



Variable Area Flow Meter

EZ-View® Flow Meters and Flow-Alerts



Badger Meter

VAM-UM-00367-EN-03 (October 2019)

User Manual

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INTRODUCTION

EZ-View® flow meters are rugged, low-cost, direct reading, industrial class flow meters that are simple to install. They can be mounted in any position without costly flow straighteners or other special plumbing. Constructed of high impact thermoplastics, the flow meters offer excellent structural integrity and chemical compatibility with a wide range of industrial chemicals.

EZ-View flow meters provide instantaneous, direct-reading flow rate measurement of liquids in closed piping systems. The transparent thermoplastic body allows visual inspection of the fluid condition as well as viewing of the internal flow indicator relative to a calibrated flow scale. See *Figure 1*.

EZ-View meters do not require electrical connections for operation. They provide measurement by creating a predictable differential pressure across a sharp-edged orifice that is located in the piston assembly.

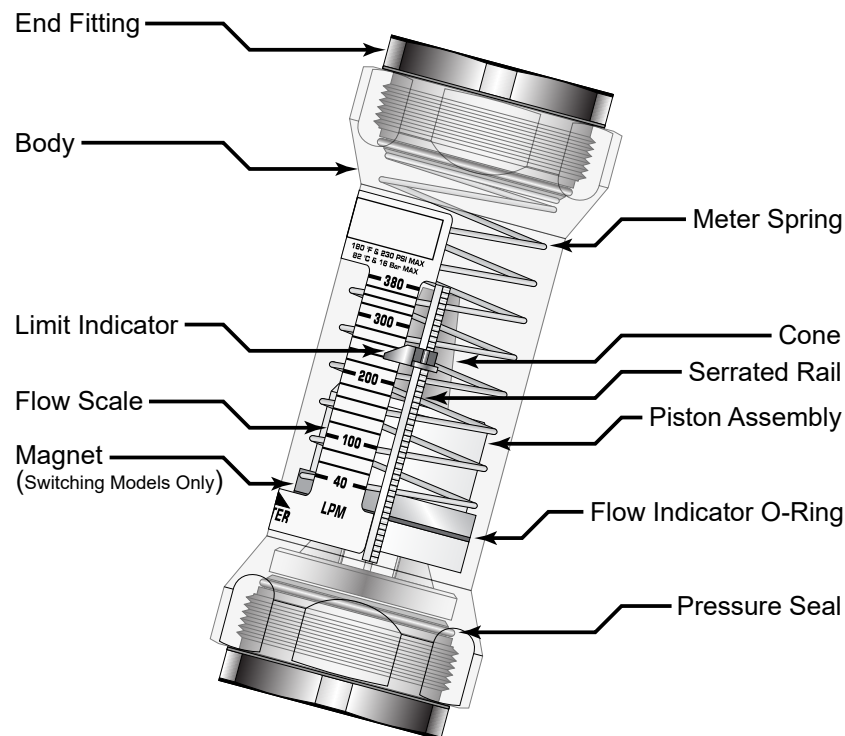


Figure 1: 1-1/2...3 in. models

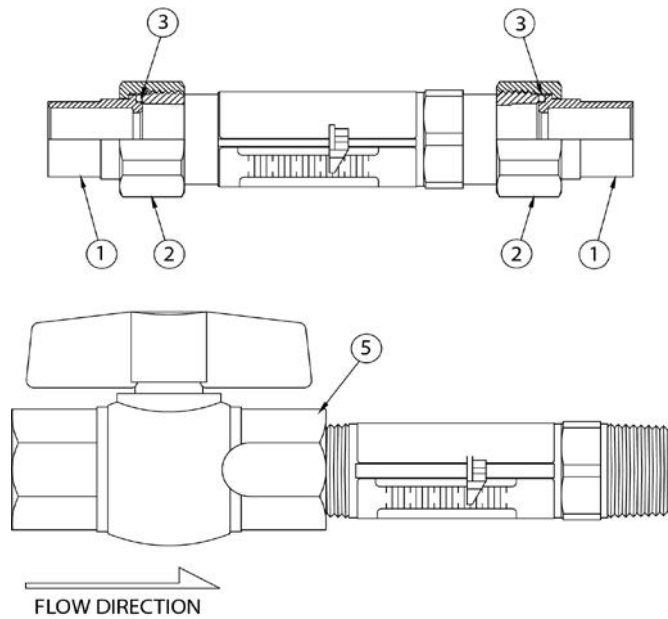


Figure 2: EZ-View Components

ID Number	Part Description	QTY
1	Fittings	2
2	Bushings	2
3	O-Ring / Seal	2
4	Pressure Gauge (Test Kits) Not Pictured	1
5	Control Valve (Test Kits)	1

OPERATING PRINCIPLE

Hedland® EZ-View flow meters are piston-type variable area flow meters that use a sharp-edged annular orifice, formed between an open-centered piston and a tapered metering cone. The piston is held in the no-flow position at the base of the cone by a precision retention spring. As flow in the pipe increases, the differential pressure correspondingly increases across the piston orifice, and moves the piston/flow indicator against the spring. The greater the flow rate, the further the piston moves along the tapered metering cone.

The flow rate is measured by viewing the indicator O-ring, mounted on the piston, relative to a graduated flow scale located on the transparent flow meter body. See *Figure 3*.

The unique design allows the meter to be mounted in any orientation (horizontal, vertical or upside down) without sacrificing measurement performance. Flow straighteners, located in the inlet and outlet, allow the flow meter to be less sensitive to turbulent flow conditions. Liquid measurements are provided in gpm and lpm.

