

Coil & Cable Heaters



Tempco-Pak Heaters

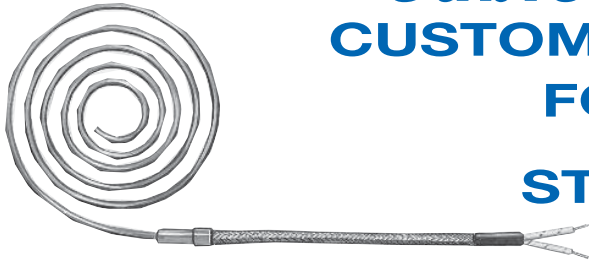
Cable HEATERS

CUSTOM ENGINEERED

FORMED

&

STRAIGHT



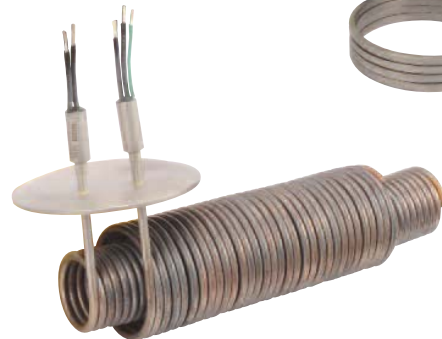
Spiral-wound Tempco-Pak heater cables are low profile and capable of generating high operating temperatures in restricted areas. The built-in thermocouple eliminates the need for a separate thermocouple. Works especially well as an alternative heat source for flat surface heating applications where other types of heaters cannot be used due to space restrictions. Consult Tempco with your requirements.



Compression fittings are available on straight cable heaters of various diameters (1/8", 3/16", 1/4", 5/16" and 3/8"). This fitting enables adjustment of the insertion length during installation. Compression fittings are available in Brass or Stainless Steel with standard male NPT threads. When ordering, specify heater sheath material, NPT size and material for compression fittings, insertion length, thermocouple type and type of junction (grounded or ungrounded), thermocouple and heater lead lengths, watts and volts. Optional—thermocouple location and cooler or unheated cable lengths. Consult Tempco with your requirements.

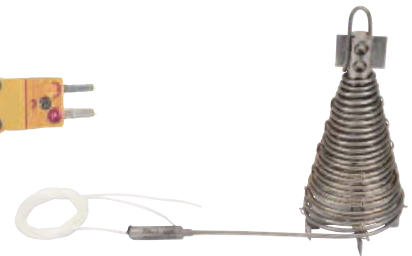


Sinuated (formed) Tempco-Pak heater cables are low profile and capable of generating high operating temperatures in restricted areas. The built-in thermocouple eliminates the need for a separate thermocouple. Works especially well as an alternative heat source for flat surface heating applications where other types of heaters cannot be used due to space restrictions. The sinuated cable can also be formed to conform to a cylindrical inside or outside surface. Consult Tempco with your requirements.



Lab Equipment: Gas Analyzer Heaters

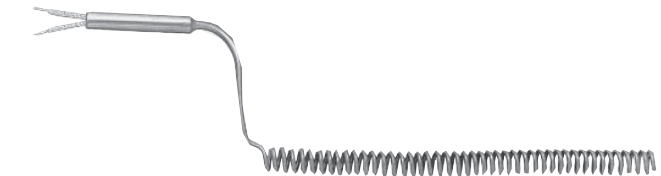
This heater heats gas analyzer samples quickly and uniformly. Low mass construction allows for a fast cool down, increasing cycle times. Adding a T/C or RTD to an assembly is not a problem. Straight lengths are also available for manual custom bending requirements.





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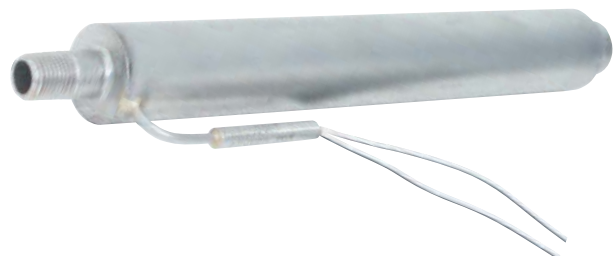


Miniature-Coil heaters are made for special applications. Cable diameter is less than .100". They work especially well as an alternative heat source for demanding and high temperature applications where other types of heaters have failed. Available with cooler or unheated cable section toward lead end. Consult Tempco with your requirements.



