

CIRCULAR CHART RECORDER

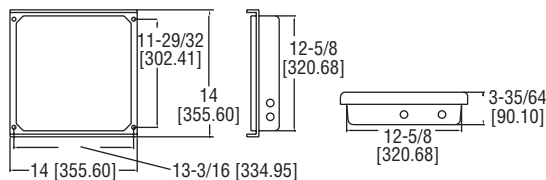
Single and Dual Pen, Rotation Speeds & Recording Times



LCR10



LCR20



The **SERIES LCR10 & LCR20** Circular Chart Recorders are two series of circular chart recorders with single and dual pen options. The LCR10 is a single pen recorder and the LCR20 is a dual pen. They can be easily programmed for any of six different thermocouple types, 100 ohm platinum DIN RTDs, or process inputs.

FEATURES/BENEFITS

- Uses large 10" (254 mm) circular chart to easily read data
- Available with dual pen inputs

APPLICATIONS

- Water level monitoring in water treatment
- Temperature/humidity in wood drying
- Room pressure monitoring in clean room applications

MODEL CHART

Model	Rotation	Pen Inputs	Output
LCR10-101	Counter-clockwise	Single	No
LCR10-111	Counter-clockwise	Single	Yes
LCR20-101	Counter-clockwise	Dual	No
LCR20-111	Counter-clockwise	Dual	Yes

SPECIFICATIONS

Ranges: Thermocouple: Type J, K, T, R, S, B; RTD: 100 Ω platinum DIN curve (0.00385 Ω per Ω per $^{\circ}\text{C}$); Process: 0 to 5 VDC, 250 Ω impedance, 4 to 20 mA across 250 Ω .

Chart Size: 10" (254 mm).

Accuracy: $\pm 0.5\%$ of span (100 division span).

Output Relay: Form C (DPDT), 1A @ 240 VAC resistive.

Chart Speed: Programmable 4, 8, 12, 24, 48, 72, 168 hour rotation (168 hours=7 days).

Ambient Operating Temperature/RH: 32 to 140 $^{\circ}\text{F}$ (0 to 60 $^{\circ}\text{C}$); 0-90% RH (non-condensing).

Power Requirements: 110/220 VAC $\pm 10\%$.

Battery Backup: 9 V alkaline battery, installed functional, user replaceable.

Power Consumption: 15 VA max.

Housing Material: Fire retardant polyphenylene ether and polystyrene PPE & PS with acrylic window.

Mounting: ± 20 degrees of vertical, ± 10 degrees of horizontal.

Weight: 7 lb (3.2 kg).

Agency Approvals: CE.

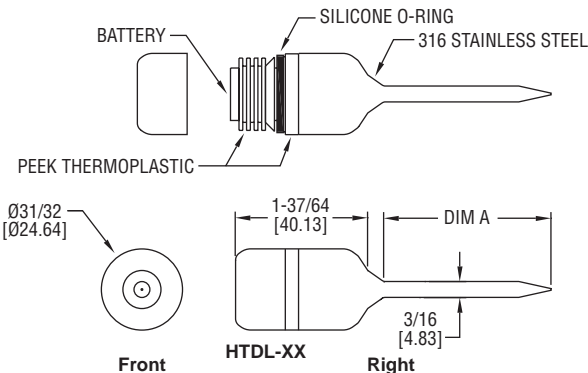
ACCESSORIES

Model	Description
LCR200	Chart paper, 0 to 200 $^{\circ}\text{F}$, 24 hour, CCW
LCR2007	Chart paper, 0 to 200 $^{\circ}\text{F}$, 7 day, CCW
LCR110C	Chart paper, 0 to 110 $^{\circ}\text{C}$, 24 hour, CCW
LCR-R	Red chart pens, package of 6
LCR-B	Blue chart pens, package of 6

MODEL HTDL-20/30

HIGH TEMPERATURE DATA LOGGER

Submersible, Continuous Recording, User Replaceable Battery



The **MODEL HTDL-20/30** is a high temperature data logger that can measure temperatures up to 500 $^{\circ}\text{F}$ (260 $^{\circ}\text{C}$) and record up to 32,700 measurements.

FEATURES/BENEFITS

- Submersible and portable
- Temperature measurement up to 500 $^{\circ}\text{F}$
- Remote probe option for chamber or oven logging
- Delay startup timer

APPLICATIONS

- Thermal testing
- Process monitoring or troubleshooting

MODEL CHART

Model	Description
HTDL-20	High temperature data logger with 2" rigid probe
HTDL-30	High temperature data logger with 24" flexible probe

SPECIFICATIONS

Range: -328 to 500 $^{\circ}\text{F}$ (-200 to 260 $^{\circ}\text{C}$).

Memory Size: 32,700 readings.

Accuracy: 0.18 $^{\circ}\text{F}$ (0.1 $^{\circ}\text{C}$) @ 68 to 284 $^{\circ}\text{F}$ (20 to 140 $^{\circ}\text{C}$); 0.54 $^{\circ}\text{F}$ (0.3 $^{\circ}\text{C}$) @ -4 to 67.98 $^{\circ}\text{F}$ (-20 to 19.99 $^{\circ}\text{C}$).

Resolution: 0.02 $^{\circ}\text{F}$ (0.01 $^{\circ}\text{C}$).

Temperature Limits: -4 to 284 $^{\circ}\text{F}$ (-20 to 140 $^{\circ}\text{C}$).

Sampling Method: Stop on memory full or continuous recording.

Sampling Rate: Selectable from 1 sec to 24 hrs.

Computer Requirements: Windows[®] Xp Sp3, Windows Vista[®], Windows[®] 7 operating systems.

Power Requirements: 3.6 V 1/2 AA ER14250SM lithium metal battery, installed functional, user replaceable.

Battery Life: 1 year (approx).

Interface: Docking station and USB cable.

Housing Material: 316 SS.

Weight: 4.2 oz (120 g).

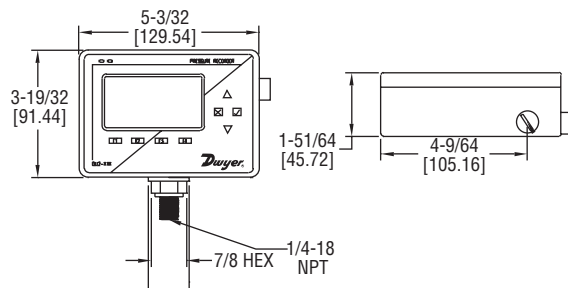
Agency Approvals: CE.

ACCESSORIES

Model	Description
HTDL-DS	Docking station, software, manual and USB interface
ER1425S-HT	Replacement battery

LCD PRESSURE DATA LOGGER

1/4" NPT Fitting, Records 262,143 Readings, Front Keypad



The **SERIES DLI2** accurately records pressure and gives instant remote readings. The large, back-lit LCD and 8-button keypad provide convenient access to current data and recorder setup as well as memory and battery levels. The Series DLI2 can be ordered for absolute or gauge pressure measurements up to 5,000 psi. Using the keypad or software, measurements can be read in psi, in. Hg, mm Hg, bar, atm, Torr, Pa, kPa, or MPa. The large memory capacity allows over 260,000 readings to be stored. The easy to use DL700 software makes creating permanent records, performing data calculations, and graphing of data simple. The DLI2 can easily be started and stopped from a PC or delayed to start up to six months in advance. It can also stop recording at a specific time or after a certain number of readings have been taken.

FEATURES/BENEFITS

- Efficient data capture tool to review processes are running correctly or to analyze alarm and out-of-spec conditions
- Intuitive keypad interface allows easy set-up
- PC start and stopping allows centralized control of data collection

APPLICATIONS

- Building automation
- Clean room
- Operating rooms
- Process applications
- Labs
- Regulated environments

MODEL CHART

Model	Pressure Range	Model	Pressure Range
DLI2-A08	0 to 30 psia	DLI2-G13	0 to 300 psig
DLI2-G08	0 to 30 psig	DLI2-A14	0 to 500 psia
DLI2-A10	0 to 100 psia	DLI2-G14	0 to 500 psig
DLI2-G10	0 to 100 psig	DLI2-A15	0 to 1000 psia
DLI2-A13	0 to 300 psia	DLI2-A19	0 to 5000 psia

SPECIFICATIONS

Ranges: 0 to 30 psia (g), 0 to 100 psia (g), 0 to 300 psia (g), 0 to 500 psia (g), 0 to 1000 psia, and 0 to 5000 psia depending on the model.
Memory Size: 262,143 readings.
Accuracy: 2% FSR, 0.25% at 77°F (25°C) typical.
Resolution: 0.002 psi (30 psi), 0.005 psi (100 psi), 0.02 psi (300 psi), 0.05 psi (500 and 1000 psi), and 0.2 psi (5000 psi) depending on model.
Sampling Method: Stop on memory full or continuous recording.
Sampling Rate: Selectable from 2 s to 12 hrs.
Computer Requirements: Windows® 95, Windows® 98, Windows® 2000, Windows® ME, Windows NT®, or Windows® XP operating system, and one free USB port.
Power Requirements: (6) AA alkaline batteries, installed functional, user replaceable.
Battery Life: 1 yr (approx).
Interface: USB port (interface cable required).
Housing Material: Black anodized aluminum case.
Wetted Material: 316L SS.
Weight: 40 oz (1134 g).
Agency Approvals: CE.

ACCESSORIES

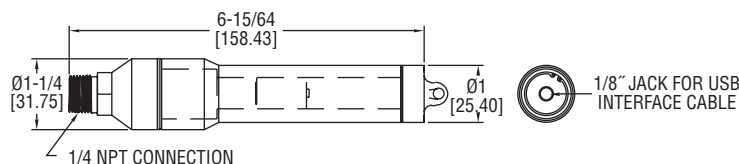
Model	Description
DL700	Software, manual and USB interface cable
DLI-120	9 V power adapter (North America)

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SERIES DLP

PRESSURE/TEMPERATURE DATA LOGGER

1/4" NPT Fitting, Up to 5000 psia



The **SERIES DLP** Data Logger can record pressure and temperature. The 1/4" NPT fitting comes standard and allows the logger to be adapted to almost any pressure fitting. The internal temperature sensor provides accurate temperature measurements without the need of a separate temperature recorder, and many of the models provide a choice between measuring pressure in psia or psig. The DLP can easily be started and stopped from a PC or delayed to start up to six months in advance. The battery-powered data logger can store over 16,000 measurements per channel, and the easy to use DL700 software makes retrieving data simple.

FEATURES/BENEFITS

- Efficient data capture tool to review processes are running correctly or to analyze alarm and out-of-spec conditions
- Battery-powered reduces need to hard wire power allowing device to be used in a as a tool in a variety of in-and-out testing
- PC start and stopping allows centralized control of data collection

APPLICATIONS

- Building automation
- Clean room
- Operating rooms
- Process applications
- Labs
- Regulated environments

MODEL CHART

Model	Pressure Range	Model	Pressure Range
DLP-A08	0 to 30 psia	DLP-G13	0 to 300 psig
DLP-G08	0 to 30 psig	DLP-A14	0 to 500 psia
DLP-A10	0 to 100 psia	DLP-G14	0 to 500 psig
DLP-G10	0 to 100 psig	DLP-A15	0 to 1000 psia
DLP-A13	0 to 300 psia	DLP-A19	0 to 5000 psia

SPECIFICATIONS

Range: Temperature: -40 to 176°F (-40 to 80°C); Pressure: 0 to 30 psia(g), 0 to 100 psia(g), 0 to 300 psia(g), 0 to 500 psia(g), 0 to 1000 psia, and 0 to 5000 psia depending on the model.
Memory Size: 16,383 readings per channel.
Accuracy: Temperature: ±0.9°F (±0.5°C); Pressure: 2% FSR, 0.25% at 77°F (25°C) typical.
Resolution: Temperature: 0.2°F (0.1°C); Pressure: 0.002 psia(g), 0.005 psia(g), 0.05 psia(g), 0.05 psia, and 0.2 psia depending on the model.
Sampling Method: Stop on memory full.
Sampling Rate: Selectable from 2 s to 12 hrs.
Computer Requirements: Windows® 95, Windows® 98, Windows® 2000, Windows® ME, Windows NT®, and Windows® XP operating system, one free USB port.
Power Requirements: 3.6 V TL2150 lithium metal battery, installed functional, user replaceable.
Battery Life: 1 yr (approx).
Interface: USB port (interface cable required).
Material: 303 SS.
Weight: 12 oz (340 g).
Agency Approvals: CE.

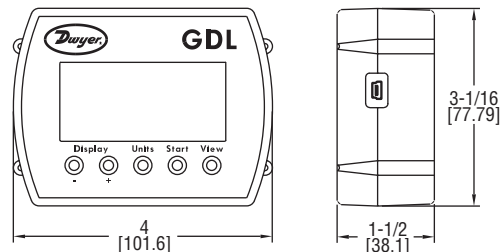
ACCESSORIES

Model	Description
DL700	Software, manual and USB interface cable
TL-2150	Replacement battery for Series DLP

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GRAPHICAL DISPLAY DATA LOGGER

Measure Temperature, Humidity and Dew Point, Instant Display



The **MODEL GDL** Graphical Display Data Logger can record and instantly display temperature, humidity, and dew point trends in a text or graphic format. The GDL has internal temperature and humidity sensors while the **MODEL GDL-T** accepts up to 3 external temperature sensors. With the included Windows® based software, the user can select the sampling interval, high/low alarms, logging channels, and recording start time. Over 40,000 data points can be recorded and the measured data stays secure with a recording session counter and password-protected calibration.

FEATURES/BENEFITS

- Measurements displayed in text or graph
- Able to record over 40,000 data points and download them to a PC
- Includes logging summary with details of the sample rate and memory status

APPLICATIONS

- Greenhouses/florists
- Medical storage facilities
- Refrigeration systems
- Wine storage

MODEL CHART

Model	Description
GDL	Temperature/humidity data logger
GDL-T	Four temperature sensor data logger

SPECIFICATIONS

Memory Size: 43,344 temperature; 21,672 temperature, RH and dew point.
Temperature Range: 15 to 150°F (-10 to 65°C).
Temperature Accuracy: ±1°F (±0.5°C).
Temperature Resolution: 0.01°F (0.01°C).
Humidity Range: 0 to 99% RH.
Humidity Accuracy: ±2% RH, from 10 to 90% RH.
Humidity Resolution: 0.01% RH.
Sampling Method: Stop on memory full or continuous recording.

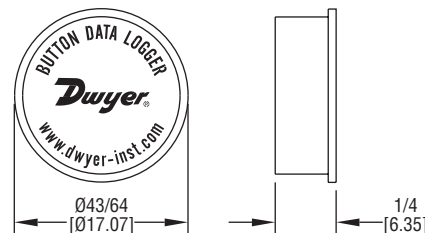
Sampling Rate: 1 s to 18 hrs, 1 s increments.
Computer Requirements: Windows® 98 and above (software included).
Power Requirements: (3) AA alkaline batteries, installed functional, user replaceable.
Alarms: Programmable high/low.
Interface: USB port (cable included).
Weight: 7 oz (20 g).
Agency Approvals: CE.

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SERIES BDL

BUTTON DATA LOGGER

Self-Powered, Compact Size, USB Interface



The **SERIES BDL** Button Data Logger records temperature and humidity in applications where size and cost effectiveness are vital. Housed in a compact stainless steel case, the BDL is durable in hostile environments, while also being able to be inserted in small items and packages. The Series BDL-K Logger Kit includes 2 buttons, 2 magnets, an interface cable, and a plastic button holder.

FEATURES/BENEFITS

- Compact to fit in small areas and durable to work in hostile environments
- Self-powered unit gives no need for external power supply
- Magnetic mounting for quicker installation

APPLICATIONS

- Food processing verification
- HVAC system testing and balancing.
- Pharmaceutical storage
- Transportation of temperature sensitive goods

MODEL CHART

Model	Input Type	Kit
BDL-1	Temperature	No
BDL-2	Temperature/humidity	No
BDL-K1	Temperature	Yes
BDL-K2	Temperature/humidity	Yes

SPECIFICATIONS

Range: BDL-1: -40 to 185°F (-40 to 85°C); BDL-2: -4 to 185°F (-20 to 85°C), 0 to 100% RH.
Memory Size: BDL-1: 2048 readings; BDL-2: 4096 temperature and 4096 humidity readings (low resolution), 2048 temperature and 2048 humidity readings (high resolution).
Accuracy: BDL-1: ±1.5°F (±1°C) from -22 to 158°F (-30 to 70°C); BDL-2: ±0.9°F (±0.5°C) from 14 to 158°F (-10 to 70°C), ±5% RH.
Resolution: BDL-1: 8 bit; BDL-2: 8 or 11 bit.
Sampling Method: Stop on memory full or continuous recording.

Sampling Rate: BDL-1: Selectable from 1 to 255 min; BDL-2: Selectable from 1 s to 24 hrs.
Computer Requirements: Windows® 98, Windows® 2000, Windows® ME, Windows NT®, Windows® XP, and Windows Vista® operating system with 16 MB RAM, one free USB port.
Power Requirements: 3 V lithium metal battery, internal, non-replaceable.
Battery Life: BDL-1: 10 years (approx); BDL-2: 5 years (approx).
Alarms: Programmable high/low.
Interface: USB port (cable included).
Housing Material: 305 SS.
Weight: 0.14 oz (4 g).
Agency Approvals: CE.

ACCESSORIES

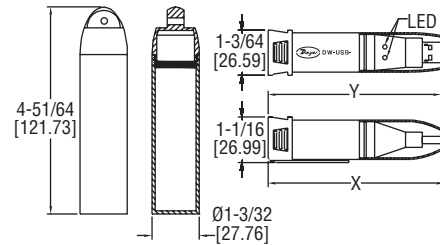
Model	Description
DL500-LITE*	Lite version Windows® operating system software
DL500**	Full version Windows® operating system software key
BDL-SIL	Weatherproof silicone housing (5 pk)
BDL-WALL	Wall mounting bracket (5 pk)
BDL-CLIP	Plastic button holder (5 pk)

*Free download from website **Need lite version also

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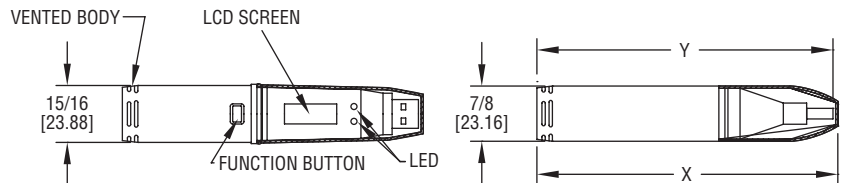
COMPACT USB DATA LOGGER

Measure Temperature, Humidity, Dew Point, Current, Voltage, or Carbon Monoxide



Model DW-USB-CASE Model DW-USB-X

Model	Overall Length (X)	Overall Length (Y)	Body/Clip	Cap	LED
DW-USB-1	3-55/64"	3-55/64"	Standard	Standard	Clear/red
DW-USB-2, -2-HA	4-1/16"	4-1/16"	Vented	Standard	Clear/clear
DW-USB-3	4-27/64"	4-27/64"	Standard	Black tip term block	Red/green
DW-USB-4	4-27/64"	4-27/64"	Standard	Blue tip term block	Red/green
DW-USB-5, -5-LR	4-59/64"	4-59/64"	Vented	Red tip CO sensor	Red/green
DW-USB-6	4-21/32"	4-21/32"	Standard	Standard	Red/green



Model	Overall Length (X)	Overall Length (Y)	Body/Clip	Cap	LED
DW-USB-1-LCD	4-21/32"	4-41/64"	Standard	Transparent	Red/green
DW-USB-2-LCD	4-31/32"	4-57/64"	Vented	Transparent	Red/green
DW-USB-2-HA-LCD	4-31/32"	4-57/64"	Vented	Transparent	Red/green
DW-USB-6-LCD	5-19/64"	5-15/64"	Plug in bottom	Transparent	Red/green

The **SERIES DW-USB** Compact USB Data Logger allows users to monitor temperature, humidity, dew point, voltage, current, or carbon monoxide almost anywhere, and then download stored data by simply plugging the module directly into a PC's USB port. The compact housing can resist moisture up to IP67 when the protective cap is attached, and has built in LED's to indicate an alarm has been met or the battery is low. Users can set the sampling rate, start time, high/low alarms, and temperature unit via software available for free download from our website.

FEATURES/BENEFITS

- Meets IP67 standards when the protective cap is fitted
- All in one unit plugs into PC with no cable required
- LED status indicators for visual confirmation
- Optional integral LCD display for local indication

APPLICATIONS

- Calibration labs
- Environmental chambers
- Pharmaceutical plants
- Storage warehouses

SPECIFICATIONS

Memory Size: 16,382 temperature; 16,382 each temperature and RH; 32,764 readings for voltage, current, and thermocouple; and 32,510 for carbon monoxide.
Sampling Mode: Stop on memory full.
Sampling Rate: Selectable from 10 s to 12 hr (temperature and RH models); 1 s to 12 hr (voltage, current, and thermocouple models); 10 s to 5 m (CO models).

Computer Requirements: Windows® 2000/XP/7/8.
Power Requirements: 3.6 V 1/2 AA lithium metal battery, included, user replaceable.
Housing: ABS plastic blend.
Alarms: Programmable high/low.
Interface: USB port.
Weight: 1.5 oz (43 g).
Agency Approvals: CE.

ACCESSORIES

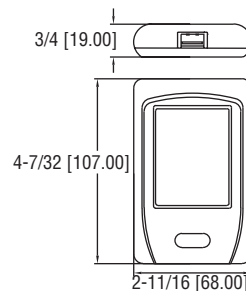
Model	Description
DW-USB-CASE	Waterproof case for DW-USB-1
1818-0074	Immersion temperature probe
1818-0078	Penetration temperature probe
1818-0082	Surface temperature probe
1818-0085	Air duct temperature probe
1718-0077	Remote temperature probe handle

MODEL CHART

Model	Sensor Type	Range	Accuracy	Resolution
DW-USB-1	Temperature	-31 to 176°F (-35 to 80°C)	±2°F (±1°C)	1°F (0.5°C)
DW-USB-2	Temperature/humidity/dew point	-31 to 176°F (-35 to 80°C), 0 to 100% RH	±4°F (2°C), ±3% RH from 20 to 80% RH, ±5% RH	1°F (0.5°C), 0.5% RH
DW-USB-2-HA	Temperature/humidity/dew point	-31 to 176°F (-35 to 80°C), 0 to 100% RH	±3°F (1.5°C), ±2% RH from 20 to 80% RH, ±4% RH	1°F (0.5°C), 0.5% RH
DW-USB-3	Voltage	0 to 30 VDC	±1%	50 mVDC
DW-USB-4	Current	4 to 20 mA	±1%	0.05 mA
DW-USB-5	Carbon monoxide	0 to 1000 ppm	±6% of reading	0.5 ppm
DW-USB-5-LR	Carbon monoxide	0 to 300 ppm	±4% of reading	0.5 ppm
DW-USB-6	External thermocouple	With supplied probe: 32 to 752°F (0 to 400°C) J-type: -202 to 1652°F (-130 to 900°C); K-type: -328 to 2372°F (-200 to 1300°C); T-type: -328 to 662°F (-200 to 350°C)	±2°F (1°C) (for data logger only)	1°F (0.5°C)
DW-USB-1-LCD	Temperature	-31 to 176°F (-35 to 80°C)	±3°F (1.5°C)	1°F (0.5°C)
DW-USB-2-LCD	Temperature/humidity/dew point	-31 to 176°F (-35 to 80°C), 0 to 100% RH	±4°F (2°C), ±3% RH from 20 to 80% RH, ±5% RH	1°F (0.5°C), 0.5% RH
DW-USB-2-HA-LCD	Temperature/humidity/dew point	-31 to 176°F (-35 to 80°C), 0 to 100% RH	±3°F (1.5°C), ±2% RH from 20 to 80% RH, ±4% RH	1°F (0.5°C), 0.5% RH
DW-USB-6-LCD	External Thermocouple	With supplied probe: 32 to 752°F (0 to 400°C) J-type: -202 to 1652°F (-130 to 900°C) K-type: -328 to 2372°F (-200 to 1300°C) T-type: -328 to 662°F (-200 to 350°C)	±2°F (1°C) (for data logger only)	1°F (0.5°C)

HANDHELD PORTABLE DATA VIEWER

Works With DW-USB Data Logger



The **MODEL DW-DATAPAD** Handheld Portable Data Viewer configures and reads data from up to 500 DW-USB data loggers and utilizes a 2.8" full color TFT touch screen display. Data can be displayed as a trend graph or a statistical summary, and can also be transferred to a computer using the provided cable and Windows® based software. Model DW-DATAPAD features a rechargeable lithium battery and has an average life of 5 to 8 hours under constant use.

FEATURES/BENEFITS

- 2.8" full color TFT touch screen simplifies navigation through configuration menus
- Rechargeable lithium battery has a 5 to 8 hour life when constantly used

APPLICATIONS

- Calibration labs
- Environmental chambers
- Pharmaceutical plants
- Storage warehouses

MODEL CHART

Model	Description
DW-DATAPAD	Handheld portable data viewer for Dwyer USB data loggers

SPECIFICATIONS

Data Recording Capacity: Internal flash memory, greater than 8.5 million readings.
Battery life: 5 to 8 hours (constant use).
Operating Temperature Range: 0 to 50°C (32 to 122°F).
Power Requirements: CA374170 lithium ion battery, installed functional, factory replaceable.
Display: 2.8" full color TFT touch screen LCD display.
Resolution: 240 X 320.
Interface: Touch screen and single front-panel push-button power switch.

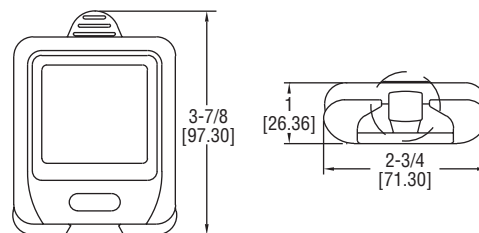
Connections: 1 USB type A socket (top of unit) for data logger connection. 1 micro-USB (bottom of unit) for connection of unit to PC via supplied USB cable.
Compatible Data Loggers: DW-USB-1, DW-USB-1-HT, DW-USB-1-LCD, DW-USB-2, DW-USB-2-HA, DW-USB-2-HA-LCD, DW-USB-2-LCD, DW-USB-6, DW-USB-6-LCD, and DW-USB-LITE.
Weight: 3.9 oz (111 kg).
Agency Approvals: CE.

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SERIES DW-WIFI

WIRELESS WI-FI DATA LOGGER

Measures Temperature/Humidity, Integral LCD



The **SERIES DW-WIFI** Wireless Wi-Fi Data Logger measures and records up to 1,000,000 temperature and/or humidity readings and shares the data with any PC or server on the same Wi-Fi network. If the Wi-Fi connection is lost, the sensor will continue to store any records until it can regain communication with the network. The downloadable Windows® based software allows users to set high/low alarms, sampling rate, and the temperature scale.

FEATURES/BENEFITS

- Continues to record values even if Wi-Fi connection is lost
- Able to record up to 1,000,000 data points, which can be downloaded to a PC
- Large LCD allows users to view data directly from unit

APPLICATIONS

- Building/site monitoring
- Environment monitoring
- Weather monitoring

MODEL CHART

Model	Input	Range	Accuracy (Typ.)	Display Resolution
DW-WIFI-T	Internal temperature	-4 to 140°F (-20 to 60°C)	±1.0°F (±0.5°C) @ 14 to 122°F (-10 to 50°C)	0.1°F (0.1°C)
DW-WIFI-TH	Internal temperature/humidity	-4 to 140°F (-20 to 60°C), 0 to 100% RH	±0.6°F (±0.3°C) @ 41 to 140°F (5 to 60°C) ±2.5% RH @ 20 to 80% RH	0.5°F (0.5°C) 1.0% RH
DW-WIFI-TP	Remote temperature probe	-40 to 257°F (-40 to 125°C)	±1.2°F (±0.6°C) @ 14 to 158°F (-10 to 70°C)	0.1°F (0.1°C)
DW-WIFI-TC	Remote thermocouple	-454 to 2372°F (-270 to 1300°C)*	±3.0°F (1.5°C)	0.1°F (0.1°C)
DW-WIFI-T-HA	Internal temperature	-4 to 140°F (-20 to 60°C)	±0.2°F (±0.1°C) @ 14 to 140°F (-10 to 60°C)	0.1°F (0.01°C)
DW-WIFI-TH-HA	Internal temperature/humidity	-4 to 140°F (-20 to 60°C), 0 to 100% RH	±0.4°F (±0.2°C) @ 41 to 140°F (5 to 60°C) ±2.5% RH @ 10 to 90% RH	0.5°F (0.5°C) 1.0% RH
DW-WIFI-TP-HA	Remote temperature probe	-40 to 257°F (-40 to 125°C)	±0.2°F (±0.1°C) @ 14 to 158°F (-10 to 70°C)	0.01°F (0.01°C)

*Probe dependent

SPECIFICATIONS

Memory Size: 1,000,000 readings; 500,000 each for DW-WIFI-TH(-HA).
Sampling Mode: Continuous recording.
Sampling Rate: Selectable from 10 s to 12 hr.
Transmission Rate: Selectable from 1 min to 24 hr.
Temperature Limits: -4 to 140°F (-20 to 60°C).
Power Requirements: 3.7 V lithium ion battery, installed functional, factory replaceable (cable for charging included).
Alarms: Programmable high/low.
Interface: Wi-Fi connection.
Probe Length: DW-WIFI-TP: 11.8" (30 cm); DW-WIFI-TC: 59" (150 cm).
Weight: 7.2 oz (204 g).
Agency Approvals: CE.

