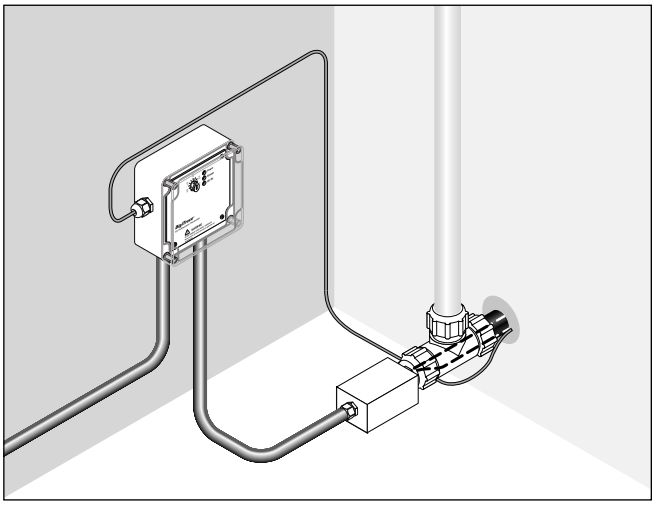
nVent

RAYCHEM

In-Pipe Retro – 240 V, 251 to 500 ft

In-Pipe Freeze Protection Heating Cable Installation Instructions



APPROVALS

C US
-PS,X/D
Made in Canada

Note: This product is suitable for use in potable water.

KIT CONTENTS

Item	Qty	Description
A	1	Temperature controller with 25 ft (7.6 m) sensor lead
B	2	1-1/4 inch pipe adaptor parts
C	2	1 inch pipe adaptor parts
D	1	Nut for plastic tee fitting
E	1	Metal junction box with cover
F	1	Heating cable with plastic tee fitting
G	1	Installation instructions (English and French)

DESCRIPTION

nVent RAYCHEM In-Pipe Retro-240 is a high wattage in-pipe heating cable designed for freeze protection of 1 inch or 1-1/4 inch uninsulated polyethylene water pipes. It is made with a tough mineral insulated cable for long life and years of trouble-free service.

To comply with nVent's, NEC and CEC requirements for ground-fault protection of equipment and to prevent fire, use a separate 240-volt grounded circuit breaker with 30-mA ground fault protection. **Please leave these instructions with the homeowner.**

Note: For use only with the following pipe types.

I.D. Series 75 & 100 (PE 1404) (SIDR 9)

I.D. Series 125 (PE 2306, 2406 or 3406 resin) (SIDR 11.5)

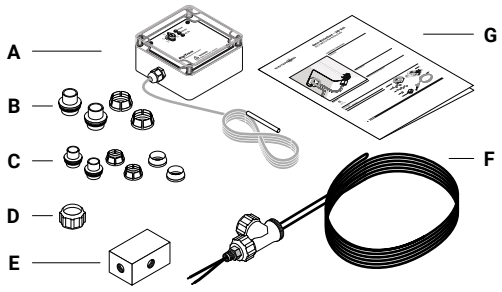
I.D. Series 160 (PE 3408 resin) (SIDR 9)

TOOLS REQUIRED

- Screwdriver
- Electrician's fish tape
- 6 ft (2 m) of strong string or rope
- Pipe wrench
- Rubber mallet

ADDITIONAL MATERIALS REQUIRED

- (4) mounting screws for temperature controller
- Duct tape
- For cables up to 410 ft (125 m): 240 V, 15 A circuit breaker with 30-mA ground-fault protection
- For cables over 410 ft (125 m): 240 V, 20 A circuit breaker with 30-mA ground-fault protection
- Wooden block



⚠ WARNING:

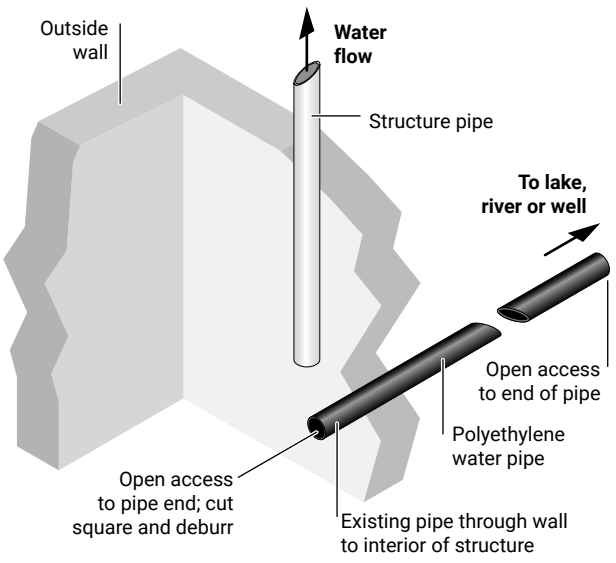
FIRE AND SHOCK HAZARD. In-Pipe Retro must be installed correctly to ensure proper operation and to prevent shock, fire or damage to the pipe. Read these important warnings and carefully follow all the installation instructions.

