

MRPU5-F - LCD FLOWRATE INDICATION FLOWMETER

(Screwed Insertion Paddlewheel)

FEATURES

- 5 digit LCD Flowrate display.
- Suitable for flowrate reading applications where no external power is accessible.
- Ideal for pipe diameters from 20 to 150 mm, with simple installation via pipe fittings/adapters.
- Suitable for measurement of liquids up to 50°C, with flow velocity ranges of 0.6 to 8.0 metres/second.
- $\pm 3\%$ accuracy (1- 7 m/s), $\pm 5\%$ accuracy (0.6 - 8m/s).
- Robust housing for harsh environments with durable alloy paddlewheel rotor.
- Sealed glass IP65 digital display compartment.
- Lid protects LCD from sunlight.
- Easy access for re-calibration.



MRPU5-F

shown with GAL40M pipe adapter

The MRPU5-F LCD display flowrate indicator flowmeter is designed and manufactured in Australia. The MRPU5-F is provided pre-fitted with a pipe adapter fitting to suit the application pipe size for pipe sizes from 20 to 315 mm diameter. Available fittings are listed on Page 2 of this data sheet, and include Class18 Cat19 PVC high pressure tees, Galvanized Iron tees, and saddle clamp agricultural poly-pipe fittings.

The MRPU5-F is suitable for a wide range of medium-to-high flow range liquid flow measurement applications where flowrate indication is the only requirement. Being internally battery powered, the unit is ideal in situations where no external power supply is accessible, making it a totally versatile flowmeter.

The flowmeter's only moving part (a virtually indestructible marine grade alloy rotor which turns as liquid flows past it) allows registration in either Litres/second, Litres/minute or KiloLitres/hour, with up to 1 decimal place on the 5 digit Liquid Crystal Display. The main body component, housing the electronic counter board, is of robust Gunmetal. The LCD display is visible through the glass window and sealed by a metal locking ring. The impact resistant ABS lid protects the glass and LCD from breakage, contaminants, and prolonged exposure to sunlight. The MRPU5-F is rugged for harsh environments.

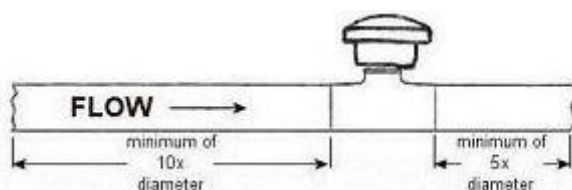
To operate, lift the hinged lid. This action automatically turns on power, and the Liquid Crystal Display is ready for measurement. When liquid flows, the display indicates the current flowrate of the liquid passing through the meter. Closing the lid turns off battery power. The internal Lithium battery has a typical life of 5-10 years. NOTE: If the lid is left open, a sleep mode function turns the display off after 15 minutes if there is no flow. The display is re-awakened either by flow occurring, or by closing and re-opening the lid.

SPECIFICATIONS

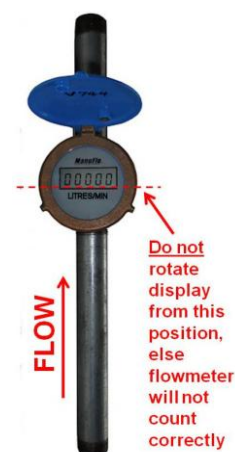
Flowrange and Accuracy	$\pm 5\%$ (0.6 - 8 metres/sec velocity) $\pm 3\%$ (1 - 7 metres/sec velocity, 10:1 flow curve)
Display readout	<ul style="list-style-type: none">• 5 digit LCD (12mm high)• in Litres/minute or Litres/second or KL/hour• up to 1 decimal place
Calibration	via 3 internal pushbuttons
Power Source	3.6v Lithium battery (5 - 10 year typical life)
Display Capsule Rating	IP65
Max. Operating Temperature	50 °C
Max. Pressure	2000 kPa with Galvanised Iron or Gunmetal pipe fittings
Pulse Output (optional)	via optional IP67 plug set. Open Collector transistor, 5-25VDC. 100 Hz maximum, 5 ms pulsewidth.
Weight (head only, unpacked)	0.8 kg

INSTALLATION GUIDE

- To maintain the stated accuracy curve, a length of **straight pipe section** (of same diameter as adapter fitting) must be in place for a minimum **10x pipe diameters on the incoming side**, and **5x diameters on the exit side**, of the flowmeter.



