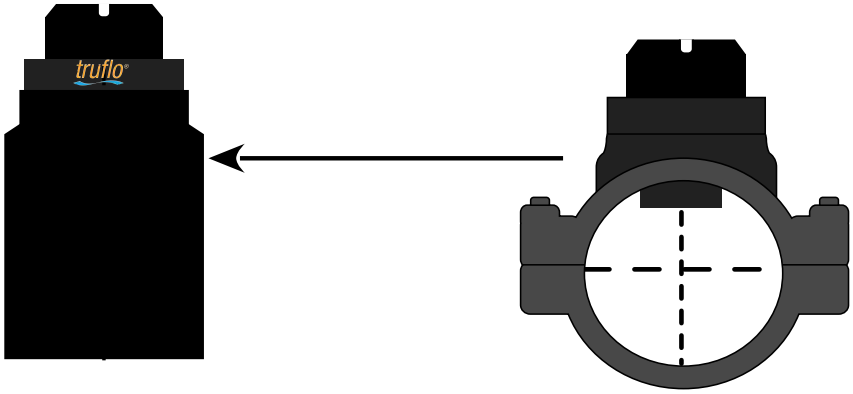
LSS SERIES

PADDLE WHEEL FLOW METER

QUICK-START MANUAL



ICON PROCESS CONTROLS™ Corrosion-Free Instrumentation Equipment

Important Proper Installation Method

Proper Sensor Installation

Very Important

Lubricate O-rings with a Viscous Lubricant compatible with the system.

- Using an **Alternating | Twisting Motion** Carefully lower the sensor into the fitting. | Do Not Force
- Engage one thread of the sensor cap then turn the sensor until the alignment tab is seated in the fitting notch | Fig-1 | Ensure Tab is Parallel to Flow Direction.

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, see Fig-1

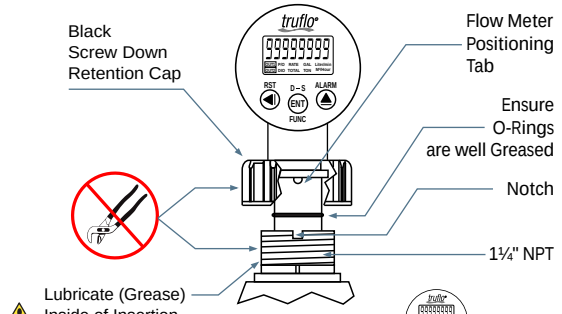


Fig-1

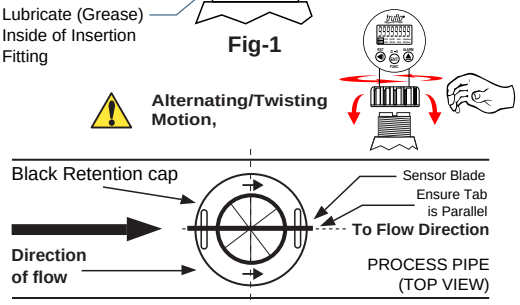


Fig-2

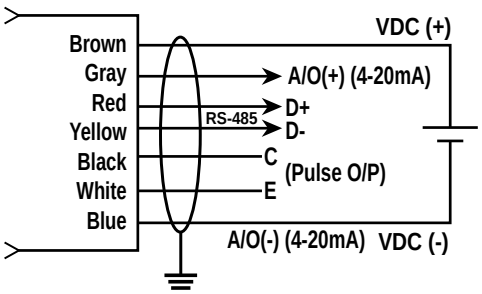
Ensure Tab is in Line with Flow Direction

ring | DC Power Only

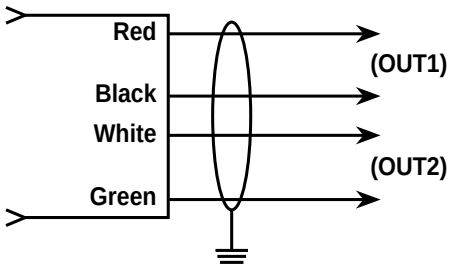
- Use conductor shielded cable 24V DC (20-26 ANG).
- Cable shield must be maintained through cable splice.

