

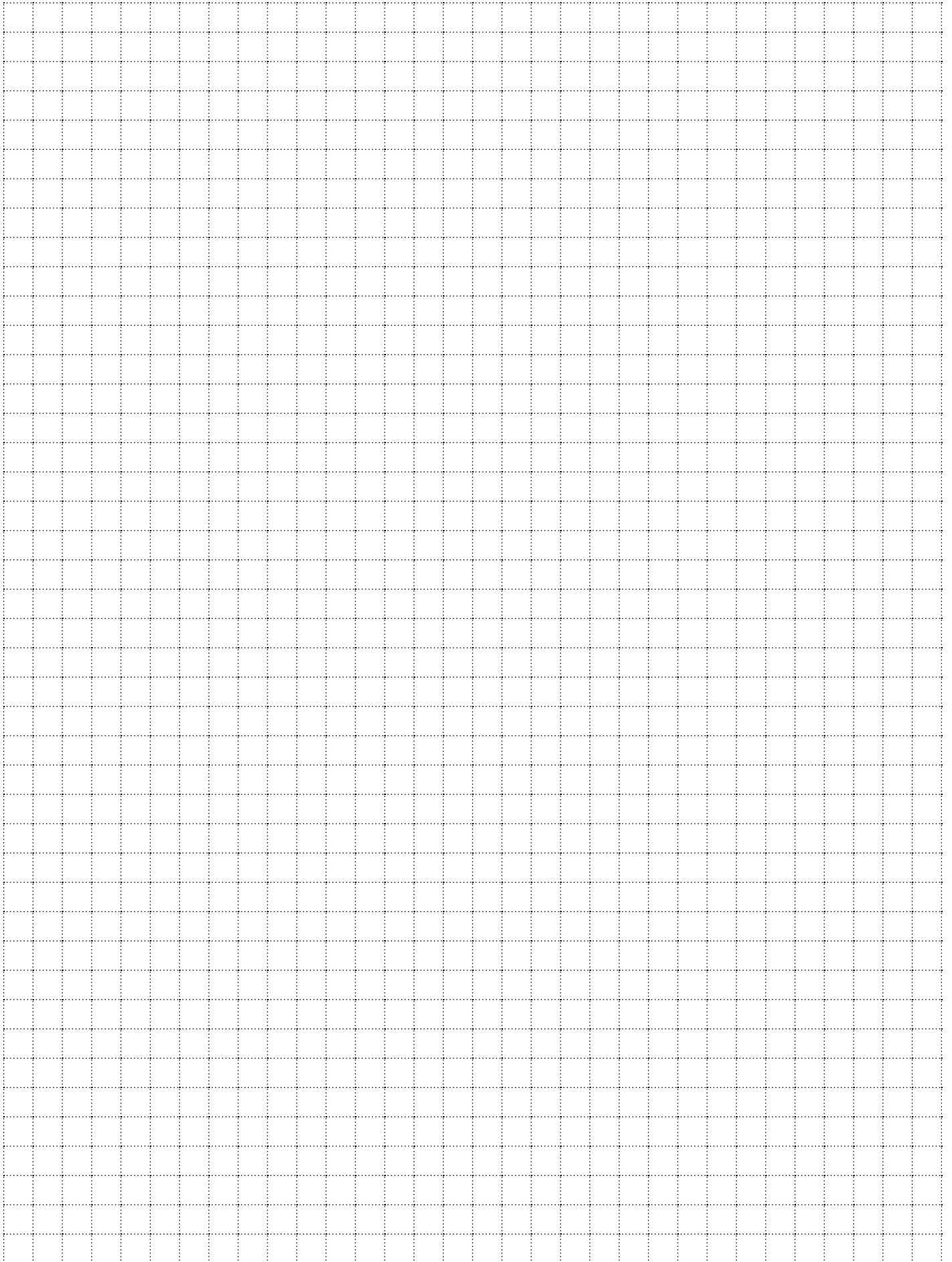


Specialists in Underfloor Heating

INSTALLATION INSTRUCTIONS

Floor Plan

Help Line - Call Free Phone: **0800 211 8249**



INSTALLATION INSTRUCTIONS

A RFM UNDERTILE HEATING MAT SYSTEM - 150 w/m²

B RFMH UNDERTILE HEATING MAT SYSTEM - 200 w/m²

C RFCIO UNDERTILE CABLE HEATING SYSTEM - 10 w/m

The above undertile heating systems are suitable for a wide range of floor coverings – ceramic, stone, limestone, slate, terracotta, porcelain or marble. These systems are designed for installation directly below the flooring, and the following instructions should be read carefully before you begin your installation.

Please read these instructions and complete your Lifetime Guarantee and return it to your supplier after installation.

All floor heating mats are 500mm wide and supplied on a roll. For example, a 3m² mat will comprise 6 metres of mat on a roll and a 12m² mat will comprise 24 metres on a roll, and so on.

The mat and cable systems can be applied to insulation construction boards, Blueboard (RF-BLUE6 or RF-BLUE10), concrete, WBP plywood and existing old tile surfaces. TILEBACKER insulation construction board is ready primed, comprising a cement finish on both sides of the board.

ELECTRICAL REQUIREMENTS

The installation must be carried out in accordance with current IEE electrical regulations and Part P of the Building Regulations.

