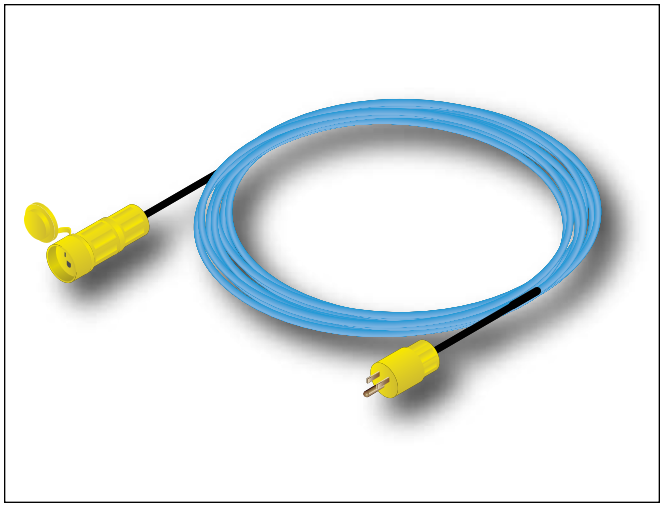
heat-line®
Freeze Protection Systems

Tandem-Link

Pre-Assembled, Inter-Connecting Heating Cable Sets for Pipe Freeze Protection



Tandem-Link Kit Contents

Tandem-Link heating cable

Installation Instructions

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Installation Instructions

General Information

Tandem-Link systems can be used on all metal and non-metal pipe materials including but not limited to copper, polyethylene and ABS/PVC. Common applications include; fresh water supply pipes, effluent and sewage pipes, drain pipes and culverts, forced mains, and more. As Tandem-Link is an interconnecting system it is ideal for temporary freeze protection as lengths can always be adjusted for future applications requirements. Tandem-Link employs the performance and operating characteristics of self-regulating heating cable technology and can be used with thermal insulation to increase energy efficiency. Tandem-Link is applied on the outside (externally) of the pipe to provide reliable freeze protection. Tandem-Link is generally applied in a single run on the bottom side of a pipe (depending on application) due to the high performance capability of the conductive polymer technology.

1. Heating cable(s) must be GFCI protected as per NEC and CEC regulations.
2. Maximum 3 systems interconnecting and/or to maximum total length rating as per voltage used.
3. Tandem-Link is suitable for use on metal and non-metal pipes.
4. Heating cable is direct earth burial and wet location approved. Do not bury power connections.
5. Exposure to temperatures above 150°F (65°C) while operating will shorten the expected life of the heating cable. Maximum exposure temperature is 185°F (85°C) when not powered.
   * Do not install in temperatures below –40°F (–40°C).
6. Remove any old heating tapes or insulation before installing the Tandem-Link heating cable.
7. Install with a minimum of 1/2" fire-resistant, waterproof thermal insulation.
8. The minimum bending radius of the heating cable is 1/2".
9. If the Tandem-Link system must be taken off and re-installed carefully follow all installation instructions.
10. Leave these instructions with the user for future reference.
11. These systems can be used with thermostats or timers where applicable to improve energy efficiency.

Tandem-Link is a technically advanced product. Handle it with proper care and be sure not to damage the outer sheaths or jackets of the cable.

Read the Warnings and Installation Instructions completely before installing this product.

Approvals

C SP US — Usage W
Installation Type A USA

⚠ WARNING:

Important Safety Instructions and Rules for Safe Installation and Operation

A. Read these rules and instructions carefully. Failure to follow them could result in serious bodily injury and/or property damage.

B. Check your local building, plumbing and electrical codes before installing. You must comply with their rules.

C. Before installing this product have the electrical outlet checked by an electrician to make sure it has been installed in accordance with the National Electrical Code and Canadian Electrical Code. The heating cable must be ground fault protected.

D. Before installing or servicing your Tandem-Link system BE CERTAIN that the power source is disconnected.

E. Do not use extension cords.

F. Never tamper with or alter the electrical apparatus associated with your Tandem-Link system.

G. The cable jacket must not be cut, nicked, or worn down, therefore:

- Never cut the cable's outer jacket.
- Do not install the cable where objects might hit it or cut it or where it might be damaged by rubbing against rough surfaces.
- Before installation, file and remove any sharp edges on the installation surface which might damage the cable. Make sure the cables cross only smooth, non-abrasive surfaces.
- Protect the complete system with a protective outer sheath where it might be damaged by animals or impact.
- Do not use any wire or clamps to attach the cable to the pipe. Use 1/2" or 1" tape, fiberglass tape, or plastic ties.
- Do not use nails, metal clamps, wires or other devices that might cut the cable or cord to support it between the pipe and receptacle.
- If you discover a nick or worn spot on your cable, immediately disconnect the system and replace the cable. Inspect the cable periodically for damage. And remember to replace any damaged insulation after each inspection of the cable.

