



The Temperature People®
Since 1943



09

Temperature Calibration Instrumentation

Product Guide



Electronic Development Labs, Inc.

EDL products are the alternative to the common place when it comes to temperature measurement and calibration. Our unique ability to design, manufacture, and test our equipment at our Virginia facility always gives you more than an off the shelf solution. Since 1943, EDL has manufactured thermocouples, RTDs, and thermistors for industry. Over the past few years EDL has developed a unique collection of temperature calibration equipment to meet the needs of our industrial and laboratory customers. These products are built with the same care and quality as our industrial product line.

More than ever it is important to buy products that do more for less without sacrificing quality. Our product does double the work at half the cost, it makes sense to use EDL. Total commitment to customer service and product support is another reason to consider our products for your company; we still repair instrumentation that was built forty years ago!

Our lab specializes in providing a source for unique temperature calibration and testing requirements. From the cryogenic range to above 1500 °C, EDL can test sensors to ASTM standards. Controlled atmosphere testing, power dissipation testing and response time testing are a few of the tests performed by EDL. We specialize in surface sensor calibration and offer this service to outside labs as well.

Don't let your suppliers tell you what will work. We want your business and we want you to tell us what you need, let us provide a solution that helps you improve your profit. We are committed to providing this kind of service and you can buy from EDL knowing teams of committed craftsman stand behind our products.

Call our sales department or one of our technical staff to see what EDL can do for you.



Drywell & Surface Calibrations

Surface Transfer Standard



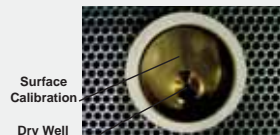
EDL's standard line of surface and insertion calibrators includes: STS-SC2, STS-SC1 (High Temp), and Practi-Cal. Practi-Cal is available with surface and interchangeable calibration wells that vary in depth and diameter. All three devices use a Eurotherm Controller with ITools for easy automation of your temperature measurement process.

- Interchangeable wells for PRI-I.
- Surface thermocouple output.
- Expanded uncertainties of ± 1.0 °C achieved for entire temperature range.

PRI-1:
Ambient to 315 °C

STS-SC1 (High Temp):
Ambient to 650 °C

STS-SC2:
Ambient to 315 °C



PRI-I: Surface & Insertion

Cryo-Cal-I Cryogenic Reference Cell

The CRYO-CAL-I is an alternative to the argon triple point and other cryogenic calibrators. It is used to calibrate temperature sensors such as SPRTs, RTDs, and thermocouples via comparison calibration. The Cryo-Cal® utilizes the phase change point of liquid nitrogen (LN₂) to establish a reference temperature of approximately -196 °C or 77 K. There are four Teflon® lined bushings that guide sensors into the gold plated equalization block. It is completely immersed in the cryogenic liquid contained within a super-insulated vacuum dewar. The Cryo-Cal®'s gold plated equalization block greatly reduces corrosion and oxidation and contributes to the 0.002 K stability and uniformity of the whole system.

- Min. use temperature 77 K (-200 °C)
- Max use temperature 273 K (0 °C) -ice point
- Stability: 2 mK
- Uniformity: 2 mK

CC-1
Reference Temp.
-196 °C (77 K)



Cryo-Cal-II Cryostat Calibrator

This new Cryogenic Calibrator (CC2) from EDL is a passively cooled cryostat that allows the user to calibrate temperature measurement devices from -196 °C (77 K) to ambient at an affordable price. Using liquid nitrogen as the cooling media eliminates the extreme cost of cascade compressor systems and the cumbersome nature of such baths. Calibrating at -160 °C is no problem and in fact any temperature above 77 K can be accomplished with dwell times greater than one hour. No expensive bath fluids are required, there is virtually no maintenance because there are no moving parts or pumping systems. With less than four liters of LN₂ comparison calibrations can be performed at any temperature above 77 K.

- Min. use temperature 77 K (-196 °C)
- Max use temperature 273 K (0 °C)
- Stability: 20 mK
- Uniformity: 20 mK

CC-2
Reference Temp.
-196 °C (77 K)



EDL Baths



MSB - 500
200 °C to 500 °C

Mini-Salt Bath

EDL introduces the Mini Salt Bath, an innovative solution to high temperature stirred liquid baths. The MSB-500 is a clear alternative to the large style salt baths that require large volumes of salt. With a 15" square foot print and weighing less than 50 lbs., this bath is well suited for bench top laboratory use and field portability. Start up time from a solid to 220 °C is approx. 60 minutes plus 30 minutes for stabilization. Heating rates are fast because there is only 14 lbs. of salt or slightly less than one gallon (3.7L) of fluid; rates greater than 3.5 °C per minute allow the user to calibrate numerous points throughout the day. That is less than 60 minutes from 220 °C to 420 °C.

