

# Katherm QE

Tangential fan convection  
with electric heating element

► **Assembly and installation instructions**

Keep these instructions in a safe place for future use!

# 2.42 Katherm QE – Tangential fan convection with electric heating element

## Ready-to-install convector-based floor trenches

### Assembly and installation instructions

#### Key to symbols:



#### Caution! Danger!

*Non-compliance with this information can result in serious personal injury or damage to property.*



#### Danger from electrocution!

*Non-compliance with this information can result in serious personal injury or damage to property from electrocution.*

**Carefully read these instructions in full prior to any assembly and installation work!**

Anyone involved with the installation, commissioning and use of this product is obliged to pass these instructions on to tradespeople who are involved at the same time or subsequently, as well as to end users or operators. Retain these instructions until final decommissioning!

**We reserve the right to make content or design-related changes without prior notice!**

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#### 1. Intended use

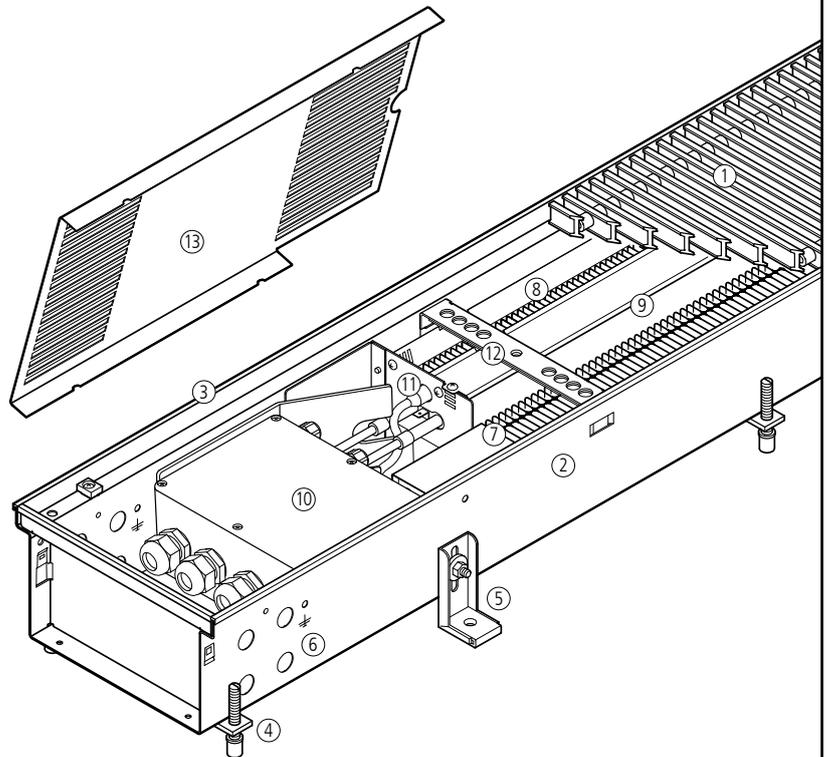
Kampmann Katherm QE are built in line with the state of the art and recognised safety regulations. Nevertheless, their use can result in danger to people or damage to the product or other material assets if they are not appropriately installed and operated or correctly and properly used.

Katherm QE are solely intended for use indoors (e.g. residential properties, commercial properties and showrooms etc.). They should not be used in humid areas, such as swimming pools or outdoors. Protect the products from any moisture during installation. If in doubt, check the proposed use with the manufacturer. Any use other than the use specified above is deemed not to be correct and intended. Any damage resulting from this is the sole responsibility of the operator of the unit. Correct and proper use is also deemed to include compliance with the installation instructions described in this manual.

The installation of this product requires specialist knowledge of heating, cooling, ventilation and electrical engineering. This knowledge, generally learned in vocational training in one of the fields mentioned above, is not described separately. Errors with the wiring can lead to the unit being damaged! Damage resulting from improper installation is the sole responsibility of the operator of the units.

#### Katherm QE

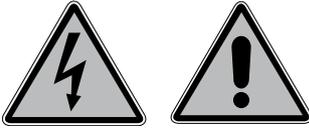
- ① Optiline roll-up grille
- ② Floor trench, graphite-grey painted
- ③ Frame profile
- ④ Raised floor feet with sound insulation
- ⑤ Height adjustment feet with sound insulation
- ⑥ Electrical wiring
- ⑦ EC tangential fans
- ⑧ Electrical heating element
- ⑨ Air baffle
- ⑩ Power control unit
- ⑪ Safety chain
- ⑫ Bracing
- ⑬ Cover plate



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## 2. Safety Information

Make sure that installation, assembly and maintenance work on electrical units is only performed by a qualified electrician (in compliance with VDE regulations).

Wiring should comply with applicable VDE regulations and provisions laid down by regional electricity providers. Non-adherence to these regulations and the operating manual can lead to malfunction of the unit with consequential damage and resulting danger to persons.

There is a risk of fatal injury if wiring is not correct or wires are crossed! All parts of the system should be disconnected from the power source before commencing with wiring or maintenance work and should be prevented from accidental re-connection! Only connect the wiring to fixed cables.

Please read this manual in full to guarantee correct and proper installation.

### Please note the following safety-relevant information:

- Disconnect all parts of the system that are being worked on.
- Ensure that the system cannot be accidentally re-connected!
- Before commencing the installation/maintenance work, wait until the fan has come to a standstill once the unit has been switched off.
- **Caution!** Components, the heating element and baffles can become very hot depending on the operating mode!
- Contractors must have adequate knowledge, obtained in their training, of:
  - Safety and accident prevention regulations
  - Guidelines and recognised technical regulations, i.e. Association of German Electricians (VDE)
  - DIN and EN standards
  - Accident prevention regulations VBG, VBG4, VBG9a
  - DIN VDE 0100, DIN VDE 0105
  - EN 60730 (Part 1)
  - Technical wiring regulations (TABs) issued by the regional electricity providers
  - EN 60335 / IEC 60364

### Modifications to the unit

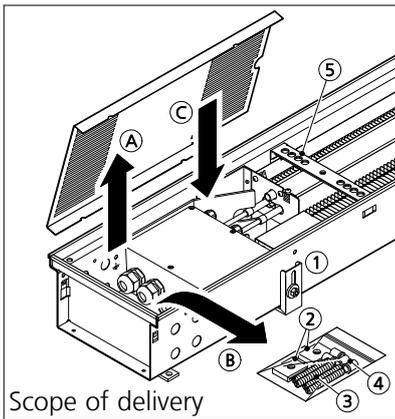
Do not undertake any modifications, renovations or additions to the Katherm QE without discussing them with the manufacturer, as this could impair the safety and operation of the unit.