SELECTION GUIDE
pages 214-215

TYPICAL APPLICATIONS
pages 216-217



Flow Sensors
pages 218-225



Fume Hood Monitors
page 226



Air Flow Switches
page 226-227



Air Velocity Transmitters
pages 227-229



Humidity Switches
page 230



Humidity/Temperature Transmitters
pages 231-235



Carbon Dioxide Transmitters
pages 236-239



Gas Sensing Transmitters
page 240



Occupancy Sensors
pages 241-242

FEATURED PRODUCTS

COMMUNICATING CARBON DIOXIDE DETECTOR
SERIES CDTA | page 237



- CO₂, RH, Temperature, and Temperature set-point with field selectable BACnet or Modbus® communications for building automation applications
- Digital Intelligent Temperature Compensation Algorithm (DITCA™) corrects for errors due to self-heating effects of combination wall sensors

CARBON MONOXIDE/NITROGEN DIOXIDE GAS TRANSMITTER
SERIES GSTC | page 240



- Field selectable BACnet or Modbus® communication
- Industrial grade replaceable CO or NO₂ sensors

HUMIDITY & HUMIDITY/TEMPERATURE Transmitters



SERIES	RHP-E/N - page 231	RHP - page 232	RHP with Shield - page 233	WHT - page 233
Service	Room	Duct or outdoor	Outdoor	Room or outdoor
Accuracy (10 to 90% RH)	±2, 3, or 5% FS	±2, 3, or 5% FS	±2, 3, or 5% FS	±3% FS
RH Output	4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC	4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC	4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC	4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC
Temperature Output	None, passive sensor, 4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC	None, passive sensor, 4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC	None, passive sensor, 4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC	None, passive sensor, 4 to 20 mA, 0 to 5 VDC, 0 to 10 VDC
Options	Optional LCD	None	None	None
Display	Optional LCD	None	None	None





AIR VELOCITY Transmitters



SERIES	AVU - page 227	AVUB - page 227	641 - page 228
Service	Clean air	Clean air	Clean air
Range	785 to 3150 FPM (4 to 16 MPS)	785 to 3150 FPM (4 to 16 MPS)	250 to 15000 FPM (1.25 to 75 MPS)
Accuracy	±5% FS	±8% FS	±3 to 4% FS
Mounting	Duct mount	Duct mount	Duct mount
Probe Length	9-7/16" (240 mm)	9-7/16" (240 mm)	6 to 36" (152 to 915 mm)
Output	4 to 20 mA or 0 to 10 VDC	0 to 10 VDC	4 to 20 mA
Display	None	None	Optional LED
Process Temperature Limits	32 to 122°F (0 to 50°C)	32 to 122°F (0 to 50°C)	-40 to 212°F (-40 to 100°C)



HUMIDITY & HUMIDITY/TEMPERATURE

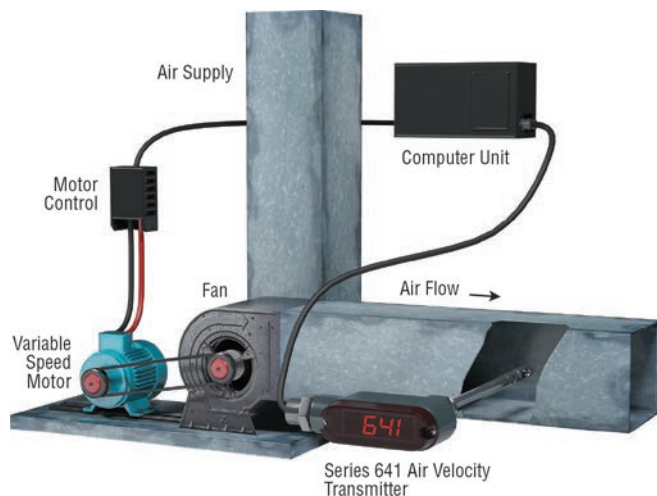
Transmitters

				
SERIES	RH-R - page 234	657 - page 234	657C - page 234	HHT - page 235
Service	Duct or process	Duct	Duct	Room or outdoor
Accuracy (10 to 90 % RH)	±2% FS	±2% FS	±2% FS	±2% FS
RH Output	4 to 20 mA	4 to 20 mA	4 to 20 mA	4 to 20 mA
Temperature Output Options	None, 4 to 20 mA	4 to 20 mA	4 to 20 mA	None, 4 to 20 mA
Display	None	None	None	Optional LCD

AIR VELOCITY

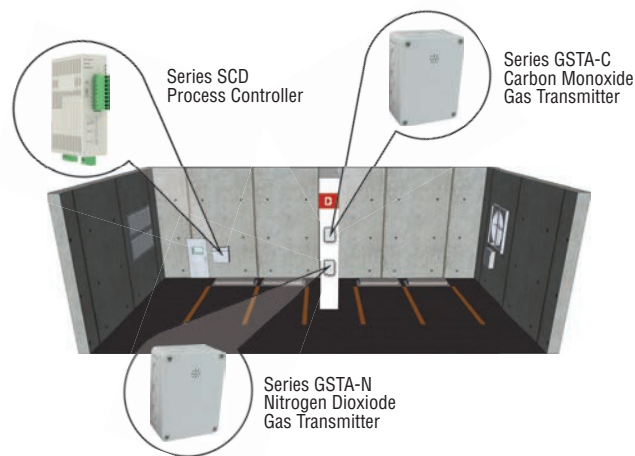
Transmitters

		
SERIES	641RM - page 229	641B - page 229
Service	Clean air	Clean air
Range	250 to 2000 FPM (1.25 to 10 MPS)	250 to 2000 FPM (1.25 to 10 MPS)
Accuracy	±3 to 4% FS	±5 to 6% FS
Mounting	Remote mount	Duct mount
Probe Length	6 to 36" (152 to 915 mm)	4-1/4" (108 mm)
Output	4 to 20 mA	4 to 20 mA
Display	Optional LED	Optional LED
Process Temperature Limits	-40 to 212°F (-40 to 100°C)	-40 to 176°F (-40 to 80°C)



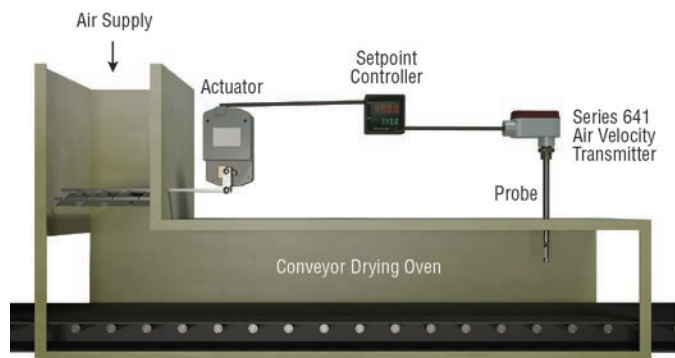
Dwyer® transmitter signals precise air velocity adjustments to computer-controlled variable-speed fan motor.

In variable air volume (VAV) HVAC systems, a computerized control provides precise adjustment of air volume to meet changing system needs with maximum energy efficiency. The Dwyer® Series 641 has an optional LED display for local indication of air flow. The LED display provides a quick, visual acknowledgment of proper system performance. The computer reacts to any change in velocity by signaling the motor control to increase or decrease fan speed to maintain the required velocity. The computer, taking inputs from other ambient condition sensors, will establish a new required air velocity and signal an appropriate adjustment in fan speed.



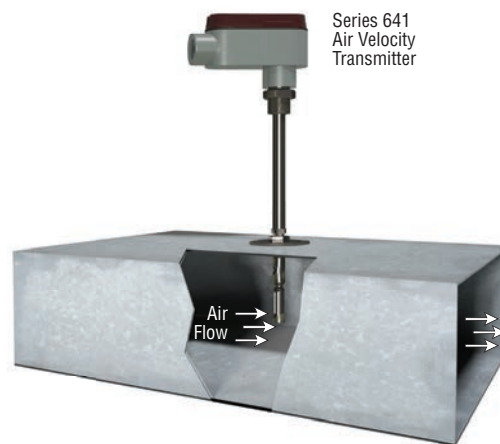
Automate your garage ventilation.

Carbon monoxide and Nitrogen Dioxide are by-products released in the exhaust from gasoline and diesel powered vehicles. These gases can build up in parking garages and loading dock areas where vehicles are concentrated, creating a potentially harmful environment. Ventilation is required to purge these gasses, but running fans non-stop increases building operating costs. The Dwyer® Series GSTA and GSTC can help to offer a more efficient solution to garage ventilation by transmitting CO or NO₂ concentrations via an analog output signal or digital BACnet/Modbus communication. This signal is sent to the Building Management System and the ventilation processes can then be automated to run only when the gases are present in dangerous concentrations. For stand-alone systems, the analog signal can be sent to a Series SCD process controller to provide a closed loop control system running the ventilation fans. Using the Dwyer® GSTA or GSTC transmitter, ventilation will occur only when needed, reducing the cost of maintaining air quality standards.



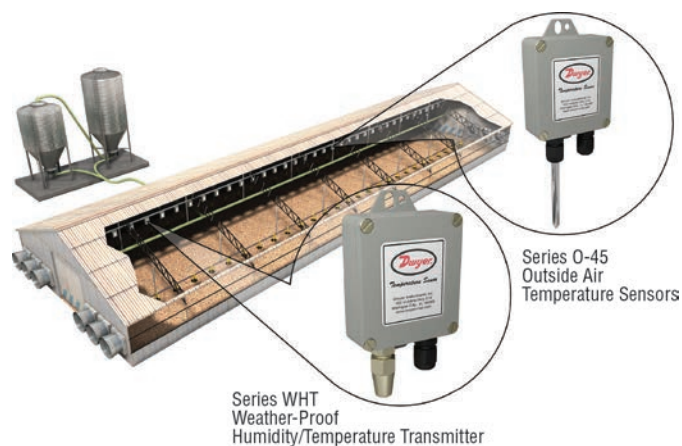
Air velocity transmitter controls drying oven air flow.

The flow of heated air is held to a constant predetermined velocity in this carefully controlled low temperature process drying oven. The constant temperature air supply is modulated by a set of inlet louvers operated by a servo-driven actuator. A Dwyer® Series 641 Air Velocity Transmitter has an optional LED display for local indication of air flow. The LED display provides a quick, visual acknowledgment of proper system performance. The controller compares the Series 641's signal to the setpoint in the controller and continuously signals appropriate louver adjustments to the actuator.



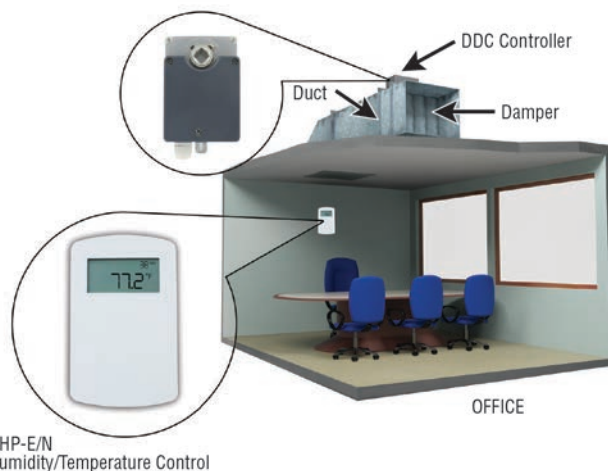
Eliminate the need for Pitot tubes, orifice plates, differential pressure sensors and temperature sensors with a Series 641.

Installing air velocity measurement systems can be a burdensome process – specifying Pitot tubes, static pressure tips, orifice plates, differential pressure transmitters, etc. Dwyer offers the 641 Air Velocity Transmitter to consolidate these components into one convenient instrument. The 641 can be easily installed into the duct or air stream to accurately measure air flow while providing local indication as well as linear analog output. Microprocessor-based technology ensures accurate, repeatable results. The 641 combines these features for simple, reliable airflow measurement without the problems associated with complex, traditional systems.



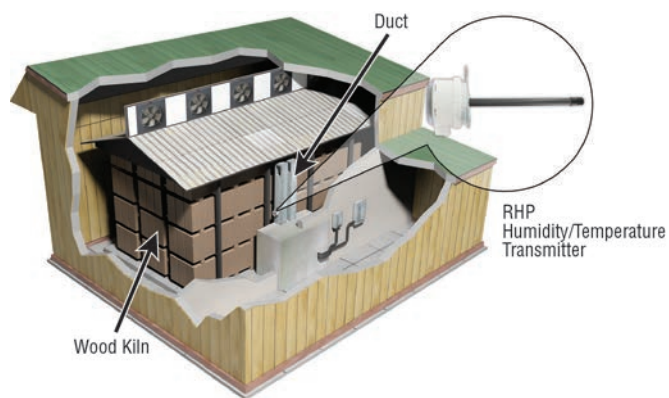
Temperature and humidity measurements used to optimize the growth of hogs and poultry.

The Dwyer® Series WHT Humidity Transmitter and Series O-4 Temperature Sensors are used to control the environmental conditions on hog and poultry farms. The amount the animals eat is linked to how comfortable the environmental conditions are. Thus the temperature, humidity, amount of light and other ambient conditions are tightly controlled to insure optimal animal growth.



Accurately measure and control the humidity and temperature in office buildings.

The Dwyer® Series RHP-E/N wall mount humidity and temperature transmitter can be combined with a DDC controller and a damper to provide comfortable working conditions in an office building. The amount of air flow entering the room is varied based on the temperature and humidity readings of the Series RHP-E/N. The compact size and mounting configuration allow this transmitter to be discretely mounted in any room.



Greatly reduce the time it takes to dry wood.

The Dwyer® Model RHP-2D11 monitors the humidity and temperature in the return air ducts in wood dehumidification rooms. Large fans are used to circulate air across the room. As dry conditioned air moves across the wood, it absorbs moisture from the wood. The humidity level of the air in the return air duct is representative of how much moisture is in the wood. When the humidity in the duct declines, it signifies that less dry conditioned air is needed to be supplied to the room.

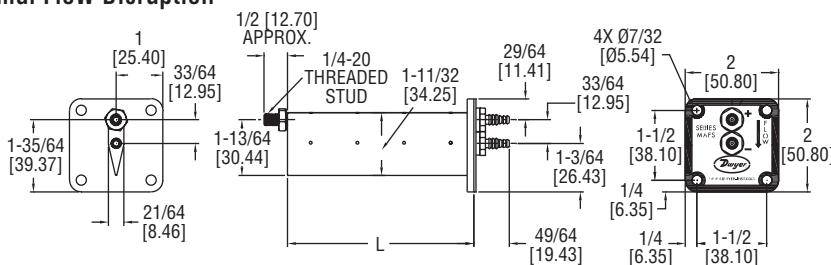


Demand control ventilation.

Since the number of people in a conference room or classroom varies throughout the day, the amount of conditioned air needed to properly ventilate the room varies as well. As the number of people in a room increase, the concentration of carbon dioxide in the room will also increase. The Dwyer® Series CDT, CDTR, CDTV, and CDTA carbon dioxide transmitters measures the amount of carbon dioxide that is emitted so that the VAV control system can supply enough fresh air into the space to return the concentration of carbon dioxide in the room to normal levels.

METAL AVERAGING FLOW SENSOR

Blade Profile Provides Enhanced Performance and Minimal Flow Disruption



The **SERIES MAFS** Metal Averaging Flow Sensor is ideal for use with Dwyer Instruments, Inc. precision air velocity gages, transmitters and switches. The Series MAFS uses evenly distributed total and static pressure measuring points to deliver an accurate measurement of velocity pressure in a duct.

FEATURES/BENEFITS

- Blade design limits disruption of air stream
- Lightweight aluminum construction
- Flange mount for rectangular or square ducts

APPLICATIONS

- VAV air flow measurement
- Fume hood exhaust flow verification
- HVAC retrofit air flow measurement

MODEL CHART

Model	Probe Length (in)	Model	Probe Length (in)	Model	Probe Length (in)
MAFS-04	4	MAFS-18	18	MAFS-32	32
MAFS-06	6	MAFS-20	20	MAFS-34	34
MAFS-08	8	MAFS-22	22	MAFS-36	36
MAFS-10	10	MAFS-24	24	MAFS-40	40
MAFS-12	12	MAFS-26	26	MAFS-48	48
MAFS-14	14	MAFS-28	28		
MAFS-16	16	MAFS-30	30		

SPECIFICATIONS

Service: Clean air.

Wetted Materials: Aluminum AA6063.

Accuracy: 400 to 9000 FPM (45.7 m/s); $\pm 2\%$ FS, $\pm 3\%$ FS for 6" and 48" length models.

K-Factor: 0.81, 0.80 for 6" and 48" lengths, 4" length=0.82.

Maximum Temperature: 400°F (204°C); Gasket: -31 to 230°F (-35 to 110°C).

Minimum Design Flow: 400 fpm (2 m/sec).

Maximum Design Flow: 12,000 fpm (60.91 m/sec).

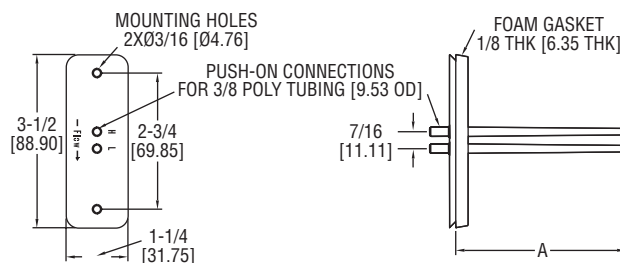
Process Connections: Dual barb for 3/16" or 1/4" ID tubing.

Straight Run Requirements: 5 diameters or longest side dimensions.

SERIES PAFS-1000

AVERAGING FLOW SENSOR

Ideal for Sensing Fan Flow Rates



The **SERIES PAFS-1000** Averaging Flow Sensor is ideal for sensing velocity pressure in the inlet section of variable air volume terminal units and fan terminal units.

FEATURES/BENEFITS

- Simple mounting flange works with both round or rectangular ducts

APPLICATIONS

- Zone control in HVAC systems
- Retrofit HVAC air flow measurement

SPECIFICATIONS

Service: Air and compatible gases.

Wetted Materials: ABS/polycarbonate (UL94-5V).

Temperature Limits: Operating: 40 to 120°F (4 to 49°C); Storage: -40 to 140°F (-40 to 60°C).

Process Connection: 1/4" (6 mm) ID, 3/8" (10 mm) OD tubing.

Mounting Orientation: Integral flange with gasket.

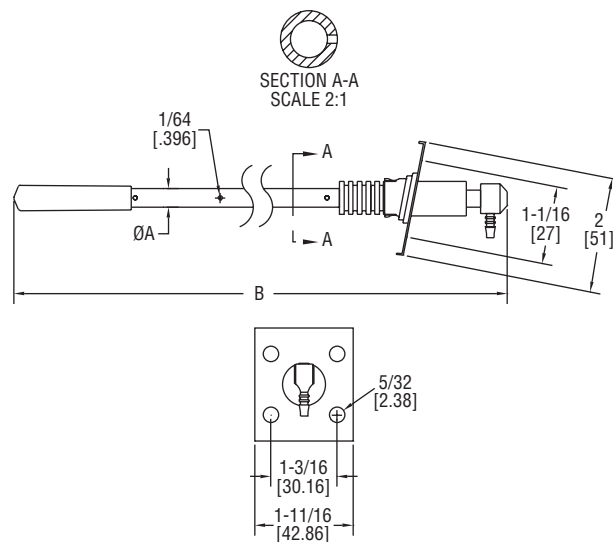
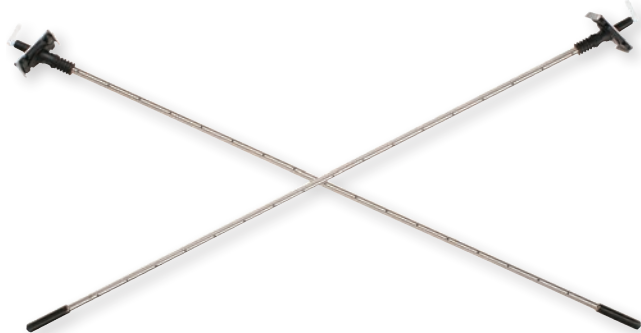
Weight: 1 oz (28 g).

MODEL CHART

Model	Length (Dim. A) in (cm)	Model	Length (Dim. A) in (cm)
PAFS-1002	3-5/32 (8.02)	PAFS-1007	14-3/4 (37.47)
PAFS-1003	5-13/32 (13.73)	PAFS-1008	17-1/8 (43.50)
PAFS-1004	7-21/32 (19.55)	PAFS-1009	19-13/32 (49.29)
PAFS-1005	9-29/32 (32.26)	PAFS-1010	21-21/32 (55.01)
PAFS-1006	12-1/2 (31.75)	PAFS-1011	23-29/32 (60.72)

AVERAGING FLOW GRID

Cost Effective Air Flow Station for Ducts up to 60"



The **SERIES AFG** Flow Grid is a fundamental pressure-sensing device designed to sense velocity pressure in an air duct. When this output is connected to a suitable measuring instrument (i.e. manometer, pressure transducer, etc.) it may be used to determine air velocity or air flow rate.

FEATURES/BENEFITS

- Kit complete with 2 probes and installation hardware
- Trimmable length for any duct size up to 60"
- Alternative to costly air flow stations

APPLICATIONS

- To display differential pressure, velocity or volume flow using a micro manometer, gage or transmitter
- To give a warning of over or under flow rate using a pressure switch
- To control air supply in a system by connecting the grid to a pressure transmitter with an electrical output which can be used to feed into a control system
- To display differential pressure on a simple fluid manometer to give visual indication of changes in volume flow rate in the duct

SPECIFICATIONS

Service: Monitor air or compatible gas flow.
Wetted Materials: 304 SS, PVC, polyurethane, acetyl plastics, and neoprene rubber.
Accuracy: $\pm 5\%$.
Maximum Temperature: 176°F (80°C).
Velocity Range: 295.2 ft/min to 5904 ft/min (1.5 to 30 m/sec).
Diameter of Tubes: 5/16" (8 mm) or 5/8" (16 mm).
Maximum Duct Diagonal: 60.4" (153.4 cm).
Maximum Duct Diameter: 59.4" (150.9 cm).
Process Connections: 5/16" barbed.
Weight: AFG-1: 1 lb (454 g); AFG-2: 3 lb (1361 g).

MODEL CHART

Model	Diameter Tube (Dim. A) in (mm)	Length (Dim. B) in (mm)
AFG-1	5/16 (8)	27 (688)
AFG-2	5/8 (16)	59-4/5 (1518)

FAN INLET AIR FLOW MEASURING PROBE

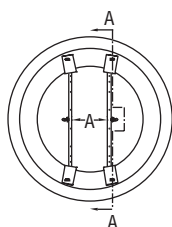
Lightweight, Durable, & Easy to Install



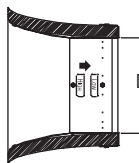
FAFM-D-xxxx



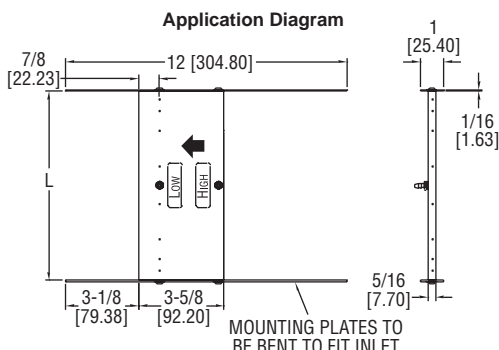
FAFM-S-xxxx



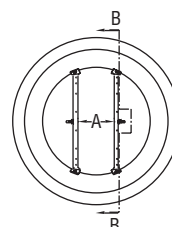
INLET FLOW VIEW



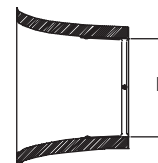
SECTION A-A



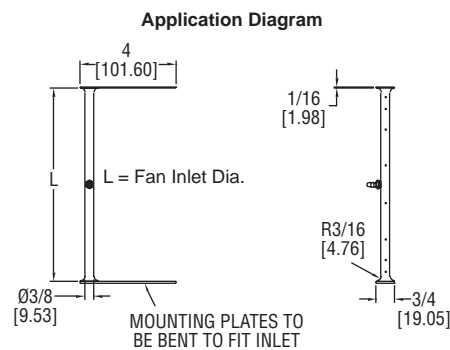
Model FAFM-D



INLET FLOW VIEW



SECTION B-B



Model FAFM-S

The **SERIES FAFM** Fan Inlet Air Flow Measuring Probes use evenly distributed total and static pressure measuring points to deliver an accurate measurement of velocity pressure in a fan inlet.

FEATURES/BENEFITS

- Installed on fan inlet outside of the air flow ducts
- Lightweight aluminum constructions

APPLICATIONS

- Ideal for HVAC applications where a proper location for a duct mount sensor is unavailable

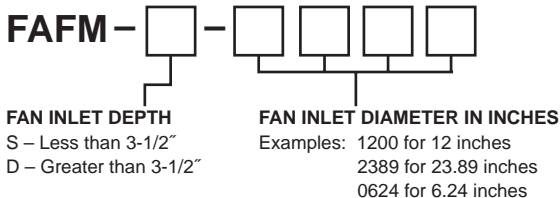
There are two versions of the model FAFM fan inlet air flow probes to choose from depending on the depth of the fan inlet.

FOR FAN INLETS WITH DEPTH LESS THAN 3-1/2" (8.89 CM)

Please order a fan inlet probe with an "S" suffix. This probe has a diameter of .375" (.95 cm). It employs one total flow measuring tube and one static measuring tube. Each probe is covered with an extruded aluminum anodized coat. Each measuring tube has multiple sensing points.

FOR FAN INLETS WITH DEPTH GREATER THAN 3-1/2" (8.89 CM)

Please order a fan inlet probe with a "D" suffix. This probe has a diameter of 3-1/2" (8.89 cm). It employs extruded aluminum anodized coated probes with both total and static sensors on each tube.



SPECIFICATIONS

Wetted Materials: Aluminum with clear anodized finish.
Accuracy: $\pm 2\%$ (Note: Field calibration may be required).
Temperature Limit: 400°F (204°C).
Minimum Design Flow: 400 fpm (2.03 m/sec).
Maximum Design Flow: 12,000 fpm (60.96 m/sec).
Process Connections: 1/4" barb.

MODEL CHART

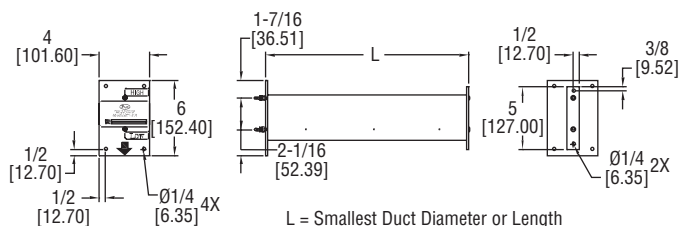
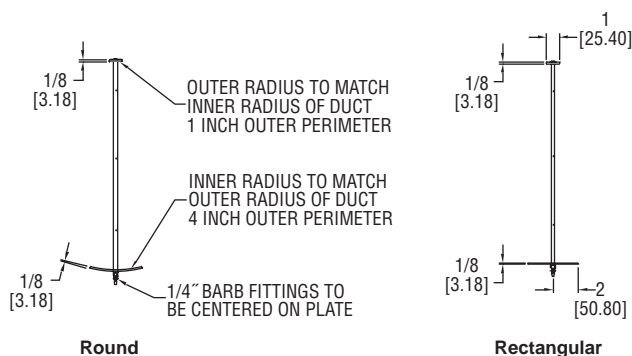
Fan Inlet Diameter (L)

6 to 12" (15.24 to 30.48 cm)
 13 to 24" (33.02 to 60.96 cm)
 25 to 36" (63.50 to 91.44 cm)
 37 to 48" (93.88 to 121.92 cm)
 49 to 60" (124.46 to 152.40 cm)
 61 to 72" (154.94 to 182.88 cm)
 73 to 84" (185.42 to 213.36 cm)
 85 to 96" (215.90 to 243.84 cm)

Note: A set of two fan inlet air flow measurement probes comes with every model ordered. A set is necessary in order to ensure an accurate reading. No more than two air flow measurement probes will be needed to obtain an accurate reading.

DUCT AIR FLOW MEASURING PROBE

Lightweight, Durable, & Easy to Install



The **SERIES DAFM** Duct Air Flow Measuring Probe uses evenly distributed total and static pressure measuring points to deliver an accurate measurement of velocity pressure in a duct.

FEATURES/BENEFITS

- Lightweight aluminum construction
- Can be used in rectangular duct up to 24" by 90" and round ducts up to 24" diameters

APPLICATIONS

- Zone control in HVAC systems
- Building air intake and exhaust flow rate measurement

In order to ensure accurate measurements you must determine the number of probes needed for your size duct. If the duct is rectangular, then consult the chart to determine appropriate quantity of probes.

If the duct is round, it is only necessary to purchase two probes for any size of duct and mount them perpendicular to each other.

Short Duct Dimension	Number of Probes
<12"	1
12" to 23"	2
24" to 35"	3
36" to 59"	4
60" to 89"	5
>89"	6

SPECIFICATIONS

Wetted Materials: Aluminum with clear anodized finish.

Accuracy: $\pm 2\%$ (**Note:** Field calibration may be required).

Temperature Limit: 400°F (204°C).

Minimum Design Flow: 400 fpm (2.03 m/sec).

Maximum Design Flow: 12,000 fpm (60.96 m/sec).

Process Connections: 1/4" barb

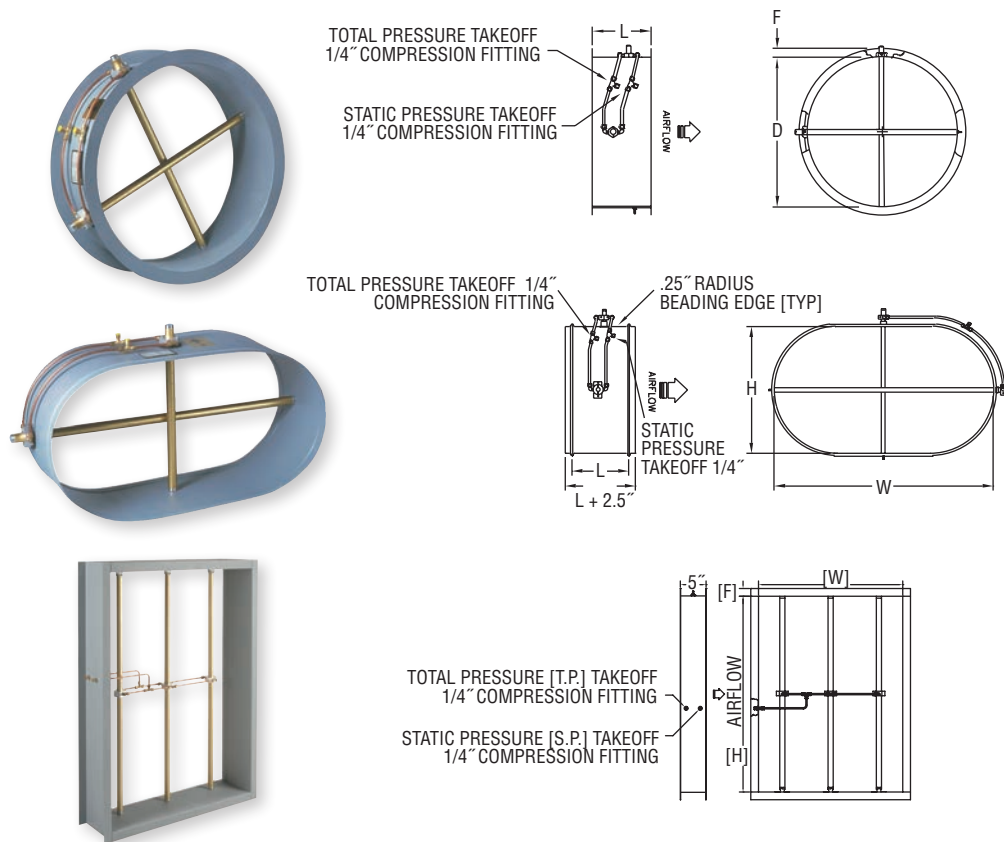
Straight Run Requirements: 5 diameters or longest side dimensions.

MODEL CHART		
Model	Duct Shape	Smallest Duct Diameter or Length (L)
DAFM-000	Round	6" (15.24 cm)
DAFM-001	Round	8" (20.32 cm)
DAFM-002	Round	10" (25.4 cm)
DAFM-003	Round	12" (30.48 cm)
DAFM-004	Round	14" (35.56 cm)
DAFM-005	Round	16" (40.64 cm)
DAFM-006	Round	18" (45.72 cm)
DAFM-007	Round	20" (50.8 cm)
DAFM-008	Round	22" (55.88 cm)
DAFM-009	Round	24" (60.96 cm)
DAFM-100	Rectangular	6" (15.24 cm)
DAFM-101	Rectangular	8" (20.32 cm)
DAFM-102	Rectangular	10" (25.4 cm)
DAFM-103	Rectangular	12" (30.48 cm)
DAFM-104	Rectangular	14" (35.56 cm)
DAFM-105	Rectangular	16" (40.64 cm)
DAFM-106	Rectangular	18" (45.72 cm)
DAFM-107	Rectangular	20" (50.8 cm)
DAFM-108	Rectangular	22" (55.88 cm)
DAFM-109	Rectangular	24" (60.96 cm)

Note: For larger sizes up to 96" (243.84 cm), please contact factory.

