

# Dwyer®

**Manufacturing Excellence Since 1931**

pressure • temperature • test & data • air quality

flow • level • process control • valves



# 2021

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[dwyer-inst.com](http://dwyer-inst.com)

# KEY MARKETS

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## HVAC

- Building Automation
- Test Equipment
- Critical Environments
- Original Equipment  
(Chillers, Boilers, Air Handlers, Cooling Towers)
- Valve Automation

## PROCESS AUTOMATION

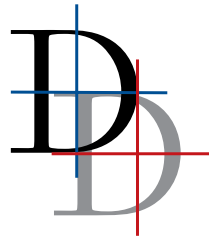
- Water and Wastewater
- Pharmaceutical
- Agriculture and Livestock
- Powder and Bulk
- Industrial Process
- Mining and Heavy Earth Moving
- Oil, Gas and Petrochemical
- Power
- Valve Automation

# INNOVATION AWARDS

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Wireless Hydronic Balancing Kit  
Series 490W



The ACHR News is the leading trade magazine in the heating, ventilating, air conditioning, and refrigeration industries.

### GOLD

- HVAC Mobile Meter® Software Test Instrument App
- PredictAir™ Application Software
- Air Velocity Transmitter | [Series AVUL](#)

### SILVER

- Universal Handheld Test Instrument | [Model UHH2](#)
- Wireless Hydronic Balancing Kit | [Series 490W](#)
- Hydronic Application Software

### BRONZE

- SMART Air Hood® Balancing Instrument | [Series SAH](#)
- Hydronic Differential Pressure Manometer | [Series 490A](#)
- Insertion Electromagnetic Flow Transmitter | [Series IEF](#)

# HVAC TESTING

The diagram shows a cross-section of a house with red arrows indicating air flow paths. Red lines connect various instruments to their application points on the house:

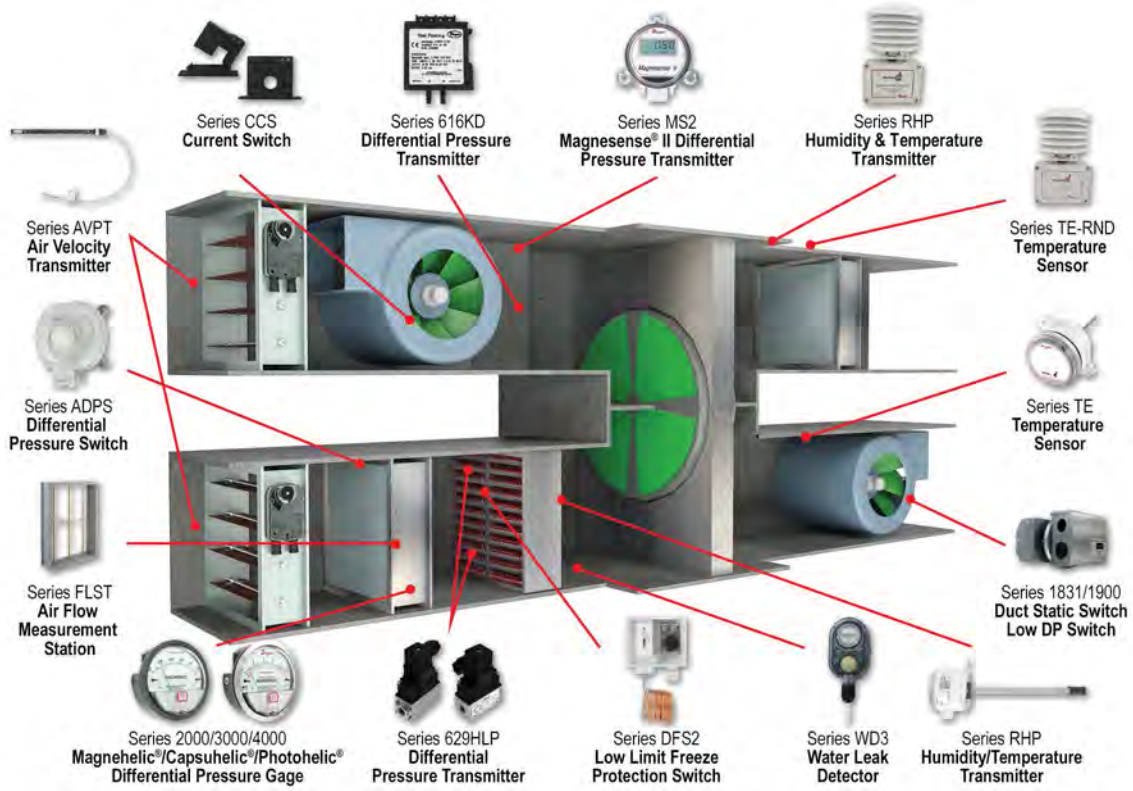
- Series 160F Pitot Tube**: Connected to the roofline.
- Series 477AV Handheld Digital Manometer**: Connected to the attic space.
- Model TAC-L Portable Digital Tachometer**: Connected to the ceiling fan.
- Series 471B Thermo-Anemometer**: Connected to the living room.
- Series WNT Multi-Jet NSF Certified Water Meter**: Connected to the basement water supply.
- Series WMH Multi-Jet Hot Water Meter**: Connected to the basement hot water supply.
- Series TUF Ultrasonic Energy Meter**: Connected to the furnace.
- Series IEFB Insertion Thermal Energy Meter**: Connected to the furnace.

# BUILDING BALANCING

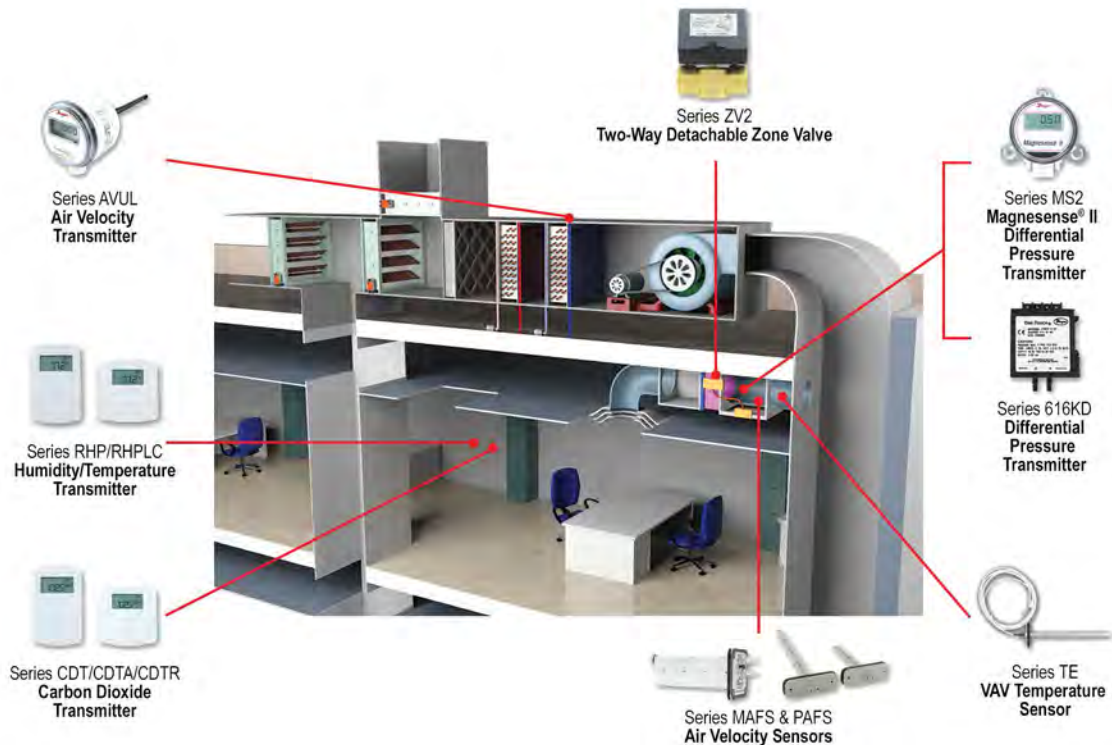
The diagram shows a 3D cutaway of a building floor plan with red dots indicating instrument locations. Red lines connect the instruments to their application points:

- Series 160G & DP3 Air Flow Grid & Differential Pressure Module**: Connected to a ceiling diffuser.
- Series SAH SMART Air Hood® Balancing Instrument & Application Software**: Connected to a ceiling diffuser.
- Mobile Meter® HVAC Software App**: Connected to a handheld device.
- Series 160F Pitot Tube**: Connected to a ceiling diffuser.
- Series PUB Portable Ultrasonic Flowmeter Kit**: Connected to a pipe in the basement.
- Model TAC-L Portable Digital Tachometer**: Connected to a ceiling fan.
- Series 490W Hydronic Differential Pressure Manometer**: Connected to a pipe in the basement.
- Series 477AV Digital Manometer**: Connected to a ceiling diffuser.
- Series 478A Digital Manometer**: Connected to a ceiling diffuser.

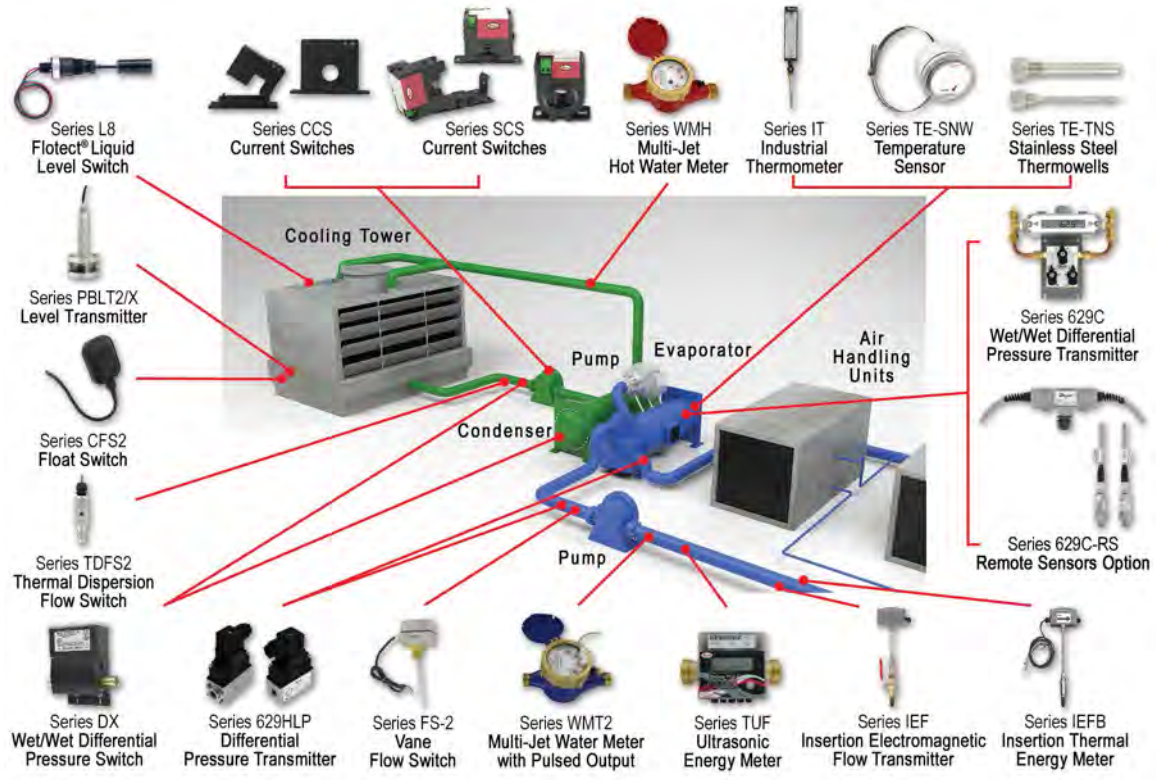
## AIR HANDLER



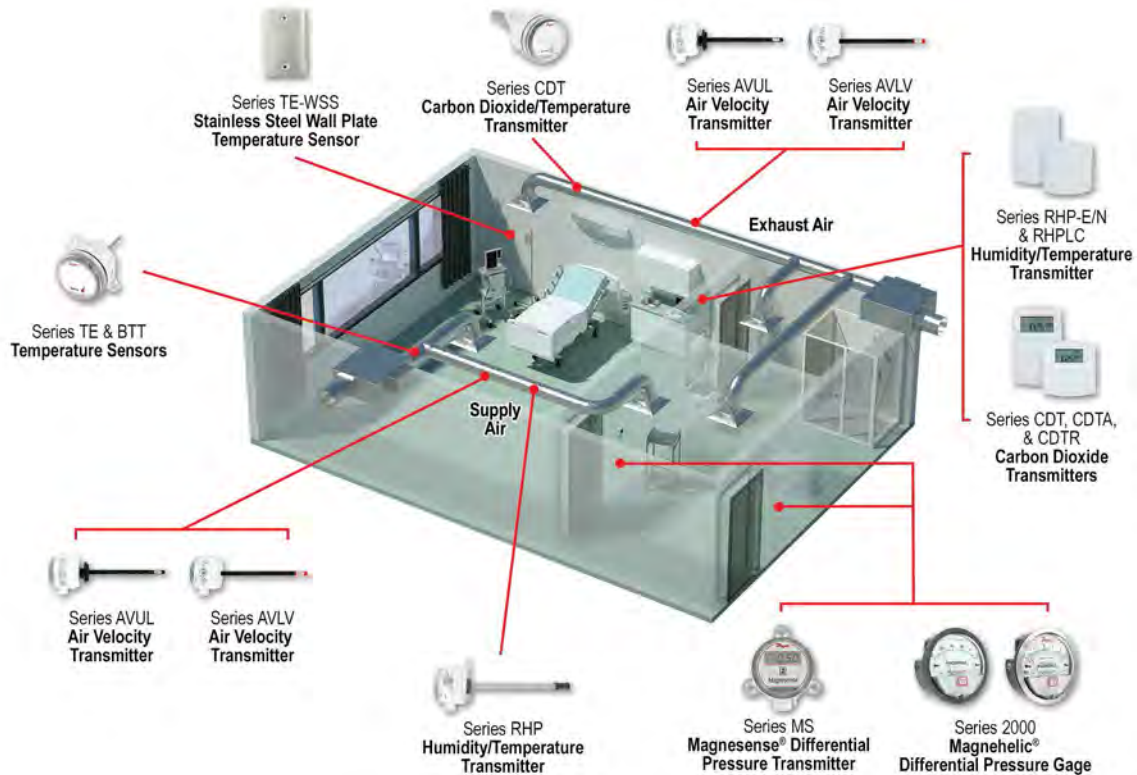
## TERMINAL UNIT



# CHILLER PLANT



# ISOLATION ROOM



## CONTAINMENT CHAMBER/BOX

Series AVUL Air Velocity Transmitter

Series RHP Humidity/Temperature Transmitter

Series SPPM Smart Programmable Panel Meter

Series SPPM2 Graphical User Interface Panel Meter

Series THC Temperature/Humidity Switch

Series 2000 Magnehelic® Differential Pressure Gage

Series DM-2000 Differential Pressure Transmitter

Series 616WL Differential Pressure Transmitter

Series DH3 Differential Pressure Controller

Series VF Visi-Float® Flowmeter

## CLEAN ROOM

Series ADPS Differential Pressure Switch

Series RHP-M Humidity/Temperature Transmitter

Series AVLV Air Velocity Transmitter

Series 641 Air Velocity Transmitter

Series 605 Magnehelic® Differential Pressure Indicating Transmitter

Series SPPM2 Graphical User Interface Panel Meter

Series RSM Room Status Monitor

Model 670 Fume Hood Monitor

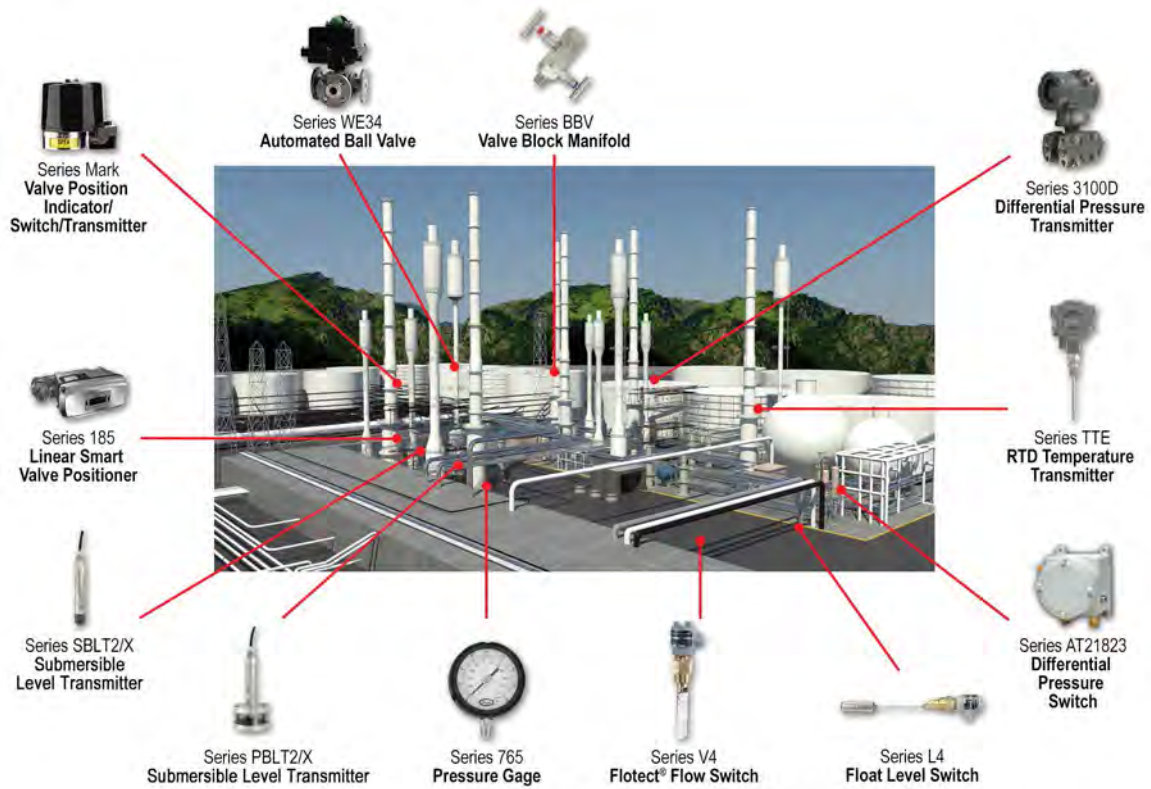
Series TE-E/N Wall Mount Temperature Sensor

Series TE-WSS Stainless Steel Wall Plate Temperature Sensor

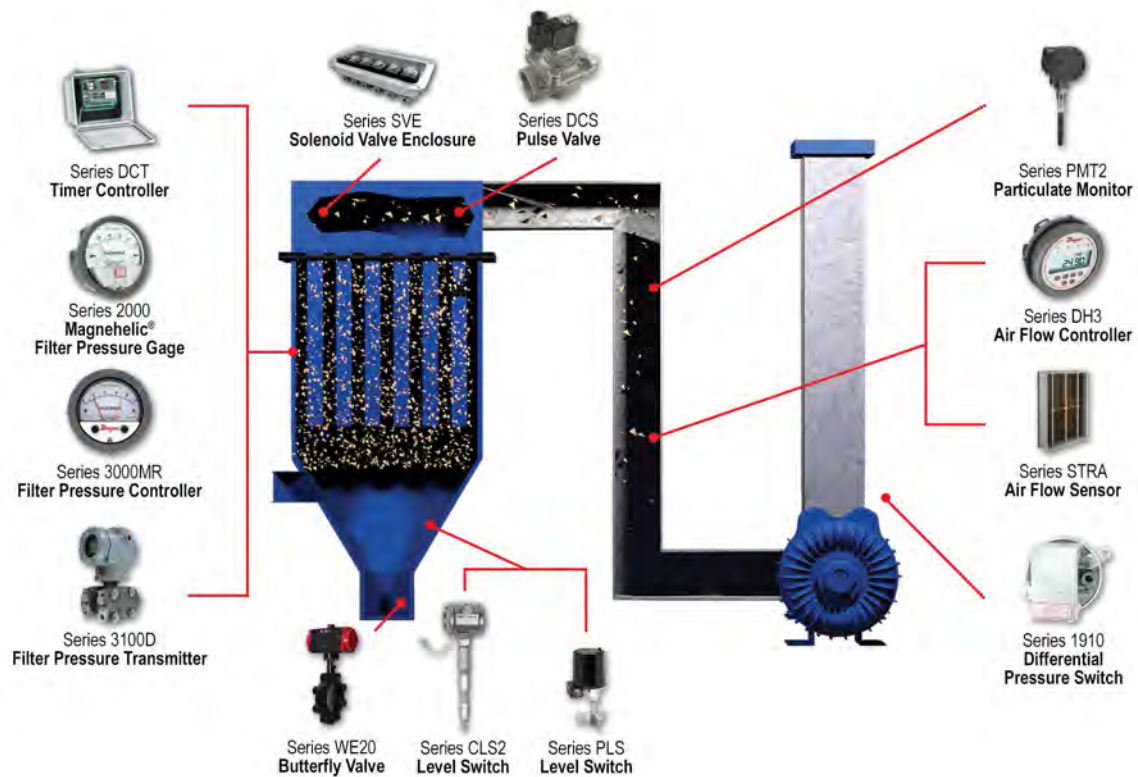
Series 4B-33-986/U Temperature/Process Controller

Series 2000 Magnehelic® Differential Pressure Gage

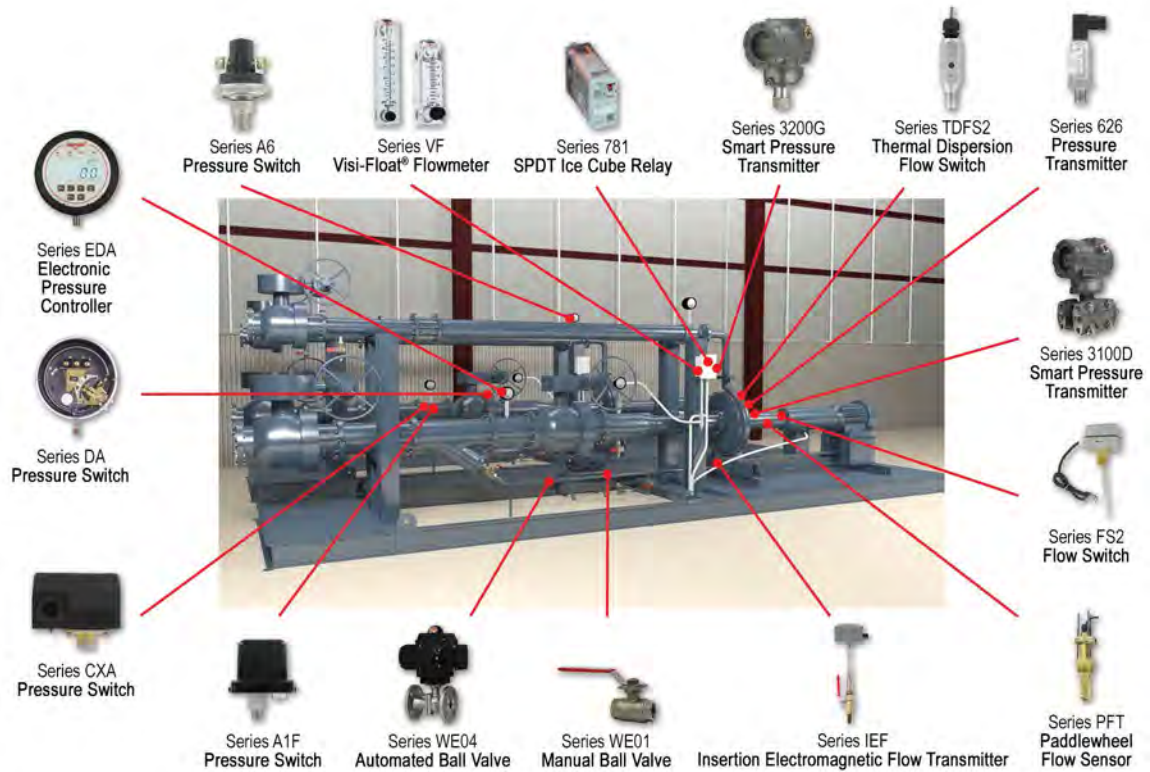
# MIDSTREAM REFINERY/CHEM PLANT



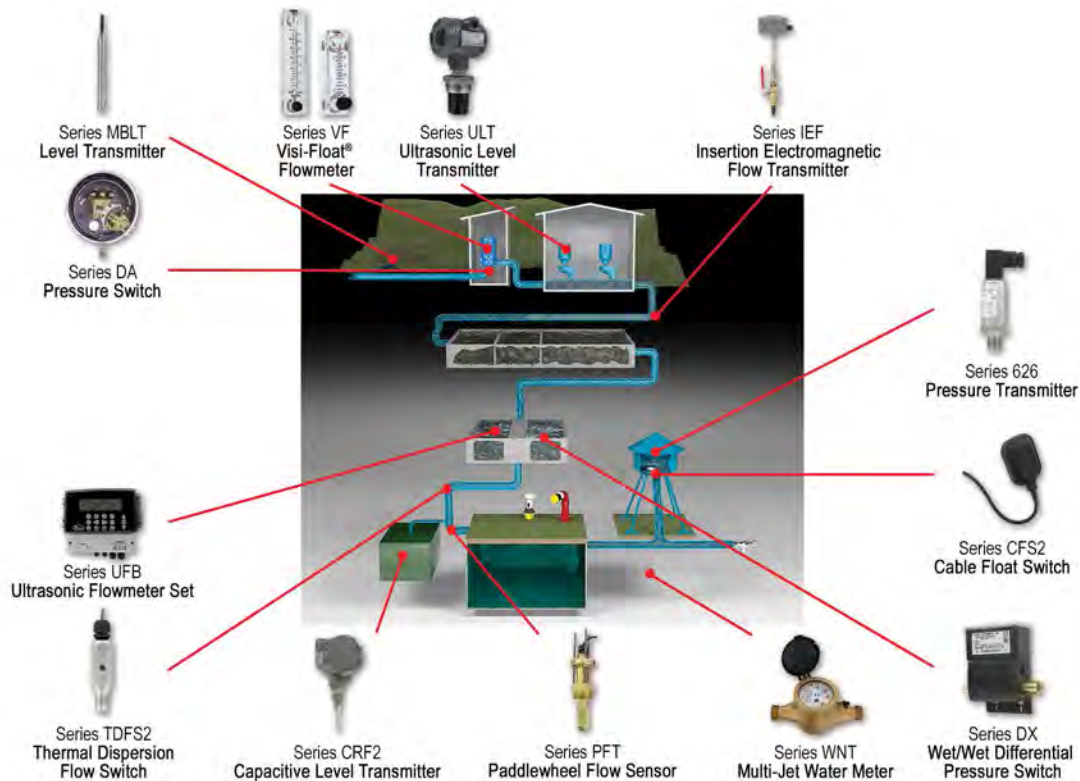
# DUST COLLECTOR



## PUMP SKID



## CLEAN WATER





# WASTEWATER

Series DA & EDA Pressure Switch & Controller

Series L4 Float Level Switch

Series L6 Float Level Switch

Series TTE Temperature Transmitter

Series VF Visi-Float® Flowmeter

Series WE Control Valve

Series 2000 Magnehelic® Differential Pressure Gage

Series DX Pressure Switch

Series UFB Ultrasonic Flowmeter Set

Series 3100D & 3200G Process Pressure Transmitters

Series IEF Insertion Electromagnetic Flow Transmitter

Series ULT Ultrasonic Level Transmitter

Series PUB Portable Ultrasonic Flowmeter Kit

Series 626/628 Pump Transmitter

Series FBLT Level Transmitter

Series PBLT2/X Level Transmitter

# IRRIGATION

Series DX Differential Pressure Switch

Series 626/628 Pressure Transmitter

Series PFT Paddlewheel Flow Sensor

Series TDFS2 Thermal Dispersion Flow Switch

Series WE31 Automated Ball Valve

Series WE01 Manual Ball Valve

Series WMT2 Water Meter

Series WPT Multi-Jet Water Meter

Series SBSV-B Solenoid Valve

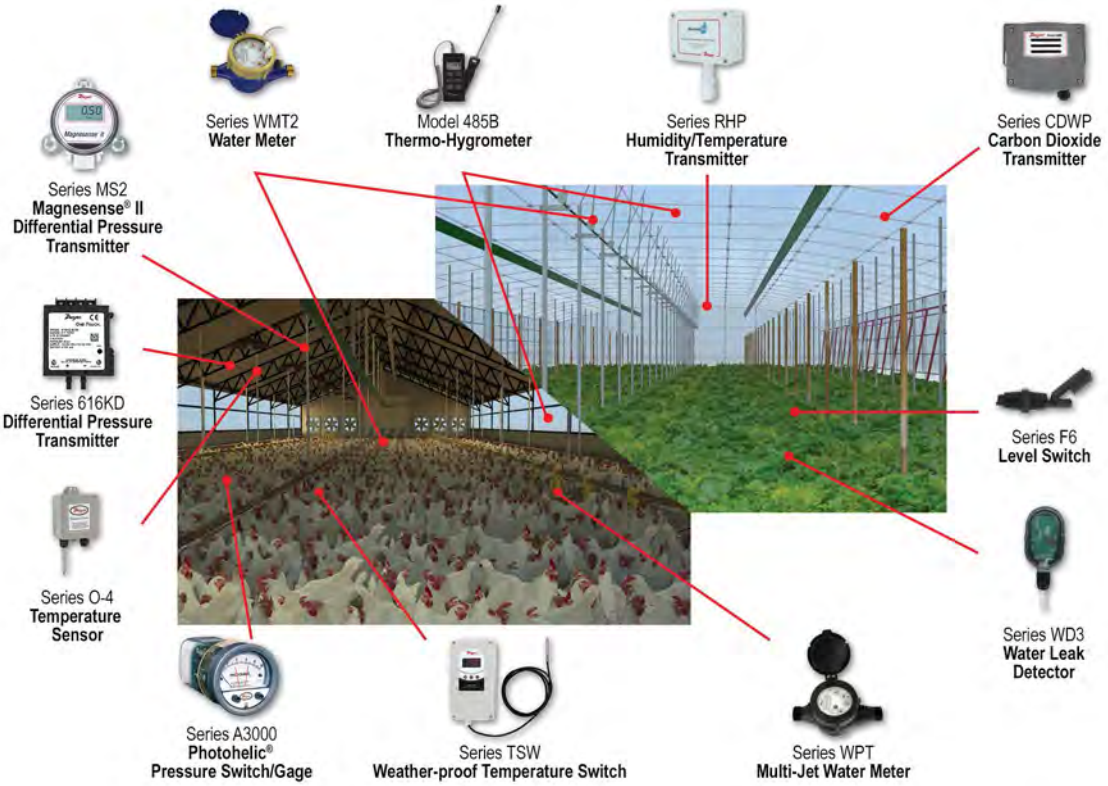
Series PDWS Flow Sensor

Series WM2 Water Meter

Series MBLT Level Transmitter

Series V10 Flow Switch

# POULTRY/HOG/GREENHOUSES



# RECENT INNOVATIONS

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## TEST, ADJUST, AND BALANCE KIT SERIES TABKIT

- Everything a balancing technician needs in a single case
- Durability, repeatability, and reliability in every instrument
- Save time by sending everything back to us, we can recalibrate all equipment in the kit

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## THERMO-HYGROMETER PROBE, THERMO-ANEMOMETER PROBE & 100 MM VANE THERMO-ANEMOMETER PROBE SERIES RP3/AP3/VP3

- New Bluetooth wireless probes
- Wirelessly connect directly to your mobile device
- Used in conjunction with the Dwyer® Mobile Meter® app

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## WIRELESS DIFFERENTIAL PRESSURE MODULE SERIES DP3

- Auto-ranging differential pressure module
- Highly accurate and ideal for low flow applications
- Used in conjunction with the Dwyer® Mobile Meter® app

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## PENCIL STYLE AIR VELOCITY TRANSMITTER SERIES AVPT

- Air velocity ranges from 1000 to 4000 FPM (5 to 20 m/s)
- Insertion lengths of 6 or 12 inches
- Low temperature functionality for outdoor air flow measurement

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## AIR VELOCITY TRANSMITTER SERIES AVLV

- Air velocity ranges from 100 to 400 FPM (0.5 to 2 m/s)
- High accuracy 1 or 2% air velocity measurement device for critical environments
- Analog or BACnet/Modbus® communications simplify device setup

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Modbus® is a registered trademark of Schneider Automation, Inc.

# RECENT INNOVATIONS

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## CARBON DIOXIDE TRANSMITTER SERIES CDWP

- Single beam dual wavelength NDIR CO<sub>2</sub> sensor automatically corrects for aging effects
- Durable and rugged aluminum housing designed to withstand 168 hour salt spray test
- Ranges include 2,000, 5,000, and 10,000 PPM allowing for use in animal husbandry as well as mechanical rooms utilizing CO<sub>2</sub> based refrigerants

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## CARBON MONOXIDE TRANSMITTER AND SWITCH SERIES CMS300

- Field selectable current or voltage analog outputs
- Integral SPDT relay contact for low or high alarm
- Jumper selectable alarm set points of 25, 60, or 150 PPM

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## INSERTION ELECTROMAGNETIC FLOW TRANSMITTER SERIES IEF

- Field configurable
- Integral or remote displays allow for ultimate flexibility
- Multiple display configurations with a single unit



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## ULTRASONIC ENERGY METERS SERIES TUF

- Manufactured to comply with EN1434-1 requirements
- Compact energy monitoring
- BACnet or Modbus<sup>®</sup> communication outputs

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## INSERTION THERMAL ENERGY METER SERIES IEFB

- Field configurable
- Integral or remote display for ultimate flexibility
- Complies with high accuracy requirements of EN 1434-1, ASTM E3137, CSA C900.1-13 for accurate heat measurement

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# STANDARD TERMS & CONDITIONS OF SALE

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## DWYER INSTRUMENTS, INC. - TERMS AND CONDITIONS OF SALE – MARCH 15, 2017

- 1. Prices and Specifications** are subject to change without notice.
- 2. Shipping dates** are approximate. They are dependent upon credit approval and subject to delays beyond our control.
- 3. Terms:** Net 30 days to companies with established credit rating. In the event Buyer fails to fulfill previous terms of payment, or in case Seller shall have any doubt at any time as to Buyer's financial responsibility, Seller may decline to make further deliveries except upon receipt of cash in advance or other special arrangements.
- 4. Point and Title:** All material is sold EXW Ex Works Dwyer Instruments, Inc. Title to all material sold shall pass to buyer upon delivery by Seller to carrier at shipping point.
- 5. State and Local Taxes:** Any taxes which the Seller may be required to pay or collect upon or with respect to the sale, purchase, delivery, use or consumption of any of the material covered hereby shall be for the account of the Buyer and shall be added to the purchase price.
- 6. Special tooling,** dies, silk screens and molds acquired specially to produce goods for Buyer remain the property of Dwyer Instruments, Inc., and may not be removed. They will be maintained in good condition for a minimum period of three years from the date of the original purchase order.
- 7. Trade Compliance:** Buyer acknowledges that the products, software, and technology, including technical information and documents (collectively "Items"), of Dwyer Instruments, Inc., are subject to regulation by agencies of the U.S. government including, but not limited to, the U.S. Department of Commerce. Buyer shall comply with the Export Administration Regulations (EAR) and all applicable U.S. laws and regulations regarding the sale, delivery and transfer of said Items. Buyer shall not, without first obtaining the required licenses, authorizations or approvals from the appropriate U.S. government agency; (i) export, re-export, transfer or divert any Item directly or indirectly to any country or national resident thereof, or any person, entity or country that has restrictions imposed upon them by the U.S. government, (ii) engage in, or knowingly sell to any party engaged in activity related to the development, production, use, testing, or maintenance of Weapons of Mass Destruction, including uses related to nuclear, missile, chemical or biological warfare, or (iii) engage in, or knowingly sell to any party engaged in activity related to the development, production, use, or maintenance of any safeguarded or unsafeguarded nuclear fuel facility or components for such facilities. Buyer shall fully cooperate with Seller, without charge, in any official audit or inspection by an authorized agent, official, employee, or accredited representative of the U.S. government. Buyer shall indemnify and hold Seller harmless from, or in connection with, any violation of this Section by Buyer, its employees, consultants, agents, or customers. The obligations, requirements and claims described herein shall survive the expiration of any business relationship with Dwyer Instruments, Inc., including its divisions, subsidiaries and affiliated companies.
- 8. Distribution:** Products sold to any entity located in the U.S. must remain in the U.S. unless a Global Distribution Agreement is in force with said entity. OEM's are excluded from this requirement. Those who violate this term are subject to a reduction of discount, loss of discount, or exclusion from purchasing future products. If you want to be a Global Distributor, please contact your Global Sales Manager in your region.
- 9. Limited Warranty:** The Seller warrants all Dwyer instruments and equipment to be free from defects in workmanship or material under normal use and service for a period of one year from date of shipment. Products qualifying for an extended warranty period will have the extended warranty as expressly indicated on the catalog page, web page, IOM, or will be covered by a specific written agreement that is (i) approved by an officer of Dwyer Instruments, Inc. and (ii) defines the warranty period. If no express statement of extended warranty is made, then the standard 1 year warranty applies. The Extended Limited Warranty only applies to products manufactured after April 1, 2017. The Warranty period extends from the date of shipment to the initial customer and not the project installation date or use.

Specific warranty exclusions include, but are not limited to:

- Specific product components not covered by the extended warranty:
  - o Humidity Sensors
  - o Batteries
  - o Electro-Chemical Gas Sensors
  - o Snap Switches
  - o Any component which exceed its normal life cycle
  - o Other Specific items added as required.
- Normal or excessive wear and tear is not cause for warranty replacement.
- Products not properly maintained, operated, installed, or use in an application not suited for the product.
- Modifications, alterations, changes, or additions outside those which are required for normal operation.
- Failure to notify Dwyer of any defect within a reasonable time.
- Damage which the customer has not taken timely action to minimize or mitigate.
- Products on which the labels, markings, nameplates, etc. have been tampered with.
- Products which contain broken factory seals or have been tampered with shall void warranty.

Liability under this warranty is limited to repair or replacement EXW Ex Works Dwyer Instruments, Inc. of any parts which prove to be defective within that time or repayment of the purchase price at the Seller's option. All products must be returned to the Seller, transportation prepaid, unless other arrangements have been pre-approved by Seller. All technical advice, recommendations and services are based on technical data and information which the Seller believes to be reliable and are intended for use by persons having skill and knowledge of the business, at their own discretion. In no case is Seller liable beyond replacement of equipment EXW Ex Works Dwyer Instruments, Inc. or the full purchase price. This warranty does not apply if the maximum ratings label is removed or if the instrument or equipment is abused, altered, used at ratings above the maximum specified, or otherwise misused in any way.

THIS EXPRESS LIMITED WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER REPRESENTATIONS MADE BY ADVERTISEMENTS OR BY AGENTS AND ALL OTHER WARRANTIES, BOTH EXPRESS AND IMPLIED. THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE FOR GOODS COVERED HEREUNDER.

- 10. Buyer's Remedies:** THE BUYER'S EXCLUSIVE AND SOLE REMEDY ON ACCOUNT OF OR IN RESPECT TO THE FURNISHING OF NON-CONFORMING OR DEFECTIVE MATERIAL SHALL BE TO SECURE REPLACEMENT THEREOF AS AFORESAID. THE SELLER SHALL NOT IN ANY EVENT BE LIABLE FOR THE COST OF ANY LABOR EXPENDED ON ANY SUCH MATERIAL OR FOR ANY SPECIAL, DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES TO ANYONE BY REASON OF THE FACT THAT IT SHALL HAVE BEEN NON-CONFORMING OR DEFECTIVE.
- 11. Acceptance:** All orders shall be subject to the terms and conditions contained or referred to in the Seller's quotation, acknowledgment, and to those listed here and to no others whatsoever. By placing an order you accept our terms and conditions. No waiver, alteration or modification of these terms and conditions shall be binding unless in writing and signed by an executive officer of the Seller. All orders are subject to written acceptance by Dwyer Instruments, Inc., Michigan City, Indiana, U.S.A.

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## FEATURED PRODUCTS

### INSERTION ELECTROMAGNETIC FLOW TRANSMITTER SERIES IEF | page 292



- Field configurable
- Integral or remote displays allow for ultimate flexibility
- Multiple display configurations with a single unit









### INSERTION THERMAL ENERGY METER SERIES IEFB | pages 294-295



- Field configurable
- Integral or remote display for ultimate flexibility
- Complies with high accuracy requirements of EN 1434-1, ASTM E3137, CSA C900.1-13 for accurate heat measurement


## GENERAL PURPOSE PANEL MOUNT

## Flowmeters

						
<b>SERIES</b>	<b>RMA</b> - pages 246-247	<b>RMB</b> - pages 246-247	<b>RMC</b> - pages 246-247	<b>VFA</b> - page 248	<b>VFB</b> - page 248	<b>VFC</b> - page 248
<b>Ranges</b>	0.05 to 200 SCFH air (5 to 2500 cc/m air); 1 to 50 GPH water (5 to 300 cc/m water)	0.5 to 600 SCFH air (0.6 to 95 LPM air); 1 to 100 GPH water (0.06 to 6.2 LPM water)	5 to 1800 SCFH air (2.5 to 850 LPM air); 0.1 to 10 GPM water (0.05 to 5 LPM water)	0.1 to 200 SCFH air (0.06 to 100 LPM air); 0.6 to 40 GPH water (6 to 200 cc/m water)	0.3 to 200 SCFH air (0.2 to 40 LPM air); 0.5 GPH to 5 GPM water (0.002 to 20 LPM water)	2.5 to 100 SCFM air (60 to 2800 LPM air); 0.5 to 20 GPM water (2 to 75 LPM water)
<b>Accuracy</b>	±4% FS	±3% FS	±2% FS	±5% FS	±3% FS	±2% FS
<b>Body Materials</b>	Polycarbonate	Polycarbonate	Polycarbonate	Acrylic	Acrylic	Acrylic
<b>Temperature Limits</b>	130°F (54°C)	130°F (54°C)	130°F (54°C)	With valve: 120°F (48°C); Without valve: 100°F (38.6°C)	With valve: 120°F (48°C); Without valve: 100°F (38°C)	120°F (48°C)
<b>Pressure Limits</b>	100 psi (6.7 bar)	100 psi (6.7 bar)	100 psi (6.7 bar)	With valve: 100 psi (6.7 bar); Without valve: 150 psi (10 bar)	With valve: 100 psi (6.7 bar); Without valve: 150 psi (10 bar)	100 psi (6.7 bar)
<b>Process Connection</b>	1/8" female NPT back connections	1/4" female NPT back connections	1/2" female NPT back connections	1/8" female NPT back or end connections	1/8" female NPT back or end connections	1" female or male NPT or BSPT back or end connections
<b>Scale Length</b>	2" (51 mm)	5" (127 mm)	10" (254 mm)	2" (51 mm)	4" (102 mm)	5" (127 mm)
<b>Metering Valve</b>	Optional bottom or top mount brass or stainless steel valve	Optional bottom brass or stainless steel valve	Optional bottom brass or stainless steel valve	Optional bottom or top mount brass or stainless steel valve	Optional bottom brass or stainless steel valve	N/A

## CORROSIVE MEDIA







## Flowmeters

								
<b>SERIES</b>	<b>VAT</b> - page 254	<b>TVA</b> - page 254	<b>VA1000</b> - page 255	<b>VA1500</b> - page 255	<b>VAT20000</b> - page 255	<b>VA25000</b> - page 255	<b>DR10000</b> - page 256	<b>DR20000</b> - page 256
<b>Ranges</b>	1.19 to 79 GPH water (75 to 5000 ml/min water)	6.34 to 79.2 GPH water (400 to 5000 ml/min water)	0.104 to 89.2 SCFH air (49 to 42000 ml/m air) 0.009 to 19.97 GPH water (0.55 to 1260 ml/m water)	0.22 to 49 SCFH air (104 to 23100 ml/min air) 0.028 to 27 GPH water (1.8 to 522 ml/min water)	0.792 to 93.9 SCFH air (374 to 44300 ml/min air) 0.087 to 21.7 GPH water (5.5 to 1370 ml/m water)	0.104 to 18.39 SCFH air (49 to 8600 ml/m air) 0.01 to 3.32 GPH water (0.61 to 209 ml/min water)	0.24 to 100 SCFH air (0.13 to 50 LPM air) 0.02 to 24 GPH water (1.5 to 1500 cc/m water)	0.33 to 90 SCFH air (0.16 to 44 LPM air) 0.05 to 21 GPH water (3.2 to 1300 cc/m water)
<b>Accuracy</b>	±5% FS	±5% FS	±2% FS	±2% FS	±2% FS	±2% FS	±5% FS	±5% FS
<b>Body Materials</b>	PFA	PFA	Glass flow tube	Glass flow tube	Glass flow tube	Glass flow tube	Glass flow tube	Glass flow tube
<b>Temperature Limits</b>	250°F (121°C)	250°F (121°C)	250°F (121°C)	150°F (65°C)	250°F (121°C)	150°F (65°C)	250°F (121°C)	250°F (121°C)
<b>Pressure Limits</b>	100 psi (6.7 bar)	100 psi (6.7 bar)	200 psi (13.8 bar)	100 psi (6.7 bar)	200 psi (13.8 bar)	100 psi (6.7 bar)	250 psi (17 bar)	250 psi (17 bar)
<b>Process Connection</b>	1/4" or 3/8" female NPT back connections	1/4" or 3/8" female NPT back connections	1/8" female NPT back connections	1/8" female NPT back connections	1/8" female NPT back connections	1/8" female NPT back connections	1/8" female NPT back connections	1/8" female NPT back connections
<b>Scale Length</b>	5" (127 mm)	3" (75 mm)	2.5" (65 mm)	2.5" (65 mm)	6" (150 mm)	6" (150 mm)	2.5" (65 mm)	6" (150 mm)
<b>Metering Valve</b>	N/A	Optional 6-turn needle valve	6-turn needle valve; Optional 16-turn high precision valve	6-turn needle valve	6-turn needle valve; Optional 16-turn high precision valve	6-turn needle valve	Optional 6-turn needle valve	Optional 6-turn needle valve



These Selection Guides are for quick comparison of similar products. Please refer to the catalog page number referenced for complete product information and specifications.



