

# MES20-S PULSE OUTPUT & LCD RESET FLOWMETER

## Size 20mm - Positive Displacement

### SPECIAL FEATURES

- **Ryton-MTL Nutating (wobbling) disc measuring chamber measures aggressive chemical admixtures and petroleum-based liquids to 1.6 Specific Gravity.**
- Interchangeable pulserate with standard MES20 models.
- Small impurities can pass chamber without jamming.
- Head options: Pulse output, or 5 digit LCD (either as resetable Total Litres, or Litres/min Flowrate).
- accuracy:  $\pm 1.5\%$  Total;  $\pm 2\%$  Flowrate.
- $\pm 0.3\%$  repeatability.
- Low hydraulic thrust minimises wear.
- Designed to meet AS3901.
- **Optional Teflon-lined body (MES20-S-T).**



**MES20LCD4-S**

with Ryton chamber and LCD display (yellow body)



**MES20-S**

with Ryton chamber and Pulse Output (yellow body)



**MES20-S-T**

with Teflon-lined body (black body)

The MES20-S magnetically coupled 20mm positive-displacement pulse output flowmeter with its Ryton-MTL nutating disc measurement flow chamber, is suitable for a wide range of precision process measurement applications. The Ryton chamber was specially developed for compatibility with aggressive admixtures and petroleum-based liquid chemical mixes, with a superior operating range from low to high flowrates. Optionally, for chemicals aggressive to metals, the cast body can be Teflon-coated (when ordering, add -T suffix to any MES20-S flowmeter Order Code). Teflon-coated meters have a black body to identify them.

The head is available as either Pulse Output, or resetable LCD Total display, or as a LCD Flowrate display. The IP54-rated Pulse version is available with either a high-resolution Transistor pulse, or a Reed Switch contact closure pulse. The IP65-rated LCD display head is internal Lithium battery powered, and is available either as a resetable Litres display (to either zero or 1 decimal place), or as a Litres/minute Flowrate display.

The Pulse and LCD heads are each self-contained units, and attach to the meter body with a bayonet turn and lock fitting mechanism. The nutating (wobbling) disc measurement flow chamber used in the MES20-S means that the meter operates with only minimal head-losses, and is able to pass small impurities without jamming. Measurement with a wide range of varying viscosity and specific gravity liquids is possible. A full compliment of spare parts is available.

### TECHNICAL SPECIFICATIONS

Type	Pulse Output Version (IP54)		LCD Resetable Display (IP65)
Size	20mm		20mm
Pulse output rate (pulses/Litre):	Specific Gravity $\geq 1.1$	Specific Gravity $< 1.1$	n/a n/a
• Transistor NPN/PNP • Reed Switch Contact Closure	1000 60.6	940 57	
LCD display	n/a		Litres to 99999, or to 9999.9
Voltage Supply	5 to 30 VDC		Internal 5-10 year 3.7v Lithium battery
Supply current	5-30 mA proportional to supply voltage		10-25 $\mu$ Amps (internal current draw)
Accuracy min-max range	$\pm 1.5\%$ (repeatability 0.3%)		$\pm 1.5\%$ Total, $\pm 2\%$ Flowrate (repeatability 0.3%)
Start flow @ 5%	0.6 Litres/minute		0.6 Litres/minute
Minimum flow	1.5 Litres/minute		1.5 Litres/minute
Nominal flow	45 Litres/minute		45 Litres/minute
Maximum flow - spec. gravity 1.4	54 Litres/minute		54 Litres/minute
spec. gravity 1.1	68 Litres/minute		68 Litres/minute
Maximum working pressure	1160 kPa		1160 kPa
Headloss at nominal flow	25 kPa		25 kPa
Maximum fluid temperature	65 C		50 C
Weight	1.8 kg		1.8 kg
<b>Order Codes:</b>	<b>MES20-S</b> NPN/PNP pulse.	<b>MES20LCD5-S</b> Reset Litres to 99999	
	<b>MES20-S-T</b> NPN/PNP pulse, Teflon coated body.	<b>MES20LCD5-S-T</b> Reset Litres to 99999, Teflon coated.	
	<b>MES20R-S</b> Contact Closure pulse.	<b>MES20LCD5DP-S<sup>#</sup></b> Reset Litres to 9999.9	
	<b>MES20R-S-T</b> Contact Closure pulse, Teflon coated body.	<b>MES20LCD5DP-S-T<sup>#</sup></b> Reset Litres to 9999.9, Teflon coated.	

# add -F suffix to any MES20LCD5DP meter, to order display showing  $\pm 2\%$  Flowrate to 9999.9 Litres/min, instead of Total Litres.

