M 40100

mfh systems
modern floor heating

Ceiling and wall heating system E-NERGY CARBON FLEECE | FLEECE S

Installation instructions

Prepare level, clean, load-bearing substrate. Dry construction boards and wood-based panels must be crack-bridging in the joint area.

Check resistance according to the installation & operating instructions and document values in the test report.

The heating foil can be shortened individually in advance. Right-angled cutting edges to the copper tracks are a prerequisite.

Measure the resistances of cut films again and document them on the label and in the test report - take the nominal values from the installation instructions.

Rework recesses for the supply lines and contacts of the heating foils if necessary.

Apply adhesive mortar according to the manufacturer's instructions.

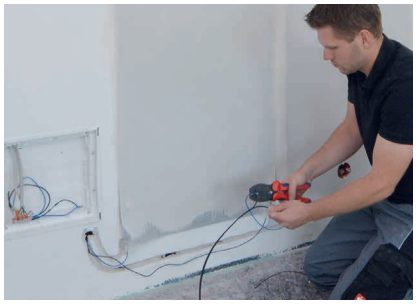
Place E-NERGY CARBON FLEECE in adhesive bed. Align the heating foils with each other (at least 2 cm distance between the foils).

Press in the heating foil with a plastic spatula to avoid kinks and folds.

Cover E-NERGY CARBON FLEECE with adhesive mortar.

Subsequent installations can be made up to a ø 70 mm. Copper strips must not be damaged.

Do not lay heating foil over expansion joints and let it end at a distance of at least 2 cm before the expansion joint.



Connect the connection cable and lead it to the transformer.

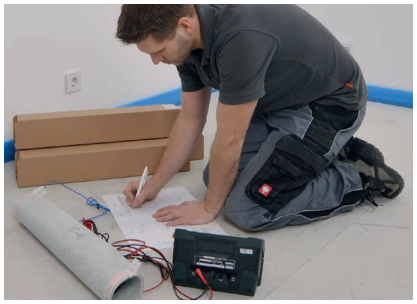
Status 02 | 2020 – Pay attention to all manufacturer details and laying instructions! © mfh systems GmbH – www.mfh-systems.com

M 40100

mfh systems
modern floor heating

Ceiling and wall heating system E-NERGY CARBON FLEECE | FLEECE S

Installation instructions

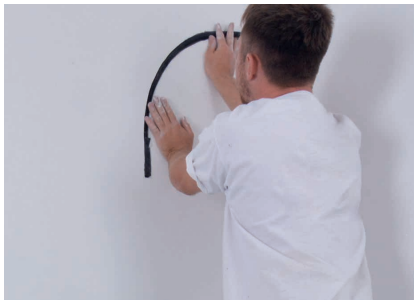


Check resistance according to assembly instructions & operating instructions and document values in the test report.

Apply the covering and surface layer according to the manufacturer's instructions.

Note for the moisture protection installation

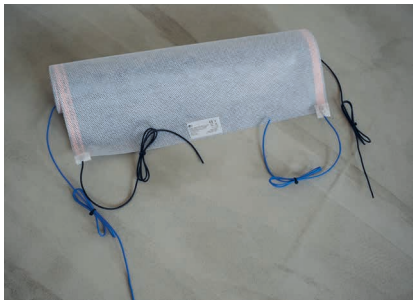
Provide recesses for temperature sensors. Position the sensor centrally under the heating foil.



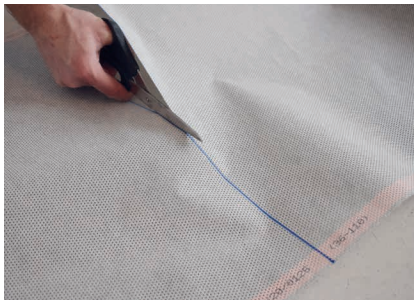
Lay the temperature sensor connection set in the recess and mask the sensor sleeve with insulating tape to avoid residual currents.

E-NERGY CARBON FLEECE can be mounted over a corner. Insert heating foil with plastic spatula without a sharp bend.

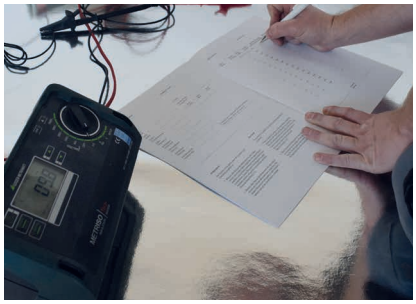
Note for heating foils with contacts on both sides.



Heating foils contacted on both sides can be cut individually into two single foils.