# GENERAL PURPOSE IN-LINE Flowmeters

						
<b>SERIES</b>	<b>LFMA</b> - page 253	<b>LFMB</b> - page 253	<b>LFMC</b> - page 253	<b>LFMD</b> - page 253	<b>LFME</b> - page 253	<b>LFMF</b> - page 253
<b>Ranges</b>	0.1 to 5 GPM water (0.5 to 18 LPM water)	0.1 to 5 GPM water (0.5 to 18 LPM water)	0.25 to 8 GPM water (1 to 30 LPM water)	0.8 to 10 GPM water (3 to 40 LPM water)	1.2 to 25 GPM water (5 to 100 LPM water)	2.5 to 70 GPM water (10 to 250 LPM water)
<b>Accuracy</b>	±5% FS	±5% FS	±5% FS	±5% FS	±5% FS	±5% FS
<b>Body Materials</b>	Polycarbonate	Polycarbonate	Polycarbonate	Polycarbonate	Polycarbonate	Polycarbonate
<b>Process Connection</b>	1/2" male NPT in-line or 90° elbow connections	1/2" male NPT in-line or 90° elbow connections	1/2" or 3/4" male NPT in-line or 1/2" male NPT 90° elbow connections	3/4" male or female NPT in-line or 3/4" male NPT 90° elbow connections	1" male or female NPT in-line or 1" male NPT 90° elbow connections	2" male or female NPT in-line connections
<b>Scale Length</b>	2" (51 mm)	3" (76 mm)	3" (76 mm)	3.5" (89 mm)	4.5" (114 mm)	5.5" (140 mm)

# INDUSTRIAL Flowmeters

		
<b>SERIES</b>	<b>IF</b> - page 257	<b>HF</b> - page 259
<b>Ranges</b>	1.2 to 250 SCFM air (35 to 7080 LPM air); 0.25 to 116 GPM water (0.95 to 439 LPM water)	2 to 22 SCFM air; 0.5 to 25 GPM oil; 0.05 to 116 GPM water
<b>Accuracy</b>	±3% FS	±4% FS
<b>Body Materials</b>	Glass flow tube	Aluminum, brass, or 304 SS
<b>Temperature Limits</b>	200°F (93°C)	240°F or 400°F (115° or 204°C)
<b>Pressure Limits</b>	200 psi (13.8 bar); some models 125 psi (8.6 bar)	600 psi to 6000 psi (41 to 413 bar)
<b>Process Connection</b>	1/2", 1" or 2" female NPT back connections	1/8" to 2" female NPT back connections
<b>Scale Length</b>	4-3/4" (120 mm)	1-1/2" to 2-1/4" (38 to 57 mm)




## PADDLE AND THERMAL STYLE Flow Switches

							
<b>SERIES</b>	<b>V4</b> - pages 270-271	<b>V6</b> - pages 272-273	<b>V7</b> - page 274	<b>V10</b> - page 274	<b>V8</b> - page 275	<b>FS-2</b> - page 276	<b>TDFS2</b> - page 276
<b>Service</b>	Gases or liquids	Gases or liquids	Liquids	Gases or liquids	Liquids	Liquids	Liquids
<b>Set Point Range</b>	3 to 2400 GPM (12 to 9000 LPM); 17 to 10000 SCFM (8 to 4700 LPM)	.03 to 10 GPM (.11 to 38 LPM); .15 to 43 SCFM (4 to 1200 LPM)	7.5 to 58.0 GPM (28.4 to 218 LPM)	2.3 to 9.5 GPM (8.7 to 36 LPM); 8.8 to 50 SCFM (250 to 1420 LPM)	6.8 to 58 GPM (25.7 to 218 LPM)	4 to 396 GPM (15 to 1500 LPM)	0.5 to 10 ft/s (0.15 to 3 m/s)
<b>Wetted Materials</b>	Brass, 430 SS, 316 SS*	Brass or 303 SS, 301 SS, 302 SS, ceramic*	301 SS	Brass or 303 SS, 316 SS, 301 SS, 302 SS, ceramic	Brass or 316 SS, 301 SS, 302 SS, ceramic	Tin-Bronze, brass, SS	316 SS
<b>Temperature Limits</b>	-4 to 400°F (-20 to 205°C)	-4 to 400°F (-20 to 205°C)	250°F (121°C)	200°F (93°C)	-40 to 250°F (-40 to 121°C)	230°F (110°C)	140°F (60°C)
<b>Pressure Limits</b>	5000 psig (345 bar)	2000 psig (138 bar)	2000 psig (138 bar)	2000 psig (138 bar)	250 psig (17.2 bar)	145 psig (10.0 bar)	300 psig (20.67 bar)
<b>Adjustable Set Point</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Power Requirement</b>	None	None	None	None	None	None	9-24 VDC
<b>Enclosure Rating</b>	WP and EXP	WP and EXP	WP	WP	WP	WP	NEMA 4X (IP65)
<b>Switch Type</b>	SPDT or DPDT	SPDT or DPDT	SPDT	SPST	SPDT	SPDT	1 NO NPN, 1 NC NPN
<b>Process Connection</b>	1-1/2" male NPT* or 1-1/2" male BSPT	1/2" male NPT* or 1/2" male BSPT	1" male NPT	1/2" male NPT* or 1/2" male BSPT	1" male NPT	1" male NPT or BSPT	1" male NPT
<b>Agency Approvals</b>	ATEX, CE, CSA, FM, IECEx, UL**	ATEX, CE, CSA, IECEx, KTL, UL	CE, UL	CE, CSA, UR	CE, cURus	CE	CE

\*Other options available, contact factory

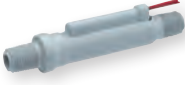


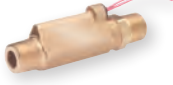


\*\*No housing option (-NH) has no approvals

## PADDLE WHEEL/TURBINE/MULTI-JET Flow Transmitters

			
<b>SERIES</b>	<b>PFT</b> - page 281	<b>SFI-100T</b> - page 283	<b>DFMT</b> - page 284
<b>Service</b>	Liquids	Liquids	Liquids
<b>Wetted Materials</b>	Brass or 316 SS	Brass	PVDF
<b>Accuracy</b>	±1% FS	±5% FS	±1.5% FS
<b>Temperature Limits</b>	212°F (100°C)	-20 to 212°F (-29 to 93°C)	194°F (90°C)
<b>Pressure Limits</b>	400 psig (27.6 bar)	125 psig (8.6 bar)	145 psi (1.0 mPa)
<b>Pipe Size</b>	1-1/2 to 40" (38.1 to 1016 mm)	1/2" or 3/4" (12.7 mm or 19 mm)	3/8", 1/2", 3/4", 1", 1-1/2" or 2" (9.5 mm, 12.7 mm, 19 mm, 25.4 mm, 38 mm or 50.8 mm)
<b>Flow Rate</b>	1.2 to 25 ft/s (0.37 to 7.62 m/s)	2 to 35 GPM (7.6 to 132.5 LPM)	0.44 to 176.11 GPM (0.1 to 40 m³/h)
<b>Output</b>	4-20 mA or pulsed	Pulsed	4-20 mA or pulsed




These Selection Guides are for quick comparison of similar products. Please refer to the catalog page number referenced for complete product information and specifications.

# PISTON STYLE Flow Switches

						
<b>SERIES</b>	<b>P2</b> - page 277	<b>P3</b> - page 277	<b>P1</b> - page 278	<b>P8</b> - page 278	<b>GVS</b> - page 279	<b>AFS</b> - page 279
<b>Service</b>	Gases or liquids	Liquids	Liquids	Liquids	Liquids	Gases or liquids
<b>Set Point Range</b>	.05 to 1 GPM (.2 to 3.79 LPM); .42 to 5 CFM (11.9 to 141 LPM)	.25 to 2 GPM (.95 to 7.57 LPM)	.1 to 1.5 GPM (.38 to 5.7 LPM)	.25 to 2 GPM (.95 to 7.57 LPM)	1 to 8 GPM (3.8 to 30.3 LPM)	1 to 75 SCFM @ 5 psi (28 to 2123 LPM @ 5 psi); .5 to 20 GPM (2 to 75.5 LPM)
<b>Wetted Materials</b>	PPE and PS, epoxy, 316 SS	Polypropylene, PPS composite, 316 SS, fluorocarbon	Brass, polysulfone, 316 SS, fluoroelastomer, epoxy	Brass, PPS composite, epoxy, 316 SS, fluorocarbon	Bronze, TFE, 316 SS, fluoroelastomer, ceramic	316 SS, fluoroelastomer, epoxy, brass
<b>Temperature Limits</b>	0 to 212°F (-18 to 100°C)	0 to 212°F (-18 to 100°C)	-20 to 225°F (-29 to 107°C)	-20 to 275°F (-28 to 135°C)	-20 to 200°F (-29 to 93°C)	-20 to 300°F (-29 to 149°C)*
<b>Pressure Limits</b>	150 psig (10.3 bar) @ 70°F (21°C); 50 psig (3.4 bar) @ 212°F (100°C)	125 psig (8.6 bar) @ 70°F (21°C); 50 psig (3.4 bar) @ 212°F (100°C)	1000 psig (69 bar)	1500 psig (103 bar)	400 psig (27 bar) @ 100°F (38°C)	1000 psig (69 bar)
<b>Adjustable Set Point</b>	No	No	No	No	Yes	Yes
<b>Power Requirement</b>	None	None	None	None	None	None
<b>Enclosure Rating</b>	GP	GP	GP	GP	GP	GP
<b>Switch Type</b>	SPST, NO	SPST, NO	SPDT	SPST, NO	SPDT	SPDT
<b>Process Connection</b>	1/4" male NPT	3/8" male NPT or 1/4" Quick Disconnect	1/4" female NPT	3/8" male NPT	1" female NPT	1/2" female NPT
<b>Agency Approvals</b>	CE	CE	CE	CE	CE	CE

\*Other options available, contact factory

# FLOW Water Meters

			
<b>SERIES</b>	<b>WMH</b> - page 285	<b>WMT2</b> - page 286	<b>WPT</b> - page 287
<b>Service</b>	Water	Water	Water
<b>Wetted Materials</b>	Body and couplings: Brass; Measuring chamber: ABS plastic	Body and couplings: Brass; Measuring chamber: ABS plastic	Body: Nylon 66; Couplings: Nylon 66, 1-1/2" (40 mm) sizes lead free ECO BRASS®; Measuring chamber: ABS plastic
<b>Accuracy</b>	WMH-A-X-XX: Transitional flow: ±3%; Nominal flow: ±1.5%	±2% FS	WPT-A-X-XX: Transitional flow: ±3; Nominal flow: ±1.5%
<b>Temperature Limits</b>	190°F (88°C)	104°F (40°C)	122°F (50°C)
<b>Pressure Limits</b>	150 psi (10 bar)	232 psi (16 bar)	150 psi (10 bar)
<b>Pipe Size</b>	5/8" x 1/2" to 2" (15 mm to 50 mm)	1/2" to 2" (12.7 mm to 50 mm)	5/8" x 1/2" to 1-1/2" (15 mm to 40 mm)
<b>Flow Rate</b>	20 to 160 GPM (3 to 30 m³/h)	20 to 160 GPM (3 to 30 m³/h)	20 to 160 GPM (3 to 30 m³/h)
<b>Output</b>	Pulsed	Pulsed	Pulsed

ECO BRASS® is a registered trademark patent by Mitsubishi Shindoh

These Selection Guides are for quick comparison of similar products. Please refer to the catalog page number referenced for complete product information and specifications.

Dwyer

# ULTRASONIC

## Flow Transmitters



SERIES	UFM - page 289	PUB - page 290
Service	Liquids	Liquids
Wetted Materials	N/A	N/A
Accuracy	±3% of reading	±2% FS
Temperature Limits	185°F (85°C)	275°F (135°C)
Pipe Size	0.98 to 4.62" (24.89 to 117.35 mm)	0.5 to 78" (13 to 2000 mm)
Flow Rate	0.33 to 32.8 ft/s (0.1 to 10 m/s)	0.33 to 65.62 ft/s (0.1 to 20 m/s)
Output	4-20 mA and pulsed	4-20 mA, 0-16 mA or 0-20 mA and pulsed
Enclosure Rating	NEMA 4X (IP66)	NEMA 4X (IP66)

# FLOW

## Heat Meters



SERIES	TUF - page 293	IEFB - pages 294-295
Services	Clean, compatible liquids	Compatible clean or dirty non coating, conductive liquids
Wetted Materials	Brass and 316L SS	316 SS, polystyrene and Silicon
Range	Refer to flow rate below	0 to 20 ft/s (0 to 6 m/s)
Accuracy	BTU: EN1434/CJ128 CLASS 2; Flow: $\pm(2+(0.02 Q_p/Q))$	BTU: RTD and calculator meet EN1434 Class B; Flow: 1% of reading or 1% FS (model dependant)
Temperature Limits	36 to 203°F (2 to 95°C)	32 to 250°F (0 to 121°C)
Pressure Limits	362 psi (25 bar) (model dependant)	400 psi (27.6 bar)
Pipe Size	1/2 to 8" (15 to 200 mm)	4 to 36" (101 to 914 mm) (model dependant)
Flow Rate	0.1 to 881 GPM (0.5 to 3333 LPM)	Refer to velocity range above
Output	BACnet, Modbus® or M-BUS (model selectable)	(1) Analog (1) Pulse/frequency (1) Empty Pipe detection/ min. or max velocity trigger (1) Reverse flow pulse output indication (1) BACnet or Modbus®

Modbus® is a registered trademark of Schneider Automation, Inc.

These Selection Guides are for quick comparison of similar products. Please refer to the catalog page number referenced for complete product information and specifications.

# ELECTROMAGNETIC, IN-LINE/INSERTION Flow Transmitters



**UFB** - page 288



**MFS** - page 291



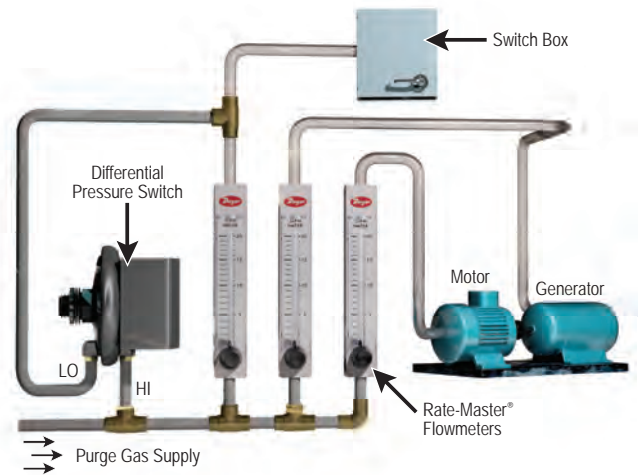
**IEF** - page 292

SERIES	UFB - page 288	MFS - page 291	IEF - page 292
Service	Liquids	Liquids	Liquids
Wetted Materials	N/A	316 SS	316 SS
Accuracy	±2% of reading	±2% of reading	0.5% of reading, 1% of reading or ±1% FS
Temperature Limits	275°F (136°C)	194°F (90°C)	15 to 250°F (-9 to 121°C)
Pressure Limits	N/A	232 psi (16 bar)	400 psi (27.6 bar)
Pipe Size	0.05 to 79" (13 to 2000 mm)	1/2 or 1" (12.7 or 25 mm)	4 to 36" (101 to 914 mm)
Flow Rate	0.33 to 33 ft/s (0.1 to 10 m/s)	0.25 to 52.8 GPM (1 to 200 LPM)	0 to 20 ft/s (0 to 6 m/s)
Output	4-20 mA, 0-16 mA or 0-20 mA	4-20 mA or pulsed	(1) Analog: 4-20 mA, 0-5 V, 0-10 V or 2-10 V (display selectable); (1) Pulse/Frequency: 0-15 V peak pulse, 0-500 Hz or scalable pulse output (display selectable); (2) Alarm: (1) Empty pipe detection or minimum/maximum velocity, (display selectable); (1) Reverse flow output indication



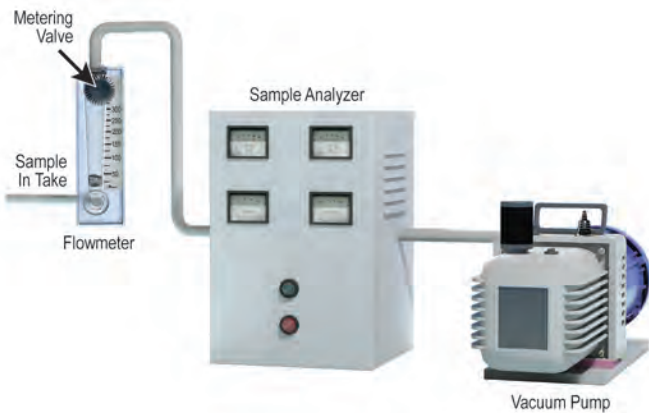
**Designers of a bio-medical incubator rely on a Dwyer® flowmeter to control CO<sub>2</sub> flow**

This low temperature incubator with CO<sub>2</sub> atmosphere is used in bio-medical applications, such as short term blood work and long term tissue culture studies. CO<sub>2</sub> 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 CO<sub>2</sub> 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.



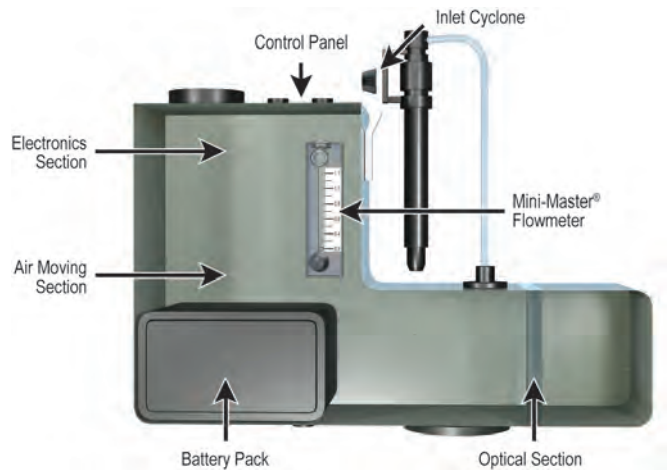
**Flowmeters and/or differential pressure switches monitor vital purge gas flow to motors, switchgear, instruments**

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.



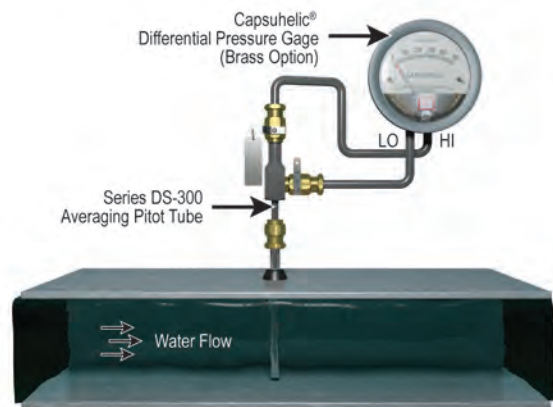
**Metering valves on Dwyer® flowmeters control air/gas intake on permanent air pollution analyzers**

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.



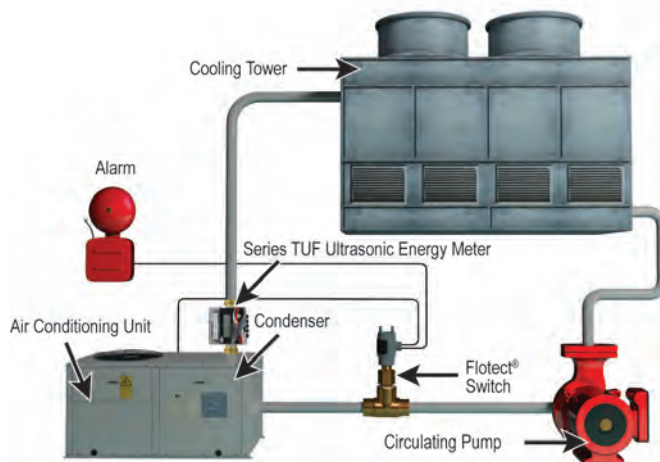
**Operator uses Mini-Master® flowmeter to verify air flow into portable dust monitor**

The small size, accuracy, and low cost of the Dwyer® Mini-Master® 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.



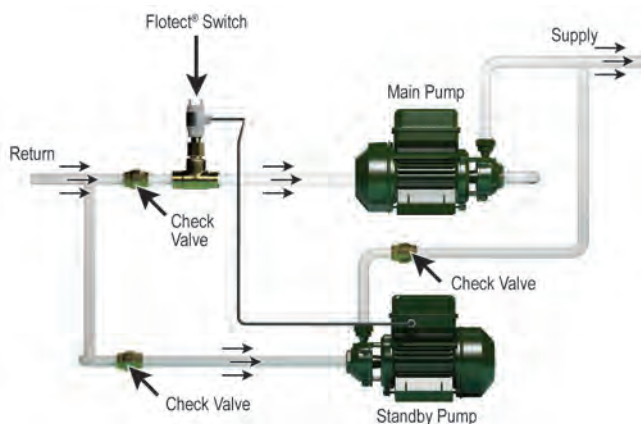
### Brass body gage measures water flow rates

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 and Series TUF monitors thermal energy loss from cooling tower to air condenser

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. The Series TUF monitors the water flow as well as the temperature of the water going into and out of the air conditioning unit in order to calculate the cooling efficiency of the air conditioning unit.



### 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 Series SFI-100 MIDWEST 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.



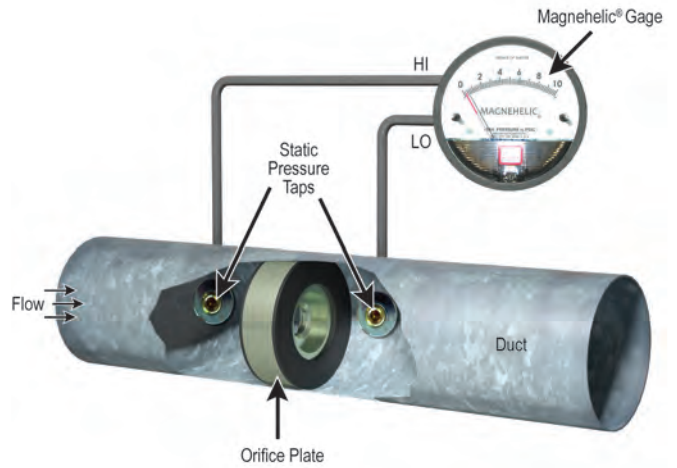
**Durable dual-column flowmeter adds value for physicians and oral surgeons.**

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.

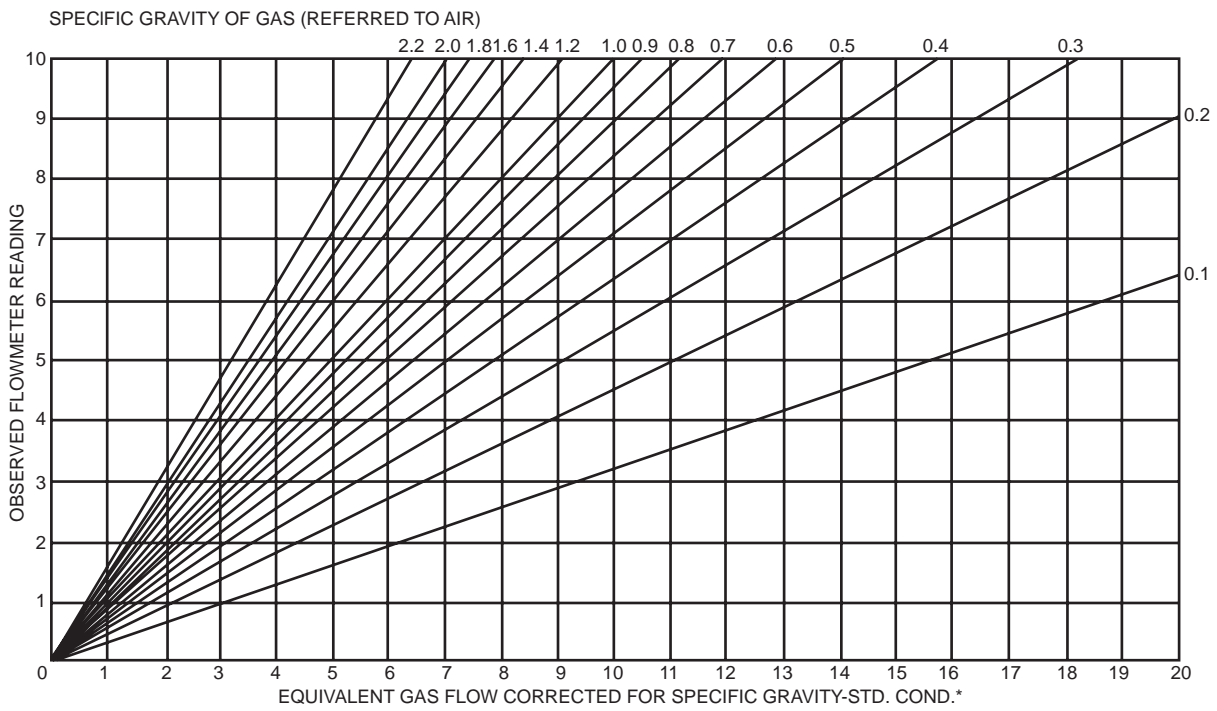
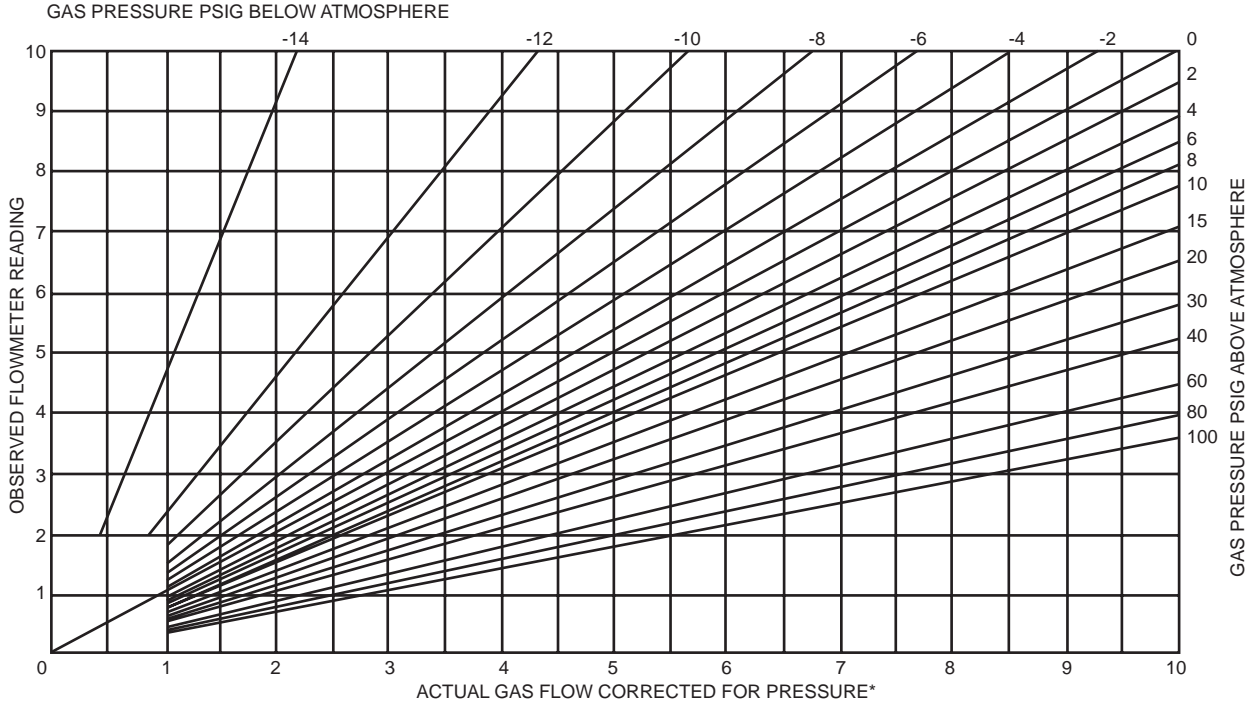


**Measuring air velocity with an orifice plate.**

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



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 or water  
 $S.G.$  = Specific gravity of media being used in flowmeter originally calibrated for air or water.

**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.

# RATE-MASTER® POLYCARBONATE FLOWMETERS

2", 5" or 10" Scale, Interchangeable Bodies



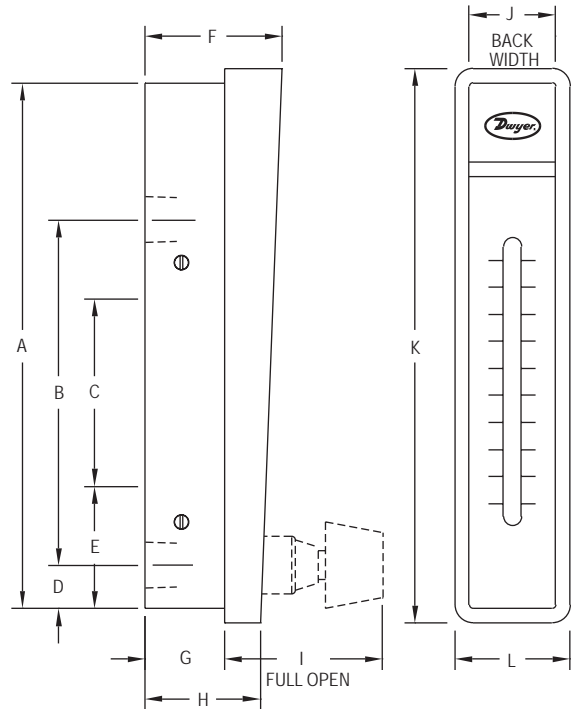
**Model RMC**  
10" scale, 15-3/8" high



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



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



DIMENSIONS - FLOWMETER			
	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] 1/8 NPT conn.	6-7/16 [163.50] 1/4 NPT conn.	12-1/4 [311.20] 1/2 NPT conn.
C	1-5/8 [41.28] 10-32 mtg. holes	3-15/16 [100.00] 1/4-20 mtg. holes	8-3/4 [222.30] 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]

Flowmeters,  
Variable Area & In-Line



The **Series RM Rate-Master® Polycarbonate Flowmeters** are a line of general use, direct reading precision flowmeters suitable for both gas and liquid applications. This Series consists of 2" (51 mm), 5" (127 mm) and 10" (254 mm) scales that can be panel or surface mounted with optional precision metering valves. Within a given Series, the Rate-Master® flowmeter bodies can be instantly interchanged, allowing the piping to remain undisturbed, interchangeability of the ranges, and easy cleaning.

**FEATURES/BENEFITS**

- Direct reading scales eliminate the need for troublesome conversions
- Stainless steel backbone absorbs piping torque reducing installation damage and cost
- Shatter-proof polycarbonate allows for long operation life
- Precision injection molding around a precision tapered pin enables high repeatability
- Increased reading accuracy with special integral flow guides that stabilize float movement
- Scale graduations on both side of the indicating tube allow for instantaneous flow reading saving time

**APPLICATIONS**

- Medical equipment
- Air samplers
- Gas analyzers
- Pollution monitors
- Chemical injectors
- Cabinet purging

**SPECIFICATIONS**

**Service:** Compatible gases and liquids.  
**Wetted Materials:** Body: Polycarbonate; O-ring: Neoprene and Buna-N; Metal parts: SS (except for optional brass valve); Float: SS, 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 FS.  
**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).  
**Agency Approvals:** Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).  
**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.

# RATE-MASTER® POLYCARBONATE FLOWMETERS

Gas Flow from 0.05 to 1800 SCFH, Water Flow to 10 GPM

RANGE CHART - RMA 2" SCALE - POPULAR RANGES			
Range No.	SCFH Air	Range No.	LPM Air
1	.05 to .4	26	.5 to 5
2	.1 to 1	21	1 to 10
3	.2 to 2	22	2 to 25
4	.5 to 5	23	5 to 50
5	1 to 10	24	5 to 70
6	2 to 20	25	10 to 100
7	5 to 50	<b>Range No. CC/Min. Water</b>	
8	10 to 100	32	5 to 50
9	15 to 150	33	10 to 110
10	20 to 200	34	20 to 300
<b>Range No. CC/Min. Air</b>			
151*	5 to 50	42	1 to 11
150*	10 to 100	43	2 to 24
11	30 to 200	44	4 to 34
12	50 to 500	45	5 to 50
13	100 to 1000		
14	200 to 2500		

\*Accuracy ±8%

RANGE CHART - RMB 5" SCALE - POPULAR RANGES			
Range No.	SCFH Air	Range No.	SCFH & LPM Air
49*	0.5 to 5	50D	1.2 to 10/0.6 to 5
50	1 to 10	51D	2 to 20/1 to 9.5
51	3 to 20	52D	4 to 50/2 to 23
52	4 to 50	53D	10 to 100/5 to 50
53	10 to 100	54D	20 to 200/10 to 95
54	20 to 200	<b>Range No. GPH &amp; LPM Water</b>	
55	40 to 400	82D	1 to 12/0.06 to 0.76
56	50 to 500	83D	1 to 20/0.065 to 1.25
57	60 to 600	85D	10 to 100/0.8 to 6.2
<b>Range No. GPH Water</b>			
82	1 to 12		
83	1 to 20		
84	4 to 40		
85	10 to 100		

\*Accuracy ±5%

RANGE CHART - RMC 10" SCALE - POPULAR RANGES			
Range No.	SCFH Air	Range No.	GPH Water
101	5 to 50	134	2 to 20
102	10 to 100	135	8 to 90
103	20 to 200	<b>Range No. GPM Water</b>	
104	40 to 400	141	.1 to 1
105	60 to 600	142	.2 to 2.2
106	100 to 1000	143	.4 to 4
107	120 to 1200	144	.8 to 7
108	200 to 1800	145	1.2 to 10
<b>Range No. SCFM Air</b>			
121	1 to 10		
122	2 to 20		
123	4 to 30		

MODEL CHART	
Model	Description
RMA-X	Standard RMA
RMA-X-BV+	RMA with brass valve
RMA-X-SSV+	RMA with stainless steel valve
RMA-X-TMV*+	RMA with top mounted valve
RMB-X	Standard RMB
RMB-X-BV+	RMB with brass valve
RMB-X-SSV+	RMB with stainless steel valve
RMC-X	Standard RMC
RMC-X-BV+	RMC with brass valve
RMC-X-SSV+	RMC with stainless steel valve

**How To Order:** Series-Range No. ("X")-Valve-Option  
**Example:** RMA-2-SSV  
 (Series RMA with .1-1 SCFH air range & stainless steel valve)

\*Provide same precision construction but for vacuum applications.  
 +Valve is designed for flow adjustment only, not intended to be used as an open/shut-off valve.

OPTIONS	
To order add suffix:	Description
-NIST	NIST traceable calibration certificate
-APF	Adjustable pointer flag for Series RMA
-BPF	Adjustable pointer flag for Series RMB
-CPF	Adjustable pointer flag for Series RMC

**Note:** Special ranges, scales, mounting arrangements, etc., are available on special order, or in OEM quantities.



**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.

ACCESSORIES	
Model	Description
RKA	Regulator kit for Series RMA
RK-RMB	Regulator kit for Series RMB

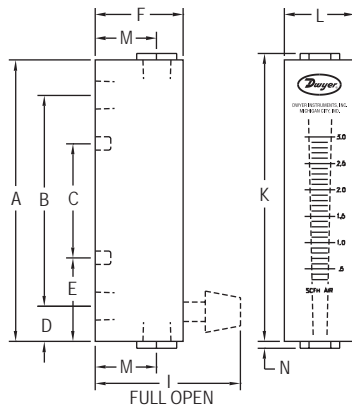


**Regulator kits**

Available as optional extras for both Rate-Master® Flowmeters and Visi-Float® Flowmeters models. This view shows Model VFA Visi-Float® flowmeter with integrally connected constant differential pressure regulator. Recommended for use where inlet air pressure fluctuates widely and constant flow is required. The regulator maintains a constant pressure differential of approximately 3 ±.15 psig. Supply pressure must be at least 3 psig above the flowmeter discharge to operate. The standard regulator may be used with any Dwyer Series RM or VF flowmeter up to 200 scfh. For higher flow rates consult the factory.

# VISI-FLOAT® ACRYLIC FLOWMETERS

## Hot-Stamped Scales, Multi-Angle Views of Flow



DIMENSIONS - FLOWMETER		
	Model VFA	Model VFB
A	4 [101.6]	6-1/2 [165.1]
B	3 [76.20]; 1/8 NPT conn.	5-1/2 [139.7]; 1/8 NPT conn.
C	1-5/8 [41.28]; 10-32 thd	3-1/2 [88.90]; 10-32 thd
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]; Open	2-1/16 [52.39]; Open
K	4-3/32 [104.0]	6-11/16 [169.9]
L	1 [25.40]	1-3/8 [34.93]
M	7/8 [22.23]; 1/8 NPT	7/8 [22.23]; 1/8 NPT
N	3/32 [2.381]	3/32 [2.381]

The **Series VF Visi-Float® Acrylic Flowmeters** are a line of direct reading, precision machined, clear acrylic body flowmeters suitable for both gas and liquid applications. The fabrication of the Visi-Float® flowmeters is backed by over 60 years of experience in acrylic instrument machining. This Series consists of 2" (51 mm) and 4" (102 mm) scales with optional precision metering valves.

**FEATURES/BENEFITS**

- Bodies are cut and precision machined from solid, clear acrylic blocks allowing for complete visual inspection
- White background allows for better visibility of the float increasing reading accuracy
- Direct reading scales are hot stamped into the plastic eliminating the need for troublesome conversions and increasing product operating life
- Precision machined tapered bore enables high repeatability
- Low installation costs with back or end connection options with metal mounting inserts that can be supported directly by system piping

**APPLICATIONS**

- Medical equipment
- Laboratory equipment
- Air samplers
- Gas analyzers
- Pollution monitors
- Chemical injectors
- Cabinet purging

**MODEL CHART**

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
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

**How To Order:** Series—Range No. ("X")—Valve—Option

**Example:** VFA-9-BV (Series VFA with 20-200 SCFH air range & brass valve)

+Valve is designed for flow adjustment only, not intended to be used as an open/shut-off valve.

**OPTIONS**

To order add suffix:	Description
-NIST	NIST traceable calibration certificate
-PF	Red ABS plastic pointer flag
-VIT	Fluoroelastomer O-rings

**ACCESSORIES**

Model	Description
RKA	Regulator kit for Series VFA
RK-VFB	Regulator kit for Series VFB

**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.

**SPECIFICATIONS**

**Service:** Compatible gases and liquids.  
**Wetted Materials:** Body: Acrylic plastic; O-ring: Buna-N (fluoroelastomer available); Metal parts: Nickel plated brass standard, SS optional; Float: SS, black glass, aluminum, K monel depending on range.  
**Temperature and 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 FS; VFB = 3% of FS.  
**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).  
**Agency Approvals:** Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

**RANGE CHART - VFA 2" SCALE - POPULAR RANGES**

Range No.	SCFH Air	Range No.	LPM Air
1	.1 to 1	21	.06 to 0.5
2	.2 to 2	22	.15 to 1
3	.6 to 5	23	.6 to 5
4	1 to 10	24	1 to 10
5	2 to 20	25	3 to 25
6	4 to 30	26	6 to 50
7	5 to 50	27	10 to 100
8	10 to 100		
9	20 to 200		
Range No.	CC/Min. Water	Range No.	GPH Water
32	6 to 50	41	.6 to 5
33	10 to 100	42	2 to 10
34	20 to 200	43	3 to 20
		44	8 to 40

**RANGE CHART - VFB 4" SCALE - POPULAR RANGES**

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

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



**Special multi-column Visi-Float® flowmeters**  
 Perfect for OEM applications, Visi-Float® Flowmeters can be custom made with up to 10 columns in a single block of acrylic plastic. Available with or without valves. Consult factory for more information.

USA: California Proposition 65  
 ⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

# VISI-FLOAT® ACRYLIC FLOWMETERS

5" Scale, In-Line or Back Connection Options



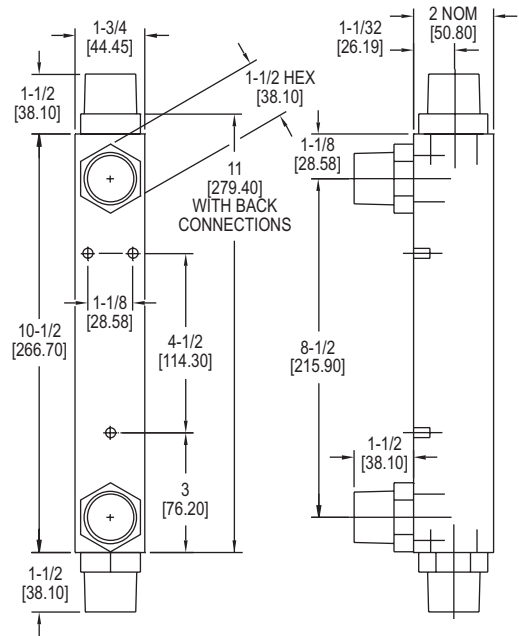
VFCII with 1" MNPT end connections



VFC with 1" FNPT end connections



VFC with 1" FNPT back connections



The Series VFC Visi-Float® Acrylic Flowmeters are direct reading, precision machined, clear acrylic body flowmeters suitable for both gas and liquid applications. This Series consists of two 5" (127 mm) scale flowmeters, the VFC and VFC II. The VFC features PVC 1" female NPT connections and the VFC II units are equipped with acetal thermoplastic 1" male NPT fittings.