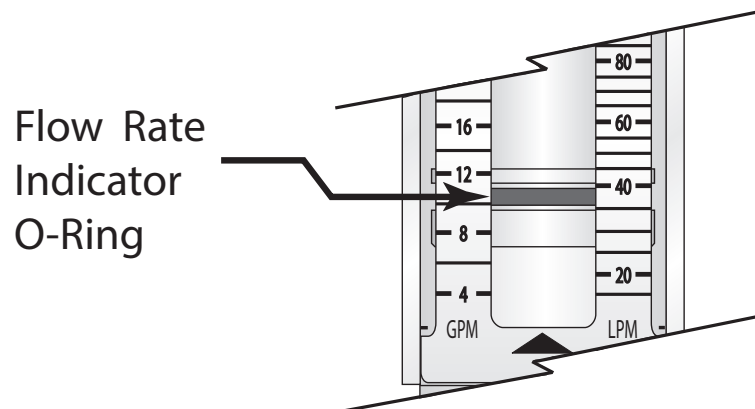


Figure 3: Flow rate indicator

INSTALLATION

⚠ CAUTION

THIS UNIT SHOULD BE INSTALLED AND SERVICED BY TECHNICALLY QUALIFIED PERSONNEL TRAINED IN MAINTAINING INDUSTRIAL CLASS FLOW INSTRUMENTATION AND PROCESSING EQUIPMENT.

⚠ CAUTION

READ INSTRUCTIONS THOROUGHLY BEFORE INSTALLING THE UNIT. IF YOU HAVE ANY QUESTIONS REGARDING PRODUCT INSTALLATION OR MAINTENANCE, CALL YOUR LOCAL SUPPLIER FOR MORE INFORMATION.

⚠ CAUTION

LIQUID PIPE SEALANTS, PVC/CPVC PRIMERS AND PVC/CPVC CEMENTS CONTAIN SOLVENTS THAT ARE NOT COMPATIBLE WITH POLYSULFONE PLASTIC. ALLOWING LIQUID PIPE SEALANTS TO CONTACT THE PLASTIC FLOW METER WILL RESULT IN WEAKENING OF THE FLOW METER BODY AND POTENTIALLY CAUSE FRACTURING UNDER PRESSURE.

Precautions

- Do not allow liquid pipe sealant, PVC/CPVC primer or PVC/CPVC cements to come into contact with the plastic flow meter. These contain solvents that are not compatible with the flow meter body and may result in weakening and potentially fracturing of the unit while under pressure. If a pipe sealant is required, use Teflon® tape.
- Do not install the flow meter in piping systems that are not aligned or properly supported.
- Do not connect the flow meter male plastic NPT fittings to female metal NPT couplings. Differences in coefficients of expansion between metals and plastics can cause the plastic flow meter body to crack. Use a female-to-female plastic pipe coupling to connect metal pipe to the plastic flow meter.
- Do not use pipe wrenches on the flow meter body. Use an open-end wrench on the integral hex flats during installation to avoid scarring or otherwise damaging the external surface.
- Do not subject the flow meter to back pressure or back flow. The flow meter can be damaged if the reverse hydraulic horsepower is too great.
- Do not install the flow meter on systems with large degrees of particulate contamination. Install a minimum filtration of 200 mesh (74 micron) for trouble-free operation.
- Do not install O-ring seals that have not been lubricated.

Piping Plumbing

⚠ CAUTION

TO AVOID UNNECESSARY PIPE FLEXING THAT COULD CAUSE STRUCTURAL STRESS ON THE FLOW METER BODY, USE INDEPENDENT SUPPORT LOCATED AS NEAR AS POSSIBLE TO THE INLET AND OUTLET OF THE METER TO ISOLATE THE METER FROM THE PIPING SYSTEM. FAILURE TO PROVIDE THIS SUPPORT COULD REDUCE THE LIFE OF THE METER.

Properly align the piping with the meter inlet and outlet to minimize structural stress on the plastic meter body. Special attention should be given to this effort if higher operational pressures and/or temperatures are anticipated. Firmly support the piping by using external mounting brackets, both upstream and downstream from the meter to avoid any pipe flexing that could reduce the life of the meter.

- If the flow meter inlet or outlet is being rigidly mounted, and the opposing port must be connected to a flexible hose, then the end connected to the flexible hose must be rigidly mounted.
- Flow meters can be installed immediately adjacent to 90° elbows or other components, providing system design flexibility.
- Install a 200 mesh (74 micron) or better filtration for reliable performance.

Flow Direction

These meters accept flow in one direction. Align the *Flow Arrow*, located on the bottom of the meter's flow scale, in the same direction as the anticipated line flow. See *Figure 4*.

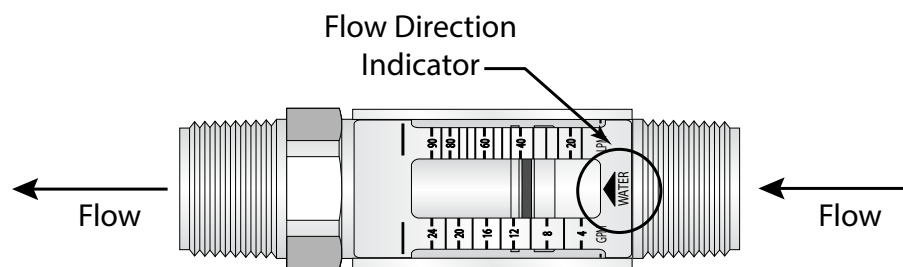


Figure 4: Flow direction indicator

Mounting Orientation

The meter can be installed to operate in any position.

