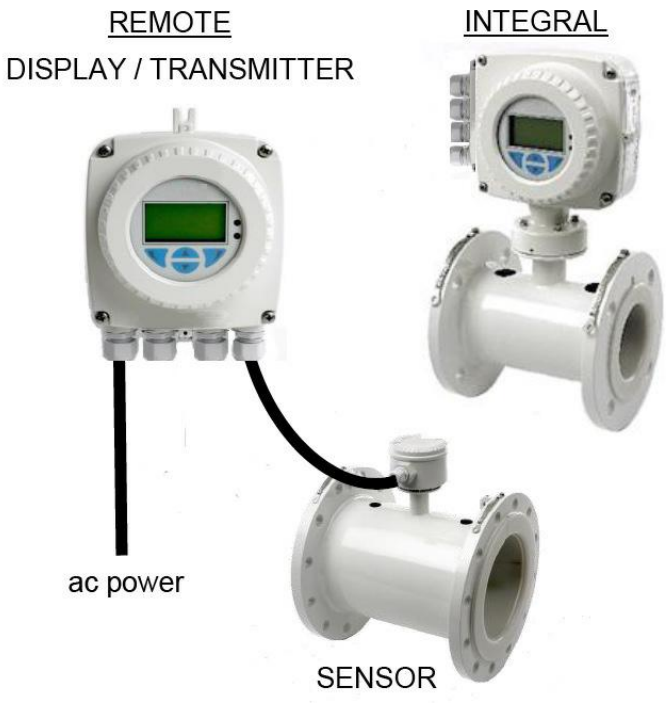
FMS - WATERMASTER™ Electromagnetic flowmeters

Sizes - 40mm to 300mm

FEATURES

- **Ideal for water batching applications.**
- **Wide flow measurement range.**
- **Fully bi-directional operation.**
- **Virtually maintenance free with no moving parts.**
- **Eliminates headlosses and need for filters.**
- **Handles wide range of water qualities.**
- **Robust construction.**
- **Frequency, analogue and alarm outputs.**
- **Unsurpassed accuracy to ± 0.2%**
- **Process temperature: - 6 to 70ºC.**
- **New octagonal sensor tube reduces sensitivity to flow profile disturbances.**
- **Upon connection of a sensor, data and configuration settings automatically transfer between the flowmeter display and the sensor.**
- **New backlit graphical display, with user friendly programming. Display can be rotated in 90° increments.**
- **Advanced Digital Signal Processing gives unsurpassed performance in harsh environments involving flow fluctuations.**
- **Empty pipe detection.**
- **Infrared configuration port.**



The WaterMaster™ electromagnetic flowmeter (wired, programmed, tested and supplied by ManuFlo) is capable of operating over a very wide flowrange. It offers reference meter quality performance with accuracy of ± 0.2% of reading, being ideal for measurement of water and wastewater applications. With no moving parts and an obstruction-less bore, this type of flowmeter guarantees the highest level of performance, whilst maintaining a high degree of accuracy.

A unique self-verifying feature has been implemented in WaterMaster, providing ultra-stable performance over time.

All WaterMasters are supplied fully wired and wet tested, with certificate, and programmed to your specific application requirements:

- **Totals: in millilitres, Litres, ML or M^3 (KL). Total is factory programmed to be resetable or non-resetable;**
- **Flowrate: in millilitres per sec/min, Litres per sec/min/hr, ML per day, or M^3 (KL) per sec/min/hr/day;**
- **Outputs: Pulse output, 4-20mA, alarm conditions.**

Application examples include use in water applications (irrigation, bore water etc) and proportional speed control via the current output signal. The uses are wide and far reaching.

FLOWRANGE PERFORMANCE and SIZING TABLE

	MINIMUM Flowrate (Litres/minute) for accuracy of			MAXIMUM Flowrate (Litres/min)
size (mm)	±3%*	±1%	±0.2%	@ ±0.2% accuracy
40	3.3	5.3	100	667
50	5.3	8.3	133	1050
80	13.3	21.7	267	2666
100	21.7	33.3	417	4167
150	53.3	83.0	1050	10500
200	83.0	133.0	1666	16667
250	140	217	2735	27350
300	210	310	3920	39000

* measures at lower flowrates, but at reduced accuracy.

