



Data Sheet

3¹/₂ digit LED digital panel meters

RS stock numbers 258-625, 258-647, 258-653, 258-732, 258-748, 258-782, 258-811, 260-432, 312-375, 312-381, 312-397, 312-404

The range of RS 3¹/₂ digit LED. digital panel meters includes three supply options, 5Vdc, 110Vac and 240V ac each available with 200mV, 2V, 20V or 200Vdc FSD. The meters have a maximum count of ± 1999 indicated by four 0.43 inch high red LED. displays viewed through a red anti-glare filter. Meters are housed in front panel mounting DIN standard boxes of black flame retardant ABS (which fit both DIN and NEMA standard panel cut-outs) with connections made via a 24 way 0.1 inch edge connector. Features include auto-zero, auto-polarity with externally programmable decimal point. The 200mV and 2V meters have a differential input and reference for ratiometric measurement whilst the 20V and 200V meters are single ended input without external reference connections.

Features

- 3 supply options
- Bright 0.43in display
- Auto polarity
- Internal band-gap reference
- 0.1% accuracy
- 4 FSD versions
- Auto zero
- Programmable decimal points
- DIN standard cut-out.

Applications

Simple bridge (for non ratiometric measurements)
Ratiometric bridge.

Specification

	Meter supply voltage (nominal)		
	5Vdc*	110Vac	240Vac
Supply voltage range	4.75 to 5.25V	99 to 121V	216 to 264V
Supply current/power	250mA	4.5VA	4.5VA
Supply frequency	d.c. (smooth)	50 to 60Hz	50 to 60Hz
Outputs: +V (typically 5Vdc)	-	5mA	5mA
: -V (typically -3.6Vdc)	1mA	1mA	1mA
: Anal. com. (typically +V-2.8Vdc)†	5mA	5mA	5mA

*Overvoltage and reverse polarity protected. If the meter is connected via a 200mA anti-surge fuse.

† Applies to 200mV and 2V FSD versions only. 20V and 200V FSD meters do not have these outputs.

Performance

	Meter FSD			
	200mV	2V	20V	200V
Measurement range	$\pm 199.9\text{mV}$	$\pm 1.999\text{V}$	$\pm 19.99\text{V}$	$\pm 199.9\text{V}$
Accuracy	$\pm 0.1\% \pm 1$ count			
Resolution	100 μV	1mV	10mV	100mV
Temperature coefficient typical	$\pm 75\text{ppm}/^\circ\text{C}$	$\pm 75\text{ppm}/^\circ\text{C}$	$\pm 150\text{ppm}/^\circ\text{C}$	$\pm 150\text{ppm}/^\circ\text{C}$
maximum	$\pm 150\text{ppm}/^\circ\text{C}$	$\pm 150\text{ppm}/^\circ\text{C}$	$\pm 350\text{ppm}/^\circ\text{C}$	$\pm 350\text{ppm}/^\circ\text{C}$
Input impedance	$>100\text{M}\Omega$	$>100\text{M}\Omega$	$11.2\text{M}\Omega \pm 2\%$	$10.11\text{M}\Omega \pm 2\%$
Input leakage current maximum	10pA	10pA		
Input over-voltage	$\pm 100\text{V}$	$\pm 100\text{V}$	$\pm 500\text{V}$	$\pm 500\text{V}$
Common mode rejection ratio (CMRR)	80 dB	80 dB		
Common mode voltage range (CMVR)	within +V - 0.5 and -V +1V			
External reference range	within CMVR			
Sampling rate	approx. 3 per second			
Integration time	100ms			
Warm up time	within 10 minutes			
Storage temperature range	-25°C to $+85^\circ\text{C}$			
Working temperature range	0°C to $+50^\circ\text{C}$			