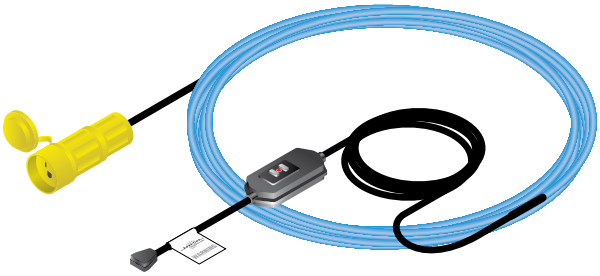
H. Never attempt to splice or repair a damaged cable. Replace it with a new unit. The system is not designed to be repaired and to do so may create a danger of fire or shock.

I. Do not install the cable close to flammable materials, liquids, or fumes. If the cable is cut while the system is energized and if there is moisture present, there is a risk of fire and flammable objects or fumes near the cable might be ignited.

WHEN PERFORMING WORK OR REPAIRS ON YOUR WATER SYSTEM BE SURE TO UNPLUG YOUR Tandem-Link SYSTEM FROM THE POWER SUPPLY.

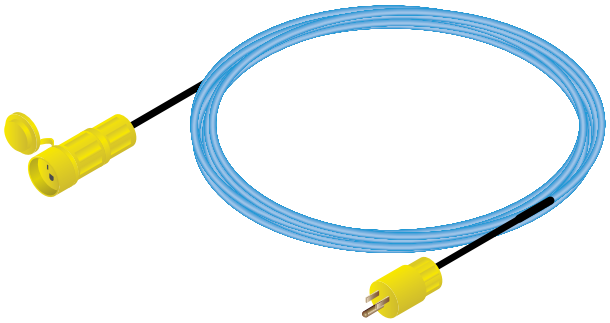
Specifications

Tandem-Link GFC

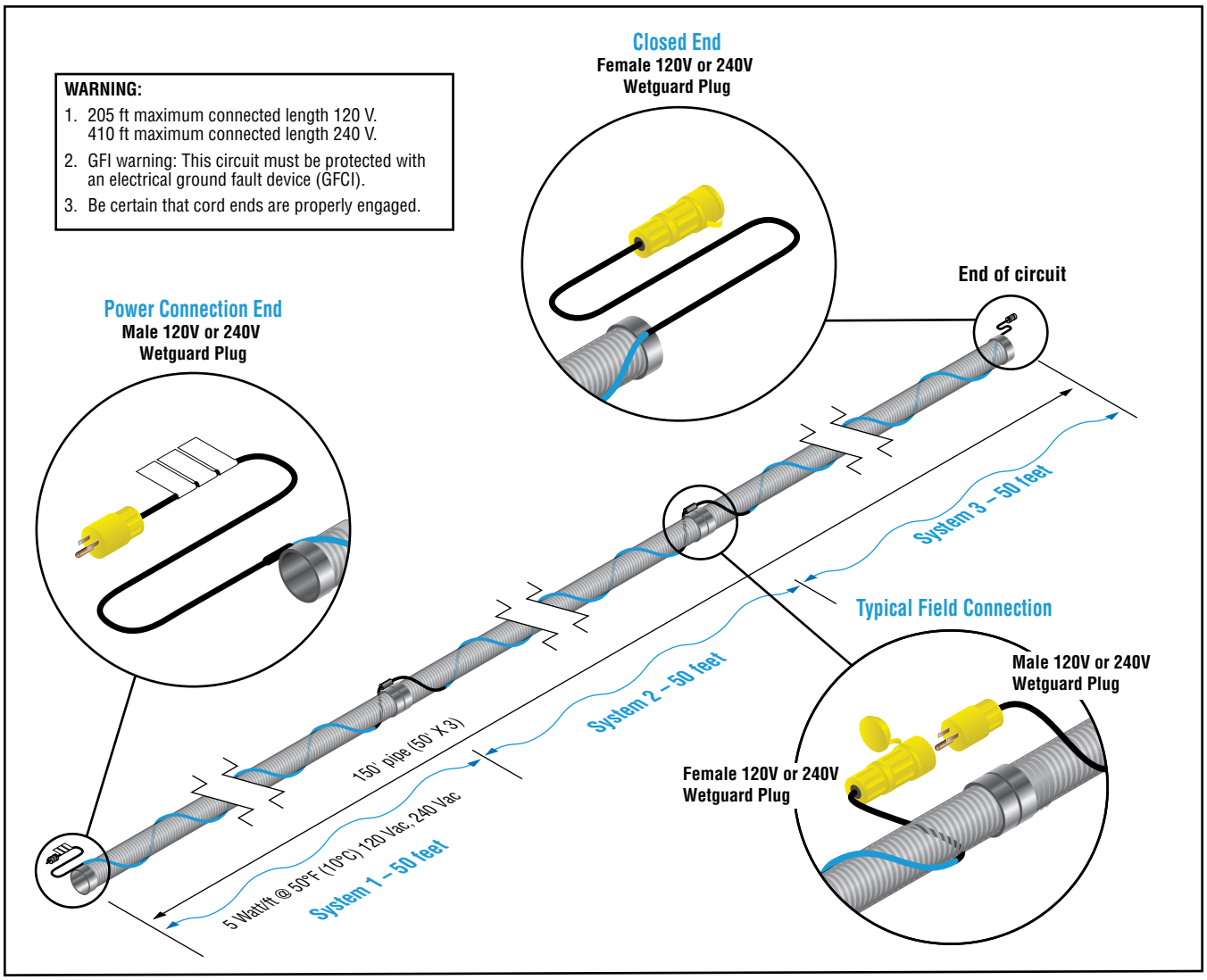


Male End 120V:	48 inches (122 cm) 27 milliamp GFCI, 5-15P
Male End 240V:	72 inches (183 cm) 27 milliamp GFCI, 6-15P
Female End 120V:	24 inches (61 cm) 14 AWG SJEOOW with 5-15R Wetguard connector
Female End 240V:	24 inches (61 cm) 14 AWG SJEOOW with 6-15R Wetguard connector

Tandem-Link CS



Male End 120V:	24 inches (61 cm) 14 AWG SJEOOW with 5-15P Wetguard connector
Male End 240V:	24 inches (61 cm) 14 AWG SJEOOW with 6-15P Wetguard connector
Female End 120V:	24 inches (61 cm) 14 AWG SJEOOW with 5-15R Wetguard connector
Female End 240V:	24 inches (61 cm) 14 AWG SJEOOW with 6-15R Wetguard connector



Pre-Installation Information

General Requirements For Pipe Freeze Protection

Install with a minimum of 1/2" fire-resistant, waterproof thermal insulation.

General Instructions

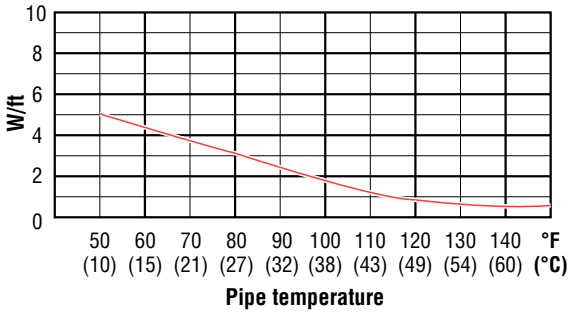
- Install only in accessible locations; do not install behind walls or where the cable would be hidden.
- Do not run the heating cable through walls, ceilings, or floors.
- Connect only to properly grounded outlets that have been installed in accordance with all prevailing national and local codes and standards and are protected from rain and other water.

