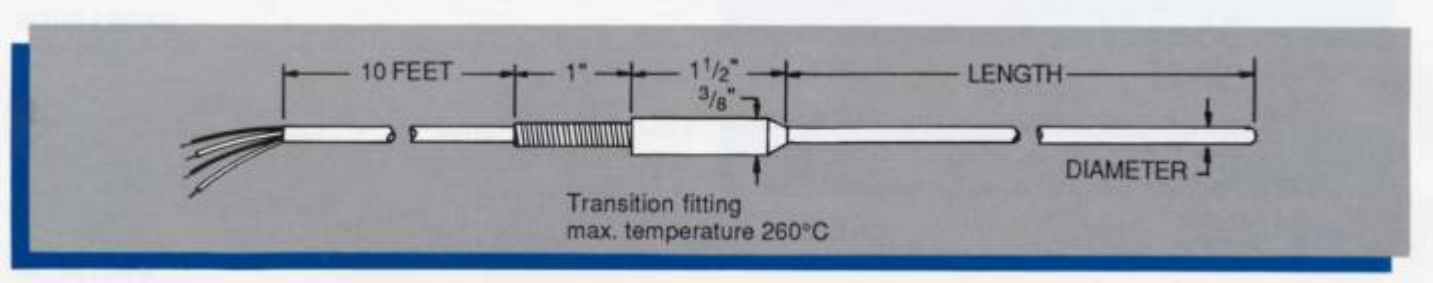
Instrulab 830 Series

Laboratory Grade Platinum RTD Sensors



The 830 Series laboratory grade platinum resistance thermometers are designed for applications that require sensors with better accuracy and stability than typical industrial sensors.

Common Specifications

R_O: 100 ±0.1 ohm @ 0ºC

Alpha: 0.00392 Ω/Ω/ºC (Nominal)

Temperature Range: -100º to +400ºC
(-150º to +750ºF)

Construction: *Sheath*, 316 stainless; *Cable*, 10 feet, 4-wire, Teflon on singles, Teflon overall, 22 gauge, stranded.

Insulation Resistance: 500 Meg ohm @ 100 VDC @ 25ºC

Immersion Depth: 102 mm (4 inches) minimum

Pressure Rating: 1500 psi

Hysteresis: 0.01ºC maximum
Hysteresis, measured at 0ºC, is the "dead band" exhibited by the sensor when driven alternately from its opposite temperature extremes.

Standard Interchangeability vs. Custom Calibration

Standard Interchangeability
Refers to the sensor accuracy when compared to the standard R vs. T table.

Custom Calibration
Refers to the generation of a sensor's individual R vs T curve. An instrument can then be calibrated to this sensor's R vs T curve, thereby greatly improving system accuracy.

Accuracy (Excitation Current = 1 mA DC)

Celsius	-100ºC	0ºC	100ºC	200ºC	300ºC	400ºC
Standard Interchangeability	±0.50	0.25	0.50	0.75	1.25	1.75
Custom Calibrated (Rn153)	±0.04	0.01	0.02	0.02	0.03	0.08
Fahrenheit	-150ºF	32ºF	212ºF	390ºF	575ºF	750ºF
Standard Interchangeability	±1.00	0.45	0.90	1.35	2.25	3.15
Custom Calibrated (Rn153)	±0.07	0.02	0.04	0.04	0.06	0.16

Comparison Guide

Model	Diameter	Length	Response Time[1] Seconds	Self Heating[2] ºC/mW	Self Heating[2] Temperature Rise	Stability[3] ºC/Year
833	1/8"	8"	3	0.025	0.0025ºC	0.05
831	3/16"	10"	5	0.02	0.002ºC	0.03
832	1/4"	10"	7	0.02	0.002ºC	0.03

[1] Response Time: Response time is for one time constant measured in water, flowing at 1 meter/second. One time constant is the time required for the sensor to reach 63.2% of a step change in temperature. Approximately five time constants are required for stabilization.
[2] Self Heating: Specified in still water at 0ºC. Temperature rise is based on a 1mA excitation current.
[3] Stability: Long term stability is measured at 0ºC.

Custom Calibration Schedules

Measurements are traceable to the NIST. All calibration in accordance with International Temperature Scale of 1990 (ITS-90) guidelines.

Printout Range	Printout Increment	Calibration Number
When used with Model 4101A Both ºC and ºF printouts are provided		
-60 to +300ºC (-76 to +572ºF)	5º 10º	059
When used with 4200 Series Instruments Both ºC and ºF printouts are provided		
0 to 250ºC (32 to 480ºF)	5º 10º	151
-100 to +250ºC (-150 to +480ºF)	5º 10º	152
-100 to +400ºC (-150 to +750ºF)	5º 10º	153
0 to 400ºC (32 to 750ºF)	5º 10º	154
Improved Accuracy above 300ºC (572ºF)		
0 to 400ºC (32 to 750ºF)	5º 10º	155
-100 to +400ºC (-150 to +750ºF)	5º 10º	156

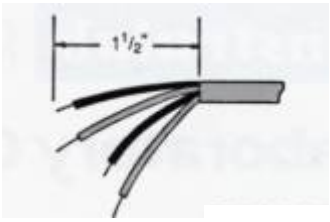
Documentation

Custom calibrated sensors are supplied with the following information:

1. Date, model, and serial number of the sensor.
2. Measured temperature and readings taken, in ohms.
3. Calibration constants: R_{tp} and coefficients a_x, and b_x, as required.
4. Resistance vs. temperature table in the printout increment indicated. Resistance resolution is 0.001 ohms.

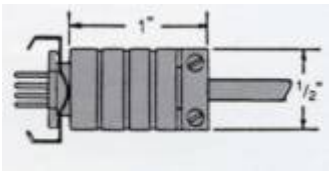
Terminations

OPTION –01



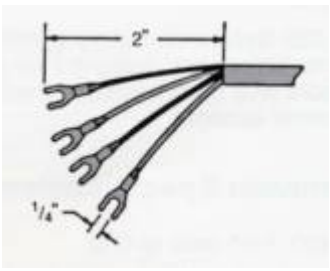
BARE LEADS

OPTION –02



4 PIN PLUG

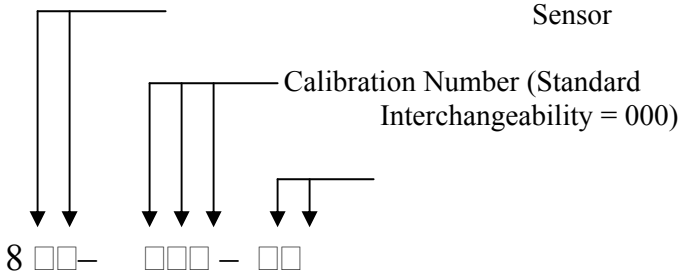
OPTION –03



GOLD PLATED SPADE LUGS (LABELED c, C, T, t)

How to Order

Specify sensor type, calibration number and termination.



Instrulab Inc.

1205 Lamar Street ● PO Box 98 ● Dayton OH 45404 ● USA
(937) 223-2241 ● FAX (937) 223-1705
www.instrulab.com Email: sales@instrulab.com

Bulletin #800-2 03-09