- Power must be supplied from a 240 Vac, 15 or 20A circuit with 30-mA ground-fault equipment protection.
- The electrical connection must be made by a qualified electrician.
- In-Pipe Retro must not be used in insulated pipe. For insulated pipes use nVent RAYCHEM In-Pipe Miser.
- The heating cable must be installed in accordance with local and national electrical codes.
- Do not use with any voltage other than 240 Vac.
- The temperature controller must be installed in a dry location.
- Do not unduly work or bend the cable (minimum inside bend radius is 6 times the outside diameter of the heating cable). Bend gently and avoid repeated sharp bends, pinching, crimping, or flattening.
- Do not cut the heating cable or alter the heating cable length.
- The heating cable must not pass through a pitless adaptor, valve or shut off of any kind.
- Do not install this heating cable on the outside of piping.
- Do not energize the system until installation is complete and the pipe is filled with water. Never energize the system if the pipe is not filled with water.
- The temperature sensor must contact the pipe at all times or it could sense an incorrect temperature.

1

Note: The minimum installation temperature is 32°F (0°C).

- **Disconnect any existing electrical connections and open up access to both ends of the pipe.** The pipe must run far enough into the lake or river to be below the ice level or into the well to be below the frost line. The pipe should be at least 1 ft (30 cm) longer than the heating cable. Cut the end of the pipe square and deburr.



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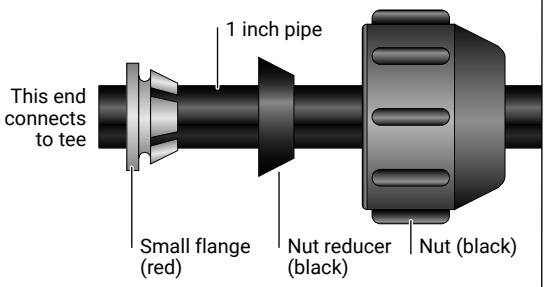
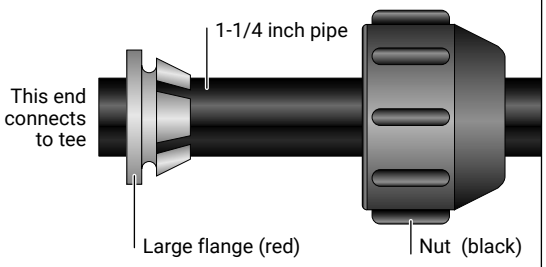
For 1 inch pipe:

- Place nut, nut reducer, and small flange on pipe in the order and direction shown.



For 1-1/4 inch pipe:

- Place nut and large flange on pipe in the order and direction shown (the nut reducer is not required).



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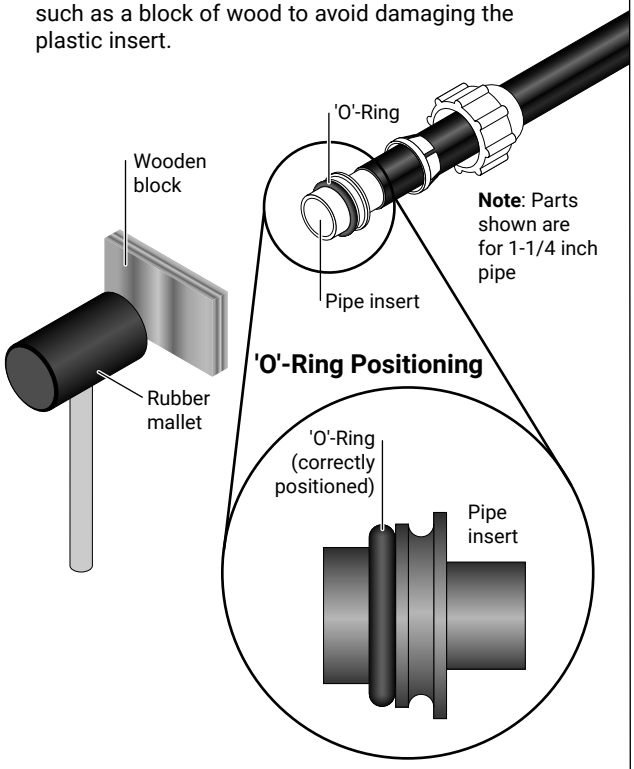
- Tap pipe insert into pipe, preferably with a flat object such as a block of wood to avoid damaging the plastic insert.