SPECIFICATIONS

FMS Electromagnetic Flowmeter, Integral or Remote

	Ambient Temp	Process Temp	Rating	Electrical Connections
Display/Transmitter	-20 to 60 ºC		IP67	20mm plastic glands
Sensor	-20 to 70 ºC	-6 to 70 ºC	IP68 to 10m depth if terminal box fully-potted	20mm plastic glands

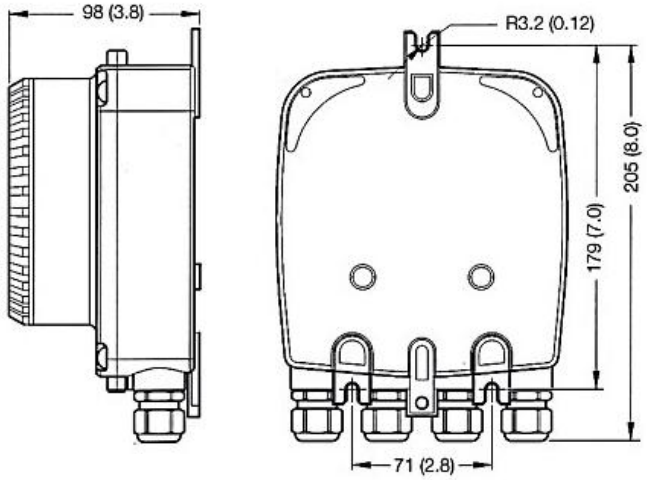
Display/Transmitter

Power supply (optionally)	85 to 265 vac @ < 7 VA 17-26 VDC @ < 0.4 A, 17-26vac
Pulse Output/Alarm Rating	30V @ 220mA, Open Collector, Galvanically isolated
Pulse o/p frequency	5 kHz maximum
Pulse Width	0.09 to 2000.00 ms
Pulses/Unit	0.09 to 1,000,000.00
Outputs	Pulse, High and Low Alarms
Current Output	4 - 20 mA, HART protocol Version 5.7
Total	Up to 10 digits. Resetable via menu
Accuracy	±0.2% of reading

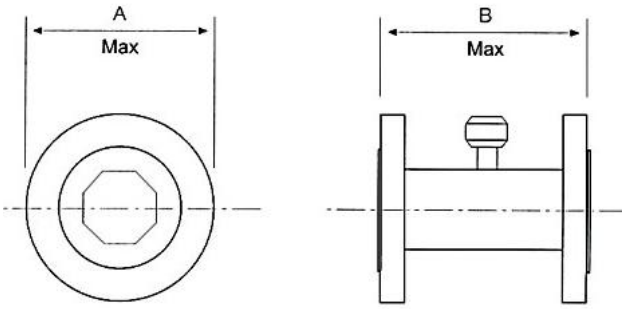
Sensor

Liquid Conductivity	> 5µS/cm
Sensor cable length	2 metres (max: 200 metres)
Maximum pressure	as per flanges (1600 kPa)
Flange type	40 & 50mm: AS2129, Table F Other sizes: AS4087, Class 16
Pressure loss	<0.25 bar (at maximum flow)
Lining material	Polypropylene
Electrode material	Stainless Steel 316 L
Grounding Rings	Stainless Steel
Terminal Box	Polycarbonate
Housing & Flange	Carbon Steel
Vibration Limits	Min: 5 Hz, Max: 150 Hz

