

FREEZE PROTECTION PLANNING GUIDE AND CHECKLIST

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— AND —
IMPROVED



Freeze Protection Planning Guide and Checklist



Introduction

Anticipating freezing conditions and protecting buildings, equipment and materials against freeze damage is a vital part of any annual property assessment. A good freeze protection plan includes steps for inspection, preventative maintenance, and corrective maintenance prior to the beginning of cold weather conditions. This guide makes winterizing your property easy. Contact your local distributor or BriskHeat at 1-800-848-7673 (U.S. & Canada)/1-614-294-3376 (Worldwide) for additional assistance.

Table of Contents

Introduction.....	2
A. General Freeze Protection Preparation Steps	3
B. Testing and Inspection Record for Heating Cable.....	6
C. Checklist for Pipe Lines and Valves Exposed to Freezing Conditions	8
D. Checklist for Containers Exposed to Freezing Conditions.....	10
E. Checklist for Large Permanent Tanks, Vessels, and Hoppers Exposed to Freezing Conditions	13
F. Checklist for Roof and Gutter Deicing.....	14
G. Checklist for Damaged Heaters To Be Replaced	16
H. Checklist for Emergency/Backup De-icing Heaters.....	17
I. Additional Freeze Protection Checklist	19

Freeze Protection Planning Guide and Checklist

(A) General Freeze Protection Preparation Steps

These are general freeze protection planning steps provided by application engineers and field experience notes. These steps are not all-inclusive and we recommend that you consult a trained professional and review your corporate policies and local/national codes prior to implementing your plan.

	Item	Assigned to	Date Complete	Sign-off
	Clean and functionally test all heating systems. Apply heat in susceptible areas.			
	Roof and gutter: Inspect, remove debris, and patch/repair (if needed): roof drains, scuppers, canals, gutters, down spouts before first frost. Inspect and functionally test installed roof and gutter heat trace system. Apply heat in susceptible areas.			
	Identify and test main water supply cutoffs for each facility. Ensure these areas are readily available to emergency personnel responding to a freeze/thaw incident. Apply heat in susceptible areas.			
	Inspect wet-pipe sprinkler systems for areas susceptible to freezing. Apply heat in susceptible areas.			
	Identify materials that are susceptible to freeze damage in outside storage pads and unheated storage areas. Develop plan to ensure these materials can be easily heated and thawed to maintain production.			
	Check and place antifreeze used in cooling systems as necessary.			
	Protect heating system power and temperature controls against inadvertent deactivation.			
	Check insulation on piping and vessels. Look for damage and susceptible areas that might be exposed to freezing conditions. Replace and add insulation as needed.			

Tip: Think about materials that might be delivered during the cold season in unheated vehicles. BriskHeat offers plug-and-play portable heaters that easily wrap around and heat drums, pails, and tanks to thaw frozen or slow-flowing materials.

Freeze Protection Planning Guide and Checklist

(A) General Freeze Protection Preparation Steps continued

	Item	Assigned to	Date Complete	Sign-off
	Drain and remove water from all seasonal cooling systems (unless protected by heating tapes or antifreeze).			
	Inspect, test, and stage portable auxiliary heaters.			
	Inspect conditions of all surface heaters such as heating tapes, heating cable, drum heaters, IBC heaters, tank heaters, and pipe heaters. Verify operation and temperature settings and test ground-fault equipment protection. Replace as needed. Tip: Look for damaged insulation on all exposed portions of the power cord. If possible, check both ends of the cord for loose connections. An exposed conductor may come in contact with personnel during maintenance activities resulting in sparks or injury.			
	Inspect, test, and repair heat trace heating cable located on cooling tower supply and return lines. Apply heat in susceptible areas.			
	Inspect and identify remaining water and air lines susceptible to freezing. Install appropriate heat and insulation Apply heat in susceptible areas. Tip: Pay special attention to valves. This is a major choke point and susceptible to damage. BriskHeat offers a safe and effective flexible heating tape that can be used to thaw out a valve quickly. <i>See section H for more information.</i>			
	For steam systems: Blow down drip legs, clean strainers, test temperature sensing devices for actuation of control valves and dampers, check steam traps, control actuators/valves, face and bypass dampers, linkages, and temperature controllers. Ensure that a vacuum breaker is installed and in working order on all preheat and heating coils which may be exposed to freezing conditions.			

