

INSTALLATION MANUAL

harmoni smartfoil



Before you begin installing, read through these instructions carefully and check that you have all the components required.

www.harmoniheating.co.uk

01473 559088

INTRODUCTION

Important notes, please read carefully before proceeding with installation

The Harmoni brand

Thank you for choosing the Harmoni SmartFoil from the Harmoni range of electric underfloor heating solutions.

The Harmoni range has been manufactured to surpass all current industry standards and comes with a lifetime warranty.

Harmoni SmartFoil

Harmoni SmartFoil is an ultra-thin electric radiant floor heating system primarily for use under laminate, engineered wood and glued hardwood.

The advantages of using Harmoni SmartFoil are:

- ease of installation
- uniform heating of your laminate flooring; the specialised materials used eliminates problems due to hotspots or localised heating.
- Independently S Mark approved by Semko, visible proof of the safety of our product.

Tools needed for installation

You will require the following items to install and test the Harmoni SmartFoil system.

- Stanley knife or similar sharp blade, plus a pair of scissors
- Electrical housing boxes 35mm deep (minimum)
- Tape measure
- Insulation boards (underlay)
- Aluminium tape
- Resistance tester (multimeter), insulation resistance tester

You will also need the appropriate tools and materials to install the finished floor surface; these will probably include products such as self-levelling compound, insulated backer board, notched tile trowel and various other tools and materials for your specific project.

If you are using more than two cables, a junction box is recommended.

Contents of Harmoni SmartFoil heating

- Harmoni SmartFoil heating mat
- Sensor tube
- Installation instructions
- Warranty

Important Information

Harmoni SmartFoil is designed for installation directly under wood laminate, on top of an underlay such as insulation boards.

The minimum thickness of any covering material must be 5mm in accordance with IEC 60335-2-96 7.12.1 g.

Contact the manufacturer of the wooden/laminate floor if unsure about the suitability of SmartFoil with their product.

Harmoni SmartFoil is not designed for installation under ceramic tiles, natural stone or similar hard floor covering, and must not be installed under nailed hardwood flooring – other products are available to heat these types of floor. Contact us for more information.

We want your installation to be trouble-free – **If you have any problems, please contact us on 01473 559088.**

DOs & DON'TS

Do

Carefully read this instruction manual before starting the installation and **follow the testing procedure on page 8.**

- Take time to plan the mat layout considering all obstacles e.g. kitchen cupboards, bathroom sinks etc.
- Ensure the mat will fit before laying. If the mat is too large, it must be exchanged for a smaller mat size.

Don't

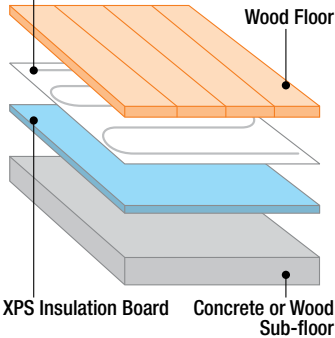
- Don't cut or shorten the foil heating cable.
- Don't cross or touch the foil heating cables together.
- Don't switch on the foil heating mat while it is rolled up or still on the drum.
- Don't fold or crease the mat at any time, always roll it.
- Don't install near other heat sources such as luminaries & chimneys.
- Don't install under cabinets or other fittings or furniture – including bean bags, rugs or mats – that will be situated permanently on the floor.
- Don't install the Harmoni SmartFoil system below 0°C ambient temperature.
- Don't install in thin set cement, or in direct contact with a cement or concrete subfloor or slab. There must always be an underlay (insulation board) under the foil mat.
- Don't install on irregular surfaces.
- The mats must not be installed on top of other in-floor radiant heating systems (for example hydronic or in-cement) unless the other system is permanently disconnected.

CONSTRUCTION OF THE HARMONI SMARTFOIL

Intertek Semko certified as per EN 60335-2-96 and GOST

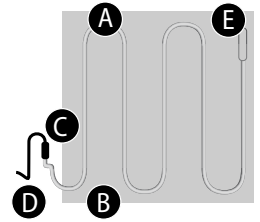


Harmoni SmartFoil



The Harmoni SmartFoil system is made with Fluoropolymer insulated heating cables which are sandwiched between two layers of specially reinforced aluminium foil. The uniform spacing of the heating elements, further backed by the aluminium foil, ensures even heat distribution. The heating element is connected to a power-supply cable which exits the laminate mat from one corner.

