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It is the policy of OMEGA Engineering, Inc. to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

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.



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.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

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.

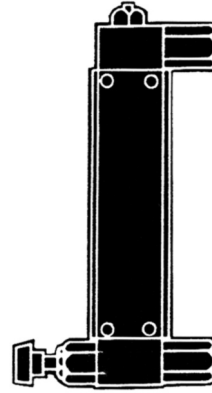
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FL-1200 Series

High Flow Rate Purge Rotometers



INSTRUCTION
SHEET

M0362/1200

Shop online at: omega.com e-mail: info@omega.com
For latest product manuals: omegamanual.info

DESCRIPTION

The FL-1200 Flowmeters are variable area, glass tube, flowrate indicating meters. The basic elements are a tapered glass metering tube and a metering float. Features include quick and simple removal or installation of the tube and float while the meter remains in the process piping.

RECEIPT OF EQUIPMENT

When the equipment is received, the outside packing case should be checked for any damage incurred during shipment. If the packing case is damaged, the local carrier should be notified at once regarding his liability.

UNPACKING

Carefully unpack the meter and inspect it for any damage that may have occurred during shipment. The flowmeters are shipped completely assembled and tested. It should not be necessary to tighten or adjust any of the parts when it is received.

RETURN SHIPMENT

Do not return any assembly without an authorized return (AR) number from OMEGA Customer Service Department (203) 359-1660.

INSTALLATION

The flowmeter should be mounted within 6° of the true vertical. The inlet connection to the flowmeter is in the bottom end fitting. The connections are normally horizontal, female NPT. Be sure that the piping is adequately supported to prevent undue strain on the meter. Both end fittings of the flowmeter may be rotated in 90° increments. To rotate the end fittings simply remove the side plates and tube and rotate the end fitting to the desired location. When the meter is reassembled, the side plates and endfittings are self-aligning.

OPERATION

CAUTION

Do not operate this instrument in excess of specifications.

After the flowmeter has been installed in the flow system, it is ready for operation. A built-in needle control valve may be provided to control the flow through flowmeter. These control valves are designed for fine control. Excessive tightening may damage the valve seat and limit its effectiveness as a control valve. If tight shut-off is required, it is recommended that a separate shut-off valve be installed in the line immediately before the flowmeter.

DISASSEMBLY AND CLEANING

It is recommended the user periodically inspect the tube and float, and clean if necessary. Dirt or foreign materials adhering to the tube and float may cause inaccuracy and sticking of the float. The metering tube (Borosilicate glass) and related parts may be ultrasonically cleaned or cleaned with any solvent which does not attack glass. To disassemble, use the following procedures:

1. Remove the plastic safety shield.
2. Loosen the seal spindle or jack screw by turning it counterclockwise with a 5/32" hex wrench. The tube may now be canted out of the meter housing.
3. **When cleaning Series FL-1200 meters, it is recommended the spring float stops and float be removed to prevent the stops and float from accidentally falling out of the tube during handling, and possibly causing damage to the float.**
4. **Packing seats and packing inserts now may be removed.**
5. With the metering tube out, the seal spindle or jack screw may be rotated clockwise for removal. It should not be necessary to remove the seal spindle unless the "O" Ring which seals the spindle requires replacement. The "O" Ring may be used as long as it is not torn or distorted.
6. The needle control valve assembly may be removed by turning the valve body counter-clockwise. The valve seat, stem and packing then may be removed easily from the valve body for cleaning or replacement.

SPECIFICATIONS

SCALES

LENGTH: 65 mm
GRADUATIONS: Direct reading in gpm water or scfm air

RATINGS

PRESSURE: 200 PSIG maximum
TEMPERATURE: 250°F maximum. Fluid temperatures below 32°F will cause frosting of the glass metering tube.

CONNECTIONS: Horizontal female, 3/8" NPT
ACCURACY: Conforms to ISA R. P. 16.1, Specifications 10-S-10 ±10% full scale

REPEATABILITY: ±0.5% of full scale
DIMENSIONS: H: 8.44" x W: 1.5" x D: 4.56"

CONSTRUCTION

METERING TUBE: Borosilicate Glass
FLOAT: 316 Stainless Steel
FLOAT STOPS: Stainless Steel
END FITTINGS & TUBE RETAINING ADAPTOR: Chrome plated brass, 316 stainless steel

SIDE PLATES: Chrome plated brass

PACKING MATERIAL: O-Rings: Buna-N w/Brass, Viton® w/Stn Stl;
Packing: Neoprene® w/Brass, Viton w/Stn Stl.

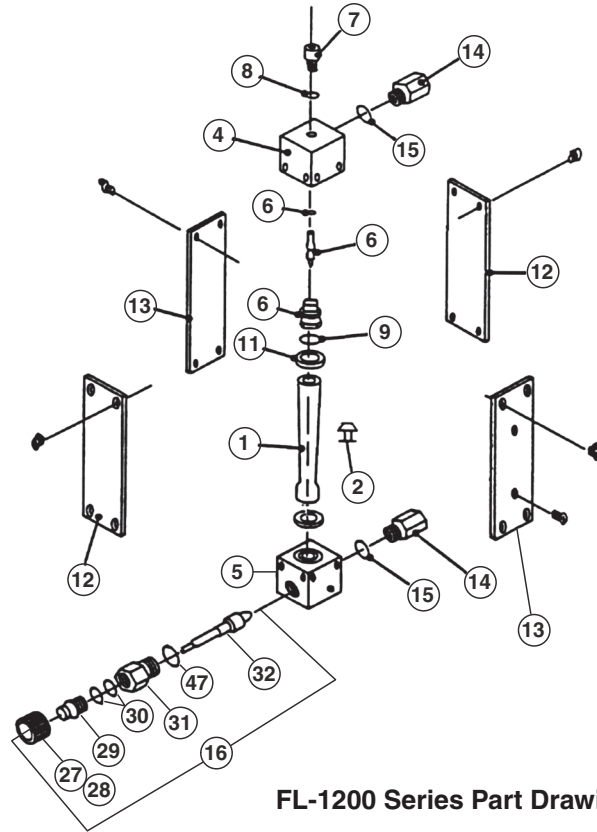
REASSEMBLY PROCEDURE

(Refer to parts diagram.)

1. Use the reverse of steps 1 through 6 of the disassembly Procedure to reassemble the meter.
2. When replacing the packing seats in the flowmeter body be sure the packing inserts are approximately 1/16" above the top of the packing seat. Also be certain the tube seats firmly on the packing seats and does not overlap onto the end block.
3. The seal spindle serves to radially compress the tube seat gasket and exert a uniform pressure on the metering tube to prevent any possibility of leakage. Do not overtighten the seal spindle.
4. After the flowmeter has been reassembled, it is important that it be hydrostatically tested at a liquid pressure of 300 psi at room temperature.

CAUTION

Hydrostatic testing should be performed only by trained and qualified personnel or serious damage could result.



FL-1200 Series Part Drawing

PARTS LIST

When ordering parts, please specify: SERIAL NUMBER, flowmeter Model Number, Part Number if available, and if known, specify materials of construction.

ITEM PART NUMBER	DESCRIPTION	MATERIAL	
1	Metering Tube Assembly, Metering Tube (Std. or Direct Etched) 316 Stainless Steel Float, Neoprene Packing, Stainless Steel Spring Stops	per S/N	Standard, or Direct Etched
2	Float	per S/N	Stainless Steel
3	Spring Float Stops	per S/N	Stainless Steel
4	End Fitting (Outlet)	A-325-G-001	Brass or Stainless Steel
*5	End Fitting (Inlet - Use Without Valve)	A-325-J-006	Brass or Stainless Steel
	End Fitting (Inlet - Use With Valve)	A-325-H-002	Brass or Stainless Steel
6	Jack-Screw Assembly	S-817-Z-009	Brass or Stainless Steel
7	Jack-Screw Nut	A-618-J-005	Brass or Stainless Steel
8	O-Ring	F-375-B-905	Buna-N, Kel-F, Viton
9	O-Ring (major)	F-375-B-211	Buna-N, Kel-F, Viton
10	O-Ring (minor)	F-375-B-010	Buna-N, Kel-F, Viton
11	Inlet and Outlet Packing	A-589-B-043	Neoprene or Teflon
12	Window Shield (2) with Screws	A-794-A-012-NOA	Clear Plexiglas
13	Sideplate (2) with Screws	A-614-A-008-FCG	Aluminum
14	Adapter (2) 3/8" NPT	A-014-C-023	Brass or Stainless Steel
15	O-Ring	F-375-B-908	Buna-N, Kel-F
16	Needle Valve Assembly	T-947-B-110	Brass or Stainless Steel

* End fitting only, valve not included. See item 16 when ordering valve.

