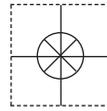


**1 YEAR**  
WARRANTY

CE



# **Ω OMEGA®** **User's Guide**



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**FPDM3000 Series  
FPDM3200 Series  
FPDM3300 Series**

**1/2" - 2" Oval Gear Flowmeter  
with Mechanical Register**



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## To the Owner

### **PLEASE READ THIS SAFETY INFORMATION CAREFULLY BEFORE USE.**

Read and retain this instruction manual to assist you in the operation and maintenance of this product.

This Flow Meter 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 flow rates are features of the oval rotor design. With a low pressure drop and high pressure rating oval rotor flow meters are suitable for both gravity and pump (in line) applications.

If you have any problems with the meter, refer to the maintenance and trouble shooting sections of this manual.

This manual contains connection and operating instructions for meters with Mechanical Displays

If you need further assistance, contact your local representative or distributor for advice.

## IMPORTANT INFORMATION



### **FLUID COMPATABILITY**

**Before use, confirm the fluid to be used is compatible with the meter. Refer to Industry fluid compatibility charts or consult your local representative for advice.**



### **AIR PURGE / LINE PRESSURE**

**To prevent damage caused by air purge slowly fill the meter with fluid.**

**To reduce pressure build-up turn off the at the end of each day.**



### **STRAINER**

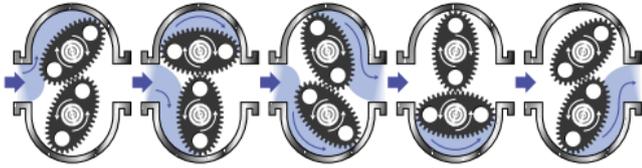
**To prevent damage from dirt or foreign matter it is recommended that a Y or Basket type mesh strainer be installed as close as possible to the inlet side of the meter.**

**When a strainer is installed it should be regularly inspected and cleaned. Failure to keep the strainer clean will dramatically effect flow meter performance.**

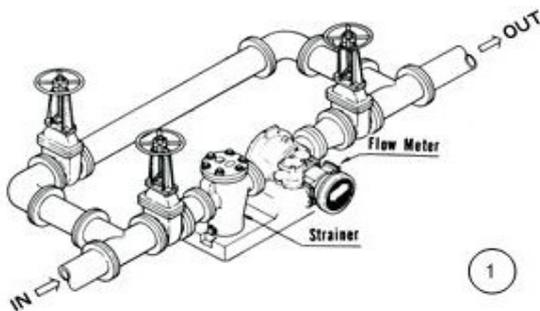
**Contact your local representative for advice.**

## OPERATING PRINCIPLE

When fluid passes through the meter the rotors turn, as shown in the diagram below. One of the rotors is fitted with a gearing pinion which (through a secondary gearing set) transfers the rotation of the rotor to the Mechanical Register.



## INSTALLATION PROCEDURE



1. It is recommended that when setting up pipe work for meter installations, a bypass line be included in the design. This provides the facility for a meter to be removed for maintenance without interrupting production. (see figure above)
2. Use thread sealant on all pipe threads.
3. For pump applications ensure pipe work and Meter have the appropriate working pressure rating to match the pressure output of the pump. Refer to Meter Specifications section for further details.
4. Install a wire mesh strainer, as close as possible to the inlet side of the meter.

**Meter 1/2"- 2" 250 micron / 60 mesh**

5. Ensure that the meter is installed so that the flow of the liquid is in the direction of the arrows embossed on the meter body.

6. The meter can be installed in any orientation as long as the meter shafts are in a horizontal plane. (Refer to diagram below for correct installation)

The mechanical register can be removed and reorientated to a different plane if required.



Do Not Install Meter This Way

- Note:** Incorrect installation can cause premature wear of meter components.
7. Do not over tighten meter connections. .
  8. It is important that after initial installation you fill the line slowly, high speed air purge could cause damage to the rotors.
  9. Test the system for leaks.
  10. Check the strainer for swarf or foreign material, after the first 200 litres check periodically, particularly if the flow rate is noted to be decreasing.

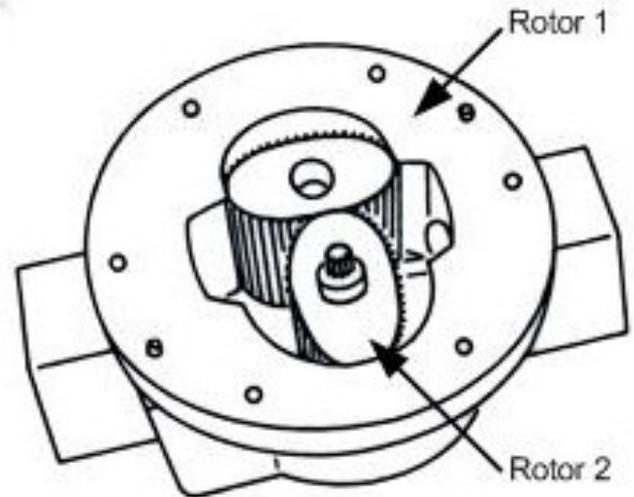
## Maintenance Procedures

### Disassembly - Flow Meter

Ensure that the fluid supply to the meter is disconnected, and the line pressure is released before disassembly.

Refer to the exploded parts diagram and parts list.

- 1) Remove the four screws located on the face of the register. Then remove the face plate cover including register assembly.
- 2) Remove the four register mounting screws and remove the lower half of the register housing.
- 3) Remove the six cover plate screws and remove the cover plate.
- 4) Remove the six meter cap screws and remove the meter cap.
- 5) Remove rotors.