Do not undertake any work on the unit that is not described in this manual. On-site systems and cabling must be suitable for connection to the intended system! Errors caused by connection or modifications can lead to the unit being damaged! The manufacturer is not liable for any damage caused by the wrong connection and/or improper handling.

Non-adherence to these regulations and the operating manual can lead to malfunction of the unit with consequential damage and resulting danger to personnel. There is a danger of fatal injury caused by wires being crossed due to incorrect wiring!



The floor trench has openings provided for the installation of a potential compensation line.



### 3. Scope of delivery

Trench heaters are delivered as standard with:

- height adjustment feet ① with rubber pads for acoustic decoupling ②;
- screws and rawplugs to be provided on site
- Raised floor feet with plastic cap for acoustic decoupling ③, ④

### 4. Levelling

- Remove the outer film and the packaging.

**Important:** Do not remove bracing during installation and operation.

- Arrange the Katherm QE with the convector on the window side.

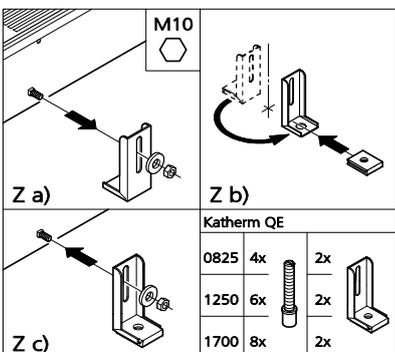
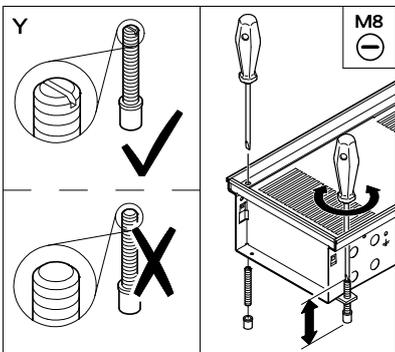
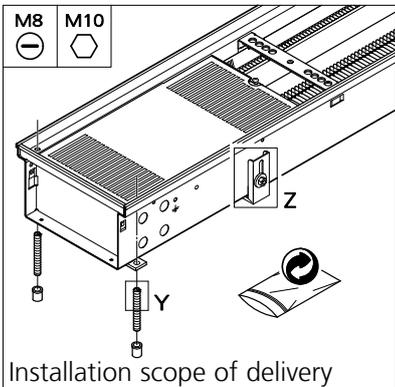
**Important:** The height adjustment feet are already fitted to the floor trench.

They are fixed the wrong way round for transport reasons.

To install and adjust the height of the trench, loosen the outer fixing nuts on the adjustment feet and turn the height adjustment feet 180° so that the foot is pointing outwards (see Fig.)

- Then level the trench heater and adjust the height using the adjustment feet and adjustment screws on the raised floor brackets ③.
- Use screws and dowels to fix the height-adjustment feet ① with rubber pads for sound decoupling ②.

**Important:** Grilles can be walked upon. However, avoid point loads (e.g. chair legs)!

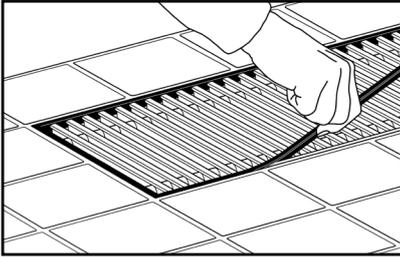


## 2.42 Katherm QE – Tangential fan convection with electric heating element

### Ready-to-install convector-based floor trenches

#### Assembly and installation instructions

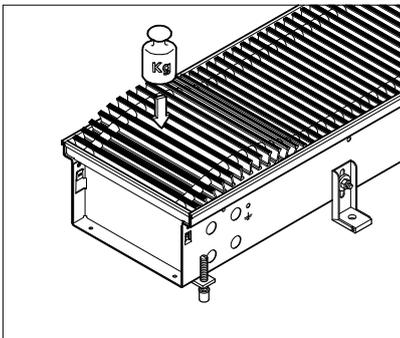
### 5. Screeding



Plastic frame protection profile:  
Only remove the plastic protective frame  
profile before commissioning the unit!

Before commencing screeding, check whether

- the electrical connection has been correctly done,
- the height and distance of the Katherm QE from the window is correct,
- the grille is covered (Caution! Cement destroys the surface of the grille!),
- sound insulation (not with raised floors) is fitted underneath the trench heater,
- there are no sound bridges to the concrete slab, especially close to the height-adjustment feet,
- appropriate materials have been used to seal all openings and punched openings in the trench heater from the ingress of screed.
- the openings and punched openings on the trench are sealed when using screed or other low-viscosity floor coverings.



**Important:** Do not allow screed or the floor to press the floor trench.  
Provide expansion joints if necessary.

**Important:** If water drains are to be provided on site, check after installation whether the drain openings are free of obstructions.

## 6. Grille fixing

High surface temperatures can be produced on the electric finned element (electric heating element). For this reason, additional grille fixings have been factory-fitted as a safety guard along both long sides of the trench. The grille can only be removed using a tool. The grille fixing only needs to be removed on one side at the electrical connection side when wiring. Refit the grille fixing once the unit has been wired.