**FEATURES/BENEFITS**

- Bodies are cut and precision machined from solid, clear acrylic blocks allowing for complete visual inspection
- White background allows for better visibility of the float increasing reading accuracy
- Direct reading scales are hot stamped into the plastic eliminating the need for troublesome conversions and increasing product operating life
- Precision machined tapered bore enables high repeatability
- Low installation costs with back or end connection options

**APPLICATIONS**

- Medical equipment
- Laboratory equipment
- Air samplers
- Gas analyzers
- Pollution monitors
- Chemical injectors
- Cabinet purging
- Remediation
- Osmosis skids

RANGE CHART - 5" SCALE - POPULAR RANGES			
Range No.	SCFM Air	Range No.	GPM Water
121	4 to 25	141	.5 to 5
122	5 to 50	142	1 to 10
123	10 to 100	143	2 to 20
Range No.	LPM Air	Range No.	LPM Water
131	100 to 700	151	2 to 20
132	200 to 1400	152	4 to 40
133	300 to 2800	153	10 to 75

**SPECIFICATIONS**

**Service:** Compatible gases and liquids.  
**Wetted Materials:** Body: Acrylic plastic; O-ring: Buna-N (fluoroelastomer available); Metal parts: SS; Float: SS; Fittings: VFC: PVC; VFCII: Acetal thermoplastic.  
**Temperature and Pressure Limits:** 100 psig (6.9 bar) @ 120°F (48°C).  
**Accuracy:** 2% of FS.  
**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).  
**Agency Approvals:** Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

MODEL CHART		
Model	Thread Type	Process Connection
VFC-X	1" FNPT	Back
VFCII-X	1" MNPT	Back
VFC-X-EC	1" FNPT	In-line end
VFCII-X-EC	1" MNPT	In-line end

**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)

OPTIONS	
To order add suffix:	Description
-VIT	Fluoroelastomer O-rings
-FDA	316 SS float and guide rod (only available on VFCII with fluoroelastomer O-rings)
-NIST	NIST traceable calibration certificate
-BSPT	BSPT process connections

# MINI-MASTER® FLOWMETERS

2" or 1-1/2" Scale, Configurable Valve Option



Standard model  
MMA-X-LV



Standard model MMA-X  
with field configurable  
valve, bottom mount



Standard model MMA-X  
with field configurable  
valve, top mount



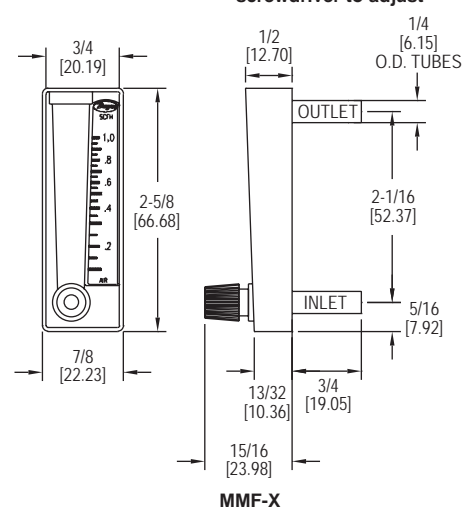
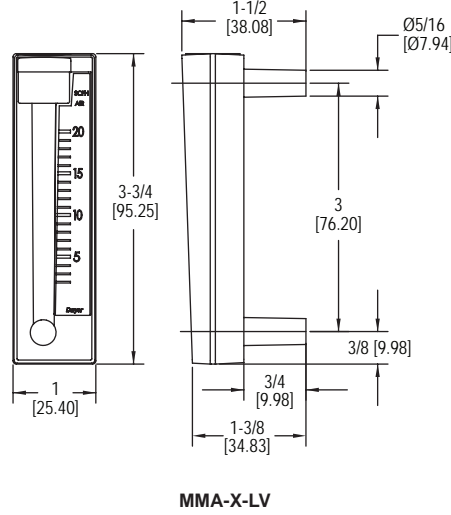
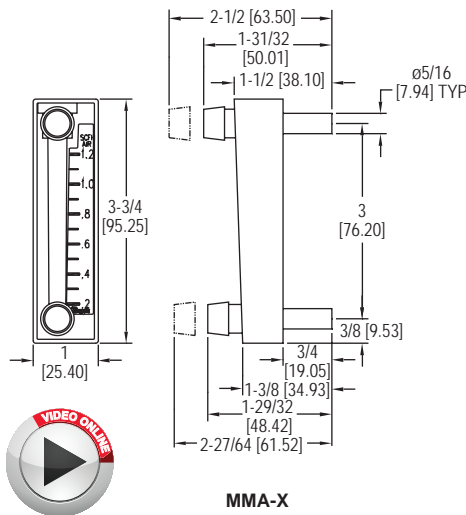
Model MMF-50-PV  
1-1/2" scale, with metering  
valve, knob



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



Flowmeters,  
Variable Area & In-Line



The **Series MM Mini-Master® Flowmeters** consists of two series of flowmeters suitable for both gas and liquid applications with advanced features at a low cost. The Series MMA is a 2" (51 mm) scale flowmeter that is user configurable with or without non-removable top or bottom front mounted metering valves. It is constructed from transparent nylon material providing high chemical resistance and is easily disassembled via the provided key for cleaning or reconfiguration. The Series MMF is a 1-1/2" (38 mm) scale compact flowmeter ideal for measuring small volume air. It features bezel type mounting that can be quickly installed from the front of the instrument panel.

**FEATURES/BENEFITS**

- Low installation costs with easy mounting
- Long operation life with durable construction
- Precision molding enables high repeatability
- White back on the flow tube allows for better visibility of the float increasing reading accuracy
- Side printed scale graduations allows for instantaneous flow reading saving time
- Compact bodies require minimal panel space freeing valuable space

**APPLICATIONS**

- Medical equipment
- Air samplers
- Gas analyzers
- Pollution monitors
- Chemical injectors
- Cabinet purging

**SPECIFICATIONS**

**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% FS.
- Process Connection:** 5/16" OD 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).
- Agency Approvals:** Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

**MMF SPECIFICATIONS**

- Service:** Compatible gases and liquids.
- Wetted Materials:** Body: Styrene acrylonitrile; Float: SS, 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% FS.
- Process Connection:** 1/4" OD for push on rubber or plastic tubing. Connect to rigid tubing with compression fittings.
- Weight:** 0.5 oz (14.17 g).
- Agency Approvals:** Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

# MINI-MASTER® FLOWMETERS

2" or 1-1/2" Scale, Configurable Valve Option

MODEL CHART	
Model	Description
MMA-X	Standard MMA
MMA-X-LV	MMA without configurable valve
<b>How To Order:</b> MMA-Range No.-Optional Valve	
<b>Example:</b> MMA -4-LV (Series MMA with .5-5 SCFH air range without configurable valve)	

ACCESSORIES - MMA	
Model	Description
A-327	5/16" union

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

MODEL CHART	
Model	Description
MMF-X	Standard MMF
MMF-X-PV	MMF with bottom mount valve
MMF-X-TMV	MMF with top mount valve
<b>How To Order:</b> MMF-Range No.-Valve	
<b>Example:</b> MMF-1-PV (Series MMF with .1-1 SCFH air range with valve)	

ACCESSORIES - MMF	
Model	Description
A-328	1/14" union

RANGE CHART - MMF	
Range No.	Range (SCFH Air)
1	.1 to 1
2	.2 to 2
10	1 to 10
50	5 to 50
100	10 to 100

OPTIONS	
To order add suffix:	Description
-NIST	NIST traceable calibration certificate



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



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



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).

# ULTRA-VIEW™ POLYSULFONE FLOWMETERS

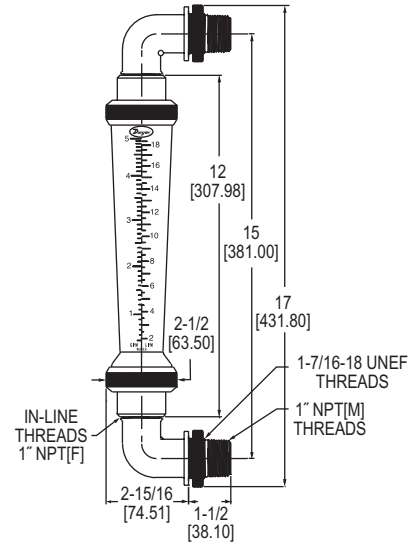
High Corrosion - Resistant Body, Dual Scales



Shown with optional polysulfone fittings



Shown with optional polycarbonate shield



Shown with optional polysulfone fittings

The **Series UV Ultra-View™ Polysulfone Flowmeters** are an ultra-pure, laboratory grade flowmeter with a dual scale 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 pressures up to 150 psi (10.34 bar).

**FEATURES/BENEFITS**

- Corrosion-resistant polysulfone body ideal for applications where other flowmeters fail saving replacement cost and time
- Easy to clean body yields low maintenance costs
- Polycarbonate shield protects internal scale increasing product operating life
- Low installation costs with optional panel mount polysulfone fittings

**APPLICATIONS**

- Chill water flow
- Reverse osmosis systems
- Deionized water systems
- Potable water systems
- Remediation applications

MODEL CHART			
Model	Range (GPM water)	Model	Range (SCFM air)
UV-0112	0.25 to 2.5 (1 to 9.5 LPM)	UV-A112	1 to 13 (30 to 370 LPM)
UV-1112	0.5 to 5.0 (2 to 19 LPM)	UV-B112	2.5 to 28 (70 to 780 LPM)
UV-2112	1.0 to 10.0 (4 to 38 LPM)	UV-C112	5 to 50 (70 to 1400 LPM)
UV-3112	2.0 to 20.0 (8 to 76 LPM)	UV-D112	14 to 100 (400 to 2800 LPM)
UV-4112	3.0 to 30.0 (12 to 112 LPM)		
UV-5112	4.0 to 40.0 (20 to 150 LPM)		

**Note:** For PVC 1" female NPT fittings, change 12 to 22.

OPTIONS	
To order add suffix:	Description
-SHD	Protective polycarbonate shield
-NIST	NIST traceable calibration certificate

ACCESSORIES	
Model	Description
A-801	Panel mount kit, polysulfone fittings
A-162	In-line fitting replacement kit. Two 1" female NPT connection fittings included in kit

**SPECIFICATIONS**

**Service:** Compatible liquids and gases.  
**Wetted Materials:** Polysulfone body and fittings, 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:** ±2% FS @ 70°F ±2°F (21.1°C) and 14.7 psia (in line connection rating only).  
**Repeatability:** ±1% FS @ 70°F ±2°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 warranty ratings will damage the flowmeter. Series UV Flowmeters are for indoor use only or areas without direct sunlight. Polysulfone is adversely affected by ultraviolet light.

Flowmeters, Variable Area & In-Line



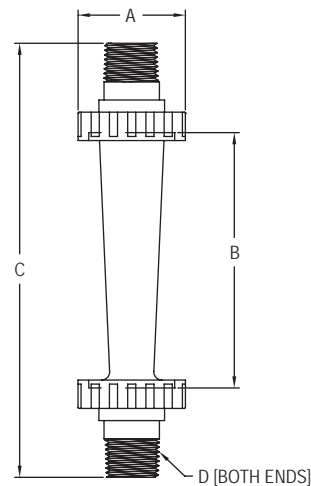
# POLYCARBONATE FLOWMETERS

Chemically Resistant, In-Line or Panel Mount Options, Adjustable Set Point Indicator Option



LFMA

LFMC



Model	AØ	B	C	D
LFMA	1-21/32 (42.07)	3-15/16 (100.01)	6-45/64 (170.26)	1/2 NPT
LFMB	1-63/64 (50.40)	6-5/16 (160.34)	8-55/64 (225.03)	1/2 NPT
LFMC	1-63/64 (50.40)	5-9/32 (134.14)	8-9/32 (210.34)	1/2 NPT
LFMD	2-21/64 (59.13)	6-45/64 (170.26)	9-27/32 (250.03)	3/4 NPT
LFME	2-27/32 (72.23)	8-55/64 (225.03)	12-19/64 (312.34)	1 NPT
LFMF	3-15/16 (100.01)	11-27/64 (290.12)	15-3/4 (400.05)	2 NPT

The **Series LFM Polycarbonate Flowmeters** are made of precision, injection molded polycarbonate bodies and fittings. This series consists of LFMA, LFMB, LFMC, LFMD, LFME and LFMF flowmeters with 3" (76 mm), 6" (152 mm), 5" (127 mm), 6" (152 mm), 8" (203 mm) and 11" (279 mm) respective scales. They feature dual, direct reading scales measuring in both GPM and LPM.

### FEATURES/BENEFITS

- Low installation costs with standard in-line male NPT process connections and 90° elbow fitting for panel mount option
- Heat and chemically resistant polycarbonate body and fittings feature a low cost for high durability
- Textured background on flowmeter bodies enhance scale readability saving time
- Easy to clean bodies yield low maintenance costs
- Adjustable set point indicator allows for easy visual set point indication decreasing costly flow reading error for LFMC, LFMD, LFME & LFMF

### APPLICATIONS

- Chill water flow
- Reverse osmosis systems
- Deionized water systems

MODEL CHART	
Model	Range (GPM Water)
LFMA-01-A2	0.1 to 1 (.5 to 4 LPM)
LFMA-02-A2	0.2 to 2 (1 to 7 LPM)
LFMA-03-A2	0.5 to 5 (1.8 to 18 LPM)
LFMB-04-A2	0.1 to 1 (.5 to 4 LPM)
LFMB-05-A2	0.2 to 2 (1 to 7 LPM)
LFMB-06-A2	0.5 to 5 (1.8 to 18 LPM)

MODEL CHART		
Model	Range (GPM Water)	Process Connection
LFMC-07-A2	0.25 to 2.5 (1 to 10 LPM)	1/2" male NPT
LFMC-08-A2	0.5 to 5 (1.8 to 18 LPM)	1/2" male NPT
LFMC-09-A2	0.8 to 8 (3 to 30 LPM)	1/2" male NPT
LFMD-10-C2	0.8 to 8 (3 to 30 LPM)	3/4" male NPT
LFMD-11-C2	1 to 10 (4 to 40 LPM)	3/4" male NPT
LFME-12-F2	1.2 to 12 (5 to 50 LPM)	1" male NPT
LFME-13-F2	2 to 20 (8 to 80 LPM)	1" male NPT
LFME-14-F2	2.5 to 25 (10 to 100 LPM)	1" male NPT
LFMF-15-I2	2.5 to 25 (10 to 100 LPM)	2" male NPT
LFMF-16-I2	5 to 45 (20 to 180 LPM)	2" male NPT
LFMF-17-I2	7 to 70 (25 to 250 LPM)	2" male NPT

OPTIONS	
Use order code:	Description
NISTCAL-FL1	NIST traceable calibration certificate

ACCESSORIES - LFMA	
Model	Description
A-560	20 mm metric union fittings - ABS
A-566	1/2" male NPT fittings - ABS

### SPECIFICATIONS

**Service:** Water.  
**Wetted Materials:** Body: Polycarbonate; Flange nut: ABS; Float stop: LFMA, LFMB, LFMC: ABS; LFMD, LFME, LFMF: Polypropylene; O-rings: Fluoroelastomer; Rod and float: 316 SS; Connections: 20 mm and 63 mm metric union fittings: ABS; 32 mm and 40 mm metric union fittings: PVC; 1/2" & 3/4" male NPT fittings for LFMA, LFMB, LFMC: ABS; 3/4" male and female NPT fittings for LFMD: PA66 nylon; 1" and 2" male NPT fittings: PA66 nylon.  
**Pressure Limit:** 87 psi (6 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; LFMC: 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; 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:** LFMA: 2 oz (56.7 g); LFMB: 3 oz (85.0 g); LFMC: 4 oz (113.4 g); LFMD: 10 oz (283.5 g); LFME: 15 oz (425.2 g); LFMF: 40 oz (1.1 kg).  
**CAUTION:** Series LFM Flowmeters are for indoor use only or areas without direct sunlight. Polycarbonate is adversely affected by ultraviolet light.

ACCESSORIES - LFMB	
Model	Description
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

ACCESSORIES - LFMC	
Model	Description
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

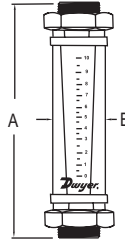
ACCESSORIES - LFMD	
Model	Description
A-563	32 mm metric union fittings - PVC
A-569	3/4" male NPT fittings - nylon
A-572	3/4" female NPT fittings - nylon
A-577	3/4" male NPT with 90° elbow fittings - PVC

ACCESSORIES - LFME	
Model	Description
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

ACCESSORIES - LFMF	
Model	Description
A-565	63 mm metric union fittings - ABS
A-571	2" male NPT fittings - nylon
A-574	2" female NPT fittings - nylon

# VARIABLE AREA FLUOROPOLYMER FLOWMETER

In-Line, Chemically Inert



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]

The **Series VAT Variable Area Fluoropolymer Flowmeter** is ideal for high purity or corrosive liquid applications. This series of flowmeters features a 0 to 10 scale for flow indication. Each unit is individually leak tested to a leak integrity rating of 1 x 10<sup>-7</sup> sccs Helium or better.

**FEATURES/BENEFITS**

- Chemically inert wetted components yield long life even in corrosive liquid applications
- All units are individually leak tested for no additional cost

**APPLICATIONS**

- Chemical injectors
- Deionized water systems

MODEL CHART			
Model		Low Range	
With Valve	Without Valve	Connections	Flow Rate GPH (ml/min)
VAT-311	VAT-301	1/4" female NPT	1.98 (125)
VAT-312	VAT-302	1/4" female NPT	3.91 (250)
VAT-313	VAT-303	1/4" female NPT	6.34 (400)
VAT-314	VAT-304	1/4" female NPT	7.92 (500)
VAT-315	VAT-305	1/4" female NPT	15.85 (1000)
VAT-316	VAT-306	3/8" female NPT	31.69 (2000)
VAT-317	VAT-307	3/8" female NPT	39.62 (2500)
VAT-318	VAT-308	3/8" female NPT	47.54 (3000)
VAT-319	VAT-309	3/8" female NPT	79.23 (5000)

**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:** ±5% FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute).  
**Process Connections:** See chart.  
**Leak Integrity:** 1 x 10<sup>-7</sup> sccs of helium.  
**Scale:** Direct reading.  
**Mounting:** Vertical, in-line.

**MODEL CHART**

Model		High Range	
With Valve	Without Valve	Connections	Flow Rate GPM (L/min)
VAT-6110	VAT-6010	1/2" female NPT	3.43 (13)
VAT-6111	VAT-6011	1/2" female NPT	5.28 (20)
VAT-6112	VAT-6012	3/4" female NPT	7.93 (30)
VAT-6113	VAT-6013	3/4" female NPT	10.57 (40)
VAT-6114	VAT-6014	3/4" female NPT	11.89 (45)

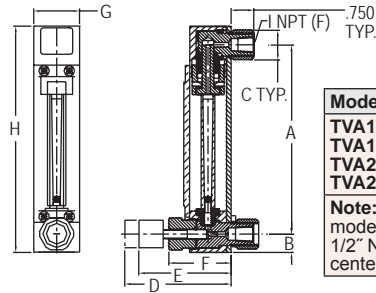
**OPTIONS**

Use order code:	Description
NISTCAL-FL1	NIST traceable calibration certificate

SERIES TVA

# ALL FLUOROPOLYMER FLOWMETERS

75 mm and 125 mm, 10:1 Turndown, Back Connect, Corrosive Resistant



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

**Note:** 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).

The **Series TVA All Fluoropolymer Flowmeters** are ideal for high purity or corrosive liquid applications. This series of flowmeters features a 0 to 10 scale graduations denoting a discrete flow rate.

**FEATURES/BENEFITS**

- Chemically inert wetted components yield long life even in corrosive liquid applications
- Low installation costs with standard back process connections for easy panel mounting

**APPLICATIONS**

- Chemical injectors
- Deionized water systems

MODEL CHART				
Model		Low Range		
With Valve	Without Valve	Length	Connections	Flow Rate Water 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)

**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:** ±5% FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute).  
**Repeatability:** ±0.25%.  
**Leak Integrity:** 1 x 10<sup>-7</sup> sccs of helium.  
**Scales:** Direct reading, 75 mm or 125 mm lengths.  
**Turn-down Ratio:** 10:1.  
**Mounting:** Vertical.

**MODEL CHART**

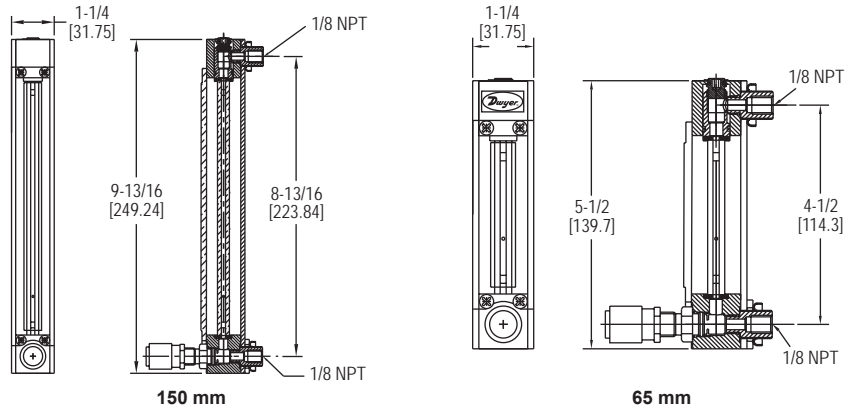
Model		High Range		
With Valve	Without Valve	Length	Connections	Flow Rate Water GPM (L/min)
TVA22110	TVA22010	125 mm	1/2" female NPT	3.43 (13)
TVA24112	TVA24012	125 mm	3/4" female NPT	7.93 (30)
TVA24114	TVA24014	125 mm	3/4" female NPT	11.9 (45)

**OPTIONS**

Use order code:	Description
NISTCAL-FL1	NIST traceable calibration certificate

# VARIABLE AREA GLASS FLOWMETERS

65 mm and 150 mm, ±2% FS Accuracy, Interchangeable Flowtubes, PTFE Options, Universal mm Scale



Panel mounting: Drill two 5/8" dia. holes at 4.5" apart for 65 mm models and 8.812" apart for 150 mm models (center-to-center).

The Series VA Variable Area Glass Flowmeters are designed with easy to read universal mm scale and supplied with correlation charts containing calibration data for air and water.

### FEATURES/BENEFITS

- Permanently fused ceramic scale with vertical locator line reduces parallax and eye fatigue saving time
- Long operating life with thick polycarbonate front shield that protects tube from breakage and serves as a magnifying lens to enhance reading resolution
- Standard 6-turn needle valve for flow rate control eliminating the need for a separate valve reducing cost
- No additional installation required with optional acrylic tripod base which allows for self-standing bench mounting
- High precision metering valves with non-rising stems are available for high sensitivity control and resolution for very low flow rate

### APPLICATIONS

- Gas or liquid metering
- Chemical processing
- Semiconductor systems
- Water and air pollution analysis systems
- Laboratory systems

MODEL CHART - METAL 65 MM SCALE					
Model				Max. Flow Rate	
Aluminum	SS	Brass	Float	Air SCFH (ml/min)	Water 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)
VA10423	VA12423	VA1349	Glass	2.29 (1081)	0.329 (20.8)
VA10424	VA12424	-	SS	4.51 (2129)	0.930 (58.7)
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 CHART - METAL 150 MM SCALE					
Model				Max. Flow Rate	
Aluminum	SS	Brass	Float	Air SCFH (ml/min)	Water 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)

OPTIONS	
Use order code:	Description
NISTCAL-FL1*	NIST traceable calibration certificate
*Specify media type (air or water) for NISTCAL option	

### SPECIFICATIONS

**Service:** Compatible gases or liquids.  
**Wetted Materials:** Flowtube: Borosilicate glass; Floats: Glass or SS (sapphire, Carboloy and tantalum are optional); Float stops: PTFE; End fittings: Anodized aluminum, 316 SS, brass or PTFE; Packings: Fluoroelastomer, none on VAX5XX models; O-rings: Buna-N on aluminum models and brass models, fluoroelastomer on SS models, PTFE on VAX5XX models.  
**Temperature Limits:** 250°F (121°C); VAX5XX: -15 to 150°F (-26 to 65°C).  
**Pressure Limits:** 200 psig (13.8 bar); VAX5XX: 100 psig (6.7 bar).  
**Accuracy:** ±2% FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute); VA1043, VA1243, VA1343, VA25425, VA25025: ±5% FS @ 70°F (21.1°C) and 14.7 psia (1 @ absolute).  
**Repeatability:** ±0.25% FS.  
**Leak Rate:** 1 x 10<sup>-7</sup> sccs of helium.  
**Scales:** Universal 65 mm or 150 mm with correlation charts.  
**Turn-Down Ratio:** 10:1.  
**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, PTFE on VAX5XX models.

MODEL CHART - PTFE 65 MM SCALE				
Model			Max. Flow Rate	
With Valve	Without Valve	Float	Air SCFH (ml/min)	Water 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)

Note: VAX5XX models indicate PTFE units.

MODEL CHART - PTFE 150 MM SCALE				
Model			Max. Flow Rate	
With Valve	Without Valve	Float	Air SCFH (ml/min)	Water 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)

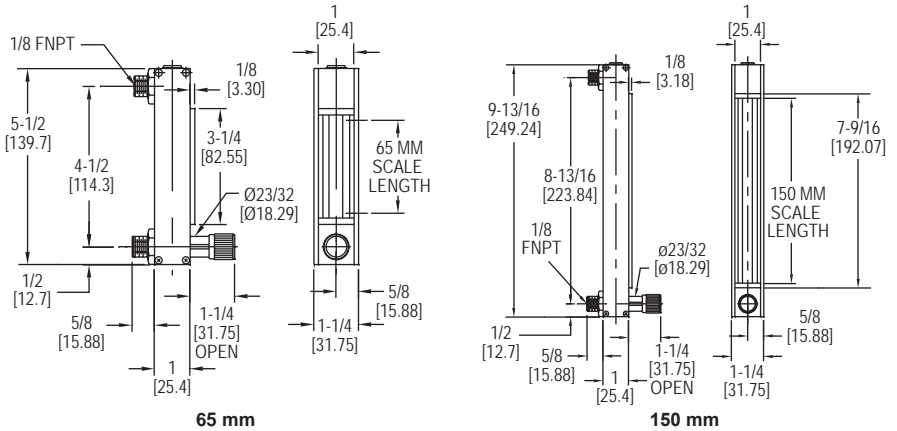
Note: VAX5XX models indicate PTFE units.

ACCESSORIES	
Model	Description
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

USA: California Proposition 65  
 ⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

# DIRECT READING GLASS FLOWMETERS

65 mm and 150 mm, Interchangeable Flowtubes, Direct Reading Scales



Panel mounting: Drill two 5/8" dia. holes at 4.5" apart for 65mm models and 8.812" apart for 150 mm models (center-to-center).

The **Series DR Direct Reading Glass Flowmeters** are ideal for the direct flow measurement of air, water, and other commonly used gases. These flowmeters are designed with direct read scales with no need for correlation charts. They feature borosilicate glass tubes in 150 mm or 65 mm scales with aluminum and SS metering valve options.

**FEATURES/BENEFITS**

- Permanently fused ceramic scale with vertical locator line, reflective lens background and 1.5 X magnification lens reduces parallax and eye fatigue saving time
- Long operating life with thick polycarbonate front shield that protects tube from breakage and serves as a magnifying lens to enhance reading resolution
- Optional needle valve for flow rate control eliminating the need for a separate valve reducing cost
- Increased protection with included safety blow-out back panel for added safety

**APPLICATIONS**

- Gas or liquid metering
- Paper manufacturing
- Chemical processing
- Semiconductor systems
- Water and air pollution analysis systems
- Laboratory systems

**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 SS 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).

Flowmeters, Variable Area & In-Line

MODEL CHART - 65 MM SCALE				
Model Without Valve		Model With Valve		Max. Flow Rate
Aluminum	SS	Aluminum	SS	Air SCFH (SCCM)
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†)

Note: Add suffix "M" for metric scale. \*Denotes glass float.  
 †Metric models use ccm as unit of measure for water & LPM for air.

MODEL CHART - 65 MM SCALE				
Model Without Valve		Model With Valve		Max. Flow Rate
Aluminum	SS	Aluminum	SS	Air SCFH (L/min)
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)

Note: Add suffix "M" for metric scale. \*Denotes glass float.

MODEL CHART - 65 MM SCALE				
Model Without Valve		Model With Valve		Max. Flow Rate
Aluminum	SS	Aluminum	SS	Water GPH (SCCM)
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)

Note: Add suffix "M" for metric scale. \*Denotes glass float.

MODEL CHART - 150 MM SCALE				
Model Without Valve		Model With Valve		Max. Flow Rate
Aluminum	SS	Aluminum	SS	Air SCFH (SCCM)
DR20032	DR22032	DR20432	DR22432	0.33 (160)
DR20082	DR22082	DR20482	DR22482	0.54 (270)
DR200132	DR220132	DR204132	DR224132	2 (840)

Note: Add suffix "M" for metric scale.

MODEL CHART - 150 MM SCALE				
Model Without Valve		Model With Valve		Max. Flow Rate
Aluminum	SS	Aluminum	SS	Air SCFH (L/min)
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)

Note: Add suffix "M" for metric scale.

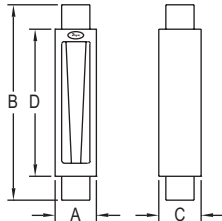
MODEL CHART - 150 MM SCALE				
Model Without Valve		Model With Valve		Max. Flow Rate
Aluminum	SS	Aluminum	SS	Water GPH (SCCM)
DR200432	DR220432	DR204432	DR224432	0.05 (3.2)
DR200482	DR220482	DR204482	DR224482	0.075 (4.6)
DR200532	DR220532	DR204532	DR224532	0.34 (21)
DR200582	DR220582	DR204582	DR224582	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)

Note: Add suffix "M" for metric scale. \*\*Not available in metric scale.

OPTIONS	
Use order code:	Description
NISTCAL-FL1	NIST traceable calibration certificate

# INDUSTRIAL DIRECT READING FLOWMETERS

Air/Water Direct Reading Scale, 304 SS Protective Shield



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]

The **Series IF Industrial Direct Reading Flowmeters** are flowmeters that directly measure flow rates up to 116 GPM (439 LPM) for water and 250 SCFM (7080 LPM) for air service.

**FEATURES/BENEFITS**

- Direct read scales with no need for correlation charts saves time
- Detachable, clear 3/16" thick polycarbonate front shield provides protection at maximum rated temperature and pressure

**APPLICATIONS**

- Gas or liquid metering
- Industrial pneumatic or hydraulic systems

**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 and 6.

**Accuracy:** ±3% of FS.  
**Repeatability:** ±0.5% of FS.  
**Turn-Down Ratio:** 10:1.  
**Scale:** Dual scale GPM and SCFM.  
**Process Connection:** See table.  
**Mounting:** Vertical.  
**Front Shield:** Polycarbonate.  
**Side Panels:** 304 SS.

**MODEL CHART**

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

**OPTIONS**

Use order code:	Description
NISTCAL-FL1	NIST traceable calibration certificate

**SERIES RSF**

# ROTATABLE SCALE FLOWMETERS

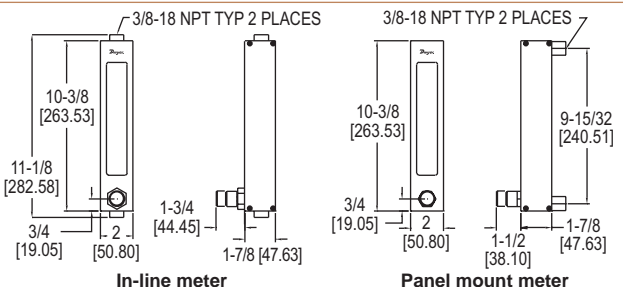
Dual, Rotatable Direct Reading Scales for Air and Water



In-line meter



Panel mount meter



The **Series RSF Rotatable Scale Flowmeters** are ideal for the direct flow measurement of air, water, and other commonly used gases. These flowmeters are designed with direct read scales with no need for correlation charts and graduations are marked on a rotating, polycarbonate tube shield. They feature borosilicate glass tubes with brass and SS metering valve options.

**FEATURES/BENEFITS**

- Reflective lens background and 1.5 X magnification lens reduces parallax and eye fatigue saving time and allowing for a more accurate reading
- Long operating life with thick polycarbonate front shield that protects tube from breakage and serves as a magnifying lens to enhance reading resolution
- Increased protection with included safety blow-out back panel for added safety in the event of breakage

**APPLICATIONS**

- Gas or liquid metering
- Water and air pollution analysis systems

**SPECIFICATIONS**

**Service:** Compatible gases or liquids.  
**Wetted Materials:** Flowtube: Borosilicate glass; Float: Brass/SS models: 316 SS; PTFE models: PTFE; 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 9.469" (240.5 mm) apart (for panel mount meters only).  
**Valve:** 6-turn needle (standard on models indicating "with valve").

**MODEL CHART**

Brass & SS Vertical In-Line Meters					Brass & SS Panel Mount Meters						
Model Without Valve		Model With Valve		Max. Flow Rate		Model Without Valve		Model With Valve		Max. Flow Rate	
Brass	SS	Brass	SS	Air SCFM (SLPM)	Water GPM (LPM)	Brass	SS	Brass	SS	Air SCFM (SLPM)	Water GPM (LPM)
RSF011	RSF111	RSF011V	RSF111V	5 (140)	1.2 (4)	RSF021	RSF121	RSF021V	RSF121V	5 (140)	1.2 (4)
RSF012	RSF112	RSF012V	RSF112V	10 (280)	2 (8)	RSF022	RSF122	RSF022V	RSF122V	10 (280)	2 (8)
RSF013	RSF113	RSF013V	RSF113V	15 (425)	3 (11.5)	RSF023	RSF123	RSF023V	RSF123V	15 (425)	3 (11.5)
RSF014	RSF114	RSF014V	RSF114V	20 (575)	4 (15)	RSF024	RSF124	RSF024V	RSF124V	20 (575)	4 (15)
RSF015	RSF115	RSF015V	RSF115V	30 (900)	5 (20)	RSF025	RSF125	RSF025V	RSF125V	30 (900)	5 (20)

Note: For PTFE models select RSF2XX (not available for all models).

**OPTIONS**

Use order code:	Description
NISTCAL-FL1	NIST traceable calibration certificate

USA: California Proposition 65

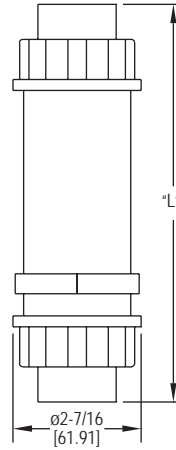
⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov



SERIES HFPC & HFPS

# PLASTIC FLOWMETERS

Mount in any Position, Corrosive Resistant



Meter Size	DIM "L"
1/2" male	7-11/16 [195.26]
1/2" female	7-5/32 [181.76]
3/4" male	8-1/32 [204.00]
3/4" female	7-9/16 [192.09]
1" male	8-3/32 [205.58]
1" female	7-9/16 [192.09]

The **Series HFPC & HFPS Plastic Flowmeters** are a series of clear body, in-line flowmeters. This Series consists of the HFPC polycarbonate body flowmeter and the HFPS polysulfone body flowmeter. These flowmeters have dual scales measuring both in GPM and LPM.

**FEATURES/BENEFITS**

- Clear body allows for visual inspection of the fluid conditions and immediate problem detection
- Reduce cost with multi position mounting to accommodate direction of flow
- Rugged construction allows for high pressure and temperature rating for long operation life
- Injection molded, polycarbonate or polysulfone bodies yield great repeatability

**APPLICATIONS**

- Chemical processing
- Pulp and paper
- Process control
- Fluid power
- Hydraulic flow
- Heating loop flow

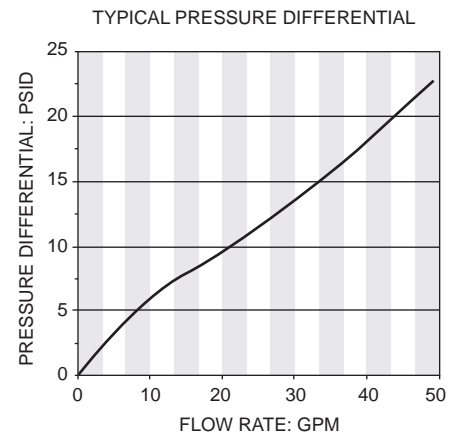
**SPECIFICATIONS**

**Service:** Compatible liquids.  
**Wetted Materials:** HFPC: Polycarbonate body, Buna-N seals, SS spring, Polysulfone connections; HFPS: Polysulfone body, Buna-N seals, SS 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).  
**CAUTION:** Series HFPC & HFPS Flowmeters are for indoor use only or areas without direct sunlight. Polycarbonate & polysulfone are adversely affected by ultraviolet light.

Flowmeters, Variable Area & In-Line

MODEL CHART						
Example	HF	PC	-1	-1	-BC	HFPC-1-1-BC
Series	HF					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 to 5 GPM (1 to 19 LPM)
			2			1 to 10 GPM (3.8 to 38 LPM)
			3			2 to 15 GPM (7.5 to 55 LPM)
			4			3 to 30 GPM (11 to 113 LPM)
Option					BC	Brass connections

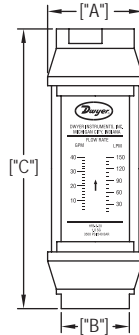
OPTIONS	
Use order code:	Description
NISTCAL-FL1	NIST traceable calibration certificate



USA: California Proposition 65  
 ⚠️WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

# IN-LINE FLOW MONITOR

For Air, Water or Caustic Fluids,  $\pm 2\%$  FS, Unrestricted Mounting, High Temperature and Pressure Options



Valve Size	"A" Reference	"B" Wrench Flats	"C" Reference
1/8 NPT	1.25	0.875	4.813
1/4 to 1/2 NPT	1.875	1.250	6.562
3/4 to 1 NPT	2.375	1.750	7.125
1-1/4 to 1-1/2 NPT	3.500	2.250	10.125
2 NPT	3.500	2.250	12.625

The **Series HF In-Line Flow Monitor** is ruggedly constructed and ideal for direct measurement for a range of compatible gases, oil or water based liquids. This Series is designed based on a floating orifice disk and variable area flow measurement. Flowing media forces linear motion of the orifice disk and a ring shaped magnet which ride on a tapered center shaft. The transfer magnet drives a clearly visible magnet follower located outside the flow tube, and a ring on the magnet follower indicates flow rate on the direct reading scale.

### FEATURES/BENEFITS

- 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
- Increased application versatility with no inlet or outlet straight plumbing requirement and can be mounted horizontally, vertically, or inverted
- Rugged construction allows for high pressure and temperature rating for long operation life

### APPLICATIONS

- Setting pressure relief valves
- Fluid handling equipment
- Detecting low-flow rates for lubricating liquids
- Pulp and paper
- Industrial maintenance
- Fluid power
- Heating loop flow

MODEL CHART - BRASS BODY FOR WATER BASED FLUIDS (NON-STEAM)		
Model	Connection Size	Range: Water GPM (LPM)*
HFB-2-05	1/2" female NPT	0.5 to 5.0 (1 to 19)
HFB-3-15	3/4" female NPT	2 to 15 (7.5 to 55)
HFB-3-20	3/4" female NPT	2 to 20 (7.5 to 75)
HFB-4-35	1" female NPT	5 to 35 (19 to 130)
HFB-5-50	1-1/2" female NPT	5 to 50 (19 to 189)
HFB-5-100	1-1/2" female NPT	10 to 100 (38 to 379)
HFB-6-75	2" female NPT	8 to 75 (31 to 284)
HFB-6-150	2" female NPT	20 to 150 (76 to 568)

\*Dual scale range

MODEL CHART - ALUMINUM, BRASS, AND STAINLESS STEEL FOR AIR AND OTHER NON-CORROSIVE GASES				
Aluminum Model	Brass Model	Stainless Steel Model	Connection (NPT female, dry seal)	Range: SCFM (LPS)*
HFA-1-001	HFB-1-001	HFS-1-001	1/4"	1.5 to 12 (0.5 to 5.5)
HFA-1-002	HFB-1-002	HFS-1-002	1/4"	4 to 23 (2 to 10)
HFA-1-003	HFB-1-003	HFS-1-003	1/4"	5 to 50 (2.5 to 25)
HFA-1-004	HFB-1-004	HFS-1-004	1/4"	10 to 100 (5 to 45)
HFA-8-001	HFB-8-001	HFS-8-001	3/8"	1.5 to 12 (.5 to 5.5)
HFA-8-002	HFB-8-002	HFS-8-002	3/8"	4 to 23 (2 to 10)
HFA-8-003	HFB-8-003	HFS-8-003	3/8"	5 to 50 (2.5 to 25)
HFA-8-004	HFB-8-004	HFS-8-004	3/8"	10 to 100 (5 to 45)
HFA-2-001	HFB-2-001	HFS-2-001	1/2"	1.5 to 12 (.5 to 5.5)
HFA-2-002	HFB-2-002	HFS-2-002	1/2"	4 to 23 (2 to 10)
HFA-2-003	HFB-2-003	HFS-2-003	1/2"	5 to 50 (2.5 to 25)
HFA-2-004	HFB-2-004	HFS-2-004	1/2"	10 to 100 (5 to 45)
HFA-3-003	HFB-3-003	HFS-3-003	3/4"	5 to 50 (3 to 23)
HFA-3-004	HFB-3-004	HFS-3-004	3/4"	10 to 100 (4 to 48)
HFA-3-005	HFB-3-005	HFS-3-005	3/4"	15 to 150 (8 to 56)
HFA-3-006	HFB-3-006	HFS-3-006	3/4"	30 to 330 (20 to 150)
HFA-4-003	HFB-4-003	HFS-4-003	1"	5 to 50 (3 to 23)
HFA-4-004	HFB-4-004	HFS-4-004	1"	10 to 100 (4 to 48)
HFA-4-005	HFB-4-005	HFS-4-005	1"	15 to 150 (8 to 56)
HFA-4-006	HFB-4-006	HFS-4-006	1"	30 to 330 (20 to 150)
HFA-9-007	HFB-9-007	HFS-9-007	1-1/4"	30 to 470 (15 to 220)
HFA-9-008	HFB-9-008	HFS-9-008	1-1/4"	150 to 900 (75 to 425)
HFA-5-007	HFB-5-007	HFS-5-007	1-1/2"	30 to 470 (15 to 220)
HFA-5-008	HFB-5-008	HFS-5-008	1-1/2"	150 to 900 (75 to 425)

\*Dual scale range

### SPECIFICATIONS

**Service:** Compatible gases or liquids.

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

**Maximum Viscosity:** 500 SSU.

**Temperature Limits:** 240°F (116°C).

**Pressure Limits:** HFA, HFB, HFL and HFH models: 600 psig (41 bar) for air and gas, 3500 psig (241 bar) for liquids; HFS model: 1000 psig (70 bar) for air and gas, 6000 psig (413 bar) for liquids.

**Accuracy:**  $\pm 2\%$  FS.

**Repeatability:**  $\pm 1\%$  of FS.

**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).

**Note:** Series HF monitors are recommended for use with system filtration of at least 74 microns or a 200 mesh screen

MODEL CHART - ALUMINUM BODY FOR OIL BASED FLUIDS		
Model	Connection Size	Range: Oil GPM (LPM)*
HFL-2-05	1/2" female NPT	0.5 to 5.0 (1 to 19)
HFL-4-25	1" female NPT	2 to 25 (7.5 to 95)

\*Dual scale range

MODEL CHART - 304 SS BODY FOR HIGH-PRESSURE FLUIDS		
Model	Connection Size	Range: Water GPM (LPM)*
HFS-2-02	1/2" female NPT	0.2 to 2.0 (0.75 to 7.5)
HFS-2-10	1/2" female NPT	0.5 to 10 (1.9 to 38)

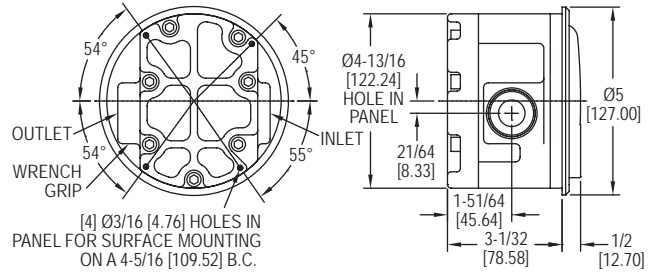
\*Dual scale range



SERIES RMV

# RATE-MASTER® DIAL-TYPE FLOWMETER

Brass Body, Three Ranges to 20 GPM Water, Shatterproof Construction



The **Series RMV Rate-Master® Dial-Type Flowmeter** measures higher water flow rates with  $\pm 2\%$  of full-scale accuracy at an affordable price. 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.

**FEATURES/BENEFITS**

- Rugged forged brass housing yields great compatibility and strength, allowing the unit to withstand system pressures to 1000 psig (68.9 bar)
- Shatter proof construction, unlike glass tube variable area flowmeters, yields long operation life

**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 operations
- Calculate required fill or drain times for tanks, water towers

OPTIONS	
To order add suffix:	Description
-NIST	NIST traceable calibration certificate
<b>Example:</b> RMV-1-3-NIST	

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

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

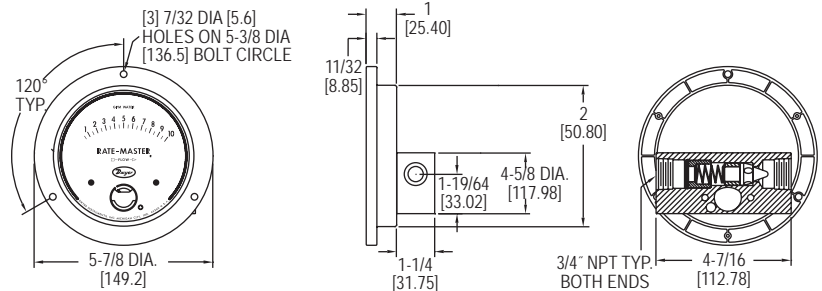
USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

SERIES RMVII

# RATE-MASTER® DIAL-TYPE FLOWMETER

For Panel Mounting, Three Ranges to 10 GPM Water, High Pressure Limits



\*FITS IN ANSI STANDARD 4.940 [125.5] PANEL CUTOUT

The **Series RMVII Rate-Master® Dial-Type Flowmeter** consists of a machined brass meter body which is ideally suited for water flows with  $\pm 5\%$  of full-scale accuracy. Body design fits standard 4-1/2" mounting hole layouts per ANSI B40.1. Inlet and outlet threads are standard 3/4" female NPT.

