Katherm QE

Trench heating with electric heating element

Technical Catalogue

KAMPMANN

Kampmanngroup.com/katherm-qe

Contents

Katherm QE: trench heating with electric heating element

Katherm QE trench heaters are an ideal alternative to LPHW convectors.

01 Product information

Katherm QE – tangential fan convection with electric heating element

Katherm QE are the ideal solution when the use of an LPHW convector is impossible or not intended. They stand out on account of their energy-saving and ultra-quiet EC tangential fans combined with high-performance electric heating element that provides high heat outputs.

Katherm QE are ideal for installation in front of floor-to-ceiling glazing. Equipped with state-of-the-art EC technology, the space is quickly heated up with a low, non-disruptive noise level. Due to the optimum air guidance effect between the tangential fan, heating element and baffles, the Katherm QE only has low and safe surface temperatures.

Katherm QE are supplied as ready-to-fit trench heaters for installation in screed. They provide cold air screening coupled with full space heating. Once installed, all that is visible is the elegant Optiline roll-up grille, available in a number of different designs.

Control

Two control schemes are available to control Katherm QE trench heaters:

- Control by a room temperature controller
- Control by an external BMS

In both schemes, the EC tangential fans are speed-controlled by a 0-10 V signal. As soon as the EC fans are switched on at any setpoint, infinitely controllable heat control starts up. The right electric heat output is available for every air volume.

Operation:

Air is drawn in by the fan and routed through the parallel heating element with air baffles. The heated air flows out from the floor trench and rises up and/or provides cold air screening of the window and draught-free warm air circulation in the room, thanks to the recirculation of the air. A separating plate effectively prevents mixing between the air intake and air outlet.

EC tangential fans:

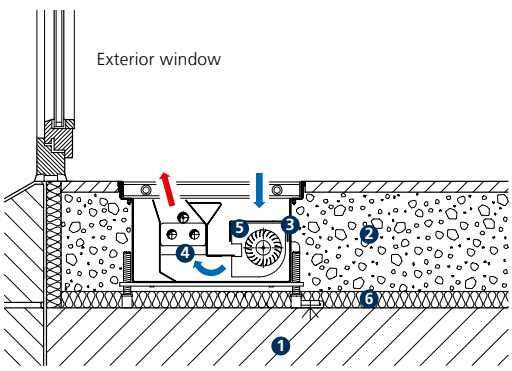
EC tangential fans can be operated across a significantly wider speed range due to their integrated power electronics. Low fan speeds generate noise that often lies far below the audible threshold and thus help to create a pleasant ambience in living rooms, bedrooms, offices and hotel bedrooms. The motor management system permanently detects the operating status and keeps the pre-set speed constant, regardless of the fan length and external influences.

Safety functions

Katherm QE trench heaters incorporate overheating cut-outs as a safety concept and to protect users from excessively high temperatures on the grille. The safety cut-out includes a locking shut-down of the heat output via a relay or indirect, locking shut-down via a safety temperature limiter, thereby ensuring operational safety, for example in the event of improper use. The speed of the fan is also monitored. If the fan no longer sends speed pulses to the power electronics, then the heat output is switched off.

QE installation example

(Installed in a raised floor, trench height 112 mm)



1. Concrete slab
2. Screed
3. Floor trench
4. Electric heating element
5. EC tangential fan
6. Heat and sound insulation

Katherm QE product data

Product features

- minimal trench dimensions for unobtrusive installation in a room
- high heat output, at the same time as low sound levels
- tangential fan with EC technology
- 2-stage safety cut-out by safety thermostat and temperature safety mechanism in the event of improper operation
- control box with integral infinitely variable power control
- low surface temperatures
- the ideal solution when the use of an LPHW convector is impossible or not intended
- primary heat source
- ideal for installation in front of floor-to-ceiling glazing
- fast heating-up
- simple control via room thermostat or BMS

Features

Standard range
trench width = 207 mm,
trench height = 112 mm,
3 trench lengths,
tailor-made range possible with empty trenches

Convection ▸ EC tangential fan
Heating ▸ Electric heating element
Cooling ▸ ---
Ventilation ▸ ---
KaControl ▸ ---
System ▸ Electric

Grille finishes
- Roll-up grilles

Performance data

Heat output [W]
- 160 – 2400

Max. sound pressure level [1] [dB(A)]
- < 20 – 33

Max. sound power level [dB(A)]
- < 28 – 41

Applications

All areas of buildings in which effective heating and cold air screening is required. Katherm QE units can provide energy-saving and low-noise heating particularly when the use of LPHW is not provided for or possible.

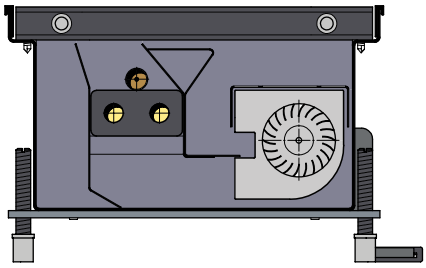
Hotels / motels
Sales rooms and showrooms
Office and meeting rooms
Homes and conservatories
Restaurants and cafés

[1] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081).

