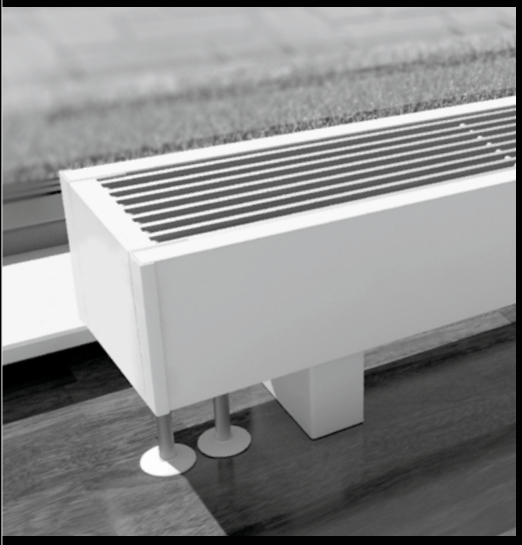
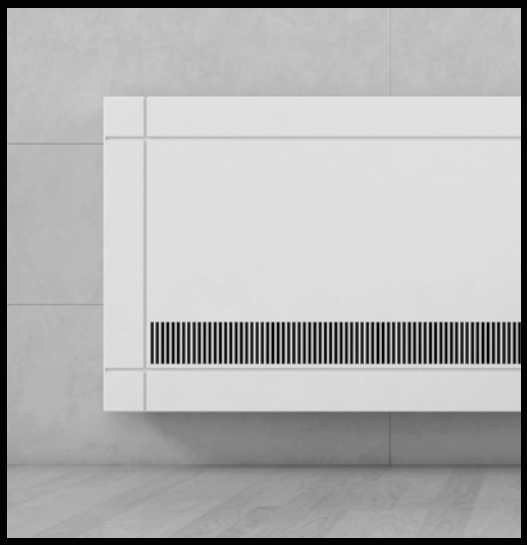
LICON®
member of KORADO Group

CONVECTORS





KORADO®

05/2018

MORE THAN 50 YEARS

QUALITY – COMPLEXITY – INNOVATION – DESIGN

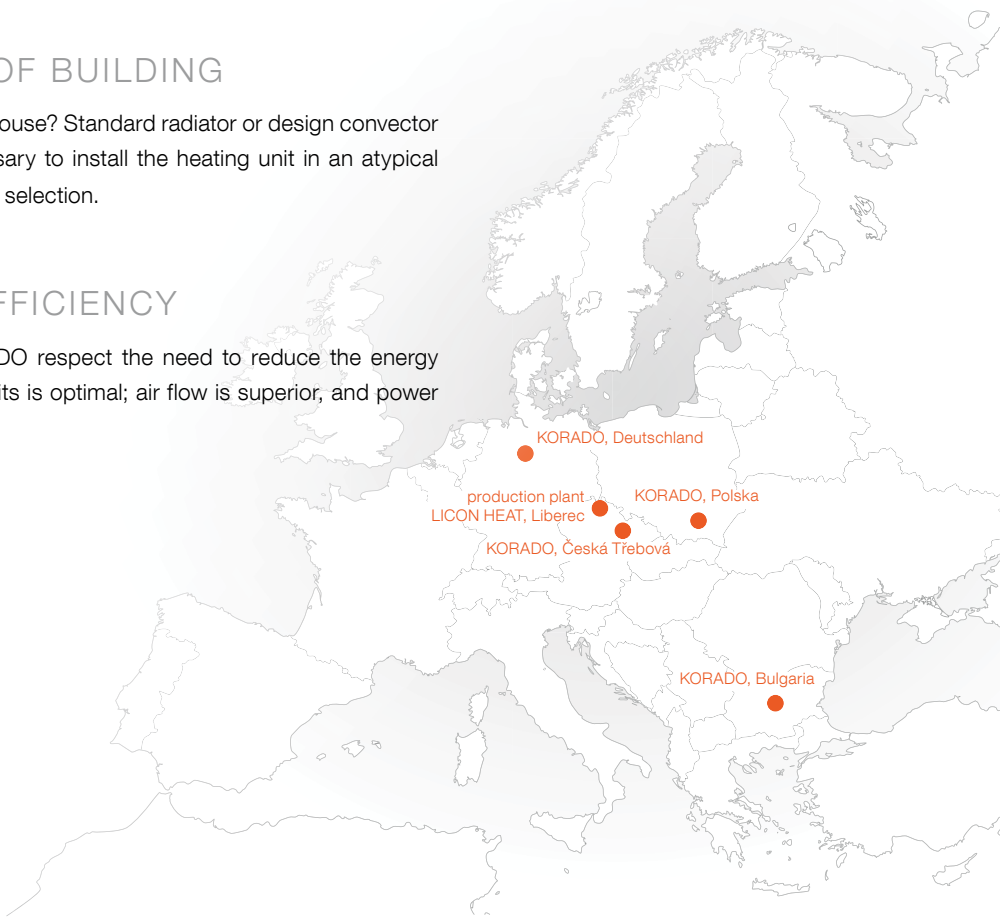
To have a reliable partner for solving with both large and small projects in the area of heating is not a question of price. We highly appreciate the close cooperation with all our customers. You are an endless source of inspiration for us. You make purpose to our work, and the quality of our products continuously increases, thanks to your eye for details.

SOLUTION FOR ANY TYPE OF BUILDING

A large shopping centre project or a small family house? Standard radiator or design convector that heats, heats up or cools down? Is it necessary to install the heating unit in an atypical manner? We satisfy any demand. Just make your selection.

ECONOMY – ECOLOGY – EFFICIENCY

Heating and recuperation units made by KORADO respect the need to reduce the energy demand of buildings. The performance of our units is optimal; air flow is superior, and power consumption is lower.



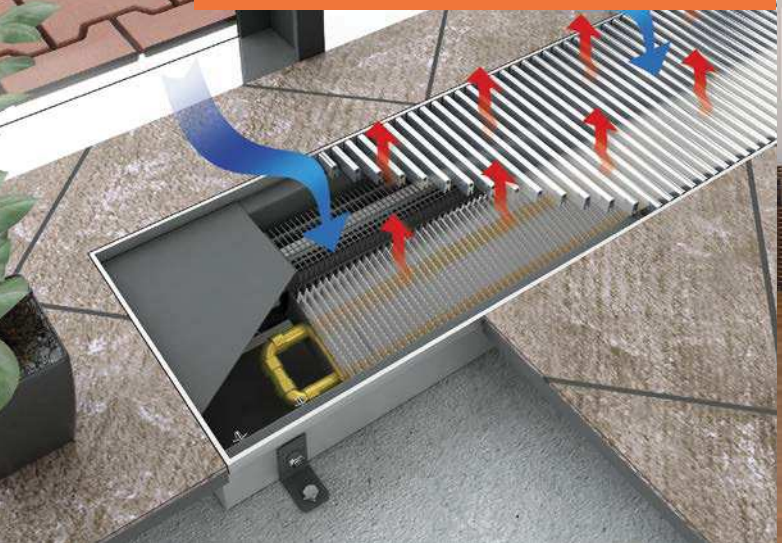
EN EURONORM 442

Management kvality
ISO 9001
www.dekra-eal.com

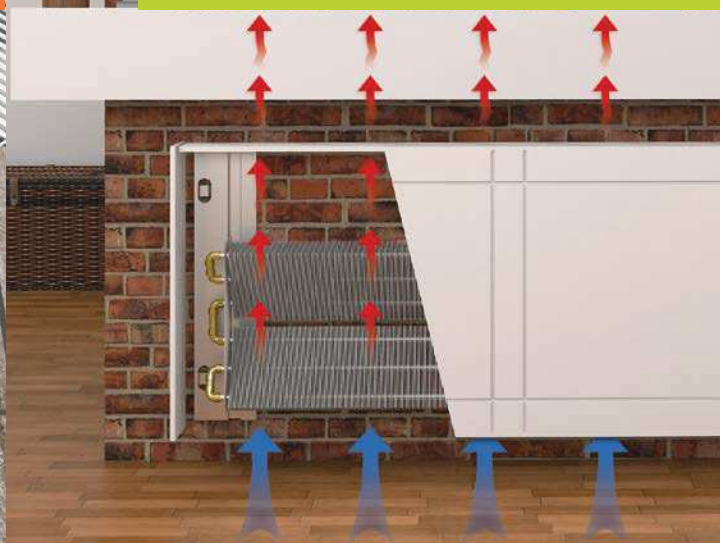
Convectors LICON HEAT s.r.o. are successfully distributed all over the world. They are manufactured in the Liberec production plant of LICON HEAT s.r.o. using the latest production technologies.

The headquarters of KORADO, a.s. is a modern European plant manufacturing radiators and heating units. Its technological equipment and layout on the area of 30,000 m² allows KORADO, a.s. further growth and development.

Operating principle of floor convectors – type PKOC



Operating principle of wall mounted convector – type OK



Optimized convection
Convectors with forced convection

Entire production series OPTIMIZED CONVECTION is optimised in terms of the noise level, heat output and power consumption required to operate the fans. Innovative and unique technology not only for heating but now also for cooling.

- OC – heating (i.e. PKOC)
- IOC – provides heating or cooling (i.e. PKIOC)
- WOC – provides heating and cooling (i.e. PKWOC)

- significant energy savings
- very silent operation
- instant optimal heat outputs, higher efficiency
- variable regulation for all building types
- easier assembly, disassembly and maintenance
- universal use
- convector with higher efficiency, new heat exchangers

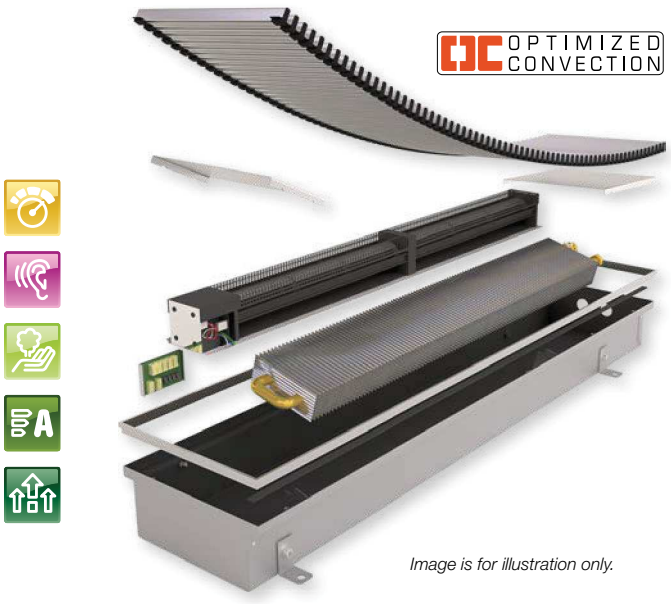


Image is for illustration only.

