



# Technical datasheet

HEATFLOW Infrared Heating Film



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# 1. Product description

## HFS 1010



## HFS 0510



100 cm

50 cm

- Infrared heating film is 0.5mm thick and emits infrared radiation with wavelength of 7-14 micrometers.

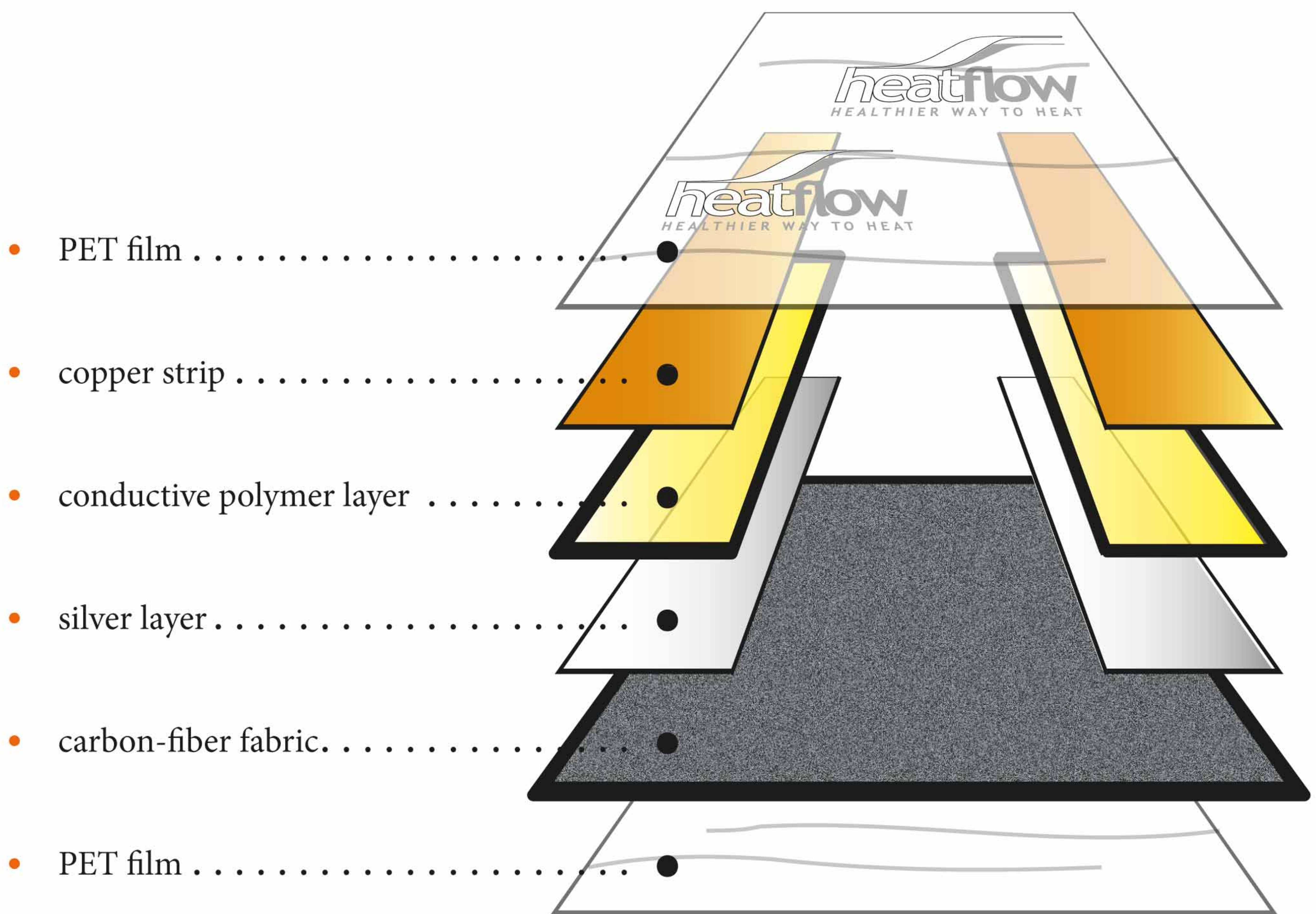
# 2. Features

- quick warming-up of the heating film
- no undesirable electromagnetic radiation
- overheating-resistant
- health-beneficial way of heating
- long service life
- antibacterial effect
- possibility of film cutting under conditions listed in section 7.1.

