



INSTRUCTION SHEET
THIS PRODUCT HAS BEEN DESIGNED FOR USE ONLY AS WATER PIPE NO-FREEZE PROTECTION. DAMAGE TO, OR IMPROPER INSTALLATION, USE AND/OR MAINTENANCE OF ELECTRICAL HEATING CABLE CAN RESULT IN FIRE, ELECTRICAL SHOCK AND/OR FREEZING OF PIPE.

WARNING
THIS IS A SAFETY ALERT SYMBOL. WHENEVER YOU SEE IT ALWAYS CAREFULLY READ AND UNDERSTAND THE WARNINGS THAT FOLLOW. BE ALERT TO THE POSSIBILITY OF SERIOUS INJURY OR DEATH.

WARNING
ONLY use this product on water supply and drain pipes. ALWAYS read AND comply with the following important safety instructions. Failure to comply can result in serious injury or death from fire or electrical shock.

For more information, or the name of your nearest Freeze*Free system supplier, call Monday-Friday, 9AM-5PM EST 800/537-4732 (US), or 800/794-3766 (Canada).

These instructions **MUST** be:

- Saved for future reference
- Made available to USER of heating cables
- Passed on to future owners

RECORD OF PURCHASE

Date purchased _____
 Purchased from _____
 Installed by _____
 Date installed _____

IMPORTANT SAFETY INSTRUCTIONS

- Heating cables MUST be installed in compliance with ALL National, State and Local codes. Check with your local electrical inspector for specific details.
- ALWAYS exercise proper care and caution during installation and use of the Freeze*Free Pipe Heating System. CAREFULLY follow and understand the instructions and warnings provided for your safety.
- The Freeze*Free orange cable connector housing and fiberglass thermal insulation with vapor seal must be kept dry and waterproof to avoid possible electrical shock or fire.
- ONLY use the Freeze*Free System on metal and plastic domestic water pipes (such as PVC, PEX or polybutylene). NEVER use product on flexible vinyl tubing (garden hose), on buried pipes, on pipes carrying any fluid other than water, or ANY non-pipe heating applications such as roof and gutter de-icing or driveway snow melting.
- NEVER expose Freeze*Free Cable to temperatures ABOVE 150°F (66°C), this will shorten the life of the cable. BEFORE installing on hot water pipes, ALWAYS set the water heater thermostat BELOW 150°F (66°C) (low to medium on most thermostats).
- ONLY use the Fused Plug Kit (10802 or 10803) for making connections.
- NEVER alter the plug in ANY way.
- To avoid short circuits, NEVER twist the wires inside the Freeze*Free Cable together OR allow them to touch each other or the outer braid.
- ALWAYS remove old heating tapes or insulation.
- ALWAYS keep cable ends clean and dry.
- Seal the cable ONLY with the end seal provided.
- ONLY cut the Freeze*Free Cable jacket at the ends when attaching the fused plug and end seal.
- NEVER cut, nick, or allow the plastic jacket of the Freeze*Free Cable to be worn down. The braid MUST remain intact.
- NEVER install the cable where it might be hit or cut by something.
- NEVER install the cable where it might be damaged by rubbing against rough surfaces.
- BEFORE installing the Freeze*Free Cable, file and remove from the pipe ALL sharp edges which might damage the cable. The cable MUST touch ONLY smooth non-abrasive pipe surfaces.
- ALWAYS protect the COMPLETE system from damage by animals or impact.
- NEVER use nails, metal clamps, wires or other devices that might cut the cable to support the cable along the pipe.
- Only use 1/2" or 1" vinyl or fiberglass tape to attach cable to pipe.

BEFORE YOU BEGIN

Make sure you have selected the CORRECT length heating cable for the pipe to be protected (See Chart #1 or #2).

Your Fused Plug Kit (10802 or 10803) should contain:

- one fused plug body with a built-in, non-replaceable fuse
- one push on end seal
- "CAUTION" labels
- cable ties – 2 pcs.