Models with 1 in. (25.40 mm) Male NPTF End Connections

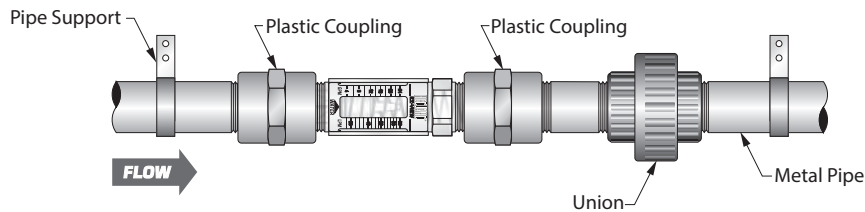


Figure 5: 1 in. (25.40 mm) Male NPTF installation

1. Apply a single layer of Teflon® tape to the male NPT threads of the flow meter.
2. Thread the flow meter inlet into a 1 in. NPT plastic, female pipe coupling.
3. Thread the flow meter and coupling onto the inlet pipe and hand tighten. Make sure the flow direction arrow on the flow meter corresponds with the system flow direction. See *Figure 4*.
4. Place an open-end wrench on the flow meter body hex and place a pipe wrench on the metal mating pipe. Tighten until snug. Do not overtighten. Make sure the flow meter scale is oriented for convenient viewing. Do not back-off or unscrew fittings to rotate scale for better viewing.
5. Thread a 1 in. NPT plastic pipe coupling to the outlet connection of the flow meter. Stack a pipe nipple and half of a pipe union onto the pipe coupling. Tighten the assembly as needed.
6. Install the other half of the pipe union to the outlet pipe and connect the union halves together.
7. Piping should be supported and aligned properly to avoid placing stress on the flow meter body.
8. Slide the limit indicators to point to appropriate positions on the flow meter scale. To remove the limit indicators, slide them fully toward the flow meter outlet.

Models with PVC Socket Weld End Fittings

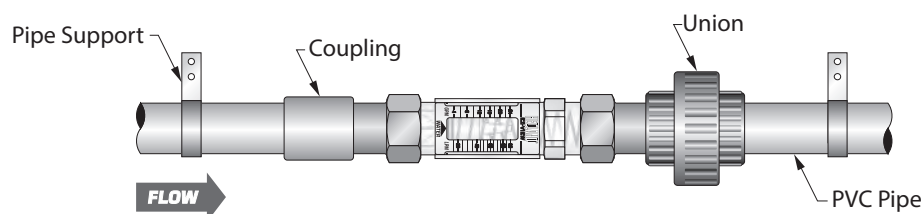


Figure 6: PVC socket weld installation

1. Remove the two end fittings from the flow meter. Lubricate the O-rings and install the fittings onto the flow meter.

CAUTION

LIQUID PIPE SEALANTS, PVC/CPVC PRIMERS AND PVC/CPVC CEMENTS CONTAIN SOLVENTS THAT ARE NOT COMPATIBLE WITH POLYSULFONE PLASTIC. ALLOWING LIQUID PIPE SEALANTS TO CONTACT THE PLASTIC FLOW METER WILL RESULT IN WEAKENING OF THE FLOW METER BODY AND POTENTIALLY CAUSE FRACTURING UNDER PRESSURE.

2. Prepare the flow meter PVC fittings and PVC pipe couplings with PVC cleaner/solvent.
3. Apply a thin layer of PVC glue to the PVC flow meter fittings. Orient the meter during curing so that excessive glue will not run into or onto the flow meter. Connect all PVC glue joints by inserting the pipes fully into their mating components and twisting 1/8 turn to provide adhesion. Allow sufficient drying time.
4. Using the method outlined in steps 2 and 3, apply half of the PVC union to the flow meter outlet fitting.
5. Install the other half of the PVC pipe union to the outlet pipe.
6. Make sure the flow direction arrow on the flow meter corresponds with the system flow direction. See *Figure 4 on page 9*. Lubricate the union O-ring and connect the union together.

NOTE: Piping should be supported and aligned properly to avoid placing stress on the flow meter body.

7. Slide the limit indicators to point to appropriate positions on the flow meter scale. To remove the limit indicators, slide them fully toward the flow meter outlet

Models with Brass Sweat End Fittings

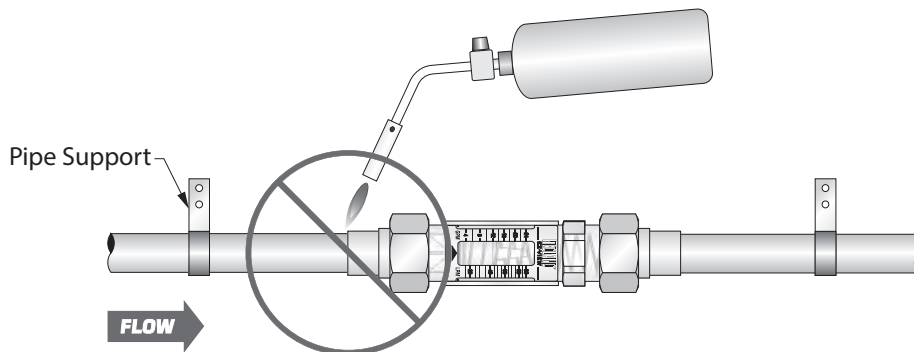


Figure 7: Brass sweat fitting installation

1. Remove both brass fittings from the flow meter inlet and outlet. Remove O-rings from the fittings.
2. Apply solder flux to the flow meter brass fittings and mating pipe surfaces.
3. Place the brass hex coupler onto the pipe with the thread facing the flow meter. Slide the brass sweat fitting onto the prepared pipe.
4. Sweat the fittings onto the pipe. Do not apply heat to the brass flow meter fitting with the plastic flow meter body or seals attached to the fitting.
5. Repeat steps 3 and 4 for the other flow meter fitting. Allow fittings to cool.
6. Lubricate the two O-rings removed in step 1. Place the O-rings onto the brass fittings.
7. Place the flow meter in between the two installed brass fittings. Make sure the flow direction arrow on the flow meter corresponds with the system flow direction. See [Figure 4 on page 9](#). Thread the two brass hex couplers into the flow meter body.
8. Rotate the flow meter body so the scale can be conveniently viewed. Tighten the hex couplers. Typically, only hand tightening is required.
9. Piping should be supported and aligned properly to avoid placing stress on the flow meter body.
10. Slide the limit indicators to point to appropriate positions on the flow meter scale. To remove the limit indicators, slide them fully toward the flow meter outlet.