The power lead is a flat thin two core flexible cord, consisting of two insulated conductors with a metal sheath/solid earth cable and an outer sheath.



- A** Heating element
- B** Aluminium foil
- C** Factory made cold tail joint
- D** Cold tail power lead
- E** End termination joint

ELECTRICAL REQUIREMENTS

Always consult an electrician regarding your requirements

Please follow these instructions carefully. If you require assistance prior to or during your installation, please call our helpline on 01473 559088

⚡ Important Notes

When designing your electrical installation, you should always consult an electrician regarding your requirements. Before installing the Harmoni SmartFoil system you should make allowance for the electrical connections.

For safety reasons, a fused spur which has a contact separation in all poles, providing full disconnection under overvoltage category III conditions, must be used.

The Harmoni SmartFoil system requires a mains voltage 230V. Due to Part P regulations, only a qualified electrician is allowed to make the final connections to the electrical supply and test the installation.

For all areas up to 20m², power connection can be provided through a 13A switched fuse spur outlet/combined RCD spur outlet. For areas larger than 20m², a dedicated circuit should be installed from the local consumer unit.

List of accessories required in addition to the Harmoni SmartFoil:

- Floor sensing programmable thermostat (*see below*)
- Main switch
- Residual current device (RCD)

Note:

Details of the thermostat installation will be available in the installation manual provided with the thermostat.

Controls

- Thermostat: OJ Electronics OCC2

The Harmoni SmartFoil system should be connected to the electrical system through a Ground Fault Circuit Interrupter (GFCI)/Residual Current Device (RCD), equivalent to having a rated residual operating current not exceeding 30mA, only by a qualified electrician. If possible, incorporate a dedicated GFCI in each circuit supplying power to the mats. This is critical to the safe operation of the Harmoni SmartFoil system.



This symbol means **Direct Floor Heating**

PRE-INSTALLATION INSTRUCTIONS

Ensure the sub floor is structurally sound, clean and dry



Make sure the Harmoni SmartFoil is the correct size before unpacking the product. Call 01473 559088 if you have any questions.

⚡ Important Notes

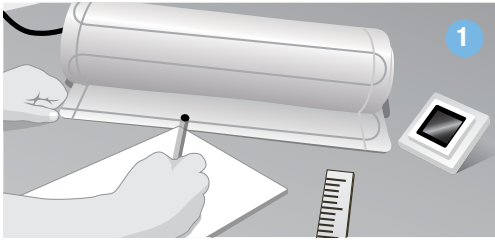
Keep an accurate record of where the mats are installed to assist you for future reference, (e.g., during renovation work).

Part P wiring regulations state that a diagram must be placed next to your fuseboard showing where underfloor heating is installed.

Step 1: Plan your mat layout

Draw a layout of your room including all obstacles e.g. toilet, sink etc, (use the floor plan grid on pages 10–11) then determine the required floor area to be heated.

Decide on a suitable position for the thermostat (start point) then sketch the proposed Harmoni SmartFoil layout to ensure the heated area is completely covered whilst using all of your mat (see mat planner notes on page 7).



Step 2: Prepare electrical & clean the floor

Carry out any electrical prep work needed for the install: chase walls, and install back boxes for fused spurs and thermostat position.

Make sure the sub-floor is clean and dry. It is crucial that there are no sharp objects protruding from or left on the floor that could damage/pierce the foil mat.

Nails, screws or staples must not be installed close to the mats or power cables. Permanent fixtures, including built-in furniture, must **never** be placed over the mats.

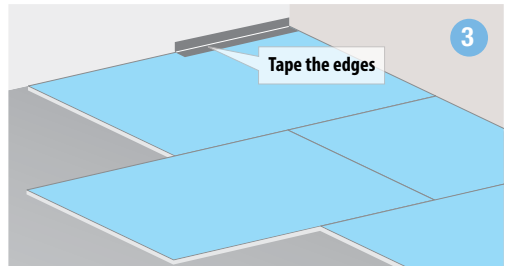
Step 3: Install underlay/insulation boards

Most types of underlay/insulation board can be used as long as they have a density of 6lbs per cubic foot. Underlayments such as 6mm thick cork or 6–10mm of expanded polystyrene (EPS) are recommended for Harmoni SmartFoil heating mats.