**FEATURES/BENEFITS**

- Unique construction fully isolates flowing media from gage front for leak-proof operation at pressures up to 3000 psig (206.7 bar)
- Target-type design combined with a damage resistant magnetic linkage, drive a pointer over easy-to-read litho scale
- Shatter proof construction, unlike glass tube variable area flowmeters, yields long operation life

**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 operations
- Calculate required fill or drain times for tanks, water towers

OPTIONS	
To order add suffix:	Description
-NIST	NIST traceable calibration certificate
<b>Example:</b> RMVII-1-NIST	

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

MODEL CHART						
Model	Range GPM Water	Range SCFM	Range LPM Air	Range GPM Oil	Range LPM Oil	
RMVII-1	0 to 3	-	-	-	-	
RMVII-3	0 to 5	-	-	-	-	
RMVII-6	0 to 10	-	-	-	-	
RMVII-10	-	0 to 10	0 to 280	-	-	
RMVII-12	-	0 to 30	0 to 850	-	-	
RMVII-14	-	0 to 50	0 to 1400	-	-	
RMVII-20	-	-	-	0 to 2.2	0 to 8	
RMVII-21	-	-	-	0 to 4.0	0 to 15	
RMVII-22	-	-	-	0 to 8.5	0 to 32	

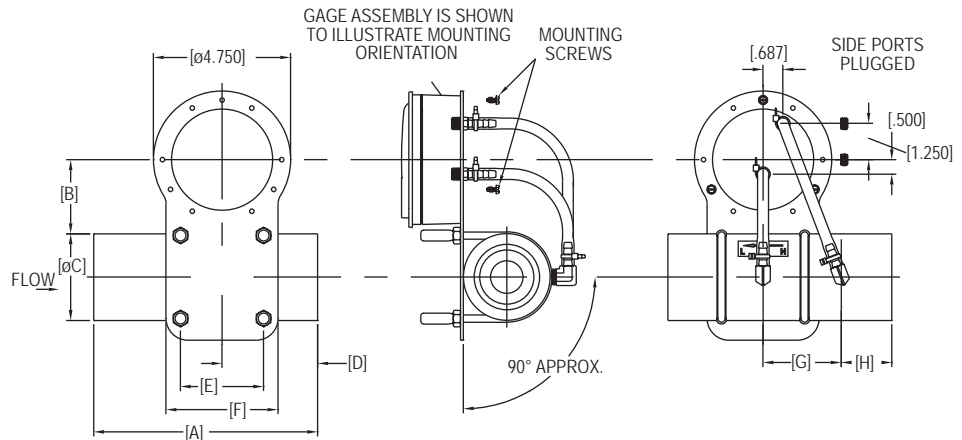
USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov



# VENTURI FLOWMETER WITH MAGNEHELIC® GAGE

±2.5% Accuracy, Dual Scale in SCFM and in w.c.



VFLO Option	Line Size	A	B	ØC	D	E	F	G	H	J	K
XXXX-XXVF1	1" FNPT	4.500	2.687	2	2.015	2.125	3.125	1.359	1.125	4.625	6.375
XXXX-XXVF2	1.5" FNPT	6	2.562	2.500	2.625	2.375	3.375	2	1.375	5.250	7.125
XXXX-XXVF3	2" FNPT	7.750	2.562	3	3.312	2.875	3.875	2.703	1.750	5.750	7.875
XXXX-XXVF4	3" FNPT	11	2.734	4	4.625	4	5.500	4	2.375	7	9.625
XXXX-XXVF5	4" FNPT	14.500	2.734	5.000	5.172	5.000	6.500	5.328	3.000	9.250	11.500

The Series VFLO Venturi Flowmeter with Magnehelic® Gage is fabricated from aluminum and has a gradual Venturi profile to reduce pressure losses through the meter. Flowmeter can be used in a vertical or horizontal position just by rotating the Magnehelic® gage. The Magnehelic® gage provides a large, clear and accurate display of your differential pressure reading. Each meter is calibrated at standard atmospheric conditions. The dual scale reads in SCFM and in w.c. The meter is supplied with easy to read reference charts for various flow conditions. It is available in line sizes from 1" to 4" and can handle vacuum and pressure applications.

## FEATURES/BENEFITS

- Gradual Venturi profile reduces pressure losses through meter helping to insure a more accurate measurement to meet measurement specifications
- Easy to read gage through undistorted plastic face permits viewing from far away
- Patented design provides quick response to pressure changes means no delay in assessing critical situations
- Durable and rugged housing and high-quality components combined provides long-service life and minimized down-time

## APPLICATIONS

- Filter monitoring
- Air velocity with Dwyer pitot tube
- Blower vacuum monitoring
- Fan pressure indication
- Duct, room or building pressures
- Clean room positive pressure indication

## Series 2000, Magnehelic® Differential Pressure Gage

To Create Venturi Model, add option from chart to end of 2000.

**Example:** 2000-10VF1 for 10 in w.c. and 20 SCFM of air scale with 1" Venturi flow tube

## ACCESSORIES

Model	Description
MVB-LM1	Mini brass ball valve with lever handle. 1/8" F X 1/8" MNPT
MVB-TM1	Mini brass valve with tee handle. 1/8" M X 1/8" FNPT
MVB-WM1	Mini brass ball valve with wedge handle. 1/8" M X 1/8" FNPT

## SPECIFICATIONS

**Service:** Air and non-combustible, compatible gases.  
**Wetted Materials:** Aluminum, silicone, acrylic, polycarbonate, high carbon steel, low carbon steel, brass, paper, acrylic paint, enamel paint, alkyd coating, nickel plate, zinc plate, helisel FC, 300 series stainless steel, PTFE, Loctite® AV sealant, commercial black rubber, neoprene, samarium cobalt, nickel alloy steel cover, beryllium copper.  
**Housing:** Die cast aluminum case and bezel, with acrylic cover. Exterior finish is coated gray to withstand 168 hour salt spray corrosion test.  
**Accuracy:** ±2.5% FS.

**Pressure Limits:** -20" Hg to 15 psig (-0.677 bar to 1.034 bar); MP option: 35 psig (2.41 bar). For applications with high cycle rate within gage total pressure rating, next higher rating is recommended.  
**Overpressure:** Relief plug opens at approximately 25 psig (1.72 kPa).  
**Temperature Limits:** 20 to 140°F (-6.67 to 60°C).  
**Size:** 4" (101.6 mm) diameter dial face.  
**Mounting Orientation:** Diaphragm in vertical position. Consult factory for other position orientations.  
**Process Connection:** Female NPT of nominal line size. (See chart).  
**Weight:** Gage only: 1 lb 2 oz (510 g), MP and HP 2 lb 2 oz (963 g); Venturi: See chart.

## OPTIONS

Option	Range	Line Size	Weight (Not Including Gage) lb (kg)
2000-10VF1	0 to 10 in w.c. and 0 to 20 SCFM air	1"	3 (1.36)
2000-20VF1	0 to 20 in w.c. and 0 to 30 SCFM air	1"	3 (1.36)
2000-40VF1	0 to 40 in w.c. and 0 to 40 SCFM air	1"	3 (1.36)
2000-10VF2	0 to 10 in w.c. and 0 to 50 SCFM air	1-1/2"	4.5 (2.04)
2000-20VF2	0 to 20 in w.c. and 0 to 70 SCFM air	1-1/2"	4.5 (2.04)
2000-40VF2	0 to 40 in w.c. and 0 to 100 SCFM air	1-1/2"	4.5 (2.04)
2000-10VF3	0 to 10 in w.c. and 0 to 85 SCFM air	2"	6 (2.72)
2000-20VF3	0 to 20 in w.c. and 0 to 120 SCFM air	2"	6 (2.72)
2000-40VF3	0 to 40 in w.c. and 0 to 160 SCFM air	2"	6 (2.72)
2000-10VF4	0 to 10 in w.c. and 0 to 200 SCFM air	3"	11 (4.99)
2000-20VF4	0 to 20 in w.c. and 0 to 290 SCFM air	3"	11 (4.99)
2000-40VF4	0 to 40 in w.c. and 0 to 395 SCFM air	3"	11 (4.99)
2000-10VF5	0 to 10 in w.c. and 0 to 350 SCFM air	4"	18 (8.16)
2000-20VF5	0 to 20 in w.c. and 0 to 500 SCFM air	4"	18 (8.16)
2000-40VF5	0 to 40 in w.c. and 0 to 675 SCFM air	4"	18 (8.16)

\*\*Venturi price must be added to Series 2000 Magnehelic® gage price

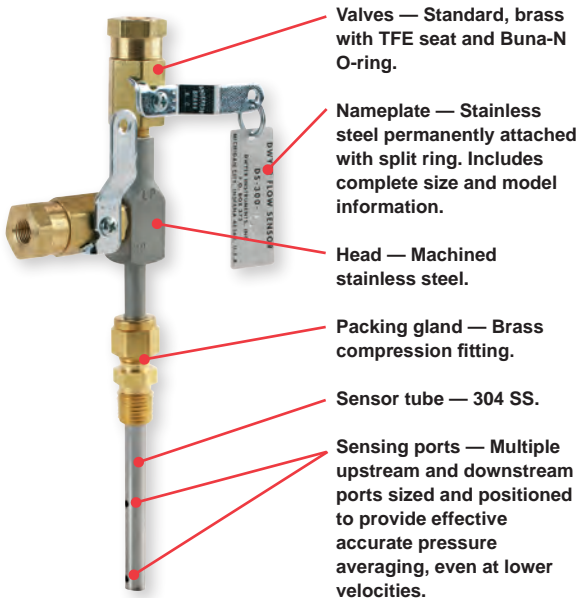
USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

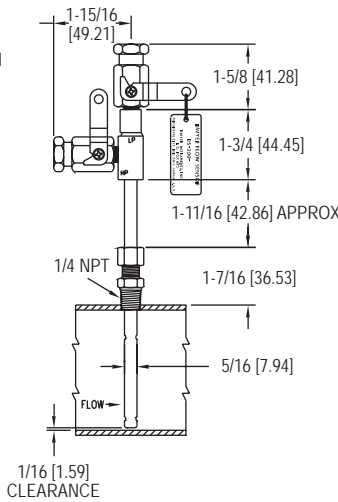
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# IN-LINE FLOW SENSORS

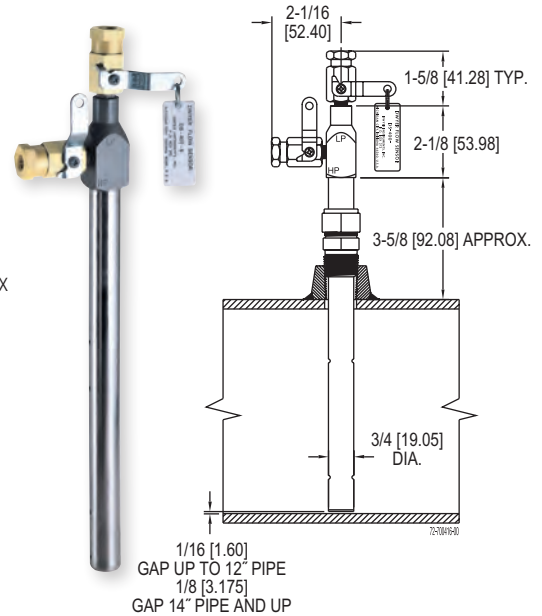
Use with the Dwyer® Differential Pressure Gages or Transmitters



- Valves — Standard, brass with TFE seat and Buna-N O-ring.
- Nameplate — Stainless steel permanently attached with split ring. Includes complete size and model information.
- Head — Machined stainless steel.
- Packing gland — Brass compression fitting.
- Sensor tube — 304 SS.
- Sensing ports — Multiple upstream and downstream ports sized and positioned to provide effective accurate pressure averaging, even at lower velocities.



Series DS-300



Large 3/4 inch diameter for extra strength in lengths to 24 inches

Series DS-400

The **Series DS In-Line Flow Sensors** are two Series of averaging Pitot tubes for compatible gases and liquids that provide accurate and convenient flow rate sensing, for schedule 40 pipe, when purchased with suitable differential pressure gage with appropriate range. The Series DS-300 Averaging Flow Sensors are designed to be inserted in the pipeline through a compression fitting and available for pipe sizes from 1 to 10" (2.5 to 25.4 cm). Accessories include adapters with 1/4" SAE 45° flared ends compatible with hoses supplied with the Model A-471 Portable Capsuhelic® Gage Kit. The Series DS-400 Averaging Flow Sensors are designed for insertion lengths up to 24" (61 cm) and include a pair of 1/8" NPT x 1/4" SAE 45° flared adapters which are compatible with hoses used in the Model A-471 Portable Capsuhelic® Gage Kit. The 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 (not included).

**FEATURES/BENEFITS**

- Multiple sensing point measurement and built-in averaging capability eliminates the need for "traversing" the flowing stream with single point velocity pressure measurement saving time
- Extremely reliable, proven technology, Pitot tubes, have been used in flow measurement for years
- All models include convenient and quick-acting quarter-turn ball valves to isolate the sensor for zeroing with 1/8" female NPT valve assembly process connections.
- Furnished with instrument shut-off valves on both pressure connections with 1/8" female NPT connections 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
- The Series 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
- Economical flow indication when used with appropriate differential pressure gage
- Rugged construction yields, non-clogging, stable design

**SPECIFICATIONS**

- Service:** Compatible gases or liquids.
- Wetted Materials:** Sensor tube: 304 SS; Compression fitting: brass.
- Temperature Limit:** 200°F (93.3°C).
- Pressure Limit:** 200 psig (13.78 bar) at 200°F (93.3°C).
- Pipe Sizes:** DS-300: 1 to 10" (2.5 to 25.4 cm); DS-400: 6 to 24" (15.2 to 61 cm).
- Process Connections:** DS-300: 1/4" male NPT compression fitting included; DS-400: 3/4" male NPT compression fitting included.
- Piping Connections:** DS-300: 1/8" female NPT; optional 1/8" female NPT x 1/4" SAE 45 flared adapter sold separately; DS-400: 1/8" female NPT with 1/8" female NPT x 1/4" SAE 45 flared adapters include.
- Weights:** Consult factory.

**APPLICATIONS**

- Remediation
- Natural, flare, flue, stack gas
- Boiler feedwater
- Cooling water
- Superheated, saturated, or geothermal steam
- Combustion or compressed air
- Oil flow monitoring

# IN-LINE FLOW SENSORS

Use with the Dwyer® Differential Pressure Gages or Transmitters

## 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.

MODEL CHART			
Model	Description	Model	Description
DS-300-1"	1" pipe size	DS-400-6"	6" pipe size
DS-300-1-1/4"	1-1/4" pipe size	DS-400-8"	8" pipe size
DS-300-1-1/2"	1-1/2" pipe size	DS-400-10"	10" pipe size
DS-300-2"	2" pipe size	DS-400-12"	12" pipe size
DS-300-2-1/2"	2-1/2" pipe size	DS-400-14"	14" pipe size
DS-300-3"	3" pipe size	DS-400-16"	16" pipe size
DS-300-4"	4" pipe size	DS-400-18"	18" pipe size
DS-300-6"	6" pipe size	DS-400-20"	20" pipe size
DS-300-8"	8" pipe size	DS-400-24"	24" pipe size
DS-300-10"	10" pipe size		

OPTIONS	
To order add suffix:	Description
-LV	DS-300 or DS-400 less valves



-LV option

RANGE CHART		Full Range Flows by Pipe Size (Approximate)									
Gage Range (in w.c.)	Media @ 70°F	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
2	Air @ 14.7 PSIA (SCFM)	19.0	33.0	42.0	65.0	113	183	330	760	1340	2130
2	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
5	Air @ 14.7 PSIA (SCFM)	30.0	51.0	66.0	118.0	178	289	510	1200	2150	3400
5	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
10	Air @ 14.7 PSIA (SCFM)	41.0	72.0	93.0	163.0	250	410	725	1690	3040	4860
10	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
25	Air @ 14.7 PSIA (SCFM)	63.0	112.0	155.0	255.0	390	640	1130	2630	4860	7700
25	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	
50	Air @ 14.7 PSIA (SCFM)	90.0	161.0	205.0	360.0	560	900	1600	3700	6400	
50	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		
100	Air @ 14.7 PSIA (SCFM)	135.0	230.0	300.0	505.0	800	1290	2290	5000		
100	Air @ 100 PSIG (SCFM)	370.0	660.0	870.0	1500.0	2300	3600	6500	15000		

ACCESSORIES	
Model	Description
A-160	Threaded branch connection, 3/8" NPT, forged steel, 3000 psi
A-161	Brass bushing, 1/4" x 3/8"
A-471	Portable kit. 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. ●
631B	Capsuhelic® wet/wet differential pressure transmitter. Low pressure transmitter for use with DS-300/400 flow sensors. Use Series 631B Capsuhelic® wet/wet differential pressure transmitter.



Capsuhelic® gage shown installed in A-471 portable kit



Series 631B

USA: California Proposition 65  
 ⚠️WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

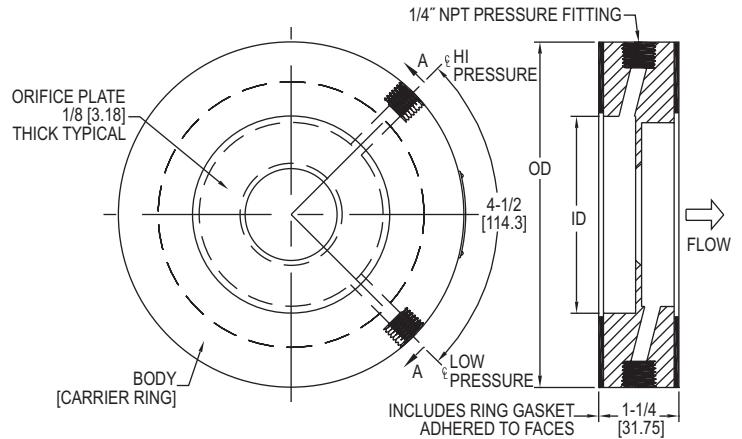
● See page 31 (Series 4000)

**Dwyer**

SERIES OP, PE &amp; TE

**ORIFICE PLATE FLOWMETERS**

PVC or PTFE, Liquid and Gas Use Options



The **Series OP Orifice Plate Flowmeters** are a complete flow metering package. They incorporate a stainless steel orifice plate with a unique holder or carrier ring containing metering taps and integral gaskets. The Series OP is available in line sizes from 1/2" to 24" and can be used with compatible liquids and gases.

**FEATURES/BENEFITS**

- Mounted with standard flanges with no need of specialty flanges
- Reduced installation costs with simple installation by slipping the unit between standard flanges
- Easy access with corner type metering taps
- Long operation life with corrosion free material
- Stainless steel wetted parts assures long term reliability and accuracy
- Proven through a wide range of applications for energy efficiency

**APPLICATIONS**

- Fluid flow rates in building water lines
- Boiler feedwater
- Cooling water
- Combustion or compressed air
- Steam flow

The **SERIES PE & TE Orifice Plate Flowmeters** are two series of plastic orifice plate flow metering packages incorporating a unique holder or carrier ring containing metering taps and integral gaskets. They can be used in place of other primary differential products for efficiency and cost effectiveness.

The Series PE orifice plate flowmeter is of PVC construction and is available in line sizes from 1/2 to 24". This series can be used for air and most gases and meets or exceeds ASME, AGA & ISO standards.

The Series TE orifice plate flowmeter is of PTFE construction and is available in line sizes from 1/2 to 24". This Series can be used with gases, liquids, corrosive and high temperature fluids.

**FEATURES/BENEFITS**

- Mounted with standard flanges with no need of specialty flanges
- Reduced installation costs with simple installation by slipping the unit between standard flanges
- Easy access with corner type metering taps
- Long operation life with corrosion free material
- Proven through a wide range of applications for energy efficiency
- PTFE construction yields excellent chemical and weather resistance
- TE models are flame retardant without factory gaskets
- Low friction leading to minimum wear and long operation life

**APPLICATIONS**

- Fluid flow rates in building water lines
- Boiler feedwater
- Cooling water
- Combustion or compressed air
- Steam flow

**SPECIFICATIONS**

**Service:** OP & TE: Compatible liquids and gases; PE: Clean air and compatible gases.

**Wetted Material:** OP: 304 SS, Buna-N gaskets; PE: Gray PVC, Buna-N gaskets; TE: PTFE, Buna-N gaskets.

**Accuracy:** 0.6% FS. (Beta = .2-.6)  $\pm 0.7\%$  for Beta greater than .6.

**Temperature Limits:** OP: -50 to 200°F (-45 to 93°C); PE: 140°F (60°C) max; TE: -40 to 200°F (-40 to 93.3°C).

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

**Head Loss:** 1-Beta ratio<sup>2</sup> eg: 1-0.72 = 1-0.49 = 51% of the d.p.

**Line Sizes:** 1/2" to 24".

**Process Connection:** 1/4" female NPT.

**Installation:** Standard flange. OP: Any rating (orifice flanges not required); PE & TE: 125#/150# rating.

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

**Weight:** Varies with line size. See chart.

# ORIFICE PLATE FLOWMETERS

PVC or PTFE, Liquid and Gas use Options

## SERIES OP ORIFICE PLATE FLOWMETER – CAPACITY STRUCTURE

- Material 304/304 L, 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 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"

MODEL CHART														
OP Model	OP Weight (lb)	PE Model	PE Weight (lb)	TE Model	TE Weight (lb)	Line Size	Bore	Beta	Water Capacity		Air Capacity - Flow in SCFM			
									in d.p. w.c.	Flow in GPM	in d.p. w.c.	at 14.7 psia (0 psig)	at 20 psig	at 100 psig
OP-A-1	1.00	PE-A-1	1.00	TE-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	PE-A-2	1.00	TE-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	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
OP-B-1	1.00	PE-B-1	1.00	TE-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	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
OP-B-3	1.00	PE-B-3	1.00	TE-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	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
OP-C-2	2.00	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
OP-C-3	2.00	PE-C-3	1.00	TE-C-3	1.00	1"	0.720"	0.69	320	36.15	200	91.28	156.51	300
OP-D-1	2.00	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
OP-D-2	2.00	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
OP-D-3	2.00	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
OP-E-1	2.00	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
OP-E-2	2.00	PE-E-2	2.00	TE-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	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
OP-F-1	3.00	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
OP-F-2	3.00	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
OP-F-3	3.00	PE-F-3	2.00	TE-F-3	2.00	2"	1.450"	0.70	320	147.74	200	372.09	639.87	1227.63
OP-G-1	4.00	PE-G-1	2.00	TE-G-1	2.00	2.5"	0.750"	0.30	20	8.63	20	32.71	50.64	92.48
OP-G-2	4.00	PE-G-2	2.00	TE-G-2	2.00	2.5"	1.250"	0.50	100	55.54	100	197.54	317.58	590.91
OP-G-3	4.00	PE-G-3	2.00	TE-G-3	2.00	2.5"	1.750"	0.70	320	216.30	200	543.99	936.56	1798.86
OP-H-1	5.00	PE-H-1	2.00	TE-H-1	2.00	3"	0.920"	0.30	20	12.97	20	49.17	76.13	139.06
OP-H-2	5.00	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
OP-H-3	5.00	PE-H-3	2.00	TE-H-3	2.00	3"	2.150"	0.70	320	324.16	200	816.7	1404.95	2696.28
OP-J-1	7.00	PE-J-1	3.00	TE-J-1	3.00	4"	1.200"	0.30	20	22.03	20	83.58	129.44	236.48
OP-J-2	7.00	PE-J-2	3.00	TE-J-2	3.00	4"	2.000"	0.50	100	141.51	100	503.76	810.06	1507.64
OP-J-3	7.00	PE-J-3	3.00	TE-J-3	3.00	4"	2.800"	0.70	320	547.11	200	1380.03	2373.02	4553.68
OP-K-1	8.00	PE-K-1	3.00	TE-K-1	4.00	5"	1.500"	0.30	20	34.39	20	130.48	202.11	369.29
OP-K-2	8.00	PE-K-2	3.00	TE-K-2	4.00	5"	2.500"	0.50	100	220.80	100	786.23	1264.42	2353.51
OP-K-3	8.00	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
OP-L-1	10.00	PE-L-1	4.00	TE-L-1	4.00	6"	1.800"	0.30	20	49.46	20	187.86	291	531.75
OP-L-2	10.00	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
OP-L-3	10.00	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
OP-M-1	14.00	PE-M-1	5.00	TE-M-1	6.00	8"	2.400"	0.30	20	87.95	20	333.87	517.25	945.28
OP-M-2	14.00	PE-M-2	5.00	TE-M-2	6.00	8"	4.000"	0.50	100	565.77	100	2014.95	3241.45	6034.85
OP-M-3	14.00	PE-M-3	5.00	TE-M-3	6.00	8"	5.600"	0.70	320	2195.86	200	5532.00	9525.43	18290.00
OP-N-1	20.00	PE-N-1	6.00	TE-N-1	8.00	10"	3.000"	0.30	20	137.35	20	521.58	808	1476.77
OP-N-2	20.00	PE-N-2	6.00	TE-N-2	8.00	10"	5.000"	0.50	100	883.04	100	3145.50	5060.38	9421.74
OP-N-3	20.00	PE-N-3	6.00	TE-N-3	8.00	10"	7.000"	0.70	320	3421.26	200	8626.42	14846.80	28506.17
OP-O-1	30.00	PE-O-1	7.00	TE-O-1	10.00	12"	3.600"	0.30	20	197.73	20	750.9	1163.44	2126.47
OP-O-2	30.00	PE-O-2	7.00	TE-O-2	10.00	12"	6.000"	0.50	100	1271.62	100	4530	7288.16	13570.33
OP-O-3	30.00	PE-O-3	7.00	TE-O-3	10.00	12"	8.400"	0.70	320	4930.86	200	12430.00	21397.00	41089.02
OP-P-1	40.00	PE-P-1	9.00	TE-P-1	15.00	14"	4.000"	0.30	20	244.14	20	927.14	1436.59	2625.81
OP-P-2	40.00	PE-P-2	9.00	TE-P-2	15.00	14"	6.600"	0.50	100	1537.49	100	6477.67	8812.87	16409.42
OP-P-3	40.00	PE-P-3	9.00	TE-P-3	15.00	14"	9.300"	0.70	320	6052.57	200	15251.50	28262.66	50427.78
OP-Q-1	48.00	PE-Q-1	10.00	TE-Q-1	18.00	16"	4.500"	0.30	20	308.76	20	1172.63	1817.05	3321.32
OP-Q-2	48.00	PE-Q-2	10.00	TE-Q-2	18.00	16"	7.600"	0.50	100	2038.95	100	7264.58	11688.26	21764.08
OP-Q-3	48.00	PE-Q-3	10.00	TE-Q-3	18.00	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.



SERIES DTFW & DTFA

# VARIABLE-AREA FLOWMETERS

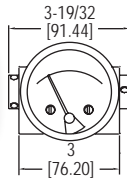
In-Line Mounting, Gas, Liquids and Oils



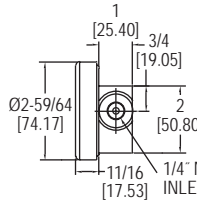
DTFW



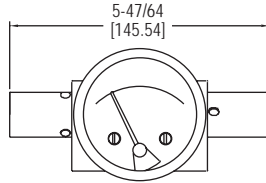
DTFA



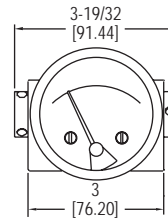
1/4" NPT connection



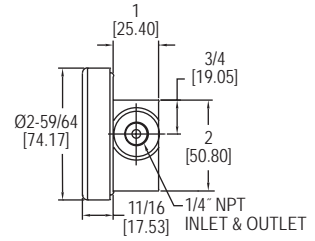
1/2" NPT connection



1/2" NPT process connection



1/4" NPT connection



The **Series DTFW Variable-Area Flowmeters** for Liquids and Oils measure water or oil flow rates with  $\pm 2\%$  of full-scale accuracy at a competitive price. Available in 1/4", 1/2" and 1" connections for a wide variety of applications and comes calibrated for horizontal in line mounting.

The **Series DTFA Variable-Area Flowmeters** for Gases measures gas flow rates with  $\pm 5\%$  of full-scale accuracy at an affordable price. Available in either 1/4" or 1/2" NPT connections and comes pre-calibrated for horizontal in-line mounting.

**FEATURES/BENEFITS**

- Durable metal construction ensures great reliability and the strength to withstand system pressures of up to 3000 psig (200 bar).
- Shatter proof construction, unlike glass tube variable area flowmeters, yields long operation life
- Perform precisely in high temperature, high vibration, shock-prone environments

**APPLICATIONS**

- Monitoring pressure drop across filters or strainers
- Flow scale based on differential pressure
- Liquid level given pressure differential between bottom and top of tank
- Hydraulic equipment
- Oil and gas equipment
- Heat exchangers
- Backflow prevention

**SPECIFICATIONS**

**Service:** DTFW: Compatible liquids; DTFA: Compatible gases.  
**Wetted Materials:** Body: 316 SS, brass or aluminum; Spring: 302 SS or PTFE-coated; Range spring: 302 SS; Magnet: PTFE-coated; Metering cone: Acetal or PTFE; Seals: Buna.  
**Temperature Limits:** -40 to 200°F (-40 to 93°C).  
**Pressure Limit:** DTFW-3S: 1500 psig (100 bar); All other DTFW models: 3000 psig (200 bar); DTFA: 3000 psig (200 bar).  
**Accuracy:** Liquid/oil calibration:  $\pm 2\%$  FS; Air calibration:  $\pm 5\%$  FS.  
**Repeatability:**  $\pm 1\%$  FS.  
**Size:** Diameter dial face 2.5" (63.5 mm).  
**Process Connection:** See model chart.  
**Weight:** DTFW-1B and 1S: 3 lb (1.36 kg); DTFW-2B and 2S: 5 lb (2.27 kg); DTFW-3S: 10 lb (4.54 kg); DTFA-1A: 3 lb (1.36 kg); DTFA-2A: 5 lb (2.27 kg).

**MODEL CHART**

Model	Range, SCFM	Body	Connection
DTFA-1A-10A	1.5 to 10	Aluminum	1/4" NPT
DTFA-1A-15A	2.0 to 15	Aluminum	1/4" NPT
DTFA-1A-20A	3.0 to 20	Aluminum	1/4" NPT
DTFA-1A-25A	3.0 to 25	Aluminum	1/4" NPT
DTFA-2A-30A	3.0 to 30	Aluminum	1/2" NPT
DTFA-2A-40A	4.0 to 40	Aluminum	1/2" NPT
DTFA-2A-50A	4.0 to 50	Aluminum	1/2" NPT
DTFA-2A-75A	5.0 to 75	Aluminum	1/2" NPT
DTFA-2A-100A	10.0 to 100	Aluminum	1/2" NPT

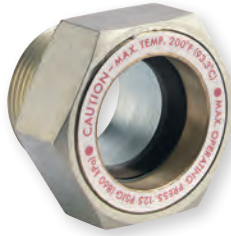
**MODEL CHART**

Model	Range GPM Water	Connection NPT	Body	Metering Cone	Model	Range GPM Water	Connection NPT	Body	Metering Cone
DTFW-1B-1W	0 to 1	1/4"	Brass	Acetal	DTFW-2B-8W	0 to 8	1/2"	Brass	Acetal
DTFW-1B-2W	0 to 2	1/4"	Brass	Acetal	DTFW-2B-10W	0 to 10	1/2"	Brass	Acetal
DTFW-1B-3W	0 to 3	1/4"	Brass	Acetal	DTFW-2S-1W	0 to 1	1/2"	SS	Acetal
DTFW-1B-4W	0 to 4	1/4"	Brass	Acetal	DTFW-2S-2W	0 to 2	1/2"	SS	Acetal
DTFW-1B-5W	0 to 5	1/4"	Brass	Acetal	DTFW-2S-3W	0 to 3	1/2"	SS	Acetal
DTFW-1S-1W	0 to 1	1/4"	SS	Acetal	DTFW-2S-4W	0 to 4	1/2"	SS	Acetal
DTFW-1S-2W	0 to 2	1/4"	SS	Acetal	DTFW-2S-5W	0 to 5	1/2"	SS	Acetal
DTFW-1S-3W	0 to 3	1/4"	SS	Acetal	DTFW-2S-8W	0 to 8	1/2"	SS	Acetal
DTFW-1S-4W	0 to 4	1/4"	SS	Acetal	DTFW-2S-10W	0 to 10	1/2"	SS	Acetal
DTFW-1S-5W	0 to 5	1/4"	SS	Acetal	DTFW-3S-10W	0 to 10	1"	SS	PTFE
DTFW-2B-1W	0 to 1	1/2"	Brass	Acetal	DTFW-3S-15W	0 to 15	1"	SS	PTFE
DTFW-2B-2W	0 to 2	1/2"	Brass	Acetal	DTFW-3S-20W	0 to 20	1"	SS	PTFE
DTFW-2B-3W	0 to 3	1/2"	Brass	Acetal	DTFW-3S-25W	0 to 25	1"	SS	PTFE
DTFW-2B-4W	0 to 4	1/2"	Brass	Acetal	DTFW-3S-30W	0 to 30	1"	SS	PTFE
DTFW-2B-5W	0 to 5	1/2"	Brass	Acetal					

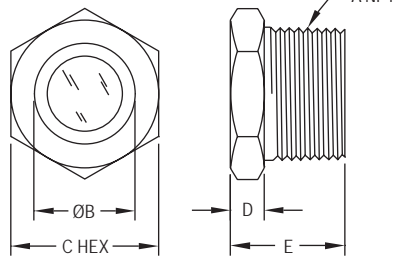
Note: Not available in 1/4" or 1/2" SS.

# SIGHT WINDOW

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



REPLACEABLE WINDOW!



Model	Dimensions — Inches (mm)				
	A	B	C	D	E
SFI-500-3/4	3/4	3/4 [19]	1-3/8 [35]	45/64 [18]	1-3/8 [35]
SFI-500-1	1	15/16 [24]	1-3/8 [35]	45/64 [18]	1-3/8 [35]
SFI-500-1-1/4	1-1/4	1-1/4 [32]	2-1/8 [54]	27/32 [22]	1-9/16 [40]
SFI-500-1-1/2	1-1/2	1-27/64 [37]	2-1/8 [54]	27/32 [22]	1-9/16 [40]
SFI-500-2	2	1-1/4 [32]	2-1/2 [64]	15/32 [12]	1-21/32 [42]

The **Series 500 Sight Window** is a Series of standard tempered glass with brass body sight windows which display level or contents of tanks or pipelines. In addition to the standard brass body, the Series 500 Sight windows are also available in carbon steel or 316 SS.

**FEATURES/BENEFITS**

- Tough, tempered glass window resists chemical attack and abrasion
- Seamless, replaceable gasket assures perfect seal
- Field replaceable glass window
- Range of wetted materials to suit a wide range of chemical compatibility

**APPLICATIONS**

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

**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.  
**Agency Approvals:** Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

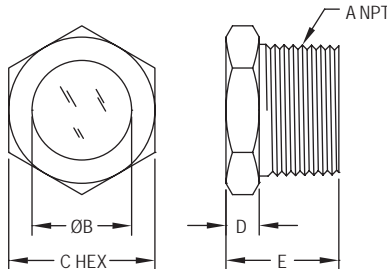
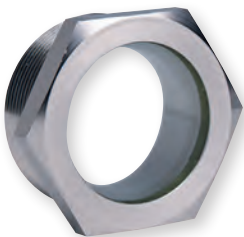
**MODEL CHART**

316 SS Model	Brass Model	Carbon Steel Model
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

USA: California Proposition 65  
 ⚠️WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

# SIGHT WINDOW

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



Model	Dimensions — Inches (mm)				
	A	B	C	D	E
SFI-550-1/4	1/4	11/32 [8.73]	5/8 [15.95]	3/16 [4.76]	5/8 [15.95]
SFI-550-3/8	3/8	7/16 [11.11]	3/4 [19.05]	7/32 [5.56]	23/32 [18.26]
SFI-550-1/2	1/2	9/16 [14.29]	15/16 [23.81]	7/32 [5.56]	25/32 [19.84]
SFI-550-3/4	3/4	3/4 [19.05]	1-1/16 [26.99]	5/16 [7.94]	15/16 [23.81]
SFI-550-1	1	15/16 [23.81]	1-3/8 [34.93]	5/16 [7.94]	1-1/16 [26.99]
SFI-550-1-1/4	1-1/4	1-3/16 [30.18]	1-3/4 [44.45]	13/32 [10.32]	1-7/32 [30.96]
SFI-550-1-1/2	1-1/2	1-7/16 [36.53]	2 [50.80]	13/32 [10.32]	1-7/32 [30.96]
SFI-550-2	2	1-7/8 [47.63]	2-1/2 [63.50]	13/32 [10.32]	1-9/32 [32.54]

The **Series 550 Sight Window** is a range of glass with plated steel body sight windows which display level or contents of tanks or pipelines. Connections are standard NPT in sizes ranging from 1/4 to 2".

**FEATURES/BENEFITS**

- Glass to metal bond for utmost reliability
- Plated steel bodies have convenient hex wrench surfaces for easy installation
- Windows are clear, ripple free, and flush with the front face, with no recess on which dirt might collect

**APPLICATIONS**

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

**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.

**MODEL CHART**

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 SFI-100, SFI-300, SFI-300F, SFI-400 & SFI-700 | W. E. ANDERSON™ BY DWYER

# MIDWEST SIGHT FLOW INDICATORS

## Inexpensive Protection for Expensive Equipment and Systems



The **Series SFI Midwest Sight Flow Indicator** is a Series of sight indicators which display flow or contents of pipelines. Available in window viewing style in the SFI-100 and SFI-300 Series and tube viewing style in the SFI-400 and SFI-700 Series with connection choices of female NPT, BSPP or BSPT threaded and flanged.

**Series SFI-100 & SFI-300 Midwest Sight Flow Indicator** offers threaded process connections, viewing windows, and bodies of brass or 316 SS. The SFI-100 type has a single window with a rotating impeller, the 300 type has a double window with a rotating impeller, the SFI-350 type has a double window with no moving indicator, and the SFI-360 type has a double window with a flapper.

**Series SFI-300F Midwest Sight Flow Indicator** offers ANSI flange process connections, double viewing windows, and bodies of carbon steel or 316 SS. The SFI-350F type has a double window with no moving indicator and the SFI-360F type has a double window with a flapper.

**Series SFI-400 Midwest Sight Flow Indicator** offers threaded or ANSI flanged process connections, tube style viewing, and bodies of cast iron or 316 SS.

**Series SFI-700 Midwest Sight Flow Indicator** offers threaded process connections, tube style viewing, and bodies of brass or 316 SS.

### FEATURES/BENEFITS

- Manufactured of quality materials and safety tested to assure long, dependable service at economical prices
- All Series SFI-100, SFI-300 and SFI-300F feature a removable window for easy service and replacement of wearing parts
- The Series SFI-400 features glass tube construction offering easy flow viewing from any angle
- Series SFI-700 offers an easy to see bright red Acetal rotating impeller that is easy to view from any angle with the glass tube construction
- Maintenance is simple for the Series SFI-700 with internal wipers which restore full 360° visibility by simply rotating the glass tube without disrupting the flow

### APPLICATIONS

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

### MODEL CHART

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

++ USA: California Proposition 65  
 ⚠WARNING: Cancer and Reproductive Harm  
 - www.P65Warnings.ca.gov

### SPECIFICATIONS

#### SFI-100 & SFI-300 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); 120°F (48°C) on W2 option; 170°F (77°C) on I1 option.

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

**Connections:** Threaded.

**Mounting Orientation:** Horizontal or vertical; 360: Horizontal only.

#### SFI-300F 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.

**Mounting Orientation:** Horizontal or vertical; 360: Horizontal only.

#### SFI-400 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.

#### SFI-700 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.

### DIMENSIONS AND WEIGHT

Model	Body Size	Length	Depth	Height	Flange Diameter	Viewing Area Diameter	Weight lb (kg)	
SFI-100	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)	
SFI-300	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)	
SFI-700	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, 1-1/2	4.875 (124)	-	2.750 (70) (across flats)	-	-	5.1 (2.3)	
	SFI-400	1/2	4.500 (144)	-	-	3.500 (89)	1.500 (38)	3.8 (1.7)
SFI-400F	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)	
	SFI-400F	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)
SFI-300F	4	5.750 (146)	-	-	9.000 (229)	5.000 (127)	31 (14.1)	
	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)





# MIDWEST SIGHT FLOW INDICATORS

## Inexpensive Protection for Expensive Equipment and Systems

MODEL CHART						
SFI-100 & SFI-300 - WINDOW STYLE WITH THREADED CONNECTIONS						
Example	SFI	-300	SS	-2	-G2	SFI-300SS-2-G2
<b>Model Designator</b>	SFI					Sight flow indicator
<b>Body Style</b>		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, 304 SS flapper
<b>Body Options</b>			SS MP			316 SS body option for 300, 350, 360 150 psig maximum pressure option, includes fluoroelastomer gaskets
<b>Body Size</b>				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
<b>Options</b>					W2 G1 G2 S2 S3 I1 I2 I3 F1 BSPT BSPP	Plexiglass window PTFE gasket Fluoroelastomer gasket 316 SS shaft (not on 350 model) Monel shaft (not on 350 model) ABS impeller with bronze bushing (not on 350, 360) 316 SS impeller (not on 350, 360) No impeller (100 only) 316 SS flapper (360 only) BSPT threads BSPP threads
<b>Note:</b> Maximum flow on impeller models: 5 FPS with liquids, 5000 FPM with gases.						

MODEL CHART				
SFI-400 - TUBE STYLE WITH THREADED OR FLANGED CONNECTIONS				
Example	SFI	-400SS	-1-1/2	SFI-400SS-1-1/2
<b>Model Designator</b>	SFI			Sight flow indicator
<b>Body Style</b>		400CI 400SS 400F		Female NPT connections, cast iron body (only for 1 through 2 inch sizes) Female NPT connections, 316 SS body Raised face flange connection, 316 SS body (only for 1 inch and up sizes)
<b>Body Size</b>			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
<b>Note:</b> Best for use in vertical pipelines where there are no mechanical strains.				

MODEL CHART					
SFI-300F - WINDOW STYLE WITH FLANGED CONNECTIONS					
Example	SFI	-360FSS	-1-1/2	-G1	SFI-360FSS-1-1/2-G1
<b>Model Designator</b>	SFI				Sight flow indicator
<b>Body Style</b>		350FCS 350FSS 360FCS 360FSS			Carbon steel body, no moving indicator 316 SS body, no moving 316 SS indicator Carbon steel body, 316 SS flapper 316 SS body, 316 SS flapper
<b>Body Size</b>			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
<b>Options</b>				G1 G2	PTFE gasket Fluoroelastomer gasket

MODEL CHART					
SFI-700 - TUBE STYLE WITH THREADED CONNECTIONS					
Example	SFI	-700SS	-1-1/2	-BSPT	SFI-700SS-1-1/2-BSPT
<b>Model Designator</b>	SFI				Sight flow indicator
<b>Body Style</b>		700 700SS			Brass body 316 SS body
<b>Body Size</b>			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
<b>Options</b>				BSPT BSPP	BSPT threads BSPP threads

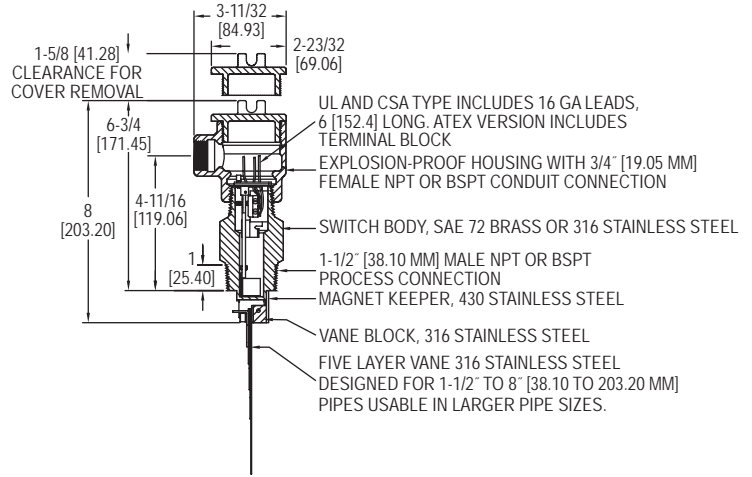


SERIES V4 | W. E. ANDERSON™ BY DWYER



# FLOTECT® VANE OPERATED FLOW SWITCH

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



The **Series V4 FloTECT® Vane Operated Flow Switch** is rugged and reliable, ideal for automatically protecting equipment and pipeline systems against damage from reduction or loss of flow. Time tested in thousands of pipeline installations and processing plants around the world this Series is Weatherproof, designed to meet NEMA 4 and Explosion-proof (listing included in specifications). This series can be used in pipes 1-1/2" (38.10 mm) and up.

