Instruction Leaflet

3½ Digit LCD DPM

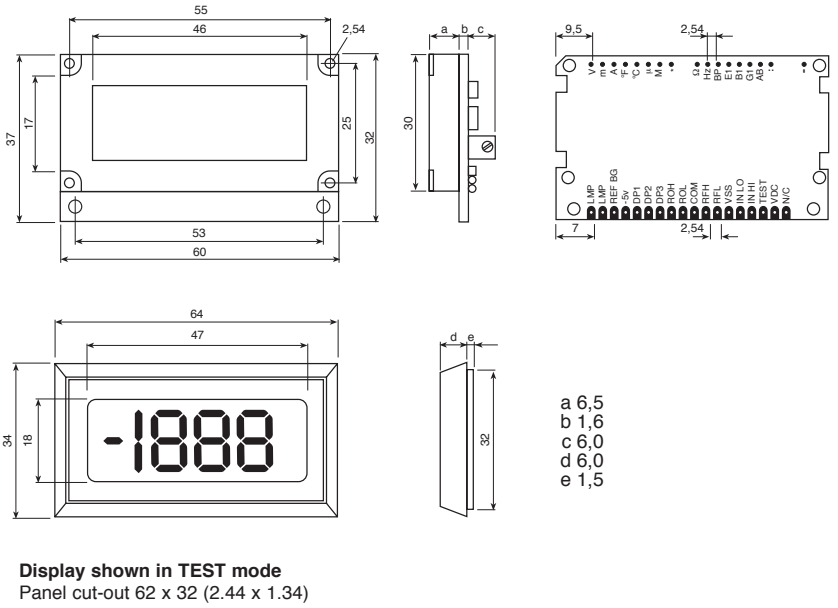
RS stock no. 260-246

- Δ Ultra-Low Power
- Δ Low Profile
- Δ Annunicators
- Δ LED Back Light
- Δ Single Rail Operation

A low profile LCD DPM using advanced components and construction techniques to provide an unrivalled combination of high performance, elegant appearance and low cost. The meter is pin for pin compatible with many existing DPM but offers several advantages including LED back lighting, which provides a clear display in poor light conditions plus long lamp life. The meter has a built-in negative rail generator which enables measurement of a signal that is referenced to the power supply 0V.

Features include Auto-Zero, Auto-Polarity, 2100mV FSD, 12.7mm Digit Height. Bandgap Reference and Programmable Decimal Points. There are many useful engineering symbols, outputs for auto-ranging applications and connections brought out allowing operating in single-ended, differential or ratiometric mode. On card solder pads for essential interconnections make selection of operating modes quick and easy with the minimum of external wiring. Calibration is by a 20-turn cermet potentiometer, which allows sensitive adjustment of the instrument. The very low current consumption resulting in long battery life makes it especially suitable for portable equipment.

Specification	Min	Typ	Max	Unit
Accuracy (±1 count)		0.05	0.1	%
Linearity			±1	Count
Sample rate		3		per sec
Temp. stability		30		ppm/°C
Temp. range	0		50	°C
Supply voltage	3.5	5	7.5	V
Supply current		350		µA
DPM 700 Lamp Current @ 5V		50		mA
Input Impedance		100		MΩ
Max. DC Input Voltage			±20	V
Low Battery Threshold (User Adjustable)		3.2		V



Display shown in TEST mode
Panel cut-out 62 x 32 (2.44 x 1.34)

