BriskHeat® *Your Heating Specialist Since 1949*

FREEZE PROTECTION PLANNING GUIDE & CHECKLIST

Freeze Protection Planning Guide & 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 800-848-7673 or 614-294-3376 for additional assistance.

Table of Contents

Freeze Protection Planning Guide & 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 to 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 prone to freezing. Apply heat in susceptible areas.			
☐	Identify materials that are subject 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.			
☐	Inspect insulation on piping and vessels. Look for damage and vulnerable areas that might be exposed to freezing conditions. Add or replace 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.*

(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 subject 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.* *See section H for more information.*			
☐	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.			

(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.			
☐	Facility Inspection			
☐	Have plan in place to remove emergency de-icing heaters after the cold weather season.			

Inspect facitity doors, windows, and exterior walls for sources of cold air infiltation. Make repairs or insulate to reduce susceptible areas.

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.

(B) Testing & 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 to 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	

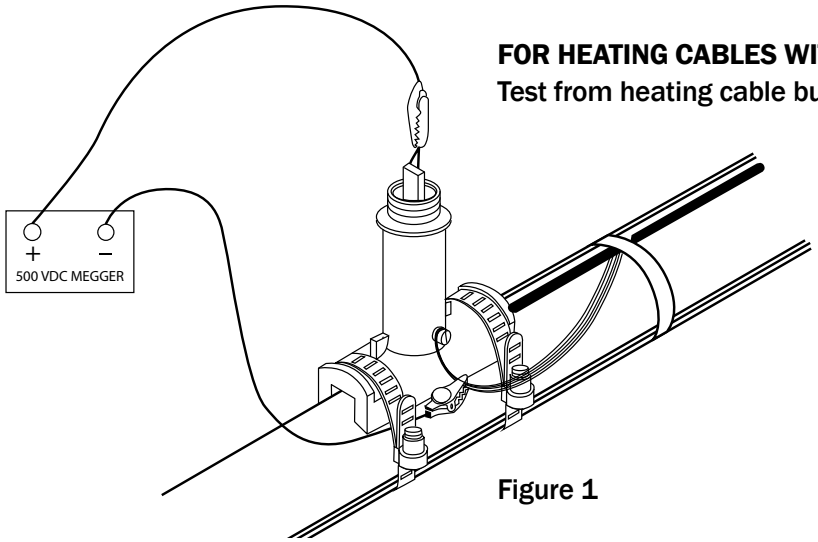
Periodic Inspection Record Form

Maintenance Check Date (Month/Year)		(mm/yy)	(mm/yy)	(mm/yy)	(mm/yy)	(mm/yy)
Visual inspection inside connection box for 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. Volts x Amps = w/ft. 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					

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.



FOR HEATING CABLES WITH BRAID
Test from heating cable bus to braid

Figure 1

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.