Selection guide: Overview of Katherm QE models

Model	Trench width	Trench height	Unit length	Heat output	Sound pressure level [1]	Sound power level
	[mm]	[mm]	[mm]	[W]	[dB(A)]	[dB(A)]
QE	207	112	825 – 1700	160 – 2400	< 20[2] – 33	< 28[2] – 41

Cross-sectional view

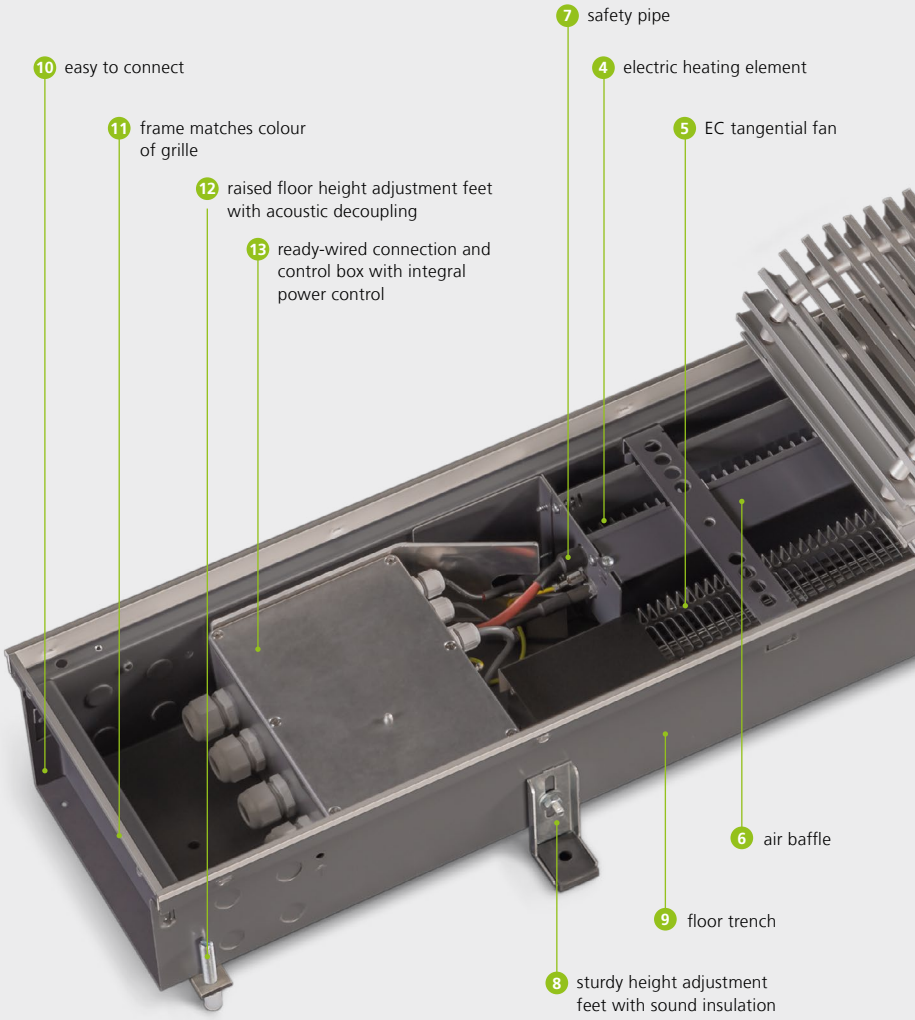


Katherm QE

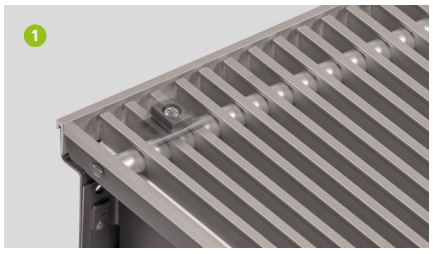
[1] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081).

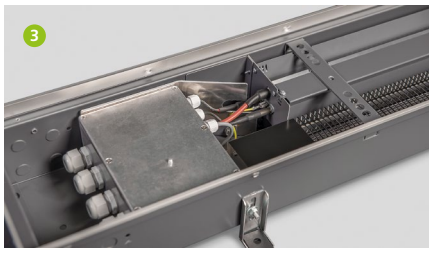
[2] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

