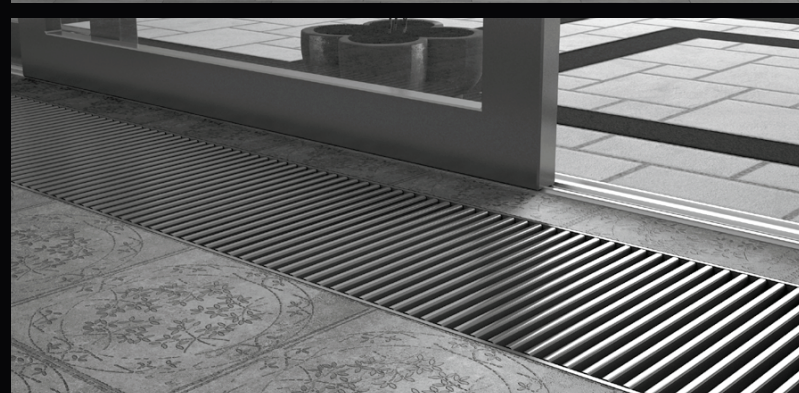




## Convectors



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Products equipped with forced convection to increase efficiency in heating, cooling and dry-cooling





# [ KORAWALL

## WALL-MOUNTED CONVECTORS

with forced convection and optimized convection

Developed for low temperature heating systems, high efficiency guaranteed also at very low temperature gradients, e.g. 35/30 °C. Ideal everywhere where the heat source is a heat pump, a solar system, a condensation boiler or as a supplementary source of heat for floor heating, particularly during a transitional period or when an instant temperature increase in the room is required. At the same time suitable for rooms' dry-cooling during the summer months. All of this with the benefits of the Optimized Convection system – low noise and low fan input while maintaining maximally attainable performances.

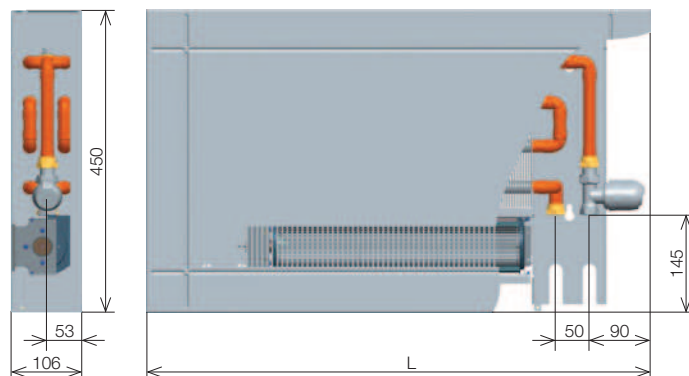
Univeral use – heating and dry-cooling!



# Wall-mounted convectors with forced convection KORAWALL WI 45/11



- used for heating or dry-cooling
- high efficiency even at low temperatures of the heating system
- patented design solutions
- high-performance, low energy and quiet fans
- the same regulation as the one for floor convectors  
KORAFLEX FV and free standing convectors with forced convection KORALINE LV
- two-pipe system
- right bottom connection
- controls possible through BMS (Building Managing System)
- the convectors is intended for dry environment



The given dimensions are in mm.

## Specification

depth (mm)	106
weight (mm)	450
length (L mm)	750, 1 000, 1 250, 1 500, 1 750, 2 000
exchanger height (mm)	240
exchanger width (mm)	100
fans' impeller diameter (mm)	60
connection to the heating system	inner G 1/2"
connection method	recommended bottom connection, right

Version KORAWALL WI • coated in RAL 9010 zinc galvanised steel

## Technical parameters



Height	cm	45																							
Width	cm	11																							
Length	cm	75				100				125				150				175				200			
Noisiness - acoustic pressure 1m	dB(A)	0	23.1	31.3	38	0	23.4	31.7	38.5	0	23.7	32.1	39	0	24	32.5	39.5	0	24.4	33	40.1	0	24.7	33.4	40.6
Max. input/voltage DC	W/V	5.5/13.5				8/13.5				9.5/13.5				14/13.5				16/13.5				18.5/13.5			
Rpm		Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3
Cooling output	t1 °C hum. %	Cooling output [W]																							
16/19 °C	28 50	0	149	207	263	0	291	407	527	0	387	542	703	0	434	604	791	0	523	732	966	0	618	864	1141
	26 50	0	123	171	218	0	240	337	435	0	320	448	581	0	359	499	653	0	432	605	798	0	510	714	943
	24 50	0	93	128	163	0	180	252	327	0	241	336	435	0	270	375	490	0	323	454	598	0	383	536	708
Heat output	t1 °C	Heat output [W]/EN 442																							
75/65 °C	18	281	858	1139	1444	563	1716	2279	2888	751	2288	3039	3850	844	2574	3418	4332	1032	3146	4178	5294	1220	3718	4938	6257
	20	<b>270</b>	<b>823</b>	<b>1093</b>	<b>1385</b>	<b>540</b>	<b>1646</b>	<b>2186</b>	<b>2770</b>	<b>720</b>	<b>2195</b>	<b>2915</b>	<b>3693</b>	<b>810</b>	<b>2469</b>	<b>3279</b>	<b>4155</b>	<b>990</b>	<b>3018</b>	<b>4008</b>	<b>5078</b>	<b>1170</b>	<b>3566</b>	<b>4736</b>	<b>6002</b>
	22	259	788	1047	1326	517	1576	2093	2652	689	2102	2791	3537	776	2364	3140	3979	948	2890	3838	4863	1120	3415	4535	5747
70/55 °C	18	239	727	966	1224	477	1454	1932	2448	636	1939	2575	3263	716	2182	2897	3671	875	2666	3541	4487	1034	3151	4185	5303
	20	227	693	920	1165	454	1385	1839	2331	606	1847	2453	3108	682	2078	2759	3496	833	2539	3372	4273	985	3001	3986	5050
	22	216	658	874	1107	432	1316	1748	2215	576	1755	2330	2953	648	1974	2622	3322	791	2413	3204	4060	935	2851	3787	4798
55/45 °C	18	168	512	680	862	336	1025	1361	1724	448	1366	1814	2299	504	1537	2041	2587	616	1879	2495	3161	728	2220	2949	3736
	20	157	478	635	805	314	957	1271	1610	419	1276	1694	2147	471	1435	1906	2415	575	1754	2330	2952	680	2073	2753	3489
	22	146	445	590	748	292	889	1181	1496	389	1186	1575	1995	438	1334	1771	2245	535	1630	2165	2743	632	1927	2559	3242
50/40 °C	18	140	428	568	720	281	856	1136	1440	374	1141	1515	1920	421	1283	1704	2160	515	1568	2083	2640	608	1854	2462	3119
	20	129	394	524	663	259	788	1047	1327	345	1051	1396	1769	388	1183	1571	1990	474	1445	1920	2432	560	1708	2269	2875
	22	118	361	479	607	237	722	958	1214	316	962	1278	1619	355	1082	1437	1821	434	1323	1757	2226	513	1563	2076	2631

- temperature exponent  $m = 1.062$

Cooling is possible only in the non-condensation zone, i.e. above the temperature of the dew-point.  
The element is not provided with condensate drain. Listed cooling outputs SENSITIV.