If installing insulated tile backing boards, you must comply with the manufacturer's instructions.

Install the boards in a brick pattern and tape the edges to prevent movement of the underlay during installation (See image 3).

Note: A vapour barrier, such as a plastic sheet, can also be placed below the underlayment, although underlayment papers are not suitable.



Step 4: Install the floor sensor probe

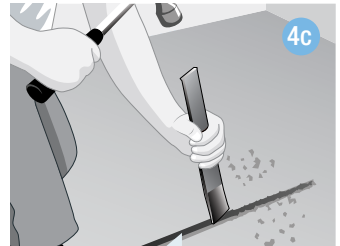
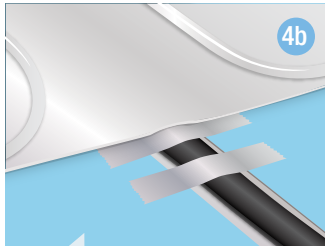
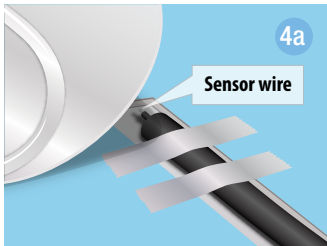
If you are using a thermostat with a floor sensor (recommended for wooden floors), install the black conduit in the wall chase and at least 150mm into the heated area. Run the probe wire down inside the conduit until it just appears from the end of the conduit (See image 4a).

Tape the sensor within a channel cut into the insulation (See images 4a & 4b) directly underneath the mat, centred between two heater wires. You may have to channel a groove into the sub-floor (See image 4c).

Run the sensor cable back up to the thermostat then connect the 2-core cable to the thermostat in the correct terminals.

INSTALLATION INSTRUCTIONS

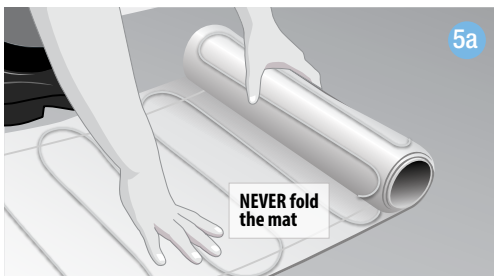
Read through these instructions carefully before laying the Harmoni SmartFoil



⚡ Important Note

Make sure the sensor probe is positioned between two heating elements – **the sensor wire must not cross over the foil heater wires.**

Note: A 6mm wide groove may have to be channelled to allow the flexible tube to remain flush with the existing floor.



Step 5: Lay the mat

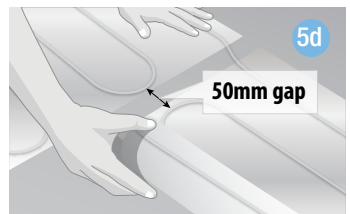
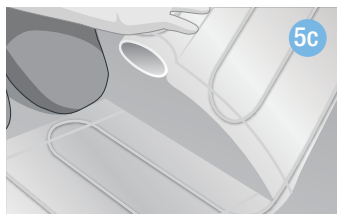
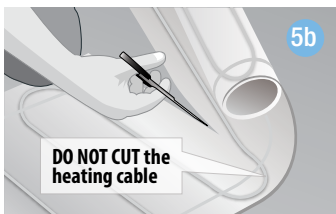
Remove the Harmoni SmartFoil mat from the packaging box, unroll it completely (See image 5a) and place it in the required position for the first run on top of the underlayment.

Make sure that heating mats are laid with the side marked "THIS SIDE UP" facing upwards.

⚡ **Now check the resistance of the mat (see page 8 for details) BEFORE you begin to lay out the mat.**

When positioning the foil mat on the underlayment, be aware of the following:

- Keep it at least 300mm from any edge of the area to be laminated (to prevent the spikes of the power stretcher damaging the mat when the laminate is being fitted).
- Ensure the power supply cables can reach the thermostat point to which they will be connected.
- Wherever possible, run the power supply cables parallel or at right angles to the walls, and avoid high-traffic areas.
- Wherever possible, keep the corner where the power supply cable enters the mat away from high traffic areas.
- **Never** run the power supply cables under or over the mats.
- The mat can be cut and turned at 90° or 180° while laying to cover the total area – the heating cable must **not** be cut (See images 5b & 5c). Ensure the heating cables are kept a minimum of 50mm apart (See image 5d).
- The mats must not be used folded. Do not fold or crease the mats at any time during installation. If mats need to be moved at a later stage, they must be rolled not folded. For these reasons Harmoni SmartFoil is not suitable for stairs.



