

MM MiniMag – Electromagnetic Flowmeter

15, 20 and 25mm

Improved!

FEATURES

- Very compact and light weight design, in sizes:
 - 15mm connection (8mm bore)
 - 20mm connection (12mm bore)
 - 25mm connection (15mm bore)
- Flowrange @ $\pm 2\%$ accuracy: to 25/50/100/120 Litres/minute
- Repeatability of rate: $< 0.2\%$
- Measures liquids of conductivity $> 20\mu\text{S/cm}$
- Process range to 70°C
- Display shows non-resetable Total (Litres) or Flowrate (Litres/min).
- NPN Pulse Output
- 4-20mA output, endpoints programmable in 0.1 Litres/min increments.
- Robust construction for industrial use to IP67.
- Stainless Steel Body, PEEK liner, SS316 electrodes with integrated grounding electrodes.
- Fast and easy installation or removal with BSP male threaded end connections.
- No moving parts. Obstructionless bore. Virtually maintenance free.
- Suitable with a wide range of conductive liquids from $20\mu\text{S/cm}$. Accuracy unaffected by varying viscosity or specific gravity.
- 19–30 VDC powered (standard), optionally with 12–24 VDC power converter.

Higher pressure -- to 1600 kPa

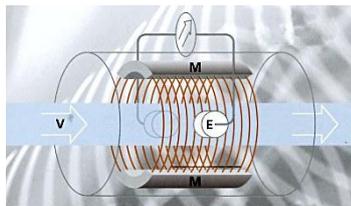


INTRODUCTION

The MiniMag is a low-cost Electromagnetic Flowmeter, suitable for flowrate and totaliser metering and batching. Liquids with an electrical conductivity of at least $20\mu\text{S/cm}$ can be measured. The converter/processor is inbuilt on the flowmeter sensor primary. These two elements form a very compact package.

With no moving parts and an obstruction-free bore, this type of flowmeter is ideal for measuring a wide range of conductive liquids (that are chemically aggressive, or dirty) up to a temperature of 70°C , with minimal head losses and virtually no ongoing maintenance. MiniMag is ideal for measurement of admixtures, and providing flowrate or total display for shotcreting and process batching/monitoring applications. The MiniMag can be used in conjunction with a remote ManuFlo FRT-303 Indicator or Batch Controller, or can be connected to PLCs via 4-20mA or pulse output.

The operation of electromagnetic flow meters is based on Faraday's Law of Induction. A voltage is induced in a conductor as it moves through a magnetic field. This principle is applied in the MiniMag design. The voltage induced in the flowing liquid is measured at two electrodes, and is proportional to the average flow velocity. The microprocessor then scales this signal voltage to read in digital units.



TECHNICAL DATA

Accuracy	± 2% of range
Repeatability	± 0.2% of rate
Protection class	IP67
Liquid Temp.	-10 °C to 70 °C
Ambient Temp.	-25 °C to 50 °C
Liquid Conductivity	≥ 20µS/cm
Liquid Viscosity	< 70mm/s @ 40°C
Approvals	IEC 1000

Max. Pressure 1600 kPa (18 kPa pressure loss @ 25 Litres/min)

Housing & Electrodes Stainless Steel 316 (EDPM seal)

Liner Material PEEK (polyether-etherketone)

Supply Power 19 - 30 VDC (120mA @ 24 VDC)

Optional converter pack: 12 VDC to 24 VDC.

Pulse Output NPN open collector. Pulse width standard 0.05 to 2 seconds.

Current Output 4 to 20 mA; load ≤ 500 Ω. Measuring range scalable.

Display 4-digit LED, shows:

- non-resetable Total in Litres or m³; or
- Flowrate in Litres/min; resolution to 0.05 Litres/min.

Damping time 0.0 to 5.0 sec (for pulsating flows), factory programable.

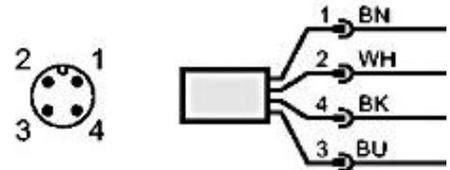
If there is Empty Pipe Detection, then pulse output stops if pipe is not full.

Order Code:	MM15	MM20	MM25	MM25-S
Connection size	15 mm	20 mm	25 mm	25 mm
Bore size	8 mm	12 mm	15 mm	15mm
Thread G BSP male	½"	¾"	1"	1"
Flowrange Litres/min	0.1-25	0.2-50	0.3-100	0.3-120
Pulse output Pulses/Litre	100	100	100	1000
Empty Pipe Detection #	no	no	no	yes
Body Band Colour	orange	orange	orange	black

ELECTRICAL CONNECTIONS

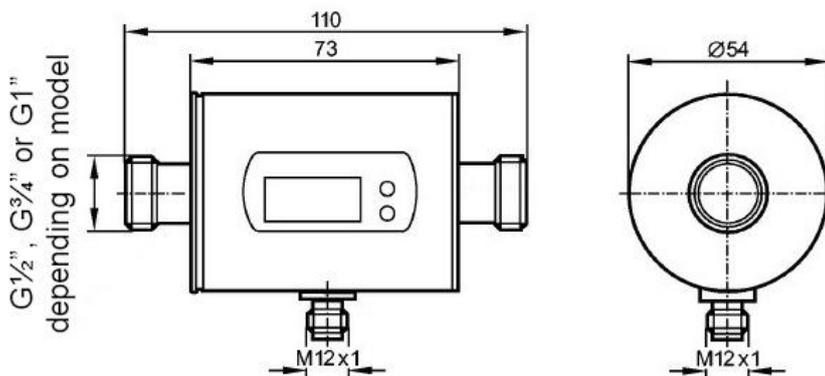
Via M12 4-pin screwed socket and plug connector. 5-metre bare lead.

Pin designations	MM25-S only	all other models
Power Connection : Positive = +	Pin 1, Brown (BN)	Pin 1, Brown (BN)
: Negative = --	Pin 3, Blue (BU)	Pin 3, Blue (BU)
Pulse output NPN optocoupler = P	Pin 2, White (WH)	Pin 4, Black (BK)
Current output 4 – 20 mA = I	Pin 4, Black (BK)	Pin 2, White (WH)



INSTALLATION

- The flowmeter should not be installed in the vicinity of strong electromagnetic fields.
- It is essential that the flowmeter tube be always completely filled with liquid. Partial filling results in measurement errors.
- Must have at least 5x diameter of straight pipe before (upstream of) flowmeter, and 2x diameter of straight pipe after (downstream of) flowmeter.
The pipe bore diameter should be the same as the flowmeter itself.
- Valves or other shutoff devices should be installed downstream from the flowmeter.
- Can be installed in horizontal or vertical orientation.
- When installed in a horizontal pipeline, the imaginary line between the two electrodes should be horizontal if at all possible to prevent air bubbles from affecting the flow signal which is measured at the electrodes.



Due to continuous product improvement, specifications may change without notice.

ManuFlo™
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