DISPLAY DIMENSIONS



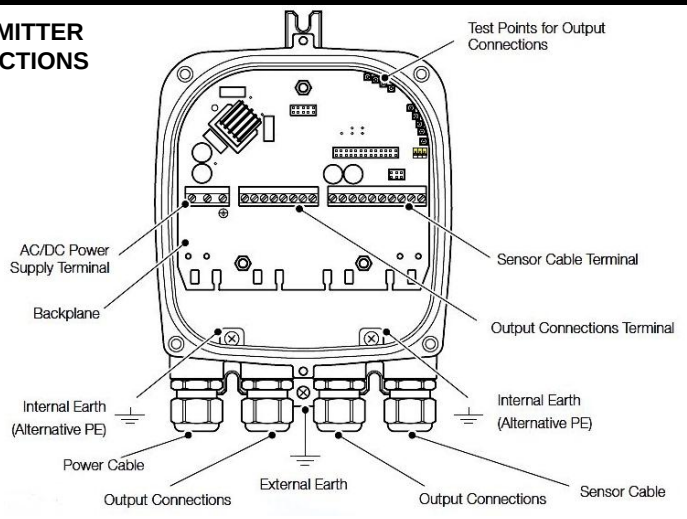
SENSOR DIMENSIONS

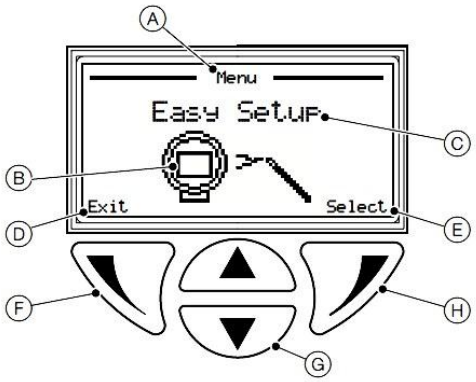


Pipesize mm	Pipesize inches	Length A* mm	Length B mm	Weight kg
40	1.5”	150	200	11
50	2”	165	200	12
80	3”	200	200	15
100	4”	230	250	18
150	6”	280	300	31
200	8”	345	350	48
250	10”	405	450	75
300	12”	485	500	112

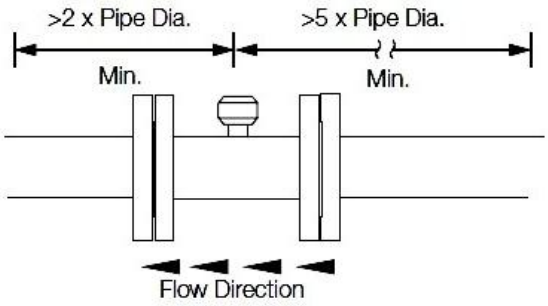
* Dimensions are approximate

TRANSMITTER CONNECTIONS



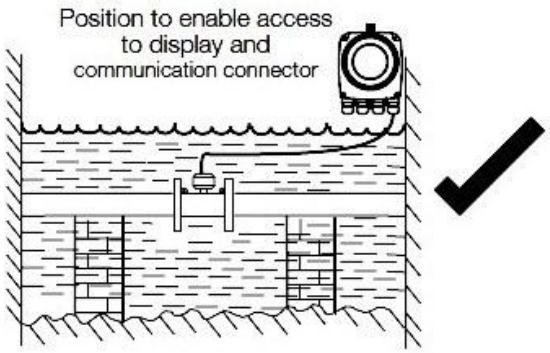


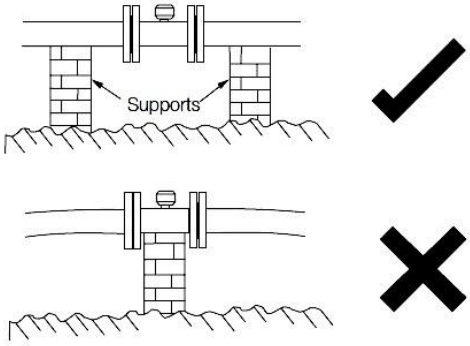
The four keys below the display are used to navigate through the menus and to execute all system commands and selections.

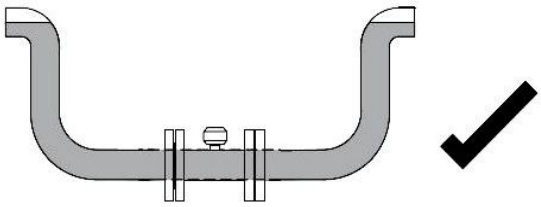


Straight Pipe Requirements
To ensure accurate measurement, must have
straight pipe (of length > 5x pipe diameter)
upstream of sensor, and also
straight pipe (of length > 2x pipe diameter)
downstream of sensor.