### 3. Usage

- underfloor heating
- wall heating
- ceiling heating
- interior areas
- main and supplemental heating
- HEATFLOW heating film is not designed to be installed and used in exteriors

### 4. Heating film structure



## 5. Technical parameters

HEATFLOW heating film					
Type		HFS 1010	HFS 1010	HFS 1010	HFS 0510
Protection		IP 41	IP 41	IP 41	IP 41
Supply voltage	[V] [Hz]	230 50 ~ 60	230 50 ~ 60	230 50 ~ 60	230 50 ~ 60
Wattage	[W/m <sup>2</sup> ]	220	250	270	290
Maximal electric current	[A]	1,06	1,09	1,17	1,26
Electric resistance	[Ω]	217	211	197	183
Efficiency	[%]	98	98	98	98
Dimensions	[m]	1 x 75	1 x 75	1 x 75	0,5 x 100
Heating temperature	[°C]	45	45	45	45
Power consumption in series circuit	[W/m <sup>2</sup> ]	55	63	68	73
Power consumption in parallel circuit	[W/m <sup>2</sup> ]	220	250	270	290
Tolerance	[%]	± 10	± 10	± 10	± 10

## 6. HEATFLOW heating film layout



When laying out the heating film, care must be taken not to allow overlapping of film edges with copper strips. Permissible layout options for HEATFLOW infrared heating film placement are presented in the illustration figure.