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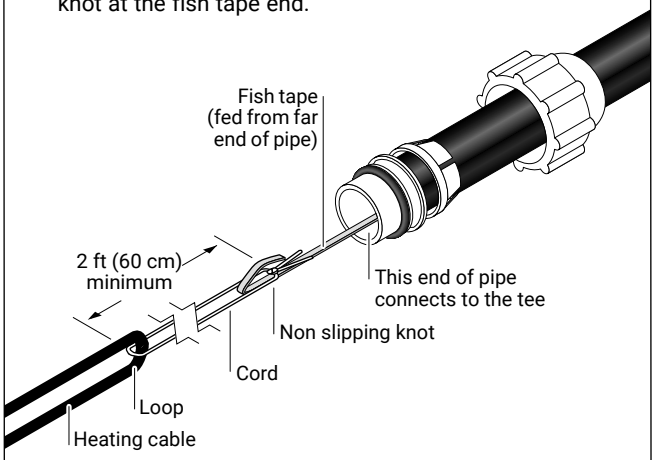
- Use an electrician's fish tape (available from rental supply stores) to pull the heating cable into the pipe. Starting at the end of the pipe that goes into the lake, river or well, feed the electrician's fish tape back through the pipe. Using strong string or cord, tie the end of the fish tape to the loop on the heating cable so that the end of the fish tape is separated by about 2 ft (60 cm) from the loop on the cable. Locate the knot at the fish tape end.



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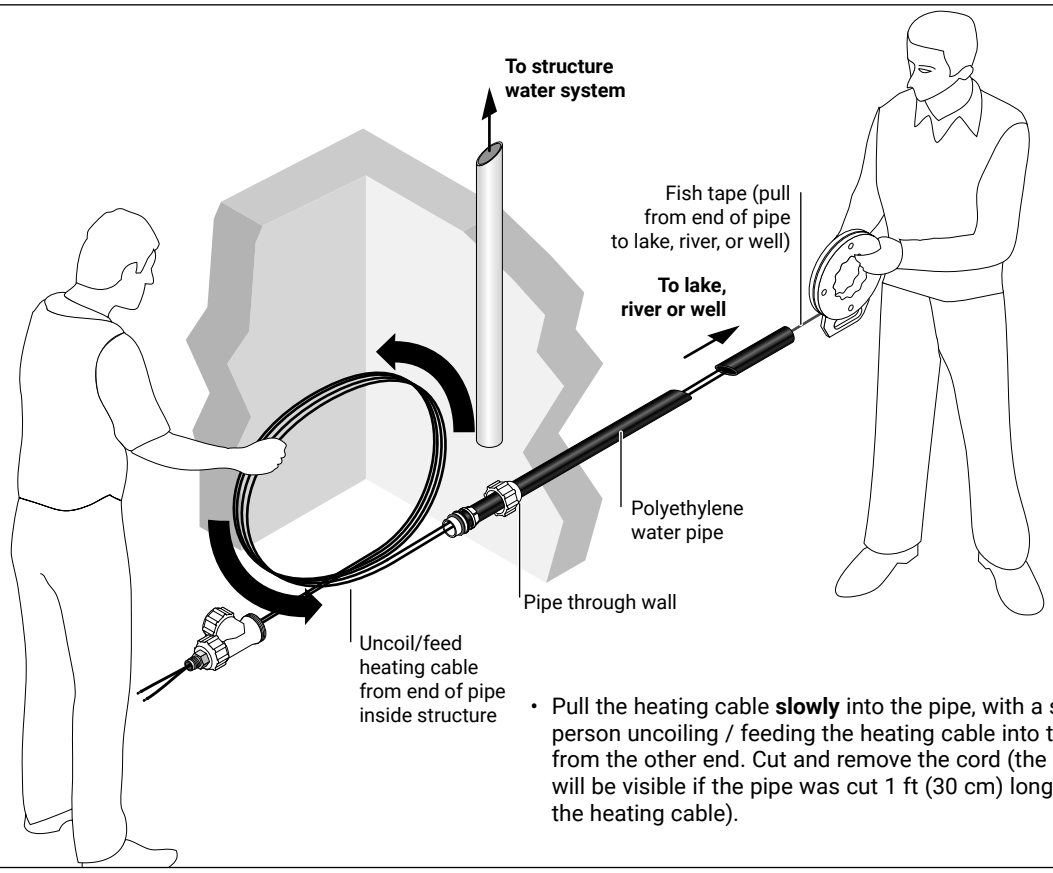
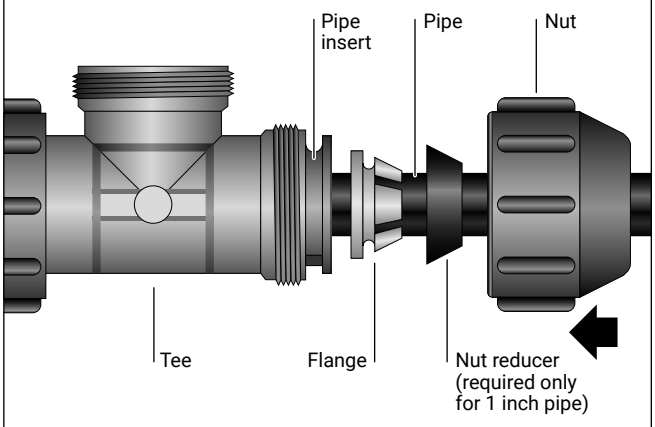