Freeze Protection Planning Guide and Checklist

(A) General Freeze Protection Preparation Steps continued

	Item	Assigned to	Date Complete	Sign-off
	For ventilation systems: Test and calibrate all temperature sensing devices, and check operation of valves, dampers, linkages, control actuators, and temperature controllers.			
	Identify areas where personal safety is at risk due to icy conditions. Develop a slip prevention maintenance plan. Apply heat in susceptible areas.			
	Identify control panels and electronic devices susceptible to condensation. Install enclosure heaters to prevent short-outs and corrosion.			
	Institute a facility-wide awareness plan to identify and report any suspected problems with heating or other cold weather protection equipment during the cold season.			
	Have plan in place to remove emergency deicing heaters after the cold weather season.			

Special Consideration: Hazardous Materials

- Ensure that all containers used for hazardous or toxic materials are properly stored, and inspect them for deterioration prior to handling. If containers become brittle (due to the combination of chemical attack, freezing temperatures, and ultraviolet light) they may break when moved.
- Liquids should not be permitted to remain in unheated process lines during periods when production has been stopped. All lines should be drained and purged to prevent future line breakage due to freezing temperatures.
- Ensure that piping, tanks, and valves in systems that carry hazardous or toxic substances are properly insulated and/or heated. Install heaters such as heating blankets, insulators, heating tapes, heating jackets, and heating cable as appropriate.

Freeze Protection Planning Guide and Checklist

(B) Testing and Inspection Record for Heating Cable

Heating Cable Inspection Record

Instructions:

- 1. One sheet per circuit.** – This inspection form allows for up to five inspections to be compared for an individual circuit.
- 2. Maintenance Check Frequency:**
Freeze Protection Circuits: Prior to the first freeze
Temperature Maintenance Circuits: At least twice per year

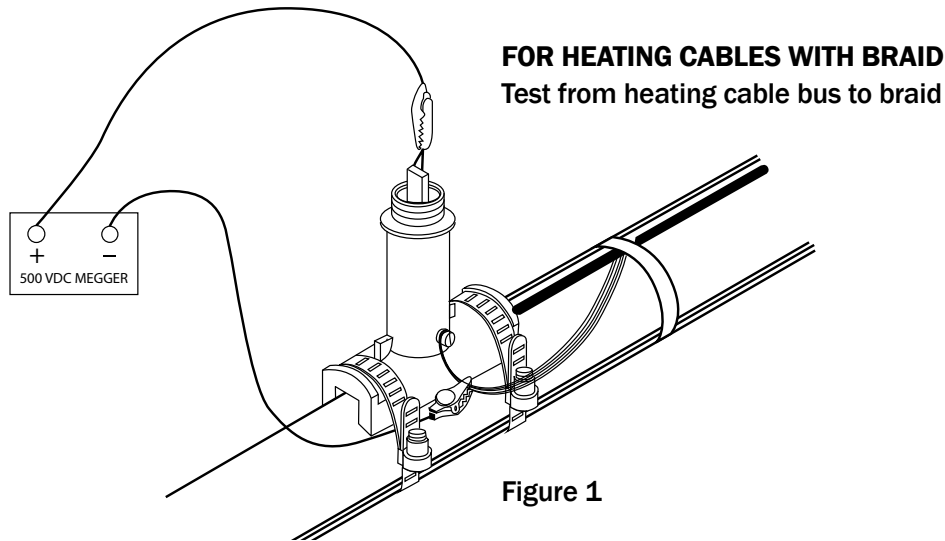
Circuit Number	
Heater Type	
Circuit Length	

