OMEGA® SERIES FL-7600 AND FL-7800 IN-LINE FLOWMETERS

GENERAL DESCRIPTION

The OMEGA® Series FL-7600 and FL-7800 In-Line Flowmeters offer high accuracy flow rate indication for oil or water (air optional), and the ability to either control the flow rate or alarm on high or low flow rates. These units feature an SPDT switch, which can be triggered at any point along the flow range.

FEATURES

- Strong, completely sealed die cast aluminum body, water and oil tight
- Formed double sealed aluminum cover (with lip) anodized
- Unbreakable Lexan window (full cover)
- Oversize neoprene cover gasket matches with double ribbed lip of die cast body. Other seals — Buna-N
- Chrome plated pan head cover screws with screw retainers
- Wire guards
- Easy wire top screw micro switch
- Mounts in any direction
- Easy set point adjustment
- Direct reading for oil or water

UNPACKING

Remove the Packing List and check off actual equipment received. If there are any questions about the shipment, please call OMEGA Customer Service Department at (203) 359-1660.

Upon receipt of 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 apparent damage to the shipping agent.

NOTE

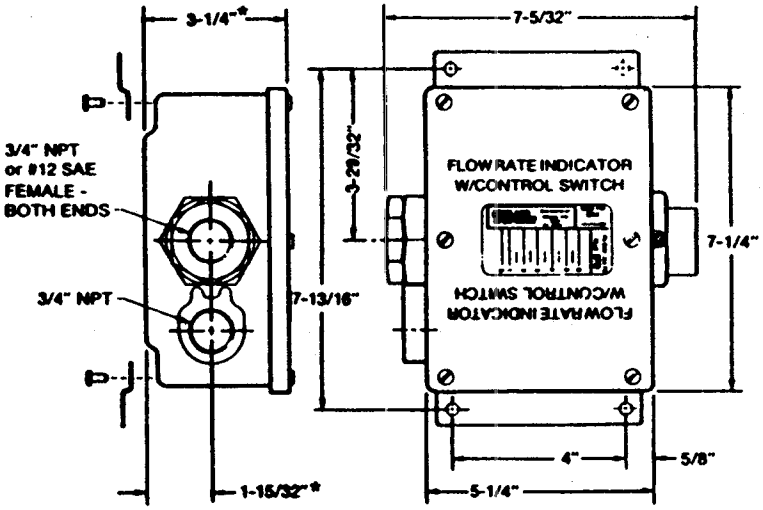
The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

PRINCIPLE OF OPERATION (See Parts Diagram)

An orifice piston containing a magnetic ring is located inside of the Flowmeter body, and is part of the sliding piston assembly. A spring returns the piston and magnet to the "no flow" position. There is a flow orifice in the center of the piston which is blocked in the "no flow" position by the stationary metering cone. The piston movement presents a gradually increasing flow area. Incoming flow will build up pressure to push the piston to a position on the cone where the pressure drop across the increased area and the spring force are in balance. The variable area feature produces uniform scale increments throughout the adjustment range.

A — Electrical Outlet
B — Ground
C — Flow Meter Cartridge Asm.
D — Tapered Metering Cone
E — Orifice Piston Asm. (magnetized)
F — Indicator (follower)
G — Die Cast Housing
H — Micro Switch
— Switch Adjustment
K — Seals
L — Cover Asm. w/Screw Retainers
M — Scale
N — Cartridge Holding Screw

INSTALLATION DIMENSIONS



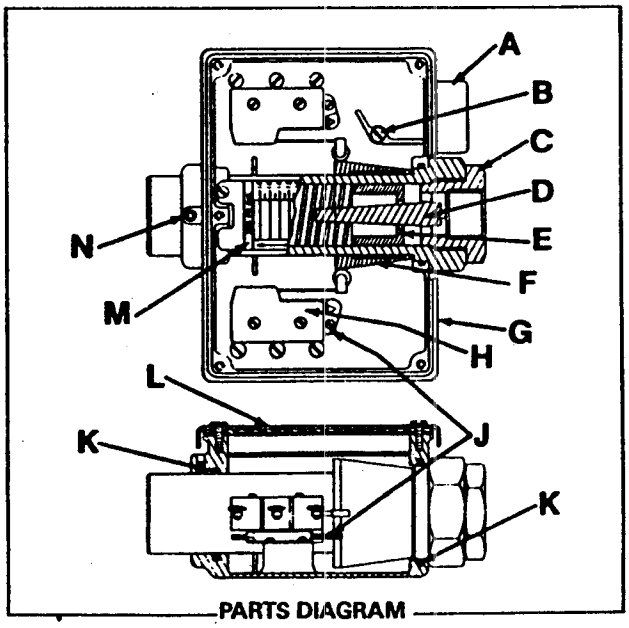
*ALSO TO BOTTOM OF OPTIONAL MOUNTING BRACKET

RECOMMENDED INSTALLATION PRACTICES

Water hammer and surges can be damaging to any flowmeter and must *always* be avoided.

