Flow Measurement
Selection Guides and Flowmeter Products
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Flow measurement is vital to industry and industrial applications, from medical research, water supply, food processes, oil exploration, gas distribution and many more. Flow applications are very diverse and each situation has its own challenges and engineering requirements.

**Understanding customer challenges**

OMEGA supplies the current and evolving flow technologies that are driving industries and industrial processes. We can help make these processes more efficient and cost effective, while also understanding the time constraints that customers face.

**What is a flowmeter?**

A flowmeter is a device used to measure the flow rate or quantity of a gas or liquid moving through a pipe.

**How do we quantify flow rate?**

With most flow measurement instruments, the flow rate is determined by measuring the velocity of the substance. Velocity depends on the pressure differential that is forcing the liquid or gas through a pipe. Because the pipe’s cross-sectional area is known and remains constant, the average velocity is an indication of the flow rate. The basic relationship for determining the liquid’s flow rate in such cases is:

\[ Q = V \times A \]

where:
- \( Q \) = liquid flow through the pipe per unit time (SI Unit m³/s)
- \( V \) = average velocity of the flow (SI Unit m/s)
- \( A \) = cross-sectional area of the pipe (SI Unit m²)

Other factors that affect fluid flow rate include the density and the friction of the fluid in contact with the pipe.

**How to predict fluid behaviour**

The Reynolds number (\( Re \)) is an important dimensionless number used to help predict flow patterns in different fluid flow situations. This number is what governs if a liquid or gas is laminar, turbulent or transient and is defined as the ratio of the liquid’s inertial force to its drag force.

At low Reynolds numbers, flow tends to be dominated by laminar (sheet-like) flow, but at high Reynolds numbers turbulence results from differences in the fluid’s speed and direction, which may sometimes intersect or even move counter to the overall direction of the flow.

The equation is:
\[
Re = \frac{\rho \times V \times d}{\mu}
\]

where \( Re \) = Reynolds Number
- \( \rho \) = density of fluid (kg/m³)
- \( V \) = mean flow velocity (m/s)
- \( d \) = diameter of the pipe (m)
- \( \mu \) = viscosity of fluid (Pa.s)

The diagram below shows that laminar (uniform and non-uniform) and turbulent flows are the two types normally encountered in flow measurement operations. Most applications involve turbulent flow, with \( Re \) values above 4000. Viscous liquids usually exhibit laminar flow, with \( Re \) values below 2000. In between these two levels there may be either laminar or turbulent flow.

The best measurements are achieved when the flow is turbulent and the flow profile is fully developed. The more developed the flow profile is, the better the quality of measurement. This is usually achieved through careful consideration of the installation requirements of the flowmeter, with regard to the number of straight pipe lengths required after a disturbance caused by either a bend or valve installed upstream of the flowmeter.

In general, gases require more straight lengths of pipe to make the best measurement, whilst liquids require less. Always consider the requirements of the installation, the measurement objectives and the requirements of the flow technique under consideration to ensure a successful measurement.
OMEGA flow products work with both liquids and gases and are used in many applications including chemical processing, filter and leak detection, pulp and paper processing, petroleum and oil, and wastewater handling. Our highly qualified sales and application engineers are at your service to guide you through our extensive product range.

What type of flowmeter is best?

Flowmeters come in many different styles and use different technologies, therefore there is not one universal flowmeter suitable for all applications. Selecting the appropriate technology for your application requires writing a flow specification which covers the use of the meter. Knowing the critical specifications is important. For example, Coriolis meters don’t respond fast enough for injection flow and Turbine flowmeters will not work in thick slurries.

Considerations before selecting a flowmeter

The basis of good flowmeter selection is a clear understanding of the requirements of the application. Therefore, time should be invested in fully evaluating the nature of the process fluid and of the overall installation. Your development of the specifications needed should be a systematic, step-by-step process.

First steps to choosing the right flowmeter

1. What is the fluid being measured?
2. Do you require volume or mass flow measurement?
3. What is the nature and viscosity of the liquid?
4. What is the minimum and maximum process pressure?
5. What is the minimum and maximum process temperature?
6. What is the minimum and maximum flowrate?
7. Is the fluid chemically compatible with the flowmeter’s wetted parts?
8. What is the size of the pipe?
9. Do you require a local display on the flowmeter?
10. Do you require an electronic signal output and/or specialised communications protocol e.g. RS232/RS485, Ethernet, HART, MODBUS etc?

Choosing the right flowmeter type

Coriolis

Renowned for their outstanding accuracy and versatility in measuring challenging flow applications, Coriolis meters can detect the flow of all liquids, as well as that of moderately dense gases. These meters are excellent on applications where multiple measurements such as mass flow, volume flow, temperature, and density are needed. A Coriolis flow meter works on the principle that the inertia created by fluid flowing through an oscillating tube causes the tube to twist in proportion to mass flowrate.

Ultrasonic flowmeters

Ultrasonic flowmeters are non-invasive and commonly used in clean or dirty applications that ordinarily cause damage to conventional sensors. The basic principle of operation employs the frequency shift (doppler effect) of an ultrasonic signal when it is reflected by suspended particles or gas bubbles in motion. The transit time method depends on the slight difference in time taken for an ultrasonic wave to travel.

Magnetic flowmeters

Electromagnetic meters can handle most liquids and slurries that are electrically conductive. Pressure drop across the meter is the same as it is through an equivalent length of pipe because there are no moving parts or obstructions to the flow. Electromagnetic flowmeters operate in accordance to Faraday’s law of electromagnetic induction, which states that a voltage will be induced when a conductor moves through a magnetic field. The liquid serves as the conductor; the magnetic field is created by energised coils outside the flow tube.
Choosing the right flowmeter type

**Mass flowmeters**

Thermal-type mass flow meters are used for the measurement of mass flow rate of a fluid, primarily gases. Popular applications include leak testing and low flow measurements in the milliliters per minute range. They operate with minor dependence on density, pressure, and fluid viscosity. This style of flowmeter utilizes either a differential pressure transducer and temperature sensor, or heated sensing elements and thermodynamic heat conduction to determine the true mass flow rate.

**Vortex meters**

Vortex meters are able to measure high temperatures in steam, gas and liquids. The main advantages of vortex meters are their low sensitivity to variations in process conditions and low wear. Vortex meters make use of a natural phenomenon called vortex shedding that occurs when a liquid flows around an object. The frequency of the vortex shedding is directly proportional to the velocity of the liquid flowing through the meter.

