

Quick Start Manual

Corrosion Resistant
NEMA 4X Enclosure

Vibrant (2x) 6-Digit LED Display

Simple Push button
Programming

M12 Quick Connect

M12 — Keyed to Ensure
Proper Connection



True Union Design

EzVu®
Rotates 330°



Read the user's manual carefully. Icon reserves the right to implement changes without prior notice.

TIF Series

Multi-Function Batching Paddle Wheel Flow Meter



Safety Information

- De-pressurize and vent system prior to installation or removal
- Confirm chemical compatibility before use
- **DO NOT** exceed maximum temperature or pressure specifications
- **ALWAYS** wear safety goggles or face-shield during installation and/or service
- **DO NOT** alter product construction



Warning | Caution | Danger

Indicates a potential hazard. Failure to follow all warnings may lead to equipment damage, personal injury, or death.



Hand Tighten Only

Over tightening may permanently damage product.



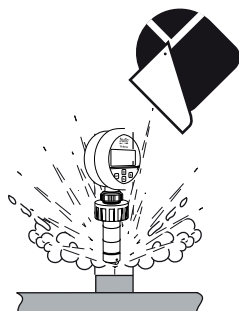
Note | Technical Notes

Highlights additional information or detailed procedure.



Do Not Use Tools

Use of tool(s) may damage product beyond repair and potentially void product warranty.



Personal Protective Equipment (PPE)

Always utilize the most appropriate PPE during installation and service of Truflo products.



Pressurized System Warning

Sensor may be under pressure. Take caution to vent system prior to installation or removal. Failure to do so may result in equipment damage and/or serious injury.

General Information

Function/Description	Specification
Operating Voltage	10 – 30VDC
Current Compensation	60mA max.
Control Communication	RS-485 Modbus
Transmitter	4-20mA
Relay Output	10A 30VDC NO NC
Flow Rate GPM LPM	0.0 – 999.9
Fluid	H2O Liquid Chemical Media
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
Materials of Construction	Rotor: ETFE Tefzel® Rotor Pin: Zirconium Ceramic Rotor Bushings: Ceramic Sensor Body: PVC/PP/PVDF/316SS
O-ring material	FPM EPDM* FFKM*
Operating Temperature	PVC < 60°C PP < 80°C PF < 100°C
Protection Rating	NEMA 4X IP66 General Purpose
Approval	CE RoHS

*Optional

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Installation

Very Important



- Lubricate O-rings with silicone (provided).
- Using an alternating twisting motion, carefully lower the sensor into the fitting. | **Do Not Force** | See Fig 5
- Ensure tab/notch are parallel to flow direction | See Fig-2

Fig - 1

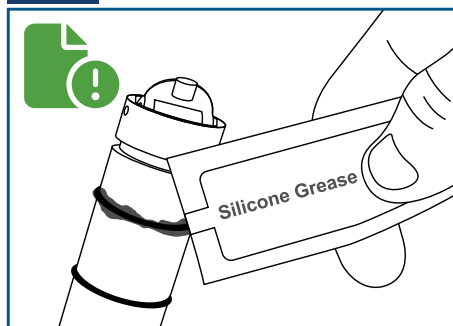


Fig - 2

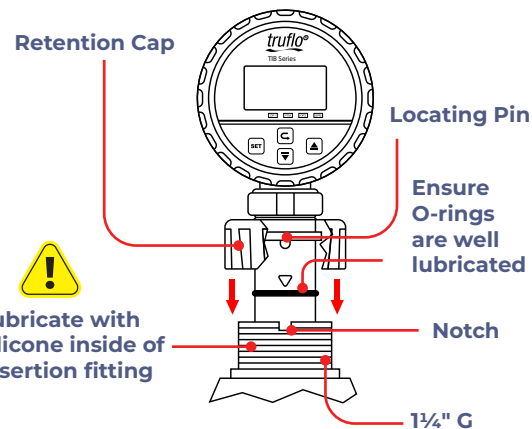
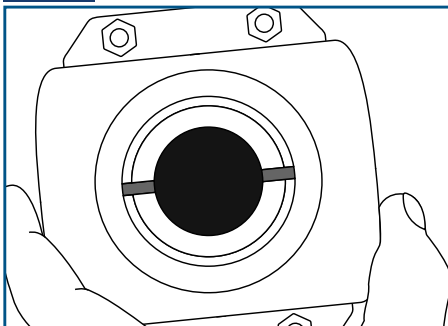


Fig - 3

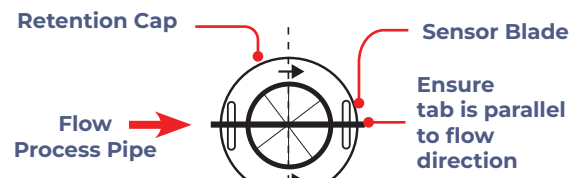


Fig - 4

Top View



Hand tighten the sensor cap. **DO NOT** use tools.

