

3½ Digit (Pt100) RTD Meters

1/8 DIN

 OMEGA®

DP302-M, -R



- ✓ Platinum 100 Ω RTD Input
- ✓ 1 mA Excitation Current
- ✓ 2-, 3- or 4-Wire Connection
- ✓ -200 to 820°C in 1°C Steps (-M)
- ✓ -199.9 to 199.9°C in 0.1°C Steps (-R)
- ✓ °C or °F, Jumper-Selectable
- ✓ Platinum Curve Linearization
- ✓ 120 dB CMR, 70 dB NMR
- ✓ 1 or 10 mV/deg Linearized Recorder Output
- ✓ Bright, 14 mm (0.56") LED Display
- ✓ Display Hold and Test
- ✓ 115/230 Vac Power
- ✓ EMI/RFI Filter for AC Power
- ✓ Screw-Terminal Barrier Strip
- ✓ Short 104 mm (4.1") Deep 1/8 DIN Case
- ✓ RoHS 2 Compliant

Options

- ✓ Isolated 9 to 32 Vdc Power or 26 to 56 Vdc Power
- ✓ NEMA 4 (IP65) Splash-Proof Lens Cover

The DP302-M and -R are low-cost 3½ digit (± 1999 count) temperature indicators for use with platinum 100 Ω RTD's with alpha of 0.00385. They are complete with 1 mA sensor excitation, sensor-break detection, and platinum curve linearization. Resolution is 1° (-M) or 0.1° (-R). Readout can be in °C or °F, as selected by push-on jumpers. The electrical connection can be by 2-, 3-, or 4-wires. High accuracy is provided by positive current feedback and matched, graded components.

STANDARD FEATURES

Mechanical features include a bright 14 mm (0.56") display, a screw-terminal barrier strip for signal and power, and a compact 1/8 DIN case that requires less than 104 mm (4.1") behind the panel. Electrical features include jumper selection of °C or °F, a linearized recorder output of 1 or 10 mV per degree, and 1 mA current excitation. The current source is tied to the reference of the A/D converter for true ratiometric operation and immunity to changes in line voltage.



DP302-M shown actual size.

OPTIONS

Options are isolated 9 to 32 Vdc or 26 to 56 Vdc power, a PCB edge connector for display control and output of 4.7 Vdc and -4.7 Vdc power, and a splash-proof lens cover which meets NEMA 4 (IP65) requirements.

Specifications

Input

RTD Type: 100-platinum with alpha of 0.00385

Calibration: IEC 751 (IPTS-68)

Configuration: 2-, 3- or 4-wire connection

Polarity: Bipolar

Zero: Adjustable $\pm 20^\circ\text{C}$ ($\pm 36^\circ\text{F}$)

Zero Tempco: ± 0.05 degree/degree (-M), ± 0.01 degree/degree (-R)

Sensor-Wire Resistance Tempco Effect Per Conductor:

2-Wire: 20 mdeg/ Ω /deg, up to 3.8 Ω

3-Wire: 50 μ deg/ Ω /deg, up to 100 Ω

4-Wire: 5.0 μ deg/ Ω /deg, up to 100 Ω

Sensor-Excitation Current: 1 mA

Sensor-Break Indication: Meter displays overrange

Overvoltage Protection: 25 Vp

Noise Rejection

NMR, SIG HI to SIG LO:

70 dB, 50/60 Hz

CMR, ANA GND to POWER GND:

120 dB DC to 60 Hz

CMV, ANA GND to ANA GND:

1500 Vp per HV test, 354 Vp per IEC spacing

Accuracy at 25°C

Span Tempco: $\pm 0.005\%$ R/°C on all models plus $\pm 0.05\%$ R/°C for -RC from -200 to 130°C

Celsius/Fahrenheit: Jumper-selectable

Full-Scale Step Response: 1 s

Warmup to Rated Accuracy: 10 min

Analog Output (Linearized)

Voltage: 1 mV/deg (-M); 10 mV/deg (-R)

Calibration Error: Same as given under accuracy

Current: 1 mA maximum

Source Resistance: 68 Ω

Analog-to-Digital Conversion

Technique: Dual-slope, average value

Signal Integration Period: 100 ms

Read Rate: 2.5/s

Display

Type: 7-segment, red LED

Height: 14.2 mm (0.56")

Symbols: 1.8.8.8

Decimal Points: XXXX (-M);
XXX.X (-R)

Overrange Indication: Three least-significant digits blank

Digital Inputs

Level: TTL or 5V CMOS compatible

Power

AC Voltages: 115 or 230 Vac, $\pm 15\%$

AC Frequency: 49 to 440 Hz

DC Voltages: 9 to 32 Vdc, isolated to 300 Vp; 26 to 56 Vdc, isolated to 300 Vp

Power Consumption: 3.7 W

Output voltages: 4.7 Vdc and -4.7 Vdc $\pm 5\%$, 10 mA max

Environmental

Operating Temperature: 0 to 60°C

Storage Temperature: -40 to 85°C

Relative Humidity: 95% at 40°C (non-condensing)

Mechanical

Bezel: 96 W x 48 H x 5.1 mm D (3.78 x 1.89 x 0.20")

Depth Behind Bezel: 104 mm (4.09")

Panel Cutout: 92 W x 45 mm H (3.62 x 1.77")

Weight: 15 oz (425 g)

Case Material: 94V-0 UL-rated polycarbonate

| Model | Range | Error | Resolution |
|----------|--------------------|---|------------|
| DP302-MC | -200 to 820°C | $\pm 0.3^\circ\text{C} \pm 0.2\% \text{ R}$ | 1°C |
| DP302-MF | -328 to 1508°F | $\pm 0.5^\circ\text{F} \pm 0.2\% \text{ R}$ | 1°F |
| DP302-RC | -199.9 to -130.0°C | $\pm 0.1^\circ\text{C} \pm 0.2\% \text{ R}$ | 0.1°C |
| | -129.9 to -199.9°C | $\pm 0.1^\circ\text{C} \pm 0.1\% \text{ R}$ | 0.1°C |
| DP302-RF | -199.9 to -199.9°F | $\pm 0.2^\circ\text{F} \pm 0.1\% \text{ R}$ | 0.1°F |

| To Order | | | |
|-----------|------|--|--|
| Model No. | | | Description |
| DP302 | | | 3½ digit (Pt100) RTD meters |
| | -MC | | 1° resolution °C, -200 to 820°C |
| | -MF | | 1° resolution °F, -328 to 1508°F |
| | -RC | | 0.1° resolution °C, -199.9 to 199.9°C |
| | -RF | | 0.1° resolution °F, -199.9 to 199.9°F |
| | * | | (Nothing, leave field blank) 115 Vac, 50/60 Hz |
| | -C1 | | 230 Vac, 50/60 Hz |
| | -C3C | | Isolated 9 to 32 Vdc |
| | -C3E | | Isolated 26 to 56 Vdc |
| | * | | (Nothing, leave field blank) red LED display |
| | -G | | Green LEDs for display |

NOTE: All combinations may not be valid, check online for valid part numbers.

Ordering Examples: DP302-MF-C1, 3½ digit (Pt100) RTD meter, 230 Vac power, -328 to 1508°F input range.