DUCT MOUNTED AIRFLOW MEASUREMENT STATION

Rectangular, Oval or Circular Configurations



DIMENSIONS - CIRCULAR FLANGE			
Station Size "D"	Flange Thickness	Flange Size "F"	Casing Length "L"
8" - 15"	.064"	1"	6"
16" - 44"	.064"	1-1/2"	6"
45" - 72"	.188"	1-1/2"	10"
73" & over	.188"	2"	12"

DIMENSIONS - OVAL FLANGE			
Station Width "W"	Flange Thickness	Flange Size "F"	Casing Length "L"
Up to 48"	.064"	1-1/2"	6"
Over 48"	.188"	1-1/2"	8"

DIMENSIONS - RECTANGULAR FLANGE	
Station Size "H" or "W"	Flange Size "F"
8" - 72"	1-1/2"
73" & Over	2"

The **SERIES FLST** Airflow Measurement Station utilizes an airflow averaging element generating a velocity pressure signal similar to the orifice, venturi, and other primary elements. Single or multiple airflow elements are factory mounted and pre-piped in a casing designed for flanged connection to the ductwork. Multiple elements are joined together for connection to a differential measurement device (gauge, transmitter, etc.) for flow measurement and indication purposes.

FEATURES/BENEFITS

- Low signal-to-noise ratio
- Factory mounted and pre-piped in a flanged duct section (casing)
- Standard construction includes galvanized casing and 6063-T5 anodized aluminum flow sensors
- Standard airflow stations can be operated (in air) continuously in temperatures up to 350°F or intermittently in temperatures up to 400°F




APPLICATIONS

- Building air intake and exhaust flow rate measurement
- HVAC air flow measurement

Circular Models

FLST-C 
DIAMETER (IN)*

Rectangular or Oval Models

FLST -  x  - 
CONFIGURATION HEIGHT (IN) x WIDTH (IN)* OPTION
R - Rectangular IM - Internal pressure connections
O - Oval F - Flange for oval mount station

Note: When ordering rectangular or oval flow stations, pressure taps will always be located on the longer of the two dimensions.

*Metric dimensions available upon request.

DUCT MOUNTED AIRFLOW MEASUREMENT STATION

Rectangular, Oval or Circular Configurations

MODEL CHART - SERIES FLST RECTANGULAR OR OVAL															
Size	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"
8"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10"		X	X	X	X	X	X	X	X	X	X	X	X	X	X
12"			X	X	X	X	X	X	X	X	X	X	X	X	X
14"				X	X	X	X	X	X	X	X	X	X	X	X
16"					X	X	X	X	X	X	X	X	X	X	X
18"						X	X	X	X	X	X	X	X	X	X
20"							X	X	X	X	X	X	X	X	X
22"								X	X	X	X	X	X	X	X
24"									X	X	X	X	X	X	X
26"										X	X	X	X	X	X
28"											X	X	X	X	X
30"												X	X	X	X
32"													X	X	X
34"														X	X
36"															X

Note: When ordering rectangular or oval flow stations, pressure taps will always be located on the longer of the two dimensions.

MODEL CHART - SERIES FLST RECTANGULAR OR OVAL																
Size	40"	44"	48"	52"	56"	60"	66"	72"	78"	84"	90"	96"	102"	108"	114"	120"
8"	X	X	X	X	X	X	X	X	X	X	X	X	X			
10"	X	X	X	X	X	X	X	X	X	X	X	X	X			
12"	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
14"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
16"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
44"		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48"			X	X	X	X	X	X	X	X	X	X	X	X	X	X
52"				X	X	X	X	X	X	X	X	X	X	X	X	X
56"					X	X	X	X	X	X	X	X	X	X	X	X
60"						X	X	X	X	X	X	X	X	X	X	X
66"							X	X	X	X	X	X	X	X	X	X
72"								X	X	X	X	X	X	X	X	X
78"									X	X	X	X	X	X	X	X
84"										X	X	X	X	X	X	X
90"											X	X	X	X	X	X
96"												X	X	X	X	X
102"													X	X	X	X
108"														X	X	X
114"															X	X
120"																X

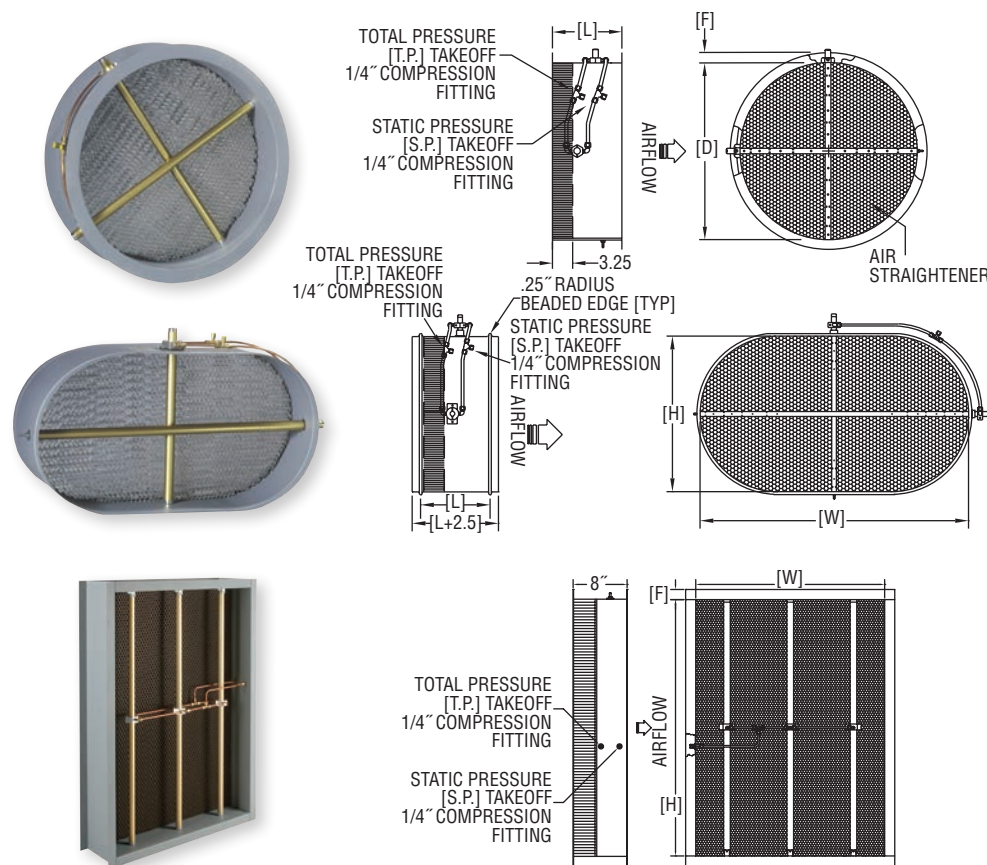
Note: When ordering rectangular or oval flow stations, pressure taps will always be located on the longer of the two dimensions.

OPTIONS	
To order add suffix:	Description
-IM	Internal pressure connections (rectangular stations only)
-F	Flange (oval stations only)
-SS1	316 SS elements with 16 GA galvanized casing
-SS2	316 SS elements with 16 GA 304 SS casing
-SS3	316 SS elements with 16 GA 316 SS casing

MODEL CHART - SERIES FLST CIRCULAR														
Size	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	32"	36"	40"
	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Size	44"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"	108"	114"	120"
	X	X	X	X	X	X	X	X	X	X	X	X	X	X

DUCT MOUNTED AIRFLOW MEASUREMENT STATION

Integral Flow Straightener, Ideal for Turbulent Measuring Conditions



DIMENSIONS - CIRCULAR FLANGE			
Station Size "D"	Flange Thickness	Flange Size "F"	Casing Length "L"
8" - 15"	.064"	1"	8"
16" - 44"	.064"	1-1/2"	8"
45" - 72"	.188"	1-1/2"	10"
73" & over	.188"	2"	12"

DIMENSIONS - OVAL FLANGE (OPTIONAL)			
Station Width "W"	Flange Thickness	Flange Size	*Casing Length "L"
Up to 44"	.064"	1-1/2"	8"
Over 44"	.188"	1-1/2"	10"

*All oval flow stations without flange have a casing length of 8".

DIMENSIONS - RECTANGULAR FLANGE	
Station Size "H" or "W"	Flange Size "F"
8" - 72"	1-1/2"
73" & Over	2"

The **SERIES STRA** Airflow Measurement Station utilizes an airflow averaging element generating a velocity pressure signal similar to the orifice, venturi, and other primary elements. Single or multiple airflow elements are factory mounted and pre-piped in a casing designed for flanged connection to the ductwork. Multiple elements are joined together for connection to a differential measurement device (gauge, transmitter, etc.) for flow measurement and indication purposes. It has been developed with a honeycomb airflow straightening section for use in duct systems having highly turbulent conditions at the point of measurement.


FEATURES/BENEFITS

- Honeycomb airflow straightening section with 1/2 opening by 3" depth
- Low signal-to-noise ratio
- Factory mounted and pre-piped in a flanged duct section (casing)
- Standard construction includes galvanized casing and 6063-T5 anodized aluminum flow sensors
- Standard airflow stations can be operated (in air) continuously in temperatures up to 350°F or intermittently in temperatures up to 400°F




APPLICATIONS

- Building air intake and exhaust flow rate measurement
- HVAC air flow measurement

Circular Models

STRA-C 
DIAMETER (IN)*

Rectangular or Oval Models

STRA -  x  - 

CONFIGURATION
R - Rectangular
O - Oval

HEIGHT (IN) x WIDTH (IN)*

OPTION
IM - Internal pressure connections
F - Flange for oval mount station

Note: When ordering rectangular or oval flow stations, pressure taps will always be located on the longer of the two dimensions.

*Metric dimensions available upon request.

DUCT MOUNTED AIRFLOW MEASUREMENT STATION

Integral Flow Straightener, Ideal for Turbulent Measuring Conditions

MODEL CHART - SERIES STRA RECTANGULAR OR OVAL															
Size	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"
8"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10"		X	X	X	X	X	X	X	X	X	X	X	X	X	X
12"			X	X	X	X	X	X	X	X	X	X	X	X	X
14"				X	X	X	X	X	X	X	X	X	X	X	X
16"					X	X	X	X	X	X	X	X	X	X	X
18"						X	X	X	X	X	X	X	X	X	X
20"							X	X	X	X	X	X	X	X	X
22"								X	X	X	X	X	X	X	X
24"									X	X	X	X	X	X	X
26"										X	X	X	X	X	X
28"											X	X	X	X	X
30"												X	X	X	X
32"													X	X	X
34"														X	X
36"															X

Note: When ordering rectangular or oval flow stations, pressure taps will always be located on the longer of the two dimensions.

MODEL CHART - SERIES STRA RECTANGULAR OR OVAL																
Size	40"	44"	48"	52"	56"	60"	66"	72"	78"	84"	90"	96"	102"	108"	114"	120"
8"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
44"		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48"			X	X	X	X	X	X	X	X	X	X	X	X	X	X
52"				X	X	X	X	X	X	X	X	X	X	X	X	X
56"					X	X	X	X	X	X	X	X	X	X	X	X
60"						X	X	X	X	X	X	X	X	X	X	X
66"							X	X	X	X	X	X	X	X	X	X
72"								X	X	X	X	X	X	X	X	X
78"									X	X	X	X	X	X	X	X
84"										X	X	X	X	X	X	X
90"											X	X	X	X	X	X
96"												X	X	X	X	X
102"													X	X	X	X
108"														X	X	X
114"															X	X
120"																X

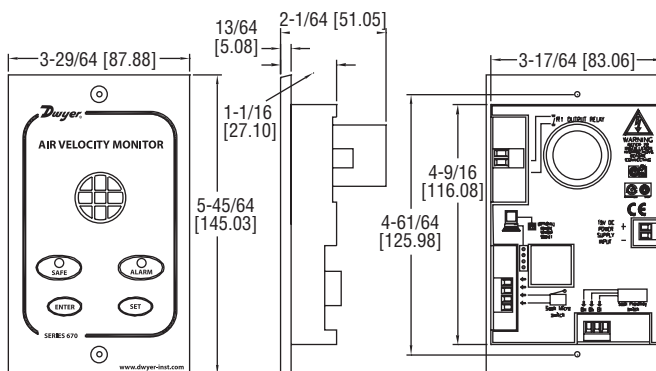
Note: When ordering rectangular or oval flow stations, pressure taps will always be located on the longer of the two dimensions.

OPTIONS	
To order add suffix:	Description
-IM	Internal pressure connections (rectangular stations only)
-F	Flange (oval stations only)

MODEL CHART - SERIES STRA CIRCULAR														
Size	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	32"	36"	40"
	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Size	44"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"	108"	114"	120"
	X	X	X	X	X	X	X	X	X	X	X	X	X	X

FUME HOOD MONITOR

Ensures Proper Fume Hood Performance



The **MODEL 670** Fume Hood Monitor continuously senses air flow through the face of the fume hood, ensuring safe levels of fresh air are exhausting. The 670 provides a highly accurate hot wire sensor to detect very low flows common on fume hoods. The Model 670 comes with everything required to quickly install the unit including a mounting bracket, 24" of tubing for connecting to the inside of the hood wall and a 120 Volt AC power adapter.

FEATURES/BENEFITS

- Flexible surface or flush mounting
- LED safe and alarm status indicators
- Audible alarm
- Sash alarm input
- Night time set-back

APPLICATIONS

- Fume hood ventilation monitoring

SPECIFICATIONS

Service: Fume hood face velocity air flow.

Alarm Range: 30-400 FPM (0.15-2.0 m/s).

Alarm Indication: Red LED & audible alarm.

Low Air Velocity Alarm Delay: Fixed 5 secs.

Visual LED Display: Red: Alarm; Green: Normal.

Horn Silence: Yes-temporary and permanent.

Accuracy: Face velocity $\pm 10\%$.

Temperature Limits: Operating temperature: 55 to 86°F (13 to 30°C); Storage temperature: -40 to 150°F (-40 to 65°C).

Power Requirement: 15 VDC 500 mA; 120 VAC, 60 Hz power transformer included.

Relay Output Low Air Flow Alarm: 5 A @ 250 VAC.

Relay Input For Night Setback: 2 wire rated for 24 VDC usage.

Sash High Indication: Using a two wire micro switch or 3 wire proximity switch input, rated for 24 VDC usage.

Mounting: Semi flush, flush or surface mounted when using included bracket.

Weight: 5.0 oz (141 g).

Agency Approvals: CE.

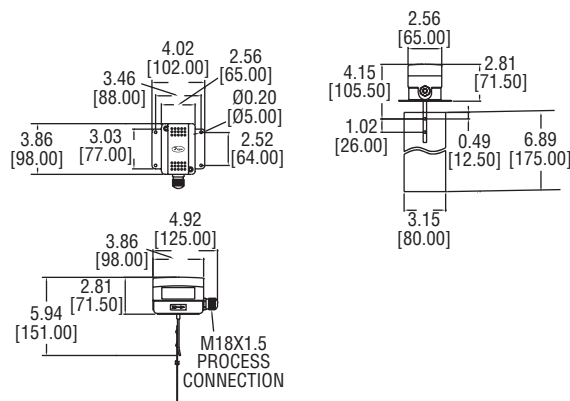
MODEL CHART

Model	Description
670	Fume hood monitor

MODEL AAFS

ADJUSTABLE AIR FLOW PADDLE SWITCH

Ranges from 200 to 1800 FPM, Stainless Steel Vane, ABS Housing



The **MODEL AAFS** Adjustable Air Flow Switch is capable of detecting a wide range of air velocities with minimal user calibration. Quality features include a stainless steel vane, galvanized steel base, and ABS enclosure.

FEATURES/BENEFITS

- Adjustable air flow sensitivity from 200 to 1800 FPM
- High current (15 A) rated SPDT contact
- IP65 enclosure rating

APPLICATIONS

- Air flow proving in HVAC systems

SPECIFICATIONS

Service: Air and compatible gas.

Wetted Materials: Vane: SS; Lever: Brass; Base: Galvanized steel.

Housing: ABS.

Temperature Limits: Ambient: -40 to 180°F (-40 to 85°C); Process: -14 to 185°F (-10 to 85°C).

Humidity Limits: 10 to 90%, non-condensing.

Switch Type: SPDT.

Electrical Rating: 15 (8) A @ 250 VAC.

Electrical Connection: Screw terminal with M18 x 1.5 cable gland.

Process Connection: Flange.

Mounting Orientation: Horizontal duct flow.

Set Point: Internal screw.

Enclosure Rating: IP65.

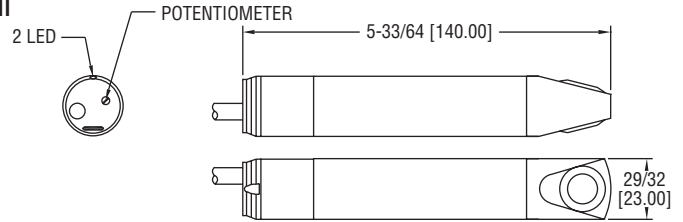
Weight: 13.6 oz (380 g).

MODEL CHART

Model	Description
AAFS	Adjustable air flow paddle switch

AIR FLOW SWITCH

Monitors Flow in Ducts with Contact Output and Local LED Indication



The **SERIES AVFS** Adjustable Air Flow Switch is specifically designed to monitor air flow in ducts and provides a 3 A contact output to indicate a change or loss of flow. The AVFS provides a $\pm 5\%$ set-point repeatability across a full scale range of 1-10 m/s (197-1969 fpm) and includes a mounting bracket for quick duct mounting.

FEATURES/BENEFITS

- Integral red/green air flow status LED's
- Flush sensor design limits issues due to dust or particulate in the air flow
- IP65 construction

APPLICATIONS

- Fan monitoring
- Filter monitoring
- Damper feedback
- Air handlers

SPECIFICATIONS

Air Velocity Range: 197-1969 FPM (1-10 m/s). Temperature Limits: 5 to 122°F (-10 to 50°C). Humidity Limits: 0-90% RH. Wetted Materials: PBT body, titanium sensor. Pressure Limit: 14.7 psig (1 bar). Housing: PBT. Repeatability: $\pm 5\%$ FS. Switch Type: N.O. SPST. Electrical Rating: 3 A @ 30 VDC/250 VAC.	Response Time: 3-60 seconds. Varies with flow and set point. Power Requirement: AVFS-1: 80 to 250 AC/DC (47 to 63 Hz AC); AVFS-2: 24 VDC $\pm 25\%$. Power Consumption: 3 VA. Electrical Connection: 6.5 ft (2 m) cable. Enclosure Rating: IP65. Display: 1 Red LED/1 Green LED. Weight: 7.2 oz (203 g). Agency Approvals: CE.
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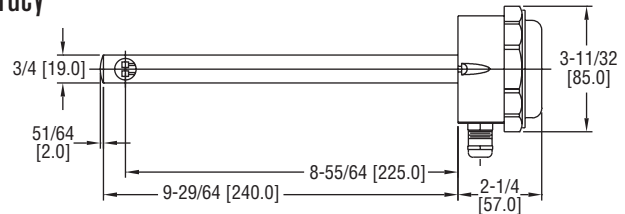
MODEL CHART

Model	Description
AVFS-1	80-250 AC/DC power thermo air flow switch
AVFS-2	24 VDC power thermo air flow switch

SERIES AVU

AIR VELOCITY TRANSMITTER

Ideal for Building Automation Systems, $\pm 5\%$ or $\pm 8\%$ Full Scale Accuracy



The **SERIES AVU** Air Velocity Transmitter is ideal for a wide range of HVAC measurement and control applications, particularly in complete building control and energy management systems.

The Series AVU Transmitter operates by measuring the heat loss from one of the two sensing elements in the air stream, then calculating the air velocity. Units are virtually immune to drift due to the design of the sensing element, which makes the transmitter accurate over the whole air velocity range.

FEATURES/BENEFITS

- 4 to 20 mA or 0 to 10 V output versions
- NEMA 6 (IP67) enclosure rating
- AC or DC powered (loop version DC only)
- 5% or 8% accuracy

APPLICATIONS

- Zone control in HVAC systems
- Supply and exhaust fan tracking
- Clean room systems
- Air pollution studies and manufacturing

SPECIFICATIONS

Service: Clean air and compatible, non-combustible gases. Accuracy: AVU: $\pm 5\%$ of FS; AVUB: $\pm 8\%$ of FS. Response Time (90%): 5 sec (typical). Temperature Limits: 32 to 122°F (0 to 50°C). Humidity Limit: 0-90% RH, non-condensing. Power Requirements: -A models 24 VDC $\pm 10\%$ -15%; -V models 24 VDC or 24 VAC $\pm 10\%$ -15%. Output Signal: -A models 4 to 20 mA current loop; -V models 0-10 VDC. Loop Resistance: (-A models) 700 Ω . Current Consumption: 60 mA + output current.	Max. Start Up Current: 85 mA; 10 V. Output Current Limit: (-V models) > 10 mA. Electrical Connections: Screw terminal. Cable gland for 4-8 mm wire (16 gauge wire). Enclosure Rating: NEMA 6 (IP67) except sensing point. Probe Dimensions: 9.45 x .75" (240 x 19 mm). Mounting Orientation: Unit not position sensitive. Probe must be aligned with airflow. Weight: 8.8 oz (250 g). Agency Approvals: CE.
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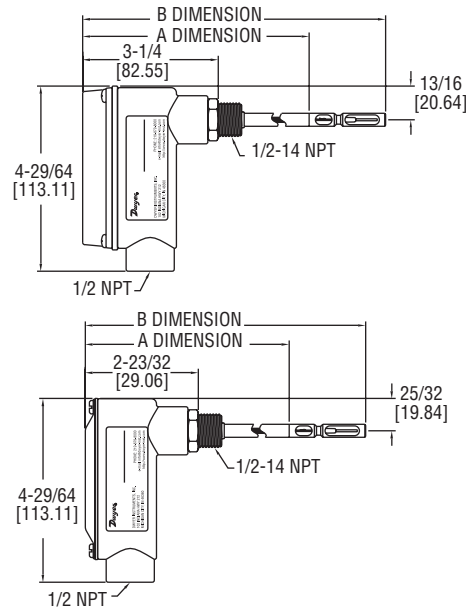
MODEL CHART

Model	Range fpm (m/s)	Output	Accuracy
AVU-1-A	0 to 785 (0 to 4)	4 to 20 mA	5%
AVU-2-A	0 to 1575 (0 to 8)	4 to 20 mA	5%
AVU-3-A	0 to 3150 (0 to 16)	4 to 20 mA	5%
AVU-1-V	0 to 785 (0 to 4)	0 to 10 VDC	5%
AVU-2-V	0 to 1575 (0 to 8)	0 to 10 VDC	5%
AVU-3-V	0 to 3150 (0 to 16)	0 to 10 VDC	5%
AVUB-1-V	0 to 785 (0 to 4)	0 to 10 VDC	8%
AVUB-2-V	0 to 1575 (0 to 8)	0 to 10 VDC	8%
AVUB-3-V	0 to 3150 (0 to 16)	0 to 10 VDC	8%

OPTION	
Use order code:	Description
NISTCAL-AV1	NIST traceable velocity calibration certificate

AIR VELOCITY TRANSMITTER

High Accuracy, Field Selectable Ranges



641 AVT WITH DISPLAY OPTION	
A Dimension	B Dimension
7-63/64 [202.80]	9-13/16 [249.24]
13-63/64 [355.20]	15-13/16 [401.64]
19-63/64 [507.60]	21-13/16 [554.04]
26-63/64 [685.40]	28-13/16 [731.84]
32-63/64 [837.80]	34-13/16 [884.24]
37-63/64 [964.80]	39-13/16 [1011.24]

641 AVT WITHOUT DISPLAY OPTION	
A Dimension	B Dimension
7-7/16 [188.91]	9-9/32 [235.74]
13-7/16 [341.31]	15-9/32 [388.14]
19-7/16 [493.71]	21-9/32 [540.54]
26-7/16 [671.51]	28-9/32 [718.34]
29-7/16 [747.71]	34-9/32 [870.74]
37-7/16 [950.91]	39-9/32 [997.74]

The **SERIES 641** Air Velocity Transmitter is the ideal instrument for monitoring air flow. This transmitter uses a heated mass flow sensor which allows for precise velocity measurements at various flow rates and temperatures. The 641's 16 field-selectable ranges provides it the versatility to be selected for several air flow applications. The optional LED produces a complete, low-cost solution for local indication of air flow.

FEATURES/BENEFITS

- Ranges from 250 FPM (1.25 MPS) to 15,000 FPM (75 MPS)
- Optional bright LED display
- Easy push button set-up
- Compact housing
- 4 to 20 mA output
- Digital filter for signal damping

APPLICATIONS

- Exhaust stack flow monitoring
- Air control in drying processes
- HVAC air velocity measurements
- Fan supply and exhaust tracking
- Clean room ventilation monitoring

MODEL CHART	
Model	Probe Length*
641-6	6" (152.4 mm)
641-6-LED	6" (152.4 mm)
641-12	12" (304.8 mm)
641-12-LED	12" (304.8 mm)
641-18	18" (457.2 mm)
641-18-LED	18" (457.2 mm)
641-24	24" (609.6 mm)
641-24-LED	24" (609.6 mm)
*Other probe lengths available contact factory.	

OPTION	
To order add suffix:	Description
-NIST	NIST traceable calibration certificate
Example: 641-6-NIST	

SPECIFICATIONS

Service: Clean air and compatible, non-combustible gases.

Accuracy: 3% FS process gas: 32 to 122°F (0 to 50°C); 4% FS process gas: -40 to 32°F & 122 to 212°F (-40 to 0°C & 50 to 100°C).

Response Time: Flow: 1.5 seconds to 95% of final value (output filter set to minimum).

Temperature Limits: Process: -40 to 212°F (-40 to 100°C); Ambient: 32 to 140°F (0 to 60°C).

Pressure Limit: 100 psi (6.89 bar) maximum.

Humidity Limit: Non-condensing.

Power Requirements: 12 to 35 VDC, 10 to 16 VAC. 1.5 A rating required on supply due to initial power surge drawn by transmitter.

Output Signal: 4 to 20 mA, isolated 24 V source, 3 or 4-wire connection.

Output Filter: Selectable 0.5 - 15 (seconds).

Loop Resistance: 600 Ω max.

Current Consumption: 300 mA max.

Electrical Connections: Screw terminal.

Process Connections: 1/2" male NPT.

Enclosure Rating: Designed to meet NEMA 4X (IP66) for non LED models only.

Mounting Orientation: Unit not position sensitive. Probe must be aligned with airflow.

Weight: 12.6 oz (357.2 g).

Agency Approval: CE.

OPTIONAL DISPLAY VERSION:

Display: 4-1/2 digit 1/2" red LED.

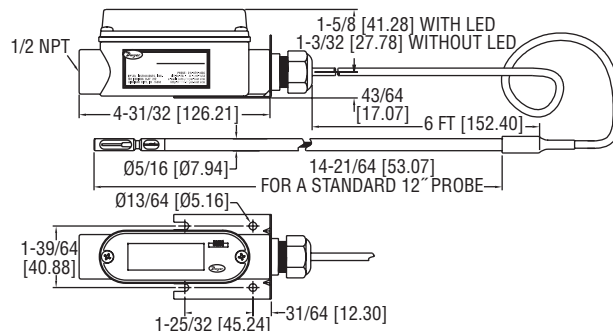
Resolution: 1 FPM, 0.01 MPS (10 FPM @ 10,000 and 15,000 FPM ranges).

Weight: 13.3 oz (377 g).

ACCESSORIES	
Model	Description
A-156	Universal mounting plate 1/2" female NPT
A-158	Split flange mounting kit
A-159	Duct mounting gland
641-LED	Field-upgradeable LED

AIR VELOCITY TRANSMITTER WITH REMOTE PROBE

For Remotely Mounting Electronic Enclosure



The **SERIES 641RM** features the same highly accurate heated mass flow sensor as the Series 641, with a remote probe construction. The units 6' cable which connects the sensing probe with the electronic enclosure allows the enclosure to be mounted where it can be more easily accessed.

FEATURES/BENEFITS

- Ranges from 250 FPM (1.25 MPS) to 15,000 FPM (75 MPS)
- Optional bright LED display
- Easy push button set-up
- Compact housing
- 4 to 20 mA output
- Digital filter for signal damping

APPLICATIONS

- Exhaust stack flow monitoring
- Air control in drying processes
- HVAC air velocity measurements
- Fan supply and exhaust tracking
- Clean room ventilation monitoring

MODEL CHART

Model	Description
641RM-12	Air velocity transmitter with 6' cable
641RM-12-LED	Air velocity transmitter with 6' cable with LED display

ACCESSORIES

Model	Description
A-156	Universal mounting plate, 1/2" female NPT
A-158	Split flange mounting kit
A-159	Duct mounting gland
641-LED	Field-upgradeable LED

SPECIFICATIONS

Service: Clean air and compatible, non-combustible gases.

Accuracy: 3% FS process gas: 32 to 122°F (0 to 50°C); 4% FS process gas: -40 to 32°F & 122 to 212°F (-40 to 0°C & 50 to 100°C).

Response Time: Flow: 1.5 seconds to 95% of final value (output filter set to minimum).

Temperature Limits: Process: -40 to 212°F (-40 to 100°C); Ambient: 32 to 140°F (0 to 60°C).

Pressure Limit: 100 psi (6.89 bar) maximum.

Humidity Limit: Non-condensing.

Power Requirements: 12 to 35 VDC, 10 to 16 VAC. 1.5 A rating required on supply due to initial power surge drawn by transmitter.

Output Signal: 4 to 20 mA, isolated 24 V source, 3 or 4-wire connection.

Output Filter: Selectable 0.5–15 (seconds).

Loop Resistance: 600 Ω max.

Current Consumption: 300 mA max.

Electrical Connections: Screw terminal.

Mounting Orientation: Unit not position sensitive. Probe must be aligned with airflow.

Weight: 13.2 oz (374.26 g).

Cable Length: 6 ft (1.82 m).

Probe Length: 12" (30.48 cm) standard.

Probe Diameter: 5/16" (0.79 cm).

OPTIONAL DISPLAY VERSION:

Display: 4-1/2 digit 1/2" red LED.

Resolution: 1 FPM, 0.01 MPS (10 FPM @ 10,000 and 15,000 FPM ranges).

Weight: 13.9 oz (394.16 g).

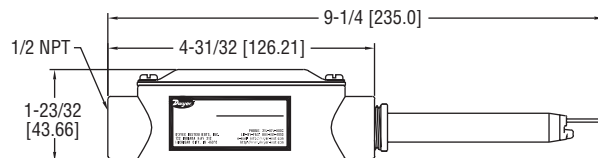
OPTION

To order add suffix:	Description
-NIST	NIST traceable calibration certificate
Example: 641RM-12-NIST	

SERIES 641B

AIR VELOCITY TRANSMITTER

Dirty Air Flow Applications



The **SERIES 641B** Air Velocity Transmitter uses a heated mass flow sensor suitable for dirty air flow applications. It has user-selectable ranges from 250 FPM (1.25 MPS) to 2000 FPM (10 MPS).

FEATURES/BENEFITS

- SS sensor suitable for dirty air flow measurement
- Ranges from 250 FPM (1.25 MPS) to 2000 FPM (10 MPS)
- 4 to 20 mA output
- Digital filter for signal damping

APPLICATIONS

- Exhaust stack flow monitoring
- Air control in drying processes
- HVAC air velocity measurements
- Fan supply and exhaust tracking
- Clean room ventilation monitoring

SPECIFICATIONS

Service: Air and compatible, non-combustible gases.

