

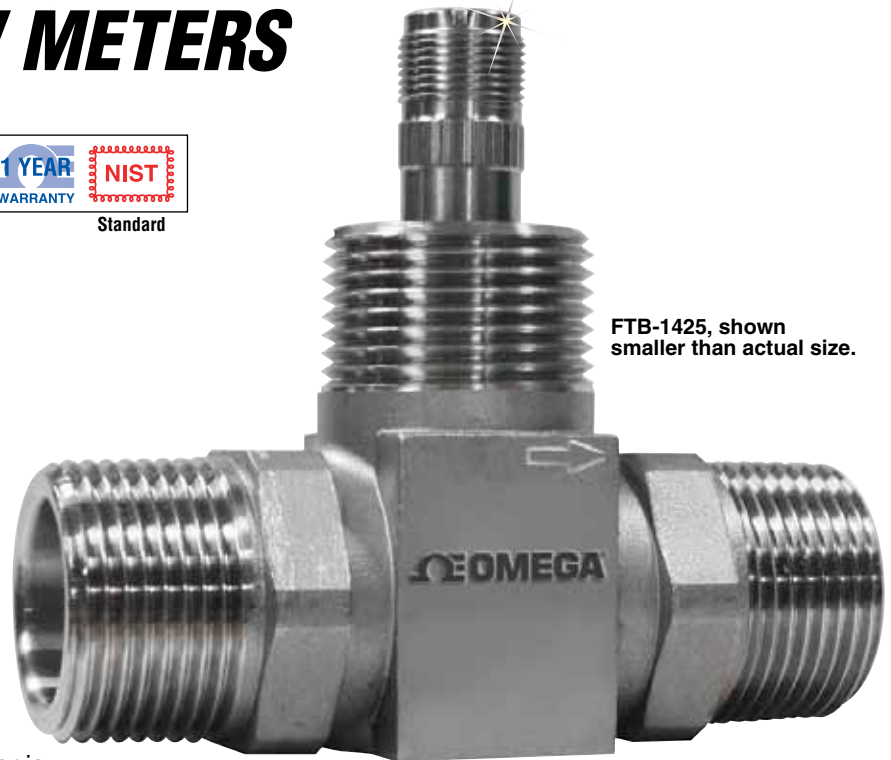
# ECONOMICAL LIQUID TURBINE FLOW METERS



## FTB-1400 Series



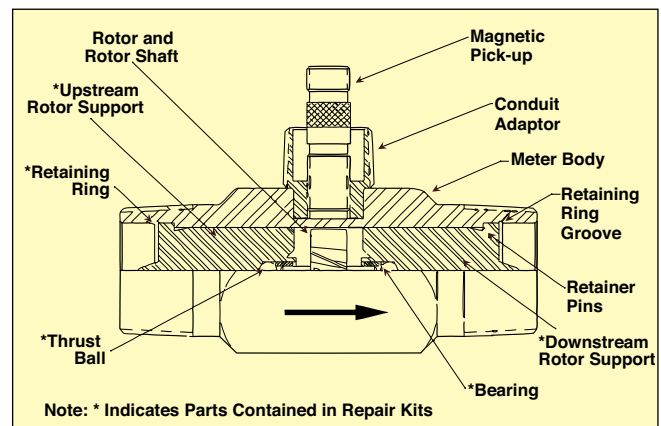
- ✓ Cost-Effective Solution for Turbine Flowmeter Applications
- ✓ Rugged 316 Stainless Steel Construction Offers Long Service Life in Severe Operating Environments
- ✓ Accurate and Repeatable Flow Measurement
- ✓ Installation in Pipe Sizes from 1/2 to 2"
- ✓ NIST Calibration



FTB-1425, shown smaller than actual size.

