



SERIES PI | PISTON IN-LINE VARIABLE AREA FLOWMETER



BENEFITS/FEATURES

- Zero straight pipe runs required before or after the meter
- Standard mechanical sensor pointer and switches do not require power
- 10:1 turndown for added measuring flexibility
- Rugged, all metal construction
- Multi-directional mounting

APPLICATIONS

- Cooling water monitoring
- Plastic injection molding coolant control
- Oil and gas measurement
- Lubricant flow control
- Hydraulic flow
- Pump protection
- Hazardous areas

DESCRIPTION

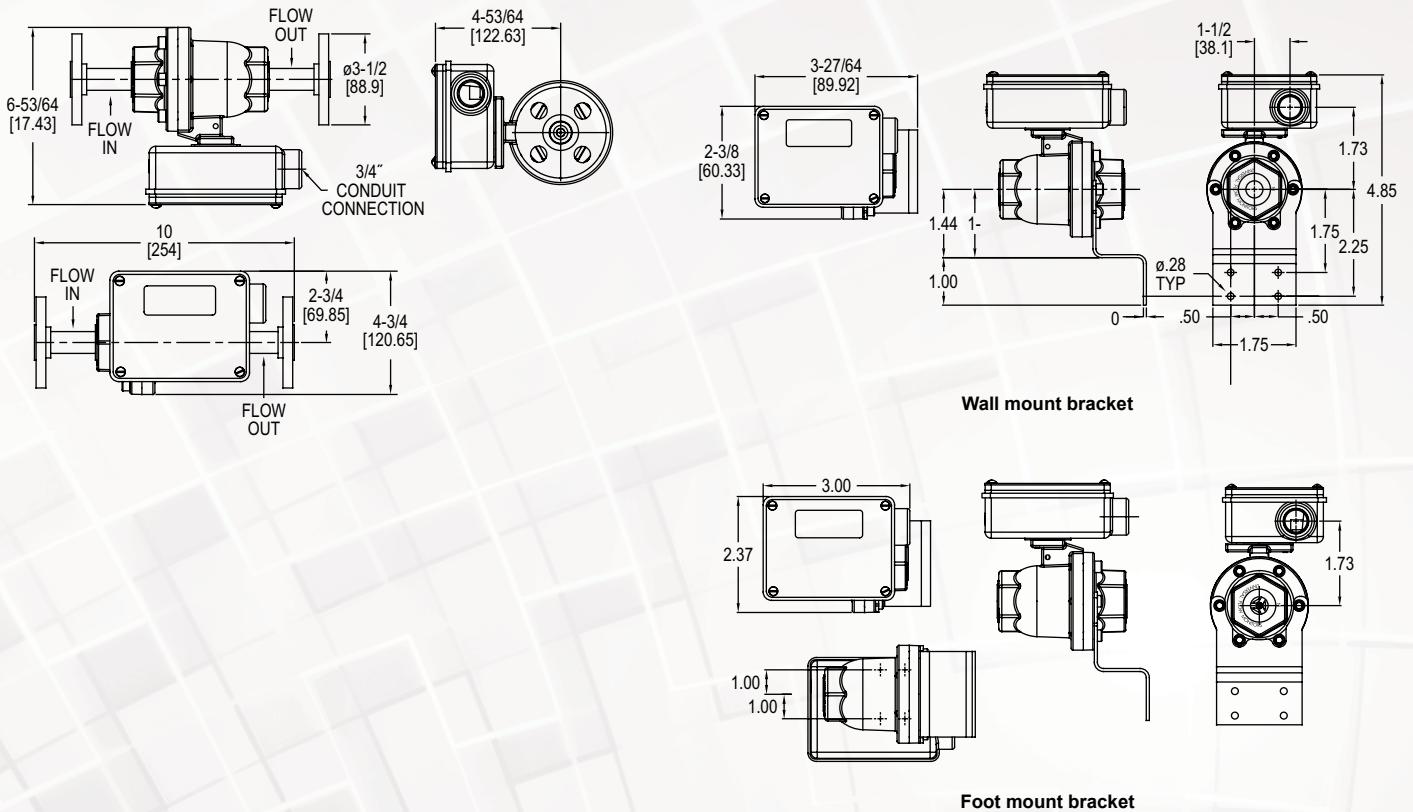
The **Series PI Piston In-Line Variable Area Flowmeter** is a series of mechanical piston variable area flow meters with visual and electronic output options. The Series PI is offered with inscribed scale displays via pointer or numeric digital LCD options. It offers mechanical switch output options and electronic output options such as 4-20 mA analog output, and HART® protocol. It is available in pipe sizes 1/4" to 1" (8 to 25 mm) and flows of 0.25 to 30 GPM (5 to 100 LPM) for liquids with viscosity up to 650 centistokes.