Important: For the Heat-Line warranty to be valid, you must comply with all the requirements outlined in these guidelines.

All thermal and design information provided here is based upon a "standard" installation with heating cable fastened to an insulated pipe. For any other application or method of installation, consult Heat-Line at (800) 584-4994.

Tandem-Link Nominal Power Output Rating

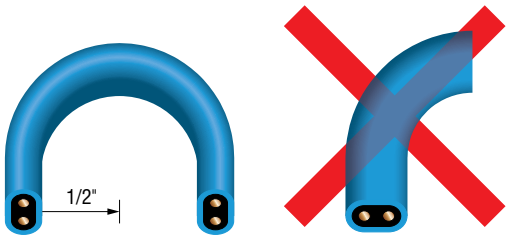
on Metal Pipes at 120 V/240 V



Bending the Cable

When positioning the heating cable on the pipe, do not bend tighter than 1/2" radius.

The heating cable does not bend well on a flat plane. Do not force such a bend as heating cable may be damaged.



Optional Accessories

HLA-120	NEMA 1 General Purpose 120V only plug-in thermostat
HLPC-TIMER	General Purpose 120/240V 20 Amps Percentage cycle timer
GF-STAT	NEMA 4X Ground Fault Protected Thermostat 120V /240V 30amp
MA-10	GFCI/ELCI Electrical Equipment Protection Device
TAPE-FOIL	Professional Grade All Weather Foil Tape 2.83'' x 150' (72mm x 46m)
INSUL-1.00	Closed cell polyethylene insulation sleeve for 1" ID pipe (6' long, 1 5/8" ID, ¾" thick wall)
INSUL-1.25	Closed cell polyethylene insulation sleeve for 1 1/4" ID pipe (6' long, 1 7/8" ID, ¾" thick wall)
INSUL-2.00	Closed cell polyethylene insulation sleeve for 2" ID pipe (6' long, 2 5/8" ID, ¾" thick wall)
INSUL-3.00	Closed cell polyethylene insulation sleeve for 3" ID pipe (6' long, 3 1/2" ID, ¾" thick wall)
INSUL-4.00	Closed cell polyethylene insulation sleeve for 4" ID pipe (6' long, 4 1/2" ID, 1" thick wall)
INSUL-FOIL	Aluminum Reflective Metalized Foil Bubble Insulation (16" wide)
INSUL-LABEL	Electric Heat Trace Caution Label for Insulation

