INSITE®

INLINE FLOW METERS

Installation and Maintenance Instructions for Ultra Pure Water

This flow meter is used for Ultra Pure Water indication of flow rate to tools, on deionized water returns and UPW returns

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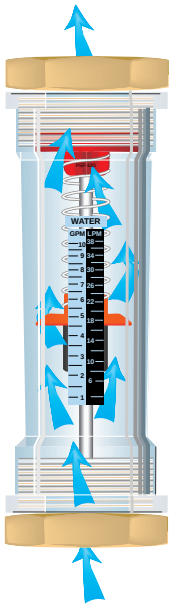
UNIVERSAL UFM FLOW MONITORS

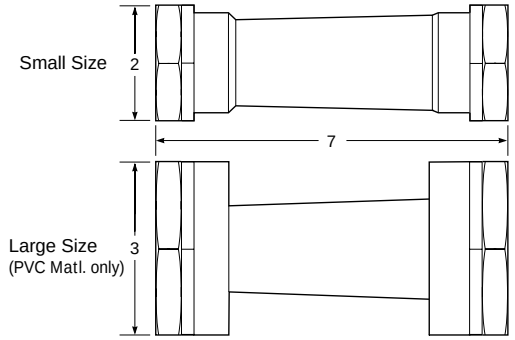
HOW IT WORKS

Fluid enters at end marked “IN” and forces the piston to move with it, against spring pressure, enough to pass given flow around piston periphery. The knife edge of the piston is visible through the transparent housing; its position under the printed scale gives the flow rate.



Max. Temp. and Pressure			
(°F)	(°C)	PSIG	BAR
150	65	150	10.3
Accuracy ± 5% full scale. Pressure drop 4 PSIG @ max flow			

DIMENSIONS (approximate in inches)



Consult factory for dimensions with switch mount

Installation

Inlet and outlet ends are marked on the flow meter body, and an arrow on the printed scale indicates flow direction. Insite flow meters can be mounted in any convenient orientation (vertical, horizontal or anything in-between) without affecting performance. No straight runs before or after the meter are required.

The end fittings are connected to the plastic body with O-ring sealed straight threads and don't need to be highly torqued to prevent leakage, or require any other kind of sealant such as Teflon tape or pipe dope.

These end fittings accept pipe with tapered threads (NPT). Teflon tape should be used on the pipe threads and standard torques applied, to make leak-free connections.

The NPT process connections are threaded into the Polysulphone body via straight threads and sealed with an O-ring. When the process connections are installed into the housing during assembly, the end fitting, which has two or more flats, is loosely held in a vise and the meter body is screwed onto the fitting by hand making sure that the O-ring seal is carefully compressed and that the fitting is secure, but not over tightened.

During installation of this meter, in the piping, it is important that the end fittings on both sides of the meter are secured, by the same flats as when they are installed, so as to prevent them from becoming over tightened by the pipe when it is screwed into the fittings. Do not attempt to use a pipe wrench on the meter body itself when connecting the piping.

It is also especially important to properly support the meter and it's adjacent piping in the installed position as the thermoplastic housing does not have the same mechanical strength as an all metal housing.

This type of thermoplastic meter is targeted as a lower cost alternative to those manufactured from expensive, more exotic materials that are used in ultra pure water applications. Users should recognize both it's mechanical limitations and it's attributes.

Many users find that a union type fitting, installed upstream of the flow meter, makes for easier removal of the flow meter for cleaning internals. Control valves should be installed downstream of the flow meters.

When the Insite meter is installed outdoors it *must* be protected from direct sunlight to avoid possible damage caused by UV light.

Maintenance

Normally, the only servicing required is a periodic cleaning of the tube and three internal parts. Use wrenches on the end fittings to remove the flow meter from the line. **Do not apply wrenches to the plastic body when breaking pipe connections, only end fittings.**

With the flow meter out of the line, completely remove the end fitting from the outlet end of the tube. Use a bent wire or other hook to grab the shaft, piston and spring and remove from tube. Inspect all parts for damage. The interior of the tube can be swabbed out, and the parts wiped off, with a soft dry cloth. If dirt or residue cannot be removed with a dry cloth, use water and a mild non-abrasive soap. **DO NOT USE SOLVENT OF ANY KIND.**
Replace any worn or damaged parts.