Installation by a non-certified electrician or as part of a DIY project is possible, provided the correct procedures are followed. This will involve submissions to the appropriate authorities and inspection of the completed project. It is particularly important to record the test results for both continuity resistance and insulation resistance at each stage of the installation, and as required by the lifetime guarantee. Also, the wiring of the system to the mains electrical supply should always be performed by a qualified electrician. **Wiring and circuit protection to comply with BS7671.**

The latest regulations list the documents that should be made accessible to users of the heating system, including a sketch showing the basic layout of the system. Copy documents to be left near the consumer unit.

The heating system is designed for operation at 230V 50Hz. All installations require a 30mA RCD (residual current device) for safe operation.

We recommend the heating is connected to a dedicated circuit. Note that a fused switch spur has a maximum rating of 13 amps, so if connecting to an existing circuit via a fused switch spur, make sure the total current (amps) of your system and other appliances connected to the circuit do not exceed the current capacity of the circuit. A dedicated circuit direct from the consumer unit is always required for heating systems rated in excess of 3Kw.

The thermostat has a 16A maximum rating. When the total load of your system exceeds 3600 watts use a contactor to switch the electrical load, or alternatively split the heating into more than one heating zone each operated by its own thermostat – **always consult your electrician.**

150w/m²

Part Number	Mat Area (m ²)	Mat Length (m)	Mat Width (m)	Total Watts	Amps	Resistance (ohms)
RFM150	1	2	0.5	150	0.65	352
RFM225	1.5	3	0.5	225	1	235
RFM300	2	4	0.5	300	1.3	176
RFM375	2.5	5	0.5	375	1.6	141
RFM450	3	6	0.5	450	1.9	118
RFM525	3.5	7	0.5	525	2.3	100
RFM600	4	8	0.5	600	2.6	88
RFM675	4.5	9	0.5	675	2.9	78
RFM750	5	10	0.5	750	3.3	71
RFM900	6	12	0.5	900	3.9	59
RFM1050	7	14	0.5	1050	4.6	50
RFM1200	8	16	0.5	1200	5.2	44
RFM1350	9	18	0.5	1350	5.9	39
RFM1500	10	20	0.5	1500	6.5	35
RFM1650	11	22	0.5	1650	7.2	32
RFM1800	12	24	0.5	1800	7.8	29

200w/m²

Part Number	Mat Area (m ²)	Mat Length (m)	Mat Width (m)	Total Watts	Amps	Resistance (ohms)
RFMH200	1	2	0.5	200	0.9	264
RFMH300	1.5	3	0.5	300	1.3	176
RFMH400	2	4	0.5	400	1.74	132
RFMH500	2.5	5	0.5	500	2.2	106
RFMH600	3	6	0.5	600	2.6	88
RFMH700	3.5	7	0.5	700	3	75
RFMH800	4	8	0.5	800	3.47	66
RFMH900	4.5	9	0.5	900	3.9	59
RFMH1000	5	10	0.5	1000	4.34	52.9
RFMH1200	6	12	0.5	1200	5.22	44
RFMH1400	7	14	0.5	1400	6.08	37.8
RFMH1600	8	16	0.5	1600	6.96	33
RFMH1800	9	18	0.5	1800	7.83	29.3
RFMH2000	10	20	0.5	2000	8.7	26.4
RFMH2200	11	22	0.5	2200	9.6	24
RFMH2400	12	24	0.5	2400	10.43	22

10w/m							
Part Number	Cable Length (m)	Total Watts	120w/m ² Cable Spacing c-c = 82mm	160w/m ² Cable Spacing c-c = 62mm	200w/m ² Cable Spacing c-c = 50mm	Amps	Cable Resistance (ohms)
RFC10-170	17	170	1.4	1.1	0.85	0.74	311
RFC10-290	29	290	2.4	1.8	1.45	1.26	182
RFC10-400	40	400	3.3	2.5	2	1.74	132
RFC10-480	48	480	4	3	2.4	2.09	110
RFC10-560	56	560	4.6	3.5	2.8	2.43	94
RFC10-700	70	700	5.8	4.3	3.5	3.04	75
RFC10-820	82	820	6.7	5.1	4.1	3.56	64

DESIGN FLEXIBILITY

You can combine more than one mat or reel of cable to cover the floor area available. Each mat and reel of cable comes with a single 3 metre long cold lead wire and with multiple circuits the lead wires must be connected electrically in parallel.

Cable requires more time to install than a mat and is therefore normally avoided in larger areas, however, a cable installation can provide the installer with layout flexibility, especially in smaller awkward areas with obstacles, such as en-suites and shower rooms.

In bathrooms the thermostat control should be mounted outside the bathroom.

THE HEATING CABLE MUST NEVER BE CUT.

To facilitate installation the length of the cold lead wire can be cut to suit.

FLOOR PREPARATION

WOODEN SUBFLOORS – timber floorboards. Make sure any loose boards are firmly fixed and reinforce the floor to prevent any movement in the floor that could cause tiles to crack. **The floor should be level.**

Reinforcement can be applied to the floor by covering the complete floor with 18mm WBP plywood (weather & boilproof plywood).

Most chipboard floors will be suitable for tiling and underfloor heating.

CONCRETE SUBFLOORS – Before proceeding with your installation repair any imperfections in the floor and level the floor with approved building materials.

FLOOR INSULATION - TILEBACKER insulation construction board can be applied overall to both wooden and concrete sub floors. Alternatively, RF-BLUE6 or RF-BLUE10 styrofoam floor insulation boards can be installed on concrete subfloors, and these provide excellent thermal properties and compression strength. See page 10.

WOODEN & CONCRETE SUBFLOORS - Clean the floor surface so that it is free from dust, dirt, grease etc.