INSTALLATION INSTRUCTIONS

Read through these instructions carefully before laying the Harmoni SmartFoil

⚡ Important Notes

Foil mats must never be cut or trimmed to fit into a space that is too small.

Ensure the mats are not laid in areas that fixed items occupy e.g. underneath sink basins or toilet pans.

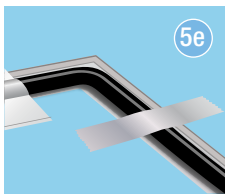
Extra care should be taken to avoid damage during installation, such as dropping heavy or sharp objects, stepping too heavily on the heating mats or careless pouring of the adhesive.

Do not walk on the mats unless absolutely necessary during installation.

Do not place anything heavy on the mats.

Step 5: Lay the mat (continued)

Following your previously drawn mat layout, decide on the route for the cold tail (power cable) from the mat to the point of supply then cut a 6mm wide channel in the insulation



along this route. Place the cold tail into this channel and tape securely into position.

You may also need to remove a small section of insulation from under the mat at the point where the power supply cord

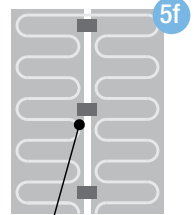
enters the mat, to prevent an unsightly lump on the laminate surface and excessive wear on that part of the mat (See image 5e).

When you have reached the end of the mat run, carefully cut the grey backing mat in-between the two heating cables (do not cut the heating cable) and turn the mat to its new position. Ensure the heating cable remains a minimum of 50mm apart (See images 5b, 5c & 5d on page 5).

Once the mat is turned and secured, continue this process until all of the mat is used. Then check the complete matting area is securely fixed to the floor.

If installing two or more heating mats next to each other make sure the heating wires in adjacent mats do not overlap (See image 5f above right). Use adhesive tape to fix them and ensure that they do not overlap over time.

When fitting more than one mat in a room or when you cut the mat to cover the total area, fix aluminium tape to adjacent mats in 3–4 places on both sides to give proper continuity/earthing to the mats. **The mats must not overlap, as overheating will result.**

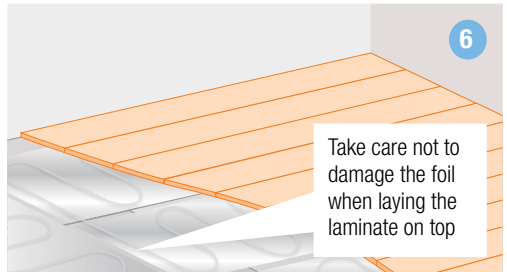


Aluminium tape on both sides

⚡ **Check the resistance of the mat again (see page 8 for details) to make sure damage hasn't occurred during the installation process.**

Step 6: Lay the laminate

Once you have completed the mat installation and checked the resistance, the laminate floor covering can be laid.



⚡ Important Note

The maximum thermal resistance recommended between heater and the room is 0.15m² K/W (1.5 tog).

After the finished floor covering has been laid, perform the following tests again (see page 8):

- Insulation resistance test
- Heating cable resistance test
- Thermostat floor sensor resistance test

The findings must be recorded on the *Commissioning Record* enclosed in the mat box or your warranty will be invalidated.

MAT PLANNING EXAMPLES

Using one & two foil mats

Planning the foil mat layout

When planning the Harmoni SmartFoil layout, ensure you cover as much of the free floor area as possible:

- never install the heating cables any less than 50mm apart.
- never cut the heating cable.
- never remove any pre-manufactured cable joints or end seal joints.

When installing two or more foil mats within the same area always ensure the cold tail (power cables) are returned to the thermostat power connection and are wired in parallel. Never wire the foil mats in series, and always check the mats have thoroughly adhered to the floor before tiling.

