

Amphenol Sensors

Delivering Value-Add  Sensors

ASTG Distributor Training

AB Series Thermistor Assemblies



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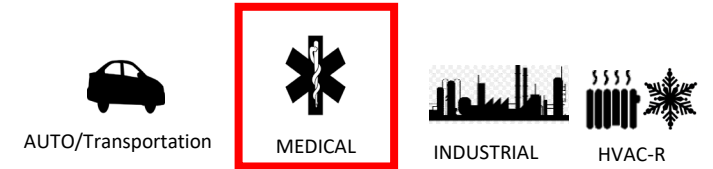


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AB Series Thermistor Assemblies

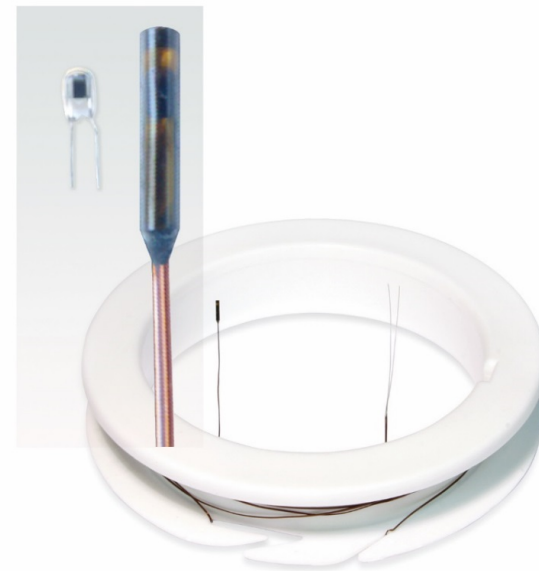


Training Topic

Overview of Amphenol Advanced Sensors AB Series miniature NTC thermistor assemblies for the Healthcare market

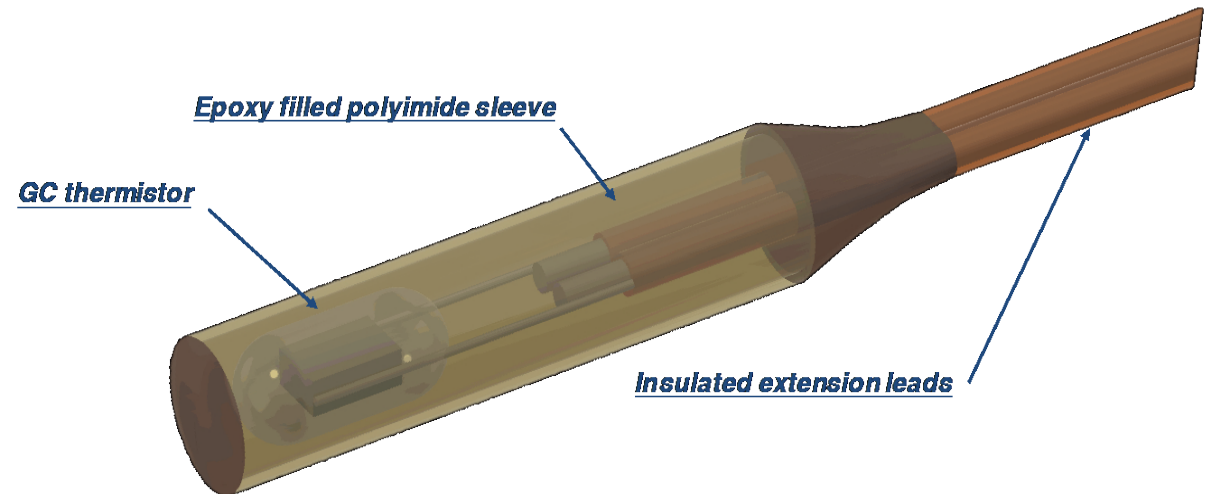
Overview

Highlight the features of the AB Series thermistor assemblies
Discuss the benefits of the AB Series
Review typical critical care / catheter applications

