

IMAS GROUP
REAL QUALITY MADE IN ITALY



DINAMICO

Floor Convectors





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Floor convectors made and supplied by IMAS 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

DINAMICO 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 FCT, FCC 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

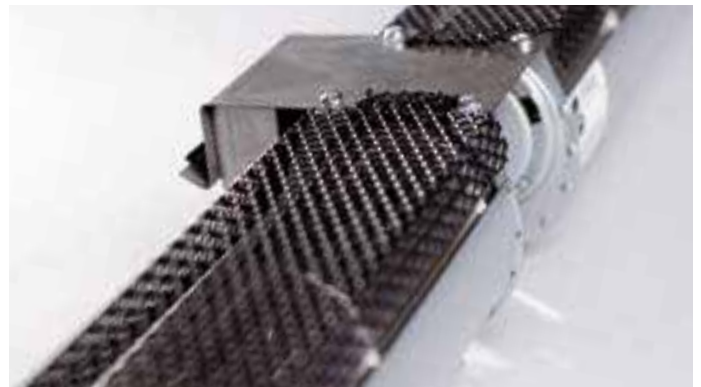
THERMOSTAT is a "brain" of the whole system controlling its performance, enabling continuous revs adjustment, moderate heating, automated and antifreeze modes. It is able to differentiate between requirements for heating and cooling either. It can be used for working in double-tube as well as in four-tube 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 FCT convectors follows by 0-10V input (eventually by PWM-signal).



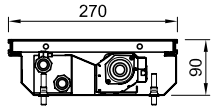
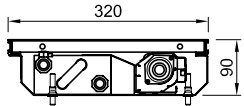
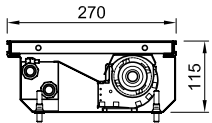
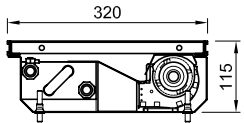
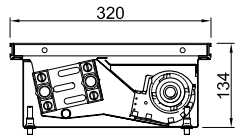
230V AC, 50HZ

Convectors with 230 V AC regulation are a favourite alternative of convectors with 24 V DC voltage. It is rated among demanded products in the heating field due to simple installation and wide offer of thermostats.

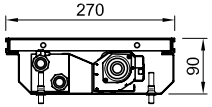
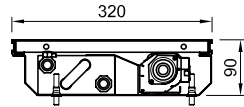
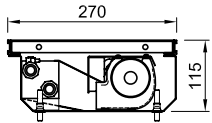
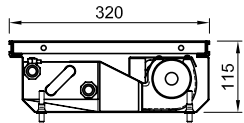
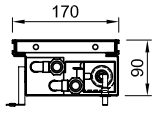
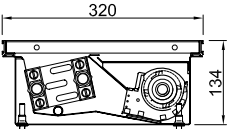


FCT FLOOR CONVECTOR WITH FAN

24V DC FLOOR CONVECTORS, DIRECT-CURRENT VOLTAGE

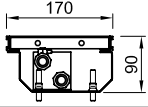
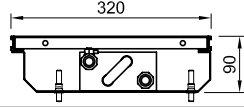
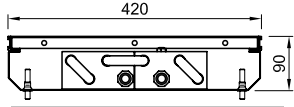
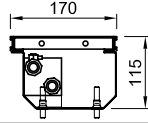
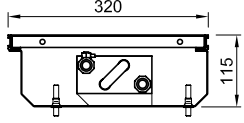
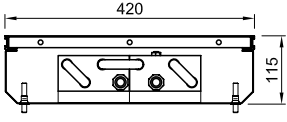
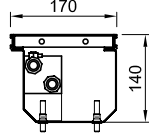
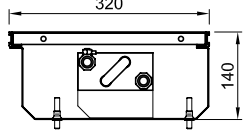
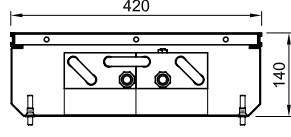
 <p>FCT20-09 270×90×800-4800 mm Q 75/65/20 °C: 394-4779 W Q 55/45/20 °C: 226-2748 W heating, 2 pipe system page 12</p>	 <p>FCT40-09 320×90×800-4800 mm Q 75/65/20 °C: 578-7039 W Q 55/45/20 °C: 345-4198 W heating, 2 pipe system page 13</p>	 <p>FCT20-11 270×115×800-4800 mm Q 75/65/20 °C: 401-4406 W Q 55/45/20 °C: 228-2513 W heating, 2 pipe system page 14</p>	 <p>FCT40-11 320×115×800-4800 mm Q 75/65/20 °C: 738-8122 W Q 55/45/20 °C: 435-4787 W heating, 2 pipe system page 15</p>	 <p>FCC2A, FCC 4A 320×134×1200-2800 mm Q 75/65/20 °C: 2001-6003 W Q 55/45/20 °C: 1191-3574 W heating, cooling, 2 and 4 pipe system page 20</p>
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230V AC FLOOR CONVECTORS, ALTERNATING-CURRENT VOLTAGE

 <p>FCT20-09 270×90×800-3600 mm Q 75/65/20 °C: 488-3902 W Q 55/45/20 °C: 280-2244 W heating, 2 pipe system page 24</p>	 <p>FCT40-09 320×90×800-3600 mm Q 75/65/20 °C: 762-6094 W Q 55/45/20 °C: 434-3471 W heating, 2 pipe system page 25</p>	 <p>FCT20-11 270×115×800-4800 mm Q 75/65/20 °C: 457-4839 W Q 55/45/20 °C: 264-2795 W heating, 2 pipe system page 26</p>	 <p>FCT40-11 320×115×800-4800 mm Q 75/65/20 °C: 834-8845 W Q 55/45/20 °C: 482-5110 W heating, 2 pipe system page 27</p>	 <p>FCT20-08 170×90×800-4800 mm Q 75/65/20 °C: 450-4950 W Q 55/45/20 °C: 260-2863 W heating, 2 pipe system page 23</p>
 <p>FCC2A, FCC 4A 320×134×1200-2800 mm Q 75/65/20 °C: 1579-4737 W Q 55/45/20 °C: 940-2821 W heating, cooling, 2 and 4 pipe system page 38</p>				

Note: Heat outputs correspond to the middle speed of a fan

FCK FLOOR CONVECTOR WITH NATURAL CONVECTION

 <p>FCK20-09 170×90×800-4800 Q 75/65/20 °C: 70-656 W Q 55/45/20 °C: 34-318 W heating, 2 pipe system page 46</p>	 <p>FCK40-09 320×90×800-4800 mm Q 75/65/20 °C: 142-1323 W Q 55/45/20 °C: 66-614 W heating, 2 pipe system page 46</p>	 <p>FCK80-09 420×90×800-4800 mm Q 75/65/20 °C: 175-1637 W Q 55/45/20 °C: 82-768 W heating, 2 pipe system page 46</p>	 <p>FCK20-11 170×115×800-4800 mm Q 75/65/20 °C: 91-848 W Q 55/45/20 °C: 44-407 W heating, 2 pipe system page 48</p>	 <p>FCK40-11 320×115×800-4800 mm Q 75/65/20 °C: 174-1624 W Q 55/45/20 °C: 83-777 W heating, 2 pipe system page 48</p>
 <p>FCK80-11 420×115×800-4800 mm Q 75/65/20 °C: 230-2149 W Q 55/45/20 °C: 111-1034 W heating, 2 pipe system page 48</p>	 <p>FCK20-14 170×140×800-4800 mm Q 75/65/20 °C: 94-875 W Q 55/45/20 °C: 45-422 W heating, 2 pipe system page 50</p>	 <p>FCK40-14 320×140×800-4800 mm Q 75/65/20 °C: 186-1733 W Q 55/45/20 °C: 87-812 W heating, 2 pipe system page 50</p>	 <p>FCK80-14 420×140×800-4800 mm Q 75/65/20 °C: 263-2451 W Q 55/45/20 °C: 125-1169 W heating, 2 pipe system page 50</p>	

STAINLESS TROUGH

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

AL-CU HEAT EXCHANGER

Aluminium lamellas are firmly pressed on a copper tube through which the heat carrier circulates. The air flowing between lamellas distributes the collected heat to the room. The exchanger is provided with an air release valve and connection female thread G1/2".

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 (FCT, FCC 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. The Dynamic series enables regulation of floor convectors working under the voltage of 24V DC or 230V AC.



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/230V AC, 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. FCT, FCC 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 trough.

Convactor 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 convactor.

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

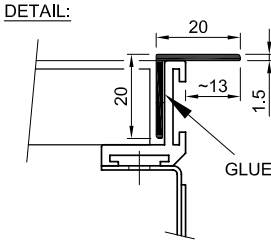
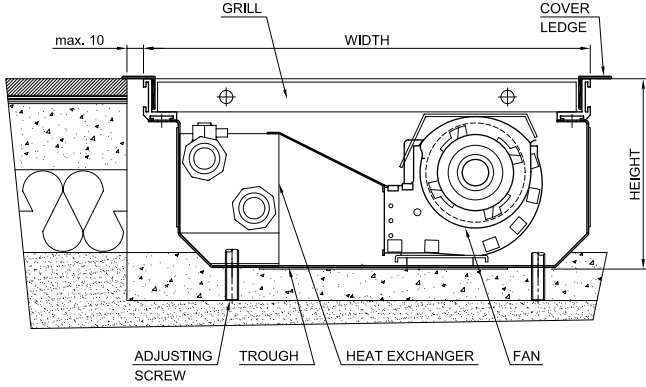
stainless steel grill, transverse

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

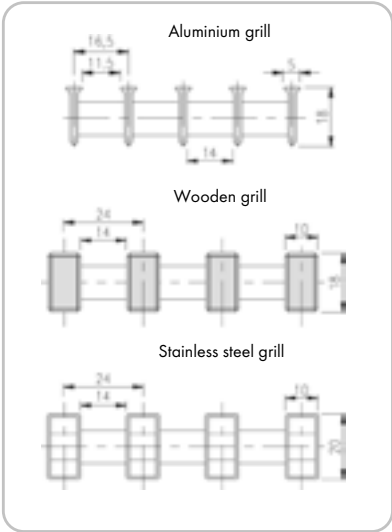
FINISHING COVER LEDGE

- 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)

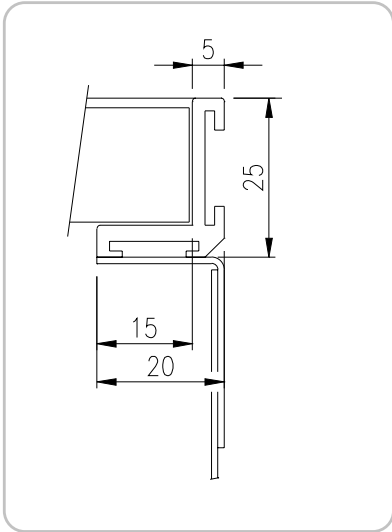
Because of modified grill width of convector, the option is to be specified when ordering the heating body. The top edge of convector frame may not protrude from the final floor level.



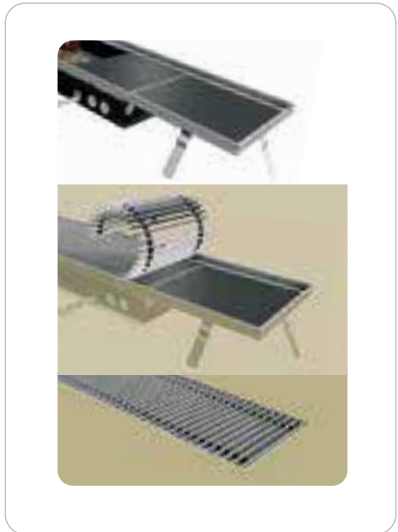
Grill cross section



Frame detail



Non standard frame



Samples of floor convector coding:
 FCT40-11120-NR110 - convector with Al-frame and grill
 FCT40-11120-ND110 - convector with Al-frame, modified grill and cover ledge
 Ordering, see the page 53

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 Al-Cu lamellar 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:

FCT20-09 (270×90×800-4800 mm)

FCT40-09 (320×90×800-4800 mm)

FCT20-11 (270×115×800-4800 mm)

FCT40-11 (320×115×800-4800 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 FCT 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 (FCT types)

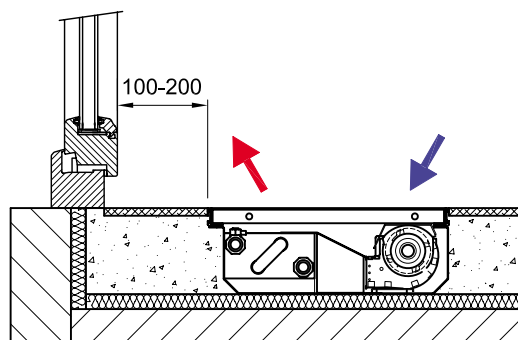
TYPE	Speed	FCT convector length [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
FCT20-09 FCT40-09	1	2W	2W	2W	4W	4W	5W	5W	6W	7W	7W	9W
	2	2W	2W	3W	4W	5W	6W	7W	7W	9W	9W	11W
	3	3W	4W	4W	7W	8W	10W	11W	11W	14W	15W	17W
	max.*	18W	18W	18W	36W	36W	54W	54W	54W	72W	72W	90W
FCT20-11 FCT40-11	1	2W	2W	3W	3W	5W	5W	6W	6W	8W	8W	9W
	2	2W	2W	4W	4W	6W	6W	8W	8W	10W	10W	12W
	3	4W	4W	7W	7W	10W	10W	13W	13W	16W	16W	19W
	max.*	20W	20W	40W	40W	60W	60W	80W	80W	100W	100W	120W

* revs max. are not regulated for the case of installation SR201.

