

## Produkt- und Systemübersicht **E-ENERGY CARBON**

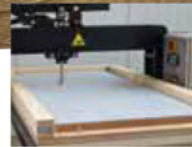
Elektrische Heizfolien für Decke, Wand und Boden

### **Product overview E-ENERGY CARBON**

*Electric heating foils for ceiling, wall and floor*



24 V



## Technologie | Innovation | Verantwortung

Den höchsten Stellenwert im Unternehmen hat die technologieoffene Entwicklung moderner und ressourcenschonender Systeme rund um die Flächenheizung und -kühlung sowie Wohnraumlüftung. Unterschiedliche Gebäudetypen bedingen individuelle Systemlösungen für maximale Effizienz und hohen Komfort.

Neue Wege zu gehen und innovative Gedanken zu verfolgen, um den Status quo in Bezug auf Kosten, Effizienz und Komfort zu verbessern ist ein wesentlicher Bestandteil der täglichen Arbeit im Unternehmen.

Als inhabergeführtes Unternehmen stehen wir jeden Tag in der Verantwortung für unsere Kunden, Lieferanten, Mitarbeiter und Familien. Das machen wir gerne und handeln nach sozialen sowie umweltgerechten Leitlinien.

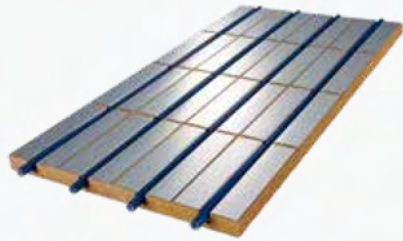
## Technology | Innovation | Responsibility

The company attaches the greatest importance to the development of modern and resource-conserving systems for panel heating and cooling as well as domestic ventilation that are open to new technologies. Different types of buildings require individual system solutions for maximum efficiency and high comfort.

Breaking new ground and pursuing innovative ideas to improve the status quo in terms of costs, efficiency and comfort is an essential part of the company's daily work.

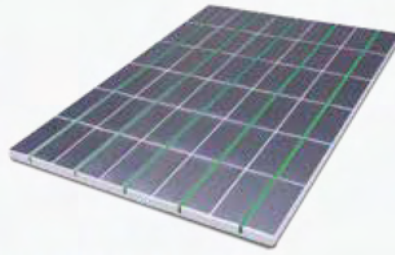
We, as an owner-managed company, are responsible every day. For our customers, suppliers, employees and families. We are happy to do this and act according to social and environmental guidelines.

## mfh Produktvielfalt | mfh product variety



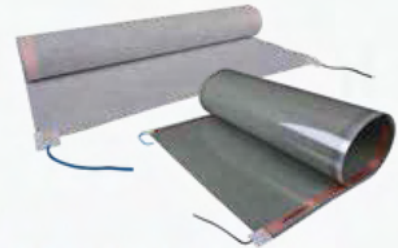
### IDEAL

Flächenheizung- und kühlung für Boden, Wand & Decke – schnell reagierende & energiesparende Bedarfsheizung  
*Surface heating and cooling for floor, wall & ceiling – fast reacting & energy saving heating on demand*



### E-ENERGY IQ

Intelligentes Heizsystem – Innovativer Energieboden für Neubau & Sanierung  
*Intelligent heating system – Innovative energy floor for new buildings & renovation*



### E-ENERGY CARBON

Elektrische Heizfolien auf Niedervoltbasis für den Einbau in Decke, Wand und Boden  
*Electrical heating foils on low-voltage base for installation in ceiling, wall and floor*



### COMPACT FLOOR

Wärmeleitschichten für Fußbodenheizungen – innovative Trockenestriche und Entkopplungen  
*Thermal conductive layers for floor heating systems – innovative dry screeds and decoupling*



### AIRUNIT

Dezentrale Wohnraumlüftung – Push-Pull-Lüftungssystem mit Wärmerückgewinnung  
*Decentralised residential ventilation – push-pull ventilation system with heat recovery*



Kennen Sie schon unsere anderen Produktfamilien?  
Weitere Informationen unter: [www.energy-heating.at](http://www.energy-heating.at)

*Do you already know our other product families?  
Further information is available at: [www.energy-heating.at](http://www.energy-heating.at)*



# Inhalt | Content

## Produktsortiment | *Product portfolio*

### E-ENERGY CARBON

E-ENERGY CARBON FLEECE . . . . .	12
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### E-ENERGY CARBON CONTROL

Netzteile BASIC   <i>Power supplies BASIC</i> . . . . .	18
Netzteile PRO   <i>Power supplies PRO</i> . . . . .	20

## SONSTIGES | *OTHER*

Angebotsformular   <i>Quotation form</i> . . . . .	24
Allgemeine Geschäftsbedingungen   <i>General terms and conditions</i> . . . . .	26

#### Hinweise

Lieferung ab Werk  
Preisliste ohne MwSt.  
Es gelten die allgemeinen Geschäftsbedingungen

#### Instructions

Delivery ex works  
Price list without VAT  
The general terms and conditions apply

# E-ENERGY CARBON – DIE NEUE FLÄCHENHEIZUNG

ELEKTRISCH HEIZEN: KOMFORTABEL. PREISWERT. EINFACH.

## E-ENERGY CARBON – THE NEW SURFACE HEATING SYSTEM

ELECTRIC HEATING: COMFORTABLE. INEXPENSIVE. SIMPLE.



### E-ENERGY CARBON

Das System **E-ENERGY CARBON** ist eine zukunftsweisende elektrische Flächenheizung für Neubauten, Sanierungen und Renovierungen. Grundlage des Systems bilden die patentierten Heizfolien. Die einfache und schnelle Regelung erfolgt komfortabel durch den **E-ENERGY** Raumthermostat mit Smart-Home Technologie.

**E-ENERGY CARBON** *The E-ENERGY CARBON system trend-setting electric panel heating for new buildings, refurbishments and renovations. The patented heating foils form the basis of the system. The E-ENERGY room thermostat with smart home technology provides quick and easy control.*



### PATENTIERTER HERSTELLUNGSPROZESS

Die **E-ENERGY CARBON** Heizfolien sind einzigartig. Die Herstellung erfolgt in einem patentierten Produktionsverfahren. Die **E-ENERGY CARBON** Folien werden homogen verschmolzen und nicht in einzelnen Schichten aufgebaut. Dadurch sind Defekte durch Ablösen einzelner Schichten ausgeschlossen.

**PATENTED PRODUCTION PROCES** *The E-ENERGY CARBON heating foils are unique. They are manufactured in a patented production process. The E-ENERGY CARBON foils are fused homogeneously and not built up in individual layers. This eliminates the possibility of defects caused by the detachment of individual layers.*

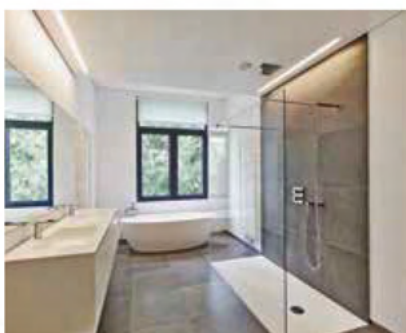




## VOLLHEIZUNG

Heizen auf Knopfdruck mit **E-ENERGY CARBON** – dem vollwertigen Heizsystem. Investitionskosten klassischer Heizsysteme entfallen. Durch **E-ENERGY CARBON** wird Heizen mit Strom zu einer sinnvollen Alternative – ökologisch und ökonomisch!

**FULL HEATING** Heating at the touch of a button with **E-ENERGY CARBON** – the fully-fledged heating system. Investment costs of classic heating systems are eliminated. **E-ENERGY CARBON** makes heating with electricity a sensible alternative – ecologically and economically!



## KOMFORTHEIZUNG

Genießen Sie Wohlfühlwärme punktuell und Raum für Raum. Temperierungen von Oberflächen mit gesunder, unsichtbarer Strahlungswärme und das sogar in Nassbereichen, wie z.B. in den Duschwänden – **E-ENERGY CARBON** macht's möglich.

**COMFORT HEATING** Enjoy the warmth of well-being at specific points and room by room. Temperature control of surfaces with healthy, invisible radiant heat, even in wet areas such as shower walls – **E-ENERGY CARBON** makes it possible.



## FEUCHTESCHUTZ

Die Oberflächentemperatur wird mit **E-ENERGY CARBON** dauerhaft über dem Taupunkt gehalten. Bildung von Kondensat an der Oberfläche wird verhindert. Feuchtigkeit, die Ursache für die Schimmelbildung, wird so nachhaltig unterbunden.

**MOISTURE PROTECTION** The surface temperature is permanently maintained above the dew point with **E-ENERGY CARBON**. Formation of condensate on the surface is prevented. Moisture, the cause of mould growth, is thus prevented in the long term.







