

FEATURES:-

- **MRPU4**
 - digit LCD resettable or non-reset totaliser (20mm high). MRPU4
 - Shows **4 digits total** in Litres (L) or KiloLitres (KL) with optional 1 decimal place.
- **MRPU6**
 - 6 digit LCD resettable or non-reset totaliser (12mm high), 5 digit flowrate
 - Flowrate in LPM or optional LPS
 - Shows **6 digits total** in Litres (L) or KiloLitres (KL) up to **3 decimal place** and **rate** in Litres per minute (L/M) or Litres per second (L/S) up to **2 decimal places**.
- Total in Litres or optional KiloLitres
- Easy reset of total via flip top lid.
- $\pm 2.5\%$ accuracy, at 0.7 - 8.0 m/s flow velocity Repeatability: $\pm 1.0\%$
- 8+ year battery life.
- Max. Process Temperature 50 °C
- Max. Operating Pressure: PVC Tee' options rated to 1100 kPa
All Metal Tee options are rated 2000 kPa
- With simple installation pipe fittings/adapters.
- For pipe sizes from 20 to 100 mm
- Optional pulse output, via M12 IP67 plugset
- Used in Irrigation, Transit mixers, Slumpstands & many other applications.



- User friendly **1 point re-calibration function** –self calculation for a new k factor.
- **External re-calibrate via PC** with RFID and EWM calibration software –No need to access buttons
- **External Reset input** for PLC/mechanical switch.
- **Wake-Reset function** –turns on the display before resetting the total.

MRPU4/6-GAL50M
has a 50mm Pipe Adapter



MRPU4/6-GAL25M,
has 25mm Pipe Adapter
(as used in slumpstands)

The MRP resettable counter flowmeter is designed and manufactured in Australia by ManuFlo. The MRPU4's round display head has a 1" BSP male threaded stem section which allows the display head to be fitted to most 1" BSP female entries. Usually, the MRPU4's are pre-fitted with a ManuFlo pipe adapter fitting. Adapters are available for a range of pipe sizes from 20 to 100 mm diameters, and the adapter range includes Galvanized Iron tees, Class18 Cat19 PVC high pressure tees, and saddle-clamp agricultural poly-pipe fittings. (For concrete truck agitators, the similar MRP20 flowmeter range is available with cast Gunmetal 20mm flowtubes).

The MRP is suitable for a wide range of medium to high flow range liquid flow measurement applications. Being internally battery powered, the unit is ideal in situations where no external power supply is accessible, making them totally portable resettable totaliser and rate flowmeters.

The flowmeter's only moving part (a virtually indestructible SST rotor which turns as liquid flows past it) allows registration in Litres (L) or KiloLitres (KL) with decimal places if required on the 4/6 digit Liquid Crystal resettable display counter. The main body component, consisting of the electronic counter board, is housed in a robust Gunmetal housing. The LCD display is visible through the glass window and sealed by a metal locking ring. The MRP is rugged for harsh environments. The impact resistant ABS lid protects the LCD and glass from prolonged sun exposure, contaminants and breakage.

To operate, lift the hinged lid twice. This action automatically turns on power, and the Liquid Crystal display is zeroed ready for measurement. Liquid flow causes counting on the display. Closing the lid resets the digits. The internal lithium battery has a typical life of 5-10 years. NOTE: To conserve battery power a sleep mode function turns the display off after 5 minutes of no use (this interval programmable). The display is re-awakened either by flow occurring or by closing and re-opening the lid.

SPECIFICATIONS:

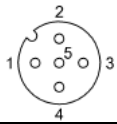
Flowrange and Accuracy	$\pm 2.5\%$ (0.6 - 8.0 m/sec velocity) $\pm 1.5\%$ (0.7 - 7.0 m/sec velocity, 10:1 flow curve)
Display readout	<ul style="list-style-type: none"> • (U4) Counter: 4 digit (4x20mm) in Litres (L), KiloLitres(KL) with up to 1 decimal place • (U6) Flowrate: 5 digit (3x6.5mm) in L/M or L/S up to 2 decimal place • (U6) Counter: 6 digit (5x12mm) in Litres (L), KiloLitres(KL) up to 3 decimal place
Calibration	<ul style="list-style-type: none"> • via 3 internal pushbuttons • via PC with RFID reader and EWM Calibration software (coming soon) ANDROID device with built-in NFC and EWM application
Power Source	3.6v 2100mAh Lithium battery

