

TURBINE FLOW METER

Stand Alone or Complete Systems with Signal Conditioning

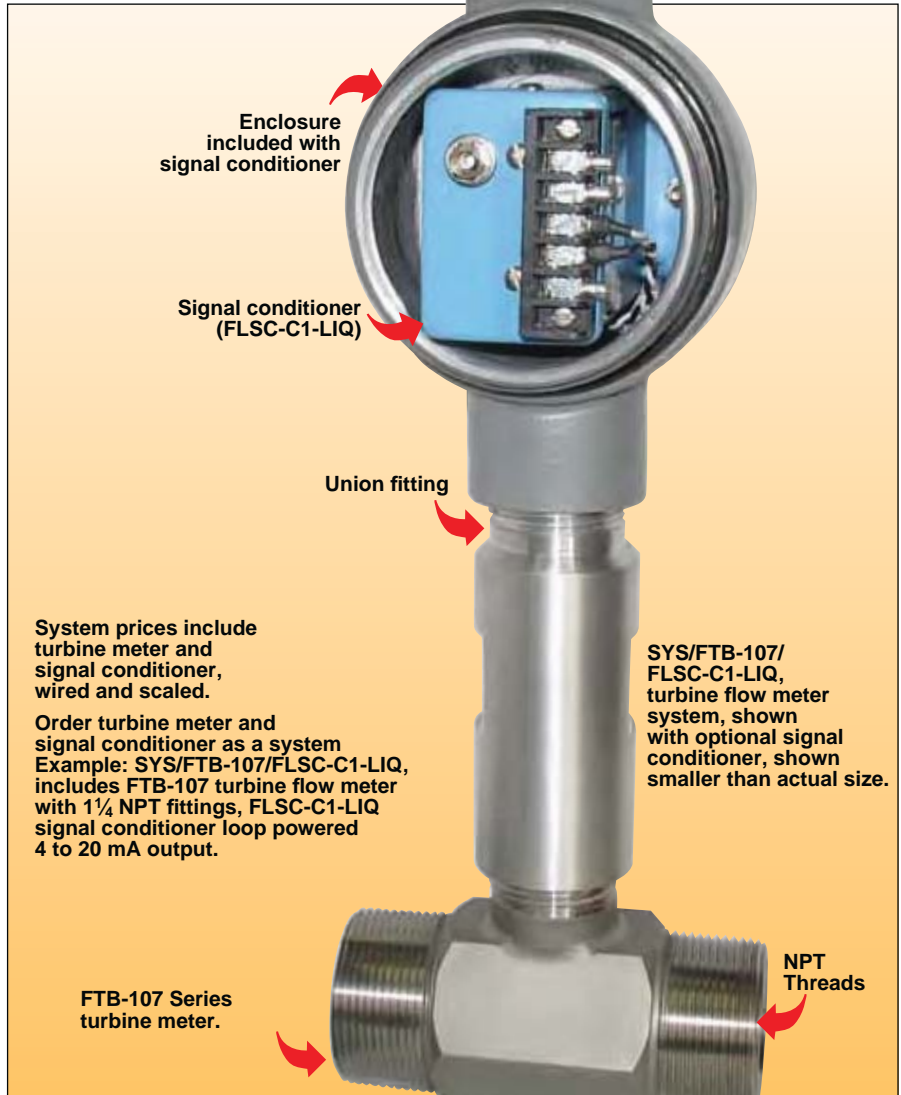
FTB-100 Series



- ✓ ±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 5V, and Scaled Frequency Outputs Available

The FTB-100 Series of turbine meters have a shielded ball bearing design for high-accuracy performance ($\pm 0.5\%$ 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.



System prices include turbine meter and signal conditioner, wired and scaled.

Order turbine meter and signal conditioner as a system
 Example: SYS/FTB-107/FLSC-C1-LIQ, includes FTB-107 turbine flow meter with 1/4 NPT fittings, FLSC-C1-LIQ signal conditioner loop powered 4 to 20 mA output.

SYS/FTB-107/FLSC-C1-LIQ, turbine flow meter system, shown with optional signal conditioner, shown smaller than actual size.

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: $\pm 0.5\%$ of reading

Repeatability: $\pm 0.1\%$ 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 DPF701.

Scaled pulse or current output

NIST Calibration for Other Viscosity Liquids*

Meter Size	Viscosity Range	
	0.6 to 99 cSt	100 to 299 cSt
FTB-101 thru 106 ½ thru 1"	Additional cost	
FTB-107 thru 109 1¼ thru 2"		
FTB-110 thru 111 2½ thru 3"		