**Variable area flowmeters**

A variable area flowmeter consists of a tapered tube and a float. It is most widely used for gas and liquid flow measurement because of its low cost, simplicity, low pressure drop, relatively wide rangeability, and linear output.

**Positive displacement flowmeters**

These meters are used for low to high viscous applications when no straight pipe is available. Operation of these units consists of separating liquids into accurately measured increments and moving them on. These meters are good for liquids where a simple mechanical meter system is needed.

**Turbine flow transmitter**

Turbine meters give very accurate readings and can be used for the measurement of clean liquids. They require a minimum of 10 inch pipe diameters of straight pipe on the inlet and 5 inch on the outlet. The unit consists of a multi-bladed rotor mounted within a pipe, perpendicular to the liquid flow. The rotor spins as the liquid passes through the blades. The rotational speed is a direct function of flow rate and can be sensed by a magnetic pick-up, photoelectric cell, or gears. Turbine meters are particularly good with low-viscosity liquids.

**Paddle wheel sensors**

One of the most popular cost-effective fluid and water flowmeters. Many are offered with flow fittings or insertion styles. These meters require a minimum of 10 inch pipe diameters of straight pipe on the inlet and 5 inch on the outlet. Chemical compatibility should be verified when not using water. Outputs come in Sine wave, Square wave, and also transmitters for panel mounting and built-in systems.

**Spring and piston flowmeters**

Also used in gas and liquid flow measurement, these flowmeters can be mounted in any orientation. Scales are based on specific gravities of 0.84 for oil meters, and 1.0 for water meters. Their simplicity of design and the ease with which they can be equipped to transmit electrical signals has made them an economical alternative to variable area flowmeters for flowrate indication and control.

Contact us on 0800 488 488, sales@omega.co.uk, to discuss which flowmeter is best for you.
What Fluid do you Need to Measure?

Use this table to identify which type of flowmeter suits your needs.

**Things to consider are:**
- Are you measuring a fluid or gas?
- Is the substance clean or corrosive?
- Do you need measurement and control?
- Do you need an indication of the measurement?

<table>
<thead>
<tr>
<th>Liquid/ Application</th>
<th>Coriolis</th>
<th>Ultrasonic</th>
<th>Magnetic</th>
<th>Thermal Mass</th>
<th>Vortex</th>
<th>Variable Area</th>
<th>Positive Displacement</th>
<th>Turbine</th>
<th>Paddle Wheel</th>
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<th>Thermal Mass</th>
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<th>Positive Displacement</th>
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<th>Paddle Wheel</th>
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Measures Mass Flow, Density, Temperature and Volume
FMC-5000 Series

Accuracy over a wide flow range from a single meter optimises your plant’s efficiency

Designed according to the principle of Coriolis force, this advanced flow and density measurement instrument is widely used in the measurement of liquids, gases and slurries. Coriolis meters are typically used in applications like batch control, blending, filling, dosing, process gas measurements, and more.

• 2 Year Warranty
• Calibration Certificate
• CE Approved
• IP65 Rated

Applications
Chemical Processing
Pharmaceutical
Pulp & Paper Industry
Food & Dairy
Solvents & Resins
Paints & Adhesives

Visit www.omega.co.uk/fmc-5000

Specifications

Maximum Pressure:
16 bar (230 psi), [Optional: 25 bar (360 psi), 40 bar (580 psi) and 63 bar (9156 psi)]

Flow Accuracy/Repeatability:
FMC-5100: 0.1/0.05% RD (Liquid Only)
FMC-5200: 0.2/0.1% RD (Liquid Only)
FMC-5500: 0.5/0.25% RD (Gases Only)

Process Temperature Range:
Integrate Type: -50 to 125°C
Remote Type: -50 to 200°C

Ambient Temperature: -40 to 55°C

Working Humidity: (5 to 95%) RH at 25°C

Temperature Accuracy: ±1.0°C

Density Measuring:
Range: 0.2 to 3.0 g/cm³
Error: ± 0.002 g/cm³
Repeatability: 0.001 g/cm³

Pulse Output:
0 to 10 Khz, +/-0.075% Full scale

Power Supply:
18 to 36vdc, 85 to 265 Vac (AC option), 15W

Current Output:
4 to 20 mA, 0.005% Full Scale

Approvals: CE, RoHS (Pending)

Communications:
RS485 (RTU Modbus®), HART®
## Ultrasonic Flowmeter Selection Guide

Ultrasonic flowmeters are able to perform measurement. Certain models can perform measurement & control, and display the measurement.

### Ultrasonic Flowmeter Applications

<table>
<thead>
<tr>
<th>Suitable Fluids</th>
<th>Clean</th>
<th>Dirty</th>
<th>Conductive</th>
<th>Viscous</th>
<th>Slurries</th>
<th>Corrosive</th>
<th>Reverse Flow</th>
<th>Pulsating Flow</th>
<th>Semi Filled Pipes</th>
<th>Open Channel</th>
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<th>Steam</th>
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<th>Wet</th>
<th>Contaminated</th>
<th>Corrosive</th>
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<table>
<thead>
<tr>
<th>Page</th>
<th>Ultrasonic Flowmeter</th>
<th>Accuracy</th>
<th>Repeatability</th>
<th>Down Turn Ratio</th>
<th>Max Flow</th>
<th>Max Pressure</th>
<th>Max Temp</th>
<th>Min Temp</th>
<th>Output</th>
<th>Connection</th>
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<tr>
<td>9</td>
<td>FDT-21</td>
<td>±1% RD</td>
<td>±0.2% RD</td>
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<td>30 m/s</td>
<td>N/A</td>
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<td>RS232C</td>
<td>Open collector transistor output</td>
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<td>FDT-40</td>
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<td>±0.5% RD</td>
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<td>12 m/s</td>
<td>N/A</td>
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<td>-40 °C</td>
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<td>Frequency PNP or NPN open collector, 4-20mA output, Modbus RTU</td>
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<td>10</td>
<td>FD-400</td>
<td>±2% FS</td>
<td>±0.2% RD</td>
<td>180:1</td>
<td>9 m/s</td>
<td>N/A</td>
<td>200 °C</td>
<td>-40 °C</td>
<td>Pulse 4 to 20 mA relay</td>
<td>Clamp on</td>
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<tr>
<td></td>
<td>FDT500</td>
<td>±2% RD</td>
<td>±0.1% RD</td>
<td>50:1</td>
<td>6000 LPM</td>
<td>230 PSI/15.8 BARG</td>
<td>50 °C</td>
<td>0 °C</td>
<td>USB RS232 4 to 20 mA</td>
<td>ANSI or DIN flange</td>
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</tbody>
</table>
Handheld Non-Invasive Ultrasonic Flowmeter