14-28VDC

- **4-20mA | RS-485 | Pulse Output**



- **Relay Outputs**

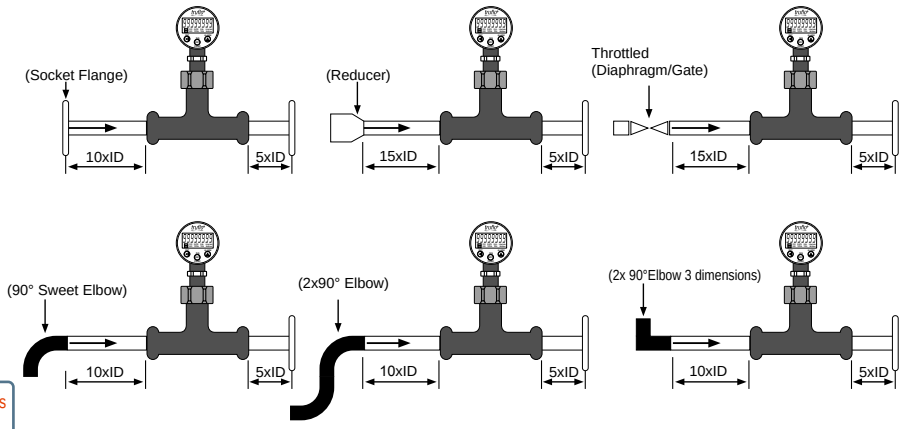


Important | Installation

Ensure Silicon Grease is Applied Prior to Insertion

Ensure Location Tabs Are Parallel to Direction of Flow

Correct Sensor Positioning



In Order to Achieve the Highest Accuracy Always Maximize the Upstream Downstream Distances Between the the Flow Meter and a Pump | Valve or Fitting.

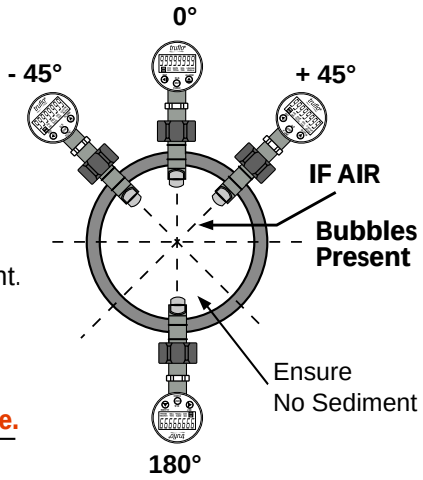
Sensor Mounting Position

Horizontal Pipe Runs

- Mount sensor in the upright (0°) position for best performance.
- Mount at a Maximum of 45° when Air Bubbles are present.
- **Do not** mount on the bottom of the pipe when Sediments is present.

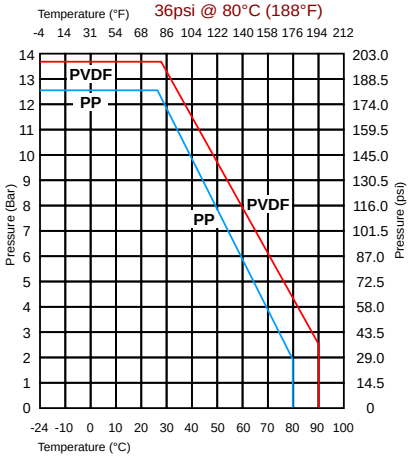
Vertical Pipe Runs

- Mount sensor in any orientation.
- Upward Vertical flow is Strongly Recommended to **Ensure Full Pipe.**



