

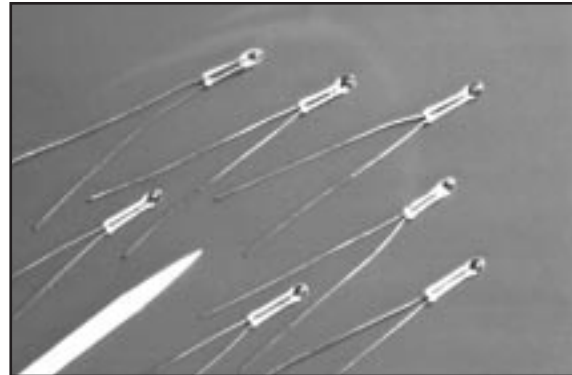


# NTC THERMISTORS: TYPE SP60/65/85/100

## ULTRASTABLE PROBE THERMISTOR

### DESCRIPTION:

The Type SP60, SP65, SP85 and SP100 ULTRASTABLE THERMOPROBES have similar construction and dimensions as the Type P60, P65, P85 and P100 THERMOPROBES. ULTRASTABLE THERMOPROBES receive additional processing to assure their continuous use in one of three (3) Temperature Classes and are categorized into one of six (6) Stability Groups.



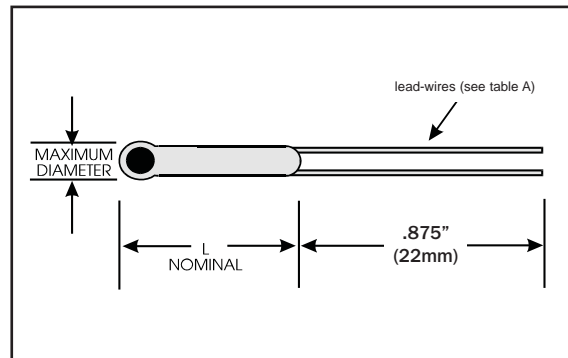
### APPLICATIONS:

The Type SP60, SP65, SP85 and SP100 ULTRASTABLE THERMOPROBES may be used in all temperature measurement and control applications with the added assurance of known long term stability and reliability. They are the ideal choice for use as secondary standards in laboratories.

### DATA:

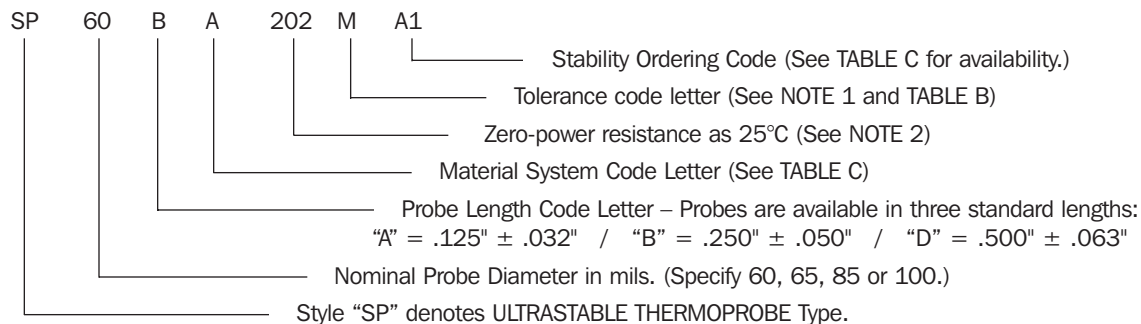
The Temperature Class represents the maximum permissible continuous operating or storage temperature. The Stability Group represents the maximum drift rate, in percent resistance change per year, of the thermistor when operated or stored at all temperatures up to the maximum rating. ULTRASTABLE THERMOPROBES should not be exposed to temperatures higher than the maximum rating as this will degrade their stability and void the stability classification. When specified, additional preconditioning can be performed to stabilize units for a particular application.

### DIMENSIONS:



### CODING:

The code number to be ordered may be specified as follows:



**NOTE 1:** Special tolerances are available on request. Consult factory for special resistance tolerances, non-standard resistances and/or non-standard temperatures.

**NOTE 2:** The zero-power resistance at 25°C, expressed in Ohms, is identified by a three digit code number. The first two digits represent significant figures, and the last digit specifies the number of zeros to follow. Example: 2k Ohms = "202". The standard resistance values are from the 24-Value series decade as specified in Military Standard MS90178.

- 1.0 / 1.1 / 1.2 / 1.3 / 1.5 / 1.6 / 1.8 / 2.0 / 2.2 / 2.4 / 2.7 / 3.0  
 3.3 / 3.6 / 3.9 / 4.3 / 4.7 / 5.1 / 5.6 / 6.2 / 6.8 / 7.5 / 8.2 / 9.1

**TABLE A: THERMAL AND ELECTRICAL PROPERTIES:**

The following table lists the THERMAL and ELECTRICAL properties for all ULTRASTABLE THERMOPROBES. All definitions and test methods are per MIL-PRF-23648.

