EMPUR® FLÄCHENHEIZUNGEN

WARMTH IS LIFE

# **Price list** 2018/2019

**'Made in Germany' seal of quality**

# EMPUR® – Quality for your home

## 'Made in Germany' seal of quality from one source

EMPUR® Produktions GmbH is a producer and full-range retailer of innovative, high-quality panel heating systems and has the right solution for every challenge:

- Systems without additional installation height or with minimal installation height for modernisations
- Versatile systems with composite panels and additional insulation for new buildings in private, communal and industrial areas
- System accessories and tools
- High-quality distribution and control engineering

The company produces and is solely responsible for over 90 % of all system components itself using its state-of-the-art systems. We work under a structured quality management system, which is certified by DEKRA in accordance with the DIN EN ISO 9001 international norm. In the interest of the most objective and neutral product evaluation possible, EMPUR® subjects its products to material testing and certification by nationally recognised testing institutes and assessment centres.

High quality, continual and pioneering product developments, technical advice and support, a three-level distribution network across Germany, reliable services, as well as specialist training for wholesalers, tradesmen and planners make EMPUR® a competent partner in the heating industry.

## Express delivery

Orders received by 11 am are shipped the same day. Orders with a net value above € 75 will be shipped free of charge, duty unpaid within Germany, up to a maximum net weight of 30 kg. For orders below this amount we shall apply a shipping and packaging fee of € 9.30 per order. This excludes insulation products, manifold cabinets, chemical and bulky items. Carriage-paid delivery by lorry/forwarding agent according to delivery mode and/or consultation.

## Validity

This documentation is valid upon issue dated 1 July 2018 until reprinted. EMPUR® Produktions GmbH reserves the right to make changes according to technical advances and/or due to market requirements and to deliver without separate announcement. All prices are gross prices, excluding those marked "net". All prices exclude statutory VAT.

DIN Geprüft · MPA Darmstadt · DEKRA · MPVA Neuwied · HLK Stuttgart GmbH Heizung Lüftung Klimatechnik · SKZ

# Contents



**NOTE** Forms for quoting and design as well as functional and leak testing can be found on our website at www.empur.com.

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## Legend (abbreviations)

| Term | pricelist |
|---|---|
| **Bag** | Bag |
| **Carton** | Car |
| **Package** | Pack |
| **Panel** | pnl |
| **Roll** | Ro |
| **Piece** | unit |
| **Drum** | Dr |

| Term | pricelist |
|---|---|
| **Composite panel** | CP |
| **Packing unit** | PU |
| **Metre** | m |
| **Square metre** | $m^2$ |
| **Kilogram** | kg |
| **Hour** | hr |

Price groups (PG)

01 – **Standard**
02 – **Tools**
03 – **CUT-THERM®**
04 – **Geniax components and products**
05 – **Geniax services**
06 – **Heatfixx**

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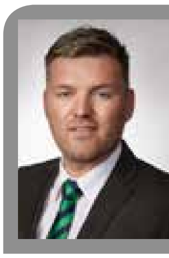

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# Heating pipes

2.1 KLIMAPEX® plastic heating pipes PE-Xa as a 5-layer pipe

## KLIMAPEX® PE-Xa as a 5-layer pipe

The KLIMAPEX® PE-Xa 5-layer pipe is a premium plastic pipe for harsh building site applications. The EVOH barrier layer is guarded against damage by the external PE protective layer. The PE-Xa heating pipe is also produced **in a hook and loop version in-house**.

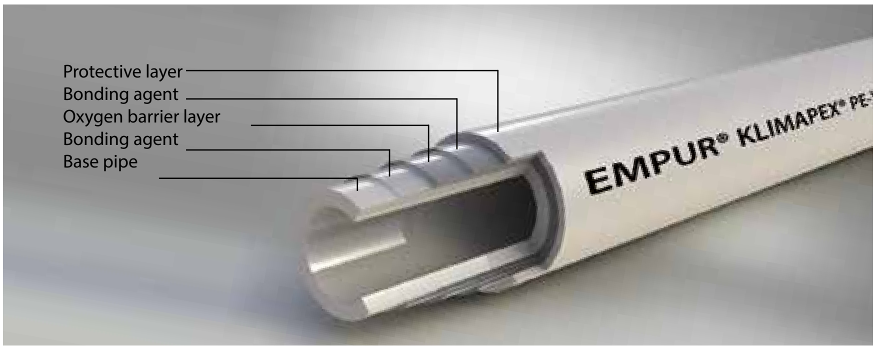
| Item | Item description | PU | Price €/m | Item No. | PG |
|---|---|---|---|---|---|
|  | **KLIMAPEX® PE-Xa as a 5-layer pipe**<br>SKZ supervised<br>Pipe made of PE-Xa: high-pressure cross-linked polyethylene in accordance with DIN EN ISO 15875 and DIN 16892/16893<br>Base material: High-density polyethylene<br>Insoluble diffusion-tight EVOH barrier layer in accordance with DIN 4726<br><br>Application classes:<br>4: Underfloor heating, low-temperature heating, radiator connection system<br>5: High-temperature heating, radiator connection system<br>Maximum loading capacity: Continuous operating temperature + 95 °C, Short-term excessive temperature (max. 2 years) + 110 °C, operating pressure 6 bar<br>10-year material and consequential damage liability<br>Dimension / Internal Ø / Weight approx. 25 kg | | | | |
| | PE-Xa 15 x 1.8* 11.4 | Ro 200 m | 1.66 | 191532 | 01 |
| | PE-Xa 17 x 2.0* 13.0 | Ro 200 m | 1.89 | 191732 | 01 |
| | * Hook and loop version of the heating pipes in the Exklusiv Klett system (see page 15) | | | | |
|  | **Heating pipes on disposable drum**<br>Dimension / Internal Ø / Weight approx. 70 kg | | | | |
| | PE-Xa 20 x 2.0 16.0 | Dr 600 m | 2.08 | 192037 | 01 |
| | PE-Xa 25 x 2.3 20.4 | Dr 400 m | 2.90 | 192534 | 01 |
|  | **Heating pipes for EMPUR® pipe dispenser**<br>Dimension / Internal Ø / Core width / Core Ø / Weight approx. 50 kg | | | | |
| | PE-Xa 15 x 1.8 11.4 420 mm 260 mm | Ro 600 m | 1.66 | 191546 | 01 |
| | PE-Xa 17 x 2.0 13.0 420 mm 260 mm | Ro 500 m | 1.89 | 191745 | 01 |
| | PE-Xa 20 x 2.0 16.0 420 mm 260 mm | Ro 400 m | 2.08 | 192044 | 01 |

Pipe dispenser (see page 45)

Recommended retail price

### Exclusiv 5-layer plastic heating pipe made by EMPUR®

Patented HP process solution for the insoluble diffusion-tight EVOH oxygen barrier layer.




## KLIMAPEX® PE-RT as a 5-layer pipe

The KLIMAPEX® PE-RT 5-layer pipe is a premium plastic pipe for harsh building site applications. The EVOH barrier layer is guarded against damage by the external PE protective layer. The PE-RT heating pipe is also produced **in a hook and loop version in-house**.

| Item | Item description | | | | PU | Price €/m | Item No. | PG |
|---|---|---|---|---|---|---|---|---|
|   | **KLIMAPEX® PE-RT as a 5-layer pipe**<br>DIN reg. no. 3V 204 PE-RT<br>Pipe made of polyethylene, Type I/II in accordance with DIN EN ISO 22391-2 and DIN 16833, with increased thermal stability and insoluble, diffusion-tight EVOH barrier layer in accordance with DIN 4726<br>Base material: PE-MD with increased thermal stability<br><br>Application classes:<br>4: Underfloor heating, low-temperature heating, radiator connection system<br>5: High-temperature heating, radiator connection system<br>High loading capacity: Continuous operating temperature + 70 °C, short-term excess temperature (max. 2 years) + 90°C, operating pressure 4 bar<br>10-year material and consequential damage liability | | | | | | | |
| | Dimension | Internal Ø | | Weight approx. 25 kg | | | | |
| | PE-RT 12 x 1.5* | 9.0 | | | Ro 120 m | 1.08 | 111231 | 01 |
| | PE-RT 15 x 1.8* | 11.4 | | **pipe, green** | Ro 200 m | 1.25 | 111532 | 01 |
| | PE-RT 17 x 2.0* | 13.0 | | | Ro 200 m | 1.42 | 111732 | 01 |
| | PE-RT 20 x 2.0 | 16.0 | | | Ro 200 m | 1.72 | 112032 | 01 |
| | * Hook and loop version of the heating pipes in the Exklusiv Klett system (see page 15) | | | | | | | |
|  | **Heating pipes for EMPUR® pipe dispenser** | | | | | | | |
| | Dimension | Internal Ø | Core width / Core Ø | Weight approx. 50kg | Ro 600 m | 1.25 | 111546 | 01 |
| | PE-RT 15 x 1.8 | 11.4 | 420 mm / 260 mm | **pipe, green** | Ro 500 m | 1.42 | 111745 | 01 |
| | PE-RT 17 x 2.0 | 13.0 | 420 mm / 260 mm | | Ro 400 m | 1.72 | 112044 | 01 |
| | PE-RT 20 x 2.0 | 16.0 | 420 mm / 260 mm | | | | | |
| | Pipe dispenser (see page 47) | | | | | | | |

Recommended retail price

# Heating pipes

2.3 KLIMAPEX® plastic heating pipes PE-RT as a 3-layer pipe and metal composite pipe PE-RT/AL/PE-RT

## KLIMAPEX® PE-RT as a 3-layer pipe

The universal pipe for housing - first-class quality for easy installation.

| Item | Item description | | | | PU | Price €/m | Item No. | PG |
|---|---|---|---|---|---|---|---|---|
|  | **KLIMAPEX® PE-RT as a 3-layer pipe**<br>DIN reg. no. 3V 204 PE-RT<br>Pipe made of polyethylene, Type I/II in accordance with DIN EN ISO 22391-2 and DIN 16833, with increased thermal stability and insoluble diffusion-tight EVOH barrier layer in accordance with DIN 4726<br>Base material: PE-MD with increased thermal stability | | | | | | | |
| | Dimension | Internal Ø | Core width | Core Ø | Weight approx. 50kg | | | |
| | PE-RT 15 x 1.8 | 11.4 | 420 mm | 260 mm | **pipe, green** | Ro 600 m | 1.17 | 111516 | 01 |
| | PE-RT 17 x 2.0 | 13.0 | 420 mm | 260 mm | | Ro 500 m | 1.36 | 111715 | 01 |

## KLIMAPEX® metal composite pipe PE-RT/AL/PE-RT

The composite pipe of dimensions 16 x 2.0 in Optimal II dry construction system (see from page 23).

| Artikel | Artikelbeschreibung | | | | VE | Preis €/m | Art. Nr. | PG |
|---|---|---|---|---|---|---|---|---|
|  | **KLIMAPEX® metal composite pipe PE-RT/AL/PE-RT**<br>SKZ supervised, made of polyethylene with welded aluminium jacket, multi-layer composite pipe, diffusion-tight and dimensionally stable | | | | | | | |
| | Dimension | Internal Ø | Core width | Core Ø | | | | |
| | 16 x 2,0 | 12,0 | | | Ro 200 m | 1,84 | 171602 | 01 |
| | 16 x 2,0 | 12,0 | 420 mm | 260 mm | Ro 500 m | 1,84 | 171615 | 01 |

**NOTE** Compression fittings for heating pipes (see page 42)

Recommended retail price

## 2.4 KLIMAPEX® plastic heating pipes, technical data

| KLIMAPEX® PE-Xa heating pipe as a 5-layer pipe | in accordance with DIN EN ISO 15875 | |
|---|---|---|
| Continuous operating temperature | + 95 °C | |
| max. operating pressure | 6 bar | |
| Smallest bending radius | 5 x d | DIN 4726 |
| Optimal processing temperature | -5 °C to 30 °C | DIN 16892 |
| Minimum degree of cross-linking | ≥ 70% | DIN 16892 |
| Thermal conductivity | 0.35 W/mK | DIN 52612 |
| Coefficient of linear expansion | $1.4 \cdot 10^{-4}$ $K^{-1}$ | DIN 52328 |
| Oxygen tightness | ≤ 0.32 mg/($m^2 \cdot d$) at 40 °C (application class 4) | DIN 4726 |

| KLIMAPEX® PE-RT heating pipe as a 5-/3-layer pipe | in accordance with DIN EN ISO 22391-2 | |
|---|---|---|
| Continuous operating temperature | + 70 °C | |
| Max. operating pressure | 4 bar | |
| Smallest bending radius | 5 x d | DIN 4726 |
| Optimal processing temperature | -5 °C to 30 °C | DIN 16833 |
| Thermal conductivity | 0.35 W/mK | DIN 52612 |
| Coefficient of linear expansion | $1.4 \cdot 10^{-4}$ $K^{-1}$ | DIN 52328 |
| Oxygen tightness | ≤ 0.32 mg/($m^2 \cdot d$) at 40 °C (application class 4) | DIN 4726 |

| KLIMAPEX® metal composite pipe PE-RT/AL/PE-RT | in accordance with DIN EN ISO 22391-2 | |
|---|---|---|
| Continuous operating temperature | + 70 °C | |
| Max. operating pressure | 10 bar | |
| Smallest bending radius | 5 x d | DIN 4726 |
| Optimal processing temperature | -5 °C bis 30 °C | DIN 16833 |
| Thermal conductivity | 0,42 W/mK | DIN 52612 |
| Coefficient of linear expansion | $2.5 \cdot 10^{-4}$ $K^{-1}$ | DIN 52328 |
| Oxygen tightness | ≤ 0.32 mg/($m^2 \cdot d$) at 40 °C (application class 4) | DIN 4726 |

### Internal diameter/water volume of KLIMAPEX® plastic heating pipes:

| Dimensions | Internal diamete | Water volume |
|---|---|---|
| 10 x 1.3 mm | 7.4 mm | 0.043 l/m |
| 12 x 1.5 mm | 9.0 mm | 0.064 l/m |
| 14 x 2.0 mm | 10.0 mm | 0.078 l/m |
| 15 x 1.8 mm | 11.4 mm | 0.102 l/m |
| 16 x 2.0 mm | 12.0 mm | 0.113 l/m |
| 17 x 2.0 mm | 13.0 mm | 0.133 l/m |
| 20 x 2.0 mm | 16.0 mm | 0.201 l/m |
| 25 x 2.3 mm | 20.4 mm | 0.327 l/m |

**Areas of application:**
Panel heating and radiator connections

**Classification:**
Application class 4:
Underfloor heating, low-temperature heating, radiator connection system.
Application class 5:
High-temperature radiator heating.

**NOTE** KLIMAPEX® heating pipes must be protected against sunlight during transportation and storage.

Other dimensions available on request

# Underfloor heating systems in new builds

3.1 PUR-THERM® stapler system

7F 057-F
7F 136-F

## PUR-THERM® stapler system

The EMPUR® PUR-THERM® stapler system is a proven and well-known panel heating system, consisting of PUR-THERM® composite panels, KLIMAPEX® plastic heating pipes and PUR-THERM® staples as its main components.

The PUR-THERM® composite panels are HBCD and CFC-free and available in different versions (polyurethane, EPS, with and without sound absorption). As a result of their highly tear-resistant multi-layer laminated film, excellent affixing of the staples is achieved when installing the heating pipes. A predefined laying grid as well as a single-sided film overhang for overlapped laying makes stapling very easy. To ensure good heat transfer, the heating pipe is uniformly covered with screed.

| Item | Item description | Thickness | R-value $m^2\,K/W$ | PU $m^2$ | Price €/$m^2$ | Item No. | PG |
|---|---|---|---|---|---|---|---|
|  | **Composite panel PUR/PE 14 "Exclusiv"**<br>Compressive stress/strength up to 5 kPa<br>Format: 2,000 x 1,000 mm = 2.0 $m^2$<br>single-sided film overhang | 14 (9 + 5) | 0.545 | Pack 20 | 8.93 | 041400 | 01 |
|  | **Composite panel PUR/PE 23 "Exclusiv"**<br>Compressive stress/strength up to 5 kPa<br>Format: 2,000 x 1,000 mm = 2.0 $m^2$<br>single-sided film overhang | 23 (13 + 10) | 0.780 | Pack 10 | 10.34 | 042300 | 01 |
|  | **Composite panel PUR "Exclusiv"**<br>Compressive stress/strength ≥100 kPa<br>Format: 2,000 x 1,000 mm = 2.0 $m^2$<br>single-sided film overhang | 23 mm<br>33 mm<br>40 mm | 0.958<br>1.375<br>1.667 | Pack 10<br>Pack 10<br>Pack 10 | 15.32<br>18.17<br>19.94 | 042400<br>043400<br>044000 | 01<br>01<br>01 |
|  | **Composite panel PUR/PE "Exclusiv"**<br>Compressive stress/strength ≥100 kPa<br>Format: 2,000 x 1,000 mm = 2.0 $m^2$<br>single-sided film overhang | 36 (31 + 5)<br>68 (63 + 5) | 1.562<br>2.950 | Pack 10<br>Pack 6 | 18.47<br>30.03 | 043150<br>046350 | 01<br>01 |

Recommended retail price

## Calculation aids

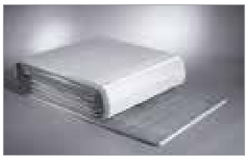
System: Composite panel PUR/PE 14, PUR/PE 23, PUR 23 and PUR 33 Material requirement/m² floor heating

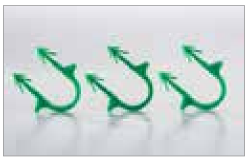
| | Pipe spacing (cm) | | | | | |
|---|---|---|---|---|---|---|
| Item | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | Item No. |
| Composite panel PUR/PE 14 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 041400 |
| Composite panel PUR/PE 23 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 042300 |
| Composite panel PUR 23 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 042400 |
| Composite panel PUR 33 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 043400 |
| Edge insulation strips m/m² | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 908152 |
| Adhesive strips m/m² | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 905501 |
| Screed additive kg/m² | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 901000 |
| Staples unit/m² | 30 | 18 | 15 | 12 | 9 | 911001/911000 |
| Pipe volumes m/m² | 10.0 | 6.7 | 5.0 | 4.0 | 3.3 | |
| Composite panel PUR/PE 14: Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | | |
| KLIMAPEX® PE-Xa 15 x 1.8 | 30.84 | 23.84 | 20.64 | 18.61 | 17.06 | 191546 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 33.21 | 25.43 | 21.83 | 19.55 | 17.85 | 191745 |
| KLIMAPEX® PE-Xa 20 x 2.0 | 35.06 | 26.67 | 22.75 | 20.29 | 18.46 | 192044 |
| KLIMAPEX® PE-RT 15 x 1.8 | 26.72 | 21.09 | 18.59 | 16.96 | 15.71 | 111546 |
| KLIMAPEX® PE-RT 17 x 2.0 | 28.47 | 22.26 | 19.46 | 17.66 | 16.28 | 111745 |
| KLIMAPEX® PE-RT 20 x 2.0 | 31.46 | 24.26 | 20.95 | 18.85 | 17.27 | 112044 |
| KLIMAPEX® metal composite pipe PE-RT 16 x 2.0 | 32.69 | 25.08 | 21.57 | 19.35 | 17.68 | 171615 |
| Composite panel PUR/PE 23: Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | | |
| KLIMAPEX® PE-Xa 15 x 1.8 | 32.25 | 25.25 | 22.05 | 20.02 | 18.47 | 191546 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 34.61 | 26.84 | 23.24 | 20.96 | 19.26 | 191745 |
| KLIMAPEX® PE-Xa 20 x 2.0 | 36.47 | 28.08 | 24.16 | 21.70 | 19.87 | 192044 |
| KLIMAPEX® PE-RT 15 x 1.8 | 28.13 | 22.50 | 20.00 | 18.37 | 17.12 | 111546 |
| KLIMAPEX® PE-RT 17 x 2.0 | 29.88 | 23.67 | 20.87 | 19.07 | 17.69 | 111745 |
| KLIMAPEX® PE-RT 20 x 2.0 | 32.87 | 25.67 | 22.36 | 20.26 | 18.68 | 112044 |
| KLIMAPEX® metal composite pipe PE-RT 16 x 2.0 | 34.10 | 26.49 | 22.98 | 20.76 | 19.09 | 171615 |
| Composite panel PUR 23: Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | | |
| KLIMAPEX® PE-Xa 15 x 1.8 | 37.23 | 30.23 | 27.04 | 25.00 | 23.45 | 191546 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 39.60 | 31.82 | 28.22 | 25.94 | 24.24 | 191745 |
| KLIMAPEX® PE-Xa 20 x 2.0 | 41.45 | 33.06 | 29.14 | 26.68 | 24.85 | 192044 |
| KLIMAPEX® PE-RT 15 x 1.8 | 33.11 | 27.48 | 24.98 | 23.35 | 22.10 | 111546 |
| KLIMAPEX® PE-RT 17 x 2.0 | 34.86 | 28.65 | 25.85 | 24.05 | 22.67 | 111745 |
| KLIMAPEX® PE-RT 20 x 2.0 | 37.85 | 30.65 | 27.34 | 25.24 | 23.66 | 112044 |
| KLIMAPEX® metal composite pipe PE-RT 16 x 2.0 | 39.08 | 31.47 | 27.96 | 25.74 | 24.07 | 171615 |
| Composite panel PUR 33: Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | | |
| KLIMAPEX® PE-Xa 15 x 1.8 | 40.08 | 33.08 | 29.89 | 27.85 | 26.31 | 191546 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 42.45 | 34.67 | 31.07 | 28.79 | 27.09 | 191745 |
| KLIMAPEX® PE-Xa 20 x 2.0 | 44.30 | 35.91 | 31.99 | 29.53 | 27.70 | 192044 |
| KLIMAPEX® PE-RT 15 x 1.8 | 35.96 | 30.33 | 27.83 | 26.20 | 24.95 | 111546 |
| KLIMAPEX® PE-RT 17 x 2.0 | 37.71 | 31.50 | 28.70 | 26.90 | 25.52 | 111745 |
| KLIMAPEX® PE-RT 20 x 2.0 | 40.70 | 33.50 | 30.19 | 28.09 | 26.51 | 112044 |
| KLIMAPEX® metal composite pipe PE-RT 16 x 2.0 | 41.93 | 34.32 | 30.81 | 28.59 | 26.92 | 171615 |

Other dimensions available on request | Recommended retail price

# Underfloor heating systems in new builds

## 3.1 PUR-THERM® stapler system

| Item | Item description | Thick-ness | R-value m²K/W | PU m² | Price €/m² | Item No. | PG |
|---|---|---|---|---|---|---|---|
|  | **Turbo-Cube EPS-DES sm**<br>WLS 045<br>Compressive stress/strength up to 4 kPa<br>Format: 12,000 x 1,000 mm = 12 m² pack | 20 - 2<br>25 - 2<br>30 - 3<br>35 - 3 | 0.444<br>0.556<br>0.667<br>0.778 | Pack 12<br>Pack 12<br>Pack 12<br>Pack 12 | 6.58<br>7.56<br>8.18<br>8.95 | 022012<br>022512<br>023012<br>023512 | 01<br>01<br>01<br>01 |
|  | **Composite panel “Objekt” EPS-DES sm**<br>WLS 045<br>Compressive stress/strength up to 4 kPa<br>Format: 2,000 x 1,000 mm = 2 m² | 20 - 2<br>25 - 2<br>30 - 3<br>35 - 3 | 0.444<br>0.556<br>0.667<br>0.778 | Pack 10<br>Pack 10<br>Pack 10<br>Pack 10 | 6.58<br>7.56<br>8.18<br>8.95 | 022010<br>022510<br>023010<br>023510 | 01<br>01<br>01<br>01 |
|  | **Composite panel “V5” EPS-DES sg**<br>WLS 040<br>Compressive stress/strength up to 5 kPa<br>Format: 2,000 x 1,000 mm = 2 m² | 30 - 2 | 0.750 | Pack 10 | 9.49 | 023020 | 01 |
|  NEW | **Composite panel “V5“ EPS-DES sg**<br>WLS 032<br>Compressive stress/strength up to 5 kPa<br>Format: 2,000 x 1,000 mm = 2 m² | 25-2<br>30-2 | 0.78<br>0.938 | Pack 10<br>Pack 10 | 10.55<br>11.70 | 022525<br>023025 | 01<br>01 |
|  | **Composite panel “Kompakt” EPS-DEO dm**<br>WLS 032<br>Compressive stress/strength ≥ 100 kPa for high com-pressive stresses, Format: 2,000 x 1,000 mm = 2 m² | 20<br>30 | 0.625<br>0.938 | Pack 10<br>Pack 10 | 8.16<br>10.84 | 022060<br>023060 | 01<br>01 |

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Long staples**<br>for PUR-THERM® stapler system for pipes up to Ø 20 mm,<br>Green, 50-unit magazines | Car =<br>1,000 units | 127.33/car | 911001 | 01 |
|  | **Short staples**<br>specially for combined composite panels PUR/PE 23 mm<br>for PUR-THERM® stapler system, for pipes up to Ø 20 mm,<br>black, 50-unit magazines | Car =<br>1,000 units | 127.33/car | 911000 | 01 |
|  | **PUR-THERM® stapler system**<br>Precise, low-wear tool for handling<br>magazine-loaded staples, with curved magazine<br>and ergonomic grip<br>Total height approx. 82 cm (handle above staple surface) | 1 unit | net<br>166.70/unit | 991010 | 02 |
|  | **PUR-THERM® stapler system extension**<br>for ergonomic adjustment of the working height,<br>consisting of extension of approx. 10 cm and two screws | 1 unit | net<br>34.74/unit | 991011 | 02 |

Recommended retail price

## Calculation aids

System: Turbo-Cube/composite panel “Objekt” 35-3, “V5” 30-2 and “Kompakt” 30 Material requirement/m² floor heating

| | Pipe spacing (cm) | | | | | |
|---|---|---|---|---|---|---|
| Item | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | Item No. |
| Turbo-Cube/composite panel “Objekt” 35-3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 023512/023510 |
| Composite panel “V5“ 30-2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 023020 |
| “Kompakt” composite panel 30 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 023060 |
| Edge insulation strips m/m² | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 908152 |
| Adhesive strips m/m² | 1.0 | 1.0 | 1.0 | 1.0 | 1.o | 905501 |
| Screed additive kg/m² | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 901000 |
| Staples unit/m² | 30 | 18 | 15 | 12 | 9 | 911001/911000 |
| Pipe volumes m/m² | 10.0 | 6.7 | 5.0 | 4.0 | 3.3 | |
| Turbo-Cube/composite panel “Objekt” 35-3: Complete price in €/m² floor heating for the following pipe types (estimate) | | | | | | |
| KLIMAPEX® PE-Xa 15 x 1.8 | 30.86 | 23.86 | 20.67 | 18.63 | 17.09 | 191546 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 33.23 | 25.45 | 21.85 | 19.57 | 17.87 | 191745 |
| KLIMAPEX® PE-Xa 20 x 2.0 | 35.08 | 26.69 | 22.77 | 20.31 | 18.48 | 192044 |
| KLIMAPEX® PE-RT 15 x 1.8 | 26.74 | 21.11 | 18.61 | 16.98 | 15.73 | 111546 |
| KLIMAPEX® PE-RT 17 x 2.0 | 28.49 | 22.28 | 19.48 | 17.68 | 16.30 | 111745 |
| KLIMAPEX® PE-RT 20 x 2.0 | 31.48 | 24.28 | 20.97 | 18.87 | 17.29 | 112044 |
| KLIMAPEX® metal composite pipe PE-RT 16 x 2.0 | 32.71 | 25.10 | 21.59 | 19.37 | 17.70 | 171615 |
| Composite panel “V5“ 30-2: Complete price in €/m² floor heating for the following pipe types (estimate) | | | | | | |
| KLIMAPEX® PE-Xa 15 x 1.8 | 31.39 | 24.40 | 21.20 | 19.16 | 17.62 | 191546 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 33.76 | 25.98 | 22.38 | 20.11 | 18.40 | 191745 |
| KLIMAPEX® PE-Xa 20 x 2.0 | 35.61 | 27.23 | 23.31 | 20.85 | 19.01 | 192044 |
| KLIMAPEX® PE-RT 15 x 1.8 | 27.28 | 21.64 | 19.14 | 17.52 | 16.26 | 111546 |
| KLIMAPEX® PE-RT 17 x 2.0 | 29.03 | 22.81 | 20.02 | 18.22 | 16.84 | 111745 |
| KLIMAPEX® PE-RT 20 x 2.0 | 32.01 | 24.81 | 21.51 | 19.41 | 17.82 | 112044 |
| KLIMAPEX® metal composite pipe PE-RT 16 x 2.0 | 33.25 | 25.64 | 22.13 | 19.90 | 18.23 | 171615 |
| “Kompakt” composite panel 30: Complete price in €/m² floor heating for the following pipe types (estimate) | | | | | | |
| KLIMAPEX® PE-Xa 15 x 1.8 | 32.75 | 25.76 | 22.56 | 20.52 | 18.98 | 191546 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 35.12 | 27.34 | 23.74 | 21.46 | 19.76 | 191745 |
| KLIMAPEX® PE-Xa 20 x 2.0 | 36.97 | 28.58 | 24.67 | 22.21 | 20.73 | 192044 |
| KLIMAPEX® PE-RT 15 x 1.8 | 28.63 | 23.00 | 20.50 | 18.87 | 17.62 | 111546 |
| KLIMAPEX® PE-RT 17 x 2.0 | 30.38 | 24.17 | 21.37 | 19.57 | 18.20 | 111745 |
| KLIMAPEX® PE-RT 20 x 2.0 | 33.37 | 26.17 | 22.87 | 20.77 | 19.18 | 112044 |
| KLIMAPEX® metal composite pipe PE-RT 16 x 2.0 | 34.60 | 27.00 | 23.48 | 21.26 | 19.59 | 171615 |

**NOTE** KLIMAPEX® heating pipes (see page 6-8)

Other dimensions available on request | Recommended retail price

# Underfloor heating systems in new builds

3.2 Exclusiv-Klett system

7F 364-F
7F 365-F

## Exclusiv-Klett

The EMPUR® Exclusiv-Klett system is an innovative application type. It uses intelligent hook and loop technology to connect the EMPUR® composite panels with the KLIMAPEX® Klett plastic heating tubes.

After the laminated composite panels with one-sided film overhang have been laid, the hook and loop pipe is fixed to the surface with light pressure, according to the pre-printed laying grid and the distance required. The hook and loop tape has excellent adhesion properties, but can be removed and pressed on again to correct the position of the composite panels. To ensure good heat transfer, the heating pipe is uniformly covered with screed.

| Item | Item description | | | | PU | Price €/m² | Item No. | PG |
|---|---|---|---|---|---|---|---|---|
|  | **Composite panel PUR/PE 15 "Exclusiv-Klett"** | | | | | | | |
| | Compressive stress/strength up to 5 kPa, | | | | | | | |
| | Format: 2,000 x 1,000 mm = 2.0 m², single-sided film overhang | | | | | | | |
| | Thickness | R-value [m² K/W] | | | Pack | | | |
| | 15 (10 + 5) | 0.584 | | | 20 m² | 11.46 | 070414 | 01 |
|  | **Composite panel PUR 23 "Exclusiv-Klett"** | | | | | | | |
| | Compressive stress/strength ≥100 kPa, | | | | | | | |
| | Format: 2,000 x 1,000 mm = 2.0 m², single-sided film overhang | | | | | | | |
| | Thickness | R-value [m² K/W] | | | Pack | | | |
| | 23 | 0.958 | | | 10 m² | 17.85 | 070424 | 01 |
|  | **Composite panel "Klett" EPS-DES sm/sg** | | | | | | | |
| | Format: 2,000 x 1,000 mm = 2.0 m² | | | | | | | |
| | Thickness | R-value [m² K/W] | Compressive stress | WLS | Pack | | | |
| | 20-2 sm | 0.444 | 4 kPa | 045 | 10 m² | 9.10 | 070220 | 01 |
| | 30-2 sg | 0.750 | 5 kPa | 040 | 10 m² | 12.02 | 070232 | 01 |
|  | **Turbo Cube "Klett" EPS-DES sm/sg** | | | | | | | |
| | Format: 12,000 x 1,000 mm = 12.0 m² | | | | | | | |
| | Thickness | R-value [m² K/W] | Compressive stress | WLS | Pack | | | |
| | 20-2 sm | 0.444 | 4 kPa | 045 | 12 m² | 9.19 | 070320 | 01 |
| | 25-2 sm | 0.556 | 4 kPa | 045 | 12 m² | 10.09 | 070325 | 01 |
| | 30-2 sg | 0.750 | 5 kPa | 040 | 12 m² | 12.02 | 070332 | 01 |
| | 30-3 sm | 0.667 | 4 kPa | 045 | 12 m² | 10.70 | 070330 | 01 |
| | 35-3 sm | 0.778 | 4 kPa | 045 | 12 m² | 11.48 | 070335 | 01 |

Recommended retail price

| Item | Item description | | | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|---|---|
|  | **Composite panel “Klett-Kompakt” EPS-DEO dm** | | | | | | |
| | Format: 2,000 x 1,000 mm = 2.0 m², | | | | | | |
| | Compressive stress/strength ≥ 100 kPa for high compressive stresses | | | | | | |
| | Thickness | R-value [m² K/W] | WLS | Pack | | | |
| | 30 | 0.938 | 032 | 10 m² | 13.77/m² | 070236 | 01 |
|  | **Fibreboard “Velcro” 2.6 mm** | | | | | | |
| | with 2,400 x 1,000 mm (2.4 m²) velcro-bonded non-woven film with | | | | | | |
| | one-sided film overhang, can be applied to clean, level, | | | | | | |
| | dry and solid substrates or to additional insulation as a mounting plate, | | | | | | |
| | compressive strength ≥ 150 kPa, | | | Pack | | | |
| | for high pressure load | | | 7,2 m² | 13,99/m² | 070503 | 01 |
|  | **KLIMAPEX® PE-Xa heating pipes “Klett”** | | | | | | |
| | SKZ supervised, pipe made of PE-Xa: high-pressure | | | | | | |
| | cross-linked polyethylene in accordance with DIN EN ISO 15875, | | | | | | |
| | Base material: high-density polyethylene, degree of cross-linking ≥ 70 % | | | | | | |
| | in accordance with DIN 4726, insoluble diffusion-tight EVOH barrier layer | | | | | | |
| | (see pages 6) | | | | | | |
| | Dimension | Internal Ø | | Ro 200 m | 1.84/m | 071592 | 01 |
| | PE-Xa 15 x 1.8 | 11.4 | | Ro 600 m | 1.84/m | 071596 | 01 |
| | | | | Ro 200 m | 2.07/m | 071792 | 01 |
| | PE-Xa 17 x 2.0 | 13.0 | | Ro 500 m | 2.07/m | 071795 | 01 |
|  | **KLIMAPEX® PE-RT heating pipes “Klett”** | | | | | | |
| | DIN reg. no. 3V 204 PE-RT, | | | | | | |
| | Pipe made of polyethylene, Type I/II, in accordance with | | | | | | |
| | DIN EN ISO 22391-2 and DIN 16833 with increased thermal stability and | | | | | | |
| | insoluble diffusion-tight EVOH barrier layer in accordance with DIN 4726 | | | | | | |
| | (see pages 6), base material: PE-MD with increased thermal stability | | | | | | |
|  | Dimension | Internal Ø | | | | | |
| | PE-RT 12 x 1.5 | 9.0 | | Ro 120 m | 1.25/m | 071211 | 01 |
| | PE-RT 15 x 1.8 | 11.4 | **pipe, green** | Ro 200 m | 1.46/m | 071512 | 01 |
| | | | | Ro 600 m | 1.46/m | 071516 | 01 |
| | PE-RT 17 x 2.0 | 13.0 | | Ro 200 m | 1.65/m | 071712 | 01 |
| | | | | Ro 500 m | 1.65/m | 071715 | 01 |
|  | **Connecting tape** | | | | | | |
| | for strong and positive connection of Exclusiv composite panels | | | | | | |
| | and additional fixing of pipelines, 30 mm wide | | | Ro 100 m | 35.26/Ro | 070001 | 01 |
|  | **Laying gloves “Klett”** | | | | net | | |
| | Size 10 | | | 1 pair | 4.97/pair | 990060 | 02 |
|  | **Laying tools** | | | | | | |
| | **Door tensioner** with rotating bezel, open, | | | | net | | |
| | Extending length min. 570 mm – max. 960 mm | | | 1 unit | 50.94/unit | 990200 | 02 |
|  | **Ceiling clamping** unit with rotating bezel, open, | | | | net | | |
| | adjustable from min. 1,650 mm to max. 2,800 mm | | | 1 unit | 48.36/unit | 990210 | 02 |

Recommended retail price

Further system components: see pages 42-48

## Calculation aids

System: "Exclusiv-Klett" Material requirement/m² floor heating

| | Installation distance (cm) | | | | | |
|---|---|---|---|---|---|---|
| Item | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | Item No. |
| Fibreboard "Velcro" 2.6 mm | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 070503 |
| Composite panel PUR/PE 15 "Exclusiv-Klett" | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 070414 |
| Composite panel PUR 23 "Exclusiv-Klett" | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 070424 |
| Composite panel Klett 20-2/Turbo Cube Klett 20-2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 070220/070320 |
| Turbo Cube Klett 25-2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 070325 |
| Composite panel Klett 30-2/Turbo Cube Klett 30-2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 070232/070332 |
| Turbo Cube Klett 30-3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 070330 |
| Turbo Cube Klett 35-3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 070335 |
| "Klett Kompakt" composite panel | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 070236 |
| Edge insulation strips m/m² | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 908152 |
| Connecting tape m/m² | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 070001 |
| Screed additive kg/m² | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 901000 |
| Pipe volumes m/m² | 10.0 | 6.7 | 5.0 | 4.0 | 3.3 | |

| Fibreboard "Velcro" 2.6 mm | Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | |
|---|---|---|---|---|---|---|
| KLIMAPEX® PE-Xa 15 x 1,8 | 34.19 | 28.11 | 24.98 | 23.13 | 21.85 | 071596 |
| KLIMAPEX® PE-Xa 17 x 2,0 | 36.45 | 29.62 | 26.11 | 24.04 | 22.59 | 071795 |
| KLIMAPEX® PE-RT 15 x 1,8 | 30.38 | 25.56 | 23.05 | 21.61 | 20.59 | 071516 |
| KLIMAPEX® PE-RT 17 x 2,0 | 32.23 | 26.80 | 24.00 | 22.35 | 21.20 | 071715 |

| PUR/PE composite panel 15 "Exclusiv-Klett" | Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | |
|---|---|---|---|---|---|---|
| KLIMAPEX® PE-Xa 15 x 1,8 | 31.65 | 25.58 | 22.45 | 20.60 | 19.31 | 071596 |
| KLIMAPEX® PE-Xa 17 x 2,0 | 33.92 | 27.09 | 23.58 | 21.51 | 20.06 | 071795 |
| KLIMAPEX® PE-RT 15 x 1,8 | 27.85 | 23.03 | 20.54 | 19.08 | 18.06 | 071516 |
| KLIMAPEX® PE-RT 17 x 2,0 | 29.70 | 24.27 | 21.47 | 19.82 | 18.67 | 071715 |

| PUR 23 composite panel "Exclusiv-Klett" | Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | |
|---|---|---|---|---|---|---|
| KLIMAPEX® PE-Xa 15 x 1,8 | 38.04 | 31.97 | 28.84 | 26.99 | 25.70 | 071596 |
| KLIMAPEX® PE-Xa 17 x 2,0 | 40.31 | 33.48 | 29.97 | 27.90 | 26.45 | 071795 |
| KLIMAPEX® PE-RT 15 x 1,8 | 34.24 | 29.42 | 26.33 | 25.47 | 24.45 | 071516 |
| KLIMAPEX® PE-RT 17 x 2,0 | 36.09 | 30.66 | 27.86 | 26.21 | 25.06 | 071715 |

| Klett composite panel 20-2/Turbo Cube Klett 20-2 | Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | |
|---|---|---|---|---|---|---|
| KLIMAPEX® PE-Xa 15 x 1,8 | 29.29 | 23.21 | 20.08 | 18.24 | 16.95 | 071596 |
| KLIMAPEX® PE-Xa 17 x 2,0 | 31.55 | 24.73 | 21.21 | 19.14 | 17.69 | 071795 |
| KLIMAPEX® PE-RT 15 x 1,8 | 25.48 | 20.66 | 18.17 | 16.71 | 15.69 | 071516 |
| KLIMAPEX® PE-RT 17 x 2,0 | 27.33 | 21.90 | 19.10 | 17.45 | 16.30 | 071715 |

Recommended retail price

| Turbo Cube Klett 25-2 | Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | |
|---|---|---|---|---|---|---|
| KLIMAPEX® PE-Xa 15 x 1.8 | 30.29 | 24.21 | 21.08 | 19.23 | 17.95 | 071596 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 32.55 | 25.72 | 22.21 | 20.14 | 18.69 | 071795 |
| KLIMAPEX® PE-RT 15 x 1.8 | 26.48 | 21.66 | 19.17 | 17.71 | 16.69 | 071516 |
| KLIMAPEX® PE-RT 17 x 2.0 | 28.33 | 22.90 | 20.10 | 18.45 | 17.30 | 071715 |

| Klett composite panel 30-2/Turbo Cube Klett 30-2 | Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | |
|---|---|---|---|---|---|---|
| KLIMAPEX® PE-Xa 15 x 1.8 | 32.21 | 26.13 | 23.00 | 21.16 | 19.87 | 071596 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 34.47 | 27.65 | 24.13 | 22.06 | 20.62 | 071795 |
| KLIMAPEX® PE-RT 15 x 1.8 | 28.40 | 23.58 | 21.10 | 19.64 | 18.61 | 071516 |
| KLIMAPEX® PE-RT 17 x 2.0 | 30.26 | 24.82 | 22.02 | 20.38 | 19.22 | 071715 |

| Turbo Cube Klett 30-3 | Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | |
|---|---|---|---|---|---|---|
| KLIMAPEX® PE-Xa 15 x 1.8 | 30.89 | 24.82 | 21.68 | 19.84 | 18.55 | 071596 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 33.16 | 26.33 | 22.82 | 20.75 | 19.30 | 071795 |
| KLIMAPEX® PE-RT 15 x 1.8 | 27.09 | 22.26 | 19.78 | 18.32 | 17.30 | 071516 |
| KLIMAPEX® PE-RT 17 x 2.0 | 28.94 | 23.51 | 20.71 | 19.06 | 17.91 | 071715 |

| Turbo Cube Klett 35-3 | Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | |
|---|---|---|---|---|---|---|
| KLIMAPEX® PE-Xa 15 x 1.8 | 31.67 | 25.60 | 22.47 | 20.62 | 19.33 | 071596 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 33.94 | 27.11 | 23.60 | 21.53 | 20.08 | 071795 |
| KLIMAPEX® PE-RT 15 x 1.8 | 27.87 | 23.05 | 20.56 | 19.10 | 18.08 | 071516 |
| KLIMAPEX® PE-RT 17 x 2.0 | 29.72 | 24.29 | 21.49 | 19.84 | 18.69 | 071715 |

| “Klett Kompakt” composite panel | Complete price in €/m² floor heating for the following 5-layer pipe types (estimate) | | | | | |
|---|---|---|---|---|---|---|
| KLIMAPEX® PE-Xa 15 x 1.8 | 33.96 | 27.88 | 24.75 | 22.91 | 21.62 | 071596 |
| KLIMAPEX® PE-Xa 17 x 2.0 | 36.22 | 29.40 | 25.88 | 23.81 | 22.37 | 071795 |
| KLIMAPEX® PE-RT 15 x 1.8 | 30.15 | 25.33 | 22.85 | 21.39 | 20.36 | 071516 |
| KLIMAPEX® PE-RT 17 x 2.0 | 32.01 | 26.57 | 23.77 | 22.13 | 20.97 | 071715 |

**NOTE** KLIMAPEX® heating pipes “Klett” (see page 15)

Recommended retail price

# Underfloor heating systems in new builds

## 3.3 top-Nopp® nub system

7F363-F

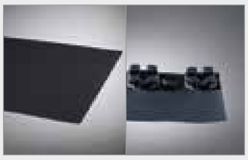

The EMPUR® top-Nopp® system components consist of a completely foam-backed, wear-resistant dimpled film and are perfectly supplemented with the KLIMAPEX® high-quality plastic heating pipes in the sizes 15mm **or** alternatively 14-17mm.