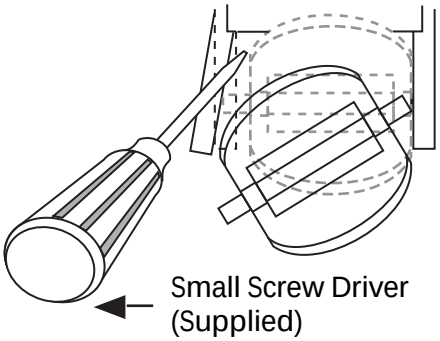
Maximum Operating Pressure/Temperature

- PP Body : (180psi @ 68°F) (25psi @ 176°F)
- PVDF Body : 200psi @ (-20 to 27°C) (-4 to 81 F) 36psi @ 80°C (188°F)



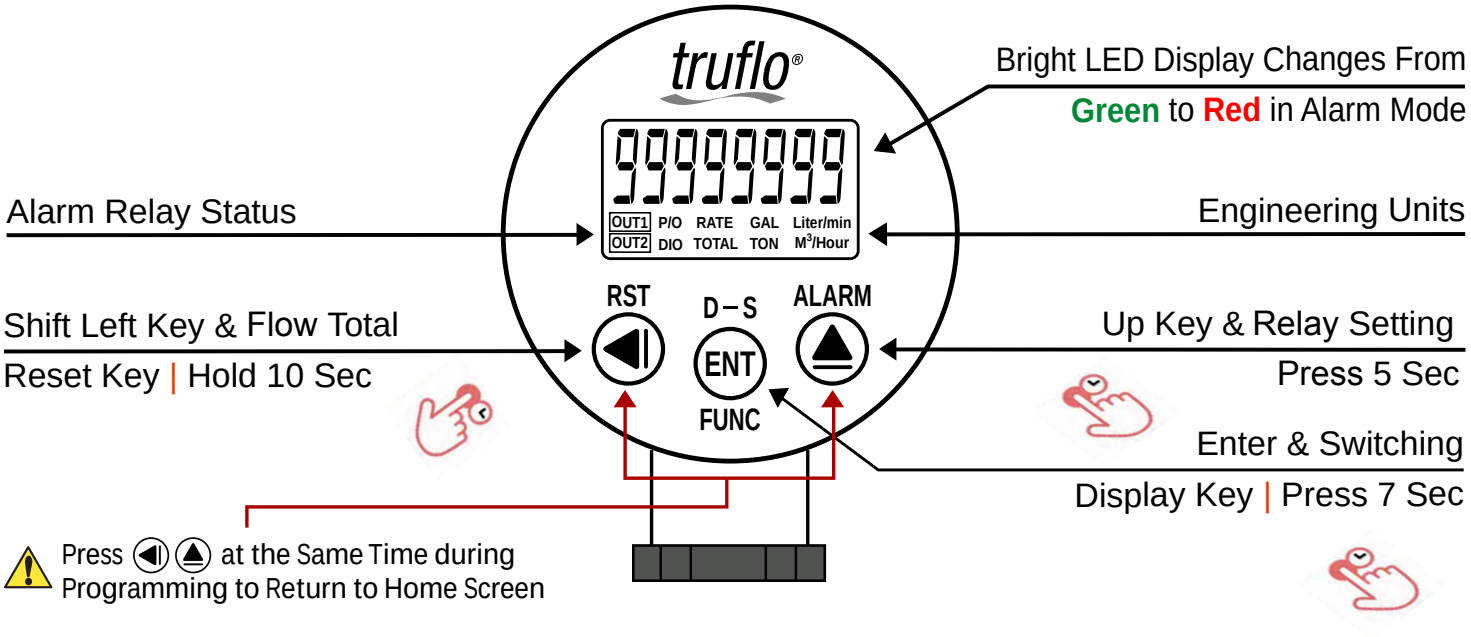
Rotor Replacement Procedure

- To remove the rotor, insert a small screwdriver between the rotor and the ear of the sensor.
- Carefully Twist the screwdriver blade to flex the ear outward enough to remove one end of the rotor and pin.
- DO NOT flex the ear any more than necessary! If it breaks, the sensor cannot be repaired and will not be considered as a valid warranty claim.
- Install the new rotor by inserting one tip of the pin into the hole, then Carefully flex the opposite ear back enough to slip rotor into place.



