



DWYER INSTRUMENTS, INC.

RIGHT CHOICE. RIGHT PRICE. RIGHT NOW.

pressure

air quality

flow

temperature

level

process control

data loggers & recorders

test equipment

valves



water/wastewater



powder & bulk solids



building automation systems



2012

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FLOW

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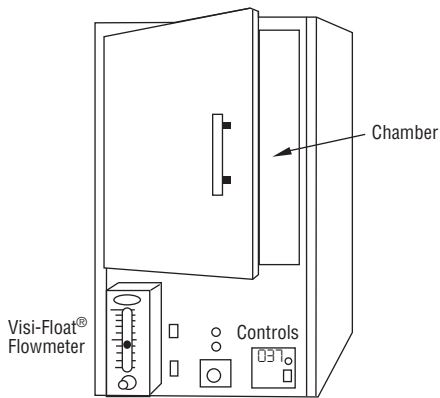
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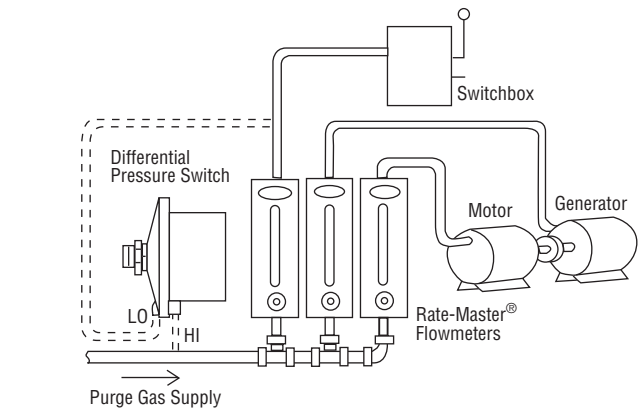


**Mass Flowmeters/
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Designers of a bio-medical incubator rely on a Dwyer® flowmeter to control CO₂ flow.

This low temperature incubator with CO₂ atmosphere is used in bio-medical applications, such as short term blood work and long term tissue culture studies. CO₂ is introduced at a high initial purge rate controlled by a timer. After the purge period, a Dwyer® Visi-Float® flowmeter with a metering valve is utilized to adjust and monitor the CO₂ flow in cubic centimeters per minute. The Visi-Float® flowmeter provides the reliability and accuracy needed to complement the host of high performance features designed into this incubator.

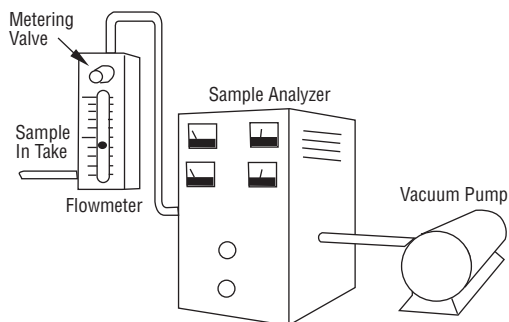


Flowmeters and/or differential pressure switches monitor vital purge gas flow to motors, switchgear, instruments.

To purge motors, generators, switchgear, and industrial instrument cases, Dwyer® flowmeters are installed in the supply line to indicate a flow of air, manufactured inert gas, or nitrogen to these devices. The flowmeters (with valves) allow maintenance personnel to set the flow quickly and recheck anytime to make sure proper flow continues. A Dwyer® differential pressure switch can also be used to monitor proper flow on a continuous basis and provide a signal or alarm if purge gas flow fails. Such an optional switch is shown above, monitoring proper flow of purge gas to the switchbox as a function of pressure drop across the flowmeter. The purging of electrical equipment in hazardous areas may require more extensive control and monitoring devices.

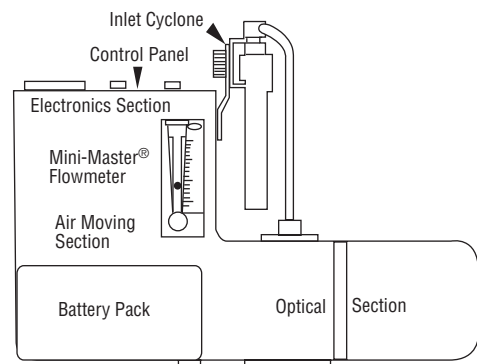
FLOW

Typical Applications



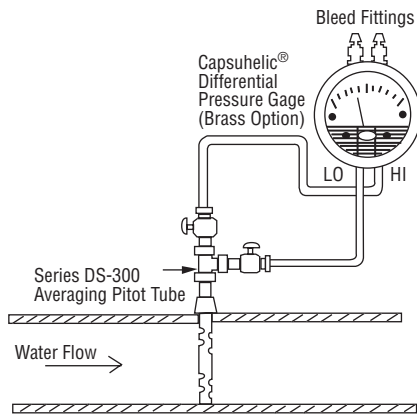
Metering valves on Dwyer® flowmeters control air/gas intake on permanent air pollution analyzers.

Regulations regarding air pollution levels require continuous monitoring a source and ambient pollutants in areas where noxious gases are generated. Ambient air quality samplers utilize either Visi-Float® or Rate-Master® flowmeters to establish the proper flow of sample or carrier gases into the analyzer. Top mounted metering valves are recommended for flowmeters used in vacuum service to maintain specified accuracy.



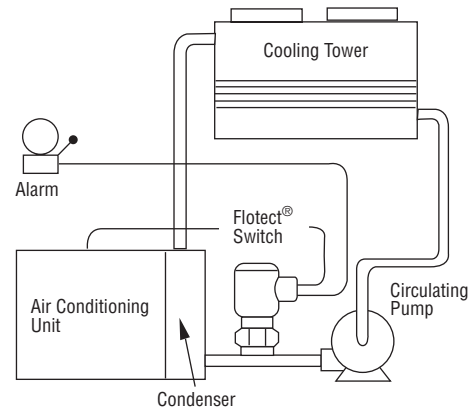
Operator uses Mini-Master® flowmeter to verify air flow into portable dust monitor.

The small size, accuracy, and low cost of the Dwyer® Mini-Master® Series flowmeter lends itself perfectly to use in this portable, battery-operated dust monitor. Using a light scattering electronic sampler, a small vacuum pump draws air through the flowmeter into the sampling chamber, and the flowmeter verifies the proper volume of sample air flow. Readout is digital and directly in dust weight per cubic meter of air.



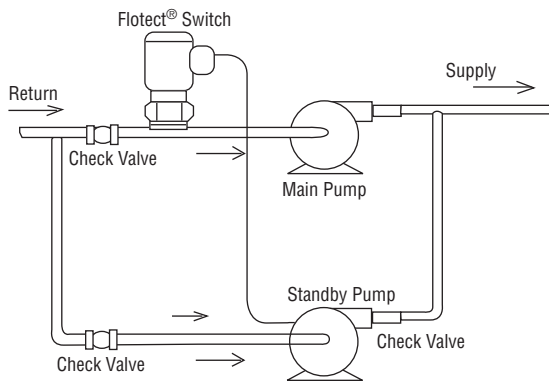
Brass body gage measures water flow rates.

A Dwyer® brass body Capsuhelic® differential pressure gage, required for water service to prevent corrosion damage to the gage, is used in conjunction with a Dwyer® Series DS-300 averaging Pitot tube. The Capsuhelic® gage provides a basic method of measuring water flow rates. As a guide in selecting the appropriate Capsuhelic® gage range, the designer can consult data provided with the DS-300 averaging Pitot tube. This relates differential pressure in inches of water column to the water flow in gallons per minute for the pipe size involved. The gage can be calibrated directly in GPM if desired. Bleed fittings installed in the top ports of the gage are recommended to facilitate removal of air from the system.



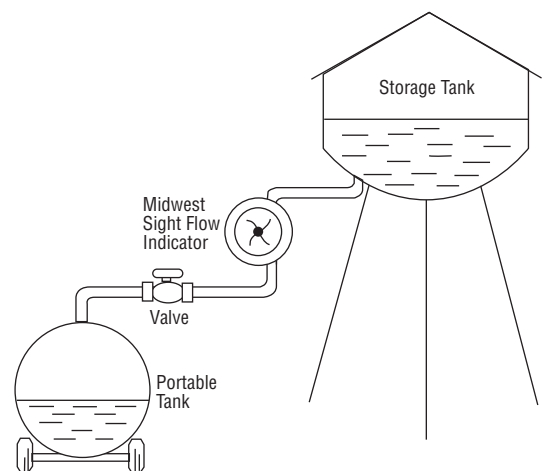
Flotect® flow switch ensures cooling water circulation before air conditioning compressor motor starts.

Large air conditioning and refrigeration systems which include water cooled condensers require that the water must circulate through the condenser and cooling tower in sufficient volume before the compressor is started. Here the W.E. Anderson® Flotect® flow switch is connected to the compressor control circuit to prevent starting or to shut down the compressor control circuit if the flow of cooling water falls below that required for proper operation. A dual Flotect® switch (available as an option) will also trigger a remote alarm to signal the operator of the shutdown as soon as it occurs.



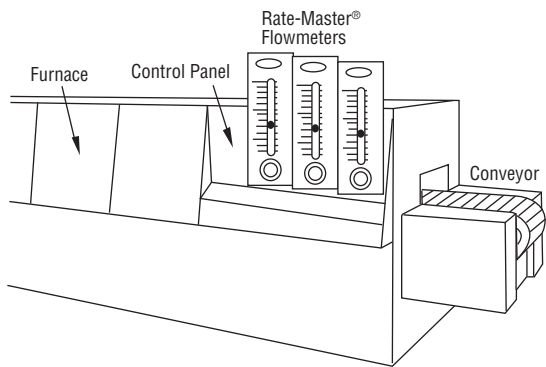
When main pump fails, Flotect® flow switch transfers to standby pump to maintain vital fluid circulation.

When proper fluid circulation in a system is critical, the W.E. Anderson® Flotect® flow switch will automatically start a standby pump should the main pump fail. The flow in the main path of the parallel system illustrated keeps the Flotect® flow switch in an open position. When the main pump fails, the flow will cease. The flow switch then closes, starting the standby pump.



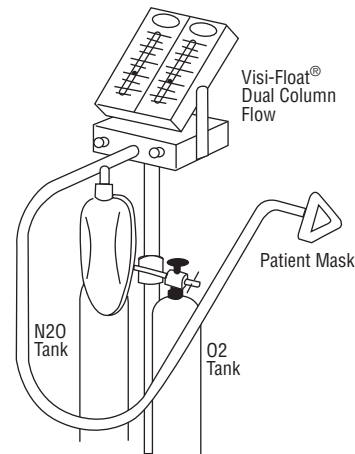
W.E. Anderson® Midwest Sight Flow Indicator reveals flow or stoppage.

In this gravity feed system delivering liquid fertilizer to portable tanks, a Midwest Model 100 sight flow indicator was installed. The operator can see the rotating vanes to check for adequate flow at any time.



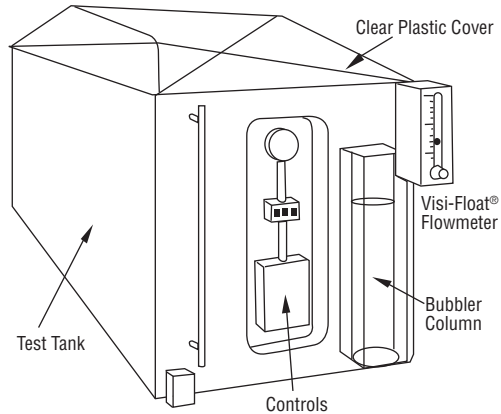
Flows of air and gases used in a special furnace are controlled by Dwyer® flowmeters.

A total of eleven Dwyer® Rate-Master® flowmeters function in the design of this sophisticated conveyor belt furnace used in manufacturing electronic devices. The flowmeters provide precise adjustment and monitoring of the flows of air and gases into the various portions of the furnace, which allow it to perform different operations, such as decarburizing and oxidizing, metallic package sealing, glass package sealing, and glass-to-metal sealing.



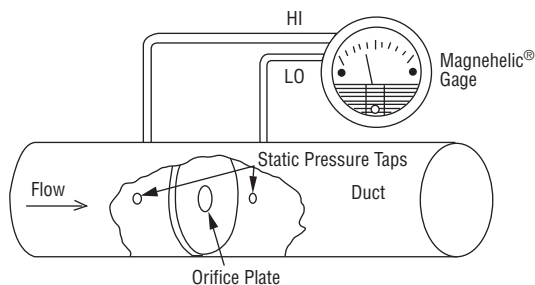
Durable dual-column flowmeter adds value for physicians and oral surgeons.

Physicians and oral surgeons who use anesthesia or analgesia in their offices on an occasional basis require a system that is reliable but small and portable. One such system employs special Dwyer® dual-column Visi-Float® flowmeters to meter and monitor precise flows of nitrous oxide and oxygen to the patient. In addition to meeting the performance level demanded by this application, the Visi-Float® flowmeters are durable and attractive complements to this important and visible medical device.



Salt corrosion test cabinet includes a Dwyer® flowmeter for adjustment of bubbler air flow.

Prior to atomizing a heated salt solution to produce a fog inside this corrosion test cabinet, compressed air is bubbled through a heated water column to properly heat and humidify the air. A Dwyer® Visi-Float® VFA flowmeter, as part of the system, provides precise adjustment of the bubbler air flow to meet test standards.

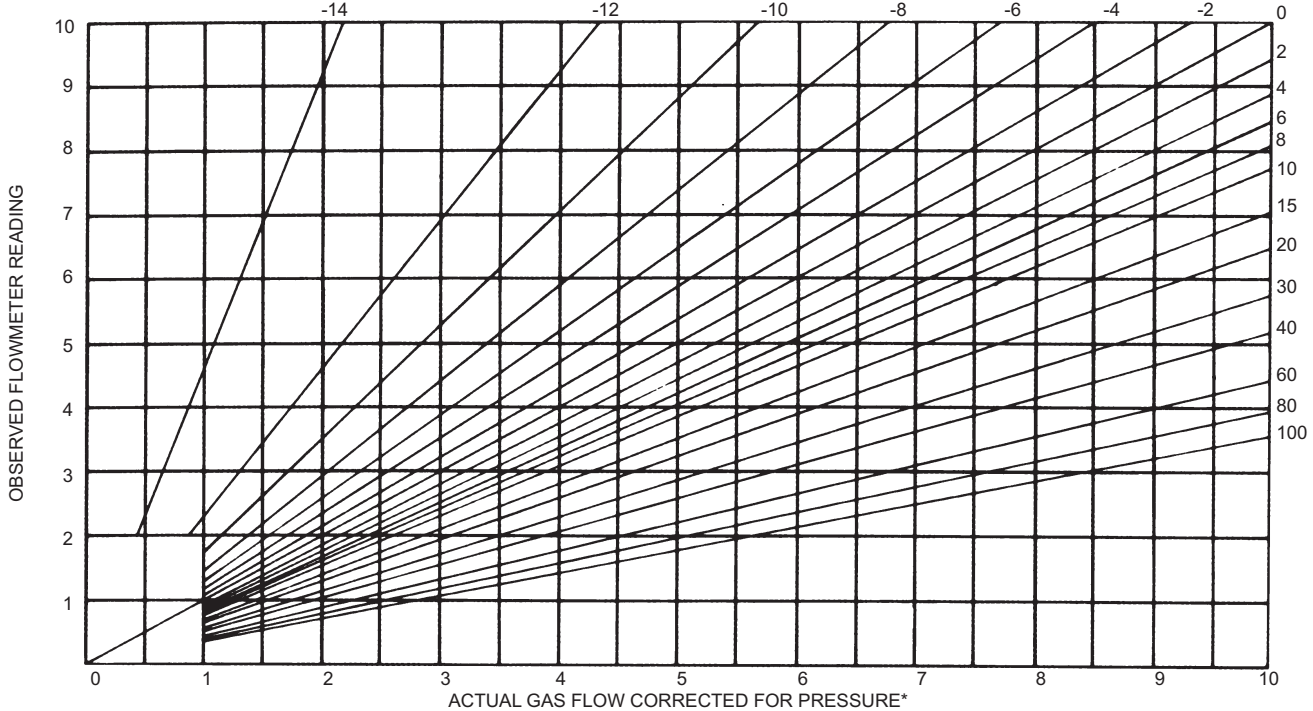


Measuring air velocity with an orifice plate.

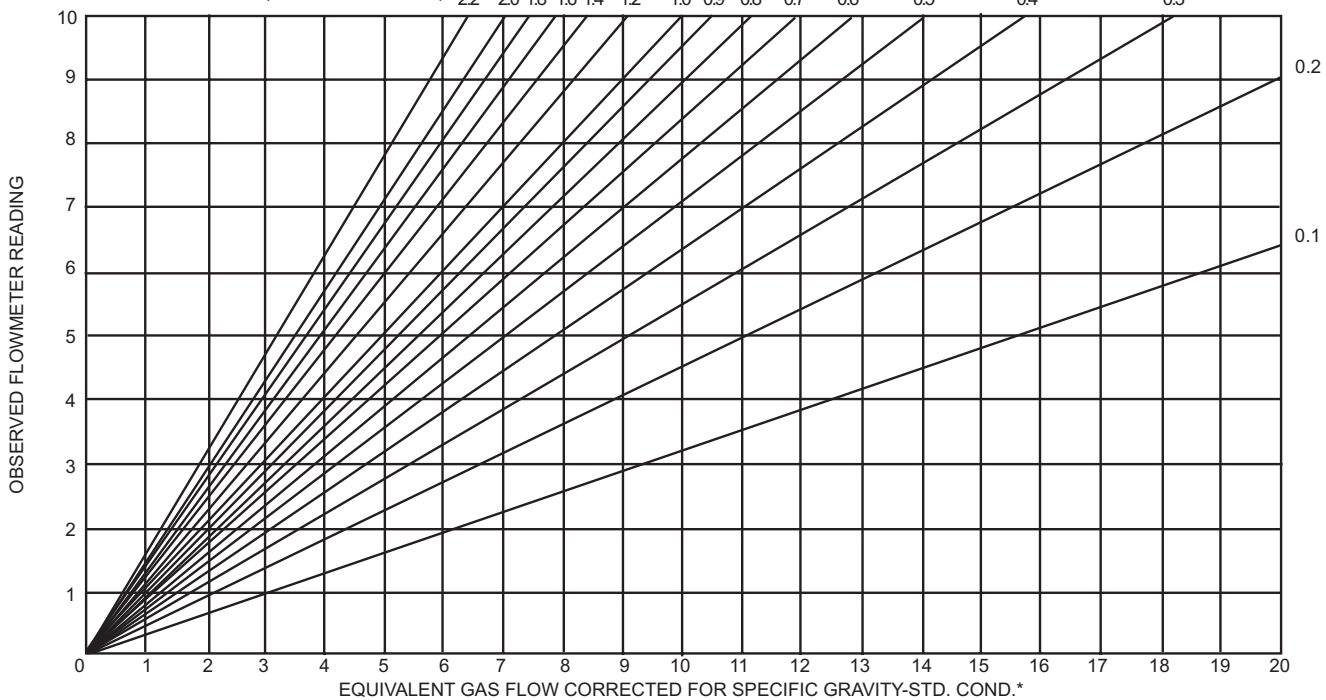
In this set-up, the Magnehelic® gage measures higher air velocities as a function of the pressure drop across a sharp-edged orifice plate in the pipe. The pressure drops can be converted to air velocity using orifice plate data supplied by the manufacturer. Details regarding available sizes, ranges, installation, and limitations are available from orifice plate manufacturers and from standard handbooks. A Dwyer® Durablock® inclined manometer or Photohelic® differential pressure switch/gage can also be used. In addition to the visual reading gage, the Photohelic® switch/gage provides an alarm signal or shutdown control function. Pressure sensing taps should be located on the side or top of the pipe or duct to prevent condensation from draining into sensing lines or gages.

CONVERSION CURVES FOR GASES

GAS PRESSURE PSIG BELOW ATMOSPHERE



SPECIFIC GRAVITY OF GAS (REFERRED TO AIR)



If more convenient, approximate correction factors may be determined using the following formulas.

A. Pressure: $Q_2 = Q_1 \times \sqrt{\frac{P_1 \times T_2}{P_2 \times T_1}}$

where: Q_1 = Actual or Observed Flowmeter Reading
 Q_2 = Standard Flow Corrected for Pressure and Temperature
 P_1 = Actual Pressure (14.7 psia + Gage Pressure)
 P_2 = Standard Pressure (14.7 psia, which is 0 psig)
 T_1 = Actual Temperature (460 R + Temp °F)
 T_2 = Standard Temperature (530 R, which is 70°F)

B. Specific Gravity: $Q_2 = Q_1 \times \sqrt{\frac{1}{S.G.}}$

where: Q_1 = Observed Flowmeter Reading
 Q_2 = Standard Flow Corrected for Specific Gravity
 1 = Specific Gravity of Air
 S.G. = Specific gravity of gas being used in flowmeter originally calibrated for air.

Note: The corrections shown in the curves and in the formulas are for variations in specific gravity and internal pressure* only. Further correction may be necessary for variations in viscosity and changes in type of flow from laminar to turbulent or vice versa. This is particularly true in the case of extremely low flows of the lighter gases. Nevertheless these charts and correction factors can be quite useful when dealing with small changes in pressure* and specific gravity.

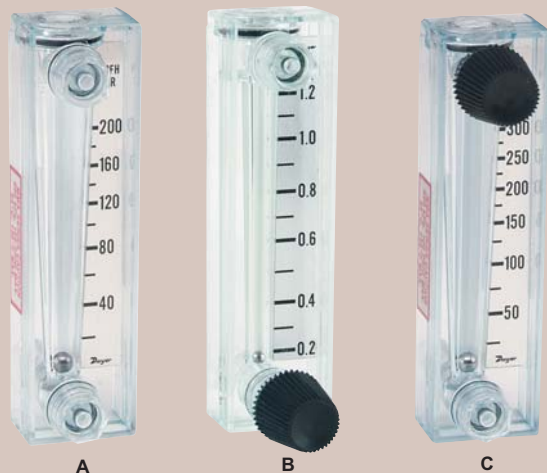
*Measured at discharge on all but TMV units. Inlet pressure on TMV models.



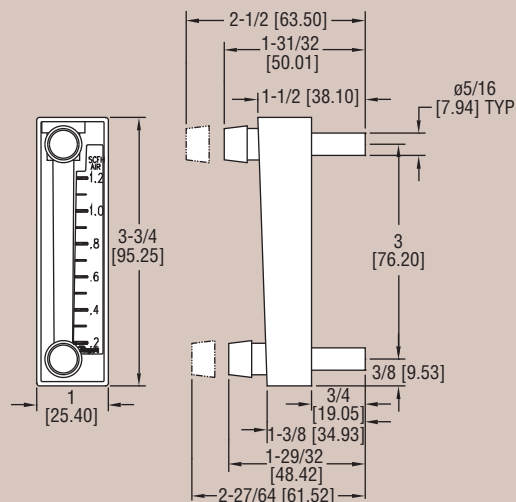
Series
MM

Mini-Master® Flowmeters

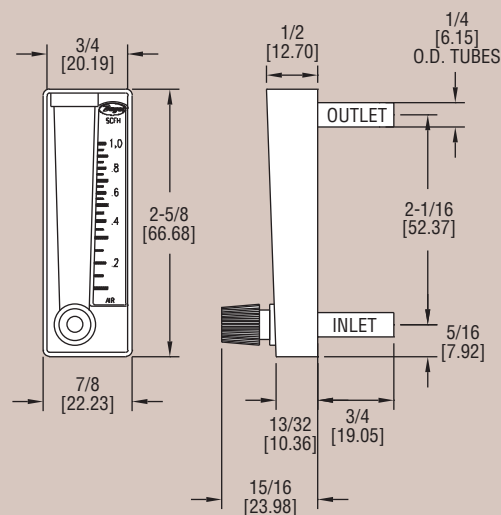
Used to Indicate or Manually Control Air or Water



A. Standard Model MMA
B. Standard Model MMA with field configurable valve, bottom mount
C. Standard Model MMA with field configurable valve, top mount



Model MMF-50-PV
1-1/2" scale, with
metering valve, knob.
Model MMF-10
with 1-1/2" scale,
no valve.
Model MMF-10-TMV with
top-mounted valve-for
vacuum service. Use
screwdriver to adjust.



FLOW

Flowmeters, Variable Area

Offering advanced features at low cost, the Series MM flowmeters are ideal for a wide range of OEM and user applications in medical equipment, air samplers, gas analyzers, pollution monitors, chemical injectors, cabinet purging, etc.

The standard Model MMA flowmeter is suitable for both gas and liquid applications. It can be configured by the user with the parts provided to have non-removable top or bottom front mounted metering valves or no valve at all. The transparent nylon material provides high chemical resistance, low moisture absorption and is transparent to facilitate routine inspection. Using the assembly key provided, the flowmeter can be disassembled anytime for cleaning or reconfiguration. In OEM quantities, ultrasonically welded caps or interchangeable mold cores enable production of the MMA flowmeter with a low profile or flat front surface where no valve is required.

The MMA is practically unbreakable, mounts easily, and is easy to read. Two 5/16" O.D. mounting – connection tubes permit quick push-on connection of rubber or plastic tubing. A bottom clip for "stand up" mounting is also provided.

Despite its compactness, the MMA flowmeter features a 2" scale which combined with precision molding, enables highly repeatable readings to be made to within ±4% accuracy.

Where a compact flowmeter is required to measure small volume air flows, the Model MMF is recommended. Easy to mount, they require a minimum of panel space. A white back on the flow tube makes the ball float easy to see. The 1-1/2" scale is highly visible and easy to read. Scale graduations are printed on aluminum alongside the flow tube (not on it), so the position of ball float is instantly visible.

The Model MMF's bezel type mounting is modern, attractive and quickly installed from the front of instrument panel. Two 1/4" O.D. mounting-connection tubes are integrally molded with flowmeter body. They can be back connected to flexible rubber or plastic tubing and held in place with two spring retainers which are furnished. If preferred, connections may be made to metal or rigid plastic tubing with a double compression fitting or nylon tube union such as Dwyer Part No. A-328.

Excellent repeatability and ±10% accuracy make the MMF flowmeter an excellent value at its low cost.

Model MMA

SPECIFICATIONS

Service: Compatible gases and liquids.

Wetted Materials: Body: Nylon 12; O-rings: Buna-N (optional materials available); Float: Black glass, K monel, stainless steel, tungsten carbide.

Temperature Limit: 130°F (54°C).

Pressure Limit: 100 psi (6.9 bar) with compression fitting. 50 psi (3.4 bar) with tubing clamp.

Accuracy: ±4% full scale.

Process Connection: 5/16" O.D. for push on rubber or plastic tubing with provided spring tubing clamp. Connect to rigid tubing with double compression fitting.

Weight: 1 oz (28.35 g).

How To Order

MMA-Range No.

Example: MMA-4

Series MMA with .5-5 SCFH Air Range

Model MMA Mini-Master® Ranges					
Range SCFH Air	Range No.	Range LPM Air	Range No.	Range GPH Water	Range No.
.5-2.5	3	.2-1.2	20	.5-8	30
.5-5	4	.25-2.5	21	1-16	31
1-10	5	.5-5	22	4-40	32
2-20	6	1-10	23	5-60	33
5-50	7	2.5-25	24	CC/Min. Water	
10-100	8	5-50	25	5-50	35
20-200	9	10-100	26	10-150	36
30-300	10	15-150	27	20-200	37
				50-500	38
				LPM Water	
				.1-1.1	40
				.25-2.5	41
				.3-3.5	42

Model MMA

A-327, 5/16" Union



MMA tubing connections secured by clamp. "Standup" mounting clip shown.



Spring retainers on connection tubes secure panel mounted MMA. Compression union, P/N A-327 shown.

Model MMF

SPECIFICATIONS

Service: Compatible gases and liquids.

Wetted Materials: Body: Styrene acrylonitrile; Float: Stainless steel, black glass, nylon; Valve: Polyurethane.

Temperature Limit: 125°F (51°C).

Pressure Limit: 50 psi (3.4 bar). Valve option: 10 psi (0.6 bar).

Accuracy: ±10% full scale.

Process Connection: 1/4" O.D. for push on rubber or plastic tubing. Connect to rigid tubing with compression fittings.

Weight: 0.5 oz (14.17 g).

How To Order

MMF-Range No.-Valve

Example: MMF-1-PV

Series MMF with .1-1 SCFH Air Range with Valve

Model MMF Mini-Master® Ranges	
Range SCFH Air	Range No.
.1-1	1
.2-2	2
1-10	10
5-50	50
10-100	100

Model MMF-X, Standard MMF

Model MMF-X-PV, MMF with bottom mount valve

Model MMF-X-TMV, MMF with top mount valve

A-328, 1/4" Union



Model MMF mounts easily from front of panel. Drill two 9/32" or 5/16" dia. holes in panel on 2-1/16" centers. Insert mounting connector spuds. From rear, slide on the two spring retainers (furnished) and push on rubber or plastic tubing.



Model MMF connections. Connector at top, installed in panel, has retainer and flexible tubing in place. Connector at bottom shows alternative connection with metal or rigid plastic tubing, using a double compression nylon tube union (as Dwyer Part No. A-328).



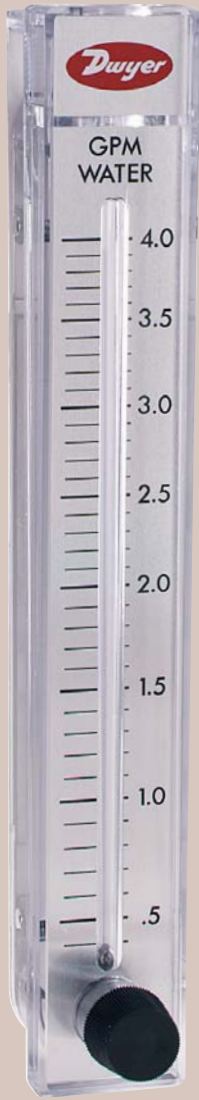
Series
RM

Rate-Master® Flowmeters

Polycarbonate, Gas Flow from 0.05-1800 SCFH, Water Flows to 10 GPM

FLOW

Flowmeters, Variable Area



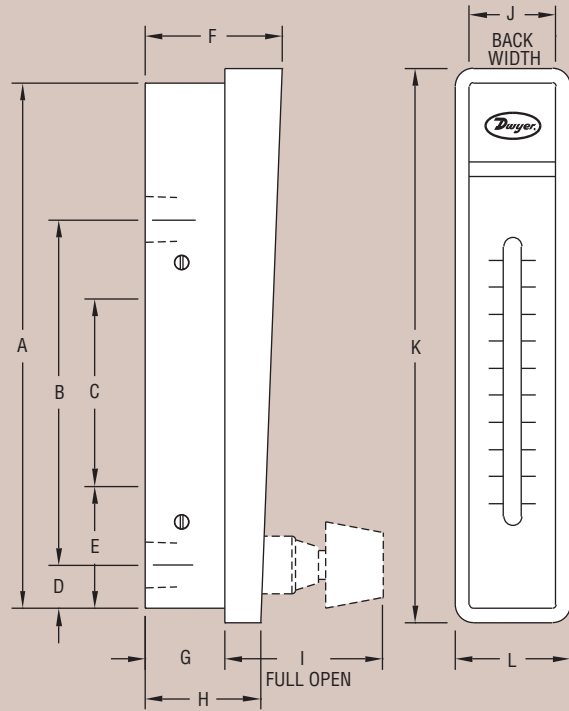
Model RMC-SSV 10"
scale, 15-3/8" high



Model RMB-SSV 5"
scale, 8-3/4" high



Model RMA-SSV 2"
scale, 4-13/16" high



Flowmeter Dimensions			
	Model RMA	Model RMB	Model RMC
A	4 -9/16 (115.90)	8-1/2 (215.90)	15 -1/8 (384.20)
B	3 (76.20)	6-7/16 (163.50)	12 -1/4 (311.20)
	1/8 NPT CONN.	1/4 NPT CONN.	1/2 NPT CONN.
C	1-5/8 (41.28)	3-15/16 (100.00)	8-3/4 (222.30)
	10-32 MTG. HOLES	1/4-20 MTG. HOLES	3/8-24 MTG. HOLES
D	3/8 (9.525)	5/8 (15.88)	1 (25.40)
E	1-1/16 (26.99)	1-7/8 (47.63)	2-3/4 (69.85)
F	1-3/16 (30.16)	1-3/4 (44.45)	2-1/2 (63.50)
G	11/16 (17.46)	1 (25.40)	1-7/16 (36.51)
H	61/64 (24.21)	1-7/16 (36.51)	1-31/32 (50.00)
I	1-3/8 (34.92)	1-13/16 (46.04)	2-1/2 (63.50)
J	3/4 (19.05)	1-1/4 (31.75)	2 (50.80)
K	4-13/16 (122.20)	8-3/4 (222.30)	15-3/8 (390.50)
L	1 (25.40)	1-1/2 (38.10)	2-1/4 (57.15)

The Rate-Master® flowmeter line of direct reading precision flowmeters incorporates many unique user features at moderate cost. These low cost flowmeters are ideal for general use.

Easy to read design – The direct reading scales eliminate troublesome conversions. The scales are brushed aluminum, coated with epoxy and the graduations are on both sides of the indicating tube. Special integral flow guides stabilize the float throughout the range to keep it from hunting or wandering in the bore. The float is highly visible against a white background.

Construction assures accuracy – All Rate-Master® flowmeter bodies are injection molded of tough, clear, shatter-proof polycarbonate plastic around a precision tapered pin. The result is accurate and repeatable readings. The single piece plastic body is mounted to a stainless steel back bone into which pipe thread inserts are welded to absorb piping torque. Precision metering valves of brass or stainless steel (specify BV or SSV on order) are available as an optional extra and permit precise flow adjustments. For vacuum applications, Model RMA units are available with top mounted valves (specify TMV). The small Series RMA models are accurate within ±4% of full scale reading; Series RMB within ±3%; large Series RMC within ±2%.

Installation is simple – The Rate-Master® Flowmeter can be neatly panel mounted to keep flow tube centers in the same plane as the panel surface or surface mounted on the panel by means of tapped holes in the backbone. When through-panel mounted, the bezel automatically positions the instrument at the correct depth in the panel cutout. Surface mounted units can also be held in place by the piping. All mounting hardware plus installation and operating instructions are included.

Easy-to-Interchange bodies – Within a given Series Rate-Master® flowmeter bodies can be instantly interchanged. Simply “unplug” the body from backbone and replace it with another. “O” rings provide a tight seal on inlet and outlet. Piping remains undisturbed. Interchangeability is useful where different scale ranges are sometimes required at the same location in the laboratory or plant.

Cleaning is easy – To release the plastic flowmeter body from the stainless steel backbone, just remove four screws. Pipe thread flow connections remain undisturbed. Remove the slide cover and the plug ball stop, clean the flow tube with soap and water and reassemble. It's that simple.

How To Order

Series-Range No.("X")-Valve-Option

Example: RMA-2-SSV

Series RMA with .1-1 SCFH Air Range & Stainless Steel Valve

Model RMA

Model RMA-X, Standard RMA

Model RMA-X-BV, RMA with Brass Valve

Model RMA-X-SSV, RMA with Stainless Steel Valve

Model RMA-X-TMV, RMA with Top Mounted Valve

Model RMB

Model RMB-X, Standard RMB

Model RMB-X-BV, RMB with Brass Valve

Model RMB-X-SSV, RMB with Stainless Steel Valve

Model RMC

Model RMC-X, Standard RMC

Model RMC-X-BV, RMC with Brass Valve

Model RMC-X-SSV, RMC with Stainless Steel Valve

Popular Ranges

Model RMA-2" Scale		Model RMB-5" Scale		Model RMC-10" Scale	
Range	Range	Range	Range	Range	Range
SCFH Air	No.	SCFH Air	No.	SCFH Air	No.
.05-.5	1	.5-5	49+	5-50	101
.1-1	2	1-10	50	10-100	102
.2-2	3	3-20	51	20-200	103
.5-5	4	4-50	52	40-400	104
1-10	5	10-100	53	60-600	105
2-20	6	20-200	54	100-1000	106
5-50	7	40-400	55	120-1200	107
10-100	8	50-500	56	200-1800	108
15-150	9	60-600	57	SCFM Air	
20-200	10	Gal. Water per hour		1-10	121
CC Air/min.				2-20	122
5-50	151*	1-12	82	4-30	123
10-100	150*	1-20	83	Gal. Water per hour	
30-240	11	4-40	84	2-20	134
50-500	12	10-100	85	8-90	135
100-1000	13	SCFH & LPM Air		Gal. Water per minute	
200-2500	14	1.2-10/0.6-5	50D	.1-1	141
LPM Air		3-20/1.5-9.5	51D	.2-2.2	142
.5-5	26	4-50/2-23	52D	.4-4	143
1-10	21	10-100/5-50	53D	.8-7	144
2-25	22	20-200/5-95	54D	1.2-10	145
5-50	23	GPH & LPM Water			
5-70	24	1-12/0.06-0.76	82D		
10-100	25	1-20/0.065-1.25	83D		
CC Water/min.		10-100/0.8-6.2	85D		
5-50	32				
10-110	33				
20-300	34				
Gal. Water/hr					
1-11	42				
2-24	43				
4-34	44				
5-50	45				

*Accuracy ±8%

+Accuracy ±5%

SPECIFICATIONS

Service: Compatible gases and liquids.

Wetted Materials: Body: Polycarbonate; O-ring: Neoprene and Buna-N; Metal parts: stainless steel (except for optional brass valve); Float: stainless steel, black glass, aluminum, K monel, tungsten carbide depending on range.

Temperature Limit: 130°F (54°C).

Pressure Limit: 100 psi (6.9 bar).

Accuracy: RMA: 4%; RMB: 3%; RMC: 2% of full scale.

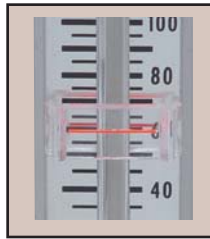
Process Connection: RMA: 1/8"; RMB: 1/4"; RMC: 1/2" female NPT.

Weight: RMA: 4 oz (113.4 g); RMB: 13 oz (368.5 g); RMC: 39 oz (1105.6 g).

CAUTION

Dwyer® Rate-Master® flowmeters are designed to provide satisfactory long term service when used with air, water, or other compatible media. Refer to factory for information on questionable gases or liquids. Caustic solutions, anti-freeze (ethylene glycol) and aromatic solvents should definitely not be used.

OPTIONS & ACCESSORIES



Adjustable pointer flags – Red lined pointer flags provide quick visual reference to a required flow level. Of clear plastic, they snap into place inside bezel and slide to desired level.



Top Mounted Metering Valves – Same precision construction for vacuum applications. RMA models only.

Specials – Special ranges, scales, mounting arrangements, etc., are available on special order, or in OEM quantities.

Model RMA-X-APF, Adjustable Pointer Flag for RMA Series

Model RMB-X-BPF, Adjustable Pointer Flag for RMB Series

Model RMC-X-CPF, Adjustable Pointer Flag for RMC Series

Model RKA, Regulator Kit for RMA Series

Model RK-RMB, Regulator Kit for RMB Series



Series
VFA
&
VFB

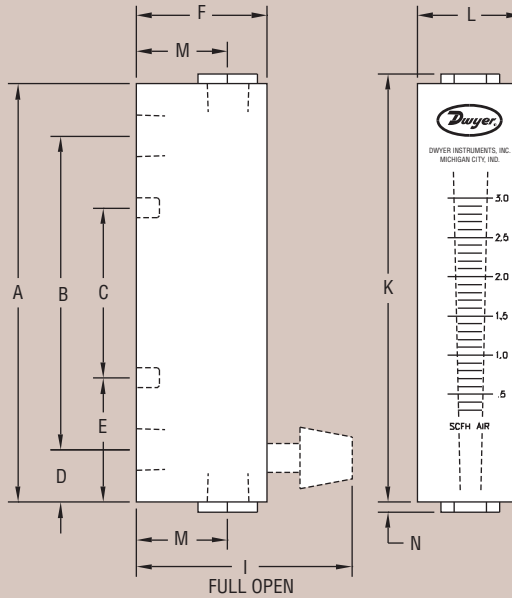
Visi-Float® Flowmeters

Used to Indicate or Manually Control Air or Water Flow



Model VFB-SSV

Model VFA-SSV



Flowmeter Dimensions		
	Model VFA	Model VFB
A	4 (101.6)	6-1/2 (165.1)
B	3 (76.20)	5-1/2 (139.7)
C	1-5/8 (41.28)	1-1/8 NPT CONN.
D	1/2 (12.70)	1/2 (12.70)
E	1-3/16 (30.16)	1-1/2 (38.10)
F	1-1/4 (31.75)	1-1/4 (31.75)
I	2-1/16 (52.39)	2-1/16 (52.39)
K	OPEN	OPEN
L	4-3/32 (104.0)	6-11/16 (169.9)
M	1 (25.40)	1-3/8 (34.93)
N	7/8 (22.23)	7/8 (22.23)
	1/8 NPT	1/8 NPT
	3/32 (2.381)	3/32 (2.381)

The Visi-Float® flowmeter bodies are cut and precision machined from solid, clear acrylic plastic blocks. This construction not only produces a handsome finished product, but permits complete visual inspection. As a result, the Visi-Float® flowmeters are especially popular for medical and laboratory equipment applications.

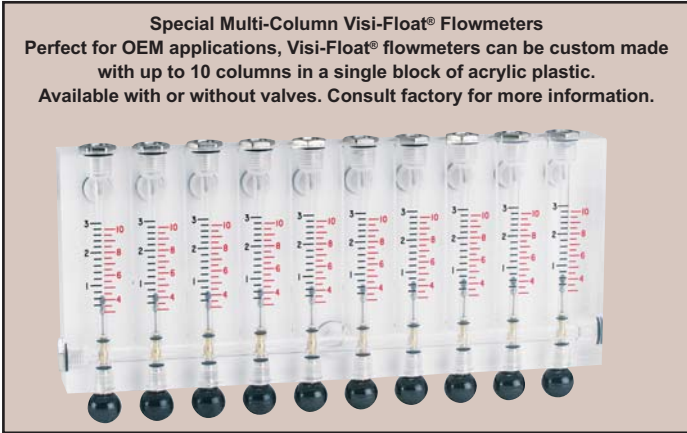
Scales are easy to read – The front scale location and white background provides excellent visibility. The direct reading scales are hot stamped into the plastic and will not wear off. Mid-range calibration is established with a master flowmeter. Accuracy is $\pm 5\%$ of full scale for VFA models, $\pm 3\%$ for VFB. Scales average 2" long on the VFA models, 4" long on VFB.

Durable and attractive construction – The machined acrylic bodies of the Visi-Float® flowmeters are practically unbreakable. Fabrication is backed by over 60 years of experience in acrylic instrument machining. The tapered bore is precision machined to a smooth surface that provides perfect visibility of the indicating float. The VFA and VFB models are available with either brass or stainless steel inlet and outlet connections and are tapped for 1/8" NPT thread. VFB models 85 and 86 have either 1/4" back or 3/8" end connections. All standard models employ Buna-N "O" rings for leak proof operation and are available with either back or end connections for horizontal or vertical piping. Precision metering valves in brass or stainless steel are available for most VFA and VFB models.

Easy installation – All Visi-Float® flowmeters have metal mounting inserts on rear for panel mounting. They can also be supported directly by system piping.

FLOW

Flowmeters, Variable Area



OEM Specials – Special flowmeter designs can be supplied to meet a wide range of requirements and specific applications. These include: on-off plunger and push-to-test valves, special gas or fluid calibration, special ranges, scales, name brand or other identification. Pointer flags can be furnished for instant visual reference. For specific information, please supply an outline of your requirements.

How To Order
 Series—Range No. ("X")—Valve—Option
Example: VFA-9-BV
 Series VFA with 20-200 SCFH Air Range & Brass Valve

VFA Series

Model	Description
VFA-X	Standard VFA
VFA-X-SS	VFA with Stainless Metal Wetted Parts
VFA-X-BV	VFA with Brass Valve
VFA-X-SSV	VFA with Stainless Steel Valve
VFA-X-EC	VFA with End Connections
VFA-X-EC-SS	VFA with End Connections and Stainless Steel Metal Wetted Parts
OPTIONS & ACCESSORIES	
-PF, Red ABS Plastic Pointer Flag	
-VIT, Fluoroelastomer O-rings	
RKA, Pressure Regulator	

Popular Ranges

Model VFA — 2" Scale			
Range No.	Range SCFH Air	Range No.	Range LPM Air
1	.1-1	21	.06-0.5
2	.2-2	22	.15-1
3	.6-5	23	.6-5
4	1-10	24	1-10
5	2-20	25	3-25
6	4-30	26	6-50
7	5-50	27	10-100
8	10-100		
9	20-200		
	CC Water per min.		Gal. Water per hour
32	6-50	41	.6-5
33	10-100	42	2-10
34	20-200	43	3-20
		44	8-40

SPECIFICATIONS

Service: Compatible gases & liquids.

Wetted Materials:

- Body: Acrylic plastic;
- O-ring: Buna-N (fluoroelastomer available);
- Metal parts: Brass standard, stainless steel optional;
- Float: Stainless steel, black glass, aluminum, K monel depending on range.

Temperature & Pressure Limits:

Without Valve: 100 psig (6.9 bar) @ 150°F (65°C); 150 psig (10 bar) @ 100°F (38°C);

With Valve: 100 psig (6.9 bar) @ 120°F (48°C).

Accuracy: VFA = 5% of full scale; VFB = 3% of full scale.

Process Connection: 1/8" female NPT. VFB ranges 85 and 86 have 1/4" NPT back connections or 3/8" NPT end connections. These ranges not available with brass valves.

Scale Length: VFA 2" typical length; VFB 4" typical length.

Mounting Orientation: Mount in vertical position.

Weight: VFA: 4.0 to 4.8 oz (.11 to .14 kg); VFB: 7.2 to 8.8 oz (.20 to .25 kg).

VFB Series

Model	Description
VFB-X	Standard VFB
VFB-X-SS	VFB with Stainless Metal Wetted Parts
VFB-X-BV	VFB with Brass Valve
VFB-X-SSV	VFB with Stainless Steel Valve
VFB-X-EC	VFB with End Connections
VFB-X-EC-SS	VFB with End Connections and Stainless Steel Metal Wetted Parts
OPTIONS & ACCESSORIES	
-PF, Red ABS Plastic Pointer Flag	
-VIT, Fluoroelastomer O-rings	
RK-VFB, Pressure Regulator	

Popular Ranges

Model VFB — 4" Scale			
Range No.	Range SCFH Air	Range No.	LPM Air
50	.3-3	65	.2-4
91+	1-10	66	1-10
51+	2-20	67	1-20
52	4-40	68	3-30
53+	10-100	69	4-40
54+	10-150		CC/Min. Water
55+	20-200	82	2-30
	SCFM Air		GPH Water
90	.3-3	80+	.5-12
	CC/Min. Air	83+	1-20
60	100-1000	84	6-40
		81	6-60
			GPM Water
		85*	.2-2
		86*	.6-5

* For dual range models in English and Metric add "D" to end of Range No.

* Ranges 85 and 86 consult factory. Not available with brass valve.

FLOW
Flowmeters, Variable Area



Series
VFC
&
VFCII

Visi-Float® Flowmeters

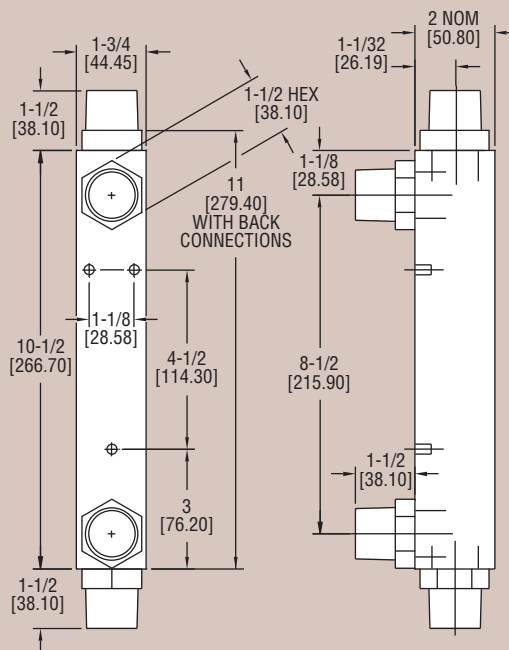
Used to Indicate Air or Water Flow



VFCII with 1" MNPT
End Connections

VFC with 1" FNPT
End Connections

VFC with 1" FNPT
Back Connections



SPECIFICATIONS

Service: Compatible gases & liquids.

Wetted Materials:

- Body: Acrylic plastic;
- O-ring: Buna-N (fluoroelastomer available);
- Metal parts: Stainless steel;
- Float: SS.

Fittings: VFC: PVC; VFCII: Acetal thermoplastic.

Temperature & Pressure Limits: 100 psig (6.9 bar) @ 120°F (48°C).

Accuracy: 2% of full scale.

Process Connection: VFC: 1" female NPT back connections. End connections optional; VFCII: 1" male NPT back connections. End connections optional.

Scale Length: 5" typical length.

Mounting Orientation: Mount in vertical position.

Weight: 24 to 25 oz (.68 to .71 kg).

Popular Ranges

Model VFC — 5" Scale			
Range No.	Range SCFM Air	Range No.	Range GPM Water
121	4-25	141	.5-5
122	5-50	142	1-10
123	10-100	143	2-20
	LPM Air		LPM Water
131	60-700	151	2-20
132	200-1400	152	4-40
133	300-2800	153	10-75

The accurate and durable VFC Visi-Float® flowmeter contains a stainless steel guide rod and large diameter float for excellent stability and visibility in high flow rates. The large 5" scale provides a ±2% full scale accuracy for precision measurement required in medical or laboratory applications. The VFC models have PVC 1" female NPT connections. VFC II units are equipped with acetal thermoplastic 1" male NPT fittings. VFC II fittings also include hex wrench flats to prevent stripped threads. All models have metal mounting inserts on the back for panel mounting. Units may also be supported directly by system piping.

How To Order

Series—Range No.—Option

Example: VFC-123-EC

Series VFC with 10-100 SCFM Air Range and 1" female NPT End Connections

VFC Series

Model	Description
VFC-X	VFC with 1" FNPT Back Connections
VFCII-X	VFCII with 1" MNPT Back Connections
VFC-X-EC	VFC with 1" FNPT In-Line End Connections
VFCII-X-EC	VFCII with 1" MNPT In-Line End Connections

OPTIONS

-VIT, Fluoroelastomer O-Rings

-FDA, 316 SS Float & Guide Rod (only available on VFCII with fluoroelastomer O-Rings)

FLOW

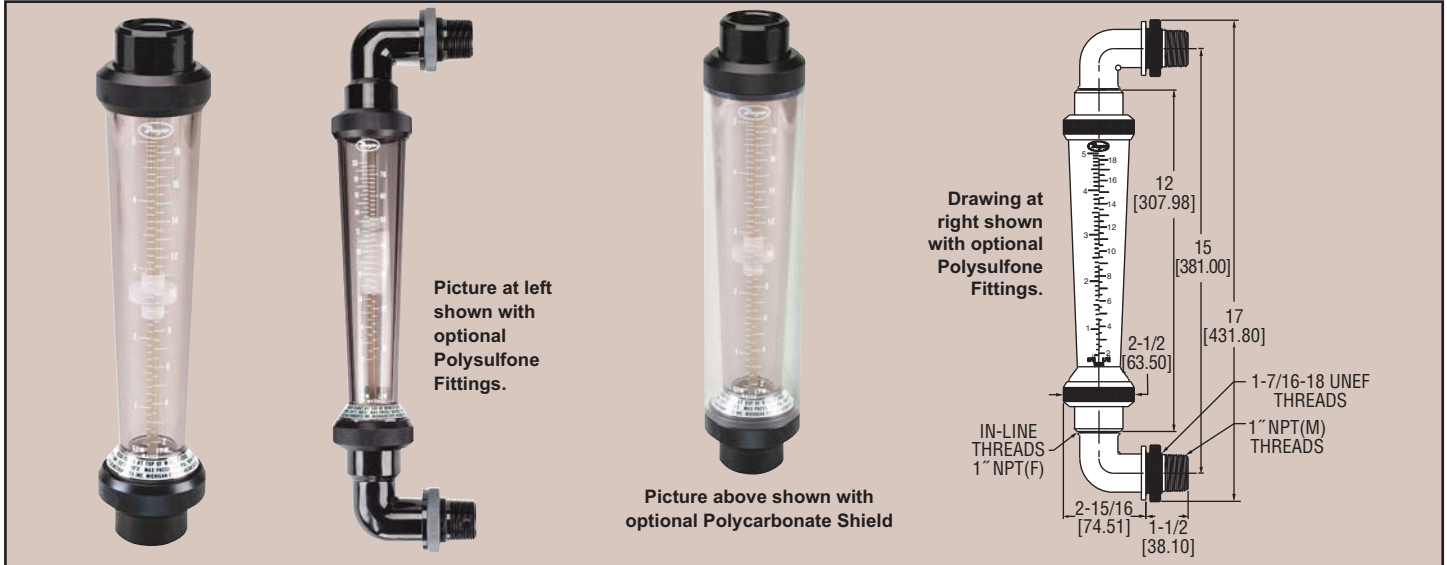
Flowmeters, Variable Area



Series
UV

Ultra-View™ Polysulfone Flowmeter

Monitor Water Flow Rates from .25 to 40 GPM, Air Rates from 1 to 100 SCFM



Setting a new standard in the industry, the **Series UV Polysulfone Flowmeter** is an ultra pure, laboratory grade flowmeter ($\pm 2\%$ F.S. accuracy) that measures flow in GPM and LPM of water, air and other compatible media. The Series UV is designed to withstand high temperatures up to 212° F (100° C) and high pressures up to 150 psi (10.34 bar). Highly corrosion-resistant, this instrument is an excellent choice for monitoring many corrosive media. Easy to install and to clean, the Series UV offers optional panel mount polysulfone fittings and a protective polycarbonate shield.

APPLICATIONS

- Monitor chill water flow
- Reverse osmosis systems
- Deionized water systems
- Potable water systems

ACCESSORIES

A-801, Panel Mount Kit, Polysulfone Fittings

A-162, In-line Fitting Replacement Kit. Two 1" female NPT connection fittings included in kit.

OPTIONS

UV-XXXX-SHD, Protective Polycarbonate Shield

UV-XX22, PVC 1" female NPT Fittings

UV-XXXX-CDS, Certified Data Sheet with Traceability to NIST

SPECIFICATIONS

Service: Compatible liquids and gases.

Wetted Materials: Polysulfone body, fluoroelastomer O-rings and virgin PTFE float.

Temperature Limits: 35 to 212°F (2 to 100°C); 35 to 130°F (2 to 54°C) for PVC fitting option.

Pressure Limit: 150 psi (10.34 bar).

Accuracy: $\pm 2\%$ full scale @ 70°F $\pm 2^\circ\text{F}$ (21.1°C) and 14.7 psia (in line connection rating only).

Repeatability: $\pm 1\%$ full scale @ 70°F $\pm 2^\circ\text{F}$ (21.1°C) and 14.7 psia (in line connection rating only).

Process Connections: 1" female NPT. Optional 90° polysulfone elbow – 1" male NPT.

Scale Length: 6" (152.40 mm) – 7" (177.80 mm), depending on model.

Fitting Torque: Maximum 22 ft - lb.

Weight: 1 lb (457 g) for 20 GPM range.

CAUTION: Ball valves can have a "water cannon" effect on opening, creating pressure that exceeds the warranted ratings and will damage the flowmeter. Series UV Flowmeters are for indoor use only or areas without direct sunlight. Polysulfone is adversely affected by ultraviolet light.

Model	Range (GPM water)	Body	Fitting Material	Float
UV-0112	0.25-2.5 (1-9.5 LPM)	Polysulfone	Polysulfone	Virgin PTFE
UV-1112	0.5-5.0 (2-19 LPM)	Polysulfone	Polysulfone	Virgin PTFE
UV-2112	1.0-10.0 (4-38 LPM)	Polysulfone	Polysulfone	Virgin PTFE
UV-3112	2.0-20.0 (8-76 LPM)	Polysulfone	Polysulfone	Virgin PTFE
UV-4112	3.0-30.0 (12-112 LPM)	Polysulfone	Polysulfone	Virgin PTFE
UV-5112	4.0-40.0 (20-150 LPM)	Polysulfone	Polysulfone	Virgin PTFE

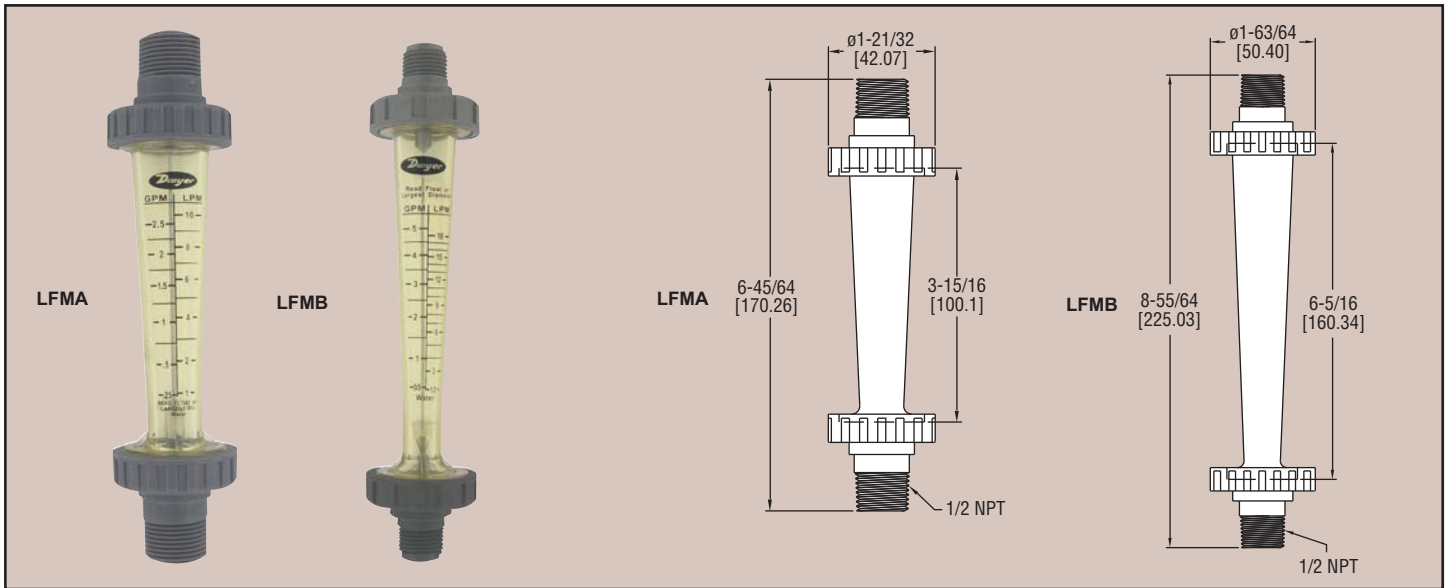
Model	Range (SCFM air)	Body	Fitting Material	Float
UV-A112	1-13 (30-370 LPM)	Polysulfone	Polysulfone	Virgin PTFE
UV-B112	2.5-28 (70-780 LPM)	Polysulfone	Polysulfone	Virgin PTFE
UV-C112	5-50 (70-1400 LPM)	Polysulfone	Polysulfone	Virgin PTFE
UV-D112	14-100 (400-2800 LPM)	Polysulfone	Polysulfone	Virgin PTFE



Series
LFM

Polycarbonate Flowmeter

In-Line or Panel Mount Meters



The **New LFM Series Flowmeters** are made of injection molded, heat and chemically resistant polycarbonate bodies and fittings. Series LFM flow meters have dual scales measuring in both GPM and LPM with 5% accuracy. A textured background on the body enhances scale readability. Standard in-line models come with 1/2" male NPT process connections while panel mount installation is available with 90° elbow fittings that include panel lock nuts. Various other fittings are available.

SPECIFICATIONS

Service: Water.

Wetted Materials:

Body: Polycarbonate;

Flange nut: ABS;

Float stop: ABS;

O-rings: Fluoroelastomer;

Rod & float: 316 SS;

Connections: Metric union and male NPT fittings-ABS; 90° male NPT elbow fittings-PVC.

Pressure Limit: 120 psi (8.2 bar) at 68°F (20°C); 90° elbow fittings 116 psi (8 bar) at 68°F (20°C).

Accuracy: ±5%.

Process Connection: LFMA: 1/2" male NPT. Optional 20 mm metric union; LFMB: 1/2" male NPT. Optional 20mm metric union or 1/2" male NPT with 90° elbow.

Weight: LFMA: 2 oz (56.7 g); LFMB: 3 oz (85.0 g).