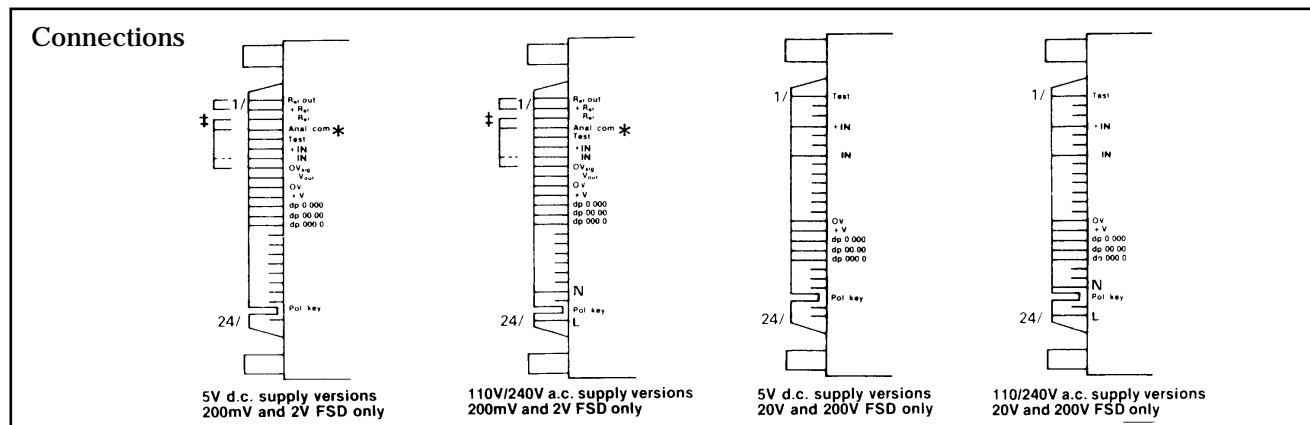
Display - all meters

Polarity: shown by minus sign.

Over-range: shown by the 3 least significant digits blanked.

Decimal point: programmable by edge connector. To illuminate a decimal point connect appropriate pin to 0V.

Test facility: connect to +V to display all segments.



‡ Standard connections for differential inputs; for single ended mode also connect - IN to OV sig.

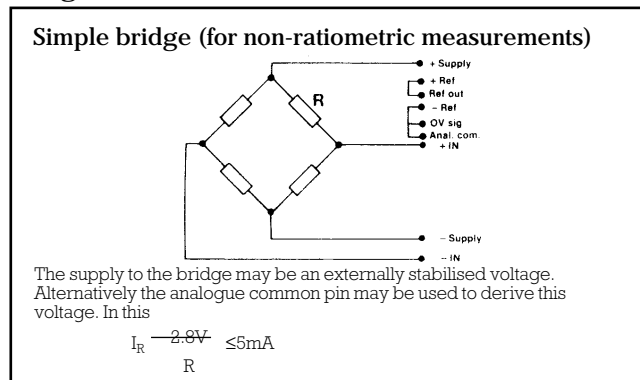
* In order to improve system linearity it may be necessary to let analogue common float with respect to the other inputs, ie left unconnected, any common mode voltage error thus introduced should be negligible.

Reference

All meters incorporate a highly stable band-gap derived reference which may be adjusted by means of the ten turn pot accessed through the hole in the display circuit board behind the filter. The 200mV and 2V meters may be used with either the internal reference or an external reference. Should the internal reference be used then the standard link connections shown above should be made. With the

Applications

Bridge circuits - use 200 mV or 2V meters



Attenuators

For applications requiring an FSD greater than the meter's basic movement then the use of an external attenuator may be made. This simply requires two resistors connected as shown below.

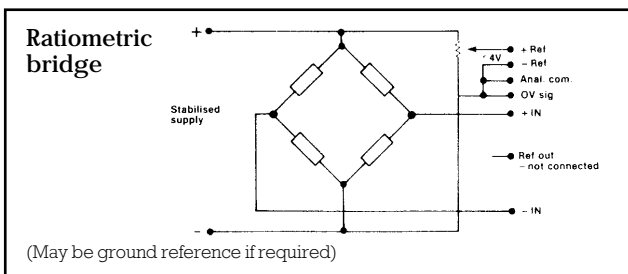
The total value of R₁ and R₂ determine the loading on an external circuit connected to the input and should be chosen to reduce this loading to an acceptable level. However, if R₂ is too high then the input impedance of the meter will affect the accuracy. Normally

20V and 200V meters the internal reference is internally connected and cannot be used with an external reference.

Calibration

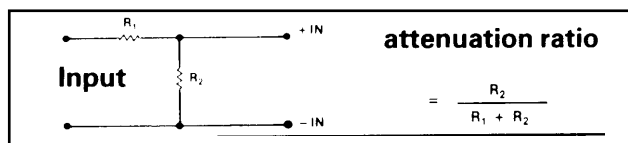
To calibrate the 200mV or 2V meter connect the standard links as shown above and adjust the reference to 100mV (200mV version) or 1.000V (2V version). The reference voltage is measured between the +ref and -ref terminals. Alternatively apply a known voltage to the input (eg. 199.5mV) and adjust the reference to give the correct reading. The 20V and 200V meters can only be calibrated by applying a known voltage to the inputs and adjusting the reference for the correct reading.

Connections should be made via a 24 way 0.1 inch edge connector, RS466-545, and may be secured to the case by two self tapping screws supplied. (Type AB No.4 × 12.7mm).



N.B. To avoid common mode errors in all the above circuits ensure that the voltage between - IN and Anal. com. (common mode voltage) does not exceed ± 1V.

the 200m V and 2V meters do not present a problem as the input impedance is greater than 100 MΩ. The 20V and 200V meters have a lower impedance, as given in the performance table, which may need to be accounted for in the attenuator value calculation.



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