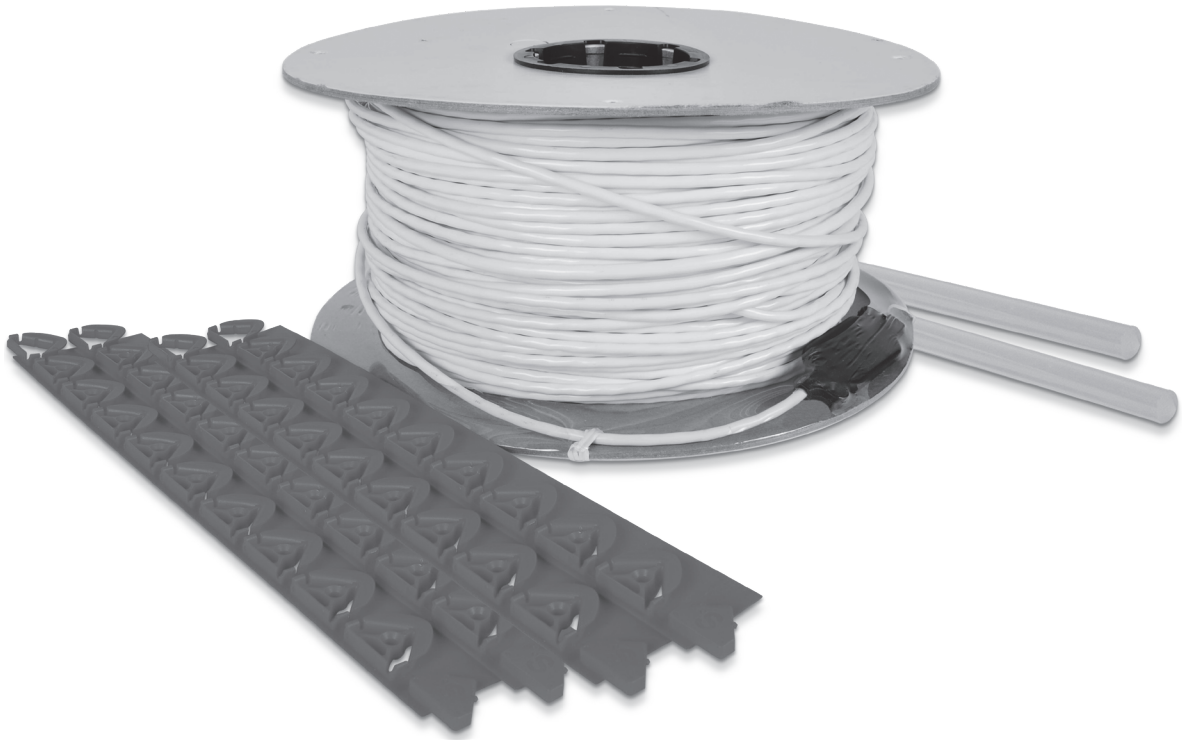
STELPRO
360 comfort

INSTALLATION GUIDE

SCU SERIES
UNIVERSAL HEATING CABLE

FOR INSTALLATION WITH MEMBRANES OR CABLE SPACERS



This cable complies with CSA and UL standards

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⚠ WARNINGS

Before installing and operating this product, the user and the installer must read, understand and follow these instructions to avoid bodily harm or property damages, serious injuries and potentially fatal electric shocks. Keep them handy for future reference. If these instructions are not followed, the warranty will be considered null and void and the manufacturer will assume no further liability for this product.

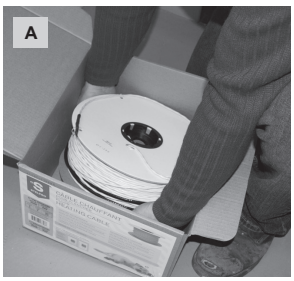
When a part of the product specifications must be changed to improve operability or other functions, priority is given to the product specifications themselves. Therefore, the actual product and packaging, as well as the name and product illustrations, may differ from the manual. Make sure the tension and wattage indicated on the product packaging match the project specifications of your customized cable layout plan drawn up in the Planning and Design section and the product specifications outlined in the following section.

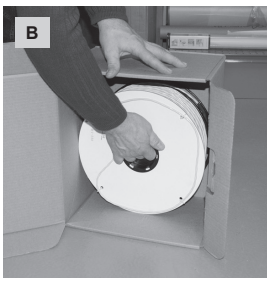
Be sure to follow these instructions. Failure to do so could cause a fire hazard and damage the system.

- This product must be installed by a qualified person according to the instructions in this installation guide. All electric connections must be made by a qualified electrician, according to the electrical (Canadian Electrical Code Part 1 or National Electrical Code) and building codes effective in your region.
- This heating cable is designed for indoor floor heating applications in which the heating section of the cable, including the cable splice, is embedded in a mortar-type layer or thin-set under a floor covering.
- Cut off power supply at circuit breaker or fuse before installing or repairing the product.
- Minimum temperature for cable installation is 5°C.
- The product must be exposed to room temperature for a minimum period of 30 minutes prior to installation.
- Do not power the heating cable while it is on the spool. Otherwise, it will overheat and become damaged, which may cause a fire.
- Never cut or modify heating cables or their connections. This would change the cable resistance and may lead to overheating and damage to the cable.
- This cable must be grounded and connected to a class A (5 mA) ground fault circuit interrupter (GFCI) in Canada and the United States for all rooms.
- The heating cable must not extend beyond the room or space from which it originates.
- The heating section of the cable must not pass through or be installed in a wall. The same applies to the cable splice.
- Always keep a minimum of three spaces between cable runs. Failure to do so may result in a fire or damage to the floor covering.
- The product must not be submitted to longitudinal stress on the cable splice or on the heating cable itself.
- The minimum radius of cable curvature is 13 mm (1/2 inch).
- Avoid folding the heating cable on itself, this could damage its sheath and the internal wires.
- Never modify the unit. You will be held responsible for any damage resulting from this modification, and the warranty and the CSA certification will be void.
- Do not walk on the cable splices, and do not fold them.
- Do not power the heating cables before they are covered with concrete, asphalt or mortar (even to test them).
- Wait until the cement or mortar is completely dry before powering the heating cables (respect the curing period)
- Never connect the cable to a circuit with higher voltage than its rated voltage. (Never install a cable designed for a 120 V power source on a 240/208 V power source.)
- Before powering the system, make sure electrical connections are secure.
- Put the high- and low-voltage cables in separate conduits. (Note: With a °Stelpro thermostat, you can put the sensor in the same conduit.)

⚠ WARNING

To avoid damaging the heating cable spool when removing it from the packaging, we recommend you pick up the spool from underneath (A) or by the side (B) (by turning the box over).





PRODUCT DESCRIPTION

°STELPRO universal heating cable is designed to heat a room with a heating cable placed under your floor covering. It can heat floor covering materials such as marble, ceramic and porcelain tiles, slate, granite as well as some poured surfaces. Before using this floor heating system under any other type of floor covering, contact your floor covering manufacturer to find out whether it's appropriate for this type of installation.

°STELPRO universal heating cable is designed for installation in membranes or with cable spacers (supplied with the product).

