

## ***Installation Manual***

1. Installation Guidelines.....	2
2.Do’s & Don’ts.....	3
2.1 Do’s.....	3
2.2 Don’ts.....	3
3. Measuring Resistance.....	4
4. System sizing, Layout and Product Selection.....	4
4.1.1 Prepare the Subfloor.....	4
4.1.2 Transfer Layout to Floor.....	5
4.1.3 Electrical Box Installation.....	5
4.2 Heating Mats Installation.....	5
4.3 Floor Installation.....	8
5. Thin set Mortar Method.....	9
6. 15 Year Limited Warranty.....	10
7. 150W/m <sup>2</sup> Heating Mat Resistance Table .....	11
8. Trouble Shooting.....	12

# Important Safety and Installation Information

READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY PRIOR TO INSTALLATION. FAILURE TO DO SO MAY CAUSE PERSONAL AND /OR PROPERTY DAMAGE AND WILL VOID THE WARRANTY.

WARNING: Shock and fire hazard

TO PREVENT FIRE, ELECTRICAL SHOCK, PERSONAL INJURY AND /OR PROPERTY DAMAGE, THE INSTALLATION MUST BE PERFORMED BY A QUALIFIED PERSONAL WHO IS FAMILIAR WITH CONSTRUCTION AND OPERATION OF THE SYSTEM, AS WELL AS THE RISKS INVOLVED.

## 1. Installation Guidelines

2. INSTALLATION OF HEATING SYSTEM MUST BE IN ACCORDANCE WITH ALL APPLICABLE NATIONAL AND LOCAL ELECTRICAL AND BUILDING CODES.

2. The combined R-value of the floor covering materials above the heating cable must not exceed the value of  $0.05 \text{m}^2 \cdot \text{k}/\text{w}$

3. Please always check the thermostat, make sure that total Amps of the heating mats installed do not exceed the max Amp rating of the thermostat, Larger installation may require multiple thermostats, sensors, dedicated circuit, circuit breakers ,etc.

4. Tools and materials required.

You will require the following items to install and test the floor heating system:

Digital multi-meter or ohmmeter- to perform resistance and insulation testing of the floor heating cable.

- Heating mats-proper sized and selected.
- Scissors-to cut the fiberglass mesh.
- Grooving tool or chisel with hammer to create a groove in the subfloor for the installation of cooled lead and sensor. ◦
- Measuring tape-to measure and mark on the subfloor location of mats as well as any fixed fixtures, obstacles etc.
- Wire strippers-to prepare and connect the cold lead to the thermostat.
- Screwdriver -to connect wiring to the thermostat.
- Floor sensor (as per specification in this manual) –required for proper operation of the thermostat.

Other materials required for installation of the selected flooring type.

## 2.Do's & Don'ts

### 2.1 Do's

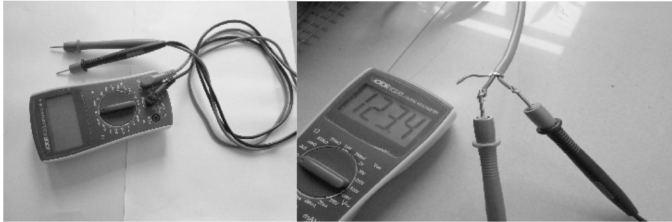
- ✓ Do read through these instructions carefully before beginning work.
- ✓ Do be free of nails, screws or other sharp objects which may damage the cable.
- ✓ Do use flexible adhesives and grout
- ✓ Do test the cable before tiling.
- ✓ Do be careful not to damage or dislodge the cable during tiling.
- ✓ Do ensure the cable is spaced no closer than 50mm between loops.
- ✓ Do try to protect the cable with cardboard or carpet during tiling.
- ✓ Do wait at least 7 days before turning on the system.
- ✓ Do read the separate installation and operating instructions for the thermostat.
- ✓ Do ensure the joint between the cold tails and heating cable is beneath the tiles.

