CORIOLIS MASS FLOW METERS
(non-invasive)

U.S. Patent: 8,404,076
8,887,578
9,677,921

Japanese Patent: 5,602,884
6,257,772

CPFM-8800

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FLOW RANGE</th>
<th>MODEL / ZERO OFFSET STABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>8803-1</td>
<td>12 to 1,500*(g/min)</td>
<td>8803-1 0.36(g/min)</td>
</tr>
<tr>
<td>8803-2</td>
<td>15 to 4,000*(g/min)</td>
<td>8803-2 0.45(g/min)</td>
</tr>
</tbody>
</table>

*Pressure drop at Max. Flow range = 10 PSI on water (1cP)

ACCURACY
Accuracy = ±{1% of rate + Z.O.S.}

CONNECTION TYPES
Tube ends, Flare, Pillar

OUTPUT
4 - 20mA Pulse Local Display

WETTED MATERIAL
PFA - available in all models

APPLICATIONS
- Highly corrosive chemicals
- Slurry and Chemicals containing bubbles
- Fluids with varying density and viscosity
- CMP slurries or solutions containing solid contents
- Surfactants

FEATURES
- Mass flow calibration is fluid independent eliminating the need to calibrate on different fluids
- Accuracy is unaffected by flow regime (e.g., laminar or turbulent flow) or variations in flow velocity profile.
- Operates and measures two-phase flow conditions with gas volumetric void functions in excess of 30%.
**ULTRASONIC FLOW METERs**
(non-invasive)

### M-2700

<table>
<thead>
<tr>
<th>Tube Sizes / Flow Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4” 0 to 3.0 L/Min</td>
</tr>
<tr>
<td>3/8” 0 to 4.0 L/Min</td>
</tr>
<tr>
<td>3/8” 0 to 8.0 L/Min</td>
</tr>
<tr>
<td>1/2” 0 to 20.0 L/Min</td>
</tr>
</tbody>
</table>

**Connection Types**
Tube ends and other custom options

**Wetted Material**
PFA

**Accuracy**
+/- 1% of Reading

**Output**
4 - 20mA  
0 - 10 VDC  
Pulse  
Display

### M-2111

<table>
<thead>
<tr>
<th>Tube Sizes / Flow Ranges</th>
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<td>1/4” 0 to 3.0 L/Min</td>
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<tr>
<td>3/8” 0 to 8.0 L/Min</td>
</tr>
<tr>
<td>1/2” 0 to 20.0 L/Min</td>
</tr>
<tr>
<td>3/4” 0 to 50.0 L/Min</td>
</tr>
<tr>
<td>1” 0 to 80.0 L/Min</td>
</tr>
</tbody>
</table>

**Connection Types**
Tube ends and other custom options

**Wetted Material**
PFA

**Accuracy**
+/- 1% of Reading

**Output**
4 - 20mA  
0 - 10 VDC  
Pulse  
Display

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**Applications**
Ultra pure liquids, DI Water, Slurry, Harsh Chemicals, Aerated Liquids

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ULTRASONIC FLOW METERS

- FAST RESPONSE
- HANDLES ENTRAINED BUBBLES
- CORROSION RESISTANT
- SUITABLE FOR SLURRY AND CHEMICALS

U.S. Patent: 6,055,868 & 5,974,897

M-1500MB

<table>
<thead>
<tr>
<th>TUBE SIZES / FLOW RANGES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8”</td>
<td>0 to 600 ml/min</td>
</tr>
<tr>
<td>1/4”</td>
<td>0 to 3000 ml/min</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONNECTION TYPES</th>
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<tr>
<td>Tube ends and other custom options</td>
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<tr>
<th>WETTED MATERIAL</th>
<th>PFA</th>
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<table>
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<tr>
<th>ACCURACY</th>
<th>+/- 2% of Reading</th>
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<table>
<thead>
<tr>
<th>OUTPUTS</th>
<th>0 - 10 VDC, 4 - 20mA</th>
</tr>
</thead>
</table>

M-1500P

<table>
<thead>
<tr>
<th>TUBE SIZES / FLOW RANGES</th>
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<tr>
<td>1/8”</td>
<td>0 to 600 ml/Min</td>
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<tr>
<th>OUTPUT</th>
<th>4 - 20mA, 0 - 10 VDC, Pulse (frequency), Pulse (Volume)</th>
</tr>
</thead>
</table>

