



Convectors



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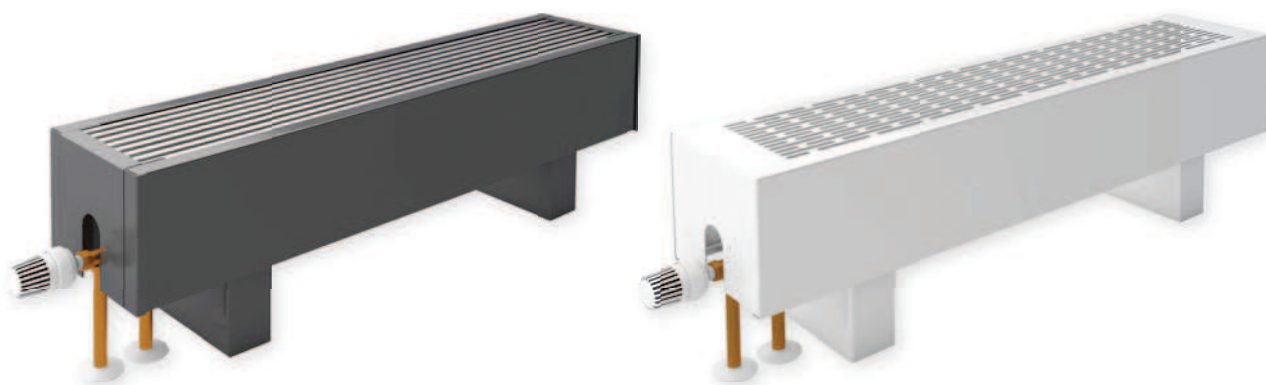




[KORALINE

FREE STANDING CONVECTORS (natural convection)

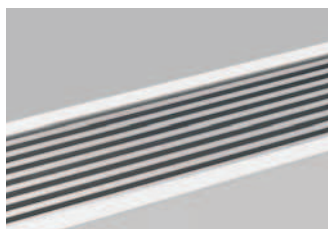
Do you like large glass surfaces or are the interior window sills low? Use subtle and graceful shapes of the free standing convectors. The design will let the windows stand out and provide a great view from the interior. Outstanding technical parameters ensure excellent thermal comfort in the room.



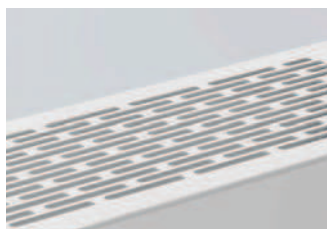
Free-standing convectors with natural convection KORALINE LK

Classification of the free-standing convectors

- **KORALINE LK Exclusive** design of zinc galvanised steel – with aluminium grid (silver eloxal coat) see image
- **KORALINE LK InPool** pool design – chemical proof stainless steel AISI 316 for wet environment coated in RAL 9010 colour shade
- **KORALINE LK Economic** zinc galvanised steel – design with embossed cover grid – see sketch (not available for pool applications)



Version KORALINE LK Exclusive and LK InPool



Version KORALINE LK Economic

Standard delivery contains

- sheathing of zinc galvanised steel sheet coated in shade RAL 9010 – white
- unpainted aluminium cover grid, silver – in version Exclusive and InPool. On Economic (LE) embossed in the free-standing convectors sheathing
- Al/Cu heat exchanger for universal connection (side or bottom) with low water content, air vent and uniquely shaped lamellas for a higher heat output
- stand on floor covering, see sketch on page 28
- the unit is packed in a durable packaging and contains an installation manual
- mounting instructions

KORALINE PLAN

Design version PLAN with completely flat front panel is available up to the height of 30 cm (only for versions KORALINE LK Exclusive and InPool).