**FDT-21**

- Perfect for Quick Checks and Maintenance Tasks
- Measures the Fluid Velocity of Liquid in a Full/Closed Pipe
- For Metallic, Plastic and Fibreglass Pipes
- Data Logging Capabilities of Over 2000 Line Data
- Positive, Negative and Net Totaliser
- 4-Line LCD Display
- 3 Different Range Sensors to Fit Pipes from DN20 - 6000
- RS232 Output
- Open Collector Output

www.omega.co.uk/fdt21

Clamp-on Ultrasonic Flowmeters for Liquid and Energy Monitoring

**FDT-40/40E Series**

- Fits pipe sizes from 12 to 2540 mm
- Measures Energy Consumption
- Clamp-on Ultrasonic Flowmeter with Bi-Directional Flow Measurement
- Rugged, Aluminium Enclosure
- Rate and Total Backlit Display
- 4 to 20 mA and Dual Alarm Outputs
- USB Programming Port
- RS485 MODBUS® Network Connection

www.omega.co.uk/fdt-40
Ultrasonic Flowmeters

Ultrasonic Meter for Liquids with Sound Reflectors or Gas Bubbles

FD-400 Series

- Measures the Flow of Liquids with Suspended Particles or Bubbles Larger than 100 Microns
- Non-Invasive, Clamp-On Transducer for Most Pipes from 6 mm to 3m (1/4 to 120 in.)
- Wide Measuring Range of 0.05 to 9 mps (0.15 to 30 fps)
- Power Supply Selector Jumper Switch to change 115/230 Vac or 12-28vdc

www.omega.co.uk/fd-400

Ultrasonic Measurement and Leakage Detection

FDT500

- Available with DIN 32 to 200 or 2 to 8 Inch Flanges
- Battery Powered
- Displays Flow Rate and Total
- Extended Low Flow Range
- Virtually No Pressure Loss
- No Moving Parts for Long Life
- USB/RS232 and 4-20MA (Optional)

www.omega.co.uk/fdt500
<table>
<thead>
<tr>
<th>Suitability</th>
<th>Clean</th>
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<th>Conductive</th>
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<th>Slurries</th>
<th>Corrosive</th>
<th>Reverse Flow</th>
<th>Pulsating Flow</th>
<th>Semi Filled Pipes</th>
<th>Open Channel</th>
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<tr>
<td>Suitable Gases</td>
<td>Steam</td>
<td>Clean</td>
<td>Wet</td>
<td>Contaminated</td>
<td>Corrosive</td>
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## Magnetic Flowmeters Applications

<table>
<thead>
<tr>
<th>Page</th>
<th>Magnetic Flowmeter</th>
<th>Accuracy</th>
<th>Repeatability</th>
<th>Down Turn Ratio</th>
<th>Max Flow</th>
<th>Max Pressure</th>
<th>Max Temp</th>
<th>Min Temp</th>
<th>Output</th>
<th>Connection</th>
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<tr>
<td>12</td>
<td>FMG600</td>
<td>±0.5% from 5 to 100% Qs, ±1% from 1 to 5% Qs</td>
<td>±0.1% RD</td>
<td>100:1</td>
<td>26,687 LPM</td>
<td>145 PSIG/10 BARG</td>
<td>150 °C</td>
<td>0 °C</td>
<td>Adjustable from 0.1 to 1000 gallons/ pulse/ 4-20mA, RS485</td>
<td>ANSI Cl.150lb Flange</td>
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<td>FMG90</td>
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<td>±1% RD</td>
<td>60:1</td>
<td>300 LPM</td>
<td>145 PSIG/9.6 BARG</td>
<td>60 °C</td>
<td>-10 °C</td>
<td>Frequency PNP or NPN open collector</td>
<td>BSP or NPT Thread</td>
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<td>13</td>
<td>FMG70B</td>
<td>±1.5% RD with ±0.3% Range</td>
<td>±1% RD</td>
<td>60:1</td>
<td>250 LPM</td>
<td>232 PSIG/16 BARG</td>
<td>90 °C</td>
<td>-20 °C</td>
<td>Frequency 4 to 20 mA</td>
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<td>14</td>
<td>FMG3000</td>
<td>±1% RD with ±0.01% m/s</td>
<td>±0.5% RD</td>
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<td>21,700 LPM</td>
<td>145 PSIG/9.6 BARG</td>
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<td>PNP/NPN Frequency</td>
<td>Tee/saddle Fittings</td>
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</table>
**Electromagnetic Flowmeter**

**Designed for Measurement of Conductive Liquids**

**FMG600 Series**

The FMG600 meters have no moving parts and a PTFE lining.

These magnetic meters can handle many harsh applications and standard outputs include analogue, frequency, and RS485 communications. Optional sanitary mounting allows for use of the FMG600 flowmeters in applications not previously open to magmeters. Local and remote display models are available.

- Virtually No Pressure Loss
- Suitable for Pipes Up to 12”
- CE Approved
- 4 to 20 mA and Frequency Outputs
- Empty Pipe Indication with Alarm
- Batch Control Function

### Specifications

<table>
<thead>
<tr>
<th>Flange Sizes:</th>
<th>150# ANSI: 19 to 305 mm (¾ to 12”)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Sanitary Tri-Clamp: 13 to 305 mm (½ to 12”)</td>
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<tr>
<td>Maximum Pressure:</td>
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<tr>
<td>Minimum Conductivity:</td>
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<td>Electrode Material:</td>
<td>Hastelloy C4</td>
</tr>
<tr>
<td>Environmental Temperature:</td>
<td>-5 to 55°C</td>
</tr>
<tr>
<td>Sensor Lining:</td>
<td>PTFE</td>
</tr>
<tr>
<td>Liquid Temperature:</td>
<td>0 to 50°C Standard</td>
</tr>
<tr>
<td></td>
<td>0 to 150°C with remote electronics</td>
</tr>
<tr>
<td>Accuracy:</td>
<td>±0.5% from 5 to 100% Qs, ±1% from 1 to 5% Qs</td>
</tr>
<tr>
<td>Repeatability:</td>
<td>±0.1% RD</td>
</tr>
<tr>
<td>Output:</td>
<td>Adjustable from 0.1 to 1000 gallons/pulse</td>
</tr>
<tr>
<td>Current:</td>
<td>4 to 20 mA with galvanic isolation</td>
</tr>
<tr>
<td>Communications:</td>
<td>RS485</td>
</tr>
<tr>
<td>Power:</td>
<td>24 Vdc, 115/230 Vac switchable (optional)</td>
</tr>
</tbody>
</table>

