

RAYCHEM
TraceTek

Sensing Cables in the Interstitial Space of Double-wall Tanks

General Instructions

GENERAL INFORMATION

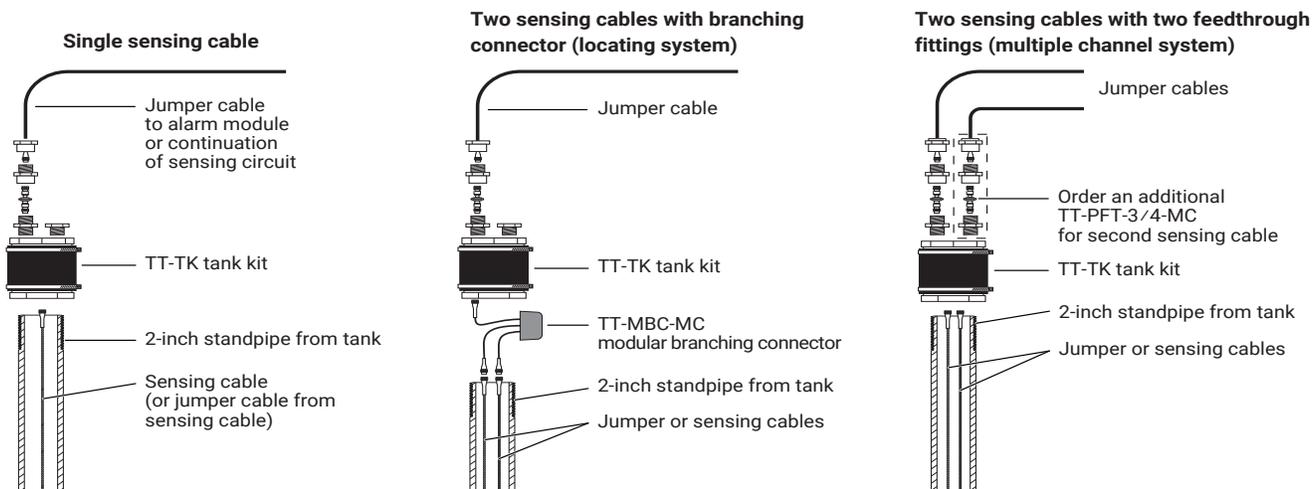
This document covers the recommended sequence of actions to install nVent RAYCHEM TraceTek sensing cables in the interstitial space of doublewall tanks. It also includes references to publications containing more detailed product and installation information.

For additional information or assistance, call (800) 545-6258.

INSTALLATION TOOLS

- TraceTek Portable Test Box (TT-PTB-1000) or high-impedance ohmmeter (20 MΩ range or greater)
- Appropriate heat gun or TT-ULTRATORCH flameless heating tool
- For FRP (fiberglass) tanks:
 - Electrician's fish tape (to install pull rope)
 - 1/4-inch or 3/8-inch hollow braid polypropylene rope
 - A clean plastic pipe 3/4 inch or 1 inch in diameter (to guide cables into the interstitial space)

GENERAL ARRANGEMENT

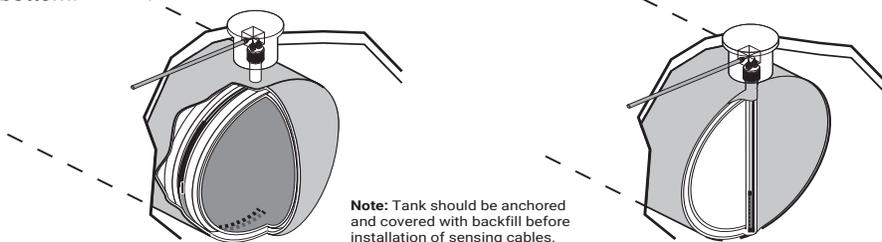


Double-wall FRP (fiberglass) tank

The sensing cables enter the tank through the riser pipe of the interstitial space. The cables run around one side of the tank and slightly past the bottom.

Double-wall steel tank

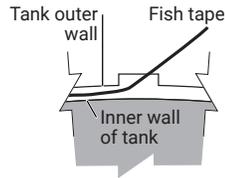
The sensing cables are positioned in a vertical monitoring pipe or well at the end of the tank.



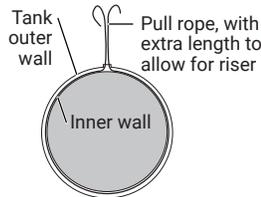
General Instructions for Double-Wall Tanks

Important: Before burying an FRP (fiberglass) tank, take these steps to prepare for installation of sensing cable.

