



# NTC THERMISTORS: TYPE P20/25/30

## MINIATURE THERMOPROBES

### DESCRIPTION:

The Type P20, P25 and P30 miniature THERMOPROBES consist of a small bead thermistor hermetically sealed in the tip of a shock resistant solid glass rod. The miniature THERMOPROBES have improved stability over glass coated and ruggedized glass bead thermistors.

### APPLICATIONS:

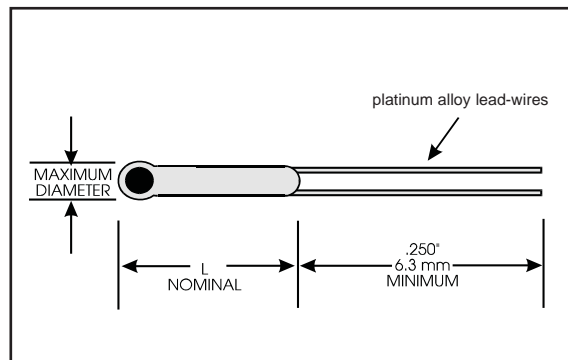
The Type P20, P25 and P30 miniature bead-in-glass probes feature high reliability, ease of handling and very fast response time. The longer body length makes them particularly well suited for applications where both fast response and immersion in fluids are the major requirements.



### DATA:

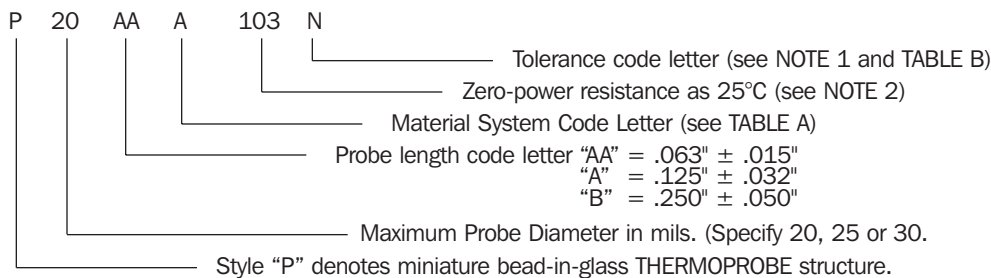
All THERMOPROBES are aged for extended periods of time. As such, they exhibit excellent stability for all service temperatures at or below the aging temperature. THERMOPROBES which are manufactured with Material System "E" are aged at 105°C; those manufactured with a Material System having a 25°C/125°C ratio of 16.9 or less are aged at 200°C; and all other Material Systems are aged at 300°C. Intermittent operation at temperatures up to 600°C is permissible, however, degraded stability will result when the aging temperature is exceeded.

### 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: 10k Ohms = "103". 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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**TABLE A: THERMAL AND ELECTRICAL PROPERTIES:**

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

THERMISTOR TYPE:			P20	P25	P30
<b>BODY DIMENSIONS:</b>					
		Max. Diameter:	.020" (.51 mm)	.025" (.64 mm)	.030" (.76 mm)
<b>Standard Body Lengths</b>	<b>"L"</b>	<b>code "AA"</b> <b>code "A"</b> <b>code "B"</b>	.063" (1.6 mm)	—	—
			.125" (3.2 mm)	.125" (3.2 mm)	.125" (3.2 mm)
			.250" (6.3 mm)**	.250" (6.3 mm)	.250" (6.3 mm)
<b>lead-wires:</b>					
		Nom. Diameter:	.0011" (.03 mm)	.002" (.05 mm)	.003" (.08 mm)
			**(.002" required)		
		Minimum Lead Length:	.250" (6.3 mm)	.250" (6.3 mm)	.250" (6.3 mm)
		Lead Material:	Platinum Alloy	Platinum Alloy	Platinum Alloy
<b>MATERIAL SYSTEM:</b>					
<b>CODE LETTER</b>	<b>R-vs-T CURVE</b>	<b>25/125 RATIO</b>	<b>Nominal Resistance Range @ 25°C</b>	<b>Nominal Resistance Range @ 25°C</b>	<b>Nominal Resistance Range @ 25°C</b>
E	0	5.0	—	—	—
A	1	11.8	300Ω – 680Ω	300Ω – 680Ω	100Ω – 300Ω
A	2	12.5	680Ω – 1.6kΩ	680Ω – 1.6kΩ	300Ω – 750Ω
A	3	14.0	1.6kΩ – 3.6kΩ	1.6kΩ – 3.6kΩ	750Ω – 1.5kΩ
A	4	16.9	3.6kΩ – 6.8kΩ	3.6kΩ – 6.8kΩ	1.5kΩ – 3.0kΩ
A	5	19.8	6.8kΩ – 27kΩ	6.8kΩ – 27kΩ	3.0kΩ – 6.8kΩ
A	6	22.1	—	—	6.8kΩ – 13kΩ
A	7	22.7	27kΩ – 75kΩ	27kΩ – 75kΩ	13kΩ – 18kΩ
B	8	29.4	75kΩ – 130kΩ	75kΩ – 130kΩ	18kΩ – 51kΩ
B	9	30.8	130kΩ – 240kΩ	130kΩ – 240kΩ	51kΩ – 82kΩ
B	10	32.3	240kΩ – 360kΩ	240kΩ – 360kΩ	82kΩ – 150kΩ
B	11	35.7	360kΩ – 820kΩ	360kΩ – 820kΩ	150kΩ – 330kΩ
B	12	38.1	820kΩ – 1.3MΩ	820kΩ – 1.3MΩ	330kΩ – 680kΩ
B	13	45.0	1.3MΩ – 3.3MΩ	1.3MΩ – 3.3MΩ	680kΩ – 1.5MΩ
B	14	48.1	3.3MΩ – 6.8MΩ	3.3MΩ – 6.8MΩ	1.5MΩ – 3.0MΩ
B	15	56.5	6.8MΩ – 10MΩ	6.8MΩ – 10MΩ	3.0MΩ – 6.2MΩ
D	16	75.6	—	—	6.2MΩ – 10MΩ
D	0	81.0	—	—	—
<b>THERMAL TIME CONSTANT:</b>					
		Still Air at 25°C:	1.6 sec	2.0 sec	3.0 sec
		Plunge into Water:	18 msec	23 msec	60 msec
<b>DISSIPATION CONSTANT:</b>					
		Still Air at 25°C:	.14 mW/°C	.16 mW/°C	.30 mW/°C
		Still Water at 25°C:	.70 mW/°C	.80 mW/°C	1.50 mW/°C
<b>POWER RATING: (in air)</b>					
		Maximum Power Rating:	.020 Watts	.025 Watts	.035 Watts
		100% Max. Power to:	150°C	150°C	150°C
		Derated to 0% at:	300°C	300°C	300°C

RESISTANCE -VS- TEMPERATURE CHARACTERISTICS: The nominal resistance range for the zero-power resistance at 25°C is shown for each miniature bead-in-glass THERMOPROBE 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.

**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

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