**Applications**

- Wastewater
- Pulp
- Food & Dairy
- slurries
Electromagnetic Flowmeter for OEM Applications
FMG90 Series

- Electromagnetic Flowmeter with No Moving Parts
- Independent to Changes of Temperature, Pressure, Viscosity
- Lightweight and Compact Design
- PVDF and 316L Wetted Parts
- Response Time < 100 mS
- Six Flow Ranges

www.omega.co.uk/fmg90

Electromagnetic Flowmeter for Extremely Small Spaces
FMG70B

- Extremely Compact
- Intended for Continuously Measuring
- No Moving Parts
- No Flow Obstructions
- Maintenance Free
- Operation / Flow Indicator LED
- Response Time < 500 mS
- Straight Pipe Requirements, Inlet:10 x ID Outlet: 5 x ID

www.omega.co.uk/fmg70B
Magnetic Flowmeters

Magnetic Flowmeter for Contaminated Liquid
FMG3000 and FMG3100 Series

- Can be Used in Contaminated Liquids
- For 0.5 to 8 inch Pipes
- 0.05 to 5 m/s (0.15 to 16.4 ft/s) Flow Rate Range
- Bi-Directional Flow Measurements
- Blind 4 to 20 mA or Frequency Output
- Remote Display Option
- Corrosion Resistant Polypropylene

www.omega.co.uk/fmg3000_fmg3100

Magnetic Flowmeter for Changing Viscosities and Pulsating Flows
FMG980 Series

- For Use with Conductive Liquids
- No Moving Parts
- Stainless Steel, Brass, and PVC Versions
- Suitable for Difficult Applications with Changing Viscosities and Pulsating Flows
- Perfect for “Debris Filled” Applications
- Square Wave Pulse Output

www.omega.co.uk/fmg980
Mass Gas Flowmeter Selection Guide

Mass flowmeters are able to perform and indicate measurement, and provide measurement control.

### Mass Gas Flowmeter Applications

<table>
<thead>
<tr>
<th>Page</th>
<th>Mass Flowmeter</th>
<th>Accuracy</th>
<th>Repeatability</th>
<th>Down Turn Ratio</th>
<th>Max Flow</th>
<th>Max Pressure</th>
<th>Max Temp</th>
<th>Min Temp</th>
<th>Output</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>FMA-LP2600A</td>
<td>± 0.8% RD ± 0.2% FS</td>
<td>±0.2% FS</td>
<td>±0.2% FS</td>
<td>200:1</td>
<td>3000 SLPM</td>
<td>50 PSIG / 3.4 BARG</td>
<td>50 °C</td>
<td>-10 °C</td>
<td>4 to 20 mA, 0 to 10 Vdc</td>
</tr>
<tr>
<td>16</td>
<td>FMA-2600A</td>
<td>± 0.8% RD ± 0.2% FS</td>
<td>±0.2% FS</td>
<td>±0.2% FS</td>
<td>200:1</td>
<td>3000 SLPM</td>
<td>145 PSIG / 9.6 BARG</td>
<td>50 °C</td>
<td>-10 °C</td>
<td>0 to 5 volts and 4 to 20 mA</td>
</tr>
<tr>
<td>17</td>
<td>FMA1700A</td>
<td>± 1.5% FS ± 0.5% FS</td>
<td>±0.2% FS</td>
<td>±0.2% FS</td>
<td>40:1</td>
<td>1000 SLPM</td>
<td>100 PSIG / 6.8 BARG</td>
<td>50 °C</td>
<td>0 °C</td>
<td>0 to 5 volts and 4 to 20 mA</td>
</tr>
<tr>
<td>17</td>
<td>FMA6600</td>
<td>± 1% FS ± 0.15% FS</td>
<td>±0.2% FS</td>
<td>±0.2% FS</td>
<td>50:1</td>
<td>100 SLPM</td>
<td>500 PSIG / 34.5 BARG</td>
<td>50 °C</td>
<td>0 °C</td>
<td>0 to 5 volts, 4 to 20 mA, RS485, RS232, Relay -output</td>
</tr>
<tr>
<td>18</td>
<td>FMA5600</td>
<td>±1% of FS ±0.15% FS</td>
<td>±0.2% FS</td>
<td>±0.2% FS</td>
<td>50:1</td>
<td>500 SCCM</td>
<td>500 PSIG / 34.5 BARG</td>
<td>25 °C</td>
<td>15 °C</td>
<td>RS-485, RS-232, 0 to 5 Vdc or 4 to 20 mA</td>
</tr>
<tr>
<td>18</td>
<td>FMA-A2000</td>
<td>± 1% FS ± 0.15% FS</td>
<td>±0.2% FS</td>
<td>±0.2% FS</td>
<td>100:1</td>
<td>100 SLPM</td>
<td>500 PSIG / 34.4 BARG</td>
<td>50 °C</td>
<td>0 °C</td>
<td>0 to 5 volts, 4 to 20 mA</td>
</tr>
<tr>
<td>19</td>
<td>FMA4300</td>
<td>± 1% FS ± 0.15% FS</td>
<td>±0.2% FS</td>
<td>±0.2% FS</td>
<td>50:1</td>
<td>100 SLPM</td>
<td>500 PSIG / 34.4 BARG</td>
<td>50 °C</td>
<td>5 °C</td>
<td>0 to 5 volts, 4 to 20 mA, RS232, RS485</td>
</tr>
<tr>
<td>19</td>
<td>FMA-PC16</td>
<td>± 0.8% RD ± 0.2% FS</td>
<td>±0.2% FS</td>
<td>±0.2% FS</td>
<td>200:1</td>
<td>1500 SLPM</td>
<td>145 PSIG / 9.6 BARG</td>
<td>50 °C</td>
<td>-10 °C</td>
<td>RS232, USB</td>
</tr>
</tbody>
</table>
Mass Gas Flowmeters