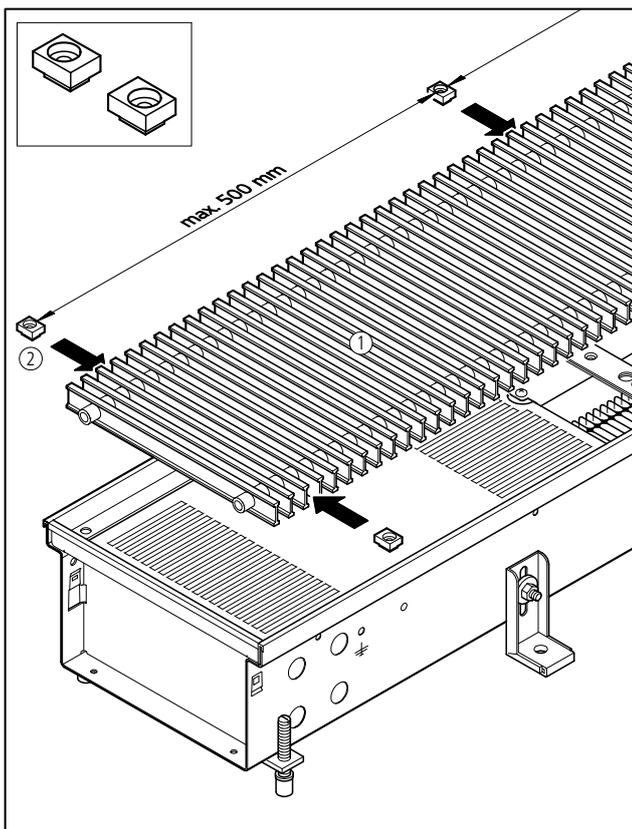
### Installation cover:



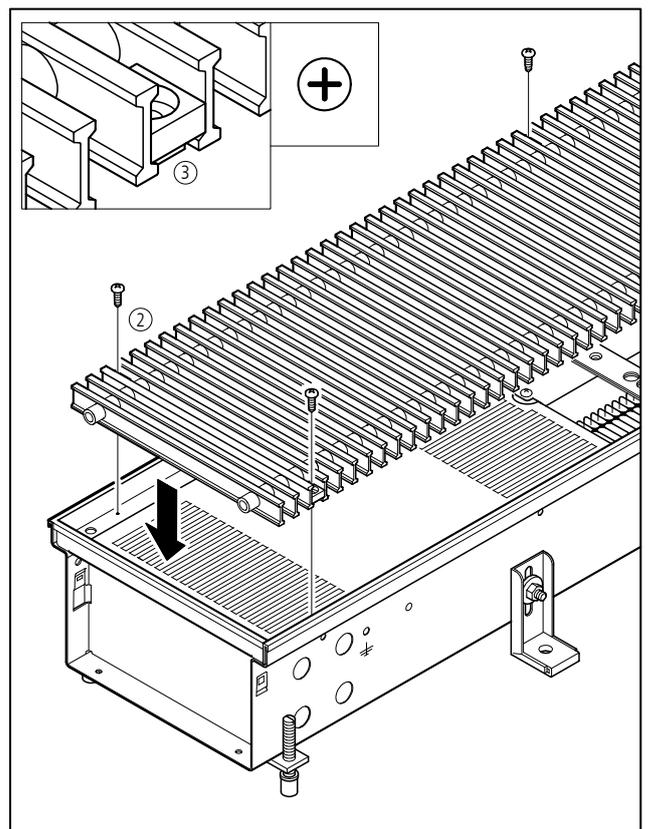
**Important:** Never operate the Katherm QE or the electric heating element with the installation cover fitted.

Once the installation cover has been removed, place the grille in position and fix in place with the grille fixings and self-tapping screws.

**Important:** Never cover the Katherm QE grille while the unit is running!



Katherm QE - grille fixing



Katherm QE - grille fixing

- ① Roll-up grille
- ② Grill fixing with self-tapping screws
- ③ Grille fixing detail

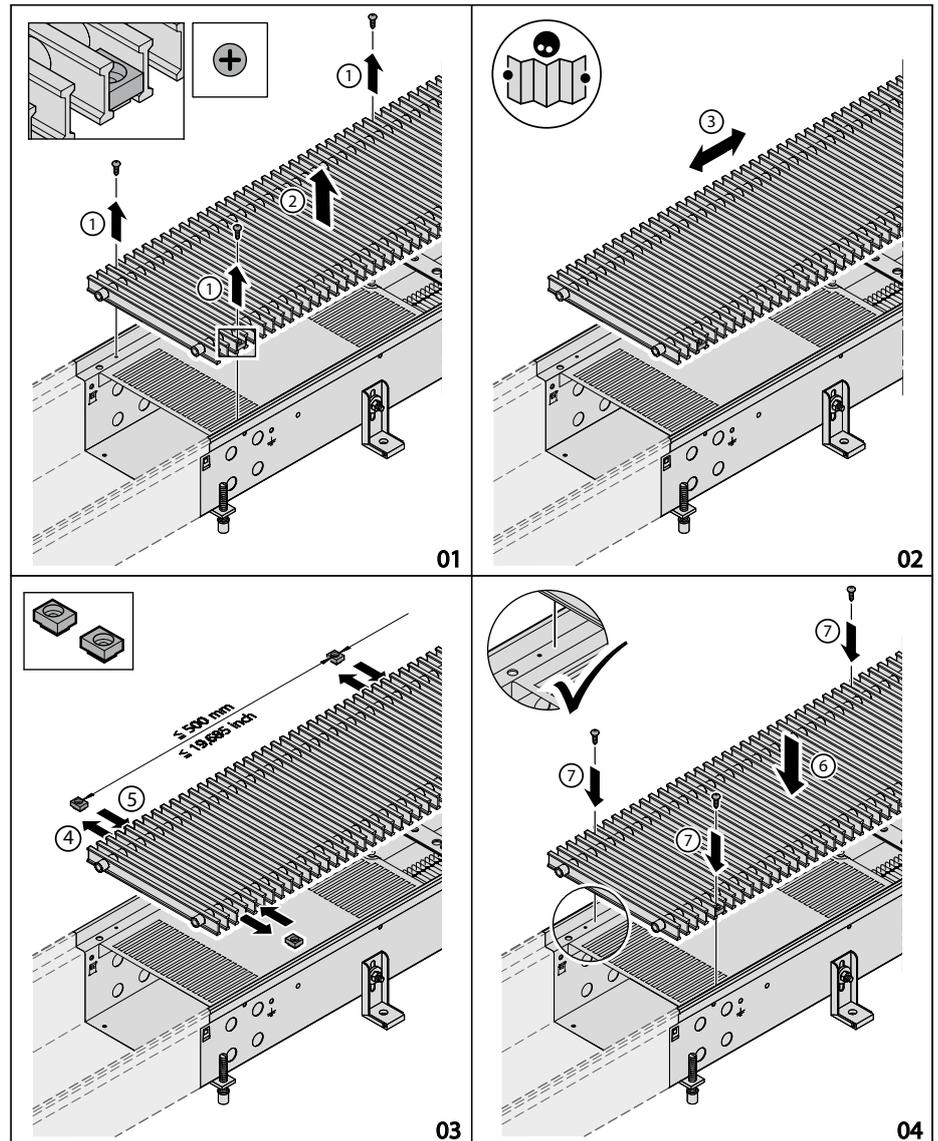
## 2.42 Katherm QE – Tangential fan convection with electric heating element Ready-to-install convector-based floor trenches

