

### F-2000

- Molded In-line Fitting
- Remote Mount Display
- Three Display Options:
  - Rate & Total Display Only
  - Rate, Total, Analog output
  - Rate, Total, Process Control



### Features:

- High accuracy digital paddlewheel technology.
- 3/8", 1/2", 3/4", 1", 1-1/2", and 2" male pipe threads.
- Flow rate from .4 to 200 GPM (1 to 700 LPM)
- Rate and total flow display.
- Optional Process Control alarm or batch processing relay.
- Optional 4-20mA or 0-10VDC output.
- Large, 8 digit LCD display, up to 4 decimal places.
- Remote mount display on panel, pipe or wall.
- Very low pressure drop.
- Total reset function can be disabled.
- Front panel security lock-out.
- Field programmable.

### Specifications:

Max. working pressure: .....300 PSI (20 bar) @ 70° F (21° C)

Max. fluid temperature: .....200° F (93° C) @ 0 PSI

Max. ambient temperature: ..14° to 110° F/ -10° to 43° C

Full scale accuracy: .....+/- 1%

Power requirement: .....15 VDC Nominal (15 - 24 VDC Absolute)

Model RT units only: .....4 AA batteries or 15-24VDC plug-in transformer

All units: ..... 15-24VDC (plug-in transformer supplied)

Signal Distance: .... AC sine wave sensor = 200 ft (60 m)

Optional Hall Effect sensor = 1 mile (1.6 km)

Signal Cable: ..... 3 conductor shielded. Included 25 ft. (7,6 m)

Max pressure drop: 8 PSI (varies per model)

Enclosure: ..... NEMA 4X (IP56)

Approx ship wt: .... 2 lb. (.91 kg)

### Materials of Construction:

Pipe fitting: .....Polypropylene (options: PVDF)

Sensor, paddlewheel, axle: ..PVDF

Sensor O-ring seals: .....Viton<sup>®</sup> (optional EP)

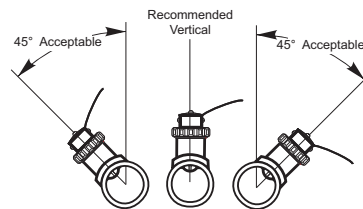
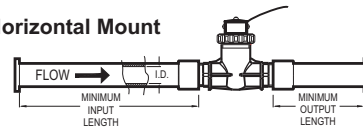
### Installation Requirements:

#### Minimum Straight Pipe Length Requirements

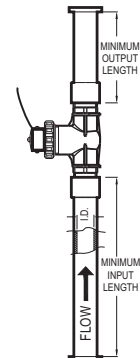
The meter's accuracy is affected by disturbances such as pumps, elbows, tees, valves, etc., in the flow stream. Install the meter in a straight run of pipe as far as possible from any disturbances. The distance required for accuracy will depend on the type of disturbance.

| Type Of Disturbance      | Minimum Inlet Pipe Length | Minimum Outlet Pipe Length |
|--------------------------|---------------------------|----------------------------|
| Flange                   | 10 X Pipe I.D.            | 5 X Pipe I.D.              |
| Reducer                  | 15 X Pipe I.D.            | 5 X Pipe I.D.              |
| 90° Elbow                | 20 X Pipe I.D.            | 5 X Pipe I.D.              |
| Two Elbows -1 Direction  | 25 X Pipe I.D.            | 5 X Pipe I.D.              |
| Two Elbows -2 Directions | 40 X Pipe I.D.            | 5 X Pipe I.D.              |
| Pump Or Gate Valves      | 50 X Pipe I.D.            | 5 X Pipe I.D.              |

#### Horizontal Mount



Angle Mount on Horizontal Pipe

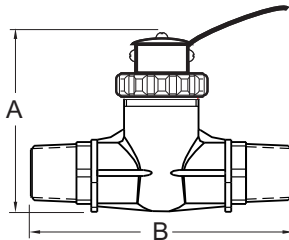
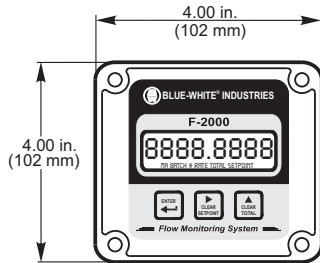


Vertical Mount

#### Mounting location

- The meter is designed to withstand outdoor conditions. A cool, dry location, where the unit can be easily serviced is recommended.
- The meter can be mounted on horizontal or vertical runs of pipe. Mounting at the vertical (twelve o'clock) position on horizontal pipe is recommended. Mounting anywhere around the diameter of vertical pipe is acceptable, however, the pipe must be completely full of water at all times. Back pressure is essential on downward flows. See the minimum straight length of pipe requirement chart above.
- The meter can accurately measure flow from either direction.