The heating foil can be shortened as required. Right-angled cut edges to the copper tracks are a prerequisite.



Measure the resistances again and document them in the test report. Take the set values from the installation instructions.

For cut-to-size foils, enter the measured resistances on the enclosed labels and stick them on the heating foil.

If the complete film is to be processed without individual cutting, cut off a contact vertically along the film.

Status 02 | 2020 – Pay attention to all manufacturer details and laying instructions! © mfh systems GmbH – www.mfh-systems.com

M 40100

mfh systems
modern floor heating

Ceiling and wall heating system E-NERGY CARBON FLEECE | FLEECE S

Installation instructions

Only a maximum of 400 W may be connected to the individual load outputs of the power supply units. The maximum lengths of the individual heating tracks are

E-NERGY CARBON FLEECE – 36 W/lfm (60 W/m²)	max. 11 m
E-NERGY CARBON FLEECE – 66 W/lfm (110 W/m²)	max. 6 m
E-NERGY CARBON FLEECE – 132 W/lfm (220 W/m²)	max. 3 m
E-NERGY CARBON FLEECE S – 25 W/lfm (145 W/m²)	max. 16 m

Depending on the design, the power supply units can be surface-mounted or flush-mounted. For this purpose, a minimum distance of 50 mm to the foil must be maintained. The maximum cable length on the secondary side of the power supply unit must not exceed 50 mm:

10 m with 2.5 mm² cable
25 m with 6 mm² cable

Resistance values as a function of length*

Länge Length	FLEECE 36 W/lfm (60 W/m²)	FLEECE 66 W/lfm (110 W/m²)	FLEECE 132 W/lfm (220 W/m²)	FLEECE S 25 W/lfm (145 W/m²)
0,1 m	365,84 Ω	199,06 Ω	99,53 Ω	516,00 Ω
0,2 m	182,92 Ω	99,53 Ω	49,77 Ω	258,00 Ω
0,3 m	121,95 Ω	66,35 Ω	33,18 Ω	172,00 Ω
0,4 m	91,46 Ω	49,77 Ω	24,88 Ω	129,00 Ω
0,5 m	73,17 Ω	39,81 Ω	19,91 Ω	103,20 Ω
0,6 m	60,97 Ω	33,18 Ω	16,59 Ω	86,00 Ω
0,7 m	52,26 Ω	28,44 Ω	14,22 Ω	73,71 Ω
0,8 m	45,73 Ω	24,88 Ω	12,44 Ω	64,50 Ω
0,9 m	40,65 Ω	22,12 Ω	11,06 Ω	57,33 Ω
1,0 m	36,58 Ω	19,91 Ω	9,95 Ω	51,60 Ω
1,1 m	33,26 Ω	18,10 Ω	9,05 Ω	46,91 Ω
1,2 m	30,49 Ω	16,59 Ω	8,29 Ω	43,00 Ω
1,3 m	28,14 Ω	15,31 Ω	7,66 Ω	39,69 Ω
1,4 m	26,13 Ω	14,22 Ω	7,11 Ω	36,86 Ω
1,5 m	24,39 Ω	13,27 Ω	6,64 Ω	34,40 Ω
1,6 m	22,87 Ω	12,44 Ω	6,22 Ω	32,25 Ω
1,7 m	21,52 Ω	11,71 Ω	5,85 Ω	30,35 Ω
1,8 m	20,32 Ω	11,06 Ω	5,53 Ω	28,67 Ω
1,9 m	19,25 Ω	10,48 Ω	5,24 Ω	27,16 Ω
2,0 m	18,29 Ω	9,95 Ω	4,98 Ω	25,80 Ω
2,1 m	17,42 Ω	9,48 Ω	4,74 Ω	24,57 Ω
2,2 m	16,63 Ω	9,05 Ω	4,52 Ω	23,45 Ω
2,3 m	15,91 Ω	8,65 Ω	4,33 Ω	22,43 Ω
2,4 m	15,24 Ω	8,29 Ω	4,15 Ω	21,50 Ω
2,5 m	14,63 Ω	7,96 Ω	3,98 Ω	20,64 Ω
2,6 m	14,07 Ω	7,66 Ω	3,83 Ω	19,85 Ω
2,7 m	13,55 Ω	7,37 Ω	3,69 Ω	19,11 Ω
2,8 m	13,07 Ω	7,11 Ω	3,55 Ω	18,43 Ω
2,9 m	12,62 Ω	6,86 Ω	3,43 Ω	17,79 Ω
3,0 m	12,19 Ω	6,64 Ω	3,32 Ω	17,20 Ω
3,1 m	11,80 Ω	6,42 Ω		16,65 Ω
3,2 m	11,43 Ω	6,22 Ω		16,13 Ω
3,3 m	11,09 Ω	6,03 Ω		15,64 Ω
3,4 m	10,76 Ω	5,85 Ω		15,18 Ω
3,5 m	10,45 Ω	5,69 Ω		14,74 Ω