## » VORTEILE ADVANTAGES

- ✓ Schnelle Reaktionszeit durch oberflächennahe Verlegung  
*Fast reaction time due to installation close to the surface*
- ✓ Geringe Investitions-, Installations- und Verbrauchskosten  
*Low investment, installation and consumption costs*
- ✓ Geringe Einbauhöhe für einfache und schnelle Nachrüstung – auch im bewohnten Zustand  
*Low installation height for simple and fast retrofitting – even when occupied*
- ✓ Flexible Installation an Decke, Wand & im Boden  
*Flexible installation on ceiling, wall & floor*
- ✓ Nachträgliche Einbauten von Spots, Steckdosen oder Schrauben in der Heizfläche sind möglich  
*Subsequent installation of spots, sockets or screws in the heating surface is possible*



# E-ENERGY CARBON FLEECE

**E-ENERGY CARBON FLEECE** ist eine diffusionsoffene, vlieskaschierte und haftungsoptimierte Heizfolie, welche durch ihre Perforation optimal für Fliesenklebstoffe und Spachtelmassen für Decken-, Wand- oder Bodeneinbauten geeignet ist.

*E-ENERGY CARBON FLEECE is a diffusion-open, fleece-laminated and adhesion-optimised heating foil which, due to its perforation, is ideally suited for tile adhesives and putty for ceiling, wall or floor installations.*

- 1** Geringe Einbauhöhe durch  
0,4 mm dünne Heizfolien  
*Low installation height due  
to 0.4 mm thin heating foils*

- 2** Perforation und Vlieskaschierung für sichere Haftung  
und flexible Installation in Decke, Wand und Boden  
*Perforation and fleece lamination for secure adhesion and  
flexible installation in ceiling, wall and floor*

- 3** Sicherer Anschluss mit 24 V Sicherheitskleinspannung (SELV)  
*Safe connection with 24 V safety extra-low voltage (SELV)*



# E-ENERGY CARBON FLEECE



Vlieskaschiert  
Fleece covered



600 mm Breite  
600 mm Width





# E-ENERGY CARBON FLEECE

## Heizfolien FLEECE | Heating foils FLEECE

Diffusionsoffene, vlieskaschierte und haftungsoptimierte Heizfolie, welche durch ihre Perforation optimal für Fliesenklebstoffe und Spachtelmassen für Decken-, Wand- und Bodeneinbauten geeignet ist.

Diffusion-open, fleece-laminated and adhesion-optimised heating foil which, due to its perforation, is ideally suited for tile adhesives and fillers for ceiling, wall and floor installations.

### 36 W/lfm (60 W/m<sup>2</sup>)



Artikel Article	Abmessung (LxBxH) Dimension (LxWxH)	Art-Nr. Item-no.	VPE PU	Preis/Stk. Price/Item
Heizfolie 24 V – 36 W/lfm (60 W/m <sup>2</sup> ), 1,1 m Heating foil 24 V – 36 W/m (60 W/m <sup>2</sup> ), 1.1 m	1.100 x 600 x 0,4 mm 1,100 x 600 x 0.4 mm	2 12 401	1 Stk. 1 pc.	68,75 € 68.75 €
Heizfolie 24 V – 36 W/lfm (60 W/m <sup>2</sup> ), 2,2 m Heating foil 24 V – 36 W/m (60 W/m <sup>2</sup> ), 2.2 m	2.200 x 600 x 0,4 mm 2,200 x 600 x 0.4 mm	2 12 402	1 Stk. 1 pc.	137,50 € 137.50 €
Heizfolie 24 V – 36 W/lfm (60 W/m <sup>2</sup> ), 3,3 m Heating foil 24 V – 36 W/m (60 W/m <sup>2</sup> ), 3.3 m	3.300 x 600 x 0,4 mm 3,300 x 600 x 0.4 mm	2 12 403	1 Stk. 1 pc.	206,25 € 206.25 €
Heizfolie 24 V – 36 W/lfm (60 W/m <sup>2</sup> ), 4,4 m Heating foil 24 V – 36 W/m (60 W/m <sup>2</sup> ), 4.4 m	4.400 x 600 x 0,4 mm 4,400 x 600 x 0.4 mm	2 12 404	1 Stk. 1 pc.	275,00 € 275.00 €

### 66 W/lfm (110 W/m<sup>2</sup>)



Artikel Article	Abmessung (LxBxH) Dimension (LxWxH)	Art-Nr. Item-no.	VPE PU	Preis/Stk. Price/Item
Heizfolie 24 V – 66 W/lfm (110 W/m <sup>2</sup> ), 1,1 m Heating foil 24 V – 66 W/m (110 W/m <sup>2</sup> ), 1.1 m	1.100 x 600 x 0,4 mm 1,100 x 600 x 0.4 mm	2 12 421	1 Stk. 1 pc.	77,00 € 77.00 €
Heizfolie 24 V – 66 W/lfm (110 W/m <sup>2</sup> ), 2,2 m Heating foil 24 V – 66 W/m (110 W/m <sup>2</sup> ), 2.2 m	2.200 x 600 x 0,4 mm 2,200 x 600 x 0.4 mm	2 12 422	1 Stk. 1 pc.	154,00 € 154.00 €
Heizfolie 24 V – 66 W/lfm (110 W/m <sup>2</sup> ), 3,3 m Heating foil 24 V – 66 W/m (110 W/m <sup>2</sup> ), 3.3 m	3.300 x 600 x 0,4 mm 3,300 x 600 x 0.4 mm	2 12 423	1 Stk. 1 pc.	231,00 € 231.00 €
Heizfolie 24 V – 66 W/lfm (110 W/m <sup>2</sup> ), 4,4 m Heating foil 24 V – 66 W/m (110 W/m <sup>2</sup> ), 4.4 m	4.400 x 600 x 0,4 mm 4,400 x 600 x 0.4 mm	2 12 424	1 Stk. 1 pc.	308,00 € 308.00 €

### 132 W/lfm (220 W/m<sup>2</sup>)





Artikel Article	Abmessung (LxBxH) Dimension (LxWxH)	Art-Nr. Item-no.	VPE PU	Preis/Stk. Price/Item
Heizfolie 24 V – 132 W/lfm (220 W/m <sup>2</sup> ), 1,1 m Heating foil 24 V – 132 W/m (220 W/m <sup>2</sup> ), 1.1 m	1.100 x 600 x 0,4 mm 1,100 x 600 x 0.4 mm	2 12 441	1 Stk. 1 pc.	85,00 € 85.00 €
Heizfolie 24 V – 132 W/lfm (220 W/m <sup>2</sup> ), 2,2 m Heating foil 24 V – 132 W/m (220 W/m <sup>2</sup> ), 2.2 m	2.200 x 600 x 0,4 mm 2,200 x 600 x 0.4 mm	2 12 442	1 Stk. 1 pc.	170,00 € 170.00 €



## Kabel & Verbinder (nur für SELV-Anschluss) | Cables & connectors (only for SELV connection)

Halogenfreie und für die Unterputzmontage geeignete Zwillingsleitung zur Verlängerung der werkseitig angecrimpten Anschlusskabel. Verfügbar in 2,5 und 6 mm<sup>2</sup> inklusive zugelassener Verbinder. *Halogen-free twin cable suitable for flush mounting for extending the factory-crimped connection cables. Available in 2.5 and 6 mm<sup>2</sup> including approved connectors.*

Für Entfernungen bis zu 10 m zum Trafo *For distances up to 10 m from the transformer*

Artikel Article	Abmessung (LxBxH) Dimension (LxWxH)	Art-Nr. Item-no.	VPE PU	Preis/Stk. Price/Item
 PUR-Zwillingsleitung PUR twin cable	2 x 2,5 mm <sup>2</sup> 2 x 2.5 mm <sup>2</sup>	2 00 604	10 lfdm 10 m	3,50 € / lfdm 3.50 € / m
	2 x 2,5 mm <sup>2</sup> 2 x 2.5 mm <sup>2</sup>	2 00 600	25 lfdm 25 m	3,50 € / lfdm 3.50 € / m
	2 x 2,5 mm <sup>2</sup> 2 x 2.5 mm <sup>2</sup>	2 00 601	50 lfdm 50 m	3,50 € / lfdm 3.50 € / m
 Quetschverbinder Crimp connector	2,5 mm <sup>2</sup> 2.5 mm <sup>2</sup>	2 00 652	5 Stk. 5 pcs.	5,40 € / Beutel 5.40 € / pouch
	2,5 mm <sup>2</sup> 2.5 mm <sup>2</sup>	2 00 650	20 Stk. 20 pcs.	20,50 € / Beutel 20.50 € / pouch

Für Entfernungen bis zu 25 m zum Trafo *For distances up to 25 m to the transformer*

