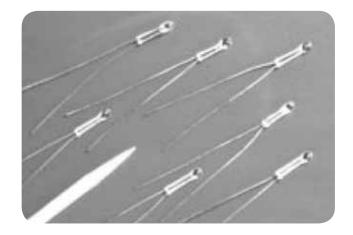


NTC Type SP Series

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 Ultrastable 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

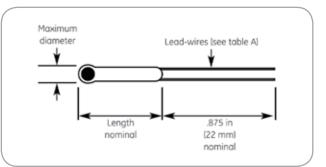
The temperature class represents the maximum permissible continuous operating or storage temperature available. The stability group represents the maximum drift rate, in percent resistance change per year, of the thermistor, when operated or stored at all temperatures up to the maximum rating. Ultrastable 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 preformed to stabilize units for a particular application.

Amphenol Advanced Sensors

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 | | |
| Body Dimensions | | · | | | | |
| Max. Diameter | .060 in (1.5 mm) | .065 in (1.6 mm) | .085 in (2.1 mm) | .100 in (2.5 mm) | | |
| Standard Lengths | | | | | | |
| Code "A" | .125 in (3.2 mm) | | |
| Code "B" | .250 in (6.3 mm) | | |
| Code "D" | .500 in (12.7 mm) | | |
| Lead-wires | | | | | | |
| 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) | | |
| Lead Material | | | | | | |
| 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 | | |
| Thermal Time Constant | | | | | | |
| 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 | | |
| Dissipation Constant | | | | | | |
| 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 | | |
| Power Rating (in air) | | | | | | |
| 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 | | |

2

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.

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

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

"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 | Mode | l Numbe | ər | | | | | | |
|------|------|---------|--------|----------|----------|----------|------------|-------------------------|---|
| SP | 60 | | | | | | | | |
| SP | 65 | | | | | | | | |
| SP | 85 | | | | | | | | |
| SP | 100 | | | | | | | | |
| 1 | I | Code | Probe | Length | า | | | | |
| | | А | 1/8 in | (3.175 r | nm) | | | | |
| | | В | 1/4 in | (6.35 m | m) | | | | |
| | | D | 1/2 in | (12.7 m | m) | | | | |
| | | 1 | Code | Mater | ial Syst | em Code | l. | | |
| | | | Х | See ta | ble B fo | r codes | | | |
| | | | 1 | Code | Zero-p | ower res | sistance @ | ₽ 77°F (25°C)** | |
| | | | | 202 | See N | ote 2 | | | |
| | | | | Т | Code | Toleran | ce* | | |
| | | | | | F | 1 | | | |
| | | | | | G | 2 | | | |
| | | | | | J | 5 | | | |
| | | | | | К | 10 | | | |
| | | | | | L | 15 | | | |
| | | | | | М | 20 | | | |
| | | | | | Ν | 25 | | | |
| | | | | | Р | 30 | | | |
| | | | | | Q | 40 | | | |
| | | | | | R | 50 | | | |
| | | | | | S | Non-sta | ndard (sp | ecify value) | |
| | | | | | | Code | Tempera | ture Class Stability | |
| | | | | | | A : | 221°F (10 | 5°C) maximum | |
| | | | | | | в | 392°F (20 | 0°C) maximum | |
| | | | | | | С | 572°F (30 | 0°C) maximum | |
| | | | | | | | Code Gr | oup (Resistance Change) |) |
| | | | | | | | 1.02 | % per year | |
| | | | | | | | 2.05 | % per year | |
| | | | | | | ; | 3.07 | 5% per year | |
| | | | | | | | 4.1% | 6 per year | |
| | | | | | | | 5.2% | 6 per year | |
| | | | | | | | 6.5% | 6 per year | |
| | | | | | | | | | |
| ¥ | ¥ | ♦ | ¥ | ᡟ | ₩ | ¥ . | ¥ | | |
| SP | | | | | | | Ту | pical model number | |

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

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