- Pull the heating cable **slowly** into the pipe, with a second person uncoiling / feeding the heating cable into the pipe from the other end. Cut and remove the cord (the cord will be visible if the pipe was cut 1 ft (30 cm) longer than the heating cable).

6

- Ensure that the 'O'-ring seal is correctly positioned on the pipe insert (see Step 3). Push the tee onto the insert/O-ring seal assembly. Slide the red flange (and nut reducer if using 1 inch pipe) up to the insert shoulder and tighten the nut using a wrench.



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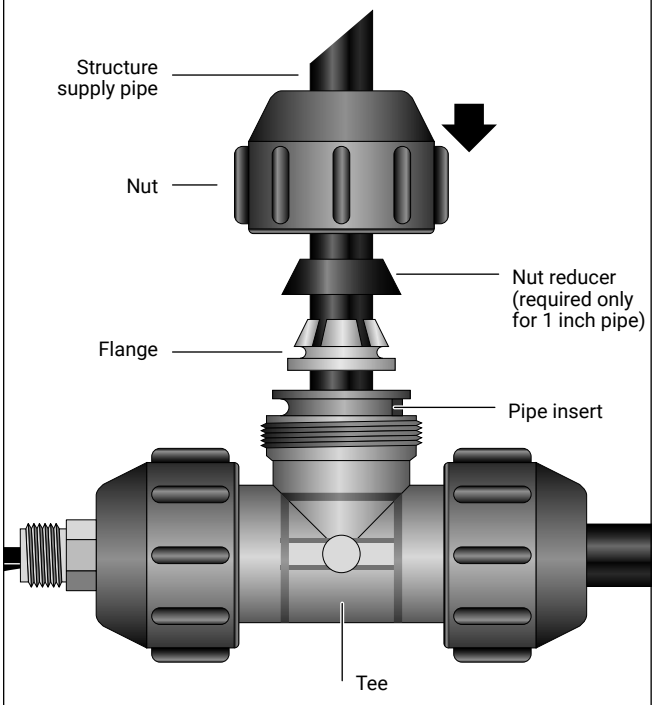
- Attach the vertical segment of the blue tee to structure water system in a similar manner (Steps 2, 3 and 6).



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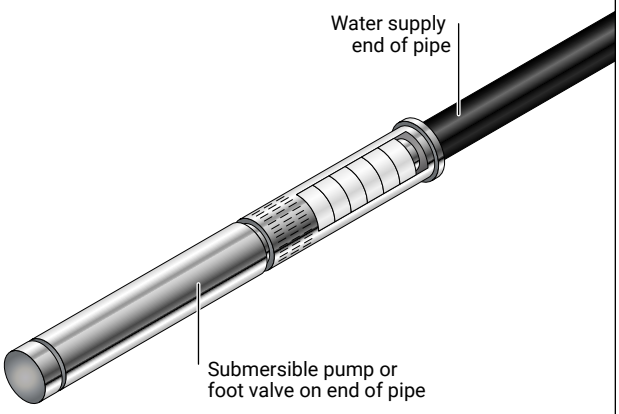
- Reconnect the submersible pump or foot valve to the water supply end, if not already connected. **The submersible pump or foot valve will ensure that the pipe is full of water at all times.**