Environmental	IP65 0% to 75% relative humidity Up to 2000m Altitude
Max. Operating Ambient Temperature	5 °C - 40 °C
Max. Pressure	2000 kPa, with Galvanised Iron and Gunmetal pipe fittings
Pulse Output (optional)	<ul style="list-style-type: none"> • via optional IP67 plug set. N-Channel MOSFET, 5-100VDC 1 Amps Max • scalable from 1 to 9999 Litres per pulse, 100 Hz maximum, 5 ms pulse width
External Reset Input (optional)	Passive input via 2 wire volt free contact for PLC or external totaliser reset switch.
Weight (head only, unpacked)	0.8 kg

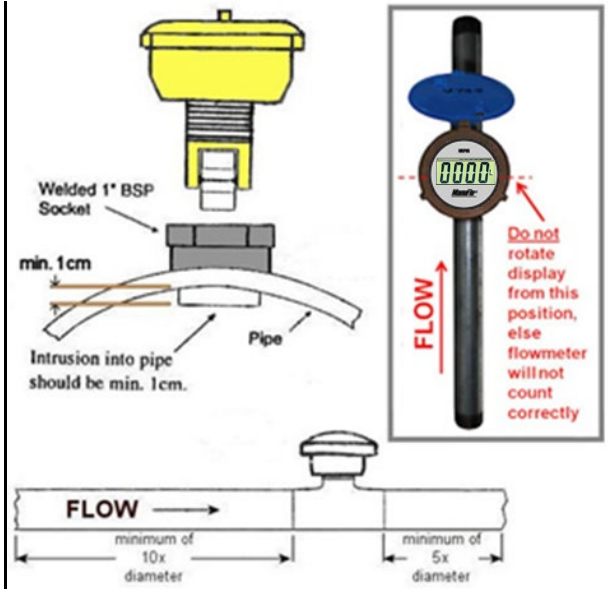
INSTALLATION GUIDE

- To maintain the stated accuracy curve, lengths of **straight pipe section** (i.e. without any bends, taps or valves), of the same diameter as the pipe adapter fitting, must be in place for a minimum 10x pipe diameters on the incoming (upstream) side, and 5x diameters on the exit (downstream) side, of the flowmeter.
- MRP flowmeters are factory **calibrated to either vertical up, vertical down, or horizontal pipe-run/flow positions (must specify when ordering)**.
- A **range of pipe adapters** 20-100mm are available. Optionally, if mounting into your own fittings, make sure MRPU4 rotor is in line with flow direction. MRPs can also be mounted onto pipes by tapping a 1" BSP (female) thread into the pipe, then simply screw the MRP into position and calibrate accordingly. The MRP paddlewheel must protrude at least one centimeter past the Internal Diameter of the pipe. Usually MRPs are factory fitted to, and calibrated with, the chosen pipe adapter fitting.
- The flowmeter must measure in a **full pipe flow of liquid**.
- Close lid after use**, to prevent LCD fading from prolonged exposure to direct sunlight.
- Using optional pulse output:**

Connect M12 mating connector to flowmeter as per the diagram below. To ensure environmental suitability rating of connector pair, use a tool to tighten the connector.



Pin 3 – 0V (Blue)
Pin 4 - Pulse (Black)



PRODUCT ORDERING CODE FORMAT

MRPU4- pipe adapter -Totaliser decimal places (0-2) -T units* -H/V*-options (if any)**

e.g. MRPU4-GAL50M-0-L-H = MRPU4, Gal. 50mm pipe adapter, Total in Litres, no decimal point, Horizontal run

MRPU6- pipe adapter -Totaliser decimal places (0-3) -T units* -Flowrate decimal places (0-2) -F units -H/V***-options (if any)**

e.g. MRPU6-GAL50M-0-L-0-L/M-H = MRPU6, Gal. 50mm pipe adapter, no decimal place, Total in Litres, no decimal place, Flowrate in Litres per minute, Horizontal run

PIPESIZE vs FLOW RANGE GUIDE

Pipe Size	Flowrange (Litres/minute)	
	Min	Max
(mm)	@ ± 2.5%	@ ± 2.5%
20	13	160
25	23	235
32	32	385
40	50	600
50	90	940
63	130	1300
65	140	1400
75	160	1600
80	200	2410
90	265	2670
100	300	3760

