

# Type HLT Self-Regulating Heater Cable

## For use in Ordinary and Hazardous (Classified) Locations

### UL:

-CB or -J options:  
Class I, Division 2,  
Groups A, B, C, D;  
Class II, Division 2,  
Groups F, G; Class I,  
Zone 1, AEx e II

### UL:

-D1 option: Class I,  
Division 1, Groups  
B, C, D; Class II,  
Division 1, Groups E,  
F, G; Class III

### CSA:

-CB or -J options:  
Class I, Division  
2, Groups B, C, D;  
Class II, Division 2,  
Groups E, F, G; Class  
III; Class 1, Zone 2,  
Group IIB+H2

### CSA:

-J option: Class I,  
Division 1, Groups  
B, C, D; Class II,  
Division 1, Groups E,  
F, G; Class I, Zone 1,  
Group IIB, Zone 1, Ex  
e II T3

### FM:

-CB or -J options:  
Class I, Division 2,  
Groups A, B, C, D;  
Class II, Division 2,  
Groups F, G; Class III

### FM:

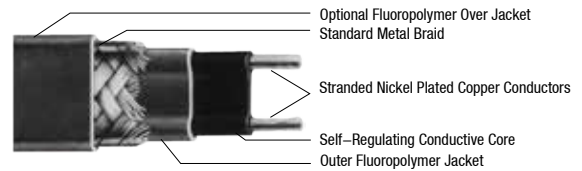
-J option: Class  
I, Zone 1 AEx e II;  
Group IIC

### FM:

-D1 option: Class I,  
Division 1, Groups  
B, C, D; Class I, Zone  
1; Group IIB

## 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 over jacket can be specified when the heater cable is to be installed in wet or corrosive environments.
- 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.



## 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 flow over a wide range of operating temperatures.
- The product is used for available for freeze protection of periodically steam (200 psig) cleaned pipes and temperature maintenance for 121°C (250°F) or lower processes.
- Typical applications include hydrocarbon and chemical product piping.

## Accessories

- Nelson AX Series Connection Kits for Power, Splice, Tee Splice, Powered Splices and End Terminations
- Nelson HASK Series Division 1 Connection Kits for Power, Splice, Tee Splice and End Terminations
- Nelson EX Series Zone 1 Connection Kits for Power, Splice, Tee Splice, Powered Splices and End Terminations
- Nelson TA, TH, TE and HC Series Thermostats and Contactors
- Junction Boxes, Tapes and Warning Signs
- Custom Control, Monitoring and Power Panels

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### Performance Rating

Service Voltage	Maximum Maintenance Temperature °C (°F)	Maximum Intermittent Exposure °C (°F)	T-Rating ①	Watts/M (Watts/Ft)
120 240	120 (250)	215 (420)	T3 (T3)	16 (5)
120 240	120 (250)	215 (420)	T3 (T3)	33 (10)
120 240	120 (250)	215 (420)	T3 (T3)	49 (15)
120 240	120 (250)	215 (420)	T3 (T2D)	66 (20)

① Electrical equipment T rating codes define the maximum surface temperature that equipment will reach. It is used in hazardous (classified) area applications.

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### Circuit Breaker Selection

Watts/M (Watts/Ft)	Start-Up Temp. °C (°F)	Max. Length in Meters (Feet) Vs. Circuit Breaker Size								
		120 VAC				240 VAC				
		15A	20A	30A	40A	15A	20A	30A	40A	50A
16 (5)	10 (50)	65 (220)	85 (280)	85 (280)	85 (280)	135 (445)	170 (560)	170 (560)	170 (560)	170 (560)
	0 (18)	60 (195)	80 (260)	85 (280)	85 (280)	115 (380)	155 (510)	170 (560)	170 (560)	170 (560)
	-29 (20)	55 (185)	75 (245)	85 (280)	85 (280)	115 (370)	150 (490)	170 (560)	170 (560)	170 (560)
33 (10)	10 (50)	40 (125)	50 (170)	60 (195)	60 (195)	75 (250)	100 (335)	120 (390)	120 (390)	120 (390)
	0 (18)	35 (110)	45 (145)	60 (195)	60 (195)	65 (220)	90 (295)	120 (390)	120 (390)	120 (390)
	-29 (20)	30 (105)	45 (140)	60 (195)	60 (195)	65 (210)	85 (280)	120 (390)	120 (390)	120 (390)
49 (15)	10 (50)	25 (85)	35 (115)	40 (135)	40 (135)	55 (175)	70 (230)	80 (270)	80 (270)	80 (270)
	0 (18)	25 (80)	30 (105)	40 (135)	40 (135)	50 (160)	65 (215)	80 (270)	80 (270)	80 (270)
	-29 (20)	25 (75)	30 (100)	40 (135)	40 (135)	45 (150)	60 (200)	80 (270)	80 (270)	80 (270)
66 (20)	10 (50)	20 (65)	25 (90)	30 (105)	30 (105)	40 (135)	55 (180)	65 (210)	65 (210)	65 (210)
	0 (18)	20 (60)	25 (80)	30 (105)	30 (105)	35 (120)	50 (165)	65 (210)	65 (210)	65 (210)
	-29 (20)	20 (60)	25 (80)	30 (105)	30 (105)	35 (120)	45 (155)	65 (210)	65 (210)	65 (210)