PROGRAMMING STEPS

FRONT PANEL & KEY FUNCTIONS



LSS SERIES

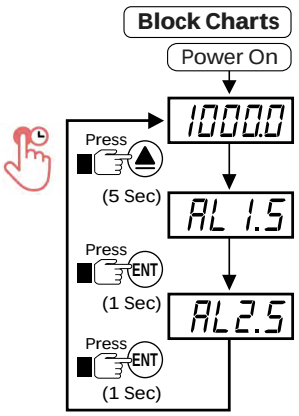
Key Name	Symbol	Descriptions
Enter & Save Key	ENT	1. In the Measuring Status, Press this Key for 5 sec to enter Programming. 2. In the Measuring Status, Press this Key to Switch the Rate & Total Value. 3. In the Measuring Status, Press this Key to Save the Value & Go to Next Programming Screen.
Shift & Totalizer Reset Key	◀	1. Press this Key for 10 sec to Reset the Total Value. 2. Pressing this Key will Move the Cursor Left.
UP Key & Relay Set Key	▲	1. Press this Key for 5 Sec to Enter to Alarm Programming Screen. 2. Pressing this Key will Increase the Digits.

1. To modify the Settings, please press ◀ ▲ and press ENT to save the Settings after the modification is made.
2. Remember the New Passcode If Changes Are Made!
3. In any Screen, press ◀ ▲ Together During programming Stage to Return Immediately to Home screen | Note : AFTER 2 min the Display will Return to Home Screen.

PROGRAMMING RELAYS

Follow Hand For Programming

Alarm Setpoint



Display	Descriptions	Default
Measuring Status	Current Value On Display	0
Alarm 1 Setpoint (AL1)	To Move Cursor — To Increase or Decrease Press ◀ ▲ to Modify Alarm 1 Setpoint. (Flow Rate) Display Changes From Green to Red In Alarm Start	00000
Alarm 2 Setpoint (AL1)	To Move Cursor — To Increase or Decrease Press ◀ ▲ to Modify Alarm 2 Setpoint. (Flow Rate) Display Changes From Green to Red. In Alarm State	00000

⚠ Press ◀ ▲ at the Same Time during Programming to Return to Home Screen.

ALARM RELAY | AL

When AL=HI, DELAY= 0 :

Current Value > Programmed Value (AL) + Hysteresis (HYS) → Relay On
Current Value < Programmed Value (AL) – Hysteresis (HYS) → Relay Off

When AL=HI, DELAY= 1 – 99 sec.:

Current Value > Programmed Value (AL) + Hysteresis (HYS) + Delay Time (DEL) → (Relay On)
Current Value < Programmed Value (AL) – Hysteresis (HYS) → (Relay Off)

When AL=HI, DELAY= -1 – 99 sec.:

Current Value > Programmed Value (AL) + Hysteresis (HYS) → (Relay On + (DEL) and then off)
Current Value < Programmed Value (AL) – Hysteresis (HYS) → (Relay Returns to Normal State After the Procedure)

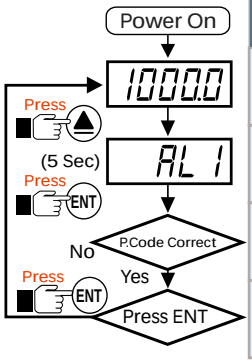
When AL=LO, DELAY= 0 :

Current Value > Programmed Value (AL) + Hysteresis (HYS) → (Relay Off)
Current Value < Programmed Value (AL) – Hysteresis (HYS) → (Relay On)

When AL=LO, DELAY = 1 – 99 sec.:

Current Value > Programmed Value (AL) + Hysteresis (HYS) → (Relay Off)
Current Value < Programmed Value (AL) – Hysteresis (HYS) + Delay Time (DEL) → (Relay On)