FLOOR PRIMING - Prime subfloors with RF-PRIMER to improve bonding between compounds, tile adhesives and the subfloor. This is a specially formulated acrylic primer which is used to prepare and stabilise porous surfaces prior to tiling and to improve adhesion on the substrate, such as timber and concrete. It will also prevent swelling of timber, plasterboard and MDF.

When installing insulation construction boards use tile adhesive to fix the boards to concrete floors and galvanised screws/washers on wooden subfloors.

ASPHALT OR BITUMEN SUBFLOORS - If your existing floor has a bitumen or asphalt surface it must either be removed or covered with a thin flexible self levelling compound, tile backer board or water resistant timber

FIRST STEP

Plan the installation.

Draw a general view of the room and mark the area which will be covered with heating. Avoid heating under units and sanitary ware as this can cause heat blockage and it is unnecessary to heat these areas anyway.

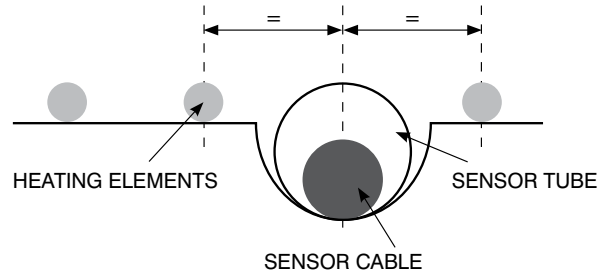
It is important you do not select a mat or cable that is too large for your room. The heating element can not be cut therefore always select a mat or cable size that is around 10% less than the floor area you are heating.

The maximum single mat size is 12m² so for many larger installations two or more mats will be required. These are connected in parallel. Parallel connection means all the “live” wires are connected together and all the “neutral” wires are connected together.

Mark the position of the cold lead wire(s) at floor level. This will be close to the thermostat position.

When you have decided on this position you can cut a groove in the floor to accommodate the protective floor sensor tube. The sensor must run centrally (in the middle) between two runs of heating element so it is important to note where the element will be positioned. Make the sensor tube level with the heating element as shown opposite.

Make sure the sensor tube has a gradual bend when it enters floor level - this will ensure the sensor cable can be easily withdrawn. The tube can be cut to length to suit. Seal the end of the tube with fixing tape.



The black cable joint between heating element (blue cable) and cold lead wire (black cable) must be located on the floor. This joint should be level with the heating system – another small groove may be necessary.

FLOOR INSULATION

On wood or concrete subfloors, a thermal barrier between the heating element and subfloor will increase performance, heat up time and saves electricity costs.

To maximise the efficiency of the installed heat energy, insulation should be installed, either below the subfloor or as a layer of insulation on top of the subfloor, OR BOTH.

If raising the floor height is an issue it is acceptable and beneficial to apply two coats of floor insulating paint RF-THERMAPAINT.

TESTING

IMPORTANT: Before and during installation resistance continuity tests are necessary. Also, measure the insulation resistance and record the value.

Test before installing, immediately after installing (before tiling) and before putting the heating into operation.

CONSULT A QUALIFIED ELECTRICIAN.

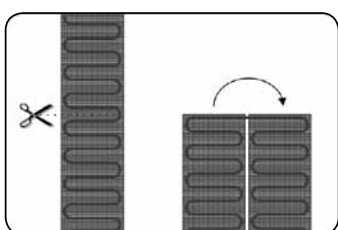
A digital multimeter is ideal for testing the cable resistance (ohms), as well as the resistance of the sensor cable.

500V insulation resistance readings should also be carried out as required by BS7671.

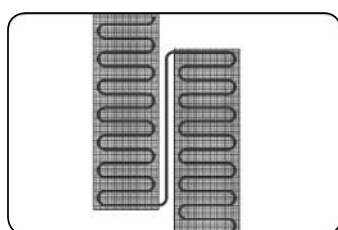
MAT LAYOUT & FIXING

The heated floor area must be free, avoid heating under kitchen cabinets, sanitary ware and appliances. The planning is important and to estimate the mat size a good guide is to measure the total floor area of the room, take away 10%, then take away the area of any fixed objects.

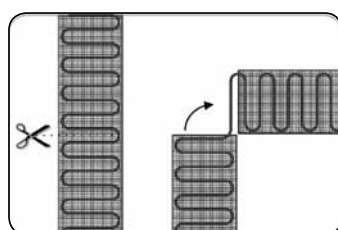
Make sure the mat system will fit the floor area to be heated. It is better to have just too little than too much over. Remember, NEVER cut the heating element. Cut only the element carrier, and turn / flip the mat to meet your requirements as shown in the small illustrations below.