Water hammer occurs when a liquid flow is suddenly stopped as with quick closing and solenoid operated valves. Surges occur when flow is suddenly begun, as when a pump is turned on at full power or a valve is quickly opened.

Liquid surges are particularly damaging to flowmeters if the pipe is originally empty. To avoid damaging surges, fluid lines should remain full (if possible) and pumps should be brought up to power slowly and valves opened slowly. In addition, to avoid both water hammer and surges, a surge chamber should be installed.



PARTS DIAGRAM

Download from Www.Somanuals.com. All Manuals Search And Download.

SPECIFICATIONS

ACCURACY: ±5% full scale
REPEATABILITY: ±1% full scale
SWITCH: Micro SPDT; 15 amps @ 480 Vac
MAX. PRESSURE: 3000 psig with 3:1 safety factor for fluid models; 600 psi with 10:1 safety factor for air models
MAX. TEMPERATURE: 240°F for FL-7600; 180°F for FL-7825
FLOW METER BODY: Aluminum
EFFECT OF DENSITY: The meter is affected by fluid density. Most petroleum based fluids have a specific gravity very close to the .84 used for calibration. For heavier fluids, the indicated flow reads high and correspondingly lighter fluids cause the readings to be low. For these cases a properly calibrated scale can be used or a correction factor applied to the standard scales. A correction chart is available for fluids from 1.25 to .65 specific gravity. The correction factor is:

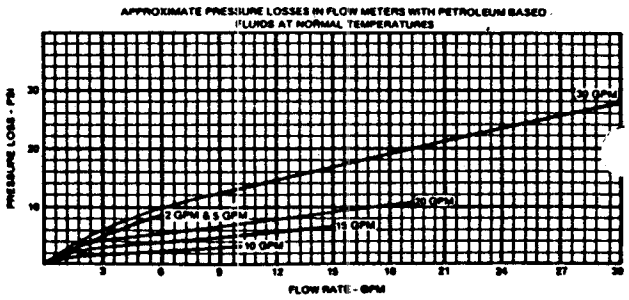
Oil Scale — $\sqrt{.84 \text{ specific gravity}}$

Water Scale — $\sqrt{1.0 \text{ specific gravity}}$

For petroleum based hydraulic fluids, this correction factor is small enough to be ignored.

Meters are calibrated for air with a specific gravity of 1.0. For gasses heavier or lighter than air refer to conversion chart.

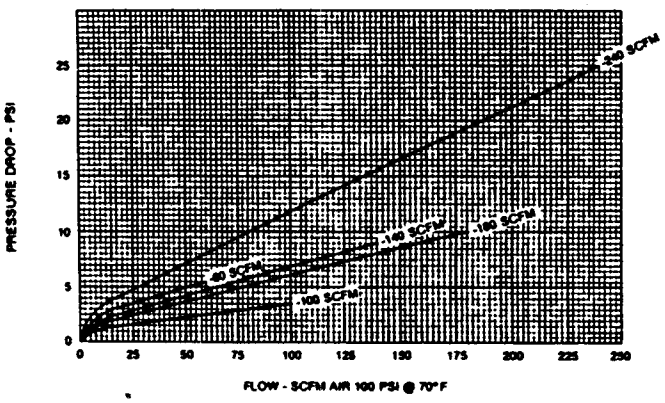
PRESSURE DROP (LOSS) OIL



Approximate pressure drop of oil at normal temperatures. Add 10% to pressure for water.

CALIBRATION: Meters are calibrated for oil at .84 specific gravity at 110°F±5°F; water at 1.0 specific gravity at 110°F±5°F; or air at 100 psi and 70°F.

