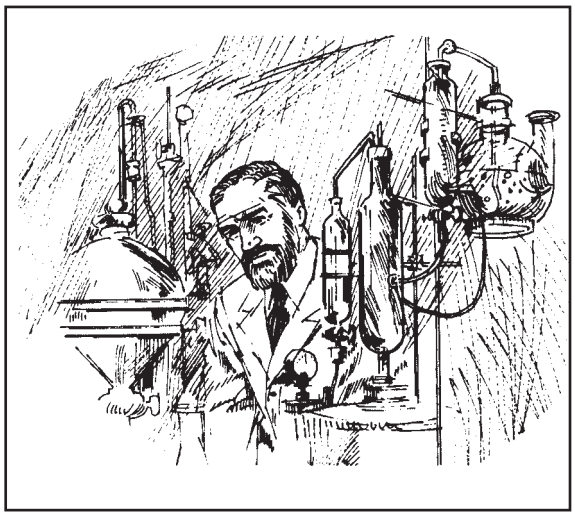
NTC THERMISTORS: TYPE MA

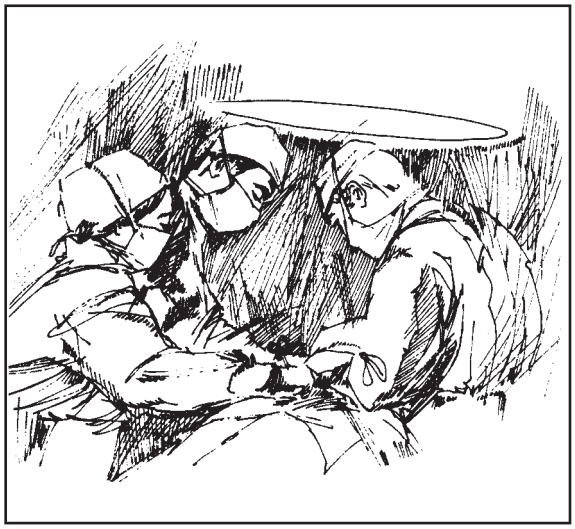
DESCRIPTION:

Our Biomedical Chip Thermistor assemblies are designed for use in applications involving both intermittent and continuous patient temperature monitoring. Repeatability and fast response are essential not only for the intermittent temperature requirements associated with oral and rectal fever measurements, but also with the continuous monitoring often necessary during induced-hypothermia and general anesthesia, or when employed in the care of infants and premature babies. Intensive care units along with recovery rooms have also adopted patient temperature as part of their vital sign monitoring procedures. Temperature monitoring for skin surface, tympanic, esophageal, foley catheters and biofeedback applications has also improved due to the high stability and tight interchangeable tolerances designed into each Thermometrics' Biomedical assembly.



APPLICATIONS:

A complete line of standard sub-assemblies is available, as shown in Figure 1; however, continuous research and development efforts within Thermometrics have resulted not only in these field proven designs, but in the development of our Unitherm Thermochip Thermistor designed exclusively for biomedical applications in the range of 0° C to 50° C. Although low in cost, these highly stable, precision thermochips provide the reliability, tight interchangeable tolerances, geometries, and fast response times required. To keep pace with this ever-improving biomedical market, our material system and processing parameters are closely monitored and improved to continually provide you with reliable, quality products. In addition, should you require it, Thermometrics employs a complete staff of experienced full-time applications engineers who welcome your inquiries, whether it's for assistance, or to help with your design requirements concerning new and existing applications.



Crown Industrial Estate, Priorswood Road
Taunton, Somerset TA2 8QY UK
Tel +44 (0) 1823 335200
Fax +44 (0) 1823 332637

808 US Highway 1
Edison, New Jersey 08817-4695 USA
Tel +1 (732) 287 2870
Fax +1 (732) 287 8847

967 Windfall Road
St. Marys, Pennsylvania 15857-3397 USA
Tel +1 (814) 834 9140
Fax +1 (814) 781 7969

TYPE MA

MA100

FIGURE 1A

Designed for use in catheter assemblies these sensors are available with nominal resistance values of 2252, 3000, 5000, and 10,000 ohms at 25° C. Close monitoring of manufacturing processes allow us to maintain tight interchangeability tolerances with volume production. Typical design parameters are represented in Table 1.

