

NEXANS Radiant Floor Warming and Heating Homeowner's Guide and Installation Manual for TXLP/1 Single Conductor Cable

NEXANS provides warmth and comfort in all residential and commercial areas in which ceramic tile, marble, slate, vinyl, carpet, laminate, hardwood or virtually any type of flooring is being installed. This includes any area from bathrooms to kitchens and atriums; breakfast and dining areas, foyers, sun rooms, basements and a variety of spaces where warm floors make a welcome addition. Only your imagination limits your use of **NEXANS** cable.

NEXANS can be installed on any sub-floor surface prepared to TCA, (*Tile Council of America*) standards. The **NEXANS** cable is set directly under tile or stone in the setting mortar, (generally of thinset variety). The heating cable and thinset are so thin that they will add little more than 1/8" additional depth to the finished installation. Call and ask our technical staff for application assistance on other applications.

The **NEXANS TXLP** cable consists of a solid copper resistance wire wrapped in a layer of thermoplastic insulation. The insulated element is further protected by a finned copper grounding shield. The armoured heating element is then wrapped in a steel shield. The cable can be easily formed and adapted to almost any geometrical floor shape, to suit your room. This design utilizes the most advanced materials and is the most easily installed cable available for residential or commercial renovation and new construction.

NEXANS is a **CSA** listed floor warming cable. It is warranted free from manufacturer's defect for 10 years (see our written Limited Warranty for details), maintenance free, safe, silent, energy efficient and, once installed, is totally out-of-sight. While a variety of controls can be used with the **NEXANS** floor warming system, we strongly recommend using a thermostat with a remote floor temperature sensor. This form of control affords the greatest comfort and control of your installation.

These features are only a few of those which make **NEXANS** the most versatile, easy to install, reliable and profitable to sell floor warming system available.

The following pages will provide you with an overview of how **NEXANS** works, how it is installed and maintained as well as the benefits of this complete floor warming system. Take a few moments to review this information. If you have further questions, one of our floor-heating professionals will be happy to assist you.

Homeowner's Information General Instructions:

The electrical connection of the **NEXANS TXLP** cable must be performed by a qualified electrician in accordance with the National Electrical Code. The installer has been instructed to provide you with a plan of the system installation. The plan shows where the heating element is installed, the location of the floor temperature sensor and the electrical description of the system. Keep the plan for your system and a copy of these instructions for future reference. Future homeowners should also receive this information.

No penetrating fasteners (such as nails or screws for doorstops, toilets, etc.) may be installed through the area warmed by the cable.

To optimize the comfort efficiency of the **NEXANS** system, throw rugs thicker than 1/2" should not be used over the heated area.

Additionally, built in cabinets, appliances and other furniture with solid bases should not be placed on warmed areas of the floor. Make sure your installation is planned to use the heating cable only in the areas of the room on which persons will walk and with a minimum distance of 3" to 4" from the walls.

Temperature Control:

A thermostat which monitors and controls the floor temperature through a remote sensor, mounted in the floor at the time of installation, is required.

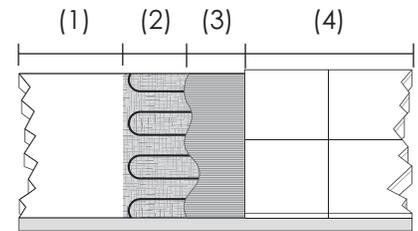
On floor areas where the heating load exceeds the load capacity of the thermostat (1920 Watts at 120V; 3840 Watts at 240 volts), **you must use a solid state relay, controlled by the thermostat**, to switch the higher load of the heating system.

Maintenance:

Periodically, the GFCI (Ground Fault Circuit Interrupter) should be tested to ensure its continued operation.

NEXANS has no moving parts. The system is virtually maintenance free. If the system does not appear to be heating properly, refer to the troubleshooting guide in this manual or call your installer.

Installer's Guide to Installation General Instructions:



(1) Sub-Floor - (2) Cable
(3) Adhesive - (4) Flooring

Figure 1.

These instructions must be followed when assembling and installing the **NEXANS** system. Make them available to the installer working on the project and when finished turn them over to the homeowner for future reference. Failure to follow these instructions may void the warranty on the installed system.

