**DESCRIPTION**

The Sparling/OVAL Flowmate is a positive displacement flowmeter designed for the measurement of very small flow rates in applications requiring high accuracy. It is an ideal flow measurement device for various fuels like kerosene, diesel, fuel oil, etc. Units are available for remote registration and totalization using either a reed switch or pulse generator output.

**APPLICATIONS**

The simple unique construction enables the Sparling/OVAL gear meter to measure various fuels with the highest accuracy for accountability and control. Common applications include:

- Fuel oil monitoring, consumption and control (kerosene, fuel oil, diesel, etc.) to engines, boilers, test stands, R & D labs, etc.
- Chemical additions in process control
- Lubrication oil to turbines, pumps and other equipment

**STANDARD FEATURES**

- Sizes include 1/8” and 1/4”
- Aluminum or SST body chambers
- ±1% of reading accuracy or better
- Carbon steel, resin coated gears – can apply for most liquids
- Reed Switch or MR sensor for remote registration or totalization
- Scaled or unscaled pulse output
- Metric or NPT end connections
- Special SST body and rotors
- Low pressure drop
- Viscosity up to 1000 cp

**PRINCIPLE OF OPERATION**

Each meter is equipped with two OVAL shaped gears which rotate when fluid passes through a fixed measuring chamber. Rotation of gears displaces a fixed volume of fluid. The sensor picks up gear rotation, which is proportional to fluid volume and flow rate.

The meter is designed to minimize the slippage between gears and measuring chamber body. As a result, the OVAL gear meter is less affected due to liquid viscosity and lubricity than other flowmeter designs.

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**Flowmate Flowmeter Technical Specifications**

**GENERAL SPECIFICATIONS**

**METER:**
- Accuracy: ±1% of reading
- Process Fluid: Clean liquid
- Max. Working Temp: -4°F to 176°F (-20°C to 80°C)
- Max. Working Pressure: 150 psi
- Flow Ranges: See Table
- Construction: Housing: Aluminum or stainless steel
- Material: Rotor: Special resin or SST (optional)
- Connections: NPT threaded adapters:
  - R 3/8 - 19......1/8” NPT female
  - R 1/2 - 14......1/4” NPT female

**PULSE GENERATOR:**

*Solid State Hall Effect Switch*

- Detection Method: MR sensor
- Response Frequency: 1,000 Hz maximum
- Ambient Temperature: -4°F to 176°F (-20°C to 80°C)
- Output Pulse: Voltage pulse: 0/1 = 0.5V less than/6.4V to 7.4V (at load resistance more than 10 k ohm)
  - Wave form ratio (%):
  - $40 \leq \frac{H}{H+L} \times 100 < 50$
  - $\frac{H}{H+L} = \frac{6.4 - 7.4 VDC}{0.5 VDC}$

- Power supply: 12 to 24 Vdc, ±10%
- Power Consumption: 7mA (0.2W) max.
- Reed Switch (option)
  - Max. Voltage: 100 VAC; 100 VDC
  - Contact Capacity: 10W or 0.5A
  - Electric Durability: 250 VDC RMS; 1 min.
  - Output Pulse: Two wire contact pulse (unfactored)
  - Ambient Temperature: -4°F to 185°F (-20°C to 85°C)*

*Note: Application is limited by meter temperature standard of -4°F to 176°F (-20°C to 80°C)*
FLOW RANGE ACCURACY ±1%

Unit in Gallons per Hour

<table>
<thead>
<tr>
<th>Meter Size</th>
<th>More than .3cp &amp; less than .8cp</th>
<th>More than .8cp &amp; less than 2cp</th>
<th>More than 2cp &amp; less than 5cp</th>
<th>More than 5cp &amp; less than 200cp</th>
<th>More than 5cp &amp; less than 1000cp</th>
<th>Rotor Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>.4 – 13.2</td>
<td>.3 – 13.2</td>
<td>—</td>
<td>.1 – 13.2</td>
<td>Special Resin</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>8.4 – 26.4</td>
<td>5.4 – 26.4</td>
<td>—</td>
<td>.3 – 26.4</td>
<td>Special Resin</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>2.6 – 132.1</td>
<td>1.9 – 132.1</td>
<td>1.06 – 132.1</td>
<td>.7 – 132.1</td>
<td>Special Resin</td>
<td></td>
</tr>
</tbody>
</table>

METER BODY

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter Size</td>
<td>40</td>
</tr>
<tr>
<td>Parallel internal threads</td>
<td>1/8&quot;</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1% RD</td>
</tr>
<tr>
<td>Operating temp. range</td>
<td>-4°F – 176°F</td>
</tr>
<tr>
<td>Max. operating press.</td>
<td>150 psi</td>
</tr>
<tr>
<td>Mat.¹</td>
<td>Body</td>
</tr>
<tr>
<td>Rotors</td>
<td>K</td>
</tr>
</tbody>
</table>

¹Material
C: Stainless steel (Body:SUS316, Rotor:SUS316L(Sintered metal))
L: Aluminum + Alumite treatment
K: Special resin

PULSE GENERATOR

MR Sensor: See specifications on front page

MR Sensor Output Pulse Unit

<table>
<thead>
<tr>
<th>Size</th>
<th>Scaled Pulse</th>
<th>Unscaled Pulse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Size</td>
<td>Pulse Unit mL/P</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
<td>13.9</td>
</tr>
<tr>
<td>41</td>
<td>1</td>
<td>27.8</td>
</tr>
<tr>
<td>45</td>
<td>10</td>
<td>13.9</td>
</tr>
</tbody>
</table>

Reed Switch (Option): See specifications on front page

Reed Switch Output Pulse Unit

<table>
<thead>
<tr>
<th>Size</th>
<th>Unscaled Pulse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Size</td>
</tr>
<tr>
<td>40</td>
<td>0.5</td>
</tr>
<tr>
<td>41</td>
<td>1.0</td>
</tr>
<tr>
<td>45</td>
<td>5.0</td>
</tr>
</tbody>
</table>

mL/P = milli-liter/pulse

METER ERROR AND PRESSURE DROP

HOW TO ORDER FLOWMATE

Base Model Number
LSF: Sparling/Oval M-III

<table>
<thead>
<tr>
<th>Size</th>
<th>Rp 1/8&quot; (6mm) – N/A in all Stainless Steel – C option</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Rp 1/8&quot; (6mm)</td>
</tr>
<tr>
<td>41</td>
<td>Rp 1/8&quot; (6mm)</td>
</tr>
<tr>
<td>45</td>
<td>Rp 1/4&quot; (8mm)</td>
</tr>
</tbody>
</table>

Material of Metering elements
C: 316 Stainless Steel Body & Rotor
L: Aluminum Body & Special Resin Rotor
P: 316 Stainless Steel Body & Special Resin Rotor

Connection
0: No connector
8: w/connector (option)

Generation
M: MR sensor
R: Read switch (option)

Kind of Pulse
1: Unscaled pulse
2: Scaled pulse (MR sensor only)

LSF _ _ _ _ _