



# User's Guide



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## FLMW 200 Series

***Flow Meters and Flow Indicators***



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The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

**WARNING:** These products are not designed for use in, and should not be used for, human applications.

This manual is a service guide produced by the manufacturer. It provides specific procedures and/or illustrations for installation, inspection, cleaning and filtration. When properly followed, these procedures will keep your FLMW 200 Series flow meter or indicator operating dependably for many years.

It is important for operators and maintenance personnel to be safety conscience when operating or repairing equipment. Developing a thorough knowledge of the precautionary areas and following safe operating procedures can prevent equipment damage and/or personal injury. Before making any repair, read all of the repair procedures to learn the correct method and all precautions.

## Operating Theory

The **FLMW 200 Series flow meter** has a low mass axial turbine which is urged towards zero flow rate by a precision torsion spring. As fluid flows past the turbine blades, a rotational torque is imposed onto the turbine and spring causing the turbine to rotate to a position where the spring's return force equals the fluid torque. Since variable fluid flow rate causes variable fluid torque, flow rate is measured by correlating turbine rotational displacement to flow rate.

The **FLMW 210 Series flow indicator** operates without the torsion spring, allowing the turbine to spin freely within the fluid stream. A chart on the side of the indicator approximates turbine RPM to GPM.

## General Specifications

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Materials of construction:	polysulphone, brass, stainless steel, Teflon and Buna-N
Measuring accuracy:	± 5% of full scale
Measuring repeatability:	± 1% of full scale
Maximum operating pressure:	200 PSIG (14 bar)
Maximum operating temperature:	250°F (121°C)
Pressure differential:	see data sheet for specific flow range
Measuring range	
VRB- flow meters:	1-30 GPM (5-110 LPM)
Minimum flow detection	
VRI- flow indicators:	0.2 GPM (0.8 LPM)
O-ring seals:	70 durometer #2-122
Filtration requirements:	37 micron (400 U.S. mesh) min.

**Warning:** Operation of FLMW 200 Series products outside of the specified operating limits can lead to serious system damage and/or personal injury.

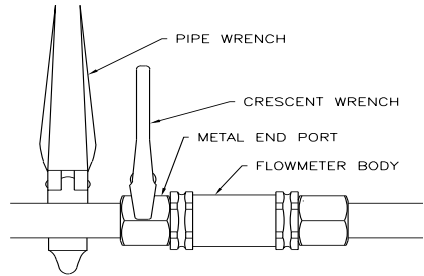
The pressure vessel of FLMW 200 Series is constructed from a high performance thermal plastic called UDEL Polysulphone. The plastic is designed for use with petroleum based oils, water and water glycols. The plastic is not compatible with many organic solvents, such as those found in paste-type pipe sealing compounds. Consult either Amoco Performance Products (800) 621-4557 or Omega for compatibility assistance.

## Installation Instructions

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FLMW 200 Series are equipped with two metal end ports for in-line connection to system plumbing. The following installation tips must be considered:

- For optimum operation, maintain at least 10 diameters of straight plumbing directly upstream of the flowmeter installation. For example,  $\frac{3}{4}$ " (19mm) pipe should have 7.5" (190 mm) of straight pipe preceding the inlet port. Failure to provide sufficient straight pipe can cause the flow rate readings to oscillate around the actual reading. The degree of oscillation will vary with fluid velocity, extent of turbulence and fluid viscous properties.



**Illustration 1**

- Use Teflon sealing tape on the pipe joints. Paste-type pipe sealants are not recommended, as most are incompatible with the plastic components of FLMW 200 Series. Apply two to three wraps of tape to the male pipe threads, but leave the initial  $\frac{1}{8}$ " (3mm) of pipe thread exposed so that the tape cannot enter the system.
- Care must be taken to avoid placing too much torque (>20 ft./lbs.) through the FLMW 200's plastic body. Excessive torque can stress the body of the meter and may result in fractures. By correctly locating wrenches during installation, over-torquing of the plastic body can be avoided. Always place a support wrench on the metal port on the same side as the pipe is being installed. **See Illustration 1.**
- Install FLMW 200 Series meters with the turbine viewing window facing a convenient observation direction.
- FLMW 200 Series can be mounted in any piping orientation - vertical up, vertical down or horizontal.
- Install a union near the flow meter so periodic cleaning and maintenance can be performed without unplumbing the entire system.

# How to Read FLMW 200 Series

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## FLOW METERS

Fluid flow imposes a torque on the flow meter's turbine and will rotate the turbine to a position where the fluid torque equals the opposing spring torque. The graduated scale on the outside perimeter of the turbine is aligned with the blue pointer to provide flow rate readings of GPM and LPM.

## FLOW INDICATORS

Fluid flow rotates the flow indicator's turbine in a predictable manner. Many applications simply require the use of an indicator to indicate the presence or absence of flow. FLMW 210 Series positively indicates fluid flow if the turbine is rotating. This rotation can be seen through the viewing window. If a more precise measurement of flow is required, the chart to the right can be referenced for approximate flow readings.

RPM	GPM	LPM
1/2 - 1	0.1	0.4
2 - 3	0.2	0.75
10 - 11	0.4	1.5
25 - 26	0.6	2.3
45 - 47	0.8	3
70 - 72	1.0	3.85
140 - 145	1.5	5.7
195 - 205	2.0	7.6

## Cleaning Maintenance

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Should flow meter or indicator become inoperative due to system contamination:

1. Remove from the system.
2. Flush thoroughly with mineral spirits.
3. Verify that the turbine is free to turn within the body of the meter. (Flow meters rotate against spring tension and will rotate approximately one complete turn before hitting a mechanical stop; Indicators meters rotate continuously.)

**DO NOT attempt to remove the turbine from meters. The turbine is attached to a torsion spring and the spring could be damaged if removal is attempted.**



## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's 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 OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's 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. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been 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 in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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## RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. **BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S 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.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

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

1. Purchase Order 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 relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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