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HEATWELL UNDERFLOOR HEATING D.I.Y INSTALLATION MANUAL

Please Note: Heatwell Ltd the manufacturer of the underfloor heating product accepts no liability express or implied for any loss or consequential damage suffered as a result of installations which in any way contravene the instructions which follow. Compatibility of waterproofing and self leveling products is at the client's discretion and Heatwell accepts no liability for any damage or loss caused from incompatible products

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Introduction:

Heatwell Underfloor Heating

- Please read all of the instructions very carefully before starting the installation. There are instructions at the back of this booklet which need action before starting.
- Underfloor heating consists of a few simple procedures explained step by step in the following document.
- We can offer additional help with this installation should you require it on FREE PHONE 0508 HEATWELL (432 893) between 8am – 5pm weekdays.

Heatwell Ltd has designed the underfloor heating to be quick and easy to install. All procedures need to be followed as per the instructions. Please note “Do's and Don'ts” at the rear of the document.



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Special Notes:

Avoid any damage to the element.

Test the element prior to installation and then prior to tiling. All elements have been tested before they have been supplied.

Never lay the element wire over itself or let the heating wires touch each other.

After installation of the element avoid any foot traffic over the heated surface until screeding or tiling is complete.

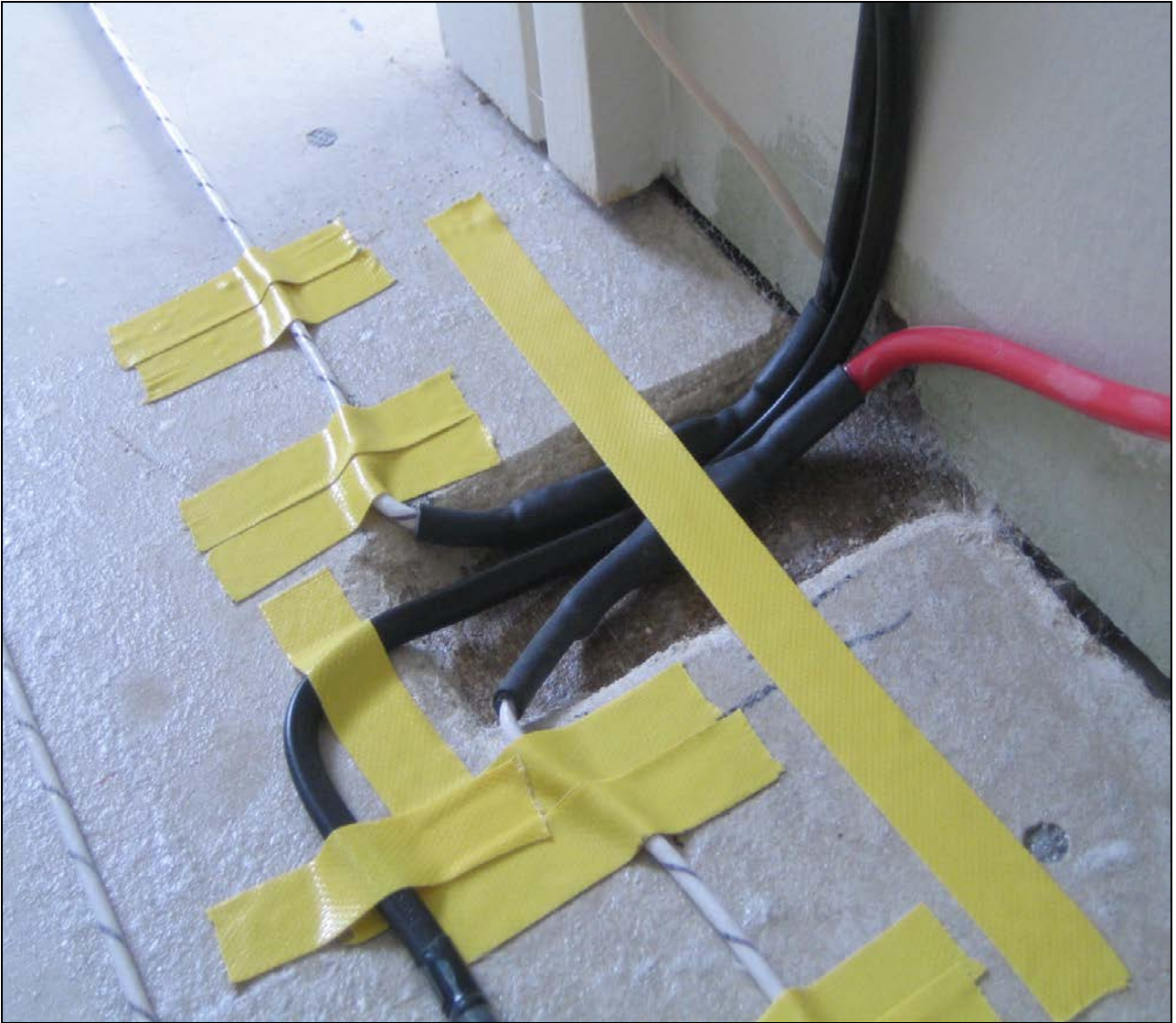
**If testing fails do not screed or tile floor.
Contact us on 0508 HEATWELL (432 893)**



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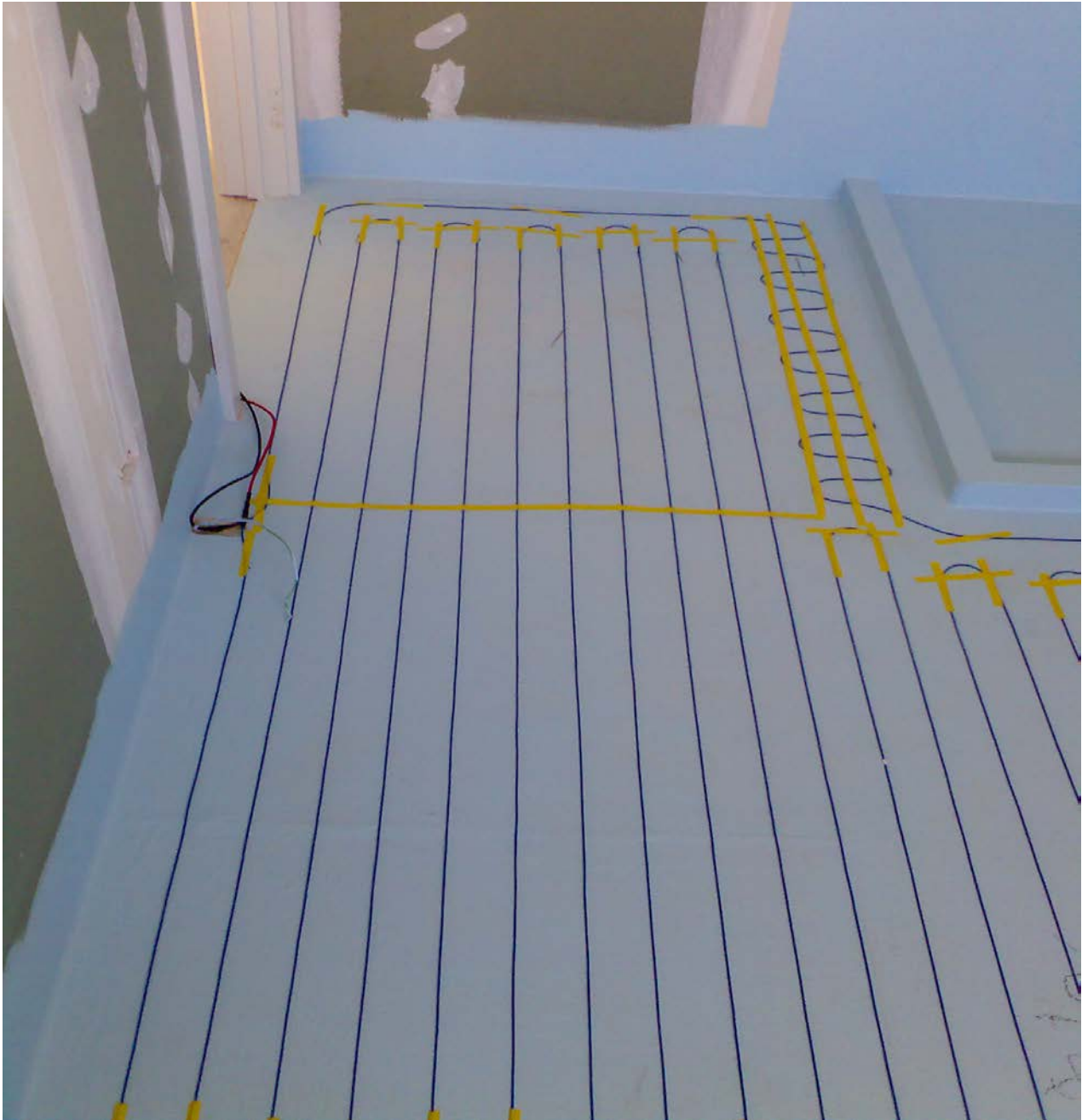
Layout Notes:

Below are examples of how the elements can be laid. There are no hard and fast rules but pictures show you possible ways to layout your work. Never lay the element wire over itself or let the element wires touch together. A recess will be needed in the floor where the cold tail joints will enter the wall. This is because the cold tail joints are quite a bit thicker than the heating element wire. See below photo 1. Note centre black wire is the probe cable.



1. Above is an example of how to prepare the recess for the cable connections. The indent into the floor stops the connections from being higher than any other point on the floor.

2. Below is an example of how to lay the element. It should be evenly spaced out as shown. No elements should cross or touch each other. Make sure you have followed the formula and attempt to set out your element cable like the below photo.



3. Below is an example of how the element can be set out without crossing the element. The direction of the cable can be changed as long as the element spacing is maintained throughout the installation.



4. This is an example of what the floor should look like after the element has been laid and self-leveling compound applied. This will be flat for the tiler to work on 24 hours after the application.



Step 1: Floor Preparation:

- Generally all floor surfaces can be laid on. Be warned that some waterproofing membranes may need special treatment. If in doubt ask your waterproofing supplier.
- If particle board floors are to be laid on check with your supplier that it is ok to do. Particle floors cannot exceed 35°C. All wooden floors such as particle board, plywood or tongue and groove floors are best if a layer “Tile & Slate” underlay is used. This will ensure a satisfactory surface for your heating to be laid on.
- Floors must be clean and dry as you would for any gluing job. Concrete floors must be cured properly. Laying elements on older or dirty floors may if necessary need a grind to get a clean surface.
- If tile and slate under is not used make sure the floor is thoroughly free of dust, oil, paint, plaster etc. If necessary sand the floor first. Clean work surfaces will mean good adhesion of tapes and screen.

Step 2: Mark the Floor for Element Installation:

- Calculate the area to be heated. Mark the floor with a marker pen or crayon for the exact area to be heated. Come off the walls, benches, shower trays etc the distances you require. Note that the heat will only spread 30 to 50mm past the last element wire.
- Be sure not to lay elements in areas which may have floor fixtures installed after tiling such as door stops, washing machines and toilets etc. See example in the photo below.





- Once the floor has been marked out and you have a defined area to be heated, measure and calculate your answer in square metres. Then use the following formula to calculate the spacing between the element wires.
- Take the area in square metres to be heated and multiply this by 1000. Then divide the answer by the length of the element(s).

$$([\text{m}^2 \times 1000] \div \text{length})$$

$$([4\text{m}^2 \times 1000] \div 53\text{m}) = 75\text{mm} \text{ (An example of a 600 watt element)}$$

The length of the element is printed on the side of the spool. The answer should be between 45 to 80mm for undertile heating. Anything outside these figures means you have made a mistake in the calculation or you have the wrong element for the area to be heated. Please contact Heatwell Ltd if this is the case.

- The formula is a good guide but does not allow for the loops of element wire at each end of a run. Add 10% to the spacing calculated to allow for this. For example (54mm x 10%) = 59.4mm. Say 60mm.
- Now mark the floor with the spacing's you have calculated so the runs of element wire are parallel with the longest wall. This is to minimise the number of runs up and down the room.
- In the event of thick tiles being laid, we recommend laying the heating element at 180 watt per square metre. Please contact Heatwell if you are unsure as to what wattage per square metre you should install.

Step 3: Installation of Element:

- The element has two cold tail wires, one at each end of the element. One is Red cable and the other is a Black cable. The Red cold tail wire is first off the spool. The Black cold tail wire is at the other end of the spool.
- Take the element spool and unroll the red cold tail wire until you reach the joint between the heating element and the Red cable. This connection **must be** placed in the recess that you have made at the base of the wall on the floor. **DO NOT** place the connection or any part of the heating element wire in the wall cavity. **ONLY** cold tails are permitted in wall.
- We recommend using a chisel to cut the recess out in the floor. Make the recess deep enough to fit the connections into.
- Now tape the Red connection into the floor recess you have made. Then unroll 3 to 4 metres of heating element and start taping it to the floor along the planned route.
- Work your way around the room with the heating element following the marks already on the floor. Once you have the element in place on the floor and you are happy with the spacing and coverage you should be back to the point where you started with the Black cold tail in hand. Tape the Black cold tail beside the Red cold tail in the recess.



- HINT – When you have completed about 80% of the element installation it pays to unroll the remaining heating element from the spool. There are two reasons for doing this. The first reason is to free the Black cold tail wire from the spool so the connection can be taped in the recess beside the Red cold tail. The second reason is so you can get an idea of how much element is left to do the remaining area.
- Now you should have the entire heating element on the floor taped in position. If you are short of heating element wire or have too much left over you will have to uplift 20-30% of the heating element wire and re-space it. This can happen to an experienced installer so don't despair. If you have more or less than 10% under/over at the end it maybe your calculations are incorrect, so check again. If necessary start again.
- Just remember that the spacing should be kept as even as possible to ensure that the heat output is as even as possible across the entire floor. You may vary the spacing by 10 to 15% without any noticeable difference in heat output.
- Now the floor probe needs to be placed in between two of the heating element end loops. The reason for this is so the thermostat can gain an accurate floor temperature reading. It needs to be taped and the probe wire needs to be placed at the base of the floor also.