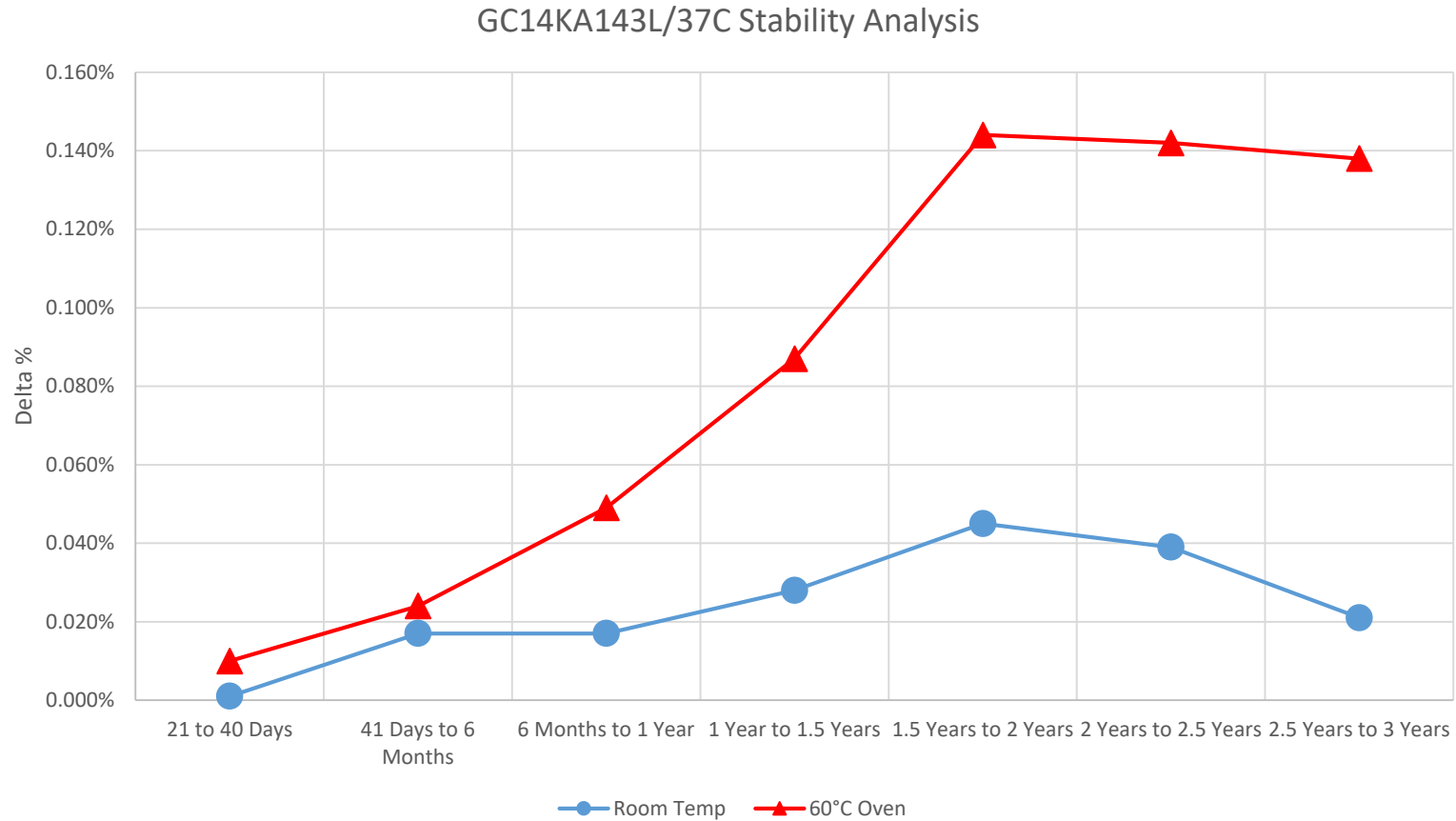


AB Thermistor Assembly Overview

- Consists of a small GC (chip-in-glass) thermistor
- Thermistor is hermetically sealed in glass
- Thermistor leads are welded to insulated extension leads
- Thermistor and / or weld joints are covered in one of several insulation types, depending upon the application or environment

