**FTB-100 Series**

- ±0.5% of Reading Accuracy
- Ball Bearing Design for Economy
- Non-Metallic Bearing Retainers for Long Life
- Replacement Bearings Field Installable Without Loss of Calibration
- Disassembles Quickly for Easy Maintenance
- Deflector Cones Stabilize Low Mass Rotor for Increased Bearing Life
- 4 to 20 mA, 0 to 5 V, and Scaled Frequency Outputs Available

The FTB-100 Series of turbine meters have a shielded ball bearing design for high-accuracy performance (±0.5% of reading, not full scale) at an economical cost. The non-metallic bearing retainers minimize friction, thereby allowing these meters to be used with clean fluids that have poor lubricating properties (i.e., water). Ball bearings also give the widest linear flow range, particularly in larger turbines. Bearing replacement and clean-up are fast and easy, since all internal parts are easily accessible by removing a single nut.

These turbine flow meters have a low mass rotor design which allows rapid dynamic response, so they can be used in pulsating flow applications.

Deflector cones eliminate downstream thrust on the rotor and allow hydrodynamic positioning of the rotor between the cones. This provides wider rangeability and longer bearing life than conventional turbine flow meters. Integral flow-straightening tubes minimize the effects of upstream turbulence.

**FTB-100 Turbine Meters** are available with integral signal conditioners which provide scaled and unscaled frequencies, 4 to 20 mA, or 0 to 5 volt outputs. Units without integral signal conditioners are supplied with mating connector for two-wire hook-up.

**SPECIFICATIONS**

- **Accuracy:** ±0.5% of reading
- **Repeatability:** ±0.1% of reading
- **Maximum Temperature Range:** -268 to 232°C (-450 to 450°F)
- **Maximum Intermittent Overrange:** 150% of maximum range
- **Minimum Output Amplitude:** 30 mV
- **Peak-to-Peak unscaled pulse**

**Materials of Construction:**

- **Body:** 304 stainless steel
- **Rotor:** 17-4 PH steel
- **Bearings:** Ceramic

**Minimum straight pipe requirements:**

- 10 pipe diameters upstream, 5 downstream
Economical Ball Bearing Design with NPT End Fittings

Complete The System

SIGNAL CONDITIONERS
4 to 20 mA, amplified pulse, or 0 to 5 Vdc.

SELECT 1 OR 2

1 DISPLAY, ALARM, CONTROL DPF60
Pulse output and voltage or current output.

2 DISPLAY, TOTALIZE, AND BATCH CONTROL
Scaled pulse or current output DPF701.

NIST Calibration for Other Viscosity Liquids*

<table>
<thead>
<tr>
<th>Viscosity Range</th>
<th>Meter Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6 to 99 cSt</td>
<td>100 to 299 cSt</td>
</tr>
<tr>
<td>FTB-101 thru 106</td>
<td>½ thru 1&quot;</td>
</tr>
<tr>
<td>FTB-107 thru 109</td>
<td>1¼ thru 2&quot;</td>
</tr>
<tr>
<td>FTB-110 thru 111</td>
<td>2½ thru 3&quot;</td>
</tr>
</tbody>
</table>

* Standard NIST calibration is for water (viscosity = 1 cSt)

