FMC Technologies Coriolis Mass Flow Meters bring advanced Coriolis sensor technology and digital signal processing to liquid measurement. Our Coriolis product offering sets a new standard for Coriolis mass flow meters, and with no moving parts the cost of ownership is reduced versus alternative metering technologies.

Exceptional flow sensitivity and performance result from its unique design geometry and rugged construction. High speed sampling and no zeroing stability ensure ultimate measurement stability and performance for a wide variety of products and markets. When high accuracy and custody transfer superiority is demanded, FMC Technologies Coriolis Meters are the first choice.

Features and Benefits

FMC Technologies Coriolis metering technology offers the following advanced features and benefits:

- Perfectly balanced dual tube design to make true “fit and forget” meters, thus eliminating the need for expensive pipe supports and long runs of straight pipe
  - No supports or braces are needed for installation
  - Installation envelope is compact and space saving

- Universal high pressure sensor allows for safe measurement
  - Allows for applications of pressures up to 3,550 psi

Specifications

### Accuracy

<table>
<thead>
<tr>
<th>Model</th>
<th>Mass Flow &amp; Volume Flow (Liquid)</th>
</tr>
</thead>
</table>
| Promass 83O | Standard Cal. | ± 0.10%  
| | Premium Cal. | ± 0.05%  
| Promass 83O | Mass Flow (Gas) | ± 0.35%  

<table>
<thead>
<tr>
<th>Density Accuracy</th>
<th>Promass 83O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field/Reference</td>
<td>± 0.0005 g/cc</td>
</tr>
<tr>
<td>Special Cal.</td>
<td>± 0.001 g/cc</td>
</tr>
<tr>
<td>Standard Cal.</td>
<td>± 0.01 g/cc</td>
</tr>
</tbody>
</table>

Flow Ranges

<table>
<thead>
<tr>
<th>Size Range</th>
<th>lb/min</th>
<th>BPH</th>
<th>GPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot;</td>
<td>0 to 6,660</td>
<td>1,132</td>
<td>792</td>
</tr>
<tr>
<td>4&quot;</td>
<td>0 to 12,860</td>
<td>2,206</td>
<td>1,544</td>
</tr>
<tr>
<td>6&quot;</td>
<td>0 to 29,400</td>
<td>5,043</td>
<td>3,530</td>
</tr>
</tbody>
</table>

1 ± [(zero point stability ÷ measured value) · 100%] o.r., PremiumCal (optional)
2 Flow rates based on process water

Note: These specifications are an abridged version. For complete specifications refer to Bulletin SS0M032.
**Sensor Tubes (Primary)**
Promass O: According to DIN PN 160, PN250 100 / according to ASME B16.5 Cl 900, Cl 1,500

**Sensor Body (Secondary Containment)**
DN 100 to 150: 16 bar (232 psig)

**Material of Construction**
**Sensor**
**Measuring Tubes**
Promass O
1.4410/UNS S 32750 (25Cr duplex)

**Transmitter Housing**
Compact housing: Powder coated die-cast aluminium
Compact housing: Wall-mount housing: Powder coated die-cast aluminium
Remote field housing: Powder coated die-cast aluminium
Connection housing, sensor (remote version): Powder coated die-cast aluminium (high-temperature version and version for heating)

**Approvals**
**Approvals for hazardous area:**
ATEX, FM, CSA, TIIS, IECEx, NEPSI
Ex Approved
CE Tested
Meets the EMC requirements
For a complete listing of approvals please see Bulletin SS0M032.

**Outputs**
**Current Output**
Active/passive selectable, galvanically isolated, time constant selectable (0.05 to 100 s), full scale value selectable, temperature coefficient: Typically 0.005% o.r./°C, resolution: 0.5 µA
Active: 0/4 to 20 mA, \( R_L < 700\Omega \) (for HART: \( R_L \geq 250\Omega \))
Passive: 4 to 20 mA; supply voltage \( V_s \) 18 to 30 V DC; \( R_i \geq 150\Omega \)

**Pulse/Frequency Output, HART**
For custody transfer measurement, two pulse outputs can be operated.
Passive, galvanically isolated, open collector, 30 V DC, 250 mA

**Frequency Output**
Full scale frequency 2 to 10000 Hz \( (f_{max} = 12500 \text{ Hz}) \), on/off ratio 1:1, pulse width max. 2 s
In "Phase-shifted pulse outputs" operating mode, the end frequency is limited to a maximum of 5000 Hz.

**Pulse Output**
Pulse value and pulse polarity selectable, pulse width configurable (0.05 to 2000 ms)

**Pulse/Frequency Output, MODBUS RS485**
Active/passive selectable, galvanically isolated
Active: 24 V DC, 25 mA (max. 250 mA during 20 ms), \( R_L > 100\Omega \)
Passive: Open Collector, 30 V DC, 250 mA
Frequency output: Full scale frequency 2 to 10000 Hz \( (f_{max} = 12500 \text{ Hz}) \), on/off ratio 1:1, pulse width max. 2 s.

