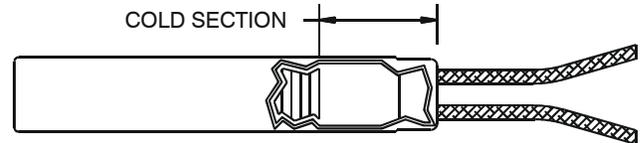


Round Cartridge Thermal And Electrical Construction Options

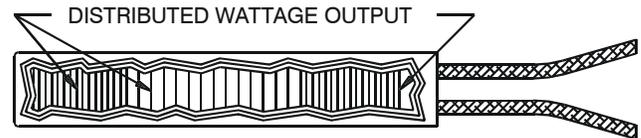
Special Cold Sections

One or more cold sections can be placed at any desired position along the heater length. Cold sections are often used in applications where a portion of the heater may not be totally enclosed within the object or liquid being heated. Additional uses include reducing heat output in key locations of applications and isolating lower temperature rated leads and seals from the higher operating temperature of the heated application. When ordering, specify length and location.



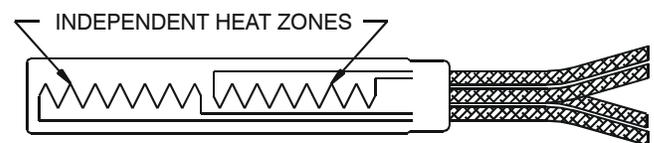
Distributed Wattage

Special heat profiles are readily produced by varying the coil pitch along the length of the heater. These distributed wattage element designs are useful in adjusting application temperature uniformity and modifying process conditions. Typical applications which benefit from the use of distributed wattage include heated plattens, sealing bars, extrusion dies and various components of runnerless systems for injection molding. To order, specify desired wattage distribution.



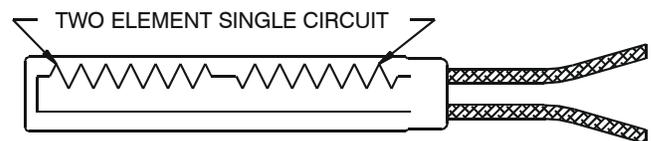
Independent Heat Zones

Independently controlled heat zones permit individual adjustment of specific areas of an application where temperatures vary due to transient process conditions. This option is particularly useful in applications which require a high level of temperature uniformity and are limited to a single cartridge heater such as a sealing bar or a runnerless mold component. Please provide complete details of your application requirements when ordering.



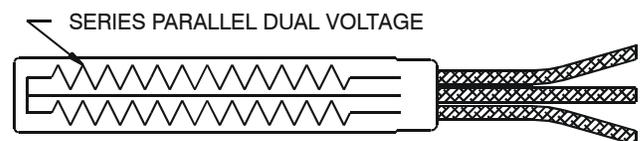
Single Circuit Element

The element of long conventional swaged cartridges is normally composed of a number of individual elements wired in parallel. The use of a series circuit design in longer cartridge heaters insures that any element failure within the cartridge results in a totally open circuit condition. This feature has proven valuable in applications where the undetected failure of a single element of the cartridge can create an unacceptable reduction in process quality.



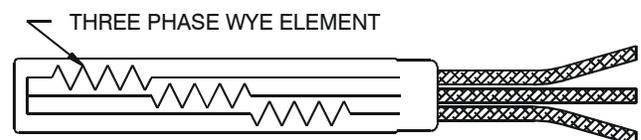
Dual Voltage Designs

Swaged cartridge heaters can be designed to operate on two different voltages through the addition of additional element and circuit leads. Leads can be wired through a switching device to select the desired operating voltage and element circuit. Dual voltage designs are commonly used when a heater must operate on two different voltages, such as in recreational vehicle equipment. Indicate the desired operating voltages when ordering.