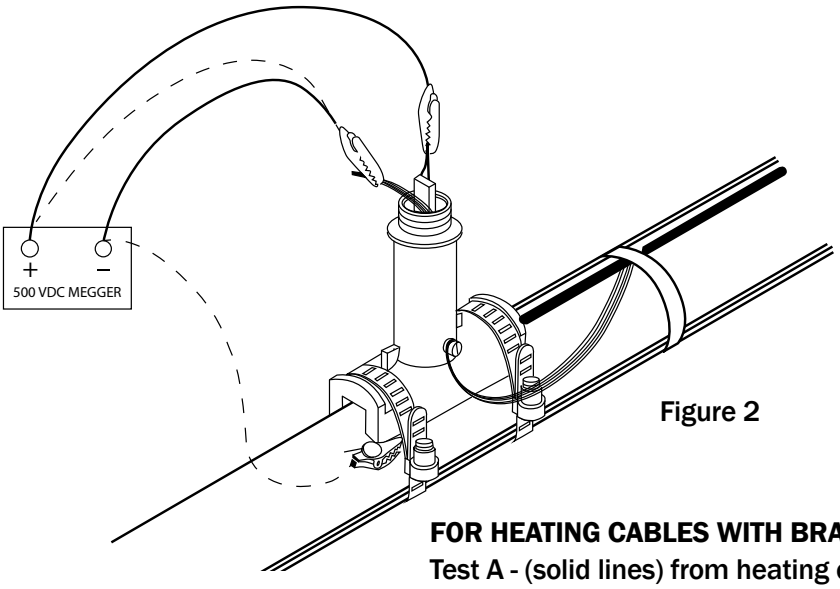


Figure 2

FOR HEATING CABLES WITH BRAID AND OUTER JACKET
Test A - (solid lines) from heating cable bus wires to braid
Test B - (dotted lines) from braid to metal pipe

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.

(C) Checklist for Pipe Lines & 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 & 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*

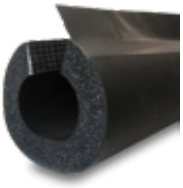
XtremeFLEX® Heating Tape

RKP: *XtremeFLEX® Heating Tapes with Preset Thermostat*

Insulators

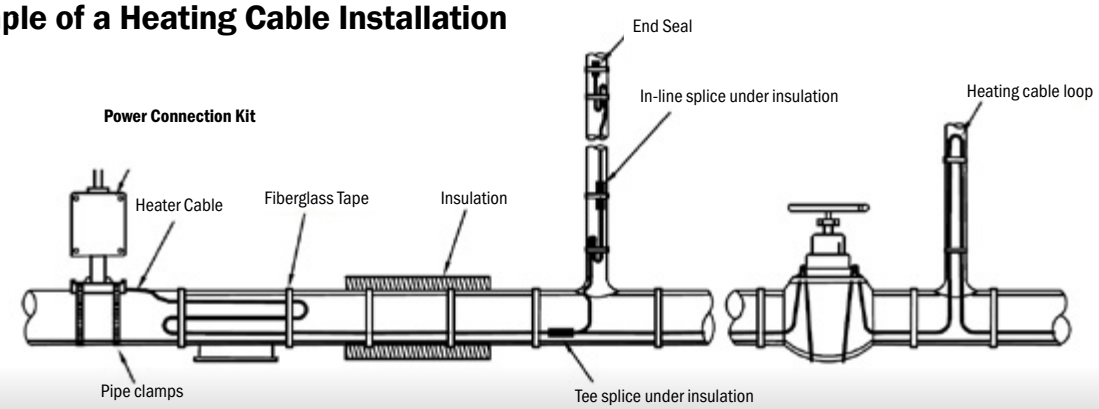
Silver-Series: *Removable Cloth Insulators*

Wet-Area Cloth Heating Jackets



INSUL-LOCK®: *Closed Cell Foam Insulation*

Example of a Heating Cable Installation



(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.
- **Drum Immersion Heater (DHI series)** — Threads directly into bung hole on standard 55-gallon drum. Heater has a built-in sensor and digital controller.
- **ATEX Rated Full-Coverage Drum Heaters (WEX series)** — ATEX certified for hazardous areas

Heavy-Duty Silicone Rubber Drum Heaters

Full-Coverage Insulated Drum Heaters

DHI Immersion Drum Heaters

ATEX Rated Full-Coverage Drum Heaters

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:

- **Wraparound 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).
- **Wet-area IBC/Tote Tank Heaters and Insulators (TOTEW/TOTEWI series)** — Water resistant, IP54 rated, full-coverage IBC/Tote Tank heaters and insulators suitable for use in outdoor/indoor use and in wash-down environments. Includes digital controller.
- **Silcone Rubber IBC/Tote Tank Heaters (TTH series)** — Installs underneath plastic bladder for direct surface contact. Add efficiency with a wraparound insulator.
- **ATEX rated Wraparound Tote Tank Heaters (WEX series)** — ATEX certified for hazardous areas