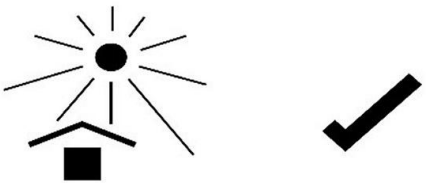
e.g. 50mm flowmeter requires
at least 250mm of straight 50mm Ø pipe upstream, and
at least 100mm of straight 50mm Ø pipe downstream.



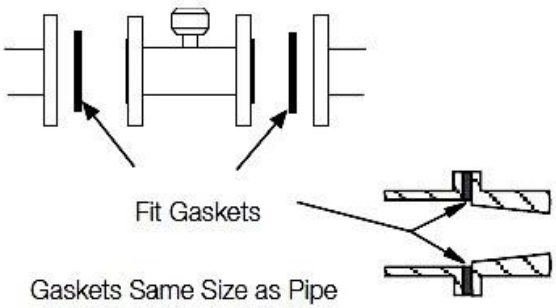


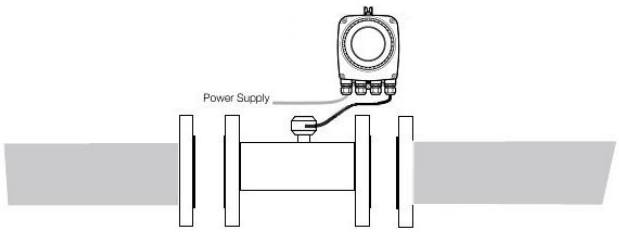


Pipe must be full at all times.



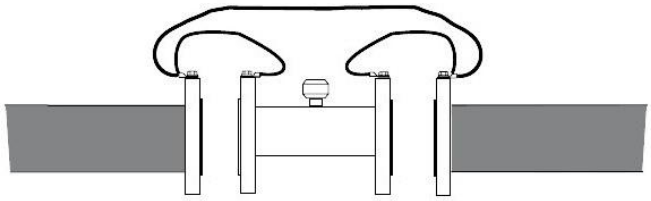
Install a sun shade if outdoors.



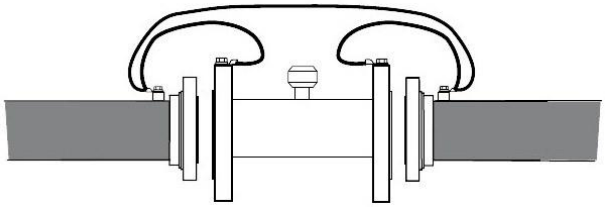


Grounding - all plastic pipe.

- The sensor must not be connected to a ground spike.
- For bonding connections use ≥ 4 mm^2 (<10 AWG) cable.



Grounding - metal pipe.



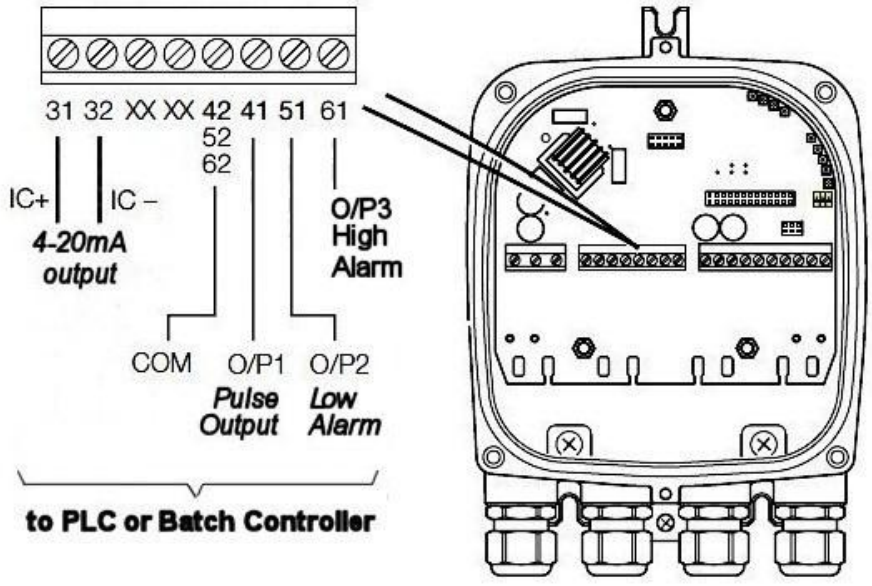
Grounding - metal pipe with flange adapter.