Accuracy: 5% FS process gas: 32 to 122°F (0 to 50°C). 6% FS process gas: -40 to 32°F & 122 to 176°F (-40 to 0°C & 50 to 80°C).

Response Time: Flow: 1.5 seconds to 95% of final value (output filter set to minimum).

Temperature Limits: Process: -40 to 176°F (-40 to 80°C). Ambient: 32 to 140°F (0 to 60°C).

Humidity Limit: Non-condensing.

Power Requirements: 12 to 35 VDC, 10 to 16 VAC. 1.5 A rating required on supply due to initial power surge drawn by transmitter.

Output Signal: 4 to 20 mA, isolated 24 V source, 3- or 4-wire connection.

Output Filter: Selectable 0.5–15 (seconds).

Loop Resistance: 600 Ω max.

Current Consumption: 300 mA max*.

Electrical Connections: Screw terminal.

Enclosure Rating: Designed to meet NEMA 4X (IP66).

Mounting Orientation: Unit not position sensitive.

Weight: 12.6 oz (357.2 g).

*A brief current transient exceeding 300 mA may be seen on startup

MODEL CHART

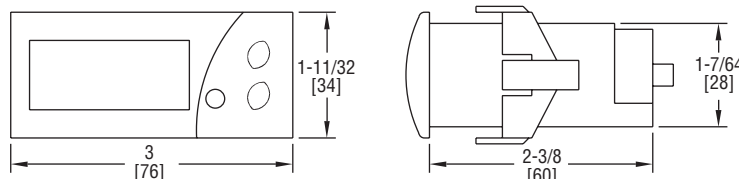
Model	Description
641B-4	Air velocity transmitter
641B-4-LED	Air velocity transmitter with LED display

ACCESSORIES

Model	Description
A-155	Mounting gland with 1/2" male NPT fitting
A-156	Flange mounting plate with 1/2" female NPT

HUMIDITY SWITCH

Programmable, 8 A Relay, 3-Digit Display



Panel Cutout 2-51/64" x 1-9/64" (71 x 29 mm)

The **SERIES HS** Humidity Switch provides control for humidifying or dehumidifying systems. Relative humidity, output status, and error messaging can be viewed on the bright green LED. Access to programming parameters can be locked for security purposes using the password protection feature.

FEATURES/BENEFITS

- Relative humidity display and control
- Parameter protection
- 0 to 1 V, 4 to 20 mA or 3 V (THC-P) input selection

APPLICATIONS

- Environmental chambers
- Beer and wine chillers
- Greenhouses

MODEL CHART	
Model	Supply Power
HS-311	115 VAC
HS-312	230 VAC

SPECIFICATIONS

Relative Humidity Range: 10 to 100% RH. Input: 0 to 1 V, 3 V or 4 to 20 mA. Accuracy: THC-P: $\pm 5\%$ @ 20 to 90%; HS: $\pm 1\%$ RH. Display: 3-digit, green, 1/2" (12.7 mm) digits. Resolution: 1 digit. Temperature Limits: 32 to 158°F (0 to 70°C). Storage Temperature: -4 to 176°F (-20 to 80°C).	Output: 16 A SPDT relay @ 250 VAC resistive. Horsepower Rating (HP): 1 HP. Control Type: ON/OFF. Power Requirements: 115 VAC or 230 VAC (depending on model). Memory Backup: Nonvolatile memory. Weight: 2.3 oz (65 g). Front Panel Rating: IP64. Agency Approvals: CE, cUR, UR.
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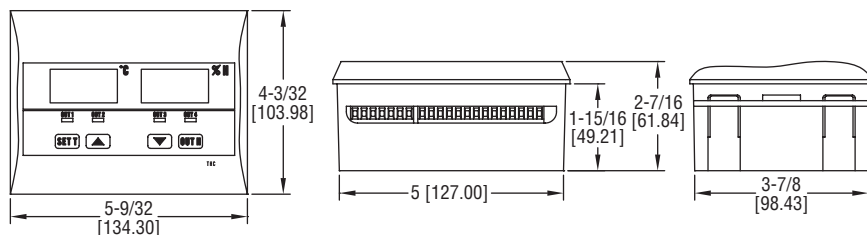
ACCESSORY

Model	Description
THC-P	Humidity probe, 3 V output, 4 ft (1.2 m) cable

SERIES THC

TEMPERATURE/HUMIDITY SWITCH

Independent Displays, 61 Programmable Parameters, 4 SPST Relays



The **SERIES THC** simultaneously measures and controls temperature and humidity. The unit offers a 3-digit red display for temperature indication and a 3-digit green display indicating humidity. The Series THC is equipped with four independent relays, two for temperature control and two relays for humidity control.

The THC Temperature/Humidity Switch accepts up to two temperature probe inputs (sold separately) and a humidity sensor. A humidity sensor with 0 to 1 V, 3 V (THC-P sold separately), or 4 to 20 mA output can be used with the Series THC.

FEATURES/BENEFITS

- Temperature and humidity control in one device
- Password protected parameter settings
- Selectable fail safe status of relay outputs

APPLICATIONS

- Isolation chambers
- Environmental chambers
- Greenhouses
- Beer and wine chillers

MODEL CHART		
Model	Supply Power	Unit
THC-10	115 VAC	°F
THC-11	115 VAC	°C
THC-20	230 VAC	°F
THC-21	230 VAC	°C

SPECIFICATIONS

Measurement Range: Temperature: -58 to 302°F (-50 to 150°C); Humidity: 0 to 100% RH. Input: Up to 2 thermistors and 1 humidity sensor. Output: 4 SPST, 8 A relays @ 250 VAC. Horsepower Rating (HP): 1/3 HP. Control Type: ON/OFF direction, direct or reverse acting, neutral. Power Requirements: 110 or 230 VAC (depending on model). Accuracy: Temperature $\pm 0.5\%$ of probe range; Humidity: 20 to 90%.	Display: Two 3-digit displays. 1/2" digits. Resolution: 0.1°. Memory Backup: Nonvolatile memory. Ambient Operating Temperature: 32 to 158°F (0 to 70°C). Storage Temperature: -4 to 176°F (-20 to 80°C). Weight: 1.17 lb (530 g). Panel Cutout: 5.15" x 3.97" (131 x 101 mm). Front Panel Protection: IP64. Agency Approvals: CE.
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ACCESSORIES

Model	Description
THC-P	Humidity probe, 3 V output, 4 ft (1.2 m) cable
TS-5	Temperature probe, PVC with 5 ft (1.5 m) cable
TS-6	Temperature probe, metal with 5 ft (1.5 m) cable
TS-51	Temperature probe, PVC with 10 ft (3 m) cable
TS-61	Temperature probe, metal with 10 ft (3 m) cable

WALL MOUNT HUMIDITY/TEMPERATURE/DEW POINT TRANSMITTER

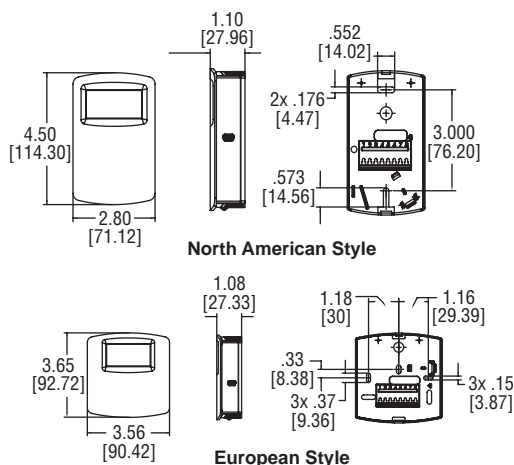
Optional LCD Display, Replaceable Sensors



European Style



North American Style



The **SERIES RHP-E/N** Wall Mount Humidity/Temperature/Dew Point Transmitter is the most versatile room transmitter on the market. The stylish housing is well vented to provide air flow across the sensor to improve measurement accuracy. The humidity and the dew point are measured using a capacitive polymer sensor. The humidity and dew point can have either a current or voltage output, while the optional temperature output can be a current, voltage, RTD or thermistor. For models with current or voltage for the temperature output, the temperature range is field selectable.

FEATURES/BENEFITS

- Field selectable relative humidity or dew point output
- Field replaceable relative humidity and temperature sensor elements
- Universal analog outputs
- Integral or service tool LCD display options
- Two housing designs to match North American and European aesthetics

APPLICATIONS

- Air economizers
- Room comfort monitoring
- Greenhouse monitoring

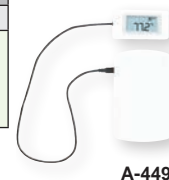
MODEL CHART						
Example	RHP	-3	N	4	A	-LCD RHP-3N4A-LCD
Series	RHP					Humidity/temperature/ Dew point transmitter
Accuracy		2 3 5				2% accuracy 3% accuracy 5% accuracy
Housing			E N			European style wall mount North American style wall mount
Humidity/ Dew Point Output				4		4-20 mA/0-5 VDC/0-10 VDC
Temperature Output					0 4 A B C D E F	None 4-20 mA/0-5 VDC/0-10 VDC 10K Ω @ 25°C thermistor type III 10K Ω @ 25°C thermistor type II 3K Ω @ 25°C thermistor 100 Ω RTD DIN 385 1K Ω RTD DIN 385 20K Ω @ 25°C thermistor
Options					LCD NIST	LCD display NIST traceable calibration certificate

SPECIFICATIONS

Relative Humidity Range: 0 to 100% RH.
Temperature Range: -40 to 140°F (-40 to 60°C) for thermistor and RTD sensors. -20 to 140°F (-28.9 to 60°C) for solid state band gap temperature sensors.
Dew Point Temperature Range: -20 to 140°F (-28.9 to 60°C); 0 to 100°F (-17.8 to 37.8°C); 40 to 90°F (4.4 to 32.3°C); -4 to 140°F (-20 to 60°C) field-selectable ranges.
Accuracy: RH: Model RHP-2XXX $\pm 2\%$ 10 to 90% RH @ 25°C; Model RHP-3XXX $\pm 3\%$ 20 to 80% RH @ 25°C; Model RHP-5XXX $\pm 5\%$ 20 to 80% RH @ 25°C; Thermistor temperature sensor: $\pm 0.36^\circ\text{F}$ @ 77°F ($\pm 0.2^\circ\text{C}$ @ 25°C); RTD temperature sensor: DIN Class B; $\pm 0.54^\circ\text{F}$ @ 32°F ($\pm 0.3^\circ\text{C}$ @ 0°C); Solid state band gap temperature sensor: $\pm 0.9^\circ\text{F}$ @ 77°F ($\pm 0.3^\circ\text{C}$ @ 25°C).
Hysteresis: $\pm 1\%$.
Repeatability: $\pm 0.1\%$ typical.
Temperature Limits: Operating: -40 to 140°F (-40 to 60°C); Storage: -40 to 176°F (-40 to 80°C).
Compensated Temperature Range: -4 to 140°F (-20 to 60°C).
4-20 mA Loop Powered Outputs: Power requirements: 10 to 35 VDC; Output signal: 4 to 20 mA, 2 channels for humidity/solid state temperature sensor models (loop powered on RH). Switch selectable RH/dew point. Switch selectable normal or reverse output.
0-5/10V Outputs: Power requirements: 15 to 35 VDC or 15 to 29 VAC; Output load: 5 mA max., 2 channels for humidity/solid state temperature sensor models. Switch selectable 0-10 V/2-10 V or 0-5 V/1-5 V output. Switch selectable RH/dew point. Switch selectable normal or reverse output.
Solid State Band Gap Temperature Sensor Output Ranges: Switch selectable, -20 to 140°F (-28.9 to 60°C); 0 to 100°F (-17.8 to 37.8°C); 40 to 90°F (4.4 to 32.3°C); -4 to 140°F (-20 to 60°C).
Response Time: 15 seconds.
Electrical Connections: Screw terminal block.
Drift: <1% RH/year.
RH Sensor: Capacitance polymer.
Enclosure Material: White polycarbonate (European); Warm gray polycarbonate (North American).
Enclosure Rating: IP20.
Display: Optional LCD; Switch selectable %RH or dew point, °F/°C.
Display Resolution: RH: 1%; Temperature: 0.1°F (0.1°C); Dew Point: 1°F (1°C).
Weight: 4.4 oz (125 g).
Agency Approvals: CE.

ACCESSORIES

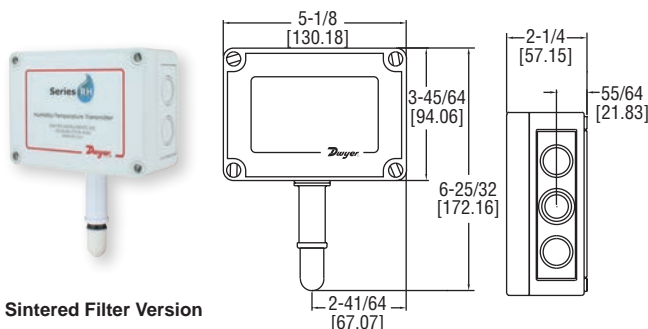
Model	Description
A-449	Remote LCD display allows remote indication of select Dwyer wall mount transmitters for validation or certification purposes
SCD-PS	100-240 VAC/VDC to 24 VDC power supply



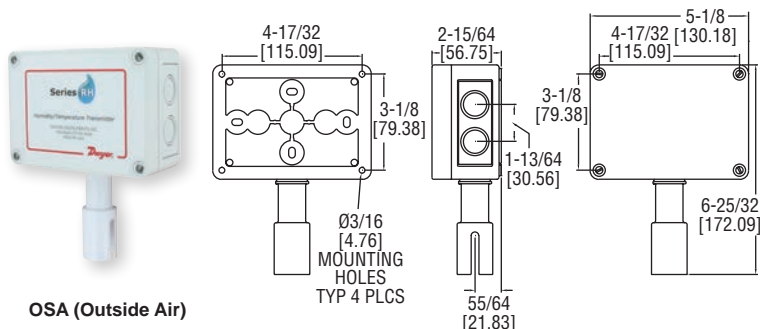
A-449

HUMIDITY/TEMPERATURE TRANSMITTER

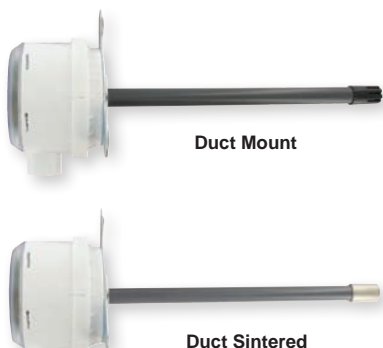
Passive Temperature Outputs, Sintered Filter Options



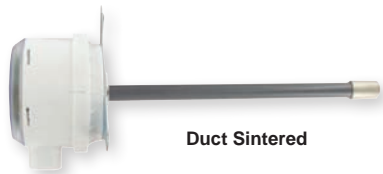
Sintered Filter Version



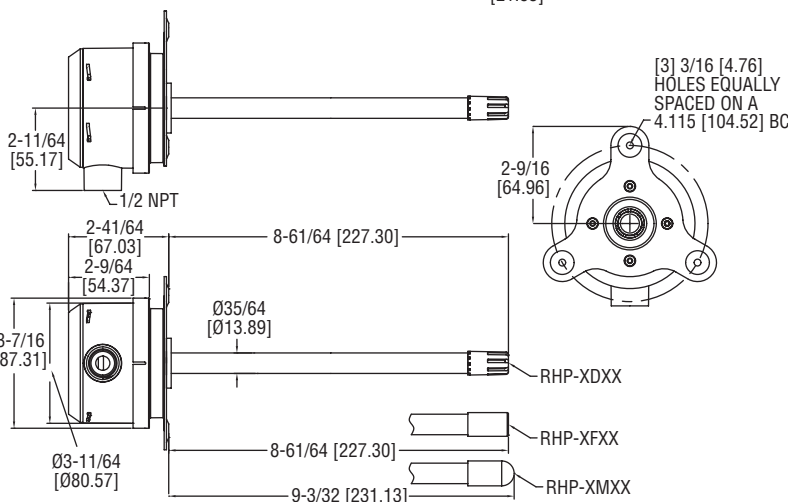
OSA (Outside Air)



Duct Mount



Duct Sintered



The **SERIES RHP** Temperature and Humidity Transmitter combine the voltage or current humidity transmitter output with a passive temperature thermistor or RTD output. Featuring polymer capacitance humidity sensors, models are available with 2%, 3% or 5% accuracies. Duct mounted transmitters are available with an optional two-line alpha numeric LCD display.

FEATURES/BENEFITS

- 2%, 3%, or 5% accuracy models
- Optional LCD display on duct mount models
- Radiation shield option for outdoor installation in direct sunlight

APPLICATIONS

- Air economizers
- Outdoor temperature and relative humidity reference
- Pool room humidity monitoring

MODEL CHART

Example	RHP	-2	D	1	A	-LCD	RHP-2D1A-LCD
Series	RHP						RH/passive temperature sensor transmitter
Accuracy		2 3 5					2% accuracy 3% accuracy 5% accuracy
Housing Type			D F M O S R				Duct mount w/ membrane filter Duct mount w/ SS sintered filter Duct mount w/ HDPE filter OSA (outside air) OSA w/sintered filter* Radiation shield
RH Output				1 2 3			4 to 20 mA 0 to 10 V 0 to 5 VDC
Temperature Sensor					0 1 2 3 A B C D E F		None 4 to 20 mA 0 to 10 VDC 0 to 5 VDC 10K @ 25°C thermistor type III 10K @ 25°C thermistor type II 3K @ 25°C thermistor 100 Ω RTD DIN 385 1K Ω RTD DIN 385 20K Ω @ 25°C thermistor
Options						LCD display NIST	LCD display NIST traceable calibration certificate

*Use OSA with sintered filter models when purchasing Series RHRS radiation shield separately.

SPECIFICATIONS

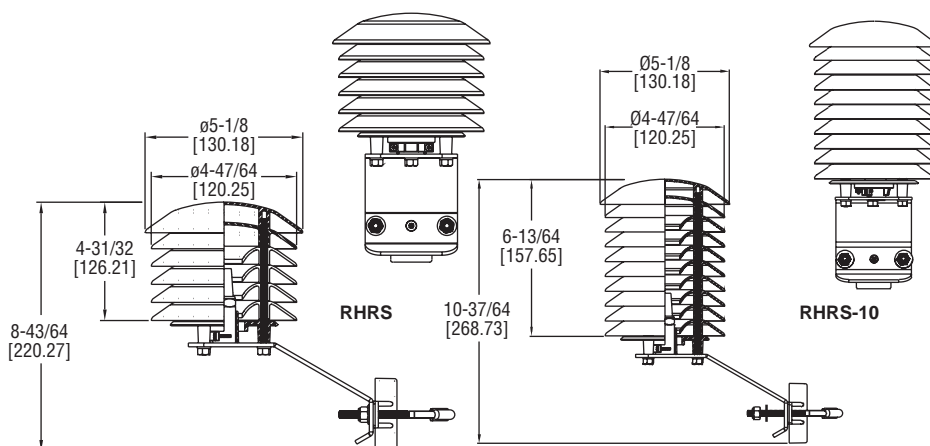
Relative Humidity Range: 0 to 100% RH.
Temperature Range: -40 to 140°F (-40 to 60°C).
Accuracy, RH: RHP-2XXX ±2% 10-90% RH @ 25°C; RHP-3XXX ±3% 20-80% RH @ 25°C; RHP-5XXX ±5% 20-80% RH @ 25°C.
Accuracy, Thermistor Temp Sensor: ±0.2°C @ 25°C (±0.36°F @ 77°F).
Accuracy, RTD Temp Sensor: DIN Class B; ±0.3°C @ 0°C (±0.54°F @ 32°F).
Accuracy, Solid State Band Gap: ±0.9°F @ 77°F (±0.3°C @ 25°C).
Hysteresis: ±1%.
Repeatability: ±0.1% typical.
Temperature Limits: -40 to 140°F (-40 to 60°C).
Storage Temperature: -40 to 176°F (-40 to 80°C).
Compensated Temperature Range: -4 to 140°F (-20 to 60°C).
4 to 20 mA Loop Powered Models: Power requirements: 10 to 35 VDC; Output signal: 4 to 20 mA.
0-5/10V Output Models: Power requirements: 15 to 35 VDC or 15 to 29 VAC; Output signal: 0 to 10 V @ 5 mA max.
Solid State Band Gap Temperature Sensor Output Ranges: Switch selectable, -20 to 140°F (-28.9 to 60°C); 0 to 100°F (-17.8 to 37.8°C); 40 to 90°F (4.4 to 32.3°C); -4 to 140°F (-20 to 60°C).
Response Time: 15 seconds.
Electrical Connections: Removable screw terminal block.
Conduit Connection: Duct mount: 1/2" NPS; OSA: 1/2" (22.3 mm).
Drift: < 1% RH/year.
RH Sensor: Capacitance polymer.
Temperature Sensor: Types 1, 2, 3: Solid state band gap; Curves A, B, C: Thermistor; Curves D, E: Platinum RTD DIN 385.
Enclosure: Duct mount: PBT; OSA: Polycarbonate.
Enclosure Rating: Duct mount: NEMA 4X (IP66) for housing only; OSA: NEMA 4X (IP66).
Display: Duct mount only, optional 2-line alpha numeric, 8 characters/line.
Display Resolution: RH: 0.1%; 0.1°F (0.1°C).
Weight: Duct mount: .616 lb (.3 kg); OSA: 1 lb (.45 kg).
Agency Approvals: CE.

OUTSIDE AIR HUMIDITY RADIATION SHIELD

6 or 10 Plate Design, Integral Pipe Mounting Kit



Picture shown with Series RHP Humidity Transmitter* (sold separately)



The **SERIES RHRS** Radiation Shield protects outside air humidity transmitters from rain and radiated heat. With the curved shape and color of the plates, air flow is able to move across the sensor to keep radiated temperatures from rooftops and surrounding surfaces from affecting humidity readings.

FEATURES/BENEFITS

- Adjustable sensor mounting collar works with Dwyer RHP sintered filter outdoor air humidity transmitters or other RH devices
- Universal mount fits 3/4" to 1-1/2" pipe or flat surfaces

APPLICATIONS

- Building outside air reference
- Weather stations

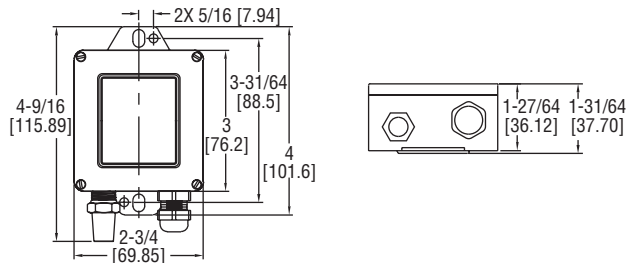
MODEL CHART	
Model	Description
RHRS	6 plate radiation shield
RHRS-10	10 plate radiation shield

Note: Only sintered filter OSA models of Series RHP are compatible with the shield.

SERIES WHT

WEATHER-RESISTANT HUMIDITY/TEMPERATURE TRANSMITTER

Compact Housing, Sintered Filter



The compact **SERIES WHT** Humidity/Temperature Transmitter is designed to withstand the elements. A removable sintered filter protects the polymer capacitance sensor from solid objects that may come in contact with the transmitter. The transmitter is available with 4 to 20 mA or 0 to 10 VDC output signals for both temperature and humidity. This transmitter is ideal for measuring outside air temperature and humidity levels for air handling economizer applications.

FEATURES/BENEFITS

- RH or RH and temperature outputs
- Compact NEMA 3S construction

APPLICATIONS

- Air handling economizers
- Air environment monitoring in agriculture or livestock cultivation houses

MODEL CHART			
Model	Accuracy	RH Output	Temperature
WHT-310	3%	4 to 20 mA	None
WHT-311	3%	4 to 20 mA	4 to 20 mA
WHT-320	3%	0 to 10 VDC	None
WHT-322	3%	0 to 10 VDC	0 to 10 VDC
WHT-330	3%	0 to 5 VDC	None
WHT-333	3%	0 to 5 VDC	0 to 5 VDC
WHT-31A	3%	4 to 20 mA	10K Q Type III
WHT-32A	3%	0 to 10 VDC	10K Q Type III

Note: For 2% accuracy, change the leading 3 to a 2.
Example: WHT-210.

SPECIFICATIONS

Relative Humidity Range: 0 to 100% RH.

Temperature Range: -40 to 140°F (-40 to 60°C).

Accuracy, RH: ±3% 20 to 80% RH, ±4% @ 10-20%, 80 to 90%.

Accuracy, Temp Models with 4 to 20 mA Temp. Output: ±0.9°F @ 72°F (±0.3°C @ 25°C).

Accuracy, Temp Models with Passive Thermistor Temp Sensor: ±0.36°F @ 77°F (±0.2°C @ 25°C).

Hysteresis, RH: ±1%.

Repeatability, RH: ±0.1% typical.

Temperature Limits: -40 to 140°F (-40 to 60°C).

Storage Temperature: -40 to 176°F (-40 to 80°C).

Compensated Temperature Range, RH: -4 to 140°F (-20 to 60°C).

4 to 20 mA Loop Powered Models: Power requirements: 10 to 35 VDC; Output signal: 4 to 20 mA.

0 to 10 V Output Models: Power requirements: 15 to 35 VDC or 15 to 29 VAC; Output signal: 0 to 10 V @ 5 mA max.

0 to 5 V Output Models: Power requirements: 10 to 35 VDC or 10 to 29 VAC; Output signal: 0 to 5 V @ 5 mA max.

Response Time: 15 seconds.

Electrical Connections: Removable screw terminal block.

Drift: < 1% RH/year.

RH Sensor: Capacitance polymer.

Temperature Sensor: 4 to 20 mA output, solid state band gap. Passive output: 10K @ 25°C thermistor (Dwyer curve A).

Enclosure: ABS.

Enclosure Rating: Designed to meet NEMA 3S (IP54).

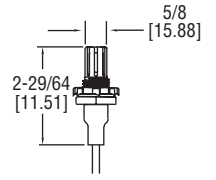
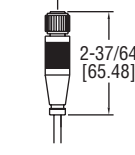
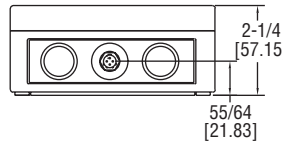
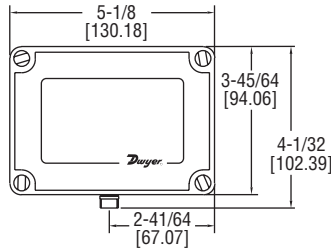
Weight: 0.3 oz (8.5 g).

Agency Approvals: CE.



HUMIDITY/TEMPERATURE TRANSMITTER

Remote Mount, Field Replaceable Sensor Filter, Up to 16' Cable



Electrical
Process
Probe Connections

The **SERIES RH-R** Humidity Transmitter is the ideal transmitter for those applications where space is limited. The compact sensor is protected by a removable filter. It can be mounted up to 16 feet away from the weatherproof base. The Series RH-R is ideal for environmental chambers, rubber bladder burst detection and air handler applications.

FEATURES/BENEFITS

- Cable lengths from 4 to 16'
- Remote housing allows for flexibility sensing where space may be limited

APPLICATIONS

- Process system monitoring
- Environmental chambers
- Air economizers

SPECIFICATIONS

Service: Dry clean air.
Relative Humidity Range: 0 to 100% RH.
Temperature Range: -40 to 140°F (-40 to 60°C).
Accuracy: ±2% @ 10-90%.
Temperature Limits: -40 to 140°F (-40 to 60°C).
Storage Temperature: -40 to 176°F (-40 to 80°C).
Compensated Temperature Range: -4 to 140°F (-20 to 60°C).
Power Requirements: 10 to 35 VDC.

Output Signal: 4 to 20 mA loop powered.
Response Time: Less than 15 seconds.
Electrical Connections: Terminal block.
Conduit Connection: 1/2" NPT.
Process Connection: 1/2 NPSM.
Drift: Less than 1%/year.
RH Sensor: Capacitance polymer
Cable Length: Up to 16'.
Housing Material: Polycarbonate, aluminum enclosure.
Enclosure Rating: NEMA 4X (IP66).
Agency Approvals: CE.

MODEL CHART

Model	Cable Length	Description	Output	Model	Cable Length	Description	Output
RHU-R004	4'	Humidity	Current	RHT-R004	4'	Humidity/temperature	Current
RHU-R008	8'	Humidity	Current	RHT-R008	8'	Humidity/temperature	Current
RHU-R012	12'	Humidity	Current	RHT-R012	12'	Humidity/temperature	Current
RHU-R016	16'	Humidity	Current	RHT-R016	16'	Humidity/temperature	Current

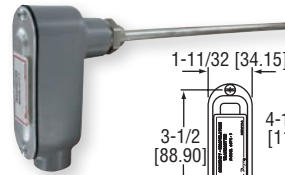
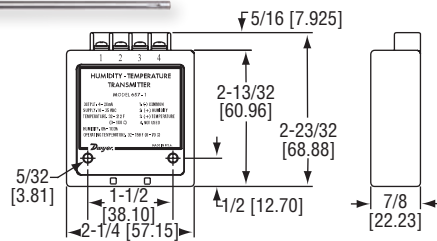
SERIES 657

RELATIVE HUMIDITY/TEMPERATURE TRANSMITTER

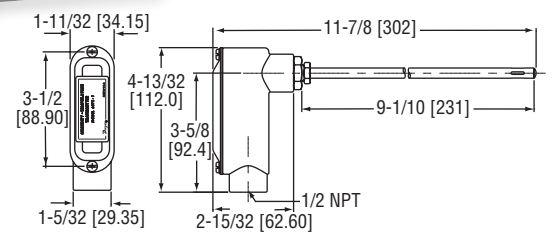
Dual Channel Design for Simultaneous 4 to 20 mA Output Signals



657



657C



The **SERIES 657** Transmitters provide two 4 to 20 mA channels to produce separate output signals for both relative humidity and temperature. These devices deliver ±2% accuracy for humidity and ±1°F for temperature measurements. Stainless steel probe can be easily mounted to most ductwork using either of the two optional kits below.

FEATURES/BENEFITS

- Polymer film humidity and thin film RTD temperature sensors offer highly reliable and stable measurements.
- Remote mount housing offers installation flexibility (657-1)
- Rugged die-cast aluminum housing is great for industrial applications (657C-1)

APPLICATIONS

- Cleanroom monitoring
- HVAC/building control monitoring

MODEL CHART

Model	Description
657-1	RH/temperature transmitter
657C-1	RH/temperature transmitter - conduit housing

ACCESSORIES

Model	Description
A-158	Split flange
A-159	Mounting gland



A-158



A-159

SPECIFICATIONS

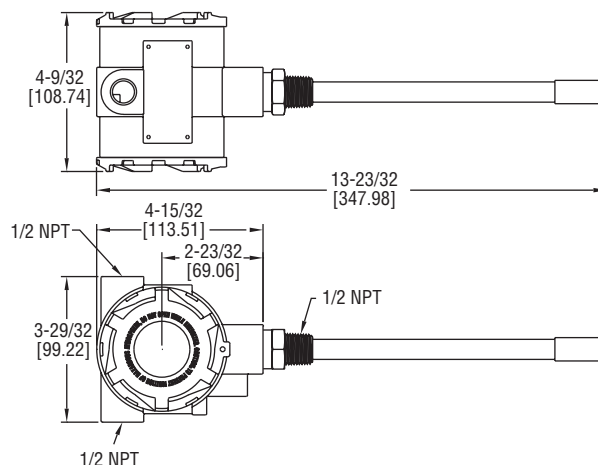
Service: Dry clean air.
Range: Relative humidity: 0 to 100%; Temperature: 32 to 212°F (0 to 100°C).
Accuracy: Relative humidity: ±2% (10 to 90% RH), ±3% (0 to 10% and 90 to 100% RH); Temperature ±1°F (0.5°C).
Temperature Limits: 32 to 140°F (0 to 60°C).
Pressure Limits: 1 psi (.07 bar).
Compensated Temperature Range: 32 to 140°F (0 to 60°C).
Power Requirements: 10 to 35 VDC.
Output Signal: 2 channels each 4 to 20 mA. Loop powered on the RH channel.
Electrical Connections: 4 screw type terminals.
Mounting Orientation: Mount in any position.
Probe: 657-1: Stainless steel 5/16" x 10" (0.8 x 25.4 cm); 657C-1: 5/16" x 9-1/10" (0.8 x 23.1 cm).
Weight: 657-1: 5.5 oz (156 g); 657C-1: 10 oz (284 g).