Note: add accessories to the convector output - thermo-electric drive 6.5 VA - at switching-on (operation power input 2.5 W)
- SR201 2.5 W speed controller

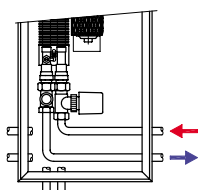
RECOMMENDED STANDARD INSTALLING IN FLOOR

- 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

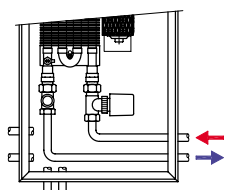


CONVECTOR CONNECTION TO THE HEATING SYSTEM

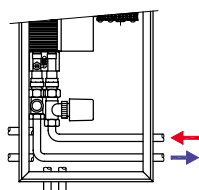
Floor convector is fitted with openings for connection to the heating system. There are three connection possibilities, from the room, side or window wall.



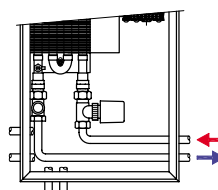
FCT20-09



FCT40-09



FCT20-11



FCT40-11

HEATING OUTPUT RECALCULATION FOR ANOTHER TEMPERATURE GRADIENT

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

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

$m=1,083$ pro FCT20-09
 $m=1,012$ pro FCT40-09

$m=1,100$ pro FCT20-11
 $m=1,040$ pro FCT40-11

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
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

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

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 [-]	invariable 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]	M – mass rate of flow in piping (kg/h) / R – hydraulic loss in exchanger (kPa)												
			M=20	40	60	80	100	120	150	200	250	300	350	400	450
FCT20-09 FCT20-11	800	0,15	0,01	0,02	0,04	0,07	0,10	0,15	0,23	0,40	0,62	0,88	1,19	1,54	1,93
	1200	0,27	0,01	0,02	0,06	0,09	0,14	0,20	0,30	0,52	0,81	1,13	1,52	1,98	2,46
	1600	0,39	0,01	0,03	0,07	0,12	0,17	0,25	0,37	0,65	0,99	1,38	1,86	2,41	3,00
	2000	0,52	0,01	0,03	0,09	0,14	0,21	0,30	0,45	0,77	1,18	1,63	2,20	2,84	3,53
	2400	0,64	0,01	0,04	0,10	0,16	0,24	0,35	0,52	0,89	1,36	1,89	2,54	3,28	4,06
	2800	0,76	0,01	0,05	0,11	0,19	0,28	0,40	0,59	1,01	1,55	2,14	2,87	3,71	4,59
	3200	0,89	0,01	0,05	0,13	0,21	0,31	0,45	0,66	1,14	1,73	2,39	3,21	4,15	5,12
	3600	1,01	0,02	0,06	0,14	0,23	0,34	0,50	0,73	1,26	1,91	2,64	3,55	4,58	5,66
	4000	1,13	0,02	0,06	0,16	0,26	0,38	0,55	0,81	1,38	2,10	2,89	3,88	5,01	6,19
	4400	1,26	0,02	0,07	0,17	0,28	0,41	0,60	0,88	1,50	2,28	3,15	4,22	5,45	6,72
4800	1,38	0,02	0,07	0,19	0,30	0,45	0,65	0,95	1,63	2,47	3,40	4,56	5,88	7,25	
FCT40-09 FCT40-11	800	0,30	0,01	0,05	0,13	0,21	0,32	0,46	0,69	1,21	1,86	2,62	3,54	4,59	5,74
	1200	0,54	0,01	0,05	0,13	0,21	0,32	0,46	0,69	1,21	1,86	2,62	3,54	4,59	5,74
	1600	0,79	0,02	0,06	0,15	0,26	0,39	0,56	0,84	1,45	2,23	3,12	4,21	5,46	6,80
	2000	1,03	0,02	0,07	0,18	0,31	0,45	0,66	0,98	1,70	2,60	3,63	4,89	6,33	7,86
	2400	1,28	0,02	0,09	0,21	0,35	0,52	0,76	1,13	1,94	2,97	4,13	5,56	7,20	8,93
	2800	1,53	0,03	0,10	0,24	0,40	0,59	0,86	1,27	2,19	3,34	4,63	6,23	8,06	9,99
	3200	1,77	0,03	0,11	0,27	0,45	0,66	0,96	1,41	2,43	3,71	5,14	6,91	8,93	11,05
	3600	2,02	0,03	0,12	0,30	0,49	0,73	1,06	1,56	2,68	4,08	5,64	7,58	9,80	12,12
	4000	2,27	0,04	0,13	0,33	0,54	0,80	1,16	1,70	2,92	4,45	6,15	8,26	10,67	13,18
	4400	2,51	0,04	0,14	0,36	0,59	0,86	1,26	1,85	3,17	4,82	6,65	8,93	11,53	14,25
4800	2,76	0,04	0,15	0,39	0,64	0,93	1,36	1,99	3,41	5,19	7,15	9,60	12,40	15,31	

PARAMETERS OF LOCKSHIELD VALVES

T-turns	0,5	0,75	1	1,5	2	2,5	3	3,5	4	5	6	MAX
K_v (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
K_v (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

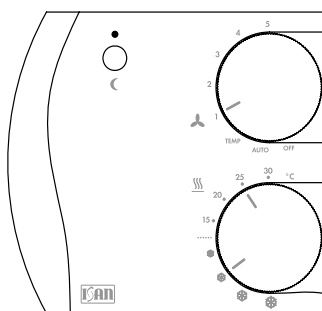
parameters of free packed in lockshield valves

Regulation of 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 preconditions 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 Foxtrót-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

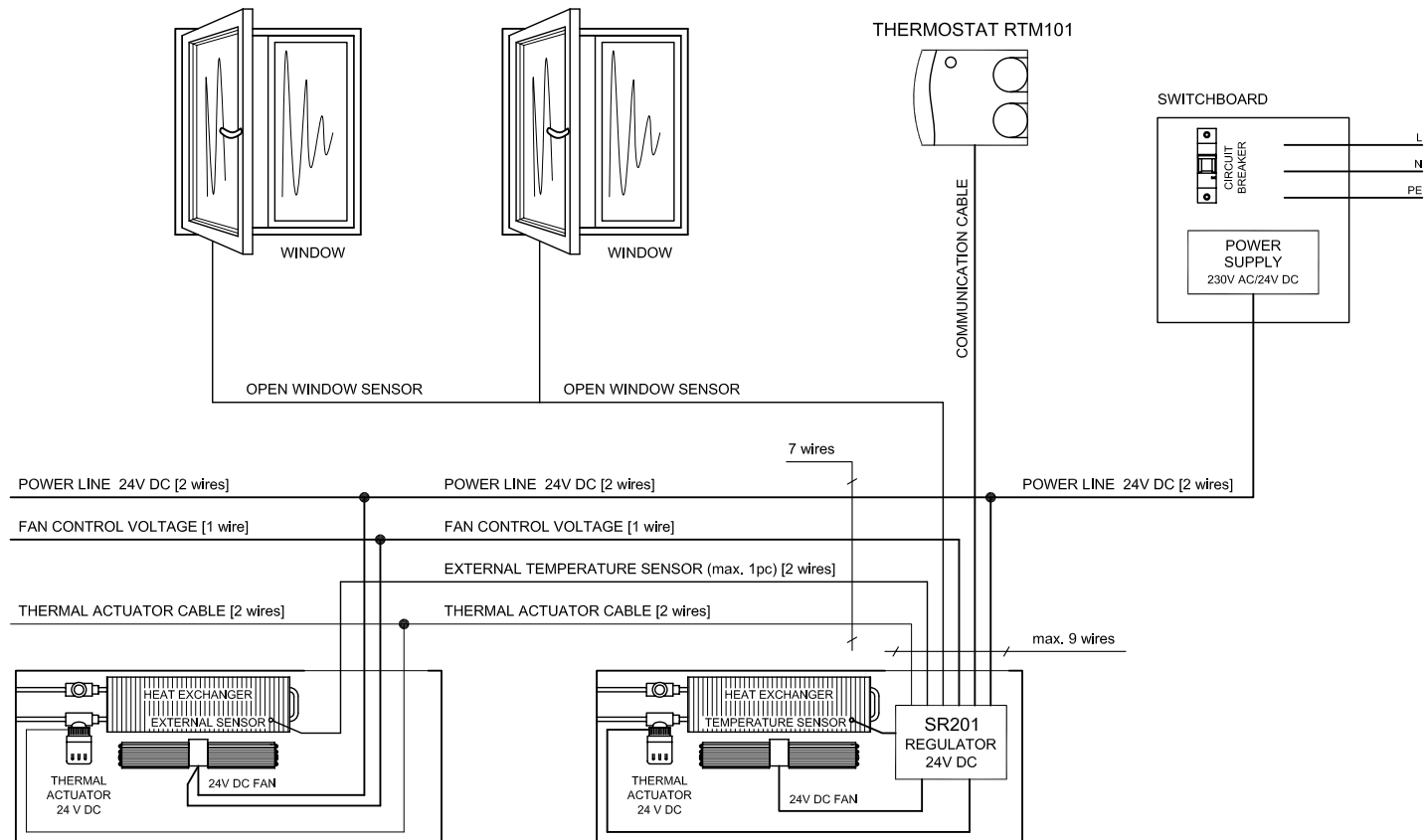
Decreases the demand for thermostat setting by -2 °C (heating) or +2 °C (cooling). It is not necessary to reset the thermostat parameters for the night or for a period of absence in the house. The sleep mode is signalized by LED diode on the thermostat cover.