To Order

<table>
<thead>
<tr>
<th>Turbine Meter Only Model No.†</th>
<th>Linear Flow Range for Water LPM (GPM)</th>
<th>MNPT End Fittings</th>
<th>Maximum Operating Pressure (psig)</th>
<th>Maximum Pressure Drop (psid)</th>
<th>Length mm (inch)</th>
<th>Nominal K-Factor (Pulses/Gallon)</th>
<th>Weight kg (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTB-101</td>
<td>1.32 to 13.2 (0.35 to 3.5)</td>
<td>½</td>
<td>5000</td>
<td>3.0</td>
<td>62 (2.45)</td>
<td>13,000</td>
<td>0.4 (1)</td>
</tr>
<tr>
<td>FTB-102</td>
<td>2.84 to 28.4 (0.75 to 7.5)</td>
<td>½</td>
<td>5000</td>
<td>5.0</td>
<td>62 (2.45)</td>
<td>10,000</td>
<td>0.4 (1)</td>
</tr>
<tr>
<td>FTB-103</td>
<td>4.73 to 36.0 (1.25 to 9.5)</td>
<td>½</td>
<td>5000</td>
<td>5.2</td>
<td>62 (2.45)</td>
<td>6000</td>
<td>0.4 (1)</td>
</tr>
<tr>
<td>FTB-104</td>
<td>6.62 to 61 (1.75 to 16)</td>
<td>½</td>
<td>5000</td>
<td>3.0</td>
<td>70 (2.75)</td>
<td>4100</td>
<td>0.4 (1)</td>
</tr>
<tr>
<td>FTB-105</td>
<td>9.5 to 110 (2.5 to 29)</td>
<td>½</td>
<td>4250</td>
<td>5.0</td>
<td>83 (3.25)</td>
<td>2200</td>
<td>0.4 (1)</td>
</tr>
<tr>
<td>FTB-106</td>
<td>15 to 227 (4 to 60)</td>
<td>1</td>
<td>3850</td>
<td>5.1</td>
<td>89 (3.50)</td>
<td>640</td>
<td>0.9 (2)</td>
</tr>
<tr>
<td>FTB-107</td>
<td>23 to 352 (6 to 93)</td>
<td>1½</td>
<td>3850</td>
<td>4.3</td>
<td>99 (3.88)</td>
<td>410</td>
<td>0.9 (2)</td>
</tr>
<tr>
<td>FTB-108</td>
<td>30 to 492 (8 to 130)</td>
<td>1½</td>
<td>3000</td>
<td>3.0</td>
<td>111 (4.38)</td>
<td>230</td>
<td>1.4 (3)</td>
</tr>
<tr>
<td>FTB-109</td>
<td>57 to 852 (15 to 225)</td>
<td>2</td>
<td>2500</td>
<td>3.3</td>
<td>121 (4.75)</td>
<td>120</td>
<td>1.8 (4)</td>
</tr>
<tr>
<td>FTB-110</td>
<td>95 to 1514 (25 to 400)</td>
<td>2½</td>
<td>2250</td>
<td>4.0</td>
<td>154 (6.06)</td>
<td>62</td>
<td>2.3 (5)</td>
</tr>
<tr>
<td>FTB-111</td>
<td>151 to 2460 (40 to 650)</td>
<td>3</td>
<td>2000</td>
<td>4.0</td>
<td>191 (7.50)</td>
<td>55</td>
<td>3.2 (7)</td>
</tr>
</tbody>
</table>

* Additional cost

To Order

Comes complete with operator’s manual and 10-point NIST calibration certificate for water.

Ordering Examples:

FTB-101, ½ NPT turbine meter with standard NIST calibration for 1 cSt viscosity.

FTB-106, 1 NPT turbine meter with NIST calibration for 5 cSt viscosity liquid.

† Complete systems with signal conditioner available, consult sales.
FLSC-C1-LIQ

» Loop Powered
  4 to 20 mA
» Signal Linearization
» Factory Configuration Available
» Windows® Configuration Software*

The FLSC-C1-LIQ is a microprocessor controlled 2-wire 4 to 20 mA transmitter. The FLSC-C1-LIQ converts a low level, frequency signal from a flow sensor into an analog 4 to 20 mA output. The output is proportional to the flow rate. The FLSC-C1-LIQ is designed for integral mounting to the FTB-100, FTB-200 and FTB-400 Series** liquid turbines.

** Visit OMEGA for details.

SPECIFICATIONS
Input Signal Type: Magnetic pickup
Input Frequency Range: 0.2 Hz to 4 KHz
Signal Level: 10 mV rms to 30 Vdc
Power Supply: Loop power 10 to 30 Vdc
Reverse polarity protected
Loop Burden Voltage: 8.5V
Analog Output: 4 to 20 mA
24 mA overflow condition
Load Resistance: Maximum 650 Ω at 24 Vdc
Accuracy: ±0.02% of full scale
Temperature Drift: 40 ppm/degree C
Communications: RS232 port for configuration and diagnostics
Operating Temperature: -40 to 85°C (-40 to 185°F)
Humidity: 0 to 90% non-condensing
Enclosure: Extruded Aluminum
Explosion-Proof ATEX enclosure
Regulatory: CE Compliant
Up to 20 point linearization
Windows Configuration Software* (cable sold separately)

Dimensions: mm (inch)