Stainless steel mounting flange is 1" diameter x .060" thick with two 1/4" holes on a 3/4" bolt circle. When ordering, specify location of mounting flange, cable diameter, length, sheath material, thermocouple type and type of junction (grounded or ungrounded), thermocouple and heater lead lengths, watts and volts—optional: thermocouple location and cooler or unheated cable lengths. Consult Tempco with your requirements.

NOTE: Mounting flange to be located over a cold or cooler section.



Gas or Air Heaters rated 1050 watts at 240 volts. One end has 1/4" MNPT and the other end has 1/4" FNPT so that you can have a series of the heaters for higher wattage requirements. It has 1-1/8" OD x 8" long stainless steel tubing body with 9-3/8" overall length.



Star-Wound Coil

Star wound formations are usually inserted into pipes or ducts and are used to heat moving air or liquids. The offset coils create a turbulent flow. This allows the flowing material to have better contact with the heater surface resulting in more efficient heat transfer.

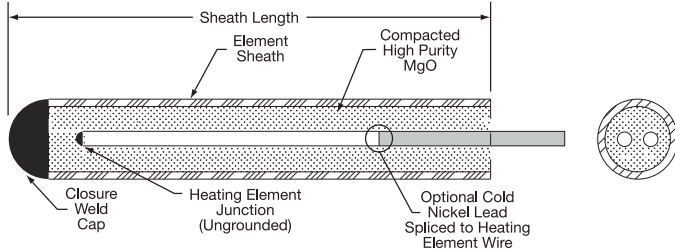
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Tempco-Pak Heaters

Tempco-Pak Heaters — Design Constructions

Tempco-Pak Heaters with Straight Wire



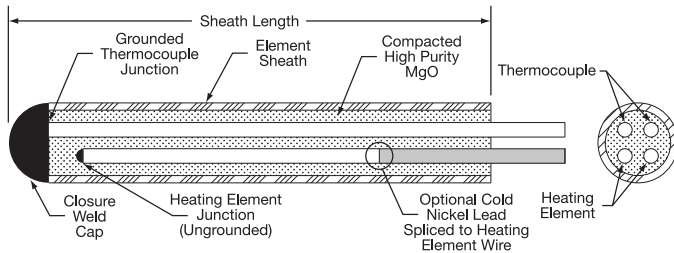
Tempco-Pak heaters are made from M.I. cable having 2 straight heating element wires insulated from the sheath by high purity MgO.

Available in nominal sheath diameters from 0.040" to 0.375" (1mm to 9.5mm) in 304 stainless steel and Inconel® 600 for Tempco-Pak heaters with straight wire. Optional cold nickel lead spliced to heating element wire is available in 0.125" diameter or larger depending on conductor material.

Nominal Sheath O.D.		Maximum Heater Length		Nominal Sheath O.D.		Maximum Heater Length	
in	mm	ft	meters	in	mm	ft	meters
.040	1.00	25	7.6	.188	4.77	100	30.5
.063	1.60	70	21.0	.250	6.35	59	18.0
.125	3.18	120	36.5	.312	7.93	38	11.5
.163	4.14	130	39.6	.375	9.53	26	8.0

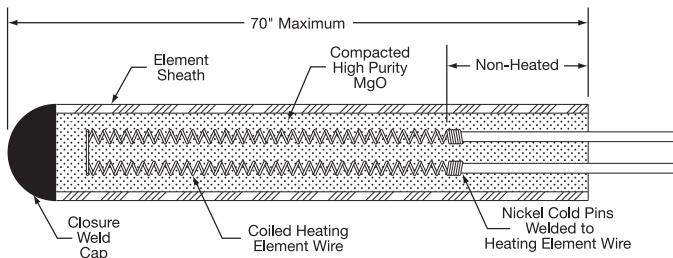


Note: Consult Tempco for diameters other than those listed above.