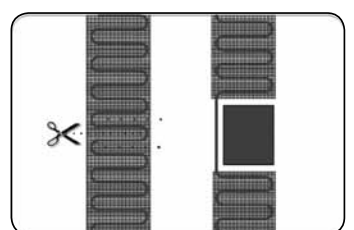
PLAIN WALL CUT



LOOSE CABLE



OPEN CORNER



OBSTACLE CUT

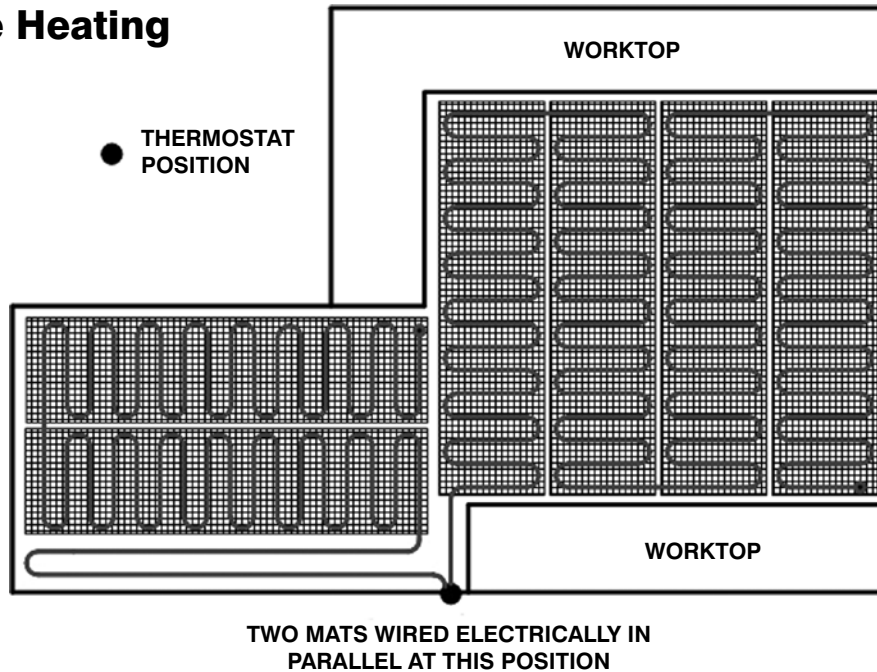
The position for the thermostat should have been decided at the initial planning stage.

Check that the cold lead wire for the mat(s) will reach the connection – this is the connection with the junction box (depending on the number of mats), or direct to the thermostat. If it does not, extend by removing some of the heating element from the carrier and fix the heating element to the floor with fixing tape.

Arrange the mat on the floor, roll out and make the appropriate cuts at walls and flip overs etc. Do not remove the two sided adhesive tape until you have planned which way you intend to lay the mat. Once the mat installation has been planned remove the two sided tape and stick to the subfloor pushing lightly to ensure good adhesion. It helps to walk on the mat in stocking feet. It is also acceptable to use fixing tape to help fix the mat.

The undertile heating mat system is installed the professional way with the heating elements facing downwards. This is especially helpful when laying your tiles directly onto the mat without first applying a screed. Also, because the elements are on the underside of the glass fibre mesh they are shielded from sharp trowels and possible damage.

Typical Layout of the Undertile Heating Mat System

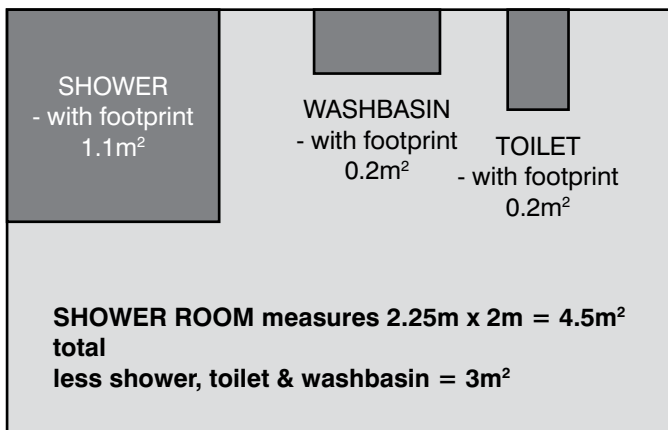


RFC10 CABLE INSTALLATION

CABLE SPACING CALCULATION

All the cable must be used on the free floor area. The cable cannot be cut, crossed over or bunched together.

Work out the total free area where you will be applying the heat, allowing for a gap of up to 100mm around the perimeter.... It is not necessary to apply the heat too close to the edge.



To calculate the cable spacing multiply the heated area by 1000 and divide by the cable length.

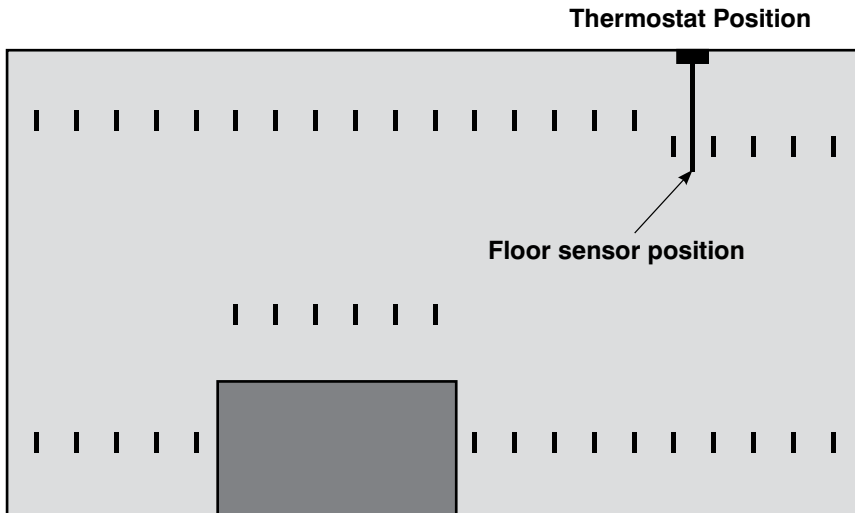
The example would be ideal for RFC10 Part Number RFC10-400, a 40 metre cable rated at 10w/m with a total loading of 400 watts

3×1000 divided by 40 = 75mm spacing

IMPORTANT: Should the spacing calculated be less than 50mm select another cable size.

