CONVECTORS & HEATING PANELS

Connections:
2 x internal thread G 1/2", welded-in for supply and return. Vent and drain plugs (or dummy plug) are factory sealed and are fitted according to the customer's specifications.

Maximum positive operating pressure
Standard design: **5 bar**

Maximum positive operating pressure:
High-pressure design **8 bar**

Maximum operating temperature: 110 °C

Guarantee statements are available to download at **www.vogelundnoot.com/download**

KONTEC convectors and horizontal heating panels are radiators in fully welded designs, with either 1 to 5 layers of steel rectangular water-flow pipes arranged one-behind-the-other (for convectors), or 1 or 2 such layers (for horizontal heating panels). In each layer, the convectors have between one and four pipes arranged one-above-the-other; the horizontal heating panels have from 5 to 11 pipes.
KONTEC vertical heating panels consist of 1 or 2 layers of steel rectangular water-flow pipes, arranged one-behind-the-other, with 2 to 12 steel pipes, arranged side-by-side.

A 2 mm space between the heating pipes guarantees additional resistance to corrosion. **KONTEC** convectors and horizontal heating panels come with side panels and top covers; **KONTEC** vertical heating panels come with side panels. **KONTEC** heating panels are delivered with welded mounting brackets.

All **KONTEC** convectors and heating panels are also delivered with factory-sealed drain plugs and pivotable vent plugs. (Exception: bottom-opposite-end connection models come with a dummy plug instead of the drain plug.)
Standard design: rectangular steel pipes, 70 x 11 x 1.5 mm

High-pressure design: rectangular steel pipes, 70 x 11 x 2.0 mm

WVO-design: KONTEC convectors are also available with a welded heat reflector (no water-flow).

Convector dimensions:
Overall lengths: between 500 mm and 1400 mm (at increments of 100 mm), and between 1600 mm and 4000 mm (at increments of 200 mm)
Overall heights: 70 mm, 142 mm, 214 mm and 286 mm

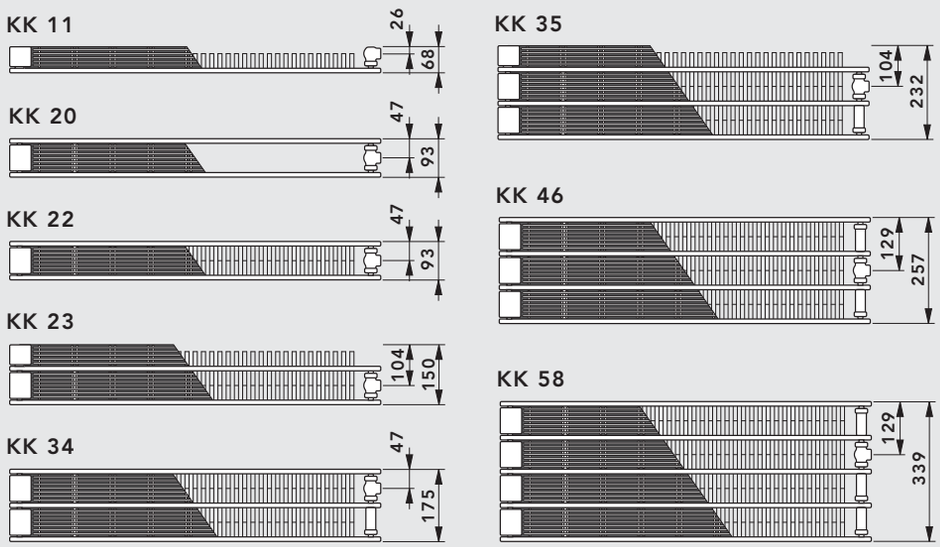
Horizontal heating panel dimensions:
Overall lengths: between 500 mm and 1400 mm (at increments of 100 mm), and between 1600 mm and 4000 mm (at increments of 200 mm)
Overall heights: 358 mm, 430 mm, 502 mm, 574 mm, 646 mm and 790 mm

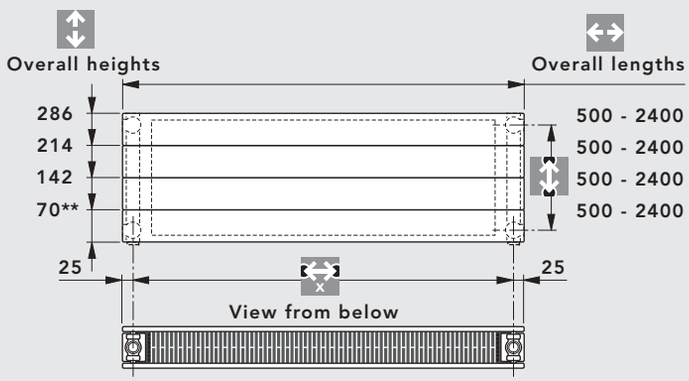
Vertical heating panel dimensions:
Overall lengths: between 142 mm and 862 mm (at increments of 72 mm)
Overall heights: between 1600 mm and 2200 mm (at increments of 200 mm)

Coatings:
1. Undercoat: electrophoretic, using water-soluble paints, conforming to DIN 55900 part 1, stoved at 165° C;
2. Finish: electrostatic powder coating, conforming to DIN 55900 part 2, in a state-of-the-art facility. (On request, and at a supplementary charge, a range of RAL and sanitary ware colours can be offered.) This particularly robust coating is stoved at an object temperature of 180° C.

Packaging: 1. Cardboard packaging
2. Edge protection
3. Shrink foil

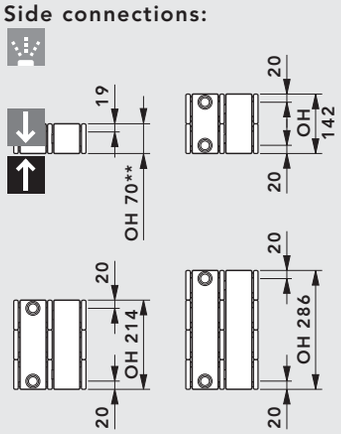
Horizontal design, KK models





Overall height [mm]		70**	142	214	286
Boss spacing NA [mm]		**32**	**102**	**174**	**246**
Boss spacing NAS* [mm]		**Overall length - 50 mm**			

Side connections:

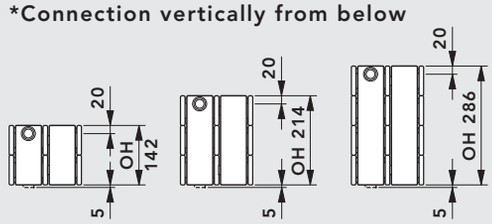


Note: with an OH of 70 mm, vertical connection from below is not available!

* Models with an overall height of 142, 214 or 286 mm can also be delivered with supply and return connections vertically from below (as special designs and with a supplementary charge).

** Only available with top-bottom, opposite-ends, side-connection.

***Connection vertically from below**



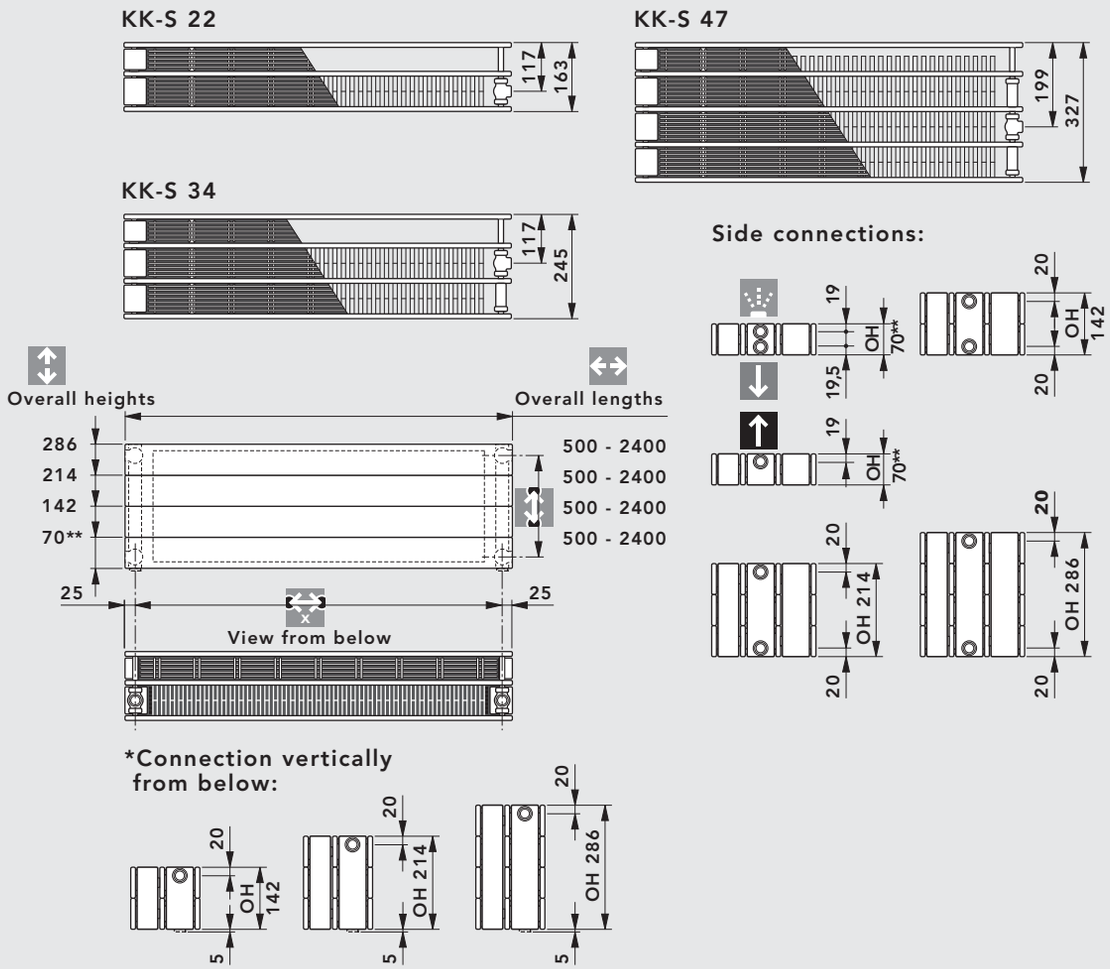
Schematic diagram

Model	KK 11		KK 20		KK 22		KK 23		KK 34		KK 35		KK 46		KK 58	
Overall height [mm]	-	-	-	142	70	142	70	142	70	142	70	142	70	142	70	142
	214	286	214	286	214	286	214	286	214	286	214	286	214	286	214	286
Overall lenght [mm]	**500 – 2400 mm (for special overall lengths see output charts), model 58 up to 2200 mm**															
Increments	**100 mm (for an overall length of 1400 mm and greater: 200 mm)**															

The KK-S models

With their factory-welded heat reflector (no water-flow), the WVO designs return a major part of the otherwise lost heat to the room. They do so by means of convection between radiator and heat reflector.