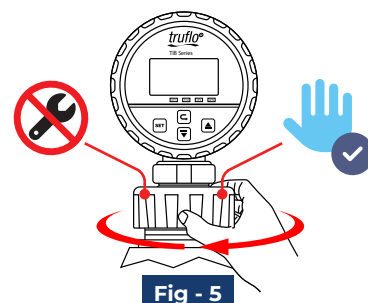


Fig - 5

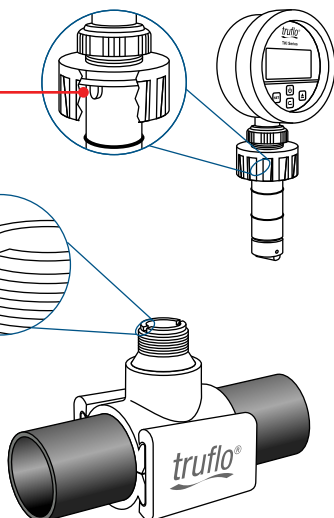
Correct Sensor Position

01



Tab

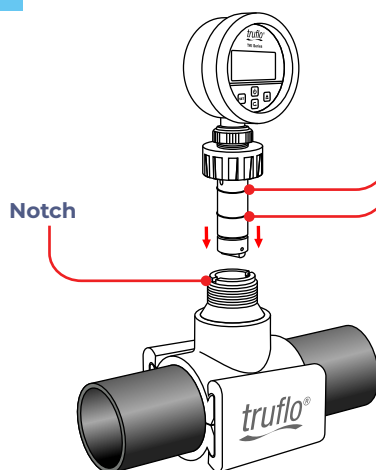
Notch



Locate the flow meter positioning tab and clamp saddle notch.

02

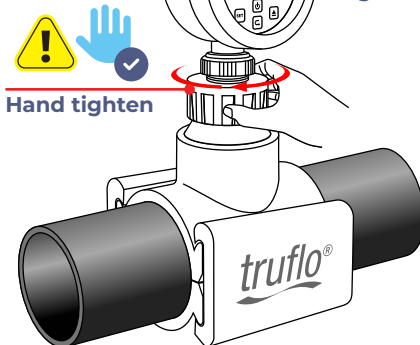
VERY IMPORTANT Lubricate O-rings with silicone



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

DO NOT use display to tighten



- Hand tighten
- **DO NOT** use tools
- Ensure meter is firmly in place

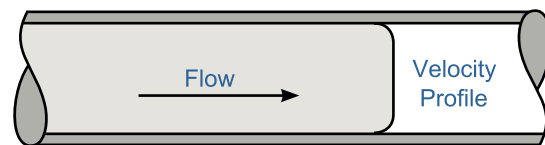
TIF Series

Multi-Function Batching Paddle Wheel Flow Meter



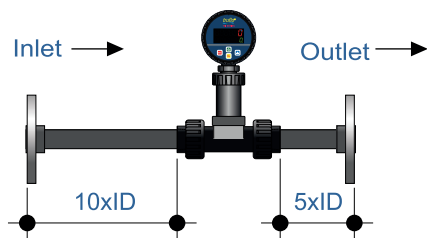
Correct Sensor Position Setup

TIF Series flow meters measure liquid media only. There should be no air bubbles and the pipe must always remain full. To ensure accurate flow measurement, the placement of the flow meter needs to adhere to specific parameters. This requires a straight run pipe with a minimum number of pipe diameters distance upstream and downstream of the flow sensor.