		(mm/yy)	(mm/yy)	(mm/yy)	(mm/yy)	(mm/yy)	
Maintenance Check Date (Month/Year)							
Periodic Inspection Record Form	Visual inspection inside connection box corrosion, moisture, etc.	Initial					
	Damage or cracks (leaks) in insulation seals at valves, hangers, pumps, etc.	Initial					
	Heating cable properly connected and grounded. Heating cable and connections insulated from connection box.	Initial					
	Thermostat checked for moisture, corrosion, set point, switch operation, and sensor damage.	Set Point					
		Initial					
	Megger tests performed at power connection with both bus wires disconnected from power wiring.	Reading					
		Initial					
	Circuit voltage at power connection.	Reading					
	Circuit amperage after 5 minutes.	Reading					
	Pipe temperature at time amps were measured.	Reading					
	Watts/Ft. <u>Volts x Amps = w/ft.</u> feet	Watts/Ft.					
		Initial					
	All connections, boxes, and thermostats have been resealed.	Initial					
End seals, covered splices and tees marked on insulation cladding.	Initial						
Remarks & Comments							

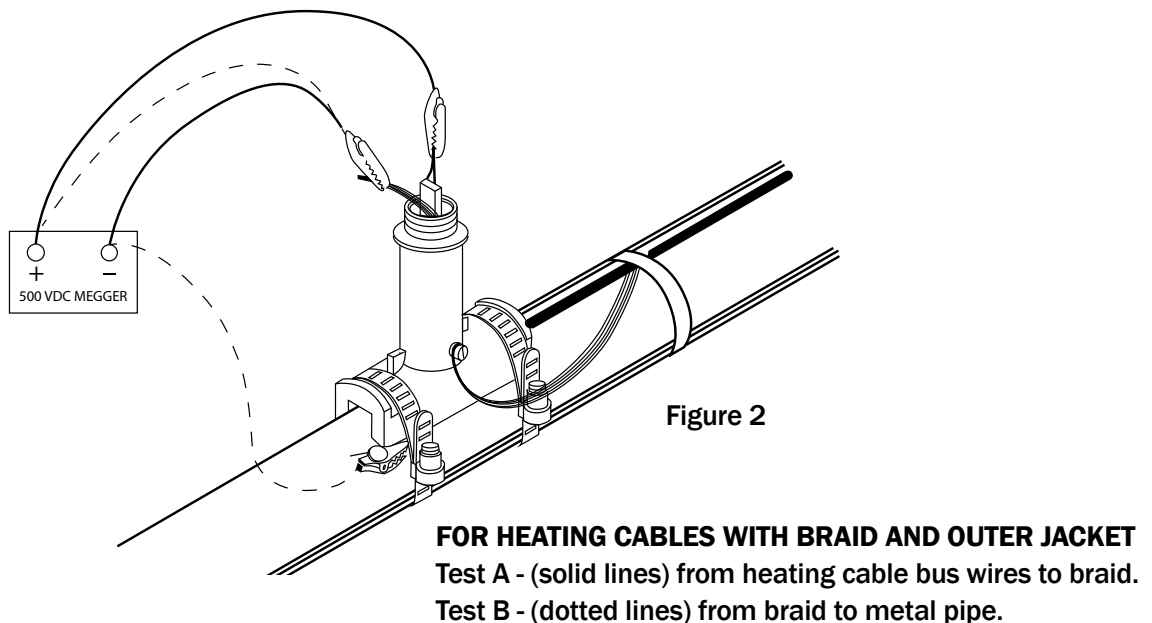
Freeze Protection Planning Guide and Checklist

Heating Cable Insulation Resistance Test

The insulation resistance test is used to check for damage to extruded jackets. Connections for the megger are made as shown in Figures 1 & 2.



Note: Test should use at least a 500 VDC megger. Do not use a megger with an excess of 2500 VDC. Minimum acceptable readings should be 20 megohms per circuit, regardless of length.



A record should be kept of the readings taken from the time the cable is first installed on the pipe. A history of the insulation resistance reading can be helpful in spotting moisture ingress into the electrical system by seeing a gradual decline in the insulation resistance or physical damage to the heating cable (sharp decline in the insulation resistance). See the previous page for a sample record.

