Littelfuse®

Expertise Applied | Answers Delivered

TEMPERATURE SENSING PRODUCTS

SELECTION GUIDE





Your Design Challenges, **Solved**

Littelfuse offers a broad portfolio of thermistors, resistance temperature detectors (RTDs), digital temperature indicators, and probes and assemblies to meet a wide range of demanding temperature sensing applications. We also specialize in designing custom NTC thermistor and RTD sensors to meet unique system requirements.







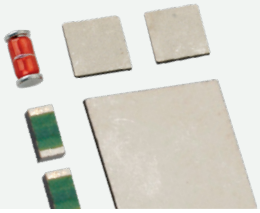


Thermistor Probes and Assemblies



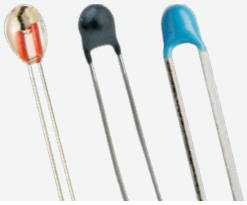
Standard and customized probe assemblies offer very precise and extremely reliable thermal monitoring in the most demanding applications.

Chip and MELF Style Thermistors



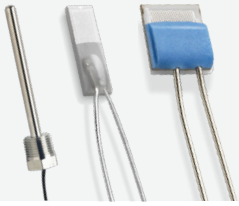
Littelfuse surface mount thermistors are available in a variety of sizes and configurations suitable for mounting using solder, wire, bond or epoxy.

NTC and PTC Thermistors



Designed to meet a broad range of applications, our leaded thermistors include standard precision, as well as glass encapsulated and epoxy coated options.

RTD Elements and Probe Assemblies



Highly accurate over a wide temperature range, our RTDs are especially suitable for use in extreme environmental conditions.

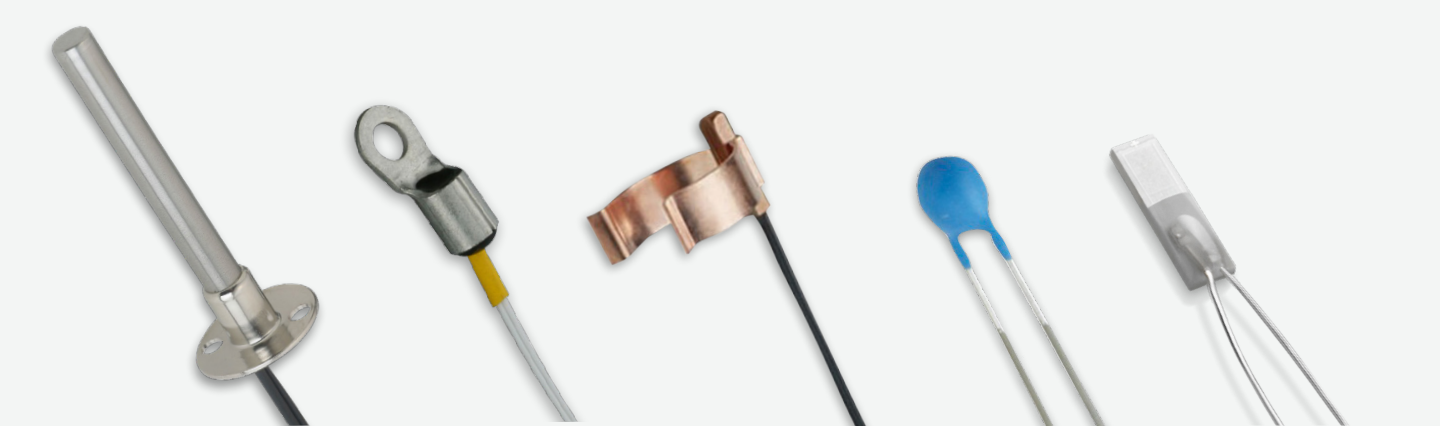
Recognized for their accuracy and long-term reliability, Littelfuse thermistors and RTDs are the sensor of choice for diverse markets.







Introduction to Temperature Sensing



A Temperature Sensor is a device that detects and measures the average heat or thermal energy in a medium and converts it into an electrical signal. A wide variety of temperature sensing devices are available today. Littelfuse offers a broad range of Thermistors, Resistance Temperature Detectors (RTDs), Digital Temperature Indicators, and probes and assemblies for temperature sensing applications worldwide. Each has its own set of operating principles, features, benefits, considerations, and limitations for optimal use.

Thermistors (NTCs and PTCs)

Thermistors are thermally sensitive resistors whose prime function is to exhibit a large, predictable, and precise change in electrical resistance when subjected to a corresponding change in body temperature. Negative Temperature Coefficient (NTC) thermistors exhibit a decrease in electrical resistance when subjected to an increase in body temperature. Positive Temperature Coefficient (PTC) thermistors exhibit an increase in electrical resistance when subjected to an increase in body temperature.

Applications

Based on the predictable characteristics and their excellent long-term stability, Thermistors are generally accepted to be the most advantageous sensor for many applications including temperature measurement and control.

RTDs

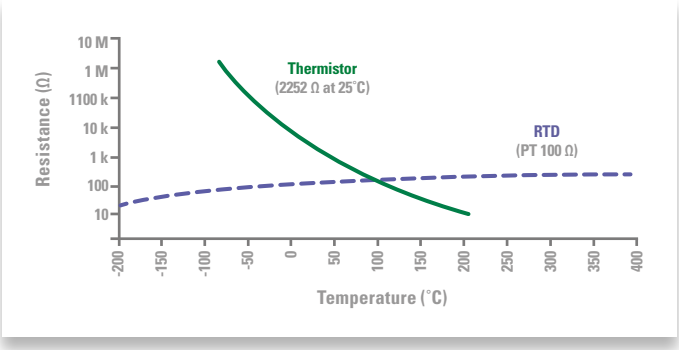
Platinum Resistance Temperature Detectors (Pt-RTDs) are temperature sensors that have a positive, predictable, and nearly linear change in resistance when subjected to a corresponding change in their body temperature.