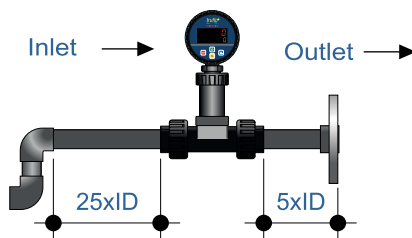


Developed Turbulent Flow

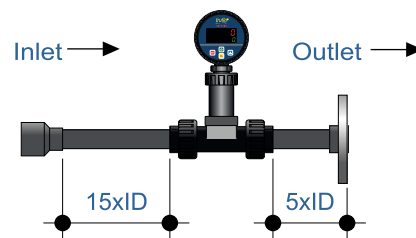
Flange



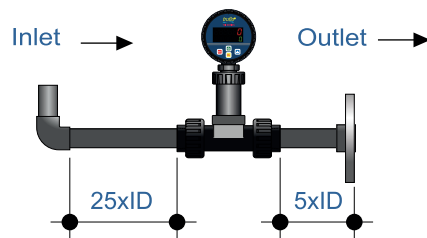
2x 90° Elbow



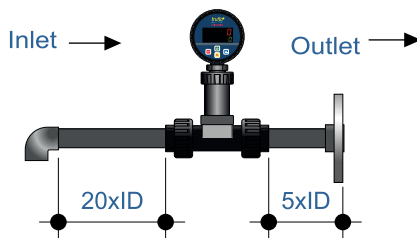
Reducer



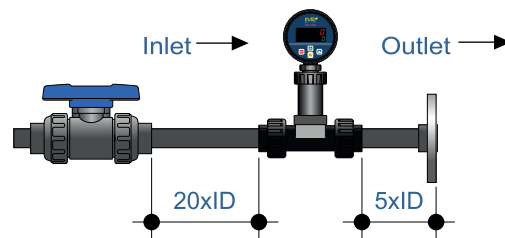
90° Downward Flow



90° Elbow Flow Upward

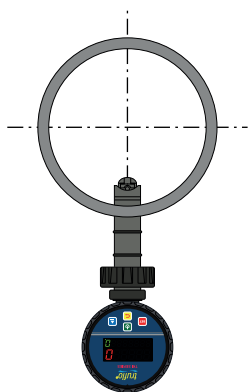


Ball Valve



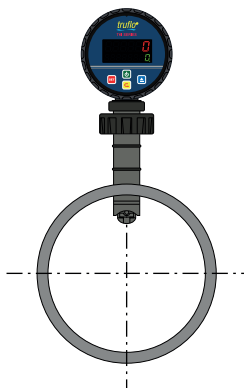
Installation Positions

Figure - 1



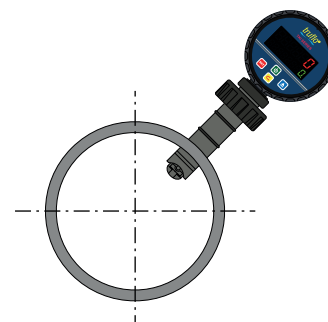
Good if NO SEDIMENT present

Figure - 2



Good if NO AIR BUBBLES present

Figure - 3



Preferred installation if SEDIMENT* or AIR BUBBLES may be present



*NOTE: Maximum % of solids \leq 10% with particle size not exceeding 0.5mm cross section or length.

TIF Series

Multi-Function Batching Paddle Wheel Flow Meter



Terminal Connections



Cable Grip Wire
Connector Combo



Terminal	Description	Color
1	+ VDC	Brown
2	Relay 2	White
3	- VDC	Blue
4	Relay 2	Black
5	Common	Yellow

M12 Connection

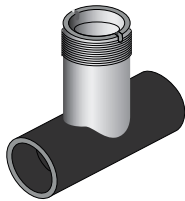
On Flow Meter

On Cable



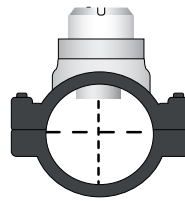
Fittings and K-Factor

TEE FITTINGS



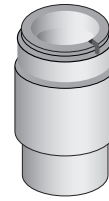
Tee Fitting		K-Factor		Sensor Length
IN	DN	LPM	GPM	
3/4"	20	160.0	604.0	S
1"	25	108.0	408.0	S
1 1/2"	40	37.0	140.0	S
2"	50	21.6	81.7	L
2 1/2"	65	14.4	54.4	L
3"	80	9.3	35.0	L
4"	100	5.2	19.8	L

CLAMP-ON SADDLES



Clamp Saddles		K-Factor		Sensor Length
IN	DN	LPM	GPM	
2"	50	21.6	81.7	S
3"	80	9.3	35.0	S
4"	100	5.2	19.8	S
6"	150	2.4	9.2	L
8"	200	1.4	5.2	L