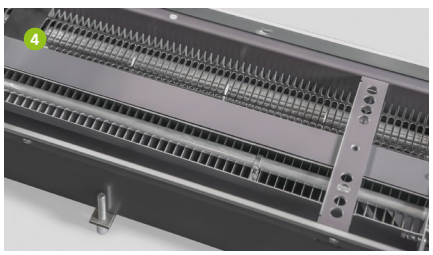
Katherm QE at a glance

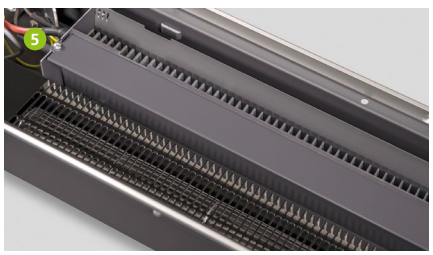


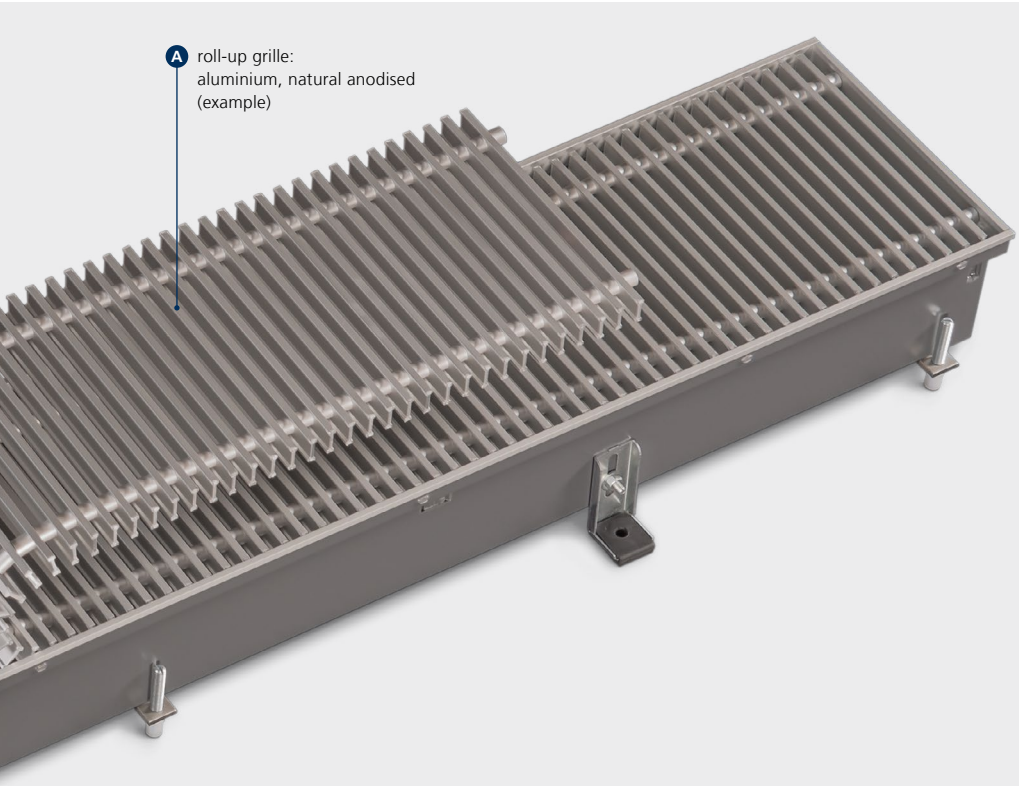
Features











1 grille fixing:
- which acts as a touch guard
- factory-fitted
- the grille can only be removed using a tool

2 cover plate:
- as visual protection and to protect against dirt
- with integral ventilation slot

3 electric heating element wiring:
- protection class IP 65
- heating element factory-wired into control unit

4 electrical heating element:
- comprising stainless steel pipes with aluminium-zinc fins
- with factory-fitted safety protective pipe for 2-stage safety chain, consisting of safety thermostat and temperature safety mechanism

5 EC tangential fan:
- with integral grille as a safety guard
- for an even airflow through the heating element, providing high heat outputs with low noise emissions
- robust motor design
- infinitely variable speed control via an external 0-10 V signal
- motor monitoring with internal fault processing

6 baffle plates:
- for optimum air guidance by the heating element
- for air guidance from the trench

7 safety pipe:
- acting as a safety pipe for 2-stage safety chain comprising a safety thermostat and temperature safety mechanism

8 sturdy height adjustment feet with sound insulation:
- for the simple fixing of the floor trench
- prevents sound transmission

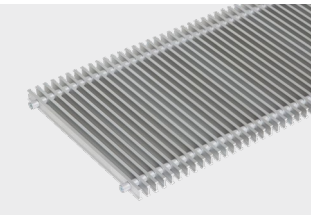
9 floor trench:
- galvanised sheet steel
- painted graphite grey on both sides
- with cross bracing to reinforce the floor trench

A aluminium roll-up grille, natural anodised:
- double T-profile roll-up
- bar dimension 18 x 5 mm (stainless steel 18 x 6 mm)
- bar spacing 9 mm (stainless steel 10.5 mm)
- connections made of corrosion-proof steel springs with spacers in a matching colour
- 65 % free area