Models with Male, Metal or PVC Threaded End Fittings

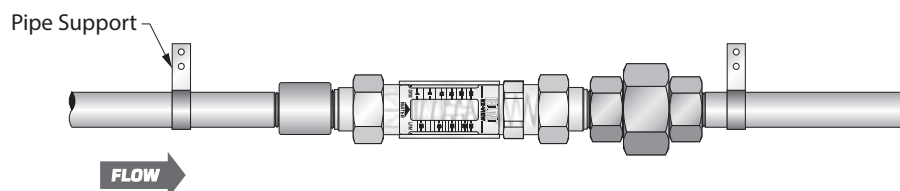


Figure 8: Male, metal or PVC threaded end fittings installation

1. Remove both fittings from the flow meter inlet and outlet. Remove the O-rings from the fittings.
2. Apply Teflon® tape to the male pipe thread connections.
3. Place the brass or stainless steel hex coupler onto the pipe with the threads facing the flow meter.
4. Thread the flow meter fittings onto the mating pipe.
5. Tighten fittings by placing an open-end wrench onto the fitting and a pipe wrench onto the mating pipe.
6. Repeat steps 3...5 for the other flow meter fitting.
7. Lubricate the two O-rings that were removed in step 1. Place the O-rings onto the threaded fittings.
8. Place flow meter between the two installed fittings. Make sure the flow direction arrow on the flow meter corresponds with the system flow direction. See *Figure 4 on page 9*. Thread the two hex couplers onto the flow meter body.
9. Rotate the flow meter body so the scale can be conveniently viewed. Tighten hex couplers. Typically, only hand tightening is required.
10. Piping should be supported and aligned properly to avoid placing stress on the flow meter body.
11. Slide the limit indicators to point to appropriate positions on the flow meter scale. To remove the limit indicators, slide them fully toward the flow meter outlet.

Models with Female, Metal Threaded End Fittings

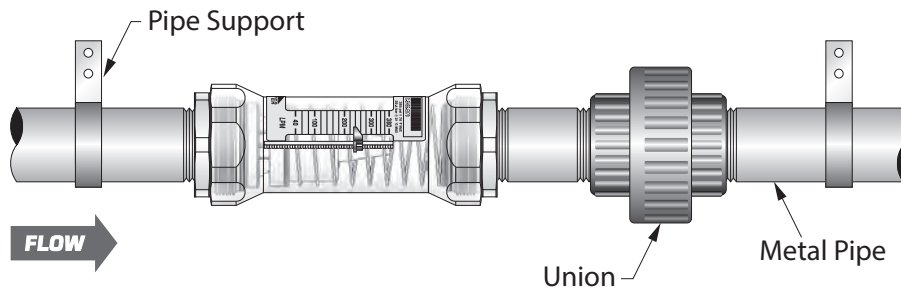


Figure 9: Female, metal threaded end fittings installation

1. Apply Teflon® tape to the male pipe thread connections.
2. Thread the inlet of the flow meter onto the appropriate pipe connection. Make sure the flow direction arrow on the flow meter corresponds with the system flow direction. See *Figure 4 on page 9*.
3. Tighten flow meter connection by placing an open-end wrench on the flow meter metal connection adjacent to the pipe that is being attached. Tighten until snug. Make sure flow meter scale is oriented for convenient viewing. Do not overtighten. Do not back off or unscrew to rotate scale for better viewing.
4. Install a union fitting at the outlet end of the flow meter.

CAUTION

DO NOT TIGHTEN THE FLOW METER BY WRENCHING FROM THE OPPOSITE FITTING, AS THE METER BODY COULD CRACK.

5. Piping should be supported and aligned properly to avoid placing stress on the flow meter body.
6. Slide the limit indicators to point to appropriate positions on the flow meter scale. To remove the limit indicators, slide them fully toward the flow meter outlet.

FLOW-ALERT SWITCH OPTIONS

NOTE: All Flow-Alert switches are magnetically triggered. Switches cannot be added to meters that were not ordered with the switching magnet. Switches and flow meters are purchased separately.

Flow-Alert Latching Limit Switch

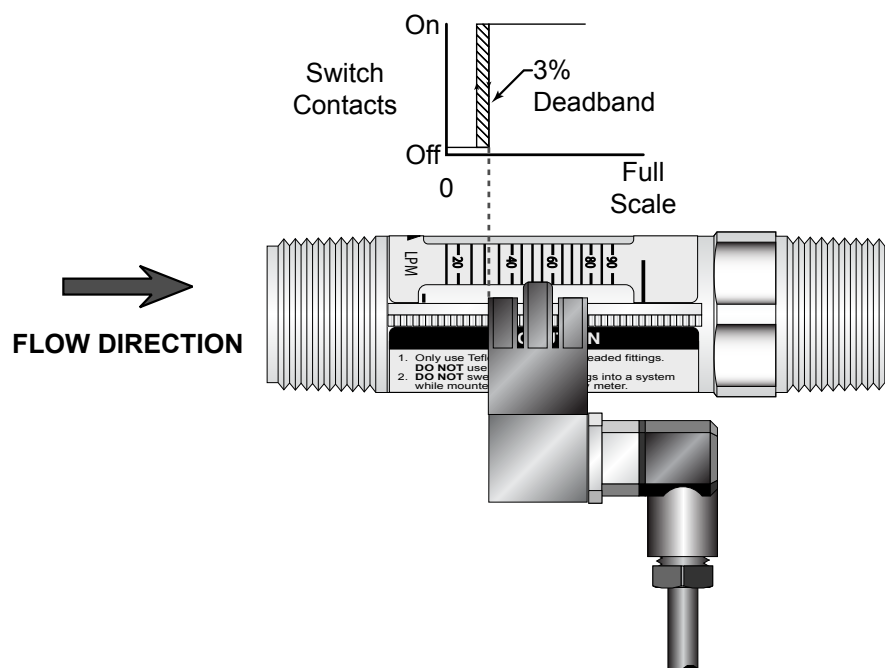


Figure 10: Latching switches

The AC and DC powered Flow-Alert modules consist of a relay circuit housed in a sealed plastic enclosure. The modules have a normally open, dry relay contact that can be used to directly control alarms, warning lights, relays or interface to a PLC. The relay is latched on as the magnet inside the flow meter passes by the module, and remains latched on until the magnet passes in the other direction, or power is interrupted. See *Figure 10*. The setpoint is adjustable from 0...100% of full scale. Flow meters can be equipped with one latching limit switch, either AC or DC.