Natural convection

Heat transfer to a room takes place in heat exchanger, which consists of a copper pipe fitted with aluminium lamellas mechanically connected to the pipe. Flow of hot water through heat exchanger heats pipe and fins, heat from which is passed to surrounding rising air, performing chimney effect or convective flow of warm air in heating element.

- unique horizontal corrugation of the lamellas' surfaces
- better heat transfer to the room

Solutions for heat pumps

- convector series OC
- convectors can operate at low temperature gradients
- our convectors can effectively heat or cool
- cooling in summer, heating in winter

WINTER
Heat pump

SUMMER
Heat pump

WINTER
Boilers and hot-water fireplaces and stoves

Why choose our convectors?

Ideal for any interior…

The range includes floor, wall-mounted, free-standing convectors and also special units that can be installed in an unobstrusive manner even in premises furnished with period furniture.

Broad product line…

You are able to select a design for any interior, for dry and wet environment, swimming-pool area, convectors that heat and cool or a whole range of design solutions.

Heating efficiency…

Convecstors begin to heat quickly, are highly efficient with low power consumption. Their operation is economical and ecological.

High technical level…

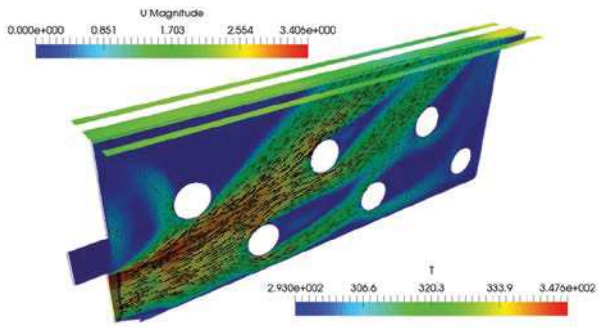
They are suitable for heating systems with all types of heat sources (heat pumps, gas, electricity, solar heat, wood and biomass).

Simple assembly, disassembly and maintenance.

Did you know that…

- KORADO group has its own research and development centre, including test chambers for measuring heat outputs under European standard EN 442, and for measuring heat and cooling output under European standard EN 16430.

- We use the latest methods of research and development and collaborate with top experts in this field in the academic sphere (Technical University in Liberec, Czech Technical University in Prague, etc.).



- The production runs on state-of-the-art machines controlled according to the principle of the so-called lean production. Products are processed in the shortest possible time while maintaining maximum quality of both their design and materials.

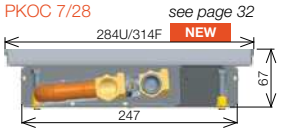
- We are a holder of the quality management system certificate under ISO 9001. Products are manufactured and tested under ČSN EN 442 and ČSN EN 16430. By using the CE mark, the producer confirms that LICON convectors conform to the characteristics stated in the Declaration of Performance issued in accordance with the Regulation of the EP and Council (EC) No. 305/2011. This conformity has been confirmed by the notification body No. 1015, Strojírenský zkušební ústav s.p. Brno.

CE

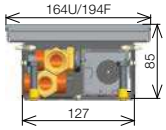
Floor convectors with forced convection PKOC, PKBOC, PKIOC and PKWOC