- Salt included
- RS-232 interface & touch screen control
- Ships UPS
- 10" deep tank for a variety of SPRTs & industrial sensors
- Built in sensor holders
- Total weight less than 50lbs
- 1/10th the salt of larger style baths



Mini-Ultra Bath

EDL brings stirred liquid bath calibration to the field and the laboratory bench top. Our Mini Baths are high precision portable calibration source instruments that simply out perform even the best dry wells at affordable prices. Accuracies and uniformities better than 20 mK are equivalent to most large style baths and all smaller style baths at a fraction of the cost. They are ideal for the calibration of thermocouples, PRTs, thermistors, and liquid in glass thermometers.

The EDL Mini-Ultra Bath is supplied with sensor support bushings that allow fast simple immersion of standard size sensors. A specially designed double o-ring lid seals the unit for storage and transport so that the media can remain in the tank. Both units include an RS-232 interface for use with the supplied I-Tools software. Full function programming, monitoring and graphing from your laptop or PC is available using this open architecture system software.



- RS-232 interface
- Stability: 20 mK
- Resolution 10 mK
- 6" (15.24cm) insertion depth

MUB-20130
-20 °C to 130 °C

MUB-50200
50 °C to 200 °C



Ultra Bath (stirred silicone oil or salt bath)

EDL is proud to announce the introduction of this new line of stirred liquid baths. The new Ultra-Bath from the metrology division at EDL incorporates a new design that is packed with features that facilitate quick, accurate, and easy calibration. The design and features of the Ultra-Bath line are the result of years of researching and using commercially available stirred liquid baths.

- Salt and silicone oil available
- RS-232 interface
- Independent high safety system
- High, mid or low temperature option

UB-4010
(Low Range)
-40 °C to 100 °C

UB-1020
(Mid Range)
100 °C to 200 °C

UB-2050
(Salt)
200 °C to 550 °C



Thermistors, Pyrometers Infrared Calibrators & Furnace



Dual Black Body Infrared Calibrator

The DBB Dual Zone Black Body calibrators are designed to make infrared calibration easier than ever before. With the introduction of these products you can quickly, easily and accurately calibrate all general purpose infrared thermometers.

The low temperature Black Body is powered by convenient and efficient Thermo electric modules. Our unique design gives you high reliability coupled with high accuracy. Data is easily collected and downloaded to your computer through the RS232 port.

- 2.5" dia. (6.4cm) calibration surface
- 0.99 emissivity
- Reference sensors included

DBB-350:
Low Range: -20 °C to 135 °C
High Range: 20 °C to 350 °C

DBB-650:
Low Range: -20 °C to 135 °C
High Range: 20 °C to 650 °C

Single Black Body Infrared Calibrator

The SBB Single Black Body Infrared Calibrator is a simple alternative to the Dual Black Body Infrared Calibrator. This instrument is ideal for those applications requiring only one temperature range. The three models we offer are available in low, mid, and high range. Data is easily collected and downloaded to your computer through the RS232 Port.

- 2.5" dia. (6.4cm) calibration surface
- 0.99 emissivity
- Reference sensor included



SBB-1 (Low Range)
-30 °C to 110 °C

SBB-2 (Mid Range)
Ambient to 350 °C

SBB-3 (High Range)
Ambient to 650 °C

FUR-1200 Calibration Furnace

The EDL Calibration Furnace model FUR-1200 is designed for the testing and calibration of both thermocouples and RTD sensors. Comparison calibration is performed between 300 °C and 1150 °C. The internal Inconel® equalization block produces a highly stable and uniform temperature field. This is ideal for high accuracy calibration, long-term drift tests, and temperature cycle tests.

- Excellent for high accuracy calibration of both thermocouples and RTDs.
- Internal Inconel® equalization block produces a highly stable and uniform temperature field.
- Stability ± 0.05 °C

FUR-1200
300 °C to 1200 °C



Reference Data

Silicone Fluid Properties Type 200

Viscosity @ 25.0 °C	Viscosity Temp. Coefficient ¹	Coefficient of Expansion ²	Boiling Point °C	Boiling Point °F	Flash Point ³	Specific Gravity @25 °C
0.65	0.31	0.00134	99.4	211	-1.1 °C	0.761
1.0	0.37	0.00134	151.7	305	37.8 °C	0.818
1.5	0.46	0.00134	191.7	377	62.8 °C	0.853
2.0	0.48	0.00117	230.0	446	79.4 °C	0.873
3.0	0.51	0.00106	70-100	158-212	101.7 °C	0.900
5.0	0.55	0.00105	120-160	248-320	135.0 °C	0.920
10.0	0.57	0.00108	>200	>392	162.8 °C	0.940
20.0	0.59	0.00107	>200	>392	232.2 °C	0.955
50.0	0.59	0.00104	>250	>482	279.4 °C	0.960

