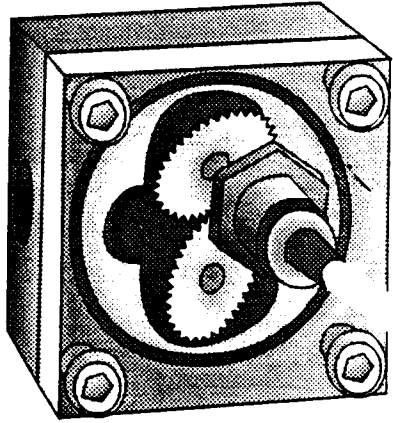


**Ω FTB-1000 Series and
Ω FTB-1500 Series
Ω Positive Displacement Flowmeters**



Ω OMEGA[®] Operator's Manual
An OMEGA Technologies Company

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Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. Call toll free in the USA and Canada: 1-800-622-2378. FAX: 203-359-7811; International: 203-359-1660, FAX: 203-359-7807.

BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, YOU MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OUR CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED.
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems you are having with the product.

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1. P.O. number to cover the COST of the repair/calibration.
2. Model and serial number of product, and
3. Repair instructions and/or specific problems you are having with the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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SECTION 1 INTRODUCTION

1.1 GENERAL DESCRIPTION

The OMEGA® FTB-1000 and FTB-1500 Series Positive Displacement Flowmeters are ideally suited for oil and other viscous fluids which are difficult to meter with a turbine type flowmeter. These flowmeters consist of two elliptical gears rotated by the fluid flow. An inductive proximity sensor produces a pulse output which can then be sent to the DP-72 or DP-74 panel meter for rate indication and batch control, or the signal conditioner accessory to provide a 4-20 mA output for use with totalizers, controllers, rate meters and computer interfaces. The signal conditioner also supplies a re-transmitted open collector pulse output.

The FTB-1000 Series Flowmeters operate from .04 to 25 GPM with an accuracy of $\pm 1\%$ of rate. Standard construction consists of an aluminum body with brass gears and carbon steel shafts for up to 212°F and 150 PSIG operation.

Also available for corrosive applications is the FTB-1500 Series Flowmeters. Construction consists of Kynar body, gears and cover with Hastelloy C shafts.

The optional integral signal conditioner includes an easy-to-read 10 increment bar graph indicator, 4-20 mA output signal and span adjustment. A 24 Vdc power supply is required.

SECTION 2 INSTALLATION

2.1 UNPACKING

Remove the packing list and verify that all equipment has been received. If there are any questions about the shipment, please call OMEGA Customer Service Department at (203) 359-1660.

Upon receipt of the shipment, inspect the container and equipment for any signs of damage. Take particular note of any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE

The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

2.2 MOUNTING

The FTB-1000/1500 Series units are available with a mounting bracket to mount the electronic box attached to the meter. The units also have mounting screws in the bottom and they can be mounted anywhere nearby, providing that the shielded sensor cable does not exceed 500 feet in length. Refer to Figure 2-1 for mounting dimensions for the signal conditioner and to Figures 2-2 through 2-4 for individual model dimensions.

