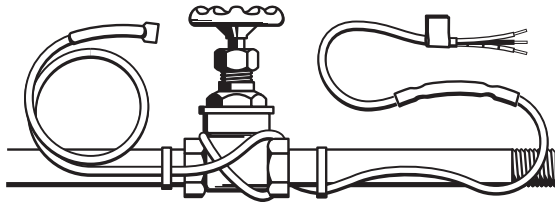




## RAYCHEM

# FROSTGUARD 240 V

## 240 V Preassembled Electric Heating Cables for Pipe Freeze Protection Installation Instructions



### DESCRIPTION

nVent RAYCHEM FrostGuard 240 V preassembled electric heating cables are intended for installation on metal or plastic water pipes for freeze protection in commercial locations. FrostGuard 240 V heating cables are available in 6-, 12-, 18-, and 24-foot lengths and each comes complete with a 6-ft cold lead.

### KIT CONTENTS

Item	Qty	Description
1		FrostGuard preassembled heating cable
3		Wire connectors

### ADDITIONAL MATERIALS REQUIRED

- 1 UL Listed or CSA Certified junction box suitable for wet or dry areas
- 1 UL Listed or CSA Certified outlet bushing and fitting
- Cable ties or glass-cloth tape
- Thermal pipe insulation

### APPROVALS



### HEATING CABLE SELECTION

#### FrostGuard 240 V (FG2) heating cable selection for pipe freeze protection:

Use the tables to the right to select the correct heating cable. Round up to the next pipe size if your pipe diameter isn't shown.

The charts assume the lowest ambient temperature is  $-20^{\circ}\text{F}$  ( $-29^{\circ}\text{C}$ ), with a minimum of 1/2 in fiberglass insulation or equivalent. For protection to  $-40^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$ ), use 1 inch fiberglass insulation or equivalent fire-resistant insulation.

Add 1 foot to your pipe length for each valve or spigot on your pipe system. If length of cable selected is longer than the pipe, spiral cable evenly along the entire pipe.

Table 1 Metal Pipes

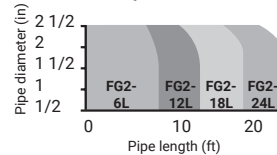
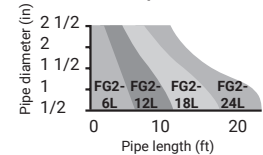


Table 2 Plastic Pipes



Add 1 foot to your pipe length for each valve or spigot on your pipe system. If cable selected is longer than the pipe, spiral it evenly along the entire pipe.

### Important

All thermal and design information provided here is based upon a "standard installation": heating cable fastened to a pipe and thermally insulated. For any other method of installation or application, consult nVent at (800) 542-8936 for design assistance to ensure proper design of electrical distribution and acceptable pipe temperatures.

### WARNING:

**FIRE AND SHOCK HAZARD.** This product is an electrical device that must be installed correctly to ensure proper operation and to prevent shock or fire. Read these important warnings and carefully follow all the installation instructions.

- 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 the National Electrical Code, ground-fault equipment protection must be used on each heating cable branch circuit. Arcing may not be stopped by conventional circuit protection.
- Use only fire-resistant insulation materials such as fiberglass wrap.
- Do not damage the heating cable and cord connector. Remove any damaged cables from service immediately.
- Do not use any wire or metal clamps to attach the cable to the pipe. Use tape (1/2 inch wide to 1 inch wide) or plastic cable ties.
- Leave these installation instructions with the user for future reference.

## GENERAL REQUIREMENTS:

- FrostGuard heating cables are not intended for use inside any pipes, for freeze protection of liquids other than water, or for use in classified hazardous locations.
- FrostGuard heating cables may be used on metal and plastic water pipes but not on flexible vinyl tubing (such as garden hoses).
- Install with a minimum of 1/2 inch fire-resistant thermal insulation. Weatherproof the insulation if it might get wet.
- Never use on any pipes that may exceed 150°F (65°C).

## GENERAL INSTRUCTIONS:

- Install only in accessible locations; do not install behind walls or where the cable would be hidden.
- Do not run the heating cable through walls, ceilings, or floors.
- Connect only to junction boxes that have been installed in accordance with all prevailing national and local codes and standards and are protected from rain and other water.
- Prior to installing the cable, remove any sharp surfaces on the pipe that might damage the heating cable.
- Follow the specific installation instructions that begin below.
- Follow the maintenance guidelines on page 3.

1

### Side View

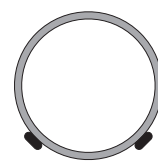


1a Spiral traced

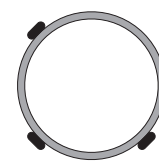


1b Straight traced

### End View



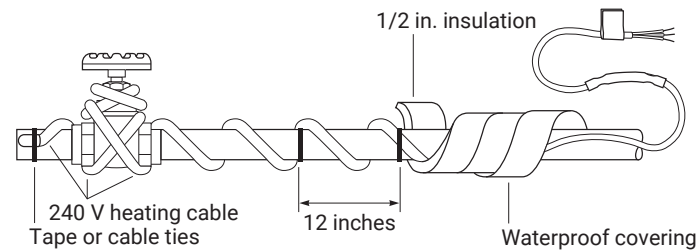
1c Two cables in 4 and 8 o'clock positions



