MES-P POSITIVE DISPLACEMENT PULSE OUTPUT FLOWMETERS

SIZES - 20, 25, 32 and 40mm

FEATURES

- **Flow Direction Detection with Digital Smart pulse.**
- **Selectable pulse value per litre on any given size.**
- **Vibration resistant.**
- **5 – 30 V DC input voltage range.**
- **Nutating (wobbling) disc measuring chamber.**
- **Small impurities pass chamber without jamming.**
- **Low hydraulic thrust minimises wear.**
- **High pulse output rate for precision flowrate & batching applications.**
- **± 1.5 % flow range accuracy curve.**
- **± 0.2 % repeatability.**
- **Sizes 20, 25, 32 & 40mm**
- **Conforms to AS3565-1988, designed to meet AS3901.**

AUSTRALIAN MADE

New

The MES range of nutating disc, magnetically-coupled, positive displacement pulse output flowmeters (introduced in 1995, with most still operational) are suitable for a wide range of precision batching and flowrate monitoring applications, operating from low to high flow ranges.

Unlike rotary piston and oval rotor principle meters, the nutating disc flow chamber can pass small impurities without jamming, whilst maintaining exceptional measurement accuracy with only minimal headlosses. Measurement of concrete admixtures and water-based chemicals with varying specific gravities up to 1.4 is achieved with only slight calibration variations.

The new Pulsehead with digital smart pulse (DSP) transmitter is a self-contained unit which couples to the meter body with a bayonet lock and turn fitting connection, while being fully isolated from the fluid measuring chamber. Pulse outputs are available as Digital Pulse Output (replaces the Transistor type) or Contact Closure. The pulsehead unit is rated to IP55 protection.

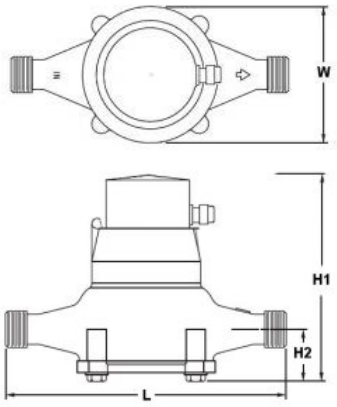
The latest MES flowmeter Pulshead model "DSP" (*Digital Smart Pulse*), uses magnetic sensors and a microcontroller unit to process and sample the signals which provides latest technology ultra-stable pulse outputs which are also virtually vibration free.
In addition, DSP technology is able to determine the direction of the flow, through three separate, live output channel options.
Optionally, the number of pulses per litre can be be ordered on the output as well, to make it suitable for expanded applications.
To make this design completely interchangeable with previous model pulseheads, the default output mode is standard with bi-directional pulse (Pulse output is live regardless of flow direction) and 1000 pulses per litre is standard on a 20mm measuring body. The different pulse value per litre will apply on the larger body sizes as per the table. Alternatively Output pulse value modes can be nominated at the time of purchase.

MES-P Flowmeters Specifications Table

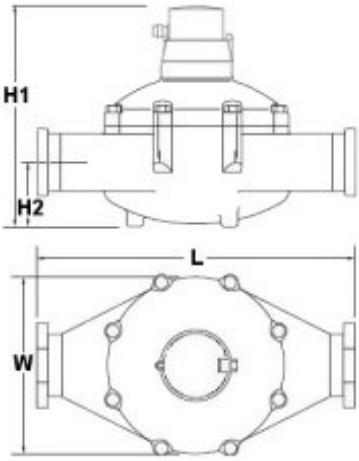
Technical Specification / Model Number		MES20	MES25	MES32	MES40
Digital	Output rate (Pulses Per Litre)	Default/Standard: 1000 PPL on 20mm measuring body Available options: 1, 10, 20, 50, 100, 250, 500 & 1000			
	Standard outputs	1000	555	261	116
	Supply voltage / current consumption	+ 5 – 30V DC / 3 – 17mA proportional to input voltage.			
	Maximum switching capacity	+ 30V DC, 950mA			
	Output options	1. Bi-directional pulse: Generates pulse on output regardless of the direction of flow. (Default/Standard) 2. Forward pulse: Generates pulse output as long as the direction of flow matches the arrow on measuring body. 3. Revese Pulse: Only generates pulse output in case of backflow.			
Transistor	Output rate (Pulses Per Litre)	1000	555	261	116
	Supply voltage / current consumption	+ 5 – 25V DC / 5 – 25mA proportional to input voltage.			
	Maximum switching capacity	+ 25V DC, 500mA			
Contact closure	Output rate (Pulses Per Litre)	60.6	34	16	7.2
	Supply voltage / current consumption	No power supply needed. (2 Wire Connection)			
	Maximum switching capacity	+40V, 400mA			
Accuracy (min – max range)		± 1.5% (repeatability ± 0.2%)			
Start Flow @ 5% (Litres/Minute)		0.6	1.1	1.5	3.0
Minimum Flowrate @ ±1.5 (Litres/Minute)		1.5	2.7	3.8	7.5
Nominal Flowrate (Litres/Minute)		45	65	125	200
Maximum Flowrate (Litres/Minute & Admix s.g. 1.4)		54	80	132	268
Maximum Flowrate (Litres/Minute & Admix s.g. 1.1)		68	102	168	340
Maximum Flowrate (Litres/Minute & Admix s.g. 1.0)		75	112	185	375
Weight (including connectors)		1.3Kg	2.3Kg	4.7Kg	17Kg
Connection Type (BSP)		3/4" (Male)	1" (Male)	1 1/4" (Male)	1 1/2" Oval flanged kit,(Female)
Metric size reference		20mm	25mm	32mm	40mm
Maximum Working Pressure		1160 kPa			
Head loss at nominal flowrate		25 kPa			
Maximum fluid temperature		50 ℃			