This product is designed for indoor use on a concrete slab or plywood embedded in thin-set or self-leveling mortar. °STELPRO universal heating cable must be installed on a circuit that has a ground-fault GFCI circuit interrupter.

In Canada only: Heating cable can be installed under a shower floor covering that has a cement base poured on site. In such cases, the cable should be installed under the membrane and within the cement base. In the United States, installing a heating cable under a shower isn't permitted.

TECHNICAL DESCRIPTION

The heating cable is comprised of two twisted conductors with fluoropolymer primary insulation. The primary insulation is protected with a tin copper wire and an external PVC sheath. The heating cable has a 7-foot cold cable.

TECHNICAL SPECIFICATIONS

DESCRIPTION	SCU
Voltage	120 V, 208/240 V
Spacing	3 spaces or 4 spaces
Linear density	3.8 W/ft
Surface density	12 W/ft2 (3 spaces) / 9 W/ft2 (4 spaces)
Surface coverage	13 - 279 ft2 (3 spaces) / 16 - 366 ft2 (4 spaces)
Cold cable length	7 ft
Cold cable diameter	3/16" x 3/8"
Cold cable gauge	14AWG (3 wires)
Hot cable diameter	0.180"
Min. folding radius	0.5"
Insulation resistance	Fluoropolymer (ECTFE)
External sheath	PVC
Ground	Tin copper wire
Max. operating temperature	105°C
Min. installation temperature	5°C
Certification	cCSAus
Marking	WS, X

CODING AND MODEL NUMBERS

The description of the alphanumeric product coding used in this installation guide is as follows:

SCU1W0203S19

SCU : °STELPRO universal cable

1 : Voltage 1 = 120 V, 2= 240 V

W0203 : Power = 203 Watt

S019 : Surface = 19 square feet

SELECTION TABLE

ACCORDING TO THE MEMBRANE OR CABLE SPACERS USED

					MEMBRANE		CABLE SPACER*	
PRODUCTS	**VOLTAGE**	**AMPERAGE**	**LENGTH**	**POWER**	**Spacing: 3 Density: 12 W/ft²**		**Spacing: 3 or 4 Density: 3 = 12 W/ft² 4 = 9 W/FT²**	
					3 spaces = 3.63" (92 mm)	**3 spaces = 3.75" (95.3 mm)**	**3 spaces = 3.63" (92 mm)**	**4 spaces = 4.83" (122.7 mm)**
	Volt	Amp.	ft	Watt	Surface (ft²)	Surface (ft²)	Surface (ft²)	Surface (ft²)
120 V								
SCU1W0135S013	120	1.1	35.3	135.0	12.9	13.5	12.5	16.6
SCU1W0203S019	120	1.7	52.9	203.0	18.7	19.5	18.2	24.2
SCU1W0270S024	120	2.3	70.5	270.0	24.5	25.4	23.9	31.7
SCU1W0338S030	120	2.8	88.2	338.0	29.6	31.3	29.5	39.3
SCU1W0405S036	120	3.4	105.8	405.0	35.8	37.1	35.1	46.7
SCU1W0475S042	120	4.0	124.1	475.0	41.6	43.3	40.8	54.3
SCU1W0540S047	120	4.5	141.1	540.0	47.0	48.8	46.2	61.4
SCU1W0650S056	120	5.4	169.8	650.0	56.1	58.2	55.0	73.4
SCU1W0815S070	120	6.8	212.9	815.0	69.7	72.2	68.7	91.5
SCU1W0920S078	120	7.7	240.2	920.0	78.3	81.1	77.2	102.7
SCU1W1055S089	120	8.8	275.5	1055.0	89.3	92.5	88.2	117.4
SCU1W1160S098	120	9.7	303.0	1160.0	97.9	101.4	96.8	128.8
SCU1W1290S109	120	10.8	336.9	1290.0	108.5	112.4	107.3	142.8
SCU1W1425S120	120	11.9	372.2	1425.0	119.5	123.7	118.3	157.2
SCU1W1700S142	120	14.2	444.0	1700.0	141.8	146.9	140.5	186.7
240 V								
SCU2W0135S013	240	0.6	35.3	135.0	12.9	13.5	12.5	16.6
SCU2W0203S019	240	0.8	53.1	203.0	18.7	19.5	18.2	24.2
SCU2W0270S025	240	1.1	70.5	270.0	24.5	25.4	23.9	31.7
SCU2W0338S030	240	1.4	88.2	338.0	29.6	31.3	29.5	39.3
SCU2W0405S036	240	1.7	105.8	405.0	35.8	37.1	35.1	46.7
SCU2W0475S042	240	2.0	124.1	475.0	41.6	43.3	40.8	54.3
SCU2W0540S047	240	2.3	141.0	540.0	47.0	48.8	46.2	61.4
SCU2W0675S058	240	2.8	176.3	675.0	58.2	60.3	57.0	76.1
SCU2W0810S069	240	3.4	211.6	810.0	69.3	71.8	68.3	90.9
SCU2W0950S081	240	4.0	248.2	950.0	80.8	83.8	79.7	106.0
SCU2W1080S091	240	4.5	282.1	1080.0	91.4	94.7	90.3	120.0
SCU2W1300S109	240	5.4	339.4	1300.0	109.3	113.2	108.1	143.7
SCU2W1630S136	240	6.8	425.8	1630.0	136.2	141.0	134.9	179.3
SCU2W1840S153	240	7.7	480.5	1840.0	153.2	158.5	151.8	201.7
SCU2W2110S175	240	8.8	551.0	2110.0	175.1	181.3	173.7	230.4
SCU2W2320S192	240	9.7	605.9	2320.0	192.2	198.9	190.7	253.2
SCU2W2580S213	240	10.8	673.8	2580.0	213.1	220.6	211.5	281.1
SCU2W8250S235	240	11.9	744.4	2850.0	234.9	243.1	234.6	310.2
SCU2W3400S279	240	14.2	888.0	3400.0	279.3	289.0	277.5	368.7

*Supplied with the product

CABLE SELECTION

Before getting started, consider what the heating goal is for the room. Do you want to heat the entire room or simply keep your feet warm? The answer to this question will determine the spacing between cable runs; a 3-space runs will heat a room without the need for a secondary source of heating (baseboard or convector), while 4-space runs will keep feet warm but, for greater comfort, the system will need to be combined with another source of heating.

Next, measure the room's square footage (surface to be heated) subtracting the areas that cannot be heated (cabinets, bathtubs, etc.). Then, depending on the cable installation method used (membrane ou cable spacers), choose the right product. Refer to this guide's Coding and model numbers section. If the surface size falls between the size ranges offered, select the product for the smaller surface to avoid having too much unused cable.

For example, the 32-ft^2 surface with 3-space runs using cable spacers falls between the following two products:

1. SCU1W0338S030 for a 29.5 ft^2 surface (120 V)
2. SCU1W0405S036 for a 35 ft^2 surface (120 V)

Therefore, model SCU1W0338S030 is suitable for this room.

DESIGN A CABLE LAYOUT INSTALLATION PLAN FOR THE SURFACE TO BE HEATED

To facilitate the installation process, it's essential to draw a plan of the heating cable layout. To this end, first determine the thermostat location which will be the starting point for the cable run and the sensor. Then, determine the thermostat sensor location.