Rotors Must be 90° to each other

### Reassembly - Flow Meter

- 1) Before reassembling check the condition of the rotors (replace if necessary).

**Note:** there is one long and one short shaft. The short shaft is to accommodate the rotor with the gearing pinion fitted

- 2) Replace the rotors onto the shafts at 90 degrees to each other and check their operation by turning either of the rotors.  
If the rotors are not in mesh correctly or do not move freely, remove one of the rotors and replace correctly at 90 degrees to the other rotor.
- 3) Re-check the operation of the rotors
- 4) Inspect the gears in the meter cap for wear.  
(Replace if required, refer to exploded diagram)
- 5) Replace the o'ring into groove in the meter cap, if the o'ring has grown or is damaged in any way replace it with a new part.
- 6) Replace the meter cap making sure that the gear on the rotor is meshing correctly with the gear in the meter cap. Insert the cap head screws and tighten in a diagonal sequence 1, 4, 2, 5, 3, 6.
- 7) Replace the cover plate inspect the o-ring, bevel gear, for wear or damage. (Replace if necessary).

## Flowmeter Specifications

<b>SERIES FPDM3004, FPDM3204</b>		Metric	US
Flow Range	Below 5 cP	3 to 25 L/min	0.8 to 6.6 G/min
	5 to 1000 cP	2 to 30 L/min	0.5 to 8 G/min
Maximum Operating Temperature		-40 - 80°C	-40 - 176°F
Maximum Operating Pressure <sup>1</sup>		3400 kPa	500 PSI
Accuracy of Reading		±1%	

1. Conforms to Directive 97/23/EC—Cat 1

<b>SERIES FPDM3005, FPDM3205, FPDM3305</b>		Metric	US
Flow Range	Below 5 cP	10 to 100 L/min	2.6 to 26 G/min
	5 to 1000 cP	6 to 120 L/min	1.6 to 32 G/min
Maximum Operating Temp (Standard / High Temp Version)		80°C / 120°C	176°F / 248°F
Maximum Operating Pressure <sup>1</sup>		3400 kPa	500 psi
Accuracy of Reading		±1%	

1. Conforms to Directive 97/23/EC—Cat 1

<b>SERIES FPDM3006, FPDM3206, FPDM3306</b>		Metric	US
Flow Range	Below 5 cP	15 to 235 L/min	4 to 62 G/min
	5 to 1000 cP	10 to 250 L/min	2.6 to 66 G/min
Maximum Operating Temp (Standard / High Temp Version)		80°C / 120°C	176°F / 248°F
Maximum Operating Pressure <sup>1</sup>		3400 kPa	500 psi
Accuracy of Reading		±1%	

1. Conforms to Directive 97/23/EC—Cat 1

## Flowmeter Specifications

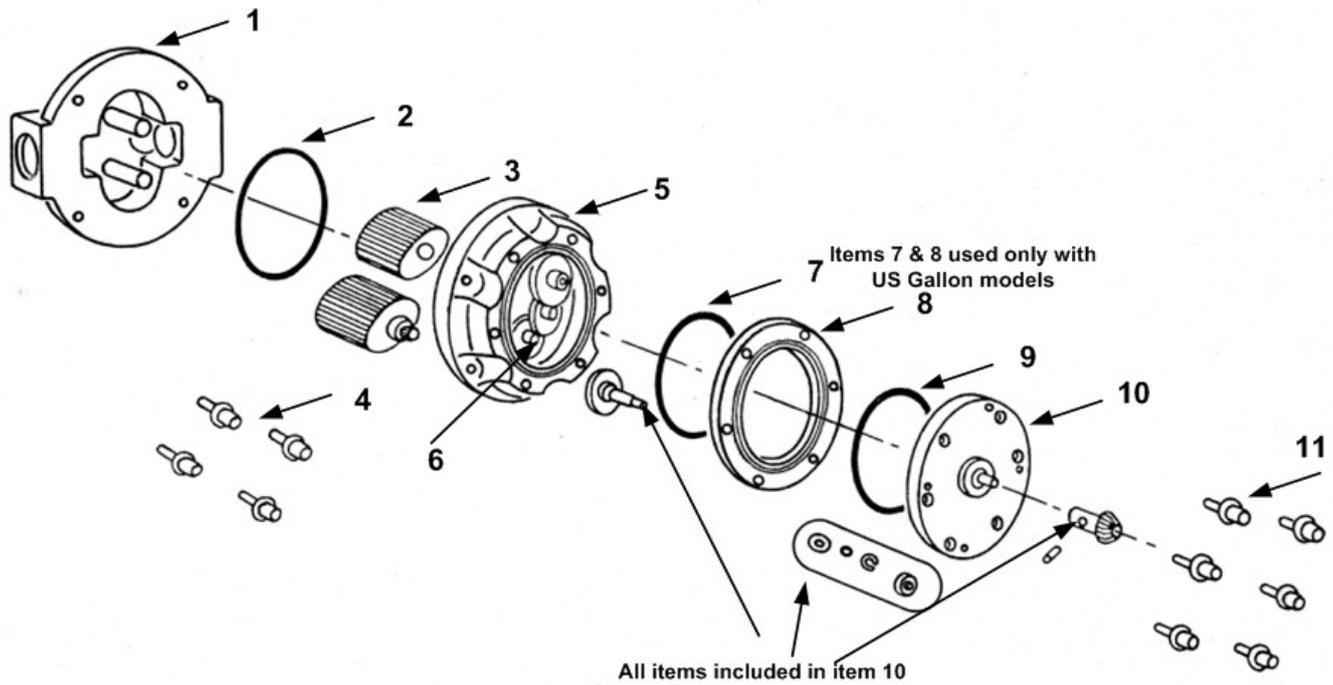
SERIES FPDM3007, FPDM3207, FPDM3307		Metric	US
Flow range	Below 5 cP	15 to 500 L/min	4 to 130 G/min
	5 to 1000 cP	15 to 500 L/min	4 to 130 G/min
Maximum Operating Temperature (Standard / High Temp)		80°C / 120°C	176°F / 248°F
Maximum Operating Pressure <sup>1</sup>		3400 kPa	500 psi
Accuracy of Reading		±1%	