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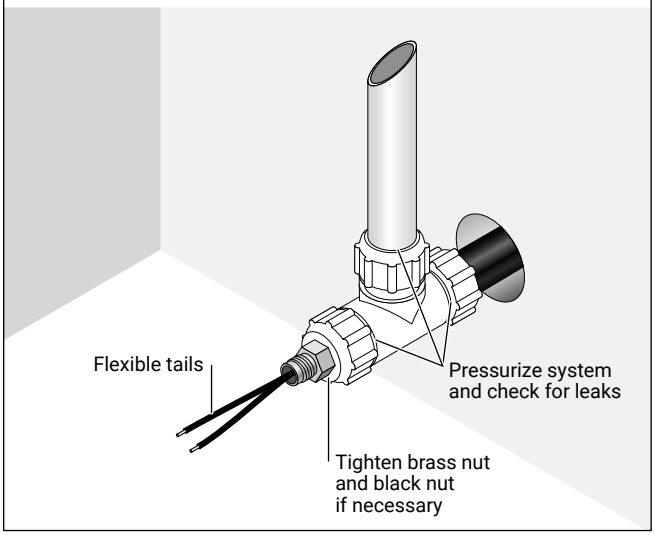
- Check that the brass nut and the black nut where the flexible tails exit the tee are tightened securely (60 to 70 inch-lbs torque). Do not over tighten brass nut as this may damage the internal 'O'-ring seal. Test the system at normal water pressure to check that it is leak free.



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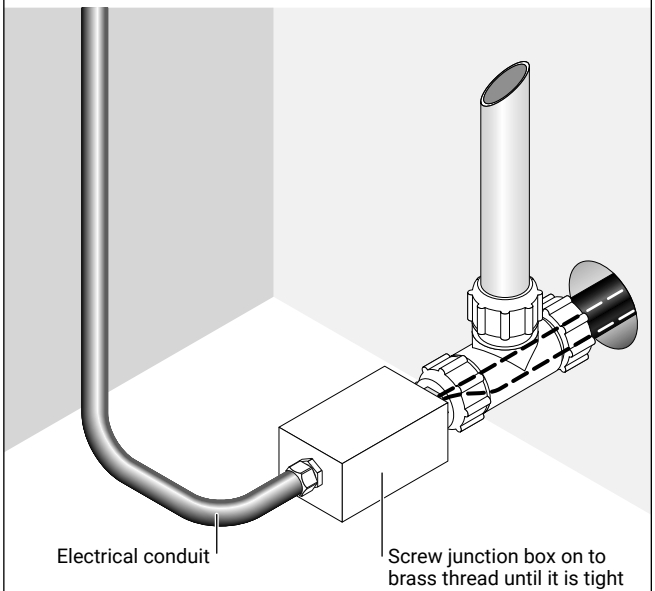
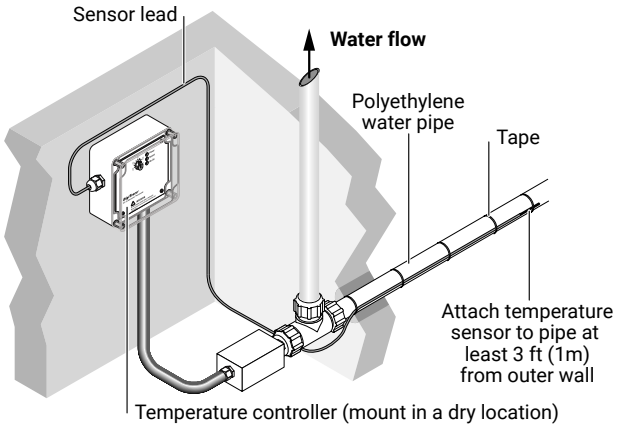
- Screw the metal junction box supplied with the heating cable on to the brass nut on the heating cable until it is tight. The junction box must be properly grounded when making the electrical power connection in Step 13. **Note: Use only the metal junction box supplied.**



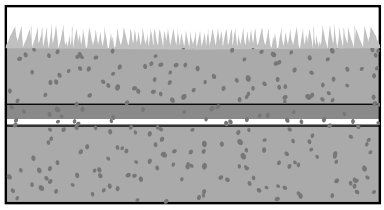
11

- Using 4 screws, mount the temperature controller in a dry location near the heating cable. Connect the temperature sensor lead to the controller following the instructions included with the controller (Steps 4, 5, 6B, and 7).
- Attach the temperature sensor to the outdoor section of pipe that is closest to the surface and within the maximum length of the sensor lead (it may be necessary to excavate a section of earth over the pipe or drill a hole through the wall while avoiding damage to the pipe). Keep the sensor at least 3 ft (1 m) away from the outside wall. Tape the sensor lead to the pipe at 1 ft (30 cm) intervals. If it is necessary to lengthen the sensor lead, contact nVent for recommendations.