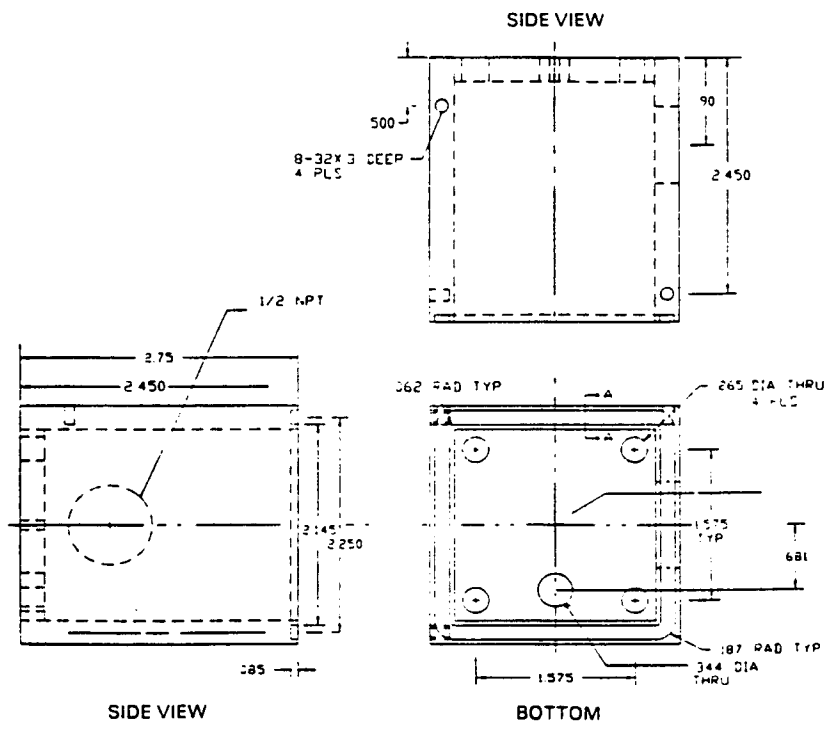
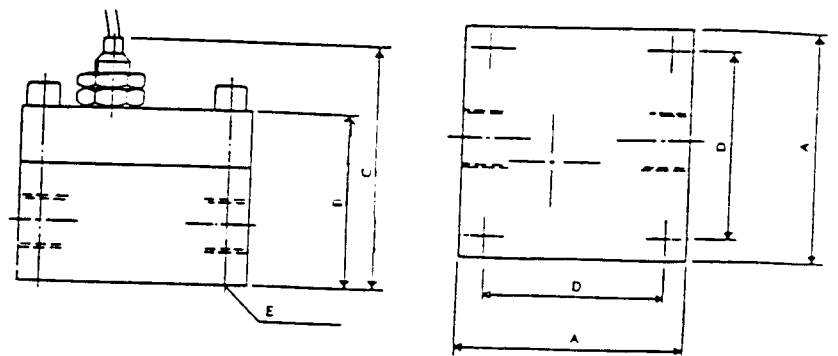


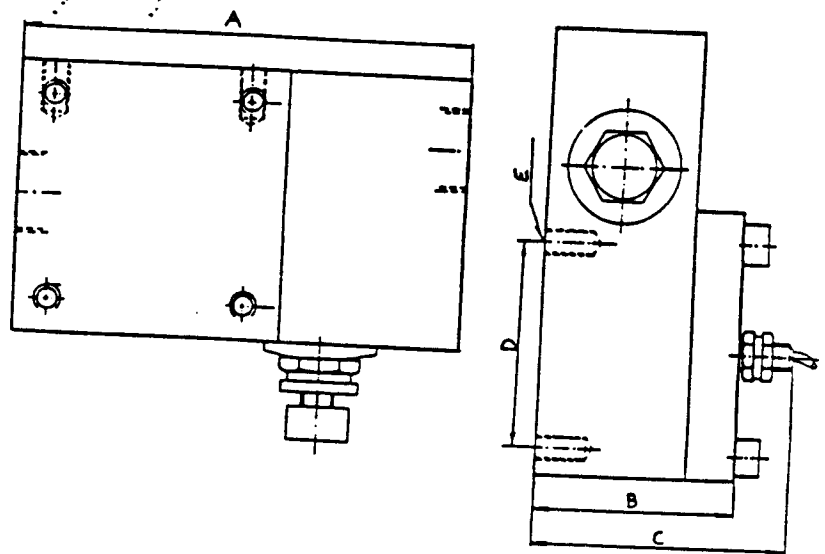
Figure 2-1. Mounting Dimensions for Signal Conditioner



MODEL	A	B	C	D	E
FTB-1002/1004	2.0	1.8	2.3	1.6	UNC 1/8"
FTB-1010	3.2	2.6	2.5	2.4	UNC 5/16"
FTB-1020	3.2	2.6	3.1	2.4	UNC 5/16"
FTB-1030	3.2	3.3	3.9	2.4	UNC 5/16"
FTB-1060	4.7	3.7	4.3	3.6	UNC 3/8"
FTB-1100	7.8	3.7	4.3	6.3	UNC 3/8"

(Dimensions in inches)

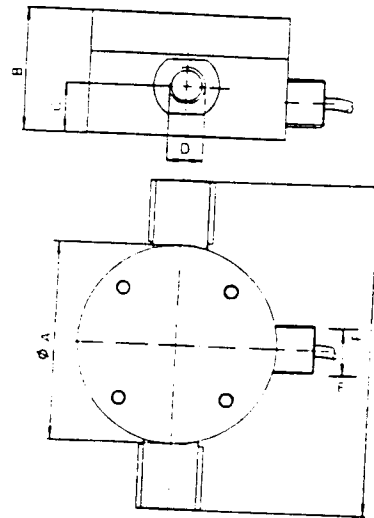
Figure 2-2. FTB-1000 Dimensions



MODEL	A	B	C	D	E
FTB-1002-4-V	3.4	4.2	4.5	2.8	UNC 1/4
FTB-1010-V	5.3	2.6	3.1	2.4	UNC 5/16
FTB-1020-V	5.3	2.6	3.1	2.4	UNC 5/16
FTB-1030-V	5.3	3.3	3.9	2.4	UNC 5/16