1. Conforms to Directive 97/23/EC—Cat 1

## Troubleshooting Guide

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
Fluid will not flow through meter	<ul style="list-style-type: none"> <li>a) Foreign matter blocking rotors</li> <li>b) Line strainer blocked</li> <li>c) Damaged rotors</li> <li>d) Meter connections over tightened</li> <li>e) Fluid is too viscous</li> </ul>	<ul style="list-style-type: none"> <li>a) Dismantle meter, clean rotors (strainer must be fitted in line)</li> <li>b) Clean strainer</li> <li>c) Replace rotors (Strainer must be fitted in line)</li> <li>d) Re-adjust connections</li> <li>e) See specifications for maximum viscosity</li> </ul>
Reduced flow through meter	<ul style="list-style-type: none"> <li>a) Strainer is partially blocked</li> <li>b) Fluid is too viscous</li> </ul>	<ul style="list-style-type: none"> <li>a) Clean strainer</li> <li>b) See specifications for maximum viscosity</li> </ul>
Meter reading inaccurate	<ul style="list-style-type: none"> <li>a) Fluid flow rate is too high or too low</li> <li>b) Air in fluid</li> <li>c) Excess wear caused by incorrect installation</li> </ul>	<ul style="list-style-type: none"> <li>a) See specifications for minimum and maximum flow rates</li> <li>b) Bleed air from system</li> <li>c) Check meter body and rotors. Replace as required. Refer to installation instructions</li> </ul>
Fluid flows but no reading on meter	<ul style="list-style-type: none"> <li>a) Bevel gear is loose on shaft</li> <li>b) Rotor drive gear is damaged</li> <li>c) Transmission gears damaged</li> <li>d) Register gears damaged</li> </ul>	<ul style="list-style-type: none"> <li>a) Tighten grub screws</li> <li>b) Replace rotor</li> <li>c) Replace gears</li> <li>d) Replace register assembly</li> </ul>
Fluid leaks into register	<ul style="list-style-type: none"> <li>a) Seal worn or damaged on the cover plate</li> </ul>	<ul style="list-style-type: none"> <li>a) Replace seal (Check seal compatibility with fluid)</li> </ul>