Important Installation Considerations:

The electrical connection of the heating system and the thermostat should be done only by a qualified electrician in accordance with the National Electrical Code and with local codes. To assure safety, the **NEXANS** floor warming system **must be connected to the electrical service via an approved GFCI (Ground Fault Circuit Interrupter)**.

The heating system may be installed over concrete, wood or any existing sub-floor. Walking on the **NEXANS** heating element during installation should be minimized and done only with rubber-soled shoes. Penetrating fasteners such as nails or screws may not be installed through the areas of the heating element.

Planning the Installation:

The **NEXANS** heating element must not be installed under cabinets, appliances or plumbing fixtures which are permanently installed and attached to the floor. Use special care when designing systems for bathrooms, kitchens, saunas or other rooms in which permanent fixtures will be installed.

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Planning the installation:

Built-in cabinets and other furniture and fixtures with solid bases must not be placed on the heated portion of the NEXANS system. Plan the installation to cover only those areas of the floor which will be walked on.

Placing carpets thicker than 1/2" on the NEXANS heated area should be avoided. Such carpets and throw rugs will act as insulators over the heated area, reducing the warming efficiency of the installation.

NOTE: To avoid damage to the heating element during installation, care must be taken that tools or tiles with sharp edges or points are not dropped or used carelessly on the element.

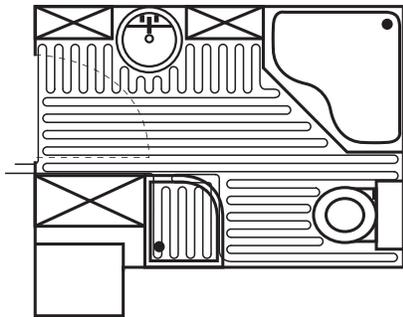


Figure 2.

Before laying the NEXANS cable, make a drawing of the installation plan for each room. Show the locations of:

- The NEXANS cable
- The cold leads of the power connection cable
- The temperature sensor
- All fixed appliances, toilets, vanities, bookcases, etc...

When planning the layout of the cable make sure that fixed objects will not be installed over the heating cable.

The installation plan must be given to the homeowner and attached to the breaker box.

LAYING OUT THE HEATING CABLES

Determine the square footage of the area to be heated and use the formula below to determine the spacing of the cable as follows:

$$\text{Area (sq. ft.)} \times 12 = \text{Spacing} \times \text{Cable Length}$$

Example:

Area in square feet - 85 sq. ft.
Cable Length - 193 ft.

$$85 \text{ sq. ft.} \times 12 = 1020 \div 193 = 5.28" \text{ on center}$$

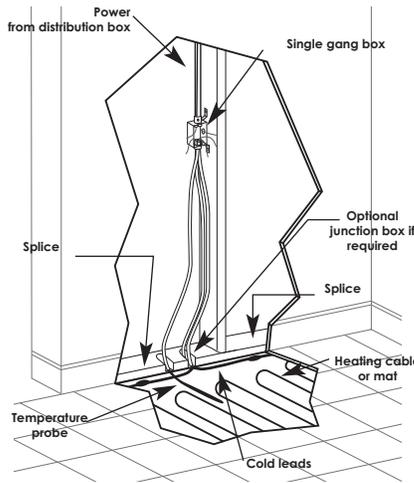
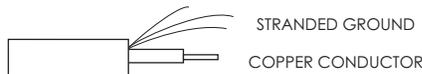


Figure 3.

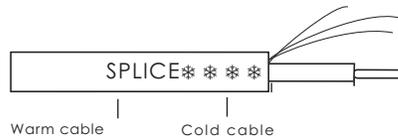
IMPORTANT: The floor sensor should be secured in the sub-floor only after heating cable has been secured to the sub-floor. This will allow you to place the sensor 12" or more into the heated floor, mid-way between two of the heating element wires.

The Cable

The cable consists of a solid copper heating element that runs through the centre, an insulator surrounding the core conductor, a silver colored, stranded ground wire, a metal shield and two (2) outer insulation layers.