(Dimensions in inches)

Figure 2-3. FTB-1000-V Dimensions



MODEL	A	B	C	D	E	F
FTB-1502 1504	73	45	18	NPT 1/2"	18	120
FTB-1510	110	67	27	NPT 3/4"	30	160
FTB-1520	110	67	27	NPT 1/2"	30	160
FTB-1530	110	87	27	NPT 3/4"	30	160

(Dimensions in mm)

Figure 2-4. FTB-1500 Dimensions

2.3 WIRING (Refer to Figure 2-5)

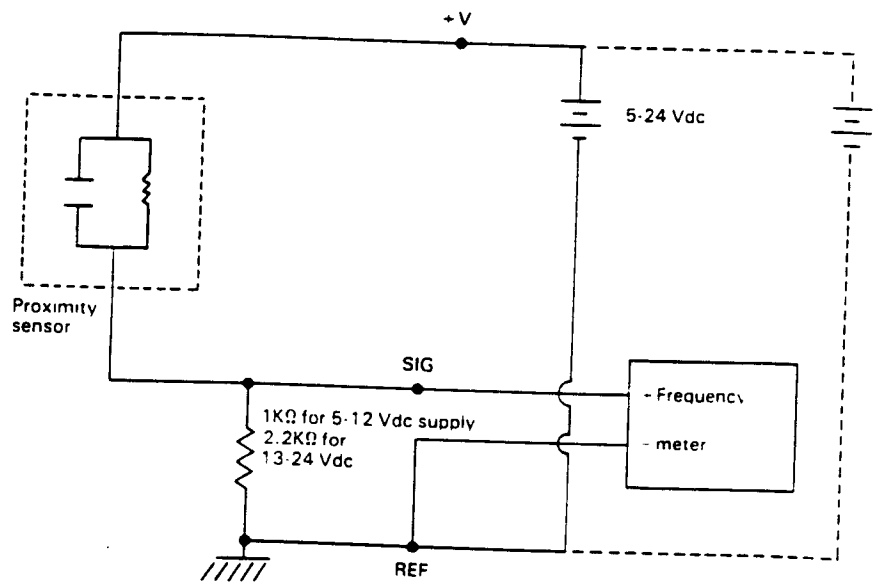


Figure 2-5. Wiring of Pulse Output to Receiving Instrument

2.4 PROXIMITY SENSOR

Inductive proximity sensors are used to pick up the rotation of the gears. The sensor requires a power supply from 5-24 Vdc. OMEGA recommends a 12 Vdc power supply. Coding of the sensor wires is as follows: (+) black, brown or white; (-) blue or yellow. The inductive proximity sensors are rated for maximum temperature of 180°.

2.5 TEMPERATURE LIMITATIONS

1. All metallic aluminum construction sensors are good up to the maximum temperature of proximity sensors.
2. For metallic meters with transparent (nylon-based) cover, the temperature limit is 180°.
3. Kynar and PVC are rated at 150°F. At higher temperatures, the plastic may swell.

SECTION 3 OPERATION

3.1 SIGNAL CONDITIONER ELECTRONICS

Units with this option have the following features:

- Ten-segment proportional flow indicator
- LED indicator which blinks when the proximity sensor produces a normal pulse.
- Output indicator (LED indicating that output is 4 mA or over)

3.1.1 Span and Zero Adjustment (Refer to Figure 3-1)

1. Connect the CL-306 or other pulse-producing instrument into the input of the FTB-1000 unit.
2. Connect suitable mA meter into the output of the FTB-1000 unit.
3. Adjust desired pulse rate to be input into the FTB-1000 proportional to a certain flow rate to be measured by the FTB-1000 meter.
4. Using span potentiometer, adjust the output of the FTB-1000 unit to 20 mA. At the same time, all ten segments should be lit. (The unit is defective otherwise).
5. Adjust pulse rate equal to approximately 5% of maximum pulse rate. This represents the low flow cutoff. By using the zero adjustment, adjust the output to 4 mA.
6. As there is interaction between these settings, repeat both settings until no further adjustment is necessary.