There are a few basic rules to follow. Because it is practically impossible to predict precisely where the cable will end, you must plan the location of a buffer zone. A buffer zone is an area of the floor where heating is not essential, typically behind a toilet or beside a door opening. The area could be heated with the excess cable or not, without causing any discomfort (see FIG. 1).

The heating cable SHOULD NEVER overlap another cable. Overlapping will generate a hot spot that could damage the cable and lead to overheating. NEVER install the heating cable under kitchen cabinets, a cupboard, counter, podium bathtubs or any other fixed piece of furniture.

Install the thermostat sensor away from direct sunlight or a supplementary heating source. It must not cross over the heating cable. The thermostat sensor must be installed between two cable runs, at least 24 inches (60 cm) from the wall, or centered in between walls. Make sure you have enough cable to reach the thermostat junction box.

Leave a minimum of 3 inches of space around the room's perimeter for membrane installation, and 3 spacers around the room's perimeter for cable spacer installation (see FIG. 1). Ensure an 8-inch (200-mm) spacing Is maintained between the heating cable runs and any other heat source (baseboards, fireplaces, etc.). A spacing of 6-inches must also be maintained between the heating cable runs and any plumbing drain (see FIG. 1).

In addition, if the cable must cover a distance greater than 10 feet (3 m), a U-shaped loop must be used to minimize conductor thermal expansion and prevent it from breaking (see FIG. 2, 3 and 4). Therefore, it is best to subdivide the area to be heated into runs of less than 10 feet. This advice is valid for both types of installation. However, with cable spacers, you need to secure the cable runs and spacers with hot glue, placing two spacer pieces back to back.

FIG. 1

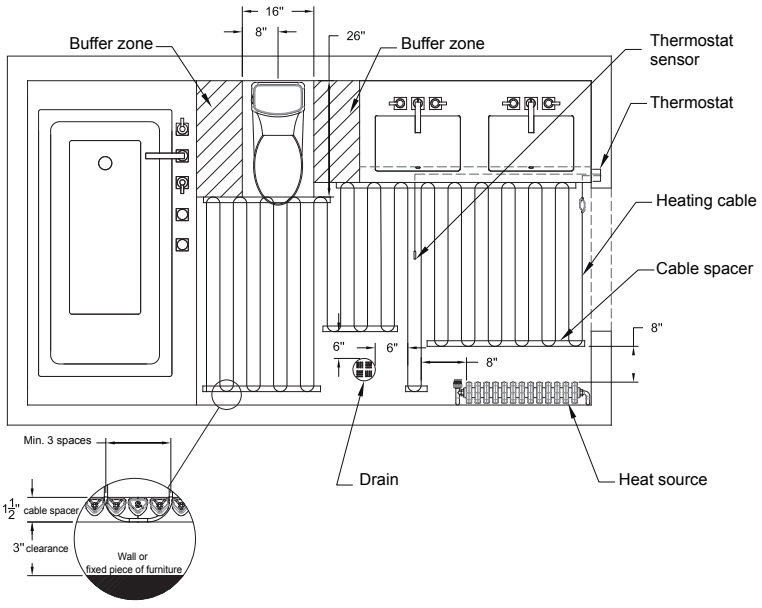


FIG. 2

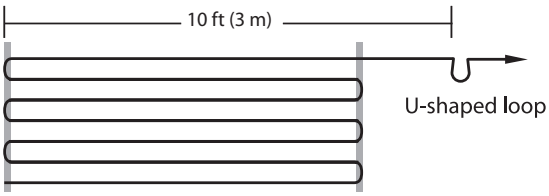


FIG. 3 U-LOOP WITH CABLE SPACERS

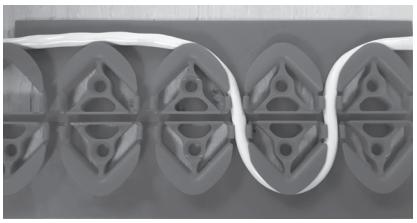


FIG. 4 U-LOOP WITH MEMBRANE

THERMOSTAT SELECTION

Only a thermostat equipped with a floor sensor maximizes the floor heating system's efficiency and, therefore, your comfort. All other control methods (e.g. ambient air thermostat or switch) are not recommended since they cannot control the floor temperature. As a result, the floor temperature will always be either too cold or too warm.

Also, the heating cable must be connected to a ground-fault GFCI circuit interrupter either integrated in the thermostat or electrical panel. For a bathroom, the GFCI breaker must be class A (5 mA).

The maximum thermostat current must correspond to the sum of cable currents wired to it. Also, the voltage of the branch circuit must correspond to the voltage prescribed for the thermostat. All thermostats wired to the heating cable must be certified by a recognized certification agency and wired in accordance with electrical and building codes applicable in your region.

TYPES OF INSTALLATION

WITH CABLE SPACERS

The benefit of using cable spacers is that the heating cable is embedded in the self-leveling mortar, which protects the heating cable and makes it suitable for use with different types of flooring such as ceramic tiles, laminate, vinyl, engineered wood, etc. Although installation is more economical (since no membrane is needed), it takes more time (i.e. cost-effective for a DIY handyman, less so when contracting a professional installer).

CEMENT (OR CONCRETE SLAB) SUBFLOOR TIPS

Concrete subfloor curing period

The curing period for concrete (typically 28 days) must be complete before the heating cable is installed. Consult a concrete manufacturer to determine the precise curing period for the type of concrete you've chosen.

Surface preparation

The concrete surface must be solid, dry, clean and free of dust, oil, grease, paint, wax, sealant or any other substance that could interfere with adhesion. Moreover, the concrete's surface must be free from debris, protruding nails and screws, etc. that may damage the heating cable.

PLYWOOD SUBFLOOR TIPS

Surface preparation

Plywood surface must be clean, solid and dry. Remove any dust, oil, grease, paint, wax, sealant or any other substance that could impede adequate adhesion. Also, the surface must be free of any debris, protruding nails and screw heads, etc. that may damage the heating cable.

Plywood subfloor strength and strengthening (also valid for concrete slab subfloor)

Each plywood sheet must be secured with screws spaced 8 inches (203 mm) apart on its center and 6 inches (150 mm) apart on its perimeter. Plywood sheets must be spaced 1/4 inch (6.3 mm) from each other to allow room for material expansion.

In order to eliminate all risks of damage to the heating cable resulting from floor covering cracks, it is important to ensure sufficient subfloor rigidity. Floor joists spaced 16 inches apart or less require a plywood subfloor thickness of at least 1 1/4 inch (2 x 5/8-inch sheets). Otherwise, if floor joist spacing exceeds 16 inches, the plywood sheets must be strengthened to achieve a total thickness of 1 7/8 inches (3 X 5/8-inch sheets).

Besides plywood sheeting, there are other methods available for strengthening a subfloor such as the use of metal screening, pre-stressed concrete boards and other strengthening materials. Seek the advice of a floor covering specialist to make sure that the subfloor is properly strengthened.

WITH MEMBRANE

The benefit of using a membrane to install the heating cables is that the cable is protected during installation and the process does not require the use of hot glue. Although the membrane is more expensive, it makes cable insertion much easier and installation faster (i.e. less expensive when done by professionals).