Timber substrates should be prepared as required by tiling guide lines, for example bracing of a timber floor with WBP.

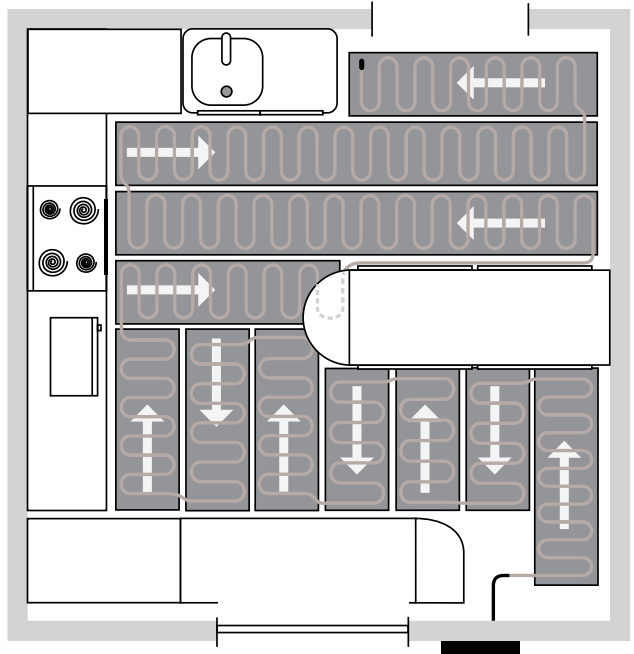
Please follow these instructions carefully. If you require assistance prior to or during your installation please call our helpline on 01473 559088.

Note

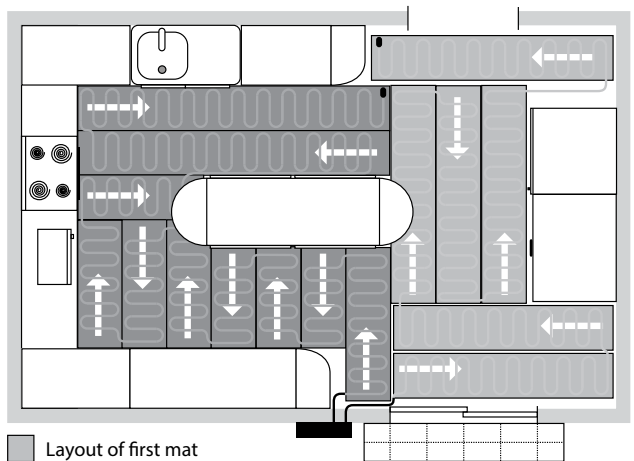
- Sketch your floor plan using the grid on pages 10 & 11
- Calculate the Total Load on page 9



Plan using one mat



Plan using two mats



- Layout of first mat
- Layout of second mat

TESTING & COMMISSIONING

The Warranty Validation Procedure must be carried out to validate the warranty



Warranty Validation

To validate your lifetime warranty registration, the insulation resistance test, the heating cable resistance test and the sensor resistance test must be carried out three times during the installation process.

1. Before laying the Harmoni SmartFoil.
2. After laying the Harmoni SmartFoil and before covering the Harmoni SmartFoil.
3. After the finished floor has been laid.

This information must then be recorded on the Commissioning Record form (enclosed in the box), otherwise the warranty will be invalidated.

Heating Cable Resistance Test

This test is carried out to prove continuity of the heating element. A low resistance ohm meter should be used (i.e. Multimeter on ohm setting). Connect the meter on to the brown and blue mains lead and confirm the resistance value matches the figure stated on the specification label on the cable cold lead joint.