 PUR-Zwillingsleitung PUR twin cable	2 x 6,0 mm <sup>2</sup> 2 x 6.0 mm <sup>2</sup>	2 00 602	25 lfdm 25 m	6,35 € / lfdm 6.35 € / m
	2 x 6,0 mm <sup>2</sup> 2 x 6.0 mm <sup>2</sup>	2 00 603	50 lfdm 50 m	6,35 € / lfdm 6.35 € / m
 Quetschverbinder Crimp connector	6,0 mm <sup>2</sup> 6.0 mm <sup>2</sup>	2 00 651	20 Stk. 20 pcs.	27,50 € / Beutel 27.50 € / pouch

Universalverbinder zur Verbindung unterschiedlicher Kabelquerschnitte und zum Verbinden mehrerer PUR-Zwillingsleitungen.  
*Universal connector for connecting different cable cross-sections and for connecting several PUR twin leads*

 Universalverbinder Universal connector 6 – 10 mm <sup>2</sup>	6 – 10 mm <sup>2</sup> 6 – 10 mm <sup>2</sup>	2 00 656	10 Stk. 10 pc.	20,50 € 20.50 €
	10 – 16 mm <sup>2</sup> 10 – 16 mm <sup>2</sup>	2 00 657	10 Stk. 10 pc.	21,75 € 21.75 €
	Presszange für Universalverbinder Crimping pliers for universal connectors	6 – 16 mm <sup>2</sup> 6 – 16 mm <sup>2</sup>	2 09 071	1 Stk. 1 pc.

Zum Verbinden von zwei PUR-Leitungen 2,5 mm<sup>2</sup> mittels Heißluftföhn *For connecting two PUR cables 2.5 mm<sup>2</sup> by means of hot air blow dryer*

 Lötverbinder Solder connectors	5,0 mm <sup>2</sup> 5.0 mm <sup>2</sup>	2 00 658	10 Stk. 10 pc.	13,95 € 13.95 €
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### Quetschverbinder *Crimp connector*

Leitungskombination <i>Line combination</i>	Verbinder <i>Connector</i>
2 x 2,5 mm <sup>2</sup>	Quetschverbinder <i>Crimp connector</i> 2,5 mm <sup>2</sup>
2 x 6,0 mm <sup>2</sup>	Quetschverbinder <i>Crimp connector</i> 6,0 mm <sup>2</sup>

### Universalverbinder *Universal connector*

Leitungskombination <i>Line combination</i>	Querschnittssumme <i>Cross-section sum</i>	Verbinder <i>Connector</i>
3 x 2,5 mm <sup>2</sup>	7,5 mm <sup>2</sup>	Universalverbinder <i>Universal connector</i> 6 – 10 mm <sup>2</sup>
1 x 2,5 mm <sup>2</sup> + 1 x 6,0 mm <sup>2</sup>	8,5 mm <sup>2</sup>	Universalverbinder <i>Universal connector</i> 6 – 10 mm <sup>2</sup>
4 x 2,5 mm <sup>2</sup>	10,0 mm <sup>2</sup>	Universalverbinder <i>Universal connector</i> 6 – 10 mm <sup>2</sup>
2 x 2,5 mm <sup>2</sup> + 1 x 6,0 mm <sup>2</sup>	11,0 mm <sup>2</sup>	Universalverbinder <i>Universal connector</i> 10 – 16 mm <sup>2</sup>
2 x 6,0 mm <sup>2</sup>	12,0 mm <sup>2</sup>	Universalverbinder <i>Universal connector</i> 10 – 16 mm <sup>2</sup>
3 x 2,5 mm <sup>2</sup> + 1 x 6,0 mm <sup>2</sup>	13,5 mm <sup>2</sup>	Universalverbinder <i>Universal connector</i> 10 – 16 mm <sup>2</sup>
4 x 2,5 mm <sup>2</sup> + 1 x 6,0 mm <sup>2</sup>	16,0 mm <sup>2</sup>	Universalverbinder <i>Universal connector</i> 10 – 16 mm <sup>2</sup>

### Lötverbinder *Solder connectors*

Leitungskombination <i>Line combination</i>	Querschnittssumme <i>Cross-section sum</i>	Verbinder <i>Connector</i>
2 x 2,5 mm <sup>2</sup>	5,0 mm <sup>2</sup>	Lötverbinder <i>Solder connectors</i> 5,0 mm <sup>2</sup>

## » KONSTRUKTIONSAUFBAU DECKE CONSTRUCTION STRUCTURE CEILING

- 1 Deckenbelag  
Ceiling covering
- 2 Spachtelmasse / Putzsystem min. 2mm  
Filler / plaster system min. 2mm
- 3 E-ENERGY CARBON FLEECE
- 4 Spachtelmasse / Kleber  
Putty / adhesive
- 5 Grundierung  
Primer

2 mm

0,4 mm

2 mm

5 mm



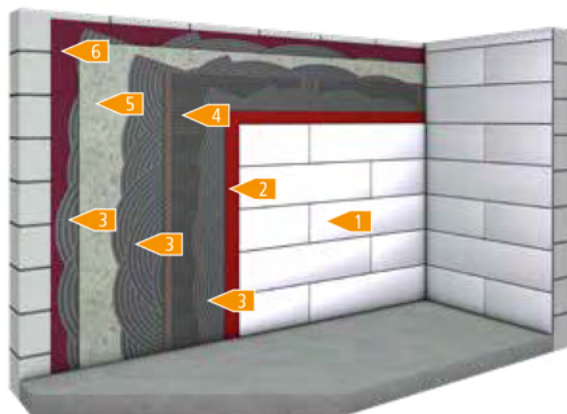
## » KONSTRUKTIONSAUFBAU WAND CONSTRUCTION STRUCTURE WALL

- 1 Fliesen | Naturstein Tiles | natural stone
- 2 ggf. Abdichtung in Feuchträumen  
Sealing in damp rooms if necessary
- 3 Fliesenkleber ca. 2 mm je Lage  
Tile adhesive approx. 2 mm per layer
- 4 E-ENERGY CARBON FLEECE
- 5 Dämm- & Entkopplungsplatte (optional)  
Insulation & decoupling board (optional)
- 6 Grundierung  
Primer

4 mm

0,4 mm

≥ 5 mm



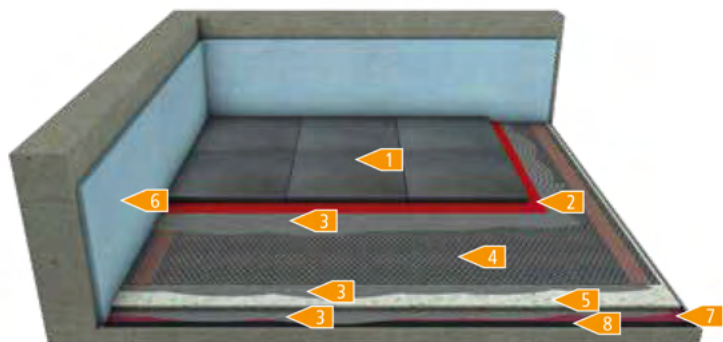
## » KONSTRUKTIONSAUFBAU BODEN (VERKLEBT) CONSTRUCTION STRUCTURE FLOOR (GLUED)

- 1 Fliesen | Naturstein Tiles | natural stone
- 2 ggf. Abdichtung in Feuchträumen  
Sealing in damp rooms if necessary
- 3 Fliesenkleber ca. 2 mm je Lage  
Tile adhesive approx. 2 mm per layer
- 4 E-ENERGY CARBON FLEECE
- 5 Dämm- & Entkopplungsplatte (optional)  
Insulation & decoupling board (optional)
- 6 Randdämmstreifen EPS | NEO  
Edge insulation strips EPS | NEO
- 7 Grundierung Primer
- 8 ggf. Feuchtigkeitssperre (Verbund zum Untergrund)  
If necessary moisture barrier (bond to the substrate)

