



# electric floor heating



Heating mats



Heating cables



Temperature controllers

**SOLUTIONS**  
FOR EVERYONE

# Floor heating as the most favourable heating solution

Of all heating systems, floor heating's vertical temperature distribution in a room is the closest form of heating to the physiological body temperature distribution.

Floor heating is a low temperature heating solution (floors will reach temperature levels of approx. 26°C), the entire floor constitutes the heating element.

The advantages of these characteristics are as follows:

- no combustion and dust convection which causes allergies,
- no draughts,
- no drastic temperature differences in rooms,
- no dry air.



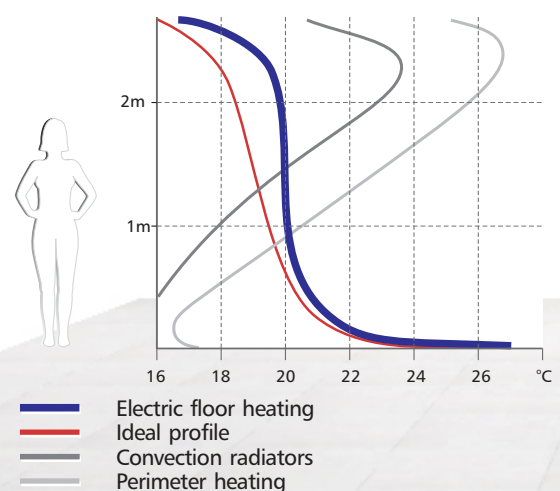
## Floor heating means:

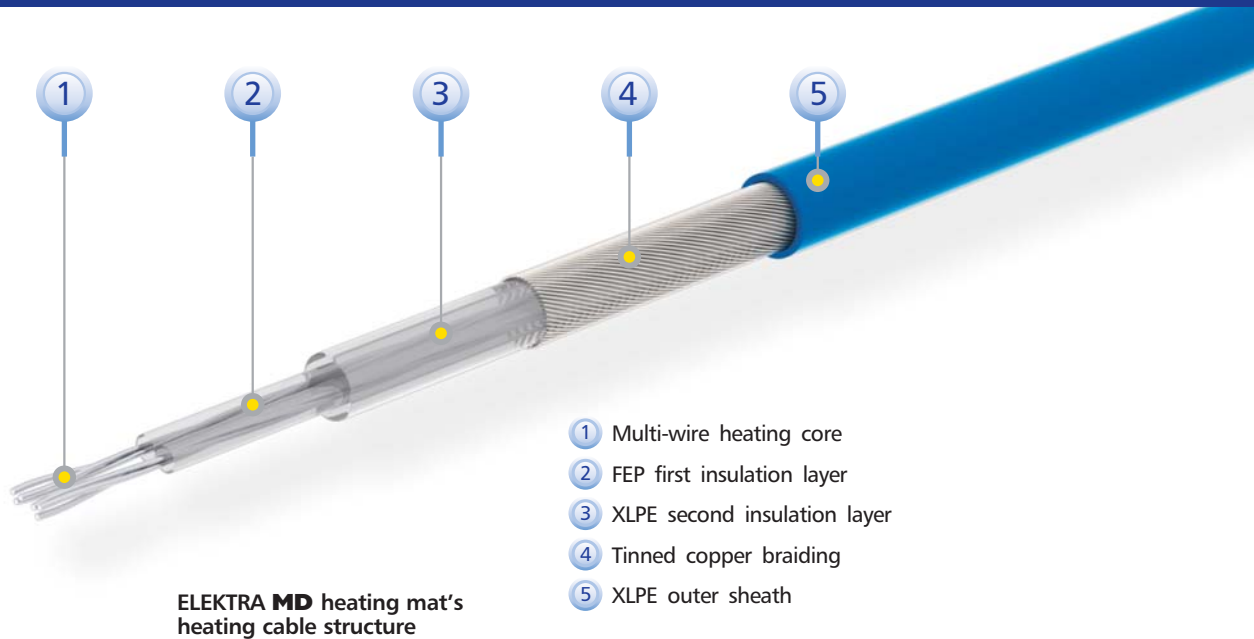
- indoor climate comfort for users
  - even room temperature distribution, favourable warm floor,
- interior designs are not compromised by bulky heaters, boilers, chimneys, and water or gas pipes,
- low capital costs,
- decentralized heating – regulation and control of individual rooms possible.