Freeze Protection Planning Guide and Checklist

(C) Checklist for Pipe Lines and Valves Exposed to Freezing Conditions

Use this checklist to identify the pipe lines and valves that need heat. Your local distributor or BriskHeat will help you determine the proper type and amount of heat, insulation, and accessories necessary for your application.

Pipe line/Valve Checklist

Pipe/Valve Location Where Heat is Needed	Length of Pipe or Size of Valve Where Heat is Needed	O.D. of Object to Be Heated	Temperature Required	Available Voltage Supply and Circuit Breaker Size	Hazardous Location? (Y/N) If Yes, Classification?	Insulation is Needed? (Y/N) Insulation Thickness?



BriskHeat[®] wet-area cloth jacket valve heater



BriskHeat[®] Silver-Series removable cloth insulators and self-regulating heating cable

Freeze Protection Planning Guide and Checklist

Recommended Solutions for Pipe Lines and Valves

Self-Regulating Heating Cable/Heat Trace Cable



SpeedTrace: Plug-and-Play, Pre-assembled with Power Plug.



SLCBL or SLCAB: Cut-to-Length Self-Regulating Heating Cable

XtremeFLEX® Heating Tape



RKP: XtremeFLEX® Heating Tapes with Preset Thermostat

Insulators



Silver-series: Removable Cloth Insulators

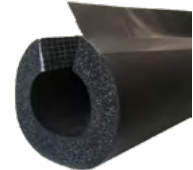
Wet-area Cloth Heating Jackets



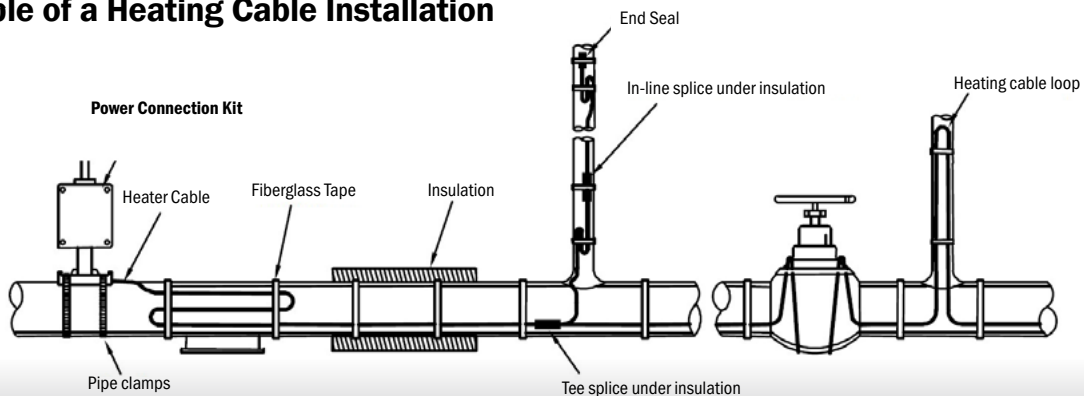
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INSUL-LOCK®: Closed Cell Foam Insulation



Example of a Heating Cable Installation



Freeze Protection Planning Guide and Checklist

(D) Checklist for Containers Exposed to Freezing Conditions

Containers such as drums, pails, tote tank/IBCs, and gas cylinders contain materials that either freeze or need a specific flow rate to maximize production. Utilizing a portable plug-and-play electrical surface heater on the container prior to and during production is a cost-effective and simple way to thaw and improve the flow rate of the material within the container.



