

INSTALLATION MANUAL

Mat 100w/150w/200w



SMARTGUARD
INSTALLER WARRANTY



Intertek



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

www.smartmat.co.uk

01473 559077

Introduction

Important notes, please read carefully before proceeding with installation

The SmartMat brand

Thank you for choosing the SmartMat underfloor heating mat from our range of electric underfloor heating solutions.

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

SmartMat underfloor heating mat

The SmartMat underfloor heating mat has a self-adhesive fibre glass backing mesh with an ultra-thin twin conductor 3mm heating cable pre attached, ensuring minimal increase to the existing floor height. The function of the matting system is to provide a warm floor.

Superior product design ensures a speedy installation with an even heat across the complete floor surface, whilst allowing unlimited adjustment of the heating element to suit irregular formats.

The SmartMat matting system is available in three output types:

100 watts per m²
(for use with timber floor substrates e.g. plywood etc).

150 watts per m²
(for use with concrete floor substrates e.g. sand cement screed, insulated backer boards etc).

200 watts per m²
(for use where a higher wattage output is required e.g. conservatory).

Tools needed for installation

You will require the following items to install and test the floor warming systems.

- Tape measure, drawing pad and pencil
- Utility knife, scissors
- Cable strippers, screw driver
- Resistance tester (multimeter), insulation resistance tester

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

Dos & Don'ts

Do

Carefully read this instruction manual before starting your installation and **follow the testing procedure on page 7**. Throughout your installation:

- Take time to plan your mat layout considering all obstacles e.g. kitchen cupboards, bathroom sinks etc. Ensure the mat will fit before laying.
- Use flexible tile adhesives and grouting materials.
- Ensure the floor sensor thermostat is inserted within the flexible tube provided and installed between two heating elements, with the floor end of the flexible tube effectively sealed (to ensure easy removal of floor sensor if required after installation). *See page 4, step 2.*
- Maintain a minimum of 50mm between the heating element runs.
- Take care not to damage the heating element and cold tail whilst tiling.
- Ensure all the orange heating element is covered with a flexible self-levelling compound or flexible tile adhesive.
- Make certain there are no air gaps underneath tiled areas or between heating element runs.
- Ensure the floor surface is prepared correctly before installation. *See note on page 4.*
- When using more than one mat from a single supply, cold tails must be connected in parallel.

Don't

- Cut or shorten the orange heating cable.
- Cross or touch the orange heating cables together.
- Switch on your under floor heating system for a minimum of 7 days after tiling to allow correct curing of tile adhesives and grouts.
- Install in temperatures lower than -10°C .
- Install near other heat sources such as luminaires and chimneys.
- Connect the heating element to the power supply whilst still rolled up.
- Leave rolled up surplus sections of mat under kitchen units or bath spaces.
- Commence installation of your floor surface before testing your mat. *See page 7.*
- Tile over damaged or twisted cables.
- Install under kitchen units or permanent fixtures such as baths

Construction of the SmartMat Underfloor Mat

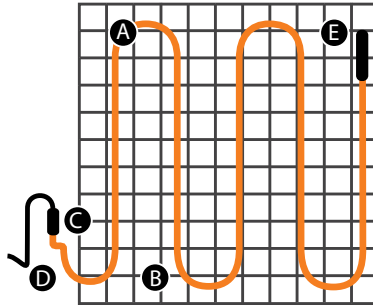
Intertek Semko certified



- Heating mat
- Sensor tube
- Installation instructions
- Warranty

This manual contains all the information you will need about the SmartMat underfloor heating mat.

Please take time to study the information thoroughly before you attempt to install this product.



- A Heating element
- B Fibreglass backing mesh
- 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 559077

⚡ Important Note

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

The SmartMat system requires a mains voltage 230/240V and must be connected and installation is to be in accordance with the national wiring rules.

For areas up to 30m² (SmartMat 100w), areas up to 20m² (SmartMat 150w) or areas up to 15m² (SmartMat 200w) power connection can be provided through a 13A switched spur outlet/combined RCD spur outlet.

For areas larger than the above, a dedicated circuit should be installed from the local consumer unit.