Model overview / connection dimensions: KK-S models, horizontal design



Overall height [mm]		70**	142	214	286
Boss spacing NA [mm]		**32**	**102**	**174**	**246**
Boss spacing NAS* [mm]		**Overall length - 50 mm**			

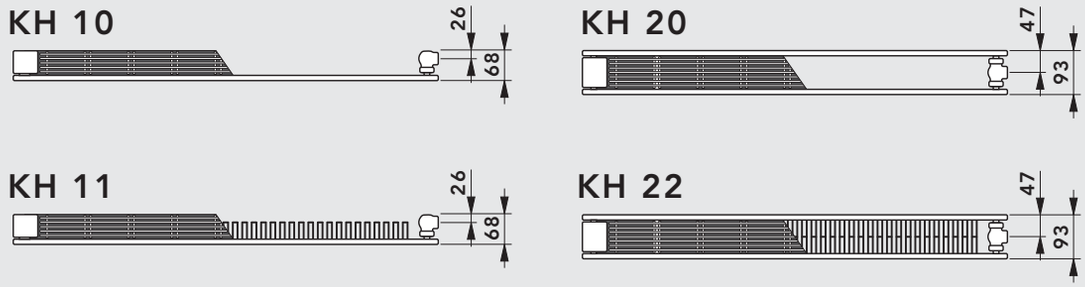
Note: with an OH of 70 mm, vertical connection from below is not available!

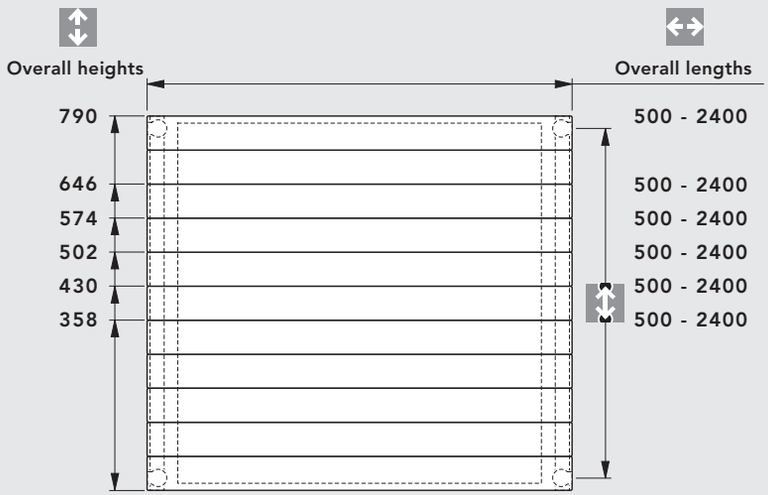
* Models with an overall height of 142, 214 or 286 mm can also be delivered with supply and return connections vertically from below (as special designs and with a supplementary charge).
** Only available with top-bottom, opposite-ends, side-connection.

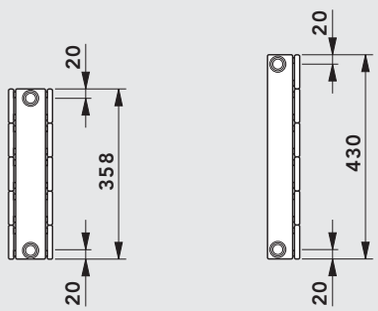
Schematic diagram

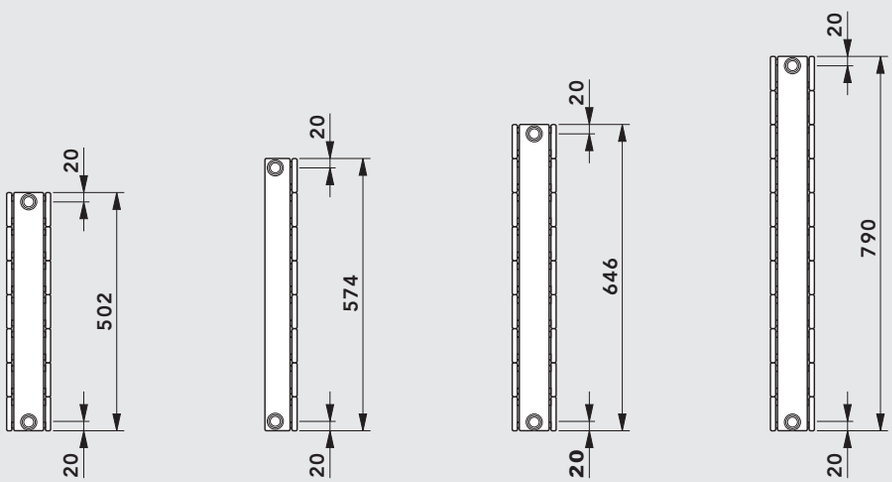
Model	KK-S 22				KK-S 34				KK-S 47			
Overall height [mm]	70	142	214	286	70	142	214	286	70	142	214	286
Overall length [mm]	**500 – 2400 mm (for special overall lengths see output charts)**											
Increments	**100 mm (for an overall length of 1400 mm and greater: 200 mm)**											

KH models horizontal design









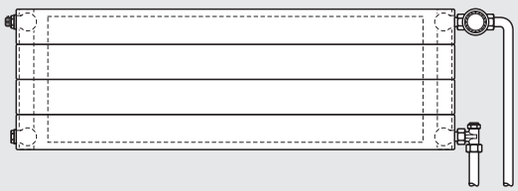
Overall height [mm]	358	430	502	574	646	790	Schematic diagram
Boss spacing NA [mm]	**318**	**390**	**462**	**534**	**606**	**750**	

Model	KH 10			KH 11			KH 20			KH 22		
Overall height [mm]	358	430	502	358	430	502	358	430	502	358	430	502
	574	646	790	574	646	790	574	646	790	574	646	790
Overall length [mm]	**500 – 2400 mm (for special overall lengths see output charts)**											
Increments	**100 mm (for an overall length of 1400 mm and greater: 200 mm)**											

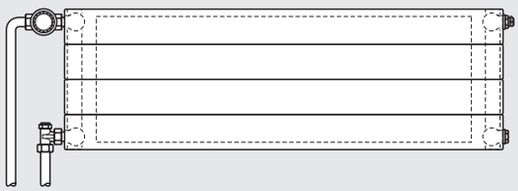
KK and KK-S models

Double-pipe system

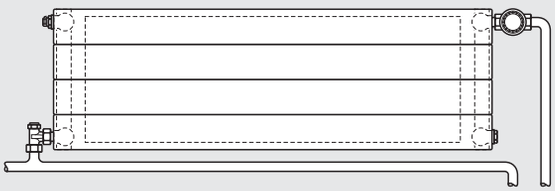
Single-sided connection, right



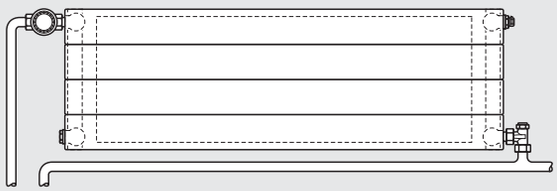
Single-sided connection, left



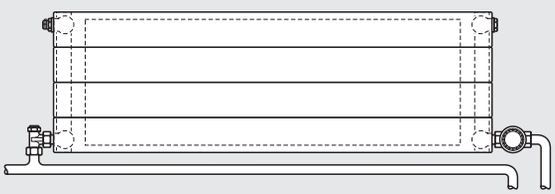
Top-bottom, opposite-end, side-connection, right-side supply



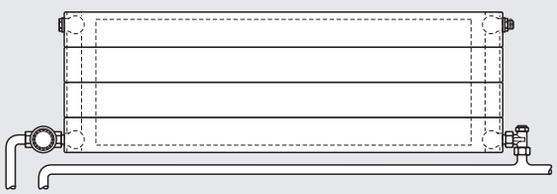
Top-bottom, opposite-end, side-connection, left-side supply



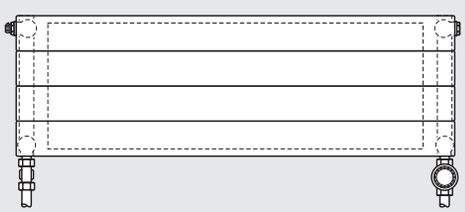
Bottom-only, opposite-end, side-connection, right-side supply
Note: reduced heat output



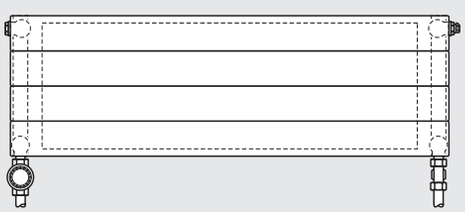
Bottom-only, opposite-end, side-connection, left-side supply
Note: reduced heat output



Vertical connection from below, bottom-only, opposite-end, right-side supply
Note: reduced heat output



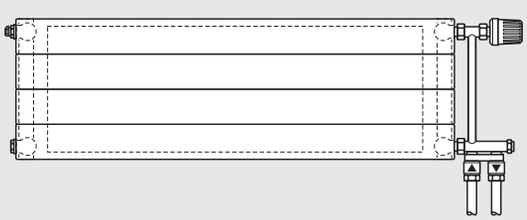
Vertical connection from below, bottom-only, opposite-end, left-side supply
Note: reduced heat output



Single-pipe system

KONTEC convectors can easily be converted for use with a single-pipe system. In this case, however, 4-way valves with a by-pass pipe need to be used.

Recommendation:
For reasons of appearance the **VONARIS** valve design is the preferred option for this connection mode.



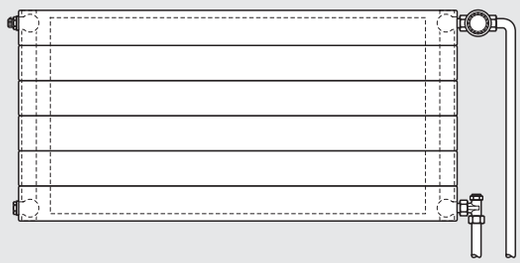
Schematic diagram

Note: when ordering your **KONTEC** convector (see price list "Description of the Ordering Process") the 4 connections must be accurately specified and assigned. This is for technical production reasons. No subsequent changes to the connections on your **KONTEC** convector are possible!