### Assembly and installation instructions

#### Grille fastenings for trench extensions

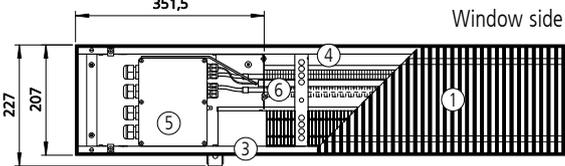
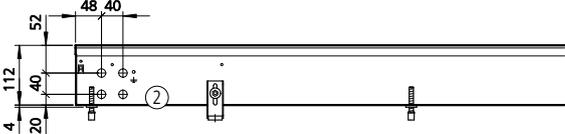
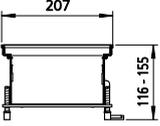
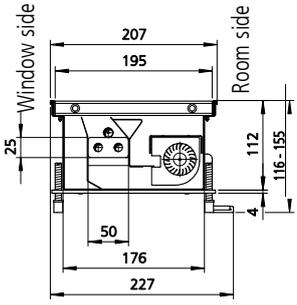
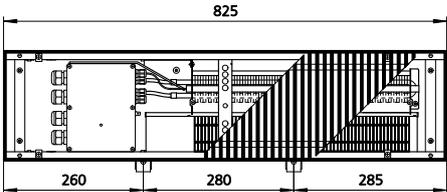
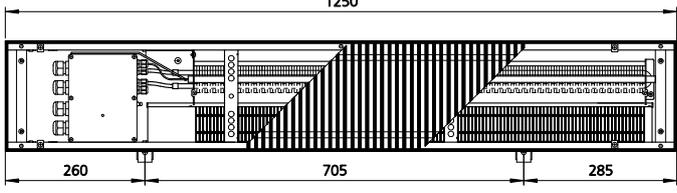
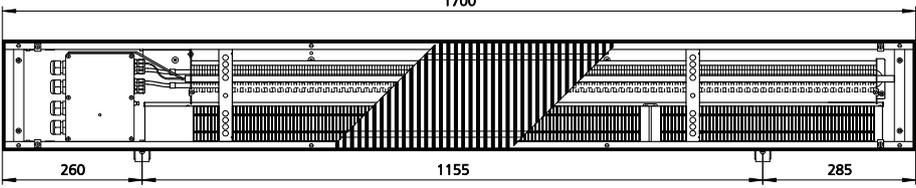
For trench extensions, the following procedure can be used for the grille fastenings to adapt the grilles to structural conditions:

- Loosen the fastening screws.
- Position the grille.
- Replace and secure the grille fastenings.
- Please note the distance between the grille fastenings.



## 7. Dimensions · Connection openings · Heat outputs

### Katherm QE

Design	Room-side connection
<ul style="list-style-type: none"> <li>① Roll-up grille</li> <li>② Electrical wiring</li> <li>③ EC tangential fans</li> <li>④ Electric heating element with air baffles</li> <li>⑤ Power control</li> <li>⑥ Safety chain</li> </ul>	<div style="text-align: right; margin-bottom: 10px;">Window side</div>  <p style="text-align: center;">Top view (without cover panel)</p> <div style="text-align: right; margin-bottom: 10px;">Room side</div>  <p style="text-align: center;">Front view</p>  <p style="text-align: center;">Side view</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p style="text-align: center;">Side view (Cross-section enlarged)</p> </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  </div> </div> <div style="text-align: center; margin-top: 20px;">  <p style="text-align: center;">Top views (views without cover panel)</p> </div>

## 2.42 Katherm QE – Tangential fan convection with electric heating element

### Ready-to-install convector-based floor trenches

#### Assembly and installation instructions

#### Technical data

Fan stage	Control signal	Heat output	Electrical power consumption	Current consumption	Sound pressure level <sup>1)</sup>	Sound power level
	[V]	[W]	[W]	[A]	[dB(A)]	[dB(A)]
<b>Trench length 825 mm</b>						
<b>Boost stage</b>	10	800	6	3,5	28	36
<b>Design stages</b>	8	660	5	3,1	26	34
	6	500	4	2,4	21	29
	4	320	3	1,5	< 20 <sup>2)</sup>	< 28 <sup>2)</sup>
<b>Minimum stage</b>	2	160	3	0,7	< 20 <sup>2)</sup>	< 28 <sup>2)</sup>
<b>Trench length 1250 mm</b>						
<b>Boost stage</b>	10	1600	7	7,0	31	39
<b>Design stages</b>	8	1320	6	6,3	29	37
	6	1000	5	4,7	24	32
	4	640	4	3,0	< 20 <sup>2)</sup>	< 28 <sup>2)</sup>
<b>Minimum stage</b>	2	320	3	1,5	< 20 <sup>2)</sup>	< 28 <sup>2)</sup>
<b>Trench length 1700 mm</b>						
<b>Boost stage</b>	10	2400	7	10,6	33	41
<b>Design stages</b>	8	1980	6	9,5	31	39
	6	1500	5	7,2	26	24
	4	960	4	4,5	< 20 <sup>2)</sup>	< 28 <sup>2)</sup>
<b>Minimum stage</b>	2	480	3	2,2	< 20 <sup>2)</sup>	< 28 <sup>2)</sup>

<sup>1)</sup> The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m<sup>3</sup> and a reverberation time of 0.5 sec (in line with VDI 2081).