SPECIFICATIONS

| | |
|---------------------------------|---|
| Service | Compatible liquids. |
| Range | See flow rate chart. |
| Display | Standard analog scale and pointer display with optional numeric digital LCD (model selectable). |
| Wetted Materials | Flow body: Aluminum, brass or 316 SS; Piston: 316L SS; Seal: Buna-N or Viton®. |
| Accuracy | ±2% or ±1% FS (model selectable). |
| Repeatability | 1% of reading. |
| Temperature Limits | 200°F (93°C) or HT option 400°F (205°C); Transmitters HT 300°F (150°C); Ambient temperature: 150°F (65°C) CSA listed only to 105°F (41°C). |
| Pressure Limits | Aluminum and brass: 500 psi (34.5 bar); 316 SS: 1500 psi (103.4 bar) (3:1 safety factor). |
| Pressure Drop | 5 psi (0.35 bar) at FS. |
| Response Time | 250 ms. |
| Power Requirements | Standard: None; 4-20 mA analog output or HART® protocol: 10-30 VDC, 0.25 A @ 24 VDC; Intrinsically safe transmitter*: 10-24 VDC, 0.25 A @ 24 VDC. |
| Output | 4-20 mA (model selectable). |
| Deadband | Alarm output: 2.5% FS for up to 1/2"; 5% FS for larger than 1/2". Viscosity: 650 centistokes max. |
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| Enclosure Rating | NEMA 12 (IP52), NEMA 4 (IP66) or NEMA 4X (IP65) (model selectable). |
| Process Connection | Female NPT, SAE, BSPT, BSPP or ANSI RF flanges (model selectable). |
| Electrical Connection | 3/4" NPT for A, L, Z and T-box enclosures; 1/2" NPT for R-box enclosure. |
| Weight | 10 to 20 lb (4.5 to 9.1 kg) (model dependent). |
| Installation Orientation | In-line and in any position. |
| Straight Pipe Run | Zero straight pipe runs before or after, meter required. |
| Switch Output Compliance | General purpose or rated for hazardous locations (all classes, groups and divisions) (model selectable). |
| Compliance | CE, ETL. |

*Only when used with intrinsically safe barrier.

DIMENSIONS



HOW TO ORDER

Use the **bold** characters from the chart below to construct a product code.

| PI | -B | Z | F | 10GM | -4 | -32 | V | 1 | -A | 1 | W | L | -W |
|---|----|---|---|------|----|---|---|---|----|---|---|---|----|
| <p>SERIES PI: Piston in-line variable area flowmeter</p> <p>HOUSING MATERIAL -A: Aluminum -B: Brass -Z: 316 SS</p> <p>INTERNAL MOVING PARTS Z: 316L SS</p> <p>SEAL MATERIAL B: Buna-N F: Viton</p> <p>MAX FLOW RATE LIQUIDS GH: 5 to 300 GPH GM: 0.25 to 30 GPM LH: 20 to 1000 LPH LM: 5 to 100 LPM CMH: 1 to 6 CMH GLM: GPM and LPM dual scale (reference ranges from page 4)</p> <p>THREADED ATTACHMENT -2: 1/4" (8 mm) NPT -3: 3/8" (10 mm) NPT -4: 1/2" (15 mm) NPT -6: 3/4" (20 mm) NPT -8: 1" (25 mm) NPT -4BT: 1/4" BSPT -6BT: 3/8" BSPT -8BT: 1/2" BSPT -12BT: 3/4" BSPT -16BT: 1" BSPT</p> <p>FLANGED OPTION No flange -2: 1/4" -4: 1/2" -6: 3/4" -8: 1"</p> <p>ATTACHMENT TYPE No flange -FW: Welded -FT: Threaded flange</p> <p>MATERIAL No flange -CS: Carbon steel -S: 316 SS</p> <p>CLASS No flange -150: 150 lb -300: 300 lb</p> <p>STYLE No flange RF: ANSI raised face</p> <p>VISCOSITY -X: Custom viscosity</p> | | | | | | <p>VISCOSITY UNITS V: SSU C: Centipoise CS: Centistokes</p> <p>SPECIFIC GRAVITY X: Custom specific gravity</p> <p>ENCLOSURE TYPE AND MATERIAL -A: A-box, standard polysulfone enclosure** -L: L-box, standard aluminium enclosure** -Z: Z-box, standard 316 SS enclosure** -T: T-box, aluminum enclosure with 4-20 mA transmitter standard (intrinsically safe with approved barriers and no switches)** -R: R-box, aluminium enclosure with higher resolution**</p> <p>CONTROL BOX X: 4-20 mA transmitter (intrinsically safe with approved barriers) H: HART® communication protocol XL: 4-20 mA transmitter (intrinsically safe with approved barriers and LCD readout with 2 open collectors (t-box only))</p> <p>OUTPUT 0: Display only 1: One SPDT (3-wire) 1B: One high vibration SPDT (3-wire) 2: Two SPDT (3-wire) 2B: Two high vibration SPDT (3-wire) 3: One SPDT (4-wire) 7: One SPDT hazardous location (r-box only) 17: One DPDT hazardous location (r-box only) 18: Two SPDT hazardous location (r-Box only) 19: Two DPDT hazardous location (r-Box only) 61: One SPDT (3-wire) high temperature 62: Two SPDT (3-wire) high temperature 71: One SPDT (3-wire) gold contact 72: Two SPDT (3-wire) gold contact 53: One SPDT (3-wire) hermetically sealed 54: Two SPDT (3-wire) hermetically sealed</p> <p>SERVICE N: Oil and dust tight NEMA 12 (IP52) available on A, L, and Z-boxes only = N W: Weatherproof NEMA 4 (IP66) X: Weatherproof, corrosion proof NEMA 4X (IP65)</p> <p>FLOW DIRECTION R: Left to right L: Right to left U: Up D: Down</p> <p>SPECIAL OPTIONS -HT: High-temp- 400°F (300°F for transmitter options) -HA: High accuracy (+/-1%) -ST: SS ID tag -TG: Safety glass -W: Wall mounting bracket -F: Foot mounting bracket</p> | | | | | | | |

**Available with analog display, mechanical switches or transmitters (HART® or 4-20 mA).

Note: For additional configuration options, such as a second switch, hermetically sealed switch, or high-temperature options refer to the web configurator.

| FLOW RATE CHART | | | |
|-----------------|-----------------|-----------|-------|
| Size | Connection Size | Flow Rate | |
| | | GPM | LPM |
| 2 | 1/4" (8 mm) | 5 | 18.9 |
| 3 | 3/8" (10 mm) | 10 | 37.9 |
| 4 | 1/2" (15 mm) | 15 | 56.8 |
| 6 | 3/4" (20 mm) | 20 | 75.7 |
| 8 | 1" (25 mm) | 30 | 113.6 |

ACCESSORIES

| Model | Description |
|------------|----------------------------|
| 8140R-ASSY | Intrinsically safe barrier |

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