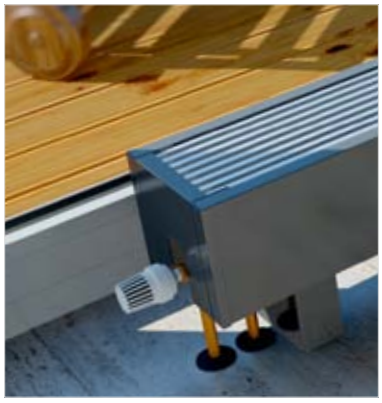
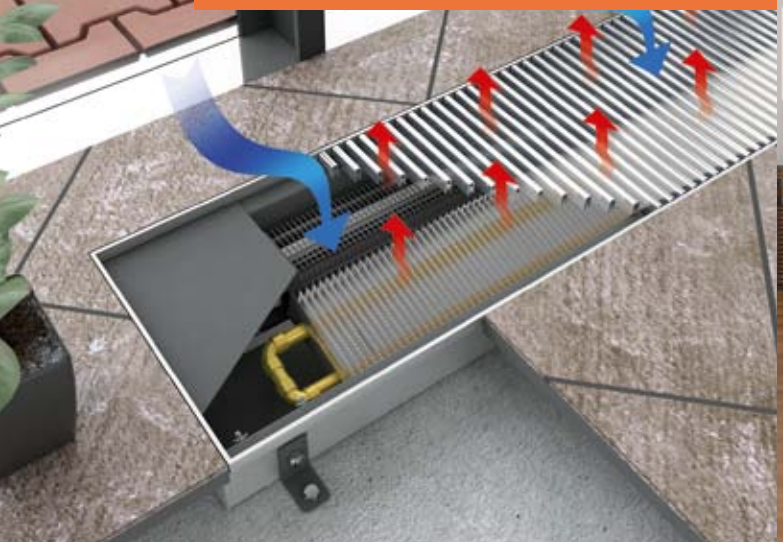
Products catalogue 2012

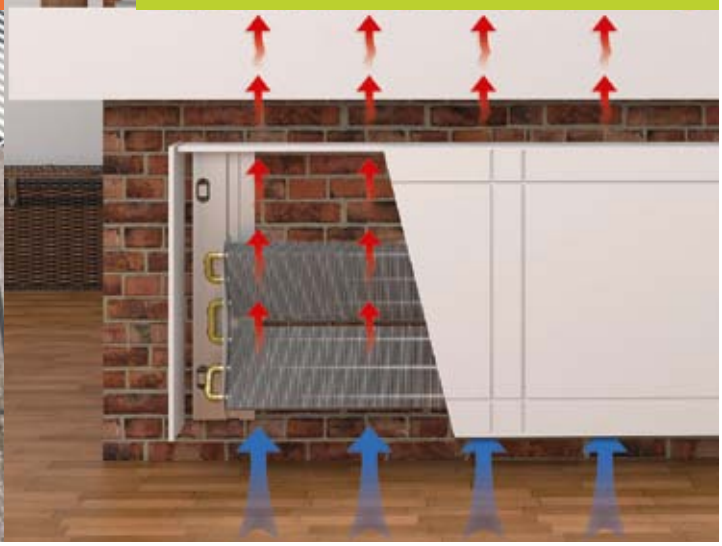
When design decides

CONTENTS

Operating principle of floor convector – type PKOC



Operating principle of wall mounted convector – type OK



Optimized convection
Convectors with forced convection

Entire production series OC 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 the new dry-cooling and cooling

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

1. significant energy savings
2. very silent run
3. instant optimal heating performance, higher efficiency
4. variable regulation for all building types
5. easier assembly, disassembly and maintenance
6. universal use
7. convector with higher efficiency, new heat exchangers

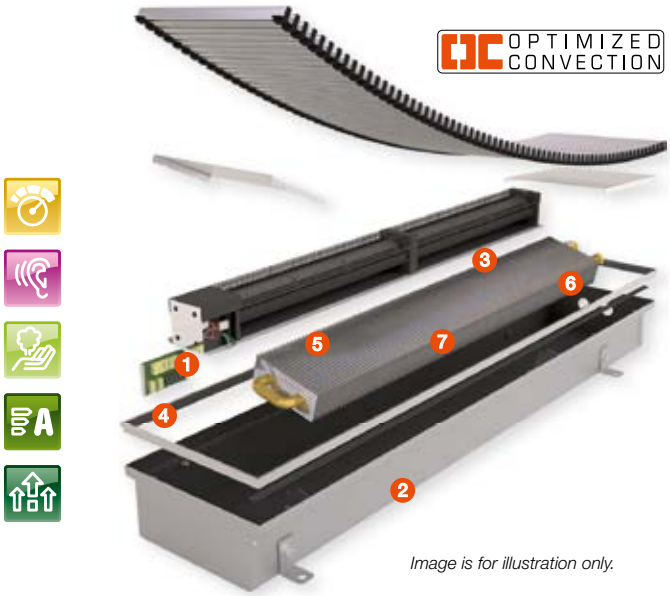


Image is for illustration only.

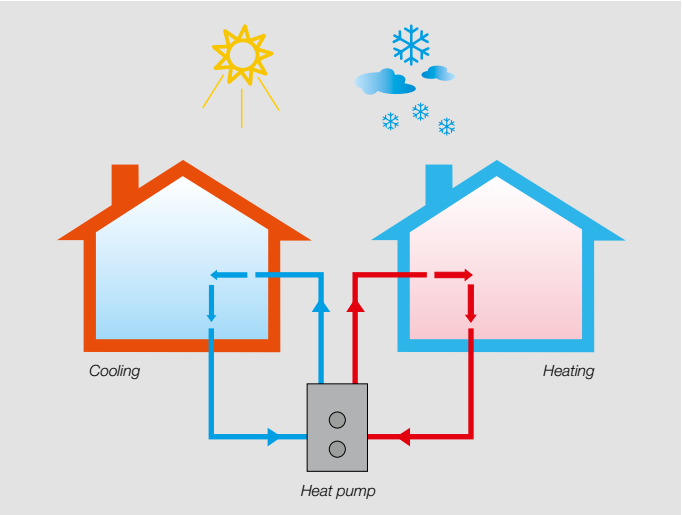
Natural convection

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 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 room

Solutions for heat pumps – Convectors PKIOC, PKWOC

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



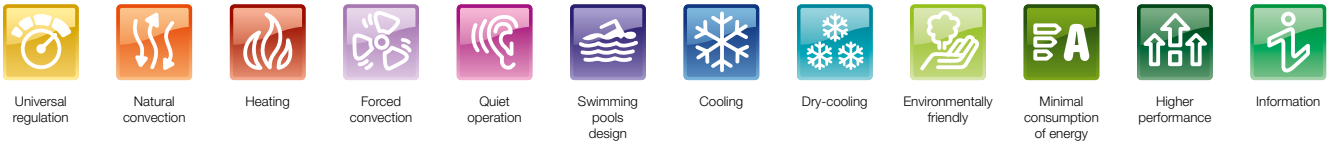
9 reasons to choose convectors Licon

1. innovative technical and design solutions
2. high efficiency, excellent solution for heat pumps
3. convectors Licon provide heating and cooling
4. also new pool design (marked with "B", e.g. PKBOC)
5. low-cost run, low power consumption, protecting
6. wide range – for each building, interior and heating type
7. fast heat distribution – efficiency, ecology, energy and media saving
8. solutions for interior, exterior, dry and damp to wet environments
9. for all energy sources (heat pumps, gas, electricity, solar suitable, wood and biomass)

Graphic symbols explanation

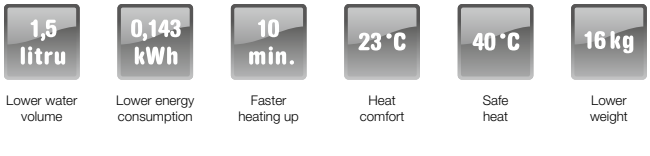
Convenient application

Functions and features



Design

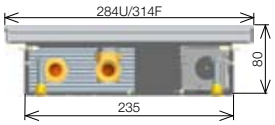
Technical parameters



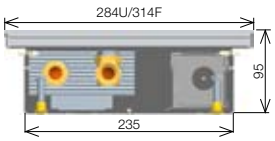
Products overview

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

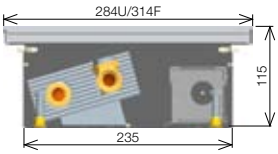
PKOC 7/28 see page 49



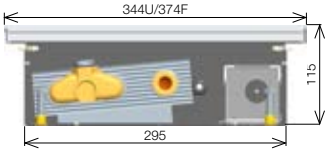
PKOC 9/28 see page 50



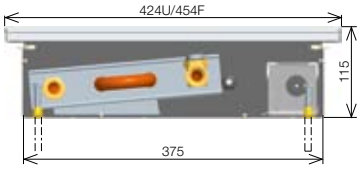
PKOC 11/28 see page 51



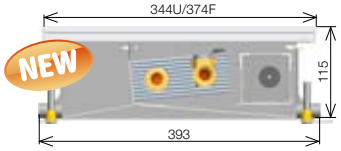
PKOC 11/34 see page 52



PKOC 11/42 see page 53

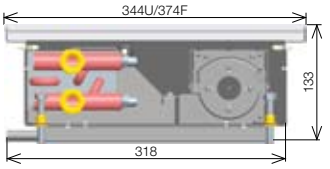


PKBOC 11/34 InPool see page 56



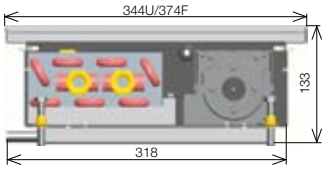
PKIOC 9/20 see page 59

PKIOC 13/34 see page 60

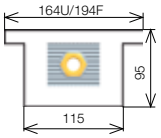


OPTIMIZED CONVECTION

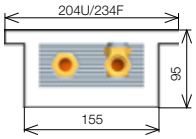
PKWOC 13/34 see page 63



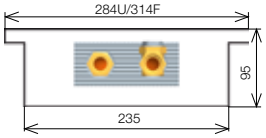
PK 9/16 cm



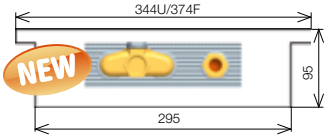
PK 9/20 cm



PK 9/28 cm

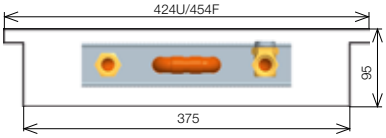


PK 9/34 cm

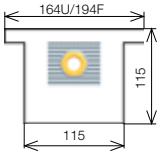


Floor convectors PK and PKB

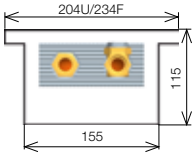
PK 9/42 cm



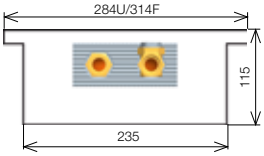
PK 11/16 cm



PK 11/20 cm



PK 11/28 cm



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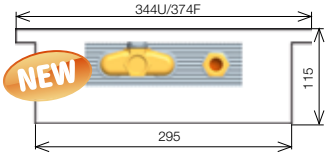
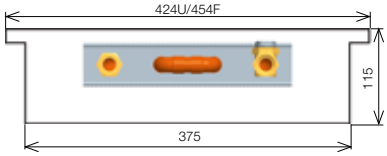
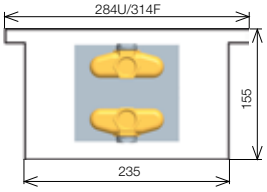


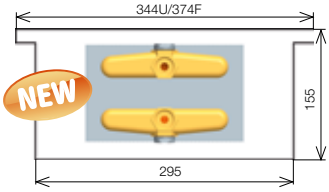
PK 11/42 cm



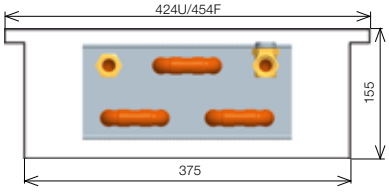
PK 15/28 cm



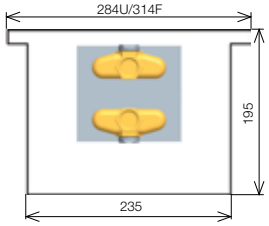
PK 15/34 cm



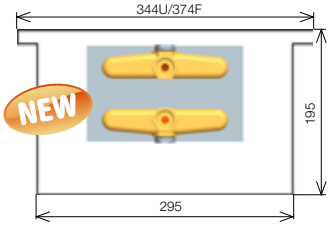
PK 15/42 cm



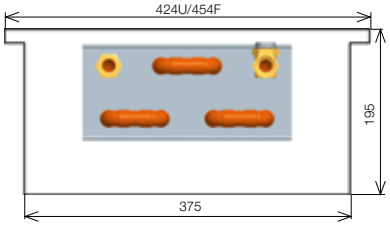
PK 19/28 cm



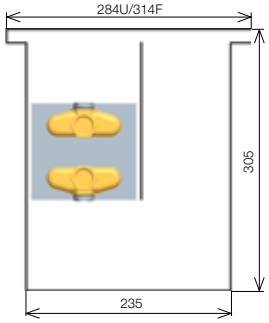
PK 19/34 cm



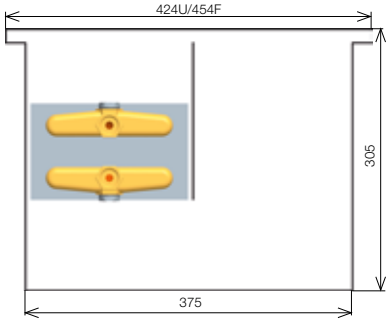
PK 19/42 cm



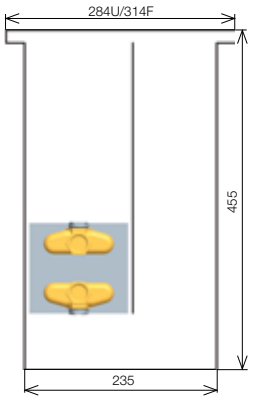
PK 30/28 cm



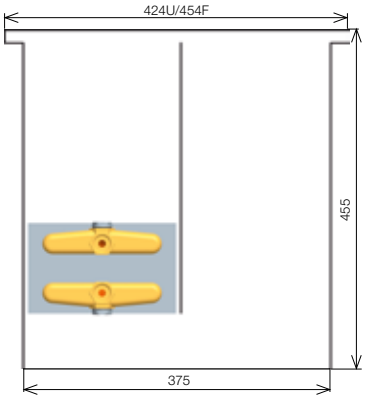
PK 30/42 cm



PK 45/28 cm



PK 45/42 cm

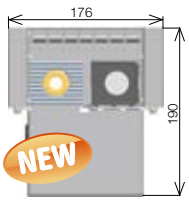


(see pages 8 - 17)

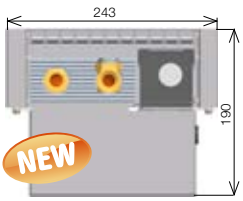
Products overview

Freestanding convector with forced convection OLOC

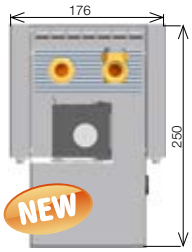
OLOC 9/18 see page 71



OLOC 9/24 see page 72



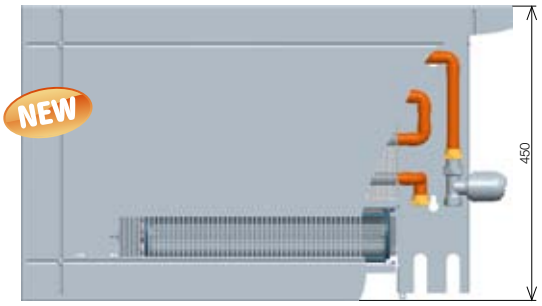
OLOC 15/18 see page 73



OPTIMIZED CONVECTION

Wall mounted convectors with forc. convection OKIOC

OKIOC 45/11

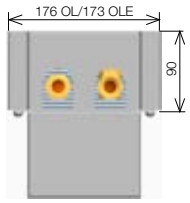


(see pages 76 - 79)

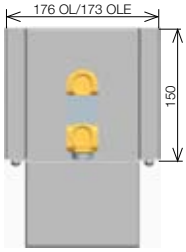
OPTIMIZED CONVECTION

Freestanding convector OL, OLB and OLE

OL • OLE • OLB
Width 18 cm
Height 9 cm

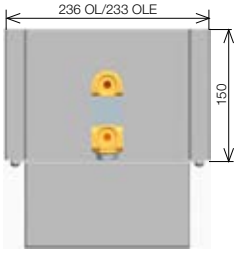


OL • OLE • OLB
Width 18 cm
Heights 15, 30, 45 and 60 cm



OL • OLE • OLB
Width 24 cm
Height 9 cm

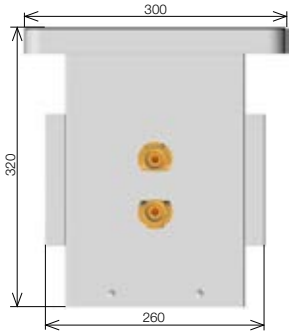
OL • OLE • OLB
Width 24 cm
Heights 15, 30, 45 and 60 cm



(see pages 24 - 29)

Bench convector with desk OL/D

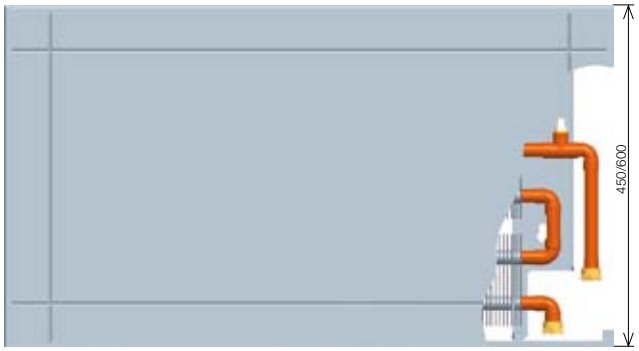
OL/D • OLB/D



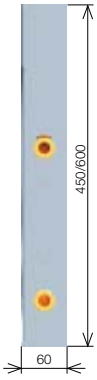
(see pages 30 - 33)

Wallmounted convectors OK, OKB and OK Plan

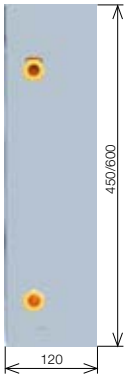
OKN • OKNB
Bottom connection
Depth 6 cm and 12 cm



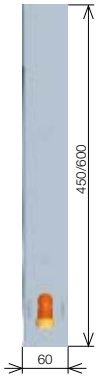
Side connection
Depth 6 cm



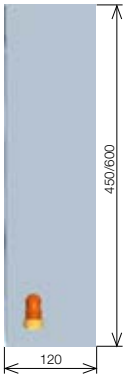
Side connection
Depth 12 cm



Bottom connection
Depth 6 cm



Bottom connection
Depth 12 cm

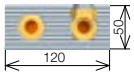


(see pages 34 - 37)

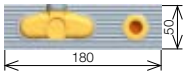
Heat exchangers OR

OR-J1

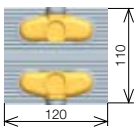
OR-J2



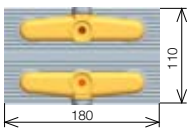
OR-J3



OR-D2



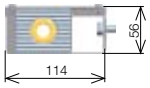
OR-D3



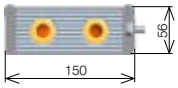
(see pages 42 - 45)

Facade convectors FK

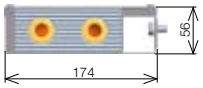
FK- xxx/6/12 – J1
Depth 5,6 cm
Width 11,4 cm



FK- xxx/6/15–J2
Depth 5,6 cm
Width 15 cm



FK- xxx/6/18–J2
Depth 5,6 cm
Width 17,4 cm



(see pages 38 - 41)

Licon PK
Licon PKB

FLOOR CONVECTOR
natural convection

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

Floor convector with natural convection
Licon PK • PKB

Licon PK convector is 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
- Use only for dry environment

Specifications

depth *(mm)*	90, 110, 150, 190, 300, 450
widths *(mm)*	160, 200, 280, 340, 420
lengths *(mm)*	800 up to 3 000 (at 200 mm)
outputs *(W)*	from 87 to 4 100
max. working pressure *(MPa)*	1.2
max. working temperature	110 °C
connecting thread	inner G 1/2"

Version Economic • basic execution in black coated galvanized steel case, exchanger without surface finishes
Version Exclusive • black coated 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
- attachment anchors to fix the channel to the floor
- a pair of flexible stainless steel hoses for easy connection
- sololit cover, protecting the exchanger against dust and dirt on the building site
- 25 mm adjustment set-srews to compensate for the floor asperity
- radiator mounting instructions
- the set is packed in a strong and durable packaging

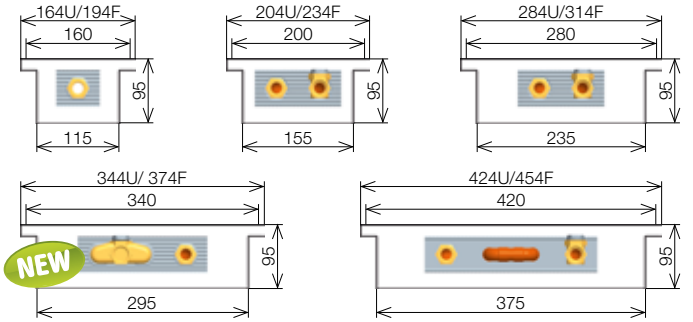
Optional specification

- 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 23
- lockable screwing thermostatic valve and thermostatic shut off valve head
- cover plate with increased rigidity
- Insufficient performance? Look for execution with OC with forced convection, see page 48

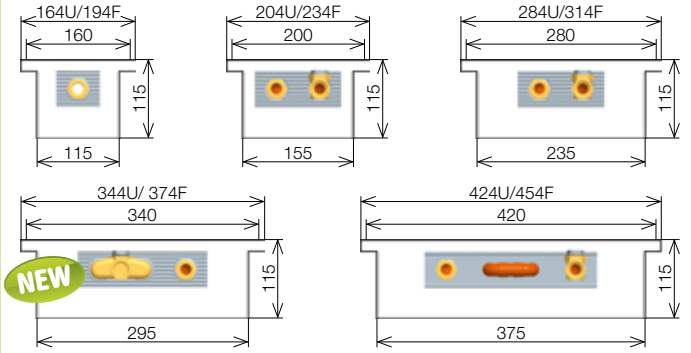
Pool design available only for depths 9 and 11 and widths 20, 28, 34 and 42 cm • Floor grids page 18

Cross section

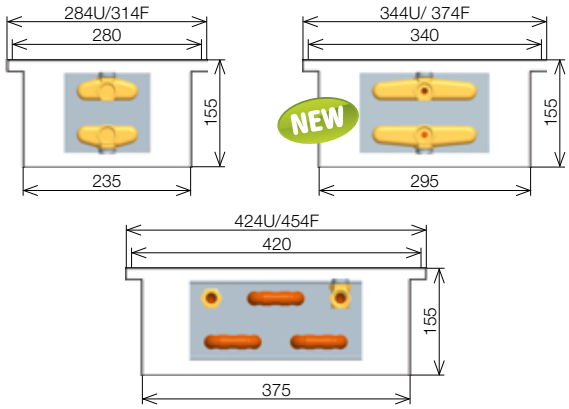
Depth 9 cm



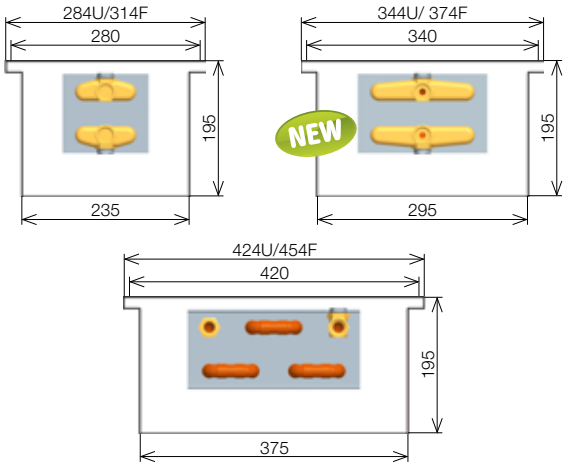
Depth 11 cm



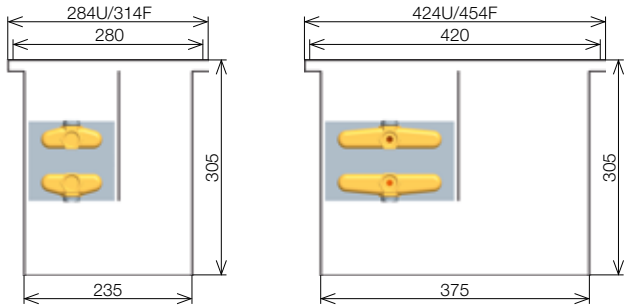
Depth 15 cm



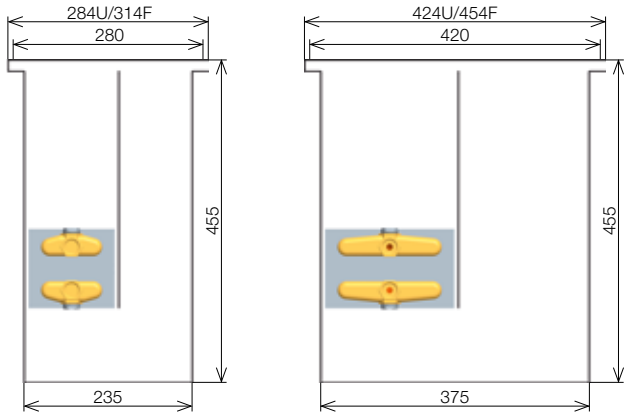
Depth 19 cm



Depth 30 cm

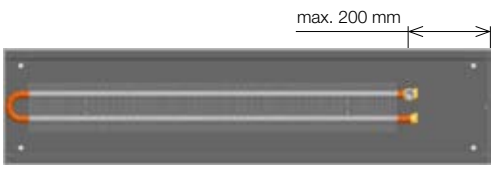


Depth 45 cm



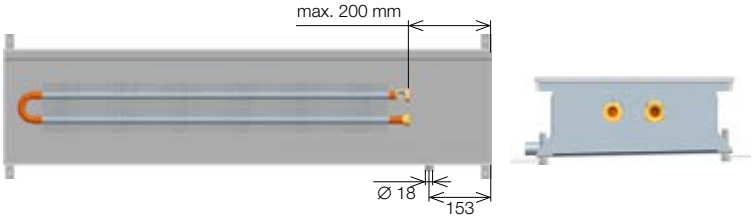
Heat exchanger placement

Standard design



The specified dimensions do not include the decorative frame.

PKB pool version (InPool)



Suitable for interior with increased humidity, must be fitted with Al or Stainless steel Cross grid, see page 19 and 22 • 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.

Thermal performances

Heat outputs (W) at tw1/tw2/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)

PK

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 89.

Weights and water volumes of floor convectors

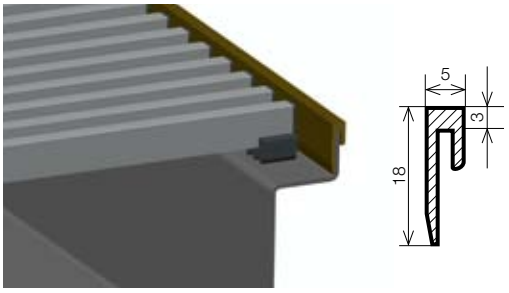
steel type	9/16	9/20	9/28	9/34	9/42	11/16	11/20	11/28	11/34	11/42	15/28	15/34	15/42	19/28	19/34	19/42	30/28	30/42	45/28	45/42
kg/linear meter	5	6	7.2	8.5	10.3	5.5	6.7	7.7	9	10.7	10.2	12,1	14.2	11.4	13.3	15.4	16.5	22	20.5	26.5
stainless steel kg/linear meter	-	4.8	5.6	6.9	8.2	-	5.25	6.1	7.4	8.6	-	9.7	11.5	-	10.5	12.2	-	-	-	-
l/1 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

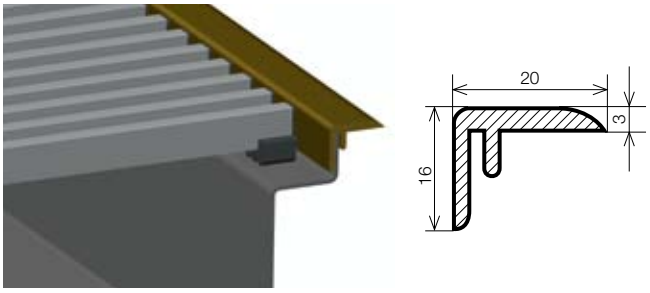
Standard design – U frame

Standard PK design contains silver U profile. Profile colour is equal with grid colour, for other colours see page 19.



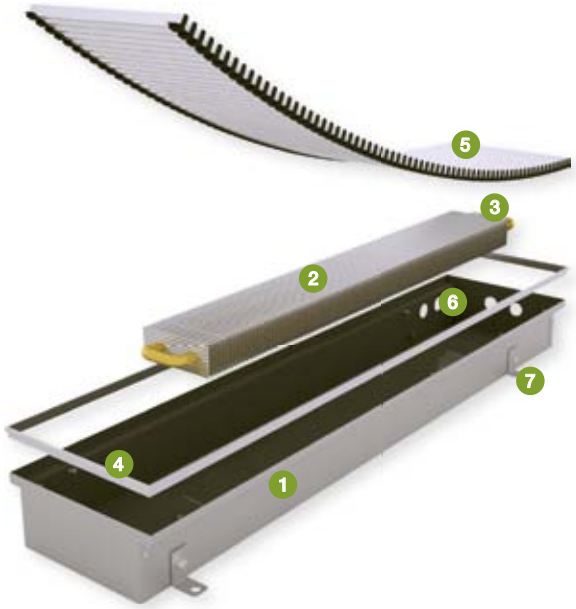
Selectable version – F frame

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.



Frame colour is equal with grid colour presented on page 19.
The sketches dimensions are given in mm.

Convector breakdown

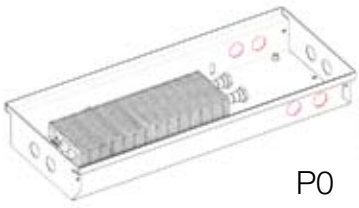


1. convector case according to the selected material
2. heat exchanger
3. air vent
4. cover frame (U or F)
5. floor grid
6. connecting holes
7. fixation anchors

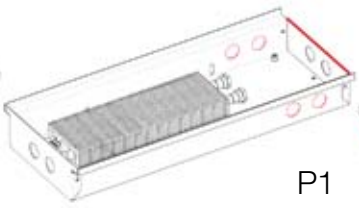
Connecting the floor convectors Licon PK

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

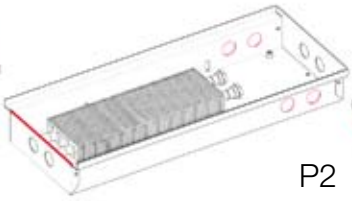
Lowering of the cases' faces is used there, where it is not desirable to see the connections between the convectors (long rows of convectors, i.e. administative buildings, hotels etc.). When ordering the walkable grid it is necessary to mention that it is the PM, which will be used for the convector with the lowered face. Note: The PKB convectors' individual cases cannot be mutually interconnected. These are made only in P0 design.



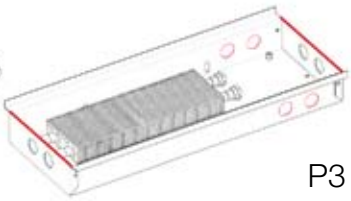
P0
Without lowering of faces
standard design



P1
Face lowering
at the inlet side



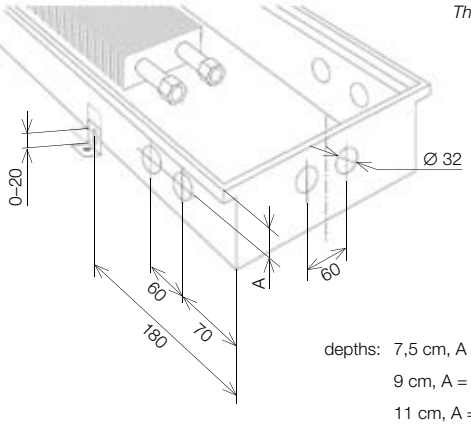
P2
Face lowering on
the opposite side of the inlets



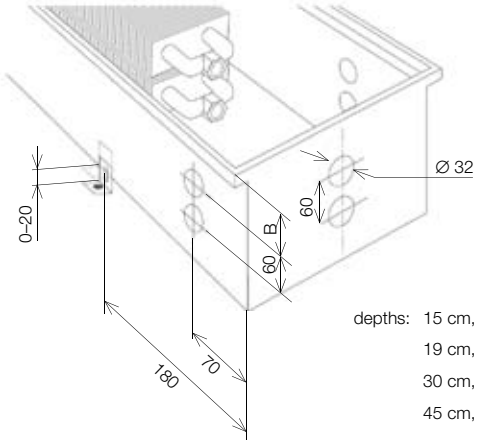
P3
Lowering
of both faces

Connection dimensions

The sketches dimensions are given in mm.



depths: 7,5 cm, A = 4 cm
9 cm, A = 5 cm
11 cm, A = 6 cm



depths: 15 cm, A = 5 cm
19 cm, A = 5 cm
30 cm, A = 12 cm
45 cm, B = 29 cm

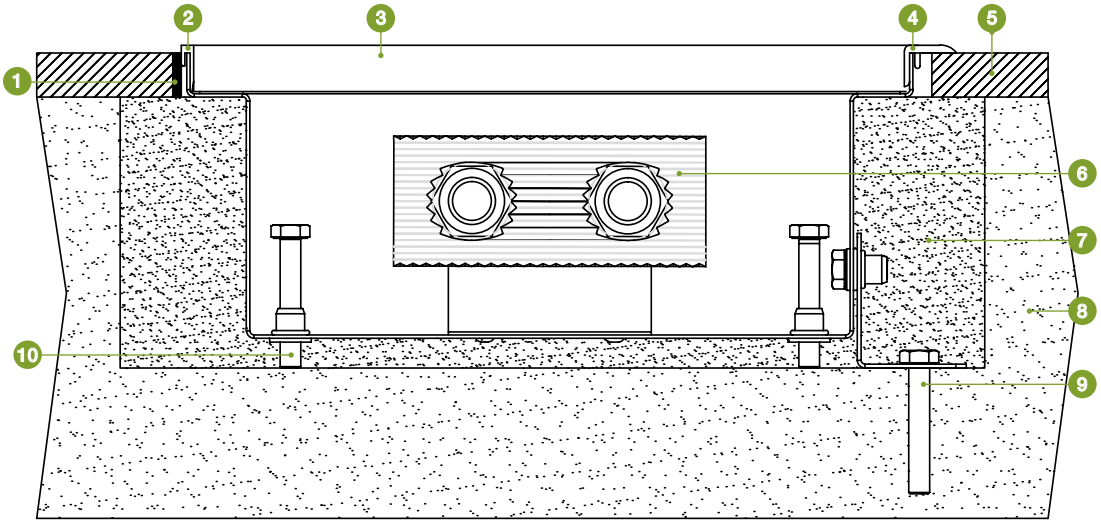
Convector installation
Licon PK

Building recommendation

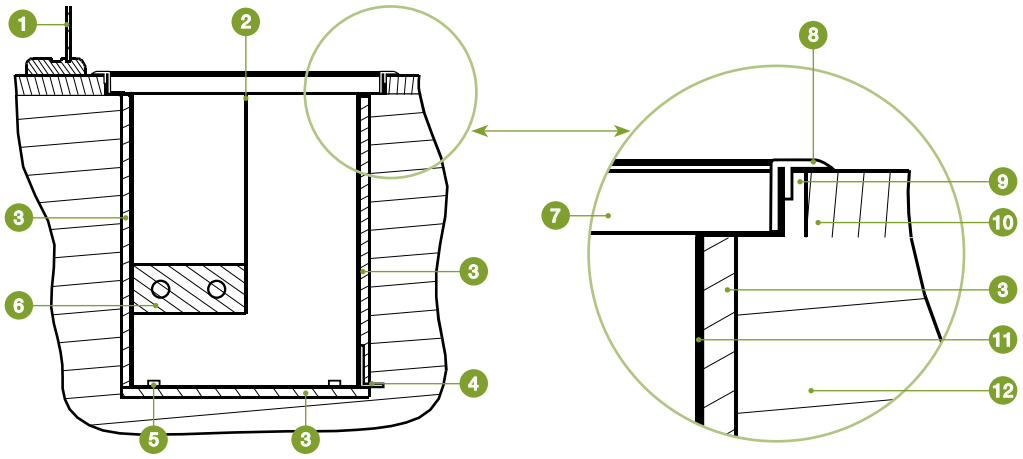
Several general principles must be fulfilled for proper function of the convector.

- 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 setting 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 anchoring 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 69 (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. clean floor
6. exchanger
7. concrete fill
8. subfloor
9. anchor
10. setting screw

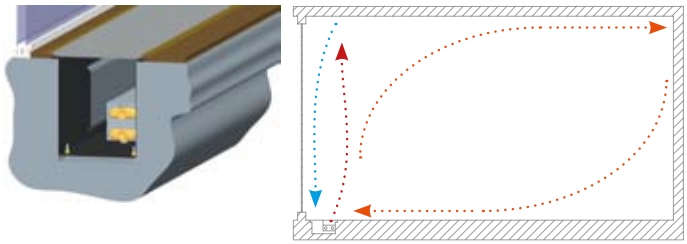


1. window
2. partition
3. insulation
4. achor
5. rectification screw
6. exchanger
7. lamella of the grid
8. decorative frame
9. expansion joint
10. clean floor
11. metal plating
12. subfloor

Recommended location of the heat exchanger Depths 30 and 45 cm

Location of the exchanger at the room side

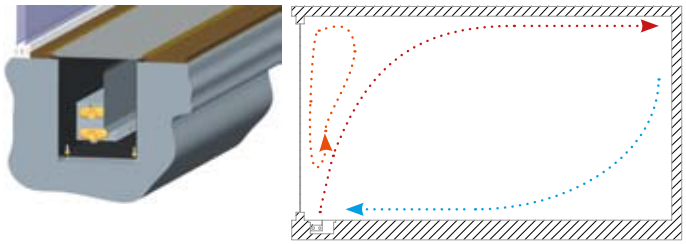
Descending stream of cool air enters the convector case. The rising flow of heated air then supports natural air circulation in the room and creates a screen in front of the window area. This arrangement is suitable in rooms where the convector is the only heating source and where the share of window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



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

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

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)

				length		depth		width								
Economic	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

** 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, 120 length, 11 depth, 34 width 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

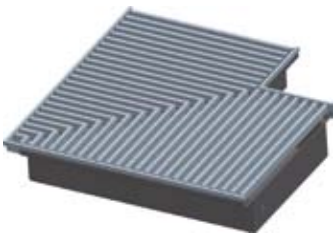
Floor convectors' design finishes

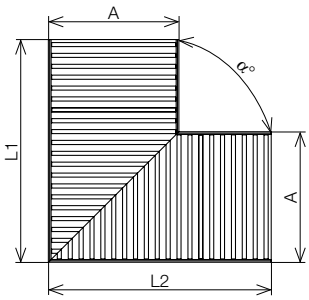
Specifications

corner (angle) parts maximum design depth *(cm)*	7
Arch design depth *(cm)*	7, 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	

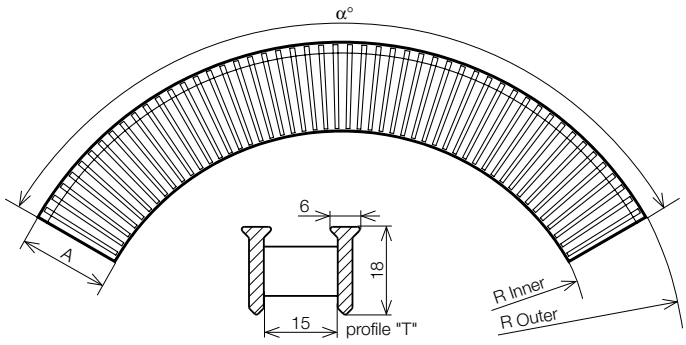
To ensure a perfect interconnection of floor convectors Licon in the rooms' corners it is best to use corner parts RD. The corner piece comes complete with a corner cover grid piece for all offered versions, see page 18.
The corner piece has no effect on the heat performance of the heating body and only serves as a visual complement. The corner pieces must be ordered together with the adjacent floor convectors including PM. No heat exchanger can be placed in the corner part, therefore it does not heat.

Corner





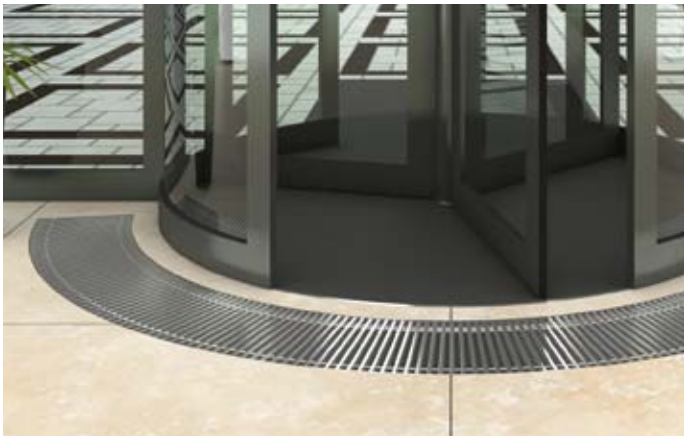
Arch



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.

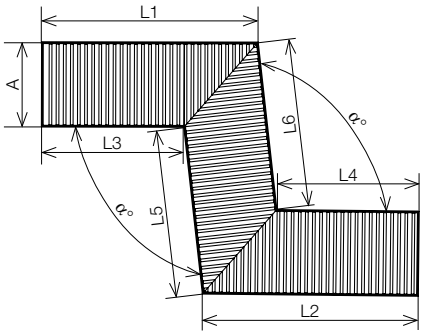


Before taking orders for a custom (atypical) design of the floor convector it is necessary to fill in the atypical product form found on www.licon.cz, otherwise ask the Licon Sales department for the form. On the basis of this filled in form we reserve the right to assess the production possibilities before accepting the order. Thermal performance can not be in any way guaranteed, the manufacturer may on request carry out an expert estimate of the possible thermal performance.

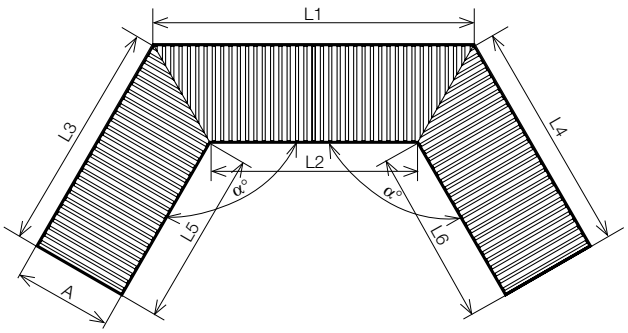
Note:

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



Licon PM

GRIDS
of the floor convectors

Take care with every detail and choose from a wide range of floor grids of the floor convectors, so that they are the top complement of the interior. Intentionally visible or quietly blending into its environment. The grids are the same for all types of the Licon floor convectors: PK, PKB, PKOC, PKIOC, PKWOC, PKBOC. Wide selection of lengths, special surface finishes in the rolling or longitudinal designs.

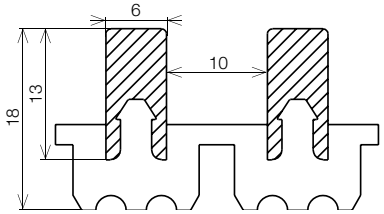
Grid eloxal coat finish
Aluminium

NEW DESIGN

Rolling

Linear *

Permeability 66 %



Dimensions in mm

** Ordering of the aluminium linear floor grids is only possible with the appropriate convector*

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.

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 joint	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

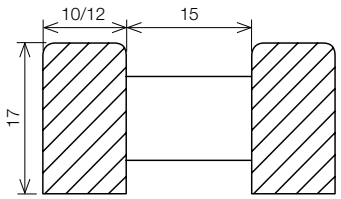
Colour availability of wooden grids

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	Orientation of the lamellas	Surface finish 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 joint (standard only for mahogany)
4 beige joint (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 *

Orientation of the lamellas
1 lateral (rolling grid)

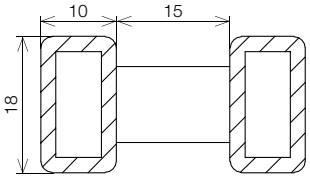
Surface finish of the lamellas
0 without any finish
1 clear varnish coat *

Grids design
Stainless steel Roll

Stainless steel Roll – rolling design

Stainless steel Roll – linear design*

Permeability 60 %



Dimensions in mm

** Ordering of the aluminium linear cover grids is only possible with the appropriate convector*

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

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

Floor grid/case type
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

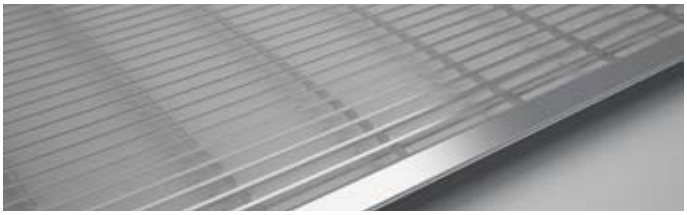
Orientation of the lamellas
1 lateral (rolling grid)
3 longitudinal (not rolling grid) *

Lamellas profile cross section
O 18×10 mm

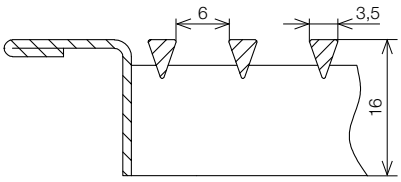
** custom-made design*

Grids design
Stainless steel Cross

Stainless steel Cross



Permeability 63 %



Dimensions in mm

**** Ordering of the stainless steel Grids Cross is only possible with the appropriate convector***

Luxury finish

The stainless steel grid including the decorative frame is of the same material as the walkable grid. High level of design, high load bearing capacity, possible choice of design:

- dry environment stainless steel AISI 304
- humid environment stainless steel AISI 316

The cover grid stainless steel Cross is designed for the case type P0 (see page 13 and 66). The stainless steel Cross up to 2 m length is supplied in one piece; above 2 m the grid is divided into two pieces.

Floor convectors including the grid intended for use in the pool area (AISI 316) must be kept clean and washed regularly with clean water and maintained with suitable preparations for the preservation of the stainless steel. More about the service and warranty conditions on www.licon.cz in the download section.

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 • Cross

		Length of convector (cm)		Width of convector (cm)			Lamellas and joints' design		Orientation of the lamellas			
Cross (for dry environment) *	PM	-	...	/	...	-	505	P0	0	3	-	X
Cross (for humid environment) *	PM	-	...	/	...	-	303	P0	0	3	-	X

** custom-made design*

Floor grids
Licon PM – Cross

Floor grid/case type
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 *

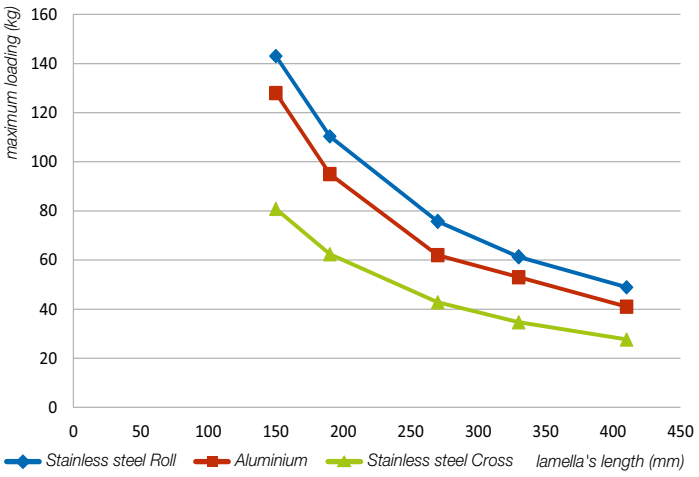
Surface finish of the lamellas
0 without any finish

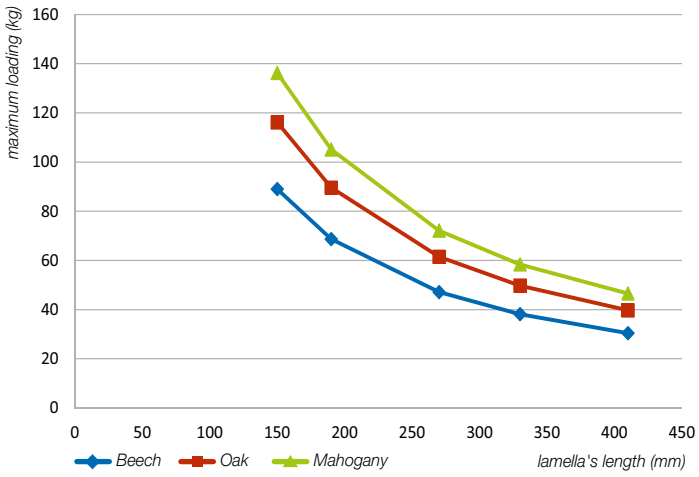
Grid profile
X including the decorative frame

Lamellas and joints' design
303 stainless steel suitable for humid environment
505 stainless steel suitable for dry environment

Orientation of the lamellas
3 longitudinal (not rolling grid) *

Cover grids load bearing capacity





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 it is not necessary to further recalculate them.

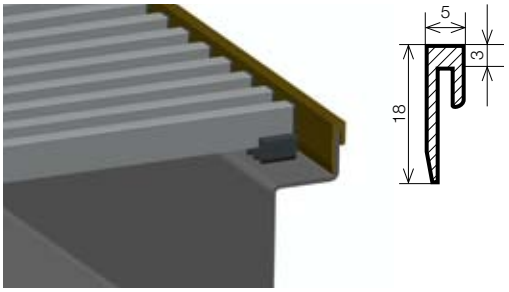
Manufacturing dimensions of the cover grids

Code designation	PM-xx/16	PM-xx/20	PM-xx/28	PM-xx/34	PM-xx/42
Width	150 mm	190 mm	270 mm	330 mm	410 mm

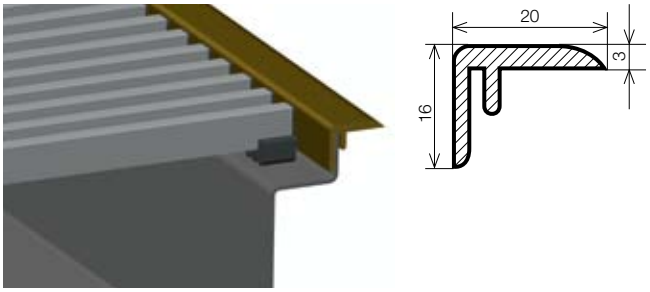
tolerance +0-1,5 mm

Profiles of the aluminium frames

U frame

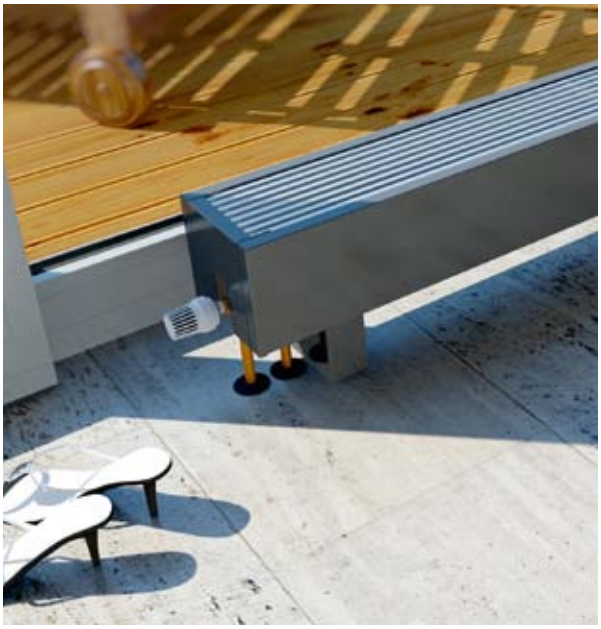


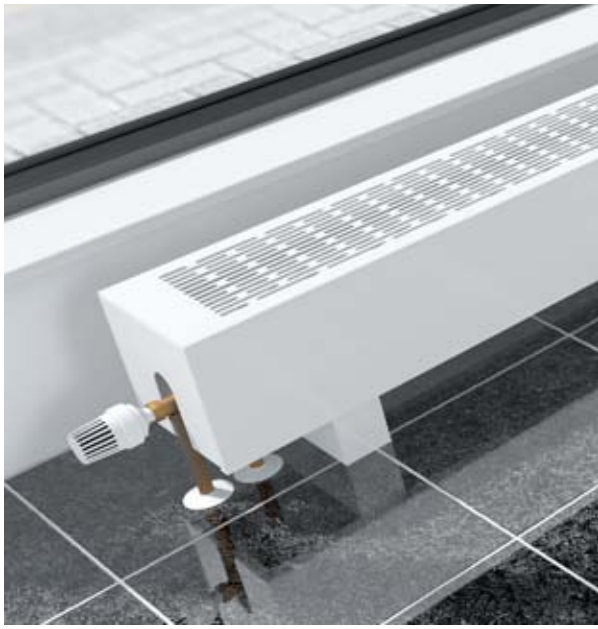
F frame



The sketches dimensions are given in mm.

The convectors are fitted as standard with the silver U profile; when frame F is ordered it is enclosed with the delivery loose.
Colour finishes of the decorative frames match the colour finishes of the aluminium grids see page 19.

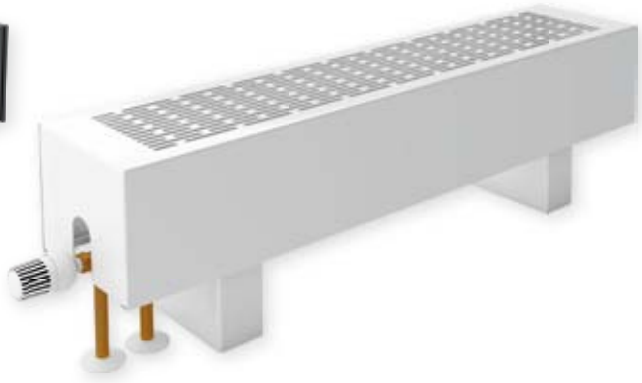




Licon OL • OLB
Licon OLE

FREE STANDING CONVECTOR
natural convection

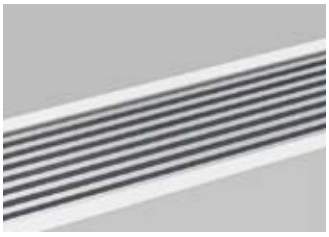
Do you like large glass surfaces or are the interior window sills low and combined with some glass surfaces? Use subtle and graceful shapes of the free standing convector. The design will let the windows stand out and provide a great view from the interior. Outstanding technical parameters ensure excellent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



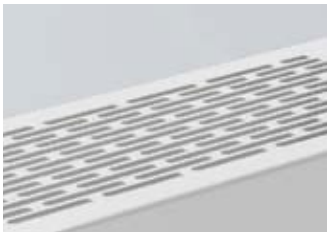
Free-standing convectors with natural convection Licon OL • OLB • OLE

Grouping of the free-standing convectors

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



Version OL, OLB



Version OLE

Standard delivery contains

- sheathing of zinc galvanised steel sheet coated in shade RAL 9010 – white
- unpainted aluminium breathing grid, silver on OL and OLB. On OLE embossed in the free-standing convector 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 clean floor, see sketch on page 28
- the unit is packed in a durable packaging and contains an installation manual

Licon OL PLAN

Design version PLAN with completely flat front panel is available up to the height of 30 cm (only OL and OLB).

Specification

casing element height *(mm)*	90, 150, 300, 450, 600
widths *(mm)*	180, 240
lengths *(mm)*	800, 1 000, 1 200, 1 400, 1 600, 1 800, 2 000, 2 200, 2 400, 2 600, 2 800, 3 000
outputs *(W)*	from 473 to 4 733
max. working pressure *(MPa)*	1.2
max. working temperature	110 °C
max. surface temperature	40 °C
connecting thread	inner G 1/2"
connection method	recommend bottom connection, side

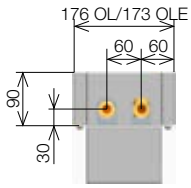
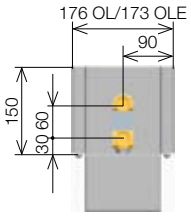
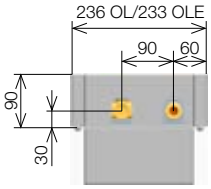
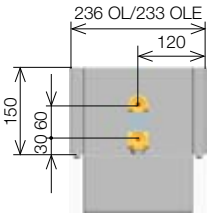
Version Exclusive (OL) • zinc galvanised steel sheet coated in colour shade RAL 9010 with aluminium anodized grid without surface finish
Version InPool (OLB) • chemical proof stainless steel AISI 316 for humid environment coated in RAL 9010 with with aluminium anodized grid without surface finish
Version Economic (OLE) • zinc galvanised steel sheet coated in colour shade RAL 9010 with an embossed grid, which is part of the sheating

Optional specification

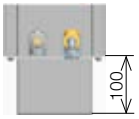
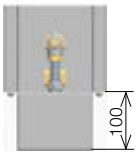
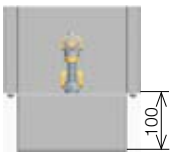
- set for bottom connection comprising the thermostatic valve and the thermostatic head Licon/Danfoss including extension pieces, see page 29
- stands on rugh floor or wall suspending consoles, see sketch on page 28
- if more than 5 pieces are ordered another colour shade can be chosen according to RAL scale (the change must be consulted with the manufacturer)
- pool design suitable for humid environment e.g. swimming pools areas
- pool design OLB – 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 70

Elements' sections

Side connection

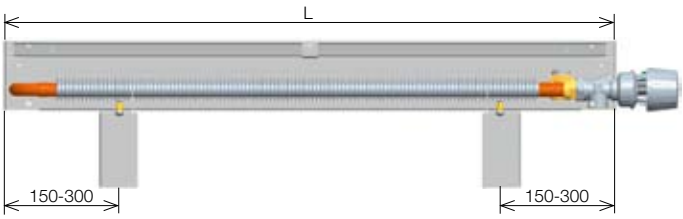
width	18 cm	18 cm	24 cm	24 cm
height	9 cm	15 cm	9 cm	15 cm
				

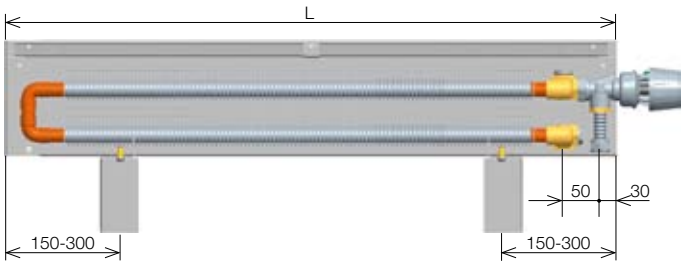
Bottom connection

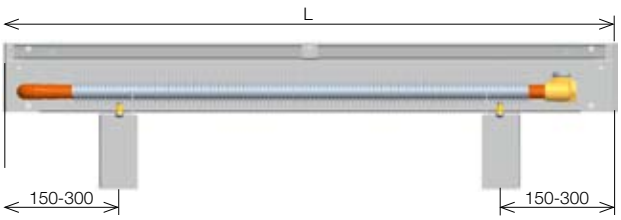
width	18 cm	18 cm	24 cm	24 cm
height	9 cm	15 cm	9 cm	15 cm
				

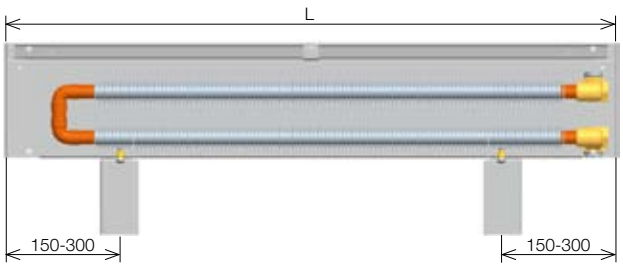
Height without stands. OL and OLE mounted convectors are produced for versatile side/bottom connection. The connection type can be selected on site during installation. In the case of bottom connection the manufacturer recommends you to use a set that contains a LICON/Danfoss thermostatic valve and thermostatic 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 to 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 OL with stands on clean floor









OL and OLE mounted convectors are supplied with stands on clean floor as standard. Another possibility of anchoring to the building structure is the use of stands on rough floor or the use of wall consoles (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.

Heating outputs

Heat outputs (W) at tw1/tw2/ti = at 75/65/20 °C (Δt=50) and 65/55/20 °C (Δt=40) / 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	473	596	720	845	969	1093	1217	1342	1466	1590	1714	1838
		Δt 40	349	440	531	623	715	806	898	990	1081	1172	1264	1356
	24	Δt 50	845	1096	1347	1598	1849	2100	2351	2603	2853	3104	3356	3607
		Δt 40	624	808	993	1179	1364	1549	1734	1920	2104	2290	2475	2661
Height 15	18	Δt 50	589	743	897	1052	1207	1362	1517	1671	1826	1980	2135	2290
		Δt 40	434	548	662	776	890	1004	1119	1233	1347	1460	1575	1689
	24	Δt 50	1105	1433	1760	2089	2417	2745	3074	3402	3730	4058	4387	4715
		Δt 40	815	1057	1298	1541	1783	2025	2267	2509	2751	2993	3236	3478
Height 30	18	Δt 50	781	985	1191	1396	1601	1807	2012					
		Δt 40	576	727	878	1030	1181	1333	1484					
	24	Δt 50	1370	1777	2183	2590	2998	3404	3811					
		Δt 40	1011	1310	1610	1911	2211	2511	2811					
Height 45	18	Δt 50	824	1040	1256	1473	1690	1906	2123					
		Δt 40	608	767	927	1086	1246	1406	1566					
	24	Δt 50	1547	2006	2465	2924	3384	3843	4303					
		Δt 40	1141	1480	1818	2157	2496	2835	3174					
Height 60	18	Δt 50	942	1188	1436	1683	1931	2179	2426					
		Δt 40	695	876	1059	1242	1424	1607	1790					
	24	Δt 50	1702	2207	2711	3217	3723	4227	4733					
		Δt 40	1255	1628	2000	2373	2746	3118	3491					

- The free-standing convectors OLE are made only in heights of 9, 15 and 30 cm and the 18 and 24 cm widths

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

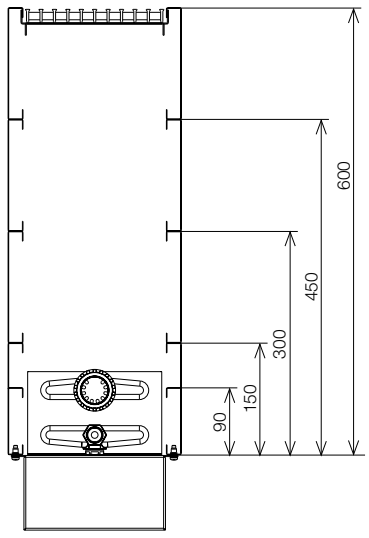
Δt (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
kt	0.265	0.284	0.304	0.324	0.344	0.364	0.385	0.406	0.427	0.449	0.471	0.493	0.515	0.537	0.560	0.583
Δt (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
kt	0.606	0.629	0.652	0.676	0.700	0.724	0.748	0.773	0.797	0.822	0.847	0.872	0.897	0.923	0.948	0.974
Δt (K)	50	51	52	53	54	55	56	57	58	59	60					
kt	1.000	1.027	1.055	1.083	1.111	1.139	1.167	1.196	1.224	1.253	1.282					

- temperature exponent m = 1.3

See the formula and example of conversion to a variant temperature difference on page 89.

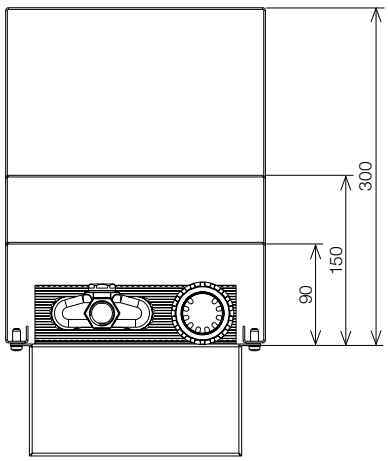
Heights of the free-standing convectors Licon

Licon OL



Licon OLE

(maximum height 300 mm)



Free-standing convectors installation
Licon OL • OLB • OLE

Installation instructions

OL stand models

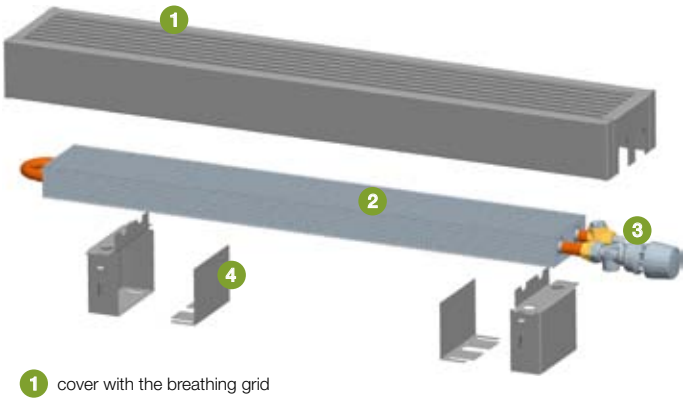
a) wall-mounted – attachment to the wall. Recommended positioning 10 cm above the clean floor. The delivered consoles (2 pieces) allow a height and length tolerance of approx. 2 cm. The mounting spacings are indicated on the sketch.

b) stand type – attachment to the floor. Stands on rough and clean floor can be chosen. The rough floor 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 consoles or stands. The heat exchanger is then positioned and connected to the heating system. Finally, the cover with the breathing grid is put on and screwed onto the consoles or the stands. The OL and OLB grids are removable for easy cleaning. More detailed information is available in the installation instructions. The elements are supplied assembled.

Free-standing convectors assembly



1. cover with the breathing grid
2. Al/Cu heat exchanger
3. Thermostatic head + valve
4. stand + stand cover

Mounting location

Floor anchoring diagram

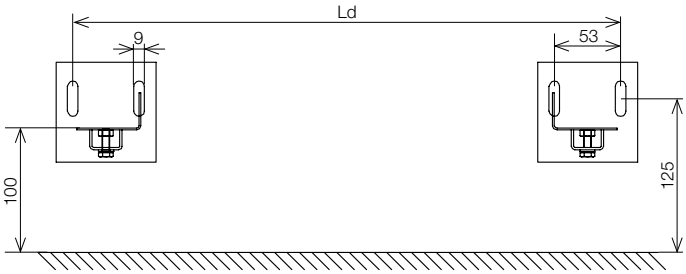
L = Convector length

Ld = L – 300 mm (up to the convector length of 1400 mm)

Ld = L – 400 mm (up to the convector length of 2 000 mm)

Ld = L – 600 mm (above the convector length of 2000 mm)

Wall anchoring diagram



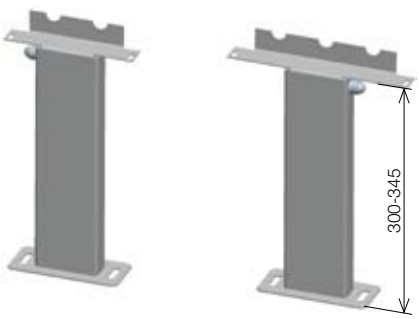
L = Convector length

Ld = L – 247 mm (up to the convector length of 1 400 mm)

Ld = L – 347 mm (up to the convector length of 2 000 mm)

Ld = L – 547 mm (above the convector length of 2000 mm)

Overview of stands and consoles for OL attachment

width 18 cm	width 24 cm	width 18 cm	width 24 cm	width 18 cm	width 24 cm
					
wall-mounted console		clean floor stand *		rough floor stand	

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

** part of supply*

Contents of the set for connection of OL • OLB • OLE
Kv values for the Licon/Danfoss RA-N 15 UK 1/2" valve

RA-N 15 valve

- thermostatic valve Licon/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

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 OL.

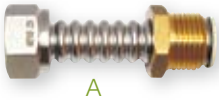
Note: The connecting set elements are packed as a complete set and cannot be supplied separately.

Thermostatic head

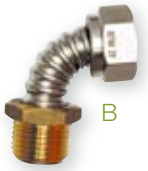
- thermostatic gas-steam head Licon/Danfoss RA 2980
- the fastest response time
- anti-theft lock
- temperature setting limiting / blocking pins

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 OL 15 cm and more)
- B angled piece for single-row exchangers (height OL 9 cm)



A



B

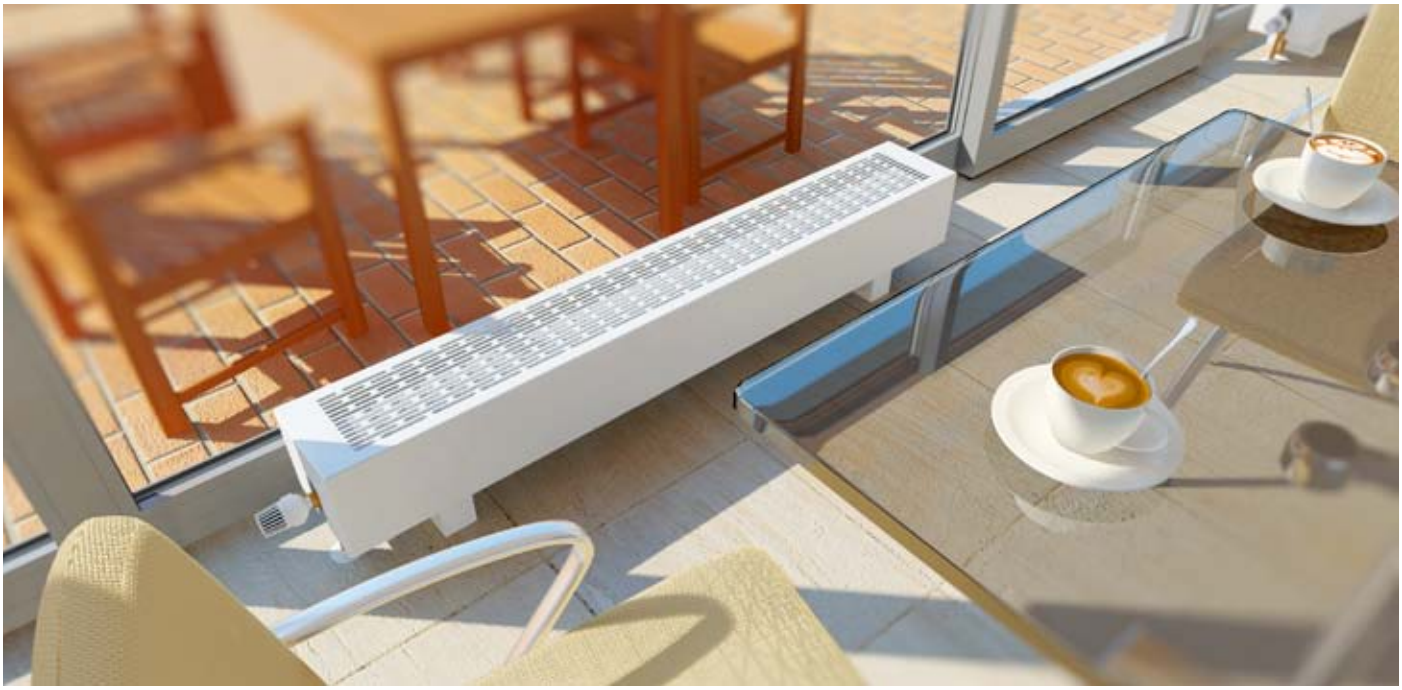
Ordering codes
Free-standing convectors OL • OLB • OLE

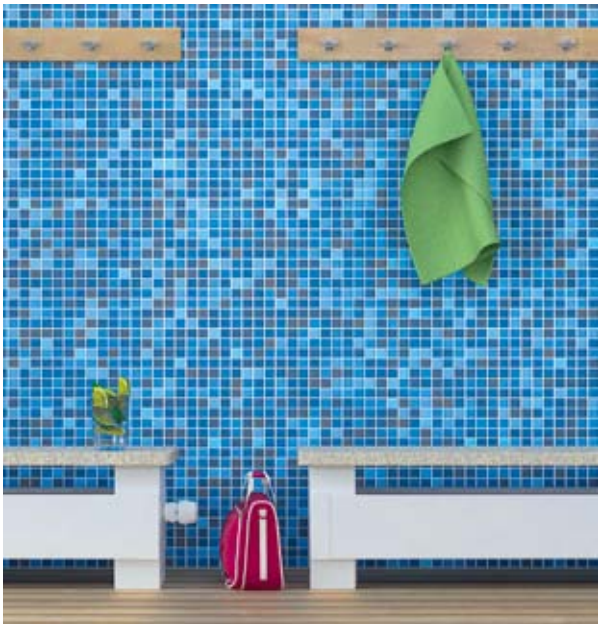
			length		height		width
Exclusive	white steel/unpainted exchanger	OL	- ...	/	...	/	..
InPool	stainless steel for humid environment white/unpainted exchanger *	OLB	- ...	/	...	/	..
Economic	white steel/unpainted exchanger	OLE	- ...	/	...	/	..

** custom-made design*

Free-standing convectors Licon OL
Free-standing pool convectors Licon OLB
Free-standing convectors Licon OLE

sheathing finish
PLAN of one sheet steel sheet (only for OL, OLB heights 30, 45, 60 cm)





Licon OL/D
Licon OLB/D

HEATING BENCHES WITH DESK
natural convection

For heating and rest? Yes. Just sit back, rest, relax or just wait. For benches with top desk made of solid oak, beech or of artificial stone a load is no problem. Proven clever combination of design, performance and utility features will be appreciated in the implementation of residential development and public spaces.

Natural convection heating benches with desk Licon OL/D • OLB/D

Convector Licon OL/D was designed for premises intended for relaxation. The bench is fitted with a co-vering desk that can withstand static load without problems and is also suitable to sit on. Attention, the covering desk must be ordered separately. The desks are positioned on the convector and fixed to the convector structure. The Licon OL/D convector can be installed for example in halls or winter gardens. For use in pool areas we recommend the order is placed for complete stainless steel finish – so called pool adaptation.

- natural convection convectors
- wide range of types and designs offered
- easy to clean and maintain

Specification

bench element height *(mm)*	290
widths *(mm)*	260
lengths *(mm)*	1 000, 1 200, 1 400, 1 600, 1 800, 2 000
length of bench with desk *(mm)*	1 060, 1 260, 1 460, 1 660, 1 860, 2 060
outputs *(W)*	from 1369 to 2 902
max. working pressure *(MPa)*	1.2
max. working temperature	110 °C
max. surface temperature	40 °C
connecting thread	inner G 1/2"
connection method	recommended bottom connection, side
design of the covering desk	stone imitation (Terrazzo); wood - beech, oak

Version Economic (OL/D) • steel sheet plating, coated in colour shade RAL 9010 – white
Version InPool (OLB/D) • steel sheet plating, stainless steel AISI 316 coated in colour shade RAL 9010 – white, suitable for humid environment

Standard delivery contains

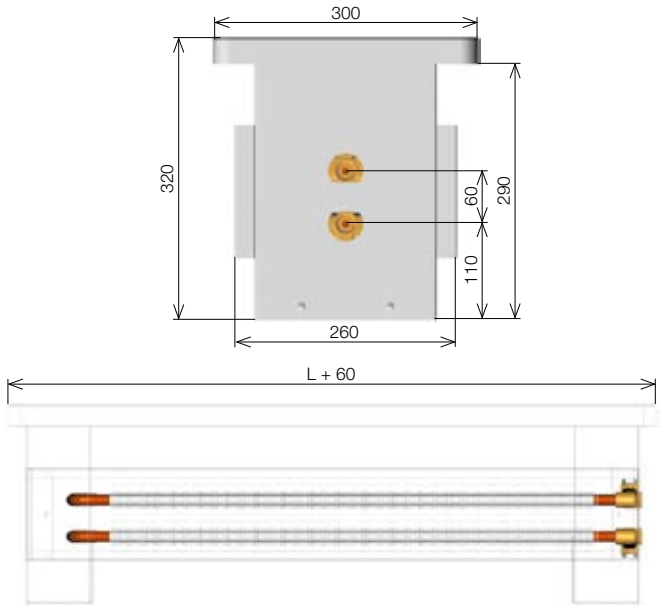
- steel sheet plating. coated in colour shade RAL 9010 – white
- Al/Cu heat exchanger with low water content, air vent and uniquely shaped lamellas for higher heat output
- the set is packed in durable packaging and contains installation instructions

Selectable specification

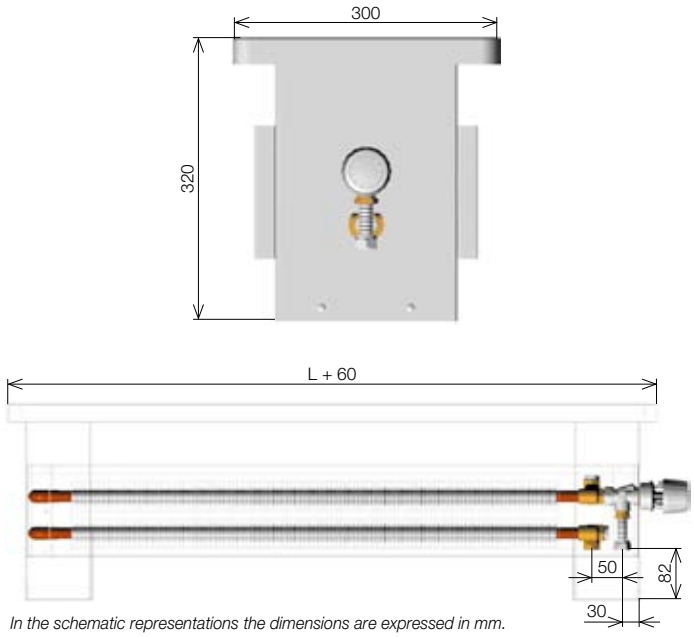
- set for the bottom connection comprising the thermostatic valve and the thermostatic head Licon/Danfoss including an extension piece, see page 33
- covering desk – Terazzo stone imitation, beech, oak wood
- if more that 5 pieces are ordered, another colour shade may be ordered according to the RAL scale (the change must be consulted with the manufacturer)
- stainless steel design suitable for humid environments such as swimming pools, for which the radiator is made of stainless steel AISI 316 and coated in colour shade RAL 9010
- in pool areas the bench must be fitted with stone desk (Terrazzo)

Elements' sections

Side connection



Bottom connection



In the schematic representations the dimensions are expressed in mm.

Heating outputs

Heat outputs (W) at tw1/tw2/ti = at 75/65/20 °C (Δt=50) and 65/55/20 °C (Δt=40) / EN 442

Height *(cm)*	Width *(cm)*	Δt	Length L *(cm)*					
			100	120	140	160	180	200
32	26	Δt 50	1369	1675	1982	2289	2596	2902
		Δt 40	1009	1236	1462	1688	1915	2140

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

See the formula and example of conversion to a variant temperature difference on page 89.

Weights and volumes of water of the heating benches and desks

Sheathing

Type	100
kg/linear meter	11.9
l/1 linear meter	1.6

Desk

Type	Terrazzo	wood
kg/linear meter	27	8

The listed weights are without a packaging.

Cover desk design versions


terrazzo


oak


beech

Caution: There is a rule for Terrazzo desk that for the dimensions of OL/D benches of 140, 160, 180 and 200 cm two shorter desks per bench are used for reasons of weight and dimensions. The desks 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. The desks are blocked against movement.

Heating benches installation Licon OL/D • OLB/D

Installation practice

We recommend to fix the element to the floor using a fastening anchor that is inside the side desk (leg). Once positioned on the convector the desks are fixed on sides against unwanted movement. You will find more detailed information in the installation instructions. The elements are supplied assembled.

OLB/D

Convectors intended for use at pools must be kept clean and regularly washed with clean water. It is also necessary to fit the pool area benches with stone desks (Terrazzo) only. More about the service and warranty conditions on www.licon.cz in the download section.

Elements connection set content Kv values for the Licon/Danfoss RA-N 15 UK 1/2" valve

RA-N 15 valve

- thermostatic valve Licon/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

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

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

Thermostatic head

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

Extension piece

- used for height compensation between the input and output of the heat exchanger screw union
- stainless-steel design
- connection thread G 1/2" inner
- straight piece for two-row exchangers OL/D

Ordering codes Heating benches OL/D • OLB/D

		Licon OL/D bench convector with desk Licon OLB/D pool bench convector with desk	length			
Economic	white steel/unpainted exchanger	OL	-	...	/	D
InPool	stainless steel* white/unpainted exchanger **	OLB	-	...	/	D

** humid environment stainless steel AISI 316*
*** custom-made design*

ORDERING CODE: OL/D length (cm), event. desk for OL/D length (cm) – terrazzo, beech, oak.
Example: OL/D 160 = Licon OL/D convector bench, length 160 cm.
The plate must be ordered separately! The standard version enables side or bottom connection to the heating system; there is no need to specify this in the order.

Licon OKN • OKNB

NEW DESIGN

WALL-MOUNTED CONVECTORS
natural convection

Apart from its design the wall-mounted convectors also offer many other advantages: efficient operation, higher performance at smaller dimensions, faster onset of heat. You won't burn yourself with our convectors! Surface max. temperature is 40 °C and the heat is transferred to the space of the room, and not into the wall :-). PLAN – design solution of wall-mounted convector with complete straight front plate.

Wall-mounted convectors with natural convection
Licon OKN • OKNB

The wall-mounted convectors Licon OKN are standard wall-mounted convectors with a long history, used in households as well as in commercial premises. The modern design, easy mounting and economical operation are the reasons why they are so popular with our customers. With regard to the unique design of the heat exchanger used they achieve higher outputs even at small dimensions of the element. The great advantage of the wall-mounted convectors OKN is their very low surface temperature of 40 °C and no heat dissipation into the wall.

Wall-mounted convectors' grouping

- OKN
- OKNB (InPool) – element intended for humid environment
- OKN PLAN – element with complete straight front wall

Standard delivery contains

- sheathing of zinc galvanised steel sheet 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
- version with the bottom or side connection (according to the code in the order), the exchanger is fitted with an air vent
- set for suspension of the element on the wall containing dowels, screws and suspension brackets
- the set is packed in durable packaging and contains installation instructions

Specification

depth *(mm)*	60, 120
height *(mm)*	450, 600
lengths *(mm)*	4 00, 6 00, 8 00, 1 000, 1 200, 1 400, 1 600, 1 800, 2 000
outputs *(W)*	from 266 to 2 598
max. working pressure *(MPa)*	1.2
max. working temperature	110 °C
max. surface temperature	40 °C
connecting thread	inner G 1/2"
connection method	recommended bottom connection, side

Version Economic (OKN) • sheathing of zinc galvanised steel sheet coated in shade RAL 9010
Version InPool (OKNB) • sheathing made of stainless steel AISI 316 and coated with RAL 9010 colour; intended for humid environment

Selectable specification

- in case of ordering more than 5 pieces it is possible to choose another colour shade finish according to the RAL scale (the manufacturer must be consulted about the change)
- all-stainless steel design suitable for humid environments such as swimming pools, stainless steel AISI 316 coated in white colour shade RAL 9010
- in case of low temperature gradient or lack of performance the OKIOC unit can be used, which is fitted with forced convection, see page 76

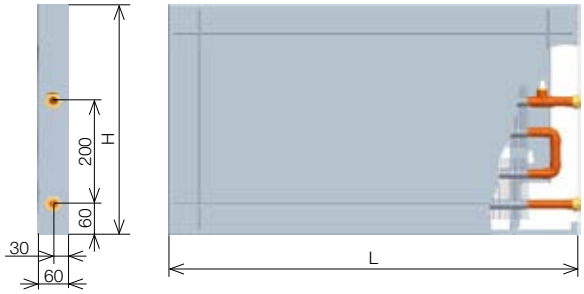
Design version
Licon OKN PLAN

PLAN with an absolutely straight front plate.

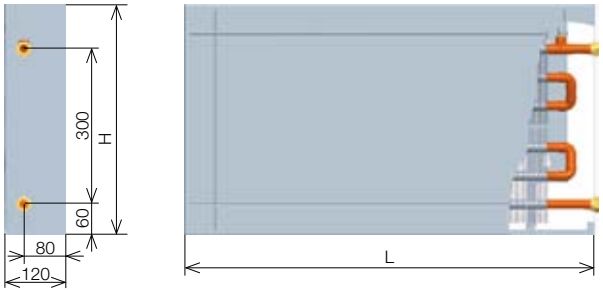
Elements' sections

Side connection

Depth 6 cm

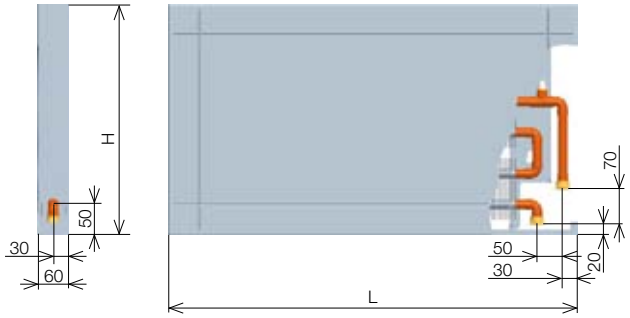


Depth 12 cm

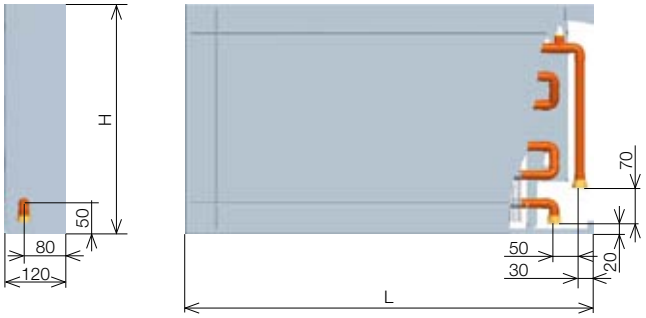


Bottom connection

Depth 6 cm



Depth 12 cm



OKN is available in right or left version. The connecting side must be indicated in the order. In the schematic representations the dimensions are expressed in mm.

Heating outputs

Heat outputs (W) at tw1/tw2/ti = at 75/65/20 °C (Δt=50) and 65/55/20 °C (Δt=40) / EN 442

Depth *(cm)*		Δt	Length L *(cm)*								
			40	60	80	100	120	140	160	180	200
Height 45	6	Δt 50	266	400	533	665	799	933	1065	1199	1332
		Δt 40	199	299	399	498	598	698	797	897	997
	12	Δt 50	449	675	902	1127	1354	1578	1804	2030	2258
		Δt 40	336	505	675	843	1013	1181	1350	1519	1690
Height 60	6	Δt 50	291	436	582	727	873	1018	1159	1304	1450
		Δt 40	218	327	435	544	653	762	867	976	1085
	12	Δt 50	519	779	1039	1298	1558	1818	2078	2338	2598
		Δt 40	388	583	777	972	1166	1360	1555	1749	1944

• temperature exponent m = 1.3

Design solutions

The wall-mounted heating elements OKN, OKNB have on their front face a significant design element, which consists of one design section in the lengths from 40 to 120 cm, two sections in the lengths from 140 to 180 cm and three sections in the length of 200 cm.

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

See the formula and example of conversion to a variant temperature difference on page 89.

Weights and water volumes of wall-mounted convectors

OKNB pool version

Convectors intended for use at pools must be kept clean and regularly washed with clean water. More about the service and warranty conditions on www.licon.cz in the download section.

Type	45/6	45/12	60/6	60/12
kg/linear meter	15	16	18	19
l/1 linear meter	1	1,5	1	1,5

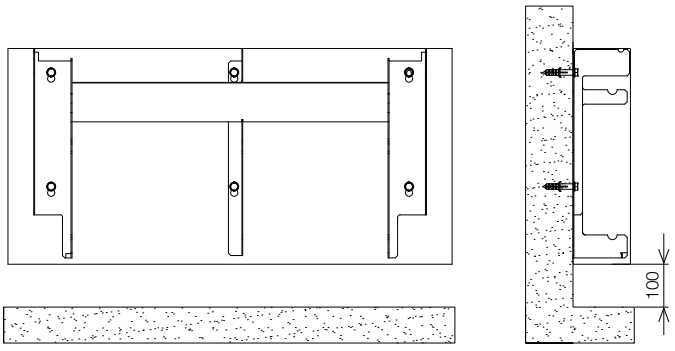
The listed weights are without a packaging.

Installation of convectors Licon OKN • OKNB

Installation instructions

It is recommended to always position the wall-mounted heating element on a peripheral wall, 10 cm above the floor. Elements are suspended on the wall with the use of dowels and screws included in the packaging. See the sketch of element anchorage for the method of suspension on the wall. The elements are supplied assembled.

Anchoring diagram



Ordering codes Wall-mounted convectors OKN • OKNB

				length		height		width		Sheathing finish PLAN of one piece no design
Economic	steel/unpainted exchanger	OKN	-	...	/	...	/	..	-	SP
InPool	stainless steel for humid environment white/ unpainted exchanger *	OKNB	-	...	/	...	/	..	-	SP

* *custom-made design*

Wall-mounted convectors Licon OKN
Wall-mounted convectors Licon OKN

Water inlet
SP bottom, right
SL bottom, left
BP side, right
BL side, left

ORDERING CODE: OKN length/height/depth (in cm) connection (B-side, S-bottom) connection side (L-left, P-right) PLAN version (PLAN) Example: OKN 140/60/9 SP = OKN convector element, length 140 cm, height 60 cm, depth 6 cm, bottom connection on the right side

Licon FK

FACADE CONVECTORS
natural convection

Facade convectors are ideal and effective solution for installations in buildings will large glass walls, where the transmission of cold in winter season considerably affect the interior microclimate. Novelty in the heat loss solution will enable the architects and designers to realize their ideas in the design and operation of the entire building, including heating.

Facade convectors with natural convection
Licon FK • FKB

The facade convectors Licon FK by its direct location on the facade prevent penetration of the cold air into the interior space. The warm air rising from the convectors mixes with the cold air and creates a thermal screen, which provides greater thermal comfort of the indoor space and prevents condensation forming on the glass surface.

- design freedom
- high-perfomance Al/Cu heat exchangers
- excellent controllability and fast heating start-up
- without heat transfer to the external facade
- additional space for placement of other through-running distribution

Standard delivery contains

- sheathing of RAL 9007 coated zinc galvanised steel
- heat exchanger with low water content and uniquely shaped lamellas air vent
- connecting material
- the set is packed in durable packaging and contains installation instructions

Specification

widths *(mm)*	120, 150, 180
depth *(mm)*	56
lengths *(mm)*	800 - 3 000, in 200 steps
max. working pressure *(MPa)*	1.2
max. working temperature	110 °C
connecting thread	inner G 1/2"

Version Economic • grey coated sheathing (RAL 9007) and unpainted exchanger
Version Exclusive • grey coated sheathing (RAL 9007) and coated exchanger (RAL 9007)
Version InPool • sheathing of the stainless steel AISI 316 and unpainted exchanger

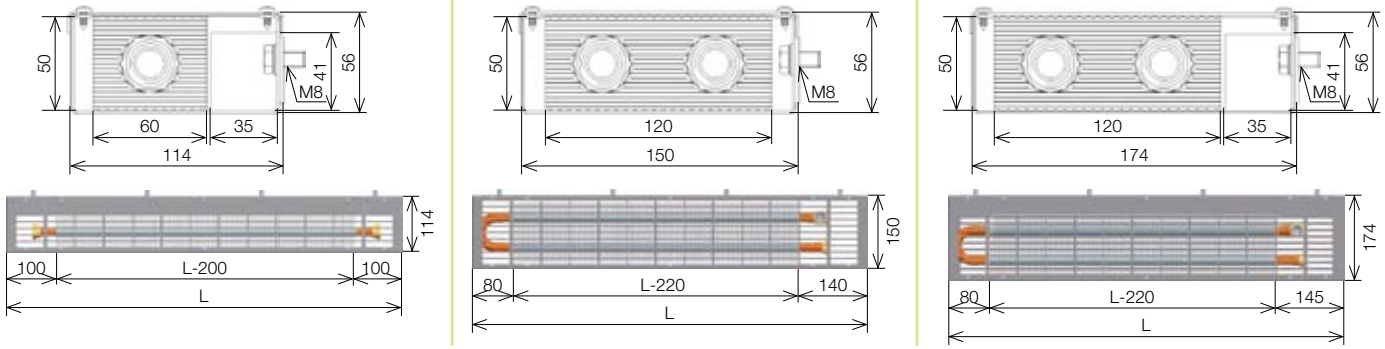
Selectable specification

- version Exclusive or InPool (using stainless steel AISI 316)
- coated heat exchanger
- different colour finish of the sheathing (according to RAL scale)
- if more that 5 pieces are ordered, another colour shade may be ordered according to the RAL scale (the change must be consulted with the manufacturer)

Elements' sections

Overview of manufactured types

FK- xxx/6/12 – J1	FK- xxx/6/15–J2	FK- xxx/6/18–J2
depth 5,3 cm	depth 5,6 cm	depth 5,6 cm
width 11,4 cm	width 15 cm	width 17,4 cm
with optional integrated piping run	without integrated piping run	with optional integrated piping run



Heat outputs

Heat outputs (W) at tw1/tw2/ti = at 75/65/20 °C (Δt=50) and 65/55/20 °C (Δt=40) / EN 442

Height *(cm)*	Width *(cm)*	Δt	Length L *(cm)*											
			80	100	120	140	160	180	200	220	240	260	280	300
Height 6	12	Δt 50	154	202	251	300	349	397	446	495	543	592	641	690
		Δt 40	115	151	188	224	261	297	334	370	407	443	480	516
Height 6	15	Δt 50	305	401	498	595	692	788	885	982	1078	1175	1272	1369
		Δt 40	228	300	373	445	517	590	662	735	807	879	952	1024
Height 6	18	Δt 50	305	401	498	595	692	788	885	982	1078	1175	1272	1369
		Δt 40	228	300	373	445	517	590	662	735	807	879	952	1024

Performances of the widths of 15 and 18 are the same due to using the same exchanger OR-J2. In addition the width of 18 comprises space for piping.

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

See the formula and example of conversion to a variant temperature difference on page 89.

Weights and water volumes of wall-mounted convectors

Type	6/12	6/15	6/18
kg/linear meter	3,9	4,8	5,3
l/1 linear meter	0,2	0,42	0,42

The listed weights are without a packaging.

Facade convectors installation
Licon FK • FKB

Installation on horizontal crosspiece, between vertical supports

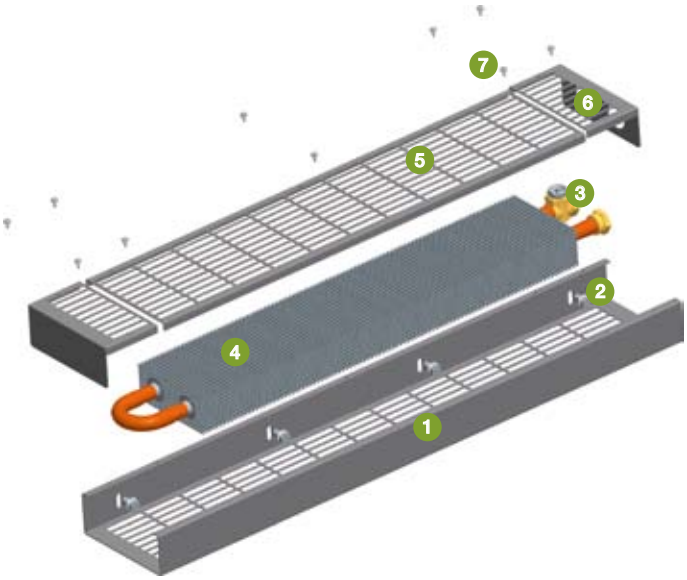
Installation on vertical support

Facade convectors installation technique

Main load bearing U shape part is fixed to the facade's carrying elements. Then the heat exchanger is inserted and connected to the heating system. Last step consists of positioning the top part and screwing of all parts together. Subject to agreement it is possible to make design modifications for the particular installation.

Convector FK assembly

1. carrier part
2. M8 fastening screw with washer
3. air vent
4. heat exchanger
5. top cover part
6. end part
7. screw (DIN 7981)



Ordering codes
Facade convectors FK • FKB

				length		height		width		On facade installation technique	Exchanger material
Economic	grey steel/unpainted exchanger	FK	-	...	/	...	/	..	-	1	A	1
Exclusive	grey steel/grey coated exchanger *	FK	-	...	/	...	/	..	-	1	A	5
InPool	grey coated stainless steel for humid environment/unpainted exchanger *	FKB	-	...	/	...	/	..	-	3	A	1

** custom-made design*

Facade convectors Licon FK
Facade pool convectors Licon FKB

Sheathing material
1 steel, grey coat RAL 9007
3 stainless steel (for humid environment), grey coat RAL 9007 *

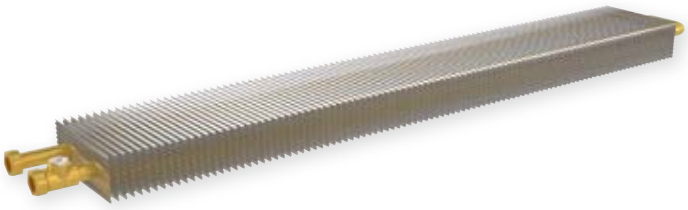
On facade installation technique
A on horizontal crosspiece, between vertical supports
B on vertical support

Exchanger material
1 unpainted
5 coated

Licon OR

HEAT EXCHANGERS

The heart of the convectors is the heat exchanger. However, its application is much wider. Imagine that you would like your heating elements to completely blend with the interior. Build your exchangers into materials, the entire interior of which is compactly created, and into places where you want to have them. A real design solution that will fulfil even the most exacting notions of preserving the interior design.



Al/Cu heat exchanger with low water content
Licon OR

It is suitable for individual installation, especially in places where compactness of interior is required in terms of materials used. If certain conditions are adhered to, the Licon OR heating exchangers can be covered with almost any material to integrate them unobstrusively into the space. The exchanger is made of copper pipes and aluminium lamellas.

Standard delivery contains

- Al/Cu heat exchanger with low water content, air vent and uniquely shaped lamellas for a higher heat output
- radiator mounting instructions
- the set is packed in strong PVC foil and protectors on edges

Specification

widths *(mm)*	60, 120, 180
height *(mm)*	50, 110
lengths *(mm)*	800 up to 3 000 (at 200 mm steps)
max. working pressure *(MPa)*	1.2
max. working temperature	110 °C
connecting thread	inner G 1/2"
outputs	by the exchanger covering height, see the output and correction factors tables for a variant case height

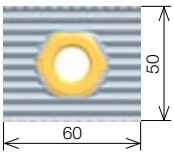
Version Economic • exchanger with no surface finishes
Version Exclusive • black coat

Selectable specification

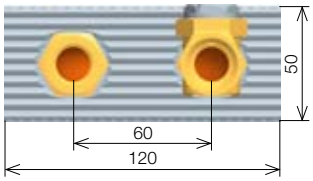
- version Exclusive
- stands and / or consoles to fit the exchanger on, see page 45

Elements' sections

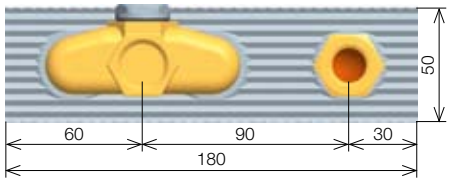
OR-J1



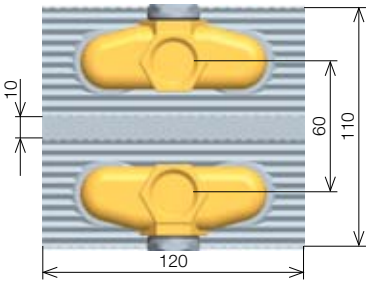
OR-J2



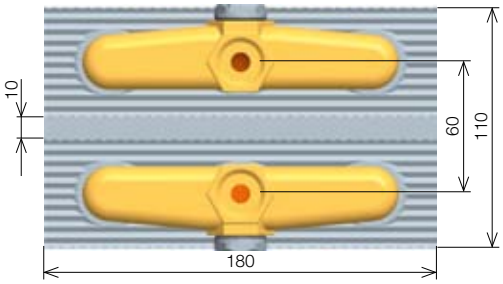
OR-J3



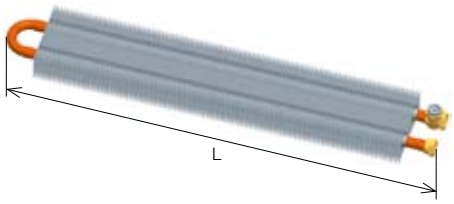
OR-D2



OR-D3



Total length of the exchanger



The dimensions are given in mm

Heat outputs

Heat outputs (W) at tw1/tw2/ti = at 75/65/20 °C (Δt=50) and 65/55/20 °C (Δt=40) / EN 442

OR type	Δt	Length L *(cm)*											
		80	100	120	140	160	180	200	220	240	260	280	300
OR-J1	Δt 50	269	344	419	494	568	643	718	793	868	942	1017	1092
	Δt 40	201	257	313	369	425	481	537	593	649	705	761	817
OR-J2	Δt 50	542	697	851	1006	1161	1316	1471	1625	1780	1935	2090	2245
	Δt 40	405	521	637	753	869	984	1100	1216	1332	1448	1564	1679
OR-J3	Δt 50	685	890	1095	1299	1504	1708	1913	2118	2322	2527	2731	2936
	Δt 40	513	666	819	972	1125	1278	1431	1584	1737	1891	2044	2197
OR-D2	Δt 50	636	824	1011	1198	1385	1572	1760	1947	2134	2321	2508	2696
	Δt 40	476	616	756	896	1036	1177	1317	1457	1597	1737	1877	2017
OR-D3	Δt 50	948	1227	1506	1784	2063	2342	2621	2900	3178	3457	3736	4015
	Δt 40	709	918	1126	1335	1544	1752	1961	2169	2378	2587	2795	3004

The stated heat outputs apply to the height of 10 cm above the floor and the cover height of 20 cm from the bottom edge of the lamellas.

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

See the formula and example of conversion to a variant temperature difference on page 89.

Weights and volumes of water of the heating benches

Type	J1	J2	J3	J4	D2	D3	D4
kg/linear meter	0,74	1,47	2,23	2,8	3,04	4,56	5,41
l/1 linear meter	0,22	0,5	0,75	1	1	1,6	2

The listed weights are without a packaging.

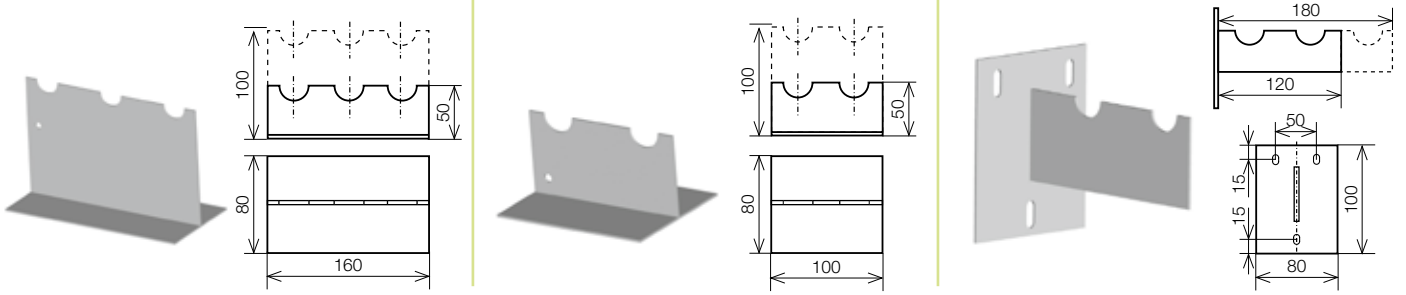
Licon OR exchangers installation

Installation instructions

For proper functioning ensure sufficient supply of air, adequately sealed convector case and the outlet grid must vent adequately (see fig. on page 18). We recommend the exchangers are installed 10 cm above the clean floor. We supply 2 types of brackets for this purpose. These could be of the floor mounting design (stand type) of 5 and 10 cm height, or of the wall-suspension design. The number of the exchanger's pipes determines the width of the bracket, see below. The brackets are not part of the supply.

Mounting location

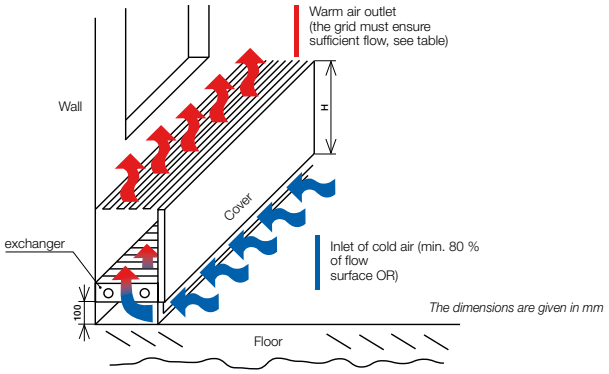
Floor mounting stands	Floor mounting stands	Wall mounting consoles
OR-J3, OR-D3	OR-J2, OR-D2	OR-J2, OR-D2, OR-J3, OR-D3
(supplied in black finish as standard)	(supplied in black finish as standard)	(supplied in white finish as standard)



The dimensions are given in mm

Correct installation

The heat output of the exchanger is dependent on several key conditions: the effective height of the cover, how well the cover (case) seals, the supply of the heated air and the size of the outlet grid's flow area (see fig.). In general, the higher the cover is positioned, the higher the heat output. The case of the convector and the adjacent building structures must be resistant to the rated temperatures of the heat-carrying media.



The dimensions are given in mm

Correction factor for a different case height H
Correction factor of the cover grid's flow surface

H (m)	0.125	0.150	0.200	0.250	0.300	0.350	0.400	0.450	0.500	0.550	0.600
kh	1.000	1.051	1.136	1.207	1.268	1.322	1.371	1.416	1.457	1.495	1.531

The case height H (m) is taken from the bottom edge of the heat exchanger lamellas. Example: Conversion of the heat output of the OR-J3/-180 exchanger to the output in a case 0.45 m high. Q = 1708 x 1.416 = 2419 W

% 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 it is not necessary to further recalculate them.

Odrering codes
Heat exchangers OR

Economic	unpainted exchanger OR-J1-x length	Economic	unpainted exchanger OR-D2-x length
Economic	unpainted exchanger OR-J2-x length	Economic	unpainted exchanger OR-D3-x length
Economic	unpainted exchanger OR-J3-x length	Exclusive	coated exchanger is the same for all OR types

ORDERING CODE:OR type/length (in cm), example: OR-J3-200 = Licon OR-J3 single-row three-pipe heat exchanger, length 200 cm

OPTIMIZED CONVECTION

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

Licon PKOC

Floor convectors
with forced convection

pages 49 - 55

PKBOC

Pool convectors
with forced convection

pages 56 - 58

Licon PKIOC

Floor convectors with forced
convection for heating or cooling

pages 59 - 62

PKWOC

Floor convectors with forced
convection for heating and cooling

pages 63 - 65

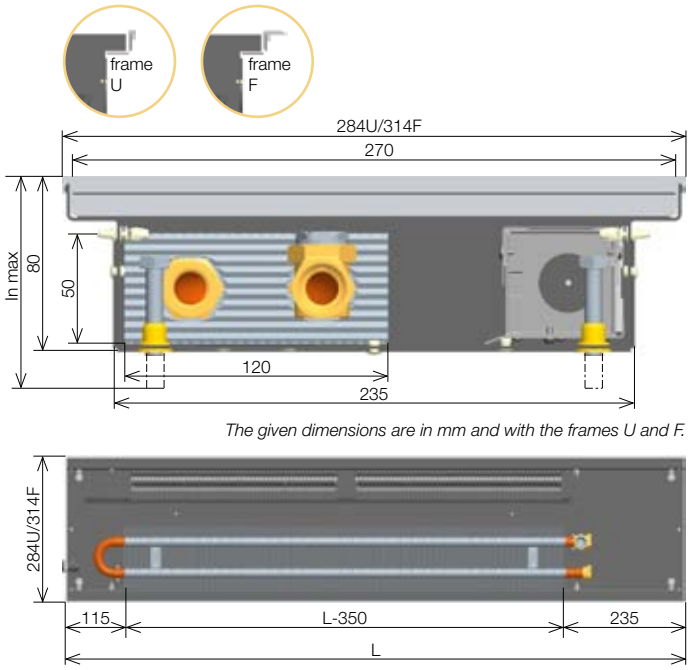
There are places with higher heat losses. Choose floor convectors Licon with forced convection and optimized convection in places where the efficiency must be increased while preserving the state of the art design.

- wide use possibilities
- convector increased heat efficiency
- cooling posibility
- very quiet operation
- energy saving fans with electric motor and minimal intake

OPTIMIZED CONVECTION

Floor convector with forced convection
Licon PKOC 7/28

- convector with the lowest construction height
- used for heating
- quietest operation at low speed
- possibility of control through BMS (Building Management System)
- can be ordered in Economic, Exclusive or Inox versions
- the convector is intended for dry environment



The given dimensions are in mm and with the frames U and F.

Specifications

width including the U/F type frame *(mm)*	284U/314F
floor case width *(mm)*	235
grid width *(mm)*	270
max. adjustable height *(V max. mm)*	80 - 107
case height *(mm)*	80
lengths *(L cm)*	800 - 2 800, with the step of 400
exchanger height *(mm)*	50
exchanger width *(mm)*	120
exchanger effective length *(mm)*	L - 350
fans impeller diameter *(mm)*	30
connection to the heating system	2 × G 1/2" inner
case material	galv. steel, stainless steel AISI 304

Version Economic • black coated galvanized steel, heat exchanger without any surface finishes
Version Exclusive • black coated steel case, black coated exchanger *
Inox version • stainless steel unpainted case AISI 304, unpainted exchanger (for dry environment only)*,
** custom design*

Specification

Width	cm	28																									
Depth	cm	7																									
Total length	cm	80				120				160				200				240				280					
Noisiness - sound pressure 1m	dB(A)	0	13.2	23	31.1	0	13.4	23.1	31.6	0	13.8	23.7	31.8	0	14.7	26	32.8	0	15	26.5	33	0	15.1	26.7	33.1		
Power input:	W/V	3 / 13.5				5.5 / 13.5				7.5 / 13.5				10 / 13.5				13 / 13.5				15 / 13.5					
Speed switch position		Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3		
Heat output	t1 °C	Heat output [W] / EN 442																									
90/70 °C	20	169	430	509	737	245	812	962	1392	281	1190	1415	2047	370	1576	1867	2703	436	1958	2320	3358	503	2340	2772	4013		
75/65 °C	18	144	366	434	628	209	692	820	1187	239	1015	1206	1745	316	1343	1591	2304	372	1669	1977	2862	428	1994	2363	3420		
	20	**138**	**351**	**415**	**601**	**200**	**662**	**785**	**1136**	**229**	**971**	**1154**	**1670**	**302**	**1285**	**1523**	**2204**	**356**	**1597**	**1892**	**2739**	**410**	**1909**	**2261**	**3273**		
	22	132	335	397	574	191	632	749	1084	219	927	1102	1595	288	1228	1454	2105	340	1525	1807	2616	392	1823	2160	3126		
70/55 °C	18	120	304	360	521	173	574	680	985	199	842	1001	1448	262	1114	1320	1911	309	1385	1640	2375	355	1655	1961	2838		
	20	114	289	342	495	165	545	646	935	188	799	950	1374	249	1058	1253	1814	293	1314	1557	2254	337	1571	1861	2694		
	22	108	273	324	469	156	516	612	886	179	757	900	1303	236	1003	1188	1719	278	1246	1476	2136	320	1489	1764	2553		
55/45 °C	18	84	213	253	366	122	403	477	690	139	590	702	1015	184	781	926	1340	216	971	1150	1665	249	1160	1375	1990		
	20	78	198	235	340	113	375	444	643	130	550	653	945	171	728	862	1248	201	904	1071	1550	232	1080	1280	1853		
	22	72	184	218	315	105	347	411	595	120	509	605	875	158	674	798	1155	187	837	991	1435	215	1000	1185	1715		
50/40 °C	18	69	176	209	302	101	333	395	571	115	488	580	840	152	647	766	1109	179	803	952	1378	206	960	1137	1646		
	20	64	162	191	277	92	305	362	524	106	448	532	770	139	593	702	1016	164	736	872	1263	189	880	1042	1509		
	22	58	147	174	253	84	278	330	477	96	408	485	701	127	540	640	926	150	671	795	1150	172	802	950	1375		
45/35 °C	18	55	140	166	240	80	265	314	454	92	388	462	668	121	514	609	882	142	639	757	1096	164	763	905	1309		
	20	50	126	150	216	72	238	282	409	82	350	415	601	109	463	548	794	128	575	681	986	148	687	814	1178		
	22	44	112	133	192	64	212	251	363	73	311	369	534	97	411	487	705	114	511	605	876	131	611	724	1047		

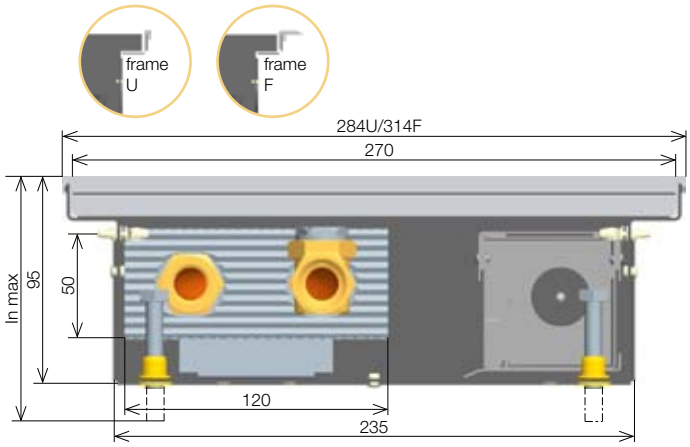
• temperature exponent m = 1.1159

Correction factor page 54 • Assembly page 68 • Regulation page 80 • Floor grids page 18

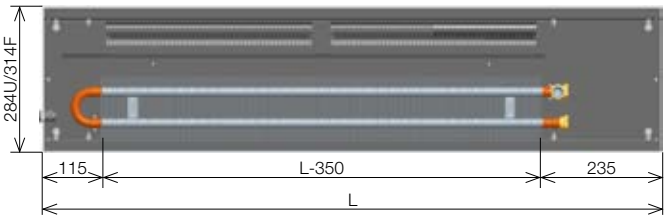
Floor convector with forced convection
Licon PKOC 9/28

OPTIMIZED CONVECTION

- used for heating
- heats with the fan off as well
- high heat output at a small construction depth
- possibility of control through BMS (Building Management System)
- can be ordered in Economic, Exclusive or Inox versions
- the convector is intended for dry environment



The given dimensions are in mm and with the frames U and F.



Specifications

width including the U/F type frame *(mm)*	284U/314F
floor case width *(mm)*	235
grid width *(mm)*	270
max. adjustable height *(V max. mm)*	95 - 122
case height *(mm)*	95
lengths *(L cm)*	800 - 2 800, with the step of 400
exchanger height *(mm)*	50
exchanger width *(mm)*	120
exchanger effective length *(mm)*	L - 350
fans impeller diameter *(mm)*	40
connection to the heating system	2 x G 1/2" inner
case material	galv. steel, stainless steel AISI 304

Version Economic • black coated galvanized steel, heat exchanger without any surface finishes
Version Exclusive • black coated steel case, black coated exchanger *
Inox version • stainless steel unpainted case AISI 304, unpainted exchanger (for dry environment only)*

** custom design*

Specification

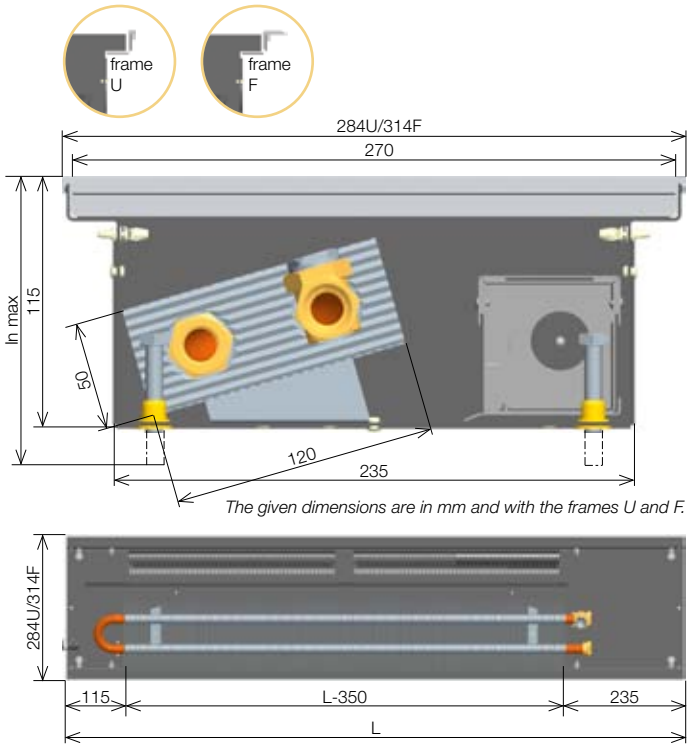
Width	cm	28																							
Depth	cm	9																							
Total length	cm	80				120				160				200				240				280			
Noisiness - sound pressure 1m	dB(A)	0	16.1	23.6	30.5	0	16.4	21.1	30.9	0	16.7	24.4	31.1	0	17.2	25	31.4	0	17.4	25.1	31.7	0	17.7	25.3	31.7
Power input:	W/V	5.5 / 13.5				11 / 13.5				12 / 13.5				20 / 13.5				22.5 / 13.5				23.5 / 13.5			
Speed switch position		Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3
Heat output	t1 °C	Heat output [W] / EN 442																							
90/70 °C	20	177	570	766	957	257	1077	1447	1807	321	1584	2128	2658	389	2091	2809	3508	457	2598	3490	4359	525	3105	4171	5209
75/65 °C	18	151	487	654	817	219	920	1236	1544	275	1353	1818	2271	332	1786	2400	2997	390	2219	2981	3724	449	2652	3563	4451
	20	**145**	**467**	**627**	**783**	**210**	**881**	**1184**	**1479**	**263**	**1296**	**1741**	**2175**	**318**	**1711**	**2298**	**2871**	**374**	**2126**	**2856**	**3567**	**430**	**2541**	**3413**	**4263**
	22	139	446	599	749	201	843	1132	1414	251	1239	1664	2079	304	1636	2197	2745	358	2032	2730	3410	411	2429	3263	4075
70/55 °C	18	126	406	545	680	182	766	1029	1285	229	1126	1513	1890	276	1487	1997	2495	325	1847	2482	3100	374	2208	2966	3705
	20	120	385	518	647	173	728	978	1222	217	1070	1438	1797	263	1413	1899	2371	309	1756	2359	2946	355	2099	2819	3521
	22	117	375	504	630	169	709	952	1189	211	1042	1400	1749	256	1376	1848	2308	301	1709	2296	2868	346	2043	2744	3427
55/45 °C	18	89	286	384	479	129	539	725	905	161	793	1065	1331	195	1047	1407	1757	229	1301	1748	2183	263	1555	2089	2609
	20	83	266	357	446	120	502	675	843	150	739	992	1240	181	975	1310	1636	213	1212	1628	2033	245	1448	1945	2430
	22	77	247	332	414	111	466	626	782	139	686	921	1151	168	905	1216	1519	198	1125	1511	1887	227	1344	1805	2255
50/40 °C	18	74	237	318	398	107	448	601	751	134	658	884	1105	162	869	1168	1458	190	1080	1451	1812	218	1291	1734	2166
	20	68	218	293	366	98	412	553	691	123	605	813	1016	149	799	1073	1341	175	993	1334	1666	201	1186	1594	1991
	22	62	199	267	334	89	375	504	630	112	552	742	927	135	729	979	1223	159	906	1217	1520	183	1082	1454	1816
45/35 °C	18	59	189	254	317	85	357	480	599	107	525	705	881	129	693	931	1163	151	861	1157	1445	174	1029	1382	1727
	20	53	170	229	286	77	322	432	540	96	473	635	794	116	625	839	1048	137	776	1042	1302	157	927	1246	1556
	22	47	152	204	254	68	286	385	481	85	421	566	707	103	556	747	933	122	691	928	1159	140	826	1109	1385

• temperature exponent m = 1.0996

Correction factor page 54 • Assembly page 68 • Regulation page 80 • Floor grids page 18

Floor convector with forced convection
Licon PKOC 11/28 (the best selling type)

- used for heating
- heats with the fan off as well
- achieves high heating performances
- low noise even in max. rpm
- possibility of control through BMS (Building Management System)
- can be ordered in Economic, Exclusive or Inox versions
- the convector is intended for dry environment



The given dimensions are in mm and with the frames U and F.

Specifications

width including the U/F type frame *(mm)*	284U/314F
floor case width *(mm)*	235
grid width *(mm)*	270
max. adjustable height *(V max. mm)*	115 - 142
case height *(mm)*	115
lengths *(L cm)*	800 - 2 800, with the step of 400
exchanger height *(mm)*	50
exchanger width *(mm)*	120
exchanger effective length *(mm)*	L - 350
fans impeller diameter *(mm)*	40
connection to the heating system	2 x G 1/2" inner
case material	galv. steel, stainless steel AISI 304

Version Economic • black coated galvanized steel, heat exchanger without any surface finishes
Version Exclusive • black coated steel case, black coated exchanger *
Inox version • stainless steel unpainted case AISI 304, unpainted exchanger (for dry environment only)*

** custom design*

Specification

Width	*cm*	28																								
Depth	*cm*	11																								
Total length	*cm*	80				120				160				200				240				280				
Noisiness - sound pressure 1m	*dB(A)*	0	16.1	23.6	30.5	0	16.4	24.1	30.9	0	16.7	24.4	31.1	0	17.2	25	31.4	0	17.4	25.1	31.7	0	17.7	25.3	31.7	
Power input:	*W/V*	5.5 / 13.5				11 / 13.5				12 / 13.5				20 / 13.5				22.5 / 13.5				23.5 / 13.5				
Speed switch position		Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	
Heat output	*t1 °C*	Heat output [W] / EN 442																								
90/70 °C	20	203	657	867	1070	364	1241	1638	2020	525	1826	2409	2861	687	2409	3180	3922	848	2994	3951	4872	1009	3578	4721	5823	
75/65 °C	18	173	561	741	914	311	1060	1399	1726	449	1560	2058	2444	587	2059	2717	3350	725	2558	3375	4163	862	3057	4034	4975	
	20	**166**	**538**	**710**	**875**	**298**	**1016**	**1340**	**1653**	**430**	**1494**	**1971**	**2341**	**562**	**1972**	**2602**	**3209**	**694**	**2450**	**3233**	**3987**	**826**	**2928**	**3864**	**4765**	
	22	159	514	678	837	285	971	1281	1581	411	1428	1884	2238	537	1885	2488	3068	663	2342	3091	3812	790	2799	3694	4556	
70/55 °C	18	144	467	617	761	259	883	1165	1437	374	1298	1713	2034	488	1713	2261	2789	603	2129	2809	3465	718	2544	3358	4141	
	20	137	444	585	722	246	838	1106	1364	355	1233	1626	1931	464	1627	2147	2648	573	2021	2667	3289	681	2415	3188	3931	
	22	130	421	555	684	233	794	1048	1293	336	1168	1541	1831	439	1542	2035	2510	543	1916	2528	3118	646	2290	3021	3726	
55/45 °C	18	102	329	434	536	182	622	820	1012	263	914	1206	1433	344	1207	1592	1964	425	1499	1979	2440	506	1792	2365	2916	
	20	95	307	405	499	170	579	764	942	245	852	1123	1334	320	1124	1483	1829	396	1396	1843	2273	471	1669	2202	2716	
	22	88	284	375	462	157	536	708	873	227	789	1041	1236	297	1041	1374	1694	366	1293	1707	2105	436	1546	2040	2516	
50/40 °C	18	84	273	361	445	151	516	681	840	218	759	1001	1189	285	1002	1322	1630	353	1244	1642	2026	420	1487	1963	2421	
	20	78	251	331	409	139	474	626	772	201	698	920	1093	262	921	1215	1499	324	1144	1510	1862	386	1367	1804	2225	
	22	71	229	302	373	127	433	571	704	183	636	840	997	239	840	1108	1367	296	1044	1377	1699	352	1247	1646	2030	
45/35 °C	18	67	218	287	354	121	411	543	670	174	605	798	948	228	799	1054	1300	281	992	1309	1615	335	1186	1565	1930	
	20	61	196	259	319	109	371	489	603	157	545	719	854	205	720	950	1171	253	894	1180	1455	301	1069	1410	1739	
	22	54	175	231	284	97	330	436	537	140	486	641	761	183	641	846	1043	226	796	1051	1296	268	952	1256	1549	

- temperature exponent m = 1.1

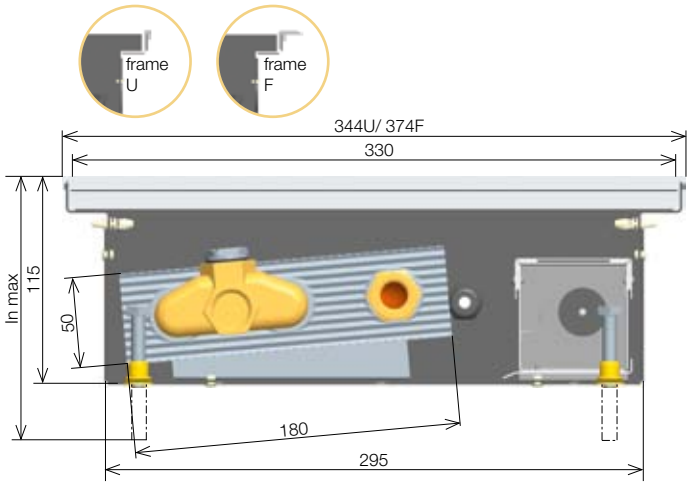
Correction factor page 54 • Assembly page 68 • Regulation page 80 • Floor grids page 18

Floor convector with forced convection
Licon PKOC 11/34

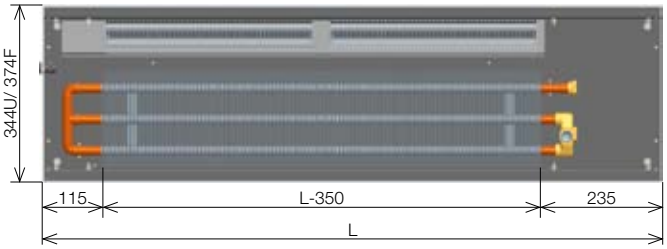
NEW

OPTIMIZED CONVECTION

- used for heating
- high performance convector at optimal width – INNOVATION
- heats with the fan off as well
- quietest operation at low speed
- possibility of control through BMS (Building Management System)
- can be ordered in Economic, Exclusive or Inox versions
- the convector is intended for dry environment



The given dimensions are in mm and with the frames U and F.



Specifications

width including the U/F type frame *(mm)*	344U/ 374F
floor case width *(mm)*	295
grid width *(mm)*	330
max. adjustable height *(V max. mm)*	115 - 142
case height *(mm)*	115
lengths *(L cm)*	800 - 2 800, with the step of 400
exchanger height *(mm)*	50
exchanger width *(mm)*	180
exchanger effective length *(mm)*	L - 350
fans impeller diameter *(mm)*	40
connection to the heating system	2 x G 1/2" inner
case material	galv. steel, stainless steel AISI 304

Version Economic • black coated galvanized steel, heat exchanger without any surface finishes
Version Exclusive • black coated steel case, black coated exchanger *
Inox version • stainless steel unpainted case AISI 304, unpainted exchanger (for dry environment only)*

** custom design*

Specification

ECON EXCL INOX

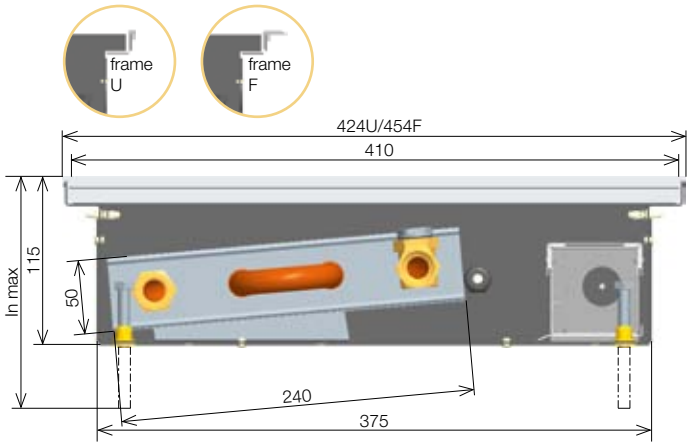
Width	*cm*	34																									
Depth	*cm*	11																									
Total length	*cm*	80				120				160				200				240				280					
Noisiness - sound pressure 1m	*dB(A)*	0	16.1	23.6	30.5	0	16.4	24.1	30.9	0	16.7	24.4	31.1	0	17.2	25	31.4	0	17.4	25.1	31.7	0	17.7	25.3	31.7		
Power input:	*W/V*	5.5 / 13.5				11 / 13.5				12 / 13.5				20 / 13.5				22.5 / 13.5				23.5 / 13.5					
Speed switch position		Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3		
Heat output	*t1 °C*	Heat output [W] / EN 442																									
90/70 °C	20	195	873	1119	1364	369	1650	2113	2577	543	2426	3108	3790	716	3202	4102	5002	890	3978	5097	6215	1064	4755	6091	7428		
75/65 °C	18	167	746	956	1166	315	1409	1805	2202	464	2073	2655	3238	612	2736	3505	4274	760	3399	4354	5310	909	4062	5204	6346		
	20	**160**	**715**	**915**	**1116**	**302**	**1350**	**1729**	**2109**	**444**	**1985**	**2543**	**3101**	**586**	**2620**	**3357**	**4093**	**728**	**3255**	**4171**	**5086**	**870**	**3891**	**4984**	**6078**		
	22	153	683	875	1067	289	1291	1653	2016	425	1898	2431	2965	560	2505	3209	3914	696	3112	3987	4862	832	3720	4765	5811		
70/55 °C	18	141	629	805	982	266	1187	1521	1855	391	1746	2237	2728	516	2305	2953	3601	641	2864	3669	4474	766	3423	4385	5347		
	20	134	598	766	934	252	1129	1446	1763	371	1660	2127	2593	490	2191	2807	3423	609	2722	3488	4253	728	3254	4168	5083		
	22	127	567	726	885	239	1071	1371	1672	352	1574	2017	2459	465	2078	2662	3246	578	2582	3308	4033	690	3086	3953	4820		
55/45 °C	18	98	437	560	683	185	826	1058	1291	272	1215	1556	1898	359	1604	2055	2505	446	1993	2553	3113	533	2381	3051	3720		
	20	91	407	522	636	172	770	986	1202	253	1132	1450	1768	334	1494	1914	2334	415	1856	2378	2899	496	2218	2842	3465		
	22	84	378	484	590	160	713	914	1114	235	1049	1344	1639	310	1385	1774	2163	385	1720	2204	2688	460	2056	2634	3212		
50/40 °C	18	81	363	465	567	153	685	878	1071	225	1008	1291	1574	298	1330	1704	2078	370	1653	2117	2582	442	1975	2531	3086		
	20	75	333	427	521	141	630	807	984	207	926	1186	1447	273	1222	1566	1910	340	1519	1946	2373	406	1815	2325	2835		
	22	68	304	390	475	129	575	736	898	189	845	1082	1320	249	1115	1429	1742	310	1386	1775	2165	370	1656	2121	2587		
45/35 °C	18	65	290	371	452	122	547	701	855	180	805	1031	1257	238	1062	1361	1659	295	1319	1690	2061	353	1577	2020	2464		
	20	58	261	334	407	110	493	631	770	162	724	928	1132	214	956	1225	1494	266	1188	1522	1856	318	1420	1819	2218		
	22	52	232	298	363	98	439	562	685	144	645	827	1008	190	852	1091	1330	237	1058	1356	1653	283	1265	1620	1976		

- temperature exponent m = 1.1

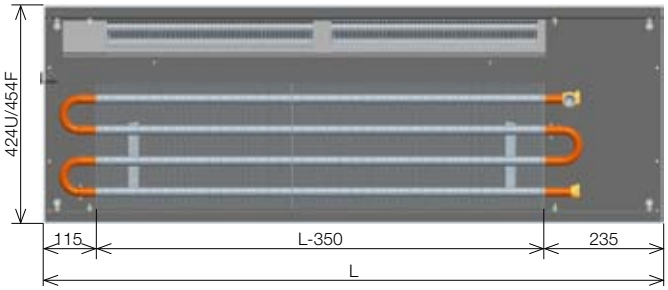
Correction factor page 54 • Assembly page 68 • Regulation page 80 • Floor grids page 18

Floor convector with forced convection
Licon PKOC 11/42

- used for heating
- heats with the fan off as well
- highest heat output
- low noise even in max. rpm
- possibility of control through BMS (Building Management System)
- can be ordered in Economic, Exclusive or Inox versions
- the convector is intended for dry environment



The given dimensions are in mm and with the frames U and F.



Specifications

width including the U/F type frame *(mm)*	424U/454F
floor case width *(mm)*	375
grid width *(mm)*	410
max. adjustable height *(V max. mm)*	115 - 142
case height *(mm)*	115
lengths *(L cm)*	8002 800, with the step of 400
exchanger height *(mm)*	50
exchanger width *(mm)*	240
exchanger effective length *(mm)*	L - 350
fans impeller diameter *(mm)*	40
connection to the heating system	2 x G 1/2" inner
case material	galv. steel, stainless steel AISI 304

Version Economic • black coated galvanized steel, heat exchanger without any surface finishes
Version Exclusive • black coated steel case, black coated exchanger *
Inox version • stainless steel unpainted case AISI 304, unpainted exchanger (for dry environment only)*

** custom design*

Specification

Width	*cm*	42																									
Depth	*cm*	11																									
Total length	*cm*	80				120				160				200				240				280					
Noisiness - sound pressure 1m	*dB(A)*	0	16.1	23.6	30.5	0	16.4	24.1	30.9	0	16.7	24.4	31.1	0	17.2	25	31.4	0	17.4	25.1	31.7	0	17.7	25.3	31.7		
Power input:	*W/V*		5.5 / 13.5				11 / 13.5				12 / 13.5				20 / 13.5				22.5 / 13.5				23.5 / 13.5				
Speed switch position		Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3		
Heat output	*t1 °C*	Heat output [W] / EN 442																									
90/70 °C	20	270	1234	1581	1929	509	2331	2987	3643	749	3428	4393	5358	989	4525	5798	7072	1229	5622	7204	8786	1468	6719	8610	10501		
75/65 °C	18	230	1054	1351	1648	435	1991	2552	3113	640	2929	3753	4577	845	3866	4954	6042	1050	4803	6155	7507	1254	5740	7356	8971		
	20	**221**	**1010**	**1294**	**1578**	**417**	**1907**	**2444**	**2981**	**613**	**2805**	**3595**	**4384**	**809**	**3703**	**4745**	**5787**	**1005**	**4600**	**5895**	**7190**	**1201**	**5498**	**7045**	**8593**		
	22	211	965	1237	1509	399	1824	2337	2850	586	2682	3437	4191	774	3540	4536	5533	961	4398	5636	6874	1149	5256	6736	8215		
70/55 °C	18	194	888	1138	1388	367	1678	2150	2622	539	2468	3162	3857	712	3257	4174	5091	884	4047	5186	6325	1057	4836	6198	7559		
	20	185	844	1082	1320	349	1595	2044	2493	513	2346	3006	3666	677	3096	3968	4840	841	3847	4930	6013	1005	4598	5892	7186		
	22	175	801	1026	1252	331	1513	1939	2364	486	2225	2851	3477	642	2937	3763	4590	797	3648	4675	5702	953	4360	5588	6815		
55/45 °C	18	135	618	792	966	255	1167	1496	1825	375	1717	2200	2683	495	2266	2904	3542	615	2816	3608	4401	735	3365	4312	5259		
	20	126	576	738	900	238	1087	1394	1700	349	1599	2049	2499	461	2111	2705	3299	573	2623	3361	4099	685	3134	4017	4899		
	22	117	534	684	834	220	1008	1292	1575	324	1482	1900	2317	428	1957	2507	3058	531	2431	3115	3799	635	2905	3723	4541		
50/40 °C	18	112	513	657	801	212	968	1241	1514	311	1424	1825	2226	411	1880	2409	2938	510	2336	2993	3650	610	2791	3577	4363		
	20	103	471	604	736	194	890	1140	1391	286	1309	1677	2045	377	1727	2213	2700	469	2146	2750	3354	561	2565	3287	4009		
	22	94	430	551	672	177	812	1040	1269	261	1194	1530	1866	344	1576	2020	2463	428	1958	2509	3060	511	2340	2999	3657		
45/35 °C	18	89	409	524	640	169	773	991	1208	248	1137	1457	1777	328	1501	1923	2346	407	1865	2389	2914	487	2228	2856	3483		
	20	81	369	472	576	152	696	892	1088	224	1024	1312	1600	295	1351	1732	2112	367	1679	2152	2624	439	2007	2571	3136		
	22	72	328	421	513	135	620	794	969	199	912	1168	1425	263	1203	1542	1881	327	1495	1916	2337	391	1787	2290	2793		

- temperature exponent m = 1.1

Correction factor page 54 • Assembly page 68 • Regulation page 80 • Floor grids page 18

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

PKOC 7/28

Δt (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
kt	0.320	0.340	0.360	0.380	0.400	0.420	0.441	0.461	0.482	0.503	0.524	0.545	0.566	0.587	0.608	0.629

Δt (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
kt	0.650	0.672	0.693	0.715	0.736	0.758	0.780	0.801	0.823	0.845	0.867	0.889	0.911	0.933	0.955	0.978

Δt (K)	50	51	52	53	54	55	56	57	58	59	60
kt	1.000	1.022	1.045	1.067	1.090	1.112	1.135	1.157	1.180	1.203	1.226

- temperature exponent m = 1.1159

PKOC 9/28

Δt (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
kt	0.325	0.345	0.365	0.385	0.405	0.426	0.446	0.467	0.487	0.508	0.529	0.549	0.570	0.591	0.612	0.633

Δt (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
kt	0.654	0.676	0.697	0.718	0.740	0.761	0.782	0.804	0.826	0.847	0.869	0.891	0.912	0.934	0.956	0.978

Δt (K)	50	51	52	53	54	55	56	57	58	59	60
kt	1.000	1.022	1.044	1.066	1.088	1.110	1.133	1.155	1.177	1.200	1.222

- temperature exponent m = 1.0996

PKOC 11/28, 11/34 NEW, 11/42

Δt (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
kt	0.325	0.345	0.365	0.385	0.405	0.426	0.446	0.467	0.487	0.508	0.528	0.549	0.570	0.591	0.612	0.633

Δt (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
kt	0.654	0.675	0.697	0.718	0.739	0.761	0.782	0.804	0.825	0.847	0.869	0.891	0.912	0.934	0.956	0.978

Δt (K)	50	51	52	53	54	55	56	57	58	59	60
kt	1.000	1.022	1.044	1.066	1.088	1.111	1.133	1.155	1.177	1.200	1.222

- temperature exponent m = 1.1

Weights and water volumes

Type	7/28	9/28	11/28	11/34	11/42
kg/linear meter	8.15	9.5	10	12.5	13.7
Stainless steel kg/1 linear meter	7.1	8.3	9	11	12
l/1 linear meter	0.4	0.4	0.4	0.6	0.6

The listed weights are without a packaging.

Convector breakdown

1. case of the floor convector
2. heat exchanger
3. fan
4. connecting terminal (F Box)
5. decorative frame
6. walkable grid

The contents of supplies and selectable specifications

Standard delivery contains

- galvanized steel case, paint finish RAL 9005 – black
- 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)
- exchanger temperature switch
- side covering metal sheets in the case colour
- aluminium decor frame, U profile, surface finish silver eloxal coat
- fixation anchors for fastening the convector to the floor
- a pair of stainless steel flexible hoses for easy connection to the heating system
- sololit cover plate protecting the heat exchanger from dust and dirt on building site
- 25 mm height adjustment set-screws to compensate for the floor unevenness
- the unit is packed in a durable packaging and contains an istallation manual

Optional accessories

- stainless steel case finish AISI 304 (Inox) for dry environment
- colour of the anodized Al frame – natural aluminium, light and dark bronze in the F profile or light or dark bronze in the U profile, see sketch page 23
- black coated heat exchanger (Exclusive finish)
- shut off valves, thermostatic valve head and an actuator
- covering plate with increased rigidity
- case with noise-absorbing material (reduction of noisiness by 1 to 3 dB) see page 86

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 80
- Regulation is identical for all OC system radiators

Ordering codes Convectors PKOC

Case type – water supply location
P on the right (looking out of room)
P on the left (looking out of room)*
Convector case's face finish
0 without lowering of faces
1 supply side face lowering *
2 face lowering on opposite side of the supply *
3 lowering of both faces *

Elements of electrical regulation in a converter
R1 standard

				length		depth		width									
Economic	black steel case/unpainted exchanger	PKOC	-	...	/	...	/	..	-	1	1	U	10	P0	-	R1
Exclusive	black steel case/black exchanger *	PKOC	-	...	/	...	/	..	-	1	5	U	10	P0	-	R1
Inox	stainless steel case/unpainted exchanger *	PKOC	-	...	/	...	/	..	-	5	1	U	10	P0	-	R1

** custom-made design*

Floor convectors with forced convection Licon PKOC

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

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

Ordering example

PKOC, 120 length, 11 depth, 34 width with a black exchanger and F shape frame, bronze eloxal coat = Exclusive Finish
Ordering code – PKOC-120/11/34-15F12P0-R1

If the order does not include the decorative frame specification, the tray and the heat exchanger design, the body will be made of black painted steel sheet and silver colour exchanger, and fitted with silver colour U-shaped frame (Economic version).

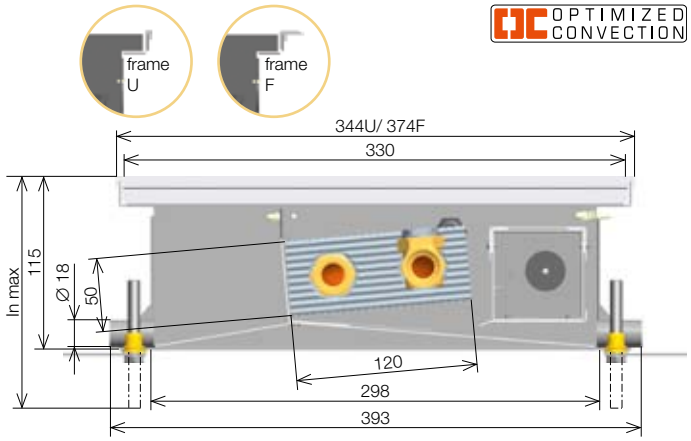
Assembly page 68 • Regulation page 80 • Floor grids page 18

Swimming pool floor convector with forced convection
Licon PKBOC 11/34 InPool

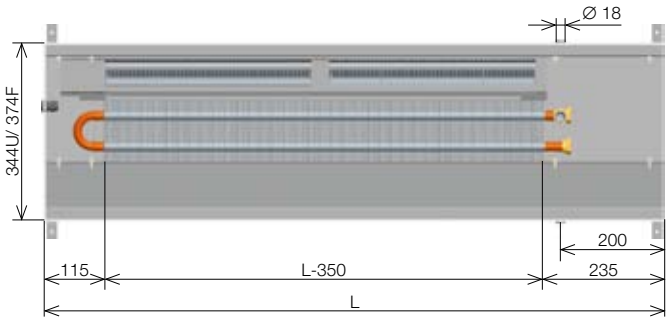
NEW

- used for heating
- heats with the fan off as well
- provided with water drain and dividing partition
- high heat output
- low noise even in max. rpm
- possibility of control through BMS (Building Management System)
- special warranty and installation conditions
- recommended to fit with aluminium grid
- supplied only with the InPool design
- the convector is intended for damp environment (i.e. indoor swimming pools, winter gardens)

OPTIMIZED CONVECTION



The given dimensions are in mm and with the frames U and F.



Specifications

width including the U/F type frame *(mm)*	344U/ 374F
floor case width *(mm)*	298
grid width *(mm)*	330
max. adjustable height *(V max. mm)*	123 - 150
case height *(mm)*	115
lengths *(L cm)*	800 - 2 800, with the step of 400
exchanger height *(mm)*	50
exchanger width *(mm)*	120
exchanger effective length *(mm)*	L - 350
fans impeller diameter *(mm)*	40
connection to the heating system	2 x G 1/2" inner
case material	stainless steel AISI 316

Specification

Width	*cm*	34																									
Depth	*cm*	11																									
Total length	*cm*	80				120				160				200				240				280					
Noisiness - sound pressure 1m	*dB(A)*	0	16.1	23.6	30.5	0	16.4	24.1	30.9	0	16.7	24.4	31.1	0	17.2	25	31.4	0	17.4	25.1	31.7	0	17.7	25.3	31.7		
Power input:	*W/V*	5.5 / 13.5				11 / 13.5				12 / 13.5				20 / 13.5				22.5 / 13.5				23.5 / 13.5					
Speed switch position		Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3		
Heat output	*t1 °C*	Heat output [W] / EN 442																									
90/70 °C	20	203	657	867	1070	364	1241	1638	2020	525	1643	2168	2575	687	2409	3180	3922	678	2694	3555	4385	757	2862	3777	4659		
75/65 °C	18	173	561	741	914	311	1060	1399	1726	449	1404	1852	2200	587	2059	2717	3350	580	2302	3038	3746	647	2445	3227	3980		
	20	**166**	**538**	**710**	**875**	**298**	**1016**	**1340**	**1653**	**430**	**1345**	**1774**	**2107**	**562**	**1972**	**2602**	**3209**	**555**	**2205**	**2910**	**3589**	**620**	**2342**	**3091**	**3812**		
	22	159	514	678	837	285	971	1281	1581	411	1285	1696	2014	537	1885	2488	3068	531	2108	2782	3431	592	2239	2955	3644		
70/55 °C	18	144	467	617	761	259	883	1165	1437	374	1168	1542	1831	488	1713	2261	2789	482	1916	2528	3118	538	2035	2686	3313		
	20	137	444	585	722	246	838	1106	1364	355	1109	1463	1738	464	1627	2147	2648	458	1819	2400	2961	511	1932	2550	3145		
	22	130	421	555	684	233	794	1048	1293	336	1051	1387	1648	439	1542	2035	2510	434	1724	2275	2806	484	1832	2417	2981		
55/45 °C	18	102	329	434	536	182	622	820	1012	263	823	1086	1289	344	1207	1592	1964	340	1349	1781	2196	379	1433	1892	2333		
	20	95	307	405	499	170	579	764	942	245	766	1011	1201	320	1124	1483	1829	316	1257	1658	2045	353	1335	1762	2173		
	22	88	284	375	462	157	536	708	873	227	710	937	1112	297	1041	1374	1694	293	1164	1536	1895	327	1237	1632	2013		
50/40 °C	18	84	273	361	445	151	516	681	840	218	683	901	1070	285	1002	1322	1630	282	1120	1478	1823	315	1190	1570	1937		
	20	78	251	331	409	139	474	626	772	201	628	828	984	262	921	1215	1499	259	1030	1359	1676	289	1094	1443	1780		
	22	71	229	302	373	127	433	571	704	183	573	756	898	239	840	1108	1367	237	939	1239	1529	264	998	1317	1624		
45/35 °C	18	67	218	287	354	121	411	543	670	174	545	718	853	228	799	1054	1300	225	893	1178	1453	251	949	1252	1544		
	20	61	196	259	319	109	371	489	603	157	491	647	769	205	720	950	1171	203	805	1062	1310	226	855	1128	1391		
	22	54	175	231	284	97	330	436	537	140	437	577	685	183	641	846	1043	180	717	946	1166	201	761	1005	1239		

- temperature exponent m = 1.1

Assembly page 68 • Regulation page 80 • Floor grids page 18

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

PKBOC 11/34

Δt (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
kt	0.325	0.345	0.365	0.385	0.405	0.426	0.446	0.467	0.487	0.508	0.528	0.549	0.570	0.591	0.612	0.633

Δt (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
kt	0.654	0.675	0.697	0.718	0.739	0.761	0.782	0.804	0.825	0.847	0.869	0.891	0.912	0.934	0.956	0.978

Δt (K)	50	51	52	53	54	55	56	57	58	59	60
kt	1.000	1.022	1.044	1.066	1.088	1.111	1.133	1.155	1.177	1.200	1.222

- temperature exponent m = 1.1

Weights and volumes of water and guarantees

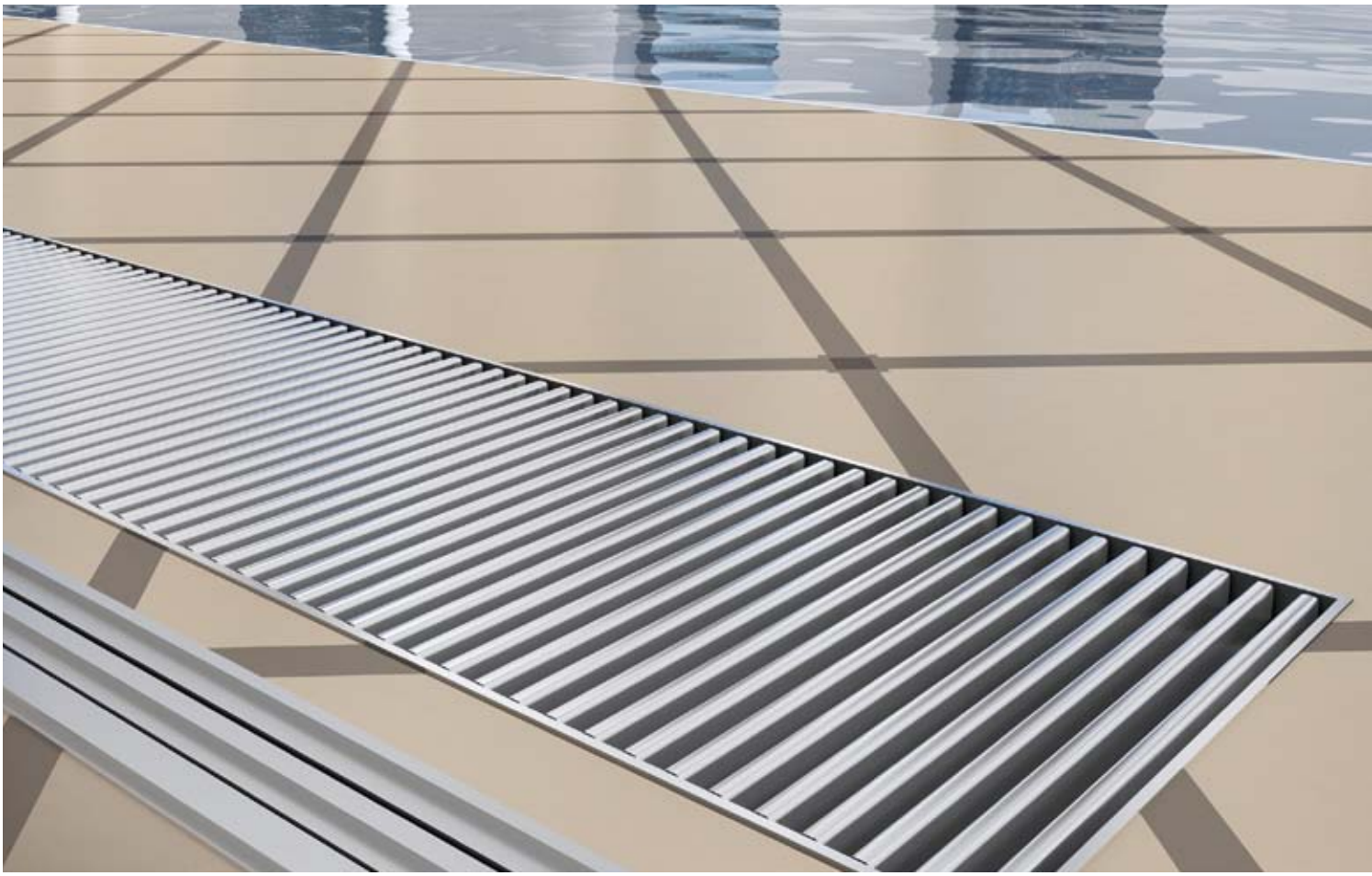
Type	11/28
Stainless steel kg/1 linear meter	9
l/1 linear meter	0,4

The listed weights are without a packaging.

Caution: Floor convector PKBOC with forced convection must be positioned so as to prevent even short term flooding of the section fitted with the motor and the fans.

PKBOC guarantee

Floor convectors including the grid intended for use in the pool area must be kept clean and washed regularly with clean water and maintained with suitable preparations for the preservation of the stainless steel. Convectors are equipped with a drain to prevent their permanent flooding which must be kept clear of any blockage. More about the operation and warranty conditions on www.licon.cz in the download section.



The contents of supplies and selectable specifications

Standard delivery contains

- stainless steel case (stainless steel AISI 316)
- Al/Cu heat exchanger with low water content, air vent and uniquely shaped lamellas for a higher heat output
- separated group of low-energy fans
- drainage holes, including a separation barrier for trapping leaking in water
- connecting terminal (F Box)
- exchanger temperature switch
- side covering metal sheets in the case colour
- anodized Al frame, U profile, in the natural aluminium colour
- a pair of stainless-steel elastic hoses for easy connection
- sololit cover plate protecting the heat exchanger from dust and dirt on building site
- approx. 25 mm height adjustment screws to compensate for uneven floors and an anchoring fastening flag for securing to the ground
- the unit is packed in a durable packaging and contains an istallation manual

Optional accessories

- anodized Al frame, F profile (see sketch)
- colour of the anodized Al frame – natural aluminium, light and dark bronze in the F profile or light or dark bronze in the U profile, see sketch page 23
- shut off valves, thermostatic valve head or an actuator
- covering plate with increased rigidity

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 80
- Regulation is identical for all OC system radiators

Ordering codes Convectors PKBOC 11/34

			length		depth		width									
InPool	stainless steel case for moist environment/ unpainted exchanger *	PKBOC	-	...	/	11	/	34	-	3	1	U	10	P0	-	R1

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

Case type – location of water supply
P on the right (looking out of room)
Convector case's face finish
0 without lowering the faces (no other type of case can be used with the PKBOC model)

* *custom-made design*

Floor convectors with forced convection for pools PKBOC

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

Elements of electrical regulation in a converter
R1 standard, waterproof

Ordering example

PKBOC, 120 length, 11 depth, 34 width InPool finish (stainless steel case, heat exchanger without any surface finish) and the F shaped frame, silver eloxal coat = InPool version
Ordering code – PKOC-120/11/34-15F12P0-R1

In the absence of specification in the order the decorative frame will be of the silver frame type in the U shape.

Note:

The PKBOC convectors' individual cases cannot be mutually interconnected.

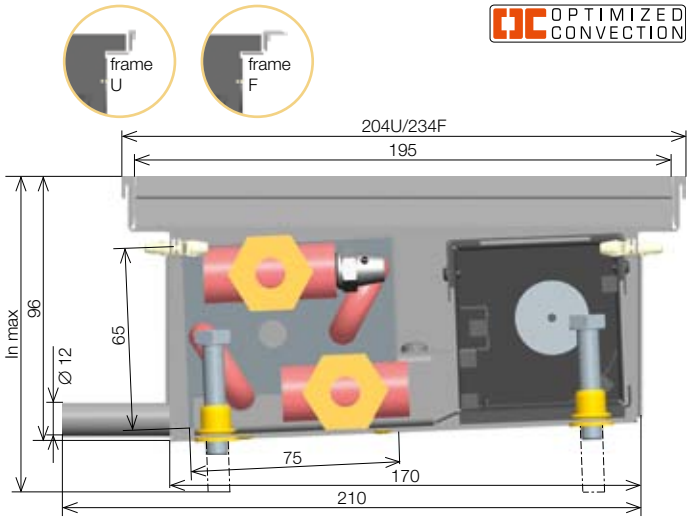
Assembly page 68 • Regulation page 80 • Floor grids page 18

Floor convector with forced convection for heating or cooling
Licon PKIOC 9/20

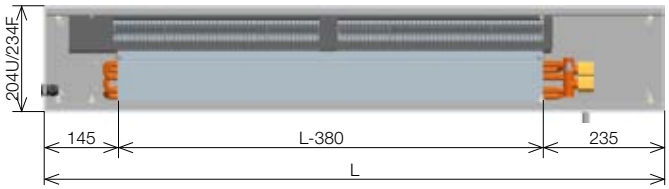
NEW

OPTIMIZED CONVECTION

- used for heating or cooling
- high heating and cooling output
- intended for two-pipe systems
- stainless steel design Inox AISI 304 for dry environment only
- the narrowest type of compact dimensions
- possibility to control via BMS (Building Management System)
- standard finish Inox (unpainted stainless steel AISI 304)
- the convector use in for dry environment only



The given dimensions are in mm and including frames U and F.



Specifications

width including the U/F type frame *(mm)*	204U/234F
floor case width *(mm)*	170
grid width *(mm)*	190
max. adjustable height *(V max. mm)*	96 - 117
case height *(mm)*	96
lengths *(L cm)*	800 - 2 800, with the step of 400
exchanger height *(mm)*	65
exchanger width *(mm)*	75
exchanger effective length *(mm)*	L - 380
fans impeller diameter *(mm)*	40
connection to the heating system	2 x G 1/2" inner
case material	stainless steel AISI 304

Inox version • stainless steel unpainted case AISI 304, unpainted exchanger (dry environment only), standard design with type 9/20

Specification

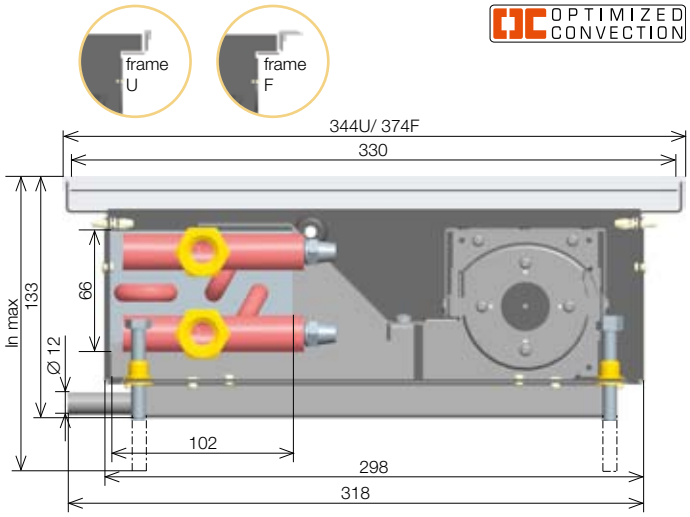
Width	cm	20																									
Depth	cm	9																									
Lengths	cm	80				120				160				200				240				280					
Noisiness - sound pressure 1m	dB(A)	0	16.1	23.6	30.5	0	16.4	24.1	30.9	0	16.7	24.4	31.1	0	17.2	25	31.4	0	17.4	25.1	31.7	0	17.7	25.3	31.7		
Max. intake/voltage DC	W/V	5.5 / 13.5				11 / 13.5				12 / 13.5				20 / 13.5				22.5 / 13.5				23.5 / 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]																								
6/12 °C	28	50	-	170	241	311	-	326	461	596	-	485	686	887	-	644	912	1180	-	803	1137	1470	-	962	1362	1760		
	26	50	-	151	214	276	-	289	409	529	-	430	609	787	-	572	810	1047	-	713	1009	1304	-	853	1208	1562		
	24	50	-	132	187	242	-	253	358	462	-	376	532	688	-	500	708	915	-	623	882	1140	-	746	1056	1366		
8/14 °C	28	50	-	151	214	276	-	289	409	529	-	430	609	787	-	572	810	1047	-	713	1009	1304	-	853	1208	1562		
	26	50	-	132	187	242	-	253	358	462	-	376	532	688	-	500	708	915	-	623	882	1140	-	746	1056	1366		
	24	50	-	113	160	207	-	217	307	396	-	322	456	590	-	429	607	784	-	534	756	978	-	640	906	1171		
10/15 °C	28	50	-	137	194	251	-	263	372	481	-	391	553	716	-	520	736	951	-	648	917	1186	-	776	1098	1420		
	26	50	-	118	168	217	-	227	321	415	-	337	478	617	-	448	635	821	-	559	791	1023	-	669	948	1225		
	24	50	-	100	141	182	-	191	270	349	-	284	402	519	-	377	534	690	-	470	665	860	-	563	797	1030		
Heat output	t1 °C		Heat output [W] / EN 442																								
75/65 °C	18		77	563	724	884	148	1078	1385	1692	220	1605	2061	2518	292	2134	2741	3348	364	2659	3416	4173	436	3185	4091	4997		
	20		**74**	**542**	**696**	**850**	**142**	**1037**	**1332**	**1627**	**211**	**1544**	**1983**	**2422**	**281**	**2053**	**2636**	**3220**	**350**	**2558**	**3285**	**4013**	**419**	**3063**	**3934**	**4806**		
	22		71	520	668	816	136	996	1279	1562	203	1482	1904	2325	270	1971	2532	3092	336	2456	3155	3853	403	2941	3778	4615		
70/55 °C	18		66	483	620	757	126	924	1186	1449	188	1375	1766	2157	250	1828	2348	2868	312	2278	2926	3574	374	2728	3504	4280		
	20		63	461	592	723	121	882	1133	1384	180	1313	1687	2060	239	1746	2243	2740	298	2176	2795	3414	357	2606	3347	4089		
	22		60	439	564	690	115	841	1080	1320	171	1252	1608	1964	228	1665	2138	2612	284	2074	2665	3255	340	2484	3191	3898		
55/45 °C	18		48	348	447	546	91	665	855	1044	136	990	1272	1554	180	1317	1692	2067	225	1641	2108	2575	269	1966	2525	3084		
	20		45	326	419	512	85	624	802	979	127	929	1193	1457	169	1235	1587	1938	211	1539	1977	2415	252	1843	2368	2892		
	22		42	305	391	478	80	583	749	914	119	867	1114	1361	158	1153	1482	1810	197	1437	1846	2255	236	1721	2211	2701		

- temperature exponent m = 0.994

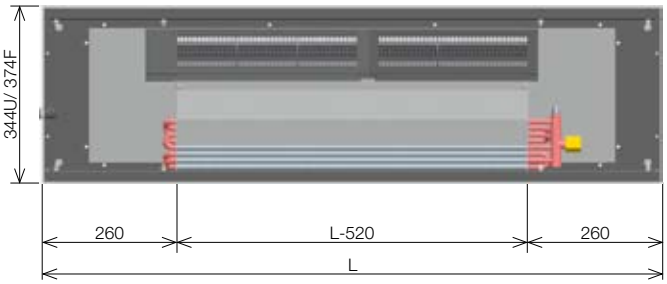
Listed cooling performance SENSITIV. Cooling performances for other operating conditions on request.
** SENSITIV – cooling power actually delivered for cooling air.*
Correction factor page 61 • Assembly page 68 • Regulation page 80 • Floor grids page 18

Floor convector with forced convection for heating or cooling
Licon PKIOC 13/34

- used for heating or cooling
- high heating and cooling output
- intended for two-pipe systems
- stainless-steel case for condensate drain
- controls possible through BMS
- can be ordered in Economic, Exclusive or Inox versions
- the convector use in for dry environment only



The given dimensions are in mm and including frames U and F.



Specifications

width including the U/F type frame *(mm)*	344U/ 374F
floor case width *(mm)*	298
grid width *(mm)*	330
max. adjustable height *(V max. mm)*	133 - 160
case height *(mm)*	133
lengths *(L cm)*	1 200, 1 500, 2 000, 2 500, 3 000
exchanger height *(mm)*	66
exchanger width *(mm)*	102
exchanger effective length *(mm)*	L - 520
fans impeller diameter *(mm)*	60
connection to the heating system	2 x G 1/2" inner
case material	galv. steel, stainless steel 304, 316

Version Economic • black coated galvanized steel with inner stainless steel case AISI 316, heat exchanger without surface finish
Version Exclusive • black coated steel case with inner stainless steel case AISI 316, black coated exchanger *
Varianta Inox • unpainted stainless steel case AISI 304 with inner stainless steel case AISI 316, unpainted exchanger (dry environment only) *

** custom-made design*

Specification

Width	cm	34																					
Depth	cm	13																					
Lengths	cm	120				150				200				250				300			
Noisiness - sound pressure 1m	dB(A)	0	28.6	33.1	39.3	0	28.9	33.5	39.8	0	29.3	34	40.4	0	29.6	34.4	40.9	0	29.9	34.8	41.4
Max. intake/voltage DC	W/V	9.5 / 13.5				14 / 13.5				18.5 / 13.5				23 / 13.5				27.5 / 13.5			
Rpm		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]																				
6/12 °C	28	50	-	542	772	1003	-	781	1113	1446	-	1179	1681	2183	-	1577	2249	2921	-	1975	2817	3658
	26	50	-	481	685	890	-	693	988	1283	-	1046	1492	1937	-	1399	1995	2591	-	1753	2499	3246
	24	50	-	420	599	778	-	605	863	1121	-	914	1304	1693	-	1223	1744	2265	-	1532	2185	2837
8/14 °C	28	50	-	481	685	890	-	693	988	1283	-	1046	1492	1937	-	1399	1995	2591	-	1753	2499	3246
	26	50	-	420	599	778	-	605	863	1121	-	914	1304	1693	-	1223	1744	2265	-	1532	2185	2837
	24	50	-	360	514	667	-	519	740	961	-	784	1118	1452	-	1049	1495	1942	-	1314	1873	2433
10/15 °C	28	50	-	437	623	809	-	630	898	1166	-	951	1356	1761	-	1272	1814	2356	-	1593	2272	2950
	26	50	-	377	537	698	-	543	775	1006	-	820	1170	1519	-	1098	1565	2032	-	1375	1960	2546
	24	50	-	317	452	587	-	457	651	846	-	690	984	1278	-	923	1316	1709	-	1156	1648	2141
Heat output	t1 °C		Heat output [W] / EN 442																				
75/65 °C	18		239	1794	2320	2847	345	2585	3344	4103	520	3904	5050	6196	696	5222	6756	8289	872	6541	8462	10383
	20		**230**	**1725**	**2232**	**2738**	**331**	**2486**	**3216**	**3946**	**501**	**3754**	**4857**	**5959**	**670**	**5023**	**6498**	**7973**	**839**	**6291**	**8138**	**9986**
	22		221	1656	2143	2629	318	2387	3088	3789	481	3605	4664	5722	643	4823	6239	7656	805	6041	7815	9589
70/55 °C	18		205	1536	1987	2439	295	2214	2864	3514	446	3344	4326	5307	596	4473	5787	7101	747	5603	7248	8894
	20		196	1468	1899	2330	282	2115	2736	3357	426	3194	4132	5070	570	4273	5528	6783	714	5353	6924	8496
	22		187	1399	1810	2221	269	2016	2608	3200	406	3045	3939	4833	543	4074	5270	6466	680	5102	6600	8099
55/45 °C	18		148	1107	1432	1757	213	1595	2064	2532	321	2409	3117	3824	430	3223	4170	5116	538	4037	5223	6408
	20		138	1038	1343	1648	199	1496	1936	2375	301	2260	2923	3587	403	3023	3911	4798	505	3786	4898	6010
	22		129	969	1254	1539	186	1397	1807	2217	281	2110	2729	3349	376	2823	3651	4480	471	3535	4573	5612

- temperature exponent m = 0.994

Listed cooling performance SENSITIV. Cooling performances for other operating conditions on request.
** SENSITIV – cooling power actually delivered for cooling air.*

Correction factor page 61 • Assembly page 68 • Regulation page 80 • Floor grids page 18

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

PKIOC 9/20, 13/34

Δt (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
kt	0.362	0.382	0.402	0.422	0.442	0.462	0.482	0.502	0.522	0.542	0.562	0.582	0.602	0.622	0.642	0.662

Δt (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
kt	0.682	0.701	0.721	0.741	0.761	0.781	0.801	0.821	0.841	0.861	0.881	0.901	0.920	0.940	0.960	0.980

Δt (K)	50	51	52	53	54	55	56	57	58	59	60
kt	1.000	1.020	1.040	1.060	1.080	1.099	1.119	1.139	1.159	1.179	1.199

- temperature exponent m = 0.994

Weights and water volumes

Type	9/20	13/34
steel kg/linear meter	–	13,2
stainless steel kg/linear meter	7,7	10,9
l/1 linear meter	0,5	0,5

The listed weights are without a packaging.

Delivery content and selectable specifications

Standard delivery contains

- galvanized steel case, surface finish RAL 9005 – black
- inner case (stainless steel AISI 316)
- Al/Cu heat exchanger with low water content and air vent
- set of low-energy fans
- connecting terminal (F Box)
- 2 temperature switches (heating, cooling)
- side cover metal sheets in colour
- anodized Al frame, U profile, in the natural aluminium colour
- fixation anchors for fastening the convector to the floor
- a pair of stainless-steel elastic hoses for easy connection
- sololit cover plate protecting the heat exchanger from dust and dirt on building site
- 25 mm height adjustment set-screws to compensate for the floor unevenness
- the unit is packed in a durable packaging and with istallation manual

Optional accessories for complete finish

- Execution Exclusive or Inox
- colour of the anodized Al frame – natural aluminium, light and dark bronze for F profile or light or dark bronze in the U profile, see sketch page 23
- black paint of the heat exchanger
- shut off valve, thermostatic valve head or an actuator
- covering plate with increased rigidity
- case with noise-absorbing material (reduction of noisiness by 1 to 3 dB) see page 86

Note:

- Standard delivery is without regulation.
  Regulation must be ordered separately and according to technical parameters.
- Electrical regulation and regulation elements see page 80
- Regulation is identical for all OC system radiators

Ordering codes
Convectors PKIOC

Case type – water supply location
P on the right (looking out of room)
P on the left (looking out of room)*
Convector case's face finish
0 without lowering of faces
1 supply side face lowering *
2 face lowering on opposite side of the supply *
3 lowering of both faces *

Elements of electrical regulation in a converter
R1 standard

				length		depth		width								
Economic	black steel case [1] /unpainted exchanger	PKIOC	-	...	/	...	/	..	-	1	1	U	10	P0	-	R1
Exclusive	black steel case [1] /black exchanger	PKIOC	-	...	/	...	/	..	-	1	5	U	10	P0	-	R1
Inox	stainless steel case/unpainted exchanger *	PKIOC	-	...	/	...	/	..	-	5	1	U	10	P0	-	R1

[1] applies only to PKIOC 13/34
** custom-made design*

Floor convectors with forced convection for heating or cooling Licon PKIOC

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

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

Ordering example

PKIOC, 150 length, 9 depth, 20 width, U shape frame, silver elxal coat

(standard only in Inox version (stainless steel AISI 304, unpainted exchanger)

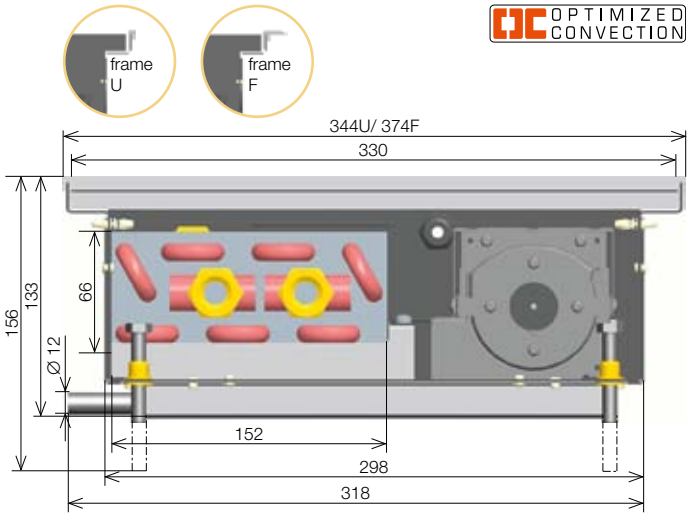
Ordering code – PKIOC-150/9/20-51U10P0-R1

If the order does not include the specifications of the decorative frame, case and heat exchanger the radiator will be manufactured in the standard finish:
9/20 Inox (stainless steel AISI 304 and unpaited exchanger)
13/34 Economic (black coated steel case and unpainted exchanger)

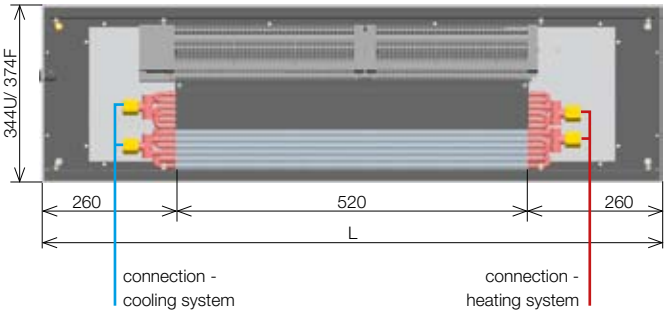
Correction factor page 61 • Assembly page 68 • Regulation page 80 • Floor grids page 18

Floor convector with forced convection for heating and cooling PKWOC 13/34

- used for heating and cooling of rooms
- high heating and cooling output
- for four-pipe systems
- stainless-steel case for condensate drain
- controls possible through BMS
- can be ordered in Economic, Exclusive or Inox versions
- the convector is intended for dry environment



The given dimensions are in mm and with the frames U and F.



Specifications

width including the U/F type frame *(mm)*	344U/374F
floor case width *(mm)*	298
grid width *(mm)*	330
max. adjustable height *(V max. mm)*	133 - 160
case height *(mm)*	133
Lengths *(L cm)*	1 200, 1 500, 2 000, 2 500, 3 000
exchanger height *(mm)*	66
exchanger width *(mm)*	152
exchanger effective length *(mm)*	L - 520
fans impeller diameter *(mm)*	60
connection to the heating system	4 x G 1/2 ˝ inner
case material	galv. steel, stainless steel 304, 316

Version Economic • black coated galvanized steel with inner stainless steel case AISI 316, the heat exchanger without surface finish
Version Exclusive • black coated steel case with inner stainless steel case AISI 316, black coated exchanger *
Varianta Inox • unpainted stainless steel case AISI 304 with inner stainless steel case AISI 316, unpainted exchanger (for dry environment only) *

** custom-made design*

Specification

Width	cm	34																			
Depth	cm	13																			
Lengths	cm	120				150				200				250				300			
Noisiness - sound pressure 1m	dB(A)	0	28.6	33.1	39.3	0	28.9	33.5	39.8	0	29.3	34	40.4	0	29.6	34.4	40.9	0	29.9	34.8	41.4
Max. intake/voltage DC	W/V	9.5 / 13.5				14 / 13.5				18.5 / 13.5				23 / 13.5				27.5 / 13.5			
Rpm		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]																		
6/12 °C	28	50	-	457	591	726	-	659	852	1046	-	995	1287	1580	-	1331	1722	2113	-	1668	2157	2647
	26	50	-	406	525	644	-	585	757	929	-	884	1143	1403	-	1182	1529	1876	-	1481	1915	2350
	24	50	-	355	459	563	-	511	661	811	-	772	999	1225	-	1033	1336	1639	-	1294	1674	2053
8/14 °C	28	50	-	406	525	644	-	585	757	929	-	884	1143	1403	-	1182	1529	1876	-	1481	1915	2350
	26	50	-	355	459	563	-	511	661	811	-	772	999	1225	-	1033	1336	1639	-	1294	1674	2053
	24	50	-	304	393	482	-	438	567	695	-	661	856	1050	-	885	1145	1405	-	1108	1434	1759
10/15 °C	28	50	-	369	478	586	-	532	688	845	-	804	1040	1276	-	1075	1391	1707	-	1347	1742	2137
	26	50	-	318	412	505	-	459	594	728	-	693	897	1100	-	927	1199	1472	-	1161	1502	1843
	24	50	-	268	346	425	-	386	499	612	-	582	754	925	-	779	1008	1237	-	976	1263	1549
Heat output	t1 °C		Heat output [W] / EN 442																		
75/65 °C	18		245	1629	2162	2696	353	2347	3116	3885	533	3545	4706	5867	713	4742	6296	7849	893	5940	7885	9831
	20		**234**	**1557**	**2067**	**2577**	**337**	**2244**	**2979**	**3714**	**509**	**3389**	**4499**	**5609**	**681**	**4534**	**6019**	**7504**	**853**	**5678**	**7538**	**9398**
	22		223	1486	1972	2459	322	2141	2843	3544	486	3234	4293	5352	650	4326	5743	7160	814	5419	7194	8969
70/55 °C	18		205	1362	1808	2255	295	1963	2606	3249	446	2965	3936	4907	596	3966	5266	6565	747	4968	6595	8223
	20		194	1292	1715	2139	280	1862	2472	3082	423	2812	3734	4655	565	3763	4995	6228	708	4713	6256	7800
	22		184	1223	1623	2024	265	1762	2339	2917	400	2661	3533	4405	535	3560	4726	5893	670	4459	5920	7381
55/45 °C	18		140	933	1239	1545	202	1345	1785	2226	305	2031	2696	3362	408	2717	3607	4497	512	3403	4518	5633
	20		130	867	1150	1434	188	1249	1658	2067	283	1886	2504	3122	379	2523	3350	4176	475	3161	4196	5231
	22		120	801	1063	1325	173	1154	1532	1910	262	1743	2313	2884	350	2331	3095	3859	439	2920	3877	4833

- temperature exponent m = 1.147

Listed cooling performance SENSITIV. Cooling performances for other operating conditions on request.
** SENSITIV – cooling power actually delivered for cooling air.*

Correction factor page 64 • Assembly page 68 • Regulation page 80 • Floor grids page 18

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

PKWOC 13/34

Δt (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
kt	0.310	0.330	0.350	0.370	0.390	0.410	0.431	0.452	0.472	0.493	0.514	0.535	0.557	0.578	0.599	0.621

Δt (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
kt	0.643	0.664	0.686	0.708	0.730	0.752	0.774	0.796	0.819	0.841	0.864	0.886	0.909	0.931	0.954	0.977

Δt (K)	50	51	52	53	54	55	56	57	58	59	60
kt	1.000	1.023	1.046	1.069	1.092	1.116	1.139	1.162	1.186	1.209	1.233

- temperature exponent m = 1.147

Weights and water volumes

Type	13/34
kg/linear meter	14,5
stainless steel kg/linear meter	12,2
l/1 linear meter	0,7

The listed weights are without a packaging.

The contents of supplies and selectable specifications

Standard delivery contains

- galvanized steel case, paint finish RAL 9005 – black
- Al/Cu heat exchanger with low water content and air vent
- group of low-energy fans
- connecting terminal (F Box)
- 2 temperature switches (heating, cooling)
- side covering metal sheets in the case colour
- anodized Al frame, U profile, in the natural aluminium colour
- fixation anchors for fastening the channel to the floor
- a pair of stainless-steel elastic hoses for easy connection
- sololit cover plate protecting the heat exchanger from dust and dirt on building site
- 25 mm height adjustment set-screws to compensate for the floor unevenness
- the unit is packed in a durable packaging and contains an istallation manual

Optional accessories

- finish Exclusive or Inox
- colour of the anodized Al frame – natural aluminium, light and dark bronze in the F profile or light or dark bronze in the U profile, see sketch page 23
- black paint of the heat exchanger
- shut off valve, thermostatic valve head or an actuator
- covering plate with increased rigidity
- case with noise-absorbing material (reduction of noisiness by 1 to 3 dB) see page 86

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 80
- Regulation is identical for all OC system radiators

Ordering codes
Convectors PKWOC

Case type – water supply location
P on the right (looking out of room)
P on the left (looking out of room)*
Convector case's face finish
0 without lowering of faces
1 supply side face lowering *
2 face lowering on opposite side of the supply *
3 lowering of both faces *

Elements of electrical regulation in a converter
R1 standard

				length		depth		width								
Economic	black steel case/unpainted exchanger	PKWOC	-	...	/	13	/	34	-	1	1	U	10	P0	-	R1
Exclusive	black steel case/black exchanger *	PKWOC	-	...	/	13	/	34	-	1	5	U	10	P0	-	R1
Inox	stainless steel case/unpainted exchanger *	PKWOC	-	...	/	13	/	34	-	5	1	U	10	P0	-	R1

** custom-made design*

Floor convectors with forced convection for heating and cooling Licon PKWOC

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

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

Ordering example

PKWOC, 150 length, 13 depth, 34 width with a black case and exchanger, U shape frame, silver eloxal coat = Exclusive Finish
Ordering code – PKWOC-150/13/34-15U10P0-R1

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.

Assembly page 68 • Regulation page 80 • Floor grids page 18

Connecting the floor convectors PKOC

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

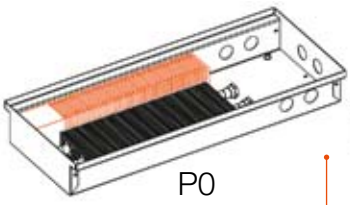
Lowering of faces of convector cases is used in places where visible connection of convectors to each other is not desirable (long rows of convectors, e.g. administrative buildings, hotels, etc.).

When ordering walkable grid it must be mentioned that it is for the lowered face convector (see ordering codes for walkable grids PM page 18).

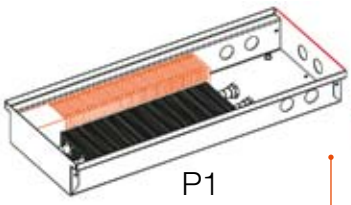
Note:

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

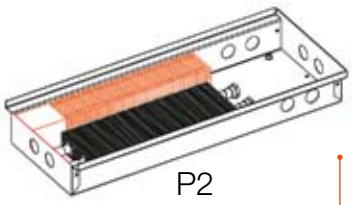
Water inlet on the right



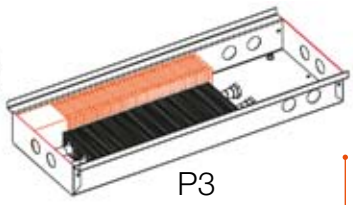
Without lowering of faces
standard design



Face lowering
at the inlet side

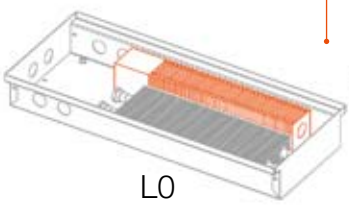


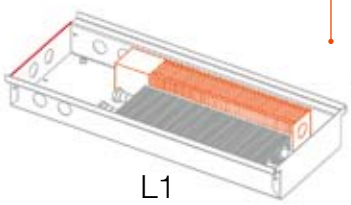
Face lowering on
the opposite side of the inlets

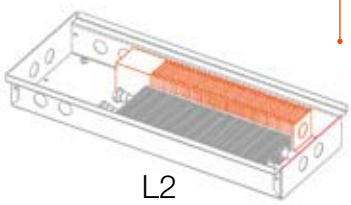


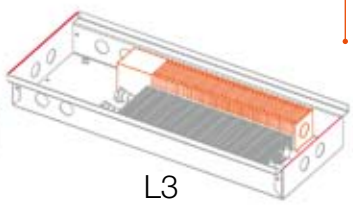
Lowering of both the faces

Water inlet on the left



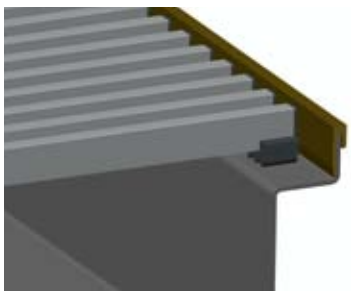


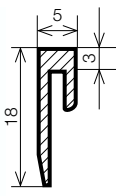




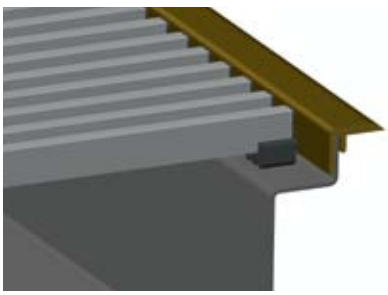
Profiles of aluminium frames

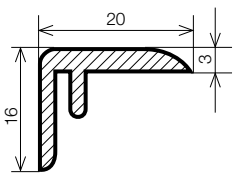
U frame





F frame





Sketches dimensions are in mm.

The convectors are fitted as standard with the silver U profile; when frame F is ordered it is enclosed with the delivery loose.
Colour finishes of the decorative frames match the colour finishes of the aluminium grids see page 19.

Information for the installation of convectors

Production series PKOC

depth – 7,5 cm, width – 28 cm

length	max. intake/max. voltage
80 cm	3 W/13,5 V DC
120 cm	5,5 W/13,5 V DC
160 cm	7,5 W/13,5 V DC
200 cm	10 W/13,5 V DC
240 cm	13 W/13,5 V DC
280 cm	15 W/13,5 V DC

Production series PKWOC, PKIOC

depth – 13 cm, width – 34 cm

length	max. intake/max. voltage
120 cm	9,5 W/13,5 V DC
150 cm	14 W/13,5 V DC
200 cm	18,5 W/13,5 V DC
250 cm	23 W/13,5 V DC
300 cm	27,5 W/13,5 V DC

Production series PKOC

depth – 9, 11 cm, width – 28, 34, 42 cm

Production series PKOC

depth – 9 cm, width – 20 cm

length	max. intake/max. voltage
80 cm	5,5 W/13,5 V DC
120 cm	11 W/13,5 V DC
160 cm	12 W/13,5 V DC
200 cm	20 W/13,5 V DC
240 cm	22,5 W/13,5 V DC
280 cm	23,5 W/13,5 V DC

Convector installation – construction part
Licon PKOC, PKBOC, PKIOC, PKWOC

Convector installation - construction recommendations

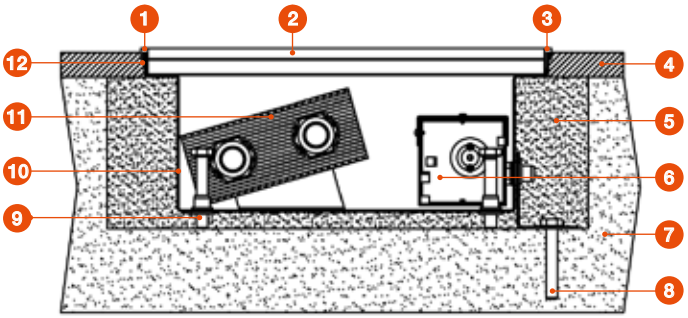
Several general principles must be fulfilled to ensure proper functioning of the convector.

- A properly installed element has the exchanger located further away from the window.
- It is recommended to use the standard stainless-steel hoses with stainless-steel jacketing which always form a part of the delivery (unless recommended otherwise) for interconnecting the exchanger and the distributing pipeline. In practice they provide a better access under the heat exchanger without having to dismantle the heating system, e.g. during cleaning.
- We recommend connecting the heating system with the use of stop valves and a thermostatic valve.
- Always connect the supply of the heat-carrying medium to the heat exchanger's pipe that is further away from the fan. In case of the 34 cm width the OR-J3 heat exchanger is used; the heat-carrying medium enters through one pipe and leaves through another one.
- The PKWOC exchanger is a four pipe unit; one circuit feeds the heating circuit and the other one the cooling circuit.
- Properly installed convector is laid horizontally with the convector's case edges intact and not bent to ensure correct function of the walkable grid and the bleeding of the exchanger possible.
- Correctly installed convector's decorative frame is at the floor level with a margin of + 2 mm.
- We recommend to keep the cover plate on the convector for the entire duration of the building work to prevent any dirt falling inside the convector. The standard plate is not walkable, but a plate with increased load bearing capacity can be ordered.
- The fans set is held down to the convector's case using magnets. In case of the stainless steel version the set of fans will be mounted using dry zips. This system allows you to remove the fans from the convector during the installation to avoid their damage or soiling, etc. They can be easily taken out for cleaning also during standard operation.
- The floor convector must be firmly set in the floor. The setting screws are only used for horizontal levelling of the convector case.
- Before concreting the convector must be fixed to the floor using anchoring screws that will prevent vertical shifting of the convector during subsequent pouring of concrete. When the concrete is poured the convector can be loaded vertically. During concreting the convector must be cross-braced to prevent deformation of the case. When pouring other material (e. g. anhydride) seal thoroughly all openings of the convector to prevent it from flooding.
- The convector's PKBOC setting screw consists of a flag used as a ground anchor. This type does not contain anchors.
- We recommend the fixing and sound proof insulation to be done in such a way that will allow a thin concrete to be poured to the convector's bottom and its sides. Optimal noise reduction is achieved by direct embedding of the convector in concrete.
- Installing the fan convector in free space can result in increased noise, therefore we recommend to order a case with noise absorbing material.
- Installation into double layer floors is described later.
- Cooled convectors (PKIOC, PKWOC) have built-in as standard a water (condensate) drain. During the installation do not forget to interconnect the case at the bottom of the convector with a pipeline with guaranteed gradient for wastewater or condensate removal. We recommend to equip the drain with an odour trap.
- Convectors PKBOC are intended for use in swimming pool areas. The separation barrier is used to capture water from the pool, but cannot serve as the standard pool water overflow. This part is always placed closer to the pool. The heating part with the exchanger and fans must be always further away from the pool. The convector is provided with drainage holes in each corner, i.e. altogether 4x. Installation, operation and maintenance of this equipment require special conditions. Please read them thoroughly on our website or in the manual.

Caution: Floor convector PKBOC with forced convection must be positioned so as to prevent even short term flooding of the section fitted with the motor and the fans.

Section of correct convector installation

Description and installation of the regulation see chapter titled Regulation page 80.



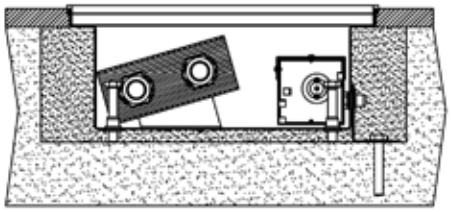
1 U frame
2 walkable grid
3 F frame
4 Clean floor
5 concrete fill
6 fan
7 rough floor
8 anchor
9 setting screw
10 heat insulation
11 exchanger
12 jointing material (silicon)

The heat insulation is not part of the delivery.

Possibilities of convector incorporation by floor types

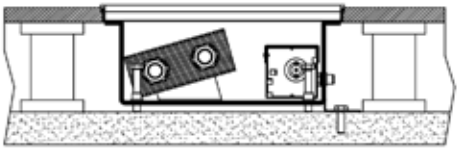
Installation by embedding in concrete

The most frequent installation option – an opening is prepared in the floor for the installation of the convector, or the convector is directly embedded in concrete. The installation procedure is described in more detail in the Convector installation chapter – construction part. It is adviceable to cross-brace the convector case before the concrete is cast to prevent its longitudinal deflection. It is also advisable to apply heat insulation (e.g. mineral wool, polystyrene) along the heat exchanger at the outer side of the case to avoid heat losses to the floor.



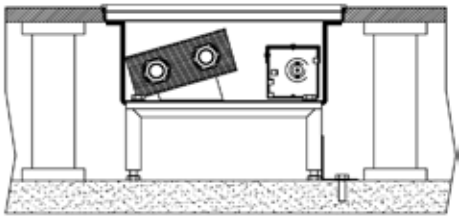
Installation in low double floor

In this case the convector must be fixed to the rough floor with the use of anchoring screws and aligned horizontally using the setting screws. With regard to the free space under the floor and around the convector we recommend to fit the convector case with noise absorbing material to suppress the noise, see page 86. This design is suitable for loading under common usage.



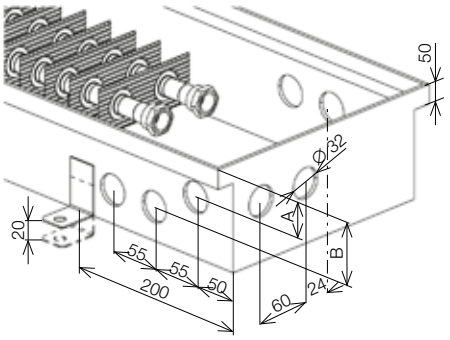
Installation in raised double floor

There is an individual design for every project. The installation procedure is the same as in option B, but instead of anchoring screws a steel beam or other aid is used to supports the convector along its full width. With regard to the free space under the floor and around the convector we recommend to fit the convector case with noise absorbing material to suppress the noise, see page 86. The agreed technical design is based on the customer's requirements.

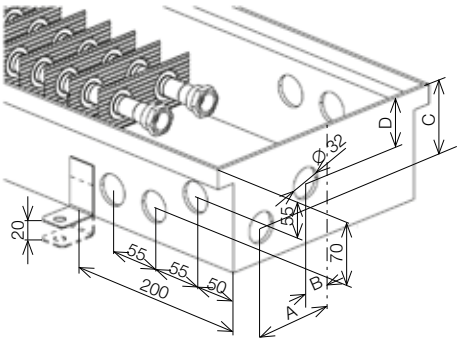


Dimensions of the mounting holes

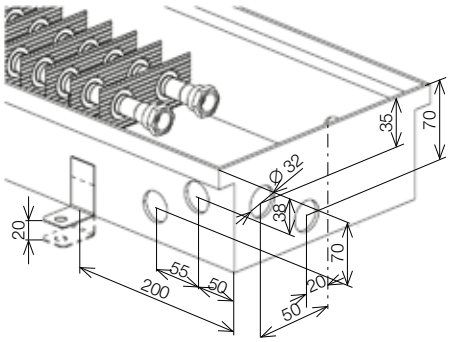
PKOC 7/28 A=50, B=50
PKOC 9/28 A=50, B=60



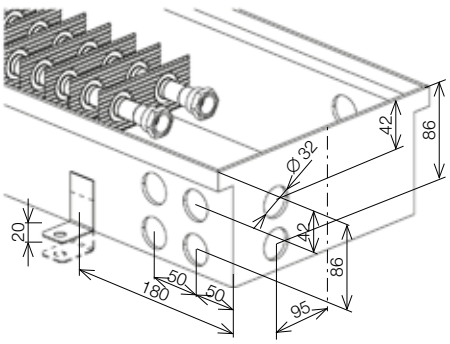
PKOC 11/28 A=80, B=20, C=74, D=57
PKOC 11/34 A=79, B=10, C=70, D=62
PKOC 11/42 A=120, B=31, C=70, D=54



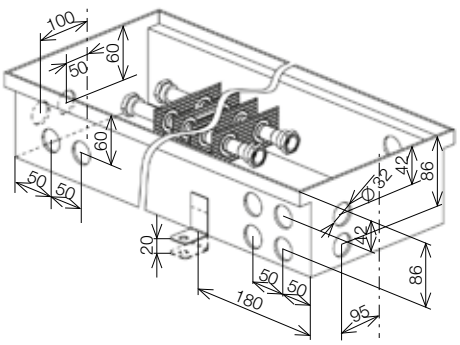
PKIOC 9/20



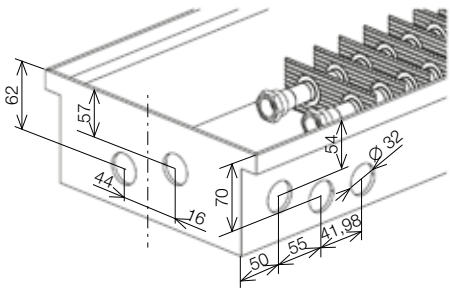
PKIOC 13/34



PKWOC 13/34



PKBOC 11/34



Licon OLOC NEW

FREE STANDING CONVECTOR
with forced convection and optimized convection

Exclusive free standing convectors design enhanced by the state-of-the-art technologies. Universal design of the free standing convectors with high efficiency also at low temperature gradients. This predeterminates them as ideal radiators to be heated by heat pumps.

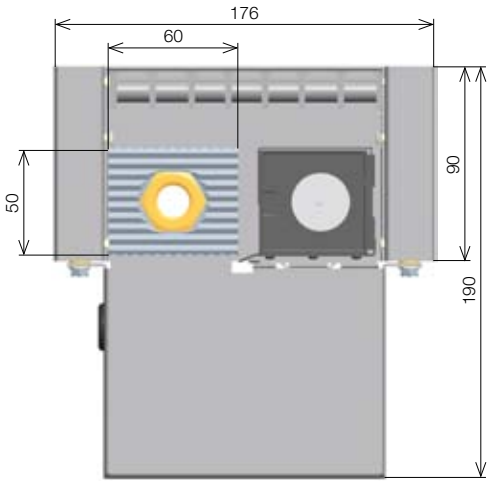
- high efficiency at low temperature of the heating water
- also suitable for installations with a heat pump
- energy efficient fans with an electric motor and a minimal intake
- immediate reaction to temperature changes in the room
- very quiet operation

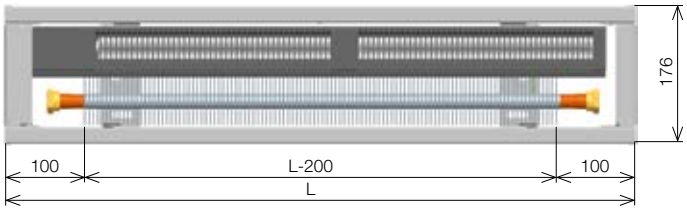
OPTIMIZED CONVECTION

Free standing convector with forced convection
Licon OLOC 9/18

NEW

- convector with the lowest construction height
- used for heating
- quietest operation at low speed
- also suitable for installations with a heat pump
- possibility of control through BMS (Building Management System)
- the convector is intended for dry environment





Specification

casing element height *(mm)*	90
widths *(mm)*	176
engths *(L mm)*	9 00, 1 200, 1 600, 2 000, 2 400, 2 800
exchanger height *(mm)*	50
exchanger width *(mm)*	60
exchanger effective length *(mm)*	L - 200
fans' impeller diameter *(mm)*	30
connection to the heating system	inner G 1/2"

Version Exclusive • coated in RAL 9010 zinc galvanised steel with aluminium unpainted grid

Specification

Width	*cm*	18																							
Depth	*cm*	9																							
Total length	*cm*	90				120				160				200				240				280			
Noisiness - acoustic pressure 1m	*dB(A)*	0	10.1	19.4	23.2	0	10.3	19.5	23.7	0	10.7	20.1	23.9	0	11.6	22.4	24.9	0	11.9	22.9	25.1	0	12	23.1	25.2
Power input:	*W/V*	4/13.5				5.5/13.5				7.5/13.5				10.5/13.5				13/13.5				15/13.5			
Speed switch position		Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3
Heat output	*t1 °C*	Heat output [W] / EN 442																							
90/70 °C	20	189	519	585	650	270	742	835	929	378	1039	1169	1300	486	1335	1504	1672	594	1632	1838	2043	702	1929	2172	2415
75/65 °C	18	162	444	500	555	231	634	714	794	323	887	999	1111	415	1141	1285	1428	508	1394	1570	1746	600	1648	1855	2063
	20	**155**	**425**	**478**	**532**	**221**	**607**	**684**	**760**	**309**	**850**	**957**	**1064**	**398**	**1093**	**1230**	**1368**	**486**	**1335**	**1504**	**1672**	**575**	**1578**	**1777**	**1976**
	22	148	406	457	509	211	580	653	727	296	812	915	1017	380	1045	1176	1308	465	1277	1438	1599	549	1509	1699	1889
70/55 °C	18	136	374	421	468	194	534	601	669	272	748	842	936	350	961	1082	1203	428	1175	1323	1471	505	1388	1563	1738
	20	129	355	400	445	185	508	572	636	259	711	800	890	333	914	1029	1144	407	1117	1258	1398	481	1320	1486	1653
	22	123	337	379	422	175	481	542	603	245	674	759	844	315	867	976	1085	386	1059	1193	1326	456	1252	1409	1567
55/45 °C	18	95	260	293	326	135	372	418	465	189	520	586	651	243	669	753	837	298	817	920	1023	352	966	1088	1209
	20	88	242	273	303	126	346	390	433	176	484	546	607	227	623	701	780	277	761	857	953	328	900	1013	1127
	22	82	225	253	281	117	321	361	402	164	449	506	562	210	577	650	723	257	706	795	884	304	834	939	1044
50/40 °C	18	79	216	243	270	112	308	347	386	157	431	486	540	202	555	625	695	247	678	763	849	292	801	902	1003
	20	72	198	223	248	103	283	319	355	144	396	446	496	186	510	574	638	227	623	702	780	268	736	829	922
	22	66	181	204	226	94	258	291	323	132	362	407	453	169	465	524	582	207	568	640	712	245	672	756	841
45/35 °C	18	63	172	194	216	90	246	277	308	125	344	388	431	161	443	499	554	197	541	609	678	233	640	720	801
	20	56	155	175	194	81	222	249	277	113	310	349	388	145	399	449	499	177	487	549	610	210	576	649	721
	22	50	138	156	173	72	197	222	247	101	276	311	346	129	355	400	445	158	434	489	543	187	513	578	642

• temperature exponent m = 1.1

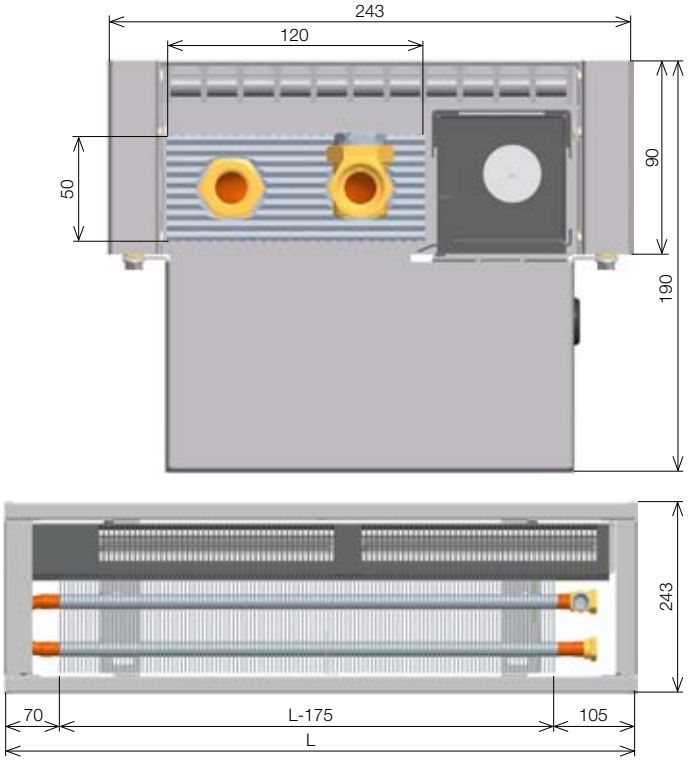
Correction factor page 74 • Assembly page 75 • Regulation page 80

Free standing convector with forced convection
Licon OLOC 9/24

NEW

OPTIMIZED CONVECTION

- convector with the lowest construction height
- used for heating
- high heat output
- possibility of control through BMS (Building Management System)
- the convector is intended for dry environment



Specification

casing element height *(mm)*	90
widths *(mm)*	243
engths *(L mm)*	900, 1 200, 1 600, 2 000, 2 400, 2 800
exchanger height *(mm)*	50
exchanger width *(mm)*	120
exchanger effective length *(mm)*	L - 175
fans' impeller diameter *(mm)*	40
connection to the heating system	2 x G 1/2" inner

Version Exclusive • coated in RAL 9010 zinc galvanised steel with aluminium unpainted grid

Specification

Width	*cm*	24																									
Depth	*cm*	9																									
Total length	*cm*	90				120				160				200				240				280					
Noisiness - acoustic pressure 1m	*dB(A)*	0	17.6	26.3	33	0	17.9	26.8	33.4	0	18.2	27.1	33.6	0	18.7	27.7	33.9	0	18.9	27.8	34.2	0	19.2	28	34.4		
Power input:	*W/V*	8/13.5				11/13.5				12/13.5				21.5/13.5				22.5/13.5				23.5/13.5					
Speed switch position		Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3		
Heat output	*t1 °C*	Heat output [W] / EN 442																									
90/70 °C	20	353	704	866	1027	499	996	1224	1452	693	1385	1702	2018	888	1773	2179	2585	1082	2162	2657	3152	1277	2551	3134	3718		
75/65 °C	18	301	602	740	877	426	851	1046	1240	592	1183	1454	1724	758	1515	1862	2208	925	1847	2270	2693	1091	2179	2678	3177		
	20	**289**	**576**	**708**	**840**	**408**	**815**	**1002**	**1188**	**567**	**1133**	**1392**	**1652**	**726**	**1451**	**1783**	**2115**	**886**	**1769**	**2174**	**2579**	**1045**	**2087**	**2565**	**3042**		
	22	276	551	677	803	390	779	958	1136	542	1083	1331	1579	695	1387	1705	2022	847	1691	2079	2466	999	1996	2452	2909		
70/55 °C	18	254	507	623	739	359	717	881	1045	499	997	1225	1453	639	1277	1569	1861	779	1556	1912	2269	919	1836	2256	2676		
	20	241	482	592	703	341	682	838	994	474	948	1164	1381	608	1214	1491	1769	741	1480	1818	2157	874	1746	2145	2544		
	22	229	457	562	666	324	646	794	942	450	899	1104	1310	576	1151	1414	1678	702	1403	1724	2045	829	1655	2034	2413		
55/45 °C	18	177	353	434	514	250	499	613	727	347	694	852	1011	445	888	1091	1295	542	1083	1331	1578	640	1278	1570	1862		
	20	165	329	404	479	233	465	571	677	323	646	794	942	414	827	1017	1206	505	1009	1239	1470	596	1190	1462	1735		
	22	153	305	374	444	216	431	529	628	300	599	736	873	384	767	942	1118	468	935	1149	1363	552	1103	1355	1608		
50/40 °C	18	147	293	360	427	207	414	508	603	288	575	707	839	369	737	905	1074	450	898	1104	1309	531	1060	1302	1545		
	20	135	269	330	392	190	380	467	554	265	529	650	771	339	677	832	987	413	825	1014	1203	487	974	1197	1419		
	22	123	245	302	358	174	347	426	506	241	482	593	703	309	618	759	900	377	753	925	1098	445	888	1092	1295		
45/35 °C	18	117	234	287	341	165	330	406	482	230	459	564	669	294	588	723	857	359	717	881	1045	424	846	1040	1233		
	20	105	210	259	307	149	297	366	434	207	414	508	603	265	530	651	772	323	646	793	941	381	762	936	1110		
	22	94	187	230	273	133	265	326	386	184	368	453	537	236	472	580	688	288	575	707	838	340	678	834	989		

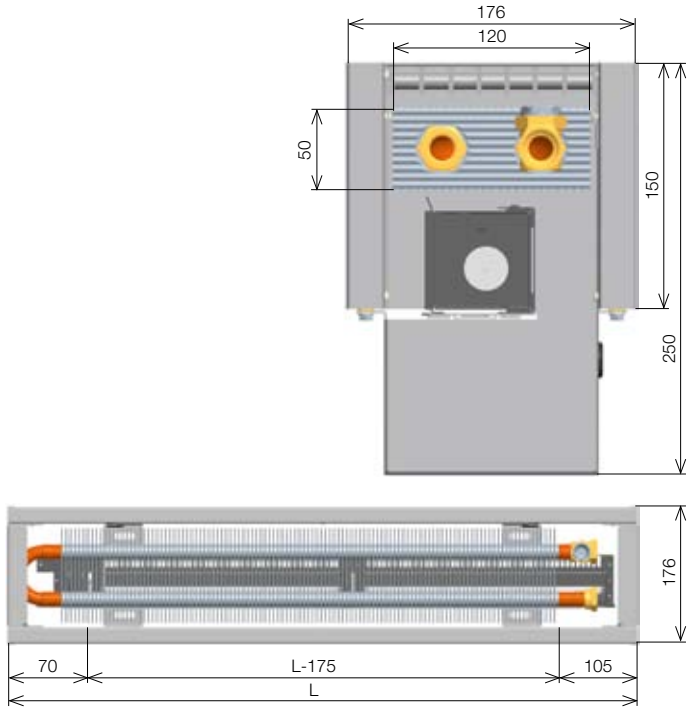
• temperature exponent m = 1.1

Correction factor page 74 • Assembly page 75 • Regulation page 80

Free standing convector with forced convection
Licon OLOC 15/18

NEW

- used for heating
- high heat output
- quietest operation at low speed
- possibility of control through BMS (Building Management System)
- the convector is intended for dry environment



Specification

casing element height *(mm)*	150
widths *(mm)*	176
engths *(L mm)*	900, 1 200, 1 600, 2 000, 2 400, 2 800
exchanger height *(mm)*	50
exchanger width *(mm)*	120
exchanger effective length *(mm)*	L - 175
fans' impeller diameter *(mm)*	40
connection to the heating system	2 x G 1/2" inner

Version Exclusive • coated in RAL 9010 zinc galvanised steel with aluminium unpainted grid

Specification

Width	*cm*	18																									
Depth	*cm*	15																									
Total length	*cm*	90				120				160				200				240				280					
Noisiness - acoustic pressure 1m	*dB(A)*	0	17.6	26.3	33	0	17.9	26.8	33.4	0	18.2	27.1	33.6	0	18.7	27.7	33.9	0	18.9	27.8	34.2	0	19.2	28	34.4		
Power input:	*W/V*	8/13.5				11/13.5				12/13.5				21.5/13.5				22.5/13.5				23.5/13.5					
Speed switch position		Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3	Off	1	2	3		
Heat output	*t1 °C*	Heat output [W] / EN 442																									
90/70 °C	20	335	751	914	1076	473	1062	1292	1521	658	1476	1796	2115	842	1891	2300	2709	1027	2305	2804	3303	1211	2720	3308	3896		
75/65 °C	18	286	642	781	919	404	907	1104	1300	562	1261	1534	1807	719	1615	1965	2314	877	1970	2396	2822	1035	2324	2826	3329		
	20	**274**	**615**	**748**	**881**	**387**	**869**	**1057**	**1245**	**538**	**1208**	**1469**	**1731**	**689**	**1547**	**1882**	**2217**	**840**	**1886**	**2294**	**2703**	**991**	**2225**	**2707**	**3188**		
	22	262	588	715	842	370	831	1011	1190	514	1155	1405	1655	659	1479	1799	2119	803	1804	2194	2584	948	2128	2588	3048		
70/55 °C	18	241	541	658	775	340	764	930	1095	473	1063	1293	1523	606	1361	1656	1950	739	1659	2018	2377	872	1958	2381	2805		
	20	229	514	625	736	324	727	884	1041	450	1010	1229	1448	576	1294	1574	1854	703	1578	1919	2260	829	1861	2264	2666		
	22	217	487	593	698	307	689	838	987	427	958	1165	1373	546	1227	1493	1758	666	1496	1820	2143	786	1765	2147	2529		
55/45 °C	18	168	376	458	539	237	532	647	762	329	739	899	1059	422	947	1152	1357	514	1155	1404	1654	607	1362	1657	1952		
	20	156	350	426	502	221	495	603	710	307	689	838	987	393	882	1073	1264	479	1075	1308	1541	565	1269	1543	1818		
	22	145	325	395	465	205	459	559	658	284	638	777	915	364	818	995	1171	444	997	1213	1428	524	1176	1430	1685		
50/40 °C	18	139	312	380	447	196	441	537	632	273	613	746	879	350	786	956	1125	427	958	1165	1372	503	1130	1374	1619		
	20	128	287	349	411	181	405	493	581	251	564	686	807	321	722	878	1034	392	880	1070	1261	462	1038	1263	1487		
	22	117	262	318	375	165	370	450	530	229	514	625	737	293	659	801	944	358	803	977	1150	422	947	1152	1357		
45/35 °C	18	111	249	303	357	157	352	428	505	218	490	596	702	279	627	763	898	340	765	930	1095	402	902	1097	1292		
	20	100	224	273	321	141	317	386	454	196	441	536	632	251	565	687	809	307	688	837	986	362	812	988	1164		
	22	89	200	243	286	126	282	344	405	175	393	478	563	224	503	612	721	273	613	746	878	322	723	880	1036		

• temperature exponent m = 1.1

Correction factor page 74 • Assembly page 75 • Regulation page 80

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

OLOC 9/18, 9/24, 15/18

Δt (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
kt	0.325	0.345	0.365	0.385	0.405	0.426	0.446	0.467	0.487	0.508	0.528	0.549	0.570	0.591	0.612	0.633

Δt (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
kt	0.654	0.675	0.697	0.718	0.739	0.761	0.782	0.804	0.825	0.847	0.869	0.891	0.912	0.934	0.956	0.978

Δt (K)	50	51	52	53	54	55	56	57	58	59	60
kt	1.000	1.022	1.044	1.066	1.088	1.111	1.133	1.155	1.177	1.200	1.222

- temperature exponent m = 1.1

Weights and water volumes OLOC

OLOC	9/18	9/24	15/18
kg/linear meter	11.6	7.7	10.2
l/linear meter	0.22	0.5	0.5

The listed weights are without a packaging.

The contents of supplies and selectable specifications

Standard delivery contains

- sheathing of zinc galvanised steel sheet 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)
- temperature switch
- stands for fixing to clean floor (it is not possible to use the wall mounting brackets or stands for the rough floor with the OLOC product)
- the set is packed in a cardboard packaging

Optional accessories

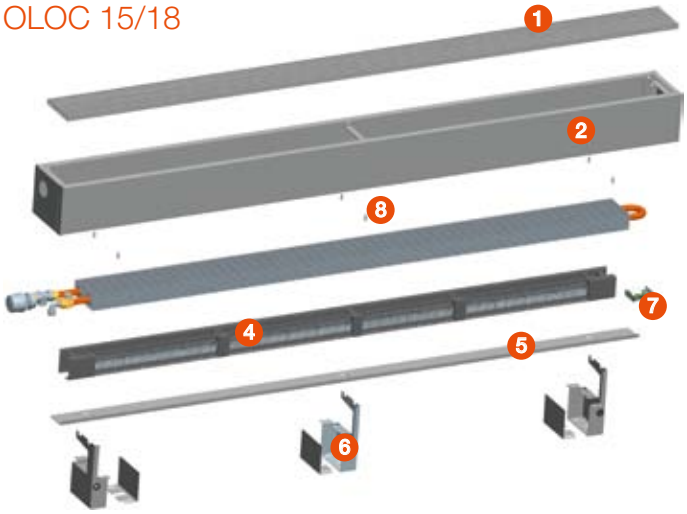
- shut off valve, thermostatic valve head or an actuator
- in case of ordering more than 5 units it is possible to select another sheathing colour shade (the manufacturer must be consulted in connection with the change)

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 80
- Regulation is identical for all OC system radiators

Convectors assembly

OLOC 15/18



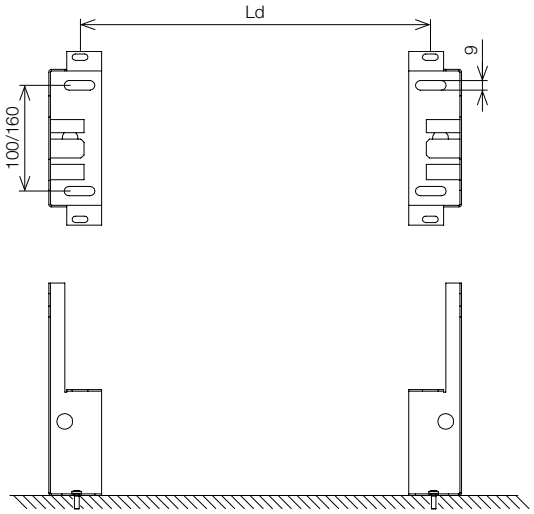
Convector breakdown

1. aluminium cover grid
2. metal plating
3. heat exchanger OR-J2
4. fans
5. fan support
6. stands
7. connecting terminal (F Box)
8. screw DIN 7981

Installation technique of OLOC (valid for all models)

Determine the stands spacing for anchoring them to the floor by pushing the fan's rail into the stands. The heat exchanger is then positioned in the stands and connected to the heating system.

The fan is fixed to the fan support and connected to the F-box. Finally, the cover with the breathing grid is put on and screwed onto the stands. The grid is removable for easy cleaning. You will find more detailed information in the installation instructions.



L = Convector length
Ld = L – 300 mm (up to the convector length of 1400 mm)
Ld = L – 400 mm (up to the convector length of 2 000 mm)
Ld = L – 600 mm (above the convector length of 2000 mm)

Ordering codes Convectors OLOC

				length		height		width		Cover grid finish 10 aluminium/silver eloxal coat						
Exclusive	white steel/unpainted exchanger	OLOC	-	...	/	...	/	..	-	1	10	1	-	R1

Free standing convector with forced convection Licon OLOC

Sheathing material
1 steel, white coat RAL 9010
9 other finish/colour RAL of the sheathing *

Exchanger finishes
1 recuperative, unpainted

Elements of electrical regulation in a converter
R1 standard

** custom-made design*

Licon OKIOC NEW

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 intake while maintaining maximally attainable performances.

Univeral use – heating and dry-cooling!

OC OPTIMIZED CONVECTION

Wall-mounted convector with forced convection
Licon OKIOC 45/11

NEW

- used for heating or dry-cooling
- high efficiency even at low temperatures of the heating system
- patented design solutions
- high-perfomance, low energy and quiet fans
- the same regulation as the one for floor convectors PKOC and free standing convector with forced convection OLOC
- two pipe system
- right bottom connection
- controls possible through BMS
- the convector is intended for dry environment

The dimensions are given in mm

Specification

depth *(mm)*	110
depth *(mm)*	450
lengths *(L mm)*	750, 1 000, 1 250, 1 500, 1 750, 2 000
outputs *(W)*	281 - 6257
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

Specification

Height	cm	45																									
Width	cm	11																									
Lengths	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. intake/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		**270**	**823**	**1093**	**1385**	**540**	**1646**	**2186**	**2770**	**720**	**2195**	**2915**	**3693**	**810**	**2469**	**3279**	**4155**	**990**	**3018**	**4008**	**5078**	**1170**	**3566**	**4736**	**6002**		
	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 performance SENSITIV.

Cooling performances for other operating conditions on request.

** SENSITIV – cooling power actually delivered for cooling the air.*

Correction factor page 78 • Assembly page 79 • Regulation page 80

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

OKIOC 45/11

Δt (K)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
kt	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

Δt (K)	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
kt	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

Δt (K)	50	51	52	53	54	55	56	57	58	59	60
kt	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 OKIOC

Type	45/11
kg/linear meter	21
l/1 linear meter	1.45

The listed weights are without a packaging.

The contents of supplies and selectable specifications

Standard delivery contains

- sheathing of zinc galvanised steel sheet 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)
- radiator wall-mounting consoles
- radiator mounting and maintenance 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 in connection with the change)
- shut off valve, thermostatic valve and actuator

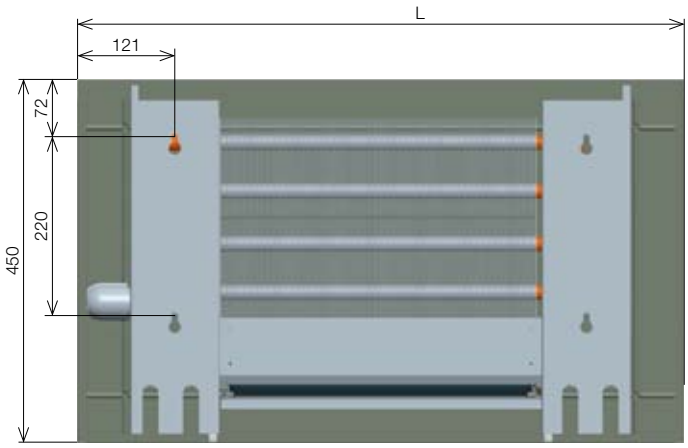
Note:

- 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 80
- Regulation is identical for all OC system radiators

Convector installation – construction recommendations Licon OKIOC

- It is recommended to position the wall-mounted heating element on a peripheral wall, 10 cm above the floor.
- The hot water supply always in the upper pipes; recommend to fit with the stop 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 radiator 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 sheating only after all building work has been completed.

Anchoring diagram



Assembly electrical part

- Regulation is identical with the one for floor convectors and free standing convector with forced convection
- We recommend to fit OKIOC with the thermoelectric drive, order no. 02300
- Do not forget to provide power supply near the installation – more details in the electrical assembly part on page 80 or in the installation instructions

Design solution of the front face of OKIOC

The wall-mounted heating elements OKIOC 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 OKIOC

			length		height		depth			Cover grid finish			
Exclusive	white steel/unpainted exchanger	OKIOC	- ...	/	...	/	..	-	1	00	1	-	R1

** custom-made design*

Wall-mounted convectors with forced convection Licon OKIOC (heating and dry-cooling)

Sheathing material
1 steel, white coat RAL 9010
9 other finish/colour RAL of the sheathing *

Exchanger finishes
1 recuperative, unpainted

Elements of electrical regulation in a converter
R1 standard

Regulation and noisiness

OPTIMIZED CONVECTION

Description of electrical regulation of convectors

Description of electrical regulation of PKIOC, PKWOC, OLOC, OKIOC (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 motor with permanent magnets. It is characterized mainly by very low power consumption – the power intake of the motor at the full range of speed does not exceed 7.5 watts; the motor 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 intake 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 actuator 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 or on www.licon.cz in the download section.

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 OKIOC. 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, RDF400/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 smootly adjustable. The convectors control can be also carried out using a BMS (Bulding 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 themoelectric 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 PKBOC

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 convector 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 convector. 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 400 and RDG 100T.

The convector 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.

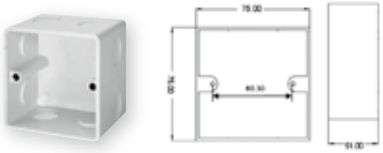
Electrical regulation elements

SIEMENS RAB 11
ordering code: 60011

- 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 RDF 400
Ordering code: 60400

- 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 thermoelectric actuator
- possibility of control using the infrared remote control
- degree of protection class IP 30
- dimensions w × h × d (mm) – 86 × 86 × 57
- part of the thermostat RDF 400/IR is the electrical installation box ARG71



Electrical installation box ARG71.

SIEMENS RDG 100T
Ordering code: 60100

- 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 6K
- 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

SIEMENS IRA 211
Ordering code: 60211

- infrared remote control for RDF 400/IR and RDG 100T
- operation type selection
- temperature setting
- fan speed selection
- compatible for use with the RDF 400, 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

Room temperature sensor QAA32
Ordering code: 60032

- 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 400, 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

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
output voltage :	15 V DC / 4 A	15 V DC / 6,5 A
dimensions w × h × d *(mm)*	78 × 93 × 56	100 × 93 × 56
Ordering code:	62060	62100

R-Box
Ordering code: 65001

- 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
- instalation on the DIN rail in the switchboard
- incorporates speed signal galvanic separator module
- operating ambient termperature: 0 - 40 °C
- dimensions w × h × d (mm) – 52 × 23 × 40

Installation box
Ordering code: 68001

- 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
Order. code: 02300

- power supply voltage: 12 V DC / 150 m A / 1,8 W
- CLOSED without power supply
- degree of protection: IP 54
- connection cable 2 × 0,75 mm^2, length 1 m
- closing / opening time < 3 min.

Thermostatic head fluid with capillary
Ordering code: 02400

- regulation range +6.5 to +28 °C
- installation of the actuator into the wall
- length of capilary 5 m
- hysteresis: ≤ 0,6 °C

Thermostatic valve
Ordering code for straight section: 02200
Ordering code for corner section: 02250

- 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

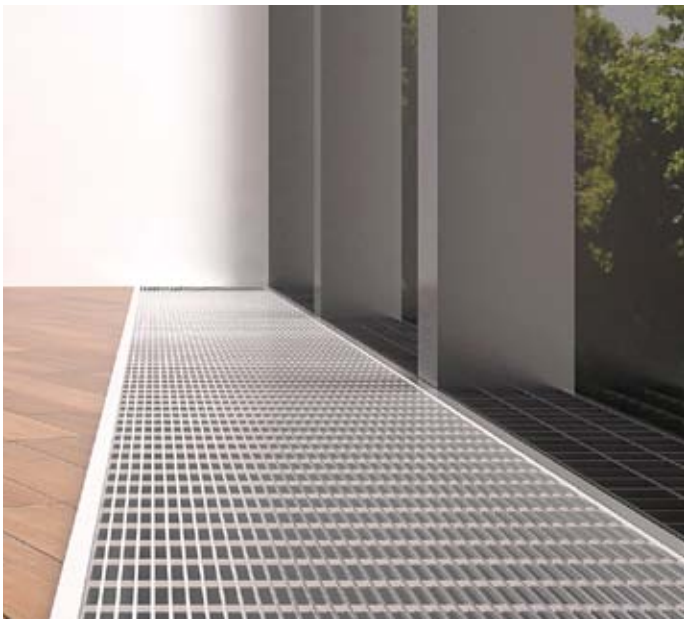
Kv *flow coefficient (m³/h)*
Kvs *maximum flow (m³/h)*
Δt = 2K *valve proportionality band (K)*

Shut-off valve
Ordering code for straight section: 02100
Ordering code for corner section: 02150

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

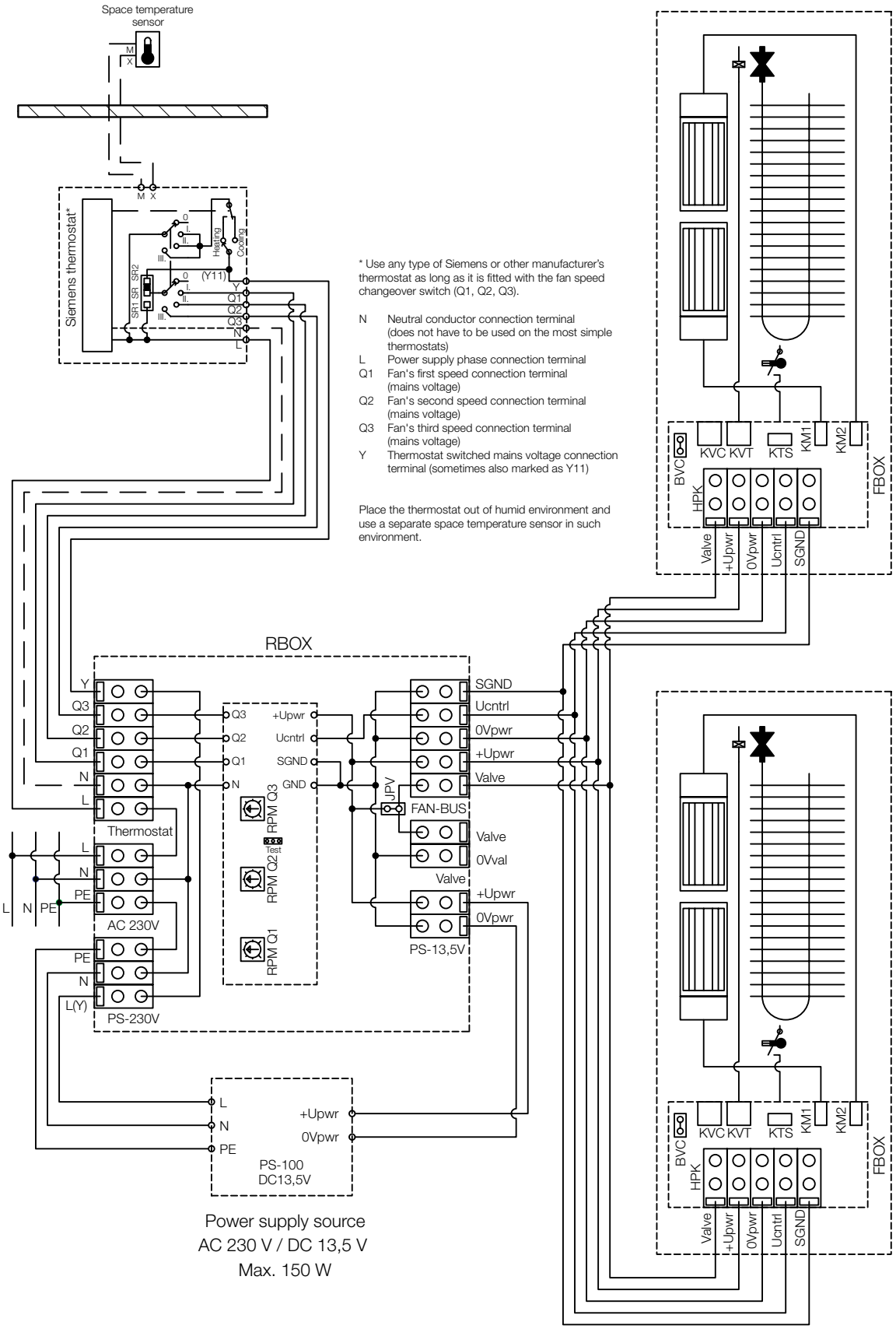
Preset stage	1	2	3	4	5	6	7	8	9
speed	1 1/4	1 1/2	1 3/4	2	2 1/2	3	3 1/2	4	Complete opening
Kv	0.14	0.20	0.31	0.43	0.60	0.79	1.00	1.20	1.35

Kv *flow coefficient (m³/h)*

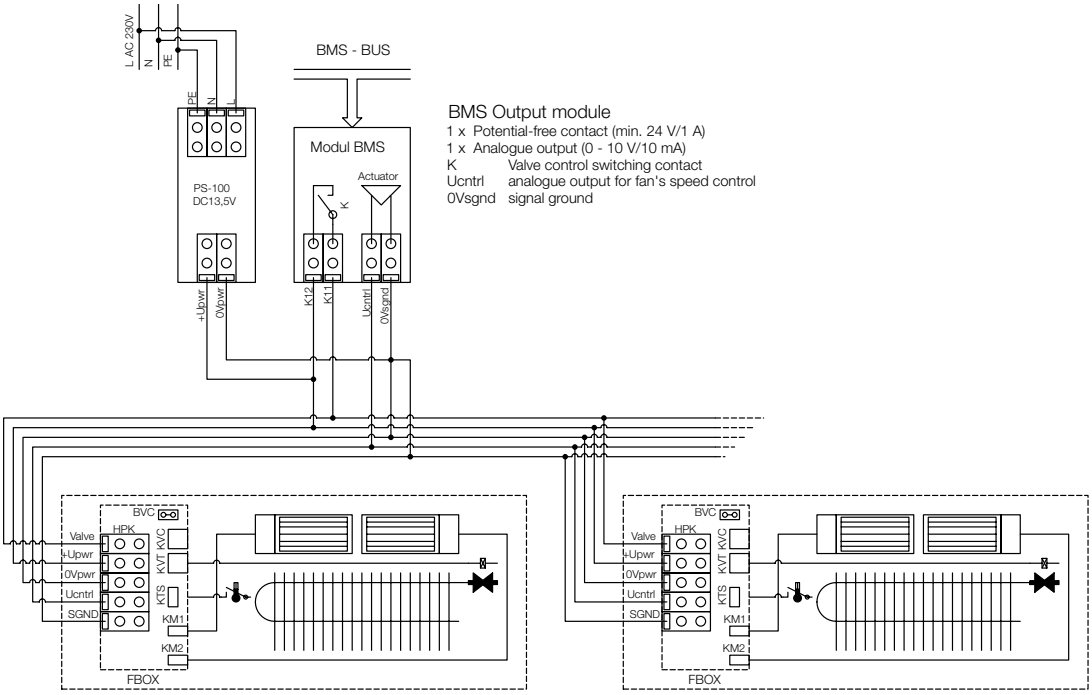


Connection diagram of convectors in the variant with heating media valves.

Convectors regulation basic connection Licon OC (PKOC, PKBOC, PKWOC, PKIOC, OLOC, OKIOC)

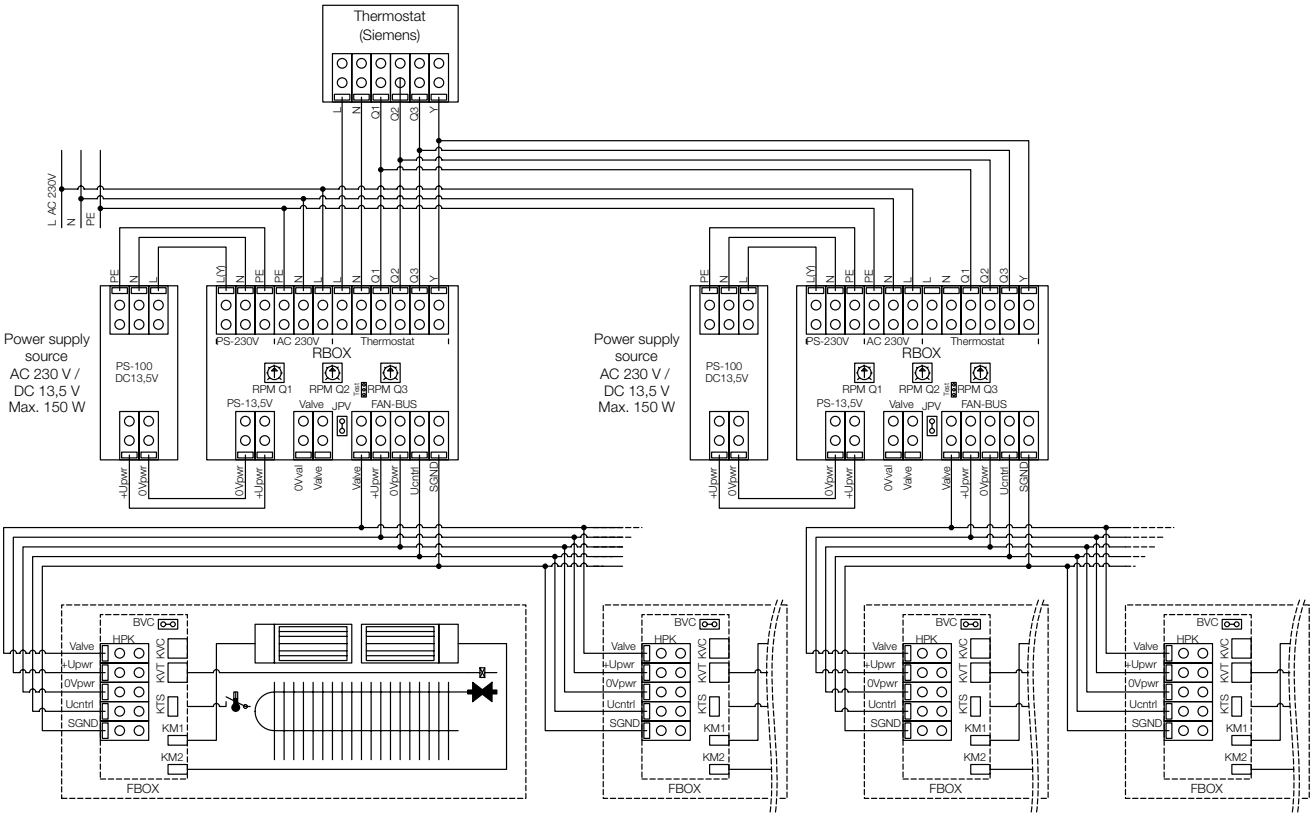


Licon OC convectors regulation connection (PKOC, PKBOC, PKWOC, PKIOC, OLOC, OKIOC)
BMS control (Building Management System)



BMS Output module
1 x Potential-free contact (min. 24 V/1 A)
1 x Analogue output (0 - 10 V/10 mA)
K Valve control switching contact
Ucntrl analogue output for fan's speed control
0Vsgnd signal ground

Licon OC convectors regulation connection (PKOC, PKBOC, PKWOC, PKIOC, OLOC, OKIOC)
with more DC power supply sources

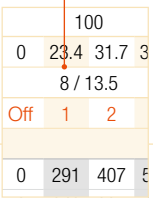


Example of the design calculation of the output of the DC power supply

The electrical intake must be calculated in terms of regulation so that the correct size of the DC power supply source is selected. The total intake power of the radiators will be the sum of all intake 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 PKOC 160/9/28 – we find the intake power of 12 W in the table
1 pc of OLOC 240/15/18 – we find the intake power of 22.5 W in the table
2 pcs of OLOC 100/45/11 – we find the intake power of 8 W in the table
(optionally 4 pieces of thermoelectric actuators –
4 x 1.8 W = 7.2 W)

Total power intake:
12 + 12 + 22.5 + 8 + 8 + (7) = 62.5 W (69.5 W)
Select source rated 100 W.



Noisiness - acoustics

Apart from the intake power one of the main parameters is the noise level of the fan convectors. Licon develops and designs its products so that they do not exceed under any circumstances the specified noice 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. Licon uses in its products always the most advanced technology. The same is also true in the case of the fans. The fans used are equipped with patented disc motor with permanent magnets. The benefits are especially a significant noise reduction and a low energy consumption compared to commercially available ventilators with the rotor and stator.

Licon indicates in its materials a parameter to assess the noise level the sound pressure Lp (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.

Sound pressure

The sound pressure is a change of the air pressure generated by a source of noise. Such pressure fluctuations are measured in N/m^2 and expressed by the symbol "p". The sound 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.

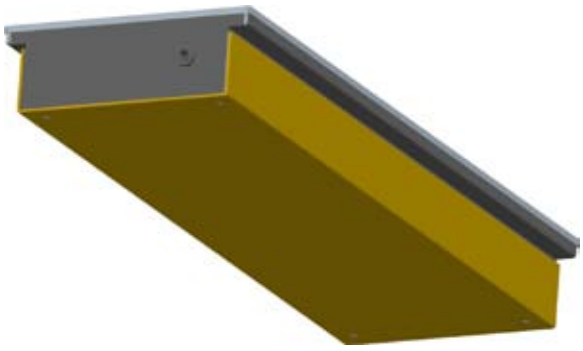
Sound power

The energy converted by a piece of equipment (the source of sound) to sound is referred to as 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 the sound pressure in the form of a hemisphere or a sphere around the sound source. The sound pressure is on this basis a quantity that is independent of space and distance. It is used for all further calculations. On request, LICON will provide values of sound power of its OC line products. Although the sound pressure level and sound power level use the same unit (dB), they are physically two different 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.

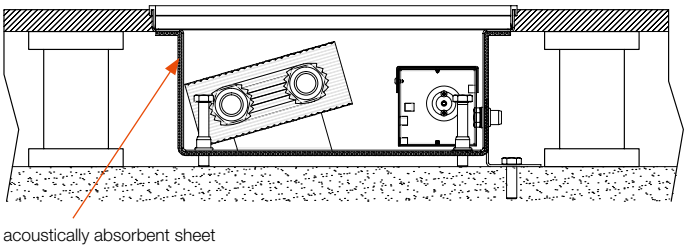
Case with noise-absorbing foil

For further noise reduction order a convector 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 convector.

Anti-noise foil



Anti-noise foil – cross section

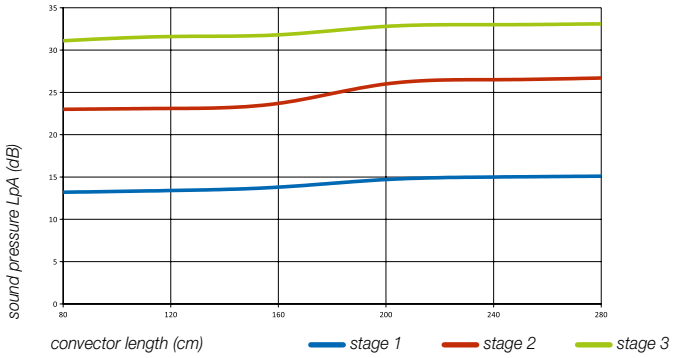


acoustically absorbent sheet

Graphic representation of the noisiness level of OC convectors

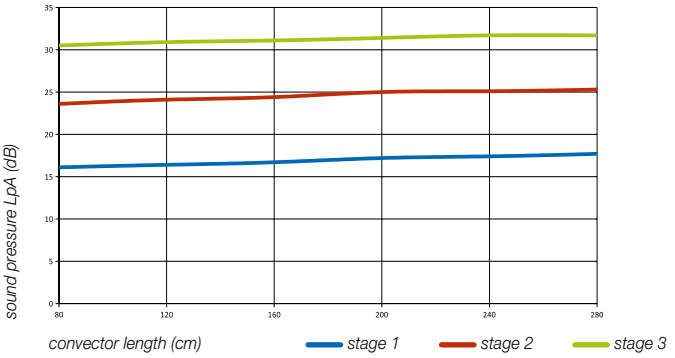
Sound pressure at the distance of 1 m from the convector with forced convection of ∅ 30 mm.

For convectors type PKOC XX/7/28.



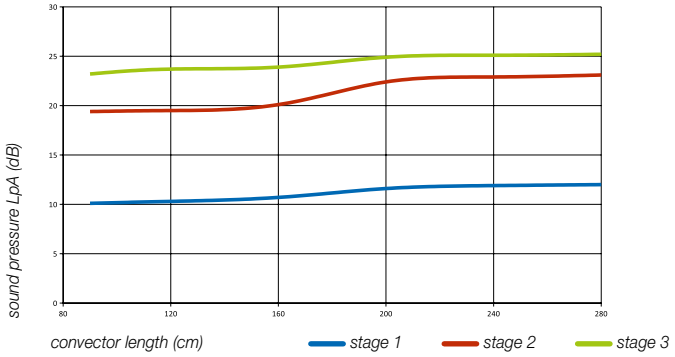
Sound pressure at the distance of 1 m from the convector with forced convection of ∅ 40 mm.

For convectors type PKOC XX/9/28, XX/11/28, XX/11/42, PKIOC XX/13/28, PKWOC XX/13/340.



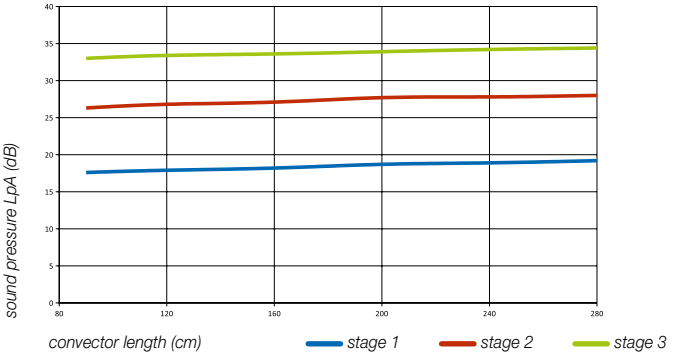
Sound pressure at the distance of 1 m from the convector with forced convection of ∅ 30 mm.

For convectors type PKOC XX/9/18.



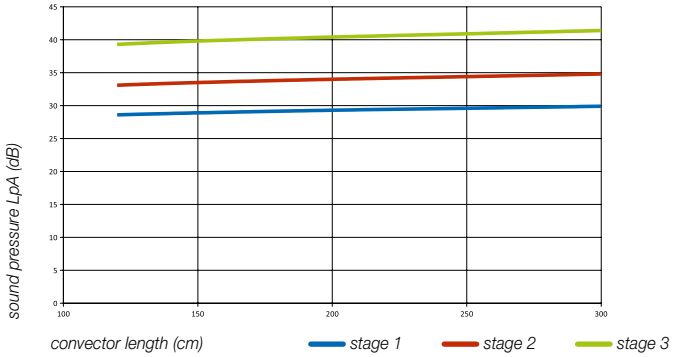
Sound pressure at the distance of 1 m from the convector with forced convection of ∅ 40 mm.

For convectors type OLOC XX/9/24, XX/15/18



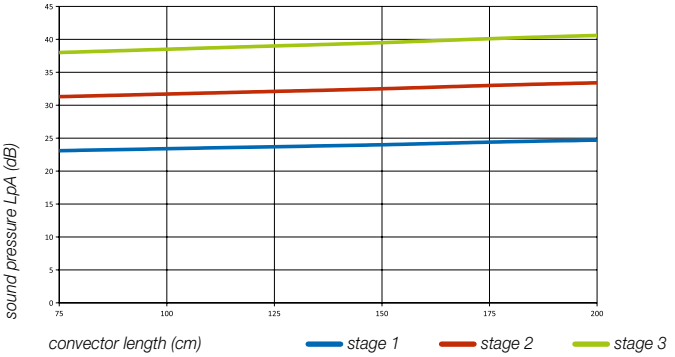
Sound pressure at the distance of 1 m from the convector with forced convection of ∅ 60 mm.

For convector types PKIOC XX/13/34, PKWOC XX/13/34.



Sound pressure at the distance of 1 m from the convector with forced convection of ∅ 60 mm.

For convectors type PKOC XX/45/11.

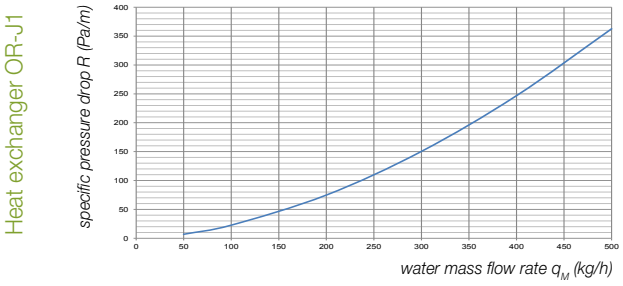


Volume of air per 1 m of fan-cooled heat exchanger length (m^3/h)

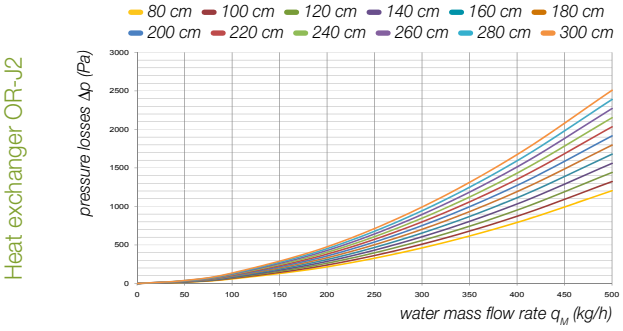
fan diameter	stage 1 speed	stage 2 speed	stage 3 speed
30 mm	135	180	225
40 mm	180	240	300
60 mm	325	437	512

Pressure losses of convectors PK

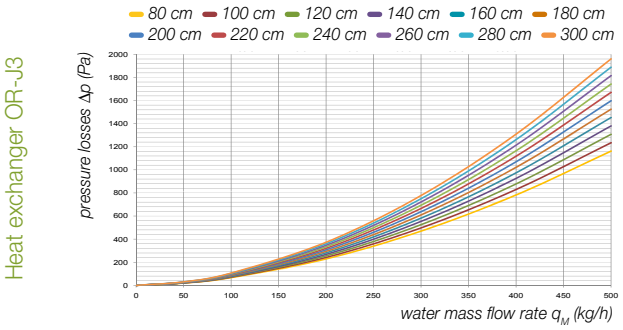
PK 9/16, PK 11/16, OLOC 9/18
OLOC 9/18, OR-J1



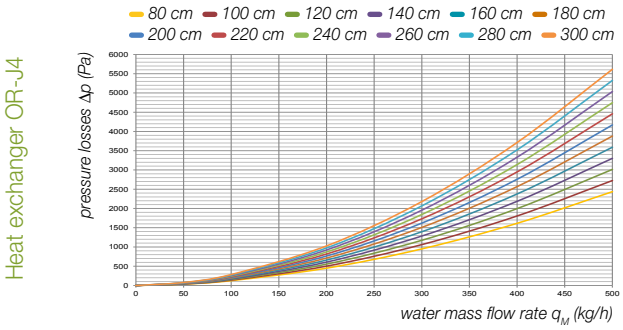
PK 9/20, PK 9/28, PK 11/20, PK 11/28
OL 9/18, OL 9/24, OR-J2
OLOC 9/24, OLOC 15/18
PKOC 7/28, PKOC 9/28, PKOC 11/28
PKBOC 13/34



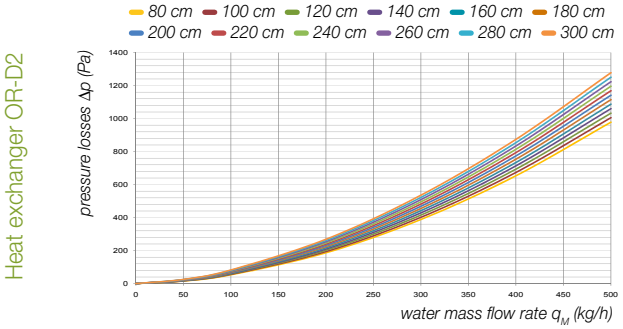
PK 9/34, PK 11/34
PKOC 11/34, OR-J3



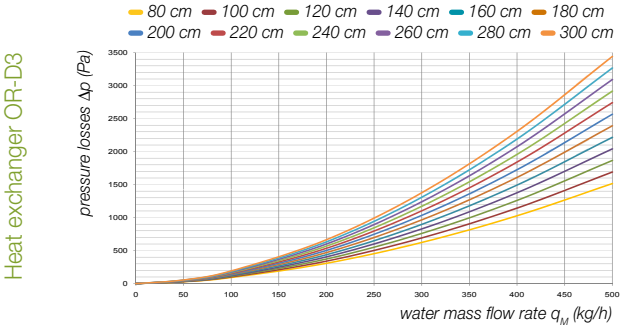
PK 9/42, PK 11/42
PKOC 11/42



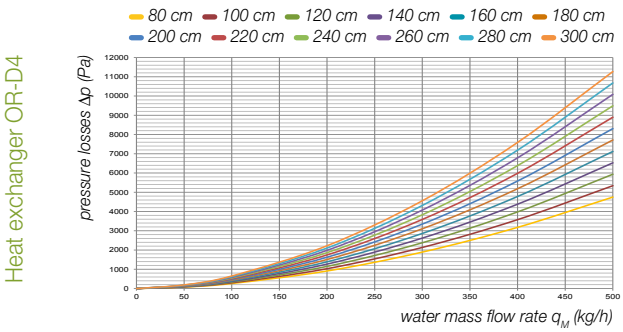
PK 15/28, PK 19/28, PK 30/20, PK 45/28
OL 15/18, OL 30/18, OL 45/18, OL 60/18
OR-D2



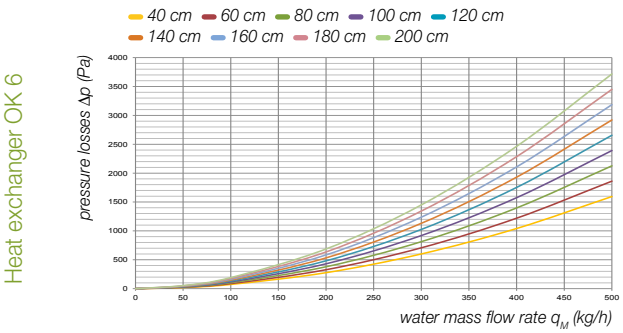
PK 15/34, PK 19/34, PK 30/42, PK 45/42
OL 15/24, OL 30/24, OL 45/24, OL 60/24
OR-D3



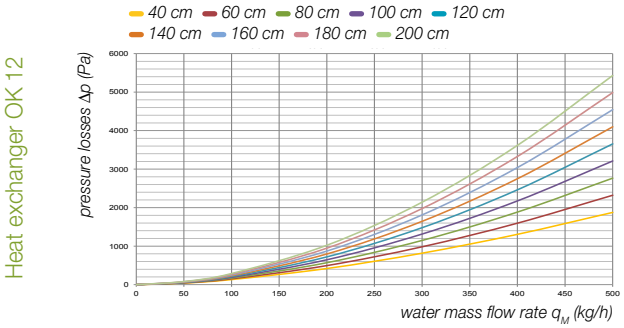
PK 15/42, PK 19/42



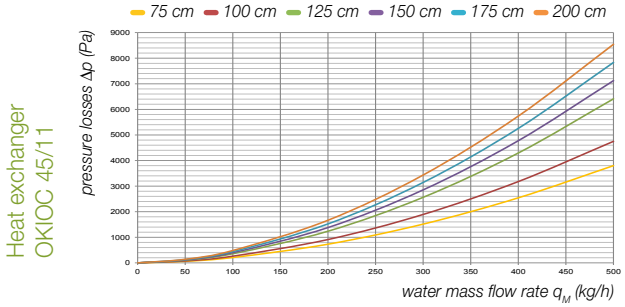
OK 45/6, OK 60/6



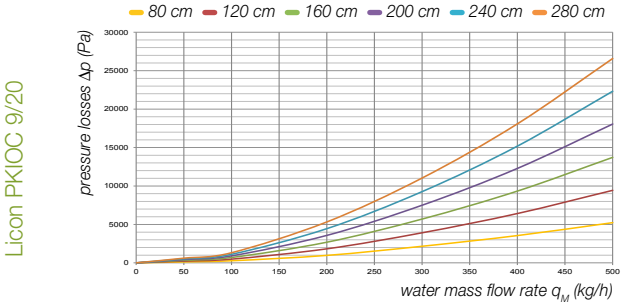
OK 45/12, OK 60/12



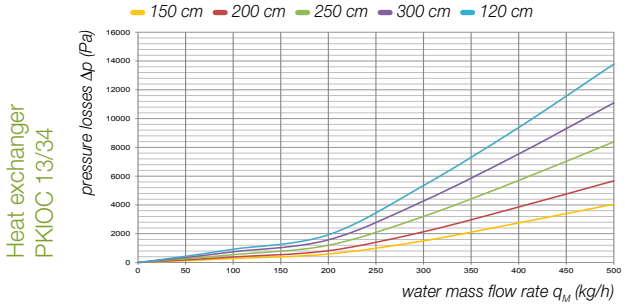
OKIOC 45/11



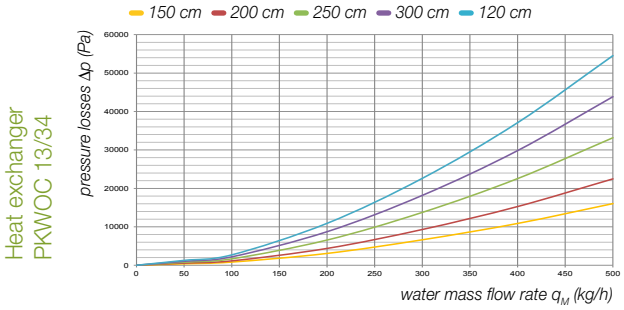
PKIOC 9/20



PKIOC 13/34



PKWOC 13/34



Examples of conversion to a variant temperature difference

Δt = (tw1 + tw2) / 2 – ti

Where: tw1 is the inlet water temperature (°C)
tw2 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 OR-D2/140 heating element
Rated operating condition: 75/65/20 °C
Qn = 1 198 W should be converted to the temperature difference
Δt = 40 K
Q = Qn × factor kt = 1198 × 0,748 = 896 W

Entered: Licon OK 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 = 1018 × 0.515 = 525 W

General information of 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
Proven heating and cooling performances

quality austria SYSTEM CERTIFIED ISO 9001:2008 NR.05269/0
Certification to ISO 9001:2008

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).

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

References

Main Point Karlín, Praha 8

Triplex - residential building, Karlovy Vary

Technical University, Liberec

Conference centre Harfa, Island

Airport, Brno

Administrative building Trinity, Brno

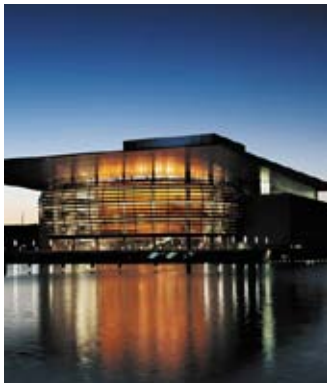
Headquarters of the Celsis Company, Lithuania

Ještěd Hotel, Liberec

SBK Spartak S. Peterburg, Russia

Lannova, Praha

Administrative building, Denmark



Opera House, Denmark

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

Modern and the state of the art production technological centre in Liberec

LICON®
RADIATORS FOR LIFE

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