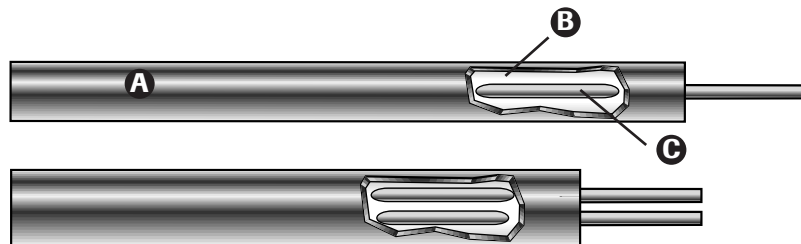




# Mineral Insulated Heating Cable



- **Constant Wattage Series Resistance Heating Cable Sets**
- **Process Temperature Maintenance up to 900°F**
- **Maximum Continuous Exposure Temperature (Power Off) up to 1100°F**
- **Wattages up to 50 W/Ft.**
- **Corrosion Resistant, Alloy 825 Sheath**
- **Factory Assembled Cable Sets—Ready for Installation**
- **Fully Annealed Sheath allows Field Bending**

## Description

Chromalox MI mineral insulated heating cables provide rugged and reliable heat tracing for a variety of demanding applications. The alloy 825 sheath, magnesium oxide dielectric insulation and resistance wire construction allow the tracing of equipment up to 900°F maintenance temperatures and excellent resistance to many corrosive environments. At lower temperatures, watt densities of up to 50 W/Ft can be designed.

## Construction

- A** Metal Sheath: High nickel content Alloy 825 is used for all heating cables and cold leads. Alloy 825 is recognized for its use in high temperature applications, and use in many corrosive environments. This alloy has excellent resistance to pitting, chloride-stress, acid, and alkali corrosion.
- B** MgO: Highly compacted Magnesium Oxide provides insulation of the resistance wire for voltages up to 600V. Completely sealed sheath protects the MgO from moisture & contamination.
- C** Resistance Wire: A large number of available resistances enables the design of a large range of lengths and wattages.
- D** Gland Fitting (Not shown above): Every set includes one or two 1/2" NPT fittings for connection to a junction box. The number of fittings depends on the configuration of the cable set (i.e. single-end or double-end).

Cold-Lead (Not shown above): Non-heating Alloy 825 sheathed MI cable extends the leads away from the high temperature equipment. 7 ft. long is standard.



# MI - Mineral Insulated Heating Cables

## Heating Cable System Design

### 1. Heater Design

Determine heater design to use. See page 6 for details.

### 2. Calculate Heat Loss

Using the Chromalox Design Guide for Heat Tracing (PJ304), calculate the heat loss of the system. To calculate the heat loss (Watts) you will need to know pipe diameter, insulation type and thickness, minimum ambient temperature and the pipe maintenance temperature. In addition, Chromalox® offers ChromaTrace, a heat trace design program to facilitate heat tracing system design.

### 3. Determine Total Cable Length

In addition to the system piping, in-line equipment such as valves, flanges and pipe supports require additional heat tracing to maintain the system operating temperature. See Chromalox Design Guide (PJ304) to determine the proper component cable allowances for your system. Add the heated pipe length and the component cable allowance lengths to calculate the total cable length.

Guidelines for tracing tanks and vessels are also given in the Chromalox Design Guide (PJ304)

### 4. Determine Available Voltage (V)

Determine what Voltage is available. At a given voltage, not every cable length and power output is available. For example, shorter lengths may require 120V supply. Trying several voltages may result in a more efficient design.

### 5. Calculate Resistance per Foot (R/ft) using the desired Watts per Foot (W/ft) and cable length (L)

$$R/ft_{\text{desired}} = V^2 / (W/ft_{\text{desired}} \times L^2)$$

### 6. Select the Proper Resistance per Foot (R/ft) Rating

Choose a cable having equal or the next lower resistance per foot value from the Ordering Information Table

### 7. Calculate Actual W/Ft. and Total Wattage ( $W_{\text{TOTAL}}$ )

$$W/ft_{\text{actual}} = V^2 / (R/ft_{\text{actual}} \times L^2)$$

$$W_{\text{TOTAL}} = W/ft_{\text{actual}} \times L$$

### 8. Determine Current Draw (I)

$$I = V / (R/ft_{\text{actual}} \times L)$$

### 9. Select Heater Single or Double Conductor Length

The cold lead is determined by the customer or by using a standard 7 ft. Standard cold lead is #14 awg.