Due to their advantages, floor heating systems are especially recommended for allergy sufferers

Indoor vertical temperature distribution for different type of heating





Efficiency of electric floor heating will depend upon the floor thermal insulation's thickness. This variable is especially significant for ground floors or floors positioned above unheated rooms.

Approved finishing materials for heated floors are as follows:

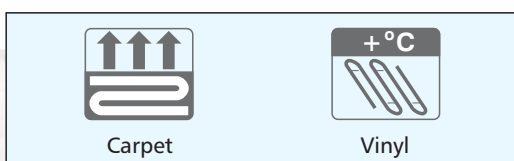
- floor tiles such as marble, ceramic, porcelain or terracotta,
- fitted carpet (of max. thickness 15 mm including underlay),
- PVC / Vinyl flooring,
- thin floor-glued wood parquet,
- laminate / engineered wood.

Each of the above materials (with the exception of floor tiles) must be approved by their producers for applications with floor heating. Also, they must be installed according to the producers' instructions.



### Floor heating system can be developed on the basis of:

1. **ELEKTRA VCD heating cables** placed in a screed at construction stage.
2. **ELEKTRA MG/MD heating mats and ELEKTRA DM/UltraTec heating cables** placed in the layer of flexible adhesive or self-levelling compound laid directly under the finished floor on the floor base (concrete or timber).
3. **ELEKTRA WoodTec1™ and WoodTec2™ heating mats** suitable for placing under laminate or engineered wood flooring.

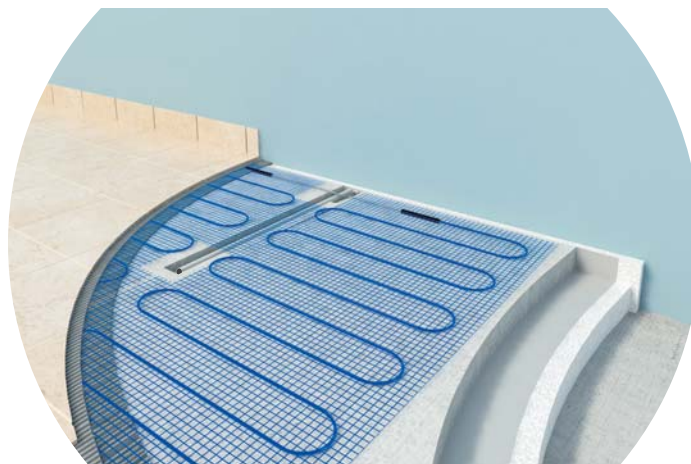


Markings on approved floorings



ELEKTRA VCD heating cables are usually used as a primary room heating, constituting the only heating element in a room.

ELEKTRA MG/MD heating mats and ELEKTRA DM and UltraTec heating cables are then normally used as supplementary heating systems, in order to achieve the warm floor. They can, however, constitute the primary heating system, if required.



**ELEKTRA heating mat in a layer of flexible adhesive or self-levelling compound, directly under the floor**

## Warm floor

### Heating system placed in a layer of flexible adhesive or self-levelling compound, directly under the floor

To achieve the warm floor, the following heat output options are recommended:

- **100-160 W per m<sup>2</sup>** of the floor
  - when tiles or stone are the floor finishing materials,
- **100 W per m<sup>2</sup>** of the floor
  - when PVC or engineered wood are the floor finishing materials.