CPVC SOCKET WELD-ON ADAPTERS

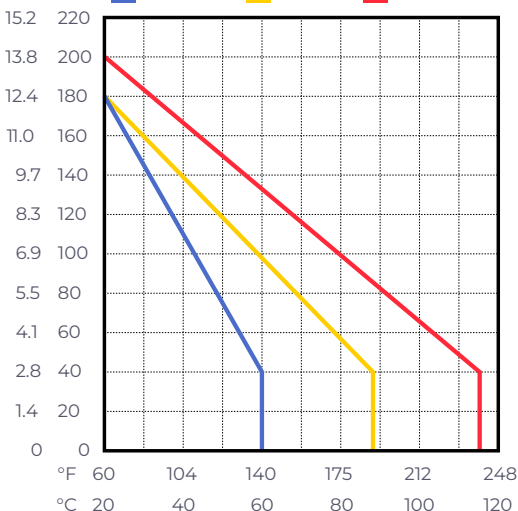


Adapter		K-Factor		Sensor Length
IN	DN	LPM	GPM	
2"	50	14.4	54.4	S
2 1/2"	65	9.3	35.5	S
3"	80	9.3	35.0	S
4"	100	5.2	19.8	S
6"	150	2.4	9.2	L
8"	200	1.4	5.2	L
10"	250	0.91	3.4	L
12"	300	0.65	2.5	L
14"	400	0.5	1.8	L
16"	500	0.4	1.4	L
18"	600	0.3	1.1	L
20"	800	0.23	0.9	L
24"	1000	0.16	0.6	L

Pressure vs. Temperature

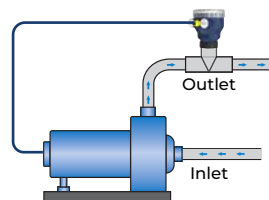
Note: During system design the specifications of all components must be considered. | Non-Shock

bar psi ■ = PVC ■ = PP ■ = PVDF



Example

- ✓ Prevent Pumps from Running Dry
- ✓ Notification for Filter | Strainer Change-Out
- ✓ Output to Alarm | Shut Off Pump



Sensor Body

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

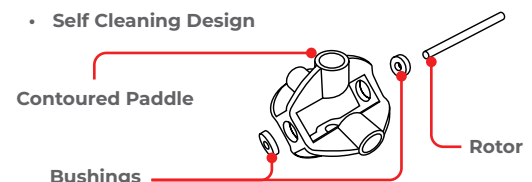
4 Blade ETFE Tefzel® Rotor

- Open Channel Design Avoids Cavitation
- New ShearPro® Contoured Designed Rotor Reduces Turbulence

The TIF Series is equipped with a zirconium ceramic rotor pin and 2 bushings. The TIF Series also incorporates a contoured, 'Low Drag' paddle wheel leading to reduced drag, longer wear and higher accuracy.

Ceramic Rotor | Bushings

- High Chemical Resistance
- Long Life - 40 years/m/s
- Self Cleaning Design



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Programming



Select/Save/Continue



Move selection left



Change digit value

STEPS	DISPLAY	OPERATION
1 Press and Hold SET SET + 3 SEC		Home Screen
2 Password SET		Factory Default: Lk = 10 Otherwise meter will enter Lockout Mode* Press / to change Press SET to save
3 Units of Flow SET		Ut.G = Gallons (Factory default) Ut.L = Liters Ut.KL = Kiloliters Press to change Press SET to save
4 K Factor SET		Enter K Factor Value Refer to Page 6 for K-Factor Values
5 Transmitter Range SET		Factory Default — 4mA = 0, 20mA = 100** **This can be change to suit application

Programming Frequency Pulse Relay Output

STEPS	DISPLAY	OPERATION
1 Press and Hold SET SET + 3 SEC		Home Screen
2 Flow Rate Pulse Output SET		CV - Program Value of (Flow Rate) Pulse (NPN) Output Preset Value of Flow Rate Change to a Value that meets your Flow Rate Pulse Output SV - CV > SV ► Flow Rate Pulse Output ON CV < SV ► Flow Rate Pulse Output OFF
3 Flow Total Pulse Output SET		CV - Program Value of Flow Totalizer Pulse (NPN) Output SV: Preset Value of Flow Total SV - CV > SV ► Flow Rate Pulse Output ON 2000 Default can be changed to desired value. Refer to "Programming OP2 Output" for totalizer options Flow Totalizer Pulse - (Step #2 - Next)

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Multi-Function Batching Paddle Wheel Flow Meter