The double-sided film overhang enables neat laying of the panels. The components can be connected easily and with minimum material loss using the press stud method afforded by the male and female nubs, which are arranged in a single row. The KLIMAPEX® plastic heating pipes are clicked into the nub structure and fastened using perfectly fitting pipe retaining nubs. The laying grid is indicated by the arrangement of the nubs and makes it significantly easier to keep to the layout distances. To ensure good heat transfer, the heating pipe is uniformly covered with screed (underfloor heating design type A according to DIN 18560).

### top-Nopp® nub system 15

| Item | Item description | PU | Price €/m² | Item No. | PG |
|---|---|---|---|---|---|
|  | **Castellated panel top-Nopp® 11, EPS-DEO, ONLY for 15 mm pipes** Castellated panel in accordance with EN 13163 **without sound absorption,** Format: 725 x 1,025 mm (useful surface 0.70 m²), installation clearance 90° axially 50 mm, 45° diagonally 70 mm, insulation thickness 11 mm, overall height 27 mm, WLS 035, R = 0.314 m² K/W, compressive stress/strength 100 kPa, fully-foamed castellations, with double-sided film overhang | Pack 28 units = 19.6 m² | 13.02 | 081125 | 01 |
|  | **Castellated panel top-Nopp® 30-2, EPS-DES, ONLY for 15 mm pipes** Polystyrene castellated panel in accordance with EN 13163 **with sound absorption,** Format: 725 x 1,025 mm (useful surface 0.70 m²), installation clearance 90° axially 50 mm, 45° diagonally 70 mm, insulation thickness 30 mm Overall height 46 mm, WLS 040, R = 0.75 m² K/W, compressive stress/strength 5 kPa, fully-foamed castellations, with double-sided film overhang | Pack 14 units = 9.8 m² | 15.83 | 083025 | 01 |
|  | **Castellated element top-Nopp®, ONLY for 15 mm pipes** Polystyrene castellated element, CFC-free, **without insulation** Format: 725 x 1,025 mm (useful surface 0.70 m²), installation clearance 90° axially 50 mm, 45° diagonally 70 mm, castellation height 17 mm | Pack 30 units =21 m² | 9.51 | 080025 | 01 |

Recommended retail price

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Connector strips top-Nopp® for TN 11/30-2, ONLY for 15 mm pipes**<br>Connector strips without insulation as connectors in snap-fastening systems, format: 1,000 x 100 mm | 10 units | 3.28/unit | 080026 | 01 |
|  | **EMPUR® door and levelling element top-Nopp® for TN 11/30-2, Set ONLY for 15 mm pipes consisting of:** 10 door elements 965 mm x 150 mm, two levelling elements 1,150 mm x 500 mm | 1 set | 30.05/set | 080027 | 01 |

**NOTE** Additional insulation also offered (see page 26)!

## Calculation aids for top-Nopp® nub system 15

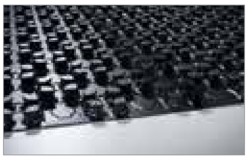
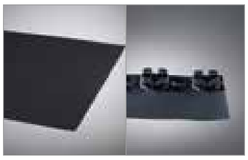
Material requirement/m² floor heating **ONLY for 15 mm pipes**

| Installation distance (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 50 | 70 | 100 | 140/150 | 200 | 210 | |
| Insulation and accessories | Installation Method: | axially | diagonal | axially | diagonal/ axially | axially | diagonal | Item No. |
| top-Nopp® castellated panel 11 useful surface per panel: 0.7 m² | | 1.43 | 1.43 | 1.43 | 1.43 | 1.43 | 1.43 | 081125 |
| Alternative top-Nopp® castellated panel 30-2 useful surface per panel: 0.7 m² | | 1.43 | 1.43 | 1.43 | 1.43 | 1.43 | 1.43 | 083025 |
| top-Nopp® castellated element useful surface per panel: 0.7 m² | | 1.43 | 1.43 | 1.43 | 1.43 | 1.43 | 1.43 | 080025 |
| Edge insulation strips m/m² | | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 908152 |
| top-Nopp® connector strips m/m² | | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 080026 |
| top-Nopp® m/m² round section | | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 089900 |
| Pipe volumes m/m² | | 20.0 | 13.3 | 10.0 | 6.7 | 5.0 | 4.4 | |
| Complete price in €/m² floor heating for the following pipe types (estimate) | | | | | | | | |
| KLIMAPEX® PE-Xa 15 x 1.8 panel TN 11 | | 48.52 | 39.07 | 31.95 | 26.48 | 23.66 | 23.33 | 191546 |
| KLIMAPEX® PE-Xa 15 x 1.8 panel TN 30-2 | | 56.06 | 45.27 | 37.12 | 30.88 | 27.66 | 27.28 | 191546 |
| KLIMAPEX® PE-Xa 15 x 1.8 castellated element | | 45.01 | 35.56 | 28.44 | 22.97 | 20.16 | 19.82 | 191546 |
| KLIMAPEX® PE-RT 15 x 1.8 panel TN 11 | | 40.28 | 33.19 | 27.83 | 23.72 | 21.61 | 21.36 | 111546 |
| KLIMAPEX® PE-RT 15 x 1.8 panel TN 30-2 | | 43.09 | 36.00 | 30.64 | 26.53 | 24.42 | 24.17 | 111546 |
| KLIMAPEX® PE-RT 15 x 1.8 castellated element | | 36.77 | 29.68 | 24.32 | 20.21 | 18.10 | 17.85 | 111546 |

**NOTE** KLIMAPEX® heating pipes (see page 6-8)

Recommended retail price

## top-Nopp® nub system 15-17

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Castellated panel top-Nopp® 11, EPS-DEO, ONLY for 15-17 mm pipes**<br>Castellated panel in accordance with EN 13163<br>**without sound absorption,**<br>Format: 1,025 x 1,025 mm (useful surface 1 $m^2$),<br>installation clearance 90° axially 50 mm, 45° diagonally 70 mm,<br>insulation thickness 11 mm, overall height 30 mm,<br>WLS 035, R= 0.314 $m^2$ K/W,<br>compressive stress/strength 100 kPa,<br>fully-foamed castellations, with double-sided film overhang | 20 pnl<br>= 20 $m^2$ | 13.71/$m^2$ | 081120 | 01 |
|  | **Castellated panel top-Nopp® 30-2, EPS-DES, ONLY for 15-17 mm pipes**<br>Polystyrene castellated panel in accordance with EN 13163<br>**with sound absorption,**<br>Format: 1,025 x 1,025 mm (useful surface 1 $m^2$),<br>installation clearance 90° axially 50 mm, 45° diagonally 70 mm,<br>insulation thickness 30 mm, overall height 49 mm,<br>WLS 040, R= 0.75 $m^2$ K/W,<br>compressive stress/strength 5 kPa,<br>fully-foamed castellations, with double-sided film overhang | 10 pnl<br>= 10 $m^2$ | 16.66/$m^2$ | 083020 | 01 |
|  | **Castellated element top-Nopp®, ONLY for 15-17 mm pipes**<br>Polystyrene castellated element, CFC-free,<br>without insulation<br>Format: 1,025 x 1,025 mm (useful surface 1 $m^2$),<br>installation clearance 90° axially 50 mm, 45° diagonally 70 mm,<br>overall height 19 mm | 20 pnl<br>= 20 $m^2$ | 10.00/$m^2$ | 080020 | 01 |
|  | **Connector strips top-Nopp® for TN 11/30-2, ONLY for 15-17 mm pipes**<br>Connector strips without insulation as connectors<br>in snap-fastening systems<br>Format: 1,000 x 100 mm | 10 units | 3.28/unit | 080021 | 01 |
|  | **Door and levelling element top-Nopp® for TN 11/30-2**<br>**Set ONLY for 15-17 mm pipes consisting of:**<br>10 door elements 965 mm x 150 mm<br>2 levelling elements 1,150 mm x 500 mm | 1 set | 30.05/set | 080022 | 01 |

**NOTE** Additional insulation (see page 22)

Recommended retail price

## Calculation aids for top-Nopp® nub system 15-17

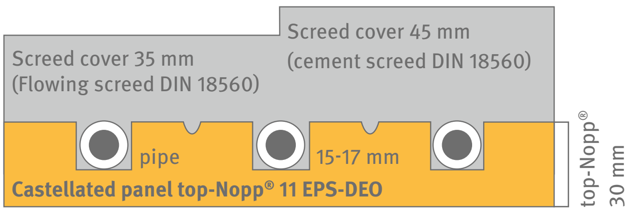
Material requirement/m² floor heating **ONLY for 17 mm pipes**

| | Installation distance (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Insulation and accessories | Installation Method: | 50 axially | 70 diagonal | 100 axially | 140/150 diagonal/ axially | 200 axially | 210 diagonal | Item No. |
| top-Nopp® castellated panel 11<br>useful surface per panel: 1.0 m² | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 081120 |
| Alternative top-Nopp® castellated panel 30-2<br>useful surface per panel: 1.0 m² | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 083020 |
| top-Nopp® castellated element<br>useful surface per panel: 1.0 m² | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 080020 |
| Edge insulation strips m/m² | | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 908152 |
| top-Nopp® connector strips m/m² | | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 080021 |
| top-Nopp® m/m² round section | | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 089900 |
| Pipe volumes m/m² | | 20.0 | 13.3 | 10.0 | 6.7 | 5.0 | 4.4 | |

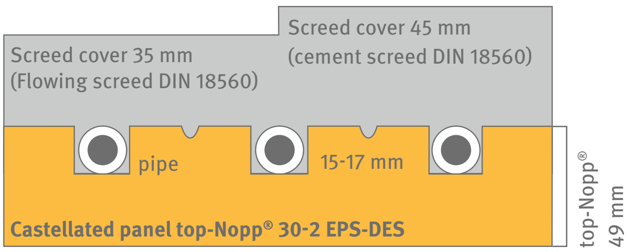
| Complete price in €/m² floor heating for the following pipe types (estimate) | | | | | | | |
|---|---|---|---|---|---|---|---|
| KLIMAPEX® PE-Xa 17 x 2.0 panel TN 11 | 53.94 | 43.15 | 35.00 | 28.76 | 25.54 | 25.16 | 191745 |
| KLIMAPEX® PE-Xa 17 x 2.0 panel TN 30-2 | 56.89 | 46.10 | 37.96 | 31.71 | 28.49 | 28.11 | 191745 |
| KLIMAPEX® PE-Xa 17 x 2.0 castellated element | 50.23 | 39.44 | 31.30 | 25.05 | 21.83 | 21.45 | 191745 |
| KLIMAPEX® PE-RT 17 x 2.0 panel TN 11 | 44.47 | 36.38 | 30.27 | 25.59 | 23.17 | 22.89 | 111745 |
| KLIMAPEX® PE-RT 17 x 2.0 panel TN 30-2 | 47.42 | 39.33 | 33.22 | 28.54 | 26.12 | 25.84 | 111745 |
| KLIMAPEX® PE-RT 17 x 2.0 castellated element | 40.77 | 32.67 | 26.57 | 21.88 | 19.47 | 19.18 | 111745 |

**NOTE** KLIMAPEX® heating pipes (see page 6-8)

### Exemplary overall structure




**Total height: 65 mm/75 mm**




**Total height: 84 mm/ 94 mm**

**Screed, height and quality are to be tested for each individual case according to the site requirements!**

Other dimensions available on request | Recommended retail price

## Accessories for top-Nopp® nub system

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Round section top-Nopp®**<br>Diameter: 18 mm for attaching edge insulation strips<br>to the castellated panel | Ro. 25 m | 0.83/m | 089900 | 01 |
|  | **Expansion gap section top-Nopp®**<br>Format: 100 mm high x 1,800 mm long made of PE, wedge-shaped<br>for the castellated panel, with adhesive strips, in accordance with<br>DIN 18560 | Carton<br>36 m | 2.03/m | 901012 | 01 |
|  | **Floor insulation panel EPS DEO dm (without sound insulation)**<br>**as additional insulation top-Nopp® 11**<br>Format: 1,000 mm x 500 mm x 10 mm, WLS 035,<br>Additional insulation R = 0.286 m² K/W,<br>Compressive stress/strength ≥100 kPa | Pack 6 m²<br>Pack 24 m² | 2.53/m²<br>2.14/m² | 080047<br>011035 | 01<br>01 |
|  | **Impact sound insulation EPS DES sg**<br>**as additional insulation top-Nopp® 30-2**<br>Format: 1,000 mm x 1,000 mm x 30 mm, WLS 040,<br>R = 0.750 m² K/W, Compressive stress/strength up to 5 kPa | Pack 15 m² | 5.92/m² | 013015 | 01 |
|  | **Expansion joint protective pipe**<br>for pipes up to Ø 18 mm, length 400 mm, slotted<br>outside Ø approx. 25 mm | Bag 10<br>units | 0.95/unit | 918400 | 01 |
|  | **Expansion joint protective pipe on roll**<br>for pipes up to Ø 18 mm, length 25 m, unslotted<br>for pipes up to Ø 18 mm, length 25 m, slotted<br>outside Ø approx. 35 mm | 1 ro<br>1 ro | 0.56/m<br>0.84/m | 918500<br>918600 | 01<br>01 |
|  | **Cutting tool set for top-Nopp® system elements**<br>specially adapted to the castellation geometry<br>with ergonomic grip | 1 unit | net<br>20.48/<br>unit | 910050 | 02 |

Recommended retail price

7F 385-F

## OPTIMAL II dry construction system

The OPTIMAL II dry construction system by EMPUR® is useful wherever a **low weight** is required due to structural reasons or where dry screed components are being used. The system consists of hard foam panels of the highest rigidity and foam incorporated grooves and pipe redirectors. The aluminium/steel heat conducting plates that are to be inserted ensure quick even heat distribution. The dry screed load distribution layer can be placed into position immediately after the pipes have been laid. The system panel can be used in many layouts. Also ideal as **wall panel heating in renovation projects** (vertical wet-system wall heating, see page 28) with plaster-board walls 9.5 – 25 mm, which can be fixed onto the elements.

**Structural heights: Floor ≥ 55 mm, wall ≥ 40 mm.** Suitable weight distribution layers: Dry screed plates 18-25 mm

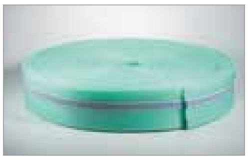
| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **System panel RA 12.5/RA 25, WLS 035**<br>1,000 x 600 x 30 mm = 0.6 m²/pnl,<br>R = 0.857 m² K/W. Compressive stress/strength up to 200 kPA,<br>universal panel for laying doorways and redirections | 10 pnl<br>= 6 m² | 12.86/m² | 030420 | 01 |
|  | **Aluminium baffle RA 12.5**<br>For insertion into system panel | 25 units | 2.61/unit | 030421 | 01 |
|  | **Aluminium heat conduction plate for high thermal output**<br>with 5 predetermined breaking points,<br>dimensions: 750 x 120 mm<br>Requirement: VA 125 › 7.5 m/m² 10 units<br>VA 250 › 3.75 m/m² 5 units | 50 units<br>= 37.5 m | 2.89/unit | 030422 | 01 |
|  | **Galvanised heat conduction plate**<br>with 5 predetermined breaking points, dimensions: 750 x 120 mm<br>Requirement: VA 125 › 7.5 m/m² 10 units<br>VA 250 › 7.5 m/m² 5 units | 50 units<br>= 37.5 m | 2.16/unit | 030423 | 01 |

The specific performance of the dry construction system with galvanised heat conduction plates is approximately 30% below that of the dry construction system with aluminium heat conduction plates.

Recommended retail price

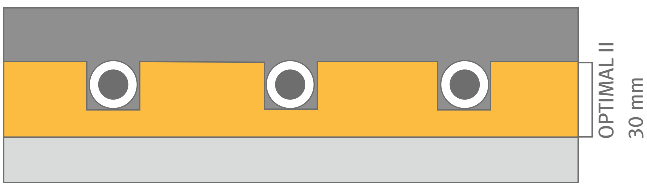
# Underfloor heating systems in new builds

## 3.4 OPTIMAL II dry construction system

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Load sharing element for doorway**<br>made of galvanised sheet steel,<br>1,000 x 500 x 0.5 mm | 1 unit | 22.16/unit | 030100 | 01 |
|  | **KLIMAPEX® PE-RT metal composite pipe**<br>SKZ supervised, made of polyethylene with welded aluminium jacket,<br>multi-layer composite pipe,<br>diffusion-tight and dimensionally stable<br>Dimension — Internal Ø — Core width — Core Ø | | | | |
| | 16 x 2.0 — 12.0 | Ro 200 m | 1.84/m | 171602 | 01 |
| | 16 x 2.0 — 12.0 — 420 mm — 260 mm | Ro 500 m | 1.84/m | 171615 | 01 |
| | **Compression fitting** 16 x 2,0 especially for aluminium composite pipe | Btl 10 Stk | 3.43/unit | 621600 | 01 |
|  | **Flexible springs**<br>for the precise bending of metal composite pipes,<br>up to Ø 16 mm | | net | | |
| | external | 1 unit | 11.85/unit | 961216 | 02 |
| | internal | 1 unit | 11.85/unit | 961116 | 02 |
|  | **Floor insulation panel EPS DEO dm (without sound absorption)**<br>WLS 035,<br>Compressive stress/strength ≥100 kPa,<br>Format: 1,000 x 500 mm,<br>Thickness: 30 mm, R-value: 0.857 $m^2 K/W$ | Pack 8 $m^2$ | 6.40/$m^2$ | 013035 | 01 |
|  | **Self-adhesive edge insulation strips, green**<br>Description as on page 42 but with additional adhesive fixing<br>on the foam backing for mounting to dry,<br>smooth, level rising structures (e.g. plasterboard)<br>8 x 150 mm | Ro 50 m | 0.69/m | 908159 | 01 |
|  | **PE cover sheeting**<br>Web width 2 m, length 50 m | Ro 100 $m^2$ | 1.01/$m^2$ | 900020 | 01 |
|  | **Hot cutting tool for OPTIMAL II dry construction systems**<br>for cutting pipe grooves into insulation panels<br>Complete set in the bag with groove cutting tip N-1,<br>R = 9 mm, W/D = 18 mm and cutting tip C, L = 35 mm,<br>3 m mains supply with contoured central plug | 1 unit | net<br>160.80/<br>unit | 030230 | 02 |

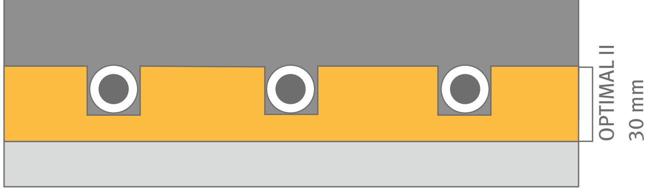
### Exemplary overall structure

Underfloor heating system with 20 mm dry screed panels




**Total height: 50 mm**

Underfloor heating system with anhydride screed 35 mm




**Total height: 65 mm**

**Screed, height and quality are to be tested for each individual case according to the site requirements!**

Recommended retail price

## Calculation aids: OPTIMAL II dry construction system

with aluminium heat conduction plates for high thermal output

| | Material requirement for a room area of 4 x 6 m = 24 m² **Installation distance (cm)** | | Material requirement for a room area of 3 x 5 m = 15 m² **Installation distance (cm)** | |
|---|---|---|---|---|
| Item | RA 12.5 | RA 25 | RA 12.5 | RA 25 |
| System element | 40 | 40 | 25 | 25 |
| Redirection plate | 32 | | 24 | |
| Load distribution element | 1 | 1 | 1 | 1 |
| Aluminium heat conduction plate | 240 | 120 | 150 | 75 |
| PE cover sheeting (m²) | 24 | 24 | 15 | 15 |
| Metal composite pipe PE-RT 16 x 2.0 | 192 | 96 | 120 | 60 |
| Edge insulation strips | 26.4 | 26.4 | 16.5 | 16.5 |
| Total price €/m² (estimate) | 62.65 | 35.47 | 62.65 | 35.47 |

**NOTE** The deflection elements are to be arranged to the short room side (4 units/m)!

## Calculation aids: OPTIMAL II dry construction system

with galvanized heat conducting plates for reduced thermal output

| | Material requirement for a room area of 4 x 6 m = 24 m² **Installation distance (cm)** | | Material requirement for a room area of 3 x 5 m = 15 m² **Installation distance (cm)** | |
|---|---|---|---|---|
| Item | RA 12.5 | RA 25 | RA 12.5 | RA 25 |
| System element | 40 | 40 | 25 | 25 |
| Load distribution element | 1 | 1 | 1 | 1 |
| Galvanised heat conduction plates | 240 | 120 | 150 | 75 |
| PE cover sheeting (m²) | 24 | 24 | 15 | 15 |
| Metal composite pipe PE-RT 16 x 2.0 | 192 | 96 | 120 | 60 |
| Edge insulation strips | 26.4 | 26.4 | 16.5 | 16.5 |
| Total price €/m² (estimate) | 51.87 | 31.82 | 51.87 | 31.82 |

## The fast solution for renovations or new constructions

| Optimal II | Install system panels, fit guide panels and aluminium composite pipe | Leak testing, install dry screed panels | Install floor finish |
|---|---|---|---|
| Time ▶ | ▶ 1st day | ▶ 2nd day | ▶ 3rd day |

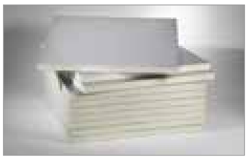

Recommended retail price

# Underfloor heating systems in new builds

3.5 Additional insulation

## Additional insulation

In order to enable all types of system structures, EMPUR® also offers heat-insulation panels made from polyurethane in accordance with EN13165 and polystyrene in accordance with EN13163 as additional insulation without a grid film and impact noise reduction, in addition to the various PUR-THERM® composite panels. These can be used under floating screed as ceiling or wall insulation. All products are HBCD and CFC-free.

| Item | Item description | Thick-ness | R-value $m^2 K/W$ | PU $m^2$ | Price €/$m^2$ | Item No. | PG |
|---|---|---|---|---|---|---|---|
|  | **Polyurethane insulation panels (without sound absorption) PUR panels WLS 024 in accordance with EN 13165 HCFC-free** double-sided aluminium cladding with smooth edges, type DEO dm<br>Compressive stress/strength ≥ 100 kPa<br>Format: 1,200 x 600 mm | 20 mm | 0.833 | Pack 7.2 | 11.67 | 002006 | 01 |
| | | 30 mm | 1.250 | Pack 7.2 | 13.61 | 003006 | 01 |
| | | 40 mm | 1.666 | Pack 7.2 | 16.32 | 004006 | 01 |
| | | 47 mm | 1.958 | Pack 7.2 | 17.74 | 004706 | 01 |
| | | 53 mm | 2.208 | Pack 7.2 | 18.77 | 005306 | 01 |
|  | **Floor insulation panel EPS DEO dm (without sound absorption) WLS 032**<br>Compressive stress/strength ≥ 100 kPa<br>Format: 1,000 x 500 mm | 10 mm | 0.313 | Pack 24 | 2.24 | 011065 | 01 |
| | | 20 mm | 0.625 | Pack 12 | 4.46 | 012065 | 01 |
| | | 30 mm | 0.938 | Pack 8 | 6.69 | 013065 | 01 |
| | | 40 mm | 1.250 | Pack 6 | 8.92 | 014065 | 01 |
| | | 50 mm | 1.563 | Pack 4.5 | 11.15 | 015065 | 01 |
| | | 60 mm | 1.875 | Pack 4 | 13.39 | 016065 | 01 |
|  | **Floor insulation panel EPS DEO dm (without sound absorption) WLS 035**<br>Compressive stress/strength ≥ 100 kPa<br>Format: 1,000 x 500 mm | 20 mm | 0.571 | Pack 12 | 4.40 | 012035 | 01 |
| | | 30 mm | 0.857 | Pack 8 | 6.40 | 013035 | 01 |
| | | 40 mm | 1.143 | Pack 6 | 8.55 | 014035 | 01 |
| | | 50 mm | 1.429 | Pack 4.5 | 10.65 | 015035 | 01 |
| | | 60 mm | 1.714 | Pack 4 | 12.78 | 016035 | 01 |
|  | **Sound insulation panel EPS DES dm (without sound absorption) WLS 040**<br>Compressive stress/strength up to 100 kPa<br>Format: 1,000 x 500 mm | 30 mm | 0.750 | Pack 8 | 5.60 | 013045 | 01 |
| | | 50 mm | 1.250 | Pack 4.5 | 9.34 | 015045 | 01 |
| | | 60 mm | 1.500 | Pack 4 | 11.21 | 016045 | 01 |

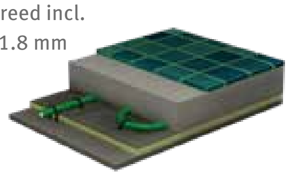
Recommended retail price

| Item | Item description | Thick-ness | R-value m² K/W | PU m² | Price €/m² | Item No. | PG |
|---|---|---|---|---|---|---|---|
|  | **Sound insulation panel EPS DES sm WLS 045** | 20-2 | 0.444 | Pack 22 | 3.16 | 012000 | 01 |
| | Compressive stress/strength up to 4 kPa | 25-2 | 0.556 | Pack 18 | 4.05 | 012500 | 01 |
| | Format: 1,000 x 1,000 mm | 30-3 | 0.667 | Pack 15 | 4.89 | 013000 | 01 |
| | | 35-3 | 0.778 | Pack 13 | 5.60 | 013500 | 01 |
| | **Sound insulation panel EPS DES sg WLS 040** | | | | | | |
| | Compressive stress/strength up to 5 kPa | | | | | | |
| | Format: 1,000 x 1,000 mm | 30-2 | 0.750 | Pack 15 | 5.92 | 013015 | 01 |

## Calculation aids

Examples of rollover calculations for 1 m² floor heating* [without manifold and manifold cabinet]

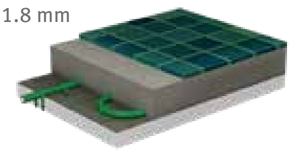
60 mm heating screed incl.
System pipe 15 x 1.8 mm



| Laying distance in cm | Price €/m² |
|---|---|
| 30 | 17.07 |
| 25 | 18.32 |
| 20 | 19.95 |
| 15 | 22.45 |
| 10 | 28.09 |

14 mm composite panel PUR/PE 9+5mm
10 mm additional insulation EPS-DEO WLS 032
**84 mm (without lining) R = 0,857 m² K/W**

60 mm heating screed incl.
System pipe 15 x 1.8 mm



| Laying distance in cm | Price €/m² |
|---|---|
| 30 | 14.87 |
| 25 | 16.13 |
| 20 | 17.76 |
| 15 | 20.27 |
| 10 | 25.92 |

35 mm composite panel Turbo Cube® WLS 045
**95 mm (without lining) R = 0,778 m² K/W**

60 mm heating screed incl.
System pipe 15 x 1.8 mm

| Laying distance in cm | Price €/m² |
|---|---|
| 30 | 16.24 |
| 25 | 17.50 |
| 20 | 19.13 |
| 15 | 21.62 |
| 10 | 27.26 |

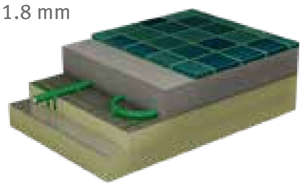
23 mm composite panel PUR/PE 13+10mm
**83 mm (without lining) R = 0,780 m² K/W**

60 mm heating screed incl.
System pipe 15 x 1.8 mm

| Laying distance in cm | Price €/m² |
|---|---|
| 30 | 15.39 |
| 25 | 16.65 |
| 20 | 18.28 |
| 15 | 20.77 |
| 10 | 26.41 |

30 mm composite panel „V5“ WLS 040
**90 mm (without lining) R = 0,750 m² K/W**

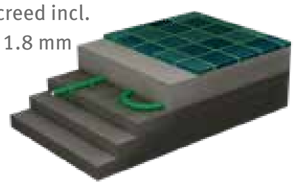
60 mm heating screed incl.
System pipe 15 x 1.8 mm



| Laying distance in cm | Price €/m² |
|---|---|
| 30 | 41.82 |
| 25 | 43.07 |
| 20 | 44.70 |
| 15 | 47.19 |
| 10 | 52.83 |

33 mm composite panel PUR 33
47 mm additional insulation PUR 47 ALU/PUR/ALU
**140 mm (without lining) R = 3,333 m² K/W**

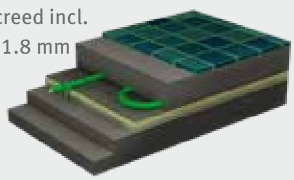
60 mm heating screed incl.
System pipe 15 x 1.8 mm



| Laying distance in cm | Price €/m² |
|---|---|
| 30 | 30.14 |
| 25 | 31.40 |
| 20 | 33.02 |
| 15 | 35.52 |
| 10 | 41.16 |

30 mm composite panel „Kompakt“ WLS 032
30 mm additional insulation EPS-DEO WLS 032
30 mm additional insulation EPS-DEO WLS 032
**150 mm (without lining) R = 2,813 m² K/W**

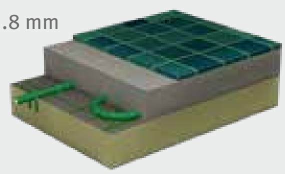
60 mm heating screed incl.
System pipe 15 x 1.8 mm



| Laying distance in cm | Price €/m² |
|---|---|
| 30 | 48.04 |
| 25 | 49.30 |
| 20 | 50.94 |
| 15 | 53.45 |
| 10 | 59.13 |

23 mm composite panel PUR 23
60 mm additional insulation EPS-DEO WLS 032
**143 mm (without lining) R = 2,833 m² K/W**

60 mm heating screed incl.
System pipe 15 x 1.8 mm



| Laying distance in cm | Price €/m² |
|---|---|
| 30 | 35.93 |
| 25 | 37.18 |
| 20 | 38.81 |
| 15 | 41.31 |
| 10 | 46.95 |

68 mm composite panel PUR/PE 63 + 5 mm
**128 mm (without lining) R = 2,950 m² K/W**

Other dimensions available on request | Recommended retail price

* Basis for the calculations are PE-RT 5-layer pipes 15 x 1.8 mm, edge insulation strips, staples, adhesive strips

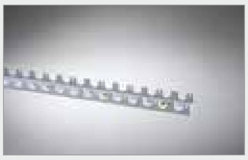
# Wall heating systems

## 4.1 Vertical wall heating

## Vertical wall heating as a wet system

The EMPUR® vertical wet wall heating system consists of wall clip rails and high-quality KLIMAPEX® plastic heating pipes.

After the clip rails have been attached to the wall according to the laying plan, the heating pipe is clipped into them. When plastering the walls, a special reinforcement fabric prevents crack formation after drying in the case of gypsum plaster.

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Wall clip rail for pipe spacing in 50 mm grid**<br>Clip rail for pipe Ø 8 – 12 mm, length 2 m with adhesive strips | 1 unit | 2.55/m | 911202 | 01 |
|  | **Wall clip rail for pipe spacing in 25mm grid**<br>Clip rail for pipe Ø 15 mm, length 2 m with adhesive strips | 1 unit | 2.62/m | 911502 | 01 |
|   | **KLIMAPEX® heating pipe PE-RT as a 5-layer pipe**<br>DIN reg. no. 3V 204 PE-RT,<br>Pipe made of polyethylene, Type I/II in accordance with<br>DIN EN ISO 22391-2 and DIN 16833, with increased thermal stability<br>and insoluble diffusion-tight EVOH barrier layer in accordance with<br>DIN 4726, Base material: PE-MD with increased thermal stability<br>Application classes: 4: Underfloor heating, low-temperature heating,<br>radiator connection system, 5: High-temperature heating,<br>radiator connection system<br>High loading capacity: continuous operating temperature + 70 °C,<br>short-term excess temperature (max. two years) + 90°C,<br>operating pressure 4 bar<br><br>10-year material and consequential damage liability<br>Dimension Internal Ø Weight approx. 25 kg | | | | |
| | PE-RT 12 x 1.5 9.0 | Ro 120 m | 1.08/m | 111231 | 01 |
| | PE-RT 15 x 1.8 11.4 **pipe, green** | Ro 200 m | 1.25/m | 111532 | 01 |

Recommended retail price



EMPUR®

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Dowel nail** | | | | |
| | Borehole Ø 6 mm x 50 mm, requirement 4 units/running metre of rail | Bag 100 units | 0.41/unit | 900050 | 01 |
| | **Dowel clamp** | | | | |
| | Borehole Ø 6 mm | Bag 20 units | 0.78/unit | 900051 | 01 |
|  | **Compression fitting** | | | | |
| | made of brass with euroconus 3/4" for pipe dimensions: | | | | |
| | 12 x 1.5 | Bag 6 units | 3.43/unit | 421211 | 01 |
| | 15 x 1.8 | Bag 10 units | 3.43/unit | 421500 | 01 |
|  | **Connection coupling** | | | | |
| | made of brass for pipe dimensions: | | | | |
| | 12 x 1.5 | Bag 5 units | 9.42/unit | 401211 | 01 |
| | 15 x 1.8 | Bag 10 units | 8.10/unit | 401500 | 01 |
|  | **Glass reinforcement fabric** | | | | |
| | Reinforcement fabric for stucco, 6 mm mesh width | | | | |
| | 1 m x 25 m roll | Ro 25 m² | 2.50/m² | 900053 | 01 |
|  | **Angle brace 90°, open** | | | | |
| | made of plastic, for redirecting manifold connections, | | | | |
| | for pipes up to max. Ø 14 mm | Bag 10 units | 1.25/unit | 901014 | 01 |
| | for pipes up to max. Ø 17 mm | Bag 10 units | 1.32/unit | 901418 | 01 |
|  | **12 m² wall heating kit for RA10 pipe 12 x 1.5** | | | | |
| | Consisting of: 120 m KLIMAPEX® heating pipe PE-RT 12 x 1.5 | | | | |
| | 12 units 2 m clip rails | | | | |
| | 6 units 12 x 1.5 compression fittings | | | | |
| | 40 units dowel clamps | | | | |
| | 100 units dowel nails | | | | |
| | Full kit packed in 1 carton, clips rails enclosed loose | 1 set | 259.11/set | 900058 | 01 |
| | **20 m² wall heating kit for RA10 pipe 15 x 1.8** | | | | |
| | Consisting of: 200 m KLIMAPEX® heating pipe PE-RT 15 x 1.8 | | | | |
| | 20 units 2 m clip rails | | | | |
| | 10 units 15 x 1.8 compression fittings | | | | |
| | 60 units dowel clamps | | | | |
| | 200 units dowel nails | | | | |
| | Full kit packed in 1 carton, clips rails enclosed loose | 1 set | 455.72/set | 900059 | 01 |

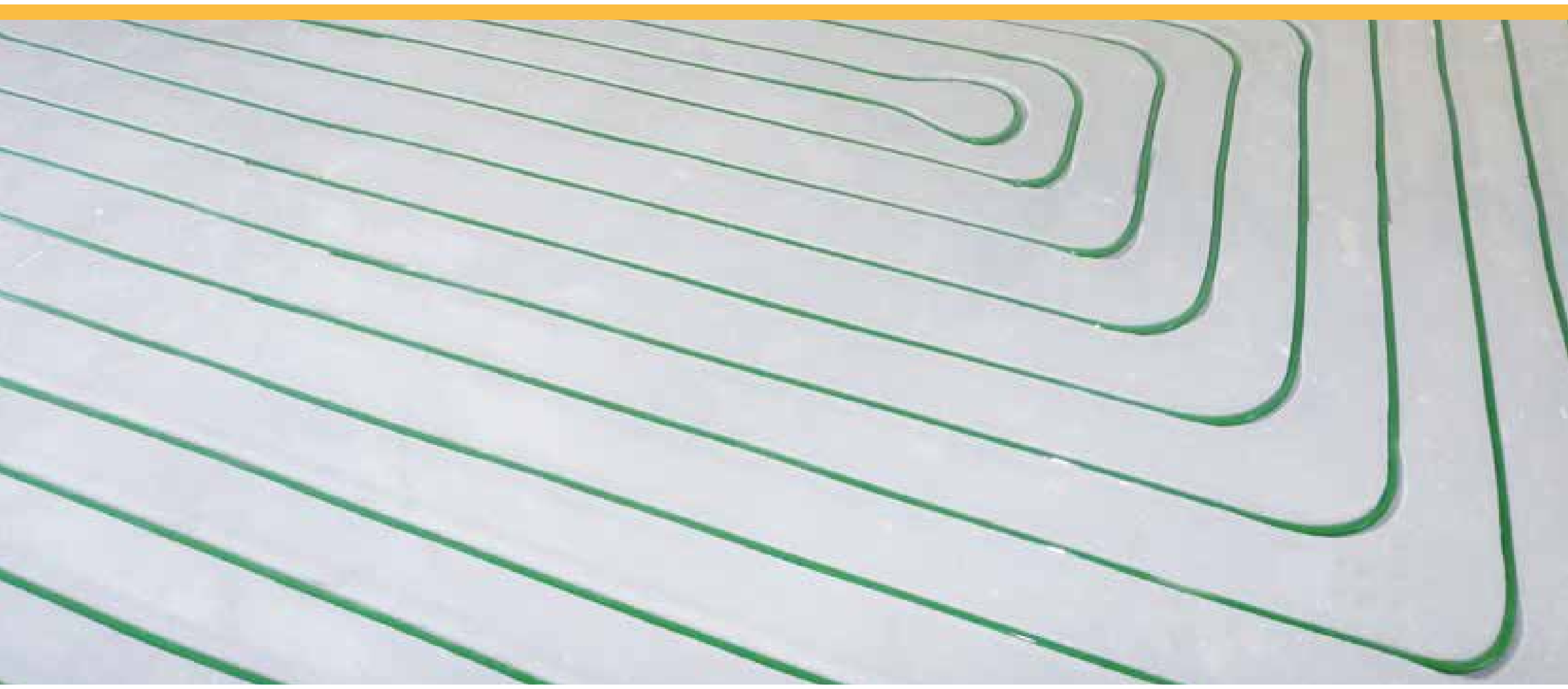
**NOTE** The components for a wall heating system in dry construction can be found in our Optimal II system from page 23/24.

Recommended retail price

# Underfloor heating systems for modernisation projects

## 5.1 CUT-THERM® milling system

7F273-F



### CUT-THERM®

CUT-THERM® is the quick solution system by EMPUR® that cuts a floor heating system into existing floors without causing damage or changing the existing screed level.

An experienced EMPUR® installation team uses a special floor milling machine to cut grooves for the heating pipes into the existing screed, with virtually no dust (cement or anhydride screed with a minimum thickness of 40 mm). Thus the floor lining can be placed into position immediately after the pipes have been laid into the grooves.

The grooves are cut directly into the existing screed, also in new builds! The construction requirements are reduced to a minimum. No floor core refurbishment is required.

Complete your CUT-THERM® range with further EMPUR® products such as a distribution cabinet and control engineering in order to enjoy a self-contained EMPUR® system. We'd be pleased to advise you!

### CUT-THERM® Scope

An experienced CUT-THERM® Installation Team* carries out the following services:

- Cutting of grooves into the existing screed at a laying distance of 12.5 cm
- Laying of the floor heating pipes into the grooves
- Connection of the floor heating pipes to the manifold**
- Leakage test with air

The following EMPUR® products are included in the **scope of delivery**:

- KLIMAPEX® PE-RT 15 x 1.8 mm (green)
- HCM-D (variant 1) or HCM-R (variant 2) made from brass, advance shipment to the specialised tradesman for installation
- Compression fittings and connection set DG/90°
- Angle brace for supply and return lines if necessary

* All necessary tools and energies are brought along if necessary.
** The connection to the existing heating system is carried out by a specialised company.

### With CUT-THERM® you are always on time

Modernisation of living space up to 120 m²

| CUT-THERM® | Remove upper flooring | CUT-THERM® milling, installing heating pipes, manifold assembly, leak testing | Install floor finish | ZERO INSTALLATION HEIGHT<br>→ result:<br>CUT-THERM® is faster, cleaner and more cost-effective than a comparable structural restoration! |
|---|---|---|---|---|
| Time ▶ | ▶ 1st day | ▶ 2nd day | ▶ 3rd day | |



EMPUR®

## Variant 1, HCM-D: includes all the services listed in the quote

with

**NEW**
**up to 250 m²**

| Heating circuits | Main heating surface | Prices in € excl. VAT Consumer* | Item No. | PG |
|---|---|---|---|---|
| HCM-D 1 | up to 10 m² | on demand | 092201 | 03 |
| HCM-D 2 | up to 20 m² | on demand | 092202 | 03 |
| HCM-D 3 | up to 30 m² | on demand | 092203 | 03 |
| HCM-D 4 | up to 40 m² | 2,596.03* | 092204 | 03 |
| HCM-D 5 | up to 50 m² | 3,073.14* | 092205 | 03 |
| HCM-D 6 | up to 60 m² | 3,546.80* | 092206 | 03 |
| HCM-D 7 | up to 70 m² | 3,993.00* | 092207 | 03 |
| HCM-D 8 | up to 80 m² | 4,301.93* | 092208 | 03 |
| HCM-D 9 | up to 90 m² | 4,751.56* | 092209 | 03 |
| HCM-D 10 | up to 100 m² | 5,167.83* | 092210 | 03 |
| HCM-D 11 | up to 110 m² | 5,592.32* | 092211 | 03 |
| HCM-D 12 | up to 120 m² | 6,013.95* | 092212 | 03 |
| HCM-D 13 | up to 130 m² | 6,531.05* | 092213 | 03 |
| HCM-D 14 | up to 140 m² | 6,957.51* | 092214 | 03 |
| HCM-D 15 | up to 150 m² | 7,385.92* | 092215 | 03 |
| HCM-D 16 | up to 160 m² | 7,811.90* | 092216 | 03 |
| HCM-D 17 | up to 170 m² | 8,182.35* | 092217 | 03 |
| HCM-D 18 | up to 180 m² | 8,604.23* | 092218 | 03 |
| HCM-D 19 | up to 190 m² | 9,024.31* | 092219 | 03 |
| HCM-D 20 | up to 200 m² | 9,444.38* | 092220 | 03 |
| HCM-D 21 | up to 210 m² | 9,868.87* | 092221 | 03 |
| HCM-D 22 | up to 220 m² | 10,293.35* | 092222 | 03 |
| HCM-D 23 | up to 230 m² | 10,714.97* | 092223 | 03 |
| HCM-D 24 | up to 240 m² | 11,136.60* | 092224 | 03 |
| HCM-D 25 | up to 250 m² | 11,653.71* | 092225 | 03 |

* Sample tables: Prices as of 7/2018. Price variations are possible due to structural conditions. Precondition for the order is the calculation of the surface heating by EMPUR®, Technical Services Department. **A separate rebate applies for the CUT-THERM® modernization system.**

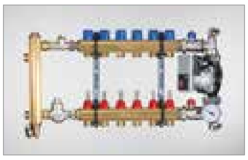
**NOTE** Illustrations only include the main components. Accessories included in the scope of delivery are not shown.