The centre conductor is the part that is connected to the thermostat. This is the part used to test cable resistance. The cable has a unique "hidden splice" which is marked >SPlice< and is located approximately 8 feet (2.5M) in from each end of the cable. This is where the unheated portion of the cable (with the snowflakes) meets the heated portion. The heated portion of the cable must **NOT** be run behind a wall. It must be completely buried in the floor.



DO NOT CUT THE HEATED PORTION OF THE CABLE

Fastening the cable to the floor:

Ceramic Tile, Marble, and Stone Installations:

The cable may be held to the floor by tying onto expanded metal mesh (diamond lath), stapling onto wooden sub-floor or using the optional cable mounting track clip strip available from the dealer. The track may be nailed or screwed onto the floor at approximately 3 foot centers. It may be wise to sketch the cable and track layout on a piece of paper before starting.

It is important to plan the layout so that the cable starts and finishes at the same point, which is usually directly below the thermostat. This is where the first splice is laid. Start by laying the cable from the thermostat, stay 3" from the wall and run the cable around the perimeter to the far side of the room. Then start the series of "S" loops on the floor working back towards the thermostat, maintain the calculated spacing as you go (Figure 2). If, for instance, the spacing is 6" on center (OC), lay the first cable 3" from the wall, the second cable loop will be 9" from the wall.

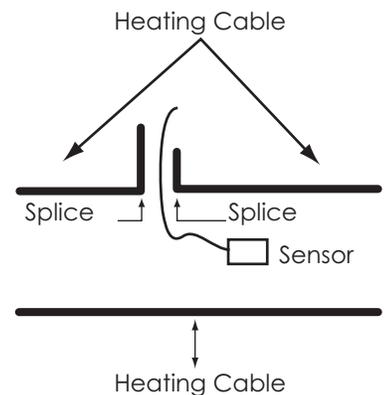
Use one half OC spacing from all obstacles, stay 8" away from toilet wax seal. Continue laying cable in the "S" pattern, maintain full spacing over balance of area to be warmed.

The cold lead wires can be field cut at any point, but never cut the heated portion (past the splice) as this will damage the cable. The splice must be buried in the masonry! This is the point at which the heating cable is attached to the cold leads.

Only the cold leads can be out of the masonry or concrete and run into walls or conduit.

The thermostat sensor should be installed between the heating cables, a minimum 12" into the heated floor area (Figure 3).

BE SURE THE COLD LEADS NEITHER CROSS NOR TOUCH THE HEATING ELEMENT WIRES.



DO NOT CROSS WIRES OVER EACH OTHER

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Hardwood and Laminate Installations:

After installing the cable and the floor mounted sensor on the recommended centers, cut spacer strips of 3/8" plywood to a width that will allow 3/4" to 1" open space between the plywood strip and the cable centered in the open trough. **(Figure 5)** Completely fill the open trough with a cement based material such as tile setting compound and sand the floor if necessary to eliminate high spots or roughness. **(Figure 6)** The tile setting compound is required to aid in heat transfer and reduce noise being transferred from a hollow cavity in the floor. Nail hardwood strip as per manufacturers instruction, (use underlay material if required), at a 90° angle to the direction of the heating cable runs. **(Figure 7)**

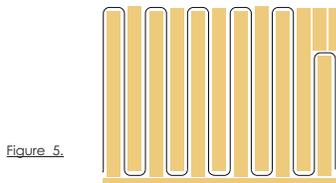


Figure 5.

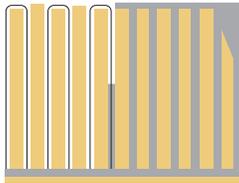


Figure 6.

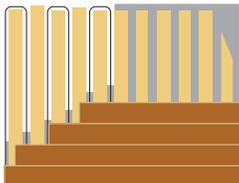


Figure 7.

CAUTION:

Always allow the flooring to acclimatize to the space as per the manufacturer's instructions. Failure to follow the manufacturer's instructions may result in warped, cracked or uneven floors.

Britech's responsibility is limited to the heating cable and controls. We will not be held responsible for hardwood cracks, checks or warping.