Silicone Fluid Properties Type 550

Viscosity @25.0 °C	Viscosity Temp. Coefficients ¹	Coefficient of Expansion ²	Weight Loss After 48 Hours @ Temp.	Flash Point ^{3, 4}	Specific Gravity @25 °C
100-150	0.76	0.00075	9.0% @ 250 °C	301.7 °C	1.07

Silicone Fluid Properties Type 710

Viscosity @25.0 °C	Viscosity Temp. Coefficients ¹	Coefficient of Expansion ²	Weight Loss After 48 Hours @ Temp.	Flash Point ^{3, 4}	Specific Gravity @25 °C
475-525	0.84	0.00077	13.0% @ 250 °C	301.7 °C	1.10

Silicone Fluid Viscosity

Fluid Type	Viscosity
SF-200-1 Silicone Oil	1 Centistoke
SF-200-5 Silicone Oil	5 Centistoke
SF-200-10 Silicone Oil	10 Centistoke
SF-200-20 Silicone Oil	20 Centistoke
SF-200-50 Silicone Oil	50 Centistoke
SF-550 Silicone Oil	100-150 Centistoke
SF-710 Silicone Oil	475-525 Centistoke

Salt

Salt Type	Low	High	Thermal Conductivity
Salt149	149 °C	593 °C	0.33BTU/HR. SQ. FT, °F/FT.
Salt190	190 °C	593 °C	0.33BTU/HR. SQ. FT, °F/FT.

Coefficients are determined by:

¹Viscosity @210 °F
Viscosity @100 °F

²cc/cc/°C

³Open Cup ASTM D97-39 Sect.5-7

⁴System open to atmosphere

Reference Thermocouples & Instrument

Platinum Reference Thermocouples

EDL's Platinum Reference Thermocouples range from 0 °C to 1450 °C for standard measurements and for short-term intermittent measurements up to 1700 °C. Our construction method and superior materials result in a highly durable and reliable reference sensor.

- Range up to 1700 °C
- Made with superior materials for guaranteed durability.
- Comparison Calibration with ITS90 Fixed Points



Standard Sizes Available

Imperial Units

Diameter	Tolerance	Length	Tolerance	O.A.L.	Lead Length	Replaceable
.187"±	.005"	10"	± .250"	15"	48"	Yes
.250"±	.005"	16"	± .250"	22"	48"	Yes
.375"±	.005"	22"	± .250"	27"	48"	Yes

Metric Units

Diameter	Tolerance	Length	Tolerance	O.A.L.	Lead Length	Replaceable
4.75 mm±	15 mm	254 mm	± 10 mm	381	1200 mm	Yes
6.34 mm±	15 mm	406 mm	± 10 mm	558	1200 mm	Yes
9.52 mm±	15 mm	558 mm	± 10 mm	685	1200 mm	Yes



LT-100 Thermocouple Reference Meter

EDL's new Thermocouple Reference Meter is hand held and designed for high precision temperature measurement. This instrument incorporates features previously found only in much higher priced bench or rack mounted instruments. We have incorporated a precision cold end reference junction that is designed to accurately compensate for changes in ambient temperature and keep the instrument functioning at its highest accuracy. When the utmost accuracy is required, the internal electronic cold end reference can be set to use with an ice bath.

- Accepts all ASTM thermocouples including type C
- Internal/external cold junction
- Selectable resolution
- Full range for all thermocouple types
- 0.01 °C resolution and 0.1 °C accuracy
- °F, °C, K, mV reading
- RS-232 interface

LT-100 All Thermocouple Types

Instrument Lugs

The EDL Instrument Lug is a high quality connector suitable for laboratory and industrial instrument connections. The gold plated thermally conductive copper fork terminal reduces thermal EMF at the terminal. These lugs will not peel or crack during use or even in severe cases where they are bent. Wires may be crimped or soldered into the barrel, and normal soldering will not affect the gold plating. EDL recommends these lugs for SPRTs, IRTDs, and Thermistors. Our lugs are compatible with all major instrumentation manufacturers' equipment. These lugs are ideally suited for high accuracy resistance measurements especially when using bridge type instrumentation.

- Gold plated conductive copper
- Will not peel or crack even if bent
- Wires may be soldered or crimped
- Suited for high accuracy resistance measurements
- Recommended for SPRTs, IRTDs, and Thermistors
- Sold in packages of 25

THL-SLCUGD Gold Plated Instrument Lugs



Check out our extensive website for more details:

www.edl-inc.com



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