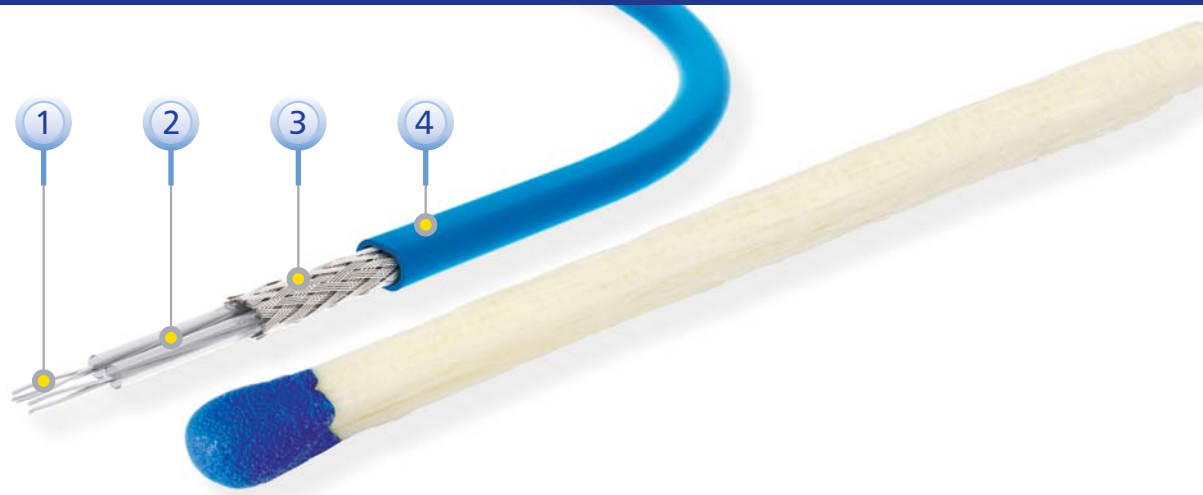
For the shortening of the warm-up time, it is recommended to install higher heat output per 1 m<sup>2</sup> (approx. 160 W/m<sup>2</sup>) when the heating system is not intended for permanent operation e.g. in hotel rooms or offices, and additionally in

situations when temperature controllers with temperature set-back option will be used for heating regulation purposes.

For the cases above, the following can be used:

- ELEKTRA MG/MD heating mats,
- ELEKTRA DM and UltraTec heating cables.

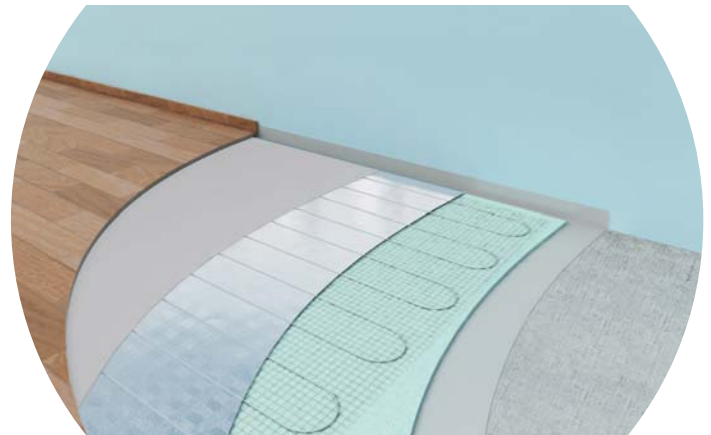
The heating mats' structure is a thin heating cable fastened to a 50-cm-wide fiberglass mesh. The mats are simpler in installation than cables themselves: self-adhesive properties facilitate floor fastening of the mats, when the DM or UltraTec cables must be attached to the floor.