The OMEGA® FTB-1400 turbine flowmeter is designed to meet the demands of the most rigorous flow measurement applications. Originally developed for the secondary oil recovery market, the FTB-1400 is an ideal meter for liquid flow measurement on or off the oilfield. The meter features a 316 Stainless Steel housing and rotor support, CD4MCU Stainless Steel rotor, and abrasion-resistant tungsten carbide rotor shaft and journal bearings. These materials help the meter to maintain accuracy and mechanical integrity when measuring the corrosive and abrasive fluids found in many industries.

Fluid entering the meter first passes through an inlet flow straightener that reduces its turbulent flow pattern. Fluid then passes through the turbine, causing the turbine to rotate at a speed proportional to fluid velocity. As each turbine blade passes through the magnetic field generated by the meters magnetic pick-up, an AC voltage pulse is generated. These pulses provide an output frequency that is proportional to volumetric flow.



### SPECIFICATIONS

**Accuracy:** ±1% of reading for 1" and larger, ±1% of reading over the upper 70% of the measuring range for 1/2" meters

**Repeatability:** ±0.1%

**Magnetic Pickup:** 30 mV/P-P

**Materials of Construction**

**Body:** 316 Stainless Steel

**Rotor:** CD4MCU Stainless Steel

**Rotor Support:** 316 Stainless Steel

**Rotor Shaft:** Tungsten carbide

**Turndown Ratio:** 10:1

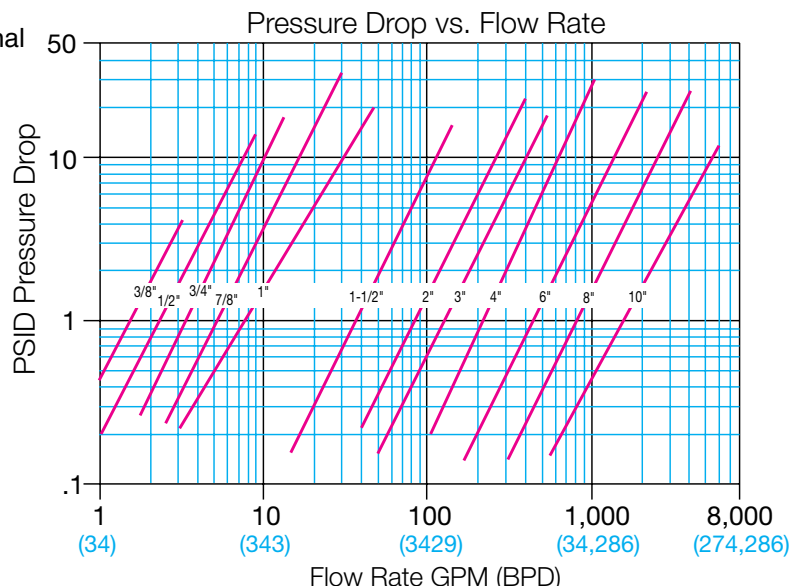
**Calibration:** Water (NIST traceable calibration)

**Pressure Rating:** 5000 psi (maximum)

**Turbine Temperature:** -101 to 177°C (-150 to 350°F);

-101 to 232°C (-150 to 450°F) (with "-HT" option)

**End Connections:** NPT, BSPP optional



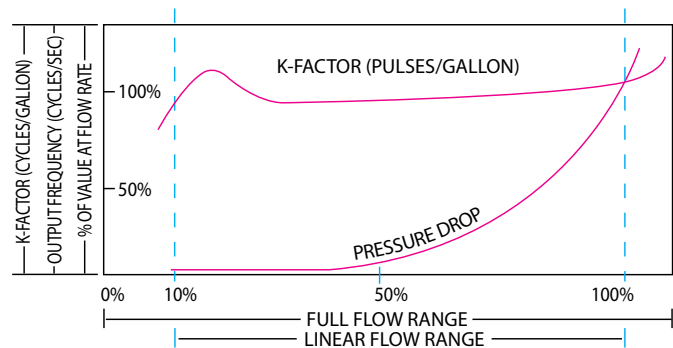
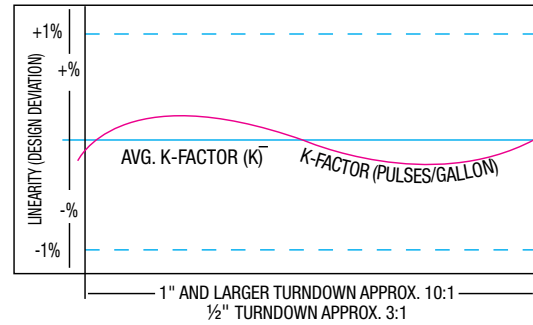
## K-Factor

