



**Carbon Fibre Heating  
Technology**



**PROFESSIONAL SOLUTIONS**

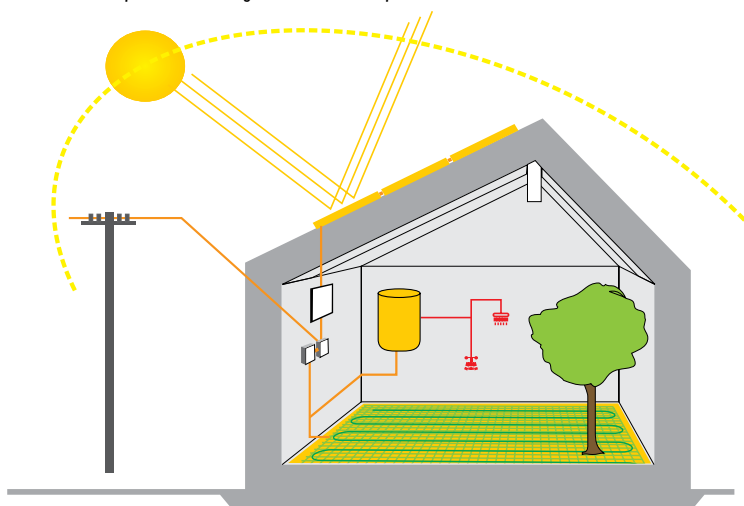
# Contents

- |     |                           |     |                                 |
|-----|---------------------------|-----|---------------------------------|
| 04. | Underfloor Heating System | 25. | Custom Wellness Heating Meshes  |
| 10. | Wall Heating System       | 26. | Under-Carpet Heating Systems    |
| 14. | Temperature Control       | 27. | Outdoor/Indoor Heating Walkways |
| 16. | Touch Power Control T713  | 28. | Outdoor Heated Meshes           |
| 18. | Wireless Thermostat       | 29. | Frost-Detector Kit              |
| 20. | Carbon Boiler             | 30. | Custom Snow-Melt Roof Meshes    |
| 22. | Radiant Ceiling Panels    | 31. | Heating System for PV Panels    |
| 24. | Radiant Footboards        |     |                                 |

## An Ideal Partner for Your PV System:

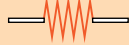
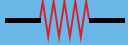
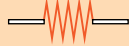
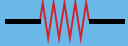
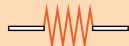
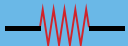
Install the Genius Carbon® heating system and save 50% off installation costs! But there's more: if you decide to invest your savings in a PV system, you'll have:

- clean energy generation
- free-of-charge energy supply
- no maintenance costs
- no part of the system to be replaced later on



## Resistor Comparison

**A carbon fibre cable is not a metal resistor!**

Carbon fibre	Metal
100W	100W
	
+110°C	+80°C
Efficiency: +40%	
100W	100W
	
+80°C	+80°C
6 minutes	10 minutes
Consumption: -40%	
60W	100W
	
+80°C	+80°C
Energy savings: 40%	

# Carbon Fibre Heating Technology

## Cost-Effective - High-Tech - Environment Friendly



The absence of electro-magnetic fields is confirmed by Istituto Giordano s.p.a. (Certificate no. 212656)

Thermal Technology® is a leading designer and manufacturer of innovative carbon fibre heating systems since 2001. Advanced research allows us to implement highly efficient, ultra-flexible solutions targeted both at the manufacturing and at the building and sports industry. The levels of efficiency and competitiveness are confirmed by major certifying institutions and prestigious European universities.

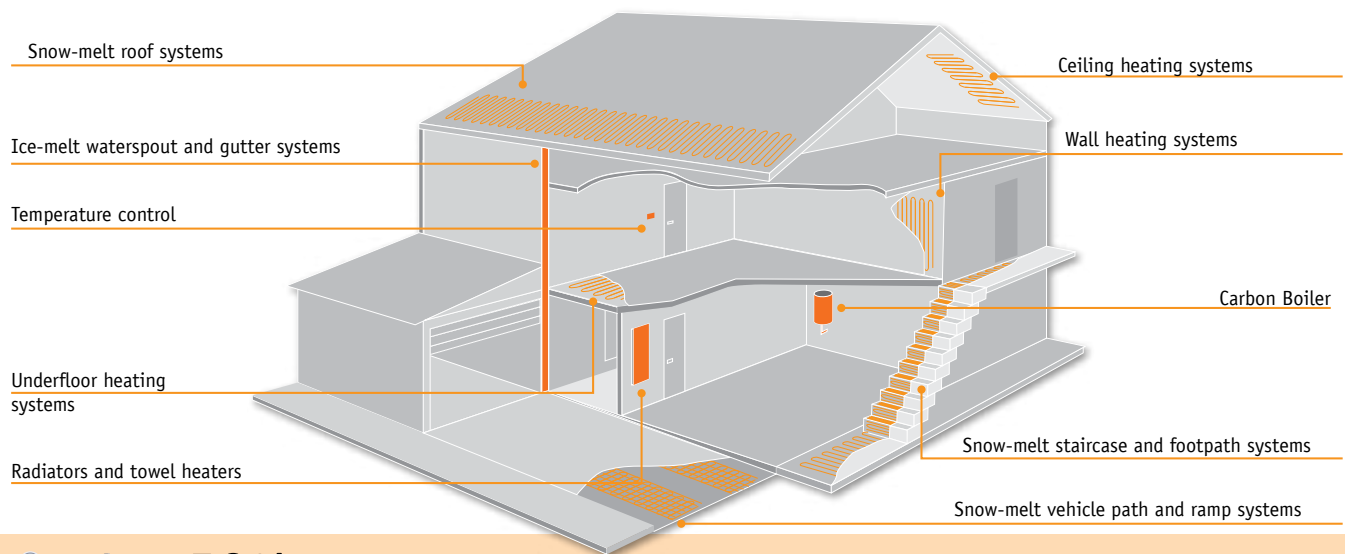
Carbon fibre is the high-performance component which lies behind Thermal Technology®'s patented power heating systems.

### The advantages of carbon fibre:

- NON-METAL resistor
- low power conductivity (997 times lower than copper)
- low heat conductivity (3 times lower than copper)
- low density (3.7 times lower than copper)
- high specific heat (1.87 times higher than copper)
- very high resistivity (2,060 times higher than copper)

### All this results in:

- no electro-magnetic fields
- no thermal inertia
- ability to store considerable amounts of heat
- ability to let out stored heat very quickly.



## - 50%

**INSTALLATION COSTS**  
Direct connection to the mains, no waterpipes needed.



## 0%

**POLLUTING EMISSIONS**  
No fuels are used, which results in 0% CO2 release.



## IP 67

**PROTECTION**  
Thermal Technology products are dust and liquid insulated.



## 0%

**CHECKS AND MAINTENANCE COSTS**  
Unlike traditional heating systems, our systems are maintenance-free and do not need to be regularly re-programmed.



## - 40%

**POWER CONSUMPTION**  
Thanks to its special properties, the carbon fibre used in Thermal Technology® heating system significantly cuts down power bills.



## 0%

**ELECTRO-MAGNETIC EMISSIONS**  
Thermal Technology® systems do not release any detectable electro-magnetic fields (see Certificate no. 212656 on previous page).



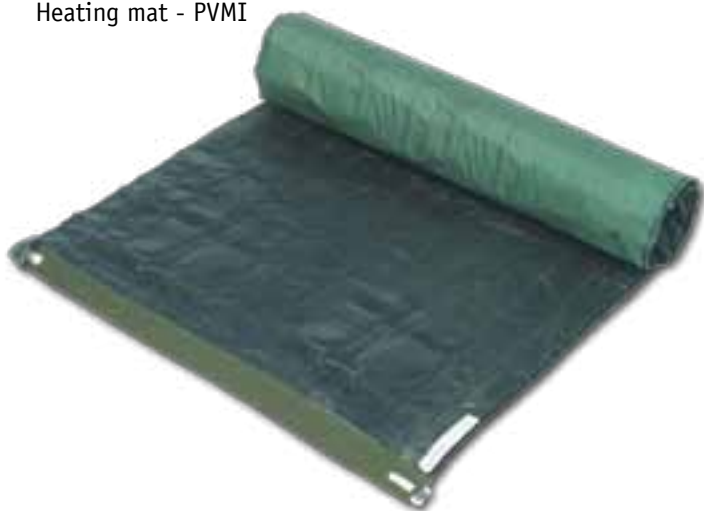
## 10

**YEAR GUARANTEE**  
Thermal Technology® products are guaranteed 10 years (underfloor heating 10 years, other products 5 years, electronic parts 2 years)

# Modular and Custom-Made Indoor Heating Mats and Meshes



Heating mat - PVMI



Our carbon-fibre underfloor heating system is a 4 mm thick patented invention which comes either in standard modules or custom built: you can choose both the power and shape for a maximum one-piece surface of 25 m<sup>2</sup>.

## Radiant heating

Radiant heating means exchanging heat by using infrared waves as heat transmitters. As a matter of fact, two bodies or objects with different temperatures naturally exchange radiations, and the heat flow tends to go from the warmer to the colder body. The radiation emitted in a room by an underfloor heating system turns into heat when it comes in contact with an object, a wall or a person. Infrared waves are not absorbed by air but rather by solids, which turn them into heat. Heat is then transmitted to the room for occupants to enjoy optimal warmth.

## A HEALTHY HEATING SOLUTION

An underfloor heating system is healthy as it does not cause air - and consequently, dust - to move and eliminates temperature gaps between adjacent rooms. Underfloor heating guarantees the best comfort and respect of today's legal requirements which allow a maximum floor surface temperature of 28°C. THERMAL TECHNOLOGY® underfloor heating systems - as confirmed by the tests and related report issued by the IUAV University of Venice - offer a further plus: **An average radiation temperature of about 21°C allows to keep air temperature lower than 20°C, i.e. lower than the temperature typically reached by traditional heating systems.** *This in turn allows you to limit the inside vs. outside temperature gap and therefore reduces heat loss. The examined thermal radiation system also guarantees an air temperature gap between floor and ceiling of about 1.5°C: this extremely low value helps prevent local discomfort due to excessively high temperature gradients between the occupants' heads and ankles'.*

Sample heating mat application



## APPLICATIONS

Thermal Technology® heating systems are ideal for any type of building including detached houses, blocks of flats, schools, hospitals, shops and stores, new buildings as well as renovations. Thermal Technology® low-temperature solutions meet the most diverse requirements.

Heating panels are installed under the floor so that the walls are freed of cumbersome radiators and more room is made for the furniture to be arranged at will.

## Comfort-providing

Heat is uniformly irradiated from floor to ceiling, and a homogeneous, steady temperature is guaranteed all over the place. Temperature is easily adjustable from every room.

## Silent



Heating mesh - PVRI



As this heating system is directly connected to an electrical board, there is no need for a boiler or other mechanical appliances which could perturb the tranquillity of the place.

#### **Flexible**

Each room can be easily provided with an independent thermostat (no pipes, pumps or valves) in order to adjust temperature based on the time actually spent there.

#### **Healthy**

Thanks to the heat radiation principle, no air masses are moved: bodies are instead heated directly, and this avoids dust and mite circulation. A heat radiation system guarantees a floor vs. ceiling air temperature gap of approx. 1.5°C, and this avoids possible discomfort due to large temperature gaps.

#### **Safe**

As it is an in-built system, there is no risk of coming in direct contact with high-voltage components.

Heaters are made in fire-proof materials.

Carbon fibres do not produce any additional electromagnetic emissions, these being around 47 times lower than the limits imposed by the law.