OPTIMIZED CONVECTION

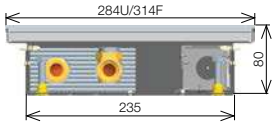
PKOC 7/28 *see page 32*



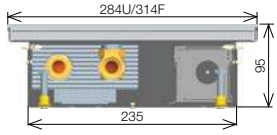
PKOC 8/16 *see page 33*



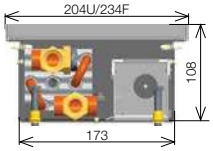
PKOC 8/28 *see page 34*



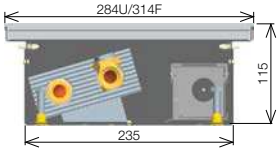
PKOC 9/28 *see page 35*



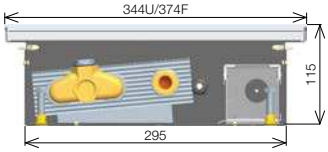
PKOC 11/20 *see page 36*



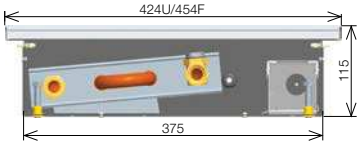
PKOC 11/28 *see page 37*



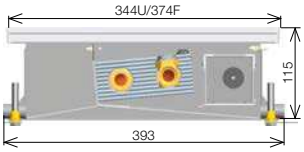
PKOC 11/34 *see page 38*



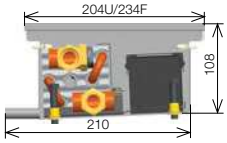
PKOC 11/42 *see page 39*



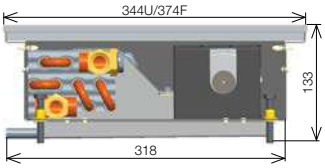
PKBOC 11/34 InPool *see page 42*



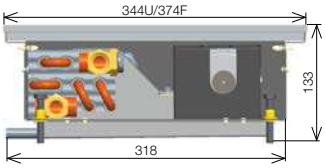
PKIOC 11/20 *see page 45*



PKIOC 13/34 *see page 46*

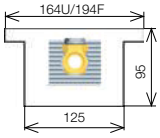


PKWOC 13/34 *see page 49*

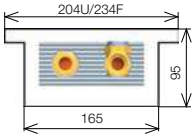


Floor convectors PK and PKB

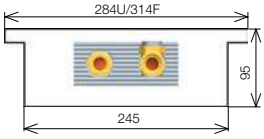
PK 9/16 cm



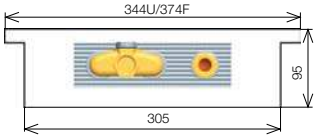
PK 9/20 cm



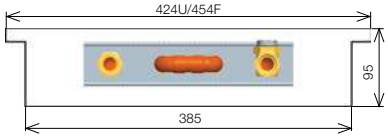
PK 9/28 cm



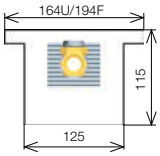
PK 9/34 cm



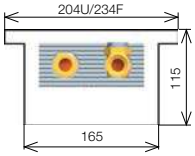
PK 9/42 cm



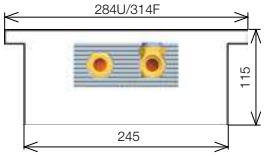
PK 11/16 cm



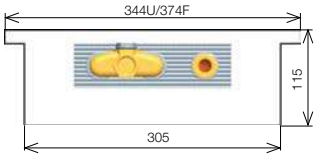
PK 11/20 cm



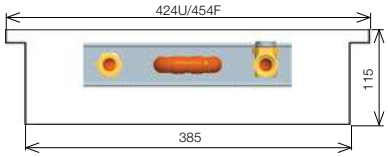
PK 11/28 cm



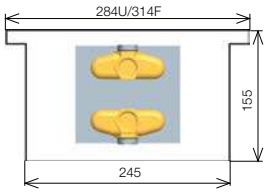
PK 11/34 cm



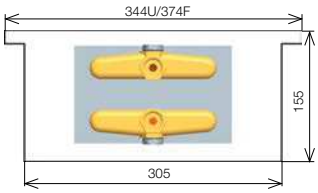
PK 11/42 cm



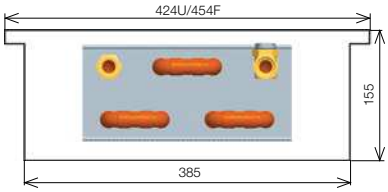
PK 15/28 cm



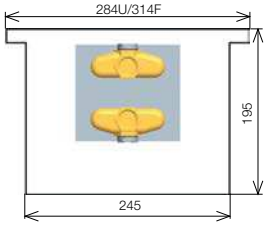
PK 15/34 cm



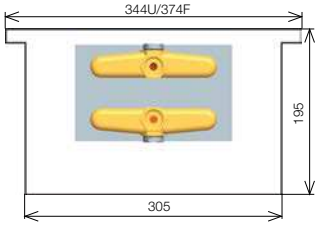
PK 15/42 cm



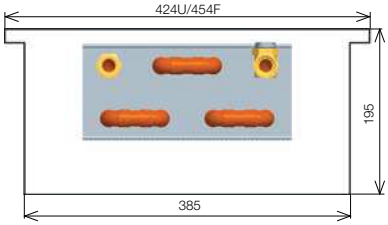
PK 19/28 cm



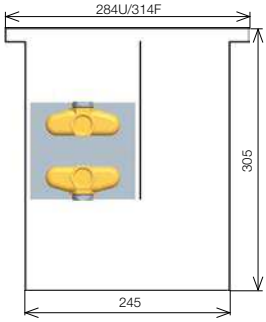
PK 19/34 cm



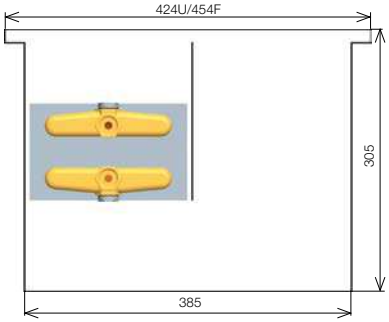
PK 19/42 cm



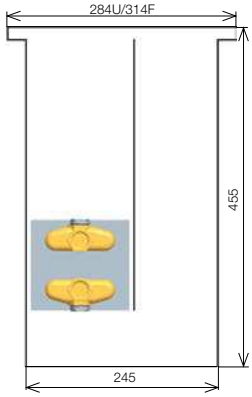
PK 30/28 cm



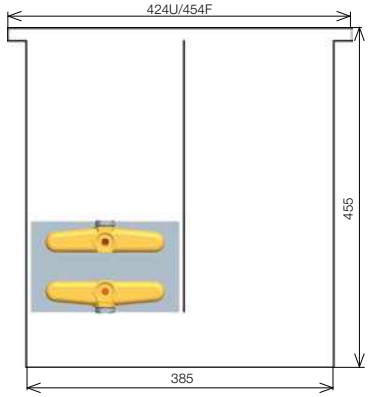
PK 30/42 cm



PK 45/28 cm



PK 45/42 cm

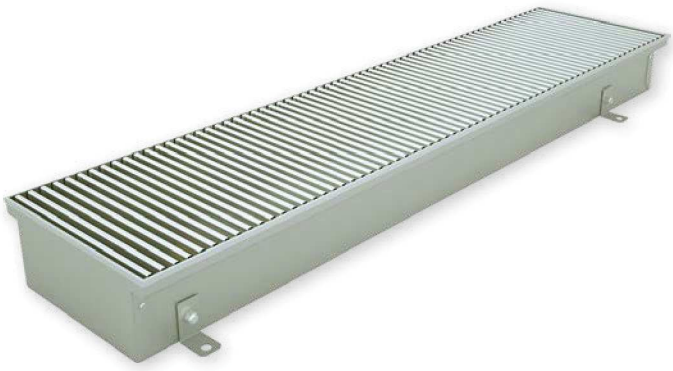


(see pages 8–17)

Licon PK
Licon PKB

FLOOR CONVECTORS natural convection
COVER GRIDS of the floor convectors

French windows will stand out, winter garden entries or balconies will completely open up. Heating units are not occupying interior doorways space. Unobtrusive, effective and aesthetically designed heating system for residential houses, shops and administrative buildings. Excellent use of floors for heating, visually inconspicuous.



Floor convectors with natural convection
Licon PK • PKB

Licon PK convectors are intended for embedding in floors, especially in places prohibiting installation of higher radiators, e.g. in front of french windows, winter garden entries, hall entrances, exits etc., in public buildings (shops, administrative buildings etc.), as well as in residential houses. Various colored designs of the floor grids are making convectors suitable for each interior.

- Natural convection convectors
- Wide type & design range
- Easy to clean and maintain
- The floor convectors are intended for dry environment, for humid environment use version InPool

Specifications

depth *(mm)*	90, 110, 150, 190, 300, 450
width *(mm)*	160, 200, 280, 340, 420
length *(mm)*	800 up to 3 000 (at 200 mm steps)
heat output *(W)*	from 87 to 4 100
max. working pressure *(bar)*	12
max. working temperature	110 °C
connecting thread	inner G 1/2"

NEW Version Basic • zinc galvanised steel case, exchanger without any surface finish, no frame. Atention – intended for dry environment
Version Economic • basic version in black coated galvanized steel case, exchanger without surface finishes
Version Exclusive • black coated galvanized steel case, black coated exchanger
Version Inox • case made of stainless steel AISI 304, unpainted exchanger (only for dry environment)
Version InPool • case made of stainless steel AISI 316, unpainted exchanger (for humid environment)

Standard delivery contains

- version Economic – black coated zinc galvanised steel case
- unpainted heat exchanger with low water content, air vent and uniquely shaped lamellas for higher heat output
- anodized Al frame, U profile, in colour of natural aluminium
- fixing anchors to fix the case to the floor
- a pair of flexible stainless steel hoses for easy connection
- chipboard cover protecting the exchanger against dust and dirt on the building site
- 25 mm height adjustment screws to compensate for the floor asperity
- mounting instructions
- the set is packed in a strong and durable packaging

Insufficient performance? Look for version with OC with forced convection, see page 31

Note: Pool design available only for depths 9 and 11 and widths 20, 28, 34 and 42 cm.

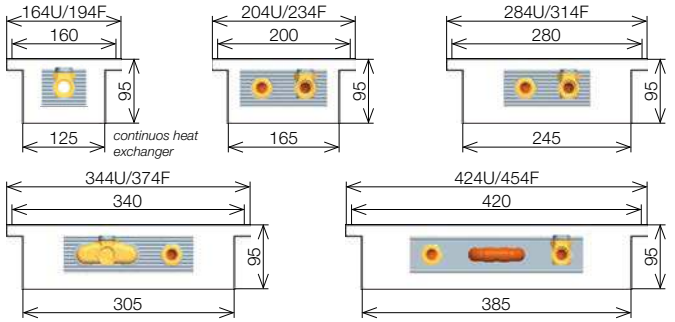
Floor grids page 18

Optional specification

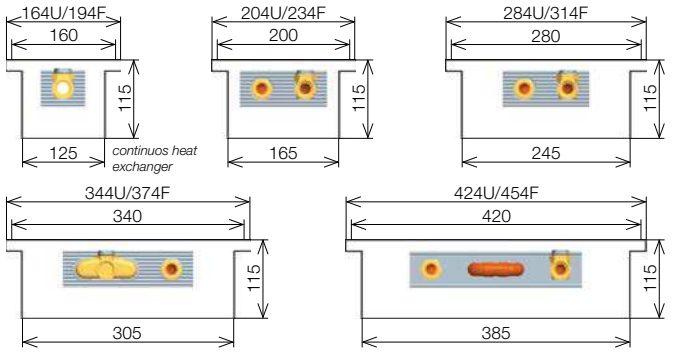
- Basic – manufactured in depths of 9 and 11 cm, in widths of 16, 20, 28, 34 and 42 cm and in lengths from 80 cm to 3 m. On the Basic version of the floor convector are possible any floor grid
- Exclusive – black coated zinc galvanised steel (identical with the design type Economic), black coated heat exchanger
- InPool – the case design in stainless steel AISI 304, unpainted exchanger (only for dry environment)
- Inox – the case design in stainless steel AISI 316, unpainted exchanger (only for dry environment)
- pool design PKB are standard designed with a drain hole
- colour of the anodized Al frame – natural aluminium, light and dark bronze in the F profile or light or dark bronze for U profile, see sketch page 21
- lockable screwing thermostatic valve and thermostatic shut off valve head
- cover plate with increased rigidity

Cross section

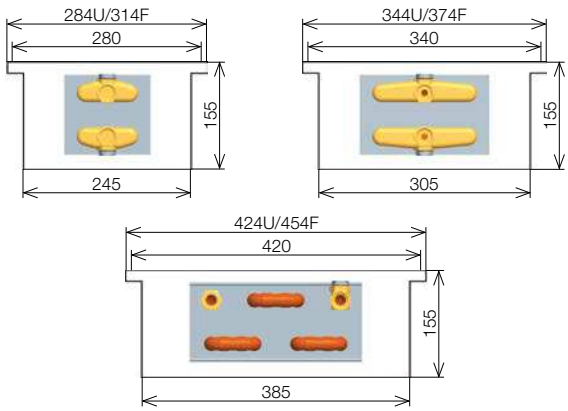
Depth 9 cm



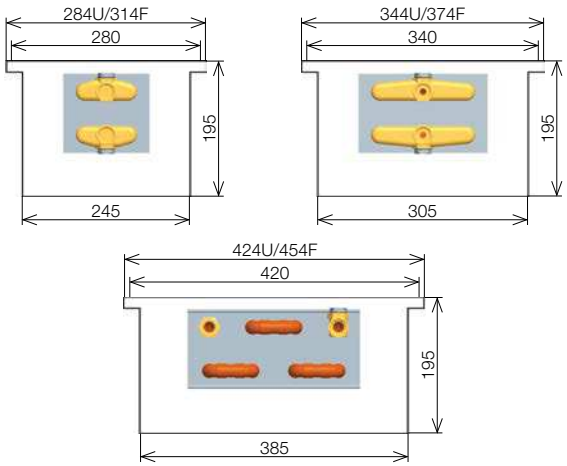
Depth 11 cm



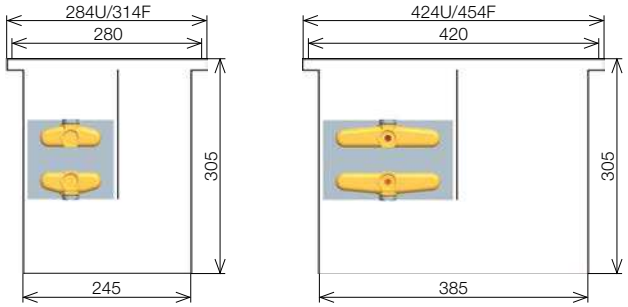
Depth 15 cm



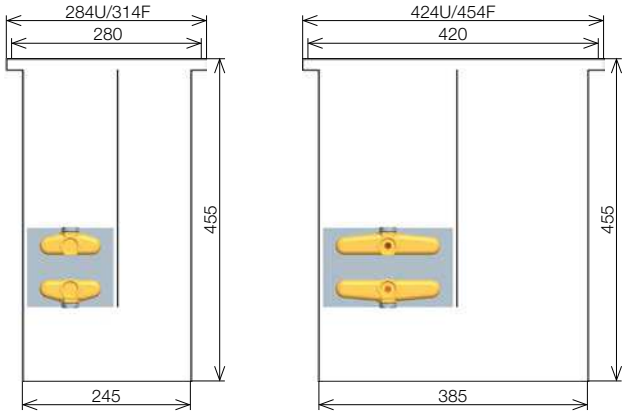
Depth 19 cm



Depth 30 cm

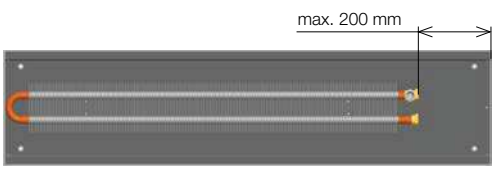


Depth 45 cm



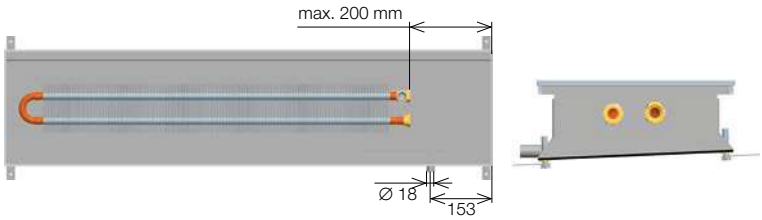
Heat exchanger placement

Standard design



The specified dimensions do not include the decorative frame.