List of accessories required in addition to the heating mat:

- 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.

It is a requirement that all SmartMat systems are protected by a 30ma RCD earth trip either at the consumer unit or by a combined RCD spur outlet.

⚡ Important Note

When installing in a bathroom or other wet areas the thermostat must be located outside Zone 2 (0.6m from any wet appliance, e.g. shower, sink etc) or outside the wet area, ideally on the opposite face of the wall. The SmartMat must be earth bonded in accordance with the national wiring rules.



This symbol means **Direct Floor Heating**

Controls

- Thermostat: OJ Electronics OCC2

Pre-Installation Instructions

Ensure the sub floor is structurally sound, clean and dry



Ensure your SmartMat is correctly sized before you unpack the product.

Call 01473 559077 if you have any questions.

Notes

The floor should now be prepared ready for the SmartMat installation.

All loose particles should be removed and the floor thoroughly cleaned and treated with any proprietary sealants as normally required for your finished floor.

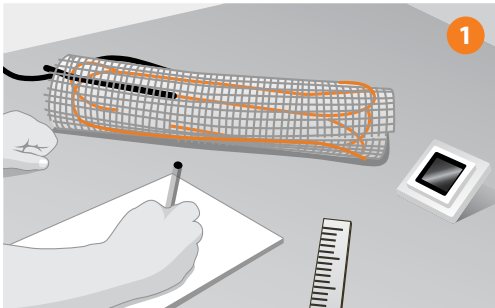
If your existing floor has a bitumen or asphalt surface, it must either be removed or covered with a thin flexible self-levelling compound, tile backer board or water resistant timber.

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

Minimum bend radius of the heat cable while laying must not be less than 10x its diameter, ie 40mm.

Step 1

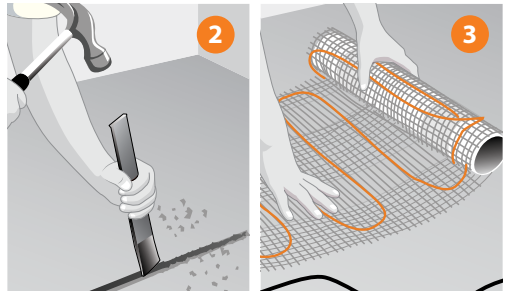
Draw a layout of your room including all obstacles e.g. toilet, sink etc, (use the floor plan grid on page 10) then determine the required floor area to be heated. Decide a suitable position for the thermostat (start point) then sketch the proposed SmartMat layout to ensure the heated area is completely covered whilst using all of your mat (see mat planner notes on page 6).



Step 2

Directly below the electrical connection point install a 10mm flexible tube (provided with each SmartMat) – you may have to channel a groove to allow the flexible tube to remain flush with the existing floor. The floor sensing probe is to be installed into the flexible tube to monitor the floor temperature. Ensure the tube is installed to allow easy replacement of the sensor probe (in case the sensor fails) and positioned between two heating elements.

The flexible tube in the floor should be sealed to prevent adhesive or self-levelling compound entering the tube.



⚡ Now check the resistance of the mat (see page 7 for details)

Step 3

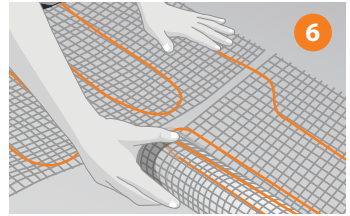
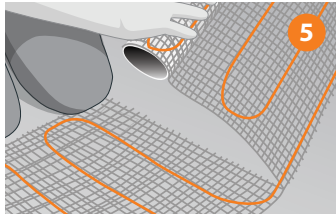
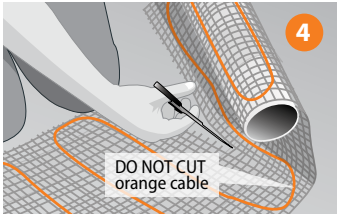
Remove the plastic outer cover from the SmartMat. Position at the start of your matting plan with the cold tail (power cable) at the electrical connection and positioned in to a low level electrical back box.

Ensure the separate thermostat floor sensor cable is inserted into the pre-installed 10mm flexible tube and returned to the low level electrical back box.

