



FLOOR CONVECTORS

TERMO



ACTIV

FLOOR CONVECTORS

2012



ISAN Radiátory s.r.o. is a manufacturer of floor convectors supplying domestic and European markets for over 15 years.

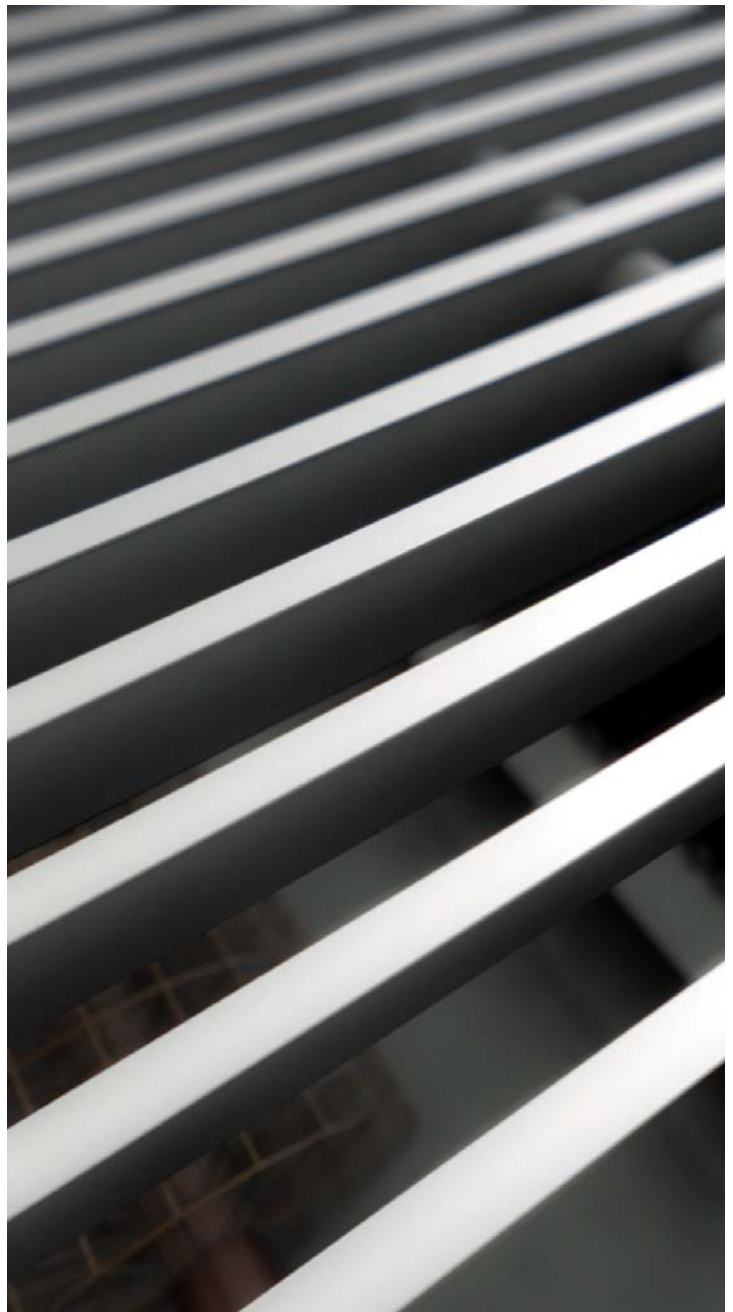
ISAN trade mark represents a traditional supplier with over 50 years' experience delivering a broad range of ISAN MELODY bathroom and design radiators, ISAN EXACT radiating convectors and lamellar radiators, ISAN EXACT ECOLITE convectors with lamellar exchangers, ISAN TERMO floor convectors, ISAN ATOL element radiators and ISAN SPIRAL finned tube radiators. Top modern technological procedures and progressive thinking of the Company's staff guarantee design and technical parameters of the best quality. ISAN is a specialist for manufacturing of radiators tailored to customer's needs and wishes.

ISAN's policy is primarily focused to customer's satisfaction. Ecological processing with greatest respect to environmental protection is taken for granted. The Company has introduced and maintains Quality Management System as per the ISO 9001:2008 standard. All the heating bodies comply with certification demands according to the actual rigorous legislative standards applicable in the supplied countries. Certification procedure for territory of the Czech Republic was performed by Strojírenský zkušební ústav (Engineering Testing Institute), Brno, a notified body ES1015.



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Floor convectors made and supplied by **ISAN Radiatory** represent a top quality mark based on innovation and technological progress. New trends and technologies are followed by professional team and implemented then into new products.

24V DC

Termo Activ is a new series of floor convectors, focused on electric power saving, intelligent control and operating safety. The economy is defined by inquiries of highly developed countries inclusively the EU markets.

Convectors equipped with FLT fans work with **safe direct-current voltage of 24V DC**. Built-in fans characterized of low electric power consumption (in watt order) are provided with regulation units evaluating the values and reacting to the room environs. Revs correction, frost protection, window sensors and other algorithms take care for protection of user's regulation system against undesirable heat leakage or local piping freeze; the heating output has been adapted to ambient conditions. The automated mode enables comfortable operation all the year round.

Floor convector control:

- room thermostat
- in convector installed regulator

THERMOSTAT is a „brain“ of the whole system controlling its performance, enabling continuous revs adjustment, moderate heating, automated and antifreeze modes. It is able to differentiate between requirements for heating and cooling either. It can be used for working in double-tube as well as in four-tube heating systems.

REGULATOR is an independent element ensuring the right fan running and by means of sensors regulating the output values for the convec-

tor to work independently and to prevent heat leakage or exchanger damage.

COMMUNICATION with floor convector follows by a **data flow** - CIB protocol. The convector may be integrated in **Building Management Systems** (BMS - Tecomat Foxtrot, Lon Works, EIB and the like).

24V DC FANS with electric commutation (EC-Technology), smooth revs regulation and efficiency of over 90 % have almost double lifetime in comparison with usual AC-engines. The continuous revs regulation of 24V DC engines used with FLT convectors follows by 0-10V input (eventually by PWM-signal).

HEAT EXCHANGERS SPIRO Cu-Cu

Cooper wire heat exchangers, special technology of wire basket on supporting cooper pipe

- **mechanical resistance** - high rigidity prevents damage during installation and cleaning
- **easy cleaning** - wire construction prevent from dust settling
- **stable characteristics** - soldered construction ensures long-term stable performance of the exchanger SPIRO
- **flexibility** - easy flexibility while maintaining the aesthetic appearance and functional properties





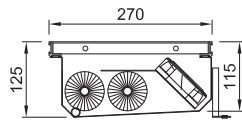
FLT FLOOR CONVECTOR WITH FAN

24V DC - FLOOR CONVECTORS, DIRECT-CURRENT VOLTAGE

<p>FLT10-09 270×90×800-4800 mm Q 75/65/20 °C: 262-3188 W Q 55/45/20 °C: 148-1808 W heating, 2 pipe system page 12</p>	<p>FLT20-09 320×90×800-4800 mm Q 75/65/20 °C: 545-6643 W Q 55/45/20 °C: 301-3670 W heating, 2 pipe system page 13</p>	<p>FLT10-11 270×115×800-4800 mm Q 75/65/20 °C: 233-2566 W Q 55/45/20 °C: 134-1472 W heating, 2 pipe system page 14</p>	<p>FLT20-11 320×115×800-4800 mm Q 75/65/20 °C: 461-5074 W Q 55/45/20 °C: 270-2970 W heating, 2 pipe system page 15</p>	<p>FLT21-12 320×125×800-3200 mm Q 75/65/20 °C: 930-3255 W Q 55/45/20 °C: 545-1906 W heating, cooling, 2 pipe system page 16</p>
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12V DC - FLOOR CONVECTORS FOR SWIMMING POOLS

<p>FLB20-12 270×125×800-4800 mm Q 75/65/20 °C: 422-4647 W Q 55/45/20 °C: 213-2348 W heating, cooling, 2 pipe system page 22</p>
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Note: The values of Q-heating output above are valid for fan medium speed.

FLOOR CONVECTOR WITH NATURAL CONVECTION

<p>FLK10-09 170×90×800-4800 mm Q 75/65/20 °C: 95-945 W Q 55/45/20 °C: 45-446 W heating, 2 pipe system page 28</p>	<p>FLK20-09 320×90×800-4800 mm Q 75/65/20 °C: 161-1655 W Q 55/45/20 °C: 76-789 W heating, 2 pipe system page 28</p>	<p>FLK30-09 360×90×800-4800 mm Q 75/65/20 °C: 227-2193 W Q 55/45/20 °C: 118-1118 W heating, 2 pipe system page 28</p>	<p>FLK40-09 420×90×800-4800 mm Q 75/65/20 °C: 293-2731 W Q 55/45/20 °C: 160-1447 W heating, 2 pipe system page 28</p>	<p>FLK10-11 170×115×800-4800 mm Q 75/65/20 °C: 102-1011 W Q 55/45/20 °C: 48-487 W heating, 2 pipe system page 30</p>
<p>FLK20-11 320×115×800-4800 mm Q 75/65/20 °C: 174-1798 W Q 55/45/20 °C: 84-859 W heating, 2 pipe system page 30</p>	<p>FLK30-11 360×115×800-4800 mm Q 75/65/20 °C: 246-2341 W Q 55/45/20 °C: 118-1118 W heating, 2 pipe system page 30</p>	<p>FLK40-11 420×115×800-4800 mm Q 75/65/20 °C: 318-2884 W Q 55/45/20 °C: 152-1377 W heating, 2 pipe system page 30</p>	<p>FLK10-14 170×140×800-4800 mm Q 75/65/20 °C: 117-1162 W Q 55/45/20 °C: 55-549 W heating, 2 pipe system page 32</p>	<p>FLK20-14 320×140×800-4800 mm Q 75/65/20 °C: 215-2229 W Q 55/45/20 °C: 104-1065 W heating, 2 pipe system page 32</p>
<p>FLK30-14 360×140×800-4800 mm Q 75/65/20 °C: 317-3019 W Q 55/45/20 °C: 152-1442 W heating, 2 pipe system page 32</p>	<p>FLK40-14 420×140×800-4800 mm Q 75/65/20 °C: 394-3576 W Q 55/45/20 °C: 188-1707 W heating, 2 pipe system page 32</p>	<p>FLK20-18 300×180×800-4800 mm Q 75/65/20 °C: 257-2787 W Q 55/45/20 °C: 124-1346 W heating, 2 pipe system page 34</p>	<p>FLK30-18 360×180×800-4800 mm Q 75/65/20 °C: 293-3180 W Q 55/45/20 °C: 142-1536 W heating, 2 pipe system page 34</p>	<p>FLK20-30 300×300×800-4800 mm Q 75/65/20 °C: 289-3131 W Q 55/45/20 °C: 135-1460 W heating, 2 pipe system page 34</p>
<p>FLK30-30 360×300×800-4800 mm Q 75/65/20 °C: 419-4284 W Q 55/45/20 °C: 195-2118 W heating, 2 pipe system page 34</p>				

STAINLESS TANK

is made of stainless steel DIN 1,4301 (17240), wall thickness 0.8 mm, inner surface treatment by spray painting is also available. The tank containing all the convector functional elements is provided with openings for water inlet/outlet and for electric cables connection (FLT types). A solid peripheral aluminium frame holds an upper grill. The construction stiffened with inner ribs contains levelling screws for height adjusting within the installation.

HEAT EXCHANGER Cu-Cu

Special wire basket soldered on a copper tube through which the heat carrier circulates. The air flowing among wires distributes the collected heat to the room. The exchanger is provided with an air release valve and connection female thread G 1/2".

UPPER GRILL

is a final visual element of the installed floor convector. The client may have a grid flooring, the long ribs of which follow the window line (material: aluminium, wood, stainless steel) or the client may choose a grill with short perpendicular ribs (material: aluminium). Convectors installed in floating floors can be decked with finishing cover ledges.

TANGENTIAL FANS

Tangential fans obtain forced air circulation reflected in more effective use of exchanger heating capacity in comparison with natural air circulation (FLT types). Shields covering the rotating parts of engine prevent accidents, injuries and fan damages. The integrated regulator enables comfortable regulation of the floor convector heating capacity.

REGULATION

A regulator placed in the convector controls the fan revs and flow rate of the heating medium through exchanger. The regulator follows instructions by wall thermostat installed in the room. Regulation, fans and convector speed control working under safe voltage 24V DC.



RUNNING CONDITIONS

- Warm-water heating system with forced circulation
- Heat medium operating temperature, max. 110 °C
- Heat medium operating overpressure, max. 1 MPa
- Electric parts IP 20, operating voltage 24V DC, dry environs
- The convector is construed for ambient temperature between +2 and 40 °C and relative moisture of 20-70 %

WARRANTY CONDITIONS | EXTRACT

The Seller's warranty covers joint tightness, surface treatment, proclaimed values of heating capacity and loss in pressure relating to heating bodies professionally installed in a closed and sealed system in accordance with applicable standards and decrees, this all under the aspect that the used medium must only serve as the heat carrier. Other usage is excluded.

Electric heating bodies shall be professionally installed in accordance with the applicable standards. FLT floor convectors with fans, IP 20 – dry environs.

PERIODS OF RISK

The period of risk is 5 years for joint tightness, 10 years for exchanger and 2 years for electro-installation and stainless steel tank.

GRILLS

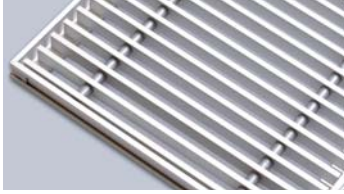


Convecter becomes a functional design element of the interior by correct choose of upper grill suitable material and colour. The grill is fit in a massive aluminium peripheral frame creating an optical boundary between the floor and convecter.

ALUMINIUM GRILLS

ROLL-UP GRILLS

The spacing between spring loaded transverse lamellas of aluminium alloy is delimited by residual rollers made of cured plastic. The lamellas have anodized and tinted surface. Any RAL shade may be reached by powder colour coating.



R1-1

Al-roll grill, natural
Al-frame, natural



R2-1

Al-roll grill, bronze
Al-frame, bronze



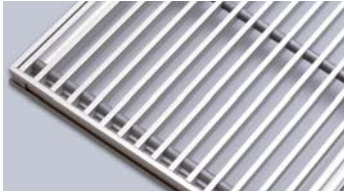
R3-1

Al-roll grill, black (coloured)
Al-frame black (coloured)

Grill supply is included in price, RAL shades to order.

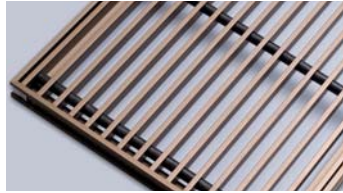
LINEAR GRILLS

Lengthwise perforated aluminium lamellas are linked by carrying steel bar. Residual rollers of cured plastic delimitate the spacing.



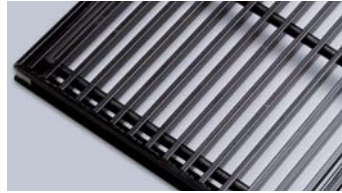
R1-2

Linear Al-grill, natural
Al-frame, natural



R2-2

Linear Al-grill, bronze
Al-frame, bronze



R3-2

Linear Al- grill, black (coloured)
Al-frame black (coloured)

Grill supply is included in price, RAL shades to order.

WOODEN GRILLS

ROLL-UP GRILLS

The spacing between spring loaded oak or beech lamellas is delimited by residual rollers made of cured plastic. The surface is raw or stained.



R6-1

Roll-up grill, natural beech
Al-frame, natural



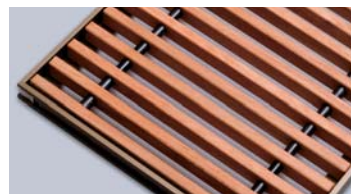
R6-2

Roll-up grill, stained beech
Al-frame, bronze



R6-3

Roll-up grill, natural oak
Al-frame, natural



R6-4

Roll-up grill, stained oak
Al-frame, bronze

Grill supply is included in price.

STAINLESS STEEL GRILL

TRANSVERSE GRILL

Stainless steel rectangular profiles are linked by steel drawbars. The spacing of lamellas is delimited by residual metal rollers. A fix non-rolling grill.



R5-1

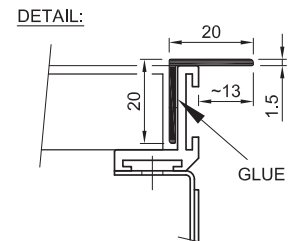
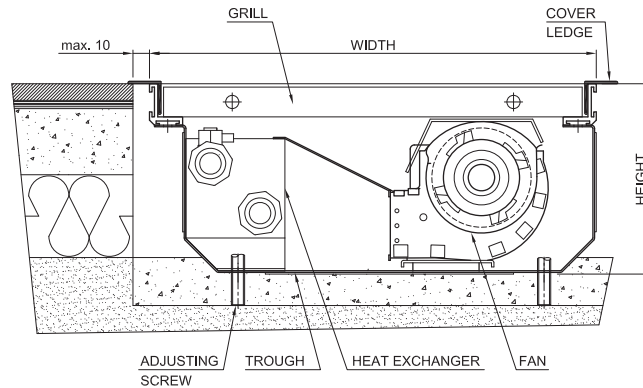
stainless steel grill, transverse

A grill available to order, calculation as per the convecter type.