Specification

casing element height (mm)	90, 150, 300, 450, 600
width (mm)	180, 240
length (mm)	800, 1 000, 1 200, 1 400, 1 600, 1 800, 2 000, 2 200, 2 400, 2 600, 2 800, 3 000
heat output (W)	from 473 to 4 733
max. working pressure (bar)	12
max. working temperature	110 °C
max. surface temperature	40 °C
connecting thread	inner G 1/2"
connection method	recommended bottom connection, side

Version KORALINE LK Exclusive • zinc galvanised steel sheet coated in colour shade RAL 9010 with aluminium anodized grid without surface finish

Version KORALINE LK InPool • chemical proof stainless steel AISI 316 for humid environment coated in RAL 9010 with with aluminium anodized grid without surface finish

Version KORALINE LK Economic • zinc galvanised steel sheet coated in colour shade RAL 9010 with an embossed grid, which is part of the sheathing

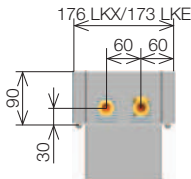
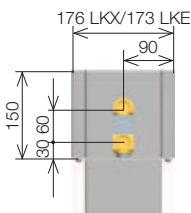
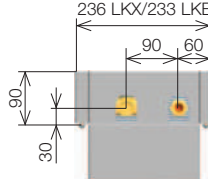
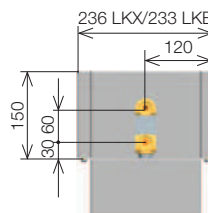


Optional specification


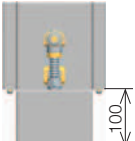

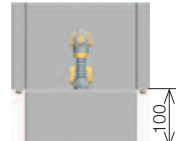
- set for bottom connection comprising the thermostatic valve and the thermostatic head Danfoss including extension pieces, see page 29
- stands on subfloor or wall suspending brackets, see sketch on page 28
- if more than 5 pieces are ordered another colour shade can be chosen according to RAL scale (the change must be consulted with the manufacturer)
- pool design suitable for humid environment e.g. swimming pools areas
- pool design KORALINE LK InPool – using stainless steel AISI 316 coated in white colour shade RAL 9010
- for increased performance a version with forced convection can be chosen, see page 72

Elements' sections

Side connection

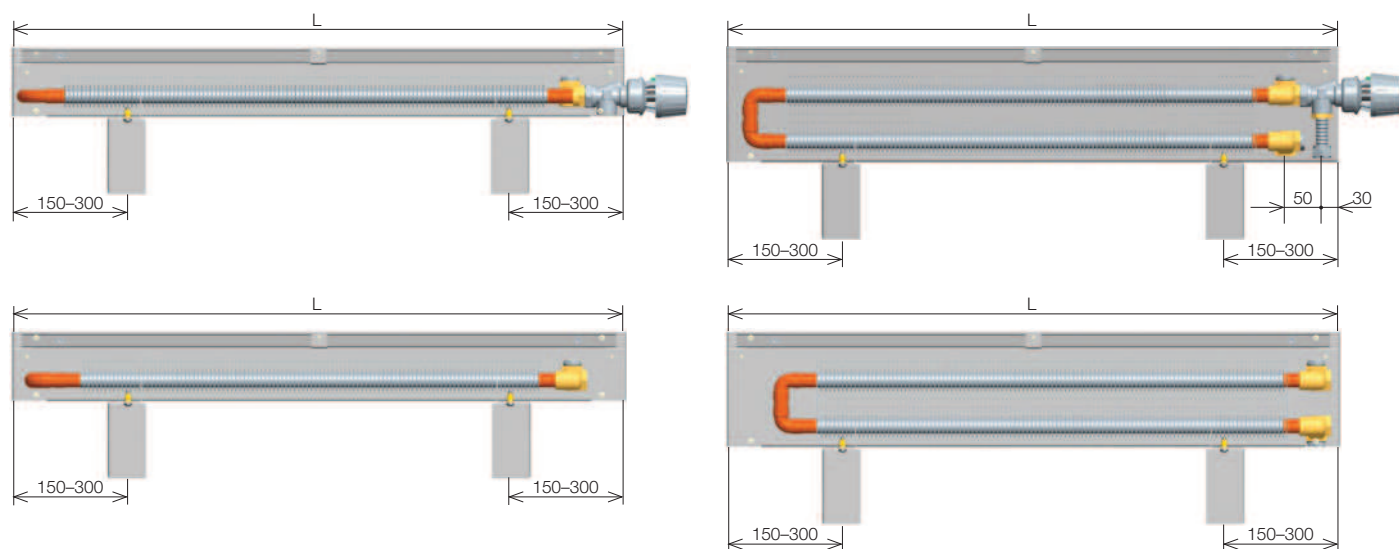
width	18 cm	18 cm	24 cm	24 cm
height	9 cm	15 cm	9 cm	15 cm
				