OPTION

To order add suffix:	Description
-NIST	NIST traceable humidity calibration certificate
Example: 657C-1-NIST	

HAZARDOUS AREA HUMIDITY/TEMPERATURE TRANSMITTER

Intrinsically Safe or Explosion-Proof Models



The **SERIES HHT** Hazardous Area Humidity/Temperature Transmitter takes accurate measurements in the harshest of environments. The explosion-proof model is offered with 4 to 20 mA output for humidity only. The intrinsically safe version is offered with 4 to 20 mA output for humidity and temperature, and do require an intrinsically safe barrier to meet hazardous area approvals.

It is important to develop a routine schedule for replacing the RH/temperature sensor (part number A-451). The sensor should be replaced annually or sooner depending on application conditions.

FEATURES/BENEFITS

- FM approved explosion-proof and intrinsically safe models
- Integral LCD option
- Replaceable calibrated sensor for long term use in harsh environments
- Dual temperature and relative humidity output models

APPLICATIONS

- Process monitoring
- Offshore HVAC monitoring
- Dust and grain handling

MODEL CHART			
Model	Protection	Description	Display
HHT-EU	Explosion-proof	Humidity	No
HHT-IU	Intrinsically safe	Humidity	No
HHT-IT	Intrinsically safe	Humidity/temperature	No
HHT-EU-LCD	Explosion-proof	Humidity	Yes
HHT-IT-LCD	Intrinsically safe	Humidity/temperature	Yes

ACCESSORIES	
Model	Description
KFD0-SCS-EX1.55●	Loop powered galvanic isolator
A-287	Mounting bracket for pipe or surface mounting (Includes bracket and two 2" U-bolts)
A-450	Replacement sintered filter
A-451	Replacement 2% sensor

SPECIFICATIONS

Relative Humidity Range: 0 to 100% RH.
Temperature Range: -40 to 140°F (-40 to 60°C).
Accuracy: ±2% 10 to 90% RH, ±0.9°F at 72°F (±0.3°C at 25°C).
Hysteresis: ±1%.
Repeatability: ±0.1% typical.
Temperature Limits: -40 to 140°F (-40 to 60°C).
Storage Temperature: -40 to 176°F (-40 to 80°C).
Compensated Temperature: -40 to 140°F (-40 to 60°C).
Power Requirements: For intrinsically safe models HHT-IX, 9.5 to 28 VDC. For explosion-proof models HHT-EX, 16.5 to 28 VDC.
Output Signal: 4 to 20 mA, 2 channels for humidity/temperature models (loop power on RH).
Response Time: 15 seconds.
Electrical Connections: Screw terminal block.
Conduit Connection: 1/2 female NPT.
Drift: < 1% RH/year.
RH Sensor: Capacitance polymer.
Temperature Sensor: Solid state band gap.
Housing Material: Aluminum.
Display: Optional 2 line alpha numeric, 8 characters/line. Temperature display is °F/°C selectable.
Display Resolution: RH: 0.1%; Temperature: 0.1°F (0.1°C).
Weight: 2 lb 8 oz (1134 g).
Enclosure Rating: NEMA 4X (IP66). Models HHT-EX: FM Explosion- Proof, Class I Div. 1 Group B, C, D, Class II Div. 1 Group E, F, G, Class III Div. 1; Models HHT-IX: FM Intrinsically Safe, Class I Div. 1 Group A, B, C, D, Class II Div. 1 Group E, F, G, Class III Div. 1 T4.
Agency Approvals: CE, FM.

CARBON DIOXIDE/TEMPERATURE TRANSMITTER

NDIR CO₂ Sensor, Universal Outputs, Optional Relay

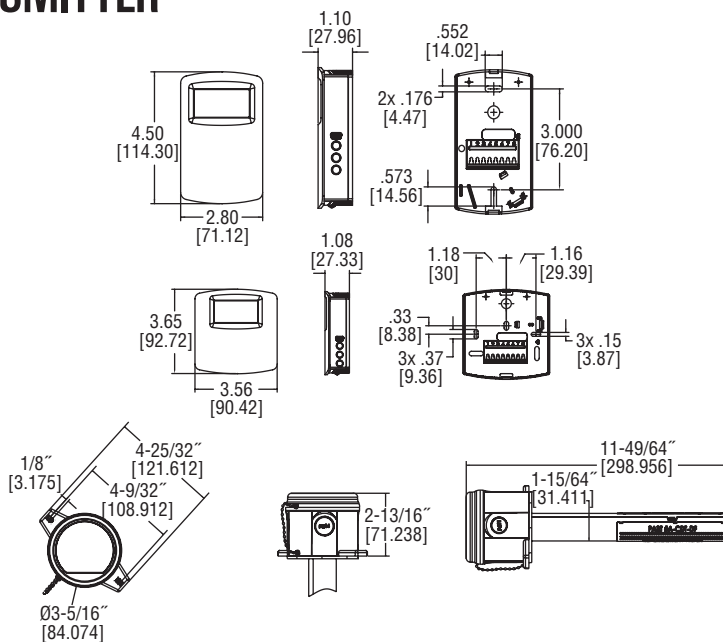
European Style



North American Style



Duct



The **SERIES CDT** Carbon Dioxide and Temperature Transmitters accurately monitor the CO₂ concentration and temperature in indoor environments to help achieve energy savings. For increased sensor accuracy, a single beam dual wavelength non-dispersive infrared (NDIR) sensor is used to automatically correct the measurement in both occupied* and unoccupied buildings against light source aging effects. The single beam dual wavelength sensor technology provides the highest level of accuracy compared to Automatic Baseline Correction methods which can unintentionally shift the calibration based on CO₂ levels and barometric pressure conditions. In order to achieve a higher level of accuracy, the Series CDT includes digital barometric pressure adjustment and the ability to field-calibrate the sensor.

For applications that require visual indication, the wall mount configurations of the Series CDT can be ordered with an integral LCD display. Push buttons are standard on all configurations of the transmitters for access to the menu structure, but wall mount configurations can be ordered without the buttons. To prevent tampering, the action of the buttons can be locked out using an internal dip switch selection.

FEATURES/BENEFITS

- Single beam dual wavelength NDIR sensor eliminates draft due to light source aging
- Integral passive temperature outputs reduce number of devices mounted in the space
- Service display tool available for models without an integral LED
- Optional integral display and relay output

APPLICATIONS

- Demand control ventilation in schools, office buildings, hospitals, and other indoor environments
- LEED® certification

*For buildings occupied 24 hours per day, it is recommended that calibration be verified every 6 to 12 months depending on application.

SPECIFICATIONS

Sensor: Single beam, dual wavelength NDIR.

Range: CO₂: 0 to 2000 or 0 to 5000 ppm (depending on model); Temperature: 32 to 122°F (0 to 50°C).

Accuracy: CO₂: ±40 ppm ±3% of reading; RH: ±2% (10 to 90% RH); Temperature: ±1°C @ 25°C.

Temperature Dependence: ±8 ppm/°C at 1100 ppm.

Non-Linearity: 16 ppm.

Pressure Dependence: 0.13% of reading per mm of Hg.

Response Time: 2 min for 99% step change.

Duct Air Velocity Range: 0-4000 FPM (20.32 m/s).

Temperature Limits: 32 to 122°F (0 to 50°C).

Humidity Limits: 10 to 95% RH (non-condensing).

Power Requirements: 16 to 35 VDC or 19 to 28 VAC.

Power Consumption: Average: 2 w; Peak: 3.75 w.

Output: Current: 4 to 20 mA (max. 500 Ω); Voltage: 0 to 5 VDC or 0 to 10 VDC (min. 500 Ω); Relay: SPST NO rated 2 A @ 30 VDC.

Weight: 4.4 oz (125 g).

Agency Approvals: CE.

ACCESSORIES

Model	Description
GCK-200CO-2000CO2	Calibration gas kit includes a 99.99% nitrogen gas cylinder for calibrating the zero point and a 200 PPM CO / 2000 PPM CO ₂ gas cylinder for calibrating the span point on Dwyer's gas sensing transmitters
A-449	Remote LCD display allows remote indication of select Dwyer® wall mount transmitters for validation or certification purposes
A-449A	Remote LCD display with buttons allows remote indication and calibration of select Dwyer® wall mount transmitters for validation and certification purposes
A-CDT-KIT	Accessory kit including terminal block and power supply

MODEL CHART

Example	CDT	-2	N	4	4	-LCD	CDT-2N44-LCD
Series	CDT						Carbon dioxide/temperature transmitter
Range		2	5				0 to 2000 ppm CO ₂ range 0 to 5000 ppm CO ₂ range
Configuration			N E D				North American style wall mount European style wall mount Duct mount
CO₂				4			4 to 20 mA / 0 to (5 or 10) VDC
Temperature Output					0 4 A B C D E F		None 4 to 20 mA / 0 to (5 or 10) VDC 10 KΩ NTC thermistor type III 10 KΩ NTC thermistor type II 3 KΩ NTC thermistor Pt100 Ω RTD Pt1000 Ω RTD 20 KΩ NTC thermistor
Options						FC LCD RLY NBC	Factory calibration certificate LCD display (wall only) Relay No buttons (wall only)



GCK-200CO-2000CO2



A-449

COMMUNICATING CARBON DIOXIDE DETECTOR

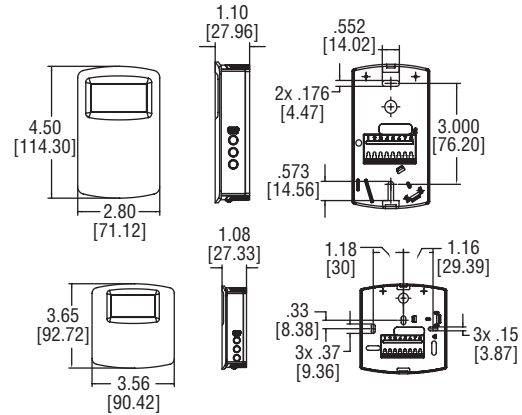
Measures CO₂, Humidity, Temperature, Temperature Set Point, and Override



European Style



North American Style



The **SERIES CDTA** Communicating Carbon Dioxide Detector combines the function of three room sensors into a single, compact housing. Parameters include carbon dioxide, humidity, temperature, and temperature set point with override. By having field selectable Modbus® and BACnet Communications, only four wires are needed for power and the communication signal. The communicating detectors can be daisy chained together to further reduce installation cost. In order to reduce the set up time, the RS-485 MAC address is set up using on board dip switches. A second set of dip switches are used to select whether output is Modbus® RTU or BACnet MS/TP communication protocols and to limit access to the set up menu.

Like our Series CDT Carbon Dioxide Transmitter, the Series CDTA uses a Single Beam Dual Wavelength Non-Dispersive Infrared (NDIR) sensor to measure the carbon dioxide level. This technology can be used in installations that will be occupied 24 hours per day. For improved accuracy, the transmitter can be field calibrated to the environmental conditions of the installation. Also, the barometric pressure can be programmed to correct for altitude. The humidity uses a capacitive polymer sensor and the temperature is measured using a 10KΩ thermistor sensor. The humidity sensor is field replaceable without the need for additional calibration.

Optional local and remote displays are available to display any of the parameters. For applications in which the building occupants aren't familiar with CO₂ concentrations, the LCD can be programmed to display temperature, humidity, or temperature set point instead.

FEATURES/BENEFITS

- Digital Intelligent Temperature Compensation Algorithm (DITCA™) corrects for errors due to self heating effects of combination wall sensors
- Field selectable Modbus® and BACnet communications reduces wiring
- Single beam dual wavelength CO₂ sensor
- Replaceable humidity/temperature sensor
- Physical hardware lockout
- Optional remote display tool

APPLICATIONS

- Demand control ventilation in schools, office buildings, hospitals, and other indoor environments
- LEED® certification

MODEL CHART			
Model	CO ₂ Concentration	Housing	Display
CDTA-2N000	2000 PPM	North American	No
CDTA-2N000-LCD	2000 PPM	North American	Yes
CDTA-2E000	2000 PPM	European	No
CDTA-2E000-LCD	2000 PPM	European	Yes
CDTA-5N000	5000 PPM	North American	No
CDTA-5N000-LCD	5000 PPM	North American	Yes
CDTA-5E000	5000 PPM	European	No
CDTA-5E000-LCD	5000 PPM	European	Yes

OPTION	
To order add suffix:	Description
-FC	Factory calibration certificate
Example: CDTA-2N000-FC	

SPECIFICATIONS

Sensor (CO₂): Single beam, dual wavelength NDIR; Humidity: Capacitive polymer; Temperature: 10KΩ thermistor.
Range: CO₂: 0 to 2000 or 5000 PPM CO₂ (depending on model); Humidity: 0 to 100% RH; Temperature: 32 to 122°F (0 to 50°C).
Accuracy: CO₂: ±40 ppm ±3% of reading; RH: ±2% (10 to 90% RH); Temperature: ±1°C @ 25°C.
Temperature Dependence (CO₂): ±8 ppm / °C at 1100 ppm.
Non-Linearity (CO₂): 16 ppm.
Pressure Dependence (CO₂): 0.13% of reading per mm of Hg.
Response Time (CO₂): 2 minutes for 99% step change.
Temperature Limits: 32 to 122°F (0 to 50°C).
Humidity Limits: 10 to 95% RH (non-condensing).
Power Requirements: 10 to 42 VDC / 10 to 30 VAC.
Power Consumption: Average: 0.5 watts; Peak: 1.2 watts.
Output: 2-wire RS-485, Modbus® RTU or BACnet MS/TP communication protocol.
Weight: 4.4 oz (125 g).
Agency Approvals: BTL, CE.

ACCESSORIES

Model	Description
GCK-200CO-2000CO2	Calibration gas kit includes a 99.99% nitrogen gas cylinder for calibrating the zero point and a 200 PPM CO / 2000 PPM CO ₂ gas cylinder for calibrating the span point on Dwyer's gas sensing transmitters
A-449	Remote LCD display allows remote indication of select Dwyer® wall mount transmitters for validation or certification purposes
A-449A	Remote LCD display with buttons allows remote indication and calibration of select Dwyer® wall mount transmitters for validation and certification purposes
A-CDT-KIT	Accessory kit including terminal block and power supply



GCK-200CO-2000CO2



A-449

CARBON DIOXIDE/RH/TEMPERATURE TRANSMITTER

NDIR CO₂ Sensor, Universal CO₂/RH Outputs, Optional Relay

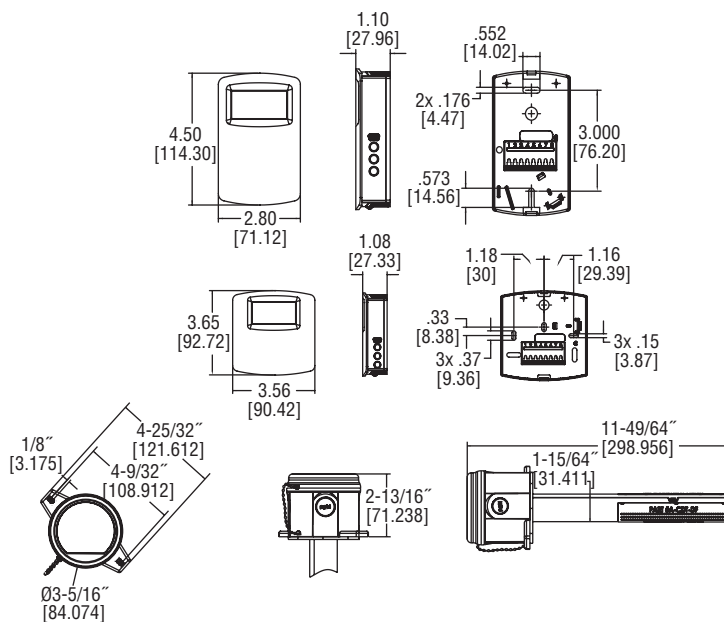
European Style



North American Style



Duct



The **SERIES CDTR** Carbon Dioxide, Relative Humidity and Temperature Transmitters reduce the number of sensors mounted on a wall or in a duct. By combining CO₂, RH, and temperature in one device, system integrators are able to reduce installation time while lowering material cost at the same time.

Like our popular Series CDT Carbon Dioxide Transmitter, a single beam dual wavelength non-dispersive infrared (NDIR) sensor is used to automatically correct the measurement in both occupied* and unoccupied buildings against light source aging effects. In order to achieve the best possible accuracy, the Series CDTR also includes digital barometric pressure adjustment and the ability to field calibrate the sensor.

Universal outputs for both carbon dioxide and relative humidity allow users to select the transmitter output to be 4 to 20 mA, 0 to 5 VDC, or 0 to 10 VDC to work with virtually any building management controller. Additionally, passive thermistor or RTD sensor can be ordered for a temperature output.

For applications that require visual indication, the wall mount configurations of the Series CDTR can be ordered with an integral LCD display. The display can be configured to display temperature only, relative humidity only, CO₂ only, CO₂ and humidity, or CO₂ and temperature. Push buttons are standard on all configurations of the transmitters for access to the menu structure. To prevent tampering, the action of the buttons can be locked out using an internal jumper selection.

FEATURES/BENEFITS

- Digital Intelligence Temperature Compensation Algorithm (DITCA™) eliminates error due to the self heating effects of wall mount combination devices.
- Single beam dual wavelength NDIR CO₂ sensor
- Replaceable humidity/temperature sensors
- Physical hardware lockout
- Service display tool available for duct mount and wall mount units without an LCD
- Relay output option

APPLICATIONS

- Demand control ventilation in schools, office buildings, hospitals, and other indoor environments
- LEED® certification

*For buildings occupied 24 hours per day, it is recommended that calibration be verified every 6 to 12 months depending on application.

SPECIFICATIONS

Range: CO₂: 0 to 2000 or 0 to 5000 ppm (depending on model); Relative humidity: 0 to 100%; Temperature: 32 to 122°F (0 to 50°C).

Accuracy: ±40 ppm + 3% of reading (CO₂); ±2% (RH).

Temperature Dependence: ±8 ppm / °C at 1100 ppm.

Non-Linearity: 16 ppm.

Pressure Dependence: 0.13% of reading per mm of Hg.

Response Time: 2 minutes for 99% step change.

Temperature Limits: 32 to 122°F (0 to 50°C).

Humidity Limits: 10 to 95% RH (non-condensing).

Power Requirements: 16 to 35 VDC / 19 to 28 VAC.

Power Consumption: Average: 2 watts; Peak: 3.75 watts.

Sensor: Single beam, dual wavelength NDIR.

Output: Current: 4 to 20 mA (max 500 Ω); Voltage: 0 to 5 VDC or 0 to 10 VDC (min 500 Ω); Relay: SPST NO 2 A @ 30 VDC; RTD or thermistor per r-t curves (depending on model).

Weight: 5.6 oz (158.8 g).

Agency Approvals: CE.

MODEL CHART

Example	CDTR	-2	N	4	A	-LCD	CDTR-2N4A4-LCD
Series	CDTR						CDTR carbon dioxide/RH/temperature transmitter
Range		2	5				0 to 2000 ppm CO ₂ range 0 to 5000 ppm CO ₂ range
Configuration			N E D				North American style wall mount European style wall mount Duct mount
CO₂ Output				4			4 to 20 mA / 0 to (5 or 10) VDC
Temperature Output					0 A B C D E F		None 10K Ω NTC thermistor type III 10K Ω NTC thermistor type II 3K Ω NTC thermistor Pt100 Ω RTD Pt1000 Ω RTD 20K Ω NTC thermistor
RH Output						4	4 to 20 mA / 0 to (5 or 10) VDC
Options						FC LCD RLY NBC	Factory calibration certificate LCD display (wall only) Relay No buttons (wall only)

ACCESSORIES

Model	Description
GCK-200CO-2000CO2	Calibration gas kit includes a 99.99% nitrogen gas cylinder for calibrating the zero point and a 200 PPM CO / 2000 PPM CO ₂ gas cylinder for calibrating the span point on Dwyer's gas sensing transmitters
A-449	Remote LCD display allows remote indication of select Dwyer® wall mount transmitters for validation or certification purposes
A-449A	Remote LCD display with buttons allows remote indication and calibration of select Dwyer® wall mount transmitters for validation and certification purposes
A-CDT-KIT	Accessory kit including terminal block and power supply



GCK-200CO-2000CO2



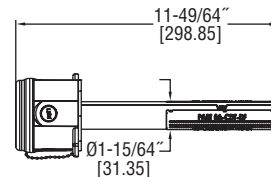
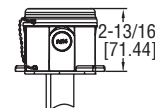
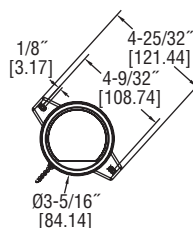
A-449



A-449A

CARBON DIOXIDE/VOLATILE ORGANIC COMPOUND TRANSMITTER

Simultaneously Outputs Both CO₂ / VOC



THE SERIES CDTV CARBON DIOXIDE / VOLATILE ORGANIC COMPOUND (VOC) TRANSMITTER reduces energy cost in buildings by lowering the amount of conditioned air based on the occupancy of the space. By sensing both CO₂ and VOC, the transmitter can detect fumes that may need to be exhausted during lower occupancy periods.

FEATURES/BENEFITS

- Combination VOC and CO₂ outputs reduce labor and material costs
- Single beam dual wavelength NDIR CO₂ sensor allows for use in spaces that may be occupied 24 hours a day
- VOC output is correlated to be equivalent to CO₂ measurements
- Ventilate using ASHRAE's occupancy-based VRP Algorithm

APPLICATIONS

- HVAC applications in hospitals, schools, and commercial buildings
- Demand control ventilation
- Odor control
- Waiting rooms or other spaces that may be occupied 24 hours a day

SPECIFICATIONS

Range: CO₂: 0 to 2000 or 0 to 5000 ppm (depending on model); VOC: 0 to 2000 ppm CO₂ equivalent.
Accuracy: CO₂: ±40 ppm + 3% of reading.
Temperature Dependence: ±8 ppm / °C at 1100 ppm.
Non-Linearity: CO₂: 16 ppm.
Pressure Dependence: CO₂: 0.13% of reading per mm of Hg.
Response Time: CO₂: 2 minutes for 99% step change; VOC: 5 minutes.
Temperature Limits: 32 to 122°F (0 to 50°C).
Power Requirements: 16 to 35 VDC / 19 to 28 VAC.
Power Consumption: Average: 2 watts; Peak: 3.75 watts.
Sensor: CO₂: Single-beam, dual-wavelength NDIR; VOC: MEMS (metal oxide semiconductor).
Output: Current: 0 to 20 mA, 4 to 20 mA, 0 to 10 mA, or 2 to 10 mA (depending on selection jumper, max 500 Ω); Voltage: 0 to 10 VDC, 2 to 10 VDC, 0 to 5 VDC, or 1 to 5 VDC (depending on selection jumper, min 500 Ω); Relay: SPST NO 2A @ 30 VDC.
Weight: 5.6 oz (158.8 g).
Agency Approvals: CE.

MODEL CHART									
Example	CDTV	-2	D	4	A	4	-RLY	CDTV-2D4A4-RLY	
Series	CDTV							Carbon dioxide/VOC transmitter	
Range		2						0 to 2000 ppm CO ₂ range	
		5						0 to 5000 ppm CO ₂ range	
Configuration			D					Duct	
CO ₂ Output				4				4 to 20 mA / 0 to (5 or 10) VDC	
Temperature Output					0			None	
					A			10 KΩ NTC thermistor type III	
					B			10 KΩ NTC thermistor type II	
					C			3 KΩ NTC thermistor	
					D			Pt100 Ω RTD	
					E			Pt1000 Ω RTD	
					F			20 KΩ NTC thermistor	
VOC Output						4		4 to 20 mA / 0 to (5 or 10) VDC	
Options							RLY	Relay	
							FC	Factory calibration certificate	

CARBON MONOXIDE/NITROGEN DIOXIDE GAS TRANSMITTER

High Accuracy Electrochemical Sensor, Universal Output or BACnet & Modbus® Communication Protocol Options



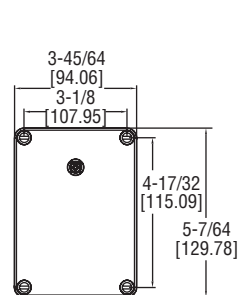
Wall Mount
With LCD



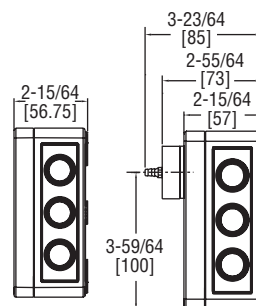
Wall Mount
Without LCD



Duct Mount



Wall Mount



Duct Mount

The **SERIES GSTA & GSTC** Carbon Monoxide/Nitrogen Dioxide Gas Transmitters monitor gas concentrations in mechanical rooms, underground parking garages and loading docks. The carbon monoxide transmitter is used to measure the exhaust of gasoline engines, while the nitrogen dioxide transmitter is used for diesel engines. The Series GSTA features field selectable current and voltage outputs while the Series GSTC features BACnet or Modbus® communication protocol, allowing gas sensing solutions that can be used with almost any building management controller.

FEATURES/BENEFITS

- Industrial grade replaceable CO or NO₂ sensors
- Field selectable current or voltage output on GSTA models, and field selectable BACnet or Modbus® communication on GSTC models
- Integral LCD display option
- Service display tool for set-up and calibration of models without a LCD

APPLICATIONS

- Garage or loading dock ventilation
- Mechanical room monitoring

MODEL CHART			
Example	GSTA	-C	GSTA-C
Series	GSTA GSTC		Field selectable analog outputs Field selectable BACnet or Modbus®
Gas Sensed		C N	CO, carbon monoxide NO ₂ , nitrogen dioxide
Options		- D LCD	Wall mount without LCD Duct mount Wall mount with LCD

ACCESSORIES	
Model	Description
GCK-200CO-2000CO2	Calibration gas
A-449	Remote LCD display
A-505	CO replacement sensor
A-506	NO ₂ replacement sensor
A-507	Calibration adapter

SPECIFICATIONS

Sensor: Field replaceable electrochemical, 4 years typical lifespan.

Range: CO: 0 to 500 PPM, NO₂: 10 PPM.

Output Drift: <5% per year in air.

Coverage Area: 5000 to 7500 sq ft typical.

Accuracy: CO: 2% FS, NO₂: 3% FS, at the time of calibration.

Resolution: CO: 1 PPM; NO₂: 0.1 PPM.

Temperature Limits: -4 to 122°F (-20 to 50°C).

Storage Temperature: For best sensor life, 32 to 68°F (0 to 20°C).

Humidity Limits: 15 to 90% RH constant; 0 to 99% RH intermittent.

Response Time: <45 s to 90% CO, <25 s to 90% NO₂.

Span and Zero Adjustment: Via pushbutton, using optional A-449 display. Zero only via BACnet or MODBUS® communication protocol.

Housing: UV resistant glass filled polycarbonate.

Output Signals: GSTA: Switch selectable 4 to 20 mA (loop powered), 0 to 5 V @ 5 mA, or 0 to 10 V @ 5 mA; Switch selectable 0 to 5 V / 1 to 5 V and 0 to 10 V / 2 to 10 V; Switch selectable normal or reverse output; GSTC: BACnet MS/TP, Modbus® RTU, or Modbus® ASCII (switch selectable) communication protocol.

Power Requirements: GSTA: Current output: 10 to 35 VDC, Voltage output: 15 to 35 VDC or 15 to 29 VAC; GSTC: 10 to 36 VDC or isolated 21.6 to 33 VAC.

Electrical Connection: Removable terminal block, knock outs for conduit fitting.

Calibration: Via pushbuttons using A-449 auxiliary display. Span gas concentration is field selectable.

Enclosure Rating: IP64.

Weight: 1 lb (0.45 kg).

Agency Approvals: CE.



GCK-200CO-2000CO2



A-449



A-505



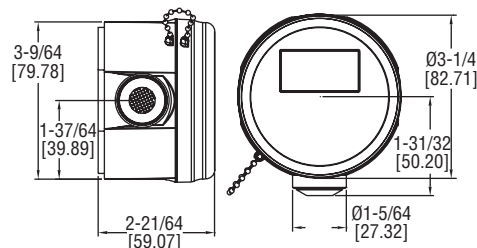
A-506



A-507

CARBON MONOXIDE TRANSMITTER

Current/Voltage Selectable Output, 200 PPM Range



The **MODEL CMT200** Carbon Monoxide Transmitter provides a field selectable current or voltage output that is proportional to the gas concentration in underground parking garages, vehicle maintenance facilities, or mechanical rooms.

FEATURES/BENEFITS

- Field selectable current or voltage outputs
- Replaceable sensor
- Field calibration kits

APPLICATIONS

- Garage ventilation
- Mechanical room monitoring

MODEL CHART	
Model	Description
CMT200	Carbon monoxide transmitter

ACCESSORIES	
Model	Description
GCK-200CO-2000CO2	Calibration gas

SPECIFICATIONS

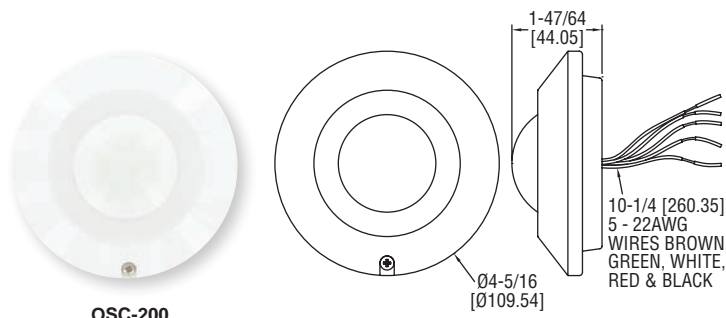
Sensor: Field replaceable electrochemical, 4 year typical lifespan.
Range: 0 to 200 ppm.
Coverage Area: 5000 to 7000 sq. ft. typical.
Accuracy: $\pm 2\%$ of reading at the time of calibration.
Output Drift: $< 5\%$ per year in air.
Temperature Limits: -4 to 122°F (-20 to 50°C).
Storage Temperature: For best sensor life, 32 to 68°F (0 to 20°C).
Humidity Limits: 15 to 90% RH constant; 0 to 99% RH intermittent.
Response Time: < 45 seconds to 90% of final value.