On the other hand, the use of a membrane restricts the choice of floor covering to ceramic tile.

The main advantage of using a membrane is that it absorbs the shear stresses since its embossed, hollow spaces allow for horizontal movement which neutralizes the stresses between the thin-set and ceramic tile (uncoupling) that are the main cause tile cracking and lifting.

Surface and subfloor preparation

Refer to the membrane manufacturer.

BEFORE GETTING STARTED

INCLUDED WITH THE PRODUCT

- Heating cable on spool
- Installation guide
- Warranty booklet
- Electrical panel label
- Plastic cable spacers for installation directly on plywood (not required for membrane installation)
- Hot glue sticks for installation directly on plywood
- Temperature sensor (one is supplied with the product, one with the thermostat; install both on the floor)

MATERIALS AND TOOLS REQUIRED FOR INSTALLATION

- Multimeter (ohmmeter) and 1000-V megohmmeter (megger). These instruments must be calibrated before use.
- Floor heating thermostat (5 mA). (See the Thermostat selection section.)
- Junction box
- Electrical conduits for cold cable (3 x 14 AWG) and temperature sensor
- Conduit connector
- Box of No. 8 1-¼" floor screws (or 3/8" T25 staples) to secure cable spacers (not required for membrane installation)
- Measuring tape
- Wire stripper
- Hot glue gun
- Electric screwdriver to secure thermostat and/or cable spacers
- Utility knife
- Self-leveling mortar (not required for membrane installation)
- Thin-set (see CONCRETE SELECTOR TABLE)
- Tuck Tape-type adhesive tape for insulating panels (for self-leveling mortar)
- Sponge
- 20-liter bucket
- Mixer with drill

TESTS

Even though each mat and cable is subject to factory quality control, testing is essential to ensure that your product remains fully functional throughout the installation process. Repairing a cable once it is covered with cement, mortar and a finishing coating can be very expensive.

Three electrical tests must be performed at different stages of the installation process, and their results must be recorded in the warranty booklet. Comparing the results of the different tests will indicate if any changes have occurred during installation.

As all measuring instruments are different, we recommend that you consult resistance measurement section of your instruments' user guide before proceeding.

If the cable is damaged during installation, contact a qualified °STELPRO-approved repair technician. Call °STELPRO customer service or visit www.stelpro.com for more details. Note that damage caused to the cable during installation is not covered under the warranty.

WHEN SHOULD TESTS BE DONE?

Three tests must be performed:

- As soon as the cable is removed from the box and while it is still on the spool with the plastic seal covering the splice. As soon as the seal is broken the warranty will be void since the cable may have been unspooled and installed. If the tests indicate that the cable is defective before being unspooled (with the seal intact), the °STELPRO warranty will apply.

- Once the cable is installed, but before it is covered with concrete or mortar. If the tests indicate that the cable is defective, the electrician is responsible for fixing the problem.
- Once the cable is fully installed, covered and the floor covering is dry. If the tests indicate that the cable is defective, the contractor is responsible for fixing the problem (i.e. replacing the cable and redoing the installation).

TEST 1: CONDUCTOR RESISTANCE TEST

WHAT'S THE PURPOSE OF THIS TEST?

This test ensures that the product is in good working order and has the proper resistance.

INSTRUMENTS REQUIRED

An ohmmeter or multimeter is required for this test.

PERFORM THE TEST

1. Make sure your ohmmeter or multimeter has been calibrated.
2. If you are using a multimeter, select the "Ohm" or "Ω" setting.
3. If you are using a manual range selection multimeter, select the smallest range of ohms that covers the nominal ohms of the mat or cable.
4. Take a reading of the resistance between the two power leads (120 V: black and yellow, 240 V: black and red). If there is a wide variance in the ohms reading, that is, if the measured value is 10 ohms or 10% higher than the nominal value printed on the product's label, it either means that the product is damaged or the measuring instrument is not well calibrated.
5. Record the ohms measurement in your warranty booklet.

FIG. 5 TEST 1

TEST 2: CONDUCTOR NON-CONTINUITY AND GROUND TEST (GREEN WIRE)

WHAT'S THE PURPOSE OF THIS TEST?

The heating cable is protected by a ground braid, and an electrical insulator prevents any contact between the braid and the conductor. This test indicates whether there is any continuity between them.

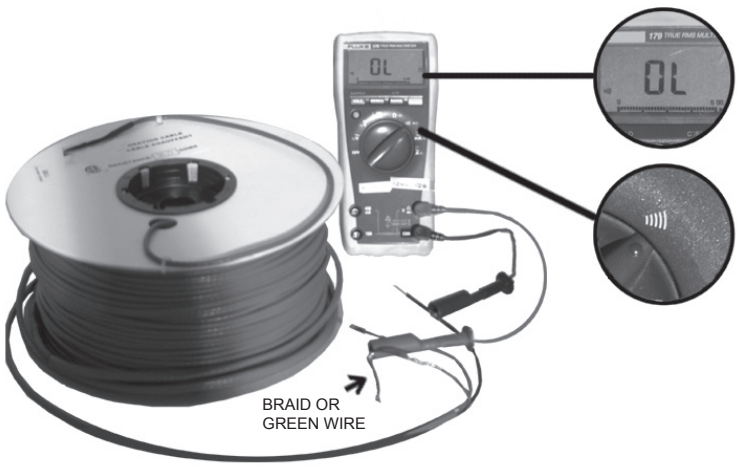
INSTRUMENTS REQUIRED

A multimeter is required for this test.

PERFORM THE TEST

1. Select the highest resistance setting on your multimeter and proceed downward, or select "Ohm" or "Ω" if you are using an automatic range selection multimeter.
2. Measure the resistance between the grounding wire and one of the two power leads (BLACK or RED/YELLOW). If there is no continuity between them, the multimeter will display "OL" for "overload" or "I" for "infinity". If the test fails, the meter will display a numbered result.
3. Record the test result in your warranty booklet.

FIG. 6 TEST 2



TEST 3: INSULATION RESISTANCE TEST

WHAT'S THE PURPOSE OF THIS TEST?

This test detects any break in the insulation of the heating cable, which could cause a current leak. Excessive leakage is usually detected by the mandatory ground-fault circuit interrupter (GFCI) which cuts off power to the cable and renders the heating system inoperative.

INSTRUMENTS REQUIRED

A 1000-V megohmmeter is required for this test.

CAUTION: HIGH VOLTAGE

PERFORM THE TEST

1. Set the megohmmeter's voltage to 1000 V.
2. Measure the insulation resistance between the grounding wire and one of the two power leads (BLACK or Red/Yellow). If the test is successful, the result will be equal to or greater than 1 gigaohm (1 gigaohm = 1 G ohm = 1000 M ohms = 1000 megaohms).
3. Record the insulation resistance measurement in your warranty booklet.