Tempco-Pak Heaters with Straight Wire and Built-In Thermocouple

Tempco-Pak heaters with 0.125" or larger diameter are also made from M.I. cable having 2 straight heating element wires and 2 straight thermocouple wires insulated from the sheath by high purity MgO. Optional cold nickel lead spliced to heating element wire is available in 0.125" diameter or larger depending on conductor material.



Tempco-Pak Heaters with Helically Coiled Wire

Hi-Density Tempco-Pak heaters are manufactured from sheathed M.I. cable having 2 coiled heating element wires or 2 coiled heating element wires and 2 straight thermocouple wires. The non-heated portion has the largest possible diameter solid nickel cold pins attached to the heating element wires, providing maximum current carrying capacity within the same continuous sheath.

Available in nominal sheath diameters from 0.120" to 0.153" (3.05 mm to 3.9 mm) including 0.125" O.D., 0.132" O.D. and 0.143" O.D. Tempco also manufactures 0.110" x 0.160" rectangular cable as well as 0.125" square cable.

Maximum sheath length including non-heated section is 70 inches (1778 mm).

Optional Built-in Thermocouple is ANSI Type J or Type K grounded at tip (end farthest from cold end) or ungrounded anywhere along heater length for .125" diameter and larger.



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The densely compacted MgO insulation used in Tempco-Pak heaters produces excellent high temperature insulation resistance and dielectric strength. Heaters can be manufactured with the optional cold nickel leads internally spliced to the heating element wires within the same continuous sheath.

Generally speaking, there is very little temperature difference between the sheath and heater wires. Tempco recommends not exceeding 150 watts per square inch of sheath surface area with the sheath operating temperature at 1000°F (537°C) or less. As temperature increases above 1000°F, the maximum watt density should be decreased.

The maximum recommended operating temperature is 1800°F (982°C) with Inconel® 600 sheath and ANSI Type K thermocouple if required. Heater life in any specific situation or application is impossible to predict. However, heater life generally decreases as temperature and/or the number of thermal cycles increases.

Tempco-Pak heaters are flexible and can be readily formed or bent by hand or production machinery, with the minimum bend radius equal to twice the sheath diameter. The heater sheath can be welded, brazed or soldered without changing its electrical characteristics.

Performance Ratings

- Watt Density:** 75 watts per square inch of sheath surface area maximum with factory approval
- Maximum temperature:** 1500°F (815°C) for 304 stainless steel sheath
1800°F (982°C) for Inconel® 600 sheath

Specifications

Electrical

- Resistance:** ±10% unless otherwise specified
- Voltage:** 120V and 240V standard
- Thermocouples:** ANSI Type J to 1500°F (815°C)
Type K to 1800°F (982°C)

All thermocouples and their junctions are internal to the heater sheath. A grounded junction at the heater tip is standard. An ungrounded junction anywhere along the heater's length is optional. Available in sheath diameters .125" and larger.

Dimensional

- Heater cable diameters:** 0.040", 0.062", 0.115", 0.120",
0.125", 0.132", 0.153", 0.163",
0.174", 0.188", 0.220", 0.250".
Others available upon request.
- Cable diameter tolerance:** ±.005
- Heater length tolerance:** 0 to 6" (+1/8", -0), 6 to 18" (+1/4", -0)
18 to 24" (+3/8", -0), 24 to 120" (+3/4", -0)
120 to 300" (±1")

Transition and Termination Construction Specifications

Transition (potting) adapters: 5/16" O.D. × 1-1/2" long for heater cable 0.163" diameter and smaller. 1/2" O.D. × 1-1/2" long for heater cable diameters above 0.163"

Transition Temperature Rating: Standard transition is rated to 482°F (250°C).

Optional High Temperature Transition is rated to 842°F (450°C).

Standard heater lead wire insulation is TGGT (Teflon®, double fiberglass, Teflon® impregnation), which is rated to 482°F (250°C).

Optional high temperature insulation is MGT (mica, fiberglass, Teflon® impregnation) which is rated to 842°F (450°C).

Thermocouple: Standard leads use a fiberglass insulation rated to 900°F (482°C). Teflon® insulation is available upon request.

Optional lead protection: Stainless steel overbraid or galvanized armor cable.