The factory made cold tail joint must be positioned in the floor area.

Installation Instructions

Read through these instructions carefully before laying your mat



Notes

In some instances it may be necessary to remove the orange cable from the grey backing mat.

Ensure the cables are not laid in areas where fixed appliances could be positioned e.g. underneath sink basins or toilet pans.

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

Step 3 (continued)

Once the mat cold tail (power cable) and thermostat floor sensor probe have been positioned (ensure the sensor probe is situated between two heating elements) you can start to lay your mat.

Following your previously drawn mat layout, ensure the mat is placed on the floor with the adhesive side down. Unroll your mat until you reach the end of your first run.

Steps 4, 5 & 6

When you have reached the end of the mat run, carefully cut the grey backing mat in-between the two orange cables (**do not cut the orange cable**) and turn the mat to its new position. Ensure the cable remains a minimum of 50mm apart.

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.

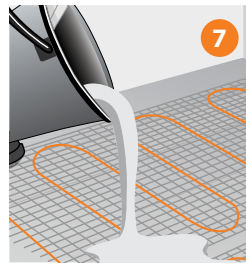
⚡ Check the resistance of the mat again (see page 7 for details) to make sure damage hasn't occurred during the installation process.

Steps 7 & 8

The mat must now be covered with a minimum of 5mm of either a flexible tile adhesive or flexible self-levelling compound.

Check there are no air pockets then carefully spread the flexible tile adhesive or self-levelling compound until all mat areas and heating cables are covered.

You can tile directly over the mat. Carefully apply the flexible tile adhesive with a notched trowel ensuring each tile is securely fixed, and all mat and cable areas are completely covered with the adhesive.



⚡ Important Notes

The maximum thermal resistance recommended between heater and the room is $0.15\text{m}^2\text{ K/W}$ (1.5 tog).

After the finished floor covering has been laid, perform the following tests (see page 7 for details):

- 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 mats

Planning your mat

Please follow these instructions carefully. If you require assistance prior to or during your installation please call our helpline on 01473 559077.

When planning your SmartMat, ensure you cover as much of your free floor area as possible:

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

When installing two or more 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 your SmartMat in series, and always check your SmartMat is 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 or tile backer board.

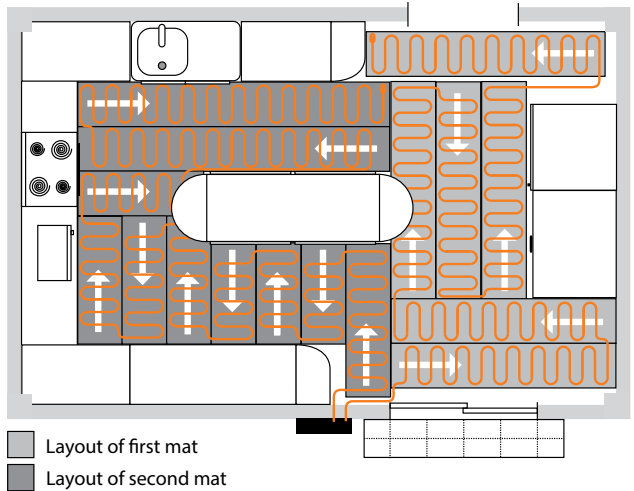


Don't switch on your SmartMat system for a minimum of 7 days after tiling to allow tile adhesives and grouts to cure completely.

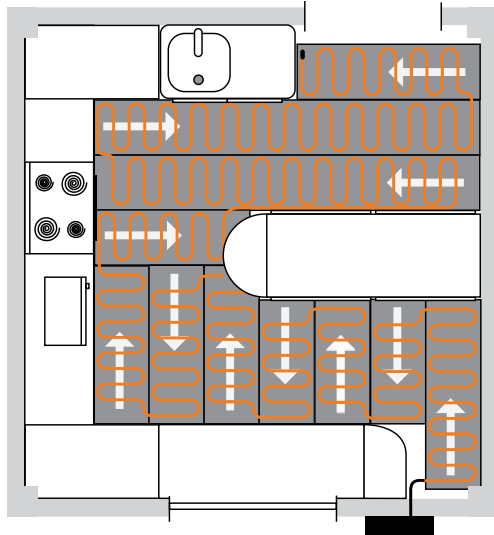


Don't place flush fitting furniture, including bean bags, rugs or mats on the floor where the heating mat is situated.

Plan using two mats



Plan using one mat



Sketch your **Floor Plan** using the grid on pages 10 & 11
Calculate your **Total Load** on page 9



Testing & Commissioning

The warranty validation procedure must be carried out to validate the warranty



Warranty Validation

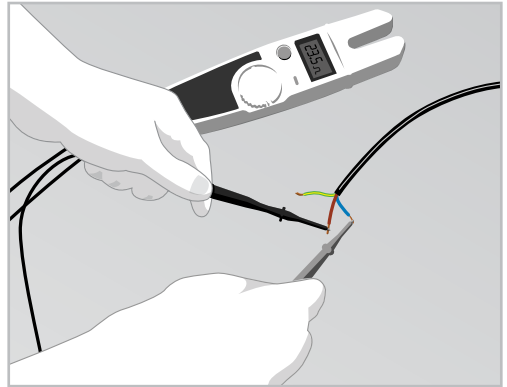
To validate your lifetime warranty registration you must perform the insulation resistance test, the heating cable resistance test and the sensor resistance test three times during the installation process.

1. Before you lay the mat.
2. After you have laid your mat and before you cover your mat.
3. After your finished floor has been laid.

This information must then be recorded on your *Commissioning Record* (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 (ie Multimeter on ohm setting), connect your meter on to the brown and blue mains lead and confirm resistance value matches that quoted on your specification label on the cable cold lead joint.



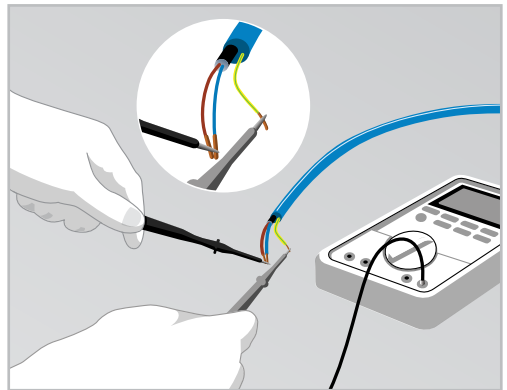
Floor Cable Resistance Test

See *Heating Cable Resistance Test* above and repeat with 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 and 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 contain the location of the installed underfloor heating



Product Specifications

100 watt/150 watt/200 watt

100W

Quick Find	Part Code	Coverage	Length	Width	Wattage	Resistance +9/-4%
13310	SmartMat 100-0.5	0.5m ²	1.0m	0.5m	50w	1058.00 Ω
8488	SmartMat 100-1	1.00m ²	2.0m	0.5m	100w	529.00 Ω
8489	SmartMat 100-1.5	1.50m ²	3.0m	0.5m	150w	352.67 Ω
8490	SmartMat 100-2	2.00m ²	4.0m	0.5m	200w	264.50 Ω
8491	SmartMat 100-2.5	2.50m ²	5.0m	0.5m	250w	211.60 Ω
8492	SmartMat 100-3	3.00m ²	6.0m	0.5m	300w	176.33 Ω
8493	SmartMat 100-3.5	3.50m ²	7.0m	0.5m	350w	151.14 Ω
8494	SmartMat 100-4	4.00m ²	8.0m	0.5m	400w	132.25 Ω
8495	SmartMat 100-5	5.00m ²	10.0m	0.5m	500w	105.80 Ω
8496	SmartMat 100-6	6.00m ²	12.0m	0.5m	600w	88.17 Ω
8497	SmartMat 100-7	7.00m ²	14.0m	0.5m	700w	75.57 Ω
8498	SmartMat 100-8	8.00m ²	16.0m	0.5m	800w	66.13 Ω
8499	SmartMat 100-9	9.00m ²	18.0m	0.5m	900w	58.78 Ω
8500	SmartMat 100-10	10.00m ²	20.0m	0.5m	1000w	52.90 Ω
8501	SmartMat 100-12	12.00m ²	24.0m	0.5m	1200w	44.08 Ω