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

To Order

Turbine Meter Only Model No.†	Linear Flow Range for Water LPM (GPM)	MNPT End Fittings	Maximum Operating Pressure (psig)	Maximum Pressure Drop (psid)	Length mm (inch)	Nominal K-Factor (Pulses/Gallon)	Weight kg (lb)
FTB-101	1.32 to 13.2 (0.35 to 3.5)	½	5000	3.0	62 (2.45)	13,000	0.4 (1)
FTB-102	2.84 to 28.4 (0.75 to 7.5)	½	5000	5.0	62 (2.45)	10,000	0.4 (1)
FTB-103	4.73 to 36.0 (1.25 to 9.5)	½	5000	5.2	62 (2.45)	6000	0.4 (1)
FTB-104	6.62 to 61 (1.75 to 16)	¾	5000	3.0	70 (2.75)	4100	0.4 (1)
FTB-105	9.5 to 110 (2.5 to 29)	¾	4250	5.0	83 (3.25)	2200	0.4 (1)
FTB-106	15 to 227 (4 to 60)	1	3850	5.1	89 (3.50)	640	0.9 (2)
FTB-107	23 to 352 (6 to 93)	1¼	3850	4.3	99 (3.88)	410	0.9 (2)
FTB-108	30 to 492 (8 to 130)	1½	3000	3.0	111 (4.38)	230	1.4 (3)
FTB-109	57 to 852 (15 to 225)	2	2500	3.3	121 (4.75)	120	1.8 (4)
FTB-110	95 to 1514 (25 to 400)	2½	2250	4.0	154 (6.06)	62	2.3 (5)
FTB-111	151 to 2460 (40 to 650)	3	2000	4.0	191 (7.50)	55	3.2 (7)

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.

INTEGRAL OR REMOTE SIGNAL CONDITIONER

FLSC-C1-LIQ



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



FLSC-C1-LIQ shown smaller than actual size.

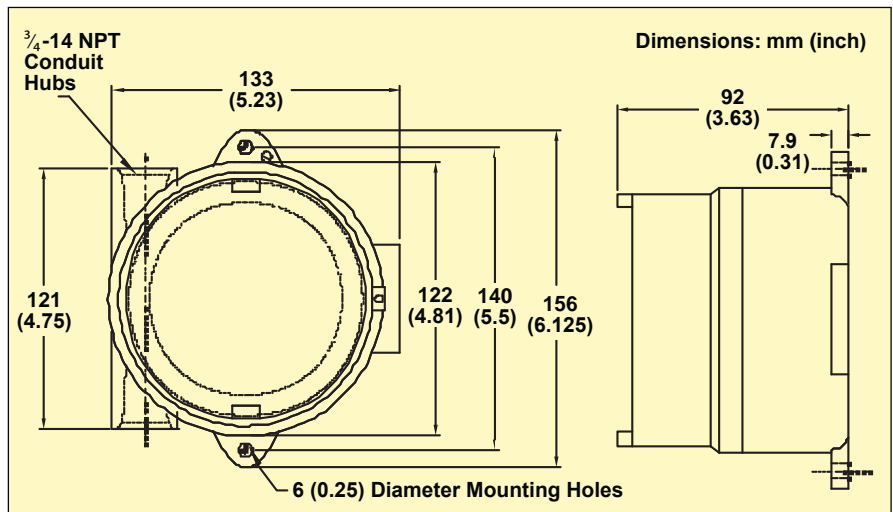
The FLSC-C1-LIQ is a microprocessor controlled 2-wire 4 to 20 mA transmitter. The FLSC-C1-LIQ converts a low level, frequency signal from a flow sensor into an analog 4 to 20 mA output. The output is proportional to the flow rate. The FLSC-C1-LIQ is designed for integral mounting to the FTB-100, FTB-200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

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



To Order	
Model No.	Description
FLSC-C1-LIQ	Loop-powered signal conditioner, 4 to 20 mA, CE
OM-CONV-USB	USB to RS232 converter
FLSC-C-CABLE	Molex to 9-pin "D" connector

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 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*



FLSC-C3-LIQ shown smaller than actual size.

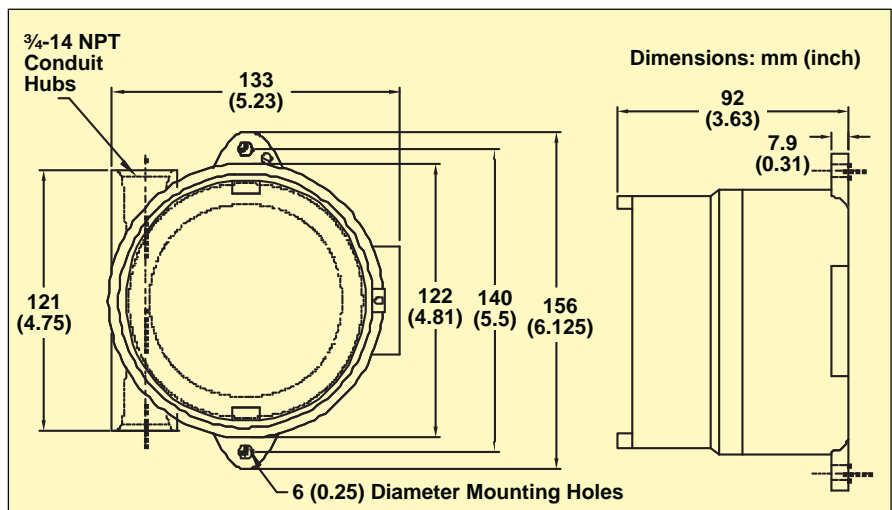
The FLSC-C3-LIQ is a DC powered, microprocessor controlled transmitter. It outputs a pulse scaled per unit of flow, and analog signal proportional to flow rate.

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.

** Visit OMEGA for details.

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

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

To Order

Model No.	Description
FLSC-C3-LIQ	DC powered signal conditioner 4 to 20 mA, CE
FLSC-C3-AL-LIQ	DC powered signal conditioner 4 to 20 mA, alarm CE
OM-CONV-USB	USB to RS232 converter
FLSC-C-CABLE	Molex to 9-pin "D" connector

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.