Applications

The nearly linear output needed to precisely measure temperature over a very wide range makes RTDs ideal for digital measurement and control applications. Typical applications include industrial controls, medical electronics, HVAC-R, aerospace systems, white goods, small appliances, and food handling.

NTC Thermistors	RTDs (Pt Thin Film)
Both are electrical resistors in which resistance changes with temperature Both require excitation current	
Metal oxide on ceramic substrate	Precious metal (typically Pt) on ceramic substrate
Very good accuracy suitable for most applications – most commonly used cost-effective temperature sensor	For more-specialized applications requiring very high accuracy (ex. 0.06%/0.15°C) For applications requiring a lot of precision
Exponential resistance-temperature curve	Nearly linear resistance-temperature curve provides ease and consistency of measurement
Wide operating temperature ranges from -50°C to 300°C	Extremely wide temperature ranges, specifically on the higher end, from -50°C to well above 500°C
Resistance values such as 100Ω, up to 5MΩ at 25°C	Resistance values such as 100Ω, 500Ω and 1000Ω at 0°C

Comparing NTC Thermistors vs. RTDs. Although both technologies sense temperature, they each exhibit different characteristics as shown in the comparison table above. Shown below is a comparison of the resistance-temperature behavior.



Digital Temperature Indicators

Digital Temperature Indicators have a positive relationship between resistance and temperature. The response is very much like a digital signal; below the trip temperature, resistance will be low, above the trip temperature, resistance will be very high. This digital response is ideal for applications where knowing the temperature has increased beyond a specific value is required. With the digital response, no analog to digital conversion is necessary, allowing designers to save time and space.

Applications

Typical applications include USB Type-C cables, power supplies, servers, and other similar systems where monitoring for a specific temperature is required.

Customizable Options

Modifications are available to existing standard product packages, such as adding connectors or changing wire size or length, as well as offering special resistance-temperature (R-T) curves, R-T curve matching, and custom lead forming and bending to discrete thermistors. In addition, the following options and services are available.

- Complete custom sensor packages, including moisture-resistant designs
- Custom resistance-temperature (R-T) characteristics
- Specialized resistance tolerance or temperature accuracy within specified temperature ranges
- Sensing element design for best long-term stability
- Rapid prototyping and quick-turn concept parts including 3D printed parts
- Prototype units using prototype tooling
- Reliability/validation testing options
- Fully designed, production-capable sensor and tooling

Quality and Reliability Testing

In addition to providing custom-designed products, we provide options to evaluate performance and long-term stability for the most demanding applications. Some of our testing capabilities include:

- Salt water immersion
- Freeze/thaw temperature cycling
- Thermal shock
- Sinusoidal vibration

Design Your Custom Temperature Sensor

Littelfuse specializes in custom design packages that meet our customers' needs for both Thermistor and Resistance Temperature Detector (RTD) sensor designs.If a standard sensor style doesn't meet your needs, contact us for further assistance at littelfuse.com/sensorform. Our application engineers are ready to help design the sensor you need.

Leaded Thermistors

Epoxy Coated Thermistors



Product Series	Description	Overall Dimensions	Resistance	Resistance Tolerance	R-T Curve	Temperature Coefficient	Beta Nominal	Dissipation Constant, Nominal	Thermal Time Constant, Max. - Still Air	Thermal Time Constant, Max. - Well-Stirred Oil	Temperature Rating
		Inches	Ohms	± %		% / °C	K	mW / °C	Seconds	Seconds	°C
		Bead W × Lead L	@ 25°C	@ 25°C		@ 25°C	0-50°C				
KC	Miniature Leaded Epoxy Coated Thermistors (135°C), Kynar Insulated Lead Wire	0.095 × 1.5	100 - 100,000	1; 10	B, F, G, J, N1, R	3.3 - 4.68	2941 - 4140	1	10	1	-55 to +135
LC	Miniature Leaded Epoxy Coated Thermistors (150°C), Tinned Solderable Wire	0.095 × 1.5	100 - 100,000	2; 5; 10	B, E, F, G, H, J, R	3.3 - 4.68	2941 - 4140	1	10	1	-55 to +150
SC	Miniature Leaded Epoxy Coated Thermistors (150°C), Tinned Solderable Wire	0.095 × 1.5	50,000 - 100,000	5	J	4.4 - 4.5	3892	2	10	---	-55 to +150
TC	Miniature Leaded Epoxy Coated Thermistors (150°C), Teflon Insulated Wire	0.095 × 1.5	100 - 100,000	10	B, F, G, J, R	3.3 - 4.68	2941 - 4140	1	10	1	-55 to +150
AC	Miniature Leaded Epoxy Coated Thermistors (125°C), Tinned Solderable Lead Wire	0.140 × 0.675	10,000	1	E1, J	4.4	3892	2	15	3	-55 to +125
DC	Miniature Leaded Epoxy Coated Thermistors (150°C), Tinned Solderable Lead Wire	0.125 × 1.0	100 - 100,000	1; 2; 10	B, F, G, J, R	3.3 - 4.68	2941 - 4140	3	15	2 - 3	-55 to +150

Glass Probe Thermistors



Product Series	Description	Overall Dimensions	Resistance	Resistance Tolerance	R-T Curve	Temperature Coefficient	Beta Nominal	Dissipation Constant, Nominal	Thermal Time Constant, Max. - Still Air	Thermal Time Constant, Max. - Well-Stirred Oil	Temperature Rating
		Inches	Ohms	± %		% / °C	K	tmW / °C	Seconds	Seconds	°C
		Body ø × Body L	@ 25°C	@ 25°C		@ 25°C	25-85°C				
GL	High-Temperature Glass Housing Thermistors (300°C), Tinned Solderable Lead Wire	0.070 × 0.500	2252	10	J	4.4	3977	---	---	---	-55 to +250