Low Pressure Drop Gas Mass Flow Meters and Controllers for Clean Gases
FMA-LP2600A

- 130+ Gas Calibrations Including Pure and Mixed Gases
- Pressure, Temperature, and Mass Flow Displayed
- PID Operated Proportional Control Valve
- Response Time of 50 to 100 ms
- Turndown Ratio of 200:1
- RS232 Standard
- Optional 2 x Analogue Outputs

www.omega.co.uk/fma-lp2600a

Mass Flow Meters and Controllers with 20+ Gas Select Functions
FMA-2600 Series

- 20+ Gas Calibrations Including: He, O₂, Neon, N₂O, N₂, Air, Argon, CO, CO₂, Methane, Ethane, Propane, Butane, Acetylene, Ethylene, H₂
- Pressure, Temperature, Volumetric and Mass Flow Simultaneously Displayed
- Adjustable Response Time - Typical 100 mS
- No Warm Up Time

www.omega.co.uk/fma2600_fvl2600

www.omega.co.uk/fma2600_fvl2600
Gas Mass Flowmeters and Controllers for Clean Gases
FMA1700A and FMA5500A

- Read and Control Gas Mass Flow without Temperature or Pressure Compensation
- Tilting LCD Display for Easy Reading
- Ideal for In-The-Field Calibration of Flowmeters or Testing of Air Sampling Equipment
- Aluminium/Brass Construction for Typical Gas Flows, 316 SS Construction for Applications Requiring more Corrosion Resistance.

www.omega.co.uk/FMA1700A_1800A

Multi Parameter Mass Flowmeter
FMA6600

- Multi-Drop Capability of up to 256 Units
- Stores Calibration Data for Up to 10 Different Gases
- 10 Different Engineering Units
- Programmable 12 Digits Totaliser
- High and Low Alarm
- Internal Conversion Factors of up to 32 Gases

www.omega.co.uk/fma6600_fma6700
Mass Gas Flowmeters

Gas Mass Flow Controller with Alarm Functions for Clean Gases
FMA6500ST Series

- Digital and Analogue Modes Operate Simultaneously
- Programmable Flow Configurations
- RS485 Standard, Multi-Drop Capability of Up to 256 units
- Stores Calibration Data for Up to 10 Gases
- Totaliser Indicates Total Gas Quantity

www.omega.co.uk/fma6500

Mass Flowmeter with or without Integral Display
FMA-A2000 Series

- Stainless Steel Versions Available
- Thermal Technology to Directly Measure Mass Flow of Gases
- No Temperature, Pressure or Square Root Corrections are Required
- Linear Output
- Specific Gas Calibration
- Power Supply Included

www.omega.co.uk/fmaa2100_2200_2300_2400
Mass Flowmeter and Totaliser for Gas
FMA-4100/4300 Series

- Mass Flow Totaliser and Meter with 23 Selectable Units
- Programmable Totaliser
- High and Low Gas Flow Alarms
- Selectable Analogue 0 to 5 Vdc or 4 to 20 mA Outputs
- Internal Conversion Factors for Up to 32 Gases
- Digital Interface RS-232 Standard

www.omega.co.uk/fma4100_4300

Portable Mass Flowmeter and Calibration Kit
FMA-PC16

- Ranges of 0 to 0.5 SCCM up to 0 to 1500 SLM
- 30+ Gas Calibrations Including Air, Ar, CH4, CO, CO2, Ethane, H2, He, N2, N2O, Neon, O2, Propane, Butane, Iso-Butane, Acetylene, Ethylene, Krypton, Xenon, and Sulfur Hexafluoride
- Simultaneously Display Pressure, Temperature, Volumetric and Mass Flow

www.omega.co.uk/fma-pc16
### Vortex Flowmeter Selection Guide

Vortex flowmeters are able to perform and indicate measurement, and provide measurement control.

<table>
<thead>
<tr>
<th>Suitable Fluids</th>
<th>Clean</th>
<th>Dirty</th>
<th>Conductive</th>
<th>Viscous</th>
<th>Slurries</th>
<th>Corrosive</th>
<th>Reverse Flow</th>
<th>Pulsating Flow</th>
<th>Semi Filled Pipes</th>
<th>Open Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Suitable Gases</th>
<th>Steam</th>
<th>Clean</th>
<th>Wet</th>
<th>Contaminated</th>
<th>Corrosive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page</th>
<th>Vortex Flowmeter</th>
<th>Accuracy</th>
<th>Repeatability</th>
<th>Down Turn Ratio</th>
<th>Max Flow</th>
<th>Max Pressure</th>
<th>Max Temp</th>
<th>Min Temp</th>
<th>Output</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>FV-500C Series</td>
<td>±0.75% FS-Liquid</td>
<td>±0.2% FS</td>
<td>20:1</td>
<td>9492 GPM / 2155 LPM</td>
<td>914 PSIG / 63 BARG</td>
<td>260 °C</td>
<td>-40 °C</td>
<td>4 to 20 mA, Pulse Output, Open Collector</td>
<td>ANSI 150, 300 LB Flange</td>
</tr>
<tr>
<td>21</td>
<td>FV100</td>
<td>±5% FS</td>
<td>±0.25% FS</td>
<td>10:1</td>
<td>600 GPM / 136 M3/Hr</td>
<td>200 PSIG / 13 BARG</td>
<td>66 °C</td>
<td>0 °C</td>
<td>4 to 20 mA</td>
<td>FNPT fitting, ANSI 150lb flange (on 3&quot; &amp; 4&quot;)</td>
</tr>
</tbody>
</table>
Measures Steam, Gas and Low Viscosity Liquids
FV-500C Series

- Measures Steam, Gas and Low Viscosity Liquids
- Displays Simultaneous Flow Rate and Process Diagnosis
- Compact Housing is Light, Small and Easy to Handle
- Simultaneous Analogue and Pulse Outputs (Pulse requires Display)
- Low Flow Stability
- Advanced Self-Diagnostics

www.omega.co.uk/fv500C

Vortex Shedding Flowmeter and Temperature Transmitter
FV100 Series

- Can be Used with Non-Viscous, Clean, or Dirty Liquids that are Compatible with Brass, PVDF and FKM
- Ideal for Cooling Loops using Water or 50% Glycols, and for Water-Soluble Machine Coolant (up to 10%).
- Individual 4 to 20 mA Outputs for Flow and Temperature
- No Moving Parts
- For Industries Including Rubber, Steel, Fabrication, Manufacturing, Refining, Paper, Chemical, Food, Petrochemical, and Power

www.omega.co.uk/fv100
## Variable Area Flowmeters Selection Guide

Variable area flowmeters are able to indicate measurement and provide control.