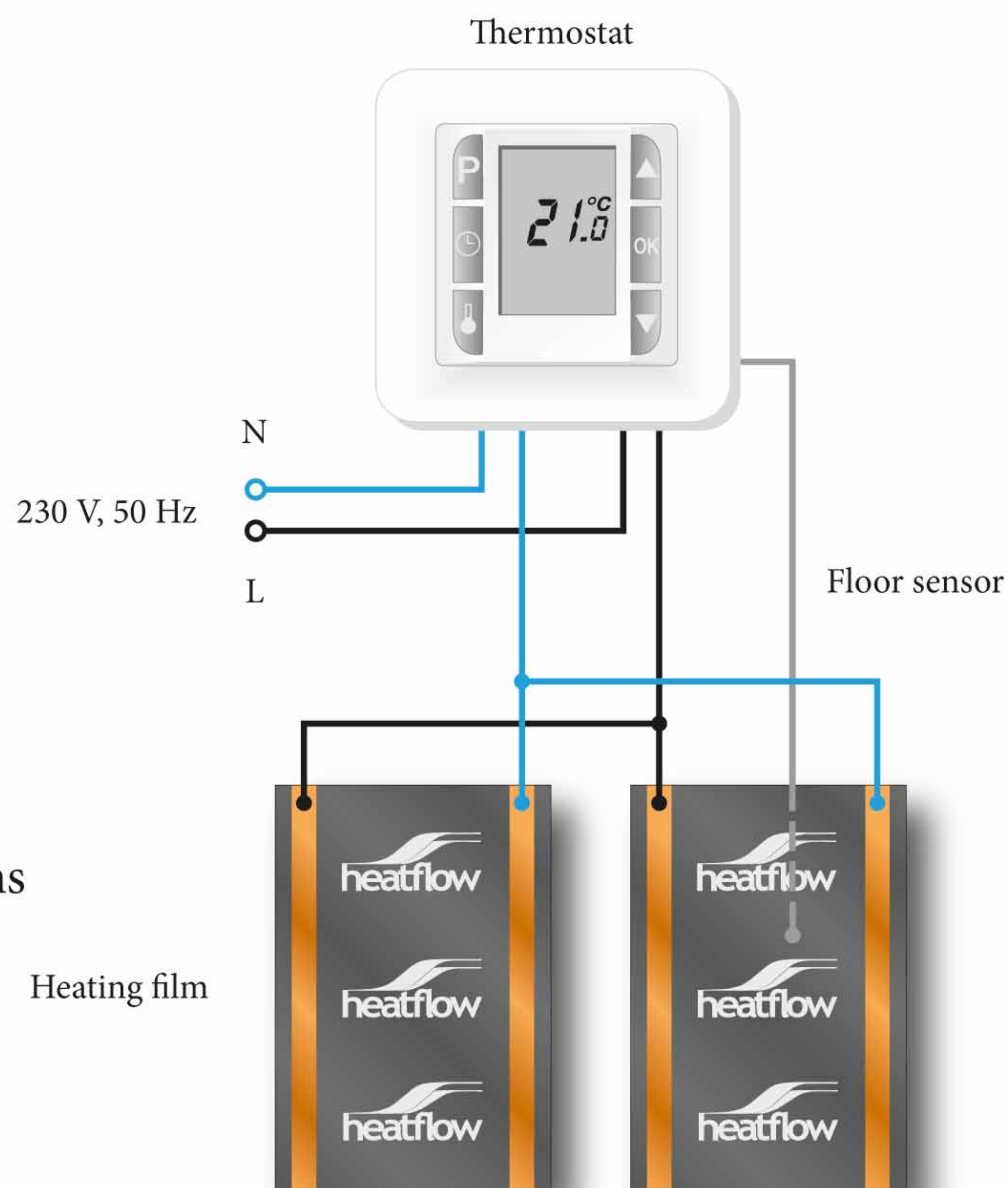
## 6.1. Connection options

### 6.1.1. Parallel circuit

- Heating film type HFS 0510 wattage:
  - » 290 W = 1 m<sup>2</sup>
- Heating film type HFS 1010 wattage:
  - » 220 W = 1 m<sup>2</sup>
  - » 250 W = 1 m<sup>2</sup>
  - » 270 W = 1 m<sup>2</sup>