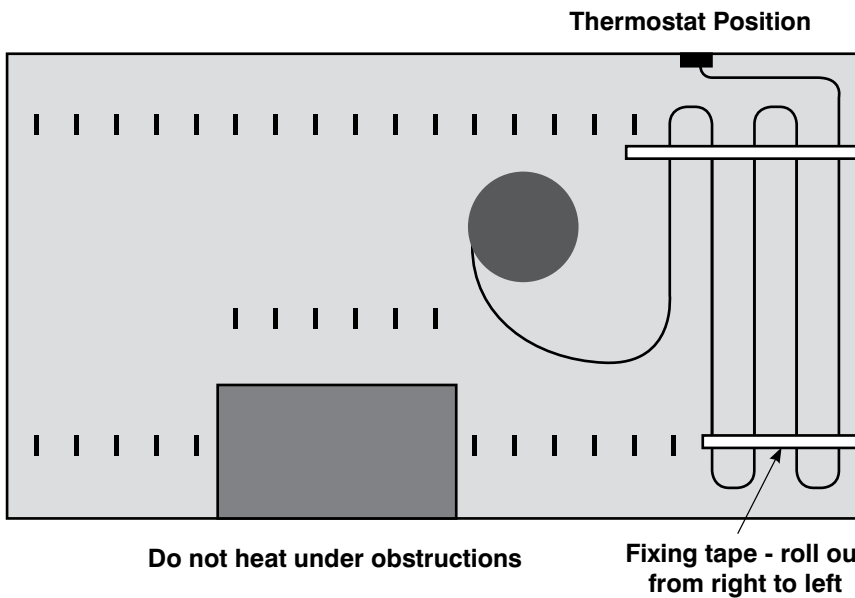
Cable can be dispensed from the reel with ease. Do not remove the cable from the reel before fixing as this will make the installation difficult.

CABLE LAYOUT & FIXING



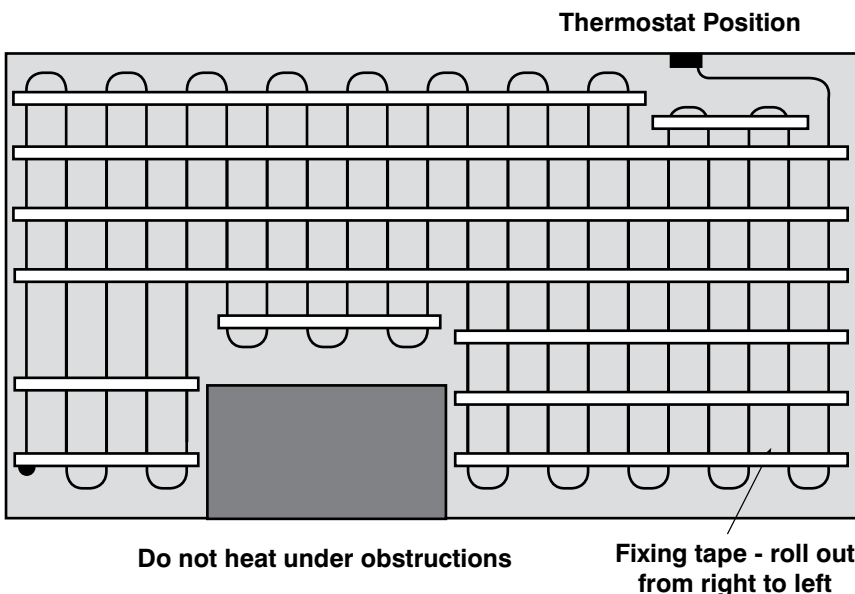
Planning is important and when calculating the heated floor area leave a gap unheated around the room perimeter of between 50-100mm. The heated floor area must be free, avoid heating under kitchen cabinets, sanitary ware and appliances.

Mark the floor with marker pen at intervals equal to the calculated spacing. Position the floor sensor.



Fix the cable to the sub-floor with fixing tape. Initially, draw the cable from the reel and secure the cable with fixing tape in the corners of the room only, gradually working across the room and rolling the fixing tape out to hold the cable in position – see left.

This enables the spacing to be adjusted where necessary to achieve even spacing prior to final fixing.



The position for the thermostat should have been decided at the initial planning stage.

Check that the cold lead wire for the cable(s) will reach the connection – (this is the connection with the junction box or direct to the thermostat).

TILING (MATS OR CABLE)

To fix tiles select a single step or two step method.

SINGLE STEP: Using a rapid set flexible adhesive the tiling can be carried out as a single operation directly on top of the heating mat or cable. Allow a depth of adhesive sufficient to lay the tile and to encapsulate the heating element with no air gaps

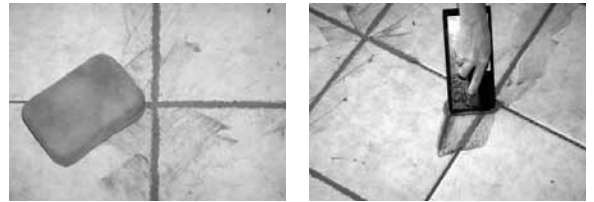
TWO STEPS: Apply a thin layer of two part latex self levelling compound just sufficient to cover the cable and encapsulate the heating elements with no air gaps. Allow to cure in accordance with the manufacturers instructions. This will provide protection to the heating cable prior to tiling and give you a good flat surface on which to install the tiles. Next apply the tiles in rapid set flexible tile adhesive in the normal manner.

