Quick Start Manual

IO-Link

ICON™ PROCESS CONTROLS Corrosion-Free Instrumentation Equipment

Safety Information

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

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

Note | Technical Notes
Highlights additional information or detailed procedure.

WARNING!

Do Not Remove Under Pressure

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.

- 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

Please ensure that the Instruments are not to be subject to water hammer or pressure spikes! Always Pressure Test System with H_2O Prior to Initial Start-Up

Before Before installation be certain the appropriate instrument has been selected considering operating pressure, full scale pressure, wetted material requirements, media compatibility, operating temperature, vibration, pulsation, desired accuracy and any other instrument component related to the service application including the potential need for protective attachments and/or special installation requirements. Failure to do so could result in equipment damage, failure and/or personal injury. Ensure only qualified personnel personnel are permitted to install and maintain this instrument.

Pressurize 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

Personal Protective Equipmet (PPE)

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

Please Ensure Full Pipe

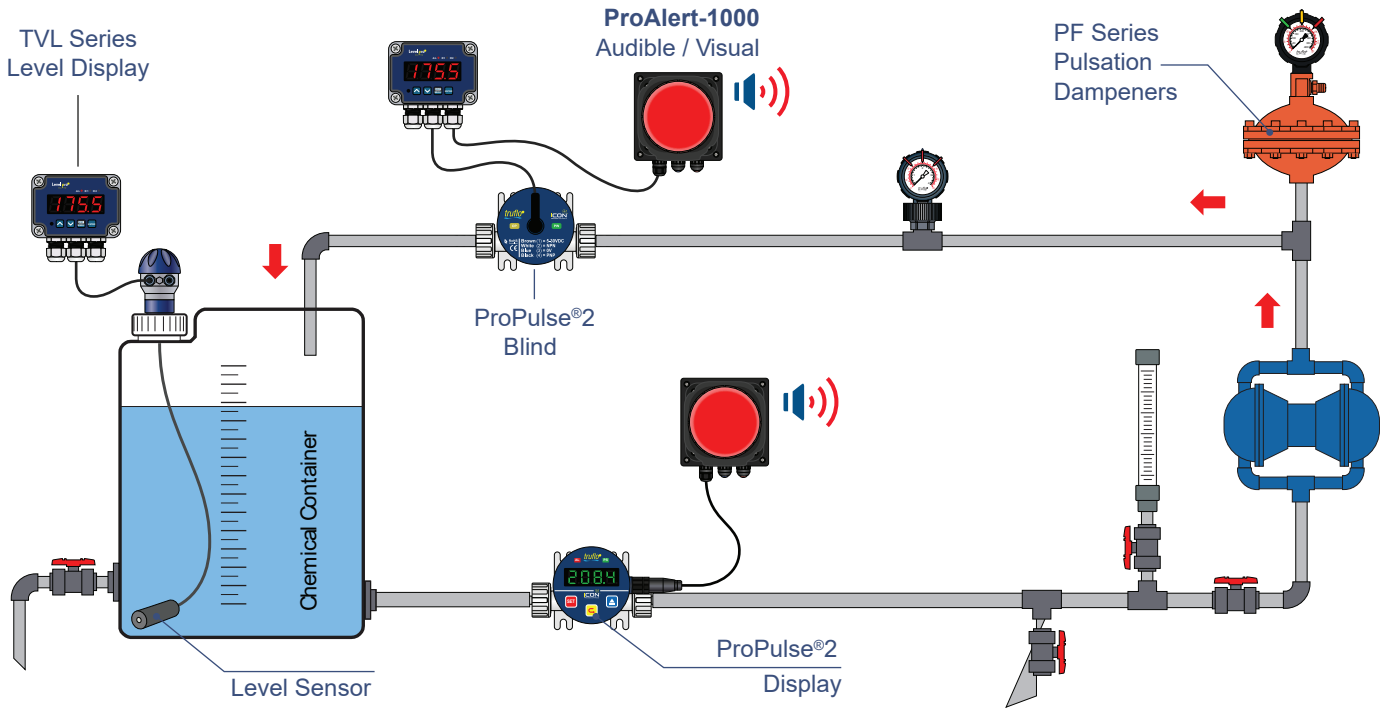
ProPulse2® Series can be installed in a horizontal or vertical direction. Please ensure enough length of straight pipe to avoid turbulence that can effect readings.