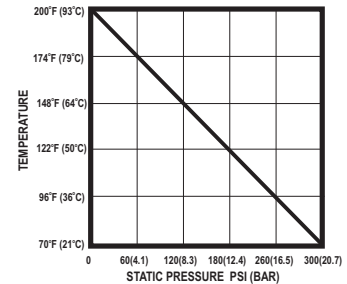
### Dimensions:



| Pipe Size | A            | B            |
|-----------|--------------|--------------|
| 3/8"      | 3-3/4" (95)  | 4-3/4" (121) |
| 1/2"      | 3-3/4" (95)  | 5-1/8" (130) |
| 3/4"      | 4" (102)     | 5-1/4" (133) |
| 1"        | 4" (102)     | 5-5/8" (143) |
| 1-1/2"    | 4-1/2" (114) | 6-1/2" (165) |
| 2"        | 4-3/4" (121) | 6-3/4" (171) |

Inches (mm)

Maximum Temperature vs. Pressure



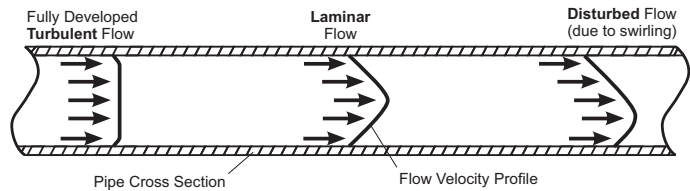
### Flow Stream Requirements:

Measuring accuracy requires a fully developed **turbulent** flow profile. Pulsating, swirling and other disruptions in the flow stream will effect accuracy. Flow conditions with a **Reynolds Number** greater than 4000 will result in a fully developed **turbulent** flow. A Reynolds Number less than 2000 is **laminar** flow and may result in inaccurate readings.

$$\text{REYNOLDS NUMBER} = \frac{3160 \times Q \times G}{D \times V}$$

Where:

- Flow rate of the fluid in GPM = Q
- Specific gravity of the fluid = G
- Pipe inside diameter in inches = D
- Fluid viscosity in centipoise = V



### Model Number Matrix:

**Display Function**  
**RT** = Rate and Total flow  
**AO** = Rate, Total, 4-20mA  
**PC** = Rate, Total, Relay  
**AP** = Rate, Total, 4-20mA, relay

**Display Mount / Sensor Type**  
**S** = Display mounted on AC coil sensor  
**P** = Display remote mount, AC coil sensor  
**H** = Display remote mount, Hall Effect sensor

**Power**  
**B** = Battery holder with 4 AA cells  
**1** = U.S. Transformer, AC 115V60Hz/15Vdc, NEMA5/15 plug  
**2** = Europe Transformer, AC 230V50Hz/15Vdc, CEE 7/11 plug  
**3** = U.S. Transformer, AC 230V60Hz/15Vdc, NEMA 5/15 plug  
**4** = U.S. Transformer, 115V60Hz and Battery back-up  
**5** = Europe Transformer, 230V50Hz and Battery back-up  
**6** = U.S. Transformer, 230V60Hz and Battery back-up  
**X** = No Selection (Customer must supply power)

RT P 1 50 M1 GM 1

**Pipe Size**  
**38** = 3/8 inch  
**50** = 1/2 inch  
**75** = 3/4 inch  
**10** = 1 inch  
**15** = 1-1/2 inch  
**20** = 2 inch

**Pipe Fitting type and Material**  
**M1** = PP body Male NPT, flow range #1  
**M2** = PP body Male NPT, flow range #2  
**M3** = PP body Male NPT, flow range #3  
**M4** = PP body Male NPT, flow range #4  
**F1** = PVDF body Male NPT, flow range #1  
**F2** = PVDF body Male NPT, flow range #2  
**F3** = PVDF body Male NPT, flow range #3  
**F4** = PVDF body Male NPT, flow range #4