Ordering Chart

Tandem-Link | Product Code

Example: **TL2 – 50 – CS or GFC**

Product

TL	120 Volt Tandem-Link
TL2	240 Volt Tandem-Link

Cord-Set Type

CS	CS male and female plug-in (no GFCI)
GFC	Ground fault protected

Length in Feet

120 V	max connected length 205 feet
240 V	max connected length 410 feet

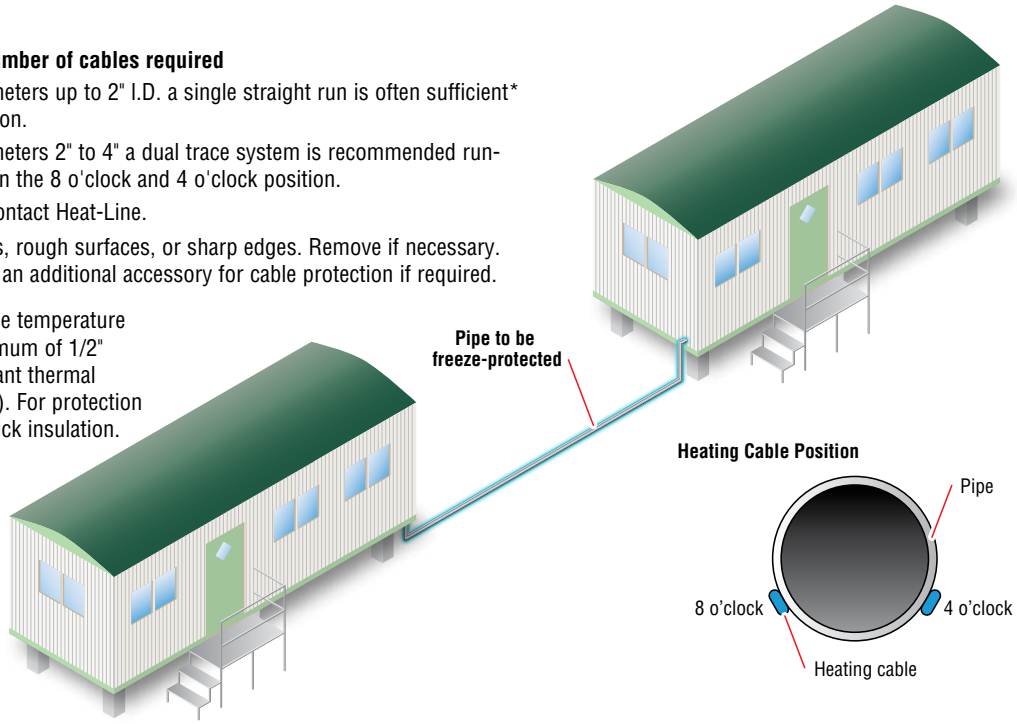
1

Determine the length and number of cables required

- For systems with pipe diameters up to 2" I.D. a single straight run is often sufficient* on the 4 or 8 o'clock position.
- For systems with pipe diameters 2" to 4" a dual trace system is recommended running the heating cable down the 8 o'clock and 4 o'clock position.
- For pipes greater than 4" contact Heat-Line.

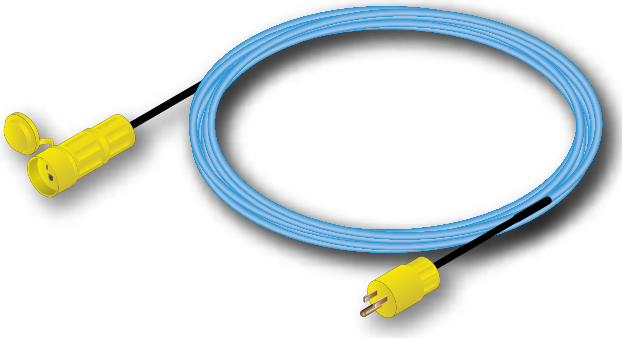
Note: Inspect piping for burrs, rough surfaces, or sharp edges. Remove if necessary. Cable guards are available as an additional accessory for cable protection if required.

* Assuming the lowest outside temperature is 0°F (–18°C), with a minimum of 1/2" thick waterproof, fire resistant thermal insulation (preformed foam). For protection to –20°F (–29°C), use 1" thick insulation.



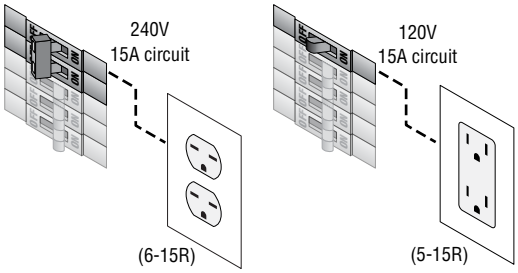
2

- Carefully remove your Tandem-Link system(s) from the package.



