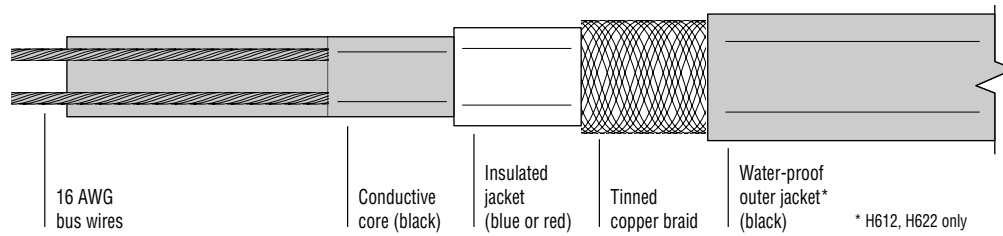


Raychem's WinterGard self-regulating heating cables provide convenient, reliable freeze protection for a wide variety of professionally installed residential and commercial water-pipe

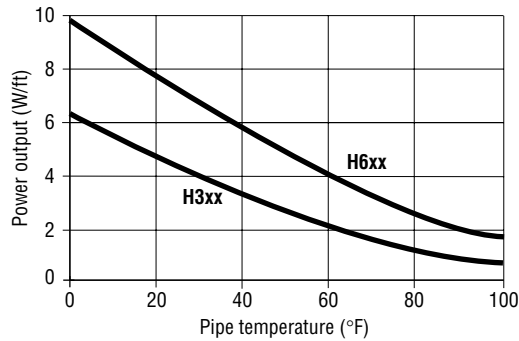
and roof-and-gutter de-icing applications. This data sheet is designed to assist in cable and accessory selection and basic circuit design of pipe-freeze-prevention applications.

Complete design guidelines, installation instructions, and safety information are provided in the H900 Power Connection Kit and the H908 Plug-in Power Connection Kit.

### Construction



### WinterGard Power Temperature Curves



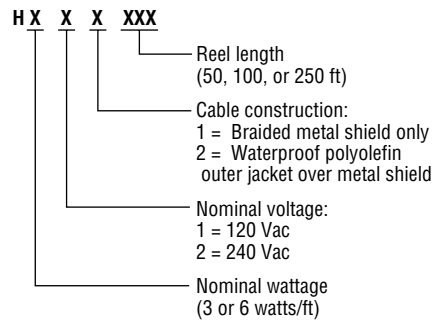
### Applications

#### Pipe Freeze Protection

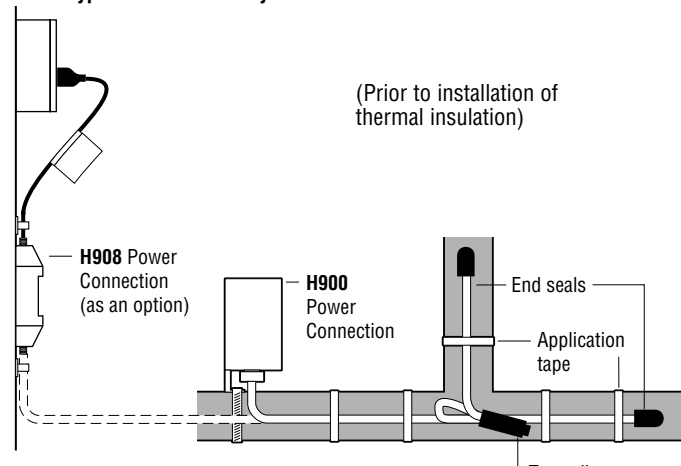
Water pipes, dry areas: H311/H611/H621

Water pipes, wet areas: H612/H622

### Catalog Numbers



### Typical Assembled System



### ⚠ WARNING:

This system must be installed correctly to ensure proper operation and to prevent shock or fire. Carefully read and follow the "HeatSystems Application and Design Guide"

and the "HeatSystems Installation Instructions." Use a ground-fault protection device and H900 series accessories.