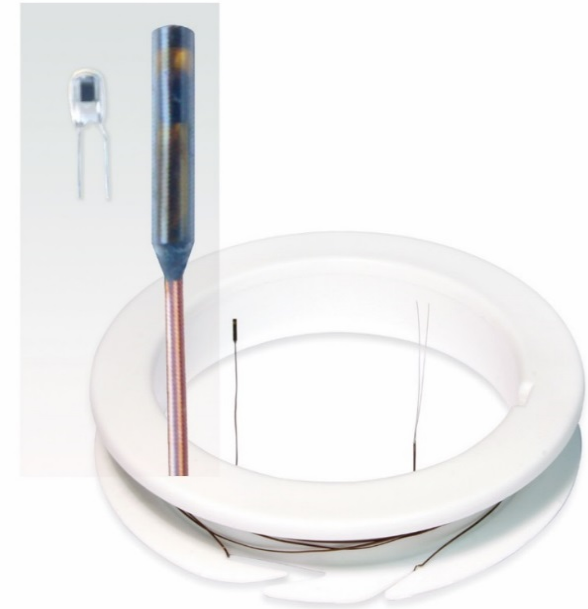


AB Thermistor Assembly Stability



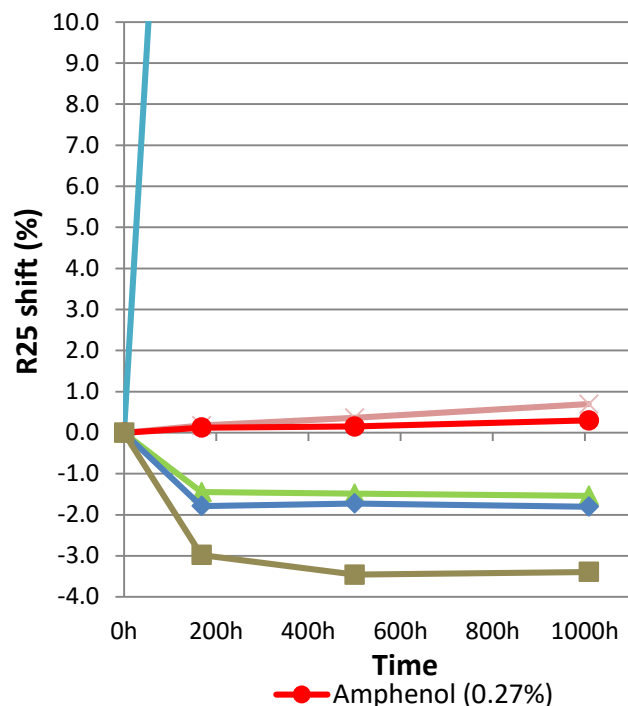
AB Thermistor Assembly Features

- Chip in Glass technology with proven reliability
- 14004 ohms @ +37°C
- $\pm 0.5\%$ & $\pm 15\%$ tolerance on resistance
- 25/50 Beta of 3500K $\pm 3\%$
- Six (6) feet long, #38 AWG Ni Alloy 200 bifilar leads with a heavy build polyester enamel insulation



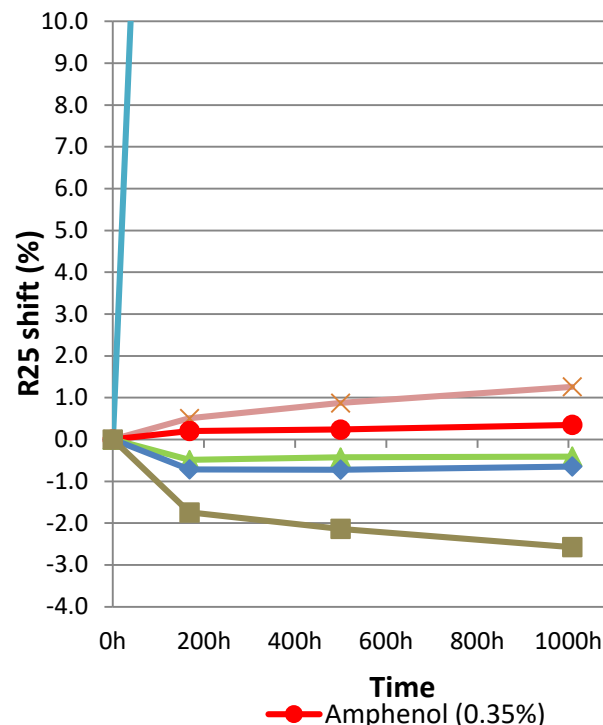
AB Thermistor Assembly Stability over temperature