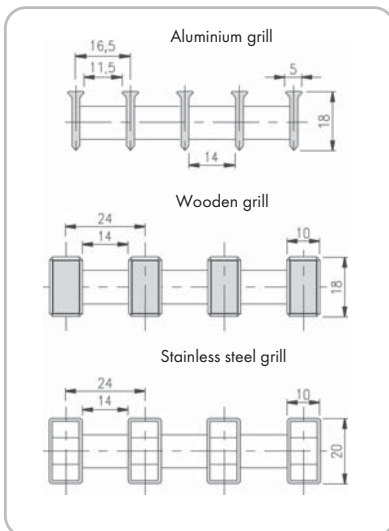
FINISHING COVER LEDGE

- for installation in wooden and floating floors to cover the dilatation joints
- variants available: Al natural, Al bronze (anodized aluminium) or coated with powder colour acc. to RAL Chart
- covers dilatation joints up to 10mm
- profile 20x20x1.5 mm
- ledge is a part of convector package
- installation after the finished convector mounting
- marking D instead of R in the code, colour matching with surface treatment of the frame (D1-1, D2-1, D3-1, D2-1, D2-2, D3-2, D6-1, D6-2, D6-3, D6-4, D5-1)

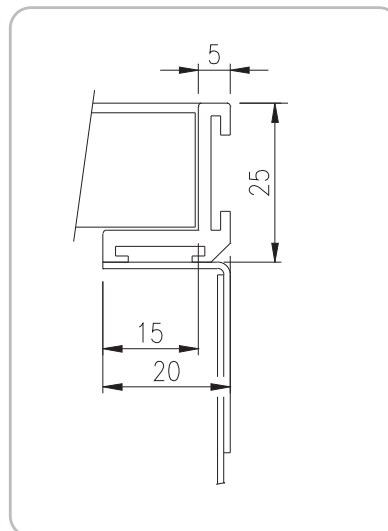
Because of modified grill width of convector, the option is to be specified when ordering the heating body. The top edge of convector frame may not protrude from the final floor level.



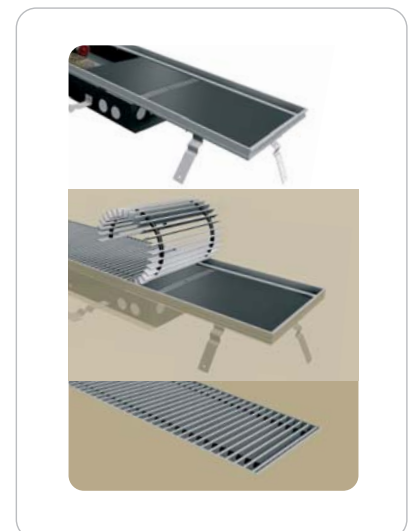
Grill cross section



Frame detail



Non standard frame



Samples of floor convector coding:
 FLT20-11120-NR110 - convector with Al-frame and grill
 FLT20-11120-ND110 - convector with Al-frame, modified grill and cover ledge
 Ordering, see the page 37

CONVECTOR WITH FANS 24V DC



Floor convector equipped with tangential fans is characterized of high heating capacity surpassing the same of convector with natural convection. By using of quiet tangential fans and in connection with intelligent regulation, the convector became a full-bodied heating element for utilization in modern buildings.

Convector is fitted with Cu-Cu wire heat exchanger through which heating medium is flowing. Lengthwise placed tangential fans guarantee a balanced exchanger covering and subsequently an optimized heat distribution to the room.

- **High heating output**
- **Energy saving fans**
- **24V DC**
- **Continuous revs regulation**

TYPES WITH 24V DC TECHNOLOGY:

- FLT10-09 (270×90×800-4800 mm)
- FLT20-09 (320×90×800-4800 mm)
- FLT10-11 (270×115×800-4800 mm)
- FLT20-11 (320×115×800-4800 mm)
- FLT21-12 (320×125×800-3200 mm)

24V DC FANS

The installed modern fans with **EC** engines work under the operating voltage of **24 V DC**. The continuous engine revs regulation **0-10V** enables accurate control of floor convector output. Power consumption of a fan is specified in watt units. Only one thermostat and one regulator is sufficient for all convectors installed in a standard room.

TABLE OF CONVECTOR ELECTRIC POWER INPUTS

- Convectors are equipped with continuously speed regulated 24V DC fans
- Recommended FLT floor convectors regulation is in the range of 0-4V
- The table below shows power take-off relating to fans performance within the standard speed gears of 1, 2, 3
- The highest possible power input of fans (control voltage of 10V) is specified for complete utilization of the available regulation levels

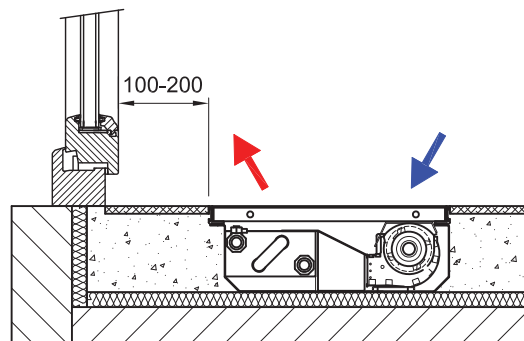
Table of fans electric power input (FLT types)

TYPE	Speed	Revolutions [rpm]	FLT convector length [mm]										
			800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
FLT10-09 FLT20-09	1	576	2W	2W	2W	4W	4W	5W	5W	6W	7W	7W	9W
	2	762	2W	2W	3W	4W	5W	6W	7W	7W	9W	9W	11W
	3	1057	3W	4W	4W	7W	8W	10W	11W	11W	14W	15W	17W
	max.*	2394	18W	18W	18W	36W	36W	54W	54W	54W	72W	72W	90W
FLT10-11 FLT20-11 FLT21-12	1	465	2W	2W	3W	3W	5W	5W	6W	6W	8W	8W	9W
	2	582	2W	2W	4W	4W	6W	6W	8W	8W	10W	10W	12W
	3	756	4W	4W	7W	7W	10W	10W	13W	13W	16W	16W	19W
	max.*	1519	20W	20W	40W	40W	60W	60W	80W	80W	100W	100W	120W

* revs max. are not regulated for the case of installation.

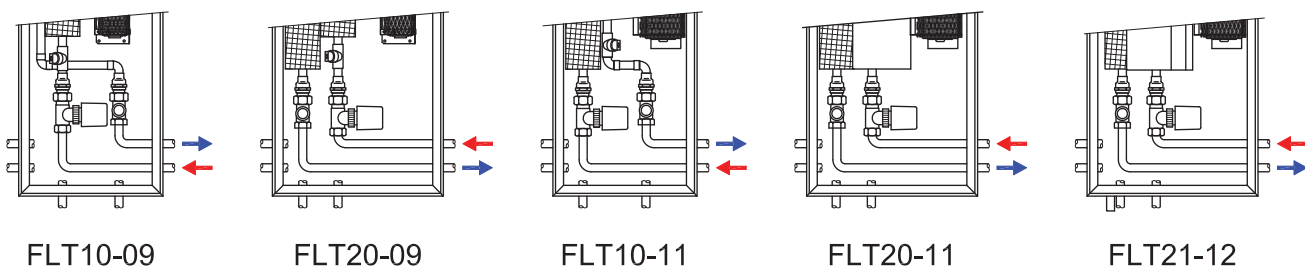
RECOMMENDED STANDARD INSTALLING IN FLOOR

- Convector installation with exchanger towards window
- ideal position 100-200 mm distance from window
- fan draws in the room air
- the air is warmed up by flowing through exchanger
- hot air is mixed with cold air flowing off the window surface
- air circulation: warms up the room air
screens the window surface
secondary demisters the window surface
- installation with fan towards window and exchanger outwards slightly raises the convector heating output, but accelerates air circulation in the room.



CONVECTOR CONNECTION TO THE HEATING SYSTEM

Floor convector is fitted with openings for connection to the heating system. There are three connection possibilities, from the room, side or window wall.





HEATING OUTPUT RECALCULATION FOR ANOTHER TEMPERATURE GRADIENT

Convector heating output reckoning follows by recalculation of the standardized output Q_n 75/65/20 °C

$$Q = Q_n * \Psi * \left(\frac{\Delta T}{50} \right)^m \text{ [W]; where } \Delta T = \left(\frac{T1 + T2}{2} \right) - T_i \text{ [°C]}$$

m=1,1103 pro FLT10-09	m=1,0483 pro FLT20-11
m=1,1613 pro FLT20-09	m=1,0477 pro FLT21-12
m=1,0872 pro FLT10-11	

Q_n [W]	heating output for temperature gradient T1/T2/Ti = 75/65/20 °C
Ψ [-]	mass rate of flow coefficient (for current flow rate $\Psi=1$)
T1 [°C]	input water temperature
T2 [°C]	output water temperature
Ti [°C]	temperature in the room
m [-]	temperature exponent

QUICK CONVERSION TO TI=22 °C A TI=15 °C FOR ORIENTATION

- If you want to learn convector output for the room temperature of 22 °C or for a corridor temperature of 15 °C
- multiply heating output of the chosen convector by the "k" coefficient

For $T_i=22^\circ\text{C}$, $k=0.95$
E.g.: $Q [55/45/22^\circ\text{C}] = 0.95 * Q [55/45/20^\circ\text{C}]$

for $T_i=15^\circ\text{C}$, $k=1.12$
E.g.: $Q [75/65/15^\circ\text{C}] = 1.12 * Q_n [75/65/20^\circ\text{C}]$

HEATING WATER FLOW RATE THROUGH EXCHANGER

$$M = 0,86Q / (T1 - T2) \text{ [kg/h]}$$

M [kg/h]	mass rate of flow, heating water flowing through exchanger
Q [W]	convector heating output
T1 - T2 [°C]	difference between input and output temperature
0.86 [-]	invariable for recalculation of units

CONVECTOR DIMENSIONING BASED ON ACOUSTIC PARAMETERS

- Convector heating output must cover thermal loss in the room and observe the acoustic parameters
- Permissible noisiness levels are determined by national legislation
- Different values of permissible noisiness levels are valid for residential houses, hospitals, offices, hotels etc.
- Heating output of convector with fan is designed for revolutions conforming with the lowest admissible acoustic pressure level in the room
- **Tables of acoustic pressure L_{pAmax} [dB(A)] are in chapters relating to the single floor convector types**
- Quoted measuring of acoustic parameters follows diagonally in the distance of 1m above and 1m in front of the convector
- The acoustic field may differ in dependence on:
 - convector placing in the room and its appropriate installation
 - the room space and segmentation (corners, partitions, ceiling)
 - furnishings as absorbing elements: tables, chairs, cupboards, wardrobes, carpets etc.
 - installation of more convectors in one room
 - sometimes, e.g. when convector is placed in a corner, the noisiness parameters may show values increased by 3dB(A)

EXCHANGER HYDRAULIC LOSSES

TYPE	Length [mm]	Volume [l]	Qv – mass rate of flow in piping (kg/h) / R – hydraulic loss in exchanger (kPa)												
			20	40	60	80	100	120	150	200	250	300	350	400	450
FLT10-09 FLT20-09 FLT10-11 FLT20-11 FLT21-12	800	0,11	0,01	0,03	0,06	0,11	0,17	0,25	0,39	0,69	1,07	1,55	2,11	2,75	3,48
	1200	0,21	0,01	0,03	0,08	0,14	0,21	0,30	0,48	0,85	1,32	1,91	2,59	3,39	4,29
	1600	0,32	0,01	0,04	0,09	0,15	0,24	0,34	0,53	0,94	1,48	2,13	2,89	3,78	4,78
	2000	0,43	0,01	0,04	0,09	0,16	0,26	0,37	0,58	1,02	1,60	2,30	3,13	4,09	5,18
	2400	0,53	0,01	0,05	0,10	0,19	0,29	0,42	0,65	1,16	1,81	2,61	3,55	4,64	5,87
	2800	0,64	0,01	0,05	0,11	0,19	0,30	0,43	0,68	1,20	1,88	2,71	3,69	4,82	6,09
	3200	0,74	0,01	0,06	0,13	0,23	0,35	0,51	0,79	1,41	2,21	3,18	4,33	5,65	7,15
	3600	0,85	0,01	0,06	0,13	0,23	0,36	0,53	0,82	1,46	2,28	3,28	4,47	5,84	7,39
	4000	0,96	0,02	0,09	0,20	0,36	0,56	0,81	1,27	2,26	3,52	5,08	6,91	9,02	11,42
	4400	1,06	0,02	0,09	0,21	0,37	0,57	0,82	1,29	2,29	3,58	5,15	7,01	9,16	11,59
4800	1,17	0,02	0,09	0,21	0,37	0,58	0,84	1,31	2,33	3,64	5,24	7,14	9,32	11,80	

PARAMETERS OF LOCKSHIELD VALVES

T-turns	0,5	0,75	1	1,5	2	2,5	3	3,5	4	5	6	MAX
Kv (m³/h) – direct version	0,3	0,4	0,55	0,75	0,91	1,05	1,25	1,33	1,4	1,6	1,7	1,8
Kv (m³/h) – corner version	0,2	0,25	0,29	0,4	0,5	0,69	0,8	1	1,2	1,55	1,9	2,2

parameters of free packed in lockshield valves

FLT 24V DC FLOOR CONVECTOR REGULATION

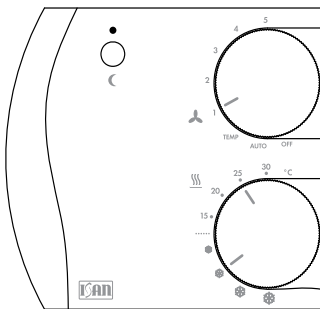


Regulation of floor convector with installed power saving 24V DC fans enables to utilize a modern control technology. Convector becoming a part of the heating system evaluates the situation and reacts to outer incentives. By means of very simple control and due to antifreeze protection eliminating any heat leakage, the heated room has all precon-

ditions for comfortable dwelling. The regulator power consumption is negligible. Communication between floor convector and thermostat follows by data flow based on CIB protocol. The system may be easily integrated in Foxtröt-BMS. Modifications for LonWorks, EIB, KNX and others are available to order.

REGULATION BY MEANS OF RTM101 THERMOSTAT AND INSTALLED SR201 REGULATOR

TEMPERATURE SETTING UP



15–30 °C range for heating
 ❄️ ❄️ ❄️ ❄️ range for cooling

The system automatically changes between heating / cooling in dependence on ambient temperature and according to the temperature of heating medium flowing through exchanger. The medium flowing and the fans are stopped, as soon as the desired temperature in the room is reached.

Modes:

- OFF convector off
- AUTO automated regulation of floor convector detecting the actual room temperature; the mode regulates continuous revs adjustment of fans, watches over the exchanger temperature, switches between heating and cooling, reacts to window sensors

- TEMP moderate heating, the fans are off, only the flow rate of heating medium is active
- 1–5 continuous fan revs regulation according to the user's demand

Sleep mode

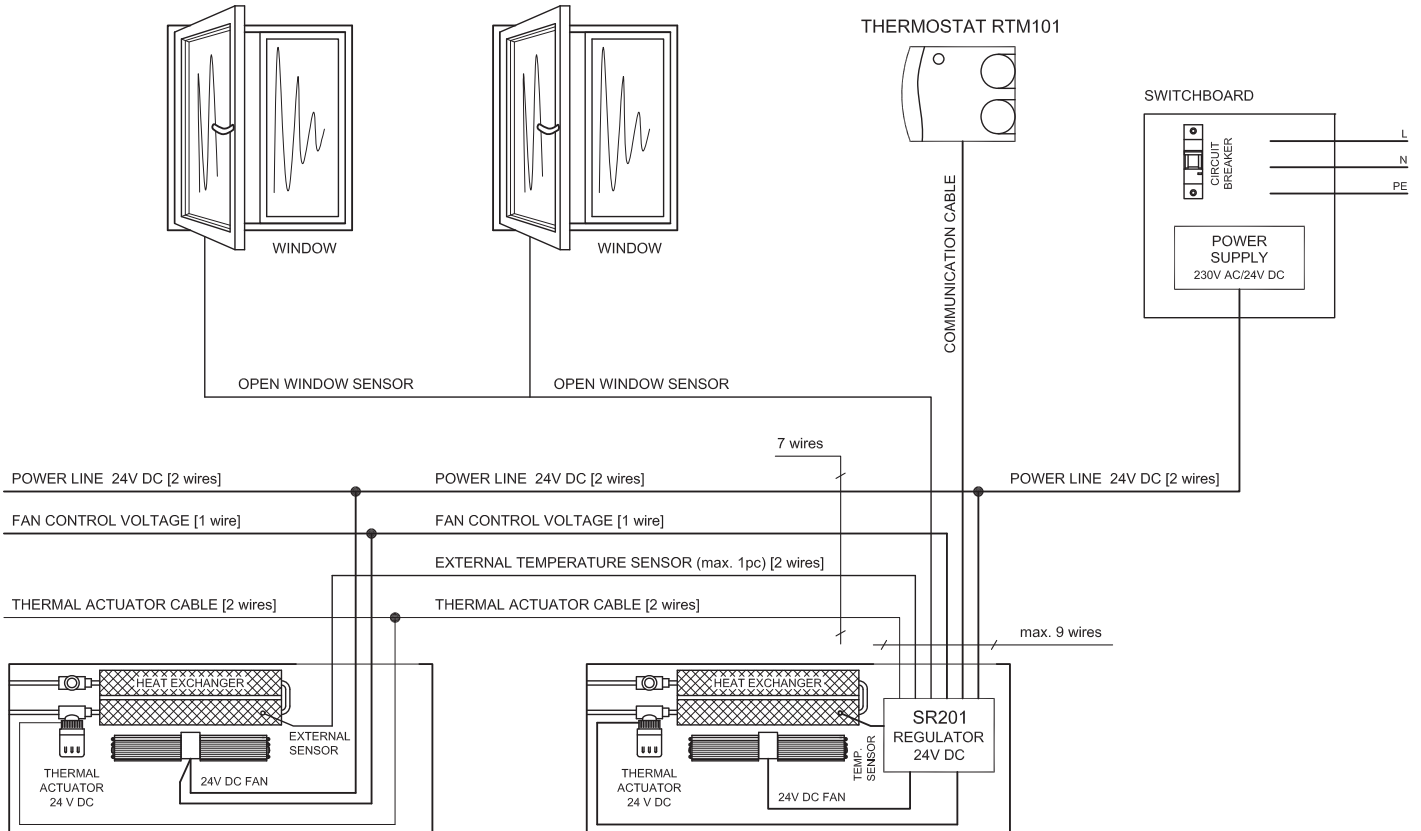
Decreases the demand for thermostat setting by -2 °C (heating) or +2 °C (cooling). It is not necessary to reset the thermostat parameters for the night or for a period of absence in the house. The sleep mode is signalized by LED diode on the thermostat cover.

Antifreeze protection

Regulator switches on a thermdrive when the local temperature drops below 5 °C around the floor convector. So, the heating medium flowing through exchanger prevents any system damage. The antifreeze protection functions within all mode options, inclusively the OFF-mode. The antifreeze protection is only available, when the heating system is supplied with heating medium.

