METRI MEASUREMENTS LPM PADDLEWHEEL SERIES

Inline Flow Meters for Liquid Measurement







CONTENTS



METRI LPM

Accurate Rugged Versatile
Compact or Remote

Industrial Inline Paddlewheel Flow Meters for Continuous Liquid Flow Measurement

- Cost effective meters for a broad range of liquids
- Accurate with low pressure drop
- Robust stainless steel construction
- Versatile, adaptable design with custom options
- High pressure rating up to 100 bar
- High temperature option up to 350°C
 - APPLICATIONS

INDUSTRIAL &

- Fuel & oil monitoring
- High pressure water monitoring
- CNC machine slurry coolant monitoring
- Chilled water circuit monitoring
- Partially contaminated liquid flows

HARINE & OFFSHORE

High temperature thermal oil monitoring

MEDICAL& SCIENCE

Chemical & water batching

RESEARCH & DEVELOPMENT

• De-ionised water monitoring

- Selection of flow instruments and displays for compact or remote installation
- Choice of outputs including pulse, 4-20 mA ATEX rated option



A COST EFFECTIVE OPTION

The Metri LPM range of industrial inline paddlewheel flow meters provides provides a cost-effective and accurate means of monitoring liquid flow rates over the range of 0.5 to 1200 l/min.

Metri LPM meters are available in 15, 20, 25, 40 and 50 mm nominal sizes; each individual meter has a specific standard flow range with a 10:1 turndown ratio*.

The Metri LPM range has a simple yet robust stainless steel construction that offers excellent corrosion resistance. Its versatile design can be adapted to meet the requirements of varying liquid flow applications or customised for OEM applications: Metri LPM flow meters are supplied with either threaded or flanged connections and a selection of outputs, flow instruments and displays for compact or remote installation; there is a choice of 3 temperature ratings - a standard operating temperature of up to 120°C with medium (up to 230°C) and high (up to 350°C) temperature options; standard threaded versions will withstand pressures up to 100 bar, although higher pressure options are available on request.



Additional meter sizes and flow ranges are available for custom applications and meters can also be supplied with an inlet jet to adjust the standard flow range.

Metri LPM meters are an ideal replacement for many turbine meters: they offer a lower pressure drop and reduced risk of contamination from liquids with suspended solids, while still achieving an excellent level of repeatability.

PRINCIPLE OF OPERATION

The Metri LPM meter features a freely supported paddlewheel impeller mounted on a bearing shaft assembly. As the fluid passes through the meter body it causes the paddlewheel to rotate at a speed that is proportional, within a small level of uncertainty, to the stream flow velocity over a 10:1 linear flow range. The rotational speed is measured by a magnetic pick-up housed in the probe assembly.

The paddlewheel is positioned in the top of the pipe to avoid solid particle contamination thus preventing possible erosion and/or impact damage which can occur on conventional full bore turbine meters. As a result, the Metri LPM series can be used for monitoring partially contaminated liquid flows. In addition, the pressure drop across the Metri LPM meter is considerably lower (less that 125 mbar) than an equivalently sized turbine meter as the rotor only obstructs a small fraction of the total flow area.

*Wider flow ranges are possible when combined with FI series flow transmitters



COMPACT OR REMOTE INSTALLATION

We offer a comprehensive selection of flow instruments & displays for compact or remote installation. Metri LPM paddlewheel meters can be combined with the following products;



FIELD AND PANEL MOUNT FLOW TRANSMITTERS

TYPE FI210 / FI220 FLOW TRANSMITTERS

- Rugged diecast aluminium construction
- Choice of powered (FI210) or battery powered (FI220)
- 2-line, 12-character LCD display
- Total / accumulated total / flow rate
- Compact or remote installation
- Frequency input
- Open collector pulse output
- 4-20 mA output (external loop-powered on FI220)
- Alarm set points (2 relays) on FI210 only



TYPE FI110 PANEL MOUNT FLOW TRANSMITTER

- 2-line, 16-character LCD display
- Total / accumulated total / flow rate
- Frequency input
- Open collector pulse output
- 4-20 mA output
- Alarm set points (2 relays)



E-SERIES EXPLOSION PROOF



IP67
-40 TO +70°C
The ATEX markings are:
Gas: II 2 G Ex d IIC T6 Gb
Dust: II 2 D Ex tb IIIC T85°C Db

The CSA / FM certification is pending according: Explosion-proof for use in Class I, Division 1, Groups A, B, C, D. DIP (Dust-Ignition-proof): Class II, Division 1, Groups E, F, and G. Class III; hazardous (classified) locations.







Intrinsically Safe - ATEX and IECEx approval for gas and dust applications.
Explosion/flame proof II 2 GD EEx d IIB T5.