DIMENSIONS

Meter Size	mm	20 mm	25 mm	32 mm	40 mm
Length of threaded end meter	L	191	229	273	330
Overall Height of meter	H1	148	178	200	252
Height –underface to centreline	H2	35	48	54	65
Overall Width	W	92	111	165	205



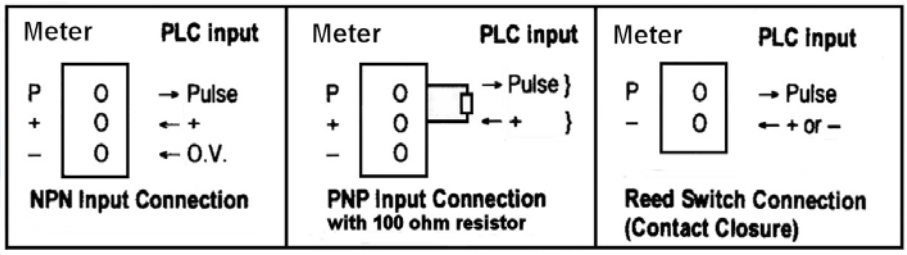
dimensions for 20, 25, 32mm



dimensions for 40 mm

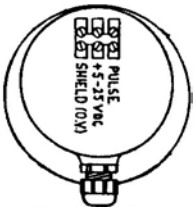
PULSE OUTPUT SPECIFICATIONS & CONNECTION

The Pulsehead unit (Digital Pulse/Transistor/Contact Closure) are of the same specification for all sizes.
The Contact Closure pulse unit (square junction housing) with current limiting resistor and Anti-bounce capacitor can switch up to 40V (400mA).
For variable selectable scaling pulse output values, use UIC/D Universal Interface Card.
For additional 24-240VAC Triac pulse switching, use UIC/A interface card.
To connect, remove the moulded housing cover, followed by the housing lid (2 screws).
Pass the cable through the gland entry and connect to the terminal connector strip.
Screw down on wire, tighten gland and reseal housing.
For best results, use shielded cable only.



Standard NPN/PNP transistor switching 5-25VDC.
The internal transistor will drive up to 500mA
For PNP input (12-24VDC) fit a 1.5 to 1.8K resistor
(Value depends on input impedance) **between + and P.**

MES Internal Junction View



INSTALLATION

1. Install the meter undercover, since the pulsehead is rated IP55 rating only.
2. Consider an accessible area for any future service. Flush out pipes thoroughly before connecting flowmeter in pipework.
3. Flowmeters may be installed in any position without affecting accuracy (but not upside down if particles are present).
4. **Ensure arrow on meter body coincides with forward flow direction.**
5. Although chamber can pass small impurities, if the fluid contains large impurities, a 1000 micron filter should be fitted prior to meter.
6. Any flow restriction or regulation valve should be fitted preferably before the flowmeter. Quick-closing valves should be fitted before the meter if used for higher-end flowrates (thus avoiding sudden pressures on the flowmeter chamber) provided that the plumbing configuration allows the pipe to remain full where the flowmeter is located.
7. Never exceed the rated maximum flow of the meter, as this could cause damage to the measuring chamber components and/or cause severe overdosing of liquid. Once installed, the flowmeter must measure a full pipe of liquid at all times.
8. Avoid installing the transistor pulse unit in high vibration areas, as this may cause false pulses.
9. **IMPORTANT: AS THE LAST STEP OF INSTALLATION, A CALIBRATION CHECK OF THE FLOWMETER MUST BE PERFORMED.**

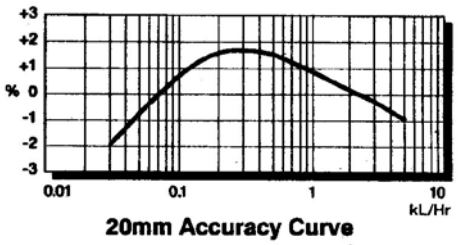
MAINTENANCE

If flow becomes excessively restricted, or meter is out of calibration, or output pulses cease, then:

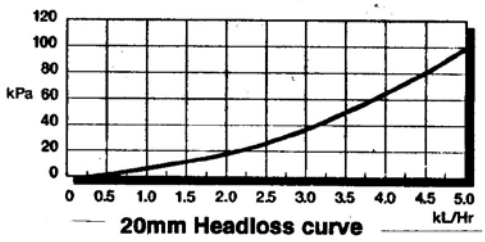
1. Where fitted, push in the pulsehead locking pin; hold pulsehead and turn it anti-clockwise, then pull up and remove pulsehead from the meter body. **CAUTION: Do not press on, or impact, the copper base of the pulsehead.** For the transistor pulse unit, shake it in a left-right motion - this should generate output pulses. If not, check voltage supply, connections and cable. If all are OK, then proceed to step 2.
   If still not working change and upgrade with new DSP digital puslehead.
2. To access measuring chamber (Meter sizes 20, 25 and 32mm) rotate or remove meter body. Remove the base screws, base plate and base sealing ring. Using pliers, pry and pull out the white strainer to free the measuring chamber unit for removal and inspection.
   For the 40mm size undo the top body plate bolts x8.
3. If required, clean chamber parts in warm water or dilute acid (4:1 Water:Hyrochloric-acid). Remove any solids which may be impeding rotation. Make sure internal nutating disc roller pin is in place and that shutter plate is refitted. Test to see that the chamber works freely. Reassemble meter by reinserting measuring chamber and reposition it with strainer. Re-fit other components and test the meter.
4. If the MES meter runs dry after measuring chemicals, make sure to flush out the meter chamber with water.
5. To avoid moisture ingress to electronics, ensure cable entry gland is secure, cables are looped downwards and the meter is under cover.
   IMPORTANT: AFTER ANY SERVICE, MUST PERFORM A CALIBRATION CHECK OF THE FLOWMETER.

MATERIAL SPECIFICATIONS

1.	Pulsehead	- Polyacetal & PVC.
2A.	Meter body	- Cast gunmetal.
3.	Strainer	- Polyacetal.
4.	(Not used)	
5.	Measuring chamber	- Nepton (synthetic polymer), SS316, Polymer barium ferrite magnet.
6.	Chamber O-ring	- NBR rubber.
7.	Base sealer ring	- NBR rubber.
8.	Base plate	- 20mm: Synthetic Polymer.
8M.	Base plate	- 25 & 32mm: Cast Iron, powder coated.
9.	Base body screws	- Stainless Steel.
14.	Top Plate	- 40mm: Gunmetal.

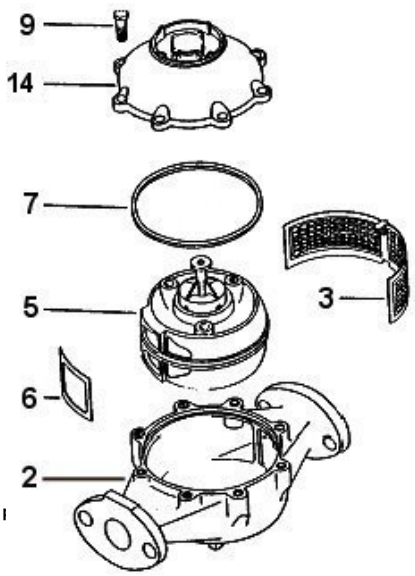


20mm Accuracy Curve



20mm Headloss curve

Spares for 40mm size



9. Bolt x8
14. Top Plate
7. Sealer Gasket
3. Strainer
5. Chamber Complete
6. O-Ring Chamber
2. Meter Body

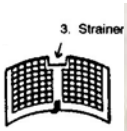
Spares for 20, 25, 32mm Sizes

1. Transistor or DSP pulsehead

1R. Contact Closure pulsehead

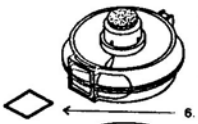
2A. Meter Body

Arrow on meter body indicates direction of flow

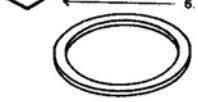


3. Strainer

MES20-N



5. Measuring chamber

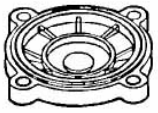


6. Chamber O ring

7. Base sealer ring

8M. Metal Base plate

8. Plastic Base plate



9. Stainless 316 base screws

FLOWMETER ORDER CODES

Code	Description
MES20-N	20mm Digital pulse o/p (1000 pulses/Litre)
MES20R	20mm Contact Closure pulse o/p (60.6 pulses/Litre)
MES20-S	20mm Digital pulse o/p with Ryton# chamber
MES20R-S	20mm Contact Closure pulse o/p with Ryton# chamber
options for any MES flowmeter Sizes 20, 25, 32 & 40 mm	
-T	with Teflon-lined body and couplings for 20mm only
-10	/10 = 100 pulses/Litre (each pulse = 10 ml)
-20	/20 = 50 pulses/Litre (each pulse = 20 ml)
-50	/50 = 20 pulses/Litre (each pulse = 50 ml)
-100	/100 = 10 pulses/Litre (each pulse = 100 ml)

Code	Size	Pulse Type	Pulses / Litre
MES25	25mm	Transistor	555
MES25R	25mm	Contact Closure	34
MES32	32mm	Transistor	261
MES32R	32mm	Contact Closure	16
MES40	40mm	Transistor	116
MES40R	40mm	Contact Closure	7.2

Special chemical/petroleum-resistant Ryton-MTL measuring chamber and seals for 20mm.

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

ManuFlo ®™
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