Both steps are approved for under tile heating.

All adhesives must be flexible and suitable for underfloor heating.

GROUTING

Use a latex, acrylic or epoxy grout for grouting between the tiles. Latex, acrylic and polymers add flexibility to grouts to resist cracking. Epoxy grouts provide high strength, good thermal shock resistance and fast cure. Do not use sharp objects to clean the grout from between the tiles. Most damage to the heating cable occurs when excess grout is scraped away and a sharp tool goes deep enough to damage the cable.



REMINDERS - (MAT OR CABLE INSTALLATIONS)

- Do** – Read the instructions before commencing installation and consult a qualified electrician.
- Do** – Take advice if you are unsure how to proceed
- Do** – Ensure the system is tested before, during and after installation. Always check the mat or cable is working before commencing tiling.
- Do** – Use approved adhesives and floor screeds
- Do** – Plan your mat or cable layout so that any drilling after tiling will not damage the wiring.
- Do** – Maintain a minimum gap between loose wire runs of 50mm (2")
- Do** – make sure the heating is connected to an RCD rated 30mA maximum.
- Do** – make sure the black joint between the blue heating element and the black cold lead wire is in the floor beneath the tiles.
- Do** – keep a record of where the floor probe is positioned and the general layout of the heating mat or cable for future reference.
- Don't** – overload circuits – consult your Electrician
- Don't** – cut the heating element
- Don't** – cross or touch heating elements
- Don't** – cut or prepare tiles on top of the mat
- Don't** – Switch on the installed mat or cable until 8 days after fitting to allow the tile adhesive to dry.
- Don't** – Connect two mats or cables in series, only in parallel
- Don't** – Leave surplus matting or cable rolled up under units or fixtures – always use the right size
- Don't** – Run the floor sensor or power lead over or under the heating element
- Don't** – Commence installation on a concrete floor that has not been fully cured

D

RFLAM UNDERLAMINATE HEATING MAT SYSTEM - 140 w/m²

The RFLAM underlamine foil heating mat system is the ultra thin underfloor heating system primarily for use under laminate, engineered woods, and other floating floors. The following instructions should be read carefully before you begin your installation.

Please read these instructions and complete your Lifetime Guarantee and return it to your supplier after installation.

RFLAM systems are installed directly under laminate or engineered wooden floors, on top of the LAMFOAM underlay. The LAMFOAM underlay must be applied to the floor before the underfloor heating. The underlay (floor insulation) shall be a 6mm layer of cross linked closed cell polyethylene, designed specifically for underfloor heating.

LAMFOAM is fixed to the floor with a light duty adhesive.

140w/m ²						
Part Number	Mat Area (m ²)	Mat Length (m)	Mat Width (m)	Total Watts	Amps	Resistance (ohms)
RFLAM-280	2	4	0.5	280	1.22	188.93
RFLAM-350	2.5	5	0.5	350	1.52	151.14
RFLAM-420	3	6	0.5	420	1.83	125.95
RFLAM-490	3.5	7	0.5	490	2.13	107.95
RFLAM-560	4	8	0.5	560	2.43	94.46
RFLAM-630	4.5	9	0.5	630	2.74	83.96
RFLAM-700	5	10	0.5	700	3.04	75.57
RFLAM-840	6	12	0.5	840	3.65	62.98
RFLAM-980	7	14	0.5	980	4.26	53.98
RFLAM-1120	8	16	0.5	1120	4.87	47.23
RFLAM-1260	9	18	0.5	1260	5.48	41.98
RFLAM-1400	10	20	0.5	1400	6.09	37.79

ELECTRICAL REQUIREMENTS

The electrical requirements are the same as given for RFM, RFMH and RFC10 systems. **Always consult your electrician.**

THE HEATING CABLE MUST NEVER BE CUT.

FLOOR PREPARATION

Please refer to the instructions given for the RFM, RFMH and RFC10 systems.

To improve bonding between the LAMFOAM insulation and the base floor prime the sub-floor.

FIRST STEP

Plan the installation.

Please refer to the instructions given for the RFM, RFMH and RFC10 systems.

Plan to use the larger RFLAM mats as much as possible to heat the required floor area.

FLOOR INSULATION

The LAMFOAM underlay must be applied to the floor before the RFLAM underfloor heating.

LAMFOAM has been tested and approved specifically for underfloor heating. It has excellent fire retardant properties, compression strength, thermal conductivity and working temperature range (-60 / +90°C). LAMFOAM also has excellent sound deadening properties.

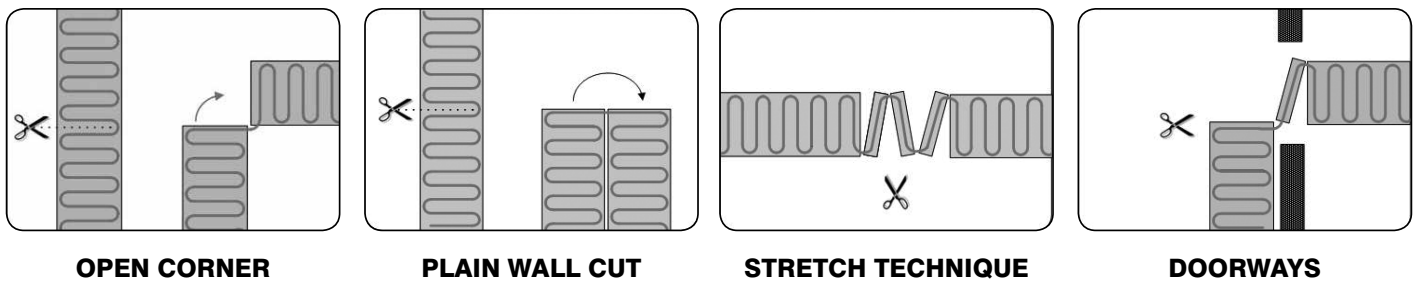
LAMFOAM is rolled out onto the subfloor (concrete or wooden) using a spray adhesive around the edges to assist the laying process prior to fitting the RFLAM mats. Remember to prime the sub-floor prior to fixing.

