

# **Raychem** WinterGard, WinterGard Plus, WinterGard Wet SELECTION GUIDE (FOR PIPE FREEZE PROTECTION APPLICATIONS)

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

16 AWG Conductive Inner jacket Tinned outer jacket (black)
bus wires core (black) (blue or red) copper braid (black)
H612, H622 only

Pipe Applications

Water pipes in dry areas:

H311/H611/H621

Water pipes in wet areas and refrigeration

H612/H622

condensate drains:

## **Product Specifications and Data**

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	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 o	ordinary (nonhazard	ous) areas. Do not e	expose to any chem	icals.		
Agency approvals*	1, 3	1, 3	1, 3	1, 2, 3	1, 2, 3		

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

#### WARNING WARNING

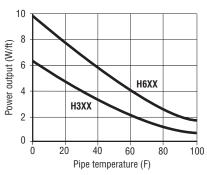
WinterGard systems must be installed correctly to ensure proper operation and to prevent shock or fire. Carefully read and follow the Commercial and Residential Self-Regulating Heating Products Application and Design Guide and the H900 series connection kit installation instructions.

- 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 Pentair Thermal Management, 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

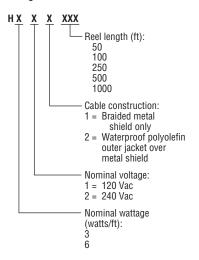


	Circuit breaker	Maximum heater length (ft) per circuit at start-up temperature				
Heating cable type	rating (A)	0°F	32°F	40°F		
WinterGard 120 V	15	150	·	250		
H311 on pipe	20	200		250		
	30	250		250		
WinterGard Plus 120 V	15	125		150		
H611 on pipe	20	140		195		
	30	200		200		
WinterGard Plus 240 V	15	200		255		
H621 on pipe	20	250		340		
	30	375		400		
WinterGard Wet 120 V	15	125		150		
H612 on pipe	20	140		195		
	30	200		200		
WinterGard Wet 120 V	15	100	125			
H612 in refrigeration	20	125	165			
condensate drains	30	150	200			
WinterGard Wet 240 V	15	200		255		
H622 on pipe	20	250		340		
	30	375		400		
WinterGard Wet 240 V	15	200	250			
H622 in refrigeration	20	250	320			
condensate drains	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 construc- tion*	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	H611050	1	6	120	50-ft box
H611	H611100	1	6	120	TruckPak box
	H611250	1	6	120	250-ft reel
WinterGard Plus	H621050	1	6	240	50-ft box
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
	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

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

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

#### WinterGard Selection Guide

## 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 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
	0.5 in									1.3	1.8
0°F	1.0 in										
	1.5 in									1.3 5 1.8 1.1 0 3.0	
	0.5 in						1.1	1.3	1.5	1.8	3.0
–20°F	1.0 in									1.1	1.5
-20 F	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	Insulation thickness	Pipe diameter (inches)									
air temp.		0.50	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	6.00
	0.5 in						1.2	1.4	1.7	2.0	3.0
0°F	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
-20 F	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 =  $-20^{\circ}$ F Insulation thickness = 1 inch Cable length = 1.2 feet of WinterGard Plus H611, H621 or WinterGard Wet H612, H622