- ① Multi-wire heating core
- ② FEP insulation layer
- ③ Tinned copper braiding
- ④ FEP outer sheath

**ELEKTRA UltraTec**  
heating cable structure

Heating cables are simpler to fit onto irregularly shaped area than mats



**ELEKTRA WoodTec™** heating mat under laminate flooring

**Heating systems laid on the levelling layer under laminate floor panels or engineered wood floorings – dry installation:**

ELEKTRA WoodTec™ heating mats laid with the dry method on the levelling layer. These heating mats' structure is a thin heating cable fixed to a fiberglass mesh covered with a layer of aluminium foil. The foil acts as a protective sheath for the heating cable, as well as a radiator transferring heat from the heating cables directly to laminate floor panels or engineered wood floorings.

## Primary heating

Primary heating (only heat source) requires having your heating system and its controls designed by a qualified designer, dealer or installer.

# Products



## ELEKTRA MG/MD heating mats

Single side supplied **ELEKTRA MD** mat, 3.9 mm thick, terminated at one side with a power supply conductor and a connecting joint at the other.

Double side supplied **ELEKTRA MG** mat, 3 mm thick, terminated at both sides with power supply conductors.

**ELEKTRA MD** mats are simpler to install, featuring only one power supply conductor. In double side supplied **ELEKTRA MG** mats, both power supply conductors need to be run to the connection box. Due to insignificant thickness, the mats are best suited for areas where floor levels should not become excessively elevated.

Heating mat's heat outputs:

- MG – 160 W/m<sup>2</sup>,
- MD – 100 and 160 W/m<sup>2</sup>  
(200 W/m<sup>2</sup> – UK only)

160 W/m<sup>2</sup> heat output heating mats are especially suited for installation under ceramic and stone floorings. 200 W/m<sup>2</sup> can be used for high heat loss areas such as conservatories. 100 W/m<sup>2</sup> heat output heating mats can be installed under any flooring type.

Product type		Place of installation	Stage on which the heating system will be constructed	Mat or cable's thickness [mm]	Number of power supply conductors
Heating mats	MG	directly under the floor, in the layer of flexible adhesive or self-levelling compound	finishing works or renovation	3	2
	MD			3.9	1
Thin heating cables	DM			4.3	1
	UltraTec			2 x 3	1
Heating cables	VCD	screed	new construction	5 x 7	1
Heating mats	WoodTec1™	directly under engineered wood, in the levelling layer	finishing works or renovation	1.9	2
	WoodTec2™			2.8	1



### ELEKTRA DM and UltraTec heating cables

Heat output 10 W/m. Terminated at one side with a 2.5 m-long power supply conductor.

**ELEKTRA DM** – thickness 4.3 mm.

**ELEKTRA UltraTec** – dimensions 2 x 3 mm.

ELEKTRA UltraTec cables are especially suited for areas where floor elevation is restricted. Installation directly under the flooring in the layer of elastic glue or self-levelling slab.



### ELEKTRA WoodTec™ heating mats

**ELEKTRA WoodTec1™** – double side supplied, 1.9 mm thick, terminated at both sides with power supply conductors.

**ELEKTRA WoodTec2™** – single side supplied, approx. 2.8 mm thick, terminated at one side with a power supply conductor and a termination at the other.

ELEKTRA WoodTec2™ heating mats are simpler to lay, as featuring one power supply conductor only.

ELEKTRA WoodTec1™ heating mats are thinner.

Installation directly under the laminate panel flooring or engineered wood flooring – dry installation.



### ELEKTRA VCD heating cables

A double-core cable, terminated at one side with a 2.5 m-long “cold tail” power supply conductor and a termination at the other.

For room heating applications, unit output power of 10 and 17 W/m is suitable. Installation in concrete slab.

## Heating mat and cable's selection

### ELEKTRA MG / MD heating mats

When selecting the proper dimensions of one or several (if room size requires it) heating mats (the 50 cm-wide width is always constant), it is necessary to adequately plan the layout – on the entire floor or its fragments only.