On new floor systems, turn the heat on low (ambient room temperature) for 24 hours then slowly increase floor temperature over 3-4 days to a maximum 25 °C. Turning up the floor temperature faster or sooner will result in a floor that is unsatisfactory or damaged.

Testing the System Resistance:

Before setting the heating cable, measure the resistance with an Ohmmeter (see resistance charts **4 and 4a**) on the following page, and note the value on the system installation plan. After completing the heating system installation, measure the system's resistance again with the Ohmmeter. Compare the new reading with the first measurement to assure they are identical and no damage has occurred to the heating cable during installation. Record the measured resistance on the attached card and fasten to the circuit breaker box.

IMPORTANT:

The system warranty is not valid without evidence that the system resistance has been tested.

Securing the Heating Cable:

Follow the *Tile Council of America* recommendations when planning how you will secure the heating cable. Selected adhesives (tile setting mortar) should be applied to the floor according to the manufacturer's instructions. The heating cable should be laid carefully, do not cut or crimp the cable. While laying the heating cable, take note of where you will position the floor sensor. The system's cold lead wires, as well as the wire from the remote sensor, are run to the junction box either through a groove prepared in the sub-floor or through conduits (as local electrical code requires).

After securing the heating cable to the sub-floor, measure the system's resistance again with the Ohmmeter. Compare the new reading with the first measurement to assure they are identical and no damage has occurred to the heating cable during installation.

Need for a Protection Layer over the Heating Cable:

In projects which are not immediately floored over the heating cable installation, a protective layer of self leveling concrete is applied over the cable to protect it until the tile is laid. For this layer, use an upgraded concrete into which acrylics are mixed to give the mortar the required elasticity and resistance to stress. These products can be found at your tile supplier, as per *Tile Council of America*. When the installation is complete, the tile or stone surface can be laid directly over the protective layer without further preparation, using any TCA approved setting mortar. When applying the various layers be sure to follow the manufacturer's directions for the mortar product.

Measure the system's resistance with an Ohmmeter. Compare with previous readings to assure no change has occurred.

NOTE: Be sure to observe recommended cure times for your installation. Ceramic tile installation may require 10 to 14 days to cure before the NEXANS floor warming system may be operated.

Choice of Floor Covering:

The NEXANS floor warming system is designed to be used with hard floors such as ceramic tile, marble or other stone floorings as well as with hardwoods, laminates and carpeting. If you are unsure about using a floor warming system with your floor covering, please contact your BRITECH / NEXANS representative.

Mounting the Output Plate:

After completing the NEXANS floor warming system installation, mark the final measured resistance on the output plate. Mark the cable location on the installation plan which is given to the homeowner with the homeowner instructions and installation manual.

System Control Options:

Wall mounted thermostat (line voltage) with remote sensor: A wall mounted 120/240V thermostat with a remote sensor, which can be mounted in the floor (Figure 3), offers the best way to regulate your system. The sensor should be installed halfway between the cables, on center, at least 12" into the heating cables serpentine arrangement, while ensuring that it does not cross any of the heating wires. By controlling the actual floor temperature, the system can be adjusted to the temperature which is the most comfortable for the situation.

Through this method, the floor temperature can be controlled as desired with little variation. The line voltage thermostat connects to the junction box, as marked in **Figure 3**.

Resistance charts 4 and 4a. are located on the following page.

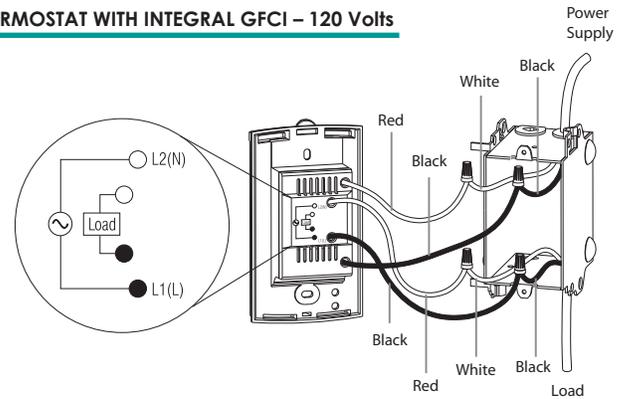
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Resistance Chart – Single conductor cable 120 Volt