### 10. Convert Design to a Model Number. See table on page 6.

Note: Some cable resistances must be modified according to the resistance curves in the Order Information Table. Modify your resistance according to the following procedure:

- Based on the desired power output in Watts/ft, use Graph-1 to determine the Sheath Temperature Rise for the particular cable diameter you select.
- Add the sheath temperature rise to the desired maintenance temperature to determine the cable resistance at operating conditions.
- From Graph-2, determine the cable resistance multiplier for your application. Multiply the resistance value given in the resistance tables by this multiplier to determine the cable resistance at operating conditions.
- Determine the electrical and thermal conditions. Once the cable resistance has been selected, verify the performance of the cable you have selected from Graph-3 and 4.

# Mineral Insulated Heating Cables - MI

## Ordering Information

### Available Resistances

Two Conductor, 3/16" Dia. O.D.

Alloy 825, 300 Volts

Cable Number	Ohms/ft	Maximum Exposure Temperature	Rating °F	Resistance Curve
556K	0.043	600		1
658K	0.0581			1
674K	0.0742			1
693K	0.0926			1
712K	0.1170			1
715K	0.1470			1
721K	0.213			3
732K	0.319			1100
742K	0.416			
752K	0.520			
766K	0.660			
774K	0.740			
783K	0.830			
810K	1.00			
813K	1.30			
818K	1.80			
824K	2.34			
830K	2.96			
838K	3.70			
846K	4.72			
860K	5.60			
866K	6.60			
894K	9.00			
919K	18.00			

Two Conductor, 5/16" Dia O.D.

Alloy 825, 600 Volts

Cable Number	Ohms/ft	Maximum Exposure Temperature	Rating °F	Resistance Curve
588B	0.0071	600		1
614B	0.0149			1
627B	0.027			2
640B	0.040			3
670B	0.065	1100	N/A	
710B	0.104			
715B	0.162			
720B	0.205			
732B	0.325			
750B	0.500			
774B	0.735			
810B	1.162			
819B	1.87			
830B	2.97			
840B	4.30			
859B	5.98			

# MI - Mineral Insulated Heating Cables

## Ordering Information

### Available Resistances

One Conductor, 3/16" Dia. O.D.

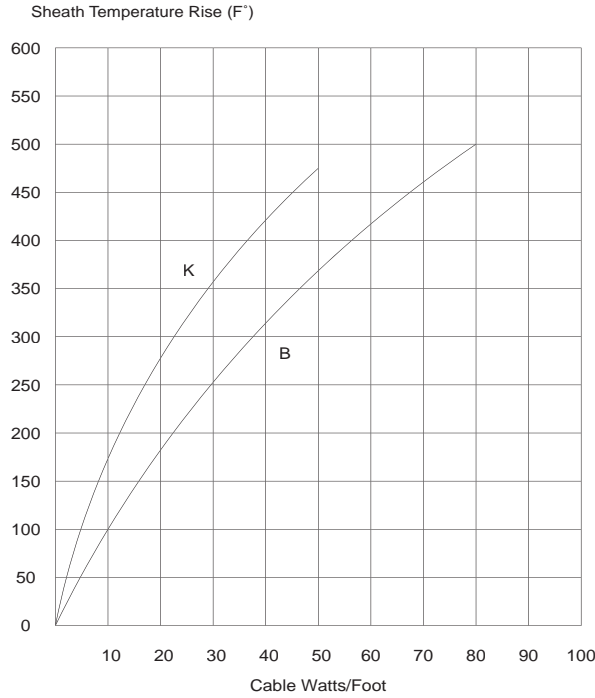
Alloy 825, 600 Volts

Cable Number	Ohms/ft	Maximum Exposure Temperature	Rating °F	Ohms/ft
145K	0.0046	600		1
189K	0.0090			1
216K	0.0165			2
239K	0.039	1100		N/A
250K	0.050			
279K	0.079			
310K	0.095			
316K	0.157			
326K	0.260			
333K	0.330			
346K	0.457			
372K	0.730			
412K	1.17			
415K	1.48			
423K	2.36			
430K	2.80			
447K	4.50			

