

DIMENSIONS AND INSTALLATION

FLOWMETER LM SERIES TYPES GN, PP, PVDF VERSIONS

These units are flowmeters having an integral electronics transmitting a pulse output linear to flow. The meters are rated to 5 bar pressure and 70°C but for longest component life the continuously rated temperature should be less than 60°C.

The turbine ring assembly is in 316 stainless steel with sapphire/sapphire bearings. The rotor is equipped with 6 sealed ferrites which are sensed by a coil mounted in the transmitter electronics housing. The standard O-ring material is Viton for the electronics/body seal.

Sizes LM01, LM05, LM24 and LM45 (and other sizes) have 8 mm OD push-on hose connections. Only the LM220 has 11 mm OD push-on hose connections. Backing rings on the flange closure are provided on the PP and PVDF versions for extra security as they are likely to be destined for more corrosive service.

If it is necessary to remove the electronics then the line should be non-pressurised and drained down. The turbine ring assembly can then be simply pulled out. If it is held against the underside of the electronics and gently blown then the flowmeter action will be duplicated. (Ensure that any dangerous fluids that may be on the rotor assembly are removed before this test).

The transmitter electronics has a 4-way M12 sensor connector [IEC-61076-2-101] rated to IP67 e.g. compatible with Brad Harrison, Hirschmann, ERNI, Murr and Turck Banner. The flowmeter is normally supplied with a separate 5m lead with the mating connector. The signal is an NPN open collector, 8 to 28Vdc input. *TTL and PNP are optional outputs.*

Options (check with transmitter certificate in all cases):

- a) Titanium turbine ring assembly and other parts may be used.
- b) If a Viton^(R) O-seal is not suitable then EPDM, Nitrile, PTFE covered Viton or Kalrez can be supplied.

Flowmeter materials: The rotor is most likely to be constructed in PFA Teflon - please check calibration certificate to confirm construction

GN Type

The rotor housing is provided in glass-filled nylon.

PP Type

The rotor housing is provided in glass-filled polypropylene.

PVDF Type

The rotor housing is provided in PVDF (Polyvinylidene Difluoride) for the most corrosive of metering applications. The turbine ring assembly can be titanium with titanium bearing holders fitted with sapphire cups. The rotor shaft can be titanium with sapphire bearing balls. Optionally this unit may be provided totally in PVDF with no wetted metal parts. The front face of the sensing electronics may be constructed in PVDF.

Installation

The LM Series of flowmeters are virtually immune from pipework installation effects. It is desirable that valves or tee pieces are not mounted directly on to the inlet pipe as a change in calibration from the factory calibration certificate will result.

The transmitter should be installed in the horizontal plane with both the inlet and outlet tubes horizontal. The electronics housing will also be on the horizontal plane. Marked on the rotor housing (with the inlet and outlet tubes) is the word 'TOP'. This should appear above the 2 tubes as installed; the word 'LITRE METER' should be at the bottom. The tubes are identified with the words 'IN' & 'OUT'. This installation attitude will duplicate that of the flowmeter's calibration test.

If the installation is poor then it may be possible to effect an in-situ flow calibration at various flow rates to establish the effect on the flowmeter. If the operating flow range is small, a new "meter factor" of pulses per litre could be used optimised for the smaller range as a result of in-situ testing. Non-linearity over a wide flow range can be minimised using a microprocessor instrument having a linearising signal processing facility. In this case the display or flow rate signal will have an enhanced accuracy over and above the flowmeter performance.

Viscosity effects

Viscosity affects all turbine type meters. If the viscosity is low this is minimal. Viscosity imposes drag on the rotor reducing the RPM even at high flows. Rangeability (turndown) is also reduced and it is desirable to operate in the higher end of the meter flow range as non-linearity appears particularly at low flows.

A relatively high viscosity fluid can be metered if the flow rate is stable or of a limited range and if the application temperature and resulting viscosity of the fluid is also stable. This applies to many batching systems where simple recalibration will provide system accuracy.