Cooling outputs for other operating conditions on request.

\* SENSITIV - cooling power actually delivered for cooling the air.

Correction factor page 80 • Assembly page 81 • Regulation page 82

# Correction factor $k_t$ for a variant temperature difference $\Delta t$ (K)

## KORAWALL WI 45/11

$\Delta t$ (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
$k_t$	0.338	0.358	0.378	0.398	0.418	0.438	0.459	0.479	0.499	0.520	0.540	0.561	0.581	0.602	0.623	0.643
$\Delta t$ (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
$k_t$	0.664	0.685	0.705	0.726	0.747	0.768	0.789	0.810	0.831	0.852	0.873	0.894	0.915	0.936	0.958	0.979
$\Delta t$ (K)	50	51	52	53	54	55	56	57	58	59	60					
$k_t$	1.000	1.021	1.043	1.064	1.085	1.107	1.128	1.149	1.171	1.192	1.214					

• temperature exponent  $m = 1.062$

## Weights and water volumes of the wall-mounted radiator KORAWALL WI

Type	45/11
kg/linear meter	18.2
l/1 linear meter	1.4

The listed weights are without a packaging.

## The contents of supplies and selectable specifications

### Standard delivery contains

- sheathing of zinc galvanised steel coated in shade RAL 9010 – white
- Al/Cu heat exchanger with low water content, air vent and uniquely shaped lamellas for a higher heat output
- group of low-energy fans
- connecting terminal (F Box)
- wall-mounting brackets
- mounting instructions
- the set is packed in a cardboard packaging

### Optional accessories

- in case of ordering more than 5 units it is possible to select another sheathing colour shade (the manufacturer must be consulted)
- shut off valve, thermostatic valve and thermoelectric drive

### Note

- Standard supply does not include the regulation
- The regulation must be ordered separately in accordance with the technical parameters
- Electrical regulation and regulation elements, see page 82
- Regulation is identical for all OC convectors



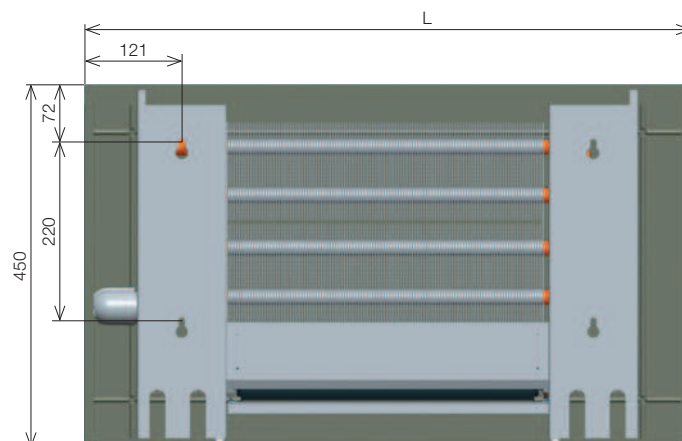
# Convectors installation – construction recommendations

## KORAWALL WI



- It is recommended to position the wall-mounted heating element on a peripheral wall, 10 cm above the floor.
- The hot water is supplied always in the upper pipes; recommend to fit with the shut-off valve and the thermostatic valve (consultation with the designer is required in case of cooling).
- We recommend to fit the fans once all building work is completed. The exchanger and the sheathing must be well protected against fouling and regular maintenance carried out – including cleaning of exchangers and fans.
- The convector is fitted to the wall using brackets. Then the heat exchanger is inserted and connected to the heating system. We recommend to check the correct position of the exchanger and the fittings in relation to the sheathing. Fit the fans and the sheathing only after all building work has been completed.

### Anchoring diagram



### Assembly electrical part

- Regulation is identical with OC convectors
- We recommend to fit KORAWALL WI with the thermoelectric drive
- Do not forget to provide power supply near the installation – more details in the electrical assembly part on page 82 or in the installation instructions

### Design solution of the front face of KORAWALL WI

The wall-mounted heating elements KORAWALL WI have on their front face a significant design element which consists of one design section in the lengths of 75, 100 and 125 cm, two sections in the lengths of 150 and 175 cm and three sections in the length of 200 cm.

## Ordering codes

### Convectors KORAWALL WI

				Length (cm)	Height (cm)	Depth (cm)	Colour
KORAWALL	white steel/unpainted exchanger	WI	-	...	45	11	- 10

Wall-mounted convectors with forced convection KORAWALL WI



## Regulation and acoustics





## Description of electrical regulation of KORAFLEX FV, FV InPool, FI, FW, KORALINE LV and KORAWALL WI (hereinafter referred to as fan-coils)

### Standard regulation:

The regulation is designed for the control of the heating and cooling output of convectors with blow fans. The standard part of the fans is:

- Group of fans with a unique disk type synchronous engine with permanent magnets. It is characterized mainly by very low power consumption – the power input of the engine at the full range of speed does not exceed 7.5 watts; the engine also runs very quietly.
- Connecting terminal (F Box)
- Exchanger temperature sensor (switch)

### Optional accessories

The DC power supply source in accordance with the total power input of the controlled fan-coil units. The offer includes 2 sizes, 60 W and 100 W. The power supply sources are supplied separately for installation in the electrical switchboard on DIN rail.

- R-Box, containing the speed signal galvanic separation module, controlling the fan speed and which also allows the selection and optimization of various degrees of speed. The R-Box is designed for mounting on DIN rail in the switchboard
- Plastic box for the placement of the DC power supply and the R-Box for installations where the switchboard is too far
- Siemens thermostats
- Valves, thermoelectric drive 12 V DC

The performance is controlled by the working media On/Off switching valve, if used, and by switching the On/Off the three speed blower fan. When using a Siemens thermostat RDG100T the speed is controlled automatically. All three speeds of the fan can be smoothly adjusted. The fan speed is given by the size of the voltage control signal CNTRL from the galvanic separation signal module (R-Box). Detailed description of functions and settings is available in the installation instructions supplied with the product.

Fans are normally blocked by a temperature switch (TS1) at a switching temperature of about 35 °C. This function may be disconnected. This accessory is not supplied for KORAWALL WI. For fan coils with dry-cooling effect it is still necessary to use one cooling medium thermal switch (TS2) connected in parallel to the temperature switch which activates at a temperature below 13 °C. The temperature and speed is controlled by Siemens Thermostats RAB11, RDF600/IR or RDG 100T. Contact fields of

these thermostats (TS1) are connected to mains voltage, and that is why it is necessary to use the R-Box signals' galvanic separation (the galvanic separation of signals is implemented by using optocouplers).

