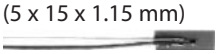
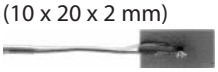
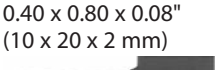
Thermal-Tab™ and Thermal-Ribbon™ Sensors

Install these compact sensors anywhere for accurate point sensing and fast response. All Thermal-Tab modules use a thin-film RTD element. All Thermal-Ribbon models conform to EN60751 Class B tolerance when ordered with a PD platinum element.

- Fast response surface sensing in aerospace, medical and industrial devices
- Rugged lamination construction
- Polyimide, silicone rubber or Mylar™ insulation
- All models are RoHS compliant

Thermal-Tab Specifications

Dimensions W x L x T_{max}	Element options	Insulation	Temperature range	Leadwires	Time constant*	Features	Model
0.20 x 0.50 x 0.08" (5 x 12 x 2 mm) 	PD, PF, PW	Polyimide with elastomer cover coat	-50 to 155°C -58 to 311°F	AWG 26, PTFE insulated	0.8 sec.	Stocked for immediate shipment	S665
0.20 x 0.60 x 0.08" (5 x 15 x 2 mm) 	PD, PF, PW, PS, NB, NA, NJ	Polyimide	-50 to 200°C -58 to 392°F	AWG 26, PTFE or polyimide insulated	1.0 sec.	Platinum models in stock	S17624
0.20 x 0.60 x 0.08" (5 x 15 x 2 mm) 	PD, PF, PW, PS	Polyimide film	-50 to 260°C -58 to 500°F	AWG 26, PTFE or polyimide insulated	0.4 sec.	Highest temperature capability	S100820
0.20 x 0.60 x 0.12" (5 x 15 x 3 mm) 	PD, PF, PW	Silicone rubber with elastomer cover and foil backing	-50 to 155°C -58 to 311°F	AWG 24, Silicone insulated	1.3 sec.	Waterproof; suitable for continuous immersion	S667
0.20 x 0.60 x 0.045" (5 x 15 x 1.15 mm) 	PD, PF, PW	Polyimide film	-50 to 200°C -58 to 392°F	AWG 26, PTFE or polyimide insulated	0.6 sec.	Thinnest profile	S100725
0.30 x 0.60 x 0.10" (7 x 15 x 2.5 mm) 	PD, PF, PW, PS, NB, NA, NJ	Polyimide film	-50 to 200°C -58 to 392°F	AWG 22, PTFE or polyimide insulated	1.2 sec.	Heavier leadwire for applications requiring ruggedized design	S100724
0.40 x 0.80 x 0.08" (10 x 20 x 2 mm) 	PD, PF, PW, PS, NB, NA, NJ	Polyimide film	-50 to 200°C -58 to 392°F	AWG 26, PTFE or polyimide insulated	0.9 sec.	Larger surface area for easier handling and maximum adhesive bond	S100723
0.40 x 0.80 x 0.08" (10 x 20 x 2 mm) 	PD, PF, PW, PS, NB, NA, NJ	Silicone rubber	-50 to 220°C -58 to 428°F	AWG 26, PTFE or polyimide insulated	1.5 sec.	High temperature rating, available with wide range of element options	S100721

Thermal-Ribbon Specifications

0.20 x 1.50 x 0.030" (5.1 x 38.1 x 0.8 mm) 	FA	Polyimide	-200 to 200°C -328 to 392°F	AWG 34, PTFE insulated	0.15 sec.	Wire-wound nickel-iron for high resistance in small package	S38
0.30 x 0.30 x 0.025" (7.6 x 7.6 x 0.7 mm) 	PD, PE	Polyimide with foil backing	-200 to 200°C -328 to 392°F	AWG 28, PTFE insulated	0.15 sec.	Wire-wound element	S651
0.75 x 0.75 x 0.04" (19 x 19 x 1.0 mm 	FA	Mylar	-200 to 150°C -328 to 302°F	AWG 30, PTFE insulated	0.3 sec.	Wire-wound nickel-iron flat element for high resistance	S25

*Notes: T_{max} is measured over the lead bulge.*Time constant is in water at 1 m/sec.*