All viscous fluids create an increased pressure drop throughout the pipe line systems. Since it is desirable to operate flowmeters at the higher end of their flow range, most users operate pumped rather than gravity fed systems for viscous fluids.

Possible sources of error – specific to low flow:

1. That small particles may be affecting/blocking the jet. The size of the jet hole is just 0.38mm for the 005 and 0.3mm for the 003. We recommend a 40 micron filter for the 005 and 003.
2. The installation must have the flowmeters inlet and outlet pipes in the horizontal plane. In addition, the electronics must also be in the horizontal plane. This ensures that the rotor axis is vertical and that there is minimum friction on the bearings. With higher friction, then at lower flows errors will be observed. In the worst case, the minimum flow measurable will be higher as well.
3. Air pockets within the flowmeter. When we calibrate on our flow rig, we are able to remove the air pockets by manipulating a flexible hose. This is necessary on all flowmeters below LM01 in size. Above this size then the simple throughput of water removes the air, but below this size then some assistance is required. Removing the air pocket can also be effected just by twisting the flowmeter along the axis of the pipe.
4. Vibrations in the pipe and flowmeter may cause extra pulses to occur but we would find this unusual. Clamping the meter may assist.

1 2 3 4 5 6

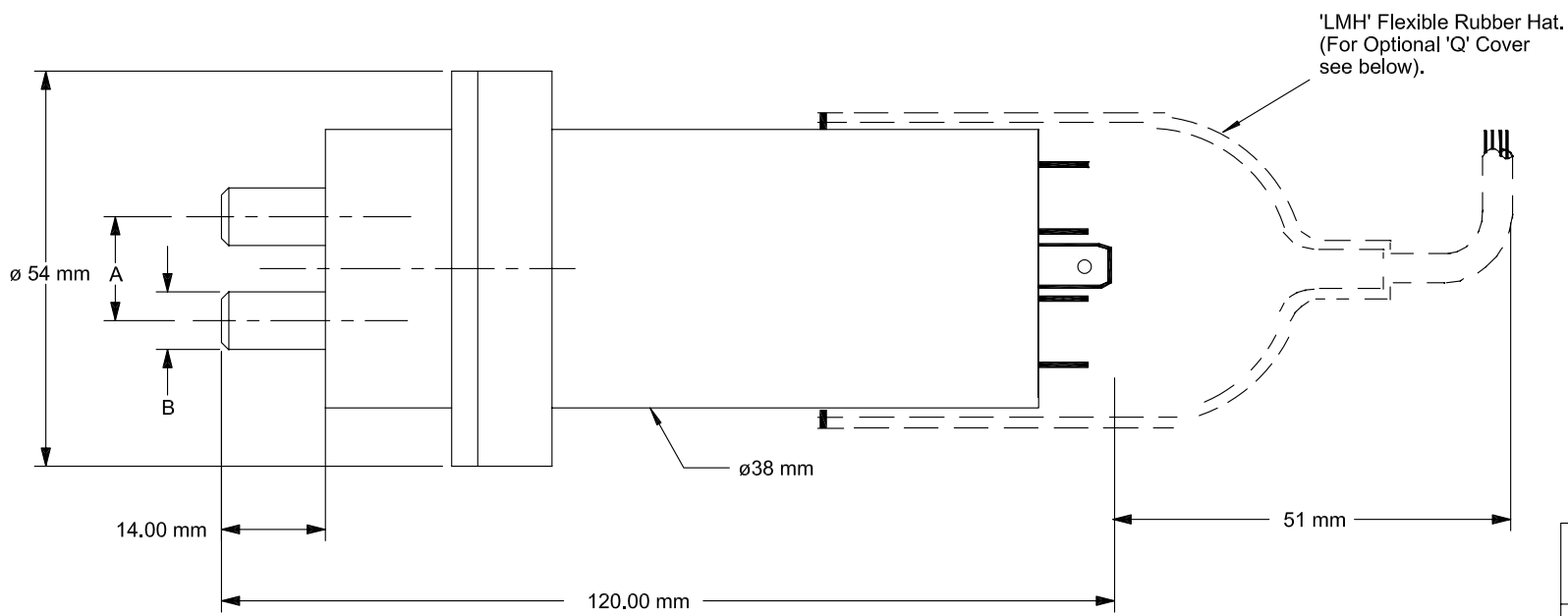
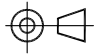
A