Bottom connection

width	18 cm	18 cm	24 cm	24 cm
height	9 cm	15 cm	9 cm	15 cm
				

Height without stands. KORALINE LK in version Exclusive and Economic mounted convectors are produced for versatile side/bottom connection. The connection type can be selected on site during installation. In the case of bottom connection the manufacturer recommends you to use a set that contains a Danfoss thermostatic valve and thermostatic head, incl. an extension adaptor. In case another valve type is used the connecting spacing of 50 mm between the input and output will not be achieved – it applies for the height of 15 cm; for the height of 9 cm, the spacing is according to the sketch, see the height (the dimensions are given in mm).

Sketches of KORALINE LK with stands on floor covering



KORALINE LK in version Exclusive and Economic mounted convectors are supplied with stands on floor covering as standard. Another possibility of anchoring to the building structure is the use of stands on subfloor or the use of wall brackets (see the illustration on page 28). Dimensions are given in mm.



For more detailed dimensional sketches including calculating the stands' distances see page 28.

Weights and volumes of water of the free-standing convectors

Type	9/18	9/24	15/18	15/24	30/18	30/24	45/18	45/24	60/18	60/24
kg/linear meter	6.5	8.1	9.2	11.5	12.9	15.4	16.7	19.2	20.5	23.1
stainless steel kg/linear meter	7	8.7	10	12.4	14.5	17.1	19	21.8	23.6	26.4
l/linear meter	0.5	0.75	1	1.6	1	1.6	1	1.6	1	1.6

The listed weights are without a packaging.



Heat outputs (W) at $tw1/tw2/ti = \text{at } 75/65/20 \text{ }^{\circ}\text{C } (\Delta t=50)$ and $65/55/20 \text{ }^{\circ}\text{C } (\Delta t=40)/\text{EN 442}$

Width (cm)		Δt	Length L (cm)												
			80	100	120	140	160	180	200	220	240	260	280	300	
Height 9	18	Δt 50	385	508	631	754	877	1001	1123	1246	1369	1492	1615	1738	
		Δt 40	288	380	472	564	656	749	840	932	1024	1116	1208	1300	
	24	Δt 50	574	757	940	1123	1307	1491	1673	1855	2038	2221	2404	2587	
		Δt 40	429	566	703	840	977	1116	1252	1388	1524	1661	1798	1935	
Height 15	18	Δt 50	589	743	897	1052	1207	1362	1517	1671	1826	1980	2135	2290	
		Δt 40	440	555	671	787	903	1019	1134	1250	1366	1481	1597	1713	
	24	Δt 50	916	1145	1374	1603	1833	2061	2290	2519	2748	2977	3206	3435	
		Δt 40	685	856	1028	1199	1371	1542	1713	1884	2056	2227	2398	2569	
Height 30	18	Δt 50	760	950	1140	1330	1520	1710	1900	The free-standing convectors KORALINE LK Economic are made only in height of 9, 15 and 30 cm and the 18 and 24 cm widths are not available.					
		Δt 40	568	711	853	995	1137	1279	1421						
	24	Δt 50	1112	1390	1668	1946	2224	2502	2780						
		Δt 40	832	1040	1248	1456	1664	1871	2079						
Height 45	18	Δt 50	857	1071	1285	1499	1714	1927	2141	The free-standing convectors KORALINE LK Economic are made only in height of 9, 15 and 30 cm and the 18 and 24 cm widths are not available.					
		Δt 40	641	801	961	1121	1282	1441	1601						
	24	Δt 50	1274	1593	1911	2230	2549	2869	3188						
		Δt 40	953	1192	1429	1668	1907	2146	2385						
Height 60	18	Δt 50	934	1168	1401	1635	1870	2104	2338	The free-standing convectors KORALINE LK Economic are made only in height of 9, 15 and 30 cm and the 18 and 24 cm widths are not available.					
		Δt 40	699	874	1048	1223	1399	1574	1749						
	24	Δt 50	1374	1717	2060	2403	2746	3089	3432						
		Δt 40	1028	1284	1541	1797	2054	2311	2567						

- The free-standing convectors KORALINE LK Economic are made only in height of 9, 15 and 30 cm and the 18 and 24 cm widths