- MRPU5-F flowmeters are factory **calibrated to either vertical up, vertical down or horizontal pipe run positions (this must be specified when ordering)**.
- If mounting in pipe diameters contrary to factory set calibration, you may need to access the internal PCB pushbuttons to **change calibration settings**. See 'Re-Calibration'.
- A range of pipe adapters** is available, from 20-315 mm with 1" BSP (f) entries. MRPU5-F's are factory fitted with the chosen pipe adapter fitting.
- The flowmeter must measure in a **full pipe of liquid**.
- Close lid after use**, to prevent LCD fading from prolonged exposure to direct sunlight.



PRODUCT ORDERING CODE FORMAT

(* ** must specify Horizontal or Vertical pipe run)

MRPU5-F- pipe adapter - No. of decimal places (0 or 1) - units* - H/V - options (if any)**

e.g. MRPU5-F-GAL50M-0-LM-H = Gal. 50mm pipe adapter, no decimal place, Litres/minute display, Horizontal run

PIPE vs FLOW RANGE GUIDE for optimum performance

Pipe Size (mm)	Flowrange (Litres/min)			
	Min		Max	
	@±5%	@±3%	@ ±3%	@ ±5%
20	12	15	120	150
25	18	30	206	235
32	30	49	337	385
40	46	76	527	600
50	71	118	824	940
63	113	188	1307	1491
65	120	200	1393	1590
75	160	267	1853	2115
80	182	305	2110	2410
90	230	384	2670	3047
100	285	475	3295	3760
110	344	574	3989	4555
125	444	741	5152	5885
140	557	929	6463	7384
150	640	1065	7420	8480
160	728	1212	8443	9648
200	1138	1892	13194	15083
225	1440	2394	16700	19095
250	1779	2955	20619	23578
280	2231	3705	25866	29582
300	2562	4252	29694	33963
315	2824	4688	32738	37447
500	7119	11798	82499	94403

* **units:** **LS** = Litres/Second
LM = Litres/Minute
KH = Kilotres/Hour

Code	OPTIONS
-P	Pulse output, with M12 IP67 plug set and 5-metre lead (pulses are simply an indication that there is flow)
-LSB	Long stem body for pipesizes > 150mm










SPARE PARTS

Code	Description
LM	Lid and magnet
PW-N	Paddlewheel (rotor) and bushes
PWAH	Axle, Tungsten Carbide
LB	3.6v Lithium battery
SCP	Plug 1" sealer

MATERIAL SPECIFICATIONS

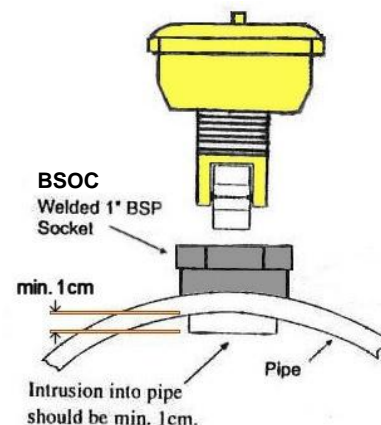
MRP housing and sealing ring	Cast gunmetal
Window	Tempered glass
Gasket	PVC
O-Ring	Neoprene
Rotor	Marine Alloy saf2205 and Delron bushes
Axle	Tungsten Carbide
Lid	ABS, ferrite magnet

ORDER CODES FOR PIPE ADAPTER FITTINGS

Material	GAL	PVC	PVC	Polypropylene	Polypropylene	STAINLESS	BRASS	BRASS
Type	T-Piece	slip T-piece	Saddle Clamp	SaddleClamp	SaddleClamp	T-Piece	T-piece	Socket
For	Gal pipe	Pressure pipe	Pressure pipe	PVC Irrigation pipe	Poly Pipe Black	S/Steel pipe	Brass pipe	
20 mm							BRA20M	
25 mm	GAL25M	PVC25M	PVC40SCM			SS25M	BRA25M	
32 mm	GAL32M	PVC32M						
40 mm	GAL40M	PVC40M		SCP40M	SC40M			
50 mm	GAL50M	PVC50M	PVC50SCM	SCP50M	SC50M			
63 mm					SC63M			
65 mm				SCP65M				
75 mm					SC75M			
80 mm	GAL80M		PVC80SCM	SCP80M				
80 mm	GAL80M-F (Table D flanged)							
90 mm					SC90M			
100 mm	GAL100M		PVC100SCM	SCP100M				
100 mm	GAL100M-F (Table D flanged)							
110 mm					SC110M			
125 mm				SCP125M	SC120M			
140 mm					SC140M			
150 mm			PVC150SCM	SCP150M				
160 mm					SC160M			
200 mm			PVC200SCM	SCP200M	SC200M			
225 mm				SCP225M	SC225M			
250 mm				SCP250M	SC250M			
280 mm					SC280M			
300 mm			PVC300SCM	SCP300M				
315 mm					SC315M			
500 mm								
								
