



### Tempco-Pak Cable Heaters

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:** ..... ±0.005

**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.

### Ordering Information

#### Standard Heaters

Order by Part Number for standard heaters listed in Tables on pages 5-21 through 5-23.

Part Numbers are for heaters with standard lead length of 24" unless otherwise specified. Longer lead length as well as stainless steel wire braid protection or armored cable protection are available upon request.

Heaters under 72" (1829 mm) will be shipped straight; longer heaters will be shipped in coils a minimum of 24" (610 mm) in diameter.

#### Custom Engineered/Manufactured Heaters

For sizes, ratings and terminations not listed, **TEMPCO** will design and manufacture a Tempco-Pak heater to meet your requirements. **Standard lead time is 3-4 weeks.**

**Please Specify** the following:

- Wattage and Voltage
- Sheath Diameter
- Heater length
- Sheath material— 304 stainless steel or Inconel® 600
- Length of internal nickel cold, or if a neck down design, length of cold section. See page 5-5.
- Thermocouple if required— Type J or K
- Thermocouple Junction— Grounded or Ungrounded. If ungrounded, specify location (.115" and larger).
- Transition type: M1, M2, M3, A1, A2, A3, B1, B2, B3, C1, C2, C3, S1, S2 or S3. See page 5-5.
- Lead length if other than 24"
- Supply a sketch or drawing.

**⚠ WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).