



## RAYCHEM

# WinterGard, WinterGard Plus, WinterGard Wet

## Selection Guide (for Pipe Freeze Protection Applications)

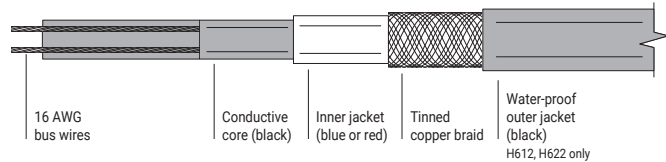
nVent RAYCHEM WinterGard self-regulating heating cables provide convenient, reliable freeze protection for a wide variety of professionally installed residential and commercial water-pipe and roof-and-gutter de-icing applications in nonhazardous areas. This selection guide is designed to assist in cable and accessory selection and basic circuit design of pipe-freeze-prevention applications.

Complete design guidelines, installation instructions, and safety

### Construction

information are provided in the Residential & Light Commercial Self-Regulating Heating Products Application and Design Guide (H53585), the H900 Power Connection Kit (H53665), and the H908 Plug-in Power Connection Kit (H54789).

For detailed information on roof and gutter de-icing applications, please refer to the WinterGard Wet Roof & Gutter De-Icing Design, Installation and Maintenance Guide (H56804).



### Pipe Applications

Water pipes in dry areas:	H311/H611/H621
Water pipes in wet areas and refrigeration condensate drains:	H612/H622

### nVent RAYCHEM Product Specifications and Data

	WinterGard	WinterGard Plus	WinterGard Plus	WinterGard Wet	WinterGard Wet
	H311100	H611050	H621050	H612050	H622050
	H311250	H611250	H621250	H612250	H622250
				H612500	H622500
				H6121000	H6221000
Service voltage	120 V	120 V	240 V	120 V	240 V
Power output at 40°F (W/ft)	3	6	6	6	6
Power output in refrigeration condensate drains at 32°F (W/ft)	n/a	n/a	n/a	8	8
Weight per 100 ft (lb)	6	6	6	7	7
Nom. cable width (in)	0.380	0.380	0.380	0.415	0.415
Nom. cable thickness (in)	0.180	0.180	0.180	0.215	0.215
Bus wire gauge (AWG)	16	16	16	16	16
Braid wire gauge equivalent (AWG)	14	14	14	14	14
Insulating jacket type	Modified polyolefin				
Outer jacket type	n/a	n/a	n/a	Modified polyolefin	
Maximum exposure temp. (°F)	150	150	150	150	150
Environment	Use only in ordinary (nonhazardous) areas. Do not expose to any chemicals.				
Agency approvals*	1, 3	1, 3	1, 3	1, 2, 3	1, 2, 3

\*1 = UL System Listed 718K Pipe Heating Cable; 2 = UL System Listed 877Z De-Icing and Snow Melting Equipment; 3 = CSA Certified LR21133

### ⚠ WARNING:

WinterGard systems must be installed correctly to ensure proper operation and to prevent shock or fire. Carefully read and follow the Residential & Light Commercial Self-Regulating Heating Products Application and Design Guide and the H900 series connection kit installation instructions.

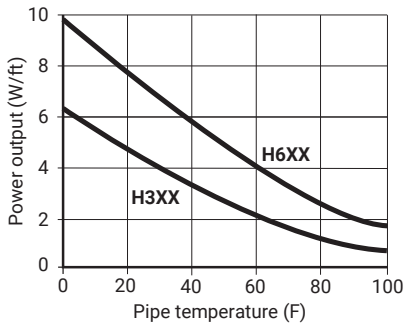
- Use only in ordinary (nonhazardous) areas. Do not expose to any chemicals, oil or grease.
- In wet areas, use only WinterGard Wet.

- 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 approvals, 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.

- This selection guide does not take the place of the installation instructions included in the Residential & Light Commercial Self-Regulating Heating Products Application and Design Guide and in the H900 series accessory kits.
- System approvals and performance are based on the use of only H900 series accessories with WinterGard heating cables. These accessories must be used. Do not substitute parts.