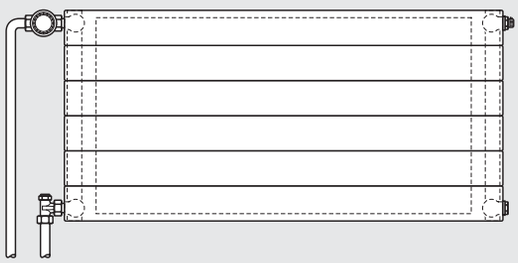
Typen KH

Double-pipe system

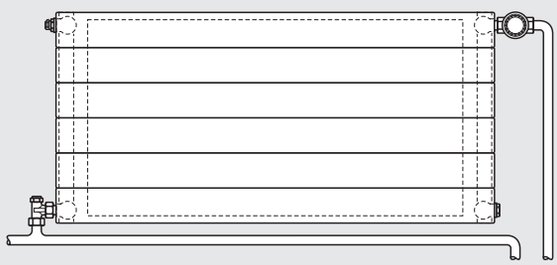
Single-sided connection, right



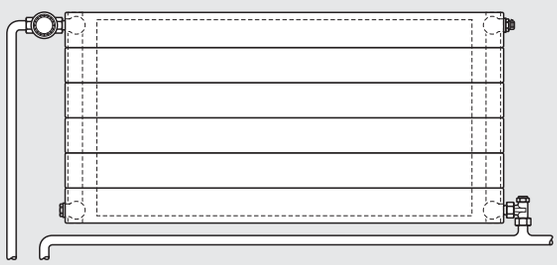
Single-sided connection, left



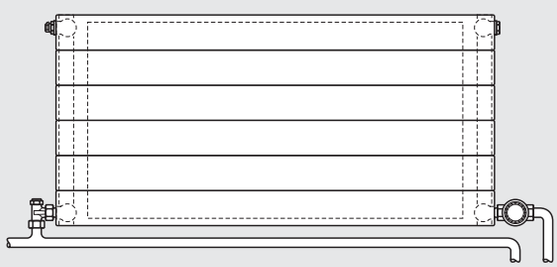
Top-bottom, opposite-end, side-connection, right-side supply



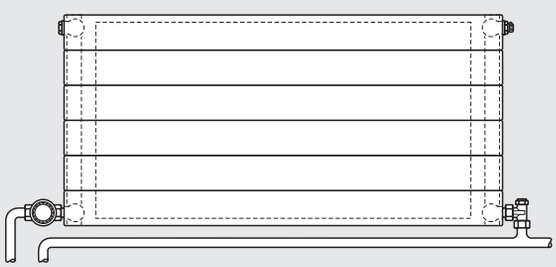
Top-bottom, opposite-end, side-connection, left-side supply



Bottom-only, opposite-end, side-connection, right-side supply
Note: reduced heat output



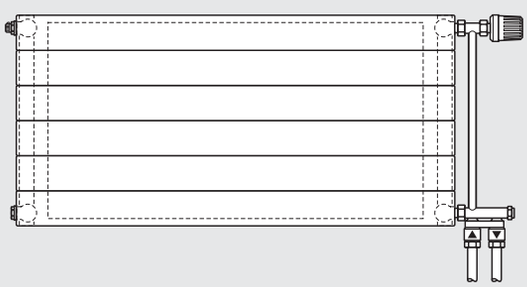
Bottom-only, opposite-end, side-connection, left-side supply
Note: reduced heat output



Single-pipe system

KONTEC convectors can easily be converted for use with a single-pipe system. In this case, however, 4-way valves with a by-pass pipe need to be used.

Recommendation:
For reasons of appearance the **VONARIS** valve design is the preferred option for this connection mode.



Schematic diagram

Note: when ordering your **KONTEC** KH model heating panels, (see price list 344, "Description of the Ordering Process") the 4 connections must be accurately specified and assigned. This is for technical production reasons. No subsequent changes to the connections on your **KONTEC** KH model heating panels are possible!

KH 20 and KH 22 models, horizontal designs

The new heat reflector

• is available for the KH 20 (OH 358 – 574 mm) and the KH 22 (OH 358 - 646 mm) models in horizontal design

• returns a major part of the otherwise lost heat to the room, by means of convection between the KONTEC heating panel and the heat reflector.

Design:
Electrophoretic coating and finish in RAL 9016 (on request and at an extra charge, in a range of RAL and Sanitary Ware colours); delivered with 8 push-in brackets, 8 stabilising brackets, 4 Z-brackets, an installation sheet, and packaging

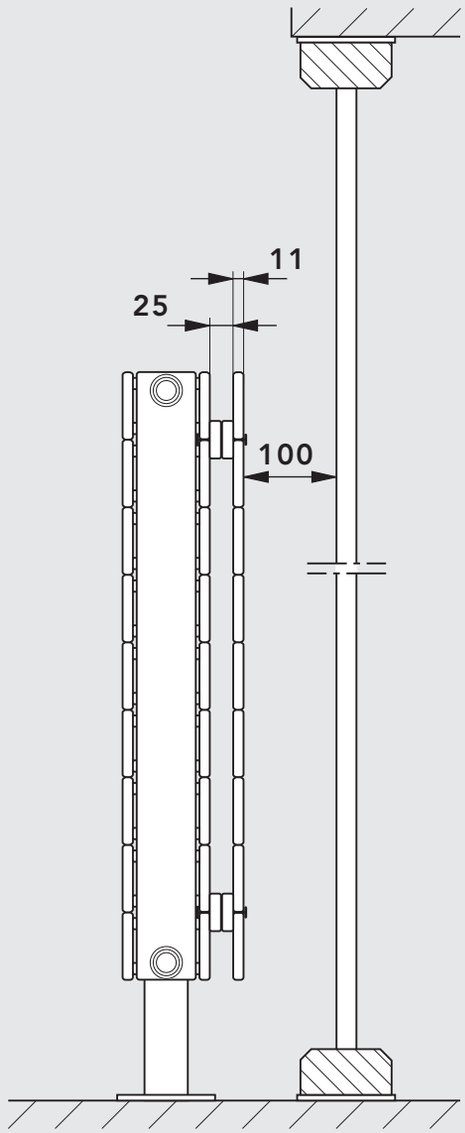
Note: when ordering one of the horizontal designs with a heat reflector, it is also essential to use either an **SK 22 (KH 20)** or an **SK 23 (KH 22) stand console**.

KONTEC heating panel with fitted heat reflector
(see image to the right)

Width: 11 mm heat reflector

Internal depth:25 mm between heating pipe and heat reflector

Minimum clearance*: 100 mm
between window surface and heat reflector



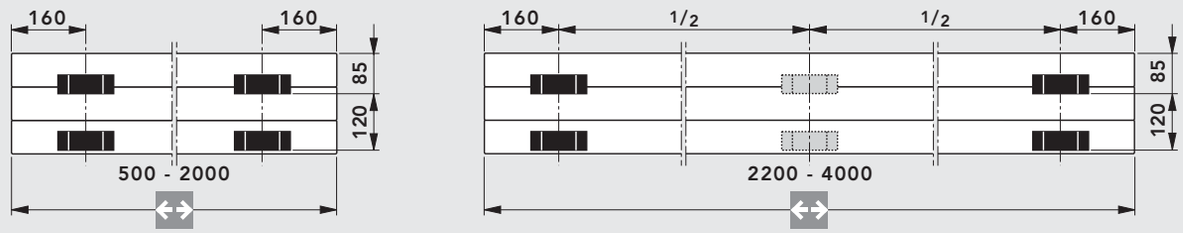
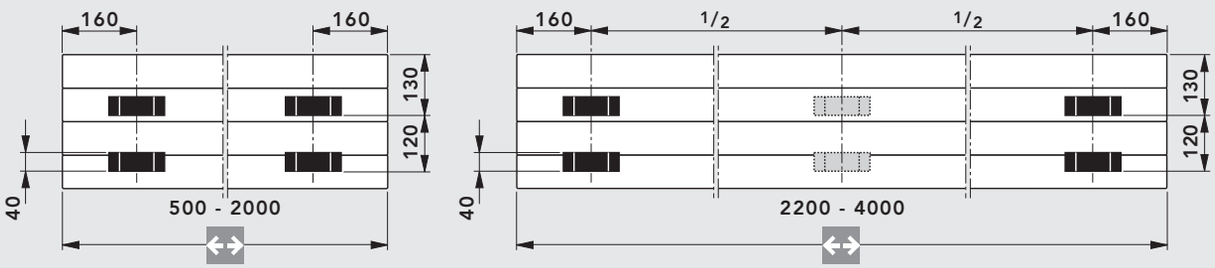
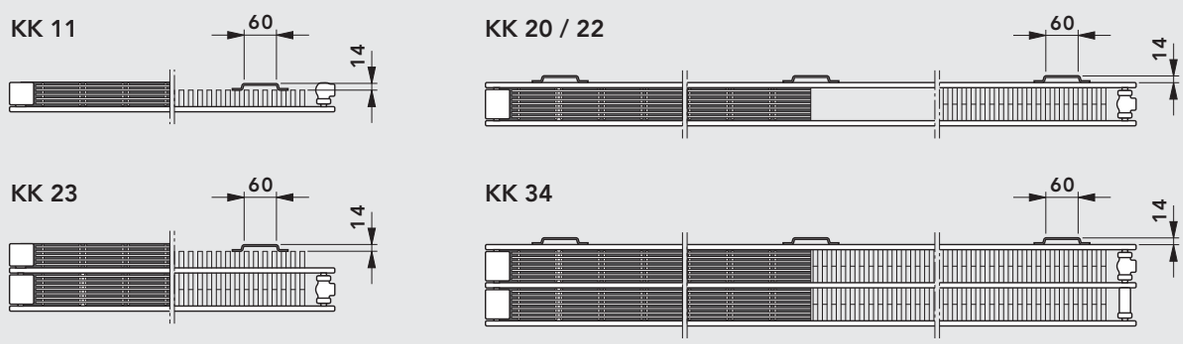
Schematic diagram

* The minimum clearance between window surface and heat reflector (100 mm) complies with the recommendations of leading window surface manufacturers.