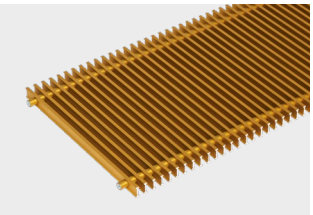
Matching grilles

Roll-up grilles

Aluminium
Natural anodised

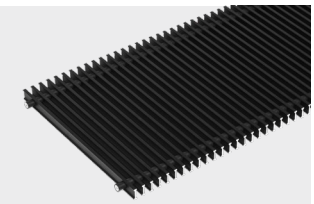


Aluminium
Brass anodised

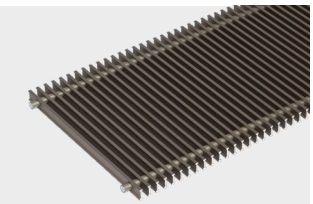


Aluminium
Bronze anodised

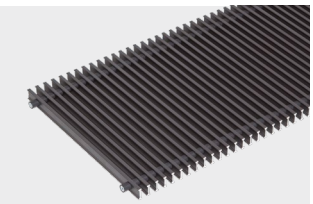
Aluminium
Black anodised



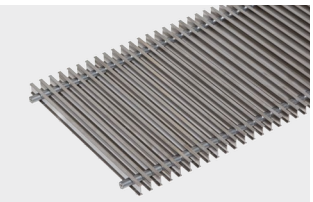
Aluminium
Bronze finish



Aluminium
Painted DB 703

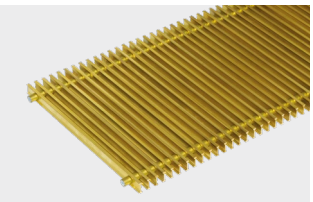


Stainless steel
Natural



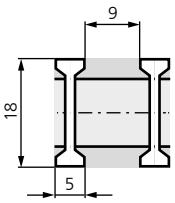
Stainless steel
Polished

Brass
Natural CuZn 44

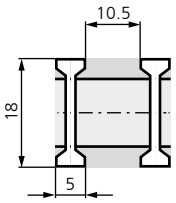


Profile dimensions

Double-T profile



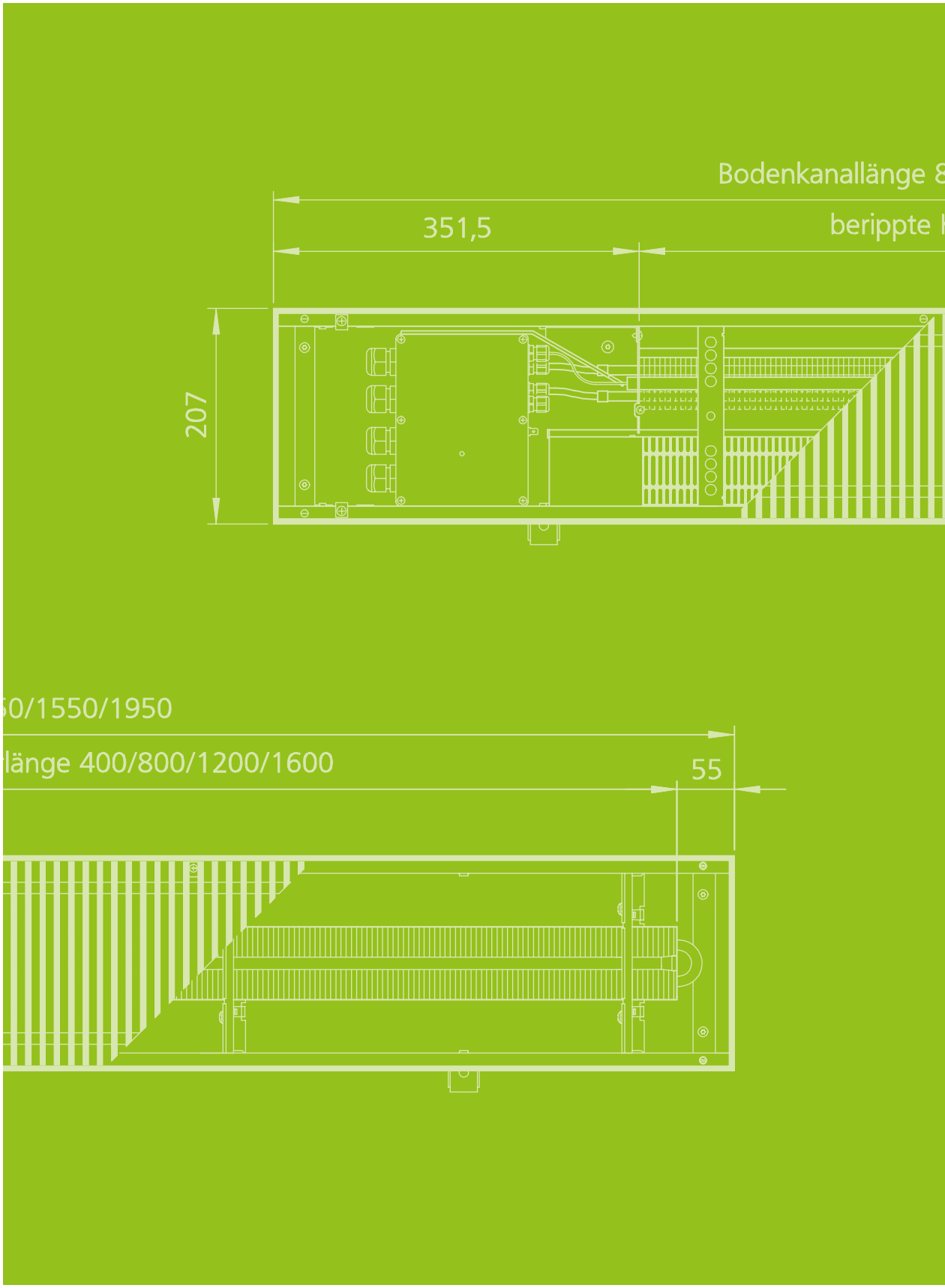
Aluminium, brass



Stainless steel

The above grilles are shown using a four-colour printing process and thus do not represent an exact reproduction of the original colour.

02 Technical data



Advice on measuring conditions

Safety functions and heat outputs

The safety functions and heat outputs are measured in accordance with the following standards:

DIN EN 60335 Safety of household and similar electrical appliances

- Part 1 (VDE 0700-1): General requirements
- Part 2-30 (VDE 0700-30): Particular requirements for room heaters
- Part 2-40 (VDE 0700-40): Particular requirements for electric heat pumps, air conditioners and dehumidifiers

Among other things, DIN EN 60335 regulates the operation of the Katherm QE in the event of:

- improper use, e.g. grille covered
- over-voltage in the mains
- maximum surface temperatures, for instance on the grille surface
- operation of the safety devices
- moisture resistance

The heat output curve proportional to the control voltage was measured by means of extensive measurements and simulations in the Kampmann Research & Development Centre. A floor trench was developed, which uniquely meets the strict requirements of the applicable standards with high heat outputs combined with low surface temperatures and low noise levels.