Product Description

The **ProPulse®2 Series** provides superior performance and delivers accurate ultra-low flow measurement that is highly repeatable under the most demanding of industrial environments.

The **ProPulse®2 Series** operates using a PP/PVDF rotor with encapsulated magnetic inserts, which rotate on a long- wearing set of zirconium ceramic bearings & rotor designed to provide years of reliability. As the rotor spins, the magnetic field produced by the magnets is picked up via a Hall Effect Sensor, which converts the rotation into a square wave NPN pulse, 4 – 20mA, IO-Link or RS485 output that can be sent directly to a metering pump, local display or PLC

Typical Application



Model Selection

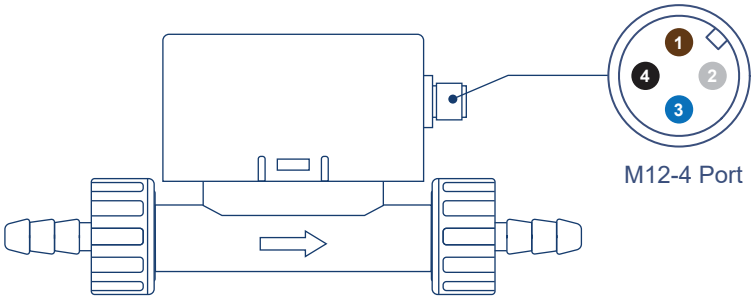
PP – M – 03H – PP

Output Option	Tube Type		Material
W : Blind with NPN Pulse | 4-20mA	**02N :** 1/8" NPT	**06T :** 3/8" Straight Tube	**PP :** PP
N : Blind with NPN | PNP	**03H :** 3/16" Hose Barb	**06H :** 3/8" Hose Barb	**PF :** PVDF
M : LED Display with 4-20mA | NPN	**04T :** 1/4" Straight Tube	**06F :** 3/8" Flared	**PA :** PFA
R : LED Display with RS485	**04F :** 1/4" Flared		
P : LED Display with NPN | PNP			

Technical Specifications

General	
Body Material	PP | PVDF
O-Ring	FPM
Environmental Conditions	-4ºF – 176°F | -20°C – 80°C (35% – 85% RH)
Operating Temperature	**PP** : -4ºF – 203°F | -20°C – 95°C **PVDF** : -40ºF – 250°F | -40°C – 120°C
Max. Working Pressure | Non-Shock	**PP** : 142 psi | 10 bar **PVDF** : 217 psi | 15 bar
Accuracy	± 1.0% of F.S. @ 25°C (PPW) | ± 0.5% of F.S. @ 25°C (PPM & PPR)
Output Current	PPW (**Blind**) 50mA max | PPM & PPR (**Display**) 150mA max
Operating Voltage	5 – 30VDC (Blind) | 10-30VDC (Display)
Protection Class	NEMA 4X | IP65
Display	4 Digits : 0.0 – 9999 (PPM | PPR)

Wiring



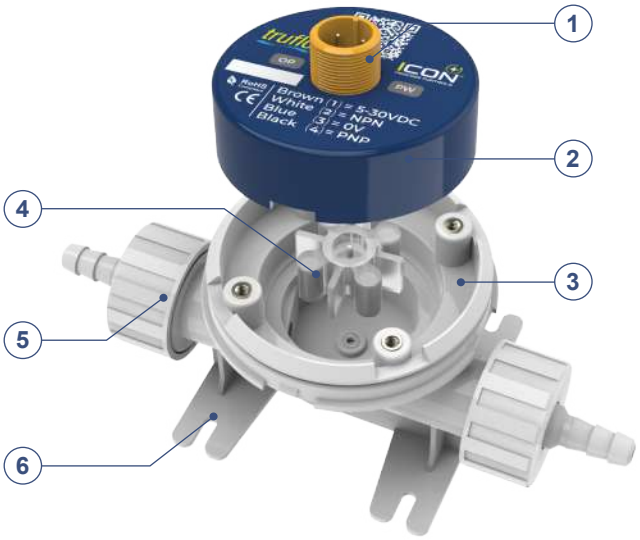
PPW- Blind (Pulse)		
Pin	Color	Function
1	Brown	+5-30VDC
2	White	NPN Output
3	Blue	-VDC
4	Black	PNP Output