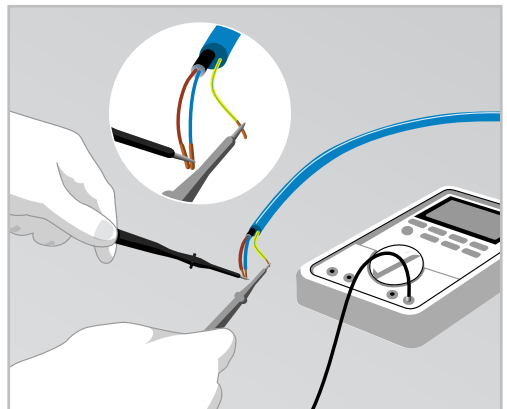
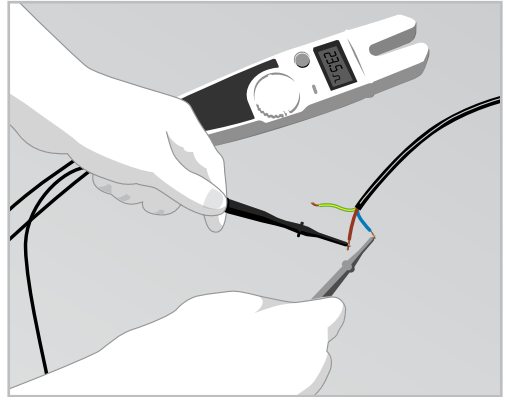
Floor Cable Resistance Test

See *Heating Cable Resistance Test* above and repeat with the floor sensor cable.

Insulation Resistance Test

This test is performed to measure the insulation resistance between conductors and ensures the cable insulation is not damaged. A low resistance reading indicates a damaged cable, which must be repaired or replaced.

The insulation resistance tester should be connected between the conductors (blue and brown cables) and the earth (yellow/green cable). The meter should record a high resistance value e.g. above 100 Meg ohms.



⚡ Important Note

The Commissioning Record must be placed adjacent to the distribution board and must specify the location of the installed underfloor heating.

Commissioning Record	
To be completed by the installer at the time of commissioning of the underfloor heating system.	
System Reference:	
Installation Date:	
Installer Name:	
Installer Address:	
Installer Contact:	
Customer Name:	
Customer Address:	
Customer Contact:	
System Type:	
System Details:	
Test Results:	
Notes:	

PRODUCT SPECIFICATIONS

Refer to the table for product specifications

140W							
Quick Find	Part Code	Coverage (Area)	Length	Width	Wattage	Current	Resistance @20°C (-5/+10%)
16396	HMF140-1.0	1.0m ²	2.0m	0.5m	140w	0.61A	378 Ω
16395	HMF140-1.5	1.5m ²	3.0m	0.5m	210w	0.91A	252 Ω
16394	HMF140-2.0	2.0m ²	4.0m	0.5m	280w	1.22A	189 Ω
16393	HMF140-2.5	2.5m ²	5.0m	0.5m	350w	1.52A	151 Ω
16392	HMF140-3.0	3.0m ²	6.0m	0.5m	420w	1.83A	126 Ω
16391	HMF140-3.5	3.5m ²	7.0m	0.5m	490w	2.13A	108 Ω
16390	HMF140-4.0	4.0m ²	8.0m	0.5m	560w	2.43A	95 Ω
16389	HMF140-5.0	5.0m ²	10.0m	0.5m	700w	3.04A	76 Ω
16388	HMF140-6.0	6.0m ²	12.0m	0.5m	840w	3.65A	63 Ω
16387	HMF140-7.0	7.0m ²	14.0m	0.5m	980w	4.26A	54 Ω
16386	HMF140-8.0	8.0m ²	16.0m	0.5m	1120w	4.87A	47 Ω
16385	HMF140-9.0	9.0m ²	18.0m	0.5m	1260w	5.48A	42 Ω
16384	HMF140-10.0	10.0m ²	20.0m	0.5m	1400w	6.09A	38 Ω
16383	HMF140-12.0	12.0m ²	24.0m	0.5m	1680w	7.30A	31.5 Ω