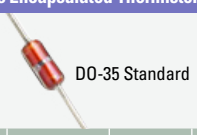
Leaded Thermistors (Continued)

Glass Coated Chip Thermistors



Product Series	Description	Overall Dimensions	Resistance	Resistance Tolerance	R-T Curve	Temperature Coefficient	Beta Nominal	Dissipation Constant, Nominal	Thermal Time Constant, Max. - Still Air	Thermal Time Constant, Max. - Well-Stirred Oil	Temperature Rating
		Inches	Ohms	± %		% / °C	K	mW / °C	Seconds	Seconds	°C
		Bead ø × Lead L	@ 25°C	@ 25°C		@ 25°C	25-85°C				
GQ	Radial Leaded Glass Coated Chip Thermistors (0.140" Dia.), Solderable Lead Wire	0.140 × 1.00	2252	10	J	4.4	3977	---	---	---	-55 to +250
GR	Radial Leaded Glass Coated Chip Thermistors (0.090" Dia.), Solderable Lead Wire	0.090 × 1.00	100 - 100,000	10; 20	B7, E1, F, J, R	3.18 - 4.68	2826 - 4263	1.3	14	---	-55 to +300
GS	Radial Leaded Glass Coated Chip Thermistors (0.060" Dia.), Solderable Lead Wire	0.060 × 1.00	200 - 1,000,000	10	E1, G, J, R	3.38 - 5.25	3047 - 4668	0.7	5	---	-55 to +300
GT	Radial Leaded Glass Coated Chip Thermistors (0.039" Dia.), Solderable Lead Wire	0.039 × 1.00	1,000 - 1,000,000	10	B, E1, F, J, L1, N1, U1	3.3 - 4.52	3009 - 4350	0.45	2.5	---	-55 to +300

Glass Encapsulated Thermistors



Product Series	Description	Overall Dimensions	Resistance	Resistance Tolerance	R-T Curve	Temperature Coefficient	Beta Nominal	Dissipation Constant, Nominal	Thermal Time Constant, Max. - Still Air	Thermal Time Constant, Max. - Well-Stirred Oil	Temperature Rating
		Inches	Ohms	± %		% / °C	K	mW / °C	Seconds	Seconds	°C
		Body ø × Body L	@ 25°C	@ 25°C		@ 25°C	0-50°C				
DO-34 Standard	Glass Encapsulated Thermistors (300°C), DO-34 Package, Tinned CCS Lead Wire	0.065 × 0.110	2,000 - 330,000	10	F, J, N1, R	3.86 - 4.68	3419 - 4263	2	5	0.5	-55 to +300
DO-35 Standard	Glass Encapsulated Thermistors (300°C), DO-35 Package, Tinned CCS Lead Wire	0.075 × 0.160	500 - 5,000,000	1; 2; 3; 5; 10	B, E, E1, F, F13, G, H, J, L1, N1, R, V3, V4, Y, Y1	3.3 - 5.33	2941 - 4640	2	2 - 8	0.5 - 1	-55 to +300
DO-41 Standard	Glass Encapsulated Thermistors (300°C), DO-41 Package, Tinned CCS Lead Wire	0.110 × 0.170	100 - 33,000	10	B, F, J, R	3.31 - 4.68	2941 - 4140	3	8	2	-55 to +300
JL	Interchangeable Glass Encapsulated Thermistors, DO-35 Package, ± 0.5°C Accuracy	0.075 × 0.160	10,000 - 100,000	---	J	4.4	3892	2	5	0.5	-55 to +300
JM	Interchangeable Glass Encapsulated Thermistors, DO-35 Package, ± 1.0°C Accuracy	0.075 × 0.160	10,000 - 100,000	---	J	4.4	3892	2	5	0.5	-55 to +300
USUG1000	UL Recognized Glass Encapsulated Thermistors, DO-35 Package	0.075 × 0.160	10,000 - 250,000	2; 5; 10	J	3.67	3892	2	---	---	-40 to +150

For details on electrical specifications, visit littelfuse.com.

Leaded Thermistors (Continued)