Calibration: 15 turn span and zero adjustment potentiometers.
Housing: UV resistant polycarbonate.
Output: Jumper selectable 4 to 20 mA (loop powered) or 2 to 10 V (load must be > 50 K Ω).
Power Requirements: Current Output: 18 to 28 VDC; Voltage Output: 18 to 28 VDC/VAC, reverse polarity protected.
Electrical Connection: Removable terminal block, includes two PG11 and one PG 16 knockouts for conduit fitting.
Weight: 0.28 lb (0.11 kg).
Agency Approvals: CE.

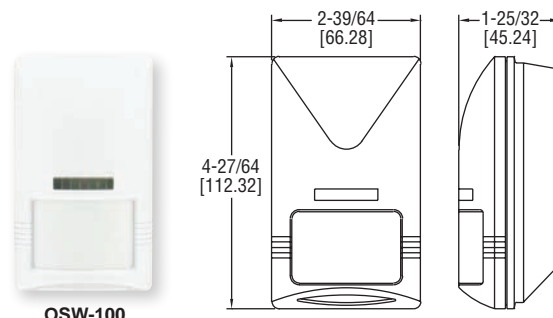
MODEL OSC-200 & OSW-100

OCCUPANCY SENSOR

Wide Viewing Angle, Easy To Install



OSC-200



OSW-100

The **MODEL OSC-200** Omnidirectional Occupancy Sensor helps to automate building control systems. A spherical Fresnel lens provides a 360° detection zone with the use of infrared technology.

The **MODEL OSW-100** Wall Mount Occupancy Sensor is an infrared sensor designed to help automate building control systems. The Model OSW-100 has a wide 110° viewing angle to capture movement up to $49.2'$ (15 m) away.

FEATURES/BENEFITS

- Delay processor suppresses switch activation during momentary occupancy

APPLICATIONS

- Lighting control
- Building energy conservation

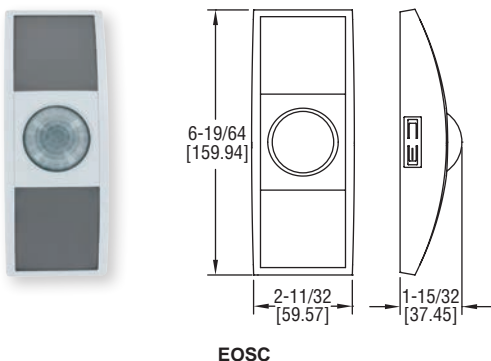
SPECIFICATIONS

Infrared Sensor: Dual element.
Range: OSC-200: $34.4'$ (10.5 m) diameter at $13.8'$ (4.2 m) mount height; OSW-100: $49.2'$ (15 m).
Detectable Speed: 0.33 to 9.8 ft/s (0.1 to 3.0 m/s).
Control Output Rating: SPDT, 0.2 A @ 30 VDC.
Ambient Operating Temperature: -4 to 140°F (-20 to 60°C).
Power Consumption: Standby: 5 mA; Operating: 18 mA.
Mounting Height: OSC-200: 7.9 to $13.8'$ (2.4 to 4.2 m); OSW-100: 5.9 to $11.8'$ (1.8 to 3.6 m).
Power Requirements: 22 to 26 VAC/DC.
Weight: OSC-200: 2.4 oz (68 g); OSW-100: 3.2 oz (90.7 g).
Agency Approvals: CE.

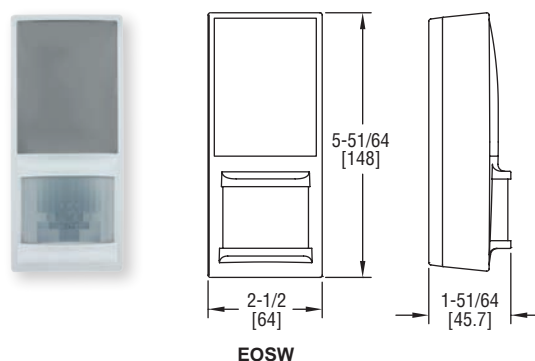
MODEL CHART	
Model	Description
OSC-200	Omnidirectional occupancy sensor
OSW-100	Wall mount occupancy sensor

WIRELESS OCCUPANCY SENSOR

With EnOcean® Technology, Ceiling or Wall Mount



EOSC



EOSW

The **SERIES EOS** Wireless Occupancy Sensor uses EnOcean® technology to enable a new level of energy saving control for rooms, hallways, and other common areas. Using a PIR motion sensor to detect movement in a space, the EOSC models have a 360 degree viewing angle and the EOSW models offer wide angle and long range lenses in the same package. The EnOcean® technology allows for wireless communication with any other EnOcean®-enabled devices.

FEATURES/BENEFITS

- Energy harvesting, no power supply or batter necessary
- Ceiling mount option for a large coverage area or flat wall/corner mount in one design
- Energy and cost savings by determining if lights or HVAC should be turned off based on room occupancy
- Meets North American and European standards

APPLICATIONS

- Lighting or HVAC control
- Feedback to building management system that a space is occupied

MODEL CHART			
Model	Mounting	RF	Approvals
EOSCU-W-EO	Ceiling	902 MHz	FCC, IC (North America)
EOSWU-W-EO	Wall	902 MHz	FCC, IC (North America)
EOSCA-W-EO	Ceiling	868 MHz	CE, IC (Europe)
EOSWA-W-EO	Wall	868 MHz	CE, IC (Europe)

SPECIFICATIONS

Range: EOSC: 40 ft (12 m) diameter; EOSW with wide angle lens: 50 ft (15 m); EOSW with long range lens: 100 ft (30 m).
RF Communications: See model chart.
RF Transmission Range: 80 ft (25 m).
Temperature Limits: 14 to 104°F (-10 to 40°C).
Humidity Limits: 20 to 95% RH (non-condensing).
Operating Light: 50 lux (min).
Mounting Height: EOSC: 7 to 10 ft (2 to 3 m); EOSW: 6 to 8 ft (1.8 to 2.5 m).
Power Requirements: Indoor light energy harvesting. An optional supplemental battery or 3 to 5 VDC power supply can be used.
Weight: 0.42 oz (12 g).
Agency Approvals: See model chart.

ACCESSORIES

Model	Description
USB-300U	Wireless Receiver, 902 MHz
USB-300	Wireless Receiver, 868 MHz

SERIES USB-300

USB WIRELESS RECEIVER

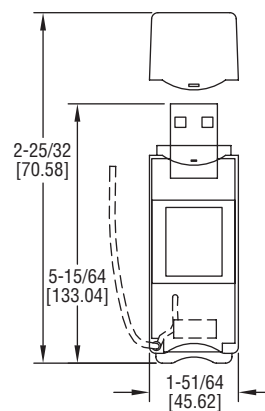
902 or 868 MHz Communications, EnOcean® Software Interface



USB-300



USB-300U



The **SERIES USB-300** USB Wireless Receiver is a simple way to allow PC's to test any EnOcean®-enabled device using wireless technology. This unit is equipped with a TCM 310 transceiver module, which provides bidirectional EnOcean® radio protocol. Radio messages are sent and received through a virtual series interface.

FEATURES/BENEFITS

- Works with any EnOcean®-enabled device
- Compact USB design
- Meets North American and European RF standards

APPLICATIONS

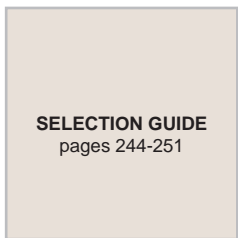


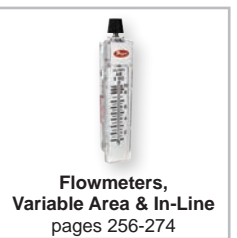
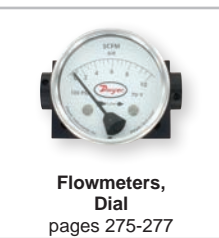






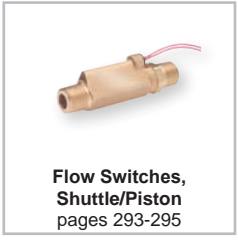







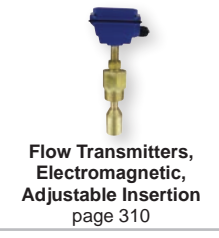

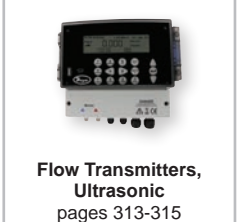
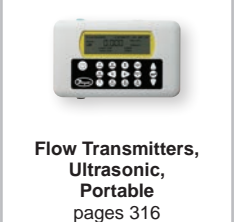


- Building commissioning
- Troubleshooting systems that incorporate EnOcean® communicating instruments
- Product installation trials

SPECIFICATIONS

Antenna Type: Whip antenna (USB-300U); Internal chip antenna (USB-300).
RF Communications: 902 MHz (USB-300U); 868 MHz (USB-300).
Temperature Limits: Operating: -4 to 122°F (-20 to 50°C); Storage: -13 to 158°F (-25 to 70°C).
Humidity Limits: Operating: 0 to 90% RH (non-condensing); Storage: 0 to 93% RH (non-condensing).
Weight: 0.42 oz (12 g).
Agency Approvals: FCC, IC, RoHS (USB-300U); CE, RoHS (USB-300).

MODEL CHART

Model	Description
USB-300U	North American, 902 MHz
USB-300	European, 868 MHz

 <p>SELECTION GUIDE pages 244-251</p>	 <p>TYPICAL APPLICATIONS pages 252-254</p>	 <p>TECHNICAL INFORMATION page 255</p>	 <p>Flowmeters, Variable Area & In-Line pages 256-274</p>	 <p>Flowmeters, Dial pages 275-277</p>
 <p>Flow Sensors, In-Line pages 278-279</p>	 <p>Flowmeters, Orifice Plate pages 280-281</p>	 <p>Flowmeters, Venturi page 282</p>	 <p>Sight Flow Indicators pages 283-285</p>	 <p>Flow Switches, Paddle pages 286-292</p>
 <p>Flow Switches, Thermal page 292</p>	 <p>Flow Switches, Shuttle/Piston pages 293-295</p>	 <p>Flow Transmitters, In-Line page 296</p>	 <p>Flow Transmitters, Turbine page 297</p>	 <p>Flow Transmitters, Paddlewheel, Adjustable Insertion page 298</p>
 <p>Flow Transmitters, Paddlewheel, Fixed Insertion page 299</p>	 <p>Flow Transmitters, Paddlewheel & Turbine, In-Line pages 300-305</p>	 <p>Water Meters pages 306-307</p>	 <p>Flow Transmitters, Electromagnetic, In-Line pages 308-309</p>	 <p>Flow Transmitters, Electromagnetic, Adjustable Insertion page 310</p>
 <p>Flow Transmitters, Electromagnetic, Fixed Insertion pages 311-312</p>	 <p>Flow Transmitters, Ultrasonic pages 313-315</p>	 <p>Flow Transmitters, Ultrasonic, Portable pages 316</p>	 <p>Mass Flowmeters/Controllers pages 317-319</p>	 <p>Flowmeters, Totalizers page 320</p>

FEATURED PRODUCTS

FLOWMETER WITH ROTO-GEAR TECHNOLOGY SERIES VFCR | page 261



- Patent pending valve with interlocking and rotating gear design offers fine flow control with full flow adjustment from fully open to fully closed
- Convenient valve cartridge assembly can easily be removed for effortless cleaning, saving time and money




ULTRASONIC ENERGY METER SERIES TUF | page 315



- Local parameter display and no moving parts yields lower maintenance costs
- Serial communication output allows for easy transfer of data




GENERAL PURPOSE PANEL MOUNT

Flowmeters

			
SERIES	RMA - pages 256-257	RMB - pages 256-257	RMC - pages 256-257
Ranges	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)
Accuracy	±4% FS	±3% FS	±2% FS
Body Materials	Polycarbonate	Polycarbonate	Polycarbonate
Temperature Limits	130°F (54°C)	130°F (54°C)	130°F (54°C)
Pressure Limits	100 psi (6.7 bar)	100 psi (6.7 bar)	100 psi (6.7 bar)
Process Connection	1/8" female NPT back connections	1/4" female NPT back connections	1/2" female NPT back connections
Scale Length	2" (51 mm)	5" (127 mm)	10" (254 mm)
Metering Valve	Optional bottom or top mount brass or stainless steel valve	Optional bottom brass or stainless steel valve	Optional bottom brass or stainless steel valve




GENERAL PURPOSE IN-LINE

Flowmeters

			
SERIES	LFMA - page 265	LFMB - page 265	LFMC - page 265
Ranges	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)
Accuracy	±5% FS	±5% FS	±5% FS
Body Materials	Polycarbonate	Polycarbonate	Polycarbonate
Process Connection	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
Scale Length	2" (51 mm)	3" (76 mm)	3" (76 mm)




GENERAL PURPOSE PANEL MOUNT

Flowmeters

			
SERIES	VFA - pages 258-259	VFB - pages 258-259	VFC/VFCR - pages 260-261
Ranges	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)
Accuracy	±5% FS	±3% FS	±2% FS
Body Materials	Acrylic	Acrylic	Acrylic
Temperature Limits	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)
Pressure Limits	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)
Process Connection	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 (VFC only)
Scale Length	2" (51 mm)	4" (102 mm)	5" (127 mm)
Metering Valve	Optional bottom or top mount brass or stainless steel valve	Optional bottom brass or stainless steel valve	VFCR standard with Delrin® plastic full adjust and control valve



GENERAL PURPOSE IN-LINE

Flowmeters

			
SERIES	LFMD - page 265	LFME - page 265	LFMF - page 265
Ranges	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)
Accuracy	±5% FS	±5% FS	±5% FS
Body Materials	Polycarbonate	Polycarbonate	Polycarbonate
Process Connection	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
Scale Length	3.5" (89 mm)	4.5" (114 mm)	5.5" (140 mm)

CORROSIVE MEDIA

Flowmeters

				
SERIES	VAT - page 266	TVA - page 266	VA1000 - page 267	VA1500 - page 267
Ranges	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)
Accuracy	±5% FS	±5% FS	±2% FS	±2% FS
Body Materials	PFA	PFA	Glass flow tube	Glass flow tube
Temperature Limits	250°F (121°C)	250°F (121°C)	250°F (121°C)	150°F (65°C)
Pressure Limits	100 psi (6.7 bar)	100 psi (6.7 bar)	200 psi (13.8 bar)	100 psi (6.7 bar)
Process Connection	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
Scale Length	5" (127 mm)	3" (75 mm)	2.5" (65 mm)	2.5" (65 mm)
Metering Valve	N/A	Optional 6-turn needle valve	6-turn needle valve; Optional 16-turn high precision valve	6-turn needle valve

INDUSTRIAL





Flowmeters

				
SERIES	IF - page 269	HF - page 271	TVFS - page 272	SSM - page 273
Ranges	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	0.025 to 0.545, 4.00 to 120.0 GPM water 0.16 to 3.20, 20.0 to 1000 SCFM air	0.2 to 5.4, 4 to 120 GPM water 2 to 50, 20 to 1000 SCFM air
Accuracy	±3% FS	±4% FS	±2% FS	±2% FS
Body Materials	Glass flow tube	Aluminum, brass, or 304 SS	Body: T316 SS; O-ring: Buna-N; Sight tube: Polysulfone	Body: T316 SS; O-ring: FKM
Temperature Limits	200°F (93°C)	240°F or 400°F (115° or 204°C)	300°F (149°C)	300°F (149°C)
Pressure Limits	200 psi (13.8 bar); some models 125 psi (8.6 bar)	600 psi to 6000 psi (41 to 413 bar)	3/4" models: 300 psig (20.6 bar) @ 200°F (93°C); 1-1/2" models: 180 psig (12.4 bar) @ 200°F (93°C)	3/4" models: 1000 psig (68.9 bar) @ 250°F (121°C); 1-1/2" models: 800 psig (55 bar) @ 250°F (121°C)
Process Connection	1/2", 1" or 2" female NPT back connections	1/8" to 2" female NPT back connections	3/4" or 1-1/2" female NPT	3/4" or 1-1/2" female NPT
Scale Length	4-3/4" (120 mm)	1-1/2" to 2-1/4" (38 to 57 mm)	3/4"NPT: 3.2" (8 cm); 1-1/2"NPT: 5.2" (13 cm)	3/4"NPT: 3.2" (8 cm); 1-1/2"NPT: 5.2" (13 cm)

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





CORROSIVE MEDIA

Flowmeters

				
SERIES	VA20000 - page 267	VA25000 - page 267	DR10000 - page 268	DR20000 - page 268
Ranges	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)
Accuracy	±2% FS	±2% FS	±5% FS	±5% FS
Body Materials	Glass flow tube	Glass flow tube	Glass flow tube	Glass flow tube
Temperature Limits	250°F (121°C)	150°F (65°C)	250°F (121°C)	250°F (121°C)
Pressure Limits	200 psi (13.8 bar)	100 psi (6.7 bar)	250 psi (17 bar)	250 psi (17 bar)
Process Connection	1/8" female NPT back connections	1/8" female NPT back connections	1/8" female NPT back connections	1/8" female NPT back connections
Scale Length	6" (150 mm)	6" (150 mm)	2.5" (65 mm)	6" (150 mm)
Metering 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

PADDLE AND THERMAL STYLE

Flow Switches




				
SERIES	V4 - pages 286-287	V6 - pages 288-289	V7 - page 290	V10 - page 290
Service	Gases or liquids	Gases or liquids	Liquids	Gases or Liquids
Set Point Range	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)
Wetted Materials	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
Temperature Limits	-4 up to 400°F (-20 to 205°C)	-4 up to 400°F (-20 to 205°C)	250°F (121°C)	200°F (93°C)
Pressure Limits	5000 psig (345 bar)	2000 psig (138 bar)	2000 psig (138 bar)	2000 psig (138 bar)
Adjustable Set Point	Yes	Yes	Yes	Yes
Power Requirement	None	None	None	None
Enclosure Rating	WP and EXP	WP and EXP	WP	WP
Switch Type	SPDT or DPDT	SPDT or DPDT	SPDT	SPST
Process Connection	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
Agency Approvals	ATEX, CE, CSA, FM, IECEx, UL**	ATEX, CE, CSA, IECEx, KTL, UL	CE, UL	CE, CSA, UR

*Other options available, contact factory

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

PISTON STYLE




Flow Switches

			
SERIES	P2 - page 293	P3 - page 293	P1 - page 294
Service	Gases or liquids	Liquids	Liquids
Set Point Range	.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)
Wetted Materials	PPE & PS, Epoxy, 316 SS	Polypropylene, PPS Composite, 316 SS, Fluorocarbon	Brass, Polysulfone, 316 SS, Fluoroelastomer, Epoxy
Temperature Limits	0 to 212°F (-18 to 100°C)	0 to 212°F (-18 to 100°C)	-20 to 225°F (-29 to 107°C)
Pressure Limits	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)
Adjustable Set Point	No	No	No
Power Requirement	None	None	None
Enclosure Rating	GP	GP	GP
Switch Type	SPST, NO	SPST, NO	SPDT
Process Connection	1/4" male NPT	3/8" male NPT or 1/4" Quick Disconnect	1/4" female NPT
Agency Approvals	CE	CE	CE

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

PADDLE AND THERMAL STYLE

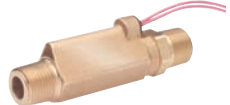


Flow Switches

			
SERIES	V8 - page 291	FS-2 - page 292	TDFS - page 292
Service	Liquids	Liquids	Liquids
Set Point Range	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)
Wetted Materials	Brass or 316 SS, 301 SS, 302 SS, Ceramic	Tin-Bronze, Brass, SS	316 SS, Polysulfone, and FKM
Temperature Limits	-40 to 250°F (-40 to 121°C)	230°F (110°C)	185°F (85°C)
Pressure Limits	250 psig (17.2 bar)	145 psig (10.0 bar)	500 psig (34.5 bar)
Adjustable Set Point	Yes	Yes	Yes
Power Requirement	None	None	9 to 24 VDC
Enclosure Rating	WP	WP	WP
Switch Type	SPDT	SPDT	1 NO NPN, 1 NC NPN
Process Connection	1" male NPT	1" male NPT or BSPT	1" male NPT
Agency Approvals	CE, cURus	CE	CE, RoHS

*Other options available, contact factory

PISTON STYLE

Flow Switches





			
SERIES	P8 - page 294	GVS - page 295	AFS - page 295
Service	Liquids	Liquids	Gases or Liquids
Set Point Range	.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)
Wetted Materials	Brass, PPS Composite, Epoxy, 316 SS, Fluorocarbon	Bronze, TFE, 316 SS, Fluoroelastomer, Ceramic	316 SS, Fluoroelastomer, Epoxy, Brass
Temperature Limits	-20 to 275°F (-28 to 135°C)	-20 to 200°F (-29 to 93°C)	-20 to 300°F (-29 to 149°C)*
Pressure Limits	1500 psig (103 bar)	400 psig (27 bar) @ 100°F (38°C)	1000 psig (69 bar)
Adjustable Set Point	No	Yes	Yes
Power Requirement	None	None	None
Enclosure Rating	GP	GP	GP
Switch Type	SPST, NO	SPDT	SPDT
Process Connection	3/8" male NPT	1" female NPT	1/2" female NPT
Agency Approvals	CE	CE	CE

*Other options available, contact factory

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




PADDLE WHEEL/TURBINE/MULTI-JET

Flow Transmitters

					
SERIES	TFP - page 297	PFT - page 298	SFI-100T - page 302	DFMT - page 305	WMT2 - page 307
Service	Gases	Liquids	Liquids	Liquids	Water
Wetted Materials	PPS	Brass or 316 SS	Brass	PVDF	Brass
Accuracy	±3% FS	±1% FS	±5% FS	±1.5% FS	±2% FS
Temperature Limits	158°F (70°C)	212°F (100°C)	-20 to 212°F (-29 to 93°C)	194°F (90°C)	104°F (40°C)
Pressure Limits	40 psig (2.8 bar)	400 psig (27.6 bar)	125 psig (8.6 bar)	145 psi (1.0 MPa)	232 psi (16 bar)
Pipe Size	1/8", 1/4", 3/8" or 1/2" (3.2 mm, 6.4 mm, 9.5 mm or 12.7 mm)	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)	1/2" to 2" (12.7 mm to 50.8 mm)
Flow Rate	.042 to 420 SCFH (0.02 to 200 LPM)	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)	20 to 160 GPM (3 to 30 m³/h)
Output	0 to 5 V	4 to 20 mA or pulsed	Pulsed	4 to 20 mA or pulsed	Pulsed

ULTRASONIC

Flow Transmitters

			
SERIES	UFB - page 313	UFM - page 314	PUB - page 316
Service	Liquids	Liquids	Liquids
Wetted Materials	n/a	n/a	n/a
Accuracy	±2% of reading	±3% of reading	±2% FS
Temperature Limits	275°F (136°C)	185°F (85°C)	275°F (135°C)
Pressure Limits	N/A	N/A	N/A
Pipe Size	0.05 to 79" (13 to 2000mm)	0.98 to 4.62" (24.89 to 117.35 mm)	0.5 to 78" (13 to 2000 mm)
Flow Rate	0.33 to 33 ft/s (0.1 to 10 m/s)	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 to 20 mA, 0 to 16 mA or 0 to 20 mA	4 to 20 mA and pulsed	4 to 20 mA, 0 to 16 mA or 0 to 20 mA and 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.

ELECTROMAGNETIC

Flow Transmitters


SERIES **MFS** - page 308

SERIES **FLMG** - page 309

SERIES **IEFS** - page 310

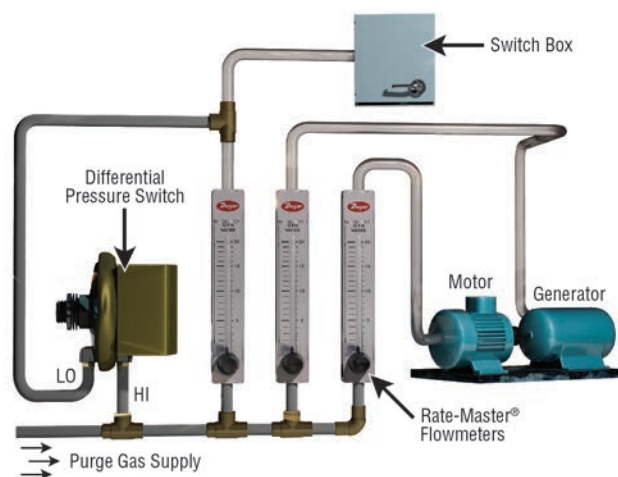
SERIES **EFS2** - page 311

Service	Liquids	Liquids	Liquids	Liquids
Wetted Materials	316 SS	316 SS	Brass or 316 SS	Brass, 316 SS or PVC
Accuracy	±2% of reading	±1% FS	±1% FS	±1% FS
Temperature Limits	194°F (90°C)	158°F (70°C)	200°F (93°C)	200°F (93°C)
Pressure Limits	232 psi (16 bar)	150 psi (10.3 bar)	200 psi (13.8 bar)	200 psi (13.8 bar)
Pipe Size	1/2 or 1" (12.7 or 25 mm)	9 to 18.18" (229 to 462mm)	3 to 48" (76.2 to 1219.2mm)	1 to 12" (25.4 to 304.8 mm)
Flow Rate	0.25 to 52.8 GPM (1 to 200 LPM)	12 to 3500 GPM (.75 to 220.8 LPS)	0.28 to 20 ft/s (0.08 to 6.09 m/s)	0.28 to 20 ft/s (0.08 to 6.09 m/s)
Output	4 to 20 mA or pulsed	Pulsed	Pulsed	Pulsed



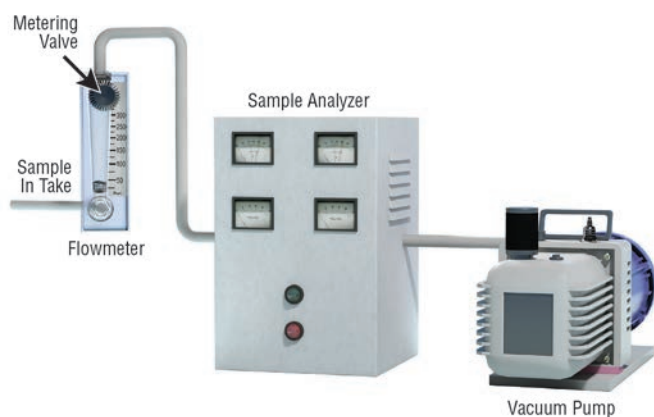
Designers of a bio-medical incubator rely on a Dwyer® flowmeter to control CO₂ flow.

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



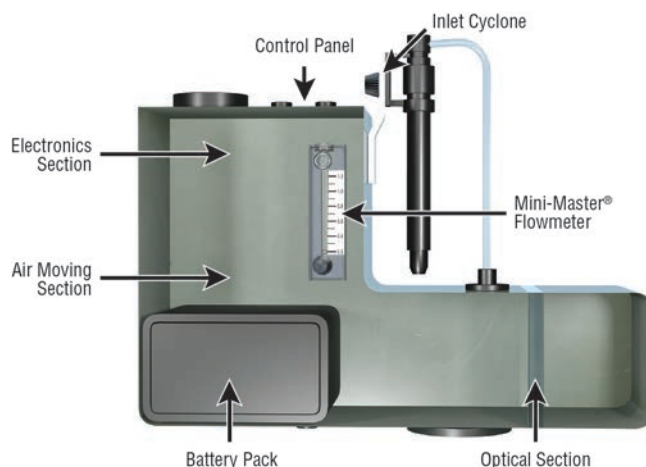
Flowmeters and/or differential pressure switches monitor vital purge gas flow to motors, switchgear, instruments.

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



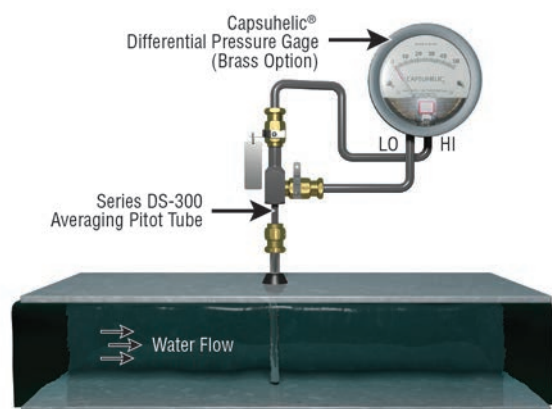
Metering valves on Dwyer® flowmeters control air/gas intake on permanent air pollution analyzers.

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



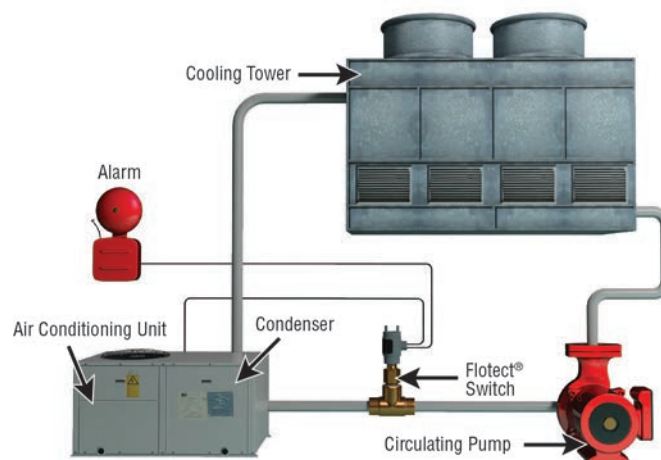
Operator uses Mini-Master® flowmeter to verify air flow into portable dust monitor.

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



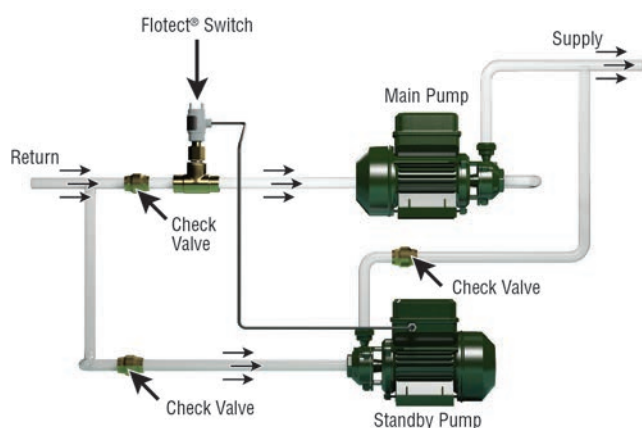
Brass body gage measures water flow rates.

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



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

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



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

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



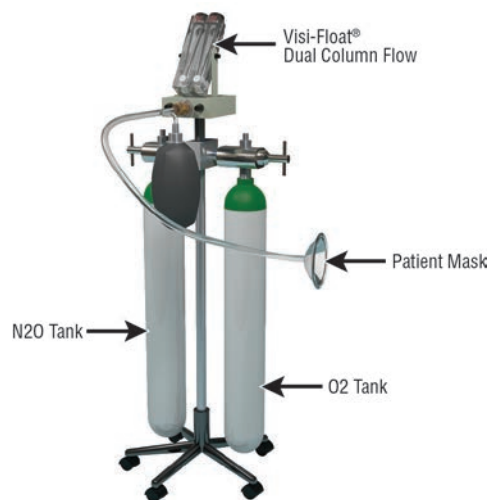
W.E. Anderson® Midwest Sight Flow Indicator reveals flow or stoppage.