Länge Length	FLEECE 36 W/lfm (60 W/m²)	FLEECE 66 W/lfm (110 W/m²)	FLEECE 132 W/lfm (220 W/m²)	FLEECE S 25 W/lfm (145 W/m²)
3,6 m	10,16 Ω	5,53 Ω		14,33 Ω
3,7 m	9,89 Ω	5,38 Ω		13,95 Ω
3,8 m	9,63 Ω	5,24 Ω		13,58 Ω
3,9 m	9,38 Ω	5,10 Ω		13,23 Ω
4,0 m	9,15 Ω	4,98 Ω		12,90 Ω
4,1 m	8,92 Ω	4,86 Ω		12,59 Ω
4,2 m	8,71 Ω	4,74 Ω		12,29 Ω
4,3 m	8,51 Ω	4,63 Ω		12,00 Ω
4,4 m	8,31 Ω	4,52 Ω		11,73 Ω
4,5 m	8,13 Ω	4,42 Ω		11,47 Ω
4,6 m	7,95 Ω	4,33 Ω		11,22 Ω
4,7 m	7,78 Ω	4,24 Ω		10,98 Ω
4,8 m	7,62 Ω	4,15 Ω		10,75 Ω
4,9 m	7,47 Ω	4,06 Ω		10,53 Ω
5,0 m	7,32 Ω	3,98 Ω		10,32 Ω
5,1 m	7,17 Ω	3,90 Ω		10,12 Ω
5,2 m	7,04 Ω	3,83 Ω		9,92 Ω
5,3 m	6,90 Ω	3,76 Ω		9,74 Ω
5,4 m	6,77 Ω	3,69 Ω		9,56 Ω
5,5 m	6,65 Ω	3,62 Ω		9,38 Ω
5,6 m	6,53 Ω	3,55 Ω		9,21 Ω
5,7 m	6,42 Ω	3,49 Ω		9,05 Ω
5,8 m	6,31 Ω	3,43 Ω		8,90 Ω
5,9 m	6,20 Ω	3,37 Ω		8,75 Ω
6,0 m	6,10 Ω	3,32 Ω		8,60 Ω
6,1 m	6,00 Ω			8,46 Ω
6,2 m	5,90 Ω			8,32 Ω
6,3 m	5,81 Ω			8,19 Ω
6,4 m	5,72 Ω			8,06 Ω
6,5 m	5,63 Ω			7,94 Ω
6,6 m	5,54 Ω			7,82 Ω
6,7 m	5,46 Ω			7,70 Ω
6,8 m	5,38 Ω			7,59 Ω
6,9 m	5,30 Ω			7,48 Ω
7,0 m	5,23 Ω			7,37 Ω

*If the measured resistance values deviate more than 15% from the output value, damage to the contacts or the heating foil must be expected. In this case you must not start up the heating system.

Status 02 | 2020 – Pay attention to all manufacturer details and laying instructions! © mfh systems GmbH – www.mfh-systems.com