KONTEC Wall mounting WA 11

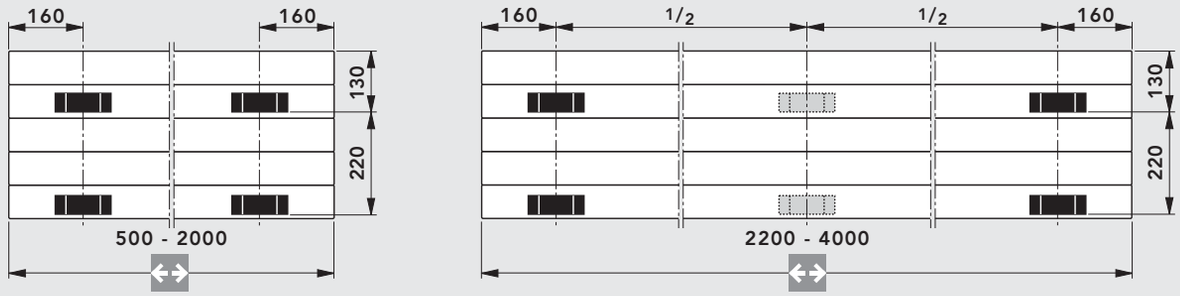
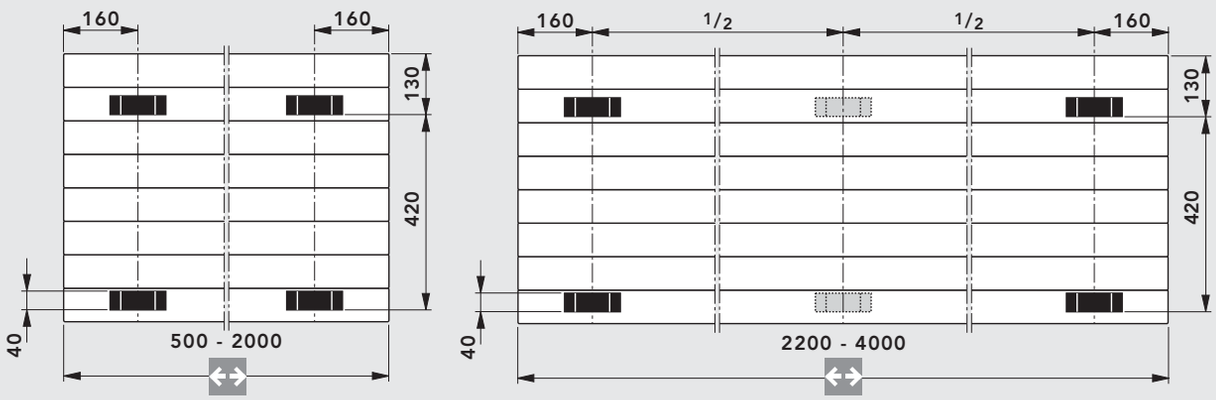
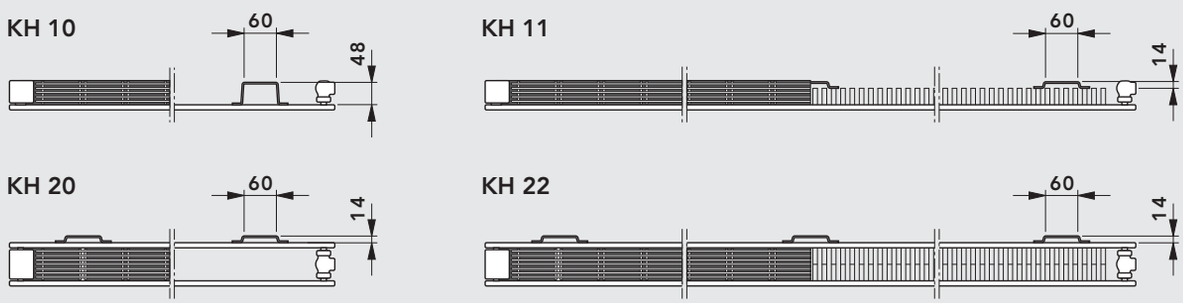
welded bracket position

Wall mounting WA 11 for all KK (Convectors) models

Type	Wall mounting WA 11 for KK 11 to KK 34
Overall height 214 mm	
	Wall mounting WA 11 for KK 11 to KK 34
Overall height 286 mm	
	
	Schematic diagram

Attention! Convectors are by default supplied without brackets. If wall mounting WA 11 is used, you are required to order the convector as a special version, equipped with brackets. Convectors with an OH of 70 or 142 mm cannot be supplied with mounting brackets.

Wall mounting WA 11 for all KH (heating wall models horizontal design) models

Type	Wall mounting WA 11 for KH 10 to KH 24
Overall height from 358 mm to 502 mm	
	Wall mounting WA 11 for KH 10 to KH 24
Overall height from 574 mm to 790 mm	
	
	Schematic diagram

KONTEC Wall mounting WA 11

Drilling and wall clearance dimensions

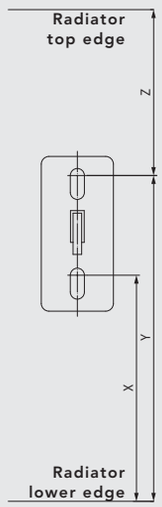
Wall mounting WA 11 for types KK (convectors) and KH (Vertical heating panels)

Wall mounting WA 11 is suitable for convector models **KK** (OH 214 and 286 mm, with brackets) and heating wall models **KH** (OH 358 - 790 mm). It ensures easy, rapid and robust mounting of **KONTEC** convectors or **KONTEC** heating panels still in the packaging.

Wall mounting WA 11 for OH 214 - 790

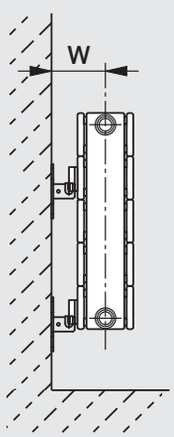
Wall mounting WA 11 drilling dimensions

From an overall length of 2200 mm: 3 consoles

Overall height [mm]	Value **X** [mm]	Value **Y** [mm]	Value **Z** [mm]	Wall mounting WA 11 for **OH 214 – 790 mm**
214	**104**	**162**	**52**	
286	**131**	**189**	**97**	
358	**203**	**261**	**97**	
430	**275**	**333**	**97**	
502	**347**	**405**	**97**	
574	**419**	**477**	**97**	
646	**491**	**549**	**97**	
790	**635**	**693**	**97**	

Schematic diagram

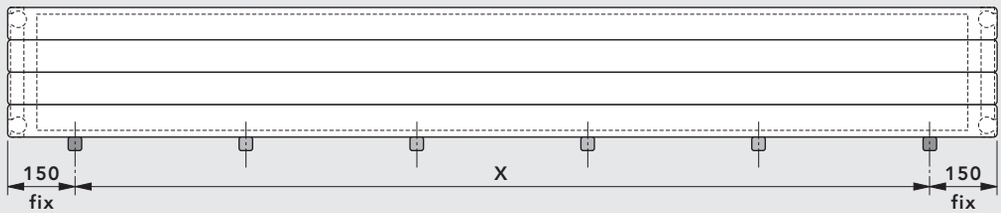
Connection – wall clearance



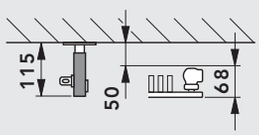
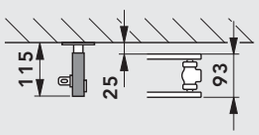
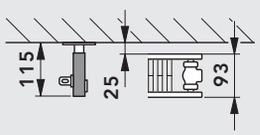
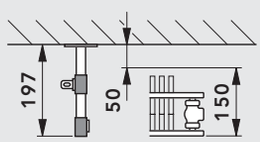
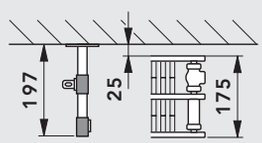
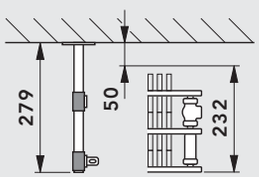
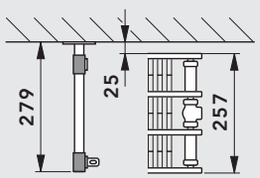
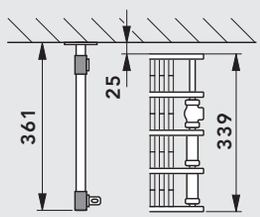
Convector and heating panel models	Overall height [mm]	Measurement **W** [mm]
KK 11	214, 286	**45**
KK 20, KK 22, KK 34	214, 286	**89**
KK 23	214, 286	**123,5**
KH 10, KH 11	358 - 790	**45**
KH 20, KH 22	358 - 790	**89**

Schematic diagram

Wall consoles WK 10 – 13: positioning for KK models (convectors)

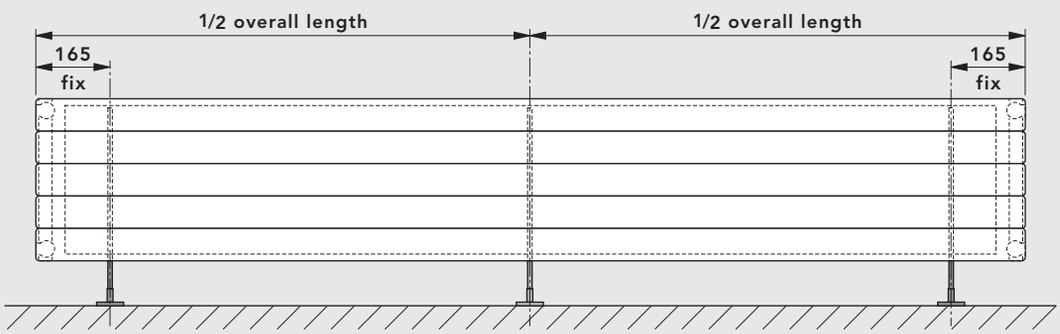


Note: when using more than 2 wall consoles the additional wall consoles must be placed at regular intervals along the line X.

WK 10 wall console			WK 11 wall console
KK 11	**KK 20**	**KK 22**	**KK 23**
			
WK 11 wall console	**WK 12 wall console**		**WK 13 wall console**
KK 34	**KK 35**	**KK 46**	**KK 58**
			

Schematic diagram

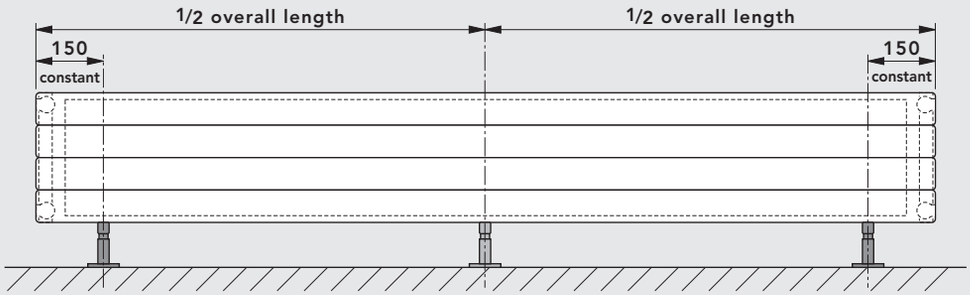
Stand consoles SK 22 and SK 23: positioning for KH models (horizontal design heating panels)



Note: for an overall length of **2200 mm** and greater, a 3rd stand console must be used!