### 2.2 Don'ts

- × **Don't** place tools or stacks of tiles on top of cable.
- × **Don't** place any bean bags or fixed furniture over the floor covering.
- × **Don't** place cable closer than 100mm near any pipes.
- × **Don't** turn on the heating mat/cable while it is rolled up or still on the drum.
- × **Don't** overlapped, crossed over, folder, cut, spliced, shortened or modified. If heating cable in the mat is damaged, the complete mat must be replaced.
- × **Don't** cross the sensor wire over the cold wire or heating cable.
- × **Don't** bend the portion of the cable where cold wire and heating cable are factory -connected(factory Splice)
- × **Don't** be installed in the walls or ceilings.
- × **Don't** staples to secure heating cable to the subfloor.
- × **Don't** install the mats and cable over the expansion joint.
- × **Don't** install the heating mat upside down.
- × **Don't** allow the wires to cross or touch.
- × **Don't** cut tiles over the heating cable.

### 3. Measuring Resistance

To perform insulation and resistance testing, a digital multimeter( or ohmmeter) with alligator clips(or equivalent testing leads) is needed.



The resistance and insulation testing of the heating mats must be performed and recorded at least four times.

1. Prior to installation (out of the box).
2. After installation of heating mat
3. After the installation of thin set cement or self-leveling mortar.
4. After installation of finished floor (tile, stone, etc.)

#### FLOOR SENSOR TESTING

Additionally, if using floor sensor, test its' resistance out of the box and prior to installation of finished flooring .

If you get different reading from those describe above stop the installation process and contact technical support for assistance.

### 4. System sizing, layout and product selection

Calculating the square footage of the heated area.

The heated area shall exclude any permanent fixtures such as showers, bathtubs, toilets, vanities or cabinets. To calculate the square footage of the heated area, multiply length feet by width feet and record the value. If the heating is not rectangular and contains triangles or obstacles, divide it into smaller areas that can be calculated by multiplying width by length,

#### 4.1 Heating mat installation

Note: It is highly recommended that the installation of the mats and floor sensor is documented with photos to note their location for further reference.

##### 4.1.1 Prepare the Subfloor

The subfloor must be dry, smooth and clean prior to mats installation.

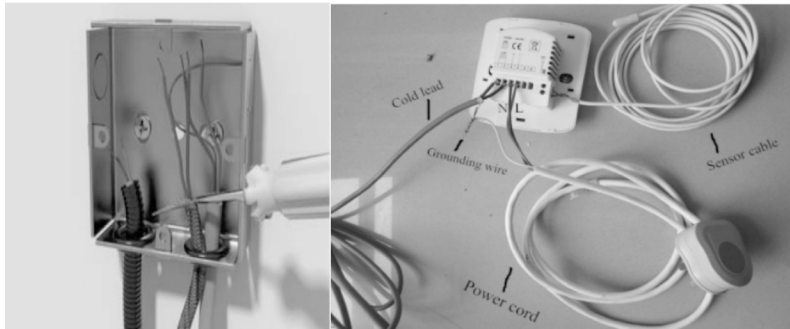
Thoroughly sweep and/or vacuum the floor to remove any dirt, dust and debris that may damage the cable and interfere with installation .Make sure there are no nails, screws and other sharp objects that may damage the cable.

### 4.1.2 Transfer Layout to Floor

Using measuring tape and pencil/marker, draw the outline of the mats layout on the floor, including all obstacles. Cabinetry, fixture, floor drains, etc. For ease of installation draw arrows pointing the direction of mat runs across the floor.

### 4.1.3 Electrical Box Installation

- Installation of electrical box and conduit pipe must be in accordance with all applicable national and local codes.
- Install an appropriate size electrical box at the desire location of the thermostat and within reach of sensor and mat's cold lead.(both are 10ft long)
- A typical location of the thermostat is 4-5ft above the floor for easy of access and operation. Run a section of conduit pipe from the electrical box to the floor for cold lead installation
- Note that conduit pipe may not be required by local codes-check with an electrician. A 1/2 conduit pipe is sufficient for single cold lead installation, Multiple cold leads may require a larger conduit pipe.
- Run appropriate type and size electrical wire copper from the power source to the electrical box. Leave excess wire at the control switch/thermostat box for making connections.



## 4.2 Heating Mats Installation

- 4.2.1 Start by creating a 3/8 by 3/8 opening in the bottom of the wall to accommodate the installation and routing of the cold lead to the electrical box. The opening should normally be positioned vertically below the electrical box. If using conduit, select the position of the hole accordingly.
- 4.2.2 Next, using a chisel and a hammer or a groove in the subfloor for routing of the cold lead. The groove must run all the way to the cavity created in the wall. and must be deep enough to prevent interference of cold lead with flooring materials above.

IMPORTANT: approximately 4' portion of the heating cable contains a factory splice between the heating cable and cold lead. This portion MUST be installed in the subfloor (3/8\*3/8 groove) and must never be bent.

4.2.3 Perform 1st insulation and resistance tests in the heating cable, Refer to “Measuring Resistance” part of this manual.(Page11)

4.2.4 Route the cold lead through the 3/8 wall cavity to electrical box.  
(through the conduit, if present)

4.2.5 Using hot glue, secure the factory splice and subsequent portion of the cold lead(which runs the opening in the wall) in the subfloor groove.

4.2.6 If using backer boards or XPS premium insulation boards, do so in accordance with The manufacturer’s Instructions.

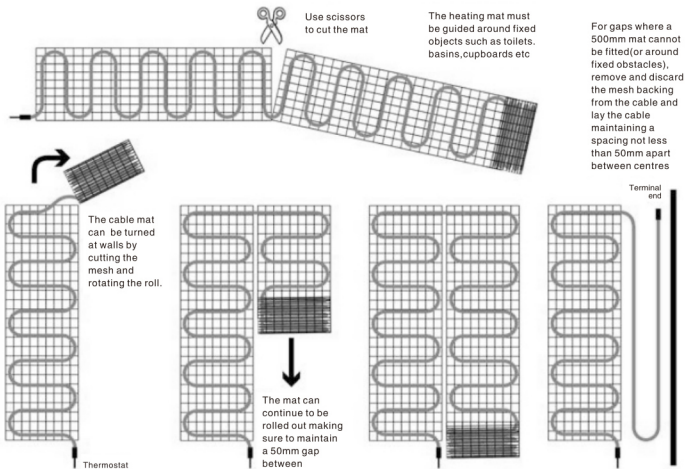


4.2.7. Start installing the mats according to the layout plan. Unroll the first few feet of the mat on the floor. Position as needed and applying palm pressure only, adhere the heating mat to the subfloor. The heating mat must be completely flat. Adhesive backing of the heating mat allows to install it over any smooth, clean & dust free surface, If it is necessary to re-arrange the mat, it can be moved several times before is loses its adhesive properties.

NOTE: Do not attempt to staple the cable. If needed, staple the mesh only using approved fasteners.

4.2.8 To make any degree turn, use scissors to cut the fiberglass mesh between the heating cables .Then rotate the mat up to 180 degrees until the desired position is reached.

IMPORTANT: DO NOT CUT ANY PORTION OF THE CABLE.



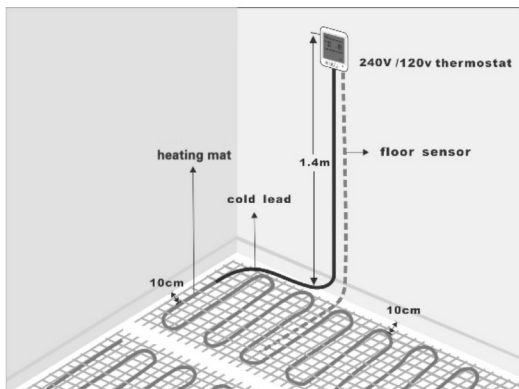
Note: Minimum bending radius of the cable in the mat is 1°C .

IF it is necessary to arrange the heating cable in non-rectangular area, or along a curved border, the mesh can be cut as needed to accommodate the installation, following the procedure described above.

4.2.9 Once installation is complete, perform 2nd insulation and resistance tests on the heating mat.

Refer to Measuring Resistance part of this manual.

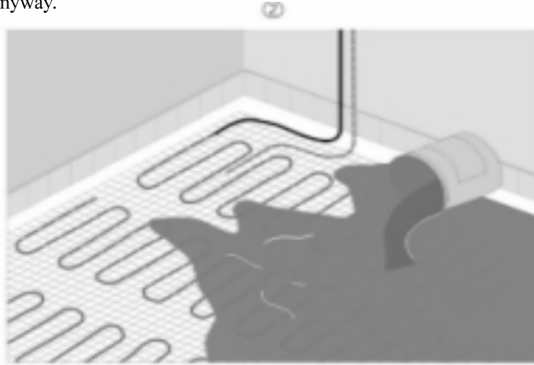
4.2.10 Position the sensor in the black conduit supplied between two runs of cable and tape into position. The sensor wire can be shortened or lengthened. If you need to cut the sensor wire you must only cut the end containing the wires. DO NOT cut the end which contains the plastic sensor. The connections to the thermostat can now be made.



4.2.11 At this point an insulation resistance test must be carried out by a qualified electrician.

The rest of the thermostat connections can be made according to the separate instructions provided.

- 4.2.12 If possible cover the cables with a thin layer of suitable latex based leveling compound (5-6mm). However extra care must be taken not to dislodge the cables or to damage the cable in anyway.



- 4.2.13 If you are using a suitable vinyl/ carpet or engineered/laminate floor as the final covering then we recommend a minimum of 8mm suitable latex leveling compound to cover the heating mat/cables to ensure even heat distribution.
- 4.2.14. Tile the floor using a flexible tile adhesive and grout as per industry standards and Manufacturers conditions. Finally wait at least 1 week before turning on to allow time to dry.
- 4.2.15 The heating may be slow to react at first, especially if installed on a new screed floor or in a new building. Start by setting the floor temperature at approx 18°C and build up by 1°C per day until your desired temperature is reached.

Please see separate instructions for connection and operation of digital thermostat.

### **4.3 Floor Installation**

- 4.3.1 Special Consideration, If check Isolation Membrane is used in the project, it must be installed below the heating mats, unless directed otherwise by the membrane manufacturer.
- 4.3.2 Use of insulation in subfloor installations is highly recommended to increase the efficiency of the radiant heating system and reduce heat loss, Wherever possible ,install the insulation between the joists manufacturer's instructions. Note: do not install any type of rigid insulation directly above or below the cement board.
- 4.3.3 Consult with flooring manufactures for information on special installation requirements for wood, laminate and vinyl or linoleum flooring.
- 4.3.4 Minimal installation temperature is 40 F
- 4.3.5 Plastic trowels are considered the safest for working with heating mats and cable ,as they minimize the chance of damage to the product during installation. A typical 3/8 \*3/8 notch



plastic trowel works best. When spreading cement over the cables, make sure to follow the direction of cable runs.

Consult with building professional to choose the optimal installation method for your system. Important: In order for the heating system to function properly, all flooring must be in direct contact with cement-based material in which the mats/cable is installed.

#### 4.3.6 Self-Leveling Method (Recommended for all Flooring Types)

This method is recommended for all types of flooring and especially for larger projects involving the installation of engineered wood, laminate, floating floors, vinyl, linoleum and carpet.

### 5. Thin set Mortar Method

This method is best used for tile, stone and similar floor covering materials,

5.1 Install the heat system

5.2 Follow the manufacturer's instruction to prepare, and spread the thin-set. Acrylic or latex modified thin-set are best for this installation type. The cable must be fully covered.