Programming Relay Output

STEPS	DISPLAY	OPERATION
1 Press and Hold SET SET + 3 SEC		Home Screen
2 OP2 Output Pulse Control (Frequency) SET		Con = n: OP2 Manual Reset (Press for 3 sec to reset) CV < SV: Relay 2 on (OP2 on) CV < SV: Relay 2 off (OP2 off)
3 Pulse Relay SET		Refer to Relay Selection Mode Below
4 Hysteresis SET		Press to change Press SET to save (Hysteresis is a buffer around the programmed set point)
5 Time Delay SET		

Relay Selection Mode

ALT NO.	Description
Alt = 0	CV > SV ► ON: CV < SV - HyS ► OFF "Normally Closed Relay"
Alt = 1	CV < SV ► ON: CV > SV + HyS ► OFF "Normally Open Relay"
Alt = 2	SV + HyS > CV > SV - HyS ► ON: CV > SV + HyS or CV < SV - HyS ► OFF
Alt = 3	SV + HyS > CV > SV - HyS ► OFF: CV > SV + HyS or CV < SV - HyS ► ON
HyS = Hysteresis — Acts like a buffer ± around pulse output (measured in GPM)	
CV: Current Value = Flow Rate SV = Selected or Programmed Value	

Reset Flow Totalizer

Press **SET** + keys for 3 seconds to reset the flow totalizer.

Min | Max Flow Rates

PIPE SIZE	GPM	LPM
½" DN15	1.0 3.5	32 120
¾" DN20	1.5 5	45 170
1" DN25	2.5 9	79 300
1½" DN40	6.5 25	225 850
2" DN50	10.5 40	357 1350

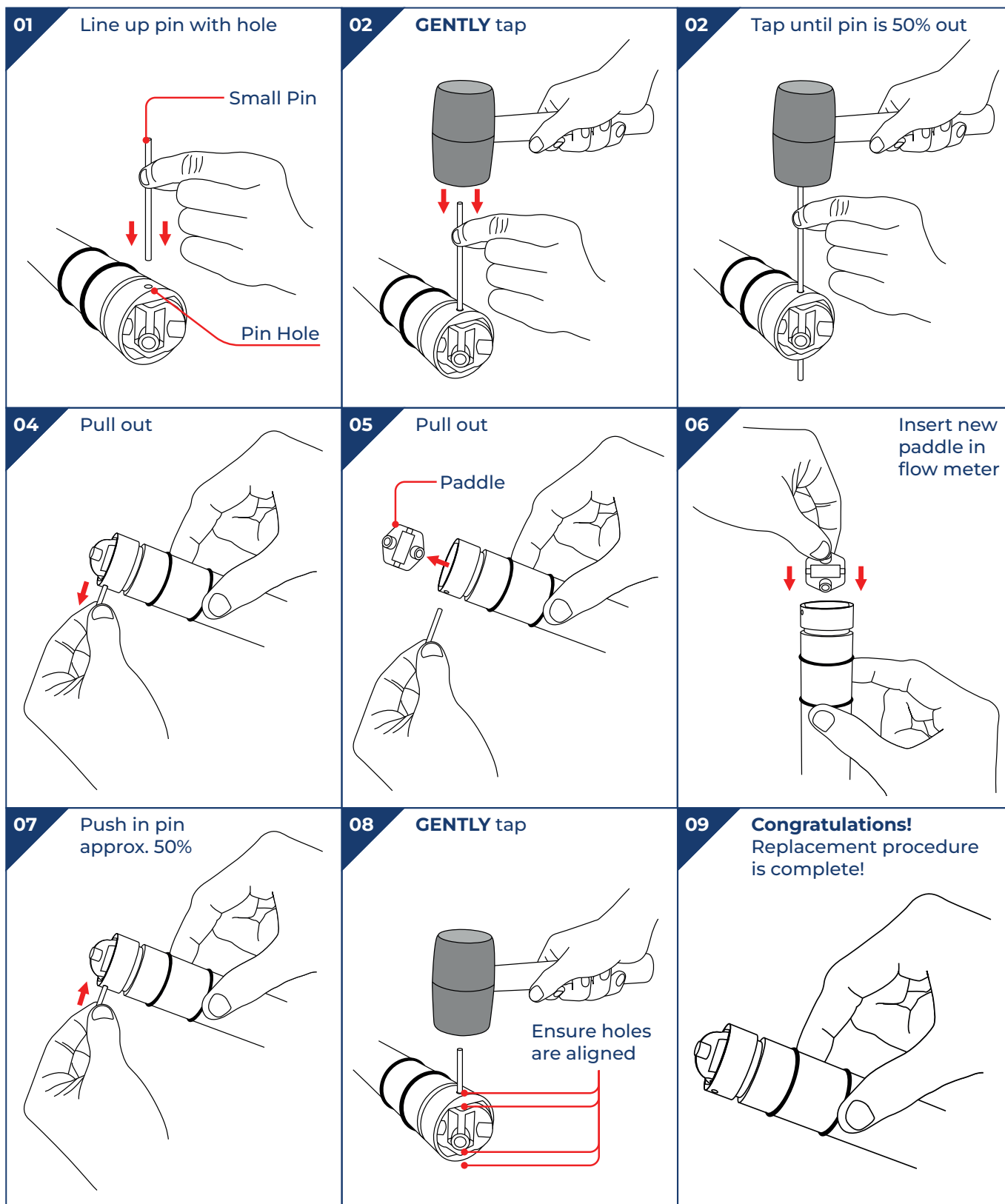
PIPE SIZE	GPM	LPM
3" DN80	24 90	739 2800
4" DN100	33 125	1149 4350
6" DN150	60 230	1997 7590
8" DN200	82 315	2735 10395