Glass Encapsulated Thermistor
Resistance Shifts @300°C/1000hrs ageing



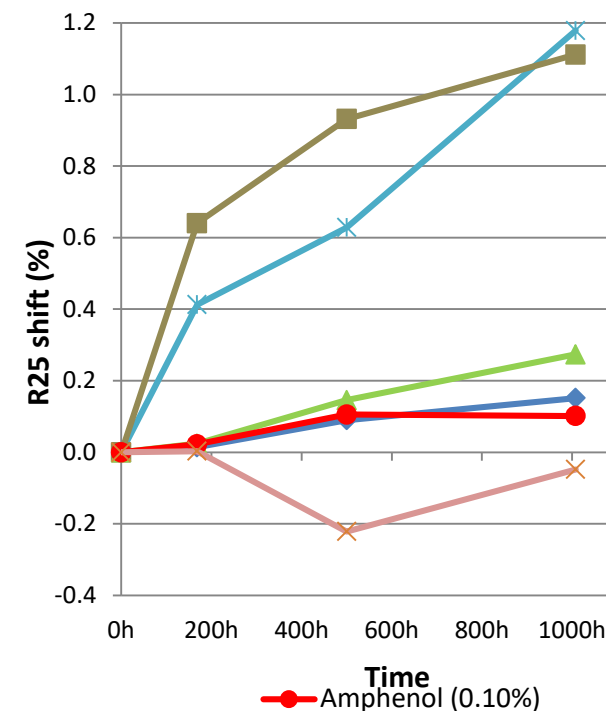
Supplier	Δ R25 %	Δ°C	Performance ranking
Amphenol	0.27	0.062	1
E	0.40	0.091	2
S	-0.64	0.146	3
K	0.69	0.157	4
V	-2.58	0.588	5
P	64.80	14.771	6

Glass Encapsulated Thermistor
Resistance Shifts @250°C/1000hrs ageing



Supplier	Δ R25 %	Δ°C	Performance ranking
Amphenol	0.350	0.080	1
E	-0.460	0.105	2
S	-0.640	0.146	3
K	1.260	0.287	4
V	-2.500	0.570	5
P	72.700	16.572	6

Glass Encapsulated Thermistor
Resistance Shifts @100°C/1000hrs ageing



Supplier	Δ R25 %	Δ°C	Performance ranking
K	-0.04	0.009	1
Amphenol	0.10	0.023	2
S	0.15	0.034	3
E	0.27	0.062	4
V	1.11	0.253	5
P	1.18	0.269	6

AB Thermistor Assembly Features



Multiple thermistor head insulation types available (***common types listed***)

Type A8: Liquid epoxy resin web over weld joints, no sleeve

Type B2: Epoxy filled polyimide sleeve, 0.090" ref long over thermistor and weld joints

Type B4: Epoxy filled polyimide sleeve, 0.090" ref long over weld joints, thermistor tip exposed

Type E3: Epoxy filled polyimide sleeve, 0.090" ref long over weld joints, liquid epoxy resin over thermistor tip

Type E5: Epoxy filled polyimide sleeve, 0.090" ref long over thermistor and weld joints, liquid epoxy resin coating

Type N2: Epoxy filled polyimide sleeve, 0.060" ref long over thermistor and weld joints

Type N4: Epoxy filled polyimide sleeve, 0.060" ref long over weld joints, thermistor tip exposed

AB Thermistor Assembly Benefits

- Suitable for insertion into hypodermic needles, catheters, or other small housings that require extended, insulated leads
- Fast response time without sacrificing ease of insertion
 - 1.2 sec nom in still air @ +25°C – Type B2 insulation
- Small profile for tight spaces, down to < 1 French
 - 0.022" OD – Type B2 w/ GC14
 - 0.016" OD – Type B4 w/ GC14
 - 0.0125" OD – Type N4 w/ GC11
- Excellent point isolation of measurement
- Available for use with any small GC (chip-in-glass), BR (ruggedized bead), B (coated bead), or P (glass probe) thermistor
- Complete immersion in conductive fluids with Type E3, E5, & E8 insulations
- Alternate lead conductor materials and insulations available