The thermostat switches the DC power supply source of the output voltage of approx. 13.5 V. Once the power supply source is switched on the heating medium valves (if used) start opening. Furthermore, the thermostat through galvanic separation module generates the control voltage signal CNTRL. The control voltage signal is of three levels, with each speed level smoothly adjustable. The convectors control can be also carried out using a BMS (Building Management System) higher-level output elements. One BMS relay output controls the valve's opening/closing, and the second continuous 0–10 V output controls the speed. The standard regulation enables the use of a thermoelectric drive 12 V DC that closes or opens the heating media valve. The function is set in such a way that if heating is required, i.e. after the thermostat switches on, the power supply is activated. The voltage from the power supply source directly supplies the thermoelectric drives of the valve for the control of the heating media inlet to the fan-coil unit. If the heating output is not sufficient without the fan, it is possible to select the required speed of the fan (I. II. III.) with a switch.

### Description of regulation of KORAFLEX FV InPool

The above described system of regulation applies to pool applications for which this product is intended. The principle is the same but the electrical equipment of the convectors differs the electronics of the motor, F box are located in a plastic box with high degree of protection IP 67 which is placed inside the convectors. When installing the connecting cables to the terminal block of the F box must be connected as per instructions. In terms of temperature and speed regulation the same types and variations of thermostats are used with a restriction that the thermostats must not be placed in the pool area. For these purposes we recommend using the temperature sensor which senses the temperature in the pool area, see Accessories. The sensor is designed for thermostats RDF 600 and RDG 100T.

The convectors is not designed for continuous flooding by pool water. Get thoroughly familiar with the warranty and operating conditions.

**Installation must be performed according to valid standards and safety regulations! The manufacturer is not liable for defects or damage caused by improper installation.**



# Electrical regulation elements

## SIEMENS RAB 11

- room thermostat with a speed switch
- switching between heating and cooling
- manual switching of the fan speed
- voltage 24 to 250 V AC, current 0.2 to 6 (2) A
- temperature setting range 8 to 30 °C
- degree of protection class IP 30
- dimensions w × h × d (mm) – 96 × 110 × 35.4



## SIEMENS IRA 211

- infrared remote control for RDF 600/IR and RDG 100T
- operation type selection
- temperature setting
- fan speed selection
- compatible for use with the RDF 600, RDG 100T thermostats
- power supply 2× 1.5 V, AAA type
- degree of protection class IP 30
- dimensions w × h × d (mm) – 42 × 106 × 18



## SIEMENS RDF 600

- room thermostat with a display and weekly program for two/four-pipe fan-coil units
- automatic switching between heating/cooling
- manual or automatic 3-stage fan speed control
- operating voltage AC 230 V, current loading max. 4 (2) A
- setting range of the required temperature 5–40 °C
- switching hystereses adjustable in the range of 0.5 to 4 K
- possibility of connection of a separate sensor e.g. for applications in a wet environment
- possibility to control the control valve with the use of a thermo-electric drive
- degree of protection class IP 30
- dimensions w × h × d (mm) – 86 × 86 × 57



## Room temperature sensor QAA32

- to measure space temperature in systems of heating where it is not possible to place a thermostat
- suitable for pool application installations
- can be connected to thermostats RDF 600, RDG 100T
- measurement range: 0–40 °C, accuracy of measurement at 25 °C ± 0.3 K
- measuring sensor – NTC, 3 kΩ at 25 °C
- safety class II according to EN 60 730, degree of protection IP 30 according to EN 60 529
- dimensions w × h × d (mm) – 96.4 × 99.6 × 36



## SIEMENS RDG 100T

- room thermostat with a display and weekly program for two/four-pipe fan-coil units
- automatic switching between heating/cooling
- manual or automatic 3-stage fan speed control
- operating voltage AC 230 V, current loading max. 5 (4) A
- setting range of the required temperature 5–40 °C
- switching hystereses adjustable in the range of 0.5 to 6 K
- possibility of connection of a separate sensor e.g. for applications in a wet environment
- possibility of control using the infrared remote control
- wide range of accessories, modern design
- degree of protection class IP 30
- dimensions w × h × d (mm) – 93 × 128 × 30



## DC power supply source 60 W and 100 W

- switching DC power supply
- noiseless operation, high efficiency
- DIN rail mounting
- degree of protection class IP 20



model	DR-60-12	DR-100-12
power supply size	60 W	100 W
input control voltage	230 V AC/0,88 A	230 V AC/1,6 A
heat output voltage	15 V DC/4 A	15 V DC/6.5 A
dimensions w × h × d (mm)	78 × 93 × 56	100 × 93 × 56

## R-Box

- input voltage: 230 V/50 Hz
- output signal: 0 to 10 V/1 kΩ
- galvanically separated 4 kV AC – optocouplers
- degree of protection: IP 20
- installation on the DIN rail in the switchboard
- incorporates speed signal galvanic separator module
- operating ambient temperature: 0–40 °C
- dimensions w × h × d (mm) – 52 × 23 × 40





## Installation box

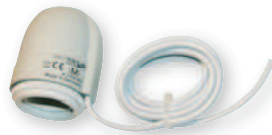
- wall built-in
- used for the DC power supply source installation and the R-Box in cases where the installation in switchboard is not possible
- IP 40
- dimensions w × h × d (mm) – 258 × 318 × 72



## Heating control elements (cooling) medium

### Thermoelectric drive

- power supply voltage: 12 V DC/150mA/1.8 W
- CLOSED without power supply
- degree of protection: IP 54
- connection cable 2 × 0.75 mm<sup>2</sup>, length 1 m
- closing/opening time < 3 min.



### Shut-off valve

- straight or corner section (according to the order)
- dimension 1/2" G
- material – nickel-plated brass



### Thermostatic head fluid with capillary

- regulation range +6.5 to +28 °C
- installation of the actuator into the wall
- length of capillary 5 m
- hysteresis: ≤ 0.6 °C



Preset stage	1	2	3	4	5	6	7	8	9
speed	1 1/4	1 1/2	1 3/4	2	2 1/2	3	3 1/2	4	Complete opening
Kv	0.14	0.20	0.31	0.43	0.60	0.79	1.00	1.20	1.35

Kv flow coefficient (m<sup>3</sup>/h)

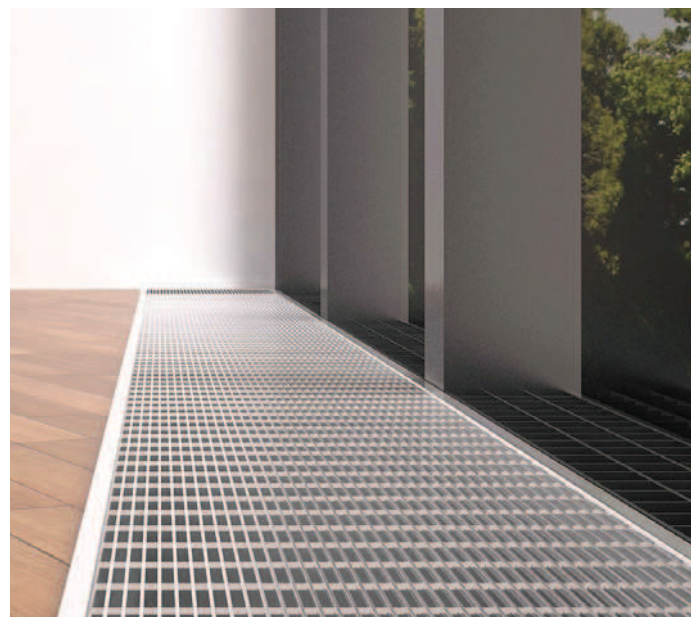
### Thermostatic valve

- straight or corner section (according to the order)
- with preset Kv value
- dimension 1/2" G
- connection dimension of the head M 30 × 1.5
- material – nickel-plated brass
- maximum operating pressure PN 10
- maximum operating temperature 90 °C