Window sensors

In case of installed window sensor, regulator stops the convector running during ventilation. The antifreeze protection remains active and after the window is closed, system returns to the standard mode.



For current installation, you only need 1 thermostat, 1 regulator and 1 power supply unit per a room.

In case of extended projects, where the power input of installed convectors goes beyond 100W, an additional regulator and a stronger power supply unit is to be installed. Please contact the manufacturer.



RTM101

Room thermostat, heating/cooling, continuous revs regulation, sleep mode, OFF, AUTO and TEMP modes, continuous revs range 1 –5

Colour: white
 Communication: CIB protocol
 CIB parameters: 24V DC; 2.2W
 Dimension: 98×106×34 mm
 Ingress protection: IP30



SR201 – double pipe system regulator

CIB fan controller for double pipe, regulation modulus heating/cooling, double-tube heating system containing exchanger temperature sensor for ISAN FLT convectors

Operating voltage: 24V DC
 Communication: CIB protocol
 Inputs: 24V DC, control signal from bus-bar and sensors
 Outputs: control signals for fans, 24V DC for thermo-drives



DR60-24, DR100-24

24V DC power supply unit, placing on DIN ledge

Input voltage: 240V /50Hz
 Output voltage: 24V DC
 Final nominal output / current DR60-24 **60W**/2.5A
 DR100-24 **100W**/4.2A



Z-TS24

Thermoactuator – a drive to be installed on thermoelectric valve for ON/OFF flow rate regulation

Input voltage: 24V DC
 Power input when switched on: 6VA
 Power input during operation: 2.5W
 Period of switching ON/OFF: 3 minutes
 Ingress protection: IP41



TE20

External temperature sensor as „antifreeze protection“

Sensor type: thermistor
 Temperature range: from -30 °C to 90 °C
 Cable length: 5 m
 Connection: by 2 cables



Z-TD001 direct, Z-TE001 corner

Thermostatic valve installed on the exchanger input tube regulates the flow rate of heating medium through the heat exchanger

Dimension: DN15, NF norm
 Connection thread: M30×1.5mm
 Operating temperature, max. 120 °C
 Operating pressure, max. PN10

Valve adjusting	1	2	3	4	5	N
k_v (m ³ /h)	0,1	0,2	0,31	0,45	0,69	0,89



Z-RD002 direct, Z-RE002 corner

Lockshield valves

Dimension: DN15, NF norm
 Connection thread: M30×1,5 mm
 Max. working temperature: 120 °C
 Max. working overpressure: PN10

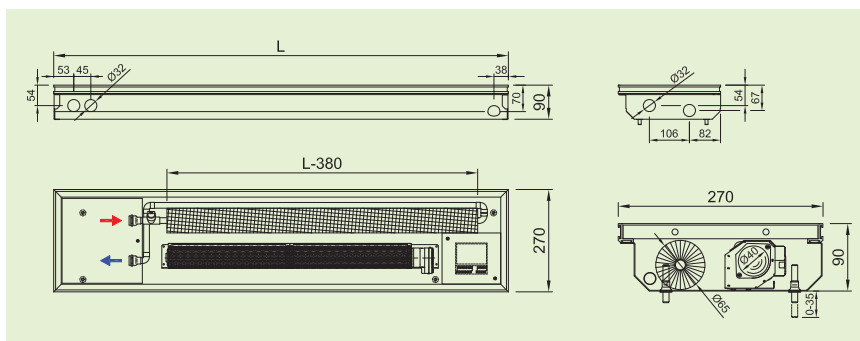
T- turns	0,25	0,5	1,0	1,5	2,0	3,0	4,0
k_v (m ³ /h)	0,13	0,22	0,43	0,65	0,85	1,25	1,7





PARAMETERS

Convector	Width	270 mm
	Height	90 mm
	Length	800-4800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	250
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	1 × Ø 65 mm
	Height	
	Finned length	L-380 mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	Ø 40 mm
	Operating voltage	Safe voltage 24V DC
	Ingress protection	IP20
Operating conditions	Regulation	control voltage 0-10V (regulation SR201, ...)
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70%



	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE L _{pAmax} [dB(A)]	1	22	24	24	25	25	25	25	25	26	26	26
	2	24	25	27	28	29	31	31	31	31	31	31
	3	30	30	33	34	37	39	39	39	39	39	40
AIR VOLUME [m³/h]	1	27	55	82	109	137	164	191	219	246	273	301
	2	36	65	92	130	184	196	250	276	315	369	380
	3	50	103	140	207	280	310	383	419	486	559	590

Code example	FLT10-09200-NR126	Floor convector FLT10-09, H=90 mm, W=270 mm, L=2000 mm, stainless steel trough, Al natur frame, Al natur linear grill, installed regulation SR201, convector 24V DC
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Ordering, see the page 37

SPECIFICATIONS

- Residence, luxury villas, houses, office buildings
- Forced convection by tangential fans
- High heating output
- Low power consumption
- Safe voltage 24V DC
- Easy control
- Cu-Cu heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Smooth running
- Using in dry ambience

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
rpm	0	576	762	1057
LENGTH [mm]	HEATING OUTPUT [W]			
800	70	268	320	393
1200	136	536	640	786
1600	202	804	961	1179
2000	268	1073	1281	1572
2400	334	1609	1921	2358
2800	401	1670	1982	2419
3200	467	2145	2561	3144
3600	533	2413	2882	3537
4000	599	2681	3202	3930
4400	666	3218	3842	4716
4800	732	3279	3904	4778

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
rpm	0	576	762	1057
LENGTH [mm]	HEATING OUTPUT [W]			
800	53	219	262	321
1200	104	438	523	642
1600	155	657	785	963
2000	206	876	1046	1284
2400	257	1314	1569	1926
2800	308	1364	1619	1976
3200	359	1752	2092	2568
3600	410	1971	2354	2889
4000	461	2190	2615	3210
4400	512	2628	3138	3852
4800	563	2678	3188	3902

Q [W] 70/55/20 °C

SPEED	0	1	2	3
rpm	0	576	762	1057
LENGTH [mm]	HEATING OUTPUT [W]			
800	42	183	218	268
1200	83	366	437	536
1600	123	549	655	804
2000	163	731	873	1072
2400	203	1097	1310	1608
2800	244	1139	1351	1649
3200	284	1463	1747	2144
3600	324	1646	1965	2412
4000	364	1828	2183	2680
4400	405	2194	2620	3216
4800	445	2236	2662	3258

Q [W] 55/45/20 °C

SPEED	0	1	2	3
rpm	0	576	762	1057
LENGTH [mm]	HEATING OUTPUT [W]			
800	26	124	148	182
1200	50	248	297	364
1600	74	373	445	546
2000	99	497	593	728
2400	123	745	890	1092
2800	147	773	918	1120
3200	172	994	1186	1456
3600	196	1118	1335	1638
4000	220	1242	1483	1820
4400	245	1490	1780	2185
4800	269	1519	1808	2213



SPECIFICATIONS

- Residence, luxury villas, houses, office buildings
- Forced convection by tangential fans
- High heating output
- Low power consumption
- Safe voltage 24V DC
- Easy control
- Cu-Cu heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Smooth running
- Using in dry ambience

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
rpm	0	576	762	1057
LENGTH [mm]	HEATING OUTPUT [W]			
800	170	661	673	687
1200	311	1323	1346	1374
1600	453	1984	2019	2060
2000	594	2646	2692	2747
2400	735	3969	4037	4121
2800	877	4103	4172	4255
3200	1018	5292	5383	5494
3600	1160	5953	6056	6181
4000	1301	6615	6729	6868
4400	1442	7938	8075	8242
4800	1584	8072	8209	8376

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
rpm	0	576	762	1057
LENGTH [mm]	HEATING OUTPUT [W]			
800	130	535	545	556
1200	239	1071	1089	1112
1600	348	1606	1634	1667
2000	456	2141	2178	2223
2400	565	3212	3267	3335
2800	674	3320	3376	3443
3200	783	4282	4356	4446
3600	891	4817	4901	5002
4000	1000	5353	5445	5558
4400	1109	6423	6534	6669
4800	1217	6532	6643	6778

Q [W] 70/55/20 °C

SPEED	0	1	2	3
rpm	0	576	762	1057
LENGTH [mm]	HEATING OUTPUT [W]			
800	103	443	451	460
1200	189	886	902	920
1600	275	1330	1353	1380
2000	361	1773	1803	1841
2400	447	2659	2705	2761
2800	533	2749	2795	2851
3200	619	3546	3607	3681
3600	705	3989	4058	4141
4000	791	4432	4509	4602
4400	877	5318	5410	5522
4800	963	5408	5500	5612

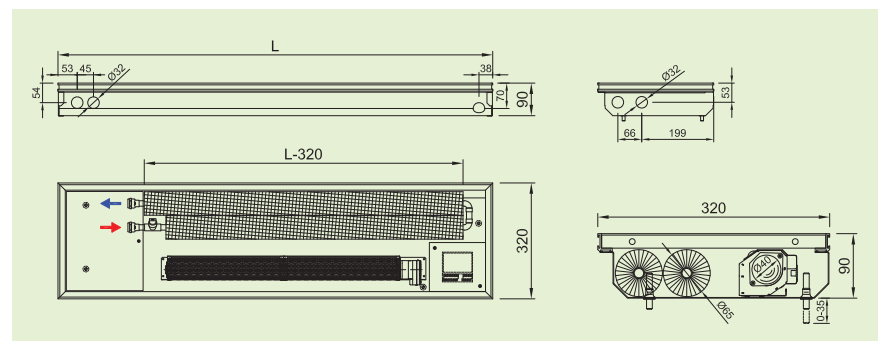
Q [W] 55/45/20 °C

SPEED	0	1	2	3
rpm	0	576	762	1057
LENGTH [mm]	HEATING OUTPUT [W]			
800	62	296	301	307
1200	114	591	602	614
1600	166	887	903	921
2000	218	1183	1203	1228
2400	270	1774	1805	1842
2800	322	1835	1865	1903
3200	374	2366	2407	2457
3600	426	2662	2708	2764
4000	478	2957	3009	3071
4400	530	3549	3610	3685
4800	582	3609	3670	3745



PARAMETERS

Convector	Width	320 mm
	Height	90 mm
	Length	800–4800 mm in step 400 mm
	Height adjusting	0–35 mm
	Stainless trough width	300 mm
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	2 × Ø 65 mm
	Height	
	Finned length	L-320 mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	Ø 40 mm
	Operating voltage	Safe voltage 24V DC
	Ingress protection	IP20
Operating conditions	Regulation	control voltage 0–10V (regulation SR201, ...)
	Ambient temperature	+2 to +40 °C
	Relative humidity	20–70%



	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE LpAmax [dB(A)]	1	22	24	24	25	25	25	25	25	26	26	26
	2	24	25	27	28	29	31	31	31	31	31	31
	3	30	30	33	34	37	39	39	39	39	39	40
AIR VOLUME [m³/h]	1	26	53	80	107	134	160	187	214	240	267	294
	2	35	64	90	128	180	191	244	270	308	361	372
	3	49	101	137	202	273	303	375	410	476	547	577

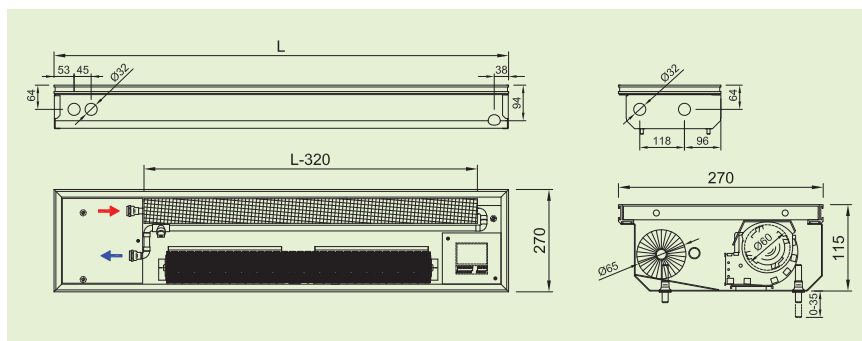
Code example	FLT20-09120-NR116	Floor convector FLT20-09, H=90 mm, W=320 mm, L=1200 mm, stainless steel trough, Al natur frame, Al natur cross roll-up grill, installed regulation SR201, convector 24V DC
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Ordering, see the page 37



PARAMETERS

Convector	Width	270 mm
	Height	115 mm
	Length	800-4800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	250 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	1 x Ø 65 mm
	Height	
	Finned length	L-440 mm
	Heat medium connection	2 x G1/2" female thread
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	Ø 60 mm
	Operating voltage	Safe voltage 24V DC
	Ingress protection	IP20
	Regulation	control voltage 0-10V (regulation SR201, ...)
Operating conditions	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70%



	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE LpAmax [dB(A)]	1	19	21	23	23	23	24	24	24	24	25	25
	2	26	27	28	28	30	31	32	32	33	33	33
	3	35	35	36	37	39	40	40	40	40	40	41
AIR VOLUME [m³/h]	1	28	56	84	113	141	169	197	225	253	281	309
	2	37	80	117	159	197	239	277	319	357	400	437
	3	51	117	168	234	285	351	402	468	519	585	636

Code example	FLT10-11080-NR215	Floor convector FLT10-11, H=115 mm, W=270 mm, L=800 mm, stainless steel trough, Al bronze frame, Al bronze cross roll-up grill, without regulation, convector 24V DC
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Ordering, see the page 37

SPECIFICATIONS

- Residence, luxury villas, houses, office buildings
- Forced convection by tangential fans
- High heating output
- Low power consumption
- Safe voltage 24V DC
- Easy control
- Cu-Cu heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Smooth running
- Using in dry ambience

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
rpm	0	465	582	756
LENGTH [mm]	HEATING OUTPUT [W]			
800	100	233	284	354
1200	183	465	569	708
1600	267	698	853	1062
2000	350	930	1138	1416
2400	433	1163	1422	1769
2800	517	1395	1706	2123
3200	600	1628	1991	2477
3600	683	1861	2275	2831
4000	767	2093	2559	3185
4400	850	2326	2844	3539
4800	933	2558	3128	3893

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
rpm	0	465	582	756
LENGTH [mm]	HEATING OUTPUT [W]			
800	77	191	233	290
1200	141	382	467	581
1600	205	572	700	871
2000	269	763	933	1161
2400	333	954	1166	1451
2800	397	1145	1400	1742
3200	461	1335	1633	2032
3600	525	1526	1866	2322
4000	589	1717	2099	2612
4400	653	1908	2333	2903
4800	717	2098	2566	3193

Q [W] 70/55/20 °C

SPEED	0	1	2	3
rpm	0	465	582	756
LENGTH [mm]	HEATING OUTPUT [W]			
800	61	160	195	243
1200	111	320	391	486
1600	162	480	586	730
2000	213	639	782	973
2400	263	799	977	1216
2800	314	959	1173	1459
3200	365	1119	1368	1703
3600	415	1279	1564	1946
4000	466	1439	1759	2189
4400	517	1599	1955	2432
4800	567	1758	2150	2676

Q [W] 55/45/20 °C

SPEED	0	1	2	3
rpm	0	465	582	756
LENGTH [mm]	HEATING OUTPUT [W]			
800	37	109	134	167
1200	67	219	268	333
1600	98	328	402	500
2000	129	438	535	666
2400	159	547	669	833
2800	190	657	803	999
3200	221	766	937	1166
3600	251	876	1071	1333
4000	282	985	1205	1499
4400	312	1095	1339	1666
4800	343	1204	1472	1832



SPECIFICATIONS

- Residence, luxury villas, houses, office buildings
- Forced convection by tangential fans
- High heating output
- Low power consumption
- Safe voltage 24V DC
- Easy control
- Cu-Cu heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Smooth running
- Using in dry ambience

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
rpm	0	465	582	756
LENGTH [mm]	HEATING OUTPUT [W]			
800	185	478	558	693
1200	339	956	1117	1387
1600	493	1435	1675	2080
2000	647	1913	2234	2774
2400	800	2391	2792	3467
2800	954	2869	3350	4160
3200	1108	3347	3909	4854
3600	1262	3826	4467	5547
4000	1416	4304	5026	6240
4400	1570	4782	5584	6934
4800	1724	5260	6142	7627

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
rpm	0	465	582	756
LENGTH [mm]	HEATING OUTPUT [W]			
800	142	395	461	573
1200	260	790	923	1146
1600	379	1185	1384	1718
2000	497	1580	1845	2291
2400	615	1975	2306	2864
2800	734	2370	2768	3437
3200	852	2765	3229	4009
3600	970	3160	3690	4582
4000	1088	3555	4151	5155
4400	1207	3950	4613	5728
4800	1325	4345	5074	6300

Q [W] 70/55/20 °C

SPEED	0	1	2	3
rpm	0	465	582	756
LENGTH [mm]	HEATING OUTPUT [W]			
800	112	333	389	483
1200	206	666	778	966
1600	299	999	1167	1449
2000	393	1332	1556	1932
2400	487	1666	1945	2415
2800	580	1999	2334	2898
3200	674	2332	2723	3381
3600	767	2665	3112	3864
4000	861	2998	3501	4347
4400	954	3331	3890	4830
4800	1048	3664	4279	5313

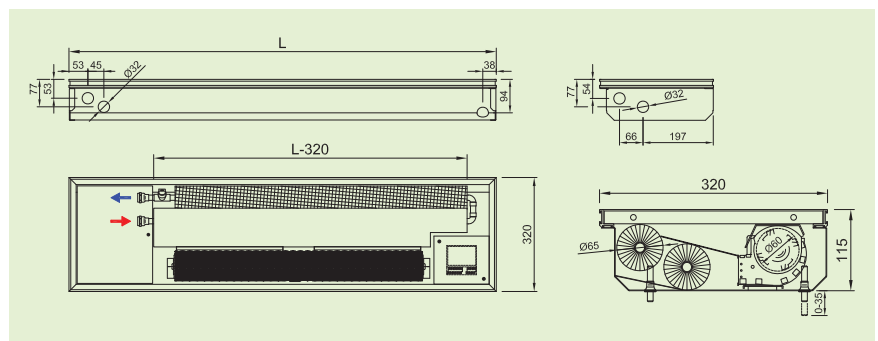
Q [W] 55/45/20 °C

SPEED	0	1	2	3
rpm	0	465	582	756
LENGTH [mm]	HEATING OUTPUT [W]			
800	68	231	270	335
1200	125	462	540	671
1600	181	694	810	1006
2000	238	925	1080	1341
2400	294	1156	1350	1676
2800	351	1387	1620	2012
3200	407	1619	1890	2347
3600	464	1850	2160	2682
4000	521	2081	2430	3017
4400	577	2312	2700	3353
4800	634	2543	2970	3688



PARAMETERS

Convector	Width	320 mm	
	Height	115 mm	
	Length	800-4800 mm in step 400 mm	
	Height adjusting	0-35 mm	
	Stainless trough width	300 mm	
	Grill type	cross / linear	
Exchanger	Grill material	anodized aluminium, wood, stainless steel	
	Width	2 × Ø 65 mm	
	Height	L-320 mm	
	Finned length	2 × G1/2" female thread	
	Heat medium connection	110 °C	
	Max. working temperature	1 MPa	
Fan	Max. working overpressure	Ø 60 mm	
	Rotor diameter	Safe voltage 24V DC	
	Operating voltage	IP20	
	Ingress protection	control voltage 0-10V (regulation SR201, ...)	
Operating conditions	Regulation	Ambient temperature	+2 to +40 °C
		Relative humidity	20-70%



	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE LpAmax [dB(A)]	1	19	21	23	23	23	24	24	24	24	25	25
	2	26	27	28	28	30	31	32	32	33	33	33
	3	35	35	36	37	39	40	40	40	40	40	41
AIR VOLUME [m³/h]	1	27	56	83	112	139	167	195	223	251	279	307
	2	37	79	116	158	195	237	275	316	354	396	433
	3	51	116	167	232	283	348	398	464	514	580	630

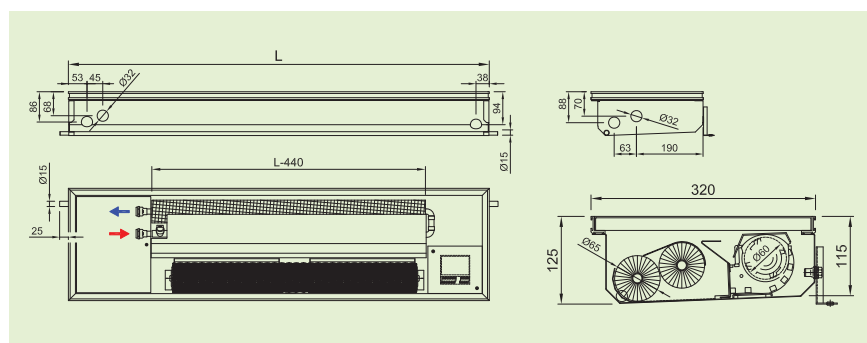
Code example	FLT20-11320-NR126	Floor convector FLT20-11, H=115 mm, W=320 mm, L=3200 mm, stainless steel trough, Al natur frame, Al natur linear grill, installed regulation SR201, convector 24V DC
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Ordering, see the page 37



PARAMETERS

Convector	Width	320 mm
	Height	125 mm
	Length	1200-3200 mm in step 400 mm
	Height adjusting	adjusting leg
	Stainless trough width	300 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	2 × Ø 65 mm
	Height	2 × Ø 65 mm
	Finned length	L-440mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	Ø 60 mm
	Operating voltage	Safe voltage 24V DC
	Ingress protection	IP20
	Regulation	control voltage 0-10V (regulation SR201, ...)
Operating conditions	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70%



	SPEED	LENGTH [mm]					
		1200	1600	2000	2400	2800	3200
ACOUSTIC PRESSURE L _{pAmax} [dB(A)]	1	21	23	23	23	23	24
	2	26	27	28	30	31	32
	3	35	35	37	39	39	40
AIR VOLUME [m³/h]	1	56	83	112	139	167	195
	2	79	116	158	195	237	275
	3	116	167	232	283	348	398

Code example	FLT21-12160-NR116	Floor convector FLT21-12, H=125 mm, W=320 mm, L=1600 mm, stainless steel trough, Al natur frame, Al natur cross roll-up grill, installed regulation SR201, convector 24V DC
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Ordering, see the page 37

SPECIFICATIONS

- Residence, luxury villas, houses, office buildings
- Forced convection by tangential fans
- High heating output
- Optimal cooling power
- Low power consumption
- Safe voltage 24V DC
- Easy control
- Cu-Cu heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Smooth running
- Using in dry ambience

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
rpm	0	478	580	757
LENGTH [mm]	HEATING OUTPUT [W]			
1200	337	959	1126	1391
1600	493	1439	1689	2086
2000	647	1919	2252	2782
2400	799	2398	2814	3477
2800	954	2878	3377	4173
3200	1106	3358	3940	4868

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
rpm	0	478	580	757
LENGTH [mm]	HEATING OUTPUT [W]			
1200	259	793	930	1149
1600	379	1189	1395	1724
2000	497	1585	1860	2298
2400	614	1981	2325	2873
2800	733	2378	2790	3447
3200	850	2774	3255	4022

Q [W] 70/55/20 °C

SPEED	0	1	2	3
rpm	0	478	580	757
LENGTH [mm]	HEATING OUTPUT [W]			
1200	205	668	784	969
1600	300	1003	1177	1454
2000	393	1337	1569	1938
2400	486	1671	1961	2423
2800	580	2005	2353	2907
3200	672	2339	2745	3392

Q [W] 55/45/20 °C

SPEED	0	1	2	3
rpm	0	478	580	757
LENGTH [mm]	HEATING OUTPUT [W]			
1200	124	464	545	673
1600	181	696	817	1009
2000	238	928	1089	1345
2400	294	1160	1361	1682
2800	351	1392	1634	2018
3200	407	1624	1906	2355



Q [W] 6/12 °C, relative humidity 50 %

SPEED		1		2		3	
rpm		COOLING OUTPUT [W]					
LENGTH [mm]	Ti [°C]	Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	24	179	155	208	172	208	199
	26	201	174	213	193	234	223
	28	222	193	235	213	258	246
	30	243	211	258	233	283	270
1600	24	268	233	284	258	313	298
	26	301	261	319	289	350	334
	28	333	289	353	320	388	369
	30	365	316	386	350	425	405
2000	24	358	311	379	344	417	397
	26	401	348	425	385	467	445
	28	444	385	470	426	517	492
	30	486	422	515	467	566	539
2400	24	447	388	474	430	521	496
	26	501	435	531	481	584	556
	28	555	481	588	533	646	615
	30	608	527	644	583	708	674
2800	24	537	466	569	515	625	596
	26	602	522	638	578	701	668
	28	666	578	705	639	775	739
	30	729	633	773	700	849	809
3200	24	626	543	664	601	729	695
	26	702	609	744	674	817	779
	28	776	674	823	746	904	862
	30	851	738	901	817	991	944

Q [W] 8/14 °C, relative humidity 50 %

SPEED		1		2		3	
rpm		COOLING OUTPUT [W]					
LENGTH [mm]	Ti [°C]	Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	24	157	136	166	151	183	174
	26	179	155	190	172	208	199
	28	201	174	213	193	234	223
	30	222	193	235	213	258	246
1600	24	236	204	250	226	274	261
	26	268	233	284	258	313	298
	28	301	261	319	289	350	334
	30	333	289	353	320	388	369
2000	24	314	273	333	302	366	349
	26	358	311	379	344	417	397
	28	401	348	425	385	467	445
	30	444	385	470	426	517	492
2400	24	393	341	416	377	457	436
	26	447	388	474	430	521	496
	28	501	435	531	481	584	556
	30	555	481	588	533	646	615
2800	24	471	409	499	453	549	523
	26	537	466	569	515	625	596
	28	602	522	638	578	701	668
	30	666	578	705	639	775	739
3200	24	550	477	583	528	640	610
	26	626	543	664	601	729	695
	28	702	609	744	674	817	779
	30	776	674	823	746	904	862

Q [W] 10/15 °C, relative humidity 50 %

SPEED		1		2		3	
rpm		COOLING OUTPUT [W]					
LENGTH [mm]	Ti [°C]	Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	24	140	122	149	135	164	156
	26	163	141	172	156	189	180
	28	184	160	195	177	215	205
	30	206	179	218	198	240	228
1600	24	211	183	223	202	245	234
	26	244	212	258	234	284	271
	28	277	240	293	266	322	307
	30	309	268	327	297	360	343
2000	24	281	244	298	270	327	312
	26	325	282	345	312	379	361
	28	369	320	391	354	429	409
	30	412	357	436	395	479	457
2400	24	351	305	372	337	409	390
	26	406	353	431	390	473	451
	28	461	400	488	443	537	511
	30	515	447	545	494	599	571
2800	24	421	366	447	405	491	468
	26	488	423	517	468	568	541
	28	553	480	586	531	644	614
	30	618	536	655	593	719	685
3200	24	492	427	521	472	573	546
	26	569	494	603	546	663	631
	28	645	560	684	620	751	716
	30	721	625	764	692	839	800

Q [W] 12/16 °C, relative humidity 50 %

SPEED		1		2		3	
rpm		COOLING OUTPUT [W]					
LENGTH [mm]	Ti [°C]	Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	24	124	107	131	119	144	137
	26	146	127	155	140	170	162
	28	168	146	178	161	196	186
	30	190	165	201	182	221	211
1600	24	186	161	197	178	216	206
	26	219	190	232	210	255	243
	28	252	219	267	242	294	280
	30	285	247	302	273	331	316
2000	24	247	215	262	238	288	275
	26	292	253	310	280	340	324
	28	336	292	356	323	391	373
	30	379	329	402	364	442	421
2400	24	309	268	328	297	360	343
	26	365	317	387	351	425	405
	28	420	365	445	403	489	466
	30	474	412	503	456	552	526
2800	24	371	322	393	356	432	412
	26	438	380	464	421	510	486
	28	504	437	534	484	587	559
	30	569	494	603	547	663	632
3200	24	433	376	459	416	504	480
	26	511	444	542	491	595	567
	28	588	510	623	565	685	653
	30	664	576	704	638	773	737

Q [W] 14/18 °C, relative humidity 50 %

SPEED		1		2		3	
rpm		COOLING OUTPUT [W]					
LENGTH [mm]	Ti [°C]	Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	24	78	78	86	86	99	99
	26	98	98	108	108	125	125
	28	135	117	143	130	157	150
	30	157	136	166	151	183	174
1600	24	116	116	129	129	149	149
	26	146	146	162	162	187	187
	28	202	176	214	194	236	225
	30	236	204	250	226	274	261
2000	24	155	155	172	172	198	198
	26	195	195	216	216	249	249
	28	270	234	286	259	314	299
	30	314	273	333	302	366	349

Q [W] 14/18 °C, relative humidity 50 %

SPEED		1		2		3	
rpm		COOLING OUTPUT [W]					
LENGTH [mm]	Ti [°C]	Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
2400	24	194	194	215	215	248	248
	26	244	244	270	270	312	312
	28	337	293	357	324	393	374
	30	393	341	416	377	457	436
2800	24	233	233	258	258	298	298
	26	293	293	324	324	374	374
	28	405	351	429	389	471	449
	30	471	409	499	453	549	523
3200	24	272	272	301	301	347	347
	26	341	341	378	378	437	437
	28	472	410	500	453	550	524
	30	550	477	583	528	640	610

Qk [W] - total cooling output, Qs[W] - sensible cooling output (air relative humidity 50 %)

CONVECTORS TO THE WET CONDITIONS 12V DC

Floor convectors for wet conditions with axial fans achieve high thermal outputs. As advantage in hot summer days, they can be used also for cooling of window surfaces. The convectors are designed for heavy conditions – for pools, where they could be flooded with water for a short time period, for winter gardens etc. The convector is equipped with draining pipes on sides for water drainage. The trough is designed of special stainless steel DIN 1.4404, resistant to aggressive conditions (e.g. chlorine). They can be installed where is no high requirement for acoustic parameters. **The convectors cannot be used at pools with salt water!**

The convectors are equipped with a Cu-Cu wire exchanger, in which heating medium flows through. There are axial fans with air distributors positioned along the whole length before the exchanger. They assure regular coverage of the heat exchanger and as a consequence, optimum temperature distribution in the room.

- high capacity
- energy saving fans
- 12 V DC
- 3-stage revolution control
- wet conditions

TYPES DELIVERED WITH 12 V DC TECHNOLOGY:

FLB20-12 (320×125×800–4800 mm)

FANS 12 V DC

There are axial fans installed in convectors, with a design suitable for conditions with higher wetness and flooding with water. They work with direct voltage of 12 V DC.

TABLE OF FAN ELECTRIC POWER OF FLB (REGAULATOR RB25)

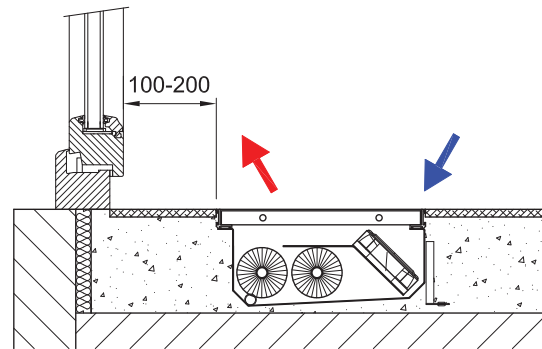
Maximum electric input power of 12V DC fans and a number of installed fans

TYPE	Voltage[V]*	800		1200		1600		2000		2400		2800		3200		3600		4000		4400		4800	
		W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs
FLB20-12	12V DC	1,6	1	3,2	2	4,8	3	6,4	4	8	5	9,6	6	11,2	7	12,8	8	14,4	9	16	10	17,6	11

* standardly, the input power is lower because of used regulator (operating voltage e.g. 8, 10,12 V DC)

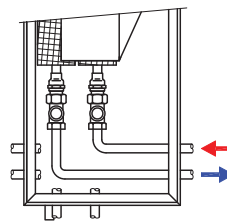
RECOMMENDED STANDARD INSTALLING IN FLOOR

- Convector installation with exchanger towards window
- Ideal position 100–200 mm distance from window
- Fan draws in the room air
- The air is warmed up by flowing through exchanger
- Hot air is mixed with cold air flowing off the window surface
- Air circulation: warms up the room air
screens the window surface
secondary demisters the window surface
- Installation with fan towards window and exchanger outwards slightly raises the convector heating output, but accelerates air circulation in the room.



CONVECTOR CONNECTION TO THE HEATING SYSTEM

Floor convector is fitted with openings for connection to the heating system. There are three connection possibilities, from the room, side or window wall.



FLB20-12



HEATING OUTPUT RECALCULATION FOR ANOTHER TEMPERATURE GRADIENT

Convactor heating output reckoning follows by recalculation of the standardized output Q_n 75/65/20 °C

$$Q = Q_n * \Psi * \left(\frac{\Delta T}{50}\right)^m \text{ [W]; where } \Delta T = \left(\frac{T1+T2}{2}\right) - T_i \text{ [°C]}$$

$m=1,033$ pro FLB20-12

Q_n [W]	heating output for temperature gradient T1/T2/Ti = 75/65/20 °C
Ψ [-]	mass rate of flow coefficient (for current flow rate $\Psi=1$)
T1 [°C]	input water temperature
T2 [°C]	output water temperature
Ti [°C]	temperature in the room
m [-]	temperature exponent

QUICK CONVERSION TO TI=22 °C A TI=15 °C FOR ORIENTATION

- If you want to learn convactor output for the room temperature of 22 °C or for a corridor temperature of 15 °C
- multiply heating output of the chosen convactor by the "k" coefficient

For $T_i=22$ °C, $k=0.95$
E.g.: Q [55/45/22 °C] = 0.95 * Q [55/45/20 °C]

for $T_i=15$ °C, $k=1.12$
E.g.: Q [75/65/15 °C] = 1.12 * Q_n [75/65/20 °C]

HEATING WATER FLOW RATE THROUGH EXCHANGER

$$M = 0.86Q/(T1-T2) \text{ [kg/h]}$$

M [kg/h]	mass rate of flow, heating water flowing through exchanger
Q [W]	convactor heating output
T1-T2 [°C]	difference between input and output temperature
0.86 [-]	variable for recalculation of units

CONVECTOR DIMENSIONING BASED ON ACOUSTIC PARAMETERS

- Convactor heating output must cover thermal loss in the room and observe the acoustic parameters
- Permissible noisiness levels are determined by national legislation
- Different values of permissible noisiness levels are valid for residential houses, hospitals, offices, hotels etc.
- Heating output of convactor with fan is designed for revolutions conforming with the lowest admissible acoustic pressure level in the room
- **Tables of acoustic pressure L_{pAmax} [dB(A)] are in chapters relating to the single floor convactor types**
- Quoted measuring of acoustic parameters follows diagonally in the distance of 1m above and 1m in front of the convactor
- The acoustic field may differ in dependence on:
 - convactor placing in the room and its appropriate installation
 - the room space and segmentation (corners, partitions, ceiling)
 - furnishings as absorbing elements: tables, chairs, cupboards, wardrobes, carpets etc.
 - installation of more convectors in one room
 - sometimes, e.g. when convactor is placed in a corner, the noisiness parameters may show values increased by 3dB(A)

EXCHANGER HYDRAULIC LOSSES

TYPE	Length [mm]	Volume [l]	Qv – mass rate of flow in piping (kg/h) / R – hydraulic loss in exchanger (kPa)												
			20	40	60	80	100	120	150	200	250	300	350	400	450
FLB20-12	800	0,11	0,01	0,03	0,06	0,11	0,17	0,25	0,39	0,69	1,07	1,55	2,11	2,75	3,48
	1200	0,21	0,01	0,03	0,08	0,14	0,21	0,30	0,48	0,85	1,32	1,91	2,59	3,39	4,29
	1600	0,32	0,01	0,04	0,09	0,15	0,24	0,34	0,53	0,94	1,48	2,13	2,89	3,78	4,78
	2000	0,43	0,01	0,04	0,09	0,16	0,26	0,37	0,58	1,02	1,60	2,30	3,13	4,09	5,18
	2400	0,53	0,01	0,05	0,10	0,19	0,29	0,42	0,65	1,16	1,81	2,61	3,55	4,64	5,87
	2800	0,64	0,01	0,05	0,11	0,19	0,30	0,43	0,68	1,20	1,88	2,71	3,69	4,82	6,09
	3200	0,74	0,01	0,06	0,13	0,23	0,35	0,51	0,79	1,41	2,21	3,18	4,33	5,65	7,15
	3600	0,85	0,01	0,06	0,13	0,23	0,36	0,53	0,82	1,46	2,28	3,28	4,47	5,84	7,39
	4000	0,96	0,02	0,09	0,20	0,36	0,56	0,81	1,27	2,26	3,52	5,08	6,91	9,02	11,42
	4400	1,06	0,02	0,09	0,21	0,37	0,57	0,82	1,29	2,29	3,58	5,15	7,01	9,16	11,59
4800	1,17	0,02	0,09	0,21	0,37	0,58	0,84	1,31	2,33	3,64	5,24	7,14	9,32	11,80	

PARAMETERS OF LOCKSHIELD VALVES

T-turns	0,5	0,75	1	1,5	2	2,5	3	3,5	4	5	6	MAX
Kv (m³/h) – direct version	0,3	0,4	0,55	0,75	0,91	1,05	1,25	1,33	1,4	1,6	1,7	1,8
Kv (m³/h) – corner version	0,2	0,25	0,29	0,4	0,5	0,69	0,8	1	1,2	1,55	1,9	2,2

parameters of free packed in lockshield valves



REGULATION OF FLB 12V DC FLOOR CONVECTORS

Regulation of floor convectors for wet environment enables control of fan revolutions in three stages.

Control elements:

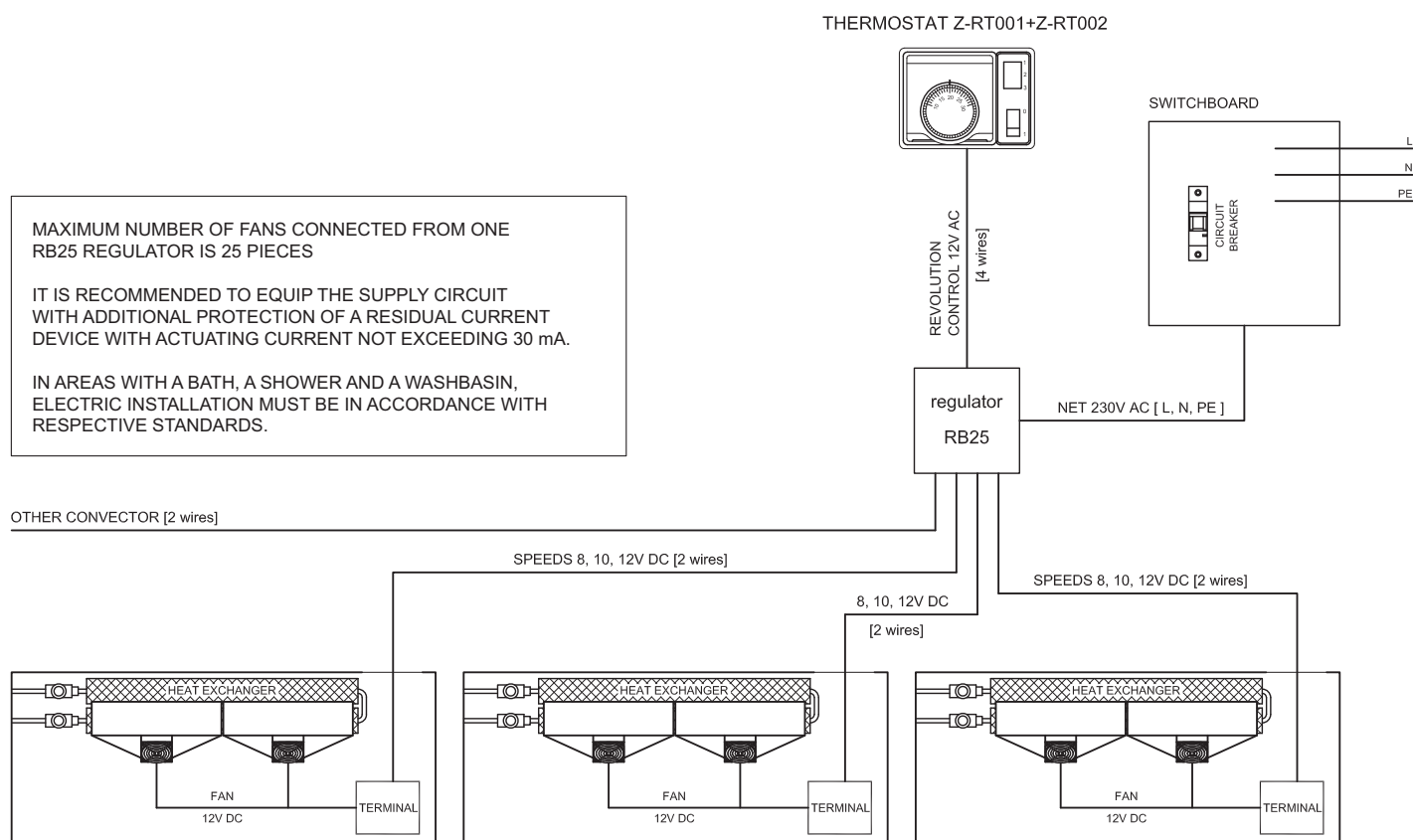
- **Thermostat** located in a room watches required temperature and switches fans according to the revolution switch
- **Revolution switch** – independently or in combination with the thermostat switches 3 revolution stages
- **RB25 regulator** transforms the network voltage to a safe voltage of 12 V (safety transformer). It is located outside the zone with wet conditions. RB25 supplies the thermostat and the voltage switch with 12 V AC, fans in convectors with 12 V DC. The regulator is installed in a box built-in in a wall.

RB25 parameters:

- the regulator can control up to **25 fans** (numbers see page 18)
- the regulator for convectors with axial fans – three-stage regulation by means of a thermostat with a switch (e.g. Z-RT001+Z-RT002)
- dimensions **135×135×75 mm** (box to be built-in in a wall outside the wet zone)
- a digital thermostat with a remote sensor can be used after consultation
- if a capacity of the regulator is used up, it is necessary to use an additional RB25 regulator

Remark: FLB regulation does not allow connection of a thermoelectric drive.

REGULATION: Z-RT001 THERMOSTAT, Z-RT002 SWITCH, RB25 REGULATOR





Z-DS002

Simple revolution switch with three speed stages

Switch levels:	0, 1, 2, 3
Operating voltage:	230V / 50Hz
Max. rating:	6 (2) A
Protection:	IP30
Colour:	white
Dimension:	97×100×43 mm



Z-RT001 + Z-RT002 – heating

manual room thermostat Z-RT001 placed at the sub-base Z-R002 with fan speed switch, heating. In this combination, it is possible to switch-off the fan and then thermostat control thermal actuator only (moderate heating).

Temperature range:	10–30 °C
Switch levels:	Speed: 0, 1, 2, 3 Switch:0/1
Operating voltage:	230V / 50Hz
Max. rating:	6 (2) A
Protection:	IP30 (thermostat)
Colour:	white
Dimension:	122×93×52 mm



RB25 – regulator of revolutions for FLB convectors

three-stage regulator, switches over fans revolutions according to thermostat instructions. The regulator is in an installation box, which is built-in in a wall, outside the wet zone.

Operating voltage:	Max. 230V / 50Hz
Input:	230V / 50Hz
Output1:	12V AC (thermostat, switcher)
Output2:	12V DC (fans)
Number of controlled fans:	25
Dimension:	135 x 135 x 75mm



Z-RD002 direct, Z-RE002 corner

Lockshield valves

Dimension:	DN15, NF norm
Connection thread::	M30×1,5 mm
Max. working temperature:	120 °C
Max. working overpressure:	PN10

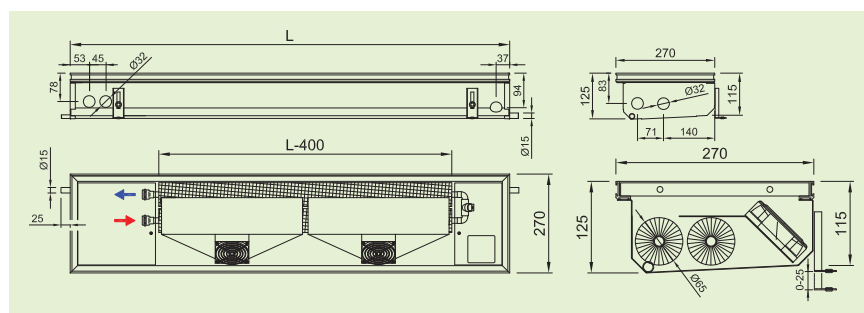
T- turns	0,25	0,5	1,0	1,5	2,0	3,0	4,0
k_v (m ³ /h)	0,13	0,22	0,43	0,65	0,85	1,25	1,7





PARAMETERS

Convector	Width	270 mm
	Height	125 mm
	Length	800–4800 mm in step 400 mm
	Height adjusting	adjusting leg
	Stainless trough width	250 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, stainless steel
Exchanger	Width	2 × Ø 65 mm
	Height	
	Finned length	L-440mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	Ø 60 mm
	Operating voltage	Safe voltage 12V DC
	Ingress protection	IP55
Operating conditions	Regulation	by output voltage modification (regulator RB25, ...)
	Ambient temperature	+2 to +40 °C
	Relative humidity	20–70%



	SPEED	LENGHT [mm]											
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800	
ACOUSTIC PRESSURE LpAmax [dB(A)]	1	38	40	40	40	41	41	41	42	42	42	42	42
	2	41	43	44	45	46	46	46	46	46	46	46	46
	3	45	48	48	48	49	49	49	50	50	50	50	50
AIR VOLUME [m³/h]	1	28	63	93	126	154	190	224	254	293	307	335	
	2	42	95	137	190	219	290	319	382	412	440	488	
	3	62	138	200	274	341	413	499	550	658	691	753	

Code example **FLB20-12200-NR110** Floor convector FLB20-12, H=125mm, W=270mm, L=2000mm, stainless steel trough, Al natur frame, Al natur cross roll-up grill, no regulation (not possible to place regulator inside the convector), convector 12V DC

Ordering, see the page 37

Heat output 90/70/20 °C – multiply values 75/65/20 °C by a coefficient 1,21 | Heat output 55/45/20 °C – multiply values 75/65/20 °C by a coefficient 0,59

SPECIFICATIONS

- full-area glassed rooms with high heat gains
- pools, wellness, winter gardens
- possibility to be flooded for a short time
- forced convection with axial fans
- heating and cooling
- low consumption of electric energy
- safe voltage of 12 V
- easy control
- Cu-Cu heat exchanger
- easy cleaning – hygiene
- designed for wet conditions

HEATING OUTPUT

Q [W] 75/65/20 °C

LENGHT [mm]	SPEED rpm	HEATING OUTPUT [W]			
		0	1	2	3
800	20	116	440	506	557
	24	103	403	464	511
	28	90	367	422	465
1200	20	231	879	1012	1114
	24	205	806	928	1022
	28	180	734	845	930
1600	20	347	1319	1518	1671
	24	308	1210	1392	1533
	28	270	1101	1267	1395
2000	20	463	1758	2024	2228
	24	410	1613	1857	2044
	28	360	1468	1690	1861
2400	20	578	2198	2530	2785
	24	513	2016	2321	2555
	28	450	1835	2112	2326
2800	20	694	2637	3035	3342
	24	615	2419	2785	3066
	28	540	2202	2535	2791
3200	20	810	3077	3541	3899
	24	718	2823	3249	3577
	28	630	2569	2957	3256
3600	20	925	3516	4047	4456
	24	820	3226	3713	4088
	28	720	2937	3380	3721
4000	20	1041	3956	4553	5013
	24	923	3629	4177	4599
	28	809	3304	3802	4186
4400	20	1157	4395	5059	5570
	24	1026	4032	4641	5110
	28	899	3671	4225	4651
4800	20	1272	4835	5565	6126
	24	1128	4436	5106	5621
	28	989	4038	4647	5116

Q [W] 70/55/20 °C

LENGHT [mm]	SPEED rpm	HEATING OUTPUT [W]			
		0	1	2	3
800	20	91	372	428	471
	24	78	332	382	421
	28	66	296	340	375
1200	20	183	743	855	942
	24	156	664	765	842
	28	133	591	681	749
1600	20	274	1115	1283	1413
	24	235	997	1147	1263
	28	199	887	1021	1124
2000	20	366	1486	1711	1883
	24	313	1329	1530	1684
	28	266	1183	1361	1498
2400	20	457	1858	2138	2354
	24	391	1661	1912	2105
	28	332	1478	1701	1873
2800	20	549	2229	2566	2825
	24	469	1993	2294	2526
	28	399	1774	2042	2248
3200	20	640	2601	2994	3296
	24	548	2326	2677	2947
	28	465	2069	2382	2622
3600	20	732	2973	3422	3767
	24	626	2658	3059	3368
	28	532	2365	2722	2997
4000	20	823	3344	3849	4238
	24	704	2990	3442	3789
	28	598	2661	3062	3372
4400	20	915	3716	4277	4709
	24	782	3322	3824	4210
	28	665	2956	3403	3746
4800	20	1006	4087	4705	5179
	24	861	3654	4206	4631
	28	731	3252	3743	4121



Q [W] 6/12 °C, relative humidity 55 %

SPEED		1		2		3	
rpm							
LENGTH [mm]	Ti [°C]	COOLING OUTPUT [W]					
		Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	24	256	160	274	174	299	194
	26	281	176	301	191	328	213
	28	305	191	327	207	356	232
	30	328	206	352	223	384	249
1600	24	384	241	412	261	449	292
	26	421	264	452	286	492	320
	28	457	287	490	311	535	347
	30	493	309	528	335	576	374
2000	24	512	321	549	348	598	389
	26	562	352	602	382	657	427
	28	610	382	654	414	713	463
	30	657	412	704	446	768	499
2400	24	640	401	686	435	748	486
	26	702	440	753	477	821	533
	28	762	478	817	518	891	579
	30	821	514	880	558	960	624
2800	24	768	481	823	522	898	583
	26	843	528	903	572	985	640
	28	915	573	980	622	1 069	695
	30	985	617	1 056	669	1 151	748
3200	24	896	562	960	609	1 047	681
	26	983	616	1 054	668	1 149	747
	28	1 067	669	1 144	725	1 247	811
	30	1 150	720	1 232	781	1 343	873

Q [W] 8/14 °C, relative humidity 55 %

SPEED		1		2		3	
rpm							
LENGTH [mm]	Ti [°C]	COOLING OUTPUT [W]					
		Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	24	230	144	247	156	269	175
	26	256	160	274	174	299	194
	28	281	176	301	191	328	213
	30	305	191	327	207	356	232
1600	24	345	216	370	235	404	262
	26	384	241	412	261	449	292
	28	421	264	452	286	492	320
	30	457	287	490	311	535	347
2000	24	461	289	494	313	538	350
	26	512	321	549	348	598	389
	28	562	352	602	382	657	427
	30	610	382	654	414	713	463
2400	24	576	361	617	391	673	437
	26	640	401	686	435	748	486
	28	702	440	753	477	821	533
	30	762	478	817	518	891	579
2800	24	691	433	740	469	807	525
	26	768	481	823	522	898	583
	28	843	528	903	572	985	640
	30	915	573	980	622	1 069	695
3200	24	806	505	864	548	942	612
	26	896	562	960	609	1 047	681
	28	983	616	1 054	668	1 149	747
	30	1 067	669	1 144	725	1 247	811

Q [W] 10/15 °C, relative humidity 55 %

SPEED		1		2		3	
rpm							
LENGTH [mm]	Ti [°C]	COOLING OUTPUT [W]					
		Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	24	210	132	225	143	246	160
	26	237	148	254	161	277	180
	28	262	164	281	178	307	199
	30	287	180	308	195	335	218
1600	24	316	198	338	214	369	240
	26	355	223	381	241	415	270
	28	394	247	422	267	460	299
	30	430	270	461	292	503	327
2000	24	421	264	451	286	492	319
	26	474	297	508	322	554	360
	28	525	329	562	356	613	398
	30	574	360	615	390	671	436
2400	24	526	329	563	357	615	399
	26	592	371	634	402	692	450
	28	656	411	703	445	766	498
	30	717	450	769	487	838	545
2800	24	631	395	676	429	737	479
	26	711	445	761	483	830	540
	28	787	493	843	535	920	598
	30	861	539	923	585	1 006	654
3200	24	736	461	789	500	860	559
	26	829	519	888	563	969	629
	28	918	575	984	624	1 073	697
	30	1 004	629	1 076	682	1 174	763

Q [W] 12/16 °C, relative humidity 55 %

SPEED		1		2		3	
rpm							
LENGTH [mm]	Ti [°C]	COOLING OUTPUT [W]					
		Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	24	190	119	203	129	222	144
	26	217	136	233	147	254	165
	28	243	152	261	165	284	185
	30	269	168	288	182	314	204
1600	24	285	178	305	193	332	216
	26	326	204	349	221	381	247
	28	365	229	391	248	426	277
	30	403	252	432	274	471	306
2000	24	379	238	407	258	443	288
	26	434	272	465	295	507	330
	28	487	305	521	331	569	370
	30	537	337	576	365	628	408
2400	24	474	297	508	322	554	360
	26	543	340	582	369	634	412
	28	608	381	652	413	711	462
	30	671	421	719	456	785	510
2800	24	569	357	610	387	665	432
	26	651	408	698	442	761	495
	28	730	457	782	496	853	554
	30	806	505	863	547	942	612
3200	24	664	416	711	451	776	504
	26	760	476	814	516	888	577
	28	852	534	913	578	995	647
	30	940	589	1 007	639	1 098	714

Q [W] 14/18 °C, relative humidity 55 %

SPEED		1		2		3	
rpm							
LENGTH [mm]	Ti [°C]	COOLING OUTPUT [W]					
		Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	24	91	91	99	99	111	111
	26	110	110	119	119	133	133
	28	204	128	218	138	238	155
	30	230	144	247	156	269	175
1600	24	137	137	148	148	166	166
	26	165	165	179	179	200	200
	28	305	191	327	207	357	232
	30	345	216	370	235	404	262
2000	24	183	183	198	198	221	221
	26	220	220	238	238	266	266
	28	407	255	436	277	476	309
	30	461	289	494	313	538	350

Q [W] 14/18 °C, relative humidity 55 %

SPEED		1		2		3	
rpm							
LENGTH [mm]	Ti [°C]	COOLING OUTPUT [W]					
		Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
2400	274	274	297	297	332	332	239
	330	330	358	358	400	400	300
	611	383	654	415	714	464	360
	691	433	740	469	807	525	419
2800	319	319	346	346	387	387	286
	385	385	417	417	466	466	360
	712	446	763	484	832	541	432
	806	505	864	548	942	612	503
3200	365	365	396	396	442	442	334
	440	440	477	477	533	533	420
	814	510	872	553	951	618	504
	921	577	987	626	1 077	700	587

Qk [W] - total cooling output, Qs[W] - sensible cooling output (air relative humidity 55 %)

CONVECTORS WITH NATURAL CONVECTION

Floor convectors with natural convection are especially suitable for installation to all-glass. The so installed convector creates a thermal curtain screening the cold air coming from the glass surface. A part of warm air streaming to the room heats up dwelling interiors. The floor convectors have been usually used as heating bodies supporting and supplementing the function of other heating systems. The floor convectors may also serve as the main heating bodies provided that the heating capacity thereof is sufficient. The floor convectors are also suitable for tempering of entrance halls, long corridors or industrial and commercial rooms.

The convectors are equipped with an Cu-Cu wire heat exchanger through which the heating medium is flowing. Cold air of the window and room absorbed by and heated up in exchanger spontaneously rises up to the window glass surface.

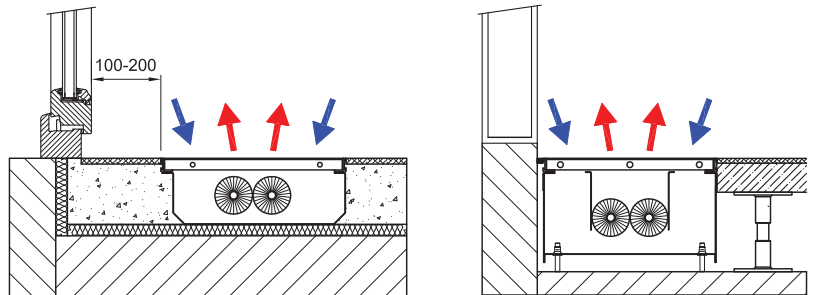
- Tempering of rooms
- Small water volume
- Quick heating up
- Broad assortment

AVAILABLE 24V DC TYPES:

FLK10-09	(170×90×800-4800 mm)
FLK10-11	(170×115×800-4800 mm)
FLK10-14	(170×140×800-4800 mm)
FLK20-09	(320×90×800-4800 mm)
FLK20-11	(320×115×800-4800 mm)
FLK20-14	(320×140×800-4800 mm)
FLK30-09	(360×90×800-4800 mm)
FLK30-11	(360×115×800-4800 mm)
FLK30-14	(360×140×800-4800 mm)
FLK40-09	(420×90×800-4800 mm)
FLK40-11	(420×115×800-4800 mm)
FLK40-14	(420×140×800-4800 mm)
FLK20-18	(300×180×800-4800 mm)
FLK20-30	(300×300×800-4800 mm)
FLK30-18	(360×180×800-4800 mm)
FLK30-30	(360×300×800-4800 mm)

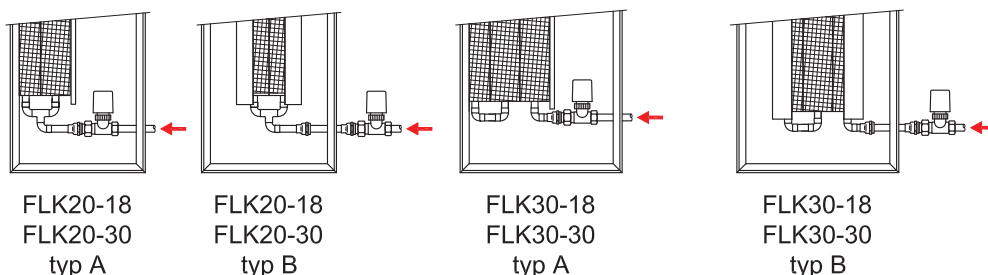
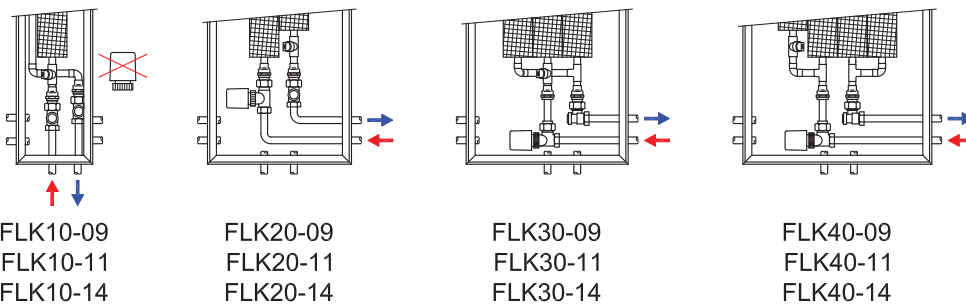
RECOMMENDED STANDARD INSTALLING IN FLOOR

- Ideal position 100–200 mm distance from window
- Fan draws in the room air
- The air is warmed up by flowing through exchanger
- Hot air is mixed with cold air flowing off the window surface
- Air circulation: warms up the room air
screens the window surface
secondary demisters the window surface
- Installation with fan towards window and exchanger outwards slightly raises the convector heating output, but accelerates air circulation in the room.



CONVECTOR CONNECTION TO THE HEATING SYSTEM

Floor convector is fitted with openings for connection to the heating system. There are three connection possibilities, from the room, side or window wall.





HEATING OUTPUT RECALCULATION FOR ANOTHER TEMPERATURE GRADIENT

Convactor heating output reckoning follows by recalculation of the standardized output Q_n 75/65/20 °C

$$Q = Q_n * \Psi * \left(\frac{\Delta T}{50}\right)^m \text{ [W]; where } \Delta T = \left(\frac{T_1 + T_2}{2}\right) - T_i \text{ [}^\circ\text{C]}$$

m= 1,45 pro FLK10-09 až FLK 40-14
m= 1,42 pro FLK20-18 a FLK30-18
m= 1,49 pro FLK20-30 a FLK30-30

Q_n [W] heating output for temperature gradient
 $T_1/T_2/T_i = 75/65/20$ °C
 Ψ [-] mass rate of flow coefficient (for current flow rate $\Psi=1$)
 T_1 [°C] input water temperature
 T_2 [°C] output water temperature
 T_i [°C] temperature in the room
m [-] temperature exponent

QUICK CONVERSION TO $T_i=22$ °C A $T_i=15$ °C FOR ORIENTATION

- If you want to learn convactor output for the room temperature of 22 °C or for a corridor temperature of 15 °C
- multiply heating output of the chosen convactor by the "k" coefficient

For $T_i=22$ °C, $k=0.95$
E.g.: $Q [55/45/22$ °C] = 0.95 * $Q [55/45/20$ °C]

for $T_i=15$ °C, $k=1.12$
E.g.: $Q [75/65/15$ °C] = 1.12 * $Q_n [75/65/20$ °C]

HEATING WATER FLOW RATE THROUGH EXCHANGER

$$M = 0.86Q/(T_1-T_2) \text{ [kg/h]}$$

M [kg/h] mass rate of flow, heating water flowing through exchanger
Q [W] convactor heating output
 $T_1 - T_2$ [°C] difference between input and output temperature
0.86 [-] invariable for recalculation of units

EXCHANGER HYDRAULIC LOSSES

TYPE	Length [mm]	Volume [l]	Qv – mass rate of flow in piping (kg/h) / R – hydraulic loss in exchanger (kPa)												
			20	40	60	80	100	120	150	200	250	300	350	400	450
FLK10-09 FLK10-11 FLK10-14 FLK20-09 FLK20-11 FLK20-14	800	0,11	0,01	0,03	0,06	0,11	0,17	0,25	0,39	0,69	1,07	1,55	2,11	2,75	3,48
	1200	0,21	0,01	0,03	0,08	0,14	0,21	0,30	0,48	0,85	1,32	1,91	2,59	3,39	4,29
	1600	0,32	0,01	0,04	0,09	0,15	0,24	0,34	0,53	0,94	1,48	2,13	2,89	3,78	4,78
	2000	0,43	0,01	0,04	0,09	0,16	0,26	0,37	0,58	1,02	1,60	2,30	3,13	4,09	5,18
	2400	0,53	0,01	0,05	0,10	0,19	0,29	0,42	0,65	1,16	1,81	2,61	3,55	4,64	5,87
	2800	0,64	0,01	0,05	0,11	0,19	0,30	0,43	0,68	1,20	1,88	2,71	3,69	4,82	6,09
	3200	0,74	0,01	0,06	0,13	0,23	0,35	0,51	0,79	1,41	2,21	3,18	4,33	5,65	7,15
	3600	0,85	0,01	0,06	0,13	0,23	0,36	0,53	0,82	1,46	2,28	3,28	4,47	5,84	7,39
	4000	0,96	0,02	0,09	0,20	0,36	0,56	0,81	1,27	2,26	3,52	5,08	6,91	9,02	11,42
	4400	1,06	0,02	0,09	0,21	0,37	0,57	0,82	1,29	2,29	3,58	5,15	7,01	9,16	11,59
4800	1,17	0,02	0,09	0,21	0,37	0,58	0,84	1,31	2,33	3,64	5,24	7,14	9,32	11,80	
FLK30-09 FLK30-11 FLK30-14	800	0,17	0,01	0,04	0,09	0,16	0,25	0,36	0,56	1,00	1,55	2,24	3,05	3,98	5,04
	1200	0,32	0,01	0,04	0,10	0,18	0,27	0,39	0,62	1,10	1,71	2,47	3,36	4,39	5,55
	1600	0,48	0,01	0,05	0,12	0,22	0,34	0,49	0,76	1,36	2,12	3,05	4,15	5,43	6,87
	2000	0,65	0,02	0,07	0,16	0,28	0,44	0,63	0,98	1,74	2,72	3,92	5,33	6,96	8,81
	2400	0,80	0,02	0,09	0,21	0,37	0,58	0,83	1,30	2,32	3,62	5,21	7,09	9,26	11,72
	2800	0,96	0,03	0,10	0,23	0,40	0,63	0,91	1,42	2,52	3,93	5,67	7,71	10,07	12,75
	3200	1,11	0,03	0,11	0,25	0,44	0,69	0,99	1,55	2,75	4,30	6,19	8,43	11,01	13,93
	3600	1,28	0,03	0,13	0,28	0,50	0,78	1,13	1,76	3,13	4,89	7,05	9,59	12,53	15,86
	4000	1,44	0,04	0,16	0,36	0,63	0,99	1,43	2,23	3,97	6,20	8,93	12,15	15,87	20,09
	4400	1,59	0,05	0,18	0,41	0,74	1,15	1,66	2,59	4,60	7,20	10,36	14,10	18,42	23,31
4800	1,76	0,05	0,21	0,47	0,83	1,30	1,88	2,93	5,21	8,15	11,73	15,97	20,86	26,40	
FLK40-09 FLK40-11 FLK40-14	800	0,22	0,01	0,03	0,07	0,13	0,20	0,29	0,45	0,80	1,24	1,79	2,44	3,18	4,03
	1200	0,42	0,01	0,04	0,08	0,14	0,22	0,32	0,49	0,88	1,37	1,97	2,69	3,51	4,44
	1600	0,64	0,01	0,04	0,10	0,17	0,27	0,39	0,61	1,09	1,70	2,44	3,32	4,34	5,49
	2000	0,86	0,01	0,06	0,13	0,22	0,35	0,50	0,78	1,39	2,18	3,13	4,26	5,57	7,05
	2400	1,06	0,02	0,07	0,17	0,30	0,46	0,67	1,04	1,85	2,89	4,17	5,67	7,41	9,38
	2800	1,28	0,02	0,08	0,18	0,32	0,50	0,73	1,13	2,01	3,15	4,53	6,17	8,06	10,20
	3200	1,48	0,02	0,09	0,20	0,35	0,55	0,79	1,24	2,20	3,44	4,95	6,74	8,81	11,14
	3600	1,70	0,03	0,10	0,23	0,40	0,63	0,90	1,41	2,51	3,92	5,64	7,67	10,02	12,69
	4000	1,92	0,03	0,13	0,29	0,51	0,79	1,14	1,79	3,17	4,96	7,14	9,72	12,70	16,07
	4400	2,12	0,04	0,15	0,33	0,59	0,92	1,33	2,07	3,68	5,76	8,29	11,28	14,74	18,65
4800	2,34	0,04	0,17	0,38	0,67	1,04	1,50	2,35	4,17	6,52	9,39	12,78	16,69	21,12	

PARAMETERS OF LOCKSHIELD VALVES

T-turns	0,5	0,75	1	1,5	2	2,5	3	3,5	4	5	6	MAX
Kv (m³/h) – direct version	0,3	0,4	0,55	0,75	0,91	1,05	1,25	1,33	1,4	1,6	1,7	1,8
Kv (m³/h) – corner version	0,2	0,25	0,29	0,4	0,5	0,69	0,8	1	1,2	1,55	1,9	2,2

parameters of free packed in lockshield valves

FLK CONVECTOR REGULATION



For regulation of fanless floor convectors, a thermostatic valve is to be installed on the input tube of heat exchanger.

ROOM THERMOSTAT Z-RT001 AND THERMAL ACTUATOR Z-TS230

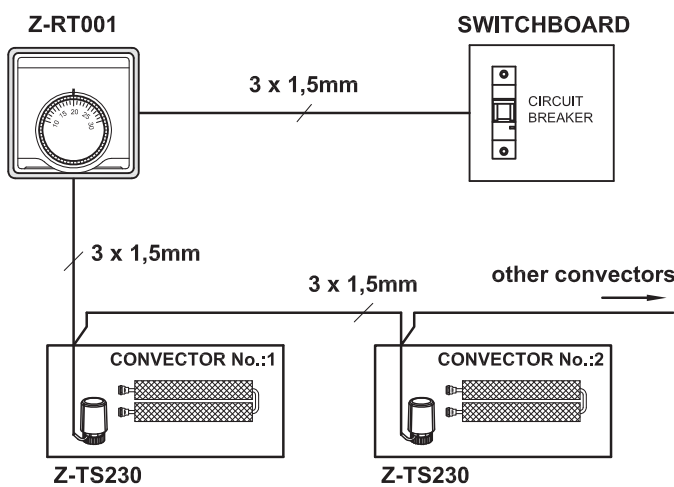
FLK convectors are regulated by means of thermo-drive opening or closing the heating medium circulation on the base of information by thermostat. The thermo-drive works in ON / OFF mode. Full circulation of heating medium follows within 3 minutes after the thermostat is activated.

Feeding voltage is 230V AC /50Hz. The thermo-drive hidden under the water connection is highly shielded with IP44 circuit breaker.

COMBINED USING OF CONVECTORS

In projects requiring combined installation of convectors fitted with 24V DC fans and convectors with natural convection, Z-TS24V thermo-drive controlled by convector fitted with regulator is used.

FLK - CABLING EXAMPLE FOR FLOOR CONVECTOR WITH Z-TS230



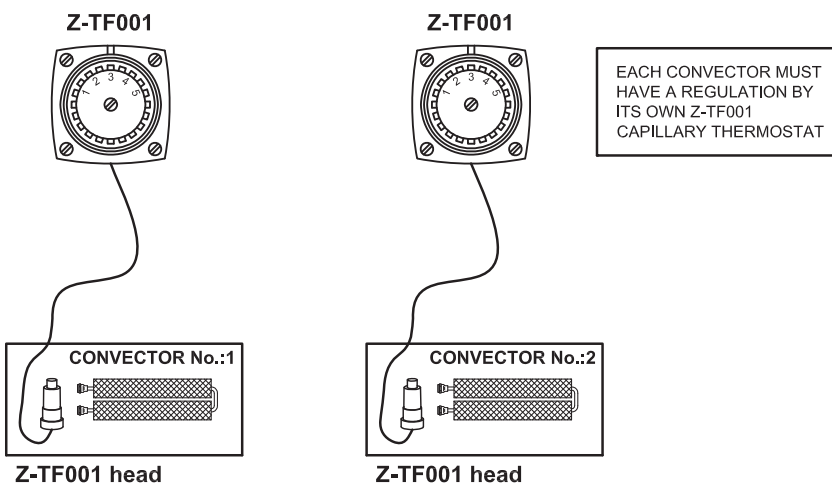
CAPILLARY THERMOSTAT Z-TF001

Thermostatic capillary head automatically controls keeping of the preset room temperature. The room temperature is regulated by user independently of any other power supply units. Keeping of the preset temperature is controlled by heat-sensitive element. Water volume in the

heating body, necessary for keeping of the preset room temperature, is regulated by thermostatic valve.

The thermostatic capillary head has been installed on each convector.

FLK - CONNECTING WITH CAPILLARY THERMOSTAT Z-TF001





Z-RT001

Room thermostat
 Temperature range: 10 to 30 °C
 Operating voltage: 230V/50Hz
 Max. rating: 10 (3) A
 Protection: IP30
 Colour: white
 Dimension: 83 × 83 × 40 mm



Z-TF001 (available for FLK only)

Capillary thermostat
 Temperature range: 9 to 26 °C, antifreeze temperature 9 °C
 Mode: proportional control
 Operating temperature: without additional energy, liquid-filled sensing
 capillara tube length: 5 m
 Body-head connection: M30 × 1,5 mm
 Dimension: 75 × 75 mm, sensor Ø 50 × 68 mm



Z-TS24

Thermoactuator – a drive to be installed on thermoelectric valve for ON/OFF flow rate regulation
 Input voltage: 230V AC
 Power input when switched on: 6VA
 Power input during operation: 2.5W
 Period of switching ON/OFF: 3 minutes
 Ingress protection: IP41



Z-TD001 / Z-TE001

Thermostatic valve direct/corner
 DN15 version NF, M30 × 1,5 mm, PN10, 120 °C

Valve adjusting	1	2	3	4	5	N
k_v (m ³ /h)	0,1	0,2	0,31	0,45	0,69	0,89



Z-RD002 direct, Z-RE002 corner

Lockshield valves
 Dimension: DN15, NF norm
 Connection thread: M30×1,5 mm
 Max. working temperature: 120 °C
 Max. working overpressure: PN10

T - turns	0,25	0,5	1,0	1,5	2,0	3,0	4,0
k_v (m ³ /h)	0,13	0,22	0,43	0,65	0,85	1,25	1,7



FLK10-09 | NATURAL CONVECTION



SPECIFICATIONS

- Width 170 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience

FLK20-09 | NATURAL CONVECTION



SPECIFICATIONS

- Width 320 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience

FLK30-09 | NATURAL CONVECTION



SPECIFICATIONS

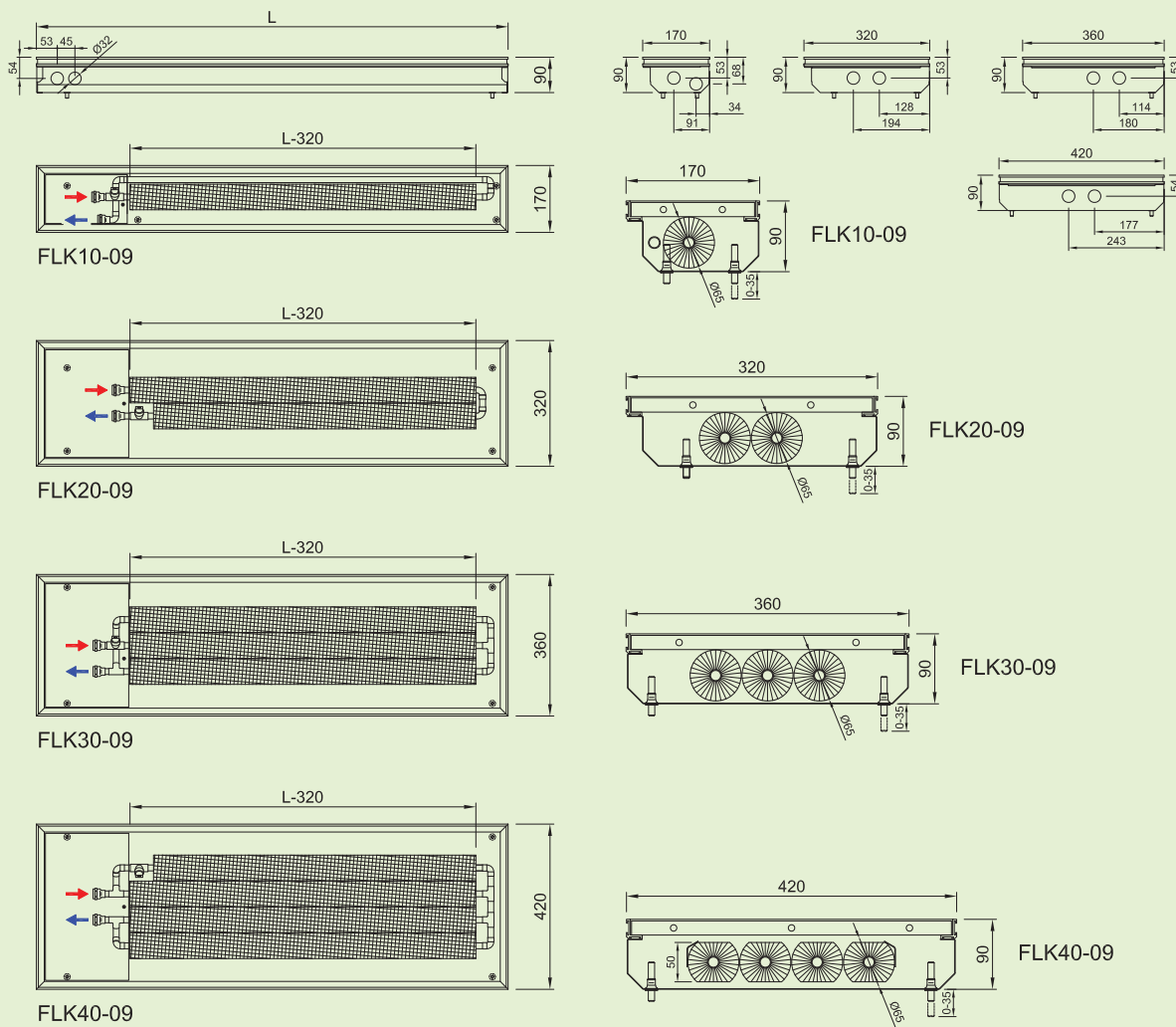
- Width 360 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience

FLK40-09 | NATURAL CONVECTION



SPECIFICATIONS

- Width 420 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience



HEATING OUTPUT

Q [W] 90/70/20°C

TYPE	FLK10-09	FLK20-09	FLK30-09	FLK40-09
LENGTH [mm]	HEATING OUTPUT [W]			
800	118	199	282	365
1200	214	366	511	656
1600	316	541	747	953
2000	419	721	986	1251
2400	523	902	1227	1552
2800	630	1088	1472	1856
3200	736	1276	1716	2156
3600	844	1466	1964	2462
4000	952	1657	2212	2767
4400	1063	1851	2462	3073
4800	1172	2046	2711	3376

Qn [W] 75/65/20°C

TYPE	FLK10-09	FLK20-09	FLK30-09	FLK40-09
LENGTH [mm]	HEATING OUTPUT [W]			
800	95	161	227	293
1200	173	296	413	530
1600	255	438	604	770
2000	338	583	797	1011
2400	422	730	992	1254
2800	508	880	1190	1500
3200	594	1032	1388	1744
3600	681	1186	1588	1990
4000	768	1341	1789	2237
4400	857	1498	1991	2484
4800	945	1655	2193	2731

Q [W] 70/55/20°C

TYPE	FLK10-09	FLK20-09	FLK30-09	FLK40-09
LENGTH [mm]	HEATING OUTPUT [W]			
800	75	127	179	231
1200	137	234	326	419
1600	201	346	477	608
2000	267	461	630	799
2400	333	577	784	991
2800	401	695	940	1185
3200	469	815	1097	1378
3600	538	937	1255	1572
4000	607	1059	1413	1767
4400	677	1184	1573	1962
4800	747	1308	1733	2158

Q [W] 55/45/20°C

TYPE	FLK10-09	FLK20-09	FLK30-09	FLK40-09
LENGTH [mm]	HEATING OUTPUT [W]			
800	45	76	118	160
1200	81	140	211	282
1600	120	208	307	406
2000	159	277	406	535
2400	199	347	506	665
2800	240	419	606	793
3200	280	492	708	924
3600	321	565	808	1051
4000	363	639	911	1183
4400	405	714	1015	1316
4800	446	789	1118	1447

PARAMETERS

Convector	Width	170, 320, 360, 420 mm
	Height	90 mm
	Length	800-4800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	150, 300, 360, 420 mm
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	1x, 2x, 3x, 4x Ø 65 mm
	Height	
	Finned length	L-320 mm
	Heat medium connection	2 × G1/2" inner
Operating conditions	Max. working temperature	110 °C
	Max. working over-pressure	1 MPa
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70 %

FLK10-11 | NATURAL CONVECTION



SPECIFICATIONS

- Width 170 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience

FLK20-11 | NATURAL CONVECTION



SPECIFICATIONS

- Width 320 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience

FLK30-11 | NATURAL CONVECTION



SPECIFICATIONS

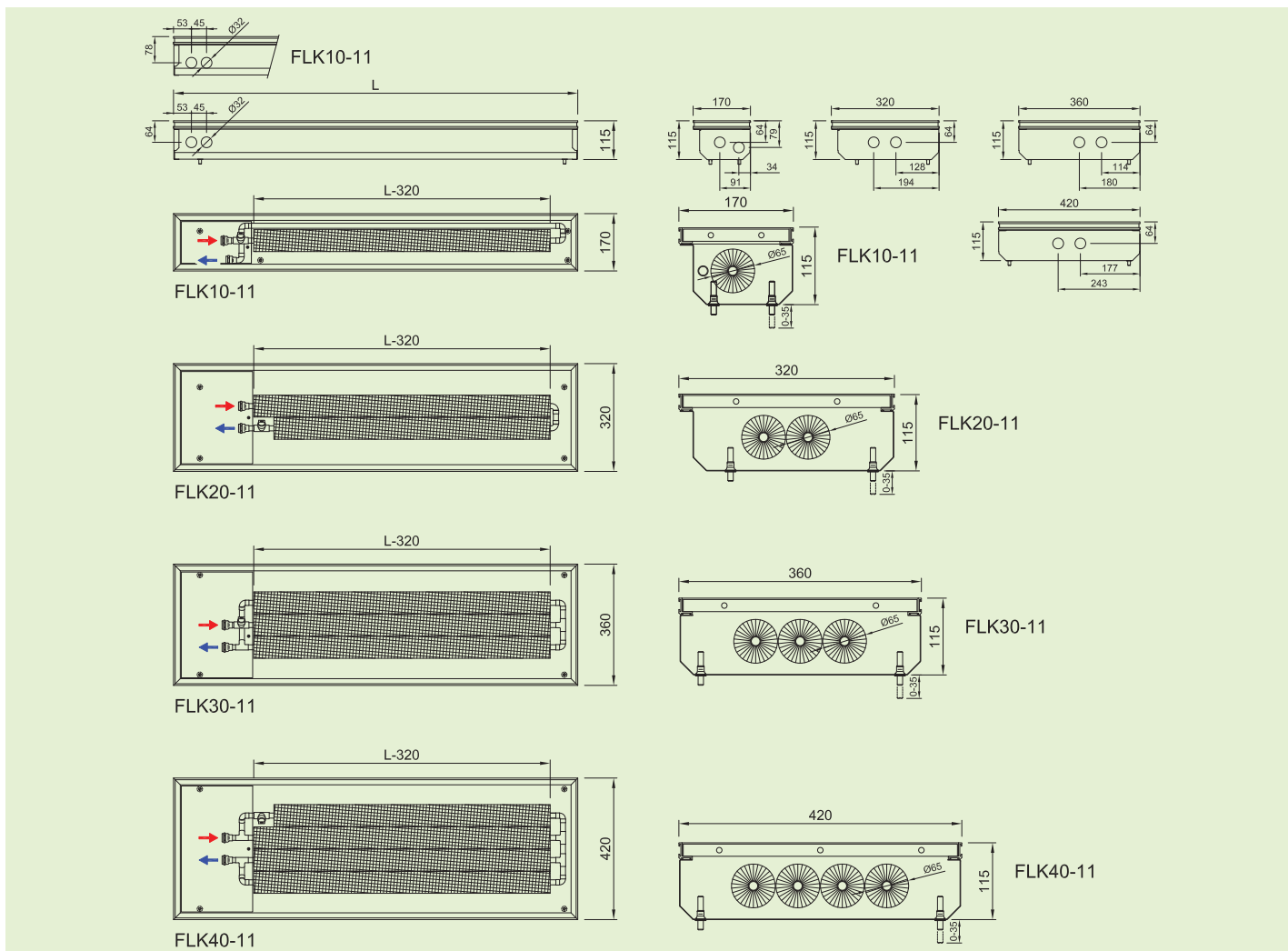
- Width 360 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience

FLK40-11 | NATURAL CONVECTION



SPECIFICATIONS

- Width 420 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience



HEATING OUTPUT

Q [W] 90/70/20°C

TYPE	FLK10-11	FLK20-11	FLK30-11	FLK40-11
LENGTH [mm]	HEATING OUTPUT [W]			
800	126	215	305	395
1200	230	398	546	694
1600	338	587	795	1003
2000	448	783	1052	1321
2400	560	980	1311	1642
2800	673	1182	1568	1954
3200	787	1386	1832	2278
3600	902	1592	2091	2590
4000	1019	1801	2358	2915
4400	1135	2011	2626	3241
4800	1253	2223	2895	3567

Qn [W] 75/65/20°C

TYPE	FLK10-11	FLK20-11	FLK30-11	FLK40-11
LENGTH [mm]	HEATING OUTPUT [W]			
800	102	174	246	318
1200	186	322	441	560
1600	273	475	642	809
2000	362	633	850	1067
2400	452	793	1060	1327
2800	543	956	1268	1580
3200	635	1121	1481	1841
3600	728	1288	1691	2094
4000	822	1457	1907	2357
4400	916	1627	2124	2621
4800	1011	1798	2341	2884

Q [W] 70/55/20°C

TYPE	FLK10-11	FLK20-11	FLK30-11	FLK40-11
LENGTH [mm]	HEATING OUTPUT [W]			
800	81	137	194	251
1200	147	254	348	442
1600	216	375	507	639
2000	286	500	672	843
2400	357	627	837	1048
2800	429	755	1002	1248
3200	502	886	1170	1454
3600	575	1018	1336	1654
4000	649	1151	1507	1862
4400	724	1285	1678	2071
4800	799	1421	1850	2279

Q [W] 55/45/20°C

TYPE	FLK10-11	FLK20-11	FLK30-11	FLK40-11
LENGTH [mm]	HEATING OUTPUT [W]			
800	48	84	118	152
1200	88	154	211	268
1600	129	227	307	387
2000	171	303	406	509
2400	213	379	506	633
2800	256	457	606	755
3200	300	536	708	880
3600	344	616	808	1000
4000	388	696	911	1126
4400	433	777	1015	1253
4800	478	859	1118	1377

PARAMETERS

Convector	Width	170, 320, 360, 420 mm
	Height	115 mm
	Length	800-4800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	150, 300, 360, 420 mm
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	1x, 2x, 3x, 4x Ø 65 mm
	Height	
	Finned length	L-320 mm
	Heat medium connection	2 x G1/2" inner
Operating conditions	Max. working temperature	110 °C
	Max. working over-pressure	1 MPa
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70 %

FLK10-14 | NATURAL CONVECTION



SPECIFICATIONS

- Width 170 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience

FLK20-14 | NATURAL CONVECTION



SPECIFICATIONS

- Width 320 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience

FLK30-14 | NATURAL CONVECTION



SPECIFICATIONS

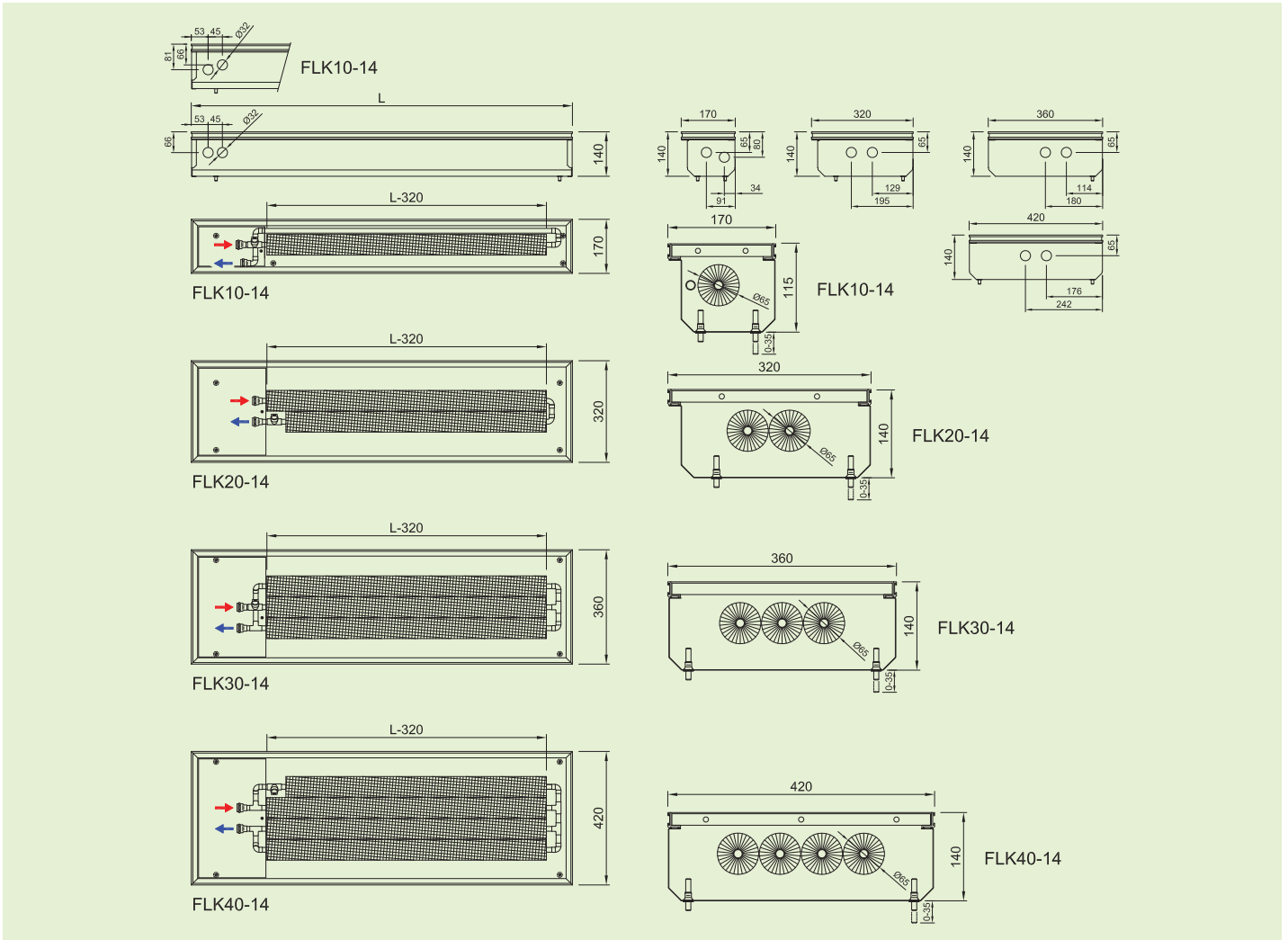
- Width 360 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience

FLK40-14 | NATURAL CONVECTION



SPECIFICATIONS

- Width 420 mm
- Offices, corridors, halls, flats, winter garden
- High heating output of natural convection
- Suitable for combining with other heating systems
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning - hygiene
- Using in dry ambience



HEATING OUTPUT

Q [W] 90/70/20°C

TYPE	FLK10-14	FLK20-14	FLK30-14	FLK40-14
LENGTH [mm]	HEATING OUTPUT [W]			
800	144	266	393	489
1200	264	493	704	860
1600	388	727	1025	1243
2000	515	970	1357	1638
2400	644	1215	1691	2036
2800	773	1465	2022	2422
3200	905	1718	2363	2824
3600	1037	1974	2697	3211
4000	1171	2233	3041	3614
4400	1305	2493	3387	4018
4800	1440	2756	3734	4423

Qn [W] 75/65/20°C

TYPE	FLK10-14	FLK20-14	FLK30-14	FLK40-14
LENGTH [mm]	HEATING OUTPUT [W]			
800	117	215	317	394
1200	213	399	568	694
1600	313	589	828	1003
2000	416	784	1096	1323
2400	519	983	1367	1645
2800	624	1185	1635	1959
3200	730	1390	1910	2282
3600	837	1597	2181	2596
4000	945	1806	2460	2922
4400	1053	2017	2739	3250
4800	1162	2229	3019	3576

Q [W] 70/55/20°C

TYPE	FLK10-14	FLK20-14	FLK30-14	FLK40-14
LENGTH [mm]	HEATING OUTPUT [W]			
800	92	170	250	311
1200	168	315	449	548
1600	247	465	654	792
2000	329	619	866	1045
2400	410	777	1080	1300
2800	493	936	1292	1548
3200	577	1098	1509	1803
3600	661	1262	1723	2051
4000	747	1427	1944	2309
4400	832	1594	2164	2568
4800	918	1761	2385	2825

Q [W] 55/45/20°C

TYPE	FLK10-14	FLK20-14	FLK30-14	FLK40-14
LENGTH [mm]	HEATING OUTPUT [W]			
800	55	104	152	188
1200	101	190	272	332
1600	148	281	396	479
2000	196	375	523	631
2400	244	469	652	784
2800	294	566	781	936
3200	345	664	913	1091
3600	395	763	1042	1240
4000	446	863	1175	1396
4400	497	963	1309	1553
4800	549	1065	1442	1707

PARAMETERS

Convector	Width	170, 320, 360, 420 mm
	Height	140 mm
	Length	800-4800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	150, 300, 360, 420 mm
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	1x, 2x, 3x, 4x Ø 65 mm
	Height	
	Finned length	L-320 mm
	Heat medium connection	2 x G1/2" inner
Operating conditions	Max. working temperature	110 °C
	Max. working over-pressure	1 MPa
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70 %

FLK20-18 | NATURAL CONVECTION



SPECIFIKACE

- Width 300 mm
- Possibility of inner construction A or B
- Installation to the double floor
- Administrative buildings, offices
- High heating output of natural convection
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning – hygiene
- Using in dry ambience

FLK30-18 | NATURAL CONVECTION



SPECIFIKACE

- Width 360 mm
- Possibility of inner construction A or B
- Installation to the double floor
- Administrative buildings, offices
- High heating output of natural convection
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning – hygiene
- Using in dry ambience

FLK20-30 | NATURAL CONVECTION



SPECIFIKACE

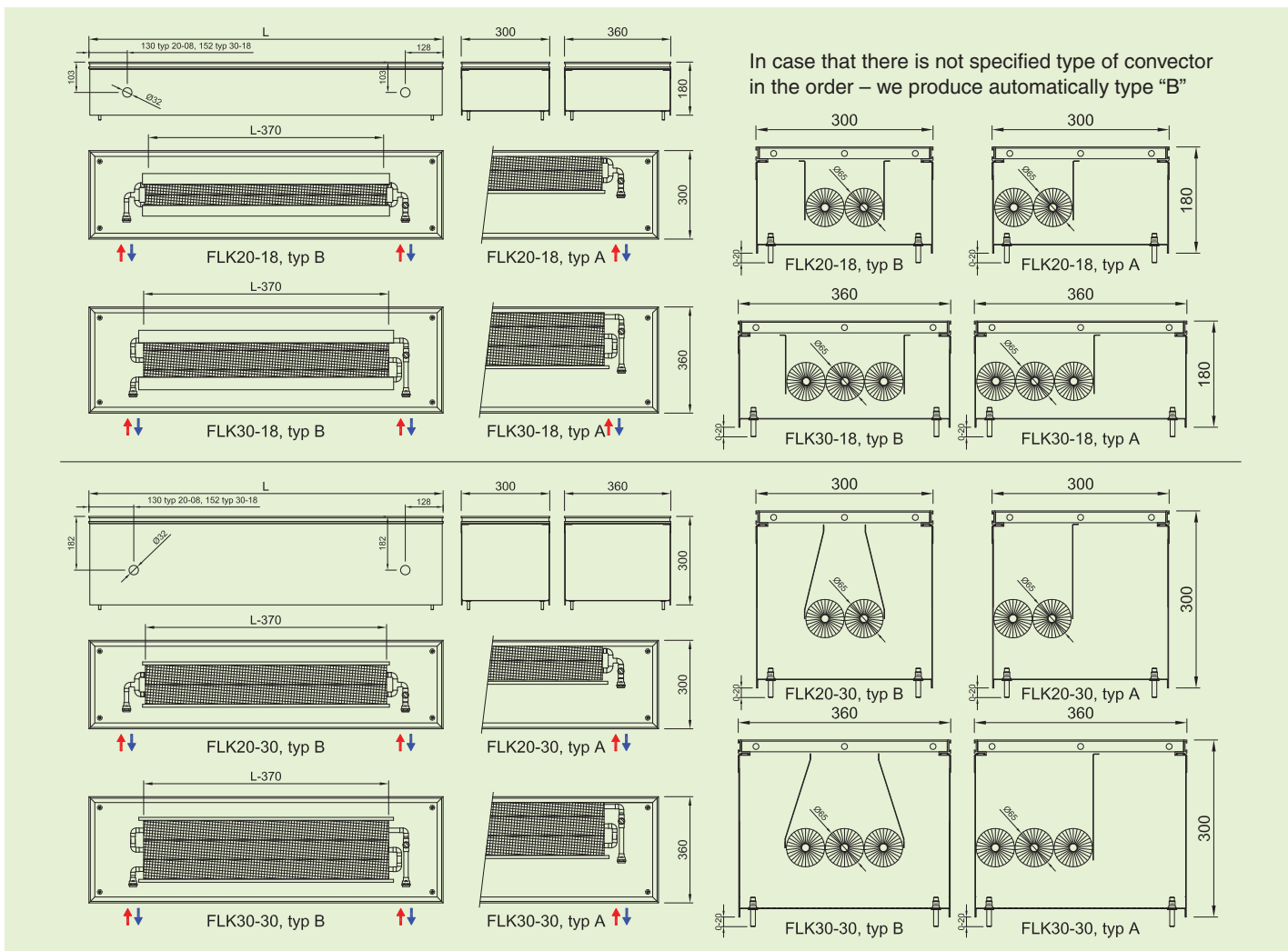
- Width 300 mm
- Possibility of inner construction A or B
- Installation to the double floor
- Administrative buildings, offices
- High heating output of natural convection
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning – hygiene
- Using in dry ambience

FLK30-30 | NATURAL CONVECTION



SPECIFIKACE

- Width 360 mm
- Possibility of inner construction A or B
- Installation to the double floor
- Administrative buildings, offices
- High heating output of natural convection
- Cu-Cu wire heat exchanger
- Mechanical resistance of the heat exchanger
- Easy cleaning – hygiene
- Using in dry ambience



HEATING OUTPUT

Q [W] 90/70/20°C

TYPE	FLK20-18	FLK30-18	FLK20-30	FLK30-30
LENGTH [mm]	HEATING OUTPUT [W]			
800	333	381	379	550
1200	661	754	752	1090
1600	995	1135	1132	1641
2000	1309	1494	1489	2159
2400	1643	1875	1869	2710
2800	1970	2248	2241	3250
3200	2304	2629	2621	3801
3600	2618	2988	2978	4319
4000	2952	3369	3358	4870
4400	3286	3750	3738	5421
4800	3613	4123	4110	5961

Qn [W] 75/65/20°C

TYPE	FLK20-18	FLK30-18	FLK20-30	FLK30-30
LENGTH [mm]	HEATING OUTPUT [W]			
800	257	293	289	419
1200	510	582	573	831
1600	767	875	862	1250
2000	1009	1152	1134	1645
2400	1267	1446	1423	2065
2800	1519	1734	1707	2476
3200	1777	2028	1996	2896
3600	2019	2304	2269	3290
4000	2277	2598	2558	3710
4400	2534	2892	2847	4130
4800	2787	3180	3131	4541

Q [W] 70/55/20°C

TYPE	FLK20-18	FLK30-18	FLK20-30	FLK30-30
LENGTH [mm]	HEATING OUTPUT [W]			
800	204	233	227	329
1200	405	462	450	652
1600	609	695	677	981
2000	801	915	890	1291
2400	1006	1148	1117	1621
2800	1206	1377	1340	1944
3200	1411	1610	1567	2273
3600	1603	1829	1781	2582
4000	1808	2063	2008	2912
4400	2012	2296	2235	3242
4800	2213	2525	2458	3564

Q [W] 55/45/20°C

TYPE	FLK20-18	FLK30-18	FLK20-30	FLK30-30
LENGTH [mm]	HEATING OUTPUT [W]			
800	124	142	135	195
1200	246	281	267	387
1600	370	423	402	583
2000	487	556	529	767
2400	612	698	664	963
2800	734	837	796	1155
3200	858	979	931	1351
3600	975	1113	1058	1535
4000	1100	1255	1193	1731
4400	1224	1397	1328	1926
4800	1346	1536	1460	2118

PARAMETERS

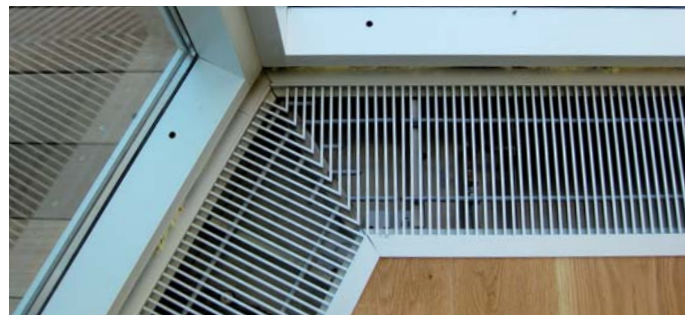
Convector	Width	300, 360 mm
	Height	180, 300 mm
	Length	800–4800 mm in step 400 mm
	Height adjusting	0–20 mm
	Stainless trough width	300, 360 mm
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	2×, 3× Ø 65 mm
	Height	2×, 3× Ø 65 mm
	Finned length	L-370 mm
	Heat medium connection	2 × G1/2" inner
Operating conditions	Max. working temperature	110 °C
	Max. working over-pressure	1 MPa
	Ambient temperature	+2 to +40 °C
Relative humidity	20–70 %	



We deliver arched, broken-line and curved convectors to fit the architectural design of buildings and customer requirements. A large variety of shapes and arrangements of floor convectors can be delivered. It is important to specify in the customer order the dimensions and a detailed and accurate measurement of the actual shape.

The measurement of the convector, performed by the customer or by an ISAN Radiatory specialist, must be carried out on site on the actual structure (not based on the design). The level of completeness of the structure required for the measurement is as follows: final shape of the wall along which the convection heater is to be installed, windows mounted, access to the measuring area (scaffolding dismantled, etc.). The technical documentation developed for the convection heaters previously measured is discussed and approved by

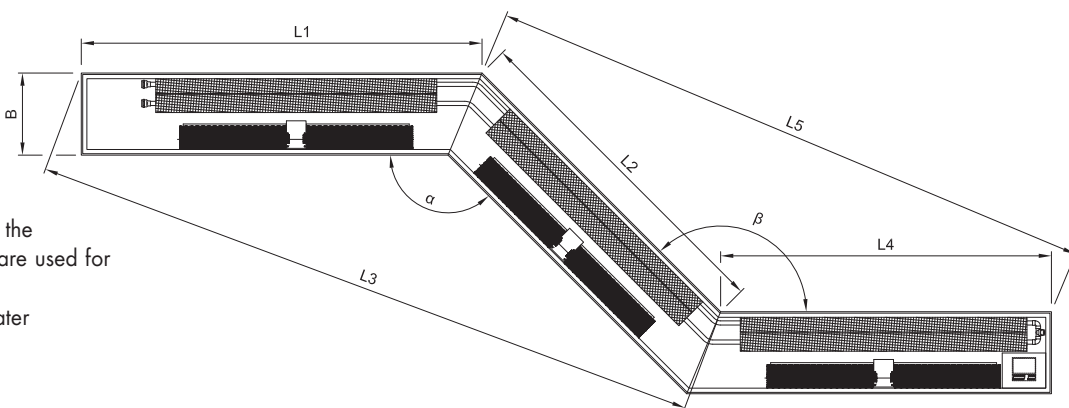
the customer and technical details are agreed (water connection side, power connection). Following that, the manufacturing of the floor convector starts.



BROKEN-LINE SHAPE CONVECTORS

To allow for the design of the convector, the following measured values are necessary:

- lengths of the heater edges (window-side edges) and the angle formed by the edges (calculated using the length of the third leg of the triangle formed by the two edges), the angles α and β are used for verification only
- width (type) of the convection heater
- a sketch of the convection heater



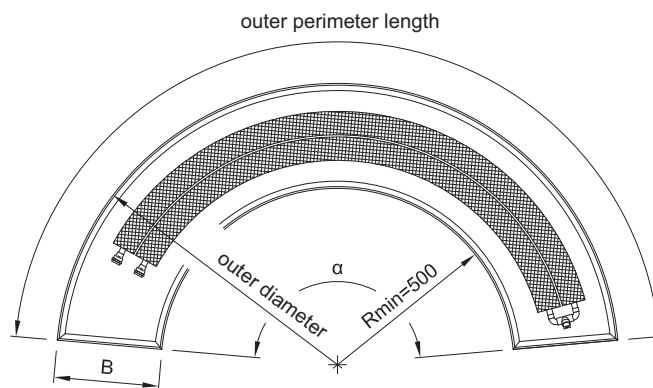
ARCHED CONVECTORS

To allow for the design of an arched convector, the following measured values are necessary:

- outer (inner) diameter of the arc and a total angle formed by the arc sector calculated using the distance of the end points and the diameter (for gentle-curved arcs) or the angle α (for arcs forming an angle larger than 120°)
- width (type) of the convection heater
- a sketch of the convection heater

or

- outer (inner) diameter of the arc and the perimeter length of the outer (inner) edge of the arc
- width (type) of the convection heater
- a sketch of the convection heater

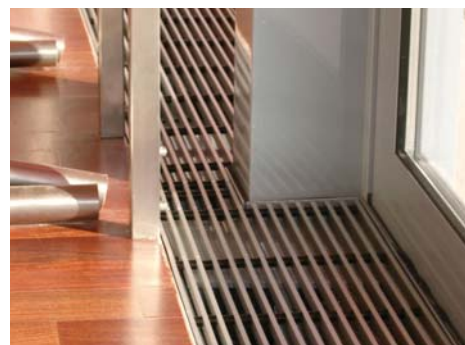


Remember that regular shapes occur rarely in real structures.

CURVED CONVECTORS

In case of more complicated shapes, it is necessary to use the reference points to determine the shape. It is recommended that the measurements are per-

formed by ISAN Radiatory specialists. The convection heaters are delivered within individually agreed deadlines, usually in 15 to 20 working days.



ORDERING FORM



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
F	L	T	2	0	-	1	1	1	6	0	-	N	R	1	2	5	-
Model Activ			Convector type		Free position	Height [cm]		Length [cm]			Atypical lengths	Surface finish of trough	Type and colour combination of the frame and grill			24V DC regulation or without regulation	Indication of the atypical design

LEGEND

Positions 1, 2, 3, 4, 5, 6, 7, 8	An overview of standard products – model, type, height
24V DC with fan	
FLT10	FLT10-09, FLT20-09
FLT20	FLT20-09, FLT20-11
FLT21	FLT21-12
12V DC with fan	
FLB	FLB20-12
with natural convection	
FLK10	FLK10-09, FLK10-11, FLK10-14
FLK20	FLK20-09, FLK20-11, FLK20-14, FLK20-18, FLK20-30
FLK30	FLK30-09, FLK30-11, FLK30-14, FLK30-18, FLK30-30
FLK40	FLK40-09, FLK40-11, FLK40-14

Positions 9, 10, 11, 12	
	- convector length in centimeters, standards lengths are given in the power output tables for the individual types DYNAMIC - atypical length of convector is marked in mm including position 12
example:	
1 6 0	convector length 1600 mm, standard length
1 4 0 0	convector length 1400 mm, atypical length
1 6 7 5	convector length 1675 mm, atypical length

Position 13	Overview of available finishes of the convectors
N	basic alternative, stainless steel convector without a surface finish (standard)
1	colour RAL 7015 (dark grey, almost black) – matt
2	colour RAL 9006 (aluminium colour) – matt
3	colour RAL9005 black – matt
4	other colours (to be specified in the ordering form)

the convector surface finishes 1, 2, 3, 4 are delivered for extra charge, the price is based on current quotation

Positions 14, 15, 16	Frame and grill specification (see pages 6, 7)
example:	
R 1 2	linear Al-grill, natural, Al-frame, natural
D 1 1	Al-cross roll-up grill natural, Al-frame natural, Al-finishing cover ledge, natural

grill and frame type must be specified in the order, R and D can't be changed after delivery



Position 17	Regulation of ACTIV convectors
24V DC with fan	
5	without regulator, convector with fans 24 V DC, control from th other convector or custom regulation
6	SR201, regulator for FLT10-09, FLT20-09, FLT10-11, FLT20-11, FLT21-12 (24V DC) placed in the convector
12V DC with fan	
0	FLB are manufactured without regulation (not inside the convector), please order separately (regulator RB25)
With natural convection	
0	no regulator; the delivered convectors have no installed regulation
Position 18	Atypical floor convector
-	standard convector (position to be left free)
A	atypical convector, orders of atypical lengths, arched or other modified constructions (shape modification, additional holes, etc.).

Please enclose approved technical documentation or exact description and measurements of the required product, when ordering convectors of special lengths.



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