Schematic diagram

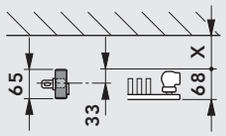
Stand consoles SK 10 - 19: positioning for KK / KK-S models



Note: for an overall length of 2200 mm and greater, a 3rd stand console must be used!

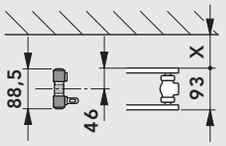
SK 10 / SK 11

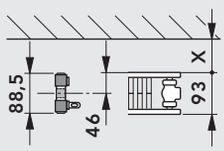
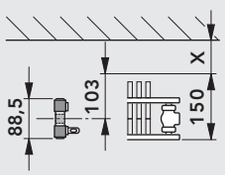
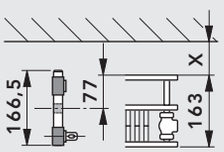
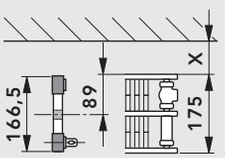
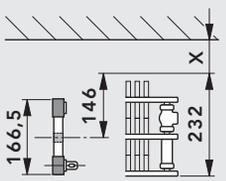
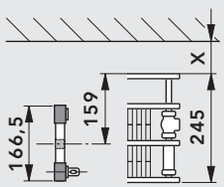
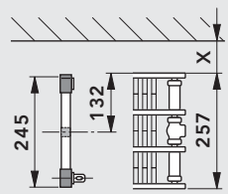
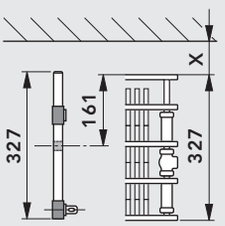
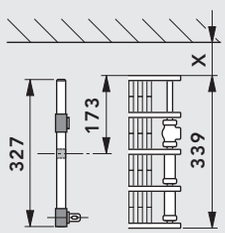
KK 11



SK 12 / SK 13

KK 20

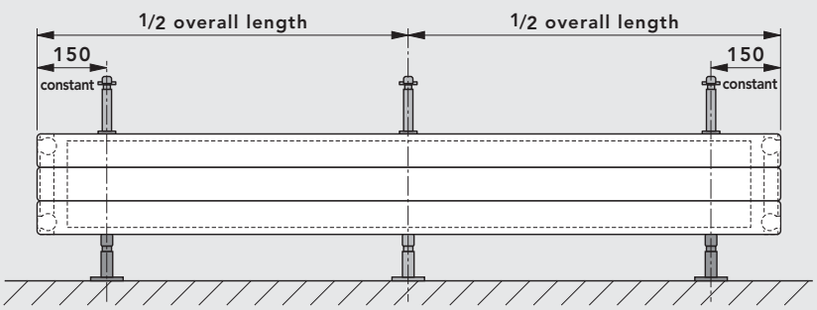


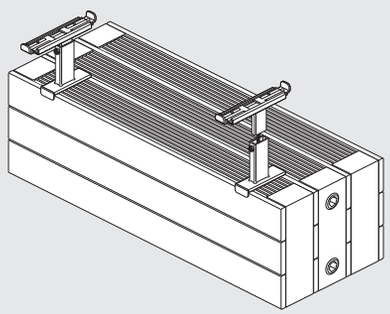
SK 12 / SK 13		SK 14 / SK 15		
KK 22	**KK 23**	**KK-S 22**	**KK 34**	**KK 35**
				
SK 14 / SK 15	**SK 16 / SK 17**	**SK 18 / SK 19**		
KK-S 34	**KK 46**	**KK-S 47**	**KK 58**	
				**Measurement X:** chosen distance between the wall or window surface and the back of the convector.

Schematic diagram

Window sill support FBT 20: positioning for KK / KK-S models

Window sill support for subsequent installation with the **KK / KK-S 22 – 58** models of **KONTEC** convectors



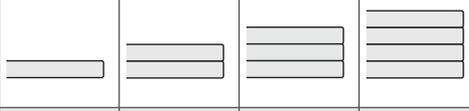


Note: for an overall length of more than **2200 mm**, a 3rd window sill support must be used!

Schematic diagram

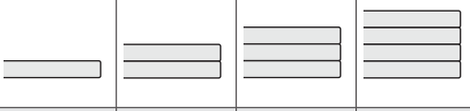
Heating output in compliance with **DIN EN 442**, and **ÖNORM EN 442,** at **75/65/20° C**

Side panels and top cover are included in the heat output specifications



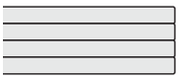
Overall height [mm]	**70**	**142**	**214**	**286**
Increments	As regards all overall lengths between 500 and 1400 mm, use increments of 100 mm, and overall lengths between 1600 and 2400 mm, use increments of 200 mm.			
Model			**KK 11***	**KK 11***
Overall depth [mm]			**68**	**68**
Watts / m 75/65/20			464	577
Watts / m 70/55/20			374	464
Watts / m 55/45/20			236	291
Water content l / m			1,67	2,22
Weight kg / m			11,14	14,51
Radiator exponent **n**			1,32	1,34
Model		**KK 20**	**KK 20**	**KK 20**
Overall depth [mm]		**93**	**93**	**93**
Watts / m 75/65/20		304	440	561
Watts / m 70/55/20		249	359	458
Watts / m 55/45/20		161	232	296
Water content l / m		2,18	3,34	4,44
Weight kg / m		9,26	13,27	17,28
Radiator exponent **n**		1,24	1,25	1,25
Model	**KK 22**	**KK 22**	**KK 22**	**KK 22**
Overall depth [mm]	**93**	**93**	**93**	**93**
Watts / m 75/65/20	424	641	838	1032
Watts / m 70/55/20	345	519	674	825
Watts / m 55/45/20	222	330	423	510
Water content l / m	1,10	2,18	3,34	4,44
Weight kg / m	7,34	13,97	20,59	27,23
Radiator exponent **n**	1,27	1,30	1,34	1,38
Model	**KK-S 22**	**KK-S 22**	**KK-S 22**	**KK-S 22**
Overall depth [mm]	**163**	**163**	**163**	**163**
Watts / m 75/65/20	424	641	838	1032
Watts / m 70/55/20	345	519	674	825
Watts / m 55/45/20	222	330	423	510
Water content l / m	1,10	2,18	3,34	4,44
Weight kg / m	10,53	19,43	28,34	37,24
Radiator exponent **n**	1,27	1,30	1,34	1,38

* For aesthetic reasons these models should not be fitted in front of a window.



Overall height [mm]	**70**	**142**	**214**	**286**
Increments	As regards all overall lengths between 500 and 1400 mm, use increments of 100 mm, and overall lengths between 1600 and 2400 mm, use increments of 200 mm.			
Model	**KK 23***	**KK 23***	**KK 23***	**KK 23***
Overall depth [mm]	**150**	**150**	**150**	**150**
Watts / m 75/65/20	524	797	1035	1261
Watts / m 70/55/20	427	645	832	1008
Watts / m 55/45/20	275	410	522	623
Water content l / m	1,10	2,18	3,34	4,44
Weight kg / m	9,20	17,02	24,84	32,66
Radiator exponent **n**	1,26	1,30	1,34	1,38
Model	**KK 34**	**KK 34**	**KK 34**	**KK 34**
Overall depth [mm]	**175**	**175**	**175**	**175**
Watts / m 75/65/20	661	1050	1394	1723
Watts / m 70/55/20	545	856	1123	1377
Watts / m 55/45/20	360	552	707	851
Water content l / m	1,68	3,33	4,99	6,66
Weight kg / m	12,68	23,93	35,18	46,42
Radiator exponent **n**	1,19	1,26	1,33	1,38
Model	**KK-S 34**	**KK-S 34**	**KK-S 34**	**KK-S 34**
Overall depth [mm]	**245**	**245**	**245**	**245**
Watts / m 75/65/20	661	1050	1394	1723
Watts / m 70/55/20	545	856	1123	1377
Watts / m 55/45/20	360	552	707	851
Water content l / m	1,68	3,33	4,99	6,66
Weight kg / m	15,87	29,39	42,92	56,44
Radiator exponent **n**	1,19	1,26	1,33	1,38

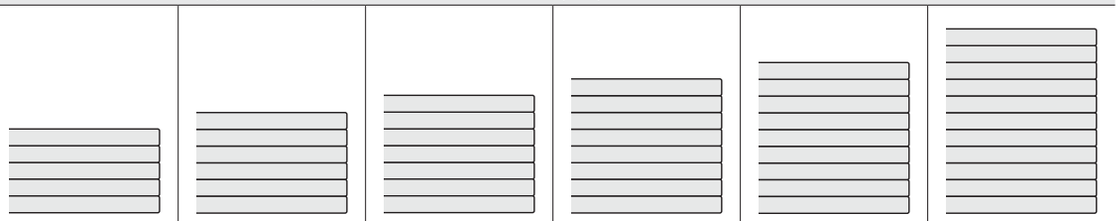
* For aesthetic reasons these models should not be fitted in front of a window.