5.3 Perform 3rd resistance and insulation testing as described in Measuring Resistance part of this manual.

5.4 Allow for the cement to cure as advised by the manufacturer.

5.5 Conduct 4th and finished floor following the manufacturer's instructions.

5.6 Alternatively, after installing heating system on top of plywood, cement board or concrete slab, a layer of thin-set mortar can be applied over the heating cable followed by immediate installation of the tile/stone, etc. This method, however, is considered to be difficult and is suitable only for experienced installers. Similar to other methods described above, resistance testing must be done after the installation of finished flooring and prior to making electrical connections.

**Important:** Regardless of the installation method selected, the cements/mortar/grout must be completely cured prior to making electrical connections and running the radiant floor heating system.

**WARNING:** Power supply to the electrical box with thermostat must be turned off prior to making any electrical connections.

1. Follow the instruction that come with the thermostat to install it and connect power supply, grounding wire(s), cold lead(s) and sensor, If using multiple heating mats, they must be connected in parallel (black to black, white to white, ground to ground). The total combined current load must not exceed 16.0 Amps per thermostat. Minimum copper wire AWG.
2. Do not remove the label from the heating cable, as it may be required for inspection. Alternatively, retain the label along with resistance measurements and other system's product manuals.
3. Mark the appropriate circuit breaker that supplies power to electric radiant floor heating system.
4. After all the electrical work is complete, power up and test the system.

## 6. 15 Year Limited Warranty

For a period of 15 years from the date of purchase and subject to the conditions, limitations and exclusions in this warranty, Corporation manufacturer warrants that its heating mats and heating cable will be free from defects in material, design and workmanship .Manufacture reserves the right to make changes to the products design and pricing ,as well discontinue them without obligation to replace or upgrade any existing products with new ones.

In order for the warranty to apply, products must be installed by a licensed, qualified professionals in accordance with the latest version of manufacturer’s installation guidelines, in accordance with all applicable local and national electric and building codes and only for the purposes designated by the manufacturer, This warranty shall apply only to products that have been properly stored, handled and tested for defects before during and after installation.

Manufacturer does not warrant:

- Any products other than original manufacturer , such as thermostats, sensors, circuit breakers etc.
- Product failures caused by other malfunctioning or defective products from other manufactures.
- Products damaged during installation, including, but not limited to cuts, kinks, scratched etc.
- System or products failures associate with defective flooring, subflooring or other building materials in the system.
- Damage to products from using inappropriate, incompatible or worn out tools.
- Damaged from exposure to corrosive or otherwise incompatible chemicals
- Damages from a disaster, such as fire, wind, lightning, flooding, etc.

All reports of product failure must be accompanied by proof of purchase, original resistance measurement records and believed reason for failure. Such as reports must be submitted to manufacturer along with the defective products, at owner’s expense. Upon receipt of the products, with reasonable time period, manufacture will conduct product resting and inspection. If the conditions of this warranty are met and the product is proved to be defective, manufacturer will provide a replacement product free of charge. Other allowances, including, but not limited to manufacturer and are not covered by this warranty.

MANFACUTER DOES NOT WARRANT THE FINISHED FLOOR COVERING,ITS’ COST AND THE COSTS ASSOCIATED WITH REOVING AND REPLACING IT.

IN ORDER TO THE WARRANTY TO APPLY,ALL ELECTRICAL CONNECTIONS AND SYSTEM GROUNDING MUST BE MADE BY A LICENSED ELECTRICIAN.

MANUFACTURER WARRANTS THAT THE HEAT OUTPUT IN WATTS OF ITS PRODUCT IS AS STATED ON PRODUCT LABELING, OR IN THE ABSENCE OF SUH,IN INSTALLATION MANUAL ,MANUFACTURE DISCLAIMS ALL WARRANTIES AS TO THE

TEMPERATURE LEVER THAT THE PRODUCT, OR THE SYSTEM IN WHICH ITS IS INSTALLED ,MAY PRODUCE.

