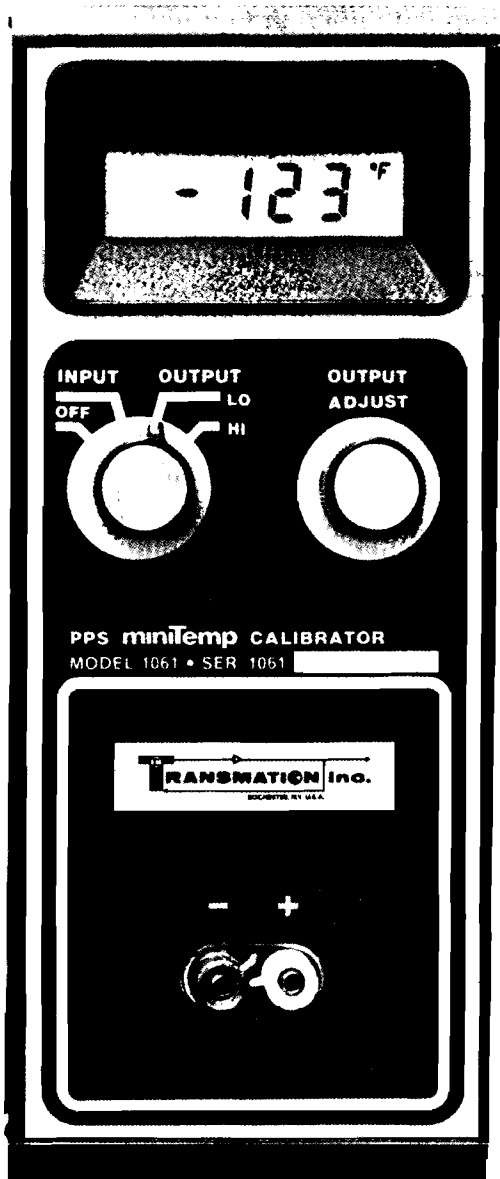




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ROCHESTER, NY U.S.A



**MODELS 1060/1061 MINITEMP®
THERMOCOUPLE CALIBRATORS**

I.S. NO.: 100740-900

DATE: OCTOBER, 1989

SUPERSEDES: APRIL, 1987

FILE: TESTER

INTERFACE INSTRUMENTATION · DIGITAL/ANALOG
Analysis · Specifications · Design · Production



977 MT. READ BLVD. □ P.O. BOX 7803 □ ROCHESTER, NEW YORK U.S.A. 14606

TELEX 97-8314 (TRANSMAT ROC) □ TELEPHONE (01) 716-254-9000

1. GENERAL INFORMATION

1.1 DESCRIPTION

The Transmation Models 1060 and 1061 Thermocouple Calibrators are hand-held digital temperature indicators with a liquid crystal display for job-site temperature readings. Power is provided by a single 9V alkaline battery with a life of three months with eight hour-per-day, five days-per-week use. Each unit accepts signals from standard ISA type J, K, T, E, R, S or B thermocouples (customer-specified at time of order) and displays temperature directly in °C or °F. A millivolt input unit is also available which accepts and displays mV. In addition to accepting an input, the Model 1061 also generates an output, calibrated directly in °C or °F. This output can be utilized in the calibration or testing of instrumentation.

Sealed switches and a gasketed housing make these instruments weather-resistant for outdoor use. Automatic cold-junction compensation, dual slope integration, digital linearization and high input impedance assure reliable, stable and drift-free readings. State-of-the-art CMOS digital logic, integrated circuit operational amplifiers, LSI circuitry and silicon electronics provide noise immunity, long-term reliability and extended battery life.

A variety of J and K thermocouple probes, a handle assembly and a 5' length of thermocouple extension wire are optionally available.

NOTE: The Models 1060 and 1061 are calibrated to thermocouple standards set forth in NBS monograph 125. Copies of the thermocouple tables from this standard may be obtained from Transmation by requesting P/N 100733-901.

1.2 SPECIFICATIONS

Unless otherwise indicated, all specifications are referred to an ambient temperature of 25°C ± 1°C (77°F ± 2°F).

- 1.2.1 INPUT RANGES AND ACCURACY: See Table 1-2 below
- 1.2.2 INPUT IMPEDANCE: 10 megohms minimum for the Model 1060 and for INPUT position on the Model 1061
- 1.2.3 INPUT BIAS CURRENT: 5 nA maximum
- 1.2.4 OUTPUT RANGE (Model 1061): Linearized and cold-junction compensated mV equivalent of input temperature range
- 1.2.5 OUTPUT IMPEDANCE (Model 1061): 125 ohms maximum
- 1.2.6 DISPLAY: 4 decade field-effect liquid crystals, 10 mm (0.4") high
- 1.2.7 UPDATE RATE: 3 readings per second nominal
- 1.2.8 RESOLUTION: ±1°C or F (10 uV for mV instruments)
- 1.2.9 REPEATABILITY: ±1°C or F
- 1.2.10 RECOMMENDED AMBIENT TEMPERATURE: 4°C to 50°C (40°F to 122°F)
- 1.2.11 STORAGE TEMPERATURE LIMITS: -40°C to 50°C (-40°F to 122°F) without battery
- 1.2.12 TEMPERATURE EFFECT:
 - Cold Junction: 0.025 deg/deg maximum
 - Reading Error: 0.01%/°C maximum
 - Zero Drift: 1 uV/°C maximum

TABLE 1-2
INPUT RANGES AND ACCURACY

INPUT	RANGE		INSTRUMENT ACCURACY
J	-100°C to + 890°C	-200°F to +1780°F	±1° ± 1 L.S.D.* above 0°C (32°F) ±2° ± 1 L.S.D.* below 0°C (32°F)
K	- 50°C to + 950°C	-100°F to +2400°F	
T	-150°C to + 350°C	-300°F to + 700°F	
E	- 50°C to + 950°C	-130°F to +1800°F	
R	250°C to +1760°C	500°F to +3100°F	±1° ± 1 L.S.D.* 500°C-1760°C (1000°F-3100°F) ±2° ± 1 L.S.D.* 250°C-500°C (500°F-1000°F)
S	250°C to +1760°C	500°F to +3100°F	
B	600°C to +1525°C	1150°F to +3050°F	±1° ± 1 L.S.D.* 750°C-1525°C (1500°F-3050°F) ±2° ± 1 L.S.D.* 600°C-750°C (1150°F-1500°F)
mV	-3 mV to 60 mV		±10 uV ± 1 L.S.D.*

* Least Significant Digit

- 1.2.13 POWER REQUIREMENTS: One 9V alkaline battery, NEDA type 1604 or equivalent
- 1.2.14 BATTERY VOLTAGE EFFECT: Less than $\pm 2^{\circ}\text{C}$ or F variation between 9V and 6.5V
- 1.2.15 LOW BATTERY INDICATOR: "LOW BAT" appears on display as warning to replace battery
- 1.2.16 BATTERY LIFE: 3 months typical, 8 hours/day, 5 days/week, 50% duty cycle
- 1.2.17 WARM-UP TIME TO RATED ACCURACY: 15 seconds maximum
- 1.2.18 NORMAL MODE REJECTION: 50 dB minimum @ 50/60 Hz
- 1.2.19 MAXIMUM NORMAL MODE VOLTAGE: 250 VRMS for 1 minute
- 1.2.20 COMMON MODE REJECTION: 120 dB minimum @ 50/60 Hz
- 1.2.21 MAXIMUM COMMON MODE VOLTAGE: 500 VRMS
- 1.2.22 INPUT/OUTPUT CONNECTIONS: By means of 5-way color-coded binding posts
- 1.2.23 HOUSING: Interlocking anodized aluminum extrusions
- 1.2.24 DIMENSIONS (HWD): 210 mm x 86 mm x 64 mm (8.25" x 3.4" x 2.5")
- 1.2.25 WEIGHT: 0.65 kg (1.4 lbs.)

1.3 UNPACKING

It is recommended that all packing materials be retained in the event that the instrument must be returned to the factory. Each instrument is shipped in its vinyl carrying case with a battery installed. Verify that the shipping carton contains:

- A Model 1060 or 1061 Thermocouple Calibrator
- A set of test leads (mV models only)
- An instruction manual, I.S. #100740-900

1.4 RECOMMENDED SPARE PARTS LIST

<u>DESCRIPTION</u>	<u>PART NO.</u>
Liquid Crystal Display	100740-207
Function Switch Knob	100001-018
Function Switch (Model 1060)	759007-009
Function Switch (Model 1061)	759007-008
Output Adjust Control Dial (Model 1061 only)	100001-019
Output Adjust Control Pot	602008-001
Binding Post	100740-XXX
Black (mV,R,S,B)	100740-239
Red (T,J,E)	100740-240
Red (K)	100740-241
Red (R,S)	100740-242
Red (mV,B)	100740-243
Yellow (K)	100740-244
Blue (T)	100740-245
Purple (E)	100740-246
White (J)	100740-247
Battery, 9V alkaline, NEDA type 1604	759550-006
Test Leads (mV models only)	500143-003
Carrying Case	100740-213
Thermocouple Conversion Tables	100733-901
Instruction Manual	100740-900

1.5 ORDERING INFORMATION

Please specify the following when ordering spare or replacement parts:

1. Model and series number
2. Thermocouple type: J, K, T, E, R, S, B or mV
3. Calibration: $^{\circ}\text{C}$, $^{\circ}\text{F}$ or mV