PPR - Display (RS485)		
Pin	Color	Function
1	Brown	+10-30VDC
2	White	RS+
3	Blue	-VDC
4	Black	RS-

PPM - Display (Pulse + 4-20mA)		
Pin	Color	Function
1	Brown	+10-30VDC
2	White	NPN Output
3	Blue	-VDC
4	Black	+mA Output

Exploded View

1. M12 Quick Connection
2. Controller
3. Body
4. Turbine
5. True Union Design
6. Integral Mounting Platform



Display Functions

Setting Method

In Setting Status : The Settable Digit is Flicker

Key : To Change the Numerical Value
Key : To Shift the Digit
SET Key : To Enter into Setting Status or Load the Setting Value

Programming

Steps	Display	Range	Description
#1 Main Display Press SET + ⊂ HOLD 3 SEC	0000	0 ~ 9999	Current Value
#2 Setting of Lock Press SET Key	LE.10	0 ~ 99	Lk = 10 : Settable
#3 Decimal Point Selection Press SET Key	0.dP.2	0 ~ 3	dP.0 = Flow rate meter 0 ~ 9999 dP.1 = Flow rate meter 0.0 ~ 999.9 dP.2 = Flow rate meter 0.00 ~ 99.99 dP.3 = Flow rate meter 0.000 ~ 9.999
#4 Unit Selection Press SET Key	0.ut.L	L / KL / G / C	ut.L = LPM ut.KL = KLPM ut.G = GPM ut.C = cc/M
#5 Alarm Mode Setting Press SET Key	ALt.0	0 ~ 4	Range : ALt.0 ~ ALt.4 *Refer to the Mode of Alarm
#6 Power on Delay Time Press SET Key	0.t.00	0 ~ 99 s	t.00 = Delay time of Alarm Output (sec)

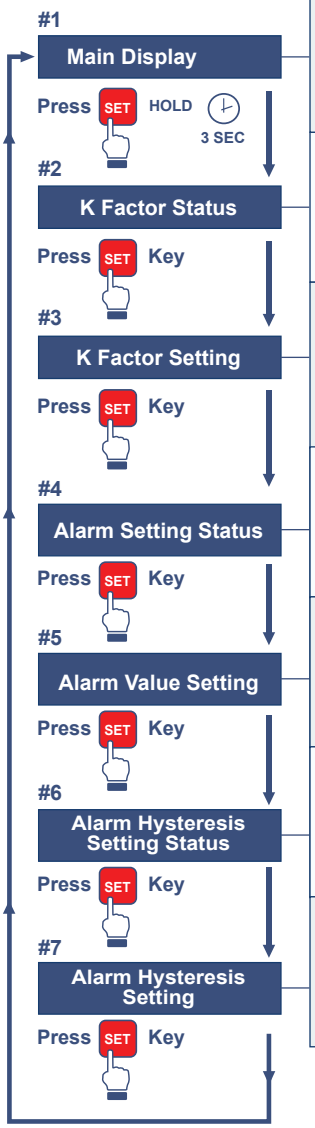
Mode of Alarm

ALt No.	Description
ALt = 0	Non alarm
ALt = 1	PV ≥ AL ⟶ Alarm ON ; PV < SV - Hys ⟶ Alarm OFF
ALt = 2	PV ≤ AL ⟶ Alarm ON ; PV > SV + Hys ⟶ Alarm OFF
ALt = 3	AL + Hys ≥ PV ≥ AL - Hys ⟶ Alarm ON ; PV > AL + Hys or PV < SV - Hys ⟶ Alarm OFF
ALt = 4	AL + Hys ≥ PV ≥ AL - Hys ⟶ Alarm OFF ; PV > AL + Hys or PV < SV - Hys ⟶ Alarm ON