### FEATURES/BENEFITS

- Unique magnetically actuated switching design gives superior performance
- Features a free-swinging vane which attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm with no bellows, springs, or seals to fail
- Leak proof body machined from bar stock
- Electrical assembly can be easily replaced without removing the unit from installation so that the process does not have to be shut down
- Installs directly and easily into pipeline with a thredolet, tee, or flange (see application drawings)
- High pressure rating of 1000 psig (69 bar) with the brass body and 2000 psig (138 bar) with the 316 SS body
- Choice of custom vane calibrated for your application, Model V4, or field adjustable multilayer vane, Model V4-2-U (see set point chart)

### 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

### 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 IECEx] ATEX and IECEx options, ambient temperature -4 to 163°F (-20 to 73°C); Process temperature -4 to 163°F (-20 to 73°C).

**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 and Explosion-proof. \*\*Listed with UL and CSA for Class I, Groups C and D; Class II, Groups E, F, and G. ATEX  $\text{C} \text{E} 2813 \text{Ex} \text{II} 2 \text{G Ex db IIB T6 Gb} -20^{\circ}\text{C} \leq \text{Tamb} \leq 73^{\circ}\text{C}.$  -20°C ≤ Process Temp ≤ 73°C. EU-Type Certificate No.: KEMA 03 ATEX 2383. ATEX Standards: EN 60079-0:2012+A11:2013; EN 60079-1:2014. IECEx Certified: For Ex db IIB T6 Gb -20°C ≤ Tamb ≤ 73°C. -20°C ≤ Process Temp ≤ 73°C.

**IECEx Certificate of Conformity:** IECEx DEK 11.0071.

**IECEx Standards:** IEC 60079-0:2011; IEC 60079-1:2014.

**Zone I.** Also FM approved.

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

**Electrical Rating:** UL, FM, ATEX and IECEx models 10 A @ 125/250 VAC (V~); CSA models: 5 A @ 125/250 VAC (V~); 5 A res., 3 A ind. @ 30 VDC (V=); MV option: 1 A @ 125 VAC (V~); 1 A res., .5 A ind. @ 30 VDC (V=); MT option: 5 A @ 125/250 VAC (V~). [MT and MV option not UL, CSA, FM, ATEX or IECEx].

**Electrical Connections:** UL and CSA models: 16 AWG, 6" (152 mm) long. ATEX and IECEx unit: Terminal block.

**Conduit Connection:** 3/4" female NPT or 19.05 mm standard or M25 with -BSPT option.

**Process Connection:** 1-1/2" male NPT or 1-1/2" male BSPT or 38.10 mm.

**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:** ATEX, CE, CSA, FM, IECEx, UL\*\*.

\*\*No housing option (-NH) has no approvals.

MODEL CHART		
Model	Description	Connection Type
V4-2-U	Brass body, universal vane	NPT
V4-SS-2-U	316 SS* body, universal vane	NPT
V4-2-U-NH**	Brass body, universal vane, no housing	NPT
V4	Brass body, custom vane	NPT
V4-SS	316 SS* body, custom vane	NPT
V4-NH**	Brass body, custom vane, no housing	NPT
V4-2-U-BSPT	Brass body, universal vane	BSPT
V4-SS-2-U-BSPT	316 SS* body, universal vane	BSPT
V4-BSPT	Brass body, custom vane	BSPT
V4-SS-BSPT	316 SS* body, custom vane	BSPT

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

**Note:** 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.

\*316 SS body with 430 SS magnet keeper.

\*\*No housing option (-NH) has no approvals.

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

OPTIONS	
To order add suffix:	Description
-D	DPDT contacts
-MV	Gold plated contacts, options for dry circuits*
-MT	High temperature, option rated 400°F (204°C)*
-TRI	Increasing flow time delay relay option with 2 SPDT contacts, adjustable from 0-1 to 0-31 minutes*
-TRD	Decreasing flow time delay relay option with 2 SPDT contacts, adjustable from 0-1 to 0-31 minutes*
-316	316 SS magnet keeper, option to replace standard 430 SS
-V	Vertical up flow, option for upward flow in vertical pipe
-AT	ATEX compliant construction
-IEC	IECEx certified construction
-BSPT	Female BSPT process connection and M25 conduit connection

\*See electrical rating in specification, no listings or approvals.

USA: California Proposition 65  
 ⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

Flow Switches, Paddle

# FLOTECT® VANE OPERATED FLOW SWITCH

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

## 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.

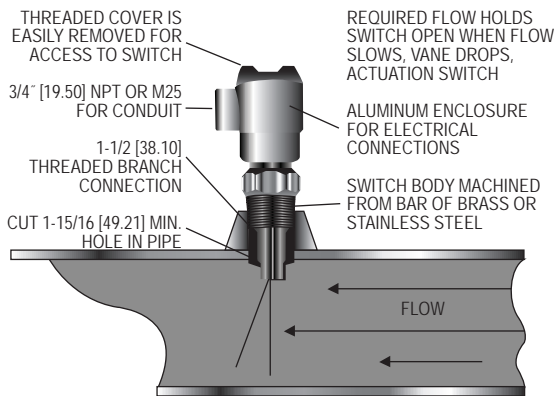
APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)												
Vane Layers	1.5" Pipe	2" Pipe	3" Pipe	4" Pipe	6" Pipe	8" Pipe	10" Pipe	12" Pipe	14" Pipe	16" Pipe	18" Pipe	20" Pipe
1	7-3 (26.67-11.67)	15-8 (56.7-30)	45-22 (167-83.3)	95-40 (367-150)	210-120 (800-450)	375-175 (1417-667)	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.

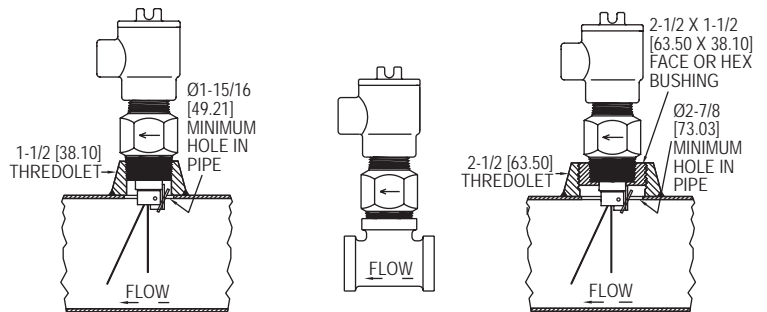
APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD AIR; SCFM (LPS)												
Vane Layers	1.5" Pipe	2" Pipe	3" Pipe	4" Pipe	6" Pipe	8" Pipe	10" Pipe	12" Pipe	14" Pipe	16" Pipe	18" Pipe	20" Pipe
1	32-17 (15-8)	65-32 (30-20)	210-105 (100-50)	400-200 (190-90)	950-475 (450-220)	1550-850 (730-400)	2400-1300 (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



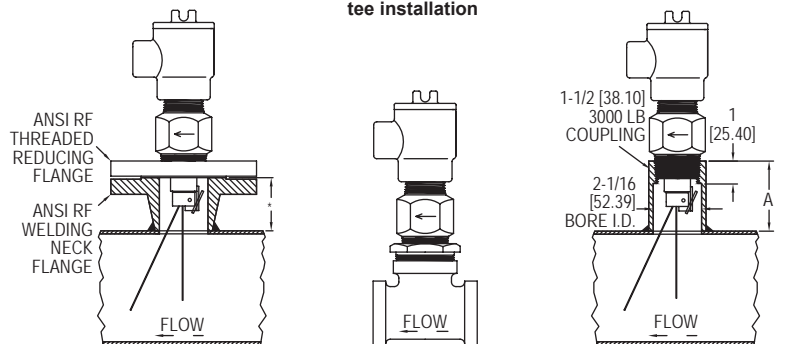
**Threaded branch connection installation.**  
May also be installed using tee, flange or coupling.



**Standard installation**

**1-1/2" x 1-1/2" x 1-1/2" (38.10 x 38.10 x 38.10 mm) tee installation**

**2-1/2" (63.50 mm) threaded branch connection**



**Flange installation**  
\*Flange face to pipe O.D. specified by customer. Normally should not exceed 5" (127)

**2" x 2" x 2" (50.80 x 50.80 x 50.80 mm) tee installation**

**Not recommended, unless coupling is bored out to 2-1/16" (52.4) as shown**

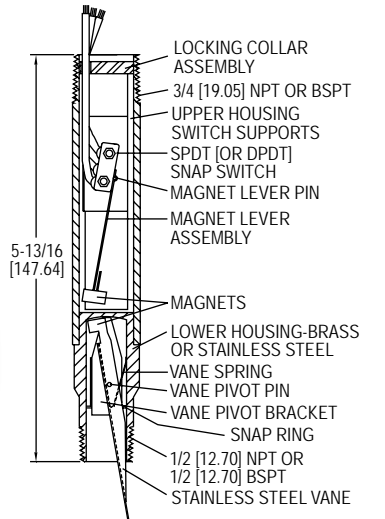
Pipe Size	Dim. A
2" (50.80 mm)	2-5/8 (66.7)
3" (76.20 mm)	2-1/2 (63.5)
4" (101.60 mm)	2-7/16 (61.9)

# FLOTECT® MINI-SIZE FLOW SWITCHES

Monitor Flow in 1/2" to 2" (12.70 to 50.80 mm) Pipe, Explosion-Proof, Compact



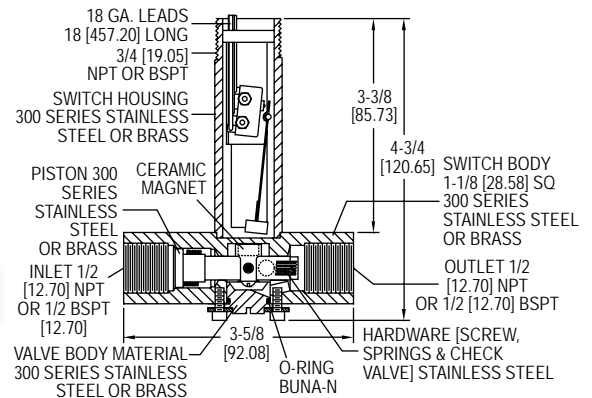
V6 with tee



OVERALL LENGTH WITH 1-1/4" TEE CONNECTION APPROXIMATELY 8" [31.75 TO 203.20 MM]



V6 low flow



The **Series V6 FloTECT® Mini-Size Flow Switches** are surprisingly compact, and specifically engineered to monitor liquid, gas, or air flows. Time tested in thousands of pipeline installations and processing plants around the world, this Series is Weatherproof, designed to meet NEMA 4 and Explosion-proof (listing included in specifications). Tees are available for installation in pipelines from 1/2" to 2" (12.70 to 50.80 mm). With bushings added the unit is easily adapted to 1/4" and 3/8" (6.35 and 9.53 mm) piping.

## FEATURES/BENEFITS

- Unique magnetically actuated switching design gives superior performance
- Features a free-swinging vane which attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm with no bellows, springs, or seals to fail
- Leak proof body machined from bar stock
- Electrical assembly can be easily replaced without removing the unit from installation so that the process does not have to be shut down
- Choice of models in a tee with calibrated vane or field adjustable trimmable vane
- Easy installation with simple pipe insert via tee and simple electrical switch connections
- High pressure rating of 1000 psig (69 bar) with the brass body and 2000 psig (138 bar) with the 316 SS body
- Low flow model offers field adjustable set point

## 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
- Signals alarm when emergency shower or eyewash station in use

## 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, ATEX, IECEx or KC) ATEX Compliant AT, IECEx IEC Option and KC (KC 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 psig (69 bar), 303 SS lower body with no tee models 2000 psig (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 CE 2813 II 2 G Ex db IIC T6 Gb Process Temp ≤75°C Alternate Temperature Class T5 Process Temp ≤90°C, 115°C (T4) Process Temp ≤105°C consult factory. EU-Type Certificate No.: KEMA 04ATEX2128.

ATEX Standards: EN 60079-0:2012+A11:2013; EN 60079-1:2014.

IECEx Certified: For Ex db IIC T6 Gb Process Temp ≤75°C Alternate Temperature Class T5 Process Temp ≤90°C, 115°C (T4) Process Temp ≤105°C consult factory. IECEx Certificate of Conformity: IECEx DEK 11.0039;

IECEx Standards: IEC 60079-0:2011; IEC 60079-1:2014;

Korean Certified (KC) for: Ex d IIC T6 Gb Process Temp ≤75°C;

KTL Certificate Number: 12-KB4B0-0091.

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

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

**Electrical Connections:** UL models: 18 AWG, 18" (457.20 mm) long. ATEX/CSA / IECEx models: terminal block.

**Upper Body:** Brass or 303 SS.

**Conduit Connections:** 3/4" (19.05 mm) male NPT standard, 3/4" (19.05 mm) female NPT or M25 with BSPT option on junction box models.

**Process Connection:** 1/2" (12.70 mm) male NPT or 1/2" (12.70 mm) male BSPT 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.

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

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

**Agency Approvals:** ATEX, CE, CSA, IECEx, KTL, UL.

USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

●Set Point Charts: See page 273 (Series V6)

# FLOTECT® MINI-SIZE FLOW SWITCHES

Monitor Flow in 1/2" to 2" (12.70 to 50.80 mm) Pipe, Explosion-Proof, Compact

MODEL CHART									
Example	V6	EP	B-B	-S	-2	-B	-MT	V6EPB-B-S-2-B-MT	
Series	V6							Flow switch	
Construction		EP						Explosion proof	
Body			B-B S-S					Brass SS	
Circuit (Switch)				S D				SPDT DPDT	
Tee Connection Size+					1 2 3 4 5 6 LF LF			1/2" (12.70 mm) 3/4" (19.50 mm) 1" (25.40 mm) 1-1/4" (31.75 mm) 1-1/2" (38.10 mm) 2" (50.80 mm) Low flow model (1/2" connection-brass) Low flow model (1/2" connection-SS)	
Process Connection						- E		NPT BSPT	
Tee Material+						MI FS B S O		Iron Forged steel Brass SS No tee, field trimmable vane** (For LF model no tee material chosen, tee material matches body choice)	
Options							CSA AT IEC MV MT VIT	CSA approved construction with junction box* ATEX compliant construction with junction box IECEx certified 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	

**Note:** M25 is not available with the CSA housing.  
 +Additional adders dependent on tee connection size and tee material, consult factory for these adders.  
 \*Options that do not have ATEX.  
 \*\*Vane will be trimmed to the connection size. If full field trimmable vane is desired, must select with tee connection size 6.

MODEL CHART			
Model	Size/Connection	Body	Tee
V6EPB-B-S-1-B	1/2" (12.70 mm) NPT	Brass	Brass
V6EPB-B-S-2-B	3/4" (19.50 mm) NPT	Brass	Brass
V6EPB-B-S-3-B	1" (25.40 mm) NPT	Brass	Brass
V6EPB-B-S-4-B	1-1/4" (31.75 mm) NPT	Brass	Brass
V6EPB-B-S-5-B	1-1/2" (38.10 mm) NPT	Brass	Brass
V6EPB-B-S-6-B	2" (50.80 mm) NPT	Brass	Brass
V6EPB-B-S-1-MI	1/2" (12.70 mm) NPT	Brass	Iron
V6EPB-B-S-2-MI	3/4" (19.50 mm) NPT	Brass	Iron
V6EPB-B-S-3-MI	1" (25.40 mm) NPT	Brass	Iron
V6EPB-B-S-4-MI	1-1/4" (31.75 mm) NPT	Brass	Iron
V6EPB-B-S-5-MI	1-1/2" (38.10 mm) NPT	Brass	Iron
V6EPB-B-S-6-MI	2" (50.80 mm) NPT	Brass	Iron
V6EPS-S-S-1-FS	1/2" (12.70 mm) NPT	SS	FS
V6EPS-S-S-2-FS	3/4" (19.50 mm) NPT	SS	FS
V6EPS-S-S-3-FS	1" (25.40 mm) NPT	SS	FS
V6EPS-S-S-4-FS	1-1/4" (31.75 mm) NPT	SS	FS
V6EPS-S-S-5-FS	1-1/2" (38.10 mm) NPT	SS	FS
V6EPS-S-S-6-FS	2" (50.80 mm) NPT	SS	FS
V6EPS-S-S-1-S	1/2" (12.70 mm) NPT	SS	SS
V6EPS-S-S-2-S	3/4" (19.50 mm) NPT	SS	SS
V6EPS-S-S-3-S	1" (25.40 mm) NPT	SS	SS
V6EPS-S-S-4-S	1-1/4" (31.75 mm) NPT	SS	SS
V6EPS-S-S-5-S	1-1/2" (38.10 mm) NPT	SS	SS
V6EPS-S-S-6-S	2" (50.80 mm) NPT	SS	SS
V6EPB-B-S-6-0	No tee	Brass	None
V6EPS-S-S-6-0	No tee	SS	None
V6EPB-B-S-LF	1/2" (12.70 mm) NPT	Brass	LF, brass
V6EPS-S-S-LF	1/2" (12.70 mm) NPT	SS	LF, SS
V6EPB-B-S-LFE	1/2" (12.70 mm) BSPT	Brass	Brass
V6EPB-B-S-1E-B	1/2" (12.70 mm) BSPT	Brass	Brass
V6EPB-B-S-2E-B	3/4" (19.50 mm) BSPT	Brass	Brass
V6EPB-B-S-3E-B	1" (25.40 mm) BSPT	Brass	Brass
V6EPB-B-S-4E-B	1-1/4" (31.75 mm) BSPT	Brass	Brass
V6EPB-B-S-5E-B	1-1/2" (38.10 mm) BSPT	Brass	Brass
V6EPB-B-S-6E-B	2" (50.80 mm) BSPT	Brass	Brass
V6EPB-B-S-6E-0	No tee	Brass	Brass
V6EPS-S-S-LFE	1/2" (12.70 mm) BSPT	SS	SS
V6EPS-S-S-1E-S	1/2" (12.70 mm) BSPT	SS	SS
V6EPS-S-S-2E-S	3/4" (19.50 mm) BSPT	SS	SS
V6EPS-S-S-3E-S	1" (25.40 mm) BSPT	SS	SS
V6EPS-S-S-4E-S	1-1/4" (31.75 mm) BSPT	SS	SS
V6EPS-S-S-5E-S	1-1/2" (38.10 mm) BSPT	SS	SS
V6EPS-S-S-6E-S	2" (50.80 mm) BSPT	SS	SS
V6EPS-S-S-6E-0	No tee	SS	SS

### V6 SET POINT CHARTS - FACTORY INSTALLED TEE

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR AIR; SCFM (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; GPM (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)

### 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).

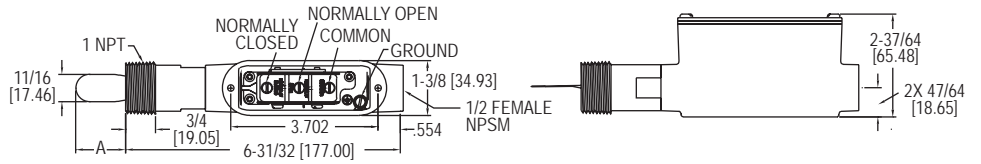


SERIES V7 | W. E. ANDERSON™ BY DWYER



# FLOTECT® VANE OPERATED FLOW SWITCH

Magnetic Linkage, UL Approved



Pipe Size	Dim. A	Pipe Size	Dim. A
1	1-17/64 [32.15]	2	2-11/64 [55.17]
1-1/4	1-19/32 [40.48]	3	2-11/64 [55.17]
1-1/2	1-53/64 [46.43]	4	2-11/64 [55.17]

The Series V7 Flotect® Vane Flow Switch is an inexpensive range switch for use with compatible liquids to start or stop electronic operated equipment when flow or no-flow conditions occur. Design is standard weatherproof, meeting NEMA 4X.

**FEATURES/BENEFITS**

- Magnetically actuated switching design gives superior performance
- Features a free-swinging vane which attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm with no bellows, springs, or seals to fail
- Lower body is machined solid metal bar stock assuring no leak points, no matter how long the unit is in service
- Robust vane design is rigid and field trimmable for set point adjustment

**APPLICATIONS**

- Proof of boiler flow
- Shuts down burner when air flow through heating coil fails
- Protects pumps, motors and other equipment against low or no flow
- Stops liquid cooled engines, machines and processing when coolant flow is interrupted

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)		
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)

**Note:** Contact the factory for different actuation-deactuation rates.

**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:** 10 A @ 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".  
**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, UL.

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

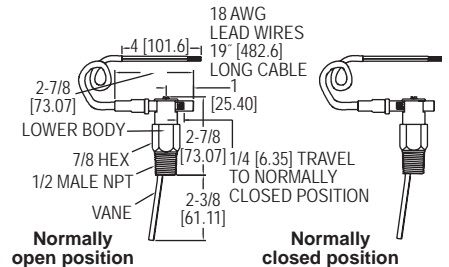
USA: California Proposition 65  
 ⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

SERIES V10 | W. E. ANDERSON™ BY DWYER



# FLOTECT® MINI-SIZE FLOW SWITCH

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



The Series V10 Flotect® Mini-Size Flow Switch is designed to provide inexpensive, reliable monitoring of the presence or absence of flow in a system. This series is available for field installation in pipelines from 1/2 to 2" diameter and available in brass or 303 SS body.

**FEATURES/BENEFITS**

- Magnetically actuated switching design gives superior performance with rugged, hermetically sealed reed switch
- Simple field switch adjustment allows user to toggle between Normally Open (NO) or Normally Closed (NC) with no change in the electrical connection
- Switch housing is located outside the process media, allowing simple switch change-over or maintenance without interruption of process flow
- Full size, field trimmable stainless steel vane provided with removable template calibrated for brass or ductile iron reducing tees with forged steel straight tee/bushing combinations

**APPLICATIONS**

- Proving flow in boilers, hot water heaters, and chillers
- Protects pumps, motors and other equipment against low or no flow
- Automatically starts auxiliary pumps and engines

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)				APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR AIR; SCFM (LPM)			
Pipe Size	Trim	N.O.	N.C.	Pipe Size	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 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:** 0.5 A @ 120 VAC; 1.5 A @ 24 VDC res.; 0.001 A @ 200 VDC res.

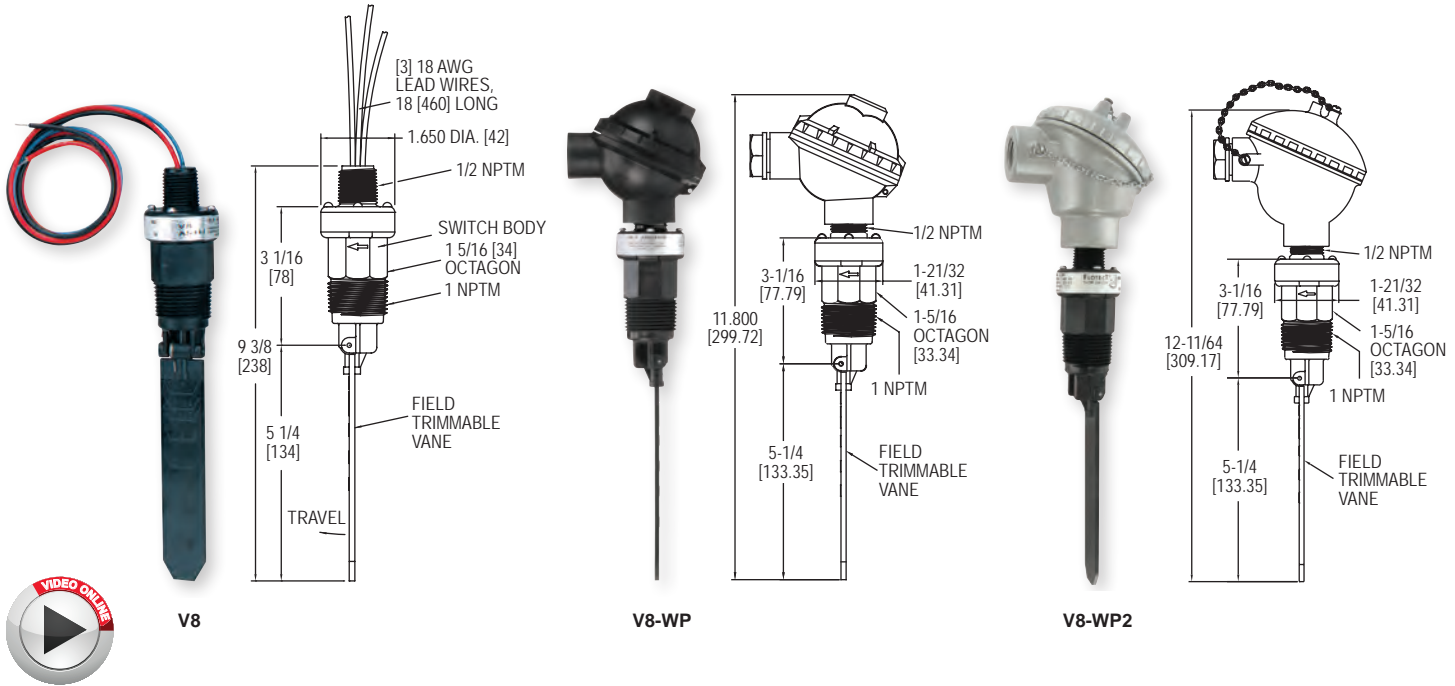
**Electrical Connections:** 18 AWG, 19" (483 mm) long, PVC jacket. Rated 221°F (105°C).  
**Process Connection:** 1/2" male NPT or 1/2" male BSPT.  
**Mounting Orientation:** Switch can be installed in any position but the actuation/deactuation flow rates are based on horizontal pipe runs and are nominal values.  
**Set Point Adjustment:** Vane is trimmable.  
**Weight:** 5.5 oz (0.16 kg).  
**Agency Approvals:** CE, CSA, UR.  
**Switch Enclosure:** Nylon.

MODEL CHART			
Model	Body Material	Connection Type	Switch Configuration
V10	Brass	NPT	Normally open or closed
V10SS	303 SS	NPT	Normally open or closed
V10-BSPT	Brass	BSPT	Normally open or closed
V10SS-BSPT	303 SS	BSPT	Normally open or closed

USA: California Proposition 65  
 ⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

# FLOTECT® VANE OPERATED FLOW SWITCHES

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



The **Series V8 Flotect® Vane Operated Flow Switches** are ideal for protecting unattended equipment from damage or loss of production. This Series is available for installation in a 1 to 6" pipe with operating pressures up to 150 psig (10 bar) and temperatures to 212°F (100°C).

**FEATURES/BENEFITS**

- UL recognized as an industrial motor controller per UL standard 508, suitable for mounting in a protected environment
- Magnetically actuated switching design gives superior performance with free-swinging vane which attracts a magnet within the switch body, actuating a snap switch with no bellows, springs, or seals to fail
- Leak proof body and vane constructed of tough durable polyphenylene sulfide which has excellent chemical resistance
- A full size trimmable vane is provided with molded-in graduations

**APPLICATIONS**

- Chemical processing
- Air conditioning
- Refrigeration
- Heating systems
- Cooling lines
- Machinery
- Liquid transfer systems
- Water treatment
- Food processing
- Machine tools

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)	
Pipe Size	Actuate/Deactuate
1"	10.8/9.1 (40.9/34.6)
1-1/4"	9.8/8.3 (37.2/31.4)
1-1/2"	8.6/6.8 (32.4/25.7)
2"	10.9/8.8 (41.2/33.4)
3"	12.9/8.9 (48.8/33.5)
4"	21.1/13.8 (79.7/52.2)
6"	45/33 (170.2/124.7)

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR AIR; SCFM (LPM)	
Pipe Size	Actuate/Deactuate
1"	39/32.6 (1105/923)
1-1/4"	37.5/32.2 (1062/912)
1-1/2"	33.4/26.7 (945/757)
2"	43/36.8 (1218/1042)
3"	52.7/38.9 (1493/1100)
4"	87.6/63.6 (2482/1802)
6"	168.6/137.4 (4775/3890)

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

**MODEL CHART**

Model	Description
V8	Flow switch

**OPTIONS**

To order add suffix:	Description
-MV	Gold plated contacts, for dry circuits; rated 1A @ 125 VAC; 1A resistive, 0.5A inductive @ 30 VDC
<b>Example:</b> V8-MV	
-INC	Inconel® alloy option; Inconel® alloy replaces standard 316 SS wetted parts; wetted parts are Inconel® alloy, ceramic 8, and polyphenylene sulfide
<b>Example:</b> V8-INC	
-WP	Weatherproof enclosure; optional housing is phenylpolioxide and provides weatherproof protection for electrical wiring; not UL approved
<b>Example:</b> V8-WP	
-WP2	Optional housing is aluminum and provides weatherproof protection for electrical wiring; not UL approved
<b>Example:</b> V8-WP2	

Inconel® is a registered trademark of Huntington Alloys Corporation

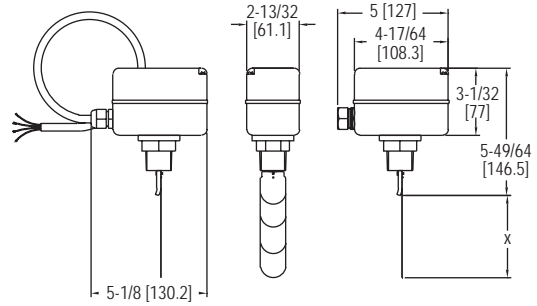


SERIES FS-2 | W. E. ANDERSON™ BY DWYER



# VANE FLOW SWITCH

Low Cost, Field Adjustable Set Point and Paddle



Shown with conduit connection option

The **Series FS-2 Vane Flow Switch** offers an economical flow proving solution. The FS-2 paddles are adjustable to fit 1 to 8" size pipe.

**FEATURES/BENEFITS**

- Field adjustable set point adjustment screw allows for easy flow switch modification
- Custom application set points enabled by field adjustable vane layers
- Aluminum weatherproof housing permits outdoor installation

**APPLICATIONS**

- Boiler flow proving
- Hot water heaters
- Chillers
- Cooling lines
- Machinery
- Liquid transfer systems

**APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR WATER; GPM (LPM)**

Pipe Size	Blade Vane Length in (mm) Dim. X	Minimum Setting		Maximum Setting	
		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: SS; 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:** 10 A res, 3 A 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.

**MODEL CHART**

Model	Description
FS-2	Paddle flow switch

**OPTIONS**

To order add suffix:	Description
-BSPT	Process connection
Example: FS-2-BSPT	
-CND	Conduit connection, 1" NPT female conduit connection with no wire leads.
Example: FS-2-CND	

USA: California Proposition 65  
 ⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

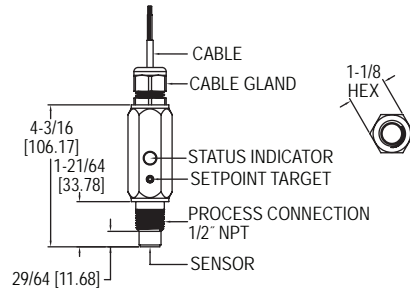
Flow Switches, Paddle / Flow Switches, Thermal

SERIES TDFS2 | W.E. ANDERSON™ BY DWYER



# THERMAL DISPERSION FLOW SWITCH

Non-Mechanical, Low Pressure Drop



The **Series TDFS2 Thermal Dispersion Flow Switch** is a thermal flow switch that indicates whether the flow rate is above or below a user set flow rate. The unit incorporates two LED status indicators providing visual switch indication. The set flow rate (setpoint) is field adjustable and the unit has both NO and NC NPN outputs.

**FEATURES/BENEFITS**

- Better reliability and life expectancy than mechanical flow switches with no paddles or vanes to wear or break, no jams in the paddle movement, and no seals on movement assembly to wear or leak
- Not affected by empty pipe as it avoids overheating by actively heating above the process temperature and then cooling down to process temperature
- Set point is easily field set by tapping the included magnet on the set point target three times at the desired flow rate
- LED status indicators provide visual switch indication of flow rate in comparison to the set point
- Low pressure drop; only needs to be inserted 10% into the flow (e.g. 1/8" for 3/4" schedule 40 pipe)

**APPLICATIONS**

- Boiler flow proving
- Hot water heaters
- Chillers
- Liquid transfer systems

**MODEL CHART**

Model	Description
TDFS2-1-P-06	Thermal flow switch, 6' (1.83 m) cable with cable gland
<b>Note:</b> Consult factory for longer cable lengths.	

**SPECIFICATIONS**

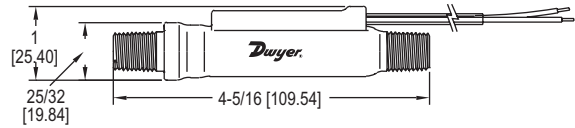
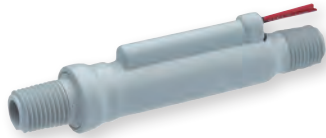
**Service:** Compatible water-based fluids.  
**Wetted Materials:** 316 SS.  
**Setpoint Range:** 0.5 to 10 ft/s (0.15 to 3.0 m/s).  
**Repeatability:** 0.07 ft/s +3% of setpoint.  
**Typical Deadband:** 0.1 ft/s +15% of setpoint.  
**Temperature Limits:** Ambient: 5 to 140°F (-15 to 60°C), Process: 5 to 140°F (-15 to 60°C), Storage: -40 to 185°F (-40 to 85°C).  
**Pressure Limits:** 300 psig (20.67 bar).  
**Response Time:** Approximately 8 s.  
**Power Requirement:** 9-24 VDC.  
**Switching Current:** 400 mA, derate 5 mA/°C above 23°C.  
**Current Consumption:** Average: 93 mA, Peak: 300 mA.  
**Electrical Connection:** 1/2" NPT cable gland with 4 conductor 22 AWG, 6' (1.83 m) cable.  
**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.





# FLOW SWITCH

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



The **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 P2 is comprised of PPE & PS (polyphenylene ether and polystyrene) housing and piston and 316 SS spring and stop pin.

### FEATURES/BENEFITS

- Piston design incorporates a hermetically sealed SPST magnetic reed switch
- All wetted parts are FDA compliant
- Economical design

### APPLICATIONS

- Pure water equipment
- Filter life monitoring
- Heat exchangers
- Cooling applications

### SPECIFICATIONS

<b>Service:</b> Compatible liquids or gases.	<b>Electrical Rating:</b> .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC.
<b>Wetted Materials:</b> Housing: PPE and PS (polyphenylene ether and polystyrene); Piston: PPE and PS and epoxy; Spring and stop pin: 316 SS.	<b>Electrical Connection:</b> 22 AWG, 18" (45.7 cm), PVC lead wires.
<b>Temperature Limits:</b> 0 to 212°F (-18 to 100°C).	<b>Process Connection:</b> 1/4" male NPT.
<b>Pressure Limits:</b> 150 psig (10.3 bar) @ 70°F (21°C); 50 psig (3.4 bar) @ 212°F (100°C).	<b>Mounting Orientation:</b> Any position. Set points shown are based on vertical, inlet down position.
<b>Switch Type:</b> SPST, N.O.	<b>Required Filtration:</b> 50 microns or better.
	<b>Weight:</b> 2 oz (.06 kg).

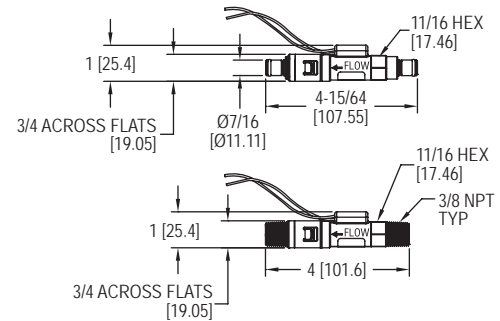
### MODEL CHART

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

## SERIES P3

# POLYPROPYLENE FLOW SWITCHES

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



The **Series P3 Polypropylene Flow Switches** fit almost any piping requirements with compatible liquids. Choose the inlet and outlet port to be 3/8" male NPT or 1/4" male "Quick Disconnect" then select a quick disconnect acetal adapter for straight through flow or with a shut off valve.

### FEATURES/BENEFITS

- Piston design incorporates a hermetically sealed SPST magnetic reed switch
- Easy integration to existing piping with a variety of fitting options
- Selectable shut off valve will stop line flow when the adapter is removed from the switch
- Economical design

### APPLICATIONS

- Pure water equipment
- Filter life monitoring
- Heat exchangers
- Cooling applications

### SPECIFICATIONS

<b>Service:</b> Compatible liquids.	<b>Electrical Rating:</b> .08 A @ 120 VAC.
<b>Wetted Materials:</b> Housing: Polypropylene; Piston: PPS composite; Spring: 316 SS; O-ring: Fluorocarbon.	<b>Electrical Connection:</b> 24" (60.96 cm), polymeric wire leads, 22 AWG.
<b>Temperature Limits:</b> 0 to 212°F (-18 to 100°C).	<b>Process Connection:</b> 3/8" male NPT or 1/4" quick disconnect.
<b>Pressure Limits:</b> 125 psig (8.6 bar) @ 70°F (21°C), 50 psig (3.4 bar) @ 212°F (100°C).	<b>Mounting Orientation:</b> Any position. Set points shown are based on vertical, inlet down position.
<b>Accuracy:</b> 20% of set point.	<b>Required Filtration:</b> 100 microns or better.
<b>Repeatability:</b> ±1%.	<b>Weight:</b> 5 oz (0.14 kg).
<b>Switch Type:</b> SPST, NO.	

### MODEL CHART

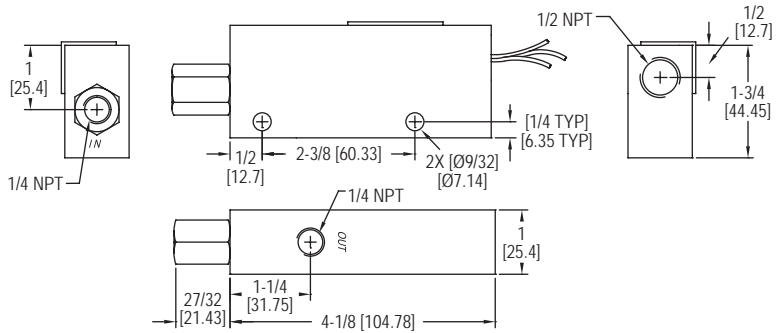
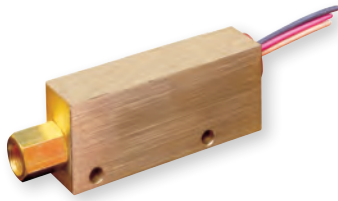
Model	Connection	Actuation Set Point
P3-31	3/8" NPT	0.25 GPM (.95 LPM)
P3-32	3/8" NPT	0.50 GPM (1.89 LPM)
P3-33	3/8" NPT	1.0 GPM (3.79 LPM)
P3-34	3/8" NPT	1.5 GPM (5.68 LPM)
P3-35	3/8" NPT	2.0 GPM (7.57 LPM)
P3-41	Quick disconnect	0.25 GPM (.95 LPM)
P3-42	Quick disconnect	0.50 GPM (1.89 LPM)
P3-43	Quick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

### ADAPTERS

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 with shut-off valve
P3-902	Quick disconnect straight through 1/4" BSPT with shut-off valve
P3-907	Quick disconnect straight through 1/4" ID tubing with shut-off valve

# BRASS FLOW SWITCH

Fixed Set points, 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 liquid flow rates. The switches have preset actuation points from 0.10 to 1.5 GPM for liquid flow.

**FEATURES/BENEFITS**

- Piston-type operation yields accurate detection of low flow rates
- The piston magnetically actuates a hermetically sealed SPST reed switch

**APPLICATIONS**

- Industrial cleaning equipment
- Detecting loss of fluid in hydraulic systems
- Assuring proper coolant flow in semiconductor processing

MODEL CHART	
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.

**SPECIFICATIONS**

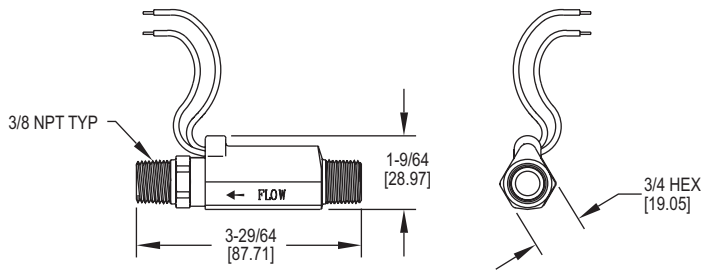
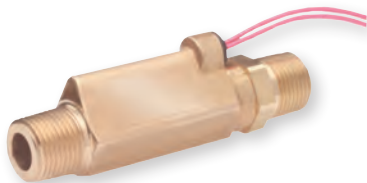
**Service:** Compatible liquids.  
**Wetted Materials:** Housing: Brass; Piston: Polysulfone; Spring: 316 SS; O-ring: Fluoroelastomer; Other: Epoxy.  
**Temperature Limits:** -20 to 225°F (-29 to 107°C).  
**Pressure Limits:** 1000 psig (68.9 bar).  
**Accuracy:** ±10% of set point.  
**Repeatability:**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

USA: California Proposition 65  
 ⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

SERIES P8

# HIGH PRESSURE BRASS FLOW SWITCH

Up to 1500 psi, Fixed Set point, Up to 2.0 GPM, Rugged Brass Body



The **Series P8 High Pressure Brass Flow Switch** is ideal for high in-line pressures. Set points range from 0.25 to 2.0 GPM for liquid flow.

**FEATURES/BENEFITS**

- Integrates a one-piece magnetic PPS composite piston to handle pressure up to 1500 psi
- Less susceptible to clogging than other high in-line pressure switches with 100 micron filtration

**APPLICATIONS**

- Industrial cleaning equipment
- High pressure lubrication systems

MODEL CHART	
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)

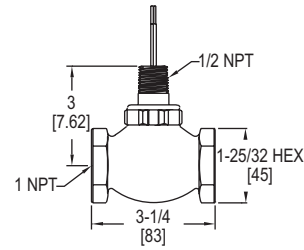
**SPECIFICATIONS**

**Service:** Compatible liquids.  
**Wetted Materials:** Housing: Brass; Piston: PPS composite, epoxy; Spring: 316 SS; 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, NO.  
**Electrical Rating:** .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 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.

USA: California Proposition 65  
 ⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

# GLOBE VALVE SWITCH

Adjustable Set Point, Rugged Bronze Construction, Straight Through Flow



The **Series GVS Globe Valve Switch** offers accurate flow detection with 1% repeatability and external adjustability over a broad range of flow settings for compatible liquids.

**FEATURES/BENEFITS**

- Externally adjustable flow set point
- Durable construction delivers long-life reliability in either water or oil
- Ample space for flow to pass keep pressure drop low

**APPLICATIONS**

- Detection of improper flow rates in high volume lubrication
- Low flow detection in cooling lines
- Flow detection in process systems

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

**SPECIFICATIONS**

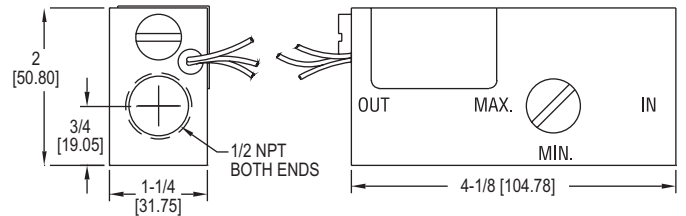
**Service:** Compatible liquids.  
**Wetted Materials:** Housing: Bronze; Shuttle: TFE; Bonnet: Bronze; Spring: 316 SS.; Other: Fluoroelastomer, ceramic.  
**Temperature Limits:** -20 to 200°F (-29 to 93°C).  
**Pressure Limits:** 400 psig (27 bar) @ 100°F (38°C).  
**Accuracy:** ±10%.  
**Repeatability:** 1% maximum deviation.  
**Switch Type:** SPDT.  
**Electrical Rating:** .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 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).

USA: California Proposition 65  
 ⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

SERIES AFS

# ADJUSTABLE FLOW SWITCH

For Oils, Water and Gases, Infinite Adjustments



The **Series AFS Adjustable Flow Switch** is externally adjustable piston-type flow switches for oils, liquids and gases. This Series offers an infinite number of flow settings from 0.5 to 20 GPM.