Antifreeze protection

Regulator switches on a thermal actuator 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 TE10, for ISAN FCT 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 thermal actuators



DR60-24, DR100-24

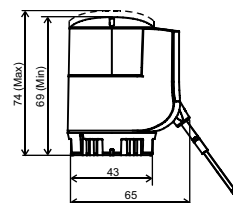
24V DC power supply unit, placing on DIN ledge

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



Z-TS24, Z-TS24-5m, thermal actuator

Input voltage: 24V DC
 Power input when switch on: 6VA
 Power input during operating: 2.5W
 Period of switching ON/OFF: 270 s
 Ingress protection: IP54 (housing)
 Connection thread: M30×1.5mm
 Cable length: Z-TS24 3 meters
 Z-TS24-5m 5 meters
 Max. height when opened: 74 mm



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

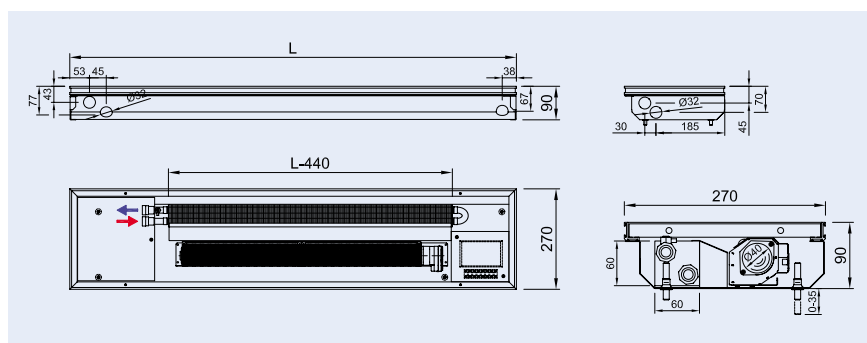
T-turns	0,25	0,5	1,0	1,5	2,0	3,0	4,0
k_v (m ³ /h)	0,13	0,22	0,43	0,65	0,85	1,25	1,7





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 mm
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	60 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 x G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 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	25	26	26
	2	24	25	27	28	29	30	31	31	31	31	31
	3	30	30	33	34	37	38	39	39	39	39	39
AIR VOLUME [m³/h]	1	28	57	85	114	142	171	199	228	256	285	313
	2	37	68	96	136	192	204	260	288	328	384	396
	3	52	108	146	216	291	323	399	437	507	583	615

Code example	FCT20-09200-NR126	Floor convector FCT20-09, 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 53

SPECIFICATIONS

- Flats, detached houses, offices, halls
- High heating output
- Forced convection by tangential fans
- Smooth running
- Dry ambience
- Safe voltage 24V DC
- Low power consumption
- Easy control

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	68	432	479	598
1200	144	863	959	1196
1600	221	1295	1438	1795
2000	298	1726	1918	2393
2400	374	2590	2877	3589
2800	450	2658	2945	3657
3200	527	3453	3835	4786
3600	603	3885	4315	5384
4000	679	4316	4794	5982
4400	756	5179	5753	7179
4800	832	5249	5823	7248

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	52	354	394	491
1200	110	709	787	982
1600	170	1063	1181	1473
2000	229	1417	1574	1964
2400	287	2126	2361	2946
2800	346	2181	2417	3002
3200	405	2834	3148	3928
3600	463	3188	3542	4419
4000	522	3543	3935	4910
4400	581	4251	4722	5892
4800	639	4308	4779	5949

Q [W] 70/55/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	41	297	330	412
1200	87	594	660	823
1600	135	891	990	1235
2000	181	1188	1320	1647
2400	227	1782	1980	2470
2800	274	1829	2027	2517
3200	320	2376	2640	3294
3600	367	2674	2970	3706
4000	413	2971	3300	4117
4400	459	3565	3960	4941
4800	506	3613	4008	4989

Q [W] 55/45/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	25	204	226	282
1200	53	407	453	565
1600	81	611	679	847
2000	109	815	905	1129
2400	137	1222	1358	1694
2800	166	1254	1390	1726
3200	194	1629	1810	2259
3600	222	1833	2036	2541
4000	250	2037	2263	2823
4400	278	2444	2715	3388
4800	306	2477	2748	3421

SPECIFICATIONS

- Flats, detached houses, offices, halls
- High heating output
- Forced convection by tangential fans
- Smooth running
- Dry ambience
- Safe voltage 24V DC
- Low power consumption
- Easy control

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	127	544	695	918
1200	268	1087	1390	1837
1600	410	1631	2084	2755
2000	551	2174	2779	3674
2400	692	3261	4169	5511
2800	833	3386	4293	5635
3200	974	4348	5558	7348
3600	1116	4892	6253	8266
4000	1257	5436	6948	9185
4400	1398	6523	8337	11021
4800	1539	6650	8464	11149

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	98	452	578	764
1200	206	904	1156	1528
1600	315	1356	1733	2291
2000	423	1808	2311	3055
2400	532	2712	3467	4583
2800	640	2815	3570	4686
3200	749	3616	4622	6110
3600	858	4068	5200	6874
4000	966	4520	5778	7638
4400	1075	5424	6933	9165
4800	1183	5530	7039	9271

Q [W] 70/55/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	77	383	490	648
1200	163	767	980	1296
1600	249	1150	1470	1944
2000	335	1534	1961	2592
2400	421	2301	2941	3888
2800	506	2388	3029	3975
3200	592	3068	3921	5184
3600	678	3451	4411	5832
4000	764	3835	4902	6480
4400	850	4602	5882	7775
4800	936	4691	5971	7865

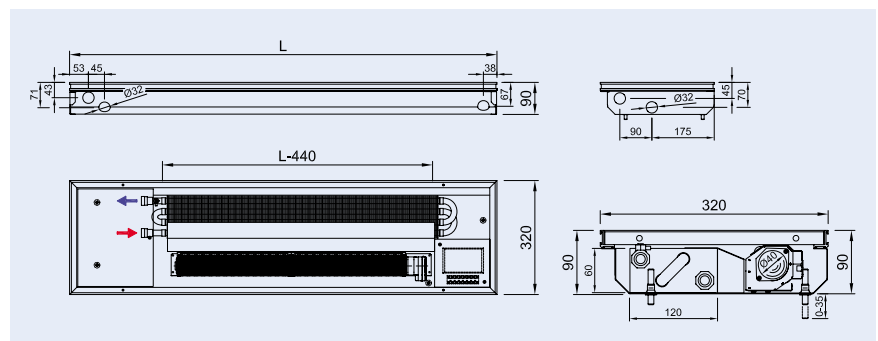
Q [W] 55/45/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	47	270	345	456
1200	99	539	689	911
1600	151	809	1034	1367
2000	202	1078	1378	1822
2400	254	1618	2068	2733
2800	306	1679	2129	2795
3200	358	2157	2757	3644
3600	410	2426	3101	4100
4000	462	2696	3446	4555
4400	514	3235	4135	5466
4800	566	3298	4198	5529



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	120 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 x G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 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	25	26	26
	2	25	25	27	28	29	30	31	31	31	31	31
	3	30	30	33	34	37	38	39	39	39	39	40
AIR VOLUME [m³/h]	1	26	53	79	106	132	158	185	211	237	264	290
	2	35	63	89	126	178	189	241	267	304	356	367
	3	48	100	135	200	270	300	370	405	470	540	570

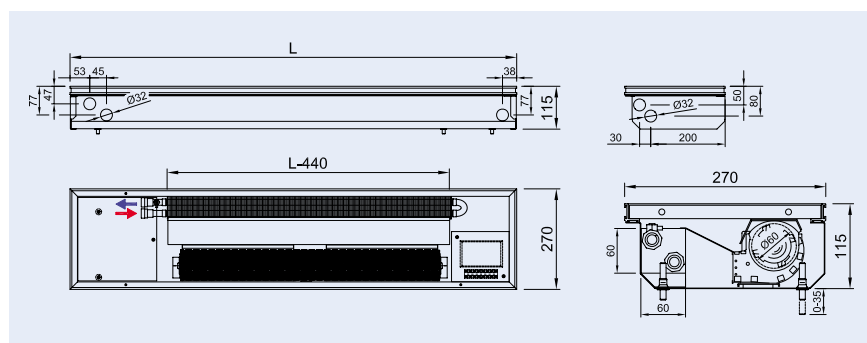
Code example	FCT40-09120-NR116	Floor convector FCT20-09, H=90 mm, W=320 mm, L=1200 mm, stainless steel trough, Al natur cross roll-up grill, installed regulation SR201, convector 24V DC
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Ordering, see the page 53



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
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	60 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 x G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 60 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	19	21	23	23	23	23	24	24	24	24	25
	2	26	26	27	286	30	31	32	32	32	33	33
	3	35	35	35	37	39	39	40	40	40	40	41
AIR VOLUME [m³/h]	1	28	56	84	112	140	168	196	224	251	280	307
	2	37	79	116	158	196	237	275	317	355	397	434
	3	51	116	167	232	283	349	399	465	516	581	632

Code example	FCT20-11080-NR215	Floor convector FCT20-11, 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 53

SPECIFICATIONS

- Flats, detached houses, offices, halls
- High heating output
- Forced convection by tangential fans
- Smooth running
- Dry ambience
- Safe voltage 24V DC
- Low power consumption
- Easy control

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	81	422	489	626
1200	171	844	979	1252
1600	262	1265	1468	1878
2000	352	1687	1957	2503
2400	442	2109	2447	3129
2800	532	2531	2936	3755
3200	622	2953	3425	4381
3600	712	3375	3915	5007
4000	803	3796	4404	5633
4400	893	4218	4893	6259
4800	983	4640	5382	6884

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	62	345	401	512
1200	132	691	801	1025
1600	201	1036	1202	1537
2000	270	1381	1602	2049
2400	340	1726	2003	2561
2800	409	2072	2403	3074
3200	478	2417	2804	3586
3600	548	2762	3204	4098
4000	617	3107	3605	4610
4400	686	3453	4005	5123
4800	756	3798	4406	5635

Q [W] 70/55/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	49	289	335	428
1200	104	578	670	857
1600	159	866	1005	1285
2000	214	1155	1340	1714
2400	269	1444	1675	2142
2800	323	1733	2010	2571
3200	378	2022	2345	2999
3600	433	2310	2680	3428
4000	488	2599	3015	3856
4400	543	2888	3350	4285
4800	598	3177	3685	4713

Q [W] 55/45/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	30	197	228	292
1200	63	394	457	585
1600	96	591	685	877
2000	129	788	914	1169
2400	162	985	1142	1461
2800	196	1182	1371	1754
3200	229	1379	1599	2046
3600	262	1576	1828	2338
4000	295	1773	2056	2630
4400	328	1970	2285	2923
4800	361	2167	2513	3215

SPECIFICATIONS

- Flats, detached houses, offices, halls
- High heating output
- Forced convection by tangential fans
- Smooth running
- Dry ambience
- Safe voltage 24V DC
- Low power consumption
- Easy control

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	156	705	892	1142
1200	329	1410	1783	2284
1600	503	2115	2675	3426
2000	676	2820	3567	4568
2400	850	3524	4458	5710
2800	1023	4229	5350	6852
3200	1196	4934	6242	7994
3600	1370	5639	7133	9137
4000	1543	6344	8025	10279
4400	1717	7049	8917	11421
4800	1890	7754	9808	12563

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	120	584	738	946
1200	253	1167	1477	1891
1600	386	1751	2215	2837
2000	520	2335	2953	3783
2400	653	2918	3692	4728
2800	786	3502	4430	5674
3200	920	4086	5168	6620
3600	1053	4669	5907	7565
4000	1186	5253	6645	8511
4400	1319	5837	7383	9457
4800	1453	6420	8122	10402

Q [W] 70/55/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	95	493	624	799
1200	200	987	1248	1599
1600	306	1480	1872	2398
2000	411	1973	2496	3197
2400	516	2467	3120	3996
2800	622	2960	3744	4796
3200	727	3453	4368	5595
3600	833	3946	4992	6394
4000	938	4440	5616	7193
4400	1043	4933	6240	7993
4800	1149	5426	6864	8792

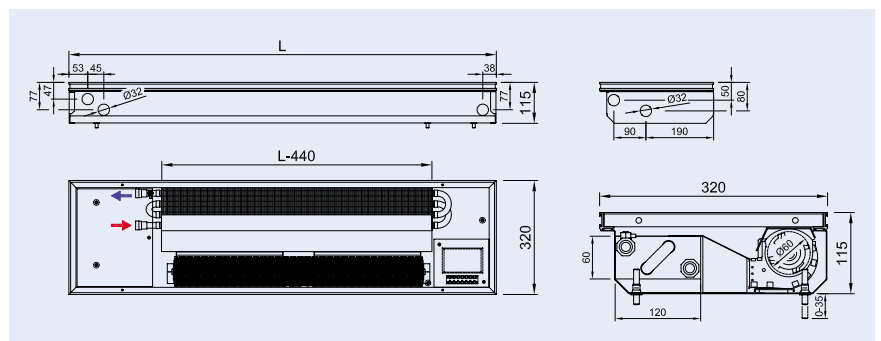
Q [W] 55/45/20 °C

SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	57	344	435	557
1200	121	688	870	1115
1600	185	1032	1305	1672
2000	249	1376	1741	2229
2400	312	1720	2176	2787
2800	376	2064	2611	3344
3200	440	2408	3046	3901
3600	504	2752	3481	4459
4000	567	3096	3916	5016
4400	631	3440	4352	5573
4800	695	3784	4787	6131



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	120 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 x G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 60 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	19	21	23	23	23	23	24	24	24	24	25
	2	26	26	27	28	30	31	32	32	32	33	33
	3	36	36	36	38	39	39	40	40	40	40	41
AIR VOLUME [m³/h]	1	26	53	79	106	132	158	185	211	237	264	290
	2	35	75	110	150	185	224	260	299	335	375	410
	3	48	110	158	219	267	329	377	439	487	549	597

Code example	FCT40-11320-NR126	Floor convector FCT40-11, 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 53

Floor convectors equipped with tangential fans excel in heating and cooling output. They are proper complements of cooling devices and air-conditioning, influence of which does not reach up to window surfaces.

