

# 4½ Digit Thermocouple Meters

1/8 DIN



DP3002-J, -K, -T



- ✓ J, K or T Thermocouple Input
- ✓ 0.05 deg/deg Cold-Junction Error
- ✓ -138 to 1248°C Range
- ✓ Five-Segment Linearization
- ✓ 0.1°C or 0.1 °F Resolution, Jumper-Selectable
- ✓ 1 mV/deg Linearized Recorder Output
- ✓ 120 dB CMR, 70 dB NMR
- ✓ 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
- ✓ Isolated 26 to 56 Vdc Power
- ✓ NEMA 4 (IP65) Splash-Proof Lens Cover

DP3002-KC1, shown larger than actual size.

The DP3002-J, -K and -T are low-cost 4½ digit ( $\pm 19,999$  count) thermocouple meters with 0.1°C or 0.1°F resolution for indication-only applications. High accuracy is provided by five-segment linearization and matched, graded components for each T/C type.

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

## OPTIONS

Power options include isolated 9 to 32 Vdc and 26 to 56 Vdc. A splash-proof lens cover which meets NEMA 4 (IP65) requirements allows the DP3002 to be used in harsh industrial environments.

## 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 tied to ANA GND)

**Polarity:** Bipolar

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

**Cold-Junction Tempco:**

$\pm 0.05$  deg/deg

**Sensor-Wire Resistance Effect Per Conductor:**

**Type J:** 40  $\mu\text{deg/deg}/\Omega$ ,  
up to 2500  $\Omega$

**Type K:** 50  $\mu\text{deg/deg}/\Omega$ ,  
up to 2000  $\Omega$

**Type T:** 50  $\mu\text{deg/deg}/\Omega$ ,  
up to 2000  $\Omega$

**Sensor-Break Current:** 300 nA

**Sensor-Break Indication:**

Positive overrange (upscale)

### Digital Inputs

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

### 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

### Accuracy at 25°C

**Range for Rated Accuracy:**

**Type J:** -138.0 to 760.0°C  
(-216.0 to 1400.0°F)

**Type K:** -105.0 to 1248.0°C  
(-157.0 to 1999.9°F)

**Type T:** -112.0 to 400.0°C  
(-170.0 to 752.0°F)

**Maximum Error:**  $\pm 1.5^{\circ}\text{C}$  ( $\pm 2.7^{\circ}\text{F}$ )  $\pm 5$  cts

**Span Tempco:**

$\pm 0.01\%$  of reading/ $^{\circ}\text{C}$

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

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

**Warmup to Rated Accuracy:** 20 min

### Analog Output

**Voltage:** 1 mV/deg

**Calibration Error:**  $\pm 1.5$  mV on  $^{\circ}\text{C}$ ,  
 $\pm 2.7$  mV on  $^{\circ}\text{F}$

**Current:** 1 mA max

**Source Resistance:** 68  $\Omega$

### 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:** -1.8.8.8.8

**Decimal Points:** Four positions programmable by jumpers behind the lens or at connector

**Overrange Indication:** Four least-significant digits flash

### 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 nominal

**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

To Order			
Model No.			Description
DP3002			4½ digit thermocouple meters
	-JC1		-138 to 760°C
	-JF1		-216 to 1400°F
	-KC1		-105 to 1248°C
	-KF1		-157 to 1999°F
	-TC1		-112 to 400°C
	-TF1		-170 to 752°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 LED display

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

**Ordering Examples:** DP3002-KC1, 4½ digit Type K thermocouple meter, 115 Vac power, -105 to 1248°C input range.