- It is recommended that a single circuit (15 amp) be installed by a qualified person for dedicated use of the Tandem-Link system. **Do not use extension cords.**

Note: If all heating cables being used are CS models, the circuit must be GFCI protected.



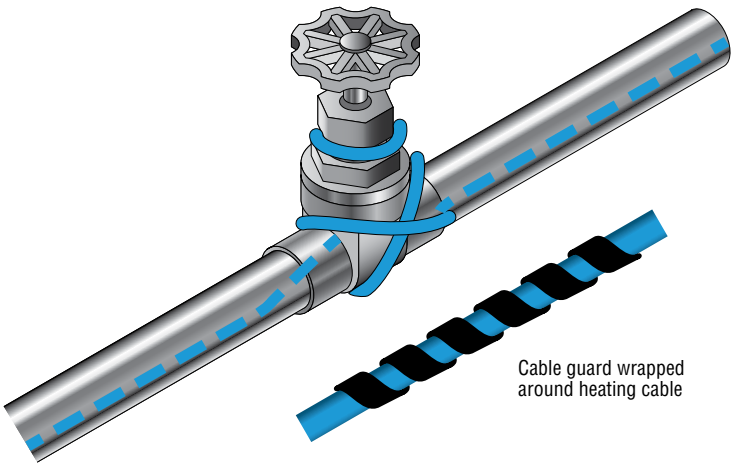
3

- To provide extra heat at valves and other fitting areas, simply wrap extra heating cable at these areas.

Pipe diameter (IPS) inches	Heating cable feet	(meters)
1/4	0.3	(0.09)
1/2	0.8	(0.24)
3/4	1.3	(0.4)
1	2.0	(0.6)
1-1/4	3.3	(1.1)
1-1/2	4.3	(1.3)
2	4.3	(1.3)

Note: It is safe for the heating cable to overlap.

- To protect heater over rough or sharp edges Cable Guards can be installed.



4

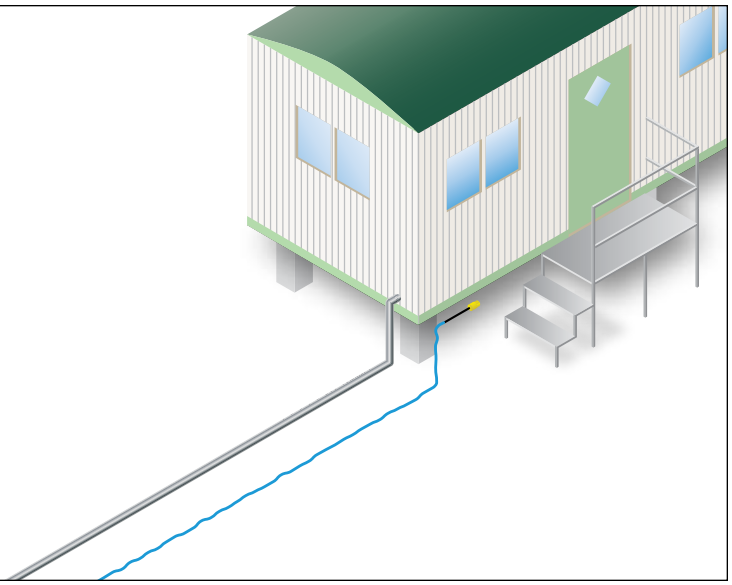
Apply cable to the pipe

- Ensure that the heating cable voltage rating is suitable for the service voltage available.

When laying out the heating cable, AVOID:

- Sharp edges
- Excessive pulling force or jerking
- Kinking and crushing
- Walking on it, or running over it with equipment

Option: For non-metallic pipes apply aluminum foil tape to outside diameter of pipe prior to installing heating cable to increase conductive heat transfer.



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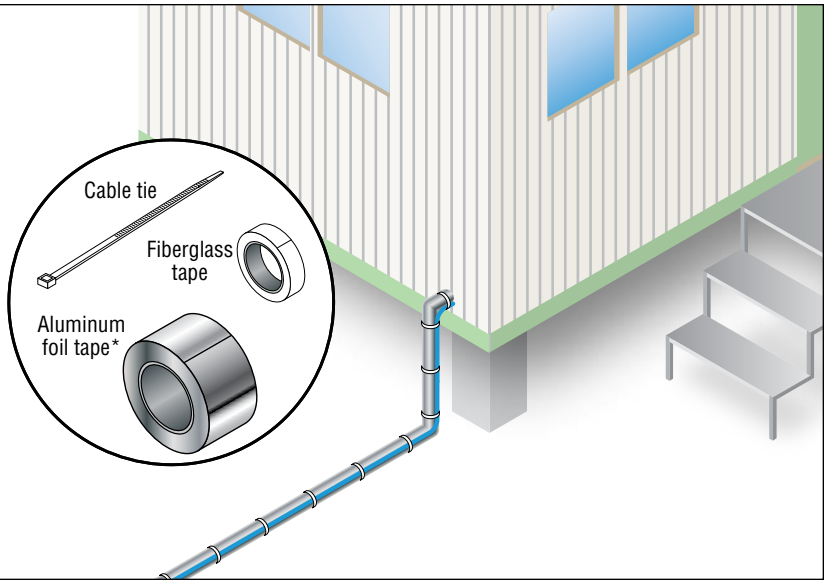
- Fasten the cable at one foot intervals using quality fiberglass tape or plastic cable ties.