Convector is fitted with Al-Cu lamellar 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.

A version of the exchanger for 2-pipe and 4-pipe systems. The convectors may be equipped with a pump of condensate that occurs at cooling.

- High heating/cooling output
- Energy saving fans 24V DC
- Continuous revs regulation
- Possible to be completed with a condensate pump

TYPES FCC 24V DC:

- FCC2A (320×134×1200-2800 mm) 2 pipe system
- FCC4A (320×134×1200-2800 mm) 4 pipe system

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 FCT floor convectors regulation is in the range of 0-10V

TABLE OF ELECTRIC POWER INPUTS OF FCC 24 V DC CONVECTORS

TYPE	Speed	FCC convector length [mm]				
		1200	1600	2000	2400	2800
FCC2A FCC4A	1	4 W	6 W	6 W	8 W	8 W
	2	6 W	10 W	10 W	13 W	13 W
	3	11 W	20 W	20 W	29 W	29 W
	4	18 W	33 W	33 W	48 W	48 W
	5	23 W	43 W	43 W	63 W	63 W

Add considered accessories to the power input of FCC:

Thermo-drive:

+6 VA power input at switching-on (operation consumption is 2.5 W)

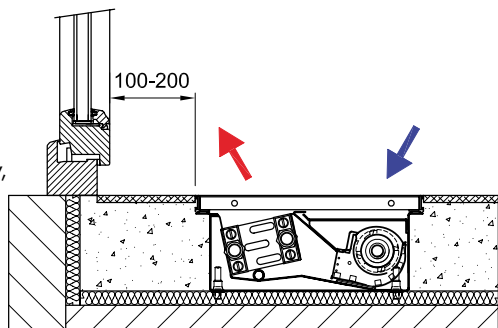
Condensate pump:

+16 W (switching-on at sufficient amount of condensate)

input power of installed fans, speed regulator and power supply

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.



CONVECTOR FUNCTIONS

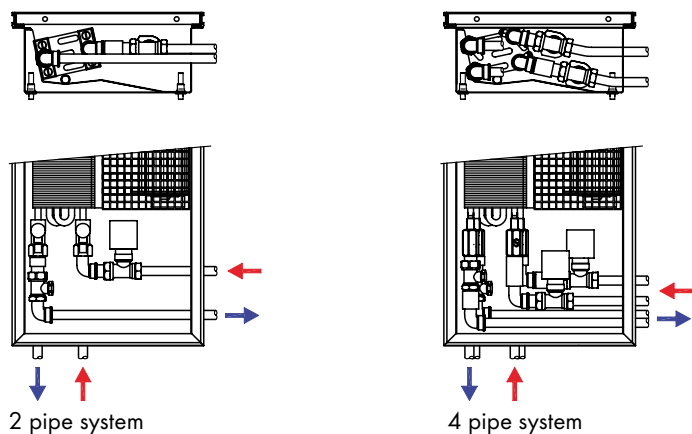
Heating:

- 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

Cooling:

- air is cooled by flowing through the exchanger
- cool air is mixed with warm air rising up on a window surface
- condensate occurs with low temperatures of cooling water, that is drained out of the convector
- air circulation:
 - it cools air in the area of the window surface
 - it decreases radiation of the window surface
- only local cooling
- it does not replace but completes the cooling device or air-conditioning, influence of which does not reach up to the window surfaces

CONVECTOR CONNECTION TO THE HEATING SYSTEM



The floor convector is provided with entry holes for connection to the heating system. Connection is possible from the face side and from the side to the room.

HEATING OUTPUT RECALCULATION FOR ANOTHER TEMPERATURE GRADIENT

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

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

$m = 1,015$ for FCC2A, FCC4A

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

COOLING OUTPUTS

Cooling outputs for the common used temperature gradients are shown in the tables for each type of FCC. To get outputs on other parameters please contact the technical department.

EXCHANGER HYDRAULIC LOSSES

Typ FCC	Length [mm]	Volume [l]	M – mass rate of flow in piping (kg/h) / R – hydraulic loss in exchanger (kPa)																
			M=50	60	70	80	90	100	120	150	200	250	300	350	400	450	500	550	
2 pipe system	FCC2A heating and cooling	1200	0,647	0,14	0,17	0,21	0,25	0,30	0,35	0,46	0,66	1,07	1,58	2,19	2,91	3,72	4,63	5,64	6,75
		1600	0,934	0,20	0,25	0,30	0,37	0,43	0,50	0,67	0,96	1,55	2,29	3,18	4,21	5,38	6,70	8,16	9,77
		2000	1,257	0,27	0,34	0,41	0,49	0,58	0,68	0,90	1,29	2,09	3,09	4,28	5,67	7,26	9,03	11,01	13,18
		2400	1,582	0,34	0,42	0,52	0,62	0,73	0,86	1,13	1,62	2,64	3,89	5,40	7,15	9,14	11,38	13,87	16,60
		2800	1,868	0,40	0,50	0,61	0,73	0,87	1,02	1,34	1,92	3,12	4,61	6,39	8,46	10,83	13,48	16,43	19,67
4 pipe system	FCC4A heating circle	1200	0,202	0,49	0,68	0,89	1,12	1,38	1,65	2,27	3,37	5,64	8,45	11,82	15,73	20,20	25,22	30,78	36,90
		1600	0,297	0,71	0,99	1,30	1,64	2,01	2,41	3,32	4,92	8,23	12,35	17,26	22,98	29,51	36,84	44,97	53,90
		2000	0,405	0,97	1,34	1,76	2,22	2,73	3,28	4,51	6,69	11,19	16,78	23,46	31,24	40,10	50,06	61,11	73,26
		2400	0,512	1,22	1,69	2,22	2,80	3,44	4,13	5,68	8,42	14,08	21,12	29,53	39,32	50,48	63,02	76,93	92,21
		2800	0,609	1,44	2,00	2,62	3,31	4,07	4,89	6,72	9,96	16,66	24,98	34,94	46,51	59,72	74,55	91,00	109,08
	FCC4A cooling circle	1200	0,409	0,16	0,23	0,31	0,39	0,48	0,58	0,81	1,20	2,00	2,99	4,18	5,56	7,12	8,88	10,83	12,97
		1600	0,599	0,24	0,34	0,45	0,57	0,70	0,85	1,17	1,74	2,90	4,34	6,07	8,06	10,34	12,89	15,72	18,83
		2000	0,816	0,32	0,45	0,60	0,77	0,95	1,14	1,58	2,35	3,92	5,87	8,20	10,90	13,98	17,43	21,25	25,45
		2400	1,029	0,40	0,57	0,76	0,97	1,20	1,45	2,00	2,97	4,97	7,44	10,38	13,80	17,70	22,07	26,91	32,23
		2800	1,223	0,48	0,69	0,91	1,16	1,44	1,73	2,39	3,55	5,94	8,90	12,42	16,51	21,17	26,40	32,19	38,56

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

HEATING WATER FLOW RATE THROUGH EXCHANGER

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

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 [-]	invariable for recalculation of units

CONVECTOR DIMENSIONING BASED ON ACOUSTIC PARAMETERS

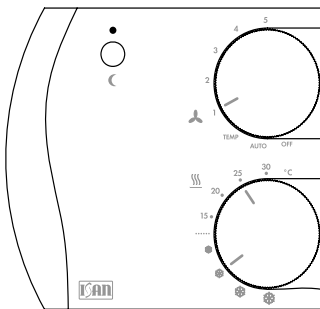
- Convactor heating output must cover thermal loss in the room and observe the acoustic parameters
- Permissible noisiness levels are determined by national legislation
- Different values of permissible noisiness levels are valid for residential houses, hospitals, offices, hotels etc.
- Heating output 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)

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 preconditions 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

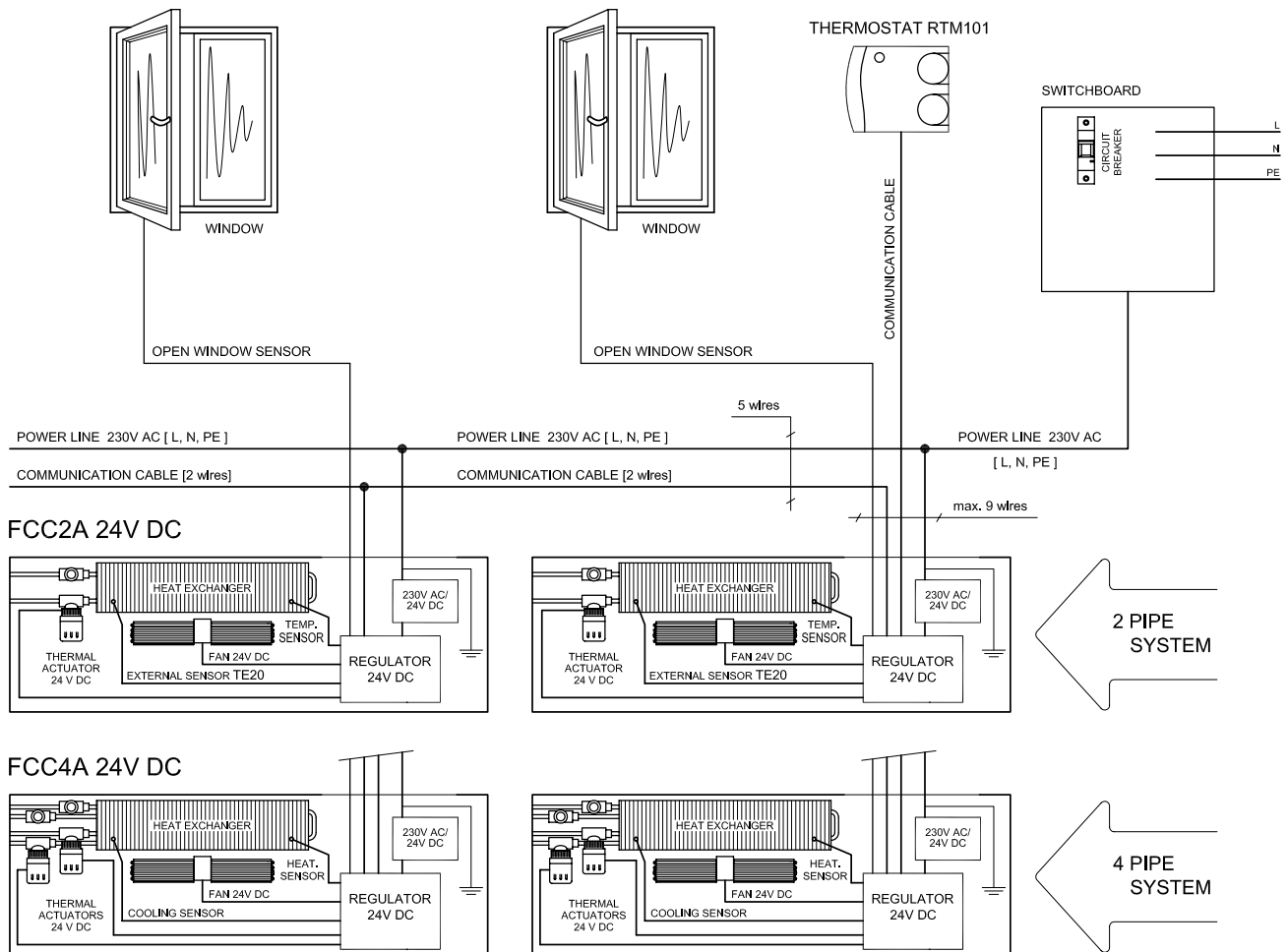
Decreases the demand for thermostat setting by -2 °C (heating) or +2 °C (cooling). It is not necessary to reset the thermostat parameters for the night or for a period of absence in the house. The sleep mode is signalized by LED diode on the thermostat cover.

Antifreeze protection

Regulator switches on a thermal actuator 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.