Recommended retail price

# Underfloor heating systems for modernisation projects

## 5.1 CUT-THERM® milling system

Variant 2, HCM-R (including high-efficiency pump, thermo-separator, connection set, line regulating valve, ruleset K.):
Includes all the services listed in the quote



with

and

**NEW**
**up to 160 m²**

| Heating circuits | Main heating surface | Prices in € excl. VAT Consumer* | Item No. | PG |
|---|---|---|---|---|
| HCM-R 2 | up to 20 m² | on demand | 092502 | 03 |
| HCM-R 3 | up to 30 m² | on demand | 092503 | 03 |
| HCM-R 4 | up to 40 m² | 3,291.13* | 092504 | 03 |
| HCM-R 5 | up to 50 m² | 3,755.72* | 092505 | 03 |
| HCM-R 6 | up to 60 m² | 4,220.30* | 092506 | 03 |
| HCM-R 7 | up to 70 m² | 4,492.80* | 092507 | 03 |
| HCM-R 8 | up to 80 m² | 4,944.61* | 092508 | 03 |
| HCM-R 9 | up to 90 m² | 5,396.33* | 092509 | 03 |
| HCM-R 10 | up to 100 m² | 5,859.60* | 092510 | 03 |
| HCM-R 11 | up to 110 m² | 6,289.31* | 092511 | 03 |
| HCM-R 12 | up to 120 m² | 6,719.01* | 092512 | 03 |
| HCM-R 13 | up to 130 m² | 7,148.73* | 092513 | 03 |
| HCM-R 14 | up to 140 m² | 7,578.44* | 092514 | 03 |
| HCM-R 15 | up to 150 m² | 8,008.14* | 092515 | 03 |
| HCM-R 16 | up to 160 m² | 8,437.85* | 092516 | 03 |

* Sample tables: Prices as of 7/2018. Price variations are possible due to structural conditions. Precondition for the order is the calculation of the surface heating by EMPUR®, Technical Services Department. **A separate rebate applies for the CUT-THERM® modernization system.**

**NOTE** Illustrations only include the main components. Accessories included in the scope of delivery are not shown.

Recommended retail price

# Underfloor heating systems for modernisation projects

5.2 Top-Nopp® mini nub system

## top-Nopp® mini nub system

The EMPUR® top-Nopp® mini system components consist of a wear-resistant, deep-drawn castellated film and are perfectly supplemented with the KLIMAPEX® high-quality plastic heating pipes. The “mini nub system” can be used whenever a low installation height is required.

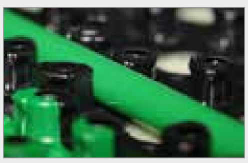
The **system plates are available in two versions for pipe 12 x 1.5 and 15 x 1.8**, both with holes in the nubs for an optimum distribution of the levelling compound. Following pre-treatment (priming) with the required levelling compound, the system is installed as a composite structure onto the existing floor lining or raw floor, but not directly onto concrete floors. During installation the nub panel is fixed to the floor with an adhesive layer underneath it. The double-sided film overhang enables neat laying of the panels. The components can be connected easily, with minimum material loss and in a short time using the press stud method afforded by the male and female nubs, which are arranged in a single row.

The KLIMAPEX® plastic heating pipes are clicked into the nub structure and fastened using perfectly fitting pipe retaining nubs. Thanks to the ideal nub arrangement, the heating tubes can be positioned at different layout distances with ease and flexibility. The heating pipe is uniformly covered with special, thin-layer screed.

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Castellated element top-Nopp® mini for 12 mm pipe**<br>Polystyrene castellated element, B2/E, CFC-free, without insulation, rear adhesive layer with removable protective film<br>Format: 1,025 x 1,025 mm (useful surface 1 m²) installation clearance 90° axially 50/100/150 mm, 45° diagonally 70/140/210 mm<br>Castellation height: 13 mm | 10 pnl = 10 m² | 19.45/m² | 080050 | 01 |
|  | **Castellated element top-Nopp® mini for 15mm pipe**<br>Polystyrene castellated element, B2/E, CFC-free, without insulation, rear adhesive layer with removable protective film<br>Format: 725 x 1,025 mm (useful surface 0.70 m²) installation clearance 90° axially 50/100/150 mm, 45° diagonally 70/140/210 mm<br>Castellation height: 17 mm | 10 pnl = 7 m² | 18.93/m² | 080051 | 01 |

# Underfloor heating systems for modernisation projects

## 5.2 Top-Nopp® mini nub system

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
| <br> | **KLIMAPEX® heating pipe PE-RT as a 5-layer pipe**<br>DIN reg. no. 3 V 204 PE-RT. Pipe made of polyethylene, Type I/II in accordance with DIN EN ISO 22391-2 and DIN 16833, with increased thermal stability and insoluble diffusion-tight EVOH barrier layer in accordance with DIN 4726<br>Base material: PE-MD with increased thermal stability<br>Application classes: 4: Underfloor heating, low-temperature heating, radiator connection system, 5: High-temperature heating, radiator connection systems, high load capacity: Consistent operating temperature of +70 °C; short-term excess temperature (max. two years) +90 °C; operating pressure 4 bar<br><br>10-year material and consequential damage liability<br>Dimension / Internal Ø / Weight approx. 25 kg | | | | |
| | PE-RT 12 x 1.5 / 9.0 | Ro 120 m | 1.08/m | 111231 | 01 |
| | PE-RT 15 x 1.8 / 11.4 / **pipe, green** | Ro 200 m | 1.25/m | 111532 | 01 |
|  | **Expansion gap section DF-P**<br>in accordance with DIN 18560, made of PE / PET 100 / 10 mm black, with levelling base and adhesive strips and horizontal incision<br>Thickness: 10 mm, height: 40 mm, Length: 1,800 mm<br>T-base: approx. 40 mm wide | 45 m =<br>25 units | 9.08/m | 901004 | 01 |
|  | **Wall sealing strip 5 x 50 mm**<br>Edge insulation strips with self-adhesive base and integrated fleece backing, colour: green | Ro 25 m | 1.33/m | 908158 | 01 |
|  | **Compression fitting**<br>made of brass with euroconus 3/4" for pipe dimensions: | | | | |
| | 12 x 1.5 | Bag 6 units | 3.43/unit | 421211 | 01 |
| | 15 x 1.8 | Bag 10 units | 3.43/unit | 421500 | 01 |
|  | **top-Nopp® mini 12 kit**<br>10 m² "top-Nopp® mini" castellated element for 12 mm pipe with fully adhesive backing<br>120 m KLIMAPEX® heating pipe PE-RT 12 x 1.5 mm<br>25 m wall sealing strips "mini", self-adhesive, 5 x 50 mm<br>6 units compression fitting MS 12 x 1.5 mm | Pack | 359.03 | 089050 | 01 |
|  | **top-Nopp® mini 15 kit**<br>21 m² "top-Nopp® mini" castellated element for 15 mm pipe with fully adhesive backing<br>200 m KLIMAPEX® heating pipe PE-RT 15 x 1.8 mm<br>25 m wall sealing strips "mini", self-adhesive, 5 x 50 mm<br>10 units compression fitting MS 15 x 1.8 mm | Pack | 679.33 | 089051 | 01 |

**NOTE** Following pre-treatment/priming (match to the levelling compound and substrate!) with the required levelling compound, the system is installed as a composite structure directly onto the existing floor lining or raw floor, but not directly onto concrete. The type, amount (observe minimum coverage) and quality of the levelling compound must be examined in each individual case according to the construction requirements (load, substrate and surface covering) as well as according to the manufacturer's specifications.

Recommended retail price

# Underfloor heating systems for modernisation projects

5.2 Top-Nopp® mini nub system

## Calculation aids

System: top-Nopp® mini material requirement/m² floor heating **ONLY for 12 mm pipes**

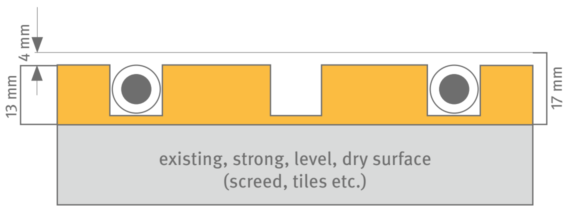
| | | Installation distance (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 50 | 70 | 100 | 140 | 150 | 200 | 210 | |
| Insulation and accessories | Installation Method: | axially | diagonal | axially | diagonal | axially | axially | diagonal | Item No. |
| Castellated element | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 080050 |
| Edge insulation strip 50 mm | | 1.10 | 1.10 | 1.10 | 1.10 | 1.00 | 1.00 | 1.10 | 908158 |
| PE-RT 12 x 1.5 | | 20.0 | 14.3 | 10.0 | 7.1 | 6.7 | 5.0 | 4.8 | 111231 |
| Complete price in €/m² | | 41.32 | 35.33 | 30.82 | 27.82 | 27.35 | 25.57 | 25.36 | |

System: top-Nopp® mini material requirement/m² floor heating **ONLY for 15 mm pipes**

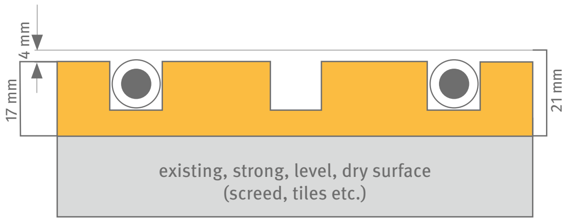
| | | Installation distance (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 50 | 70 | 100 | 140 | 150 | 200 | 210 | |
| Insulation and accessories | Installation Method: | axially | diagonal | axially | diagonal | axially | axially | diagonal | Item No. |
| Castellated element | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 080051 |
| Edge insulation strip 50 mm | | 1.10 | 1.10 | 1.10 | 1.10 | 1.00 | 1.00 | 1.10 | 908158 |
| PE-RT 15 x 1.8 | | 20.0 | 14.3 | 10.0 | 7.1 | 6.7 | 5.0 | 4.8 | 111532 |
| Complete price in €/m² | | 44.02 | 37.12 | 31.92 | 28.46 | 27.93 | 25.87 | 25.63 | |

### Exemplary overall structure

**top-Nopp® mini 12:**
Knauf N 430, gypsum-bound floor levelling filler




**top-Nopp® mini 15:**
Knauf N 430, gypsum-bound floor levelling filler




**Screed, height and quality are to be tested for each individual case according to the site requirements and manufacturers information!**

**NOTE** Following pre-treatment/priming (match to the levelling compound and substrate!) with the required levelling compound, the system is installed as a composite structure directly onto the existing floor lining or raw floor, but not directly onto concrete. The type, amount (observe minimum coverage) and quality of the levelling compound must be examined in each individual case according to the construction requirements (load, substrate and surface covering) as well as according to the manufacturer's specifications.

Other dimensions available on request | Recommended retail price

# Underfloor heating systems for modernisation projects

## 5.3 PURFLEX®-super and PURFLEX®-economy

## PURFLEX®-super and PURFLEX®-economy modernisation systems

The PURFLEX®-super modernisation system is always a good choice for when a floor heating system is to be used on a critical surface (i.e. timber beam floors, dry screed structures, mixed surfaces, surfaces that do not keep their shape well, and concrete floors). The thin layer PURFLEX-economy® system is used when a floor heating system with extremely low installation heights is to be installed. The laying mortar, which can be used for both systems, is easy to use and can be exposed to loads already after a short time. The system is optimally supplemented with bonding mortar and joining mortar for subsequent laying of the floor lining.

**NOTE** The inherent system properties are based on the use of system-related materials; laying mortar, bonding mortar and joining mortar. Combinations with other, non-system materials will lead to loss of guaranteed properties.

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **PURFLEX®-super B.02 laying mortar**<br>Cement-based laying mortar tempered with latex and rubber fibres for creating load distribution layers between 8-15mm | 18 kg | 4.05/kg | 903001 | 01 |
|  | **PURFLEX®-super 1.01 bonding mortar**<br>Cement-based bonding mortar tempered with latex and rubber fibres for thin-bed layering of ceramic lining | 25 kg | 4.65/kg | 903002 | 01 |
|  | **PURFLEX®-super B.01 joining mortar “grey”**<br>Joining mortar with system approval for permanent joint creation | 20 kg | 3.19/kg | 903003 | 01 |
|  | **Trowel**<br>For mounting the PURFLEX®-super B.02 laying mortar<br>Recommendation: "Weber Floor 4310" putty to level parquet, laminate, for example | 1 unit | net 47.76/unit | 903000 | 02 |

Recommended retail price

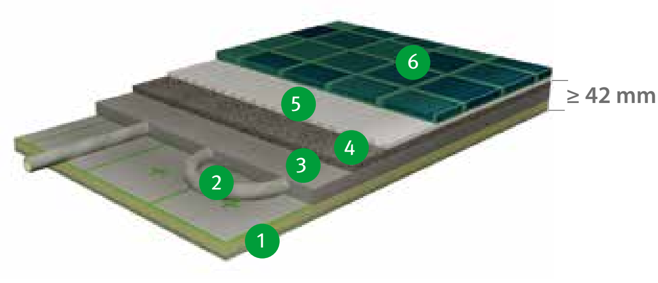
## PURFLEX®-super modernisation

for KLIMAPEX®-pipe 15 x 1.8 mm

PURFLEX®-super is tempered with latex and rubber fibres premixed cement-based mortar. Suitable for wood floors, mixed surfaces as well as surfaces that do not keep their shape well and concrete floors.

The advantages: high bending strength, low **installation height (including insulation ≥ 42 mm)**, light and thermally conductive. Suitable for refurbishment of old buildings and in new buildings.

### Example of overall structure




PURFLEX®-super modernisation with Klett

1. EMPUR® composite panel PUR/PE 15 “Exclusiv-Klett” alternatively PUR/PE 14, 23, 36, 68 or rather PUR 33 or 40
2. KLIMAPEX® heating pipe Klett PE-RT 15 x 1.8 alternatively KLIMAPEX® heating pipe PE-RT 15 x 1.8 with staples or clip rails
3. Levelling screed according to DIN18560, thickness ≥20 mm
4. PURFLEX®-super B.02 laying mortar, thickness 8 to 15 mm
5. PURFLEX®-super 1.01 bonding mortar, thickness upon request
6. Tiling with PURFLEX®-super B.01 joining mortar

### Calculation aid: Regular structure ≥ 42 mm

| Delivery form | Consumption values/m² | | |
|---|---|---|---|
| PURFLEX®-super B.02 laying mortar 18 kg paper sack | 8 mm layer thickness<br>10 mm layer thickness | | 11.2 kg<br>14.0 kg |
| PURFLEX®-super 1.01 bonding mortar 25 kg paper sack | at 3 mm<br>at 6 mm<br>at 8 mm<br>at 10 mm | dental spatula<br>dental spatula<br>dental spatula<br>dental spatula | 1.9 kg/m²<br>3.8 kg/m²<br>5.1 kg/m²<br>6.4 kg/m² |
| | Format in cm | Joint width in mm | Consumption in g/m² at 10 mm panel thickness |
| PURFLEX®-super B.01 grey joining mortar 20 kg paper sack<br>* | 10 x 20<br>20 x 20<br>30 x 30<br>30 x 30<br>40 x 40 | 3<br>8<br>3<br>8<br>10 | 450<br>1100<br>400<br>960<br>1,350 |

| PURFLEX®-super | Installa-tion of the system, apply cement-based levelling screed (≥ 20 mm) | After at least 48 hrs. apply the load dis-tribution layer (8-15 mm) of PURFLEX®-super laying mortar B.02 | After at least 24 hrs. lay the tiles with ad-hesive mortar 1.01 | After at least 24 hrs. grout with PURFLEX®-super joining mortar B.01 | After 48 hrs. floor fully loadable, functional heating after 28 days |
|---|---|---|---|---|---|
| Time ▶ | ▶ 1st day | ▶ 3rd day | ▶ 4th day | ▶ 5th day | ▶ 7th day |


**NOTE**

The inherent system properties are based on the use of system-related materials; laying mortar, bonding mortar and joining mortar. Combinations with other, non-system materials will lead to loss of guaranteed properties. The overall structure shown only applies in connection with tiling (usual tiles in rectangular format 40 x 40 cm). Please note that different floor coverings require separate testing! **We are happy to answer any questions you might have regarding our PURFLEX® system. Give us a call.**

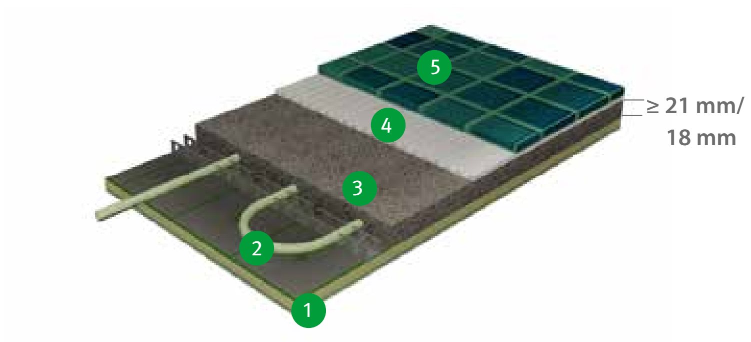
## PURFLEX®-economy thin layer system

for KLIMAPEX® pipe 10 x 1.3 mm

Use PURFLEX®-super as a thin-film PURFLEX®-economy system to achieve warm water floor heating with extremely low floor installations! PURFLEX®-super is tempered with latex and rubber fibres premixed cement-based mortar. Suitable for wood floors, mixed surfaces as well as surfaces that do not keep their shape well and concrete floors.

The advantages: high bending strength, extremely low **installation height of only 21 mm** with 8 mm pipe covering, light and thermally conductive. Ideally suited for renovation of old buildings.

### Example of overall structure




1. EMPUR® Composite panel PUR/PE 14, 23 or PUR/PE 15 “Exclusiv-Klett”
2. KLIMAPEX® heating pipe PE-RT 10 x 1.3/12 x 1.5 with clip rails alternatively KLIMAPEX® PE-RT heating pipe “Klett” 12 x 1.5
3. PURFLEX®-super B.02 laying mortar, thickness 18 mm/21 mm
4. PURFLEX®-super 1.01 bonding mortar, thickness upon request
5. Tiling with PURFLEX®-super B.01 joining mortar

PURFLEX®-economy thin layer system with clip rail

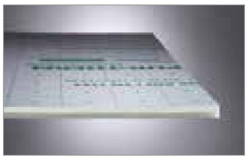
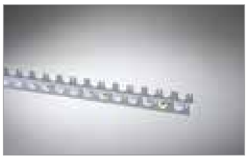
### Calculation aid: Regular structure ≥ 21 mm

| Delivery form | Consumption values/m² | | |
|---|---|---|---|
| PURFLEX®-super B.02 laying mortar 18 kg paper sack | 21 mm layer thickness | | 29.4 kg |
| PURFLEX®-super 1.01 bonding mortar 25 kg paper sack | at 3 mm<br>at 6 mm<br>at 8 mm<br>at 10 mm | dental spatula<br>dental spatula<br>dental spatula<br>dental spatula | 1.9 kg/m²<br>3.8 kg/m²<br>5.1 kg/m²<br>6.4 kg/m² |
| | Format in cm | Joint width in mm | Consumption in g/m² at 10 mm panel thickness |
| PURFLEX®-super B.01 grey joining mortar 20 kg paper sack | 10 x 20<br>20 x 20<br>30 x 30<br>30 x 30<br>40 x 40 | 3<br>8<br>3<br>8<br>10 | 450<br>1,100<br>400<br>960<br>1,350 |

| PURFLEX®-economy | Laying the system, apply the load distribution layer of PURFLEX®-super laying mortar B.02 | After at least 24 hrs. lay the tiles with adhesive mortar 1.01 | After at least 24 hrs. grout with PURFLEX®-super joining mortar B.01 | After 48 hrs. floor fully loadable, functional heating after 28 days |
|---|---|---|---|---|
| Time ▶ | ▶ 1st day | ▶ 2nd day | ▶ 3rd day | ▶ 5th day |


**NOTE** The inherent system properties are based on the use of system-related materials; laying mortar, bonding mortar and joining mortar. Combinations with other, non-system materials will lead to loss of guaranteed properties. The overall structure shown only applies in connection with tiling (usual tiles in rectangular format 40 x 40 cm). Please note that different floor coverings require separate testing! **We are happy to answer any questions you might have regarding our PURFLEX® system. Give us a call.**

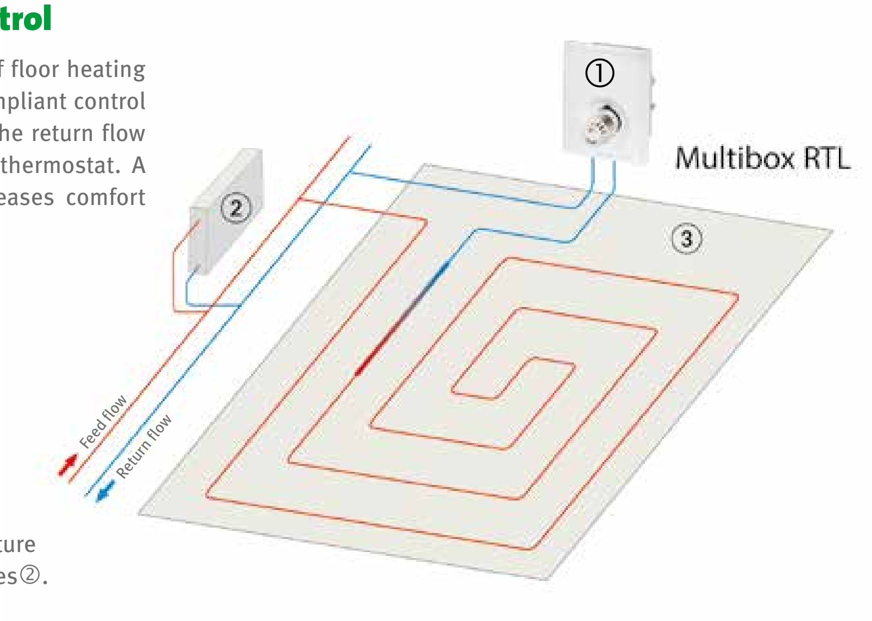
## PURFLEX®-super and PURFLEX®-economy can only be combined with:

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Composite panel PUR/PE 15 "Exclusiv-Klett"**<br>Compressive stress/strength up to 5 kPa,<br>Format: 2,000 x 1,000 mm = 2.0 m², single-sided film overhang<br>Thickness: 15 (10 + 5), R value: 0.584 m² K/W | Pack 20 m² | 11.46/m² | 070414 | 01 |
|  | **Composite panel PUR/PE 14 "Exclusiv"**<br>Compressive strength/stress up to 5 kPa<br>Format: 2,000 x 1,000 mm = 2.0 m², single-sided film overhang<br>Thickness: 14 (9 + 5), R value: 0.545 m² K/W | Pack 20 m² | 8.93/m² | 041400 | 01 |
|  | **Composite panel PUR/PE 23 "Exclusiv"**<br>Compressive stress/strength up to 5 kPa<br>Format: 2,000 x 1,000 mm = 2.0 m², single-sided film overhang<br>Thickness: 23 (13+10), R value: 0.780 m²K/W | Pack 10 m² | 10.34/m² | 042300 | 01 |
|  | **Clip rail for pipe Ø 8 - 12 mm,**<br>for pipe spacing in 50 mm grid, length 2 m with adhesive strips | 1 unit | 2.55/m | 911202 | 01 |
|  | **Clip rail for pipe Ø 15 mm,**<br>for pipe spacing in 25 mm grid, length 2 m with adhesive strips | 1 unit | 2.62/m | 911502 | 01 |
|  | **KLIMAPEX® PE-RT as a 5-layer pipe**<br>DIN reg. no. 3 V 204 PE-RT. Pipe made of polyethylene,<br>Type I/II in accordance with DIN EN ISO 22391-2 and DIN 16833,<br>with increased thermal stability and insoluble diffusion-tight EVOH<br>(see pages 6-8) | | | | |
|  | Dimension / Internal Ø / Weight approx. 25 kg | | | | |
| | PE-RT 12 x 1.5 / 9.0 | Ro 120 m | 1.08/m | 111231 | 01 |
| | PE-RT 15 x 1.8 / 11.4 / **pipe, green** | Ro 200 m | 1.25/m | 111532 | 01 |
|  | **Connection couplings**<br>made of brass for pipe dimensions: | | | | |
| | 10 x 1.3 | Bag 5 units | 8.59/unit | 401010 | 01 |
| | 12 x 1.5 | Bag 5 units | 9.42/unit | 401211 | 01 |
| | 15 x 1.8 | Bag 10 units | 8.10/unit | 401500 | 01 |
|  | **Compression fittings**<br>made of brass with euroconus 3/4" for pipe dimensions: | | | | |
| | 10 x 1.3 | Bag 6 units | 3.13/unit | 421000 | 01 |
| | 12 x 1.5 | Bag 6 units | 3.43/unit | 421211 | 01 |
| | 15 x 1.8 | Bag 10 units | 3.43/unit | 421500 | 01 |

Recommended retail price

## Multibox-RTL individual room control

for the renovation and subsequent installation of floor heating in individual rooms, e.g. Bath room. An EnEV compliant control is possible thanks to the separate detection of the return flow temperature and the room temperature by the thermostat. A simple and inexpensive installation which increases comfort and reduces energy costs.




System illustration (example):

Multibox RTL ① in the system return flow of the floor heating③ connected to return flow temperature in an existing heating system with heating surfaces②.

| Item | Item description | PU | Price €/set | Item No. | PG |
|---|---|---|---|---|---|
|  | **UP control set**<br>for individual room control in accordance with the Energy Saving Ordinance (EnEV), consisting of base body with rotating connection block and connection thread 3/4" euroconus, bleed valve, EPS building protection panel<br>For approx. 100 m pipe 17 x 2.0 mm and approx. 80 m pipe 15 x 1.8 mm<br>in conjunction with configuration options 1 or 2 | 1 set | 101.46 | 573010 | 01 |
|  | **Option 1:**<br>Individual room control in accordance with the Energy Saving Ordinance (EnEV) consisting of:<br>• 1 stylish thermostat head with integrated return flow temperature limitation<br>• 1 white cover panel with rotating adjustment ring | 1 set | 116.66 | 573020 | 01 |
|  | **Option 2:**<br>Individual room control in accordance with the Energy Saving Ordinance (EnEV) with optional room thermostat consisting of:<br>• 1 adapter with return flow temperature limiter<br>• 1 actuator<br>• 1 cover for concealed assembly of the actuator | 1 set | 120.45 | 573030 | 01 |

**NOTE** Other connection components from page 42/43, controlling components and room thermostats from page 84

Recommended retail price

# Accessories and tools

## 6.1 Panel heating system accessories

### Panel heating system accessories

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **Compression fittings** | | | | |
| | made of brass with euroconus 3/4" for pipe dimensions : | | | | |
| | 10 x 1.3 | Bag 6 units | 3.13 | 421000 | 01 |
| | 12 x 1.5 | Bag 6 units | 3.43 | 421211 | 01 |
| | 15 x 1.8 | Bag 10 units | 3.43 | 421500 | 01 |
| | 17 x 2.0 | Bag 10 units | 3.43 | 421700 | 01 |
| | 20 x 2.0 | Bag 10 units | 3.52 | 422000 | 01 |
|  | **Compression fittings for stainless steel manifolds** | | | | |
| | made of nickel-plated brass with euroconus 3/4" for pipe dimensions: | | | | |
| | 14 x 2.0 (for aluminium composite pipe) | Bag 10 units | 3.43 | 621400 | 01 |
| | 15 x 1.8 | Bag 10 units | 3.68 | 421501 | 01 |
| | 16 x 2.0 (for aluminium composite pipe) | Bag 10 units | 3.43 | 621600 | 01 |
| | 17 x 2.0 | Bag 10 units | 3.68 | 421701 | 01 |
| | 20 x 2.0 | Bag 10 units | 3.78 | 422001 | 01 |
|  | **Connection couplings** | | | | |
| | made of brass for pipe dimensions: | | | | |
| | 10 x 1.3 | Bag 5 units | 8.59 | 401010 | 01 |
| | 12 x 1.5 | Bag 5 units | 9.42 | 401211 | 01 |
| | 15 x 1.8 | Bag 10 units | 8.10 | 401500 | 01 |
| | 16 x 2.0 | Bag 10 units | 8.63 | 401600 | 01 |
| | 17 x 2.0 | Bag 10 units | 8.68 | 401700 | 01 |
| | 20 x 2.0 | Bag 10 units | 9.89 | 402000 | 01 |
| | 25 x 2.3 | Bag 5 units | 19.29 | 402500 | 01 |
|  | **Sealable cap** | | | | |
| | for not required manifold outlets | | | | |
| | 3/4" IT brass with euroconus and seals | unit | 3.60 | 790111 | 01 |
| | 3/4" IT nickel-plated brass with euroconus and seals | unit | 3.72 | 790112 | 01 |

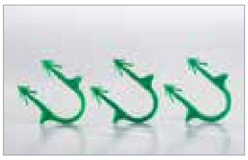
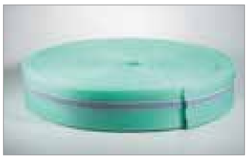
Recommended retail price

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Press-fit coupling with TH contour** for pipe dimensions: | | | | |
| | 14 x 2.0 | Bag 5 units | 6.86/unit | 301400 | 01 |
| | 15 x 1.8 | Bag 5 units | 8.28/unit | 301500 | 01 |
| | 16 x 2.0 | Bag 5 units | 8.28/unit | 301600 | 01 |
| | 17 x 2.0 | Bag 5 units | 8.28/unit | 301700 | 01 |
| | 20 x 2.0 | Bag 5 units | 8.75/unit | 302000 | 01 |
| | 25 x 2.3 | Bag 5 units | 12.13/unit | 302500 | 01 |
|  | **Adapter nipple with TH contour** | | | | |
| | with pipe thread and press-fit connection for pipe dimensions: | | | | |
| | 15 x 1.8 x 1/2" ET | Bag 10 units | 6.08/unit | 361500 | 01 |
| | 16 x 2.0 x 1/2" ET | Bag 10 units | 7.02/unit | 361600 | 01 |
| | 17 x 2.0 x 1/2" ET | Bag 10 units | 7.02/unit | 361700 | 01 |
| | 20 x 2.0 x 3/4" ET | Bag 10 units | 7.50/unit | 362000 | 01 |
| | 25 x 2.3 x 3/4" ET | Bag 5 units | 10.40/unit | 362500 | 01 |
|  | **Adapter sleeve** | | | | |
| | 15 x 1.8 x 1/2" IT | Bag 10 units | 6.05/unit | 351500 | 01 |
|  | **Connection screws** | | | | |
| | for pipe dimensions: | | | | |
| | 1/2" ET x 14 x 2.0 | Bag 10 units | 4.64/unit | 461400 | 01 |
| | 1/2" ET x 15 x 1.8 | Bag 10 units | 4.64/unit | 461500 | 01 |
| | 1/2" ET x 17 x 2.0 | Bag 10 units | 4.64/unit | 461700 | 01 |
| | 1/2" ET x 20 x 2.0 | Bag 10 units | 5.25/unit | 462000 | 01 |
| | 3/4" ET x 25 x 2.3 | Bag 5 units | 10.61/unit | 462500 | 01 |
| | 3/4" IT x 25 x 2.3 | Bag 5 units | 11.45/unit | 452500 | 01 |
|  | **Double nipple** | | | | |
| | made of brass with euroconus | | | | |
| | 3/4" ET | Bag 5 units | 2.08/unit | 793435 | 01 |
| | 1" ET | Bag 5 units | 2.93/unit | 793440 | 01 |
|  | **Radiator connection bracket 90°** | | | | |
| | 300 mm long, nickel-plated with press-fit connection | | | | |
| | Dimensions 15 x 1.8 x 300 mm | 2 units | 25.45/unit | 371503 | 01 |
| | Dimensions 17 x 2.0 x 300 mm | 2 units | 25.45/unit | 371703 | 01 |
|  | **Radiator T-connection-piece** | | | | |
| | 300 mm long, nickel-plated with press-fit connection | | | | |
| | Dimensions 15 x 1.8 x 15 x 1.8 x 300 mm | 2 units | 23.76/unit | 371513 | 01 |
| | Dimensions 17 x 2.0 x 17 x 2.0 x 300 mm | 2 units | 23.76/unit | 371713 | 01 |

Recommended retail price

# Accessories and tools

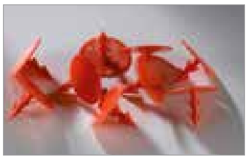
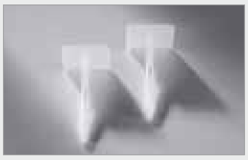
## 6.1 Panel heating system accessories

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Long staples**<br>for PUR-THERM® stapler system for pipes up to Ø 20 mm,<br>green, 50-unit magazines | Car =<br>1,000 units | 127.33/car | 911001 | 01 |
|  | **Short staples**<br>specially for combined composite panels PUR/PE 23 mm for<br>PUR-THERM® Stapler system, for pipes up to Ø 20 mm, black,<br>50-unit magazines | Car =<br>1,000 units | 127.33/car | 911000 | 01 |
|  | **Expansion gap section**<br>in accordance with DIN 18560, made of PE/PET 100/10 mm black,<br>with levelling base and adhesive strips and horizontal incision<br>Length: 1,800 mm | Carton<br>20 units<br>= 36 m | 9.93/m | 901010 | 01 |
|  | **Edge insulation strip with adhesive film tab, green**<br>for the standardised separation of floating screeds with<br>underfloor heating on walls and rising structures in accordance with<br>DIN EN 1264-4/DIN 18560-2, made of closed-cell PE foam with<br>patented tear-off edge and welded film tab with adhesive for fixing<br>and sealing to the surface<br>8 x 150 mm<br>10 x 150 mm | Ro 50 m<br>Ro 50 m | 0.65/m<br>0.69/m | 908152<br>908154 | 01<br>01 |
|  | **Edge insulation strip with self-adhesive base, green**<br>Description as above but with additional adhesive fixing<br>on the foam backing for mounting to dry,<br>smooth, level rising structures (e.g. plasterboard)<br>8 x 150 mm | Ro 50 m | 0.69/m | 908159 | 01 |
|  | **PE film moisture barrier**<br>in accordance with DIN 18533/W1-E for structural waterproofing on<br>the foundation slab against rising dampness, made of tear-proof<br>PE film with PE foam underneath and integrated sealing tape<br>for single-sided overlapping, width 1,250 mm + overlap<br>**Important: Request the EMPUR® installation guidelines before installation!** | Ro 50 $m^2$ | 4.40/$m^2$ | 903200 | 01 |
|  | **Bitumen sealant and adhesive**<br>Cartridge with polymer bitumen adhesive, 300 ml<br>Ø consumption: 2 cartridges/50 $m^2$ | 1 item | 13.34/unit | 903201 | 01 |
|  | **Fixing tape, single-sided adhesive**<br>100 mm wide, for PE film as a moisture barrier,<br>for adhering connections | Ro 5 m | 63.19/ro | 903204 | 01 |
|  | **Butyl sealing tape as an alternative to bitumen sealant and adhesive**<br>For adhering PE film as a moisture barrier,<br>20 mm wide, 15 m long, Ø consumption: 1 roll/50 $m^2$ | Ro 15 m | 27.98/ro | 903202 | 01 |

Recommended retail price



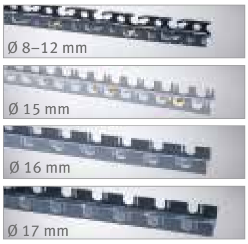
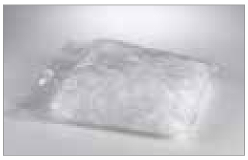
EMPUR®

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **System connection strips**<br>For producing connections on rising masonry walls<br>and for waterproofing, width 200 mm, length 25 m | Ro 25 m | 54.37/Ro | 903203 | 01 |
|  | **PE cover sheeting, as a separating layer**<br>Width 2 m, length 50 m, thickness 0.1 mm | Ro 100 $m^2$ | 1.01/$m^2$ | 900020 | 01 |
|  | **Plastic grid film (PP)**<br>with printed 100 x 100 mm grid<br>Length: 100 m, width 1,030 mm | Ro 103 m | 4.53/m | 901002 | 01 |
|  | **Plastic adhesive tape** (extremely tear-proof)<br>highly adhesive, for sealing intersections, 1 roll for approx. 50 $m^2$,<br>roll 66 m, width 50 mm, core diameter 75 mm, grey/silver | Car 36 Ro | 5.36/unit | 905501 | 01 |
|  | **Film dowel**<br>for attaching the grid film to the insulation,<br>Requirement = 4 units/$m^2$, shaft length 25 mm | Bag<br>100 units | 0.25/unit | 900015 | 01 |
|  | **Retaining dowel**<br>made of PE, 80 mm shaft length, Ø 8 mm borehole | Bag<br>100 units | 0.25/unit | 900010 | 01 |
|  | **Deflection curve 90°**<br>for deflecting heating pipes in the manifold,<br>for pipes up to max. Ø 20 mm, r = 130 mm | Bag<br>10 units | 2.33/unit | 912800 | 01 |
|  | **Angle brace 90°, open**<br>for redirecting pipes in the manifold and floor area<br>for pipes up to max. Ø 14 mm<br>for pipes up to max. Ø 17 mm<br>for pipes up to max. Ø 20 mm | <br><br>Bag 10 units<br>Bag 10 units<br>Bag 10 units | <br><br>1.25/unit<br>1.32/unit<br>2.17/unit | <br><br>901014<br>901418<br>902020 | <br><br>01<br>01<br>01 |
|  | **Expansion joint protective pipe**<br>for pipes up to Ø 18 mm, length 400 mm, slotted<br>for pipes up to Ø 18 mm, length 25 m, unslotted<br>for pipes up to Ø 18 mm, length 25 m, slotted | <br>Bag 10 units<br>1 Ro<br>1 Ro | <br>0.95/unit<br>0.56/m<br>0.84/m | <br>918400<br>918500<br>918600 | <br>01<br>01<br>01 |

Recommended retail price

# Accessories and tools

## 6.1 Panel heating system accessories

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Clip rail**<br>(2 m long with adhesive strips)<br>for pipe Ø 8 – 12 mm, for pipe spacing in 50 mm grid<br>for pipe Ø 15 mm, for pipe spacing in 25 mm grid<br>for pipe Ø 16 mm, for pipe spacing in 50 mm grid<br>for pipe Ø 17 mm, for pipe spacing in 50 mm grid | <br><br>1 unit<br>1 unit<br>1 unit<br>1 unit | <br><br>2.55/m<br>2.62/m<br>2.82/m<br>2.82/m | <br><br>911202<br>911502<br>911602<br>911702 | <br><br>01<br>01<br>01<br>01 |
|  | **Coupling cabinet**<br>for connection couplings in screed in accordance with<br>DIN/EN 1264 part 4 | 1 unit | 8.99/unit | 910020 | 01 |
|  | **Marking set**<br>for indicating a moisture measuring point<br>of a heating screed in accordance with DIN 1264 Part 4<br>(min. 3 measurement points/200 m$^2$) | Bag 5 units | 7.75/unit | 990100 | 01 |
|  | **Hard bed** (note processing information and areas of application)<br>according to DIN EN 18560-2 made of hemp chips with<br>solvent-free bitumen film for “bonding” the components.<br>For filling flaws in the insulation around line and pipe routes.<br>Density approx. 150 kg/m$^3$, delivery in 100 l bag, weight: 15 kg | Bag | 58.62 | 904000 | 01 |
|  | **Screed reinforcement fibre**<br>PP plastic fibre for preventing stress and shrinkage cracks, especially<br>for screeds with ceramic top layers, Requirement: Five bags fibre/<br>cubic metre of screed = 15 m$^2$ for 65 mm screed thickness<br>(1 bag/50 kg cement) in biodegradable bags | 1 bag | 4.64/Btl | 902000 | 01 |
|  | **Screed additive**<br>Plasticiser for cement screeds in accordance with DIN 18560<br>Requirement approx. 0.2 kg/m$^2$ per 65 mm screed thickness | 10 kg | 3.52/kg | 901000 | 01 |
|  | **“EXPRESS” screed additive for shorter drying times**<br>Plasticiser for cement screeds in accordance with DIN 18560<br>Requirement approx. 1.5 kg/50 kg cement (3 % of cement weight) | 10 kg | 10.00/kg | 901003 | 01 |

Recommended retail price

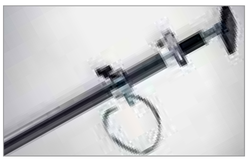
## Panel heating system tools

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **PUR-THERM® stapler system**<br>Precise, low-wear tool for handling<br>magazine-loaded staples, with curved magazine<br>and ergonomic grip<br>Total height approx. 82 cm (handle above staple surface) | 1 unit | net<br>166.70 | 991010 | 02 |
|  | **PUR-THERM® stapler system extension**<br>for ergonomic adjustment of the working height,<br>consisting of extension of approx. 10 cm and two screws | 1 unit | net<br>34.74 | 991011 | 02 |
|  | **Pipe decoiler 3-arm** (without pipe)<br>in a practical carrying bag, lightweight at 11 kg, simple construction,<br>stable design with max. permissible load of approx. 70 kg,<br>secure footing, stand min. Ø 1,150 to 1,500 mm,<br>minimum roll diameter approx. 200 mm, especially for 200 m roll | 1 unit | net<br>161.97 | 990702 | 02 |
|  | **PUR-THERM® pipe dispenser** (without pipe)<br>Consisting of a plastic drum with removable<br>side parts and a metal load-bearing roller frame<br>for pipe rolls with core Ø 260 mm, width 420 mm | 1 unit | net<br>426.40 | 990800 | 02 |
|  | **Hand dispenser**<br>robust design for plastic adhesive tape<br>core diameter 75 mm | 1 unit | net<br>19.65 | 995501 | 02 |
|  | **Pipe cutter**<br>for pipes up to Ø 35 mm | 1 unit | net<br>30.59 | 910027 | 02 |
|  | **Box wrench, open SW 30**<br>especially for EMPUR® compression fittings | 1 unit | net<br>37.46 | 990040 | 02 |
|  | **Torque wrench**<br>pre-set at 30 Nm with factory certificate | 1 unit | net<br>122.97 | 990041 | 02 |
|  | **Box wrench insert**, open SW 30<br>for EMPUR® torque wrench | 1 unit | net<br>39.51 | 990042 | 02 |

