The VF-3000 Flow Sensor offers a cost-effective instrument for the measurement of liquid flow. A simple and clean design makes the VF-3000 a good choice for the measurement of ultra-pure water, DIW (de-ionized water) in semiconductor manufacturing plants. Current output model, Pulse output model and Display model with current / alarm outputs are available. All PFA fused construction version has been added, the VF-3000 is an ideal choice for plant where the extreme cleanliness of pipe is required.

**FEATURES**

- **Wide flow range enough to cover minimum 0.3 L/min and maximum 150L/min.**
- **Designed for Cleanness**
  Sensor body is made of New PFA (420HP-J). All PFA fused construction version has been lined up and designed to eliminate the deposit.
- **No Maintenance Cost**
  Since the VF-3000 has no moving parts, no maintenance is needed.
- **Simple and Compact Design**
  The VF-3000 Flow Sensor is assembled with a few pieces of components. The sensor body and Shedder bar (vortex generator) are molded as one component. This design approach has reduced the cost as well as the size and weight of the flowmeter.
- **CE Marking**
  The VF-3000 meets the EMC directive for CE mark.
- **3 models are lined-up.**
  The function can be selected depending upon the application.

**Display + Current output model**

4 to 20mA output (3-wire), LED indicator, 2 points alarm output (Open collector)

**Current output model**

4 to 20mA output (3-wire)

**Pulse output model**

Open collector output (Unscaled pulse)

* The flow range of All PFA fused construction version is 0.3 to 2.5L/min, 0.5 to 4L/min or 15 to 150L/min.

**OPERATING PRINCIPLE**

A bluff body or Shedder bar in the flow generates a street of vortices downstream. The VF-3000 Flow Sensor measures the flow rate by counting the number of vortices with a piezoelectric sensor.
**STANDARD SPECIFICATION**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current Output Model</td>
</tr>
<tr>
<td>VF-301</td>
<td></td>
</tr>
<tr>
<td>VF-302</td>
<td></td>
</tr>
<tr>
<td>VF-303</td>
<td></td>
</tr>
</tbody>
</table>

**Measuring fluid**
- Ultra-pure water, Water, Chemical liquid (low viscosity)

**Flow range / Conn. size**

<table>
<thead>
<tr>
<th>Flow range</th>
<th>Model</th>
<th>Conn. size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 to 2.5L/min or 0.08 to 0.65GPM</td>
<td>VF-301</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>0.5 to 4L/min or 0.13 to 1GPM</td>
<td>VF-302</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>2 to 16L/min or 0.5 to 4GPM</td>
<td>VF-303</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>4 to 40L/min or 1 to 10GPM</td>
<td>VF-304</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>15 to 150L/min or 4 to 40GPM</td>
<td>VF-305</td>
<td>1&quot;</td>
</tr>
</tbody>
</table>

**Current output**
- 4 to 20mA (3-wire)
- Load: 0 to 250 ohms at 12V DC, 250 to 600 ohms at 24V DC (Refer to Figure 3)
- Damping Time Constant: 1s (63% Response)

**Pulse output**
- [Unscaled pulse]
- Open collector:
  - Max. 10mA/30V DC
  - Pulse duty factor: approx. 50%
- Output frequency at 100% flow
  - VF-3020: 750Hz at 2.5L/min
  - VF-3021: 867Hz at 4L/min
  - VF-3022: 860Hz at 16L/min
  - VF-3033: 596Hz at 40L/min
  - VF-3025: 900Hz at 150L/min

**Alarm output**
- Alarm-1 and Alarm-2
- Open collector: Max. 80mA, 30V DC
- Hysteresis: equal to display resolution

**Display**
- Flow rate: 3-digit LED
- Alarm: 2 LED (Alarm-1, Alarm-2)

**Resolution**
- VF-3030/3031: 0.1L/min or 0.1 GPM
- VF-3032: 0.1L/min or 0.1 GPM
- VF-3033: 0.1L/min or 0.1 GPM
- VF-3035: 1L/min or 1 GPM

**Power consumption**
- 1W: 0.5W, 2W

**Ambient Temperature**
- 0 to 50°C (Refer to Figure 2)

**Ambient Humidity**
- 5 to 90% RH

**Materials**
- Sensor body: New PFA (420HP-J)
- Tube: New PFA (equivalent to 450HP)
- Fitting: PFA or New PFA
- Sensor: Piezoelectric element molded with New PFA (420HP-J)
- O-ring: Perfluoro elastomer (PF) or without o-ring (Fused construction for sensor part)*2
- Cover: Poly-butylene terephthalate (PBT)
- Cable sheath: Heat resistant PVC

**Mass**
- Meter: 80 to 220g (Mass changes depending on type of fitting)
- Cable: 75g
- 100 to 240g (Mass changes depending on type of fitting)
- Cable: 90g

**Min. Straight Pipe Run**
- VF-301: 50mm upstream (Not required downstream)
- VF-302: 80mm upstream (Not required downstream)
- VF-303: Upstream 180mm, Downstream 50mm