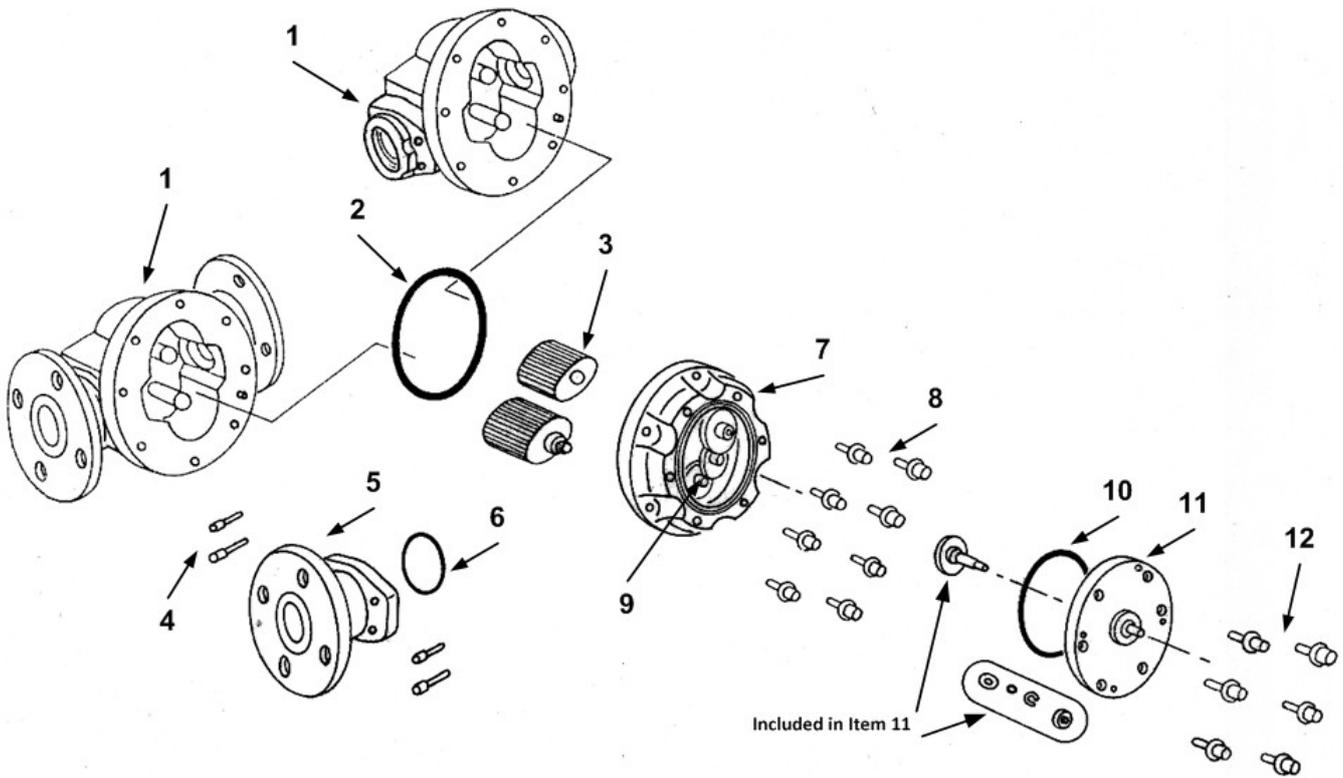
## Series FPDM3x04 Exploded diagram



## Series FPDM3x04 Parts Listing

Item No.	Part Description
1	Meter Body
2	Meter Cap O-Ring
3	Rotors Set
4	Meter Cap Bolts
5	Meter Cap
6	Gear Set
7	Spacer Ring O-Ring ( <i>US gallon models only</i> )
8	Spacer Ring ( <i>US gallon models only</i> )
9	Cover Plate O-Ring
10	Cover Plate Seal and Bush set
11	Cover Plate Screws

## Series FPDM3x05 - FPDM3x07 Exploded Diagram



## Series FPDM3x05 - FPDM3x07 Parts Identification

Item No.	Part Description
1	Meter Body
2	Meter Cap O-Ring
3	Rotors Set
4	Flange Bolts
5	Flange Adaptor
6	Flange O-Ring Set
7	Meter Cap
8	Meter Cap Screws
9	Gear Set
10	O-Ring - Cover Plate
11	Cover Plate and Gear Set
12	Cover Plate Screws

## Wetted Parts

<b>SERIES FPDM3x04</b>	<b>FPDM3004</b>	<b>FPDM3204</b>
<b>Meter Body</b>	Al	SS
<b>Rotor Shaft</b>	SS	SS
<b>Rotors - Standard</b>	PPS	PPS
<b>Rotor Bushes</b>	-	CA
<b>Meter Cap</b>	Al	SS
<b>Gear Assembly</b>	SS/POM	SS/POM
<b>Cover Plate</b>	SS	SS
<b>Output Gear and Shaft assy.</b>	SS/FFKM/POM	SS/FFKM/POM
<b>O Rings</b>	FKM	K

<b>SERIES FPDM3x05</b>	<b>FPDM3005</b>	<b>FPDM3305</b>	<b>FPDM3205</b>
<b>Meter Body</b>	Al	Al	SS
<b>Rotor Shafts</b>	SS	SS	SS
<b>Rotors - Standard</b>	PPS	SS	PPS
<b>- High Temp.</b>	-	-	SS
<b>- High Viscosity.</b>	-	SS	SS
<b>Rotor Bushes</b>	-	CA	CA
<b>Meter Cap</b>	Al	Al	SS
<b>Gear Assembly</b>	SS/POM	SS/POM	SS/POM
<b>Cover Plate</b>	SS	SS	SS
<b>Output Gear and Shaft assy.</b>	SS/FFKM/POM	SS/FFKM/POM	SS/FFKM/POM
<b>O Rings</b>	FKM	K	K

## Wetted Parts

<b>SERIES FPDM3x06</b>	<b>FPDM3006</b>	<b>FPDM3306</b>	<b>FPDM3206</b>
Meter Body	Al	Al	SS
Rotor Shafts	SS	SS	SS
Rotors - Standard	PPS	Al	PPS
- High Temp.	-	-	SS
- High Viscosity.	-	SS	SS
Rotor Bushes	-	CA	CA
Meter Cap	Al	Al	SS
Gear Assembly	SS/POM	SS/POM	SS/POM
Cover Plate	SS	SS	SS
Output Gear and Shaft assy.	SS/FFKM/POM	SS/FFKM/POM	SS/FFKM/POM
O Rings	FKM	K	K

<b>SERIES FPDM3x07</b>	<b>FPDM3007</b>	<b>FPDM3307</b>	<b>FPDM3207</b>
Meter Body	Al	Al	SS
Rotor Shafts	SS	SS	SS
Rotors - Standard	PPS	Al	PPS
- High Temp.	-	-	SS
- High Viscosity.	-	SS	SS
Rotor Bushes	-	CA	CA
Meter Cap	Al	Al	SS
Gear Assembly	SS/POM	SS/POM	SS/POM
Cover Plate	SS	SS	SS
Output Gear and Shaft assy.	SS/FFKM/POM	SS/FFKM/POM	SS/FFKM/POM
O Rings	FKM	K	K