B

C

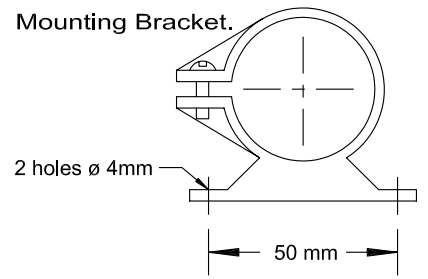
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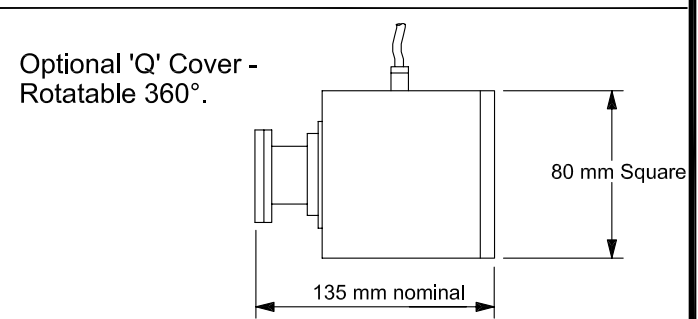
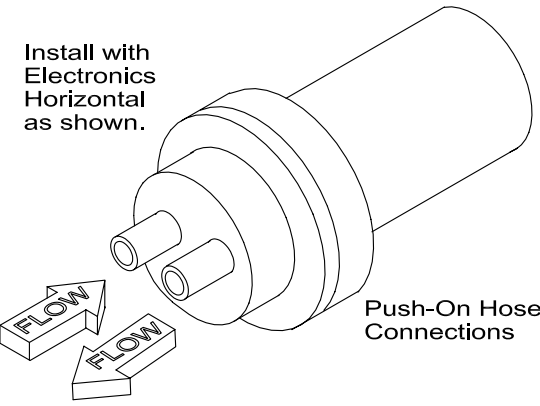




| | | |
|----|-------|----------|
| LM | 01-45 | 220 only |
| A | 14 | 17 |
| B | 8 | 11 |

Mounting Bracket.



Includes :
GN
PP
PVDF
types



| | | | | | | | | | | | |
|-------|------|-------|------|-------------|--|---|---|------------|--|---------------------------------|---|
| 6 | | | | | FINISH 0.8µm Ra unless otherwise stated | MATERIAL : | Dimensions in mm unless otherwise stated | TOLERANCES | x. ± 1mm x.x ± 0.5mm | x.xx ± 0.25mm x.xxx ± 0.05mm | x° ± ¼° |
| 5 | | | | |  LITRE METER Specialist flow measurement engineering Tel: 01296 420341 Fax: 01296 436446 | Litre Meter Ltd 50/53 Rabans Close Rabans Lane Ind Est Aylesbury Bucks HP19 8TG | Title | | INSTALLATION OF LM GN CE TYPE FLOWMETER | | Drawing No. |
| 4 | | | | STOCK CODE: | | | | | Copy No. | | |
| 3 | 1251 | DRB | | 15/07/03 | | | Website http://www.litremeter.com E-mail do@litremeter.com | | | |  |
| Issue | DCMR | Drawn | Appd | Date | | | | | | | |

IF IN DOUBT - ASK

REPORT ERRORS

DO NOT SCALE