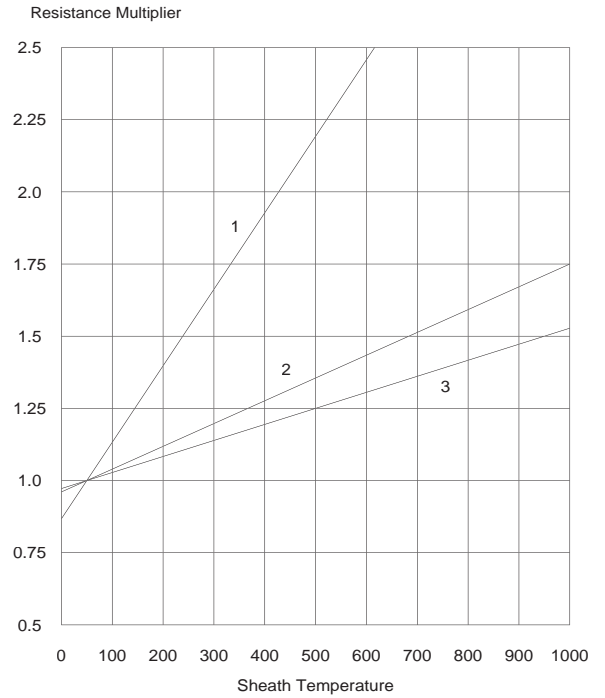
# Mineral Insulated Heating Cables - MI

## Specification / Application Information

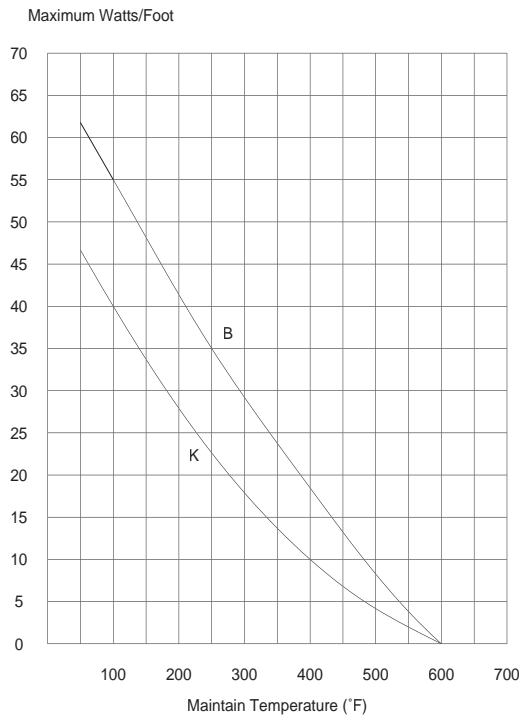
**Graph-1**  
Cable Sheath Temperature Rise



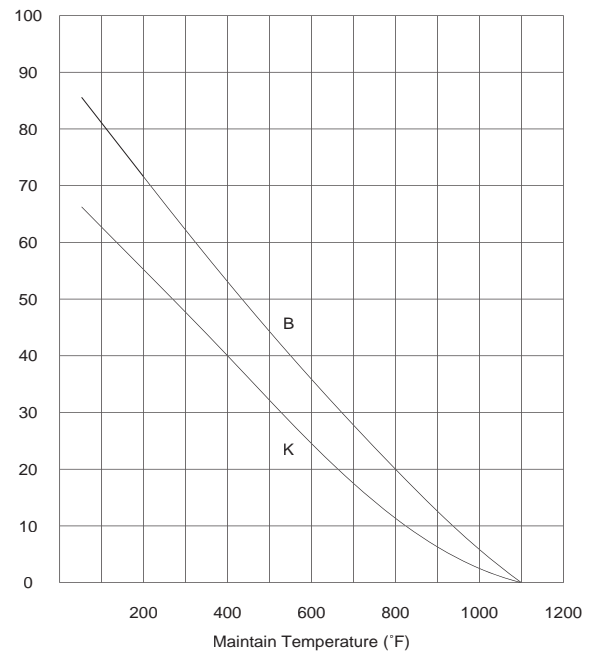
**Graph-2**  
Cable Resistance Temperature Multiplier



**Graph-3**  
Maximum Wattages - All Cables  
With Hot/Cold Junction Under Insulation



**Graph-4**  
Maximum Wattages -  
All 1100°F Maximum Temperature  
Cables With Hot/Cold Junction Under Insulation

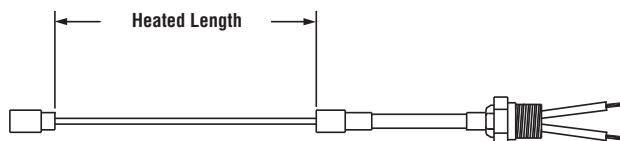


# MI - Mineral Insulated Heating Cables

## Available Designs

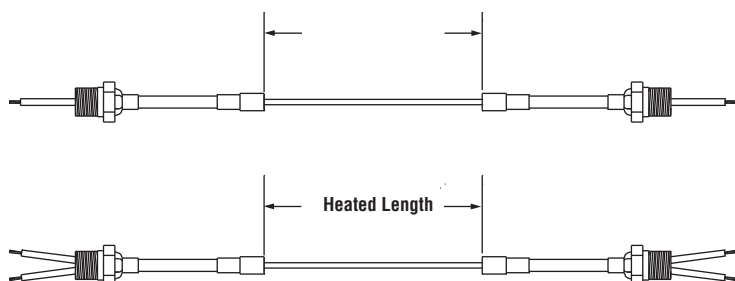
Form "A" (one cold lead connection and termination w/end cap, .050" fittings)