Specifications, continued

Leadwire insulation codes	
S25, S38, S651, S665, S667	Leave blank
S17624, S100721, S100723, S100724, S100725, S100820	T = PTFE insulated wires K = Polyimide insulated wires

Specifications subject to change

Sensing elements

Sensing element specifications**		Code
Platinum (0.00385 TCR) (EN60751, Class B)	100 Ω ±0.12% at 0°C	PD
Platinum (0.00385 TCR)	100 Ω ±0.22% at 0°C	PE
Platinum (0.00385 TCR)	1000 Ω ±0.12% at 0°C	PF
Platinum (0.00375 TCR)	1000 Ω ±0.12% at 0°C	PW
Platinum (0.00385 TCR)	10,000 Ω ±0.12% at 0°C	PS
Nickel-iron (0.00518 TCR)	604 Ω ±0.26% at 0°C	FA
Nickel (0.00618 TCR) (DIN43760 NI100, Class B)	100 Ω ±0.22% at 0°C	NB
Nickel (0.00672 TCR)	120 Ω ±0.50% at 0°C	NA
Nickel (0.00618 TCR) (DIN43760 NI1000, Class B)	1,000 Ω ±0.22% at 0°C	NJ

*** See table on previous page for element options on each model.*

Waterproof model

Model S667 is waterproof and suitable for continuous immersion. Use it to monitor the temperature of water in a tank or container, or on equipment that must withstand wash-down or immersion.

Check with Minco for suitability in other liquids.

Specifications and order options

S17624	Model number from table
PD	Sensing element from table
Z	Number of leads: Y = 2 leads Z = 3 leads (N/A on S25, S38) X = 4 leads (N/A on S25, S38 or S665/S667)
T	Leadwire insulation code from table at left
24	Lead length in inches: S665/S667: 60" max.
A	Adhesive backing: A = No adhesive B = Pressure-sensitive adhesive (PSA)
Stop here for all models except S665 or S667. For models S665 and S667, add:	
C	Compliancy: C = RoHS Compliance
S665PDY40AC = Sample part number	

Notes: PSA reduces temperature range to -20 to 177°C (-4 to 350°F) and adds 0.005" (0.1 mm) to thickness.

Custom Thermal-Ribbon designs

Minco can custom-wind Thermal-Ribbon elements in virtually any shape and size. We can profile sensing elements to provide increased sensitivity in selected zones, and provide packaging to perfectly fit your applications.

Contact Minco Sales and Customer Service today to discuss your application.

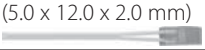
STOCKED PARTS AVAILABLE

Thermistor Thermal-Tab™

Overview

Model TS665 and TS667 offer extremely sensitive NTC thermistors for applications with small temperature changes. Model TS667 also features waterproof construction, making it suitable for continuous immersion.

Specifications

Dimensions W x L x T_{max}	Element options	Insulation	Temp. range	Leadwires	Time constant	Feature	Model
0.20 x 0.47 x 0.079" (5.0 x 12.0 x 2.0 mm) 	TF, TK	Polyimide with elastomer cover coat	-50 to 125°C (-58 to 257°F)	AWG 26, PTFE insulated	0.8 sec.	Small, low-cost	▼TS665
0.20 x 0.60 x 0.118" (5.0 x 15.2 x 3.0 mm) 		Silicone rubber with elastomer cover and foil backing		AWG 24, Silicone insulated	1.3 sec.	Waterproof, suitable for continuous immersion	▼TS667

*Notes: T_{max} is measured over the lead bulge. TS665 is suitable for the CT325 temperature controller (page 4-20). *Time constant is in water at 1 m/sec.*

Sensing elements

Sensing element specifications**		Code
NTC thermistor	50k Ω ±1% at 25°C	▼TF
NTC thermistor	10k Ω ±1% at 25°C	▼TK

*** See table above for element options on each model.*

Specification and order options

TS665	Model number from table	
TF	Sensing element from table	
Y	Number of leads:	Y = 2 leads
40	Lead length in inches:	▼40" (60" max.)
A	Adhesive backing: ▼A = No adhesive	B = Pressure-sensitive adhesive (PSA)
C	Compliancy: C = RoHS compliant	
TS665TFY40AC = Sample part number		

Note: PSA reduces temp. range to -20 to 177°C (-4 to 350°F) and adds 0.005" (0.1 mm) to thickness.