<table>
<thead>
<tr>
<th>Conduit Hubs</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>133 (5.23)</td>
<td></td>
</tr>
<tr>
<td>122 (4.81)</td>
<td>121 (4.75)</td>
</tr>
<tr>
<td>140 (5.5)</td>
<td>156 (6.125)</td>
</tr>
<tr>
<td>92 (3.63)</td>
<td>7.9 (0.31)</td>
</tr>
<tr>
<td>6 (0.25)</td>
<td>Diameter Mounting Holes</td>
</tr>
</tbody>
</table>


To Order

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLSC-C1-LIQ</td>
<td>Loop-powered signal conditioner, 4 to 20 mA, CE/ATEX</td>
</tr>
<tr>
<td>OM-CONV-USB</td>
<td>USB to RS232 converter</td>
</tr>
<tr>
<td>FLSC-C-CABLE</td>
<td>Molex to 9-pin “D” connector</td>
</tr>
</tbody>
</table>

Comes complete with operator’s manual and enclosure.
* Available free at omega.com/ftp
Ordering Example: FLSC-C1-LIQ, loop-powered turbine signal conditioner in ATEX enclosure with FLSC-C-CABLE Molex to 9-pin “D” connector.
**INTEGRAL OR REMOTE SIGNAL CONDITIONER**

**FLSC-C3-LIQ**

- DC or AC Powered
- Pulse and Analog Outputs
- High or Low Alarms (Optional)
- 20 Point Linearization
- Factory Configuration Available
- Windows® Configuration Software*

The FLSC-C3-LIQ is a DC powered, microprocessor controlled transmitter. It outputs a pulse scaled per unit of flow, and analog signal proportional to flow rate.

The FLSC-C3-LIQ-AL can be configured with high or low alarms. The FLSC-C3-LIQ is designed for integral mounting to the FTB-100, FTB-200 and FTB-400 Series** liquid turbines.

**SPECIFICATIONS**

**Input Signal Type:** Magnetic pickup, MCP pickup, contact closure, pulse

**Input Frequency Range:** 0.2 Hz to 4 KHz

**Signal Level:** 10 mV rms to 30 Vdc

**Power Supply:** 13 to 30 Vdc reverse polarity protection

**Analog Output:** 4 to 20 mA, 1 to 5V 24 mA overflow condition

**Load Resistance:** Maximum 650 Ω at 24 Vdc

**Accuracy:** ±0.02% of full scale

**Temperature Drift:** 40 ppm/degree C

**Pulse Output:** 0 to 5V, 0 to 10V, open collector, AC square. Internal pull up 10 kΩ. Recommended minimum load resistance 50 kΩ

**Pulse Scaling:** Divide by 1, 10 or 100 per flow unit

**Hi/Lo Alarm (-AL Model) Optional:** Relay (2A, 30 Vdc), 0 to 5V, open collector (0.5A, 30V)

**Communications:** RS232 port for configuration and diagnostics

**Operating Temperature:** -40 to 85°C (-40 to 185°F)

**Humidity:** 0 to 90% non-condensing

**Enclosure:** Extruded aluminum explosion-proof ATEX

**Regulatory:** CE Compliant up to 20 point linearization Windows Configuration Software* (cable sold separately)

**Dimensions:** mm (inch)

| 3½-14 NPT Conduit Hubs | 92 (3.63) |
| 133 (5.23) |
| 156 (6.125) |
| 122 (4.81) |
| 140 (5.5) |
| 121 (4.75) |
| 6 (0.25) Diameter Mounting Holes |

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</thead>
<tbody>
<tr>
<td>FLSC-C3-LIQ</td>
<td>DC powered signal conditioner 4 to 20 mA, CE ATEX</td>
</tr>
<tr>
<td>FLSC-C3-AL-LIQ</td>
<td>DC powered signal conditioner 4 to 20 mA, alarm CE ATEX</td>
</tr>
<tr>
<td>OM-CONV-USB</td>
<td>USB to RS232 converter</td>
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<td>Molex to 9-pin “D” connector</td>
</tr>
</tbody>
</table>

*Comes complete with operator’s manual and enclosure.

*Available free at omega.com/ftp

**Ordering Example:** FLSC-C3-LIQ, DC powered turbine signal conditioner with FLSC-C-CABLE Molex to 9-pin “D” connector.