• Modbus RS 485



PULSE / ANALOGUE OUTPUT MODULES

Low mV input range
 PNP/NPN selectable output
(pulse module)



FLOW SWITCH

• Freely adjustable module for each meter size • Switching ranges from 0.5-1200 l/min

THE METRI LPM PADDLEWHEEL SERIES

Nominal size	DN15, DN20, DN25, DN40, DN50
Process connection	BSPP (parallel) & BSPT (taper) female threaded, DIN & ANSI flanged; other on request eg PNXX, ti-clamp, NPT, RJT
Flange rating	PN 16, 40, 100 (BS EN 1092-1); ANSI 150, 300, 600 RF (ANSI B16.5)
Compatibility	Solids free and partially contaminated liquids including water, chemicals, hydrocarbons, mineral oils, alcohols
Flow range	05.5 to 1200 I/min, various range (see section 6 Configuration)
Operating temperature	Standard: -40 to 120°C Medium: -40 to 230°C High: -40 to 350°C
Max operating pressure	All threaded bodies: up to 100 bar Flanged bodies: depends on flange rating and operating temperature range Higher pressure rating on request
Frequency range	25-750 Hz
Pressure drop	Typically less than 125 mbar at maximum flow rate (standard ranges without flow restrictor)
Linearity	±0.5% FSD
Repeatability	±0.1% of reading
Materials	Body:304 stainless steel (standard); 316 (optional); other materials available on requestRotor:431 stainless steelRotor shaft:316 stainless steel; other materials on requestBearings:PEEK 450G and jewel bearings (standard & medium temperature); stainless steel ball race (high temperature)O-ring:Buna N (standard); Viton (optional)
Output/display	Coil only (mV); pulse / analogue output modules; flow transmitter (see below)
Installation	Horizontal or vertical flow rising, full pipe only
Approvals	CE, ATEX EEx ia IIC or IIB T6 to T3 (excluding high temperature option) (Ex) 🎬

INSTRUMENT / DISPLAY SPECIFICATION

Туре	Coil only	IC-MV-PO pulse output module	IC-MV-AN analogue output module	FI 200/220 powered/ FI110/FI210 powered battery powered flow transmitter		E & F Series ATEX	
Input		20-200 mV peak to peak	20-200 mV peak to peak	mV/Pulse mV/Pulse/4-20 mA		mV/Pulse/4-20 mA	
Frequency range	25-750 Hz	30-1000 Hz	25-750 Hz	0-1000 Hz 0-1000 Hz		0-1000 Hz	
Supply voltage		5-24 Vdc	24 Vdc	- 24 Vdc 110/240VA		24 Vdc 110/240VAC	
Outputs	mV	Open collector PNP/NPN selectable	4-20 mA, 2 wire current loop	Open collector pulse, 4-20 mA Open collector pulse, external loop-powered 4-20 mA, relay		Open collector pulse, 4-20 mA relay, Hart & Modbus	
Operating temp		-10 to 55°C	-10 to 55°C	-10 to 55°C -10 to 55°C		-40 to 70°C	
Rating	IP65, ATEX (optional)	IP65	IP65	200: IP65, 220: IP67	FI110:IP67 FI210:IP67, ATEX (consult factory)	IP67	



VERSATILE CONFIGURATIONS

Ordering information for the Metri Contro Inline Paddlewheel Flow Meter

Configurations can be adapted or customised to meet your requirements



IC-LPM DIMENSIONS



IC-LPM flanged coil only



IC-LPM screwed coil only



IC-LPM flanged with IC-MV-PO/AN output board





IC-LPM screwed with IC-MV-PO/AN output board









DIMENSIONS

Nominal Size	L mm		H mm				Weight kg *	
	Screwed	Flanged	Coil only	IC-MV-PO/AN	FI200	FI220/FI210	Screwed	Flanged
15 mm (1/2")	90	152	100	115	130	192	1.2	2.8
20 mm (3/4")	90	152	100	115	130	192	1.2	3.7
25 mm (1")	100	181	106	121	136	198	1.5	4.8
40 mm (1.5")	120	185	110	125	140	202	2.5	8.9
50 mm (2")	120	205	115	130	145	207	3.0	10.1

*approximate weight based on IC-MV-PO/AN output board and ANSI 300/PN40 if flanged

VARYING LIQUID FLOW APPLICATIONS



The Metri LPM is employed by a European temperature control specialist in their range of tool heaters and temperature controllers which ensure that temperatures are accurately managed

within applications such as injection moulding, extrusion and die casting. The standard temperature Metri LPM with mV output is used in water based heaters up to 90°C which the high temperature version is used in oil based heaters from 150 to 350°C.

The Metri LPM with battery-powered resettable flow totaliser is used in mobile aircraft de-icing systems to monitor use of deicing fluid and



allow billing of individual airlines. The Metri LPM was chosen as a cost effective alternative to a turbine flow meter or insertion paddlewheel meter.



A company that concentrates on fuel storage and handling of diesel and oil is using the standard temperature Metri

LPM with a battery powered flow rate indicator for monitoring the flow of diesel to/from storage tanks. The Metri LPM meter was chosen primarily because of the short lead time compared with supply of an equivalent turbine meter.

A leading provider of engineering solutions in machining technology has integrated the standard temperature Metri LPM with mV output into a CNC milling machine to control flow and optimise usage of machine cutting fluid.



INSTALLATION

The meter can be installed either horizontally or vertically with flow rising and only with a full pipe. For best practice and optimum accuracy, allow at least 10 diameters of straight pipe run upstream and 5 diameters of straight pipe run downstream of the flow meter installation. Greater straight run lengths may be required when installed close to bends, elbows and valves (please consult our engineers with details of your application). If there is not a sufficient straight run of pipe, a flow straightener may be used to reduce the straight run requirements.

GET IN TOUCH TO DISCUSS YOUR PROJECT

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