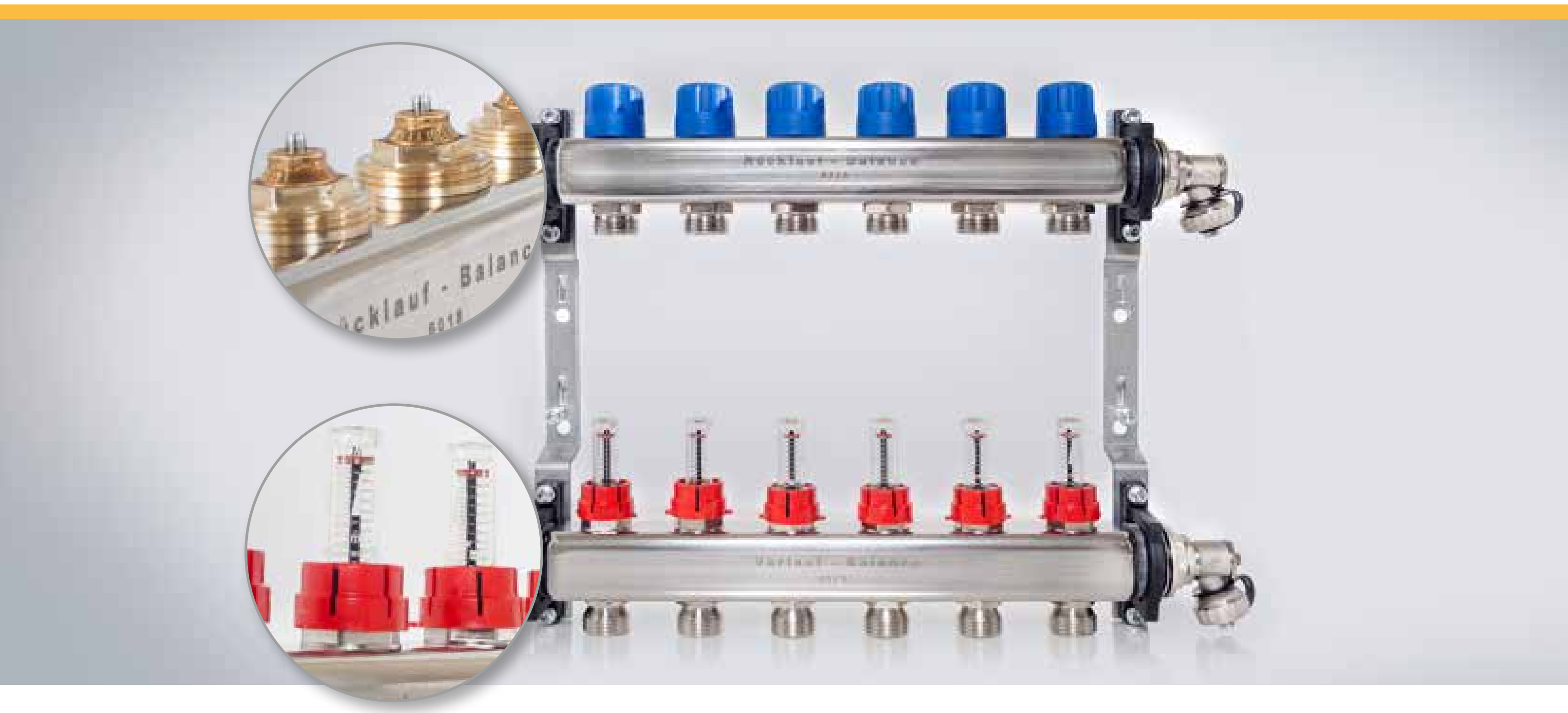
Recommended retail price

# Accessories and tools

## 6.2 Panel heating system tools

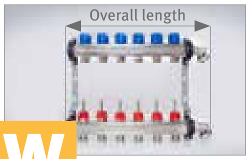
| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **Trestle** | | | | |
| | 2 units per drum required | | net | | |
| | for 600 m/400 m disposable drums | 1 unit | 80.87/pair | 992750 | 02 |
|  | **Press jaw with TH press contour** | | | | |
| | for standard press machines | | | | |
| | | | net | | |
| | for pipe dim. 14 x 2.0 | 1 unit | 153.64 | 961014 | 02 |
| | for pipe dim. 15 x 1.8 | 1 unit | 153.64 | 961015 | 02 |
| | for pipe dim. 16 x 2.0 | 1 unit | 153.64 | 961016 | 02 |
| | for pipe dim. 17 x 2.0 | 1 unit | 153.64 | 961017 | 02 |
| | for pipe dim. 20 x 2.0 | 1 unit | 153.64 | 961020 | 02 |
| | for pipe dim. 25 x 2.3 | 1 unit | 163,89 | 961025 | 02 |
|  | **Calibrator with standard handle** | | | | |
| | for calibrating the KLIMAPEX® pipe | | | | |
| | | | net | | |
| | for pipe Ø 15 x 1.8 | 1 unit | 47.64 | 961501 | 02 |
| | for pipe Ø 16 x 2.0 | 1 unit | 47.64 | 961601 | 02 |
| | for pipe Ø 17 x 2.0 | 1 unit | 47.64 | 961701 | 02 |
| | for pipe Ø 20 x 2.0 | 1 unit | 47.64 | 962001 | 02 |
| | for pipe Ø 25 x 2.3 | 1 unit | 47.64 | 962501 | 02 |
|  | **Herz Changefix Tool** | | | | |
| | Changefix Tool for upper part of thermostat valves, | | | | |
| | with threaded connection 28 x 1.5 (Herz), | | | | |
| | for repairing systems without changing water, | | net | | |
| | with little time and cost | 1 unit | 114.23 | 961720 | 02 |
|  | **Notching pliers** | | | | |
| | Special pliers for notching | | | | |
| | pipe feed-through holes | | net | | |
| | in the expansion joint section | 1 unit | 76.09 | 901011 | 02 |
|  | **Door tensioner** | | | | |
| | with rotating bezel, open, | | net | | |
| | extending length min. 570 mm to max. 960 mm | 1 unit | 50.94 | 990200 | 02 |
|  | **Ceiling spanner** | | | | |
| | with rotating bezel, open, | | net | | |
| | adjustable from min. 1,650 mm to max. 2,800 mm | 1 unit | 48.36 | 990210 | 02 |

Recommended retail price

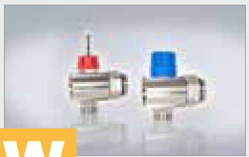



## Stainless steel manifold, series 03 Balance

pre-mounted with integrated valve for dynamic flow control, without manifold connection set

| Item | Item description | Heating circuit | Con-nection | Overall length in mm* | Price €/ item | Item No. | PG |
|---|---|---|---|---|---|---|---|
|   NEW | **System manifold HCM-D Balance with integrated, dynamically control valves in the pressure range 17-60 kPa, pre-settable for flow rates of 30-300 l/h** Complete manifold made of 1" stainless steel section pipe, 50 mm valve clearance. Fully installed in the factory on the manifold holder with inserts for noise suppression, pre-mounted for quick installation in the manifold cabinet, return flow valve (above) with blue protection cap, EMPUR® actuators can be installed directly instead of the blue pro-tection cap, feed flow (below) with flow indicator without scaling for shut off and function display. Heating circuit connections 3/4" euroconus, two manifold end-pieces with reducer revolving for filling, bleeding and draining, rotating, packed in bag, all packed in carton with identification plates. | HCM-DB 2 | 1" IG | 200 | 150.10 | 220278 | 01 |
| | | HCM-DB 3 | 1" IG | 250 | 198.02 | 220378 | 01 |
| | | HCM-DB 4 | 1" IG | 300 | 246.55 | 220478 | 01 |
| | | HCM-DB 5 | 1" IG | 350 | 295.98 | 220578 | 01 |
| | | HCM-DB 6 | 1" IG | 400 | 344.89 | 220678 | 01 |
| | | HCM-DB 7 | 1" IG | 450 | 397.46 | 220778 | 01 |
| | | HCM-DB 8 | 1" IG | 500 | 446.63 | 220878 | 01 |
| | | HCM-DB 9 | 1" IG | 550 | 496.88 | 220978 | 01 |
| | | HCM-DB 10 | 1" IG | 600 | 547.26 | 221078 | 01 |
| | | HCM-DB 11 | 1" IG | 650 | 595.74 | 221178 | 01 |
| | | HCM-DB 12 | 1" IG | 700 | 645.47 | 221278 | 01 |

Compression fittings according to the pipe dimension see page 42,
allocation table see page opposite, manifold cabinets see page 61 et seq.
Manifold accessories, connection/WMZ sets see page 56

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  NEW | **Extension set for system manifolds HCM-D Balance made of 1" section pipe, nickel-plated with integrated, dynamic control valves, heating circuit connections 3/4" euroconus** Set consisting of: 1x backflow valve (top), 1 flow extension with FR without scaling for shut-off and function display, 2 x 1" double nipples with self-sealing O-rings, for easy assembly and secure manifold connection, packed loose in carton, for assembly on the right/left of the manifold | 1 Set | 99.44 | 220178 | 01 |

**NOTE** The water quality requirements according to VDI 2035 must be adhered to!

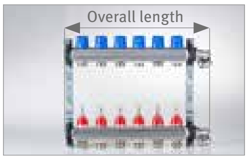
Recommended retail price

# Manifold technology

7.1 Stainless steel manifold

## Stainless steel manifold, series 03

pre-mounted on manifold holder, 1" connection without manifold connection kit

| Item | Item description | Heating circuit | Con-nection | Overall length in mm* | Price €/ item | Item No. | PG |
|---|---|---|---|---|---|---|---|
|  | **System manifold HCM-D**<br>**pre-mounted on manifold holder, with flow rate indicators**<br>Complete manifold made of 1" stainless steel section pipe, 50 mm valve clearance. Fully installed in the factory on the manifold holder with inserts for noise suppression, pre-assembled for quick installation in the manifold cabinet, return flow valve (above) with blue protection cap, EMPUR® actuators can be installed directly instead of the blue protection cap, feed flow (below) with controllable and adjustable flow rate indicators (0-2.5 l/min.), heating circuit connections 3/4" euroconus, two manifold end-pieces with reducer revolving for filling, bleeding and draining, rotating, packed in bag, all packed in carton with identification plates. | HCM-D 2 | 1" IG | 200 | 109.14 | 220276 | 01 |
| | | HCM-D 3 | 1" IG | 250 | 136.05 | 220376 | 01 |
| | | HCM-D 4 | 1" IG | 300 | 163.00 | 220476 | 01 |
| | | HCM-D 5 | 1" IG | 350 | 191.41 | 220576 | 01 |
| | | HCM-D 6 | 1" IG | 400 | 219.29 | 220676 | 01 |
| | | HCM-D 7 | 1" IG | 450 | 250.95 | 220776 | 01 |
| | | HCM-D 8 | 1" IG | 500 | 279.04 | 220876 | 01 |
| | | HCM-D 9 | 1" IG | 550 | 308.25 | 220976 | 01 |
| | | HCM-D 10 | 1" IG | 600 | 337.02 | 221076 | 01 |
| | | HCM-D 11 | 1" IG | 650 | 365.63 | 221176 | 01 |
| | | HCM-D 12 | 1" IG | 700 | 394.25 | 221276 | 01 |

Compression fittings according to the pipe dimension see page 42,
allocation table see page opposite, manifold cabinets see page 61 et seq.
Manifold accessories, connection/WMZ sets see page 56

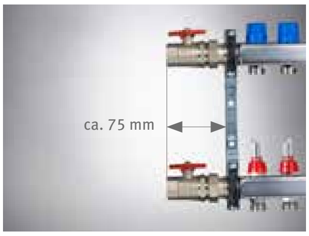
| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Extension set for system manifolds HCM-D**<br>**made of 1" section pipe, nickel-plated with integrated valves,**<br>**50 mm valve clearance, heating circuit connections 3/4" euroconus**<br>Set consisting of: 1x backflow valve (top) with blue protection cap, EMPUR® actuator can be mounted directly instead, 1x flow extension (bottom) with controllable and adjustable flow rate indicators (0-2.5 l/min), 2 x 1" double nipples with self-sealing O-rings, for easy assembly and secure manifold connection, packed loose in carton, for assembly on the right/left of the manifold | 1 set | 74.24 | 220176 | 01 |

**NOTE** The water quality requirements according to VDI 2035 must be adhered to!

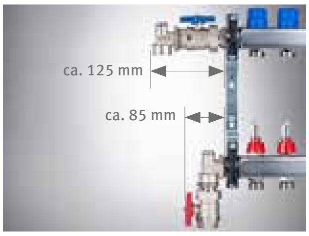
Recommended retail price

## Assignment of stainless steel manifolds / manifold connection set and WMZ connection set in combination with manifold cabinets "Top Standard" and "Exclusiv"

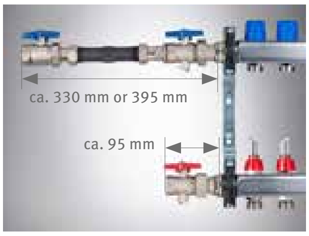
The following combinations are possible and should be ordered separately as a set:



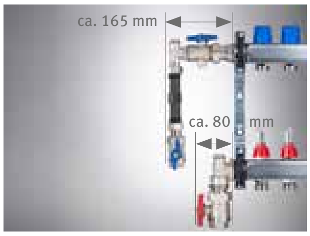
Ball valve set passageway (Item No. 295100)



Manifold connection set 90° (Item No. 291100)



WMZ connection set passageway (Item No. 721017 or 721027)



WMZ connection set 90° (Item No. 721037 or 721047)

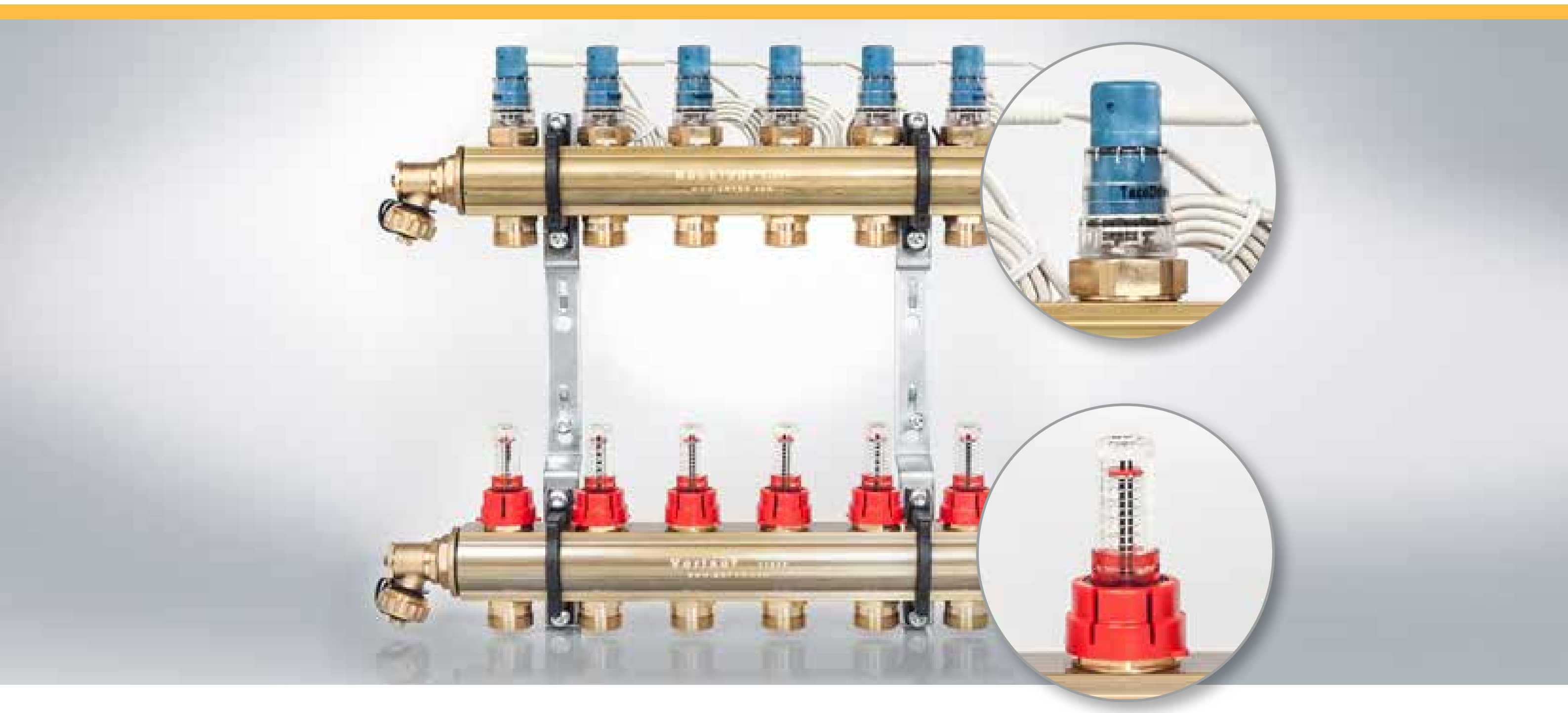
| Heating circuits | Ball valve set passageway | Manifold connection set 90° | WMZ connection set passageway | | WMZ connection set 90° |
|---|---|---|---|---|---|
| | 295100 | 291100 | 721017 | 721027 | 721037 / 721047 |
| 2 | 520 mm | 520 mm | 720 mm | | 520 mm |
| 3 | 520 mm | 520 mm | 720 mm | | 520 mm |
| 4 | 520 mm | 520 mm | 720 mm | | 720 mm |
| 5 | 520 mm | 720 mm | 920 mm | | 720 mm |
| 6 | 720 mm | 720 mm | 920 mm | 920 mm | 720 mm |
| 7 | 720 mm | 720 mm | 920 mm | 920 mm | 720 mm |
| 8 | 720 mm | 720 mm | 920 mm | 1,120 mm | 920 mm |
| 9 | 720 mm | 920 mm | 1,120 mm | 1,120 mm | 920 mm |
| 10 | 920 mm | 920 mm | 1,120 mm | 1,120 mm | 920 mm |
| 11 | 920 mm | 920 mm | 1,120 mm | 1,120 mm | 920 mm |
| 12 | 920 mm | 920 mm | 1,120 mm | --- | 1,120 mm |

## Assignment of stainless steel manifolds / manifold connection set and WMZ connection set in combination with manifold cabinets "Economy" flush- or surface mounted

| Heating circuits | Ball valve set passageway | Manifold connection set 90° | WMZ connection set passageway | | WMZ connection set 90° |
|---|---|---|---|---|---|
| | 295100 | 291100 | 721017 | 721027 | 721037 / 721047 |
| 2 | 550 mm | 550 mm | 700 mm | | 550 mm |
| 3 | 550 mm | 550 mm | 700 mm | | 550 mm |
| 4 | 550 mm | 550 mm | 850 mm | | 550 mm |
| 5 | 550 mm | 550 mm | 850 mm | | 700 mm |
| 6 | 550 mm | 700 mm | 850 mm | 1,000 mm | 700 mm |
| 7 | 700 mm | 700 mm | 1,000 mm | 1,000 mm | 700 mm |
| 8 | 700 mm | 700 mm | 1,000 mm | 1,000 mm | 850 mm |
| 9 | 700 mm | 850 mm | 1,000 mm | --- | 850 mm |
| 10 | 850 mm | 850 mm | --- | --- | 850 mm |
| 11 | 850 mm | 850 mm | --- | --- | 1,000 mm |
| 12 | 850 mm | 1,000 mm | --- | --- | 1,000 mm |

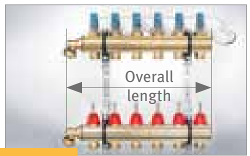
**NOTE** The images show possible installation situations.
Other combinations with valves (page 57) and the assignment of manifold – manifold cabinet (from page 61) are possible, however, but not available as a set.

# Notes

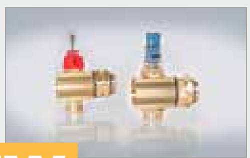


## Brass manifold, version 2.0 Unit

with integrated valve actuator unit, pre-mounted on manifold holder, without manifold connection set

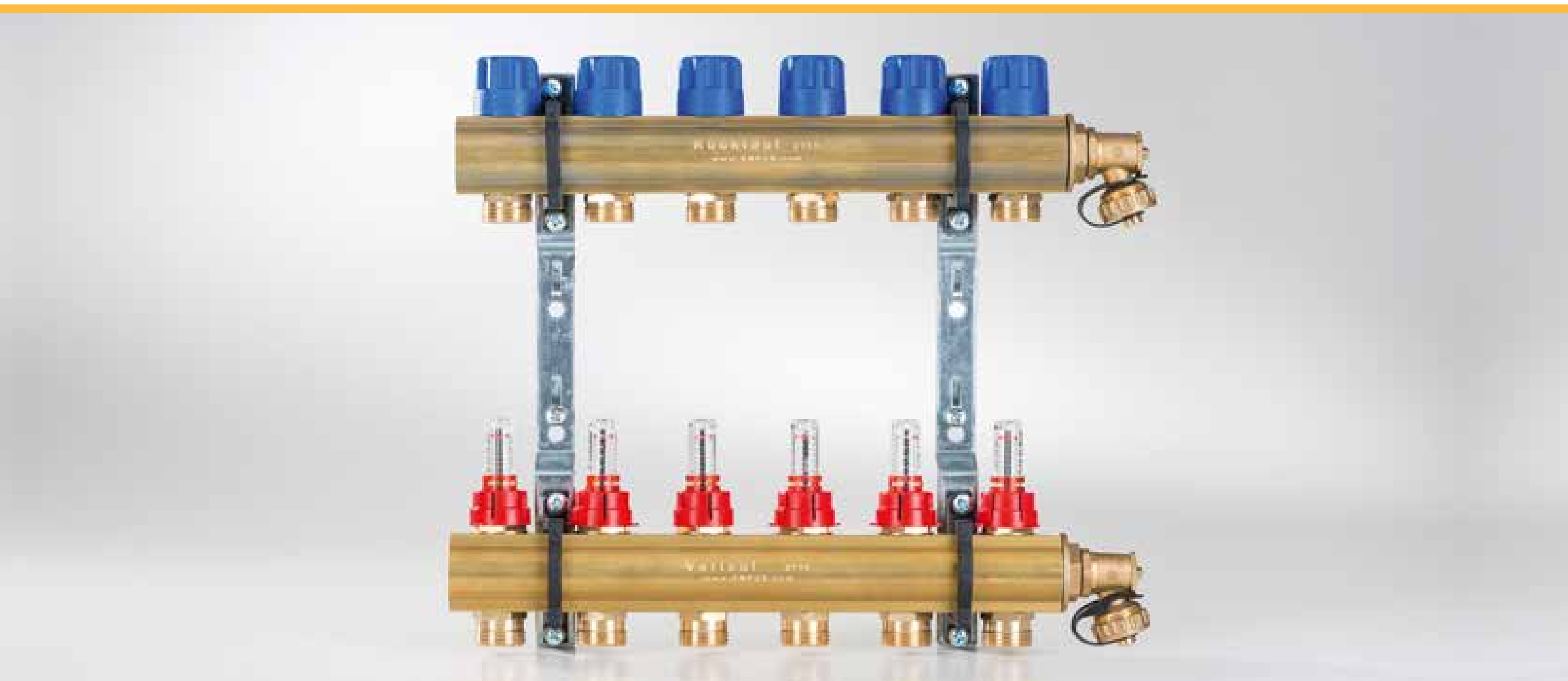
| Item | Item description | Heating circuit | Con-nection | Overall length in mm* | Price €/ item | Item No. | PG |
|---|---|---|---|---|---|---|---|
|  NEW | **System manifold HCM-D Unit with integrated valve actuator unit 230 V with manual reversible 'First open' function**<br>Complete manifold made of brass section pipe with integrated valves, 50 mm valve clearance. Return flow (top) with actuators 230 V NC/1.8 W/IP 54 with integrated valve, 1 m connection cable 2 x 0.75 mm with reverse po-larity protected plug. Feed flow (bottom) with controllable and adjustable flow rate indicators (0-2.5 l/min.). Heating circuit connection 3/4" ET eurocones. Two manifold endpieces with reducer for filling, bleeding and draining, rotating, packed in bag and enclosed. All packaged in a carton and with identification plates. | HCM-DU 2 | 1" IG | 150 | 150.67 | 220247 | 01 |
| | | HCM-DU 3 | 1" IG | 200 | 210.57 | 220347 | 01 |
| | | HCM-DU 4 | 1" IG | 250 | 268.84 | 220447 | 01 |
| | | HCM-DU 5 | 1" IG | 300 | 327.95 | 220547 | 01 |
| | | HCM-DU 6 | 1" IG | 350 | 386.23 | 220647 | 01 |
| | | HCM-DU 7 | 1" IG | 400 | 444.64 | 220747 | 01 |
| | | HCM-DU 8 | 1" IG | 450 | 503.04 | 220847 | 01 |
| | | HCM-DU 9 | 1" IG | 500 | 561.32 | 220947 | 01 |
| | | HCM-DU 10 | 1" IG | 550 | 619.60 | 221047 | 01 |
| | | HCM-DU 11 | 1" IG | 600 | 678.44 | 221147 | 01 |
| | | HCM-DU 12 | 1" IG | 650 | 736.72 | 221247 | 01 |

Compression fittings according to the pipe dimension see page 42, allocation table see page opposite, manifold cabinets see page 61 et seq. Manifold accessories, connection/WMZ sets see page 56

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  NEW | **Extension set for system manifolds HCM-D Unit made of 1" brass section pipe with integrated valve actuator unit, heating circuit connections 3/4" euroconus**<br>Set consisting of: Return flow valve with actuator 230 V (as above) 1 flow extension with adjustable and lockable flow rate indicators (0-2.5 l/min), 2 x 1" double nipples with self-sealing O-rings, for easy assembly and secure manifold connection, packed loose in carton, for assembly on the right/left of the manifold | 1 Set | 96.65 | 220147 | 01 |

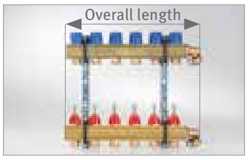
**NOTE** The water quality requirements according to VDI 2035 must be adhered to!
**5-year warranty for professional assembly and electrical connection to EMPUR® control terminal strip.**

Recommended retail price



## Brass manifold, version 2.0

pre-mounted on manifold holder, without manifold connection kit

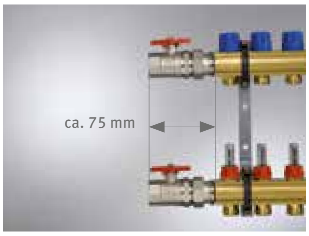
| Item | Item description | Heating circuit | Con-nection | Overall length in mm* | Price €/item | Item No. | PG |
|---|---|---|---|---|---|---|---|
|  | **System manifold HCM-D with flow rate indicators** Complete manifold made of brass section pipe with integrated valves, 50 mm valve clearance, return valves (above) with blue protection cap, factory assembled on manifold holders with inserts for noise suppression. EMPUR® actuators can be installed directly instead of the blue protection cap. Feed flow (bottom) with controllable and adjustable flow rate indicators (0-2.5 l/min.). Heating circuit connection 3/4" ET eurocones. Two manifold end-pieces with reducer for filling, bleeding and draining, rotating, packed in bag and enclosed. All packaged in a carton and with identification plates. | HCM-D 2 | 1" IT | 150 | 89.92 | 220246 | 01 |
| | | HCM-D 3 | 1" IT | 200 | 125.54 | 220346 | 01 |
| | | HCM-D 4 | 1" IT | 250 | 156.03 | 220446 | 01 |
| | | HCM-D 5 | 1" IT | 300 | 186.75 | 220546 | 01 |
| | | HCM-D 6 | 1" IT | 350 | 217.25 | 220646 | 01 |
| | | HCM-D 7 | 1" IT | 400 | 247.26 | 220746 | 01 |
| | | HCM-D 8 | 1" IT | 450 | 277.88 | 220846 | 01 |
| | | HCM-D 9 | 1" IT | 500 | 308.37 | 220946 | 01 |
| | | HCM-D 10 | 1" IT | 550 | 339.69 | 221046 | 01 |
| | | HCM-D 11 | 1" IT | 600 | 370.89 | 221146 | 01 |
| | | HCM-D 12 | 1" IT | 650 | 401.38 | 221246 | 01 |
| | | HCM-D 13 | 5/4" IT | 700 | 460.11 | 221346 | 01 |
| | | HCM-D 14 | 5/4" IT | 750 | 494.52 | 221446 | 01 |
| | Compression fittings according to the pipe dimension see page 42, allocation table see page opposite, manifold cabinets see page 61 et seq. Manifold accessories, connection/WMZ sets see page 56 | HCM-D 15 | 5/4" IT | 800 | 526.33 | 221546 | 01 |
| | | HCM-D 16 | 5/4" IT | 850 | 559.55 | 221646 | 01 |

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Extension set for system manifolds HCM-D made of 1" brass section pipe, nickel-plated with integrated valves, 50 mm valve clearance, heating circuit connections 3/4" euroconus** Set consisting of: 1x backflow valve (top) with blue protection cap, EMPUR® actuator can be mounted directly instead, 1x flow extension (bottom) with controllable and adjustable flow rate indicators (0-2.5 l/min), 2 x 1" double nipples with self-sealing O-rings, for easy assembly and secure manifold connection, packed loose in carton, for assembly on the right/left of the manifold | Set HCM-D 1" | 80.26/Set | 220141 | 01 |
| | | Set HCM-D 5/4" | 93.01/Set | 220142 | 01 |

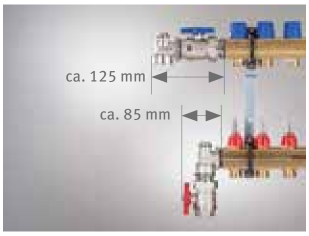
Recommended retail price

## Assignment of brass manifolds / manifold connection set and WMZ connection set in combination with manifold cabinets “Top Standard” and “Exclusiv”

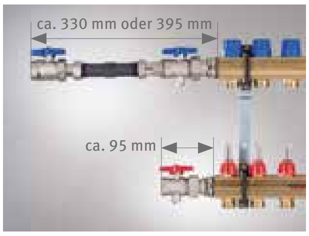
The following combinations are possible and should be ordered separately as a set:



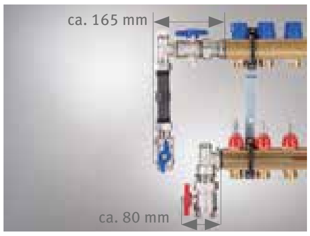
Ball valve set passageway (Item No. 295100)



Manifold connection set 90° (Item No. 291100)



WMZ connection set passageway (Item No. 721017 or 721027)



WMZ connection set 90° (Item No. 721037 or 721047)

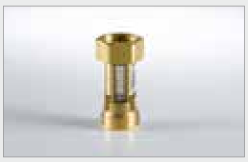
| Heating circuits | Ball valve set passageway | Manifold connection set 90° | WMZ connection set passageway | | WMZ connection set 90° |
|---|---|---|---|---|---|
| | 295100 | 291100 | 721017 | 721027 | 721037 / 721047 |
| 2 | 520 mm | 520 mm | 720 mm | | 520 mm |
| 3 | 520 mm | 520 mm | 720 mm | | 520 mm |
| 4 | 520 mm | 520 mm | 720 mm | | 520 mm |
| 5 | 520 mm | 520 mm | 720 mm | | 720 mm |
| 6 | 520 mm | 720 mm | 920 mm | 920 mm | 720 mm |
| 7 | 720 mm | 720 mm | 920 mm | 920 mm | 720 mm |
| 8 | 720 mm | 720 mm | 920 mm | 920 mm | 720 mm |
| 9 | 720 mm | 720 mm | 920 mm | 1,120 mm | 920 mm |
| 10 | 720 mm | 920 mm | 1,120 mm | 1,120 mm | 920 mm |
| 11 | 920 mm | 920 mm | 1,120 mm | 1,120 mm | 920 mm |
| 12 | 920 mm | 920 mm | 1,120 mm | 1,120 mm | 920 mm |

## Assignment of brass manifolds / manifold connection set and WMZ connection set in combination with manifold cabinets “Economy” flush- or surface mounted

| Heating circuits | Ball valve set passageway | Manifold connection set 90° | WMZ connection set passageway | | WMZ connection set 90° |
|---|---|---|---|---|---|
| | 295100 | 291100 | 721017 | 721027 | 721037 / 721047 |
| 2 | 550 mm | 550 mm | 700 mm | | 550 mm |
| 3 | 550 mm | 550 mm | 700 mm | | 550 mm |
| 4 | 550 mm | 550 mm | 700 mm | | 550 mm |
| 5 | 550 mm | 550 mm | 850 mm | | 550 mm |
| 6 | 550 mm | 550 mm | 850 mm | 850 mm | 700 mm |
| 7 | 550 mm | 700 mm | 850 mm | 1,000 mm | 700 mm |
| 8 | 700 mm | 700 mm | 1,000 mm | 1,000 mm | 700 mm |
| 9 | 700 mm | 700 mm | 1,000 mm | 1,000 mm | 850 mm |
| 10 | 700 mm | 850 mm | 1,000 mm | --- | 850 mm |
| 11 | 850 mm | 850 mm | --- | --- | 850 mm |
| 12 | 850 mm | 850 mm | --- | --- | 1,000 mm |

**NOTE** The images show possible installation situations.
Other combinations with valves (page 57) and the assignment of manifold – manifold cabinet (from page 61) are possible, however, but not available as a set.

## manifold accessories

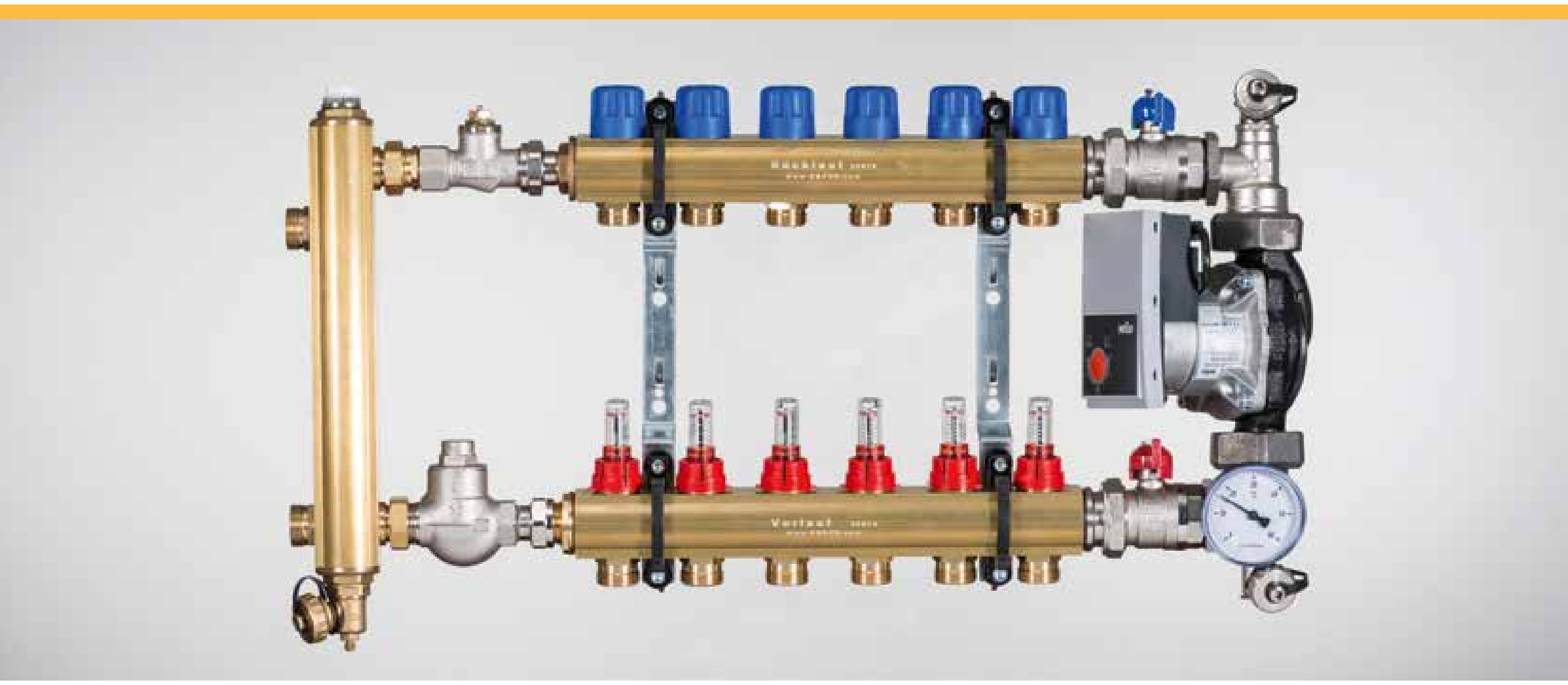
| Item | Item description | PU | Price €/set | Item No. | PG |
|---|---|---|---|---|---|
|  | **Manifold connection set 90° for manifold 1"**<br>consisting of: 2 ball valves DG 1" with screwed connection and connection bracket, 1" IT/ET, O-ring seal, additional borehole 1/2" for sensor or thermometer | 1 set | 45.26 | 291100 | 01 |
|  | **Manifold connection set passageway for manifold**<br>nickel-plated, O-ring seal, consisting of: 2 ball valves with screwed connection<br>1" IT/ET | 1 set | 29.78 | 295100 | 01 |
| | 5/4" IT/ET | 1 set | 75.03 | 290114 | 01 |
|  | **1/2" WMZ connection set 90°, fully pre-assembled for manifold 1", incl. ball valves**<br>for installed length L = 110 mm (Qn = 0.6 – 1.5 m³/h) consisting of: 1 DG ball valve, 2 elbows and 2 DG ball valves with M10x1 sensor bore-hole for short direct immersion sensor, type DS (27.5) in accordance with EN1434, total length approx. 315 mm, installation width approx. 165 mm | 1 set | 76.61 | 721037 | 01 |
| | **3/4" WMZ connection set 90°, fully pre-assembled for manifold 1", incl. ball valves**<br>for installed length L = 130 mm (Qn = 1.6 – 2.5 m³/h) consisting of: 1 DG ball valve, 2 elbows and 2 DG ball valves with M10x1 sensor bore-hole for short direct immersion sensor, type DS (27.5) in accordance with EN1434, total length approx. 385 mm, installation width approx. 165 mm | 1 set | 101.42 | 721047 | 01 |
|  | **1/2" WMZ connection set passageway, fully pre-assembled for manifold 1", incl. ball valves**<br>for installed length L = 110 mm (Qn = 0.6 – 1.5 m³/h) consisting of: 1 DG ball valve and 2 DG ball valves with M10x1 sensor borehole for short direct immersion sensor, type DS (27.5) in accordance with EN1434, Total length approx. 330mm | 1 set | 70.81 | 721017 | 01 |
| | **3/4" WMZ connection set passageway, fully pre-assembled for manifold 1", incl. ball valves**<br>for installed length L = 130 mm (Qn = 1.6 – 2.5 m³/h) consisting of: 1 DG ball valve and 2 DG ball valves with M10x1 sensor borehole for short direct immersion sensor, type DS (27.5) in accordance with EN1434, Total length approx. 395 mm | 1 set | 95.44 | 721027 | 01 |
|  | **Ball valve 3/4" nickel-plated for manifold 1"**<br>acc. to DIN EN 1264-4 the following requirements according to 4.1.2.4.3 must be met: “Every circuit must have two shut-off valves and one balancing device. The shut-off and balancing functions must be independent of each other...”<br>For assembly on feed flow (bottom) | 1 unit | 5.45/unit | 722002 | 01 |
|  | **Flow meter for manifold 1"**<br>Flow meters with direct display 0.6-2.4 l / min. 3/4" x 3/4" IT x 3/4" ET euroconus. For installation in the return flow (above) | 1 unit | 22.63/unit | 233434 | 01 |

**NOTE** Assignment of manifold and connection sets see page 51 and 55

Recommended retail price

| Item | Item description | PU | Price €/set | Item No. | PG |
|---|---|---|---|---|---|
|  | **Balancing valve 2-16 l/min**<br>with angle seat valve and integrated flow indicator for the precise and fast hydraulic balancing of consumer circuits in HVAC systems, max. operating temperature 100 °C at 6 bar operating pressure or 70 °C at 10 bar. Brass casing, EPDM seals. DN 20, kvs value 2.0;<br>installation length approx. 86 mm, total length approx. 101 mm | 1 unit | 54.77 | 521001 | 01 |
|  | **STAD line regulating valve**<br>consisting of: Casing, upper part, spindle and throttling valve plug, O-ring seals made of EPDM, fitting for differential pressure and flow measurement with volume limitation, shut-off and drainage<br>DN 20, kvs value 3.6;<br>installation length about 91 mm, total length about 135 mm | 1 unit | 106.00 | 270134 | 01 |
| | DN 25, kvs value 6.5;<br>installation length about 110 mm, total length about 146 mm | 1 unit | 121.43 | 270135 | 01 |
|  | **Connector piece**<br>made of brass, for sensors, heat meters or thermometers<br>Dimensions: 1" IA x 1/2" IT single | 1 unit | 13.69 | 721100 | 01 |
|  | **Immersion sleeve**<br>for WMZ feed flow sensor 1/2" ET | 1 unit | 17.87 | 720134 | 01 |
|  | **Manifold crosspiece**<br>1" ET x 1/2" IT x 3/8" IT | 1 unit | 8.73 | 720100 | 01 |
|  | **Brass reducer**<br>1" ET x 1/2" IT | Bag 5 unit | 3.45 | 791012 | 01 |
| | 1" ET x 3/4" IT | Bag 5 unit | 3.45 | 791034 | 01 |
| | 5/4" ET x 1" IT | Bag 5 unit | 4.76 | 791010 | 01 |
|  | **Immersion thermometer indicator** spec. design, adjustable, 0-60 °C<br>Red | 1 unit | 11.74 | 620060 | 01 |
| | Blue | 1 unit | 11.74 | 620062 | 01 |
|  | **Contact thermometer** with spring<br>for mounting to manifold or pipeline to max. 5/4"<br>black 0-80 °C, diameter: 40 mm | 1 unit | 10.10 | 620067 | 01 |
|  | **Zone valve**<br>with screwed connection and actuator for zone-by-zone control via room thermostat, dimensions: 3/4" ET - 3/4" IT,<br>length: 125 mm, kvs value 5.1 m $^3$/h with reducer 1" ET x 3/4" IT | 1 unit | 69.43 | 520027 | 01 |

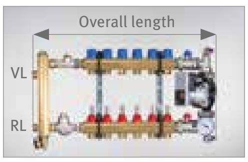
Recommended retail price



## Control manifold HCM-DR with high-efficiency pump and thermoseparator, version 2.0

**From 1" brass profile pipe with integrated valves and flowrate indicator**

Fully assembled control manifold with pump and thermoseparator, suitable for variable or constant flow temperature control in combination with control set V or K for the hydraulic integration of low-temperature floor heating in existing heating system consisting of: Brass manifold HCM-D, high-efficiency pump, fine control valve, valve body for rule set “connection K” or “actuator control set V”, 1 thermo separator, 2 shut-off valves, 2 rinsing, filling and drain valves as well as a pointer thermometer.

| Item | Item description | Heating circuits | Connection | Overall length in mm** | Price € / unit | Item No. | PG |
|---|---|---|---|---|---|---|---|
|  | **Control manifold HCM-DR** with high-efficiency pump and integral valves, valve clearance 50 mm factory assembled on manifold holders with inserts for noise suppression, thermoseparator with ventilation and draining. Return flow valve (above) with blue protection cap. EMPUR® actuators can be installed directly instead. Feed flow (below) with controllable and adjustable flow rate indicators (0-2.5 l/min.). Heating circuit connections 3/4" euroconus, clamping rings ordered separately according to the pipe sizing. In carton with nameplates to identify the manifold outlets. | HCM-DR 2 | 1" | 430 | 768.39 | 250212 | 01 |
| | | HCM-DR 3 | 1" | 480 | 804.00 | 250312 | 01 |
| | | HCM-DR 4 | 1" | 530 | 834.69 | 250412 | 01 |
| | | HCM-DR 5 | 1" | 580 | 865.21 | 250512 | 01 |
| | | HCM-DR 6 | 1" | 630 | 895.71 | 250612 | 01 |
| | | HCM-DR 7 | 1" | 680 | 925.72 | 250712 | 01 |
| | | HCM-DR 8 | 1" | 730 | 956.34 | 250812 | 01 |
| | | HCM-DR 9 | 1" | 780 | 986.83 | 250912 | 01 |
| | | HCM-DR 10 | 5/4" | 885 | 1,137.87 | 251012 | 01 |
| | | HCM-DR 11 | 5/4" | 935 | 1,171.48 | 251112 | 01 |
| | | HCM-DR 12 | 5/4" | 985 | 1,204.91 | 251212 | 01 |
| | | HCM-DR 13 | 5/4" | 1,035 | 1,238.42 | 251312 | 01 |
| | | HCM-DR 14 | 5/4" | 1,085 | 1,271.98 | 251412 | 01 |
| | | HCM-DR 15 | 5/4" | 1,135 | 1,305.54 | 251512 | 01 |
| | | HCM-DR 16 | 5/4" | 1,185 | 1,339.06 | 251612 | 01 |

* Construction length incl. thermoseparator

Compression fittings according to the pipe dimensions see page 42, allocation table see page 60, manifold cabinets see page 64/65 (plus cabinets!).