Heating film wattage tolerance is  $\pm 10\%$

- RQuick warming-up
- Suitable for small and medium sized rooms

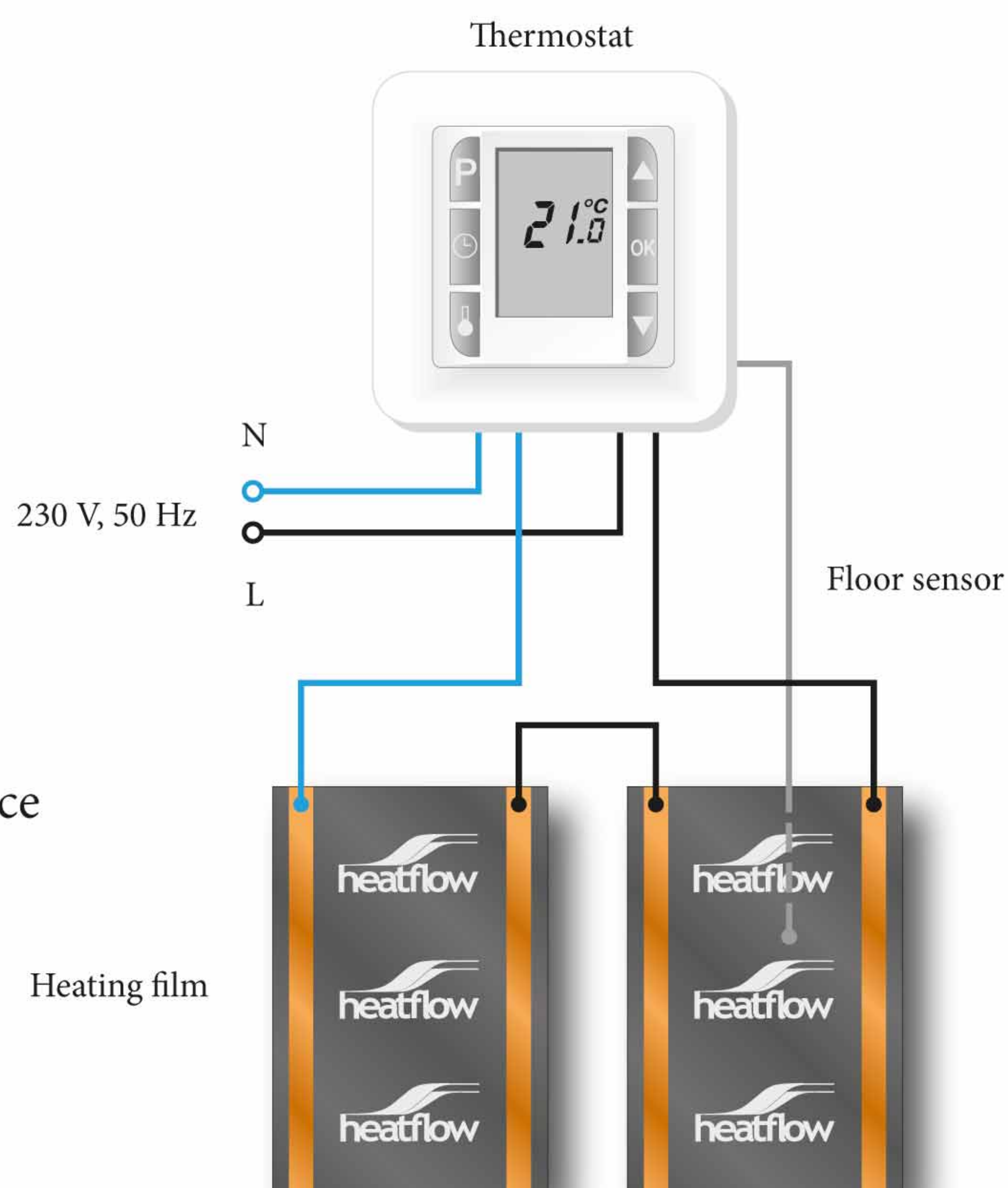


### 6.1.2. Series circuit

- Heating film type HFS 0510 wattage:
  - » 72,5 W = 1 m<sup>2</sup>
- Heating film type HFS 1010 wattage:
  - » 55 W = 1 m<sup>2</sup>
  - » 63 W = 1 m<sup>2</sup>
  - » 68 W = 1 m<sup>2</sup>

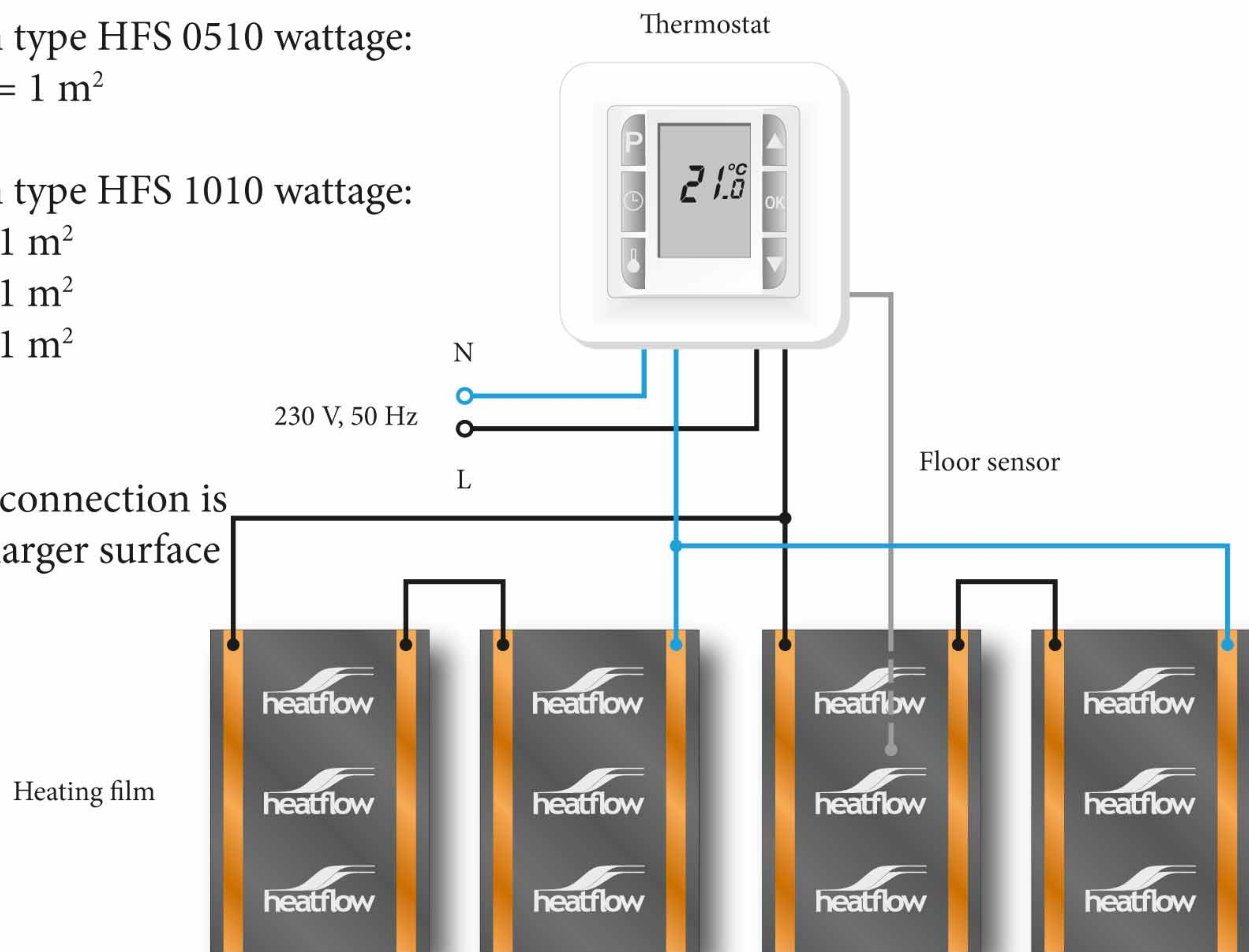
Heating film wattage tolerance is  $\pm 10\%$