Correction factor k_t for a variant temperature difference Δt (K)

Δt (K)	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
k_t	0.287	0.326	0.367	0.410	0.453	0.498	0.544	0.591	0.639	0.688	0.737	0.788	0.839	0.892	0.946	1.000

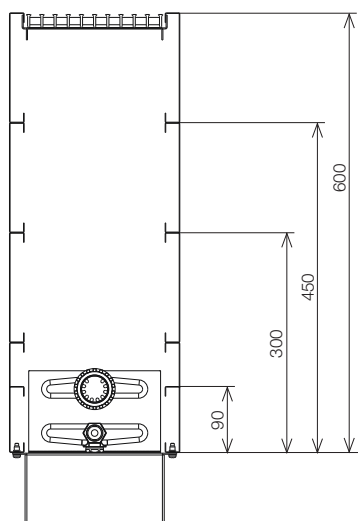
Δt (K)	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
k_t	1.055	1.111	1.167	1.224	1.282	1.341	1.401	1.460	1.521	1.582	1.644	1.676	1.770	1.834	1.898

See the formula and example of conversion to a variant temperature difference on page 91.

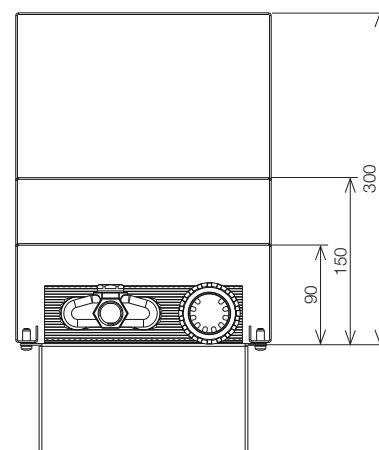
- temperature exponent $m = 1.364$

Heights of the free-standing convectors KORALINE LK

KORALINE LK Exclusive



KORALINE LK Economic
(maximum height 300 mm)



Free-standing convectors installation

KORALINE LK

Installation instructions

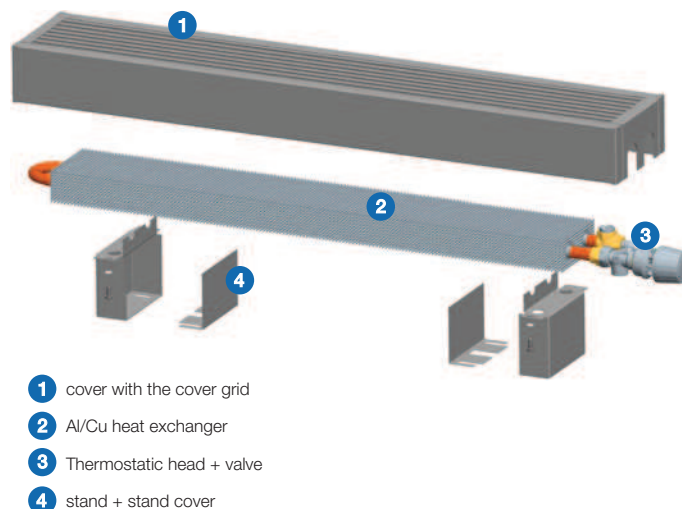
Stand models

- a) **wall-mounted** – attachment to the wall. Recommended positioning 10 cm above the floor covering. The delivered brackets (2 pieces) allow a height and length tolerance of approx. 2 cm. The mounting spacings are indicated on the sketch.
- b) **stand type** – attachment to the floor. Stands on rough and floor covering can be chosen. The subfloor version allows a height tolerance of about 5 cm. The floor mounting spacing is given on the sketch.

Installation procedure (valid for all models)

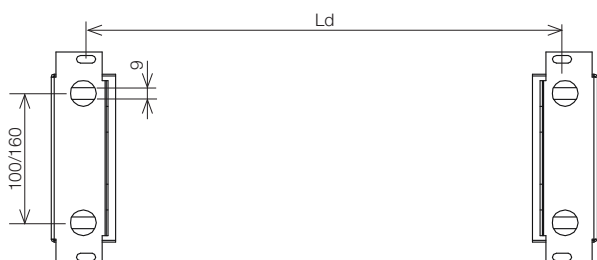
The first step consists in measurement and drilling for the brackets or stands. The heat exchanger is then positioned and connected to the heating system. Finally, the cover with the cover grid is put on and screwed onto the brackets or the stands. The free standing convectors KORALINE LK Exclusive and InPool grids are removable for easy cleaning. More detailed information is available in the installation instructions. The elements are supplied assembled.