In accordance with the requirements of EC Regulation No.: 641/2009 on the energy performance of circulators, these control stations shall have an energy efficiency index (EEI) of $\leq$ 0.23 since 1.1.2015. The control manifold comes as standard with high-efficiency pumps. This pump falls significantly below the required value with an EEI value of $\leq$ 0.20 and therefore offers the possibility of immediate energy savings.

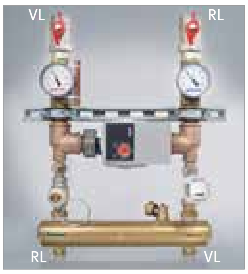
**NOTE** The water quality requirements according to VDI 2035 must be adhered to! To protect the flow rate indicator and fittings, we recommend that old systems are rinsed thoroughly and to check for the installation of a dirt trap. Use cabinets Top Standard plus or Exclusiv plus in combination with this! Thermostatic head control set K or actuator for control set V must be ordered separately! Control terminal strip with pump logic (see page 87, Item 574111/574112 or page 89 Item 585017) is required, overheat thermostat recommended, WMZ set upon request!

Recommended retail price

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Thermostatic head control set “K” for control manifold HCM-DR version 2.0** constant flow temperature control via adjustable thermostatic head, mounted on the valve body (on the return manifold, above). Capillary sensor, loose for detecting the heating circuit flow temperature, mounting on the flow manifold (below). Packaged in carton. | 1 unit | 50.16/unit | 520040 | 01 |
|  | **Actuator PUR DRIVE 230 V/1,8 W/NC** with adapter 28 x 1,5 **control set “V” for control manifold HCM-DR, version 2.0** as a zone controller in combination with room thermostat and control terminal strips with pump logic, to be mounted on the valve body in the return flow (above). | 1 unit | 29.78/unit | 520030 | 01 |
|  | **Overheat thermostat 230 V for control manifold HCM-DR, version 2.0** for limiting the max. heating circuit flow temperature on the control manifold, with capillary sensor for detecting the heating circuit flow temperature, mounting on the flow manifold (below). Adjustment range: 30-90°C, blocking of the temperature possible. Operating voltage: 230 V AC 50 Hz; 1 changeover contact 15 (2) A switching current; IP 20. Dimensions ca. 105 x 45 x 50 mm. Packaged in carton. | 1 unit | 30.78/unit | 510621 | 01 |
|  | **Ball valve 3/4" nickel-plated for PUR-THERM® manifold 1"** according to DIN EN 1264-4 the following requirements according to 4.1.2.4.3 must be met: “Every circuit must have two shut-off valves and one balancing device. The shut-off and balancing functions must be independent of each other...” For assembly on feed flow (bottom). | 1 unit | 5.45/unit | 722001 | 01 |
|  | **Connection set 90° for thermoseparator** consisting of: 1 STAD 3/4", 1 brass bracket 3/4" IA, 1 brass screwed connection 3/4" IA, 1 corner ball valve 3/4" 1 brass sleeve 3/4" | 1 set | 154.83/set | 230042 | 01 |
|  | **DG connection set for thermoseparator** consisting of: 1 STAD 3/4", 1 brass screwed connection 3/4" IA, 1 ball valve DG 3/4", 1 brass sleeve 3/4" | 1 set | 150.68/set | 230032 | 01 |

## CONTEMP alpha control station with high-efficiency pump and thermoseparator

for maintaining a constant feed flow temperature, for fluctuating feed flow temperatures of the heat generator




| | | | | | |
|---|---|---|---|---|---|
| | **CONTEMP alpha control station with high-efficiency pump** CONTEMP 1" thermoseparator, control valve with remote sensor metering valve, pointer immersion thermometer for feed and return flow and ball shut-off valves with screwed connection. **The installation of a STAD valve for hydraulic balancing is stipulated.** Heat generator connection 3/4" ET, CONTEMP alpha 25, depending on volume flow and pressure loss suitable for areas of up to 250 m², factory design recommended! | 1 unit | 853.93/unit | 510705 | 01 |

Recommended retail price

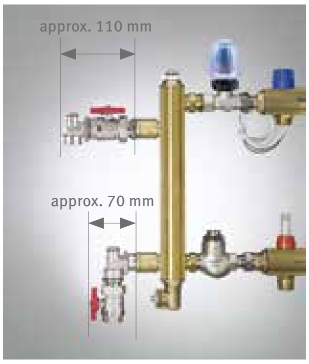
# Manifold technology

7.4 Control manifold

## Assignment of control manifold HCM-DR incl. hydraulic separator in combination with manifold cabinets “Top Standard plus” and “Exclusiv plus”


KH-DG


STAD-DG




KH-90°


STAD-90°

### Control manifold always in the “plus” manifold cabinet

| HCM-R - Type heating circuits | KH-DG + hydr, separator | STAD-DG + hydr, separator | KH-90° + hydr, separator | STAD-90° + hydr, separtor |
|---|---|---|---|---|
| 2 | 720 mm | 720 mm | 720 mm | 920 mm |
| 3 | 720 mm | 920 mm | 920 mm | 920 mm |
| 4 | 920 mm | 920 mm | 920 mm | 920 mm |
| 5 | 920 mm | 920 mm | 920 mm | 920 mm |
| 6 | 920 mm | 920 mm | 920 mm | 1,120 mm |
| 7 | 920 mm | 1,120 mm | 1,120 mm | 1,120 mm |
| 8 | 1,120 mm | 1,120 mm | 1,120 mm | 1,120 mm |
| 9 | 1,120 mm | 1,120 mm | 1,120 mm | 1,120 mm |
| 10 | 1,120 mm | 1,120 mm | 1,120 mm | 1,320 mm |
| 11 | 1,320 mm | 1,320 mm | 1,320 mm | 1,320 mm |
| 12 | 1,320 mm | 1,320 mm | 1,320 mm | 1,320 mm |
| 13 | 1,320 mm | 1,320 mm | 1,320 mm | 1,520 mm |
| 14 | 1,520 mm | 1,520 mm | 1,520 mm | 1,520 mm |
| 15 | 1,520 mm | 1,520 mm | 1,520 mm | 1,520 mm |
| 16 | 1,520 mm | 1,520 mm | 1,520 mm | 1,520 mm |

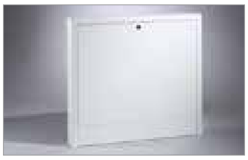
| Accessories for special items | Item description | Price €/unit | Item No. | PG |
|---|---|---|---|---|
| **Only available in combination with HCM-DR, subject to factory lay-out and pre-assembled!** | **Assembly accessories for WMZ connection set to 1" control manifold HCM-DR 2-9** compl. factory pre-mounted with pump, thermoseparator and selected WMZ set DG* | **Surcharge** 86.94 | EM000005 | 01 |
| | **Assembly accessories for WMZ connection set to 5/4" control manifold HCM-DR 10-16** compl. factory pre-mounted with pump, thermoseparator and selected WMZ set DG* | **Surcharge** 94.72 | EM000006 | 01 |
| | *** ATTENTION! Item no. 721017 (1/2" 110 mm) or 721027 (3/4" 130 mm) see page 56, must be ordered separately! Adjust cabinet width, see data sheet!** | | | |

**NOTE** The diagrams show potential installation situations. The ball valve or STAD accessories shown for connection to the thermoseparator (see page 56/57) must be ordered separately, are then supplied with the manifold or can be pre-mounted at the factory at an extra charge. Unless otherwise stated, HCM-R manifolds are prefabricated for connection on the left, as illustrated.

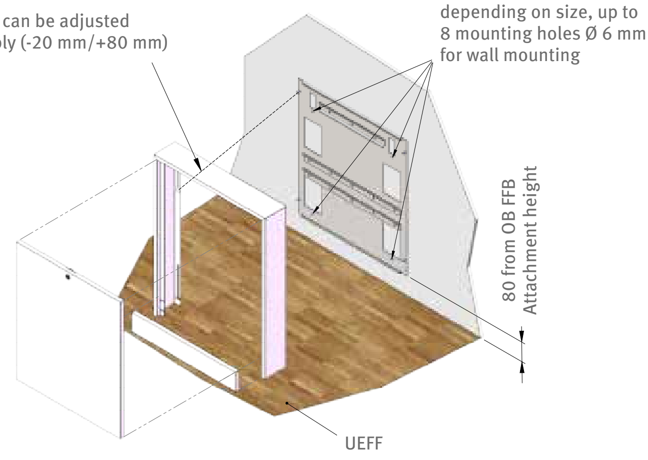
Recommended retail price

## Manifold cabinet "Top Standard"

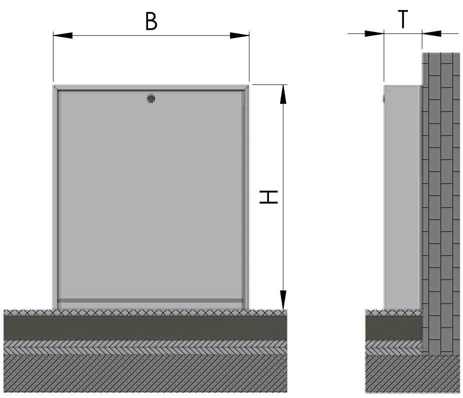
HCM 1" made of brass and stainless steel for 2-12 heating circuits (see from pages 49)

| Item | Item description |
|---|---|
|  | **Manifold cabinet "Top Standard" with removable back panel**<br>for **wall-mounted assembly** in shell construction and for retrofitting on finished floors, made of sheet steel, galvanised, all visible parts foiled in white similar to RAL 9016, Height 650 mm, Depth 100 mm, available in four different sizes, removable back panel with pre-mounted top-hat rail for holding the terminal strip and suspension rail for securing the system manifold, also pre-punched left and right openings for the primary connections in the back panel, removable door with coin-operated lock, removable screed bezel |

| | Size | Width (B) in mm | Height (H) in mm | Depth (T) in mm | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|---|---|
| | 1 | 520 | 650 | 100 | 110.51 | 268130 | 01 |
| | 2 | 720 | 650 | 100 | 125.29 | 268230 | 01 |
| | 3 | 920 | 650 | 100 | 154.74 | 268330 | 01 |
| | 4 | 1,120 | 650 | 100 | 169.52 | 268430 | 01 |




size in mm



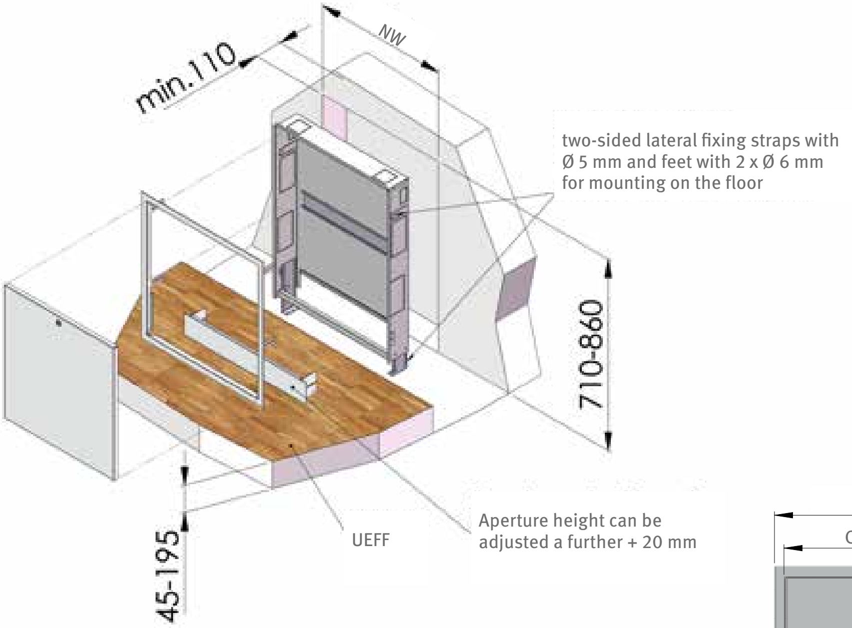

**NOTE** When assembling the "TOP-Standard" manifold cabinet, the attachment height of the back panel must be observed!

Recommended retail price

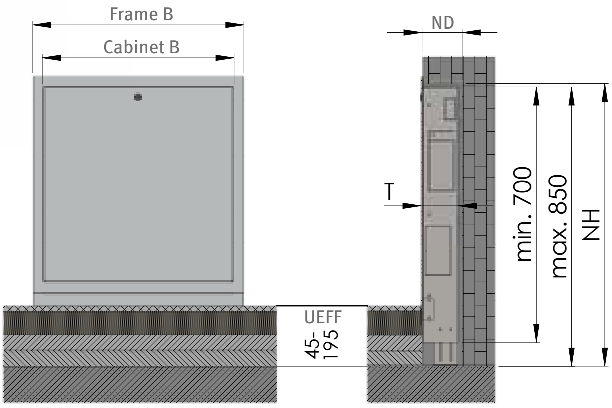
## Manifold cabinet "Exclusiv"

| Item | Item description |
|---|---|
|  | **Manifold cabinet "Exclusiv"**<br>for **flush-mounted installation** made of sheet steel, galvanised, all visible parts in white similar to RAL 9016, height adjustable 700-850 mm, adjustable depth 100-150 mm, available in four different sizes, Rear wall with pre-mounted top-hat rail for the regulator terminal strip and suspension rail for securing the system manifold, pre-punched left and right openings for the primary connections removable door with coin-operated lock, removable diverting rail and height adjustable screed bezel |

| Size | Cabinet width (B) in mm | Frame width (B1) in mm | Niche width (NB) in mm | Cabinet height (H) in mm | Cabinet height incl. frame (H1) in mm | Niche height (NH) in mm | Cabinet depth (T) in mm | Niche depth (NT) in mm | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 520 | 575 | 540 | 700-850 | 725-875 | 710-860 | 100-150 | min. 110 | 117.92 | 268120 | 01 |
| 2 | 720 | 775 | 740 | 700-850 | 725-875 | 710-860 | 100-150 | min. 110 | 132.67 | 268220 | 01 |
| 3 | 920 | 975 | 940 | 700-850 | 725-875 | 710-860 | 100-150 | min. 110 | 158.47 | 268320 | 01 |
| 4 | 1,120 | 1,175 | 1,140 | 700-850 | 725-875 | 710-860 | 100-150 | min. 110 | 173.19 | 268420 | 01 |



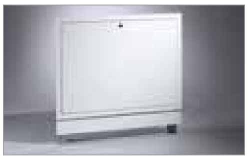

size in mm



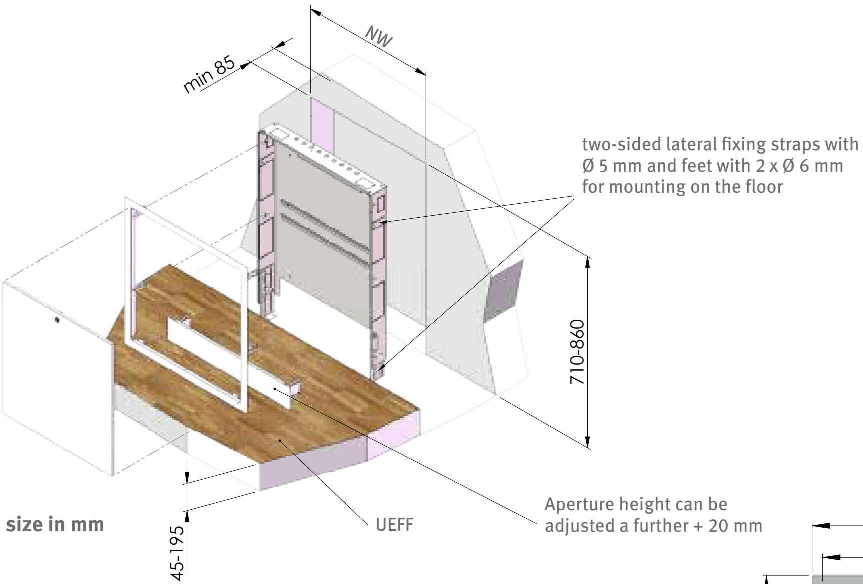

**NOTE** **"Top Standard" and "Exclusiv" quick manifold installation in just 2 steps:**
**1. Position in the manifold cabinet rail**
**2. Fix with screws**
**With top-hat rail for control terminal strip, plastic door on request.**

Recommended retail price

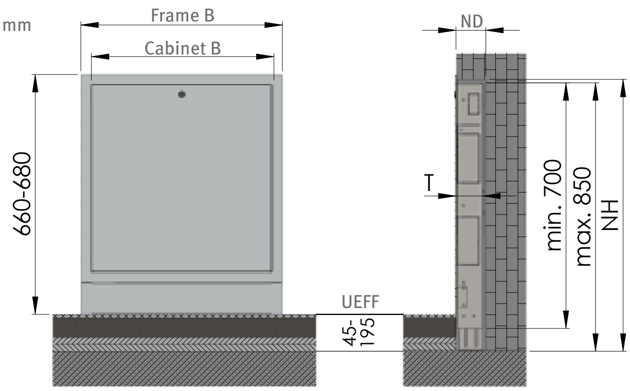
## Manifold cabinet "Exclusiv superflach"

| Item | Item description |
|---|---|
|  | **Manifold cabinet "Exclusiv superflach"**<br>like the manifold cabinet "Exclusiv", but for **flush-mounted assembly in lightweight and drywall construction,** adjustable depth 75-100 mm<br>– without diverting rail – |

| Size | Cabinet width (B) in mm | Frame width (B1) in mm | Niche width (NB) in mm | Cabinet height (H) in mm | Cabinet height incl. frame (H1) in mm | Niche height (NH) in mm | Cabinet depth (T) in mm | Niche depth (NT) in mm | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 520 | 575 | 540 | 700-850 | 725-875 | 710-860 | 75-100 | min. 85 | 116.08 | 268140 | 01 |
| 2 | 720 | 775 | 740 | 700-850 | 725-875 | 710-860 | 75-100 | min. 85 | 130.82 | 268240 | 01 |
| 3 | 920 | 975 | 940 | 700-850 | 725-875 | 710-860 | 75-100 | min. 85 | 156.61 | 268340 | 01 |
| 4 | 1,120 | 1.175 | 1,140 | 700-850 | 725-875 | 710-860 | 75-100 | min. 85 | 171.35 | 268440 | 01 |




size in mm




**NOTE**

**"Exclusiv superflach" quick manifold assembly in just 2 steps:**
**1. Position in the manifold cabinet rail**
**2. Fix with screws**
**With top-hat rail for control terminal strip, plastic door on request.**

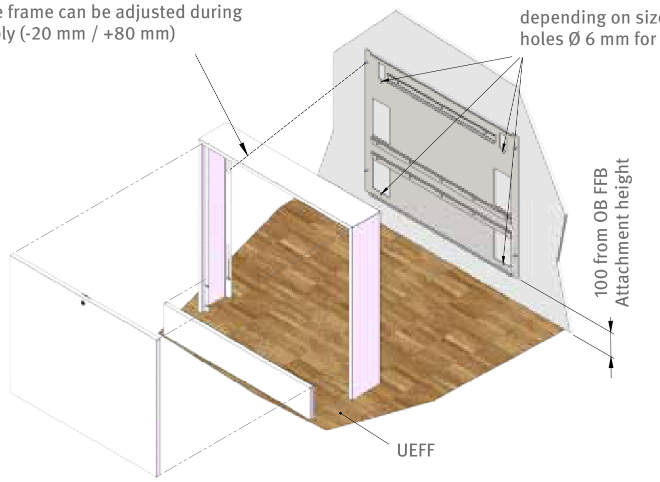
Recommended retail price

## Manifold cabinet “Top Standard plus”

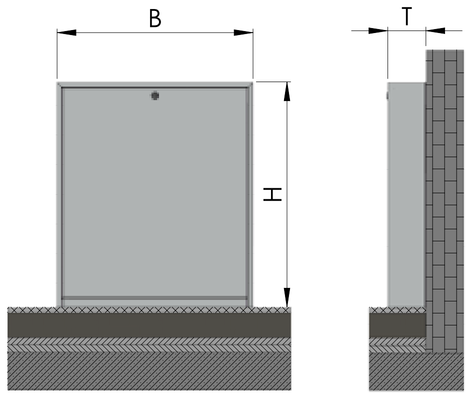
Brass manifold HCM-D 5/4" 13 - 16 Heating circuits (Page 54)
Control manifold HCM-DR 1" 2 - 9 Heating circuits (Page 58)
Control manifold HCM-DR 5/4" 10 - 16 Heating circuits (Page 58)
Industry manifold XXL 5/4" 5 - 16 Heating circuits (Page 97)

| Item | Item description |
|---|---|
|  | **Manifold cabinet “Top Standard plus” with removable back panel**<br>for **on-the-wall mounting** in shell construction as well as for subsequent installation on finished floors, made of sheet steel, galvanised, all visible parts foiled in white, similar to RAL 9016, height 700 mm, depth 130 mm, available in five different sizes, with pre-mounted top-hat rail for holding the control terminal strip and suspension rail for fixing the system manifold, also pre-punched left and right openings for the primary connections in the back panel, removable door with coin-operated lock, removable screed bezel |

| Size | Width (B) in mm | Height (H) in mm | Depth (T) in mm | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|---|
| 1 | 720 | 700 | 130 | 182.78 | 269135 | 01 |
| 2 | 920 | 700 | 130 | 227.37 | 269235 | 01 |
| 3 | 1,120 | 700 | 130 | 249.85 | 269335 | 01 |
| 4 | 1,320 | 700 | 130 | 283.38 | 269435 | 01 |
| 5 | 1,520 | 700 | 130 | 316.55 | 269535 | 01 |




**size in mm**

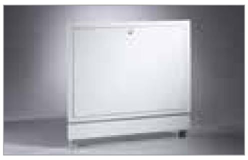



**NOTE**

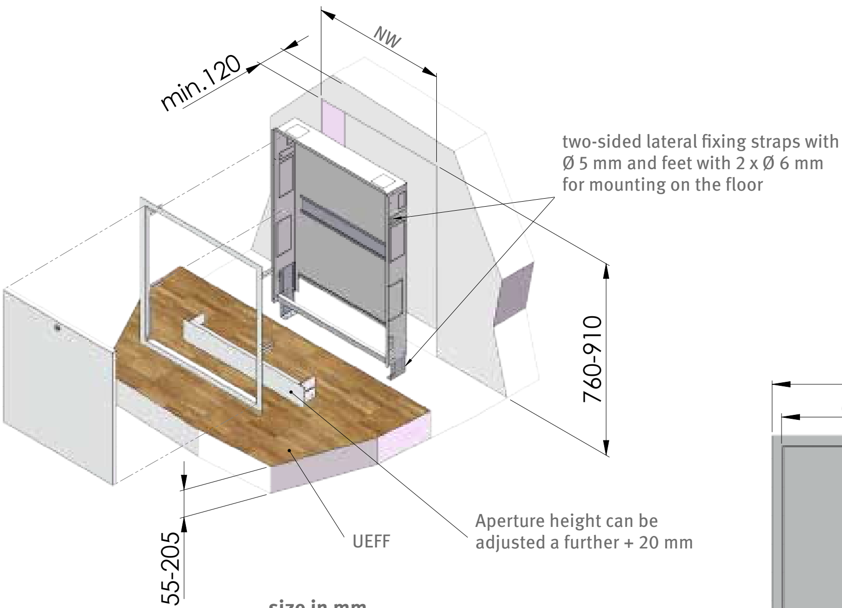
**“Top Standard plus” and “Exclusiv plus” quick manifold installation in just 2 steps:**
**1. Position in the manifold cabinet rail**
**2. Fix with screws**
**With top-hat rail for control terminal strip, plastic door on request.**

Recommended retail price

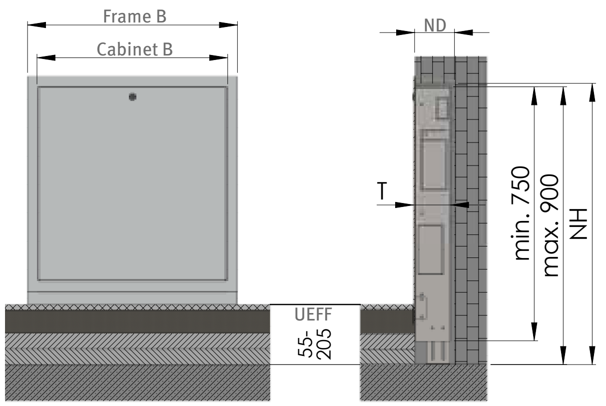
## Manifold cabinet “Exclusiv plus”

| Item | Item description |
|---|---|
|  | **Manifold cabinet “Exclusiv-plus”**<br>For **flush-mounted installation** made of sheet steel, galvanised, all visible parts foiled in white similar to RAL 9016, height-adjustable 750-900 mm, adjustable depth 110-160 mm, available in five different sizes, pre-mounted top-hat rail on the back panel for accommodating the control terminal strip and suspension rail for securing the system manifold, pre-punched left and right openings for the primary connections, removable door with coin-operated lock, removable diverting rail and height adjustable screed bezel |

| Size | Cabinet width (B) in mm | Frame width (B1) in mm | Niche width (NB) in mm | Cabinet height (H) in mm | Cabinet height incl. frame (H1) in mm | Niche height (NH) in mm | Cabinet depth (T) in mm | Niche depth (NT) in mm | Price €/ unit | Item No. | PG |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 720 | 775 | 740 | 750-900 | 775-925 | 760-910 | 110-160 | min. 120 | 147.40 | 269125 | 01 |
| 2 | 920 | 975 | 940 | 750-900 | 775-925 | 760-910 | 110-160 | min. 120 | 175.04 | 269225 | 01 |
| 3 | 1,120 | 1,175 | 1,140 | 750-900 | 775-925 | 760-910 | 110-160 | min. 120 | 193.46 | 269325 | 01 |
| 4 | 1,320 | 1,375 | 1,340 | 750-900 | 775-925 | 760-910 | 110-160 | min. 120 | 217.42 | 269425 | 01 |
| 5 | 1,520 | 1,575 | 1,540 | 750-900 | 775-925 | 760-910 | 110-160 | min. 120 | 241.38 | 269525 | 01 |




size in mm




**NOTE**

**“Top Standard plus” and “Exclusiv plus” quick manifold installation in just 2 steps:**
**1. Position in the manifold cabinet rail**
**2. Fix with screws**
**With top-hat rail for control terminal strip, plastic door on request.**

Recommended retail price

## Manifold cabinet "Economy"

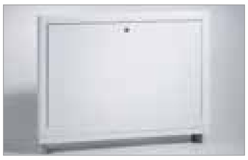
The universal cabinet for housing – simple, compact and economical!

| Item | Item description |
|---|---|

**Manifold cabinet "Economy"**
made of galvanised sheet steel for **wall-mounted assembly**, all visible parts white powder coated,
4 different sizes (widths) available and packed in a box;
depth 110 mm, height 585 mm
closed design, smooth side panels, supply and return connections from below,
removable door with twist-lock incl. 2 manifold mounting rails and 8 mounting screws

**Top-hat rail for mounting the control terminal strip is not supplied!**

| Size | Width (B) in mm | Height (H) in mm | Depth (T) in mm | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|---|
| 1 | 550 | 585 | 110 | 61,44 | 267130 | 01 |
| 2 | 700 | 585 | 110 | 72.65 | 267230 | 01 |
| 3 | 850 | 585 | 110 | 83.08 | 267330 | 01 |
| 4 | 1,000 | 585 | 110 | 91.78 | 267430 | 01 |



**Manifold cabinet "Economy"**
made of galvanised sheet steel for **flush-mounted assembly**, all visible parts white powder coated,
4 different sizes (widths) available and packed in a box;
depth 110 to 165 mm, height 560 to 660 mm
Supply and return connections either from left, right or below, removable door with twist-lock
incl. 2 manifold mounting rails and 8 mounting screws

**Top-hat rail for mounting the control terminal strip is not supplied!**

| Size | Cabinet width (B) in mm | Frame width (B1) in mm | Niche width (NB) in mm | Cabinet height (H) in mm | Cabinet height incl. frame (H1) in mm | Niche height (NH) in mm | Cabinet depth (T) in mm | Niche depth (NT) in mm | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 550 | 620 | 570 | 560-660 | 595-695 | 570-670 | 110-165 | min. 120 | 68.20 | 267120 | 01 |
| 2 | 700 | 770 | 720 | 560-660 | 595-695 | 570-670 | 110-165 | min. 120 | 75.10 | 267220 | 01 |
| 3 | 850 | 920 | 870 | 560-660 | 595-695 | 570-670 | 110-165 | min. 120 | 83.15 | 267320 | 01 |
| 4 | 1,000 | 1,070 | 1,020 | 560-660 | 595-695 | 570-670 | 110-165 | min. 120 | 98.67 | 267420 | 01 |

**NOTE**

**Top-hat rail for mounting a control terminal strip is not supplied!**
Due to the compact cabinet dimensions (height), the additional space required for this must be taken into account horizontally where necessary and then the cabinet width increased.
Quick manifold installation not available! Plastic door not available.
**Cannot be used for XXL industrial manifold (5/4"), HCM-R (1" and 5/4") and EMPUR® Geniax complete manifolds.**

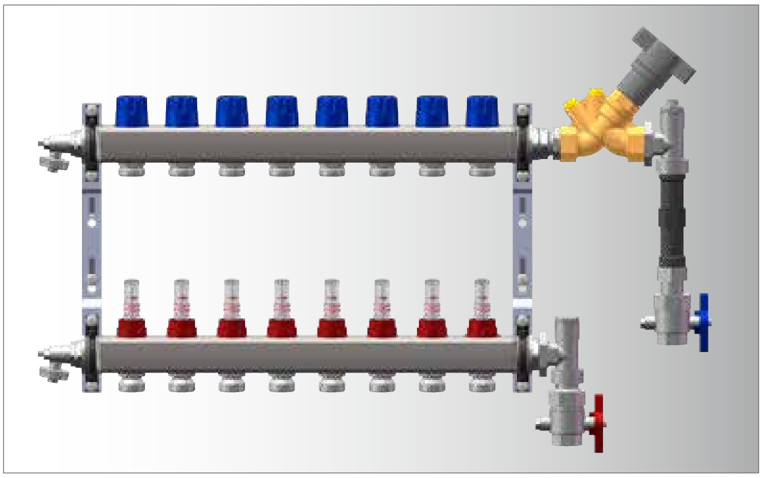
Recommended retail price

## We produce individual complete manifold solutions on request!

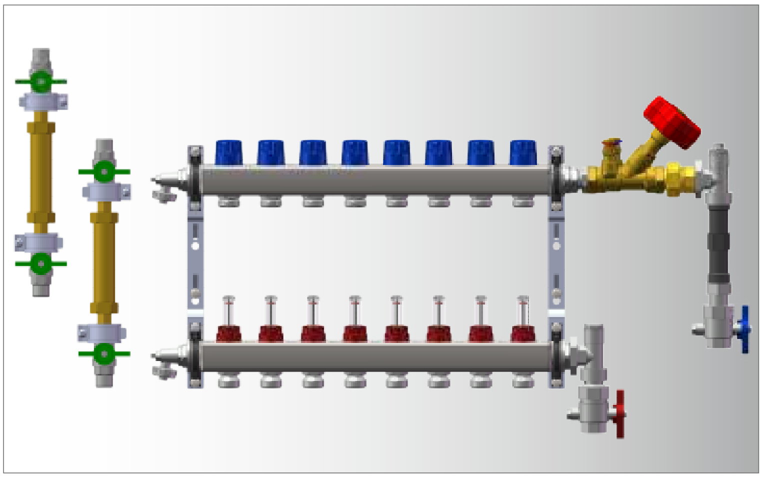
Please email your enquiries to your corresponding sales representative.

### Components fully assembled according to customer specifications

- Manifold
- Manifold cabinet
- Heat volume measurement set
- Water meter track
- Actuators
- Control terminal strip
- Line regulating valve
- Connection accessories



Please choose from our price list of corresponding components.



# EMPUR® Geniax heat distribution system

## 8.1 Comfort manager for the heating

The EMPUR® Geniax heat distribution system is a flexible surface heating and control system which enables the appropriate, customised heating of individual rooms in residential and non-residential buildings.

Each heating circuit is equipped with a small, highly-efficient glandless circulation pump on the manifold or directly on the radiator, which often makes the central heating pump obsolete. The decentralised pumps are controlled by a central intelligence system, the Geniax server. This server receives its information regarding changing actual and target temperature values from control units with integrated sensors which are networked with one another using the Geniax BUS.

The combination of software-controlled temperature regulation and decentralised pumps at the heat transfer panels ensures that each individual room is provided with the exact required heat.

Besides the benefits which include best possible energy efficiency and increased heating comfort, the system is characterised by high functionality and flexibility.

The range of services offered by EMPUR® includes the manufacture and sale of Geniax components. Within the company group, the core competencies of planning and commissioning for Geniax solutions are anchored in the two independent scopes of EM-plan GmbH and EM-solution GmbH. The expert EM-plan team assists in the configuration of Geniax manifold solutions and EM-solution is responsible for commissioning and functional checks.

### Benefits for the end-consumer

- Average 20% heating cost savings*
- Average 50% electricity cost savings*
- Additional 15% saving potential through automatic hydraulic balancing
- Simple and intuitive operation with smartphone, tablet or PC
- Sustainable and environmentally friendly system
- Maintains desired temperatures with individual, room-by-room adjustment of time and temperature profiles
- Quick heating function for pleasant warmth in no time at all
- Modern design in terms of shape and function

* compared to conventional heating systems

### Benefits for specialised trade

- Time savings due to the elimination of manual hydraulic balancing
- No installation of thermostat and line regulating valves
- Installation of pump adapters with simple connection and assembly technology
- Pumps can be installed and removed when the system is full
- Can be remotely operated
- Support from EMPUR® during planning
- On-site service during design and commissioning by EMPUR® service technicians

## Design

EMPUR® Geniax – the comfort manager for heat distribution and cooling with decentralised pumps and room temperature control system

## Note

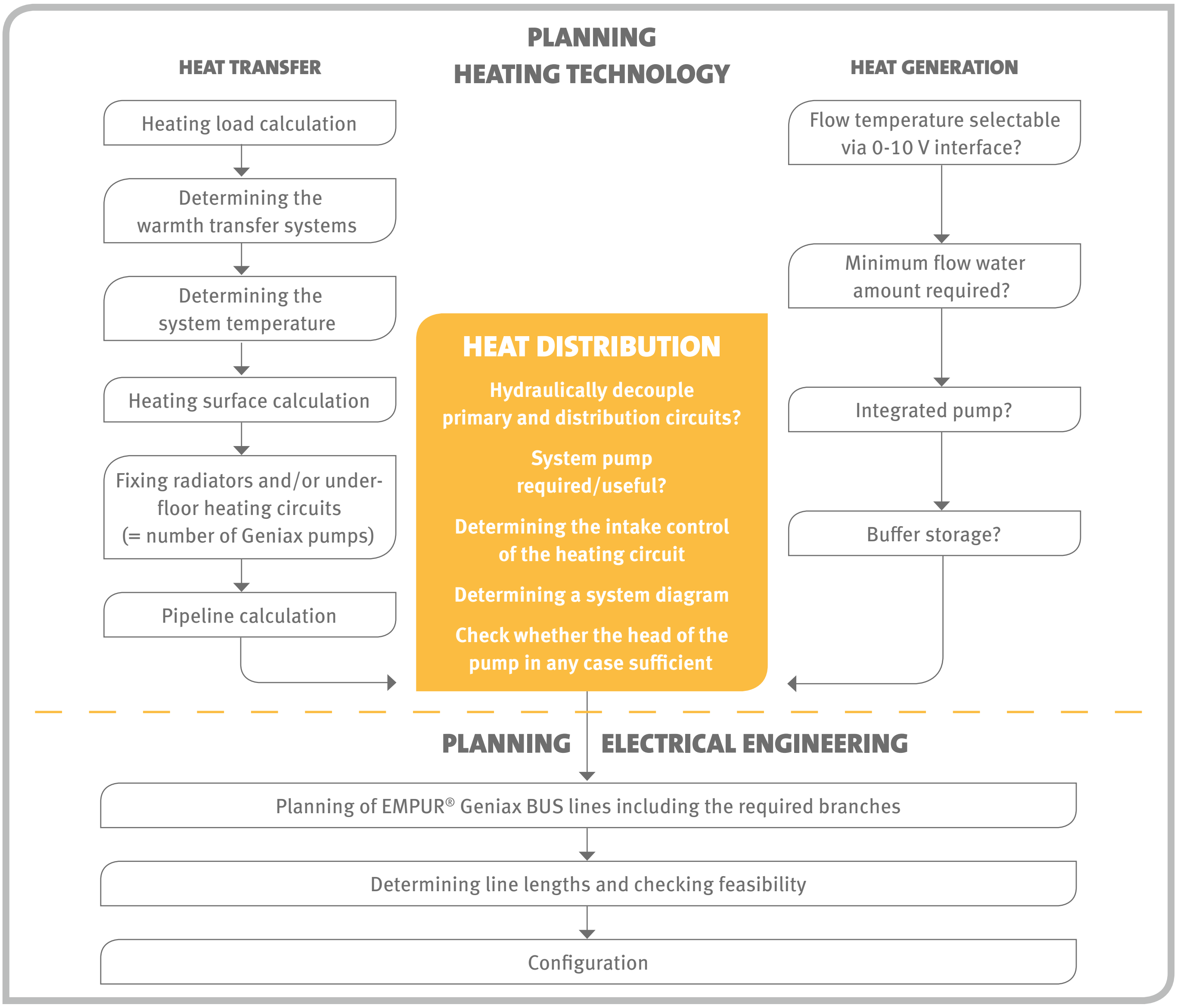
The EMPUR® Geniax decentralised pump system consists of three component groups: Geniax pump, Geniax management and Geniax operation. The interaction between the decentralised pumps, the control units (for temperature recording and operation in each room) and the components at the management level (server, BUS, coupler, power supply...) ensures that the system functions as a whole. The decentralised pumps cannot be used without the management and operating level components.

## Use

- **Hot-water heating** in combination with surface heating or radiators
- **Cooling function**

### Special features/product benefits

- **Safety of an optimally hydraulically balanced system with proven energy savings of 20%**
- **Affordable alternative to building automation with a graphical analysis option and a focus on heating and cooling**
- **Highest level of home and living comfort as a result of incomparable temperature stability, room-by-room control as well as time and user profiles**
- **High level of supply reliability due to decentralised pumps**



# EMPUR® Geniax heat distribution system



## Consideration of the interplay

If decentralised pumps are planned, the system must be considered as a whole. An integrated plan is then expected to create an optimum interplay of all components.

## Differences to the conventional process

Planning a heating system with decentralised pumps according to the EMPUR® Geniax principle does not differ from the conventional process until the heating surface calculation. Once the pressure losses of the individual lines are known, check whether the delivery head of the decentralised heating pumps is sufficient in each case. If it is not sufficient, a solution can be found by enlarging the cross-sections of the pipes, dividing up the heating surfaces or including a feeder circuit.

**When planning transfer surfaces, it is important that the decentralised heating pumps must always be installed in the return flow pipe. In addition, backflow preventers must be installed in the inflow pipe.**

Mixer valves and primary mass flow throttle valves must be checked.

## Building and client preferences

Of course, the starting point is the building and its specific heat requirement. The client's desire for specific warmth transfer systems such as underfloor or radiator heating together with the physical conditions provide the starting point for planning.

## Heat generator

The choice of heat generator will lend the system further properties. Depending on whether the heat generator has an integrated pump and/or requires a minimum volume of circulating water, a hydraulic decoupling of the primary and secondary circuits may be required, e.g. using a hydraulic separator. To be able to make use of the flow temperature optimisation, heat generators with a 0-10 V interface are best, as they can be controlled directly by the EMPUR® Geniax server.

## Heat distribution

Heat distribution must meet the defined specifications. It should also optimally make use of the decentralised pumps. The delivery head and the possible volume flow of the pumps are to be observed. You can choose from a multitude of hydraulic variants.

## EMPUR® Geniax complete manifold

The unique EMPUR® Geniax pump technology in the unit together with the high-quality EMPUR® components such as the manifold, manifold cabinet etc. facilitate the installation and operation of modern surface heating systems (e.g. floor or wall heating systems) as well as conventional heating systems in heating and cooling applications.

## Geniax BUS system

Once the hydraulic planning has been completed, the EMPUR® Geniax BUS must then be planned. True-to-scale building plans are an imperative prerequisite for this. The exact line lengths are required to determine an adequate power supply.

The installation location of the room control units is determined by the room layout and is normally on the inner walls. During the hydraulic planning stage, the installation locations for pumps and their electronics are fixed (distance of pump to electronics max. 1.5 m). In the vicinity of the heat generator, the next step is to determine the installation location of the control cabinet for the Geniax server and power supply.

From the server, the lines of the Geniax BUS are planned according to the specifications described in the EMPUR® Geniax planning manual. For branching, Geniax bus couplers with power supply must be provided. The same applies to longer line lengths, where a sufficient power supply can not be guaranteed with only one central power supply.

At the end of the electrical planning stage, a topological plan with all bus participants and cable paths is created. The topological plan describes the arrangement of bus participants and the cable routing in buildings, taking into account the specific characteristics of the bus participants.

## Configuration

Once all components including the mass flows and the control concept are fixed, the essential details are transferred to the configuration. The configuration file created using the configuration software is saved on an SD card and inserted into the server for commissioning. In doing so, the configuration is automatically uploaded to the server. This file forms the basis for all component assignments and their control functions.

## Commissioning and functional checks

Trained EMPUR® customer service technicians carry out commissioning and functional checks in Germany.

The listed net prices, which do not include VAT, do not include costs for any materials required. The prices are only valid for properly installed systems.