ADDITIONAL TOOLS AND MATERIALS REQUIRED

- Application tape (Cat.No. HCA) or high quality electrician's tape such as Scotch 44 or 33.
- 1/2" fiberglass pipe insulation with vapor seal.
- Wire cutters or heavy scissors
- Phillips #2 and slotted screwdrivers.
- Ruler or measuring tape.

HOW TO DETERMINE THE LENGTH OF CABLE YOU NEED (MAXIMUM CIRCUIT LENGTH: 75 FEET)

STEP 1 COLLECT THE FOLLOWING NECESSARY INFORMATION

- Pipe size
 - outside diameter
 - length
- Lowest expected air temperature (disregard windchill: it has been figured into the Length Selection chart)
- Number of valves and spigots
- Distance from pipe to electrical outlet
- 1 ball valve
- 2 feet

STEP 2 REFER TO THE LENGTH SELECTION CHARTS

These charts will tell you the length of the cable you need per foot of pipe and also the recommended distance to leave between each spiral wrap of cable on the pipe.

HOW TO USE THE LENGTH SELECTION CHART

Choose either Chart #1 or Chart #2 for your type of pipe (plastic or metal). Read down to find your pipe diameter, then read across to the box below your lowest expected temperature. The first number appearing in the box will tell you the length (feet) of cable you need per foot of pipe. The second number indicates the recommended distance between each spiral wrap of cable on the pipe. The abbreviation "str" indicates that the cable should be run in a straight line instead of spiral wrap (see Step #6).

Example

- Your pipe diameter is 1 1/2"
- Your lowest expected temperature is -20°F (-29°C)
- Your pipe length is 12 feet

From Chart #1

- You need 2.5 feet of cable per foot of pipe for plastic pipes.

Chart #1 Length Selection for Plastic Pipes
(based on the use of 1/2" insulation)

Pipe Dia.	+20°F/-7°C		0°F/-18°C		-20°F/-29°C		-40°F/-40°C		-60°F/-51°C	
1/2"	1'	str	1'	str	1.5'	2 1/4"	2'	1 1/2"	2.4'	1 1/4"
3/4"	1'	str	1.1'	7 1/4"	1.7'	2 1/4"	2.3'	1 1/2"	2.9'	1 1/4"
1"	1'	str	1.3'	5"	2'	2 1/4"	2.7'	1 1/2"	3.3'	1 1/4"
1 1/4"	1'	str	1.6'	4 1/4"	2.3'	2 1/4"	3.2'	1 1/2"	4.1'	1 1/4"
1 1/2"	1'	str	1.8'	4"	2.5'	2 1/4"	3.6'	1 1/2"	4.7'	1 1/4"
2"	1'	str	2.1'	3'	4"	2 1/4"	5.4'	1 1/2"	6.5'	1 1/4"

From Chart #2

- You need 1.8 feet of cable per foot of pipe for metal pipes.

Chart #2 Length Selection for Metal Pipes
(based on the use of 1/2" insulation)

Pipe Dia.	+20°F/-7°C		0°F/-18°C		-20°F/-29°C		-40°F/-40°C		-60°F/-51°C	
1/2"	1'	str	1'	str	1'	str	1.3'	3 1/4"	1.7'	2"
3/4"	1'	str	1'	str	1.1'	7 1/4"	1.5'	3"	2'	2"
1"	1'	str	1'	5"	1.3'	5"	1.8'	2 1/4"	2.4'	1 1/4"
1 1/4"	1'	str	1.1'	11 1/2"	1.6'	4 1/4"	2.1'	2 1/4"	2.9'	1 1/4"
1 1/2"	1'	str	1.2'	9"	1.8'	4"	2.4'	2 1/4"	3.2'	1 1/4"
2"	1'	str	1.5'	6 1/4"	2.2'	3 3/4"	2.8'	2 1/4"	3.9'	2"

STEP 3 CALCULATE EXACT HEATER LENGTH NEEDED

Multiply the cable length required per foot of pipe by the length of your pipe. Add one extra foot for each valve located in your line. Maximum cable length is 75 feet. For cable lengths longer than 75 feet, use two cables.