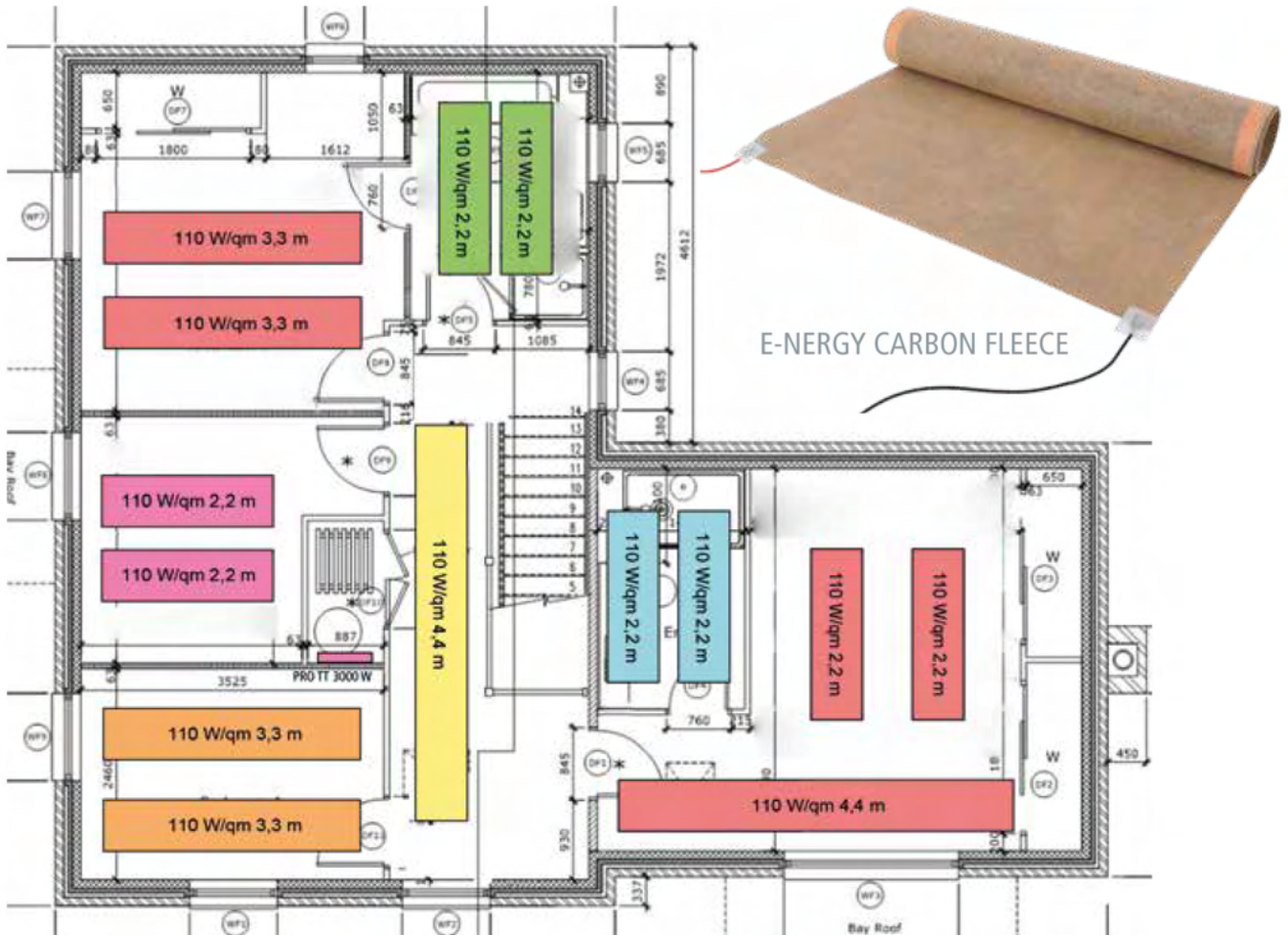
4 mm

0,4 mm

≥ 5 mm



# » AUSLEGUNGSBEISPIEL DECKENHEIZUNG DESIGN EXAMPLE CEILING HEATING



## Montagezeiten & Belegungsgrad | Installation time & occupancy rate

Die genannten Montagezeiten sind Erfahrungswerte und dienen als Kalkulationshilfe. Die Angaben zum Heizsystem beziehen sich auf einen Monteur (1-Mann-Montage).  
The assembly times stated are empirical values and serve as a calculation aid. The information on the heating system refers to one fitter (1-man installation).

Montagezeiten Installation time	E-ENERGY CARBON FLEECE	20-30 min / m <sup>2</sup>	Belegungsgrad Occupancy rate	Decke Ceiling	30 - 50 %
	Trafo Transformer	30 min / Trafo 30 min / transformer		Wand Wall	30 - 50 %
	Anschluss Heizfolie Connection heating foil	2 min / Heizfolie 2 min / heating foil		Boden Floor	70 - 90 %
	Raumthermostat Room thermostat	30 min / Raumthermostat 30 min / transformer			

# E-ENERGY CARBON CONTROL

**E-ENERGY CARBON** arbeitet mit Sicherheitskleinspannung (SELV). Herzstück der Spannungsversorgung sind die geprüften Transformatoren. Zur Auswahl stehen sowohl effiziente Ringtrafos mit einem Wirkungsgrad von bis zu 95%, als auch kostenoptimierte EI-Transformatoren. Die Steuerung von **E-ENERGY CARBON** erfolgt über Raumthermostate, welche auch mit moderner Smart-Home und App-Technologie verfügbar sind.

*E-ENERGY CARBON operates with safety extra-low voltage (SELV). The tested transformers are the heart of the power supply. There is a choice of both efficient ring transformers with an efficiency of up to 95% and cost-optimised EI transformers. E-ENERGY CARBON is controlled by room thermostats, which are also available with modern Smart-Home and App technology.*

**1** Ringkerntrafos mit hohem Wirkungsgrad von bis zu 95 %  
*Toroidal transformers with high efficiency of up to 95 %*



**2** Sicherheitskleinspannung (SELV) für eine sichere Spannungsversorgung  
*Safety extra-low voltage (SELV) for a safe power supply*



**3** Raumthermostate mit Smart-Home Funktion  
*Room thermostats with Smart-Home function*





## Netzteile BASIC | Power supplies BASIC



24 V



100 – 1.800 W  
100 – 1,800 W

SELV

Ringkern & EI  
*Toroidal core & EI*

## Netzteile PRO | Power supplies PRO



24 V



3.000 W  
3,000 W

SELV

Ringkern  
*Toroidal core*



# Netzteile BASIC | Power supplies BASIC

Ringkerntrafo mit integriertem Einschaltstrombegrenzer, sekundärseitiger Absicherung der Heizkreise und hohem Wirkungsgrad von bis zu 95 %. Im Aufputzgehäuse für die Aufputz- sowie Unterputzmontage geeignet. Optimale Ausnutzung der Trafoleistung durch intelligente Aufteilung der Heizkreise mit flexiblen Anschlussmöglichkeiten. Versorgungskontakt (230 V) zum Anschluss eines Raumthermostaten sowie einem Steuereingang (230 V – Schließerkontakt) zur Schaltung des Trafos.

Toroidal transformer with integrated inrush current limiter, secondary-side protection of the heating circuits and high efficiency of up to 95 %. In surface-mounted housing suitable for surface and flush mounting. Optimum utilisation of the transformer output through intelligent division of the heating circuits with flexible connection options. Supply contact (230 V) for connecting a room thermostat and a control input (230 V – normally open contact) for switching the transformer.

## Netzteile BASIC EI | Power supply units BASIC EI








Artikel Article	Abmessung (LxBxH) Dimension (LxWxH)	Art-Nr. Item-no.	VPE PU	Preis/Stk. Price/Item
Netzteil BASIC EI-C 24 V   100 W AP/UP Power supply BASIC EI-C 24 V   100 W AP/UP	120 x 80 x 77 mm 120 x 80 x 77 mm	2 03 584	1 Stk. 1 pc.	110,00 € 110.00 €
Netzteil BASIC EI-C 24 V   300 W AP/UP Power supply BASIC EI-C 24 V   300 W AP/UP	129 x 91 x 100 mm 129 x 91 x 100 mm	2 03 585	1 Stk. 1 pc.	169,00 € 169.00 €

## Netzteile BASIC TT | Power supply units BASIC TT




Artikel Article	Abmessung (LxBxH) Dimension (LxWxH)	Art-Nr. Item-no.	VPE PU	Preis/Stk. Price/Item
Netzteil BASIC TT 24 V   900 W AP/UP Power supply BASIC TT 24 V   900 W AP/UP	300 x 218 x 85 mm 300 x 218 x 85 mm	2 03 586	1 Stk. 1 pc.	595,00 € 595.00 €
Netzteil BASIC TT 24 V   1.800 W AP/UP Power supply BASIC TT 24 V   1,800 W AP/UP	430 x 280 x 90 mm 430 x 280 x 90 mm	2 03 587	1 Stk. 1 pc.	1.130,00 € 1,130.00 €