## Inspection and maintenance

Regular inspections and maintenance of systems ensure complete performance in the long term with appropriate energy utilisation and operational reliability.

## By experts for experts

Our customers and partners have very different needs. That is why EMPUR® experts offer a wide range of consulting services for specialised tradesmen and planners. We support you competently and develop solutions together with you with state-of-the-art communication means. So you get the correct information that you need.

**The EMPUR® Geniax helpline for specialist trade companies**

- Product Information
- Answers to application questions
- Information concerning delivery times
- Spare parts advice

**Tel. +49 2683 96062-731**

**The EMPUR® Geniax helpline for planners and engineers**

- Information about products, applications and documentation
- Support for product design
- Provision of technical data

**Tel. +49 2683 96062-732**

**E-mail: Geniax-Helpline@empur.com**

| | | |
|---|---|---|
| **Availability:** | Monday to Thursday | 7 am to 6 pm |
| | Friday | 7 am to 3 pm |

**Our well-known website: www.geniax.de**

# EMPUR® Geniax heat distribution system

## 8.3 EMPUR® Geniax stainless-steel manifold

The unique Geniax pump technology in the unit together with the high-quality EMPUR® components such as the manifold, manifold cabinet etc. facilitate the installation and operation of modern surface heating systems (e.g. floor or wall heating systems) as well as conventional radiator systems. The advantages of individual production and the production expertise set standards in manifold technology.

### EMPUR® Geniax complete stainless steel manifold

| Item description | Heating circuits | Connec-tion | Overall length | Cabinet width in mm* | Price €/ unit | Item No. | PG |
|---|---|---|---|---|---|---|---|
| **EMPUR® Geniax complete manifold HCM-G, stainless steel** | | | | | | | |
| Fully assembled in the **“Exclusiv plus” flush-mounted** | | | | | | | |
| **manifold cabinet** with factory-mounted pump electronics | HCM-G 2 | 1" IT | 200 | 720 | 573.86 | 280206 | 04 |
| and bus terminals, Geniax pumps and backflow preventer | HCM-G 3 | 1" IT | 250 | 720 | 794.72 | 280306 | 04 |
| supplied loose, factory tested and logged | HCM-G 4 | 1" IT | 300 | 720 | 1,015.25 | 280406 | 04 |
| | HCM-G 5 | 1" IT | 350 | 920 | 1,243.35 | 280506 | 04 |
| Stainless-steel 1" section pipe manifold with pump | HCM-G 6 | 1" IT | 400 | 920 | 1,463.90 | 280606 | 04 |
| adapters for installation of Geniax pumps in return flow | HCM-G 7 | 1" IT | 450 | 920 | 1,684.33 | 280706 | 04 |
| (above) and adapters for installing the backflow preventer | HCM-G 8 | 1" IT | 500 | 920 | 1,905.49 | 280806 | 04 |
| in the feed flow, two nickel-plated manifold end-pieces | HCM-G 9 | 1" IT | 550 | 1,120 | 2,133.24 | 280906 | 04 |
| with reducer for filling, bleeding and draining, rotating, | HCM-G 10 | 1" IT | 600 | 1,120 | 2,353.90 | 281006 | 04 |
| manifold holder with sound insulation insert and identifi- | HCM-G 11 | 1" IT | 650 | 1,120 | 2,573.82 | 281106 | 04 |
| cation plates | HCM-G 12 | 1" IT | 700 | 1,120 | 2,798.03 | 281206 | 04 |
| **EMPUR® Geniax complete manifold HCM-G, stainless steel** | | | | | | | |
| Fully assembled in the **“Top standard plus” surface-mounted** | HCM-G 2 | 1" IT | 200 | 720 | 566.98 | 280207 | 04 |
| **manifold cabinet** with factory-mounted pump electronics | HCM-G 3 | 1" IT | 250 | 720 | 787.84 | 280307 | 04 |
| and bus terminals, Geniax pumps and backflow preventer | HCM-G 4 | 1" IT | 300 | 720 | 1,008.37 | 280407 | 04 |
| supplied loose, factory tested and logged | HCM-G 5 | 1" IT | 350 | 920 | 1,239.84 | 280507 | 04 |
| | HCM-G 6 | 1" IT | 400 | 920 | 1,460.40 | 280607 | 04 |
| Stainless-steel 1" section pipe manifold with pump adapters | HCM-G 7 | 1" IT | 450 | 920 | 1,680.82 | 280707 | 04 |
| for installation of Geniax pumps in return flow (above) and | HCM-G 8 | 1" IT | 500 | 920 | 1,901.99 | 280807 | 04 |
| adapters for installing the backflow preventer in the feed | HCM-G 9 | 1" IT | 550 | 1,120 | 2,126.88 | 280907 | 04 |
| flow, two nickel-plated manifold end-pieces with reducer for | HCM-G 10 | 1" IT | 600 | 1,120 | 2,347.15 | 281007 | 04 |
| filling, bleeding and draining, rotating, manifold holder with | HCM-G 11 | 1" IT | 650 | 1,120 | 2,567.47 | 281107 | 04 |
| sound insulation insert and identification plates | HCM-G 12 | 1" IT | 700 | 1,120 | 2,791.67 | 281207 | 04 |

**NOTE**

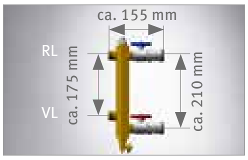
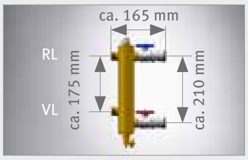
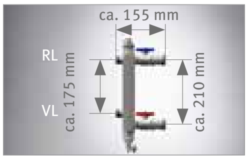
* Cabinet width is designed for manifold incl. switch.
All complete manifolds can be optionally expanded with hydraulic switch in brass or stainless steel.
Niche width concealed manifold cabinet = cabinet width + 20 mm. Delivery time upon request.

Recommended retail price

## Complete EMPUR® Geniax brass manifold

| Item description | Heating circuits | Connection | Overall length | Cabinet width in mm* | Price €/ unit | Item No. | PG |
|---|---|---|---|---|---|---|---|
| **EMPUR® Geniax complete manifold HCM-G, brass** Fully assembled in the **"Exclusiv plus" flush-mounted manifold cabinet** with factory-mounted pump electronics and bus terminals, Geniax pumps and backflow preventer supplied loose, factory tested and logged | HCM-G 2 | 1" IT | 150 | 720 | 567.51 | 280202 | 04 |
| | HCM-G 3 | 1" IT | 200 | 720 | 786.25 | 280302 | 04 |
| | HCM-G 4 | 1" IT | 250 | 720 | 1,004.22 | 280402 | 04 |
| | HCM-G 5 | 1" IT | 300 | 920 | 1,229.87 | 280502 | 04 |
| | HCM-G 6 | 1" IT | 350 | 920 | 1,447.84 | 280602 | 04 |
| | HCM-G 7 | 1" IT | 400 | 920 | 1,665.86 | 280702 | 04 |
| Brass 1" (5/4") section pipe manifold with pump adapters for installation of Geniax pumps in return flow (above) and adapters for installing the backflow preventer in the feed flow, two manifold end-pieces with reducer for filling, bleeding and draining, rotating, manifold holder with sound insulation insert and identification plates | HCM-G 8 | 1" IT | 450 | 920 | 1,884.40 | 280802 | 04 |
| | HCM-G 9 | 1" IT | 500 | 1,120 | 2,109.76 | 280902 | 04 |
| | HCM-G 10 | 1" IT | 550 | 1,120 | 2,327.78 | 281002 | 04 |
| | HCM-G 11 | 1" IT | 600 | 1,120 | 2,545.73 | 281102 | 04 |
| | HCM-G 12 | 1" IT | 650 | 1,120 | 2,763.72 | 281202 | 04 |
| | HCM-G 13 | 5/4" IT | 700 | 1,320 | 3,049.35 | 281302 | 04 |
| | HCM-G 14 | 5/4" IT | 750 | 1,320 | 3,269.86 | 281402 | 04 |
| | HCM-G 15 | 5/4" IT | 800 | 1,320 | 3,490.34 | 281502 | 04 |
| **EMPUR® Geniax complete manifold HCM-G, brass** Fully assembled in the **"Top Standard plus" surface-mounted manifold cabinet** with factory-mounted pump electronics and bus terminals, Geniax pumps and backflow preventer supplied loose, factory tested and logged | HCM-G 2 | 1" IT | 150 | 720 | 560.64 | 280203 | 04 |
| | HCM-G 3 | 1" IT | 200 | 720 | 779.37 | 280303 | 04 |
| | HCM-G 4 | 1" IT | 250 | 720 | 997.35 | 280403 | 04 |
| | HCM-G 5 | 1" IT | 300 | 920 | 1,226.36 | 280503 | 04 |
| | HCM-G 6 | 1" IT | 350 | 920 | 1,444.34 | 280603 | 04 |
| | HCM-G 7 | 1" IT | 400 | 920 | 1,662.35 | 280703 | 04 |
| Brass 1" (5/4") section pipe manifold with pump adapters for installation of Geniax pumps in return flow (above) and adapters for installing the backflow preventer in the feed flow, two manifold end-pieces with reducer for filling, bleeding and draining, rotating, manifold holder with sound insulation insert and identification plates | HCM-G 8 | 1" IT | 450 | 920 | 1,880.89 | 280803 | 04 |
| | HCM-G 9 | 1" IT | 500 | 1,120 | 2,103.40 | 280903 | 04 |
| | HCM-G 10 | 1" IT | 550 | 1,120 | 2,321.42 | 281003 | 04 |
| | HCM-G 11 | 1" IT | 600 | 1,120 | 2,539.37 | 281103 | 04 |
| | HCM-G 12 | 1" IT | 650 | 1,120 | 2,757.37 | 281203 | 04 |
| | HCM-G 13 | 5/4" IT | 700 | 1,320 | 3,045.82 | 281303 | 04 |
| | HCM-G 14 | 5/4" IT | 750 | 1,320 | 3,266.33 | 281403 | 04 |
| | HCM-G 15 | 5/4" IT | 800 | 1,320 | 3,486.82 | 281503 | 04 |

**Thermoseparators for EMPUR® Geniax stainless steel and brass complete manifolds must be ordered separately!**

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **Thermoseparator 1" brass** with 3/4" ball valves for manifold installation, secondary connection 1" for distance 210 mm primary connection 3/4" ET flat sealing, distance 175 mm | 1 unit | 77.06 | 230052 | 04 |
|  | **Thermoseparator 5/4" brass** with 3/4" ball valves for manifold installation, secondary connection 1" for distance 210 mm primary connection 3/4" ET flat sealing, distance 175 mm | 1 unit | 104.58 | 230053 | 04 |
|  | **Thermoseparator 1" stainless steel** with 3/4" ball valves for manifold installation, distance 210 mm incl. transitions primary connection 3/4" ET flat sealing, distance 175 mm | 1 unit | 71.55 | 230054 | 04 |

**NOTE** Connection set for thermoseparator can be found on page 59 (Check cabinet width!). The water quality requirements according to VDI 2035 must be adhered to! With 10 outflows or more, the modules are not fully assembled! Delivery is then as a cabinet incl. accessories, packed separately and with fully assembled Geniax manifold. If self-assembly is preferred, all components and parts shall be delivered as a set. This reduces the list price of the complete manifold by € 17 per heating circuit outflow.

Recommended retail price

NEW

## Adapter for heaters and radiators

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Adapter Set Radiator**<br>for connection to conventional compact heaters/radiators, set consisting of one ready-to-connect feed flow adapter and one ready-to-connect return flow adapter in passageway design each, feed flow adapter for accommodating a backflow preventer, return flow adapter for accommodating the decentralised pump | 1 unit | 72.00 | 2115496 | 04 |
|   | **Adapter Set Corner**<br>for connection to conventional compact heaters/radiators, set consisting of one ready-to-connect feed flow adapter and one ready-to-connect return flow adapter in corner version each, feed flow adapter for accommodating a backflow preventer, return flow adapter for accommodating the decentralised pump. Depending on the adapter version, can be installed on the left or right or on alternate sides of the radiator | | | | |
| | **Adapter Set Corner right** | 1 unit | 72.00 | 2132813 | 04 |
| | **Adapter Set Corner left** | 1 unit | 72.00 | 2132814 | 04 |
| | **Adapter Set Corner right/left** | 1 unit | 72.00 | 2132815 | 04 |
| | **Adapter Set Corner left/right** | 1 unit | 72.00 | 2132816 | 04 |
|   | **Adapter Set Angle**<br>for connection to conventional compact heaters/radiators, set consisting of one ready-to-connect feed flow adapter and one ready-to-connect return flow adapter in angle corner design each, feed flow adapter for accommodating a backflow preventer, return flow adapter for accommodating the decentralised pump, depending on the adapter version, can be installed on the left or right or on alternate sides of the radiator | | | | |
| | **Adapter Set Angle right** | 1 unit | 72.00 | 2132817 | 04 |
| | **Adapter Set Angle left** | 1 unit | 72.00 | 2132818 | 04 |
| | **Adapter Set Angle right/left** (alternate) | 1 unit | 72.00 | 2132819 | 04 |
| | **Adapter Set Angle left/right** (alternate) | 1 unit | 72.00 | 2132820 | 04 |
|  | **Adapter H-Inline**<br>for connection to radiators with lower two-point connection, connection-ready pump adapter in passageway version for accommodating the decentralised heating pump EMPUR® Geniax pump as well as the backflow preventer | 1 unit | 72.00 | 2117514 | 04 |
|  | **Adapter H-Angle right** (pump right)<br>for connection to radiators with lower two-point connection, connection-ready pump adapter in corner version for accommodating the decentralised heating pump EMPUR® Geniax pump as well as the backflow preventer | 1 unit | 72.00 | 2117515 | 04 |
|  | **Adapter H-Angle left** (pump left)<br>for connection to radiators with lower two-point connection, connection-ready pump adapter in corner version for accommodating the decentralised heating pump EMPUR® Geniax pump as well as the backflow preventer | 1 unit | 72.00 | 2117516 | 04 |

Recommended retail price

## Adapter for manifold solutions

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Adapter Set Manifold**<br>for connection to heating circuit manifold.<br>Set consisting of two ready-to-connect adapters in passageway design for accommodating a backflow preventer and decentralised pump | 1 unit | 56.00 | 2115497 | 04 |

## Pump and pump electronics

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **EMPUR® Geniax Pump 1.0**<br>for installation in the manifold flow (above)<br>Highly-efficient glandless circulation pump with automatic power adaptation, consisting of motor with ECM technology, connection cable 1.5 m long and hydraulic unit for connection to corresponding Geniax pump adapters, power supply 24 V DC SELV | 1 unit | 87.90 | 2107484 | 04 |
|  | **EMPUR® Geniax Pump Tronic**<br>ready-to-connect pump electronics for control/regulation of the decentralised pump to be installed close to the pump, ready for installation in flush-mounted boxes, power supply 24 V DC SELV | 1 unit | 66.90 | 2097372 | 04 |

**NOTE** To complete the pump/adapter unit and ensure hydraulic function, the following is also required: **Geniax NRV set**, Item no. 2115498. Set consisting of 10 pieces of bypass with backflow preventer; Geniax accessories (see page 79).

Recommended retail price

# EMPUR® Geniax heat distribution system

## 8.5 Management

NEW

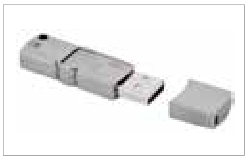
| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **EMPUR® Geniax Server 2.0**<br>connection-ready regulation and control unit, central intelligence of the Geniax system, control of all connected components, with housing according to DIN 43880 for installation in electrical manifold cabinet, power supply 24 V DC SELV | 1 unit | 675.00 | 2125135 | 04 |
|  | **EMPUR® Geniax BUS Coupler**<br>connection-ready as complete device with housing according to DIN 43880 for installation in electrical manifold cabinet, Power supply 24 V DC SELV | 1 unit | 147.00 | 2097374 | 04 |
|  | **EMPUR® Geniax Power Supply**<br>for mounting rail power supply 24 V DC, primary switch mode, 1phase for installation in the electrical manifold cabinet, Power supply 230 V AC/50 Hz | | | | |
| | **2.5 A** | 1 unit | 65.00 | 2098647 | 04 |
| | **4.2 A** | 1 unit | 79.00 | 2099206 | 04 |
|  | **EMPUR® Geniax KNX Coupler**<br>connection-ready KNX interface module as complete unit for installation in the electrical manifold cabinet, Power supply 24 V DC SELV<br>1 KNX module max. 15 rooms, several modules can be used per Geniax server | 1 unit | 526.00 | 2137532 | 04 |
|  | **EMPUR® Geniax UGW KNX**<br>Universal coupler KNX, 50 data points | 1 unit | 525.00 | 2137533 | 04 |
| | **EMPUR® Geniax UGW extension** to item no. 2137533 | | | | |
| | to 200 data points | 1 unit | 355.00 | 2137534 | 04 |
| | to 500 data points | 1 unit | 796.00 | 2137535 | 04 |
| | to 1,000 data points | 1 unit | 975.00 | 2137536 | 04 |
| | to another protocol driver e.g. BACnet, ModBus | 1 unit | 469.00 | 2137540 | 04 |
|  | **EMPUR® Geniax UGW BACnet**<br>Universal coupler BACnet, 50 data points | 1 unit | 490.00 | 2137560 | 04 |
| | **EMPUR® Geniax UGW extension** to item no. 2137560 | | | | |
| | to 200 data points | 1 unit | 355.00 | 2137534 | 04 |
| | to 500 data points | 1 unit | 796.00 | 2137535 | 04 |
| | to 1,000 data points | 1 unit | 975.00 | 2137536 | 04 |
|  | **EMPUR® Geniax BACnet Module**<br>connection-ready BACnet interface module as complete unit for installation in the electrical manifold cabinet, Power supply 24 V DC SELV | 1 unit | 2,549.00 | 2105645 | 04 |
|  | NOTE<br>**EMPUR® Geniax complete electro-manifolds**<br>Property-oriented and prefabricated electrical distribution for Geniax system, tested quality, a plug and play solution for quick installation and commissioning | | on demand | | |

Recommended retail price

NEW

# EMPUR® Geniax heat distribution system



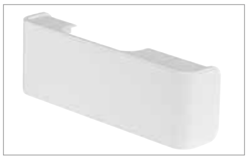
| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **EMPUR® Geniax Central Control**<br>Central control unit for temperature and time-dependent operation/ control of room groups in the EMPUR® Geniax decentralised pump system, power supply 24 V DC SELV, white | 1 unit | 183.50 | 2104104 | 04 |
|  | **EMPUR® Geniax Basic Control**<br>Room control unit for temperature-dependent, room-by-room operation of the EMPUR® Geniax decentralised pump system, for use in conjunction with an EMPUR® Geniax Central Control, power supply 24 V DC SELV, white | 1 unit | 102.50 | 2104100 | 04 |
|  | **EMPUR® Geniax Ambient Sensor**<br>(Wall-mounted)<br>Sensor for recording the room temperature in conjunction with an EMPUR® Geniax Central Control for wall-mounted installation, power supply 24 V DC SELV, white | 1 unit | 95.50 | 2104099 | 04 |
|  | **EMPUR® Geniax Ambient Sensor i**<br>(Flush-mounted)<br>Sensor for recording the room temperature in conjunction with an EMPUR® Geniax Central Control for flush-mounted installation, white | 1 unit | 106.90 | 2131230 | 04 |
|  | **EMPUR® Geniax Licence key**<br>(for the building operator or facilities manager)<br>Licence key for the EMPUR® Geniax PC operating software (EMPUR® Geniax SysManager).<br>A free USB port on the PC is required to use the licence key.<br>The following hardware and software requirements must be met to use the EMPUR® Geniax SysManager:<br>› Windows Vista/7/8 (32 or 64-bit)<br>› CPU Dual Core<br>› 1 GB RAM<br>› At least 1 GB of free hard disk space | 1 unit | 166.00 | 2122546 | 04 |
|  | **EMPUR® Geniax Licence key Pro**<br>(only for specialised tradesmen)<br>Licence key for the EMPUR® Geniax PC operating software (EMPUR® Geniax SysManager),<br>A free USB port on the PC is required to use the licence key.<br>The following hardware and software requirements must be met to use the EMPUR® Geniax SysManager:<br>› Windows Vista/7/8 (32 or 64-bit)<br>› CPU Dual Core<br>› 1 GB RAM<br>› At least 1 GB of free hard disk space | 1 unit | 261.00 | 2122547 | 04 |

Recommended retail price

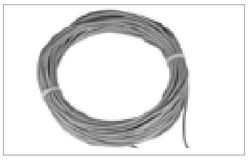
# EMPUR® Geniax heat distribution system

## 8.7 Design accessories

NEW

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Design Cover S**<br>Use in conjunction with the passageway Adapter Set Radiator, for complete coverage of the feed flow adapter including the mounted backflow preventer, white | 1 unit | 9.50 | 2117408 | 04 |
|  | **Design Cover M**<br>Use in conjunction with the passageway Adapter Set Radiators, for complete coverage of the return flow adapter including the mounted pump, white | 1 unit | 8.50 | 2101232 | 04 |
|  | **Design Cover MC**<br>Use in conjunction with the corner or Adapter Set Corner, for complete coverage of the return flow adapter including the mounted pump, white | 1 unit | 9.50 | 2132821 | 04 |
|  | **Design Cover SC**<br>Use in conjunction with the corner or Adapter Set Corner or Adapter Set Angle, for complete coverage of the feed flow adapter including the mounted backflow preventer, white | 1 unit | 8.90 | 2132822 | 04 |
|  | **Design Cover L**<br>Use in conjunction with the Adapter Set H-Inline or H-Angle, for complete coverage of the adapter including the mounted pump and mounted backflow preventer, white | 1 unit | 8.50 | 2101230 | 04 |
|  | **Design Cover Tronic**<br>For complete coverage of the Geniax Pump Tronic as well as for accommodating the pump connection cable, white | 1 unit | 12.50 | 2104098 | 04 |

Recommended retail price

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Reducing double nipple R½ x R¾**<br>self-sealing reducing double nipple R½ x R¾,<br>for assembling the Geniax Adapter H-Inline/H-Angle onto radiators with lower two-point connection | Bag = 20 units | 2.50 | 2098646 | 04 |
|  | **Eurokonus levelling piece**<br>self-sealing levelling piece with Eurokonus,<br>for assembling the Geniax Adapter H-Inline/H-Angle onto radiators with lower two-point connection | Bag = 20 units | 2.60 | 2098649 | 04 |
|  | **NRV set**<br>Bypass with integrated backflow preventer,<br>for replacing the bypass inserted into the adapters at the factory (before commissioning the EMPUR® Geniax system) | Car = 10 units | 6.20 | 2115498 | 04 |
|  | **Assembly aid**<br>for simplified assembly/disassembly of the decentralised Geniax pump as well as the bypass on all Geniax adapters,<br>for opening and closing the bypasses or the flow at the pump adapters | 1 unit | 14.50 | 2115889 | 04 |
|  | **Flow temperature sensor for heating circuits**<br>(PT 1000) for recording the flow temperatures of the heating circuits (3 m cable length) | 1 unit | 15.00 | 2101235 | 04 |
|  | **Immersion sleeve**<br>for accommodating the flow temperature sensor for heating circuits | 1 unit | 15.00 | 2101233 | 04 |
|  | **External temperature sensor**<br>(PT 1000) with housing | 1 unit | 19.00 | 2101238 | 04 |
|  | **BUS tester**<br>for checking or for limited fault diagnosis of EMPUR® Geniax BUS segments during installation and commissioning | 1 unit | 55.50 | 2132766 | 04 |

Recommended retail price

NEW

## Design

Retrofit set for under-supplied heating surfaces, consisting of:

- Heatfixx pumps: High-efficiency glandless circulation pump with fixed speed and EC motor, connection cable and hydraulic unit for connection to the corresponding Heatfixx pump adapters
- Heatfixx electronics box
- Heatfixx remote room thermostat

## Use

The Heatfixx retrofit set is intended for stand-alone use for under-supplied heating surfaces in residential and commercial areas as well as in small businesses. The set is not suitable for single-pipe heating and industrial applications.

### Special features/product benefits

- **No additional planning or complex configuration**
- **Easy handling without special tools or special training**
- **Uncomplicated assembly without major structural intervention**
- **Manageable time expenditure as a result of well-known installation technology**
- **Universal use for commercially available heating surfaces**

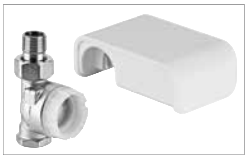
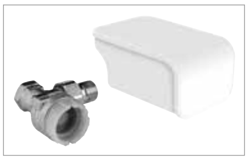
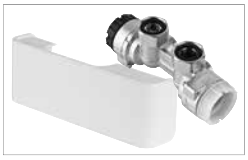
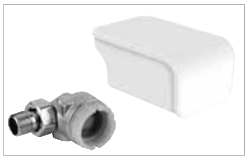
## Scope of delivery

Heatfixx wall-mounted assembly set, complete with

- Electronic box incl. mains plug for 230 V AC, power supply 24 V DC, Heatfixx module (pump electronics) and radio receiver for EnOcean® signals
- Heatfixx pump 1.0
- Remote room thermostat
- Adhesive strips for wall mounting of the remote room thermostat
- Batteries 3.6 V/1.1, Ah Type LS14250 1/2AA (for remote room thermostat)
- Installation and operating manual
- Assembly template for electronics box

Heatfixx flush-mounted assembly set, complete with

- Electronics box for flush-mounted installation, power supply 24 V DC, Heatfixx module (pump electronics) and radio receiver for EnOcean® signals
- Heatfixx pump 1.0
- Remote room thermostat
- Adhesive strips for wall mounting of the remote room thermostat

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Heatfixx flush-mounted assembly set**<br>for assembly on triple flush-mounted switch box/D = 60 mm<br>Dimensions: 223 x 85 x 51 mm | 1 unit | 510.00 | 2139419 | 06 |
|  | **Heatfixx wall-mounted assembly set**<br>Dimensions: 223 x 85 x 58 mm | 1 unit | 510.00 | 2139420 | 06 |
|  | **Heatfixx Adapter Radiator and Design Cover M** | 1 unit | 49.00 | 2140204 | 06 |
|  | **Heatfixx Adapter Corner right and Design Cover MC**<br>(for mounting the pump on the right side of the heating surface, rear outlet) | 1 unit | 49.00 | 2140205 | 06 |
|  | **Heatfixx Adapter Corner left and Design Cover MC**<br>(for mounting the pump on the left side of the heating surface, rear outlet) | 1 unit | 49.00 | 2140206 | 06 |
|  | **Heatfixx Adapter H-Inline and Design Cover L**<br>(for mounting the pump on either the left or right of the heating surface) | 1 unit | 79.00 | 2140207 | 06 |
|  | **Heatfixx Adapter H-Angle right and Design Cover L**<br>(for mounting the pump on the right side of the heating surface) | 1 unit | 79.00 | 2140208 | 06 |
|  | **Heatfixx Adapter H-Angle left and Design Cover L**<br>(for mounting the pump on the left side of the heating surface) | 1 unit | 79.00 | 2140209 | 06 |
|  | **Heatfixx Adapter Angle right and Design Cover MC**<br>(for mounting the pump on the right side of the heating surface,<br>bottom outlet) | 1 unit | 49.00 | 2145119 | 06 |
|  | **Heatfixx Adapter Angle left and Design Cover MC**<br>(for mounting the pump on the left side of the heating surface,<br>bottom outlet) | 1 unit | 49.00 | 2145120 | 06 |
| | **Assembly aid** for pump and adapter (see page 79) | 1 unit | 14.50 | 2115889 | 06 |

Recommended retail price

NEW

## Configuration

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
| | **Configuration Geniax Server < 50 pumps**<br>Creation of the server configuration for the decentralised pump system EMPUR® Geniax with < 50 pumps,<br>Creation of the topology and server configuration,<br>Configuration is carried out according to the client's specifications for nomenclature, setpoints, weekly time programs and further configuration parameters | 1 unit | 210.00 | 572065 | 05 |
| | **Configuration Geniax Server < 100 pumps**<br>Creation of the server configuration for the decentralised pump system EMPUR® Geniax with < 100 pumps,<br>Creation of the topology and server configuration,<br>Configuration is carried out according to the client's specifications for nomenclature, setpoints, weekly time programs and further configuration parameters | 1 unit | 420.00 | 572066 | 05 |
| | **Configuration Geniax Server > 100 pumps**<br>Creation of the server configuration for the decentralised pump system EMPUR® Geniax with > 100 pumps,<br>Creation of the topology and server configuration,<br>Configuration is carried out according to the client's specifications for labels, set-points, weekly programmes and further configuration parameters, billed according to costs | 1 unit | 109.00 | 572067 | 05 |
| | **Geniax KNX (2137532) configuration**<br>Creation of the KNX server configuration for the EMPUR® Geniax decentralised pump system,<br>Adaptation of the existing topology and server configuration to the corresponding KNX objects, setting of the group addresses and all necessary device settings. This is based on the existing and already implemented object-specific server configuration as well as the transfer of KNX group addresses specified by the client | 1 unit | 120.00 | 572061 | 05 |
| | **Geniax BacNet (2105645) configuration**<br>Adaptation of the existing topology and server configuration,<br>Creation of the configuration for the BACnet module as well as all necessary BACnet objects, creation of an EDE list for the BACnet objects in agreement with the BMS supplier or building automation. This is based on the existing and already implemented object-specific server configuration, billed per module. | 1 unit | 660.00 | 2120425 | 05 |
| | **Geniax UGW KNX/BACnet (2137533 + 2137560) configuration**<br>Creation of the KNX/BACnet and configuring the EMPUR® Geniax decentralised pump system,<br>Adaptation of the existing topology and server configuration<br>Creation of the gateway configuration with the corresponding KNX or BACnet objects based on the existing and already implemented object-specific server configuration as well as the transfer of the necessary information for configuration by the client, billed according to costs | 1 unit | 109.00 | 2137530 | 05 |

Recommended retail price

## Commissioning

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
| | **Commissioning Geniax Server**<br>Initial commissioning of a Geniax Server in accordance with the creator and/or the object-specific design, training on all system components, hydraulic and electrical testing of the Geniax components and the overall system, commissioning and functional testing, documentation, instruction of and handover to the customer. This is based on the existing and already implemented object-specific server configuration as well as assembly and wiring of all components, billed according to costs plus travel expenses | 1 h | 109.00 | 572060 | 05 |
| | **Commissioning KNX/BACnet**<br>Initial commissioning of a Geniax BACnet, Geniax UGW BACnet or KNX UGW module,<br>check the BACnet/KNX objects transferred via the interface, for affiliation and functionality,<br>the test is based on the EDE list created in the configuration, it is not a 1:1 data point test, but a point-by-point data point test, billed according to costs plus travel expenses | 1 h | 109.00 | 2120426 | 05 |
| | **Geniax support**<br>billed at an hourly rate for unforeseen services in relation to the configuration and/or commissioning of a Geniax system, billed according to costs plus travel expenses | 1 h | 109.00 | 2120428 | 05 |
| | **Travel expenses**<br>Outward and return per kilometre travelled | 1 km | 1.20 | 572081 | 05 |

**NOTE**

**Trained EMPUR® customer service technicians carry out commissioning and functional checks in Germany. The listed net prices, which do not include VAT, do not include costs for any materials required. The prices are valid for properly installed systems.**

**Inspection and maintenance: Regular inspections and maintenance of systems ensure complete performance in the long term with appropriate energy utilisation and operational reliability.**

**Please note that services (05) are generally not eligible for a discount.**

Recommended retail price

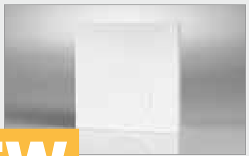
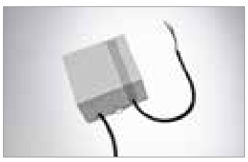
# Control technology

9.1 Standard Heating

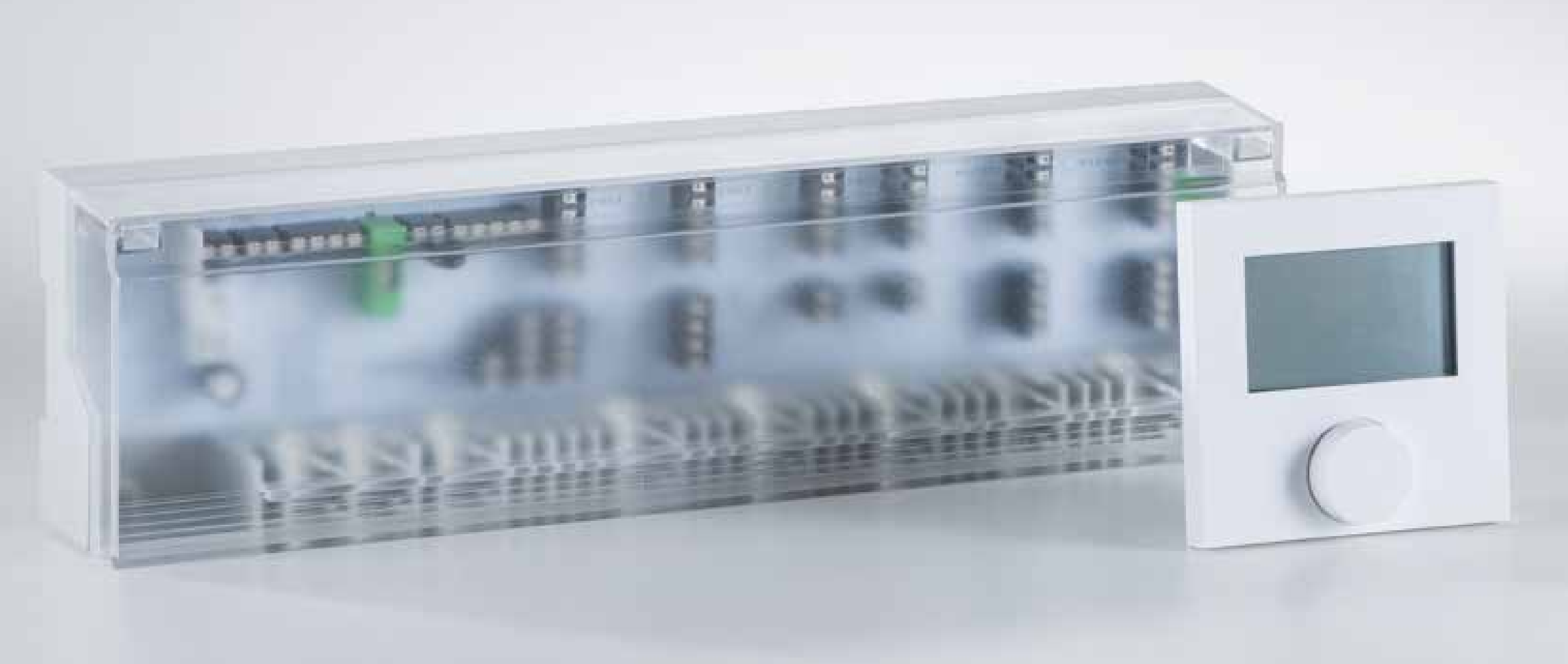

## Standard Heating control technology

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **Actuator PUR DRIVE, normally closed**<br>For zone control and for direct and simple assembly on PUR-THERM® brass and stainless steel manifolds.<br>Protection type IP 44 in all mounting positions (even overhead), protection class II; ambient temperature: 0 - 60 °C, opening/closing time: approx. 3 min, connecting cable: 2 × 0,75 mm², PVC, 1 m cable length | | | | |
| | **Actuator 230 V/1.8 W/NC** (with adapter M 30 x 1.5) | 10 units | 29.78 | 553201 | 01 |
| | **Actuator 24 V/1.8 W/NC** (with adapter M 30 x 1.5) | 10 units | 29.78 | 553202 | 01 |
| | **Actuator 230 V/1.8 W/NC** (with adapter M 28 x 1.5) | 1 unit | 29.78 | 520030 | 01 |
| | **5-year warranty for professional assembly and electrical connection to EMPUR® control terminal strip.** | | | | |
|  | **Actuator "Economy"**<br>Operating voltage 230 V, continuous power 3 W, nominal stroke 3 mm<br>Protection type IP 42, protection class II, connection cable 2 x 0.5 mm²<br>Dual position indication available (top and side)<br>Connecting thread M 30 x 1.5 mm | 50 units | 25.60 | 552309 | 01 |
|  | **DDC actuator 24 V AC, control 0-10V DC signal**<br>with adapters for valves 30 x 1.5 mm, 1 m connection cable pluggable, 3 x 0.22 m² white normally closed (NC), 1 W power consumption, "First open function", protection type IP 54 in any mounting position | 1 unit | 107.18 | 550101 | 01 |
|  | **Digital time switch 230 V with two channels**<br>for regulator terminal strip Standard heating, with 84 memory locations<br>Front panel mounting or wall mounting possible<br>Weekly and holiday program<br>Automatic summer and winter heating switchover<br>changeover contact, potential-free and phase-independent<br>text supportive user guidance on display<br>switchable display illumination, about 10-year power reserve<br>Protection type IP 20, protection class II according to EN 60 730-1<br>Dimensions: 72 x 104 x 69 mm | 1 unit | 309.28 | 584020 | 01 |

Recommended retail price

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **Room operating unit 230 V/24 V analogue standard heating**<br>Adjustment range target temperature 10-28 °C, lowering input with fixed lowering temperature. 4 °C, frost protection, IP 20 protection type, protection class: II (230 V), III (24 V), screw terminal connections for max. (5x) 1.5 mm²; Dimensions: 86 x 86 x 29 mm, ABS casing, white, set point adjuster with bar display (without set point limiter), Switching differential ± 0.5 K | | | | |
| | **230 V Analogue heating**<br>Operating voltage 230 V/50 Hz, max. switching capacity 2 A, max. 30 W resistive load (200 VA inductive)/fuse T2AH | 1 unit | 27.39 | 574103 | 01 |
| | **24 V Analogue heating**<br>Operating voltage 24 V/max. switching capacity 1 A, max. 15 W resistive load/fuse T1A | 1 unit | 27.39 | 574133 | 01 |
| <br>NEW | **Room sensor 230 V standard heating** (public building model)<br>with hidden controls for use in public areas<br>Setting range 10-28 °C, lowering input with fixed lowering temperature 2 K, frost protection function from 6 °C, protection type IP20, protection class: II<br>Operating voltage 230 V/50 Hz, max. switching capacity 1.8 A, max. 30 W resistive load (200 VA inductive)/fuse T 2 AH<br>Dimensions: 86 x 86 x 26 mm, white housing | 1 unit | 49.56 | 574105 | 01 |
|  | **Room operating unit 230 V/24 V Display Standard heating**<br>Adjustment range target temperature 5-30 °C , frost and valve protection<br>Screw terminal connections for max. 1.5 mm²<br>Dimensions: 86 x 86 x 31 mm; ABS casing, white | | | | |
| | **230 V Display heating**<br>Operating voltage 230 V/50 Hz, max. switching capacity 1A, max. 5 W, resistive load (200 VA inductive)/fuse T1AH, protection type IP20, Class II (230 V) | 1 unit | 44.94 | 572306 | 01 |
| | **24 V Display heating**<br>Operating voltage 24 V/max. switching capacity 1 A, max. 5 W resistive load/fuse T1A, IP20 protection, protection class III (24 V) | 1 unit | 44.94 | 572307 | 01 |
|  | **Regulator terminal strip 6 or 10 zones 230 V Standard heating**<br>Operating voltage 230 V/50 Hz, max. output 50 VA, fuse T4AH, integrated standard stress relief, screwless terminals for connection, two separate lowering channels for control via external timer signal, IP20 protection type, protection class II, Dimensions (H x W x D): 90 x 327 x 50 mm<br>Casing ABS light grey, transparent cover | | | | |
| | **6 zones for: 6 room control units/max. 15 actuators 230 V NC**<br>(1x5 + 1x4 + 2x2 + 2x1) Starting current per actuator max. 500 mA | 1 unit | 76.58 | 572333 | 01 |
| | **10 zones for: 10 room control units/max. 18 actuators 230 V NC**<br>(1x5 + 1x4 + 4x2 + 4x1) Starting current per actuator max. 500 mA | 1 unit | 87.52 | 572334 | 01 |
| <br> | **Regulator terminal strip 6 or 10 zones 24 V Standard heating**<br>incl. system transformer 230 V/24 V, power consumption max. 30 VA (Idle ‹0.5 W), fuse T2A for max. 15 (6 zones) or 18 (10 zones) actuators 24 V NC, max. nominal load of all drives 24 W, integrated standard stress relief, two separate lowering channels for control via external timer signal, IP20 protection type, protection class III, screwless terminals for connection cross-section max. (5x) 1.5 mm²<br>Dimensions (H x W x D): 90 x 327 x 50 mm<br>Casing ABS light grey, transparent cover | | | | |
| | **6 zones for: 6 room control units/max. 15 actuators 24 V NC**<br>(1x5 + 1x4 + 2x2 + 2x1) rated load capacity of all drives max. 24 W | 1 unit | 123.39 | 572343 | 01 |
| | **10 zones for: 10 room control units/max. 18 actuators 24 V NC**<br>(1x5 + 1x4 + 4x2 + 4x1) rated load capacity of all drives max. 24 W | 1 unit | 134.33 | 572344 | 01 |

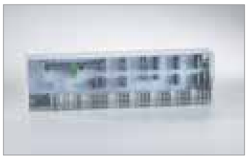
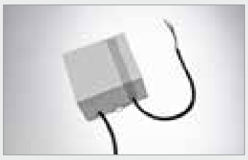
Recommended retail price



## Standard plus Heating/Cooling control technology

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **Room operating unit 230 V/24 V analogue standard plus heating/cooling**<br>Adjustment range target temperature 10-28 °C, frost protection function<br>Lowering input with fixed lowering temperature 4 °C<br>Lock the changeover input (heating/cooling switch), with cooling feature<br>Screw terminal connections for max. (5x) 1.5 mm²<br>Dimensions: 86 x 86 x 29 mm; ABS casing, white<br>set point adjuster with figures (without set point limiter) | | | | |
| | **230 V Analogue heating/cooling**<br>Operating voltage 230 V/50 Hz, max. switching capacity 2A, max. 30 W resistive load (200 VA inductive)/fuse T2AH, protection type IP20, Class II (230 V) | 1 unit | 69.87 | 574101 | 01 |
| | **24 V Analogue heating/cooling**<br>Operating voltage 24 V/max. switching capacity 1 A, max. 15 W resistive load/fuse T1A, IP20 protection, protection class III (24 V) | 1 unit | 69.87 | 574131 | 01 |
|  | **Room operating unit 230 V/24 V Display Standard plus heating/cooling**<br>Changeover input (CO signal), lowering output (switching signal), adjustable temperatures (5-30 °C) for day and night (for heating and cooling), adjustable time programmes (days/week), selectable operating mode: day/night/auto, internal timer (date and time), power reserve (10 h), correction of actual temperature (± 2K), setpoint temperature limitation, valve and frost protection function, deactivatable switching outputs (e.g. suspend cooling), child safety lock (control lock), ground sensor connection, Screw terminal connections for max. (5x) 1.5 mm²<br>Dimensions (H x W x D): 86 x 86 x 31 mm; ABS casing, white | | | | |
| | **230 V Display heating/cooling**<br>Operating voltage 230 V/50 Hz, max. switching capacity 1A, max. 15 W, resistive load (200 VA inductive)/fuse T1AH, protection type IP20, Class II (230 V) | 1 unit | 116.33 | 574102 | 01 |
| | **24 V Display heating/cooling**<br>Operating voltage 24 V/max. switching capacity 1 A, max. 15 W resistive load/fuse T1A, IP20 protection, protection class III (24 V) | 1 unit | 116.33 | 574132 | 01 |
| | **Floor sensors (NTC) 0-50 °C as accessories**<br>**for room operating unit 230 V/24 V Display Standard plus heating/cooling**<br>3 m cable length (2 x 0.75 m²), protection type IP67 | 1 unit | 26.32 | 584022 | 01 |

Recommended retail price

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **Regulator terminal strip 6 or 10 zones 230 V Standard plus heating/cooling**<br>Operating voltage 230 V/50 Hz<br>max. output 50 VA, fuse T4AH<br>Signal input changeover connection (heating/cooling changeover)<br>pump control (NO contact, unipolar switching)<br>Signal input for temperature limiter or dew point sensor<br>Lowering function with signal input for connecting external time switch<br>IP20 protection type, protection class II, screwless terminals for<br>connection cross-section max. (5x) 1.5 mm²<br>Dimensions (H x W x D): 90 x 326 x 52 mm<br>Casing ABS light grey, transparent cover | | | | |
| | **6 zones for: 6 room control units/max. 15 actuators 230 V NC**<br>(1x5 + 1x4 + 2x2 + 2x1) Starting current per actuator max. 500 mA | 1 unit | 122.44 | 574111 | 01 |
| | **10 zones for: 10 room control units/max. 18 actuators 230 V NC**<br>(1x5 + 1x4 + 4x2 + 4x1) Starting current per actuator max. 500 mA | 1 unit | 137.52 | 574112 | 01 |
| <br> | **Regulator terminal strip 6 or 10 zones 24 V Standard heating**<br>incl. system transformer 230 V/24 V, power consumption max. 30 VA<br>(Idle ‹0.5 W), fuse T2A for max. 15 (6 zones) or 18 (10 zones) actuators<br>24 V NC, max. nominal load of all drives 24 W, integrated standard stress<br>relief, two separate lowering channels for control via external timer signal,<br>IP20 protection type, protection class III, screwless terminals for connection<br>cross-section max. (5x) 1.5 mm²<br>Dimensions (H x W x D): 90 x 327 x 50 mm<br>Casing ABS light grey, transparent cover | | | | |
| | **6 zones for: 6 room control units/max. 15 actuators 24 V NC**<br>(1x5 + 1x4 + 2x2 + 2x1) rated load capacity of all drives max. 24 W | 1 unit | 172.21 | 574141 | 01 |
| | **10 zones for: 10 room control units/max. 18 actuators 24 V NC**<br>(1x5 + 1x4 + 4x2 + 4x1) rated load capacity of all drives max. 24 W | 1 unit | 183.18 | 574142 | 01 |
| **NOTE** | **Can be combined with humidity monitoring as an option**<br>Item no. 585020 or 585021 (see page 93) | | | | |
|  | **Top-hat rail for mounting the base station in the manifold cabinet**<br>Length: approx. 400 mm, packed in carton with 2 screws | 1 unit | 5.07 | 902600 | 01 |
| | Only order supplies for “Economy” manifold cabinets! | | | | |

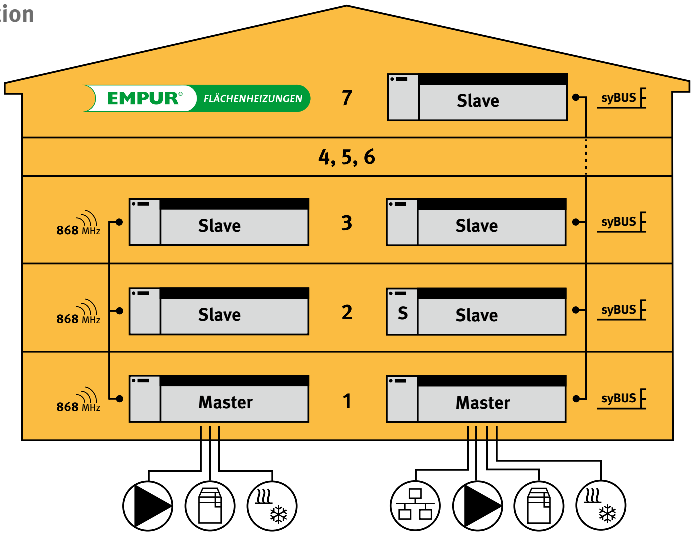
Recommended retail price

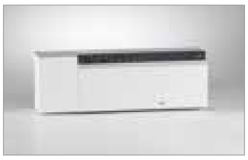
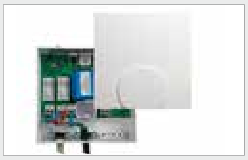
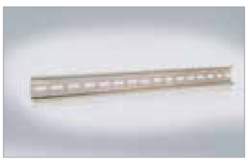
## Radio control technology

With the latest generation in convenient individual room control, you can maximise your energy efficiency and user comfort at the highest level. The modular control system offers individual solutions for new builds and renovation projects. The system is ideal for family homes or apartment buildings, administrative and commercial buildings, as well as hotels and schools. Integration into automation systems is possible.