**FEATURES/BENEFITS**

- Externally adjustable flow set point
- Offers a number of flow settings at pressures up to 1000 psig, with low pressure drop and precise repeatability

**APPLICATIONS**

- Protecting machine tools from coolant flow failure
- Protecting bearings from loss of lubricant
- Assuring proper air flow
- Water or compatible liquid control
- Oil flow control
- Control of gas flows

MODEL CHART				
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	316 SS	316 SS
AFS-231	Gases	Wire leads	Brass	Brass
AFS-251	Gases	Wire leads	316 SS	316 SS
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	316 SS	316 SS
AFS-232	Gases	1/2" NPT conduit	Brass	Brass
AFS-252	Gases	1/2" NPT conduit	316 SS	316 SS

**SPECIFICATIONS**

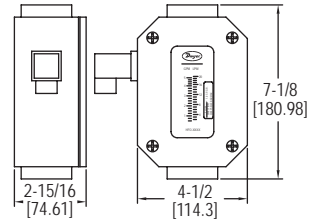
**Service:** Compatible gases or liquids.  
**Wetted Materials:** Housing and Piston: See model chart; Spring: 316 SS; O-ring: Fluoroelastomer; Other: Epoxy.  
**Temperature Limits:** -20 to 300°F (-29 to 149°C), -20 to 225°F (-29 to 107.2°C) with polysulfone piston.  
**Pressure Limit:** 1000 psi (68 bar).  
**Accuracy:** ±10% of set point.  
**Repeatability:** ±1% maximum deviation.  
**Switch Type:** SPDT.  
**Electrical Rating:** .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 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.  
**Set Point 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.

USA: California Proposition 65  
 ⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov



# IN-LINE FLOW ALARM

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



The **Series HFO In-Line 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. Available in 1/4", 1/2", 1" or 1-1/2" female NPT process connections, in aluminum, brass or 304 SS body.

**FEATURES/BENEFITS**

- Provides two 10 A SPDT limit switches with field adjustable alarm settings for application control and integral direct reading scale provides local indication of flow rate
- Increased application versatility with no inlet or outlet straight plumbing requirement and can be mounted horizontally, vertically, or inverted
- Outdoor or harsh environment installation capable with rugged cast aluminum construction and NEMA 4X (IP65) enclosure

**APPLICATIONS**

- Waste water processing
- Lubrication systems
- Process control
- Solar systems
- Drain lines
- Pump testing

MODEL CHART - DUAL SCALE RANGE			
Model	Connection Size	Range, Air: SCFM, SLPS	Body Material
HFO-21112	1/4" female NPT	2 to 12, 1 to 5.5	Aluminum
HFO-21123	1/4" female NPT	4 to 23, 2 to 10	Aluminum

**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:** 170°F (76°C).  
**Pressure Limits:** Aluminum body: 600 psig (41 bar); Brass body: 3500 psig (240 bar); 304 SS body: 6000 psig (413 bar).  
**Enclosure Rating:** NEMA 4X (IP66).  
**Accuracy:** ±2% FS.  
**Repeatability:** ±1% of FS.  
**Switch Type:** SPDT, 10 A @ 250 VAC; 0.5 A @ 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).

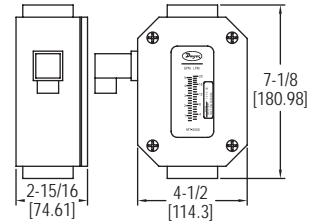
MODEL CHART			
Model	Connection Size	Range, Water: GPM, LPM	Body Material
HFO-22205	1/2" female NPT	0.5 to 5.0, 2 to 19	Brass
HFO-22315	3/4" female NPT	1 to 15, 5 to 55	Brass
HFO-22320	3/4" female NPT	2 to 20, 10 to 74	Brass
HFO-22440	1" female NPT	4 to 40, 20 to 150	Brass
HFO-22550	1-1/2" female NPT	6 to 50, 20 to 190	Brass
HFO-23202	1/2" female NPT	.2 to 2, 1 to 8	304 SS
HFO-23210	1/2" female NPT	1 to 10, 3 to 37.5	304 SS

USA: California Proposition 65  
 ⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

SERIES HFT

# IN-LINE FLOW TRANSMITTER

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



The **Series HFT In-Line Flow Transmitter** provides continuous monitoring of flow rate levels via a direct reading in-line flowmeter with electronics to provide proportional 4-20 mA, 0-5 and 1-5 VDC analog outputs.

**FEATURES/BENEFITS**

- Provides analog output to monitor application flow and integral direct reading scale to provide local indication of flow rate
- Increased application versatility with no inlet or outlet straight plumbing requirement and can be mounted horizontally, vertically, or inverted
- Outdoor or harsh environment installation capable with rugged cast aluminum construction and NEMA 4X (IP65) enclosure

**APPLICATIONS**

- Waste water processing
- Lubrication systems
- Process control
- Solar systems
- Drain lines
- Pump testing
- Drive data acquisition devices, meters or analog input cards

MODEL CHART - DUAL SCALE RANGE			
Model	Connection Size	Range, Air: SCFM, SLPS	Body Material
HFT-1112	1/4" female NPT	2 to 12, 1 to 5.5	Aluminum
HFT-1123	1/4" female NPT	4 to 23, 2 to 10	Aluminum

**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:** 170°F (76°C).  
**Pressure Limits:** Aluminum body: 600 psig (41 bar); Brass body: 3500 psig (240 bar); 304 SS body: 6000 psig (413 bar).  
**Power Requirements:** 12-35 VDC.  
**Enclosure Rating:** NEMA 4X (IP66).  
**Accuracy:** ±2% FS.  
**Repeatability:** ±1% of FS.  
**Response Time:** < 100 ms.  
**Output Signal:** 4-20 mA; 0-5 V; 1-5 V.  
**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).

MODEL CHART			
Model	Connection Size	Range, Water: GPM, LPM	Body Material
HFT-2205	1/2" female NPT	0.5 to 5.0, 2 to 19	Brass
HFT-2315	3/4" female NPT	1 to 15, 5 to 55	Brass
HFT-2320	3/4" female NPT	2 to 20, 1 to 75	Brass
HFT-2440	1" female NPT	4 to 40, 15 to 150	Brass
HFT-2550	1-1/2" female NPT	6 to 50, 20 to 190	Brass
HFT-3202	1/2" female NPT	.2 to 2, 1 to 8	304 SS
HFT-3210	1/2" female NPT	1 to 10, 3 to 3.75	304 SS

OPTIONS	
Use order code:	Description
NISTCAL-FT1	NIST traceable calibration certificate

USA: California Proposition 65  
 ⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

# PADDLEWHEEL FLOW SENSOR

Non-Magnetic Sensing, Adjustable for 1-1/2 to 40" (38.1 to 1016 mm) Pipe, Pulse or 4-20 mA



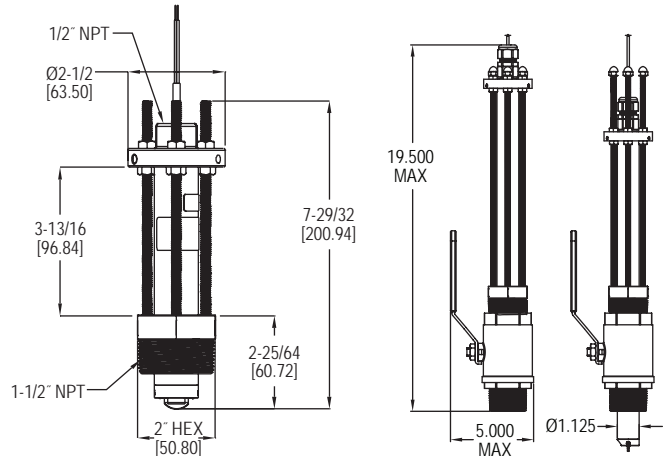
PFT-IAN-B111-S



PFT-HDN-S611-S  
shown with  
A-PFT-HKIT-SS



PFT-HDN-B611-S  
shown with  
A-PFT-HKIT



The Series PFT Paddlewheel Flow Sensor is used to monitor liquid flow rates in pipes from 1-1/2 to 40" (40-1016 mm). The unit has one size-adjustable sensor and is available in brass or 316 SS body. The unit outputs a frequency proportional pulsed or 4-20 mA output. The pulse models are a square wave output signal with frequency proportional to the flow velocity and the 4-20 mA models have a linear output of the velocity with 4 mA equal to 0 ft/s and 20 mA equal to 25 ft/s.

**FEATURES/BENEFITS**

- Bearings and shaft offer excellent wear protection even in applications with particulate for long life
- Weatherproof and submersible rated for irrigation applications
- One unit adjustable over a large pipe size range
- Multiple wetted material choices offer application versatility
- Integral 4-20 mA output with no need for additional external components
- Sensor technology uses inductive sensing to sense the blades of the impeller therefore does not use magnets allowing low flow rate monitoring with no concerns regarding magnetic material in the flow

**APPLICATIONS**

- Irrigation
- Ground water remediation
- Cooling systems
- Pump protection
- Leak detection
- Filtration systems

**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.  
**Linearity:** ±1.0% of FS.  
**Repeatability:** ±0.5% of FS.  
**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 or 1-1/2" BSPT male standard, 2" NPT male or 2" BSPT male optional.  
**Output:** Pulse: NPN open collector with square wave output, rated 60 V @ 50 mA max; Frequency: 3.2 to 200 Hz. Pulse width: 2.5 msec ±25%; 4-20 mA: 4 mA is 0 ft/s, 20 mA is 25 ft/s.  
**Power Requirement:** 10-35 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 (1.36 kg).  
**Agency Approvals:** CE.

\*Brass units IP67 only.

MODEL CHART											
Example	PFT	-I	D	N	-B	1	1	1	-S	-ST	PFT-IDN-B111-S-ST
<b>Series</b>	PFT										Paddlewheel flow sensor
<b>Style</b>		I H									Insertion Hot-tap insertion
<b>Output</b>			D A								600UA/40 MA 2.5 MS pulse Analog 4-20 mA transmitter
<b>Approvals</b>				N							None
<b>Body Material</b>					B S						Brass body 316 SST body
<b>Mounting</b>						1 2 3 4 5 6 7 8					1-1/2" NPTM mounting 2" NPTM mounting 1-1/2" male BSPT mounting 2" male BSPT mounting 1-1/2" NPTM hot tap with valve 1-1/2" NPTM hot tap without valve 1-1/2" male BSPT hot tap with valve 1-1/2" male BSPT hot tap without valve
<b>O-Ring Material</b>							1 2 3				FKM fluoroelastomer Silicone (FDA approved) Buna-N
<b>Wetted Materials</b>								1 2			Tungsten-carbide shaft, 316 SS impeller, PTFE bearing 316 SS shaft, 316 SS impeller, PTFE bearing
<b>Electrical Connection</b>									S B		22 GA shielded wire, 20 ft (6.1 m) 18 GA UL listed burial rated, 4 ft (1.2 m)
<b>Options</b>										ST	Stainless steel tag

MODEL CHART	
Model	Description
PFT-IAN-B111-S	Standard brass 1-1/2" NPTM analog output
PFT-IAN-S111-S	Standard 316 SST 1-1/2" NPTM analog output
PFT-IDN-B111-S	Standard brass 1-1/2" NPTM pulse output
PFT-IDN-S111-S	Standard 316 SST 1-1/2" NPTM pulse output
PFT-HAN-B611-S	Hot tap without valve brass 1-1/2" NPTM analog output
PFT-HAN-S611-S	Hot tap without valve 316 SST 1-1/2" NPTM analog output
PFT-HDN-B611-S	Hot tap without valve brass 1-1/2" NPTM pulse output
PFT-HDN-S611-S	Hot tap without valve 316 SST 1-1/2" NPTM pulse output

ACCESSORIES	
Model	Description
A-PFT-HKIT	1-1/2" Brass valve NPT with nipple
A-PFT-HKIT-BSPT	1-1/2" Brass valve BSPT with nipple
A-PFT-HKIT-SS	1-1/2" SS valve NPT with nipple
A-PFT-HKIT-SS-BSPT	1-1/2" SS valve BSPT with nipple

USA: California Proposition 65  
 ⚠️WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

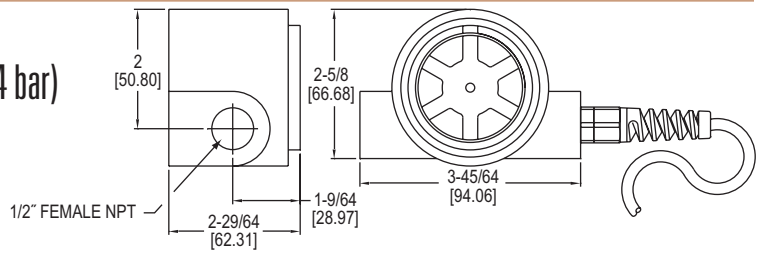


SERIES SF | W. E. ANDERSON® BY DWYER



# SIGHT FLOW TRANSMITTER

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



The **Series SF Sight Flow Transmitter** is a Series of sight indicators which can display flow or contents of pipelines and provide an analog 4-20 mA signal proportional to the flow rate. It is available with a 316 SS or clear polycarbonate cover.

**FEATURES/BENEFITS**

- Integrates tangential turbine technology with hermetically sealed circuitry to provide accurate flow measurement and control in the harshest environments
- 2-wire loop-powered design transmits a 4-20 mA signal proportional to flow rate for remote flow monitoring
- Clear polycarbonate viewing cover option for visible indication of flow
- 316 SS cover offers added protection with pressure limit up to 500 psig (34 bar)
- LED power indication, adjustable zero and span, polarity protection and over current limiting
- Accurately measures flow in both directions and can be mounted in any orientation

**APPLICATIONS**

- Cooling and lubrication circuits
- HVAC systems
- Aggressive chemical metering
- Batching systems

MODEL CHART	
Model	Cover Material
SF10	316 SS
SF11	Clear polycarbonate

**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 (2 to 60 LPM).  
**Accuracy:** ±2% FS.  
**Repeatability:** 0.5% FS.  
**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 s to 90% (step change in flow rate).  
**Supply Voltage:** 12-35 VDC.  
**Output:** 4-20 mA.  
**Loop Resistance:** 1150 Ω 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.

**OPTIONS**

Use order code:	Description
NISTCAL-FT1	NIST traceable calibration certificate

Iglide® is a registered trademark of Iguus GMBH

**SERIES SF2**

# SIGHT FLOW METERS

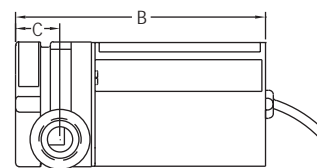
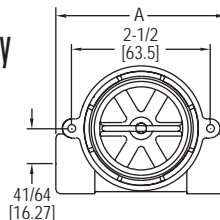
SPDT or Pulse Output, Visual Flow Confirmation, Brass Body



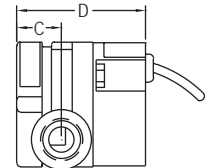
SF2-1



SF2-2



Side view VAC switch models



Side view VDC switch and transmitter models

**DIMENSIONS in [mm]**

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

The **Series SF2 Sight Flow Meters** combine visual confirmation of flow with a relay or pulse output. The SF2-1 offers a SPDT relay output and the SF2-2 offers a pulse output proportional to the rate of flow. The 4.5-24 VDC pulse output is compatible with most digital logic families.

**FEATURES/BENEFITS**

- Brass, solid body construction, one piece composite rotor, and ceramic shaft delivers durability with broader chemical, temperature, and pressure capabilities
- Set points are fully adjustable over the specified flow range
- The dynamic operation of the rotor guards against jamming and false actuation

**APPLICATIONS**

- Cooling and lubrication circuits
- HVAC systems
- Aggressive chemical metering
- Batching systems

**MODEL CHART - 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

**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 4.5-24 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.  
**Set Point Differential:** 15% max for relay output models.  
**Maximum Viscosity:** 200 SSU.  
**Agency Approvals:** CE.

**MODEL CHART - PULSED OUTPUT**

Model	Range (GPM)	Power	Connection
SF2-204	0.5 to 5.0	4.5-24 VDC	1/4" female NPT
SF2-214	4.0 to 20.0	4.5-24 VDC	1/2" female NPT
SF2-224	5.0 to 30.0	4.5-24 VDC	3/4" female NPT
SF2-234	8.0 to 60.0	4.5-24 VDC	1" female NPT

USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov



SERIES SFI-800 | W. E. ANDERSON® BY DWYER

# SIGHT FLOW INDICATORS/TRANSMITTERS

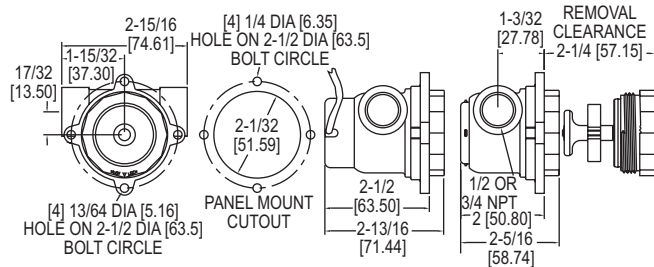
Low Cost, Optional Output for Flow Rate and Totalization  
UV Stabilized Polycarbonate Model



SFI-801

SFI-800

SFI with A-711 option



SFI with A-711 option

SFI model only

The Series SFI-800 Sight Flow Indicators/Transmitters are low cost, durable rotor style flow indicators with optional Hall Effect magnetic output packages to combine visual confirmation of flow with optional remote flow monitoring. There are three output sensors available, the A-711 offering two pulsed voltage signals proportional to flow rate, the A-712 which outputs a linear 1-10 VDC signal proportional to flow rate, and the A-713 which offers two programmable open collector switch outputs.

The Model A-711 is a unique and patent pending sensor that outputs two pulsed voltage signals with one providing a 5 VDC pulse and the other a pulse of the input supply voltage used, ranging from 8-18 VDC.

The Model A-712 is a sensor that outputs a linear 1-10 VDC signal proportional to flow rate.

The Model A-713 is a sensor with two programmable open collector switch outputs with one output closed above the set point and the other output closed below the set point ideal for low flow or high flow indication.

### FEATURES/BENEFITS

- Constructed of clear plastic enabling 360° viewing of the 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 and easy view bright red impeller
- All three output packages can be installed or replaced in the field without any tools and without removing the body from the process line
- Units are weather-tight for outdoor or wash-down area use
- A-713 features a user-friendly set point button which is set at the desired flow rate with red LED indication of switch status

### APPLICATIONS

- Cooling and lubrication circuits
- HVAC systems
- Aggressive chemical metering
- Batching systems

### MODEL CHART - SENSOR ONLY

Model	Description
A-711	Pulsed output
A-712	1-10 VDC
A-713	Two open collectors

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

### MODEL CHART - BODY ONLY

Polysulfone Body Model	Description	Range GPM (LPM)	Connection Female NPT
SFI-800-1/2	Indicator only	2 to 20 (7.6 to 75.5)	1/2"
SFI-800-3/4	Indicator only	3 to 35 (11.4 to 132.5)	3/4"
SFI-800-1/2-LF	Indicator only	0.5 to 6.5 (1.9 to 24.6)	1/2"
Polycarbonate Body Model	Description	Range GPM (LPM)	Connection Female NPT
SFI-801-1/2	Indicator only	2 to 20 (7.6 to 75.5)	1/2"
SFI-801-3/4	Indicator only	3 to 35 (11.4 to 132.5)	3/4"
SFI-801-1/2-LF	Indicator only	0.5 to 6.5 (1.9 to 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:** 8-28 VDC.  
**Output Signal:** White lead: 5 VDC; Green lead: 8-28 VDC equal to supply voltage. Pulsed output with frequency rate proportional to flow rate.  
**Accuracy:** ±5% FS.  
**Frequency Output Range:** 0 to 100 Hz.  
**Electrical Connections:** Black lead - ground; White lead: 5 VDC out pulse; Green lead: 8-28 VDC out pulse; Red lead: 8-28 VDC supply.

**ELECTRICAL SPECIFICATIONS (for A-712 option only)**  
**Temperature Limits:** -20 to 212°F (-29 to 100°C).  
**Power Requirements:** 15-28 VDC.  
**Output Signal:** White lead: 1-10 VDC.  
**Accuracy:** ±5% FS.  
**Electrical Termination:** Black lead: Ground; Red lead: 15-28 VDC input; White lead: 1-10 VDC output.

**ELECTRICAL SPECIFICATIONS (for A-713 option only)**  
**Temperature Limits:** -20 to 212°F (-29 to 100°C).  
**Power Requirements:** 8-28 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: 8-28 VDC.

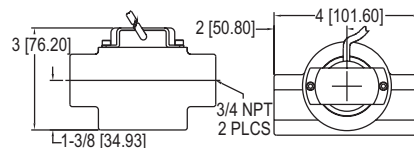
### OPTIONS - BODY AND SENSORS ATTACHED

To order add suffix:	Description
-A711	A-711 attached to flow indicator body
<b>Example:</b> SFI-800-1/2-A711	
-A712	A-712 attached to flow indicator body
<b>Example:</b> SFI-800-1/2-A712	
-A713	A-713 attached to flow indicator body
<b>Example:</b> SFI-800-1/2-A713	

SERIES SFI-100T | W. E. ANDERSON® BY DWYER

# SIGHT FLOW INDICATOR/TRANSMITTER

Output for Flow Rate and Totalization



The Series SFI-100T Sight Flow Indicator/Transmitter is a low cost and durable flow transmitter that combines our popular 100 Series Sight Flow Indicator with our A-711T output sensor for visual and remote monitoring of flow. The A-711T output sensor has two pulsed voltage signals with one providing a 5 VDC pulse, the other a pulse of the input supply voltage used, ranging from 8-28 VDC and a pulsed output with a frequency change proportional to the flow rate.

### FEATURES/BENEFITS

- Constructed of a robust, solid brass body and a tempered glass window
- Bright red impeller yields great visual indication of flow through the window
- Front window can be easily unscrewed to clean out the sight flow indicator
- Ideal for outdoor applications with weatherproof body that is unaffected by UV light

### APPLICATIONS

- Cooling and lubrication circuits
- HVAC systems
- Monitoring chilled or hot water flow
- Monitoring water flow in chillers

### MODEL CHART

Model	Description	Range GPM (LPM)	Connection Female NPT
SFI-100T-1/2-A711T	Brass indicator with A-711T sensor	2 to 20 (7.6 to 75.5)	1/2"
SFI-100T-3/4-A711T	Brass indicator with A-711T sensor	3 to 35 (11.4 to 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:** 8-28 VDC.  
**Output Signal:** White lead: 5 VDC. Green lead: 8-28 VDC equal to supply voltage. Pulsed output with frequency rate proportional to flow rate.  
**Accuracy:** ±5% FS.  
**Frequency Output Range:** 0 to 100 Hz.  
**Mounting Orientation:** Horizontal.  
**Electrical Connections:** Black lead: Ground; White lead: 5 VDC out pulse; Green lead: 8-28 VDC out pulse; Red lead: 8-28 VDC supply.

++ USA: California Proposition 65  
 ⚠ WARNING: Cancer and Reproductive Harm  
 - www.P65Warnings.ca.gov



SERIES DFMT & DFMT2

# DIGITAL PADDLEWHEEL FLOW TRANSMITTERS

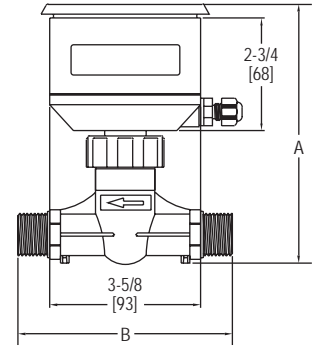
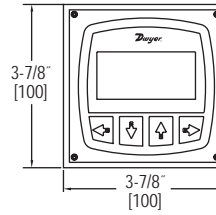
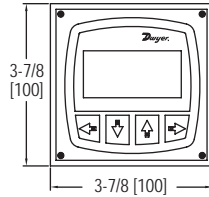
Flow and Total Indication, Easy to Read LCD Display, 4-20 mA or Pulse Output



DFMT

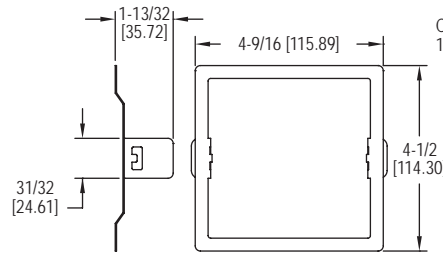


DFMT2



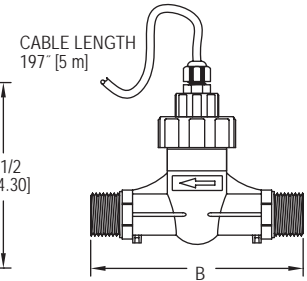
DFMT

Connection	A	B
3/8"	6" (152 mm)	4-3/4" (121 mm)
1/2"	6" (152 mm)	5-1/8" (130 mm)
3/4"	6-1/4" (158 mm)	5-5/8" (142 mm)
1"	6-1/4" (158 mm)	5-1/2" (141 mm)
1-1/2"	6-5/8" (168 mm)	6-7/8" (175 mm)
2"	7-1/4" (184 mm)	6-7/8" (175 mm)



Remote mounting bracket (stainless steel)

DFMT2



The **Series DFMT Digital Paddlewheel Flow Transmitters** provide instantaneous, as well as totalizing flow monitoring. The unit offers a user selectable 4-20 mA or pulse output with compact display.

**FEATURES/BENEFITS**

- The large backlit LCD display defines instantaneous as well as cumulative flow with visual indication bar designating percent of max flow
- Long operation life with high accuracy paddlewheel technology and corrosion resistant PVDF sensor
- Totalizer is user resettable at any time ideal for single batch totalization
- Security password protecting prevents any unauthorized changes

**APPLICATIONS**

- Cooling towers
- Chemical proportioning or blending
- Industrial water and wastewater treatment
- Cooling water monitoring
- Fluctuating fluid conductivity applications
- Reverse osmosis systems

The **Series DFMT2 Remote Digital Paddlewheel Flow Transmitter** provides instantaneous, as well as totalizing flow monitoring. The unit offers a user selectable 4-20 mA or pulse output with remote display.

**FEATURES/BENEFITS**

- Two piece design allows the user to separate the control display from the application, making it ideal in areas where space is limited
- The large backlit LCD display defines instantaneous as well as cumulative flow with visual indication bar designating percent of max flow
- Long operation life with high accuracy paddlewheel technology and corrosion resistant PVDF sensor
- Totalizer is user resettable at any time ideal for single batch totalization
- Security password protecting prevents any unauthorized changes

**APPLICATIONS**

- Reverse osmosis systems
- Remote flow monitoring
- Cooling towers
- Chemical proportioning or blending
- Industrial water and wastewater treatment
- Cooling water monitoring
- Fluctuating fluid conductivity applications

SPECIFICATIONS	
<b>Service:</b>	Compatible clean liquids.
<b>Range:</b>	See model chart.
<b>Wetted Materials:</b>	Sensor and impeller: PVDF; Shaft: Ceramic; O-rings: Fluoroelastomer.
<b>Accuracy:</b>	±1.5% FS.
<b>Repeatability:</b>	±0.5% FS.
<b>Output:</b>	Analog: 4-20 mA (750 Ω max. loop resistance); Pulse: NPN square wave output; Frequency: 0 to 2 kHz (adjustable); Pulse width: 0 to 1000 ms (adjustable).
<b>Electrical Connections:</b>	Removable screw terminal.
<b>Temperature Limits:</b>	Process: -4 to 194°F (-20 to 90°C); Ambient: -4 to 149°F (-20 to 65°C).
<b>Pressure Limit:</b>	145 psi (1.0 MPa).
<b>Power Requirements:</b>	12-24 VDC.
<b>Power Consumption:</b>	2 W.
<b>Display:</b>	2.38 x 1.25" (60.33 x 31.75 mm) LCD.
<b>Totalizing Display Maximum:</b>	9,999,999,999.
<b>Process Connection:</b>	See model chart.
<b>Enclosure Rating:</b>	IP65.
<b>Enclosure Material:</b>	ABS plastic.
<b>Weight:</b>	See model chart.

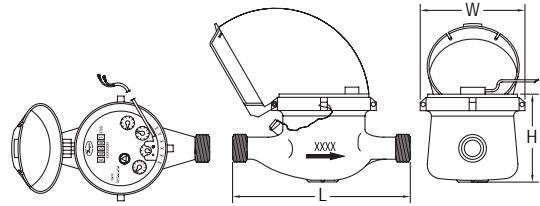
MODEL CHART			
Model	Range GPM (m³/h)	Connection	Weight lb (kg)
DFMT-10A	0.44 to 7.93 (0.1 to 1.8)	3/8" NPT	1.06 (0.48)
DFMT-15A	0.88 to 17.61 (0.2 to 4)	1/2" NPT	1.10 (0.5)
DFMT-20A	1.32 to 26.42 (0.3 to 6)	3/4" NPT	1.15 (0.52)
DFMT-25A	2.20 to 52.83 (0.5 to 12)	1" NPT	1.23 (0.56)
DFMT-40A	6.61 to 105.67 (1.5 to 24)	1-1/2" NPT	1.46 (0.66)
DFMT-50A	8.81 to 176.11 (2 to 40)	2" NPT	1.68 (0.76)

MODEL CHART			
Model	Range GPM (m³/h)	Connection	Weight lb (kg)
DFMT2-10A	0.44 to 7.93 (0.1 to 1.8)	3/8" NPT	1.76 (0.8)
DFMT2-15A	0.88 to 17.61 (0.2 to 4)	1/2" NPT	1.81 (0.82)
DFMT2-20A	1.32 to 26.42 (0.3 to 6)	3/4" NPT	1.85 (0.84)
DFMT2-25A	2.20 to 52.83 (0.5 to 12)	1" NPT	1.94 (0.88)
DFMT2-40A	6.61 to 105.67 (1.5 to 24)	1-1/2" NPT	2.20 (1.0)
DFMT2-50A	8.81 to 176.11 (2 to 40)	2" NPT	2.43 (1.1)



# MULTI-JET HOT WATER METER

High Temperature Threshold, Pulsed Output



Size in (mm)	Spud NPSM (BSPP)	Length 'L' in (mm)	Width 'W' in (mm)	Height 'H' in (mm)	Weight lb (kg)
5/8 x 1/2 (15)	3/4" (3/4")	6-1/2(165)	3-45/64 (94)	4-15/64(107.5)	3.75(1.7)
5/8 x 3/4	1" (1")	7-1/2(190)	3-45/64(94)	4-15/64(107.5)	3.97(1.8)
3/4 (20)	1" (1")	7-1/2(190)	3-45/64(94)	4-15/64(107.5)	4.9(2.2)
1 (25)	1-1/4" (1-1/4")	10-1/4(260)	3-55/64(98)	4-5/8(117.5)	6.4(2.9)
1-1/4 (32)	1-1/2" (1-1/2")	10-1/4 (260)	3-55/64(98)	4-5/8(117.5)	8.2(3.7)
1-1/2 (40)	2" (2")	11-13/16 (300)	4-51/64(122)	5-9/16(141.5)	13.52 (6.17)
2 (50)	2-1/2" (2-1/2")	11-13/16 (300)	5-45/64(145)	6-31/32(177)	18.74 (8.5)

The **Series WMH Multi-Jet Hot Water Meter** is a series of mechanical, water totalizing meters that display the total water usage in gallons with m<sup>3</sup> options. They are available in a range of body sizes and include NPT or BSPT optional couplings. The high temperature resistant brass body is compatible in applications with high temperature water not suitable with standard brass water meters and maintains its accuracy.

**FEATURES/BENEFITS**

- High temperature threshold of 190°F (88°C) ideal for high temperature applications
- Multi-jet design allows for simplicity and accuracy with wide flow ranges, even in low flow applications
- Magnetically driven, hermetically sealed register does not leak or fog and is completely separated from the water
- Designed for long service life and maintenance-free operation
- Integral strainer that protects meter from particulate damage
- Easy installation with included coupling adapters
- Pulsed output proportional to flow allows for remote flow totalization

**APPLICATIONS**

- HVAC applications
- Measuring total condenser water flow in residential, commercial and industrial applications
- Remote hot water monitoring

**SPECIFICATIONS**

**Service:** Water.  
**Wetted Materials:** Body: Brass; Couplings: Brass; Measuring chamber: Brass.  
**Flow Range:** See model chart.  
**Accuracy:** WMH-A-X-XX: Transitional flow: ±3%; Nominal flow: ±1.5%.  
**Temperature Limit:** 190°F (88°C).  
**Pressure Limit:** 150 psi (10 bar).  
**Totalizing Display Maximum:** See model chart.  
**Output Signal:** Pulse output with frequency proportional to flow rate.  
**Pulse Options:** 0.1 gal, 1 gal, 10 gal, 100 gal per pulse (1 L, 10 L, 100 L, 1000 per pulse) See model chart.\*  
**Electrical Rating:** 0.01A @ 24VAC/DC.  
**Electrical Connections:** Color-coded lead wires, 4.5' (1.5 m) long.  
**Mounting Orientation:** Horizontal with register facing up.  
**Weight:** See dimension chart.  
 \*Consult factory for m<sup>3</sup>, BSPT units or additional pulse output options

**MODEL CHART**

Model	Size	Coupling Size	GPM (Gallons Per Minute)			Display Max (Gallons)	Pulse Rate (Gal/Pulse)
			Max Flow	Nominal Flow Range	Transitional Flow		
WMH-A-C-01	5/8" x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WMH-A-C-02	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WMH-A-C-03	3/4" SL	3/4" NPT	30	2 to 30	0.5	9,999,999.99	0.1
WMH-A-C-06	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	0.1
WMH-A-C-01-1	5/8" x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	1
WMH-A-C-02-1	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	1
WMH-A-C-03-1	3/4" SL	3/4" NPT	30	2 to 30	0.5	9,999,999.99	1
WMH-A-C-06-1	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	1
WMH-A-C-07-1	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	9,999,999.9	1
WMH-A-C-08-1	2"	2" NPT	160	8 to 160	2	9,999,999.9	1
WMH-A-C-01-10	5/8" x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	10
WMH-A-C-02-10	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	10
WMH-A-C-03-10	3/4" SL	3/4" NPT	30	2 to 30	0.5	9,999,999.99	10
WMH-A-C-06-10	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	10
WMH-A-C-07-10	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	9,999,999.9	10
WMH-A-C-08-10	2"	2" NPT	160	8 to 160	2	9,999,999.9	10

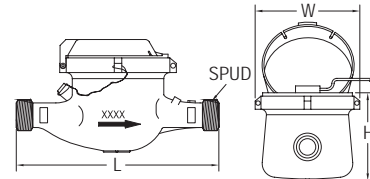
USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

SERIES WNT

# MULTI-JET BRASS BODY WATER METER

NSF Certified, Lead Free, Economical



Size in (mm)	Spud NPSM (BSPP)	Length 'L' in (mm)	Width 'W' in (mm)	Height 'H' in (mm)	Weight lb (kg)
5/8 x 1/2 (15)	3/4" (3/4")	7-31/64(190)	3-45/64 (94)	4-15/64 (107.5)	3.58 (1.63)
5/8 x 3/4 (15)	1" (1")	7-31/64(190)	3-45/64 (94)	4-15/64 (107.5)	3.81 (1.73)
3/4 (20)	1" (1")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	6.02 (2.73)
1 (25)	1-1/4" (1-1/4")	10-1/4(260)	3-55/64 (98)	4-5/8 (117.5)	6.02 (2.73)
1-1/2 (40)	2" (2")	11-13/16 (300)	4-51/64 (122)	4-5/8 (117.5)	12.02 (5.45)
2 (50)	2-1/2" (2-1/2")	11-13/16 (300)	5-45/64 (145)	5-9/16 (141.5)	13.23 (6)

The **Series WNT Multi-Jet Brass Body Water Meter** is a series of mechanical, water totalizing meters that display the total water usage in gallons or cubic meter. They are available in a range of body sizes and include NPT or BSPT couplings. Its lead free, NSF certified body is ideal for potable water applications.

**FEATURES/BENEFITS**

- NSF/ANSI makes it ideal for no lead portable water requirements
- Multi-jet design allows for simplicity and accuracy with wide flow ranges, even in low flow applications
- Magnetically driven, hermetically sealed register does not leak or fog and is completely separated from the water
- Designed for long service life and maintenance-free operation
- Integral strainer that protects meter from particulate damage
- Easy installation with included coupling adapters
- Pulsed output proportional to flow allows for remote flow totalization

**APPLICATIONS**

- Potable water applications
- Residential water measurement
- Remote water monitoring

**SPECIFICATIONS**

**Service:** Water.  
**Wetted Materials:** Body: ECO BRASS®; Couplings: ECO BRASS®; Measuring chamber: ABS plastic.  
**Flow Range:** See model chart.  
**Accuracy:** Transitional flow: ±3%; Nominal flow: ±1.5%.  
**Temperature Limit:** 122°F (50° C).  
**Pressure Limit:** 150 psi (10 bar).  
**Totalizing Display Maximum:** See model chart.  
**Output Signal:** Pulse output with frequency proportional to flow rate.  
**Pulse Options:** 0.1 gal, 1 gal, 10 gal, 100 gal per pulse.  
**Electrical Rating:** 0.01 A @ 24 VAC/DC.  
**Electrical Connections:** Color-coded lead wires, 4.5' (1.5 m) long.  
**Mounting Orientation:** Horizontal with register facing up.  
**Agency Approvals:** NSF.  
**Weight:** See dimension chart.

**MODEL CHART**

Model	Size	Coupling Size	GPM (Gallons Per Minute)			Display Max (Gallons)	Pulse Rate (Gal/Pulse)
			Max Flow	Nominal Flow Range	Transitional Flow		
WNT-A-C-01	5/8" x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WNT-A-C-02	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WNT-A-C-05	3/4" x 1"	1" NPT	30	2 to 30	0.5	9,999,999.99	0.1
WNT-A-C-06	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	0.1
WNT-A-C-07-1	1-1/2"	1-1/2" NPT	100	5 to 100	1.25	9,999,999.9	1
WNT-A-C-08-1	2"	2" NPT	160	8 to 160	2	9,999,999.9	1

⚠ WARNING: Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

ECO BRASS® is a registered trademark patent by Mitsubishi Shindoh



SERIES WM2 & WMT2

# MULTI-JET WATER METER

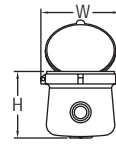
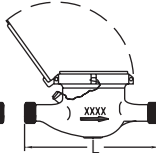
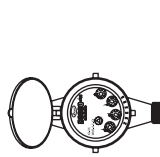
Economical, Brass Body, Dry Dial



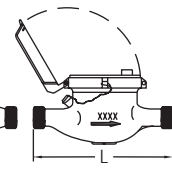
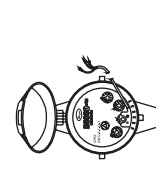
WM2



WMT2



WM2



WMT2



Size in (mm)	Spud NPSM (BSPP)	Length 'L' in (mm)	Width 'W' in (mm)	Height 'H' in (mm)	Weight lb (kg)
5/8 x 1/2 (15)	3/4" (3/4")	6-1/2 (165)	3-45/64 (94)	4-15/64 (107.5)	3.75 (1.7)
5/8 x 3/4	1" (1")	7-1/2 (190)	3-45/64 (94)	4-15/64 (107.5)	3.97 (1.8)
3/4 (20)	1" (1")	7-1/2 (190)	3-45/64 (94)	4-15/64 (107.5)	4.9 (2.2)
1 (25)	1-1/4" (1-1/4")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	6.4 (2.9)
1-1/4 (32)	1-1/2" (1-1/2")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	8.2 (3.7)
1-1/2 (40)	2" (2")	11-13/16 (300)	4-51/64 (122)	5-9/16 (141.5)	13.52 (6.17)
2 (50)	2-1/2" (2-1/2")	11-13/16 (300)	5-45/64 (145)	6-31/32 (177)	18.74 (8.5)

The Series WM2 Multi-Jet Water Meter is a series of mechanical, water totalizing meters that display the total water usage in gallons or m<sup>3</sup>. They are available in a range of body sizes and include NPT or BSPT couplings. The Series WMT2 Multi-Jet Water Meter with Pulsed Output is a series of mechanical, water totalizing meters that display the total water usage in gallons or m<sup>3</sup> and provide a reed switch output proportional to flow rate. They are available in a range of body sizes and include NPT or BSPT couplings.

**FEATURES/BENEFITS**

- Multi-jet design allows for simplicity and accuracy with wide flow ranges, even in low flow applications
- Magnetically driven, hermetically sealed register does not leak or fog and is completely separated from the water
- Designed for long service life and maintenance-free operation, even under harsh conditions
- Integral strainer that protects meter from particulate damage
- Easy installation with included coupling adapters

**APPLICATIONS**

- Irrigation
- Cooling systems
- Filtration systems
- Water monitoring

**SPECIFICATIONS**

**Service:** Water.  
**Wetted Materials:** Body: Brass, polyethylene; Couplings: Brass; Measuring Chamber: Polyethylene, ABS plastic, ferrite, acetal.  
**Flow Range:** See model chart.  
**Accuracy:** Transitional flow: ±5%; Nominal flow: ±2%.  
**Temperature Limit:** 104°F (40°C).  
**Pressure Limit:** 232 psi (16 bar).  
**Totalizing Display Maximum:** See model chart.  
**Output Signal:** Pulse output with frequency proportional to flow rate (WMT2 only).  
**Pulse Options:** 0.1 gal, 1 gal, 10 gal, 100 gal per pulse (1 L, 10 L, 100 L per pulse) (WMT2 only).  
**Electrical Rating:** 0.01 A @ 24 VAC/DC (WMT2 only).  
**Electrical Connections:** Color-coded lead wires, 4.5' (1.5 m) long (WMT2 only).  
**Mounting Orientation:** Horizontal with the register face pointing up.  
**Weight:** See dimension chart.

**MODEL CHART**

Model	Size	Coupling Size	Max Flow GPM (Gallons Per Minute)	Nominal Flow Range	Transitional Flow	Display Max (Gallons)
WM2-A-C-01	5/8 x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99
WM2-A-C-02	5/8 x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99
WM2-A-C-03	3/4"	3/4" NPT	30	2 to 30	0.5	99,999,999.9
WM2-A-C-04	1"	1" NPT	50	3 to 50	0.75	99,999,999.9
WM2-A-C-06	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	99,999,999.9
WM2-A-C-07	2"	2" NPT	160	8 to 160	2	99,999,999.9

**MODEL CHART**

Model	Size	Coupling Size	Max Flow m <sup>3</sup> /h	Nominal Flow Range	Transitional Flow	Display Max (m <sup>3</sup> )
WM2-B-C-08	15 mm	1/2" BSPT	3	0.12 to 1.5	0.03	99,999.9999
WM2-B-C-10	20 mm	3/4" BSPT	5	0.2 to 2.5	0.05	99,999.9999
WM2-B-C-11	25 mm	1" BSPT	7	0.28 to 3.5	0.07	99,999.9999
WM2-B-C-12	32 mm	1-1/4" BSPT	12	0.48 to 6	0.12	99,999.9999
WM2-B-C-13	40 mm	1-1/2" BSPT	20	0.8 to 10	0.2	999,999.9999
WM2-B-C-14	50 mm	2" BSPT	30	1.2 to 15	0.3	999,999.9999

**MODEL CHART**

Model	Size	Coupling Size	Max Flow GPM (Gallons Per Minute)	Nominal Flow Range	Transitional Flow	Display Max (Gallons)	Pulse Rate (Gal./Pulse)
WMT2-A-C-01	5/8 x 1/2"	1/2" NPT	20	1 to 10	0.25	9,999,999.99	0.1
WMT2-A-C-02	5/8 x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WMT2-A-C-03*	3/4"	3/4" NPT	30	2 to 30	0.25	9,999,999.99	0.1
WMT2-A-C-04	1"	1" NPT	50	3 to 50	0.75	99,999,999.9	0.1
WMT2-A-C-01-1	5/8 x 1/2"	1/2" NPT	20	1 to 10	0.25	9,999,999.99	1
WMT2-A-C-02-1	5/8 x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	1
WMT2-A-C-03-1*	3/4"	3/4" NPT	30	2 to 30	0.25	9,999,999.99	1
WMT2-A-C-04-1	1"	1" NPT	50	3 to 50	0.75	99,999,999.9	1
WMT2-A-C-06-10	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	99,999,999.9	10
WMT2-A-C-07-10	2"	2" NPT	160	8 to 160	2	99,999,999.9	10
WMT2-A-C-04-100	1"	1" NPT	50	3 to 50	0.75	99,999,999.9	100
WMT2-A-C-07-100	2"	2" NPT	160	8 to 160	2	99,999,999.9	100

\*Does not include inlet filter.