Interchangeable Thermistors


KS


PS

Product Series	Description	Overall Dimensions	Resistance	Accuracy	R-T Curve	Temperature Coefficient	Beta Nominal	Dissipation Constant, Nominal	Thermal Time Constant, Max. - Still Air	Thermal Time Constant, Max. - Well-Stirred Oil	Temperature Rating	Max. Storage & Operation Temperature for Best Long-Term Stability
		Inches	Ohms	± ˚C		% / ˚C	K	mW / ˚C	Seconds	Seconds	˚C	
		Bead W × Bead L	@ 25˚C	0-70˚C		@ 25˚C	0-50˚C					
KS	Standard Precision Interchangeable Thermistors (135°C), ± 0.1°C Accuracy, Kynar Insulated Leads	0.095 × 1.5	1,000 - 100,000	±0.1°C	G, J, R	4.04 - 4.68	3575 - 4140	1	10	1	-80 to +135	-80 to +75
KT	Standard Precision Interchangeable Thermistors (135°C), ± 0.2°C Accuracy, Kynar Insulated Leads	0.095 × 1.5	1,000 - 100,000	±0.2°C	G, J, R	4.04 - 4.68	3575 - 4140	1	10	1	-80 to +135	-80 to +120
KW	Precision Interchangeable Thermistors (135°C), ± 0.5°C Accuracy, Kynar Insulated Leads	0.095 × 1.5	1,000 - 100,000	±0.5°C	G, J, R	4.04 - 4.68	3575 - 4140	1	10	1	-80 to +135	-80 to +120
KX	Precision Interchangeable Thermistors (135°C), ± 1.0°C Accuracy, Kynar Insulated Leads	0.095 × 1.5	1,000 - 100,000	±1.0°C	G, J, R	4.04 - 4.68	3575 - 4140	1	10	1	-80 to +135	-80 to +120
PS	Standard Precision Interchangeable Thermistors (150°C), ± 0.1°C Accuracy, Uninsulated Leads	0.095 × 1.5	1,000 - 100,000	±0.1°C	G, J, R	4.04 - 4.68	3575 - 4140	1	10	1	-80 to +135	-80 to +75
PT	Standard Precision Interchangeable Thermistors (150°C), ± 0.2°C Accuracy, Uninsulated Leads	0.095 × 1.5	1,000 - 100,000	±0.2°C	G, J, R	4.04 - 4.68	3575 - 4140	1	10	1	-80 to +135	-80 to +120
PW	Precision Interchangeable Thermistors (150°C), ± 0.5°C Accuracy, Uninsulated Leads	0.095 × 1.5	1,000 - 100,000	±0.5°C	E, G, J, R	3.67 - 4.68	3263 - 4140	1	10	1	-80 to +135	-80 to +120
PX	Precision Interchangeable Thermistors (150°C), ± 1.0°C Accuracy, Uninsulated Leads	0.095 × 1.5	1,000 - 100,000	±1.0°C	E, G, J, R	3.67 - 4.68	3263 - 4140	1	10	1	-80 to +135	-80 to +120

Epoxy Chip and Lead Assembly


TO

Product Series	Description	Overall Dimensions	Nominal Resistance	Resistance Tolerance	Temperature Accuracy	R-T Curve	Temperature Coefficient	Beta	Operating Temperature	Max. Storage & Operation Temperature for Best Long-Term Stability
		Inches	Ohms	± %	± ˚C		% / ˚C	K	˚C	˚C
		Body L × W × T	@ 25˚C	@ 25˚C	0-70˚ C		@ 25˚C	0-50˚C		Maximum
TO-220	TO-220 Package Thermistors	0.595 × 0.400 × 0.165	5,000 - 10,000	1; 5; 10	---	J	-4.4	3892	55 to +150	---

Surface Mount Thermistors

End-Banded Chip Thermistors


RB

Product Series	Description	Overall Dimensions	Resistance	Resistance Tolerance	Temperature Coefficient	Beta Nominal	Max. Power Rating	Temperature Rating
		Inches	Ohms	± %	A	K	mW	˚C
		L × W × T	@ 25˚C	@ 25˚C	@ 25˚C	25-85˚C		
RA	Surface Mount End-Banded Chip Thermistors 0402 Style (125°C)	0.0394 × 0.0197 × 0.208	10,000 - 200,000	1; 5	-4.4	3800 - 4250	40mW	-40 to +125
RB	Surface Mount End-Banded Chip Thermistors 0603 Style (125°C)	0.063 × 0.0315 × 0.0395	1,000 - 200,000	5	-4.4	3250 - 4250	150mW	-40 to +125
KR	Surface Mount End-Banded Chip Thermistors 0805 Style (125°C)	0.0787 × 0.0492 × 0.050	1,000 - 200,000	5	-4.4	3250 - 4250	300mW	-40 to +125
LR	Surface Mount End-Banded Chip Thermistors 1206 Style (125°C)	0.126 × 0.063 × 0.050	1,000 - 500,000	5	---	3250 - 4250	320 - 400 mW	-40 to +125

Leadless Top-Bottom Terminated Chip Thermistors


BC

Product Series	Description	Overall Dimensions	Resistance	Resistance Tolerance	R-T Curve	Temperature Coefficient	Beta Nominal	Dissipation Constant, Nominal	Thermal Time Constant, Max. - Still Air	Temperature Rating
		Inches	Ohms	± %		% / ˚C	K	mW / ˚C	Seconds	˚C
		L × W × T	@ 25˚C	@ 25˚C		@ 25˚C	0-50˚C			
BC	Leadless Top/Bottom Terminated Chip Thermistors (150°C)	Various Sizes	100 - 100,000	10	B, F, J, R	-4.68 to -3.31	2941 - 4140	1	2	-55 to +150

MELF Style Thermistors


MM


HM


SM


WM

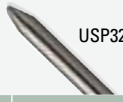

SB

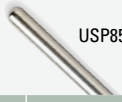
Product Series	Description	Overall Dimensions	Resistance	Resistance Tolerance	R-T Curve	Temperature Coefficient	Beta Nominal	Dissipation Constant, Nominal	Thermal Time Constant, Max. - Still Air	Temperature Rating
		Inches	Ohms	± %		% / ˚C	K	mW / ˚C	Seconds	˚C
		ø × L	@ 25˚C	@ 25˚C		@ 25˚C	0-50˚C			
MM	Surface Mount NTC LL-31 MicroMELF Style (220°C)	0.049 × 0.075	2,186 - 200,000	1; 10	E1, F, G, J, R	-4.68 to -3.82	3320 - 4140	1	5	-55 to +220
HM	Surface Mount NTC LL-34 MiniMELF Interchangeable (220°C) ±0.5°C Accuracy	0.0603 × 0.135	10,000 - 100,000	0.5	J	-4.4	3892	2	8	-55 to +220
SM	Surface Mount NTC LL-34 MiniMELF Style (220°C)	0.060 × 0.135	500 - 1,000,000	1; 10	B, D2, E, E1, F, G, J, R, V3	-4.93 to -3.3	2941 - 4369	2	8	-55 to +220
WM	Surface Mount NTC LL-34 MiniMELF Interchangeable (220°C) ±1.0°C Accuracy	0.060 × 0.135	10,000 - 100,000	---	---	-4.4	3892	2	8	-55 to +220
SB	Surface Mount NTC LL-41 MELF Style (220°C)	0.060 × 0.135	1,000 - 20,000	10	F, J, R	-4.68 to -3.68	3419 - 4140	3	8	-55 to +220

For details on electrical specifications, visit littelfuse.com.