	Galvanised Iron, threaded entries BSP(female). 2000 kPa NOTE: 25mm is supplied with straight pipe sections already fitted: 	PVC T-piece Class 18, Cat 19 Glue-in (female) 1100 kPa	PVC 1400 kPa	PVC ≤ 150mm: 1600 kPa > 150mm: 1000 kPa	Poly-pipe agricultural Saddle Clamps. ≤ 150mm: 1600 kPa > 150mm: 1000 kPa	Stainless Steel 316 T-piece. BSP (female) threaded entry 2000 kPa	Brass T-piece BSP (female) threaded entry 2000 kPa	1" BSP Brass pipe socket adaptor (see installation diagram below)

GAL80M - 80mm Galvanized Iron pipe adapter (80mm ϕ x 600mm long)**IMPORTANT:**

The display head is factory programmed according to the pipesize, and the display head and it's pipe adapter are calibrated together to operate as one unit. **DO NOT** remove the display head and place it on a different sized pipe adapter, because the display will then not read correctly for the new pipesize.



RE-CALIBRATION

- When ordering, **specify the intended pipe run: either horizontal, or vertical position.**
The calibration (K-factor) characteristics can vary up to 6% from horizontal to vertical runs.
- To check calibration, fill a container of known volume (for accuracy, keep flowrate constant and above the minimum flowrange for the pipe diameter). You need to record: * the volume of the container; * the flowrate displayed by the meter whilst the container is filling; and * the time taken to fill the container.
- The actual flowrate is the container volume divided by the time to fill the container
e.g. (50 L) / (1 min) = 50 L/min
- If the actual flowrate corresponds to the displayed flowrate within 3%, then no adjustment to calibration is necessary. Otherwise, the Calibration Value can be adjusted to fine tune the displayed Flowrate:
 - to decrease the Flowrate displayed on the LCD, increase the Calibration Value.
 - to increase the Flowrate displayed on the LCD, decrease the Calibration Value.

Example:

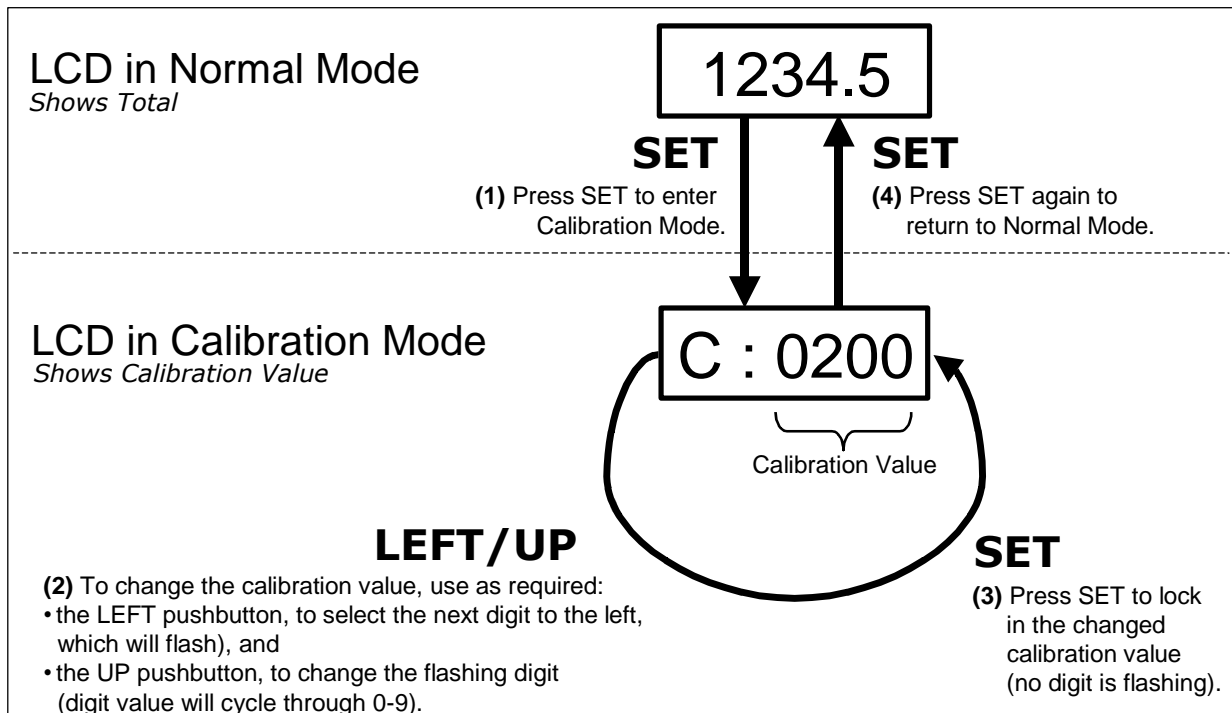
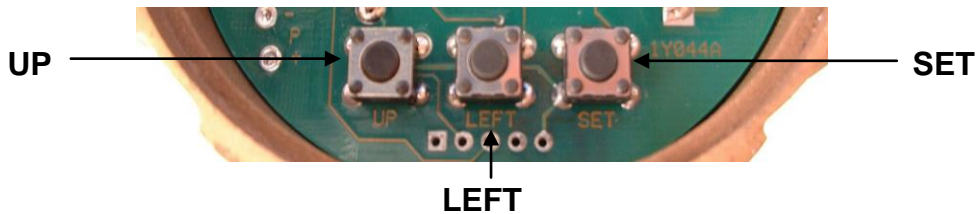
- MRPU5-F indicated a flowrate of 55 Litres/minute,
- you filled a 50 Litre container in 1 minute (so actual flowrate was 50 Litres/minute)
- the MRPU5-F Calibration Value is 200.