## Regelungssystem | Control system

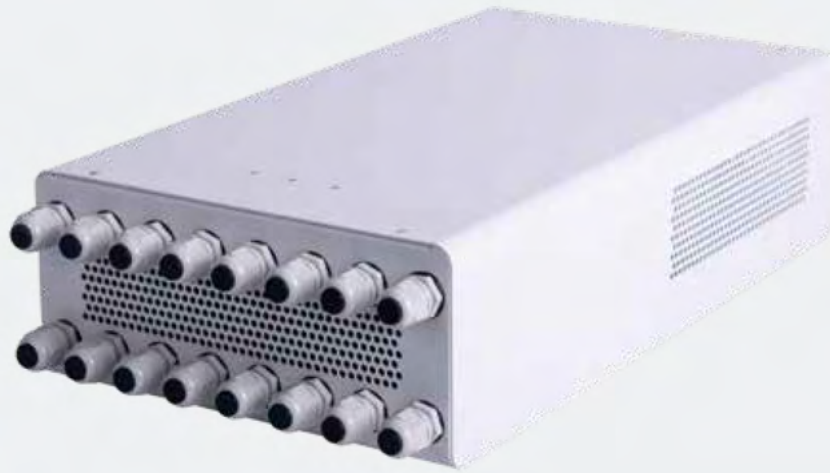
	Artikel Article	Abmessung (LxBxH) Dimension (LxWxH)	Art-Nr. Item-no.	VPE PU	Preis/Stk. Price/Item
    	<b>Raumthermostat Touch</b> (inkl. externen Temperaturfühler, Versorgung 230 V) Room thermostat touch (incl. external temperature sensor, supply 230 V)	85 x 85 x 40 mm 85 x 85 x 40 mm	2 03 250	1 Stk. 1 pc.	205,00 € 205.00 €
	<b>Raumthermostat WIFI</b> (inkl. externen Temperaturfühler, Versorgung 230 V) Room thermostat WIFI (incl. external temperature sensor, supply 230 V)	85 x 85 x 40 mm 85 x 85 x 40 mm	2 03 251	1 Stk. 1 pc.	225,00 € 225.00 €
	<b>Raumthermostat EN 01</b> (inkl. externen Temperaturfühler, Versorgung 230 V) Room thermostat EN 01 (incl. external temperature sensor, supply 230 V)	80 x 80 x 40 mm 80 x 80 x 40 mm	2 03 252	1 Stk. 1 pc.	175,00 € 175.00 €
	<b>Raumthermostat EN 02</b> (inkl. externen Temperaturfühler, Versorgung 230 V) Room thermostat EN 02 (incl. external temperature sensor, supply 230 V)	84 x 84 x 40 mm 84 x 84 x 40 mm	2 03 253	1 Stk. 1 pc.	124,00 € 124.00 €
	<b>Raumthermostat FN 02 (batteriebetrieben)</b> Room thermostat FN 02 (battery-powered)	118 x 95 x 26 mm 118 x 95 x 26 mm	2 03 273	1 Stk. 1 pc.	125,00 € 124.00 €
	<b>Funkrelais-Set</b> Radio relay set	84 x 84 x 28 mm 85 x 85 x 28 mm	2 03 276	1 Stk. 1 pc.	115,00 € 115.00 €

## Zubehör | Accessories

	Artikel Article	Abmessung (LxBxH) Dimension (LxWxH)	Art-Nr. Item-no.	VPE PU	Preis/Stk. Price/Item
	<b>Fühler-Anschluss-Set</b> Sensor connection set		2 00 554	1 Stk. 1 pc.	27,50 € 27.50 €
	<b>DC-Netzfilter</b> DC mains filter	50 x 40 x 30 mm 50 x 40 x 30 mm	2 03 562	1 Stk. 1 pc.	50,00 € 50.00 €

	Netzteil BASIC EI-C 100 W AP/UP Power supply BASIC EI-C 100 W AP/UP	Netzteil BASIC EI-C 300 W AP/UP Power supply BASIC EI-C 300 W AP/UP	Netzteil BASIC 900 W AP/UP Power supply BASIC 900 W AP/UP	Netzteil BASIC 1.800 W AP/UP Power supply BASIC 1,800 W AP/UP
Nennleistung Nominal power	100 W	300 W	900 W	1.800 W
Steuereingang für Raumthermostat 230 V Control input for room thermostat 230 V	1x	Nur schaltbar über Raumthermostat EN 01 Only switchable via Room thermostat EN 01	1x	1x
Lastausgänge Load outputs	1x	1x	5x*	10x*
Einschaltstrombegrenzer Inrush current limiter	-	-	●	●
Integrierter Sicherheitstemperaturbegrenzer Integrated safety temperature limiter protection	●	●	●	●

\* Pro Lastausgang dürfen max. 300 W (BAISCTT) angeschlossen werden. Die angeschlossene Gesamtleistung darf die Nennleistung des Netzteils nicht übersteigen.  
 \* Per load output max. 300 W (BAISCTT) may be connected. The total power connected must not exceed the rated power of the power supply unit.



# Netzteile PRO | Power supplies PRO

## Netzteile PRO TT | Power supply units PRO TT

Zentrale Stromversorgungsstation mit Sicherheitstransformator nach EN 61558-2-6 mit 24 V AC Sicherheitskleinspannung (SELV) zum Anschluss von Heizfolien des Systems E-ENERGY CARBON. Für den Betrieb ganzer Wohneinheiten / Etagen ausgestattet mit 10 Eingängen zum Anschluss von bis zu 10 Raumthermostaten und 10 Ausgängen zum Anschluss von bis zu 10 Heizkreisen. Steuerelektronik mit integrierten Einschaltstrombegrenzer, DC-Netzfilter sowie Federzugklemmen für eine dauerhaft sichere elektrische Verbindung aller Anschlüsse. In einem Aufputz-Metallgehäuse montiert, besitzen die Stromversorgungsstationen einen Wirkungsgrad von bis zu 95 %.

Central power supply station with safety transformer according to EN 61558-2-6 with 24 V AC safety extra-low voltage (SELV) for connecting heating foils of the E-ENERGY CARBON system. For operating entire residential units / floors equipped with 10 inputs for connecting up to 10 room thermostats and 10 outputs for connecting up to 10 heating circuits. Control electronics with integrated inrush current limiter, DC mains filter as well as spring-loaded terminals for a permanently secure electrical connection of all connections. Mounted in a surface-mounted metal housing, the power supply stations have an efficiency of up to 95 %.



Artikel Article	Abmessung (LxBxH) Dimension (LxWxH)	Art-Nr. Item-no.	VPE PU	Preis/Stk. Price/Item
Netzteil PRO TT 24 V   3.000 W AP/UP Power supply PRO TT 24 V   3.000 W AP/UP	300 x 140 x 560 mm 300 x 140 x 560 mm	2 03 588	1 Stk. 1 pc.	1.975,00 € 1.975,00 €

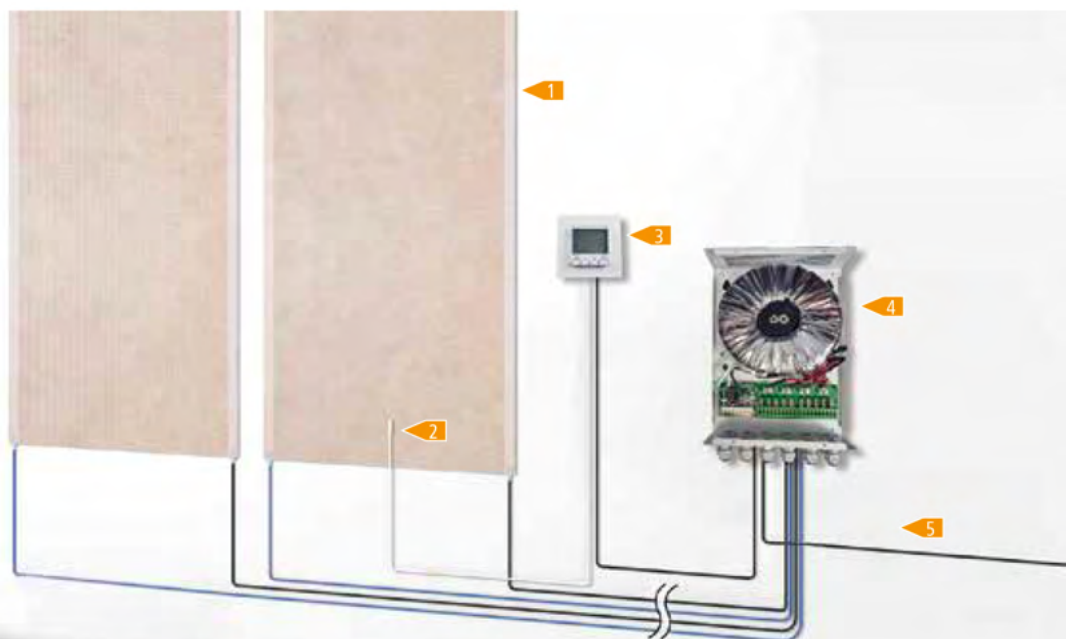
	Netzteil PRO TT 24 V   3.000 W AP/UP Power supply PRO TT 24 V   3.000 W AP/UP
Nennleistung <i>Nominal power</i>	3.000 W
Steuereingang für Raumthermostat 230 V <i>Control input for room thermostat 230V</i>	10 x
Lastausgänge <i>Load outputs</i>	10 x*
Einschaltstrombegrenzer <i>Inrush current limiter</i>	●
Integrierter Sicherheitstemperaturbegrenzer <i>Integrated safety temperature limiter protection</i>	●
Integrierter DC-Netzfilter <i>Integrated DC mains filter</i>	●

\* Pro Lastausgang dürfen max. 300 W angeschlossen werden. Die angeschlossene Gesamtleistung darf die Nennleistung des Netzteils nicht übersteigen.