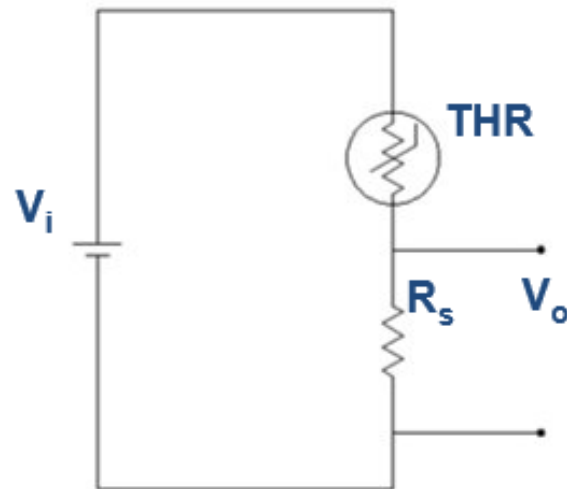
AB Thermistor Assembly Applications

- Continuous cardiac output monitoring
- Thermal dilution catheters
- Ablation catheters
- Foley catheters
- Esophageal catheters
- Internal body temperature monitoring
- Surgical instruments / probes
- Disposable patient temperature monitoring

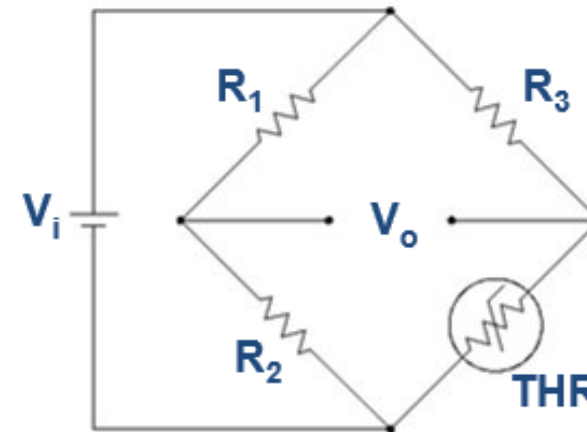


AB Thermistor Assembly Applications

Voltage Divider



Wheatstone Bridge



Additional Information

Product Spotlight

Product Spotlight

"AB" Thermistors for Healthcare

Features

- Chip in Glass Technology with proven reliability
- 14004 ohms @ 37°C
- 25/50 Beta: 3500 nominal
- Very Fast Response Time
- Small Profile for Tight Spaces
- Excellent Point Isolation of Measurement

Resistance vs. Temperature

Temp (°C)	Resistance (ohms)	Temp (°C)	Resistance (ohms)	Temp (°C)	Resistance (ohms)
0	80775.7	17	8008.7	34	15004.0
1	80044.0	18	29002.1	35	15007.0
2	17000.0	19	27000.0	36	14004.0
3	54000.4	20	26000.0	37	14004.0
4	12000.0	21	25000.0	38	13004.0
5	12000.0	22	24000.0	39	13000.0
6	40000.0	23	23000.0	40	12000.0
7	40000.4	24	22000.0	41	12000.0
8	44000.0	25	21000.0	42	11000.0
9	40000.4	26	21000.0	43	11000.0
10	40000.0	27	20000.0	44	10000.0
11	39000.0	28	19000.0	45	10000.0
12	37000.0	29	18000.0	46	10000.0
13	35000.0	30	17000.0	47	9000.0
14	34000.4	31	17000.0	48	9000.0
15	33000.0	32	16000.0	49	9000.0
16	31000.0	33	15000.0	50	8000.0

Applications

- Continuous Cardiac Output Monitoring
- Thermal dilution catheters
- Foley catheters
- Esophageal catheters
- Internal Body Temperature monitoring
- Other Disposable Temperature Monitoring

SKU	Description	Tol. @ 37°C	Figure	"OD"	"LEN"	Lead Type
800812	AB6B2-Q016K143E/37G	±0.6%	1	0.022"	0.090"±0.010"	#38AWG Ni
800804	AB6B2-Q014K143L/37G	±15%	1	0.022"	0.090"±0.010"	#38AWG Ni
807894	AB6B4-Q011K143L/37G	±15%	2	0.014"	0.090"±0.010"	#40AWG Cu
808401	AB6B4-Q011K143L/37G	±15%	2	0.012"	0.090"±0.010"	#44AWG Cu
800891	AB6B2-Q014K143E/37G	±0.6%	1	0.015" max	0.090" ± 0.006"	#38AWG Ni
808403	AB6B4-Q011K143L/37G	±15%	2	0.012" max	0.095" ± 0.009"	#44AWG Ni

