



T H E R M O M E T R I C S  
A C O M M I T M E N T T O E X C E L L E N C E

# NTC Type SP Series

## Ultra-stable Probe Thermistors



The NTC Type SP60, SP65, SP85, and SP100 Ultra-stable Probe Thermistors have similar construction and dimensions to the Type P60, P65, P85, and P100 Probe Thermistors. Ultra-stable Probe Thermistors receive additional processing to assure their continuous use in one of three temperature classes and are categorized into one of six stability groups.

### Applications

The NTC Type SP60, SP65, SP85, and SP100 Ultra-stable Probe Thermistors may be used in all temperature measurement and control applications with the added assurance of 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 available. 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. Ultra-stable Probe Thermistors 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.

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# SP60/65/85/100 Specifications

## Thermal and Electrical Properties

The following table lists the thermal and electrical properties for all ultra-stable probe thermistors. All definitions and test methods are per MIL-PRF-23648



NTC Type SP60/65/85/100 dimensions

Table A

Thermistor Type	SP60	SP65	SP85	SP100
<b>Body Dimensions</b>				
Max. Diameter	.060 in (1.5 mm)	.065 in (1.6 mm)	.085 in (2.1 mm)	.100 in (2.5 mm)
<b>Standard Lengths</b>				
Code "A"	.125 in (3.2 mm)	.125 in (3.2 mm)	.125 in (3.2 mm)	.125 in (3.2 mm)
Code "B"	.250 in (6.3 mm)	.250 in (6.3 mm)	.250 in (6.3 mm)	.250 in (6.3 mm)
Code "D"	.500 in (12.7 mm)	.500 in (12.7 mm)	.500 in (12.7 mm)	.500 in (12.7 mm)
<b>Lead-wires</b>				
Nominal Diameter	.008 in (.20 mm)	.008 in (.20 mm)	.012 in (.30 mm)	.012 in (.30 mm)
Minimum Lead Length	.875 in (22 mm)	.875 in (22 mm)	.875 in (22 mm)	.875 in (22 mm)
<b>Lead Material</b>				
Class "A" 200°F (105°C)	Tinned Dumet	Tinned Dumet	Tinned Dumet	Tinned Dumet
Class "B" 392°F (200°C)	Platinum Alloy	Platinum Alloy	Platinum Alloy	Platinum Alloy
Class "C" 572°F (300°C)	Platinum Alloy	Platinum Alloy	Platinum Alloy	Platinum Alloy
<b>Thermal Time Constant</b>				
Still Air at 77°F (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 77°F (25°C)	.60 mW/°C	.65 mW/°C	.85 mW/°C	1.00 mW/°C
Still Water at 77°F (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 @ 77°F (25°C)	.048 Watts	.052 Watts	.068 Watts	.080 Watts
Derated to 0% @ Maximum Temperature	See Class	See Class	See Class	See Class

## Stability Classes (By Nominal Resistance at 77°F (25°C))

Ultra-stable probe thermistors availability depends upon nominal resistance at 77°F (25°C). Stability class is indicated by a code letter for temperature class and a code number for stability group.

Example: "A1" = .02% maximum change per year at 221°F (105°C) maximum temperature.

Table B  
Material System (All Types 60/65/85/100)

Code Letter	R-vs-T Curve	25/125 Ratio	Nominal Resistance Range @ 77°F (25°C) Ohms (W)	Code Class "A"						Class "B"		Class "C"			
				221°F (105°C) maximum						392°F (200°C) maximum		572°F (300°C) maximum			
E	0	5.0	30 to 51	-	-	-	-	-	A6	-	-	-	-	-	C6
A	1	11.8	51 to 150	-	-	A3	A4	A5	A6	-	-	B6	-	-	C6
A	2	12.5	150 to 360	-	-	A3	A4	A5	A6	-	-	B6	-	-	C6
A	3	14.0	360 to 750	-	-	A3	A4	A5	A6	-	-	B6	-	-	C6
A	4	16.9	750 to 1.5k	A1	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
A	5	19.8	1.5k to 3.6k	A1	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
A	6	22.1	3.6k to 6.2k	A1	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
A	7	22.7	6.2k to 9.1k	A1	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
B	8	29.4	9.1k to 27k	A1	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
B	9	30.8	27k to 43k	-	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
B	10	32.3	43k to 75k	-	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
B	11	35.7	75k to 160k	-	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
B	12	38.1	160k to 360k	-	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
B	13	45.0	360k to 750k	-	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
B	14	48.1	750k to 1.5M	-	A2	A3	A4	A5	A6	-	B5	B6	-	-	C6
B	15	56.5	1.5M to 3.0M	-	-	-	A4	A5	A6	-	-	B6	-	-	C6
D	16	75.6	3.0M to 8.2M	-	-	-	A4	A5	A6	-	-	B6	-	-	C6
D	17	81.0	8.2M to 20M	-	-	-	A4	A5	A6	-	-	B6	-	-	C6

"1" = 0.02%/year

"2" = 0.05%/year

"3" = 0.075%/year

"4" = 0.1%/year

"5" = 0.2%/year

"6" = 0.5%/year

# Ordering Information

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

Code	Model Number
SP	60
SP	65
SP	85
SP	100

  

Code	Probe Length
A	1/8 in (3.175 mm)
B	1/4 in (6.35 mm)
D	1/2 in (12.7 mm)

  

Code	Material System Code
X	See table B for codes

  

Code	Zero-power resistance @ 77°F (25°C)**
202	See Note 2

  

Code	Tolerance*
F	1
G	2
J	5
K	10
L	15
M	20
N	25
P	30
Q	40
R	50
S	Non-standard (specify value)

  

Code	Temperature Class Stability
A	221°F (105°C) maximum
B	392°F (200°C) maximum
C	572°F (300°C) maximum

  

Code	Group (Resistance Change)
1	.02% per year
2	.05% per year
3	.075% per year
4	.1% per year
5	.2% per year
6	.5% per year

  

SP    \_ - \_ - \_ - \_ - \_ - \_ - \_ - \_ -    Typical model number

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

\*\*The zero-power resistance at 77°F (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