<sup>2)</sup> Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

## 8. Number of height-adjustment feet and raised floor feet

Trench length [mm]	Number	
	Height adjust- ment feet	Raised floor feet
825	2	2
1250	2	3
1700	2	4

## 9. Maintenance

### Notes

Maintenance of the Katherm QE trench heaters should only be carried out by qualified personnel trained in compliance with the installation and operating instructions as well as any regulations currently in force. Regularly maintain and inspect Katherm QE units to ensure their proper function and performance.

### Fan

- Inspect the tangential fans every 6 months for dirt and damage (visual inspection).
- Clean the fan shafts carefully with a cloth if dirty.

### Heating element

- Inspect the in-built fan coil every 6 months for dirt and possible damage. Visual inspection is sufficient here too.
- Carefully vacuum the heating element from above, if dirty, or clean the air baffle with a cloth.

## 2.42 Katherm QE – Tangential fan convection with electric heating element

### Ready-to-install convector-based floor trenches

#### Assembly and installation instructions

### 10. Electrical wiring

- Personnel:
- Installation personnel
  - Qualified electrician
- Protective equipment:
- Safety shoes
  - Protective gloves
  - Workwear



Only allow qualified electricians to perform electrical work. Further connections, for instance to building control systems or external controllers, may optionally be necessary. Refer to the manufacturer's literature in this respect.

- Wire the unit in accordance with the enclosed wiring diagram.
- Wire the unit in accordance with the currently applicable VDE and EN regulations and the energy supply companies' Technical Wiring Regulations.
- Only connect the unit to fixed cables.

#### Important note:



Provide an all-pole mains separator in the wiring on site that can be reliably secured to avoid the system being reconnected (e.g. a lockable switch with a contact opening of at least 3 mm up to a rated voltage of 480 V).

No protective measures are indicated in the Kampmann wiring diagrams. These must be provided additionally when installing the system and when connecting the units in accordance with VDE 0100 and the regulations of each energy supply company.

#### 10.1 Control

Connect the units via a PCB in the electrical junction box.

Wire the unit as per the wiring diagram.

The cable types and cable cross-sections to be installed are defined by an authorised electrician, as the cable cross-sections are essentially dependent on the electrical fuse, cable length and type of installation on site.

Every Katherm QE trench heater is fitted with an integral power control for the electric heating element and the EC tangential fan.

Power control is provided by PWM actuation and is proportional to the active 0...10 VDC input signal. Room temperature control can be provided by a room temperature control or a building management system.

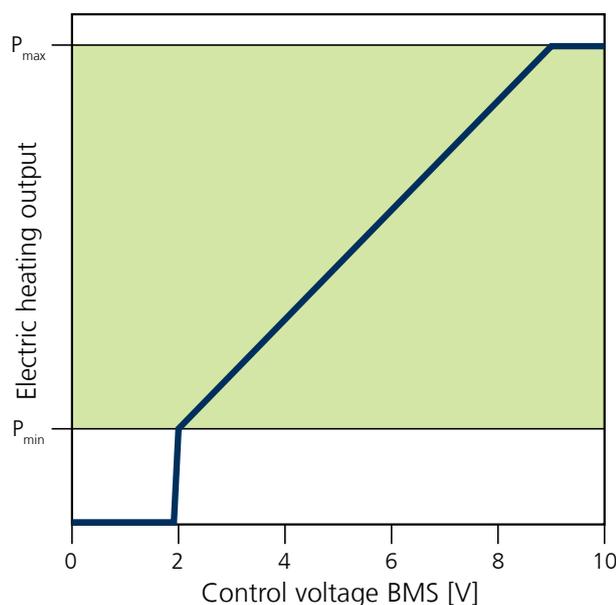
Group control of several trenches is possible without the need for additional accessories. The Katherm QE should be connected or switched in parallel in accordance with VDE 0100 / IEC 60364-1. The discharge current often produced when using EC fans is 0 mA and thus complies with the applicable IEC EN 60355-2-40.

#### 10.2 Control strategy

With a control signal of 2 V, the EC tangential fan is operated at minimum speed and the electric heating element with minimum heat output.

When the control voltage is increased, the speed of the EC tangential fan and the heat output of the electric heating element is proportionately increased. The ideal electrical heat output is thus provided for every volumetric flow.

Energy-optimised heating operation is guaranteed by the infinitely variable adjustment of the electric heating element to the room heat requirement.



## 2.42 Katherm QE – Tangential fan convection with electric heating element

### Ready-to-install convector-based floor trenches

#### Assembly and installation instructions

The Katherm QE can be controlled as follows:

#### Operating with room temperature controller type 146928



The internal sensor in the room temperature controller type 146928 measures the room temperature. In the event of deviation of the actual value to the target value, the controller constantly changes the output signal. The heat output of the Katherm QE is proportional to the output signal of the room temperature controller.

#### Product features:

- flat surface-mounted housing
- colour: pure white (similar to RAL 9010)
- operating voltage: 24 V AC/DC / 50 Hz
- 2 output signals: 0-10 V max. 5 mA
- protection class: IP 30
- control range: 13-29 degrees C
- room temperature sensor: Internal NTC
- assembly: surface-mounted/wall-mounted
- Inputs: external sensor, on / off or eco / day