## WinterGard Selection Guide

### Catalog References and Circuit Sizing Guide

Cable type	Circuit breaker rating (A)	Max. heater length per circuit at start-up temperature		Catalog number	Cable construction*	Watts/ft (on 40°F metal pipe)	Nominal voltage	Package type**
		40°F	0°F					
WinterGard H311	15	250 ft	150 ft	H311100	1	3	120	TruckPak box
	30	250 ft	150 ft	H311250	1	3	120	250-ft reel
				H611050	1	6	120	50-ft box
WinterGard Plus H611	15	150 ft	125 ft	H611100	1	6	120	TruckPak box
	30	200 ft	200 ft	H611250	1	6	120	250-ft reel
				H621050	1	6	240	50-ft box
WinterGard Plus H621	15	300 ft	225 ft	H621100	1	6	240	TruckPak box
	30	350 ft	350 ft	H621250	1	6	240	250-ft reel
				H612050	2	6	120	50-ft box
WinterGard Wet H612 on pipe	15	150 ft	125 ft	H612100	2	6	120	TruckPak box
	30	200 ft	200 ft	H612250	2	6	120	250-ft reel
				H6121000	2	6	120	1000-ft reel
				H622050	2	6	240	50-ft box
WinterGard Wet H622 on pipe	15	320 ft	225 ft	H622100	2	6	240	TruckPak box
	30	350 ft	350 ft	H622250	2	6	240	250-ft reel
				H6221000	2	6	240	1000-ft reel

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

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

### WinterGard Accessories (for Pipe Applications)

<b>H900</b> Power Connection (Hardwire)	<b>H910</b> Splice and Tee Kit (wet or dry)	<b>H921</b> Junction Box Kit
<b>H903</b> Application Tape	<b>H911</b> Plug-in Power Connection Kit (for use with H311 only)	<b>H931</b> Plug-in GFCI Adapter
<b>H908</b> Plug-in Power Connection Kit with ground fault	<b>H912</b> Gel-filled End Seal Kit (includes 2 seals)	<b>AMC-F5</b> Set Point Thermostat

### Product Specifications and Data

	H311100 H311250	H611050 H611100 H611250	H621050 H621100 H621250	H612050 H612100 H612250 H6121000	H622050 H622100 H622250 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
Maximum circuit length (on pipe)	250	200	350	200	350
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 thickness and type		0.028" (min.) modified polyolefin			
Outer jacket thickness and type	n/a	n/a	n/a	0.011" (min.) 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 718K Pipe Heating Cable; 2 = UL System Listed 877Z De-Icing and Snow Melting Equipment; 3 = CSA Certified LR21133

### Selection Tables

Use one of the tables below to help select the correct WinterGard heating cable for your application. (Consult the "HeatSystems 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	8.00	
0°F	0.5"										1.3	1.8	3.0
	1.0"												1.3
	1.5"												
-20°F	0.5"							1.1	1.3	1.5	1.8	3.0	
	1.0"										1.1	1.5	1.9
	1.5"											1.1	1.3
	2.0"												
-40°F	0.5"				1.1	1.2	1.4	1.7	2.0	3.0			
	1.0"								1.1	1.4	1.9	3.0	
	1.5"										1.4	1.7	
	2.0"										1.1	1.4	

**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	8.00	
0°F	0.5"						1.2	1.4	1.7	2.0	3.0		
	1.0"									1.2	1.6	2.0	
	1.5"										1.2	1.5	
-20°F	0.5"			1.1	1.3	1.5	1.8	2.0	3.0				
	1.0"						1.1	1.2	1.4	1.8	3.0		
	1.5"								1.1	1.3	1.7	3.0	
	2.0"										1.4	1.7	
-40°F	0.5"	1.1	1.1	1.5	1.8	2.0	3.0	3.0					
	1.0"				1.1	1.2	1.4	1.6	1.9	3.0			
	1.5"						1.1	1.2	1.4	1.7	3.0	3.0	
	2.0"								1.1	1.3	1.8	3.0	

#### 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

*HeatSystems, TruckPak, WinterGard, WinterGard Plus, and WinterGard Wet are trademarks of Raychem HTS Tyco Flow Control.*

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