Practical Instrument Electronics

Model 525
T/C & RTD Dual Calibrator
With Auto Stepping
Datasheet

Features

Combined RTD & Thermocouple Unit
***DIRECT REPLACEMENT TO HIGH RESOLUTION DECADE BOXES**
***SELECTABLE RESOLUTION 0.01° or 0.001°**

***"WIDEST" Compatibility with field devices available**

***IN RTD mode Automatic Detection of 2, 3, or 4 wire Connections**

***Selectable Back Lighting**

No buttons or switches required, 2W, 3W, or 4W indicator is automatic

A valuable troubleshooting tool

***Guaranteed to Work with ALL Pulsed Instruments including popular Rosemount and Honeywell Models, PLCs, DCS Recorders and all others**

***Auto Stepping -** To assist in remote calibrations

***Accurate to ±0.1 °C (±0.2 °F)**

Direct Temperature Input/Output
Read or Source in °C or °F for your T/C type and RTD curves

8 Standard T/C Types Available
Types J, K, E, T, R, S, B, N and mV

Cold Junction Compensated

Millivolt accuracy of ±(0.008 % + 0.006 mV)

8 RTD Curves Available

Pt100 α=3850, Pt100 α=3902, Pt100 α=3916, Pt100 α=3926, Cu10 α=427, Cu50 α=428, Ni110 Bristol, Ni120 α=672, Ω

Resistance accuracy of ± (0.015 % + 0.05) Ω
Custom types and ranges are available

EZ-Dial™ Knob
Easily adjust output by 0.1 ° or 0.01°

Pressing down and turning will select a faster dialing speed

EZ-Check™ Switch
User selectable EZ-Check™ for 0 % and 100 % span adjustment

Store new EZ-Check™ values by pressing the EZ-Dial™ knob

Recall stored minimum and maximum readings

Uses a standard 9V Alkaline Battery
Superior battery life of 45 hours under typical continuous usage

Easy access to battery compartment

Lightweight and Rugged with a Solid Feel Small & tough

Protected to 60 V

PATENT PENDING FEATURES

Description

The Practical Instrument Electronics Model 525 T/C & RTD calibrator provides direct temperature calibration to all types of instruments such as transmitters, recorders, controllers, alarms, data acquisition, and computer systems. Also, he Model 525 reads RTD & T/C outputs and displays temperature. It is compatible with pulsed systems and transmitters (like the Rosemount 3144) 2, 3, or 4 wire connections are detected automatically. The Model 525 is a superior replacement for decade boxes, and eliminates the need for lugging around large equipment and the possibility of misreading RTD tables.

Use the EZ-Check™ Switch to quickly switch between three stored temperatures, Ω/mV outputs. It's easy to customize these values to your application. In read mode, the EZ-Check™ Switch recalls minimum and maximum readings. Store/Clear memory with a press of the EZ-Dial™ Knob.

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Model 525 Datasheet

The Practical Instrument Electronics Model 525 offers the highest performance and functions in its class by exceeding the accuracy and functions of many higher priced T/C & RTD calibrators. It is a low cost solution for checkout and calibration of all T/C & RTD instruments in the field, shop or control room. Contact Practical Instruments Electronics for custom T/C & RTD curves, ranges, or special requirements not provided by the Model 525.

Specifications

General Specifications:

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

Temperature 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
Overall Size	4.9 X 3.15 X 1.82 inches (125.5 X 80 X 46.2 mm)
Overall Weight (including 9V battery)	7.2 oz (204 grams)
Battery	9V Alkaline provides 45 hours of continuous use
Miscellaneous	Low battery indication with nominal 1 hour of operation left
	Overload protected to 60 volts for 30 seconds or less
	High-contrast graphic liquid crystal display with *0.357" (9.07 mm)* high digits
Accuracy:	
Millivolt Accuracy	±(0.008 % of mV Setting + 0.006 mV)
Temperature Coefficient of mV Source	50 ppm/°C of output range
Cold Junction Calibration Accuracy	±0.1 °C (0.2 °F)
Cold Junction Sensor Temperature Coefficient	±0.025 °/° in ambient temperature (°C or °F)
General Temperature Accuracy	±(0.008 % of mV setting + 0.006 mV) ± 0.1 °C (0.2 °F)
Maximum Resolution	0.01° or 0.001Ω

Source Thermocouple Specifications:

Output Range	-13.000 to +80.000 mV
Output Noise	±5 µV pp from 0.1 Hz to 10 Hz
Output Impedance	0.2 Ω (200 nV/uA)
Source Current	< 8 mA

Read Thermocouple Specifications:

Input Noise	< ±1 LSD from 0.1 Hz to 10 Hz
Input Impedance	> 1 MΩ
Open T/C Test Pulse	< 100uA for 300 ms
Open T/C Response Time	< 3 seconds
Open T/C Threshold	10 kΩ nominal

RTD Simulation Specifications:

Allowable Excitation Current	100 µA to 10.2 mA, steady or pulsed/intermittent/smart
for accuracies below 100µA add	±10µV/Excitation Current (units are in Ω)
Pulsed Excitation Current Compatibility	DC to 0.01 second pulse widths

RTD Read Specifications:

Excitation Current	300uA nominal

Available Options:

Carrying Case	Part Number: 020-0201 without logo
	020-205 with logo

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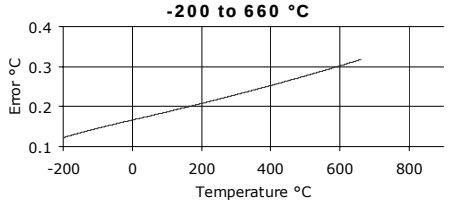
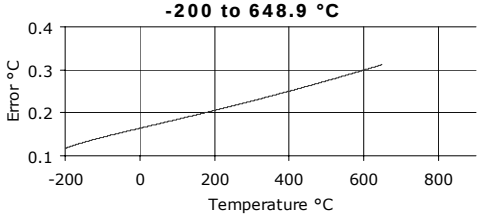
RTD Temperature Accuracy

The following charts give worst-case temperature accuracy based on stated resistance accuracy of ±(0.015 % + 0.05) Ω.