THERMISTOR TYPE:		SP60	SP65	SP85	SP100
<b>BODY DIMENSIONS:</b>					
	Max. Diameter:	.060" (1.5 mm)	.065" (1.5 mm)	.085" (1.5 mm)	.100" (1.5 mm)
<b>Standard Lengths:</b>	code "A"	.125" (3.2 mm)	.125" (3.2 mm)	.125" (3.2 mm)	.125" (3.2 mm)
	code "B"	.250" (6.3 mm)	.250" (6.3 mm)	.250" (6.3 mm)	.250" (6.3 mm)
	code "D"	.500" (12.7 mm)	.500" (12.7 mm)	.500" (12.7 mm)	.500" (12.7 mm)
<b>lead-wires:</b>					
	Nom. Diameter:	.008" (.20 mm)	.008" (.20 mm)	.012" (.30 mm)	.012" (.20 mm)
	Minimum Lead Length:	.875" (22 mm)	.875" (22 mm)	.875" (22 mm)	.875" (22 mm)
	Lead Material:				
	Class "A" (105°C)	Tinned Dumet	Tinned Dumet	Tinned Dumet	Tinned Dumet
	Class "B" (200°C)	Platinum Alloy	Platinum Alloy	Platinum Alloy	Platinum Alloy
	Class "C" (300°C)	Platinum Alloy	Platinum Alloy	Platinum Alloy	Platinum Alloy
<b>THERMAL TIME CONSTANT:</b>					
	Still Air at 25°C:	12 sec	13 sec	16 sec	22 sec
	Plunge into Water:	300 msec	320 msec	400 msec	600 msec
<b>DISSIPATION CONSTANT:</b>					
	Still Air at 25°C:	.60 mW/°C	.65 mW/°C	.85 mW/°C	1.00 mW/°C
	Still Water at 25°C:	3.00 mW/°C	3.30 mW/°C	4.00 mW/°C	5.00 mW/°C
<b>POWER RATING: (in air)</b>					
	100% Maximum Power Rating @ 25°:	.048 Watts	.052 Watts	.068 Watts	.080 Watts
	Derated to 0% @ Max. Temp.	See Class	See Class	See Class	See Class

**TABLE B: STANDARD TOLERANCES:**

Tolerance Code Letter	F	G	J	K	L	M	N	P	Q	R	S
± % Tolerance at 25°C	1	2	5	10	15	20	25	30	40	50	Non-standard – consult factory

**TABLE C: STABILITY CLASSES: (BY NOMINAL RESISTANCE AT 25°C)**

ULTRASTABLE THERMOPROBE availability depends upon nominal resistance at 25°C. Stability Class is indicated by a code letter for Temperature Class and a code number for Stability Group. Example: "A1" = .02% max. change per year at 105°C Max. Temperature.

ALL TYPES: SP60, SP65, SP85, SP100			Nominal Resistance Range @ 25°C (Ohms)	Temperature Class		Stability Group (resistance change)	
CODE LETTER	R-vs-T CURVE	25/125 RATIO		Class "A"	Class "B"	Class "C"	Class "C"
E	0	5.0	30 – 51	– – – – – A6	– – – – –	– – – – –	C6
A	1	11.8	51 – 150	– – A3 A4 A5 A6	– – B6	– – C6	C6
A	2	12.5	150 – 360	– – A3 A4 A5 A6	– – B6	– – C6	C6
A	3	14.0	360 – 750	– – A3 A4 A5 A6	– – B6	– – C6	C6
A	4	16.9	750 – 1.5k	A1 A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
A	5	19.8	1.5k – 3.6k	A1 A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
A	6	22.1	3.6k – 6.2k	A1 A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
A	7	22.7	6.2k – 9.1k	A1 A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
B	8	29.4	9.1k – 27k	A1 A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
B	9	30.8	27k – 43k	– A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
B	10	32.3	43k – 75k	– A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
B	11	35.7	75k – 160k	– A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
B	12	38.1	160k – 360k	– A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
B	13	45.0	360k – 750k	– A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
B	14	48.1	750k – 1.5M	– A2 A3 A4 A5 A6	– B5 B6	– – C6	C6
B	15	56.5	1.5M – 3.0M	– – – A4 A5 A6	– – B6	– – C6	C6
D	16	75.6	3.0M – 8.2M	– – – A4 A5 A6	– – B6	– – C6	C6
D	17	81.0	8.2M – 20M	– – – A4 A5 A6	– – B6	– – C6	C6

RESISTANCE -VS- TEMPERATURE CHARACTERISTICS: The nominal resistance range for the zero-power resistance at 25°C is shown for each large bead-in-glass THERMOROD Type and each available Material System. Each Material System is denoted by an ordering Code Letter, a referenced Curve number and the nominal 25°C/125°C resistance ratio.