#### Operating with external building management system

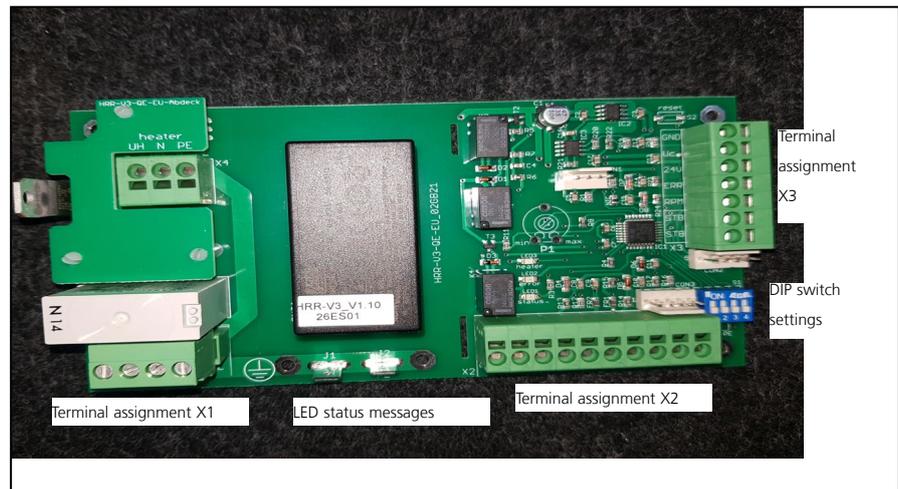
In the event of operation by a BMS, it must provide a continuous control signal of 0..10 VDC. The heat output of the Katherm QE is proportional to the pending control signal. Switching the enable contact can optionally enable or disable the Katherm QE. Group operation of several units is possible with a parallel connection. Group operation is provided for by a parallel connection. It can transmit a possible fault via an internal potential-free fault alert contact in the BMS.

### 10.3 Description of PCB

#### Performance data:

Switching power for the heating element = 2500 W

Switching power for the EC fan = 13 W



#### Klemmenbelegung

X1	mains	Mains connection (230 V/50 Hz)
X2	vault enable	Potential-free fault alert output (max. load 60 V AC/DC / 1 A)
	24V	DI1, potential-free enable contact
	0-10V	Voltage output 24 VDC (max. 40 mA)
	NTC 10K	AI1, Control signal 0...10V = Heating output 0...100% (Ri = 100KOhm)
X3	STB	AI2, Temperature sensor
	STB	Safety temperature limiter
	RPM	Safety temperature limiter
	ERR	Input signal of the number of revolutions of the EC tangential fan
	24V	Input signal of the status of the EC tangential fan
	GND	Supply voltage (+) for the EC tangential fan
		Supply voltage (-) for the EC tangential fan

#### Functional description

The factory setting activates the electric heating element with a heat output of 20% and, at the same time, the EC tangential fan with minimum fan revolution at a control voltage of 2 VDC.

Increasing the control voltage to 9 VDC increases the electric heat output and the fan speed proportionally to the control voltage to up to 100%.

Setting the DIP switch 2 to „ON“ increases the minimum fan speed of the EC tangential fan whilst keeping the heat output unchanged.

In the lower speed range, the discharge temperature is lowered by this.

The accumulation of heat is prevented when the electric heating element is switched off by the fan running on for 90 seconds.

Setting the DIP switch 3 to „ON“ increases the minimum electric heat output to 30% whilst keeping the fan speed unchanged. Primarily in the lower bandwidth of the control voltage, this enables a higher heat output, which

## 2.42 Katherm QE – Tangential fan convection with electric heating element

### Ready-to-install convector-based floor trenches

#### Assembly and installation instructions

also slightly raises the discharge temperature of the Katherm QE. In the event of impermissible temperature increase within the Katherm QE, for example by increasing the temperature within the Katherm QE, an integrated two-stage safety switch guarantees that the unit is properly switched off. At a temperature of 80°C within the Katherm QE, the heating element is disabled.

A roll-up grille temperature of 45 Kelvin above the room temperature is maintained in accordance with IEC EN 60335-2-30. The triggering of the safety temperature monitor can be signalled via a potential-free

fault alert contact. After rectifying the cause of the fault, the fault message is acknowledged by resetting the supply voltage.

The speed of the EC tangential fan is also monitored.

Should no speed pulses of the EC tangential fan be generated because of the motor coming to a standstill, the electric heating element is disabled.

#### DIP switch settings

	Factory setting	OFF	ON
DIP 1	OFF	Enable not required	Enable required
DIP 2	OFF	Speed increase Off	Speed increase On
DIP 3	OFF	Minimum heat output = 20%	Minimum heat output = 30%
DIP 4	OFF	–	–

#### LED status messages

LED	Function	Colour	Status	Description
1	Heating	Yellow	Lights up	Heating mode
2	Fault message	Red	1x flashes	Fault of EC motor
			2x flashes	EC motor speed
			3x flashes	PCB temperature sensor has triggered
			Lights up	STB has triggered
3	Status	Green	OFF	No mains voltage or error
			flashes cyclically	Operation
			alternating fast-flow flashing	No enable
			Lights up	Standby

#### Status coding of the red LED fault signal

Lights up = Continuously lit

1 x flash = On (0.2 sec.) → Off (0.8 sec.) ...