NOTE: .030"(10K ohm only) and .050" diameters available with kapton sleeve only.
.070" diameter normally supplied with molded plastic tip.

MA200

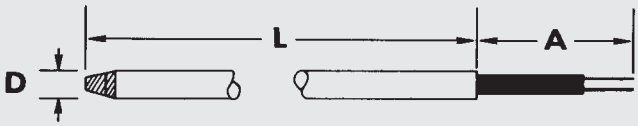


FIGURE 1B

Intermittent body temperature measurements are common practice in all phases of patient care. This assembly is ideally suited for the disposable cover oral and rectal fever thermometers in use today. It features rugged construction with tip sensitive shaft assemblies exhibiting resistance values of 2252, 3000, 5000, and 10,000 ohms at 25° C.

Refer to Table 1 for typical design parameters.

MA300

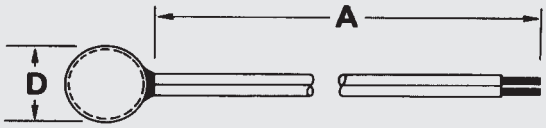


FIGURE 1C

Routine continuous patient temperature monitoring is now feasible by using the convenience of the patient's skin site as an indicator of body temperature. The stainless steel housing used is suitable for both reusable and disposable applications, while maintaining maximum patient comfort. Nominal resistance values of 2252, 3000, 5000, and 10,000 ohms at 25° C are available.

Refer to Table 1 for typical design parameters.

TABLE 1

Assembly Type	MA100	MA200	MA300
Standard Diameters D	.030" .050" .070" .080"	.156"	.375"
Body Length L	3/8"	3.75"	N / A
Lead Length A	24"	2"	24"
Tolerance	See Table	See Table	See Table
Wire Gauge	28, 30, 32, 38 AWG	30 AWG	30 AWG
Standard Wire Insulation	*Heavy Isomid *Medical Grade PVC *Polyurethane with Nylon Overcoat	Teflon	Medical Grade PVC Teflon
Body Material	Molded Plastic or Kapton Sleeve	Lexan Shaft Aluminum Tip	Stainless Steel
Nominal R Values @ 25°C	2252, 3000, 5000, 10,000 Ohms		

THERMAL RESPONSE TIME (63% RESPONSE)

Series	Still Air	Still Water*
MA100 Catheter Assembly	15 sec.	2.0 sec.
MA200 Oral-Rectal Assembly	35 sec.	0.6 sec.
MA300 Skin Surface Assembly	45 sec.	2.0 sec.

* Response time provided is for assembly plunged from 25°C air to 5°C still water

TOLERANCE CODE AND TEMPERATURE RANGE

Temperature Range °C	Tolerance Code		
	A ± °C	B ±°C	C ±°C
0-20	.15	.2	.25
20-35	.1	.15	.2
35-39	.05	.1	.15
39-42	.075	.15	.2
42-45	.1	.15	.2
45-50	.15	.2	.25

DATA:

Our biomedical series thermistor chips and sub assemblies are designed to be interchangeable over a 0°C to 50°C range. Best overall stability is maintained when exposure and storage temperatures remain below 70°C.

CODING:

MA XXXXX - XXX - X

TOLERANCE CODE: REFER TO TABLE

RESISTANCE CODE:*

232 = 2,252 OHMS
302 = 3,000 OHMS
502 = 5,000 OHMS
103 = 10,000 OHMS
103(Y) = 10,000 OHMS

*Refer to Resistance vs. Temperature Table

RESISTANCE VS. TEMPERATURE

TEMP °C	2252 OHMS	3k OHMS	5k OHMS	10k OHMS	103(Y) OHMS
0	7352.90	9795.16	16325.3	32650.5	29491.24
1	6988.42	9309.62	15516.0	31032.1	28157.49
2	6643.38	8849.98	14750.0	29499.9	26891.19
3	6317.41	8415.73	14026.2	28052.4	25688.61
4	6009.39	8005.39	13342.3	26684.6	24546.22
5	5718.10	7617.37	12695.6	25391.2	23460.72
6	5442.68	7250.46	12084.1	24168.2	22428.99
7	5182.12	6903.35	11505.6	23011.2	21448.12
8	4935.54	6574.88	10958.1	21916.3	20515.34
9	4702.12	6263.93	10439.9	20879.8	19628.07
10	4481.09	5969.48	9949.14	19898.3	18783.87
11	4271.72	5690.57	9484.28	18968.6	17980.43
12	4073.33	5426.28	9043.80	18087.6	17215.58
13	3885.28	5175.78	8626.30	17252.6	16487.30
14	3706.99	4938.27	8230.45	16460.9	15793.65
15	3537.90	4713.01	7855.01	15710.0	15132.82
16	3377.47	4499.30	7498.83	14997.7	14503.11
17	3225.23	4296.48	7160.80	14321.6	13902.89
18	3080.70	4103.95	6839.92	13679.8	13330.64
19	2943.46	3921.13	6535.22	13070.4	12784.92
20	2813.11	3747.48	6245.80	12491.6	12264.39
21	2689.26	3582.49	5970.82	11941.6	11767.75
22	2571.54	3425.68	5709.47	11418.9	11293.80
23	2459.64	6276.61	5461.01	10922.0	10841.39
24	2353.22	3134.84	5224.74	10449.5	10409.44
25	2252.00	3000.00	5000.00	10000.0	10000.00
26	2155.69	2871.70	4786.16	9572.32	9602.89
27	2064.02	2749.59	4582.64	9165.29	9226.41
28	1976.76	2633.34	4388.89	8777.79	8866.62
29	1893.67	2522.10	4204.34	8408.68	8522.70
30	1814.51	2417.19	4028.66	8057.31	8193.89
31	1739.09	2316.73	3861.22	7722.43	7879.43
32	1667.22	2220.99	3701.65	7403.29	7578.65
33	1598.51	2129.52	3549.20	7098.42	7290.88
34	1533.20	2042.50	3404.18	6808.36	7015.50
35	1470.89	1959.39	3265.65	6531.31	6751.92
36	1411.58	1880.47	3134.12	6265.75	6499.57
37	1354.91	1804.94	3008.23	6016.47	6257.93
38	1300.77	1732.82	2888.03	5776.05	6026.49
39	1249.08	1663.96	2773.26	5546.53	5804.78
40	1199.72	1598.20	2663.67	5327.34	5592.33
41	1152.57	1535.39	2558.99	5117.97	5388.73
42	1107.52	1475.38	2458.97	4917.94	5193.56
43	1064.47	1418.03	2363.39	4726.77	5006.43
44	1023.30	1363.17	2271.95	4543.91	4826.98
45	983.97	1310.80	2184.66	4369.33	4654.86
46	946.02	1260.25	2100.92	4200.84	4489.73
47	909.99	1212.24	2020.40	4040.81	5331.28
48	875.92	1166.85	1944.76	3889.51	4179.20
49	842.96	1122.95	1871.59	3743.17	4033.22
50	811.42	1080.93	1801.55	3603.10	3893.05

STANDARD ASSEMBLIES

100FA - Series 100, .070" diameter molded plastic tip, 30 gauge PVC insulated ribbon cable.

100FD - Series 100, .070" diameter molded plastic tip, 32 gauge bifilar heavy isomid insulation.

100DD - Series 100, .050" diameter kapton sleeve with 32 gauge bifilar heavy isomid insulation.

100BF - Series 100, .030" diameter kapton sleeve with 38 gauge bifilar heavy isomid insulation.

200LC - Series 200, .156" diameter aluminum tip, 30 gauge teflon leads.

300TA - Series 300, .375" diameter stainless steel cup, 30 gauge PVC insulated ribbon cable.

300TB - Series 300, .375" diameter stainless steel cup, 30 gauge teflon insulated ribbon cable.

100GG - Series, 100, .080” diameter molded plastic tip, 28 gauge kynar insulated twisted pair.