\* Per load output max. 300 W may be connected. The total power connected must not exceed the rated power of the power supply unit.

## » AUSLEGUNGSBEISPIEL DESIGN EXAMPLE

- 1 Heizfolie  
Heating foil
- 2 Externer Temperaturfühler  
External temperature sensor
- 3 Raumthermostat  
Room thermostat
- 4 Netzteil  
Power supply unit
- 5 230 V AC  
230 V AC



PUR-Zwillingsleitungen sind geeignet für die Verlegung unter Putz sowie im Mauerwerk.

- PUR-Zwillingsleitung 2,5 mm<sup>2</sup> bis 10 m
- PUR-Zwillingsleitung 6,0 mm<sup>2</sup> bis 25 m

Die Absicherung der Lastausgänge der **E-ENERGY CARBON BASIC TT Netzteile und PRO TT Netzteile** sind auf max. 300 W begrenzt. Sie entspricht den folgenden Heizfolienlängen:

- Heizfolie E-ENERGY CARBON FLEECE  
24 V – 36 W/lfm (60 W/m<sup>2</sup>), max. 8,2 m
- Heizfolie E-ENERGY CARBON FLEECE  
24 V – 66 W/lfm (110 W/m<sup>2</sup>), max. 4,4 m
- Heizfolie E-ENERGY CARBON FLEECE  
24 V – 132 W/lfm (220 W/m<sup>2</sup>), max. 2,2 m

PUR twin cables are suitable for installation under plaster as well as in masonry.

- PUR twin cable 2.5 mm<sup>2</sup> to 10 m
- PUR twin cable 6.0 mm<sup>2</sup> up to 25 m

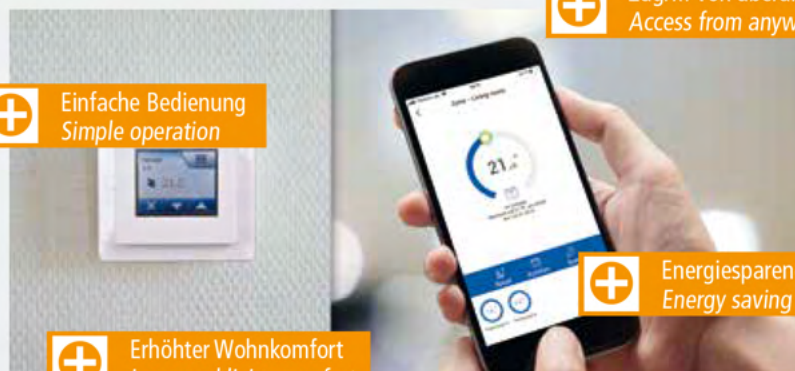
The fusing of the load outputs of the **E-ENERGY CARBON BASIC TT and HT power supplies** is limited to max. 300 W. It corresponds to the following heating foil lengths:

- E-ENERGY CARBON FLEECE heating foil  
24 V – 36 W/lfm (60 W/m<sup>2</sup>), max. 8.2 m
- E-ENERGY CARBON FLEECE heating foil  
24 V – 66 W/lfm (110 W/m<sup>2</sup>), max. 4.4 m
- E-ENERGY CARBON FLEECE heating foil  
24 V – 132 W/lfm (220 W/m<sup>2</sup>), max. 2.2 m

# » APP-FÄHIG – STEUERUNG VIA SMARTPHONE APP-ENABLED – CONTROL VIA SMARTPHONE



+ Einfache Bedienung  
Simple operation



+ Zugriff von überall  
Access from anywhere

+ Energiesparend  
Energy saving

+ Erhöhter Wohnkomfort  
Increased living comfort



	Raumthermostat EN 01 Room thermostat EN 01	Raumthermostat Touch Room thermostat touch	Raumthermostat WIFI Room thermostat WIFI	Raumthermostat EN 02 Room thermostat EN 02	Raumthermostat FN 02 Room thermostat FN 02
Netzteil BASIC TT Power supply BASIC TT	●	●	●	●	—
Netzteil BASIC EI Power supply BASIC EI	●	(nur mit Relais) (only with relay)	(nur mit Relais) (only with relay)	(nur mit Relais) (only with relay)	●
Versorgungsspannung Supply voltage	230 V	230 V	230 V	230 V	2 x AA Alkali Batterien 2 x AA alkaline batteries
Ext. Temperaturfühler Ext. temperature sensor	●	●	●	●	—
Installation Installation	Unterputz Flush-mounted	Unterputz Flush-mounted	Unterputz Flush-mounted	Unterputz Flush-mounted	Aufputz Surface-mounted
Schalterrahmen switch ranges	50 x 50 mm	55 x 55 mm	55 x 55 mm	55 x 55 mm	—
Zeitprogramm Time schedule	●	●	●	●	●
Fensterauf-Erkennung Window-On-Detection	—	●	●	●	—
Adaptives Aufheizverhalten Adaptive heat-up behaviour	●	●	●	●	●
APP-fähig APP compatible	—	—	●	—	—
Kommunikation Communication	Kabelgebunden Wired	Kabelgebunden Wired	Kabelgebunden Wired	Kabelgebunden Wired	Funk Radio
ErP-Konform ErP compliant	●	●	●	●	●

## Angebotsformular E-ENERGY CARBON – Elektro-Flächenheizung

per Fax an: **+43 (0) 3855 45551**

per Mail an: **office@energy-heating.at**

Fachbetrieb:

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Projekt | Bauherr:

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### Angaben zum Bauvorhaben

Art des Vorhabens  Neubau  Sanierung  
Gebäudealter  ab 2012  ab 1980  älter als 1960  
20-60 W/m<sup>2</sup> 60-150 W/m<sup>2</sup> 150-300 W/m<sup>2</sup>

Anzahl zu beheizender Räume \_\_\_\_\_

Hausanschluss  3 x 35 A  3 x 63 A  \_\_\_\_ x \_\_\_\_ A

### Art der Beheizung

- Raum-Vollheizung Deckung der Vollheizlast  
 Komfortheizung Als Zusatzheizung  
 Schimmelprävention Als Bautenschutz

### Anwendungsbereich

- Decke  
 Wand  
 Boden  schwimmend  gespachtelt

### Wärmebedarf

- Die zu erwartende Heizlast beträgt ca. \_\_\_\_\_ W/m<sup>2</sup>  
 Es liegt keine Berechnung vor, das Objekt ist nach eigener Einschätzung  schlecht gedämmt  gut gedämmt

### Regelung

- Standard  Funk  WiFi-fähig

### Bodenbelag

- Parkett \_\_\_\_\_ m<sup>2</sup>  Laminat \_\_\_\_\_ m<sup>2</sup>  
 Fliese \_\_\_\_\_ m<sup>2</sup>

### Räume

Bezeichnung l x b x h

Bezeichnung	l x b x h
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

### Grundriss / Skizze mit Maßangaben erforderlich!

Bitte zu beheizende Räume/ Wandflächen markieren!  
Bitte Fenster und Türen bei Wandheizung ebenfalls bemaßen!

### Weitere Angaben

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Quotation form E-ENERGY – Electrical surface heating

please fax to: **+43 (0) 3855 45551**

please mail to: **office@energy-heating.at**

Company:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Project name:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Project details

Type of project  New building  Renovation  
construction year  from 2012  from 1980  older than 1960  
20-60 W/m<sup>2</sup> 60-150 W/m<sup>2</sup> 150-300 W/m<sup>2</sup>  
Number of heated rooms \_\_\_\_\_  
Home connection  3 x 35 A  3 x 63 A  \_\_\_\_ x \_\_\_\_ A

Flooring

Parquet \_\_\_\_\_ m<sup>2</sup>  Laminate \_\_\_\_\_ m<sup>2</sup>  
 Tiles \_\_\_\_\_ m<sup>2</sup>

Rooms

description	l x w x h
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Type of heating

Full room heating Covering the full heat load  
 Comfort heating For additional heating  
 Mould prevention For building protection

Field of application

ceiling  
 wall  
 floor  floating  puttyled

Heat requirement

Expected heat load is about \_\_\_\_\_ W/m<sup>2</sup>  
 There is no calculation as of yet, according to personal estimation, the building is  Badly insulated  Well insulated

Floor plan / a sketch with measurements is required!