FIG. 7 TEST 3

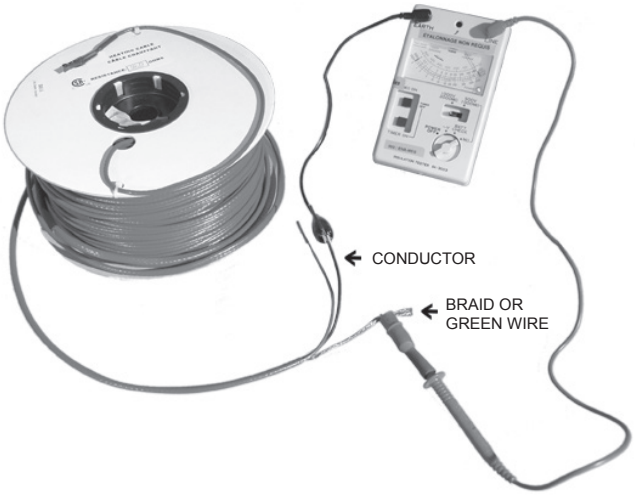
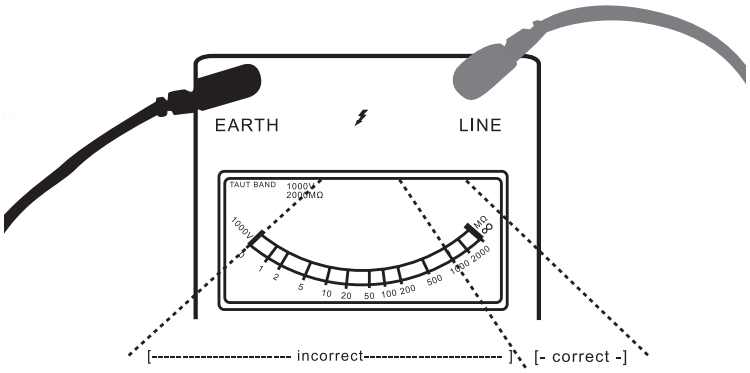


FIG. 8 TEST 3



INSTALLATION

In the instructions below, follow the guidelines that apply to your type of installation: installation with cable spacers on a concrete or plywood surface or installation with an uncoupling membrane.

INSTALLATION PRECAUTIONS

- Thoroughly clean the surfaces. These need to be strong, dry, clean and free of dust, oil, grease, paint, wax, protective coating, or any other substance that may interfere with adhesion.
- Moreover, the surface must be free of all debris, nails, screws, etc. that could damage the heating cable.
- Avoid walking on the cables at the junction of the hot (white) and cold (black) sections, where the factory-installed splice is located.
- Make sure there is no debris on the sole of the shoes you wear during installation that could damage the cable.
- The subfloor must comply with the recommendations for membrane installations. Consult the manufacturer for details (if installing with membrane).
- The subfloor must meet the requirements set out in the Subfloor section (if installing with cable spacers).
- Do not drop or deposit anything on the cable.
- Be careful not to trip over the cable, as you could injure yourself and damage the cable.
- Once the cable is inserted into the cable spacer, apply about 5 lb (2.3 kg / 22 N) of pressure on it before moving on to the next cable spacer, and allow the cable to adopt its natural curve between the moulded hooks. Do not bend the cable at a right angle (90 degrees) where it hooks into the cable spacers (see FIG. 9).

- To avoid damaging your heating cable, handle it carefully and use a wire feeder to unspool it (see FIG. 10).
- The tip of the hot glue gun must never touch the cable.

FIG. 9

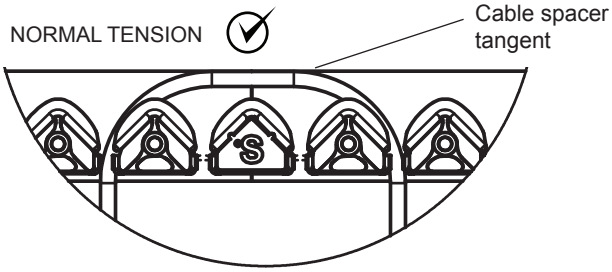
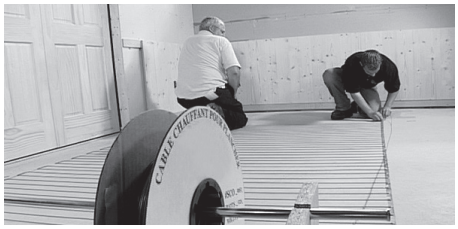


FIG. 10



ELECTRICAL INSTALLATION REQUIREMENTS

The nominal maximum rated current of the branch circuit breaker or fuse supplying this product must be no greater than 20 A (15 A x 1.25).

Attach a label near the electrical panel to indicate the location of the installed heat units for easy identification.

INSTALLATION WITH CABLE SPACERS

STEP 1: PERFORM TESTS

Before breaking the plastic seal and unspooling the heating cable: Perform the three tests (see the Tests section). If all results are compliant, continue with the installation. Record the results in the warranty booklet.

STEP 2: POSITION THERMOSTAT JUNCTION BOX

Using the cable layout plan drawn up in the Planning and Design section, install the thermostat junction box with the conduit, in accordance with the electrical codes effective in your area.

Cut a hole in the wall for a junction box at the desired location. At floor level, directly below the thermostat box, make a U-shaped groove in the base of the wall (metal plate) to accommodate the entry of the power lead.

Determine the length of conduit needed between the inlet knockout of the junction box and the base of the wall (metal plate) according to the electrical codes in your area.

Note: It is unnecessary to include an elbow at the base of the conduit, unless it is required by the electrical code in your area (see FIG. 11).

STEP 3: SECURE SPLICE TO FLOOR

Position the splice on the floor (see FIG. 11) near the junction box (refer to your cable layout plan drawn up in the Planning and Design section).

Dig a hole in the floor deep enough to hold the splice so that it is flush with the heating cable. (Depth to dig: about 1/4” to 1/2” or 6 to 13 mm). Clean the floor, place the splice in the hole and secure it to the floor with hot glue. Make sure the cold cable on the floor does not protrude above the plastic cable spacer. Then, attach a metal plate to the base of wall to protect the electrical wires in the groove.

The splice must not be installed inside the wall.

STEP 4: INSTALL CABLE SPACERS

Using the cable layout plan drawn up in the Planning and Design section, install the cable spacers at the planned locations and secure them to the floor with No. 8 floor screws, or staples, or with hot glue (see Fig. 12). Leave a 3” clearance between the wall (or a fixed piece of furniture) and the cable spacer (see FIG. 1).

It is important to install the cable spacers so that the cable, once installed, lies perpendicular (90º) to them.