RTM101

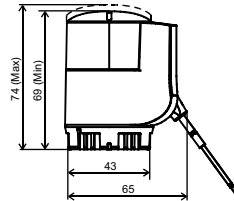
Room thermostat, heating/cooling, continuous revs regulation, sleep mode, OFF, AUTO and TEMP modes, continuous revs range 1 -5

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



Z-TS24, Z-TS24-5m, thermal actuator

Input voltage: 24V DC
 Power input when switch on: 6VA
 Power input during operating: 2.5W
 Period of switching ON/OFF: 270 s
 Ingress protection: IP54 (housing)
 Connection thread: M30×1.5mm
 Cable length: Z-TS24 3 meters
 Z-TS24-5m 5 meters
 Max. height when opened: 74 mm



TE20 (only for FC2A)

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



DF10

Filter of fan suction
 Colour: black
 Filter dimensions: please mention in the order the length of the FCC convector (e.g. DF10 for FCC l=2000 mm)



CP10

A membrane pump of condensate that may occur at cooling, connection to the convector drain pipe

Operation voltage: 230 V/50 Hz
 Power input: 16 W / 0.17 A
 Max. recommended delivery: 10 m
 Capacity l/h: 12 l (0 m) - 4.5 l (10 m)
 Acoustic pressure at delivery of 1 m: 21 dB(A)
 Voltage-free contact - alarm: 3 A induction, contacts N.O., N.C.



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

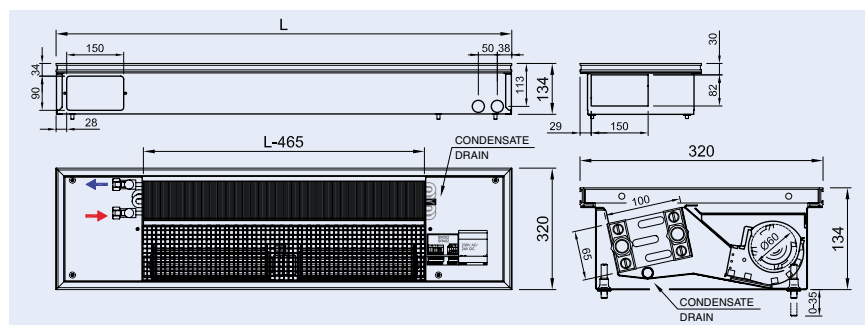


Note: A speed controller and a power supply are always parts of the FCC floor convector



PARAMETERS

Convector	Width	320 mm
	Height	134 mm
	Length	1200-2800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	280 mm
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	100 mm
	Height	65 mm
	Finned length	L-465 mm
	Heat medium connection	2 x G1/2" female thread (2 pipe system)
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 60 mm
	Operating voltage	input to convector 230V AC, fans 24V DC
	Ingress protection	IP20
Operating conditions	Regulation	control voltage 0-10V (installed regulation)
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70 %



	SPEED	LENGTH [mm]				
		1200	1600	2000	2400	2800
ACOUSTIC PRESSURE LpAmax [dB(A)]	1	<20	<20	<20	<20	<20
	2	20	22	25	25	25
	3	30	32	34	35	36
	4	40	42	44	45	46
	5	48	49	51	52	53
AIR VOLUME [m³/h]	1	47	66	100	114	147
	2	89	123	179	195	266
	3	134	191	266	336	394
	4	179	255	356	449	526
	5	212	302	422	532	624

Code example	FCC2A-13200-NR127	Floor convector FCC2A-13, H=134 mm, W=320 mm, L=2000 mm, stainless steel trough, Al natur frame, Al natur linear grill, installed regulation, convector with fans 24V DC
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Regulation is always a part of the convector, black covers of water and electricity. Ordering, see the page 53

SPECIFICATION

- Fully glazed rooms with big heat gains
- Flats, villas, residences, hotels
- High heat output
- Optimum after-cooling output
- Convection with tangential fans
- Silent operation
- Dry environment
- Safety voltage 24 V
- Low consumption of electric energy
- Easy operation

HEATING OUTPUT

Q [W] 90/70/20 °C

Speed level	Minimal	Standard level			Maximal
SPEED	1	2	3	4	5
LENGTH [mm]	HEATING OUTPUT Q _h [W]				
1200	645	1466	2408	3115	3591
1600	967	2198	3612	4673	5386
2000	1290	2931	4816	6231	7181
2400	1612	3664	6019	7788	8977
2800	1935	4397	7223	9346	10772

Qn [W] 75/65/20 °C

Speed level	Minimal	Standard level			Maximal
SPEED	1	2	3	4	5
LENGTH [mm]	HEATING OUTPUT Q _h [W]				
1200	536	1218	2001	2589	2984
1600	804	1827	3002	3884	4476
2000	1072	2436	4002	5178	5968
2400	1340	3045	5003	6473	7460
2800	1608	3654	6003	7767	8952

Q [W] 70/55/20 °C

Speed level	Minimal	Standard level			Maximal
SPEED	1	2	3	4	5
LENGTH [mm]	HEATING OUTPUT Q _h [W]				
1200	454	1033	1697	2195	2530
1600	682	1549	2545	3293	3795
2000	909	2066	3393	4391	5060
2400	1136	2582	4242	5488	6326
2800	1363	3098	5090	6586	7591

Q [W] 55/45/20 °C

Speed level	Minimal	Standard level			Maximal
SPEED	1	2	3	4	5
LENGTH [mm]	HEATING OUTPUT Q _h [W]				
1200	319	725	1191	1542	1777
1600	479	1088	1787	2312	2665
2000	638	1450	2383	3083	3553
2400	798	1813	2979	3854	4442
2800	957	2176	3574	4625	5330

Q [W] 6/12 °C

Speed level		Minimal		Standard level				Maximal				
SPEED		1		2		3		4		5		
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]									
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	183	117	547	356	1119	740	1300	880	1520	1047
	28	50	170	106	508	322	1038	669	1206	794	1410	943
	26	50	140	95	415	287	847	598	985	712	1148	847
1600	30	45	274	175	820	534	1678	1110	1950	1320	2280	1571
	28	50	256	160	762	483	1557	1003	1810	1191	2115	1415
	26	50	210	143	623	431	1270	896	1478	1068	1722	1271
2000	30	45	365	233	1093	711	2238	1481	2600	1761	3040	2095
	28	50	341	213	1016	644	2076	1338	2413	1587	2820	1886
	26	50	280	190	831	574	1694	1195	1970	1424	2296	1694
2400	30	45	456	292	1366	889	2797	1851	3249	2201	3800	2619
	28	50	426	266	1270	805	2595	1672	3016	1984	3525	2358
	26	50	351	238	1039	718	2117	1494	2463	1780	2870	2118
2800	30	45	548	350	1640	1067	3357	2221	3899	2641	4560	3142
	28	50	511	319	1524	966	3114	2007	3619	2381	4230	2829
	26	50	421	285	1246	862	2541	1793	2956	2136	3444	2542
	24	50	320	248	977	755	1984	1573	2318	1882	2693	2240

Q [W] 8/14 °C

Speed level		Minimal		Standard level				Maximal				
SPEED		1		2		3		4		5		
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]									
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	155	104	461	318	939	664	1094	796	1275	948
	28	50	142	93	421	283	857	591	1000	709	1163	842
	26	50	111	82	325	248	660	519	774	624	898	745
1600	30	45	233	157	691	477	1409	996	1641	1193	1913	1422
	28	50	213	140	632	425	1286	886	1499	1064	1745	1264
	26	50	167	123	487	372	991	778	1162	937	1346	1117
2000	30	45	311	209	921	636	1878	1328	2188	1591	2550	1896
	28	50	284	186	842	567	1715	1182	1999	1418	2326	1685
	26	50	222	164	650	495	1321	1037	1549	1249	1795	1490
2400	30	45	388	261	1152	795	2348	1660	2735	1989	3188	2369
	28	50	355	233	1053	708	2143	1477	2499	1773	2908	2106
	26	50	278	205	812	619	1651	1296	1936	1561	2244	1862
2800	30	45	466	313	1382	954	2817	1992	3282	2387	3825	2843
	28	50	426	280	1264	850	2572	1773	2999	2127	3489	2527
	26	50	333	246	974	743	1981	1556	2323	1873	2693	2234
	24	50	234	206	688	627	1396	1324	1662	1611	2035	2035

Q [W] 12/16 °C

Speed level		Minimal		Standard level				Maximal				
SPEED		1		2		3		4		5		
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]									
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	114	88	337	268	686	563	802	685	935	821
	28	50	101	76	297	233	603	491	708	597	823	714
	26	50	69	64	200	198	441	441	539	539	635	635
1600	30	45	171	131	506	402	1029	845	1204	1028	1402	1231
	28	50	151	114	445	350	905	736	1062	896	1234	1072
	26	50	103	96	299	296	662	662	808	808	952	952
2000	30	45	228	175	675	536	1372	1127	1605	1370	1869	1641
	28	50	201	152	594	467	1207	982	1416	1195	1645	1429
	26	50	137	128	399	395	883	883	1078	1078	1269	1269
2400	30	45	285	219	843	670	1715	1408	2006	1713	2336	2052
	28	50	252	191	742	583	1508	1227	1770	1494	2056	1786
	26	50	172	160	499	494	1104	1104	1347	1347	1587	1587
2800	30	45	346	263	1012	839	2058	1690	2407	2055	2804	2462
	28	50	302	229	891	700	1810	1473	2124	1792	2468	2143
	26	50	206	192	599	593	1324	1324	1616	1616	1904	1904
	24	50	175	175	526	526	1108	1108	1345	1345	1583	1583

Q [W] 16/18 °C

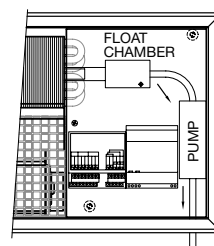
Speed level		Minimal		Standard level				Maximal				
SPEED		1		2		3		4		5		
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]									
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	72	72	222	222	473	473	584	584	693	693
	28	50	61	61	189	189	402	402	495	495	587	587
	26	50	51	51	156	156	330	330	407	407	481	481
1600	30	45	107	107	333	333	709	709	876	876	1039	1039
	28	50	92	92	283	283	602	602	743	743	881	881
	26	50	76	76	234	234	495	495	610	610	722	722
2000	30	45	143	143	443	443	946	946	1168	1168	1385	1385
	28	50	122	122	378	378	803	803	991	991	1175	1175
	26	50	102	102	312	312	660	660	814	814	962	962
2400	30	45	179	179	554	554	1182	1182	1460	1460	1731	1731
	28	50	153	153	472	472	1004	1004	1239	1239	1468	1468
	26	50	127	127	390	390	825	825	1017	1017	1203	1203
2800	30	45	215	215	665	665	1419	1419	1752	1752	2078	2078
	28	50	184	184	567	567	1205	1205	1486	1486	1762	1762
	26	50	152	152	468	468	991	991	1221	1221	1443	1443
	24	50	119	119	367	367	776	776	950	950	1121	1121

Qk [W] - total cooling output, Qs [W] - sensible cooling output RH [%] - relative humidity

CONDENSATE

If the cooling system is dimensioned so that condensate may occur ($Q_s < Q_k$), it is necessary to drain it from the convector. Condensate drips from lamellas of the exchanger to a drain chute, from which it flows out through a pipe on the convector right side. If condensate needs to be delivered to a collecting container or to a position above the convector, please use the condensate pump. Before use, check correct operation of the pump and its tightness by filling it with a small water amount through the exchanger. A float chamber must be cleaned from deposit dirt from time to time. Please follow instructions in the attached user manual.