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<https://www.amphenol-sensors.com/en/component/edocman/330-thermometrics-product-spotlight-ab-thermistors-for-healthcare/download?Itemid=8484%20%27>

Datasheet

NTC Type AB6 Thermometrics Thermobeads and GCs (Chip-in-Glass)

Description

NTC Type AB6 thermistor assemblies consist of small GC (chip-in-glass) or Thermobeads that are welded to insulated extension leads. The Thermobeads or GC (chip-in-glass) are hermetically sealed in glass and have fine diameter 0.0007 in to 0.004 in (0.01778 mm to 0.1016 mm) platinum alloy leads. The platinum leads are cut short and welded to insulated extension leads and the joints are covered in one of several insulation types, depending upon the application or environment. The assembly is then ready for insertion into hypodermic needles, catheters or other small housings that require extended leads. Any of the Thermobeads or GC (chip-in-glass) listed in Table I may be used in a NTC Type AB6 assembly. Please consult the data shown for specific electrical or mechanical properties for the thermistor selected.

Applications

Thermobead and GC (chip-in-glass) assemblies are used where the small thermistor must be further connected to longer leads, for insertion into deep wells and cavities, or threading into long tubes. They may also be used, as is, for applications that require fast response measurements in confined spaces. With these assemblies, the fast response of the small thermistor is available without sacrificing ease of insertion. The added leads and insulation allow the minute assemblies to be handled in further assembly operations, such as insertion into catheter lumens. The same electrical characteristics that apply to the selected thermistor (resistance value, resistance ratio, stability) are unaltered in the assembly.

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<https://www.amphenol-sensors.com/en/component/edocman/143-thermometrics-ntc-type-thermistor-assemblies-ab6-series-datasheet/download?Itemid=8484%20%27>

Application Spotlight

Application Spotlight

Temperature Sensing in Medical Devices

Medical applications demand the ultimate in accurate and reliable monitoring of critical temperature measurement.

From the Amphenol Advanced Sensors family of brands, Thermometrics, Inc., designs and manufactures an extensive line of NTC thermistors and non-contact infrared (IR) based temperature sensors for this vital market.

In addition to our standard product offerings, Amphenol Advanced Sensors prides itself in our ability to customize a unique solution for each customer's application needs.

Whether superior resistance stability, tight temperature accuracy, small diameter, fast response, or all the above are critical for your design, our team is ready to partner with you.

Application Offerings

Cardiac Care Small diameter chip-in-glass or glass bead thermistor assemblies for temperature monitoring of catheterization catheters and continuous cardiac output systems. <i>Type AB6</i>	Respiratory Care Glass bead or epoxy-coated chip thermistors for temperature monitoring of ventilator flow tubes and humidifiers. <i>Type Glass Bead / Type AB6 / Type C01</i>
Skin Surface Interchangeable thermistor assemblies with temperature accuracy of ±0.05°C @ 37°C for continuous patient monitoring and neonatal incubator systems. <i>Type M0</i>	Thermometry Interchangeable thermistors and RT sensors for oral, rectal, tympanic, and auxiliary temperature measurements for predictive, clinical, or home thermometers. <i>Type M0 / Type M1 / Type M2</i>
Dialysis Small interchangeable thermistors for assembly into metal housings used to monitor fluid temperature during dialysis. <i>Type M0 / Type M1</i>	Surgical Miniature chip-in-glass or glass bead thermistors with fine diameter wires for insertion into hypodermic needles for myocardial surgeries and external attachment to metal lumens used during laser surgery. <i>Type M0 / Type M1 / Type M2</i>

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<https://www.amphenol-sensors.com/en/healthcare-spotlights/518-thermometrics-application-spotlight-thermistor-stability-benchmarking-part-4-application-spotlight>

Summary

- Chip in Glass technology with proven performance reliability
- 14004 ohms @ +37°C
- 25/50 Beta of 3500K $\pm 3\%$
- Very fast response time: 1.2 sec in still air w/ type B2
- Small profile for tight spaces: < 1 French (0.0125" OD)
- Excellent point insulation of measurement
- Catalog and customized options available: thermistor, insulation, and wire