(Cable length required per foot of pipe x pipe length) + one foot for each valve or spigot = total cable length

Example

You have 12 feet of plastic pipe length
 1 ball valve
 You need 2.5 feet of cable per foot of plastic pipe as determined in Step 2 above.
 Calculate (12 feet x 2.5) + 1 foot for ball valve

Total cable length = 31 feet
MAXIMUM CABLE LENGTH IS 75 FEET. USE OF LONGER LENGTH MAY CAUSE THE INTERNAL FUSE TO BLOW.

STEP 4 HOW TO ASSEMBLE AND INSTALL THE CABLE AND FUSED PLUG KIT

INSTALLING THE END SEAL

4a. CLEANLY cut off the end of the cable.



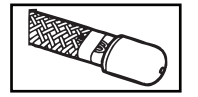
4b. Use a pencil or screwdriver to unravel the braid back 1" from the cable end.



4c. Tape the braid pigtail back on top of the braided cable.



2. Pushing firmly, insert the cable into the end seal all the way (at least 3/4"). Some gel may ooze out. Do not attempt to wipe off.



DO NOT TWIST THE END SEAL DURING OR AFTER INSERTION. DO NOT REUSE AN END SEAL.

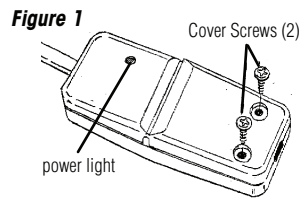
To avoid short circuits, NEVER twist the wires inside the Freeze*Free Cable together OR allow them to touch each other or the outer braid.

STEP 5 INSTALLING THE PLUG

WARNING NEVER ATTEMPT TO MAKE PLUG/END SEAL ASSEMBLY WHILE PLUG IS CONNECTED TO POWER.

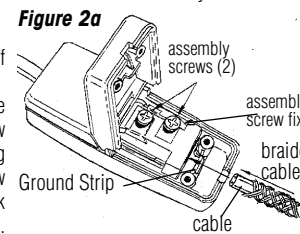
Before removing the cover screws, plug the power cord into 120 volt power outlet to check for the function of the Power Light Indicator. If the light is not lit, do not install the cable; return the plug to your dealer for a replacement.

5a. 1. Remove the power cord from the outlet. Remove two cover screws. (See Figure 1)



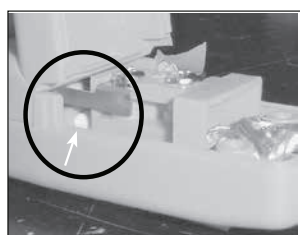
5b. 1. Loosen two assembly screws (approximately 1/4").
 2. DO NOT fully remove the assembly screws (see figure 2a).

5c. 1. Cleanly cut 1" off cable.
 2. Insert braided cable into assembly screw fixture opening (tunnel). Allow braid to slide back as cable is inserted.



3. Push until the yellow jacket is seen from the opening as shown in Figure 2b.
 4. The ground braid MUST NOT enter the assembly screw fixture opening where it can contact an assembly screw which will be a live part when the plug is reassembled and the system is operating.

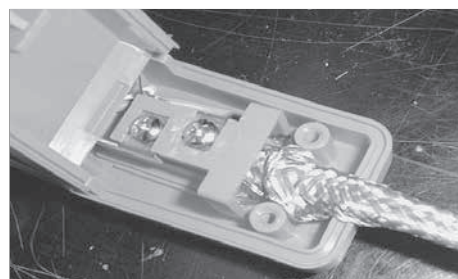
Figure 2b



5d. Tighten the two assembly screws until they are each snug against the metal surfaces on top of the assembly screw fixture (5" lb. in torque).

5e. Make sure that the ground braid covering the cable is in contact with the ground strip when the plug is reassembled. Contact between the ground braid and ground strip completes the systems ground circuit. See figure 3.

Figure 3



5f. Close cover and insert both cover screws. Tighten both cover screws until they are snug against their recessed plastic surfaces.