**MODEL CHART**

Model	Size	Coupling Size	Max Flow m <sup>3</sup> /h	Nominal Flow Range	Transitional Flow	Display Max (m <sup>3</sup> /h)	Pulse Rate (L/Pulse)
WMT2-B-C-08-1	15 mm	1/2" BSPT	3	0.12 to 1.5	0.03	99,999.9999	1
WMT2-B-C-10-1*	20 mm	3/4" BSPT	5	0.2 to 2.5	0.05	99,999.9999	1
WMT2-B-C-11-1	25 mm	1" BSPT	7	0.25 to 3.5	0.07	99,999.9999	1
WMT2-B-C-12-1	32 mm	1-1/4" BSPT	12	0.48 to 6	0.12	99,999.9999	1
WMT2-B-C-08-10	15 mm	1/2" BSPT	3	0.12 to 1.5	0.03	99,999.9999	10
WMT2-B-C-12-10	32 mm	1-1/4" BSPT	12	0.48 to 6	0.12	99,999.9999	10
WMT2-B-C-14-10	50 mm	2" BSPT	30	1.2 to 15	0.3	999,999.9999	10
WMT2-B-C-12-100	32 mm	1-1/4" BSPT	12	0.48 to 6	0.12	99,999.9999	100
WMT2-B-C-14-100	50 mm	2" BSPT	30	1.2 to 15	0.3	999,999.9999	100

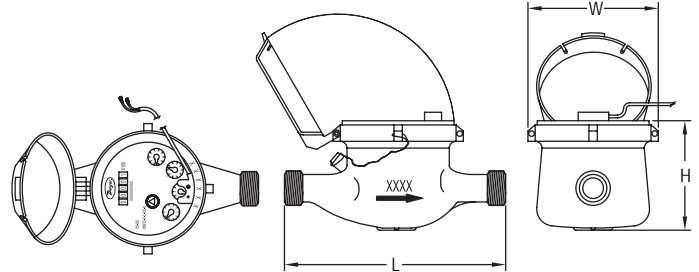
\*Does not include inlet filter.

USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

# MULTI-JET PLASTIC WATER METER

Lead Free, Economical Plastic Body, Pulse Output



Size in (mm)	Spud NPSM (BSPP)	Length 'L' in (mm)	Width 'W' in (mm)	Height 'H' in (mm)	Weight lb (kg)
5/8 x 1/2 (15)	3/4" (3/4")	6-1/2(165)	3-23/32 (94)	4-15/64 (107.5)	1.55 (0.7)
5/8 x 3/4	1" (1")	7-1/2(190)	3-23/32 (94)	4-15/64 (107.5)	1.77 (0.8)
3/4 x 1 (20)	1-1/4" (1-1/4")	10-1/4 (260)	3-23/32 (94)	4-15/64 (107.5)	2.43 (1.1)
1 (25)	1-1/4" (1-1/4")	10-1/4(260)	3-23/32 (94)	4-15/64 (107.5)	2.43 (1.1)
1-1/2 (40)	2" (2")	9-5/8 (245)	4-13/16 (122)	5-45/64 (141.5)	4.41 (2)



The Series WPT Multi-Jet Plastic Water Meter is a series of mechanical, water totalizing meters that display the total water usage in gallons with m<sup>3</sup> options. They are available in a range of body sizes and include NPT or BSPT optional couplings. The plastic body water meters can be used in potable water applications, some corrosive environments, or where an economical water totalizer is desired.

**FEATURES/BENEFITS**

- Plastic body ideal for lead free requirements
- Multi-jet design allows for simplicity and accuracy with wide flow ranges, even in low flow applications
- Magnetically driven, hermetically sealed register does not leak or fog and is completely separated from the water
- Designed for long service life and maintenance-free operation
- Integral strainer that protects meter from particulate damage
- Easy installation with included coupling adapters
- Pulsed output proportional to flow allows for remote flow totalization

**APPLICATIONS**

- Low cost residential water measurement
- Agriculture (fertilizers, pesticides, and herbicides)
- Irrigation
- Remote water monitoring

**SPECIFICATIONS**

**Service:** Water.  
**Wetted Materials:** Body: Nylon 66; Couplings: Nylon 66, 1-1/2" (40 mm) sizes lead free ECO BRASS® alloy; Measuring Chamber: ABS Plastic.  
**Flow Range:** See model chart.  
**Accuracy:** WPT-A-X-XX: Transitional Flow: ±3%; Nominal Flow: ±1.5%.  
**Temperature Limit:** 122°F (50°C).  
**Pressure Limit:** 150 psi (10 bar).  
**Totalizing Display Maximum:** See model chart.  
**Output Signal:** Pulse output with frequency proportional to flow rate.  
**Pulse Options:** 0.1 gal, 1 gal, 10 gal, 100 gal per pulse (1 L, 10 L, 100 L, 1000 per pulse) See model chart.\*  
**Electrical Rating:** 0.01 A @ 24 VAC/DC.  
**Electrical Connections:** Color-coded lead wires, 4.5' (1.5 m) long.  
**Mounting Orientation:** Horizontal with register facing up.  
**Weight:** See dimension chart.  
 \*Consult factory for m<sup>3</sup>, BSPT units or additional pulse output options

**MODEL CHART**

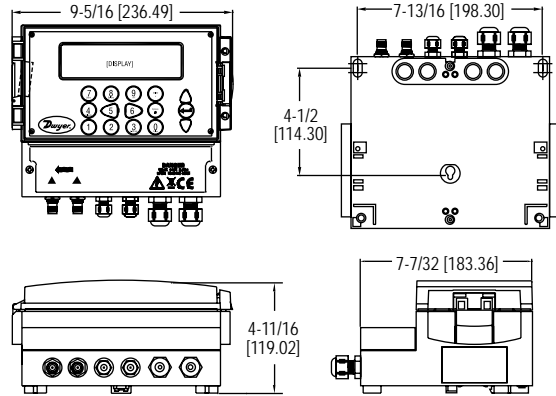
Model	Size	Coupling Size	GPM (Gallons Per Minute)			Display Max (Gallons)	Pulse Rate (Gal/Pulse)
			Max Flow	Nominal Flow Range	Transitional Flow		
WPT-A-C-01	5/8" x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WPT-A-C-02	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WPT-A-C-03	3/4" x 1"	1" NPT	30	2 to 30	0.5	9,999,999.99	0.1
WPT-A-C-04	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	0.1
WPT-A-C-01-1	1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	1
WPT-A-C-02-1	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	1
WPT-A-C-03-1	3/4" x 1"	1" NPT	30	2 to 30	0.5	9,999,999.99	1
WPT-A-C-04-1	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	1
WPT-A-C-05-1	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	9,999,999.9	1
WPT-A-C-01-10	1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99	10
WPT-A-C-02-10	5/8" x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	10
WPT-A-C-03-10	3/4" x 1"	1" NPT	30	2 to 30	0.5	9,999,999.99	10
WPT-A-C-04-10	1"	1" NPT	50	3 to 50	0.75	9,999,999.99	10
WPT-A-C-05-10	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	9,999,999.9	10

USA: California Proposition 65  
 ⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

ECO BRASS® is a registered mark patented by Mitsubishi Shindoh

# ULTRASONIC FLOWMETER SETS

## Non-Invasive Pipe Flow Measurement, Easy Operation



The **Series UFB Ultrasonic Flowmeter Sets** utilize the transit-time difference for measuring flow rates in pipes. These units are permanent mount, where the converters can be mounted on a surface or pipe with a 4-20 mA and pulse output capabilities for pipe sizes from 1/2 to 79" (13 to 2000 mm).

**FEATURES/BENEFITS**

- Non-invasive pipe measurement
- Easy-to-use compact and lightweight design, intended for homogeneous liquids that contain no air
- Simple installation with all necessary components included such as converter, sensor, cables and mounting accessories
- Sturdy IP65 rating, protecting it from dust and direct water contact

**APPLICATIONS**

- Water treatment
- Industrial systems
- Irrigation applications
- Treated water flow
- River water
- Sea water
- Potable water
- Demineralized water
- Glycol/water mix
- Hydraulic system
- Diesel oil
- Water use data logging

**KIT INCLUDES**

- Converter
- Set of transducers
- Ruled guide rail
- Steel banding
- Banding clips
- Set of transducer cables
- Set of high temperature interface cables
- Ultrasonic coupling grease

MODEL CHART - STANDARD VERSION		
Model	Pipe Size Range in (mm)	Power Supply
UFB-122	0.5 to 4.5 (13 to 115)	86-264 VAC
UFB-123	2 to 79 (50 to 2000)	86-264 VAC
UFB-222	0.5 to 4.5 (13 to 115)	24 VAC/VDC
UFB-223	2 to 79 (50 to 2000)	24 VAC/VDC

OPTIONS	
Use order code:	Description
NISTCAL-FU	NIST traceable calibration certificate

**SPECIFICATIONS**

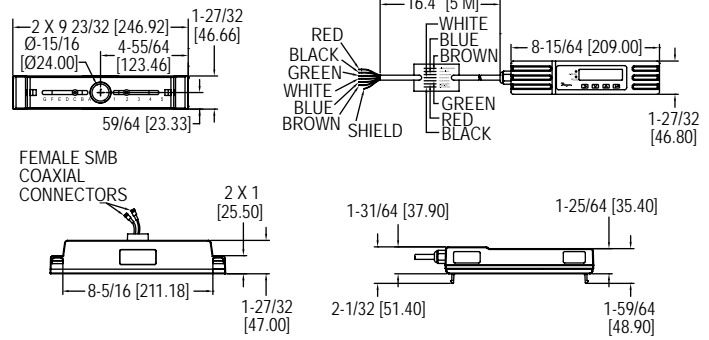
**Service:** Homogeneous liquids that do not contain more than 3% of air bubbles or particulate and capable of ultrasonic wave propagation.  
**Inputs:** TNC cable from sensors.  
**Range:** 0.33 to 33 ft/s (0.1 to 10 m/s).  
**Display:** 240 x 64 pixel graphic display, high contrast black on white with backlight; Languages: English, French, German, Swedish, Italian, Spanish, Portuguese, Russian, Norwegian, and Dutch; 5" W x 1.3" H (5 x 33.02 mm).  
**Accuracy:** ±0.5 to ±2% of flow reading of flow rate > 0.03 ft/s (0.01 m/s) and pipe OD > 3.0 in (75 mm); ±3% of flow reading for flow rate > 0.03 ft/s (0.01 m/s) and pipe OD 0.5 to 3 in (13 to 75 mm); ±6% of flow reading for flow rate < 0.03 ft/s (0.01 m/s).  
**Power Requirements:** 86-264 VAC (50 to 60 Hz) or 24 VAC/VDC (1 A max).  
**Power Consumption:** 10.5 W.  
**Temperature Limits:** Transducer: -4 to 275°F (-20 to 135°C); Controller: -4 to 122°F (-20 to 50°C).  
**Outputs:** Analog 1 opto-isolated output: 4-20 mA, 0-16 mA or 0-20 mA (selectable); Error current: 0-26 mA (selectable); Load resistance: 620 Ω max; Alarm: 2 opto-isolated MOSFET NO relays, 48 V at 500 mA, maximum 200 Hz; Pulsed: 1 opto-isolated MOSFET relay, 48 V at 500 mA, 1 to 250 pps; Pulse width: 2 to 500 ms (selectable).  
**Enclosure Rating:** IP65 when using TNC connector; Transducers IP54.  
**Materials:** Plastic ABS and aluminum.  
**Repeatability:** ±0.5 % of measured value or 0.03 ft/s (0.01 m/s).  
**Electrical Connections:** Removable screw-in type terminal block.  
**Mounting:** Wall mounted using 3 type M4 screws.  
**Turbidity:** < 3 % by volume of particulate content.  
**Permissible Air Content:** < 3% by volume.  
**Response Time:** < 500 ms.  
**Weight:** Unit not including accessories: 2.80 lb (1.26 kg); Unit including accessories: 9.92 lb (4.5 kg).  
**Agency Approvals:** CE.

**ADDITIONAL SPECIFICATIONS**  
**Applicable Pipe Material:** Carbon steel, SS, copper, UPVC/PVDF, concrete, mild steel, glass, brass.  
**Applicable Pipe Lining:** Rubber, glass, concrete, epoxy, steel, other\*.  
**Pipe Wall Thickness:** 0.04 to 3" (1 to 75 mm).  
**Pipe Lining Thickness:** < 1" (< 25 mm).  
 \*Selectable option for special material with known propagation rate of lining material.

Flow Transmitters, Ultrasonic

# COMPACT ULTRASONIC FLOWMETERS

Cost Effective, Compact and Adjustable Design, Non-Invasive



The **Series UFM2 Compact Ultrasonic Flowmeters** are economical, clamp-on, ultrasonic flowmeters. The UFM2 implements the transit-time difference to measure flow rates in pipes and can measure velocity and flow in pipes with outside diameters ranging from 3/4 to 7" (25 to 180 mm). This model comes with a volume pulse and 4-20 mA flow rate output.

**FEATURES/BENEFITS**

- Non-invasive pipe measurement
- Simple installation with all necessary components included such as converter, sensor, cables and mounting accessories
- Compact and lightweight design, featuring an easily installed, all in one clamp-on unit intended for homogeneous liquids that contain no air
- Screen offers easy-to-read text displaying both flow rate and total with a convenient backlight for visual comfort

**APPLICATIONS**

- Flow measurement for heat metering
- Metering and monitoring in:
  - Chilled water
  - Potable water
  - Process water

**KIT INCLUDES**

- Converter with adjustable guiderail
- Set of pipe clamps (model dependent)
- Set of small pipe adapter circle clamps
- Set of small pipe adapter V clamps
- Ultrasonic coupling grease

**SPECIFICATIONS**

**Service:** Clean water with <3% by volume of particulate content.  
**Range:** 0.33 to 32.8 ft/s (0.1 to 10 m/s).  
**Display:** Backlit: 3.27" H x 0.74" W (83.1 mm x 18.8 mm), 2 line x 16 characters.  
**Accuracy:** ±3% of flow reading for >0.98 ft/s (>0.3 m/s).  
**Power Requirements:** 12-24 VDC/VAC.  
**Power Consumption:** 7 W max.  
**Temperature Limits:** Process: 32 to 185°F (0 to 85°C); Ambient: 32 to 122°F (0 to 50°C).  
**Outputs:** Analog: 1 opto-isolated: 4-20 mA; Error current: 3.5 mA; Load resistance: 620 Ω max; Pulse: 1 opto-isolated MOSFET relay, 500 mA max, 166 pps max, 200 Hz max.  
**Enclosure Rating:** IP54.

**Enclosure Material:** Plastic polycarbonate.  
**Repeatability:** ±0.15% of measured value.  
**Electrical Connections:** 16.4' (5 m) cable.  
**Response Time:** <1 s.  
**Weight:** 2.9 lb (1.315 kg).  
**Agency Approvals:** CE.

**ADDITIONAL SPECIFICATIONS**  
**Applicable Pipe Material:** Steel, copper, or plastic.  
**Pipe Outside Diameter:** 3/4 to 7" (25 to 180 mm)\*.  
**Applicable Pipe Lining:** None.  
**Pipe Wall Thickness:** 0.02 to 0.39" (0.5 to 10 mm).

\*Pipe size is dependent on pipe material and internal diameter.

**MODEL CHART**

Model	Description
UFM2-14	Compact ultrasonic flowmeter, pulse and 4-20 mA outputs, 3/4 to 4" (25 to 115 mm) pipe
UFM2-16	Compact ultrasonic flowmeter, pulse and 4-20 mA outputs, 5 to 7" (125 to 180 mm) pipe

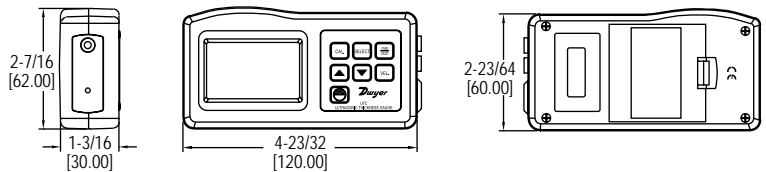
**OPTIONS**

Use order code:	Description
NISTCAL-FU	NIST traceable calibration certificate

**MODEL UTG**

# ULTRASONIC THICKNESS GAGE

Ideal For Use with Ultrasonic Flow Transmitters, Adjustable Sound Velocity



The **Model UTG Ultrasonic Thickness Gage** measures the thickness of a variety of materials. The UTG works on a variety of parallel surface material ranging from 0.05 to 7.9" (1.2 to 200 mm).

**FEATURES/BENEFITS**

- Non-invasive thickness measurement
- Reads in inches or millimeters and features an adjustable sound velocity to allow for an array of materials to be measured
- Allows the user to find the wall thickness of the pipe when programming an ultrasonic transmitter without cutting or removing a section of the pipe to measure it
- Ideal for monitoring corrosion in closed vessels such as boilers and chemical tanks and with any ultrasonic flow transmitter

**APPLICATIONS**

- Pipe thickness measurement
- Finding wall thickness
- Monitoring corrosion in closed vessels
- Industrial applications
- Automotive
- HVAC
- Plumbing

**SPECIFICATIONS**

**Service:** Steel, cast iron, aluminum, red copper, brass, zinc, quartz glass, polyethylene, PVC, gray cast iron, nodular cast iron, other. Selectable option for special materials with known sound propagation rate.\*  
**Range:** 0.047 to 7.874" (1.2 to 200 mm).  
**Accuracy:** ±0.5%.  
**Resolution:** 0.001" / 0.1 mm.

**Sound Velocity:** 1118 to 20132 mph (500 to 9000 m/s).  
**Temperature Limits:** 32 to 122°F (0 to 50°C).  
**Humidity Limit:** < 80%.  
**Display:** 4 digits, 0.394" (10 mm) LCD.  
**Power Requirement:** (4) 1.5 V AAA alkaline batteries, not included, user replaceable.  
**Weight:** 5.78 oz (164 g).

\*Material must be uniform with minimal coating/paint.

**MODEL CHART**

Model	Description
UTG	Ultrasonic thickness gage

USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

# PORTABLE ULTRASONIC FLOWMETER KITS

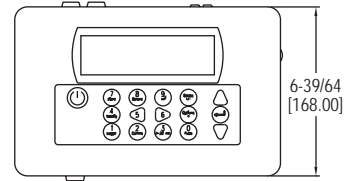
Portable, Non-Invasive and Data Logging Option



PUB



PUF



The Series PUB & PUF Portable Ultrasonic Flowmeter Kits utilize the transit-time difference for measuring flow rates in pipes non-invasively. Units offer flow rate local display with analog and pulsed outputs. The Series PUF offers the same features plus data logging capability.

**FEATURES/BENEFITS**

- Non-invasive pipe measurement
- Compact and lightweight
- Incorporate the latest electronics and signal processing technologies realizing high performance and easy operation
- Ideal for on-the-go flow monitoring, capable of 20 hours continuous operation with built-in, rechargeable battery
- Easy to read graphic display with convenient backlight for visual comfort
- Efficient layout of the function keys for easy to use programming
- PUB features rugged carrying case with molded foam inserts
- PUF boasts an IP67 rated case to hold and protect all equipment conveniently

**APPLICATIONS**

- Water treatment
- Industrial systems
- Irrigation applications
- Treated water flow
- River water
- Sea water
- Potable water
- Demineralized water
- Glycol/water mix
- Hydraulic system
- Diesel oil
- Water use data logging

**KIT INCLUDES**

- Converter
- Set of transducers
- Transducer holders
- Set of transducer cables (6.56' (2 m))
- 4-20 mA communication cables
- 12 VDC power supply
- Ultrasonic coupling grease
- Set of chains
- Ruled guide rail
- Test block
- Carrying case

MODEL CHART - STANDARD VERSION	
Model	Pipe Size Range in (mm)
PUB-10	0.5 to 4.5 (13 to 115)
PUB-20	2 to 40 (50.7 to 1016)

MODEL CHART - DATA LOGGING VERSION	
Model	Pipe Size Range in (mm)
PUF-1001	0.5 to 78 (13 to 2000)
PUF-1002	0.5 to 4.5 (13 to 115)
PUF-1003	2 to 78 (50 to 2000)

**SPECIFICATIONS**

**Service:** Homogeneous liquids that do not contain air bubbles capable of ultrasonic wave propagation.  
**Inputs:** Lemo connector cable from sensors.  
**Range:** 0.33 to 65.62 ft/s (0.1 to 20 m/s).  
**Display:** 240 x 64 pixel graphic display, high contrast black on white with backlight; Languages: English, French, German, Swedish, Italian, Spanish, Portuguese, Russian, Norwegian, and Dutch; 5.2" W x 1.5" H.  
**Accuracy:** ±0.5 to 2% of flow reading for flow rate > 0.66 ft/s (0.2 m/s) and pipe ID > 2.95 in (75 mm); ±3% of flow reading for flow rate > 0.66 ft/s (0.2 m/s) and pipe ID in range 0.512 to 2.95" (13 to 75 mm); ±6% of flow reading for flow rate < 0.66 ft/s (0.2 m/s).  
**Power Requirements:** 9-24 VDC, (1) 5-Cell NiMH battery, internal, factory replaceable (continuous operation time: 20 hours with back-light and output off) (recharging time: 6.5 hours, power adapter used).  
**Power Consumption:** 10.5 W.  
**Power Adapter:** 110/240 VAC adapter. UK, US, European adapters included.  
**Temperature Limits:** -4 to 275°F (-20 to 135°C).  
**Outputs:** Analog: 1 opto-isolated output: 4-20 mA, 0-16 mA or 0-20 mA (selectable); Error current: 0-26 mA (selectable); Load resistance: 620 Ω max; Pulse: 1 opto-isolated MOSFET relay, 150 mA max, 500 pps max, 200 Hz max.  
**Serial Communications:** USB; RS-232 (PUF only).  
**Enclosure Rating:** Converter: IP54; Transducers: IP51.  
**Materials:** Flame retardant injection molded ABS plastic.  
**Repeatability:** ±0.5 % of measured value or ±0.066 ft/s (0.02 m/s).  
**Electrical Connections:** Multi-pin Lemo plugs.  
**Turbidity:** < 3% by volume of particulate content.  
**Permissible Air Content:** < 3% by volume.  
**Response Time:** < 500 ms.  
**Weight:** Unit without accessories: 2.3 lb (1.06 kg); Unit with accessories in carrying case: 13.23 lb (6.0 kg).  
**Agency Approvals:** CE.

**ADDITIONAL SPECIFICATIONS**

**Applicable Pipe Material:** Carbon steel, SS, copper, UPVC/PVDF, concrete, galvanized steel, mild steel, glass, brass.  
**Applicable Pipe Lining:** Rubber, glass, concrete, epoxy, steel, other\*.  
**Pipe Wall Thickness:** 0.04 to 3" (1 to 75 mm).  
**Pipe Lining Thickness:** < 1" (< 25 mm).

\*Selectable option for special material with known propagation rate of lining material.

OPTIONS	
Use order code:	Description
NISTCAL-FU	NIST traceable calibration certificate

USA: California Proposition 65  
 ⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

Flow Transmitters, Ultrasonic, Portable

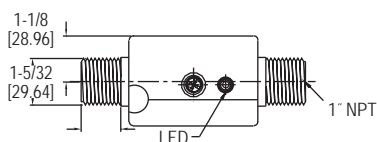
# MAGNETIC INDUCTIVE FLOW SENSORS

No Moving Parts, Frequency and 4-20 mA Output, Maintenance-Free

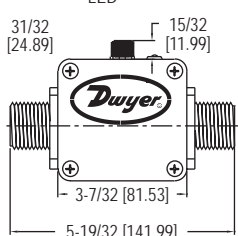


MFS

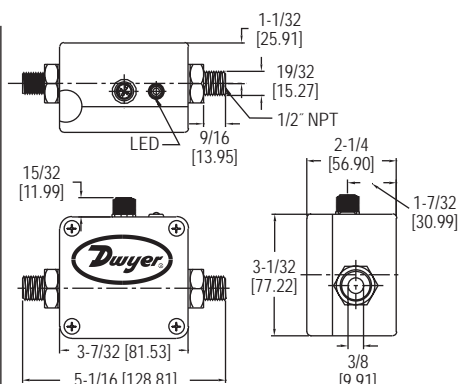
Model	L1	L2	D1	D2
MFS2-1	4"	0.86"	1/2-14" NPT	0.31"
MFS2-2	4"	0.86"	1/2-14" NPT	0.31"
MFS2-3	4.02"	0.86"	3/4-14" NPT	0.55"
MFS2-4	4.41"	1.04"	1-11.5" NPT	0.71"
MFS2-5	4.41"	1.04"	1-11.5" NPT	0.71"
MFS2-6	4.81"	1.13"	1-1/4-11.5" NPT	0.98"



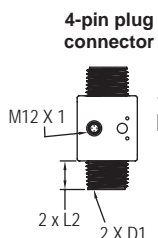
MFS-31 & MFS-32



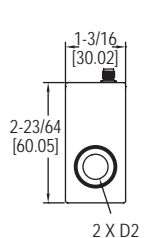
MFS-11 & MFS-12  
MFS-21 & MFS-22



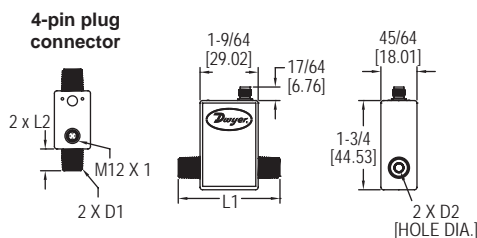
MFS2



MFS2-6



MFS2-1/5



The **Series MFS & MFS2 Magnetic Inductive Flow Sensors** are compact, 316 SS body, in line flowmeters with pulse and optional analog 4-20 mA output. It is available in a variety of flow ranges from 0.25 to 52.8 GPM (1 to 200 LPM) and process connection sizes of 1/2" and 1" NPT.

**FEATURES/BENEFITS**

- Long life cycle with no moving parts to wear or break
- Can be applied in applications dealing with contaminated media with no mechanical component in the flow
- Obstruction free pipe cross-section yields low pressure drop
- Unaffected by change in temperature, density, viscosity or concentration

**APPLICATIONS**

- Contaminated liquid flow monitoring
- Flow of conductive liquids
- Water & wastewater treatment
- Industrial systems
- Irrigation applications

**SPECIFICATIONS**

**Service:** Compatible, non-coating, conductive liquids.  
**Range:** See model chart.  
**Wetted Materials:** Electrodes: 316 SS; Process connections: MFS: 316 SS; MFS2: PVDF; Measuring pipe: MFS: PEEK-GF30; Gasket: EPDM.  
**Accuracy:** MFS: ±2% of reading; MFS2: ±1% or reading.  
**Repeatability:** 1%.  
**Temperature Limits:** MFS: Process: 32 to 194°F (0 to 90°C); Ambient: 41 to 158°F (5 to 70°C); MFS2: Process: 14 to 140°F (-10 to 60°C); Ambient: 41 to 140°F (5 to 60°C).  
**Pressure Limits:** MFS: 232 psi (16 bar); MFS2: 145 psi (10 bar) @ 68°F (20°C); 116 psi (8 bar) @ 104°F (40°C); 87 psi (6 bar) @ 140°F (60°C).  
**Response Time:** MFS: < 500 ms; MFS2: < 100 ms.

**Power Requirements:** 24 VDC ±10%.  
**Power Consumption:** 0.6 W.  
**Output: Frequency:** Square-wave, NPN or PNP; Analog: 4-20 mA.  
**Loop Resistance:** 250 Ω.  
**Current Consumption:** Max 80 mA.  
**Minimum Conductivity of Medium:** 50 µS/cm.  
**Flow Indication:** LED green, flow proportional blinking.  
**Enclosure Rating:** NEMA 4 (IP65).  
**Process Connection:** See model chart.  
**Electrical Connection:** Plug connector M12x1.  
**Weight:** MFS-1X: 1.5 lb (0.68 kg); MFS-2X: 1.7 lb (0.77 kg); MFS-3X: 1.9 lb (0.87 kg); MFS2-1, -2, -3, -4, -5: 8 oz (226.8 g); MFS2-6: 1 lb (0.45 kg).

Flow Transmitters, Electromagnetic, In-Line

MODEL CHART				
Model	Range GPM (LPM)	Minimum Output Signal GPM (LPM)	Process Connection	Output
MFS-11	0.25 to 5.3 (1 to 20)	0.13 (0.5)	1/2" NPT	Frequency
MFS-21	0.5 to 10.5 (2 to 40)	0.25 (1)	1/2" NPT	Frequency
MFS-31	2.5 to 52.8 (10 to 200)	1.3 (5)	1" NPT	Frequency
MFS-12	0.25 to 5.3 (1 to 20)	0.13 (0.5)	1/2" NPT	Frequency & analog

MODEL CHART			
Model	Range GPM (LPM)	Process Connection	Output
MFS2-1	0.07 to 1.3 (0.25 to 5)	1/2" male NPT	Frequency
MFS2-2	0.26 to 5.3 (1.0 to 20)	1/2" male NPT	Frequency
MFS2-3	0.66 to 13.2 (2.5 to 50)	3/4" male NPT	Frequency
MFS2-4	1.3 to 26.4 (5.0 to 100)	1" male NPT	Frequency
MFS2-5	2.6 to 52.8 (10 to 200)	1" male NPT	Frequency
MFS2-6	3.3 to 66.0 (12.5 to 250)	1-1/4" male NPT	Frequency

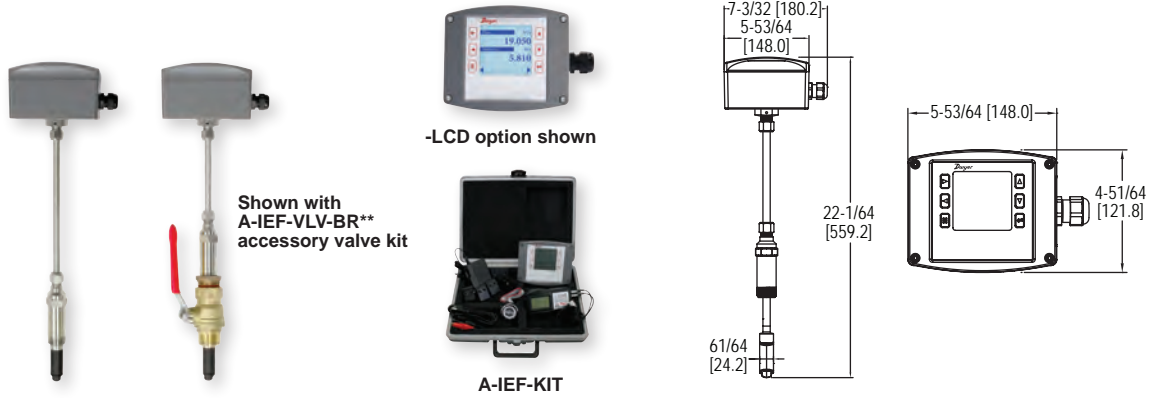
ACCESSORIES	
Model	Description
MFS-C3	4 pin cable socket M12x1 connect, 9.8 ft (3 m)
MFS-C5	4 pin cable socket M12x1 connect, 16.4 ft (5 m)
MFS-C10	4 pin cable socket M12x1 connect, 32.8 ft (10 m)



MFS-X 4 pin cable

# INSERTION ELECTROMAGNETIC FLOW TRANSMITTER

Field Configurable, High Accuracy, BACnet or Modbus® Protocol



The Series IEF Insertion Electromagnetic Flow Transmitter is an adjustable insertion flowmeter featuring electromagnetic technology that accurately and reliably measures fluid velocity in addition to providing several continuous signal outputs. This series is specifically designed to offer superior performance paired with simple installation and use. One unit is adjustable to fit pipe sizes from 4 to 36" (102 to 914 mm), and offers several output options including selectable BACnet MS/TP or Modbus® RTU communications protocol over 2-wire RS-485 in addition to the standard analog, frequency and alarm outputs.

**FEATURES/BENEFITS**

- Field configurable setup displays (-LCD integral option or remote accessory A-IEF-DSP) allow for ultimate flexibility by accommodating a variety of application configurations with one model through multiple display configurations i.e. pipe size, pipe material, liquid type, analog output, pulse/frequency output, alarm outputs, communication outputs, damping, and calibration factor.
- High performance accuracy is maintained through changes in temperature, density or viscosity.
- Setup Wizard and installation tool are simple to use allowing for quick and precise installation.
- Accessory setup kit A-IEF-KIT ensures exact installation application depth with included thickness gage and measuring tape.
- Long Life Cycle and minimal maintenance requirements with no moving parts to wear or break and electrodes that discourage fouling.
- Isolation valve accessory options allow for installation in operational systems via hot-tap kit or easy removal without system downtime.
- NIST traceable pass/fail verification certificate included standard for Carbon Steel Schedule 40 pipes sized 4" (102 mm), 6" (150 mm), 8" (200 mm), and 10" (250 mm) with high accuracy option; 10" (250 mm) with standard option.

**APPLICATIONS**

- Boiler feed water
- Chilled water
- Open and closed loop condenser water
- Irrigation system
- Municipal water distribution
- Process and coolant flow
- Ground water remediation
- Chemical processing
- Pump protection
- Wastewater
- Mining

**SPECIFICATIONS**

**Service:** Compatible clean or dirty non coating, conductive liquids.  
**Range:** 0 to 20 ft/s (0 to 6 m/s).\*  
**Wetted Materials:** Body shaft/fitting: 316 SS; Electrodes: 316 SS; Electrode cap: Polymer/Polystyrene; O-ring: Silicon.  
**Accuracy:** High accuracy units: ±0.5% of reading at calibrated velocity; ±1% of reading from 2 to 20 ft/s (0.6 to 6 m/s); ±0.02 ft/s (±0.006 m/s) at < 2 ft/s (0.6 m/s); Standard accuracy units: ±1% FS.  
**Temperature Limits:** Ambient: -20 to 160°F (-29 to 71°C); Process: 15 to 250°F (-9 to 121°C); Storage: -40 to 185°F (-40 to 85°C).  
**Process Connection:** 1" NPT or BSPT with accessory full port ball valve options.  
**Pressure Limits:** 400 psi (27.6 bar) @ 100° F (37.8°C).  
**Pressure Drop:** < 0.1 psi at 12 ft/s in 4" (101.6 mm) and larger pipe.  
**Outputs:**  
 (1) Analog: 4-20 mA, 0-5 V, 0-10 V or 2-10 V (display selectable);  
 (1) Pulse/Frequency: 0-15 V peak pulse, 0 to 500 Hz or scalable pulse output (display selectable);  
 (2) Alarm: (1) Empty pipe detection or minimum/maximum velocity, (display selectable); (1) Reverse flow output indication.  
**Power Requirements:** 12-42.4 VDC, .25 A @ 24 VDC; 12-36 VAC.  
**Electrical Connection:** Removable terminal blocks, model selectable 1/2" female NPT conduit connection, PG 16 gland or PG 16 gland with (2) 10 ft (3 m) 9 conductor 22 AWG plenum rated cables, accessory cable lengths up to 200 ft (61 m) optional.  
**Display (-LCD option):** 2" (5.08 cm) x 2" (5.08 cm) graphic LCD with backlight.  
**Conductivity:** >20 microsiemens.  
**Enclosure Material:** Powder coated die cast aluminum.  
**Enclosure Ratings:** NEMA 6P (IP68) (Non display models); NEMA 4X (IP66) (-LCD option).  
**Agency Approvals:** BTL, CE, NSF/ANSI 61 and 372.  
**COMMUNICATIONS (-COM OPTION)**  
**Type:** BACnet MS/TP or Modbus® RTU communication protocol (default disabled, display selectable).  
**Supported Baud Rates:** 9600, 19200, 38400, 57600, 76800, or 115200 bps (display selectable).  
**Device Load:** 1/8 unit load.  
**ADDITIONAL SPECIFICATIONS**  
**Applicable Pipe Material:** Most popular plastic and metal pipes; i.e. Carbon steel, SS, copper, UPVC/PVDF, galvanized steel, mild steel, and brass.  
**Applicable Pipe Size:** 4-36" (101 to 914 mm), model dependent. See model chart.  
**Diameter Length Requirements:** >10 upstream; >5 downstream.  
**Glycol:** 0 to 100% display selectable.

\*For max flowrates >10 ft/s (3 m/s) order option -CC.  
 †Brass fittings and pipe are not to be used with NSF Certified models.

**MODEL CHART**

Example	IEF	-H	N	-CND	-LCD	IEF-HN-CND-LCD
<b>Series</b>	IEF					Insertion electromagnetic flow transmitter
<b>Accuracy</b>		L G S T I E T H				Standard accuracy <10" (250 mm) pipe; 1% FS Standard accuracy >10" (250 mm) pipe; 1% FS Standard accuracy 4 to 36" (100 to 900 mm) pipe; 1% FS High accuracy 4" (100 mm) pipe; 1% of reading High accuracy 6" (150 mm) pipe; 1% of reading High accuracy 8" (200 mm) pipe; 1% of reading High accuracy 10" (250 mm) pipe; 1% of reading High accuracy 4 to 10" (100 to 250 mm) pipe; 1% of reading
<b>Process Connection</b>			N B			1" male NPT 1" male BSPT
<b>Housing Electrical Connection</b>				CND PG 10		1/2" female NPT conduit connection without cable PG gland without cable PG gland with 10' (3 m) cable
<b>Options</b>					LCD COM NIST FC CC NW	Integral LCD display BACnet or Modbus® communication protocol (display selectable) Six point NIST traceable calibration certificate Factory calibration certificate for 0.5% of reading at single point Custom configured for specific installation NSF certified

**Note:** For CC option, must provide completed configuration paperwork.  
**Note:** For maximum performance select -LCD option or setup display accessory.

**ACCESSORIES**

Model	Description
A-IEF-KIT	Setup kit (includes setup display, thickness gage and measuring tape), and universal power adapter
A-IEF-DSP	Setup display
A-IEF-CBL-50	Plenum rated cable 50 ft (15.2 m)
A-IEF-VLV-BR	1-1/4" full port isolation valve brass kit**
A-IEF-VLV-SS	1-1/4" full port isolation valve 316 SS kit
A-IEF-PA	AC wall adapter

\*\*Brass fittings and pipe are not to be used with NSF Certified models. Brass valves are non-RoHS compliant.

Modbus® is a registered trademark of Schneider Automation, Inc.

A-IEF Remote Display now available: See page 295

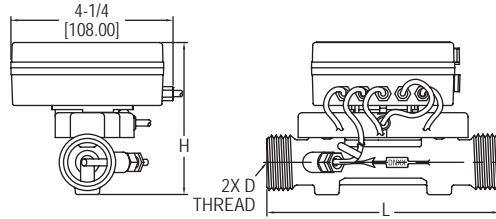


# ULTRASONIC ENERGY METERS

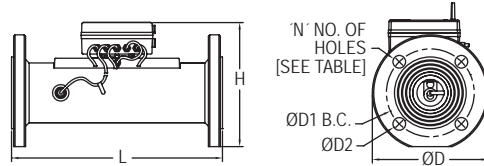
Flow and Temperature Monitoring Capability, Modbus® or BACnet Communication



TUF-150/400



TUF-500



DIMENSIONS in [mm]			
Model	L	D	H
TUF-150-XX	4-21/64 [110.00]	G3/4B	3-31/32 [101.00]
TUF-200-XX	5-1/8 [130.00]	G1B	3-31/32 [101.00]
TUF-250-XX	6-19/64 [160.00]	G11/4B	4-11/64 [106.00]
TUF-320-XX	7-3/32 [180.00]	G11/2B	4-29/64 [113.00]
TUF-400-XX	7-7/8 [200.00]	G2B	4-49/64 [121.00]

DIMENSIONS in [mm]						
Model	L	ØD	H	ØD1	ØD2	N
TUF-500-XX	7-7/8 [200]	6-1/2 [165.00]	9-27/32 [250]	4-59/64 [125.00]	45/64 [18.00]	4
TUF-650-XX	7-7/8 [200]	7-9/32 [185.00]	10-7/16 [265]	5-45/64 [145.00]	45/64 [18.00]	4
TUF-800-XX	8-55/64 [225]	7-7/8 [200.00]	11-1/32 [280]	6-19/64 [160.00]	45/64 [18.00]	8
TUF-1000-XX	9-27/32 [250]	8-21/32 [220.00]	12-13/64 [310]	7-3/32 [180.00]	45/64 [18.00]	8
TUF-1250-XX	9-27/32 [250]	9-27/32 [250.00]	12-63/64 [330]	8-17/64 [180.00]	45/64 [18.00]	8

The Series TUF Ultrasonic Energy Meters are highly accurate and stable energy meter that utilizes ultrasonic technology to measure heating and cooling energy consumption. The Series TUF is a compact meter with a flowmeter and energy calculator in one, making it great for installation on chillers and boilers.

### FEATURES/BENEFITS

- Lower maintenance costs with local parameter display and no moving parts
- Serial communication output allows for easy transfer of data
- Flow and temperature monitor in one unit eliminates the need for multiple units

### APPLICATIONS

- Heat metering
- Tenant billing
- Utilities billing
- Monitoring of water heating or cooling: radiators, fan coils

### INSTRUCTIONS FOR ORDERING

- Choose 1 ultrasonic energy meter model (includes 2 BSPP pipe fittings, 2 tightening nuts, 2 O-rings, and 1 thermowell with welding collar)
- Choose 1 pipe fitting model given the appropriate fitting size if NPT or BSPT connections are required (for DN15 to DN40 only)\*

**Example:** TUF-150-MD, Fitting Size: A, select pipe fitting Model WM-ACC-C01 or WM-ACC-C11.

### SPECIFICATIONS

**Service:** Clean, compatible liquids.  
**Wetted Materials:** Brass and 316L SS.  
**Range:** See chart.  
**Display:** 8-digit LED.  
**Accuracy:** BTU: EN1434/CJ128 Class 2; Flow:  $\pm(2+(0.02 Q_p / Q))\%$ ; Temperature:  $\pm 0.1^\circ\text{C}$ .  
**Power Requirements:** 24 VDC/VAC (model dependent) or 3.6 V ER26500 lithium metal battery, user supplied and installed, battery acts as back-up if power is lost.  
**Power Consumption:** 1 W.  
**Temperature Limits:** Ambient: 41 to 131°F (5 to 55°C); Process: 36 to 203°F (2 to 95°C).  
**Humidity Limit:** < 93%.

**Pressure Limits:** 232 psi (16 bar) for DN15 to DN40; 362 psi (25 bar) for >DN50.  
**Pressure Drop:** < 1.5 psi (10 kPa).  
**Process Connection:** See chart.  
**Serial Communications:** Modbus® RTU or BACnet MSTP (selectable)\*\*.  
**Enclosure Rating:** IP65.  
**Enclosure Material:** Plastic.  
**Repeatability:** Flowmeter: 1%.  
**Electrical Connections:** 3' (0.91 m) 4x0.2 mm2 cable with terminal block.  
**Flow Direction:** Unidirectional.  
**Mounting Orientation:** Horizontal or vertical.  
**Weight:** See chart.  
**Agency Approvals:** CE.

\*\*M-BUS available upon request.