BENEFITS

- NO MOVING PARTS
- FOR ULTRA PURE WATER AND CHEMICALS
- SIMPLE AND COMPACT
- LOW PRESSURE DROP
- LINEAR OUTPUT

# Vortex and Paddle Wheel Flow Meters

## VF-8100
- **Tube Sizes / Flow Ranges**
  - 3/8" 0.4 to 4.0 L/Min
  - 1/2" 2.0 to 20.0 L/Min
  - 3/4" 5.0 to 50.0 L/Min
  - 1" 10.0 to 100.0 L/Min
- **Connection Types**
  - Tube, Flare, Pillar
- **Wetted Material**
  - PFA
- **Output**
  - 4-20mA
  - Pulse
  - Local Display

## VF-8200
- **Tube Sizes / Flow Ranges**
  - 3/8" 0.5 to 4.0 L/Min
  - 1/2" 2.0 to 16.0 L/Min
  - 3/4" 4.0 to 40.0 L/Min
  - 1" 10.0 to 150.0 L/Min
- **Connection Types**
  - RC / Other options available
- **Wetted Material**
  - FPS
- **Output**
  - 4-20mA
  - Pulse
  - Local Display

## M-10000
- **Tube Sizes / Flow Ranges**
  - 1/4" 0.1 to 5.0 L/min
  - 3/8" 1.0 to 30.0 L/Min
  - 1/2" 4.0 to 50.0 L/Min
  - 3/4" 20.0 to 115.0 L/Min
  - 1" 38.0 to 225.0 L/Min
- **Connection Types**
  - FNPT, Flare
- **Body Materials**
  - Celcon, PTFE, 316SS
- **Accuracy**
  - ±1% of Full Scale
- **Outputs**
  - 0 - 10 VDC
  - 4 - 20 mA
  - Pulse (frequency)
  - Alarm

## Benefits
- No moving parts
- For ultra pure water and chemicals
- CE-marking
- Simple and compact
- Low pressure drop
- Linear output

FLOW SWITCHES - FIXED SET POINT TYPE

M-61-F / M-62-F
M-50
M-60
M-64
M-701

Fixed Flow Switch

SET POINT RANGE
300 to 55000 sccm air
10 to 1600 mL/min water

SET POINT RANGE
50 to 5000 sccm air
1 to 170 mL/min water

SET POINT RANGE
300 to 5500 sccm air
10 to 1600 mL/min water

SET POINT RANGE
1 to 70 NL/min air
0.4 to 28 L/min water

SET POINT RANGE
1 to 20 L/min water

CONNECTION SIZES
1/4", 3/8"

CONNECTION SIZES
1/8", 1/4"

CONNECTION SIZES
1/4"

CONNECTION SIZES
3/8", 1/2"

CONNECTION SIZES
3/4"

CONNECTION TYPES
Flare

CONNECTION TYPES
FNPT

CONNECTION TYPES
FNPT

CONNECTION TYPES
FNPT

CONNECTION TYPES
FNPT

WETTED MATERIAL
PFA, PTFE

BODY MATERIALS*
Acrylic, Aluminum,
Polypropylene,
PTFE, 316SS

BODY MATERIALS*
Acrylic, Aluminum,
Polypropylene,
PTFE, 316SS

BODY MATERIALS*
Aluminum, Polypropylene,
PTFE, 316SS

BODY MATERIALS*
Polypropylene

ACCURACY
±10% of Set Point

ACCURACY
±10% of Set Point

ACCURACY
±10% of Set Point

ACCURACY
±10% of Set Point

OUTPUTS
SPST

OUTPUTS
SPST

OUTPUTS
SPST

OUTPUTS
SPST

OUTPUTS
SPST

*see data sheet for list of wetted materials

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<table>
<thead>
<tr>
<th>Model</th>
<th>Set Point Range</th>
<th>Connection Sizes</th>
<th>Connection Types</th>
<th>Body Materials*</th>
<th>Accuracy</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M-100</strong></td>
<td>20 to 60000 sccm air 1 to 950 mL/min water</td>
<td>1/8&quot;, 1/4&quot;</td>
<td>FNPT</td>
<td>PTFE, 316SS</td>
<td>±10% of Set Point</td>
<td>SPST, SPDT</td>
</tr>
<tr>
<td><strong>M-200</strong></td>
<td>1 to 50 scfm air 0.2 to 20 L/min water</td>
<td>3/8&quot;, 1/2&quot;, 3/4&quot;</td>
<td>FNPT</td>
<td>Acrylic, Aluminum, PTFE, 316SS</td>
<td>±10% of Set Point</td>
<td>SPST, SPDT</td>
</tr>
<tr>
<td><strong>M-200-F</strong></td>
<td>Adjustable Flow Switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>M-VF-F</strong></td>
<td>Pressure Relief Valve</td>
<td></td>
<td></td>
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*see data sheet for list of wetted materials