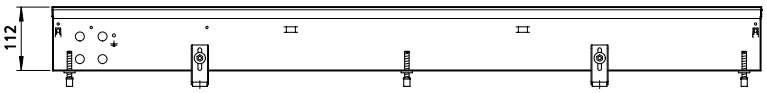
Acoustics

Katherm QE are very often used in acoustically sensitive areas. Accordingly, Katherm QE have been optimised in terms of noise levels. Determination of the sound power and sound energy levels of sources of sound from sound pressure measurements – precision 2 class of enveloping measurement surface for an essentially free sound field over a reflective plane. The sound power level is measured according to DIN EN ISO 3744 in a semi-low reflective acoustic measuring chamber.

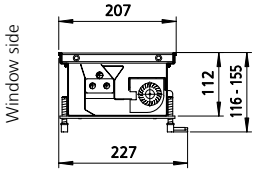
Acoustic measuring chamber

Katherm QE

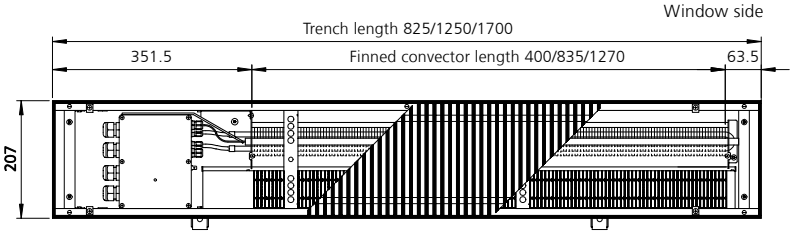
Technical drawings (all dimensions in mm)



Front view



Cross-section
(example showing roll-up grille)



Top view
(view without cover panel)

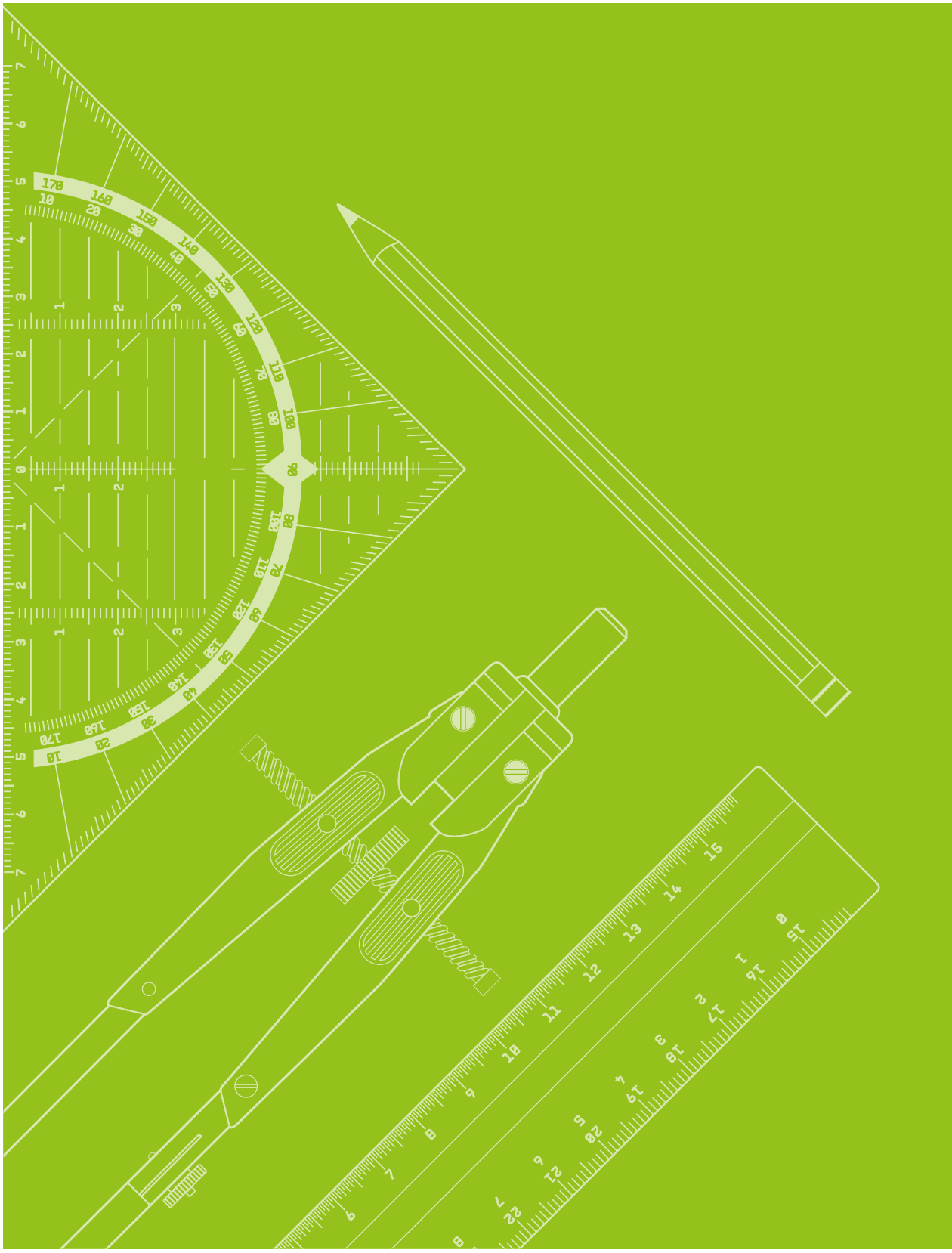
Katherm QE outputs

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

[1] 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 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081).