* T units:	L = Litres
	KL = KiloLitres
*** H/V	H = Horizontal / V = Vertical pipe run
** F units:	L/M = Litres per minute
	L/S = Litres per second

FUNCTION OPTIONS

Code	Description
-P	IP67-rated pulse output plug-set from 1 to 9999 Litres per pulse
-ER	External reset input via IP67 plug-set
-WR	Wake and Reset Function
-NR	No reset of total

SPARE PARTS

Code	Description
LM	Lid with magnet and pin
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

MAINTAINANCE GUIDE










Fault Diagnosis & Rectification:

- If the LCD display is blank, the MRP may be in sleep mode because it is not receiving input pulses from the paddlewheel. The LCD is reawakened once flow restarts, or by closing and re-opening the lid.
- If the flowmeter ceases to count, the paddlewheel may be blocked, remove inspect and clean as described above.
- If the MRP 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.
- When not in use, keep the outer lid should be closed. If prolonged direct exposure to sunlight causes the LCD to fade or discolour, return the MRP to ManuFlo for servicing.
- Should the device still not operate please return or contact ManuFlo Support.

Cleaning:

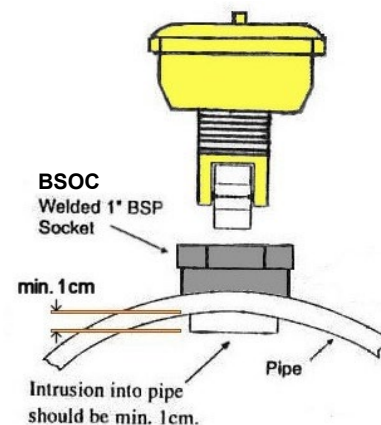
- 1 - If the paddlewheel (rotor) and or sensor body is coated with scale, immerse the sensor section in diluted hydrochloric acid, scour gently if required.
- 2 - **For ease of removal or refitting of sensor we strongly recommend to lubricate the body O-rings using petroleum jelly.**
- 3 - If the paddlewheel requires servicing, push out the axle using a small hole punch or similar implement, remove the paddle wheel and service or replace rotor and/or axle as required (spare parts available from ManuFlo).

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)							
								
	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 its 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.

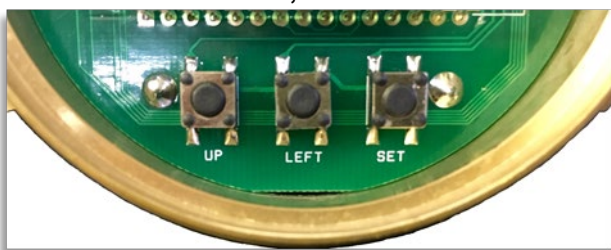


Calibration is via the three internal pushbuttons (marked **UP**, **LEFT** and **SET**) located underneath screen.

- Note: The calibration (K-factor) characteristics can vary up to 6% between horizontal or vertical runs.
- Run liquid through the MRPU4 into a calibrated vessel or load cell, until at least 50 Litres is displayed on the MRPU4. For accuracy, keep flowrate continuous and above minimum flow range for the pipe size.
- Compare the actual amount collected against what is displayed on the MRPU4. If the amount collected matches the amount displayed within $\pm 2\%$, then no adjustment to calibration is necessary.
- **Formula:** $Percentage\ error = (Amount\ displayed - Amount\ collected) / Amount\ displayed \times 100$
- If the percentage error is more than $\pm 2\%$, please follow **1 point calibration** procedure.
- **To access buttons**, open the hinged lid and remove the four SST screws holding the viewing window to the enclosure. Set the viewing window aside in a safe place you will now be able to see the green electronics board.

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

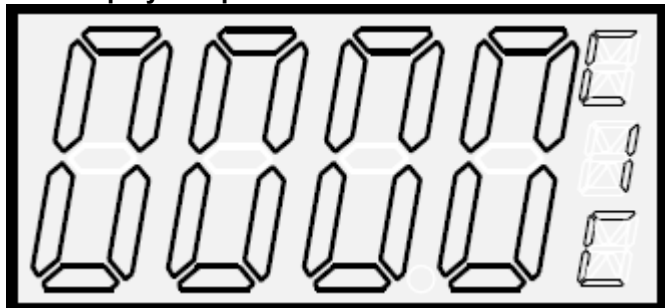
Internal Push Buttons **UP**, **LEFT** and **SET**