The Flowrate displayed is 10% higher than the actual flowrate.

So, to lower the displayed Flowrate by 10% so as to match actual flowrate, the

Calibration Value must be increased by 10% (i.e. increased by 10% x 200 = 20) to new value of '220'.

- **Changing the Calibration Value is performed via three pushbuttons** (marked UP, LEFT and SET) mounted on the internal PCB. **To access the PCB**, open the hinged lid cover, then with a pair of multi-grips, grasp the metal locking ring and turn it anti-clock wise until the four lock tabs align with the four matching slots on the metal PCB housing. Remove the locking ring, and then the glass window, to access the buttons.



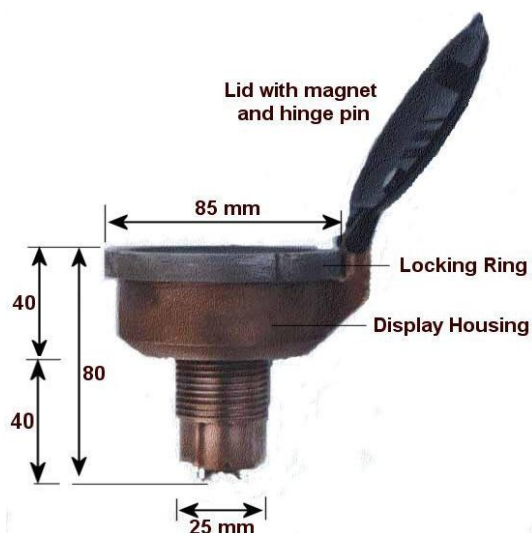
Adjusting the Calibration Value using the internal Calibration pushbuttons SET, LEFT and UP.