K Factor | Alarm Programming (For 4-20mA Output Models)

Steps	Display	Range	Description
#1 Main Display Press SET HOLD 3 SEC	0000	0~9999	Current Value
#2 K Factor Status Press SET Key	K.0	K.0 or K.1	Coefficient for Flow Rate Meter K.0 = 0 ~ 9999; K.1 = 10000 ~ 19999
#3 K Factor Setting Press SET Key	9999	0 ~ 9999 or 10000 ~ 19999	K.0 Setting Range = 0 ~ 9999 K.1 Setting Range = 10000 ~ 19999 *See Page 11
#4 20mA Range Status Press SET Key	tr.		20mA (High) Range
#5 20mA Range Setting Press SET Key	3000	0~9999	Set 20mA - Max. Flow Rate
#6 Alarm Setting Status Press SET Key	AL.		Alarm Set Point
#7 Alarm Value Setting Press SET Key	1000	0~9999	Enter Value
#8 Alarm Hysteresis Setting Status Press SET Key	HYS		Alarm Hysterisis
#9 Alarm Hysteresis Setting Press SET Key	1.0	0~9999	Enter Value Prevents Relay Chatter

K Factor | Alarm Programming (For Pulse Output Models)



Steps	Display	Range	Description
#1 Main Display	0000	0~9999	Current Value
#2 K Factor Status	A.A.t.0	K.0 or K.1	Coefficient for Flow rate meter K.0 = 0 ~ 9999; K.1 = 10000 ~ 19999
#3 K Factor Setting	9999	0 ~ 9999 or 10000 ~ 19999	K.0 Setting Range = 0 ~ 9999 K.1 Setting Range = 10000 ~ 19999
#4 Alarm Setting Status	A.A.AL.		Alarm Set Point
#5 Alarm Value Setting	100.0	0~9999	Enter Value
#6 Alarm Hysteresis Setting Status	A.HYS		Alarm Hysterisis
#7 Alarm Hysteresis Setting	A.A.1.0	0~9999	Enter Value Prevents Relay Chatter

Setting of RS485 Communication (For RS485 Output Models)

Steps	Display	Range	Description
#1 Main Display Press SET + HOLD 3 SEC	0000		Current Value
#2 Id NO Press SET Key	1001	1~255	
#3 Protocol Press SET Key	rS0	0 or 1	rs=0 : Modbus-RTU rs=1 : Modbus-ASCII
#4 BPS Press SET Key	bPS0	0 ~ 2	bPS.0 : 9600 bps bPS.1 : 19200 bps bPS.2 : 38400 bps
#5 Configuration Press SET Key	blt0	0 ~ 5	1. blt.0 = 8N1 : 8 bit non parity; 2. blt.1 = 8O1 : 8 bit odd parity 3. blt.2 = 8E1 : 8 bit even parity; 4. blt.3 = 8N2 : 8 bit non parity 5. blt.4 = 7O1 : 7 bit odd parity; 6. blt.5 = 7E1 : 7 bit even parity

Parameter Address

Address	Parameter	Description	Address	Parameter	Description	Address	Parameter	Description
00H 01H	CV	Flow Rate Value	00H 05H	HYS	Alarm Hysteresis Setting	00H 09H	ALt	Alarm Mode Setting
00H 02H	K.0	K Factor Range Selection	00H 06H	Lk	Setting of Lock	00H 0AH	t	Alarm Delay Time
00H 03H	K	K Factor	00H 07H	dP	Decimal Point Selecting	00H 0BH	Output status*	
00H 04H	AL	Alarm Value Setting	00H 08H	U t	Unit Selecting	00H 0CH		