#### Notes

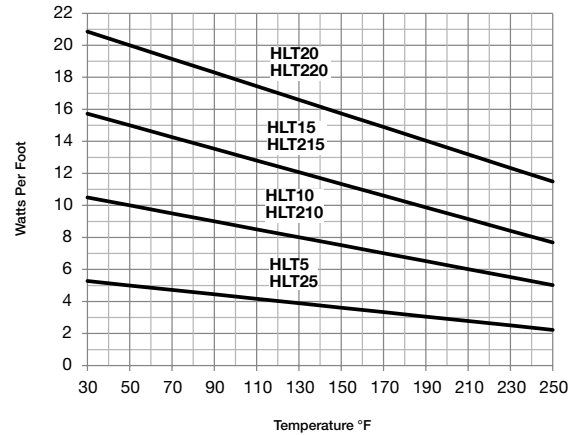
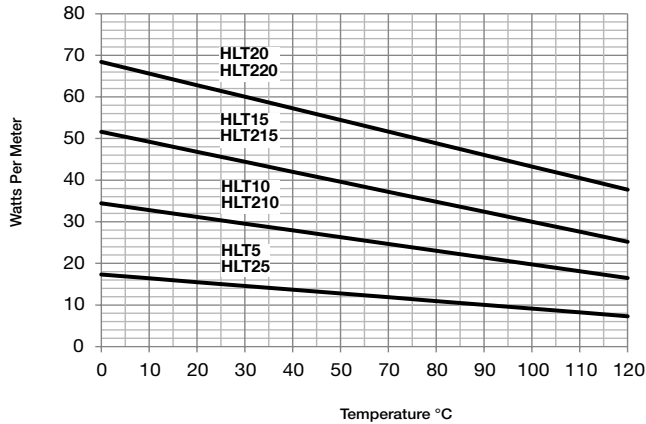
1. Circuit breakers are sized per national electrical codes and are based on start-up temperatures between -29°C (20°F) and 10°C (50°F).
2. When using 240 volt product at 208, 220 or 277 volts, use the circuit adjustment factors shown in the Voltage Adjustment Table.
3. When using 2 or more heater cables 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 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.

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### Power Output Rating



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Zone 1, AEx e II

**UL:**  
-D1 option: Class I,  
Division 1, Groups  
B, C, D; Class II,  
Division 1, Groups E,  
F, G; Class III

**CSA:**  
-CB or -J options:  
Class I, Division  
2, Groups B, C, D;  
Class II, Division 2,  
Groups E, F, G; Class  
III; Class 1, Zone 2,  
Group IIB+H2

**CSA:**  
-J option: Class I,  
Division 1, Groups  
B, C, D; Class II,  
Division 1, Groups E,  
F, G; Class I, Zone 1,  
Group IIB, Zone 1, Ex  
e II T3

**FM:**  
-CB or -J options:  
Class I, Division 2,  
Groups A, B, C, D;  
Class II, Division 2,  
Groups F, G; Class III

**FM:**  
-J option: Class  
I, Zone 1 AEx e II;  
Group IIC

**FM:**  
-D1 option: Class I,  
Division 1, Groups  
B, C, D; Class I, Zone  
1; Group IIB

**Selection Table**

Service Voltage	Maximum Segment Length Meters (Ft)	Description	Catalog Number
120	85 (280)	Tinned Copper Braid	HLT5-CB
		Tinned Copper Braid and Fluoropolymer	HLT5-J
		Class 1, Division 1, Groups B, C and D	D1-HLT5
240	170 (560)	Tinned Copper Braid	HLT25-CB
		Tinned Copper Braid and Fluoropolymer	HLT25-J
		Class 1, Division 1, Groups B, C and D	D1-HLT25
120	60 (195)	Tinned Copper Braid	HLT10-CB
		Tinned Copper Braid and Fluoropolymer	HLT10-J
		Class 1, Division 1, Groups B, C and D	D1-HLT10
240	120 (390)	Tinned Copper Braid	HLT210-CB
		Tinned Copper Braid and Fluoropolymer	HLT210-J
		Class 1, Division 1, Groups B, C and D	D1-HLT210
120	40 (135)	Tinned Copper Braid	HLT15-CB
		Tinned Copper Braid and Fluoropolymer	HLT15-J
		Class 1, Division 1, Groups B, C and D	D1-HLT15
240	80 (270)	Tinned Copper Braid	HLT215-CB
		Tinned Copper Braid and Fluoropolymer	HLT215-J
		Class 1, Division 1, Groups B, C and D	D1-HLT215
120	30 (105)	Tinned Copper Braid	HLT20-CB
		Tinned Copper Braid and Fluoropolymer	HLT20-J
		Class 1, Division 1, Groups B, C and D	D1-HLT20
240	65 (210)	Tinned Copper Braid	HLT220-CB
		Tinned Copper Braid and Fluoropolymer	HLT220-J
		Class 1, Division 1, Groups B, C and D	D1-HLT220

**Voltage Adjustment** ①

Absolute Max Length Meters (Feet)	Adjustment Multiplier							Product
	208 VAC		220 VAC		277 VAC			
	Power	Length	Power	Length	Power	Length		
170 (560)	0.76	0.93	0.85	0.96	1.29	1.07	HLT25	
120 (390)	0.80	0.93	0.88	0.96	1.23	1.07	HLT210	
80 (270)	0.83	0.93	0.89	0.96	1.19	1.02	HLT215	
65 (210)	0.88	1.00	0.93	1.00	1.15	1.00	HLT220	

① Use of Self-Regulating heater products at other than rated voltages require minor adjustments in power and maximum circuit lengths.