The K-Factor represents the number of output pulses transmitted per gallon of fluid passing through the turbine meter. Each turbine has a unique K-Factor. However, turbine meters are not functionally consistent throughout the full flow range of the meter.

There are several forms of “friction” inherent in turbine meters that retard the rotational movement of the turbine rotor. These frictional forces include: magnetic drag, created by electromagnetic force of pickup transducers; mechanical drag, due to bearing friction; and viscous drag, produced by flowing fluid. See charts on right.

As flow increases, the frictional forces are minimized and the free-wheeling motion of the turbine rotor becomes more linear (proportional to flow). The K-Factor becomes relatively constant and linear throughout the balance of the linear flow range. This is approximately a 10:1 turndown ratio from the maximum flow rate down to the minimum flow rate.

Typical K-Factor Curve (Pulses Per Gallon)



## To Order

Model No.	Connection MNPT	Range			K-Factor Pul/Gal	Lay Length mm (inch)
		LPM	GPM	Barrels/Day		
FTB-1411	3/8"	2.3 to 11.3	0.6 to 3	20 to 100	18,000	76 (3)
FTB-1412	1/2"	2.8 to 28	0.75 to 7.5	25 to 250	13,000	76 (3)
FTB-1413	3/4"	7.6 to 56.7	2 to 15	68 to 515	3300	76 (3)
FTB-1421	3/8"	2.3 to 11.3	0.6 to 3	20 to 100	18,000	76 (3)
FTB-1422	1/2"	2.8 to 28	0.75 to 7.5	25 to 250	13,000	76 (3)
FTB-1423	3/4"	7.6 to 56.7	2 to 15	68 to 515	3300	76 (3)
FTB-1424	7/8"	11.3 to 113	3 to 30	100 to 1000	3100	101 (4)
FTB-1425	1"	18.9 to 189	5 to 50	170 to 1700	870	101 (4)
FTB-1431	1-1/2"	56.8 to 681	15 to 180	515 to 6000	330	152 (6)
FTB-1441	2" Low	56.8 to 681	15 to 180	515 to 6000	330	152 (6)

## Accessories

Model No.	Description
FTB-1400-CABLE	3 m (10') cable assembly with 2-pin connector (required for remote display)
FTB-1400-90CABLE	3 m (10') cable assembly with 2-pin 90° connector (required for remote display)
FTB-1400-MP	Replacement standard magnetic pick-up

Comes complete with operator's manual and 5 point NIST calibration certificate for water. Cable with connector sold separately. Cable/connector are required for operation.

For units with high temp magnetic pulse output, add suffix “-HT” to model number, consult Flow Engineering for price (not available on “-AMP” models).

For units with amplified pulse output, add suffix “-AMP” to model number consult Flow Engineering for price (not available on “-HT” models).

For units with BSPP threads, add suffix “BSP” to model number for additional cost.

**Ordering Examples:** FTB-1424, 1 NPT stainless turbine.

FTB-1411, 1/2 NPT stainless turbine and DPF701, digital panel meter for rate of total display, FTB-1400-CABLE, 3 m (10') cable assembly with 2-pin connector. For details on DPF701 meter, visit [omega.com/dpf700](http://omega.com/dpf700) for details.