Drums/Pails Checklist

Recommended Solutions:

- **Heavy-Duty Silicone Rubber Band Heaters (DHCS | DHCH | DPCS | DPCH series)** – Great all-purpose choice: economical, moisture & chemical resistant and long lasting. Includes built-in adjustable thermostat control. 120V model includes standard 3-prong (NEMA 5-15) grounded plug.
- **Full-Coverage Insulated Drum Heaters and Insulators (FGDH | FGPDH | FGDI series)** – Fully insulated and more wattage for faster and more energy-efficient heat-ups. Heaters includes built-in digital temperature controller. 120V model includes standard 3-prong (NEMA 5-15) grounded plug.
- **NEW Wet-area Full-Coverage Drum Heaters and Insulators (FGDHW | FGDIW series)** – NEW water resistant, IP 54 rated, full coverage drum heaters and insulators suitable for use in outdoor/indoor use and in wash down environments.
- **NEW ATEX rated Full-Coverage Drum Heaters (WEX series)** – ATEX certified for hazardous areas



Heavy-Duty
Silicone Rubber Drum Heaters



Full-Coverage
Insulated Drum Heaters



Wet-Area Full-Coverage
Drum Heaters



ATEX Rated Full-Coverage
Drum Heaters

Freeze Protection Planning Guide and Checklist

Qty of Containers that Need Heat	Container Size (Make a special note if the container will be in a hazardous environment)	Container Outer Material (metal, plastic, etc.)	Available Voltage Supply for Heater (120V or 240V)
	55 gallon (208 litre) drums/barrels		
	30 gallon (114 litre) drums/barrels		
	15 & 16 gallon (57 & 60 litre) pails		
	5 gallon (19 litre) pails		

Tip: For faster heat-up, use multiple silicone rubber band heaters at one time or a full-coverage insulated drum heater.

Intermediate Bulk Container (IBC)/Tote Tank Checklist

Recommended Solutions:

- **Wrap-Around IBC/Tote Tank Heater (TOTE series)** – Fully insulated blanket heater wraps around tote tank/IBC without contaminating or scorching your product. Adjustable straps allow it to fit multiple container widths. Includes dual adjustable thermostat control: 50 to 160°F (10 to 71°C).
- **NEW Wet-area IBC/Tote Tank Heaters and Insulators (TOTEW | TOTEWI series)** – Water resistant, IP 54 rated, full coverage IBC/Tote Tank heaters and insulators suitable for use in outdoor/indoor use and in wash down environments. Includes digital controller.
- **NEW IBC/Tote Tank Immersion Heaters (TTI series)** – Provides maximum thermal efficiency. Twice the heat-up rate compared to standard wrap-around heaters when paired with an insulator.
- **NEW ATEX rated Wrap-Around Tote Tank Heaters (WEX series)** – ATEX certified for hazardous areas



Wrap-Around IBC/Tote Tank Heaters



Wet-Area Wrap-Around IBC/Tote Tank Heaters



IBC/Tote Tank Immersion Heaters



ATEX Rated Wrap-Around IBC/Tote Tank Heaters

Freeze Protection Planning Guide and Checklist

Intermediate Bulk Containers (IBC)/Tote Tanks continued

Qty of Tanks that Need Heat	Tank Height (Not including pallet or support stand)	Tank Length	Tank Width	Tank Outer Material (metal, plastic, caged, etc.)	Available Voltage Supply for Heater (120V or 240V)

Gas Cylinders

Recommended Solutions:

- If Ordinary Location: GCW series- Ordinary Location Gas Cylinder Warmer – 2in (50mm) thick insulation and self-regulating heating element. No extra temperature control necessary. 120V model includes standard 3-prong (NEMA 5-15) grounded plug.
- If Class I, Division 1 Hazardous-Area Location: HCW series- Hazardous-Area Gas Cylinder Warmer – Same as above except it is suitable for Class I Division 1 Groups B, C, and D. No plug is included.
- If ATEX Hazardous-Area Location: WEX series - ATEX Gas Cylinder Warmers.