Free-standing convectors assembly



Mounting location

Floor anchoring diagram



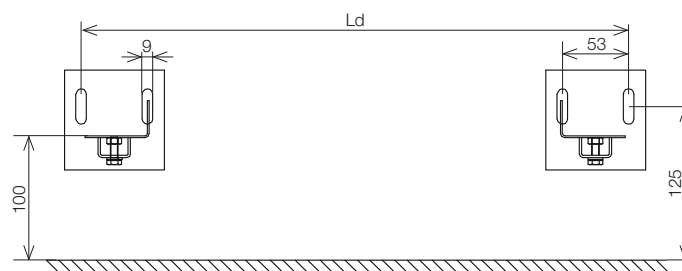
L = Convectors length

Ld = L - 300 mm (up to the convectors length of 1 400 mm)

Ld = L - 400 mm (up to the convectors length of 2 000 mm)

Ld = L - 600 mm (above the convectors length of 2 000 mm)

Wall anchoring diagram



L = Convectors length

Ld = L - 247 mm (up to the convectors length of 1 400 mm)

Ld = L - 347 mm (up to the convectors length of 2 000 mm)

Ld = L - 547 mm (above the convectors length of 2 000 mm)

Overview of stands and brackets for free standing convectors KORALINE attachment

width 18 cm	width 24 cm	width 18 cm	width 24 cm	width 18 cm	width 24 cm
wall-mounted brackets		floor covering stand*		subfloor stand	

After suspending the free-standing convectors the distance between the wall and the element is 10–30 mm.

* part of supply

Contents of the set for connection of KORALINE LK Kv values for the Danfoss RA-N 15 UK 1/2" valve



RA-N 15 valve

- thermostatic valve
Danfoss RA-N 15 1/2"
- valve body allowing
presetting of flow
- flow can be set without using tools
- basic setting is selectable in 7 stages
- maximum working pressure 10 bar
- maximum working temperature 120 °C
- threadless connection with the thermostatic head



Thermostatic head

- thermostatic gas-steam head
Danfoss RA 2980
- the fastest response time
- anti-theft lock
- temperature setting limiting/blocking pins

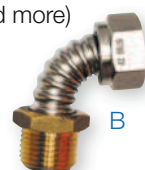


Extension pieces

- used for height compensation between the input
and output of the heat exchanger screw union
- stainless-steel design
- connection thread G 1/2", inner
- A straight piece for two row exchangers
(height of the free standing convectors 15 cm and more)
- B angled piece for single-row exchangers
(height of the free standing convectors 9 cm)



A



B

Preset stage	1	2	3	4	5	6	7	N
Kv	0.16	0.20	0.25	0.36	0.47	0.59	0.74	0.81

This valve type is used in optional accessories supplied for the free standing convectors.