HOW TO INSTALL THE CABLE ON THE PIPE

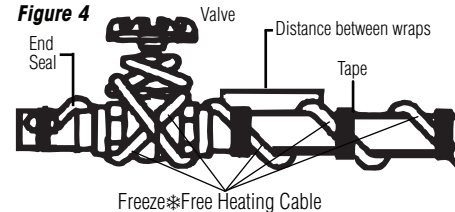
STEP 6 ATTACHING THE CABLE TO THE PIPE

6a. Starting at the plug end, either spiral wrap or straight trace the cable on the pipe, as indicated in the Length Selection Chart. Mount the plug on the pipe with plastic tie wraps.

Spiral wrapping method

Spiral wrap the cable around the outside of the pipe. BE SURE to allow the required distance between wraps as indicated in the Length Selection Chart. Mark the pipe at the required distance between wraps before attaching the cable to the pipe. (See Figure 4).

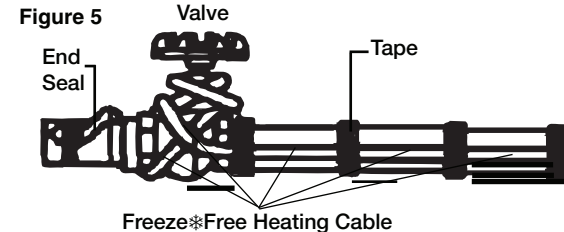
Figure 4



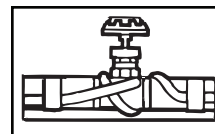
Straight tracing method

With the pipe at eye level, run the cable in a straight line parallel to and approximately 1/3 of the way from the BOTTOM of the pipe. (See Figure 5)

Figure 5



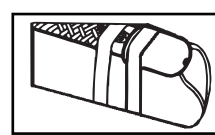
6b. Provide extra heat at valves and spigots by wrapping each with one additional foot of cable, overlapping as required.



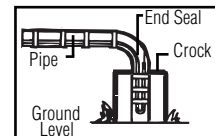
6c. Fasten the cable to the pipe at SIX-INCH intervals with tape. If excess cable remains at the end of the pipe, Double it back along the pipe where the insulation will COMPLETELY cover it. Be sure cable is held tightly to the pipe.



6d. Tape end seal to pipe.



6e. In a mobile crock or standpipe, NEVER install the Freeze*Free Cable end seal where it would normally be submerged.



STEP 7 INSTALLING THE INSULATION

Thermal insulation protects the Freeze*Free Cable and helps prevent pipe freezing.

7a. BEFORE insulating, MAKE SURE that there is NO Freeze*Free Cable damage (such as nicks or cuts) and that the braid is intact.

7b. Cover the pipe, cable, connections, valves and spigots with 1/2" clean, dry fiberglass insulation. DO NOT LEAVE THE CABLE EXPOSED (See Figure 6). Where jacket damage is possible, protect the exposed cable with insulation or other coverings. Do not cover the Power Indicator Light with insulation or covering.

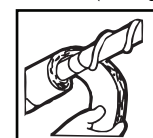


Figure 6



- ONLY use fire-resistant insulation materials such as fiberglass wrap.

- MAKE SURE fiberglass insulation is water-proof by installing a water-tight sleeve or vapor barrier such as polyethylene sheeting around it whenever there is ANY chance that it might come in contact with water.

7c. Place the "Caution" label on the insulation-covered pipe where it can be easily seen.

HOW TO OPERATE AND MAINTAIN YOUR FREEZE*FREE CABLE SYSTEM

STEP 8 PUTTING YOUR FREEZE*FREE SYSTEM TO WORK

Once installation is complete, plug the cable into a 120 volt AC outlet. Do not use any water for about an hour and then turn on a water tap on the Freeze*Free protected pipe and test the temperature of the water. It should feel warm almost immediately as the water heated by the Freeze*Free Cable runs through the pipe.