Please mark rooms/ walls surfaces to be heated!  
Please also add the mesasurements of windows and doors for wall heating!

Control

Standard  Radio  WiFi enabled

Further details

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# General Terms and Conditions

## 1. General information/scope of application

1.1 These General Terms and Conditions (GTC) apply exclusively and for all Contractors (Section 14 BGB (German Civil Code)), legal entities under public law or special funds under public law. We only accept opposing conditions or conditions of the Customer deviating from our general terms and conditions unless we have expressly agreed to their application in writing.

1.2 Our offers, services and deliveries are based exclusively upon these GTC.

1.3 With the receipt of an offer, an order confirmation or the granting of order or acceptance of a service with the incorporation of these general terms and conditions at the latest, the Contractor acknowledges that these GTC are to apply exclusively for the entire business relationship – also in the future.

1.4 Contractual stipulations agreed upon between the contractual parties in individual cases (also subsidiary agreements, amendments and changes) apply only in relation to an order and have to be documented in writing to be applicable, thereby taking priority over these GTC in any case.

1.5 Orders or assignments are binding for the Customer (I, II); the agreement is formed by the confirmation of the assignment or the execution of the order or the assignment at our discretion. We explicitly reject deviating general terms and conditions or counter confirmations. An opposing assignment prohibition is hereby explicitly refuted. Our silence regarding such deviating conditions is particularly not regarded as recognition or approval, also in case of future transactions. Our offers are subject to change and non-binding unless we have explicitly declared them or indicated to be binding in writing.

1.6 The terms listed below are defined as follows:

"We / Contractor / Supplier": mfm systems GmbH, Hager Feld 8, 49191 Belm. "Force majeure": constitutes any reason which renders the fulfillment of the respective contractual obligations impossible and which is generated due to circumstances outside of the reasonable control of the respective Party, including but not limited to natural disasters, acts by governments or supra-national institutions, outbreaks of violence, national states of emergency, terror attacks, riots, internal unrests, fires, explosions or floods. "Order": constitutes any offer to the supplier for the sale of goods with reference to the conditions of this Agreement. "Principal / Customer": constitutes the Purchaser of the goods specified on the order form. "Goods": are the commodities dispatched by us. "Product description": is a detailed illustration of the goods with correct usage instructions.

## 2 Offer and conclusion of the contract

2.1 We are bound to an offer of the Customer for 14 days. Subsequent acceptances by the Principal represent a new offer and require the Contractor's acceptance. If the Principal's order deviates from the Contractor's quote, a contract is only formed in this case with the confirmation of the Contractor.

2.2 We reserve proprietary rights and copyrights to all documents e.g. calculations, drawings etc. provided to the Customer in the context of the assignment. The Purchaser may only transfer these to third parties with our written consent, regardless whether or not we have labelled them as confidential. If the Customer acts contrary to this regulation, we reserve the right to take further steps. These documents may not be made accessible to third parties unless we explicitly agree or if it is necessary for the implementation of the Agreement. Unless we accept the offer of the contractual partner within the period specified in item 2.1, these documents have to be returned to us without undue delay.

2.3 The Principal has to hand over the data or plans necessary for the execution of the service and which have to be provided by him in accordance with the Agreement free of charge and in due time, i.e. at least four (4) weeks prior to the commencement of production.

2.4 If this deadline is not met and if this omission causes delays, the Principal is responsible for any resulting additional costs and/or damages.

## 3 Quality of goods

3.1 Construction and form changes of the delivery item remain reserved if the delivery item is not significantly altered and if the changes are reasonable for the Purchaser or in the nature of things.

3.2 Templates, samples, analysis data and other specifications regarding the quality on our part are only indications within the actually available range of the respective values pertaining to dimensions, colour, quality, chemical composition and action mechanism of the products supplied by us. The Agreement is deemed fulfilled also in case of a respective excess or short delivery.

3.3 We only assume the guarantee for quality, durability or the earnings of the delivery item or the procurement risk upon explicit, written, order-related statement, however, not based on the content of product descriptions, technical data and other printed material and information.

## 4 Prices and payment conditions

4.1 Subject to a deviating agreement, prices apply ex our warehouse or ex works in case of direct dispatch from the manufacturers location, exclusive of packaging. (ex-works" (Incoterms 2010).

4.2 Specified and agreed prices are net plus VAT in the statutory amount applicable at the time of execution of the service. Payment is due immediately upon receipt or provision and receipt of the invoice without any deduction free paying agent, unless the invoice specifies a different payment term. A discount is only admissible following a special written agreement between us and the Purchaser. Payment is only received once we are ultimately able to dispose over the full amount. We do not accept bills of exchange or cheques as payment.

4.3 If the Purchaser is in default of payment, the entire claims against the Purchaser become due and payable immediately if he is in default with more than one account. Payments may only be made to employees of our company if they produce a written authorisation to collect.

4.4 If, based on facts which become known to us only after conclusion of the Agreement, there are justified doubts about the creditworthiness of the Purchaser or if the creditworthiness has deteriorated significantly between the conclusion of the Agreement and delivery, we may demand advance payment or corresponding securities. If the Purchaser

does not pay in advance or provide securities despite a grace period and if the threat to refuse to pay after the deadline has expired, or if he finally refuses them, we can withdraw from the contract by written declaration.

4.5 The Purchaser is not permitted to offset our claims unless the claim for offsetting is uncontested, conclusively determined and accepted by us. The Purchaser is only entitled to a right of retention if his counter claim is based on the same contractual relationship.

## 5. Delivery and performance time, default / self-supply and force majeure

5.1 Delivery times and deadlines are determined by us in writing and are binding only at that point. The delivery deadline is met if the delivery item has been dispatched up to its expiration.

5.2 The delivery term commences on the day of undersigning a written purchase agreement or the dispatch of the order confirmation, however not before the delivery of the documents, permits or approvals to be provided by the Purchaser as well as the receipt of a possible/agreed deposit.

5.3 Partial deliveries are admissible if the contractual partner does not incur any significant additional expenses or additional costs, if the residual delivery is ensured and if the partial delivery is usable by the Customer in the context of the contractually determined purpose.

5.4 We shall inform the Customer in writing or text form immediately if we do not receive deliveries/performance from our pre-suppliers, not correctly or not in time for reasons outside of our sphere of responsibility for the provision of contractually owed deliveries/performance despite proper and sufficient respective provision (congruent provision) or in the event of force majeure for a significant period of time [i.e. with a duration of more than 14 calendar days].

In this case we are entitled to delay the delivery by the duration of the impediment or partially or entirely withdraw from the agreement with respect to the unfulfilled part if we have complied with our above mentioned duty to provide information and if we have not accepted the risk of procurement.

5.5 If a delivery/performance date or delivery/performance deadline has been bindingly agreed and if it is exceeded based on the above mentioned events, the Customer is entitled to withdraw from the agreement with respect to the unfulfilled part of the agreement following futile expiration of an appropriate period of grace if a further compliance with the agreement is objectively unacceptable for the Customer. Further claims of the Customer, particularly those pertaining to compensation, are excluded in this case.

The regulation above applies accordingly if a conventional delivery/performance deadline has been exceeded by more than 7 calendar days due to the above mentioned reasons, also without the contractual agreement of a fixed delivery/performance deadline. If the agreement for delivery/performance to be provided by us is dissolved entirely or partially by us or the Customer due to the above mentioned regulations, we shall immediately refund to the Customer – deducting the cost incurred to us at that time – the part of consideration with respect to the dissolved part of the agreement in the event that he has paid a deposit.

## 6. Transfer of risk, dispatch, packaging

6.1 The route and means of dispatch are left to our discretion in the absence of an individual agreement. The goods shall be additionally insured at the request and expense of the Customer.

6.2 The Purchaser is responsible for any additional costs generated due to alterations to the routes and means based on Customer requests after the conclusion of the Agreement or special requests and interests of the Purchaser.

6.3 The risk for the goods is transferred to the Customer upon handover of the goods to the forwarding agent or freight carrier, however at the latest upon leaving the warehouse or, in case of direct dispatch ex-works upon the goods leaving the factory. This also applies in case of partial deliveries. If dispatch is delayed due to circumstances owed to the Purchaser, the risk is transferred to the Purchaser from the day the goods are ready for dispatch; however, we are obligated to store the goods at the request and expense of the Customer.

6.4 Detected transport damages have to be reported to us and the forwarder immediately and the goods have to be returned to us with an acknowledgement statement from the forwarding agent, post, rail or other parcel service as well as an assignment declaration of the Purchaser. Subsequently, we are able to dispatch a replacement delivery if the prerequisites of a claim of the transport company exists and if the Customer has submitted all necessary documents and information.

