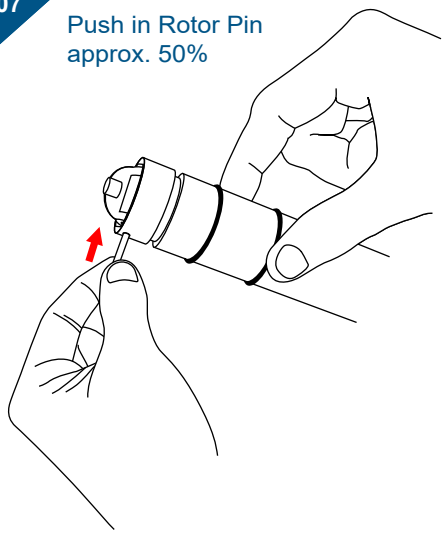
05 Paddle



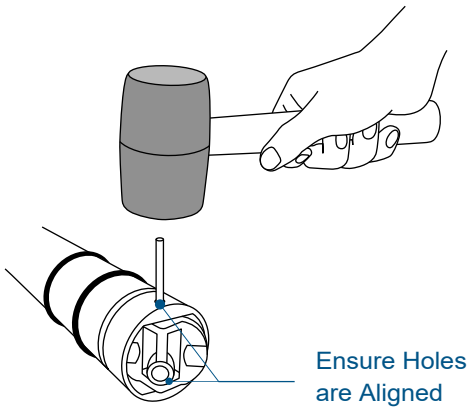
06 Insert New Paddle in Flow Meter



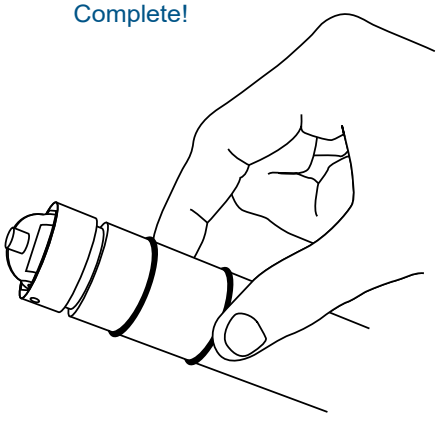
07 Push in Rotor Pin approx. 50%



08 **GENTLY** tap Rotor Pin with Mallet or Hammer



09 Congratulations!
Replacement Procedure Complete!



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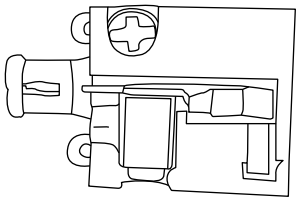

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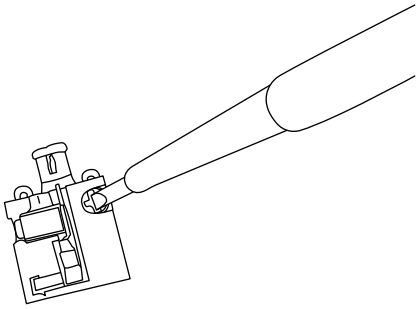

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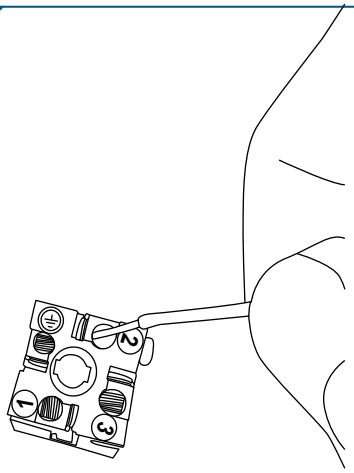

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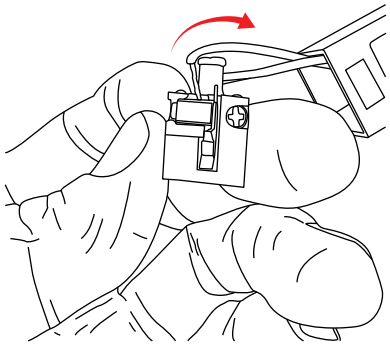

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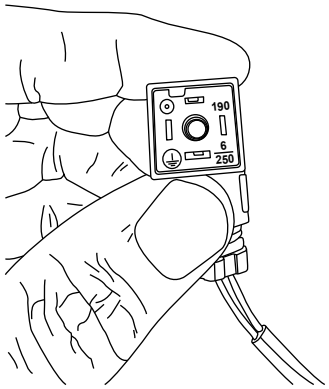