## INSTALLATION

1. Meter body end threads: male 20mm 3/4" BSP.
2. Install pulse version meter undercover as the pulsehead is splashproof only (rated IP54).
3. Consider an accessible area for any future service. Flowmeters may generally be installed in any plane without affecting accuracy (but not upside down if particles are present, as mag-drive assembly may be obstructed).
4. Flush out pipes thoroughly before connecting flowmeter. Ensure arrow on meter body coincides with forward direction of flow.
5. Although meter can pass small impurities, a filter box or strainer should be fitted prior to flowmeter (1000-micron cartridge filter is recommended), especially if liquid contains granules or many impurities
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. In high vibration areas, if the NPN version pulse output meter emits stray pulses, then avoid vibration areas or install rubber dampeners or consider the Reed Switch version.
8. The LCD digital head can be repositioned in 4 x 90° viewing positions. Avoid prolonged direct sunlight on the LCD display.
9. Once installed, flowmeter must be full of liquid at all times.
10. **AS LAST STEP OF INSTALLATION, A CALIBRATION CHECK OF FLOWMETER MUST BE PERFORMED.**

### MATERIAL SPECIFICATIONS

- |                        |                             |
|------------------------|-----------------------------|
| 1. Pulse Head          | - Polyacetal, PVC           |
| 1A LCD Display Head    | - Polyacetal, PVC, glass    |
| 1B LCD Display Head    | - Polyacetal, PVC, glass    |
| 2A. Meter body (outer) | - Gunmetal AS1565 C83810    |
| Meter body (inner)     | - optionally Teflon coated  |
| 3. Spacer              | - Teflon                    |
| 5. Measuring chamber   | - Ryton-MTL                 |
| 6. Chamber O-ring      | - Viton                     |
| 7. Base sealer ring    | - Viton                     |
| 8M. Base plate         | - Cast Iron, powder coated. |
| 9. Base body screws    | - Stainless Steel 316       |



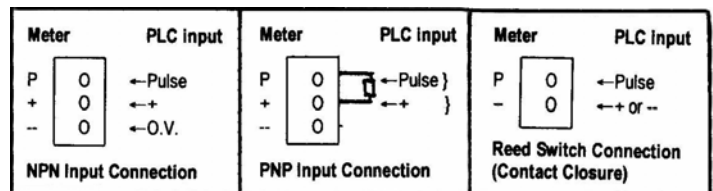
Chamber parts and spacer.



LCD Head (left) and Pulse Head.

### PULSE OUTPUT SPECIFICATIONS

1. **Standard NPN/PNP transistor 1 ml/1pulse 5-25VDC**  
**The internal transistor will drive upto 250mA.**  
**For PNP input (12-24VDC), fit a 1.5 to 1.8K resistor**  
 (value depends on input impedance) - see diagram.  
 Re-transmission distance upto 1000 metres.  
**USE SHIELDED CABLE ONLY.**



2. **Reed switch contact closure 60.6 pulses/Litre**

Switching current upto 100mA. Current limiting resistor and debounce capacitor fitted.

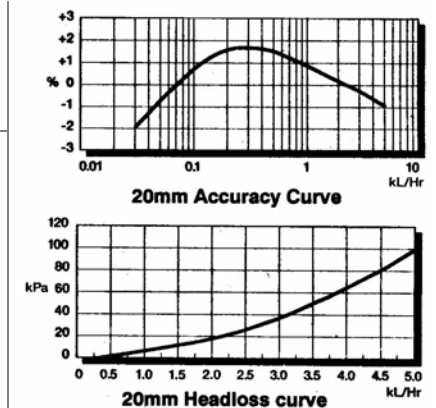
FOR 24 to 240 vac PULSE-OUTPUT USE UIC/A,  
 FULLY SCALABLE DIVIDED PULSE INTERFACE CARD (see UIC datasheet).

### LCD DIGITAL RESETTABLE TOTAL DISPLAY OPERATION

The LCD display is powered by a long life Lithium battery, making the meters totally portable for a wide range of liquid chemical and petroleum measurement transfer applications. The digital capsule is fully self-contained, with an impact resistant glass window for easy reading and cleaning. Display digits 14mm high.

**To operate:** open the hinged lid. LCD digits are zeroed ready for measurement. Display counts in either Litres to 99999, or decimal place increments to 9999.9 Closing the lid resets the digits and turns off battery power.

To replace battery (after 5-10 years), return to the point of purchase for a battery-replacement/calibration/maintenance check at minimal charge.



**MAINTENANCE** If flow becomes excessively restricted, meter is out of calibration, does not count, or pulses stop under flow, then:

1. With a screwdriver, push in the locking pin located at the rear of the pulse/LCD head. Holding the pulse or LCD head, turn the head anti-clockwise, pull up and remove. **CAUTION: Do not press on, or impact, the copper base of the head.** For Pulsehead (NPN/PNP), shake it left-right, this should generate some pulses. If not, check wiring. If still no pulses, replace pulsehead. If pulsehead pulses, then problem may be in the flow chamber - proceed to step 2.
2. To access measuring chamber: rotate flowmeter or remove flowmeter from pipe. Unscrew 4 x base screws; remove base plate and base seal ring. Remove the white spacer and then the measuring chamber assembly. Open the measuring chamber and inspect nutating disc, magnet roller and magnet.
3. If required, clean chamber parts in solvent or dilute acid (4:1 Water:Hydrochloric-acid). Re-assemble chamber and reseal carefully with locator notch and spacer.  
**IMPORTANT: AFTER ANY SERVICE, MUST PERFORM CALIBRATION CHECK OF METER.**
4. After use with admixture chemicals, if MES20-S is removed from pipeline, be sure to flush out working chamber with solvent.  
**Always perform a calibration check of the flowmeter upon re-installation.**

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