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

03 Design information



Information on planning and design, Katherm QE

Katherm QE

Katherm QE are suitable for use in all kinds of buildings demanding heating due to their internal loads.

High heating loads in the rooms can be met with ultra-quiet EC fans. Katherm QE are also used to efficiently combat condensation on external glazing.

They are generally positioned directly in front of the external façade without a large gap. Katherm QE can provide cost-effective and efficient heating, particularly in front of large areas of glazing.

Air outlet

All Katherm QE are positioned with the heating element on the window side. The warm air rising up the exterior façade flows draught-free into the room, guaranteeing optimum cold air screening.

Acoustics

The respective sound power levels of Katherm QE are listed in the Technical Data. 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 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081).
As the sound level is not only due to the Katherm QE, but is also influenced by the number of Katherm QE and also very significantly by the acoustic characteristics of the room, the actual figure may vary in practice.

We would recommend designing Katherm QE taking into account the respective permitted sound pressure level in the room.

Heat outputs

The heat output curve proportional to the control voltage was measured in accordance with DIN EN 60335 Part 1, Part 2 - 30 and Part 2 - 40.

04 Controls

Convenient surface-mounted electrical control

Room thermostat, surface-mounted

In an attractive flat surface-mounted housing. A 55 mm diameter back box is needed for installation.

Product features

- Housing: surface-mounted, white
- Voltage: 24 V
- Control range: 14 – 29°C
- Power consumption: approx. 1 W
- Protection class: IP 30
- Protection class: III Protective low voltage
- Dimensions (W x H x D): 78 x 83 x 26 mm

Safety cut-out

The electric heating element is fitted with a safety cut-out. If the temperature of the grille surface rises to 70°C, in the event of improper use, for instance by covering the floor trench, the electric heating element is switched off by a safety temperature limiter. As soon as the heating element has cooled down, or the cause of the overheating has been rectified, the safety temperature limiter restarts automatically. Should the temperature in the floor trench continue to rise for some inexplicable reason, then the safety temperature limiter will switch to a locked position. The triggering of the safety temperature limiter can be signalled by a potential-free fault alert contact. The floor trench can then only be restarted by trained personnel.

Katherm QE control technology

Every Katherm QE floor trench is fitted with an integral power control for the electric heating element and the EC tangential fan. The output is regulated by means of an active 0-10 V DC signal and is proportional to the control signal. Room temperature control is provided by a room temperature controller or a BMS. Group control of several trenches is possible without the need for additional accessories. Katherm QE units must be connected and/or switched in parallel in accordance with VDE 0100 / IEC 60364-1. There is no discharge current (0 mA) in accordance with IEC 60335-2-40. The EC tangential fan is operated at minimum speed with a 2 V control signal and the electric heating element is activated with minimum heat output. Should the control voltage rise, the speed of the EC tangential fan and the heat output of the electric heating element increases proportionately. The correct electric heat output is available for every air volume.
Energy-efficient heating is therefore guaranteed by the infinitely variable adaptation of the electric heat output to the room heat requirement.

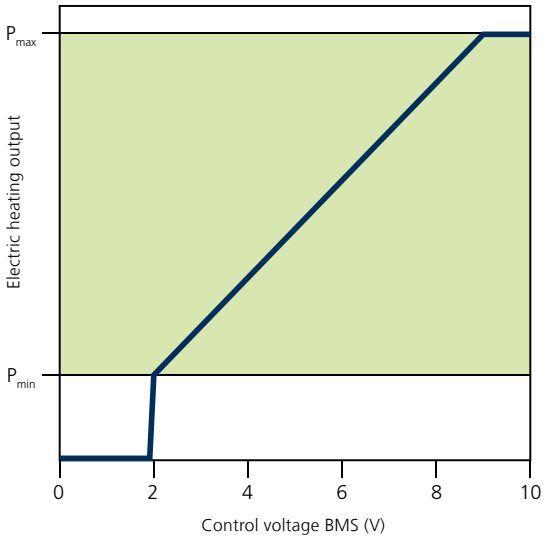
Katherm QE can be controlled as follows:

By a thermostat

The internal sensor in the room temperature sensor measures the room temperature. In the event of the actual figure deviating from the setpoint, the controller continuously modifies the output voltage between 0-10 V (max. 5 mA per output). The output of the electric heating element is proportional to the output voltage of the thermostat. The thermostat requires a 24 V/AC/DC voltage supply. The control range lies between 14 and 29°C.