**Calibration Flow Range**  
**1** = Range 1 (see pipe fitting range data)  
**2** = Range 2 (see pipe fitting range data)  
**3** = Range 3 (see pipe fitting range data)  
**4** = Range 4 (see pipe fitting range data)  
**5** = Range 5 (see pipe fitting range data)  
**6** = Range 6 (see pipe fitting range data)

**Calibration Units**  
**GM** = U.S. Gal per min  
**GH** = U.S. Gal per hour  
**OM** = U.S. Oz per min  
**FM** = Cubic Ft per min  
**AD** = Acre Ft per day  
**LM** = Liters per min  
**LH** = Liters per hour  
**MH** = Cubic Mtr per hour  
**IM** = Imperial Gal per min  
**IH** = Imperial Gal per hour

### Pipe Size, Flow Range and Display Model Options:

#### 115v AC Models with Polypropylene Pipe Fitting

| Pipe Size<br>M/NPT | GPM<br>flow<br>Range | LPM<br>flow<br>Range | M3/HR<br>flow<br>Range | OZ/M<br>flow<br>Range | RATE & TOTAL<br>DISPLAY<br>Model Number | ANALOG<br>OUTPUT<br>Model Number | PROCESS<br>CONTROL<br>Model Number |
|--------------------|----------------------|----------------------|------------------------|-----------------------|---|----------------------------------|------------------------------------|
| 3/8"               | .8 to 8              | 3 to 30              | .2 to 1.8              | 106 to 1058           | RTP138M1*1                              | AOP138M1*1                       | PCP138M1*1                         |
| 3/8"               | .4 to 4              | 1 to 10              | .1 to 0.6              | 35 to 353             | RTP138M2*2                              | AOP138M2*2                       | PCP138M2*2                         |
| 1/2"               | 2 to 20              | 7 to 70              | .4 to 4.2              | 247 to 2469           | RTP150M1*1                              | AOP150M1*1                       | PCP150M1*1                         |
| 1/2"               | .5 to 5              | 2 to 20              | .1 to 1.2              | 71 to 705             | RTP150M2*2                              | AOP150M2*2                       | PCP150M2*2                         |
| 3/4"               | 3 to 30              | 11 to 110            | .7 to 6.6              | 388 to 3880           | RTP175M1*1                              | AOP175M1*1                       | PCP175M1*1                         |
| 3/4"               | .8 to 8              | 3 to 30              | .2 to 1.8              | 106 to 1058           | RTP175M2*2                              | AOP175M2*2                       | PCP175M2*2                         |
| 1"                 | 5 to 50              | 20 to 200            | 1.2 to 12              | 705 to 7054           | RTP110M1*1                              | AOP110M1*1                       | PCP110M1*1                         |
| 1"                 | 2 to 20              | 7 to 70              | .4 to 4.2              | 247 to 2469           | RTP110M2*2                              | AOP110M2*2                       | PCP110M2*2                         |
| 1-1/2"             | 4 to 40              | 15 to 150            | .9 to 9                | 529 to 5291           | RTP115M1*1                              | AOP115M1*1                       | PCP115M1*1                         |
| 1-1/2"             | 6 to 60              | 25 to 250            | 1.5 to 15              | 882 to 8818           | RTP115M2*2                              | AOP115M2*2                       | PCP115M2*2                         |
| 1-1/2"             | 10 to 100            | 40 to 400            | 2.4 to 24              | 1411 to 14108         | RTP115M3*3                              | AOP115M3*3                       | PCP115M3*3                         |
| 2"                 | 4 to 40              | 15 to 150            | .9 to 9                | 529 to 5291           | RTP120M1*1                              | AOP120M1*1                       | PCP120M1*1                         |
| 2"                 | 6 to 60              | 25 to 250            | 1.5 to 15              | 882 to 8818           | RTP120M2*2                              | AOP120M2*2                       | PCP120M2*2                         |
| 2"                 | 10 to 100            | 40 to 400            | 2.4 to 24              | 1411 to 14108         | RTP120M3*3                              | AOP120M3*3                       | PCP120M3*3                         |
| 2"                 | 20 to 200            | 70 to 700            | 4.2 to 42              | 2469 to 24689         | RTP120M4*4                              | AOP120M4*4                       | PCP120M4*4                         |

\* calibration units