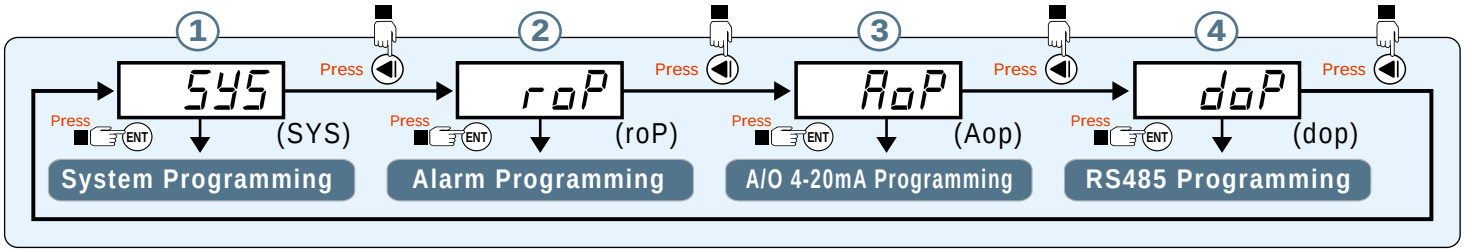
Follow Hand For Programming



Display	Descriptions	Default
Measuring Status	Current Flow Value. (Press 5 Sec)	
Pass Code (P. Cod)	To Move Cursor — To Increase or Decrease Press ◀ ▲ to enter Passcode.	00000
	If Pass-code is correct the Flow Meter will enter into Programming Status. If Passcode is incorrect the Display will to Return to Measuring Status.	
	Press Enter Again	

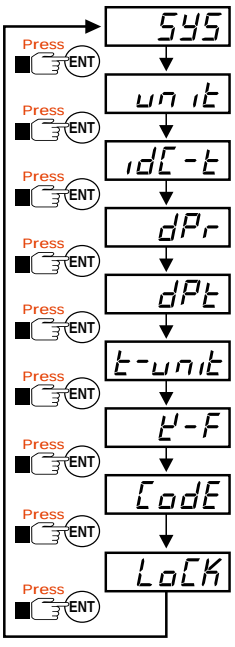
NOTE

1. There are Four (4) Programming Windows (1) "System Programming Group (SYS)" (2) "Alarm Programming Group (roP)" (3) "Analog 4-20mA Output Setting (AoP)" (4) "RS485 (Optional) Programming (doP)".
2. Press ◀ to select each Section Screen Press ENT to enter Programming page for modifying the parameters.



Programming Steps

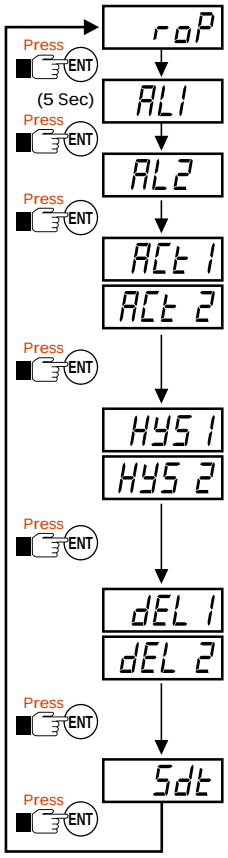
Follow Hand For Programming



Display	Descriptions	Default
Flow Unit Setting (Unit)	Press ▲ to modify the Unit of measurement (Liter, Gal, Ton., m^3)	LTR
Sampling Time Base (idC-t)	Press ▲ to Change sampling time (0.5, 1.0, 2.5, 5.0 sec).	1.0
Decimal Point of Rate Setting (dPr)	Press ▲ to select decimal point (0,1,2,3,4) (0 STD).	00000
Decimal Point of Total Setting (dPt)	Press ▲ to select total decimal point (0,1,2,3,4) (0 STD).	00000
Time Parameter Setting (t-unit)	Press ▲ to modify time parameter (sec/min/hour) Minutes (Recommeded)	SEC
K Factor Setting (K-F)	Press ◀ ▲ to modify K Factor (0.1~999.999 Section See Fittings Section Page 8)	10000
Passcode Setting (CodE)	Press ◀ ▲ to modify passcode (0~19999). PS: Please don't forget the new passcode after Change.	00000
Lock Setting (LoCK)	Press ▲ to lock the keys, using key lock function allows only viewing of the programs, but any change any of the values will be blocked. No (Unlock), YES ("ENT" unlock).	no