Mats **shall not** be placed where fixed furnishings are planned (floor-based cupboards, bathtubs, toilets etc.) Mats will be properly shaped by trimming the mesh and turning in the required direction.

Use the tables below to select the product of the length corresponding to the layout requirements.

**Note: Heating mats must not be shortened.**

### ELEKTRA VCD, DM and UltraTec heating cables

For the correct selection of the heating cable, calculate its heat output as follows:

**Cable's Heating Output** = P x S, where:

P – assumed heat output per 1 m<sup>2</sup> of the floor,

S – floor area to be heated, free of fixed furnishings.

Then, use the product table to select the cable which features the heat output closest to the calculated one.

### ELEKTRA WoodTec™ heating mats

When selecting the WoodTec™ heating mat, follow the guidelines for ELEKTRA MG/MD mats.

**ELEKTRA MG** double side supplied heating mats

Type	Dimensions [m x m]	Heating area [m <sup>2</sup> ]	Power output [W]
<b>160 W/m<sup>2</sup></b>			
MG 160/1.0	0.5 x 2.0	1.00	160
MG 160/1.5	0.5 x 3.0	1.50	240
MG 160/2.0	0.5 x 4.0	2.00	320
MG 160/2.5	0.5 x 5.0	2.50	400
MG 160/3.0	0.5 x 6.0	3.00	480
MG 160/3.5	0.5 x 7.0	3.50	560
MG 160/4.0	0.5 x 8.0	4.00	640
MG 160/5.0	0.5 x 10.0	5.00	800
MG 160/6.0	0.5 x 12.0	6.00	960
MG 160/7.0	0.5 x 14.0	7.00	1120
MG 160/8.0	0.5 x 16.0	8.00	1280
MG 160/9.0	0.5 x 18.0	9.00	1440
MG 160/10.0	0.5 x 20.0	10.00	1600

**ELEKTRA WoodTec™** heating mats

Type	Dimensions [m x m]	Heating area [m <sup>2</sup> ]	Power output [W]
<b>70 W/m<sup>2</sup></b>			
WoodTec <sub>2</sub> ™ 70/2.0	0.5 x 4.0	2.00	140
WoodTec <sub>2</sub> ™ 70/3.0	0.5 x 6.0	3.00	210
WoodTec <sub>2</sub> ™ 70/4.0	0.5 x 8.0	4.00	280
WoodTec <sub>2</sub> ™ 70/6.0	0.5 x 12.0	6.00	420
WoodTec <sub>2</sub> ™ 70/8.0	0.5 x 16.0	8.00	560
WoodTec <sub>2</sub> ™ 70/11.0	0.5 x 22.0	11.00	770
WoodTec <sub>2</sub> ™ 70/13.0	0.5 x 26.0	13.00	910
<b>60 W/m<sup>2</sup></b>			
WoodTec <sub>1</sub> ™ 60/2.0	0.5 x 4.0	2.00	120
WoodTec <sub>1</sub> ™ 60/3.0	0.5 x 6.0	3.00	180
WoodTec <sub>1</sub> ™ 60/4.0	0.5 x 8.0	4.00	240
WoodTec <sub>1</sub> ™ 60/6.0	0.5 x 12.0	6.00	360
WoodTec <sub>1</sub> ™ 60/8.0	0.5 x 16.0	8.00	480
WoodTec <sub>1</sub> ™ 60/10.0	0.5 x 20.0	10.00	600
WoodTec <sub>1</sub> ™ 60/12.0	0.5 x 24.0	12.00	720
<b>140 W/m<sup>2</sup> (applicable in the UK only)</b>			
WoodTec <sub>2</sub> ™ 140/3.0	0.5 x 6.0	3.00	420
WoodTec <sub>2</sub> ™ 140/4.0	0.5 x 8.0	4.00	560
WoodTec <sub>2</sub> ™ 140/5.0	0.5 x 10.0	5.00	700
WoodTec <sub>2</sub> ™ 140/6.0	0.5 x 12.0	6.00	840
WoodTec <sub>2</sub> ™ 140/8.0	0.5 x 16.0	8.00	1120
WoodTec <sub>2</sub> ™ 140/10.0	0.5 x 20.0	10.00	1400