PKB pool version (InPool)



Suitable for interiors with increased humidity, must be fitted with Al grid, see page 18 • Pool design available only in depths 9 and 11 and widths 20, 28, 34 and 42 cm • ***Not possible to connect cases from more PKB convectors.***

Heat outputs

Heat outputs (W) at t1/t2/ti = at 75/65/20 °C (Δt=50) and 65/55/20 °C (Δt=40) / EN 442

Depth (cm)		Δt	Length L (cm)											
			80	100	120	140	160	180	200	220	240	260	280	300
Width 16	9	Δt 50	87	121	156	191	226	260	295	330	364	399	434	469
		Δt 40	65	91	117	143	169	195	221	247	273	299	325	351
	11	Δt 50	100	140	180	220	260	300	340	380	420	460	500	540
		Δt 40	75	105	135	165	195	224	254	284	314	344	374	404
Width 20	9	Δt 50	110	154	197	241	285	329	373	417	461	505	549	592
		Δt 40	82	115	148	181	213	246	279	312	345	378	410	443
	11	Δt 50	127	178	229	280	330	381	432	483	534	584	635	686
		Δt 40	95	133	171	209	247	285	323	361	399	437	475	513
Width 28	9	Δt 50	161	226	290	355	419	484	548	612	677	741	806	870
		Δt 40	121	169	217	265	314	362	410	458	506	555	603	651
	11	Δt 50	174	244	313	383	453	522	592	662	731	801	871	940
		Δt 40	130	182	234	287	339	391	443	495	547	599	651	703
	15	Δt 50	245	344	442	540	638	736	834	932	1031	1129	1227	1325
		Δt 40	184	257	330	404	477	551	624	698	771	845	918	991
	19	Δt 50	267	374	480	587	694	801	908	1014	1121	1228	1335	1441
		Δt 40	200	280	359	439	519	599	679	759	839	919	999	1078
	30	Δt 50	313	439	564	690	815	940	1066	1191	1317	1442	1567	1693
		Δt 40	235	328	422	516	610	704	797	891	985	1079	1173	1266
	45	Δt 50	483	676	870	1063	1256	1449	1642	1836	2029	2222	2415	2609
		Δt 40	361	506	651	795	940	1084	1229	1373	1518	1663	1807	1952
Width 34	9	Δt 50	226	316	406	497	587	677	768	858	948	1039	1129	1219
		Δt 40	169	236	304	372	439	507	574	642	709	777	845	912
	11	Δt 50	242	339	436	533	630	727	824	921	1018	1115	1212	1308
		Δt 40	181	254	326	399	471	544	616	689	761	834	906	979
	15	Δt 50	315	440	566	692	818	944	1070	1196	1321	1447	1573	1699
		Δt 40	235	330	424	518	612	706	800	895	989	1083	1177	1271
	19	Δt 50	360	503	647	791	935	1079	1223	1367	1510	1654	1798	1942
		Δt 40	269	377	484	592	700	807	915	1022	1130	1238	1345	1453
Width 42	9	Δt 50	318	445	573	700	827	954	1081	1209	1336	1463	1590	1718
		Δt 40	238	333	428	524	619	714	809	904	1000	1095	1190	1285
	11	Δt 50	337	472	606	741	876	1011	1146	1280	1415	1550	1685	1819
		Δt 40	252	353	454	555	655	756	857	958	1059	1160	1260	1361
	15	Δt 50	433	606	779	952	1125	1298	1471	1644	1817	1990	2163	2337
		Δt 40	324	453	583	712	842	971	1101	1230	1360	1489	1619	1748
	19	Δt 50	471	660	848	1037	1225	1413	1602	1790	1979	2167	2356	2544
		Δt 40	353	494	635	776	917	1058	1199	1340	1481	1622	1763	1904
	30	Δt 50	546	765	983	1202	1420	1638	1857	2075	2294	2512	2731	2949
		Δt 40	409	572	736	899	1062	1226	1389	1553	1716	1880	2043	2207
	45	Δt 50	759	1063	1367	1670	1974	2278	2581	2885	3189	3492	3796	4100
		Δt 40	568	795	1022	1250	1477	1704	1931	2159	2386	2613	2840	3067

- temperature exponent m = 1.3

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

Δt (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
kt	0.265	0.284	0.304	0.324	0.344	0.364	0.385	0.406	0.427	0.449	0.471	0.493	0.515	0.537	0.560	0.583

Δt (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
kt	0.606	0.629	0.652	0.676	0.700	0.724	0.748	0.773	0.797	0.822	0.847	0.872	0.897	0.923	0.948	0.974

Δt (K)	50	51	52	53	54	55	56	57	58	59	60
kt	1.000	1.026	1.052	1.079	1.105	1.132	1.159	1.186	1.213	1.240	1.267

- temperature exponent m = 1.3

For the formula and example of conversion for a variant temperature difference see page 77.

Weights and water volumes of floor convectors

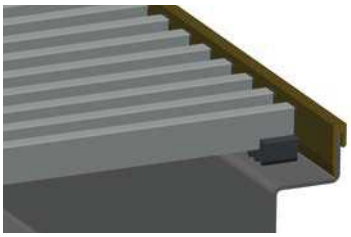
steel type	9/16	9/20	9/28	9/34	9/42	11/16	11/20	11/28	11/34	11/42	15/28	15/34	15/42	19/28	19/34	19/42	30/28	30/42	45/28	45/42
kg/linear meter	4.1	5.12	5.96	7.24	8.47	4.43	5.54	6.4	7.7	9	8.59	10.53	12	9.47	11.5	12.96	13.9	18.45	17.7	22.3
stainless steel kg/linear meter	–	5.07	5.94	7.24	8.5	–	5.47	6.36	7.7	9	–	–	–	–	–	–	–	–	–	–
l/linear meter	0.18	0.4	0.4	0.6	0.8	0.18	0.4	0.4	0.6	0.8	0.8	1.2	1.6	0.8	1.2	1.6	0.8	1.2	0.8	1.2

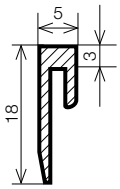
The listed weights are without a packaging.

Aluminium frame profiles

Standard design – U frame

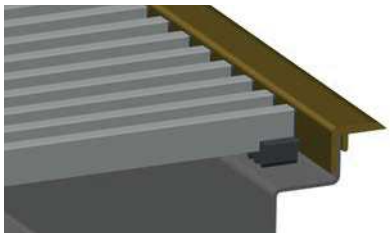
Standard PK design contains silver U profile. Profile colour is equal with grid colour, for other colours see page 18.

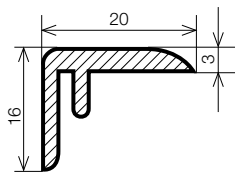




Selectable version – F frame

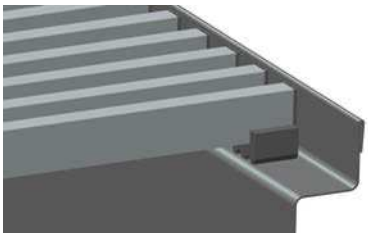
When the selectable frame F is ordered, it is attached separately to convector (not installed on convector). Frame colours are identical with aluminium grid colours.

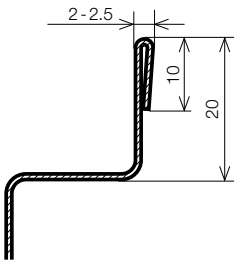




Version Basic – without frame NEW

Floor convector finish with no frame fitting option (U and F).





Frame colour is equal with grid colour presented on page 18.
The sketches dimensions are given in mm.

Convector breakdown

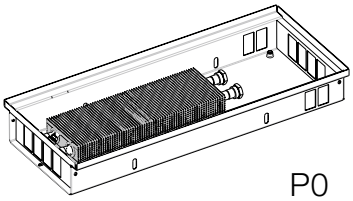
1. convector case according to the selected material
2. heat exchanger
3. air vent
4. cover frame (U or F)
5. floor grid
6. connecting holes
7. fixing anchors
8. covering metal sheet

Connecting the floor convectors Licon PK

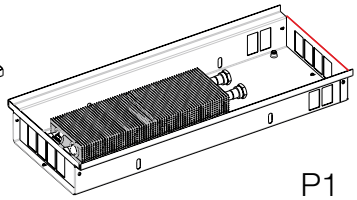
Cases' types according to water inlets' location and lowering of faces for batch assembly

Lowering of the cases' faces is used where it is not desirable to see the connections between the convectors (long rows of convectors, i.e. administative buildings, hotels etc.). When ordering the walkable grid it is necessary to mention that it is the PM, which will be used for the convector with the lowered face.

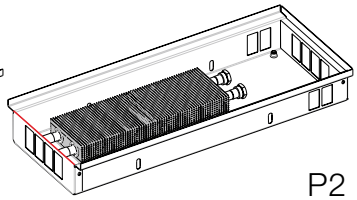
Note: The PKB convectors' individual cases cannot be mutually interconnected. These are made only in P0 design.