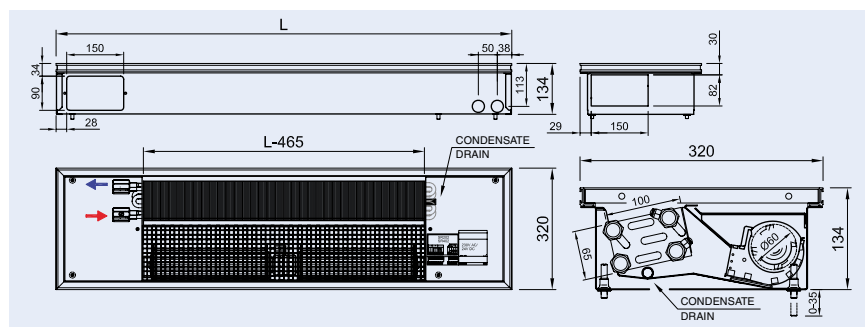
EXAMPLE OF CONNECTION OF A FLOOR CONVECTOR WITH A CONDENSATE PUMP





PARAMETERS

Convector	Width	320 mm
	Height	134 mm
	Length	1200-2800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	280 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	100 mm
	Height	65 mm
	Finned length	L-465 mm
	Heat medium connection	4 × G1/2" female thread (4 pipe system)
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 60 mm
	Operating voltage	input to convector 230V AC, fans 24V DC
	Ingress protection	IP20
Operating conditions	Regulation	control voltage 0-10V (installed regulation)
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70 %



	SPEED	LENGTH [mm]				
		1200	1600	2000	2400	2800
ACOUSTIC PRESSURE LpAmax [dB(A)]	1	<20	<20	<20	<20	<20
	2	20	22	25	25	25
	3	30	32	34	35	36
	4	40	42	44	45	46
	5	48	49	51	52	53
AIR VOLUME [m³/h]	1	47	66	100	114	147
	2	89	123	179	195	266
	3	134	191	266	336	394
	4	179	255	356	449	526
	5	212	302	422	532	624

Code example	FCC4A-13240-NR217	Floor convector FCC4A-13, H=134 mm, W=320 mm, L=2400 mm, stainless steel trough, Al bronze frame, Al bronze cross roll-up grill, installed regulation, convector with fans 24V DC
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Regulation is always a part of the convector, black covers of water and electricity. Ordering, see the page 53

SPECIFICATION

- Fully glazed rooms with big heat gains
- Flats, villas, residences, hotels
- High heat output
- Optimum after-cooling output
- Convection with tangential fans
- Silent operation
- Dry environment
- Safety voltage 24 V
- Low consumption of electric energy
- Easy operation

HEATING OUTPUT

Q [W] 90/70/20 °C

Speed level	Minimal	Standard level			Maximal
SPEED	1	2	3	4	5
LENGTH [mm]	HEATING OUTPUT Q _h [W]				
1200	438	995	1621	1977	2141
1600	657	1493	2431	2965	3211
2000	876	1990	3242	3954	4281
2400	1095	2488	4052	4942	5352
2800	1314	2985	4862	5931	6422

Qn [W] 75/65/20 °C

Speed level	Minimal	Standard level			Maximal
SPEED	1	2	3	4	5
LENGTH [mm]	HEATING OUTPUT Q _h [W]				
1200	364	827	1347	1643	1779
1600	546	1241	2021	2465	2669
2000	728	1654	2694	3286	3558
2400	910	2068	3368	4108	4448
2800	1092	2481	4041	4929	5337

Q [W] 70/55/20 °C

Speed level	Minimal	Standard level			Maximal
SPEED	1	2	3	4	5
LENGTH [mm]	HEATING OUTPUT Q _h [W]				
1200	309	701	1142	1393	1508
1600	463	1052	1713	2090	2263
2000	617	1402	2284	2786	3017
2400	772	1753	2855	3483	3771
2800	926	2104	3426	4179	4525

Q [W] 55/45/20 °C

Speed level	Minimal	Standard level			Maximal
SPEED	1	2	3	4	5
LENGTH [mm]	HEATING OUTPUT Q _h [W]				
1200	217	492	802	978	1059
1600	325	739	1203	1467	1589
2000	433	985	1604	1957	2119
2400	542	1231	2005	2446	2648
2800	650	1477	2406	2935	3178

Q [W] 6/12 °C

Speed level		Minimal		Standard level								Maximal	
SPEED		1		2		3		4		5			
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]										
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	
1200	30	45	166	108	493	329	974	671	1087	781	1137	853	
	28	50	154	98	456	297	900	604	1005	701	1050	764	
	26	50	126	87	369	264	726	540	810	630	847	688	
	24	50	98	75	285	230	559	474	623	558	650	611	
1600	30	45	250	162	739	493	1461	1007	1630	1172	1706	1280	
	28	50	231	146	684	445	1350	906	1507	1051	1576	1145	
	26	50	189	130	554	397	1090	810	1216	945	1270	1032	
	24	50	148	113	427	346	838	711	934	836	975	916	
2000	30	45	333	216	986	657	1948	1343	2174	1562	2275	1706	
	28	50	308	195	912	593	1800	1207	2010	1402	2101	1527	
	26	50	253	174	739	529	1453	1080	1621	1260	1693	1376	
	24	50	197	151	570	461	1117	948	1245	1115	1301	1221	
2400	30	45	416	271	1232	821	2435	1679	2717	1953	2843	2133	
	28	50	385	244	1140	741	2251	1509	2512	1752	2626	1909	
	26	50	316	217	924	661	1816	1350	2026	1576	2116	1720	
	24	50	246	189	712	576	1396	1185	1557	1394	1626	1527	
2800	30	45	499	325	1479	986	2921	2014	3261	2343	3412	2560	
	28	50	463	293	1368	890	2701	1811	3014	2103	3151	2291	
	26	50	379	261	1108	793	2179	1620	2431	1891	2540	2064	
	24	50	295	226	855	691	1676	1422	1868	1673	1951	1832	

Q [W] 8/14 °C

Speed level		Minimal		Standard level								Maximal	
SPEED		1		2		3		4		5			
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]										
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	
1200	30	45	140	96	411	294	807	602	897	707	937	778	
	28	50	128	86	373	261	732	534	814	625	850	687	
	26	50	98	75	284	227	555	469	617	554	645	611	
	24	50	68	63	195	192	432	432	509	509	549	549	
1600	30	45	210	144	617	440	1210	903	1346	1060	1406	1167	
	28	50	192	129	560	391	1099	801	1221	938	1276	1031	
	26	50	148	112	426	341	832	704	926	831	967	916	
	24	50	102	95	293	289	648	648	764	764	824	824	
2000	30	45	280	192	822	587	1614	1204	1794	1413	1874	1555	
	28	50	256	172	747	521	1465	1068	1628	1251	1701	1374	
	26	50	197	149	568	455	1109	938	1234	1108	1289	1221	
	24	50	136	126	391	385	864	864	1019	1019	1099	1099	
2400	30	45	351	240	1028	734	2017	1504	2243	1767	2343	1944	
	28	50	320	215	933	651	1831	1335	2035	1564	2126	1718	
	26	50	246	187	710	569	1387	1173	1543	1384	1612	1527	
	24	50	170	158	489	481	1080	1080	1274	1274	1373	1373	
2800	30	45	421	288	1234	881	2421	1805	2692	2120	2812	2333	
	28	50	384	258	1120	782	2197	1602	2443	1876	2551	2061	
	26	50	295	224	852	682	1664	1408	1851	1661	1934	1832	
	24	50	204	189	586	577	1296	1296	1528	1528	1648	1648	

Q [W] 12/16 °C

Speed level		Minimal		Standard level								Maximal	
SPEED		1		2		3		4		5			
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]										
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	
1200	30	45	103	81	299	250	588	519	654	617	704	704	
	28	50	90	71	262	218	513	451	571	536	599	597	
	26	50	62	62	196	196	405	405	481	481	523	523	
	24	50	53	53	163	163	337	337	399	399	431	431	
1600	30	45	154	122	449	375	882	779	981	926	1056	1056	
	28	50	135	106	394	327	770	676	856	804	899	896	
	26	50	92	92	295	295	608	608	722	722	784	784	
	24	50	80	80	245	245	505	505	599	599	647	647	
2000	30	45	205	162	599	500	1176	1039	1308	1234	1408	1408	
	28	50	180	141	525	436	1027	901	1142	1072	1199	1195	
	26	50	123	123	393	393	811	811	962	962	1046	1046	
	24	50	107	107	327	327	673	673	798	798	863	863	
2400	30	45	256	203	749	625	1470	1298	1635	1543	1760	1760	
	28	50	226	176	656	544	1284	1126	1427	1340	1498	1494	
	26	50	154	154	491	491	1014	1014	1203	1203	1307	1307	
	24	50	133	133	408	408	842	842	998	998	1078	1078	
2800	30	45	308	244	898	750	1764	1558	1961	1851	2112	2112	
	28	50	271	212	787	653	1540	1352	1712	1608	1798	1792	
	26	50	185	185	589	589	1216	1216	1443	1443	1569	1569	
	24	50	160	160	490	490	1010	1010	1197	1197	1294	1294	

Q [W] 16/18 °C

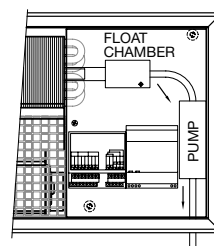
Speed level		Minimal		Standard level								Maximal	
SPEED		1		2		3		4		5			
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]										
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]	
1200	30	45	67	67	211	211	442	442	529	529	583	583	
	28	50	57	57	179	179	374	374	447	447	493	493	
	26	50	48	48	148	148	307	307	367	367	402	402	
	24	50	38	38	116	116	240	240	285	285	310	310	
1600	30	45	101	101	316	316	663	663	794	794	875	875	
	28	50	86	86	268	268	561	561	671	671	739	739	
	26	50	71	71	222	222	461	461	550	550	603	603	
	24	50	57	57	174	174	359	359	427	427	464	464	
2000	30	45	134	134	422	422	884	884	1059	1059	1167	1167	
	28	50	115	115	358	358	748	748	894	894	985	985	
	26	50	95	95	296	296	615	615	734	734	804	804	
	24	50	75	75	231	231	479	479	570	570	619	619	
2400	30	45	168	168	527	527	1104	1104	1323	1323	1458	1458	
	28	50	144	144	447	447	935	935	1118	1118	1232	1232	
	26	50	119	119	369	369	768	768	917	917	1005	1005	
	24	50	94	94	289	289	599	599	712	712	774	774	
2800	30	45	202	202	633	633	1325	1325	1588	1588	1750	1750	
	28	50	172	172	537	537	1122	1122	1342	1342	1478	1478	
	26	50	143	143	443	443	922	922	1101	1101	1206	1206	
	24	50	113	113	347	347	719	719	855	855	929	929	

Qk [W] - total cooling output, Qs [W] - sensible cooling output RH [%] - relative humidity

CONDENSATE

If the cooling system is dimensioned so that condensate may occur ($Q_s < Q_k$), it is necessary to drain it from the convector. Condensate drips from lamellas of the exchanger to a drain chute, from which it flows out through a pipe on the convector right side. If condensate needs to be delivered to a collecting container or to a position above the convector, please use the condensate pump. Before use, check correct operation of the pump and its tightness by filling it with a small water amount through the exchanger. A float chamber must be cleaned from deposit dirt from time to time. Please follow instructions in the attached user manual.

EXAMPLE OF CONNECTION OF A FLOOR CONVECTOR WITH A CONDENSATE PUMP



Floor convectors fitted with tangential fans are characterized of high heating capacity surpassing the same of convectors with natural convection. Convenient placing in modern buildings is under the windows. This convector type is suitable for utilization in flats, offices, administration buildings, hotels, theatres, entrance halls, corridors etc. Supplies of convectors equipped with 230V fans will continue in order to meet demands relating to the existing ready projects. All models will have equivalents with 24V DC technology and EC-fans successively.

Convector is fitted with Al-Cu lamellar 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
- Fans with quiet tangential rotors
- 230V / 50Hz
- Engine speed regulation in the range of 1-3

TYPES SUPPLIED WITH 230V AC TECHNOLOGY:

FCT20-08	(170×90×800-4800 mm)
FCT20-09	(270×90×800-3600 mm)
FCT40-09	(320×90×800-3600 mm)
FCT20-11	(270×115×800-4800 mm)
FCT40-11	(320×115×880-4800 mm)

FANS 230V AC / 50HZ

The floor convectors have built-in fans with tangential rotors. The heating output of floor convector is regulated by alteration of engine speed enabling to reach optimized heating output under a low noisiness. The safety of convector working under a low voltage is ensured by grounding of components as well as by manufacturer's break-down and contact resistance control tests.