**ELEKTRA MD** single side supplied heating mats

Type	Dimensions [m x m]	Heating area [m <sup>2</sup> ]	Power output [W]
<b>100 W/m<sup>2</sup></b>			
MD 100/1.0	0.5 x 2.0	1.00	100
MD 100/1.5	0.5 x 3.0	1.50	150
MD 100/2.0	0.5 x 4.0	2.00	200
MD 100/2.5	0.5 x 5.0	2.50	250
MD 100/3.0	0.5 x 6.0	3.00	300
MD 100/3.5	0.5 x 7.0	3.50	350
MD 100/4.0	0.5 x 8.0	4.00	400
MD 100/4.5	0.5 x 9.0	4.50	450
MD 100/5.0	0.5 x 10.0	5.00	500
MD 100/6.0	0.5 x 12.0	6.00	600
MD 100/8.0	0.5 x 16.0	8.00	800
MD 100/10.0	0.5 x 20.0	10.00	1000
MD 100/12.0	0.5 x 24.0	12.00	1200
<b>160 W/m<sup>2</sup></b>			
MD 160/0.5	0.5 x 1.0	0.50	80
MD 160/1.0	0.5 x 2.0	1.00	160
MD 160/1.5	0.5 x 3.0	1.50	240
MD 160/2.0	0.5 x 4.0	2.00	320
MD 160/2.5	0.5 x 5.0	2.50	400
MD 160/3.0	0.5 x 6.0	3.00	480
MD 160/3.5	0.5 x 7.0	3.50	560
MD 160/4.0	0.5 x 8.0	4.00	640
MD 160/5.0	0.5 x 10.0	5.00	800
MD 160/6.0	0.5 x 12.0	6.00	960
MD 160/7.0	0.5 x 14.0	7.00	1120
MD 160/8.0	0.5 x 16.0	8.00	1280
MD 160/9.0	0.5 x 18.0	9.00	1440
MD 160/10.0	0.5 x 20.0	10.00	1600
<b>200 W/m<sup>2</sup> (applicable in the UK only)</b>			
MD 200/1.0	0.5 x 2.0	1.00	200
MD 200/1.5	0.5 x 3.0	1.50	300
MD 200/2.0	0.5 x 4.0	2.00	400
MD 200/2.5	0.5 x 5.0	2.50	500
MD 200/3.0	0.5 x 6.0	3.00	600
MD 200/3.5	0.5 x 7.0	3.50	700
MD 200/4.0	0.5 x 8.0	4.00	800
MD 200/4.5	0.5 x 9.0	4.50	900
MD 200/5.0	0.5 x 10.0	5.00	1000
MD 200/6.0	0.5 x 12.0	6.00	1200
MD 200/7.0	0.5 x 14.0	7.00	1400
MD 200/8.0	0.5 x 16.0	8.00	1600
MD 200/10.0	0.5 x 20.0	10.00	2000



**ELEKTRA VCD** heating cables

Type	Length [m]	Power output [W]
<b>10 W/m<sup>2</sup></b>		
VCD 10/70	7.5	70
VCD 10/90	9.0	90
VCD 10/110	11.0	110
VCD 10/135	13.5	135
VCD 10/170	16.5	170
VCD 10/200	20.0	200
VCD 10/235	23.5	235
VCD 10/265	27.0	265
VCD 10/315	32.0	315
VCD 10/370	36.5	370
VCD 10/415	42.0	415
VCD 10/460	46.0	460
VCD 10/570	57.0	570
VCD 10/700	70.0	700
VCD 10/910	92.0	910
VCD 10/1100	111.0	1100
VCD 10/1220	122.0	1220
VCD 10/1450	144.0	1450
VCD 10/1560	156.0	1560
VCD 10/1740	174.0	1740
VCD 10/1920	191.0	1920
VCD 10/2030	203.0	2030
VCD 10/2260	225.0	2260

