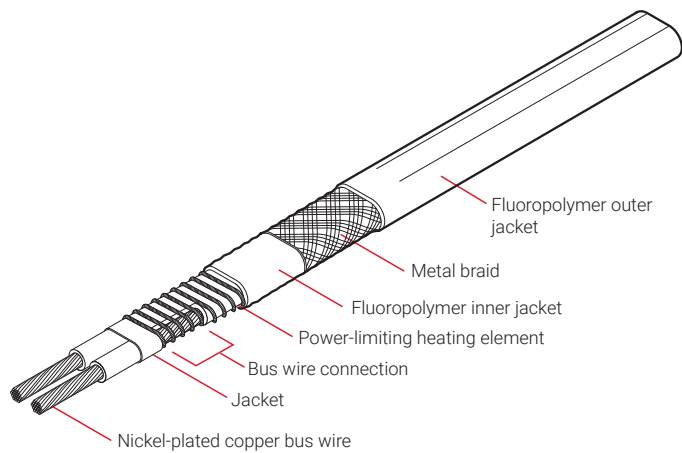


### High-temperature power-limiting heating cables for freeze protection and process temperature maintenance (nonhazardous and hazardous locations)

#### PRODUCT OVERVIEW



Heating cable construction



nVent RAYCHEM VPL is a family of power-limiting heating cables designed for pipe heat tracing in industrial applications. VPL can be used for freeze protection and process-temperature maintenance requiring high power output and/or high temperature exposure up to 455°F (235°C) and can withstand routine steam purges and temperature excursions to 500°F (260°C) with power off.

Power-limiting cables are parallel heaters formed by a coiled resistor alloy heating element wrapped around two parallel bus wires. The distance between conductor contact points forms the heating zone length. This parallel construction allows the cable to be cut to length and terminated on site. The power output of VPL heating cables decreases with increasing temperature. VPL heating cables can be overlapped. The relatively flat power temperature curve of VPL ensures a low start-up current and high output at elevated temperatures.

VPL cables are approved for use in non-hazardous and hazardous locations. Approvals are listed below.

nVent RAYCHEM VPL cables meet the requirements of the U.S. National Electrical Code and the Canadian Electrical Code. For additional information contact your nVent representative or call (800) 545-6258.

#### APPLICATION

Area classification	Nonhazardous and hazardous locations
Traced surface type	Metal
Chemical resistance	Organic and aqueous inorganic chemicals and corrosives

#### SUPPLY VOLTAGE

VPL1	100-120 Vac
VPL2	200-277 Vac (20VPL2-CT 200-240 Vac only)
VPL4	400-480 Vac

## SPECIFICATIONS

Maximum exposure temperature (power off)	500°F (260°C)
Minimum installation temperature	-76°F (-60°C)
Bus wire size	12 AWG
Outer jacket color	Red
Minimum bending radius	-76°F (-60°C) ≤ T < -4°F (-20°C): 0.75" (19 mm) -4°F (-20°C) ≤ T < 50°F (+10°C): 0.6" (15 mm) T ≥ 50°F (+10°C): 0.5" (12.7 mm)
Temperature classification	To be established using the principles of stabilized design. Use nVent RAYCHEM TraceCalc Pro design software or contact nVent for assistance.

### Maximum continuous maintain (power on) temperature table

Cable	120 V	208 V	230 V	240 V	277 V	480 V
5VPL1-CT	445°F (230°C)	-	-	-	-	-
10VPL1-CT	400°F (205°C)	-	-	-	-	-
15VPL1-CT	335°F (170°C)	-	-	-	-	-
20VPL1-CT	300°F (150°C)	-	-	-	-	-
5VPL2-CT	-	455°F (235°C)	445°F (230°C)	445°F (230°C)	435°F (225°C)	-
10VPL2-CT	-	425°F (220°C)	410°F (210°C)	400°F (205°C)	383°F (195°C)	-
15VPL2-CT	-	390°F (200°C)	356°F (180°C)	335°F (170°C)	221°F (105°C)	-
20 VPL2-CT	-	300°F (150°C)	300°F (150°C)	300°F (150°C)	-	-
5VPL4-CT	-	-	-	-	-	445°F (230°C)
10VPL4-CT	-	-	-	-	-	400°F (205°C)
15VPL4-CT	-	-	-	-	-	320°F (160°C)
20VPL4-CT	-	-	-	-	-	300°F (150°C)

## APPROVALS

### Hazardous Locations

<b>IECEX</b> IECEx BAS 20.0008X Ex 60079-30-1 eb IIC T* Gb Ex 60079-30-1 tb IIIC IP66 T**°C Db Ex 60079-30-1 eb mb IIC T* Gb Ex 60079-30-1 mb tb IIIC IP66 T**°C Db Tmin -60°C		Class I, Div. 2, Groups B, C, D Class II, Div. 2, Groups F, G Class III T-class by design Tmin -40°C		Class I, Div. 1 and 2, Groups A, B, C, D Class II, Div. 1 and 2, Groups E, F, G -WS for Canada		Ex 60079-30-1 IIC T* Gb Ex 60079-30-1 IIIC T* Db c <sub>us</sub> Class I Zone 1 AEx eb IIC T* Gb Zone 21 AEx tb IIIC T* Db -WS for Canada *T class by design



IEEx 09.0007X  
 Ex eb IIC T\* Gb  
 Ex eb mb IIC T\* Gb

(\*,\*\*) For maximum surface temperature, see heating cable, design documentation or schedule

