MES20 PULSE OUTPUT ADMIXTURE FLOWMETER (DSP-OC)

Size 20mm - Positive Displacement

FEATURES

- **Measures Admixtures (Specific Gravity <= 1.4)**
- **Nutating disc measuring chamber.**
- **Small impurities can pass chamber without jamming.**
- **Low hydraulic thrust minimises wear.**
- **+4 to +40DC wide input voltage range**
- **Exclusive 1 pulse per 1 millilitre output.**
- **Pulses in forward/reverse directions.**
- **± 1.5 % accuracy curve.**
- **Accuracy is largely unaffected by varying viscocities & S.G**
- **± 0.2 % repeatability of rate.**
- **Conforms to AS3565-1988, Designed to meet AS3901.**

MES20 Digital pulse

The MES20-DSP(OC) magnetically-coupled positive displacement pulse output flowmeter, with its nutating disc measurement principle flow chamber, provides a high resolution pulseout, making it suitable for a wide range of precision batching and flowrate monitoring applications, operating over a wide flow range.

The MES20 was introduced in 1995, and is now used throughout the world. It is the primary choice for most construction chemicals suppliers throughtout Australasia and other parts of the world for measuring and dispensing liquid admixture chemicals.

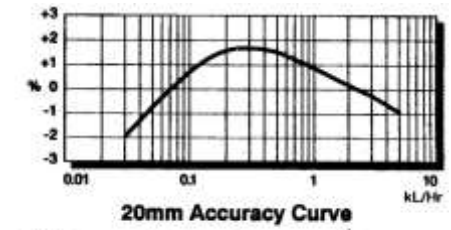
The nutating (wobble) disc measurement flow chamber employed in the MES20, makes the meter operate with only minimal headlosses and can pass small impurities without jamming. Measurement with a wide range of varying viscocity and specific gravity liquid water based admixtures is possible with negligable calibration variations. The optimum operating flow rate is at nominal (Nom) flow, expect at least 15 years operating life of the chamber with standard admixture liquids.

The pulsehead (electronic) is fully self contained unit, which attaches to the main meter body with a bayonet turn and lock fitting mechanism. Although the MES20 was designed primarily for economical measurement of concrete admixtures, it is also used for a wide range of other water based liquid measurement applications.

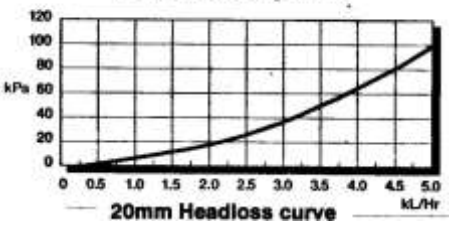
The newest MES flowmeter model (*Digital Smart Pulse*) -DSP, uses magnetic sensors and a microcontroller unit to process and sample the signals which provides the latest technology pulse output that is virtually vibration free.
Note: (-OC) Open contact version means the internal pull resistor is removed to operate with MANUFLO equipment and certain devices which already have an internal pull-resistor on their input circuit.

TECHNICAL SPECIFICATIONS

Size	:	20mm
Pulse output rate: Digital Output	:	1 pulse per 1 millilitre (1000 pulses / Litre), (factory programmable)
Voltage supply	:	+4 to +30 VDC
Supply current - Digital Pulse	:	5mA to 25mA proportional to supply voltage
- Contact Closure	:	switching upto 100mA.
Accuracy (min - max range)	:	± 1.5 % (repeatability ± 0.2 %)
Start flow @ 5%	:	0.6 Litres per minute
Minimum (Min) flow	:	1.5 Litres per minute
Nominal (Nom) flow	:	45 Litres per minute
Maximum (Max) flow	:	54 Litres per minute (Admix s.g. 1.4)
		68 Litres per minute (Admix s.g. 1.1)
		75 Litres per minute (Water s.g. 1.0)
Maximum working pressure	:	1160 kPa
Headloss at nominal flow	:	25 kPa
Maximum fluid temperature	:	50 °C
Weight	:	1.5 kg