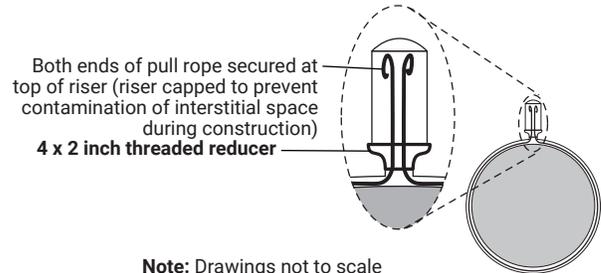
1. Install a pull rope around the interstitial space of the tank.
 - Push an electrician's fish tape around the interstitial space (i.e., the space between the inner and outer walls) of the double wall tank.



- Use the fish tape to pull a 1/4-inch or 3/8-inch hollow braid polypropylene rope around the interstitial space. Leave plenty of slack, and include a generous amount of extra length to allow for the riser.



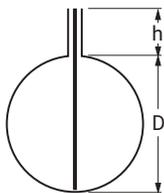
2. Ensure the riser is 4-inch diameter or larger. If the entry to the interstitial space of the tank has a 2-inch fitting, use a 4x2 inch threaded reducer to provide a 4-inch riser; use PVC or FRP for the reducer and riser to avoid corrosion. Secure both ends of the pull rope at the top of the riser.



Installation Steps

1. Confirm that all materials are on hand.

Review the bill of materials, and ensure that all materials are on hand. In particular, confirm that the lengths of sensing cable and jumper cable will be sufficient to span the tank plus the riser (if any).



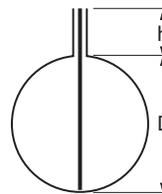
For an FRP (fiberglass) tank, the length of sensing cable plus jumper cable must be slightly longer than:

$$\frac{\pi D}{2} + h$$

where "D" is the diameter of the tank and "h" is the height of the riser.

For example, for a 10,000-gallon tank that is 8-feet in diameter with a 3-foot riser, the cable string must be at least:

$$\frac{3.14 \times 8}{2} + 3 = 16 \text{ feet}$$



For a steel tank, the length of the cable string must be at least:

$$D + h$$

TraceTek materials

To verify that the TraceTek bill of materials is complete, consult the TraceTek Products Selection Guide (H54783). It provides a complete listing of TraceTek products and includes examples of the bill of materials for various configurations.

Other materials:

- Teflon sealing tape
- Electrical tape

2. Verify that construction is complete.

Verify that major construction is complete. In particular, ensure that the tank has been anchored and covered with backfill.

3. Prepare the tank(s) in which the sensing cable will be installed.

- Verify that the interstitial space of the tank is clean and dry. If it is not, take appropriate corrective action (for example, pump and purge) to prepare the interstitial space for monitoring.

Important: During cleanup operations, take care not to exceed the pressure and/or vacuum rating of the tank.

- If installing in an FRP tank, ensure that no uncured resin remains. After opening the port of the interstitial space, if you smell the strong odor of styrene, the tank space needs to be vented until the

uncured material has dissipated. You can accelerate the venting process by using the pull rope to pull a 1/8-inch or 3/16-inch tube to the bottom and purge with nitrogen or dry air. If excess resin must be vented, take precautions to avoid contamination of the interstitial space (for example, by a rainstorm/flood) during the venting.

- Ensure the tank entry port is free of pipe dope and other possible contaminants; clean as necessary.

4. Observe proper precautions when handling sensing cables.

Observe the do's and don'ts under "General Notes" in the TT3000 and TT5000 Series Modular Sensing Cables Installation Instructions (H55357), supplied with the cable.



5. Assemble the sensing-cable strings.

- Connect a modular end termination to each modular sensing/locating cable.