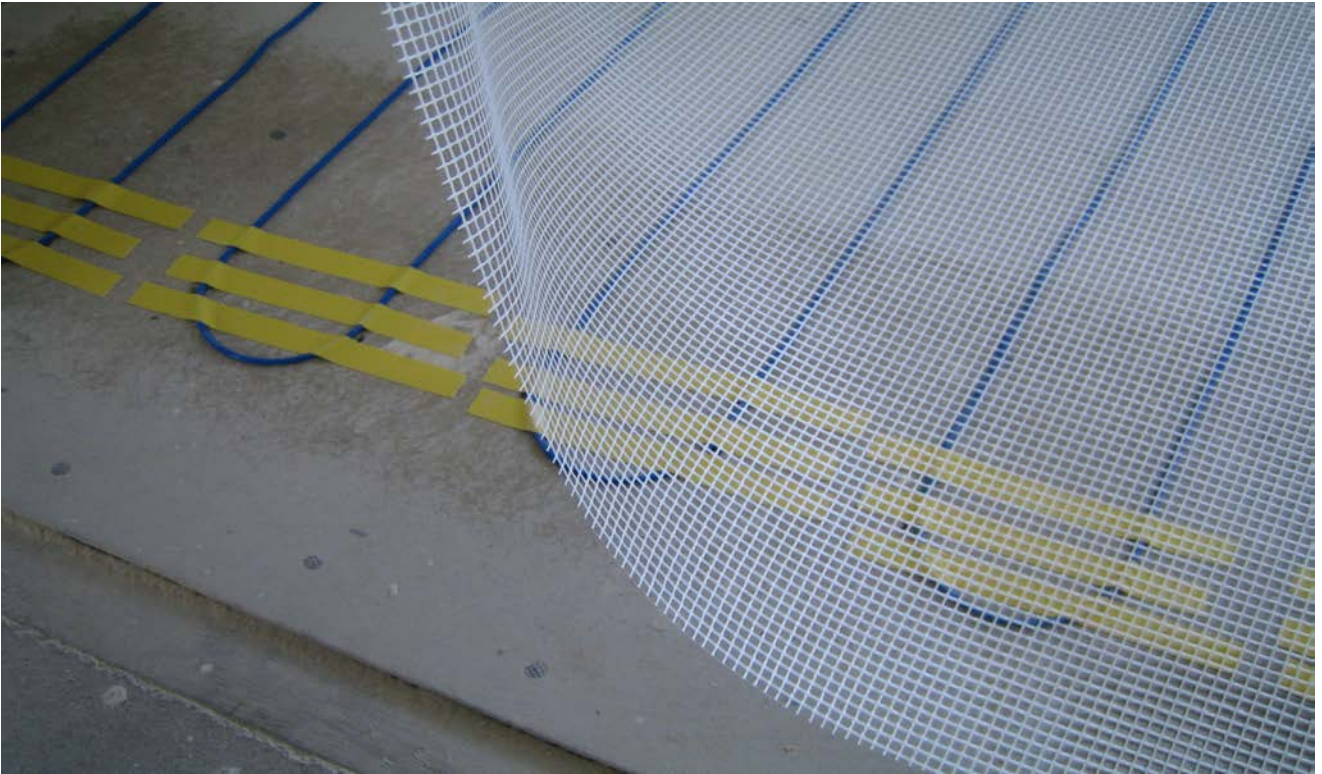


- The heating element wire is now all in place and you have the Red and Black cold tail wires and probe wire to finish off. These wires will exit the room by means of holes already drilled inside the wall and a draw wire and should be in place before the installation begins. Tape the ends of the Red, Black and probe wires to the draw wire and pull up to the thermostat position. BE CAREFUL, because if you pulled too hard on the draw wire it may break and then the wires will be stuck halfway up the wall, this is not good.
- Clean up the mess and remember, avoid any unnecessary foot traffic on the heating elements.

Step 4: Install Fibreglass Mesh (optional):

- Installing the fiberglass mesh is easy. Just lay on the floor over the heating element. Trim with a craft knife or kitchen scissors. Make sure the heating element is completely covered with the mesh. There is no need to cover areas with mesh where there is no heating element laid.
- Don't tape or glue the mesh to the floor as it needs to move as you apply the screed. Taping or gluing the mesh down will cause the mesh to bubble.
- It is not essential that you use fiberglass mesh if screen is not used. Tiling directly on top of the heating element it is best to buttering the back of the tiles than trying to place tile glue on the floor.





Step 5: Application of Self-Leveling Compound:

- It is common practice to apply self-leveling compound (screed) on top of the heating element once the mesh has been applied. We highly recommend this method of installation.
- The Self-Leveling compound should be of a type which is suitable for use with Heatwell under floor heating. Check with Heatwell if unsure.
- When applying the self leveling compound, DO NOT place the bucket or container containing the screed on top of the heating element, as this may damage the heating element.
- Most self-leveling screen compounds require a primer to be applied first. This needs to be applied evenly across the floor. Please ask the supplier of the self leveling compound about the proper application method.

- Mix the screed to the instructions on the bag. Once mixed adequately pour the screed over the element/mesh and use a trowel to evenly spread the compound across the floor.
- Once applied, it is strongly recommended that no one walks on the screeded area for between 24-48 hours. This is to give the product the best chance to properly dry.
- Once dried, the tiler will be able to apply their products directly to the self-leveling compound.

Step 6: Laying the tiles:

- Tile adhesives and grout should be of a type which are suitable for use with Heatwell under floor heating. Check with a “tile shop”, that you have the right products. Generally all glues ending in the word “flex” are satisfactory. Grout should be latex based.
- **NOTE:** Do not cut, store or drop tiles on the heated floor area. Use protective covers such as carpet underlay or corrugated cardboard to minimise any damage.
- Grouting should be done as soon as the tile glue is dry. If any glue has come up between the tiles take care when removing it. Use something blunt and plastic to gently scrap the glue away. A cut in the element at this stage is a costly repair.



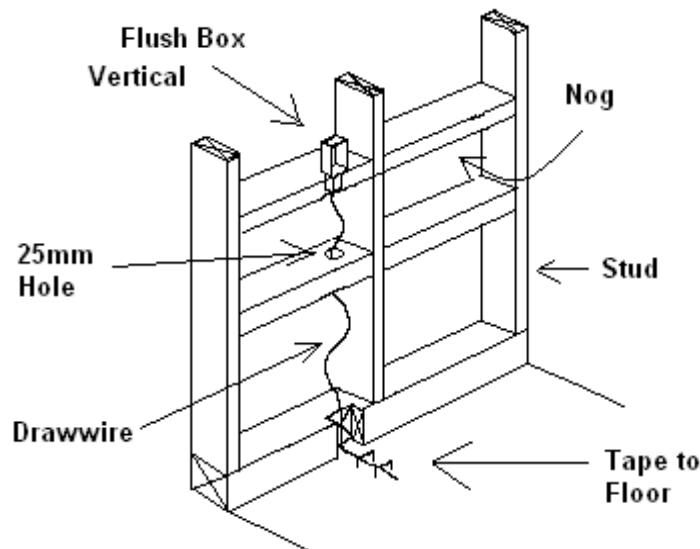
Step 7: Wiring and Fitting Thermostat:

- **WARNING:** Thermostats should only be fitted by a Registered Electrician. The following instructions are for electricians **ONLY**.
- Wiring is easy, it is done in a new building or extension before the lining goes on. At the back of the booklet there is a drawing showing the correct way to prepare your Heatwell under floor heating. If you are installing the heating in an existing building the wiring may be more difficult.
- The electrical supply must be taken from a RCD (residual current device). Timer units, thermostats and isolating switches should be installed within the room being heated if practicable.
- Air Sensing thermostats are best mounted at 1.5 meters above the floor level. Air sensing thermostats **MUST** be in the room where Heatwell under floor heating has been installed. Probe thermostats are good for more accurate temperature control. Probe thermostats can be placed in cupboards, pantries or by the switchboard etc. Probes must be laid during the installation of the heating element as noted.
- The supply cable and the Red and Black cold tails and probe wire must be installed within the wall cavity or in an approved casing or trunking. It is against wiring regulations to have exposed wires below 2.0 meters.
- When the heating is turned on the warm up times vary depending on the sub-floor layer, tile type and element spacing but is on average around 30 to 45 minutes.
- Thermostats, timers and probes can be purchased from Heatwell Ltd through our free phone “0508 HEATWELL” (432 893).