**The Exclusiv control technology (radio/BUS) also has the option to control your heating system via Smartphone and PC.**

- **Perfect interplay of control systems over several storeys via serial bus (syBUS)**
- **Ethernet interface for simple, room-by-room operation, programming and set-up of the individual room control system as well as status visualisation via PC or smartphone**
- **Up 20% energy saving possible through intelligent control**
- **Secure communication between the system components**
- **Intuitive operation, central programming, simple initialisation**
- **Integrated system clock**
- **Individual programming and setting per heating zone**



| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **Radio basis station 230 V 868 MHz**<br>Central module for all information processing and communication with the system components.<br><br>Up to 7 base stations can be linked via radio frequency.<br>Simple, intuitive installation with clamp and plug-in technology, pilot function for heating and cooling via boiler output, central switching via external signal, dew-point monitoring via potential-free contact, integrated pump module including pump protection function, connection for safety temperature limiter, anti-freeze function, emergency operation, monitoring of the floor temperature in combination with the floor sensors, valve protection function at all outputs | | | | |
| | **4 zones for: 4 operator units/6 actuators 230 V (2 x 2 + 2 x 1)**<br>for "top hat" rail mounting<br>Max. rated load of all actuators 24 W<br>Dimensions: 225 x 52 x 75 mm | 1 unit | 317.66 | 585014 | 01 |
| | **8 zones for: 8 operator units/12 actuators 230 V (4 x 2 + 4 x 1)**<br>for "top hat" rail mounting<br>Max. rated load of all actuators 24 W<br>Dimensions: 290 x 52 x 75 mm | 1 unit | 356.83 | 585015 | 01 |
| | **12 zones for: 12 operator units/18 actuators 230 V (6 x 2 + 6 x 1)**<br>for "top hat" rail mounting<br>Max. rated load of all actuators 24 W<br>Dimensions: 355 x 52 x 75 mm | 1 unit | 432.82 | 585016 | 01 |
| <br>**1 zone version** | **Wireless base station 230 V 868 MHz**<br>**for one room control unit and one actuator (max. 10 W)**<br>**with pump logic**<br><br>for wall-mounted and flush-mounted box assembly<br>Dimensions: 86 x 86 x 33 mm<br>Colour: Casing pure white (RAL 9003)<br><br>- For a heating or cooling zone<br>- LED button for status display and easy programming<br>- Screwless spring/clamp connection technology with strain relief<br>- Micro SD card slot for easy configuration and software updates (card not included in delivery)<br>- Connection for up to seven base stations via radio<br>- Valve and pump protection function<br>- Integrated system clock<br>- Smart Start function for energy-efficient operation | 1 unit | 245.20 | 585017 | 01 |
|  | **Top-hat rail for mounting the base station in the manifold cabinet**<br>Length: approx. 400 mm, packed in carton with 2 screws<br><br>Only order supplies for "Economy" manifold cabinets! | 1 unit | 5.07 | 902600 | 01 |

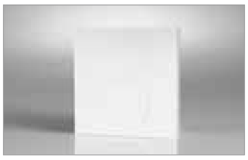
Recommended retail price

# Control technology

## 9.4 Exclusiv radio with Ethernet connection

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
| <br>Ethernet version | **Wireless base station 230 V 868 MHz with Ethernet connection RJ45**<br>The central module for all information processing and communication with the system components. In the Ethernet version, the single room control can be controlled additionally via a PC and/or Smartphone and on the Internet. An XML interface is also integrated.<br><br>Up to 7 base stations can be linked via radio frequency.<br>Simple, intuitive installation with clamp and plug-in technology, pilot function for heating and cooling via boiler output, central switching via external signal, dew-point monitoring via potential-free contact, integrated pump module including pump protection function, connection for safety temperature limiter, anti-freeze function, emergency operation, monitoring of the floor temperature in combination with the floor sensors, valve protection function at all outputs | | | | |
| | **4 zones for: 4 operator units/6 actuators 230 V (2 x 2 + 2 x 1)**<br>for “top hat” rail mounting<br>Max. rated load of all actuators 24 W<br>Dimensions: 225 x 52 x 75 mm | 1 unit | 396.00 | 585011 | 01 |
| | **8 zones for: 8 operator units/12 actuators 230 V (4 x 2 + 4 x 1)**<br>for “top hat” rail mounting<br>Max. rated load of all actuators 24 W<br>Dimensions: 290 x 52 x 75 mm | 1 unit | 435.16 | 585012 | 01 |
| | **12 zones for: 12 operator units/18 actuators 230 V (6 x 2 + 6 x 1)**<br>for “top hat” rail mounting<br>Max. rated load of all actuators 24 W<br>Dimensions: 355 x 52 x 75 mm | 1 unit | 511.16 | 585013 | 01 |
|  | **Top-hat rail for mounting the base station in the manifold cabinet**<br>Length: approx. 400 mm, packed in carton with 2 screws<br><br>Only order supplies for “Economy” manifold cabinets! | 1 unit | 5.07 | 902600 | 01 |

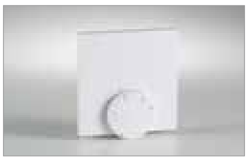
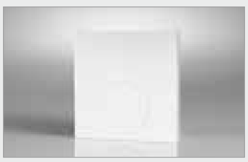
Recommended retail price

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **868 MHz wireless room control unit with display**<br>for wall and flush-mounted box assembly with large and<br>clear LC display (60 x 40 mm) from scratchproof plastic,<br>continuous display of room temperature, system time and operating status,<br>limitation of the adjustment range of the room temperature,<br>convenient dial operation,<br>turn-push mechanism with precise, dynamic setting<br><br>Adjustment range: 5-30 °C<br>Dimensions: 86 x 86 x 26 mm<br>Battery operation (2 x AAA 1.5 V)<br>Colour: casing white, anthracite display | 1 unit | 94.01 | 585001 | 01 |
|  | **Analogue 868 MHz wireless room control unit without display**<br>for wall and flush-mounted box mounting<br>convenient dial operation with 1/4-degree soft setting,<br>Patented target value comparison<br><br>Adjustment range: 10-28 °C<br>Dimensions: 86 x 86 x 26 mm<br>Battery operation (2 x AAA 1.5 V)<br>Colour: casing white | 1 unit | 76.38 | 585002 | 01 |
|  | **868 MHz radio room sensor** (authorities' model)<br>for wall-mounted and flush-mounted box assembly<br>with hidden controls for use in public areas<br><br>Adjustment range: 5-30 °C<br>Dimensions: 86 x 86 x 26 mm<br>Battery operation (2 x AAA, 1.5 V)<br>Colour: casing white | 1 unit | 86.95 | 585003 | 01 |

Recommended retail price

# Control technology

## 9.6 Exclusiv BUS with Ethernet connection

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
| <br>Ethernet version<br>BUS version wired | **Base station BUS 24 V with Ethernet connection RJ45**<br>The central module for all information processing and communication with the system components. In the Ethernet version, the single room control can be controlled additionally via a PC and/or Smartphone and on the Internet. An XML interface is also integrated.<br><br>Up to seven base stations can be linked to one another via a 3-way BUS connection. Simple, intuitive installation with clamp and plug-in technology, pilot function for heating and cooling via boiler output, central switching via external signal, dew-point monitoring via potential-free contact, integrated pump module including pump protection function, connection for safety temperature limiter, anti-freeze function, emergency operation, monitoring of the floor temperature in combination with the floor sensors, Valve protection function at all outputs<br><br>**8 zones for: 8 operator units/12 actuators 24 V (4 x 2 + 4 x 1)**<br>for “top hat” rail mounting<br>Max. rated load of all actuators 24 W<br>Dimensions: 370 x 52 x 75 mm<br>Including 24 V system transformer with mains plug | 1 unit | 474.34 | 575042 | 01 |
| <br>BUS version wired | **Room control unit BUS with display**<br>for wall and flush-mounted box assembly with large and clear LC display (60 x 40 mm) from scratchproof plastic, continuous display of room temperature, system time and operating status, limitation of the adjustment range of the room temperature, convenient dial operation, turn-push mechanism with precise, dynamic setting<br><br>Adjustment range: 5-30 °C<br>Dimensions: 86 x 86 x 26 mm<br>Battery operation (2 x AAA 1.5 V)<br>Colour: casing white, anthracite display<br><br>Two-wire bus connection, reverse polarity protected, for power supply and display backlighting | 1 unit | 94.01 | 575001 | 01 |
| <br>BUS version wired | **Room control unit BUS analogue without display**<br>for wall and flush-mounted box mounting<br>convenient dial operation with 1/4-degree soft setting, patented target value comparison<br><br>Adjustment range: 10-28 °C<br>Dimensions: 86 x 86 x 26 mm<br>Battery operation (2 x AAA 1.5 V)<br>Colour: casing white<br><br>Two-wire bus connection, reverse polarity protected, for power supply | 1 unit | 76.38 | 575002 | 01 |
|  | **868 MHz radio room sensor** (authorities’ model)<br>for wall-mounted and flush-mounted box assembly with hidden controls for use in public areas<br><br>Adjustment range: 5-30 °C, Dimensions: 86 x 86 x 26 mm<br>Battery operation (2 x AAA, 1.5 V), Colour: casing white | 1 unit | 86.95 | 575003 | 01 |

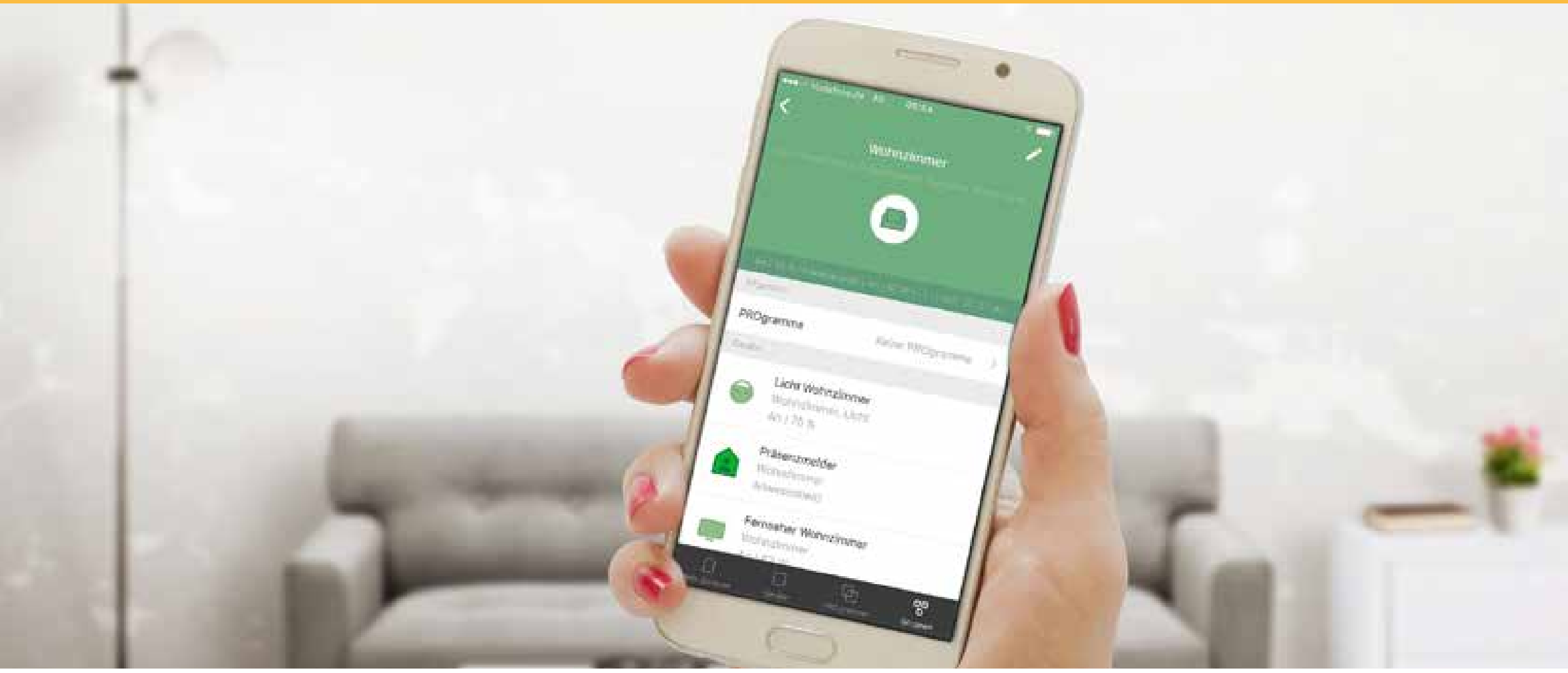
Recommended retail price

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **Humidity monitoring with internal sensor**<br>serves the purpose within a surface heating/cooling system of monitoring the dew point. It detects any condensation on the connection pipe and switches off the cooling mode of the system to protect the building, until no condensation can be discerned.<br>Power supply (24V AC/DC) via base station radio<br>(Observe the wiring) | 1 unit | 255.38 | 585020 | 01 |
|  | **Humidity monitoring with external sensor, 1 m cable length** | 1 unit | 370.14 | 585021 | 01 |
|  | **Repeater with power adapter, 1.5 m cable length**<br>is used to extend the radio range between the base station and room control units<br>Range ≥ 25 m in buildings<br>Power supply 5 V via power adapter | 1 unit | 194.67 | 585022 | 01 |
|  | **Active external antenna, with connecting cable 5 m**<br>is used to extend the radio range of the base station<br>Range ≥ 25 m in buildings<br>Power supply by base station<br><br>**Attention: Only use the supplied 5 m antenna connection cable!** | 1 unit | 189.18 | 585023 | 01 |
|  | **Top-hat rail for mounting the base station in the manifold cabinet**<br>Length: approx. 400 mm, packed in carton with 2 screws<br><br>Only order supplies for “Economy” manifold cabinets! | 1 unit | 5.07 | 902600 | 01 |

Recommended retail price

# Control technology

9.8 EMPUR® Smart Home




## EMPUR® Smart Home

The EMPUR® Smart Home Server is designed for the reliable operation of small smart home solutions up to complete building management systems. Sensors and actuators can be included in the smart home system quickly and with little effort (plug & play). The user has access to a LAN, WLAN connection and USB port for Internet access and communication with routers, smartphones, tablets and PCs.

The EMPUR® Smart Home Server is flexibly scalable, intuitive to use and ideally suited for building a smart home system in family homes, apartment buildings or administrative buildings. In addition to an increase in living comfort, intelligent home control leads above all to greater safety, the protection of buildings, energy efficiency, cost savings and, last but not least, the conservation of important resources.

The individuality and expandability of building management systems which use an EMPUR® Smart Home Server have no limits.

### The EMPUR® Smart Home in three simple steps

1. **Download the free App** for smartphone or tablet.
2. **Install** EMPUR® Smart Home **Server** .
3. **Select compatible products** yourself and enjoy complete flexibility. The products are easy to install and add on in a few simple steps.
4. **Your smart home**
   Welcome to your personal Smart Home.

### One home – one app

With the app, your smartphone becomes the remote control for the house. All sensors, actuators and devices can be operated simply and intuitively thanks to the app's clear presentation. The user gets a comprehensive overview of the current situation in their home. Various logic states, temperature values, information on air quality, window positions, system states, consumption values, and much more can be displayed or, if required, transmitted via push message.

### Secure home

Privacy protection is of the utmost importance. The EMPUR® Smart Home Server can also be operated without an internet connection. In this case, a stand-alone Wi-Fi network is established. All user data and passwords are stored and processed locally.

| Item | Item description | PU | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|
|  | **EMPUR® Smart Home Server**<br>Intelligent Smart Home Server for controlling and managing sensors and actuators with EnOcean® and Z-Wave wireless technology.<br>Connections for USB 2.0, Mini-USB 2.0 and LAN RJ45 as well as a reset switch<br>Supply voltage AC 100-240 V via plug-in power supply, power consumption max. 10 W, ambient temperature 0/40 °C, storage temperature -20/+60 °C, range 10-30 m, dimensions (W x H x D) 205 x 146 x 37 mm | 1 unit | 844.35 | 585161 | 01 |
|  | **Basic module for EMPUR® Smart Home control terminal strip, wireless (2/6 zones)**<br>Integration with EMPUR® Smart Home Server via EnOcean® wireless technology, heating/cooling switching, control of heating/cooling pumps<br>Supply voltage AC 230 V, 50-60 Hz, rated power 1 VA, ambient and storage temperature -10/+60 °C, plastic housing made of PC/ABS, colour light grey, dimensions (W x H x D) 122 x 92 x 45 mm, protection class IP 20 | 1 unit | 165.19 | 585130 | 01 |
|  | **Control terminal strip EMPUR® Smart Home, wireless 2 zones 230 V**<br>with external antenna, for max. 2 zones and 8 actuators<br>Supply voltage AC 230 V, DC 5 V via base module, rated power 0.3 W, Ambient and storage temperature -10/+60 °C, plastic housing made of PC/ABS, colour light grey, dimensions (W x H x D) 73 x 92 x 45 mm, protection class IP 20. **Can only be used in combination with basic module!** | 1 unit | 272.19 | 585131 | 01 |
|  | **Control terminal strip EMPUR® Smart Home, wireless 6 zones 230 V**<br>with external antenna, for max. 6 zones and 24 actuators<br>Supply voltage AC 230 V, DC 5 V via base module, rated power 0.5 W, Ambient and storage temperature -10/+60 °C, plastic housing made of PC/ABS, colour light grey, dimensions (W x H x D) 162 x 92 x 45 mm, protection class IP 20. **Can only be used in combination with basic module!** | 1 unit | 339.77 | 585132 | 01 |
|  | **Room control unit for EMPUR® Smart Home wireless control terminal strips**<br>extremely flat, detection of room actual temperature, setting of the room target temperature via dial operation, temperature setting range 8-30 °C, supply via solar cell, optional battery CR1632, plastic casing made of PC, colour white, dimensions (W x H x D) 78 x 82.5 x 12.5 mm,<br>4 adhesive spots for attachment | 1 unit | 183.96 | 585101 | 01 |
|  | **Room temperature sensor for EMPUR® Smart Home wireless control terminal strips**<br>Detection of room actual temperature, supply via solar cell, optional battery 1/2 AA, plastic housing made of ABS, colour white, dimensions (W x H x D) 52 x 40 x 17 mm, wall holder and 2 adhesive points for attachment | 1 unit | 162.19 | 585170 | 01 |
|  | **Room temperature and humidity sensor for EMPUR® Smart Home wireless control terminal strips**<br>Recording of room actual temperature and room actual humidity, humidity measurement 0-100 % RH ± 5% RH.<br>Supply via solar cell, optional battery 1/2 AA,<br>plastic housing made of PC, colour white,<br>dimensions (W x H x D) 52 x 40 x 17 mm,<br>wall holder and 2 adhesive points for attachment | 1 unit | 237.65 | 585171 | 01 |

**NOTE**

**The EMPUR® Smart Home Server can only be sold in combination with other system components on this page!**
The **wireless room control units, control terminal strips, as well as room temperature and humidity sensors** are connected to the **EMPUR® Smart Home Server** via EnOcean® wireless technology. The wireless range is 10 to a maximum of 30 m, depending on the room situation and the building materials used. The voltage supply of the room control units, room temperature and humidity sensors is provided by photovoltaic cells (battery operated as an option). Technical data: Accuracy ±1 K, temperature range 0-40 °C, ambient and storage temperature -20/+60 °C, protection type IP 30 (EN 60529).

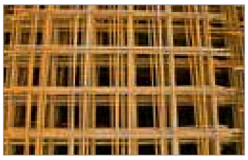
# Industry solutions

## 10.1 XXL-Industrie and EMPUR® concrete core tempering (CCT)

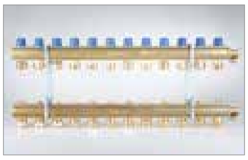
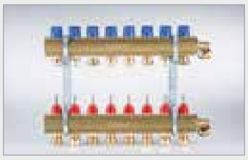
7F274-F

## XXL-Industrie and EMPUR® concrete core tempering (CCT)

The XXL-Industrie industrial panel heating system and EMPUR® concrete core tempering are sensible and cost-efficient heating systems for commercial and trade applications. With these two industrial solutions the pipes (mostly 5-layer pipes) are laid on reinforcement steel mesh and attached with binding wire. Here, the heating pipes are fixed depending on the application to the bottom, to the middle or to the upper reinforcement.

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Primed pipe mat**<br>Wire thickness 3 mm, main grid 100 x 100 mm<br>Dimensions 2,100 x 1,200 mm, weight 2.98 kg/unit | 1 unit | 6.95/m² | 900303 | 01 |
| | Wire thickness 3 mm, main grid 150 x 150 mm<br>Dimensions 2,100 x 1,200 mm, weight 2.05 kg/unit | 1 unit | 4.85/m² | 900311 | 01 |
| | **Bare pipe mat**<br>Wire thickness 3 mm, main grid 100 x 100 mm<br>Dimensions 2,100 x 1,200 mm, weight 2.98 kg/unit | 1 unit | 5.79/m² | 900302 | 01 |
| | Wire thickness 3 mm, main grid 150 x 150 mm<br>Dimensions 2,100 x 1,200 mm, weight 2.05 kg/unit | 1 unit | 4.05/m² | 900310 | 01 |
|  | **Fixing elements for pipe mats**<br>for attaching and fixing pipe mats<br>in the neutral zone of concrete ceilings<br>Length 100 mm | 1,000 units | 0.49/unit | 900071 | 01 |
|  | **XXL-Industrie edge insulation strip**<br>Special edge insulation strips for industrial panel heating,<br>made of polyethylene with self-adhesive film apron,<br>for structural heights of up to 250 mm<br>Dimension 10 x 250 mm | Ro 50 m | 1.94/m | 908155 | 01 |

Recommended retail price

| Item | Item description | Heating circuit | Con-nection | Overall length | Cabinet width in mm* | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|---|---|---|
|  | **Industrial manifolds XXL-I for pipe 25 x 2.3** Complete manifold made of brass section pipe 5/4" with integrated valves, 65 mm valve clearance, feed flow (bottom) with shut-off and controllable inserts for presetting, return flow valves (top) with blue protection cap. EMPUR® actuators can be installed directly instead of the blue protection cap. 2 manifold end-pieces with reducer for filling, bleeding and draining, rotating, manifold holder, with sound insulation insert, heating circuit connections for pipe 25 x 2.3 including compression fittings, packed in bag and enclosed. All packaged in a carton and with identification plates. | HCM-I 5 | 5/4" IT | 375 | 720 | 283.36 | 270515 | 01 |
| | | HCM-I 6 | 5/4" IT | 440 | 920 | 330.86 | 270615 | 01 |
| | | HCM-I 7 | 5/4" IT | 505 | 920 | 377.67 | 270715 | 01 |
| | | HCM-I 8 | 5/4" IT | 560 | 920 | 424.86 | 270815 | 01 |
| | | HCM-I 9 | 5/4" IT | 635 | 1,120 | 471.78 | 270915 | 01 |
| | | HCM-I 10 | 5/4" IT | 700 | 1,120 | 518.97 | 271015 | 01 |
| | | HCM-I 11 | 5/4" IT | 765 | 1,120 | 566.55 | 271115 | 01 |
| | | HCM-I 12 | 5/4" IT | 830 | 1,320 | 613.77 | 271215 | 01 |
| | | HCM-I 13 | 5/4" IT | 895 | 1,320 | 660.26 | 271315 | 01 |
| | | HCM-I 14 | 5/4" IT | 960 | 1,320 | 708.86 | 271415 | 01 |
| | | HCM-I 15 | 5/4" IT | 1,025 | 1,520 | 755.98 | 271515 | 01 |
| | | HCM-I 16 | 5/4" IT | 1,100 | 1,520 | 804.11 | 271615 | 01 |
|  | **Industrial manifold XXL-D for pipe 20 x 2.0** Complete manifold made of brass section pipe 5/4" with integrated valves, 50 mm valve clearance. Return flow valve (top) with blue protection cap. EMPUR® actuators can be installed directly instead of the blue protection cap. Feed flow (bottom) with controllable and adjustable flow rate indicators (0-5 l/min.). 2 manifold end-pieces with reducer for filling, bleeding and draining, rotating, manifold holder with sound insulation insert, Heating circuit connections for pipe 20 x 2.0 including compression fittings, packed in bag and enclosed. All packaged in a carton and with identification plates. | HCM-D 5 | 5/4" IT | 315 | 720 | 230.35 | 270520 | 01 |
| | | HCM-D 6 | 5/4" IT | 365 | 720 | 266.71 | 270620 | 01 |
| | | HCM-D 7 | 5/4" IT | 415 | 720 | 302.29 | 270720 | 01 |
| | | HCM-D 8 | 5/4" IT | 465 | 920 | 338.50 | 270820 | 01 |
| | | HCM-D 9 | 5/4" IT | 515 | 920 | 374.21 | 270920 | 01 |
| | | HCM-D 10 | 5/4" IT | 565 | 920 | 409.84 | 271020 | 01 |
| | | HCM-D 11 | 5/4" IT | 615 | 920 | 446.29 | 271120 | 01 |
| | | HCM-D 12 | 5/4" IT | 665 | 1,120 | 482.20 | 271220 | 01 |
| | | HCM-D 13 | 5/4" IT | 715 | 1,120 | 517.16 | 271320 | 01 |
| | | HCM-D 14 | 5/4" IT | 765 | 1,120 | 554.85 | 271420 | 01 |
| | | HCM-D 15 | 5/4" IT | 815 | 1,120 | 590.88 | 271520 | 01 |
| | | HCM-D 16 | 5/4" IT | 865 | 1,320 | 627.73 | 271620 | 01 |

## Assignment of manifold 5/4" with 50 mm valve clearance in combination with manifold cabinets „Top Standard plus“ and „Exclusiv plus“

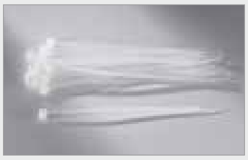
| Heating circuits | KH-DG | KH-90° | WMZ-horizontal | WMZ-vertikal |
|---|---|---|---|---|
| 5/6 | 720 mm | 720 mm | 920 mm | 920 mm |
| 7 | 720 mm | 920 mm | 920 mm | 920 mm |
| 8 | 920 mm | 920 mm | 1,120 mm | 920 mm |
| 9/10 | 920 mm | 920 mm | 1,120 mm | 1,120 mm |
| 11 | 920 mm | 1,120 mm | 1,120 mm | 1,120 mm |
| 12 | 1,120 mm | 1,120 mm | 1,320 mm | 1,120 mm |
| 13/14 | 1,120 mm | 1,120 mm | 1,320 mm | 1,320 mm |
| 15 | 1,120 mm | 1,320 mm | 1,320 mm | 1,320 mm |
| 16 | 1,320 mm | 1,320 mm | 1,520 mm | 1,320 mm |

**NOTE**

The water quality requirements according to VDI 2035 must be adhered to. KLIMAPEX® heating pipes see page 6-8

* Cabinet size for manifolds with connection set DG 5/4" (item no. 290114), suitable manifold cabinets: “Top Standard-plus” and “Exclusiv-plus” see page 64/65

Recommended retail price

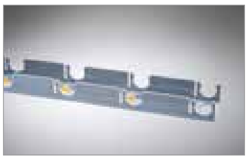
| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Mounting clips**<br>made of PP copolymer, without sharp edges, can be fitted to reinforcement mats installed on site, individual laying clearances possible | | | | |
| | for pipe Ø 20 x 2.0 mm, universal | Bag 100 units | 10.19/bag | 912000 | 01 |
| | for pipe Ø 25 x 2.3 mm, 6 mm wire thickness | Bag 100 units | 24.02/bag | 912506 | 01 |
| | for pipe Ø 25 x 2.3 mm, 8 mm wire thickness | Bag 100 units | 24.02/bag | 912508 | 01 |
|  | **Pipe holder for industrial panel heating** | | | | |
| | 4.8 x 170 mm | 100 units | 0.19/bag | 914817 | 01 |
| | 7.8 x 290 mm | 100 units | 0.21/unit | 914818 | 01 |
|  | **Mat connector/Pipe connector**<br>Wire loops to connect the reinforcement mats installed on site and for fixing the expansion joint protection pipes in the expansion joint area, simple assembly with EMPUR®drill tool for fast and efficient installation | | | | |
| | 120 mm | Bag 1,000 units | 9.26/bag | 900045 | 01 |
| | 180 mm | Bag 1,000 units | 13.89/bag | 900046 | 01 |
|  | **Drill tool**<br>Drill tool for the quick and easy assembly of EMPUR® pipe connector on reinforcement mats laid on site | 1 unit | net<br>36.75/unit | 990046 | 02 |

## System accessories EMPUR® concrete core tempering (CCT)

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **CCT cover strip**<br>for routing the heating circuit connection pipes to the manifold through the concrete ceiling, with connection below 25° to the horizontal, with 4 mounting nails<br>Dimensions: length 300 mm, width 45 mm, height 65 mm<br>For pipe Ø 20 and 25 | Bag 5 units | 6.57/unit | 906101 | 01 |
|  | **CCT cover strip**<br>for routing the heating circuit connection pipes to the manifold through the concrete ceiling, horizontal connection, with 4 mounting nails<br>Dimensions: length 300 mm, width 40 mm, height 30 mm<br>For pipe Ø 20 | Bag 5 units | 4.83/unit | 906111 | 01 |
|  | **CCT installation box**<br>for flexible connection of peak load modules with pre-mounted quick-couplings and connector with 1/2" IT for feed and return flow<br>Dimensions: Length 115 mm, width 115 mm, height 90 mm | | | | |
| | For pipe Ø 20 | 1 unit | 50.06/unit | 906020 | 01 |
| | For pipe Ø 25 | 1 unit | 53.77/unit | 906025 | 01 |
|  | **Socket cover for CCT installation box**<br>Dimensions length 130 mm, width 130 mm, height 7 mm | 1 unit | 11.97/unit | 906001 | 01 |

Recommended retail price

## System accessories XXL-Industrie and EMPUR® concrete core tempering (CCT)

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Clip rail**<br>for KLIMAPEX® heating pipes for fast and efficient laying<br>of industrial panel heating,<br>for pipe Ø 20, length 2 m, | | | | |
| | with adhesive strips for pipe spacing in 50 mm grid | 1 unit | 3.85/m | 912002 | 01 |
| | for pipe Ø 25, length 2 m,<br>with adhesive strips for pipe spacing in 100 mm grid | 1 unit | 5.78/m | 912502 | 01 |
|  | **Angle brace 90°, open**<br>for redirecting pipes in the manifold and floor zone, | | | | |
| | for pipes up to max. Ø 20 | Bag 10 units | 2.17/unit | 902020 | 01 |
| | for pipes up to max. Ø 25 | Bag 10 units | 4.38/unit | 902426 | 01 |
|  | **Expansion joint protective pipe**<br>for pipes up to Ø 25 mm, length 400 mm, slotted<br>outside Ø approx. 25 mm | Bag 5 units | 1.34/unit | 918410 | 01 |
|  | **Expansion joint protective pipe on roll**<br>for pipes up to Ø 25 mm, length 25 m, unslotted | | | | |
| | for pipes up to Ø 25 mm, length 25 m, slotted | 1 ro | 1.01/m | 918510 | 01 |
| | outside Ø approx. 35 mm | 1 ro | 1.23/m | 918610 | 01 |
|  | **Zone valve**<br>Zone valve with screwed connection and actuator for zone-by-zone<br>control via room thermostat, dimensions: 1" ET/1" IT,<br>Length: 125 mm, with reducer 5/4" ET-1" IT, kv: 5.1 m3/h | 1 unit | 76.90/unit | 520026 | 01 |
|  | **Binding machine**<br>with new designed tongs<br>for efficient mounting of KLIMAPEX® heating pipes on reinforcement<br>mats or heating grids installed on site,<br>span Ø 12-40 mm, wire thickness: 0.8 mm, less than<br>1 seconds per binding with 3 coils per binding, wire<br>roll for approx. 120 bindings, strength and wire length of the<br>binding is adjustable, about 2,600 bindings per battery charge,<br>ergonomically-shaped tool for gentle hand and muscle handling,<br>binding machines in practical plastic box with two batteries and<br>a 230 volt charger and two rolls of wire<br>weight: 2.4 kg, dimensions: 305 x 105 x 290 mm | 1 unit | net<br>2,923.57/unit | 990050 | 02 |
| **NOTE** | **Binding machine can be provided property-related and on request as a loan unit!** | | | | |
|  | **Wire reel for binding machine**<br>Wire thickness: 0.8 mm, for approx. 120 bindings | 1 ro | net<br>4.67/ro | 990051 | 02 |

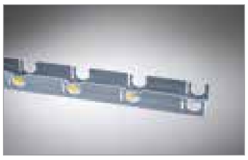
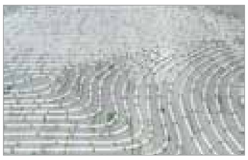
Recommended retail price

7F192-F

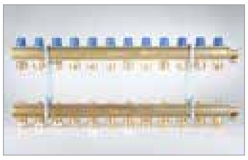
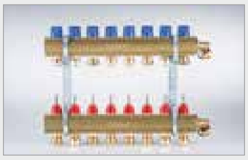
## EMPUR® sports floor heating

With its flexible surface heating systems, EMPUR® also provides special individual solutions for sports halls and sports areas. The combination of low system temperatures and modern heat-generation systems makes sports facilities comfortable.

The following versions are available, depending on functionality and use:
**Area-elastic sports floors** – Heating pipes are laid on the EMPUR® system insulation in the air space, application of the stapler system, the “Optimal II” dry construction system or the clip rail system
**Point-elastic sports floors** – the pipes are laid on the EMPUR® system insulation. Subsequently a conventional cement or anhydride layer must be applied

| Item | Item description | PU | Price € | Item No. | PG |
|---|---|---|---|---|---|
|  | **Clip rail**<br>For KLIMAPEX® heating pipes for fast and efficient laying of sports floor heating<br>for pipe Ø 20, length 2 m,<br>with adhesive strips for pipe spacing in 50 mm grid | 1 unit | 3.85/m | 912002 | 01 |
| | for pipe Ø 25, length 2m,<br>with adhesive strips for pipe spacing in 100 mm grid | 1 unit | 5.78/m | 912502 | 01 |
|  | **Point-elastic sports floors**<br>Heating pipes are laid on the EMPUR® system insulation in the air space, application of the stapler system (see from page 10), the “Optimal II” dry construction system (see page from 23) or the clip rail system | | | | |
|  | **Point-elastic sports floors**<br>The pipes are laid on the EMPUR® system insulation. Subsequently a conventional cement or anhydride layer must be applied, system components (see from page 10) | | | | |
|  | **Pipe guide rail for area-elastic sports floors**<br>for installation of pipelines on the subfloor construction design<br>for pipe 20 x 2.0 mm | 1 unit | 9.38/unit | 914920 | 01 |
| | for pipe 25 x 2.3 mm | 1 unit | 12.93/unit | 914925 | 01 |

Recommended retail price

| Item | Item description | Heating circuit | Con-nection | Over-all length | Cabinet width in mm* | Price €/unit | Item No. | PG |
|---|---|---|---|---|---|---|---|---|
|  | **Industrial manifolds XXL-I for pipe 25 x 2.3** Complete manifold made of brass section pipe 5/4" with integrated valves, 65 mm valve clearance, feed flow (bottom) with shut-off and controllable inserts for presetting, return flow valves (top) with blue protection cap. EMPUR® actuators can be installed directly instead of the blue protection cap. 2 manifold end-pieces with reducer for filling, bleeding and draining, rotating, manifold holder, with sound insulation insert, heating circuit connections for pipe 25 x 2.3 including compression fittings, packed in bag and enclosed. All packaged in a carton and with identification plates. | HCM-I 5 | 5/4" IT | 375 | 720 | 283.36 | 270515 | 01 |
| | | HCM-I 6 | 5/4" IT | 440 | 920 | 330.86 | 270615 | 01 |
| | | HCM-I 7 | 5/4" IT | 505 | 920 | 377.67 | 270715 | 01 |
| | | HCM-I 8 | 5/4" IT | 560 | 920 | 424.86 | 270815 | 01 |
| | | HCM-I 9 | 5/4" IT | 635 | 1,120 | 471.78 | 270915 | 01 |
| | | HCM-I 10 | 5/4" IT | 700 | 1,120 | 518.97 | 271015 | 01 |
| | | HCM-I 11 | 5/4" IT | 765 | 1,120 | 566.55 | 271115 | 01 |
| | | HCM-I 12 | 5/4" IT | 830 | 1,320 | 613.77 | 271215 | 01 |
| | | HCM-I 13 | 5/4" IT | 895 | 1,320 | 660.26 | 271315 | 01 |
| | | HCM-I 14 | 5/4" IT | 960 | 1,320 | 708.86 | 271415 | 01 |
| | | HCM-I 15 | 5/4" IT | 1,025 | 1,520 | 755.98 | 271515 | 01 |
| | | HCM-I 16 | 5/4" IT | 1,100 | 1,520 | 804.11 | 271615 | 01 |
|  | **Industrial manifold XXL-D for pipe 20 x 2.0** Complete manifold made of brass section pipe 5/4” with integrated valves, 50 mm valve clearance. Return flow valve (top) with blue protection cap. EMPUR® actuators can be installed directly instead of the blue protection cap. Feed flow (bottom) with controllable and adjustable flow rate indicators (0-5 l/min.). 2 manifold end-pieces with reducer for filling, bleeding and draining, rotating, manifold holder with sound insulation insert, Heating circuit connections for pipe 20 x 2.0 including compression fittings, packed in bag and enclosed. All packaged in a carton and with identification plates. | HCM-D 5 | 5/4” IT | 315 | 720 | 230.35 | 270520 | 01 |
| | | HCM-D 6 | 5/4” IT | 365 | 720 | 266.71 | 270620 | 01 |
| | | HCM-D 7 | 5/4” IT | 415 | 720 | 302.29 | 270720 | 01 |
| | | HCM-D 8 | 5/4” IT | 465 | 920 | 338.50 | 270820 | 01 |
| | | HCM-D 9 | 5/4” IT | 515 | 920 | 374.21 | 270920 | 01 |
| | | HCM-D 10 | 5/4” IT | 565 | 920 | 409.84 | 271020 | 01 |
| | | HCM-D 11 | 5/4” IT | 615 | 920 | 446.29 | 271120 | 01 |
| | | HCM-D 12 | 5/4” IT | 665 | 1,120 | 482.20 | 271220 | 01 |
| | | HCM-D 13 | 5/4” IT | 715 | 1,120 | 517.16 | 271320 | 01 |
| | | HCM-D 14 | 5/4” IT | 765 | 1,120 | 554.85 | 271420 | 01 |
| | | HCM-D 15 | 5/4” IT | 815 | 1,120 | 590.88 | 271520 | 01 |
| | | HCM-D 16 | 5/4” IT | 865 | 1,320 | 627.73 | 271620 | 01 |

## Assignment of manifold 5/4" with 50 mm valve clearance in combination with manifold cabinets „Top Standard plus“ and „Exclusiv plus“

| Heating circuits | KH-DG | KH-90° | WMZ-horizontal | WMZ-vertikal |
|---|---|---|---|---|
| 5/6 | 720 mm | 720 mm | 920 mm | 920 mm |
| 7 | 720 mm | 920 mm | 920 mm | 920 mm |
| 8 | 920 mm | 920 mm | 1,120 mm | 920 mm |
| 9/10 | 920 mm | 920 mm | 1,120 mm | 1,120 mm |
| 11 | 920 mm | 1,120 mm | 1,120 mm | 1,120 mm |
| 12 | 1,120 mm | 1,120 mm | 1,320 mm | 1,120 mm |
| 13/14 | 1,120 mm | 1,120 mm | 1,320 mm | 1,320 mm |
| 15 | 1,120 mm | 1,320 mm | 1,320 mm | 1,320 mm |
| 16 | 1,320 mm | 1,320 mm | 1,520 mm | 1,320 mm |

**NOTE**

The water quality requirements according to VDI 2035 must be adhered to. KLIMAPEX® heating pipes see page 6-8

* Cabinet size for manifolds with connection set DG 5/4" (item no. 290114), suitable manifold cabinets: “Top Standard-plus” and “Exclusiv-plus” see page 64/65

Recommended retail price

EMPUR® FLÄCHENHEIZUNGEN
*WARMTH IS LIFE*

# Warranty Certificate



We only manufacture and supply quality products.
We furnish a warranty for the system components supplied by us for 10 years from date of delivery.