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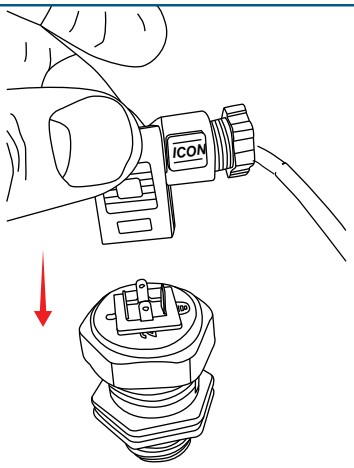

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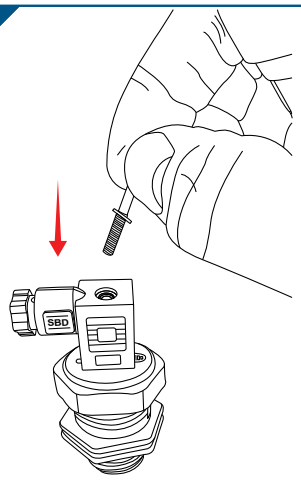

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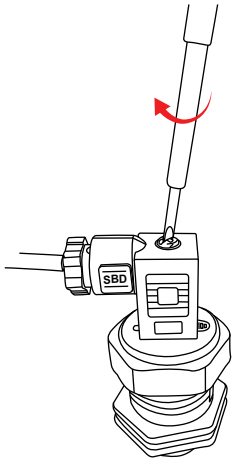

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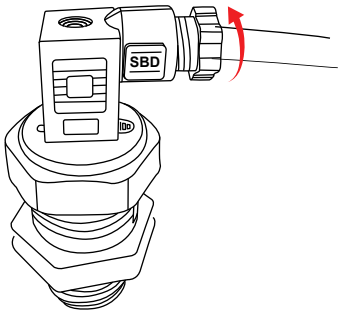


Long Service Life

The TIW Series is equipped with a Zirconium Ceramic Rotor Pin and 2 Bushings. The TIW Series also incorporates a contoured, 'Low Drag' Paddle Wheel leading to reduced drag, longer wear and a higher accuracy.

Ceramic Rotor | Bushings
- High Chemical Resistance
- Long Life - 40 years/m/s
- Self Cleaning Design

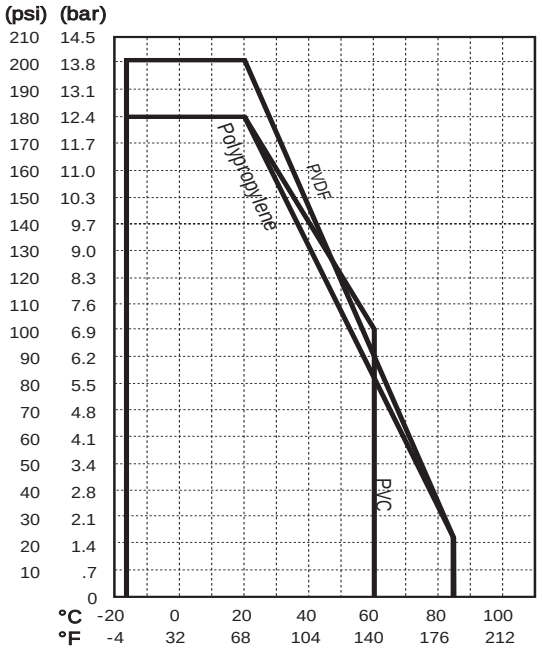
Sensor Body
- Available in PVC | PP | PVDF
- 2 Sensor Lengths to Measure 1/2" to 24" Pipes

