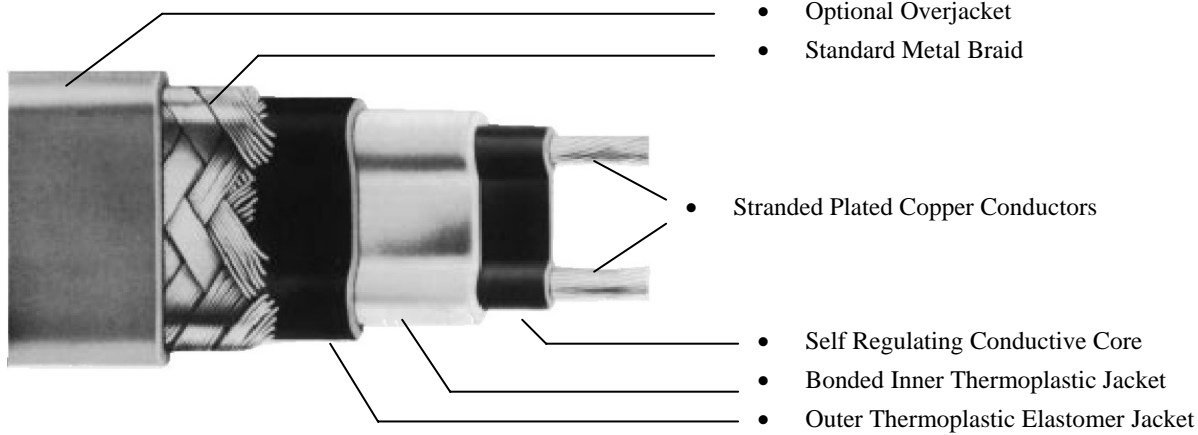


SPECIFICATION/APPLICATION INFORMATION

COMMERCIAL SELF-REGULATING HEATER CABLE



Description:

Commercial self-regulating heater cable is a parallel circuit electric heater strip. An irradiation cross-linked conductive polymer core material is extruded over the multi-stranded, tin-plated, 18-gauge copper bus wires. The conductive core material increases or decreases its heat output in response to

temperature changes. Two jackets provide extra dielectric strength, moisture resistance, and protection from impact and abrasion damage. The inner thermoplastic jacket is extruded over and bonded to the core material. A thermoplastic elastomer outer jacket is then extruded over the inner jacket.

A tinned copper braid is installed over the second jacket, providing a continuous ground path.

An option UV stabilized polyolefin overjacket is available to cover the braid for wet applications.

Principle of Operation:

The parallel bus wires apply voltage along the entire length of the heater cable. The conductive core provides an infinite number of parallel conductive paths permitting the cable to be cut to any length in the field with no dead or cold zones developing. The heater cable derives its self-regulating characteristic from the inherent properties of the conductive core material. As the core

material temperature increases, the number of conductive paths in the core material decrease, automatically decreasing the heat output. As the temperature decreases, the number of conductive paths increase, causing the heat output to increase. This occurs at every point along the length of the cable, adjusting the power output to the varying conditions along the pipe.

The self-regulating effect allows the cable to be overlapped without creating hot spots or burnout. As the cable self-regulates its heat output, it provides for the efficient use of electric power, producing heat only when and where it is needed, and also limiting the maximum sheath temperature.

Application:

Commercial self-regulating heater cable is ideal for use in maintaining fluid flow under low ambient conditions. Freeze protection and low watt density process temperature systems such as product pipelines, fire protection, process water, dust suppression systems, hot water and structure anti-icing are typical applications for this product.

For other than metal pipe heating, see appropriate application guide.

The base product is supplied with a tinned copper metal braid that may be used in general applications and in dry, non-corrosive areas. It is also used to provide a conductive ground path when cable is installed on non-conductive surfaces, such as plastic or painted pipe.

Options: (Delete -CB and add)

-CR A tinned copper metal braid with a modified polyolefin overjacket is available for wet applications. It is also recommended where mechanical abuse is a problem.

