Mechanical Fuel Meters

FM-100

World class Mechanical Fuel Meter, extremely compact, yet easy to read

Nutating Disc Mechanism offers high tolerance to fuel contamination

Robust aluminum die cast construction

3 Port Design
The meter can be used:
a. In–Line
b. At 90 Degrees
Inlet & outlet ports at right angle

Register cap can be easily removed & rotated to every 90° orientation for convenient read out

Easy user re-calibration

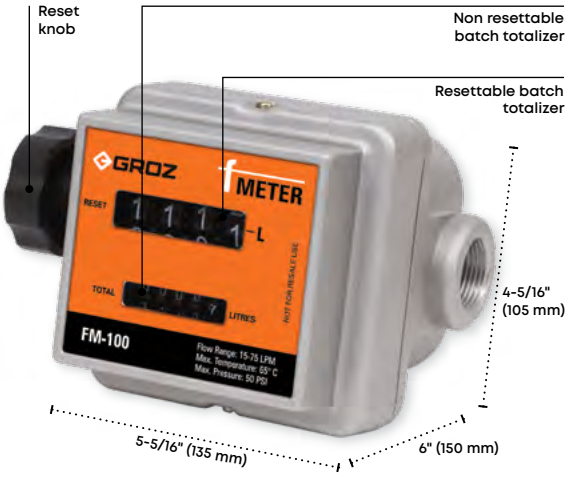
For use with electric fuel pumps or gravity flow (with a minimum gravity head of 4')

Available in litre/gallon version in a choice of 3/4" or 1" threads

WETTED COMPONENTS
Aluminum, Poly Butylene Terephthalate (PBT), Viton, Stainless Steel

RECOMMENDED USE
Diesel, Gasoline, Low to Medium Viscosity Oils

DO NOT USE WITH
Water based media



SPECIFICATIONS

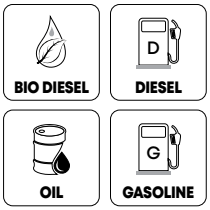
Flow Rate	15-75 LPM	4 -20 GPM
Accuracy*	± 2%	
Repeatability*	± 1%	
Max. working pressure	50 PSI	3.5 BAR
Working Temperature RANGE	-10°C TO 65°C	14°F TO 150°F
Max. Resettable Batch Totallzer	9999.9 Litres or 999.9 Gallons	
Max. Non Resettable Batch Totalizer	999999 Litres or 99999.9 Gallons	
Least Count / Resolution	0.10 Litres or 0.10 Gallons	

* Tested in laboratory conditions
Note: Not to be used to measure media for resale

ORDERING INFORMATION

CAT NR.	ORD NR.	MEASUREMENT	THREADS
FM-100/3-4/BSP	45680	Litres	3/4" BSP (F)
FM-100/3-4/N	45681	Litres	3/4" NPT (F)
FM-100G/3-4/N	45682	Gallons	3/4" NPT (F)
FM-100/0-1/BSP	45683	Litres	1" BSP (F)
FM-100/0-1/N	45684	Litres	1" NPT (F)
FM-100G/0-1/N	45685	Gallons	1" NPT (F)

FLUIDS

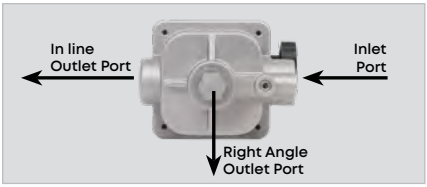


INSTALLATION

The meter can be installed in any position, on rigid pipelines or flexible hoses, directly on pumps or tanks. The meter can be fitted In–Line or with the Inlet & outlet ports at Right Angle. Inlet & Outlet ports are marked with IN & OUT respectively. Meter Cover (4) can be removed and the Counter Assembly (7) can be rotated at every 90° orientation in four different positions.

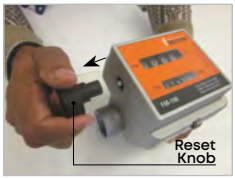
WARNING

If solid particles enter the measuring chamber, the correct working of the nutating disk may be affected. Always filter the fluid by installing a filter at the meter inlet.



HOW TO ROTATE THE DISPLAY

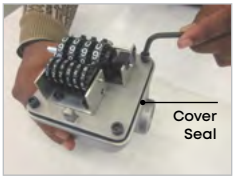
1. Pull out the Reset Knob (3) from the meter.



2. Unscrew the two Allen bolts (2) anticlockwise with allen key (size 4) & remove the meter cover (4).

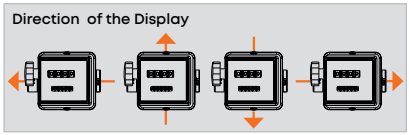
3. Unscrew the four Allen bolts (6) anticlockwise with allen key (size 4).

4. Carefully remove the Cover Seal (5).

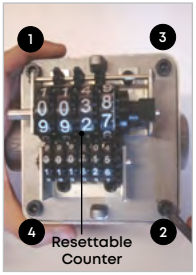


5. Remove Counter Assembly (7) taking care not to damage the Housing Seal (13).

6. Rotate & reinstall Counter Assembly (7) in the desired position. The display can be chosen from one of the following positions.