### Variable Area Flowmeters Applications

<table>
<thead>
<tr>
<th>Suitable Fluids</th>
<th>Clean</th>
<th>Dirty</th>
<th>Conductive</th>
<th>Viscous</th>
<th>Slurries</th>
<th>Corrosive</th>
<th>Reverse Flow</th>
<th>Pulsating Flow</th>
<th>Semi Filled Pipes</th>
<th>Open Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Limited</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Suitable Gases</th>
<th>Steam</th>
<th>Clean</th>
<th>Wet</th>
<th>Contaminated</th>
<th>Corrosive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Variable Area Flowmeter Specifications

<table>
<thead>
<tr>
<th>Page</th>
<th>Variable Area Flowmeter</th>
<th>Accuracy</th>
<th>Repeatability</th>
<th>Down Turn Ratio</th>
<th>Max Flow</th>
<th>Max Pressure</th>
<th>Max Temp</th>
<th>Min Temp</th>
<th>Output</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>FL-2000 Series</td>
<td>±0.25% FS</td>
<td>±0.25% FS</td>
<td>10:1</td>
<td>4000 LPM</td>
<td>100 PSIG</td>
<td>65 °C</td>
<td>0 °C</td>
<td>N/A</td>
<td>Brass as standard, stainless steel and plastic available 1/8” 1/4” &amp; 1” FNPT Fittings</td>
</tr>
<tr>
<td>23</td>
<td>FL-3600</td>
<td>±2% FS</td>
<td>±0.25% FS</td>
<td>10:1</td>
<td>59 LPM</td>
<td>200 PSIG/13.8 BARG</td>
<td>121 °C</td>
<td>0 °C</td>
<td>N/A</td>
<td>1/8 FNPT</td>
</tr>
<tr>
<td>24</td>
<td>FL-2500</td>
<td>±5% FS</td>
<td>±0.25% FS</td>
<td>10:1</td>
<td>AIR: 50 LPM W/ WATER: 1.4 LPM</td>
<td>100 PSIG/6.9 BARG</td>
<td>65 °C</td>
<td>0 °C</td>
<td>N/A</td>
<td>1/8 FNPT</td>
</tr>
<tr>
<td>24</td>
<td>FLD Series</td>
<td>±5% FS</td>
<td>±0.25% FS</td>
<td>10:1</td>
<td>GASES: 42 LPM / LIQUID: 2 LPM</td>
<td>200 PSIG/13.8 BARG</td>
<td>121 °C</td>
<td>0 °C</td>
<td>N/A</td>
<td>1/8 FNPT</td>
</tr>
</tbody>
</table>
Acrylic Flowmeters for Water and Air
FL-2000 Series

- Water Ranges from 4 CCM to 20 USGPM
- Air Ranges from 40 CCM to 4000 LPM
- Threaded Brass Inserts for Quick Installation
- Easy Disassembly and Assembly for Maintenance
- Applications:
  - Air Sampling Equipment
  - Gas Analysers
  - Medical Systems
  - Desalination Equipment
  - Water Treatment and Distribution Systems

www.omega.co.uk/fl2000

65 and 150 MM Variable Area Flowmeters
FL-3600 Series

- Aluminium and Stainless Steel Frames Available
- Easy-to-Read Scale Design
- Special Lock Nut Design for Easy Tube Replacement
- Shielded for Pressurized Systems
- Panel Mounting Design
- Millimeter Scale and Correlation Charts to Measure a Large Range of Gases

www.omega.co.uk/fl3600_fl3800
Variable Area Flowmeters

Variable Area Flowmeters with or without Needle Valve
FL-2500 Series

- Easy-to-Read Dual Imperial and Metric Scales
- Interchangeable Scales for 6 Common Gases and Water
- Economical and Compact
- Easy Disassembly and Assembly for Cleaning
- Each Kit Includes Seven Interchangeable Direct Read Scales for Air, Water, Argon, CO₂, Helium, Nitrogen and Oxygen

www.omega.co.uk/fl-2500_series

Variable Area Flowmeters for Gas and Liquid
FLD Series

- Measures Air, Water, N2, H2, CO₂, Ar, He, and O2
- Rib-Guided or Fluted Metering Tubes Facilitate Stable, Accurate Readings
- Magnifier Lens Enhances Reading Resolution
- Interchangeability of Flow Tubes and Floats
- Simple Means of Panel Mounting

www.omega.co.uk/fld
### Positive Displacement Flowmeter Guide

PD flowmeters are able to perform measurement, provide control, and indicate measurement.

#### PD Flowmeter Applications

<table>
<thead>
<tr>
<th>Suitable Fluids</th>
<th>Clean</th>
<th>Dirty</th>
<th>Conductive</th>
<th>Viscous</th>
<th>Slurries</th>
<th>Corrosive</th>
<th>Reverse Flow</th>
<th>Pulsating Flow</th>
<th>Semi Filled Pipes</th>
<th>Open Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Suitable Gases</th>
<th>Steam</th>
<th>Clean</th>
<th>Wet</th>
<th>Contaminated</th>
<th>Corrosive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>No</td>
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<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page</th>
<th>Positive Displacement</th>
<th>Accuracy</th>
<th>Repeatability</th>
<th>Down Turn Ratio</th>
<th>Max Flow</th>
<th>Max Pressure</th>
<th>Max Temp</th>
<th>Min Temp</th>
<th>Output</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>FPD3300</td>
<td>±0.5% RD</td>
<td>±0.03%</td>
<td>15:1</td>
<td>317 GPM / 1200 LPM</td>
<td>2000 PSIG / 137 BARG</td>
<td>80 °C</td>
<td>-40 °C</td>
<td>4 to 20 mA,</td>
<td>DIN, JIS, ANSI, NPT or BSP</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>26</td>
<td>FPD3100</td>
<td>±0.5% RD</td>
<td>±0.03%</td>
<td>15:1</td>
<td>8 GPM / 30 LPM</td>
<td>150 PSIG / 10 BARG</td>
<td>80 °C</td>
<td>-40 °C</td>
<td>4 to 20 mA,</td>
<td>BSP or NPT thread</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>FPD3000</td>
<td>±1% RD</td>
<td>±0.03%</td>
<td>15:1</td>
<td>130 GPM / 500 LPM</td>
<td>500 PSIG / 34.4 BARG</td>
<td>120 °C</td>
<td>-40 °C</td>
<td>4 to 20 mA,</td>
<td>Mechanical totaliser, DIN, JIS, ANSI, NPT or BSP</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>FPD2000</td>
<td>±0.5% RD</td>
<td>±0.1%</td>
<td>10:1</td>
<td>26,687 LPM</td>
<td>5000 PSIG/345 BARG</td>
<td>204 °C</td>
<td>0 °C</td>
<td>4 to 20 mA &amp; Pulse output</td>
<td>FNPT thread</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Positive Displacement Flow
Sensor for Solvents
FPD3300 Series

