# 3½ Digit Thermocouple Meters

## ⅛ DIN

**DP302-J, -K, -T** 1 YEAR WARRANTY


**DP302-J, shown actual size.**

- **J, K or T Thermocouple Input**
- **1° or 0.1° Resolution**
- **°C or °F, Jumper-Selectable**
- **0.05 Deg/Deg Cold-Junction Error**
- **Five-Segment Linearization**
- **1 mV/deg Linearized Recorder**
- **120 dB CMR, 70 dB NMR**
- **Bright, 14.2 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 ⅛ 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-J, -K and -T are 3½ digit (±1999 count) panel meters for thermocouple types J, K and T.

They are available for display in °C or °F and resolution of 1° up to 1999° or 0.1° up to 199.9°. They are recommended for demanding indication-only applications where exceptionally low-cost is required. For display up to 1999.9° with 0.1° resolution, OMEGA® recommends its DP3002 Series meters, which provides a 4½ digit (±19,999 count) main assembly.

### STANDARD FEATURES

The DP302 Series thermocouple meters provide exceptional accuracy, as made possible by five-segment linearization and use of matched, graded components for each T/C type. Electrical features include cold-junction compensation and jumper selection of °C or °F. A 1 mV per count linearized analog output is standard and is ideal for driving a strip-chart recorder.

Mechanical features include a bright 14.2 mm (0.56") display, a screw-terminal barrier strip for signal and power, and a compact ⅛ DIN case that requires less than 104 mm (4.1") behind the panel.

Electrical features include cold-junction compensation, jumper selection of °C or °F, and a linearized recorder output of 1 mV per degree.

### 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, and a splash-proof lens cover which meets NEMA 4 (IP65) requirements.

## Specifications

### Input

**Thermocouple:**
**Type J** (Iron-Constantan, Fe-CuNi)
**Type K** (Chromel-Alumel, NiCr-NiAl)
**Type T** (Copper-Constantan, Cu-CuNi)

**Calibration:** IEC 584-1 (IPTS-68)

**Configuration:** Single-ended (-TC lead connected to ANA GND)

**Polarity:** Bipolar

**Zero:** Adjustable ±20°C (±36°F)

**Cold-Junction Tempco:** ±0.05 deg/deg

**Sensor-Wire Resistance Effect Per Conductor:**
**Type J:** 40 µdeg/deg/Ω, up to 2500 Ω
**Type K:** 50 µdeg/deg/Ω, up to 2000 Ω
**Type T:** 50 µdeg/deg/Ω, up to 2000 Ω

**Sensor-Break Current:** 300 nA

**Sensor-Break Indication:** Meter displays positive overrange (upscale)

## Noise Rejection

**NMR, SIG HI to SIG LO:** 70 dB, 50/60 Hz

**CMR, ANA GND to PWR GND:** 120 dB, DC to 60 Hz

**CMV, ANA GND to PWR GND:** 1500 Vp per HV test, 354 Vp per IEC spacing

## Digital Inputs

**Level:** TTL or 5 V CMOS compatible

## Accuracy at 25°C (1° resolution models)

**Range for Rated Accuracy:**

**Type J:** -138 to 760°C (-216 to 1400°F)

**Type K:** -105 to 1248°C (-157 to 1999°F)

**Type T:** -112 to 400 °C (-170 to 752°F)

**Maximum Error:** ±1.5°C (±2.7°F) ±½ count

**Span Tempco:** ±0.01% of reading/°C

**Resolution:** 0.1°C or 0.1°F (jumper-selectable)

**Full-Scale Step Response:** 1 s

**Warmup to Rated Accuracy:** 10 min

## Accuracy at 25°C (0.1° resolution models)

**Range for Rated Accuracy, all T/C Types:** -105.0 to 199.9°C (-157.0 to 199.9°F)

**Maximum Error:** ±1.0°C (±1.8°F) ±½ count

**Span Tempco:** ±0.01% of reading/°C

**Resolution:** 0.1°C or 0.1°F (jumper-selectable)

**Full-Scale Step Response:** 1 s

**Warmup to Rated Accuracy:** 20 min

## Analog Output (Linearized)

**Voltage:** 1 mV/count

**Calibration Error:** ±1.5 mV on °C, ±2.7 mV on °F

**Current:** 1 mA max

**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

**Overrange Indication:** Three least-significant digits blank

## Power

**AC Voltages:** 115 or 230 Vac, ±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 ±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

## To Order

| Model No. | | | | Description |
|---|---|---|---|---|
| **DP302** | | | | 3½ digit thermocouple meters |
| | **-JC1** | | | Type J Iron-Constantan, -138 to 760°C |
| | **-JC2** | | | Type J Iron-Constantan, -105.0 to 199.9°C |
| | **-JF1** | | | Type J Iron-Constantan, -216 to 1400°F |
| | **-JF2** | | | Type J Iron-Constantan, -157.0 to 199.9°F |
| | **-KC1** | | | Type K Chromel-Alumel, -105 to 1248°C |
| | **-KC2** | | | Type K Chromel-Alumel, -105.0 to 199.9°C |
| | **-KF1** | | | Type K Chromel-Alumel, -157 to 1999°F |
| | **-KF2** | | | Type K Chromel-Alumel, -157.0 to 199.9°F |
| | **-TC1** | | | Type T Cu-Constantan, -112 to 400°C |
| | **-TC2** | | | Type T Cu-Constantan, -105.0 to 199.9°C |
| | **-TF1** | | | Type T Cu-Constantan, -170 to 752°F |
| | **-TF2** | | | Type T Cu-Constantan, -157.0 to 199.9°F |
| | | * | | (Nothing, leave field blank), 115 Vac, 50/60 Hz power |
| | | **-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-JF1,*** *3½ digit J Type thermocouple meter, 115 Vac power, -216 to 1400°F input range.*