PIPING FREEZE PROTECTION - COMMERCIAL HEATER CABLE APPLICATION INFORMATION

Performance and Rating Data:

| Catalog No. | 3W/120V/C | 5W/120V/C | 8W/120V/C | 3W/240V/C | 5W/240V/C | 3W/120V/C |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Voltage (VAC) | 120 | 120 | 120 | 240 | 240 | 240 |
| Power Output @ 40°F (W/ft.) | 3.2 | 5.4 | 8.6 | 3.2 | 5.4 | 8.6 |
| Maximum Segment Length (ft.) | 221 | 178 | 142 | 533 | 458 | 347 |
| Minimum Installation Temp (°F) | -35°F | -35°F | -35°F | -35°F | -35°F | -35°F |
| Current Load (amp/foot): | | | | | | |
| At 0°F Start-up | .072 | .100 | .143 | .036 | .050 | .071 |
| At -20°F Start-up | .080 | .111 | .158 | .040 | .056 | .079 |
| At -40°F Start-up | .088 | .122 | .174 | .044 | .061 | .087 |

Note: Amp/Foot values include 20% breaker derating per National Electrical Code.

Circuit Breaker Selection:

| Watts/Ft. | Start-Up Temp. | Maximum Length (feet) Vs Circuit Breaker Size | | | | | | |
|-----------|----------------|---|-----|-----|--------|-----|------|------|
| | | 120VAC | | | 240VAC | | | |
| | | 15A | 20A | 30A | 15A | 20A | 30A | 40A |
| 3 | 40°F | 268 | 358 | 537 | 537 | 716 | 1074 | 1432 |
| | 0°F | 208 | 277 | 416 | 416 | 555 | 832 | 1110 |
| | -20°F | 187 | 249 | 374 | 374 | 499 | 748 | 998 |
| | -40°F | 170 | 226 | 340 | 340 | 453 | 679 | 906 |
| 5 | 40°F | 192 | 256 | 384 | 384 | 511 | 767 | 1023 |
| | 0°F | 150 | 199 | 299 | 299 | 399 | 598 | 798 |
| | -20°F | 135 | 180 | 269 | 269 | 359 | 539 | 718 |
| | -40°F | 123 | 163 | 245 | 245 | 327 | 490 | 654 |
| 8 | 40°F | 134 | 179 | 269 | 269 | 358 | 537 | 716 |
| | 0°F | 105 | 140 | 210 | 210 | 280 | 421 | 561 |
| | -20°F | 95 | 127 | 190 | 190 | 253 | 380 | 506 |
| | -40°F | 86 | 115 | 173 | 173 | 231 | 346 | 461 |

Notes:

- Maximum segment length is the maximum continuous heater run with minimal voltage drop. For breaker loading, multiple heater segments can be installed in parallel providing no individual length is longer than the maximum published segment length. For voltages other than 240VAC, multiply the amps/foot value in the table above by the power adjustment value below, then divide full breaker amperage rating by the adjusted value to determine maximum total footage allowed.
- Circuit breakers are sized per Article 427-4 of the 1999 National Electrical Code.
- Article 427-22 of the National Electrical Code requires ground-fault equipment protection for each branch circuit supplying electric heating equipment. Electrical connections should be made by a licensed electrician.
- Cable Selection Tables are designed for product selection over a wide range of piping materials. For specific applications utilizing heat transfer aids, such as aluminum foil tape, consult your Nelson products representative.

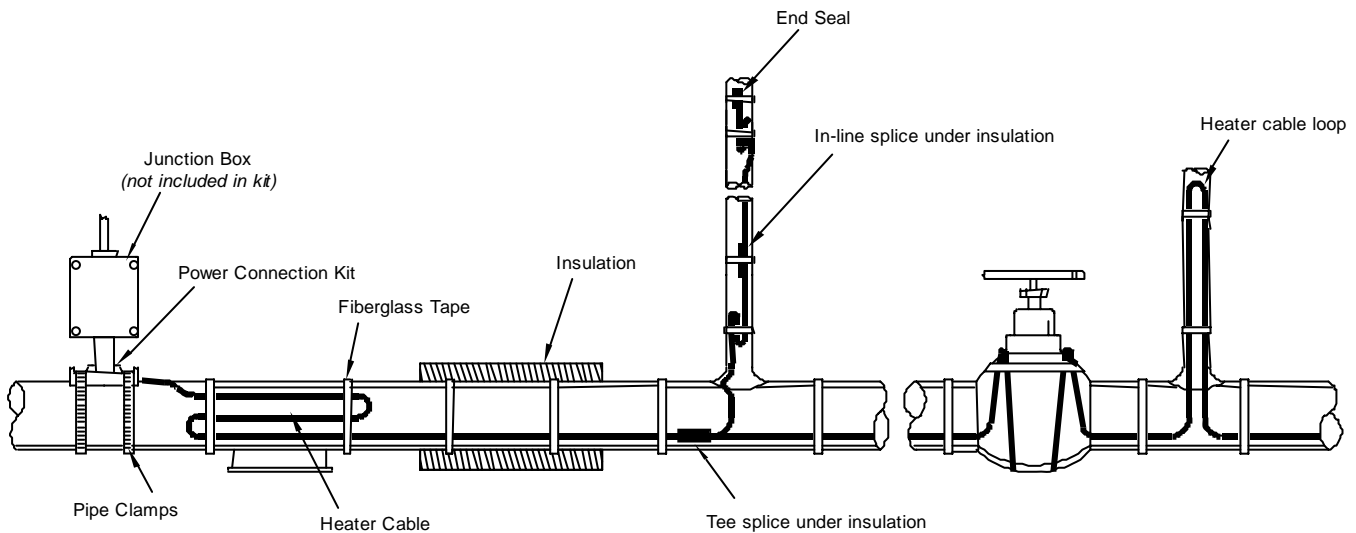
Voltage Adjustment:

Use of commercial cable products at other than nominal voltages requires minor adjustments in power and maximum segment lengths.

| Product | Adjustment Multiplier | | | |
|---------|-----------------------|--------|--------|--------|
| | 208VAC | | 277VAC | |
| | Power | Length | Power | Length |
| 3W/240 | .71 | 1.04 | 1.34 | .98 |
| 5W/240 | .80 | 1.01 | 1.22 | 1.02 |
| 8W/240 | .87 | 1.00 | 1.12 | 1.03 |

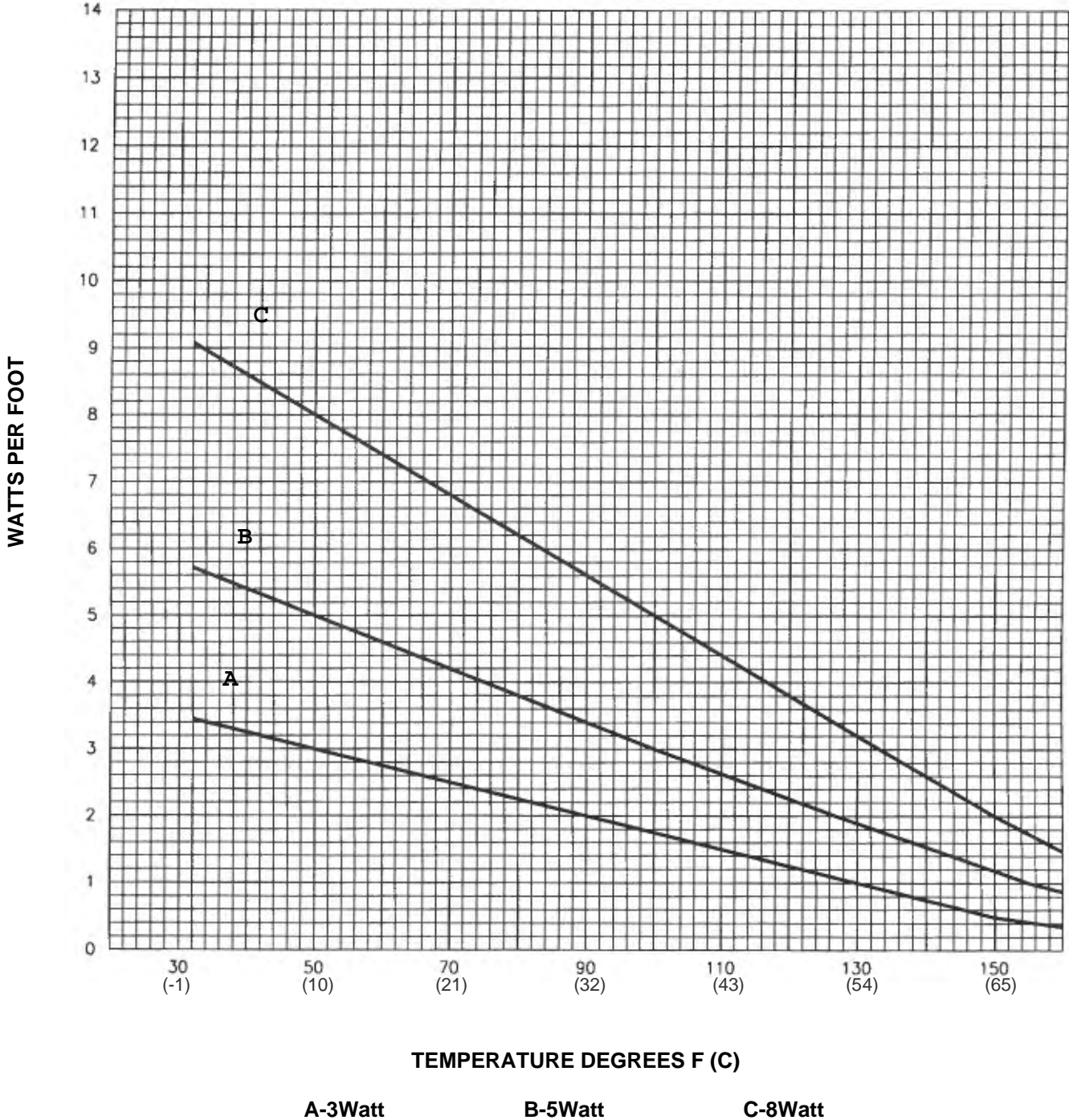
PIPING FREEZE PROTECTION - COMMERCIAL HEATER CABLE APPLICATION INFORMATION

| Additional Footage of Heater for Various Heat Sinks | | | | | | |
|---|-----------------|--------------|--------------|-------------------------|---------------|-----------------|
| Pipe Size | Standard Flange | Blind Flange | Pipe Support | Screwed or Welded Valve | Flanged Valve | Butterfly Valve |
| 0.50 | .3 | .5 | 1.0 | 1.0 | 1.0 | 1.0 |
| 0.75 | .3 | .5 | 1.5 | 1.0 | 1.5 | 1.0 |
| 1.00 | .3 | .5 | 1.5 | 1.0 | 2.0 | 1.0 |
| 1.50 | .3 | .5 | 1.5 | 1.5 | 2.5 | 1.5 |
| 2.00 | .3 | .5 | 2.0 | 2.0 | 2.5 | 2.0 |
| 3.00 | .5 | .75 | 2.0 | 2.5 | 3.0 | 2.5 |
| 4.00 | .5 | .75 | 2.5 | 3.0 | 4.0 | 3.0 |
| 6.00 | .75 | 1.0 | 2.5 | 3.5 | 5.0 | 3.5 |
| 8.00 | .75 | 1.0 | 2.5 | 4.0 | 7.0 | 4.0 |



Note: Heater cable power connections and end seals are included in Power Connection Kit. Additional heater cable end seals, splices, tees and thermostats are used as needed.

Power Output Rating:



WATTS PER FOOT X 3.28 = WATTS PER METER
 PIPE TEMPERATURE °F CONVERSION TO °C = 5/9 (°F-32)