Heating output in compliance with **DIN EN 442**, and **ÖNORM EN 442,** at **75/65/20° C**				
Side panels and top cover are included in the heat output specifications				
				
Overall height [mm]	**70**	**142**	**214**	**286**
Increments	As regards all overall lengths between 500 and 1400 mm, use increments of 100 mm, and overall lengths between 1600 and 2400 mm, use increments of 200 mm.			
Model	**KK 35***	**KK 35***	**KK 35***	**KK 35***
Overall depth [mm]	**232**	**232**	**232**	**232**
Watts / m 75/65/20	809	1197	1651	1971
Watts / m 70/55/20	661	971	1326	1570
Watts / m 55/45/20	429	619	828	964
Water content l / m	1,69	3,33	4,99	6,66
Weight kg / m	14,54	26,98	39,42	51,86
Radiator exponent **n**	1,24	1,29	1,35	1,40
Model	**KK 46**	**KK 46**	**KK 46**	**KK 46**
Overall depth [mm]	**257**	**257**	**257**	**257**
Watts / m 75/65/20	950	1454	2072	2447
Watts / m 70/55/20	778	1117	1661	1949
Watts / m 55/45/20	507	748	1034	1197
Water content l / m	2,26	4,53	6,79	9,06
Weight kg / m	18,02	33,89	49,76	65,62
Radiator exponent **n**	1,23	1,30	1,36	1,40
Model	**KK-S 47**	**KK-S 47**	**KK-S 47**	**KK-S 47**
Overall depth [mm]	**327**	**327**	**327**	**327**
Watts / m 75/65/20	986	1522	2302	2667
Watts / m 70/55/20	817	1240	1846	2128
Watts / m 55/45/20	545	800	1149	1311
Water content l / m	2,26	4,53	6,79	9,06
Weight kg / m	22,04	41,27	60,50	79,74
Radiator exponent **n**	1,16	1,26	1,36	1,39
Model	**KK 58**	**KK 58**	**KK 58**	**KK 58**
Overall depth [mm]	**339**	**339**	**339**	**339**
Watts / m 75/65/20	1023	1659	2592	3022
Watts / m 70/55/20	849	1354	2081	2411
Watts / m 55/45/20	569	876	1301	1486
Water content l / m	2,83	5,68	8,52	11,36
Weight kg / m	23,36	43,85	64,34	85,82
Radiator exponent **n**	1,15	1,25	1,35	1,39

* For aesthetic reasons these models should not be fitted in front of a window.

Heating output in compliance with **DIN EN 442**, and **ÖNORM EN 442,** at **75/65/20° C**

Side panels and top cover are included in the heat output specifications



Overall height [mm]	**358**	**430**	**502**	**574**	**646**	**790**
Increments	As regards all overall lengths between 500 and 1400 mm, use increments of 100 mm, and overall lengths between 1600 and 2400 mm, use increments of 200 mm.					
Model	**KH 10**	**KH 10**	**KH 10**	**KH 10**	**KH 10**	**KH 10**
Overall depth [mm]	**68**	**68**	**68**	**68**	**68**	**68**
Watts / m 75/65/20	394	458	523	588	655	795
Watts / m 70/55/20	322	374	427	480	534	647
Watts / m 55/45/20	209	243	276	311	344	416
Water content l / m	2,76	3,33	3,87	4,44	4,99	6,12
Weight kg / m	11,91	14,04	16,17	18,29	20,43	24,68
Radiator exponent **n**	1,24	1,24	1,25	1,25	1,26	1,27
Model	**KH 11***	**KH 11***	**KH 11***	**KH 11***	**KH 11***	**KH 11***
Overall depth [mm]	**68**	**68**	**68**	**68**	**68**	**68**
Watts / m 75/65/20	667	760	845	921	989	1105
Watts / m 70/55/20	540	615	683	743	797	889
Watts / m 55/45/20	344	391	433	470	503	558
Water content l / m	2,78	3,33	3,87	4,44	4,99	6,12
Weight kg / m	16,71	19,85	22,99	26,15	29,29	33,55
Radiator exponent **n**	1,30	1,30	1,31	1,32	1,32	1,34
Model	**KH 20**	**KH 20**	**KH 20**	**KH 20**	**KH 20**	**KH 20**
Overall depth [mm]	**93**	**93**	**93**	**93**	**93**	**93**
Watts / m 75/65/20	654	757	859	960	1063	1271
Watts / m 70/55/20	533	617	699	781	863	1032
Watts / m 55/45/20	344	398	449	502	553	661
Water content l / m	5,55	6,66	7,77	8,88	9,99	12,22
Weight kg / m	21,29	25,30	29,31	33,31	37,32	45,33
Radiator exponent **n**	1,26	1,26	1,27	1,27	1,28	1,28
Model	**KH 22**	**KH 22**	**KH 22**	**KH 22**	**KH 22**	**KH 22**
Overall depth [mm]	**93**	**93**	**93**	**93**	**93**	**93**
Watts / m 75/65/20	1197	1343	1474	1592	1699	1886
Watts / m 70/55/20	963	1079	1182	1274	1357	1500
Watts / m 55/45/20	605	675	736	790	838	919
Water content l / m	5,55	6,66	7,77	8,88	9,99	12,22
Weight kg / m	30,89	36,93	42,96	49,01	55,05	63,06
Radiator exponent **n**	1,34	1,35	1,36	1,37	1,38	1,41

* For aesthetic reasons these models should not be fitted in front of a window.

Simplified procedure for the domain of standard and low-temperature (ST/LT)

The conversion factors in the table state to which extent the heat emission has to be altered under other operating conditions, compared to the following standard-design data:

supply temperature t_1 **75 °C**
return temperature t_2 **65 °C**
room temperature t_r **20 °C**

Because an average exponent of 1.3 has been used for both the calculation of the performance data and the specification of the conversion factor, a slight performance variation from the calculated value is possible.

The standard heat emission Φ_S of a radiator covering the required heat $\Phi_{HL,i}$ at the chosen operating conditions, is calculated according to the formula:

$$\Phi_S = \Phi_{HL,i} \times f$$

Φ_S = standard heat emission, in accordance with EN 442
$\Phi_{HL,i}$ = required heat, in accordance with EN 12831
f = conversion factor from the table

Example:
The required heat of a room is 1000 W, in accordance with EN 12831.

Design data: t_1 50 °C, t_2 40 °C, t_r 20 °C

Factor **f** according to the table = **2.50**

Supply temperature °C	Return temperature °C	Room temperature °C 12	15	18	20	22	24	26
90	80	0,61	0,64	0,68	0,71	0,74	0,77	0,81
	70	0,67	0,72	0,76	0,80	0,83	0,87	0,91
80	70	0,74	0,79	0,84	0,88	0,93	0,97	1,03
	60	0,83	0,89	0,96	1,01	1,07	1,13	1,20
	50	0,96	1,04	1,13	1,20	1,28	1,37	1,47
75	**65**	0,82	0,88	0,95	**1,00**	1,05	1,12	1,18
	60	0,88	0,94	1,02	1,08	1,14	1,21	1,29
	55	0,94	1,01	1,10	1,17	1,24	1,32	1,42
70	65	0,87	0,94	1,01	1,07	1,13	1,19	1,27
	60	0,93	1,00	1,08	1,15	1,22	1,30	1,39
	55	0,99	1,08	1,17	1,25	1,33	1,42	1,53
	50	1,07	1,17	1,28	1,37	1,47	1,58	1,71
65	60	0,98	1,07	1,16	1,23	1,31	1,40	1,50
	55	1,05	1,15	1,26	1,34	1,43	1,54	1,66
	50	1,14	1,25	1,37	1,47	1,59	1,71	1,86
	45	1,24	1,37	1,52	1,64	1,78	1,94	2,13
60	55	1,13	1,23	1,36	1,45	1,56	1,68	1,82
	50	1,22	1,34	1,48	1,60	1,73	1,87	2,05
	45	1,33	1,47	1,65	1,78	1,94	2,13	2,36
	40	1,47	1,64	1,86	2,03	2,24	2,50	2,80
55	50	1,31	1,45	1,62	1,75	1,90	2,07	2,28
	45	1,43	1,60	1,80	1,96	2,15	2,37	2,64
	40	1,59	1,78	2,03	2,24	2,48	2,78	3,15
	35	1,78	2,03	2,36	2,64	2,99	3,43	4,02
50	45	1,56	1,75	1,98	2,17	2,40	2,67	3,00
	40	1,73	1,96	2,25	2,50	2,79	3,15	3,61
	35	1,94	2,24	2,63	2,96	3,38	3,92	4,64
	30	2,24	2,64	3,20	3,70	4,39	5,39	6,99
45	40	1,90	2,17	2,53	2,83	3,19	3,66	4,25
	35	2,15	2,50	2,96	3,37	3,89	4,58	5,52

$\Phi_S = \Phi_{HL,i} \times f$ = 1000 Watts x 2,50 = 2500 Watts

A radiator has to be installed that emits 2500 W under the standard design (75/65/20).

Exact method for the performance calculation for the domain of standard and low-temperature (ST/LT)

Using the formula $\Phi = \Phi_S \left[\frac{\Delta T}{\Delta T_S}\right]^n$ any performance differing from the standard can be calculated.

Φ = Radiator power [W]
Φ_S = Standard radiator power in accordance with EN 442 [W]
ΔT = Arithmetic radiator excess temperature [K]
ΔT_S = Arithmetic radiator excess temperature 50 K, at a standard state of 75 °C / 65 °C / 20 °C
n = Radiator exponent

Please note: if the condition $c = \frac{t_2 - t_r}{t_1 - t_r} < 0.7$ is met, the excess temperatures will be specified logarithmically.

$$\Delta T_{arithmetic} = \frac{t_1 + t_2}{2} - tr \qquad \Delta T_{logarithmic} = \frac{t_1 - t_2}{\ln \frac{t_1 - t_r}{t_2 - t_r}}$$

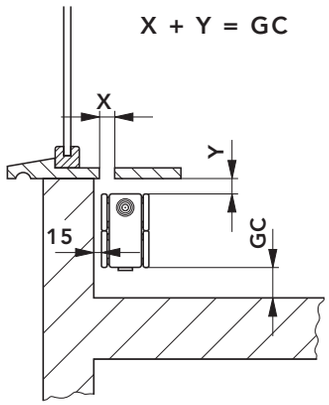
Use our radiator performance calculator under www.vogelundnoot.com

Technical information subject to change.