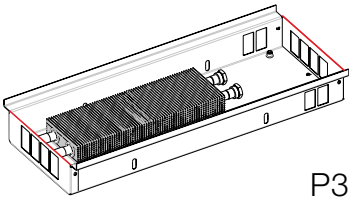
P0
Without lowering of faces
standard design



P1
Face lowering
at the inlet side



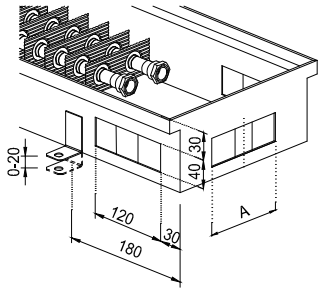
P2
Face lowering on
the opposite side of the inlets



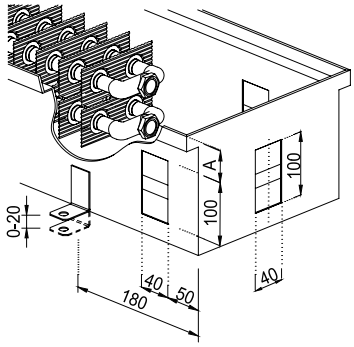
P3
Lowering
of both faces

Connection dimensions

PK 9/16, 11/16: A = 4 cm
PK 9/20, 9/28, 11/20, 11/28: A = 11 cm
PK 9/42, 11/42, 15/42, 19/42: A = 16 cm
PK 9/34, 11/34: A = 22 cm



PK 15/28, 15/34, 19/28, 19/34, 45/28, 45/42: A = 3 cm
PK 30/28, 30/42: A = 12 cm



The sketches dimensions are given in mm.

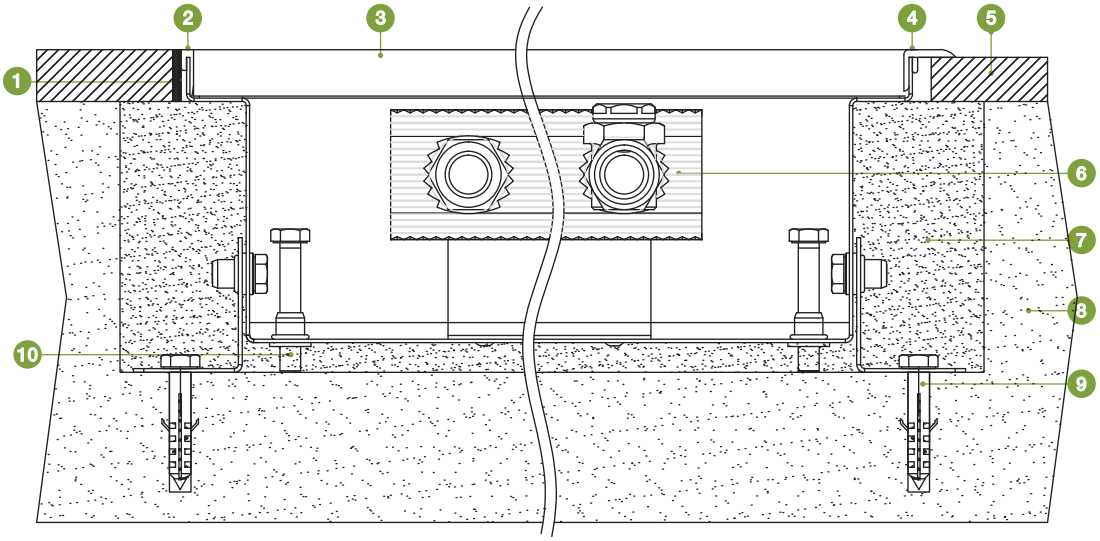
Convectors installation
Licon PK

Building recommendation

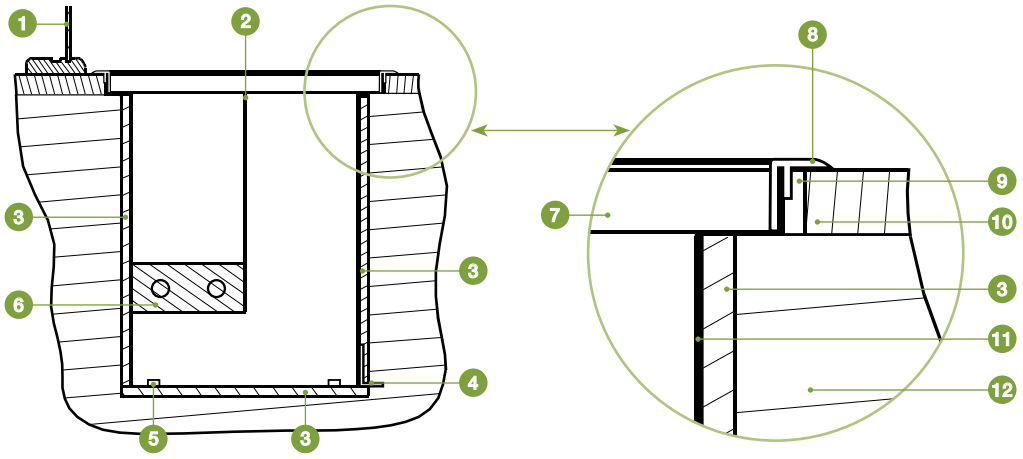
Several general principles must be fulfilled for proper function of the convector.

- To interconnect the exchanger and the distributing pipeline, the standard stainless-steel hoses with stainless-steel jacketing must be used (unless recommended otherwise) which always form a part of the delivery. In practice they provide a better access under the heat exchanger without having to dismantle the heating system, e.g. during cleaning.
- A correctly installed convector is mounted horizontally and the top edges of the convector case are not warped or deflected to ensure proper functioning of the walk-on grid and allows venting of the heat exchanger.
- Correctly installed convector's decorative frame at the floor covering is within the margin of + 2 mm.
- We recommend to keep the cover board in its place for the full duration of the building work to prevent dirt getting inside the convector. The standard board supplied is not walkable. A higher load bearing capacity board can be ordered.
- The height adjustment screws are only used for horizontal levelling of the convector case.
- During concreting the convector must be fixed to the floor with the use of fixing anchors screws that will prevent vertical shifting of the convector during subsequent pouring of concrete. The convector can be vertically loaded during concrete pouring. During concreting the convector must be strutted to prevent deformation of the case. When using other casting material (e.g. anhydride) seal thoroughly all passages into the convector to prevent it from flooding.
- Convectors with stainless steel case, designed for humid environments and identified as PKB have a standard built-in water drainage. It must be interconnected during the installation with a pipe with secured slope to drain the waste water. We recommend to fit the drain with the odour trap.
- For further versions for PK built-in see page 55 (Possibility to imbed in floors according to floor types).

Cross section of the correct embedding and location of the convector



1. jointing material (silicon)
2. U frame
3. walkable grid
4. F frame
5. floor covering
6. exchanger
7. concrete fill
8. subfloor
9. fixing anchor
10. height adjustment screw

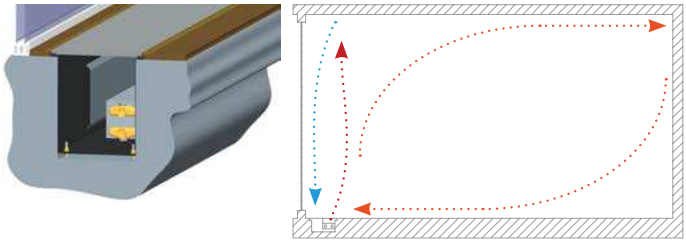


1. window
2. partition
3. insulation
4. fixing anchor
5. height adjustment screw
6. exchanger
7. lamella of the grid
8. decorative frame
9. expansion joint
10. floor covering
11. metal plating
12. subfloor

Recommended location of the heat exchanger
Depths 30 and 45 cm

Location of the exchanger at the room side

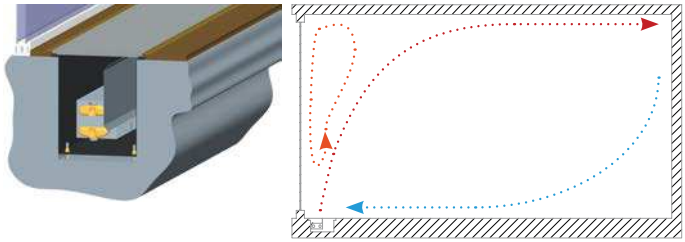
Descending stream of cool air enters the convector case. The rising flow of heated air then supports natural air circulation in the room and creates a screen in front of the window area. This arrangement is suitable in rooms where the convector is the only heating source and where the share of window heat losses in the total heat loss of the room is about 70–100 %.



$$\frac{\text{Q of the window}}{\text{Q of the convector}} = 70\text{–}100\ \%$$

Location of the exchanger at the window side

This location is suitable in rooms where heat losses on the part of the room prevail and there is only a small share of window losses (20 % at the most). The distance between the convector and the window must be as small as possible.



$$\frac{\text{Q of the convector}}{\text{Q of the window}} = \text{up to } 20\ \%$$

Ordering codes
Convectors PK

			length		depth		width								
Basic*	zinc galvanised steel case, unpainted OR without frame	PK	-	...	/	...	/	..	-	1	1	N	00	P	0
Standard	black steel case/unpainted exchanger	PK	-	...	/	...	/	..	-	1	1	U	10	P	0
Exclusive*	black steel case/black exchanger	PK	-	...	/	...	/	..	-	1	5	U	10	P	0
Inox	stainless steel case AISI 304/unpainted exchanger	PK	-	...	/	...	/	..	-	5	1	U	10	P	0
InPool*	stainless steel case AISI 316/unpainted exchanger	PKB	-	...	/	...	/	..	-	3	1	U	10	P	0

Frame finish
00 not fitted with a frame*
10 aluminium/silver
12 aluminium/bronze*
13 aluminium/light bronze*

Location of supply water (case type)
P on the right (looking out of room)

** custom-made design*
PKB cannot be mutually interconnected

Floor convectors Licon PK and Licon PKB

Frame type
N not fitted with a frame*
U U profile
F F profile*

Convector's case's face finish
0 without lowering of faces
1 lowering face on the supply side*
2 face lowering on opposite side of the supply*
3 lowering of both faces*

Ordering example

PK, length 120 cm, depth 11 cm, width 34 cm with the black exchanger and F shape frame, bronze eloxal coat = Exclusive Finish
Ordering code – PK-120/11/34-15F12P0

If the order does not specify the decorative frame, design of the case and the heat exchanger, the body will be made of black coated steel sheet with silver exchanger, and fitted with a silver frame in the shape of U.