Flow-Alert Reed Limit Switch

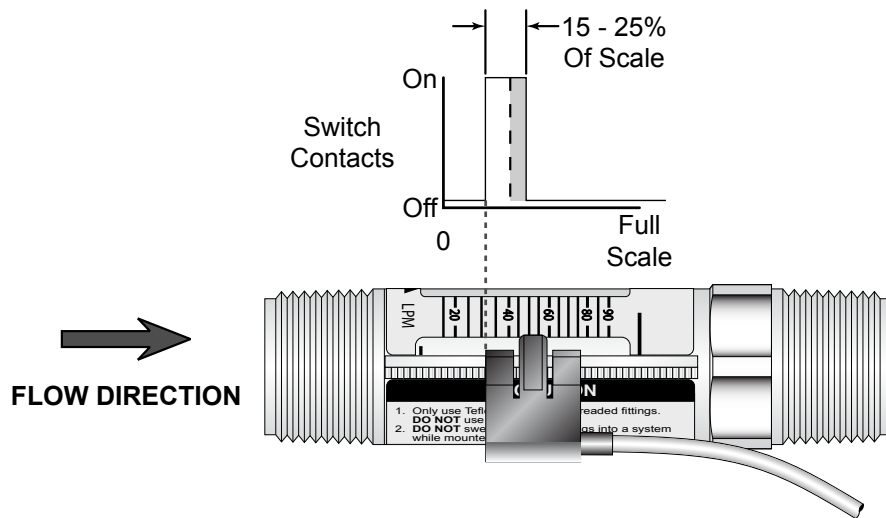


Figure 11: Reed switches

The reed switch Flow-Alert modules are available in three forms: Form A (normally open), Form B (normally closed), and Form C (single-pole, double throw).

Reed switches are housed in a sealed plastic enclosure for environmental protection. The reed switch modules do not provide a latching function like the AC and DC powered units. When the magnet inside the flow meter comes within proximity of the module, the reed switch will change state. See *Figure 11*. The setpoint is adjustable from 0...100% of full scale. Two reed switch Flow-Alert may be installed on a single flow meter but one must be set for activation on increasing flow and the second must be set for activation on decreasing flow.

FLOW-ALERT SWITCH INSTALLATION

Latching Switch

1. Install one end of the vibration locking kit onto the lpm side of the meter's serrated rail as shown in *Figure 12*.
2. Install the switch by placing the adjustment arm over the serrated rail from the inlet end of the 1/2 in. (12 mm), 3/4 in. (19 mm) and 1 in. (25 mm) meters, or the outlet end of the 1-1/2 in. (38 mm) or 2 in. (50 mm) meters. The direction of the connector and cable assembly indicates whether the switch will activate on increasing flow (connector and cable pointing down). See *Figure 13*. Secure the other end of the vibration locking kit and tighten after positioning.



Figure 12: Vibration locking kit installation

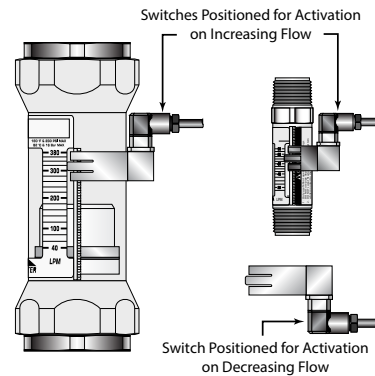


Figure 13: Switch position

3. The connector has four solder lugs labeled 1, 2, 3 and 4. Soldering wires to the terminals first requires disassembly of the connector as shown in *Figure 14*. The specific wiring pinouts for each style latching switch are shown in *Figure 14*.

NOTE: Before reassembly, label each wire with the corresponding lug position.

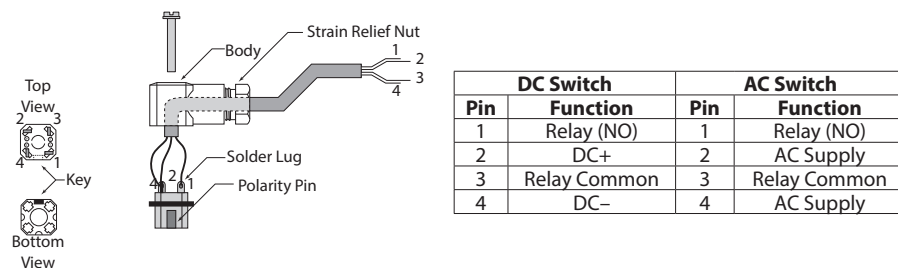


Figure 14: Wiring pinouts

4. Determine which direction the body of the connector should face. See *Figure 15*.
5. Snap the connector back together, pull the excess wire out of the strain relief, then tighten the strain relief nut.
6. Plug the connector into the switch module and secure with the screw provided.

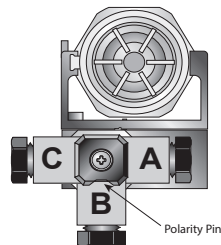


Figure 15: Polarity pin

Latching Switch AC Wiring Configuration

WARNING

ALL WIRING SHOULD BE MADE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE® AND MUST CONFORM TO ANY APPLICABLE STATE AND LOCAL CODES.

AC Conventional Connection

NOTE: The load must be within the specified contact rating range of 1A @ 30V DC/500 mA @ 125V AC.

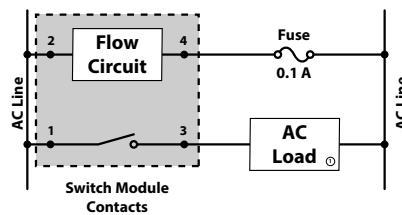


Figure 16: AC conventional connection

AC Conventional Secondary Connections

Figure 17 shows a secondary relay with a 115V AC coil integrated with the AC switch module. This combination allows switching of loads up to the rating of the relay contacts.