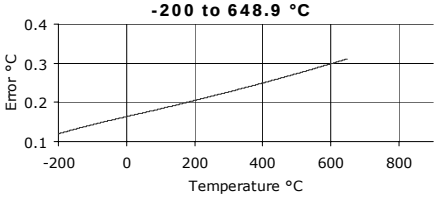
Pt100 TCR=0.00385
-200 to 660 °C



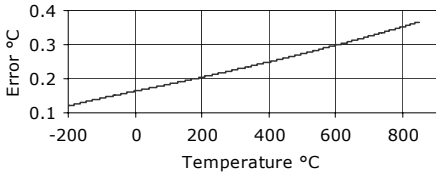
Pt100 TCR=0.003902
-200 to 648.9 °C



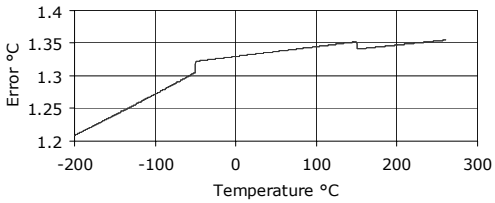
Pt100 TCR=0.003916
-200 to 648.9 °C



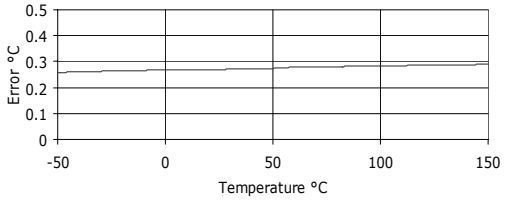
Pt100 TCR=0.003926
-200 to 850 °C



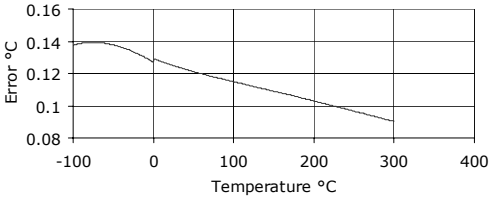
Cu10 TCR=0.00427
-200 to 260 °C



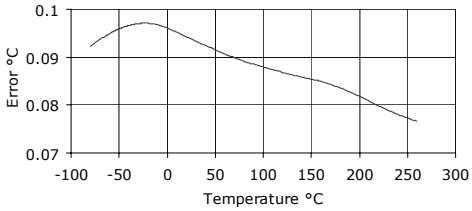
Cu50 TCR=0.00428
-50 to 150 °C



Ni110 TCR=0.00530
-100 to 300 °C



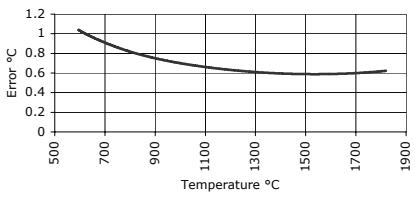
Ni120 TCR=0.00672
-80 to 260 °C



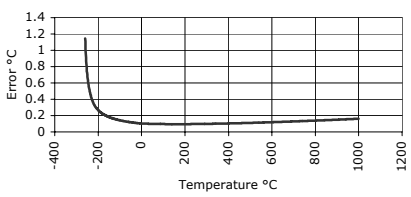
Temperature Accuracy

The following charts give worst-case temperature accuracy based on stated millivolt accuracy of ±(0.008 % of reading + 0.006mV). Temperature is uncompensated on the horizontal axis, referenced to 0 °C. Cold Junction calibration accuracy of 0.1 °C is not included in the temperature error.

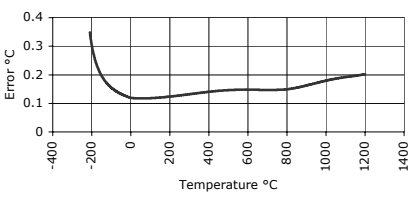
TYPE B
594 to 1820 °C



TYPE E
-260 to 1000 °C



TYPE J
-210 to 1200 °C



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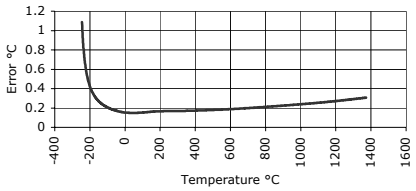
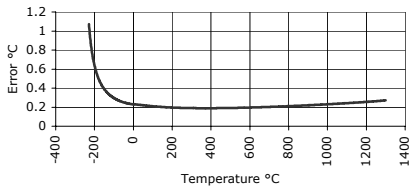
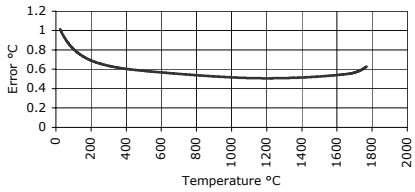
TYPE K
-245 to 1372 °C



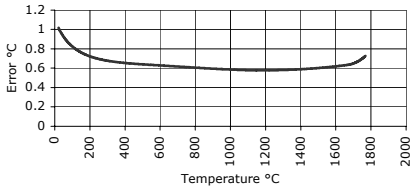
TYPE N
-229 to 1300 °C



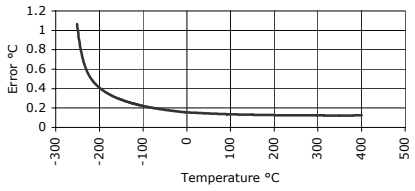
TYPE R
24 to 1768 °C



TYPE S
21 to 1768 °C



TYPE T
-251 to 400 °C



Other Products Available:

RTD Source (Single Type/1° resolution)	Model 510
RTD Source (7 Types, Ω/0.1° resolution)	Model 511
Pt100: α=1.3850, 1.3902, 1.3916, 1.3926, Cu10: α=1.427	
Ni110: α=1.530, Ni120: α=1.672	
RTD Calibrator (Source/Read 7 Types, Ω /0.1° resolution)	Model 512
RTD Calibrator (Source, Read & Auto Stepping 8 Types, Ω /0.1° resolution)	Model 512S
T/C Source (Single Type/1° resolution)	Model 520
T/C Source (8 Types, mV/0.1° resolution)	Model 521
B, E, J, K, N, R, S, T, mV	
T/C Calibrator (Source/Read 8 Types, mV /0.1° resolution)	Model 522
B, E, J, K, N, R, S, T, mV	
4-20 Milliamp Loop Calibrator	Model 530
Pocket-Mate Milliamp Calibrator	Model 531
4-20 Milliamp Loop Calibrator with Diagnostic	Model 532
4-20/10-50 Dual Range Loop Calibrator	Model 535
Frequency Read & Source with Totalizer	Model 541

Warranty

Our equipment is guaranteed against defective material and workmanship (excluding batteries) for a period of three years from the date of shipment. Claims under guarantee 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 guarantee. 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.

Your Local PIE Representative

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