## Wetted Parts

*K - FEP/PTFE Encapsulated*

*SS - Stainless Steel 316*

*Al - Aluminium AA610*

*CA - Carbon*

*FKM - Fluoroelastomer*

*PPS - Polyphenylene Sulphide*

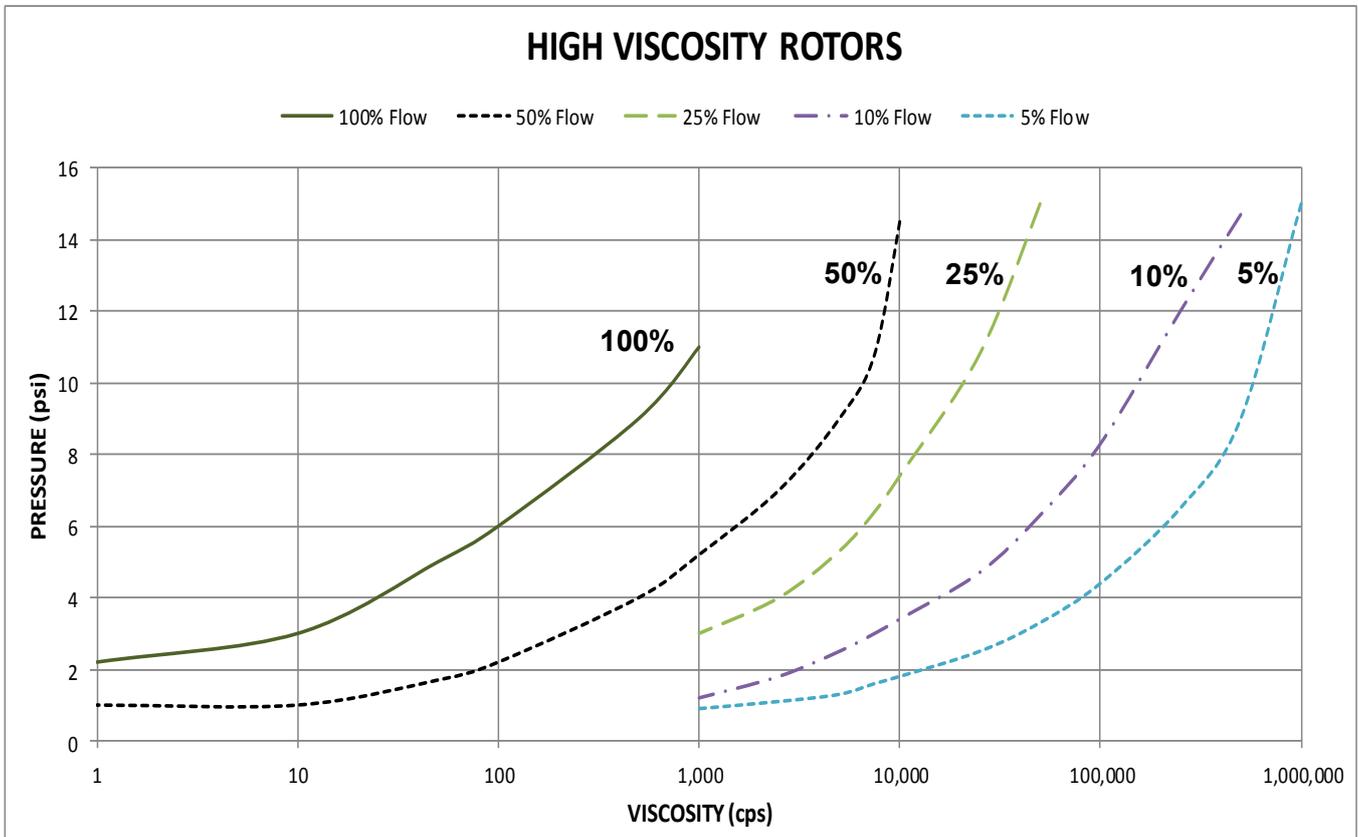
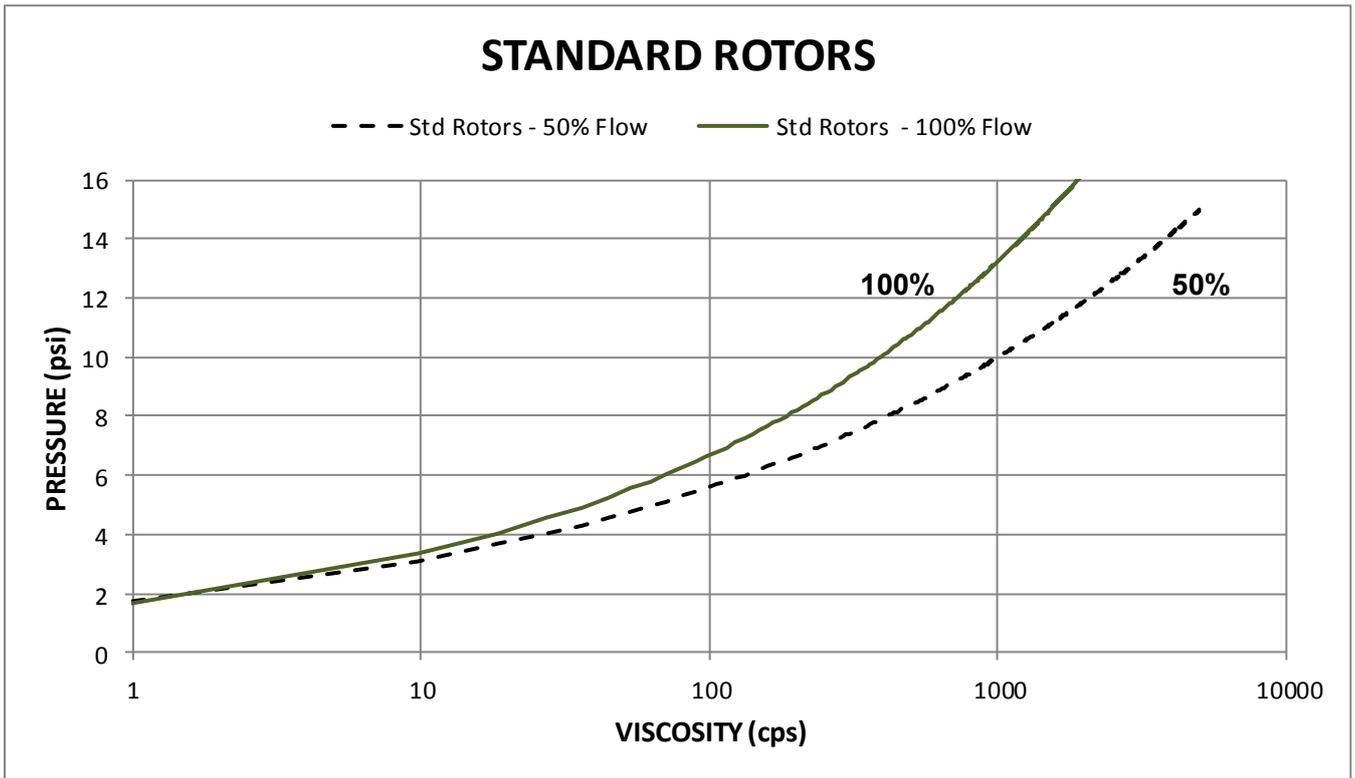
*PVDF - Polyvinylidene Flouride*