NOTE: Load limited by relay contacts.

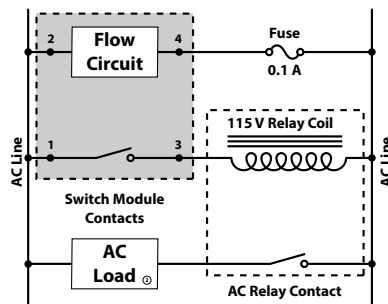


Figure 17: AC conventional secondary connections

DC Conventional Connection

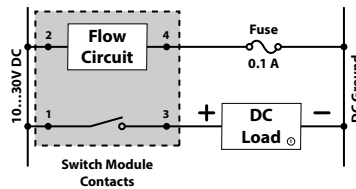


Figure 18: DC conventional connection

DC Conventional Secondary Connections

Figure 19 shows a secondary relay with a DC coil integrated with the DC switch module. This combination allows switching of loads up to the rating of the relay contacts.

NOTE: Load limited by relay contacts.

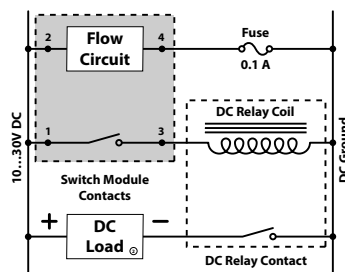


Figure 19: DC conventional secondary connections

Reed Switch

Install the switch on the flow meter by placing the adjustment arm over the serrated rail from the inlet end of the 1/2 in. (12 mm), 3/4 in. (19 mm), and 1 in. (25 mm) meters, or the outlet end of the 1-1/2 in. (38 mm) and 2 in. (50 mm) meters. Each meter accepts up to two reed switches, and the switches for 1/2 in. (12 mm), 3/4 in. (19 mm) and 1 in. (25 mm) meters must be installed before the meter is plumbed into the system.

Flow-Alert reed switches are available in three configurations: Form A (normally open), Form B (normally closed), and Form C (SPDT). See *Figure 20* for wire color codes and switch configurations.

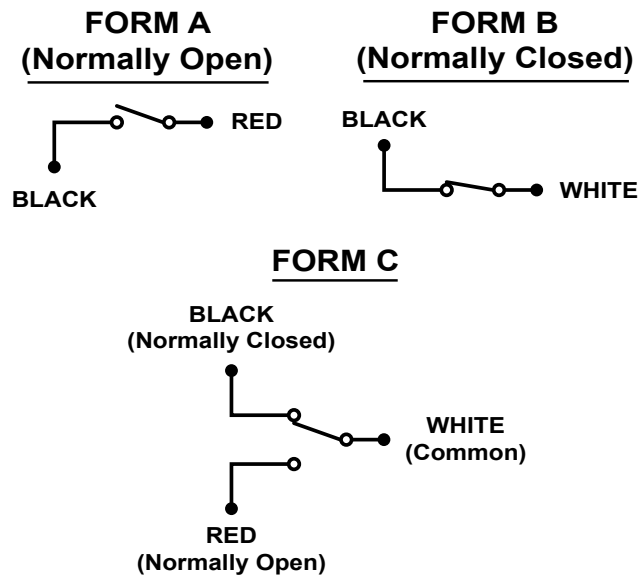


Figure 20: Form A, B and C

Flow-Alert Reed Switch Adjustment

After the flow meter has been installed and the switch wired, the flow rate at which the switch activates must be adjusted.

1. With the fluid running through the meter, gently move the switch adjustment tab outward until the switch body is free to slide up or down on the serrated rail. See *Figure 21*.
2. Move the switch into position until the switch activates.
3. Release the switch adjustment tab(s) to set the switch position.

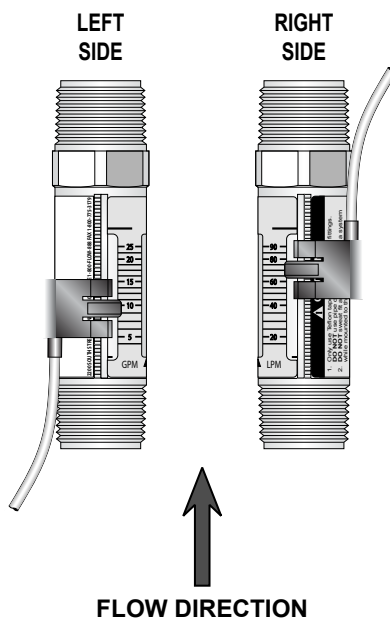


Figure 21: Switch adjustment

WARNING

IF THE FLOW METER AND SWITCH ARE INSTALLED IN A CRITICAL APPLICATION, MAKE SURE THE SYSTEM IS FAIL-SAFE. THE SWITCH SHOULD BE WIRED SO ANY SWITCH FAILURE STOPS THE SYSTEM. FAILURE TO FAIL-SAFE THE SYSTEM MAY LEAD TO SYSTEM DAMAGE AND/OR PERSONAL INJURY.

MAINTENANCE

EZ-View flow meters are designed to provide many years of service with little or no maintenance requirements. Periodic cleaning may be required.

To clean the outside of the meter, use denatured alcohol or mild detergent and warm water. If the inside of the meter becomes stained or particulates get jammed in the meter, use one of the following disassembly procedures:

1/2...1 in. (12.70...25.40 mm) Meters

1. Measure the insertion depth of the retaining ring into the flow meter body with a caliper or other measuring device.
2. Carefully remove the retaining clip with a small, flathead screwdriver.
3. Remove the spring and piston assembly.
4. Clean the inside of the flow meter body and piston assembly with denatured alcohol or mild detergent and water.
5. Reassemble the meter in reverse order of disassembly.
6. Install the retaining ring to the depth measured in step 1. Use a deep socket of approximately 0.9 in. (22.86 mm) diameter and hand pressure to install the retaining ring.

1-1/2...2 in. (38.10...50.80 mm) Meters

1. Remove the two end fittings.
2. Slide out the metering pin from the inlet.
3. Remove the spring and piston assembly.
4. Clean the inside of the flow meter body and piston assembly with denatured alcohol or mild detergent and water.
5. Reassemble the meter in reverse order of disassembly.
6. Re-install the two end fittings.

FLUID CORRECTION STANDARD FLOW SCALES

Standard liquid flow scales are calibrated in gpm (Gallons per Minute) and lpm (Liters per Minute) at 0.876 specific gravity for petroleum-based fluids, and 1.0 specific gravity for water and water-based fluids.

For field conversion of the standard scale to other fluids, see "*Density Effect*" below.

Special Flow Scales

Special scales are available for liquids in any measurement unit. Inverted scales are also available.

Viscosity Effect

The design uses a sharp-edged orifice and biasing calibration spring for operating stability and accuracy over the wide viscosity range common to many fluids. Generally, high flow models of each meter size provide good accuracy over a viscosity range of 40...500 SUS (4.2...108 cSt).

Density Effect

Any fluid density change from stated standards has a proportional effect on meter accuracy. Special scales can be supplied if actual specific gravity decreases accuracy beyond application limits. Corrections for more or less dense fluids can be made to standard scales using the following correction factor:

$$\sqrt{\frac{1.0}{\text{Specific Gravity}}}$$

Figure 22: Correction for water-based meters

$$\sqrt{\frac{0.876}{\text{Specific Gravity}}}$$

Figure 23: Correction for petroleum-based meters

Fluid Selection Chart

Fluid	Specific Gravity	Correction Factor of Standard Scales		Internal Components				Fittings		
		Oil	Water	Polysulfone	T300 Stainless	Buna X	PH157 MO Stainless	— 360 Brass	PV— Type 1	T303 Stainless
Acetic Acid (Air Free)	1.06	0.909	0.971	O	O	—	O	X	O	O
Acetone	0.79	1.053	1.125	X	O	X	O	O	X	O
Alcohol, Butyl (Butanol)	0.83	1.027	1.089	O	O	O	O	—	O	O
Alcohol, Ethyl (Ethanol)	0.83	1.027	1.089	O	O	X	O	—	O	O
Ammonia	0.89	0.992	1.060	O	O	—	O	—	O	O
Benzene	0.69	1.127	1.204	X	X	X	X	O	X	X
Carbon Disulfide	1.26	0.834	0.891	X	O	X	O	X	X	O
Castor Oil	0.97	0.950	1.015	—	—	O	—	O	—	—
Cotton Seed Oil	0.93	0.970	1.037	O	O	O	O	O	X	O
Ethylene Glycol 50/50	1.12	0.884	0.945	O	O	O	O	O	O	O
Freon II	1.46	0.774	0.828	X	O	X	O	O	X	O
Gasoline	0.70	1.119	1.195	O	O	O	O	O	—	O
Glycerin	1.26	0.834	0.891	O	O	O	O	O	O	O
Kerosene	0.82	1.033	1.104	O	O	O	O	O	O	O
Liquid Propane (LPG)	0.51	1.310	1.400	X	O	O	O	O	O	O
Mineral Oil	0.92	0.976	1.042	O	O	O	O	O	O	O
Naphtha	0.76	1.074	1.147	X	O	O	O	X	X	O
Perchloroethylene	1.62	0.735	0.786	X	O	O	O	X	X	O
Petroleum Oil	0.876	1.000	1.068	O	O	O	O	O	O	O
Phosphate Ester	1.18	0.862	0.921	X	O	X	O	O	X	O
Phosphate Ester Base	1.26	0.833	0.891	X	O	X	O	O	X	O
Phosphoric Acid (Air Free)	1.78	0.701	0.749	O	X	—	X	X	O	X
Sea Water	1.03	0.922	0.985	O	X	O	X	X	O	X
Synthetic Petroleum Base	1.00	0.936	1.000	O	O	O	O	—	O	O
Water	1.00	0.936	1.000	O	O	O	O	O	O	O
Water Glycol 50/50	1.07	0.950	0.967	O	O	O	O	O	O	O
Water-in-Oil	0.93	0.970	1.037	O	O	O	O	O	O	O

"O" - Recommended

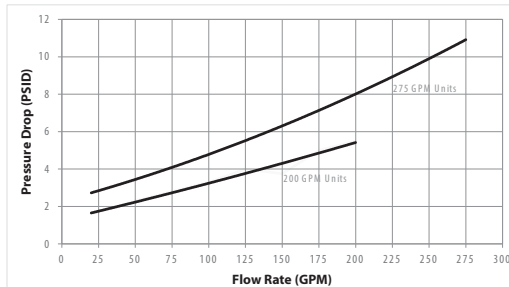
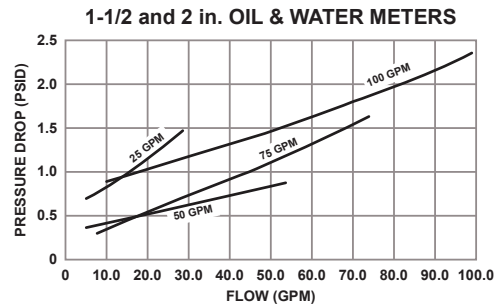
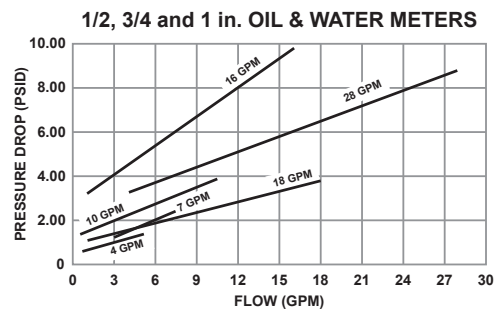
"X" - Not Recommended

"—" - Consult Factory

PRESSURE DROP CHARTS

The pressure drop curves are valid for fluids with density and viscosity similar to factory test fluids. Fluids with higher viscosity than these test fluids yield a higher pressure drop through the flow meter and piping system per a given flow volume.

A system must have adequate fluidic horsepower available to move the system fluid at a prescribed rate at a pressure adequate to overcome all pressure reducing devices, including the flow meter.



SPECIFICATIONS

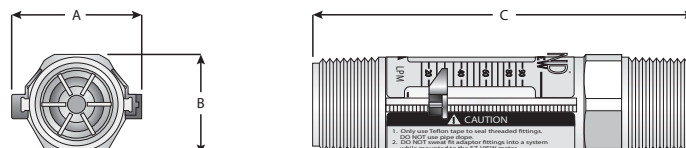
Accuracy	±5% of full scale		
Repeatability	±1%		
Pressure Rating	325 psi (22.4 bar) Maximum		
	Meters with PVC fittings subject to normal PVC system ratings		
Temperature Range	32...250° F (0...121° C)		
	32...140° F (0...60° C) for meters with PVC fittings		
Fittings/Threads	NPT ANSI/ASME B1.20.1		
	BSPT ISOR7		
	BSPP ISO228		
Materials	Wetted	Body, Piston and Cone	Polysulfone*
		Spring	300 Series Stainless Steel
		Retaining Rings	1/2...1 in. PH15-7MO Stainless Steel
		Seals	Buna-N**
		Indicator Ring	1/2...2 in. Buna-N**
			2-1/2...3 in. Silicone
		Magnet	Strontium Ferrite (switching units only)
		Fittings	Brass, PVC or T303 Stainless Steel
	Non-wetted	Limit Indicator	Polypropylene
		Scale	Polyester
Calibration Fluid	Oil	0.876 specific gravity, 32 cSt viscosity	
	Water	1.0 specific gravity, 1.0 cSt viscosity	

*For material compatibility and data sheets for polysulfone, consult factory

**Other materials available on request. Consult factory for lead-time and delivery estimates.

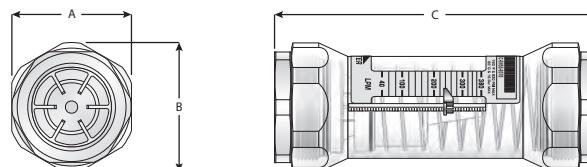
DIMENSIONS

1/2 in., 3/4 in. and 1 in. Sizes



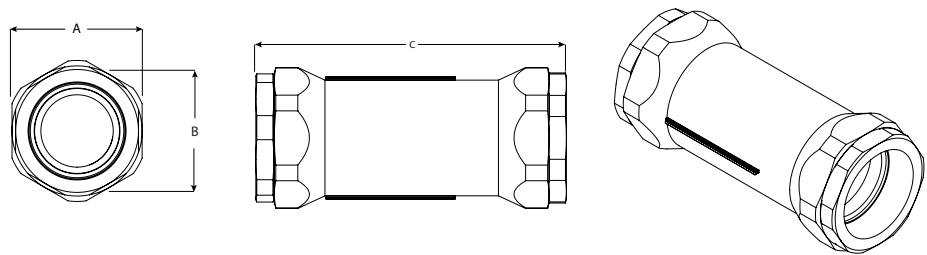
Connection Size	Model	A Width in. (mm)	B Body Flats in. (mm)	C Lay Length in. (mm)	Fitting Flats in. (mm)
1/2 in.	H624	1.78 (45.21)	1.37 (34.80)	7.75 (196.85)	1.50 (38.10)
	H626	1.78 (45.21)	1.37 (34.80)	7.75 (196.85)	1.50 (38.10)
	H627	1.78 (45.21)	1.37 (34.80)	7.75 (196.85)	1.50 (38.10)
3/4 in.	H625	1.78 (45.21)	1.37 (34.80)	8.25 (209.55)	1.50 (38.10)
	H630	1.78 (45.21)	1.37 (34.80)	8.25 (209.55)	1.50 (38.10)
3/4 in. /1 in.	H620	1.78 (45.21)	1.37 (34.80)	7.75 (196.85)	1.50 (38.10)
1 in.	H621	1.78 (45.21)	1.37 (34.80)	5.25 (133.35)	—
1 in.	H628	1.78 (45.21)	1.37 (34.80)	8.46 (214.88)	1.54 (39.12)
1 in.	H629	1.78 (45.21)	1.37 (34.80)	8.86 (225.04)	1.50 (38.10)

1-1/2 in. and 2 in. Sizes



Connection Size	Model	A Body Flats in. (mm)	B Width in. (mm)	C Lay Length in. (mm)	Fitting Flats in. (mm)
1-1/2 in.	H615	3.25 (82.55)	3.50 (88.90)	8.72 (221.49)	3.00 (76.20)
	H616	3.25 (82.55)	3.50 (88.90)	12.72 (323.09)	—
2 in.	H617	3.25 (82.55)	3.50 (88.90)	8.72 (221.49)	3.00 (76.20)
	H618	3.25 (82.55)	3.50 (88.90)	8.72 (221.49)	3.00 (76.20)
	H619	3.25 (82.55)	3.50 (88.90)	11.48 (291.59)	—

2-1/2 in. and 3 in. Sizes



Connection Size	Model	A Body Flats in. (mm)	B Fitting Flats in. (mm)	C Lay Length in. (mm)	Max Dia. in. (mm)
2-1/2 in.	H915	4.50 (114.30)	4.25 (107.95)	10.50 (266.70)	4.88 (123.95)
	H916	4.50 (114.30)	4.25 (107.95)	10.50 (266.70)	4.88 (123.95)
3 in.	H917	4.50 (114.30)	4.25 (107.95)	10.50 (266.70)	4.88 (123.95)
	H918	4.50 (114.30)	4.25 (107.95)	10.50 (266.70)	4.88 (123.95)
	H919	4.50 (114.30)	Contact Factory	Contact Factory	Contact Factory

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