6.5 Delivered objects have to be accepted by the Purchaser also if they exhibit insignificant defects, regardless of his rights based on the law and the agreement.

6.6 Transport and all other packaging according to the specifications of the respectively valid Packaging Ordinance are non-returnable. The Purchaser is obligated to ensure the disposal of the packaging at his expense.

## 7. Warranty and notice of defect

7.1 We are entitled to subsequent fulfillment in form of a remedy or – in case of purchase agreements, to supply a new defect-free item at our discretion. We have the right to carry out supplementary fulfillment twice. Subsequently, the Customer can demand withdrawal or reduction according to the statutory regulations.

7.2 The Principal is obligated to inspect the delivery immediately. The supplier has to be informed in writing of the determination of defects within a preclusion period of one week, specifying the detailed reclamation. The preclusion period commences with the handover in case of obvious defects and upon discovery in case of hidden defects. Any warranty claims of the Customer are excluded upon the expiration of this period without a complaint of defects.

7.3 In case of purchase agreements, the statute of limitations for warranty claims based on purchasing or service supply agreements is one year from delivery of the goods, in case of service agreements one year from acceptance.

7.4 Warranty is excluded for the sale of used items.

7.5 This does not apply for claims based on warranty, the takeover of a procurement risk in terms of Section 276 BGB (German Civil Code), claims based on the

violation of life, limb or health, malicious, intentional or gross negligent acts on our part. It also applies in cases of Sections 478, 479 BGB (recourse within the supply chain), Section 438 (1) no. 2 or in as far as a longer mandatory limitation period is determined. Section 305b BGB (priority of the individual verbal or textual or written understanding) remains unaffected. A reversal of the onus of proof is not associated with the above regulation.

7.6 Our warranty and the resulting liability is excluded if defects and related damages are not verifiably and culpably based on faulty material, faulty construction or execution or faulty manufacturing materials or, if owed, on insufficient usage instructions.

7.7 The warranty and resulting liability based on breach of duty due to poor performance is particularly excluded for the consequences of incorrect usage, unsuitable storage conditions and the consequences of chemical, electromagnetic, mechanical or electrolytic impacts, which do not comply with our product descriptions or an alternately agreed product specification or the respective product-specific data sheet on our part or the manufacturer's average standard impacts. This does not apply in case of malicious, gross negligent or intentional acts on our part or the violation of life, limb or health, the assumption of a warranty, the liability risk according to Section 276 BGB (German Civil Code) or quality risk according to statutory mandatory liability.

7.8 We are not liable according to Sections 478, 479 BGB (recourse in the supply chain – supplier regress), if the Customer has processed or incorporated or otherwise altered the products supplied by us according to the agreement, unless this complies with the contractually agreed purpose of the products.

7.9 The acknowledgement of breaches of duty in form of material defects owed to us always requires the written form. Section 305b BGB (priority of individual agreement) remains unaffected.

7.10 If the liability for damages is not based on the violation of life, limb or health of the Purchaser and negligence is not excluded, such claims become statute barred within one year, commencing with the generation of the claim.

7.11 The above mentioned exclusion of liability also applies to slightly negligent or intentional acts of our vicarious agents. If our liability for compensation is excluded or limited, this also applies in terms of the personal liability for compensation with respect to our employees, representatives and vicarious agents.

## 8. Reservation of title

8.1 We reserve ownership to the goods and objects delivered or – not permanently – installed by us up to the full payment of outstanding claims. The reservation of title also applies until all, including future and conditional claims from the business relationship between the Principal and us are fulfilled.

8.2 The Principal is entitled to process the supplied goods in the context of his regular business operation. The goods are processed for the Contractor without obligations for him, the new items become the property of the Contractor.

8.3 If the goods are processed with other goods not belonging to the Contractor, the Contractor obtains co-ownership of the newly produced item at the ratio of the invoice value of the reserved goods to the other processed items. If the property of the Contractor should nonetheless perish and the Principal should become (co-)owner, the Principal hereby transfers his ownership to the Contractor as security according to the ratio of the invoice value of the reserved goods to the other processed objects. In all cases mentioned above, the Principal has to store the items owned or co-owned by the Contractor free of charge for the Contractor.

8.4 The Principal's authority to on-sell expires automatically with a futile attempt of an enforcement of judgement of debt as well as the lodgement of an application to initiate insolvency proceedings pertaining to the Principal's assets. For the remainder, other injunctions pertaining to the reserved goods, particularly pledging and chattel mortgages without consent are inadmissible and lead to a prohibition to on-sell.

8.5 The Principal hereby assigns all claims with all ancillary rights generated from the on-selling of the reserved processed and unprocessed goods to the Contractor, who accepts this assignment.

8.6 In the event of a sale of processed, connected, mixed or intermingled reserved goods, the supplier procures the top-ranking partial amount equating to the percentage share of the invoice value of his supplied goods plus a security surcharge of 5%.

8.7 The Principal is entitled, subject to revocation at any time, to collect the claims assigned to the Contractor in the regular business operation. The Contractor shall not utilise his own authority to collect as long as the Purchaser complies with his payment obligations according to the Agreement – also toward third parties. If the Principal assigns his subsequent claim to a factoring institute in the context of so-called non-recourse factoring subject to assuming the delcredere risk, the Principal assigns his claims against the factoring institute for the payment of the factoring proceeds to the Contractor and is obligated to notify the factoring institute of this assignment immediately upon invoicing by the Contractor.

8.8 Upon demand, the Purchaser is obligated to provide the Contractor with a detailed list of the claims owed to the Contractor incl. name and address of the buyers, amount of individual claims, invoices etc. and all information necessary for the assertion of the assigned claims and allow the Contractor to verify this information. The Purchaser is obligated to handle the goods carefully.

8.9 The Purchaser is obligated to immediately inform us immediately in case of pledges or other third-party interventions. The Principal is only permitted any subsequent processing, installation, connection or redesigning (Sections 946, 947, 950 BGB) of the goods still owned by the Contractor with the prior written consent of the supplier.

## 9. Change to General Terms and Conditions

9.1 The Contractor is entitled to unilaterally change these General Terms and Conditions – in as far as they are incorporated in the contractual relationship with the contractor [Principal?] – as far as necessary for the elimination of subsequently arising equivalence disturbances or to adapt to changed legal or technical framework conditions. The contractor is informed of these amended regulations together

with their relevant content.

9.2 The change becomes a component of the Agreement if the Principal does not object to the inclusion in the contractual relationship in writing within six (6) weeks following the receipt of the change notice.

## 10. Place of jurisdiction, applicable law

10.1 If the Purchaser is a merchant, a legal person under public law or a public special fund, the place of jurisdiction for all legal disputes is our registered address. This also applies for claims asserted during summary proceedings for recovery of debt.

10.2 The inclusion and interpretation of these General Terms and Conditions as well as conclusion and interpretation of legal transactions with the Principal are exclusively regulated according to the laws of the Federal Republic of Germany. The application of the uniform laws regarding the conclusion of international contacts pertaining to movable objects, the uniform law regarding the international purchase of movable objects of the of the United Nations Convention on Contracts for the International Sale of Goods are excluded.

## 11. Severability clause

11.1 If a condition of this Agreement is or becomes entirely or partially ineffective/void and/or unenforceable for reasons of the right of General Terms and Conditions according to Sections 305 to 310 BGB, the statutory regulations apply. 11.2 If a current or future regulation of the Agreement is or becomes entirely or partially ineffective/void and/or unenforceable due to reasons other than the regulations concerning the right to General Terms and Conditions according to Sections 305 to 310 BGB, the validity of the remaining conditions of this agreement is not affected in as far as the execution of the agreement – also under consideration of the subsequent regulations – would constitute an unreasonable hardship for one party. This also applies in the event of a gap after the conclusion of the Agreement, which requires completion.

11.3 Contrary to the principle of the adjudication of the German Federal Court of Justice, according to which a safeguarding conservation clause is Principally designed to merely reverse the burden of proof, the effectiveness of the remaining contractual regulations is to remain intact under any circumstances, thus excluding Section 139 BGB (German Civil Code) entirely.

11.4 The parties shall replace an invalid/void/unenforceable condition or gaps which require filling, which are invalid/void/unenforceable for reasons other than the regulations in terms of the right of general business conditions according to Sections 305 to 310 BGB, with an effective condition, the legal and commercial context of which complies with the invalid/void/unenforceable condition and the entire purpose of this Agreement. Section 139 BGB (partial invalidity) is explicitly excluded.

11.5 If the invalidity of a condition is based on a measure of performance or time (period of notice or deadline) specified therein, the condition is deemed agreed upon with a legally admissible measure closest to the original specification.

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