## Circuit Sizing Guide

### WinterGard Power Temperature Curves

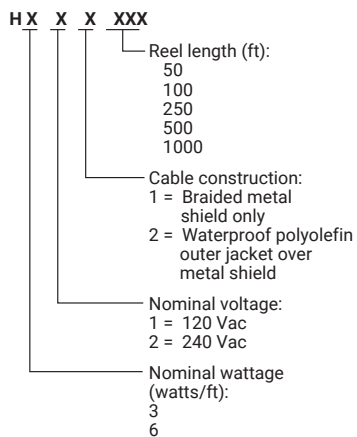


Heating cable type	Circuit breaker rating (A)	Maximum heater length (ft) per circuit at start-up temperature		
		0°F	32°F	40°F
<b>WinterGard 120 V</b> H311 on pipe	15	150		250
	20	200		250
	30	250		250
<b>WinterGard Plus 120 V</b> H611 on pipe	15	125		150
	20	140		195
	30	200		200
<b>WinterGard Plus 240 V</b> H621 on pipe	15	200		255
	20	250		340
	30	375		400
<b>WinterGard Wet 120 V</b> H612 on pipe	15	125		150
	20	140		195
	30	200		200
<b>WinterGard Wet 120 V</b> H612 in refrigeration condensate drains	15	100	125	
	20	125	165	
	30	150	200	
<b>WinterGard Wet 240 V</b> H622 on pipe	15	200		255
	20	250		340
	30	375		400
<b>WinterGard Wet 240 V</b> H622 in refrigeration condensate drains	15	200	250	
	20	250	320	
	30	305	400	

**Note:** Maximum circuit lengths are based on start-up load. Steady-state amps per foot is dependent upon heating cable temperature.

## Catalog References

### Catalog Numbers



Cable type	Catalog number	Cable construction*	Watts/ft (on 40°F metal pipe)	Nominal voltage	Package type**
WinterGard H311	H311100	1	3	120	TruckPak <sup>®</sup> box
	H311250	1	3	120	250-ft reel
WinterGard Plus H611	H611050	1	6	120	50-ft box
	H611100	1	6	120	TruckPak box
	H611250	1	6	120	250-ft reel
WinterGard Plus H621	H621050	1	6	240	50-ft box
	H621100	1	6	240	TruckPak box
	H621250	1	6	240	250-ft reel
WinterGard Wet H612	H612050	2	6	120	50-ft box
	H612100	2	6	120	TruckPak box
	H612250	2	6	120	250-ft reel
	H612500	2	6	120	500-ft reel
	H6121000	2	6	120	1000-ft reel
WinterGard Wet H622	H622050	2	6	240	50-ft box
	H622100	2	6	240	TruckPak box
	H622250	2	6	240	250-ft reel
	H622500	2	6	240	500-ft reel
	H6221000	2	6	240	1000-ft reel

\* Construction: 1 = braided metal shield only; 2 = waterproof polyolefin outer jacket over braid.

\*\* TruckPak consists of 100-foot cable reel, 2 power connections, 1 splice/tee kit, 1 roll application tape, 10 "Electric Traced" labels.

## Selection Tables

Use one of the tables below to help select the correct WinterGard heating cable for your application. (Consult the Residential & Light Commercial Application and Design Guide or H900/H908 Installation Instructions for complete system design information.)

Use Table 1 to select heating cables for insulated metal pipes. Use Table 2 for insulated plastic pipes.

Read across the table to find your pipe diameter, then drop down to the line corresponding to the lowest air temperature for that application and the correct insulation thickness. The cell at that intersection has a particular shade and may have a number.

The shade indicates which heating cable to use (key to the shades appears to the left of Table 1). A number in the cell represents the spiraling ratio (feet of heating cable per foot

of pipe). If no number appears in the cell, straight trace the pipe. If a number does appear in the cell, spiral trace the pipe. If your spiraling ratio is 2.0, multiple-trace the pipe using two straight traces at the 4 o'clock and 8 o'clock positions.

If your spiraling ratio is 3.0, multiple-trace the pipe using three straight traces at the 11 o'clock or 1 o'clock position and at the 4 o'clock and 8 o'clock positions.

### Key to Tables 1 and 2

- H311 WinterGard
- H611/621 WinterGard Plus  
H612/H622 WinterGard Wet
- Increase insulation thickness.