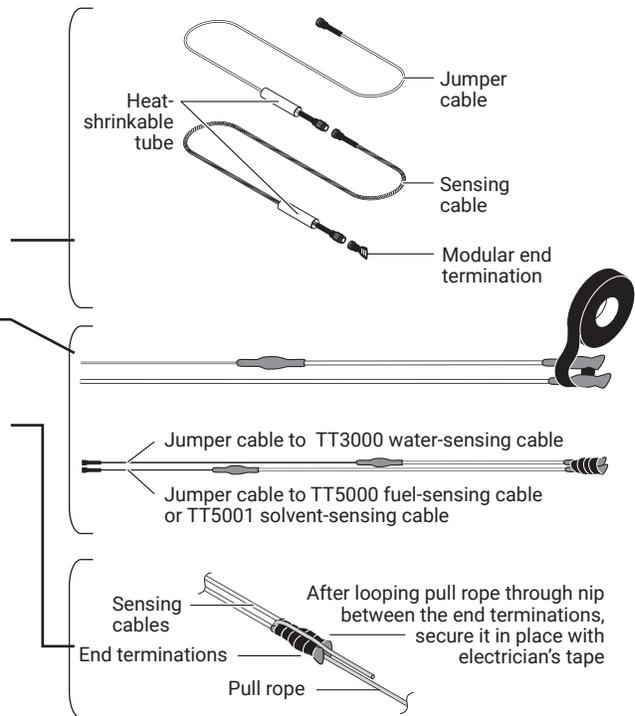
Note: This step is not required for zone cables because the end termination is installed at the factory.

Important: Install the heat-shrink tubing (supplied with the end termination kit) over the connection; be sure to shrink it down fully in accordance with the kit instructions.

- Connect each modular sensing cable to a modular jumper cable as necessary to span the tank plus riser. Properly install the heatshrink tubing (supplied with the cable) over the connection.
- If two sensing cables are to be installed in the annular space (TT5000 series for fuel or solvent, TT3000 series for water), use electrical tape to tape the two end terminations together. Attach sensing cable only at the end terminations.
- If installing in an FRP tank, securely attach the pull rope to the end termination(s). Loop the pull rope around the end terminations and affix it with tape; splice the rope (see step 3 of H55553).

Important: To avoid putting cable into an alarm condition, take care not to pinch TT5000 series sensing cable, and do not put tape on any exposed portion of either type of sensing cable.

Important: If installing two cables in the tank's interstitial space, be sure to clearly mark the jumper cable for each cable with a TraceTek identification product or other suitable means (because after installation in the tank one cannot tell which cable string is which unless the jumper cable has an identifying label).



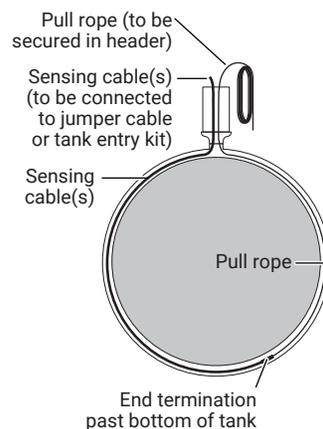
6. Test sensing cables before installation.

To ensure that each length of sensing cable is intact, free of contamination and/or pinching, follow the test procedures detailed in the sensing cable installation instructions (shipped with each length). Use either the TraceTek Portable Test Box (TT-PTB-1000) or a high-impedance ohmmeter for the testing.

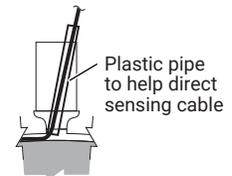


7. Install sensing cables; observe proper handling precautions.

- Take care not to pinch or contaminate the sensing cable.
- Insert the sensing cable string(s) into the interstitial space, leading with the end termination(s).
- In steel tanks, the cables go straight down a vertical monitoring tube.
- In FRP tanks, the cables go around the wall of the tank. The length of sensing cable inserted should be calculated to ensure the end termination runs slightly past the bottom of the tank (as described in step 1).
 - Attach the pull rope to the cable end termination(s) as noted in step 5.
 - Feed the sensing cable: push it into the interstitial space. Use the pull rope to guide the sensing cables down the riser and around the interstitial space: do not attempt to pull the sensing cable without feeding it.
 - After the cables are in position, secure the pull rope in the riser. Do **not** cut off the rope pulled out of the interstitial space; that length will be required if the sensing cable must be removed/replaced for any reason.



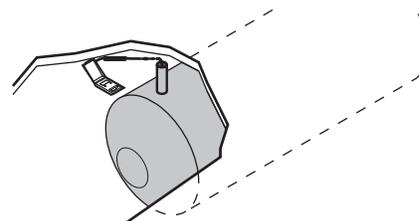
Note: If a pull rope was not installed, you may be able to guide the sensing cable down the interstitial space with a short length of small-diameter pipe.