- Maintain Consistent Accuracy Despite Changing Viscosity
- Ideal for Solvents and Non-Abrasive Lubricating Fluids
- Affordable and Accurate
- Aluminium Body
- Temperatures up to 80 ºC
- BSP, NPT, JIS, DIN, ANSI Fittings Available
- Non-Display Version Available

www.omega.co.uk/fpd3300

Positive Displacement Flow
Sensor for Corrosive Liquids
FPD3100

- Ideal for Corrosive Environments
- Maintain Accuracy with Different Viscosity Ranges
- Affordable and Accurate
- Aluminium Body
- Temperatures up to 80 ºC
- NPT or BSP Threads
- Non-Display Version Available

www.omega.co.uk/fpd3100
Positive Displacement Flowmeters

Oval Gear Totaliser for Viscous Liquids
FPDM3000

- Measurement of Viscous Fluids
- Measures Temperatures up to 120°C
- BSP, NPT, JIS, DIN, ANSI Fittings Available
- Aluminium or Stainless Body
- Rate and Total Available in Gallons or Litres
- Maximum Viscosity: 1000 cPs standard
- Maximum Pressure: 3400 kPa (500 psi)

www.omega.co.uk/fpdm3000

Flowmeter for Oil, Grease, Fuel, Solvents, Polyurethanes and Brake Fluid
FPD2000 Series

- Ideal for Non-Abrasive Lubricating Fluids
- No Need for Straight Run Piping
- Economical Cost
- High Temperature Version Available
- Aluminium, 303 or 316 SS Bodies
- Bi-Directional Flow Capabilities

www.omega.co.uk/fpd2000_series
### Turbine Flowmeter Guide

Turbine flowmeters are able to perform measurement, indicate measurement and provide control.

#### Turbine Flowmeter Applications

<table>
<thead>
<tr>
<th>Suitable Fluids</th>
<th>Clean</th>
<th>Dirty</th>
<th>Conductive</th>
<th>Viscous</th>
<th>Slurries</th>
<th>Corrosive</th>
<th>Reverse Flow</th>
<th>Pulsating Flow</th>
<th>Semi Filled Pipes</th>
<th>Open Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Limited</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Suitable Gases</th>
<th>Steam</th>
<th>Clean</th>
<th>Wet</th>
<th>Contaminated</th>
<th>Corrosive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page</th>
<th>Turbine Flowmeter</th>
<th>Accuracy</th>
<th>Repeatability</th>
<th>Down Turn Ratio</th>
<th>Max Flow</th>
<th>Max Pressure</th>
<th>Max Temp</th>
<th>Min Temp</th>
<th>Output</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>FTB600B</td>
<td>±1% RD</td>
<td>±1% RD</td>
<td>30:1</td>
<td>120 LPM</td>
<td>150 PSIG/10.3 BARG</td>
<td>82 °C</td>
<td>-40 °C</td>
<td>Pulse PNP/NPN frequency</td>
<td>Hose fitting, NPT Fitting</td>
</tr>
<tr>
<td>29</td>
<td>FTB2000</td>
<td>±3% RD</td>
<td>±0.5% RD</td>
<td>15:1</td>
<td>30 LPM</td>
<td>198 PSIG/13.7 BARG</td>
<td>100 °C</td>
<td>-20 °C</td>
<td>Pulse NPN sinking open collector</td>
<td>3/8&quot; NPT Fitting</td>
</tr>
<tr>
<td>30</td>
<td>FTB-1400</td>
<td>±1% RD</td>
<td>±0.1% RD</td>
<td>10:1</td>
<td>681 LPM</td>
<td>5000 PSIG/345 BARG</td>
<td>Up to 232 °C</td>
<td>-101 °C</td>
<td>Pulse 4 to 20 mA</td>
<td>NPT, BSP Optional</td>
</tr>
<tr>
<td>30</td>
<td>FTB-700S</td>
<td>±1% FS</td>
<td>-</td>
<td>100:1</td>
<td>11,350 LPM</td>
<td>200 PSIG/13.8 BARG</td>
<td>93 °C</td>
<td>0 °C</td>
<td>Pulse 4 to 20 mA</td>
<td>ANSI cl. 150 lb Flange</td>
</tr>
<tr>
<td>31</td>
<td>FLR1000</td>
<td>±3% RD</td>
<td>±0.5 FS</td>
<td>5:1 (Gas) 10:1</td>
<td>500 L/ min(G) 10 L/ min(L)</td>
<td>500 PSIG/34.5 BARG (Liquid)</td>
<td>55 °C</td>
<td>5 °C</td>
<td>0 to 5V 4 to 20 mA pulse</td>
<td>NPT thread</td>
</tr>
<tr>
<td>31</td>
<td>FTB790</td>
<td>±1% RD</td>
<td>±0.1% RD</td>
<td>10:1</td>
<td>760 LPM</td>
<td>3000 PSIG/207 BARG</td>
<td>121 °C</td>
<td>-40 °C</td>
<td>Pulse 4 to 20 mA</td>
<td>BSP or NPT Thread, TRI-clamp</td>
</tr>
</tbody>
</table>
Flow Sensor for Low to Medium Corrosive Flows