TXLP/1 Type	Resistance Ohms	Length Ohms/m	Length Meters	Length Feet	120V Watt
200/1	69.13	5.62	12.2	40.3	200
300/1	46.00	2.50	18.3	60.4	300
400/1	35.55	1.41	24.4	80.4	400
500/1	27.63	0.90	30.8	100.7	500
600/1	24.07	0.68	35.4	116.1	600
730/1	19.73	0.46	43.0	140.8	730
875/1	16.45	0.32	51.5	168.8	875
1370/1	19.73	0.13	80.7	264.8	1370
1470/1	16.45	0.11	86.6	284.1	1470

Chart 4

THERMOSTAT WITH INTEGRAL GFCI – 120 Volts

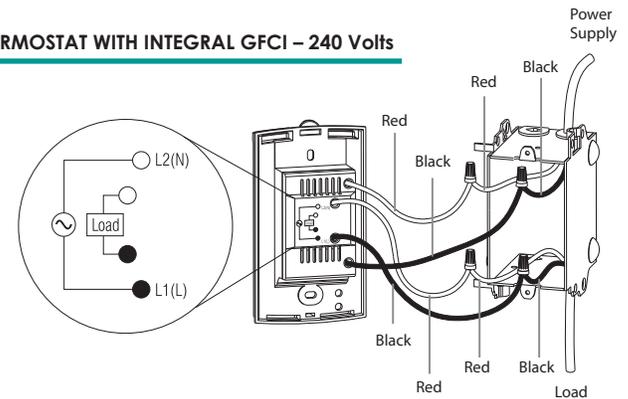


Resistance Chart – Single conductor cable 240 Volt

TXLP/1 Type	Resistance Ohms	Resistance Ohms/m	Length Meters	Length Feet	208 V Watt	240 V Watt
300/17	176.00	10.00	17.7	58	245	330
400/17	132.07	5.62	23.5	77	330	435
500/17	105.84	3.60	29.3	96	410	545
600/17	88.25	2.50	35.1	115	490	650
700/17	75.81	1.84	41.2	135	570	760
850/17	62.00	1.24	50.0	164	700	925
1000/17	52.92	0.90	58.8	193	820	1090
1250/17	42.63	0.58	73.5	241	1020	1360
1400/17	37.86	0.46	82.3	270	1145	1525
1750/17	29.84	0.29	103.0	338	1430	1905
2200/17	24.59	0.19	129.3	424	1800	2395
2600/17	20.30	0.13	156.1	512	2130	2830
3100/17	17.10	0.09	186.0	610	2540	3375

Chart 4A

THERMOSTAT WITH INTEGRAL GFCI – 240 Volts



NOTE:
Thermostats, timers, snow melt controls and cable mounting track are available at your NEXANS distributor.



Troubleshooting:

CAUTION: TURN OFF ELECTRICITY BEFORE TROUBLESHOOTING SYSTEM.

1. If the system fails to heat, make sure the GFCI (Ground Fault Circuit Interrupter) has not been tripped. If it has, find the fault
2. Check for continuity with an Ohmmeter. Compare the reading with the resistance marked on the Output Plate. Lack of or reduced continuity may indicate a break in the system.
3. Make sure the breaker or fuse is delivering power to the system.

If your system fails to heat after these checks call your installer. Be sure to tell the installer the Model Number of your system. This will be found on the warranty card attached to the circuit breaker box door.

This schematic is meant as a preliminary guide only. Refer to the instructions provided with the thermostat GFCI, and timer. All electrical work should be performed by a licensed electrician.

WARNING:

THE FLOOR HEATING SYSTEM IS DESIGNED TO BE INSTALLED WITH A GFCI (GROUND FAULT CIRCUIT INTERRUPTER). FAILURE TO DO SO MAY RESULT IN INJURY.

This system may not be energized unless the system is installed according to the enclosed instructions. The installation must meet or exceed all local and national electrical codes

NOTE: Do Not Connect 120 volt systems on 208 or 240 Volt Supply. You will harm the cable.