7. Install Cover Seal (5). First, tighten the four Allen bolts (6) by hand in an even & diagonal pattern as shown in the picture & finally tighten them with allen key (size 4).



NOTE: After installation, rotate the resettable counter with fingers & ensure their smooth movement.

8. Install the meter cover (4). Fix Reset Knob (3) by pushing it firmly onto the reset shaft.

METER CALIBRATION

(Refer to exploded view)

The meter is pre-calibrated in factory under standard conditions.
A new calibration is necessary whenever there is a change in any of the following:

- Media Viscosity
- Flow Rate
- Operating Temperature

IMPORTANT

For ensuring the accuracy of measurements, the flow rate should never be kept below 20 LPM (5 GPM).

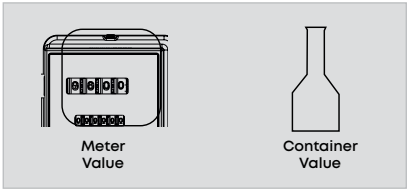
Calibration procedure

1. Vent the air from pump, pipelines and meter by dispensing until the flow stream is full and steady.
2. Stop the flow by shutting off the nozzle, but let the pump run.
3. Reset the Batch Total to zero using reset knob (3).
4. Dispense at the desired flow rate into a graduated container whose capacity should not be lower than 20 litres (5 gallons).

NOTE: Do not reduce the flow in order to reach a pre-set value of the calibration container.

The right method is to start with full flow and stop when the required volume is transferred

5. The Meter Value should be matched with the Container Value as given below.
   - If the Meter Value is higher than Container Value (i.e the meter is running fast), loosen the Calibration screw (16) anticlockwise.
   - If the Meter Value is lower than the Container Value (i.e the meter is running slow), tighten the Calibration screw (16) clockwise.



NOTE: Always fix the Calibration Screw with O-Ring (15) to avoid leakage.

6. Repeat steps (3 - 5) until accuracy is satisfactory.

OPERATION

(Refer to exploded view)

After installation, turn the reset knob (3) until the batch total becomes zero. The totalizer cannot be reset

Use by Gravity

This meter can also be used without pump pressure in a system where flow is generated due to difference in height between fuel level and dispensing point.

NOTE

- Longer pipes or nozzles reduce the flow by causing higher pressure losses.
- Use By Gravity is not recommended where the height of fuel reservoir is lower than 4 feet as the flow rate will be reduced, resulting in inaccurate measurement. For better accuracy, ensure that the flow rate never falls below 20 LPM (5 GPM).
- On field calibration is always recommended in case of Gravity installations.

MAINTENANCE

This fuel meter does not require any special maintenance other than the cleaning of measuring chamber (It may get clogged sometimes due to improper filtration).

NOTE

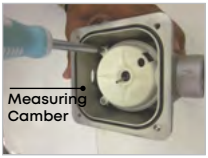
- The meter can be easily disassembled into its main parts without removing the meter from the pipes.
- Never remove meter label from the meter.
- Internal parts should be cleaned with a soft brush or small tool (i.e. a screwdriver).
- During cleaning, be careful not to damage the measuring chamber or nutating disk.
- A new calibration is always necessary after disassembling the measuring chamber. Before disassembling always ensure that the line pressure is released and all fluid is drained from the meter.

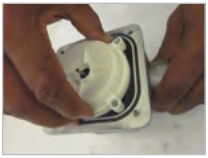
CLEANING THE MEASURING CHAMBER

(Refer to exploded view)

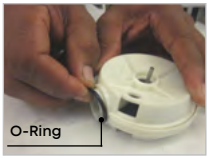
1. Remove the allen bolts (2), Meter cover (4) & Counter Assembly (7) by following steps 1 - 5 from the section: **“How to rotate the display”- on Page 2.**

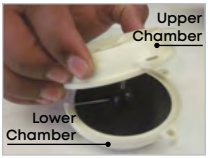
2. Unscrew the two screws (8) with a Phillips Screwdriver and remove Nutating Disc Assembly.





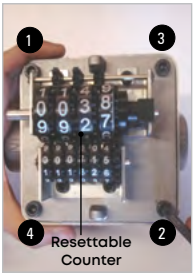
3. Remove O-Ring (10) and disconnect Upper Chamber (9), Lower Chamber (12) & Nutating Disk (11).





4. Use a soft brush to clean the Measuring Chamber (14). Be careful not to damage the plastic components.

5. To reassemble, reverse the above mentioned procedure paying particular attention to:
   - Lubricate the Seal (13) and O ring (10) with small amount of grease before installation.
   - First, tighten the four Allen bolts (6) by hand in an even & diagonal pattern as shown in the picture & finally tighten them with allen key (size 4).