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



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

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



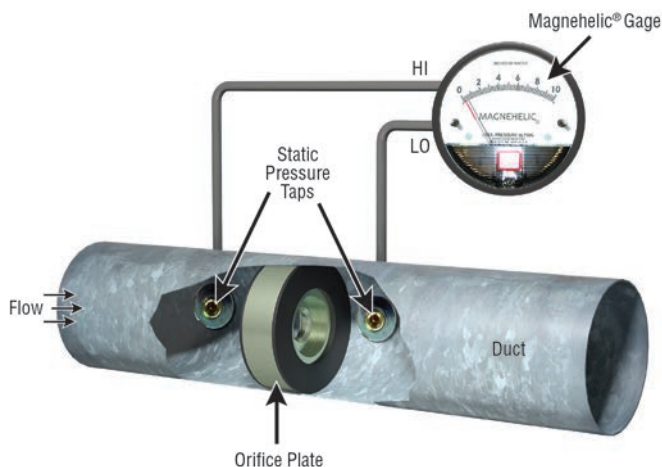
Durable dual-column flowmeter adds value for physicians and oral surgeons.

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



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

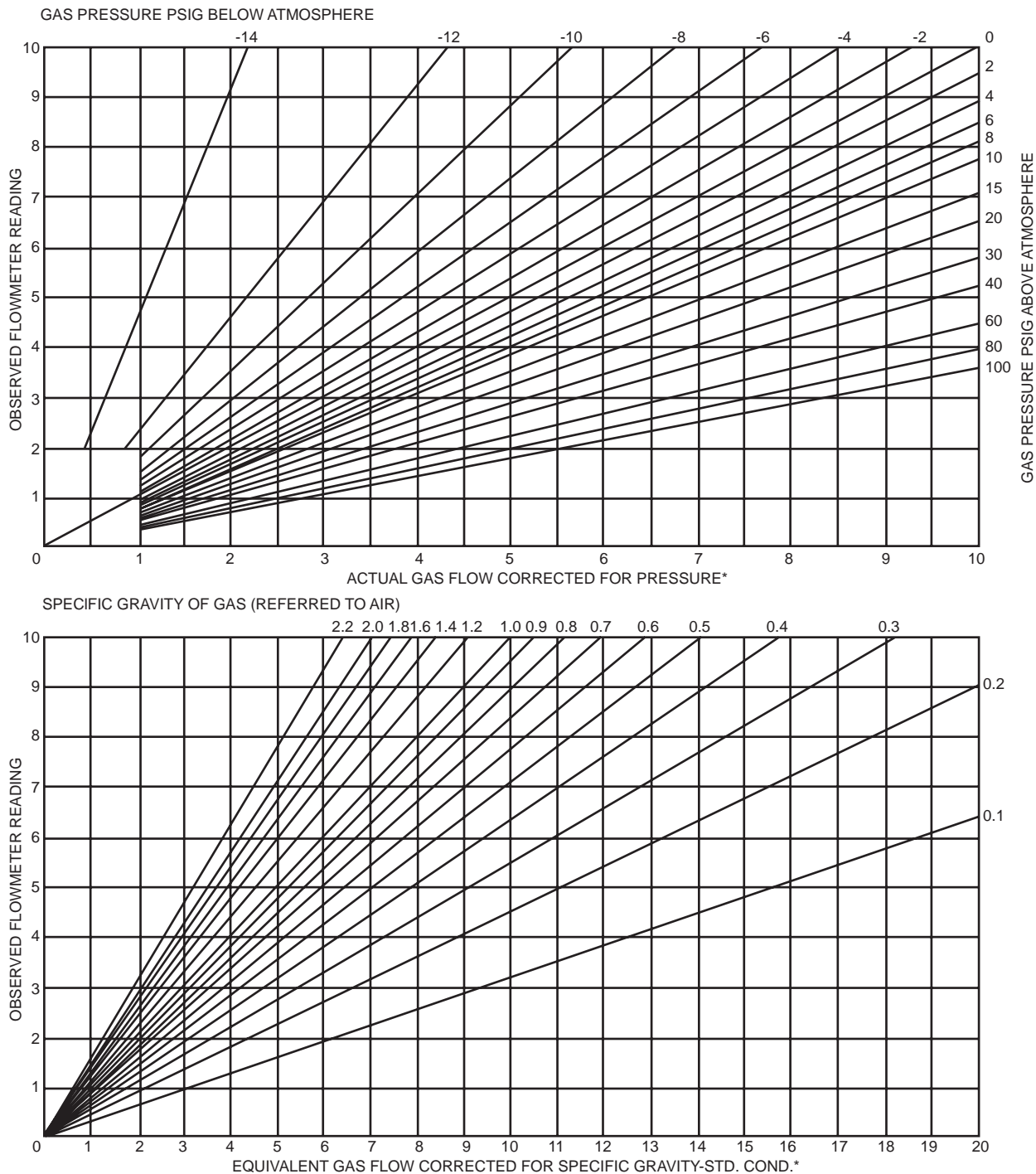
Prior to atomizing a heated salt solution to produce a fog inside this corrosion test cabinet, compressed air is bubbled through a heated water column to properly heat and humidify the air. A Dwyer® Visi-Float® VFA flowmeter, as part of the system, provides precise adjustment of the bubbler air flow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



Measuring air velocity with an orifice plate.

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

CONVERSION CURVES FOR GASES



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.

Dwyer
SERIES RM

RATE-MASTER® POLYCARBONATE FLOWMETERS

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



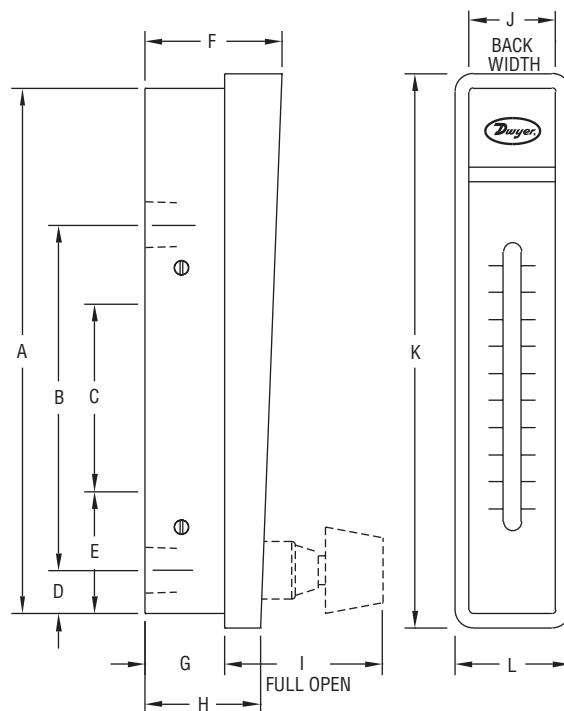
Model RMC
10" scale, 15-3/8" high



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]	6-7/16 [163.50]	12-1/4 [311.20]
	1/8 NPT conn.	1/4 NPT conn.	1/2 NPT conn.
C	1-5/8 [41.28]	3-15/16 [100.00]	8-3/4 [222.30]
	10-32 mtg. holes	1/4-20 mtg. holes	3/8-24 mtg. holes
D	3/8 [9.525]	5/8 [15.88]	1 [25.40]
E	1-1/16 [26.99]	1-7/8 [47.63]	2-3/4 [69.85]
F	1-3/16 [30.16]	1-3/4 [44.45]	2-1/2 [63.50]
G	11/16 [17.46]	1 [25.40]	1-7/16 [36.51]
H	61/64 [24.21]	1-7/16 [36.51]	1-31/32 [50.00]
I	1-3/8 [34.92]	1-13/16 [46.04]	2-1/2 [63.50]
J	3/4 [19.05]	1-1/4 [31.75]	2 [50.80]
K	4-13/16 [122.20]	8-3/4 [222.30]	15-3/8 [390.50]
L	1 [25.40]	1-1/2 [38.10]	2-1/4 [57.15]

The **SERIES RM** Rate-Master® 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



RATE-MASTER® POLYCARBONATE FLOWMETERS

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

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).
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.

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.	

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	Range No.	CC/Min. Water
8	10 to 100	32	5 to 50
9	15 to 150	33	10 to 110
10	20 to 200	34	20 to 300
Range No.	CC/Min. Air	Range No.	GPH Water
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%

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.

RANGE CHART - RMB 5" SCALE - POPULAR RANGES			
Range No.	SCFH Air	Range No.	SCFH & LPM Air
49*	-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	Range No.	GPH & LPM Water
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
Range No.	GPH Water		
82	1 to 12		
83	1 to 20		
84	4 to 40		
85	10 to 100		

*Accuracy ±5%

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.

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	Range No.	GPM Water
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
Range No.	SCFM Air		
121	1 to 10		
122	2 to 20		
123	4 to 30		

VISI-FLOAT® ACRYLIC FLOWMETERS

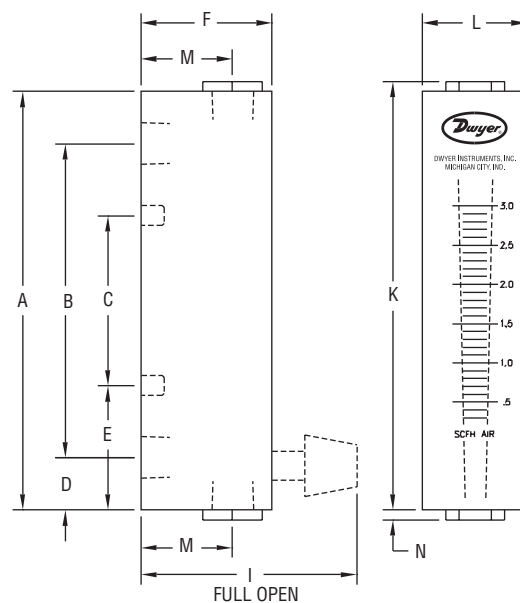
Hot-Stamped Scales, Multi-Angle Views of Flow



Model VFB



Model VFA-SSV



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® 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® 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

SPECIFICATIONS

Service: Compatible gases & liquids.

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

Temperature & Pressure Limits: Without valve: 100 psig (6.9 bar) @ 150°F (65°C); 150 psig (10 bar) @ 100°F (38°C); With valve: 100 psig (6.9 bar) @ 120°F (48°C).

Accuracy: VFA = 5% of 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).



VISI-FLOAT® ACRYLIC FLOWMETERS

Used to Indicate or Manually Control Air or Water Flow

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	Range No.	CC/Min. Water
55*	20 to 200	82	2 to 30
Range No.	SCFM Air	Range No.	GPH Water
90	.3 to 3	80*	.5 to 12
Range No.	CC/Min. Air	83*	1 to 20
60	100 to 1000	84	6 to 40
		81	6 to 60
		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.

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



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.

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



Special Multi-Column Visi-Float® Flowmeters

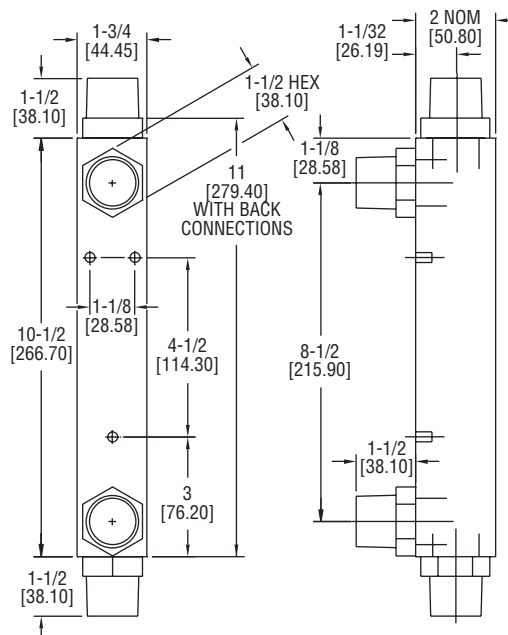
Perfect for OEM applications, Visi-Float® flowmeters can be custom made with up to 10 columns in a single block of acrylic plastic. Available with or without valves. Consult factory for more information.

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.

VISI-FLOAT® ACRYLIC FLOWMETERS

5" Scale, In-Line or Back Connection Options

VFCII with 1" MNPT
End ConnectionsVFC with 1" FNPT
End ConnectionsVFC with 1" FNPT
Back Connections

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

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)

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

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

SPECIFICATIONS

Service: Compatible gases & liquids.

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

Fittings: VFC: PVC; VFCII: Acetal thermoplastic.

Temperature & 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.

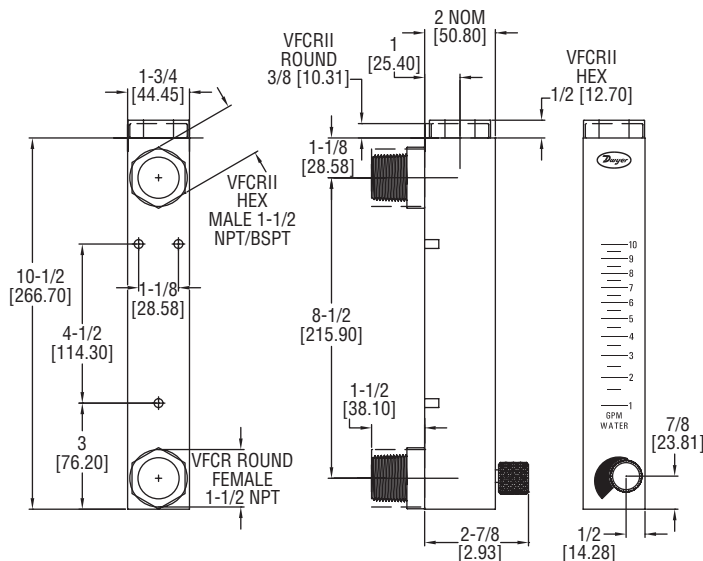
Mounting Orientation: Mount in vertical position.

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

VISI-FLOAT® ACRYLIC FLOWMETERS WITH ROTO-GEAR VALVE TECHNOLOGY Full On/Off Control and Precise Flow Adjustment in One Valve Design



VFCR Left with 1" female NPT Connections VFCR with 1" male NPT Connections



The innovative **SERIES VFCR** Visi-Float® Acrylic Flowmeter with Roto-Gear Technology is a direct reading variable area flowmeter with scales for liquid or gas applications. Roto-gear valve technology permits full open to close adjustment while maintaining fine flow control of the process media in one valve design. Installation, operation, and maintenance are simple ensuring a long, accurate, and trouble-free operation life.

FEATURES/BENEFITS

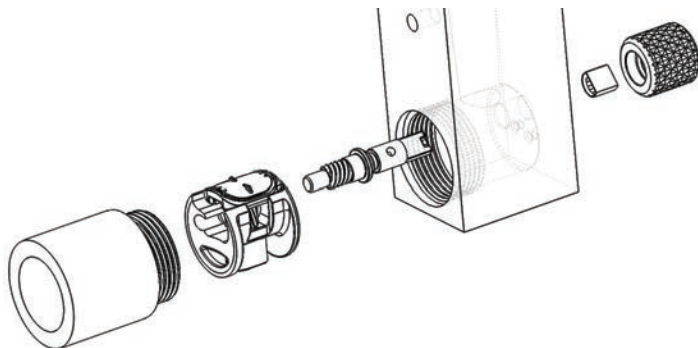
- Patent pending interlocking and rotating gear valve design offers fine flow control with full flow adjustment from fully open to fully closed
- Convenient valve cartridge assembly can easily be removed for effortless cleaning saving time and money
- Direct reading scales are hot stamped into the acrylic body resisting fading or wearing and extending product life
- Bodies are cut and precision machined from solid, clear acrylic blocks with white backgrounds for better visibility of the float, increasing reading accuracy
- Valve design features leak tight closure

APPLICATIONS

- Medical equipment
- Pollution monitors
- Chemical injectors
- Mining
- Laboratory
- Gas analysis
- Wastewater

REMOVABLE ROTO-GEAR VALVE CARTRIDGE ASSEMBLY

Easily remove or replace valve assembly



SPECIFICATIONS

Service: Compatible gases and liquids.
Wetted Materials: Body: Acrylic plastic; O-ring: Buna-N (optional fluoroelastomer); Valve: Delrin®; Float: Stainless steel; Float stop: Polyolefin (range no. 141 Polyolefin and PVC); Float rod: 18-8 SST; Fittings: PVC (VFCR Delrin®).
Temperature Limit: 120°F (48°C).
Pressure Limit: 100 psig (6.9 bar).
Accuracy: 2% of FS.
Process Connection: VFCR: 1" female NPT back connections; VFCR II: 1" male NPT back connections.
Scale Length: 5" (127 mm).
Mounting Orientation: Mount in vertical position.
Weight: 25.6 oz (0.73 kg).

MODEL CHART

Model	Thread Type
VFCR-X	1" FNPT
VFCR II-X	1" MNPT

How To Order:
 Model - Range No. - Option
Example: VFCR-121-NIST

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

OPTION CHART

To order add suffix:	Description
-VIT	Fluoroelastomer O-rings
-NIST	NIST traceable calibration certificate
-BSPT	BSPT process connections

Example: VFCR-121-NIST

Dwyer
SERIES MM

MINI-MASTER® FLOWMETERS

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



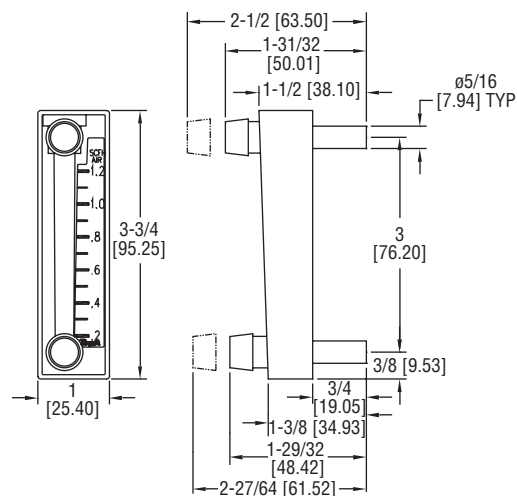
Standard Model MMA



Standard Model MMA
with field configurable
valve, bottom mount



Standard Model MMA
with field configurable
valve, top mount



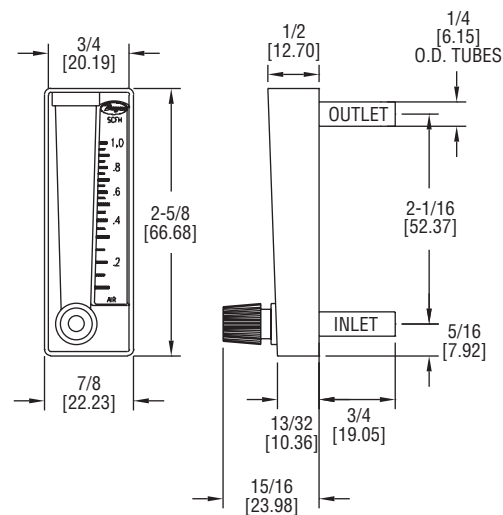
Model MMF-50-PV
1-1/2" scale, with metering
valve, knob.



Model MMF-10
with 1-1/2" scale,
no valve.



Model MMF-10-TMV
with top-mounted valve-
for vacuum service. Use
screwdriver to adjust.



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

MINI-MASTER® FLOWMETERS

Used to Indicate or Manually Control Air or Water, Compact Size

SPECIFICATIONS - MMA
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).

MODEL CHART	
Model	Description
MMA	Standard MMA
How To Order: MMA-Range No.	
Example: MMA-4	
(Series MMA with .5-5 SCFH air range)	

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		



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



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

SPECIFICATIONS - MMF
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).

MODEL CHART	
Model	Description
MMF-X	Standard MMF
MMF-X-PV	MMF with bottom mount valve
MMF-X-TMV	MMF with top mount valve
How To Order: MMF-Range No.-Valve	
Example: 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

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



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

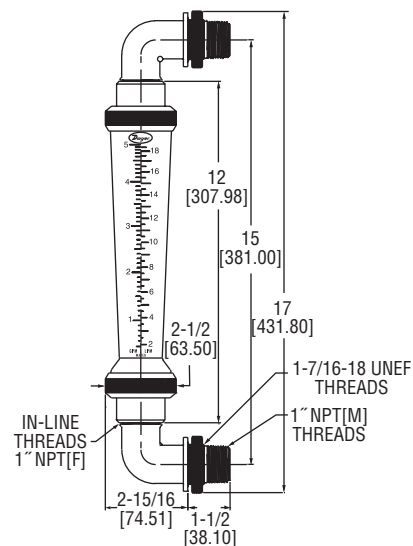
High Corrosion - Resistant Body, Dual Scales



Shown with optional
Polysulfone Fittings



Shown with optional
Polycarbonate Shield



Shown with optional
Polysulfone Fittings

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

APPLICATIONS

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

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

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

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

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

Fitting Torque: Maximum 22 ft - lb.

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

CAUTION: Ball valves can have a "water cannon" effect on opening, creating pressure that exceeds the 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.

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.

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

OPTIONS

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

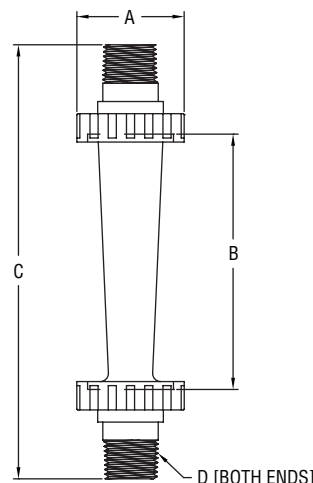
POLYCARBONATE FLOWMETERS

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 LFMA, LFMB, LFMC, LFMD, LFME & LFMF Flowmeters are made of injection molded, heat and chemically resistant polycarbonate bodies and fittings. Series LFM flowmeters have dual scales measuring in both GPM and LPM with 5% accuracy. A textured background on the body enhances scale readability. Standard in-line models come with male NPT process connections while panel mount installation is available with 90° elbow fittings that include panel lock nuts. Various other fittings are available. LFMC, LFMD, LFME & LFMF include an adjustable set point indicator.

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

OPTION	
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

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

SPECIFICATIONS

Service: Water.

Wetted Materials: Body: Polycarbonate; Flange nut: ABS; Float stop: LFMA, LFMB, LFMC: ABS; LFMD, LFME, LFMF: Polypropylene; O-rings: Fluoroelastomer; Rod & float: 316 SS; Connections: 20 mm & 63 mm metric union fittings: ABS; 32 mm & 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" & 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 - 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

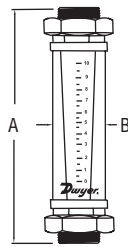
Model	Description
A-564	40 mm metric union fittings - PVC
A-570	1" male NPT fittings - nylon
A-573	1" female NPT fittings - nylon
A-578	1" male NPT with 90° elbow fittings - PVC

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

Dwyer**SERIES VAT****VARIABLE AREA FLUOROPOLYMER FLOWMETERS**

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]

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

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)

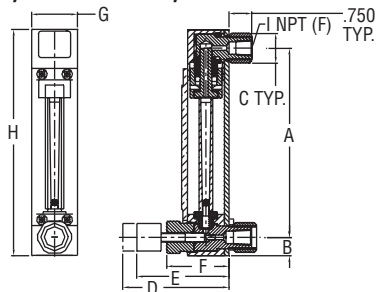
OPTION	
Use order code:	Description
NISTCAL-FL1	NIST traceable calibration certificate

SPECIFICATIONS**Service:** Compatible liquids.**Wetted Materials:** Flowtube: PFA; Float and end fittings: PTFE; Guide rods: PCTFE.**Temperature Limit:** 250°F (121°C).**Pressure Limit:** 100 psig (6.9 bar).**Accuracy:** $\pm 5\%$ FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute).**Process Connections:** See chart.**Leak Integrity:** 1×10^{-7} sccs of helium.**Scale:** 0 to 10 markings.**Mounting:** Vertical, in-line.

MODEL 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)

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).

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

MODEL 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)

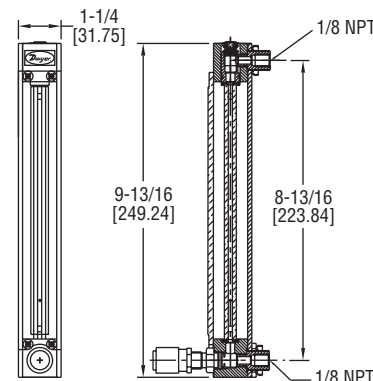
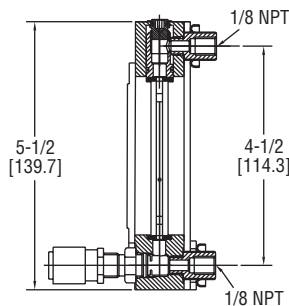
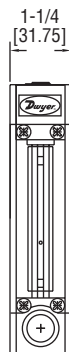
OPTION	
Use order code:	Description
NISTCAL-FL1	NIST traceable calibration certificate

SPECIFICATIONS**Service:** Compatible liquids.**Wetted Materials:** Flowtube: PFA; Float and end fittings: PTFE; Guide rods: PCTFE.**Temperature Limit:** 250°F (121°C).**Pressure Limit:** 100 psig (6.9 bar).**Accuracy:** $\pm 5\%$ FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute).**Repeatability:** $\pm 0.25\%$.**Leak Integrity:** 1×10^{-7} sccs of helium.**Scales:** 0 to 10 markings, 75 mm or 125 mm lengths.**Turn-down Ratio:** 10:1.**Mounting:** Vertical.

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)

VARIABLE AREA GLASS FLOWMETERS

65 mm and 150 mm, $\pm 2\%$ 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).

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

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

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

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	2.09 (986)	0.325 (20.5)
VA10424	VA12424	-	SS	4.12 (1946)	0.881 (55.6)
VA10411	VA12411	VA13411	Glass	2.65 (1249)	0.428 (27)
VA10412	VA12412	-	SS	5.34 (2520)	1.125 (71)
VA10413	VA12413	VA13413	Glass	4.32 (2040)	0.63 (40)
VA10414	VA12414	-	SS	8.45 (3990)	1.71 (108)
VA10417	VA12417	VA13417	Glass	13.4 (6318)	2.33 (147)
VA10418	VA12418	-	SS	25.5 (12058)	5.77 (364)
VA10419	VA12419	VA13419	Glass	27.9 (13153)	4.9 (309)
VA10420	VA12420	-	SS	52.3 (24680)	11.81 (745)
VA10421	VA12421	VA13421	Glass	49.1 (23169)	8.27 (522)
VA10422	VA12422	-	SS	89.2 (42094)	19.97 (1260)

MODEL 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)

OPTION

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, Carbonyl and tantalum are optional); Float stops: PTFE; End fittings: Anodized aluminum, 316 SS, brass or PTFE; Packings: Fluoroelastomer; 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: $\pm 2\%$ FS @ 70°F (21.1°C) and 14.7 psia (1 atm absolute); VA1042, VA1243, VA1343, VA25425, VA25025: $\pm 5\%$ FS @ 70°F (21.1°C) and 14.7 psia (1 @ absolute).

Repeatability: $\pm 0.25\%$ FS.

Leak Rate: 1 x 10⁻⁷ 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.				

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)

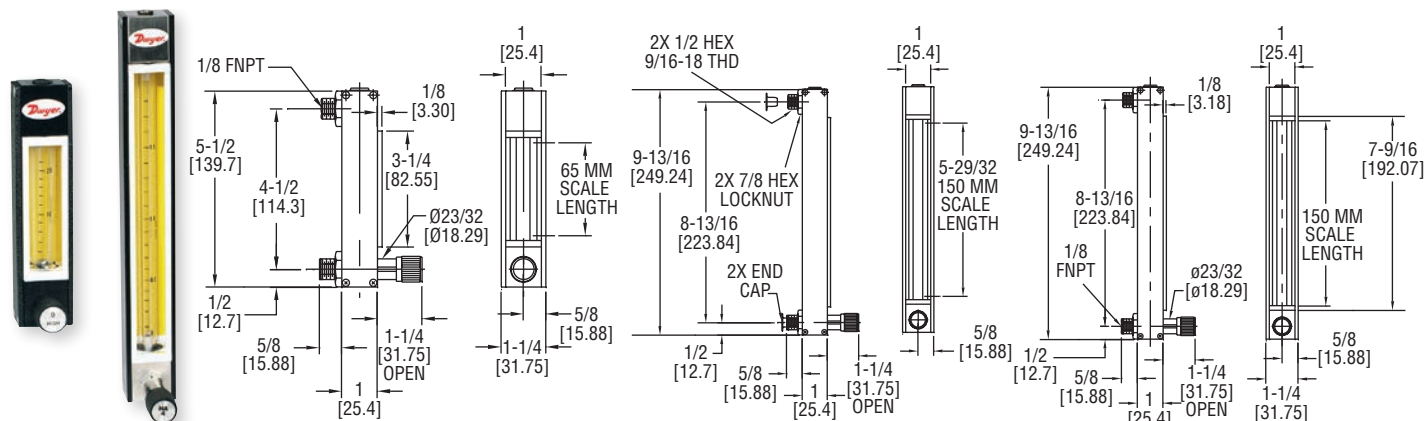
Note: VAX5XX models indicate PTFE units.

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

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).

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

APPLICATIONS

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

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.

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).

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)

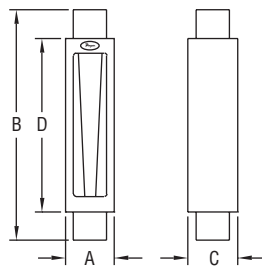
Note: Add suffix "M" for metric scale. **Not available in metric scale.

OPTION

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]

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

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

SPECIFICATIONS

Service: Liquids or gases.
Wetted Materials: Flowtube: Borosilicate glass; float, guide rods, float stops, end; Fittings: 316 SS; O-rings: Fluoroelastomer.
Temperature Limit: 200°F (93°C).
Pressure Limit: 200 psi (13.8 bar); 125 psi for tube size 5 & 6.
Accuracy: ±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.

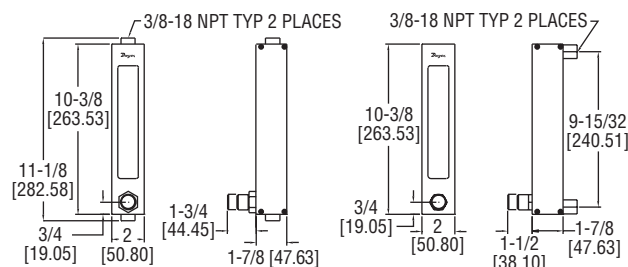
MODEL CHART

	Maximum Flow Rate				Press. Drop (in H ₂ O)		Maximum Flow Rate				Press. Drop (in H ₂ O)		Maximum Flow Rate				Press. Drop (in H ₂ O)
	Water GPM (LPM)	Air SCFM (LPM)	Tube Size				Water GPM (LPM)	Air SCFM (LPM)	Tube Size				Water GPM (LPM)	Air SCFM (LPM)	Tube Size		
Model	(LPM)	(LPM)				Model	(LPM)	(LPM)				Model	(LPM)	(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							

SERIES RSF

ROTATABLE SCALE FLOWMETERS

Dual, Rotatable Direct Reading Scales for Air and Water



In-Line Meter

Panel Mount Meter

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

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

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").

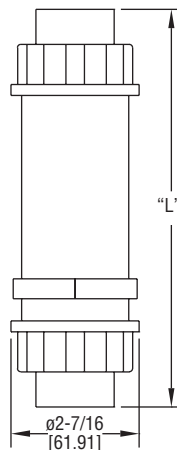
MODEL CHART

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).

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** 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 and bidirectional flow eliminating the need for multiple flowmeters
- 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

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

OPTION

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

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.

