

HLT3-CB	HLT23-CB
HLT5-CB	HLT25-CB
HLT8-CB	HLT28-CB
HLT10-CB	HLT210-CB
HLT12-CB	HLT212-CB
HLT15-CB	HLT215-CB
HLT18-CB	HLT218-CB
HLT20-CB	HLT220-CB

### Description:

Nelson's Type HLT self-regulating heater cable is a parallel circuit electric heater strip. A conductive fluoropolymer core material is extruded over the multi-stranded, nickel-plated, 16-gauge copper bus wires. A fluoropolymer jacket

provides excellent dielectric strength, moisture resistance, protection from impact and abrasion damage, and a wide range of chemical resistance.

A stranded tinned copper metal braid is supplied on all heaters.

An optional fluoropolymer overjacket can be specified when the heater cable is to be installed in wet or corrosive environments.

### Operating Principle:

The parallel bus wires apply voltage along the entire length of the heater cable. The conductive core provides a continuous parallel heating element 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 decreases, automatically decreasing the heat output. As the temperature decreases, the number of conductive paths increases, 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 limits the maximum sheath temperature, while also providing useful power for process temperature maintenance

### Application:

Nelson's Type HLT self-regulating heater cable is ideal for maintaining fluid flow over a wide range of operating temperatures. The product is used for freeze protection of periodically steam (200 psig) cleaned pipes and temperature maintenance for 250°F (121°C) or lower processes. Typical applications include hydrocarbon and chemical product piping. 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)

-J A tinned copper metal braid with a fluoropolymer overjacket 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 hazardous areas. Standard construction utilizes a tinned copper metal braid with a fluoropolymer overjacket. D1-heating cable requires the use of HASK series connection kits and Ground Fault Protection Devices must be used on each heater circuit. All Division 1 designs must be reviewed by Nelson before being installed.

# NELSON™

## TYPE HLT SELF-REGULATING HEATER CABLE

## SPECIFICATION/APPLICATION INFORMATION

### Performance and Rating Data:

Catalog Number	Service Voltage	Maximum Length	Maximum Maintenance Temperature	Maximum Intermittent Exposure	T-Rating*
HLT3	120	395	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT23	240	785	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT5	120	310	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT25	240	620	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT8	120	225	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT28	240	460	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT10	120	190	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT210	240	375	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT12	120	170	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT212	240	335	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT15	120	135	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT215	240	270	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT18	120	125	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT218	240	245	250°F (121°C)	375°F (191°C)	T3 (T3)
HLT20	120	105	250°F (121°C)	375°F (191°C)	T3 (T2D)
HLT220	240	210	250°F (121°C)	375°F (191°C)	T3 (T2D)

\* Electrical equipment T-rating codes define the maximum surface temperature that equipment will reach. It is used in hazardous (classified) area applications. Parenthesized T-ratings are determined at a 20% over voltage required for Class I, Division 1 applications.

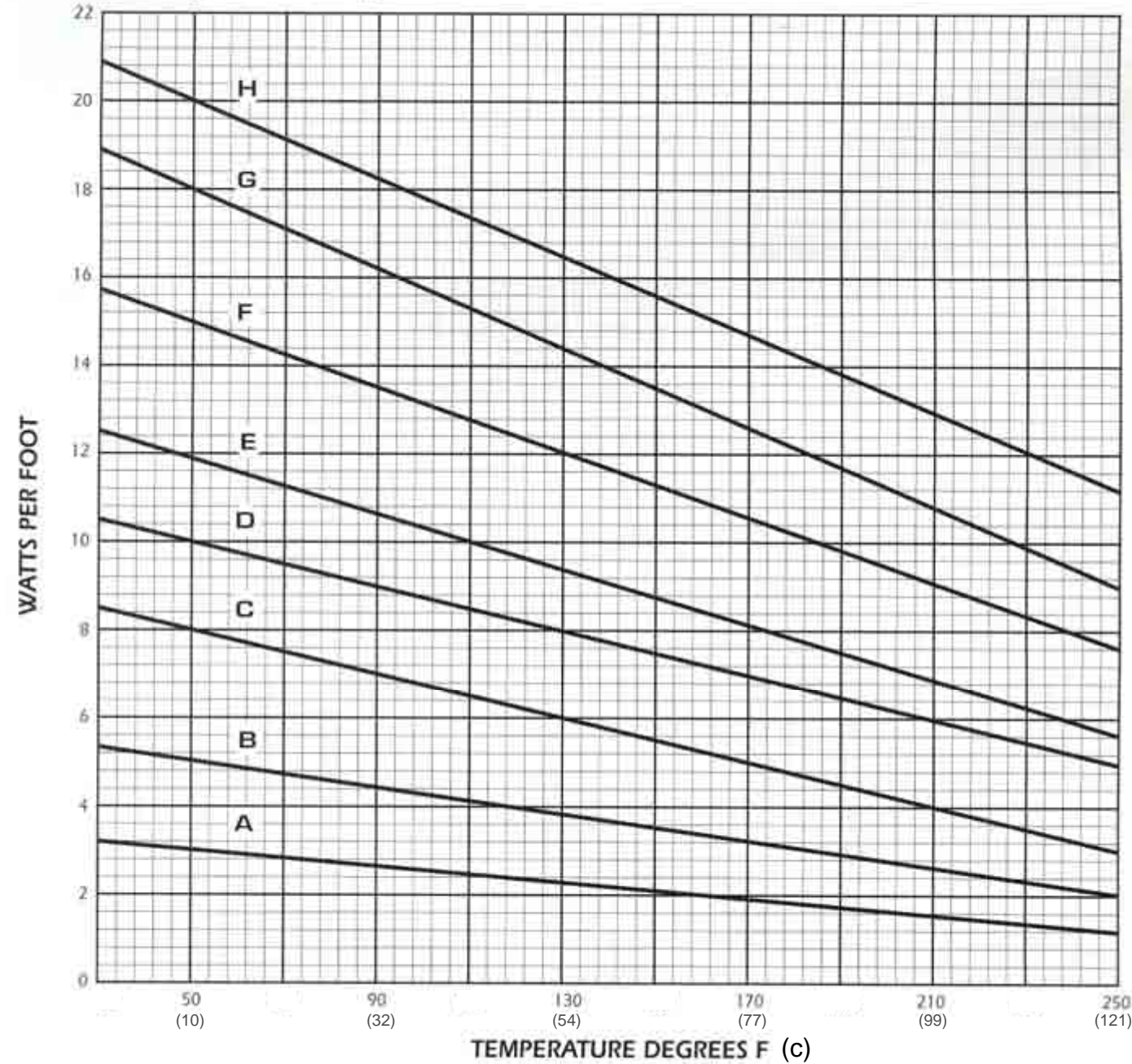
### Circuit Breaker Selection:

Watts/Ft.	Max. Length (Feet) Vs. Circuit Breaker Size					
	120 Volt			240 Volt		
	15A	20A	30A	15A	20A	30A
3	295	395		585	785	
5	185	245	310	385	500	620
8	145	195	225	290	390	460
10	115	150	190	225	300	375
12	98	130	170	195	260	335
15	80	110	135	160	215	270
18	70	95	125	140	185	245
20	65	85	105	125	170	210

#### NOTES:

1. Circuit breakers are sized per national electrical codes and are based on start-up temperatures between -20°F (-29°C) and 50°F (10°C).
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 a ground fault interrupter/ground leakage device with a trip setting no greater than 30mA.

Power Output Rating:



A	HLT3 HLT23	B	HLT5 HLT25	C	HLT8 HLT28	D	HLT10 HLT210	E	HLT12 HLT212	F	HLT15 HLT215	G	HLT18 HLT218	H	HLT20 HLT220
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WATTS PER FOOT x 3.28 = WATTS PER METER  
PIPE TEMPERATURE °F CONVERSION TO °C = 5/9 (°F - 32)

# NELSON™

## TYPE HLT SELF-REGULATING HEATER CABLE

## SPECIFICATION/APPLICATION INFORMATION

### Catalog Numbers:

BASIC CATALOG NUMBERS								
	Watts Per Foot							
Voltage	3	5	8	10	12	15	18	20
120 VAC	HLT3	HLT5	HLT8	HLT10	HLT12	HLT15	HLT18	HLT20
240 VAC	HLT23	HLT25	HLT28	HLT210	HLT212	HLT215	HLT218	HLT220

### Standard Feature Suffix:

-CB Tinned Copper Braid

### Optional Features Suffix:

-J Tinned Copper Braid and Fluoropolymer Overjacket  
D1- Class I, Division I, Groups B, C and D approved

### Voltage Adjustment:

Use of self-regulating products at other than rated voltages require minor adjustments in power and maximum circuit lengths.

ADJUSTMENT MULTIPLIER							
Product	208 VAC		220 VAC		277 VAC		Absolute Max Length
	Power	Length	Power	Length	Power	Length	
HLT23	.74	.93	.84	.96	1.30	1.07	785 ft.
HLT25	.76	.93	.85	.96	1.29	1.07	620 ft.
HLT28	.78	.93	.86	.96	1.25	1.07	460 ft.
HLT210	.80	.93	.88	.96	1.23	1.07	375 ft.
HLT212	.81	.93	.88	.96	1.21	1.07	335 ft.
HLT215	.83	.93	.89	.96	1.19	1.02	270 ft.
HLT218	.85	1.01	.91	1.00	1.18	1.00	245 ft.
HLT220	.88	1.00	.93	1.00	1.15	1.00	210 ft.

### Approvals:

#### FM

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



#### CSA

**Ordinary Locations -**  
(-CB or -J options)  
**Hazardous (Classified) Locations**  
(-CB or -J options)  
Class I, Division 2  
Groups B, C, D  
Class II, Division 2  
Groups E, F, G  
(-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 T3



#### UL

**Ordinary Locations -**  
(-CB or -J options)  
**Hazardous (Classified) Locations**  
(-CB or -J 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 & 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).