MAT LAYOUT & FIXING

RFLAM mats must be fitted directly on top of the underlay (floor insulation), and directly under the laminate flooring – no screeds, vapour barriers or additional materials are required.

Planning is important and when calculating the heated floor area leave a minimum unheated gap of approx.100mm around

the room perimeter. The heated floor area must be free, avoid heating under kitchen cabinets, sanitary ware and appliances. Make sure the RFLAM system can fit the floor area to be heated. It is better to have too little than too much over. **Remember, NEVER cut the heating element.** Cut only the element carrier (aluminium), and turn / flip the mat to meet your requirements as shown in the small illustrations below. Cut across the mat width centrally between two runs of heating element.



WARNING: NEVER CUT THE HEATING ELEMENT

The position for the thermostat should be decided at the initial planning stage.

Check that the cold lead wire for the mat(s) will reach the connection – this is the connection with the junction box (depending on the number of mats) OR direct to the thermostat. When installing more than two mats the use of a junction box is recommended.

Arrange the mat on the floor, roll out and make the appropriate cuts. Make sure the mat is the correct way up. The exposed heating element loops MUST be on the underside of the mat when the mat is laid onto the insulation. The side marked “THIS SIDE UP” is facing upwards.

The RFLAM system is supplied complete with fixing tape. The mats are installed flat and fixed to the underlay with the fixing tape.

When a mat has been cut and turned strips of aluminium foil tape are supplied so that you can bridge the gap between the strips of mat.

This is required to ensure the mat maintains its ground (earth) circuit throughout the mat.

Electrical cold leads must not cross each other or cross over the mats.

ELECTRICAL CONNECTIONS

When installing more than one mat mark the leads coming from each mat with the same number for identification purposes. For example, MAT 1: mark both the leads with 1, MAT 2: mark both the leads with 2 etc.

REMINDERS

- Do** – read the instructions
- Do** – use the right size of mat(s) and only apply the mat to the area to be heated
- Do** – consult a certified / qualified electrician
- Do** – make sure the heating is connected to an RCD rated 30mA maximum.
- Do** – make sure the cold lead joint is in the floor beneath the laminate / wooden flooring.
- Do** – keep a record of where the floor probe is positioned and the general layout of the heating mats for future reference.
- Do** – use the recommended underlay / floor insulation – Part Number: LAMFOAM
- Do** – ensure the earth leads are connected to the earth circuit of the property
- Don't** – overload circuits – consult your Electrician
- Don't** – cut the heating element
- Don't** – cross or touch heating elements
- Don't** – cross cold leads, electrical supply cables or sensor cable over the mats
- Don't** – drop sharp tools or heavy objects on top of the mats
- Don't** – put any other form of underlay (acoustic) between the foil heating mats and the wooden floor
- Don't** – use wooden floors that have metallic clips as part of their locking system as these metallic strips may damage the RFLAM mat.
- Don't** – connect any other electrical appliance on the same fused spur or RCD of the heating system
- Don't** – install RFLAM mats when the room temperature is below -5°C

- Don't** – overlap heating mats
- Don't** – crease or fold the RFLAM heating mats
- Don't** – Create a heat blockage on the floor with bean bags or similar furniture.
- Don't** – RFLAM must not be installed in screeds, or in direct contact with the sub floor. LAMFOAM underlay must always be used with RFLAM mats.
- Don't** – use RFLAM under carpet with a TOG rating greater than 2. Carpet must be approved by the manufacturer for underfloor heating.
- Don't** – install RFLAM under floors with a thickness greater than 18mm
- Don't** – walk unnecessarily on the RFLAM mats. **WARNING:** once the mats are installed it is important to avoid traffic over the mats until the floor has been laid. If the floor is not being installed immediately, RFLAM mats should be protected with layers of cardboard or hardboard to prevent damage.
- Don't** – place RFLAM on top of other in-floor radiant heating systems (i.e. hydronic or in-screed systems), unless the other system is permanently disconnected.
- Don't** – use chairs on castors directly on the carpet surface, always use a plastic carpet protector.
- Don't** – pierce carpet with sharp items.
- Don't** – drive nails or screws through a carpet.

BLUEBOARD INSULATION SHEET

Part Numbers: RF-BLUE6 and RF-BLUE10

INSTALLATION INSTRUCTIONS

Blueboard insulation sheets measure 1245mm long x 600mm wide and are easily cut with a sharp knife.

Each board will cover a floor area of 0.72m²

Do Not: Use ready mixed or solvent based adhesives

Do: Layout and fix blueboard onto the floor in a staggered brickwork pattern.

UNDERTILE HEATING SYSTEMS (MATS OR LOOSE CABLE)

Do Not: Install Blueboard directly onto wooden floorboards

Do Not: Use solvent based or ready mixed adhesive products

- **CONCRETE & SCREEDED FLOORS** - When using with undertile heating systems (mats or loose cable), ensure the blueboards are bonded to a clean dry floor surface after initially priming the floor with a suitable primer.

