

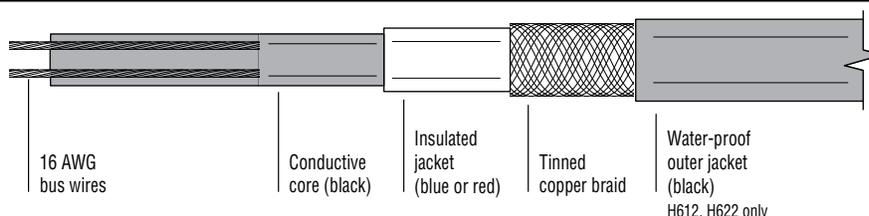
Raychem® WinterGard® self-regulating heating cables provide convenient, reliable freeze protection for a wide variety of professionally installed residential and commercial water-pipe and roof-and-gutter de-icing applications in nonhazardous areas. This data sheet is designed to assist in cable and accessory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

Complete design guidelines, installation instructions, and safety information are provided in the *Commercial and Residential Self-*

Regulating Heating Products Application and Design Guide (H53585), the H900 Power Connection Kit, the H908 Plug-in Power Connection Kit, and the H921 120-V ground-fault protected junction box.

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

Construction



Pipe Applications

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

Product Specifications and Data

	WinterGard H311100 H311250	WinterGard Plus H611050 H611100 H611250	WinterGard Plus H621050 H621100 H621250	WinterGard Wet H612050 H612100 H612250 H612500 H6121000	WinterGard Wet H622050 H622100 H622250 H622500 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 *Commercial and Residential 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.

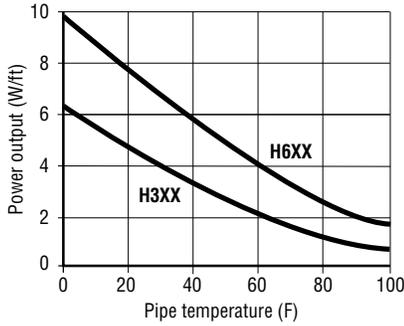
- In wet areas, use only WinterGard Wet.
- To minimize the danger of fire from sustained electrical arcing if the heating cable is damaged or improperly installed, and to comply with the requirements of Tyco Thermal Controls, agency approvals, and national electrical codes, ground-fault equipment protection 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 *Commercial and Residential 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.

WinterGard Selection Guide

Circuit Sizing Guide

WinterGard Power Temperature Curves

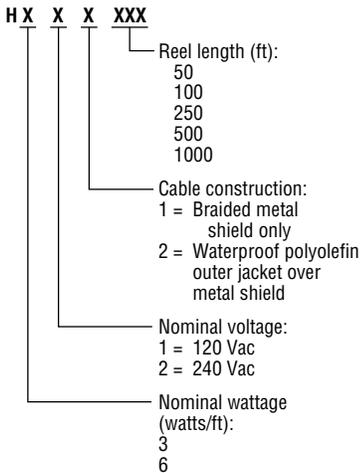


Heating cable type	Circuit breaker rating (A)	Maximum heater length (ft) per circuit at start-up temperature		
		0°F	32°F	40°F
WinterGard 120 V <i>H311 on pipe</i>	15	150		250
	20	200		250
	30	250		250
WinterGard Plus 120 V <i>H611 on pipe</i>	15	125		150
	20	140		195
	30	200		200
WinterGard Plus 240 V <i>H621 on pipe</i>	15	200		255
	20	250		340
	30	375		400
WinterGard Wet 120 V <i>H612 on pipe</i>	15	125		150
	20	140		195
	30	200		200
WinterGard Wet 120 V <i>H612 in refrigeration condensate drains</i>	15	100	125	
	20	125	165	
	30	150	200	
WinterGard Wet 240 V <i>H622 on pipe</i>	15	200		255
	20	250		340
	30	375		400
WinterGard Wet 240 V <i>H622 in refrigeration condensate drains</i>	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® box
	H311250	1	3	120	250-ft reel
WinterGard Plus H611	H611050	1	6	120	50-ft box
	H611100	1	6	120	TruckPak box
WinterGard Plus H621	H611250	1	6	120	250-ft reel
	H621050	1	6	240	50-ft box
WinterGard Plus H621	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
WinterGard Wet H622	H6121000	2	6	120	1000-ft reel
	H622050	2	6	240	50-ft box
	H622100	2	6	240	TruckPak box
	H622250	2	6	240	250-ft reel
WinterGard Wet H622	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 *Commercial and Residential 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
- H611, H612, H621, H622
- 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

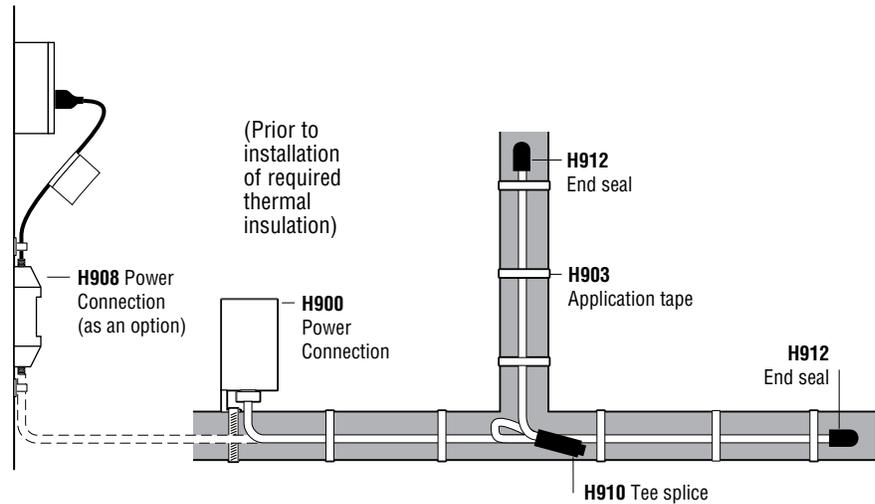
Pipe = 2-inch-diameter metal
 Lowest air temperature = 0°F
 Insulation thickness = 1 inch
 Cable length and type = 1 foot of WinterGard H311 per foot of pipe

Example 2

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

WinterGard Selection Guide

Typical Assembled System



WinterGard Accessories (for Pipe Applications)

H900	Power Connection (Hardwire)
H903	Application Tape
H908	Plug-in Power Connection Kit with ground fault
H910	Splice and Tee Kit (wet or dry)
H912	Gel-filled End Seal Kit (includes 2 seals)
H921	Ground-fault Protected Junction Box Kit
AMC-F5	Fixed Set Point Thermostat



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

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