Preset stage	1	2	3	4	5	6
Kv (Δt = 2K)	0.10	0.20	0.30	0.40	0.50	0.60
Kvs	0.10	0.20	0.30	0.40	0.57	0.80

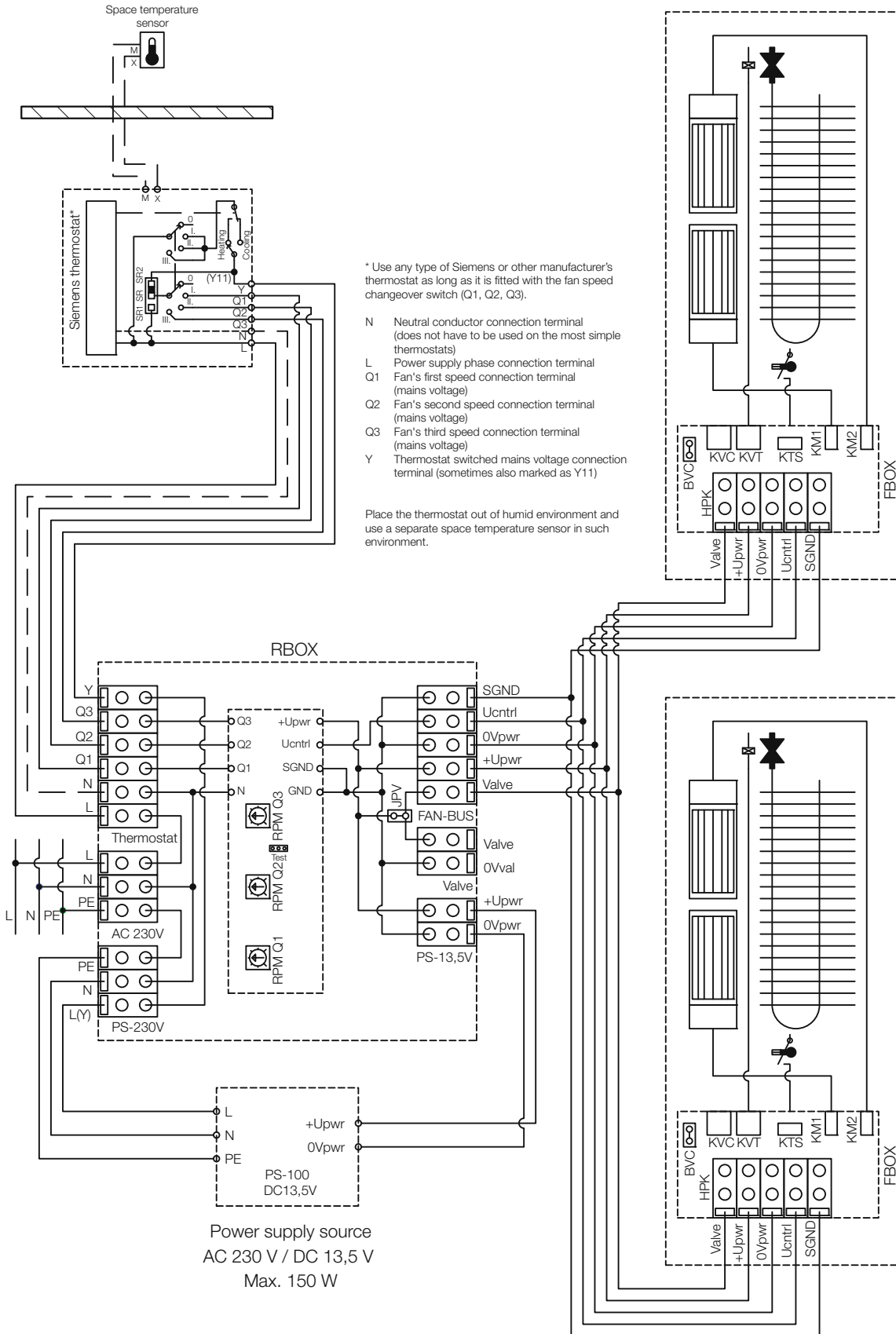
Kv flow coefficient (m<sup>3</sup>/h)  
 Kvs maximum flow (m<sup>3</sup>/h)  
 Δt = 2K valve proportionality band (K)



# Connection diagram of convectors in the variant with heating media valves.

## Convectors regulation basic connection OC

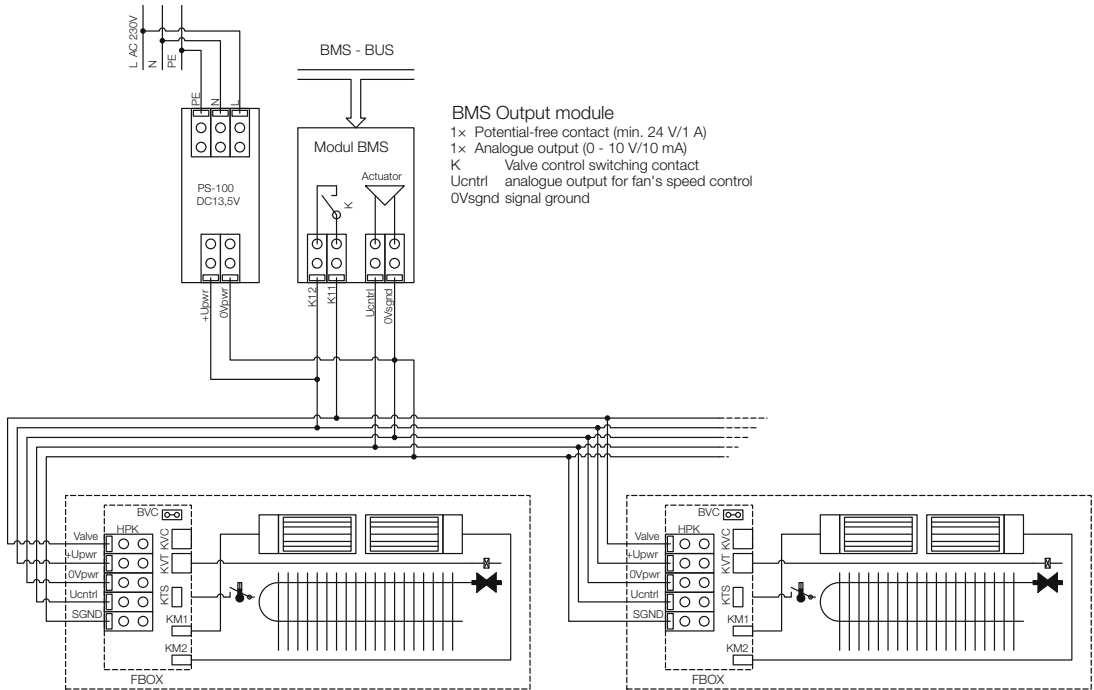
KORAFLEX FV, KORAFLEX FV InPool, KORAFLEX FW, KORAFLEX FI, KORALINE LV, KORAWALL WI