Output Status*

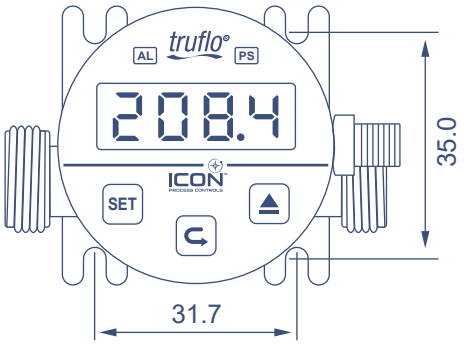
Data	Alarm	Data	Alarm
00H 00H	Off	00H 01H	On

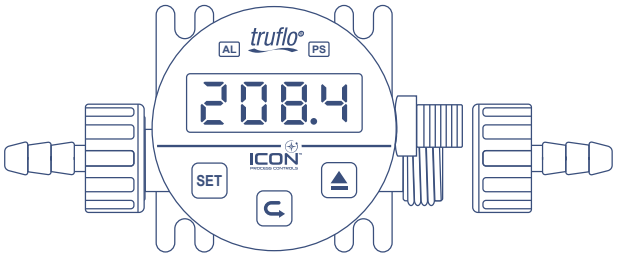
Flow Range

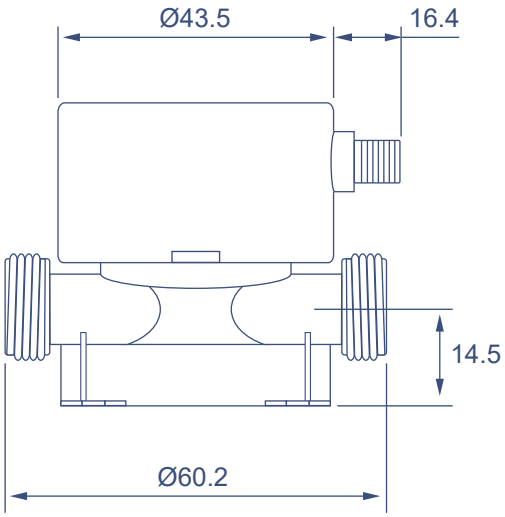
Connection		Flow Range (LPM)	Flow Range (GPM)	K Factor *(LPM/GPM)
02N	1/8" NPT	0.12 ~ 16.20	0.032 ~ 4.280	5350
03H	3/16" Hose Barb	0.04 ~ 2.20	0.010 ~ 0.581	5350
04T	¼" Straight Tube	0.12 ~ 8.20	0.032 ~ 2.166	1700
04F	¼" Flared	0.40 ~ 2.80	0.106 ~ 0.740	1700
06T	3/8" Straight Tube	0.12 ~ 16.20	0.032 ~ 4.280	875
06H	3/8" Hose Barb	0.12 ~ 16.20	0.032 ~ 4.280	875
06F	3/8" Flared	0.40 ~ 9.80	0.106 ~ 2.589	875

* Note : K factor can be modified to fit specific application

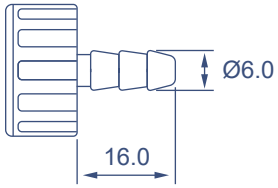
Dimensions (mm)