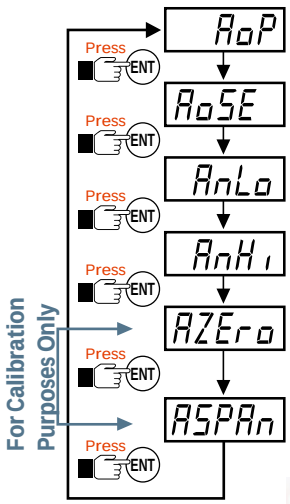
Press ◀ ▲ at the Same Time during Programming to Return to Home Screen

Programming Relay Set Points



Display		Descriptions	Default
Programming Relay Page (roP)		The following steps are only available for alarm output.	
Alarm 1 Selection Setting (AL 1)		Press ▲ to select alarm 1 (Flow Rate or Total).	RATE
Alarm 2 Selection Setting (AL 2)		Press ▲ to select alarm 2 (Flow Rate or Total)	RATE
Alarm 1 (ACt1) / Alarm 2 (ACt2)	Alarm Relay Setting	Press▲ Change Relay Set Point Value that is ≥ (Hi) or <(Lo) for Relay action. Hi = Above Current Flow Lo = Below Current Flow	HI
Hysteresis 1 (HYS1) / Hysteresis 2 (HYS2)	Alarm Hysteresis Setting	Press ◀ ▲ to modify the Hysteresis value, when Flow Rate runs below or above display value (depends on alarm action). Alarm setpoint ± this value (0~999) will turn off the alarm. Note : If AL1.5 or AL2.5 are set to Alarm based on Total (see above) then the Hysteresis will be Disabled	00000
Delay Time 1 (dEL1)	Alarm Run Delay Setting	Press ◀ ▲ to modify the value, Based on Value Entered the Alarm will activate only when the Display Value is Reached and the time is passed Initial Start - Up - (Prevents False Alarms)	00000
Delay Time 2 (dEL2)	Alarm Run Delay Setting	Press ◀ ▲ to modify the value, when the display value reach the alarm value Set the delay (sec) before alarm Activates (0~99 sec) for alarm action. Initial Start - Up - (Prevents False Alarms)	00000
Alarm Start Band Time Setting (Sdt)		Press ◀ ▲ to modify the value (0~99 sec), if the display value hits alarm start band value; the alarm will be active (sec). Initial Start - Up, Filter Change Out	00000