Bond the blueboard to the floor with a good quality **Rapid Set Flexible** floor tile adhesive. Apply the adhesive with a notched comb and using a straight edge make sure the insulation sheets are bedded into the adhesive.

Apply the heating system.

Apply a **two part latex self levelling compound** to embed the heating system prior to tiling.

Alternatively, it is possible to tile directly over the blueboard and heating system. Ensure that all the heating elements are fully embedded within the tile adhesive.

Use a **Rapid Set Flexible** tile adhesive.

UNDERLAMINATE FOIL HEATING SYSTEMS

- **CONCRETE, SCREEDED & WOODEN FLOORS (ALL SUB FLOOR TYPES)** - Blueboards to be laid loose on the sub-floor in a staggered brickwork pattern. The blueboards can be taped together to prevent movement during the laying of the foil heating system.



GUARANTEE CERTIFICATE

Please complete and return this certificate to your supplier within 30 days and keep a copy to validate the lifetime guarantee.

Name:

Address:

..... Phone No:

Type of room:

Heating mat / cable Part Number(s):

Purchased from: Date of Purchase:

Initial Resistance test (continuity): (ohms)

Insulation Resistance:

Signed by electrician / installer:

Date:

Resistance test (continuity) prior to laying tiles: (ohms)

Insulation Resistance – prior to laying tiles:

Signed by electrician / installer:

Date:

Final Resistance test (continuity): (ohms)

Insulation Resistance:

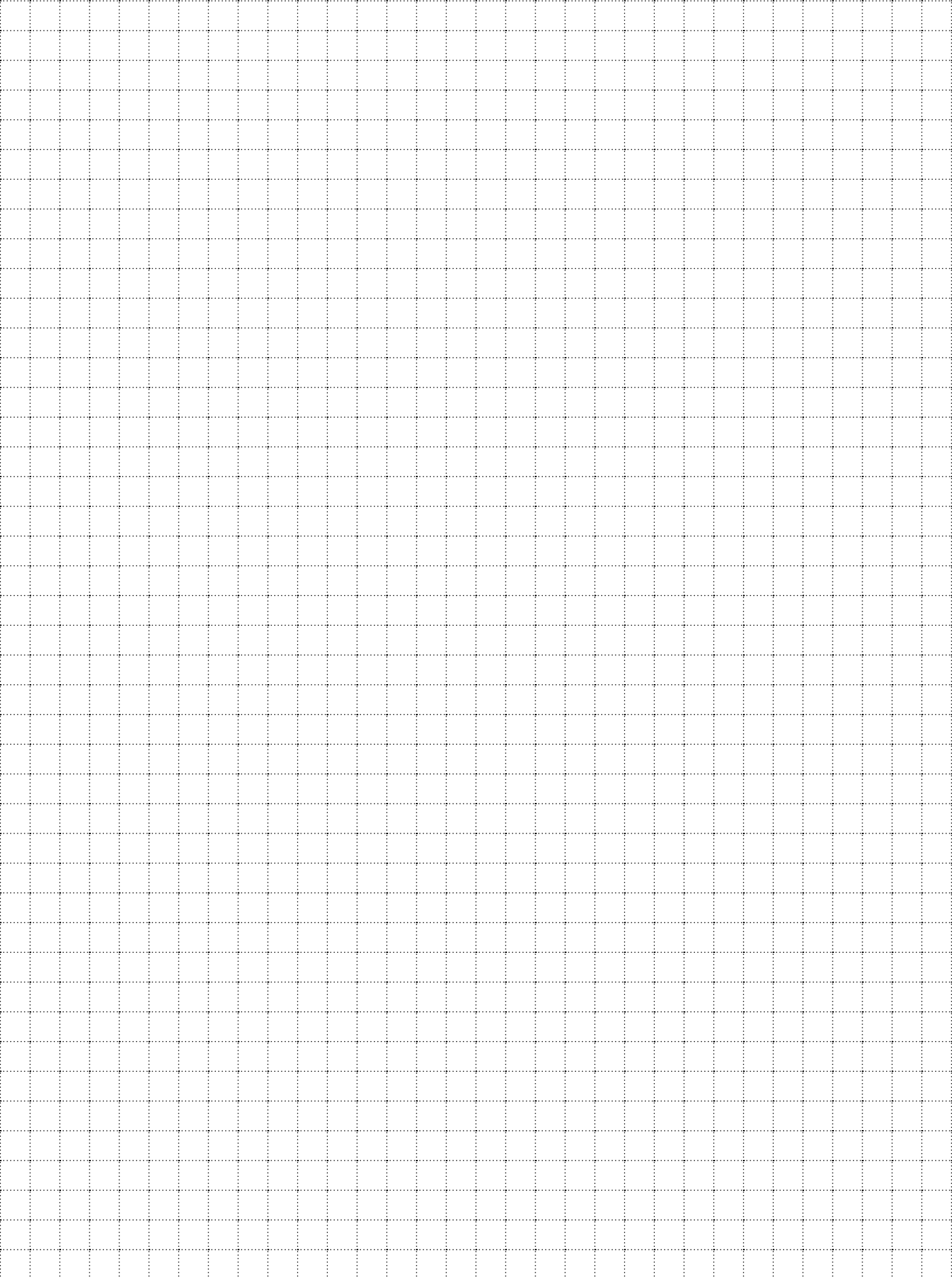
Signed by electrician / installer:

Date:

Date of completion:

Floor Plan

Help Line - Call Free Phone: 0800 211 8249





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