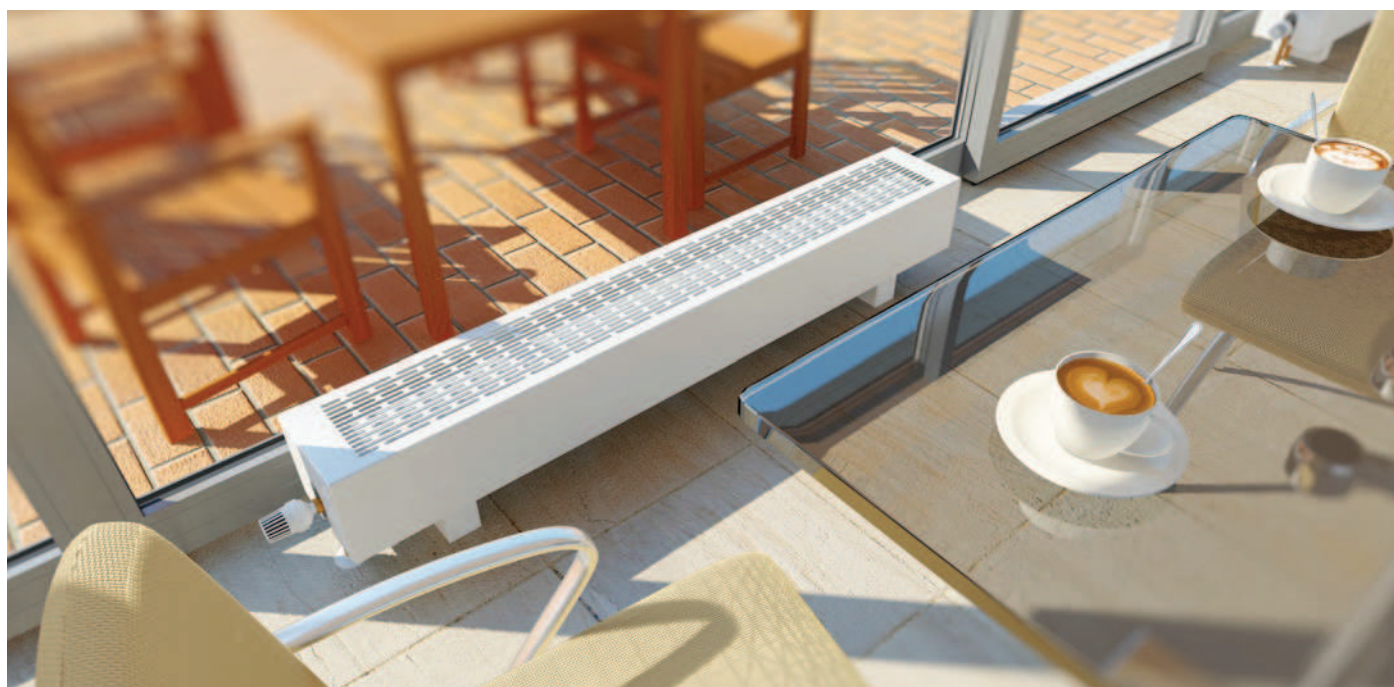
Note: The connecting set elements are packed
as a complete set and cannot be supplied separately.

Ordering codes Free-standing convectors KORALINE LK

		Type		Versions		Length (cm)	Height (cm)	Width (cm)		Colour
		K	P PLAN*	X Exclusive	P InPool					
Exclusive	white steel/unpainted exchanger	L	K	X		...	..	..	-	10
InPool	stainless steel for humid environment white/unpainted exchanger*	L	K	P		...	..	..	-	10
Economic	white steel/unpainted exchanger	L	K	E		...	..	..	-	10

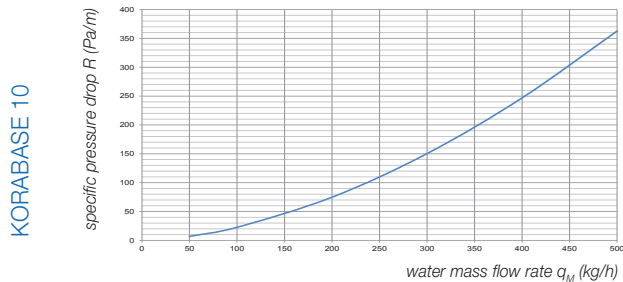
* P PLAN from one steel sheet
(only for KORALINE LK Exclusive
and LK InPool heights 30, 45, 60)