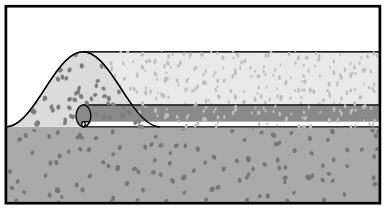


12

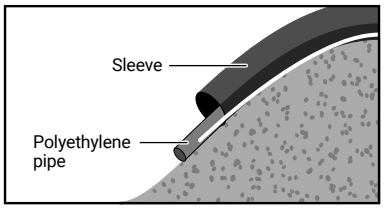
- If the water pipe is not already buried, protect the pipe from the wind by burying it at least 3 in (7.5 cm) deep or covering it with earth as shown. On rocky surfaces and where the water pipe enters a lake or river, slide a larger plastic pipe sleeve (such as 4 in (10 cm) corrugated pipe), over the exposed water pipe to protect from the wind and abrasion damage. Place the far end of the pipe in the lake or river using weights to hold the pipe down as necessary.



Bury the pipe a minimum of 3 in (7.5 cm) deep



Running above ground, cover with 3 in (7.5 cm) of soil or sand



On rocky or inclined surfaces and where the pipe enters the lake, protect with oversized polyethylene pipe 4 in (10 cm) diameter or larger

13

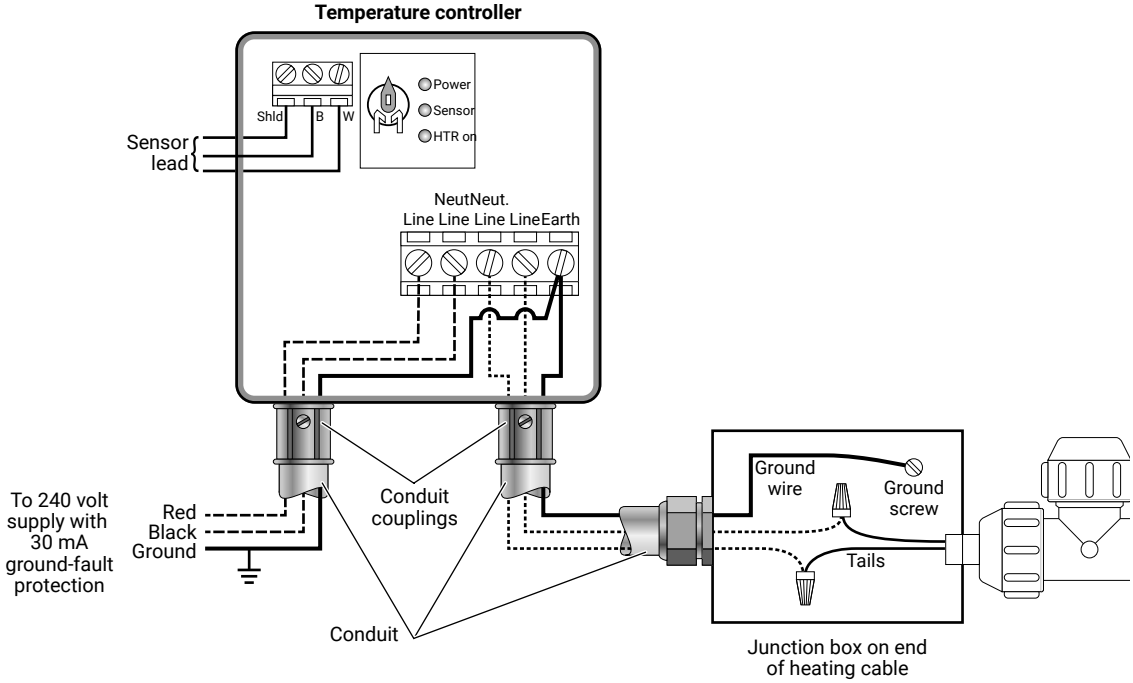
- Connect the heating cable and power from the breaker panel to the temperature controller (see wiring diagram below).
- For 251 ft to 410 ft (76.5 m to 125 m) long cables: Connect the heating cable and temperature controller to a 240 V, 15 A circuit with 30 mA ground-fault protection, being sure to comply with all local and national electrical codes.
- For 411 ft to 500 ft (125.3 m to 152.4 m) long cables: Connect the heating cable and temperature controller to a 240 V, 20 A circuit with 30 mA ground-fault protection, being sure to comply with all local and national electrical codes.

