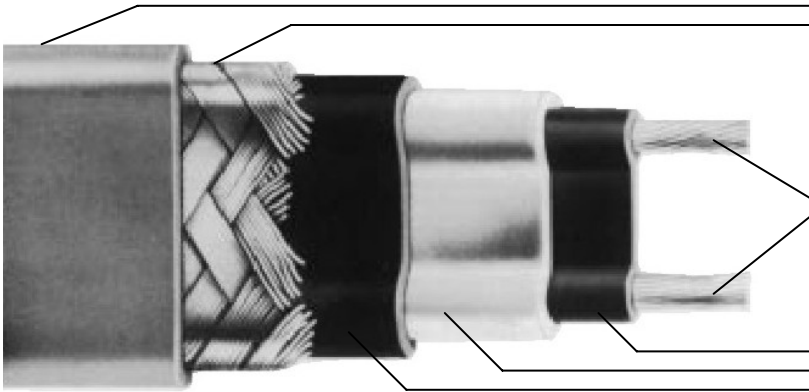


# NELSON™ TYPE LT

## SELF-REGULATING HEATER CABLE

## SPECIFICATION/APPLICATION INFORMATION



- Optional Overjacket
- Standard Metal Braid

|         |          |
|---------|----------|
| LT3-CB  | LT23-CB  |
| LT5-CB  | LT25-CB  |
| LT8-CB  | LT28-CB  |
| LT10-CB | LT210-CB |

- Stranded Plated Copper Conductors

- Self-Regulating Conductive
- Bonded Inner Thermoplastic Jacket
- Outer Thermoplastic Elastomer Jacket

### Description:

Nelson Type LT 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, 16-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 stranded tinned copper metal braid is supplied on all heaters. An optional overjacket (fluoropolymer or modified polyolefin) can be specified when the heater cable is to be installed in wet or corrosive environments.

### 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:

Nelson's Type LT 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, lube oil, condensate return, hot water and structure anti-icing are typical applications for this product.

The base product is supplied with a tinned copper metal braid that may be used in both general applications and in dry, non-corrosive hazardous (classified) 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)

- JT A tinned copper metal braid with a modified polyolefin overjacket is available for use when the heater cable is exposed to aqueous solutions of inorganic chemicals (phosphate, dilute acids, chlorides, bases and carbonites). It is also recommended where mechanical abuse is a problem.
- J A tinned copper metal braid with a fluoropolymer overjacket is available for use when the heater is available for use when the heater cable is exposed to excessive moisture, organic chemicals, solvents, etc. in hazardous (classified) areas and ordinary areas.

- D1- Approved for use in Class I, Division 1, Groups B, C, and D, Class II, Division 1, Groups E, F and G, Class III hazardous areas. D1 heating cable requires the use of HASK series connection kits.

**Performance and Rating Data:**

| Catalog Number | Service Voltage | Maximum Length | Maximum Maintenance Temperature | Maximum Intermittent Exposure | T-Rating* |
|----------------|-----------------|----------------|---------------------------------|-------------------------------|-----------|
| LT3            | 120             | 325            | 150°F (65°C)                    | 185°F (85°C)                  | T6        |
| LT23           | 240             | 650            | 150°F (65°C)                    | 185°F (85°C)                  | T6        |
| LT5            | 120             | 270            | 150°F (65°C)                    | 185°F (85°C)                  | T6        |
| LT25           | 240             | 540            | 150°F (65°C)                    | 185°F (85°C)                  | T6        |
| LT8            | 120             | 210            | 150°F (65°C)                    | 185°F (85°C)                  | T5        |
| LT28           | 240             | 420            | 150°F (65°C)                    | 185°F (85°C)                  | T5        |
| LT10           | 120             | 180            | 150°F (65°C)                    | 185°F (85°C)                  | T5        |
| LT210          | 240             | 360            | 150°F (65°C)                    | 185°F (85°C)                  | T5        |

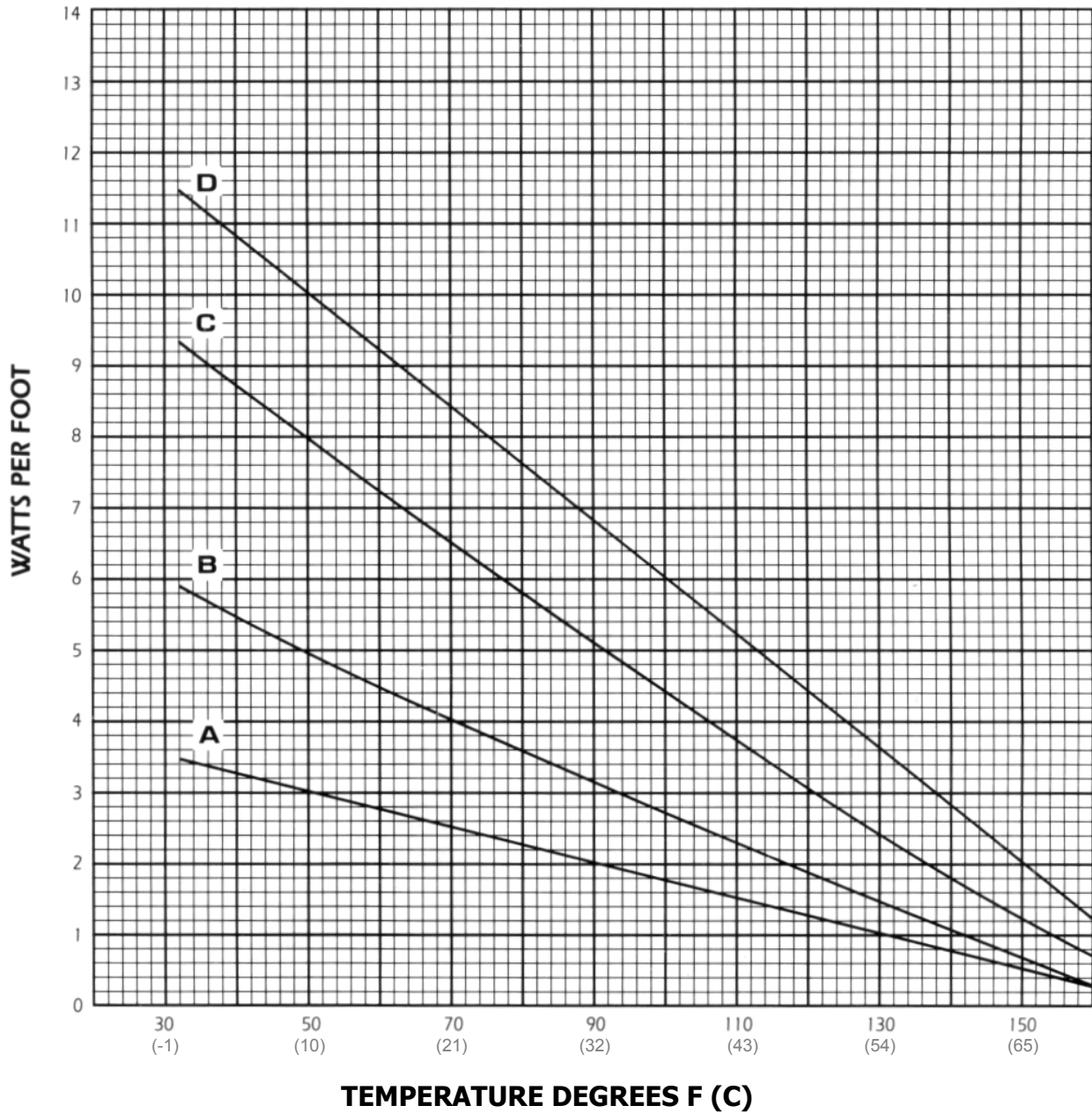
\*Electrical equipment T-rating codes define the maximum surface temperature that equipment will reach. It is used in hazardous (classified) area applications.

**Circuit Breaker Selection:**

| Watts/Ft. | Start-Up Temp. | Max. Length (Feet) Vs. Circuit Breaker Size |     |     |     |          |     |     |     |
|-----------|----------------|---|-----|-----|-----|----------|-----|-----|-----|
|           |                | 120 Volt                                    |     |     |     | 240 Volt |     |     |     |
|           |                | 15A   | 20A | 30A | 40A | 15A      | 20A | 30A | 40A |
| 3         | 50°F (10°C)    | 325   |     |     |     | 650      |     |     |     |
|           | 0°F (-18°C)    | 230   | 305 | 325 |     | 460      | 620 | 650 |     |
|           | -20°F (-29°C)  | 205   | 275 | 325 |     | 410      | 550 | 650 |     |
| 5         | 50°F (10°C)    | 225   | 270 |     |     | 460      | 540 |     |     |
|           | 0°F (-18°C)    | 155   | 205 | 270 |     | 310      | 415 | 540 |     |
|           | -20°F (-29°C)  | 135   | 180 | 270 |     | 275      | 370 | 540 |     |
| 8         | 50°F (10°C)    | 145   | 195 | 210 |     | 295      | 390 | 420 |     |
|           | 0°F (-18°C)    | 100   | 130 | 195 | 210 | 200      | 265 | 395 | 420 |
|           | -20°F (-29°C)  | 90  | 115 | 175 | 210 | 175      | 235 | 350 | 420 |
| 10        | 50°F (10°C)    | 115   | 150 | 180 |     | 230      | 305 | 360 |     |
|           | 0°F (-18°C)    | 85  | 110 | 155 | 180 | 165      | 220 | 325 | 360 |
|           | -20°F (-29°C)  | 75  | 100 | 145 | 180 | 150      | 195 | 290 | 360 |

- NOTES:
1. Circuit breakers are sized per national electrical codes.
  2. When using 240 volt product at 208, 220 or 277 volts, use the circuit adjustment factors shown in the Voltage Adjustment Table.
  3. When using 2 or more heater cables of different wattage ratings in parallel on a single circuit breaker, use the 15A column amperage of 15 amps, divide it by the maximum footage to arrive at an amps/foot figure for each cable. You can then calculate circuit breaker sizes for these combination loads. These amps/foot factors include the 125% sizing factor.
  4. National electrical codes require ground-fault equipment protection for each branch circuit supplying electric heating equipment. Exceptions to this requirement can be found in the 2002 N.E.C.
  5. Heater cables with D1 optional construction require the use of ground fault interrupter/ground leakage device with a trip setting no greater than 30mA.

**Power Output Rating:**



**A** LT3  
 LT23

**B** LT5  
 LT25

**C** LT8  
 LT28

**D** LT10  
 LT210

WATTS PER FOOT x 3.28 = WATTS PER METER

PIPE TEMPERATURE °F CONVERSION TO °C = 5/9 (°F - 32)

# NELSON™ TYPE LT SELF-REGULATING HEATER CABLE

# SPECIFICATION/APPLICATION INFORMATION

## Catalog Numbers:

| BASIC CATALOG NUMBERS |                |      |      |       |
|-----------------------|----------------|------|------|-------|
| Voltage               | Watts Per Foot |      |      |       |
|                       | 3              | 5    | 8    | 10    |
| 120 VAC               | LT3            | LT5  | LT8  | LT10  |
| 240 VAC               | LT23           | LT25 | LT28 | LT210 |

## Standard Feature Suffix:

-CB Tinned Copper Braid

## Optional Features Suffix:

-J Tinned Copper Braid and Fluoropolymer Overjacket  
 -JT Tinned Copper Braid and Modified Polyolefin Overjacket  
 D1- Division 1 approved

## Voltage Adjustment:

Use of Self-Regulating heater products at other than rated voltages require minor adjustments in power and maximum circuit lengths.

| Product | ADJUSTMENT MULTIPLIER |        |         |        |         |        | Absolute<br>Max Length |
|---------|-----------------------|--------|---------|--------|---------|--------|------------------------|
|         | 208 VAC               |        | 220 VAC |        | 277 VAC |        |                        |
|         | Power                 | Length | Power   | Length | Power   | Length |                        |
| LT23    | .76                   | .93    | .85     | .96    | 1.27    | 1.07   | 650 ft.                |
| LT25    | .79                   | .93    | .87     | .96    | 1.24    | 1.07   | 540 ft.                |
| LT28    | .84                   | .93    | .90     | .96    | 1.19    | 1.08   | 420 ft.                |
| LT210   | .86                   | .93    | .92     | .96    | 1.16    | 1.09   | 360 ft.                |

## Approvals:

### FM

**Ordinary Locations -**  
 (-CB, -J or -JT options)  
**Hazardous (Classified)  
 Locations**  
 (-CB, -J or -JT options)  
 Class I, Division 2;  
 Groups B, C, D  
 Class II, Division 2  
 Groups G  
 Class III, Division 2  
 (-J option)  
 Class I, Zone 1  
 Group IIC  
 (D1 option)  
 Class I, Division 1  
 Groups B, C, D



### CSA

**Ordinary Locations -**  
 (-CB, -J or -JT options)  
**Hazardous (Classified)  
 Locations**  
 (-CB, -J or -JT options)  
 Class I, Division 2  
 Groups B, C, D  
 Class II, Division 2  
 Groups E, F, G  
 Class III, Division 2  
 (-J option)  
 Class I, Division 1  
 Groups B, C, D  
 Class II, Division 1  
 Groups E, F, G  
 Class I, Zone 1  
 Group IIB + H2  
 Zone 1, Ex e II T6 (T5)



### UL

**Ordinary Locations -**  
 (-CB, -J or -JT options)  
**Hazardous (Classified)  
 Locations**  
 (-CB, -J or -JT options)  
 Class I, Division 2;  
 Groups A, B, C, D  
 Class II, Division 2  
 Groups F, G  
 Class III, Division 2  
 (-J option)  
 Class I, Zone 1 and 2  
 Group IIC  
 (D1 option)  
 Class I, Division 1  
 Groups B, C, D  
 Class II, Division 1  
 Groups E, F, G  
 Class III



## Accessories:

- Connection Kits for Power Connection, Tee Splice, Splices and End Seals (Nelson PLT and ALT Series)
- Thermostatic Controls (Nelson TA, TH, TE and HC Series)
- Junction Boxes, Tapes and Warning Signs
- Custom Control, Monitoring and Power Panels
- Division 1 Connection Kits for Power Connection, Tee Splice, Splice and End Connection (Nelson HASK Series)
- Zone 1 Connection Kits for Power Connection, Tee Splice, Splice and End Connection (Nelson Z1-PLT and Z1-ALT Series)

Nelson Heat Tracing Systems products are supplied with a limited warranty. Complete Terms and Conditions may be found on Nelson's website at [www.nelsonheaters.com](http://www.nelsonheaters.com).