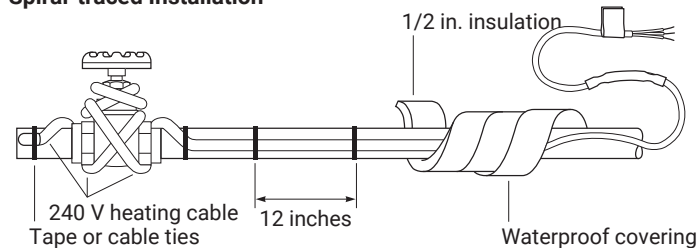
1d Three cables in 4, 8, and 10 o'clock positions

- If your FrostGuard cable is longer than the pipe, spiral it evenly along the pipe (Figure 1a).
- If your FrostGuard cable is the same length as the pipe, run it straight along the pipe (Figure 1b) in the 4 o'clock or 8 o'clock position.
- If two FrostGuard cables are used, position them in the 4 o'clock and 8 o'clock positions (Figure 1c).
- If three FrostGuard cables are used, position them in the 4, 8, and 10 (or 2) o'clock positions (Figure 1d).

2



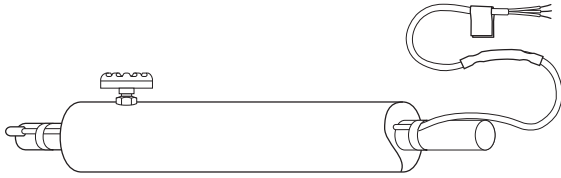
### Spiral-traced Installation



### Straight-traced Installation

- Fasten the cable to the pipe at 12-inch intervals with glass cloth tape or plastic cable ties. If excess cable remains at the end of the pipe, double it back along the pipe and cover it with insulation.
- Provide extra heat at valves and spigots by wrapping each with an additional foot of heating cable, overlapping as required.

3



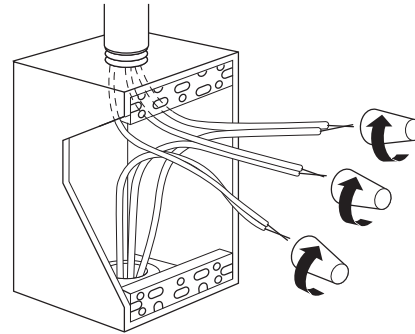
**Thermal insulation**

- Before installing the thermal insulation, check to see that the heating cable is free from mechanical damage (such as from cuts or clamps) and thermal damage (such as from solder or overheating).
- Using a megohmmeter, test each circuit according to the "Cable testing and maintenance" instructions below, both prior to and after installing the thermal insulation.

**Note:** A reliable FrostGuard system depends on properly installed and dry, weatherproofed thermal insulation.

- Ensure that at least 1/2 inch of fiberglass or equivalent thermal insulation is used and that all pipework, including valves, joints, and wall penetrations, has been fully insulated. To minimize the potential for mechanical damage after installation, install the insulation on the pipework as soon as possible.
- Be sure the FrostGuard 240 V label is visible on the outside of the thermal insulation.

4



**Connecting the FrostGuard cable to power**

Using the three wire connectors included in the kit, connect the black and white cold leads to both phase wires and the green cold lead to ground. Provide suitable UL Listed and CSA Certified junction box and outlet bushing and fitting.

**CABLE TESTING AND MAINTENANCE**

Using a 2500-Vdc megohmmeter, check the insulation resistance between the lead wires and ground wire during installation. Minimum reading should be 1000 megohms.

The installer should record the original values for each circuit. Subsequent readings taken during regular maintenance schedules should be compared to the original value.

If the readings should fall below 1000 megohms, replace the FrostGuard cable with a new unit. Do not attempt to repair the unit.

**⚠ WARNING: Fire and Shock Hazard. Damaged heating cable can cause electrical shock, arcing, or fire. Do not attempt to repair or energize damaged heating cable. Remove it at once and replace with a new length.**

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**Product Specifications**

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	<b>FG2-6L</b>	<b>FG2-12L</b>	<b>FG2-18L</b>	<b>FG2-24L</b>
Cable length (ft/m)	6 (1.8)	12 (3.7)	18 (5.5)	24 (7.3)
Min. thermal output on a pipe at 40°F/4°C (watts)	30	60	90	120
Min. thermal output on a pipe at 0°F/-18°C (watts)	46	92	138	184
Max. current draw on a pipe at 40°F/4°C (amps)	0.21	0.43	0.64	0.85
Max. current draw on a pipe at 0°F/-18°C (amps)	0.32	0.64	0.96	1.28

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**General Specifications for all FG2 Products**

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Maximum cable width (inch/mm)	0.45 (11.4)
Maximum cable thickness (inch/mm)	0.24 (6.1)
Heating cable bus wire gauge (AWG)	16
Voltage rating (Vac)	208-240
Circuit breaker size	15 A max.
Cold lead length (ft/m)	6 (1.83)
Maximum exposure temperature	150°F (65°C)
Minimum installation temperature	5°F (-15°C)
Minimum bend radius (inch/mm)	5/8 (16)
Electrical classification	Nonhazardous areas only
Exposure to chemicals	None

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