STEP 9 TROUBLESHOOTING

If in Step 8, the water doesn't feel warm when the tap is turned on, or any time a freeze-up on the Freeze*Free protected pipe occurs visually check the power light on the plug to see if the cable is energized. If the power light is off, unplug the Freeze*Free Cable, and check for and correct the following:

- 9a. Do you have power going to your electrical outlet?
- 9b. Is the fused plug wired correctly?
- 9c. Is fiberglass insulation applied properly dry?
- 9d. Have you installed the correct amount of cable for your pipe diameter, lowest expected temperature, and insulation thickness?

WARNING

IF ANY PART of the Freeze*Free Cable System is damaged, the WHOLE SYSTEM is damaged. NEVER attempt to repair ANY PART of the cable system, including a blown fused plug. ALWAYS replace a damaged system with a NEW system.

STEP 10 SEASONAL INSPECTION

While the Freeze*Free system can be left plugged in all year, you will save energy if you unplug it during non-freezing weather. In any case, EACH TIME you plug it in, OR AT LEAST once a year if you leave the system plugged in, or ANY time you have reason to suspect damage, make the following inspection:

- 10a.** Check the ENTIRE Freeze*Free system for signs of damage. NOTE this may be evidenced by damaged or discolored insulation.
- 10b.** Inspect ANY exposed portion of the cable for evidence of cuts, nicks, abrasions, gnawing by animals, or other physical damage.
- 10c.** If there is damage, IMMEDIATELY REPLACE the damaged cable system.
- 10d.** After a THOROUGH INSPECTION, repeat Steps 8 and 9.

LIMITED WARRANTY AND LIABILITY

Frost King warrants that if there are any defects in material or workmanship in this product during the first twelve (12) months after the date of its purchase, we will replace the product with an equivalent model, not including any labor or other installation costs.

Our obligation to replace the product as described above is conditioned upon (a) the installation of the product conforms to the specifications set forth in our installation instructions and (b) the product not having been damaged by unrelated mechanical or electrical activities.

Product replacement as described above shall be your sole and exclusive remedy for a breach of this warranty. This limited warranty does not cover any service costs relating to repair or replacement.

We shall not be liable for any incidental, special or consequential damages as a result of any breach of this warranty or otherwise, whether or not caused by negligence. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

The warranty above is exclusive and makes no other warranties with respect to description or quality of the product. No affirmation of fact or promise made by us, by words or action, shall constitute a warranty. If any model or sample was shown to you, the model or sample was used merely to illustrate the general type and quality of the goods and not to represent that the goods would necessarily be of that type or nature. **No agent, employee or representative of ours has authority to bind us to any affirmation, representation or warranty concerning the goods sold unless such affirmation, representation or warranty is specifically incorporated by written agreement.**

Any implied warranty of merchantability or fitness for particular purpose that may arise in connection with the sale of this product shall be limited in duration to twelve (12) months from the date of purchase. We disclaim all other implied warranties, unless we are prohibited by law from doing so, in which case all such implied warranties shall expire at the earliest time permitted by applicable law. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or province to province.

To obtain a replacement under this warranty any inoperative product or component must be returned, with proof of purchase, to Frost King at the addresses noted herein. Buyer is responsible for all costs incurred in removal and re-installation of product and must pre-pay shipment to factory or point of purchase.

In USA
 Thermwell Products Co., Inc.
 Mahwah, NJ 07430 Sparks, NV 89431

UL System Listed

952S Mobile Home Pipe Heating Cable

The UL Listing for the Freeze*Free Heating Cable system is limited to mobile home pipe heating and the limitations below MUST be observed.

- The Freeze*Free System IS NOT for outdoor use other than the UNDERSIDE of a mobile home.
- It MUST NEVER be connected to an exposed electrical outlet.
- It MUST NEVER be connected to an outdoor electrical outlet other than one located UNDER a mobile home.
- NEVER use an extension cord to reach the electrical outlet.
- The National Electrical Code requires that a heating cable system electrical outlet located on the underside of a mobile home MUST be WITHIN 2 feet of the cold water inlet.
- ONLY connect the Freeze*Free System to an electrical outlet so located.



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