20mm Accuracy Curve



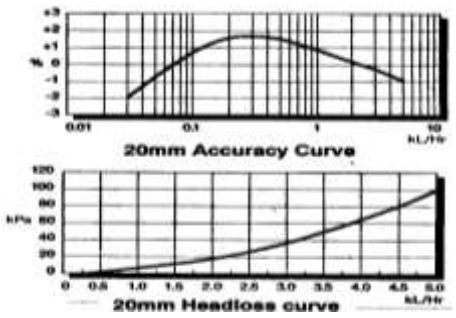
20mm Headloss curve

MES20 *Flow Direction sensing:*

Flow Characteristics

The new digital pulse head has the ability to determine the direction of the flow. To make the new design completely intechangiable with the previous models, 3 separate live pulse output channels are available on this model:

1. Bi-directional pulse output:
   Generates pulses on the output regardless of the direction of the flow. (Forward and Reverse -this is the default configuration).
2. Separate Dual Pulse for Forward & Reverse flow pulse outputs:
   Generates a individual pulse train on the output for forward flow And for Reverse flows.



DIMMENSIONS

MES20

Meter Size – 20mm		MES20
Length of threaded end meter	L	191
Height – overall of meter	H1	160
Height – underface to centreline	H2	35
Height – underface to top body	H3	68
Overall Width	W	92

CONNECTION

20mm (3/4") BSP-male threaded ends (USA 5/8").

SPECIFICATIONS for Size: 20mm		
Pulse head model IP63 rated with cap.		Ratings
Digital	**Output rate (Pulses Per Litre)**	**1000 PPL (is standard).** (3 wire connection) Available options: 1, 10, 20, 50, 100, 250, 500 & 1000 PPL
	Supply voltage / current consumption	+ 4 – 30V DC / 2.2mA (MAX) (DSP - Digital Smart pulse)
	Maximum switching capacity	+ 30V DC, 500mA
Transistor (Superseeded White round JB))	Output rate (Pulses Per Litre)	Fixed 1000 pulses per litre. (1 pulse per 1 millilitre)
	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 pulses per litre (2 wire connection, internal 470Ω)
	Supply voltage / current consumption	No power supply needed. Switches +0-30VDC to 300mA
Connection via IP67 PG9 cable gland entry		3 wire screw down terminals (use shielded signal cable)
Accuracy (min – max range)		± 1.5% (repeatability ± 0.2% or better of rate)
Start Flow @ 5%		0.6 Litres per minute
Minimum Flowrate @ -1.5%		1.5 Litres per minute
Nominal Flowrate @ 0%		45 Litres per minute
Maximum Flowrate @ +1.5%		54 Litres per minute (Admix s.g. 1.4) 70 Litres per minute (Admix s.g. 1.1) 80 Litres per minute (Admix s.g. 1.0)
Maximum Working Pressure		1160 kPa (Headloss at nominal flowrate 25 kPa)
Maximum fluid temperature		50 ℃
Weight		1.45 kg

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INSTALLATION

MES20

1. Meter body end threads are male 20mm ¾" BSP. Arrow on meter body indicates direction of flow.
2. Install meter undercover, the pulsehead now rated IP63 when hood cap is secured. NOTE: use only shielded cable for all wiring
3. Consider an accessable area for any future service. Flowmeters may generally be installed in any plane without affecting accuracy (but not upside down, as mag-drive assembly may be eventually obstructed).
4. Older Transistor Meter model may emit some stray pulses in high vibration areas, so avoid high vibration areas, or install dampeners, or use the DSP-OC digital smart pulsehead version which are immune to vibration.
5. Flush out pipes thoroughly before connecting flowmeter. Ensure arrow on meter body coincides with forward direction of flow.
6. Although meter passes small impurities, a filter box or strainer (800 micron cartridge filter recommended) may be fitted prior to flowmeter, especially if fluid contains granules or many impurities.
7. 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.
8. Once installed, flowmeter must be full of liquid at all times.
9. **IMPORTANT: AS LAST STEP OF INSTALLATION, A CALIBRATION CHECK OF FLOWMETER MUST BE PERFORMED**

MATERIAL SPECIFICATIONS:

1.	Pulsehead	- ASA-UV.
2.	Meter body	- Gun metal AS1565 C83810.
3.	Strainer/Spacer	- Polyolefin.
4.	Wobble Disc/Shutter	- Graphite Compound
5.	Measuring chamber	- Nepton/SS316/barium ferrite.
6.	Chamber gasket	- NBR rubber
7.	Base sealer cap gasket	- NBR rubber *or*
7E	Base sealer cap gasket	- EDPM
8.	Base plate	- PVC or Synthetic Polymer
9.	Base body hex screw	- Stainless steel 316

NOTE: A full complement of spare parts is available.

arrow on meter body indicates direction of flow

PULSE OUTPUT SPECIFICATIONS

1) Standard NPN/PNP Digital Pulse = 1 ml/1pulse (1000ppL)

+4-30VDC -the internal circuit will drive upto 500mA**.**
For PNP input (12-24VDC) fit a 1.5 to 1.8K resistor
(Value dedends on devices input impedence).
Re-transmission distance upto 1000 metres.

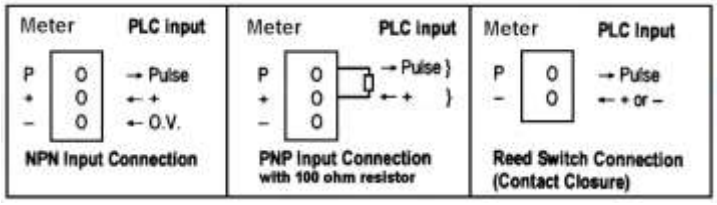
To connect, remove the moulded cap, followed by the housing lid (2 screws).
Pass the cable through the gland entry and connect to the terminal connector strip.
Screw down on bare wire, properly tighten gland and reseal housing with cap cover.

To avoid signal interferrence, use shielded cable only.

2) Contact closure 60.6 pulses/ Litre
Current limiting resistor & debounce capacitor fitted.

FOR 24 to 240 VAC PULSE OUTPUT SWITCHING USE **UIC/A2** Or **UIC/D** for 5-24VDC FULLY SCALABLE & VARIABLE DIVIDED PULSE INTERFACE CARD (refer datasheet).

MES20-DSP-OC or MES20-DSP
Identifier label located on lid



Order Code:	Description
MES20	**Digital pulse: 1000 pulses/Litre**
-DSP-OC	For ManuFlo equipment
-DSP	Other devices (internal pull-up res.)
MES20-R	**Contact closure 60.0 pulses/Litre**
-E	EDPM base gasket seal option
-T	Teflon coated body

MAINTENANCE

If flow becomes excessively restricted, or meter is out of calibration, or pulsehead stops pulsing, then:

1. Where fitted, push in the locking pin. Hold the pulsehead, turn it anticlockwise, pull up and remove. **CAUTION: Do not press on, or impact, the copper base of the pulsehead.** Use a magnet (or **UMT8** ManuFlo tester) to rotate at copper can base of pulsehead- this should generate pulses. (Note: Older transistor/optical pulseheads can be shaken to generate pulses). If still no pulses, check voltage supply, connections & cable. If still no pulses, replace the pulsehead. If pulsehead does pulse, then problem may be in flow chamber (blocked/jammed/broken), so proceed to step 2.
2. To access the measuring chamber, first rotate or remove meter body to access the base screws. Unscrew the 4 x hex bolts in the base, remove base plate and base seal ring. Using long nose pliers to pry and pull out white strainer/spacer thus allowing measuring chamber assembly removal. Remove chamber and inspect. (if broken/cracked or missing parts- replace parts or with complete new chamber).
3. If required, clean chamber parts in warm water or diluted acid (4:1 Water: Acid). Make sure internal chamber wobble disc roller pin is in place, shutter plate is refitted & chamber gasket is positioned. Re-assemble meter by reinserting measuring chamber; secure in position with strainer, re-position Base seal gasket (replace if swollen) and seat base plate, then secure with screws. Refit any other components & test meter.
4. After use with chemicals, if MES20 is removed from pipeline, be sure to flush out working chamber with water to flush any sticky admix residue.
5. To avoid moisture ingress to electronics, always make sure all cable entry glands are secure, cables are looped downwards and the meter is under cover. **IMPORTANT: AFTER ANY SERVICE, A VOLUMETRIC CALIBRATION CHECK OF THE FLOWMETER MUST BE PERFORMED.**

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

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