150W

Quick Find	Part Code	Coverage	Length	Width	Wattage	Resistance +9/-4%
13314	SmartMat 150-0.5	0.5m ²	1.0m	0.5m	75w	705.30 Ω
8502	SmartMat 150-1	1.00m ²	2.0m	0.5m	150w	352.67 Ω
8503	SmartMat 150-1.5	1.50m ²	3.0m	0.5m	225w	235.11 Ω
8504	SmartMat 150-2	2.00m ²	4.0m	0.5m	300w	176.33 Ω
8505	SmartMat 150-2.5	2.50m ²	5.0m	0.5m	375w	141.07 Ω
8506	SmartMat 150-3	3.00m ²	6.0m	0.5m	450w	117.56 Ω
8507	SmartMat 150-3.5	3.50m ²	7.0m	0.5m	525w	100.76 Ω
8508	SmartMat 150-4	4.00m ²	8.0m	0.5m	600w	88.17 Ω
8509	SmartMat 150-5	5.00m ²	10.0m	0.5m	750w	70.53 Ω
8510	SmartMat 150-6	6.00m ²	12.0m	0.5m	900w	58.78 Ω
8511	SmartMat 150-7	7.00m ²	14.0m	0.5m	1050w	50.38 Ω
8512	SmartMat 150-8	8.00m ²	16.0m	0.5m	1200w	44.08 Ω
8513	SmartMat 150-9	9.00m ²	18.0m	0.5m	1350w	39.19 Ω
8514	SmartMat 150-10	10.00m ²	20.0m	0.5m	1500w	35.27 Ω
8515	SmartMat 150-12	12.00m ²	24.0m	0.5m	1800w	29.39 Ω

Product Specifications

100 watt/150 watt/200 watt

200W

Quick Find	Part Code	Coverage	Length	Width	Wattage	Resistance +9/-4%
13318	SmartMat 200-0.5	0.5m ²	1.0m	0.5m	100w	529.00 Ω
8516	SmartMat 200-1	1.00m ²	2.0m	0.5m	200w	264.50 Ω
8517	SmartMat 200-1.5	1.50m ²	3.0m	0.5m	300w	176.33 Ω
8518	SmartMat 200-2	2.00m ²	4.0m	0.5m	400w	132.25 Ω
8519	SmartMat 200-2.5	2.50m ²	5.0m	0.5m	500w	105.80 Ω
8520	SmartMat 200-3	3.00m ²	6.0m	0.5m	600w	88.17 Ω
8521	SmartMat 200-3.5	3.50m ²	7.0m	0.5m	700w	75.57 Ω
8522	SmartMat 200-4	4.00m ²	8.0m	0.5m	800w	66.13 Ω
8523	SmartMat 200-5	5.00m ²	10.0m	0.5m	1000w	52.90 Ω
8524	SmartMat 200-6	6.00m ²	12.0m	0.5m	1200w	44.08 Ω
8525	SmartMat 200-7	7.00m ²	14.0m	0.5m	1400w	37.79 Ω
8526	SmartMat 200-8	8.00m ²	16.0m	0.5m	1600w	33.06 Ω
8527	SmartMat 200-9	9.00m ²	18.0m	0.5m	1800w	29.39 Ω
8528	SmartMat 200-10	10.00m ²	20.0m	0.5m	2000w	26.45 Ω
8529	SmartMat 200-12	12.00m ²	24.0m	0.5m	2400w	22.04 Ω