Thermistor Probes and Assemblies

Straight/Cylindrical


USP3275


USP8528


USP11492


USP11491


USP12920

Product Series	Description	Overall Dimensions	Nominal Resistance	Resistance Tolerance	Temperature Accuracy	R-T Curve	Temperature Coefficient	Beta	Operating Temperature	Max. Storage & Operation Temperature for Best Long-Term Stability
		Inches	Ohms	± %	± ˚C		% / ˚C	K	˚C	˚C
		Probe ø × Probe L	@ 25˚C	@ 25˚C	0-70˚ C		@ 25˚C	0-50˚C		Maximum
USP3275	Stainless Steel Housing - Pointed Tip, Teflon Insulated Lead Wire	0.188 × 10.00	10,000	5	---	J	-4.4	3892	-55 to +105	---
USP7806	Stainless Steel Housing, PFA Insulated Zip Cord	0.125 × 1.500	100,000	4.78	1.0 (+25°C)	V	-4.78	---	-55 to +150	---
USP8528	Stainless Steel Housing and Spring, PFA Insulated Lead Wire	0.188 × 2.250	10,000	---	0.20 (+25 to +80°C)	J	-4.4	3892	-55 to +125	---
USP10972	Stainless Steel Housing, PVC Insulated Zip Cord, Moisture Resistant	0.250 × 2.00	10,000	1	---	J	-4.4	3892	-55 to +105	---
USP11491	Stainless Steel Housing, Teflon Insulated Lead Wire	0.125 × 2.50	10,000	---	0.20	J	-4.4	3892	-55 to +150	+120
USP11492	Stainless Steel Housing, Teflon Insulated Lead Wire	0.188 × 1.50	10,000	---	0.20	J	-4.4	3892	-55 to +150	+120
USP12920	Stainless Steel Housing, Glass Braid Insulated, Glass Braid Jacketed Wire	0.250 × 2.00	100,000	1	---	J	-4.4	3892	-55 to +300	---

Flanged


USP9728


USP10979

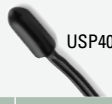

USP12836

Product Series	Description	Overall Dimensions		Nominal Resistance	Resistance Tolerance	R-T Curve	Temperature Coefficient	Beta	Operating Temperature
		Inches		Ohms	± %		% / ˚C	K	˚C
		Probe ø × Probe L	Flange L × Flange W	@ 25˚C	@ 25˚C		@ 25˚C	0-50˚C	
USP9728	Stainless Steel Housing, #6 Stud Mounting Holes, Glass Braid Insulated, Glass Braid Jacketed Wire	0.250 × 2.250	0.815 ø	100,000	2	J	-4.4	3892	-55 to +300
USP10979	Stainless Steel Housing, #6 Stud Mounting Holes, Moisture Resistant	0.250 × 2.250	0.815 ø	10,000	1	J	-4.4	3892	-55 to +105
USP12836	Stainless Steel Housing, 0.1772" Dia. Mounting Hole, PVC Zip Cord Lead Wire	0.1772 × 1.1811	0.7874 × 0.4724	10,000	1	J	-4.4	3977	-55 to +105

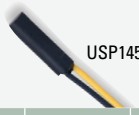
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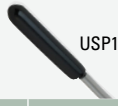
Thermistor Probes and Assemblies (Continued)

Plastic


USP4065


USP10680

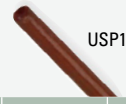

USP14579


USP11493


USP12838

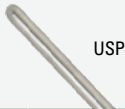
Product Series	Description	Overall Dimensions	Nominal Resistance	Resistance Tolerance	Temperature Accuracy	R-T Curve	Temperature Coefficient	Beta	Operating Temperature	Max. Storage & Operation Temperature for Best Long-Term Stability
		Inches	Ohms	± %	± ˚C		% / ˚C	K	˚C	˚C
		Probe ø × Probe L	@ 25˚C	@ 25˚C			@ 25˚C	0-50˚C		Maximum
USP4065	Vinyl Housing, PVC Insulated Zip Cord	0.225 × 0.580	2,000	---	1.67 (-26.1 to +4.4°C)	F	-3.86	3419	-40 to +100	---
USP7537	Polyimide Tube Housing, Kynar Insulated Lead Wire	0.060 × 0.250	2,500	---	0.05 (0 to +50°C)	J	-4.4	3892	-55 to +80	+50
USP10680	Vinyl Housing, PVC Insulated Zip Cord	0.290 × 1.060	10,000	---	0.56 (+18.3 to +29.4°C)	J	-4.4	3892	-40 to +105	---
USP10975	Plastic Housing, Kynar Insulated Lead Wire	0.100 × 0.215	10,000	1	---	J	-4.4	3892	-55 to +125	---
USP10982	Vinyl Housing, PVC Insulated Lead Wire, Moisture Resistant	0.230 × 1.350	10,000	1	---	J	-4.4	3892	-40 to +80	---
USP11493	Vinyl Housing, PVC Insulated Zip Cord	0.225 × 0.580	2,252	---	0.10 (0 to +70°C)	J	-4.4	3892	-40 to +105	+75
USP12838	Vinyl Housing, PVC Insulated Lead Wire	0.089 × 0.340	10,000	1	---	J	-4.4	3892	-40 to +80	---
USP14439	Polyimide Tube Housing, Two Conductor PVC Insulated Lead Wire	0.085 × 0.375	10,000	---	0.10 (0 to +50°C)	J	-4.4	3892	-40 to +105	+75
USP14579	Positive Temperature Coefficient Thermistor, Plastic Housing, Teflon Insulated Lead Wire	0.155 × 0.500	1,000	2	---	---	---	---	-40 to +105	---
USP17957	Positive Temperature Coefficient Thermistor, Plastic Housing, Teflon Insulated Lead Wire	0.140 × 0.380	1,000	2	---	---	---	---	-40 to +105	---