FIG. 11

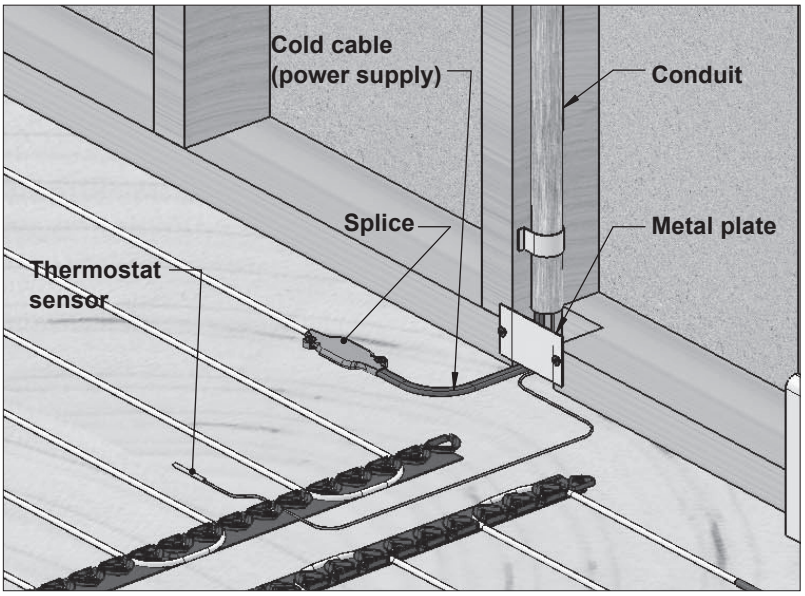
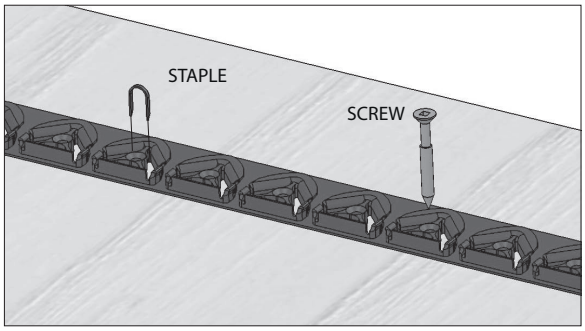


FIG. 12



STEP 5: RUN HEATING CABLE THROUGH CABLE SPACERS

It is IMPORTANT to always maintain the same spacing between the cable runs on the surface to be heated, i.e. 3 spaces or 4 spaces, depending on the type of heating desired (see Planning and Design section).

The heating cable must be tangent to the edge of the cable spacer; do not apply too much pressure on the cable (See FIG. 9) – 5 lbs max.

However, 2-space runs are acceptable in the buffer zone for only a few (2 to 3) cable runs. Since this tighter spacing will generate a higher temperature, it should be used only where needed.

To maintain spacing between cable runs longer than 6 feet (1.8 m) and to prevent the cable from rising to the surface when self-leveling mortar is installed, the use of hot glue is recommended to bond the termination joint as well as the center of each cable run (12” in length).

STEP 6: SECOND SERIES OF TESTS

Perform the three tests (see the Tests section). If all results are compliant, continue with the installation. Record the results in the warranty booklet.

STEP 7: THERMOSTAT SENSOR

Install the thermostat sensor between two heating cable runs, at least 24 inches (60 cm) from the wall or centered between walls. Choose a location where the sensor wire does not cross over the heating cable when it is passed through the base of the wall. Make sure you have enough cable to reach the thermostat junction box, and then use hot glue to secure the cable to the floor. (see FIG. 11).

STEP 8: PUT COLD CABLE IN THERMOSTAT JUNCTION BOX

Make sure the circuit is not powered.

Insert the cold cable (power lead) with the sensor wires through the conduit into the inside of the thermostat junction box and leave 6 inches protruding. Secure excess cold wire to the floor (see FIG. 11) using cable spacer pieces and hot glue. Make sure the cold cable installed on the floor does not protrude above the plastic cable spacer. Next, attach a metal plate to the base of the wall to protect the electrical wires in the groove.

STEP 9: APPLY SELF-LEVELING MORTAR (SCRATCH COAT)

Using Tuck Tape-type adhesive tape, seal any area into which mortar may seep. Moreover, you must choose a waterproof fir plywood (BC fir). Before buying another type of plywood, ask your cement manufacturer if it is suitable.

Once cable installation is complete and the primer has been applied (if required), you must cover the cables with either a polymer-modified mortar meeting A1184 (A) ANSI standards or a self-leveling mortar (see CONCRETE SELECTOR TABLE to protect them and facilitate eventual repairs. Mix the concrete in accordance with manufacturer instructions, and cover the heating cable with the concrete or mortar. The heating cable must be completely covered by the concrete or mortar layer, making sure the thickness of the concrete is not exceed the manufacturer’s recommendations.

> **Note:** Although self-leveling mortar is by its very nature self-leveling, you may have to use a trowel to level the corners of the room. Wait until the concrete or mortar is dry. Consult the manufacturer to find out the required curing period.

The heating cable must always be embedded in concrete or covered by a thin concrete layer. Two methods are available: the SCRATCH COAT (method recommended by STELPRO) and the THIN-SET METHOD (alternative method for experienced tile setters only). Please refer to the CONCRETE SELECTOR TABLE below to find out the type of concrete recommended for each method.

CONCRETE SELECTOR TABLE*				
USAGE SPECIFIC CONCRETE PRODUCTS	CABLE EMBEDDING (SCRATCH COAT ONLY)	CERAMIC TILE ADHESIVE	GROUT	STANDARDS
Self-leveling mortar	YES	NO	NO	N/A**
Polymer-modified mortar* **	YES	YES	NO	ANSI A118.4 (A)
Polymer-modified grout (with or without sand)	NO	NO	YES	ANSI A118.6 (A) or A118.7 (A)
Epoxy grout	NO	NO	YES	ANSI A118.3

TTMAC: Terrazzo, Tile & Marble Association of Canada
ANSI: American National Standards Institute

* For each of these concrete products, follow the manufacturer's recommendations and ensure compatibility of their product with floor heating systems and your subfloor type.

** N/A: Standard not available. Check with the manufacturer to ensure product compatibility with the floor heating system.

*** A polymer-modified mortar (thin-set) can be obtained using one of these two methods: by adding water to a polymer-modified mortar or by adding a liquid additive containing polymers to a non-polymer-modified mortar.

STEP 10: INSTALL FLOOR COVERING ON SCRATCH COAT

Once the self-leveling mortar is dry, you can install your floor covering (floating floor, vinyl floor, etc.). Be careful. Before installing a floor covering other than ceramic tiles on the scratch-coat surface, consult the floor covering manufacturer to determine if it is suitable for installation on a radiant floor.

Note: Natural hardwood flooring is not compatible with floor heating systems.

Install ceramic tile flooring

Given the large number of "on/off" cycles dictated by the thermostat, only a highly flexible polymer-modified mortar (thin-set) meeting A118.4(A) ANSI standards may be used to secure the tiles onto the scratch coat. The polymers comprised in this type of mortar contribute to its strength and flexibility ensuring long term effectiveness.

Spread the thin-set with a notched trowel (1/4" x 3/8") to cover the surface well and install the tiles on top, working in sections (learn more about the procedure before getting started).

Grouting can begin no sooner than 24 hours after the installation has been completed. Either use a polymer-modified grout (with or without sand) meeting A118.6(A) or A118.7(A) ANSI standards or an epoxy grout meeting A118.3 ANSI standards (see FIG. 13 and CONCRETE SELECTOR TABLE).

Note: Tile can be installed directly with thin-set. However, care must be taken not to damage the heating cable with the notched trowel (see FIG. 14).