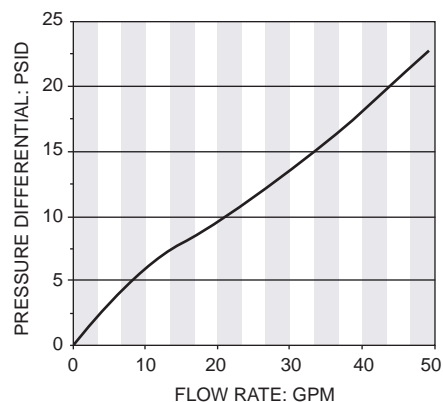
Repeatability: ±1% FS.

Pressure Loss: See chart.

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

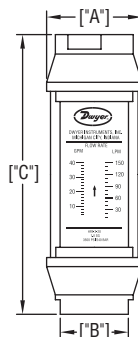
CAUTION: Series HFPC & HFPS Flowmeters are for indoor use only or areas without direct sunlight. Polycarbonate & polysulfone are adversely affected by ultraviolet light.

TYPICAL PRESSURE DIFFERENTIAL



IN-LINE FLOW MONITORS

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 Monitors are 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)

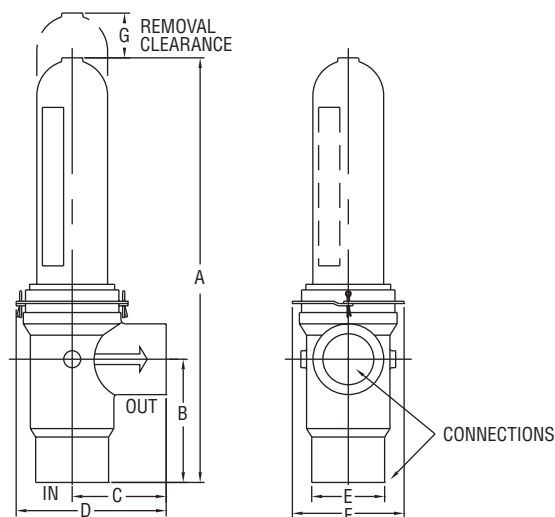
*Dual scale range

TOTAL VIEW INDUSTRIAL FLOWMETERS

View Flow Rate from 360°, Water or Air Ranges



TVFS



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

The **SERIES TVF** Total View Industrial Flowmeters are economically priced, tough, simple and accurate meters. The flowmeters have a full scale accuracy of $\pm 2\%$ and constructed of T-316 stainless steel. The Series TVF flowmeters are available with standard 3/4" and 1-1/2" female NPT connections.

FEATURES/BENEFITS

- Easy to read with 360° rotation of scale on plastic sight tube models
- The sight tube is comprised of polysulfone for added corrosion resistance
- Easily disassembled without the meter being removed from the pipeline for easy cleaning
- Rugged construction allows for high pressure and temperature rating for long operation life

APPLICATIONS

- Water & oil flow monitoring
- Coolant lines
- Compressed gases
- Industrial applications

MODEL CHART

Example	TVFS	-00	TVFS-00
Series	TVFS		3/4" female NPT 1-1/2" female NPT
Range Code		-XX	See Range/Connection Chart (add range code to Series designator for model number)

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

RANGE/CONNECTION CHART

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

SPECIFICATIONS

Service: Compatible gases or liquids.

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

Temperature Limits: See "Operating Limits" table.

Pressure Limits: See "Operating Limits" table.

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

Repeatability: $\pm 0.25\%$ of indicated flow rate.

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

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

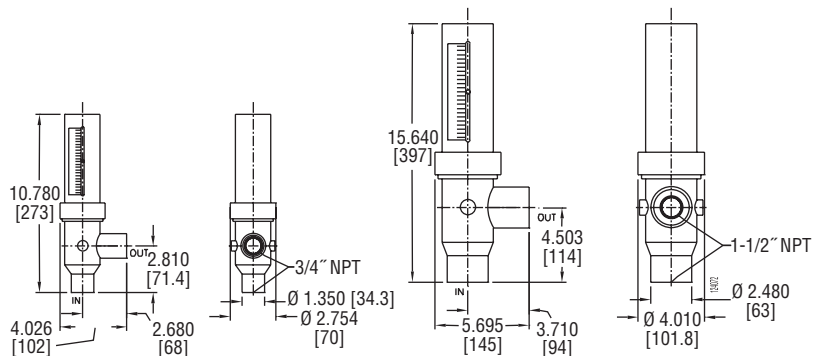
Weight: 4 lb (1.8 kg) for 3/4", and 12 lb (5.5 kg) for 1-1/2".

OPERATING LIMITS

Maximum Non-Shock Working Pressure psig @ °F (bar @ °C)			
Connection	200°F (93°C)	250°F (121°C)	300°F (148°C)
3/4"	300 (20.6)	250 (17.2)	115 (7.9)
1-1/2"	180 (12.4)	145 (10.0)	70 (4.8)

ALL METAL FLOWMETERS

Available in Stainless Steel for Industrial Environments



3/4" Models

1-1/2" Models

The **SERIES SSM** Metal Flowmeters are rugged, general purpose industrial flowmeters with a direct reading scale and $\pm 2\%$ accuracy. These meters are of T316SS construction and offered in 3/4" and 1-1/2" process connections.

FEATURES/BENEFITS

- Increased compatibility with an internal magnet that moves the external flow indicator in a non-wetted enclosure
- Easily disassembled without the meter being removed from the pipeline for easy cleaning
- Pipe adaptors may be used to adapt to alternate size liner without altering accuracy
- Higher than typical $\pm 2\%$ accuracy on a 25 to 1 ratio range compared to typical variable area ball float flowmeters

APPLICATIONS

- Dirty or opaque fluids
- High temperature & pressure industrial flow
- Harsh environments
- Coolant lines
- Compressed gases

SPECIFICATIONS

Service: Compatible liquids and gases.

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

Temperature Limits: 300°F (149°C).

Pressure Limits: 3/4" models: 1000 psig (68.9 bar) @ 250°F (121°C), 1-1/2" models: 800 psig (55 bar) @ 250°F (121°C).

Accuracy: $\pm 2\%$ FS.

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

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

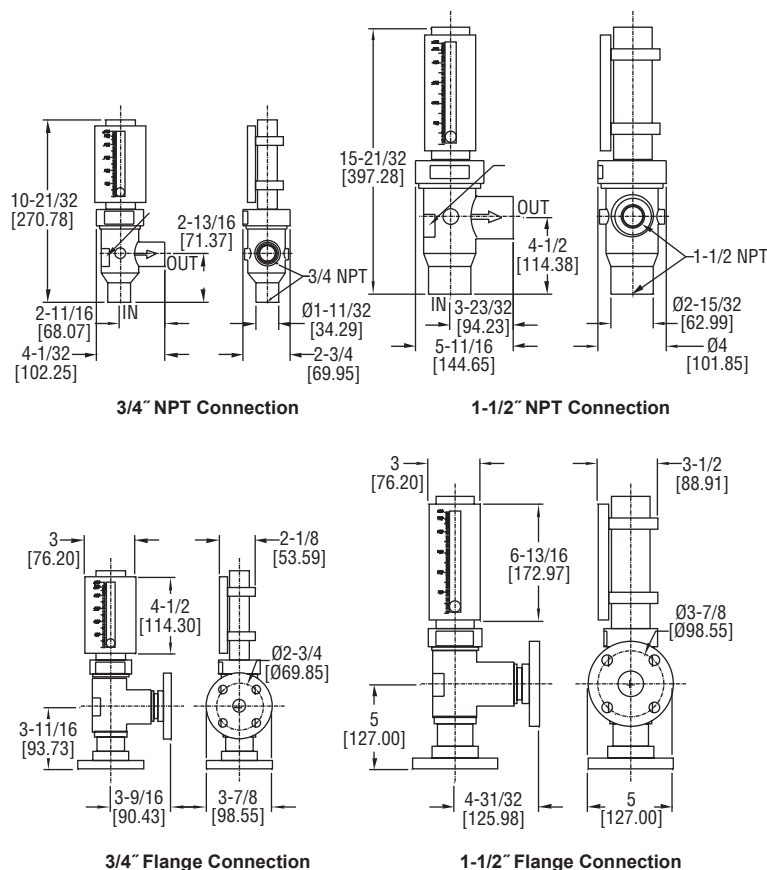
Scale Length: 3/4" models: 3.2" (8 cm); 1-1/2" models: 5.2" (13 cm).

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

MODEL CHART			
316 SS Body	Range	Connection	Max. Pressure Loss
SSM-00	0.2 to 5.4 GPM water (0.75 to 21 LPM)	3/4"	17.2 in w.c.
SSM-01	0.2 to 10 GPM water (1 to 35 LPM)	3/4"	22.0 in w.c.
SSM-02	0.5 to 23 GPM water (0.5 to 90 LPM)	3/4"	75.0 in w.c.
SSM-03	0.5 to 35 GPM water (2 to 130 LPM)	1-1/2"	18.5 in w.c.
SSM-04	1 to 50 GPM water (8 to 200 LPM)	1-1/2"	26.0 in w.c.
SSM-05	2 to 70 GPM water (2 to 265 LPM)	1-1/2"	80.0 in w.c.
SSM-06	4 to 120 GPM water (15 to 450 LPM)	1-1/2"	130.0 in w.c.
SSM-07	2 to 50 SCFM air (4 to 85 m³/hr)	3/4"	4.5 in w.c.
SSM-08	6 to 125 SCFM air (10 to 210 m³/hr)	3/4"	11.8 in w.c.
SSM-09	4 to 260 SCFM air (10 to 440 m³/hr)	3/4"	93.0 in w.c.
SSM-10	2 to 310 SCFM air (10 to 530 m³/hr)	1-1/2"	12.0 in w.c.
SSM-11	10 to 515 SCFM air (20 to 880 m³/hr)	1-1/2"	40.0 in w.c.
SSM-12	35 to 750 SCFM air (40 to 1300 m³/hr)	1-1/2"	70.0 in w.c.
SSM-13	20 to 1000 SCFM air (40 to 1700 m³/hr)	1-1/2"	90.0 in w.c.

STAINLESS STEEL FLOWMETERS

Ideal for Steam Applications



The **SERIES STFLO** Steam Flowmeters are heavy duty, industrial flowmeters with high temperature and pressure limits. These units include a geothermal PTFE O-ring with direct reading scale and $\pm 2\%$ accuracy. These meters are of T316SS construction and offered in 3/4" and 1-1/2" process connections.

FEATURES/BENEFITS

- Easily disassembled without the meter being removed from the pipeline for easy cleaning
- Rugged construction allows for high pressure and temperature rating for long operation life

APPLICATIONS

- Monitoring steam flow
- High temperature & pressure industrial flow
- Harsh environments

SPECIFICATIONS

Service: Compatible with liquids and gases.

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

Temperature Limits: See chart.

Pressure Limits: See chart.

Accuracy: $\pm 2\%$ FS.

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

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

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

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

OPTIONS

To order add suffix:	Description
F1	3/4" 150 # ANSI flange connection
F2	1-1/2" 150 # ANSI flange connection

MODEL CHART

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

Note: For ranges calibrated for water or air contact the factory. *For flanged connection, see Options.

OPERATING LIMITS

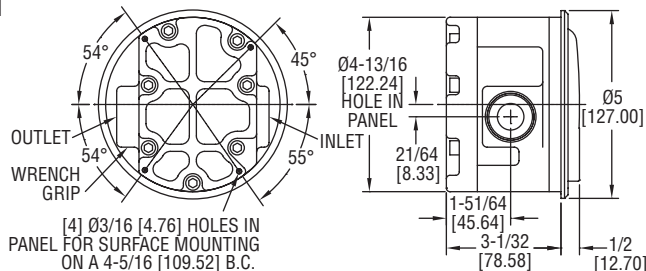
Maximum Non-Shock Working Pressure, psig (bar)

Connection	0°F (-18°C)	70°F (21°C)	300°F (148°C)	350°F (176°C)	400°F (204°C)	450°F (232°C)	500°F* (260°C)	600°F* (315°C)
3/4"	1000 (68.9)	1000 (68.9)	1000 (68.9)	990 (68.2)	970 (66.8)	950 (65.5)	930 (64.1)	900 (62)
1-1/2"	800 (55)	800 (55)	800 (55)	790 (54.4)	780 (53.7)	770 (53)	760 (52.4)	750 (51.7)

*Consult factory for high temperature option. 450°F (232°C) max standard with PTFE O-ring.

RATE-MASTER® DIAL-TYPE FLOWMETERS

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



The **SERIES RMV** Rate-Master® Flowmeters measure 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

OPTION	
To order add suffix:	Description
-NIST	NIST traceable calibration certificate
Example: RMV-1-3-NIST	

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Brass, copper, 302 SS, sintered barium ferrite.
Temperature Limits: 20 to 200°F (-6.7 to 93°C).
Pressure Limit: 1000 psig (68.9 bar).

Pressure Drop: 0 to 5 GPM: 3.2 psid; 0 to 10 GPM: 5.3 psid; 0 to 20 GPM: 10.4 psid.
Accuracy: $\pm 2\%$ of FS.
Size: Diameter dial face 4" (101.6 mm).
Process Connections: See chart.
Maximum Flow: 1.5 x full-scale reading.
Weight: 9 lb (4.08 kg).

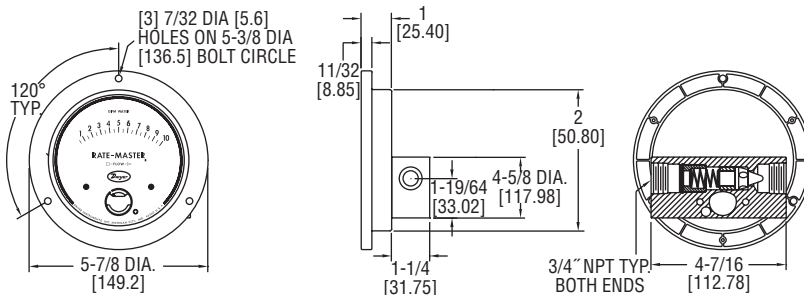
MODEL CHART

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

SERIES RMVII

RATE-MASTER® DIAL-TYPE FLOWMETERS

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® Flowmeters 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

OPTION	
To order add suffix:	Description
-NIST	NIST traceable calibration certificate
Example: RMVII-1-NIST	

SPECIFICATIONS

Service: Compatible gases & liquids & oils.
Wetted Materials: Brass, 302 SS, sintered barium ferrite, polyacetyl.
Temperature Limit: 200°F (93°C).
Pressure Limit: 3000 psig (206 bar).

Pressure Drop: 0 to 5 GPM: 3.2 psid; 0 to 10 GPM: 5.3 psid; 0 to 20 GPM: 10.4 psid.
Accuracy: $\pm 5\%$ of FS.
Size: Diameter dial face 4.5" (114.3 mm).
Process Connections: 3/4" female NPT.
Weight: 2 lb, 14 oz (1.3 kg).

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

VARIABLE-AREA FLOWMETERS

In-Line Mounting, Gas, Liquids & Oils



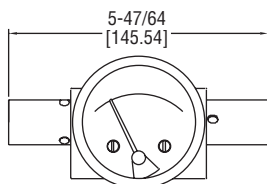
DTFW



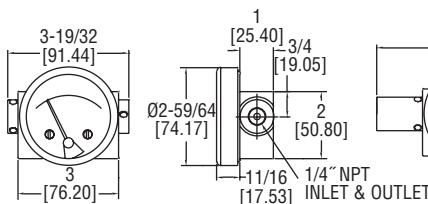
DTFO



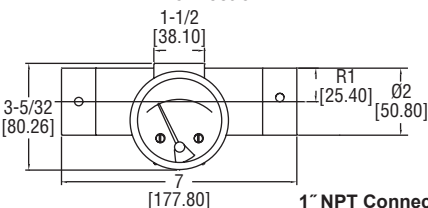
DTFA



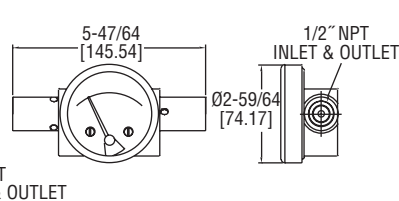
1/2" NPT Process Connection



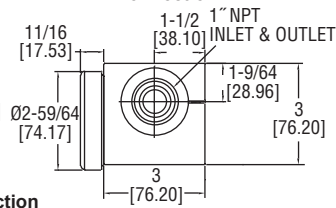
1/4" NPT Connection



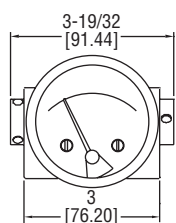
1" NPT Connection



1/2" NPT Connection



1" NPT Connection



1/4" NPT Connection

The **SERIES DTFW & DTFO** 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 & gas equipment
- Heat exchangers
- Backflow prevention

SPECIFICATIONS

Service: DTFW: Compatible liquids; DTFO: Compatible oils; 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); DTFO-1B and DTFO-2B: 3000 psig (200 bar); DTFO-3S: 1500 psig (100 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); DTFO-1B: 3 lb (1.36 kg); DTFO-2B: 5 lb (2.27 kg); DTFO-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

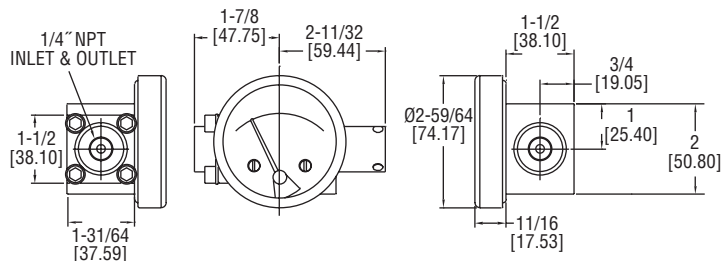
Model	Range GPM Water	Connection NPT	Body	Metering Cone	Model	Range GPM Water	Connection NPT	Body	Metering Cone
DTFW-1B-1W	0 to 1	1/4"	Brass	Acetal	DTFW-2B-8W	0 to 8	1/2"	Brass	Acetal
DTFW-1B-2W	0 to 2	1/4"	Brass	Acetal	DTFW-2B-10W	0 to 10	1/2"	Brass	Acetal
DTFW-1B-3W	0 to 3	1/4"	Brass	Acetal	DTFW-2S-1W	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: For oil compatible models, change all W's to O's in model number. **Example:** DTFO-1B-1O

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

FIXED-ORIFICE FLOWMETER FOR LOW FLOW RATES

316 SS Body, Oil/Gas/Water Calibration



1/4" NPT Process Connection

The **SERIES DTFF** Variable-Area Flowmeters for Low Flow Rates measures water, oil, or air flow rates with great accuracy at a competitive price. This Series is available in a wide range of flow rates for each calibration, with stainless steel construction as standard and is pre calibrated for horizontal in-line mounting.

FEATURES/BENEFITS

- Rugged stainless steel construction ensures great compatibility and is an excellent choice for high line pressure applications, with a maximum pressure of 3000 psig (200 bar)
- High sensitivity for low flow measurement
- Shatter proof construction, unlike glass tube variable area flowmeters, yields long operation life

APPLICATIONS

- Monitoring low pressure drop across filters or strainers
- Low flow monitoring based on differential pressure
- Oil & gas equipment
- Heat exchangers
- Backflow prevention

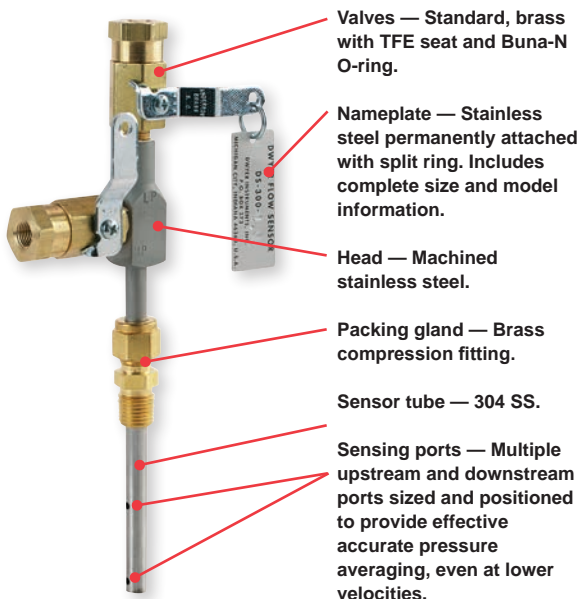
SPECIFICATIONS

Service: Compatible gases & liquids & oils.
Wetted Materials: Body: 316 SS; Spring: 302 SS; Range spring: 302 SS; Magnet: PTFE-coated; Orifice piston: Acetal; Diaphragm: Fluoroelastomer.
Temperature Limit: -22 to 200°F (30 to 93°C).
Pressure Limit: 3000 psig (200 bar).
Accuracy: Liquid/oil calibration: ±2% FS; Air calibration: ±5% FS.
Repeatability: ±1% FS.
Size: Diameter dial face 2.5" (63.5 mm).
Process Connections: 1/4" female NPT.
Weight: 4 lb (1.81 kg).

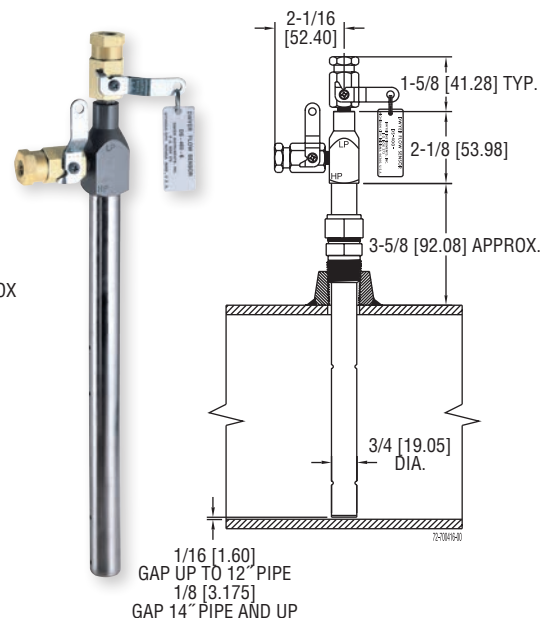
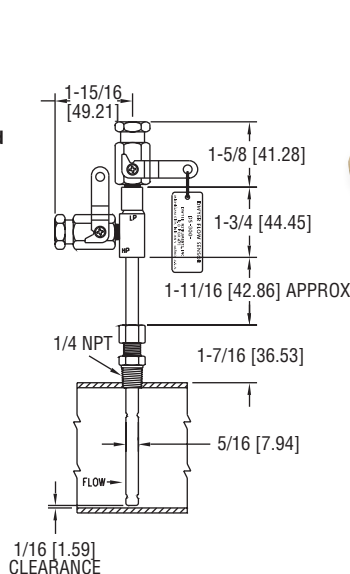
MODEL CHART					
Model	Range	Calibration	Model	Range	Calibration
DTFF-1S-4W	0 to 4 GPH	Water	DTFF-1S-4O	0 to 4 GPH	Oil
DTFF-1S-5W	0 to 5 GPH	Water	DTFF-1S-5O	0 to 5 GPH	Oil
DTFF-1S-8W	0 to 8 GPH	Water	DTFF-1S-8O	0 to 8 GPH	Oil
DTFF-1S-10W	0 to 10 GPH	Water	DTFF-1S-10O	0 to 10 GPH	Oil
DTFF-1S-15W	0 to 15 GPH	Water	DTFF-1S-15O	0 to 15 GPH	Oil
DTFF-1S-20W	0 to 20 GPH	Water	DTFF-1S-20O	0 to 20 GPH	Oil
DTFF-1S-25W	0 to 25 GPH	Water	DTFF-1S-25O	0 to 25 GPH	Oil
DTFF-1S-40W	0 to 40 GPH	Water	DTFF-1S-40O	0 to 40 GPH	Oil
			DTFF-1S-5A	1.5 to 5 SCFM	Air

IN-LINE FLOW SENSORS

Use with the Dwyer® Differential Pressure Gages or Transmitters



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

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		

OPTION	
To order add suffix:	Description
-LV	DS-300 or DS-400 Less Valves

RANGE CHART											
Gage Range (in w.c.)	Media @ 70°F	Full Range Flows by Pipe Size (Approximate)									
		1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"	10"
2	Water (GPM)	4.8	8.3	11.5	20.5	30	49	86	205	350	560
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. ❶
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. ❷



Capsuhelic® Gage Shown
Installed In A-471 Portable Kit



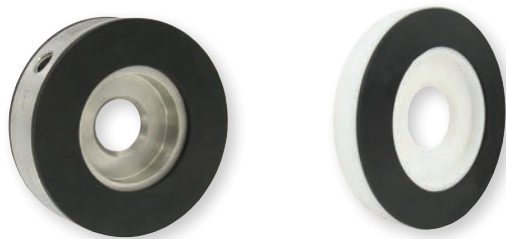
Series 631B

❶ See page 31 (Series 4000)

❷ See page 78 (Series 631B)

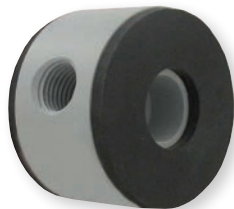
ORIFICE PLATE FLOWMETER

PVC or PTFE, Liquid and Gas use Options

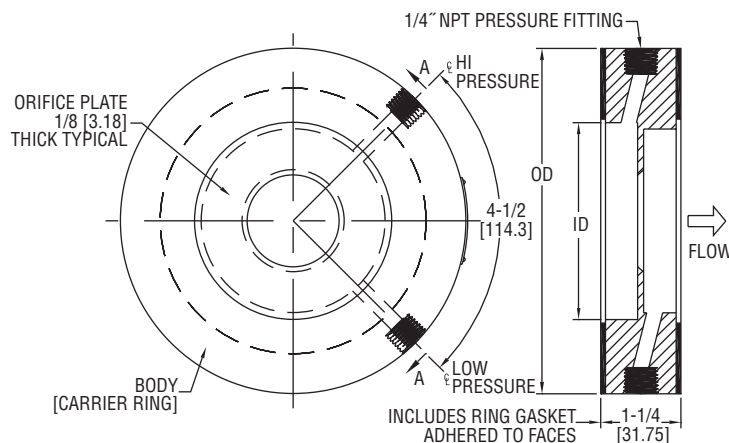


OP

TE



PE



The **SERIES OP** Orifice Plate Flowmeter is a complete orifice plate flow metering package. It incorporates a stainless steel orifice plate with a unique holder or carrier ring containing metering taps and integral gaskets. 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 ratio² 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 FLOWMETER

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"

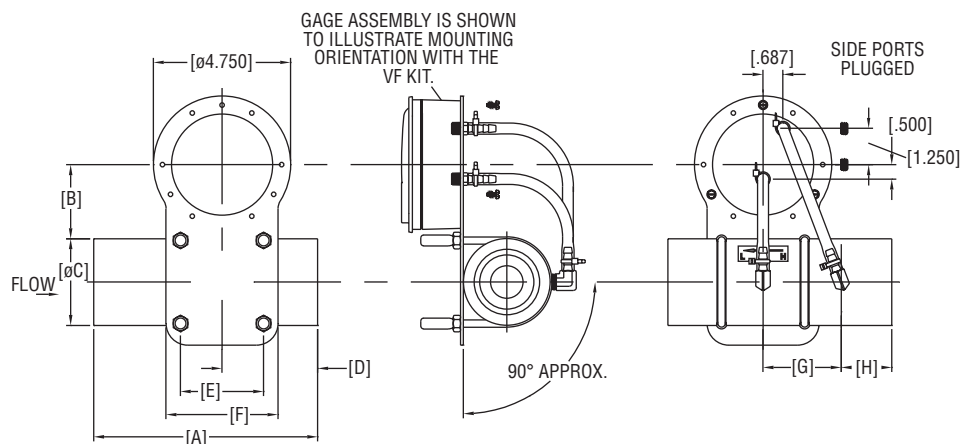
MODEL CHART

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.

VENTURI FLOWMETER WITH MAGNEHELIC® GAGE

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



VFLO Kit	Line Size	A	B	ØC	D	E	F	G	H	J	K
VF1	1" FNPT	4.500	2.687	2	2.015	2.125	3.125	1.359	1.125	4.625	6.375
VF2	1.5" FNPT	6	2.562	2.500	2.625	2.375	3.375	2	1.375	5.250	7.125
VF3	2" FNPT	7.750	2.562	3	3.312	2.875	3.875	2.703	1.750	5.750	7.875
VF4	3" FNPT	11	2.734	4	4.625	4	5.500	4	2.375	7	9.625
VF5	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. Flexible connections enable the meter to be used in vertical or horizontal applications. 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. & 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. (Natural gas option available).

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 & HP 2 lb 2 oz (963 g); Venturi: see chart.

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

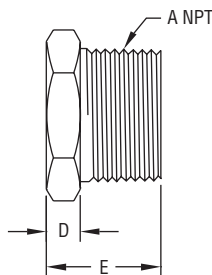
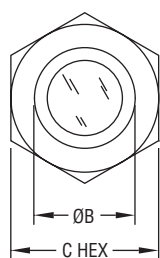
**Venturi price must be added to Series 2000 Magnehelic® gage price

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 Windows 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.

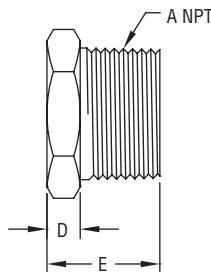
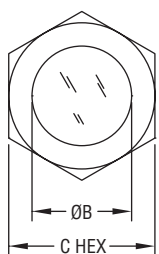
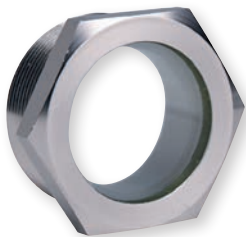
MODEL CHART

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

SERIES 550 | W. E. ANDERSON BY DWYER

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 Windows 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

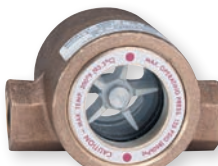
Model	Model
SFI-550-1/4	SFI-550-1
SFI-550-3/8	SFI-550-1-1/4
SFI-550-1/2	SFI-550-1-1/2
SFI-550-3/4	SFI-550-2

MIDWEST SIGHT FLOW INDICATORS

Inexpensive Protection for Expensive Equipment and Systems



Model 100, 100MP



Model 300, 300MP



Model 360F



Model 400



Model 700

The **SERIES SFI** Sight Flow Indicators 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 Sight Flow Indicators offer 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 Sight Flow Indicators offer 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 Sight Flow Indicators offer threaded or ANSI flanged process connections, tube style viewing, and bodies of cast iron or 316 SS.

SERIES SFI-700 Sight Flow Indicators offer 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

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.

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	4.875 (124)	-	2.750 (70)	-	-	5.1 (2.3)
	1-1/2	-	-	(across flats)	-	-	-
SFI-400	1/2	4.500 (144)	-	-	3.500 (89)	1.500 (38)	3.8 (1.7)
	3/4	5.125 (130)	-	-	3.875 (98)	1.750 (44)	4.8 (2.2)
	1	5.625 (143)	-	-	4.250 (108)	2.000 (51)	6.2 (2.8)
	1-1/4	5.750 (146)	-	-	4.625 (117)	2.000 (51)	7.6 (3.5)
	1-1/2	5.875 (149)	-	-	5.000 (127)	2.500 (64)	8.7 (4.0)
	2	6.125 (156)	-	-	6.000 (152)	3.000 (76)	13 (6.0)
	3	6.250 (159)	-	-	7.500 (191)	4.000 (102)	17 (7.7)
	4	6.250 (159)	-	-	9.000 (229)	5.000 (127)	25 (11.0)
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)
	4	5.750 (146)	-	-	9.000 (229)	5.000 (127)	31 (14.1)
SFI-300F	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)