

# Type CLT Self-Regulating Heaters

## For use in Ordinary (Unclassified) Locations



THORNE &  
DERRICK  
INTERNATIONAL

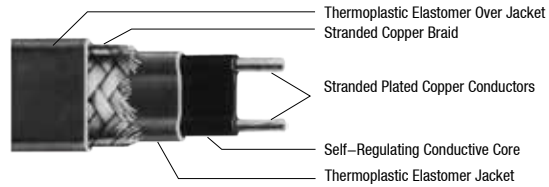
Thorne & Derrick  
+44 (0) 191 410 4292  
www.heatingandprocess.com

UL:  
Ordinary (Unclassified) Locations

CSA:  
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### Description

- Nelson Type CLT 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.
- A thermoplastic elastomer over jacket is then extruded over the inner jacket.
- A stranded copper braid is installed over the second jacket, providing a continuous ground path.
- A standard option UV stabilized polyolefin over jacket is available to cover the braid for wet applications.



### Operating Principle

- 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 Type CLT 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.

### Accessories

- Nelson PLT and AX Series 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

### Certifications and Compliances

- UL Listed: E33597, E53501
- CSA Standard: CSA C22.2 No. 130-16
- CSA Certified: LR42103
- Other Standards: IEEE 515-2011, IEEE 515.1-2012

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COMMERCIAL/LITE INDUSTRIAL HEATING SYSTEMS: SELF-REGULATING HEATING CABLES

NELSON™

### Performance Rating

Service Voltage	Maximum Maintenance Temperature °C (°F)	Maximum Intermittent Exposure °C (°F)	Watts/m (Watts/ft)
120	65 (150)	85 (185)	10 (3)
240			
120	65 (150)	85 (185)	16 (5)
240			
120	65 (150)	85 (185)	26 (8)
240			

### Circuit Breaker Selection

Watts/m (Watts/ft)	Start-Up Temp. °C (°F)	Maximum Length in Meters (Feet) Vs. Circuit Breaker Size								
		120 Volt				240 Volt				
		15A	20A	30A	40A	15A	20A	30A	40A	50A
10 (3)	10 (50)	90 (290)	90 (290)	90 (290)	90 (290)	175 (580)	175 (580)	175 (580)	175 (580)	175 (580)
	-18 (0)	70 (230)	90 (290)	90 (290)	90 (290)	140 (460)	175 (580)	175 (580)	175 (580)	175 (580)
	-29 (-20)	65 (205)	85 (275)	90 (290)	90 (290)	125 (415)	170 (550)	175 (580)	175 (580)	175 (580)
16 (5)	10 (50)	70 (220)	70 (225)	70 (225)	70 (225)	135 (445)	135 (450)	135 (450)	135 (450)	135 (450)
	-18 (0)	50 (160)	65 (215)	70 (225)	70 (225)	100 (320)	130 (425)	135 (450)	135 (450)	135 (450)
	-29 (-20)	45 (145)	60 (195)	70 (225)	70 (225)	90 (290)	115 (385)	135 (450)	135 (450)	135 (450)
26 (8)	10 (50)	45 (150)	55 (180)	55 (180)	55 (180)	95 (305)	110 (360)	110 (360)	110 (360)	110 (360)
	-18 (0)	35 (110)	45 (145)	55 (185)	55 (185)	65 (220)	90 (295)	110 (360)	110 (360)	110 (360)
	-29 (-20)	30 (100)	40 (135)	55 (185)	55 (185)	60 (200)	80 (265)	110 (360)	110 (360)	110 (360)

#### 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 NFPA 70, National Electrical Code.

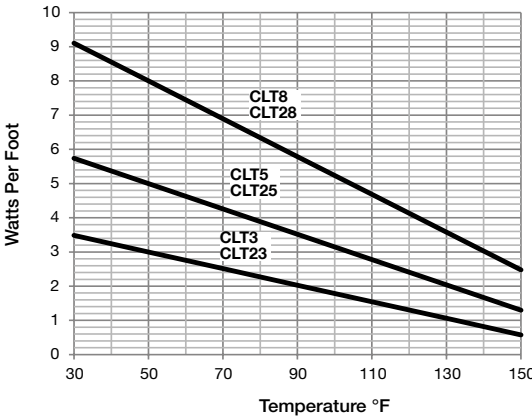
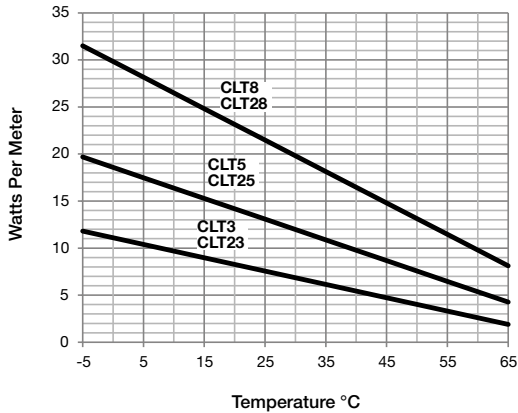
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### Power Output Rating



### Selection Table

Service Voltage	Maximum Segment Length Meters (Ft)	Description	Catalog Number
120	90 (290)	Copper Braid and Modified Polyolefin	CLT3-JT
240	175 (580)		CLT23-JT
120	70 (225)	Copper Braid and Modified Polyolefin	CLT5-JT
240	135 (450)		CLT25-JT
120	55 (180)	Copper Braid and Modified Polyolefin	CLT8-JT
240	110 (360)		CLT28-JT

### Voltage Adjustment ①

Absolute Max Length Meters (Feet)	Adjustment Multiplier						Product
	208Vac		220Vac		277 Vac		
	Power	Length	Power	Length	Power	Length	
175 (580)	0.71	1.04	0.81	1.02	1.34	0.98	CLT23
135 (450)	0.80	1.01	0.87	1.00	1.22	1.02	CLT25
110 (360)	0.87	1.00	0.92	1.00	1.12	1.03	CLT28

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