Floor grids page 18

Floor convectors' design finishes

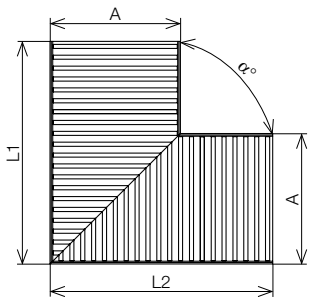
Specifications

corner (angle) parts maximum design depth *(cm)*	7
arch design depth *(cm)*	8, 9, 11, 15 and 19
production possibilities must be evaluated individually	
case design	black zinc galvanised steel
grid design	aluminium, wood, stainless steel
the floor grid must be always ordered together with the design convector	

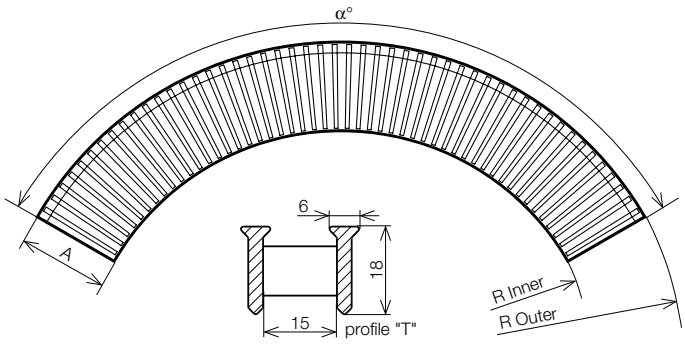
To ensure a perfect interconnection of floor convectors Licon in the rooms' corners it is best to use corner parts RD. The corner piece comes complete with a corner cover grid piece for all offered versions, see page 18.

The corner piece has no effect on the heat performance of the heating body and only serves as a visual complement. The corner pieces must be ordered together with the adjacent floor convectors including cover grids. No heat exchanger can be placed in the corner part, therefore it does not heat.

Corner



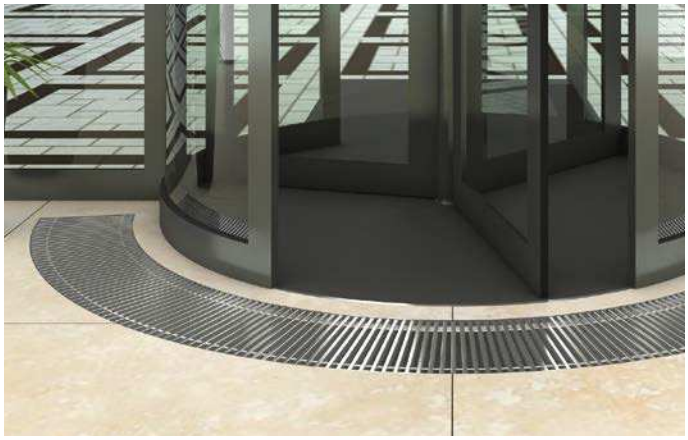
Arch



Dimensional series

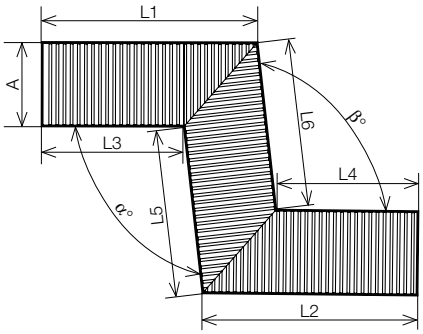
width of channel A *(cm)*	16	20	28	34	42
length L1, L2 *(cm)*	20	30	40	50	50

The minimum internal radius of the arc version must be more than 300 cm. Use type "T" profile aluminium grids on a spring when fitting the arch version with the aluminium grids, see image and U frame. (F frame could not be used due to design reasons)

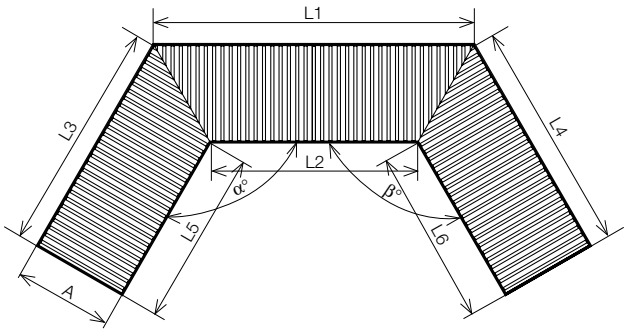


Before taking orders for a custom (atypical) design of the floor convector it is necessary to fill in the atypical product form found on www.licon.cz, otherwise ask the Licon Sales department for the form. On the basis of this filled in form we reserve the right to assess the production possibilities before accepting the order. Heat outputs can not be in any way guaranteed, the manufacturer may on request carry out an expert estimate of the possible heat output. To order a corner design you must specify the angle α and the total width (A), which must correspond with the widths of the produced floor mounted cases. It is necessary to specify the angle α for all shapes, including the arched design, and the inner or outer radius (R – inner, R – outer) and the overall width (A) that must correspond with the widths of the produced floor mounted cases.

Corner Z



Corner U

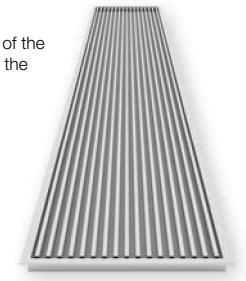


Grid eloxal coat finish
Aluminium

Lateral

Longitudinal*

* The frame is not part of the cover grid but part of the floor convector



Supporting elements under the longitudinal grid

If you order a longitudinal Aluminium cover grid, the supporting elements will be included in the grid package.

Version elox is designed for dry and humid environment.

Colour availability of aluminium grids

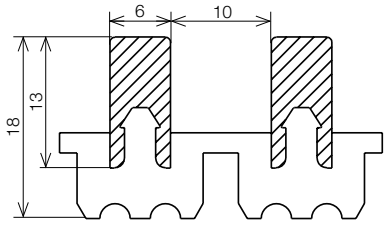
aluminium/silver

aluminium/bronze

aluminium/light bronze

The floor grids are made of natural materials and therefore minor deviations in the colour design cannot be eliminated.
The supplier cannot fully guarantee the presented colours and accept complaints for the reason of possible colour deviations.

Permeability 66 %



Dimensions in mm

Ordering codes aluminium grids

	Floor grids Licon PM		Length of convector (cm)		Width of convector (cm)		Material and colours of lamellas	Lamellas' joint design 2 black plastic strip	Grid type for connected PK P0 grid designed for the case type P0 or for the first convector in the connected cases assembly P2 grid designed for the second and every subsequent convector in the connected cases assembly *	Surface finish of the lamellas 0 without any finish	Orientation of the lamellas 1 lateral (rolling grid) 3 longitudinal (not rolling grid)*		Lamellas profile cross section A
aluminium/silver	PM	-	...	/	...	-	10	2	P0	0	1	-	A
aluminium/bronze	PM	-	...	/	...	-	12	2	P0	0	1	-	A
aluminium/light bronze	PM	-	...	/	...	-	13	2	P0	0	1	-	A

** custom-made design*

Grids design
Wood

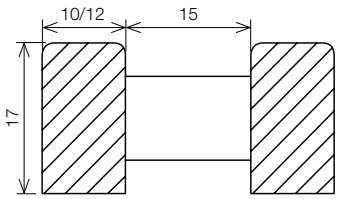
Colour availability of wooden grids

beech

oak

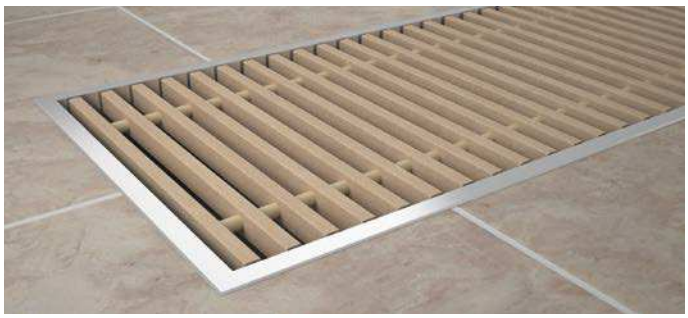
mahogany

Permeability 60 %



Dimensions in mm

The floor grids are made of natural materials and therefore minor deviations in the colour design cannot be eliminated. The supplier cannot fully guarantee the presented colours and accept claims due to possible colour deviations.



Ordering codes
Wooden grids

	Floor grids Licon PM	Length of convector (cm)		Width of convector (cm)		Lamellas material	Lamellas' joint design	Grid type for connected PK	Surface finish of the lamellas	Orientation of the lamellas
beech	PM	-	...	/	...	- 20	4	P0	0	1
oak	PM	-	...	/	...	- 21	4	P0	0	1
mahogany	PM	-	...	/	...	- 23	2	P0	0	1

** custom-made design*

Lamellas material
20 beech
21 oak
23 mahogany

Lamellas' joint design
2 black spacer (standard only for mahogany)
4 beige spacer (standard only for beech and oak)

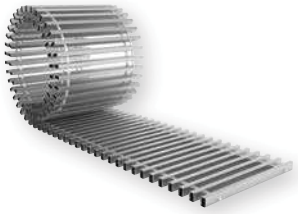
Grid type for connected PK
P0 grid designed for the case type P0 or for the first convector in the connected cases assembly
P2 grid designed for the second and every subsequent convector in the connected cases assembly*

Surface finish of the lamellas
0 without any finish
1 clear varnish coat*

Orientation of the lamellas
1 lateral (rolling grid)

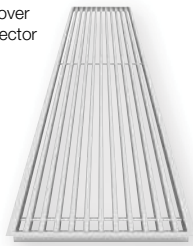
Grids design
Stainless steel Roll

Stainless steel Roll – lateral design



Stainless steel Roll – longitudinal design*

* The frame is not part of the cover grid but part of the floor convector

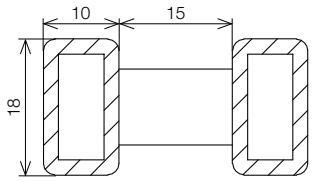


The Roll design is suitable only for dry environment (material AISI 304)

Supporting elements under the longitudinal grid

If you order a longitudinal Stainless steel Roll cover grid, the supporting elements will be included in the grid package.