*POM - Acetal*

*PTFE - Polytetrafluoroethylene*

*FFKM - Perfluoro Elastomer*

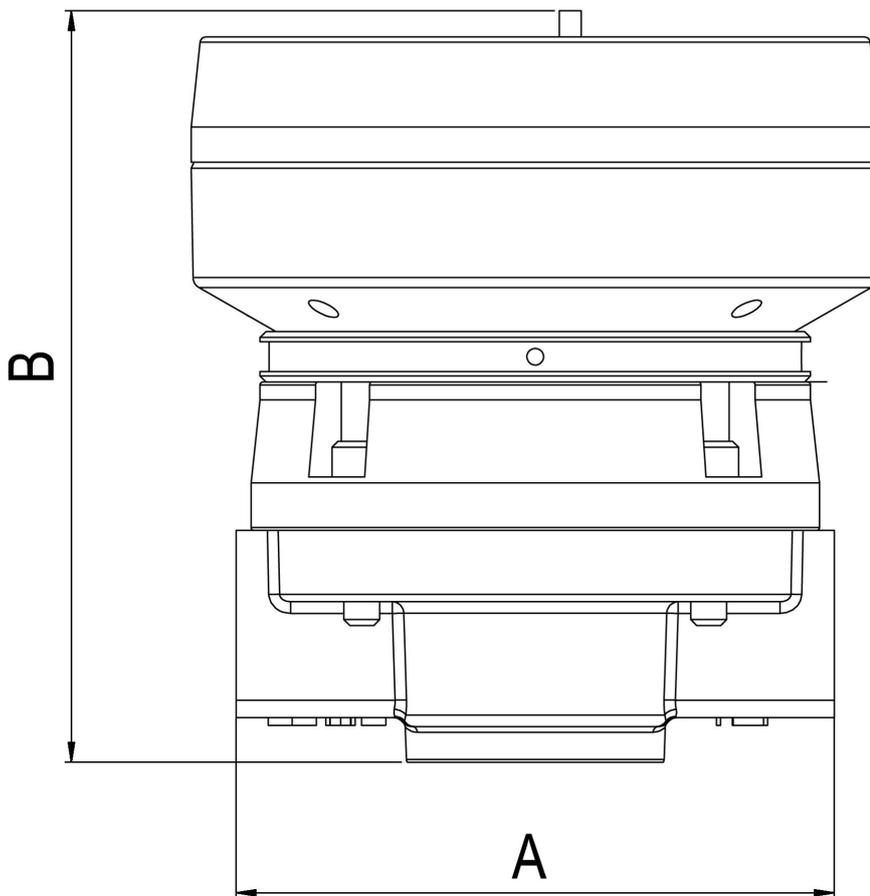
# PRESSURE DROP v VISCOSITY



Register Type	B – Register Height
M (Ltr)	123mm
M (USG)	128mm

	A – Face to Face length	
	FPDM3004	FPDM3204
NPT	100mm	100mm

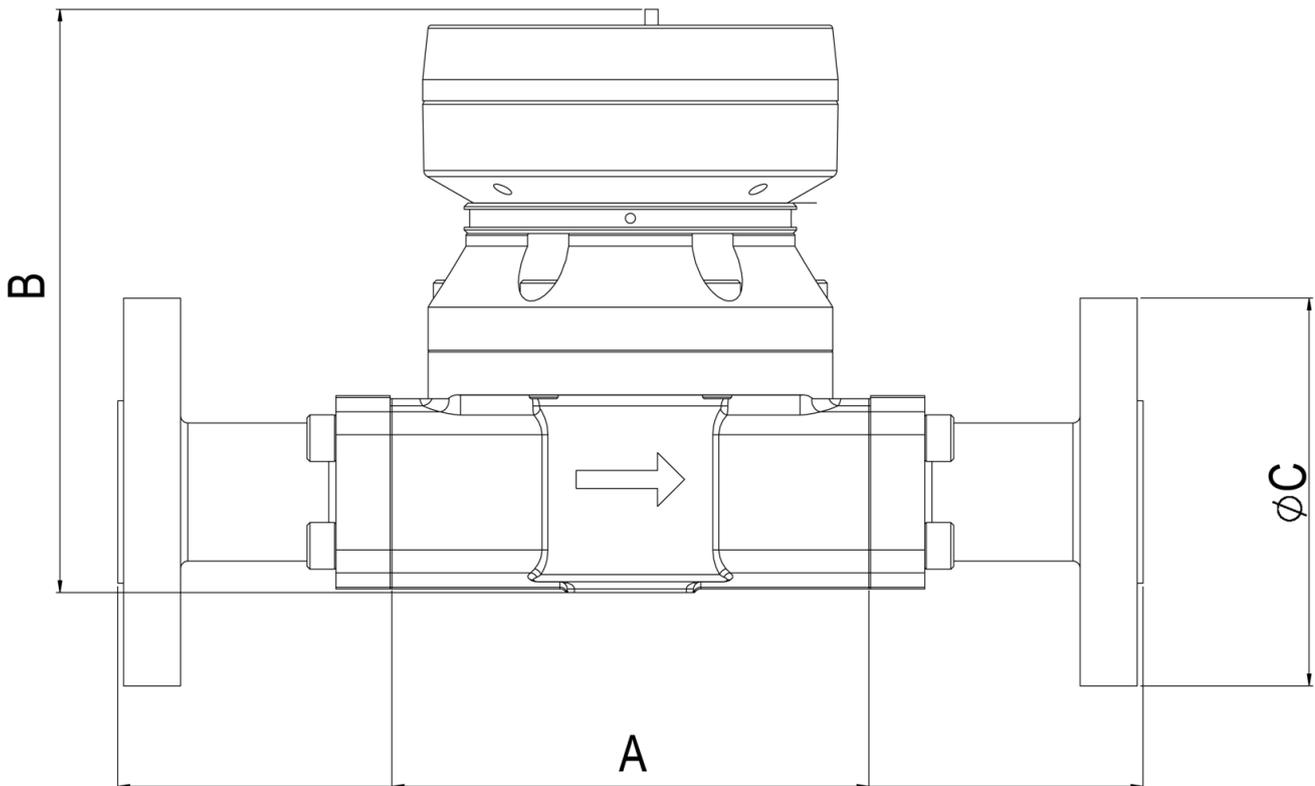
**Type M mechanical register**



Register Type	B – Register Height
M	159mm

	A – Face to Face		C – Flange Diameter
	FPDM3005 / FPDM3305	FPDM3205	
NPT	133mm	143mm	
ANSI	284mm	294mm	108mm