Note: The electrical connection must be made by a qualified electrician.

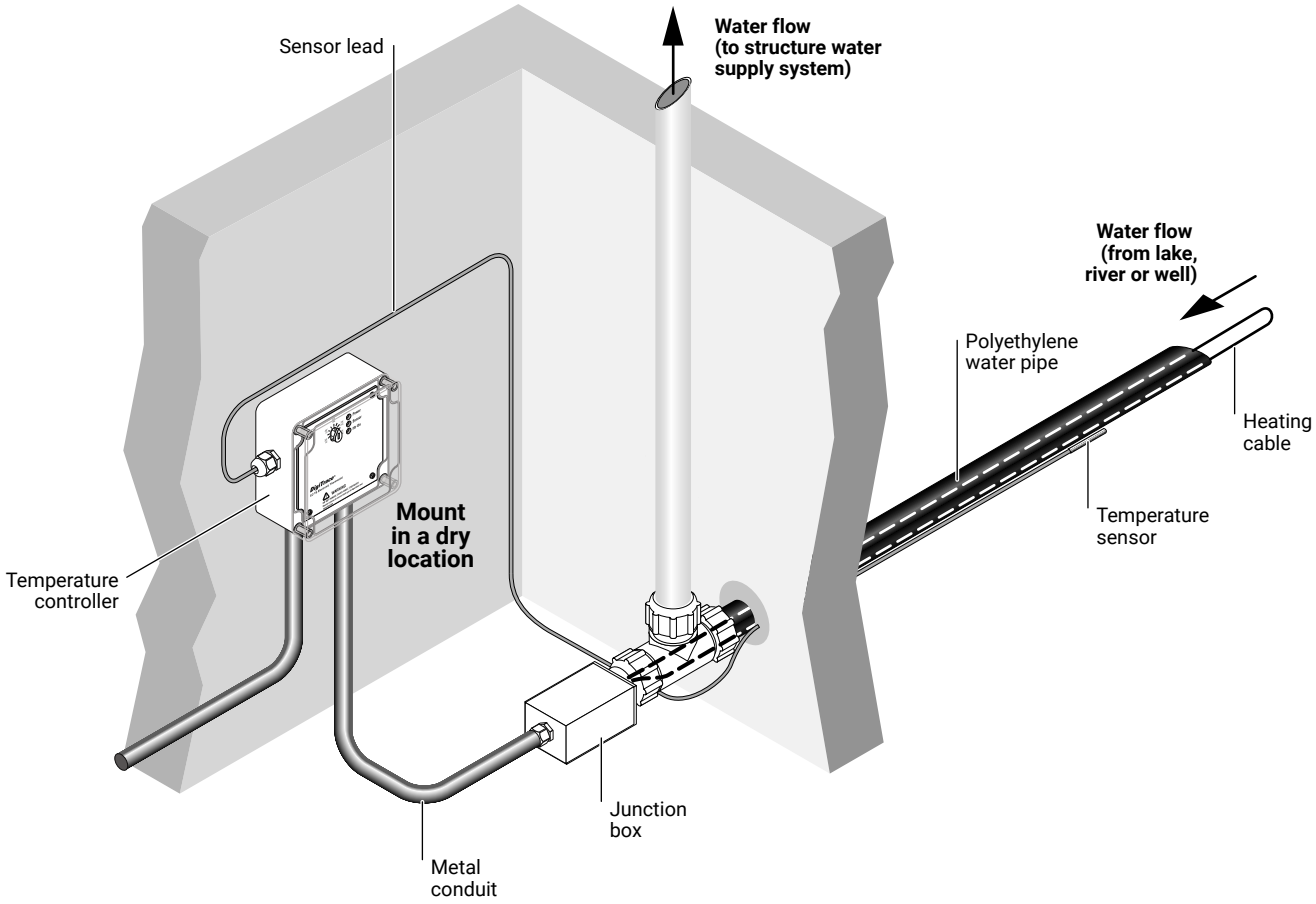
- **Install the temperature controller wire cover.**
- **Turn the pointer to 50°F (10°C).**
- Install the clear plastic lid.

Note: Do not energize the heating cable if the pipe is empty as this could cause overheating and damage to the pipe.