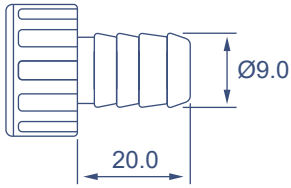




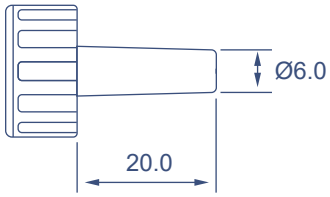
Hose Barb : 03H



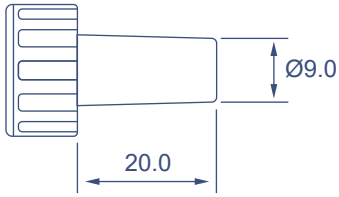
Hose Barb : 06H



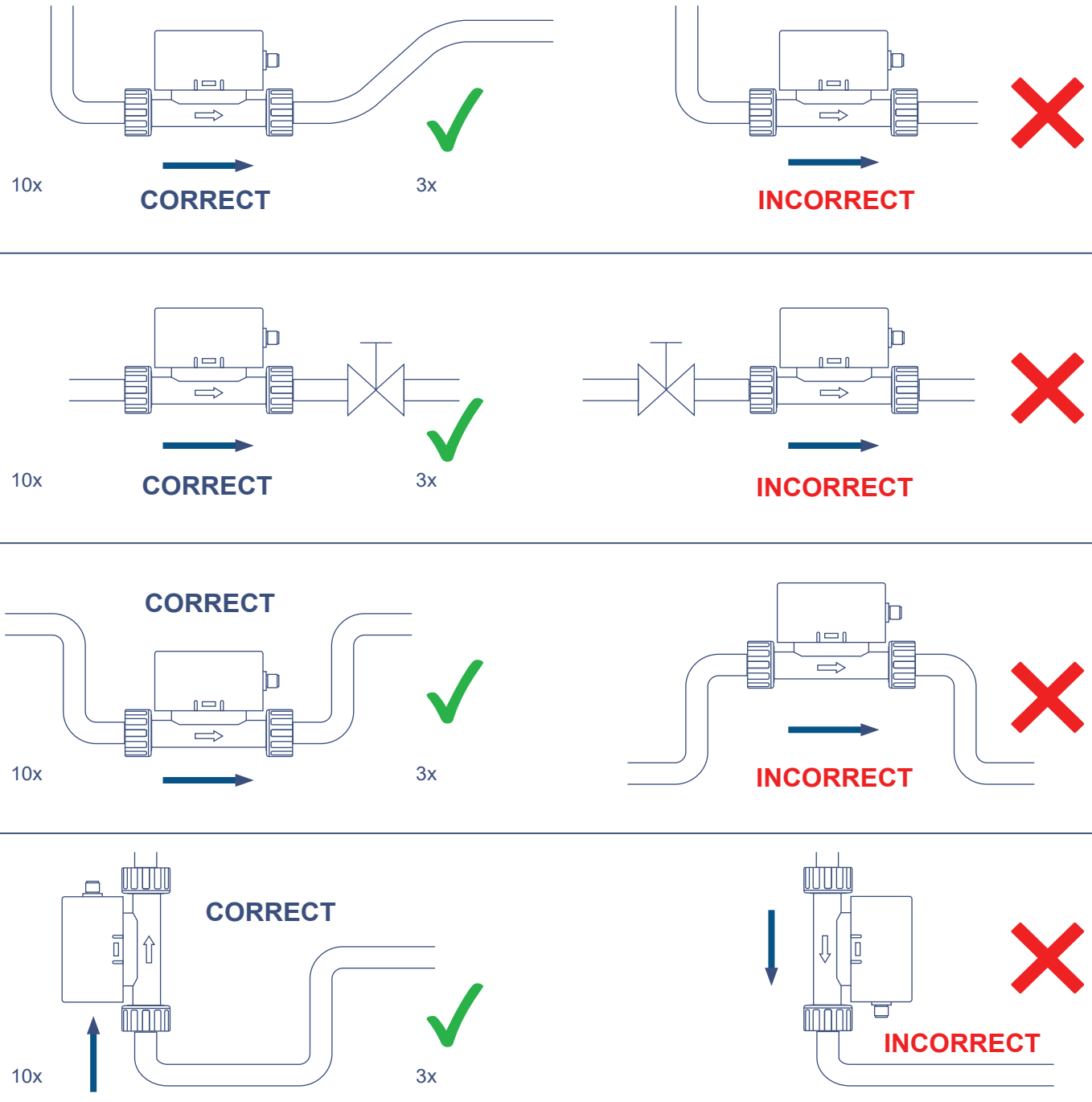
Straight Tube : 04T



Straight Tube : 06T



Installation Positions



1. Please make sure the measuring tube must be filled with the fluid under normal operation.
2. **ProPulse2® Series** can be installed at horizontal or vertical direction.
3. Please set enough length of straight pipe to avoid the vortex might be existed.
   (The minimum straight upstream must be over 10 x DN and downstream must be observed over 3 x DN)
4. Please adopt filtering device in the upstream to avoid the paddle wheel from be damaged by the solids or fibers.
5. Please do not flush the pipe after the measuring unit being installed, if do that may crack the ceramic shaft.