STOCKED PARTS AVAILABLE

Thermocouple Thermal-Ribbon™

Overview

TC40 is a patch-style thermocouple that adheres to all types of surfaces for quick and easy mounting.

Specifications

Dimensions W x L x T_{max}	0.75 x 0.75 x 0.065" (19.1 x 19.1 x 1.7 mm) 
Junction type	E, J, K, or T
Insulation	Polyimide
Temp. range	-200 to 200°C (-328 to 392°F)
Leadwires	AWG 24, solid PTFE insulated
Time constant	0.6 sec.
Features	Surface mounting
Model	TC40

Notes: T_{max} is measured over the lead bulge.
**Time constant is in water at 1 m/sec.*

Specification and order options

TC40	Model number
J	Junction type: E, ▼J, ▼K, or ▼T
T	Covering over leadwires: ▼T = PTFE only S = Stainless steel braid
40	Lead length in inches: ▼: 40, 240
A	Adhesive backing: A = No adhesive B = Pressure-sensitive adhesive (PSA)
TC40JT36A = Sample part number	

Note: PSA reduces temperature range to -20 to 177°C (-4 to 350°F) and adds 0.005" (0.1 mm) to thickness.

▼= STANDARD OPTIONS

Specifications subject to change

Thermal-Ribbon Installation and Accessories

Thermal-Ribbons lend themselves to a variety of installation methods. You should avoid repeated bending during the installation process, and Thermal-Ribbons should not flex in use unless they are specifically designed to do so. Take care to secure leadwires so they do not pull against sensor bodies. Leadwires should be routed along the sensed surface a short distance so that they do not sink heat away from the sensing element. Listed below are some standard installation methods.

Pressure sensitive adhesive

PSA (option B in part number) is the simplest mounting method, but it is restricted to flat surfaces and temperatures below 177°C (350°F). PSA is usually factory applied to the mounting surface of the Thermal-Ribbon. To install, just remove the backing paper and press in place.

#20 stretch tape

High temperature silicone rubber tape for mounting Thermal-Ribbons to pipes or other cylinders as shown above. It comes in 1" wide rolls, 6 or 36 feet long.

#6 RTV cement

Room temperature vulcanizing cement for mounting silicone rubber Thermal-Ribbons to flat or curved surfaces. It is available in 3 oz. (89 ml) tubes. Contact Minco for other adhesives usable with Kapton™ or Mylar™ Thermal-Ribbons.

Shrink bands

Minco shrink bands are pre-stretched plastic strips with adhesive at both ends. Use them to mount Thermal-Ribbons to cylinders. Simply wrap the band around the sensor and cylinder, secure the ends, and heat to shrink in place.
To order, specify band width and cylinder diameter.

#21 Polyimide tape

High temperature tape with silicone-based adhesive. Useful for quick mounting of Thermal-Ribbon or Thermal-Tab sensors to flat surfaces. Makes a strong but removable bond to most smooth and clean surfaces. Maximum operating temperature is 150°C. 0.5 inch wide x 108 ft. long roll.

Thermal Ribbons for pipe sensing

Thermal Ribbons make a practical, economical alternative to traditional immersed sensors for sensing fluid temperatures in pipes or tanks. They mount directly on pipe surfaces, so there is no need to tap and drain systems to install thermowells. If the Thermal-Ribbon is installed correctly, tests show that the thermal response is as quick and accurate as traditional invasive sensors. See page 8-7 for Thermal-Ribbons specially designed for pipe sensing.

Minco manufactures flexible Thermofoil™ etched-foil heaters for precision temperature control of critical applications. We can integrate heaters with Thermal-Ribbons and other sensors and controllers to provide complete turnkey thermal solutions.

Learn more about Thermofoil heater solutions at www.mod-tronic.com

Specifications subject to change