MODEL CHART										
Ultrasonic Energy Meter Model	Body Size†	Pipe Size		Fitting Size	Communication	Meter Connection	GPM (LPM)			Weight lb (kg)
		in	mm				Min Flow (Qi)	Nominal Flow Range (Qp)	Max Flow (Qs)	
TUF-150-MD	DN15	1/2	15	A	Modbus®	G-3/4	0.1 (0.5)	6.6 (25)	13 (50)	3.1 (1.4)
TUF-200-MD	DN20	3/4	20	B	Modbus®	G1	0.2 (0.8)	11 (42)	22 (83)	3.1 (1.4)
TUF-250-MD	DN25	1	25	C	Modbus®	G1-1/4	0.3 (1.2)	15 (58)	31 (117)	4.1 (1.8)
TUF-320-MD	DN32	1-1/4	32	D	Modbus®	G1-1/2	0.5 (2)	26 (100)	53 (200)	5.2 (2.3)
TUF-400-MD	DN40	1-1/2	40	E	Modbus®	G2	0.9 (3)	44 (167)	88 (333)	6.6 (3)
TUF-500-MD*	DN50	2	50	-	Modbus®	Flange	1.3 (5)	66 (250)	132 (500)	33 (15)
TUF-650-MD	DN65	2-1/2	65	-	Modbus®	Flange	2.2 (8.3)	110 (417)	220 (833)	10.1 (4.6)
TUF-800-MD	DN80	3	80	-	Modbus®	Flange	3.5 (13.3)	176 (667)	352 (1333)	13.5 (6.1)
TUF-1000-MD	DN100	4	100	-	Modbus®	Flange	5.3 (20)	264 (1000)	528 (2000)	16.5 (7.5)
TUF-1250-MD	DN125	5	125	-	Modbus®	Flange	8.8 (33)	440 (1667)	881 (3333)	21.1 (9.6)
TUF-150-BN	DN15	1/2	15	A	BACnet	G-3/4	0.1 (0.5)	6.6 (25)	13 (50)	3.1 (1.4)
TUF-200-BN	DN20	3/4	20	B	BACnet	G2	0.2 (0.8)	11 (42)	22 (83)	3.1 (1.4)
TUF-250-BN	DN25	1	25	C	BACnet	G1-1/4	0.3 (1.2)	15 (58)	31 (117)	4.1 (1.8)
TUF-320-BN	DN32	1-1/4	32	D	BACnet	G1-1/2	0.5 (2)	26 (100)	53 (200)	5.2 (2.3)
TUF-400-BN	DN40	1-1/2	40	E	BACnet	G2	0.9 (3)	44 (167)	88 (333)	6.6 (3)
TUF-500-BN*	DN50	2	50	-	BACnet	Flange	1.3 (5)	66 (250)	132 (500)	33 (15)
TUF-650-BN	DN65	2-1/2	65	-	BACnet	Flange	2.2 (8.3)	110 (417)	220 (833)	10.1 (4.6)
TUF-800-BN	DN80	3	80	-	BACnet	Flange	3.5 (13.3)	176 (667)	352 (1333)	13.5 (6.1)
TUF-1000-BN	DN100	4	100	-	BACnet	Flange	5.3 (20)	264 (1000)	528 (2000)	16.5 (7.5)
TUF-1250-BN	DN125	5	125	-	BACnet	Flange	8.8 (33)	440 (1667)	881 (3333)	21.1 (9.6)
<b>Model</b>	<b>Power Requirements</b>									
TUF-XXX-XX	24 VAC/VDC									
TUF-XXX-XX-DC	24 VDC									

\*A pipe fitting is required to use the DN15 to DN40 energy meters. The DN50 has a flange connection and does not require a pipe fitting.  
 †For additional sizes up to 8" (203.2 mm) contact factory.

MODEL CHART							
Fitting Size	Pipe Fitting Model*	Process Connection Size	Weight lb (kg)	Fitting Size	Pipe Fitting Model*	Process Connection Size	Weight lb (kg)
A	WM-ACC-C01	1/2" NPT	0.6 (0.3)	C	WM-ACC-C13	1" BSPT	1.8 (0.8)
A	WM-ACC-C11	1/2" BSPT	0.6 (0.3)	D	WM-ACC-C04	1-1/4" NPT	2.3 (1.1)
B	WM-ACC-C02	3/4" NPT	1.2 (0.5)	D	WM-ACC-C14	1-1/4" BSPT	2.3 (1.1)
B	WM-ACC-C12	3/4" BSPT	1.2 (0.5)	E	WM-ACC-C05	1-1/2" NPT	4.4 (2)
C	WM-ACC-C03	1" NPT	1.8 (0.8)	E	WM-ACC-C15	1-1/2" BSPT	4.4 (2)

\*Each model includes 1 fitting.

USA: California Proposition 65

⚠ WARNING: Cancer and Reproductive Harm  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

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# INSERTION THERMAL ENERGY METER

Field Adjustable, BACnet/Modbus® Outputs

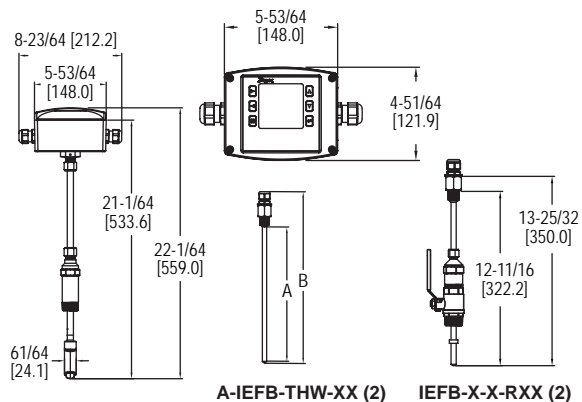


IEFB-X-X-TXX

IEFB-X-X-TXX  
Shown with  
A-IEF-VLV-BR  
accessory valve

A-IEFB-THW-XX (2)

Hot-tap thermowells for model  
IEFB-X-X-RXX (2) shown  
with A-IEFB-VLV-BR-1  
accessory valve



A-IEFB-THW-XX (2) IEFB-X-X-RXX (2)



THERMOWELL MODEL CHART		
Model	A	B
A-IEFB-THW-4	4-11/16" (119.0 mm)	5-25/32 (146.8 mm)
A-IEFB-THW-6	6-11/16" (169.8 mm)	7-25/32 (197.6 mm)

The **Series IEFB** is a field-adjustable insertion thermal energy meter that uses electromagnetic technology to accurately and reliably measure fluid velocity and energy consumption. The high accuracy IEFB is adjustable to fit pipe sizes from 4 to 10" (100 to 250 mm), while the standard accuracy IEFB fits pipe sizes 4 to 36" (100 to 900 mm). The energy meter is simple to install and incorporates a temperature meter and calculator into a single unit. The IEFB incorporates a temperature meter and a calculator into a single unit. The LCD display provides clear readings of the meter's values, including temperature and energy consumption, making it ideal for installation on chillers, boilers, and other heating and cooling applications. The high measuring accuracy and long lifetime keeps annual operating costs at a minimum. In addition, it offers several output options, including selectable BACnet MS/TP or Modbus® RTU communications protocol over 2-wire RS-485 and standard analog, frequency, and alarm outputs.

**FEATURES/BENEFITS**

- Flexible, field configurable setup displays (-LCD integral option or remote accessory A-IEF-DSP) accommodate a variety of application configurations. Application information is display selectable and includes pipe size, pipe material, liquid type, analog output, pulse/frequency output, alarm outputs, communication, outputs, damping, and calibration factor
- High performance accuracy is maintained through changes in temperature, density and/or viscosity
- The Setup Wizard and installation tool are simple to use, providing quick and precise installation
- Accessory setup kit A-IEF-KIT comes with a thickness gage and measuring tape to ensure exact installation depth
- The meter has no moving parts and electrodes that discourage fouling, which gives the meter a long lifecycle and minimizes the need for maintenance
- Hot-tap isolation valve accessories allow for easy installation and removal in operational systems without system downtime

**APPLICATIONS**

- Monitoring chiller cooling output performance
- Industrial boiler heating performance
- Energy efficiency monitoring
- Optimization of heat energy performance
- Commercial and residential heat energy consumption and metering
- District heating and cooling monitoring
- Energy cost allocation monitoring

**SPECIFICATIONS**

**Service:** Compatible clean or dirty non coating, conductive liquids.  
**Range:** 0 to 20 ft/s (0 to 6 m/s).\*  
**Wetted Materials:** Body shaft/fitting: 316 SS; Electrodes: 316 SS; Electrode cap: Polymer/polystyrene; O-ring: Silicone; Thermowells: 304 SS.  
**BTU Accuracy per EN1434/ASTM E3137/CSA C900.1-13:** High accuracy units: Class 2 for 2 to 20 ft/s (0.6 to 6 m/s)\*\*; Standard accuracy units: Class 3 for 6.5 to 20 ft/s (2 to 6 m/s)\*\*.  
**Flow Sensor Accuracy:** High accuracy units: ±0.5% of reading at calibrated velocity, ±1% of reading from 2 to 20 ft/s (0.6 to 6 m/s) ±0.02 ft/s (±0.006 m/s) at < 2 ft/s (0.6 m/s); Standard accuracy units: ±1% FS.  
**Temperature Accuracy:** Class B ±(0.30 + 0.005\**t*)°C per EN60751.  
**Differential Temperature Accuracy:** Et = ±(0.5 + 3\*Δ*θ*min/Δ*θ*) % per EN1434.  
**Calculator Accuracy:** Ec = ±(0.5 + Δ*θ*min/Δ*θ*) % per EN1434.  
**Temperature Compensation:** 140 to 220°F (60 to 104.4°C) < 2% error over ±30°F (-1.1 °C) change, 40 to 70°F (4.4 to 21.1°C) < 2% error over ±10°F (-12.2°C) change.  
**Temperature Limits:** Ambient: -20 to 160°F (-29 to 71°C)\*\*; LCD -4 to 158°F (-20 to 70°C); Process: 15 to 250°F (-9 to 121°C); Storage: -40 to 185°F (-40 to 85°C).  
**Process Connection:** Flowmeter: 1" NPT or BSPT with accessory full port ball valve options; Thermowell: (2) 1/2" NPT or BSPT thermowell with 1" full port ball valve options.  
**Pressure Limit:** 400 psi (27.6 bar) @ 100°F (37.8°C).  
**Pressure Drop:** < 0.1 psi at 12 ft/s in 4" (<0.01 bar at 3.7 m/s in 100 mm) and larger pipe.  
**Outputs:** (1) Analog: 4-20 mA, 0-5 V, 0-10 V or 2-10 V (display selectable); (1) Pulse/Frequency: 0-15 V peak pulse, 0 to 500 Hz or scalable pulse output (display selectable); (2) Alarm: Empty pipe detection or minimum/maximum velocity, (display selectable) and reverse flow output indication.  
**Power Requirements:** 12-42 VDC, .25 A @ 24 VDC; 12-36 VAC.  
**Electrical Connection:** Removable terminal blocks, (2) model selectable 1/2" female NPT conduit connection, (2) PG 16 gland or (2) PG 16 gland with 10 ft (3 m) 9 conductor 22 AWG plenum rated cables, accessory cable lengths up to 200 ft (61 m) optional.  
**Display (-LCD option):** 2 x 2" (50 x 50 mm) graphic LCD with backlight.  
**Conductivity:** >20 microsiemens.  
**Enclosure Material:** Powder coated die cast aluminum.  
**Enclosure Ratings:** NEMA 6P (IP68) (Non display models); NEMA 4X (IP66) (-LCD option).  
**Agency Approvals:** BTL.  
**COMMUNICATIONS (-COM OPTION)**  
**Type:** BACnet MS/TP or Modbus® RTU communication protocol (default disabled, display selectable).  
**Supported Baud Rates:** 9600, 19200, 38400, 57600, 76800, or 115200 bps (display selectable).  
**Device Load:** 1/8 unit load.  
**ADDITIONAL SPECIFICATIONS**  
**Applicable Pipe Material:** Most popular plastic and metal pipes; i.e. Carbon steel, SS, copper, UPVC/PVDF, galvanized steel, mild steel, and brass.  
**Applicable Pipe Size:** 4 to 36" (100 to 900 mm), model dependent. See model chart.  
**Diameter Length Requirements:** >10 upstream, >5 downstream.  
**Temperature Resistance:** Matched 4 wire platinum RTD's.  
**Relative Humidity:** 10 to 90% non-condensing.  
**Output Impedance:** 4-20 mA: 536 Ω; 5V: 500 Ω; 10V: 1.27k Ω.  
\*For max flowrates >10 ft/s (3 m/s) order option -CC.  
 \*\*Verified at standard temperature 73.4°F (23°C) refer to listed standards for detailed accuracy formulations.

# INSERTION THERMAL ENERGY METER

Field Adjustable, BACnet/Modbus® Outputs

MODEL CHART							
Example	IEFB	-L	N	-CND	-R10	-LCD	IEFB-LN-CND-R10-LCD
Series	IEFB						Insertion thermal energy meter
Accuracy		L G S F I E T H					Standard accuracy <10" (250 mm) pipe; 1% FS Standard accuracy >10" (250 mm) pipe; 1% FS Standard accuracy 4 to 36" (100 to 900 mm) pipe; 1% FS High accuracy 4" (100 mm) pipe; 1% of reading High accuracy 6" (150 mm) pipe; 1% of reading High accuracy 8" (200 mm) pipe; 1% of reading High accuracy 10" (250 mm) pipe; 1% of reading High accuracy 4 to 10" (100 to 250 mm) pipe; 1% of reading
Process Connection			N B				1" Male NPT 1" Male BSPT
Housing Electrical Connection				CND PG 10			1/2" female NPT PG 16 gland without cable PG 16 gland with (2) 10' (3 m) cables
Temperature Sensors					T10 T20 T50 R10  R20  R50		(2) 10' (3 m) PT temperature sensors* (2) 20' (6 m) PT temperature sensors* (2) 50' (15 m) PT temperature sensors* (2) 10' (3 m) PT temperature sensors with hot-tap thermowells (2) 20' (6 m) PT temperature sensors with hot-tap thermowells (2) 50' (15 m) PT temperature sensors with hot-tap thermowells
Options						LCD COM  NIST  FC  CC	Integral LCD display BACnet or Modbus® communications protocol (display selectable) NIST traceable calibration certification for flow and temperature Factory calibration certification for 0.5% of reading at single point Custom configuration (required input)

\*Thermowells not included. Refer to accessories model chart to purchase permanent thermowells.  
Note: FOR MAXIMUM PERFORMANCE SELECT -LCD OPTION OR SETUP DISPLAY ACCESSORY.

ACCESSORIES	
Model	Description
A-IEF-KIT	Setup kit (includes setup display, thickness gage, and measuring tape) and universal power adapter
A-IEF-DSP	Setup display
A-IEF-VLV-BR†	1-1/4" full port isolation valve brass kit**
A-IEF-VLV-SS†	1-1/4" full port isolation valve 316 SS kit
Thermowells	
A-IEFB-THW-4	(2) 1/2" NPT, 4" thermowell for 4 to 7" pipe
A-IEFB-THW-6	(2) 1/2" NPT, 6" thermowell for ≥ 8" pipe
A-IEFB-THW-4-BSPT	(2) 1/2" BSPT, 4" thermowell for 4 to 7" pipe
A-IEFB-THW-6-BSPT	(2) 1/2" BSPT, 6" thermowell for ≥ 8" pipe
Hot-Tap Valves	
A-IEFB-VLV-BR-1†	(2) 1" NPT full port isolation valve brass for temperature sensor with 1" branch outlet and 1" nipple**
A-IEFB-VLV-SS-1†	(2) 1" NPT full port isolation valve 316 SS for temperature sensor with 1" branch outlet and 1" nipple

\*\*Brass fittings and pipe are not to be used with NSF Certified models. Brass valves are non-RoHS compliant.  
†BSPT valves also available

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## SERIES A-IEF

# REMOTE DISPLAY FOR SERIES IEF AND IEFB

Convenient Access to IEF & IEFB Meter Readings



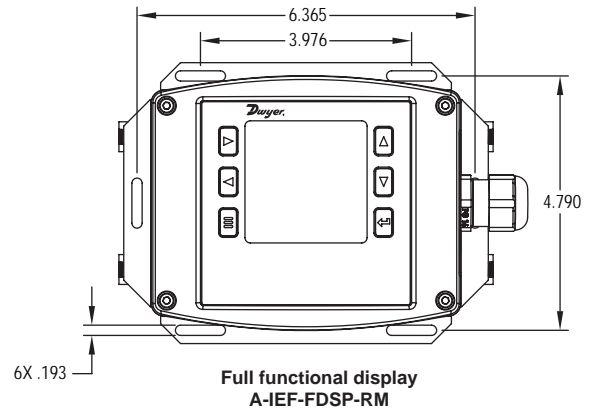
Full functional display  
A-IEF-FDSP-RM



Indicator display  
A-IEF-IDSP-RM



Shown with IEF-HN-PG and  
A-IEF-VLV-BR accessory valve



Full functional display  
A-IEF-FDSP-RM

The **Series A-IEF Remote Display** can be installed almost anywhere near a Series IEF flow transmitter or IEFB thermal energy meter. Both the indicator display (A-IEF-IDSP-RM) and the full functional display (A-IEF-FDSP-RM) have a maximum display cable length of 100 ft (30 m) to permit easy viewing of flow readings. The full functional display allows for convenient adjustment of configuration settings and allows the user to save the IEF or IEFB configuration settings to a computer for printing.

### FEATURES/BENEFITS

- Full functional display can be used to set up the IEF/IEFB and adjust the settings if it is installed in a hard-to-reach location.
- Indicator display makes it convenient to read process values if the meter is inaccessible.
- Varying cable lengths of up to 100 ft (30 m) allows for flexible installation on a wall or pipe mount.
- Easy to install and wire in the field.

### APPLICATIONS

- Mechanical rooms with a small footprint
- Hard-to-reach piping
- Boilers and chillers
- Chilled water
- Condenser water
- Make-up water
- Heating water
- Boiler feed water
- Steam condensate

### SPECIFICATIONS

**Temperature Limits:** Ambient: -4 to 158°F (-20 to 70°C); Storage: -40 to 185°F (-40 to 85°C).  
**Display:** 3.3" diagonal graphic LCD. Backlight (full functional display only).  
**Enclosure Material Housing:** Powder coated die cast aluminum.  
**Enclosure Rating:** NEMA 4X (IP66).  
**Electrical Connection:** Removable terminal blocks, #22 AWG (100 ft (30 m) max).  
**Mounting:** Wall or pipe mount.  
**Mounting Orientation:** Any orientation.  
**Weight:** 2.46 lbs (1.12kg).  
**Agency Approvals:** CE.

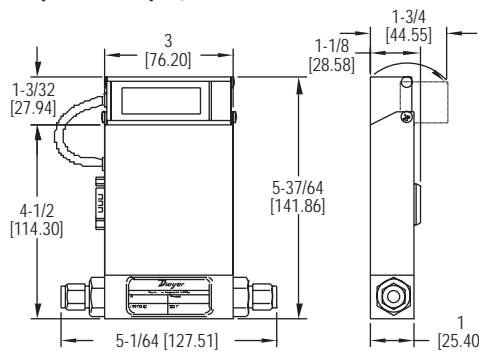
MODEL CHART	
Model	Description
A-IEF-IDSP-RM	A-IEF-DSP-RM indicator remote display
A-IEF-FDSP-RM	A-IEF-DSP-RM full functional remote display

ACCESSORIES	
Model	Description
A-IEF-CBL-50	Plenum rated cable 50 ft (15.2 m)

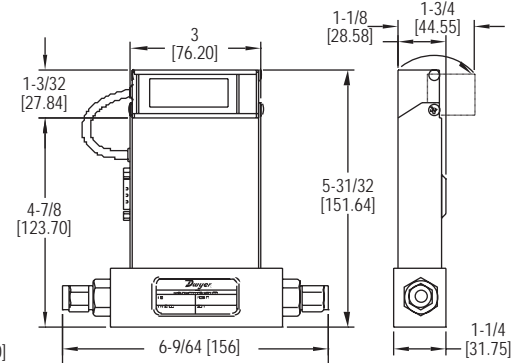
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# GAS MASS FLOW METERS

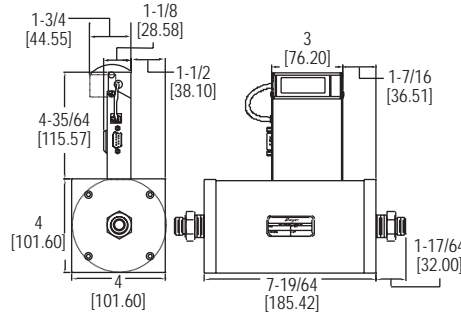
Flow Range Up to 1000 L/min, Pressures Up to 1000 psi, NIST Traceable



**Model GFM-1101 thru GFM-1111  
& GFM-2101 thru GFM-2111**



**Model GFM-1140  
thru GFM-1142 & GFM-2140  
thru GFM-2142**  
**Model GFM-1130  
thru GFM-1133 & GFM-2130  
thru GFM-2133**



**Model GFM-1143 thru GFM-1145  
& GFM-2143 thru GFM-2145**

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 fluoroeelastomer O-rings; GFM-2XXX: 316 SS and fluoroeelastomer O-rings.  
**Accuracy:** ±1% FS including linearity over 59 to 77°F (5 to 25°C) and 5 to 60 psia (0.34 to 4 bar); Series X143, X144, X145, ±1.5% FS.  
**Repeatability:** ±0.25% of FS.  
**Response Time:** 2 s 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:** 1000 psig (68.9 bar); Series GFM-X143, X144, X145, 500 psig (34.5 bar).  
**Leak Integrity:** 1 x 10<sup>-9</sup> sccs of He.  
**Display:** 90° tiltable, 3-1/2 digit.  
**Agency Approvals:** CE.

### ACCESSORIES

Model	Description
GFM-110P	110 V power supply
GFM-220PE	220 V power supply
GFM-CBL4	3' cable for 4-20 mA output
GFM-CBL5	3' cable for 0-5 VDC output

### MODEL CHART

Model*	Material	Flow Range	Process Connector Compression Fitting	Model*	Material	Flow Range	Process Connector Compression Fitting
GFM-1101	Aluminum	0 to 10 mL/m	1/4"	GFM-2101	SS	0 to 10 mL/m	1/4"
GFM-1102	Aluminum	0 to 20 mL/m	1/4"	GFM-2102	SS	0 to 20 mL/m	1/4"
GFM-1103	Aluminum	0 to 50 mL/m	1/4"	GFM-2103	SS	0 to 50 mL/m	1/4"
GFM-1104	Aluminum	0 to 100 mL/m	1/4"	GFM-2104	SS	0 to 100 mL/m	1/4"
GFM-1105	Aluminum	0 to 200 mL/m	1/4"	GFM-2105	SS	0 to 200 mL/m	1/4"
GFM-1106	Aluminum	0 to 500 mL/m	1/4"	GFM-2106	SS	0 to 500 mL/m	1/4"
GFM-1107	Aluminum	0 to 1000 mL/m	1/4"	GFM-2107	SS	0 to 1000 mL/m	1/4"
GFM-1108	Aluminum	0 to 2 L/min	1/4"	GFM-2108	SS	0 to 2 L/min	1/4"
GFM-1109	Aluminum	0 to 5 L/min	1/4"	GFM-2109	SS	0 to 5 L/min	1/4"
GFM-1111	Aluminum	0 to 15 L/min	1/4"	GFM-2111	SS	0 to 15 L/min	1/4"
GFM-1131	Aluminum	0 to 30 L/min	1/4"	GFM-2131	SS	0 to 30 L/min	1/4"
GFM-1133	Aluminum	0 to 50 L/min	1/4"	GFM-2133	SS	0 to 50 L/min	1/4"
GFM-1142	Aluminum	0 to 100 L/min	3/8"	GFM-2142	SS	0 to 100 L/min	3/8"
GFM-1144	Aluminum	0 to 200 L/min	3/8"	GFM-2143	SS	0 to 200 L/min	3/8"
GFM-1144	Aluminum	0 to 500 L/min	1/2"	GFM-2144	SS	0 to 500 L/min	1/2"
GFM-1145	Aluminum	0 to 1000 L/min	3/4"	GFM-2145	SS	0 to 1000 L/min	3/4"

\*Specified flow ranges are for an equivalent flow of nitrogen at 70°F (21°C) @ 760 mm Hg.

# GAS MASS FLOW METERS

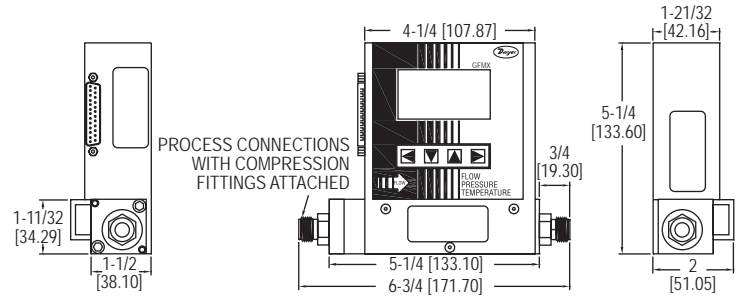
Flow Monitoring, Push-Button Configuration



GFM3



GFM4



The Series GFM3 & GFM4 Gas Mass Flow Meters are an ideal choice for the measurement of flow rates of a wide variety of gases. Unit can be calibrated for a variety of gases via push-button with 0-5 VDC, 0-10 VDC or 4-20 mA and relay outputs.

**FEATURES/BENEFITS**

- Multi parameter flow meter supports various functions such as flow totalizer, flow, temperature, and pressure alarms, and is available in a choice of 0-5 VDC, 0-10 VDC, or 4-20 mA output signals
- Set alarms remotely via digital interface for flow, pressure, and temperature to alert user of high or low thresholds being exceeded
- Programmable 12-digit totalizer for total gas volume indication, and is available in the choice of 0-5 VDC, 0-10 VDC, or 4-20 mA output signals
- Standard four button keypad and large 128 x 64 graphical LCD with backlight allows easy access to the many features
- Digital interface operates through available RS-485 or RS-232, providing access to internal data parameters and multi-drop capability of up to 255 units (RS-485 only)
- Set alarms remotely via digital interface for flow to alert user of high or low thresholds being exceeded
- Internal conversion factors for up to 32 gases
- NIST traceable certificate included
- Automatic zero adjustment
- Self-diagnostic tests

**SPECIFICATIONS**

- Service:** Clean gases compatible with wetted parts.
- Wetted Materials:** 316 SS, 416 SS; Fluoroelastomer, Buna-N, EPR or PTFE O-rings.
- Accuracy:** ±1% FS.
- Repeatability:** ±0.25% FS.
- Response Time:** 0.6 to 1.0 s to within ±2% of set point over 20 to 100% FS.
- Output Signal:** Linear 0-5 VDC (3000 Ω min. load impedance); 0-10 VDC (6000 Ω min. load impedance); 4-20 mA (500 Ω max. loop resistance).
- Relay Rating:** 1 A @ 24 VDC.
- Max. Particulate Size:** 5 microns.
- Temperature Limits:** Ambient: 32 to 122°F (0 to 50°C); Dry Gases: 14 to 122°F (-10 to 50°C).
- Power Supply:** 12 VDC; 15 VDC; ±24 VDC.
- Process Connections:** 1/8" compression fitting for flow rates ≤ 10 L/min; 1/4" for ≤ 50 L/min; 3/8" for ≤ 100 L/min.
- Pressure Limits:** 500 psia (35 bar).
- Leak Integrity:** 1 x 10<sup>-9</sup> smL/sec of helium.
- Display:** 128 x 64 graphic LCD with backlight.
- Weight:** 1 lb (.45 kg).

MODEL CHART											
Example	GFM3	-AIR	-010	-5	-E	-B	-L	-B	-C	-2	GFM3-AIR-010-5-E-B-L-B-C-2
Series	GFM3 GFM4										Gas mass flow meter Gas mass flow meter with temperature
Specialty Gas and K-Factor		AIR AR C2H2 C3H8 C4H10 CH4 CO CO2 HF HE H2 N2 NH3 O2 SO2									Air 1.0000 Argon 1.4573 Acetylene 0.5829 Propane 0.3500 Butane 0.2631 Methane 0.7175 Carbon monoxide 1.0000 Carbon dioxide 0.7382 Hydrogen fluoride 0.9998 Helium 1.4540 Hydrogen 1.0106 Nitrogen 1.0000 Ammonia 0.7310 Oxygen 0.9926 Sulfur dioxide 0.6900
Body Size			010 050 100								Low flow Medium flow High flow
Power Supply				5 2 4							±15 VDC 12 VDC 24 VDC
Seal Material					V B E T						Fluoroelastomer Buna-N EPR PTFE
Fittings								A B D			1/4" compression (low) 1/8" compression (medium) 3/8" compression (high)
Display							L				LED display
Flow Output Signal								A B G			0-5 VDC 4-20 mA 0-10 VDC
Temperature and Pressure Output Signal									A B C D E F G H I J		N.A./N.A 0-5 VDC/0-5 VDC 0-5 VDC/4-20 mA 0-5 VDC/0-10 VDC 4-20 mA/0-5 VDC 4-20 mA/4-20 mA 4-20 mA/0-10 VDC 0-10 VDC/0-5 VDC 0-10 VDC/4-20 mA 0-10 VDC/0-10 VDC
Digital Interface										2 5 9	RS232 RS485 PROFIBUS

Note: Specify flow range at time of order

**APPLICATIONS**

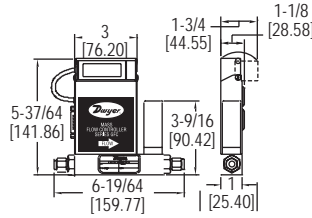
- Gas flow measurement
- Gas flow control
- Operating pumps and valves
- Process equipment
- Vacuum processes
- Glass and metal coating
- Film deposition

**ACCESSORIES**

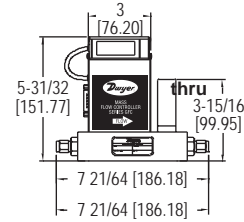
Model	Description
A-110N12	110 VAC power supply, 12 VDC standard interface
A-110N24	110 VAC power supply, 24 VDC standard interface
A-110NA15	110 VAC power supply, 15 VDC standard interface

# GAS MASS FLOW CONTROLLERS

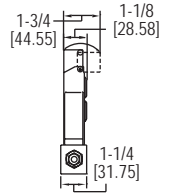
Flow Range Up to 1000 L/min, Pressures Up to 500 psi, NIST Traceable



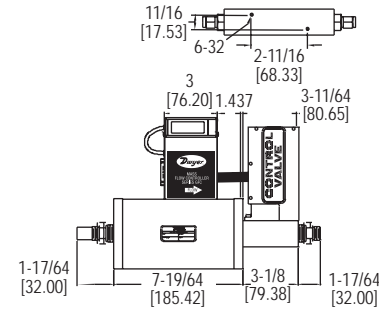
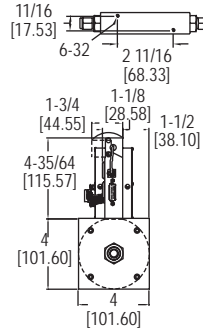
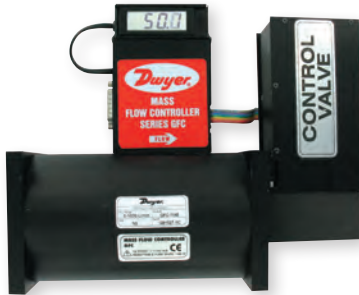
**Model GFC-1101 thru GFC-1111 & GFC-2101 thru GFC-2111**



**Model GFC-1130 thru GFC-1133 & GFC-2130 thru GFC-2133**



**Model GFC-1140 thru GFC-1142 & GFC-2140 thru GFC-2142**



**Model GFC-1143 thru GFC-1145 & GFC-2143 thru GFC-2145**

The **Series GFC Gas Mass Flow Controllers** combine a straight tube sensor with a restrictor flow element. It is available for flow ranges up to 1000 L/min and offered in aluminum or 316 SS in 1/4", 3/8", 1/2" and 3/4" sizes.

**FEATURES/BENEFITS**

- Provides high accuracy and repeatability
- Flow rates are virtually unaffected by temperature and pressure variations
- Utilizes an electromagnetic valve and PID electronics to maintain continuous control by comparing measured sensor signal set to flow rates
- Set points can be adjusted with local potentiometers or remotely via 0-5 VDC or 4-20 mA analog signal
- Actual gas flow is displayed in engineering units on a 3-1/2 digit, 90° tiltable LCD readout
- Can be used with Series GFT2 Flow Totalizer for applications requiring totalization
- NIST traceable certificate included

**APPLICATIONS**

- Gas flow measurement
- Gas flow control
- Operating pumps and valves
- Process equipment
- Vacuum processes
- Glass and metal coating
- Film deposition

**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% FS including linearity over 59 to 77°F (5 to 25°C) and 5 to 60 psia (0.34 to 4 bar); Series GFC X143, X144, X145, ±1.5% FS.  
**Repeatability:** ±0.25% FS.  
**Response Time:** 2 s 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:** 1000 psig (68.9 bar); Series GFC-X143, X144, X145, 500 psig (34.5 bar).  
**Leak Integrity:** 1 x 10<sup>-9</sup> sccs of He.  
**Display:** 90° tiltable, 3-1/2 digit.  
**Agency Approvals:** CE.

**MODEL CHART**

Aluminum Model	SS Model	Flow Range	Process Connector Compression Fitting
GFC-1101*	GFC-2101*	0 to 10 mL/m	1/4"
GFC-1102*	GFC-2102*	0 to 20 mL/m	1/4"
GFC-1103*	GFC-2103*	0 to 50 mL/m	1/4"
GFC-1104*	GFC-2104*	0 to 100 mL/m	1/4"
GFC-1105*	GFC-2105*	0 to 200 mL/m	1/4"
GFC-1106*	GFC-2106*	0 to 500 mL/m	1/4"
GFC-1107*	GFC-2107*	0 to 1000 mL/m	1/4"
GFC-1108*	GFC-2108*	0 to 2 L/min	1/4"
GFC-1109*	GFC-2109*	0 to 5 L/min	1/4"
GFC-1111*	GFC-2111*	0 to 15 L/min	1/4"
GFC-1131*	GFC-2131*	0 to 30 L/min	1/4"
GFC-1133*	GFC-2133*	0 to 50 L/min	1/4"
GFC-1142*	GFC-2142*	0 to 100 L/min	3/8"
GFC-1143*	GFC-2143*	0 to 200 L/min	3/8"
GFC-1144*	GFC-2144*	0 to 500 L/min	1/2"
GFC-1145*	GFC-2145*	0 to 1000 L/min	3/4"

\*Specified flow ranges are for an equivalent flow of nitrogen at 70°F (21°C) @ 760 mm Hg

**ACCESSORIES**

Model	Description
GFC-110P	110 V power supply
GFC-220PE	220 V power supply
GFC-CBL1	8' cable with 15-pin connector
GFC-CBL3	3' extension cable for LCD readout

USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

# PRESSURE CONVERSION CHART

in./H <sub>2</sub> O	P.S.I.	in/Hg	mm/H <sub>2</sub> O	mm/Hg	kg/cm <sup>2</sup>	bar	mbar	Pa	kPa
.1	.0036	.0073	2.534	.1863	.0002	.0002	.2482	24.82	.0248
.2	.0072	.0146	5.067	.3726	.0005	.0005	.4964	49.64	.0496
.4	.0144	.0293	10.13	.7452	.0010	.0010	.9928	99.28	.0993
6	.0216	.0440	15.20	1.118	.0015	.0015	1.489	148.9	.1489
8	.0288	.0588	20.34	1.496	.0020	.0020	1.992	199.2	.1992
1.0	.0361	.0735	25.41	1.868	.0025	.0025	2.489	248.9	.2489
2	.0722	.1470	50.81	3.736	.0051	.0050	4.978	497.8	.4978
3	.1083	.2205	76.22	5.604	.0076	.0075	7.467	746.7	.7476
4	.1444	.2940	101.62	7.472	.0102	.0099	9.956	995.6	.9956
5	.1804	.3673	127.0	9.335	.0127	.0124	12.44	1244	1.244
6	.2165	.4408	152.4	11.203	.0152	.0149	14.93	1493	1.493
7	.2526	.5143	177.8	13.072	.0178	.0174	17.42	1742	1.742
8	.2887	.5878	203.2	14.940	.0203	.0199	19.90	1990	1.990
9	.3248	.6613	228.6	16.808	.0228	.0224	22.39	2239	2.239
10	.3609	.7348	254.0	18.676	.0254	.0249	24.88	2488	2.488
11	.3970	.8083	279.4	20.544	.0279	.0274	27.37	2737	2.737
12	.4331	.8818	304.8	22.412	.0304	.0299	29.86	2986	2.986
13	.4692	.9553	330.2	24.280	.0330	.0324	32.35	3235	3.235
14	.5053	1.029	355.6	26.148	.0355	.0348	34.84	3484	3.484
15	.5414	1.102	381.0	28.016	.0381	.0373	37.33	3733	3.733
16	.5774	1.176	406.4	29.879	.0406	.0398	39.81	3981	3.981
17	.6136	1.249	431.8	31.742	.0431	.0423	42.31	4231	4.231
18	.6496	1.322	457.2	33.616	.0457	.0448	44.79	4479	4.479
19	.6857	1.396	482.6	35.484	.0482	.0473	47.28	4728	4.728
20	.7218	1.470	508.0	37.352	.0507	.0498	49.77	4977	4.977
21	.7579	1.543	533.4	39.222	.0533	.0523	52.26	5226	5.226
22	.7940	1.616	558.8	41.09	.0558	.0547	54.74	5474	5.474
23	.8301	1.690	584.2	42.96	.0584	.0572	57.23	5723	5.723
24	.8662	1.764	609.6	44.82	.0609	.0597	59.72	5972	5.972
25	.9023	1.837	635.0	46.69	.0634	.0622	62.21	6221	6.221
26	.9384	1.910	660.4	48.56	.0660	.0647	64.70	6470	6.470
27	.9745	1.984	685.8	50.43	.0685	.0672	67.19	6719	6.719
28	1.010	2.056	710.8	52.26	.0710	.0696	69.64	6964	6.964
29	1.047	2.132	736.8	54.18	.0736	.0722	72.19	7219	7.219
30	1.083	2.205	762.2	56.04	.0761	.0747	74.67	7467	7.467
31	1.119	2.278	787.5	57.91	.0787	.0772	77.15	7715	7.715
32	1.155	2.352	812.8	59.77	.0812	.0796	79.63	7963	7.963
33	1.191	2.425	838.2	61.63	.0837	.0821	82.12	8212	8.212
34	1.227	2.498	863.5	63.49	.0862	.0846	84.60	8460	8.460
35	1.263	2.571	888.9	65.36	.0888	.0871	87.08	8708	8.708
36	1.299	2.645	914.2	67.22	.0913	.0896	89.56	8956	8.956
37	1.335	2.718	939.5	69.08	.0938	.0920	92.04	9204	9.204
38	1.371	2.791	964.9	70.95	.0964	.0945	94.53	9453	9.453
39	1.408	2.876	990.9	72.86	.0989	.0971	97.08	9708	9.708
40	1.444	2.949	1016	74.72	.1015	.0996	99.56	9956	9.956
41	1.480	3.013	1042	76.59	.1040	.1020	102.0	10204	10.20
42	1.516	3.086	1067	78.45	.1066	.1045	104.5	10452	10.45
43	1.552	3.160	1092	80.31	.1091	.1070	107.0	10701	10.70
44	1.588	3.233	1118	82.18	.1116	.1095	109.5	10949	10.95
45	1.624	3.306	1143	84.04	.1142	.1120	112.0	11197	11.20
46	1.660	3.378	1168	85.90	.1167	.1144	114.4	11445	11.44
47	1.696	3.453	1194	87.76	.1192	.1169	116.9	11694	11.69
48	1.732	3.526	1219	89.63	.1218	.1194	119.4	11942	11.94
49	1.768	3.600	1244	91.49	.1243	.1219	121.9	12190	12.19
50	1.804	3.673	1270	93.35	.1268	.1244	124.4	12438	12.44
51	1.841	3.748	1296	95.27	.1294	.1269	126.9	12693	12.69
52	1.877	3.822	1321	97.13	.1320	.1294	129.4	12941	12.94
53	1.913	3.895	1346	98.99	.1345	.1319	131.9	13190	13.19
54	1.949	3.968	1372	100.8	.1370	.1344	134.4	13438	13.44
55	1.985	4.041	1397	102.7	.1395	.1369	136.9	13686	13.69
56	2.021	4.115	1422	104.6	.1421	.1393	139.3	13934	13.93
57	2.057	4.188	1448	106.4	.1446	.1418	141.8	14182	14.18
58	2.093	4.261	1473	108.3	.1471	.1443	144.3	14431	14.43
59	2.129	4.335	1498	110.2	.1497	.1468	146.8	14679	14.68
60	2.165	4.408	1524	112.0	.1522	.1493	149.3	14927	14.93
61	2.202	4.483	1550	113.9	.1548	.1518	151.8	15182	15.18
62	2.238	4.556	1575	115.8	.1573	.1543	154.3	15430	15.43
63	2.274	4.630	1600	117.7	.1599	.1568	156.8	15679	15.68
64	2.310	4.703	1626	119.5	.1624	.1593	159.3	15927	15.93
65	2.346	4.776	1651	121.4	.1649	.1618	161.8	16175	16.18
66	2.382	4.850	1676	123.3	.1674	.1642	164.2	16423	16.42
67	2.418	4.923	1702	125.1	.1700	.1667	166.7	16672	16.67
68	2.454	4.996	1727	127.0	.1725	.1692	169.2	16920	16.92
69	2.490	5.070	1752	128.8	.1750	.1717	171.7	17168	17.17
70	2.526	5.143	1778	130.7	.1776	.1742	174.2	17416	17.42
71	2.562	5.216	1803	132.6	.1801	.1766	176.6	17664	17.66
72	2.598	5.290	1828	134.4	.1826	.1791	179.1	17912	17.91
73	2.635	5.365	1854	136.4	.1852	.1817	181.7	18168	18.17
74	2.671	5.438	1880	138.2	.1878	.1842	184.2	18416	18.42
75	2.707	5.511	1905	140.1	.1903	.1866	186.6	18664	18.66
76	2.743	5.585	1930	141.9	.1928	.1891	189.1	18912	18.91
77	2.779	5.658	1956	143.8	.1954	.1916	191.6	19160	19.16
78	2.815	5.731	1981	145.7	.1979	.1941	194.1	19409	19.41
79	2.851	5.805	2006	147.5	.2004	.1966	196.6	19657	19.66
80	2.887	5.878	2032	149.4	.2030	.1991	199.1	19905	19.90
81	2.923	5.951	2057	151.2	.2055	.2015	201.5	20153	20.15
82	2.959	6.024	2082	153.1	.2080	.2040	204.0	20402	20.40
83	2.996	6.100	2108	155.0	.2106	.2066	206.6	20657	20.66
84	3.032	6.173	2134	156.9	.2131	.2091	209.1	20905	20.90
85	3.068	6.246	2159	158.8	.2157	.2115	211.5	21153	21.15
86	3.104	6.320	2184	160.6	.2182	.2140	214.0	21401	21.40
87	3.140	6.393	2210	162.5	.2207	.2165	216.5	21650	21.65
88	3.176	6.466	2235	164.4	.2233	.2190	219.0	21900	21.90
89	3.212	6.540	2260	166.2	.2258	.2215	221.5	22146	22.15
90	3.248	6.613	2286	168.1	.2283	.2239	223.9	22394	22.39
91	3.284	6.686	2311	169.9	.2309	.2264	226.4	22642	22.64
92	3.320	6.760	2336	171.8	.2334	.2289	228.9	22890	22.89
93	3.356	6.833	2362	173.7	.2359	.2314	231.4	23139	23.14
94	3.392	6.906	2387	175.5	.2384	.2339	233.9	23387	23.39
95	3.429	6.981	2413	177.4	.2410	.2364	236.4	23642	23.64
96	3.465	7.055	2438	179.3	.2436	.2389	238.9	23890	23.89
97	3.501	7.128	2464	181.2	.2461	.2414	241.4	24138	24.14
98	3.537	7.201	2489	183.0	.2486	.2439	243.9	24387	24.39
99	3.573	7.275	2514	184.9	.2512	.2464	246.4	24635	24.64
100	3.609	7.348	2540	186.8	.2537	.2488	248.8	24883	24.88

P.S.I.	in./H <sub>2</sub> O	in/Hg	mm/H <sub>2</sub> O	mm/Hg	kg/cm <sup>2</sup>	bar	mbar	Pa	kPa
1.0	27.71	2.036	703.1	51.75	.0703	.0689	68.95	6895	6.895
1.1	30.45	2.240	773.4	56.89	.0773	.0758	75.84	7584	7.584
1.2	33.22	2.443	843.7	62.06	.0844	.0827	82.74	8274	8.274
1.3	35.98	2.647	914.0	67.23	.0914	.0896	89.63	8963	8.963
1.4	38.75	2.850	984.3	72.40	.0984	.0965	96.52	9652	9.652
1.5	41.52	3.054	1054.5	77.57	.1055	.1034	103.4	10340	10.34
1.6	44.29	3.258	1124.8	82.74	.1125	.1103	110.3	11030	11.03
1.7	47.06	3.461	1195.1	87.92	.1195	.1172	117.2	11720	11.72
1.8	49.82	3.665	1265.4	93.09	.1266	.1241	124.1	12410	12.41
1.9	52.59	3.868	1335.7	98.26	.1336	.1310	131.0	13100	13.10
2.0	55.36	4.072	1406.0	103.43	.1406	.1379	137.9	13790	13.79
2.1	58.13	4.276	1476.3	108.6	.1476	.1448	144.8	14480	14.48
2.2	60.90	4.479	1546.6	113.8	.1547	.1517	151.7	15170	15.17
2.3	63.67	4.683	1616.9	118.9	.1617	.1586	158.6	15860	15.86
2.4	66.43	4.886	1687.2	124.1	.1687	.1655	165.5	16550	16.55
2.5	69.20	5.090	1757.5	129.3	.1758	.1724	172.4	17240	17.24
2.6	71.97	5.294	1827.8	134.5	.182				

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