mfh systems
modern floor heating

Ceiling and wall heating system E-NERGY CARBON FLEECE | FLEECE S

Installation instructions

Resistance values as a function of length*

Länge Length	FLEECE 36 W/lfm (60 W/m²)	FLEECE 66 W/lfm (110 W/m²)	FLEECE 132 W/lfm (220 W/m²)	FLEECE S 25 W/lfm (145 W/m²)
7,1 m	5,15 Ω			7,27 Ω
7,2 m	5,08 Ω			7,17 Ω
7,3 m	5,01 Ω			7,07 Ω
7,4 m	4,94 Ω			6,97 Ω
7,5 m	4,88 Ω			6,88 Ω
7,6 m	4,81 Ω			6,79 Ω
7,7 m	4,75 Ω			6,70 Ω
7,8 m	4,69 Ω			6,62 Ω
7,9 m	4,63 Ω			6,53 Ω
8,0 m	4,57 Ω			6,45 Ω
8,1 m	4,52 Ω			6,37 Ω
8,2 m	4,46 Ω			6,29 Ω
8,3 m	4,41 Ω			6,22 Ω
8,4 m	4,36 Ω			6,14 Ω
8,5 m	4,30 Ω			6,07 Ω
8,6 m	4,25 Ω			6,00 Ω
8,7 m	4,21 Ω			5,93 Ω
8,8 m	4,16 Ω			5,86 Ω
8,9 m	4,11 Ω			5,80 Ω
9,0 m	4,06 Ω			5,73 Ω
9,1 m	4,02 Ω			5,67 Ω
9,2 m	3,98 Ω			5,61 Ω
9,3 m	3,93 Ω			5,55 Ω
9,4 m	3,89 Ω			5,49 Ω
9,5 m	3,85 Ω			5,43 Ω
9,6 m	3,81 Ω			5,38 Ω
9,7 m	3,77 Ω			5,32 Ω
9,8 m	3,73 Ω			5,27 Ω
9,9 m	3,70 Ω			5,21 Ω
10,0 m	3,66 Ω			5,16 Ω
10,1 m	3,62 Ω			5,11 Ω
10,2 m	3,59 Ω			5,06 Ω
10,3 m	3,55 Ω			5,01 Ω
10,4 m	3,52 Ω			4,96 Ω
10,5 m	3,48 Ω			4,91 Ω
10,6 m	3,45 Ω			4,87 Ω
10,7 m	3,42 Ω			4,82 Ω
10,8 m	3,39 Ω			4,78 Ω
10,9 m	3,36 Ω			4,73 Ω
11,0 m	3,33 Ω			4,69 Ω
11,1 m				4,65 Ω
11,2 m				4,61 Ω
11,3 m				4,57 Ω
11,4 m				4,53 Ω
11,5 m				4,49 Ω

Länge Length	FLEECE 36 W/lfm (60 W/m²)	FLEECE 66 W/lfm (110 W/m²)	FLEECE 132 W/lfm (220 W/m²)	FLEECE S 25 W/lfm (145 W/m²)
11,6 m				4,45 Ω
11,7 m				4,41 Ω
11,8 m				4,37 Ω
11,9 m				4,34 Ω
12,0 m				4,30 Ω
12,1 m				4,26 Ω
12,2 m				4,23 Ω
12,3 m				4,20 Ω
12,4 m				4,16 Ω
12,5 m				4,13 Ω
12,6 m				4,10 Ω
12,7 m				4,06 Ω
12,8 m				4,03 Ω
12,9 m				4,00 Ω
13,0 m				3,97 Ω
13,1 m				3,94 Ω
13,2 m				3,91 Ω
13,3 m				3,88 Ω
13,4 m				3,85 Ω
13,5 m				3,82 Ω
13,6 m				3,79 Ω
13,7 m				3,77 Ω
13,8 m				3,74 Ω
13,9 m				3,71 Ω
14,0 m				3,69 Ω
14,1 m				3,66 Ω
14,2 m				3,63 Ω
14,3 m				3,61 Ω
14,4 m				3,58 Ω
14,5 m				3,56 Ω
14,6 m				3,53 Ω
14,7 m				3,51 Ω
14,8 m				3,49 Ω
14,9 m				3,46 Ω
15,0 m				3,44 Ω
15,1 m				3,42 Ω
15,2 m				3,39 Ω
15,3 m				3,37 Ω
15,4 m				3,35 Ω
15,5 m				3,33 Ω
15,6 m				3,31 Ω
15,7 m				3,29 Ω
15,8 m				3,27 Ω
15,9 m				3,25 Ω
16,0 m				3,23 Ω

*If the measured resistance values deviate more than 15% from the output value, damage to the contacts or the heating foil must be expected. In this case you must not start up the heating system.

Status 02 | 2020 – Pay attention to all manufacturer details and laying instructions! © mfh systems GmbH – www.mfh-systems.com

M 40100

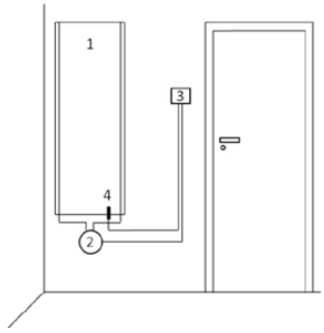
mfh systems
modern floor heating

Ceiling and wall heating system E-NERGY CARBON FLEECE | FLEECE S

Installation instructions

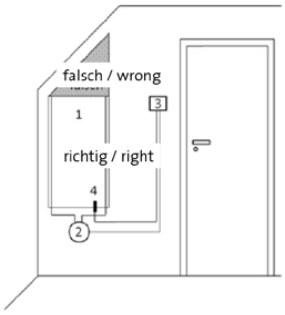
General notes

Allgemeiner Wandaufbau
General wall structure



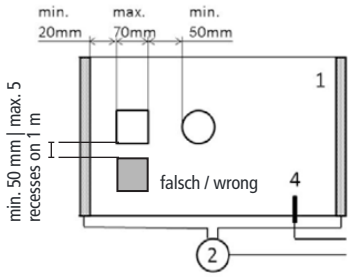
(1) Heizungsfolie
(3) Regler
(2) Trafo
(4) Fühler