TABLE OF ELECTRIC POWER INPUTS

- Convectors have installed fans for alternating voltage of 230V
- The revs control follows by regulation of input voltage
- Standard running is limited by engine speed regulator

Maximal electric input at voltage 230V AC (without speed regulator) and number of installed fans

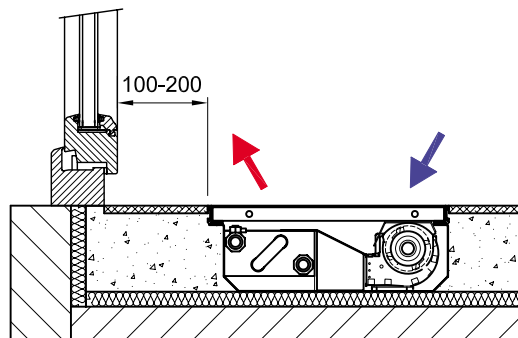
TYPE	Voltage[V]*	800		1200		1600		2000		2400		2800		3200		3600		4000		4400		4800	
		W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs	W	pcs
FCT20-08	230V = max.	6	1	17	1	23	2	34	2	40	3	51	3	57	4	68	4	74	5	85	5	91	6
FCT20-09		41	1	41	1	82	2	82	2	123	3	123	3	164	4	164	4	-	-	-	-	-	-
FCT40-09		41	1	41	1	82	2	82	2	123	3	123	3	164	4	164	4	-	-	-	-	-	-
FCT20-11		25	1	45	1	70	2	90	2	90	2	135	3	135	3	180	4	180	4	180	4	205	5
FCT20-11		25	1	45	1	70	2	90	2	90	2	135	3	135	3	180	4	180	4	180	4	205	5
FCT40-11		25	1	45	1	70	2	90	2	90	2	135	3	135	3	-	-	-	-	-	-	-	-

* standardly, the input power is lower because of used regulator (operating voltage e.g. 130V, 160V)

Note: add accessories to the convector output: thermo-electric drive 58 VA - at switching-on (operation power input 2.5 W)

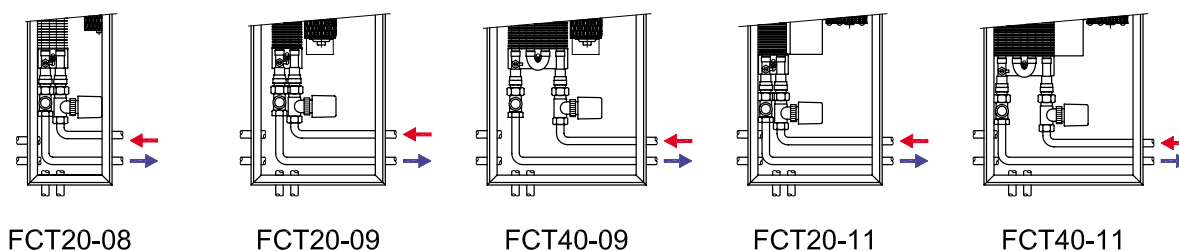
RECOMMENDED STANDARD INSTALLING IN FLOOR

- 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



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

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

m=1,072 pro FCT20-08
m=1,083 pro FCT20-09
m=1,102 pro FCT40-09

m=1,074 pro FCT20-11
m=1,073 pro FCT40-11

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
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 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 $T_i=22$ °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]	convector heating output
$T1-T2$	[°C]	difference between input and output temperature
0.86	[-]	variable 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]	M – mass rate of flow in piping (kg/h) / R – hydraulic loss in exchanger (kPa)												
			M=20	40	60	80	100	120	150	200	250	300	350	400	450
FCT20-08 FCT20-09 FCT20-11	800	0,15	0,01	0,02	0,04	0,07	0,10	0,15	0,23	0,40	0,62	0,88	1,19	1,54	1,93
	1200	0,27	0,01	0,02	0,06	0,09	0,14	0,20	0,30	0,52	0,81	1,13	1,52	1,98	2,46
	1600	0,39	0,01	0,03	0,07	0,12	0,17	0,25	0,37	0,65	0,99	1,38	1,86	2,41	3,00
	2000	0,52	0,01	0,03	0,09	0,14	0,21	0,30	0,45	0,77	1,18	1,63	2,20	2,84	3,53
	2400	0,64	0,01	0,04	0,10	0,16	0,24	0,35	0,52	0,89	1,36	1,89	2,54	3,28	4,06
	2800	0,76	0,01	0,05	0,11	0,19	0,28	0,40	0,59	1,01	1,55	2,14	2,87	3,71	4,59
	3200	0,89	0,01	0,05	0,13	0,21	0,31	0,45	0,66	1,14	1,73	2,39	3,21	4,15	5,12
	3600	1,01	0,02	0,06	0,14	0,23	0,34	0,50	0,73	1,26	1,91	2,64	3,55	4,58	5,66
	4000	1,13	0,02	0,06	0,16	0,26	0,38	0,55	0,81	1,38	2,10	2,89	3,88	5,01	6,19
	4400	1,26	0,02	0,07	0,17	0,28	0,41	0,60	0,88	1,50	2,28	3,15	4,22	5,45	6,72
4800	1,38	0,02	0,07	0,19	0,30	0,45	0,65	0,95	1,63	2,47	3,40	4,56	5,88	7,25	
FCT40-09 FCT40-11	800	0,30	0,01	0,05	0,13	0,21	0,32	0,46	0,69	1,21	1,86	2,62	3,54	4,59	5,74
	1200	0,54	0,01	0,05	0,13	0,21	0,32	0,46	0,69	1,21	1,86	2,62	3,54	4,59	5,74
	1600	0,79	0,02	0,06	0,15	0,26	0,39	0,56	0,84	1,45	2,23	3,12	4,21	5,46	6,80
	2000	1,03	0,02	0,07	0,18	0,31	0,45	0,66	0,98	1,70	2,60	3,63	4,89	6,33	7,86
	2400	1,28	0,02	0,09	0,21	0,35	0,52	0,76	1,13	1,94	2,97	4,13	5,56	7,20	8,93
	2800	1,53	0,03	0,10	0,24	0,40	0,59	0,86	1,27	2,19	3,34	4,63	6,23	8,06	9,99
	3200	1,77	0,03	0,11	0,27	0,45	0,66	0,96	1,41	2,43	3,71	5,14	6,91	8,93	11,05
	3600	2,02	0,03	0,12	0,30	0,49	0,73	1,06	1,56	2,68	4,08	5,64	7,58	9,80	12,12
	4000	2,27	0,04	0,13	0,33	0,54	0,80	1,16	1,70	2,92	4,45	6,15	8,26	10,67	13,18
	4400	2,51	0,04	0,14	0,36	0,59	0,86	1,26	1,85	3,17	4,82	6,65	8,93	11,53	14,25
4800	2,76	0,04	0,15	0,39	0,64	0,93	1,36	1,99	3,41	5,19	7,15	9,60	12,40	15,31	

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 FCT 230V AC/50HZ FLOOR CONVECTORS

Standard regulation of floor convectors with installed tangential fans working under the alternating voltage of 230V AC enables speed alteration in the range of 1-3. Level 1 for sleep mode, level 2 for current running and level 3 for quick initial heating.

Standard equipment:

- thermostat with revs change-over switch, manual or digital control (Z-RT005, Z-RT006)
- regulator as an element controlling the fan and thermo-drive speed and reacting to revs blocking

Other regulation possibilities:

- Thermal actuator installed on thermostatic valve placed on piping and following the given instructions opens or closes the flowing of heating medium through exchanger.
- Revs blocking prevents fans running, until the heating water reaches the required temperature. The starting up temperature of heating water is adjustable

All regulation elements are available to order, as per the project demands. The manufacturer's offers reckon with one thermostat per a room, the number of regulators depends on the system capacity and convector length. Thermophone installation is influenced by consideration, whether

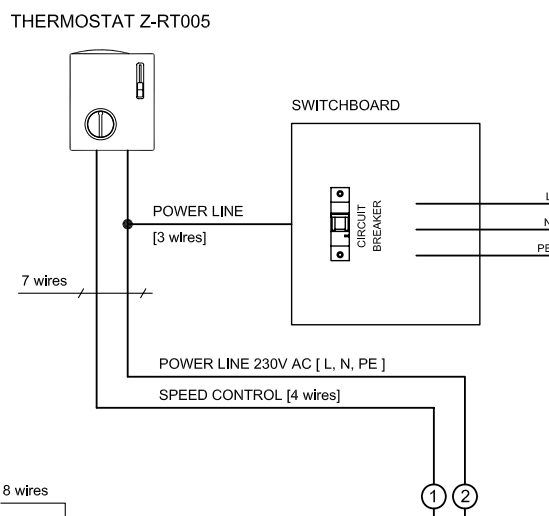
it is necessary to limit the medium flow rate through exchanger when the fans are not running. The revs blocking is installed in the first convector only.

SAMPLE FOR REGULATION OF FCT40-11 CONVECTOR WITH INSTALLED Z-RT005 THERMOSTAT AND Z-VD003 REGULATOR

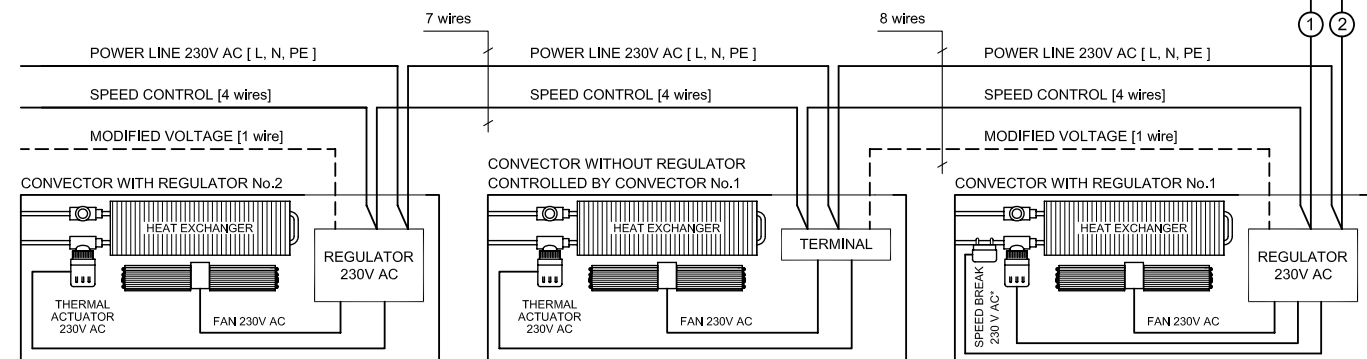
Setting of the desired temperature

0-30 °C range for heating or cooling

Thermostat, having received information requiring heating, activates the running of fans under the chosen speed and opens the exchanger for the necessary flow rate of heating medium.

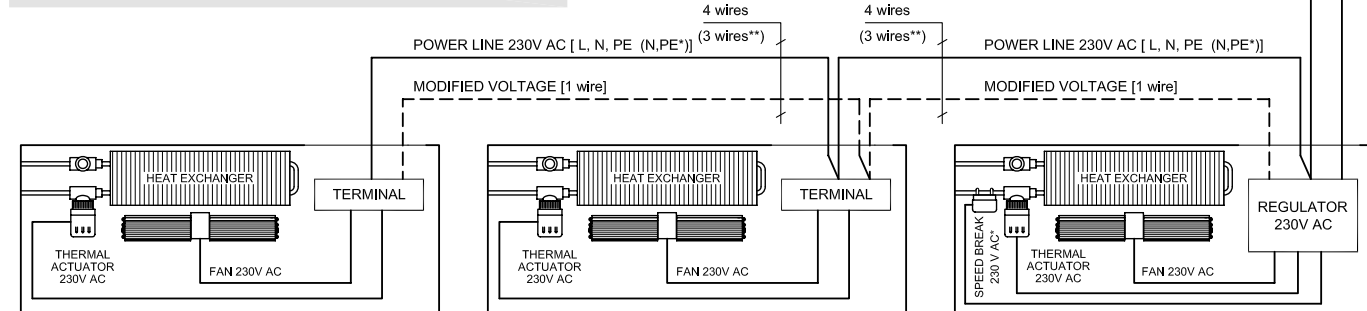


CONNECTION WITH MORE REGULATORS
IF THE CAPACITY OF THE REGULATOR IS OVER USE NEXT REGULATOR



* installation of the speed break only to the first convector

CONNECTION WITH ONE REGULATOR
IF THE CAPACITY OF REGULATOR IS ENOUGH FOR MORE CONVECTORS



* installation of the speed break only to the first convector

** in case that thermal actuator is not used

Caution

It has **no antifreeze protection**. Floor convectors to be installed in places, where the local temperature can drop under 5 °C, have no thermo-drive for closing of the heat medium circuit.

Z-DS002

Fan speed switch	
Switch levels:	0, 1, 2, 3
Operating voltage:	230V / 50Hz
Max. rating:	6 (2.5) A
Protection:	IP30
Colour:	white
Dimension:	96×97×36 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



Z-RT005 – heating

Manual room thermostat with speed switch, heating

Temperature range:	8–30 °C
Switch levels:	Speeds: 0, 1, 2, 3
Operating voltage:	230V / 50Hz
Max. rating:	6 (2) A
Protection:	IP30
Colour:	white
Dimension:	96×110×36 mm



Z-RT006 – heating, cooling

Room thermostat with backlit LCD, 7-day time program, 8 programmable timers, manual or automatic speed switching, mode heating/cooling for 2-pipe and 4-pipe floor convectors

Temperature range:	0-49 °C
Modes:	Comfort, Economy, Protection
Speeds:	1,2,3 or automatic
Operating voltage:	230V / 50Hz
Power consumption:	Max 3.5 VA / 0.8 W
Max. total load current through terminal L:	7A
Outputs rating:	5 (2)A
Protection:	IP30
Colour:	RAL9003 white
Dimension:	86 × 86 × 46



Z-VD001, Z-VD003 – Speed controllers

Three-stage regulator switching-over the fan speed according to thermostat commands, actuating thermo-drive and reacting to speed brake. The ordered regulated convectors have been always fitted with suitable regulators matching the concrete convector types.