Three Phase Element

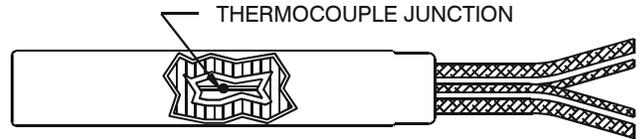
Any cartridge, 3/8" or more in diameter, can be designed with a three phase element provided that voltage limits are observed. The vast majority, however, are 5/8" or larger in diameter. Three phase design benefits include maintaining voltage supply balance and providing higher heater power ratings without exceeding the amperage capacity of the pins and leads. Please specify three phase delta or three phase wye connection when ordering.



Round Cartridge Internal Temperature Sensor Options

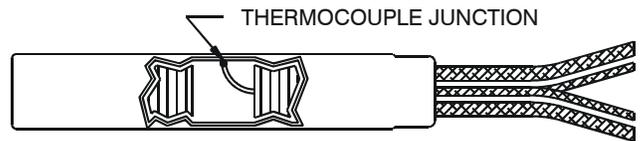
Thermocouple Style 1

The "Style 1" thermocouple is located within the element core and is used to determine actual element temperature during operation. It is useful in the development of new applications where it is necessary to insure that internal temperatures do not exceed the 1600 °F maximum recommended limit of the cartridge. Specify the style number, calibration and desired location when ordering.



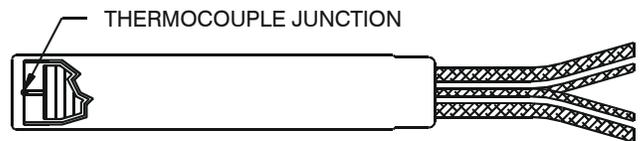
Thermocouple Style 2

The "Style 2" thermocouple junction is grounded against the inside diameter of the heater sheath and is located within a 1/2" cold length. The thermocouple junction may be located anywhere along the heater sheath. This thermocouple style will give a good approximation of the application temperature at that location and can be used for control. Specify style number, calibration and desired location when ordering.



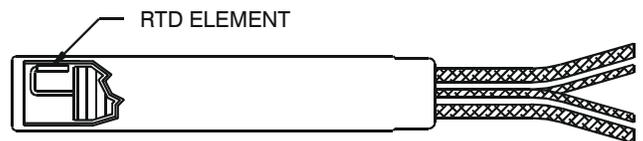
Thermocouple Style 3

The "Style 3" thermocouple junction is internally grounded to the end disc of the cartridge. This style of thermocouple will give a good approximation of part temperature in the heater end disc area. It is most useful in applications requiring close control at the end of the component, such as gating probes for runnerless molding systems. Specify style number and calibration when ordering.



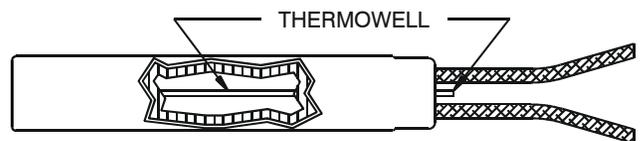
RTD Elements

Various styles of RTD elements, including platinum 100 ohm thin film and wire wound styles, can be located within cold sections of a cartridge 1/4" or more in diameter. Unless otherwise specified, the RTD will be located in the end disc area, providing a good approximation of heated part temperature. A 100 ohm thin film RTD rated at -30 °F to 900 °F is standard. Please specify if a higher temperature rating or an optional sensing location is required.



Thermowells

Small diameter, stainless steel thermowells can be swaged into 1/4" diameter and larger cartridge heaters. These thermowells permit the insertion of mineral insulated thermocouples for temperature measurement along the length of the cartridge. Thermowells can be located within the element or adjacent the inside diameter of the sheath. Specify thermowell location. Please indicate quantity and calibration of optional thermocouples if required.



Thermostats

Fixed set point thermostats located within a cold zone are primarily intended for immersion applications and are available only in 1/2" diameter cartridges and larger. These devices can be used to prevent overheating of the liquid or the cartridge. Successful control of liquid temperatures usually requires pre-production prototypes and testing. Please supply complete description of application when ordering.