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Multi-Function Batching Paddle Wheel Flow Meter



Rotor Pin | Paddle Replacement



TIF Series

Multi-Function Batching Paddle Wheel Flow Meter



Warranty, Returns and Limitations

Warranty

Icon Process Controls Ltd warrants to the original purchaser of its products that such products will be free from defects in material and workmanship under normal use and service in accordance with instructions furnished by **Icon Process Controls Ltd** for a period of one year from the date of sale of such products. **Icon Process Controls Ltd** obligation under this warranty is solely and exclusively limited to the repair or replacement, at **Icon Process Controls Ltd** option, of the products or components, which **Icon Process Controls Ltd** examination determines to its satisfaction to be defective in material or workmanship within the warranty period. **Icon Process Controls Ltd** must be notified pursuant to the instructions below of any claim under this warranty within thirty (30) days of any claimed lack of conformity of the product. Any product repaired under this warranty will be warranted only for the remainder of the original warranty period. Any product provided as a replacement under this warranty will be warranted for the one year from the date of replacement.

Returns

Products cannot be returned to **Icon Process Controls Ltd** without prior authorization. To return a product that is thought to be defective, submit a customer return (MRA) request form and follow the instructions therein. All warranty and non-warranty product returns to **Icon Process Controls Ltd** must be shipped prepaid and insured. **Icon Process Controls Ltd** will not be responsible for any products lost or damaged in shipment.

Limitations

This warranty does not apply to products which: 1) are beyond the warranty period or are products for which the original purchaser does not follow the warranty procedures outlined above; 2) have been subjected to electrical, mechanical or chemical damage due to improper, accidental or negligent use; 3) have been modified or altered; 4) anyone other than service personnel authorized by **Icon Process Controls Ltd** have attempted to repair; 5) have been involved in accidents or natural disasters; or 6) are damaged during return shipment to **Icon Process Controls Ltd** reserves the right to unilaterally waive this warranty and dispose of any product returned to **Icon Process Controls Ltd** where: 1) there is evidence of a potentially hazardous material present with the product; or 2) the product has remained unclaimed at **Icon Process Controls Ltd** for more than 30 days after **Icon Process Controls Ltd** has dutifully requested disposition. This warranty contains the sole express warranty made by **Icon Process Controls Ltd** in connection with its products. **ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED.** The remedies of repair or replacement as stated above are the exclusive remedies for the breach of this warranty. **IN NO EVENT SHALL Icon Process Controls Ltd BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND INCLUDING PERSONAL OR REAL PROPERTY OR FOR INJURY TO ANY PERSON. THIS WARRANTY CONSTITUTES THE FINAL, COMPLETE AND EXCLUSIVE STATEMENT OF WARRANTY TERMS AND NO PERSON IS AUTHORIZED TO MAKE ANY OTHER WARRANTIES OR REPRESENTATIONS ON BEHALF OF Icon Process Controls Ltd.** This warranty will be interpreted pursuant to the laws of the province of Ontario, Canada.

If any portion of this warranty is held to be invalid or unenforceable for any reason, such finding will not invalidate any other provision of this warranty.