TURBINE FLOW METER
Stand Alone or Complete Systems with Signal Conditioning
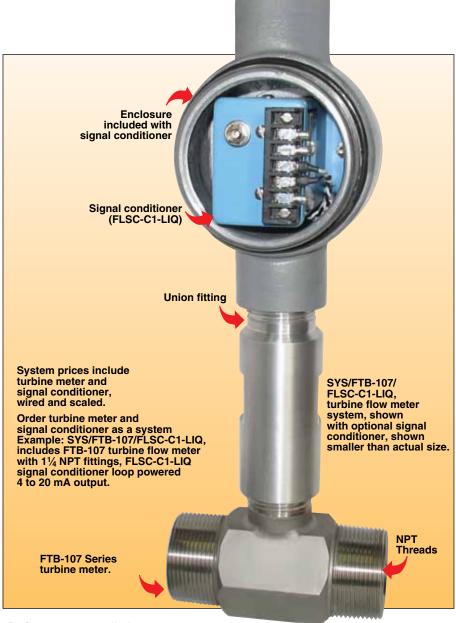
FTB-100 Series

1 YEAR WARRANTY | **NIST** | **RoHS**
Standard

- ✔ **±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**

Enclosure included with signal conditioner

Signal conditioner (FLSC-C1-LIQ)

Union fitting

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 1¼ 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.

NPT Threads

FTB-107 Series turbine meter.

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*

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

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

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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

1 YEAR WARRANTY CE Ex

↳ **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.*

FLSC-C1-LIQ shown smaller than actual size.

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
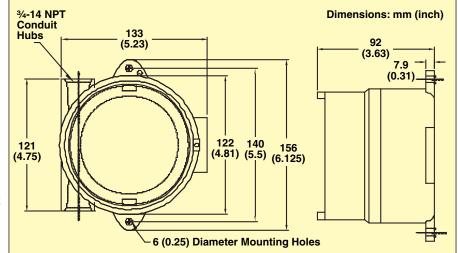**Load Resistance:** Maximum 650 Ω at 24 Vdc
Accuracy: ±0.02% of full scale
Temperature Drift: 40 ppm/degree C
Communications: RS232 port for configuration and diagnostics
Operating Temperature: -40 to 85°C (-40 to 185°F)
Humidity: 0 to 90% non-condensing
Enclosure: Extruded Aluminum Explosion-Proof ATEX enclosure
Regulatory: CE Compliant
Up to 20 point linearization
Windows Configuration Software* (cable sold separately)

Dimensions: mm (inch)

¾-14 NPT Conduit Hubs
133 (5.23)
121 (4.75)
122 (4.81)
140 (5.5)
156 (6.125)
6 (0.25) Diameter Mounting Holes
92 (3.63)
7.9 (0.31)

Enclosure meets Class I, Div 1 & 2, Groups A, B, C & D. Class 1, Zones 1 & 2, Groups IIB + H2 IIA. Class II, Div 1 & 2 Groups E, F & G. Class III. NEMA 3, 4, 7(B, C, D) 9(E, F, G). Cenelec EEx d IIC IP66, UL, CSA, FM Approved. ATEX Certified.

To Order

Model No.	Description
FLSC-C1-LIQ	Loop-powered signal conditioner, 4 to 20 mA, CE/ATEX
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 ATEX enclosure with **FLSC-C-CABLE** Molex to 9-pin "D" connector.*

INTEGRAL OR REMOTE SIGNAL CONDITIONER

FLSC-C3-LIQ

1 YEAR WARRANTY CE Ex

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

MODEL: **FLSC-C3-LIQ**
www.omega.com®
1-800-826-6342 US & CANADA
www.OmegaManual.info
Ω OMEGA®
Made in the USA
CE

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
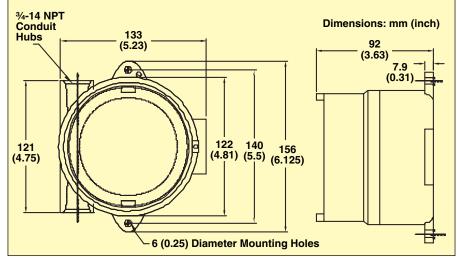**Pulse Scaling:** Divide by 1, 10 or 100 per flow unit
Hi/Lo Alarm (-AL Model) Optional: Relay (2A, 30 Vdc), 0 to 5V, open collector (0.5A, 30V)
Communications: RS232 port for configuration and diagnostics
Operating Temperature: -40 to 85ºC (-40 to 185°F)

¾-14 NPT Conduit Hubs
Dimensions: mm (inch)
133 (5.23)
121 (4.75)
122 (4.81)
140 (5.5)
156 (6.125)
92 (3.63)
7.9 (0.31)
6 (0.25) Diameter Mounting Holes

Enclosure meets Class I, Div 1 & 2, Groups A, B, C & D. Class 1, Zones 1 & 2, Groups IIB + H2IIA. Class II, Div 1 & 2 Groups E, F & G. Class III. NEMA 3, 4 7(B, C, D) 9(E, F, G). Cenelec EEx d IIC IP66, UL, CSA, FM Approved. ATEX Certified.

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)

To Order

Model No.	Description
FLSC-C3-LIQ	DC powered signal conditioner 4 to 20 mA, CE ATEX
FLSC-C3-AL-LIQ	DC powered signal conditioner 4 to 20 mA, alarm CE ATEX
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.*

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