Calculator

Calculate your total load

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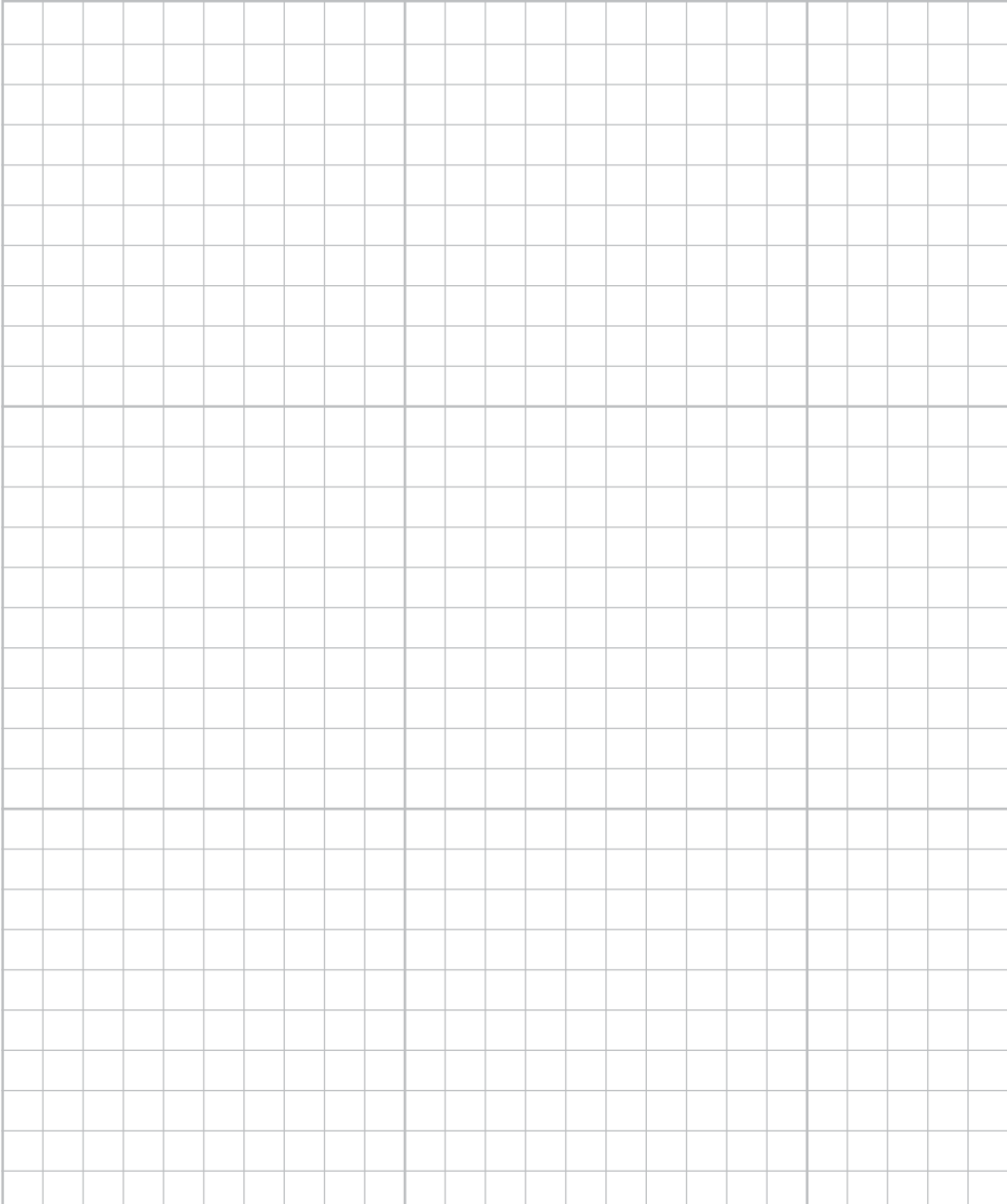
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Total Load

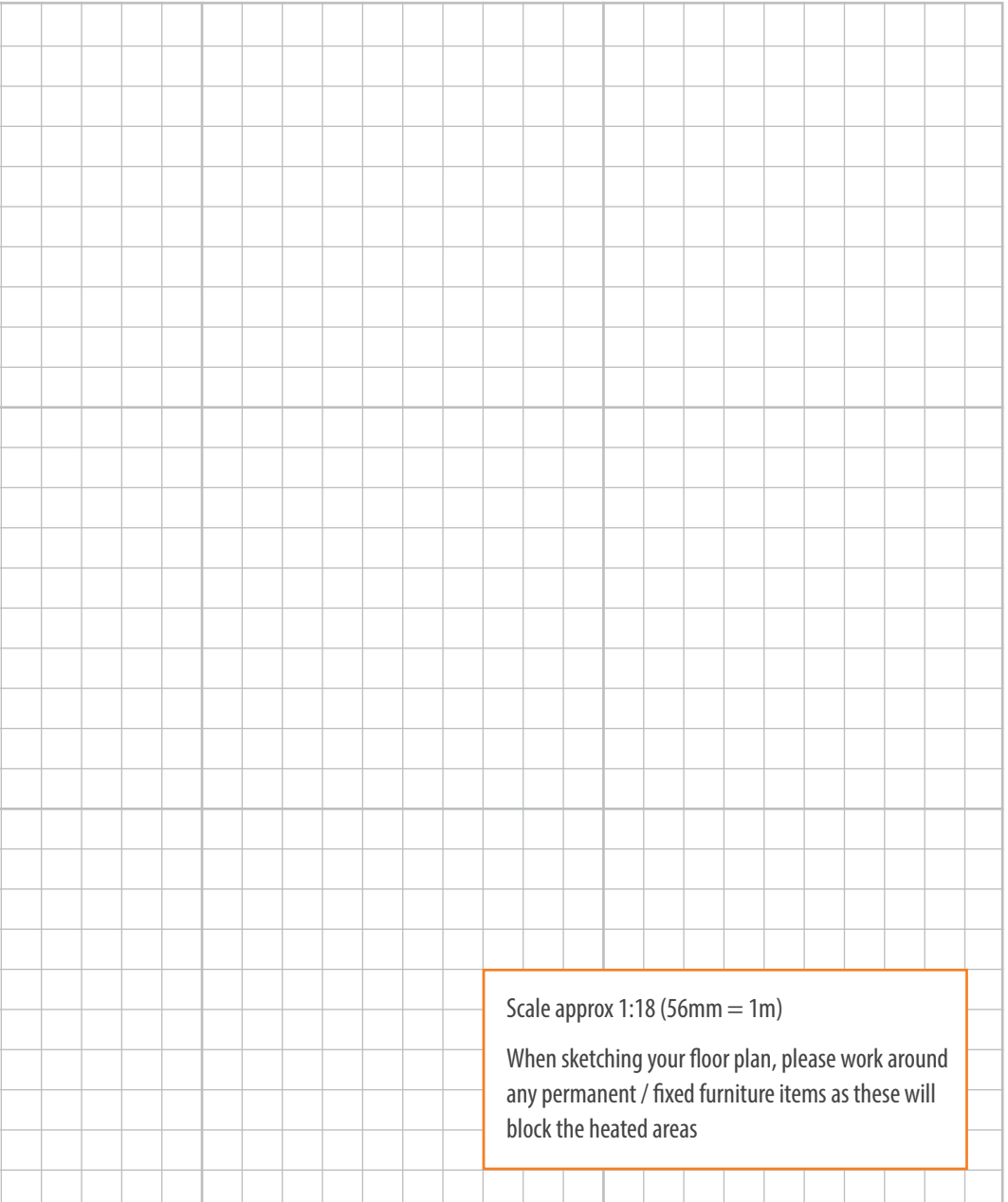
Floor Plan Sketch

Calculate your total heat area



Floor Plan Sketch

Calculate your total heat area

A large grid for sketching a floor plan. The grid is composed of small squares, with a larger square grid pattern overlaid on it. The grid is intended for drawing a floor plan and calculating the total heat area.

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

Refer to the table below and contact us with any questions on 01473 559077

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 SmartMat Helpdesk 01473 559077
	Heating element cut or damaged	Contact the SmartMat Helpdesk 01473 559077
Floor warming all the time	Thermostat not set correctly	Refer to thermostat instructions
	Floor temperature sensor not connected	Refer to thermostat instructions
Floor not getting warm enough	Thermostat not set correctly	Refer to thermostat instructions
	Floor sensor too close to heating element	Contact the SmartMat Helpdesk 01473 559077

Contact the SmartMat Helpdesk with any questions on 01473 559077

Notes

Use this space to make notes for reference



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