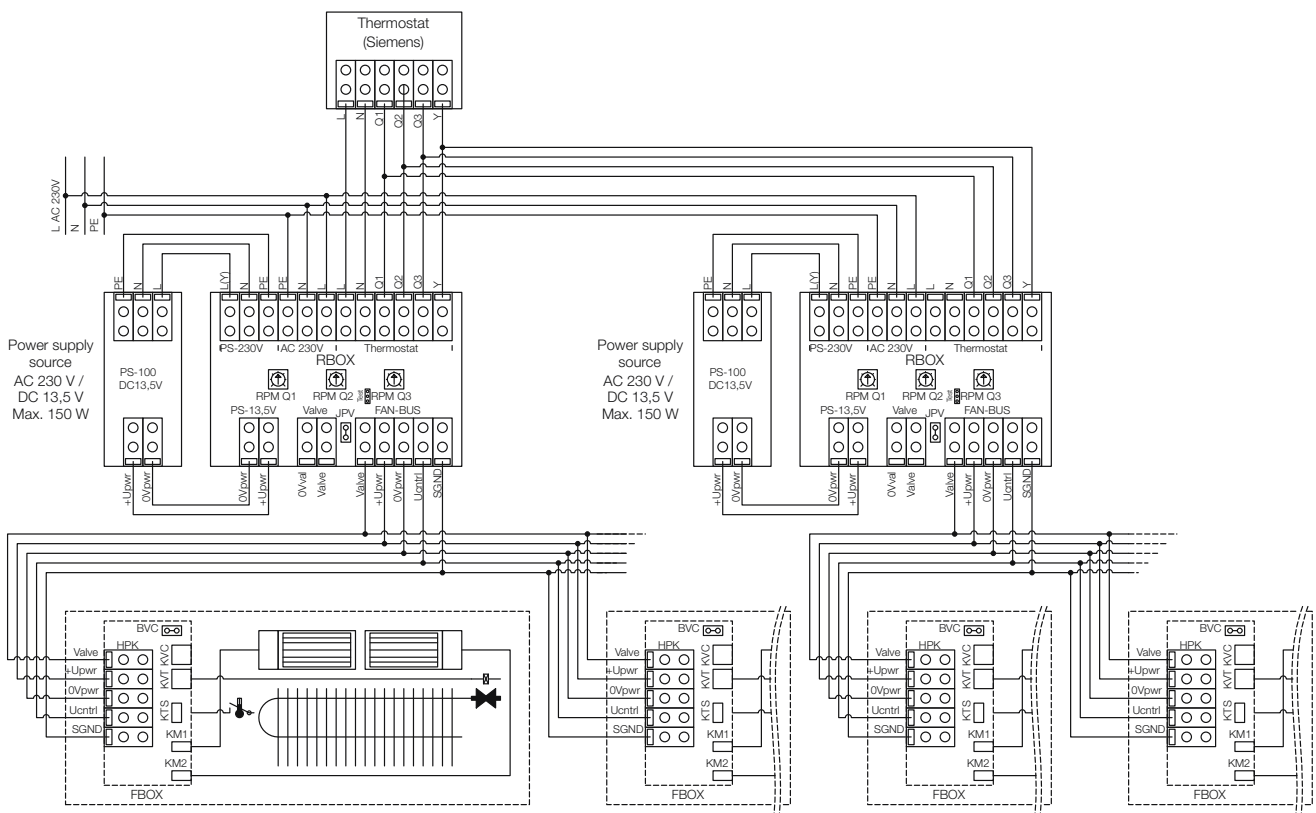
Power supply source  
AC 230 V / DC 13,5 V  
Max. 150 W



OC convectors regulation connection  
 KORAFLEX FV, KORAFLEX FV InPool, KORAFLEX FW, KORAFLEX FI,  
 KORALINE LV, KORAWALL WI **BMS control (Building Management System)**



OC convectors regulation connection  
 KORAFLEX FV, KORAFLEX FV InPool, KORAFLEX FW, KORAFLEX FI,  
 KORALINE LV, KORAWALL WI **with more DC power supply sources**



## Example of the design calculation of the output of the DC power supply

The electrical input must be calculated in terms of regulation so that the correct size of the DC power supply source is selected. The total input power will be a sum of all input power of the convectors with forced convection which will be controlled through one thermostat.

For example:

According to the project we have the following fan-coil unit types:

2 pcs of KORAFLEX FV 160/9/28 – we find the input power of 12 W in the table

1 pc of KORALINE LV 240/15/18 – we find the input power of 22.5 W in the table

2 pcs of KORAWALL WI 100/45/11 – we find the input power of 8 W in the table

(optionally 4 pieces of thermoelectric drives –

4 x 1.8 W = 7.2 W)


Total power input:

$12 + 12 + 22.5 + 8 + 8 + 8 + (7) = 62.5 \text{ W (69.5 W)}$

Select source rated 100 W.

		100
0	23.4	31.7
	8 / 13.5	
Off	1	2
0	291	407

## Acoustics

Apart from the input power one of the main parameters is the noise level of the fan convectors. Manufacturer develops and designs its products so that they do not exceed under any circumstances the specified noise levels laid down by the health standards for this type of equipment. Generally this limit is 30 dB (A) of the sound power that means that the product does not exceed this limit at the minimum speed. Products marked with the logo OC  OPTIMIZED CONVECTION has been optimized for the noise/performance ratio.

Manufacturer uses in its products always the most advanced technology, as well as in the case of the fans. The used fans are equipped with a patented disc engine with permanent magnets. Among the main benefits is belong a significant noise reduction and a low energy consumption compared to commercially available fans with the rotor and stator.

**Manufacturer indicates in its materials a parameter to assess the noise level the acoustic pressure  $L_p$  (A) measured at 1 m from the source. The measurements were carried out by an authorised test laboratory.**

The values of the sound power are available on request.

### Acoustic pressure

The acoustic pressure is a change of the air pressure generated by a source of noise. Such pressure fluctuations are measured in  $\text{N/m}^2$  and expressed by the symbol "p". The acoustic pressure represents the measure of volume. It depends on the distance between the source of the noise and the place of the measurement and also on the characteristics of the space.