CORIOLIS MASS FLOW CONTROLLERS

- IMMUNITY TO ENTRAINED GAS UP TO 30% BY VOLUME
- RESPONSE INDEPENDENT TO PHYSICAL & CHEMICAL PROPERTIES

U.S. Patent: 8,404,076 8,887,578 9,677,921
Japanese Patent: 5,602,884 6,257,772

CMFC-9000 / CMFC-5000

Integrated closed loop controller for chemical and slurry applications

TUBE SIZES
1/4” and 3/8”

FLOW RANGES
Starting from 5 g/min to 5000 g/min

ACCURACY
+- 1.5% of Set Point or +- 3 g/min (whichever is larger)

CONNECTION TYPES
Tube ends, Flare, Pillar

WETTED MATERIAL
PFA/PTFE or PFA/Pt cured silcone

INPUT / OUTPUTS
4 - 20mA, 0 - 10 VDC

APPLICATIONS
- Highly corrosive chemicals
- Slurry and Chemicals containing bubbles
- Fluids with varying density and viscosity
- CMP slurries or solutions containing solid contents
- Surfactants

ULTRASONIC FLOW CONTROLLERS

- FAST RESPONSE
- HANDLES ENTRAINED BUBBLES
- CORROSION RESISTANT
- SUITABLE FOR SLURRY AND CHEMICALS

MFC-8100

Integrated Closed Loop Flow Controller for Chemical and Slurry Applications

TUBE SIZES / FLOW RANGES
1/4” or 3/8” : 5mL/min to 5 L/min

CONNECTION TYPES
Tube ends, Flare, Pillar

WETTED MATERIAL
PFA/PTFE or PFA/Pt cured silicone

ACCURACY
+/- 1% of Set Point or +/- 2 mL/min (whichever is larger)

INPUT / OUTPUTS
0 - 10 VDC
4 - 20mA

LFC-7000

Integrated Closed Loop Flow Controller for Chemical and Slurry Applications

TUBE SIZES / FLOW RANGES
1/4” or 3/8” : 5mL/min to 5 L/min

CONNECTION TYPES
Tube ends, Flare, Pillar

WETTED MATERIAL
PFA/PTFE or PFA/Pt cured silicone

ACCURACY
+/- 1% of Set Point or +/- 3 mL/min (whichever is larger)

INPUT / OUTPUTS
0 - 10 VDC
4 - 20mA

*An Optional shut off valve can be integrated.

*other models available with flow ranges up to 40 L/min.
MALEMA INTERCONNECT INTERLOCK DEVICE

• DETECTS LEAKS IN VALVE SEALS AND PREVENTS CROSS CONTAMINATION OF THE FLUIDS


MIID

FEATURES

• All High-purity PTFE and PFA construction of the wetted components
• Integrated design for compact, space savings installation
• Designed for minimal head loss
• Field configurable flare connections [Inlets and Outlets can be configured as either 1/4” or 3/8” flare nipples] allowing for simplified retrofit installation and reduced inventories
• Valve components tested to over 10,000,000 cycles in DIW (over 1,050,000 in Slurries)
• Valve Cv = 0.8
• Built-in leak detection & monitoring

BENEFITS

• Improves tool up time by preventing cross contamination from occurring
• Provides early indication of unreliable valve operation ensuring that the bulk supplies cannot be contaminated during unplanned or unexpected pressure fluctuations occurring during normal operations.

* For more details contact factory.
DISPENSE VERIFICATION METER

• VERY HIGH ACCURACY ON INDIVIDUAL DISPENSES
• QUICK RESPONSE

U.S. Patent No: 8,185,237 & 8,467,900

MDM-3000

FEATURES
• Directly reports dispensed volume from micro-liter to liter
• Analog output and two user specified alarm limits
• Transducer, electronics and software that easily integrates into existing dispense system

BENEFITS
• Improves users capability to measure and monitor important process variables
• Instant verification of “out-of-spec” dispense
• Eliminates wasteful chemical use
• Improves product yield
• Reduces labor associated with manual gravimetric or volumetric dispense verifications

* For more details contact factory.
Malema endeavors to provide its customers with state-of-the-art flow and pressure measurement and closed-loop flow control products. We support these endeavors with a multi-faceted engineering team that specializes in providing custom solutions to meet customer requirements.

Our goal is to maintain lasting and satisfying customer relationships by delivering a quality product at a competitive price and lead-time.

In addition to high-purity products, Malema has a complete line of industrial products which can be viewed at www.malema.com