THIS LIMITED WARRANTY IS AN EXCLUSIVE WARRANTY IN LIEU OF ANY OTHER EXPRESS WARRANTIES. ANY IMPLIED WARRANTIES INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR ARE DISCLAIMED.

MANUFACTURER SHALL NOT BE LIABLE FOR ANY INJURIES, LOSSES OR DAMAGES, WHETHER DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL, INCLUDING, BUT NOT LIMITED TO DAMAGES FROM LOST PROFITS OR SALES, PERSONAL INJURIES ,PROPERTY DAMAGE AND OTHER LOSSES ARISING FROM USE OR INABILITY TO USE ITS PRODUCTS AND THE PURCHASER AGREES THAT NO OTHER REMEDY SHALL BE AVAILABLE TO IT.

Some states do not allow the limitation of duration of warranty and exclusion of incidental or consequential damages. Therefore, such limitations may not apply to you, this warranty gives you specific legal rights and depending on the state of residence/ installation, you may have other legal rights. To the extent allowed by applicable laws. Manufacturer disclaims any and all such legal rights.

Twin conductor Electric heating mat 150w/m <sup>2</sup>						
Model	Wattage (w)	Voltage (V)	Power (w/M)	Resistance (Ω)	Cable length (m)	Area (m <sup>2</sup> )
ABDX-150-0.5	75	230V	12.0	705.30	6.25	1x0.5=0.5
ABDX-150-1.0	150	230V	12.0	352.70	12.50	2 × 0.5=1
ABDX-150-1.5	225	230V	12.0	235.11	18.80	3 × 0.5=1.5
ABDX-150-2.0	300	230V	12.0	176.33	25.00	4 × 0.5=2
ABDX-150-2.5	375	230V	12.0	141.07	31.30	5 × 0.5=2.5
ABDX-150-3.0	450	230V	12.0	117.56	37.50	6 × 0.5=3
ABDX-150-3.5	525	230V	12.0	100.76	43.80	7 × 0.5=3.5
ABDX-150-4.0	600	230V	12.0	88.17	50.00	8 × 0.5=4
ABDX-150-5.0	750	230V	12.0	70.53	60.40	10 × 0.5=5
ABDX-150-6.0	900	230V	12.0	58.78	75.00	12 × 0.5=6
ABDX-150-7.0	1050	230V	12.0	50.38	87.50	14 × 0.5=7
ABDX-150-8.0	1200	230V	12.0	44.08	100.00	16 × 0.5=8
ABDX-150-9.0	1350	230V	12.0	39.19	112.50	18 × 0.5=9
ABDX-150-10.0	1500	230V	12.0	35.27	125.00	20 × 0.5=10
ABDX-150-11.0	1650	230V	12.0	32.06	137.50	20 × 0.5=11
ABDX-150-12.0	1800	230V	12.0	29.39	150.00	24 × 0.5=12

# TROUBLE SHOOTING

Issue	Possible Causes	Solutions
No heat from floor	No power.	Check circuit breaker
	Circuit breaker tripped.	Ensure that there are not too many cables or other appliances connected on the same circuit. The heating Mat requires a dedicated circuit.
	Ground-fault tripped in the thermostat.	Refer to Thermostat Installation and Operation Manual.
	Thermostat not turned on.	Refer to Thermostat Installation and Operation Manual.
	Cable not connected to thermostat.	Refer to Thermostat Installation and Operation Manual.
	Floor temperature sensor not connected.	Refer to Thermostat Installation and Operation Manual.
	Faulty sensor.	Use backup sensor instead (if installed) or replace existing floor sensor.
Floor is warm all the time or is not warm enough.	Thermostat is not properly programmed.	Refer to Thermostat Installation and Operation Manual.