- Suitable for room temperature maintenance

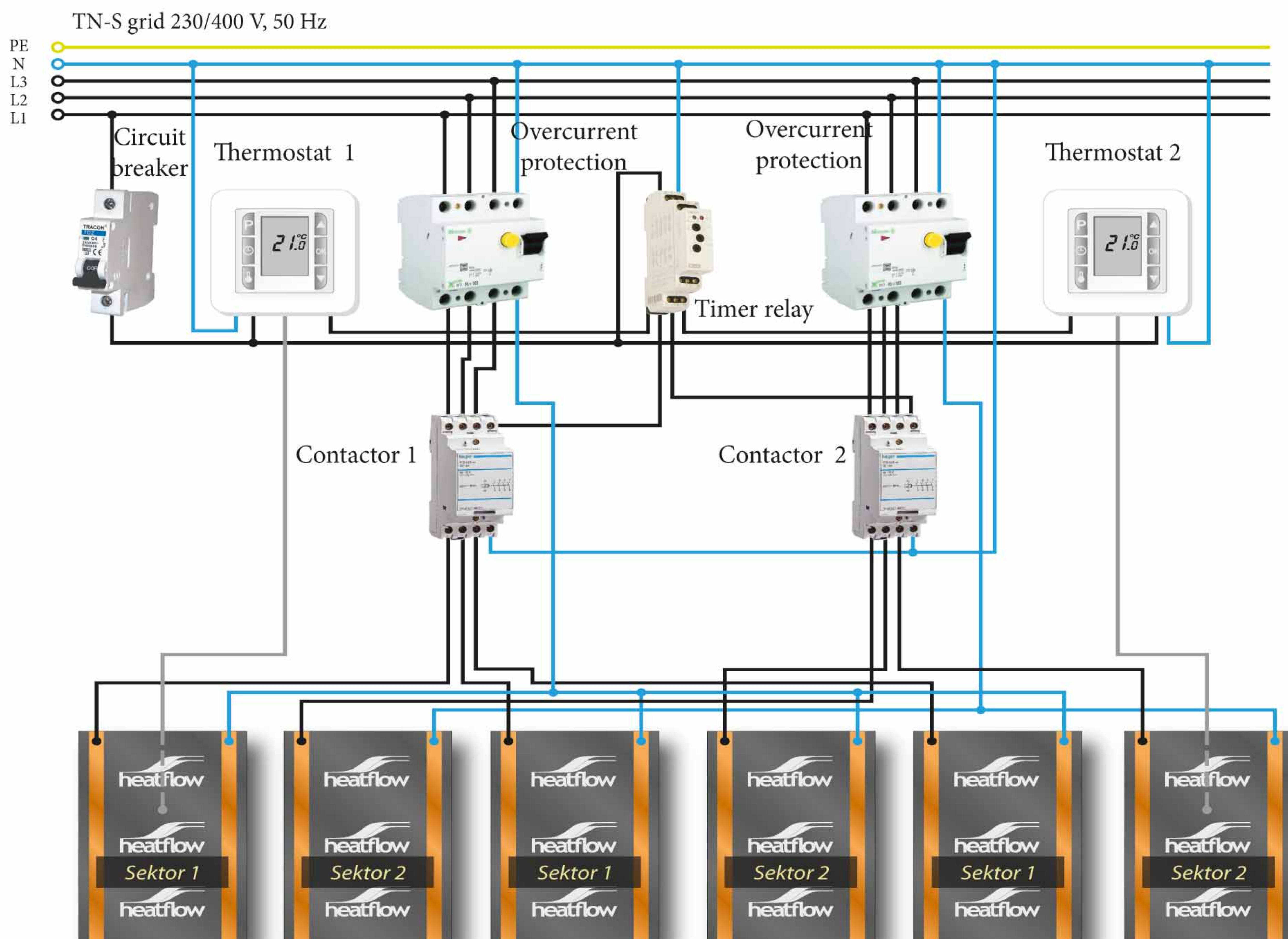


### 6.1.3. Series-parallel circuit

- Heating film type HFS 0510 wattage:
  - »  $72,5 \text{ W} = 1 \text{ m}^2$
- Heating film type HFS 1010 wattage:
  - »  $55 \text{ W} = 1 \text{ m}^2$
  - »  $63 \text{ W} = 1 \text{ m}^2$
  - »  $68 \text{ W} = 1 \text{ m}^2$
- This type of connection is suitable for larger surface areas