FTB600B Series

- All Plastic, Perfect for Corrosive Environments
- For Translucent liquids Only
- Viscosity Range 1-15 cSt
- Six Flow Ranges, from 0.1 to 120 LPM
- Turn Down Up to 30:1
- Easily Mounts in Any Position
- Hose-Barb or Threaded Connections

www.omega.co.uk/ftb600

Flow Rate Sensor for OEM Applications Involving Low-Flow Monitoring

FTB2000 Series

- Economical and Ideal for OEM
- Measures Low Liquid Flow Rates of 0.5 to 29.9 l/m
- Can be Mounted in Any Position
- FTBMC2005 has 2-30 l/m Range, 3/8” BSPP Fitting and 1m Cable
- FTB2000 has 3/8” NPT Fitting and Spade Terminals for Electrical Connection

www.omega.co.uk/ftb2000
Turbine Flowmeters

Turbine Flowmeters with PVC or Carbon Steel Flanged Bodies

FTB700-C/FTB700-S Series

- Maximum Temperature of Carbon Steel Version: 93°C
- Maximum Temperature of PVC Version: 49°C
- Ideal for Long Life in Water and Water-Based Fluids
- Entire Rotor Assembly can be Easily Removed
- Precisely-Machined Helical Rotors and High-Quality Jewel Bearings
- Standard Meter Bodies are Flanged

www.omega.co.uk/ftb700

Liquid Turbine Flowmeters for the Oil Field

FTB1400 Series

- Rugged 316 Stainless Steel Construction Offers Long Service Life in Severe Operating Environments
- Available In NPT or BSP Threads
- Accurate and Repeatable Flow Measurement
- Installation in Pipe Sizes from 1/2 to 2 in.
- Turbine Temperature: -101 to 232 °C with High Temperature Magnetic Pulse Output Option

www.omega.co.uk/ftb1400_series
Turbine Flowmeters

Air/Water Flow Sensors with or without Display
FLR1000 Series

- Measures Extremely Low Flow Rates
- Ideal for Industrial and Laboratory Environments
- Incorporate into Data Acquisition Systems
- 0 to 5 Vdc Linear Output Signal
- Power Input 12 Vdc or 24 Vdc
- Ranges from 20 to 100 ml/min, 100 to 500 L/min

www.omega.co.uk/flr1000

Compact Turbine Flowmeters with Display
FTB790 Series

- Large Choice of Fitting Sizes
- Rate and Total Indication
- Display Models have Selectable Units of Litres, Gallons or 15-point user curve
- 6-Digit Display
- Battery and DC Powered for Pulse/4-20mA Output
- Easy Maintenance Design

www.omega.co.uk/ftb790
# Paddle Wheel Flowmeter Selection Guide

Paddle wheel flowmeters are able to perform measurement, certain models can perform measurement & control, and display the measurement.

## Paddle Wheel Applications

<table>
<thead>
<tr>
<th>Suitable Fluids</th>
<th>Clean</th>
<th>Dirty</th>
<th>Conductive</th>
<th>Viscous</th>
<th>Slurries</th>
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<tr>
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<td>No</td>
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<td>No</td>
</tr>
</tbody>
</table>

## Paddle Wheel Flowmeters

<table>
<thead>
<tr>
<th>Page</th>
<th>Paddle wheel</th>
<th>Accuracy</th>
<th>Repeatability</th>
<th>Down Turn Ratio</th>
<th>Max Flow</th>
<th>Max Pressure</th>
<th>Max Temp</th>
<th>Min Temp</th>
<th>Output</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>FPR-200</td>
<td>±2% FS</td>
<td>±0.5% FS</td>
<td>10:1</td>
<td>189.3 LPM /50 GPM</td>
<td>500 PSIG /34 BARG</td>
<td>107 °C</td>
<td>-7 °C</td>
<td>4 to 20 mA or 0 to 5 Vdc</td>
<td>NPT fittings/ NPT to BSPP/BSPT adapters available</td>
</tr>
<tr>
<td>33</td>
<td>FP1408</td>
<td>±1% FS</td>
<td>±0.25% FS</td>
<td>10:1</td>
<td>35 GPM / 132 LPM</td>
<td>150 PSIG / 10 BARG</td>
<td>60 °C</td>
<td>0 °C</td>
<td>4 to 20 mA or 1 to 5 Vdc</td>
<td>NPT threads</td>
</tr>
<tr>
<td>34</td>
<td>FP-5600</td>
<td>±1% FS</td>
<td>±0.5% FS</td>
<td>66:1</td>
<td>0.1 to 6 m/s</td>
<td>0.3 to 20 fps</td>
<td>200 PSIG / 13.8 BARG at 20 °C</td>
<td>85 °C at 1.7 BARG / 25 PSIG</td>
<td>-18 °C</td>
<td>Open collector output</td>
</tr>
<tr>
<td>34</td>
<td>FP-6500</td>
<td>±1.5% FS</td>
<td>±1% FS</td>
<td>10:1</td>
<td>29,140 GPM, 6,618 M3/HR based on velocity of 3 m/s</td>
<td>200 PSIG / 13.8 BARG</td>
<td>93 °C</td>
<td>0 °C</td>
<td>Frequency output, 4-20mA output</td>
<td>NPT thread fitting</td>
</tr>
</tbody>
</table>
Paddle Wheel Flowmeters

Liquid Flow Transmitters
FPR200 Series

- Ideal for Cooling Circuits and HVAC Systems
- Blind/Visual Indication with an Analogue or Pulse Output Available
- Available in Polypropylene/Stainless Steel Bodies
- Ideal for Fluids with Viscosity of 5 cPs
- Different O-Ring Seal Materials Available

www.omega.co.uk/fpr200

Digital Plastic Paddle Wheel for Flow and Temperature
FP1400 Series

- Includes Sensor and Alarms for Flow and Temperature
- 29 Engineering Unit
- Two Programmable Totalisers
- Programmable Alarms
- Isolated Analogue 0 to 5 Vdc or 4 to 20 mA
- RS232 Communications Standard

www.omega.co.uk/fp1400
Paddle Wheel Flowmeters

Insertion Paddle Wheel Flow Sensors
FP-6500

- Can Transmit a Signal Long Distance without a Transmitter over Unshielded Cable
- Available in 316 Stainless Steel or Brass
- Installs in a Wide Range of Pipe Sizes From 2" to 40"
- Excellent Low-Flow Performance
- NEMA-4 Housing
- Special Fittings Not Required

www.omega.co.uk/FP6500

Low Flow Sensors
FP-5600

- Measures Low Flow from 0.1 m/s
- High Resolution and Noise Immunity
  Sensor can be Installed 300 Metres Away
- Installs into Pipe Sizes: DN15 to DN900, 0.5" to 36"
- Wide Chemical Compatibility
- Comes with Standard 7.6 Metre Cable
- Low pressure drop

www.omega.co.uk/fp5600_8500a
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