



LITREMETER

Specialist flow measurement engineering

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DIMENSIONS AND INSTALLATION

FLOWMETER LM SERIES TYPES GN, PP, PVDF VERSION CE

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 have top mounted push on terminals. The terminal's cover provided as standard is the LMH rubber protective hat. This is a push-on fit over the transmitter electronics and is a sliding fit on the cable. This protective hat or boot has no official designation for environmental protection standards. However, it has been found to be highly reliable in service both in industry and for agricultural spraying. An optional "Q" ABS enclosure rated to IP65 is available as per optional extras.

Optional Extras - please check calibration certificate to confirm construction data.

- a) If titanium is superior to 316 stainless steel for certain fluid applications then a titanium sensing turbine ring assembly can be provided at a relatively small extra charge.
- b) If a Viton O-seal is not suitable then EPDM or Nitrile can be substituted at no extra cost. A PTFE covered Viton or Silicon O-ring can be specified. Alternatively Kalrez can be supplied if necessary.
- e) If an official IP65 protection is required then the Q-cover should be used. It is a robust ABS material enclosure complete with IP65 gland entry for cable connection. The top lid has a sealing gasket and is removable for access to the terminations.

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.