**MODBUS RS485**
MODBUS device type: Slave
Address range: 1 to 247
Functions codes supported: 03, 04, 06, 08, 16, 23
Broadcast: supported with the function codes 06, 16, 23
Physical interface: RS485 in accordance with standard EIA/TIA-485
Baud rate supported: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 Baud
Transmission mode: RTU oder ASCII
Response time: Direct data access = typically 25 to 50 ms

**Relay Output**
Normally closed (NC or break) or normally open (NO or make) contacts available max. 30 V/ 0.5 A AC; 60 V/ 0.1 A DC, galvanically isolated

**Signal on Alarm**
Current output: Failsafe mode selectable (e.g. in accordance with NAMUR Recommendation NE 43)
Pulse/frequency output: Failsafe mode selectable
Relay output: De-energised by fault or power supply failure
MODBUS RS485: If an error occurs, the value NaN (not a number) is output for the process variables

**Display Interface**
**Promass 83**
• Quick setup for fast and easy commissioning
• Touch control operation allows programming without opening electronics
• 4-line back lit display
• Advanced diagnostics, batching and concentration measurement
Flowmeter Selection

Note: Refer to the Application Data Sheet FM0M025 provided by your FMC Technologies representative for a more in depth list of requirements needed to properly order a meter.

Promass sensor sizing requires the following information:
- Flow Rate (Min., Max., and Nominal)
- Operating Viscosity
- Specific Gravity
- Line Size
- Pressure
- Temperature

The following steps guide flowmeter selection:

1. **Determine the normal flow rate for the application.** Select the sensor such that this rate is as high in the range of the sensor as possible, pressure drop permitting.

2. **Calculate accuracy and repeatability.** Use the corresponding equations to properly calculate the following:
   - **Accuracy (Promass O)**
     - Mass Flow (Liquid)
     - \[ \pm 0.05\% \pm \left[ \frac{1}{2} \cdot \left( \frac{\text{zero point stability}}{\text{measured value}} \right) \right] \% \text{ o.r.}, \text{ Premium Cal (optional)} \]
     - Mass Flow (Gas)
     - \[ \pm 0.35\% \pm \left[ \frac{1}{2} \cdot \left( \frac{\text{zero point stability}}{\text{measured value}} \right) \right] \% \text{ o.r.} \]
     - Volume Flow (Liquid)
     - \[ \pm 0.15\% \pm \left[ \frac{1}{2} \cdot \left( \frac{\text{zero point stability}}{\text{measured value}} \right) \right] \% \text{ o.r.} \]
   - **Repeatability Promass O**
     - Mass Flow (Liquid)
     - \[ \pm 0.05\% \pm \left[ \frac{1}{2} \cdot \left( \frac{\text{zero point stability}}{\text{measured value}} \right) \right] \% \text{ o.r.}, \text{ Premium Cal (optional)} \]
     - Mass Flow (Gas)
     - \[ \pm 0.25\% \pm \left[ \frac{1}{2} \cdot \left( \frac{\text{zero point stability}}{\text{measured value}} \right) \right] \% \text{ o.r.} \]
     - Volume Flow (Liquid)
     - \[ \pm 0.15\% \pm \left[ \frac{1}{2} \cdot \left( \frac{\text{zero point stability}}{\text{measured value}} \right) \right] \% \text{ o.r.} \]

3. **Estimate actual pressure drop.** The chart on the following page represents the apparent pressure drop at various mass flow rates and line sizes. Each curve represents a different meter size. Locate the normal flow rate on the horizontal axis. Use the curves to identify the associated apparent pressure drop on the vertical axis.
### Pressure Loss Coefficient for Promass O

<table>
<thead>
<tr>
<th>DN</th>
<th>Inches</th>
<th>d [m]</th>
<th>K</th>
<th>K1</th>
<th>K2</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>3</td>
<td>40.50 · 10³</td>
<td>5.35 · 10⁴</td>
<td>7.71 · 10⁴</td>
<td>1.42 · 10⁴</td>
</tr>
<tr>
<td>100</td>
<td>4</td>
<td>51.20 · 10³</td>
<td>5.35 · 10⁴</td>
<td>3.54 · 10⁴</td>
<td>5.40 · 10⁴</td>
</tr>
<tr>
<td>150</td>
<td>6</td>
<td>68.90 · 10³</td>
<td>5.35 · 10⁴</td>
<td>2.04 · 10⁴</td>
<td>6.46 · 10³</td>
</tr>
</tbody>
</table>

### Pressure Loss Diagram for Water

Pressure loss diagram for water

### Dimensions

For a complete list of sensor (3 to 6 inch) and transmitter dimensions, please refer to specification bulletin SS0M032.
Options and Modeling

For options and modeling codes refer to Bulletin SS0M030A1.

EXAMPLE – 3 Inch Promass 83 Transmitter, O Sensor

83O80  J  ADD  F  9  O  1  B  A  A  N

000 Transmitter and Nominal Diameters

010 Measuring Tube Material

020 Process Connection

030 Additional Test, Certificate

040 FMC (US, Canada and Mexico)
Calibration Mass Flow, Density

050 Approval

060 Housing

070 Cable Entry

080 Power Supply, Display

090 Adjustment, Software Feature

100 Output, Input