When reassembling the Insite flow meter, be sure the piston is installed as shown in the drawing. Don’t put in upside down. Inspect O-rings for damage and replace if necessary. Wet O-rings with water prior to assembly to improve sealing.

For Electric Signalling

Switch Kits: Flow meters can be equipped with one or two electric switches so that any flow rate within the range of the meter can be made to trigger a signal (or signals). Switch settings are easily adjusted. Switches are supplied in kit form for installation in the field.

Each switch kit consists of a ring shaped ceramic magnet, that fits around the flow meter piston, and a proximity switch in a housing that clamps to the body of the flow meter. As the magnet moves with the piston, its field trips the proximity switch. An adjustment screw changes the actuation point by moving the switch.

Switch contact ratings (max.) are 8 watts @ 120 VAC/ 100 VDC. Do not exceed 8 watts with any combination of specified volts or current. Switch has three wires: Black for normally open, Blue for normally closed, and White for common. Switch specs contact ratings: 12 VDC@.66 A, 28 VDC @ .285 A, 120 VAC @ .066 A (at 77° F).

To order switch kits

For flow ranges 3 to 15 GPM Order No. ISS-15-B-T. For flow ranges 20 to 50 GPM Order No. ISS-50-B-T.

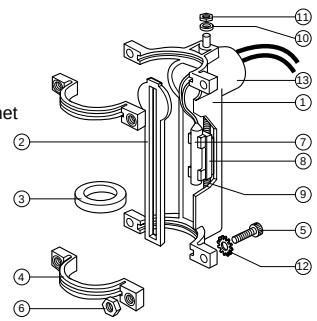
NOTE: Switch has a 25% of full scale operating band. Within the band, the switch activates. Above and below the band, the switch deactivates. Thus, one switch can be used as a deviation alarm.

Switch Installation

Step 1. Installing the magnet. You must disassemble the flow meter to do this. Follow instructions found under the heading “Maintenance” on page 3. Remove piston from the shaft and **place the magnet between piston and spring. Be sure that the piston is installed as in the drawing (page 4), and the spring is seated on the magnet and piston.** Insert into tube and replace outlet end fittings.

Insite Switch
Parts Description

1. Housing
2. Gasket
3. Teflon coated magnet
4. Half-collars (2)
5. Capscrews (4)
6. Capscrew nuts (2)
7. Switch
8. Switch carrier
9. Adjustment screw
10. O-ring (2)
11. Retainer clip
12. Lockwashers (4)
13. 1/2" NPTF conduit connection



Step 2. Installing the foam gasket. It has an adhesive on one side, covered with a protective paper. Peel off and press the gasket firmly into place on the switch housing.

Step 3. Installing the switch housing(s) on the flow meter body.

(A) Single switch: push the capscrews through the switch housing tabs, and thread them into the half-collars, as shown. Use the washers provided. The nuts may be discarded.

(B) Dual switches, match up the tabs on the two switch housings and push the capscrews through both collar tabs. Put the nuts on the threaded ends of the capscrews and tighten. Use the washers provided. (The half-collars and extra magnet may be discarded.)

NOTE: There is no “wrong orientation” of the switch housing. If you are installing two switch housings, they can both be oriented the same way, as in the photo, or one “up” and the other “down”. Install to suit your needs in wiring and switch adjustment.

Setting The Switch Points

Flow meter installed:
Simply adjust the amount of flow to move the piston to the level on the indicator where a switch signal is desired, then turn the switch adjustment screw until switch actuates. (Switch moves toward the adjustment screw head as you turn it clockwise. Use an ohmmeter to determine actuation.) If you are using two switches, repeat procedure for second switch.