CALCULATOR

Calculate your total load

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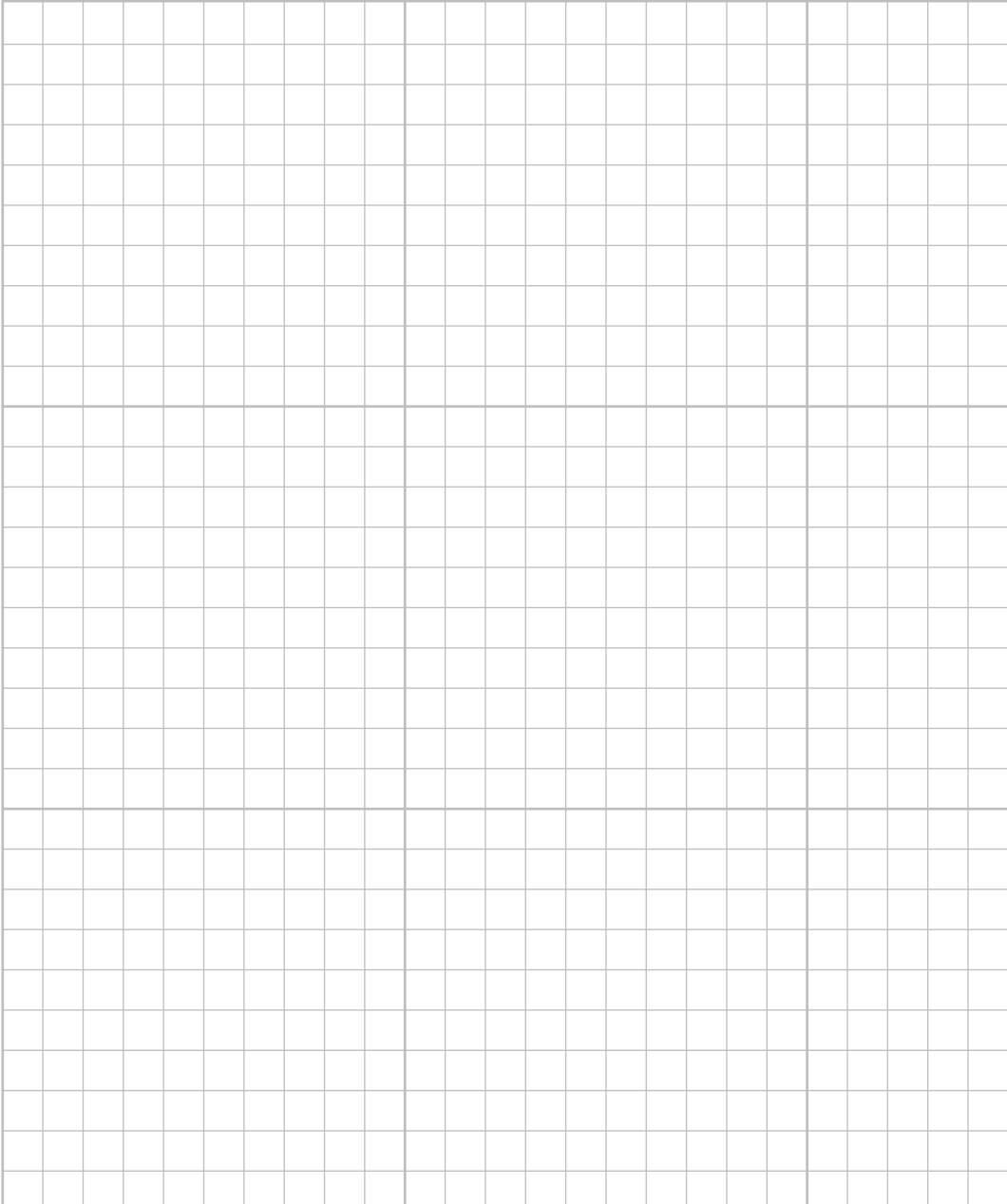
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Total Load