Wraparound IBC/Tote Tank Heaters

Wet-Area Wraparound IBC/Tote Tank Heaters

TTH Silicone Rubber IBC/Tote Tank Heater

ATEX Rated Wraparound IBC/Tote Tank Heaters

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

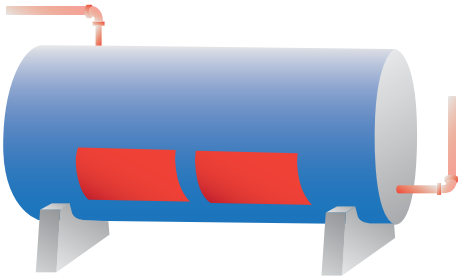
Class I, Division 1 Hazardous-Area Rated Gas Cylinder Warmer

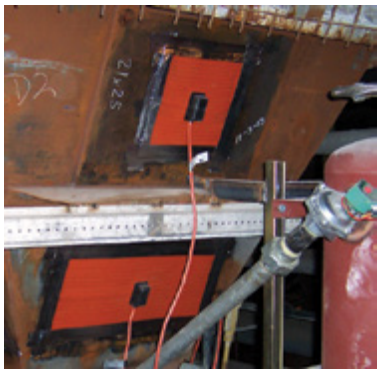
ATEX Rated Gas Cylinder Warmer

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)

(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, and which style of heater, insulation, and temperature control is right for you.



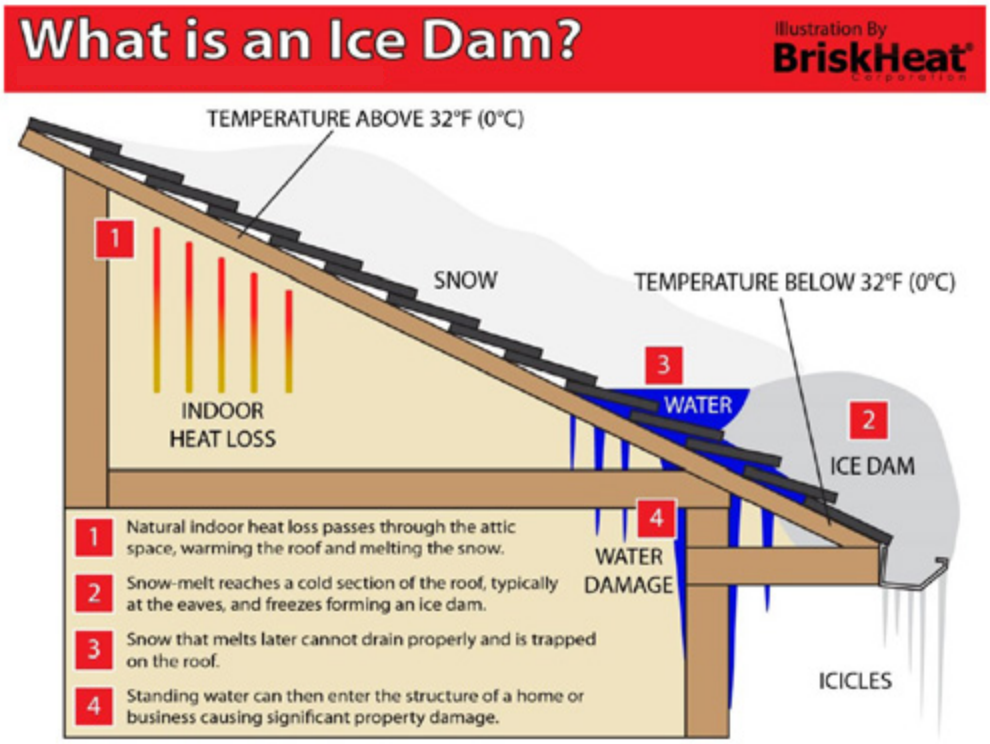


Wide range of silicone rubber heating blankets available to heat nearly any type of tank or vessel.

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**

(F) Checklist for Roof & Gutter De-icing

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.