Integrated Solid State Electronics
- Encapsulated in Epoxy

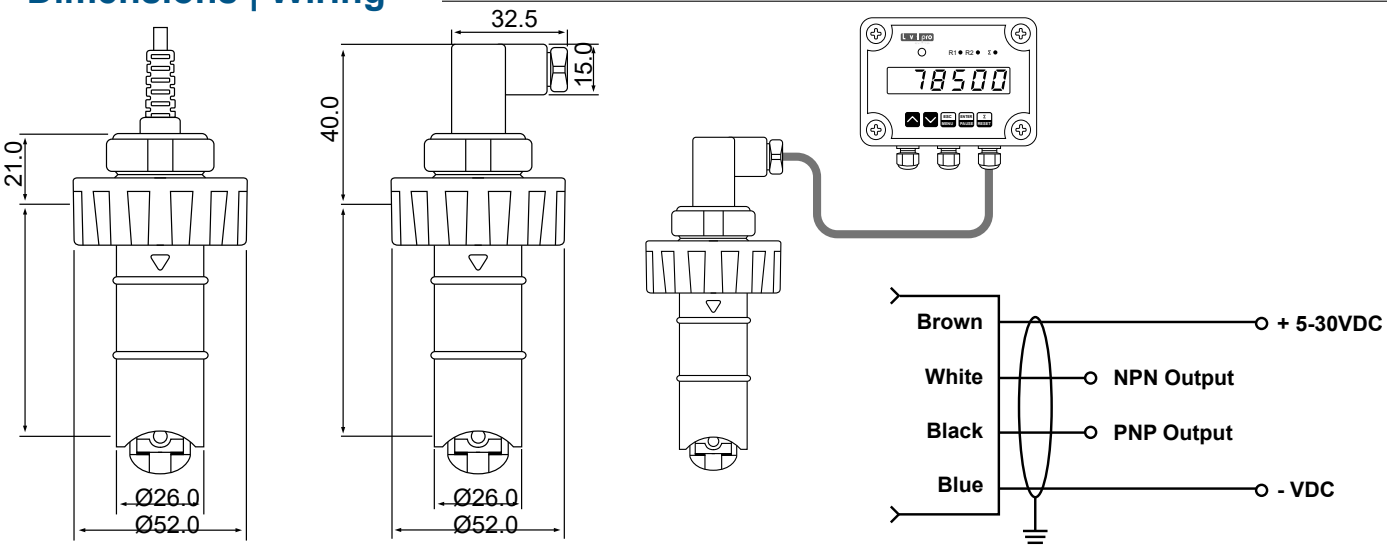
4 Blade ETFE (Tefzel®) Rotor
- Open Channel Design Avoids Cavitation
- Re-Designed Contoured Paddle

Maximum Pressure | Temperature

Note: During system design the specifications of all components must be considered. | Non-Shock



Dimensions | Wiring

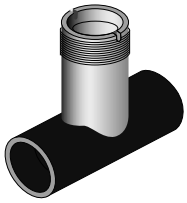


Min | Max | Flow Rates

Pipe Size (O.D.)	ANSI (ID) (Inches)		DIN (ID) (mm)	Flow Rate (LPM) / USGPM	
	Sch (40)	Sch (80)		0.3m/s min.	10m/s max.
1/2" | DN15	0.62	0.55	Ø20	3.5 | 1.0	120 | 32
3/4" | DN20	0.82	0.74	Ø25	5 | 1.5	170 | 45
1" | DN25	1.00	0.96	Ø32	9 | 2.5	300 | 79
1 ½" | DN40	1.40	1.50	Ø50	25 | 6.5	850 | 225
2" | DN50	2.00	1.90	Ø63	40 | 10.5	1350 | 357
2 ½	2.50	2.30	Ø75	60 | 16	1850 | 357
3" | DN80	3.10	2.90	Ø78	90 | 24	2800 | 739
4" | DN100	4.00	3.80	Ø96.50	125 | 33	4350 | 1149
6" | DN150	6.06	5.70	Ø150	230 | 60	7590 | 1997
8" | DN200	7.94	7.56	Ø200	315 | 82	10395 | 2735

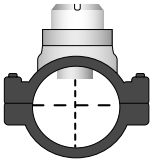
K Factor Tables

TEE FITTINGS



Tee Fitting (Unit:inch)			K-Factor	Sensor Length
Size	DN	Id	CPVC | SCH80	
½"	15	0.55	**1013.04**	S
¾"	20	0.74	**604.80**	S
1"	25	0.96	**408.24**	S
1-¼"	32	1.30	**250.40**	S
1-½"	40	1.50	**139.86**	S
2"	50	1.90	**81.65**	S
2-½"	65	2.30	**54.43**	S
3"	80	2.90	**34.96**	S
4"	100	3.83	**19.80**	S

CLAMP-ON SADDLES



Clamp Saddles			K-Factor	Sensor Length
Size	DN	Id	CPVC | SCH80	
2"	50	1.9	**81.65**	S
3"	65	2.3	**34.96**	S
4"	80	2.9	**19.80**	S
6"	100	3.8	**9.18**	L
8"	150	5.7	**5.21**	L

CPVC SOCKET WELD-ON ADAPTERS

Tee Fitting (Unit:inch)			K-Factor	Sensor Length
Size	DN	Id	CPVC | SCH80	
2"	50	1.9	**81.65**	S
2-½"	65	2.3	**54.43**	S
3"	80	2.9	**34.96**	S
4"	100	3.8	**19.80**	S
6"	150	5.7	**9.18**	L
8"	200	7.0	**5.21**	L
10"	250	9.5	**3.43**	L
12"	300	11.3	**2.45**	L
14"	350	12.4	**1.77**	L
16"	400	15.1	**1.36**	L
20"	500	19.0	**0.86**	L
24"	600	21.0	**0.60**	L

Warranty Information

All warranty and non-warranty repairs being returned must include The RGA number and a fully completed Service Form and Flow Meter. must be returned to Icon Process Controls directly or to the authorized distributor. Product returned without a RGA number and Service Form will not be warranty replaced or repaired. Truflo Flow Meters are warranted out of box but not against any damage, due to Process or Misapplication Failures e.g. High Temperature, Chemical Attack or Physical Mishandling of Product.