Free-standing convectors
KORALINE LK

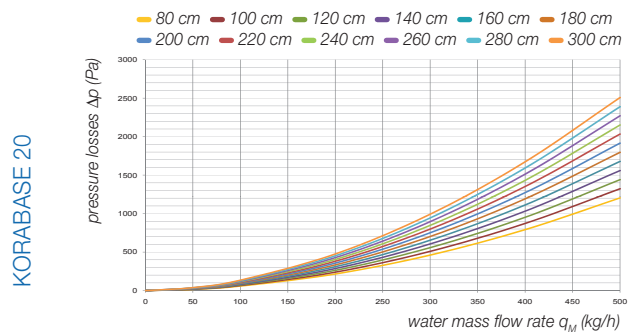


Pressure losses of convectors

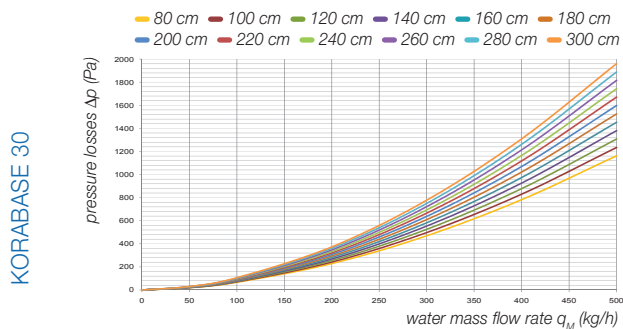
KORAFLEX FK 9/16, 11/16
KORABASE 10



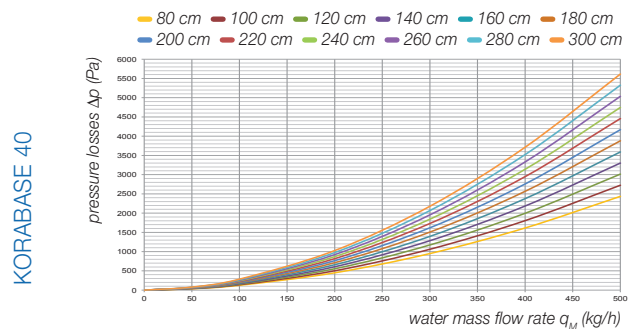
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KORALINE 9/18 and 9/24, KORABASE 20
KORAFLEX FV 8/28, 9/28, 11/28
KORAFLEX FV InPool 13/34



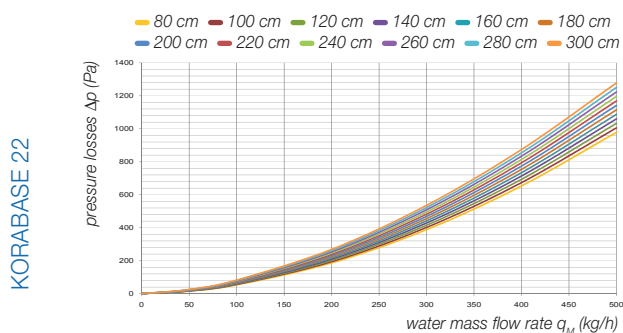
KORAFLEX 9/34, 11/34
KORAFLEX FV 11/34, KORABASE 30



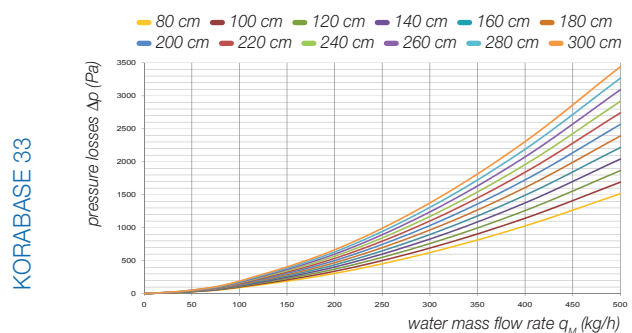
KORAFLEX FK 9/42, 11/42
KORAFLEX FV 11/42