PRESSURE DROP (LOSS) AIR



DETERMINE FLOW RATES USING DIFFERENT PRESSURES & TEMPERATURES

$$\text{SCFM (actual)} = \frac{\text{SCFM (indicated)}}{f_1 \times f_2 \times f_3}$$

Where: f_1 = Conversion factor for inlet pressure, f_2 = Conversion factor for temperature, f_3 = Conversion factor for specific gravity

TABLE 1 PRESSURE CORRECTION FACTOR (f_1)

OPERATING PRESSURE, psig										
psig	25	50	75	100	125	150	175	200	225	250
f_1	1.700	1.331	1.131	1.00	.902	.835	.778	.731	.692	.658

$$f_1 = \sqrt{\frac{114.7}{14.7 + \text{psig}}}$$

TABLE 2 TEMPERATURE CORRECTION FACTOR (f_2)

OPERATING TEMPERATURE, °F										
°F	10	30	50	70	90	110	130	150	170	190
f_2	.942	.962	.981	1.00	1.018	1.037	1.055	1.072	1.090	1.107

$$f_2 = \sqrt{\frac{460 + °F}{530}}$$

TABLE 3 SPECIFIC GRAVITY CORRECTION FACTOR (f_3)

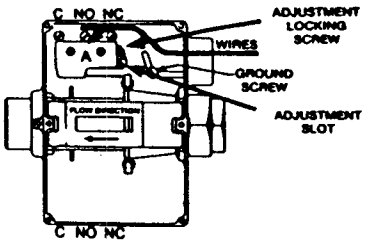
$$f_3 = \sqrt{\text{Sp. Gr.}}$$

CAPACITIES

FL-7602	Oil .84	0.2 to 1.6	¾" NPT	3¼"	7¼"	7 3/32"
FL-7605	Oil .84	0.5 to 4.5	¾" NPT	3¼"	7¼"	7 3/32"
FL-7609	Oil .84	0.5 to 8.5	¾" NPT	3¼"	7¼"	7 3/32"
FL-7612	Oil .84	1 to 12	¾" NPT	3¼"	7¼"	7 3/32"
FL-7615	Oil .84	1 to 15	¾" NPT	3¼"	7¼"	7 3/32"
FL-7825	Water	3 to 25	¾" NPT	3¼"	7¼"	7 3/32"

WIRING INFORMATION (See switch wiring diagram)

1. Switch can be wired for either normally open or normally closed operation.
2. Attach ground wire to ground screw provided.

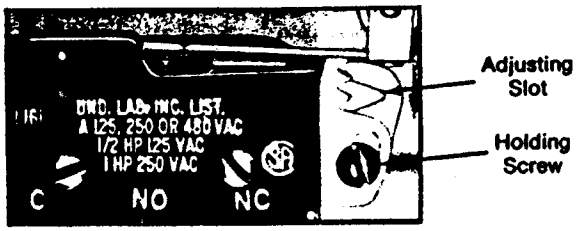


SWITCH WIRING DIAGRAM

SWITCH ADJUSTMENT

1. Set top edge of white collar at desired flow rate with proper rate flowing or by manual bench adjustment (by manually sliding collar to read desired flow rate).
2. (a) Loosen holding screw(s)
   (b) With screwdriver in adjusting slot, rotate screwdriver clockwise or counterclockwise to move switch in or out to operate switch at selected flow rate.
   (c) Minor adjustment correction may be necessary due to hysteresis.
   (d) Tighten adjustment holding screw(s)
   (e) For bench adjustment only — Return collar to "r flow" position.

Download from Www.Somanuals.com. All Manuals Search And Download.



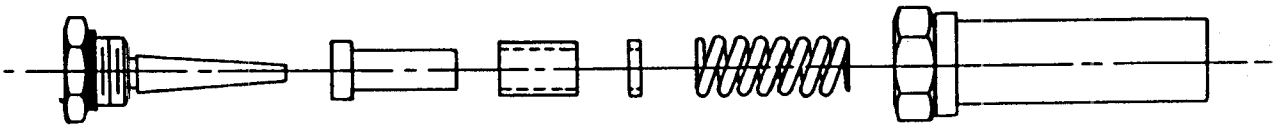
SWITCH ADJUSTMENT

FILTRATION

The OMEGA Series FL-7600 and FL-7800 Flowmeters will allow the flow of particles, which would normally jam most valves or flow controls. Normal system filtrations should be sufficient. Systems which do not have any filtration should be equipped with at least a 200 mesh sieve or 74 micron filter. Most hydraulic systems would already have a much finer filtration.

Within the cartridge, dirt or sealing agents, such as Teflon tape, may lodge within and cause malfunction. If a malfunction does occur and you are using proper filtration, we would recommend disassembly and cleaning. This can be done as follows:

On clean bench, remove smaller hex from larger and all internal parts should slide out when tilted (see disassembly diagram).



DISASSEMBLY DIAGRAM

Download from Www.Somanuals.com. All Manuals Search And Download.