### Sound power

The energy converted by a piece of equipment (the source of sound) to sound is referred to the sound power. This sound power is brought to the air in the form of pressure fluctuations. The sound power is not a directly measurable quantity. It is determined by integrating of the acoustic pressure in the form

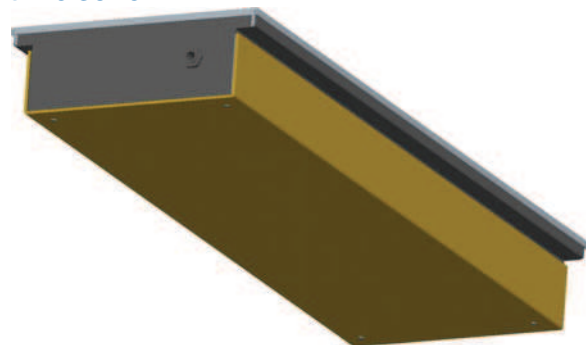
of a hemisphere or a sphere around the sound source.

The acoustic pressure is on this basis a quantity that is independent of space and distance. It is used for all further calculations. On request, will provide values of sound power of its OC products. Although the acoustic pressure level and sound power level use the same unit (dB), they are two different physical quantities. The sound power level is the sound generated at the sound source (energy introduced to the space) while the acoustic pressure level is the sound registered at a certain distance from the sound source. This means that the sound power level is generally higher than the acoustic pressure level.

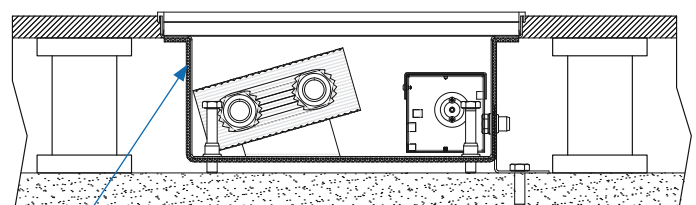
### Case with noise-absorbing foil

For further noise reduction, it is possible to order a convectors case fitted with noise-absorbing foil. The foil reduces the noisiness by 1 to 3 dB depending on the type, length and speed of the convectors.

### Anti-noise foil



### Anti-noise foil – cross section



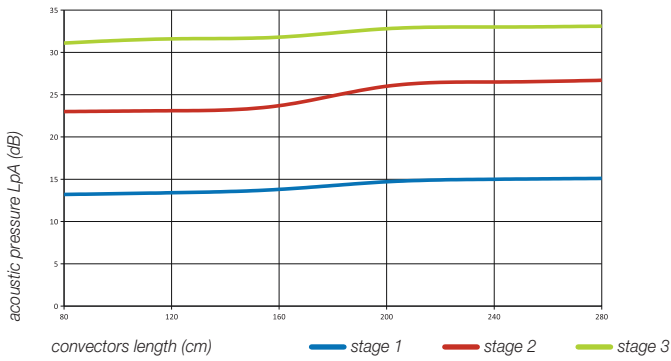
acoustically absorbent sheet

# Graphic representation of the noisiness level of OC convectors



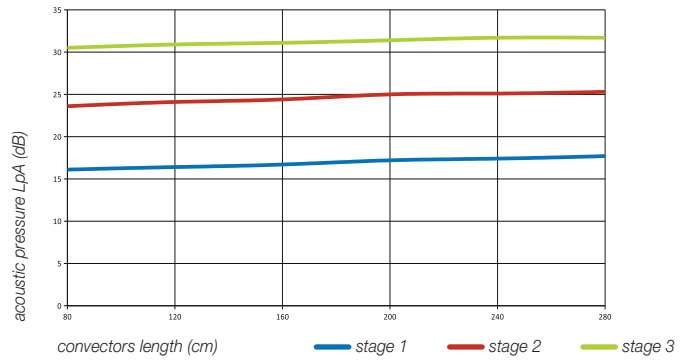
Acoustic pressure at the distance of 1 m from the convectors with forced convection of Ø 30 mm.

For convectors type KORAFLEX FV 8/16 a 8/28.



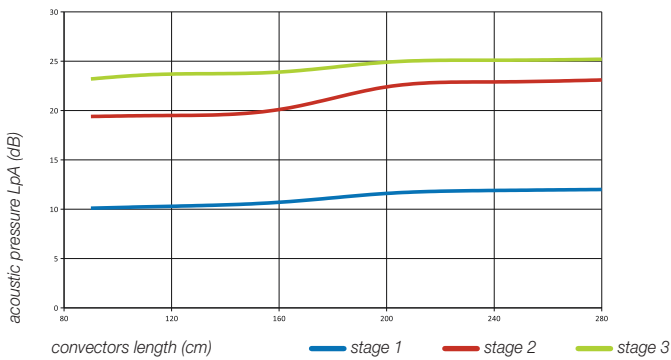
Acoustic pressure at the distance of 1 m from the convectors with forced convection of Ø 40 mm.

For convectors type KORAFLEX FV 9/28, 11/20, 11/28, 11/34, 11/42, KORAFLEX FI 11/20, KORAFLEX FV InPool 13/34.



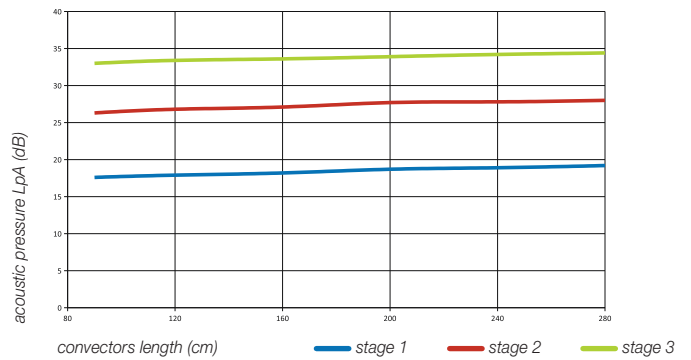
Acoustic pressure at the distance of 1 m from the convectors with forced convection of Ø 30 mm.

For convectors type KORALINE LV 15/11.



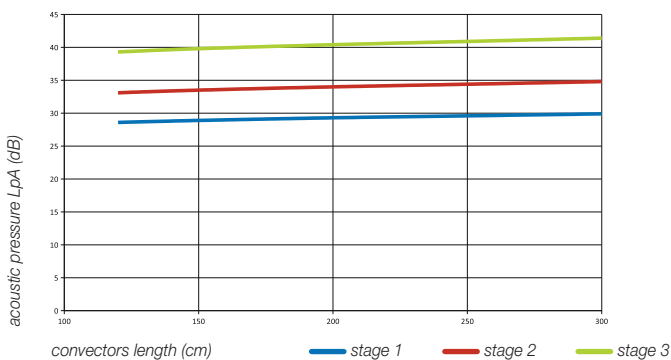
Acoustic pressure at the distance of 1 m from the convectors with forced convection of Ø 40 mm.

For convectors type KORALINE LV 15/18 a 15/24.



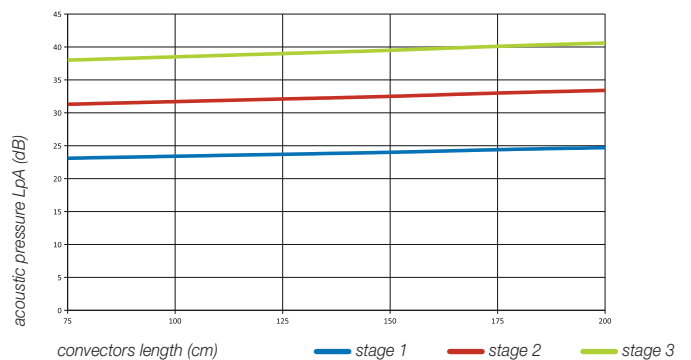
Acoustic pressure at the distance of 1 m from the convectors with forced convection of Ø 60 mm.