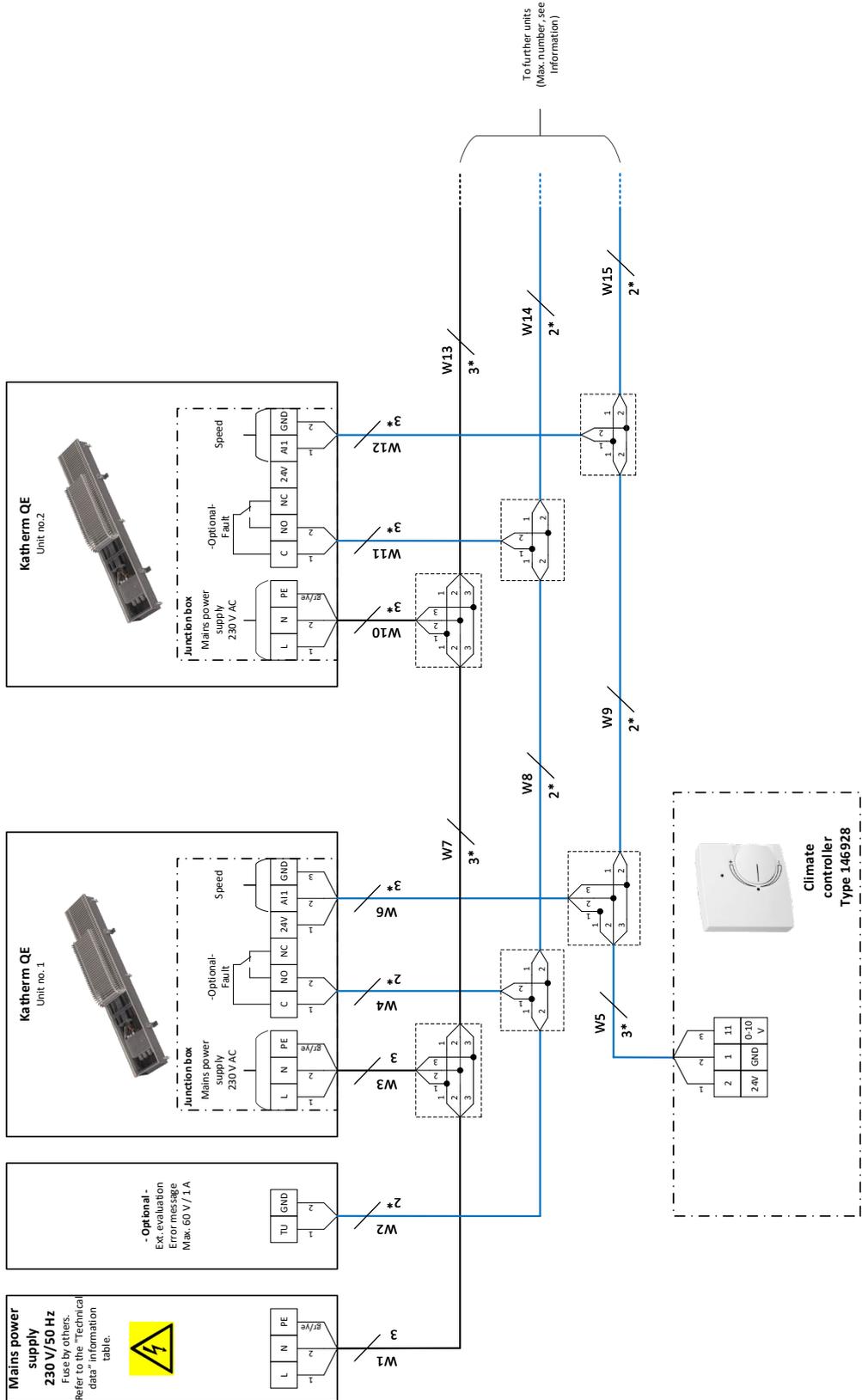
2 x flashes = On (0.2 sec.) → Off (0.8 sec.) → On (0.2 sec.) → Off (2 sec.) ...

3 x flashes = On (0.2 sec.) → Off (0.8 sec.) → On (0.2 sec.) → Off (0.8 sec.) → On (0.2 sec.) → Off (2 sec.) ...

Alternating = On (0.5 sec.) → Off (0.2 sec.) → On (0.1 sec.) → Off (0.2 sec.) ...

#### 10.4 Cabling

#### Floor trench with electric heating element, room thermostat control, type 146928



Note these points in the following layout plans:

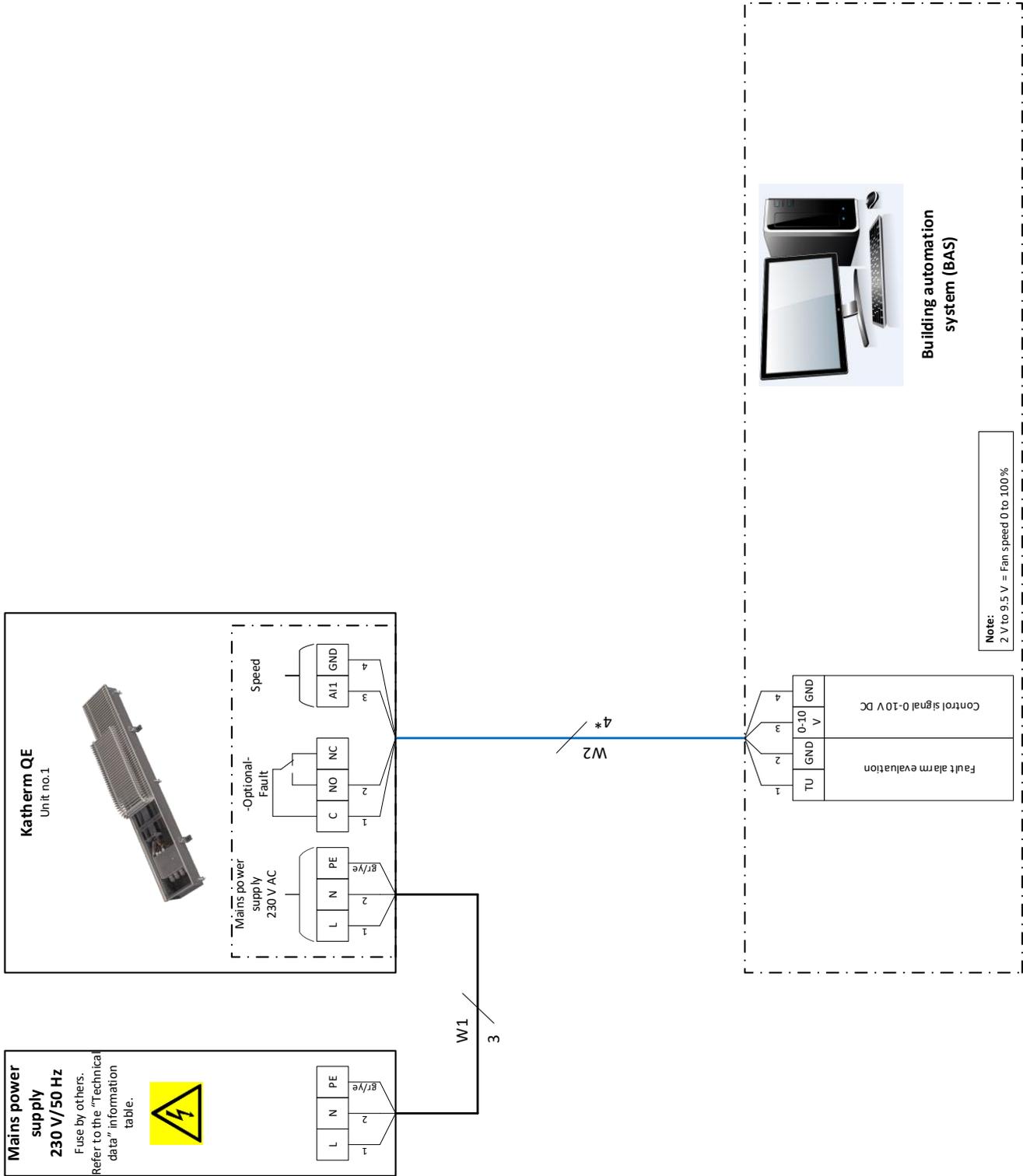
- Comply with the following details on the types of cable and cabling taking into consideration VDE 0100.
- Without \*: NYM NYM-J. The requisite number of wires, including PE conductor, is stated on the cable. Cross-sections are not stated, as the cable length is involved in the calculation of the cross-section.
- \*): Shielded paired cable e.g. UNITRONIC® BUS LD 2x2x0.22 mm or similar. Lay separately from high voltage lines.
- \*\*): Lay shielded cable, J-Y(STY) 0.8 mm or similar. Lay separately from high voltage lines.
- If other types of cables are used, they must be at least equivalent.
- The terminals on the unit are suitable for a maximum wire cross-section of 2.5 mm<sup>2</sup>. We recommend type F when using RCCBs.
- Refer to the provisions of DIN VDE 0100 Parts 400 and 500 when designing the rated fault current.
- The electrical data need to be respected when rating the in situ mains power supply and fusing.