Flow meter NOT installed:
Simulate flow by pushing the eraser-end of a pencil (or a similar tool) through the inlet end of the tube, contacting the float, and moving it against the spring pressure until the knife edge of the float is at the desired reading on the scale. (If your unit has a 1/2 in. pipe fitting, remove it to gain better access.) Then, turn the switch adjustment screw till the switch actuates. (Switch moves toward the adjustment screw head as you turn it clockwise. Use an ohmmeter to determine actuation.) If you are using two switches, repeat procedure for second switch.

When connecting the switch wires, leave enough lead length (as a pigtail) to allow full travel of the switch.

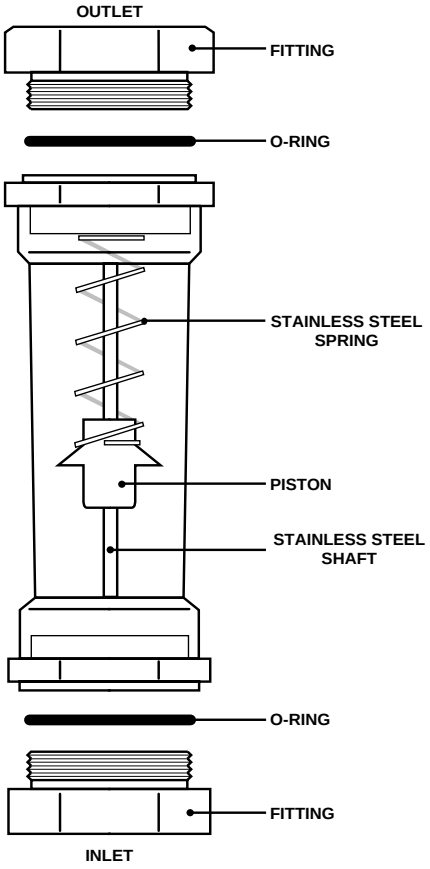
INSITE Switch Replacement Parts	
MAGNET (ONLY) Part # 1122-T	SWITCH (ONLY) Part # 1127
	

UPMAN-200.1M 05/17/1999

Insite Replacement Parts

Replacement Part Numbers For Model Codes

DESCRIPTION			IS - 5, 10, and 15	IS-20, 30, 40 and 50
	Flow Tube Assembly with Max. Flow Reading	5	**1119-AS**	
		10	**1116-AS**	
		15	**1117-AS**	
		20		**1173-AS**
		30		**1174-AS**
		40		**1175-AS**
		50		**1176-AS**
	PVDF End Fittings	1/2	**1192-4**	**-**
		3/4	**1192-6**	**3145-6**
		1	**1192-8**	**3145-8**
		1-1/2	**-**	**3145-12**
	316 S.S. End Fittings	1/2	**1188-4**	**-**
		3/4	**1188-6**	**476-6**
		1	**1188-8**	**476-8**
		1-1/2	**-**	**476-12**
	Viton Seal (2 Required)		**1112**	**396**
	Kalrez Seal (2 Required)		**1114**	**483**



Model Code Description

Select appropriate symbols, and build an ordering code as shown.

EXAMPLE: IS - 10 GPM - 6 - M4 - J - EP

TUBE MATERIAL

Polysulphone = **IS**

MAX FLOW SIZE & UNITS

(Consult factory for calibrated Increments)

Small Series	Large Series
3,5,**10**,15 **GPM**	20,30,40,50 GPM
20,38,55 LPM	75,110,150,200 LPM

PORT SIZE (NPT)

1/2"	12.70 mm (Small Series Only)	= 4
3/4"	19.05 mm	= **6**
1"	25.04 mm	= 8
1-1/2"	38.10 mm	= 12

SPECIAL OPTIONS

(No Symbol = None)

IS1T = Installed with One Switch Kit
IS2T = Installed with Two Switch Kit
ST = Stainless Steel Identification Tag
FL = LED Switch Indicator Light
EP = Electro Polished S.S. Shaft and Spring
C1 = Class 1000 Cleaning
B1 = BCF End Fittings (PVDF Only)