Available in two conductor only



Form "E" (two cold lead connections, .050" fittings)

Available in one conductor or two conductor



## Accessories

Pulling Eye For "A" form Only

QHT-3 High Temperature Adapter is used to heat sink the hot section transition as it passes through the thermal insulation when the hot to cold connection must be located outside the thermal insulation due to sheath .....temperatures over 600°F, and cable wattage above 20 w/ft.

## Optional Construction

**Chromalox®**

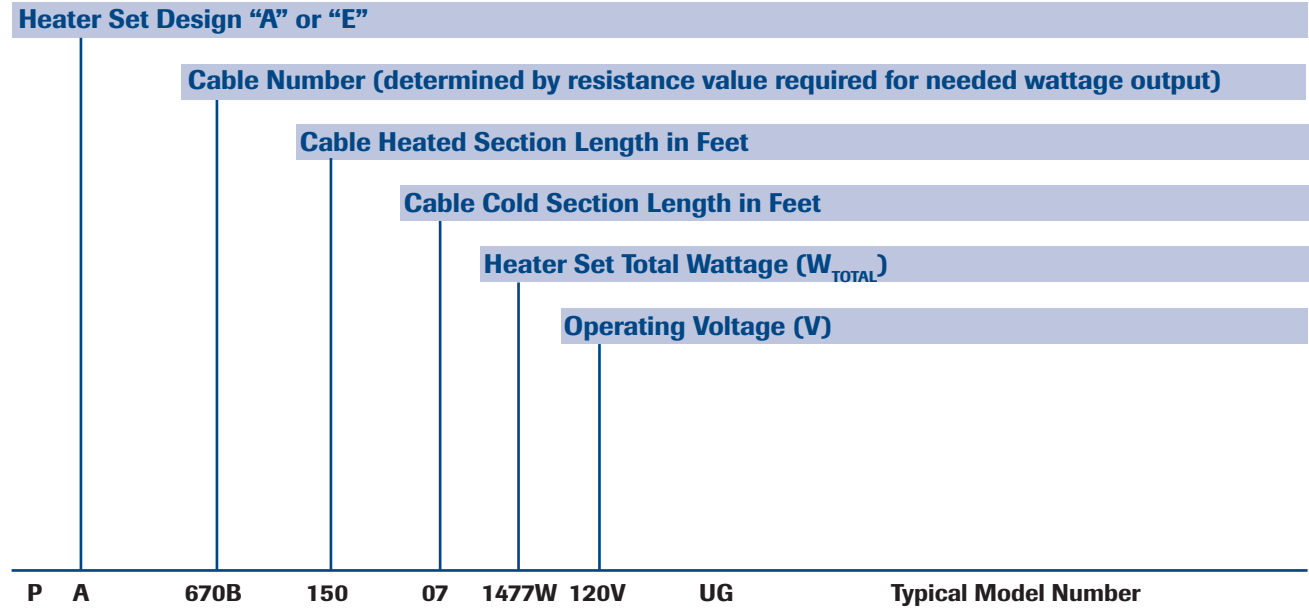
Prefix	Suffix	Description
P		Pulling Eye for "A" form only
X		Oversized cold section current >25 Amps and <40 Amps
	EM	Mounting of hot-cold junction outside thermal insulation (freeze protection of lones over 600°F
	QT	QHT-3 High temperature adapter
	UG	UL listing tag**
	UH	UL hazardous area listing tag**
	PH	FM hazardous area listing tag**
	CH	CSA hazardous area listing tag**
	CHB	CSA group B hazardous area listing tag**

\*\*Required volts,amps, and watts with each cable order

# Mineral Insulated Heating Cables - MI

## Model Numbers

**To Order** Complete the Model Number by using the Matrix below. If applicable, specify hazardous location classifications.



(120V, 9.9 w/ft cable, 150 feet long, with pulling eye and UL listing tag)

# MI - Mineral Insulated Heating Cables

MI PDS  
PJ328-2  
February 2003