For convectors types KORAFLEX FI 13/34, KORAFLEX FW 13/34.



Acoustic pressure at the distance of 1 m from the convectors with forced convection of Ø 60 mm.

For convectors type KORAWALL WI 45/11.



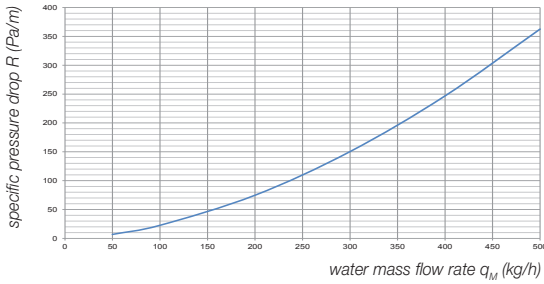
Volume of air per 1 m of fan-cooled heat exchanger length (m<sup>3</sup>/h)

fan diameter	stage 1 speed	stage 2 speed	stage 3 speed
30mm	135	180	225
40mm	180	240	300
60mm	325	437	512

# Pressure losses of convectors

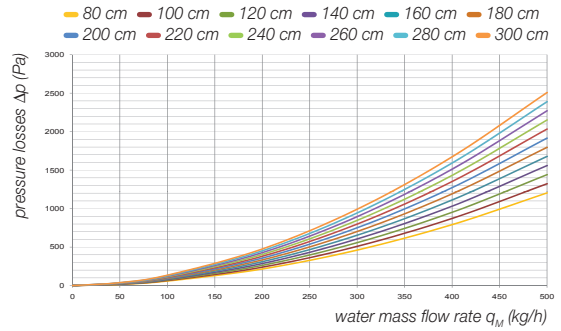
KORAFLEX FK 9/16, 11/16  
KORABASE 10

KORABASE 10



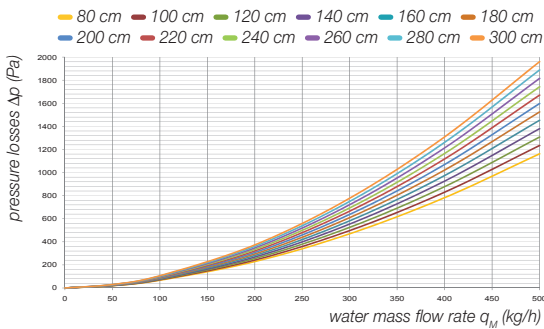
KORAFLEX FK 9/20, 9/28, 11/20, 11/28  
KORALINE 9/18 and 9/24, KORABASE 20  
KORAFLEX FV 8/28, 9/28, 11/28  
KORAFLEX FV InPool 13/34

KORABASE 20



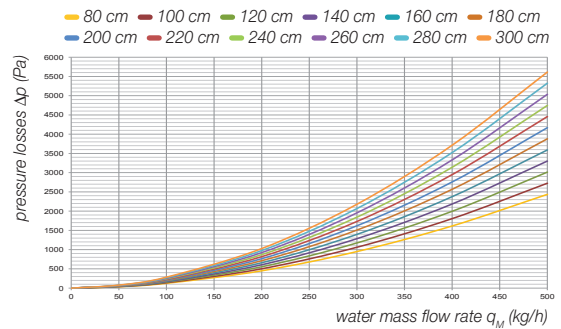
KORAFLEX 9/34, 11/34  
KORAFLEX FV 11/34, KORABASE 30

KORABASE 30



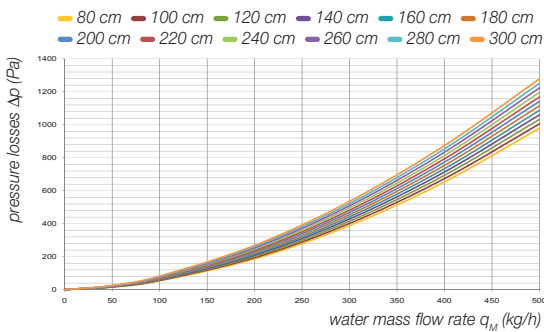
KORAFLEX FK 9/42, 11/42  
KORAFLEX FV 11/42

KORABASE 40



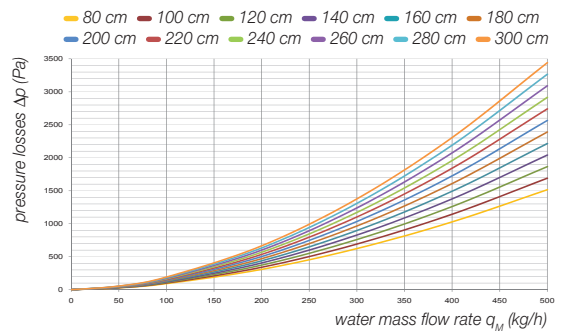
KORAFLEX FK 15/28, 19/28, 30/28, 45/28  
KORALINE LK 15/18, 30/18, 45/18, 60/18  
KORABASE 22

KORABASE 22



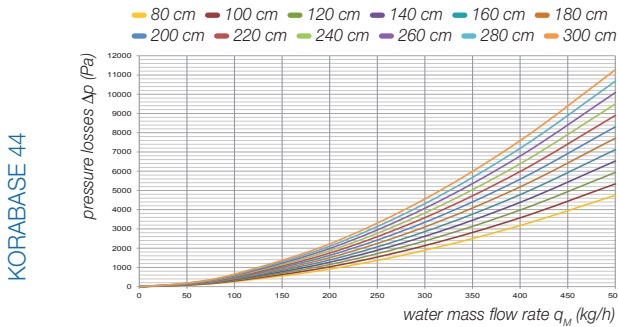
KORAFLEX FK 15/34, 19/34, 30/42, 45/42  
KORALINE LK 15/24, 45/24, 60/24  
KORABASE 33