Note: Aluminum foil tape may be installed over entire length of heating cable for increased heat transfer and to keep heating cable in constant contact with pipe wall.



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- If one heating cable is not long enough to complete required run, connect the installed heating cable into the next heating cable being used and repeat previous steps.
  - Never exceed 3 connected cables.
  - Never exceed the maximum length connected length as per voltage used.

    120V -205 ft maximum

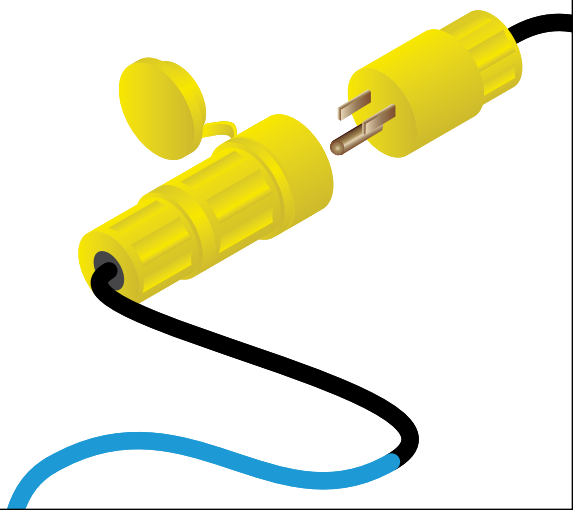
    240V - 410 ft maximum

Example 1: 120V Circuit:

Correct	100 ft + 80 ft +25 ft systems	= 205 ft
Incorrect	100ft + 80 ft+ 30 ft systems (over maximum circuit length, 240V must be used)	= 210 ft

Example 2: 120V Circuit:

Correct	100 ft + 105 ft	= 205 ft
Incorrect	50 ft + 50 ft + 50 ft + 50 ft (under maximum length but over maximum connected cables allowed)	= 200 ft



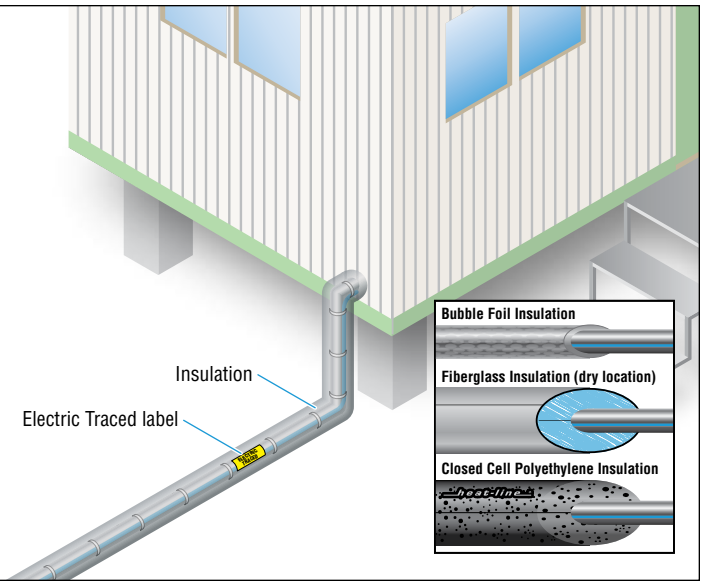
7

Protect the system with insulation

- Suitable insulation may include: foil bubble insulations, fiberglass pipe insulations in dry locations or foam sleeve insulations outside in wet locations. Always make sure insulation is suitable for the location.
- Before insulating ensure that there is no cable damage, such as nicks or cuts.

Note: Pipes must be insulated for maximum efficiency and performance.

- Apply 'Electric Traced' labels on the outside of the insulation at 10 foot (3m) intervals on alternate sides to indicate presence of electric cables.