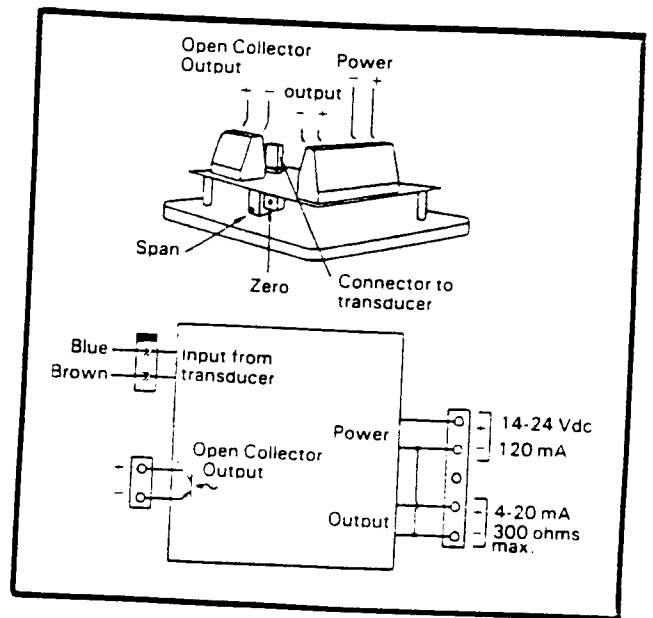


Figure 3-1. Signal Conditioner Connections

SECTION 4 MAINTENANCE

Generally, the only maintenance required is replacement of gears if they are damaged or swollen (plastic units), or cleaning of the meter if foreign particles have seized the rotation of the gears. In FTB-1000 and 1500 models, unscrew the cover screws and remove the gears to clean or replace them. For special construction units (P/N FSK-XXXX), consult Engineering.

In normal use where very small particles are present, it is common for meters to run smoothly for many years.

It is important to realize that for the FTB-1000 Series units with the standard aluminum cover, the inductive proximity sensor is drilled through the cover and is a wetted part of the flow sensor. The proximity sensor therefore cannot be removed from these units while they are in-line. For the FTB-1000 with the Nylon cover and the FTB-1500, the proximity sensor is not a wetted part and can therefore be removed even while the flowmeter is in-line.

SECTION 5 SPECIFICATIONS

MODEL	RATING
FTB-1000 & FTB-1000-V	Pressure: 150 PSIG max. Temp: 212 deg F max.
FTB-1000 w/see-thru nylon cover	Pressure: 150 PSIG max. Temp: 185 deg F max.
FTB-1500 w/PVC construction	Press/Temp: 100 PSIG max. at 70 deg F 50 PSIG max. at 120 deg F
FTB-1500 Series	Press/Temp: 150 PSIG max. at 70 deg F 100 PSIG max. at 120 deg F 50 PSIG max. at 150 deg F
REPEATABILITY:	±1% of rate
ACCURACY:	±6% of rate
TURNDOWN RATIO:	10/1
SENSOR PULSE OUTPUT:	5 to 24 Vdc square wave, amplitude = input voltage
POWER REQUIREMENTS:	Proximity sensor requires a 5-24 Vdc power supply.
VISCOSITY LIMITS:	30-1000 centistokes, down to 1 cen- tistoke on special order

**OPEN COLLECTOR PULSE OUTPUT
FROM SIGNAL CONDITIONER:**

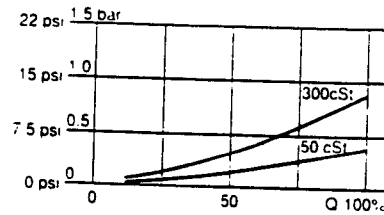
30 Vdc max.; 60 mA max.

Model No.	Model No. (for Corrosive Applications)	Nominal Lay Length (Inches) 1000/1500	Nom. Max. Capacity	Nom. K Factor		NPT Connections
				p/L	p/gal	
FTB-1002 FTB-1004	FTB-1502 FTB-1504	2.0/2.9 2.0/2.9	2 LPM 4 LPM	455 304	1720 1150	1/4" NPT 1/4" NPT
FTB-1010 FTB-1020 FTB-1030	FTB-1510 FTB-1520 FTB-1530	3.2/4.4 3.2/4.4 3.2/4.4	10 LPM 20 LPM 30 LPM	124 75.5 47.2	470 286 179	3/4" NPT 1" NPT 1" NPT
FTB-1060 FTB-1100	Consult Sales	4.72/— 7.87/—	60 LPM 100 LPM	22 11.7	87 44.1	1" NPT 1 1/2" NPT

FTB-1000 Series with integral valve: 2-4 LPM units, lay length is 3.43", for 10-30 LPM units, lay length is 5.31". Ports are offset, not in-line.

FTB-1500 Series units are also available with PVC construction for corrosive applications-consult Engineering.

PRESSURE DROP



WARRANTY

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of 13 months from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that our customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. Our Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

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