*1 Conditions for calibration
- Fluid: Water, Fluid temperature: 25°C
- Ambient temperature: 23°C, Supply voltage: 24 VDC

*2: The flow range of All PFA fused construction version is 0.3 to 2.5L/min, 0.5 to 4L/min or 15 to 150L/min.
**VF-3000 Vortex Flow Sensor**

**Fluid Pressure and Temperature**

![Graph showing fluid pressure and temperature relationship](image)

**Fluid and Ambient Temperature**

(for Display model VF-303\_H11623)

![Graph showing fluid and ambient temperature relationship](image)

**WIRING DIAGRAM**

- **Current Output Model (VF-301\_H11623)**

- **Pulse Output Model (VF-302\_H11623)**

- **Display + Current Output Model (VF-303\_H11623)**

**Load Resistance Range for Current Output**

![Graph showing load resistance range](image)

**MODEL CODE**

<table>
<thead>
<tr>
<th>Model code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VF - 30</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Current output : 4-20mA DC</td>
</tr>
<tr>
<td>2</td>
<td>Pulse output : Open collector (Unscaled pulse)</td>
</tr>
<tr>
<td>3</td>
<td>Display : Flow rate (3-digit LED), Alarm (2 LED)</td>
</tr>
<tr>
<td></td>
<td>Current output : 4 to 20mA DC</td>
</tr>
<tr>
<td></td>
<td>Alarm output : Open collector (2 points)</td>
</tr>
<tr>
<td>0</td>
<td>0.3 to 2.5L/min or 0.08 to 0.65GPM / 3/8&quot;</td>
</tr>
<tr>
<td>1</td>
<td>0.5 to 4L/min or 0.13 to 1GPM / 3/8&quot;</td>
</tr>
<tr>
<td>2</td>
<td>2 to 16L/min or 0.5 to 4GPM / 3/4&quot;</td>
</tr>
<tr>
<td>3</td>
<td>4 to 40L/min or 1 to 10GPM / 3/4&quot;</td>
</tr>
<tr>
<td>5</td>
<td>15 to 150L/min or 4 to 40GPM / 1&quot;</td>
</tr>
<tr>
<td>- P</td>
<td>Perfluoro erastomer (PF) [VF-30_2, VF-30_3]</td>
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<tr>
<td>- 0</td>
<td>Without o-ring (Fused construction for sensor part) [VF-30_0, VF-30_1, VF-30_5]</td>
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<tr>
<td>0</td>
<td>PFA Tube end [Standard]</td>
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<tr>
<td>1</td>
<td>FLARETECK</td>
</tr>
<tr>
<td>2</td>
<td>PILLAR [SUPER TYPE PILLARFITTING]</td>
</tr>
<tr>
<td>3</td>
<td>FINALLOCK</td>
</tr>
<tr>
<td>4</td>
<td>Flowell [ 20 Series Tube Fittings ]</td>
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<td>5</td>
<td>Flowell [ 20A Series Tube Fittings ]</td>
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<tr>
<td>6</td>
<td>Flowell [ 60 Series Tube Fittings ]</td>
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<tr>
<td>7</td>
<td>PILLAR [ SUPER 300 TYPE PILLARFITTING ]</td>
</tr>
<tr>
<td>1</td>
<td>L/min</td>
</tr>
<tr>
<td>2</td>
<td>GPM</td>
</tr>
</tbody>
</table>
OUTLINE DIMENSIONS

VF-3000 Vortex Flow Sensor

OUTLINE DIMENSIONS

- VF-301
- VF-302
  (Tube end type)

- VF-301
- VF-302
  (Fitting type)

VF-301
VF-302
(Tube end type)

VF-303
(Fitting type)

VF-303
(Fitting type)

<table>
<thead>
<tr>
<th>Model</th>
<th>Conn. size</th>
<th>L (Refer to MODEL CODE for Process connection)</th>
<th>D</th>
<th>d</th>
<th>H1</th>
<th>h1</th>
<th>H2</th>
<th>h2</th>
<th>h3</th>
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</thead>
<tbody>
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<td>200 170 160 165 150 150 200 159 19.53 6.35 52 39 58 31 13</td>
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<tr>
<td>VF-30</td>
<td>3/4&quot;</td>
<td>200 185 190 170 165 165 220 189 19.05 15.9 52 39 58 31 13</td>
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<tr>
<td>VF-30</td>
<td>3/4&quot;</td>
<td>200 185 190 170 165 165 220 189 19.05 15.9 53.5 40.5 59.5 32.5 13</td>
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<tr>
<td>VF-30</td>
<td>1&quot;</td>
<td>250 225 235 210 200 200 255 246 25.4 22.2 67 47 73 39 20</td>
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<td></td>
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</tr>
</tbody>
</table>

Note: “L” connection size is subject to being changed without notice, depending on the size change by joint maker.

ORDERING INSTRUCTION

Specify the following when ordering:
1. Model code
2. Fluid name

* Specification is subject to change without notice.