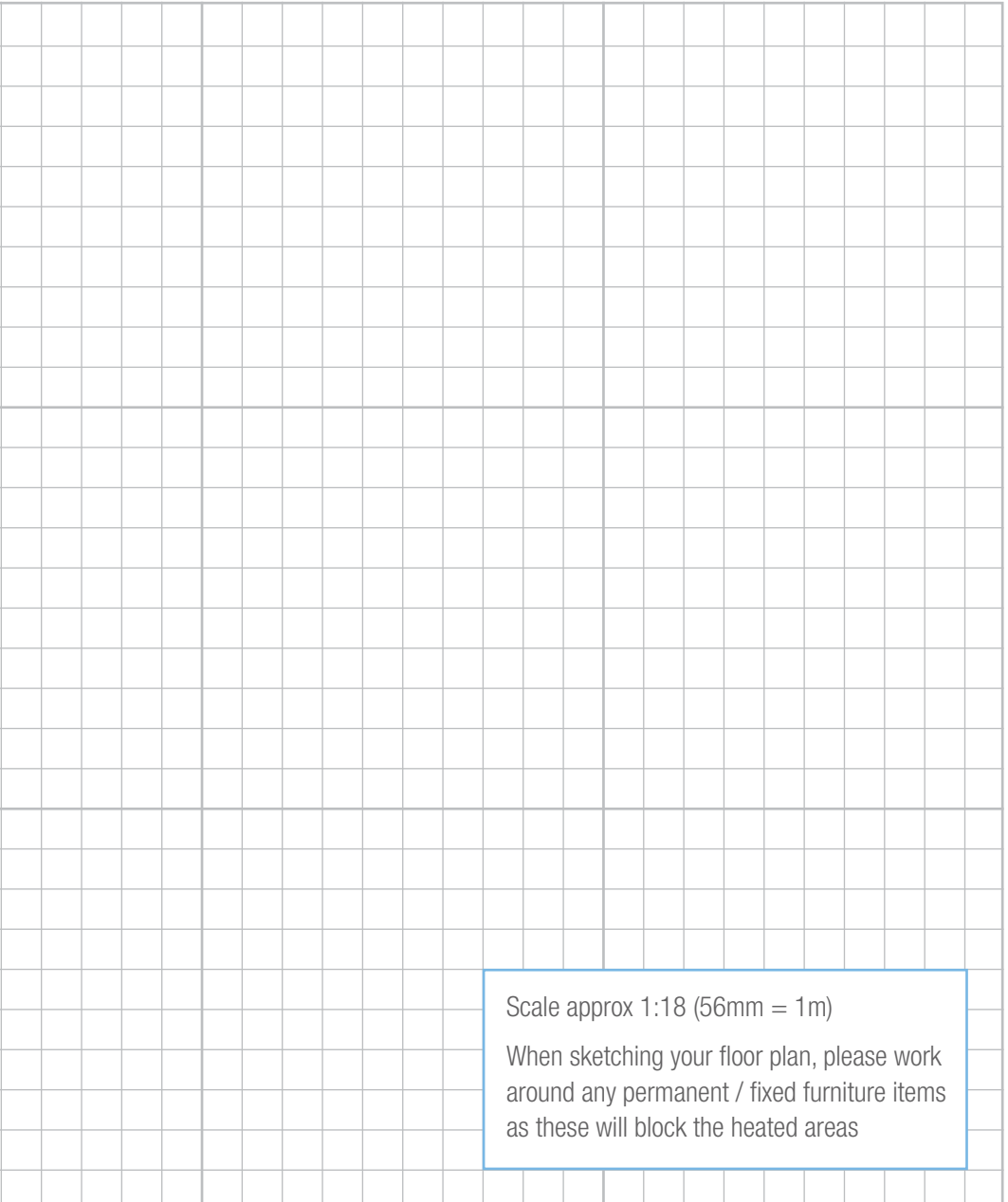
FLOOR PLAN SKETCH

Calculate your total heat area



FLOOR PLAN SKETCH

Calculate your total heat area



A large grid for drawing a floor plan sketch. The grid is composed of small squares, with a larger square grid overlaid on top. The larger square grid is centered and covers most of the page. The smaller grid is the background for the entire page.

Scale approx 1:18 (56mm = 1m)
When sketching your floor plan, please work around any permanent / fixed furniture items as these will block the heated areas

TROUBLESHOOTING

140 watt

Symptom	Probable Causes	Corrective Action
Floor does not heat	No power at controller	Check power supply
	RCD/MCB tripped	Check the circuit is not overloaded
	Thermostat not set correctly	Refer to thermostat instructions
	Cable not correctly connected with thermostat	Refer to thermostat instructions
	Floor temperature sensor not connected	Refer to thermostat instructions
	Faulty sensor/thermostat	Contact the Harmoni Helpdesk 01473 559088
Floor warming all the time	Heating element cut or damaged	Contact the Harmoni Helpdesk 01473 559088
	Thermostat not set correctly	Refer to thermostat instructions
Floor not getting warm enough	Floor temperature sensor not connected	Refer to thermostat instructions
	Thermostat not set correctly	Refer to thermostat instructions
Floor sensor too close to heating element	Floor sensor too close to heating element	Contact the Harmoni Helpdesk 01473 559088

Contact the Harmoni Helpdesk with any questions on 01473 559088

NOTES

Use this space to make notes for reference

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harmoni