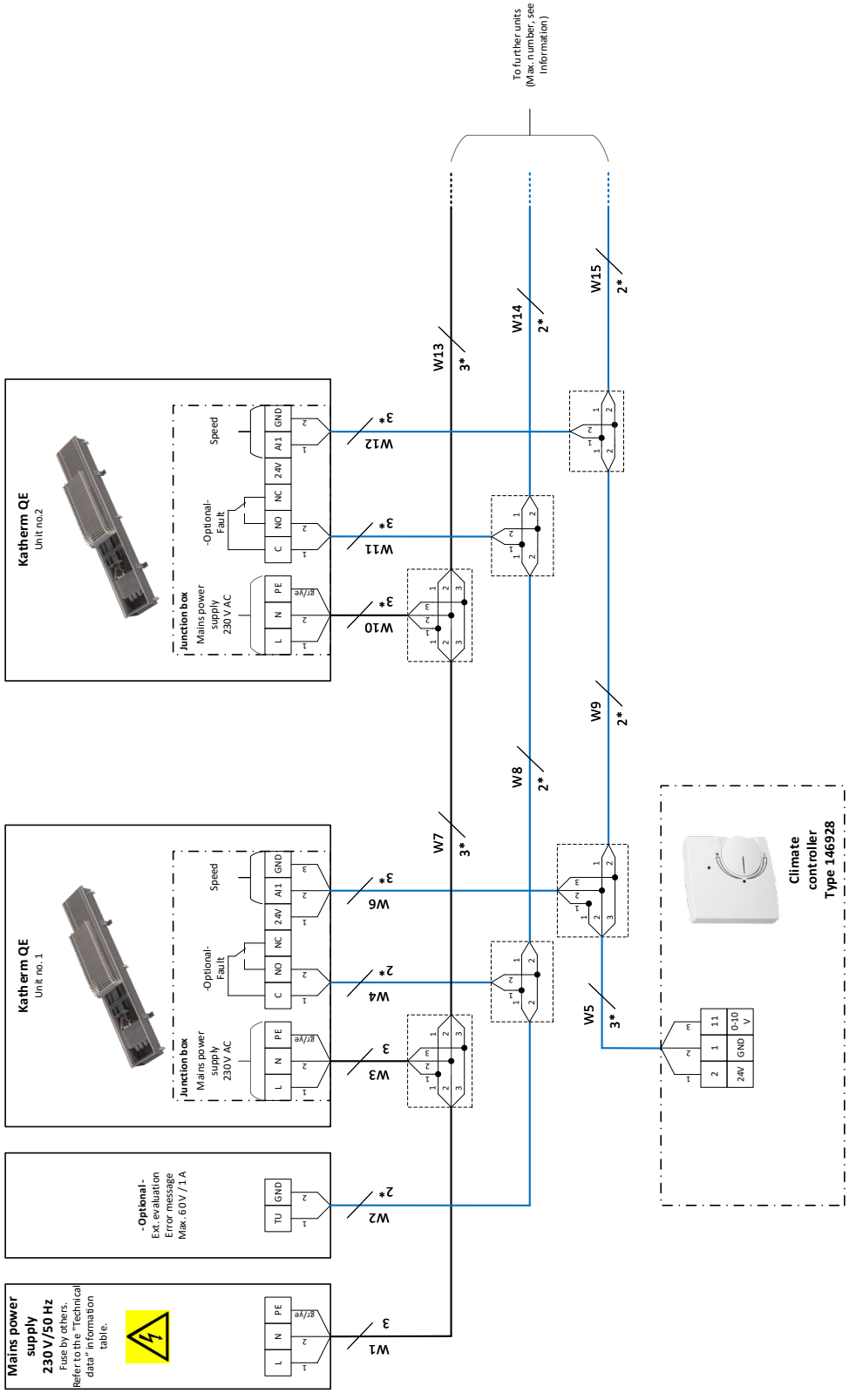
Operation by an external BMS

In the event of operation by a BMS, it must provide a continuous control signal of 0-10 V. The output of the electric heating element is proportional to the pending control signal. The floor trench can also be activated or deactivated by an enable signal. If several units are connected, the control signal and enable signal can simply be connected in parallel. In the event of the safety temperature limiter being triggered, this can be conveyed to the BMS via a potential-free fault alert contact. Power control is governed solely by the BMS and the control voltage must be regulated in the event of deviation.