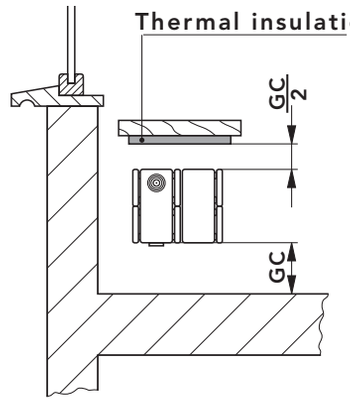
Horizontal design of VONARIS, VONARIS-M and KONTEC

Radiator placement

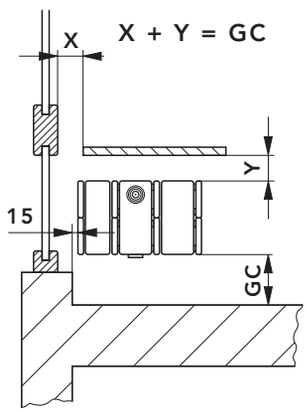
Placement below a window parapet



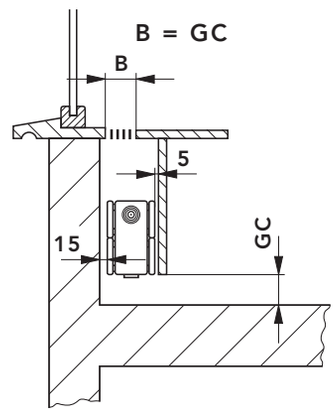
Placement under a bench



Placement behind a glass surface



Placement below a shop window



Schematic diagram

Recommended minimum clearance for convectors

		VONARIS		VONARIS-M		KONTEC	
	GC [mm]	Model	OH [mm]	Model	OH [mm]	Model	OH [mm]
GC = ground clearance in mm The minimum ground clearance recommended here apply for all images on the pages 306 and 307!	**60**	VHV 11	214, 286	VHV-M 11	214, 286	KK 11	214, 286
	60	VHV 20	142	VHV-M 20	142	KK 20	142
	60	VHV 22	142	VHV-M 22	142	KK 22	70, 142
	70	VHV 23	142	VHV-M 23	142	KK 23	70, 142
	80	VHV 20	214, 286	VHV-M 20	214, 286	KK 20	214, 286
	80	VHV 22	214, 286	VHV-M 22	214, 286	KK 22	214, 286
	90	VHV 23	214, 286	VHV-M 23	214, 286	KK 23	214, 286
	100	VHV 34	142	VHV-M 34	142	KK 34	70, 142
	110	VHV 34	214, 286	VHV-M 34	214, 286	KK 34	214, 286
	120	VHV 35	142	VHV-M 35	142	KK 35	70, 142
	130	VHV 35	214, 286	VHV-M 35	214, 286	KK 35	214, 286
	130	VHV 46	142	VHV-M 46	142	KK 46	70, 142
	130	-	-	-	-	KK 58	70
	140	-	-	-	-	KK 46	214, 286
	140	-	-	-	-	KK 58	142
	150	-	-	-	-	KK 58	214, 286

Horizontal design of VONARIS, VONARIS-M and KONTEC

Radiator placement

Placement behind a screen

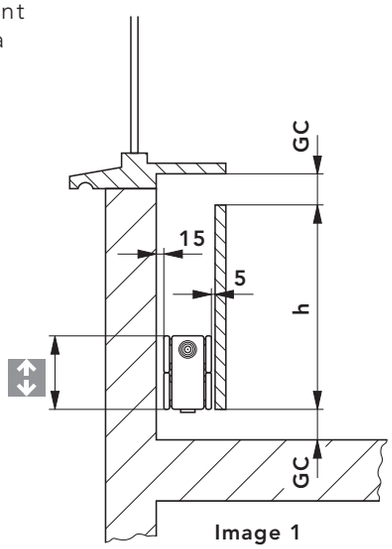


Image 1

Placement behind a desk

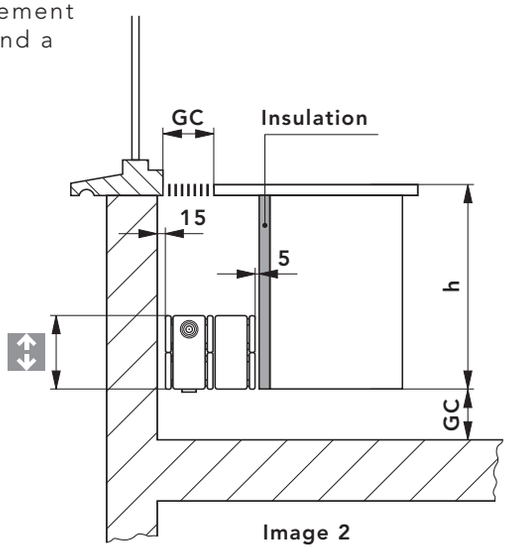


Image 2

Schematische Darstellung

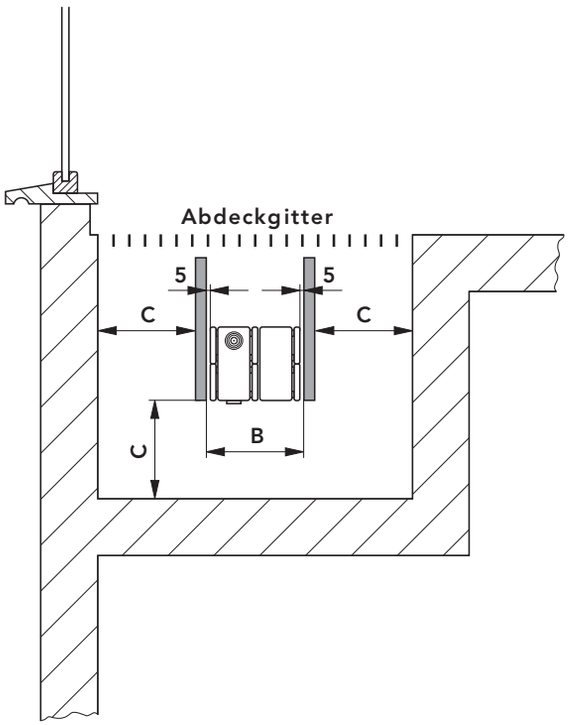
Note:
Screens and desks should be movable so that the radiators and conduits can be cleaned.

Percentage increase of the radiator's heat emission due to the chimney effect, as Illustrated with the placement in picture 1 and picture 2.

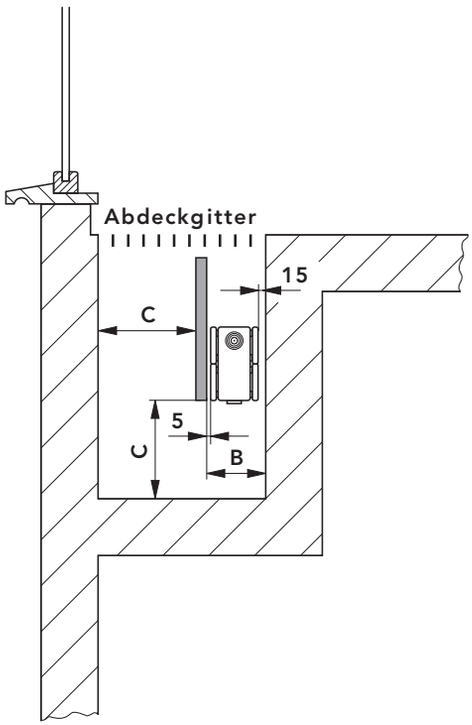
h [mm]	Percentage increase of the heat emission			
	OH 70 mm	OH 142 mm	OH 214 mm	OH 286 mm
150	14	-	-	-
200	20	8	-	-
250	26	12	2	-
300	30	15	6	-
350	33	19	9	3
400	36	22	12	6
450	39	25	15	9
500	41	28	17	11
600	46	32	21	14
700	50	35	24	18
800	-	38	27	21

Horizontal design of VONARIS, VONARIS-M and KONTEC

Placement of the radiators in regard to floor conduits



B = Overall radiator depth + 10 mm
C ≥ B



B = Overall radiator depth + 20 mm
C ≥ B

Schematic diagram

The screening between the radiator surfaces and conduit walls must be made of heat-insulating materials (e. g.: timber, plastics etc.).

Take care that the lower edge of the screening corresponds to the lower edge of the radiator. The top edge of the screening should be fitted as near to the floor conduit cover as possible.

The cover grids of the floor conduit should be designed in a way that the open cross-sectional area amounts to at least 60 %.

We recommend to use cover grids that can easily be taken off in order to facilitate the cleaning of the floor conduit.

The heat emission of radiators installed in floor conduits (subsurface heating) is reduced at about 20 %, compared with the values given in the heat output index.

Guide table for the selection and number of required fastening systems for VONARIS solitary finished radiators

Guide for the selection and number of required stand consoles
for types VHV and VHV-S (WVO design), up to an overall height of 286 mm

Stand consoles for the horizontal design, up to OH 286 mm

Radiator model	VHV 11		VHV 20		VHV 22		VHV-S 22		VHV 23	
Overall lenght [mm]	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200
SK 10 for finished floors	**2**	**3**								
SK 11 for unfinished floors	**2**	**3**								
SK 12 for finished floors			**2**	**3**	**2**	**3**			**2**	**3**
SK 13 for unfinished floors			**2**	**3**	**2**	**3**			**2**	**3**
SK 14 for finished floors							**2**	**3**		
SK 15 for unfinished floors							**2**	**3**		

Radiator model	VHV 34		VHV-S 34		VHV 35		VHV 46		VHV-S 47	
Overall lenght [mm]	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200
SK 14 for finished floors	**2**	**3**	**2**	**3**	**2**	**3**				
SK 15 for unfinished floors	**2**	**3**	**2**	**3**	**2**	**3**				
SK 16 for finished floors							**2**	**3**		
SK 17 for unfinished floors							**2**	**3**		
SK 18 for finished floors									**2**	**3**
SK 19 for unfinished floors									**2**	**3**

Guide for the selection and number of required **stand consoles**
for types VHV 11, VHV 20 and VHV 22

Stand consoles suitable for the horizontal design with or without a heat reflector, for types VHV 11, VHV 20 and VHV 22, with an overall height of 358, 430, 502, 574 and 646 mm

Radiator model	VHV 11		VHV 20		VHV 22	
Overall lenght [mm]	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200
SK 22			**2**			
SK 22				**3**		
SK 23	**2**				**2**	
SK 23		**3**				**3**

Guide table for the selection and number of required fastening systems for VONARIS solitary finished radiators

Guide for the selection and number of required **wall consoles**
for types VHV, up to an overall height of 286 mm

Wall consoles for the horizontal design, up to OH 286 mm

Radiator model		VHV 11		VHV 20		VHV 22		VHV 23	
Wall console model		WK 10		WK 10 - M		WK 10 - M		WK 11-M	
Overall length [mm]		between 500 and 2000	between 2200 and 4000	between 500 and 2000	between 2200 and 4000	between 500 and 2000	between 2200 and 4000	between 500 and 2000	between 2200 and 4000
Overall height [mm]	142			2	3	2	3	2	3
	214	2	3	2	3	2	3	2	3
	286	2	3	2	3	2	3	2	3

Radiator model		VHV 34		VHV 35		VHV 35		VHV 35	
Wall console model		WK 11-M		WK 12		WK 12		WK 12	
Overall length [mm]		between 500 and 2000	between 2200 and 4000	between 500 and 2000	between 2200 and 4000	between 500 and 1800	between 2000 and 2600	between 2800 and 3600	between 3800 and 4000
Overall height [mm]	142	2	3	2	3				
	214	2	3	2	3				
	286	2	3			2	3	4	5