Warranty, Returns & 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** without Icon's prior authorization. To return a product that is thought to be defective please submit a customer return (MRA) request form and follow the instructions therein. All warranty and non-warranty product returns to **Icon Process Controls** must be shipped prepaid and insured. Icon 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;
6) Are damaged during return shipment to **Icon Process Controls**.

Icon Process Controls reserves the right to unilaterally waive this warranty and dispose of any product returned to Icon where :

1) There is evidence of a potentially hazardous material present with the product;
2) The product has remained unclaimed at **Levelpro** for more than 30 days after **Icon Process Controls** has dutifully requested disposition.

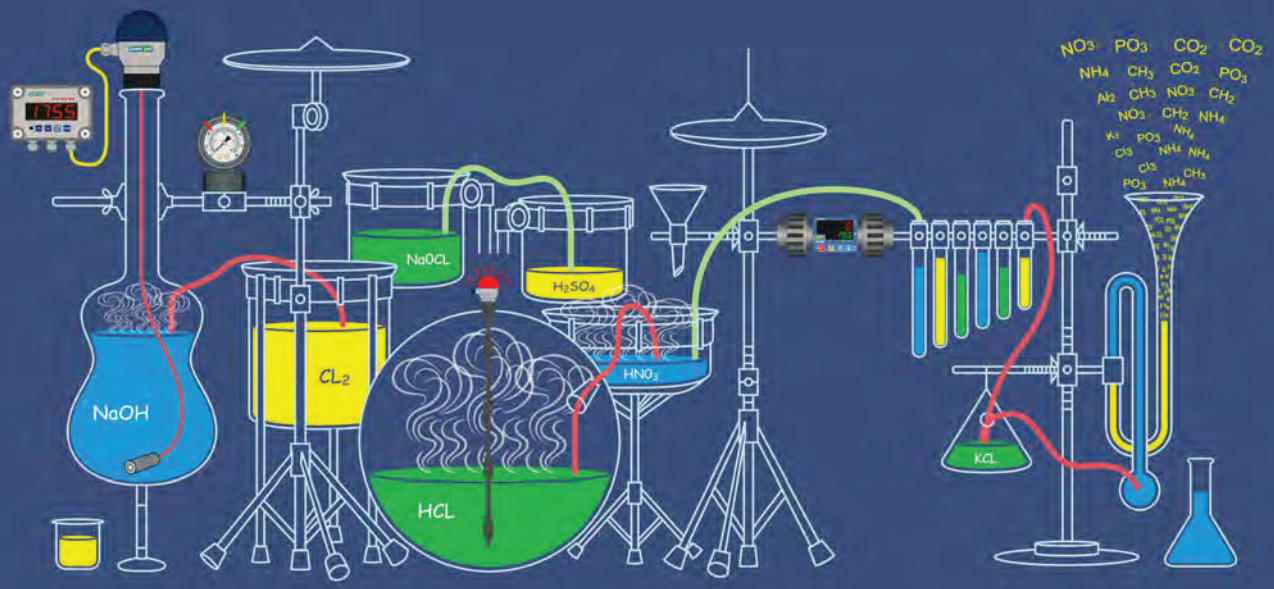
This warranty contains the sole express warranty made by **Icon Process Controls Ltd** in connection with its products. **ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED**. The remedies of repair or 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

For additional product documentation and technical support **visit www.iconprocon.com | e-mail: sales@iconprocon.com support@iconprocon.com | Ph: 905.469.9283**

ICON™ PROCESS CONTROLS Corrosion-Free Instrumentation Equipment

~~CORROSION~~



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