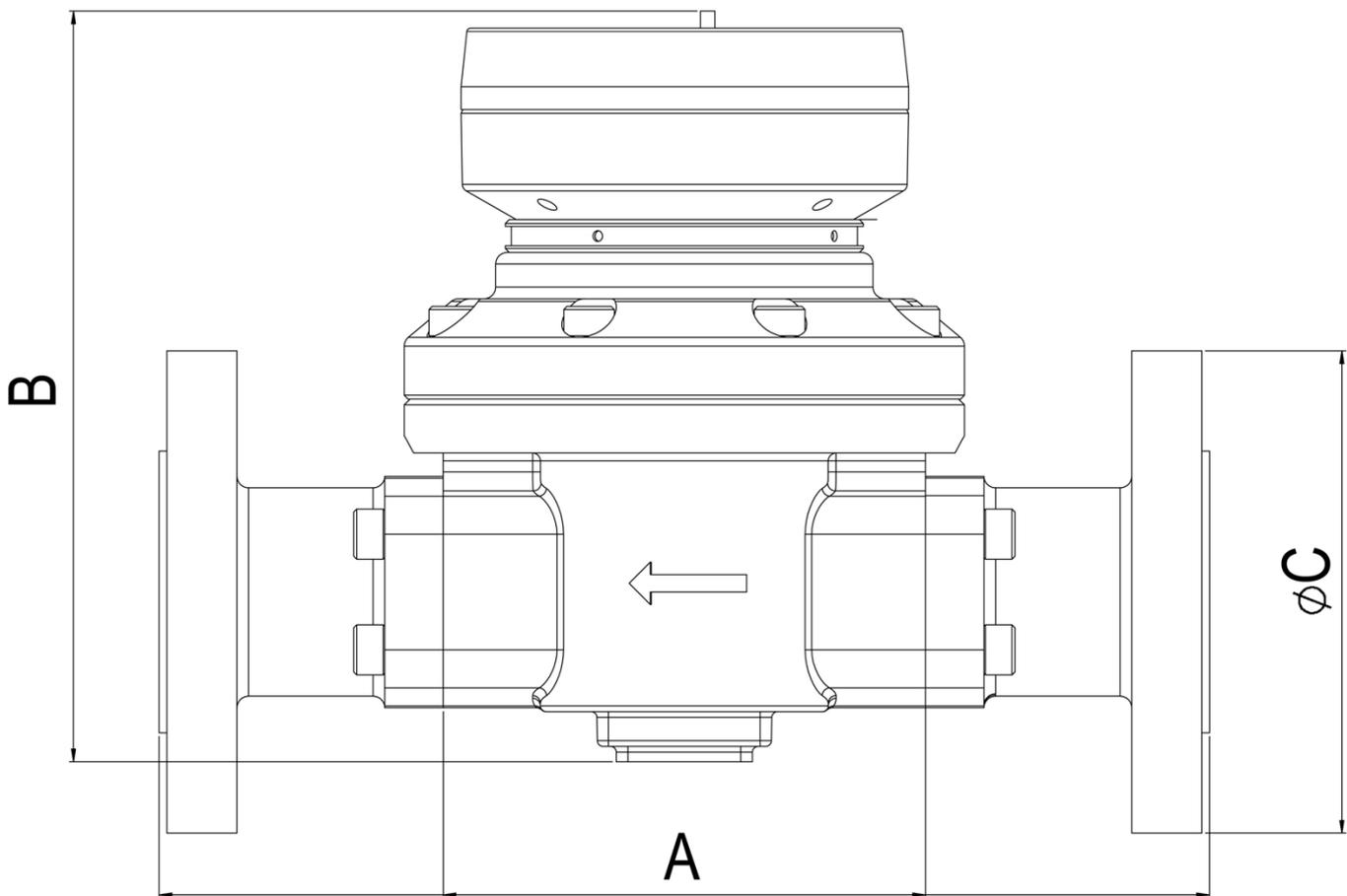
**Type M mechanical register**



Register Type	B – Register Height
M	191mm

	A – Face to Face		C – Flange Diameter
	FPDM3006 / FPDM3306	FPDM3206	
NPT	124mm	124mm	
ANSI	270mm	270mm	127mm

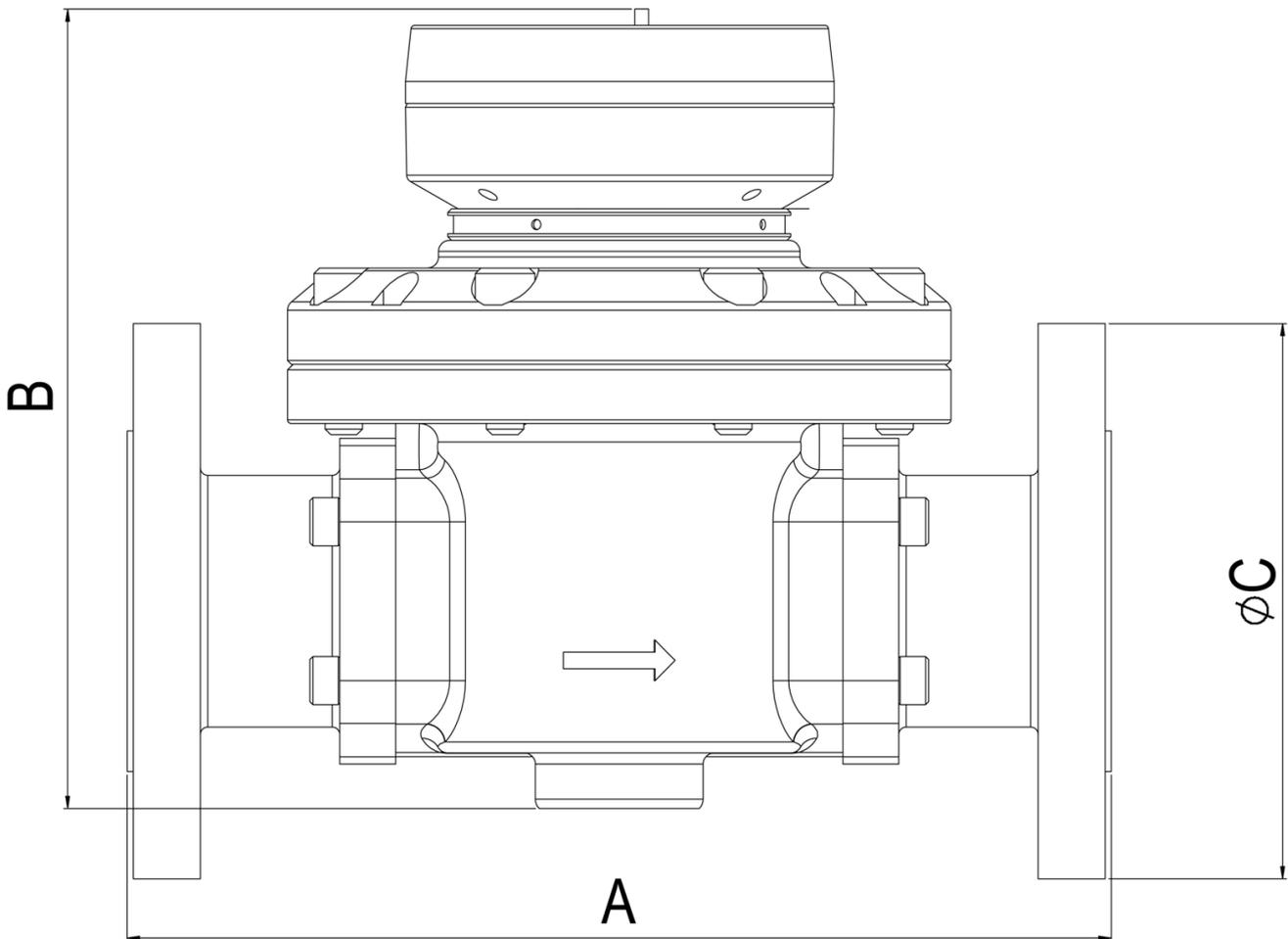
**Type M mechanical register**



Register Type	B – Register Height
M	210mm

	A – Face to Face		C – Flange Diameter
	FPDM3007 / FPDM3307	FPDM3207	
NPT	210mm	210mm	
ANSI	264mm	264mm	152mm

**Type M mechanical register**



## 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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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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