Micro Probes


USP12837

Product Series	Description	Overall Dimensions	Nominal Resistance	Resistance Tolerance	Temperature Accuracy	R-T Curve	Temperature Coefficient	Beta	Operating Temperature	Max. Storage & Operation Temperature for Best Long-Term Stability
		Inches	Ohms	± %	± ˚C		% / ˚C	K	˚C	˚C
		Probe ø × Probe L	@ 25˚C	@ 25˚C	0-70˚ C		@ 25˚C	0-50˚C		Maximum
USP12837	Polyimide Tube Housing, Poly-Nylon Insulated Lead Wire	0.020 × 0.150	10,000	1	---	J	-4.4	3892	-55 to +125	+100

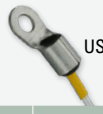
Laboratory Grade

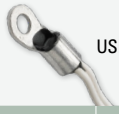

USP3986

Product Series	Description	Overall Dimensions	Nominal Resistance	Resistance Tolerance	Temperature Accuracy	R-T Curve	Temperature Coefficient	Beta	Operating Temperature
		Inches	Ohms	± %	± ˚C		% / ˚C	K	˚C
		Probe ø × Probe L	@ 25˚C	@ 25˚C	-20 to +70˚C		@ 25˚C	0-50˚C	
USP3021	Stainless Steel Housing, PVC Insulated Zip Cord, Supplied with NIST Traceable Calibration Certificate	0.250 × 9.50	10,000	2	0.01 (-20 to +70°C)	J	-4.4	3892	-55 to +105
USP3986	Stainless Steel Housing, PVC Insulated Zip Cord, Supplied with NIST Traceable Calibration Certificate	0.250 × 9.50	100,000	---	0.01 (0 to +105°C)	J	-4.4	3892	-55 to +105

Thermistor Probes and Assemblies (Continued)

Surface Temperature Sensing


USUR1000


USP4261


USP7570


USP7765


USP10973

Product Series	Description	Overall Dimensions	Nominal Resistance	Resistance Tolerance	Temperature Accuracy	R-T Curve	Temperature Coefficient	Beta	Operating Temperature	Max. Storage & Operation Temperature for Best Long-Term Stability
		Inches	Ohms	± %	± ˚C		% / ˚C	K	˚C	˚C
		Body L × W × T	@ 25˚C	@ 25˚C	0-70˚ C		@ 25˚C	0-50˚C		Maximum
USUR1000	UL Recognized NTC Thermistor Assemblies with #6 Ring Lug Housing	0.615 × 0.280 × 0.215	1,000 - 100,000	2; 3; 5; 10	---	J	-4.4	3892	-40 to +125	---
USP4261	Ring Lug Housing, #6 Mounting Hole, PVC Insulated Zip Cord	0.615 × 0.280 × 0.215	10,000	1	---	J	-4.4	3892	-40 to +105	---
USP5510	Flag Terminal Housing, #6 Mounting Hole, Teflon Insulated Lead Wire	0.310 × 0.645 × 0.220	10,000	---	0.50 (0 to +70°C)	J	-4.4	3892	-55 to +150	---
USP6295	Ring Lug Housing, #4 Mounting Hole, Kynar Insulated Lead Wire	0.620 × 0.281 × 0.215	10,000	5	---	J	-4.4	3892	-55 to +125	---
USP6998	Ring Lug Housing, 1/4" Mounting Hole, Teflon Insulated Lead Wire, Harwin Connector	1.270 × 0.445	200,000	1	---	R	-4.68	4140	-55 to +150	---
USP7570	Ring Lug Housing, #6 Mounting Hole, Teflon Insulated Lead Wire	0.620 × 0.281 × 0.215	10,000	---	5.0 (+60 to +100°C)	J	-4.4	3892	-55 to +135	---
USP10976	Ring Lug Housing, #6 Mounting Hole, Teflon Insulated Lead Wire	0.620 × 0.281	10,000	1	---	J	-4.4	3892	-55 to +150	+120
USP7765	Overmolded Plastic Housing, UL1015 Style Lead Wire, Moisture Resistant	1.300 × 0.400 × 0.250	10,000	1	---	J	-4.4	3892	-40 to +105	---
USP7766	Copper Housing, Supplied with 3 Copper-Plated Clips for Mounting to 0.3125"; 0.375" & 0.500" Dia. Pipes, PVC Insulated Zip Cord, Moisture Resistant	0.787 × 0.164	10,000	1	---	J	-4.4	3892	-40 to +105	---
USP8798	Copper Housing, Copper-Plated Clip for Mounting to 0.250" Dia. Pipe, PVC Insulated Zip Cord, Moisture Resistant	0.787 × 0.220 × 0.167	10,000	---	0.50 (+20 to +35°C)	J	-4.4	3892	-40 to +105	---
USP10973	Copper Housing, PVC Insulated Zip Cord, Moisture Resistant	0.787 × 0.177 × 0.164	10,000	1	---	J	-4.4	3892	-40 to +105	---
USP18967	Copper Housing, Copper-Plated Clip for Mounting to 0.875" Dia. Pipe, PVC Insulated Zip Cord, Moisture Resistant	0.787 × 0.233 × 0.164	10,000	1	---	J	-4.4	3977	-40 to +105	---