Permeability 60 %



Dimensions in mm

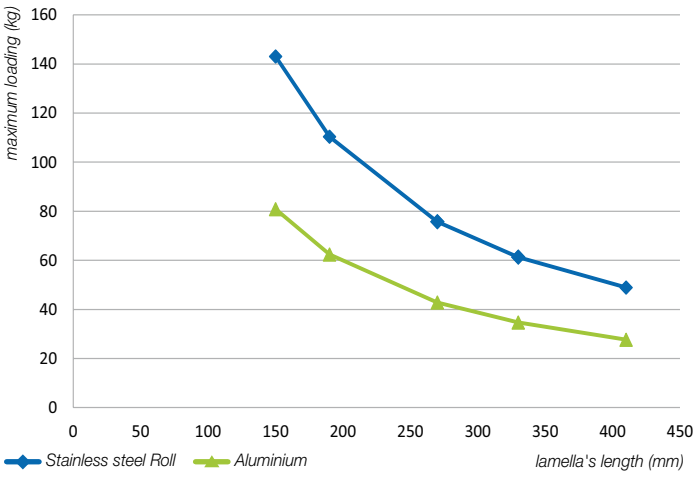
The floor grids are made of natural materials and therefore minor deviations in the colour design cannot be eliminated. The supplier cannot fully guarantee the presented colours and accept claims due to possible colour deviations.

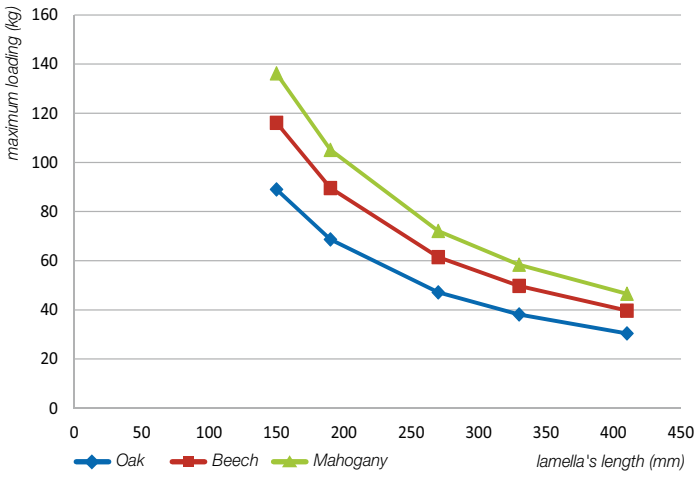
Ordering codes
Floor grids • Roll

			Length of convector (cm)		Width of convector (cm)				Floor grid/case type		Orientation of the lamellas		
Stainless steel for dry environment	PM	-	...	/	...	-	50	5	P0	0	1	-	O
	Floor grids Licon PM – Roll						Material and colours of lamellas 50 stainless steel (for dry environment)	Design of the lamellas' joints 5 stainless steel for dry environment	P0 grid designed for the case type P0 or for the first convector in the connected cases assembly P2 grid designed for the second and every subsequent convector in the connected cases assembly*	Surface finish of the lamellas 0 without any finish	1 lateral (rolling grid) 3 longitudinal (not rolling grid)*	Lamellas profile cross section O 18 × 10 mm	

** custom-made design*

Cover grids load bearing capacity





Point load on 1 grid lamella according to produced widths.

Correction factor per flow area of the grid

% of flow surface	> 75	60	50	40	30
correction factor	1.00	0.95	0.90	0.85	0.60

The flow surface means the flow surface of the heat exchanger (width × length of the radiator) minus the area of the breathing grid (all dimensions given in %). The heat output of the particular convector is multiplied by this correction factor. Measurements of the performances of the Licon products include the breathing grid, therefore no further recalculation is necessary.

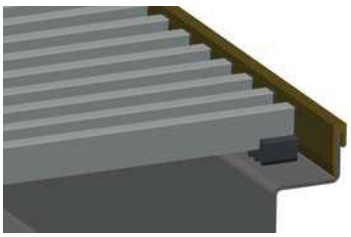
Manufacturing dimensions of the cover grids

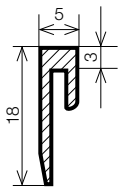
Code designation	PM-xx/16	PM-xx/20	PM-xx/28	PM-xx/34	PM-xx/42
Width	152 mm	192 mm	272 mm	332 mm	412 mm

tolerance +0–1,5 mm

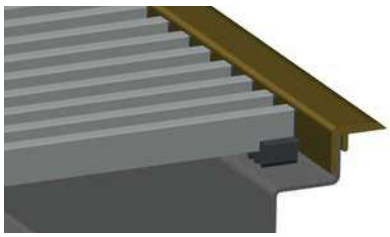
Profiles of the aluminium frames

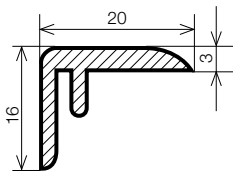
U frame



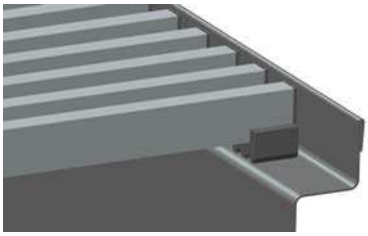


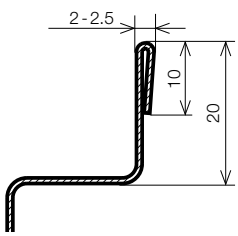
F frame





Version Basic – without frame NEW

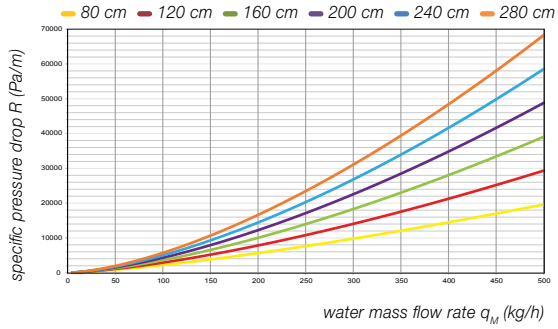




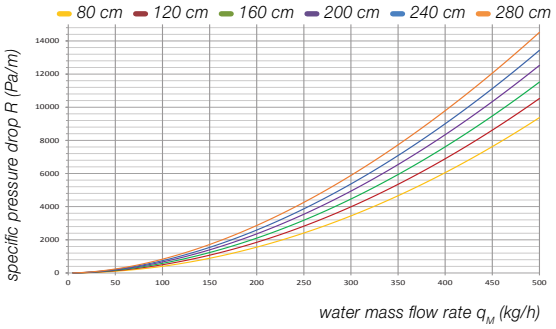
The convectors are fitted as standard with the silver U profile; when frame F is ordered it is enclosed with the delivery. Colour finishes of the decorative frames match the colour finishes of the aluminium grids see page 18. The sketches dimensions are given in mm.

Pressure losses of convectors

PKOC 7/28

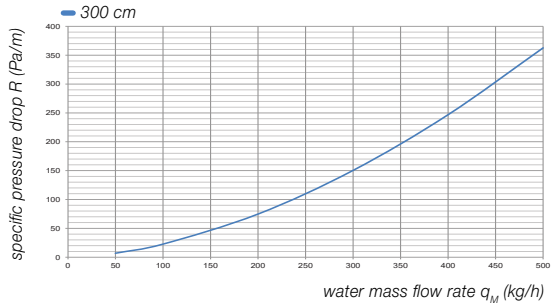


PKOC 8/16



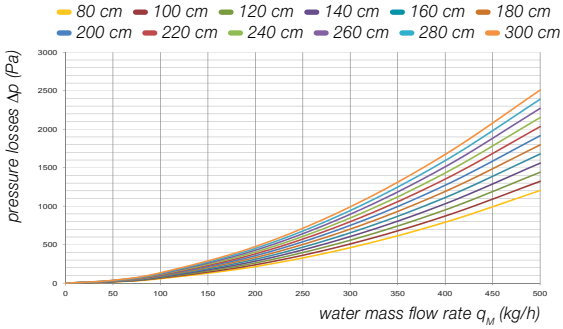
PK 9/16, PK 11/16

Heat exchanger OR-J1



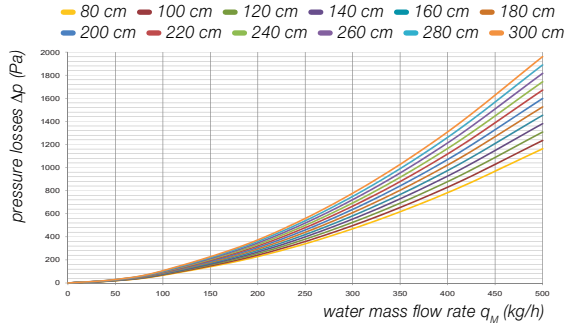
PK 9/20, PK 9/28, PK 11/20, PK 11/28
PKOC 8/28, PKOC 9/28, PKOC 11/28
PKBOC 13/34