**Table 1. For metal pipes with fiberglass insulation or equivalent** (based on 40°F maintain)

Lowest air temp.	Insulation thickness	Pipe diameter (inches)										
		0.50	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	6.00	
0°F	0.5 in										1.3	1.8
	1.0 in											
	1.5 in											
-20°F	0.5 in						1.1	1.3	1.5	1.8	3.0	
	1.0 in									1.1	1.5	
	1.5 in											1.1
	2.0 in											
-40°F	0.5 in				1.1	1.2	1.4	1.7	2.0	3.0		
	1.0 in								1.1	1.4	1.9	
	1.5 in										1.4	
	2.0 in											1.1

**Table 2. For plastic pipes with fiberglass insulation or equivalent** (based on 40°F maintain)

Lowest air temp.	Insulation thickness	Pipe diameter (inches)										
		0.50	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	6.00	
0°F	0.5 in						1.2	1.4	1.7	2.0	3.0	
	1.0 in									1.2	1.6	
	1.5 in											1.2
-20°F	0.5 in			1.1	1.3	1.5	1.8	2.0	3.0			
	1.0 in						1.1	1.2	1.4	1.8	3.0	
	1.5 in								1.1	1.3	1.7	
	2.0 in											1.4
-40°F	0.5 in	1.1	1.1	1.5	1.8	2.0	3.0	3.0				
	1.0 in				1.1	1.2	1.4	1.6	1.9	3.0		
	1.5 in						1.1	1.2	1.4	1.7	3.0	
	2.0 in								1.1	1.3	1.8	

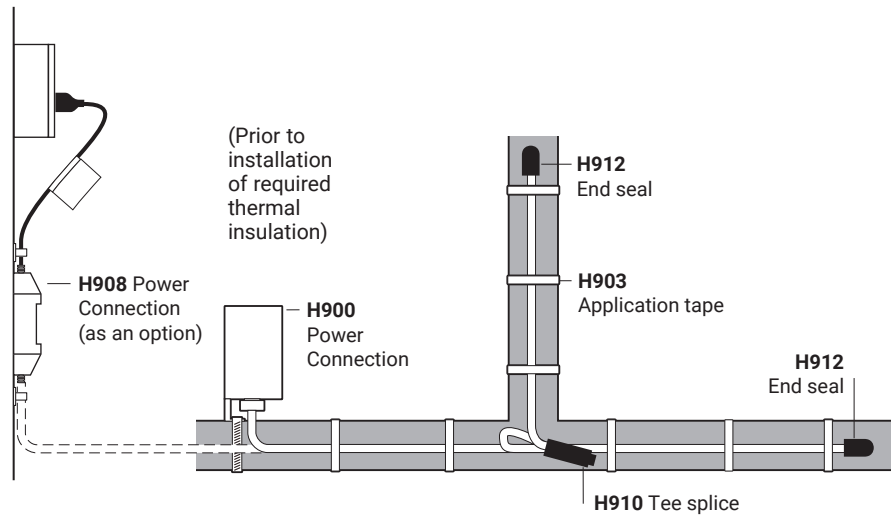
### Example 1

Pipe = 2-inch-diameter metal  
 Lowest air temperature = 0°F  
 Insulation thickness = 1 inch  
 Cable length and type = 1 foot of WinterGard H311 per foot of pipe

### Example 2

Pipe = 2.5-inch-diameter plastic  
 Lowest air temperature = -20°F  
 Insulation thickness = 1 inch  
 Cable length = 1.2 feet of WinterGard Plus H611, H621 or WinterGard Wet H612, H622

## Typical Assembled System



## nVent RAYCHEM WinterGard Accessories (for Pipe Applications)

<b>H900</b>	Power Connection (Hardwire)
<b>H903</b>	Application Tape
<b>H908</b>	Plug-in Power Connection Kit with ground fault
<b>H910</b>	Splice and Tee Kit (wet or dry)
<b>H912</b>	Gel-filled End Seal Kit (includes 2 seals)
<b>AMC-F5</b>	Fixed Set Point Thermostat
<b>AMC-1A</b>	Adjustable Mechanical Thermostat 15F - 140F
<b>EC-TS</b>	Adjustable Electronic Thermostat 30F - 110F



**IMPORTANT:** H900 series accessories must be used with WinterGard heating cables. Do not substitute parts.

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