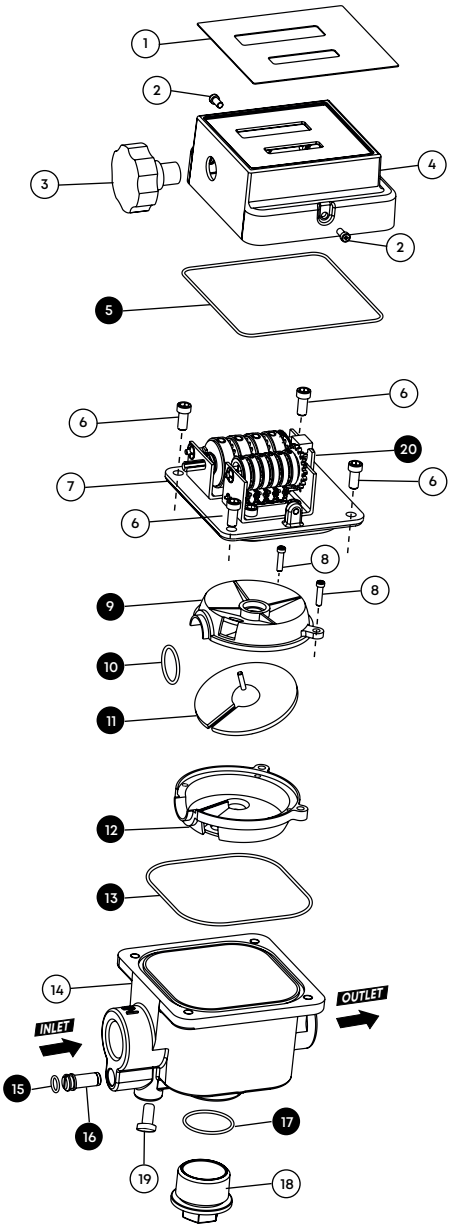
NOTE

After installation, rotate the Resettable counter with fingers & ensure their smooth movement.

- Recalibrate the meter as mentioned in the section: **"METER CALIBRATION"- on Page 2.**

EXPLODED VIEW

● **SA/KIT/RPR/FM-100**



PARTS LIST

REF NO.	PARTS DESCRIPTION	QUANTITY
1	Meter Label	1
2	Allen Bolts	2
3	Reset Knob	1
4	Meter Cover	1
5	Cover Seal	1
6	Allen Bolts	4
7	Counter Assembly	1
8	Screw	2
9	Upper Chamber	1
10	Nutating Chamber Seal	1

REF NO.	PARTS DESCRIPTION	QUANTITY
11	Nutating Disk	1
12	Lower Chamber	1
13	Housing seal	1
14	Measuring Chamber	1
15	Calibration Screw Seal	1
16	Calibration Screw	1
17	O Ring Plug	1
18	Bottom Plug	1
19	Grub Screw	1
20	Shaft Seal	1

REPAIR KIT PART LIST

KIT DESCRIPTION		PARTS DESCRIPTION	REFERENCE PART # FROM PART LIST	QUANTITY
SA/KIT/RPR/FM-100		Cover Seal	5	1
		Upper Chamber	9	1
		Nutating Chamber Seal	10	1
		Nutating Disk	11	1
		Lower Chamber	12	1
		Housing seal	13	1
		Calibration Screw Seal	15	1
		Calibration Screw	16	1
	*ORG/V/BS021	O Ring Plug	17	1
	**ORG/V/BS025			
		Shaft Seal	20	1

*FM-100/3-4/BSP
**FM-100/0-1/BSP

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTIVE SOLUTION
Accuracy	Wrong calibration	Recalibrate the meter as shown in section **"Meter Calibration"**
	Soiled or blocked measuring chamber	Clean the measuring chamber as mentioned in section **"Cleaning The Measuring Chamber"**
	Air in the fluid	Locate and eliminate leaks in inlet lines
Reduced flow rate	Clogged measuring chamber	Clean the measuring chamber as mentioned in section **"Cleaning The Measuring Chamber"**
	Blocked or soiled filter	Clean the filter

NOTE

NOTE

GROZ WARRANTY POLICY

Groz makes all efforts to ensure that its products meet the highest standards of quality and durability and warrants to the original purchaser its range of products for a period of 12 months from Groz Invoice date, against defects in materials and workmanship. If the Groz product is part of a set, only the portion that is defective is subject to this warranty.

This warranty does not apply to damage due directly or indirectly, to misuse, abuse, wear and tear, negligence or accident, repairs or alterations outside Groz plants, or to lack of maintenance. Groz shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special or consequential damages arising from the use of its products. It is upto the user to determine suitability and safety of the product for their intended use, and the user assumes all risks and liability herewith.

In no event, shall Groz's liability exceed the invoiced cost of the product In case of identification of defect covered under this warranty, the same must be notified in writing to Groz /Groz designated authorized service location. Proof of purchase date must accompany the complaint. Groz reserves the right to call back the faulty unit, all charges including transportation prepaid. On verification of the defect, the unit will be repaired or replaced with a new or reconditioned product or part of equal utility or a full refund given at Groz's discretion. The repaired /replaced units will be returned to the user freight prepaid, using most economical freight carrier. However if determined that the defect resulted from causes not within the scope of the warranty, then the cost of returning the product would be to buyer's account.

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