KORABASE 33

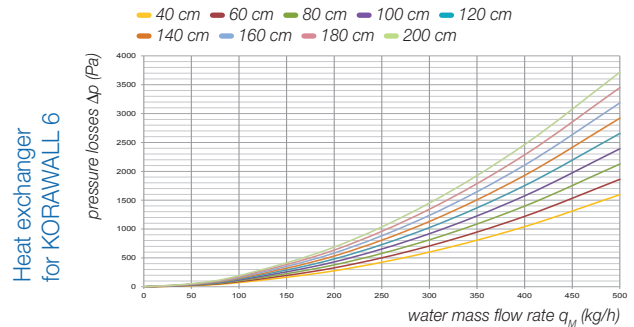




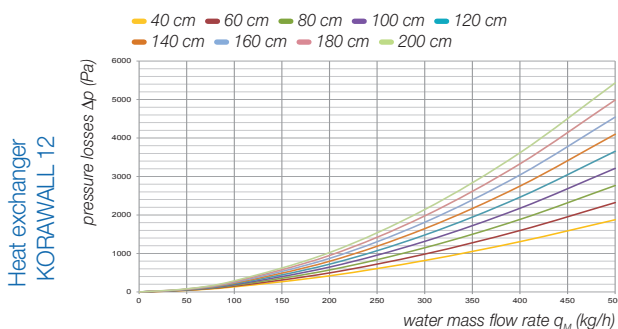
## KORAFLEX FK 15/42, 19/42



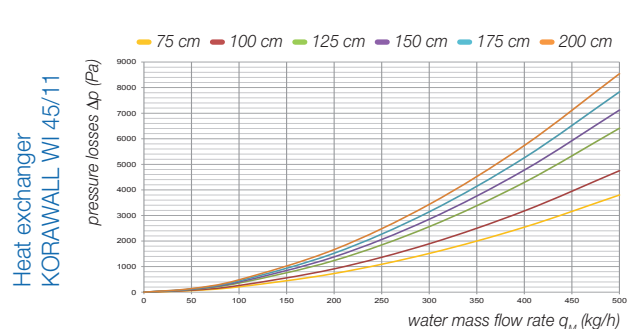
## KORAWALL WK 45/6, 60/6



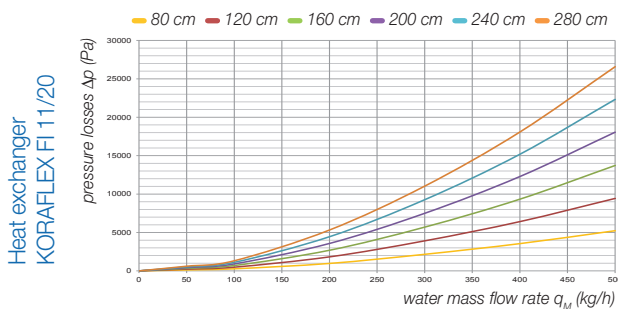
## KORAWALL WK 45/12, 60/12



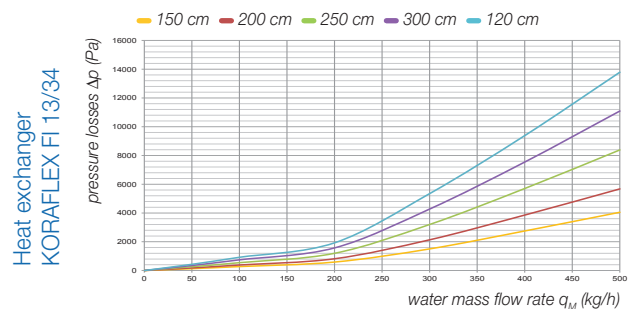
## KORAWALL WI 45/11



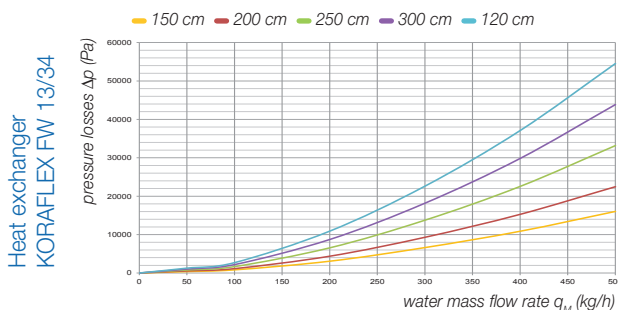
## KORAFLEX FI 11/20



## KORAFLEX FI 13/34



## KORAFLEX FW 13/34



## Examples of conversion to a variant temperature difference

$$\Delta t = (tw1 + tw2)/2 - ti$$

Where:  $tw1$  is the inlet water temperature ( $^{\circ}\text{C}$ )  
 $tw2$  is the outlet water temperature ( $^{\circ}\text{C}$ )  
 $ti$  is the air temperature ( $^{\circ}\text{C}$ )  
 $\Delta t$  is the cooling of water (K)

The resistance coefficient is valid for both 1/2" connections. You will find the kt factor in the table of correction factors of the particular element.

Entered: KORABASE 22/140 heating element

Rated operating condition: 75/65/20  $^{\circ}\text{C}$

$Q_n = 1\ 198\ \text{W}$  should be converted to the temperature difference  $\Delta t = 40\ \text{K}$

$Q = Q_n \times \text{factor kt} = 1\ 198 \times 0.748 = 896\ \text{W}$

Entered: KORAWALL WK 140/60/6 heating element

Computational operating status: 75/65/20  $^{\circ}\text{C}$

$Q_n = 1\ 018\ \text{W}$  should be converted to the temperature difference  $\Delta t = 30\ \text{K}$

$Q = Q_n \times \text{factor kt} = 1\ 018 \times 0.515 = 525\ \text{W}$

\* Pressure losses of KORALINE LV are available on request.



## General information about products

Heating elements are produced using the state-of-the-art technologies. Most production operations are executed on CNC machines. The surface of elements is treated with powder coating of epoxy-polystyrene paints on an environment-friendly line. In-house production of high performance heat exchangers (copper pipe, aluminium lamellas) guarantees high quality and wide variety of products offered. To achieve an "invisible" impression you can order a black coated exchanger.

The case supplied as the standard is made of a black coated galvanised steel sheet. For use in wet environments you can order a case of a high corrosion resistance stainless steel. Thanks to our advanced production technology we are able to produce atypical dimensions, including angled and arc convectors' designs.

The shortest possible delivery periods are offered, from 3 to 10 working days. Guaranteed warranty and after-warranty service.



Universal regulation



Natural convection



Heating



Forced convection



Quiet operation



Swimming pools design



Cooling



Dry-cooling



Environmentally friendly



Minimal Energy consumption



Higher performance



Information

## Transport and storage instruction

During transport the elements must be handled with extreme care and must be secured against motion and damage. The transport and storage area must be dry and protected from climatic influences.

## Maintenance

The convectors must be kept clean and especially before the heating season any dirt and dust should be removed from the convectors. The fan convectors must be checked if the fans are not mechanically blocked (by fallen objects, a layer of dust, etc.).

## Quality

Manufacturer is a holder of the certified quality management system as per ISO 9001:2008. The products are manufactured and tested according to EN 422. By using CE mark the producer confirms that the convectors are in conformity with the characteristics stated in the Declaration of Performance issued in conformity with the directive of EP and the Council (EU) No. 305/2011. This conformity was approved by the notified body No.1015, Strojírenský zkušební ústav, s.p. Brno.



Proven heating and cooling performances



## Warranties

The products are subject to 2-year warranty. 10-year warranty is provided for the tightness of the heat exchanger. Full service and warranty terms and conditions are available on demand.

Manufacturer KORADO, a.s. is not responsible for damage caused by improper installation, or damages arising from poor electrical or thermal installations (such as fluctuating voltage or hydraulic pressure which deviates significantly from normal values).

Manufacturer reserves the right to change technical specifications without a prior notice.