Ordinary Locations Gas Cylinder Warmer



Class I, Division 1 Hazardous-Area Rated Gas Cylinder Warmer



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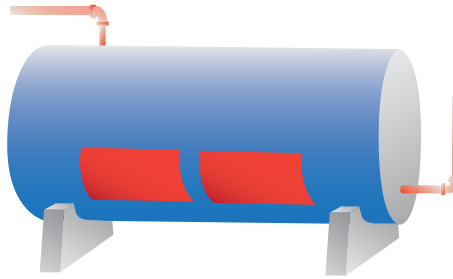
ATEX Rated Gas Cylinder Warmer

Qty of Cylinders that Need Heat	Cylinder Diameter	Cylinder Height	Hazardous Location? (Y/N) If Yes, Classification?	Available Voltage Supply for Heater (120V or 240V)

Freeze Protection Planning Guide and Checklist

(E) Checklist for Large Tanks, Vessels, and Hoppers Exposed to Freezing Conditions

Use this checklist to identify the tanks, vessels, and hoppers that are susceptible to freezing. Your local distributor or BriskHeat will help recommend exactly how much heat you need to prevent freezing or improve flow as well as which style of heater, insulation, and temperature control is right for you.



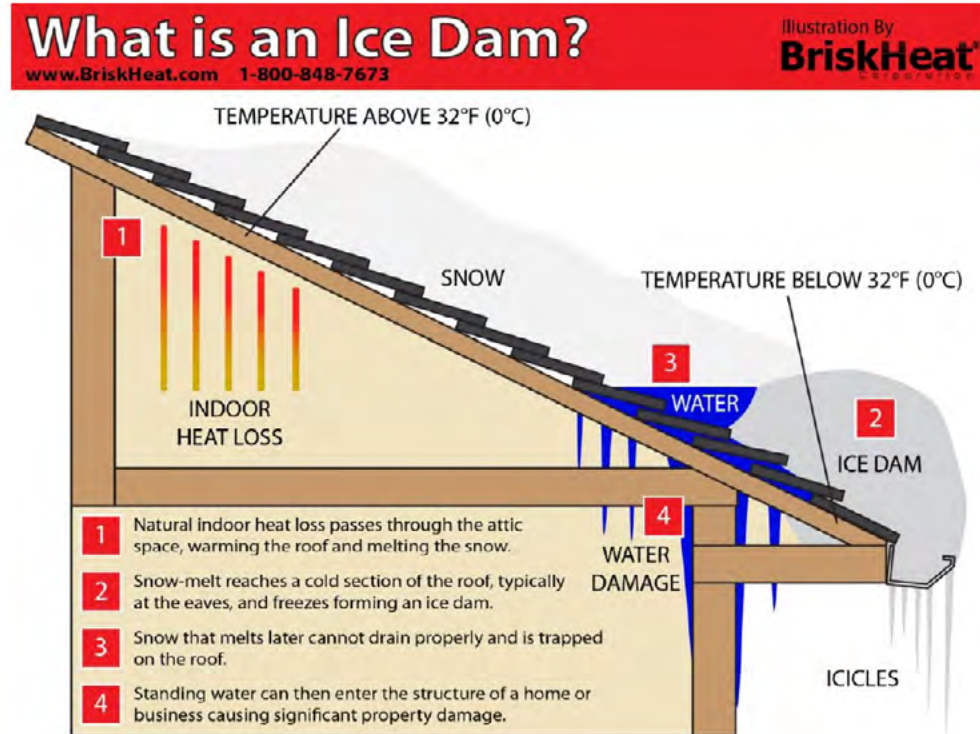
Wide range of silicone rubber heating blankets available to heat nearly any type of tank or vessel

Vessel Location (Make a special note if it is in a Hazardous Location)	Vessel Type (Cylindrical Tank, Rectangular Tank, Hopper, etc.)	Vessel Size	Vessel Outer Material (metal, plastic, etc.)	Content Stored in Vessel	Process Temperature	Available Voltage Supply and Circuit Breaker Size

Freeze Protection Planning Guide and Checklist

(F) Checklist for Roof and Gutter Deicing

When gutters and downspouts freeze, major damage can occur to your building's roof and façade. We recommend roof and gutter self-regulating heating cable as the solution.



BriskHeat's SpeedTrace Roof & Gutter De-icing Kits are designed to prevent the formation of ice dams on rooftops by using an electric self-regulating heating cable system. The heating cable melts away excessive ice and snow from the roof, gutters, and downspouts to ensure proper draining.