SEAL MATERIAL

F = Viton®
J = Kalrez

FITTING MATERIAL

M4 = PVDF (Kynar)
I = 316 Stainless Steel

UNIVERSAL FLOW MONITORS, INC. PRODUCT WARRANTY

1) **ACCEPTANCE AND INTEGRATION CLAUSE:** This Sales Order Acknowledgment constitutes an acceptance by Universal Flow Monitors, Inc., (hereinafter "Universal") of an offer by the buyer upon the conditions and terms and at the prices stated herein. The issuance of this written acknowledgment confirms the existence of a contract binding upon the buyer upon the terms and conditions stated herein. This acknowledgment states all of the terms of the agreement between the parties relative to the purchase and sale of the goods described herein. Said agreement cannot be modified except through a written modification signed by Universal. **EXCEPT FOR SUCH WRITTEN MODIFICATION, NO DEVIATION FROM THE TERMS AND CONDITION OF THE AGREEMENT AS SET FORTH IN THIS ACCEPTANCE IS AUTHORIZED.**

2) **WAIVER:** Waiver by Universal of any specific default or defaults by the buyer shall not constitute waiver by Universal of any of the conditions of the agreement between Universal and the buyer as set forth here under with respect to any further or subsequent default by the buyer.

3) Universal shall not be responsible for failure or delays in deliveries due to fire, strikes, breakdowns, acts of God, failure of carrier's, inability to secure required materials, or other causes beyond Universal's control. Buyer waives any claims for damage arising by virtue of delay in delivery of material by Universal.

4) **LIMITED WARRANTY:** For a period of one (1) year from the date of manufacture, Universal warrants each product covered by this Acknowledgment and manufactured by Universal to be free from defects in material and workmanship. In the case of a repaired product, for a period of one (1) year from the date of repair, Universal warrants each part replaced or repaired covered by this Acknowledgment and manufactured by Universal to be free from defects in material and workmanship. In order to qualify for any remedy as specified herein, buyer must give notice to Universal within the one (1) year period, return the product intact, accompanied by MSDS Documents and prepay any transportation charges. Universal's **SOLE OBLIGATION** pursuant to this limited warranty or otherwise for any defect in its product(s) is the following:

Universal shall, at its sole and exclusive option, at no charge to buyer, either repair or replace the defective product at its factory or refund purchase price thereof.

REWORK, REPLACEMENT OR REFUND, AS PROVIDED UNDER THIS WARRANTY, ARE THE EXCLUSIVE REMEDIES PROVIDED TO THE CUSTOMER OR ANY OTHER PERSON OR ENTITY, WHETHER IN CONTRACT OR IN TORT AND IN CONNECTION WITH ANY WARRANTY, WHETHER EXPRESS OR IMPLIED. BUYER AGREES THAT UNIVERSAL SHALL NOT BE LIABLE FOR ANY DIRECT OR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR DEFECT AND/OR FOR BREACH OF ANY WARRANTY ON ANY PRODUCT, WHETHER IN CONTRACT OR IN TORT, EXPRESS OR IMPLIED IN LAW OR IN FACT. The warranty and the associated repair, replacement or refund remedy provided for herein are for the benefit of and may directly be enforced by past and present owners of Universal's Product, as appropriate, to the exclusion of any other right or remedy which might otherwise be available to such person or entity.

The expressed warranty set forth herein shall be in lieu of any other warranty, expressed or implied, in contract or in tort, including but not limited to any **IMPLIED WARRANTY OF MERCHANTABILITY and any IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.** However, should it for any reason be determined that Universal has given one or more implied warranties to buyer or any other person or entity, the repair, replacement or refund remedy provided for here under shall be the exclusive remedy pursuant to such warranty or warranties for any and all such persons.

This warranty extends to any Owner of the Product at the time of failure, whether or not such owner was or is the Privity of contract with Universal, to the exclusion of any other right or remedy which might otherwise be available to such person or entity; provided, however, that under no circumstances shall Universal be obligated to supply more than one replacement or refund for any defective product.

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