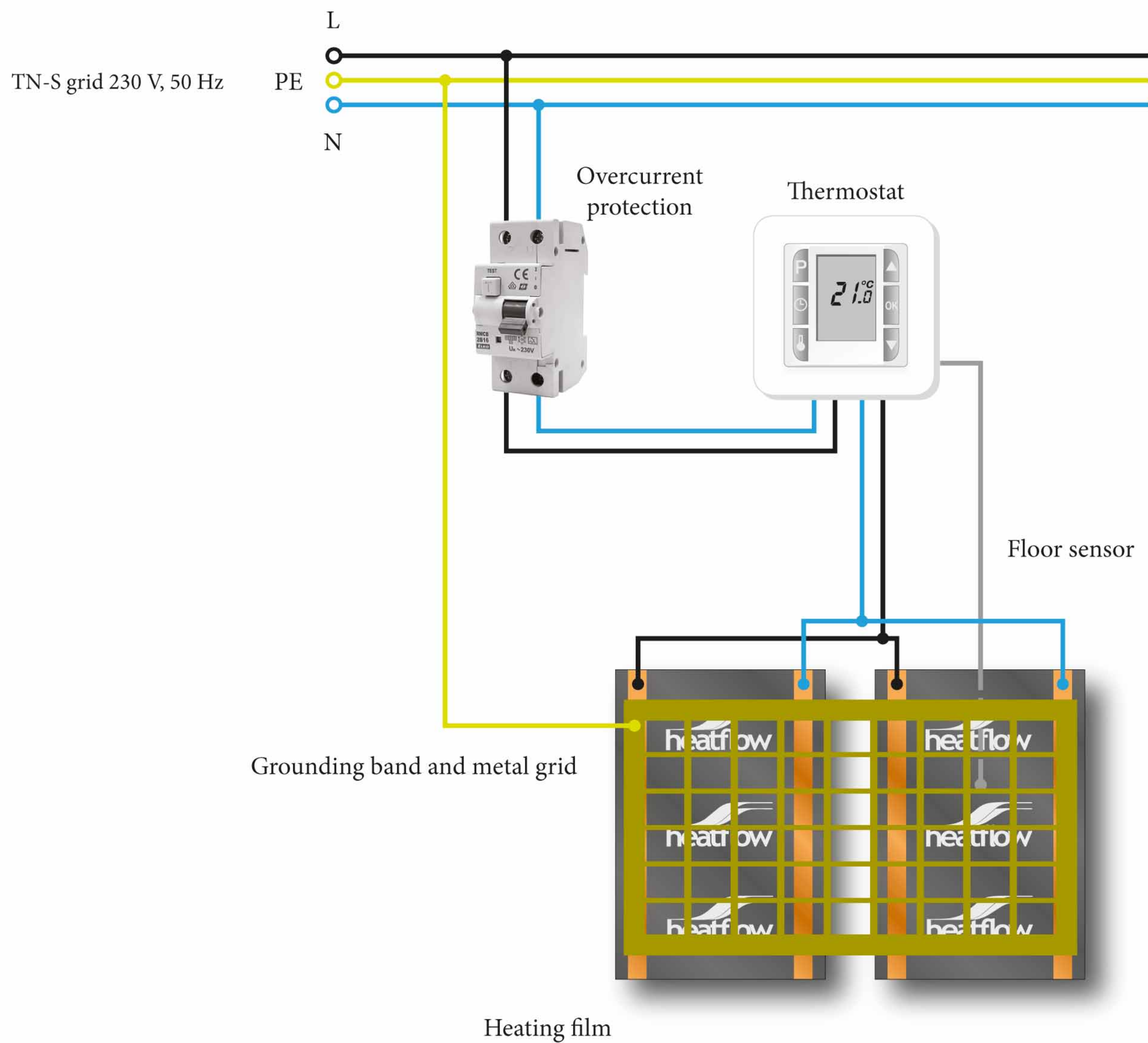


### 6.1.4. Section parallel circuit



## 6.1.5. Circuit with overcurrent protection

- Circuit suitable for areas with elevated humidity





## 7. Recommended installation adjustments

### 7.1. Recommended adjustments



- All cut edges must be insulated with bitumen adhesive insulation tape.

### 7.2. Unrecommended adjustments



## 8. Packaging

Heating film type	Film dimensions	Weight	Packaging
	[m]	[kg]	1 ks [m]
HFS 1010	1 x 75	cca 39	1,09 x 0,27 x 0,27
HFS 0510	0,5 x 100	cca 23	0,55 x 0,28 x 0,28

## 9. Transport packaging

The heating film is packaged in cardboard wrappings and palletized:

- plastic pallet 1.1 x 1.1 x 1.44 m - max. 20 packages for HFS 1010
- plastic pallet 1.1 x 1.1 x 0.95 m - max. 24 packages for HFS 0510

## 10. Storage

- protect from long-term exposure to direct sunlight, from fire and chemicals
- store in dry areas at temperature 4 – 40 °C
- store HEATFLOW heating film in vertical position

## 11. Safety warning

Prior to installation and commissioning of HEATFLOW heating film, read the NAOS EUROPE Installation Guide carefully and follow all installation and scheme instructions to avoid any damage from improper handling.

The manufacturer and the supplier disclaim any liability for damages caused by using tools or material other than recommended, by non-professional handling, or by non-professional modifications of heating film structure. Installation technician is not authorized to disassemble the product nor any of its components, nor to perform any modifications thereof.

The installation must be carried out in compliance with the requirements of local codes, regulations, and guidelines applicable in the country of supplier. During the installation, observe the safety regulations for work with electrical equipment in particular.

# 12. Accompanying documents

## LVD Compliance Certificate




Date issued: August 14, 2007  
CERTIFICATE No.: STE-07-1043 S C LV

### CERTIFICATE OF LVD COMPLIANCE

Product submitted.....: Heating film that using Carbon Filament  
Model Heat Flow HFS1010  
Rated Input: 220-240 V~, 50/60 Hz, 160 W / 1 m at 220 V, 168 W / 1 m at 230-240V

Applicant (Manufacturer).....: NAOS CO., LTD.  
B-908 Digital Empire, #980-3, Yeongtong-Dong, Yeongtong-Gu, Suwon-City,  
Kyunggi-Do, Korea

Testing Laboratory.....: SGS Testing Korea Co., Ltd.