# 2.42 Katherm QE – Tangential fan convection with electric heating element

## Ready-to-install convector-based floor trenches

### Assembly and installation instructions

#### Floor trench with electric heating element, BMS control



#### Spare parts list

Description	Fits trench length			Type number
	825 mm	1250 mm	1700 mm	
Electrical power module	X	X	X	000001264781
Electrical PCB	X	X	X	000001246305
Electrical heating element	X			000001264764
		X		000001264752
			X	000001246993
Safety chain	X			000001265464
		X		000001265462
			X	000001264413
EC tangential fan	X			000001217798
		X		000001217821
			X	000001217823
Cable tree for tangential fan	X	X	X	001941264859

# 2.42 Katherm QE – Tangential fan convection with electric heating element

## Ready-to-install convector-based floor trenches

### Assembly and installation instructions

## 11. Declaration of Conformity



## EU-Konformitätserklärung

EU Declaration of Conformity  
Déclaration de Conformité CE  
Deklaracja zgodności CE  
EU prohlášení o konformite

### Wir (Name des Anbieters, Anschrift):

We (Supplier's Name, Address):  
Nous (Nom du Fournisseur, Adresse):  
My (Nazwa Dostawcy, adres):  
My (Jméno dodavatele, adresa):

**KAMPMANN** GMBH & Co. KG  
Friedrich-Ebert-Str. 128-130  
49811 Lingen (Ems)

### erklären in alleiniger Verantwortung, dass das Produkt:

declare under sole responsibility, that the product:  
déclarons sous notre seule responsabilité, que le produit:  
deklarujemy z pełną odpowiedzialnością, że produkt:  
deklarujeme, vědomi si své odpovědnosti, že produkt:

<b>Type, Modell, Artikel-Nr.:</b>	<b>Katherm QE</b>	<b>242***</b>
Type, Model, Articles No.:		
Type, Modèle, N° d'article:		
Typ, Model, Nr artykułu:		
Typ, Model, Číslo výrobku:		

### auf das sich diese Erklärung bezieht, mit der / den folgenden Norm(en) oder normativen Dokumenten übereinstimmt:

to which this declaration relates is in conformity with the following standard(s) or other normative document(s):  
auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou autre(s) document(s) normatif(s):  
do którego odnosi się niniejsza deklaracja, jest zgodny z następującymi normami lub innymi dokumentami normatywnymi:  
na který se tato deklarace vztahuje, souhlasí s následující(mi) normou/normami nebo s normativními dokumenty:

<b>DIN EN 55014-1 ; -2</b>	<b>Elektromagnetische Verträglichkeit</b>
<b>DIN EN 61000-3-2 ; -3-3</b>	<b>Elektromagnetische Verträglichkeit</b>
<b>DIN EN 61000-6-1 ; -6-2 ; -6-3</b>	<b>Elektromagnetische Verträglichkeit</b>
<b>DIN EN 60335-1 ; -2-30</b>	<b>Sicherheit elektr. Geräte für den Hausgebrauch und ähnliche Zwecke. Besondere Anforderungen für Raumheizgeräte</b>

Kampmann GmbH & Co. KG  
Friedrich-Ebert-Straße 128–130  
49811 Lingen (Ems)

Registergericht: Osnabrück, HRA 205688  
USt-IdNr: DE313505294  
Kampmann.de

Persönlich haftende Gesellschafterin:  
Kampmann Beteiligungsgesellschaft mbH  
Sitz: Lingen (Ems)

Registergericht: Osnabrück, HRB 211684  
Geschäftsführer: Hendrik Kampmann





**Gemäß den Bestimmungen der Richtlinien:**

Following the provisions of Directive:  
Conformément aux dispositions de Directive:  
Zgodnie z postanowieniami Dyrektywy:  
Odpovídající ustanovení směrnic:

2014/30/EU  
2014/35/EU

EMV-Richtlinie  
Niederspannungsrichtlinie

Lingen (Ems), den 01.09.2020

**Ort und Datum der Ausstellung**

Place and Date of Issue  
Lieu et date d'établissement  
Miejsce i data wystawienia  
Místo a datum vystavení

Hendrik Kampmann

**Name und Unterschrift des Befugten**

Name and Signature of authorized person  
Nom et signature de la personne autorisée  
Nazwisko i podpis osoby upoważnionej  
Jméno a podpis oprávněné osoby

2/2

## **2.42** **Katherm QE** – Tangential fan convection with electric heating element Ready-to-install convector-based floor trenches

Assembly and installation instructions



[Kampmann.eu/Katherm-QE](http://Kampmann.eu/Katherm-QE)  
[Kampmann.co.uk/Katherm-QE](http://Kampmann.co.uk/Katherm-QE)

**KAMPMANN**