ACCESSORIES

LFMA

A-560, 20 mm Metric Union Fittings-ABS

A-566, 1/2" male NPT Fittings-ABS

LFMB

A-561, 20 mm Metric Union Fittings-ABS

A-567, 1/2" male NPT Fittings-ABS

A-575, 1/2" male NPT with 90° Elbow Fittings-PVC

CAUTION: Series LFM Flowmeters are for indoor use only or areas without direct sunlight. Polycarbonate is adversely affected by ultraviolet light.

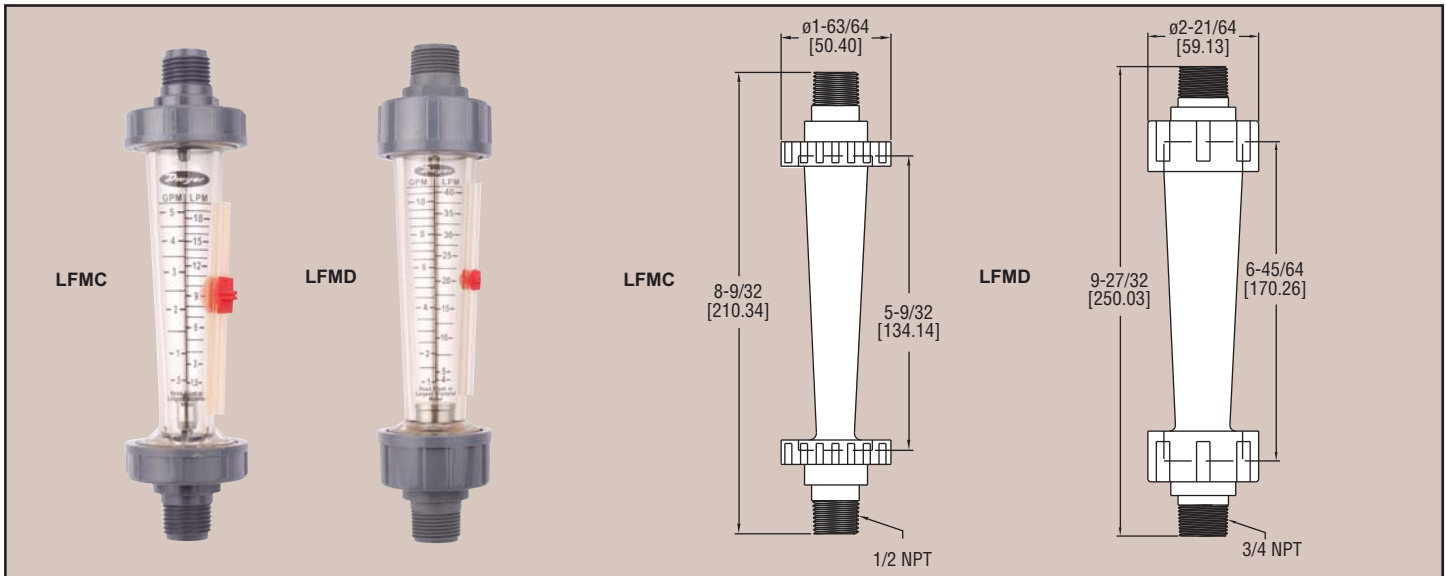
Model	Range (GPM water)	Process Connection	Float
LFMA-01-A2	0.1-1 (.5-4 LPM)	1/2" male NPT	316 SS
LFMA-02-A2	0.2-2 (1-7 LPM)	1/2" male NPT	316 SS
LFMA-03-A2	0.5-5 (1.8-18 LPM)	1/2" male NPT	316 SS
LFMB-04-A2	0.1-1 (.5-4 LPM)	1/2" male NPT	316 SS
LFMB-05-A2	0.2-2 (1-7 LPM)	1/2" male NPT	316 SS
LFMB-06-A2	0.5-5 (1.8-18 LPM)	1/2" male NPT	316 SS



Series
LFM

Polycarbonate Flowmeter

In-Line or Panel Mount Meters. New Adjustable Set Point Indicator



The **New LFM Series Flowmeters** are made of injection molded, heat and chemically resistant polycarbonate bodies and fittings. Series LFM flow meters have dual scales measuring in both GPM and LPM with 5% accuracy. A textured background on the body enhances scale readability. Standard in-line models come with 1/2" male NPT connections for LPMC and 3/4" male NPT connections for LFMD. Panel mount installation is available with 90° elbow fittings that includes panel lock nuts. Various other fittings are available.

SPECIFICATIONS

Service: Water.

Wetted Materials:

Body: Polycarbonate;

Flange nut: ABS;

Float stop: LPMC-ABS; LFMD-polypropylene;

O-rings: Fluoroelastomer;

Rod & float: 316 SS;

Connections:

90° male NPT elbow fittings-PVC.

20 mm metric union fittings-ABS.

32 mm metric union fittings-PVC.

1/2" & 3/4" male NPT fittings for LPMC-ABS.

3/4" male and female NPT fittings for LFMD-PA66 nylon.

Pressure Limit: 120 psi (8.2 bar) at 68°F (20°C); 90° elbow fitting 116 psi (8 bar) at 68°F (20°C).

Accuracy: ±5%.

Process Connection: LPMC: 1/2" male NPT. Optional 20 mm metric union, 3/4" male NPT, or 1/2" male NPT with 90° elbow; LFMD: 3/4" male NPT. Optional 32 mm metric union, 3/4" female NPT, or 3/4" male NPT with 90° elbow.

Weight: LPMC: 4 oz (113.4 g); LFMD: 10 oz (283.5 g).

ACCESSORIES

LPMC

A-562, 20 mm Metric Union Fittings-ABS

A-567, 1/2" male NPT Fittings-ABS

A-568, 3/4" male NPT Fittings-ABS

A-576, 1/2" male NPT with 90° Elbow Fittings-PVC

LFMD

A-563, 32 mm Metric Union Fittings-PVC

A-569, 3/4" male NPT Fittings-Nylon

A-572, 3/4" female NPT Fittings-Nylon

A-577, 3/4" male NPT with 90° Elbow Fittings-PVC

Model	Range (GPM water)	Process Connection	Float
LFMC-07-A2	0.25-2.5 (1-10 LPM)	1/2" male NPT	316 SS
LFMC-08-A2	0.5-5 (1.8-18 LPM)	1/2" male NPT	316 SS
LFMC-09-A2	0.8-8 (3-30 LPM)	1/2" male NPT	316 SS
LFMD-10-C2	0.8-8 (3-30 LPM)	3/4" male NPT	316 SS
LFMD-11-C2	1-10 (4-40 LPM)	3/4" male NPT	316 SS

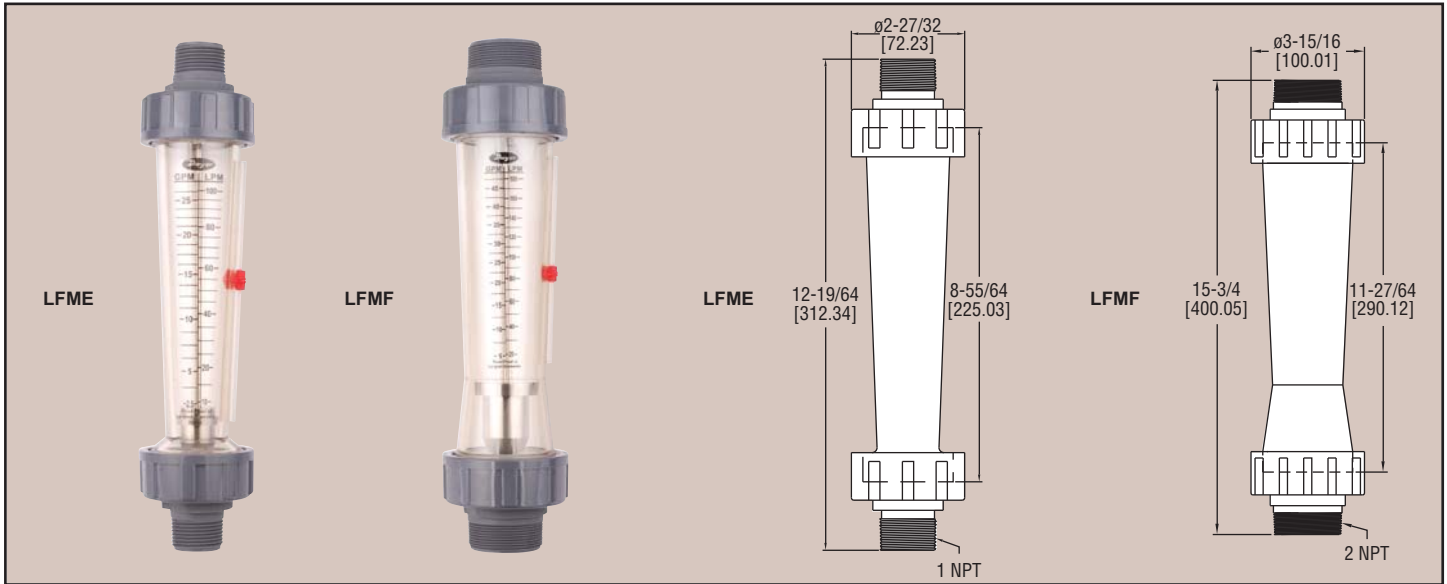
CAUTION: Series LFM Flowmeters are for indoor use only or areas without direct sunlight. Polycarbonate is adversely affected by ultraviolet light.



Series
LFM

Polycarbonate Flowmeter

In-Line or Panel Mount Meters. New Adjustable Set Point Indicator



The **New LFM Series Flowmeters** are made of injection molded, heat and chemically resistant polycarbonate bodies and fittings. Series LFM flow meters have dual scales measuring in both GPM and LPM with 5% accuracy. A textured background on the body enhances scale readability. Standard in-line models come with 1/2" male NPT connections for LFME and 2" male NPT connections for LFMF. Panel mount installation is available with 90° elbow fittings that includes panel lock nuts. Various other fittings are available.

SPECIFICATIONS

Service: Water.

Wetted Materials:

- Body: Polycarbonate;
- Flange nut: ABS;
- Float stop: Polypropylene;
- O-rings: Fluoroelastomer;
- Rod & float: 316 SS;
- Connections:

- Male & female NPT fittings-PA66 nylon;
- 1" male NPT 90° elbow fittings-PVC;
- 40 mm metric union fittings-PVC;
- 63 mm metric union fittings-ABS.

Pressure Limit: 120 psi (8.2 bar) at 68°F (20°C); 90° elbow fittings 116 psi (8 bar) at 68°F (20°C).

Accuracy: ±5%.

Process Connection: LFME: 1" male NPT. Optional 40 mm metric union, 1" female NPT, or 1" male NPT with 90° elbow; LFMF: 2" male NPT. Optional 63 mm metric union or 2" female NPT.

Weight: LFME: 15 oz (425.2 g); LFMF: 40 oz (1.1 kg).

ACCESSORIES

LFME

- A-564, 40 mm Metric Union Fittings-PVC
- A-570, 1" male NPT Fittings-Nylon
- A-573, 1" female NPT Fittings-Nylon
- A-578, 1" male NPT with 90° Elbow Fittings-PVC

LFMF

- A-565, 63 mm Metric Union Fittings-ABS
- A-571, 2" male NPT Fittings-Nylon
- A-574, 2" female NPT Fittings-Nylon

CAUTION: Series LFM Flowmeters are for indoor use only or areas without direct sunlight. Polycarbonate is adversely affected by ultraviolet light.

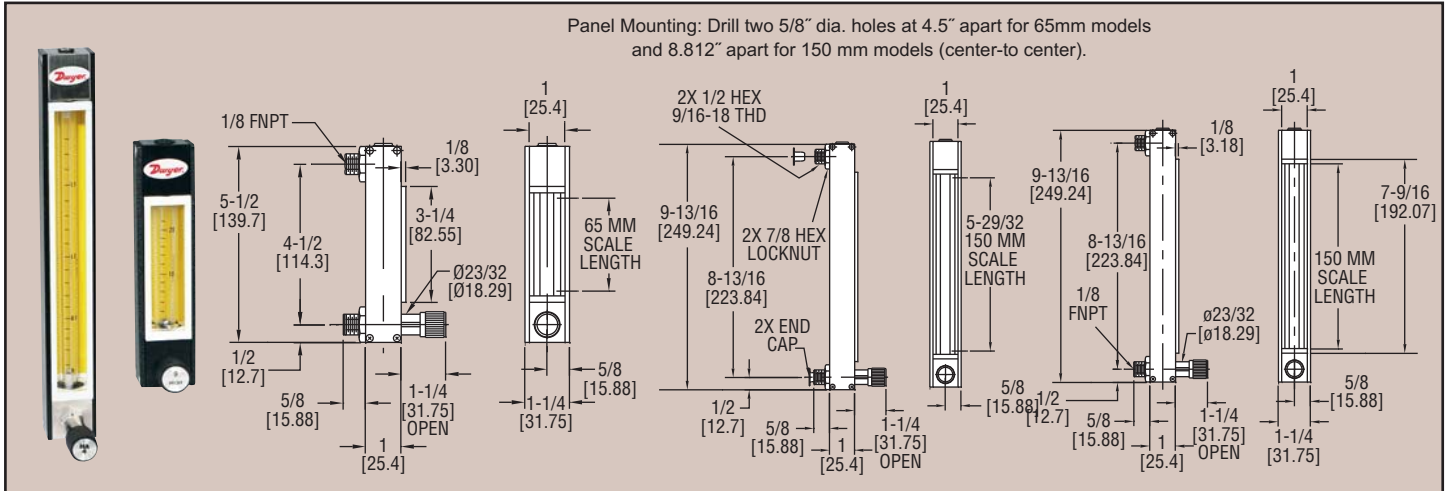
Model	Range (GPM water)	Process Connection	Float
LFME-12-F2	1.2-12 (5-50 LPM)	1" male NPT	316 SS
LFME-13-F2	2-20 (8-80 LPM)	1" male NPT	316 SS
LFME-14-F2	2.5-25 (10-100 LPM)	1" male NPT	316 SS
LFMF-15-I2	2.5-25 (10-100 LPM)	2" male NPT	316 SS
LFMF-16-I2	5-45 (20-180 LPM)	2" male NPT	316 SS
LFMF-17-I2	7-70 (25-250 LPM)	2" male NPT	316 SS



Series
DR

Direct Reading Glass Flowmeters

65 mm and 150 mm, ±5% FS Accuracy, Interchangeable Flowtubes



Use Series DR Glass Flowmeters to accurately measure flow rates of air or water with the convenience of a direct reading scale. Permanently fused ceramic scale has integral float guides for optimum float performance. Reflective plastic background and 1.5 X magnification lens reduces eye fatigue and allows for more accurate readings. Units include a safety blow-out back panel for additional protection. Flowmeters are shipped completely assembled and include standard panel mounting hardware for quick installation.

Model (65 mm scale)					
Without Valve		With Valve		Flow Rate (Air) scfh (sccm)	Flow Rate (H2O) gph (sccm)
Aluminum	SS	Aluminum	SS		
DR10010*	DR12010*	DR10410*	DR12410*	0.24 (130†)	—
DR10022	DR12022	DR10422	DR12422	0.65 (300†)	—
DR10030*	DR12030*	DR10430*	DR12430*	1.1 (500†)	—
DR10042	DR12042	DR10442	DR12442	2.2 (1000†)	—
				scfh (LPM)	
DR10062	DR12062	DR10462	DR12462	5.6 (2.1)	—
DR10070*	DR12070*	DR10470*	DR12470*	11 (5)	—
DR10082	DR12082	DR10482	DR12482	20 (9.5)	—
DR10090*	DR12090*	DR10490*	DR12490*	55 (24)	—
DR100102	DR120102	DR104102	DR124102	100 (50)	—
DR100120*	DR120120*	DR104120*	DR124120*	—	0.02 (1.5)
DR100132	DR120132	DR104132	DR124132	—	0.1 (6.5)
DR100140*	DR120140*	DR104140*	DR124140*	—	0.13 (8)
DR100152	DR120152	DR104152	DR124152	—	0.36 (24)
DR100172	DR120172	DR104172	DR124172	—	0.9 (55)
DR100180*	DR120180*	DR104180*	DR124180*	—	2.2 (140)
DR100192	DR120192	DR104192	DR124192	—	4.4 (280)
DR100200*	DR120200*	DR104200*	DR124200*	—	10 (600)
DR100212	DR120212	DR104212	DR124212	—	24 (1500)

Model (150 mm scale)					
Without Valve		With Valve		Flow Rate (Air) scfh (sccm)	Flow Rate (H2O) gph (sccm)
Aluminum	SS	Aluminum	SS		
DR20032	DR22032	DR20432	DR22432	0.33 (160)	—
DR20082	DR22082	DR20482	DR22482	0.54 (270)	—
DR200132	DR220132	DR204132	DR224132	2 (840)	—
				scfh (LPM)	
DR200182	DR220182	DR204182	DR224182	3.8 (1.8)	—
DR200232	DR220232	DR204232	DR224232	10 (4.8)	—
DR200282	DR220282	DR204282	DR224282	16 (7.5)	—
DR200332	DR220332	DR204332	DR224332	35 (16)	—
DR200382	DR220382	DR204382	DR224382	90 (44)	—
DR200432	DR220432	DR204432	DR224432	—	0.05 (3.2)
DR200482	DR220482	DR204482	DR224482	—	0.075 (4.6)
DR200532	DR220532	DR204532	DR224532	—	0.34 (21)
DR200582	DR220582	DR204582	DR224582	—	0.75 (46)
DR200632	DR220632	DR204632	DR224632	—	2.2 (140)
DR200682	DR220682	DR204682	DR224682	—	3.6 (230)
DR200732	DR220732	DR204732	DR224732	—	7.5 (480)
DR200782	DR220782	DR204782	DR224782	—	21 (1300)

SPECIFICATIONS

Service: Compatible gases or liquids.

Wetting Materials:

- Flowtube: Borosilicate glass;
- Float: 316 SS (black glass as indicated);
- Float stops: PTFE;
- End fittings: Anodized aluminum or 316 SS;
- O-rings: Buna-N on aluminum models and fluoroelastomer on stainless steel models.

Temperature Limit: 250°F (121°C).

Pressure Limit: 250 psig (17 bar).

Accuracy: ±5% FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute).

Repeatability: ±0.25% of scale reading.

Scales: Direct reading 65 mm or 150 mm scales for air or water.

Turn-down Ratio: 10:1.

Connection: 1/8" female NPT.

Mounting: Vertical.

Valve: 6-turn needle (standard on models with valve).

APPLICATIONS

Glass flowmeters are suitable for metering gases or liquids for film processing, paper manufacturing, chemical processing, semiconductor industry, water and air pollution analysis equipment, metals processing, industrial fuel and energy conservation, cylinder gas metering, and general laboratory and industrial applications.

Add suffix "M" for metric scale.

* Denotes glass float.

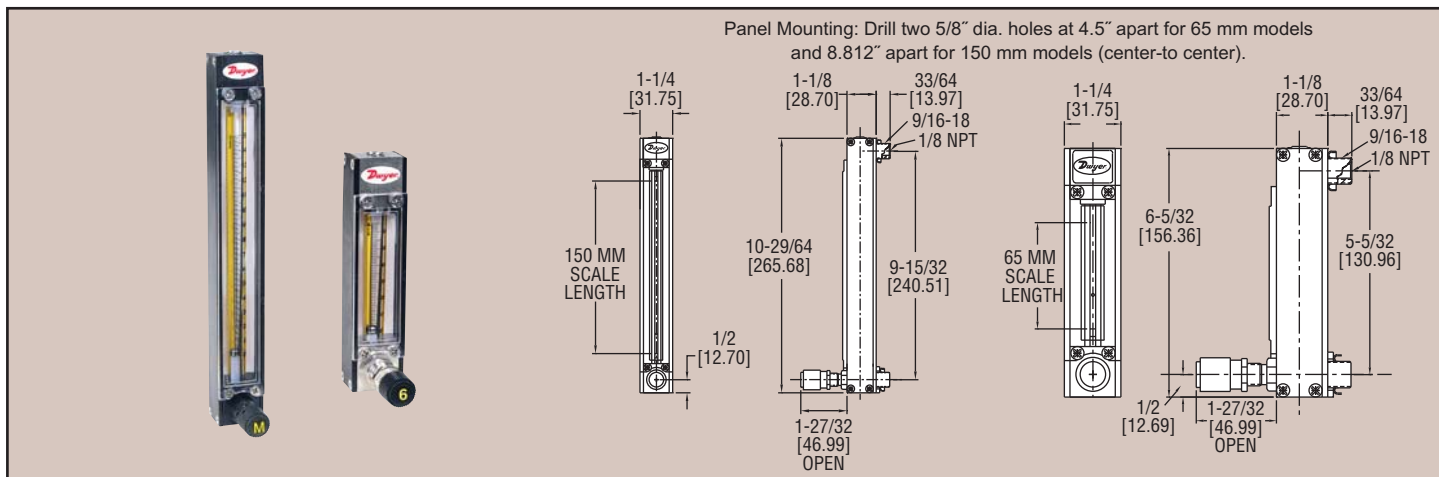
† Metric models use ccm as unit of measure.



Series
VA

Variable Area Glass Flowmeters

65 mm and 150 mm, ±2% FS Accuracy, Interchangeable Flowtubes



Accurately measure flow rates of air, water, and other commonly used gases with the Series VA Variable Area Glass Flowmeters. Flowmeters are designed with an easy-to-read universal mm scale and supplied with a correlation chart containing calibration data for air and water. Correlation data for other gases and liquids are available. Permanently fused ceramic scale with vertical locator line reduces parallax and eye fatigue. Thick polycarbonate front shield protects tube from breakage and also serves as a magnifying lens to enhance reading resolution.

Glass flowmeters are suitable for metering carrier gases, liquid and gas measurement in pilot plants, laboratories, process flow and level indicating. Units are equipped with a standard 6-turn needle valve for flow rate control. High precision metering valves with non-rising stems (sold separately) are available for high sensitivity control and resolution - particularly suited for very low flow rates.

Flowmeters are shipped completely assembled and ready for panel mounting. Use an optional acrylic tripod base to convert to self-standing bench mounting.

SPECIFICATIONS

Service: Compatible gases or liquids.

Wetted Materials:

- Flowtube: Borosilicate glass;
- Floats: Glass or stainless steel (sapphire, Carboloy and tantalum are optional);
- Float stops: PTFE;
- End fittings: Anodized aluminum, 316 SS or brass;
- Packings: Fluoroelastomer;
- O-rings: Buna-N on aluminum models and brass models, and fluoroelastomer on stainless steel models.

Temperature Limits: 250°F (121°C).

Pressure Limits: 200 psig (13.8 bar).

Accuracy: ±2% FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute).

Repeatability: ±0.25% full scale.

Scales: Universal 65 mm or 150 mm with correlation charts.

Turn-down Ratio: 10:1; 20:1 with combinations of two floats installed in meter.

Connections: Two 1/8" female NPT.

Mounting: Vertical.

Valve: 6-turn needle (standard), optional 16-turn high precision valve.

Valve Orifice: Acetal on aluminum models and brass models, PCTFE on stainless steel models.

Model 65 mm Scale				Maximum	Maximum
Aluminum Fittings	SS Fittings	Brass Fittings	Float	Flow Rate (Air) scfh (ml/min)	Flow Rate (H ₂ O) gph (ml/min)
VA1043	VA1243	VA1343	Glass	0.104 (49)	0.009 (0.55)
VA1044	VA1244	-	SS	0.307 (145)	0.038 (2.38)
VA1045	VA1245	VA1345	Glass	0.220 (104)	0.028 (1.8)
VA1046	VA1246	-	SS	0.633 (299)	0.122 (7.7)
VA1047	VA1247	VA1347	Glass	0.43 (202)	0.041 (2.6)
VA1048	VA1248	-	SS	1.1 (522)	0.19 (12.0)
VA1049	VA1249	VA1349	Glass	2.09 (986)	0.325 (20.5)
VA10410	VA12410	-	SS	4.12 (1946)	0.881 (55.6)
VA10411	VA12411	VA13411	Glass	2.65 (1249)	0.428 (27)
VA10412	VA12412	-	SS	5.34 (2520)	1.125 (71)
VA10413	VA12413	VA13413	Glass	4.32 (2040)	0.63 (40)
VA10414	VA12414	-	SS	8.45 (3990)	1.71 (108)
VA10417	VA12417	VA13417	Glass	13.4 (6318)	2.33 (147)
VA10418	VA12418	-	SS	25.5 (12058)	5.77 (364)
VA10419	VA12419	VA13419	Glass	27.9 (13153)	4.9 (309)
VA10420	VA12420	-	SS	52.3 (24680)	11.81 (745)
VA10421	VA12421	VA13421	Glass	49.1 (23169)	8.27 (522)
VA10422	VA12422	-	SS	89.2 (42094)	19.97 (1260)

Model 150 mm Scale				Maximum	Maximum
Aluminum Fittings	SS Fittings	Brass Fittings	Float	Flow Rate (Air) scfh (ml/min)	Flow Rate (H ₂ O) gph (ml/min)
VA20429	VA22429	VA23429	Glass	0.792 (374)	0.087 (5.5)
VA20430	VA22430	-	SS	1.725 (814)	0.323 (20.4)
VA20433	VA22433	VA23433	Glass	4.9 (2313)	0.848 (54)
VA20434	VA22434	-	SS	9.67 (4562)	2.067 (130)
VA20435	VA22435	VA23435	Glass	8.07 (3807)	1.336 (84)
VA20436	VA22436	-	SS	16.08 (7590)	3.34 (217)
VA20437	VA22437	VA23437	Glass	18.38 (8678)	3.32 (210)
VA20438	VA22438	-	SS	35.5 (16737)	8.02 (506)
VA20439	VA22439	VA23439	Glass	49.9 (23564)	9.0 (568)
VA20440	VA22440	-	SS	93.9 (44336)	21.7 (1370)

ACCESSORIES

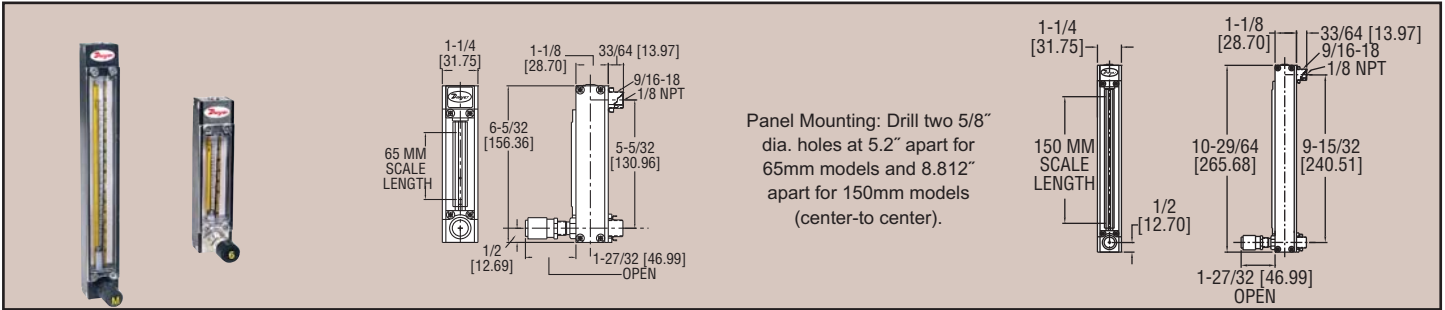
- VA81, High precision valve, 316 SS, 0.42 scfh capacity
- VA82, High precision valve, 316 SS, 0.85 scfh capacity
- VA83, High precision valve, 316 SS, 2.12 scfh capacity
- VA84, High precision valve, 316 SS, 4.87 scfh capacity
- VA85, High precision valve, 316 SS, 13.14 scfh capacity
- VA86, High precision valve, 316 SS, 45.55 scfh capacity
- VA7, Acrylic tripod for single meter



Series
VA

PTFE/Glass Flowmeters

Variable Area, Universal 65 mm and 150 mm Scales, ±2% FS Accuracy



Measure flow of corrosive or ultra-pure liquids or gases with the Series VA Variable Area PTFE/Glass Flowmeters. Flowmeters are constructed of chemically inert materials and housed in a rigid anodized aluminum frame with a polycarbonate safety shield. Units are designed with an easy-to-read universal mm scale and supplied with a correlation chart containing calibration data for air and water. Correlation data for other gases and liquids are available.

ACCESSORY

VA7, Acrylic tripod for single meter

65 mm scale				
Model	Valve	No Valve	Flow Rate (Air) scfh (ml/min)	Flow Rate (H ₂ O) gph (ml/min)
VA1545	VA1505	Glass	0.220 (104)	0.028 (1.8)
VA1547	VA1507	Glass	0.428 (202)	0.047 (2.95)
VA15411	VA15011	Glass	2.646 (1249)	0.428 (27)
VA15413	VA15013	Glass	4.322 (2040)	0.630 (39.7)
VA15417	VA15017	Glass	13.39 (6318)	2.33 (147)
VA15419	VA15019	Glass	27.9 (13153)	4.9 (309)
VA15421	VA15021	Glass	49 (23169)	8.27 (522)

SPECIFICATIONS

Service: Compatible gases or liquids.

Wetted Materials:

- Flowtube: Borosilicate glass;
- Float: Glass (sapphire optional);
- Float stops and end fittings: PTFE;
- O-rings and packings: PTFE.

Temperature Limits: -15 to 150°F (-26 to 65°C).

Pressure Limits: 100 psi (6.7 bar).
Accuracy: ±2% FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute).

Repeatability: ±0.25%.

Leak Integrity: 1 x 10⁻⁷ sccs of helium.

Scales: Universal 65 mm or 150 mm with correlation charts.

Turn-down ratio: 10:1, 20:1 with combinations of two floats installed in meter.

Connections: Two 1/8" female NPT.

Mounting: Vertical.

Valve: 6-turn needle.

Valve Orifice: PTFE.

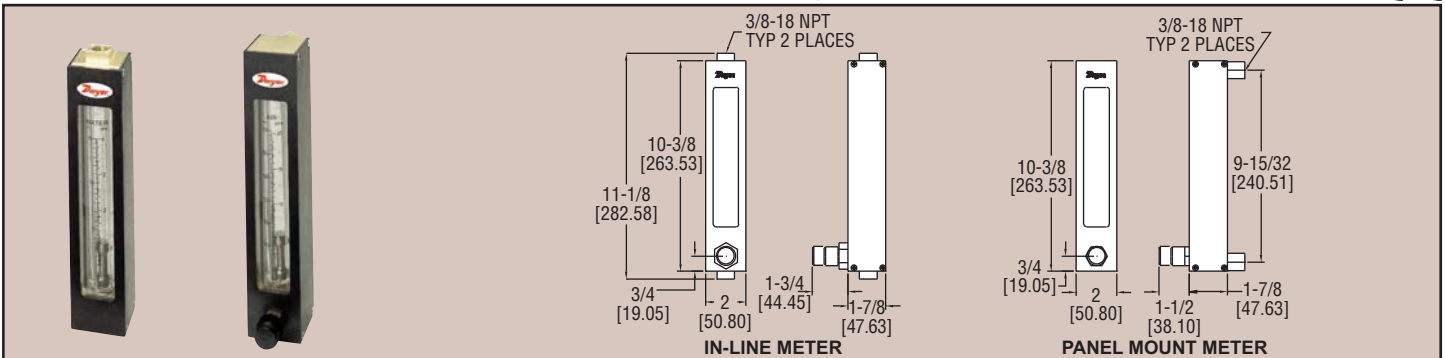
150 mm scale				
Model	Valve	No Valve	Flow Rate (Air) scfh (ml/min)	Flow Rate (H ₂ O) gph (ml/min)
VA25425	VA25025	Glass	0.104 (49)	0.01 (0.61)
VA25429	VA25029	Glass	0.792 (374)	0.087 (5.5)
VA25431	VA25031	Glass	1.75 (825)	0.262 (16.5)
VA25435	VA25035	Glass	8.07 (3807)	1.34 (84.3)
VA25437	VA25037	Glass	18.39 (8678)	3.32 (209)



Series
RSF

Rotatable Scale Flowmeters

Dual, Rotatable Direct Reading Scales for Air and Water



Series RSF Flowmeters are designed with unique rotatable scales of dual, air-water direct reading graduations. Flow rate is indicated in SCFM and SLPM for air and GPM and LPM for water. Graduations are marked on a rotating, polycarbonate tubeshield which also serves to protect the borosilicate glass flowtube. Flowmeters include a reflective plastic background and 1.5 X magnification lens to reduce eye fatigue and allow for more accurate readings. A blow-out back panel provides additional protection in the event of breakage. Series RSF Flowmeters are available in vertical in-line mounting or panel mounting. Units are shipped completely assembled and include standard mounting hardware for quick installation.

Brass & SS Vertical In-Line Meters					
Without Valve		With Valve		Max. Flow Rate	
Brass	SS	Brass	SS	Air scfm (SLPM)	Water GPM (LPM)
RSF011	RSF111	RSF011V	RSF111V	5 (140)	1.2 (4)
RSF012	RSF112	RSF012V	RSF112V	10 (280)	2 (8)
RSF013	RSF113	RSF013V	RSF113V	15 (425)	3 (11.5)
RSF014	RSF114	RSF014V	RSF114V	20 (575)	4 (15)
RSF015	RSF115	RSF015V	RSF115V	30 (900)	5 (20)

Brass & SS Panel Mount Meters					
Without Valve		With Valve		Max. Flow Rate	
Brass	SS	Brass	SS	Air scfm (SLPM)	Water GPM (LPM)
RSF021	RSF121	RSF021V	RSF121V	5 (140)	1.2 (4)
RSF022	RSF122	RSF022V	RSF122V	10 (280)	2 (8)
RSF023	RSF123	RSF023V	RSF123V	15 (425)	3 (11.5)
RSF024	RSF124	RSF024V	RSF124V	20 (575)	4 (15)
RSF025	RSF125	RSF025V	RSF125V	30 (900)	5 (20)

SPECIFICATIONS

Service: Compatible gases or liquids.

Wetted Materials:

- Flowtube: Borosilicate glass.
- Float: Brass/SS models: 316 SS; PTFE models: PTFE.
- Tube shield: Polycarbonate
- Float stops: Brass/SS models: 316 SS; PTFE models: PTFE.
- End fittings: Brass/SS models: Brass or 316 SS; PTFE models: PTFE.
- O-rings: Brass/SS models: Fluoroelastomer; PTFE models: PTFE.

Temperature Limit: 250°F (121°C). PTFE models: 150°F (65°C).

Pressure Limit: 150 psig (10.34 bar) @ 200°F (93°C). PTFE models: 100 psig (6.7 bar).

Accuracy: ±7% FS.

Repeatability: ±0.25% FS.

Scale: Direct Reading 127 mm scales for air and water.

Turn-Down Ratio: 10:1.

Connections: Two 3/8" female NPT.

Mounting: Vertical or panel mount.

Panel Cutout: Drill two 7/8" diameter holes 9.0" (229 mm) apart (for panel mount meters only).

Valve: 6-turn needle (standard on models indicating "with valve").

Agency Approvals: CE.

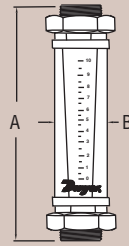
Note: For PTFE models contact the factory.



Series
VAT

Variable Area Fluoropolymer Flowmeter

In-Line, $\pm 5\%$ Accuracy, Chemically Inert



Dimensions

Connection	A	B
1/4"	5-11/16" (144)	1-1/4" (31.8)
3/8"	5-11/16" (144)	1-1/4" (31.8)
1/2"	10-1/2" (267)	2" (50.8)
3/4"	10-1/2" (267)	2" (50.8)

Constructed entirely of fluoropolymers, the Series VAT Flowmeters are ideal for high purity or corrosive liquid applications. Flowmeters feature a 0-10 scale for flow indication. Each unit is individually leak tested to a leak integrity rating of 1×10^{-7} sccs Helium or better. The Series VAT are designed for in-line mounting and include a removable protective shield.

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials:

- Flowtube: PFA;
- Float and end fittings: PTFE;
- Guide rods: PCTFE.

Temperature Limit: 250°F (121°C).

Pressure Limit: 100 psig (6.9 bar).

Accuracy: $\pm 5\%$ FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute).

Process Connections: See chart.

Leak Integrity: 1×10^{-7} sccs of helium.

Scale: 0 to 10 markings.

Mounting: Vertical, in-line.

Model		Low Range	
Valve	No Valve	Connections	Flow Rate ml/min (gph)
VAT-311	VAT-301	1/4" female NPT	125 (1.98)
VAT-312	VAT-302	1/4" female NPT	250 (3.91)
VAT-313	VAT-303	1/4" female NPT	400 (6.34)
VAT-314	VAT-304	1/4" female NPT	500 (7.92)
VAT-315	VAT-305	1/4" female NPT	1000 (15.85)
VAT-316	VAT-306	3/8" female NPT	2000 (31.69)
VAT-317	VAT-307	3/8" female NPT	2500 (39.62)
VAT-318	VAT-308	3/8" female NPT	3000 (47.54)
VAT-319	VAT-309	3/8" female NPT	5000 (79.23)
Model		High Range	
Valve	No Valve	Connections	Flow Rate L/min (gpm)
VAT-6110	VAT-6010	1/2" female NPT	13 (3.43)
VAT-6111	VAT-6011	1/2" female NPT	20 (5.28)
VAT-6112	VAT-6012	3/4" female NPT	30 (7.93)
VAT-6113	VAT-6013	3/4" female NPT	40 (10.57)
VAT-6114	VAT-6014	3/4" female NPT	45 (11.89)

FLOW

Flowmeters, Variable Area



Series
TVA

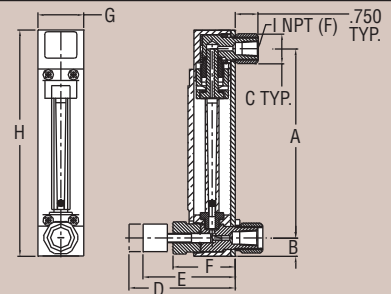
All Fluoropolymer Flowmeters

75 mm and 125 mm, 10:1 Turndown, $\pm 5\%$ FS Accuracy



Model	A	B	C	D	E	F	G
TVA11XX	4.97 [126]	0.56 [14]	1.06 [27]	3.35 [85]	1.25 [32]	6.16 [156]	1/4
TVA13XX	4.97 [126]	0.56 [14]	1.25 [32]	4.65 [118]	1.50 [38]	6.16 [156]	3/8
TVA22XX	8.72 [221]	0.88 [22]	1.75 [44]	4.57 [116]	2.00 [51]	10.4 [264]	1/2
TVA24XX	8.47 [215]	1.00 [25]	1.75 [44]	5.95 [151]	2.25 [57]	10.4 [264]	3/4

Panel Mounting: Drill two holes: 3/4" dia. at 4.97" apart for 1/4" NPT models, 7/8" dia. at 4.97" apart for 3/8" NPT models, 1" dia. at 8.72" apart for 1/2" NPT models, and 1-1/4" dia. at 8.47" apart for 3/4" NPT models (center-to-center).



Series TVA All Fluoropolymer Flowmeters offer solutions for measuring flow rates of highly corrosive or ultra-pure liquids. Flowmeters are designed with 0 to 10 scale graduations denoting a discrete flow rate.

Model		Low Range		
Valve	No Valve	Length	Connections	Flow Rate (H ₂ O) gph (ml/min)
TVA1113	TVA1103	75 mm	1/4" female NPT	6.34 (400)
TVA1115	TVA1105	75 mm	1/4" female NPT	15.9 (1000)
TVA1317	TVA1307	75 mm	3/8" female NPT	39.6 (2500)
TVA1319	TVA1309	75 mm	3/8" female NPT	79.2 (5000)
Model		High Range		
Valve	No Valve	Length	Connections	Flow Rate (H ₂ O) gph (l/min)
TVA22110	TVA22010	125 mm	1/2" female NPT	3.43 (13)
TVA24112	TVA24012	125 mm	3/4" female NPT	7.93 (30)
TVA24114	TVA24014	125 mm	3/4" female NPT	11.9 (45)

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials:

- Flowtube: PFA;
- Float and end fittings: PTFE;
- Guide rods: PCTFE.

Temperature Limit: 250°F (121°C).

Pressure Limit: 100 psig (6.9 bar).

Accuracy: $\pm 5\%$ FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute).

Repeatability: $\pm 0.25\%$.

Leak Integrity: 1×10^{-7} sccs of helium.

Scales: 0 to 10 markings, 75 mm or 125 mm lengths.

Turn-down Ratio: 10:1.

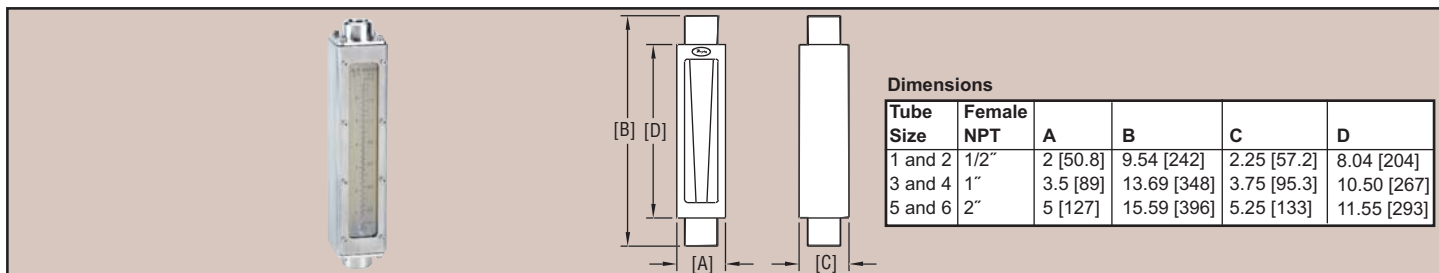
Mounting: Vertical.



Series
IF

Industrial Direct Reading Flowmeter

Air/Water Direct Reading Scale, 304 SS Protective Shield, $\pm 3\%$ Accuracy



Dimensions

Tube Size	Female NPT	A	B	C	D
1 and 2	1/2"	2 [50.8]	9.54 [242]	2.25 [57.2]	8.04 [204]
3 and 4	1"	3.5 [89]	13.69 [348]	3.75 [95.3]	10.50 [267]
5 and 6	2"	5 [127]	15.59 [396]	5.25 [133]	11.55 [293]

Ideal for industrial applications, the Series IF Industrial Direct Reading Flowmeters are fully enclosed in a brushed stainless steel case. The flowmeters can directly measure flow rates up to 116 GPM (439 lpm) for water and 250 SCFM (7080 lpm) for air service. The detachable, clear 3/16" thick polycarbonate front shield provides protection at maximum rated temperature and pressure. Each unit is designed with female NPT end fittings for easy in-line installation.

SPECIFICATIONS

Service: Liquids or gases.

Wetted Materials:

- Flowtube: Borosilicate glass; float, guide rods, float stops, end;
- Fittings: 316 SS;
- O-Rings: Fluoroelastomer.

Temperature Limit: 200°F (93°C).

Pressure Limit: 200 psi (13.8 bar);
125 psi for tube size 5 & 6.

Accuracy: $\pm 3\%$ of full scale.

Repeatability: $\pm 0.5\%$ of full scale.

Turndown Ratio: 10:1.

Scale: Dual scale GPM and SCFM.

Process Connection: See table.

Mounting: Vertical.

Front Shield: Polycarbonate.

Side Panels: 304 SS.

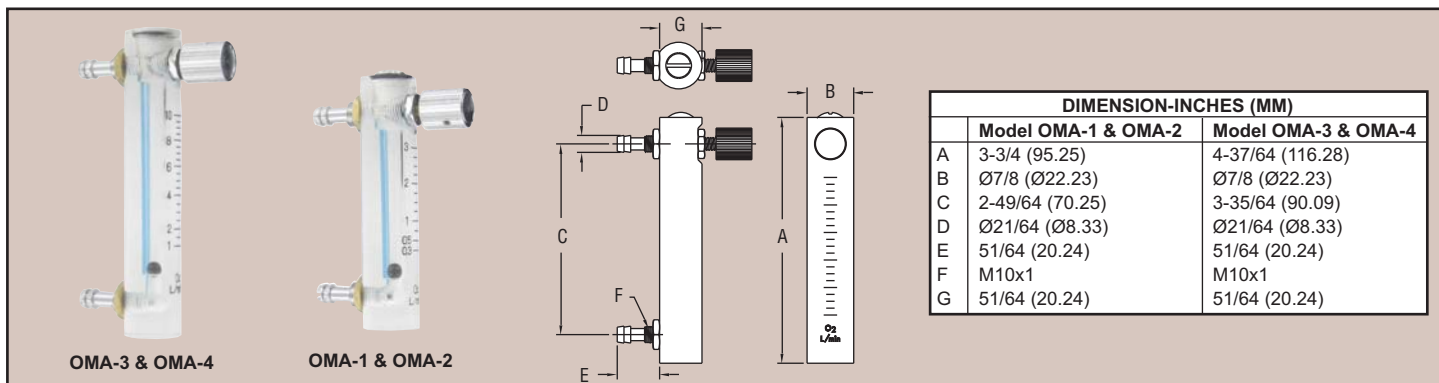
Model	Maximum Flow Rate		Tube Size	Pressure Drop (in H ₂ O)	Model	Maximum Flow Rate		Tube Size	Pressure Drop (in H ₂ O)
	Water GPM (LPM)	Air SCFM (LPM)				Water GPM (LPM)	Air SCFM (LPM)		
IF2700	0.25 (0.95)	1.2 (35)	1	—	IF2711	11 (40)	47.5 (1400)	4	13
IF2701	0.36 (1.3)	1.7 (50)	1	2	IF2712	14 (50)	62 (1800)	4	24
IF2702	0.76 (3.0)	3.3 (90)	1	5	IF2713	20 (75)	90 (2600)	4	39
IF2703	1 (3.7)	4.2 (120)	2	6	IF2714	22 (83)	90 (2550)	5	16
IF2704	1.5 (5.6)	6.5 (180)	2	—	IF2715	26 (98)	—	4	70
IF2705	2.2 (8.2)	8.5 (250)	2	10	IF2716	41 (155)	160 (4531)	6	5
IF2706	3.8 (14)	16 (475)	3	10	IF2717	44 (167)	180 (5098)	5	30
IF2707	5 (18)	21.5 (650)	3	14	IF2718	60 (227)	245 (6938)	6	16
IF2708	6 (20)	25.5 (725)	4	5	IF2719	61 (231)	250 (7080)	5	40
IF2709	7.4 (27.5)	30 (900)	4	6	IF2720	86 (326)	—	6	25
IF2710	9.6 (35)	40 (1200)	4	10	IF2721	116 (439)	—	6	45



Series
OMA

Oxygen Flowmeter

Use to Indicate and Manually Control Oxygen Flow



DIMENSION-INCHES (MM)

	Model OMA-1 & OMA-2	Model OMA-3 & OMA-4
A	3-3/4 (95.25)	4-37/64 (116.28)
B	Ø7/8 (Ø22.23)	Ø7/8 (Ø22.23)
C	2-49/64 (70.25)	3-35/64 (90.09)
D	Ø21/64 (Ø8.33)	Ø21/64 (Ø8.33)
E	51/64 (20.24)	51/64 (20.24)
F	M10x1	M10x1
G	51/64 (20.24)	51/64 (20.24)

The Compact Series OMA Oxygen Flowmeter is made especially for medical applications and manually controlling flow from oxygen generators. Flow levels are kept stable by precision valve and knob adjustment. The low cost flowmeter is made from durable clear acrylic plastic. The easy-to-read scale is hot stamped into the acrylic so it will not wear off. The ball float is highly visible against the light blue background. Readings are repeatable within $\pm 4\%$ full scale accuracy.

SPECIFICATIONS

Service: Oxygen.

Wetted Materials: Acrylic and electroplated brass; Ball float: SS (OMA-1); Agate (OMA-2,-3,-4); O-ring: NBR.

Pressure Limits: 29 psi (2.0 bar).

Temperature Limits: 32 to 140°F (0 to 60°C).

Accuracy: $\pm 4\%$ of full scale.

Connection: 1/4" I.D. tubing.

Mounting: Vertical.

Model	Scale (L/min)
OMA-1	0.1-1.5
OMA-2	0.3-3
OMA-3	0.5-5
OMA-4	1.0-10

ACCESSORY

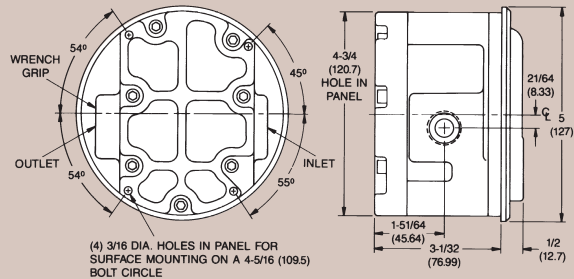
A-222, .240" I.D. x .375" O.D. tubing



Series
RMV

Rate-Master® Dial-Type Flowmeters

Brass Body; Three Ranges to 20 GPM Water



Series RMV Rate-Master® Flowmeters measure higher water flow rates with $\pm 2\%$ of full scale accuracy at affordable prices. Rugged forged brass housing is standard on all models for great compatibility and the strength to withstand system pressures to 1000 psig (68.9 bar). Unlike glass tube rotameters, these units won't shatter and they work fine with even dark and/or opaque liquids. Stocked models are fitted with 1" female NPT inlet and outlet; 3/4" and 1/2" sizes are also available. Install in line, supported by piping or flush panel mount with complete hardware package included.

Model	Range, GPM Water	Connection Size
RMV-1-3	0-5	1" female NPT
RMV-2-3	0-10	1" female NPT
RMV-3-3	0-20	1" female NPT
RMV-1-2	0-5	3/4" female NPT
RMV-2-2	0-10	3/4" female NPT
RMV-3-2	0-20	3/4" female NPT
RMV-1-1	0-5	1/2" female NPT
RMV-2-1	0-10	1/2" female NPT
RMV-3-1	0-20	1/2" female NPT

SPECIFICATIONS

- Service:** Compatible liquids.
- Wetted Materials:** Brass, copper, 302 SS, sintered barium ferrite.
- Temperature Limits:** 20 to 200°F (-6.7 to 93°C).
- Pressure Limit:** 1000 psig (68.9 bar).
- Pressure Drop:** 0-5 GPM: 3.2 psid; 0-10 GPM: 5.3 psid; 0-20 GPM: 10.4 psid.
- Accuracy:** $\pm 2\%$ of full scale.
- Size:** Diameter dial face 4" (101.6 mm).
- Process Connections:** See chart.
- Maximum Flow:** 1.5 x full scale reading.
- Weight:** 9 lb (4.08 kg).

APPLICATIONS

Monitor coolant flow through ingot heaters, high-amp switchgear, resistance welders, heat exchangers, compressors, scrubbers; monitor water consumption to different processes and operations for more efficient operation; calculate required fill or drain times for tanks, water towers.

FLOW

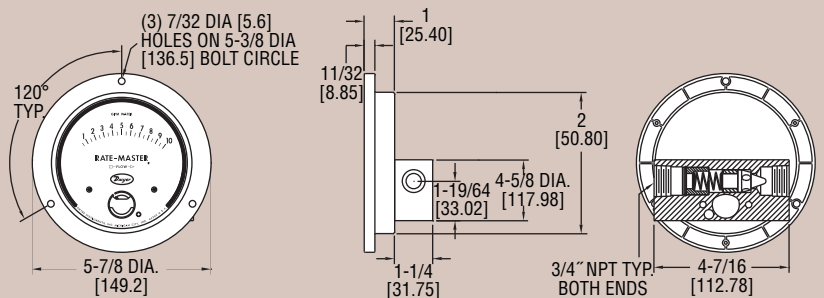
Flowmeters, In-Line



Series
RMV II

Rate-Master® Dial-Type Flowmeter

For Panel Mounting, Three Ranges to 10 GPM Water



* FITS IN ANSI STANDARD 4.940 [125.5] PANEL CUTOUT

Series RMV II Rate-Master® Flowmeters employ a target-type design combined with a damage resistant magnetic linkage to drive a pointer over an easy-to-read litho scale. This unique construction fully isolates flowing media from gage front for leakproof operation at pressures to 3000 psig (206.7 bar) with $\pm 5\%$ of full scale accuracy. Solid machined brass meter body is ideally suited for water flows. Body design fits standard 4 1/2" mounting hole layouts per ANSI B40.1. Inlet and outlet threads are standard 3/4" female NPT.

Model	Range GPM Water	Range SCFM	Range LPM Air	Model	Range GPM Oil	Range SCFM	Range LPM Air	Range LPM Oil
RMVII-1	0-3	—	—	RMVII-12	—	0-30	0-850	—
RMVII-3	0-5	—	—	RMVII-14	—	0-50	0-1400	—
RMVII-6	0-10	—	—	RMVII-20	0-2.2	—	—	0-8
RMVII-10	—	0-10	0-280	RMVII-21	0-4.0	—	—	0-15
				RMVII-22	0-18.5	—	—	0-32

SPECIFICATIONS

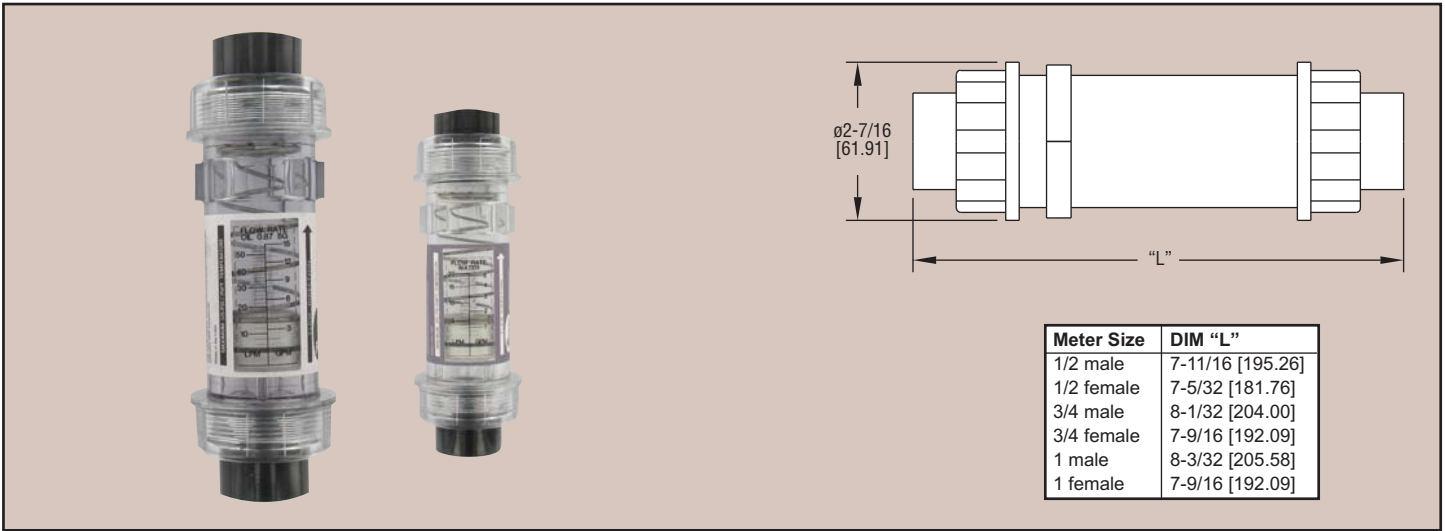
- Service:** Compatible gases & liquids & oils.
- Wetted Materials:** Brass, 302 SS, sintered barium ferrite, polyacetyl.
- Temperature Limit:** 200°F (93°C).
- Pressure Limit:** 3000 psig (206 bar).
- Pressure Drop:** 0-5 GPM: 3.2 psid; 0-10 GPM: 5.3 psid; 0-20 GPM: 10.4 psid.
- Accuracy:** $\pm 5\%$ of full scale.
- Size:** Diameter dial face 4.5" (114.3 mm).
- Process Connections:** 3/4" female NPT.
- Weight:** 2 lb, 14 oz (1.3 kg).



Series
HFPC
&
HFPS

Plastic Flowmeters

± 5% FS Accuracy, Mount in any Position



The New HFPC & HFPS Series Flowmeters are made of injection molded, polycarbonate and polysulfone bodies. Series HFPC and HFPS flowmeters have dual scales measuring in both GPM and LPM with ±5% full scale accuracy. Models are available with 1/2", 3/4" or 1" male or female NPT connections. Female 1/2", 3/4" and 1" BSPP connections are also available. Rugged construction allows these meters to handle maximum pressures of 325 psig and 200 °F. Units can be mounted in any position, even applications with downward flow.

CAUTION: Series HFPC & HFPS Flowmeters are for indoor use only or areas without direct sunlight. Polycarbonate & polysulfone are adversely affected by ultraviolet light.

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials: HFPC: Polycarbonate body, Buna-N seals, stainless steel spring, Polysulfone connections; HFPS: Polysulfone body, Buna-N seals, stainless steel spring, polysulfone connections.

Pressure Limit: 325 psig (22.4 bar).

Temperature Limit: HFPC: 200°F (93°C); HFPS: 250°F (121°C).

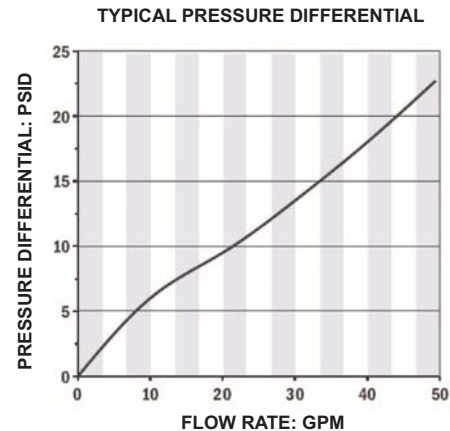
Accuracy: ±5% FS.

Repeatability: ±1% FS.

Pressure Loss: See chart.

Weight: Standard models 1 lb (453.6 g). Models with optional brass connections 2 lb (907 g).

Series	HF				Series HF Plastic Flow Meters
Wetted Parts		PC			Polycarbonate Body, Polysulfone Connections
		PS			Polysulfone Body, Polysulfone Connections
Connection			-1		1/2" female NPT
			-2		3/4" female NPT
			-3		1" female NPT
			-4		1/2" male NPT Brass Connections Only
			-5		3/4" male NPT Brass Connections Only
			-6		1" male NPT Brass Connections Only
			-7		1/2" female BSPP
			-8		3/4" female BSPP
			-9		1" female BSPP
Range			-1		.5-5 GPM (1-19 LPM)
			-2		1-10 GPM (3.8-38 LPM)
			-3		2-15 GPM (7.5-55 LPM)
			-4		3-30 GPM (11-113 LPM)
Option			-BC		Brass Connections



FLOW

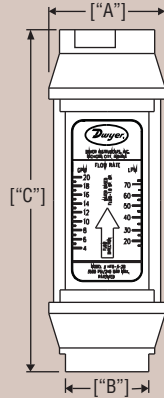
Flowmeters, In-Line



Series
HF

In-Line Flow Monitors

For Air, Water or Caustic Fluids, $\pm 2.5\%$ Accuracy, Unrestricted Mounting



Connection Size	"A" Reference	"B" Wrench Flats	"C" Reference
1/4" to 1/2" NPT	1-7/8" (48 mm)	1-1/4" (32 mm)	6-9/16" (167 mm)
3/4" to 1" NPT	2-3/8" (60 mm)	1-3/4" (45 mm)	7-1/8" (181 mm)
1-1/2" NPT	3-1/2" (89 mm)	2-5/8" (67 mm)	10-1/8" (257 mm)
2" NPT	3-1/2" (89 mm)	2-5/8" (67 mm)	12-5/8" (321 mm)

FLOW

Flowmeters, In-Line

Low cost, Series HF In-Line Flow Monitors have a design based on a floating sharp-edged orifice disk and variable area flow measurement to yield accuracy of $\pm 2.5\%$ over center one-third of scale. This unique design allows accurate performance with fluid viscosities up to 500 SSU. All internal wetted parts are contained inside a sealed metal tubular casing assuring a virtually maintenance-free unit. Flowing media forces linear motion of a spring loaded, sharp edge orifice disk and ring shaped transfer magnet which both ride on a tapered center shaft. The transfer magnet drives a clearly visible magnet follower located outside the flow tube, protected under the clear polycarbonate tube. A ring on the magnet follower indicates flow rate on the direct reading scale. Rubber bumpers are provided for external impact resistance.

Designed for single-direction flow, Series HF Monitors are recommended for use with system filtration of at least 74 microns or a 200 mesh screen. Some applications may also require magnetic filtration. These flowmeters do not require inlet or outlet straight plumbing and can be mounted horizontally, vertically, or inverted.

APPLICATIONS

HF Flow Monitors can be used to set flow rates, fluid motor and cylinder speeds. Check pump high pressure performance, pressure relief valve settings, fluid handling systems in agricultural, construction or industrial machinery, power tools and equipment. Monitor petrochemical operations with brass or stainless steel models. Industrial pneumatic systems air flow can be monitored with the HFA models which are calibrated at 100 psig inlet pressure.

SPECIFICATIONS

Service: Compatible gases or liquids.

Wetted Materials: HFA: Aluminum casing, Buna-N seals, PTFE coated Alnico magnet, stainless steel disk; HFB: Brass casing, Buna-N seals, PTFE coated Alnico magnet, stainless steel disk; HFS: 303 stainless steel casing, FKM seals with PTFE backup, PTFE coated Alnico magnet, stainless steel disk; HFH: Brass casing, FKM seals with PTFE backup, PTFE coated Alnico magnet, stainless steel disk.

Maximum Viscosity: 500 SSU.

Temperature Limits: HFA, HFL, HFB and HFS models: 240°F (116°C); HFH models: 400°F (204°C).

Pressure Limits: HFA models: 600 psig (41 bar); HFL, HFB and HFH models: 3500 psig (240 bar); HFS: 1000 psig (70 bar) for air and gas, 6000 psig (413 bar) for liquids.

Accuracy: $\pm 4\%$ FS over entire range; $\pm 2.5\%$ over center third of the measuring range.

Repeatability: $\pm 1\%$ of full scale.

Shipping Weight: 1/4" to 1/2" female NPT models: 2 lb (0.9 kg); 3/4" to 1" female NPT models: 3.5 lb (1.59 kg); 1-1/2" female NPT models: 11 lb (5 kg); 2" female NPT models: 13.5 lb (6.12 kg).

Brass body for water based fluids (non-steam):

Model	Connection Size	Range, Water GPM (LPM)
HFB-2-05	1/2" female NPT	0.5-5.0 (1-19)
HFB-3-15	3/4" female NPT	2-15 (7.5-55)
HFB-3-20	3/4" female NPT	2-20 (7.5-75)
HFB-4-35	1" female NPT	5-35 (19-130)
HFB-5-50	1-1/2" female NPT	5-50 (19-189)
HFB-5-100	1-1/2" female NPT	10-100 (38-379)
HFB-6-75	2" female NPT	8-75 (31-284)
HFB-6-150	2" female NPT	20-150 (76-568)

Aluminum body for oil based fluids:

Model	Connection Size	Range, GPM (LPM) Oil
HFL-2-05	1/2" female NPT	0.5-5.0 (1-19)
HFL-4-25	1" female NPT	2-25 (7.5-95)

304 SS body for high-pressure fluids:

Model	Connection Size	Range, Water GPM (LPM)
HFS-2-02	1/2" female NPT	0.2-2.0 (0.75-7.5)
HFS-2-10	1/2" female NPT	0.5-10 (1.9-38)

Aluminum, Brass, and Stainless Steel for air and other non-corrosive gases:

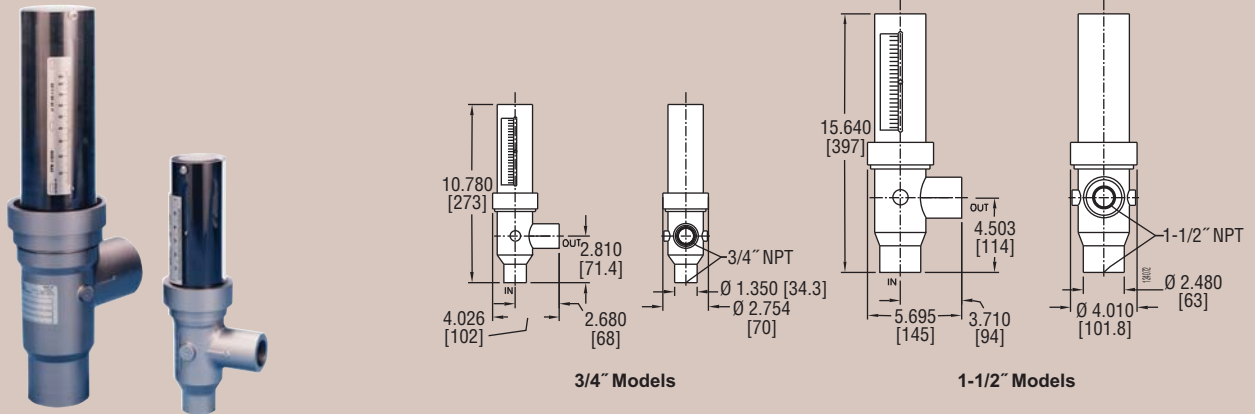
Aluminum	Brass	Stainless Steel	Connection (NPT female, dry seal)	Range scfm (lps)
HFA-1-001	HFB-1-001	HFS-1-001	1/4"	1.5-12 (0.5-5.5)
HFA-1-002	HFB-1-002	HFS-1-002	1/4"	4-23 (2-10)
HFA-1-003	HFB-1-003	HFS-1-003	1/4"	5-50 (2.5-25)
HFA-1-004	HFB-1-004	HFS-1-004	1/4"	10-100 (5-45)
HFA-8-001	HFB-8-001	HFS-8-001	3/8"	1.5-12 (.5-5.5)
HFA-8-002	HFB-8-002	HFS-8-002	3/8"	4-23 (2-10)
HFA-8-003	HFB-8-003	HFS-8-003	3/8"	5-50 (2.5-25)
HFA-8-004	HFB-8-004	HFS-8-004	3/8"	10-100 (5-45)
HFA-2-001	HFB-2-001	HFS-2-001	1/2"	1.5-12 (.5-5.5)
HFA-2-002	HFB-2-002	HFS-2-002	1/2"	4-23 (2-10)
HFA-2-003	HFB-2-003	HFS-2-003	1/2"	5-50 (2.5-25)
HFA-2-004	HFB-2-004	HFS-2-004	1/2"	10-100 (5-45)
HFA-3-003	HFB-3-003	HFS-3-003	3/4"	5-50 (3-23)
HFA-3-004	HFB-3-004	HFS-3-004	3/4"	10-100 (4-48)
HFA-3-005	HFB-3-005	HFS-3-005	3/4"	15-150 (8-56)
HFA-3-006	HFB-3-006	HFS-3-006	3/4"	30-330 (20-150)
HFA-4-003	HFB-4-003	HFS-4-003	1"	5-50 (3-23)
HFA-4-004	HFB-4-004	HFS-4-004	1"	10-100 (4-48)
HFA-4-005	HFB-4-005	HFS-4-005	1"	15-150 (8-56)
HFA-4-006	HFB-4-006	HFS-4-006	1"	30-330 (20-150)
HFA-9-007	HFB-9-007	HFS-9-007	1-1/4"	30-470 (15-220)
HFA-9-008	HFB-9-008	HFS-9-008	1-1/4"	150-900 (75-425)
HFA-5-007	HFB-5-007	HFS-5-007	1-1/2"	30-470 (15-220)
HFA-5-008	HFB-5-008	HFS-5-008	1-1/2"	150-900 (75-425)



Series
SSM

All Metal Flowmeter

Available in Stainless Steel for Industrial Environments



3/4" Models

1-1/2" Models

Series SSM 316 All Metal Flowmeters are ideal for dirty or opaque fluids, high temperature and high pressure service and harsh environments. The direct reading scale provides $\pm 2\%$ accuracy on approximate 25 to 1 ranges, which are wider than typical variable area ball float flow meters. The internal magnet carries the external flow indicator in a non-wetted enclosure. Flowmeters can quickly be disassembled without removing the body from the pipeline for easy cleaning. Pipe adaptors may be used to adapt to alternate size liner without altering accuracy.

SPECIFICATIONS

Service: Compatible liquids and gases.

Wetted Material: T316 SS, Alnico magnet, FKM O-ring.

Temperature Limits: 300°F (149°C).

Pressure Limits: 3/4" models: 1000 psig (68.9 bar) @ 250°F (121°C),

1-1/2" models: 800 psig (55 bar) @ 250°F (121°C).

Accuracy: $\pm 2\%$ full scale.

Repeatability: $\pm 0.5\%$ of indicated flow rate.

Process Connections: 3/4" or 1-1/2" female NPT.

Scale Length: 3/4" models: 3.2" (8 cm); 1-1/2" models: 5.2" (13 cm).

Weight: 3/4" models: 5 lb (2.3 kg); 1-1/2" models: 13 lb (5.9 kg).

316 SS Body	Range	Connection	Max. Pressure Loss (in w.c.)
SSM-00	0.2-5.4 GPM Water (0.75-21 LPM)	3/4"	17.2
SSM-01	0.2-10 GPM Water (1-35 LPM)	3/4"	22.0
SSM-02	0.5-23 GPM Water (0.5-90 LPM)	3/4"	75.0
SSM-03	0.5-35 GPM Water (2-130 LPM)	1-1/2"	18.5
SSM-04	1-50 GPM Water (8-200 LPM)	1-1/2"	26.0
SSM-05	2-70 GPM Water (2-265 LPM)	1-1/2"	80.0
SSM-06	4-120 GPM Water (15-450 LPM)	1-1/2"	130.0
SSM-07	2-50 SCFM Air (4-85 M ³ /HR)	3/4"	4.5
SSM-08	6-125 SCFM Air (10-210 M ³ /HR)	3/4"	11.8
SSM-09	4-260 SCFM Air (10-440 M ³ /HR)	3/4"	93.0
SSM-10	2-310 SCFM Air (10-530 M ³ /HR)	1-1/2"	12.0
SSM-11	10-515 SCFM Air (20-880 M ³ /HR)	1-1/2"	40.0
SSM-12	35-750 SCFM Air (40-1300 M ³ /HR)	1-1/2"	70.0
SSM-13	20-1000 SCFM Air (40-1700 M ³ /HR)	1-1/2"	90.0

FLOW

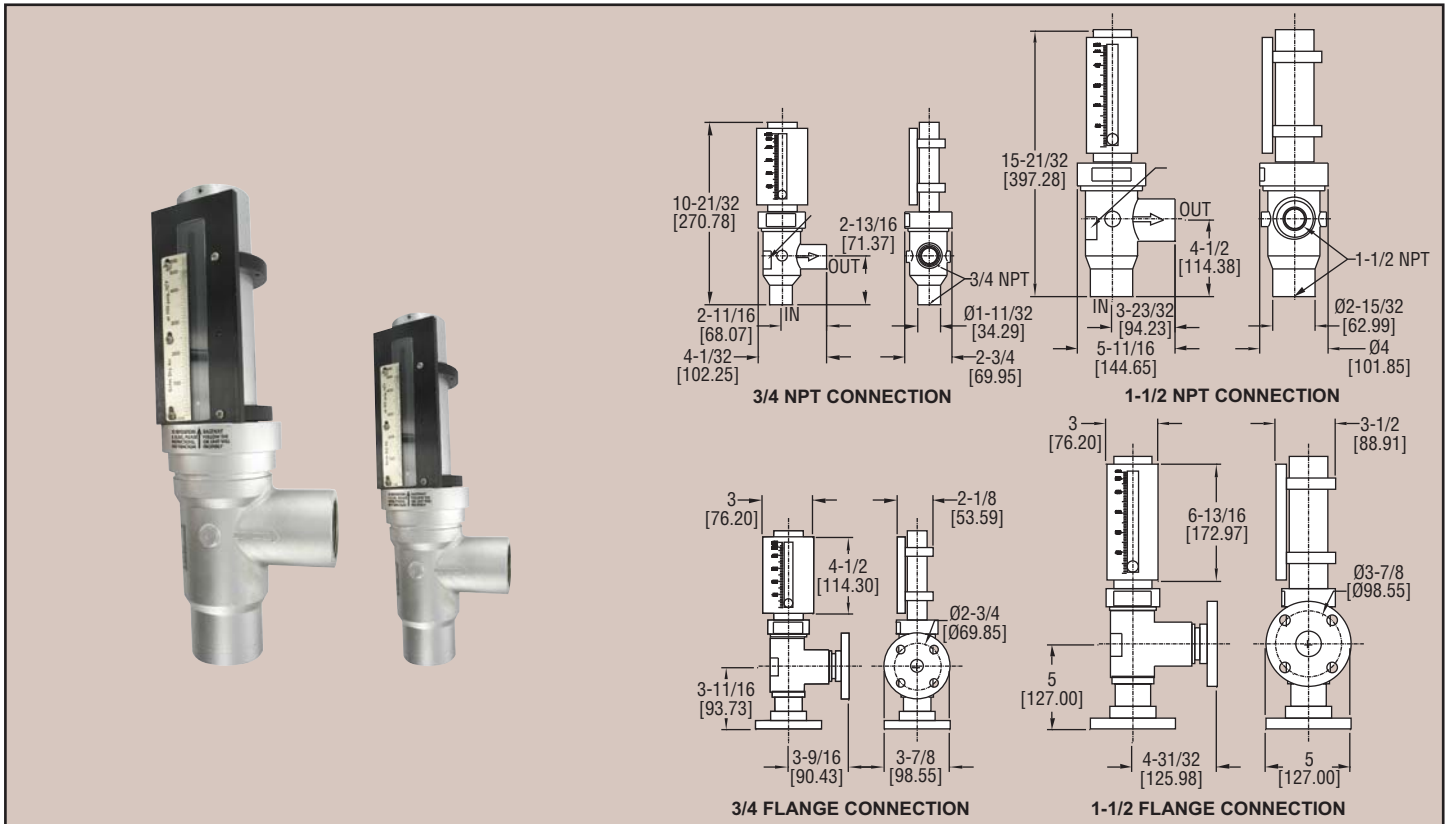
Flowmeters, In-Line



Series
STFLO

Stainless Steel Flowmeters

Ideal for Steam Applications



The STFLO Series Stainless Steel Flowmeters are ideal for high temperature and high pressure applications such as steam. The direct reading scale provides $\pm 2\%$ accuracy. These flowmeters can be quickly disassembled without removing the body from the pipeline for easy cleaning.

Model	Range	Connection
STFLO-00	2.3-50 lb/Hr. Steam	3/4" NPT
STFLO-01	5-100 lb/Hr. Steam	3/4" NPT
STFLO-02	5-150 lb/Hr. Steam	3/4" NPT
STFLO-03	9.5-240 lb/Hr. Steam	3/4" NPT
STFLO-04	14-335 lb/Hr. Steam	3/4" NPT
STFLO-05	18.5-405 lb/Hr. Steam	3/4" NPT
STFLO-06	28.5-770 lb/Hr. Steam	3/4" NPT
STFLO-07	28.5-1230 lb/Hr. Steam	3/4" NPT
STFLO-08	7-100 lb/Hr. Steam	1-1/2" NPT
STFLO-09	7-150 lb/Hr. Steam	1-1/2" NPT
STFLO-10	14.5-335 lb/Hr. Steam	1-1/2" NPT
STFLO-11	24-800 lb/Hr. Steam	1-1/2" NPT
STFLO-12	28.5-1200 lb/Hr. Steam	1-1/2" NPT
STFLO-13	14.5-1480 lb/Hr. Steam	1-1/2" NPT
STFLO-14	35-1825 lb/Hr. Steam	1-1/2" NPT

SPECIFICATIONS

Service: Compatible with liquids and gases.

Wetted Material: T316 SS, Alnico magnet, geothermal EPR O-ring.

Temperature Limits: See chart.

Pressure Limits: See chart.

Accuracy: $\pm 2\%$ full scale.

Repeatability: $\pm 0.5\%$ of indicated flow rate.

Process Connections: 3/4" or 1-1/2" female NPT, optional flange connections.

Scale Length: 3/4" models: 3.2" (8 cm); 1-1/2" models: 5.2" (13 cm).

Weight: 3/4" NPT models: 5.75 lb (2.6 kg); 1-1/2" NPT models: 14 lb (6.4 kg). 3/4" Flange: 9.75 lb (4.4 kg); 1-1/2" Flange: 22 lb (10 kg).

Meter Size & Material	MAXIMUM NON-SHOCK WORKING PRESSURE, psig (bar)							
	0°F (-18°C)	70°F (21°C)	300°F (148°C)	350°F (176°C)	400°F (204°C)	450°F (232°C)	500°F (260°C)	600°F (315°C)
(3/4" NPT)	1000 (68.9)	1000 (68.9)	1000 (68.9)	990 (68.2)	970 (66.8)	950 (65.5)	930 (64.1)	900 (62)
(1-1/2" NPT)	800 (55)	800 (55)	800 (55)	790 (54.4)	780 (53.7)	770 (53)	760 (52.4)	750 (51.7)

Note: For ranges calibrated for water or air contact the factory.

OPTIONS

If you wish to change 3/4" NPT to 3/4" Flanged Connection, add F1 to the end of the model number. If you wish to change 1-1/2" NPT to 1-1/2" Flanged Connection, add F2 to the end of the model number.

F1, 3/4" 150 lb ANSI flange connection

F2, 1-1/2" 150 lb ANSI flange connection

FLOW

Flowmeters, In-Line



Series
TVF

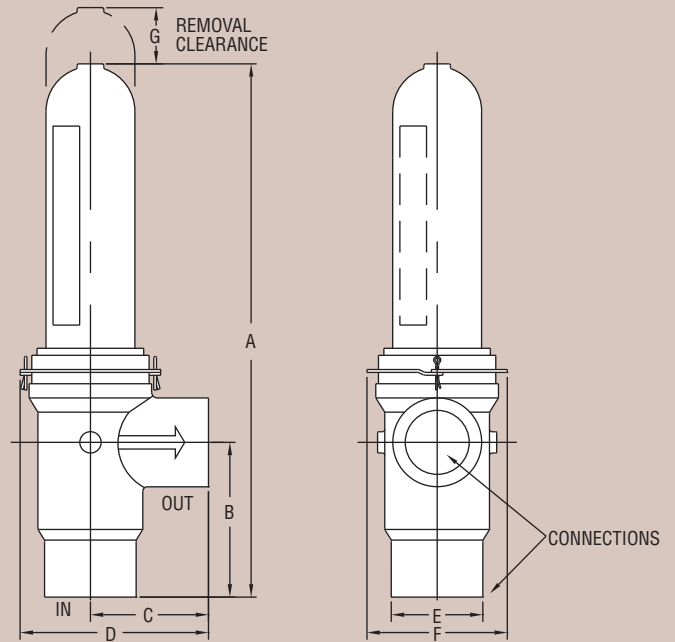
Total View Industrial Flowmeter

View Flow Rate from 360° Water or Air Ranges



TVFS

A	B	C	D	E	F	G	Female NPT	Material
9.36	2.81	2.68	4.00	1.35	2.72	3.00	3/4"	SS
15.22	4.53	3.71	5.70	2.48	3.95	5.00	1-1/2"	SS



The Series TVF Total View Industrial Flowmeters are economically priced, tough, simple and accurate meters for water, oils, coolants, compressed gases and other industrial applications. The flowmeters have a full-scale accuracy of $\pm 2\%$ and can be disassembled quickly without the meter being removed from the pipeline for easy cleaning. The TVFS is constructed of T-316 stainless steel and features a polysulfone sight tube. The Series Total View Industrial Flowmeters are available with standard 3/4" and 1-1/2" female NPT connections. The easy to read flowmeters provide 360° rotation of scale on plastic sight tube models.

SPECIFICATIONS

Service: Compatible gases or liquids.

Wetted Materials: Body: Stainless steel; O-rings: Buna-N; Sight tube: Polysulfone.

Temperature Limits: see "Operating Limits" table.

Pressure Limits: see "Operating Limits" table.

Accuracy: $\pm 2\%$ of full scale.

Repeatability: $\pm 1/4\%$ of indicated flow rate.

Process Connections: 3/4" and 1-1/2" female NPT.

Scale Length: 3.2" (8 cm) for 3/4" NPT connection, 5.2" (13 cm) for 1-1/2" NPT connection.

Weight: 4 lb (1.8 kg) for 3/4", and 12 lb (5.5 kg) for 1-1/2".

Operating Limits

Connection	200°F (93°C)	250°F (121°C)	300°F (148°C)
3/4"	300 (20.6)	250 (17.2)	115 (7.9)
1-1/2"	180 (12.4)	145 (10.0)	70 (4.8)

Series	TVFS		T-316 Stainless Steel
Range Code		-XX	See Range/ Connection Chart (add Range code to Series designator for model number)

*Contact factory for optional metric scales (liters/minute).

Available Ranges

Range Code	Range	Connection (female NPT)	Range Code	Range	Connection (female NPT)	Range Code	Range	Connection (female NPT)
-00	0.025-0.545 GPM Water	3/4" NPT	-19	0.16-3.20 SCFM Air	3/4" NPT	-33	1.50-25.0 SCFM Air	1-1/2" NPT
-01	0.04-0.80 GPM Water	3/4" NPT	-20	0.50-5.00 SCFM Air	3/4" NPT	-34	1.00-31.0 SCFM Air	1-1/2" NPT
-02	0.06-1.20 GPM Water	3/4" NPT	-21	0.30-7.40 SCFM Air	3/4" NPT	-35	2.00-40.0 SCFM Air	1-1/2" NPT
-03	0.08-1.64 GPM Water	3/4" NPT	-22	0.50-10.2 SCFM Air	3/4" NPT	-36	3.0-70.0 SCFM Air	1-1/2" NPT
-04	0.10-2.60 GPM Water	3/4" NPT	-23	0.60-14.0 SCFM Air	3/4" NPT	-37	4.0-100.0 SCFM Air	1-1/2" NPT
-05	0.15-3.80 GPM Water	3/4" NPT	-24	1.00-20.0 SCFM Air	3/4" NPT	-38	5.0-140.0 SCFM Air	1-1/2" NPT
-06	0.20-5.40 GPM Water	3/4" NPT	-25	1.00-26.0 SCFM Air	3/4" NPT	-39	5.0-175.0 SCFM Air	1-1/2" NPT
-07	0.20-7.00 GPM Water	3/4" NPT	-26	1.00-35.0 SCFM Air	3/4" NPT	-40	6.00-250.0 SCFM Air	1-1/2" NPT
-08	0.20-10.0 GPM Water	3/4" NPT	-27	2.00-50.0 SCFM Air	3/4" NPT	-41	2.00-310.0 SCFM Air	1-1/2" NPT
-09	0.60-14.00 GPM Water	3/4" NPT	-28	3.00-70.0 SCFM Air	3/4" NPT	-42	7.50-390.0 SCFM Air	1-1/2" NPT
-10	0.50-23.00 GPM Water	3/4" NPT	-29	4.00-85.0 SCFM Air	3/4" NPT	-43	10.0-510.0 SCFM Air	1-1/2" NPT
-11	0.50-11.0 GPM Water	1-1/2" NPT	-30	6.00-125.0 SCFM Air	3/4" NPT	-44	35.0-750.0 SCFM Air	1-1/2" NPT
-12	0.70-15.0 GPM Water	1-1/2" NPT	-31	6.0-160.0 SCFM Air	3/4" NPT	-45	20.0-1000.0 SCFM Air	1-1/2" NPT
-13	1.00-21.0 GPM Water	1-1/2" NPT	-32	4.00-260.0 SCFM Air	3/4" NPT			
-14	0.50-35.0 GPM Water	1-1/2" NPT						
-15	1.00-50.0 GPM Water	1-1/2" NPT						
-16	2.00-70.0 GPM Water	1-1/2" NPT						
-17	3.00-90.0 GPM Water	1-1/2" NPT						
-18	4.00-120.0 GPM Water	1-1/2" NPT						

FLOW

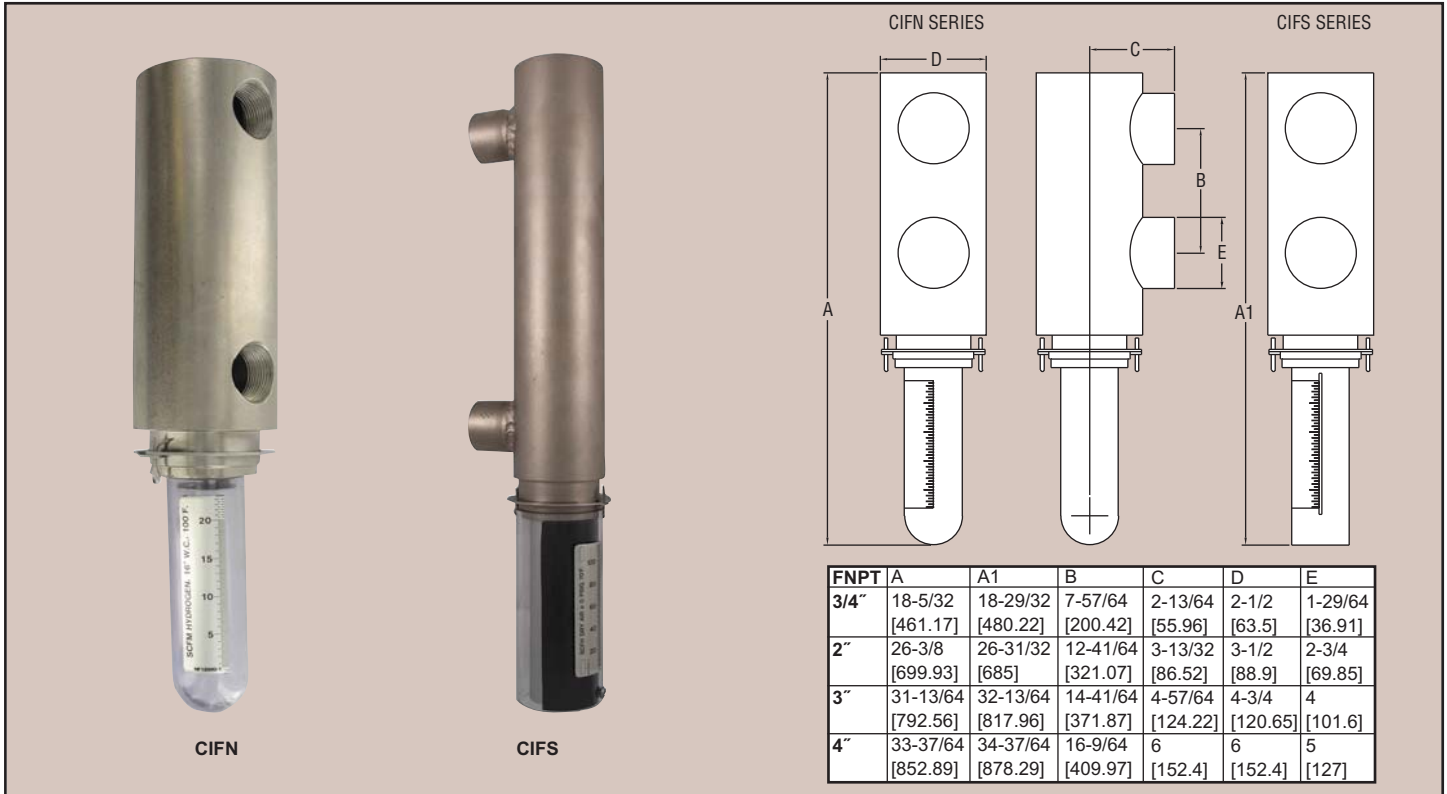
Flowmeters, In-Line



Series
CIF

Combustion Flowmeter

For Low Pressure Gas Flow



FNPT	A	A1	B	C	D	E
3/4"	18-5/32 [461.17]	18-29/32 [480.22]	7-57/64 [200.42]	2-13/64 [55.96]	2-1/2 [63.5]	1-29/64 [36.91]
2"	26-3/8 [699.93]	26-31/32 [685]	12-41/64 [321.07]	3-13/32 [86.52]	3-1/2 [88.9]	2-3/4 [69.85]
3"	31-13/64 [792.56]	32-13/64 [817.96]	14-41/64 [371.87]	4-57/64 [124.22]	4-3/4 [120.65]	4 [101.6]
4"	33-37/64 [852.89]	34-37/64 [878.29]	16-9/64 [409.97]	6 [152.4]	6 [152.4]	5 [127]

The Series CIF Combustion Flowmeters are tough, simple and accurate meters for low pressure, low-density gas measurement. They have a verifiable accuracy of $\pm 2\%$ for combustion gases, annealing atmospheres, vacuum flows, digesters and gas mixing. They can be disassembled quickly without the meter being removed from the pipeline for easy cleaning. Series CIF Combustion Flowmeters are extremely robust constructed of nickel plated steel or optional stainless steel with maximum pressure ratings of 150 psig (10.34 bar) and temperature ratings of 600°F (315°C).

Series	CIFN CIFS		Ni Plated Steel Body All Stainless Steel
Range Code		-XX	See Range/ Connection Chart (add Range code to Series designator for model number)

* For optional 3" and 4" connections ranging up to 30,000 SCFH, flange connections, and metric scales (liters/minute), contact the factory.

SPECIFICATIONS

Service: Compatible gases.

Wetted Materials: CIFN: Nickel plated steel body, 18-8 stainless steel, Buna-N O-rings, polysulfone sight tube; CIFS: 18-8 stainless steel, Buna-N O-rings, 18-8 stainless steel sight tube.

Temperature Limits: 600°F (315°C).

Pressure Limits: 150 psig (10 bar).

Maximum Pressure Drop: 2" w.c. (500 Pa).

Accuracy: $\pm 2\%$ of reading for dry air at 14.7 psig (1 bar), 70°F (21°C).

Repeatability: $\pm 1/4\%$ of indicated flow rate.

Process Connections: 3/4" and 2" female NPT, optional 3" and 4" female NPT.

Weight: 8 lb (6.4 kg) for 3/4" and 25 lb (11.4 kg) for 2".

Available Ranges

Range Code	Range	Connection (NPT)	Range Code	Range	Connection (NPT)
-00	0.8-20.0 SCFH Air	3/4"	-11	20-500 SCFH Air	2"
-01	1.0-30.0 SCFH Air	3/4"	-12	30-750 SCFH Air	2"
-02	2.0-50.0 SCFH Air	3/4"	-13	40-1000 SCFH Air	2"
-03	3.0-75.0 SCFH Air	3/4"	-14	50-1200 SCFH Air	2"
-04	4.0-100 SCFH Air	3/4"	-15	60-1500 SCFH Air	2"
-05	6.0-150 SCFH Air	3/4"	-16	80-2000 SCFH Air	2"
-06	10-250 SCFH Air	3/4"	-17	100-2500 SCFH Air	2"
-07	10-350 SCFH Air	3/4"	-18	120-3000 SCFH Air	2"
-08	20-500 SCFH Air	3/4"	-19	160-4000 SCFH Air	2"
-09	30-750 SCFH Air	3/4"	-20	200-5000 SCFH Air	2"
-10	40-1000 SCFH Air	3/4"			



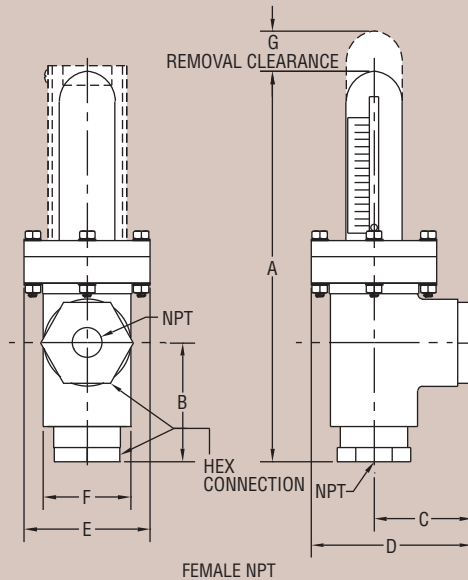
Series
PVF
&
CPF

PVC and CPVC Flowmeters

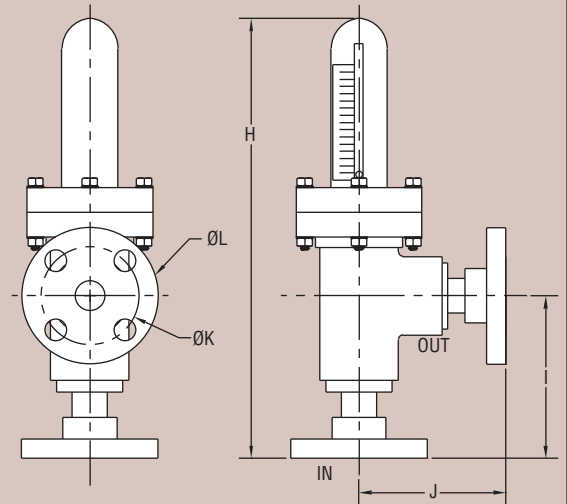
Perfect for Compatible Acids, Caustics and D.I. Water



PVF



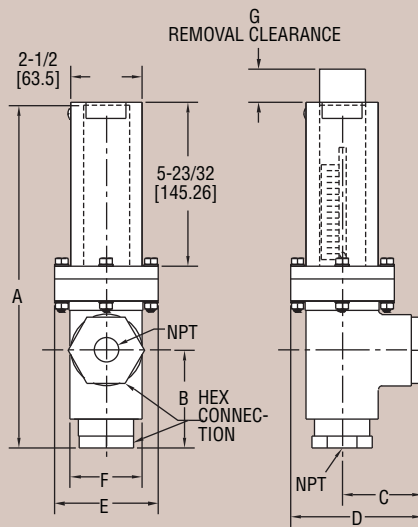
FEMALE NPT



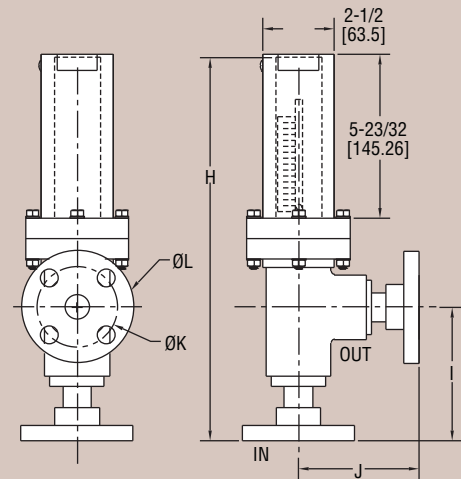
FLANGE VERSION



CPF



FEMALE NPT



FLANGE VERSION

Standard (NPT)

Range	NPT	A	B	C	D	E	F	G
00/10	3/4"	11-1/32	3-25/64	2-53/64	4-43/64	3-39/64	2-35/64	3
29/40		[280.19]	[86.12]	[71.83]	[118.67]	[91.68]	[64.69]	[76.2]
11/17	1-1/2"	16-15/16	4-1/4	4	6-29/64	5-1/32	3-29/64	5
41/51		[430.21]	[107.95]	[101.6]	[163.91]	[127.79]	[87.71]	[127]
18/22	3"	24-11/32	7-29/32	7-29/32	11-19/32	5-1/32	4-5/16	5
52/56		[618.27]	[200.66]	[200.66]	[294.63]	[127.79]	[109.22]	[127]
23/28	4"	26-43/64	9-13/16	9-13/16	14-9/32	5-7/16	5-7/16	5
57/62		[728.20]	[248.66]	[248.66]	[362.96]	[138.17]	[138.17]	[127]

Optional Flange

Option	Range	Flange	H	I	J	K	L	# of Bolt Holes	Flange Opening Diameter
F1	00/10 29/40	3/4"	12-1/4 [311.65]	4-5/8 [117.6]	4-1/16 [103.38]	2-3/4 [69.85]	3-7/8 [98.55]	4	(1-1/8")
F2	11/17 41/51	1-1/2"	18-5/8 [473.19]	5-15/16 [151.13]	5-11/16 [144.78]	3-7/8 [98.55]	5 [127]	4	(2")
F3	18/22 52/56	3"	22-35/64 [572.64]	6-7/64 [155.18]	6-7/64 [155.18]	6 [152.4]	7-1/2 [190.5]	4	(3-1/2")
F4	23/28 57/62	4"	26-3/8 [669.86]	7-1/2 [190.5]	7-1/2 [190.5]	7-1/2 [190.5]	9 [228.6]	8	(4-1/2")

FLOW

Flowmeters, In-Line

The Series PVF & CPF Flowmeters are heavy bodied meters for corrosives and high purity fluids. They are economically priced meters ideal for acids or de-ionized water making them suited for water & wastewater treatment facilities. The flowmeters are comprised of all plastic wetted components for maximum corrosion resistance. They have a full-scale accuracy of $\pm 2\%$ and can be disassembled quickly without the meter being removed from the pipeline for easy cleaning. The flowmeters are available with 3/4", 1-1/2", 3", and 4" female NPT connections. Optional flange connections are also available.

SPECIFICATIONS

Service: Compatible gases or liquids.
Wetted Materials: PVF: PVC, fluoroelastomer O-rings; CPF: CPVC, Buna-N O-rings.
Temperature Limits: See operating limits chart.
Pressure Limits: See operating limits chart.
Accuracy: $\pm 2\%$ of full scale.
Repeatability: $\pm 1/2\%$ of indicated flow rate.
Process Connections: 3/4", 1-1/2", 3", and 4" female NPT.
Weight: 3 lb (1.4 kg) for 3/4", 9 lb (4.1 kg) for 1-1/2", 14 lb (6.4 kg) for 3", and 18 lb (8.2) for 4".

Water Service

Range (GPM Water)	Connection (female NPT)	Model	Model
0.025-0.54	3/4"	PVF-00	CPF-00
0.04-0.80	3/4"	PVF-01	CPF-01
0.06-1.20	3/4"	PVF-02	CPF-02
0.08-1.64	3/4"	PVF-03	CPF-03
0.10-2.60	3/4"	PVF-04	CPF-04
0.15-3.80	3/4"	PVF-05	CPF-05
0.20-5.40	3/4"	PVF-06	CPF-06
0.20-7.00	3/4"	PVF-07	CPF-07
0.20-10.00	3/4"	PVF-08	CPF-08
0.60-15.00	3/4"	PVF-09	CPF-09
0.50-20.0	3/4"	PVF-10	CPF-10
0.50-11.0	1-1/2"	PVF-11	CPF-11
0.70-15.0	1-1/2"	PVF-12	CPF-12
1.00-25.0	1-1/2"	PVF-13	CPF-13
0.50-35.0	1-1/2"	PVF-14	CPF-14
1.00-50.0	1-1/2"	PVF-15	CPF-15
2.00-70.0	1-1/2"	PVF-16	CPF-16
4.00-120	1-1/2"	PVF-17	CPF-17
2.00-50.0	3"	PVF-18	CPF-18
4.00-100	3"	PVF-19	CPF-19
7.00-150	3"	PVF-20	CPF-20
10.0-200	3"	PVF-21	CPF-21
15.0-300	3"	PVF-22	CPF-22
4.00-100	4"	PVF-23	CPF-23
7.00-150	4"	PVF-24	CPF-24
10.0-200	4"	PVF-25	CPF-25
15.0-300	4"	PVF-26	CPF-26
15.0-400	4"	PVF-27	CPF-27
20.0-500	4"	PVF-28	CPF-28

Note: For optional flange connections contact the factory.

Air Service

Range (SCFM Air)	Connection (female NPT)	Model	Model
0.30-7.40	3/4"	PVF-29	CPF-29
0.50-10.2	3/4"	PVF-30	CPF-30
0.70-14.0	3/4"	PVF-31	CPF-31
1.00-20.0	3/4"	PVF-32	CPF-32
1.00-26.0	3/4"	PVF-33	CPF-33
1.00-35.0	3/4"	PVF-34	CPF-34
2.00-50.0	3/4"	PVF-35	CPF-35
3.00-70.0	3/4"	PVF-36	CPF-36
4.00-85.0	3/4"	PVF-37	CPF-37
6.00-125	3/4"	PVF-38	CPF-38
6.00-160	3/4"	PVF-39	CPF-39
4.00-260	3/4"	PVF-40	CPF-40
2.0-40.0	1-1/2"	PVF-41	CPF-41
3.00-70.0	1-1/2"	PVF-42	CPF-42
4.00-100	1-1/2"	PVF-43	CPF-43
5.00-140	1-1/2"	PVF-44	CPF-44
5.00-175	1-1/2"	PVF-45	CPF-45
6.00-250	1-1/2"	PVF-46	CPF-46
2.0-310	1-1/2"	PVF-47	CPF-47
7.50-390	1-1/2"	PVF-48	CPF-48
10.0-510	1-1/2"	PVF-49	CPF-49
35.0-750	1-1/2"	PVF-50	CPF-50
20.0-1000	1-1/2"	PVF-51	CPF-51
30.0-600	3"	PVF-52	CPF-52
40.0-1000	3"	PVF-53	CPF-53
70.0-1750	3"	PVF-54	CPF-54
100.0-2300	3"	PVF-55	CPF-55
150.0-3500	3"	PVF-56	CPF-56
40.0-1000	4"	PVF-57	CPF-57
70.0-1750	4"	PVF-58	CPF-58
100.0-2300	4"	PVF-59	CPF-59
150.0-3500	4"	PVF-60	CPF-60
150.0-4000	4"	PVF-61	CPF-61
200.0-5000	4"	PVF-62	CPF-62

Operating Limits For Series PVF Flowmeters

Maximum Non-Shock Working Pressure, psig @ °F (bar @ °C)					
Body Size and Description	70°F (21°C)	80°F (26°C)	100°F (37°C)	120°F (48°C)	140°F (60°C)
3/4" PVC-NPT connection	250 (17)	255 (15)	150 (10)	90 (6)	50 (3)
1-1/2" PVC-NPT connection	170 (11)	150 (10)	105 (7)	65 (4)	40 (2)
3" and 4" PVC-NPT connection	160 (11)	150 (10)	105 (7)	65 (4)	40 (2)
3/4" PVC-Flange connection	150 (10)	150 (10)	150 (10)	65 (4)	50 (3)
1-1/2" PVC-Flange connection	150 (10)	150 (10)	105 (7)	65 (4)	40 (2)
3" and 4" PVC-Flange connection	150 (10)	150 (10)	105 (7)	65 (4)	40 (2)

Operating Limits For Series CPF Flowmeters

Maximum Non-Shock Working Pressure, psig @ °F (bar @ °C)								
Body Size and Description	70°F (21°C)	80°F (26°C)	100°F (37°C)	120°F (48°C)	140°F (60°C)	160°F (71°C)	180°F (82°C)	210°F (98°C)
3/4" CPVC-NPT connection	270 (19)	270 (19)	250 (17)	200 (10)	150 (10)	130 (9)	80 (6)	50 (3)
1-1/2" CPVC-NPT connection	180 (12)	180 (12)	170 (11)	145 (10)	115 (8)	85 (6)	50 (3)	30 (2)
3" and 4" CPVC-NPT connection	160 (11)	160 (11)	140 (10)	125 (9)	105 (7)	75 (5)	50 (3)	30 (2)
3/4" CPVC-Flange connection	150 (10)	150 (10)	150 (10)	135 (9)	110 (8)	90 (6)	70 (5)	40 (2)
1-1/2" CPVC-Flange connection	150 (10)	150 (10)	150 (10)	135 (9)	110 (8)	90 (6)	70 (5)	40 (2)
3" and 4" CPVC-Flange connection	150 (10)	150 (10)	150 (10)	135 (9)	110 (8)	90 (6)	70 (5)	40 (2)





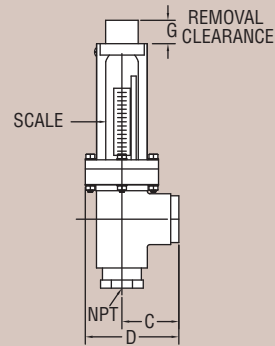
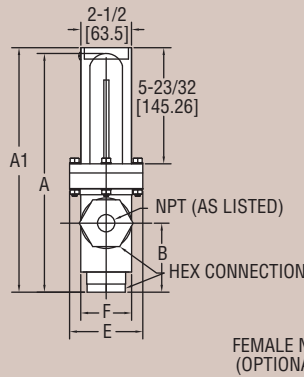
Series
P72

P72 Flowmeters

Perfect for Wastewater and Water Treatment Facilities Dealing with Water, Caustics and Chlorines



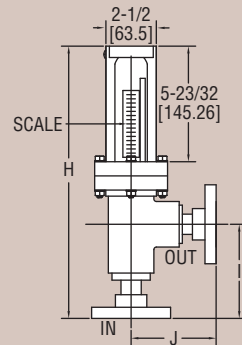
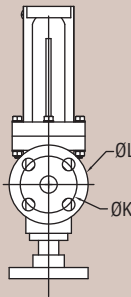
P72-A With Optional NPT



FEMALE NPT
(OPTIONAL)



P72-B With Flange



FLANGE VERSION FOR P72-A/P72-B
(STANDARD)

NPT OPTION

NPT	A	B	C	D	E	F	G
3/4"	11-1/32 [280.19]	3-25/64 [86.12]	2-53/64 [71.83]	4-43/64 [118.67]	3-39/64 [91.68]	2-35/64 [64.69]	3 [76.2]
1-1/2"	16-15/16 [430.21]	4-1/4 [107.95]	4 [101.6]	6-29/64 [163.91]	5-1/32 [127.79]	3-29/64 [87.71]	5 [127]

Flange	H	I	J	ØK	ØL	# of Bolt Holes	Flange Opening Diameter
3/4"	12-1/4 [311.65]	4-5/8 [117.6]	4-1/16 [103.38]	2-3/4 [69.85]	3-7/8 [98.55]	4	(1-1/8")
1-1/2"	18-5/8 [473.19]	5-15/16 [151.13]	5-11/16 [144.78]	3-7/8 [98.55]	5 [127]	4	(2")
3"	22-35/64 [572.64]	6-7/64 [155.18]	6-7/64 [155.18]	6 [152.4]	7-1/2 [190.5]	4	(3-1/2")
4"	26-3/8 [669.86]	7-1/2 [190.5]	7-1/2 [190.5]	7-1/2 [190.5]	9 [228.6]	8	(4-1/2")

The Series P72 Flowmeters are heavy bodied meters for corrosives, gases, and high purity fluids. These meters are designed specifically for demanding applications. They are economically priced meters ideal for caustic solutions as well as liquid chlorine, sodium hypochlorite and chlorine gas. The Series P72 Flowmeters are suited for water treatment facilities that deal with these aggressive types of gases and fluids. The P72-A is comprised of P72 and polysulfone, while the P72-B has all P72 wetted components for maximum corrosion resistance. Units have a full-scale accuracy of ±2% and can be disassembled quickly without the meter being removed from the pipeline for easy cleaning. The Series P72 Flowmeters are available with standard 3/4", 1-1/2", 3", and 4" flange connections. Optional NPT connections are also available.

OPERATING LIMITS FOR SERIES P72 FLOWMETERS

Maximum Non-Shock Working Pressure, PSIG @ °F (bar @ °C)

Body Size and Description	70°F (21°C)	80°F (26°C)	100°F (37°C)	120°F (48°C)	140°F (60°C)	160°F (71°C)	180°F (82°C)	210°F (98°C)
3/4" P72-NPT connection	270 (19)	270 (19)	250 (17)	200 (10)	150 (10)	130 (9)	80 (6)	50 (3)
1-1/2" P72-NPT connection	180 (12)	180 (12)	170 (11)	145 (10)	115 (8)	75 (5)	50 (3)	30 (2)
3/4" P72-Flange connection	150 (10)	150 (10)	150 (10)	135 (9)	110 (8)	90 (6)	70 (5)	40 (2)
1-1/2" P72-Flange connection	150 (10)	150 (10)	150 (10)	135 (9)	110 (8)	90 (6)	70 (5)	40 (2)
3" and 4" P72-Flange connection	150 (10)	150 (10)	150 (10)	135 (9)	110 (8)	90 (6)	70 (5)	40 (2)

SPECIFICATIONS

Service: Compatible gases or liquids.

Wetted Materials:

P72-A: P72, polysulfone;

P72-B: P72.

Temperature Limits: See operating limits.

Pressure Limits: See operating limits.

Accuracy: ±2% of full scale.

Repeatability: ±1/2% of indicated flow rate.

Process Connections: 3/4", 1-1/2", 3" and 4" flange connection with optional NPT connection available.

Weight: 3 lb (1.4 kg) for 3/4", 9 lb (4.1 kg) for 1-1/2", 14 lb (6.4 kg) for 3", and 18 lb (8.2 kg) for 4".

FLOW

Flowmeters, In-Line

Model	Range (GPM Cl)	Connection (Flange)
P72-A126	0.03 to 0.62	3/4"
P72-A127	0.05 to 0.92	3/4"
P72-A128	0.07 to 1.39	3/4"
P72-A129	0.09 to 1.89	3/4"
P72-A130	0.12 to 3.00	3/4"
P72-A131	0.17 to 4.39	3/4"
P72-A132	0.23 to 6.24	3/4"
P72-A133	0.23 to 8.08	3/4"
P72-A134	0.23 to 11.55	3/4"
P72-A135	0.69 to 17.32	3/4"
P72-A136	0.58 to 23.09	3/4"
P72-A137	0.58 to 12.50	1-1/2"
P72-A138	0.81 to 17.00	1-1/2"
P72-A139	1.15 to 28.50	1-1/2"
P72-A140	0.58 to 40.00	1-1/2"
P72-A141	1.15 to 57.50	1-1/2"
P72-A142	2.30 to 80.50	1-1/2"
P72-A143	4.50 to 138.50	1-1/2"
P72-A144	2.30 to 57.50	3"
P72-A145	4.62 to 115	3"
P72-A146	8.10 to 175	3"
P72-A147	11.5 to 230	3"
P72-A148	17.0 to 350	3"
P72-A149	4.60 to 115	4"
P72-A150	8.10 to 175	4"
P72-A151	11.5 to 230	4"
P72-A152	17.0 to 350	4"

Model	Range (SCFM Cl2)	Connection (Flange)
P72-A184	0.47 to 11.70	3/4"
P72-A185	0.79 to 16.10	3/4"
P72-A186	1.10 to 22.10	3/4"
P72-A187	1.50 to 31.50	3/4"
P72-A188	1.50 to 41.00	3/4"
P72-A189	1.50 to 55.00	3/4"
P72-A190	3.10 to 78.50	3/4"
P72-A191	4.70 to 110	3/4"
P72-A192	6.30 to 134	3/4"
P72-A193	9.50 to 195	3/4"
P72-A194	9.50 to 250	3/4"
P72-A195	6.30 to 410	3/4"
P72-A196	3.10 to 63	1-1/2"
P72-A197	4.73 to 110	1-1/2"
P72-A198	6.30 to 157	1-1/2"
P72-A199	7.50 to 220	1-1/2"
P72-A200	7.50 to 275	1-1/2"
P72-A201	9.5 to 394	1-1/2"
P72-A202	3.10 to 489	1-1/2"
P72-A203	11.8 to 615	1-1/2"
P72-A204	15.7 to 804	1-1/2"
P72-A205	55.0 to 1180	1-1/2"
P72-A206	31.5 to 1575	1-1/2"
P72-A207	47.0 to 945	3"
P72-A208	63.0 to 1575	3"
P72-A209	110.0 to 2760	3"
P72-A210	157.0 to 3625	3"
P72-A211	253.0 to 5520	3"
P72-A212	63.0 to 1575	4"
P72-A213	70.0 to 1750	4"
P72-A214	110.0 to 2760	4"
P72-A215	235.0 to 5520	4"

Model	Range (SCFM NaOH)	Connection (Flange)
P72-A252	0.44 to 10.75	3/4"
P72-A253	0.70 to 14.75	3/4"
P72-A254	1.00 to 20.40	3/4"
P72-A255	1.45 to 29.15	3/4"
P72-A256	1.45 to 37.90	3/4"
P72-A257	1.45 to 51.50	3/4"
P72-A258	2.92 to 72.90	3/4"
P72-A259	4.38 to 102.10	3/4"
P72-A260	5.80 to 124	3/4"
P72-A261	8.75 to 182	3/4"
P72-A262	8.75 to 233	3/4"
P72-A263	5.80 to 379	3/4"
P72-A264	2.90 to 58.40	1-1/2"
P72-A265	4.38 to 102	1-1/2"
P72-A266	5.80 to 145	1-1/2"
P72-A267	7.30 to 204	1-1/2"
P72-A268	7.30 to 255	1-1/2"
P72-A269	8.75 to 365	1-1/2"
P72-A270	2.9 to 450	1-1/2"
P72-A271	10.9 to 565	1-1/2"
P72-A272	14.5 to 740	1-1/2"
P72-A273	51.1 to 1090	1-1/2"
P72-A274	29.0 to 1450	1-1/2"
P72-A275	44.0 to 875	3"
P72-A276	58.4 to 1450	3"
P72-A277	102.1 to 2550	3"
P72-A278	145 to 3350	3"
P72-A279	218.8 to 5105	3"
P72-A280	58.4 to 1450	4"
P72-A281	102.1 to 2550	4"
P72-A282	145 to 3350	4"
P72-A283	218.8 to 5105	4"

Model	Range (GPM Water)	Connection (Flange)
P72-A000	0.025 to 0.54	3/4"
P72-A001	0.04 to 0.80	3/4"
P72-A002	0.06 to 1.20	3/4"
P72-A003	0.08 to 1.64	3/4"
P72-A004	0.10 to 2.60	3/4"
P72-A005	0.15 to 3.80	3/4"
P72-A006	0.20 to 5.40	3/4"
P72-A007	0.20 to 7.00	3/4"
P72-A008	0.20 to 10.00	3/4"
P72-A009	0.60 to 15.00	3/4"
P72-A010	0.50 to 20.0	3/4"
P72-A011	0.50 to 11.0	1-1/2"
P72-A012	0.70 to 15.0	1-1/2"
P72-A013	1.00 to 25.0	1-1/2"
P72-A014	0.50 to 35.0	1-1/2"
P72-A015	1.00 to 50.0	1-1/2"
P72-A016	2.00 to 70.0	1-1/2"
P72-A017	4.00 to 120	1-1/2"
P72-A018	2.00 to 50.0	3"
P72-A019	4.00 to 100	3"
P72-A020	7.00 to 150	3"
P72-A021	10.0 to 200	3"
P72-A022	15.0 to 300	3"
P72-A023	4.00 to 100	4"
P72-A024	7.00 to 150	4"
P72-A025	10.0 to 200	4"
P72-A026	15.0 to 300	4"

Model	Range (SCFM Air)	Connection (Flange)
P72-A058	0.30 to 7.40	3/4"
P72-A059	0.50 to 10.2	3/4"
P72-A060	0.70 to 14.0	3/4"
P72-A061	1.00 to 20.0	3/4"
P72-A062	1.00 to 26.0	3/4"
P72-A063	1.00 to 35.0	3/4"
P72-A064	2.00 to 50.0	3/4"
P72-A065	3.00 to 70.0	3/4"
P72-A066	4.00 to 85.0	3/4"
P72-A067	6.00 to 125	3/4"
P72-A068	6.00 to 160	3/4"
P72-A069	4.00 to 260	3/4"
P72-A070	2.0 to 40.0	1-1/2"
P72-A071	3.00 to 70.0	1-1/2"
P72-A072	4.00 to 100	1-1/2"
P72-A073	5.00 to 140	1-1/2"
P72-A074	5.00 to 175	1-1/2"
P72-A075	6.00 to 250	1-1/2"
P72-A076	2.0 to 310	1-1/2"
P72-A077	7.50 to 390	1-1/2"
P72-A078	10.0 to 510	1-1/2"
P72-A079	35.0 to 750	1-1/2"
P72-A080	20.0 to 1000	1-1/2"
P72-A081	30.0 to 600	3"
P72-A082	40.0 to 1000	3"
P72-A083	70.0 to 1750	3"
P72-A084	100.0 to 2300	3"
P72-A085	150.0 to 3500	3"
P72-A086	40.0 to 1000	4"
P72-A087	70.0 to 1750	4"
P72-A088	100.0 to 2300	4"
P72-A089	150.0 to 3500	4"

Model	Range (GPM NaOCRI)	Connection (Flange)
P72-A320	0.03 to 0.65	3/4"
P72-A321	0.05 to 0.90	3/4"
P72-A322	0.07 to 1.35	3/4"
P72-A323	0.09 to 1.85	3/4"
P72-A324	0.10 to 2.93	3/4"
P72-A325	0.17 to 4.28	3/4"
P72-A326	0.23 to 6.08	3/4"
P72-A327	0.23 to 7.89	3/4"
P72-A328	0.23 to 11.27	3/4"
P72-A329	0.68 to 16.90	3/4"
P72-A330	0.56 to 22.54	3/4"
P72-A331	0.56 to 12.4	1-1/2"
P72-A332	0.79 to 16.9	1-1/2"
P72-A333	1.13 to 28.2	1-1/2"
P72-A334	0.56 to 39.4	1-1/2"
P72-A335	1.13 to 56.3	1-1/2"
P72-A336	2.25 to 78.9	1-1/2"
P72-A337	4.50 to 135	1-1/2"
P72-A338	2.25 to 56.3	3"
P72-A339	4.50 to 113	3"
P72-A340	7.9 to 169	3"
P72-A341	11.3 to 225	3"
P72-A342	16.9 to 338	3"
P72-A343	4.50 to 112	4"
P72-A344	7.9 to 169	4"
P72-A345	11.2 to 225	4"
P72-A346	16.9 to 338	4"

Note: For all P72 construction, change "A" to "B". Consult website or factory for ordering code and pricing. Meters available with optional 3/4" and 1-1/2" female NPT connections instead of flange.

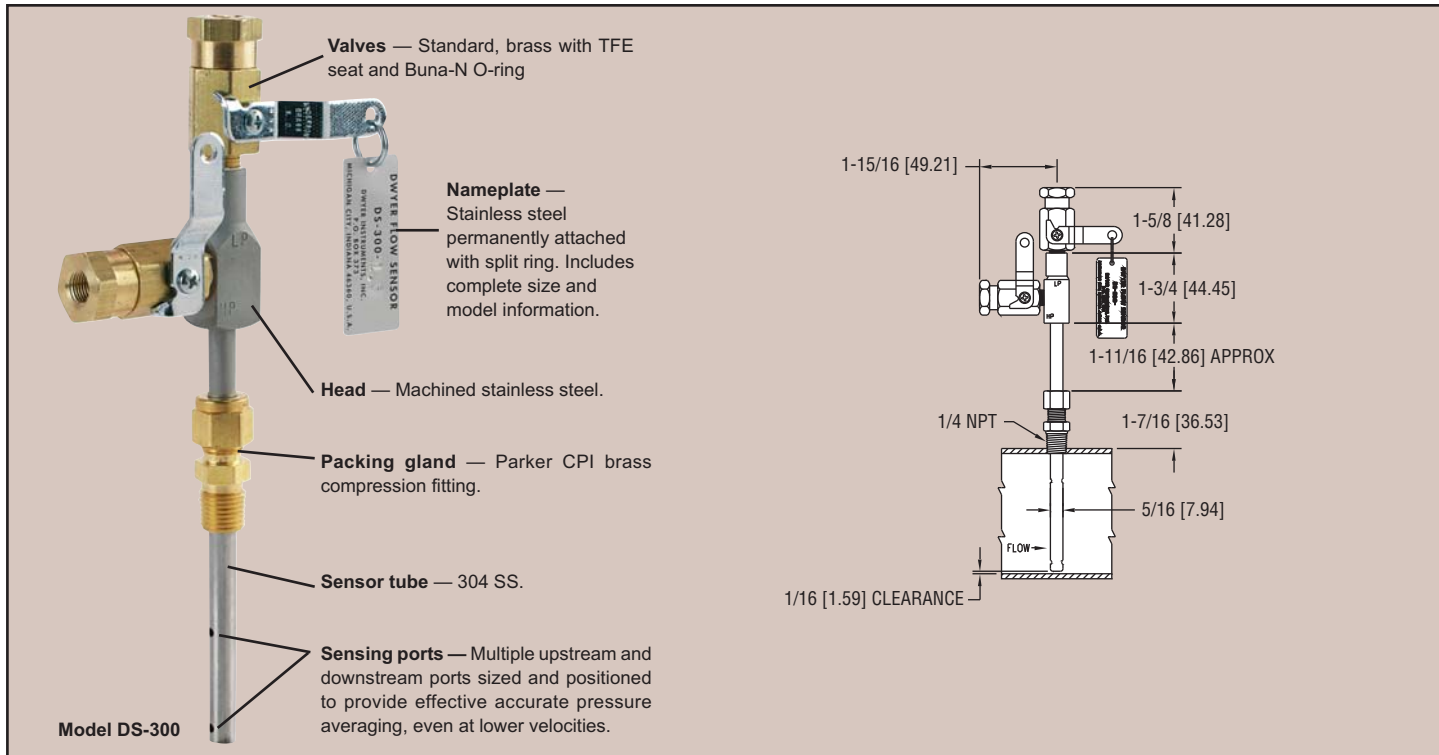
FLOW
Flowmeters, In-Line



Series
DS

In-Line Flow Sensors

Use with the Dwyer® Differential Pressure Gages or Transmitters



FLOW

Flow Sensors, In-Line

In-Line Flow Sensors are averaging Pitot tubes that provide accurate and convenient flow rate sensing for schedule 40 pipe. When purchased with a Dwyer® Capsuhelic® differential pressure gage of appropriate range, the result is a flow indicating system delivered off the shelf at an economical price.

Pitot tubes have been used in flow measurement for years. Conventional pitot tubes sense velocity pressure at only one point in the flowing stream. Therefore, a series of measurements must be taken across the stream to obtain a meaningful average flow rate. The Dwyer® flow sensor eliminates the need for “traversing” the flowing stream because of its multiple sensing points and built-in averaging capability.

The Series DS-300 flow sensors are designed to be inserted in the pipeline through a compression fitting. They are furnished with instrument shut-off valves on both pressure connections. Valves are fitted with 1/8” female NPT connections. Accessories include adapters with 1/4” SAE 45° flared ends compatible with hoses supplied with the Model A-471 Portable Capsuhelic® gage kit. Standard valves are rated at 200 psig (13.7 bar) and 200°F (93.3°C). Where valves are not required, they can be omitted at reduced cost. Series DS-300 flow sensors are available for pipe sizes from 1” to 10”.

DS-400 Averaging Flow Sensors are quality constructed from extra strong 3/4” dia. stainless steel to resist increased forces encountered at higher flow rates with both air and water. This extra strength also allows them to be made in longer insertion lengths up to 24 inches (61 cm). All models include convenient and quick-acting quarter-turn ball valves to isolate the sensor for zeroing. Process connections to the valve assembly are 1/8” female NPT. A pair of 1/8” NPT X 1/4” SAE 45° flared adapters are included, compatible with hoses used in the Model A-471 Portable Capsuhelic® Gage Kit. Supplied solid brass mounting adapter has a 3/4” dia. compression fitting to lock in required insertion length and a 3/4” male NPT thread for mounting in a Threaded Branch Connection.

Select model with suffix which matches pipe size

- Model DS-300-1”
- Model DS-300-1-1/4”
- Model DS-300-1-1/2”
- Model DS-300-2”
- Model DS-300-2-1/2”
- Model DS-300-3”
- Model DS-300-4”
- Model DS-300-6”
- Model DS-300-8”
- Model DS-300-10”

- Model DS-400-6”
- Model DS-400-8”
- Model DS-400-10”
- Model DS-400-12”
- Model DS-400-14”
- Model DS-400-16”
- Model DS-400-18”
- Model DS-400-20”
- Model DS-400-24”

OPTIONS & ACCESSORIES

- DS-300 or DS-400 Less Valves. To order, add suffix **-LV**
- A-160**, Threaded Branch Connection, 3/8” NPT, forged steel, 3000 psi
- A-161**, Brass Bushing, 1/4” x 3/8”

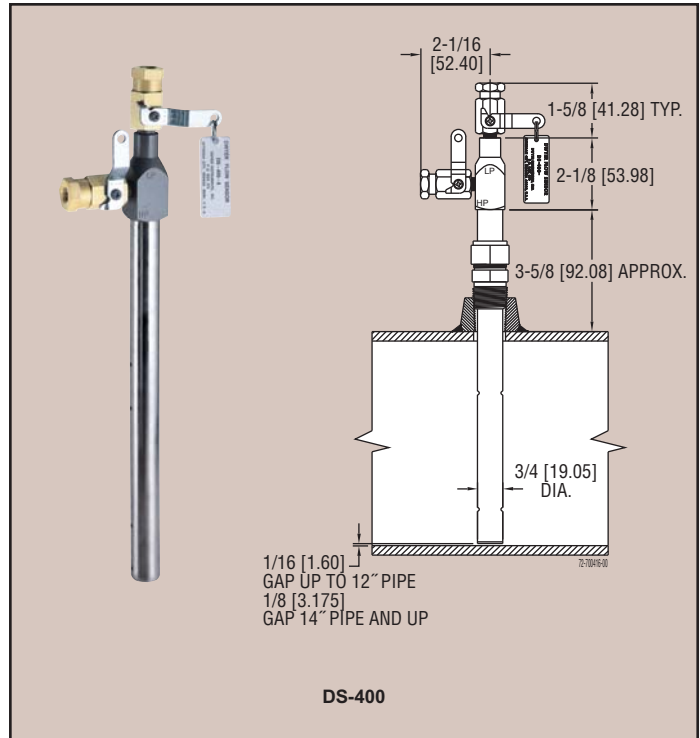
How To Order

Merely determine the pipe size into which the flow sensor will be mounted and designate the size as a suffix to Model DS-300. For example, a flow sensor to be mounted in a 2" pipe would be a Model No. DS-300-2".

For non-critical water and air flow monitoring applications, the chart below can be utilized for ordering a stock Capsuhelic® differential pressure gage for use with the DS-300 flow sensor. Simply locate the maximum flow rate for the media being measured under the appropriate pipe size and read the Capsuhelic® gage range in inches of water column to the left. The DS-300 sensor is supplied with installation and operating instructions, Bulletin F-50. It also includes complete flow conversion information for the three media conditions shown in the chart below. This information enables the user to create a complete differential pressure to flow rate conversion table for the sensor and differential pressure gage employed. Both the Dwyer® Capsuhelic® gage and flow sensor feature excellent repeatability so, once the desired flow rate is determined, deviation from that flow in quantitative measure can be easily determined. You may wish to order the adjustable signal flag option for the Capsuhelic® gage to provide an easily identified reference point for the proper flow.

Capsuhelic® gages with special ranges and/or direct reading scales in appropriate flow units are available on special order for more critical applications. Customer supplied data for the full scale flow (quantity and units) is required along with the differential pressure reading at that full flow figure. Prior to ordering a special Capsuhelic® differential pressure gage for flow read-out, we recommend you request Bulletin F-50 to obtain complete data on converting flow rates of various media to the sensor differential pressure output. With this bulletin and after making a few simple calculations, the exact range gage required can easily be determined.

Large 3/4 Inch Diameter for Extra Strength in Lengths to 24 Inches



Gage Range (in w.c.)	Media @ 70°F	Full Range Flows by Pipe Size (Approximate)									
		1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"	10"
2	Water (GPM)	4.8	8.3	11.5	20.5	30	49	86	205	350	560
	Air @ 14.7 PSIA (SCFM)	19.0	33.0	42.0	65.0	113	183	330	760	1340	2130
	Air @ 100 PSIG (SCFM)	50.0	90.5	120.0	210.0	325	510	920	2050	3600	6000
5	Water (GPM)	7.7	14.0	18.0	34.0	47	78	138	320	560	890
	Air @ 14.7 PSIA (SCFM)	30.0	51.0	66.0	118.0	178	289	510	1200	2150	3400
	Air @ 100 PSIG (SCFM)	83.0	142.0	190.0	340.0	610	820	1600	3300	5700	10000
10	Water (GPM)	11.0	19.0	25.5	45.5	67	110	195	450	800	1260
	Air @ 14.7 PSIA (SCFM)	41.0	72.0	93.0	163.0	250	410	725	1690	3040	4860
	Air @ 100 PSIG (SCFM)	120.0	205.0	275.0	470.0	740	1100	2000	4600	8100	15000
25	Water (GPM)	18.0	32.0	40.5	72.0	108	173	310	720	1250	2000
	Air @ 14.7 PSIA (SCFM)	63.0	112.0	155.0	255.0	390	640	1130	2630	4860	7700
	Air @ 100 PSIG (SCFM)	185.0	325.0	430.0	760.0	1200	1800	3300	7200	13000	22000
50	Water (GPM)	25.0	44.0	57.5	100.0	152	247	435	1000	1800	
	Air @ 14.7 PSIA (SCFM)	90.0	161.0	205.0	360.0	560	900	1600	3700	6400	
	Air @ 100 PSIG (SCFM)	260.0	460.0	620.0	1050.0	1700	2600	4600	10000	18500	
100	Water (GPM)	36.5	62.0	82.0	142.0	220	350	620	1500		
	Air @ 14.7 PSIA (SCFM)	135.0	230.0	300.0	505.0	800	1290	2290	5000		
	Air @ 100 PSIG (SCFM)	370.0	660.0	870.0	1500.0	2300	3600	6500	15000		

Model A-471 Portable Kit

The Dwyer® Series 4000 Capsuhelic® differential pressure gage is ideally suited for use as a read-out device with the DS-300 Flow Sensors. The gage may be used on system pressures of up to 500 psig even when the flow sensor differential pressure to be read is less than 0.5" w.c. With accuracy of ±3% of full scale, the Capsuhelic® gage can be used in ambient temperatures from 32 to 200°F (0 to 93.3°C). Zero and range adjustments are made from outside the gage. The standard gage with a die cast aluminum housing can be used with the flow sensor for air or oil applications. For water flow measurements, the optional forged brass housing should be specified. The Capsuhelic® gage may be panel or surface mounted and permanently plumbed to the flow sensor if desired. The optional A-610 pipe mounting bracket allows the gage to be easily attached to any 1-1/4" - 2" horizontal or vertical pipe.

For portable operation, the A-471 Capsuhelic® Portable Gage Kit is available complete with tough polypropylene carrying case, mounting bracket, 3-way manifold valve, two 10' high pressure hoses, and all necessary fittings. See pages 10 and 11 for complete information on the Capsuhelic® gage

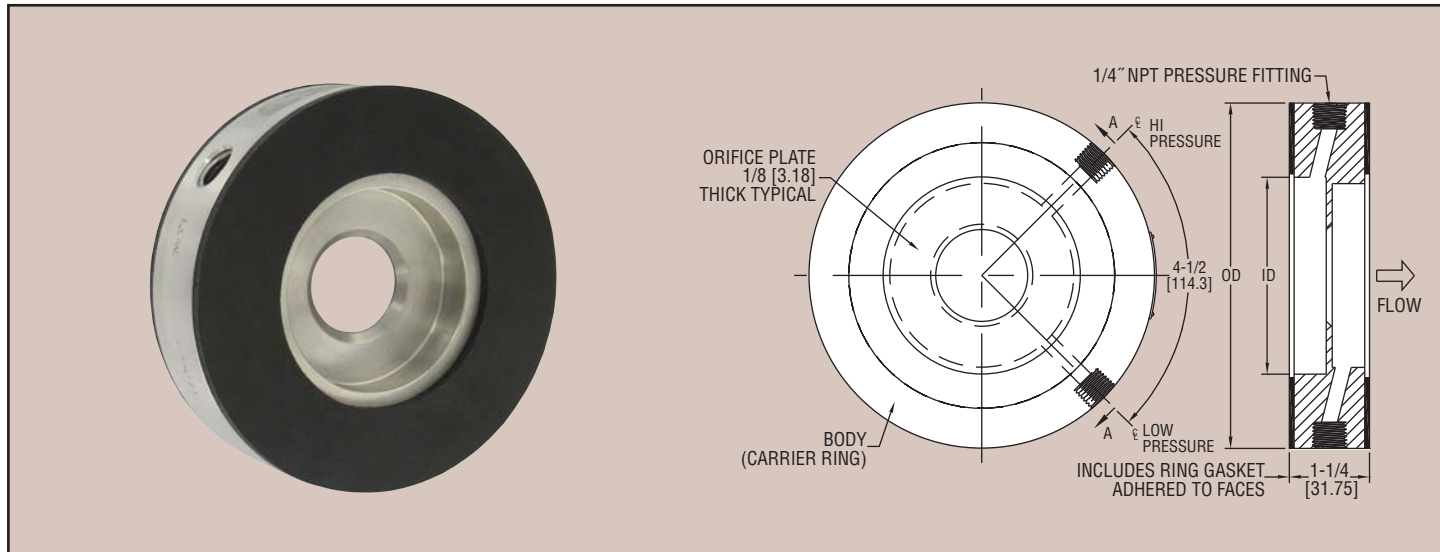




Series
OP

Orifice Plate Flowmeter

Stainless Steel for Use with Liquids and Gases



The Series OP Orifice Plate Flow Meter is a complete orifice plate flow metering package. It incorporates a stainless steel orifice plate with a unique holder or carrier ring containing metering taps and integral gaskets. It was designed for use wherever there is an application for a conventional flow orifice plate. It can also be used in place of other primary differential producers for efficiency and cost effectiveness. Installation is accomplished simply by slipping the unit between standard flanges (orifice flanges are not required). The Series OP is available in line sizes from 1/2" to 24" and can be used with compatible liquids and gases.

FEATURES

- Mounted with standard flanges
- Corner type metering taps
- Corrosion free material
- Simplified installation
- Stainless steel wetted parts
- Proven through a wide range of applications for energy efficiency
- Assures long term reliability and accuracy

APPLICATION

Fluid flow rates in building water lines.

SPECIFICATIONS

Service: For metering compatible liquids and gases.

Wetted Material: 304 SS, Buna-N gaskets.

Accuracy: 0.6% of full scale flow. (Beta = .2-.6) $\pm 0.7\%$ for Beta greater than .6.

Temperature Limits: -50 to 200°F (-45 to 93°C).

Pressure Limits: Limited only by pipe and flange rating restrictions.

Head Loss: 1-Beta ratio² eg: $1-0.7^2 = 1-0.49 = 51\%$ of the d.p.

Line Sizes: 1/2" to 24".

Process Connection: 1/4" female NPT.

Installation: Standard flange, any rating (orifice flanges not required).

Pipe Requirements: General requirements 10 diameter upstream and 5 diameter downstream of orifice plate.

Weight: Varies with line size. See chart.

Series OP Orifice Plate Flowmeter

- Material 304/304 L- dual certified- Gaskets Buna-N
- Based on 70°F, 14.7 psia (Base Conditions)
- Beta Value Based on Std Sch pipe I.D.
- 1.25" overall thickness
- Orifice plate thickness is 0.125"

Model	Weight (lb)	Line Size	Bore	Beta	Water Capacity		Air Capacity - Flow in SCFM			
					Inch d.p. W/C	Flow in GPM	Inch d.p. W/C	at 14.7 psia (0 psig)	at 20 psig	at 100 psig
OP-A-1	1.00	1/2"	0.200"	0.32	20	0.62	20	2.35	3.63	6.61
OP-A-2	1.00	1/2"	0.310"	0.50	100	3.44	100	12.21	19.58	36.37
OP-A-3	1.00	1/2"	0.430"	0.69	320	13.00	200	32.77	56.15	107.47
OP-B-1	1.00	3/4"	0.250"	0.30	20	0.97	20	3.65	5.66	10.3
OP-B-2	1.00	3/4"	0.400"	0.49	100	5.69	100	20.21	32.44	60.26
OP-B-3	1.00	3/4"	0.580"	0.70	320	23.82	200	59.92	102.91	197.2
OP-C-1	2.00	1"	0.300"	0.29	20	1.38	20	5.24	8.11	14.8
OP-C-2	2.00	1"	0.520"	0.49	100	9.63	100	34.2	54.92	102.09
OP-C-3	2.00	1"	0.720"	0.69	320	36.15	200	91.28	156.51	300
OP-D-1	2.00	1.25"	0.400"	0.29	20	2.46	20	9.31	14.41	26.3
OP-D-2	2.00	1.25"	0.700"	0.51	100	17.48	100	62.09	99.75	185.5
OP-D-3	2.00	1.25"	1.00"	0.72	320	71.77	200	180	309.97	595.2
OP-E-1	2.00	1.5"	0.500"	0.31	20	3.85	20	14.57	22.55	41.16
OP-E-2	2.00	1.5"	0.800"	0.50	100	22.73	100	80.82	129.68	241.5
OP-E-3	2.00	1.5"	1.100"	0.68	320	83.95	200	212.18	363.93	697.39
OP-F-1	3.00	2"	0.600"	0.29	20	5.52	20	20.92	32.38	59.13
OP-F-2	3.00	2"	1.000"	0.48	100	35.34	100	125.74	202.03	375.8
OP-F-3	3.00	2"	1.450"	0.70	320	147.74	200	372.09	639.87	1227.63
OP-G-1	4.00	2.5"	0.750"	0.30	20	8.63	20	32.71	50.64	92.48
OP-G-2	4.00	2.5"	1.250"	0.50	100	55.54	100	197.54	317.58	590.91
OP-G-3	4.00	2.5"	1.750"	0.70	320	216.30	200	543.99	936.56	1798.86
OP-H-1	5.00	3"	0.920"	0.30	20	12.97	20	49.17	76.13	139.06
OP-H-2	5.00	3"	1.500"	0.49	100	79.94	100	282.9	454.77	846.21
OP-H-3	5.00	3"	2.150"	0.70	320	324.16	200	816.7	1404.95	2696.28
OP-J-1	7.00	4"	1.200"	0.30	20	22.03	20	83.58	129.44	236.48
OP-J-2	7.00	4"	2.000"	0.50	100	141.51	100	503.76	810.06	1507.64
OP-J-3	7.00	4"	2.800"	0.70	320	547.11	200	1380.03	2373.02	4553.68
OP-K-1	8.00	5"	1.500"	0.30	20	34.39	20	130.48	202.11	369.29
OP-K-2	8.00	5"	2.500"	0.50	100	220.80	100	786.23	1264.42	2353.51
OP-K-3	8.00	5"	3.500"	0.69	320	853.09	200	2152.83	3701.57	7103.22
OP-L-1	10.00	6"	1.800"	0.30	20	49.46	20	187.86	291	531.75
OP-L-2	10.00	6"	3.000"	0.49	100	317.74	100	1331.63	1820.05	3387.93
OP-L-3	10.00	6"	4.200"	0.69	320	1226.98	200	3097.20	5325.20	10219.28
OP-M-1	14.00	8"	2.400"	0.30	20	87.95	20	333.87	517.25	945.28
OP-M-2	14.00	8"	4.000"	0.50	100	565.77	100	2014.95	3241.45	6034.85
OP-M-3	14.00	8"	5.600"	0.70	320	2195.86	200	5532.00	9525.43	18290.00
OP-N-1	20.00	10"	3.000"	0.30	20	137.35	20	521.58	808	1476.77
OP-N-2	20.00	10"	5.000"	0.50	100	883.04	100	3145.50	5060.38	9421.74
OP-N-3	20.00	10"	7.000"	0.70	320	3421.26	200	8626.42	14846.80	28506.17
OP-O-1	30.00	12"	3.600"	0.30	20	197.73	20	750.9	1163.44	2126.47
OP-O-2	30.00	12"	6.000"	0.50	100	1271.62	100	4530	7288.16	13570.33
OP-O-3	30.00	12"	8.400"	0.70	320	4930.86	200	12430.00	21397.00	41089.02
OP-P-1	40.00	14"	4.000"	0.30	20	244.14	20	927.14	1436.59	2625.81
OP-P-2	40.00	14"	6.600"	0.50	100	1537.49	100	6477.67	8812.87	16409.42
OP-P-3	40.00	14"	9.300"	0.70	320	6052.57	200	15251.50	28262.66	50427.78
OP-Q-1	48.00	16"	4.500"	0.30	20	308.76	20	1172.63	1817.05	3321.32
OP-Q-2	48.00	16"	7.600"	0.50	100	2038.95	100	7264.58	11688.26	21764.08
OP-Q-3	48.00	16"	10.700"	0.70	320	8007.74	200	20179.85	34749.32	66737.64

Note: Differential pressure values should be less than 50% of the inlet absolute pressure.

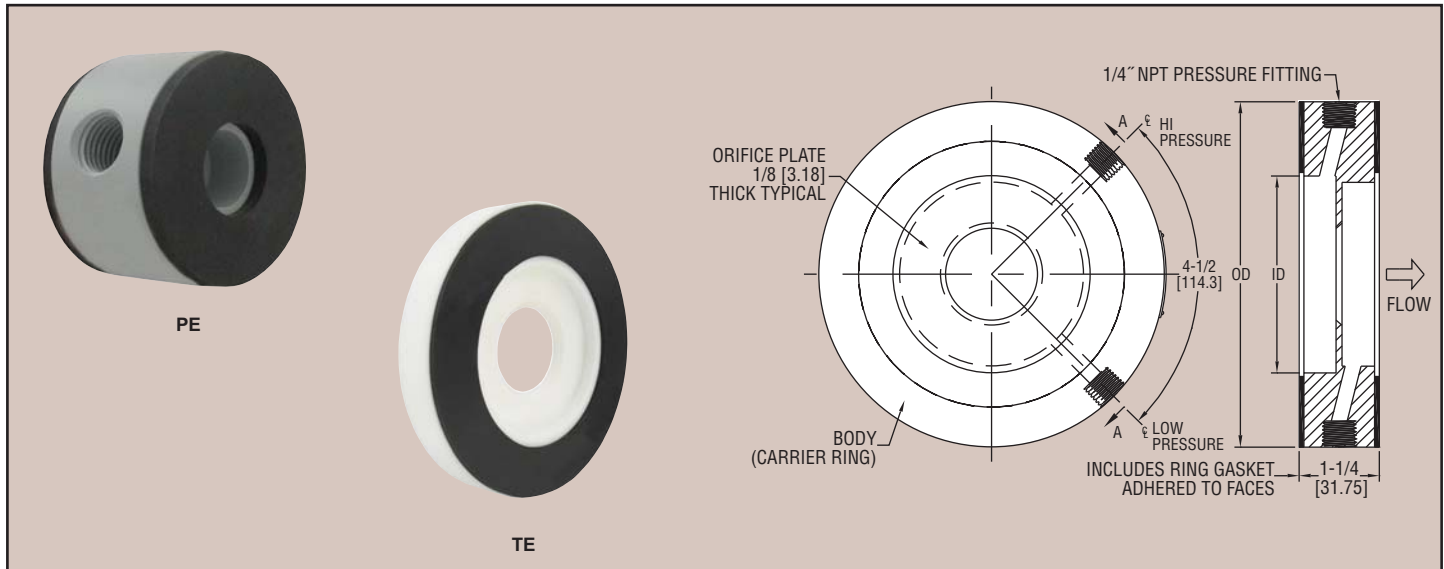
FLOW
Flowmeters, Orifice Plate



Series
PE
&
TE

Orifice Plate Flowmeter

PVC or PTFE Orifice Plates



The Series PE Orifice Plate Flow Meter offers one-piece PVC construction incorporating a unique holder or carrier ring containing metering taps and integral gaskets. Unlike a standard orifice plate, the Series PE is a true primary element including the various components for differential pressure measurement. It was designed for use wherever there is an application for a conventional flow orifice plate. It can also be used in place of other primary differential producers for efficiency and cost effectiveness. The Series PE is available in line sizes from 1/2" to 24" and used for air and most gases. It meets or exceeds ASME, AGA & ISO standards.

SERIES PE FEATURES

- Mounted with standard flanges
- Standard "corner tap" configuration
- Corrosion free material
- Simplified installation
- Built in metering taps (1/4" female NPT STD)
- Proven through a wide range of applications for accuracy and energy efficiency
- Assures long term reliability and accuracy

The Series TE Orifice Plate Flowmeter offers one-piece PTFE construction similar to the OP and PE Series orifice plates, which incorporate a unique holder or carrier ring containing metering taps and integral gaskets. Available for line sizes from 1/2" to 24", the Series TE orifice plate can be used with gases, liquids, corrosive, and high temperature fluids. The Series TE can be easily installed by slipping the unit between standard flanges (orifice flanges are not required). The Series TE was designed for use anywhere there is an application for a conventional flow orifice plate. It can also be used in place of other primary differential producers for efficiency and cost effectiveness.

SERIES TE FEATURES

- Excellent chemical resistance
- Weather resistant
- Flame retardant (without factory gaskets)
- Low friction (minimum wear)
- Orifice plate thickness 1/4" offering greater stability

SPECIFICATIONS

- Service:** PE: Clean air and compatible gases; TE: Compatible gases and liquids.
- Wetted Material:** Monolithic (single piece) constructed entirely of gray PVC for PE or white PTFE for TE, Buna-N gaskets.
- Accuracy:** $\pm 0.6\%$ full scale flow. (Beta = .2-.6) $\pm 0.7\%$ for Beta greater than .6.
- Temperature Limits:** PE: 140°F max (60°C max); TE: -40 to 200°F (-40 to 93.3°C).
- Pressure Limits:** 150 psi (10 bar) max.
- Head Loss:** $1 - \text{Beta ratio}^2$ eg: $1 - 0.7^2 = 1 - 0.49 = 51\%$ of the d.p.
- Line Sizes:** 1/2" to 24".
- Process Connections:** 1/4" female NPT.
- Installation:** Standard flange 125#/150# rating.
- Pipe Requirements:** General requirements 10 diameter upstream and 5 diameter downstream.
- Weight:** Varies with line size. See chart.

Series PE Orifice Plate Flowmeter – Air Capacity Structure

- Material PVC- Gaskets Buna-N
- Based on 70°F, 14.7 psia (Base Conditions)
- Beta Value Based on Std Sch pipe I.D.
- 1.25" overall thickness
- Orifice plate thickness is 0.125"

Series TE Orifice Plate Flowmeter – Capacity Structure

- Material PTFE - Gaskets Buna-N
- Based on 70°F, 14.7 psia (base conditions)
- Beta value based on Std Sch pipe I.D.
- 1.25" overall thickness
- Orifice plate thickness is 0.250"

PE Model	PE Weight (lb)	TE Model	TE Weight (lb)	Line Size	Bore	Beta	Water Capacity (TE)		Air Capacity - Flow in SCFM			
							Inch d.p. W/C	Flow in GPM	Inch d/p W/C	at 14.7 psia (0 psig)	at 20 psig	at 100 psig
PE-A-1	1.00	TE-A-1	1.00	1/2"	0.200"	0.3	20	0.62	20	2.35	3.63	6.61
PE-A-2	1.00	TE-A-2	1.00	1/2"	0.310"	0.5	100	3.44	100	12.21	19.58	36.37
PE-A-3	1.00	TE-A-3	1.00	1/2"	0.430"	0.69	320	13.00	200	32.77	56.15	107.47
PE-B-1	1.00	TE-B-1	1.00	3/4"	0.250"	0.3	20	0.97	20	3.65	5.66	10.3
PE-B-2	1.00	TE-B-2	1.00	3/4"	0.400"	0.49	100	5.69	100	20.21	32.44	60.26
PE-B-3	1.00	TE-B-3	1.00	3/4"	0.580"	0.7	320	23.82	200	59.92	102.91	197.2
PE-C-1	1.00	TE-C-1	1.00	1"	0.300"	0.29	20	1.38	20	5.24	8.11	14.8
PE-C-2	1.00	TE-C-2	1.00	1"	0.520"	0.49	100	9.63	100	34.2	54.92	102.09
PE-C-3	1.00	TE-C-3	1.00	1"	0.720"	0.69	320	36.15	200	91.28	156.51	300
PE-D-1	1.00	TE-D-1	1.00	1.25"	0.400"	0.29	20	2.46	20	9.31	14.41	26.3
PE-D-2	1.00	TE-D-2	1.00	1.25"	0.700"	0.51	100	17.48	100	62.09	99.75	185.5
PE-D-3	1.00	TE-D-3	1.00	1.25"	1.00"	0.72	320	71.77	200	180	309.97	595.2
PE-E-1	2.00	TE-E-1	2.00	1.5"	0.500"	0.31	20	3.85	20	14.57	22.55	41.16
PE-E-2	2.00	TE-E-2	2.00	1.5"	0.800"	0.5	100	22.73	100	80.82	129.68	241.5
PE-E-3	2.00	TE-E-3	2.00	1.5"	1.100"	0.68	320	83.95	200	212.18	363.93	697.39
PE-F-1	2.00	TE-F-1	2.00	2"	0.600"	0.29	20	5.52	20	20.92	32.38	59.13
PE-F-2	2.00	TE-F-2	2.00	2"	1.000"	0.48	100	35.34	100	125.74	202.03	375.8
PE-F-3	2.00	TE-F-3	2.00	2"	1.450"	0.7	320	147.74	200	372.09	639.87	1227.63
PE-G-1	2.00	TE-G-1	2.00	2.5"	0.750"	0.3	20	8.63	20	32.71	50.64	92.48
PE-G-2	2.00	TE-G-2	2.00	2.5"	1.250"	0.5	100	55.54	100	197.54	317.58	590.91
PE-G-3	2.00	TE-G-3	2.00	2.5"	1.750"	0.7	320	216.30	200	543.99	936.56	1798.86
PE-H-1	2.00	TE-H-1	2.00	3"	0.920"	0.3	20	12.97	20	49.17	78.13	139.06
PE-H-2	2.00	TE-H-2	2.00	3"	1.500"	0.49	100	79.94	100	282.9	454.77	846.21
PE-H-3	2.00	TE-H-3	2.00	3"	2.150"	0.7	320	324.16	200	816.7	1404.95	2696.28
PE-J-1	3.00	TE-J-1	3.00	4"	1.200"	0.3	20	22.03	20	83.58	129.44	236.48
PE-J-2	3.00	TE-J-2	3.00	4"	2.000"	0.5	100	141.51	100	503.76	810.06	1507.64
PE-J-3	3.00	TE-J-3	3.00	4"	2.800"	0.7	320	547.11	200	1380.03	2373.02	4553.68
PE-K-1	3.00	TE-K-1	4.00	5"	1.500"	0.3	20	34.39	20	130.48	202.11	369.29
PE-K-2	3.00	TE-K-2	4.00	5"	2.500"	0.5	100	220.80	100	786.23	1264.42	2353.51
PE-K-3	3.00	TE-K-3	4.00	5"	3.500"	0.69	320	853.09	200	2152.83	3701.57	7103.22
PE-L-1	4.00	TE-L-1	4.00	6"	1.800"	0.3	20	49.46	20	187.86	291	531.75
PE-L-2	4.00	TE-L-2	4.00	6"	3.000"	0.49	100	317.74	100	1331.63	1820.05	3387.93
PE-L-3	4.00	TE-L-3	4.00	6"	4.200"	0.69	320	1226.98	200	3097.20	5325.20	10219.28
PE-M-1	5.00	TE-M-1	6.00	8"	2.400"	0.3	20	87.95	20	333.87	517.25	945.28
PE-M-2	5.00	TE-M-2	6.00	8"	4.000"	0.5	100	565.77	100	2014.95	3241.45	6034.85
PE-M-3	5.00	TE-M-3	6.00	8"	5.600"	0.7	320	2195.86	200	5532.00	9525.43	18290.00
PE-N-1	6.00	TE-N-1	8.00	10"	3.000"	0.3	20	137.35	20	521.58	808	1476.77
PE-N-2	6.00	TE-N-2	8.00	10"	5.000"	0.5	100	883.04	100	3145.50	5060.38	9421.74
PE-N-3	6.00	TE-N-3	8.00	10"	7.000"	0.7	320	3421.26	200	8626.42	14846.80	28506.17
PE-O-1	7.00	TE-O-1	10.00	12"	3.600"	0.3	20	197.73	20	750.9	1163.44	2126.47
PE-O-2	7.00	TE-O-2	10.00	12"	6.000"	0.5	100	1271.62	100	4530	7288.16	13570.33
PE-O-3	7.00	TE-O-3	10.00	12"	8.400"	0.7	320	4930.86	200	12430.00	21397.00	41089.02
PE-P-1	9.00	TE-P-1	15.00	14"	4.000"	0.3	20	244.14	20	927.14	1436.59	2625.81
PE-P-2	9.00	TE-P-2	15.00	14"	6.600"	0.5	100	1537.49	100	5477.67	8812.87	16409.42
PE-P-3	9.00	TE-P-3	15.00	14"	9.300"	0.7	320	6052.57	200	15251.50	28262.66	50437.78
PE-Q-1	10.00	TE-Q-1	18.00	16"	4.500"	0.3	20	308.76	20	1172.63	1817.05	3321.32
PE-Q-2	10.00	TE-Q-2	18.00	16"	7.600"	0.5	100	2038.95	100	7264.58	11688.26	21764.08
PE-Q-3	10.00	TE-Q-3	18.00	16"	10.700"	0.7	320	8007.74	200	20179.85	34749.32	66737.64

Note: Differential pressure values should be less than 50% of the inlet absolute pressure.

FLOW
Flowmeters, Orifice Plate



Series
SFI-100, SFI-300,
SFI-350, SFI-360,
SFI-400, SFI-700

MIDWEST Sight Flow Indicators

Inexpensive Protection for Expensive Equipment and Systems



FLOW

Midwest Sight Flow Indicators are manufactured of quality materials and safety tested to assure long, dependable service at economical prices. Available in window viewing style in the 100 and 300 Series and tube viewing style in the 400 and 700 Series with connection choices of female NPT, BSPP, or BSPT threaded and flanged. Series 700 has impeller and internal wipers for cleaning sight tube, which is perfect for fluids with suspended solids. Just rotate the glass tube and restore full 360° visibility without disrupting the flow.

Models

- 100 - Single window with impeller
- 300 - Double window with impeller
- 350 - Double window with no indicator
- 360 - Double window with flapper
- 400 - Tube type with no indicator
- 700 - Tube type with impeller and internal wipers to clean glass tube

Sight Flow Indicator Dimensions and Weight

Model	Body Size	Length	Depth	Height	Flange Diameter	Viewing Area Diameter	Weight lb (kg)
100 Series	1/4, 3/8	3.000 (76)	1.813 (46)	2.125 (54)	-	-	1.1 (0.5)
	1/2, 3/4	4.000 (102)	2.250 (57)	2.563 (65)	-	-	1.5 (0.7)
	1, 1-1/4	4.375 (111)	2.563 (65)	2.625 (67)	-	-	2.7 (1.2)
	1-1/2, 2	5.688 (144)	3.250 (83)	3.625 (83)	-	-	5.5 (2.5)
300 Series	1/4, 3/8	3.063 (78)	2.250 (57)	2.125 (54)	-	-	1.7 (0.8)
	1/2, 3/4	4.063 (103)	2.750 (70)	2.563 (65)	-	-	2.6 (1.2)
	1, 1-1/4	4.375 (111)	3.125 (79)	2.563 (65)	-	-	3.0 (1.4)
	1-1/2, 2	5.500 (140)	3.688 (93)	4.063 (103)	-	-	7.0 (3.2)
700 Series	1/4, 3/8	2.750 (70)	-	1.500 (38)	-	-	0.9 (0.4)
	1/2, 3/4	3.688 (94)	-	2.250 (57)	-	-	2.4 (1.1)
	1, 1-1/4	4.875 (124)	-	2.750 (70)	-	-	5.1 (2.3)
	1-1/2	-	-	(across flats)	-	-	-
400 Series	1/2	4.500 (144)	-	-	3.500 (89)	1.500 (38)	3.8 (1.7)
	3/4	5.125 (130)	-	-	3.875 (98)	1.750 (44)	4.8 (2.2)
	1	5.625 (143)	-	-	4.250 (108)	2.000 (51)	6.2 (2.8)
	1-1/4	5.750 (146)	-	-	4.625 (117)	2.000 (51)	7.6 (3.5)
	1-1/2	5.875 (149)	-	-	5.000 (127)	2.500 (64)	8.7 (4.0)
	2	6.125 (156)	-	-	6.000 (152)	3.000 (76)	13 (6.0)
	3	6.250 (159)	-	-	7.500 (191)	4.000 (102)	17 (7.7)
4	6.250 (159)	-	-	9.000 (229)	5.000 (127)	25 (11.0)	
400F Series	1	5.000 (127)	-	-	4.250 (108)	2.000 (51)	7 (3.2)
	1-1/4	5.125 (130)	-	-	4.625 (117)	2.000 (51)	8 (3.6)
	1-1/2	5.250 (133)	-	-	5.000 (127)	2.500 (64)	12 (5.5)
	2	5.370 (137)	-	-	6.000 (152)	3.000 (76)	14 (6.4)
	3	5.750 (146)	-	-	7.500 (191)	4.000 (102)	23 (10.4)
4	5.750 (146)	-	-	9.000 (229)	5.000 (127)	31 (14.1)	
300F Series	1-1/2	6.375 (162)	-	-	5.000 (127)	2.313 (58)	12 (5.5)
	2	6.500 (165)	-	-	6.000 (152)	2.313 (58)	16 (7.5)
	3	8.875 (225)	-	-	7.500 (191)	3.000 (76)	38 (17)
	4	10.250 (260)	-	-	9.000 (229)	4.000 (102)	56 (25)
	6	12.500 (318)	-	-	11.000 (279)	6.000 (152)	120 (55)

Dimensions are in inches (mm)

Sight Flow Indicators

SFI-100 & SFI-300 SERIES

Window Style with Threaded Connections

SPECIFICATIONS

Service: Compatible gases and liquids.

Wetted Materials: Window: Tempered glass; Body: Bronze or 316 SS; Gasket: Buna-N, fluoroelastomer or PTFE; Indicator: ABS or 316 SS impeller (100 and 300), 304 SS or 316 SS flapper (360).

Temperature Limit: 200°F (93°C).

Pressure Limit: 125 psig (8.62 bar), 150 psig (10.34 bar) on "MP" models.

Connections: Threaded.

Example	SFI	300	SS	2	G2	SFI-300SS-2-G2 Sight Flow Indicator; double window, temper glass, Fluoroelastomer gaskets, 316SS body, ABS impeller, 2 inch female NPT connections.
Model Designator	SFI					Sight flow indicator, tempered glass standard, Buna-N gaskets standard, female NPT connections standard.
Body Style		100 300 350 360				Single window, bronze body, ABS Impeller Double window, bronze body, ABS Impeller Double window, bronze body, no moving indicator Double window, bronze body, 304SS flapper
Body Options			SS MP			316SS body option for 300, 350, 360 150 psig maximum pressure option, includes Fluoroelastomer gaskets
Body Size				1/4 3/8 1/2 3/4 1 1-1/4 1-1/2 2		1/4 inch connection size 3/8 inch connection size 1/2 inch connection size 3/4 inch connection size 1 inch connection size 1-1/4 inch connection size 1-1/2 inch connection size 2 inch connection size
Options					W2 G1 G2 S2 S3 I1 I2 I3 F1 BSPT BSPP	Plexiglass window PTFE gasket Fluoroelastomer gasket 316SS Shaft (Not on 350 Model) Monel Shaft (Not on 350 Model) ABS impeller with bronze bushing (Not on 350, 360) 316SS impeller (Not on 350, 360) No impeller (100 only) 316SS Flapper (360 only) BSPT threads BSPP threads

(Maximum flow on impeller models: 5 FPS with liquids, 5000 FPM with gases)

SFI-300F SERIES

Window Style with Flanged Connections

SPECIFICATIONS

Service: Compatible gases and liquids.

Wetted Materials: Window: Tempered glass; Body: Carbon steel or 316 SS; Gasket: Buna-N, fluoroelastomer or PTFE; Indicator: 316 SS flapper (360).

Temperature Limit: 200°F (93°C).

Pressure Limit: 150 psig (10.34 bar).

Connections: Flanged.

Example	SFI	360FSS	1-1/2	G1	SFI-360FSS-1-1/2-G1 Sight Flow Indicator; double window, tempered glass, PTFE gasket, 316SS body, 304SS flapper, 1-1/2 inch raised face flange connections
Model Designator	SFI				Sight flow indicator, double window, tempered glass, Buna-N gaskets standard, raised face flange connections
Body Style		350FCS 350FSS 360FCS 360FSS			Carbon steel body, no moving indicator 316SS body, no moving 316SS indicator Carbon steel body, 316SS flapper 316SS body, 316SS flapper
Body Size			1-1/2 2 3 4 6		1-1/2 inch raised face flange connection size 2 inch raised face flange connection size 3 inch raised face flange connection size 4 inch raised face flange connection size 6 inch raised face flange connection size
Options				G1 G2	PTFE gasket Fluoroelastomer gasket

SFI-700 SERIES

Tube Style with Threaded Connections

SPECIFICATIONS

Service: Compatible gases and liquids.

Wetted Materials: Tube: Tempered borosilicate; Body: Brass or 316 SS; Gasket: Fluoroelastomer; Indicator: Acetal.

Temperature Limit: 212°F (100°C).

Pressure Limit: 230 psig (15.86 bar).

Connections: Threaded.

Example	SFI	700SS	1-1/2	SFI-700SS-1-1/2 Sight Flow Indicator; tube type with 8 blade Acetal impeller and integral wipers to clean tube interior, tempered borosilicate tube, Fluoroelastomer gaskets, 316SS body, 1-1/2 inch female NPT connections
Model Designator	SFI			Sight flow indicator, tube type with 8 blade Acetal impeller and integral wipers to clean tube interior, tempered borosilicate tube, Fluoroelastomer gaskets
Body Style		700 700SS		Brass body 316SS body
Body Size			1/4 3/8 1/2 3/4 1 1-1/4 1-1/2	1/4 inch female NPT connection size 3/8 inch female NPT connection size 1/2 inch female NPT connection size 3/4 inch female NPT connection size 1 inch female NPT connection size 1-1/4 inch female NPT connection size 1-1/2 inch female NPT connection size
Options				BSPT BSPT threads BSPP BSPP threads

SFI-400 SERIES

Tube Style with Threaded or Flanged Connections

SPECIFICATIONS

Service: Compatible gases and liquids.

Wetted Materials: Tube: Borosilicate; Body: Cast iron or 316 SS; Gasket: PTFE.

Temperature Limit: 200°F (93°C).

Pressure Limit: 50 psig (3.45 bar).

Connections: Threaded or flanged.

Example	SFI	400	1-1/2	SFI-400SS-1-1/2 Sight Flow Indicator; tube type, borosilicate tube, PTFE gaskets, 316SS body, 1-1/2 inch female NPT connections
Model Designator	SFI			Sight flow indicator, tube type, borosilicate tube, PTFE gaskets
Body Style		400CI 400SS 400F		Female NPT connections, cast iron body (only for 1 through 2 inch sizes) Female NPT connections, 316SS body Raised face flange connection, 316SS body (only for 1 inch and up sizes)
Body Size			1/2 3/4 1 1-1/4 1-1/2 2 3 4	1/2 inch connection size 3/4 inch connection size 1 inch connection size 1-1/4 inch connection size 1-1/2 inch connection size 2 inch connection size 3 inch connection size 4 inch connection size

(Best for use in vertical pipelines where there are no mechanical strains)

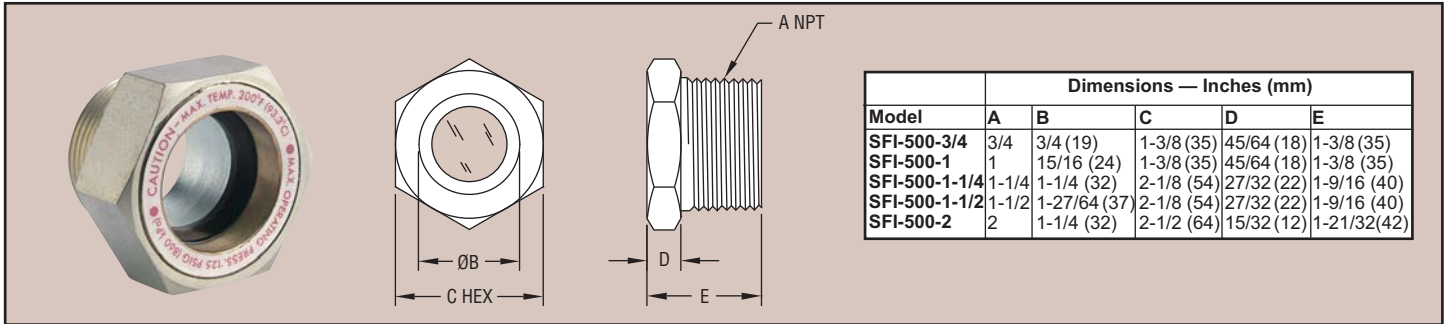
FLOW
Sight Flow Indicators



Series
500

Sight Window

Shows Level or Contents of Tanks, Pipelines; Tempered, Replaceable Glass Window



Tough, tempered glass window resists chemical attack and abrasion. Seamless gasket assures perfect seal and is easily field replaceable. In addition to the standard brass body, Model 500 Sight Windows are also available in carbon steel or 316 SS to suit a wide range of chemical compatibility.

SPECIFICATIONS

Service: Compatible gases and liquids.

Wetted Materials:

Window: Tempered glass;

Body: Brass, carbon steel, or 316 SS;

Gasket: Buna-N on brass and carbon steel body, PTFE on 316 SS body.

Temperature Limit: 200°F (93°C).

Pressure Limit: 125 psig (8.6 bar).

Connections: 3/4" to 2" male NPT.

APPLICATIONS

- Hydraulic tanks
- Pressure vessels
- Coolant tanks
- Hydraulic lines
- Oil reservoirs

Model 316 SS	Model Brass	Model Carbon Steel
SFI-500SS-3/4	SFI-500B-3/4	SFI-500CS-3/4
SFI-500SS-1	SFI-500B-1	SFI-500CS-1
SFI-500SS-1-1/4	SFI-500B-1-1/4	SFI-500CS-1-1/4
SFI-500SS-1-1/2	SFI-500B-1-1/2	SFI-500CS-1-1/2
SFI-500SS-2	SFI-500B-2	SFI-500CS-2

FLOW

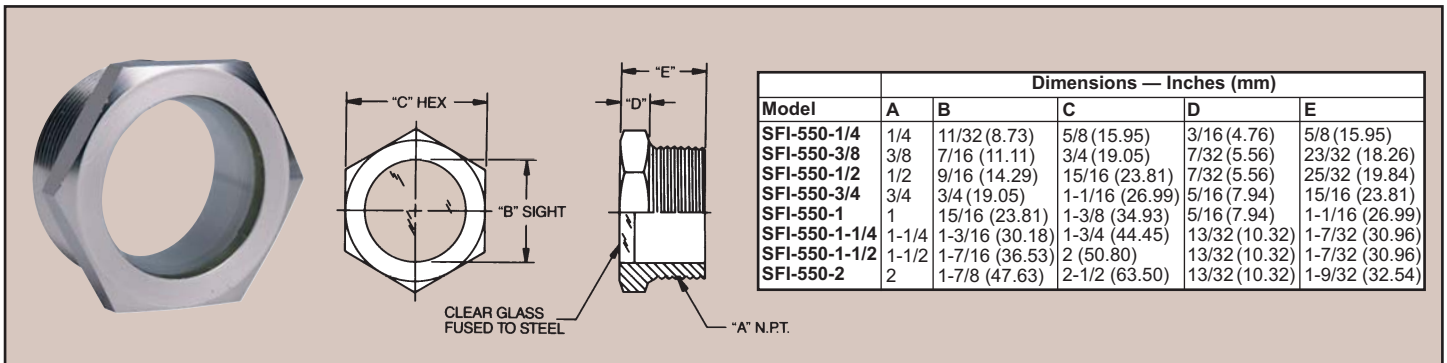
Sight Flow Indicators



Series
550

Sight Window

Shows Level or Contents of Tanks, Pipelines; Fused Glass and Steel Construction



Fused glass style sight windows feature glass to metal bond for utmost reliability. Plated steel bodies have convenient hex wrench surfaces. Connections are standard NPT in sizes from 1/4" to 2". Windows are clear, ripple free, and flush with the front face, having no recess on which dirt might collect.

SPECIFICATIONS

Service: Compatible gases and liquids.

Wetted Materials:

Window: Glass;

Body: Plated steel.

Temperature Limit: 200°F (93°C).

Pressure Limit: 125 psig (8.6 bar).

Connections: 1/4" to 2" male NPT.

APPLICATIONS

- Hydraulic tanks
- Pressure vessels
- Coolant tanks
- Hydraulic lines
- Oil reservoirs

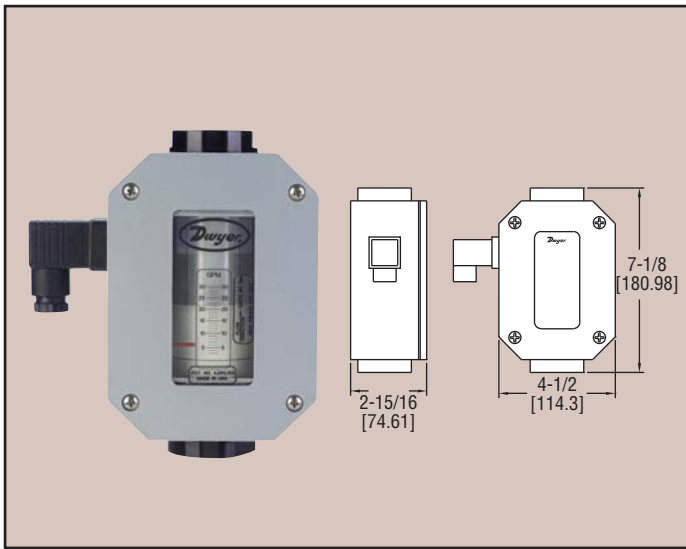
Model	Model
SFI-550-1/4	SFI-550-1
SFI-550-3/8	SFI-550-1-1/4
SFI-550-1/2	SFI-550-1-1/2
SFI-550-3/4	SFI-550-2



Series
HFO

In-Line Flow Alarms

Latching Alarm Capabilities, For Air, Water or Caustic Fluids, Unrestricted Mounting



The Series HFO Flow Alarm provides continuous monitoring and control of flow rate levels. The flow alarm can be configured to open or close a contact for an increasing or decreasing set point. The unit includes two 10A SPDT limit switches with field adjustable alarm settings. Integral direct reading scale provides local indication of flow rate. The flow alarm is designed to mount in any orientation and does not require inlet or outlet straight plumbing. The Series HFO is constructed with a rugged cast aluminum NEMA 4X (IP65) enclosure for installations outdoors or in harsh environments.

APPLICATIONS

Monitoring flow in chemical processing, waste water processing, lubrication systems, process control, solar systems, drain lines and pump testing.

SPECIFICATIONS

Service: Compatible gases or liquids.

Wetted Materials:

- Body: Aluminum, brass or 304 SS;
- Seals: Buna-N or fluoroelastomer;
- Magnet: PTFE coated Alnico;
- Other internal parts: 304 SS.

Viscosity: 500 SSU.

Temperature Limits: 240°F (116°C).

Pressure Limits: See chart.

Enclosure Rating: NEMA 4X (IP65).

Accuracy: Measuring ±4% FS over entire range; ±2.5% over center third of the measuring range.

Repeatability: ±1% of full scale.

Switch Type: SPDT, 10A @ 250 VAC; 0.5A @ 125 VDC, (resistive).

Shipping Weight: 1/4 to 1/2" female NPT models: 3 lb (1.4 kg); 3/4 to 1" female NPT models: 4.5 lb (2.0 kg); 1-1/2" female NPT models: 12 lb (5.4 kg).

Aluminum body for air or other non-corrosive gases: 600 psig (41 bar)

Wetted Parts: Aluminum, PTFE coated Alnico, 304 SS and Buna-N

Model	Connection Size	Range, Air SCFM
HFO-21112	1/4" female NPT	1.5-12
HFO-21123	1/4" female NPT	4-23

Brass body for water based fluids (non-steam): 3500 psig (240 bar)

Wetted Parts: Brass, PTFE coated Alnico, 304 SS and Buna-N

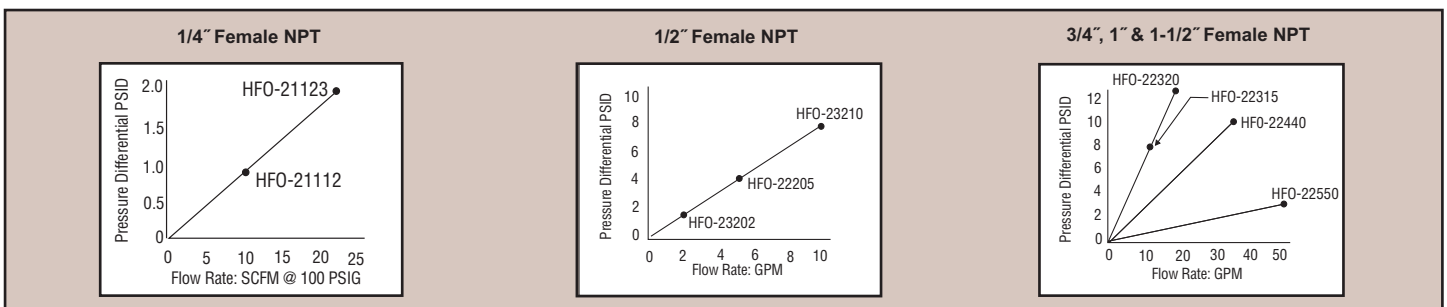
Model	Connection Size	Range, Water GPM (LPM)
HFO-22205	1/2" female NPT	0.5-5.0 (1-19)
HFO-22315	3/4" female NPT	1-15 (3.8-55)
HFO-22320	3/4" female NPT	2-20 (7.5-75)
HFO-22440	1" female NPT	4-40 (15-151)
HFO-22550	1-1/2" female NPT	5-50 (19-189)

304 SS body for high-pressure fluids: 6000 psig (413 bar)

Wetted Parts: 304 SS, Fluoroelastomer and PTFE

Model	Connection Size	Range, Water GPM (LPM)
HFO-23202	1/2" female NPT	0.2-2.0 (0.75-7.5)
HFO-23210	1/2" female NPT	1-10 (3.8-38)

Pressure Differential VS. Flow Rate

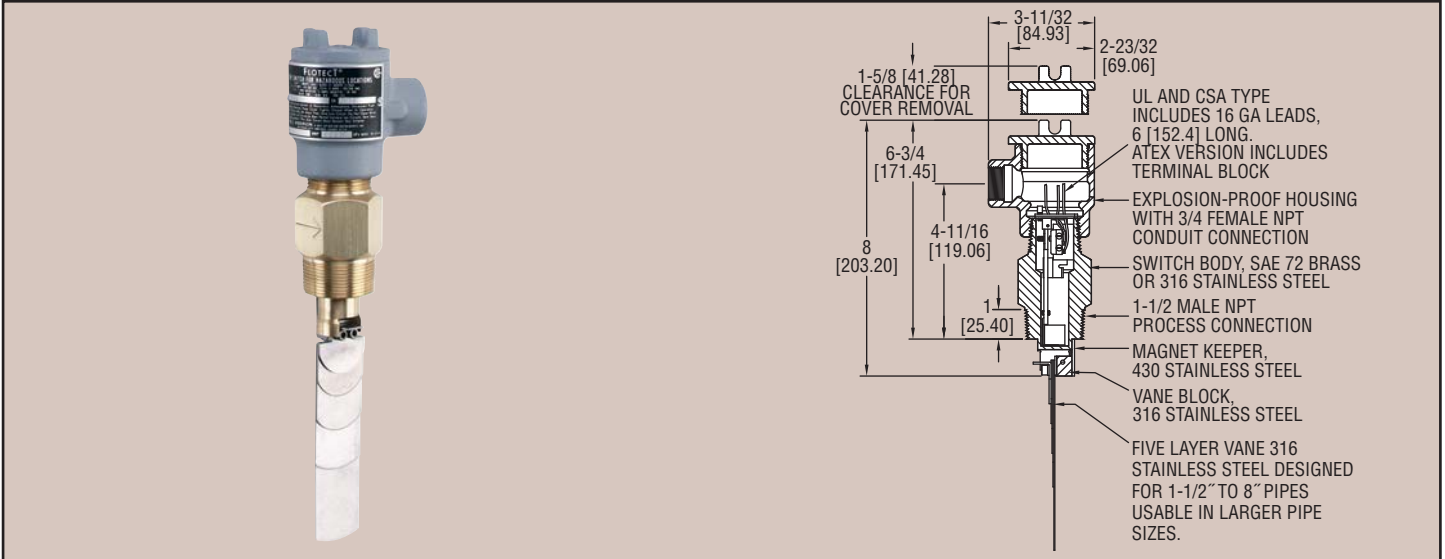




Series V4

FLOTECT® Vane Operated Flow Switch

Field Adjustable — Dependable Protection Against Flow Variation or Stopping in Pipelines for Fluids, Gases and Flowing Solids



Rugged and reliable the Series V4 Flotect® flow switch operates automatically to protect equipment and pipeline systems against damage from reduction or loss of flow. The V4 is time tested being installed in thousands of pipelines and processing plants around the world. A unique magnetically actuated switching design gives superior performance. There are no bellows, springs, or seals to fail. Instead, a free-swinging vane attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm.

FEATURES

- Leak proof body machined from bar stock
- Choice of custom vane calibrated for your application, Model V4, or field adjustable multilayer vane, Model V4-2-U (see set point chart)
- Weatherproof, designed to meet NEMA 4
- Explosion-proof (listing included in specifications)
- Installs directly and easily into pipeline with a thredolet, tee, or flange (see application drawings)
- Can be used in pipes 1-1/2" and up
- Electrical assembly can be easily replaced without removing the unit from installation so that the process does not have to be shut down
- High pressure rating of 1000 psig (69 bar) with the brass body and 2000 psig (138 bar) with the 316 SS body

APPLICATIONS

- Protects pumps, motors and other equipment against low or no flow
- Controls sequential operation of pumps
- Automatically starts auxiliary pumps and engines
- Stops liquid cooled engines, machines and processing when coolant flow is interrupted
- Shuts down burner when air flow through heating coil fails
- Controls dampers according to flow

Model	Description
V4-2-U	Brass body, universal vane
V4-SS-2-U	316SS* body, universal vane
V4	Brass body, custom vane
V4-SS	316SS* body, custom vane

*316SS body with 430SS magnet keeper.

Consult factory for price and availability of fittings for V4 installation. Thredolets, bushings, and tees are available in a variety of sizes and materials.

For custom vane models, please supply factory with following information: pipe size, flow direction (horizontal, up), mounting, pressure, temperature, specific gravity, flow rates (maximum normal, actuation/deactuation*), etc.

*When both values are supplied, note which is critical.

SPECIFICATIONS

Service: Gases or liquids compatible with wetted materials.

Wetted Materials:

- Vane: 316 SS;
- Body: Brass or 316 SS standard;
- Magnet Keeper: 430 SS standard, 316 SS optional;
- Options: Other materials also available, consult factory (e.g. PVC, Hastelloy, nickel, Monel, titanium).

Temperature Limit: -4 to 275°F (-20 to 135°C) standard, MT high temperature option 400°F (205°C) [MT option not UL, CSA, ATEX, or SAA].

Pressure Limit: Brass body 1000 psig (69 bar), 316 SS body 2000 psig (138 bar), optional 5000 psig (345 bar) available with 316 SS body and SPDT switch only.

Enclosure Rating: Weatherproof (meets NEMA 4 (IP65)) and explosion-proof. Listed with UL and CSA for Class I, Groups C and D; Class II, Groups E, F, and G. ATEX 0344 II 2 G EEx d IIB T6 -20°C ≤ Tamb ≤ 75°C; EC-Type Certificate No.: KEMA 03ATEX 2383; SAA: Exd II C T6 (Tamb=60°C). Zone I. Also FM approved.

OPTIONS (add as a suffix to the model number):

- D, DPDT contacts
- MV, Gold Plated Contacts, options for dry circuits (see electrical rating in specification, no listings or approvals)
- MT, High Temperature, option rated 400°F (204°C) (see electrical rating in specifications, no listings or approvals)
- TRI (increasing flow), -TRD (decreasing flow), Time Delay Relay, option with 2 SPDT contacts, adjustable from 0-1 to 0-31 minutes. (no listings or approvals)
- 316, 316 SS Magnet Keeper, option to replace standard 430 SS
- SAA, SAA listed construction
- V, Vertical Up Flow, option for upward flow in vertical pipe
- AT, ATEX listed construction

- Switch Type:** SPDT snap switch standard, DPDT snap switch optional.
- Electrical Rating:** UL, FM, ATEX and SAA models 10A @ 125/250 VAC (V~). CSA models: 5A @ 125/250 VAC (V~); 5A res., 3A ind. @ 30 VDC (V~). MV option: 1A @ 125 VAC (V~); 1A res., .5A ind. @ 30 VDC (V~). MT option: 5A @ 125/250 VAC (V~). [MT and MV option not UL, CSA, FM, ATEX or SAA].
- Electrical Connections:** UL and CSA models: 16 AWG, 6" (152 mm) long. ATEX and SAA unit: Terminal block.
- Conduit Connection:** 3/4" female NPT.
- Process Connection:** 1-1/2" male NPT.
- Mounting Orientation:** Within 5° of vertical for proper operation. Units for horizontal installation (vertical pipe with up flow) available.
- Set Point Adjustment:** For universal vane: five vane combinations.
- Weight:** 4 lb 8 oz (1.9 kg).
- Agency Approvals:** UL, CSA, CE, FM, SAA, and ATEX.

V4 Universal Vane Flow Charts

Values shown in both charts are nominal. If normal flows exceed actuation rates by less than 10%, custom vanes are recommended. Figures are based on standard vertical installation in a 1-1/2" Threaded Branch Connection in a horizontal run of pipe.

Approximate Actuation/Deactuation Flow Rates for Cold Water. Upper Figures in GPM. Lower Figures in LPM.												
Vane Layers	1.5" Pipe	2" Pipe	3" Pipe	4" Pipe	6" Pipe	8" Pipe	10" Pipe	12" Pipe	14" Pipe	16" Pipe	18" Pipe	20" Pipe
1	7-3 26.67-11.67	15-8 56.7-30	45-22 167-83.3	95-40 367-150	210-120 800-450	375-175 1417-667	600-300 2267-1133	900-450 3400-1700	1200-600 4550-2267	1400-800 5300-3033	2000-1000 7567-3783	2400-1200 9083-4550
1&2		7-4 26.7-15	23-14 86.7-53.3	50-35 190-132	130-90 500-333	230-150 867-567	450-250 1700-950	650-350 2467-1317	900-500 3400-1900	1200-650 4550-2467	1450-800 5483-3033	1800-1000 6817-3783
1,2,&3			11-7 41.7-26.7	27-19 102-71.7	80-60 300-233	160-115 600-433	300-180 1133-683	450-275 1700-1033	600-350 2267-1317	750-450 2750-2083	1000-600 3783-2267	1200-700 4550-2650
1,2,3,&4				17-12 65-45	60-45 233-167	120-90 450-333	230-150 867-567	310-200 1167-750	430-280 1633-1067	550-360 2083-1367	700-450 2650-1700	850-550 3217-2083
1,2,3,4,&5					40-30 152-113	80-65 300-250	135-100 517-383	200-140 750-533	290-200 1100-750	360-250 1367-950	460-325 1733-1233	575-400 2183-1517

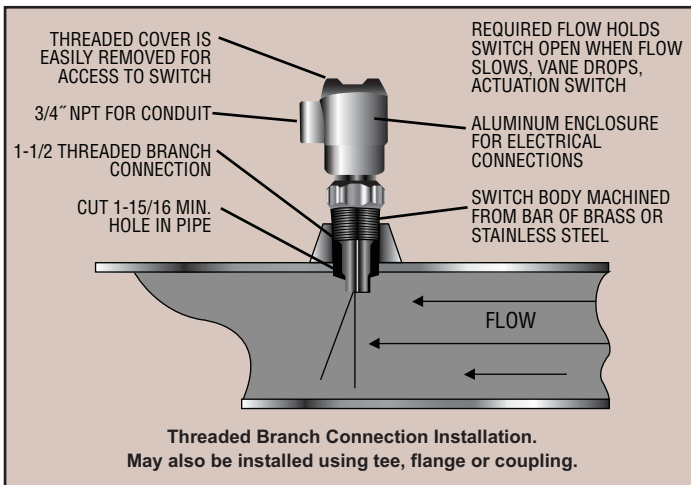
Actuation rates are based on cold water at a specific gravity of 1.0.

For fluids of different specific gravity, actuation rates may be approximated by dividing the rate shown by the square root of the specific gravity.

Approximate Actuation/Deactuation Flow Rates for Cold Air. Upper Figures in SCFM. Lower Figures in LPS.												
Vane Layers	1.5" Pipe	2" Pipe	3" Pipe	4" Pipe	6" Pipe	8" Pipe	10" Pipe	12" Pipe	14" Pipe	16" Pipe	18" Pipe	20" Pipe
1	32-17 15-8	65-32 30-20	210-105 100-50	400-200 190-90	950-475 450-220	1550-850 730-400	2400-1300 1100-600	3450-1900 1600-900	4700-2600 2200-1200	6400-3500 3000-1700	8000-4400 3800-2100	10000-5500 4700-2600
1&2		23-13 10-6	120-70 60-30	195-140 90-70	550-375 260-180	1100-700 520-330	1850-1200 870-570	2700-1750 1300-800	3400-2200 1600-1000	4800-3100 2300-1500	6000-3900 2800-1800	7400-4800 3500-2300
1,2,&3			60-48 30-20	135-100 60-50	375-265 180-130	725-500 340-240	1200-850 570-400	1850-1300 870-610	2600-1800 1200-800	3350-2350 1600-1100	4300-3000 2000-1400	5300-3700 2500-1700
1,2,3,&4				65-50 30-20	260-200 120-90	500-400 240-190	875-700 410-330	1250-1000 590-470	1900-1500 900-710	2500-2000 1200-900	3100-2500 1500-1200	3900-3100 1800-1500
1,2,3,4,&5					130-100 60-50	310-250 150-120	650-525 310-250	1000-800 470-380	1600-1250 760-590	2200-1750 1040-830	2800-2250 1300-1100	3550-2850 1700-1300

Actuation rates are based on air at standard conditions. For gases at other pressures, temperatures, or specific gravities, consult factory for equivalent flow approximations.

**Application Drawings
For Flotect® Automatic Flow Switches**



Standard Installation

1-1/2" x 1-1/2" Tee Installation

2-1/2" Threaded Branch Connection

Flange Installation

2" x 2" x 2" Tee Installation

Not Recommended, Unless Coupling is Bored Out to 2-1/16" (52.4) As Shown

LINE PIPE SIZE	DIAM. "A"
2"	2 5/8 (66.7)
3"	2 1/2 (63.5)
4"	2 1/8 (61.9)

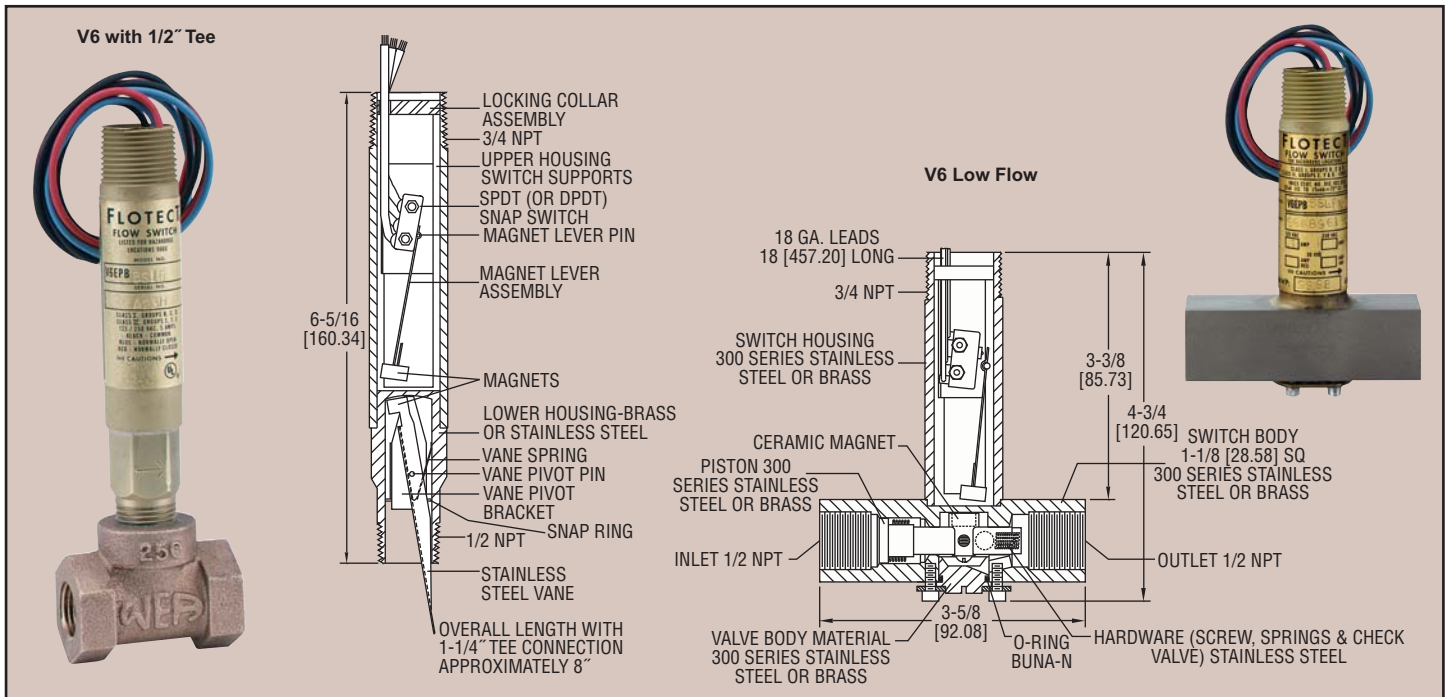
FLOW
Flow Switches, Paddle



Series
V6

FLOTECT® Mini-Size Flow Switches

Monitor flow in 1/2" to 2" pipe, Explosion-proof



Surprisingly compact, the Series V6 Flotect® Flow Switch is engineered to specifically monitor liquid, gas, or airflows. Operation is simple and dependable with no mechanical linkage as the flow switch is magnetically actuated. The lower body holds the flow vane and one magnet, which controls the switch actuating magnet in the separate upper housing. In most applications the switch is normally off with the pipeline flow forcing the vane against the vane spring. As the flow decreases the vane spring pushes back the vane, actuating the switch to signal an alarm or shutdown. Tees are available for installation in pipelines from 1/2" to 2", with bushings added the unit is easily adapted to 1/4" and 3/8" piping.

FEATURES

- Leak proof lower body machined from bar stock
- Choice of models in a tee with calibrated vane or field adjustable trimmable vane
- Weatherproof
- Explosion-proof (listing included in specifications)
- Electrical assembly can be easily replaced without removing the unit from the installation so that the process does not have to be shut down
- High pressure rating of 1000 psig (69 bar) with brass body and 2000 psig (138 bar) on the 316 SS body (see specifications)
- Low flow model offers field adjustable set point
- Easy installation, simply insert the tee in the pipeline and complete electrical connections

APPLICATIONS

- Protects pumps, motors and other equipment against low or no flow
- Controls sequential operation of pumps
- Automatically starts auxiliary pumps and engines
- Shuts down burner when air flow through heating coil fails
- Controls dampers according to flow

SPECIFICATIONS

Service: Gases or liquids compatible with wetted materials.

Wetted Materials: Standard V6 models: Vane: 301 SS; Lower Body: Brass or 303 SS; Magnet: Ceramic; Other: 301, 302 SS; Tee: Brass, iron, forged steel, or 304 SS. V6 low flow models: Lower body: Brass or 303 SS; Tee: Brass or 304 SS; Magnet: Ceramic; O-ring: Buna-N standard, fluoroelastomer optional; Other: 301, 302 SS.

Temperature Limits: -4 to 220°F (-20 to 105°C) standard, MT high temperature option 400°F (205°C) (MT not UL, CSA or ATEX). ATEX compliant AT option ambient temperature -4 to 167°F (-20 to 75°C), process temperature: -4 to 220°F (-20 to 105°C).

Pressure Limit: Brass lower body with no tee models: 1000 psi (69 bar); 303 SS lower body with no tee models: 2000 psi (138 bar); Brass tee models: 250 psi (17.2 bar); Iron tee models: 1000 psi (69 bar); Forged and stainless steel tee models: 2000 psi (138 bar); Low flow models: 1450 psi (100 bar).

Enclosure Rating: Weatherproof and explosion-proof. Listed with UL and CSA for Class I, Groups A, B, C and D; Class II, Groups E, F, and G. (Group A on stainless steel body models only).

ATEX 0344 Ex II 2 G EEx d IIC T6 Process Temp ≤75°C.
EC-type Certificate No.: KEMA 04ATEX2128.

Switch Type: SPDT snap switch standard, DPDT snap switch optional.

Electrical Rating: UL models: 5A @125/250 VAC (V~). CSA and ATEX models: 5A @ 125/250 VAC (V~); 5A res., 3A ind. @ 30 VDC (V=). MV option: .1A @ 125 VAC (V~). MT option: 5A @125/250 VAC (V~). [MT option not UL, CSA or ATEX].

Electrical Connections: UL models: 18 AWG, 18" (460 mm) long; ATEX and CSA models: terminal block.

Upper Body: Brass or 303 SS.

Conduit Connections: 3/4" male NPT standard, 3/4" female NPT on junction box models.

Process Connection: 1/2" male NPT on models without a tee.

Mounting Orientation: Switch can be installed in any position but the actuation/deactuation flow rates in the charts are based on horizontal pipe runs and are nominal values.

Set Point Adjustment: Standard V6 models none. Without tee models vane is trimmable. Low flow models are field adjustable in the range shown. See set point charts on opposite page.

Weight: 2 to 6 lb (.9 to 2.7 kg) depending on construction.

Options not Shown: Custom calibration, bushings, PVC tee, reinforced vane.

Agency Approvals: UL, CSA, CE, and ATEX.

Example	V6	EP	B	B	S	2	B	MT	V6EPB-B-S-2-B-MT flow switch; brass upper housing, brass lower housing, brass tee with 3/4" NPT connections, SPDT snap switch, and high temperature option
Series	V6								Series V6 flow switch
Construction		EP							Explosion proof
Upper Body			B	S					Brass Stainless Steel
Lower Body				B	S				Brass Stainless Steel
Circuit (Switch)					S	D			SPDT DPDT
Tee Connection Size						1 2 3 4 5 6 LF			1/2" NPT 3/4" NPT 1" NPT 1-1/4" NPT 1-1/2" NPT 2" NPT Low Flow Model (1/2" NPT connections)
Tee Material							MI FS B S 0		Iron Forged Steel Brass Stainless Steel No tee, field trimmable vane (For LF Model no tee material chosen, tee material matches lower housing choice)
Options								CSA AT MV MT VIT	CSA approved construction with junction box* ATEX approved construction with junction box Gold contacts on snap switch for dry circuits (see specifications for ratings) High temperature option rated 400°F (205°C) (see specifications for ratings)* Fluoroelastomer O-rings in place of Buna-N on low flow models

*Options that do not have ATEX.

V6 Set Point Charts - Factory Installed Tee

Approximate Actuation-Deactuation Flow Rates for Air. Upper figures are SCFM, Lower figures in LPM		
Pipe Size	Actuate	Deactuate
1/2"	6.50 180	5.00 120
3/4"	10.0 300	8.00 240
1	14.0 420	12.0 360
1-1/4"	21.0 600	18.0 540
1-1/2"	33.0 960	30.0 840
2	43.0 1200	36.0 1020

Approximate Actuation-Deactuation Flow Rates for Cold Water. Upper figures are GPM, Lower figures in LPM		
Pipe Size	Actuate	Deactuate
1/2"	1.50 5.667	1.00 3.83
3/4"	2.00 7.5	1.25 4.67
1	3.00 11.33	1.75 6.67
1-1/4"	4.00 15.17	3.00 11.3
1-1/2"	6.00 22.67	5.00 18.9
2	10.00 37.83	8.50 32.2

Model	Size	Lower Body	Tee
V6EPB-B-S-1-B	1/2"	Brass	Brass
V6EPB-B-S-2-B	3/4"	Brass	Brass
V6EPB-B-S-3-B	1"	Brass	Brass
V6EPB-B-S-4-B	1-1/4"	Brass	Brass
V6EPB-B-S-5-B	1-1/2"	Brass	Brass
V6EPB-B-S-6-B	2"	Brass	Brass
V6EPB-B-S-1-MI	1/2"	Brass	Iron
V6EPB-B-S-2-MI	3/4"	Brass	Iron
V6EPB-B-S-3-MI	1"	Brass	Iron
V6EPB-B-S-4-MI	1-1/4"	Brass	Iron
V6EPB-B-S-5-MI	1-1/2"	Brass	Iron
V6EPB-B-S-6-MI	2"	Brass	Iron
V6EPB-S-S-1-MI	1/2"	SS	Iron
V6EPB-S-S-2-MI	3/4"	SS	Iron
V6EPB-S-S-3-MI	1"	SS	Iron
V6EPB-S-S-4-MI	1-1/4"	SS	Iron
V6EPB-S-S-5-MI	1-1/2"	SS	Iron
V6EPB-S-S-6-MI	2"	SS	Iron
V6EPB-S-S-1-FS	1/2"	SS	FS
V6EPB-S-S-2-FS	3/4"	SS	FS
V6EPB-S-S-3-FS	1"	SS	FS
V6EPB-S-S-4-FS	1-1/4"	SS	FS
V6EPB-S-S-5-FS	1-1/2"	SS	FS
V6EPB-S-S-6-FS	2"	SS	FS
V6EPB-S-S-1-S	1/2"	SS	SS
V6EPB-S-S-2-S	3/4"	SS	SS
V6EPB-S-S-3-S	1"	SS	SS
V6EPB-S-S-4-S	1-1/4"	SS	SS
V6EPB-S-S-5-S	1-1/2"	SS	SS
V6EPB-S-S-6-S	2"	SS	SS
V6EPB-B-S-6-0	No Tee	Brass	None
V6EPB-S-S-6-0	No Tee	SS	None
V6EPB-B-S-LF	1/2"	Brass	LF, Brass
V6EPB-S-S-LF	1/2"	SS	LF, SS

V6 Low Flow Set Point Chart

Min-Max Flow Rates in 1/2" Pipe		
Media	Actuate	Deactuate
GPM-Water	.04-0.75	.03-0.60
LPM-Water	.15-2.84	.11-2.27
SCFM-Air	.18-2.70	.15-2.0
LPS-Air	.09-1.3	.07-.95

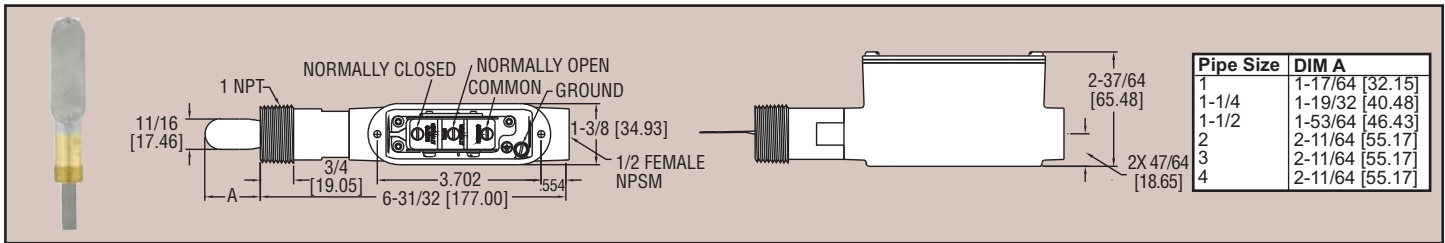
Pressure drop (head loss) is a function of both set point and flow rate. Typically, pressure drop at actuation flow rate listed will be 5-10 psid (.34-.69 bar). Pressure drops at other flow rates will vary in proportion to the (change in flow).



Series
V7

FLOTECT® Vane Operated Flow Switch

Magnetic Linkage



The Series V7 Flotect® Flow Switch is an inexpensive switch for use with compatible liquids to start or stop electronic operated equipment when flow or no-flow conditions occur. Magnetic operation is simple and dependable with no mechanical linkages or seals to wear or leak. Lower body is machined solid metal bar stock assuring no leak points, no matter how long the unit is in service. Design is standard weatherproof, meeting NEMA 4X, for application versatility. Robust vane design is rigid and field trimmable for set point adjustment.

Pipe Size	Actuate	Deactuate
1"	7.5 (28.4)	6.8 (25.7)
1-1/4"	8.1 (30.8)	7.6 (28.9)
1-1/2"	11.7 (44.1)	10.9 (41.3)
2"	16.9 (64.0)	15.6 (59.1)
2-1/2"	19.6 (74.2)	18.1 (68.5)
3"	31.6 (120)	29.6 (112)
4"	58.0 (218)	52.0 (197)

Contact the factory for different actuation-deactuation rates.

Model	Body Material
V7-WBS-30N	Brass
V7-WSS-30N	316 SS

SPECIFICATIONS

Service: Liquids compatible with wetted materials that are non-coating and non-crystallizing.
Wetted Materials: Vane: 301 SS; Process connection: Brass or 316 SS; Magnet: Ceramic; Other: 301, 302 SS.
Upper Body Material: Die cast aluminum.
Temperature Limits: -40 to 250°F (-40 to 121°C).
Pressure Limits: 250 psi (17.2 bar).
Enclosure Rating: Weatherproof, meets NEMA 4X (IP66).
Switch Type: SPDT snap switch.
Electrical Rating: 10A @ 125, 250, 480 VAC; 1/8 hp @ 125 VAC, 1/4 hp @ 250 VAC.

Electrical Connections: 3 screw type, common, normally open and normally closed.

Conduit Connection: 1/2" NPSM.
Process Connection: 1" male NPT. Contact factory for optional tees.
Pipe Size: 1 to 4 inch.
Mounting Orientation: Horizontal or vertical (actuation flow rates are based on horizontal pipe runs in the vertical position). Will not work in vertical pipe with down flow.
Set Point Adjustment: Vane is trimmable, see set point chart.
Weight: 1 lb 2 oz (500 g).
Agency Approvals: CE, UL353.

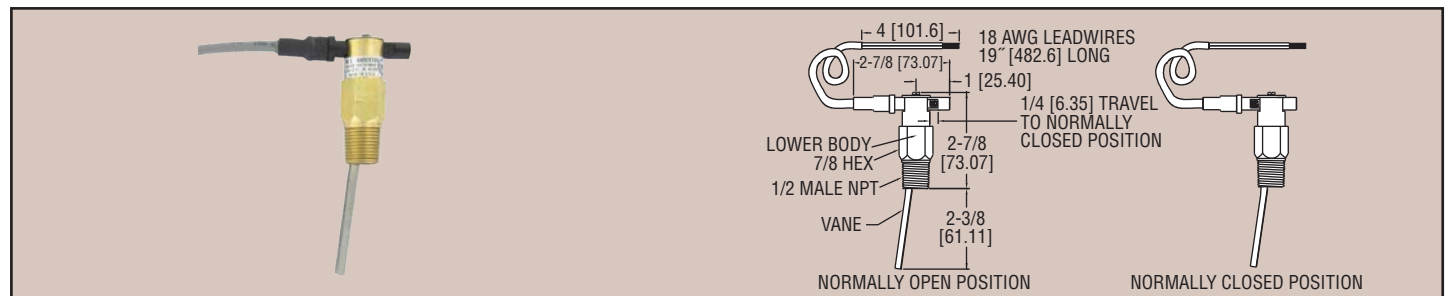
FLOW



Series
V10

FLOTECT® Mini-Size Flow Switch

Proof of Flow or No Flow in 1/2 to 2" Pipe,
Low Cost, Leak Proof Body, Weatherproof



Designed to provide an inexpensive, reliable unit to monitor the presence or absence of flow in a system. The V10 flow switch is used to monitor unattended equipment and protect it from costly damage. The V10 flow switch utilizes a rugged, hermetically sealed reed switch which is encapsulated in a polypropylene switch housing that fits into a standard heavy duty leak proof brass body or optional 303 SS body. The switch adjustment allows the user to change the switch to Normally Open (NO) or Normally Closed (NC) in the field merely by loosening two screws. The switch housing is located outside the process media, making switch change-over or maintenance easy without interruption of process flow.

A full size, trimmable stainless steel vane is provided with a removable laminated template. This template is calibrated for brass or ductile iron reducing tees and forged steel straight tee/bushing combinations. Allows for field installation in pipelines from 1/2" to 2" diameter. A table with approximate actuation and deactuation values is provided below.

Cold Water Flow Rates				Air Flow Rates			
Approximate actuation/deactuation GPM upper, LPM lower				Approximate actuation/deactuation SCFM upper, LPM lower			
Pipe	Trim	N.O.	N.C.	Pipe	Trim	N.O.	N.C.
1/2"	L	2.6/2.3 9.8/8.7	2.6/2.5 9.8/9.5	1/2"	L	10.3/8.8 291.7/250	10.2/9.2 288/260
3/4"	J	3.1/2.7 11.7/10.2	3.1/2.8 11.7/10.6	3/4"	J	13/11.6 368.3/328	12.9/11.6 365/328
1"	H	4.8/4.5 18.2/17	4.8/4.4 18.2/16.7	1"	H	19.2/17.6 543.3/498	18.9/17.6 535/498
1-1/4"	E	6.2/5.6 23.5/21.2	6.1/5.6 23.1/21.2	1-1/4"	E	24.8/22.2 701.7/628	24.5/22.5 693/637
1-1/2"	C	8.2/7.7 31/29.1	8.2/7.7 31/29.1	1-1/2"	C	33.4/31.2 946.7/883	33/30.6 935/867
2"	Full	9.5/9.1 36/34.4	9.5/9 36/34.1	2"	Full	50.2/48.4 1422/1370	50.2/47.7 1422/1352

SPECIFICATIONS

Service: Compatible gases or liquids.
Wetted Materials:
 Vane: 301 SS;
 Body: Brass or 303 SS;
 Pin and spring: 301 SS, 302 SS, and 316 SS;
 Magnet: Ceramic 8.
Temperature Limit: 200°F (93°C).
Pressure Limit: Brass body: 1000 psig (69 bar); 303 SS body: 2000 psig (138 bar).
Enclosure Rating: Weatherproof, meets NEMA 4X (IP66).
Switch Type: SPST hermetically sealed reed switch. Field adjustable for normally open or normally closed.
Electrical Rating: 0.5A @ 30 VAC; 1.5A @ 24 VDC.

Electrical Connections: 18 AWG, 18" (460 mm) long, PVC jacket. Rated 221°F (105°C).

Process Connection: 1/2" male NPT standard. Contact factory for other options.
Mounting Orientation: Switch can be installed in any position but the actuation/deactuation flow rates are based on horizontal pipe runs and are nominal values.
Set Point Adjustment: Vane is trimmable.
Weight: 4.5 oz (0.13 kg).
Agency Approvals: CE, UL and CSA.
Switch Enclosure: Polypropylene.

Model	Body Material	Switch Configuration
V10	Brass	Normally Open or Closed
V10SS	303SS	Normally Open or Closed

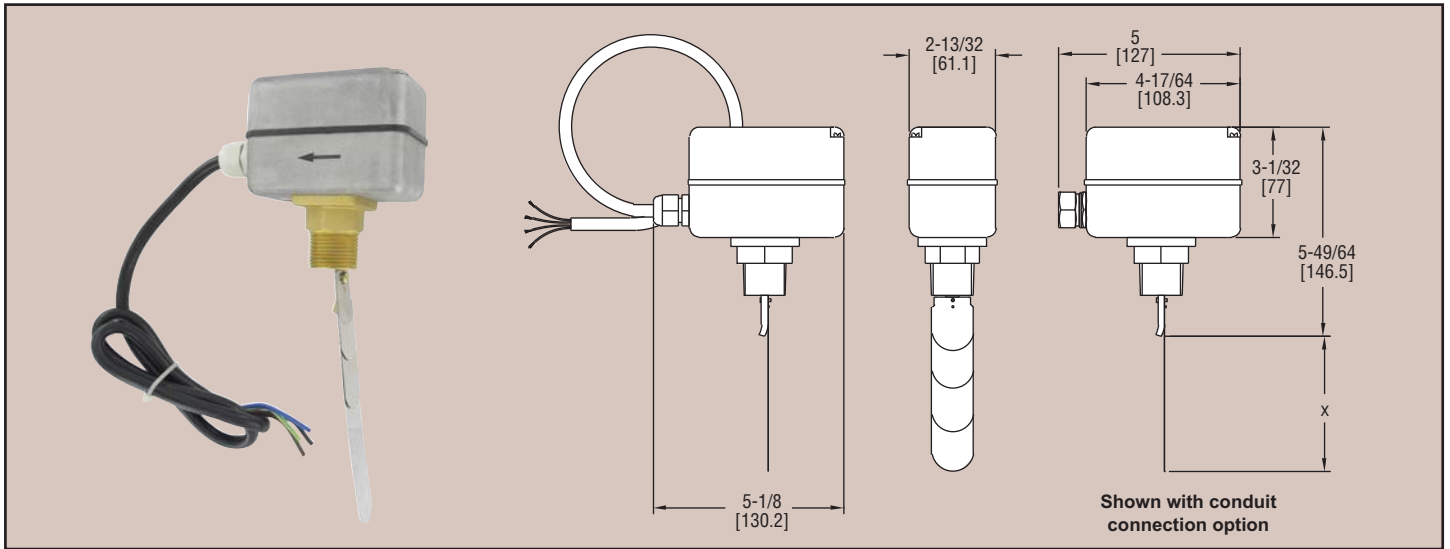
Flow Switches, Paddle



Series
FS-2

Vane Flow Switch

Low Cost, Field Adjustable Set Point



The Series FS-2 Vane Flow Switch offers an economical flow proving solution. Custom set points tailored for the application are enabled by field adjustable vane layers and a set point adjustment screw. The FS-2 features an aluminum weatherproof housing for outdoor installation. Paddles are adjustable to fit 1" to 8" size pipe. FS-2 is ideal for use in "flow or no flow" applications in cold and hot water systems. Perfect for proving flow in boilers, hot water heaters, and chillers.

APPLICATION

- Perfect for proving flow in boilers, hot water heaters, and chillers

FEATURES

- Field adjustable paddle
- Field adjustable set point
- Weatherproof construction

Flow Rate Chart

Pipe Diameter (inch)	Blade Vane Length in (mm) Dim. X	Approximate Actuation and Deactuation Flow Rates for Water			
		Minimum Setting GPM (LPM)		Maximum Setting GPM (LPM)	
		Actuate	Deactuate	Actuate	Deactuate
1	1.34 (34)	4.0 (15.0)	1.8 (6.7)	8.8 (33.3)	6.6 (25.0)
1-1/4	1.34 (34)	5.3 (20.0)	2.6 (10.0)	11.4 (43.3)	8.4 (31.7)
1-1/2	2.24 (57)	7.0 (26.7)	4.0 (15.0)	14.5 (55.0)	11.4 (43.3)
2	2.24 (57)	14.1 (53.3)	9.7 (36.7)	31.3 (118.3)	22.5 (85.0)
2-1/2	3.46 (88)	18.5 (70.0)	15.4 (58.3)	35.2 (133.3)	30.8 (116.7)
3	3.46 (88)	27.7 (105.0)	25.1 (95.0)	52.8 (200.0)	46.2 (175.0)
4	3.46 (88)	59.4 (225.0)	52.8 (200.0)	123.3 (466.7)	114.5 (433.3)
5	6.57 (167)	52.8 (200.0)	39.6 (150.0)	132.1 (500.0)	123.3 (466.7)
6	6.57 (167)	75.7 (286.7)	52.8 (200.0)	154.1 (583.3)	140.9 (533.3)
8	6.57 (167)	184.9 (700.0)	158.5 (600.0)	396.3 (1500.0)	374.2 (1416.7)

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials:

- Bellow: Tin-bronze;
- Vane: Stainless steel;
- Body: Forged brass.

Temperature Limit: 230°F (110°C).

Pressure Limit: 145 psig (10 bar).

Enclosure Rating: NEMA 4 (IP64).

Switch Type: SPDT snap switch.

Electrical Rating: 10A res, 3A ind @ 250 VAC.

Electrical Connection: Cable gland with attached wire leads or optional conduit connection.

Process Connection: 1" male NPT or BSPT.

Mounting Orientation: Switch must be installed vertically on horizontal pipe runs.

Set Point Adjustment: Four vane combinations and an adjustment screw.

Enclosure: Die-cast aluminum alloy.

Weight: 28.22 oz (0.8 kg).

Agency Approvals: CE.

Series FS-2, Paddle Flow Switch

OPTIONS

BSPT Process Connection,

To order add suffix -BSPT.

Example: **FS-2-BSPT**

Conduit Connection, 1" NPT female conduit connection with no wire leads.

To order add suffix -CND.

Example: **FS-2-CND**

FLOW

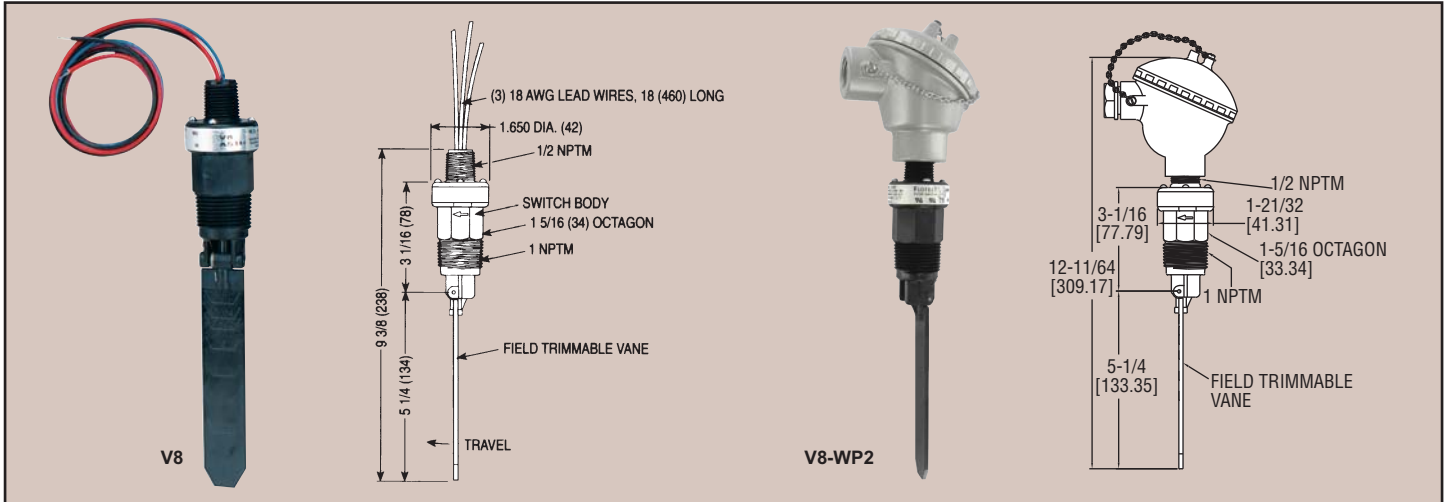
Flow Switches, Paddle



Series
V8

FLOTECT® Vane Operated Flow Switch

Field Adjustable — 1 to 6 Inch Pipe, Leak Proof Body



V8 Flotect® Flow Switch Protects Equipment: Operation is simple and dependable. In most applications, the switch is normally off while there is sufficient flow of liquid or air. When flow stops, the vane spring moves the vane, actuating a single pole double throw switch rated 5A @ 120/250 VAC to start or stop motor, pump, engine, etc. Operate a damper or valve; shut down a burner or actuate an alarm or signal, protecting unattended equipment from damage or loss of production.

The V8 Flotect® Flow Switch has a leak proof body and vane constructed of tough durable polyphenylene sulfide which has excellent chemical resistance. The full size trimmable vane is provided with molded-in graduations allowing for installation in a 1 inch through 6 inch pipe. Operating pressures are up to 150 psig (10 bar) and temperatures to 212°F (100°C). The V8 flow switch can be used in various chemical processes, industrial systems and similar applications where process conditions are compatible with polyphenylene sulfide, ceramic 8 and 316SS. The V8 Flotect® flow switch is UL recognized as an industrial motor controller per UL standard 508, suitable for mounting in a protected environment.

SPECIFICATIONS

Service: Compatible gases or liquids.

Wetted Materials:

- Vane and body: Polyphenylene Sulfide (PPS);
- Pin and spring: 316 SS or Inconel®;
- Magnet: Ceramic 8.

Temperature Limit: 212°F (100°C).

Pressure Limit: 150 psig (10.34 bar).

Enclosure Rating: General purpose, WP/WP2 option is weatherproof.

Switch Type: SPDT snap switch, MV option: SPDT gold contact snap switch.

Electrical Rating: 5A @ 125/250 VAC, 5A resistive, 3A inductive @ 30 VDC; MV option: 1A @ 125 VAC, 1A resistive, 0.5A inductive @ 30 VDC.

Electrical Connections: 18 AWG, 18" (460 mm) long.

Conduit Connection: 1/2" male NPT, 1/2" female NPT on WP and WP2.

Process Connection: 1" male NPT.

Mounting Orientation: Actuation/deactuation flow rates are based on horizontal pipe runs and are nominal values. Unit cannot be used with vertical down flow.

Set Point Adjustment: Vane is trimmable.

Weight: 4.5 oz (0.13 kg).

Agency Approvals: CE, UL 508 for US and Canada.

Series V8, Flow Switch

OPTIONS

Gold Plated Contacts, for dry circuits. Rated 1A @ 125 VAC; 1A resistive, 0.5A inductive @ 30 VDC. To order add suffix -MV.

Example: **V8-MV**

Inconel® Alloy Option. Inconel® Alloy replaces standard 316 SS wetted parts. Wetted parts are Inconel® Alloy, ceramic 8, and Polyphenylene Sulfide. To order add suffix -INC.

Example: **V8-INC**

Weatherproof Enclosure. Optional housing is phenylpolioxide and provides weatherproof protection for electrical wiring. To order add suffix -WP. (Not UL approved)

Example: **V8-WP**

Weatherproof Enclosure. Optional housing is aluminum and provides weatherproof protection for electrical wiring.

To order add suffix -WP2. (Not UL approved)

Example: **V8-WP2**

Cold Water Flow Rates		Air Flow Rates	
Approximate actuation/deactuation		Approximate actuation/deactuation	
GPM upper, LPM lower		SCFM upper, LPM lower	
Pipe Size		Pipe Size	
1"	10.8/9.1 40.9/34.6	1"	39/32.6 1105/923
1-1/4"	9.8/8.3 37.2/31.4	1-1/4"	37.5/32.2 1062/912
1-1/2"	8.6/6.8 32.4/25.7	1-1/2"	33.4/26.7 945/757
2"	10.9/8.8 41.2/33.4	2"	43/36.8 1218/1042
3"	12.9/8.9 48.8/33.5	3"	52.7/38.9 1493/1100
4"	21.1/13.8 79.7/52.2	4"	87.6/63.6 2482/1802
6"	45/33 170.2/124.7	6"	168.6/137.4 4775/3890

APPLICATIONS

Applications are chemical processing, air conditioning, refrigeration, heating systems, cooling lines, machinery, liquid transfer systems, water treatment, food processing, and machine tools. Also, other applications compatible with the materials of construction.

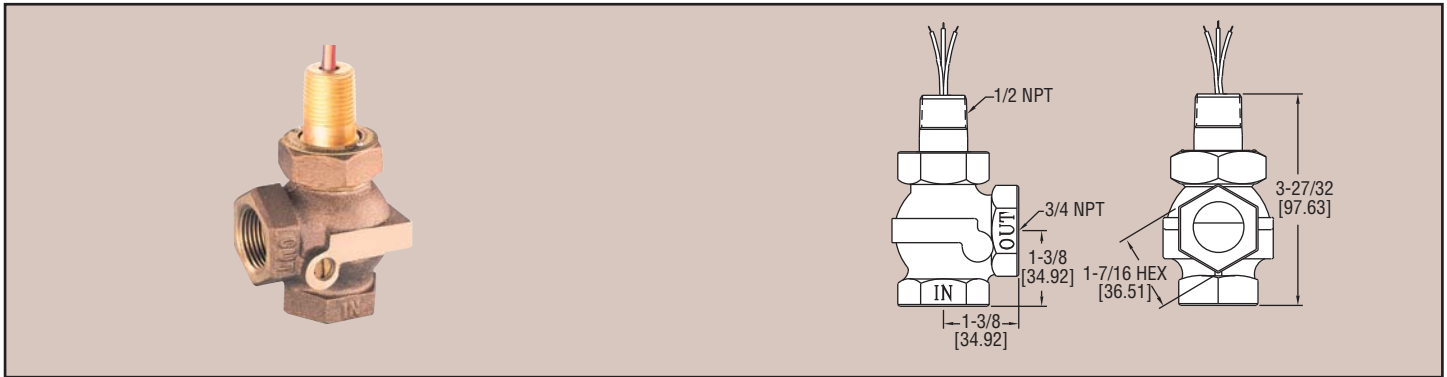
Inconel® is a registered trademark of Huntington Alloys Corporation



Series
G9

Globe Flow Switch

Adjustable Set Point, Water or Oil Service, 90° Flow Path



The Series G9 Globe Flow Switch provides accurate flow detection in water and oil with $\pm 1\%$ repeatability. A shuttle by-pass vane inside the housing is controlled externally using an ordinary flat blade screwdriver, allowing flow settings to be changed without disassembly. Each switch is constructed of non-corrosive materials and resists shock and vibration. The Series G9 is suitable for triggering alarms on interlocking shutdown circuitry when flow rate is incorrect and for protecting bearings, gears, and cooling systems.

Model	Actuation Set Point Range GPM (LPM)
G9-21	0.75 - 4.0 (2.8 - 15.1)
G9-22	2.0 - 8.0 (7.6 - 30.3)
G9-23	7.0 - 14.0 (26.5 - 53.0)

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Housing: Bronze; Shuttle: Acetal; Spring: 316 SS; O-ring: Fluoroelastomer; Other: Ceramic.
Temperature Limits: -20 to 180°F (-29 to 82°C).
Pressure Limits: 400 psi (27 bar) @ 100°F (37.8°C).
Accuracy: $\pm 10\%$ of set point.
Repeatability: $\pm 1\%$ maximum deviation.
Switch Type: SPDT.
Electrical Rating: .17A @ 120 VAC, .08A @ 240 VAC, .13A @ 120 VDC, .06A @ 240 VDC.

Electrical Connections: 18 AWG, 24" (61 cm), polymeric lead wires.
Process Connection: 3/4" female NPT.
Mounting Orientation: Any position. Set points shown are based on vertical, lead wires up position.
Required Filtration: 150 microns or better.
Weight: 1 lb, 11 oz (0.76 kg).
Agency Approvals: CE.

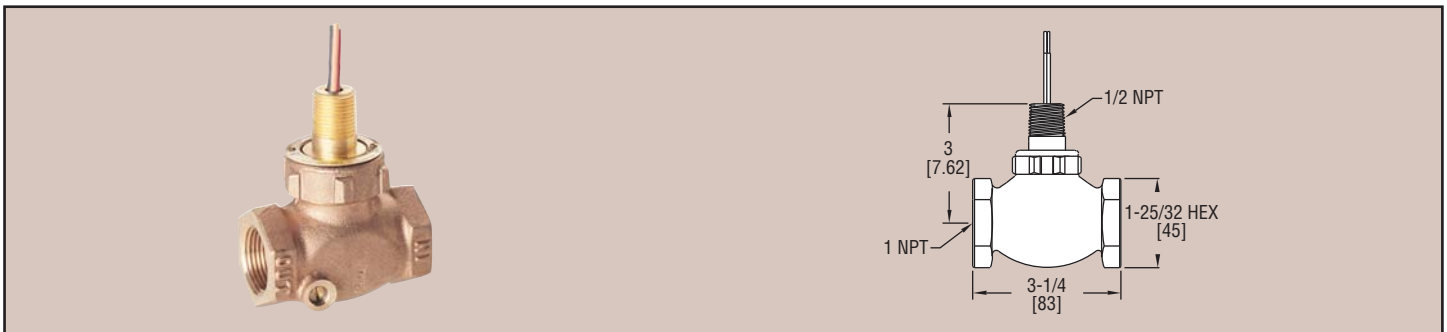
FLOW



Series
GVS

Globe Valve Switch

Adjustable Set Point, Rugged Bronze Construction, Straight Through Flow



The Series GVS offers accurate flow detection with 1% repeatability and external adjustability over a broad range of flow settings. The durable construction delivers long-life reliability in either water or oil. Generous flow paths keep pressure drop low. The GVS are ideal for detection of improper flow rates in high volume lubrication, cooling or process systems.

Model	Actuation Set Point Range GPM (LPM)
GVS-111	1.0 - 6.0 (3.8 - 22.7)
GVS-112	5.0 - 15.0 (18.9 - 56.8)
GVS-113	2.0 - 8.0 (7.6 - 30.3)

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Housing: Bronze; Shuttle: TFE; Bonnet: Bronze; Spring: 316SS.; Other: Fluoroelastomer, ceramic.
Temperature Limits: -20 to 200°F (-29 to 93°C).
Pressure Limits: 400 psig (27 bar) @ 100°F (38°C).
Accuracy: $\pm 10\%$.
Repeatability: 1% maximum deviation.
Switch Type: SPDT.
Electrical Rating: .17A @ 120 VAC, .08A @ 240 VAC, .13A @ 120 VDC, .06A @ 240 VDC.
Electrical Connections: 18 AWG, 24" (61 cm), polymeric lead wires.
Process Connections: 1" female NPT.
Mounting Orientation: Any position. Set points shown are based on horizontal, lead wires up positional
Required Filtration: 150 microns or better.
Weight: 2 lb, 8 oz (1.16 kg).
Agency Approvals: CE.

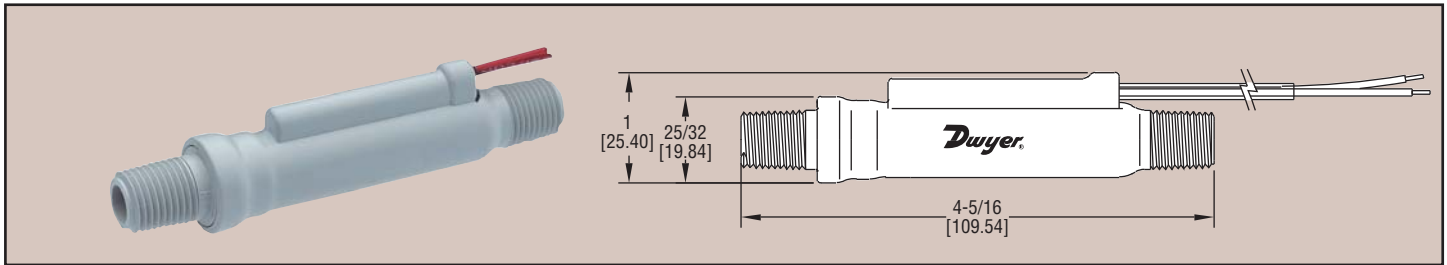
Flow Switches,
Shuttle/Piston



Series
P2

Flow Switch

Ideal for Air and Post-Filtered Water Applications, Fixed Set Point, FDA Compliant



The compact Series P2 Flow Switch utilizes a piston-type design for both air and pure water applications. The switches have preset actuation points from 0.05 to 1.0 GPM for water and 25 CFH to 5 CFM for air. The piston design incorporates a hermetically sealed SPST magnetic reed switch. The P2 is comprised of PPE and PS housing and piston and 316 SS spring and stop pin. All wetted parts are FDA compliant. Economical and superior design make this an excellent switch for pure water equipment, filter life monitoring, heat exchangers, and cooling applications.

Media	Model	Actuation Set Point
Liquids	P2-11	.05 (.19)
	P2-12	.25 (.95)
	P2-13	.50 (1.89)
	P2-14	1.0 (3.79)
Gases	P2-15	.42 (11.9)
	P2-16	1.0 (28.3)
	P2-17	2.5 (70.8)
	P2-18	5.0 (141.6)
	CFM (LPM) @ 5 psi	

SPECIFICATIONS

Service: Compatible liquids or gases.

Wetted Materials: Housing: PPE & PS (polyphenylene ether and polystyrene); Piston: PPE & PS and epoxy; Spring and stop pin: 316 SS.

Temperature Limits: 0 to 212°F (-18 to 100°C).

Pressure Limits: 150 psig (10.3 bar) @ 70°F (21°C); 50 psig (3.4 bar) @ 212°F (100°C).

Switch Type: SPST, N.O.

Electrical Rating: .17A @ 120 VAC, .08A @ 240 VAC, .13A @ 120 VDC, .06A @ 240 VDC.

Electrical Connection: 22 AWG, 18" (45.7 cm), PVC lead wires.

Process Connection: 1/4" male NPT.

Mounting Orientation: Any position. Set points shown are based on vertical, inlet down position.

Required Filtration: 50 microns or better.

Weight: 2 oz (.06 kg).

Agency Approvals: CE.

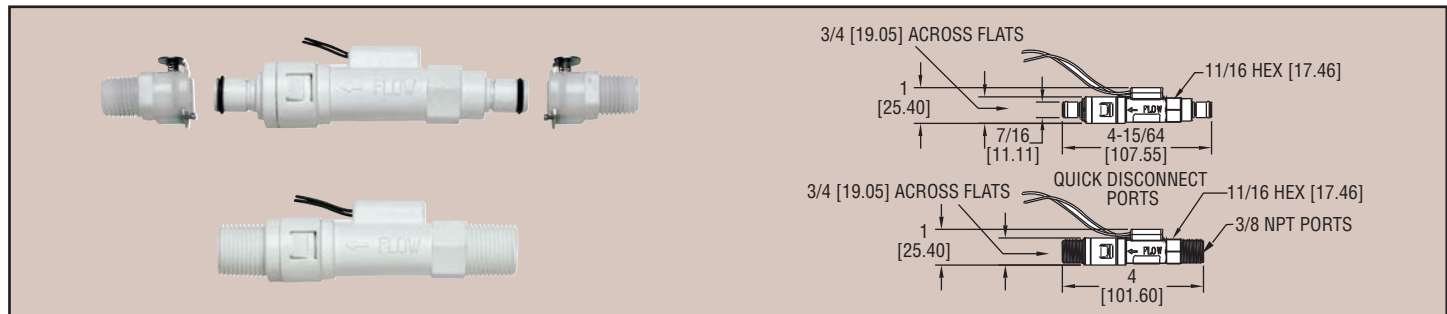
FLOW



Series
P3

Polypropylene Flow Switch

Fixed Set Points from 0.25 to 2.0 GPM, 3/8" NPT or "Quick Disconnect" Adapters



Fit almost any piping requirements with the Series P3 Polypropylene Flow Switch. The basic piston design consists of a hermetically sealed SPST normally open reed switch. Choose the inlet and outlet port to be 3/8" male NPT or 1/4" male "Quick Disconnect". Select a quick disconnect acetal adapter for straight through flow or with a shut off valve. The shut off valve will stop line flow when the adapter is removed from the switch. The flow will resume when the adapter is reconnected. With many snap-on fittings to choose from, any flow application can integrate the P3 Flow Switch into the existing piping.

Model	Connection	Actuation Set Point GPM (LPM)
P3-31	3/8" NPT	0.25 (.95)
P3-32	3/8" NPT	0.50 (1.89)
P3-33	3/8" NPT	1.0 (3.79)
P3-34	3/8" NPT	1.5 (5.68)
P3-35	3/8" NPT	2.0 (7.57)
P3-41	Q Disconnect	0.25 (.95)
P3-42	Q Disconnect	0.50 (1.89)
P3-43	Q Disconnect	1.0 (3.79)
P3-44	Q Disconnect	1.5 (5.68)
P3-45	Q Disconnect	2.0 (7.57)

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials: Housing: Polypropylene; Piston: PPS composite; Spring: 316SS; O-ring: Fluorocarbon.

Temperature Limits: 0 to 212°F (-18 to 100°C).

Pressure Limits: 125 psig (8.6 bar) @ 70°F (21°C), 50 psig (3.4 bar) @ 212°F (100°C).

Accuracy: 20% of set point.

Repeatability: ±1%.

Switch Type: SPST, N.O.

Electrical Rating: .08A @ 120 VAC.

Electrical Connection: 24" (60.96 cm), polymeric wire leads, 22 AWG.

Process Connection: 3/8" male NPT or 1/4" quick disconnect.

Mounting Orientation: Any position. Set points shown are based on vertical, inlet down position.

Required Filtration: 100 microns or better.

Weight: 5 oz (0.14 kg).

Agency Approvals: CE.

Adapters (Price shown per unit, need two per switch)

Model	Connection
P3-801	Quick disconnect straight through 1/4" NPT
P3-802	Quick disconnect straight through 1/4" BSPT
P3-804	Quick disconnect straight through 3/8" BSPT
P3-807	Quick disconnect straight through 1/4" ID tubing
P3-901	Quick disconnect straight through 1/4" NPT w/shut-off valve
P3-902	Quick disconnect straight through 1/4" BSPT w/shut-off valve
P3-907	Quick disconnect straight through 1/4" ID tubing w/shut-off valve

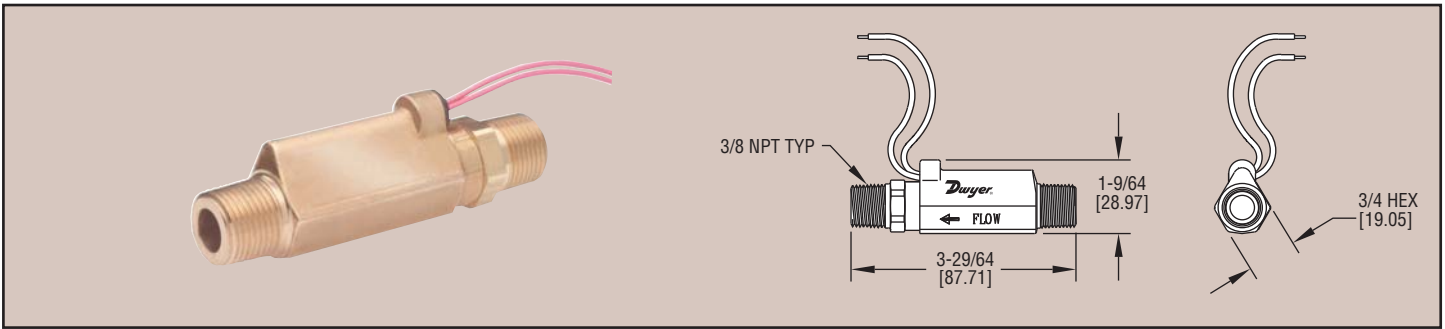
Flow Switches,
Shuttle/Piston



Series
P8

High Pressure Brass Flow Switch

Up to 1500 psi, Fixed Setpoint, Up to 2.0 GPM, Rugged Brass Body



High inline pressures are no problem for the Series P8 brass flow switch. The switch integrates a one-piece magnetic PPS composite piston to handle pressure up to 1500 psi. The P8 switches use 100 micron filtration and are less susceptible to clogging than other high inline pressure switches. Setpoints range from 0.25 to 2.0 GPM for liquid flow. Use the Series P8 in industrial cleaning equipment or high pressure lubrication systems.

Model	Actuation Set Point GPM (LPM)
P8-11	0.25 (.95)
P8-12	0.50 (1.89)
P8-13	1.0 (3.79)
P8-14	1.5 (5.68)
P8-15	2.0 (7.57)

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials: Housing: Brass; Piston: PPS composite, epoxy; Spring: 316SS; O-ring: Fluorocarbon.

Temperature Limits: -20 to 275°F (-28 to 135°C).

Pressure Limits: 1500 psi (103.4 bar).

Accuracy: ±20% of set point.

Switch Type: SPST, N.O.

Electrical Rating: .17A @ 120 VAC, .08A @ 240 VAC, .13A @ 120 VDC, .06A @ 240 VDC.

Electrical Connection: No. 22 AWG, 24" (61 cm), polymeric leads.

Process Connections: 3/8" male NPT.

Mounting Orientation: Any position. Set points shown are based on vertical, inlet down position.

Required Filtration: 100 microns or better.

Weight: 6 oz (.17 kg).

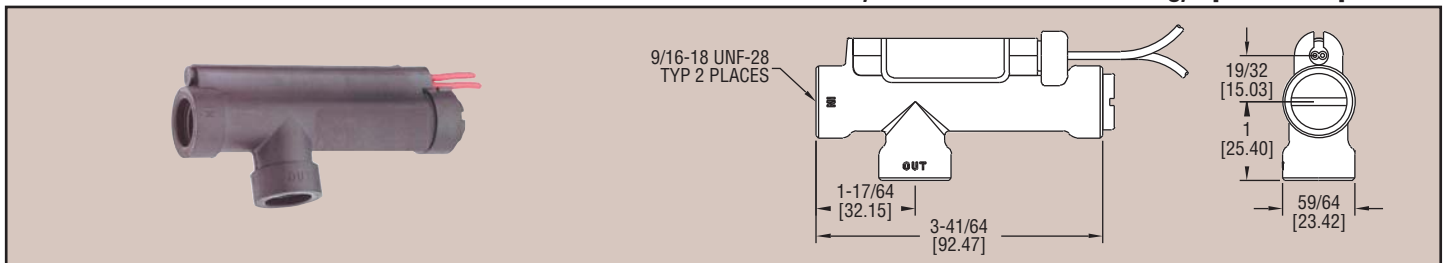
Agency Approvals: CE.



Series
P4

PPS Piston Flow Switch

Fixed Set Points from 0.1 to 1.5 GPM, SPST and SPDT Switching, Optional Adapters



The **Series P4 PPS Flow Switch** features a molded plastic construction for enhanced performance. Monitor liquids with fixed set points from 0.1 to 1.5 GPM. Choose normally open or normally closed SPST or SPDT hermetically sealed reed switch technology. The industrial switch features PPS R4 housing and piston, 316SS spring, Fluoroelastomer O-ring and Epoxy. The inlet and outlet ports are 9/16"-18 UNF-28 thread with optional 1/8" and 1/4" NPT or 1/2" barbed adapters.

Model	Actuation Set Point GPM (LPM)	Switch Type
P4-11	.1 (.38)	SPST, N.O.
P4-12	.25 (.95)	SPST, N.O.
P4-13	.5 (1.89)	SPST, N.O.
P4-14	.75 (2.84)	SPST, N.O.
P4-15	1 (3.7)	SPST, N.O.
P4-16	1.5 (5.68)	SPST, N.O.
P4-31	.1 (.38)	SPDT
P4-32	0.25 (.95)	SPDT
P4-33	0.5 (1.89)	SPDT
P4-34	0.75 (2.84)	SPDT
P4-35	1.0 (3.79)	SPDT
P4-36	1.5 (5.68)	SPDT

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials: Housing and piston:

Polyphenylene sulfide (PPS) R4;

Spring: 316 SS; O-ring:

Fluoroelastomer; Other: Epoxy.

Temperature Limits: 0 to 225°F (17 to 107°C).

Pressure Limits: 250 psig (17 bar) @ 54°F (12°C).

Accuracy: ±15% of set point.

Repeatability: ±1%.

Switch Type: SPST or SPDT.

Electrical Rating: .17A @ 120 VAC, .08A @ 240 VAC, .13A @ 120 VDC, .06A @ 240 VDC.

Electrical Connection: 18 AWG, 24" (60.96 cm), PVC lead wires.

Process Connection: 9/16-18 UNF-28 or choice of connection adapters (sold separately).

Mounting Orientation: Any position. Set points shown are based on vertical, inlet down position.

Required Filtration: 50 microns or better.

Weight: 4 oz (0.11 kg).

Agency Approvals: CE.

Optional Adapters

Model	Description
P4-98	1/8" NPT female
P4-94	1/4" NPT female
P4-92	1/2" barb female

FLOW

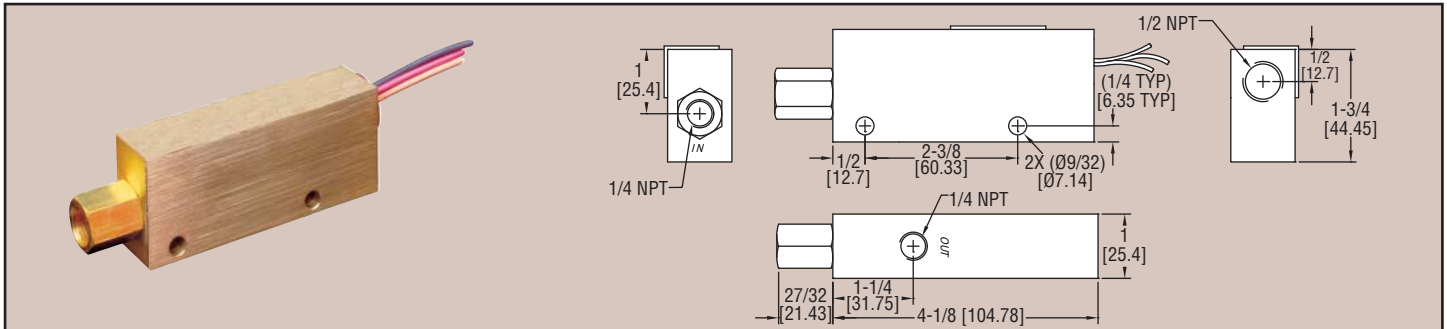
Flow Switches,
Shuttle/Piston



Series
P1

Brass Flow Switch

Fixed Setpoints, Flow Rates from 0.10 to 1.5 GPM



The Series P1 Brass Flow Switch utilizes a piston-type design for accurate detection of excessive or insufficient flow rates. The piston magnetically actuates a hermetically sealed SPDT reed switch. The switches have preset actuation points from 0.10 to 1.5 GPM for liquid flow. The Series P1 is ideal for protecting against loss of fluid flow in hydraulic systems or assuring proper coolant flow in semiconductor processing.

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Housing: Brass; Piston: Polysulfone; Spring: 316SS; O-Ring: Fluoroelastomer; Other: Epoxy.
Temperature Limits: -20 to 225°F (-29 to 107°C).
Pressure Limits: 1000 psig (68.9 bar).
Accuracy: ±10% of set point.
Repeatability: ±1%.
Switch Type: SPDT.
Electrical Rating: .17A @ 120 VAC, .08A @ 240 VAC, .13A @ 120 VDC, .06A @ 240 VDC.

Electrical Connection: 18 AWG, 24" (60.96 cm), polymeric lead wires.

Process Connection: 1/4" female NPT.

Mounting Orientation: Any position.

Set points shown are based on vertical, inlet down position.

Required Filtration: 50 microns or better.

Weight: 0.66 lb (301 g).

Agency Approvals: CE.

Model	Actuation Set Point* GPM (LPM)
P1-011	0.10 (.38)
P1-012	0.25 (.95)
P1-013	0.50 (1.89)
P1-014	0.75 (2.84)
P1-015	1.00 (3.79)
P1-016	1.50 (5.68)

*Calibrated for water at standard conditions.

FLOW

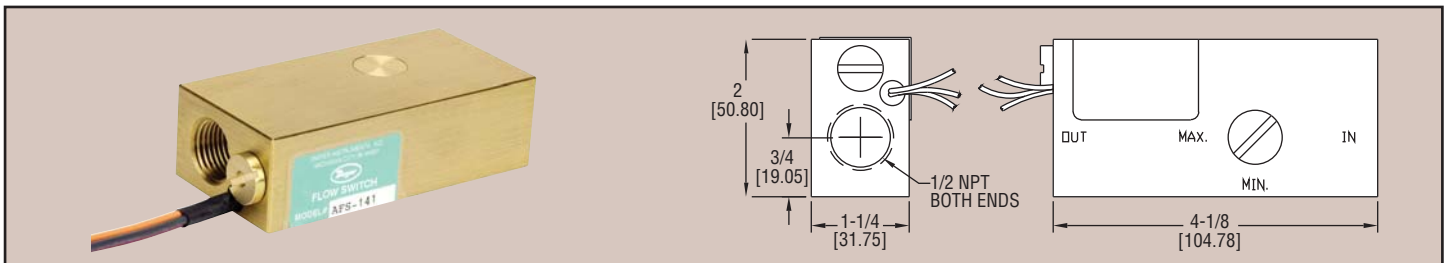
Flow Switches,
Shuttle/Piston



Series
AFS

Adjustable Flow Switch

For Oils, Water and Gases, Infinite Adjustments



The Series AFS Adjustable Flow Switch is externally adjustable and is ideal for protecting machine tools from coolant flow failure, protecting bearings from loss of lubricant or assuring proper air flow. The Series AFS offers an infinite number of flow settings from 0.5 to 20 GPM at pressures up to 1000 psig, with low pressure drop and precise repeatability. The AFS is housed in either brass or stainless steel and can be used with water, compatible liquids, oils, and gases.

SPECIFICATIONS

Service: Compatible gases or liquids.
Wetted Materials: Housing and Piston: See model chart; Spring: 316SS; O-ring: Fluoroelastomer; Other: Epoxy.
Temperature Limits: -20 to 300°F (-29 to 149°C), -20 to 225°F (-29 to 107.2°C) with polysulfone piston.
Pressure Limit: 1000 psi (68 bar).
Accuracy: ±10% of setpoint.
Repeatability: ±1% maximum deviation.
Switch Type: SPDT.
Electrical Rating: .17A @ 120 VAC, .08A @ 240 VAC, .13A @ 120 VDC, .06A @ 240 VDC.
Electrical Connections: 18 AWG, 24" (61 cm), polymeric lead wires, optional 1/2" male NPT conduit connection.
Process Connection: 1/2" female NPT ports.
Mounting Orientation: Any.
Setpoint Adjustment: Liquids: 0.5 to 20 GPM (1.9 to 75.7 LPM); Gases: 1.0 to 75 SCFM (28 to 2124 LPM) at 5 psig.
Required Filtration: 50 microns or better.
Weight: 2 lb, 11 oz (1.22 kg).
Agency Approvals: CE.

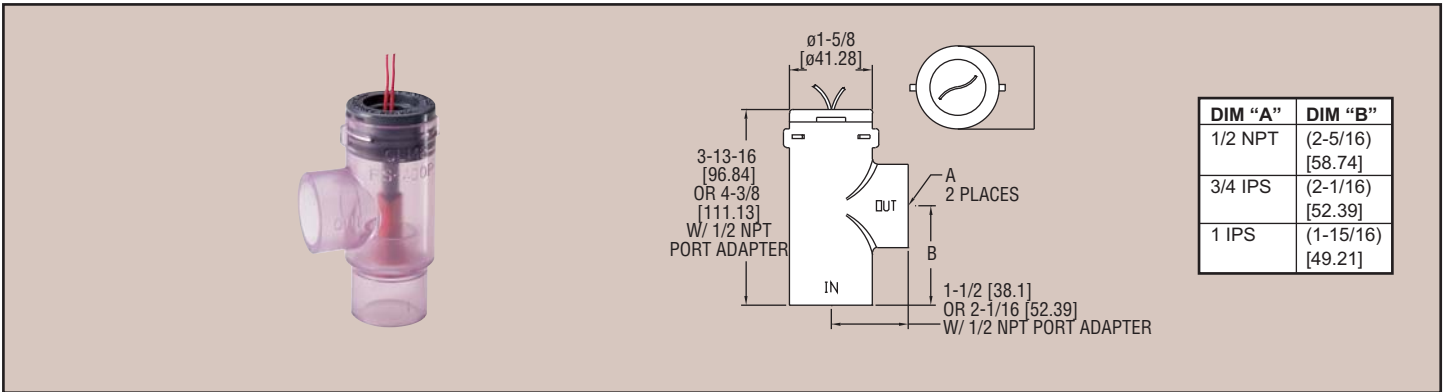
Model	Media	Electrical Connection	Piston	Housing
AFS-131	Oil	Wire leads	Brass	Brass
AFS-141	Water	Wire leads	Polysulfone	Brass
AFS-151	Liquids	Wire leads	316SS	316SS
AFS-231	Gases	Wire leads	Brass	Brass
AFS-251	Gases	Wire leads	316SS	316SS
AFS-132	Oil	1/2" NPT conduit	Brass	Brass
AFS-142	Water	1/2" NPT conduit	Polysulfone	Brass
AFS-152	Liquids	1/2" NPT conduit	316SS	316SS
AFS-232	Gases	1/2" NPT conduit	Brass	Brass
AFS-252	Gases	1/2" NPT conduit	316SS	316SS



Series
P5

PVC Shuttle Flow Switch

Low Cost Flow/No Flow Monitoring, Visual Flow Indication, Broad Chemical Compatibility



The transparent Series P5 Shuttle Flow Switch features corrosion resistant, durable PVC housing for visual confirmation in flow/no flow applications. The switches have preset actuation points from 0.5 to 2.0 GPM for actuation on increasing flow. Switching is SPST normally open at no flow. Choose from 1/2" NPT or 3/4" IPS (for 0.5 GPM) or 1" IPS (for 2.0 GPM) inlet and outlet ports. The shuttle design has only one moving part for long life and minimum maintenance. Remove the one-piece bonnet and shuttle assembly to quickly clean the unit without disturbing the housing or piping. Rugged construction and excellent chemical compatibility simplify flow / no flow detection.

Model	Actuation Set Point GPM (LPM)	Process Connection
P5-1	.5 (1.89)	1/2" NPT port adapter
P5-2	.5 (1.89)	3/4" IPS
P5-3	2.0 (7.57)	1" IPS

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Housing, shuttle and bonnet: PVC; O-ring: Buna-N; Epoxy.
Temperature Limits: 120°F (49°C).
Pressure Limit: 120 psig (8.2 bar) @ 70°F (21°C) to 100°F (38°C), 50 psig (3.45 bar) @ 101°F (38.3°C) to 120°F (49°C).
Accuracy: ±20% of set point.
Repeatability: ±1%.
Switch Type: SPST, N.O.

Electrical Rating: .17A @ 120 VAC, .08A @ 240 VAC, .13A @ 120 VDC, .06A @ 240 VDC.
Electrical Connection: 22 AWG, 24" (61 cm), PVC lead wire.
Process Connection: 1/2" female NPT, 3/4" IPS or 1" IPS.
Required Filtration: 150 microns or better.
Mounting Orientation: Vertical, inlet facing down.
Weight: 6 oz (.17 kg).
Agency Approvals: CE.

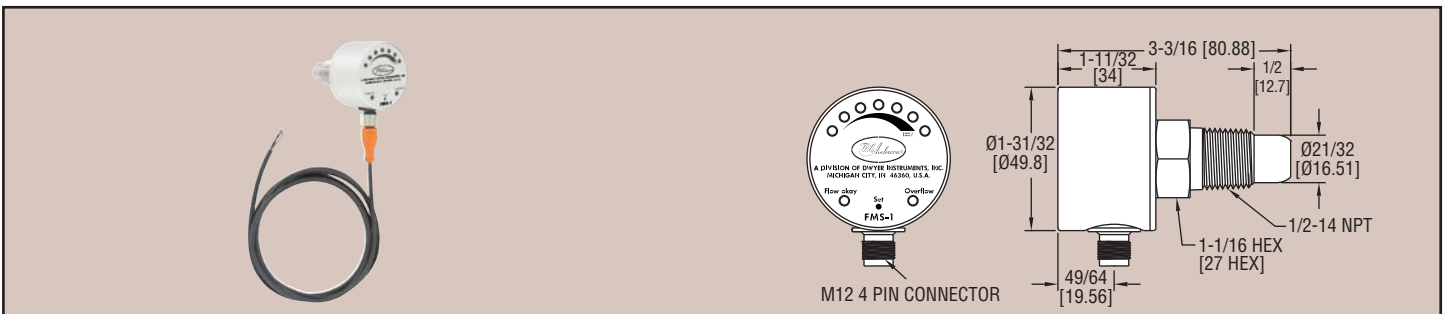
FLOW
Flow Switches, Shuttle/Piston



Series
FMS

Flow Sensor

For Water and Water Based Liquids/Oil and Oil-Based Liquids



Series FMS Flow Sensor FMS-1 is for applications requiring RELATIVE measurement and set-point of flow rate. This means that the actual velocity of the flow or the quantitative measurement in GPM is not known and is not important. What is important is that the set-point can be set as a "percentage of" or "relative to" the full flow rate. No other flow sensor could do it this simply or effectively.

How It Operates

The model FMS uses a set of flashing LED's to indicate flow. All 7 of the LED's will remain lit to show 100% flow rate. The flow OK light will also be lit showing that the established full flow rate is what is flowing in the pipe. When you initially set the flow rate, it will mark that as your 100% mark. If your flow reduces below the 50% mark, you will get an alarm from the sensor. If flow increases beyond the initially established flow rate, the "Overflow" LED light will come on.

Model FMS-1, Flow Sensor PNP N.O.
Model FMS-2, Flow Sensor PNP N.C.

SPECIFICATIONS

Service: Water and water based liquids/oil and oil-based liquids.
Wetted Materials: Sensor head: 303 SS.
Low Flow Set Point: Auto set @ 50% / adjustable via "set" push button.
Set Point Range: 5.0 ft/sec (0-150 cm/sec.)
Repeatability: < 0.5%.
Hysteresis: 10% of set-point value typical.
Medium Temperature Limits: -4 to 176°F (-20 to 80°C).
Pressure Limit: 450 psi (30 bar).
Response Time: 25 seconds (typical).

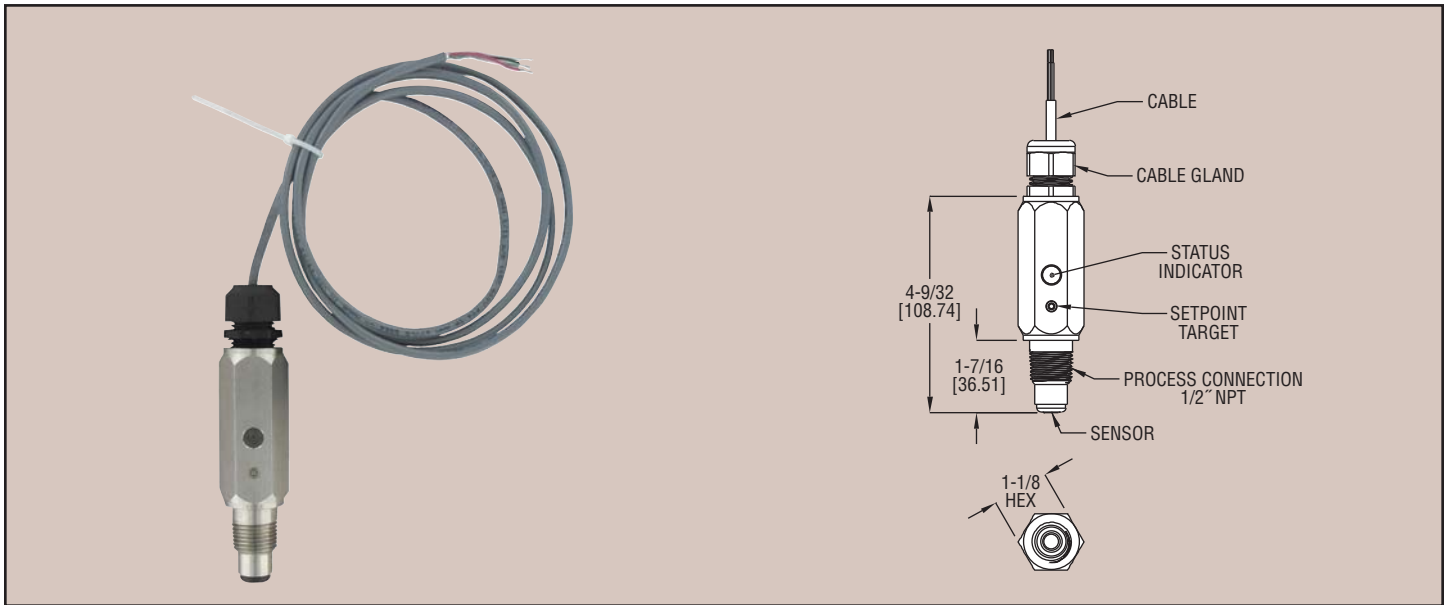
Supply Voltage: 20-30 VDC (short circuit protected).
Switching Current: < 200 mA.
Power Consumption: 6 W max.
Electrical Connection: M12 male socket 4-pin. Comes with 6.5 ft (2 m) cable with M12 connector and pigtail.
Process Connection: 1/2" male NPT.
Enclosure Rating: NEMA 4 (IP65).
Initial Operation: After 15 seconds.
Switch Type: PNP N.O. (switch closed with flow), PNP N.C. (switch open with flow).
Weight: .55 lb (.25 kg).



Series
TDFS

Thermal Dispersion Flow Switch

Non-Mechanical, Low Pressure Drop



The **Series TDFS** is a thermal flow switch that indicates whether the flow rate is above or below a user set flow rate with NO and NC NPN outputs. Setpoint is easily field set, just tap the included magnet on the setpoint target three times at the desired flow rate and it's done. Incorporated into the unit are two LED status indicators on opposite sides of the unit providing visual switch indication, green when the flow is above set point, red when the flow is below set point.

The TDFS uses an impulse thermal dispersion measurement technique to measure the flow rate where the probe is heated above the process temperature and then is allowed to cool down to the process temperature. Empty pipe is not a problem with the TDFS unlike some competitor units that will overheat. Thermal flow switches can offer better long term reliability and life expectancy than mechanical flow switches.

TDFS Advantages over Mechanical Flow Switches

- No paddles or vanes to break off into the flow
- No jams or material stopping the paddle movement
- No seals on movement assembly to wear or leak
- Low pressure drop, only needs to be 10% into the flow (e.g. 1/8" for 3/4" schedule 40 pipe)

TDFS-1-P-06, Thermal flow switch, 6' cable with cable gland

Consult factory for longer cable lengths

SPECIFICATIONS

Service: Compatible water-based fluids.

Wetted Materials: 316 SS, Polysulfone, and FKM.

Setpoint Range: 0.5 to 10 ft/s (0.15 to 3.0 m/s).

Repeatability: 0.07 ft/s +3% of setpoint.

Typical Deadband: 0.1 ft/s +15% of setpoint.

Temperature Limits: Process: 5 to 185°F (-15 to 85°C) (non-freezing); Ambient: 5 to 167°F (-15 to 75°C), Storage: -40 to 185°F (-40 to 85°C).

Pressure Limits: 150 psig (10.34 bar), max. momentary surge: 500 psig (34.47 bar).

Response Time: Approximately 8 s.

Power Requirement: 9 to 24 VDC.

Switching Current: 400 mA, derate 5 mA/°C above 23°C.

Current Consumption: Average: 93 mA, Peak: 300 mA.

Electrical Connection: 4 conductor 22 AWG, 6' (1.83 m) long with cable gland.

Process Connection: 1/2" NPT male.

Enclosure Rating: NEMA 4X (IP65).

Housing Materials: 316 SS, 416 SS, polycarbonate, neoprene, and acrylated urethane.

Switch Type: 1 NO NPN, 1 NC NPN.

Input Power and Protection: 0.5A fuse (resettable) reverse polarity protected.

Switched Output Protection: 0.5A fuse (resettable) reverse polarity protected.

Agency Approvals: CE, RoHS.

FLOW

Flow Switches,
Thermal

NEW PRODUCT!



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Series
TSP

Liquid Flow Controller

NO or NC Relay Output, Adjustable Time Delay



Model	DIM "A" in (cm)	DIM "B" in (cm)	DIM "C" in (cm)
TSP110	6-1/2 (165.1)	1-5/16 (33.34)	45/64 (17.86)
TSP210	6-1/2 (165.1)	1-5/16 (33.34)	45/64 (17.86)
TSP120	7-29/32 (200.82)	2-13/16 (71.44)	2-7/64 (53.58)
TSP220	7-29/32 (200.82)	2-13/16 (71.44)	2-7/64 (53.58)
TSP110S	8-5/16 (211.14)	1-9/64 (28.97)	45/64 (17.86)
TSP210S	8-5/16 (211.14)	1-9/64 (28.97)	45/64 (17.86)
TSP120S	9-13/16 (249.24)	2-13/16 (71.44)	2-7/64 (53.58)
TSP220S	9-13/16 (249.24)	2-13/16 (71.44)	2-7/64 (53.58)

Protect pumps and valves from dry running with the Series TSP Liquid Flow Controller. The Series TSP combine a liquid flow switch with a failsafe relay controller to detect a flow or no flow situation and provides switching for direct actuation of pumps and valves. Controller features adjustable time delay, selectable NO or NC operation, and LED indication of sensor, relay, and power status. Four models (TSP110S, TSP210S, TSP120S, TSP220S) are designed with an integral flash alarm to provide immediate indication of local alarm conditions.

Model	Flash Alarm	Wetted Parts	Sensor Length
TSP110	No	PP	Short
TSP210	No	PVDF	Short
TSP120	No	PP	Long
TSP220	No	PVDF	Long
TSP110S	Yes	PP	Short
TSP210S	Yes	PVDF	Short
TSP120S	Yes	PP	Long
TSP220S	Yes	PVDF	Long

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Polypropylene/PPS or polyvinylidene fluoride.
Temperature Limits: -40 to 158°F (-40 to 70°C).
Pressure Limits: 150 psi (10 bar) @ 77°F (25°C), derated 1.67 psi (.113 bar) per °C above 25°C.
Relay Output: 1 SPDT form C, isolated and sealed.
Relay Load: 250 VAC, 10 A resistive, 1/2 hp.
Switching Mode: Selectable NO or NC.
Supply Voltage: 120/240 VAC, 50/60 Hz, selectable.
Current Consumption: .25 amps maximum.

*Applies to models with flash alarm only.

Sensor Voltage Supply: 13 VDC, 1 Watt max., nominal.

Sensor Trigger Point: Dry <10 mA, wet >10 mA.

Time Delay: Adjustable, 0.15 to 60 seconds.

Flash Type: *Xenon tube.

Flash Frequency: *1 per second.

Brightness: *>50,000 CP.

Strobe Life: *10 M cycles.

Conduit Connection: 1/2" NPT.

Mounting Connection: 3/4" NPT.

Enclosure: Polypropylene, flame retardant, probe NEMA 4X (IP65).

Agency Approvals: CE.



Series
TDS

Thermal Dispersion Flow Switch

Adjustable Switch Point, LED Indication



Dim.	TDS112, TDS212	TDS122, TDS222
A	3.0" (7.6 cm)	4.5" (11.4 cm)
B	0.7" (1.8 cm)	2.1" (5.3 cm)

The Series TDS Thermal Dispersion Flow Switch offers solid state flow detection of non-coating liquids for pump and process protection. SPDT output allows for interfacing with remote PLC or relay control device. The adjustable switch point is factory calibrated at 0.2 fps with LED indication of flow and calibration status. Units feature selectable NO or NC operation and are not damaged by overranging flow velocities.

Model	Wetted Parts	Length
TDS112	PP/PPS	3.0" (7.6 cm)
TDS212	PVDF	3.0" (7.6 cm)
TDS122	PP/PPS	4.5" (11.4 cm)
TDS222	PVDF	4.5" (11.4 cm)

SPECIFICATIONS

Service: Liquids.
Wetted Materials: Polypropylene /PPS or polyvinylidene fluoride.
Range: 0.04 to 10 fps (1.2X10⁻² to 3.05 m/s)
Temperature Limits: 32 to 140°F (0 to 60°C).
Pressure Limits: 150 psi (10 bar) @ 25°C, derated @ 1.667 psi (.113 bar) per °C above 25°C.
Repeatability: ±5% of setpoint.
Switch Type: SPDT.
Electrical Rating: 60 VAC/60 VDC @ 1 A.
Electrical Connections: 22 AWG 3-wire, 10 ft (3 m) length.

Process Connections: 3/4" male NPT.

Mounting Orientation: Any orientation, for pipe sizes 3/4" to 1-1/2" use 3.0" (7.6 cm) length switch; for 2" to 16" pipe sizes use 4.5" (11.4 cm) length switch.

Setpoint Adjustment: 0.04 to 3 fps (1.2X10⁻² to .91 m/s).

Setpoint Drift: 0.5% of setpoint.

Response Time: 1-10 seconds.

Viscosity Range: 1 to 200 centipoise.

Supply Voltage: 12 to 36 VDC.

Consumption: 50 mA (nominal).

Indication: LED for flow status.

Weight: 3 oz (94 g).

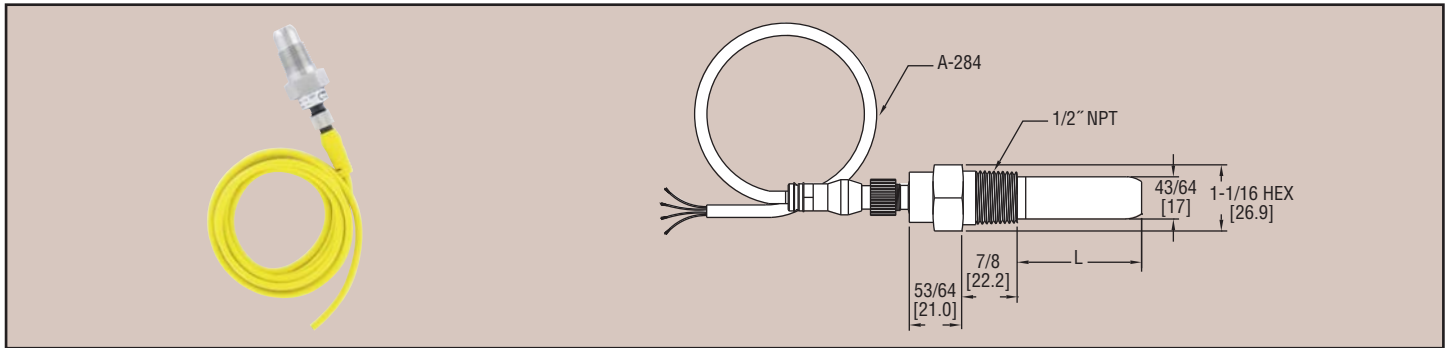
Agency Approvals: CE.



Series
FTS

Thermal Flow and Temperature Switch

For Industrial Cooling Systems



Series FTS Thermal Flow Switch is especially designed, for all types of cooling systems, as a reliable alternative to failure prone mechanical flow switches. The thermal flow switch continually samples the temperature of the coolant and adjusts the low flow setpoint automatically, providing a solid state switch should the coolant flow rate fall below the setpoint value. In addition, the thermal flow switch will provide an alarm output should the coolant temperature rise above acceptable levels. You have double protection with the FTS.

SPECIFICATIONS

- Service:** Water based liquids.
- Low Flow Set Point:** .4 m/s (1.2 fps) (water related) typical.
- Temperature Set Point:** 122°F (50°C) or 158°F (70°C), other settings possible on OEM demand.
- Temperature Limits:** -4 to 176°F (-20 to 80°C).
- Response Time:** 5 to 10 seconds.
- Repeatability:** 0.5%.
- Hysteresis:** <20% of set-point value.
- Pressure Limit:** 150 psi (10 bar).
- Protection Class:** NEMA 6 (IP 67).
- Wetted Material:** 303 SS.
- Process Connection:** 1/2" male NPT.
- Electrical Connection:** M12 male socket 4 pin with 6 ft (2 m) connection cable with M12 connector sold separately.
- Power Requirement:** 18-30 VDC.
- Electrical Rating:** <200 mA.
- Power Consumption:** 4 W max.
- Initial Operation:** After 15 seconds.
- Switch Type:** PNP N.O. (switch closes with flow).

Model	Temp. Set Point	Sensor Length (L)
FTS-AS	122°F (50°C)	1/2" (12.7 cm)
FTS-AL	122°F (50°C)	2" (50.8 cm)
FTS-BS	158°F (70°C)	1/2" (12.7 cm)
FTS-BL	158°F (70°C)	2" (50.8 cm)

ACCESSORY

A-284, Wiring cable 6 ft (2 m) long with M12 connector

FLOW

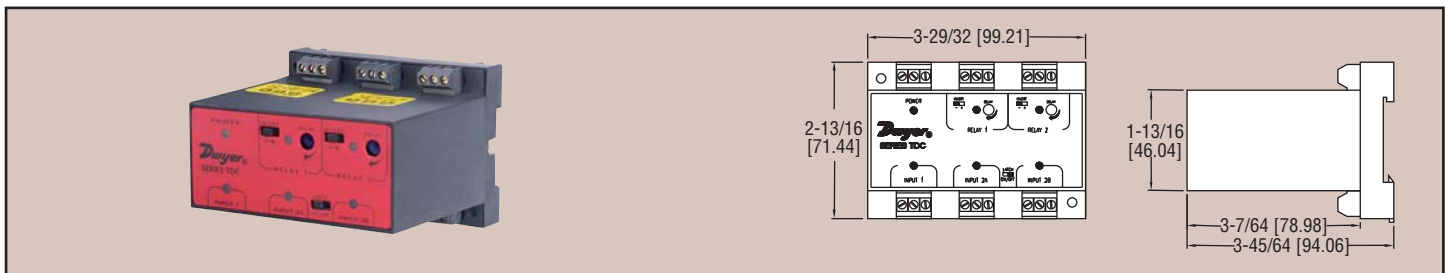
Flow Switches,
Thermal



Series
TDC

Remote Flow Controller

Single or Dual Relay Output, Adjustable Time Delay



Series TDC Remote Flow Controller coupled with a thermal dispersion flow switch (Series TDS) provides a complete system for leak detection, signaling high or low flow conditions, low flow cutoff, and pump or valve actuation. Controller features adjustable time delay for dampening of relay chatter, selectable NO or NC operation, and LED indication of sensor, relay, and power status. Model TDC1 accepts single switch input and single relay output. Model TDC2 accepts three switch inputs and two relay outputs.

SPECIFICATIONS

- Relay Output:** TDC1: 1 SPDT form C; TDC2: 2 SPDT form C (one latching relay).
- Relay Load:** 240 VAC, 12 A resistive, 1/2 HP.
- Switching Mode:** Field selectable NO or NC.
- Supply Voltage:** 120/240 VAC, 50/60 Hz., selectable.
- Current Consumption:** .25 amps maximum.
- Time Delay:** Adjustable, 0.15 to 60 seconds.
- Sensor Voltage Supply:** 13.5 VDC, 100 mA max., nominal.
- Sensor Trigger Point:** Dry <12 mA; Wet >12 mA.
- Sensor Input:** Terminal block.
- Mounting:** EN 50 022 standard 32 mm DIN or panel mount.
- Enclosure:** Polypropylene, flame retardant.
- Temperature Limits:** -4 to 158°F (-20 to 70°C).
- Agency Approvals:** CE.

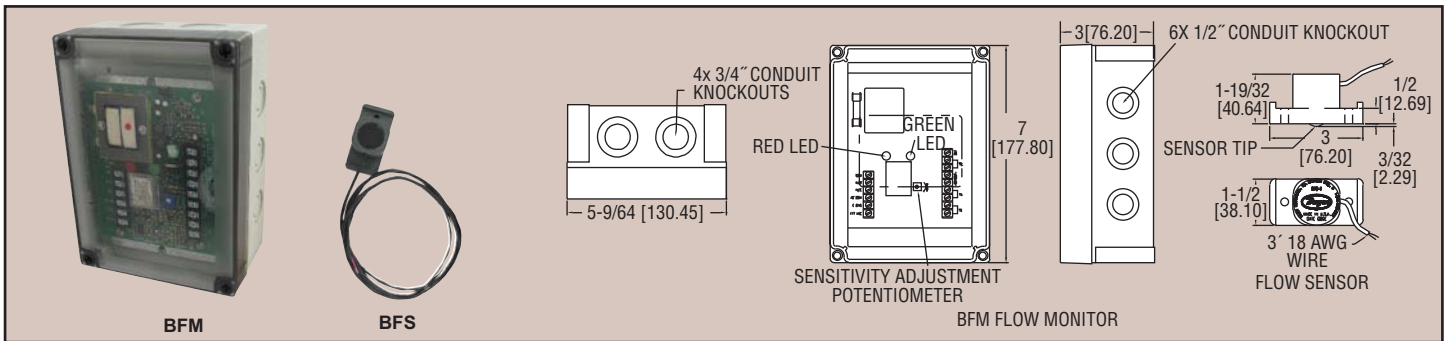
Model	Description
TDC1	Single Point Flow Controller
TDC2	Dual Point Flow Controller



Series
BFM

Bulk Flow Monitor

Monitors Movement of Solids and Liquids



Series BFM Bulk Flow Monitor provides effective monitoring for most flow/no flow conditions in pipes and chutes. Its sensing techniques, which use a Piezo element, makes the BFM versatile for most flow/no flow applications.

The **BFM Control** offers many unique advance features that exceed the industry standards. The BFM Central Processing Unit monitors movement of almost anything through a pipe or chute system. The BFM is ideal for sensing the presence or absence of materials in Pneumatic Conveying Systems. The BFM offers adjustable sensitivity depending on the application demand. Also, it provides easy installation and requires no maintenance. The unit has LED indicators - flow (green)/ no flow (red).

The **BFS-1 Sensor** yields many advance features. It externally mounts to the outside of the pipe or chute. It provides mounting tabs for easy installation. The Sensor is prewired with 3' wire.

Series BFM has many practical applications. You can use it to monitor oil spray systems, discharge chutes, distributors, screw conveyors, drag conveyors, water systems, air systems, pneumatic systems, gravity feed systems, slurry systems, chemical processing, food processing and rotary drums.

Model	Descriptions
BFM-1	Control Unit: NEMA 4X, Polycarbonate Housing, 120VAC
BFM-2	Control Unit: NEMA 4X, Polycarbonate Housing, 220VAC
BFM-3	Control Unit: NEMA 4X, Polycarbonate Housing, 12VDC
BFS-1	Sensor

SPECIFICATIONS

BFM Specifications

Service: Solids and liquids.

Power Requirement: 120VAC, 220VAC or 12VDC.

Power Consumption: .1A.

Temperature Limits: 120°F (48.9°C).

Output: Relay: SPDT rated 4A @ 125/250VAC, 1/10 HP @ 125/250VAC, 3A @ 30VDC. TTL: 0-5 V.

Serial Communications: RS-232.

Electrical Connection: Screw terminal.

Conduit Connection: Knockouts (four 3/4" for power, six 1/2" for sensor and outputs).

Enclosure Rating: NEMA 4X (IP66).

Material: Polycarbonate.

Weight: 3 lb (1.36 kg).

BFS Specifications

Pipe Size: 1/2" to 60" (1.27 to 152.4 cm).

Enclosure Rating: NEMA 4X (IP66).

Electrical Connection: 3' (0.9 m) of 18 gauge wire.

Temperature Limits: 155°F (68.3°C).

Materials: PVC type 1 grade 1 grey.

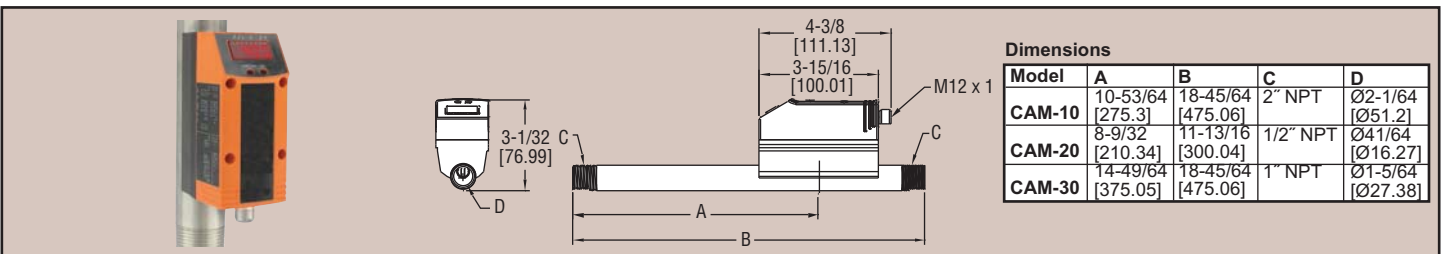
Weight: 5 oz (141.8 g).



Series
CAM

Compressed Air Meter

Steady-State and Cumulative Totals PNP/4-20 mA Output



The **Series CAM Compressed Air Meter** operates by the calorimetric measuring principle to detect the standard volume flow of operating compressed air. It is designed specifically to evaluate the current flow rate and the current consumed quantity in compressed air systems. With an easily programmable digital display, this unit offers a quick, accurate readout. The Series CAM is constructed of high-grade materials and is virtually maintenance free.

Model CAM-10, 2" NPT, 1.4 - 412.0 SCFM

Model CAM-20, 1 1/2" NPT, 0.2 - 44.1 SCFM

Model CAM-30, 1" NPT, 1.0 - 132.4 SCFM

ACCESSORY

A-283, 4-Wire Connector

Class	Max. Oil Content	Max. Residual Dust	Max. Residual Water		
	Oil Content mg/m ³	Dust Concentration mg/m ³	Particle Size mg/μm	Residual Water g/m ³	Pressure Dew Point °C
1	0.01	0.1	0.1	0.003	-70
2	0.1	1	0.1	0.117	-40
3	1	5	5	0.880	-20
4	5	8	15	5.953	+3
5	25	10	40	7.732	+7
6	-	-	-	9.356	+10

SPECIFICATIONS

Service: Compressed air; Air quality (see chart).

Wetted Materials: Stainless steel (304S15), ceramics, glass passivated, PEEK, polyester, fluoroelelastomer, anodized aluminum.

Accuracy: Class 1.4.1: ±3% of measured value +0.3% of full scale value; Class 3.4.4: ±6% of measured value +.6% of full scale value.

Response Time: < 0.1 seconds.

Temperature Limit: 32 to 140°F (0 to 60°C).

Pressure Limit: 232 psig (16 bar).

Humidity Limit: 90% RH.

Power Requirements: 19-30 VDC.

Output Signal: Output 1: PNP open collector: VOUT(max)=30 VDC / ISINK(max)=250mA; Output 2: 4-20 mA (scaleable) or PNP open collector.

Loop Resistance: 500 ohms.

Current Consumption: <100 mA.

Electrical Connections: 4 pin M12 (micro) cable connection.

Process Connections: 1/2", 1" and 2" NPT.

Display: 4-digit alpha numeric red LED.

Enclosure Rating: IP65 (NEMA 4X).

Mounting Orientation: Vertical, horizontal, side with pipe length facing left.

Weight: CAM-10: 12.5 lb; CAM-20: 2.35 lb; CAM-30: 4.16 lb.

Agency Approvals: CE.



Series
HFT

In-Line Flow Transmitters

Local Flow Indication, Unrestricted Mounting, 4-20 mA, 0-5 V, and 1-5 V Output



The Series HFT combines a direct reading HF flowmeter with electronics to provide a proportional analog output of 4-20, 0-5, and 1-5 VDC. Use the output to drive data acquisition devices, meters, or analog input cards. The entire assembly is housed in a rugged cast aluminum NEMA 4X enclosure. The unit can be installed in outdoor applications or harsh environments where liquid tight seals are required. The flow transmitter does not require input or output straight plumbing, and can be mounted in any orientation.

Aluminum body for air or other non-corrosive gases: 600 psig (41 bar)

Wetted Parts: Aluminum, PTFE coated Alnico, 304 SS and Buna-N

Model	Connection Size	Range, Air SCFM
HFT-1112	1/4" female NPT	1.5-12
HFT-1123	1/4" female NPT	4-23

Brass body for water based fluids (non-steam): 3500 psig (240 bar)

Wetted Parts: Brass, PTFE coated Alnico, 304 SS and Buna-N

Model	Connection Size	Range, Water GPM (LPM)
HFT-2205	1/2" female NPT	0.5-5.0 (1-19)
HFT-2315	3/4" female NPT	1-15 (3.8-55)
HFT-2320	3/4" female NPT	2-20 (7.5-75)
HFT-2440	1" female NPT	4-40 (15-151)
HFT-2550	1-1/2" female NPT	5-50 (19-189)

SPECIFICATIONS

Service: Compatible gases or liquids.
Wetted Materials: Body: Aluminum, brass or 304 SS; Seals: Buna-N or Fluoroelastomer; Magnet: PTFE coated Alnico; Other internal parts: 304 SS.
Viscosity: 500 SSU.
Accuracy: ±4% FS over entire range; ±2.5% over center third of the measuring range.
Repeatability: ±1% of full scale.

Response Time: <100 msec.

Output Signal: 4-20 mA; 0-5 V; 1-5 V.
Temperature Limits: 240°F (116°C).
Pressure Limits: See chart.
Power Requirements: 12-35 VDC.
Enclosure Rating: NEMA 4X (IP65).
Shipping Weight: 1/4 to 1/2" female NPT models: 3 lb (1.4 kg); 3/4 to 1" female NPT models: 4.5 lb (2.0 kg); 1-1/2" female NPT models: 12 lb (5.4 kg).

304 SS body for high-pressure fluids: 6000 psig (413 bar)

Wetted Parts: 304 SS, Fluoroelastomer and PTFE

Model	Connection Size	Range, Water GPM (LPM)
HFT-3202	1/2" female NPT	0.2-2.0 (0.75-7.5)
HFT-3210	1/2" female NPT	1-10 (3.8-38)

FLOW

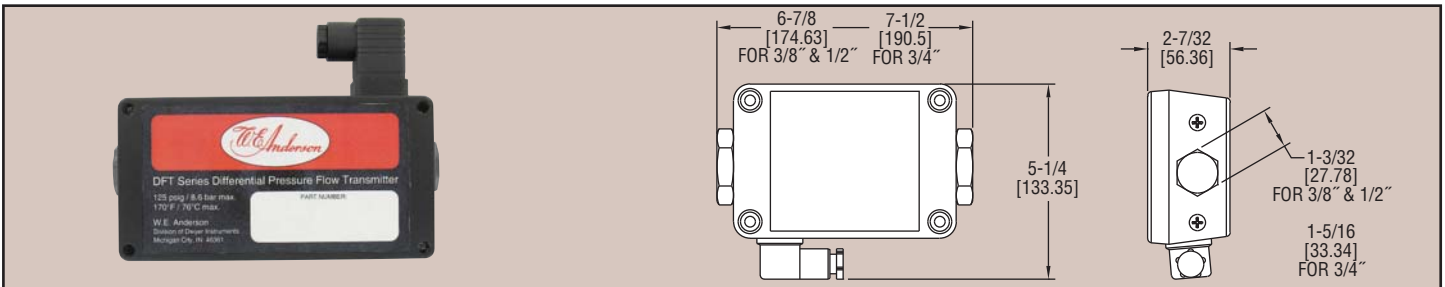
Flow Transmitters, In-Line



Series
DFT

Inline Differential Flow Transmitter

Low Cost, Compact and Rugged Design



Series DFT Flow Transmitters use a segmented wedge differential producer to measure flow rates as related to pressure to monitor process fluids. The segmented wedge provides a simple and reliable restriction for sensing flow as related to pressure differential. The sensor can be mounted in any position and allows the designer to install it in any orientation: horizontal, vertical or inverted. The sensor is offered with three flow measuring ranges: 0.5-5, 1-10 and 1-15 GPM and three electrical output signals: 4-20 mA, 1-5 VDC and 1-10 VDC. The sensor offers low-cost precision with a measuring accuracy of ±2% of full-scale range and repeatability of ±0.5%.

Model	Flow Ranges GPM (LPM)	Nominal Port Size (NPT Female)
DFT-PNW1-01C1	0.5-5 (1.9-18.9)	3/8"
DFT-PNW1-02C1	0.5-5 (1.9-18.9)	1/2"
DFT-PNW1-03C1	0.5-5 (1.9-18.9)	3/4"
DFT-PNW1-01C2	1-10 (3.8-37.9)	3/8"
DFT-PNW1-02C2	1-10 (3.8-37.9)	1/2"
DFT-PNW1-03C2	1-10 (3.8-37.9)	3/4"
DFT-PNW1-01C3	1-15 (3.8-56.8)	3/8"
DFT-PNW1-02C3	1-15 (3.8-56.8)	1/2"
DFT-PNW1-03C3	1-15 (3.8-56.8)	3/4"

SPECIFICATIONS

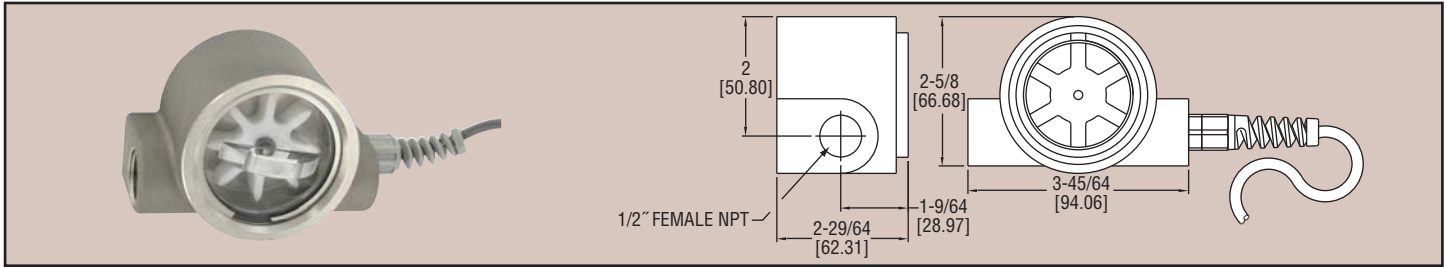
Service: Compatible liquids.
Wetted Materials: End ports: PVC; Wedge element: PVC; Pressure sensor: polyetherimide.
Flow Measuring Ranges: 0.5-5, 1-10, 1-15 GPM.
Accuracy: ±2% of full-scale.
Repeatability: ±0.5% of full-scale.
Response Time: Indication of no less than 90% of any step change within <500ms.
Power Requirements: 12-35 VDC.
Output Signal: 4-20 mA (optional 0-5 VDC or 0-10 VDC consult factory).
Maximum Current Consumption: 25 mA.
Minimum Load Resistance: 1000 Ω.
Maximum Transmission Distance: 200 ft.
Resolution: Infinite.
Temperature Limits: 170°F (76°C).
Pressure Limits: 125 psig (8.6 bar).
Enclosure Rating: NEMA 4 (IP65).
Maximum Particulate Size: 200 microns.
Weight: 1 lb (0.45 kg).



Series
SF

Sight Flow Transmitter

±2% FS Accuracy, 4 to 20 mA Output, Pressure up to 500 psig (34 bar)



Series SF Sight Flow Transmitter integrates tangential turbine technology with hermetically sealed circuitry to provide accurate flow measurement and control in the harshest environments. The 2-wire loop-powered design transmits a 4 to 20 mA signal proportional to flow rate. Models can accurately measure flow in both directions and can be mounted in any orientation. Model SF11 has a clear polycarbonate viewing cover for visible indication of flow. Units feature LED power indication, adjustable zero and span, polarity protection and over current limiting.

Model	Cover Material
SF10	316 SS
SF11	Clear Polycarbonate

APPLICATIONS

Ideal for measuring flow rates in cooling and lubrication circuits, HVAC systems, aggressive chemical metering, and batching systems.

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: 316 SS shaft and case, Iglide® bearings, Buna-N seal and acetal copolymer, (polycarbonate cover on Model SF11).
Flow Range: 0.5 to 15 GPM (5.7 to 56.8 LPM).
Accuracy: ±2% FS.
Repeatability: 0.5% full scale.
Temperature Limits: 20 to 225°F (-7 to 107°C).
Pressure Limits: 500 psig (34 bar) Model SF10; 200 psig (14 bar) Model SF11.

Response Time: 2 seconds to 90% (step change in flow rate).
Supply Voltage: 12 to 35 VDC.
Output: 4 to 20 mA.
Loop Resistance: 1150 ohms max.
Process Connection: 1/2" female NPT.
Electrical Connection: Wire leads: 22 AWG x 9' (2.7 m).
Max. Particle Size: 100µm.
Agency Approvals: CE.

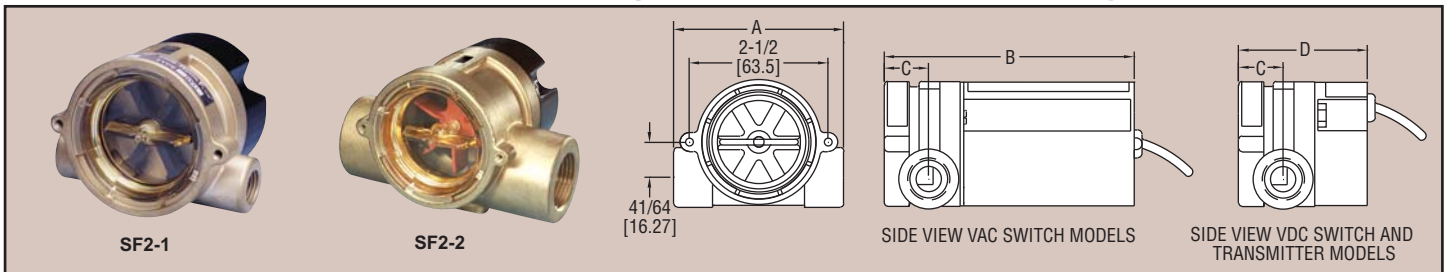
Iglide® is a registered trademark of Igus GMBH



Series
SF2

Sight Flow Meters

SPDT or Pulse Output, Visual Flow Confirmation, Brass Body



Series SF2 Sight Flow Meters combine visual confirmation of flow with a relay or pulse output. The brass, unibody construction, one piece composite rotor, and ceramic shaft delivers durability with broader chemical, temperature, and pressure capabilities. For specific flow setpoint switching, select SF2-1 meters with a SPDT relay output. Setpoints are fully adjustable over the specified flow range. The dynamic operation of the rotor guards against jamming and false actuation. For flow rate monitoring or metering applications, select SF2-2 meters with a pulse output proportional to the rate of flow. The 4.5 to 24 VDC pulse output is compatible with most digital logic families.

Dimensions in [mm]

Model	A	B	C	D
SF2-104	—	—	—	2-21/64 [59.13]
SF2-101	—	4-1/2 [114.3]	7/8 [22.23]	—
SF2-114	3-1/64 [76.6]	—	—	2-21/64 [59.13]
SF2-111	—	4-1/2 [114.3]	—	—
SF2-124	—	—	—	2-61/64 [75]
SF2-121	—	4-49/64 [121.05]	1-1/16 [26.99]	—
SF2-134	3-61/64 [100.41]	—	—	2-61/64 [75]
SF2-131	—	4-49/64 [121.05]	—	—
SF2-204	—	—	—	—
SF2-214	3-1/64 [76.6]	—	13/16 [20.64]	2-21/64 [59.13]
SF2-224	—	—	—	—
SF2-234	3-61/64 [100.41]	—	1-1/16 [26.99]	2-61/64 [75]

SPDT Relay Output			
Model	Range (GPM)	Power	Connection
SF2-104	0.5 to 5.0	24 VDC	1/4" female NPT
SF2-101	0.5 to 5.0	110 VAC	1/4" female NPT
SF2-114	4.0 to 20.0	24 VDC	1/2" female NPT
SF2-111	4.0 to 20.0	110 VAC	1/2" female NPT
SF2-124	5.0 to 30.0	24 VDC	3/4" female NPT
SF2-121	5.0 to 30.0	110 VAC	3/4" female NPT
SF2-134	8.0 to 60.0	24 VDC	1" female NPT
SF2-131	8.0 to 60.0	110 VAC	1" female NPT
Pulsed Output			
Model	Range (GPM)	Power	Connection
SF2-204	0.5 to 5.0	4.5 to 24 VDC	1/4" female NPT
SF2-214	4.0 to 20.0	4.5 to 24 VDC	1/2" female NPT
SF2-224	5.0 to 30.0	4.5 to 24 VDC	3/4" female NPT
SF2-234	8.0 to 60.0	4.5 to 24 VDC	1" female NPT

SPECIFICATIONS

Service: Liquids compatible with wetted parts.
Wetted Materials: Brass body, ceramic pin, PPS rotor, Polysulfone lens and fluoroelastomer O-ring.
Accuracy: Relay output: ±5%; Pulsed output: ±7% for ranges up to 5.0 GPM, ±15% for ranges up to 60.0 GPM.
Temperature Limits: -20 to 212°F (-29 to 100°C).
Pressure Limit: 200 psig (13.8 bar) @ 70°F.
Power Requirements: See table.

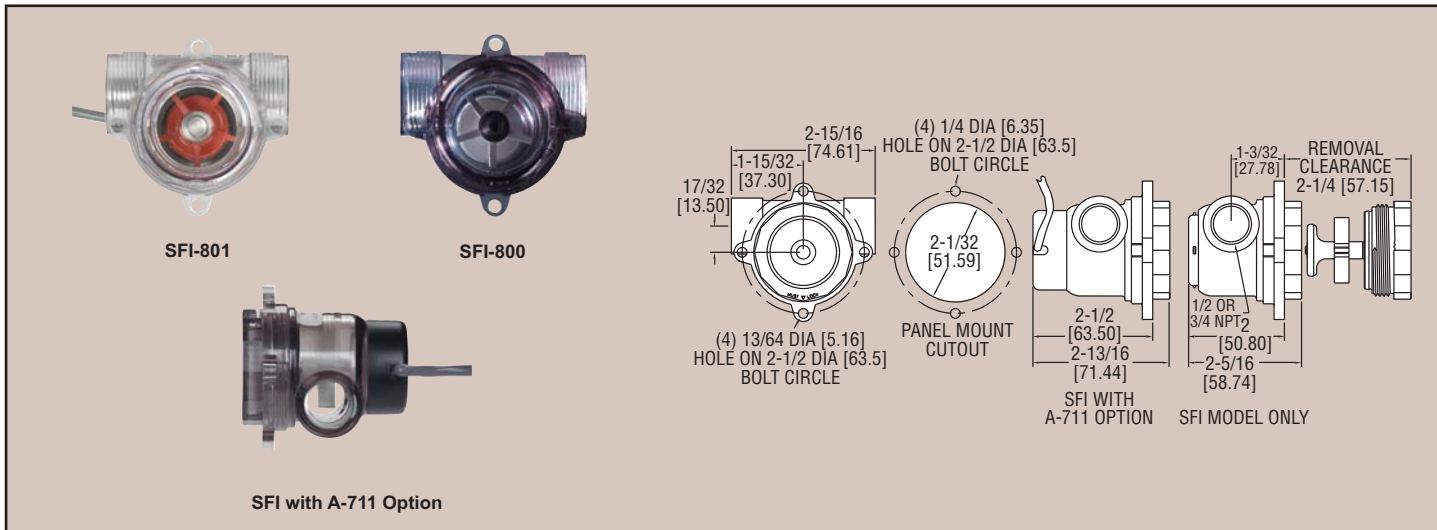
Output: SPDT: 1 Amp, 24 VDC resistive; 0.3 Amp, 110 VAC or 4.5 VDC to 24 VDC pulse depending on model.
Electrical Connections: Relay output models: 20AWG PVC-jacketed, 24" cable; Pulsed output models: 22AWG PVC-jacketed, 24" cable.
Process Connections: See table.
Setpoint Differential: 15% max for relay output models.
Maximum Viscosity: 200 SSU.
Agency Approvals: CE.



Series
SFI-800

Sight Flow Indicator/Transmitter

Low Cost, Optional Output for Flow Rate and Totalization
UV Stabilized Polycarbonate Model



The Series SFI-800 Sight Flow Indicator is a low cost, durable rotor style flow indicator with optional Hall effect magnetic output packages for remote flow monitoring. Both SFI-800 and 801 models are constructed of clear plastic enabling 360° viewing of the spinning rotor for easy flow indication. SFI-800 models are constructed of polysulfone with excellent chemical compatibility, high pressure and temperature ratings, and all wetted materials are FDA/NSF ratable for potable water applications. SFI-801 models are constructed of UV stabilized polycarbonate making them ideal for outdoor applications (materials do not meet FDA/NSF). The SFI-801 models also feature an easy view bright red impeller.

Body and Sensors Attached:

To order A-711 attached to flow indicator body add suffix -A711 to the body part number.

Example: SFI-800-1/2-A711

To order A-712 attached to flow indicator body add suffix -A712 to the body part number.

Example: SFI-800-1/2-A712

To order A-713 attached to flow indicator body add suffix -A713 to the body part number.

Example: SFI-800-1/2-A713

SENSOR ONLY

Model	Description
A-711	Pulsed Output
A-712	1 to 10 VDC
A-713	Two Open Collectors

*Sensor only, not attached to the flow indicator body.

BODY ONLY

Model	Description	Range GPM (LPM)	Connection Female NPT
Polysulfone Body			
SFI-800-1/2	Indicator Only	2-20 (7.6-75.5)	1/2"
SFI-800-3/4	Indicator Only	3-35 (11.4-132.5)	3/4"
SFI-800-1/2-LF	Indicator Only	0.5-6.5 (1.9-24.6)	1/2"
Polycarbonate Body			
SFI-801-1/2	Indicator Only	2-20 (7.6-75.5)	1/2"
SFI-801-3/4	Indicator Only	3-35 (11.4-132.5)	3/4"
SFI-801-1/2-LF	Indicator Only	0.5-6.5 (1.9-24.6)	1/2"

SPECIFICATIONS

Service: Compatible fluids.

Wetted Materials

Body: SFI-800: Polysulfone; SFI-801: UV stabilized polycarbonate;
Window: SFI-800: Polysulfone; SFI-801: UV stabilized polycarbonate;
Rotor: SFI-800: White polysulfone; SFI-801: Red UV stabilized PBT;
Rotor Pin: 316 SS;
Thrust washers: 300 Series SS;
O-ring: SFI-800: Fluoroelastomer (NSF grade); SFI-801: Buna-N.

Temperature Limits: SFI-800: -20 to 212°F (-29 to 100°C); SFI-801: -20 to 130°F (-29 to 55°C).

Pressure Limits: SFI-800: 150 psi (10.34 bar); SFI-801: 125 psi (8.62 bar).

Viscosity Max: 200 SSU.

Weight: SFI-800: 3.35 oz (95 g); SFI-800-A711: 5.0 oz (142 g).

ELECTRICAL SPECIFICATIONS (for A-711 Option Only)

Temperature Limits: -20 to 212°F (-29 to 100°C).

Power Requirements: 8 to 28 VDC.

Output Signal: White lead: 5 VDC; Green lead: 8 to 28 VDC equal to supply voltage. Pulsed output with frequency rate proportional to flow rate.

Accuracy: ±5% of F.S.

Frequency Output Range: 0 to 100 Hz.

Electrical Connections: Black lead - ground; White lead: 5 VDC out pulse; Green lead: 8 to 28 VDC out pulse; Red lead: 8 to 28 VDC supply.

ELECTRICAL SPECIFICATIONS (for A-712 option only)

Temperature Limits: -20 to 212°F (-29 to 100°C).

Power Requirements: 15 to 28 VDC.

Output Signal: White lead: 1 to 10 VDC.

Accuracy: ±5% of F.S.

Electrical Termination: Black lead: Ground; Red lead: 15 to 28 VDC input; White lead: 1 to 10 VDC output.

ELECTRICAL SPECIFICATIONS (for A-713 option only)

Temperature Limits: -20 to 212°F (-29 to 100°C).

Power Requirements: 8 to 28 VDC.

Output Signal: White lead: Normally open switch; Green lead: Normally closed switch. Both open collector, 100 mA max, 28 VDC max.

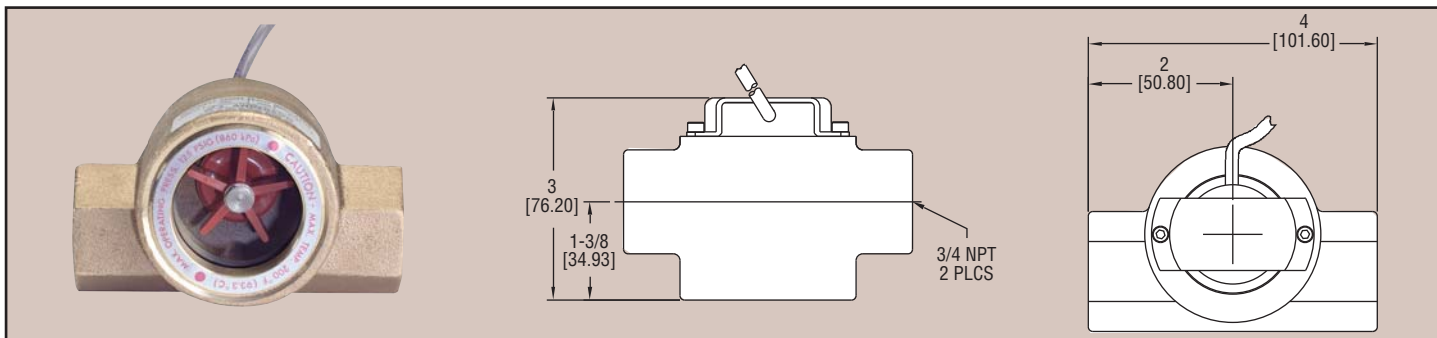
Electrical Connections: Black lead: Ground; White lead: Normally open; Green lead: Normally closed; Red lead: 8 to 28 VDC.



Series
SFI-100T

Sight Flow Indicator/Transmitter

Output for Flow Rate and Totalization



The SFI-100T is a low cost and durable flow transmitter that combines our popular 100 Series Sight Flow indicator with our A-711T output sensor. The SFI-100T sight flow indicator is constructed of a robust, solid brass body and a tempered glass window. A bright red impeller is featured for great visual indication of flow through the window. The front window can be easily unscrewed to clean out the sight flow indicator. Ideal for outdoor applications, the flow transmitter is weatherproof and unaffected by UV light.

The A-711T output sensor has a VDC output with pulsing for flow totalization and a proportional frequency change for flow rate. For added versatility there are two output choices of 5 VDC or a VDC equal to the input power supplied. The output is compatible with digital rate meters/totalizers and other electronic systems. Great for use in monitoring water flow especially in chillers.

Model	Description	Range GPM (LPM)	Connection Female NPT
SFI-100T-1/2-A711T	Brass Indicator with A-711T Sensor	2-20 (7.6-75.5)	1/2"
SFI-100T-3/4-A711T	Brass Indicator with A-711T Sensor	3-35 (11.4-132.5)	3/4"
A-711T	Output Sensor Package	—	—

SPECIFICATIONS

Service: Compatible fluids.

Wetted Materials: Body: Brass; Window: Tempered glass; Rotor: Red UV stabilized PBT; Rotor pin: 316 SS; Thrust washers: 300 series SS; Gasket: Buna-N.

Temperature Limits: -20 to 200°F (-29 to 93°C).

Pressure Limits: 125 psi (8.62 bar).

Viscosity Max: 200 SSU.

Weight: SFI only: 1.5 lb (0.7 kg); with A-711T: 1.8 lb (0.8 kg).

ELECTRICAL SPECIFICATIONS

Temperature Limits: -20 to 212°F (-29 to 100°C).

Power Requirements: 8 to 28 VDC.

Output Signal: White lead: 5 VDC. Green lead: 8 to 28 VDC equal to supply voltage. Pulsed output with frequency rate proportional to flow rate.

Accuracy: ±5% of F.S.

Frequency Output Range: 0 to 100 Hz.

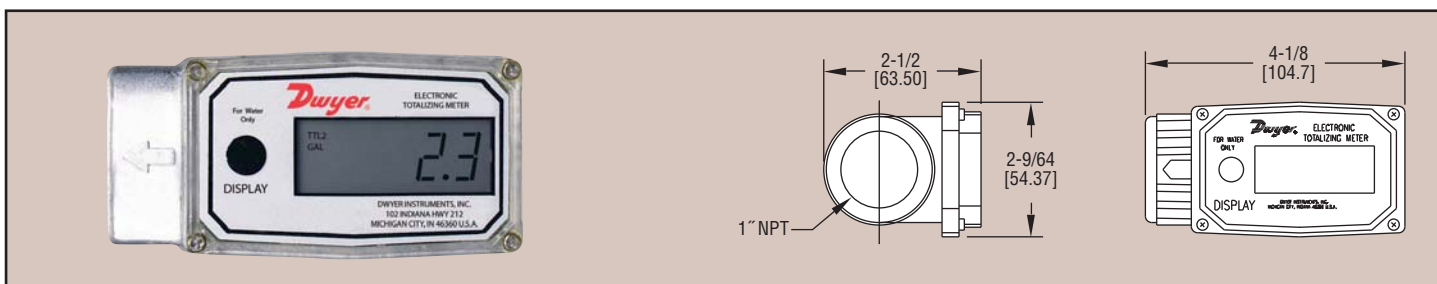
Electrical Connections: Black lead: Ground; White lead: 5 VDC out pulse; Green lead: 8 to 28 VDC out pulse; Red lead: 8 to 28 VDC supply.



Series
TTM

Electronic Totalizing Meter

Batch or Cumulative Totals, Easy-to-Read LCD Display, ±5% Accuracy



Measure batch and cumulative totals in liquid transfer systems with the Series TTM Electronic Totalizing Meter. The meter is designed for any pump, pressure, or gravity feed system with a 3 to 30 GPM (10 to 100 LPM) flow range. View batch and cumulative totals on the large 4-digit LCD display. Batch totals can be reset to measure flow during a single use. The cumulative total will automatically reset to zero when a maximum reading of 9999 is obtained. Models designed for use in water applications are constructed of nylon and rated to 150 psig (10.3 bar). Aluminum models are calibrated for fuels and rated to 300 psig (20.7 bar).

Model	Application	Body Material	Units
TTM10	Water*	Nylon	Gallons
TTM11	Water*	Nylon	Liters
TTM20	Fuels†	Aluminum	Gallons
TTM21	Fuels†	Aluminum	Liters

*Calibrated for use with water

†Calibrated for use with gasoline, diesel fuel and kerosene

SPECIFICATIONS

Service: Compatible liquids.

Flow Range: 3 to 30 GPM (10 to 100 LPM).

Wetted Materials: Bearings: Ceramic; Shaft: Tungsten carbide; Rotor: Nylon 6-6; Rings: 316 SS; Body: TTM10, 11: Nylon 6-6, TTM20, 21: Aluminum; Other: TTM20, 21: Ceramic magnet.

Accuracy: ±5%.

Batch Total Maximum: 9999.

Cumulative Total Maximum: 9999.

Temperature Limits: 14 to 130°F (-10 to 54°C).

Pressure Limits: Nylon models: 150 psig (10 bar); Aluminum models: 300 psig (20 bar).

Pressure Drop: 2 psi (0.14 bar) @ 30 GPM (100 LPM).

Maximum Particulate Size: 350 microns.

Display: 4-digit LCD, 5/8" H.

Auto Shut-off: After 1 minute.

Connections: 1" female NPT.

Power: Two AAA alkaline batteries (included).

Battery Life: Approx. 9000 hours.

Weight: Nylon models: 0.4 lb (190 g); Aluminum models: 0.7 lb (340 g).

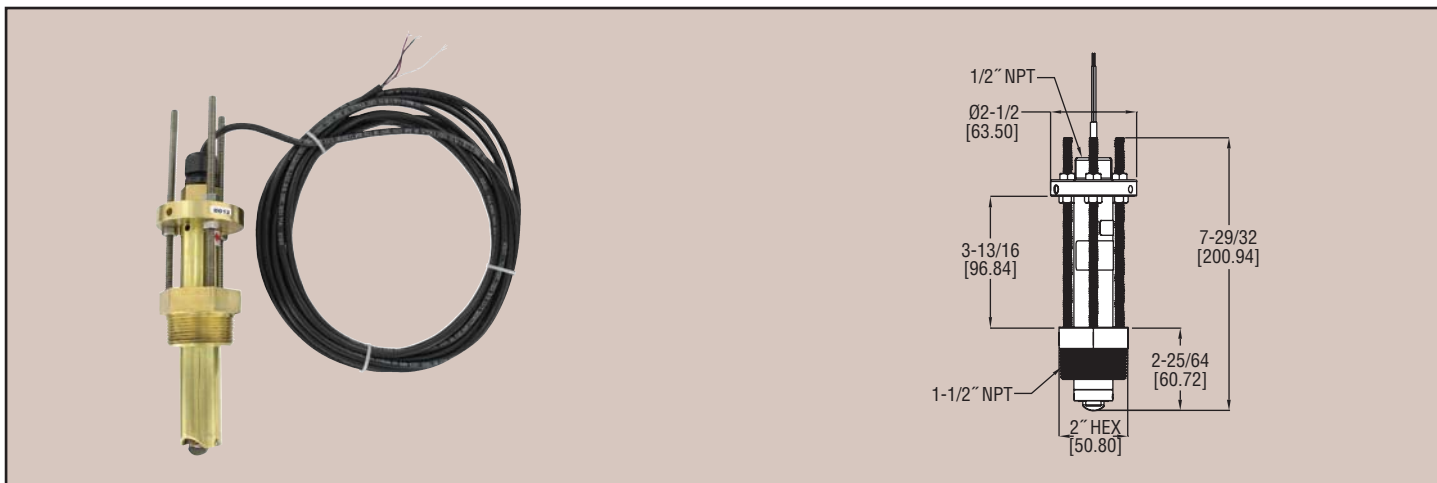
Agency Approvals: CE.



Series
PFT

Paddlewheel Flow Sensor

Non-Magnetic Sensing, Insertion Style for 1-1/2 to 40" Pipe



The Series PFT is a paddlewheel flow sensor used to monitor liquid flow rates in pipes from 1-1/2 to 40" with just one size adjustable sensor. A square wave output signal is generated with frequency proportional to flow velocity. Multiple wetted material choices offer application versatility. The PFT is ideal for monitoring water flow rates in irrigation systems and building automation cooling systems. The PFT uses inductive sensing to sense the blades of the impeller as they rotate. Sensor technology does not use magnets allowing low flow rate monitoring and no concerns with magnetic material in the flow. Paddlewheel, shaft and bearings are easily field replaceable.

FEATURES

- Bearings and shaft offer excellent wear protection even in applications with particulate for long life
- Weatherproof and submersible rated for irrigation applications

APPLICATIONS

- Irrigation, ground water remediation, cooling systems, pump protection, leak detection, filtration systems

Model	Description
PFT-IDN-B111-S	Brass body, FKM o-ring, 316 SS impeller, tungsten carbide shaft, PTFE bearing, 1-1/2" NPT male connection, 20' of cable
PFT-IDN-S111-S	316 SS body, FKM o-ring, 316 SS impeller, tungsten carbide shaft, PTFE bearing, 1-1/2" NPT male connection, 20' of cable

Consult factory for longer cable lengths, burial rated cable, 2" NPT connection, or other wetted materials.

SPECIFICATIONS

- Service:** Water-based fluids.
Range: 1.2 to 25 ft/s (0.37 to 7.62 m/s).
Wetted Materials: Body and fitting: Brass or 316 SS; fitting o-ring: FKM standard, silicone or Buna-N optional; impeller: 316 SS; shaft: Tungsten carbide standard or 316 SS optional; bearing: PTFE standard, carbon graphite optional.
Linearity: ±1.0% of full range.
Repeatability: ±0.5% of full range.
Temperature Limits: -40 to 212°F (-40 to 100°C).
Pressure Limits: 400 psig (27.6 bar) @ 100°F (37.8°C), 325 psig (22.4 bar) @ 212°F (100°C).
Process Connection: 1-1/2" NPT male standard, 2" NPT male optional.
Output: NPN open collector with square wave output, rated 60V @ 50 mA maximum.
 Frequency: 3.2 to 200 Hz;
 Pulse width: 2.5 msec ±25%.
Power Requirement: 10 to 35 VDC.
Power Consumption: 40 mA (max).
Electrical Connection: 22 AWG shielded UL type PTLC rated 105°C, 20' (6.1 m) long with cable gland. Can be extended up to 2000' (609 m) with similar cable. Optional UL listed burial rated cable.
Enclosure Rating: NEMA 6P (IP67).
Housing Materials: Brass or 316 SS.
Weight: 3 lb.
Agency Approvals: CE.

FLOW

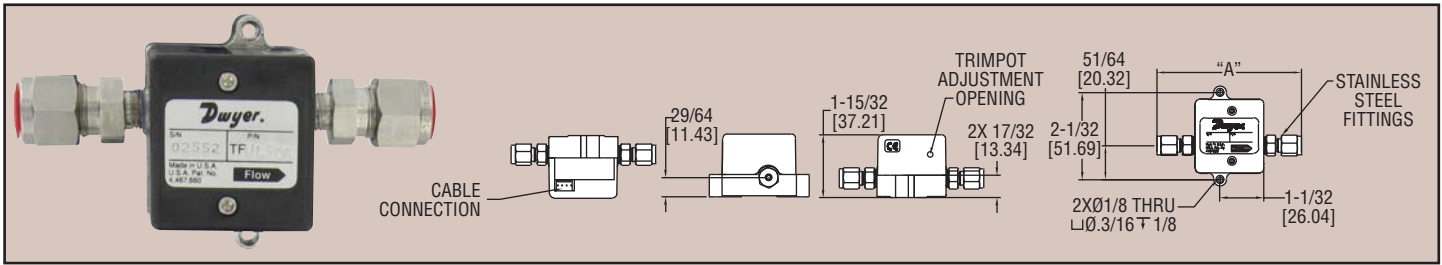
Flow Transmitters,
Paddlewheel



Series
TFM-LP

Liquid Turbine Flow Meter

316SS Body, 0 to 5 VDC and Pulse Outputs



Series TFM-LP Liquid Turbine Flow Meters are suitable for a wide variety of industrial, commercial, and laboratory flow applications. These meters utilize a turbine wheel and electro-optical detection to convert flow rates into a linear 0 to 5 VDC output signal for recording and data logging. Couple this unit with a Series TM2 Flow Totalizer for a remote flow monitoring display. A power adapter or mating cable assembly is required for operation.

Model	Range	Connection	"A" (in)
TFM-LP03	.21 to 1.6 GPH (.0013 to .1 LPM)	1/8" OD	3-27/64
TFM-LP04	.32 to 3.2 GPH (.02 to .2 LPM)	1/4" OD	3-53/64
TFM-LP05	.79 to 7.9 GPH (.05 to .5 LPM)	1/4" OD	3-53/64
TFM-LP06	1.6 to 16 GPH (0.1 to 1 LPM)	1/4" OD	3-53/64
TFM-LP07	3.2 to 32 GPH (.2 to 2 LPM)	1/4" OD	3-53/64
TFM-LP08	7.9 to 79 GPH (.5 to 5 LPM)	3/8" OD	4-1/8
TFM-LP09	16 to 160 GPH (1 to 10 LPM)	3/8" OD	4-1/8

ACCESSORIES

Model	Description
A-454	115 VAC Power Adapter and Signal Cable
A-455	230 VAC Power Adapter and Signal Cable
A-456	36" Mating Cable with Spliced Leads

SPECIFICATIONS

Service: Clean liquids compatible with wetted materials.
Wetted Materials: 316 SS, acetal, sapphire, glass, epoxy, and fluoroelastomer.
Accuracy: ±1% of full scale.
Linearity: ±1% of full scale.
Repeatability: ±0.2% of full scale.
Temperature Limits: 41 to 131°F (5 to 55°C); Storage: 32 to 158°F (0 to 70°C); Sensitivity: ±0.2% of full scale per °C.
Pressure Limits: 500 psig (34.5 bar).
Process Connection: Compression fitting, see model table.
Power Requirements: 11.5 to 15 VDC.
Power Consumption: 35 mA @ 12 VDC.
Output Signal: 0 to 5 VDC; Minimum 2.5 kΩ load; Pulse: 7.5 VDC peak buffered square wave.
Electrical Connections: Four-pin power and signal connector. A power adapter or mating cable required for operation. See Accessories Table.
Enclosure Rating: IP10 (NEMA 1).
Weight: 0.86 lb (390 g).
Agency Approvals: CE.

FLOW

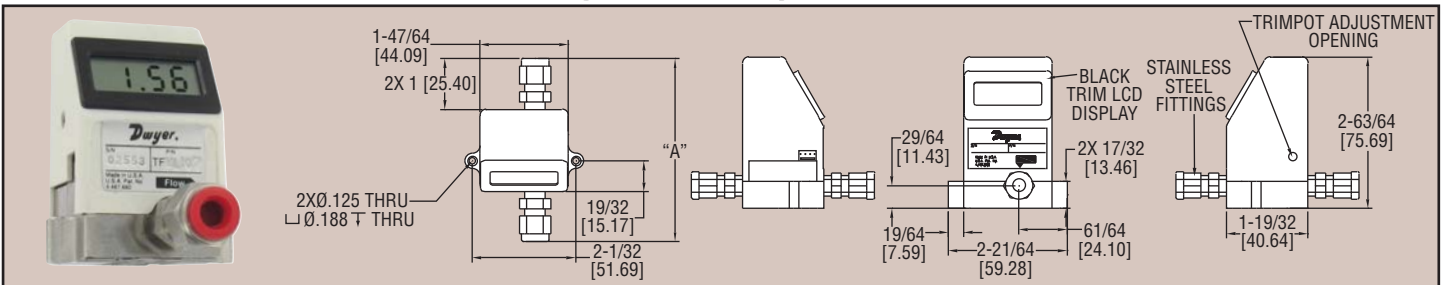
Flow Transmitters,
Turbine



Series
TFM-LI

Liquid Turbine Flow Meter

316SS Body, 0 to 5 VDC Output, LCD Indication



Series TFM-LI Liquid Turbine Flow Meters are suitable for a wide variety of industrial, commercial, and laboratory flow applications. These meters utilize a turbine wheel and electro-optical detection to convert flow rates into a linear 0 to 5 VDC output signal for recording and data logging. A 3-1/2 digit LCD informs the user of the actual flow rate. A power adapter or mating cable assembly is required for operation.

Model	Range	Connection	"A" (in)
TFM-LI03	.21 to 1.6 GPH (.0013 to .1 LPM)	1/8" OD	3-9/16
TFM-LI04	.32 to 3.2 GPH (.02 to .2 LPM)	1/4" OD	3-41/64
TFM-LI05	.79 to 7.9 GPH (.05 to .5 LPM)	1/4" OD	3-41/64
TFM-LI06	1.6 to 16 GPH (0.1 to 1 LPM)	1/4" OD	3-41/64
TFM-LI07	3.2 to 32 GPH (.2 to 2 LPM)	1/4" OD	3-41/64
TFM-LI08	7.9 to 79 GPH (.5 to 5 LPM)	3/8" OD	3-27/32
TFM-LI09	16 to 160 GPH (1 to 10 LPM)	3/8" OD	3-27/32

ACCESSORIES

Model	Description
A-454	115 VAC Power Adapter and Signal Cable
A-455	230 VAC Power Adapter and Signal Cable
A-456	36" Mating Cable with Spliced Leads

SPECIFICATIONS

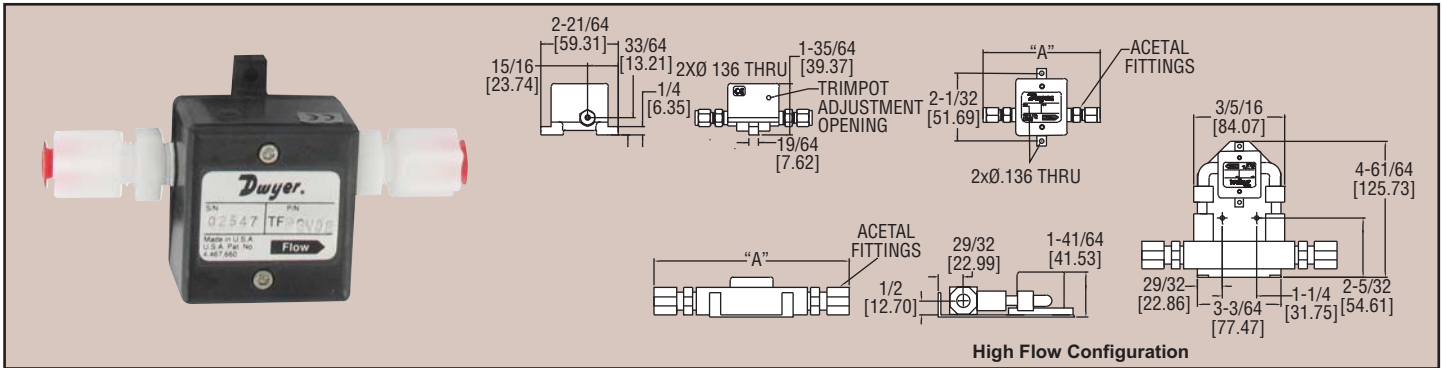
Service: Clean liquids compatible with wetted materials.
Wetted Materials: 316 SS, acetal, sapphire, glass, epoxy, and fluoroelastomer.
Accuracy: ±1% of full scale.
Linearity: ±1% of full scale.
Repeatability: ±0.2% of full scale.
Temperature Limits: 41 to 131°F (5 to 55°C); Storage: 32 to 158°F (0 to 70°C); Sensitivity: ±0.2% of full scale per °C.
Pressure Limits: 500 psig (34.5 bar).
Process Connection: Compression fitting, see model table.
Power Requirements: 11.5 to 15 VDC.
Power Consumption: 35 mA @ 12 VDC.
Output Signal: 0 to 5 VDC; Minimum 2.5 kΩ load.
Electrical Connections: Four-pin power and signal connector. A power adapter or mating cable required for operation. See Accessories Table.
Display: LCD, 0.39" (10 mm) digits (only in LPM).
Enclosure Rating: IP10 (NEMA 1).
Weight: 0.80 lb (380 g).
Agency Approvals: CE.



Series
TFP-GV

Gas Turbine Flow Meter

PPS Body, 0 to 5 VDC Output



High Flow Configuration

Series TFP-GV Gas Turbine Flow Meters are suitable for a wide variety of industrial, commercial, and laboratory flow applications. These meters utilize a turbine wheel and electro-optical detection to convert flow rates into a linear 0 to 5 VDC output signal for recording and data logging. Couple this unit with a Series FIV Flow Totalizer for a remote flow monitoring display. A power adapter or mating cable assembly is required for operation.

Model	Range	Connection	"A" (in)
TFP-GV03	.042 to .21 SCFH (.02 to .1 LPM)	1/8" OD	3-27/64
TFP-GV04	.085 to .42 SCFH (.04 to .2 LPM)	1/8" OD	3-27/64
TFP-GV05	.21 to 1.1 SCFH (.1 to .5 LPM)	1/8" OD	3-27/64
TFP-GV06	.42 to 2.1 SCFH (.2 to 1 LPM)	1/8" OD	3-27/64
TFP-GV07	.85 to 4.2 SCFH (.4 to 2 LPM)	1/4" OD	3-13/16
TFP-GV08	2.1 to 11 SCFH (1 to 5 LPM)	1/4" OD	3-13/16
TFP-GV09	4.2 to 21 SCFH (2 to 10 LPM)	1/4" OD	3-13/16
TFP-GV10*	8.5 to 42 SCFH (4 to 20 LPM)	3/8" OD	7-7/64
TFP-GV11*	21 to 110 SCFH (10 to 50 LPM)	3/8" OD	7-7/64
TFP-GV12*	42 to 210 SCFH (20 to 100 LPM)	1/2" OD	7-1/2
TFP-GV13*	85 to 420 SCFH (40 to 200 LPM)	1/2" OD	7-1/2

* These models come in high flow configuration

SPECIFICATIONS

Service: Clean dry gases compatible with wetted materials.
Wetted Materials: PPS, acetal, sapphire, glass, epoxy, and fluoroelastomer.
Accuracy: ±3% of full scale.
Linearity: ±3% of full scale.
Repeatability: ±0.5% of full scale.
Temperature Limits: 41 to 131°F (5 to 55°C); Storage: 32 to 158°F (0 to 70°C); Sensitivity: ±0.2% of full scale per °C.
Pressure Limits: 40 psig (2.8 bar).

Process Connection: Compression fitting, see model table.
Power Requirements: 11.5 to 15 VDC.
Power Consumption: 35 mA @ 12 VDC.
Output Signal: 0 to 5 VDC; Minimum 2.5 kΩ load.
Electrical Connections: Four-pin power and signal connector. A power adapter or mating cable required for operation. See Accessories Table.
Enclosure Rating: IP10 (NEMA 1).
Weight: 0.16 lb (75 g).
Agency Approvals: CE.

ACCESSORIES

Model	Description
A-454	115 VAC Power Adapter and Signal Cable
A-455	230 VAC Power Adapter and Signal Cable
A-456	36" Mating Cable with Spliced Leads

FLOW

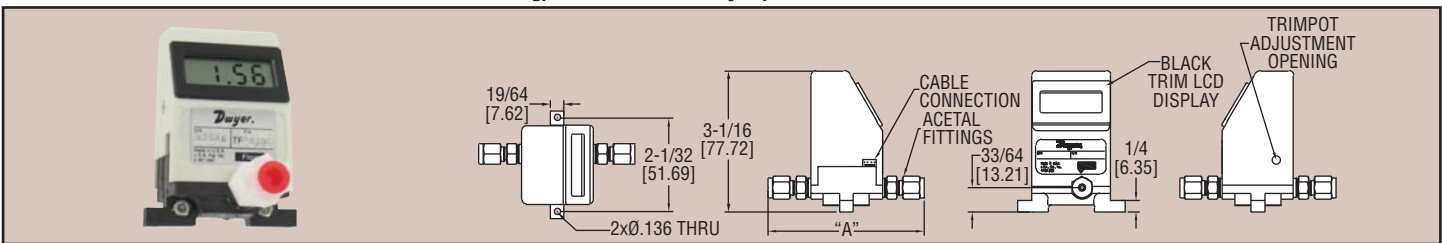
Flow Transmitters, Turbine



Series
TFP-GI

Gas Turbine Flow Meter

PPS Body, 0 to 5 VDC Output, LCD Indication



Series TFP-GI Gas Turbine Flow Meters are suitable for a wide variety of industrial, commercial, and laboratory flow applications. These meters utilize a turbine wheel and electro-optical detection to convert flow rates into a linear 0 to 5 VDC output signal for recording and data logging. A 3-1/2 digit LCD informs the user of the actual flow rate. A power adapter or mating cable assembly is required for operation.

Model	Range	Connection	"A" (in)
TFP-GI03	.042 to .21 SCFH (.02 to .1 LPM)	1/8" OD	3-27/64
TFP-GI04	.085 to .42 SCFH (.04 to .2 LPM)	1/8" OD	3-27/64
TFP-GI05	.21 to 1.1 SCFH (.1 to .5 LPM)	1/8" OD	3-27/64
TFP-GI06	.42 to 2.1 SCFH (.2 to 1 LPM)	1/8" OD	3-27/64
TFP-GI07	.85 to 4.2 SCFH (.4 to 2 LPM)	1/4" OD	3-13/16
TFP-GI08	2.1 to 11 SCFH (1 to 5 LPM)	1/4" OD	3-13/16

ACCESSORIES

Model	Description
A-454	115 VAC Power Adapter and Signal Cable
A-455	230 VAC Power Adapter and Signal Cable
A-456	36" Mating Cable with Spliced Leads

SPECIFICATIONS

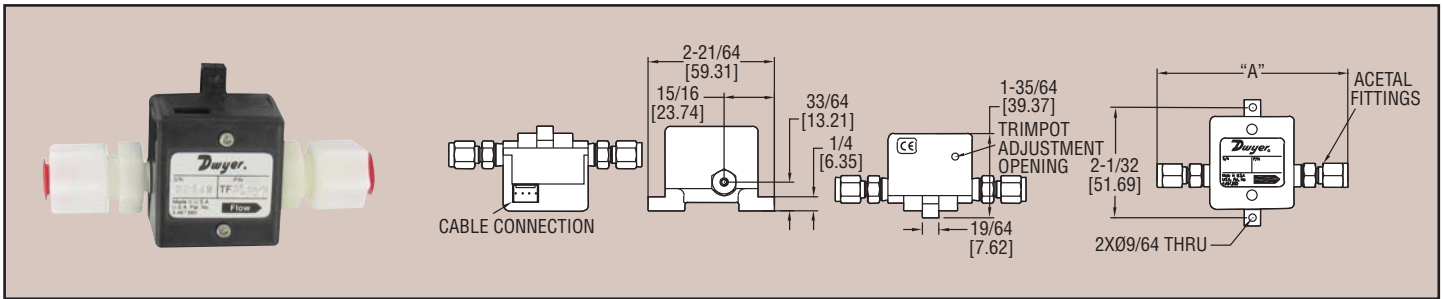
Service: Clean dry gases compatible with wetted materials.
Wetted Materials: PPS, acetal, sapphire, glass, epoxy, and fluoroelastomer.
Accuracy: ±3% of full scale.
Linearity: ±3% of full scale.
Repeatability: ±0.5% of full scale.
Temperature Limits: 41 to 131°F (5 to 55°C); Storage: 32 to 158°F (0 to 70°C); Sensitivity: ±0.2% of full scale per °C.
Pressure Limits: 40 psig (2.8 bar).
Process Connection: Compression fitting, see model table.
Power Requirements: 11.5 to 15 VDC.
Power Consumption: 35 mA @ 12 VDC.
Output Signal: 0 to 5 VDC; Minimum 2.5 kΩ load.
Electrical Connections: Four-pin power and signal connector. A power adapter or mating cable required for operation. See Accessories Table.
Display: LCD, 0.39" (10 mm) digits (only in LPM).
Enclosure Rating: IP10 (NEMA 1).
Weight: 0.23 lb (101 g).
Agency Approvals: CE.



Series
TFP-LP

Liquid Turbine Flow Meter

PPS Body, 0 to 5 VDC and Pulse Outputs



Series TFP-LP Liquid Turbine Flow Meters are suitable for a wide variety of industrial, commercial, and laboratory flow applications. These meters utilize a turbine wheel and electro-optical detection to convert flow rates into a linear 0 to 5 VDC output signal for recording and data logging. Couple this unit with a Series TM2 Flow Totalizer for a remote flow monitoring display. A power adapter or mating cable assembly is required for operation.

Model	Range	Connection	"A" (in)
TFP-LP03	.21 to 1.6 GPH (.0013 to .1 LPM)	1/8" OD	3-9/16
TFP-LP04	.32 to 3.2 GPH (.02 to .2 LPM)	1/4" OD	3-41/64
TFP-LP05	.79 to 7.9 GPH (.05 to .5 LPM)	1/4" OD	3-41/64
TFP-LP06	1.6 to 16 GPH (0.1 to 1 LPM)	1/4" OD	3-41/64
TFP-LP07	3.2 to 32 GPH (.2 to 2 LPM)	1/4" OD	3-41/64
TFP-LP08	7.9 to 79 GPH (.5 to 5 LPM)	3/8" OD	3-27/32
TFP-LP09	16 to 160 GPH (1 to 10 LPM)	3/8" OD	3-27/32

ACCESSORIES

Model	Description
A-454	115 VAC Power Adapter and Signal Cable
A-455	230 VAC Power Adapter and Signal Cable
A-456	36" Mating Cable with Spliced Leads

SPECIFICATIONS

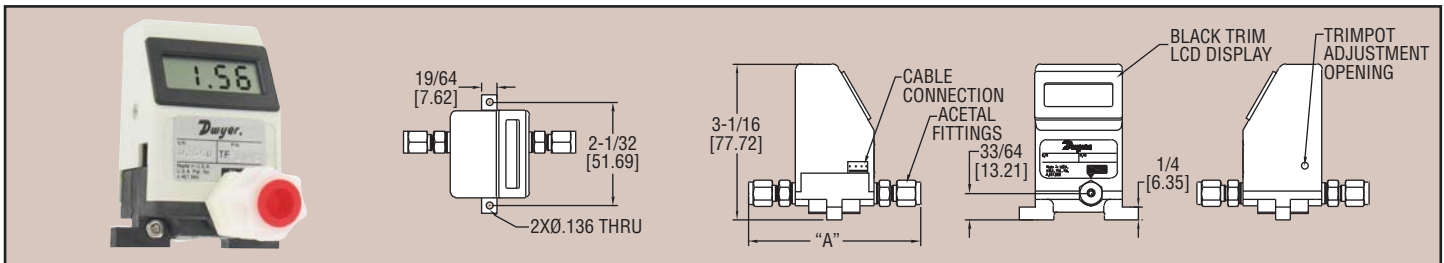
Service: Clean liquids compatible with wetted materials.
Wetted Materials: PPS, acetal, sapphire, glass, epoxy, and fluoroelastomer.
Accuracy: ±1% of full scale.
Linearity: ±1% of full scale.
Repeatability: ±0.2% of full scale.
Temperature Limits: 41 to 131°F (5 to 55°C); Storage: 32 to 158°F (0 to 70°C); Sensitivity: ±0.2% of full scale per °C.
Pressure Limits: 100 psig (6.8 bar).
Process Connection: Compression fitting, see model table.
Power Requirements: 11.5 to 15 VDC.
Power Consumption: 35 mA @ 12 VDC.
Output Signal: 0 to 5 VDC: Minimum 2.5 kΩ load; Pulse: 7.5 VDC peak buffered square wave.
Electrical Connections: Four-pin power and signal connector. A power adapter or mating cable required for operation. See Accessories Table.
Enclosure Rating: IP10 (NEMA 1).
Weight: 0.19 lb (85 g).
Agency Approvals: CE.



Series
TFP-LI

Liquid Turbine Flow Meter

PPS Body, 0 to 5 VDC Output, LCD Indication



Series TFP-LI Liquid Turbine Flow Meters are suitable for a wide variety of industrial, commercial, and laboratory flow applications. These meters utilize a turbine wheel and electro-optical detection to convert flow rates into a linear 0 to 5 VDC output signal for recording and data logging. A 3-1/2 digit LCD informs the user of the actual flow rate. A power adapter or mating cable assembly is required for operation.

Model	Range	Connection	"A" (in)
TFP-LI03	.21 to 1.6 GPH (.0013 to .1 LPM)	1/8" OD	3-27/64
TFP-LI04	.32 to 3.2 GPH (.02 to .2 LPM)	1/4" OD	3-13/16
TFP-LI05	.79 to 7.9 GPH (.05 to .5 LPM)	1/4" OD	3-13/16
TFP-LI06	1.6 to 16 GPH (0.1 to 1 LPM)	1/4" OD	3-13/16
TFP-LI07	3.2 to 32 GPH (.2 to 2 LPM)	1/4" OD	3-13/16
TFP-LI08	7.9 to 79 GPH (.5 to 5 LPM)	3/8" OD	4-1/8
TFP-LI09	16 to 160 GPH (1 to 10 LPM)	3/8" OD	4-1/8

ACCESSORIES

Model	Description
A-454	115 VAC Power Adapter and Signal Cable
A-455	230 VAC Power Adapter and Signal Cable
A-456	36" Mating Cable with Spliced Leads

SPECIFICATIONS

Service: Clean liquids compatible with wetted materials.
Wetted Materials: PPS, acetal, sapphire, glass, epoxy, and fluoroelastomer.
Accuracy: ±1% of full scale.
Linearity: ±1% of full scale.
Repeatability: ±0.2% of full scale.
Temperature Limits: 41 to 131°F (5 to 55°C); Storage: 32 to 158°F (0 to 70°C); Sensitivity: ±0.2% of full scale per °C.
Pressure Limits: 100 psig (6.8 bar).
Process Connection: Compression fitting, see model table.
Power Requirements: 11.5 to 15 VDC.
Power Consumption: 35 mA @ 12 VDC.
Output Signal: 0 to 5 VDC: Minimum 2.5 kΩ load.
Electrical Connections: Four-pin power and signal connector. A power adapter or mating cable required for operation. See Accessories Table.
Display: LCD, 0.39" (10 mm) digits (only in LPM).
Enclosure Rating: IP10 (NEMA 1).
Weight: 0.27 lb (121 g).
Agency Approvals: CE.

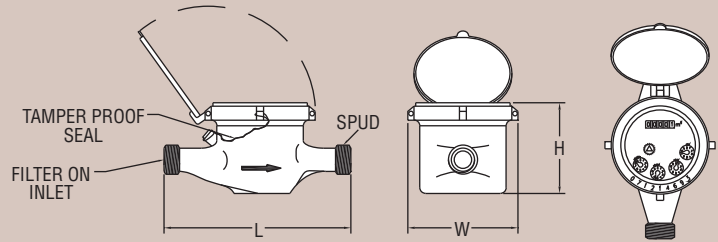
FLOW Transmitters, Turbine



Series
WM

Multi-Jet Water Meter

Economical, Bronze Body, Dry Dial



Size (S)	Spud	Length (L)	Width (W)	Height (H)	Weight
in [mm]	NPSM [BSPP]	in [mm]	in [mm]	in [mm]	lb [kg]
5/8 [15]	3/4 [3/4]	6-1/2 [165]	3-15/16 [99]	4-1/8 [104]	3.09 [1.4]
5/8 x 3/4 [15 x 20]	1 [1]	7-11/16 [195]	3-15/16 [99]	4-3/16 [106]	3.53 [1.6]
3/4 [20]	1 [1]	7-11/16 [195]	3-15/16 [99]	4-3/16 [106]	3.53 [1.6]
1 [25]	1-1/4 [1-1/4]	10-1/4 [260]	4-1/16 [103]	4-1/2 [114]	5.73 [2.6]
1-1/4 [32]	1-1/2 [1-1/2]	10-1/4 [260]	4-1/8 [104]	4-5/8 [117]	6.17 [2.8]
1-1/2 [40]	2 [2]	11-13/16 [300]	4-7/8 [124]	5-13/16 [147]	11.24 [5.1]
2 [50]	2-1/2 [2-1/2]	11-13/16 [300]	4-15/16 [125]	6-3/4 [172]	18.74 [8.5]

The Series WM Multi-Jet Water Meters are ideal for commercial and industrial applications. The multi-jet design allows simplicity and accuracy with wide flow ranges, even in low flow applications. The magnetically driven, hermetically sealed register will not leak or fog and is completely separated from the water. These water meters are designed for long service life and maintenance-free operation.

FEATURES

- Magnetic drive - water is sealed from entering register
- Dry dial won't discolor or fade - hermetically sealed from the elements
- Integral strainer that protects meters from particulate damage
- Pointer-roller indicator
- Frost resistant body
- Includes two mounting adapters (couplings)

SPECIFICATIONS

- Service:** Water.
- Flow Range:** See model chart.
- Wetted Materials:** Body: Brass, nylon, acetal; Couplings: Brass; Measuring chamber: Fluorocarbon (FKM), polyethylene, high impact polystyrene, ABS plastic.
- Accuracy:** Transitional flow: $\pm 5\%$; Nominal flow: $\pm 2\%$ (see instruction manual).
- Temperature Limit:** 104°F (40°C).
- Pressure Limit:** 145 psi (10 bar).
- Pressure Drop:** See instruction manual.
- Totalizing Display Maximum:** 9,999,999 counts.
- Mounting Orientation:** Horizontal.
- Weight:** See dimension chart.

Model	Size	Coupling Size	Transitional Flow (GPM)	Nominal Flow (GPM)	Max Flow (GPM)
WM-A-C-01	5/8"	1/2" NPT	0.125	0.5-13	13
WM-A-C-02	5/8" x 3/4"	3/4" NPT	0.125	1-20	20
WM-A-C-03	3/4"	3/4" NPT	0.25	1-22	22
WM-A-C-04	1"	1" NPT	0.375	1.25-30	30
WM-A-C-06	1-1/2"	1-1/2 NPT	1.0	3-88	88
WM-A-C-07	2"	2" NPT	1.25	5-132	132

Model	Size	Coupling Size	Transitional Flow (L/h)	Nominal Flow (m ³ /h)	Max Flow (m ³ /h)
WM-B-C-08	15 mm	1/2" BSPT	30	0.12-3.0	3
WM-B-C-10	20 mm	3/4" BSPT	50	0.2-5.0	5
WM-B-C-11	25 mm	1" BSPT	70	0.28-5	7
WM-B-C-12	32 mm	1-1/4" BSPT	120	0.48-12	12
WM-B-C-13	40 mm	1-1/2" BSPT	200	0.8-20	20
WM-B-C-14	50 mm	2" BSPT	300	1.2-30	30

Note: Transition flow accuracy ($\pm 5\%$) GPM (L/h). Nominal flow accuracy ($\pm 2\%$) GPM (M3/h)

FLOW

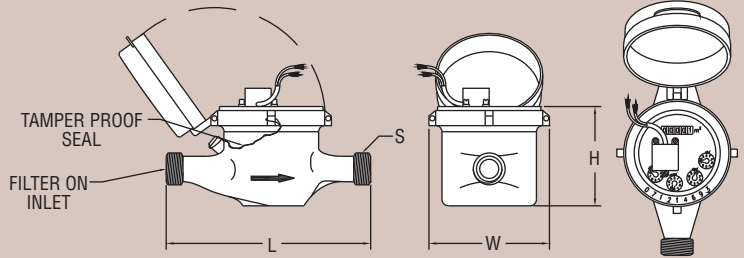
Flowmeters,
Totalizing



Series
WMT

Multi-Jet Water Meter/Pulsed Output

Economical, Bronze Body, Dry Dial



Size (S)	Spud	Length (L)	Width (W)	Height (H)	Weight
in [mm]	NPSM [BSPP]	in [mm]	in [mm]	in [mm]	lb [kg]
5/8 [15]	3/4 [3/4]	6-1/2 [165]	3-15/16 [99]	4-1/8 [104]	3.09 [1.4]
5/8 x 3/4 [15 x 20]	1 [1]	7-11/16 [195]	3-15/16 [99]	4-3/16 [106]	3.53 [1.6]
3/4 [20]	1 [1]	7-11/16 [195]	3-15/16 [99]	4-3/16 [106]	3.53 [1.6]
1 [25]	1-1/4 [1-1/4]	10-1/4 [260]	4-1/16 [103]	4-1/2 [114]	5.73 [2.6]
1-1/4 [32]	1-1/2 [1-1/2]	10-1/4 [260]	4-1/8 [104]	4-5/8 [117]	6.17 [2.8]
1-1/2 [40]	2 [2]	11-13/16 [300]	4-7/8 [124]	5-13/16 [147]	11.24 [5.1]
2 [50]	2-1/2 [2-1/2]	11-13/16 [300]	4-15/16 [125]	6-3/4 [172]	18.74 [8.5]

The Series WMT Multi-Jet Water Meters are ideal for commercial and industrial applications. The multi-jet design allows simplicity and accuracy with wide flow ranges, even in low flow applications. The meter is designed for long service life and relatively maintenance-free operation, even under adverse conditions. The magnetically driven, hermetically sealed register will not leak or fog and is completely separated from the water. The reed switch is activated by a magnet on the dial which is directly proportional to the flow rate. The output is perfect for remote monitoring of flow rate or flow totalization and can interface with PLC's, counters, data loggers, and SCADA systems.

FEATURES

- Magnetic drive - water is sealed from entering register
- Dry dial won't discolor or fade - hermetically sealed from the elements
- Integral strainer that protects meters from particulate damage
- Pointer-roller indicator
- Frost resistant body
- Pulsed output
- Includes two mounting adapters (couplings)

SPECIFICATIONS

Service: Water.

Flow Range: See model chart.

Wetted Materials: Body: Brass, nylon, acetal; Couplings: Brass; Measuring chamber: Fluorocarbon (FKM), polyethylene, high impact polystyrene, ABS plastic.

Accuracy: Transitional flow: $\pm 5\%$; Nominal flow: $\pm 2\%$ (see instruction manual).

Temperature Limit: 104°F (40°C).

Pressure Limit: 145 psi (10 bar).

Pressure Drop: See instruction manual.

Totalizing Display Maximum: 9,999,999 counts.

Output Signal: Pulse output with frequency proportional to flow rate. Pulse options: 0.1 gal, 1 gal, 10 gal, 100 gal per pulse (1L, 10L, 100L per pulse).

Electrical Rating: 0.01A @ 24VAC/DC.

Electrical Connections: Lead wires, 4.5 feet (1.5 meters) long.

Mounting Orientation: Horizontal.

Weight: See dimension chart.

Model	Size	Coupling Size	Transitional Flow (GPM)	Nominal Flow (GPM)	Max Flow (GPM)	Gallons per Pulse
WMT-A-C-01	5/8"	1/2" NPT	0.125	0.5-13	13	0.1
WMT-A-C-02	5/8" x 3/4"	3/4" NPT	0.125	1-20	20	0.1
WMT-A-C-03	3/4"	3/4" NPT	0.25	1-22	22	0.1
WMT-A-C-04	1"	1" NPT	0.375	1.25-30	30	0.1
WMT-A-C-01-1	5/8"	1/2" NPT	0.125	0.5-13	13	1
WMT-A-C-02-1	5/8" x 3/4"	3/4" NPT	0.125	1-20	20	1
WMT-A-C-03-1	3/4"	3/4" NPT	0.25	1-22	22	1
WMT-A-C-04-1	1"	1" NPT	0.375	1.25-30	30	1
WMT-A-C-06-10	1-1/2"	1-1/2" NPT	1.0	3-88	88	10
WMT-A-C-07-10	2"	2" NPT	1.25	5-132	132	10
WMT-A-C-04-100	1"	1" NPT	0.375	1.25-30	30	100
WMT-A-C-07-100	2"	2" NPT	1.25	5-132	132	100

Model	Size	Coupling Size	Transitional Flow (L/h)	Nominal Flow (m ³ /h)	Max Flow (m ³ /h)	Liters per Pulse
WMT-B-C-08-1	15 mm	1/2" BSPT	30	0.12-3.0	3	1
WMT-B-C-10-1	20 mm	3/4" BSPT	50	0.2-5.0	5	1
WMT-B-C-11-1	25 mm	1" BSPT	70	0.28-5	7	1
WMT-B-C-12-1	32 mm	1-1/4" BSPT	120	0.48-12	12	1
WMT-B-C-08-10	15 mm	1/2" BSPT	30	0.12-3.0	3	10
WMT-B-C-12-10	32 mm	1-1/4" BSPT	120	0.48-12	12	10
WMT-B-C-14-10	50 mm	2" BSPT	300	1.2-30	30	10
WMT-B-C-12-100	32 mm	1-1/4" BSPT	120	0.48-12	12	100
WMT-B-C-14-100	50 mm	2" BSPT	300	1.2-30	30	100

Note: Transition flow accuracy ($\pm 5\%$) GPM (L/h). Nominal flow accuracy ($\pm 2\%$) GPM (M³/h).

FLOW

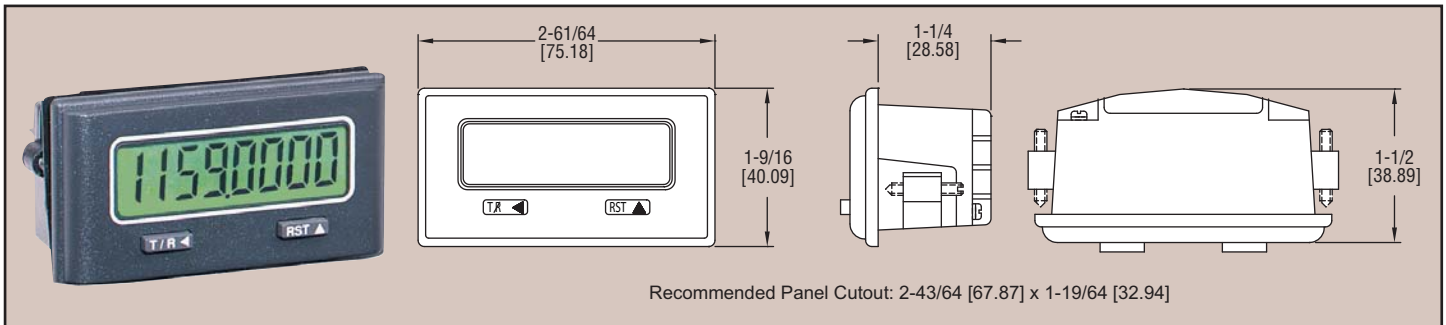
Flowmeters,
Totalizing



Model
TM2

Flow Totalizer

Pulse Input, 8-digit LCD Display



Monitor flow rate or total flow with Model TM2 Flow Totalizer. Unit features a four digit flow rate display and an eight digit totalizing display with a programmable, five position decimal point. Easily toggle between rate and total with front-panel push-button. Use scaling factor to define flow rate in engineering units such as ml/min, l/min, or gal/hr.

SPECIFICATIONS

Input: 7.5 VDC max. pulse.
Accuracy: $\pm 0.2\%$.
Input Impedance: 27 k Ω at 3 VDC.
Totalizer Type: Up count.
Rate Indication Type: Frequency.
Count Input Speed: 10 kHz @ 50% duty cycle.
Totalizing Range: 0.0001 to 100.0000 (five position decimal point).
Rate Indication Range: 0.001 to 9999 (five position decimal point).
Update Time: 0.7 seconds.
Display: 8-digit LCD, 7/16" H.
Temperature Limits: 32 to 131°F (0 to 55°C).
Housing Material: ABS X-17.
Power: One 3V lithium battery (included).
Average Battery Life: Approximately 5 years.
Weight: 1 lb (0.5 kg).
Agency Approvals: CE.

Model TM2

ACCESSORY

TM25, Replacement 3V lithium battery

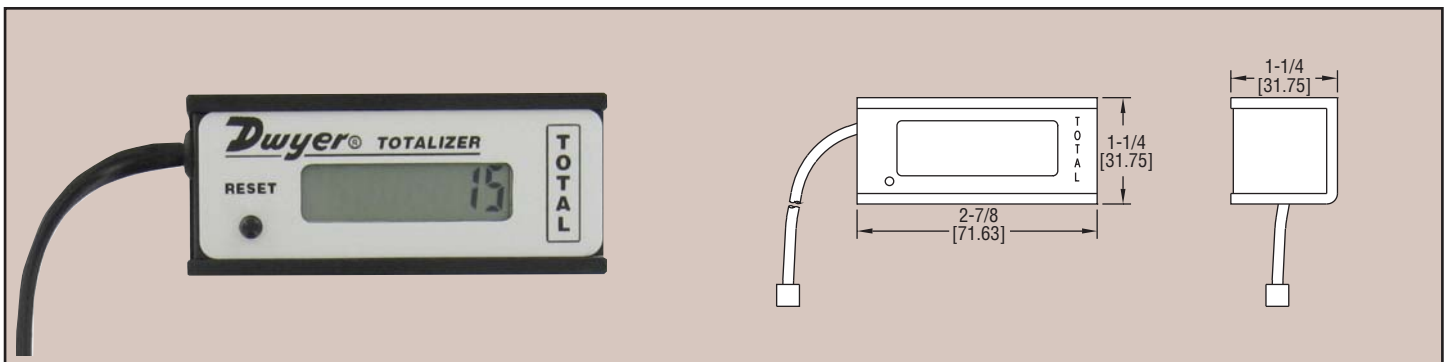
FLOW



Series
GFT

Flow Totalizer

Seven Digit Display, Easy Installation



Series GFT Flow Totalizer is designed to be used with mass flowmeters and mass flow controllers. The totalizer accepts analog output flow signals of either 0 to 5 VDC or 5 to 10 VDC. Series GFT integrates and accumulates up to 7 digits of direct engineering units for a given gas and flow rate (standard liters, standard cubic centimeters, etc.). Quickly connect the GFT-10 to Series GFC and GFM mass flow controllers and meters via the modular jack (replacing the LCD display) or use the GFT-10C to connect in parallel with the display.

SPECIFICATIONS

Input Analog Range: 0 to 5 or 5 to 10 VDC.
Power Consumption: 10 mA @ 12 VDC, less than 0.125 Watts.
Accuracy: $\pm 0.5\%$ FS.
Temperature Stability: ± 100 ppm/°C in the range of 5 to 50°C.
Reset: Momentary tact switch.
Display: 7-digit, 5/16" (8mm) H.
Power Supply: Internal lithium battery.
Agency Approvals: CE.

Model GFT-05, accepts 0 to 5 VDC input
Model GFT-10, accepts 0 to 10 VDC input

ACCESSORIES

Model GFT-05C, Cable for 0 to 5 VDC models
Model GFT-10C, Cable for 5 to 10 VDC models

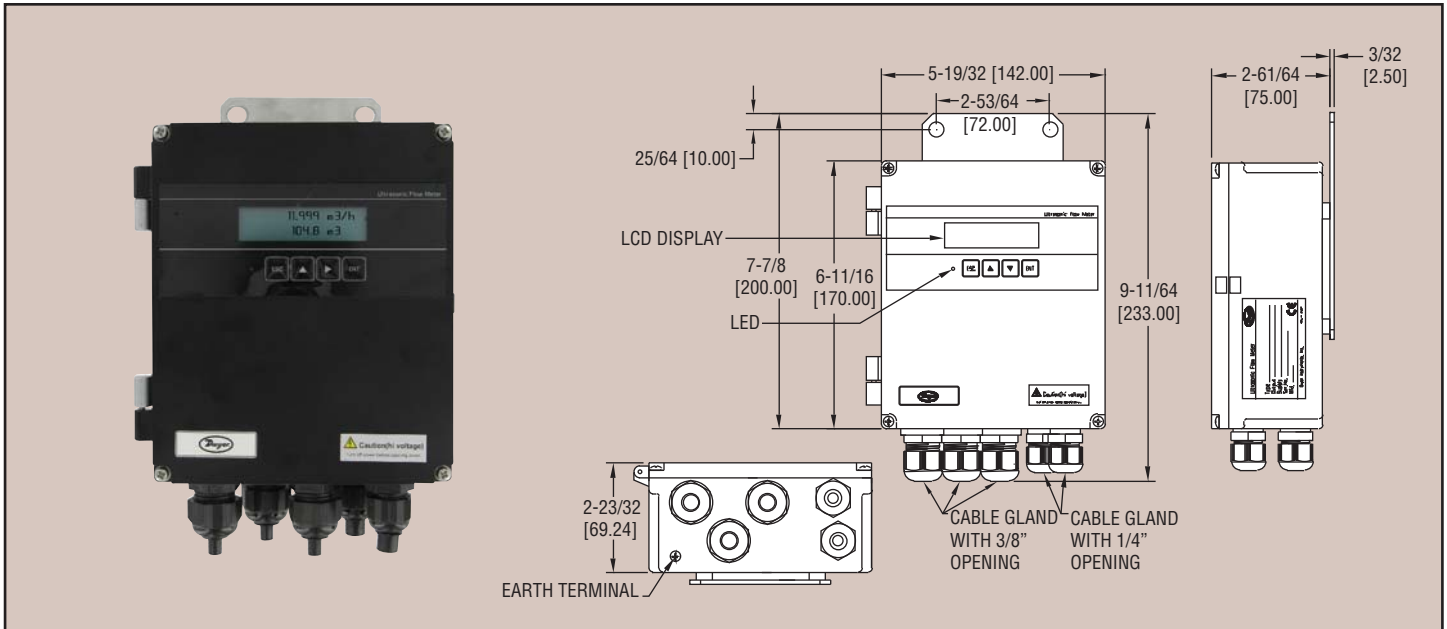
Flowmeters,
Totalizing



Series
UXF3

Ultrasonic Flowmeter Converter

Excellent Performance and Easy Operation



The Series UXF3 Ultrasonic Flowmeter Converters are paired with Series SX1 or SX2 sensors in order to utilize the transit-time measure method. Thanks to microprocessor-based electronics, the flowmeter can easily be configured from the front keypad to specific applications. The flowmeter is suitable for liquid flow measurements for pipes from 1/2 inch to 19.5 feet diameter. The accuracy of this flowmeter falls within $\pm 1\%$ of the flow rate. The UXF3 also provides excellent resistance against aerated flow such as sludge, raw sewage, and bubble contained flow. The multilingual display supports a variety of language choices. The combination of the easy to read LCD screen and front panel buttons along with the variety of language selections makes this flowmeter very user friendly. This flowmeter incorporates the latest electronics and high-speed digital signal processing technologies (32 bit MPU), realizing high performance and easy operation. See bulletin F-107-UXF3 for more details.

FEATURES

- High accuracy
- Excellent resistance against aerated flow
- Quick response with high-speed microprocessor
- Multilingual display (English, Japanese, German, French, and Spanish)
- Large type graphic LCD
- Front keypad

Model	Power Supply	Serial Communications
UXF3-A0	100-240 VAC 50/60Hz	N/A
UXF3-B0	20-30 VDC	N/A
UXF3-A1	100-240 VAC 50/60Hz	RS485
UXF3-B1	20-30 VDC	RS485

SPECIFICATIONS

Service: Liquid flow through which ultrasonic signal can be transmitted (water, sea water, oil, and fluid of unknown velocity).

Inputs: Sensor cable radio frequency coaxial cable RG-58A/U2.

Range: 0 to ± 105 fps (0 to ± 32 m/s) (bi-directional flow).

Display: LCD with backlight, 16 letters 2 lines.

Accuracy: $\pm 1.0\%$ of rate.

Power Requirements: 100 to 240 VAC $\pm 10\%$ 50/60 Hz, or 20 to 30 VDC.

Power Consumption: AC: 15 VA; DC: 6W.

Temperature Limits: Ambient -4 to 131°F (-20 to 55°C).

Output: Analog: 4 to 20 mA DC current output; Digital: One mechanical relay output, 240 VAC, 30 VDC, 1 A. Two transistor outputs available, Open collector output: 30 VDC, 0.1A.

Serial Communications (option): RS485.

Enclosure Rating: NEMA 4X (IP66).

Material: Aluminum alloy.

Electrical Connections: Screw terminals.

Mounting: Wall or pipe mount.

Weight: 10 lb (4.5 kg).

FLOW

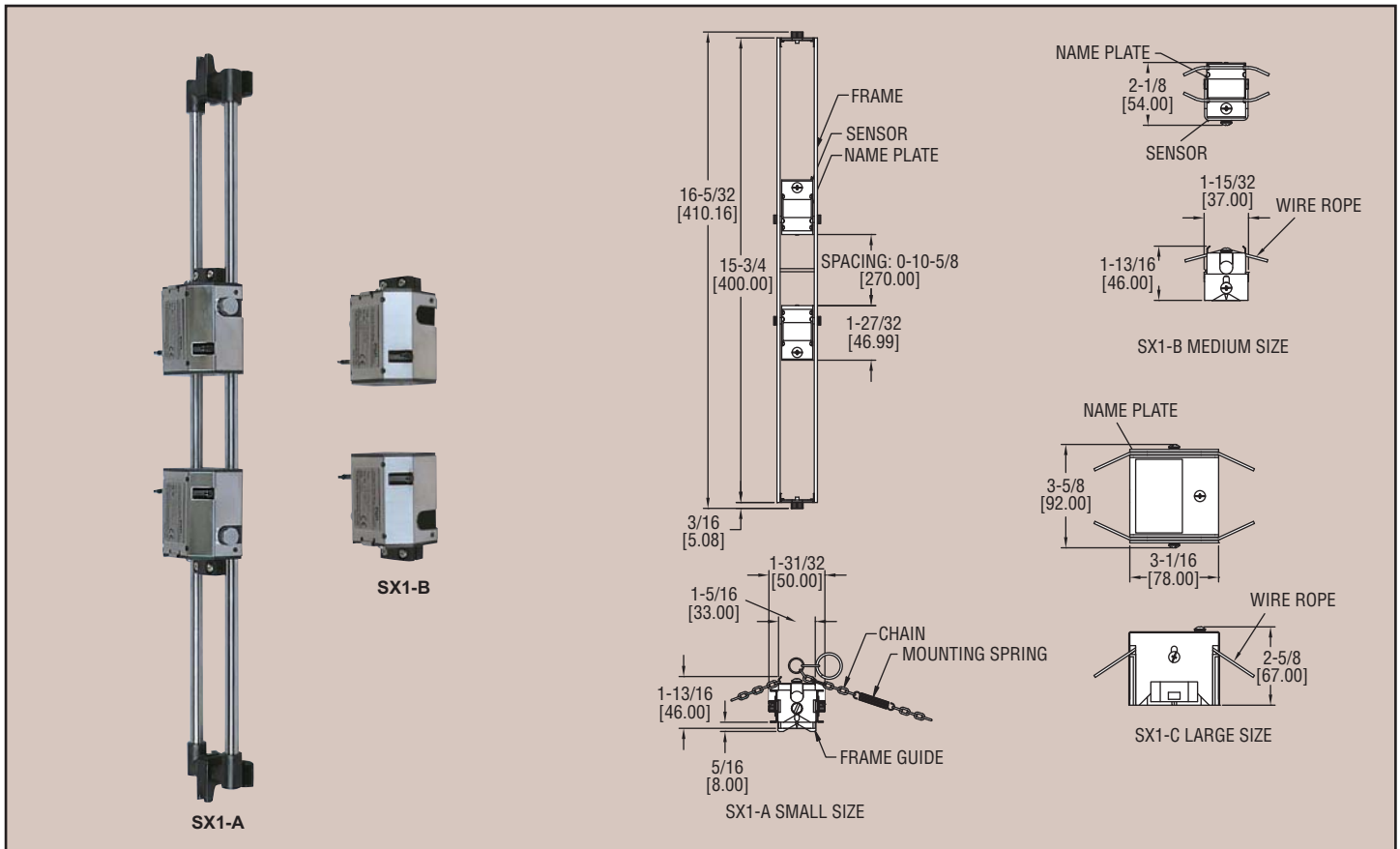
Flow Transmitters,
Ultrasonic



Series
SX1

Ultrasonic Flowmeter Detector

Excellent Performance and Easy Operation



FLOW

Flow Transmitters,
Ultrasonic

Series SX1 Ultrasonic Flowmeter Detectors are paired with Series UXF1 and UXF3 converters in order to utilize the transit-time measuring method. Two ultrasonic sensors are mounted on the pipe exterior, and each transmits an ultrasonic pulse to the opposite sensor. The difference in the transit times of the two waves is used to calculate the flow velocity.

Series SX1 Ultrasonic Flowmeter Detector:

- Easy installation, no pipe work required
- Simple maintenance, no moving parts
- Free from pressure loss, choking, and leakage
- Clamp-on features allow for reduction of total ownership cost

Model	Description
SX1-A	Detector, Small Sensor
SX1-B	Detector, Medium Sensor
SX1-C	Detector, Large Sensor

ACCESSORIES

Model	Description
SXC-1A	16.4 ft (5 m) cable for SX1
SXC-1B	32.8 ft (10 m) cable for SX1
A-186	Silicone-based grease acoustic couplant, 3 oz tube
A-187	Silicone RTV acoustic couplant, 4 oz tube
A-188	Silicone-free acoustic couplant, 4 oz tube

OPTIONS

Consult factory for other cable lengths.

SPECIFICATIONS

Service: Liquid flow through which ultrasonic signal can be transmitted (water, sea water, oil, and fluid of unknown velocity).

Turbidity: 10000 deg (mg/L) or less.

Type of Flow: Well-developed turbulent or laminar flow in a full-filled pipe.

Range: 0 to ±105 fps (0 to ±32 m/s) (bidirectional flow).

Flow Pipe Sizes: SX1-A: 1.97 to 15.75 in (50 to 400 mm); SX1-B: 1.97 to 47.24 in (50 to 1200 mm); SX1-C: 7.87 to 236.2 in (200 to 6000 mm).

Accuracy:

- Pipe Size: 0.51 in (13 mm) to under 1.99 in (50 mm)
±0.03 m/s for flow rate: Under 2 m/s
±0.75% to ±1.5% of rate for flow rate: 2 m/s to 32 m/s;
- Pipe Size: 1.99 in (50 mm) to under 11.8 in (300 mm)
±0.02 m/s for flow rate: Under 2 m/s
±0.5% to ±1.0% of rate for flow rate: 1 m/s to 32 m/s;
- Pipe Size: 11.8 in (300 mm) up to 19.69 ft (6000 mm)
±0.01 m/s for flow rate: Under 1 m/s
±0.5% to ±1.0% of rate for flow rate 1 m/s to 32 m/s.

Response Time: 0.5s or less.

Temperature Limits: Ambient 176°F (80°C); Fluid temperature: -40 to 176°F (-40 to 80°C) for SX1-A, SX1-B, SX1-C.

Enclosure Rating: IP67

Materials: SX1A: Plastic case; 304 stainless steel and plastic guide rail; SX1B and SX1C: Plastic case; Silicone rubber couplers on all models.

Sensor Cable: Radio frequency coaxial cable (RG-58A/U), see accessories table for specific lengths.

Electrical Connection: Screw terminals.

Mounting: Clamped on pipe wall.

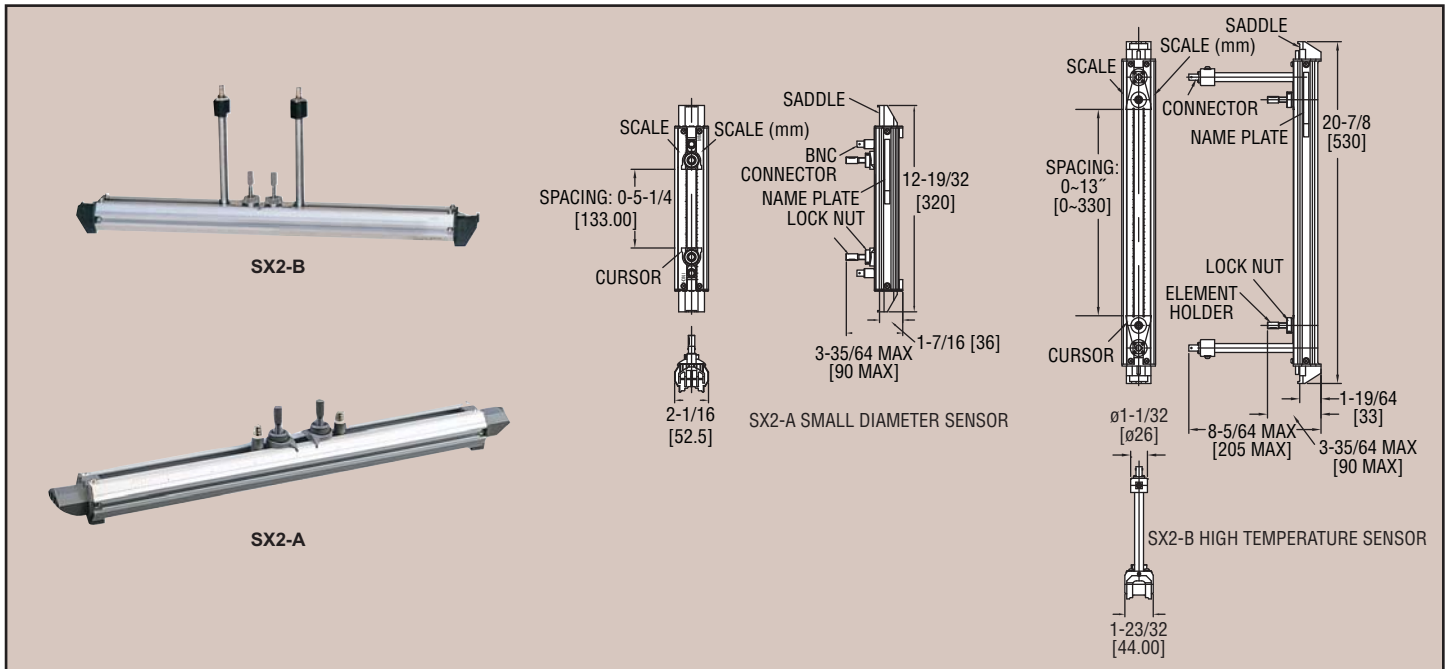
Weight: SX1-A: 2.2 lb (1 kg); SX1-B: 0.88 lb (0.4 kg); SX1-C: 3.1 lb (1.4 kg).



Series
SX2

Portable Ultrasonic Flowmeter Detector

Compact and Lightweight



Series SX2 Ultrasonic Flowmeter Detectors are paired with Series UXF1 and UXF3 converters in order to utilize the transit-time method for measuring flow rates in pipes from the outside. Two ultrasonic sensors are mounted on the pipe exterior, and each transmits an ultrasonic pulse to the opposite sensor. The difference in the transit times of the two waves is used to calculate the flow velocity. Paired with the UXF1 or UXF3 Series converters, Series SX2 detectors provide ultrasonic flowmeter sensors for both small diameter needs as well as high-temperature applications.

Series SX2 Ultrasonic Flowmeter Detectors:

- Easy installation, no pipe work required
- Simple maintenance, no moving parts
- Free from pressure loss, choking, and leakage
- Clamp-on features allow for reduction of total ownership cost

ACCESSORIES

Model	Description
A-186	Silicone-based grease acoustic couplant, 3 oz tube
A-187	Silicone RTV acoustic couplant, 4 oz tube
A-188	Silicone-free acoustic couplant, 4 oz tube

Model	Description	Cable Length ft (m)
SX2-A	Detector, Small Diameter Sensor	16.4 (5)
SX2-B	Detector, High Temperature Sensor	16.4 (5)

SPECIFICATIONS

Service: Liquid flow through which ultrasonic signal can be transmitted (water, sea water, oil, and fluid of unknown velocity).

Turbidity: 10000 deg (mg/L) or less.

Type of Flow: Well-developed turbulent or laminar flow in a full-filled pipe.

Range: 0 to ±105 fps (0 to ±32 m/s) (bidirectional flow).

Flow Pipe Sizes: SX2-A: 0.51 to 3.94 in (13 to 100 mm), SX2-B: 1.97 to 15.75 in (50 to 400 mm).

Accuracy:

- Pipe Size: 0.51 in (13 mm) to under 1.99 in (50 mm)
±0.03 m/s for flow rate: Under 2 m/s
±0.75% to ±1.5% of rate for flow rate: 2 m/s to 32 m/s;
- Pipe Size: 1.99 in (50 mm) to under 11.8 in (300 mm)
±0.02 m/s for flow rate: Under 2 m/s
±0.5% to ±1.0% of rate for flow rate: 1 m/s to 32 m/s;
- Pipe Size: 11.8 in (300 mm) up to 19.69 ft (6000 mm)
±0.01 m/s for flow rate: Under 1 m/s
±0.5% to ±1.0% of rate for flow rate: 1 m/s to 32 m/s.

Response Time: 0.5s or less.

Temperature Limits: Ambient 176°F (80°C); Fluid temperature: -40 to 212°F (-40 to 100°C) for SX2-A, -40 to 392°F (-40 to 200°C) for SX2-B.

Enclosure Rating: NEMA 3 (IP52).

Materials: SX2-A: Plastic case, aluminum and plastic guide rail, silicone rubber coupler; SX2-B: 304SS case, aluminum and 304SS guide rail, silicone grease coupler.

Sensor Cable: Radio frequency coaxial cable (RG-58A/U), 16.4 ft (5 m).

Electrical Connection: Screw terminals.

Mounting: Clamped on pipe wall.

Weight: SX2-A: 1.32 lb (0.6 kg); SX2-B: 3.53 lb (1.6 kg).

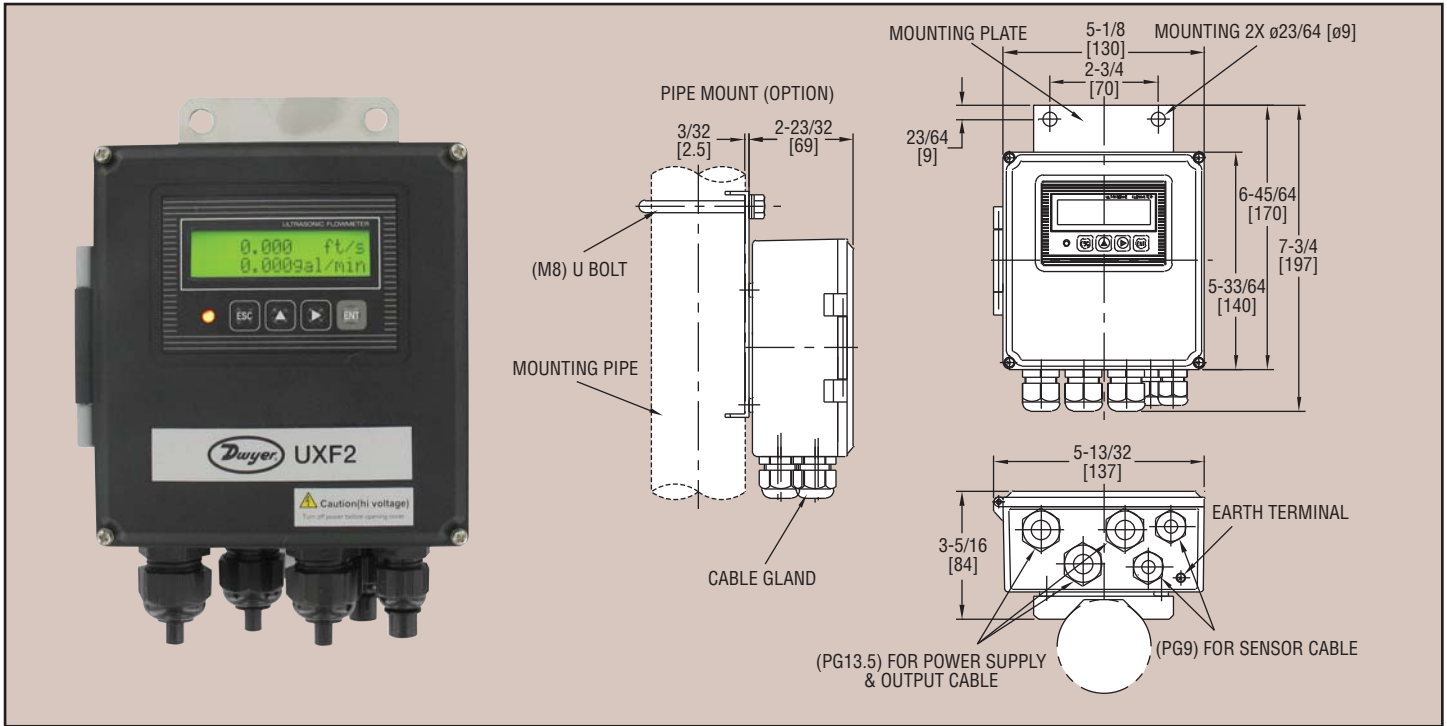
FLOW
Flow Transmitters,
Ultrasonic



Series
UXF2

Ultrasonic Flow Converter

Excellent Performance and Easy Operation



Series UXF2 Ultrasonic Flow Converters are paired with Series SX3 detectors in order to utilize the transit-time measuring method. Two ultrasonic sensors are mounted on the pipe exterior, and each transmits an ultrasonic pulse to the opposite sensor. The difference in the transit times of the two waves is used to calculate the flow velocity. This meter is a clamp-on type ultrasonic flowmeter for permanent use and is ideal for clean liquids containing no air bubbles such as pure water. The easy-to-use compact and lightweight design is intended for integration into mechanical devices. The adoption of a sound velocity measurement system, which calculates sound velocity from the transit time, keeps the flowmeter unaffected by the temperature and the pressure of the fluid to be measured. Additionally, with the use of a high-speed transit time processor, the system cycle is 0.2 seconds and applicable to short batch processes.

Series UXF2 Ultrasonic Flowmeter Converter:

- Compact and lightweight
- Easy operation by external keypads
- Plastic housing with IP65 rating
- Communication and synchronization options available

Model	Power Supply	Communication
UXF2-11P1	100 to 120 VAC	None
UXF2-21P1	200 to 240 VAC	None
UXF2-31P1	20 to 30 VDC	None
UXF2-12P1	100 to 120 VAC	RS-232
UXF2-22P1	200 to 240 VAC	RS-232
UXF2-32P1	20 to 30 VDC	RS-232
UXF2-13P1	100 to 120 VAC	RS-485
UXF2-23P1	200 to 240 VAC	RS-485
UXF2-33P1	20 to 30 VDC	RS-485
UXF2-14P1	100 to 120 VAC	Sync
UXF2-24P1	200 to 240 VAC	Sync
UXF2-34P1	20 to 30 VDC	Sync

SPECIFICATIONS

Service: Clean liquids that pass ultrasound and do not contain air bubbles (such as pure water and chemical solution).

Input: BNC connector, coaxial cable from sensor.

Range: 0 to ± 32.8 fps (0 to ± 10 m/s).

Display: 2-color LED (normal: green, abnormal: red), LCD with 2 lines of 16 characters and back light, Languages: English, Japanese, French, German, or Spanish.

Accuracy: See SX3.

Power Requirement: 100 to 120 VAC $\pm 10\%$ 50/60 Hz, or 200 to 240 VAC $\pm 10\%$ 50/60 Hz, or 20 to 30 VDC.

Power Consumption: 15 VA or less for AC power supply, 5W or less for DC power supply.

Temperature Limits: Ambient 122°F (50°C).

Outputs: Analog: 4 to 20 mA DC, 1 point; Digital: Open Collector: 1 point; Relay contact: 1 point.

Serial Communications: RS-232C or RS-485.

Enclosure Rating: IP65.

Materials: Plastic ABS.

Electrical Connections: Screw terminals.

Mounting: Wall or pipe mount.

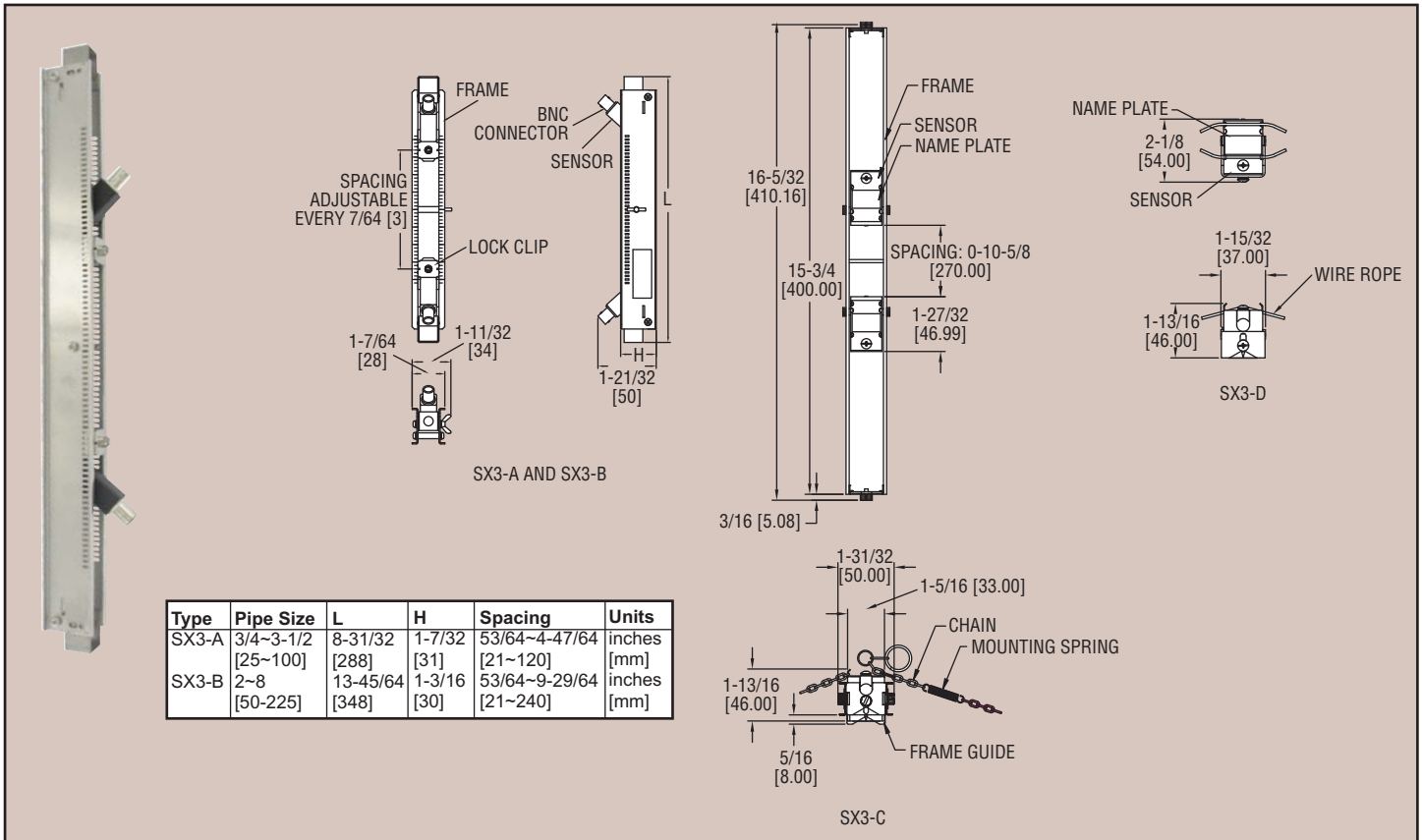
Weight: 1.8 lb (0.8 kg).



Series
SX3

Ultrasonic Flowmeter Detector

Quick and Easy Mounting



Type	Pipe Size	L	H	Spacing	Units
SX3-A	3/4~3-1/2 [25~100]	8-31/32 [288]	1-7/32 [31]	53/64~4-47/64 [21~120]	inches [mm]
SX3-B	2~8 [50-225]	13-45/64 [348]	1-3/16 [30]	53/64~9-29/64 [21~240]	inches [mm]

Series SX3 Ultrasonic Flowmeter Detectors are paired with Series UXF2 converters and employ a clamp-on type design for permanent use based on transit time measuring method. These detectors are ideal for clean liquids containing no air bubbles such as pure water. The easy-to-use compact and lightweight design is intended for integration into mechanical devices. It is applicable for small to medium size pipes of diameter range from 1 to 23 in (25 to 600 mm) and provides superior cost performance.

Series SX3 Ultrasonic Flowmeter Detectors:

- Helps ensure pumping efficiency
- Provides accurate leak detection
- Not influenced by fluid's temperature or pressure

Model	Kind of Detector	Flow Pipe Size in (mm)	Acoustic Coupler
SX3-A0	Small Standard	0.98 to 3.94 (25 to 100)	None
SX3-B0	Small	1.97 to 8.86 (50 to 225)	None
SX3-C0	Medium	1.97 to 11.81 (50 to 300)	None
SX3-D0	Large	11.81 to 23.62 (300 to 600)	None

ACCESSORIES

Model	Description
A-186	Silicone-based grease acoustic couplant, 3 oz tube
A-187	Silicone RTV acoustic couplant, 4 oz tube
A-188	Silicone-free acoustic couplant, 4 oz tube

Model	Description	Cable Length ft (m)
SX3C-1A	Heat Resistant Cable with waterproof BNC connector for SX3-A and SX3-B	16.4 (5)
SX3C-1B	Heat Resistant Cable with waterproof BNC connector for SX3-A and SX3-B	32.8 (10)
SX3C-2A	Heat Resistant Cable for SX3-C and SX3-D	16.4 (5)
SX3C-2B	Heat Resistant Cable for SX3-C and SX3-D	32.8 (10)

Option-Consult factory for other cable lengths.

SPECIFICATIONS

Service: Clean liquids that pass ultrasound and do not contain air bubbles (such as pure water and chemical solution).
Turbidity: 10000 deg (mg/L) or less.
Type of Flow: Well-developed turbulent or laminar flow in a fluid-filled pipe.
Permissible Air Volume Rate: Up to 2% at 1 m/s (inversely proportional to velocity).
Range: 0 to ± 32.8 fps (0 to ±10 m/s).
Flow Pipe Sizes: SX3A: 0.98 to 3.94 in (25 to 100 mm) for plastic piping 1.97 to 3.94 in (50 to 100 mm) for metal piping; SX3B: 1.97 to 8.86 in (50 to 225 mm); SX3C: 1.97 to 11.81 in (50 to 300 mm); SX3D: 11.81 to 23.62 in (300 to 600 mm).
Accuracy: 1.5 to 2% of rate.
Response Time: System cycle: 0.2 s; Dead time: 0.2 s or less; Time constant: 0.1s.
Temperature Limits: Ambient -4 to 140°F (-20 to 60°C); Fluid Temperature: SX3A/SX3B: -4 to 212°F (-20 to 100°C); SX3C/SX3D w/ silicone rubber for acoustic couplant: -4 to 176°F (-20 to 80°C), w/ silicone free grease for acoustic couplant: 32 to 140°F (0 to 60°C).
Enclosure Rating: SX3A and SX3B: IP65 (jetproof) when using waterproof BNC connector; SX3C and SX3D: IP67 (immersion-proof) when the terminal block is filled with silicone rubber after wiring.
Materials: For SX3A and SX3B: Plastic PBT for sensor housing, 304SS for guide frame; For SX3C and SX3D: Plastic PBT for sensor housing, 304SS for sensor cover, 304SS and PBT for guide rail.
Electrical Connection: Coaxial cable up to 98.4 ft (30 m) and thermal stability of 212°F (100°C).
Mounting: Clamped on pipe surface.
Weight: SX3A: 10.6 oz (0.3 kg); SX3B: 14.1 oz (0.4 kg); SX3C: 2.2 lb (1 kg); SX3D: 14.1 oz (0.4 kg).

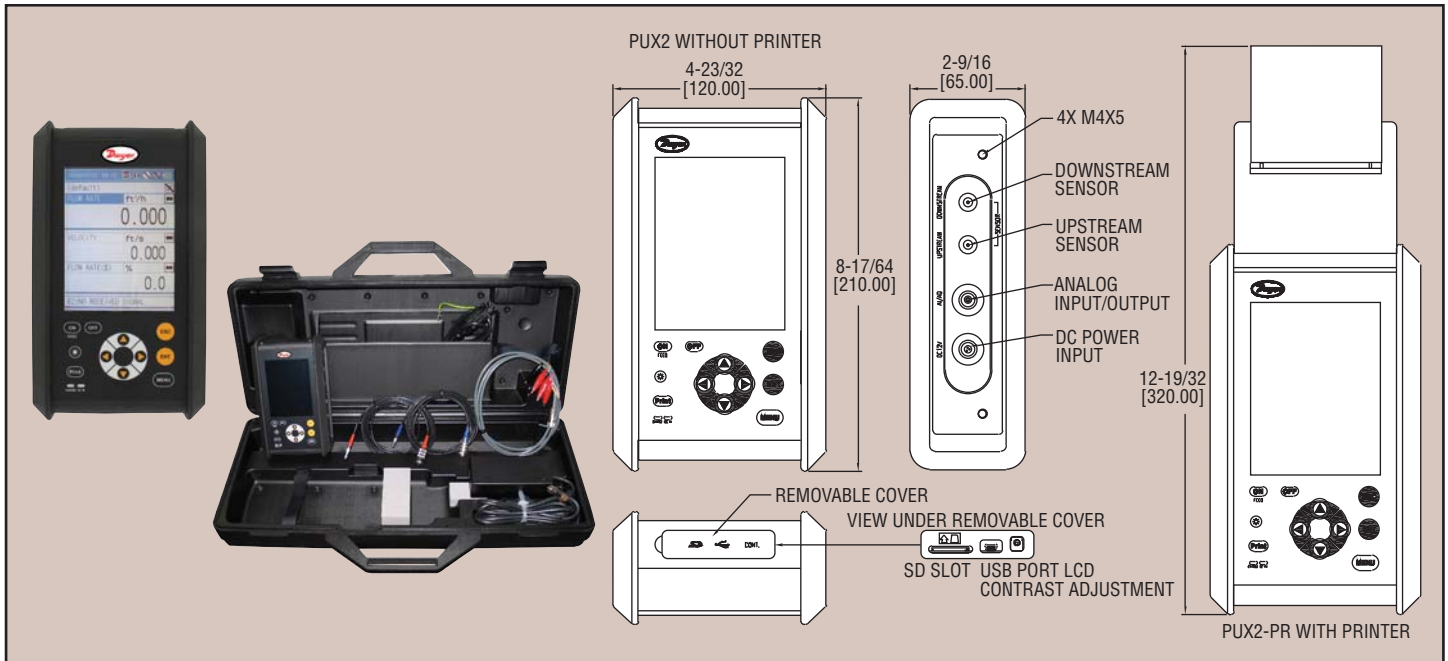
FLOW
Flow Transmitters,
Ultrasonic



Series
PUX2

Portable Ultrasonic Flowmeter Converter

Data Logging and BTU Capability



FLOW

Flow Transmitters,
Ultrasonic

The Series PUX2 Portable Ultrasonic Flowmeter Converters are paired with Series PSX2 sensors in order to utilize the transit-time difference for measuring flow rates in pipes from the outside. It is a compact and lightweight instrument incorporating the latest electronics and digital signal processing technologies, realizing high performance and easy operation. This device is designed for high accuracy and high-speed response. This portable unit is capable of 12 hours of continuous operation with its built-in battery, which requires only 3 hours to recharge. The rugged NEMA 3X enclosure allows the PUX2 to be exposed to rain, while the efficient layout of the function keys aid the user with easy page selection and setting changes. The built in USB port allows for easy connection to a personal computer. See bulletin F-9-PUX2 for more details.

FEATURES

- SD memory card slot for recording data
- USB port for easy PC connection
- High accuracy
- Large type color graphic LCD
- Flow rate, flow velocity, and flow totalization functions
- Thermal flow rate (BTU) function with two temperature inputs perfect for energy audits

Model	Portable Ultrasonic Flowmeter Converter
PUX2	Converter
PUX2-PR	Converter with Printer

Unit includes 5 m coaxial cable for use with PSX2-A sensor.

SPECIFICATIONS

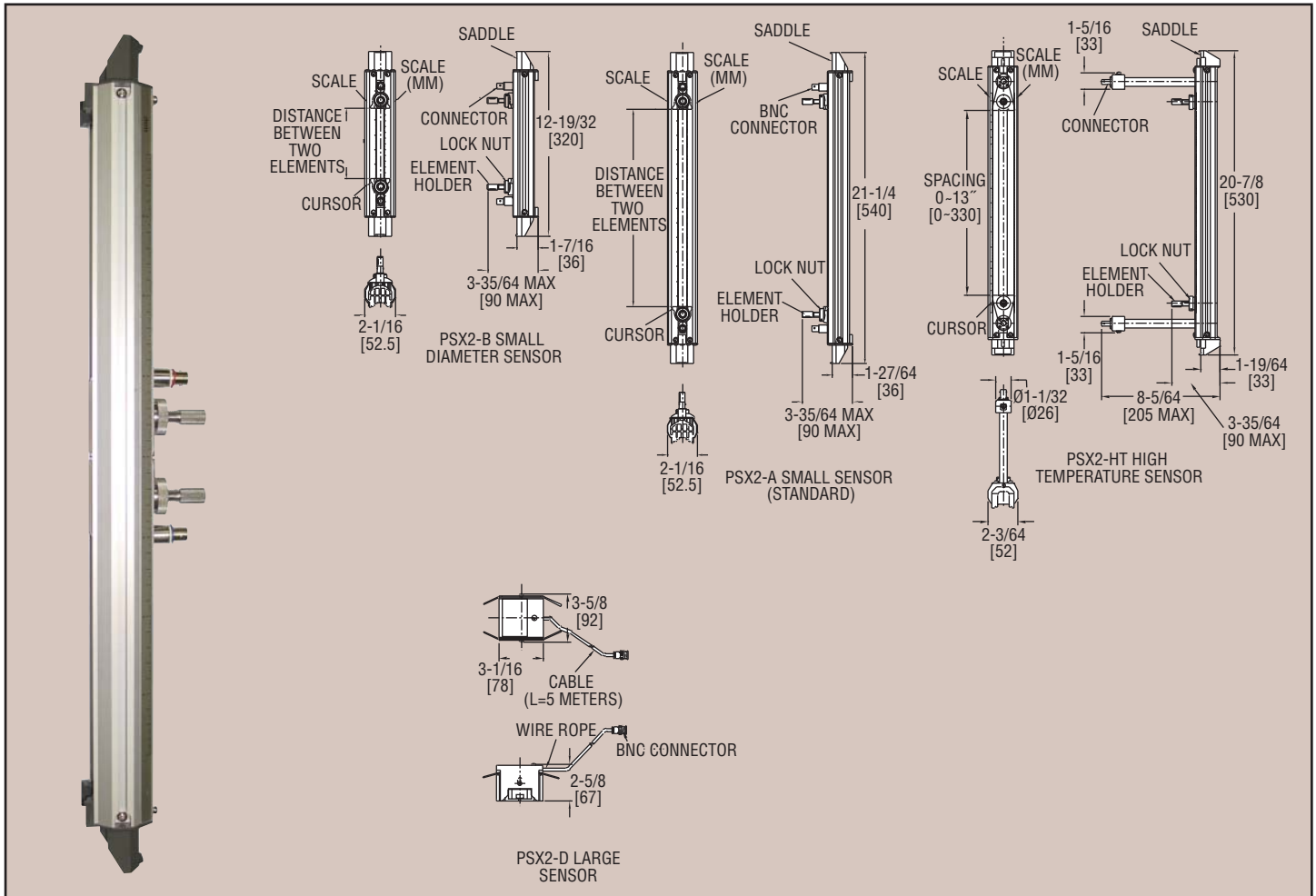
- Service:** Homogenous liquids (water, sea water, oil, and fluid of unknown velocity) capable of ultrasonic wave propagation.
- Inputs:** BNC connector, coaxial cable from flow sensor. Two 4-20 mA DC, or one 4-20 mA DC and one 1 to 5 V DC.
- Range:** 1 to ± 105 fps (0.3 to ± 32 m/s).
- Display:** LCD 240 x 320 dot (with back light).
- Accuracy:** ± 1.0 % of rate.
- Power Requirements:** Built in special type lithium battery (continuous operation time: 12 hours without printer and back light off) (recharging time: 3 hours, power adapter used).
- Power Consumption:** 3W.
- Power Adapter:** Special type power adapter 90 to 264 VAC, 50/60 Hz.
- Power Failure Backup:** Memory backup with lithium battery (effective term, 10 years).
- Temperature Limits:** Ambient 131°F (55°C) without printer; 113°F (45°C) with printer.
- Output:** 4 to 20 mA DC, 1 point (load resistance, 0 to 600 Ω).
- Serial Communications:** RS-485, 1 point.
- Enclosure Rating:** NEMA 3X (IP64) (without printer).
- Material:** Plastic case.
- Weight:** 2.2 lb (1 kg) without printer; 2.65 lb (1.2 kg) with printer.



Series
PSX2

Portable Ultrasonic Flowmeter Detector

Compact and Lightweight



Series PSX2 Portable Ultrasonic Flowmeter Detectors are paired with Series PUX and PUX2 converters in order to utilize the transit-time difference for measuring flow rates in pipes from the outside. It is a compact and lightweight instrument incorporating the latest electronics and digital signal processing technologies, realizing high performance and easy operation. Series PSX2 Detectors are non-intrusive clamp-on sensors and are easy to install, require simple maintenance, and are free from pressure-loss, choking, corrosion, and leaking.

ACCESSORIES

Model	Description
A-186	Silicone-based grease acoustic couplant, 3 oz tube
A-187	Silicone RTV acoustic couplant, 4 oz tube
A-188	Silicone-free acoustic couplant, 4 oz tube

SPECIFICATIONS

Service: Homogenous liquids (water, sea water, oil, and fluid of unknown velocity) capable of ultrasonic wave propagation; Turbidity: 10000 deg. (mg/L) or less; State of flow: Axis-symmetric flow in pipe filled with fluid.

Range: 0 to ±105 fps (0 to +32 m/s).

Accuracy: ±1.0% of rate, except PSX2-B: ±1.5% of rate.

Response Time: 1s or less.

Temperature Limits: Ambient 140°F (60°C); Fluid Temperature: PSX2-B: -40 to 212°F (-40 to 100°C) PSX2-D, and PSX2-E: -40 to 176°F (-40 to 80°C) PSX2-HT: -40 to 392°F (-40 to 200°C).

Enclosure Rating: Drip-proof, IP52 (NEMA 5); Large sensor, immersion proof, IP67 (NEMA 6).

Materials: PSX2-E, PSX2-B, and PSX2-D: Plastic case, and aluminum alloy and plastic mounting bracket; PSX2-HT: 304SS case, and aluminum alloy and 304SS mounting bracket.

Electrical Connection: Terminal screws.

Mounting: PSX2-E and PSX2-B: Plastic cloth belt; PSX2-D: Stainless steel wire; PSX2-HT: Stainless steel belt.

Weight: PSX2-E: 1.32 lb (0.6 kg); PSX2-B: 1.76 lb (0.8 kg); PSX2-D: 3.1 lb (1.4 kg); PSX2-HT: 3.75 lb (1.6 kg).

Model	Description	Flow Pipe Sizes
PSX2-A	Small Sensor (2 MHz), General Use Structure	1.97 to 15.75 in (50 to 400 mm)
PSX2-B	Small Diameter Sensor, General Use Structure, 5 m Coaxial Cable	0.51 to 3.94 in (13 to 100 mm)
PSX2-D	Large Sensor, General Use Structure, 5 m Coaxial Cable	7.87 to 236.22 in (200 to 6000 mm)
PSX2-HT	High-Temperature Sensor, General Use Structure, 5 m Coaxial Cable	1.97 to 15.75 in (50 to 400 mm)

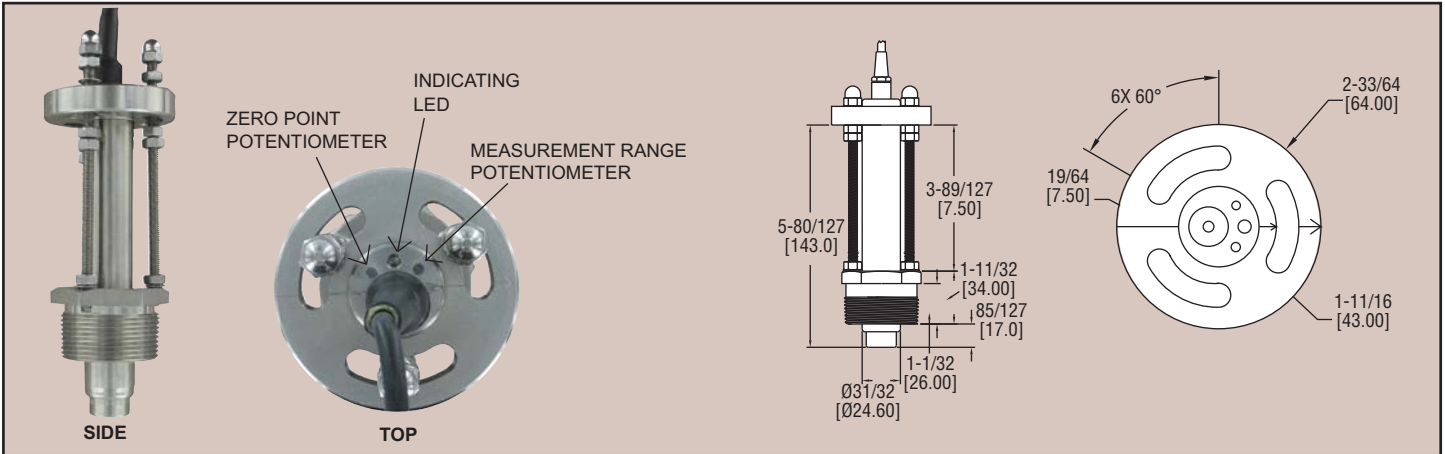
FLOW
Flow Transmitters,
Ultrasonic



Series
TDT

Thermal Dispersion Flow Transmitter

No Moving Parts, 4 to 20 mA Output, Adjustable Insertion Mounting



The Series TDT is an excellent alternative to turbine and paddlewheel insertion flow meters, with the ability to deliver high accuracy over a wide range of pipe sizes. This unit has the same insertion mounting into a 1-1/2" NPT but no moving parts to wear, break, or clog. This transmitter has available extensions that can be used for pipes sized up to 75" in diameter. The TDT Dispersion Transmitter measures even very low flow rates due to the applied calorimetric principle, and can be used for the metering of all fluid media such as: water, oil, aggressive media, paste, glue, sludge, grease, etc. Optional titanium allows this transmitter to be used with an even wider range of corrosive media, and the optional output allows the user to measure both flow and temperature. When deciding on the correct length, use the 1/7th law (the TDT's probe length needs to measure 1/7th of the pipe diameter).

PRINCIPLES OF OPERATION

The sensor head of the Thermal Dispersion Transmitter contains two PT-resistors. One of them is measuring the temperature of the media, while the other is heated by an attached heating resistor. The temperature difference between the two PT-resistors is predetermined and a control circuit keeps this temperature difference constant. The flow of the media cools the heated PT-resistor proportional to the speed of the flow, this results in a linear output signal proportional to the flow speed.

SPECIFICATIONS

Service: Water, oil, compatible liquids, paste, glue, sludge and grease.

Wetted Materials: 316 SS, optional titanium.

Flow Range:

Min: 0 to 0.66 ft/s (0 to 20 cm/s);

Max: See model chart.

Temperature Range: (For optional output only) 32 to 212°F (0 to 100°C).

Accuracy: <3% of full range.

Repeatability: <1%.

Response Time: 10 seconds.

Temperature Limits:

Process: 32 to 176°F (0 to 80°C);

Ambient: -4 to 160°F (-20 to 70°C).

Pressure Limits: 261 psi (18 bar).

Process Connections: 1-1/2" male NPT.

Output Signal: 4 to 20 mA for flow, optional 4 to 20 mA for temperature.

Power Requirements: 24 VDC +10 to 15%.

Resistive Load: 0 to 600 Ω.

Current Consumption: Approx. 100 to 200 mA (max. flow).

Electrical Connection: 6.5 ft (2 m) moulded oilflex cable with three 21 AWG (0.5 sq mm) wires.

Enclosure Rating: NEMA 4X (IP65).

Shipping Weight: 2 lb (907 g).

Model	Description
TDT-WS-301	Water base, 316 SS, 0 to 6.56 ft/s (0 to 2 m/s)
TDT-WS-401	Water base, 316 SS, 0 to 9.84 ft/s (0 to 3 m/s)

Example	TDT	W	S	1	0	1	TDT-WS-101
Series	TDT						Thermal Dispersion Transmitter
Base Type		W					Water based fluids
		L					Oil based fluids
Wetted Material			S				316 SS
			T				Titanium
Range				1			0 to 1.64 ft/s (0 to 0.5 m/s)
				2			0 to 3.28 ft/s (0 to 1 m/s)
				3			0 to 6.56 ft/s (0 to 2 m/s)
				4			0 to 9.84 ft/s (0 to 3 m/s)
				5			0 to 12.47 ft/s (0 to 3.8 m/s)
Extension					0		None
					1		+10.28" (+261 mm)
					2		+15.75" (+400 mm)
Output						1	1 flow output
						2	1 flow output plus 1 temperature output

FEATURES

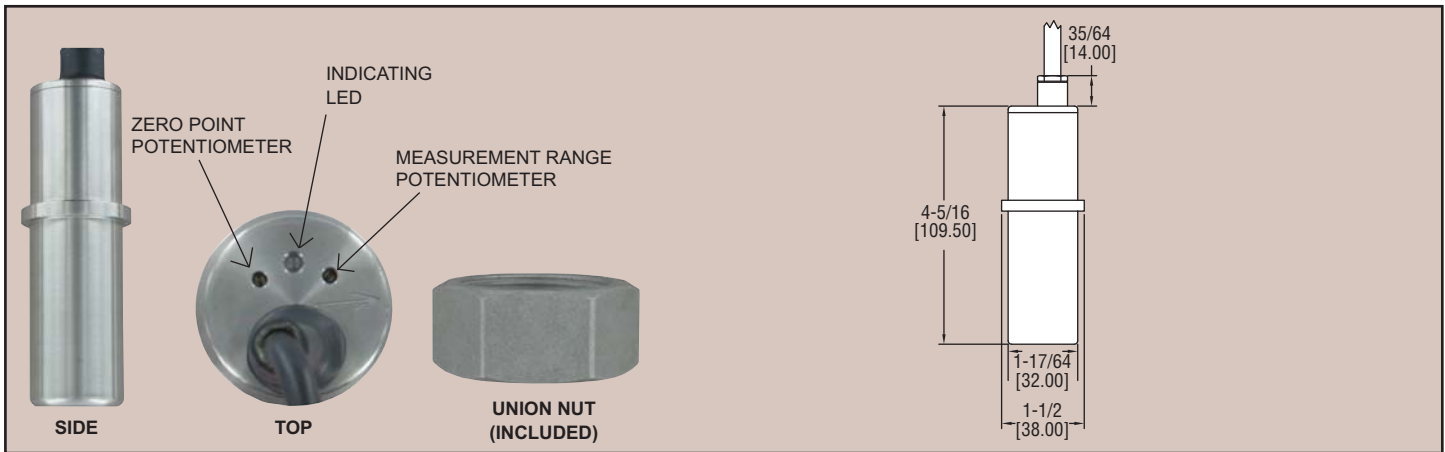
- No moving parts
- Low pressure drop
- Base model works for pipe sizes of 1 to 24" inner diameter, with adjustable insertion mounting
- Adjustable zero and span
- Weatherproof construction for wide application usage
- 316 SS for excellent chemical compatibility
- Optional titanium for high corrosive media
- Optional secondary output for temperature



Series
TDMT

Thermal Dispersion Flow Meter

No Moving Parts, 4 to 20 mA Output



The Series TDMT Flow Meter is for use in industrial applications, and can be easily installed virtually non-intrusively into any pipe. This non-intrusive installation allows flow-sensing without obstruction of the pipe diameter. It is completely encapsulated in epoxy resin and is compact, rugged, shock and vibration resistant. It provides proven reliability and long-term stability, even under the harshest environmental conditions. The TDMT is made of stainless steel with a titanium option making it resistant to aggressive media. In addition to its small and compact size, the TDMT also comes with a choice of a 1" unit with 1" NPT union nut or a 1-1/4" unit with 1-1/4" union nut, as well as available extensions that can be used for pipes sized up to 10" in diameter. With an optional temperature output, this meter provides the user with a very broad range of usage. When trying to decide on the correct length, use the 1/7th law (the TDMT's probe length needs to be 1/7th of the pipe diameter).

PRINCIPLES OF OPERATION

The TDMT operates according to a new calorimetric principle, allowing for a wide measuring range. This meter also provides a very short integration time, even at low flow rates, making it ideal for quick control loops. Its measurement accuracy at low flow rates is considerably better than all other competing measurement devices.

Model	Description
TDMT-WS-1101	Water base, 1" unit, 0 to 6.56 ft/s (0 to 2 m/s)
TDMT-WS-1201	Water base, 1-1/4" unit, 0 to 6.56 ft/s (0 to 2 m/s)

SPECIFICATIONS

Service: Water, oil, compatible liquids, paste, glue, sludge and grease.

Wetted Materials: 316 SS, optional titanium.

Flow Range:

Min: 0 to 0.66 ft/s (0 to 20 cm/s);

Max: See model chart.

Temperature Range: (For optional output only) 32 to 212°F (0 to 100°C).

Accuracy: <3% of full range.

Repeatability: <1%.

Response Time: 10 seconds.

Temperature Limits:

Process: 14 to 176°F (-10 to 80°C);

Ambient: 14 to 140°F (-10 to 60°C).

Pressure Limits: 435 psi (30 bar).

Process Connections:

1" unit: 1" NPT union nut;

1-1/4" unit: 1-1/4" NPT union nut.

Output Signal: 4 to 20 mA for flow, optional 4 to 20 mA for temperature.

Power Requirements: 24 VDC ±10%.

Resistive Load: 0 to 600 Ω.

Current Consumption: Approx. 100 to 200 mA (max. flow).

Electrical Connection: 6.5 ft (2 m) moulded oilflex cable with three 21 AWG (0.5 sq mm) wires.

Enclosure Rating: NEMA 4X (IP65).

Shipping Weight:

1" unit: 5.6 oz (158.76 g);

1-1/4" unit: 13.4 oz (379.88 g).

Example	TDMT	W	S	1	1	0	1	TDMT-WS-1101
Series	TDMT							Thermal Dispersion Flow Meter
Base Type		W						Water based fluids
		L						Oil based fluids
Wetted Material			S					316 SS
			T					Titanium
Range				1				0 to 6.56 ft/s (0 to 2 m/s)
				2				0 to 9.84 ft/s (0 to 3 m/s)
				3				0 to 13.12 ft/s (0 to 4 m/s)
Fitting					1			1" unit with 1" NPT union nut (up to 4" inner pipe diameter)
					2			1-1/4" unit with 1-1/4" NPT union nut (4" to 10" inner pipe diameter)
Extension						0		None
						1		+7.87" (+ 200 mm)
Output							1	1 flow output
							2	1 flow output plus 1 temperature output (only available with 1" NPT unit)

FEATURES

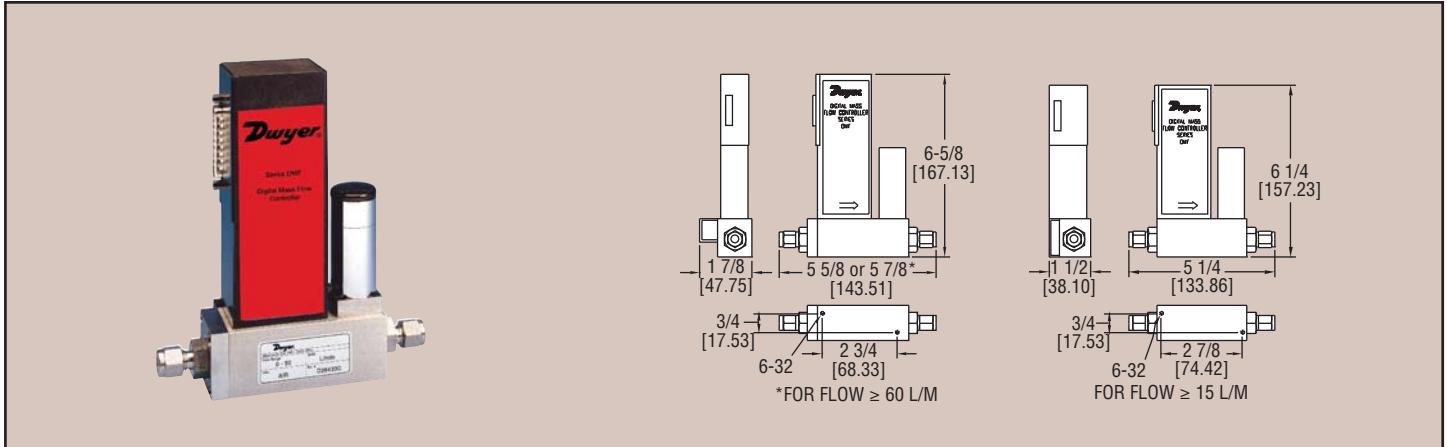
- No moving parts
- Non-intrusive sensing
- Adjustable measuring range
- Base model works for pipe sizes up to 4" in diameter
- Weatherproof construction for wide application usage
- 316 SS for excellent chemical compatibility
- Optional titanium for high corrosive media
- Optional secondary output for temperature



Series
DMF

Digital Mass Flow Controllers

Programmable, RS485 Interface, Up To 500 psig, $\pm 1\%$ Accuracy



Program, record, analyze, and control flow rates of various gases with Series DMF Digital Mass Flow Controller. Controllers are designed with straight tube sensors with restrictor flow elements to ensure laminar gas flow for accurate and repeatable results. Series DMF are unaffected by temperature and pressure variations.

Controllers can be programmed for various control functions including flow set point, totalizer, stop totalizer, totalize from preset flow, stop and preset total, auto zero, and more. Auto zero feature utilizes an automatic balancing circuit that virtually eliminates drift of zero and span. In addition, Series DMF controllers have two dry contact closures to operate pumps, valves, or other process equipment.

The Series DMF features an auto tune function to optimize control response for a specific gas under actual process conditions. Self diagnostic tests are run at power up to ensure the controller is in optimum working condition. Calibration information for up to 10 gases and conversion factors for up to 256 different gases are stored in memory. High and low gas flow alarm limits are programmed via RS-485 interface. Software supports programmable flow modes, allowing execution of custom programming of up to ten steps.

SPECIFICATIONS

Service: Clean gases compatible with wetted parts.

Wetted Materials: 316 SS, 416 SS, fluoroelastomer O-rings.

Accuracy: $\pm 1\%$ FS including linearity between 59 to 77°F (15 to 25°C) and 10 to 60 psia (0.7 to 4 bar); $\pm 2\%$ FS from 32 to 122°F (0 to 50°C) and 5 to 150 psia (0.3 to 10 bar).

Repeatability: $\pm 0.15\%$ of full scale.

Response Time: 0.6 to 1.0 second to within $\pm 2\%$ of setpoint over 20% to 100% FS.

Output: Linear 0-5 VDC (2000 Ω min. load impedance); 0-10 VDC (4000 Ω min. load impedance).

Maximum Particulate Size: 100 microns.

Temperature Limits: 41 to 122°F (5 to 50°C).

Power Supply: ± 15 VDC; 13.5 watts maximum.

Process Connections: 1/4" compression fitting for flow rates ≤ 50 L/m; 3/8" for flows ≥ 60 L/m.

Pressure Limits: 500 psig (34.5 bar).

Leak Integrity: 1×10^{-9} sccs of helium.

Computer Interface: RS-485.

Agency Approvals: CE.

ACCESSORIES

Model DMF-110P, 110V power supply with 25-pin connector

Model DMF-220PE, 220V power supply with 25-pin connector

Model DMF-CBL1, 6 ft cable with branch to separate power supply

Model DMF-CBL2, 6 ft cable with branch to computer port

Model*	Range	Model*	Range
DMF-41401	0 to 10 sccm	DMF-41408	0 to 2 L/min
DMF-41402	0 to 20 sccm	DMF-41409	0 to 5 L/min
DMF-41403	0 to 50 sccm	DMF-41411	0 to 15 L/min
DMF-41404	0 to 100 sccm	DMF-41431	0 to 30 L/min
DMF-41405	0 to 200 sccm	DMF-41433	0 to 50 L/min
DMF-41406	0 to 500 sccm	DMF-41842	0 to 100 L/min
DMF-41407	0 to 1 L/min		

*Specified flow ranges are for an equivalent flow of nitrogen at 70°F (21°C) @ 760 mm Hg.

FLOW

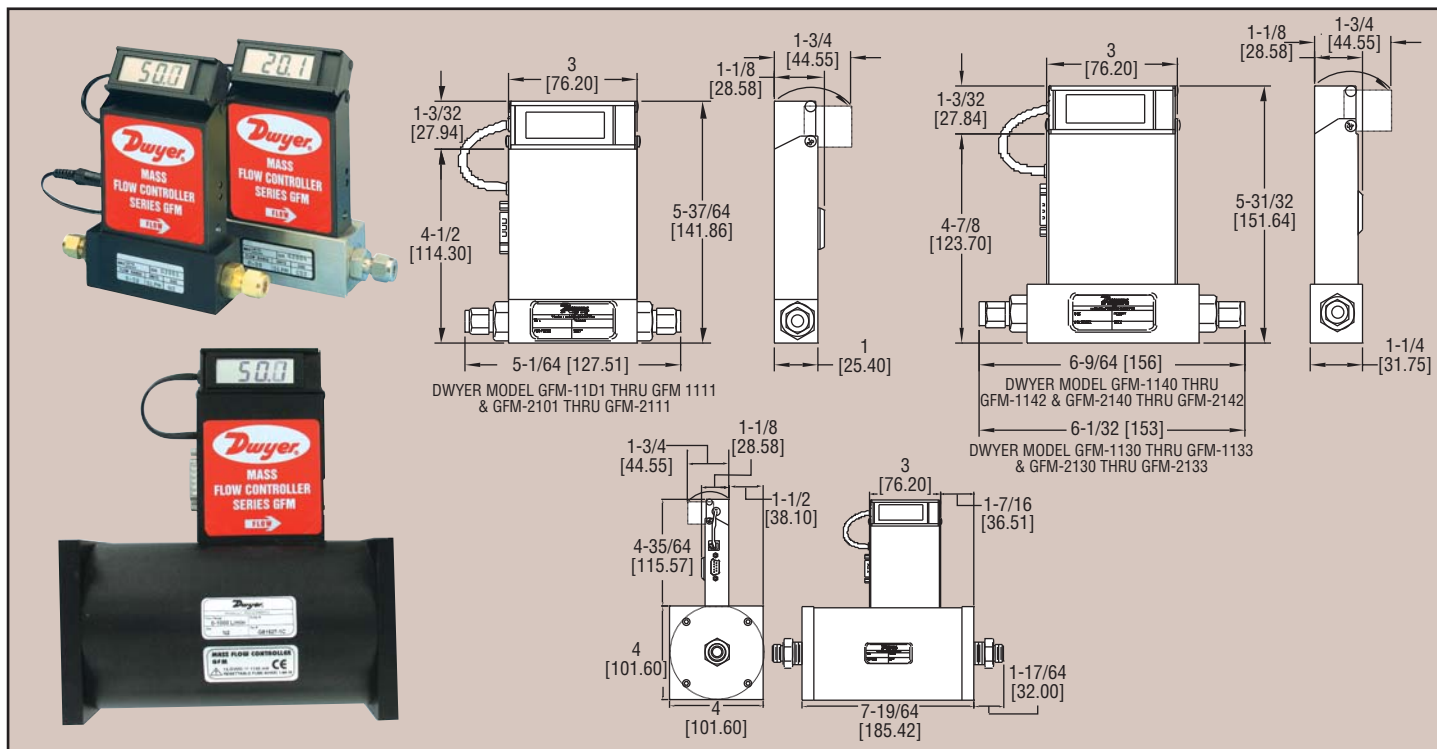
Mass Flowmeters/
Controllers



Series
GFM

Gas Mass Flow Meters

Flow Range Up to 1000 L/min, Pressures Up to 500 psi, NIST Traceable



Series GFM Gas Mass Flow Meters combine a straight tube sensor with a restrictor flow element to provide high accuracy and repeatability. Flow rates are virtually unaffected by temperature and pressure variations. Actual gas flow is displayed in engineering units on a 3-digit, 90° tiltable LCD readout. Units can be used with Series GFT Flow Totalizer for applications requiring totalization. Series GFM includes a NIST traceable certificate.

SPECIFICATIONS

Service: Clean gases compatible with wetted parts.

Wetted Materials:

GFM-1XXX: Anodized aluminum, brass, 316 SS and fluoroelastomer O-rings;
GFM-2XXX: 316 SS and fluoroelastomer O-rings.

Accuracy: ±1.5% FS including linearity over 59 to 77°F (5 to 25°C) and 5 to 60 psia (0.35 to 4 bar).

Repeatability: ±0.5% of full scale.

Response Time: 2 seconds to within ±2% of actual flow.

Output: Linear 0-5 VDC and 4-20 mA.

Max. Particulate Size: 5 microns.

Temperature Limits: 32 to 122°F (0 to 50°C).

Power Supply: ±12 VDC.

Process Connections: 1/4" compression fitting for flow rates ≤50 L/m; 3/8" for 100 and 200 L/m; 1/2" for 500 L/min; 3/4" for 1000 L/min.

Pressure Limits: 500 psig (34.5 bar).

Leak Integrity: 1 x 10⁻⁷ sccs of helium.

Display: 90° tiltable, 3-1/2 digit.

Agency Approvals: CE.

ACCESSORIES

For Series GFM Gas Mass Flowmeters

Model GFM-110P, 110V Power Supply

Model GFM-220PE, 220V Power Supply

Model GFM-CBL4, 3 ft cable for 4-20 mA output

Model GFM-CBL5, 3 ft cable for 0-5 VDC output

Model IO-1, 0-5 VDC to RS232 Input to Output Signal Conditioner

GFT-10, Flow Totalizer with 5-10 VDC input for direct connection to GFM and GFC (replaces GFM/GFC LCD Process display)

GFT-10C, Connection Cable for utilizing GFT-10 totalizer in conjunction with GFM/GFC LCD process display

Flow Range	Model		Process Connector Compression Fitting
	Aluminum	SS	
0-10 mL/m	GFM-1101*	GFM-2101*	1/4"
0-20 mL/m	GFM-1102*	GFM-2102*	1/4"
0-50 mL/m	GFM-1103*	GFM-2103*	1/4"
0-100 mL/m	GFM-1104*	GFM-2104*	1/4"
0-200 mL/m	GFM-1105*	GFM-2105*	1/4"
0-500 mL/m	GFM-1106*	GFM-2106*	1/4"
0-1000 mL/m	GFM-1107*	GFM-2107*	1/4"
0-2 L/min	GFM-1108*	GFM-2108*	1/4"
0-5 L/min	GFM-1109*	GFM-2109*	1/4"
0-15 L/min	GFM-1111*	GFM-2111*	1/4"
0-30 L/min	GFM-1131*	GFM-2131*	1/4"
0-50 L/min	GFM-1133*	GFM-2133*	1/4"
0-100 L/min	GFM-1142*	GFM-2142*	3/8"
0-200 L/min	GFM-1143*	GFM-2143*	3/8"
0-500 L/min	GFM-1144*	GFM-2144*	1/2"
0-1000 L/min	GFM-1145*	GFM-2145*	3/4"

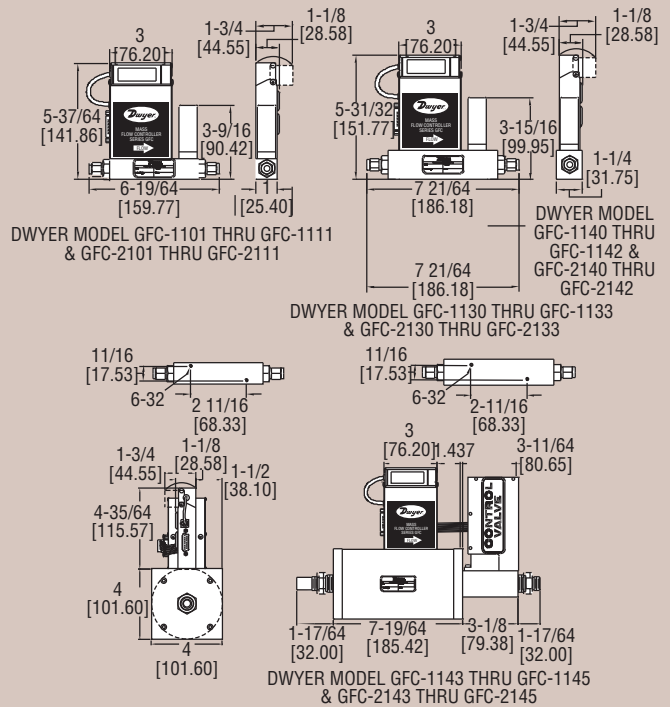
*Specified flow ranges are for an equivalent flow of nitrogen at 70°F (21°C) @ 760 mm Hg.



Series
GFC

Gas Mass Flow Controllers

Flow Range Up to 1000 L/min, Pressures Up to 500 psi, NIST Traceable



FLOW

Mass Flowmeters/
Controllers

Series GFC Gas Mass Flow Controllers combine a straight tube sensor with a restrictor flow element to provide high accuracy and repeatability. Gas mass flow controllers utilize an electromagnetic valve and PID electronics to maintain continuous control by comparing measured sensor signal set to flow rates. Setpoints can be adjusted with local potentiometers or remotely via 0 to 5 VDC or 4 to 20 mA analog signal. Flow rates are virtually unaffected by temperature and pressure variations. Actual gas flow is displayed in engineering units on a 3-digit, 90° tiltable LCD readout. Units can be used with Series GFT Flow Totalizer for applications requiring totalization. Series GFC includes a NIST traceable certificate.

Flow Range	Model		Process Connector Compression Fitting
	Aluminum	SS	
0-10 mL/m	GFC-1101*	GFC-2101*	1/4"
0-20 mL/m	GFC-1102*	GFC-2102*	1/4"
0-50 mL/m	GFC-1103*	GFC-2103*	1/4"
0-100 mL/m	GFC-1104*	GFC-2104*	1/4"
0-200 mL/m	GFC-1105*	GFC-2105*	1/4"
0-500 mL/m	GFC-1106*	GFC-2106*	1/4"
0-1000 mL/m	GFC-1107*	GFC-2107*	1/4"
0-2 L/min	GFC-1108*	GFC-2108*	1/4"
0-5 L/min	GFC-1109*	GFC-2109*	1/4"
0-15 L/min	GFC-1111*	GFC-2111*	1/4"
0-30 L/min	GFC-1131*	GFC-2131*	1/4"
0-50 L/min	GFC-1133*	GFC-2133*	1/4"
0-100 L/min	GFC-1142*	GFC-2142*	3/8"
0-200 L/min	GFC-1143*	GFC-2143*	3/8"
0-500 L/min	GFC-1144*	GFC-2144*	1/2"
0-1000 L/min	GFC-1145*	GFC-2145*	3/4"

*Specified flow ranges are for an equivalent flow of nitrogen at 70°F (21°C) @ 760 mm Hg.

SPECIFICATIONS

Service: Clean gases compatible with wetted parts.

Wetted Materials:

- GFC-1XXX: Anodized aluminum, brass, 316 SS and fluoroelastomer O-rings;
- GFC-2XXX: 316 SS and fluoroelastomer O-rings.

Accuracy: ±1.5% FS including linearity over 59 to 77°F (5 to 25°C) and 5 to 60 psia (0.35 to 4 bar).

Repeatability: ±0.5% of full scale.

Response Time: 2 seconds to within ±2% of actual flow.

Output: Linear 0-5 VDC and 4-20 mA.

Max. Particulate Size: 5 microns.

Temperature Limits: 32 to 122°F (0 to 50°C).

Power Supply: ±12 VDC.

Process Connections: 1/4" compression fitting for flow rates ≤50 L/m; 3/8" for 100 and 200 L/m; 1/2" for 500 L/min; 3/4" for 1000 L/min.

Pressure Limits: 500 psig (34.5 bar).

Leak Integrity: 1 x 10⁻⁷ sccs of helium.

Display: 90° tiltable, 3-1/2 digit.

Agency Approvals: CE.

ACCESSORIES

For Series GFC Gas Mass Flow Controllers

Model GFC-110P, 110V Power Supply

Model GFC-220PE, 220V Power Supply

Model GFC-CBL1, 8 ft cable with 15-pin connector

Model GFC-CBL3, 3 ft extension cable for LCD readout

Model IO-1, 0-5 VDC to RS232 Input to Output Signal Conditioner

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GFT-10C, Connection Cable for utilizing GFT-10 totalizer

in conjunction with GFM/GFC LCD process display