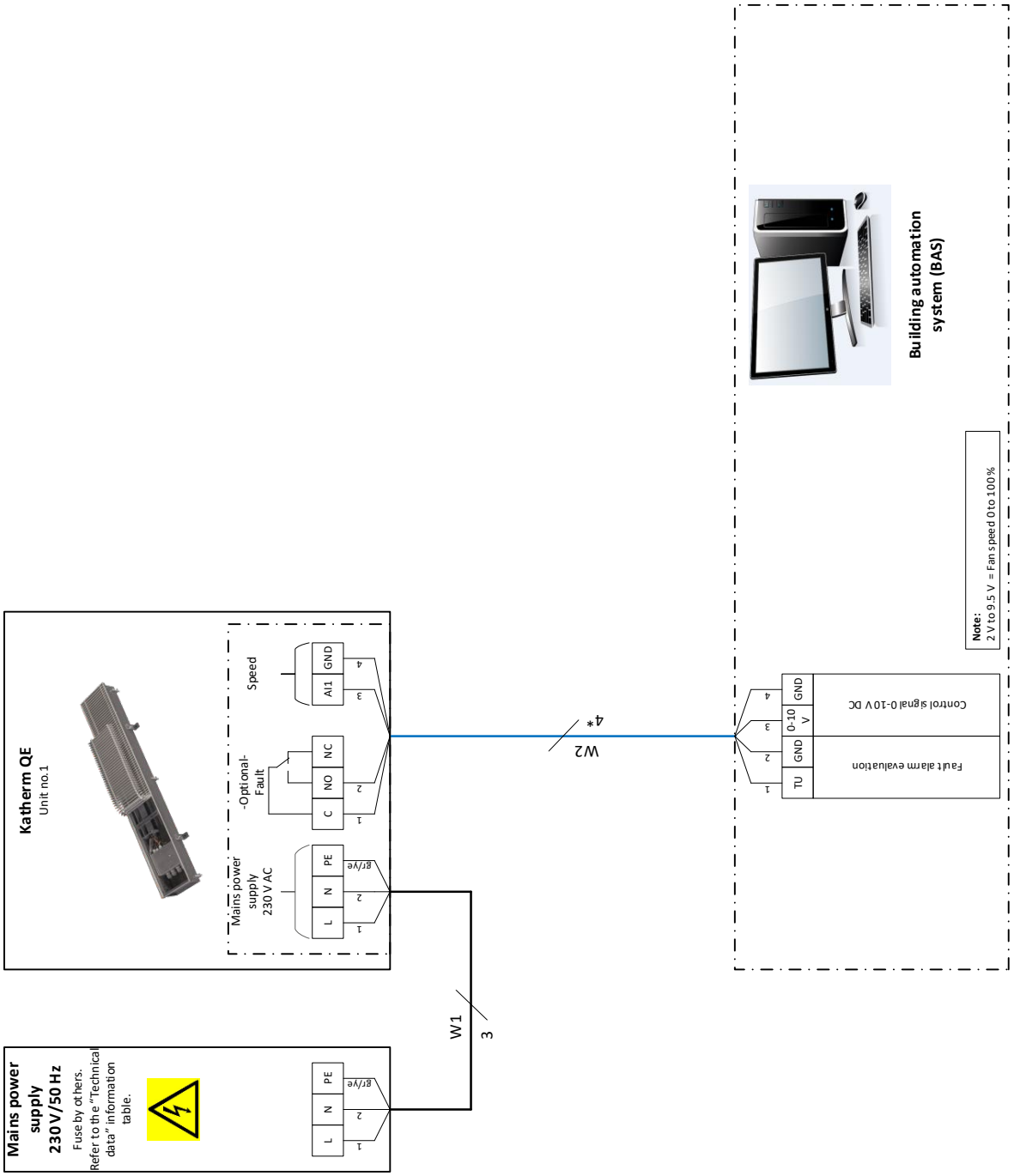


Cabling, Katherm QE

Control by Climate Controller type 146928



0-10 V DC actuation via BMS

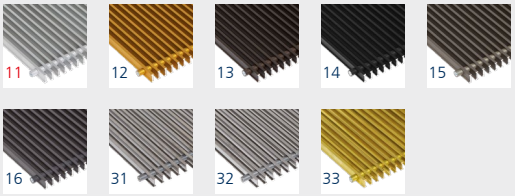


05 Ordering information

Katherm QE

Unit length	Grille design (roll-up grille only)	Art. No.
[mm]		
825	Aluminium, natural anodised	**242211111111**
	Aluminium, brass anodised	**242211111211**
	Aluminium, bronze anodised	**242211111311**
	Aluminium, black anodised	**242211111411**
	Aluminium, bronze finish	**242211111511**
	Aluminium, painted DB 703	**242211111611**
	Stainless steel	**242211113111**
	Stainless steel, polished	**242211113211**
	Brass, natural CuZn 44	**242211113311**
1250	Aluminium, natural anodised	**242211111120**
	Aluminium, brass anodised	**242211111220**
	Aluminium, bronze anodised	**242211111320**
	Aluminium, black anodised	**242211111420**
	Aluminium, bronze finish	**242211111520**
	Aluminium, painted DB 703	**242211111620**
	Stainless steel	**242211113120**
	Stainless steel, polished	**242211113220**
	Brass, natural CuZn 44	**242211113320**
1700	Aluminium, natural anodised	**242211111129**
	Aluminium, brass anodised	**242211111229**
	Aluminium, bronze anodised	**242211111329**
	Aluminium, black anodised	**242211111429**
	Aluminium, bronze finish	**242211111529**
	Aluminium, painted DB 703	**242211111629**
	Stainless steel	**242211113129**
	Stainless steel, polished	**242211113229**
	Brass, natural CuZn 44	**242211113329**

Trench heaters are supplied as standard with a natural anodised aluminium grille This can be replaced by one of the following grilles at a surcharge. Please change the two red digits to the left of the red line in the article number to select an alternative grille.



Article key for grille finish (Example of Art. no.)

24221111 **11** 11 — Aluminium, natural anodised (standard)
12 — Aluminium, brass anodised
13 — Aluminium, bronze anodised
14 — Aluminium, black anodised
15 — Aluminium, bronze finish
16 — Aluminium, painted DB 703
31 — Stainless steel, natural
32 — Stainless steel, polished
33 — Brass, natural CuZn 44

The floor trenches are available in lengths of 825, 1250 and 1700 mm. Please change the two red digits to the right of the red line in the article number to select the required convector length.

Article key for trench length (Example of Art. no.)

2422111111 **11** — Trench length 825 mm
20 — Trench length 1250 mm
29 — Trench length 1700 mm

Accessories

Figure	Article	Properties	Suitable for	Art. No.
	Room temperature control			
	**Room temperature control**	24 V AC/DC, 0 –10 V, surface-mounted/wall-mounted, pure white (similar to RAL 9010), Enclosure IP 30, control range 14 – 29 °C		**194000146928**

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