Kits include: SpeedTrace Roof & Gutter Heating Cable (pre-assembled with power plug), Heavy Duty Roof Clips, Downspout Hanger Brackets, UV Resistant Cable Ties.

Measuring Heating Cable Length for Roof & Gutter De-icing Use the equation below to calculate heating cable length:

Cable Required for Roof = **(R x M) + G + D**

(R) Roof Edge Length (linear length of roof to protect)

(M) Multiplier from table below

(G) Gutter Length

(D) Downspout Length (x2 if heating cable returns back to gutter)

Roof Overhang (Eave/Soffit)	Standard Roof	Standing Seam Roof, 18 in (45 cm) Seam	Standing Seam Roof, 24 in (60 cm) Seam
None	2.0	2.5	2.0
12 in (30 cm)	2.5	2.8	2.4
24 in (60 cm)	3.0	3.6	2.9
36 in (90 cm)	4.0	4.3	3.6



Freeze Protection Planning Guide and Checklist

(F) Checklist for Roof and Gutter Deicing continued



Complete kit includes everything you need!



Roof and Gutter Kits:

Qty Needed	Part No. 110 -120 VAC	Part No. 208 -277 VAC	Cable Length ft (m)	Kit Includes			
				Roof Clips	Down- spout Hangers	Cable Ties	Caution Labels
	FFRG15-50	FFRG25-50	50 (15.2)	30	2	15	2
	FFRG15-75	FFRG25-75	75 (22.8)	50	4	20	2
	FFRG15-100	FFRG25-100	100 (30.4)	60	4	25	2
	FFRG15-125	FFRG25-125	125 (38.1)	80	4	30	2
	FFRG15-150	FFRG25-150	150 (45.7)	100	6	40	2

Freeze Protection Planning Guide and Checklist

(H) Checklist for Emergency/Backup De-icing Heaters

It is always a good idea to have a few flexible multi-purpose heaters on hand in the event of emergency de-icing. XtremeFLEX® flexible heating tapes with built-in adjustable temperature controls (MSTAT and HSTAT series) are ideal to prevent freezing or thaw frozen valves, pipes, and many other objects. Unlike dangerous blow torches, these heaters are safe, make direct contact with the object to be heated, are moisture and chemical resistant, and can be run unsupervised.



Do not be left without a few of these lifesavers in the toolbox when freezing occurs.

Tips:

- Circle Part Number to indicate voltage preference
- Choice of two temperature ranges: Up to 160°F (71°C) [MSTAT series] and up to 425°F (218°C) [HSTAT series]
- Have at least one of each size on hand so that you have the right size when you need it. Shorter lengths are typically used for valves, bearings, pumps, and actuators. Longer lengths are typically used for pipe runs.
- When estimating heating tape lengths, keep in mind that the heating tape cannot be overlapped upon itself. That will cause damage to the heater.

MSTAT XtremeFLEX® Heating Tapes with Adjustable Thermostat Controls - up to 160°F (71°C)

Qty Needed	Heating Tape Width	Heating Tape Length	Wattage	Part Number (120V)	Part Number (240V)
	1in (25 mm)	2 ft (0.6 m)	144	MSTAT101002	MSTAT102002
	1in (25 mm)	4 ft (1.2 m)	288	MSTAT101004	MSTAT102004
	1in (25 mm)	6 ft (1.8 m)	432	MSTAT101006	MSTAT102006
	1in (25 mm)	8 ft (2.4 m)	576	MSTAT101008	MSTAT102008
	1in (25 mm)	10 ft (3.1 m)	720	MSTAT101010	MSTAT102010
	1in (25 mm)	20 ft (6.0 m)	1200	MSTAT101020	MSTAT102020
	1in (25 mm)	30 ft (9.1 m)	1440	MSTAT101030*	MSTAT102030*
	1in (25 mm)	40 ft (12.2 m)	1440	MSTAT101040*	MSTAT102040*
	1in (25 mm)	50 ft (15.2 m)	1440	MSTAT101050*	MSTAT102050*

Other widths and lengths are available upon request.