Radiator model		VHV 46		VHV 46		VHV 46		VHV 46	
Wall console model		WK 12		WK 12		WK 12		WK 12	
Overall length [mm]		between 500 and 2000	between 2200 and 3000	between 500 and 1800	between 2000 and 2800	3000	between 500 and 1400	between 1600 and 2200	between 2400 and 2800
Overall height [mm]	142	2	3						
	214			2	3	4			
	286					5	2	3	4

Guide table for the selection and number of required fastening systems for VONARIS solitary finished radiators

Guide for the selection and number of required **VONOFIX rapid installation consoles**
for types VHV 20, VHV 22 and VHV 34

VONOFIX rapid installation consoles for overall heights of 214, 286, 358, 430, 502, 574, 646 and 790 mm

Radiator model		VHV 20		VHV 22		VHV 34	
Overall length [mm]		up to 2000	from 2200 with foot console	up to 2000	from 2200 with foot console	up to 2000	from 2200 with foot console
Overall height [mm]	VONOFIX 1 (set for 214)	1	1	1	1	1	1
	VONOFIX 2 (set for 286)	1	1	1	1	1	1
	VONOFIX 2 (set for 358)	1	1	1	1		
	VONOFIX 3 (set for 430)	1	1	1	1		
	VONOFIX 3 (set for 502)	1	1	1	1		
	VONOFIX 4 (set for 574)	1	1	1	1		
	VONOFIX 4 (set for 646)	1	1	1	1		
	VONOFIX 5 (set for 790)	1	1	1	1		

Guide table for the selection and number of required fastening systems for VONARIS solitary finished radiators

Guide for the selection and number of required **VONOFIX rapid installation consoles** for types VSV 10, VSV 11, VSV 20 and VSV 21

Wall mounting brackets for the vertical design

Radiator model	VSV 10		VSV 11		VSV 20		VSV 21	
Overall length [mm]	214	ab 286	214	ab 286	214	ab 286	214	ab 286
WA 10, set	1		1		1		1	
WA 11, set of 2		1		1		1		1

Guide table for the selection and number of required fastening systems for VONARIS central connection radiators

Guide for the selection and number of required **stand consoles** for types VHV-M up to an overall height of 286 mm.

Stand consoles for the horizontal design, up to OH 286 mm

Radiator model	VHV-M 22		VHV-M S 22		VHV-M 34		VHV-M 46		VHV-M S 46	
Overall length [mm]	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200
SK 12 for finished floors	2	3								
SK 13 for unfinished floors	2	3								
SK 14 for finished floors			2	3	2	3				
SK 15 for unfinished floors			2	3	2	3				
SK 16 for finished floors							2	3		
SK 17 for unfinished floors							2	3		
SK 18 for finished floors									2	3
SK 19 for unfinished floors									2	3

Guide table for the selection and number of required fastening systems for VONARIS central connection radiators

Guide for the selection and number of required **wall fastening brackets** for types VSV-M 10, VSV-M 11, VSV-M 20 and VSV-M 21

Wall fastening brackets for the vertical design

Radiator model		VHV-M 22		VHV-M 34		VHV-M 46	
Wall console model		WK 10 - M		WK 11 - M		WK 12	
Overall length [mm]		between 500 and 2000	between 2200 and 2400	between 500 and 2000	between 2000 and 2400	between 500 and 2000	between 2200 and 2400
Overall height [mm]	142	2	3				
	214			2	3	4	
	286					5	2

Guide table for the selection and number of required fastening systems for VONARIS central connection radiators

Guide for the selection and number of required **VONOFIX rapid installation consoles** for types VHV-M 20, VHV-M 22 and VHV-M 34

VONOFIX rapid installation consoles for overall heights of 214, 286, 358, 430, 502, 574, 646 and 790 mm

Radiator model		VHV-M 20		VHV-M 22		VHV-M 34	
↔ Overall length [mm]		up to 2000	from 2200 with foot console	up to 2000	from 2200 with foot console	up to 2000	from 2200 with foot console
Overall height ↕ [mm]	VONOFIX 1 (set for 214)			1	1	1	1
	VONOFIX 2 (set for 286)			1	1	1	1
	VONOFIX 2 (set for 358)	1	1	1	1		
	VONOFIX 3 (set for 430)	1	1	1	1		
	VONOFIX 3 (set for 502)	1	1	1	1		
	VONOFIX 4 (set for 574)	1	1	1	1		
	VONOFIX 4 (set for 646)	1	1	1	1		
	VONOFIX 5 (set for 718)	1	1	1	1		
	VONOFIX 5 (set for 790)	1	1	1	1		

Guide for the selection and number of required **wall fastening brackets** for types VSV-M 10, VSV-M 11, VSV-M 20 and VSV-M 21

Wall fastening brackets for the vertical design

Radiator model	VSV-M 10*		VSV-M 11*		VSV-M 20		VSV-M 21	
↔ Overall length [mm]	214	ab 286	214	ab 286	214	ab 286	214	ab 286
WA 10, set	1		1		1		1	
WA 11, set of 2		1		1		1		1

***Note:** when installing the VSV-M 10 and VSV-M 11 models with an angled connection set (**ZE**, **EE**), please use the appropriate drill consoles and angled fishplates to ensure that the required distance from the wall is maintained.

Guide table for the selection and number of required fastening systems for KONTEC convectors

Guide for the selection and number of required **stand consoles** for **KONTEC convectors**, types KK and KK-S (WVO design)

Stand consoles for convectors **without brackets**

Radiator model	KK 11		KK 20		KK 22		KK-S 22	
↔ Overall length [mm]	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200
SK 10 for finisched floors	2	3						
SK 11 for unfinished floors	2	3						
SK 12 for finisched floors			2	3	2	3		
SK 13 for unfinished floors			2	3	2	3		
SK 14 for finisched floors							2	3
SK 15 for unfinished floors							2	3

Guide table for the selection and number of required fastening systems for KONTEC convectors

Guide for the selection and number of required **stand consoles** for **KONTEC convectors**, types KK and KK-S (WVO design)

Stand consoles for convectors **without brackets**

Radiator model	KK 23		KK 34		KK-S 34		KK 35	
Overall length [mm]	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200
SK 12 for finished floors	**2**	**3**						
SK 13 for unfinished floors	**2**	**3**						
SK 14 for finished floors			**2**	**3**	**2**	**3**	**2**	**3**
SK 15 for unfinished floors			**2**	**3**	**2**	**3**	**2**	**3**

Radiator model	KK 46		KK-S 47		KK 58	
Overall length [mm]	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200
SK 16 for finished floors	**2**	**3**				
SK 17 for unfinished floors	**2**	**3**				
SK 18 for finished floors			**2**	**3**	**2**	**3**
SK 19 for unfinished floors			**2**	**3**	**2**	**3**

Guide table for the selection and number of required fastening systems for KONTEC convectors

Guide for the selection and number of required wall consoles for KONTEC convectors, type KK

Wall consoles for convectors **without brackets**

Radiator model		KK 11		KK 20		KK 22		KK 23		KK 34	
Wall console model		WK 10		WK 10 - M		WK 10 - M		WK 11-M		WK 11-M	
Overall length [mm]		between 500 and 2000	between 2200 and 4000	between 500 and 2000	between 2200 and 4000	between 500 and 2000	between 2200 and 4000	between 500 and 2000	between 2200 and 4000	between 500 and 2000	between 2200 and 4000
Overall height [mm]	**70**			**2**	**3**	**2**	**3**	**2**	**3**	**2**	**3**
	142			**2**	**3**	**2**	**3**	**2**	**3**	**2**	**3**
	214	**2**	**3**	**2**	**3**	**2**	**3**	**2**	**3**	**2**	**3**
	286	**2**	**3**	**2**	**3**	**2**	**3**	**2**	**3**	**2**	**3**

Radiator model		KK 35		KK 35		KK 35		KK 46		KK 46	
Wall console model		WK 12		WK 12		WK 12		WK 12		WK 12	
Overall length [mm]		between 500 and 2000	between 2200 and 4000	between 500 and 1800	between 2000 and 2600	between 2800 and 3600	between 3800 and 4000	between 500 and 2000	between 2200 and 3000	between 500 and 1900	between 2000 and 2800
Overall height [mm]	**70**	**2**	**3**					**2**	**3**		
	142	**2**	**3**					**2**	**3**		
	214	**2**	**3**							**2**	**3**
	286			**2**	**3**	**4**	**5**				

Guide table for the selection and number of required fastening systems for KONTEC convectors

Guide for the selection and number of required **wall consoles** for **KONTEC convectors**, type KK

Wall consoles for convectors **without brackets**

Radiator model		**KK 46**		**KK 46**		**KK 58**		**KK 58**		**KK 58**	
Wall console model		**WK 12**		**WK 12**		**WK 13**		**WK 13**		**WK 13**	
Overall length [mm]		3000	between 500 and 1400	between 1500 and 2200	between 2400 and 2800	between 500 and 2000	2200	between 500 and 1700	between 1800 and 2200	between 500 and 1100	between 1200 and 1700
Overall height	**70**					**2**	**3**				
	142							**2**	**3**		
	214	**4**								**2**	**3**
[mm]	**286**	**5**	**2**	**3**	**4**		**6**				

Radiator model		**KK 58**		**KK 58**		**KK 58**	
Wall console model		**WK 13**		**WK 13**		**WK 13**	
Overall length [mm]		between 1800 and 2200	between 500 and 800	between 900 and 1300	between 1400 and 1700	between 1800 and 2000	
Overall height	**70**						
	142						
	214	**4**					
[mm]	**286**		**2**	**3**	**4**	**5**	

Guide table for the selection and number of required fastening systems for KONTEC convectors

Guide for the selection and number of required fastening systems for KONTEC heating panels

Stand consoles, suitable for horizontal heating panels with or without heat reflector, for types KH 11, KH 20 and KH 22

Radiator model	**KH 11**		**KH 20**		**KH 22**	
Overall length [mm]	up to 2000	from 2200	up to 2000	from 2200	up to 2000	from 2200
SK 22			**2**			
SK 22				**3**		
SK 23	**2**				**2**	
SK 23		**3**				**3**

Guide for the selection and number of required **wall fastening brackets** for vertical **KONTEC** heating panels, type KS

Wall fastening brackets for vertical heating panels

Radiator model	**KS 10**		**KS 11**		**KS 20**		**KS 21**	
Overall length [mm]	**up to 214**	**from 286**	**up to 214**	**from 286**	**up to 214**	**from 286**	**up to 214**	**from 286**
WA 10, set	**1**		**1**		**1**		**1**	
WA 11, set of 2		**1**		**1**		**1**		**1**