FIG. 13

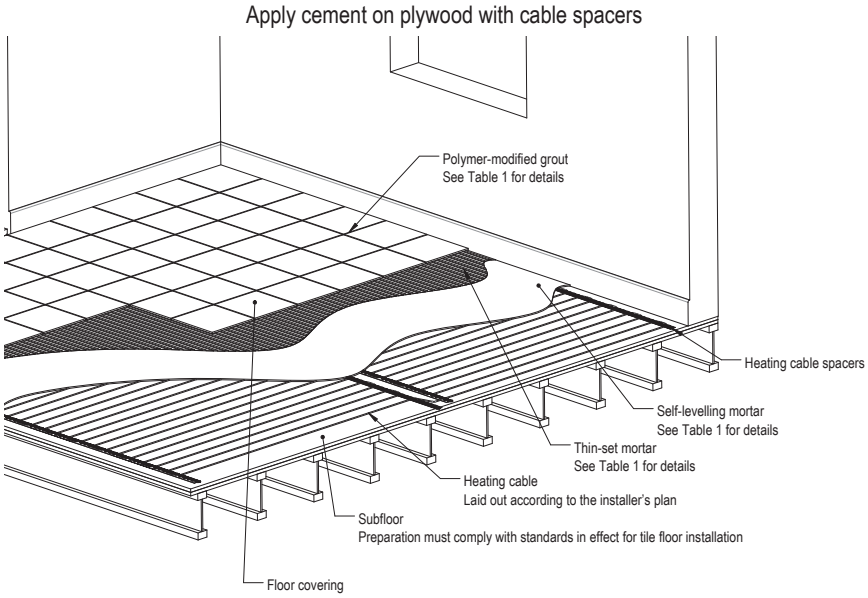


FIG. 14

STEP 11: THIRD SERIES OF TESTS

Perform the three tests (see the Tests section). Record the results in the warranty booklet.

STEP 12: WIRING

Curing period

Initial start up of the floor heating system must be delayed until the end of the curing period (typically 28 days). Otherwise, the concrete's adhesive properties will be compromised, thus reducing the floor covering adhesion. Contact a floor covering specialist to ensure proper system start-up.

Wiring preparation

Make sure that the circuit turned off at the electrical panel.

The heating cable's CSA identification tag must be in the junction box. Do not remove it from the cable.

The wiring of the cable to the thermostat or the relay must be made in accordance with the thermostat/relay manufacturer's recommendations.

Connect the ground (green wire) at back of the junction box.

The heating cable must be connected to a thermostat with an integrated GFCI or GFCI-protected circuit installed in the electrical panel.

Identify the floor heating dedicated circuit using the label supplied with the warranty booklet (see FIG. 15).

Turn the power back on.

FIG. 15

INSTALLATION WITH MEMBRANE

STEP 1: INSTALL MEMBRANE

Complete the floor preparation and membrane installation according to the manufacturer's instructions. Wait until the mortar is dry (a minimum of 24 hours).

STEP 2: PERFORM TESTS

Before breaking the plastic seal and unspooling the heating cable: Perform the three tests (see the Tests section). If all the results are compliant, continue the installation. Record the results in the warranty booklet.

STEP 3: POSITION THERMOSTAT JUNCTION BOX

Install the thermostat junction box with the conduit, in accordance with the electrical codes effective in your area.

Cut a hole in the wall for a junction box at the desired location. At floor level, directly below the thermostat box, make a U-shaped groove in the base of the wall (metal plate) to accommodate the entry of the power lead.

Determine the length of conduit needed between the inlet knockout of the junction box and the base of the wall (metal plate) according to the electrical codes in your area.

Note: It is unnecessary to include an elbow at the base of the conduit, unless it is required by the electrical code in your area (see FIG 16).

STEP 4: SECURE SPLICE TO FLOOR

Position the splice on the floor (see FIG. 16) near the junction box (refer to your cable layout plan drawn up in the Planning and Design section). Cut the membrane to a width of 2 spaces and the minimum length required to pass the cold cable through, and clean the excess cement below the splice.

Dig a hole in the floor deep enough to hold the splice so that it is flush with the membrane. (Depth to dig: about ¼" to ½" or 6 to 13 mm). Clean the floor, place the splice in the hole and secure it to the floor with hot glue. Make sure the cold cable lead installed on the floor does not protrude above the membrane.

Then, attach a metal plate to the base of the wall to protect the electrical wires in the groove.

The splice must not be installed inside the wall.

STEP 5: RUN HEATING CABLE THROUGH MEMBRANE

Based on the cable layout plan drawn up in the Planning and Design section, run the heating cable through the membrane. When inserting the cable into the membrane, make sure the heating cable is properly secured inside it. Remember to make a U-loop if the cable is longer than 10 feet (see FIG. 4).

It is IMPORTANT to always maintain the same spacing between the cable runs on the surface to be heated, depending on the type of heating desired (see Planning and Design section).

However, 2-space runs are acceptable in the **buffer zone for only a few (2 to 3) cable runs**. Since this tighter spacing will generate a higher temperature, it should be used only where needed.

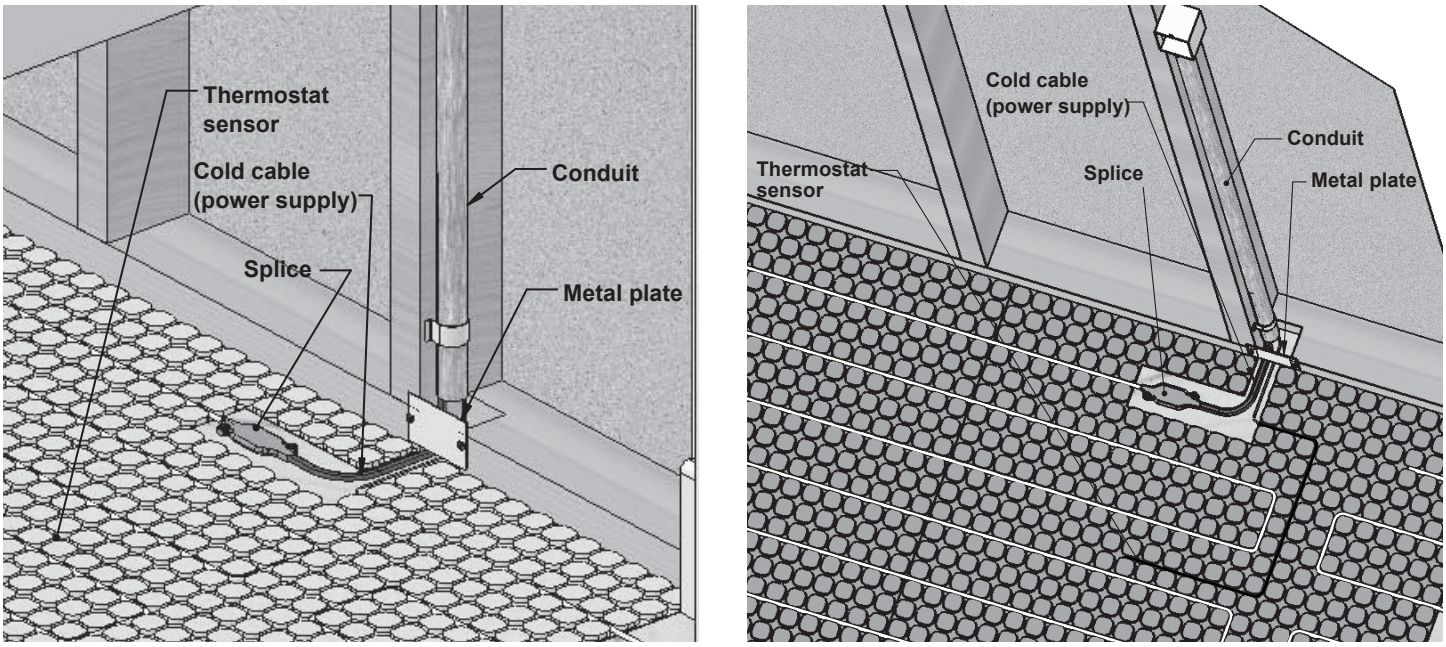
STEP 6: SECOND SERIES OF TESTS

Perform the three tests (see the Tests section). If all results are compliant, continue with the installation. Record the results in the warranty booklet.