Type	Length [m]	Power output [W]
<b>17 W/m<sup>2</sup></b>		
VCD 17/100	5.5	100
VCD 17/140	8.5	140
VCD 17/180	10.0	180
VCD 17/215	13.0	215
VCD 17/260	15.5	260
VCD 17/305	18.0	305
VCD 17/350	20.5	350
VCD 17/410	24.5	410
VCD 17/480	28.0	480
VCD 17/545	32.0	545
VCD 17/610	35.0	610
VCD 17/745	43.0	745
VCD 17/910	54.0	910
VCD 17/1200	70.0	1200
VCD 17/1430	85.0	1430
VCD 17/1590	93.0	1590
VCD 17/1900	110.0	1900
VCD 17/2030	120.0	2030
VCD 17/2280	133.0	2280
VCD 17/2490	147.0	2490
VCD 17/2660	155.0	2660
VCD 17/2950	172.0	2950

**ELEKTRA DM** heating cables

Type	Length [m]	Power output [W]
<b>10 W/m<sup>2</sup></b>		
DM 10/90	8.5	90
DM 10/135	13.5	135
DM 10/145	15.0	145
DM 10/220	22.5	220
DM 10/285	28.5	285
DM 10/320	32.0	320
DM 10/400	40.0	400
DM 10/450	45.0	450
DM 10/555	55.0	555
DM 10/690	70.0	690
DM 10/780	78.0	780
DM 10/980	98.0	980
DM 10/1100	110.0	1100
DM 10/1320	132.0	1320
DM 10/1650	165.0	1650
DM 10/2050	203.0	2050

**ELEKTRA UltraTec** heating cables

Type	Length [m]	Power output [W]
<b>10 W/m<sup>2</sup></b>		
UltraTec 10/90	8.5	90
UltraTec 10/135	13.5	135
UltraTec 10/145	15.0	145
UltraTec 10/220	22.5	220
UltraTec 10/285	28.5	285
UltraTec 10/320	32.0	320
UltraTec 10/400	40.0	400
UltraTec 10/450	45.0	450
UltraTec 10/555	55.0	555
UltraTec 10/690	70.0	690
UltraTec 10/780	78.0	780
UltraTec 10/980	98.0	980
UltraTec 10/1100	110.0	1100
UltraTec 10/1320	132.0	1320
UltraTec 10/1650	165.0	1650
UltraTec 10/2050	203.0	2050

# Floor heating system's control

**Each room to be heated should be controlled with a separate temperature controller for regulation of the heating circuit.**

Heating mats or cables will be connected to domestic electric circuit through a temperature controller which will ensure maintaining the required floor or air temperature.

In case the warm floor is required, temperature controllers will be recommended equipped with floor temperature sensors which enable maintaining the desired floor temperature.

For floor heating systems intended as primary heating, the most important issue for the users will be achieving the optimal room temperature. For these applications, temperature controllers with built-in air sensors and limiting floor sensors will be recommended.

**Properly selected temperature controllers will save as much as 30% of the energy consumption for the heating purposes**



**ELEKTRA OCD4 programmable temperature controller**



**ELEKTRA OCD5 programmable temperature controller**

## Types of temperature controllers:

- manual temperature controllers for maintaining steady temperature levels,
- programmable controllers featuring options for programming temperature levels in daily and weekly cycles.

Temperature controllers can regulate heating circuits consisting of one or more heating mats (or cables), of total heat output of 3600 W.

For outputs exceeding max. permissible controller's terminal loads (3600 W), heating circuits should be equipped with a contactor.