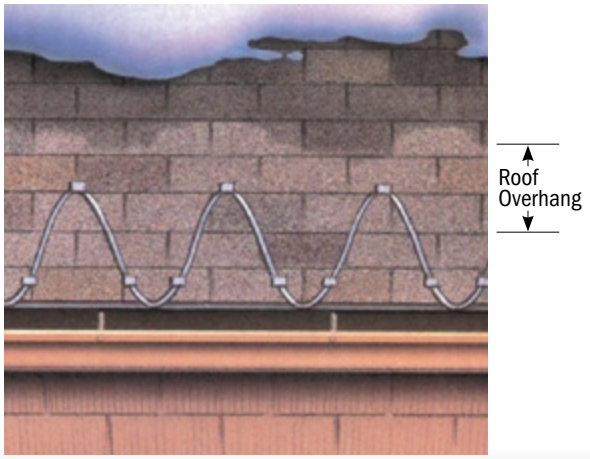


BriskHeat's SpeedTrace Roof & Gutter De-Icing Kits are designed to prevent the formation of ice dams on rooftops by using an electric self-regulating heating cable system. The heating cable melts away excessive ice and snow from the roof, gutters, and downspouts to ensure proper draining.

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

(F) Checklist for Roof & Gutter De-icing 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

(G) Checklist for Heating Cable Pipe Tracing

Self-Regulating cable is well suited to cold weather conditions as it automatically adjusts heat output based on surface temperature. It is also safe to overlap and can be cut-to-length and terminated in the field.

Qty Needed	Outer Jacket	Part No. 120 VAC	Watts/ft (Watts/m)
	Tinned Copper Braid	**SLCBL5120B**	5 (17)
		SLCBL8120B	8 (25)
		SLCBL10120B	10 (31)
	Thermoplastic Elastomer	**SLCBL5120BP**	5 (17)
		SLCBL8120BP	8 (25)
		SLCBL10120BP	10 (31)

Standard Spool Sizes: 50 ft, 125 ft, 150 ft, 250 ft, 500 ft, 1000 ft (15 m, 38 m, 46 m, 76 m, 152 m). For orders greater than 10,000 ft (3,048 m), call for pricing.

(H) Checklist for Damaged Heaters to be Replaced

Use this checklist to identify any heaters that need to be replaced due to damage.

Qty Needed	Heater Location	Heater Type	Issue	Heater Size	Heater Voltage	Heater Wattage

(I) 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.

Easy-to-use adjustable thermostat

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 correct 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.

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**

Extremely flexible — Heats a wide range of objects quickly

Other widths and lengths are available upon request.

Enclosure Heaters

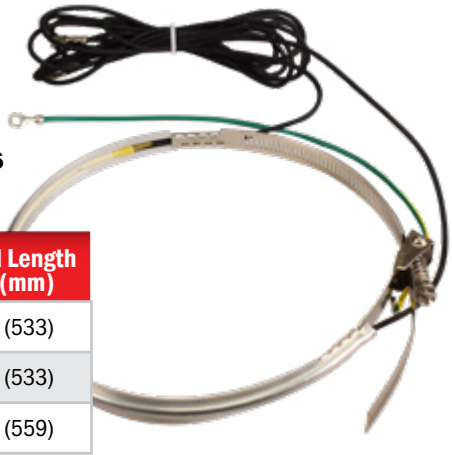
Ideal for control panels and electronic devices susceptible to condensation. Enclosure heater is a silicone rubber heater on an easy-to-install aluminum mounting plate— two mounting slots that are ¼ x 5⁄32 in (6 x 4 mm) centered on a ½ in (12 mm) flange. Includes air sensing thermometer unless otherwise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

(J) Additional Freeze Protection Solutions Checklist

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



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™ Wraparound Refrigerant Jug Warmer

Preheat 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

About BriskHeat

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 countless industries including semiconductor, chemical, food processing, biotech, aviation, laboratory, and power generation.

BriskHeat has a broad range of experience with applications including freeze protection, viscosity control, condensation prevention, and process heat. We also offer expert application support and custom engineering.

Large or small projects, high or low volume, domestic or worldwide, BriskHeat stands by to help you solve your application issues. With a ready staff of sales and application engineers to help you find the most economical solution for your needs, BriskHeat is your heating specialist.

BriskHeat
800-848-7673 | 614-294-3376
BriskHeat.com
bhtsales1@briskheat.com

PN: 11745-19 Rev0