STEP 7: THERMOSTAT SENSOR

Based on the cable layout plan drawn up in the Planning and Design section, install the thermostat sensor between two heating cable runs, at least 24 inches (60 cm) from the wall or centered between walls. Choose the location where the sensor wire does not cross over the heating cable once it is passed through the base of the wall. Make sure you have enough cable to reach it to the thermostat junction box, and then use hot glue to secure it to the floor. (see FIG. 16).

FIG. 16



STEP 8: PUT COLD CABLE IN THERMOSTAT JUNCTION BOX

Insert the cold cable (power lead) with the sensor wires into the conduit and the inside of the thermostat junction box, and leave 6 inches protruding. Secure excess cold wire to the floor (see FIG. 16) using hot glue. Make sure the cold cable on the floor does not protrude above the membrane. Next, attach a metal plate to the base of the wall to protect the electrical wires in the groove.

STEP 9: INSTALL FLOOR COVERING ON MEMBRANE

Spread the thin-set with a notched trowel (1/4" x 3/8") to cover the surface well and install the tiles on top, working in sections (learn more about the procedure before getting started).

Grouting can begin no sooner than 24 hours after the installation has been completed. Use grout (with or without polymer-modified sand). Contact the membrane manufacturer for information on selecting the appropriate thin-set and grout for your installation.

STEP 10: THIRD SERIES OF TESTS

Perform the three tests (see the Tests section). Record the results in the warranty booklet.

STEP 11: WIRING

Curing period

Initial start up of the floor heating system must be delayed until the end of the curing period (typically 28 days). Otherwise, the concrete's+ adhesive properties will be compromised, thus reducing the floor covering adhesion. Contact a floor covering specialist to ensure proper system start-up.

Wiring preparation

Make sure that the circuit turned off at the electrical panel.

The heating cable's CSA identification tag must be in the junction box. Do not remove it from the cable.

The wiring of the cable to the thermostat or the relay must be made in accordance with the thermostat/relay manufacturer's recommendations.

Connect the ground (green wire) at back of the junction box.

The heating cable must be connected to a thermostat with an integrated GFCI or GFCI-protected circuit installed in the electrical panel.

Identify the floor heating dedicated circuit using the label supplied with the warranty booklet (see FIG. 15).

Turn the power back on.

ATTENTION!

The warranty booklet must be **COMPLETED and RETURNED to °STELPRO** to activate the warranty. Failing which

THE WARRANTY WILL NOT BE ACTIVATED AND WILL NOT BE VALID.

ALL REQUIRED INFORMATION AND TEST RESULTS MUST BE ENTERED IN THE BOOKLET, ACCORDING TO THE INSTRUCTIONS IN THIS GUIDE.

Please also fill out the warranty card on our website: **www.stelpro.com/en-CA/warranty**.

WARRANTY

This limited warranty is offered by °STELPRO Design Inc. ("°STELPRO") and applies to the following products made by °STELPRO: SCU. Please read this limited warranty carefully. Subject to the terms of this warranty, °STELPRO warrants its products and their components against defects in workmanship and/or materials for the following period from the date of purchase: 25 years (heating cables). This warranty applies only to the original purchaser; it is non-transferable and cannot be extended.

CLAIM PROCEDURE

If at any time during the warranty period the unit becomes defective after the product has been correctly installed, you must cut off the power supply at the main electrical panel and contact 1) your installer or distributor, 2) your service center or 3) °STELPRO's customer service department. In all cases, you must have a copy of the invoice and provide the information written on the product nameplate. °STELPRO reserves the right to examine or to ask one of its representatives to examine the product itself or any part of it before honoring the warranty. °STELPRO also reserves the right to replace the entire unit, refund its purchase price or repair a defective part. Please note that repairs made within the warranty period must be authorized in advance in writing by °STELPRO and carried out by persons authorized by °STELPRO.

Before returning a product to the °STELPRO plant, you must have a °STELPRO authorization number (RMA). To obtain it, call the customer service department at: 1-800-363-3414 (electricians and distributors – French), 1-800-343-1022 (electricians and distributors – English), or 1-866-766-6020 (consumers). The authorization number must be clearly written on the parcel, failing which it will be refused.

CONDITIONS, EXCLUSIONS AND DISCLAIMER OF LIABILITY

This warranty is exclusive and in lieu of all other representations and warranties (except of title), expressed or implied, and °STELPRO expressly disclaims and excludes any implied warranty of merchantability or implied warranty of fitness for a particular purpose. °STELPRO's liability with respect to products is limited as provided above. °STELPRO shall not be subject to any other obligations or liabilities whatsoever, whether based on contract, tort or other theories of law, with respect to goods or services furnished by it, or any undertakings, acts or omissions relating thereto. Without limiting the generality of the foregoing, °STELPRO expressly disclaims any liability for property or personal injury damages, penalties, special or punitive damages, damages for lost profits, loss of use of equipment, cost of capital, cost of substitute products, facilities or services, shutdowns, slowdowns, or for other types of economic loss or for claims of a dealer's customers or any third party for such damages. °STELPRO specifically disclaims all consequential, incidental and contingent damages whatsoever.

This warranty does not cover any damages or failures resulting from: 1) a faulty installation or improper storage; 2) an abusive or abnormal use, lack of maintenance, improper maintenance (other than that prescribed by Stelpro) or a use other than that for which the unit was designed; 3) a natural disaster or an event out of °STELPRO's control, including, but not limited to, hurricanes, tornadoes, earthquakes, terrorist attacks, wars, overvoltage, flooding, water damages, etc. This warranty does not cover any accidental or intentional losses or damages, nor does it cover damages caused by negligence of the user or owner of the product. Moreover, it does not cover the cost of disconnection, transport, and installation.

The warranty is limited to the repair or the replacement of the unit or the refund of its purchase price, at the discretion of °STELPRO. Any parts replaced or repaired within the warranty period with the written authorization of °STELPRO will be warranted for the remainder of the original warranty period. This warranty will be considered null and void and °STELPRO will have the right to refuse any claims if products have been altered without the written authorization of °STELPRO and if the nameplate numbers have been removed or modified. This warranty does not cover scratches, dents, corrosion or discoloration caused by excessive heat, chemical cleaning products and abrasive agents. It does not cover any damage that occurred during shipping.

Some states and provinces do not allow the exclusion or limitation of incidental or consequential damages and some of them do not allow limitations on how long an implied warranty lasts, so these exclusions or limitations may not apply to you. This warranty gives you specific legal rights and you may have other rights which vary from state to state or from province to province.