Test Report Number(s).....: STE-07-1043 S R LV

Specification Requested.....: EN 60335-1:2002 + A11:2004 + A1:2004

**Conclusion**  
Based on a review of the test report, this apparatus meets the requirements of the above standards and hence fulfills the requirements of Directive 2006/95/EC.

This certificate is only valid for the equipment submitted and configuration described, in conjunction with the test data detailed above. It does not permit the use of the SGS PRODUCT CERTIFICATION MARK.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives.






Windsor Kim  
Manager

Eric Lee  
General Manager

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SGSPAPER 06400036

## EMC Compliance Certificate




Test Report No.: STK-07-EMCG0198  
Page : 1 of 11


### EMC TEST REPORT

Reference No. : STE-07-1043/G  
Applicant : NAOS CO., LTD.  
Equipment Under Test (EUT) :  
Product Name : Heating Film that using carbon filament  
Model No. : Heat Flow HFS1010  
Standards : EN 55014-1:2000/A1:2001/A2:2002  
Date of Receipt : 19 July 2007  
Date of Test : 26 July 2007  
Date of Issue : 06 August 2007

Test Result	PASS
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In the configuration tested the EUT complied with the standards specified above.

Tested by :  
(SGS Testing Korea Co., Ltd.)   
Douglas Kim

Approved by :  
(SGS Testing Korea Co., Ltd.)   
Forest Lee

**Remarks :**  
This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.  
This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

SGS Testing Korea Co., Ltd. 18-34, Seoncheon-dong, Gyeonggi-do, Korea 425-040 T: +82(31) 428 5700 F: +82(31) 427 2370 www.sgstesting.co.kr

## ISO 9001 Certificate



### Certificate of Registration

This is to certify that :  
**NAOS CO., LTD.**  
Rm.908 B-Dong Digital Empire.#980-3 Yeongtong-dong, Yeongtong-gu,Suwon-si, Gyeonggi-do, Korea

Has been assessed by International Certification Registrar Ltd., in respect of their Quality Management Systems and found to comply with

**ISO 9001:2008**

Approval is hereby granted for registration providing the rules and conditions relating to certification are observed at all times.

Certification Scope  
Design, Development, Manufacturing and Servicing of  
Carbon Filament Forming Heater(Multi-Function, Picture Frame Type)

Certificate Issue Date : 18<sup>th</sup> May 2010      Certificate No. Q343510  
Expiration Date : 17<sup>th</sup> May 2013

The Seal of ICR Limited was here to affixed in the presence of :  
  
President



ICR International Certification Registrar Ltd.

## EMC Compliance Certificate



### Attestation of Conformity

No. N8 11 05 76663 001

Holder of Certificate: **NAOS Company Limited**  
923-4, Gumuncheon-ri, Hyangnam-eup  
Hwasung-si, Gyeonggi-do 445-922  
REPUBLIC OF KOREA

Product: **Heating element (Carbon Heating Film)**

This Attestation of Conformity is issued on a voluntary basis according to the Low Voltage Directive 2006/95/EC relating to electrical equipment designed for use within certain voltage limits. It confirms that the listed equipment complies with the principal protection requirements of the directive. It refers only to the particular sample submitted for testing and certification. See also notes overleaf.

Test report no.: CPSA0109621

Date, 2011-05-16   
( James Jeon )



CE After preparation of the necessary technical documentation as well as the EC conformity declaration the required CE marking can be affixed on the product. Other relevant directives have to be observed.

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TÜV SÜD Product Service GmbH · Zertifizierungsstelle · Ridlerstraße 65 · 80339 München · Germany



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**NAOS EUROPE, s.r.o.** – headquarters  
Priemyselná 4, 040 01 Košice, Slovak republic

[www.naoseurope.eu](http://www.naoseurope.eu)

[info@naoseurope.eu](mailto:info@naoseurope.eu)

Your distributor: