



User's Guide

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**FPD1000-HP SERIES
HIGH PRESSURE
Positive Displacement Flowmeters**



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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.

To the owner:

Thank you for purchasing an OMEGA FPD Series Flowmeter. Please take a few minutes to read through the manual before installing and operating your meter. If you have any problems with the meter, refer to the Maintenance and Troubleshooting sections of the manual.

This manual contains connection and operating instructions for the OMEGA FPD Series meters with pulse outputs. This includes the following models:

FPD1202-HP FPD1203-HP

The OMEGA FPD Series flowmeter has incorporated the oval rotor principal into its design. This has proven to be a reliable and highly accurate method of measuring flow. Exceptional repeatability and high accuracy over a wide range of fluid viscosities and flowrates are features of the OMEGA FPD Series flowmeter design. With low pressure drop and high pressure rating, means the OMEGA FPD Series flowmeters are suitable for both gravity and pump (in-line) applications.

IMPORTANT INFORMATION



Please read this information carefully before use!

Before use, confirm the fluid to be used is compatible with the meter or consult with OMEGA for advice.

To prevent damage from dirt or foreign matter, OMEGA recommends a Y or basket type 200 mesh strainer be installed as close as possible to the inlet side of the meter. (If required, contact OMEGA for further information.)

To prevent damage to the meter, slowly fill the system with fluid. This will prevent damage caused by air purge.

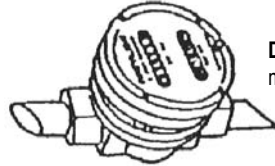
NOTE: Failure to do this could damage the meter.

For pump applications, turn off the pump at the end of each day.

INSTALLATION

1. Use thread sealant on all pipe threads.
2. Ensure the meter is installed so that rotor shafts are always in a horizontal plane (See Figure 1). Flow is bi-directional.

Figure 1



DO NOT install meter this way.

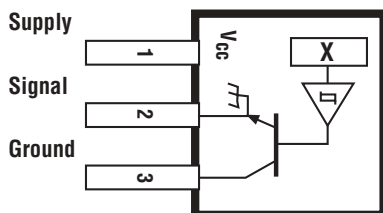
3. OMEGA recommends use of flexible connections.
4. Extreme care must be taken when installing the meter. Pipe strain or over-tightening meter connections can cause meter damage.

PULSER DETAILS

Hall Effect Sensor Specifications

- 4.5 V to 24 V (4.6 - 9 mA) operation needs only an unregulated supply.
- Open collector 25 mA output NPN (Current Sink) compatible with digital logic.
- Reverse battery precaution.

Figure 2

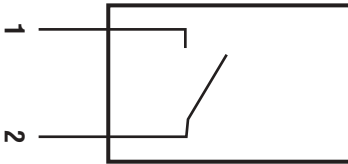


Hall Effect Sensor Wiring Details
(HP Models Only)

Reed Relay Specifications

- Two wire SPST N/O.
- Switching voltage 150 VDC; maximum current 0.25 Amps.
- Rating 3 watts.
- Duty cycle 20% ON, 80% OFF.

Figure 3



Reed Switch Wiring Details
(HP Models Only)

Reassembly:

1. Replace rotors into the meter body. The rotors should be at 90 degrees to each other.
2. Lightly rotate the rotors by hand. They must rotate freely.
3. Install O-ring.
4. Replace the meter cap and tighten the eight screws uniformly to 35Nm (25 Ft. Lbs.).
5. Replace the pulser cap and tighten the four screws.

MAINTENANCE

Disassembly:

1. Ensure the fluid supply to the meter has been disconnected, and the line pressure has been released before disassembly.
2. Remove the four screws and remove the pulser cap.
3. Remove the gasket.
4. Remove eight screws and remove the meter cap.
5. Remove O-ring and inspect. Replace O-ring if damaged.
6. Remove rotors, clean and inspect. Replace rotors if damaged.
7. To remove the PCB, remove the two screws.

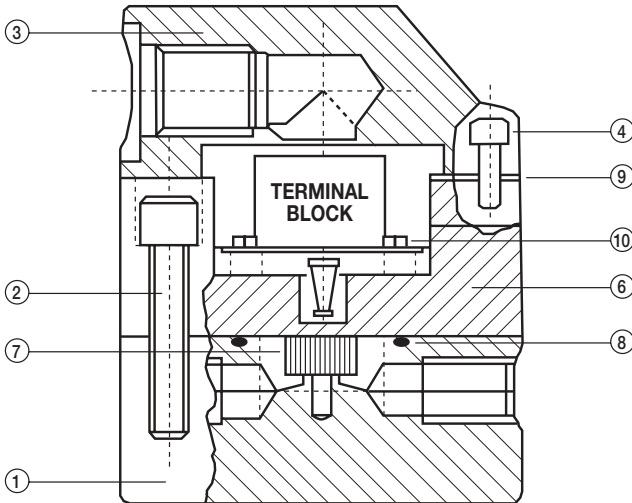
NOTE: Reed Switch PCB's cannot be removed.

