



# PIECAL 322

## Automated Thermocouple Calibrator

- **Easy to use**

With the PIECAL 322 you can check & calibrate all your thermocouple instruments and measure thermocouple sensors. Plug in any thermocouple via a miniature thermocouple jack.

- **Take it into the shop, plant or field**

Carry it without worry - it comes protected with a rubber boot and rugged, low profile switch. Easy to operate even in the dark areas of the plant with the backlit display.

- **Calibrate directly in temperature (°C & °F)**

Stop carrying around a millivolt source and thermocouple tables. The PIECAL 322 works with the thermocouples you use including types J, K, T, and E. Easily set any value quickly to within 0.1° with the adjustable digital potentiometer " DIAL " plus store any three temperatures for instant recall with the EZ-CHECK™ switch. Or calibrate from -13.999 to +80.000 mV.

- **Fast calibration with automatic output stepping**

Choose between 2, 3, 5, 11 and 21 steps to automatically increment the output in 100%, 50%, 25%, 10% or 5% of span. Select the step time to match your system from 5, 6, 7, 8, 10, 15, 20, 25, 30 and 60 seconds.

- **Compatible with ALL process instruments**

No competitor's calibrator is compatible with as many process instruments! Connect directly to the thermocouple inputs of smart transmitters, PLCs, DCS and multichannel recorders and verify their outputs or displays. Works with older instruments and newer multichannel instruments that switch between input channels.

- **Measure thermocouple sensors**

Trouble shoot sensor connections and find broken wires or corroded connections. Connect your thermocouple with a miniature thermocouple connector and the PIECAL 322 measures the probe in degrees C or F.

- **Evolutionary design**

PIECAL Calibrators are designed and built by members of the same team that designed and built the calibrators manufactured by Fluke\* under the Altek\* label. The PIECAL 322 improves upon other brands by including a rubber boot, tilt stand, backlit display with larger digits, rugged switches and a battery compartment for fast battery changes.



Actual Size

\* PIECAL Calibrators are not manufactured or distributed by Fluke Corp or Altek Industries Inc, manufacturers of Altek Calibrators.



Practical Instrument Electronics

Please contact an authorized sales representative at 800-346-4620 or order at [www.Instrumentation.com](http://www.Instrumentation.com)

## PIECAL 322 Specifications

(Unless otherwise indicated all specifications are rated from a nominal 23°C, 70% RH for 1 year from calibration)

| General                                |   |
|--|---|
| Accuracy                               | ±(0.008% of Reading + 0.006 mV)   |
| Cold Junction Compensation             | ± 0.16°F (±0.1 °C)  |
| Millivolt Range                        | -13.000 to 80.000 mV  |
| Operating Temp. Range                  | -25 to 60 °C (-10 to 140 °F)  |
| Relative Humidity Range                | 10 % ≤RH ≤90 % (0 to 35 °C), Non-condensing<br>10 % ≤RH ≤ 70 % (35 to 60 °C), Non-condensing  |
| Size                                   | L=5.63 x W=3.00 x H=1.60 inches   |
| Weight                                 | 12.1 ounces (including boot & batteries)  |
| Batteries                              | Four "AA" Alkaline 1.5V (LR6)   |
| Battery Life                           | 50 Hours; Low Battery indication with 1 hour life left  |
| Optional NiMh Rechargeable battery kit | 120 VAC for North America Only; charger, four NiMh batteries, AC & DC cords [Part # 020-0103] |
| Protection against misconnection       | Over-voltage protection to 60V dc (rated for 30 seconds)                                      |
| Display                                | High contrast graphic liquid crystal display. LED backlighting for use in low lit areas.      |

| Read                              |   |
|-----------------------------------|---|
| Input Impedance                   | > 10 Megohms  |
| Open Thermocouple Threshold Pulse | 10,000 Ohms nominal<br>< 10 microamp pulse for 300 milliseconds |
| Normal Mode Rejection             | 50/60 Hz, 50 dB   |
| Common Mode Rejection             | 50/60 Hz, 120 dB  |

| Source           |  |
|------------------|--|
| Output Impedance | < 0.3 Ohms   |
| Source Current   | > 20 mA (drives 80 mV into 10 Ohms)                  |
| Noise            | ≤ 4 microvolts p-p for frequencies of 10 Hz or below |

### Ranges & Accuracies

| T/C | Degrees C Range  | °C    | Degrees F Range  | °F    | T/C Material                      |
|-----|------------------|-------|------------------|-------|-----------------------------------|
| J   | -200.0 to -180.0 | ±0.3° | -346.0 to -292.0 | ±0.5° | +Iron<br>-Constantan<br>Jacket    |
|     | -180.0 to -50.0  | ±0.2° | -292.0 to -58.0  | ±0.4° |                                   |
|     | -50.0 to 500.0   | ±0.1° | -58.0 to 932.0   | ±0.2° |                                   |
|     | 500.0 to 1200.0  | ±0.2° | 932.0 to 2192.0  | ±0.4° |                                   |
| K   | -230.0 to -100.0 | ±0.6° | -382.0 to -148.0 | ±1.1° | +Chromel®<br>-Alumel®<br>Jacket   |
|     | -100.0 to 1050.0 | ±0.2° | -148.0 to 1922.0 | ±0.4° |                                   |
|     | 1050.0 to 1371.1 | ±0.3° | 1922.0 to 2500.0 | ±0.5° |                                   |
| T   | -260.0 to -200.0 | ±1.0° | -436.0 to -328.0 | ±1.8° | +Copper<br>-Constantan<br>Jacket  |
|     | -200.0 to -50.0  | ±0.5° | -328.0 to -58.0  | ±0.9° |                                   |
|     | -50.0 to 0.0     | ±0.2° | -58.0 to 32.0    | ±0.4° |                                   |
|     | 0.0 to 400.0     | ±0.1° | 32.0 to 752.0    | ±0.2° |                                   |
| E   | -240.0 to -200.0 | ±0.4° | -400.0 to -328.0 | ±0.7° | +Chromel<br>-Constantan<br>Jacket |
|     | -200.0 to -100.0 | ±0.2° | -328.0 to -148.0 | ±0.4° |                                   |
|     | -100.0 to 850.0  | ±0.1° | -148.0 to 1562.0 | ±0.2° |                                   |
|     | 850.0 to 1000.0  | ±0.2° | 1562.0 to 1832.0 | ±0.4° |                                   |

### Accessories

**Included:**  
Rubber Boot, Four "AA" Alkaline batteries, Certificate of Calibration  
Small Carrying Case with PIE Logo Part No. 020-0205

**Optional:**  
Ni-MH 1 Hour Charger with 4 Ni-MH AA Batteries Part No. 020-0103  
(100-120 V AC input for North America Only)  
T/C Wire Kit 1 for Types J, K, T & E Part No. 020-0202  
T/C Wire Kit 2 for Types B, R/S & K Part No. 020-0203  
Three feet (1 meter) of T/C extension wire, stripped on one end with a miniature T/C male connector on the other end.

### Additional Information

PIE Calibrators are manufactured in the USA. This product is calibrated on equipment traceable to NIST and includes a Certificate of Calibration. Test Data is available for an additional charge.

Practical Instrument Electronics recommends a calibration interval of one year. Contact your local representative for recalibration and repair services.

### Warranty

Our equipment is warranted against defective material and workmanship (excluding batteries) for a period of three years from the date of shipment. Claims under warranty can be made by returning the equipment prepaid to our factory. The equipment will be repaired, replaced or adjusted at our option. The liability of Practical Instrument Electronics (PIE) is restricted to that given under our warranty. No responsibility is accepted for damage, loss or other expense incurred through sale or use of our equipment. Under no condition shall Practical Instrument Electronics, Inc. be liable for any special, incidental or consequential damage.

### Available From:

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