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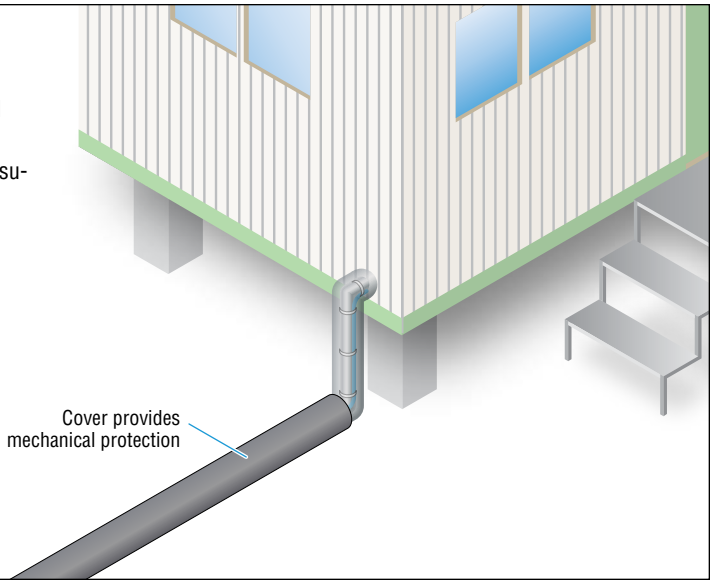
Optional: Mechanical Protection

- A metallic or non-metallic pipe may be slipped over the insulated and heat traced pipe to provide mechanical protection.
- The protective outer sheath will help to prevent damage to the insulation and heating cable from animals, mechanical impact and or abrasion that can occur when in contact with rocky geography.



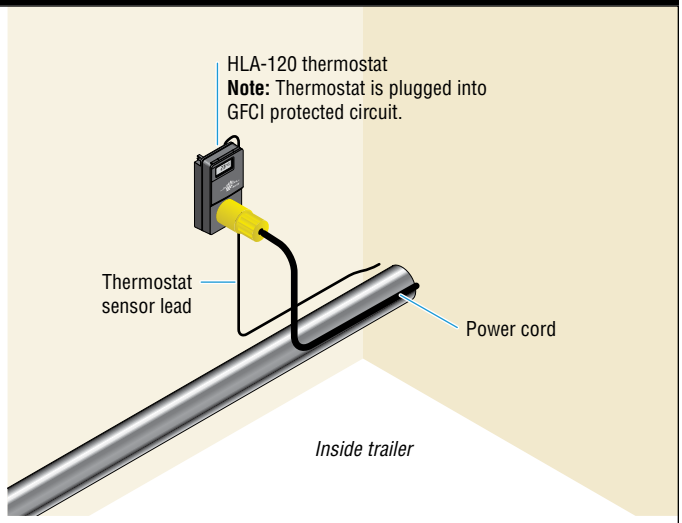
Thermostat Sensor Location and Insulation Installation

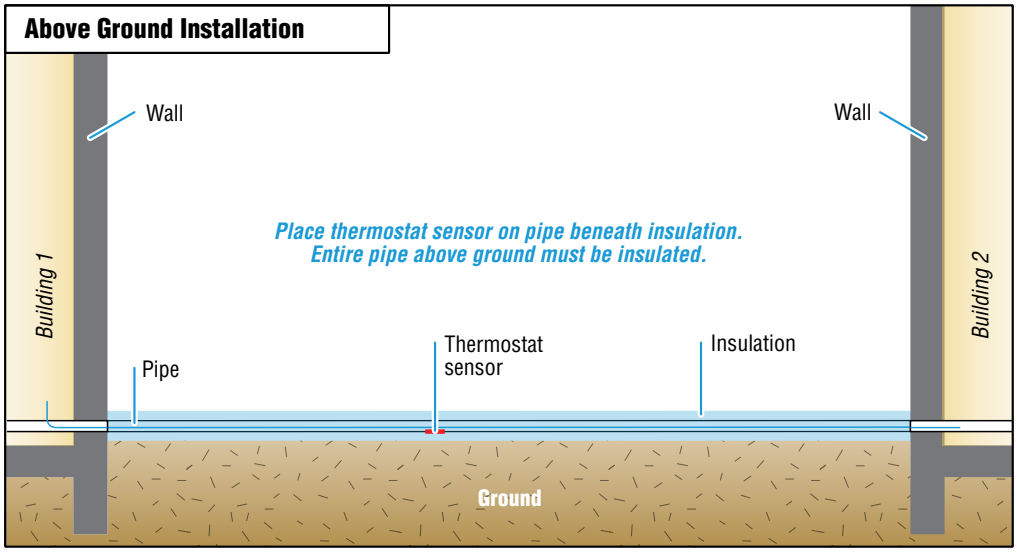
Control devices are not required to operate the heating cable system. They can be added for energy efficiency.

Thermostats are used to duty cycle the system in an on/off operation saving power consumption and maintain a certain pipe temperature. A sensor lead must be placed on the coldest section of pipe.

Timers are used to duty cycle the system in anon/off operation based on preset time intervals to save on power consumption.

Insulation is recommended for all new pipe installations, even where the pipe is to be buried. For existing pipe applications, insulation is only required where the pipe is exposed to ambient outdoor temperatures, and/or where the pipe is above the ground. Insulation aids in heat retention making the heating cable more energy efficient and providing cold weather reliability.