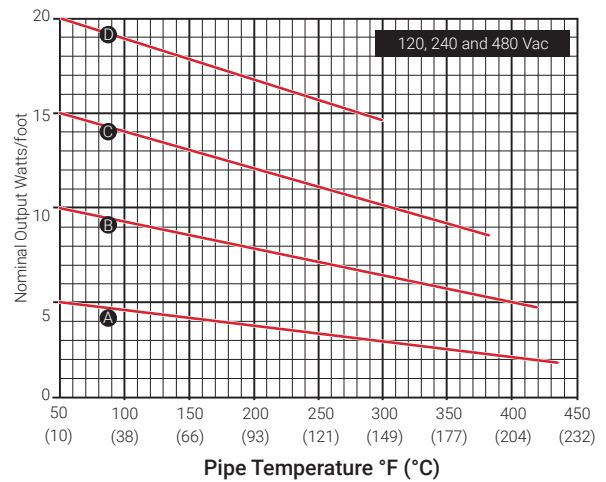
## DESIGN AND INSTALLATION

For proper design and installation, use TraceCalc Pro design software or the Design section of the nVent Products & Services Catalogue (H56550). Also, refer to the nVent Maintenance Manual (H57274). Literature is available via the nVent web site, [www.nVent.com](http://www.nVent.com).

## NOMINAL POWER OUTPUT RATING ON METAL PIPES AT 120 V, 240 V AND 480 V

	Adjustment factors	
	Power output	Circuit length
<b>208 V</b>		
5VPL2-CT	0.77	0.89
10VPL2-CT	0.78	0.90
15VPL2-CT	0.79	0.91
20VPL2-CT	0.80	0.92
<b>277 V</b>		
5VPL2-CT	1.30	1.13
10VPL2-CT	1.28	1.11
15VPL2-CT	1.26	1.09
20VPL2-CT	Not allowed	

A 5VPL-CT  
B 10VPL-CT  
C 15VPL-CT  
D 20VPL-CT



**Note:** To choose the correct heating cable for your application, use the Design section of the nVent Products & Services Catalogue (H56550). For more detailed information, use TraceCalc Pro design software.

## MAXIMUM CIRCUIT LENGTHS BASED ON CIRCUIT BREAKER SIZES

	Ambient temperature at start-up	Maximum circuit length (in feet) per circuit breaker														
		120 V					240 V					480 V				
		15 A	20 A	30 A	40 A	50 A	15 A	20 A	30 A	40 A	50 A	15 A	20 A	30 A	40 A	50 A
5VPL-CT	50°F (10°C)	260	350	370	370	370	525	85	40	740	740	1050	1370	1480	1480	1480
	0°F (-18°C)	240	325	370	370	370	485	645	0	740	740	970	1290	1480	1480	1480
	-20°F (-29°C)	235	315	370	370	370	470	625	740	740	740	940	1250	1480	1480	1480
	-40°F (-40°C)	225	305	370	370	370	455	610	740	740	740	910	1220	1480	1480	1480
10VPL-CT	50°F (10°C)	130	175	260	260	260	260	50	525	525	525	520	700	1050	1050	1050
	0°F (-18°C)	120	165	245	260	260	245	25	490	525	525	490	650	980	1050	1050
	-20°F (-29°C)	120	160	240	260	260	235	315	475	525	525	470	630	950	1050	1050
	-40°F (-40°C)	115	155	230	260	260	230	310	465	525	525	460	620	930	1050	1050
15VPL-CT	50°F (10°C)	85	115	175	215	215	175	230	350	430	430	350	460	700	860	860
	0°F (-18°C)	80	110	165	215	215	165	220	325	430	430	330	440	650	860	860
	-20°F (-29°C)	80	105	160	215	215	160	215	320	425	430	320	430	640	850	860
	-40°F (-40°C)	75	100	155	210	215	155	210	310	415	430	310	420	620	830	860
20VPL-CT	50°F (10°C)	65	85	130	175	185	130	175	260	350	370	260	350	520	700	740
	0°F (-18°C)	60	85	125	165	185	125	165	250	330	370	250	330	500	660	740
	-20°F (-29°C)	60	80	120	160	185	120	160	245	325	370	240	320	490	650	740
	-40°F (-40°C)	60	80	120	160	185	115	155	240	320	370	230	310	480	640	740

## PRODUCT DIMENSIONS AND WEIGHT

Weight 140 lbs/1000 ft (208 g/m)

Width x Thickness (nominal) 0.458 x 0.322 in (11.6 x 8.2 mm)

## ORDERING DETAILS

Part Description	Part Number
5VPL1-CT	587458-000
5VPL2-CT	451828-000
5VPL4-CT	P000000678
10VPL1-CT	276822-000
10VPL2-CT	892652-000
10VPL4-CT	P000000679

Part Description	Part Number
15VPL1-CT	181162-000
15VPL2-CT	068380-000
15VPL4-CT	P000000680
20VPL1-CT	005614-000
20VPL2-CT	589252-000
20VPL4-CT	P000000681

## CONNECTION KITS

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nVent offers a full range of connection kits for power connections, splices, and end seals. These connection kits must be used to ensure proper functioning of the product and compliance with warranty, code, and approvals requirements.

## GROUND-FAULT PROTECTION

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To minimize the danger of fire from sustained electrical arcing if the heating cable is damaged or improperly installed, and to comply with the requirements of nVent, agency certifications, and national electrical codes, ground-fault equipment protection must be used on each heating cable branch circuit. Arcing may not be stopped by conventional circuit protection. Many nVent RAYCHEM control and monitoring systems meet the ground-fault protection requirement.

480 V VPL must use nVent RAYCHEM 920, nVent RAYCHEM NGC-30 or NGC-40 controllers only, which provide ground-fault protection at 480 volts.

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