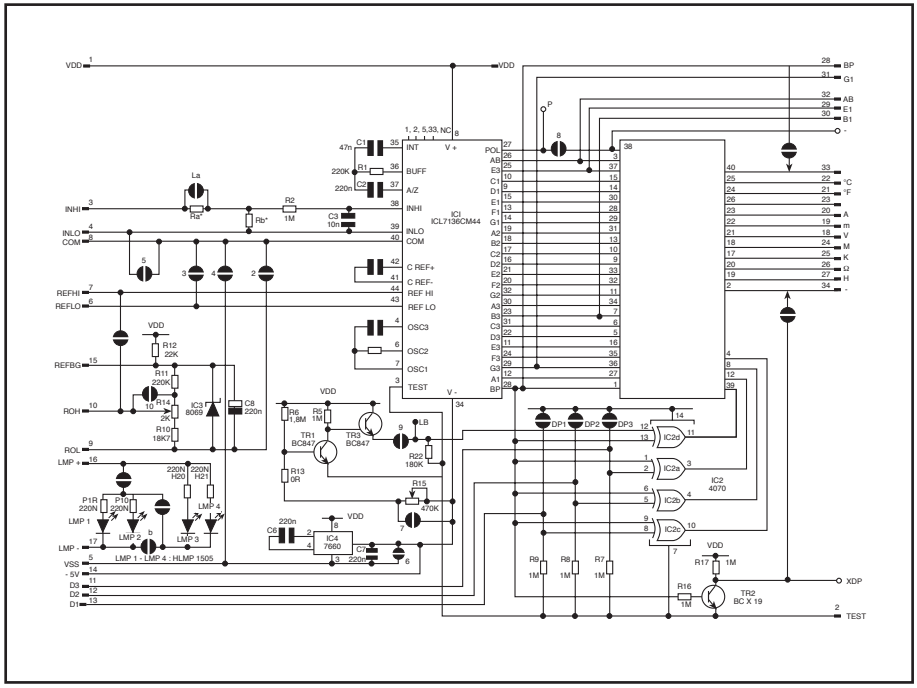
Pin Functions

1. VDD. Positive power supply. Connect to pin 11, 12, or 13 to display required DP.
2. TEST. Connecting this pin to VDD turns on the segments as illustrated. DO NOT operate for more than a few seconds as the DC voltage applied to the LCD may 'burn' the display. This pin is held nominally at 5V below VDD and is the ground for the digital section of the meter. It can be used to power external logic up to a maximum of 1mA.
3. IN.HI. Positive measuring input.
4. IN.LO. Negative measuring input.
5. VSS. Negative power supply.
6. RFL. Negative input for reference voltage.
7. RFH. Positive input for reference voltage.
8. COM. The ground for the analogue section of the converter, held actively at 2.8v (nom) below VDD. COM must not be allowed to sink excessive current (>100µA) by connecting it directly to a higher voltage.
9. ROL. Negative output from internal reference.
10. ROH. Positive output from internal reference.
11. D3. DP 199.9.
12. D2. DP.19.99.
13. D1. DP 1.999.
14. -5V. Output from negative rail generator circuit. This output is an inversion of VDD.
15. REF. BG Output of bandgap reference (1.22V nom).
16. LMP+. Positive lamp input 5V DC.
17. LMP-. Negative lamp input.

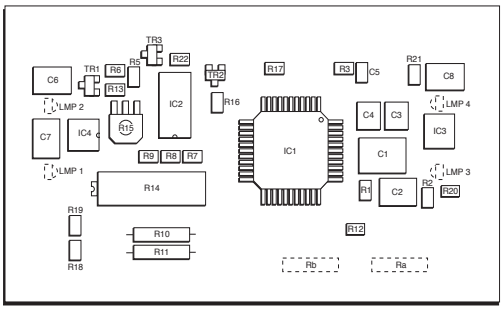
28(BP), 29(E1), 30(B1), 31(G1), 32(AB): Outputs for autoranging applications.

Special note: Annunicators
The DPM annunciators (A, °F, °C etc) can be illuminated by applying a solder link to the drive pad located alongside the annunciator input holes. These input holes are tied via links to Back Plane in order to suppress the annunciators when not required. Care should be taken to ensure that links to BP are broken before connecting annunciator inputs to the drive pad.

Circuit Diagram



Component Layout



Applications

Input scaling: Two resistors Ra and Rb may be fitted in order to alter the full scale reading of the meter. See Table.

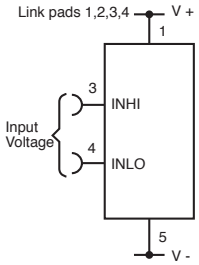
Required F.S.D		Ra	Rb
2V	2	910K	100K
20V	2	1M	10K
200V	2	1M	1K
2000V	1,2	1M	100R
200µA		LINK	1K
2mA		LINK	100R
20mA		LINK	10R
200mA		LINK	1R

Notes

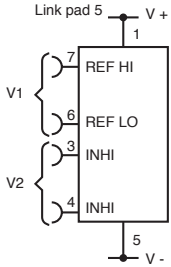
1. Input must not exceed ±500V.
2. Ensure link across Ra is cut. Meter will need re-calibration.

Analogue inputs

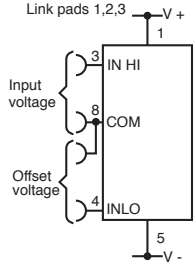
IN HI, IN LO and REF HI, REF LO are differential inputs. They respond to the voltage across them and not their voltage with respect to the power supply. There is a limit to this, however, known as the Common Mode Range. Any input must be no higher than VDD - 0.5V and no lower than -5 + 1.0V. (The input must be no lower than 1.0V above the -5V output) If the power supply is floating with respect to the circuit being monitored or the unit is being used in single ended mode, connect IN LO and REF LO to AN COM for best results.



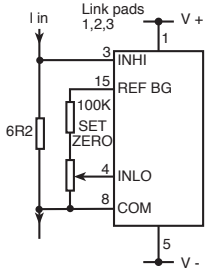
Measuring a floating voltage source of 200mV full scale. 1000V2/V1



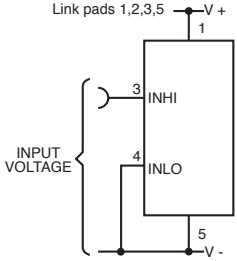
Measuring the ratio of two voltages. Reading =



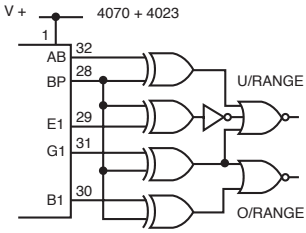
Zero display when the applied input is not zero.



Measuring 4-20 mA to read 0-999.



Measuring a single ended input referenced to supply.



Generating basic Auto-ranging outputs

Solder Pad Links

Interconnections can be made by applying a solder link across the appropriate solder pad provided (see circuit diagram).

Important

If there is any danger that an input may be taken beyond the power supply rails, a series resistor must be fitted to limit the input current to less than 100µA.

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