## Manual controllers for maintaining steady temperature levels

- **ELEKTRA OTN temperature controller**

ELEKTRA OTN temperature controller is equipped with a floor temperature sensor. The connection to an external "day/week" timer is possible, where periods of comfort or economical temperature (5° lower than the comfort temperature) can be programmed. Possible installation in a double frame e.g. with a light switch (not UK).

- **ELEKTRA OTD2 temperature controller**

ELEKTRA OTD2 ultra flat temperature controller consists of a control device with a built-in air sensor, and a floor sensor. Temperature measurement can be configured in 3 variants, via: air sensor, floor sensor and both air and floor (limiting) sensor. The controller can be connected to an external "day/week" timer, where periods of comfort, economical or frost-protection temperature can be programmed. Possible installation in a double frame e.g. with a light switch (not UK).



## Programmable temperature controllers

Equipped with air- and floor temperature sensors. Temperature measurement selection possible, via: air sensor, floor sensor and both air and floor (limiting) sensor. Programmable controllers feature adaptive function (controllers will automatically "learn" thermal floor inertia) to maximize the precision of temperature setting in the given time period. Another featured function is a holiday mode: in the period of 1-30 days it is possible to program one fixed temperature level from the range of 10 - 30°C, later the temperature will automatically return to the comfort level.

- **ELEKTRA OCD4 temperature controller**

ELEKTRA OCD4 controller is equipped with a microchip enabling complex programming of chronologically ordered series of six heating events. Weekdays can be divided into 2, 4 or 6 situations: morning wake-up, out-of-home, come-back-home, out-of-home during the day, come-back-home and night rest. Different temperature levels can be ascribed to individual events. The controller features enhanced user communication option thanks to a dot-matrix screen with a backlight. Several other functions are also featured. Possible installation in a double frame e.g. with a light switch (not UK).

- **ELEKTRA OCD5 programmable temperature controller**

ELEKTRA OCD5 is equipped with a 2-inch colour touch screen. It enables programming of 6 events per day. The controller features a calendar enabling entering the start and finish date of absence. During this time the heating will be off or only the set min. temperature will be maintained. Due to the application of the QR code it is possible to execute the fast view of the controller's settings with a smartphone.



Type	ELEKTRA OCD4	ELEKTRA OCD5	ELEKTRA OTN	ELEKTRA OTD2
Touch screen	-	+	-	-
Floor sensor	+	+	+	+
Air sensor	+	+	-	+
Installation	flush	flush	flush	flush
Comfort temperature range (°C)	from +5 to +40	from +5 to +40	from +5 to +40	from 0 to +40
Temperature setback (°C)	from +5 to +40	from +5 to +40	by 5	from +2 to +8
Max. load (W)	3600	3600	3600	3600
Switch	2-pole	2-pole	1-pole	2-pole
IP protection rating	21	21	20	21
Dimensions: height x width x depth (mm)	84 x 84 x 40	82 x 82 x 40	80 x 80 x 50	84 x 84 x 40

# Product selection guide

Type of Heating	Type of Floor	In-screed heating		Heating Directly Under Floor Finish						Temperature Controllers
				In adhesive or Self-leveling screed / compound				dry installation		
		Heating Cables			Heating Mats					
		VCD		DM	UltraTec	MG 160	MD		WoodTec™	
		10	17				100	160		
Primary	Stone Ceramic	+	+	+	+	+	+	+	-	OCD5-1999 OCD4-1999 OTD2-1999
	Carpet, Vinyl or glued down wooden flooring	+	-	+	+	-	+	-	-	
	Laminate flooring and engineered wood	+	-	+	+	-	+	-	+	
Warm Floor	Stone Ceramic	-	-	+	+	+	+	+	-	OCD5-1999 OCD4-1999 OTD2-1999 OTN-1991
	Vinyl or glued down wooden flooring	-	-	+	+	-	+	-	-	
	Laminate flooring and engineered wood	-	-	-	-	-	-	-	+	

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