## Heating Pipes

Free replacement if damage occurs to the heating pipes and PU plates which can be demonstrably attributed to manufacturing defects and for which we are at fault. For your further protection against damage to the heating pipes that we supply, we have a product liability insurance with a sum insured of

## EUR 2.5 Million/Insured Claim
## EUR 5 Million/Year

Within the above mentioned period, we also assume liability for damages caused to third party property because of a fault to the heating pipes that we supply and for which we are responsible. Insofar as claims go beyond our liability according to legal provisions, we are only liable insofar as the claim assigned to us is covered by insurance protection from our product liability insurance.

The prerequisite for our liability is always:

- The exclusive use of our approved system components.
- Compliance with our planning, operating and installation instructions.
- Compliance with the relevant technical standards.
- Professional installation by an authorised specialist company.

We are free to fulfil our obligation in the form of a replacement delivery or repair carried out by us or by third parties.
In addition, our General Terms and Conditions as amended shall apply.

We hereby assume the warranty for any consequential damages to our EMPUR® surface heating in accordance with this warranty certificate for the following object:

Construction project: ____________________

Street, P.O. Box/Place: ____________________

Executing specialist company: ____________________

Date of installation/commissioning: ____________________

Buchholz-Mendt, ____________________ Signature: ____________________

EMPUR® Produktions GmbH • Industriepark Nord 60 • 53567 Buchholz-Mendt
Telefon 02683 960620 • Fax 02683 9606299 • verkauf@empur.com • www.empur.com

DIN CERTCO
ZERTIFIKAT
Zertifikatinhaber
EMPUR Produktions GmbH
Industriepark Nord 60
53567 Buchholz
Produkt
Raumflächenintegrierte Heiz- und Kühlsysteme mit Wasserdurchströmung in Fußböden, Decken und Wänden
Typ, Modell
TBS Optimal II
Prüfgrundlage(n)
DIN EN 1264-2:2013-03
DIN EN 1264-3:2009-11
DIN EN 1264-4:2009-11
Zertifizierungsprogramm Raumflächenintegrierte Heiz- und Kühlsysteme mit Wasserdurchströmung (2009-11)
Konformitätszeichen
DIN Geprüft
Registernummer
7F385-F
Gültig bis
2022-07-31
Nutzungsrecht
Dieses Zertifikat berechtigt zum Führen des oben stehenden Konformitätszeichens in Verbindung mit der genannten Registernummer.
Weitere Angaben siehe Anhang.
DAkkS
DIN CERTCO
ZERTIFIKAT
Zertifikatinhaber
EMPUR Produktions GmbH
Industriepark Nord 60
53567 Buchholz
Produkt
Raumflächenintegrierte Heiz- und Kühlsysteme mit Wasserdurchströmung in Fußböden, Decken und Wänden
Typ, Modell
Top-Noppe PE-RT 15
Prüfgrundlage(n)
DIN EN 1264-2:2013-03
DIN EN 1264-3:2009-11
DIN EN 1264-4:2009-11
Zertifizierungsprogramm Raumflächenintegrierte Heiz- und Kühlsysteme mit Wasserdurchströmung (2009-11)
Konformitätszeichen
DIN Geprüft
Registernummer
7F163-F
Gültig bis
2021-06-30
Nutzungsrecht
Dieses Zertifikat berechtigt zum Führen des oben stehenden Konformitätszeichens in Verbindung mit der genannten Registernummer.
Weitere Angaben siehe Anhang.
DAkkS

## PUR-THERM® sets standards throughout Europe

EMPUR® has developed the highest standards for the PUR-THERM® underfloor heating. These are confirmed by the EnEV 2014 and exceed the requirements of the new European standard EN 1264. This makes PUR-THERM® the number one choice for floor heating systems:

Thermal protection according EN 1264

1 I Receivable
DIN EN 1264
R = 0.75 m² K/W

2,3 I Receivable
DIN EN 1264
R = 1.25 m² K/W

4 I Receivable
DIN EN 1264
R = 2.00 m² K/W

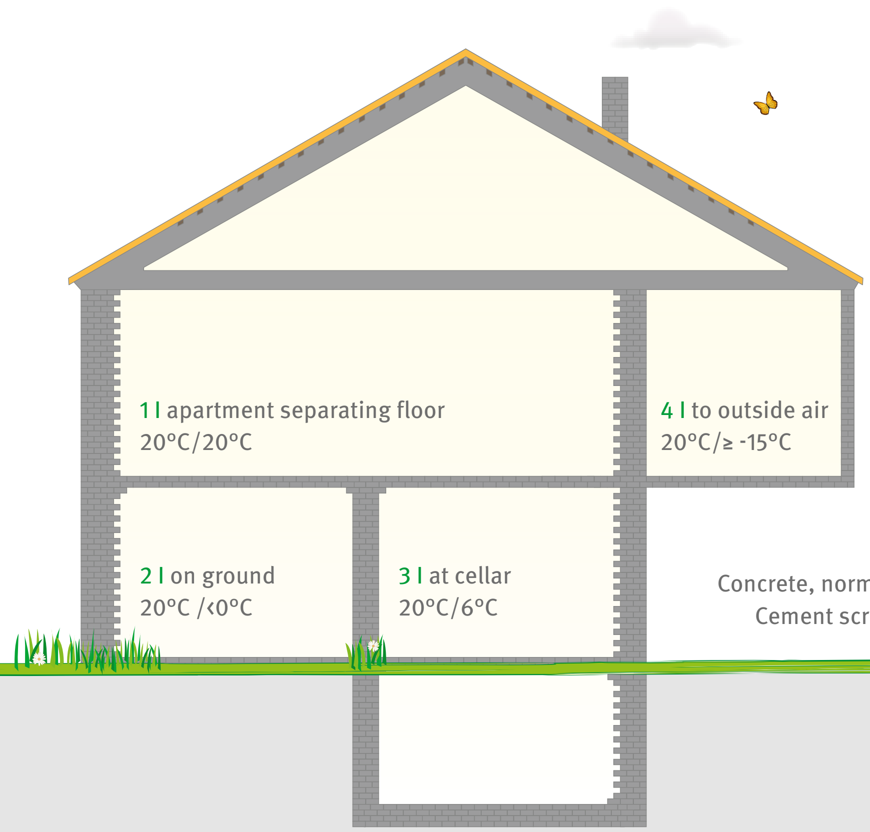
statutory thermal insulation
according to EnEV with PUR-THERM®

1 I Receivable
DIN EN 1264
R = 0.75 m² K/W

2, 3 + 4 I Receivable
DIN 4108/EnEV *

Minimum requirements
acc. to EnEV

Annex 1, Table 1:
U = 0.35 W/m² K*
Insulation value ≥ 2.857 m² K/W




Basis of the calculation:

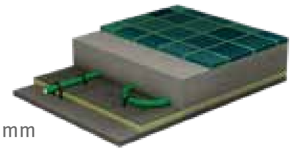
Concrete, normal 16 cm: R = 0.076 m² K/W $R_{SE}$ = 0,10
Cement screed 6 cm: R = 0.042 m² K/W $R_{SI}$ = 0.17

*WARNING: The Regulation stipulates that the thermal insulation of the building envelope for new construction projects from 1 January 2016 is improved by about 20%. The calculated annual primary energy demand of the reference building is to be multiplied for newly constructed buildings from this time on by a factor of 0.75!

Take account of the required insulation according to energy balance (EnEV certificate) of the architect/building planner!

## 1 flat separating ceiling above rooms with similar use (20 °C / 20 °C)

Requirement DIN EN 1264 R = 0.75 m²K/W (U=1.33 W/m² K)

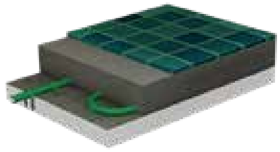


60 mm heating screed incl.
System pipe 15 x 1.8 mm

14 mm composite panel PUR/PE 9 + 5 mm

10 mm additional insulation EPS-DEO WLS 032

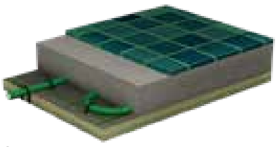
**84 mm (without lining) R = 0.857 m² K/W**



60 mm heating screed incl.
System pipe 15 x 1.8 mm

35 mm composite panel Turbo Cube® EPS-DES WLS 045

**95 mm (without lining) R = 0.778 m² K/W**



60 mm heating screed incl.
System pipe 15 x 1.8 mm

23 mm composite panel PUR/PE 13 + 10mm

**83 mm (without lining) R = 0.780 m² K/W**

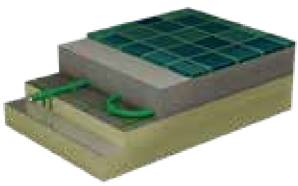
60 mm heating screed incl.
System pipe 15 x 1.8 mm

30 mm composite panel "V5" EPS-DES WLS 040

**90 mm (without lining) R = 0.750 m² K/W**

## 2, 3+4 insulation according to EnEV

The energy performance certificate of the building is to be drafted and checked for defining an insulation on the ground under a floor heating on the ground, unheated rooms and rooms with limited heating. Examples of floor heating with special thermal protection against unheated rooms or rooms that are heated intermittently, underlying rooms or on the ground with PUR-THERM® composite panels and heating pipe 15 x 1.8.

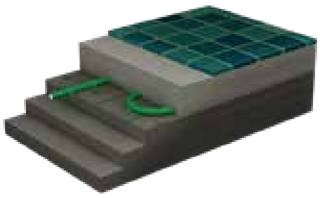


60 mm heating screed incl.
System pipe 15 x 1.8 mm

33 mm composite panel PUR 33

47 mm additional insulation PUR 47 ALU/PUR/ALU

**140 mm (without lining) R = 3.333 m² K/W**



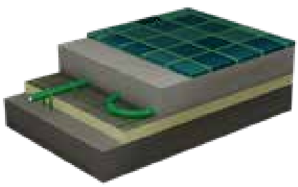
60 mm heating screed incl.
System pipe 15 x 1.8 mm

30 mm composite panel "Kompakt" WLS 032

30 mm additional insulation EPS-DEO WLS 032

30 mm additional insulation EPS-DEO WLS 032

**150 mm (without lining) R = 2.813 m² K/W**

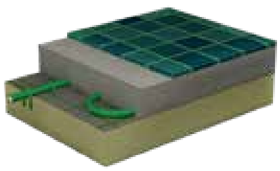


60 mm heating screed incl.
System pipe 15 x 1.8 mm

23 mm composite panel PUR 23

60 mm additional insulation EPS-DEO WLS 032

**143 mm (without lining) R = 2.833 m² K/W**



60 mm heating screed incl.
System pipe 15 x 1.8 mm

68 mm composite panel PUR/PE 63 + 5 mm

**128 mm (without lining) R = 2.950 m² K/W**

# Annex

## 12.3 Energy Saving Ordinance

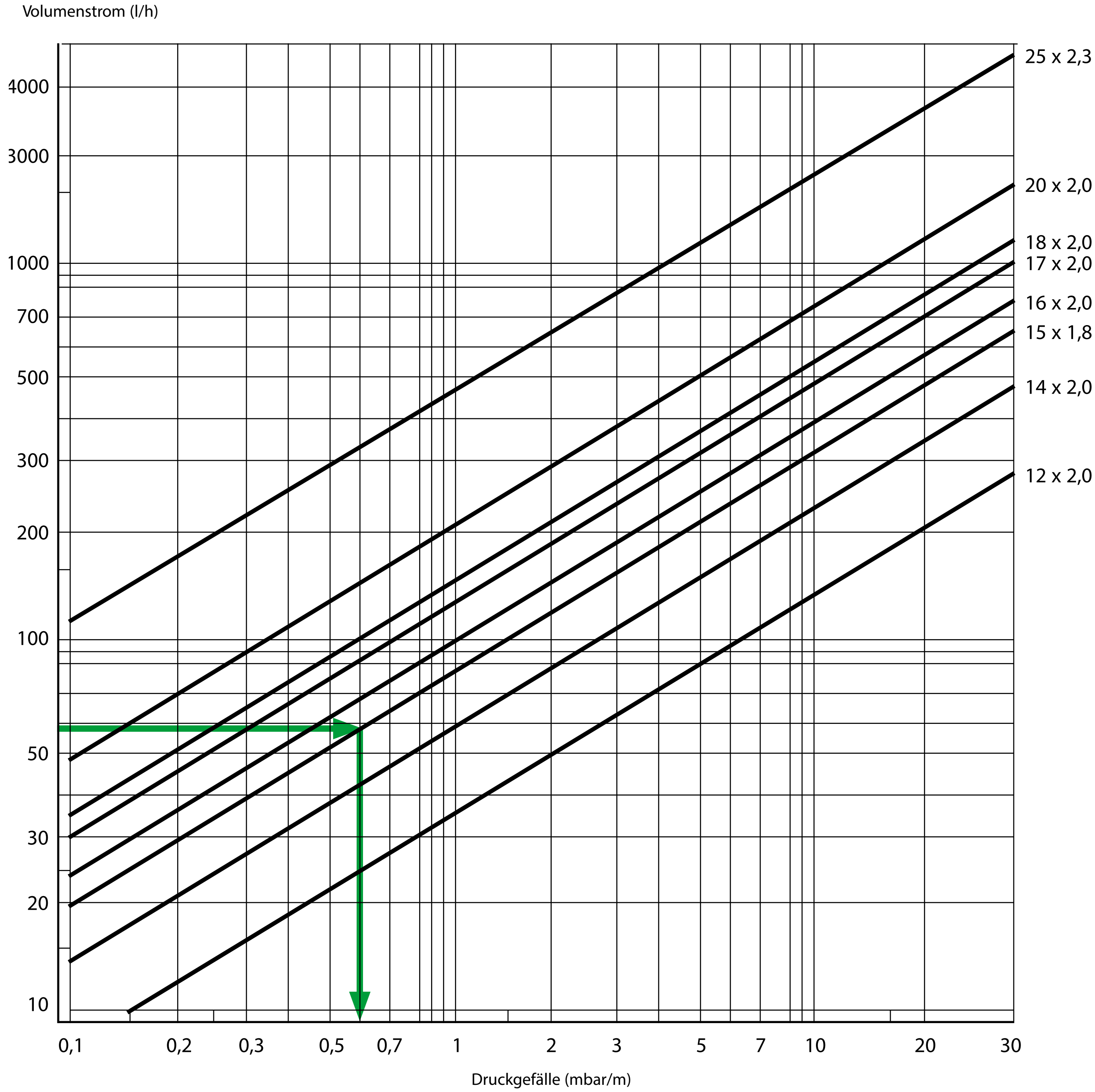
**PUR-THERM® Exclusiv composite panels from EMPUR®:**
R-values for thermal protection according to EnEv in combination with PUR/ALU/ALU or EPS DEO WLS 032

| R-value | 2.208 | 1.958 | 1.250 | 0.833 | **Insulating panel** (PUR VP/TC/TN) | 0.625 | 0.938 | 1.250 | 1.563 | 1.875 | R-value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALU / PUR / ALU WLS 024 | | | | | EPS-DEO WLS 032 | | | | | |
| | 53 mm | 47 mm | 30 mm | 20 mm | | 20 mm | 30 mm | 40 mm | 50 mm | 60 mm | |
| | | | | | | | | (20+20) | (20+30) | (30+30) | |
| R-value | 2.753 | 2.503 | 1.795 | 1.378 | **PUR/PE 14** | 1.170 | 1.483 | 1.795 | 2.108 | 2.420 | R-value |
| height insulation | 67 | 61 | 44 | 34 | R-value [m² K/W] | 34 | 44 | 54 | 64 | 74 | height insulation |
| (*) Total height | 127 | 121 | 104 | 94 | 0.545 | 94 | 104 | 114 | 124 | 134 | (*) Total height |
| R-value | 2.988 | 2.738 | 2.030 | 1.613 | **PUR/PE 23** | 1.405 | 1.718 | 2.030 | 2.343 | 2.655 | R-value |
| height insulation | 76 | 70 | 53 | 43 | R-value [m² K/W] | 43 | 53 | 63 | 73 | 83 | height insulation |
| (*) Total height | 136 | 130 | 113 | 103 | 0.780 | 103 | 113 | 123 | 133 | 143 | (*) Total height |
| R-value | 3.167 | 2.917 | 2.208 | 1.792 | **PUR 23** | 1.583 | 1.896 | 2.208 | 2.521 | 2.833 | R-value |
| height insulation | 76 | 70 | 53 | 43 | R-value [m² K/W] | 43 | 53 | 63 | 73 | 83 | height insulation |
| (*) Total height | 136 | 130 | 113 | 103 | 0.958 | 103 | 113 | 123 | 133 | 143 | (*) Total height |
| R-value | 3.583 | 3.333 | 2.625 | 2.208 | **PUR 33** | 2.000 | 2.313 | 2.625 | 2.938 | 3.250 | R-value |
| height insulation | 86 | 80 | 63 | 53 | R-value [m² K/W] | 53 | 63 | 73 | 83 | 93 | height insulation |
| (*) Total height | 146 | 140 | 123 | 113 | 1.375 | 113 | 123 | 133 | 143 | 153 | (*) Total height |
| R-value | 2.764 | 2.514 | 1.806 | 1.389 | **VP-/ TC- 25-2** | 1.181 | 1.494 | 1.806 | 2.119 | 2.431 | R-value |
| height insulation | 78 | 72 | 55 | 45 | R-value [m² K/W] | 45 | 55 | 65 | 75 | 85 | height insulation |
| (*) Total height | 138 | 132 | 115 | 105 | 0.556 | 105 | 115 | 125 | 135 | 145 | (*) Total height |
| R-value | 2.875 | 2.625 | 1.917 | 1.500 | **VP-/ TC- 30-3** | 1.292 | 1.605 | 1.917 | 2.230 | 2.542 | R-value |
| height insulation | 83 | 77 | 60 | 50 | R-value [m² K/W] | 50 | 60 | 70 | 80 | 90 | height insulation |
| (*) Total height | 143 | 137 | 120 | 110 | 0.667 | 110 | 120 | 130 | 140 | 150 | (*) Total height |
| R-value | 2.986 | 2.736 | 2.028 | 1.611 | **VP-/ TC- 35-3** | 1.403 | 1.716 | 2.028 | 2.341 | 2.653 | R-value |
| height insulation | 88 | 82 | 65 | 55 | R-value [m² K/W] | 55 | 65 | 75 | 85 | 95 | height insulation |
| (*) Total height | 148 | 142 | 125 | 115 | 0.778 | 115 | 125 | 135 | 145 | 155 | (*) Total height |
| R-value | 2.522 | 2.272 | 1.564 | 1.147 | **TN11 EPS-DEO** | 0.939 | 1.252 | 1.564 | 1.877 | 2.189 | R-value |
| height insulation | 64 | 58 | 41 | 31 | R-value [m² K/W] | 31 | 41 | 51 | 61 | 71 | height insulation |
| (*) Total height | 124 | 118 | 101 | 91 | 0.314 | 91 | 101 | 111 | 121 | 131 | (*) Total height |
| R-value | 2.958 | 2.708 | 2.000 | 1.583 | **TN30-2 EPS-DES** | 1.375 | 1.688 | 2.000 | 2.313 | 2.625 | R-value |
| height insulation | 83 | 77 | 60 | 50 | R-value [m²K/W] | 50 | 60 | 70 | 80 | 90 | height insulation |
| (*) Total height | 143 | 137 | 120 | 110 | 0.750 | 110 | 120 | 130 | 140 | 150 | (*) Total height |

VP = composite panel TC = Turbo Cube TN = top-Nopp

KLIMAPEX® plastic heating pipes

Chart for pressure loss determination for different pipe diameters, depending on the volume flow




Example: Flow rate about 60 l/h, 0.6 mbar/m

With a volume flow, read on the volume flow meter, of almost one litre per minute (60 litres per hour) results in a pressure drop of about 0.6 mbar per metre of pipe length with a 15 plastic pipe

**General conditions of sale and delivery for EMPUR® Produktions GmbH**
Last revised 25/04/2018

**Section 1**
**Scope of Application**
Each and every contract is concluded solely and exclusively on the basis of the General Terms and Conditions of Sale, Supply and Payment of EMPUR®. EMPUR® does not accept the Buyer's contrary or deviating terms and conditions unless EMPUR® has expressly agreed to their application in writing. EMPUR®'s terms and conditions of sale apply even if delivery is made to the Buyer without reservation in awareness of Buyer's contrary or deviating terms and conditions of purchasing. EMPUR®'s General Terms and Conditions of Sale, Supply and Payment apply to any future transactions with the Buyer even if no express reference to their application is made during the conclusion of future contracts.

**Section 2**
**Conclusion and Content of Contract**
1. EMPUR®'s sales offers are subject to change. The Buyer is required to submit an order within a period of 4 weeks. The contract is concluded by EMPUR®'s issue of an order confirmation within this period or by a delivery undertaken immediately in response to the order. The requirement of written form is satisfied by the transmission of order confirmations using web-based technology and/or fax. Oral agreements or oral modifications of or amendments to orders are not legally effective unless expressly confirmed in writing by EMPUR®. EMPUR® is entitled to give notification in its order confirmation of any deviations from the order which the Buyer can reasonably be expected to accept. Any such deviations become binding on both Parties unless the Buyer submits written objection to the content of the order confirmation no later than 12 days after its dispatch. In the event such objection is raised, EMPUR® is entitled to cancel the contract by sending a written statement to this effect within a further period of 12 days; any and all claims to damage compensation are excluded.

2. Rescheduling of an order which has effectively been concluded is possible only by mutual agreement.

3. EMPUR® is entitled to immediately cancel the contract, in whole or in part:
   – If and when the effects of force majeure (natural disaster, civil unrest, war, government actions, transport disruptions, strikes, lock-outs, operational disruptions) interfere long-term with fulfilment of the contract;
   – If and when EMPUR® does not receive supplies from its own suppliers and is not accountable for the supply failure;
   – If and when a petition for the initiation of bankruptcy proceedings (or equivalent proceedings according to local law) against the Buyer's assets is filed.

**Section 3**
**Place of Performance**
1. The supply and shipment of the goods is made from EMPUR®'s company headquarters. The Buyer will be billed costs for freight, packaging, shipping and unloading only for a net product value of less than €3,950.00 unless the Parties have otherwise agreed.

2. EMPUR® is entitled to make partial deliveries and to issue separate invoices for such deliveries.

3. EMPUR® will package the goods properly.

4. The regulations of the INCOTERMS as most recently revised (EXW) apply as a supplement to deliveries outside of Germany.

**Section 4**
**Delivery Period**
1. Compliance with agreed delivery times presumes the receipt in good time of any and all documents, necessary permits and releases to be provided by the Buyer, in particular, but not limited to, plans, as well as the Buyer's compliance with the agreed terms and conditions of payment. If these prerequisites are not fulfilled in good time, the delivery times will be extended by a reasonable period unless EMPUR® is accountable for the delays.

2. The day on which the Seller gives notification of the readiness of the purchased goods for shipping is authoritative for determining that the delivery is in good time. If and when the goods are not accepted in due time through the Buyer's fault, EMPUR® may at its discretion, after setting a subsequent period of 10 days, either request immediate payment of the purchase price without regard for any agreed credit line (arrears invoice) or cancel the contract and request damages for non-fulfilment.

3. Agreed delivery periods will be extended by a reasonable period in cases of force majeure, industrial actions and other operational disruptions for which EMPUR® is not accountable or in cases of delay in the delivery of essential preliminary materials if the hindrance continues for more than one week. The delivery period will be extended by the duration of the hindrance, but by no longer than 8 weeks plus subsequent delivery period. EMPUR® is obligated to notify the Buyer without delay of the reason for the hindrance as soon as it can be seen that compliance with the agreed delivery periods will not be possible. If a hindrance continues for a period in excess of 5 weeks, both of the Parties have the right to cancel the contract. However, the Buyer's right to cancel the contract must be announced in writing no less than 2 weeks before it is exercised.

**Section 5**
**Subsequent Delivery Period and Damage Caused by Delay**
1. Upon expiration of the agreed delivery period, a subsequent delivery period of 14 days will commence without further declaration, unless the provisions of Section 4 (3) apply. Upon expiration of this subsequent delivery period, the Buyer is entitled to set in writing a subsequent period of 4 weeks for EMPUR®. Upon expiration of this period, the Buyer is entitled to withdraw from the contract, provided that it has announced this intention when setting the subsequent period. If no such statement was made when the subsequent period was set, EMPUR® will, at its discretion, be released from the obligation to make delivery upon expiration of this period if and when the Buyer has not stated, upon being asked, within the subsequent period whether it insists on fulfilment of the contract.

2. No fixed-date transactions are concluded.

3. EMPUR® is liable for damage or loss claimed by the Buyer in the event of delays in delivery, including claims for the reimbursement of expenses pursuant to Section 284 BGB [German Civil Code], only if and when it caused the delay in delivery through wilful intent or gross negligence. The above exclusion of liability does not apply in cases of injury to life, body or health, of breach of legally binding warranties and of fraudulent behaviour and gross culpability. In all other respects, compensation claims based on the breach of material obligations of the contract are limited to the foreseeable damage or loss typical of the contract and to 50% of the foreseeable damage or loss in cases of slight negligence unless the possibility of a greater damage or loss was pointed out to EMPUR® at the time the order was placed.

**Section 6**
**Acceptance Obligation**
If the Buyer does not accept the goods, announces its refusal to accept before delivery is made or returns delivered goods without justification, or if EMPUR® is entitled to refuse delivery in accordance with Section 11, EMPUR® has the right to request that the Buyer fulfil the contract within a period of 12 days. The Buyer bears the costs incurred for storage, insurance and any other protective measures resulting from the delay in acceptance. EMPUR® is entitled to bill these costs in the lump-sum amount of 0.5% of the order value for each and every week of delay, limited, however, in the aggregate to 5% of the order value. Upon expiration of this period, EMPUR® is entitled to dispose otherwise of the goods and to bill the suffered loss or damage as a lump sum of 33% of the agreed purchase price or, at its discretion, to assert the loss in earnings which it has verifiably actually suffered. The Buyer is entitled to prove that loss or damage actually suffered was lower.

**Section 7**
**Examination for Defects**
1. The Buyer is obligated to inspect the goods immediately after their receipt and to submit notification of any defects – including the delivery of goods in deviation from the order – within a preclusion period of 7 days after receipt of the goods. In the event of hidden defects, the period commences upon their discovery. EMPUR®'s field representatives are not authorised to accept complaints of defects. Upon expiration of the period, any complaints – including recourse pursuant to Section 478 BGB – are excluded. The above provision also applies in cases in which the Buyer has modified the delivered goods.

**Section 8**
**Liability for Defects**
1. Deviations in quality, dimensions or weights that are usual in trade or technically unavoidable do not qualify as defects. Manufacturer's public statements, promotions or advertising do not qualify as agreements regarding characteristics.

2. If and when the Buyer has proved that it fulfilled its obligations pursuant to Section 377 HGB [German Commercial Code], EMPUR® has the right, at its discretion, in cases of legitimate complaints to carry out subsequent improvement or substitute delivery. EMPUR® is entitled to subsequent performance within a period of 2 months after return of the defective purchased goods. The Buyer's warranty rights are forfeit if and when, in the event of a complaint, it does not make the goods available to EMPUR® despite the latter's express request within a period of 10 days. If and when the subsequent performance has failed, the Buyer is entitled either to cancel the contract or to reduce the purchase price; this option is limited, however, to the goods about which complaint was made.

3. There are no claims due to material defects for natural wear and tear of the purchased goods or due to damage occurring after the passing of risk as a consequence of incorrect or negligent handling, overuse or unsuitable operating materials or arising from unusual external influences that were not foreseen in the contract. If the Buyer or third parties undertake improper modifications or repair work, there are also no claims due to defects for these and the resulting consequences. The following circumstances also result in the exclusion of warranty and liability claims:
   – Improper use of the purchased goods
   – Improper installation, commissioning, operation and maintenance of the purchased goods
   – Failure to observe the information in the operating instructions regarding transport, storage, installation, commissioning, operation, maintenance
   – Unauthorised construction changes
   – Effects of force majeure

4. If the complaint of defects proves to be unjustified, the Buyer is obligated to reimburse any expenditures incurred by the complaint (transport costs, inspection costs etc.).

5. If the Buyer has installed the defective product in another object or attached it to another object in accordance with its character and intended purpose, EMPUR® is entitled to point out to the Buyer the reimbursement for expenses pursuant to Section 439 (3) BGB in addition to the liability for the defective purchased product. Reworking by the Seller instead is subject to agreement. The expenses within the sense of Section 439 (3) BGB do not include the costs that result because parts that do not belong to the delivered product are destroyed, in whole or in part, during the installation and removal, unless it can be proved that the Seller acted culpably within the sense of wilful intent or gross negligence.

6. In the event that the costs for subsequent improvement are unreasonable, EMPUR® is entitled to refuse to carry out the subsequent performance or the type of subsequent performance as well as the claim to reimbursement of expenses pursuant to Section 439 (4) BGB.

7. If transport, road, labour and material costs increase because the purchased product has been conveyed to a site other than the contractually agreed destination, the resulting increase in the expenses will not be borne by EMPUR®.

8. There are no warranty claims for parts subject to wear and tear.

9. The warranty period for new goods is 1 year as of the passing of risk. This period is a limitation period and also applies to the assertion of loss or damage which did not occur to the supplied goods themselves, presuming that any liability at all pursuant to Subsection 4 is to be assumed. Claims for actions in tort or for allegations of bad faith on the part of EMPUR® are subject to statutory limitation periods. There is a warranty for used or restored products solely if such a warranty has been specifically agreed; otherwise, any such warranty is excluded. If legal provisions prescribe longer warranty periods (e.g. Section 438 BGB), these periods apply.

10. In the event of legitimate complaints due to defects, the Buyer may retain payments solely in a scope that is in a reasonable relationship to the defects that have occurred and the subsequent improvement costs required for the remedy. If and when payment obligations beyond this scope are not fulfilled:
    – EMPUR® is entitled to refuse subsequent performance until payment of the legitimate claim has been made;
    – Regress claims in accordance with Section 478 BGB are excluded.

11. The Seller is liable additionally, pursuant to the provisions governing contracts for works in the BGB, for defects in the milling and installation work (laying of heating pipes and installation of the distributor) carried out by the affiliated company EM-solution within the framework of the CUT-THERM® modernisation. Liability for defects is excluded or restricted in the event of a breach by the end customer (heating engineer or installer) of the “General Notes and Information for the End Customer” provided to it by the Seller.

**Section 9**
**Limitation of Liability**
If and when EMPUR®'s subsequent performance fails, the Buyer is not entitled to the assertion of any claims, regardless of the legal basis (including provisions concerning actions in tort), in excess of the rights pursuant to Section 437, nos. 2 and 3 BGB. EMPUR® is not liable for damage or loss which did not occur to the goods themselves or for lost profit or other pecuniary losses of the Buyer. To the extent that EMPUR®'s liability is excluded or limited, said exclusion or limitation also applies to the personal liability of its management, its permanent employees, worker representatives and vicarious agents. The indemnification from liability does not apply to injury to life, body or health; if and when loss or damage has been caused wilfully or through gross negligence; or, if EMPUR® has assumed a warranty of characteristics, or EMPUR® can be blamed for fraudulent behaviour. Moreover, it does not apply to claims asserted pursuant to Sections 1 and 4 of the German Product Liability Act. If and when EMPUR® is in breach of a cardinal obligation or other material obligation of the contract due to negligence, the compensation obligation is limited to the foreseeable damage or loss typical of the contract and to 50% of the foreseeable damage or loss in cases of slight negligence.

**Section 10**
**Payment**
1. The invoice will be issued on the day of delivery or when the goods are made available. Invoices are payable net within 30 days. The Buyer is entitled to deduct a cash discount of 3% if payment is made within 8 days of the issue of the invoice and to deduct a cash discount of 2% if payment is made within 14 days of the issue of the invoice.

2. If and when EMPUR® shows the prices in foreign currency, they will not be affected by changes in the official exchange rate of the euro to the foreign currency. Payment in these cases must be made in the foreign currency and in the amount of the invoice. Bills of exchange or cheques are accepted only on account of performance.

3. When payment is made by cheque, the date of the redemption of the cheque is authoritative; when payment is made by bank transfer, the date the payment is credited to EMPUR®'s account is authoritative.

4. Payments are always attributed to settlement of the oldest due claim plus any default interest which has accrued to this claim.

5. EMPUR®'s prices are shown excluding legally applicable VAT. VAT in the statutory amount will be itemised in the invoice on the day of the issue of the invoice.

6. For transactions outside Germany, the purchase price must be paid in advance before shipment/provision of the goods.

**Section 11**
**Default of Payment**
1. In the event of default of payment, EMPUR® is entitled to charge default interest in the amount of 9 percentage points over the base lending rate or to request compensation for verifiably higher loss or damage owing to the default.

2. EMPUR® has the additional rights shown below in the event of default of payment caused by exceeding the granted credit line:

   a) EMPUR® is entitled to refuse to make further deliveries pursuant to current contracts. Delivery periods for current contracts which have not been fulfilled will be suspended, without specific notice, retroactively as of the time from the default of payment until full payment has been made.

   b) EMPUR® is entitled to request immediate payment before delivery of the goods for any outstanding deliveries from any and all current contracts, any agreed credit lines notwithstanding.

   c) EMPUR® is entitled to exercise the rights agreed in Section 13 (securing retention of title) and/or to cancel, in whole or in part, any and all current contracts.

3. EMPUR® is also entitled to the above-mentioned rights if a significant worsening of the Buyer's financial position occurs (e.g. suspension of payment to other parties, petition for bankruptcy, execution measures, protests to cheques or bills of exchange, closing of business).

4. In the event of default of payment, the Buyer must bear any and all costs and fees incurred by EMPUR®. Moreover, the Buyer must bear any and all costs EMPUR® incurs for the engagement of a German or foreign lawyer, including a correspondence lawyer.

**Section 12**
**Offset and Retention**
The Buyer may offset counterclaims only if and when they are undisputed or have been finally adjudicated. The above provision also applies to a right of retention, provided that the Buyer is a merchant. If this is not the case, a right of retention may be asserted only if and when the counterclaim arises from the same contractual relationship.

**Section 13**
**Securing of Retention of Title**
1. EMPUR® retains title of ownership to the goods (reserved goods) until full payment of any and all claims from the delivery of goods from the entire business relationship, including subsidiary claims, damage compensation claims and the redemption of cheques and bills of exchange. The retention of title also remains effective if and when individual claims have been assimilated into a current invoice and the balance has been determined and acknowledged.

2. Any processing or working undertaken by the Buyer is done on behalf of EMPUR®, but does not establish any obligations on EMPUR®. If and when reserved goods are processed, used and mixed with other goods that do not belong to EMPUR®, EMPUR® is entitled to a share of co-ownership in the new product in the ratio of the invoice value to the other processed goods at the time of the processing, use or mixture. If the Buyer acquires sole ownership of the new product, the Parties are in agreement that the Buyer will grant to EMPUR® a share of co-ownership in the new product in the ratio of the invoice value of the processed, combined or mixed reserved goods and will safeguard the new goods on EMPUR®'s behalf free of charge.

3. The Buyer is entitled to resell the goods in the ordinary course of its business. However, it assigns here and now any claims, including any and all subsidiary rights, arising from the resale of the reserved goods. EMPUR® accepts this assignment. The Buyer remains authorised to collect the assigned claims.

4. The Buyer is not authorised to utilise the reserved goods within the scope of global assignments to financing institutes or similar institutions or to pledge or assign them by way of security in any other fashion. The Buyer shall notify EMPUR® immediately in writing of any attachments or other seizures by third parties so that it is in a position to assert its rights in accordance with Section 771 ZPO [German Civil Procedure]. If and when the third party is not able to reimburse EMPUR® for court and out-of-court costs of a suit in accordance with Section 771 ZPO, the Buyer is liable for any loss or damage that is suffered.

5. In the event of breach of contract by the Buyer, in particular in case of default of payment, EMPUR® is entitled to cancel the contract and to take back the purchased goods. The Buyer agrees to this condition here and now. After reclaiming possession of the purchased goods, EMPUR® is entitled to utilise them, whereby the resulting loss or damage may be billed in accordance with Section 6.

6. If and when the value of EMPUR®'s collateral exceeds that of its claims by more than 20%, EMPUR® will, upon petition by the Buyer, release the excess collateral at its discretion.

**Section 14**
**Industrial Property Rights and Copyrights, Life Cycle Management Act**
1. A review of any documents provided by the Buyer (templates, samples etc.) to determine whether they are subject to any third-party rights, in particular, but not limited to, copyrights and industrial property rights, is the sole and exclusive responsibility of the Buyer. If and when claims pursuant to any such rights are asserted against the Supplier, the Buyer is obligated to compensate the Supplier for any and all loss or damage suffered by the latter as a consequence.

2. Unless otherwise agreed, the Supplier is obligated to perform the delivery free of any and all third-party industrial property rights and copyrights (hereinafter: intellectual property rights) solely in the country of the delivery destination. If and when a third party asserts legitimate claims against the Buyer pursuant to an infringement on intellectual property rights by products delivered by the Supplier and used in accordance with the contract, the Supplier is liable within the period defined in Section VII (3) as follows:

   a) The Supplier will, at its discretion and at his own expense, either obtain a utilisation right for the pertinent product, modify the product so that it no longer infringes on the intellectual property right or replace the product. If this is not possible under conditions that are reasonable for the Supplier, the Buyer is entitled to statutory rights of cancellation of the contract or reduction of the purchase price.

   b) The Supplier's obligations described above apply to relationships between entrepreneurs solely if and when the Buyer notifies the Supplier without delay in writing about the claims asserted by the third party and does not acknowledge any infringement and any and all defence measures and settlement negotiations remain the sole responsibility of the Supplier.

   c) If and when the Buyer suspends use of the products for the purpose of minimising loss or damage or for other good reasons, it is obligated to notify the third party that the suspension of the use of the products does not entail any acknowledgement of any infringement of intellectual property rights.

**Section 15**
**Proper Law**
1. The Parties agree that any and all legal transactions will be governed by the laws of Germany. The application of the provisions of the UN Uniform Law on the International Sale of Goods for Movable Items is expressly excluded.

2. If and when goods are exported, EMPUR® is responsible for compliance with the relevant German legal provisions. Observance and performance of the relevant foreign trade legal provisions (e.g. import licences, currency transfer permits etc.) and any and all other laws applicable outside of Germany, including, but not limited to, those of the destination country, fall within the Buyer's purview.

**Section 16**
**Venue**
If and when the Buyer is a merchant, the agreed venue for any disputes, including those related to bills of exchange and cheques, is the court having local jurisdiction for EMPUR®'s company headquarters (Neuwied Local Court — Koblenz Regional Court). However, EMPUR® is also entitled to file suit against the Buyer at the latter's registered place of business.

**Section 17**
**Severability and Subsidiary Agreements**
1. If and when individual provisions of this contract, in whole or in part, should be invalid or later become invalid, the validity of the remaining provisions of the contract will not be affected. The above provision also applies if it is determined that there is an omission in the regulations of the contract. In lieu of the invalid or unenforceable provisions or to remedy the omission, a regulation will be deemed agreed that corresponds most closely in legally permissible form to the commercial intent of the invalid or unenforceable provision or, in the case of an omission, that takes into account the provision that the Parties would have wanted (in accordance with the sense and purpose of the contract) if they had considered the point at the time of the conclusion of the contract or the later addition of a provision.

2. Subsidiary agreements with persons whose representation authority for EMPUR® is not shown in the Commercial Register are invalid unless EMPUR® expressly confirms them in writing.

3. Oral subsidiary agreements are not valid.

# Notes

**EMPUR® FLÄCHENHEIZUNGEN**

*WARMTH IS LIFE*


## Your specialists for surface heating systems

Expertise, reliability and commitment are **EMPUR®'s** strengths. In addition to the production and sale of high-quality surface heating systems and components, the company's range of services also includes comprehensive services relating to the planning and installation of our complete systems.

**EM plan's** specialist engineers and planning consultants are available to help you with their expertise in demanding property planning in almost all TGA areas such as heating, air conditioning, ventilation, plumbing and electrical.

We have bundled our many years of experience in the installation of surface heating systems into our **EM-solution** and support tradesmen to complete their construction projects on time.

EMPUR®, EM-plan and EM-solution together form the **EM Gruppe®**. Thus, the three core areas of expertise – production, planning and installation – come from a single source.

### planning

**EM-plan**

- Planning surface heating and cooling systems for new builds, modernisation projects and customised solutions
- Project planning for heating, ventilation and air conditioning applications, electrical engineering and swimming pool technology
- Creation of performance specifications
- Project planning for Smart Home solutions
- Planning and designing Geniax projects
- EnEV (energy saving ordinance) certificates according to DIN 18599
- Construction supervision for technical building systems

www.em-plan.net

### production

**EMPUR®**

- Plastic heating pipes, insulation and composite panels for surface heating and cooling systems for new builds and modernisation projects
- Manifold technology and Geniax heat distribution systems
- Control technology and Smart Home solutions
- Accessories and tools
- Customised solutions for industrial, sports and commercial buildings

www.empur.com

### installation

**EM-solution**

- Installation of surface heating and cooling systems in new build and modernisation projects
- Installation of the CUT-THERM® milling system
- Commissioning of Geniax heat distribution systems and heat pump systems
- Service for technical building installations

www.em-solution.de

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