Heat exchanger OR-J2



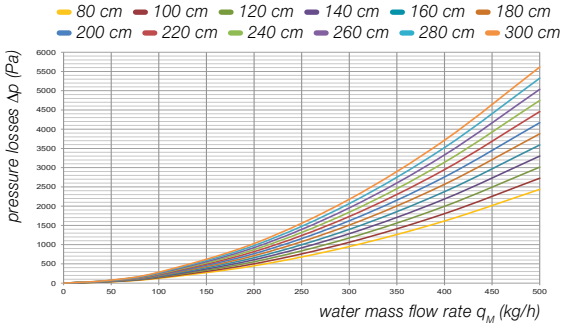
PK 9/34, PK 11/34
PKOC 11/34, OR-J3

Heat exchanger OR-J3



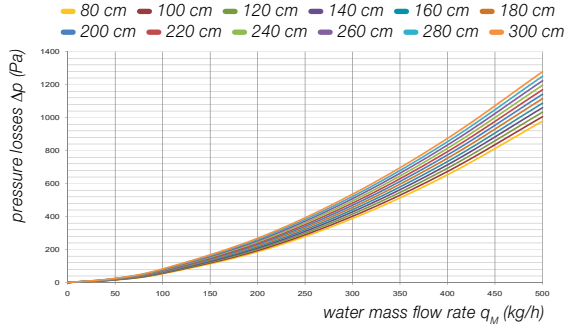
PK 9/42, PK 11/42
PKOC 11/42

Heat exchanger OR-J4



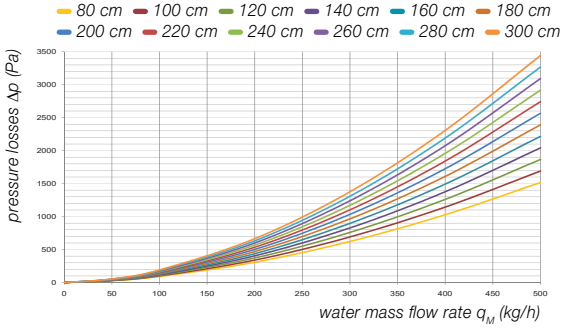
PK 15/28, PK 19/28, PK 30/28, PK 45/28

Heat exchanger OR-D2



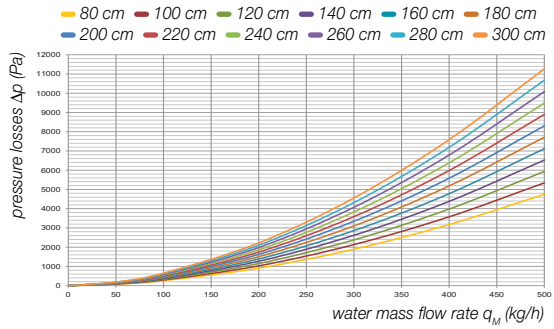
PK 15/34, PK 19/34, PK 30/42, PK 45/42

Heat exchanger OR-D3



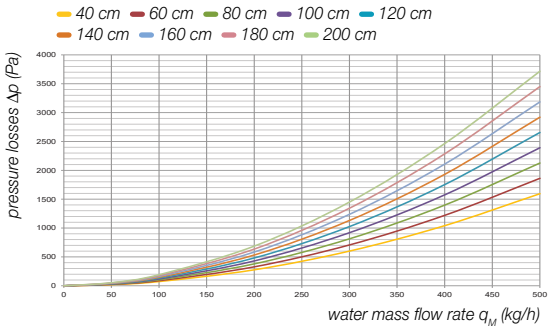
PK 15/42, PK 19/42

Heat exchanger OR-D4



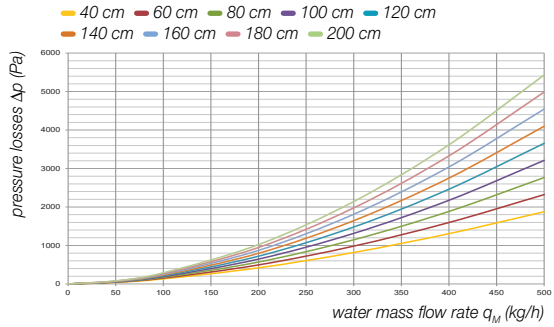
OKN 45/6, OKN 60/6

Heat exchanger OKN 6



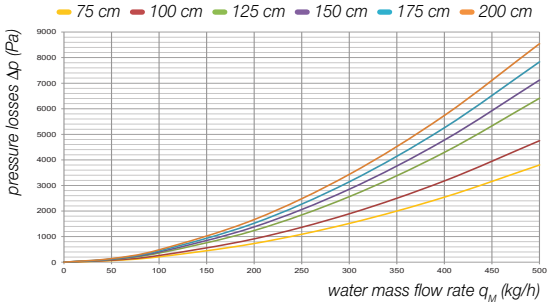
OKN 45/12, OKN 60/12

Heat exchanger OKN 12



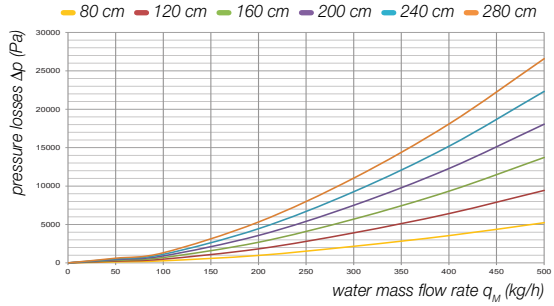
OKIOC 45/11

Heat exchanger OKIOC 45/11



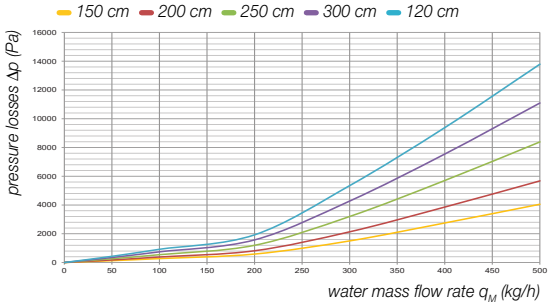
PKIOC 11/20, PKOC 11/20

Licon PKIOC 11/20



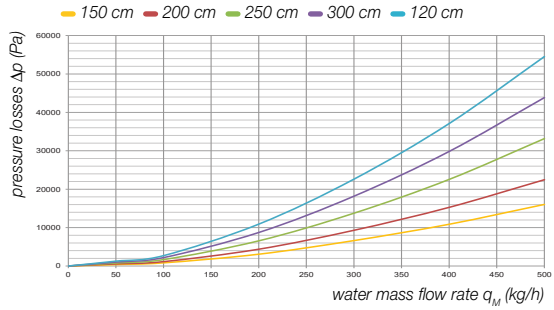
PKIOC 13/34

Heat exchanger PKIOC 13/34



PKWOC 13/34

Heat exchanger PKWOC 13/34



** Pressure losses of OLOC are available on request.*

Examples of conversion to a variant temperature difference

$\Delta t = (t1 + t2) / 2 - ti$

Where:
- t1 is the inlet water temperature (°C)
- t2 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: Licon PK-300/11/28 heating element
Rated operating condition: 75/65/20 °C
Qn = 940 W should be converted to the temperature difference Δt = 40 K
Q = Qn × factor kt = 940 × 0.748 = 703 W

Entered: Licon OKN 140/60/6 heating element
Computational operating status: 75/65/20 °C
Qn = 1 018 W should be converted to the temperature difference Δt = 30 K
Q = Qn × factor kt = 1 018 × 0.515 = 525 W

General information about LICON products

Licon 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) guarantee 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 sheet steel. For use in wet applications 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, usually 3 to 10 working days. Guaranteed warranty and after-warranty service.

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 convector. The fan convectors must be checked if the fans are not mechanically blocked (by fallen objects, a layer of dust, etc.).

Quality

Licon Co. is a holder of the certified quality management system as per ISO 9001:2008. The products are manufactured and tested according to EN 422. The products bear the CE mark indicating compliance with the relevant regulations of the European Community.

CE

E-30-00103-12

EN EURONORM 442

HLK STUTTGART

Quality Management ISO 9001 DEKRA

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 www.licon.cz in the download section.

LICON HEAT Co. s.r.o. (Ltd) 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).

LICON HEAT Co. s.r.o. (Ltd) reserves the right to change technical specifications without a prior notice.

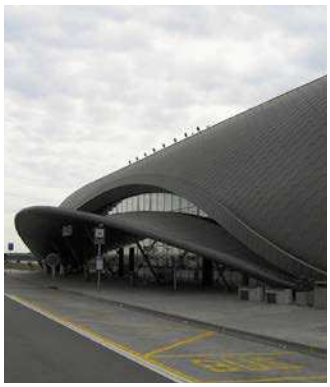
References

Main Point Karlín, Prague 8

Triplex - residential building, Karlovy Vary

Technical University, Liberec

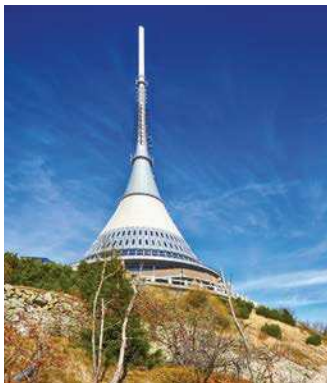
Conference centre Harfa, Ireland



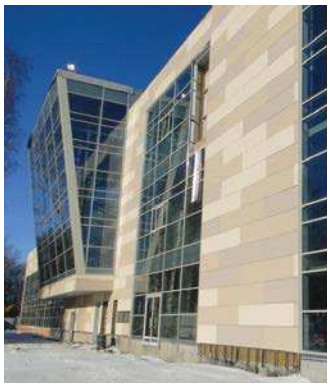
Airport, Brno

Administrative building Trinity, Brno

Headquarters of the Celsis Company, Lithuania



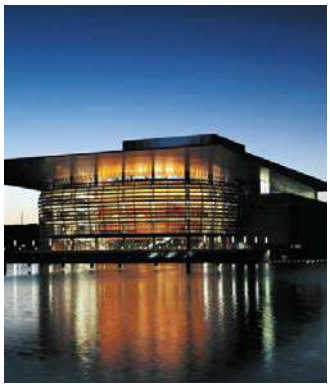
Ještěd Hotel, Liberec



SBK Spartak S. Peterburg, Russia

City Green Court, Prague

Administrative building, Denmark



Opera House, Denmark

We shall be pleased to extend the overview of interesting references also by your project!

member of KORADO Group

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