Freeze Protection Planning Guide and Checklist

HSTAT XtremeFLEX® Heating Tapes with Adjustable Thermostat Controls - up to 425°F (218°C)

Qty Needed	Heating Tape Width	Heating Tape Length	Wattage	Part Number (120V)	Part Number (240V)
	1in (25 mm)	2 ft (0.6 m)	144	HSTAT101002	HSTAT102002
	1in (25 mm)	4 ft (1.2 m)	288	HSTAT101004	HSTAT102004
	1in (25 mm)	6 ft (1.8 m)	432	HSTAT101006	HSTAT102006
	1in (25 mm)	8 ft (2.4 m)	576	HSTAT101008	HSTAT102008
	1in (25 mm)	10 ft (3.1 m)	720	HSTAT101010	HSTAT102010

Other widths and lengths are available upon request.



Freeze Protection Planning Guide and Checklist

(I) Additional Freeze Protection Solutions Checklist

Use this checklist to identify any remaining heaters needed for freeze protection.

Enclosure Heaters

Ideal for control panels and electronic devices susceptible to condensation. Enclosure heater is a silicone rubber heater on an easy-to-install aluminum mounting plate—two mounting slots that are ¼ x 5/32 in (6 x 4 mm) centered on a ½ in (12 mm) flange. Includes air sensing thermometer unless otherwise listed.



Qty Needed	Part No. 120 VAC	Part No. 240 VAC	Thermostat Setting Open/Close °F (°C)	Heater Size in	Heater Size mm	Watts
	TSREH640	TSREH2640	60/40 (15/4)	2.5 x 6	64 x 152	60
	TSREH1240	TSREH21240		2.5 x 12	64 x 305	120
	TSREH600	TSREH2600	No thermostat	2.5 x 6	64 x 152	60
	TSREH1200	TSREH21200		2.5 x 12	64 x 305	120

Also available with other thermostats.

Band-Style Crankcase Heaters for HVAC/R Compressors

Protects A/C and heat pump compression in cold weather.

Qty Needed	Part No.	Circumference in	Circumference mm	Voltage	Wattage	Lead Length in (mm)
	840051001	15.3 to 22.0	389 to 559	240	40	21 (533)
	840051002	20.5 to 27.1	521 to 688	240	40	21 (533)
	840051004	21.3 to 28.0	541 to 711	480	70	22 (559)
	840051006	21 to 28.0	533 to 711	240	70	48 (1219)
	840051007	27.3 to 34.0	693 to 864	240	93	48 (1219)
	840051008	27.3 to 34.0	693 to 864	480,400	93,66	48 (1219)
	840051010	27.3 to 34.0	693 to 864	230	66	48 (1219)
	840051009	39.5 to 46.1	1003 to 1171	230	95	29 (737)



HotBelt™ Wrap-Around Refrigerant Jug Warmer

Pre-heat and keep refrigerant jug cylinders warm when servicing HVACR systems in cold weather

Qty Needed	Part No.	Voltage	Plug Type	Watts
	HB1001	120	NEMA 5-15P	200
	HB2001	240	NEMA 6-15P	200
	HB2003	230	Ferrule leads	200
	HB2002	230	Schuko CEE 7/7	200





BriskHeat offers a full range of surface and immersion heating products, controllers, insulators, and accessories for a wide-variety of applications.

BriskHeat products include heating tapes, cables, blankets, drum and tote heaters, cloth jackets, tubular heaters, band and cartridge heaters, composite curing systems, and more. Since 1949, BriskHeat has provided quality heating and temperature control solutions to industries including petrochemical, semiconductor, food processing, biotech, aviation, steel, laboratory, power generation and many others.

BriskHeat has a broad range of experience with applications including freeze protection, viscosity control, condensation prevention, and process heat. Additionally, we offer expert application support and custom engineering and thermal simulation services.

Large projects or small, high volume or low, domestic or world-wide, BriskHeat stands by to help you solve your application issues. With an accessible staff of sales and application engineers experienced at helping you find the most economical solution for your needs, BriskHeat is your heating specialist.

BriskHeat

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