MAINTENANCE

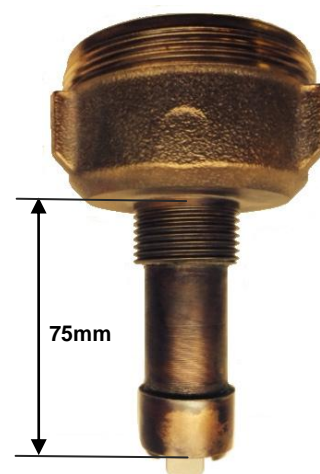
- If the LCD display is blank, the MRPU5-F may be in dormant mode because it is not receiving pulses from the paddlewheel (because the paddlewheel is stationary because there is no flow). The LCD will be reawakened once flow restarts, or can be re-awakened by closing and re-opening the lid.
- If the flowmeter ceases to indicate flowrate, the paddlewheel may be blocked:
 - Grasp the readout head and turn it anti-clockwise, until it clears the threaded section.
 - Examine and, if required, clear debris from rotor.
 - If used with reclaimed water, then over time a calcium buildup may deposit on the rotor, so immerse the rotor in diluted acid to clear.
 - Re-insert the readout head and screw-in clockwise to its original position.
- If the MRPU5-F counts when there is no flow, a nearby 50Hz AC field is probably causing false counts. Move the flowmeter away from the 50Hz field, or move the source of the field if practical.
- To access the internal electronic display board to replace the Lithium battery:
 - refer to "Re-calibration" section for instructions to open the MRPU5-F to access the PCB.
 - Two screws secure the PCB. Unscrew them and remove the PCB to access the battery on underside.
 - Replace battery with an equivalent unit.
 - Re-insert the PCB and glass.
 - secure the lock ring, and seal under lock ring with silicon as a precaution against liquid ingress.
- When not in use, keep the lid closed. If prolonged direct exposure to sunlight causes the LCD to become faint or discoloured, return the MRPU5-F to Manu Electronics for servicing.



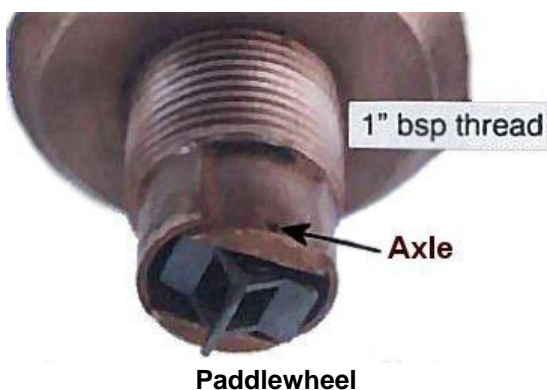
Internal view - PCB and 3 calibration pushbuttons



Side view, with dimensions



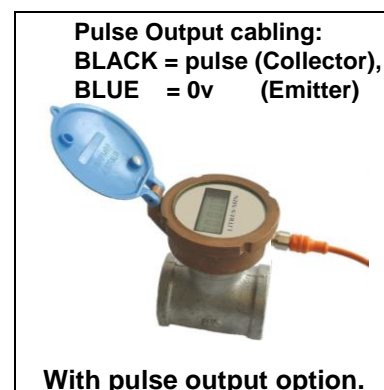
Long Stem body version for pipesizes > 150mm (other body dimensions as at left)



Paddlewheel



With GAL40M adapter.



Pulse Output cabling:
 BLACK = pulse (Collector),
 BLUE = 0v (Emitter)

With pulse output option.

FLOWRATE FLOWMETERS



MESLCD5DP-F series

- 5-digit LCD shows Flowrate in Litres/min to 1 decimal place.
- Sizes: 20-50mm
- Series flowrange: 1.5 - 600 Litres/min.
- Accuracy: $\pm 2\%$
- Nutating disc measuring chamber.
- Internal Lithium battery powered.



MRPU5-F series

- 5-digit LCD shows Flowrate in Litres/min to 1 decimal place.
- Sizes: 25-200mm.
- Series flowrange: 18 - 15070 Litres/min.
- Accuracy: $\pm 3\%$
- Paddlewheel type. Various pipe adapters.
- Internal Lithium battery powered.

with integral display

ME5-F-B Flowrate Indicator

- LCD shows Flowrate.
- Programmable.
- internal Lithium battery (5 -10 year battery life).
- IP65 enclosure.
- with cover to protect LCD from UV light.



FRT303-B Indicator

- LCD shows Flowrate, Total (resetable) and Grand Total.
- Programmable.
- internal Lithium battery (5 -10 year battery life).
- IP65 enclosure.
- with cover to protect LCD from UV light.



and with many other ManuFlo pulse output flowmeters, including Electromagnetic flowmeters with in-built flowrate display.

with remote display



RPFS-L

- paddlewheel flow sensor.
- inductive coil pulse output.
- with various adapters for 20-500mm pipes.
- series flowrange: 9.5 - 100,000 Litres/min
- for fresh or mild recycled water.



MESR series

- nutating disc type flowmeter.
- with Reed Switch Pulse output.
- in sizes 20-50 mm.
- power not required.
- series flowrange: 1.5 - 600 Litres/min

ManuFlo [®]TM

Flow Measurement & Control Products

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