Folienbeschnitt
Film cutting



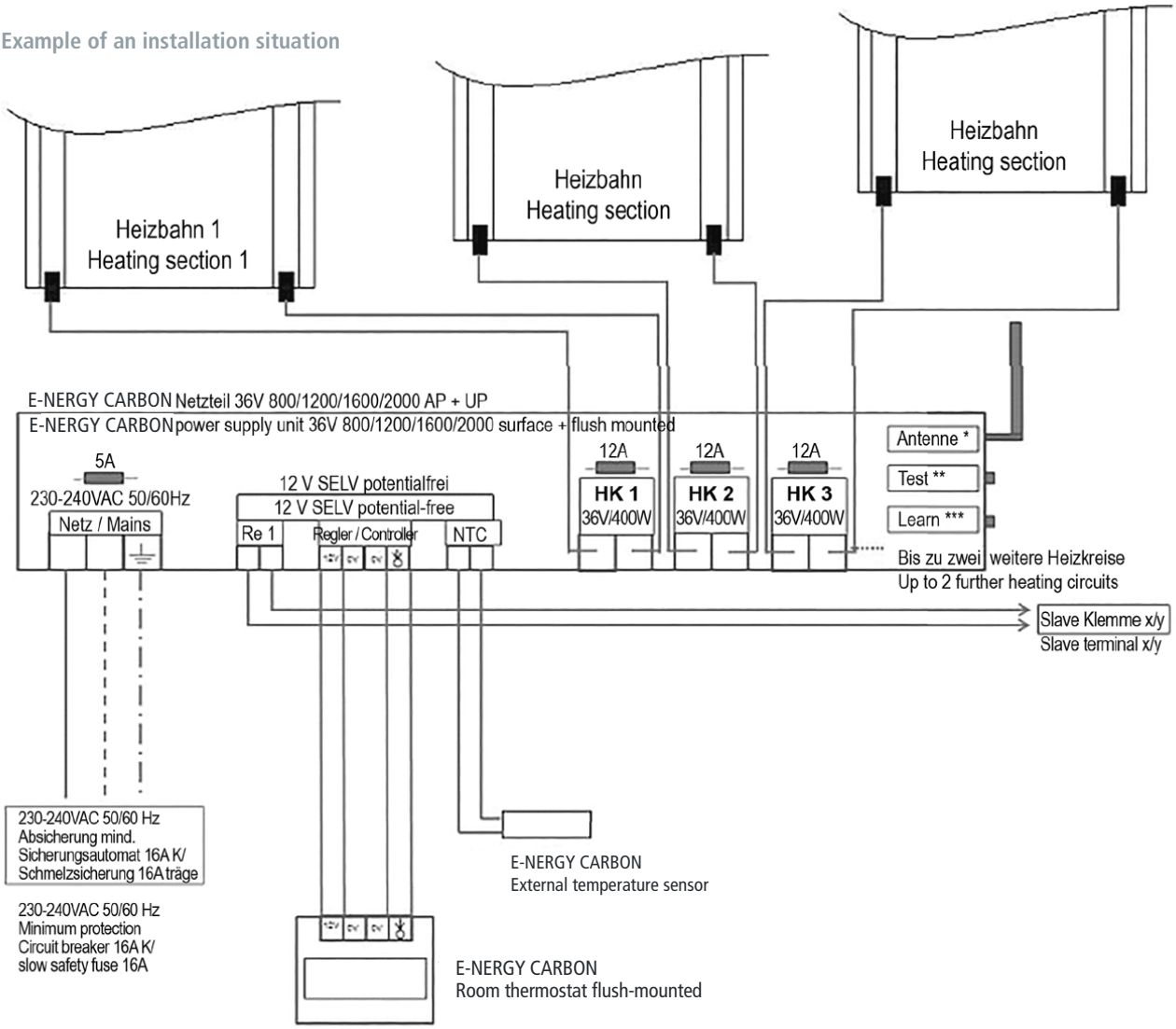
(1) Heating film
(3) Controller

Folienaussparungen
Film cutout



(2) Transformer
(4) Sensor

Example of an installation situation



Status 02 | 2020 – Pay attention to all manufacturer details and laying instructions! © mfh systems GmbH – www.mfh-systems.com