#### **Inexpensive**

Thanks to an excellent distribution of heat, Thermal Technology® underfloor heating systems allow to reduce the temperature of the room by 1 -2°C compared to all other heating systems. 1°C less means a 7% consumption cut.

#### **No maintenance required**

The system does not require maintenance and none of its parts needs replacing.

#### **Guarantee**

Thanks to the carbon fibre, our systems boast extremely high technical and mechanical standards, so much so that our customers enjoy a 10-year guarantee from purchase date.

Moreover, Thermal Technology® heating systems are:

- reliable and long lasting,
- easy and quick to install,
- re-usable (if installed under a floating floor),
- self-extinguishing and moisture-resistant (IP67 certified electrical connections).

Sample heating mesh application



#### **TEMPERATURE CONTROL**

The Thermal Technology® heating system does not require double temperature control (floor probe plus room thermostat). Temperature control is guaranteed by a simple thermostat or clock-timer. In case of a system spanning across several rooms we advise using a Power Control unit to:

- adjust operation based on the outside temperature,
- control and manage absorption peaks,
- use set-back time slots

Modular mat	Modular mesh	Size	m <sup>2</sup>	Power
PVMM.060100	PVMR.060100	60X100	0.6	60 W
PVMM.060150	PVMR.060150	60X150	0.9	90 W
PVMM.060250	PVMR.060250	60X250	1.5	150 W
PVMM.060350	PVMR.060350	60X350	2.1	210 W
PVMM.090150	PVMR.090150	90X150	1.35	135 W
PVMM.090250	PVMR.090250	90X250	2.25	225 W
PVMM.090350	PVMR.090350	90X350	3.15	315 W
PVMM.090450	PVMR.090450	90X450	4.05	405 W
PVMM.150150	PVMR.150150	150X150	2.25	225 W
PVMM.150250	PVMR.150250	150X250	3.75	375 W
PVMM.150350	PVMR.150350	150X350	5.25	525 W
PVMM.150450	PVMR.150450	150X450	6.75	675 W

Code	Modular mesh and mat accessories Description
PVMM.40075.NR	Shimming for non-heated portions 400X75
PVMM.00PL80	Module-to-module extension (80 cm)
PVMM.0PL200	Module-to-module extension (200 cm)
PVMM.0PL400	Power-to-module extension (400 cm)

#### Modular mat application



#### Modular mesh application



## MODULAR SYSTEMS

### MODULAR MAT SPECIFICATIONS

The modular heating mat system comprises of 12 modules of different sizes (see table) interconnected by a patented, 5 mm thick IP67 protected plug-in system.

Modules are in turn made up of a multi-layer mat with heat insulating, conductive and reflecting layers and incorporating carbon fibre thermal conductors. Voltage: 230 VAC.

The special mat construction causes heat to be uniformly irradiated upwards. There is a sheer 5% heat loss downwards.

Velcroed edges ensure effortless joining of all elements. In the event a floating floor is used, neutral elements to be cut on demand are available to obtain an even laying plan.

### MODULAR MESH SPECIFICATIONS

The modular heating mesh system comprises of 12 modules of different sizes (see table) interconnected by a patented, 4 mm thick IP67 protected plug-in system.

Heating modules are made up of an alkali-resistant fibreglass mesh which also acts as a support for thermal conductors. These are made of carbon fibre cables protected by an insulating band which reduces heat loss downwards.

Voltage: 230 VAC.

In both mats and meshes, carbon cables are interconnected in parallel to a single feeder. This allows to keep the system working also in the event of damage caused by users (e.g. if the heater is pierced and the carbon fibre cable is cut). In such case, just a minimum surface of about 1 square metre will cease to work.

### INSTALLED POWER FOR MODULAR SYSTEMS

Each module is conceived to use 100 Watts/1 m<sup>2</sup> to meet the necessary requirements and withstand most severe conditions.

### GENIUS CARBON HIGHLIGHTS

The Thermal Technology® modular system includes:

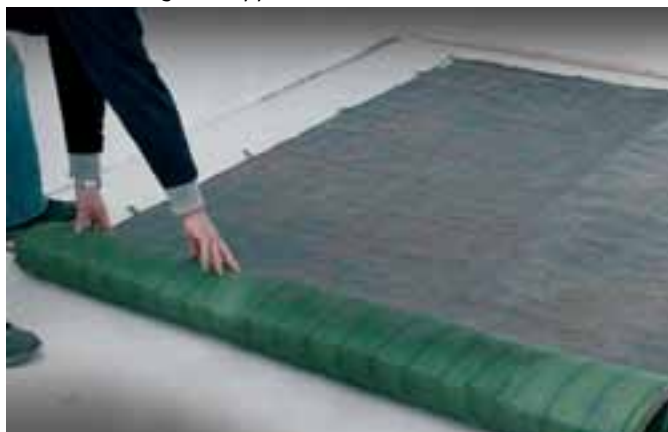
- 12 heating elements of several different sizes (see table),
- 2 extensions of various lengths to join elements together,
- 1 extension for the connection to the wiring system.



Extension - PVMM.0PL200

Custom-cut mat	Custom-cut mesh	Size	m <sup>2</sup>	Power (W)
PVMI.000000	PVRI.000000	mesh	/	mesh

Custom heating mat application



Custom heating mesh application



## CUSTOM-MADE SYSTEMS

### CUSTOM MAT SPECIFICATIONS

Each heating mat designed according to plan is made up of multiple insulating, conductive and reflective layers which incorporate carbon fibre thermal conductors. Heating mats are made to measure both in terms of power and in terms of shape, are about 5 mm thick and IP67 protected. The required voltage is 230 VAC. Their special construction causes heat to be irradiated uniformly upwards. There is a sheer 5% heat loss downwards.

### CUSTOM MESH SPECIFICATIONS

This heating mesh system developed according to plan includes an alkali-resistant fibreglass mesh which also acts as a support for thermal conductors. These are made of carbon fibre cables protected by an insulating band which reduces heat loss downwards. Heating meshes are made to measure both in terms of power and in terms of shape, are about 4 mm thick and IP67 protected. The required voltage is 230 VAC.

In both mats and meshes, carbon cables are interconnected in parallel to a single feeder. This allows to keep the system working also in the event of damage caused by users (e.g. if the heater is pierced and the carbon fibre cable is cut). In such case, just a minimum surface of about 1 square metre will cease to work.

### INSTALLED POWER FOR CUSTOM-MADE SYSTEMS

The installed power envisaged for the correct use of the system depends on the maximum heat loss of the building (energy class A, B or C), in its turn determined by its climatic zone and degree of thermal insulation. The heater is built based on the above parameters with power varying from 25 to 100 Watts per square metre.

#### General guidelines

- Make sure you use flooring products which are compatible with an underfloor heating system.
- Lay the solid or laminated wood floor following the manufacturer's instructions.
- Use elastic glues.
- Allow sub-floors and glues to dry as specified in the relevant manufacturer's instructions.
- Entrust qualified professionals with any electrical work.

#### Conformity

These products conform with the electrical safety standards established by the LVD (Low Voltage) Directive 2006/95/EC and with electromagnetic compatibility as stated in the EMC (Electromagnetic Compatibility) Directive 2004/108/EC.

They also respect the CEI EN 50366:2004 standards on electromagnetic emissions 2004 (Electromagnetic Emissions)

UNI EN fire resistance certificate: 13501-1: 200 Class: B

These products have undergone CE - TÜV - CB tests.



ISTITUTO  
GIORDANO  
Qualità al Plurale.



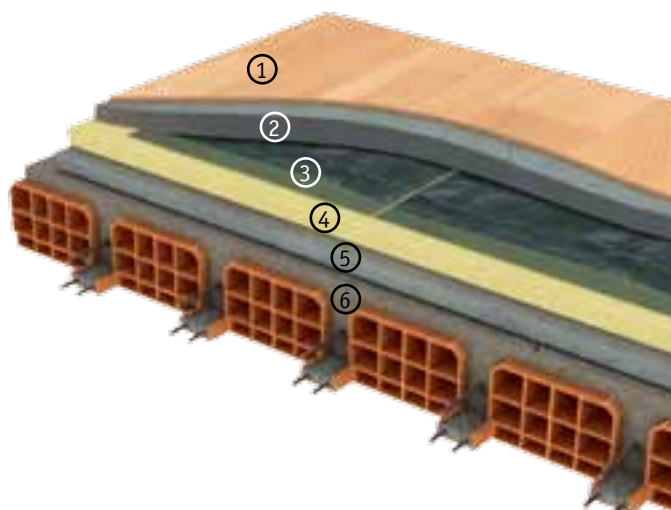
# Sample applications

## LAYING A HEATING MAT UNDER THE SCREED

Installing the heating mat under the screed helps keep the temperature of the room high even after switching off the system. This is due to the thermal inertia provided by the screed. Recommended for permanent residence.

### Layer analysis:

1. Ceramic & wood flooring.
2. Concrete screed.
3. Heating mat.
4. Thermal insulation board.
5. Neutral mat portions.
6. Floor slab.

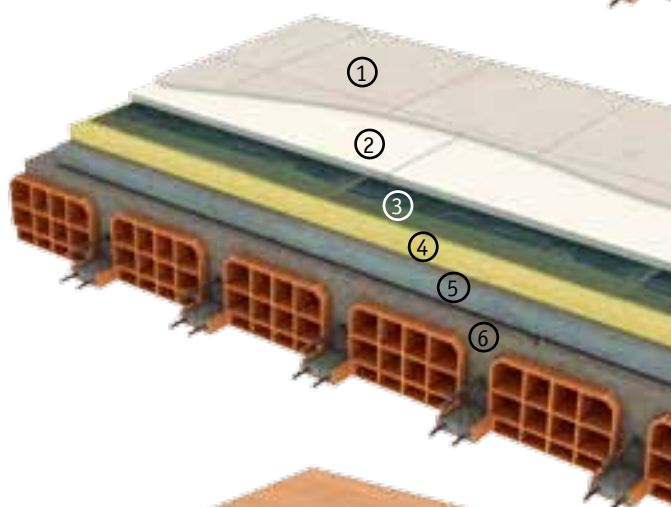


## LAYING A HEATING MAT UNDER DRY SCREED

Combining a heating mat system with gypsum fibreboard dry screed is a quick, cheap and convenient solution particularly in case of reduced available thickness (e.g. renovations, living roof-spaces, toilets, etc.). For suggestions on how to lay dry screed, follow the manufacturer's instructions (we recommend using Knauf Brio dry floors).

### Layer analysis:

1. Ceramic & wood flooring
2. Dry screed/Gypsum fibreboards
3. Heating mat.
4. Thermal insulation board.
5. Neutral mat portions.
6. Floor slab.

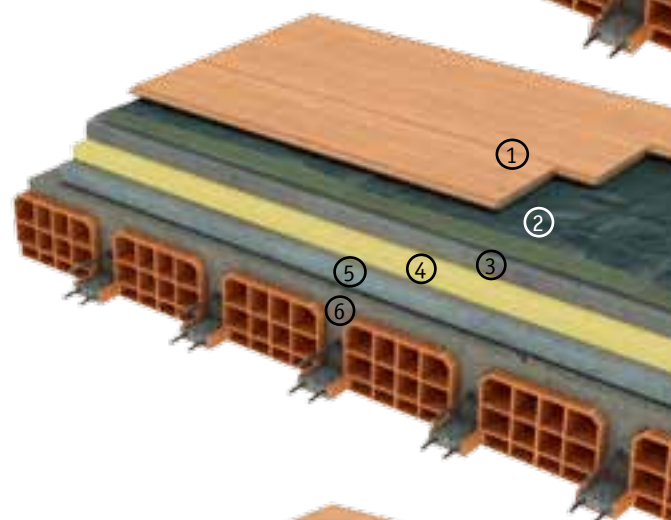


## LAYING A HEATING MAT OVER CONCRETE SCREED

Installation between screed and a floating floor allows to heat the room and achieve thermal inertia very quickly due to the modest mass of the system. Heating mats are especially recommended for places which have to be heated discontinuously, such as holiday homes, offices, shops, meeting rooms, restaurants, hotel rooms, etc..

### Layer analysis:

1. Solid/laminated wood (floating) floor.
2. Heating mat.
3. Concrete screed.
4. Thermal insulation board.
5. Neutral mat portions.
6. Floor slab.



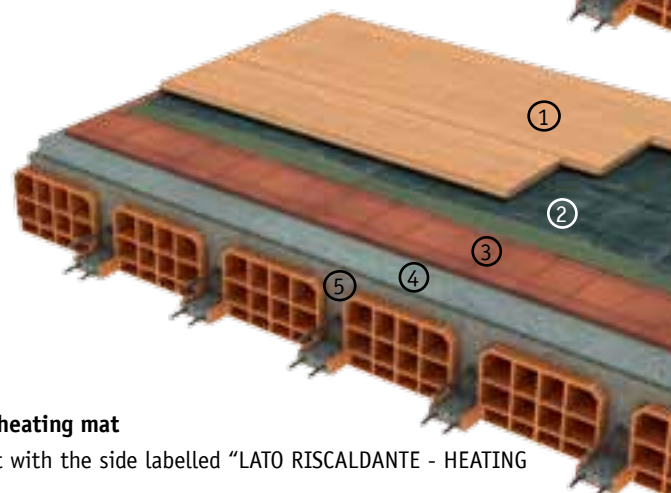
## LAYING A HEATING MAT OVER AN EXISTING FLOOR

Ideal for renovation works where floor slab overload should be avoided and internal heights are binding.

The heating mat requires floating solid or laminated wood floors where boards are groove-and-tongued or glued together. Installation between the screed and the new floor allows to heat the room and achieve thermal inertia very quickly due to the modest mass of the system. Especially recommended for places which have to be heated discontinuously, such as holiday homes, offices, shops, meeting rooms, restaurants, hotel rooms, etc.. WE recommend installing a thermal insulation board.

### Layer analysis:

1. Solid/laminated wood (floating) floor.
2. Heating mat
3. Existing floor
4. Concrete screed
5. Floor slab



### How to lay a heating mat

Unroll the mat with the side labelled "LATO RISCALDANTE - HEATING SURFACE" up.



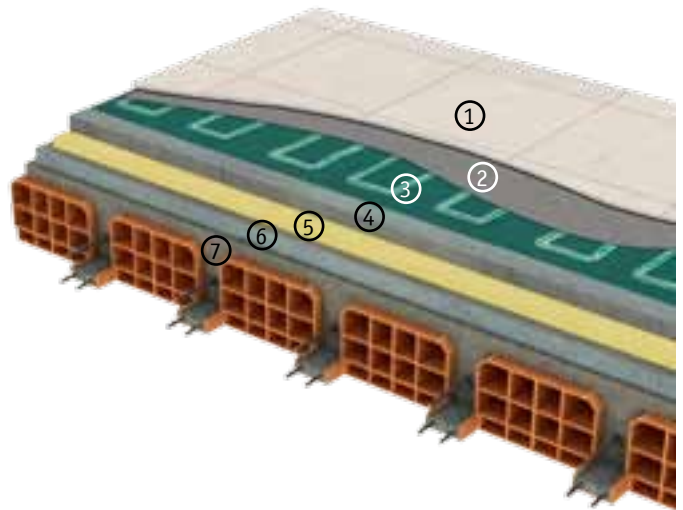
## LAYING A HEATING MESH BETWEEN A CONCRETE SCREED AND CERAMIC, SANDSTONE OR MARBLE FLOORING

Installation between screed and floor allows to heat the room and achieve thermal inertia very quickly due to the modest mass of the system.

This heating system is especially recommended for places which have to be heated discontinuously, such as holiday homes, offices, shops, meeting rooms, restaurants, hotel rooms, etc..

### Layer analysis:

1. Ceramic & marble flooring
2. Elastic glue
3. Heating mesh
4. Concrete screed
5. Thermal insulation board
6. Neutral mat portions
7. Floor slab



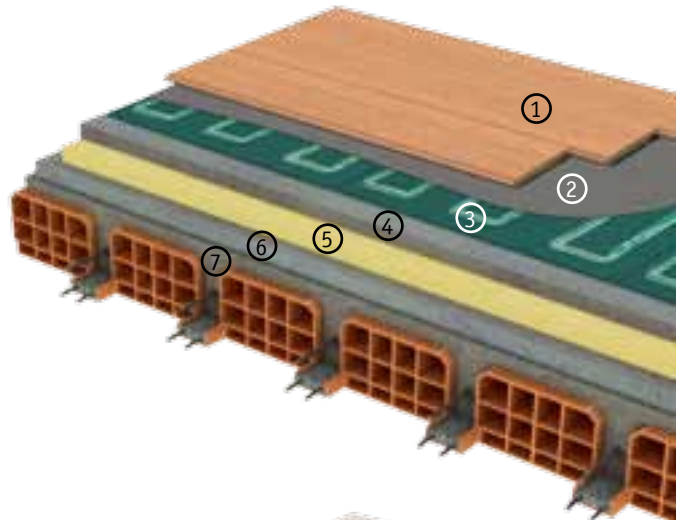
## LAYING A HEATING MESH BETWEEN A CONCRETE SCREED AND SOLID OR LAMINATED WOOD FLOORING

Installation between screed and floor allows to heat the room and achieve thermal inertia very quickly due to the modest mass of the system.

Recommended for places which have to be heated discontinuously, such as holiday homes, offices, shops, meeting rooms, restaurants, hotel rooms, etc..

### Layer analysis:

1. (Floating) solid/glued laminated wood floor
2. Elastic glue
3. Heating mesh
4. Concrete screed
5. Thermal insulation board
6. Neutral mat portions
7. Floor slab



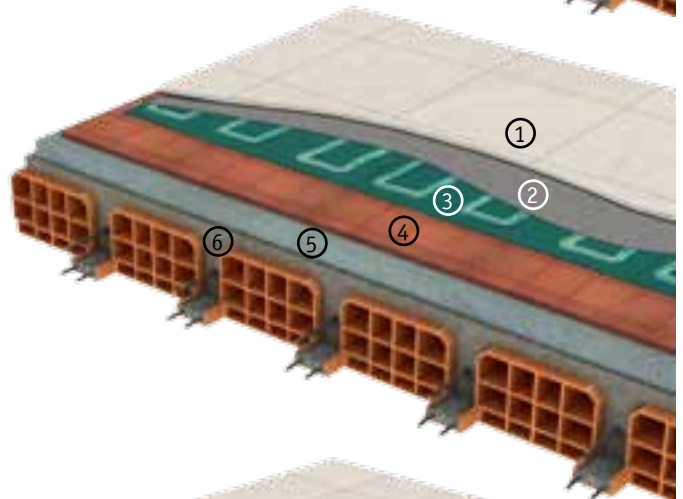
## LAYING A HEATING MESH OVER AN EXISTING FLOOR

Ideal for renovation works where floor slab overload should be avoided and internal heights are binding.

Installation between the screed and the new floor allows to heat the room and achieve thermal inertia very quickly due to the modest mass of the system. Recommended for places which have to be heated discontinuously, such as holiday homes, offices, shops, meeting rooms, restaurants, hotel rooms, etc..

### Layer analysis:

1. Ceramic & marble flooring
2. Elastic glue
3. Heating mesh
4. Existing tiles.
5. Neutral mat portions
6. Floor slab



## LAYING A HEATING MESH OVER THERMAL INSULATING PANELS

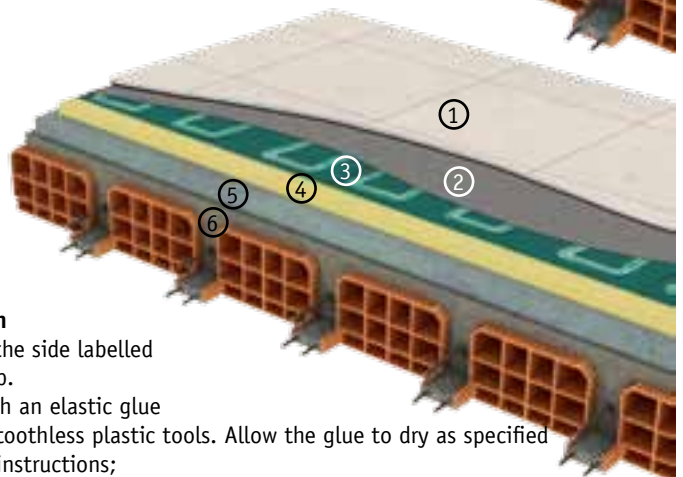
Here, tiles or wooden planks are glued directly onto thermal insulation resin-coated polystyrene panels. This provides a sheer 1.5 cm thick surface to heat (tile + glue) so that the desired surface temperature is reached very quickly.

### Layer analysis:

1. Ceramic & marble flooring
2. Elastic glue
3. Heating mesh
4. Thermal insulation board.
5. Neutral mat portions
6. Floor slab

### How to lay a heating mesh

- Unroll the mesh with the side labelled "HEATING SURFACE" up.
- Smoothe the mesh with an elastic glue using putty knives or toothless plastic tools. Allow the glue to dry as specified in the manufacturers' instructions;
- Lay the floor using the same type of glue and tools.



# Wall/Ceiling Heating System



Fibreboard panel



Under plasterboard panel



Under plaster mesh

Both systems may be installed where it is not possible to install an underfloor system or in places where supplemental heating is needed but only a small floor surface is available (e.g. bathrooms, stairwells), or when you want to install a heating system at an extremely low cost.

ALSO ideal to re-create ambiances similar to saunas, Turkish baths, and so on.

## Radiant heating

This system is based on the radiant heating principle.

Radiant heating means exchanging heat by using infrared waves as heat transmitters. As a matter of fact, two bodies or objects with different temperatures naturally exchange radiations, and the heat flow tends to go from the warmer to the colder body. The radiation emitted in a room by a wall heating system turns into heat when it comes in contact with an object, a wall or a person. Waves are not absorbed by air but rather by solids, which turn them into heat. Heat is then transmitted to the surrounding environment for occupants to enjoy optimal heating comfort.

There are three possible ways to apply this effective, space-saving system:

- Using fibreboard panels incorporating heating carbon fibre cables, or
- Using plasterboard panels incorporating heating carbon fibre cables, or
- Installing a heating mesh under the plaster.

## TEMPERATURE CONTROL

Thermal Technology® wall and ceiling heating systems do not require double temperature control (floor probe plus room thermostat). Temperature control is guaranteed by a simple thermostat or clock-timer. If necessary, a surface temperature control may be installed on demand.

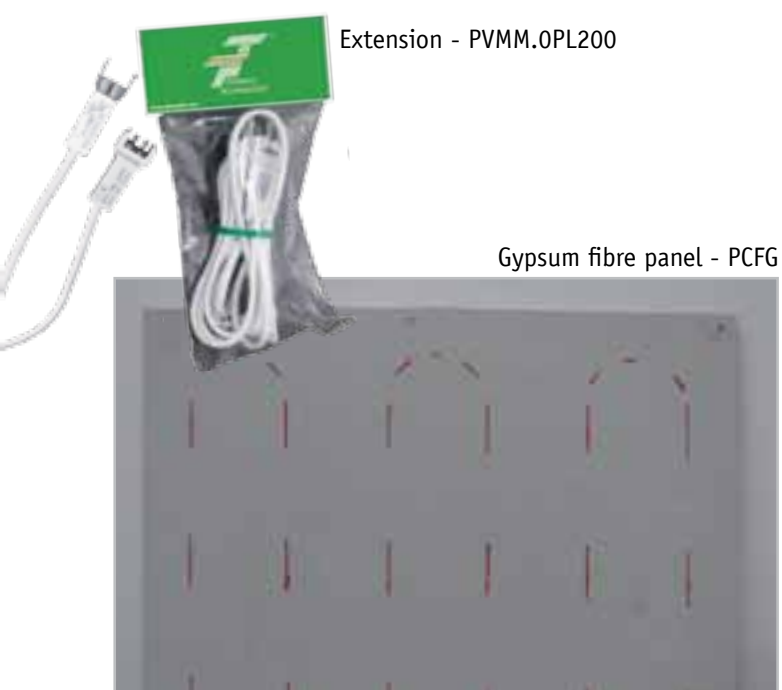
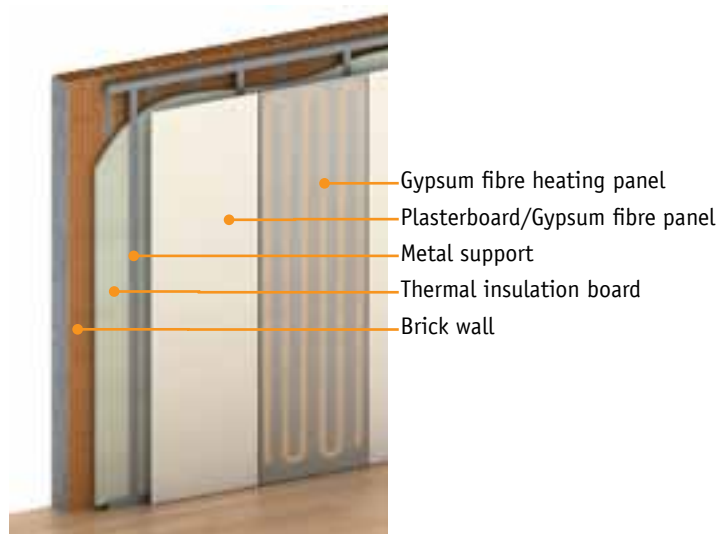
## ADDITIONAL ADVANTAGES PROVIDED BY THERMAL TECHNOLOGY® SYSTEMS

- Less energy needed (-30~40%) thanks to the specific characteristics of carbon fibres,
- Lower wall temperature needed (saves 7% per 1°C less),
- Minimum outward heat loss: about 15%.

Code	Power	Dimensions (cm)
PCFG.B.000.000	140 W	200X60

Code	Accessories
PVMM.00PL80	Module-to-module extension (80 cm)
PVMM.0PL200	Module-to-module extension (200 cm)
PVMM.0PL400	Power-to-module extension (400 cm)

## GYPSUM FIBRE PANEL HEATING HIGHLIGHTS



## GYPSUM FIBRE PANELS

### TECHNICAL SPECIFICATIONS

The system consists of standard width (60 cm) gypsum fibre boards with carbon fibre conductor grooves. In order to improve heat transmission to the environment and therefore reduce heat loss to the wall, the back of the panel is coated with a reflective aluminium sheet which distributes and reflects heat towards the room.

On the front of the panel, the positions of the various cables are shown so that these are not damaged by drilling as they are fixed to the metal frame. Each panel is provided with special insulated (IP67) flat connectors to connect several heating panels. Panels are 1.25 cm thick.

### SPECIFICATIONS:

Gypsum fibre panel highlights:

- Made of gypsum and cellulose fibres (Knauf/Widiwall),
- Good thermal conduction (0.29 W/mK),
- High surface hardness values (Brinnell 25-30),
- Excellent mechanical resistance,
- High resistance to hanging and suspended loads,
- Moisture resistance; suitable for wet areas such as bathrooms or kitchens (water absorption: 250 g/1 m<sup>2</sup>)
- Excellent fire resistance (fire reaction class 1: flame-proof according to the Italian Legislative Decree 26/6/84).

With an environmental temperature of 20°C, the surface temperature of the wall can reach 37°C.

## INSTALLATION

### General guidelines

- Make sure the products used for surface finishing are compatible with a wall heating system.
- Use elastic glues suitable for heated surfaces.
- Test the system before completing the wall or false ceiling.
- Entrust qualified professionals with any electrical work.

A safety warning board should be applied to the wall to prevent accidental drilling where the heating panel is installed.

Fix the panels to the steel brackets of the metal wall, false wall or false ceiling by means of the same fixing tools as used for the building of plasterboard metalwork. If there is more than one heating element, they should first be connected together and then to the electrical system. (Connection to the electrical system should be performed by qualified professionals only). Up to maximum 9 panels may be interconnected with a single power cable extension.

A ceramic coating may be applied to gypsum fibre heating panels. In this case, use elastic glue only.

Better results are achieved if a good-quality thermal insulator is applied behind the panel or inside the metal wall structure.



Code	Power	Dimensions (cm)
PCSC.A.000.000	390 W	200x50
PCSC.B.000.000	300 W	150X50

## UNDERPLASTERBOARD HEATING SYSTEM

### TECHNICAL SPECIFICATIONS

This system includes a 4 mm thick heating panel acting as a thermal insulator, which should be glued on the back of a plaster board.

### SPECIFICATIONS:

Voltage: 230 VAC (or others on demand).

Max. standard working temperature: 55°C with an operating room temperature of 20°C.

#### Carbon fibre heating technology

- Flexible cable with carbon fibre conductor, insulated with special silicone rubber.
- In-built multiple wire carbon fibre cable.

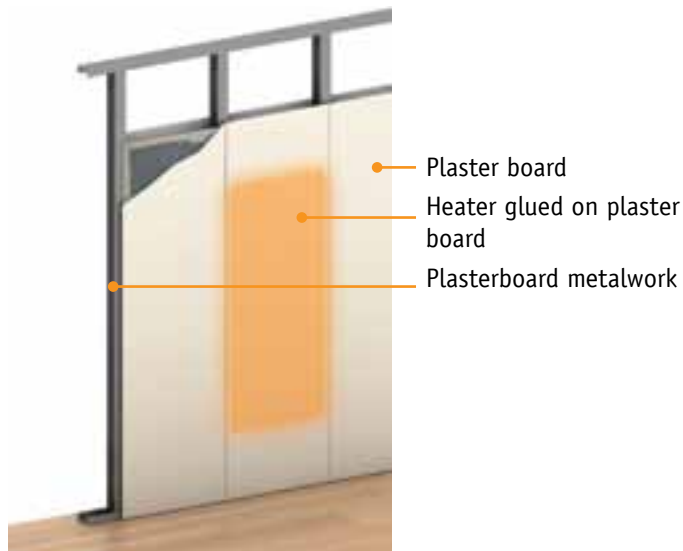
The special silicone rubber makes the cable exceptionally resistant to both high and low temperatures.

### INSTALLATION

#### Wall installation

The panel should be glued on the back of a plaster board (within its borders). Use elastic glue (e.g. Mapei Keraflex).

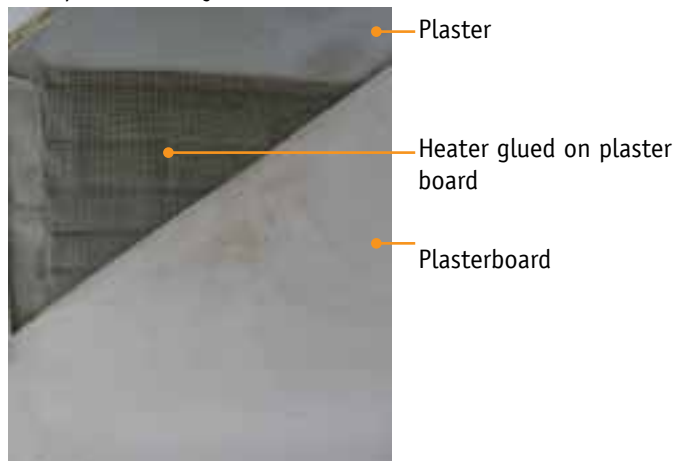
### UNDERPLASTERBOARD HEATING SYSTEM



Under plasterboard heating mesh - PCSC

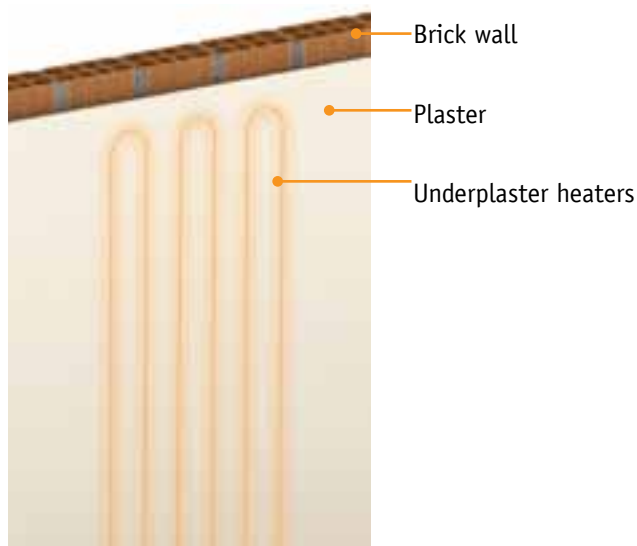


Example of wall lay

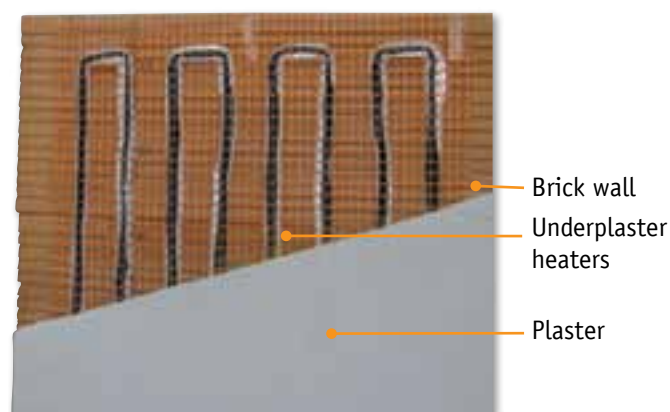


Code	Power	Dimensions (cm)	Thickness (mm)
PIR1.A.000.000	390 W	200x50	4
PIR1.B.000.000	300 W	150X50	4

## UNDER-PLASTER HEATING SYSTEM



Underplaster mesh - PIR1



Example of wall lay



## UNDER PLASTER HEATING SYSTEM

### TECHNICAL SPECIFICATIONS

These Thermal Technology® heating panels can also be laid by non-professional people. Both for wall and ceiling installation, panels should be nailed to the raw surface where necessary and, in case there is more than one, connected together by means of the specially provided plugs. After connecting them to the electrical system, complete the plastering. Allow the plaster to dry out before switching on the heating system.

The heating mesh can also be installed between the plaster and a ceramic coating: in this case, fix the mesh and protect it with a layer of elastic glue using putty knives and toothless plastic tools. Before tiling the area, follow the manufacturer's instructions and wait until the glue has dried out.

Use elastic glue and toothless, plastic putty knives and tools also for coatings.

Electrical works should be performed by professionals only.

### SPECIFICATIONS:

- Voltage: 230 VAC
- Power: 390 Watts/m².
- Max. standard operation temperature: 55°C with room thermostat at 20°C.

### Carbon fibre heating technology

- Flexible cable with carbon fibre conductor, insulated with special silicone rubber.
- In-built multiple wire carbon fibre cable.

The special silicone rubber makes the cable exceptionally resistant to both high and low temperatures.

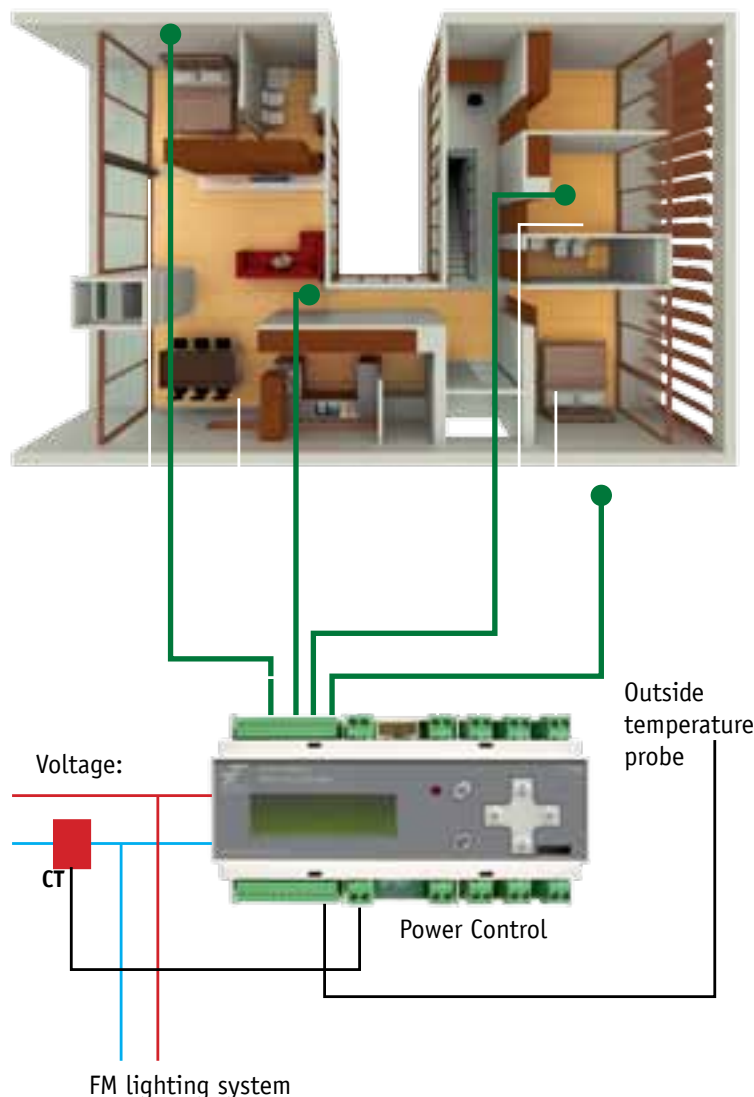
### APPLICATION

#### General guidelines

- Make sure the products used for surface finishing are compatible with a wall heating system.
- Use elastic glues suitable for heated surfaces.
- Before completing plastering, test the heating system.
- Entrust qualified professionals with any electrical work.

A safety warning board should be applied to the wall to prevent accidental drilling where the heating panel is installed.

# Temperature Control T705 Power Control Unit



Thermal Technology® heating systems are usually controlled by room thermostats acting directly on the heating element by means of a relay.

If a Thermal Technology® heating system is installed in more than one room, an electronic control unit is recommended. Thermal Technology has developed a current draw reducing control unit. This analyses the actual power consumption of the system at every moment. In case of over-absorption, the unit switches off the connected fixtures according to the priorities established by the user, thus avoiding a power shut off. This results in a permanent control of consumption and in reduced management costs.

The Power Control unit controls up to 14 outputs and operates in combination with the thermostat or temperature probe of each single area (we recommend using a thermostat/probe in every room). While establishing priorities, not only the heating system outputs are taken into account, but also common electrical appliances such as the washing or dish-washing machine or the oven, so that these can be switched off in case of over-absorption.

The Power Control unit also modulates heating ignition through an outdoor probe.

## How it works

The control unit powers the various areas to be heated. Each output is connected to a heating carpet or a wall heater and is associated to a thermostat (or wall probe). If the thermostat/probe requires heating, the control unit activates the circuit.

If the number of thermostats requiring heating causes pre-set On, Eco or Start absorption peaks to be exceeded, the control unit will activate fewer outputs and start a cyclic activation programme. This programme orders timed operation of individual outputs while allotting longer operation time to prioritized outputs (1=high priority, 3=low priority).

As the Power Control software is aware of the degree of absorption of the whole system, it will limit overall absorption values so that they do not exceed the boundaries set by the meter.

## Modulation working

Modulation working requires an outside temperature probe and individual in-room probes.

A calculated value from 0 to 100 based both on outside and inside temperature is assigned to each output.

The maximum heat loss under minimum design temperature conditions should be calculated for each building. This information is the starting point for establishing the rated voltage of the heating system (with a small additional percentage).

Heat loss is reduced proportionally with the minimum design temperature increase, so the room can be heated with a lower voltage than the rated one.

The Power Control unit is provided with relay outputs, so it is not



Code	Description
T705.0.000.000	Indoor Power Control Unit
T706.0.000.000	Power Control unit expansion pack

## SPECIFICATIONS:

Voltage: 12V AC/DC  
Absorption: Max 1.5A  
Size: 9 DIN-rail sockets (+4 with T706 expansion pack)  
8 inputs to connect to a voltage-free thermostat contact (common +12V)  
8 NTC 10K (AT-103AT) inputs (common to the probe earth +5V) (configurable as a thermostat input)  
8 one-way relay outputs, 8A 230 VAC voltage-free contact (resistive load)

Each relay output can be specifically configured for the heating system or to cut out other fixtures which should not be included in the thermostat programme.

### TA transformer input (C,T1 clamps):

- 0-50 A (0-5V) (tolerance 0,2A)

### Ports:

- Slave RS485 Port, Modbus protocol
- CanBus Port, remote IO extension proprietary protocol

possible to reduce power by cutting half waves. The output can actually be either switched on or switched off.

In order to reduce the system power (e.g. to 70%), one output remains switched on 7 minutes out of 10.

This reduces both heat mass and power consumption.

### How to calculate working percentage

If the outside temperature is the same as the design temperature (e.g. -5°C), the working percentage will be 100%. If the outside temperature is higher than the design temperature, working temperature will be lower as heat loss is lower.

System power control by means of a current transformer (for single-phase systems only)

A current transformer (CT) allows to measure and display the current running in the system. It is installed upstream of the main switch so that the power absorption of all domestic appliances (both heating and household equipment) is measured.

This additional monitoring helps minimize energy absorption, which can be set to not exceed a given number of absorbed Watts.

In this way, besides the advantage of limiting consumption, the Power Control unit allows for some power to be permanently available for additional electrical or domestic appliances.

## FUNCTIONS

- Instantaneous power absorption control of the system thanks to a current transformer (CT);
- Load cut-off with priority scale (heating system or other domestic fixtures);
- Modulated working of the heating system thanks to an outside temperature probe;
- Timer-set night attenuation;
- 8 thermostat inputs;
- 8 probe/thermostat inputs;
- 8 8A relay outputs with expansion module providing 6 more outputs.

Output expansion pack - T706



Power Control - T705



# Touch Power Control T713



## FUNCTION SCREEN



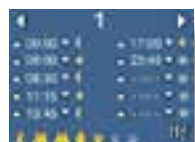
Adjustment of room temperatures



Absorption measurement and consumption self-monitoring



Power generation and consumption diagram



Weekly clock-thermostat

Through a modbus RS485 interface, the Touch Power Control panel connects with the Power Control unit. The Touch Power Control panel provides easy and user-friendly access to some Power Control unit settings (temperatures, status, limits, etc.) and also provides PV system functions.

The control unit has been developed in collaboration with Micro Solution - a domotic company.

The Touch Power Control panel is to be installed flush with the wall and has a 2,8" TFT colour display which matches any type of environment. Just finger touch the screen to view and/or modify the temperature and weekly programme. The Touch Power Control panel allows you not only to pilot the T705 Power Control unit remotely, but also to program 6 different domotic scenarios to control the lighting, intrusion, curtain, and irrigation systems.

## FUNCTIONS

### Adjustment of room temperatures

If you install room probes, the Touch Power Control panel can be used as an easy, interactive interface to adjust the temperature of each single room or area (thermal regulation is performed by the Power Control unit anyway).

### Absorption measurement and consumption self-monitoring.

If you install an impulse power consumption counter upstream of the wiring system and another one along the PV line, the Touch Power Control panel shows the total house consumption and PV system generation.

Moreover, the panel reports to the Power Control unit how much power is readily available for use.

### Power generation and consumption diagram.

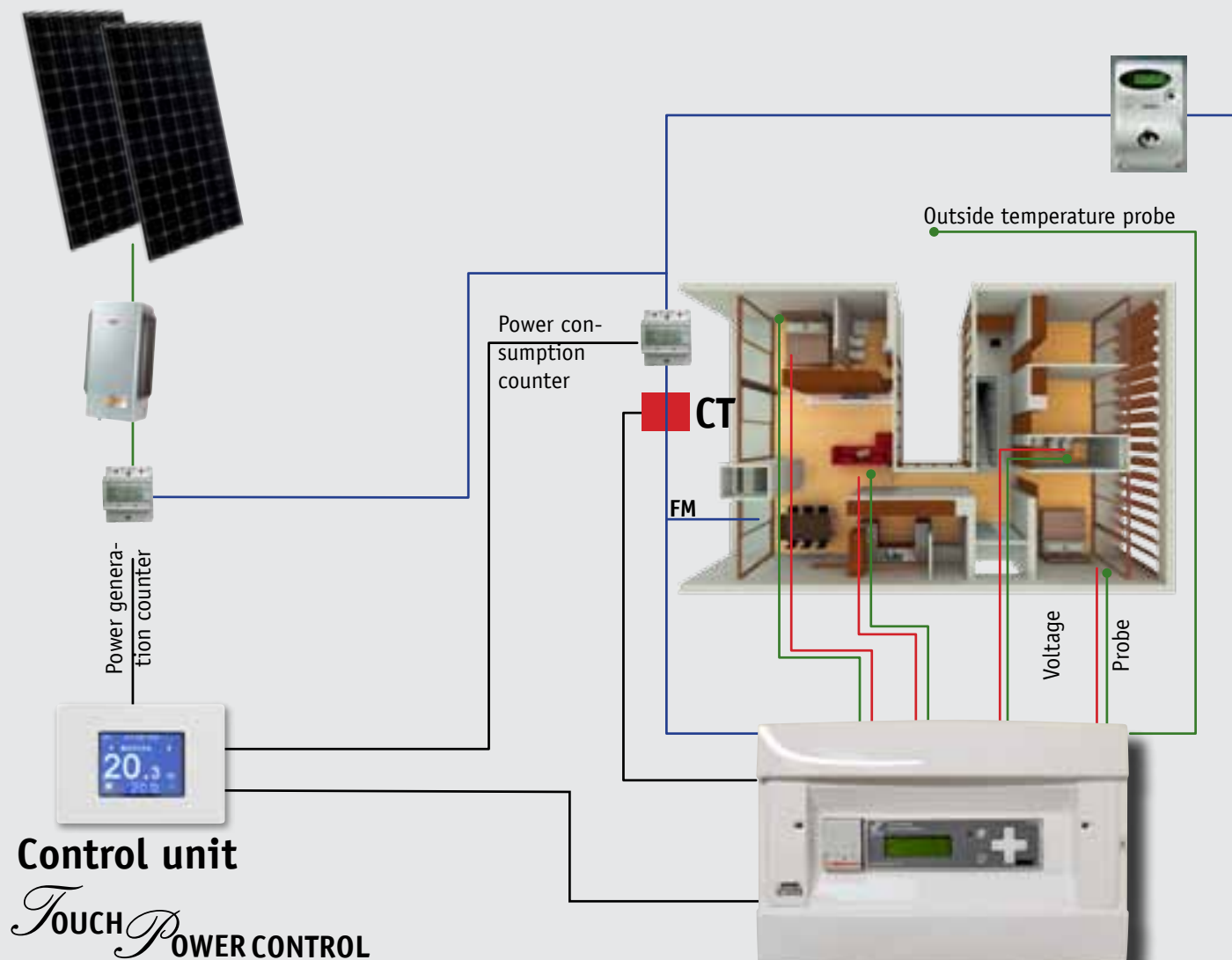
Power consumption and generation trends can be viewed in form of diagrams.

### Weekly clock-thermostat.

The Touch Power Control panel can also be used to adjust the temperature of each room based on daily or weekly profiles.

Code	Description
T713.0.000.000	Touch Power Control (T705 remote display)

## INSTALLATION



## Expandable with products from the domotic company micro solution

domotica

The Touch Power Control panel can control domotic scenarios which are compatible with the domotic bus of Micro Solution. This means it can be integrated in a full domotic system which controls the lighting, shutter, cooling systems, etc..

### SPECIFICATIONS:

- Display: 2.8" TFT LCD 65000 colour full touch screen
- Installation: recessed 503 box, flush with the wall.
- Max. size: 15.5 x 11.5 cm, 6 mm overhang.
- Voltage and consumption: 12÷14 VDC (no batteries, maintenance-free), 0.9 W.
- Min. interval available: 15 minutes.



# Wireless Thermostat



Wireless Clock-Thermostat - T714.A



The Thermal Technology® Wireless Thermostat allows you to adjust the temperature of a room with several radiators.

Thermostat-radiator cabling is not necessary; just connect the radiator with the mains. Switching on and off is controlled by the wireless thermostat.

The Thermal Technology® Wireless Thermostat is compatible both with our design radiators and with radiant floor heating systems.

## WIRELESS THERMOSTAT

### FUNCTIONS

- Large back-lit blue LCD display.
- 5 operating modes: Comfort, Saving, Anti-Freeze, Auto, Off.
- Weekly program.
- Copy program function.
- Leave programming from 1 to 365 days,
- Delay timer from 30 minutes to 72 hours.
- Anti-seize function.
- Battery wear alert.
- Temperature view mode (program value or ambient value).

### TECHNICAL SPECIFICATIONS

- Voltage: Choose between 2 x 1.5 V AAA alkaline batteries or 230 V
- Batteries accessible from front panel
- Radio range from 100 to 300 m in free field condition
- Battery life: over 2 years
- Adjustment: PI
- Protection level: IP30
- Insulation: class II
- Installation: wall installation with in-built box or other support (radio version)
- Operating temperature: from 0 to +40°C
- Frequency: 868 MHz
- Dimensions: 135 x 80 x 20 mm.

## WIRELESS THERMOSTAT RECEIVER

Code	Description
T714.A.000.000	Wireless clock-thermostat for wall installation
T714.C.000.000	Wireless switch-on receiver

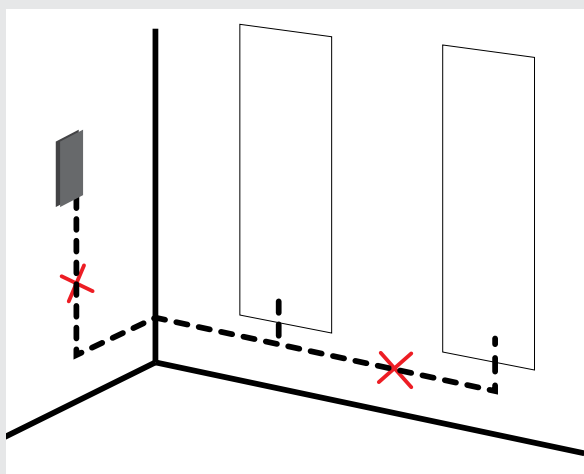
## Wireless Thermostat receiver - T714.C



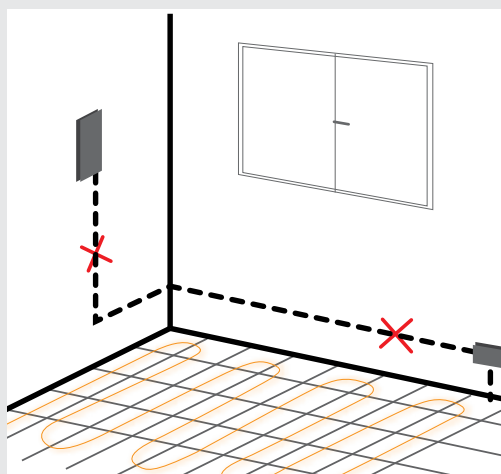
## SPECIFICATIONS

- Voltage: 230 V, 50 Hz
- Consumption: 0.5 VA.
- 16A terminal box output.
- Dry contact.
- PID controller.
- Frequency: 868MHz
- Insulation: class II.
- Protection level: IP44.
- Dimensions: 120 x 54 x 25 mm.

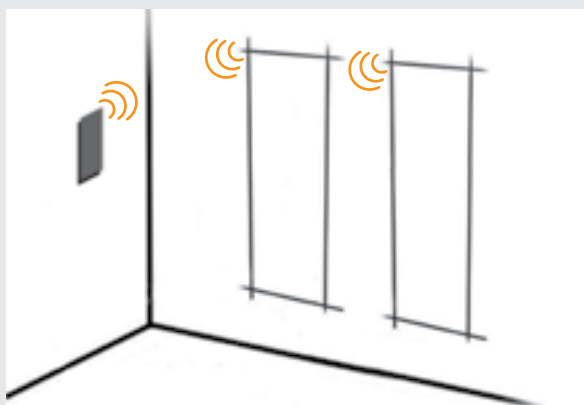
### SAMPLE CONNECTION:



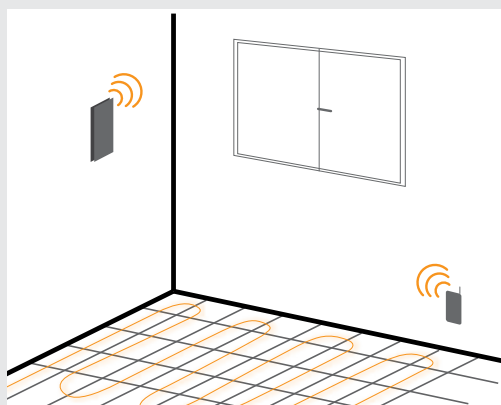
CABLED



### SAMPLE CONNECTION:



WIRELESS



# Carbon Boiler



Carbon Boiler - NTAX



## TECHNICAL SPECIFICATIONS

The unusual design of this tank provides a considerable heating surface (larger than one square meter) wrapped in a special heating cover. Once powered up, the cover reaches a temperature of 120°C and takes the temperature inside the inner tank walls as high as 85°C: this increases the thermal exchange with water and, at the same time, prevents limescale build-up.

## FUNCTIONAL SPECIFICATIONS

Cold water flowing into the tank from below is conveyed along heated walls, so that the temperature exchange between water and the walls is faster and more effective and water is heated up more quickly.

This results in reduced and optimised power consumption thanks to:

- the heater – which is made up of carbon fibre cables (carbon fibres cut power demand by 40% given the same target temperature), and
- power splitting (470 W - 1220 W - 1470 W in “Plus” mode).

The process is supervised by an electronic control unit.

The control unit, provided with a display unit, is connected to two water temperature measuring probes working continuously: one of them is installed in the lower and the other in the higher part of the tank.

### The control unit allows you to

- set two daily working time slots (two-rate time-of-day tariff option),
- decide how to use the storage temperature and gauge electrical consumption based on the user’s actual demand of hot water,
- manage power output.

## ADVANTAGES

Thanks to the above, the Thermal Technology® Carbon Boiler can:

- produce unparalleled hot water quantities compared with similar electrically heated water dipped products,
- ensure significant energy savings and respect for the environment,
- modulate power consumption, which is a very important pre-requisite for energy savings and rationalisation.

## A TYPICALLY SUPPLIED BOILER

The above performances combined with an electronic control unit allow you to pre-set hot water supplies depending on your actual needs.



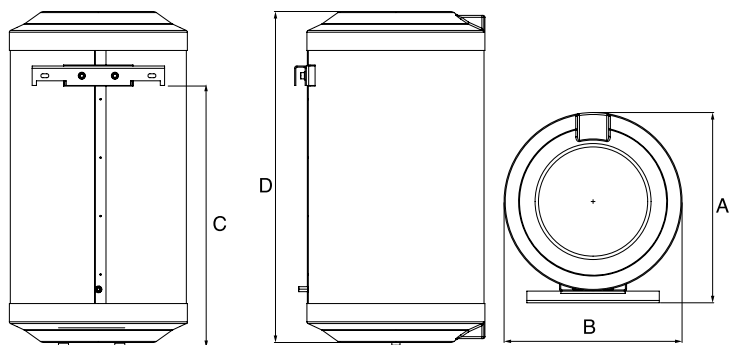
## TEST PERFORMANCES

DT = 25°C	1 hr 30 min.	Consumption 1.56 kWh
DT = 45°C	2 hrs 50 min.	Consumption: 3.00 kWh
Max. operating temperature	90°C	
Thermal loss at 65°C 24/24 hrs	1.40 kWh	
40°C water intake		
(15°C inflow water temperature)	140 l	
5-min. long water intake cycles at 40°C		
(35 l delivered water per cycle - 7 litres/1 min.) with 15 min. breaks		
between intakes in minutes (15°C inflow water temperature)	7 cycles	245 l delivered water
7-min. long water intake cycles at 40°C		
(50 l delivered water per cycle - 7 litres/1 min.) with 15 min. breaks		
between intakes in minutes (15°C inflow water temperature)	4 cycles	200 l. delivered water

No. OF PEOPLE	TEMPERATURE SETTING	WATER OUTPUT	CONSUMPTION (kWh/dd)	COST (€)
4	65°C	245 l	6.25 kWh	expressed in €/1.13
3 people	60°C	190 l	5.15 kWh	expressed in €/0.93
2	55°C	135 l	4.10 kWh	expressed in €/0.74
1	45°C	90 l	2.45 kWh	expressed in €/0.45

By way of example and based on the number of occupants, the following daily consumption values are expected. They take into account water output intervals and resetting pre-set water temperature to 1 kWh = € 0.18

Technical details		NTA1.A	NTA1.B	NTA1.C
Capacity	l	50	75	100
Power	W	250/710 1020	470/1220 1470	470/1630 1880
Voltage	V	230	230	230
Heating time ( $\Delta t = 45^\circ\text{C}$ )	hr. min.	*	2.32	*
Max. operating temperature:	°C	90	90	90
Heat loss at 65°C	kWh/24h	*	1.37	*
Max. operating pressure	bar	6	6	6
Net weight	kg	21	29	33
Size				
A	mm	500	500	500
B	mm	460	460	460
C	mm	460	720	960
D	mm	650	910	1150



## A TYPICAL BOILER CONSISTS OF:

- TIG and micro-Plasma welded AISI 316L stainless steel body with pickling treatment both inside and outside,
- Stray current and corrosion protective device (replaceable magnesium anode),
- Inspection flange (diam. 12 cm),
- Max. operating pressure: 6 bar,
- Hot and cold water connections: 1/2",
- High-density, extra-thick (40 mm) PU foam insulation - CFC and HCFC-free,
- Epoxy powder painted sheet steel shell,
- Anti-static, shock-proof ABS lower and upper plates,
- Display indicating storage water temperature, operating power range, ON/OFF status, time,
- Thermostatic valve for manual control of output water temperature,
- Safety valve (compulsory);
- Power options: 470 W - 1220 W - 1470 W (ref. to 75 l);
- Net weight: 29 kg,
- IP40 protection.

## INSTALLATION REMARKS

- We recommend installing an expansion tank to compensate for the increased volume of heated water.
- Install an inlet pressure adjustment unit.
- Considering that feed water is usually rather hard (up to 25°f), we recommend installing a polyphosphate filter to avoid calcium precipitate in the boiler. For intensive use or water harder than 25°f a water softener must be installed (see UNI8065).

# Radiant Ceiling Panels



Showroom



Meeting room in a villa



Restaurant



The Radiant Ceiling Panels by Thermal Technology® are extremely versatile: whether integrated in false ceilings, fixed to the ceiling or mounted hanging at a definite height, they can be easily removed and re-used. Radiant Heating Panels are ideal to heat individual areas or workplaces in large environments such as workshops, warehouses, laboratories, kiosks or patios of public places (pubs, restaurants, etc.).

Radiant panel heating results in energy savings as all the irradiated energy is streamlined to heat persons, the floor, the walls, and objects. Air is only heated indirectly. The system is power operated and therefore exempt from legal requirements including certifications from Local Health Authorities or from the Fire Brigade. As no combustion is involved, the system does not need any exhaust outlets, boiler houses or fume emission compliance certificates.

## Radiant heating

Practical, lightweight heating panels are easily installed. Purchasing, installation and operating costs are extremely competitive compared to any other type of similar systems including hot-water radiant strips, radiant gas heaters, thermal umbrellas, etc. Heating elements have a very low thermal inertia and this contributes to fastening the heating process. No assistance or maintenance needed, no permissions to apply for and no specific regulations to conform to.

## TEMPERATURE CONTROL

The system can be controlled by clock-timers and probes or by a consumption-limiting electronic unit which optimises operating costs.

## APPLICATIONS

Typical installations include workplaces.

Radiant heating panels are ideally installed above the operator or above busy places. They are also suitable for heating offices, and can be installed even in breeding farms.

## INSTALLATION

A Radiant Heating Panel is to be mounted at a certain height with the radiant surface facing downwards. Recommended installation height: 2.30 m with seating persons; 2.70 m with standing persons. Under special circumstances heating panels may also be installed at different heights (please refer to the manufacturer). Radiant Heating Panels are provided with 4 hooks for ceiling mounting.

## PRS1

60x60 cm panels are only delivered with the 200 Watt power option and are ideal for trade and business centres.

## False ceiling heating panels



### SPECIFICATIONS:

- Size: 59.9x59.9 cm.
- Voltage: 230 VAC
- Power: 250W.
- Protection level: IP54.
- Weight: 5 kg.
- Max. surface temperature: 90°C

### PRS2

200X50 cm panels have three workload options.

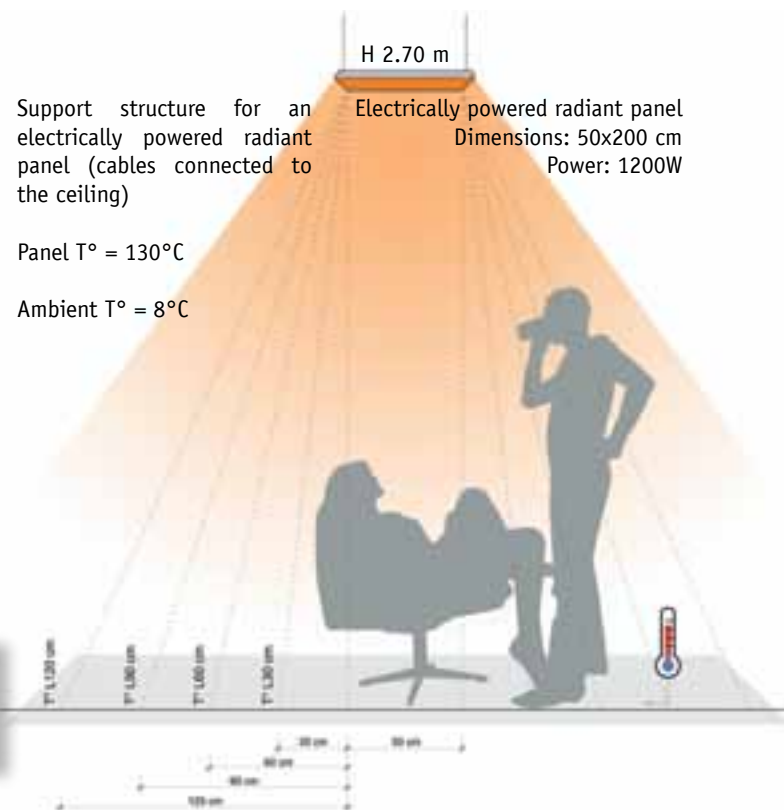
### SPECIFICATIONS:

- Size: 200x50 cm.
- Voltage: 230 VAC
- Power: 1200W (400W/800W/1200W).
- Protection level: IP54.
- Weight: 11.5 kg.
- Max. surface temperature: 110°C/130°C depending on ambient conditions.

## Workplace



### PERFORMANCE EXAMPLE



Code	Dimensions (cm)	Power
PRS1.A.000.2A2	59.5x59.5	220W
PRS2.A.000.2A2	200x50	1200W

Flooring type	T° L 0cm	T° L 30cm	T° L 60cm	T° L 90cm	T° L 120 cm
Ceramic tiles/Concrete floor	24°C	23°C	20°C	20°C	18°C
Wood slabs / pre-finished	29°C	26°C	24°C	22°C	20°C

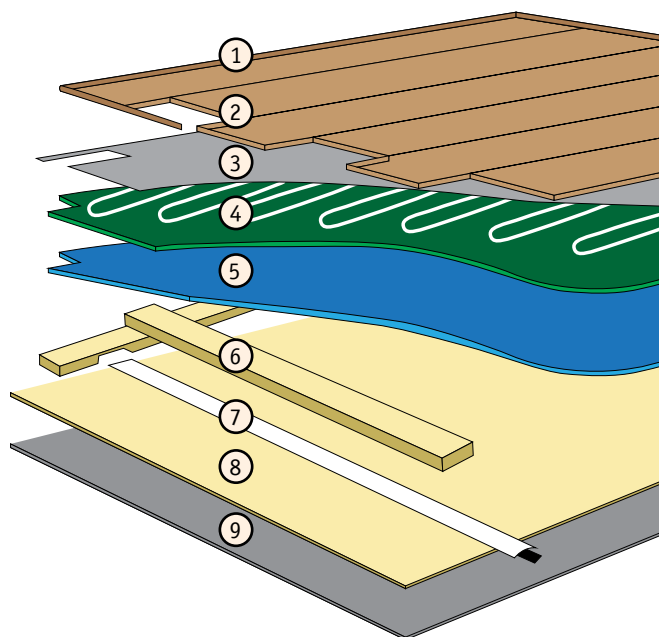


# Radiant Footboards



The electrically powered Thermal Technology® heating footboard with carbon fibre cable is specially developed for heating offices, secretarial workstations, etc..

The footboard is lain over the floor and heats standing or sitting people by radiation. This is an ideal solution for large environments, where heating can be limited to restricted areas. The special construction of radiant heating footboards allows you to minimize heat loss to the floor for increased efficiency and reduced operating costs. This system is particularly suited for discontinuous operation: this means that it can be switched on just before use to benefit those who stay over the footboards. It is generally not sized to heat the air of the whole place. Footboard temperature is controlled by probes connected to an electronic unit. Daily use also helps improve local comfort as it prevents perimeter wall temperatures to fall excessively. Large heating footboards come also divided into separate zones so that some of them can be switched off when unnecessary. The heating footboard system is covered by several international patents and is maintenance-free as it has no boilers, pumps or water pipes. Installation is quick and non-invasive, installation costs are significantly reduced compared to any other traditional air or water based heating system. Installed power is also lower than traditional systems.



## Construction:

1. Framing
2. Laminated floor
3. Zinc-plated sheet steel heat diffuser
4. Thermal Technology® heating mat
5. Thermal insulation board
6. Wooden support framing
7. Wiring channel
8. Plywood base
9. Vapour barrier

**Overall thickness: 27 mm**

## SPECIFICATIONS:

- Voltage: 230 VAC
- Absorption: 200 W/m².
- Temperature adjustment by separate electronic control or thermostat (max. surface temperature: 30°C).
- Marking: CE.
- Protection level: IP40

Code	Description
PEDI.X	Custom footboard modules including thermal insulation and sheet steel plate

# Custom Wellness Heating Meshes



Thermal Technology® manufactures low-voltage heating meshes which are specially designed for wet environments such as bathrooms, Turkish baths, saunas, salt caves, loungers, shower walls, bathtub and swimming pool seats and benches.

All the above are custom sized and applied under the lining of benches, bathtubs, loungers, walls, floors, and shower stalls.

Our Wellness Meshes are easily installed on typical curved surfaces.

## SPECIFICATIONS:

Voltage: 12-48 V (on demand)

Typical power: 150 W/m<sup>2</sup>\*

Temperature: up to 45°C\*

Temperature control: in-built NTC 10K probe for surface temperature control.

\*Various power options. We can deliver custom made heating elements for temperatures up to 70/80°C.



Code	Description
PVRW.0.000.000	Custom heating mesh with curved surfaces or more than 4 sides

Custom Wellness Heating Mesh - PVRW

# Under-Carpet Heating Systems



Under-carpet radiant heating solutions are ideal to heat large environments temporarily during events, meetings, exhibitions, catwalks, etc..

The system comprises of roll-out heating elements to be lain side by side over the existing floor.

Both installation and removal are easy and quick.

Each heating element is provided with a power supply cable for direct connection to the electrical panel, and with a temperature probe.

The special construction layers of an under-carpet system guarantees good thermal insulation on the lower side as well as providing a semi-rigid surface on the upper side to support chairs, tables, etc..

Rugs or additional carpets can be easily lain over the under-carpet heating system.

The system can be easily removed in summertime to bring the covered area back to its original appearance.

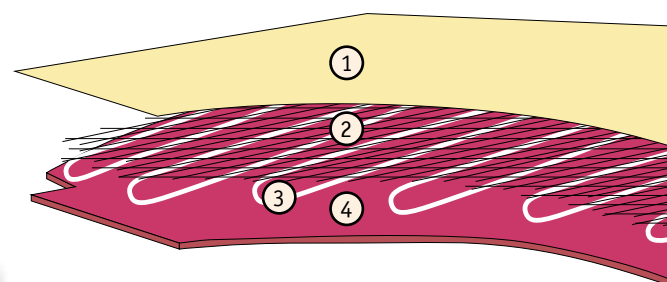
## Construction:

1. Aramid fabric.
2. Metal mesh earthing.
3. Flame-proof carbon fibre heating cables.
4. Thermal insulating material (fire reaction class 1).

**Under-carpet system thickness: 8.5 mm**

## SPECIFICATIONS:

- Dimensions: custom size (max. width 150 cm, max. length 900 cm for each module)
- Voltage: 230 VAC
- Absorption: 200 W/m<sup>2</sup>.
- Adjustable power and/or temperature.
- Marking: CE.
- Protection level: IP67
- Guarantee: 24 months (see User Manual).



Code	Description
STM0.X	Under-carpet custom system



# Outdoor/Indoor Heating Walkways



200 x 100 indoor carpet - TAP1

Thermal Technology® Carbon Fibre Heating Carpets are used to benefit lower limbs and provide comfort whenever a person remains still for long hours. This product comes either standard in a 200 x 100 cm size or according to plan. Custom made indoor heating carpets are manufactured to order.

## Construction:

- Striped grey pile.
- Carbon fibre resistors.
- Skid-proof.

## SPECIFICATIONS:

- Dimensions: 200 x 100 cm or custom sized
- Available colours: anthracite grey
- Voltage: 230V (2 m extension)
- Power: 390 W/m<sup>2</sup>
- Electronic surface temperature control.

Adjust the temperature regulator integrated in the plug body on the desired surface temperature depending on momentary requirements.



Thanks to its carbon fibre cabling, the outdoor Thermal Technology® heating system is excellent if used on outdoor staircases or hotel entrance halls for ice or snow melting. Outdoor heating carpets are manufactured according to plan and designed to the customer's needs.

## Construction:

- Pile carpets
- Metal mesh
- Carbon fibre resistors
- Adhesive aluminium
- Insulating material
- Anti-skid tape on the lower side

## SPECIFICATIONS:

- Custom sizes
- Voltage: 230V 50/60Hz with H07 3x0.75 cable (1, 2 – 230V power supply, 3 – earthing)
- Power: 150 W/m<sup>2</sup>
- Protection level: IP67

Code	Description
TAPI.X	Custom indoor carpet
TAP1.A.C00.1A1	200x100 indoor carpet with workload adjuster
TAPE.X	Snow-melt carpet with pile finish

# Outdoor Meshes



Outdoor mesh - PVRR



Code	Power	Dimensions (cm)
PVRR.050150	130 W	50 x 150
PVRR.050190	140 W	50 x 190
PVRR.050360	280 W	50 x 360
PVRR.050530	400 W	50 x 530
PVRR.050700	540 W	50 x 700
PVRE.0.000.000	Custom outdoor heating mesh	
PVRE.A.000.000	Custom outdoor heating mesh	with reinforced cable
PVRE.0.000.XXX	Custom outdoor heating mesh	for curved surfaces/staircases

Code	Description
PVRR.OPL100	FG7 2x2.5 extension cable w/ double connector
PVRR.OPL600	FG7 2x2.5 m power cable w/ connector
T601	Outdoor control unit w/ probe (T751+T804 kit)
T611	Ice Detector kit for ramps w/ temperature/humidity probe and ice/snow detector

Outdoor heating meshes are made of fibreglass modules supporting special silicone coated carbon fibre heating cables. The system can be tailor cut based on customer's drawings or available in modular combinations. Standard module width is 50 cm, whereas length is available in several options. Individual modules are all supplied with IP67 sealed connectors which make laying them easy and fast even for unskilled people. The system excellently solves problems due to snow accumulation and ice build-up on footpaths, garage ramps and the like. Mesh modules are easily adapted to the specific ramp or footpath size. Thanks to specially developed connectors containing portions of free cables, bending paths can be covered as well. Extensions are supplied to connect together the two wheel passage bands for garage ramps, or to connect paths where the underlying structure is severed by structural joints, or paths with interposed pits or other barriers. Outdoor meshes can be installed over cement, under asphalt, under concrete or porphyry subfloors, etc. Thanks to a special moisture and surface temperature detecting probe, the system works automatically and only when necessary.

## INSTALLATION

The various elements are lain and connected together by means of special IP67 sealed connectors and/or a power supply extension. Connection to the electrical system should be made by qualified professionals only.

### Laying the mesh over pre-cast concrete:

The heating mesh can be cast in cement or simply lain over an arc-welded mesh. The heating mesh should be kept 5-6 cm lower than the floor level so that the heating process is faster. Heating panels should be lain so as not to cover structural joints.

When an arc-welded mesh is used:

The heating mesh is generally placed over it and fixed by means of plastic straps. The arc-welded mesh should be shimmed so that it lays 5-6 cm below the finished floor level.

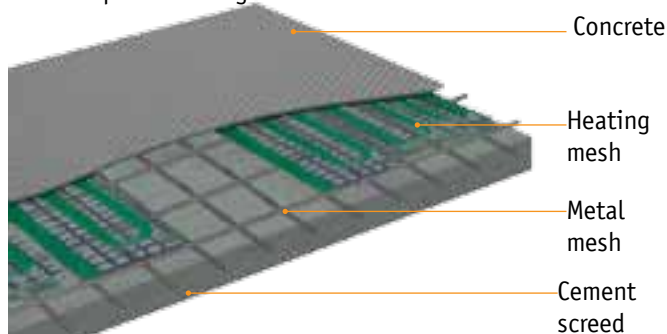
### Laying the heating mesh under slab or porphyry floors:

The heating mesh can be lain over the subfloor (e.g. concrete). It is preferable to create voids for connectors, and smoothe with a thin layer of cement or glue so that the mesh is protected while laying slabs or porphyry.

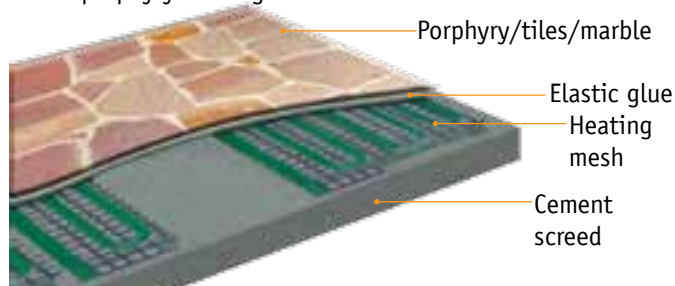
## SPECIFICATIONS

- 340 g/m<sup>2</sup> reinforced fibreglass mesh, inner mesh size 28 x 28 conforming to UNI 9311/4 – UNI 9311/1 – UNI 9311/2 – UNI 9311/5 and UNI 8532 directives.
- Carbon fibre resistors covered with polyolefin over a heat-

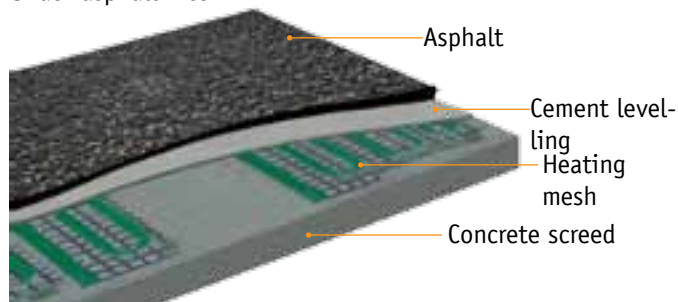
Under-asphalt heating mesh



Under-porphyry heating mesh



Under-asphalt mesh



insulating reflective 2 cm wide band. Cables are protected with a nylon strip for an overall mechanical resistance of 15 N/mm<sup>2</sup>.

- Voltage: 230V, 50Hz by an FG7 2 x 1.5 extension provided with an IP68 F-connector.
- Module-to-module connection by IP68 pin-and-socket snake connector
- Absorbed power: 150 W/m<sup>2</sup> (custom designed on demand)
- Max. power for each connector plug: 2500 W
- Full IP67 system protection.
- Connector diameter: 27 mm.

#### Custom heating system

Custom-cut modules feature various shapes and sizes depending on individual specifications. Power ranges between 140 and 250 W/m<sup>2</sup>. Every single powered module can reach about 2500 W (larger modules can be divided into several sections).

Modules are not provided with connectors, but with an FG7 cable (length to be determined at the design stage).

#### CONFORMITY

This product conforms with the electrical safety standards established by the LVD (Low Voltage) Directive 2006/95/EC and with electromagnetic compatibility as stated in the EMC (Electromagnetic Compatibility) Directive 2004/108/EC.

This product has undergone CE - TÜV - CB tests.



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Qualità al Plurale.

## T611 Frost-Detector Kit

Floor sensor kit (ramps, pavements, squares, etc.)



Code	Description
T611	Ice Detector kit for ramps

Thermal Technology® offers an ice/snow-detector unit to be used in combination with outdoor heating systems. Standard supplies include a temperature/humidity probe and an ice/snow detector. The heating system switch-on is timed up by the station to prevent ice build-up, i.e. before the outside temperature reaches the freezing point. In this way, useless energy waste is avoided as the system switches on only when the risk of ice build-up arises.

#### Characteristics:

- Up to 80% energy savings.
- LCD display showing current values.
- User friendly: three buttons to enter setpoint values.
- Pre-uploaded standard software.
- Adjustable post-heating delay.
- Adjustable lowest temperature limit.
- Heating system meter.
- Alarm output contact.
- 6 DIN-rail format.
- Conforming to EN 60703.
- Conforming to EN 55014.
- 16A output contact.

\*In some cases, e.g. with dry snow, the control unit might not switch on the system. The control unit can be switched on/off manually.



# Custom Snow-Melt Roof Meshes



## Snow-melt roof mesh - PVRE



The Thermal Technology® Snow-Melt System is an ideal solution to melt snow build-up off roofs. The system comes equipped with velcro straps and hooks.

It also includes a reinforced fibreglass mesh (340 g/m<sup>2</sup>, 28 mm meshes) with insulated carbon fibre heating cables protected by a PVC-covered tinned copper reinforcement. All this is finished with a black PE strip secured to the mesh.

### SPECIFICATIONS:

- Voltage: 230 V
- Power: 160W/m<sup>2</sup>
- Protection level: IP67
- FG7 power cable

Code	Description
PVRT.0.000.000	Custom snow-melt roof mesh w/ fastening kit

## Sample installations





# Heating System for PV Panels



## Snow-melt system for PV panels - FT 1E-ALU



Back view

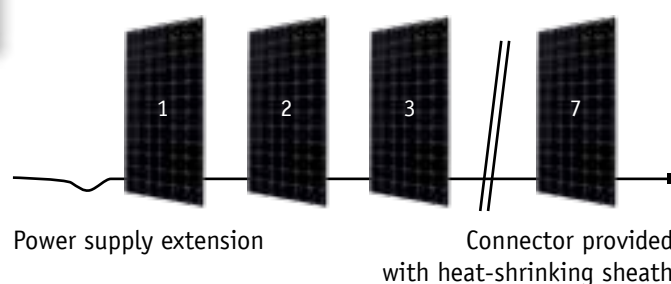
The Thermal Technology® heating system for PV panels melts down snow build-up and guarantees trouble-free working. Switch on the snow-melt system during and/or after build-up so as to leave the PV surface free. The time necessary to melt the snow off the entire panel surface depends on the snow quantity and on outside temperature. The heating system must NOT be working with outside temperatures higher than 10°C.

### SPECIFICATIONS:

- Carbon fibre resistors.
- Voltage: 230 V
- Power: 250 W
- Standard panel custom dimensions
- Other dimensions are available on demand.
- Special H07RNF connecting cable.
- IP67 protected connector.
- ON/OFF operation.
- Marking: CE.
- Guarantee: 24 months with optional extension.

Code	Description
FT 1E-ALU	Heating system for PV panels
FT 1E-RETE_PL	Power supply extension and 4 m cable

1 power cable connects max. 7 heating panels



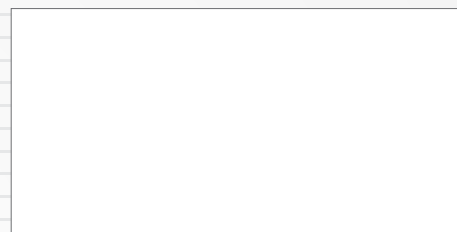


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