Note: Drawings not to scale

8. Test sensing cables after inserting into the interstitial space.

Test each sensing cable string to verify that the sensing cable was not damaged during installation, and to evaluate whether the condition of the tank interstitial space requires any corrective action. Test procedures are detailed in the TT3000 and TT5000 Series Modular Sensing Cables Installation Instructions (H55357). If a problem is detected, remove and inspect the sensing cables. If necessary, dry the annular space, and reinstall the cables after drying is complete.

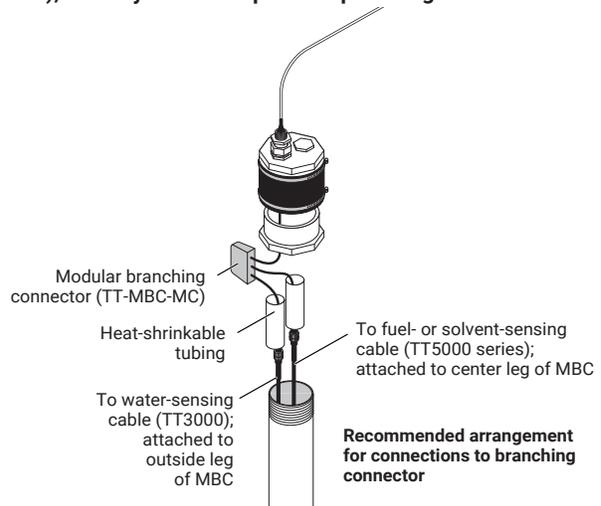


9. Install TraceTek Tank Kit (TT-TK), branching connector (TT-MBC-MC), and any other components per design.

- Install all necessary circuit and mechanical components as called for in the engineering design.
- For TraceTek locating leak detection systems with both fuel- and water-sensing cables for the tank, the cables are usually connected to a Modular Branching Connector (MBC) in the interstitial space. When making this connection:
 - Connect each cable string to a leg of the branching connector.
 - Properly install the heat-shrink tubing (supplied with the branching connector) over each connection.

Important: Record which cable string is connected to which leg of the MBC. We recommend that the water-sensing cable be connected to the outside leg of the MBC.

- Install the TraceTek Tank Kit (TT-TK) to seal the interstitial space. Follow the detailed instructions included with the kit. Remember to use Teflon tape, not pipe dope, and to install heat-shrink tubing over each connection.
- If connecting two sensing cables to a TTG multichannel alarm, a second Pressure Feedthrough Fitting (TT-PFT-3/4-MC) must be installed in the tank kit as it is assembled (MBC not used).

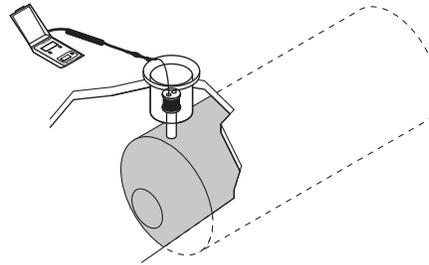


10. Test sensing cables after sealing the interstitial space.

Test the sensing-cable string to verify that it was not damaged during installation and to confirm the condition of the tank's interstitial space. Test procedures are detailed in the TT3000 and TT5000 Series Modular Sensing Cable Installation Instructions (H55357). If liquid is detected, disassemble the tank kit, remove and inspect the sensing cables, take appropriate corrective action, and reinstall the cables when done.

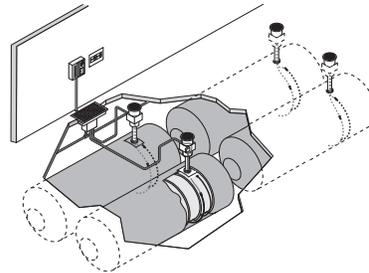
Important: During drying operations, take care not to exceed the pressure and/or vacuum rating of the tank.

Note: If a heat-shrink tube must be removed to access a connector, refer to Oversleeve Removal Instructions (H54258).



11. Complete the leak detection circuit and connect it to the alarm module.

- Run jumper cable between the top of the tank and either the TraceTek alarm module or a continuation of the TraceTek circuit, as the engineering design specifies.
- If using bulk jumper cable, install a metal connector (following kit instructions) on the jumper cable end at the top of the tank.
- Connect the jumper cable to the connector at the top of the TraceTek tank kit. Be sure to install heat shrinkable tube (supplied with the cable) over the mated connection.
- Activate the leak detection system as soon as possible to monitor for events during the final stages of construction.



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