



# NTC THERMISTORS: TYPE P60/65/85/100

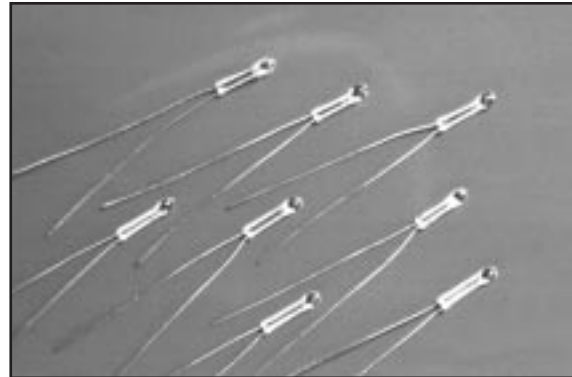
## LARGE BEAD-IN-GLASS THERMOPROBES

### DESCRIPTION:

The Type P60, P65, P85 and P100 THERMOPROBES consist of a large bead thermistor hermetically sealed in the tip of a shock resistant solid glass rod. They have excellent long term stability.

### APPLICATIONS:

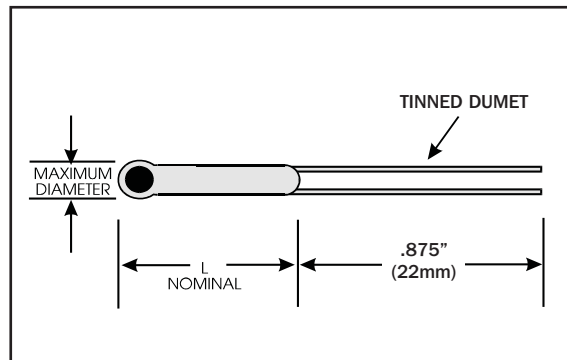
The Type P60, P65, P85 and P100 THERMOPROBES are recommended for all low cost, general purpose applications involving temperature measurement, temperature control, circuit temperature compensation, liquid level sensing or fluid flow sensing. They are ideally suited for applications which require a reliable, low cost sensor.



### DATA:

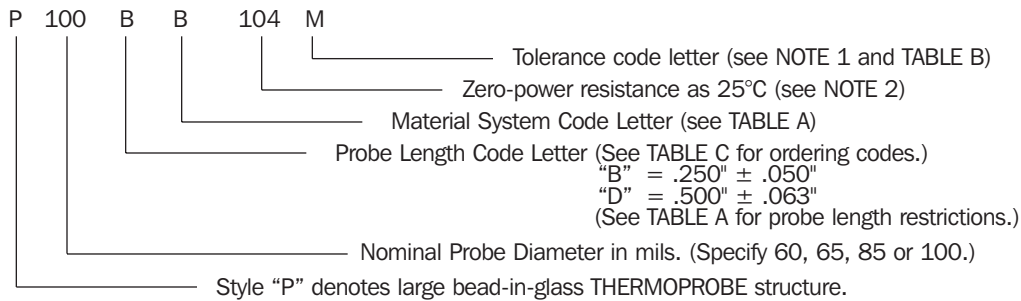
All THERMOPROBES are aged for extended periods of time. As such, they exhibit excellent stability for all service temperatures at or below the aging temperature. THERMOPROBES which are manufactured with Material System "E" are aged at 105°C; those manufactured with a Material System having a 25°C/125°C 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: 100k Ohms = "104". 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 LARGE BEAD-IN-GLASS THERMOPROBES. All definitions and test methods are per MIL-PRF-23648.

THERMISTOR TYPE:			P60	P65	P85	P100
<b>BODY DIMENSIONS:</b>						
	Max. Diameter:		.060" (1.5 mm)	.065" (1.7 mm)	.085" (2.2 mm)	.100" (2.5 mm)
<b>Standard Lengths:</b>	"L" { code "B" code "D"		.250" (6.3 mm)	.250" (6.3 mm)	.250" (6.3 mm)	.250" (6.3 mm)
	<b>Length Codes Available (Special Order Only)</b>		.500" (12.7 mm) "A", "C"	.500" (12.7 mm) "A", "C"	.500" (12.7 mm) "A", "C", "F", "H"	.500" (12.7 mm) "A", "C", "F", "H" "K", "M", "P", "R"
<b>lead-wires:</b>						
	Nom. Diameter:		.008" (.20 mm)	.008" (.20 mm)	.012" (.30 mm)	.012" (.30 mm)
	Minimum Lead Length:		.875" (22 mm)	.875" (22 mm)	.875" (22 mm)	.875" (22 mm)
	Lead Material:		Tinned Dumet	Tinned Dumet	Tinned Dumet	Tinned Dumet
<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 (Ohms)</b>	<b>Nominal Resistance Range @ 25°C (Ohms)</b>	<b>Nominal Resistance Range @ 25°C (Ohms)</b>	<b>Nominal Resistance Range @ 25°C (Ohms)</b>
E	0	5.0	30 – 51	30 – 51	30 – 51	30 – 51
A	1	11.8	51 – 150	51 – 150	51 – 150	51 – 150
A	2	12.5	150 – 360	150 – 360	150 – 360	150 – 360
A	3	14.0	360 – 750	360 – 750	360 – 750	360 – 750
A	4	16.9	750 – 1.5k	750 – 1.5k	750 – 1.5k	750 – 1.5k
A	5	19.8	1.5k – 3.6k	1.5k – 3.6k	1.5k – 3.6k	1.5k – 3.6k
A	6	22.1	3.6k – 6.2k	3.6k – 6.2k	3.6k – 6.2k	3.6k – 6.2k
A	7	22.7	6.2k – 9.1k	6.2k – 9.1k	6.2k – 9.1k	6.2k – 9.1k
B	8	29.4	9.1k – 27k	9.1k – 27k	9.1k – 27k	9.1k – 27k
B	9	30.8	27k – 43k	27k – 43k	27k – 43k	27k – 43k
B	10	32.3	43k – 75k	43k – 75k	43k – 75k	43k – 75k
B	11	35.7	75k – 160k	75k – 160k	75k – 160k	75k – 160k
B	12	38.1	160k – 360k	160k – 360k	160k – 360k	160k – 360k
B	13	45.0	360k – 750k	360k – 750k	360k – 750k	360k – 750k
B	14	48.1	750k – 1.5M	750k – 1.5M	750k – 1.5M	750k – 1.5M
B	15	56.5	1.5M – 3.0M	1.5M – 3.0M	1.5M – 3.0M	1.5M – 3.0M
D	16	75.6	3.0M – 8.2M	3.0M – 8.2M	3.0M – 8.2M	3.0M – 8.2M
D	17	81.0	8.2M – 20M	8.2M – 20M	8.2M – 20M	8.2M – 20M
<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>						
	Maximum Power Rating:		.060 Watts	.065 Watts	.085 Watts	.100 Watts
	100% Max. Power to:		200°C	200°C	200°C	200°C
	Derated to 0% at:		300°C	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 large 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

**TABLE C: PROBE LENGTH CODES:** (Refer to TABLE A for length options.)

Nominal Probe Length:	.125"	.250"	.375"	.500"	.750"	1.00"	1.25"	1.50"	1.75"	2.00"
Probe Length Code Letter:	A	B	C	D	F	H	K	M	P	R