Typical 240 volt electronic controller wiring diagram



- Ensure that the pipe is filled with water.
- Energize the heating cable (at electrical breaker panel).



Temperature Controller Operation

Function	LED color	Description
Power	Green	When energized, indicates power to the controller
Sensor	Red	When energized, indicates shorted or open sensor
Htr On	Green	When energized, indicates power to the heating cable

Replacement Parts

Part Number	Description
PMSFTEE	Blue Tee with 3 black nuts
PMSFADPT1	1 inch fitting kit includes (1) pipe insert with large O-ring, (1) red flange, and (1) black nut reducer
PMSFADPT114	1-1/4 inch fitting kit includes (1) pipe insert with large O-ring, (1) red flange
PMSFPLUG78	Black plastic heating cable insert with O-ring
WPPORING	O-ring for brass nut
EC-TS	Replacement temperature controller
WGNUTEXT	Brass nut for 240 V kit
JB-B5V	Junction box
COVERPLATE	Junction box cover

Troubleshooting

Problem	Solution
The Tee will not fit properly with my pipe.	1. Check that it is the correct type of pipe. The blue tee adaptor supplied with the heating cable kit is designed to be used only with the pipe types shown on the first page of this installation instruction. 2. Check that fittings are in the correct order and facing the proper direction (see Step 2).
The Tee is leaking.	1. Ensure that the three large plastic nuts are properly tightened. 2. Check that it is the correct type of pipe. The blue tee adaptor supplied with the heating cable kit is designed to be used only with the pipe types shown on the first page of this installation instruction. 3. Check that fittings are in the correct order and facing the proper direction (see Step 2). 4. Ensure that the brass nut on the heating cable entering the blue tee is properly tightened (see Step 9). If the brass nut is over-tightened, the O-ring may have been damaged and may need to be replaced.
Ground-fault protection trips.	1. Reset ground-fault protection. If ground-fault protection trips again, record the serial number from the metal tag attached to the heating cable and call nVent technical support for assistance. 2. Check that the trip level of the ground-fault circuit breaker (supplied by customer) is 30 mA. A lower trip level (example 5 mA) will cause nuisance tripping.
Tee is cracked or broken.	1. See **Replacement Parts**.
Pipe is frozen.	1. Ground-fault protection has tripped. See above under “Ground-fault protection trips.” 2. Temperature controller is defective. 3. Pipe is not buried or protected with a plastic sleeve as shown in Step 12. 4. No power to heating cable (e.g. tripped breaker).
The LED’s on the temperature controller are all off.	1. Ground-fault protection has tripped. See above under “Ground-fault protection trips.”

In-Pipe Retro Warranty Information

nVent warrants all In-Pipe Heating Cables against faulty workmanship and use of defective materials for two (2) years from the date of purchase. This warranty can be amended only by a written instrument signed by a duly authorized officer of nVent. Buyer's exclusive remedy under this warranty shall be to have nVent, within a reasonable time, repair such goods or supply replacement goods or credit Buyer's account for such goods and accept their return whichever nVent may elect at its sole discretion. nVent shall in no event be liable for the cost of removal or installation, for loss or damage to or loss of use of facilities or other property, loss of revenue, loss of use of revenue, loss of anticipated profits, or other damages or costs of any kind whatsoever, whether direct, indirect, incidental, or consequential.

Notwithstanding the foregoing, nVent shall have no liability whatsoever unless: (a) Buyer promptly notifies nVent in writing after discovery of an alleged nonconformity and includes a detailed explanation of the alleged nonconformity; (b) buyer promptly returns goods to nVent postage prepaid, at 250 West Street, Trenton, Ontario, K8V 5S2, Canada; and (c) nVent examination of such goods establishes to nVent satisfaction that such alleged nonconformities actually exist and occurred in the cause of proper and normal use and were not caused by accident, misuse, neglect, alteration or improper installation, repair or testing or such other cause outside of the responsibility of nVent under this Limited Warranty. **THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER REPRESENTATIONS, WARRANTIES, OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT, AND OF ANY OTHER OBLIGATION OR LIABILITY ON THE PART OF nVent, WHETHER BY STATUTE, CONTRACT, STRICT LIABILITY, TORT OR OTHERWISE**. If the goods are a consumer product in buyer's jurisdiction, the above exclusion or limitation of incidental or consequential damages and the above disclaimer of implied warranties may not apply. The term of any such implied warranty is limited to the term of this two-year Limited Warranty. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply. This warranty gives consumers specific legal rights, and consumers may also have other rights, which vary by jurisdiction.

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