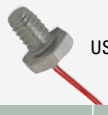
Threaded


USP3121


USP10978


USP10997


USP12755


USP12840

Product Series	Description	Overall Dimensions		Nominal Resistance	Resistance Tolerance	R-T Curve	Temperature Coefficient	Beta	Operating Temperature
		Inches		Ohms	± %		% / ˚C	K	˚C
		Probe ø × Probe L	Hex Head W × Plug L	@ 25˚C	@ 25˚C		@ 25˚C	0-50˚C	
USP3121	Aluminum Hex Housing, 6-32 Thread, Kynar Insulated Lead Wire	---	0.250 × 0.625	10,000	5	J	-4.4	3892	-55 to +125
USP10978	Brass Housing, 1/4"-18 NPT Thread, PVC Insulated Lead Wire	0.250 × 0.650	0.562 × 0.880	10,000	1	J	-4.4	3892	-55 to +105
USP10981	Stainless Steel Housing, 1/8"-27 NPT Thread, PVC Insulated Zip Cord, Moisture Resistant	0.250 × 1.250	0.4375 × 0.625	10,000	1	J	-4.4	3892	-55 to +105
USP10997	Brass Plug, 1/8"-27 NPT Thread, PVC Insulated Lead Wire	---	0.4375 × 0.560	10,000	5	J	-4.4	3892	-55 to +105
USP12755	Stainless Steel Housing, 5/16"-24 UNJF-3A Thread, PVC Insulated Lead Wire	0.188 × 0.500	0.500 × 0.650	10,000	---	E1	---	3435	-55 to +105
USP12840	Stainless Steel Hex Head Screw, 10-32 Thread, Kynar Insulated Lead Wire	---	0.3125 × 0.370	10,000	1	J	-4.4	3892	-55 to +125

Thermistor Probes and Assemblies (Continued)

Special Probes


USP16673

Product Series	Description	Overall Dimensions	Nominal Resistance	Resistance Tolerance	Temperature Accuracy	R-T Curve	Temperature Coefficient	Beta	Dissipation Constant, Nominal	Thermal Time Constant, Nominal - Still Air	Operating Temperature
		Inches	Ohms	± %	± ˚C		% / ˚C	K	mW / ˚C	Seconds	˚C
		Body L × W × T	@ 25˚C	@ 25˚C	0-70˚ C		@ 25˚C	0-50˚C			
USP16673	Ultra-Thin Polyimide Insulation Film, Solderable Lead Wires	1.260 × 0.197 × 0.040	10,000	1	---	E1	---	3435	0.7	5	-30 to +90

RTD Probes and Assemblies

Threaded


USW3483

Product Series	Description	Overall Dimensions		Nominal Resistance	Resistance Tolerance	DIN 43760 Class	Temperature Coefficient of Resistance	Temperature Rating
		Inches		Ohms	%		ppm / ˚C	˚C
		Probe ø × Probe L	Hex Head W × Plug L	@ 25˚C				Maximum
USW3483	Stainless Steel Housing, 3/8"-18 NPT Thread, PVC Insulated Lead Wire	0.250 × 3.00	0.6875 × 0.750	1,000	0.06	A	3850	105

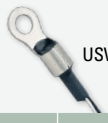
Plastic

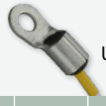

USW2883

Product Series	Description	Overall Dimensions	Nominal Resistance	Resistance Tolerance	DIN 43760 Class	Temperature Coefficient of Resistance	Temperature Rating
		Inches	Ohms	%		ppm / ˚C	˚C
		Probe ø × Probe L	@ 25˚C				Maximum
USW2883	Polyimide Housing, Uninsulated Nickel Lead Wire	0.110 × 0.220	500	0.12	B	3850	150

Ring Lug


USW2295


USW2299


USW3866

Product Series	Description	Overall Dimensions	Nominal Resistance	Resistance Tolerance	DIN 43760 Class	IEC 60751 Class	Temperature Coefficient of Resistance	Temperature Rating
		Inches	Ohms	%			ppm / ˚C	˚C
		Ring Lug L × Ring Lug W	@ 0˚C					Maximum
USW2295	Ring Lug Housing, #6 Mounting Hole, Teflon Insulated Lead Wire	0.620 × 0.281	100	0.24	C	---	3850	150
USW2299	Ring Lug Housing, #8 Mounting Hole, Teflon Insulated Lead Wire	0.720 × 0.312	1,000	0.12	B	---	3850	105
USW3866	Ring Lug Housing, #10 Mounting Hole, PVC Insulated Lead Wire	0.750 × 0.375	1,000	0.12	B	F 0.3	3850	105

For details on electrical specifications, visit littelfuse.com.

Leaded RTDs

Thin-Film Plated RTD Sensors



PPG

Product Series	Description	Overall Dimensions	Resistance	Resistance Tolerance	DIN 43760 Class	IEC 60751 Class	Temperature Deviation	Temperature Coefficient of Resistance	Dissipation Constant, Nominal	Thermal Time Constant, Max. - 1 m/s Moving Air	Temperature Rating
		Inches	Ohms	± %			± ˚C	ppm / ˚C	mW / ˚C	Seconds	˚C
		Body L × W × T	@ 0˚C	@ 0˚C			@ 0˚C				
PPG	Thin-Film Platinum RTDs	0.0315 × 0.1181 × 0.049 or 0.0472 × 0.063 × 0.049 or 0.118 × 0.079 × 0.049	100 - 1000	0.06; 0.12; 0.24	B, C	F 0.15	0.15 - 0.6	3750 - 3850	1.8 - 2.2	1.2 - 15	-200 to +600

Digital Temperature Indicators

Digital Temperature Indicators



setP™

Product Series	Description	Overall Dimensions	Indicating Temperature			Resistance		Hold Current	Trip Current	Withstand Voltage	Max. Fault Current	Power Dissipated	Time-to-Trip Current	Time-to-Trip	R_{min}	R_{tmax}	Temperature Rating
		Inches	˚C			Ohms		A	A	Vdc	A	W	A	Seconds	Ohms	Ohms	˚C
		L × W × T	Minimum	Typical	Maximum	Max. @ 25˚C	Indicating			Maximum	Maximum	Typical		Maximum	Minimum	Maximum	
setP™	Digital Temperature Indicators, Surface Mount, 0805 Size	0.087 × 0.059 × 0.024	90	100	110	6; 12	35,000	0.06 - 0.075	0.25 - 0.30	6	1	0.6	0.3	1 - 5	0.5	6 - 12	-40°C to +85°C

For details on electrical specifications, visit littelfuse.com.