Note: detailed installation instructions are in the Manual provided with the flowmeter.

FMS Electromagnetic Flowmeter
Installation Guide and Checklist

Note: detailed installation instructions are in the Manual provided with the flowmeter.

LOCATION	
To avoid vibration that may hinder correct flow readings, **support the weight** of the flowmeter sensor.	☐
Mount the flowmeter's display box in an area that allows **easy access** for reading.	☐
If mounted outdoors: • Install a **sunshade**, to protect the display box from direct sunlight; and • Install a lockable vandal-proof enclosure, preferably with a window for reading the flowmeter display.	☐
To ensure correct flow readings, **avoid** installing the flowmeter sensor in the vicinity of strong **electromagnetic fields**, and avoid areas where there is **excessive vibration**.	☐
Ensure that the chosen location will allow the flowmeter to operate within its **environmental rating**.	☐
ELECTRICAL	
Have the appropriate **power supply** (e.g 85-265vac or 24VDC) available.	☐
Units in most cases come prewired between sensor and transmitter/display box, otherwise ensure proper colour coding is used when wiring signal cable.	☐
If unsure regarding wiring of outputs –call ManuFlo. Use cable glands provided and make sure they are properly tightened and sealed.	☐
PLUMBING	
Install the flowmeter sensor in a section of pipe that is **full at all times,** to ensure correct flow readings.	☐
To prevent turbulence in the flow that may hinder correct flow readings, ensure that there is **straight pipe before and after the sensor**, of length at least: • 5x pipe diameter before (upstream of) sensor; and • 2x pipe diameter after (downstream of) sensor. e.g. for 50mm diameter pipe, the lengths of straight pipe required are at least 5x50mm=250mm before sensor, and 2x50mm=100mm after sensor.	☐
Install any **gaskets and bonding cables** according to the type of pipe.	☐

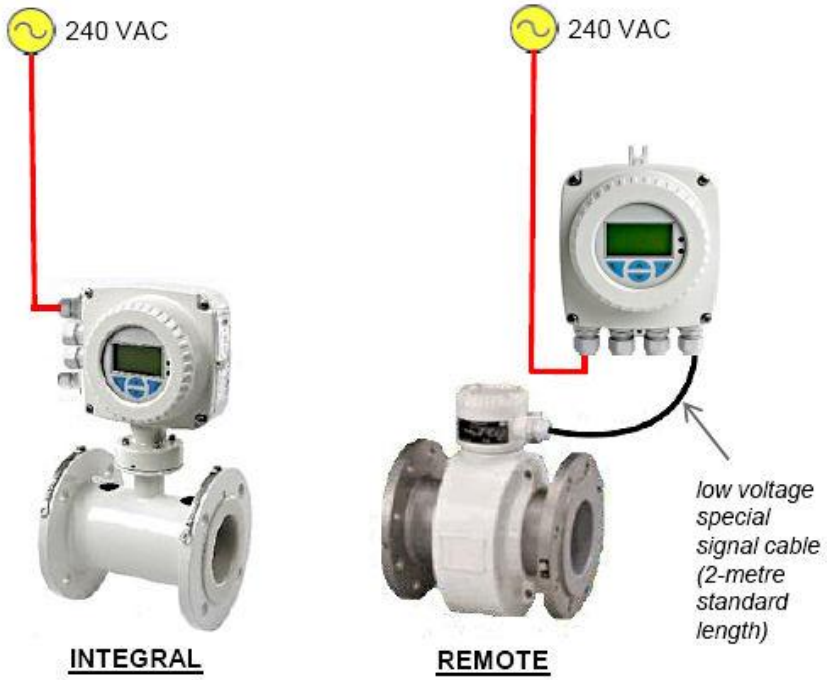


Pulse Output and 4-20mA Output

Due to continous product improvement, specifications are subject to change without notice.