1 Point Calibration Function: (User friendly, No calculations needed)

Step 1. Press **UP** button for approximately 5 seconds

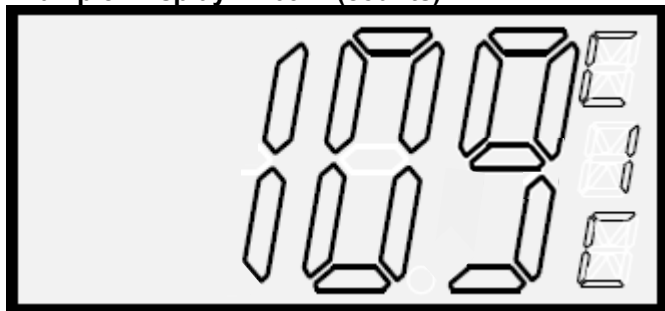
LCD display in 1 point calibration mode.



Step 2. Start flow (Run liquid through the MRPU4)

- Calibration will automatically start upon flow detection.
- Display must have at least 100 counts or more to have an accurate calibration before stopping the flow.

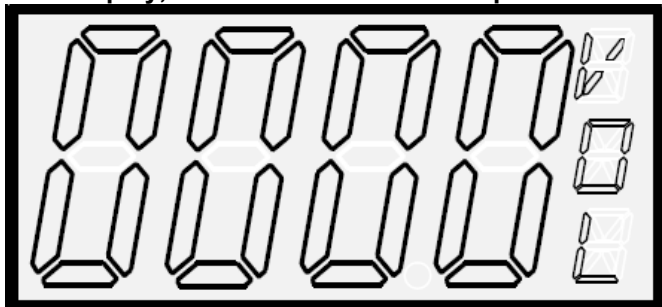
Example: Display = 109 C (counts)



Step 3. Stop flow

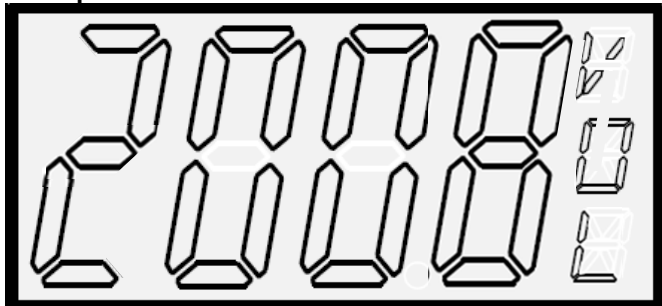
- After flow is completely stopped, wait for approximately 10 seconds and the display will update to allow entry of collected amount of liquid in litres.

LCD display, 10 seconds after flow stops.



Step 4. Enter volume collected in Litres.

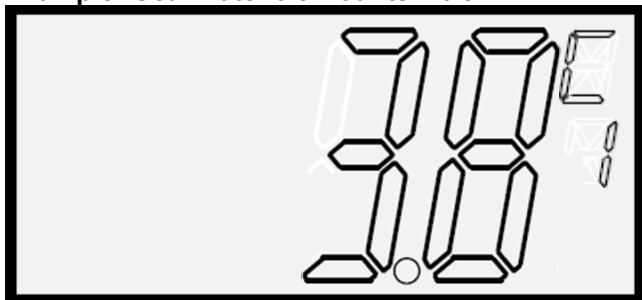
Example: Volume = 2008 Litres



- Press **LEFT** button to select desired digit to be change.
- Press **UP** button to change the value of selected digit.
- Press **SET** to lock in the changed value.

Step 5. Press **SET** to display Gear Rate.

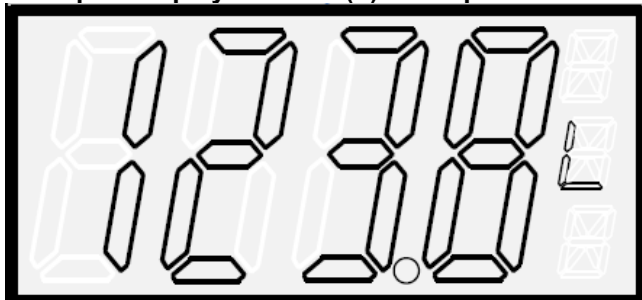
Example: Gear Rate: 3.8 Counts/Litre



Note:

Gear Rate value will be shown for approximately 5 seconds then display will revert to counting mode (main display), this is the indication that the meter has been successfully re-calibrated.