Typical Applications

HVAC/R

- Residential & Commercial A/C
- Chilled Water Systems
- Outdoor Temperature Sensors
- Instant Water Heaters
- Condenser, Evaporator & Duct Sensors



Renewable Energy

- Hydrogen Fuel Cell Sensors
- Battery Fuel Gauges
- Solar Panel
- Geothermal
- Battery Energy Storage Systems
- Solar Inverters



Appliances

- Oven Temperature Control
- Washing Machines
- Clothes Dryers
- Water Heaters
- Consumer Refrigerators/ Freezers



Food Service

- Commercial Coffee Makers
- Hot/Cold Beverage Dispensers
- Food Thermometers
- Walk-in & Reach-in Refrigerators/Freezers
- Temperature Controlled Display Cases



Medical

- Blood Analysis Equipment
- Infant Incubators
- Skin Temperature Monitors
- Blood Dialysis Equipment
- Patient Warming

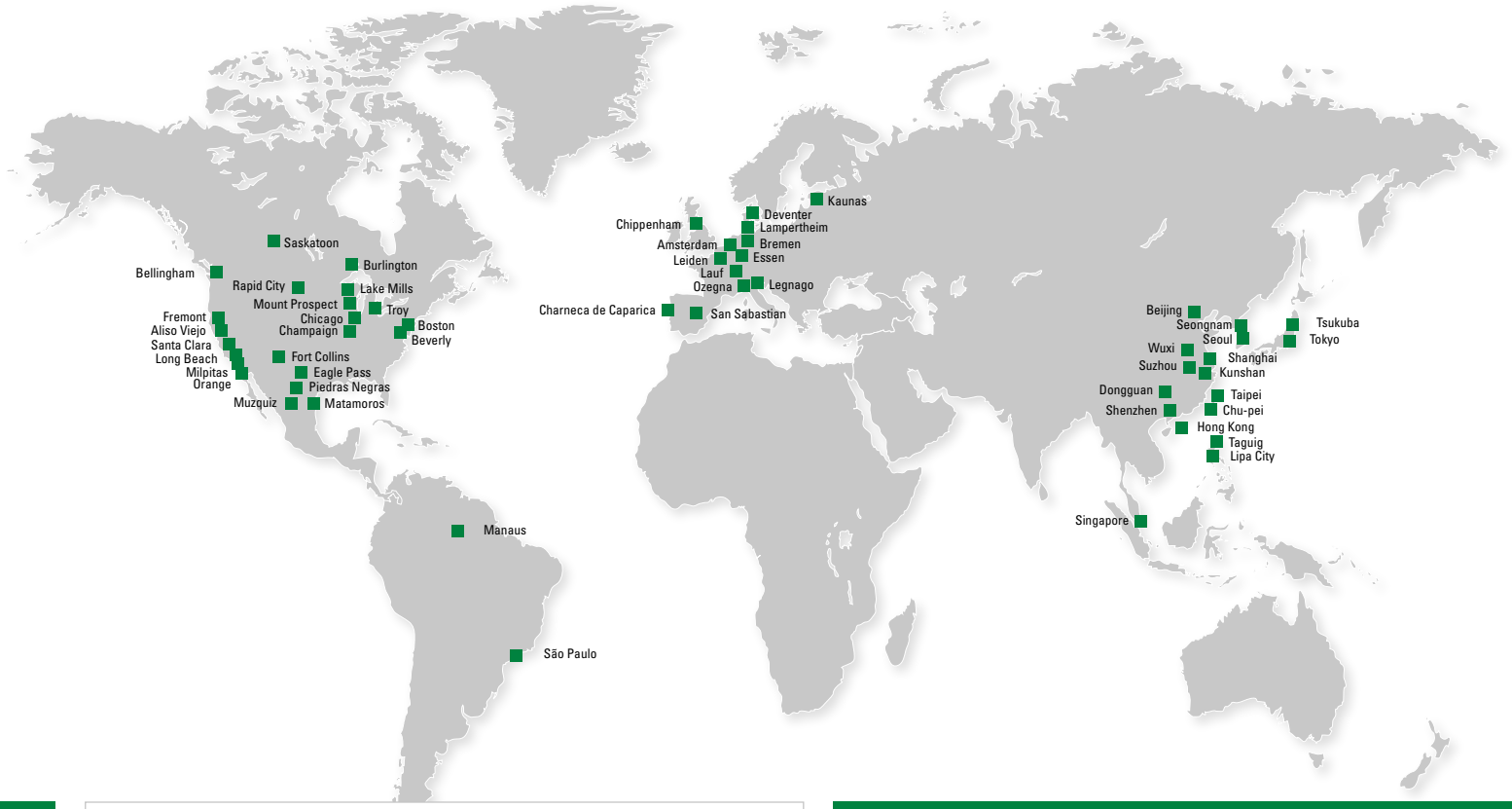


Industrial

- Fluid Flow Measurement
- Crystal Ovens
- Welding Equipment
- Industrial Process Controls



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