SEASONAL INSPECTION BY USER

IMPORTANT: While the Tandem-Link cable can be left plugged in year round, it will use less energy if you unplug it during non-freezing weather. Each season before you plug it back in, make the following inspection:

1. Check the entire system for signs of damage (may be evidenced by damage to insulation).
2. Inspect the exposed portion of the cable for evidence of cuts, nicks, abrasions, gnawing by animals, or other physical damage.
3. If there is damage, immediately replace the cable. Do not attempt to repair any part of the cable.
4. After a thorough inspection, complete the **ELECTRICAL SYSTEM CHECK**.
5. Ground fault device should be stored in dry location off of concrete floors or the ground.

Unplug when not in use.

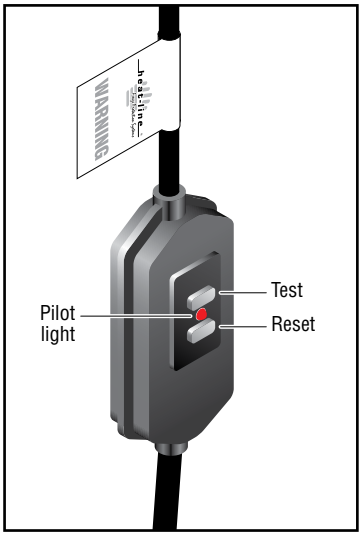
ELECTRICAL SYSTEM CHECK

A. Unpack the Tandem-Link system plug from its protective package.
B. Plug into your dedicated outlet. 120V 5-15R outlet for 120V systems or 240V 6-15R outlet for 240V systems.
C. Push reset button on the cord set ground fault device until light comes ON. If light does not illuminate check power to outlet. Do not remove or tamper with the cord set. If used with a thermostat it may be necessary to bypass the thermostat control and plug directly into receptacle to perform test.
D. Push test button and light will go OFF. This indicates that the electrical circuit is intact and fully protected.
E. Push reset button again and light will come ON. This indicates that your Heat-Line is working.
F. Follow this test procedure before each season and monthly while in use.

Your Heat-Line is now fully functional.

If at any time your Heat-Line system fails to work call your local electrician or Heat-Line for assistance at (800) 584-4944.

Unplug when not in use.



Note: GFCI model supplied may be different than the one shown.

Limited Warranty

During the time periods and subject to the conditions hereinafter set forth. Heat-Line will repair or replace to the original user any portion of your Tandem-Link Series product which proves defective in materials or workmanship of Heat-Line. Contact Heat-Line or your installer for warranty service.

At all times Heat-Line shall have and possess the sole right and option to determine whether to repair or replace defective equipment, parts or components. **Damage due to natural events or conditions beyond the control of Heat-Line are NOT COVERED BY THIS WARRANTY.**

STANDARD WARRANTY PERIOD: 60 months from date of purchase or 63 months from date of manufacture, which ever occurs first.

ACCESSORIES, COMPONENTS, ELECTRONICS: Not manufactured by Heat-Line, are warranted only to the extent of original manufacturer's warranty.

LABOUR, COSTS, ETC.: Heat-Line shall in NO EVENT be responsible or liable for the cost of field labour or other charges incurred by any customer in removing and/or reaffixing any Heat-Line product, part or component thereof.

THIS WARRANTY WILL NOT APPLY:

(a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with printed instructions provided,
(b) to failures resulting from abuse, accident or negligence;
(c) to normal maintenance services and
(d) to parts not used in accordance with applicable local codes, ordinance and good trade practices;
(e) if the unit is moved from its original installation location or
(f) if the unit is used for purposes other than for what it was designed and manufactured,
(g) to the integral ground fault device and related electronics.

PRODUCT IMPROVEMENTS: Heat-Line reserves the right to change or improve its products or any component thereof without being obligated to provide such a change or improvement for units sold and/or shipped prior to such change or improvement.

WARRANTY EXCLUSIONS: As to any Heat-Line product after the expiration of the time period of the warranty applicable thereto as set forth above. There will be no warranties including any implied warranties of merchantability or fitness for any particular purpose. No warranties or representations at any time made by any representative of Heat-Line, shall vary or expand the provisions hereof.

LIABILITY LIMITATION: In no event shall Heat-Line be able or responsible for consequential, incidental or special damages resulting from or related in any manner to any Heat-Line product or parts thereof. In the absence of suitable proof of the purchase date, the effective date of this warranty will be based upon the date of manufacture plus 90 days.

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Important: *All information, including illustrations, is believed to be reliable. Users, however, should independently evaluate the suitability of each product for their particular application. Heat-Line a Division of Christopher MacLean Ltd. makes no warranties as to the accuracy or completeness of the information, and disclaims any liability regarding its use. Heat-Line's only obligations are those in the Heat-Line Standard Terms and Conditions of Sale for this product, and in no case will Heat-Line be liable for any incidental, indirect, or consequential damages arising from the sale, resale, use, or misuse of the product. Specifications are subject to change without notice. In addition, Heat-Line reserves the right to make changes—without notification to Buyer—to processing or materials that do not affect compliance with any applicable specification.*