Step 8: Pre-wiring for Underfloor Heating:

1. For **MANUAL THERMOSTATS** mount flush box above second nog or at approximately 1680mm above floor level to ensure a correct room temperature reading.
2. For **AUTOMATIC THERMOSTATS** mount flush box at the same level as the manual thermostat for easy of operation. If an alternative high is desired or remote location mounting required this is ok as these thermostats are floor probe sensing.
3. The flush box should be mounted **VERTICALLY** to allow for an Automatic thermostat.
4. Holes for the draw wire/pull wire should be a "**Minimum of 25mm**" diameter to ensure that no jamming occurs while pulling wires up the wall from the floor.
5. **DO NOT** use TPS cable as a draw wire, single core wire only to be used.
6. Check out the bottom plate to minimum dimension of 50mm wide and 25mm depth.
7. Nail or staple draw wire to floor to stop it from being removed or lost during construction.
8. It is imperative that the draw wire be **FREE** to move and not be jammed by any wall tiles, wall insulation, and nogs or skirting.



Do's and Don'ts:

Do's

- Read all instructions carefully from start to finish before starting work.
- Clean the floor well. A clean surface will ensure good adhesion.
- Measure the area to be heated and calculate the element spacing.
- When planning the element layout watch for items to be fixed at a later date such as door stops, drains, toilets etc.
- Keep the spacing even between the element wires, 45 to 80mm.
- Use suitable tile glue and grouts.
- Make sure the element is tested before tiling.
- Take care you don't damage the element. Use protective covers when working over the elements.
- Call Heatwell if you have any questions. One of our representatives will be happy to help.

Don't s

- Don't tile on concrete floors that are powdery or not fully cured.
- Don't lay on dirty floors.
- Don't EVER cross the heating element.
- Don't EVER cut the element to shorten it. This will increase the wattage of the element and may damage the cable.
- Don't allow foot traffic on to unprotected elements.
- Don't cut tiles or place sharp or heavy objects on untilled floors.
- Don't tile the floor until testing the element has been done.
- Don't run heating without a thermostat.
- Don't run element wire in walls or under the floor. It must always be covered by tiles.
- Don't space elements further apart than 80mm.
- Don't apply waterproofing to heating elements without self leveling screed being applied first. This is against New Zealand underfloor heating standards.

Note: It is the responsibility of the purchaser to be aware of and comply with the current industry standards. Heatwell Ltd will not be responsible for any damage or loss incurred by the purchaser if the purchaser does not comply with the current industry standards.



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Instructions for the testing and connection of Under Floor Heating Elements



- You will see in the above picture that the cold tail has 2 conductors. A stranded wire or centre core and a solid wire under the outer sheath. The centre core is the conductor and the solid wire is the earth conductor or sensor wire. **DO NOT** make the mistake of terminating or twisting the 2 conductors together as the element will burn out.
- Using a 500 volt insulation tester (megger) check the continuity of the element and the earth wire. Also check the element for insulation resistance between the element and the earth conductors. The insulation resistance between these two should be infinite.
- Check the resistance of the element (by using an ohms meter) and make sure the ohmic value (plus or minus 5%) is the same as the label on the spool. Also check the element label has been checked and signed off for QA compliance. If not please contact Heatwell.
- The recommended spacing is 45mm – 80mm for under tile heating areas. This can be worked out by using the simple formula below. Add 10% to the answer as the formula does not account for the loops at the end of each run.

Spacing in mm = (Area in Sqm) x (1000) / Length of element



Underfloor Heating Specialists

Heatwell Under tile heating Elements Warranty

Heatwell warrants that your new Heatwell under floor heating equipment is free from any manufacturing defects. All heating elements have been tested prior to their sale.

This warranty applies to Heatwell under tile heating element for a period of 2 years from the date of purchase. Proof of purchase will need to be provided.

Heatwell Ltd reserves the right to repair or offer a full refund to the value of the heating kit only, in the event of the heating element malfunctioning within the allotted 2 year warranty period.

Heatwell Ltd, reserve the right to charge for any repairs caused by installation damage which is not the fault of Heatwell Ltd.

All procedures in this manual must be followed to make the warranty valid. Any deviation makes the warranty null and void.

Our warranty means that you have all of the protections given to you as a consumer in the Consumer Guarantees Act 1993 and applies in all circumstances covered by the Consumer Guarantees Act.

Please note: All Siemens thermostats have a separate Siemens manufacturer's warranty.

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