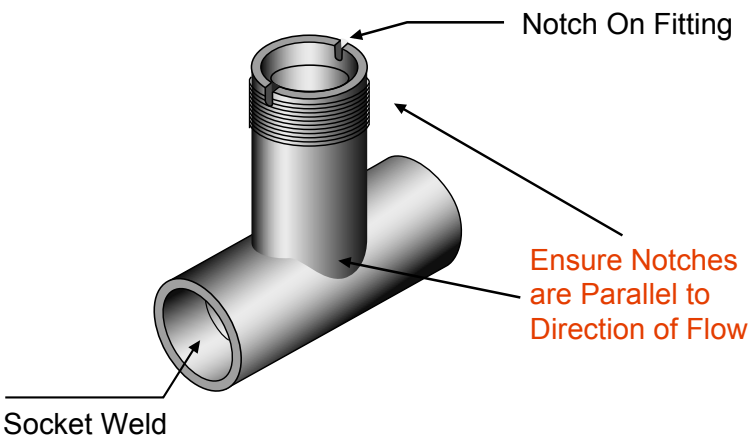
Programming 4-20mA Output

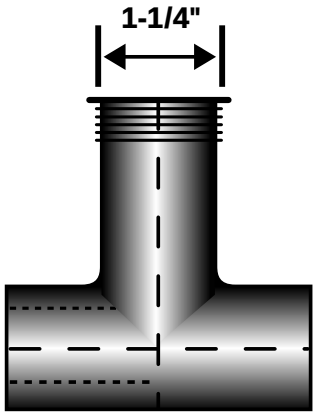


Display	Descriptions	Default
A/O Programming (AoP) 4-20mA	**The following steps are only available for 4-20mA output.**	
A/O Selection Setting (Ao. SEL)	Press ▲ to select 4-20mA output for Flow Rate or Flow Total.	RATE
A/O Low Scale Setting (AnLo)	Press ◀ ▲ to adjust A/O low scale to correspond to the display value (programmable). Ex: A/O is 4-20mA the display is 0 to output 4mA, this value must be set for 0	00000
A/O High Scale Setting (AnHi)	Press ◀ ▲ to adjust A/O hi scale to correspond to the display value (programmable). Ex: A/O is 4-20mA, the display is 90.0 to output 20mA, this value must be set for 90.0	99999
A/O Zero Adjustment (AZEro)	Press ▲ to select adjusting For Valves Above Flow Rate, press ▲ to modify the A/O zero. PS: Use this function to adjust the real A/O zero. i.e. If you wish to have 0mA read other than 0 i.e. 10 GPM	00000
A/O Span Adjustment (ASPAn)	Press ◀ to select adjusting flow rate, press ◀ to modify the A/O span. PS: To use this function to adjust the real A/O span. i.e. Flow Rate 20mA =150 GPM. When you wish to Set a pre-determined Max Flow Value	00000

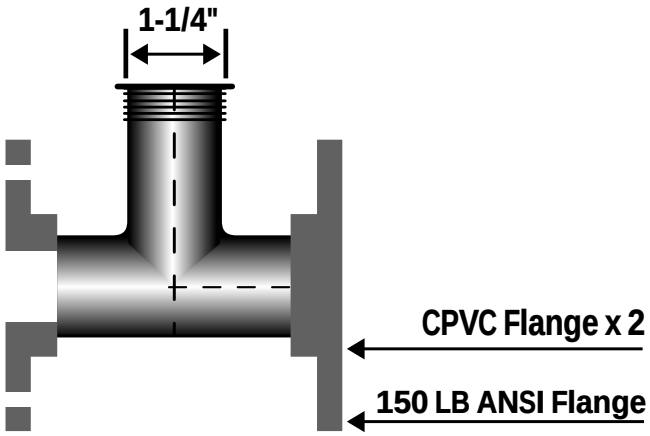
Note : All Sensors are Factory Calibrated - Calibration Not Required

CPVC TEE FITTING | SCH80





Remember to Grease Flow Meter & Fitting



K-Factor | Pulse/Gal*

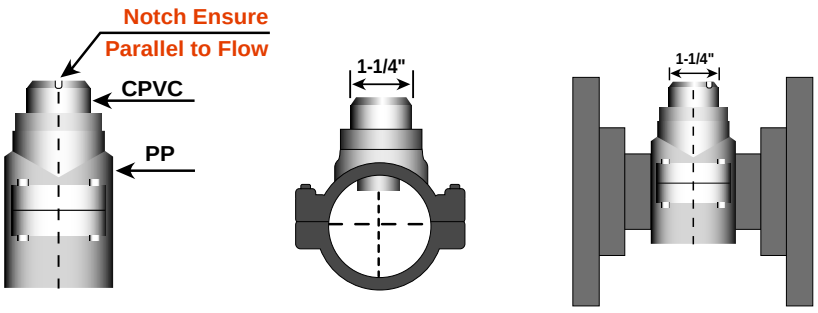
TEE FITTING			K-Factor	Sensor Length
Size	DN	Id	CPVC | SCH80	
1/2"	15	0.55	**811**	T
3/4"	20	0.74	**430.3**	T
1"	25	0.96	**334.7**	T
1-1/4"	32	1.30	**188.6**	T
1-1/2"	40	1.50	**156.8**	T