TROUBLESHOOTING

Symptom	Probable Cause	Corrective Action
FLUID WILL NOT FLOW THROUGH THE METER	<ol style="list-style-type: none"> 1. Foreign matter blocking rotors 2. Line strainer blocked 3. Damaged rotors 4. Meter connections over-tightened 	<p>Dismantle meter, clean rotors. Strainer must be fitted in-line.</p> <p>Clean strainer.</p> <p>Replace rotors. Strainer must be fitted in-line.</p> <p>Re-adjust connections.</p>
REDUCED FLOW THROUGH THE METER	<ol style="list-style-type: none"> 1. Line strainer partially blocked 2. Fluid is too viscous 	<p>Clean strainer.</p> <p>Maximum viscosity 1000 centipoise.</p>
METER READING INACCURATE	<ol style="list-style-type: none"> 1. Fluid flowrate is too low or too high 2. Air in fluid. 3. Excess wear caused by incorrect installation 	<p>See specifications for minimum and maximum flowrates.</p> <p>Bleed air from system.</p> <p>Check meter for damage. Install correctly.</p>
METER NOT GIVING A PULSE SIGNAL	<ol style="list-style-type: none"> 1. Faulty Hall Effect sensor or Reed Switch 2. Faulty magnet 	<p>Replace meter cap for Reed Switch models, replace PCB for Hall Effect models.</p> <p>Replace rotors.</p>

DISPLAY PARTS LISTING

Model: FPD1202-HP



u = Recommended Spare Parts to stock.

Bold Text = Indicates Stainless Steel model parts.

Item No.	Qty.	Rec. Parts	Part or Set (Order from this column only)	Part Description
1	1		MS1NS	Meter Body Assembly NPT
2	8	u	MS367S	Bolt Set - Socket Head
3	1		MS170H	Pulser Cap (BSP)
3	1		MS170HN	Pulser Cap (NPT)
4	4	u	MS115S	Bolt Set - Socket Head
6	1		MS3HES	Meter Cap & Hall Effect Assembly*
6	1		MS3HPS	Meter Cap & Reed Switch Assembly*
7	2	u	MS6-1S	Rotor Set (Stainless Steel)
8	1	u	BS029V	O-Ring (Viton)
8	1	u	BS029TE	O-Ring (Kalrez)
9	1		MS300HS	Gasket
10	1		MS284S	Screw Sets

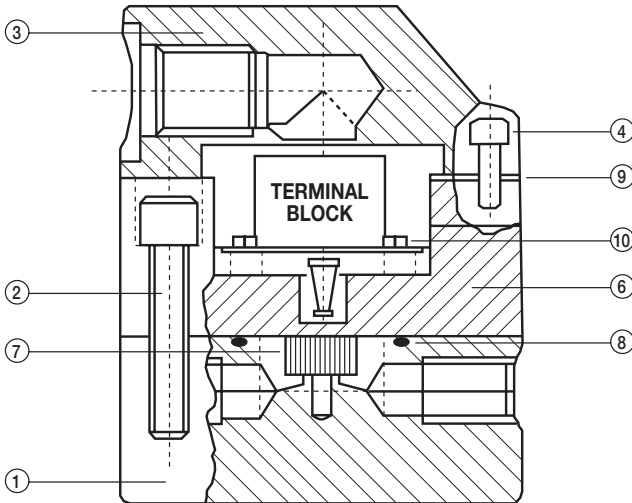
* Reed Switch & Hall Effect are unavailable without meter cap.

SPECIFICATIONS

	Pulse Meter Models
Flow Ranges (LPM or GPM)	
Above 5 centipoise	2 to 100 / 0.53 to 26.4
Below 5 centipoise	5 to 100 / 1.32 to 26.4
Accuracy of Reading	± 1%
Maximum Viscosity	1000 Centipoise
Maximum Operating Pressure	55160 kPa / 8000 PSI / 551 Bar
Maximum Operating Temperature	120°C / 248°F
Pulse Type	Hall Effect Sensor / Reed Switch
Pulses per Litre/Gallons	1000 / 3785
Meter Dimensions	86mm Dia. / 3.4" Dia. (Meter Body) 83mm / 3.25" (Port Face to Face)
Weight	3.3 kg / 116 oz.

DISPLAY PARTS LISTING

Model: FPD1203-HP



u = Recommended Spare Parts to stock.

Bold Text = Indicates Stainless Steel model parts.

Item No.	Qty.	Rec. Parts	Part or Set (Order from this column only)	Part Description
1	1		MS2NS	Meter Body Assembly NPT
2	8	u	MS367S	Bolt Set - Socket Head
3	1		MS170H	Pulser Cap (BSP)
3	1		MS170HN	Pulser Cap (NPT)
4	4	u	MS115S	Bolt Set - Socket Head
6	1		MS3HES	Meter Cap & Hall Effect Assembly*
6	1		MS3HPS	Meter Cap & Reed Switch Assembly*
7	2	u	MS7-1ES	Rotor Set (S/Steel) - Hall Effect
7	2	u	MS7-1RS	Rotor Set (S/Steel) - Reed Switch
7	2	u	MS7-1HES	Rotor Set (S/Steel) - Hall Effect, High Visc.
7	2	u	MS7-1HRS	Rotor Set (S/Steel) - Reed Switch, High Visc.
8	1	u	BS029V	O-Ring (Viton)
8	1	u	BS029TE	O-Ring (Kalrez)
9	1		MS300HS	Gasket
10	1		MS284S	Screw Sets

* Reed Switch & Hall Effect are unavailable without meter cap.

SPECIFICATIONS

	Pulse Meter Models
Flow Ranges (LPM or GPM)	
Above 5 centipoise	15 to 500 / 4.0 to 132
Below 5 centipoise	25 to 500 / 6.0 to 132
Accuracy of Reading	± 1%
Maximum Viscosity*	1000 Centipoise
Maximum Operating Pressure	55160 kPa / 8000 PSI / 551 Bar
Maximum Operating Temperature	120°C / 248°F
Pulse Type	Hall Effect Sensor / Reed Switch
Pulses per Litre/Gallons	400 / 1514
Meter Dimensions	86mm Dia. / 3.4" Dia. (Meter Body) 83mm / 3.25" (Port Face to Face)
Weight	3.3 kg / 116 oz.

* Unless high viscosity rotors are fitted.

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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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.

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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