WARNING Glass metering tubes are designed for operation up to the maximum operating pressures and temperatures as specified herein. Due to the inherent brittle characteristics of glass and conditions beyond our control, tube breakage could result below specified operating conditions. Possible glass tube breakage represents a potential hazard to operating personnel; therefore, operator protection should be supplied where operating pressures may exceed 50 psig. A safety shield constructed of 1/2 inch acrylic plastic may be used or the glass tube meter may be replaced with an all metal (armored) meter.

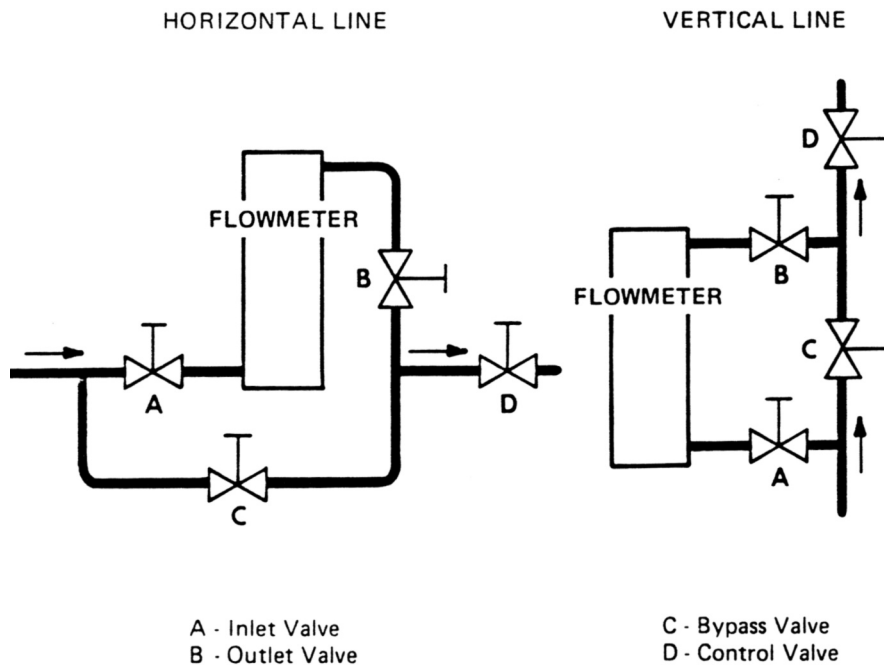
CAPACITIES

MAXIMUM FLOWRATE			
Part No.	Water (gpm)	Pressure Drop Inches W.C. w/o Valve	Pressure Drop Inches W.C. w/Valve
FL-1210	.08-8	12.6	13.6
FL-1211	.15 -1.5	22.2	27.0
FL-1212	.25-2.5	61.0	85.2
FL-1213	.35-3.5	88.7	121.0
FL-1214	.5-5.0	172.0	238.0
Part No.	Air (scfm)	Pressure Drop Inches W.C. W/o valve	Pressure Drop Inches W.C. W/Valve
FL-1201	.34-3.4	14.34	15.5
FL-1202	.6-6.0	25.34	30.8
FL-1203	1.2 -12.0	69.34	97.3
FL-1204	1.5 -15.0	101.34	138.3

WARNING

FLOWMETER OPERATION

If the inlet and outlet valves adjacent to the flowmeter are to be closed for any reason, the flowmeter must be completely drained. Failure to do so may result in thermal expansion of the liquid which can cause rupture of the meter and possible personal injury.



TYPICAL INSTALLATIONS

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.