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

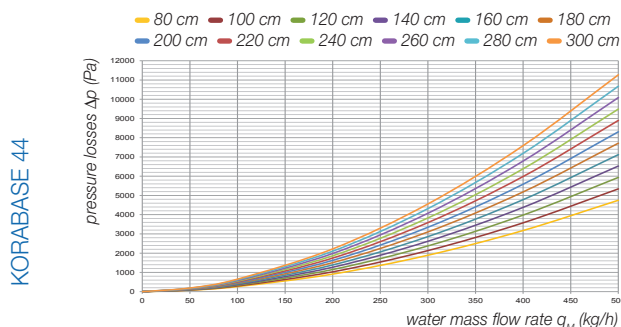


KORAFLEX FK 15/34, 19/34, 30/42, 45/42
KORALINE LK 15/24, 45/24, 60/24
KORABASE 33

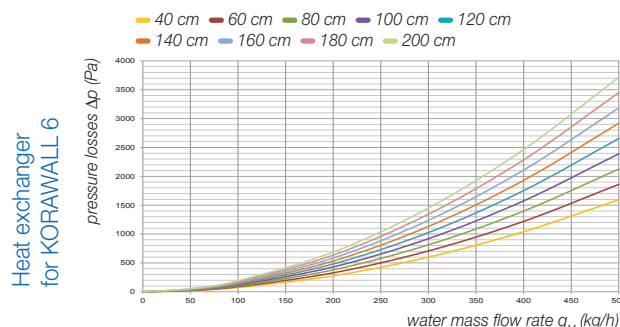




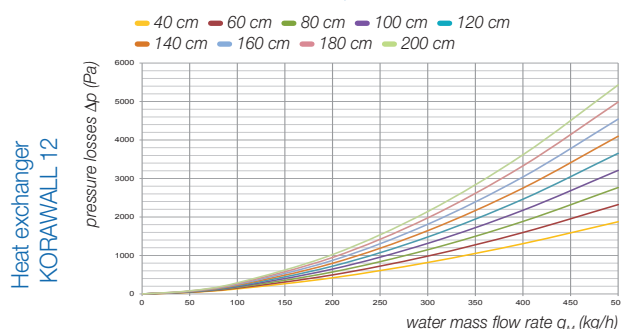
KORAFLEX FK 15/42, 19/42



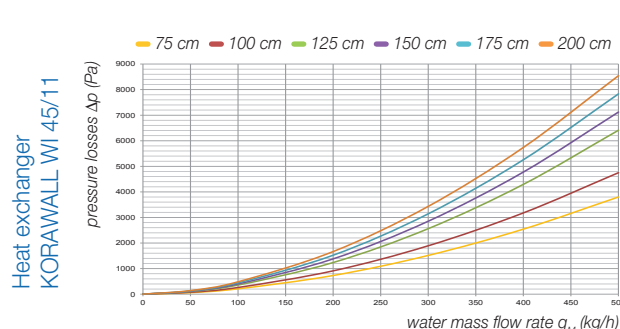
KORAWALL WK 45/6, 60/6



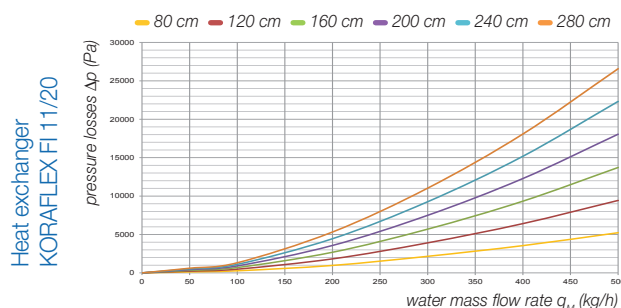
KORAWALL WK 45/12, 60/12



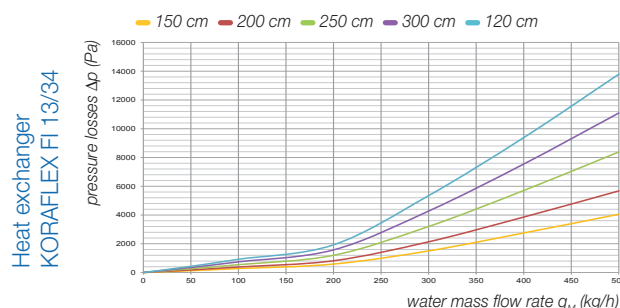
KORAWALL WI 45/11



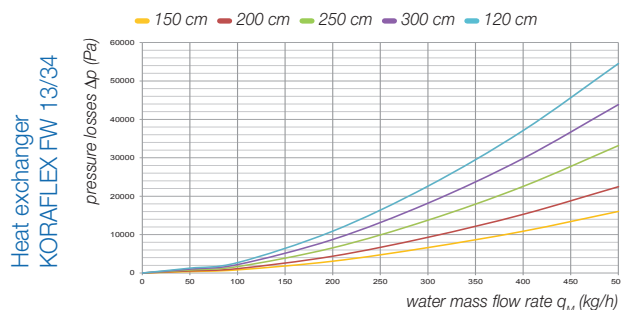
KORAFLEX FI 11/20



KORAFLEX FI 13/34



KORAFLEX FW 13/34



Examples of conversion to a variant temperature difference

$$\Delta t = (tw_1 + tw_2)/2 - ti$$

Where: tw_1 is the inlet water temperature (°C)
 tw_2 is the outlet water temperature (°C)
 ti is the air temperature (°C)
 Δt 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 °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 °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.