TEE FITTING			K-Factor	Sensor Length
Size	DN	Id	CPVC | SCH80	
2"	50	1.90	**28.7**	T
2-1/2"	65	2.30	**19.6**	T
3"	80	2.90	**11.9**	T
4"	100	3.83	**6.3**	T
6"	150	3.80	**2.6**	T1

*Divide K- Factor by 3.8 to change to LPM

K-FACTOR TABLES

CLAMP SADDLES

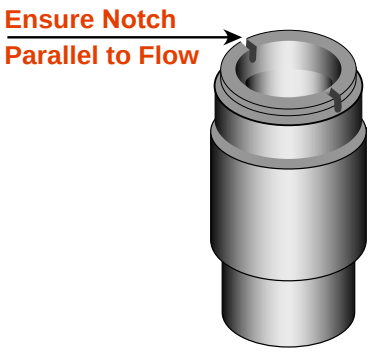


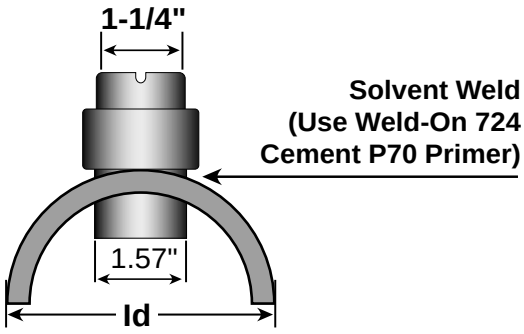
Clamp Saddles			K-Factor | Pulse/Gal*	Sensor Length
Size	DN	Id	CPVC (SCH80)	
2"	50	1.9	**29.0**	T
2-1/2"	65	2.3	**19.8**	T
3"	80	2.9	**12.0**	T
4"	100	3.8	**6.3**	T
6"	150	5.7	**2.6**	T1

*Divide K- Factor by 3.8 to change to LPM

CPVC SOCKET WELD-ON ADAPTERS

Remember to Grease Flow Meter & Fitting





Glue-On Adapters			K-Factor | Pulse/Gal*	Sensor Length
Size	DN	Id	CPVC (SCH80)	
2"	50	1.9	**29.0**	T
2-1/2"	65	2.3	**14.8**	T
3"	80	2.9	**12.0**	T
4"	100	3.8	**6.3**	T
6"	150	5.7	**2.6**	T1
8"	200	7.0	**1.4**	T1

Glue-On Adapters			K-Factor | Pulse/Gal*	Sensor Length
Size	DN	Id	CPVC (SCH80)	
10"	250	9.5	**0.90**	T1
12"	300	11.3	**0.64**	T1
14"	350	12.4	**0.53**	T1
16"	400	15.1	**0.40**	T1
20"	500	19.0	**0.77**	T1
24"	600	21.0	**0.18**	T1

*Divide K- Factor by 3.8 to change to LPM

Warranty Information

All warranty and non-warranty repairs being returned must include a fully completed Service Form and goods must be returned to Icon Process Controls directly or to the authorized distributor. Product returned without a 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.

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.

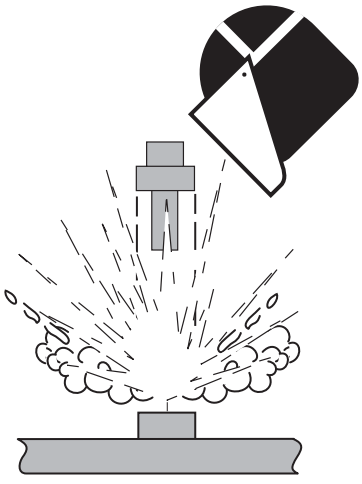
Note / Technical Notes
Highlights additional information or detailed procedure.

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

WARNING!

Personal Protective Equipment (PPE)
Always utilize the most appropriate PPE during installation and service of Signet 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.



DC Power Only