Example: Display in Litres (L) with optional decimal point



Step 6. Verify that the meter has been properly re-calibrated.

- Do one or more test run and verify if the MRP4 displayed amount is now within $\pm 2\%$ error.
- If satisfied, properly mount the glass window and locking ring back to its original state.
- Otherwise, repeat Steps 1 to 6

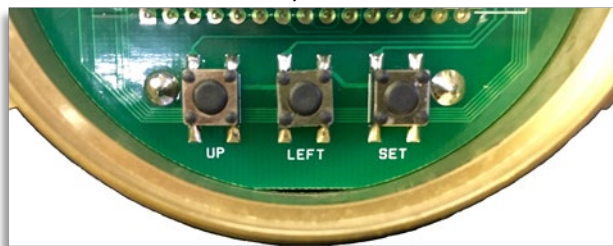
Note: MRP5 manual re-calibration procedure is still applicable to MRP4 meters. If MRP5 re-calibration procedure is preferred, please refer MRP5 User's Manual.

RE-CALIBRATION via three internal pushbuttons (marked **UP**, **LEFT** and **SET**)

- Note: The calibration (K-factor) characteristics can vary up to 6% between horizontal or vertical runs.
- Run liquid through the MRPU6 into a calibrated vessel or load cell, until at least 50 Litres is displayed on the MRPU6. For accuracy, keep flowrate continuous and above minimum flow range for the pipe size.
- Compare the actual amount collected against what is displayed on the MRPU6. If the amount collected matches the amount displayed within $\pm 2\%$, then no adjustment to calibration is necessary.
- **Formula:** $Percentage\ error = (Amount\ displayed - Amount\ collected) / Amount\ displayed \times 100$
- If the percentage error is more than $\pm 2\%$, please follow **1 point calibration** procedure.
- **To access buttons**, open the hinged lid cover, and with a pair of multi-grips, grasp the metal locking ring and turn it anti-clock wise until it clears the threaded section. Remove the locking ring, and then remove the glass window.

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

Internal Push Buttons **UP**, **LEFT** and **SET**



1 Point Calibration Function: (User friendly, no calculations needed)

Step 1. Press **UP** button for approximately 5 seconds.

LCD display in 1 point calibration mode.



Step 2. Start flow (Run liquid through the MRPU6)

- Calibration will automatically start upon flow detection.
- Display must have at least 100 counts or more to have an accurate calibration before stopping the flow.

Example: Display = 119 C (counts)



Step 3. Stop flow

- After flow is completely stopped, wait for approximately 10 seconds and the display will update to allow entry of collected amount of liquid in Litres.

LCD display, 10 seconds after flow stops.



Step 4. Enter volume collected in Litres.

Example: Volume = 20.15 Litres



- Press **LEFT** button to select desired digit to be change.
- Press **UP** button to change the value of selected digit.
- Press **SET** to lock in the changed value.

Step 5. Press **SET** to display Gear Rate.

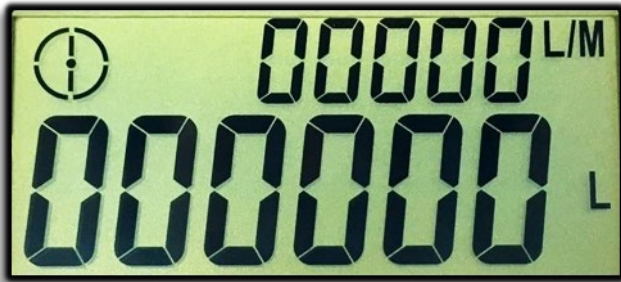
Example: Gear Rate: 4.9 Counts/Litre



Note:

Gear Rate value will be shown for approximately 5 seconds then display will revert to counting mode (main display), this is the indication that the meter has been successfully re-calibrated.

Example: Main display in L/M and Litres (L)



Step 6. Verify that the meter has been properly re-calibrated.

- Do one or more test run and verify if the MRPU6 displayed amount is now within $\pm 2\%$ error.
- If satisfied, properly mount the glass window and locking ring back to its original state.
- Otherwise, repeat Steps 1 to 6

Note: MRPU5 re-calibration procedure is still applicable to MRPU6 meters. If MRPU5 re-calibration procedure is prefer, please see MRPU5 User's Manual

NOTES:

