



# PIECAL 510B & 511B RTD Simulator

- **Easy to use**

With the PIECAL 510B or 511B you can check & calibrate all your RTD instruments. Includes four detachable leads with spade lugs for easy connection to your RTD instruments.

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

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

- **Simulate one or ten RTD types**

Choose the PIECAL 510B if you have only one type of RTD connected to your instruments or the PIECAL 511B if you have multiple types of RTDs.

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

Stop carrying around a decade box and RTD resistance tables. The PIECAL 311 simulates the RTDs you use including Platinum 100 (alpha = 3850, 3902, 3926) & 1000 (alpha = 3850, 3750) Ohm, Copper 10 & 50 Ohm, Nickel 100 and 120 Ohm. 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 use like a decade box from 0.00 to 410.00 and from 410.0 to 4001.0 Ohms.

- **Compatible with ALL process instruments**

No competitor's calibrator is compatible with as many process instruments! Connect directly to the RTD 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 the excitation current between input channels.

- **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 510B/511B improves upon other brands by including backlit display with larger digits, rugged switches and a battery compartment for fast battery changes. Add an optional rubber boot with tilt stand for extra protection on the plant floor or in the field.

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



Actual Size (Shown with optional boot)



technical

# PIECAL 510B/511B Specifications

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

General	
Accuracy	±(0.015% of Setting in Ohms + 0.05 Ohms)
Temperature Drift	± 0.05 Ohms/°C
Operating Temp. Range	-25 to 60 °C (-10 to 140 °F)
Relative Humidity Range	10 % ≤RH ≤90 % (0 to 35 °C), Non-condensing
	10 % ≤RH ≤ 70 % (35 to 60 °C), Non-condensing
Size With Boot	4.96 x 2.73 x 1.79 in, 126 x 69 x 45 mm (LxWxH)
	5.67 x 3.06 x 2.05 in, 144 x 78 x 52 mm (LxWxH)
Weight With Boot	8.4 ounces, 0.24 kg (including batteries)
	11 ounces, 0.32 kg (including 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.

Simulate	
Accuracy From 1 to 10.2 mA External Excitation Current	±(0.015% of Setting + 0.05 Ohms)
	±(0.015% of Setting + $\frac{0.01 \text{ mV}}{\text{mA Excitation Current}} + 0.05 \text{ Ohms}$ )
Below 1 mA of External Excitation Current	
Resistance Ranges	0.00 to 410.00, 410.1 to 4001.0 Ohms
Allowable Excitation Current Range	<410 Ohms: 10.2 mA max; steady or pulsed/intermittent
	410 to 4001 Ohms: 1 mA max; steady or pulsed/intermittent
Pulsed Excitation Current Compatibility	DC to 0.01 second pulse width

## Ranges & Accuracies

RTD Type	Alpha	Degrees C Range	°C	Degrees F Range	°F
Pt 100 Ohm DIN/IEC/JIS 1989 Based on ITS-90	1.3850 (0.00385)	-200.0 to 200.0	±0.2°	-328.0 to 392.0	±0.4°
		200.0 to 600.0	±0.3°	392.0 to 1112.0	±0.6°
		600.0 to 850.0	±0.4°	1112.0 to 1562.0	±0.7°
Pt 100 Ohm (Burns)	1.3902 (0.003902)	-195.6 to 200.0	±0.2°	-320.0 to 392.0	±0.4°
		200.0 to 648.9	±0.3°	392.0 to 1200	±0.6°
Pt 100 Ohm (Old JIS 1981)	1.3916 (0.003916)	-200.0 to 200.0	±0.2°	-328.0 to 392.0	±0.4°
		200.0 to 648.9	±0.3°	392.0 to 1200	±0.6°
Pt 100 Ohm (US Lab)	1.3926 (0.003926)	-200.0 to 100.0	±0.2°	-328.0 to 212.0	±0.4°
		100.0 to 700.0	±0.3°	212.0 to 1292.0	±0.6°
		700.0 to 850.0	±0.4°	1292.0 to 1562.0	±0.7°
Pt 1000 Ohm DIN/IEC/JIS 1989	1.3850 (0.00385)	-200.0 to 200.0	±0.2°	-328.0 to 392.0	±0.4°
		200.0 to 600.0	±0.3°	392.0 to 1112.0	±0.6°
		600.0 to 850.0	±0.4°	1112.0 to 1562.0	±0.7°
Pt 1000 Ohm Hy-Cal HVAC	1.3750 (0.00375)	-200.0 to 200.0	±0.2°	-328.0 to 392.0	±0.4°
		200.0 to 600.0	±0.3°	392.0 to 1112.0	±0.6°
		600.0 to 850.0	±0.4°	1112.0 to 1562.0	±0.7°
Copper 10 Ohm (Minco)	1.4274 (0.004274)	-200.0 to 260.0	±2.0°	-328.0 to 500.0	±4.0°
Copper 50 Ohm	1.4280 (0.00428)	-50.0 to 150.0	±1.0°	-58.0 to 302.0	±1.6°
Ni 120 Ohm (Pure)	1.6720 (0.00672)	-80.0 to 260.0	±0.1°	-112.0 to 500.0	±0.2°
Ni 110 (Bristol 7 NA)	1.5801 (0.005801)	-100.0 to 260.0	±0.2°	-148.0 to 500.0	±0.3°

## Ordering Information

**PIECAL 510B** (Choose one of the ordering codes below):

- PIECAL 510B-Pt-100-1 ( $\alpha=1.3850$ )
- PIECAL 510B-Pt-100-2 ( $\alpha=1.3902$ )
- PIECAL 510B-Pt-100-3 ( $\alpha=1.3916$ )
- PIECAL 510B-Pt-100-4 ( $\alpha=1.3926$ )
- PIECAL 510B-Pt-1000-5 ( $\alpha=1.3850$ )
- PIECAL 510B-Pt-1000-6 ( $\alpha=1.375$ )
- PIECAL 510B-Cu-10
- PIECAL 510B-Cu-50
- PIECAL 510B-Ni-110
- PIECAL 510B-Ni-120

**PIECAL 511B:**

Includes all ten RTD Types listed above

## Accessories

Included:	Part Number
Four "AA" Alkaline batteries, Certificate of Calibration	
Evolution RTD Wire Kit	020-0208
2 Red & 2 Black Leads with Retractable Shield Banana Plugs & Spade Lugs	
Optional:	Part Number
Rubber Boot	020-0209
Small Carrying Case with Logo (fits with or without boot)	020-0205
Ni-MH 1 Hour Charger with 4 Ni-MH AA Batteries (100-120 V AC input for North America Only)	020-0103

## More Than A Simple Boot

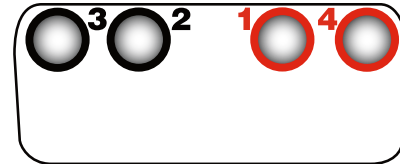
The optional boot provides more than just protection. Flip out the tilt stand and free up both hands for calibration adjustments.



## Connections

### Two, Three and Four Wire connections

Two red and two black leads are included with the calibrator. Each lead has a retractable shield banana plug on the calibrator end and a spade lug on the end which will connect to the RTD input of the device being calibrated.



Banana jacks on the top of the calibrator

## 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:

**techniCAL**  
eXpanding possibilities

866-327-8731 [www.techniCAL-sys.com](http://www.techniCAL-sys.com)