WATERMASTER POWER SETUP CONFIGURATION OPTIONS

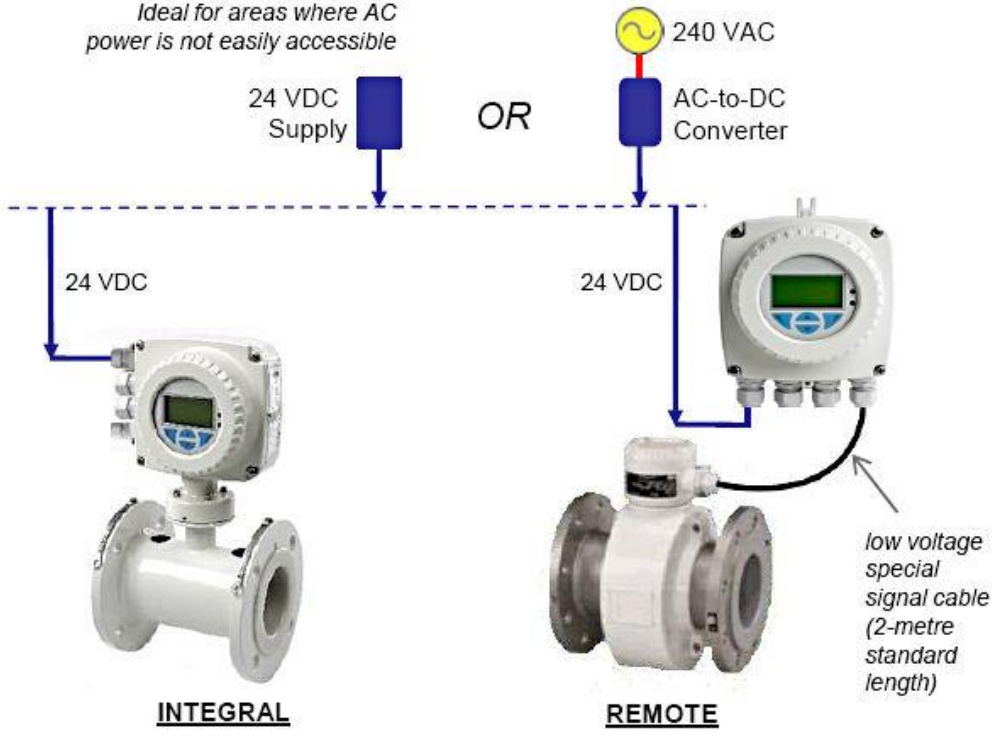
AC Direct Powered



DC Powered, Direct

Ideal for areas where AC power is not easily accessible

DC Powered, via 240VAC-to-24VDC Converter



Integral display flowmeter:

- The display is mounted on top of the flowmeter sensor fitted in the pipeline.
- The display must be in a position to be easily read and be accessable to be able to connect to the sampler output plug.
- Usually AC power is used to power the unit. If AC power is not available or is hard to make available at the flowmeter location, then the DC-powered flowmeter option is preferred. At the AC power source, use an AC-to-DC power supply from ManuFlo) then run safer low-voltage DC to the flowmeter.

Remote display flowmeter:

- Where an integral display cannot be easily accessed, then the remote display option is chosen.
- The display unit with sampler output is separate to the sensor, and is connected to the sensor via a low voltage signal cable (standard 2-meter length).
- The display unit is mounted in an easily viewable and accessible position, and is usually AC powered

ManuFlo ®™

Flow Measurement & Control Products

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