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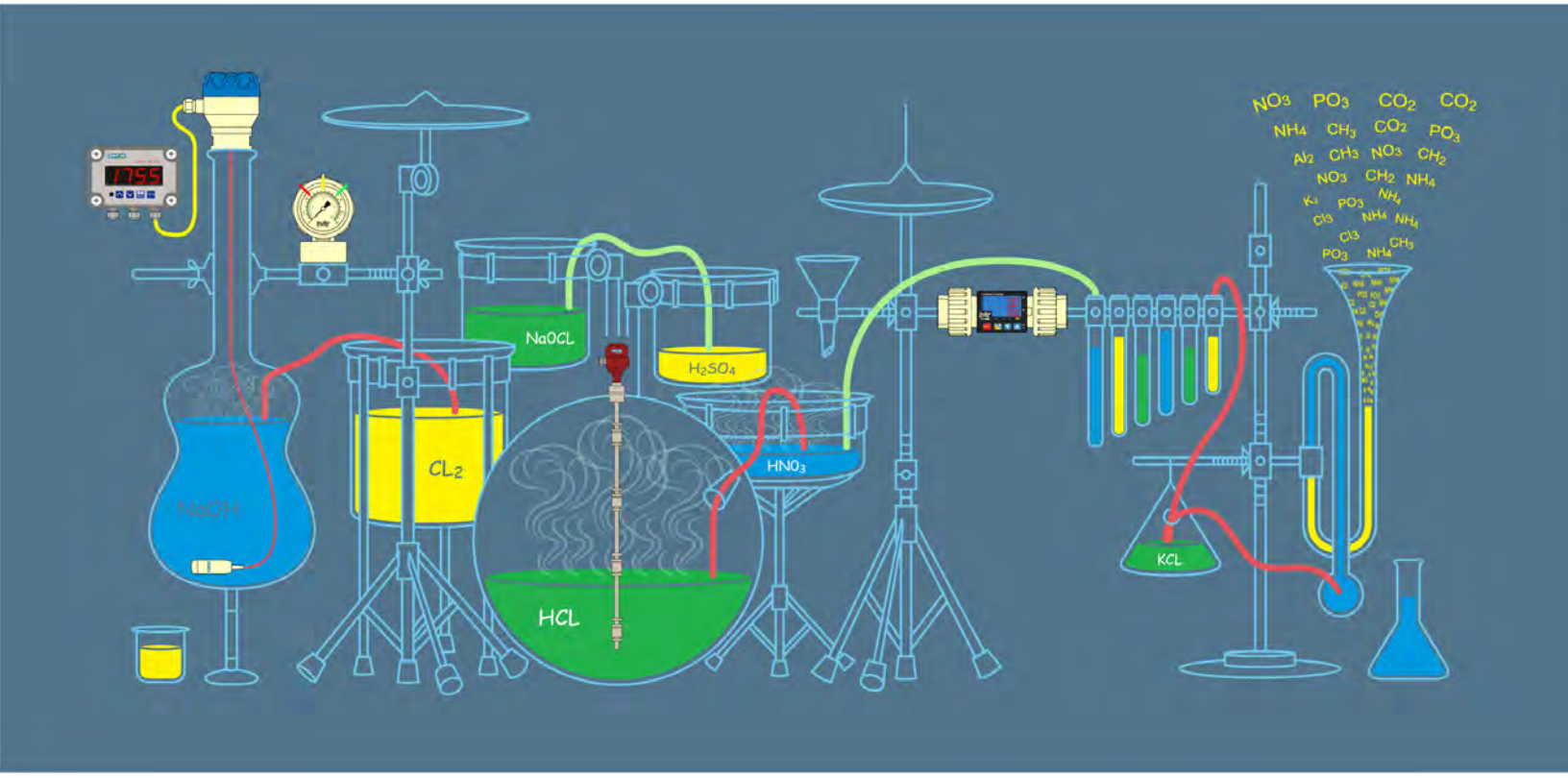

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