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 current, heat, moisture, vibration, or misuse. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

THERE ARE NO WARRANTIES EXCEPT AS STATED HEREIN. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL OMEGA ENGINEERING, INC. BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES. THE BUYER'S SOLE REMEDY FOR ANY BREACH OF THIS AGREEMENT BY OMEGA ENGINEERING, INC. OR ANY BREACH OF ANY WARRANTY BY OMEGA ENGINEERING, INC. SHALL NOT EXCEED THE PURCHASE PRICE PAID BY THE PURCHASER TO OMEGA ENGINEERING, INC. FOR THE UNIT OR UNITS OR EQUIPMENT DIRECTLY AFFECTED BY SUCH BREACH.

OMEGA ENGINEERING, INC.
An OMEGA Group Company
One Omega Drive, Box 4047
Stamford, Connecticut 06907-0047
(203) 359-1660 Telex: 996404 Cable: OMEGA FAX: (203) 359-7700

Return Requests/Inquiries

Direct all warranty and repair requests/inquiries to OMEGA Customer Service Department, telephone number (203) 359-1660. Before returning any instrument, please contact the OMEGA Customer Service Department to obtain an authorized return (AR) number. The designated AR number should then be marked on the outside of the return package.

To avoid processing delays, also please be sure to include:

1. Returnee's name, address, and phone number.
2. Model and Serial numbers.
3. Repair instructions.

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

OMEGA® is a registered trademark of OMEGA ENGINEERING, INC.

© Copyright 1987 OMEGA ENGINEERING, INC. All rights reserved including illustrations. Nothing in this manual may be reproduced in any manner, either wholly or in part for any purpose whatsoever without written permission from OMEGA ENGINEERING, INC.

Printed in U.S.A.

M382/067

Download from Www.Somanuals.com. All Manuals Search And Download.

omega.com®

Your One-Stop Source for Process Measurement and Control!

One Omega Drive | Stamford, CT 06907 | 1-888-TC-OMEGA (1-888-826-6342) | info@omega.com

www.omega.com

UNITED STATES
www.omega.com
1-800-TC-OMEGA
Stamford, CT.

CANADA
www.omega.ca
Laval(Quebec)
1-800-TC-OMEGA

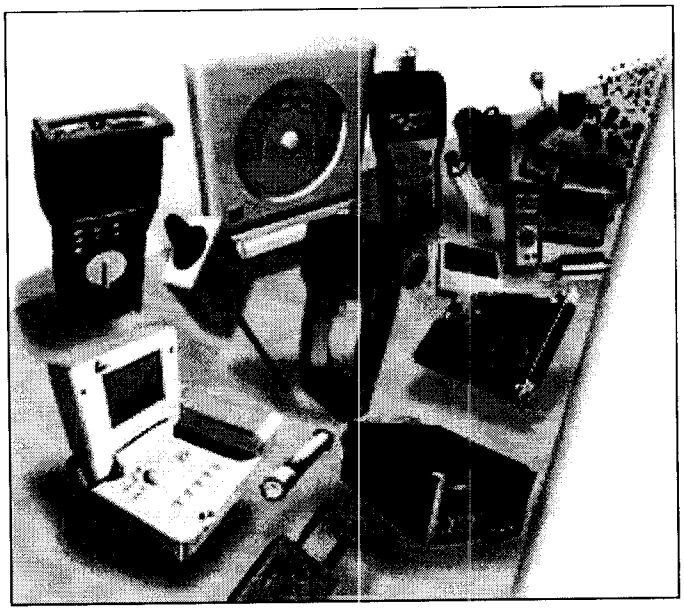
GERMANY
www.omega.de
Deckenpfronn, Germany
0800-8266342

UNITED KINGDOM
www. omega.co.uk
Manchester, England
0800-488-488

FRANCE
www.omega.fr
Guyancourt, France
088-466-342

CZECH REPUBLIC
www.omegaeng.cz
Karviná, Czech Republic
596-311-899

BENELUX
www.omega.nl
Amstelveen, NL
0800-099-33-44



More than 100,000 Products Available!

• Temperature

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

• Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

• pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

• Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

• Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

• Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

• click here to go to the omega.com home page •

Download from Www.Somanuals.com. All Manuals Search And Download.

Free Manuals Download Website

http://myh66.com

http://usermanuals.us

http://www.somanuals.com

http://www.4manuals.cc

http://www.manual-lib.com

http://www.404manual.com

http://www.luxmanual.com

http://aubethermostatmanual.com

Golf course search by state

http://golfingnear.com

Email search by domain

http://emailbydomain.com

Auto manuals search

http://auto.somanuals.com

TV manuals search

http://tv.somanuals.com