Operating voltage:	230V / 50Hz
Protection:	IP20
Colour:	black



Z-VD001

Convector type:	FCT20-08
Number of controlled fans:	7

Convector type:	FCT20-09, 40-09
Number of controlled fans:	4

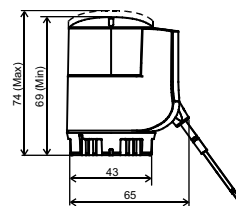
Dimension:	114×70×65 mm
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Z-VD003

Convector type:	FCT20-11, FCT40-11
Number of controlled fans:	5
Dimension:	132×79×67 mm

Z-TS230, Z-TS230-5m, thermoactuator

Input voltage:	230V / 50Hz
Power input when switch on:	58VA
Power input during operating:	2.5W
Period of switching ON/OFF:	210 s
Ingress protection:	IP54 (housing)
Connection thread:	M30×1.5mm
Cable length:	Z-TS230 3 meters Z-TS230-5m 5 meters
Max. height when opened:	74 mm



Z-RT009

a speed brake stopping the fan(s) running, as soon as the water temperature drops under the standard level

Temperature range:	10–40 °C
Operating voltage:	230V / 50Hz
Max. rating:	4 (2) A
Diference:	10K
Colour:	white
Dimension:	44×79×54 mm



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::	M30×1,5 mm
Max. working temperature:	120 °C
Max. working overpressure:	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



SPECIFICATIONS

- Offices, corridors, halls
- Optimal rating output
- Forced convection by tangential fans
- Smooth running
- Dry ambience

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
rpm	0	1692	1928	2455
LENGTH [mm]	HEATING OUTPUT [W]			
800	63	473	547	594
1200	133	947	1094	1187
1600	203	1420	1641	1781
2000	273	1893	2189	2375
2400	343	2366	2736	2968
2800	413	2840	3283	3562
3200	483	3313	3830	4155
3600	553	3786	4377	4749
4000	624	4259	4924	5343
4400	694	4733	5471	5936
4800	764	5206	6018	6530

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
rpm	0	1692	1928	2455
LENGTH [mm]	HEATING OUTPUT [W]			
800	48	389	450	488
1200	102	779	900	977
1600	156	1168	1350	1465
2000	210	1557	1800	1953
2400	264	1946	2250	2441
2800	318	2336	2700	2930
3200	372	2725	3150	3418
3600	425	3114	3600	3906
4000	479	3503	4050	4394
4400	533	3893	4500	4883
4800	587	4282	4950	5371

Q [W] 70/55/20 °C

SPEED	0	1	2	3
rpm	0	1692	1928	2455
LENGTH [mm]	HEATING OUTPUT [W]			
800	38	327	378	410
1200	81	654	756	820
1600	123	981	1134	1231
2000	166	1308	1512	1641
2400	209	1635	1890	2051
2800	251	1962	2268	2461
3200	294	2289	2646	2871
3600	336	2616	3024	3282
4000	379	2943	3403	3692
4400	422	3270	3781	4102
4800	464	3597	4159	4512

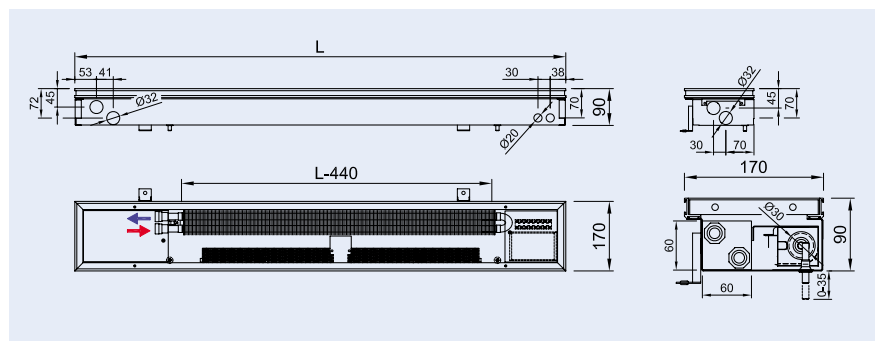
Q [W] 55/45/20 °C

SPEED	0	1	2	3
rpm	0	1692	1928	2455
LENGTH [mm]	HEATING OUTPUT [W]			
800	23	225	260	282
1200	49	450	521	565
1600	75	675	781	847
2000	100	901	1041	1130
2400	126	1126	1301	1412
2800	152	1351	1562	1694
3200	178	1576	1822	1977
3600	203	1801	2082	2259
4000	229	2026	2342	2541
4400	255	2251	2603	2824
4800	281	2476	2863	3106



PARAMETERS

Convector	Width	170 mm
	Height	90 mm
	Length	800-4800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	150 mm
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	60 mm
	Height	60 mm
	Finned length	L-440mm
	Heat medium connection	2 x G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 30 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
Operating conditions	Regulation	by output voltage modification (regulation Z-VD...)
	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	33	34	35	35	35	36	37	37	37	38	39
	2	41	41	42	43	43	43	44	45	45	46	46
	3	46	47	47	48	48	46	49	50	50	51	51
AIR VOLUME [m³/h]	1	32	66	99	133	165	199	232	266	298	332	365
	2	41	86	127	171	212	257	298	343	384	429	470
	3	49	98	147	197	245	295	343	393	442	491	540

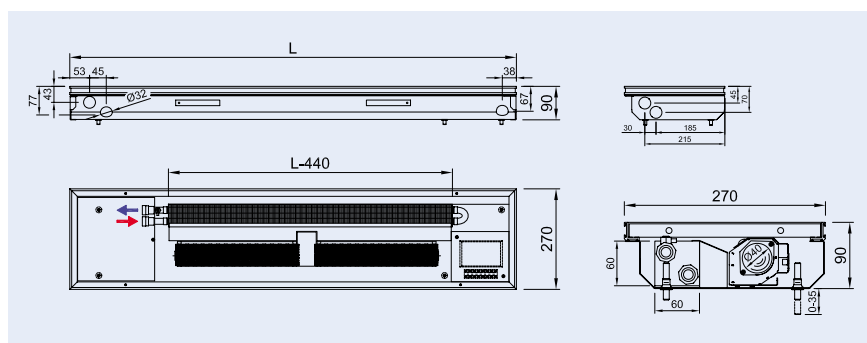
Code example	FCT20-08120-NR111	Floor convector FCT20-08, H=90 mm, W=170 mm, L=1200 mm, stainless steel trough, Al natur frame, Al natur cross roll-up grill, installed regulation Z-VD001, Convector 230 V AC
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Ordering, see the page 53



PARAMETERS

Convector	Width	270 mm
	Height	90 mm
	Length	800-3600 mm v kroku po 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	250 mm
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	60 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 x G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 40 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
Operating conditions	Regulation	by output voltage modification (regulation Z-VD...)
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70%



	SPEED	LENGTH [mm]							
		800	1200	1600	2000	2400	2800	3200	3600
ACOUSTIC PRESSURE LpAmax [dB(A)]	1	22	24	24	25	25	25	25	26
	2	34	35	37	38	39	40	41	41
	3	42	42	46	46	49	51	51	51
AIR VOLUME [m³/h]	1	24	52	76	104	128	156	180	209
	2	50	108	158	216	216	324	374	432
	3	66	143	208	285	285	428	494	571

Code example **FCT20-09200-NR210** Floor convector FCT20-09, H=90 mm, W=270 mm, L=2000 mm, stainless steel trough, Al bronze frame, Al bronze cross roll-up grill, without regulation, Convector 230 V AC

Ordering, see the page 53

SPECIFICATIONS

- Offices, corridors, halls
- Optimal rating output
- Forced convection by tangential fans
- Smooth running
- Dry ambience

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
rpm	0	576	972	1183
LENGTH [mm]	HEATING OUTPUT [W]			
800	64	422	594	720
1200	134	844	1188	1441
1600	205	1266	1783	2161
2000	276	1687	2377	2881
2400	346	2109	2971	3602
2800	417	2531	3565	4322
3200	488	2953	4160	5042
3600	558	3375	4754	5763

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
rpm	0	576	972	1183
LENGTH [mm]	HEATING OUTPUT [W]			
800	49	346	488	591
1200	103	693	976	1183
1600	157	1039	1463	1774
2000	212	1385	1951	2365
2400	266	1731	2439	2956
2800	320	2078	2927	3548
3200	375	2424	3414	4139
3600	429	2770	3902	4730

Q [W] 70/55/20 °C

SPEED	0	1	2	3
rpm	0	576	972	1183
LENGTH [mm]	HEATING OUTPUT [W]			
800	39	290	409	496
1200	82	581	818	992
1600	125	871	1227	1487
2000	168	1161	1636	1983
2400	210	1452	2045	2479
2800	253	1742	2454	2975
3200	296	2033	2863	3471
3600	339	2323	3272	3967

Q [W] 55/45/20 °C

SPEED	0	1	2	3
rpm	0	576	972	1183
LENGTH [mm]	HEATING OUTPUT [W]			
800	23	199	280	340
1200	49	398	561	680
1600	75	597	841	1020
2000	101	796	1122	1360
2400	127	996	1402	1700
2800	153	1195	1683	2040
3200	179	1394	1963	2380
3600	205	1593	2244	2720

SPECIFICATIONS

- Offices, corridors, halls
- Optimal rating output
- Forced convection by tangential fans
- Smooth running
- Dry ambience

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
rpm	0	576	972	1183
LENGTH [mm]	HEATING OUTPUT [W]			
800	127	550	931	1082
1200	269	1099	1863	2164
1600	410	1649	2794	3246
2000	551	2198	3725	4328
2400	693	2748	4656	5410
2800	834	3297	5588	6492
3200	976	3847	6519	7574
3600	1117	4396	7450	8655

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
rpm	0	576	972	1183
LENGTH [mm]	HEATING OUTPUT [W]			
800	98	450	762	885
1200	206	899	1524	1770
1600	315	1349	2285	2655
2000	424	1798	3047	3540
2400	532	2248	3809	4425
2800	641	2697	4571	5310
3200	750	3147	5332	6195
3600	859	3596	6094	7080

Q [W] 70/55/20 °C

SPEED	0	1	2	3
rpm	0	576	972	1183
LENGTH [mm]	HEATING OUTPUT [W]			
800	77	376	637	740
1200	163	752	1274	1480
1600	249	1127	1911	2220
2000	335	1503	2547	2960
2400	421	1879	3184	3699
2800	507	2255	3821	4439
3200	593	2631	4458	5179
3600	679	3006	5095	5919

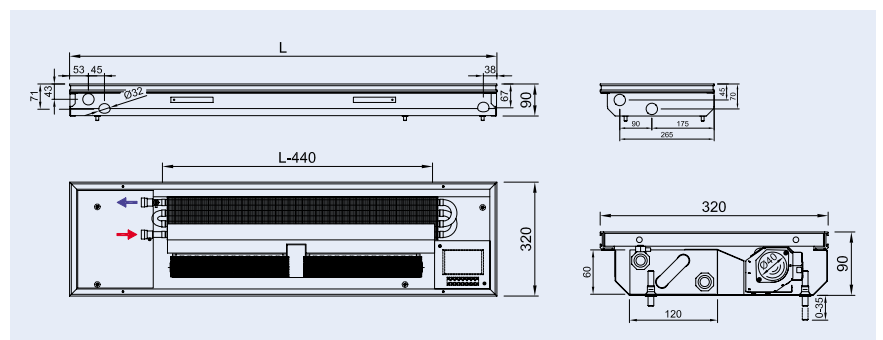
Q [W] 55/45/20 °C

SPEED	0	1	2	3
rpm	0	576	972	1183
LENGTH [mm]	HEATING OUTPUT [W]			
800	47	256	434	504
1200	99	512	868	1008
1600	151	768	1302	1512
2000	203	1024	1735	2016
2400	255	1280	2169	2520
2800	307	1536	2603	3024
3200	359	1792	3037	3528
3600	411	2048	3471	4032



PARAMETERS

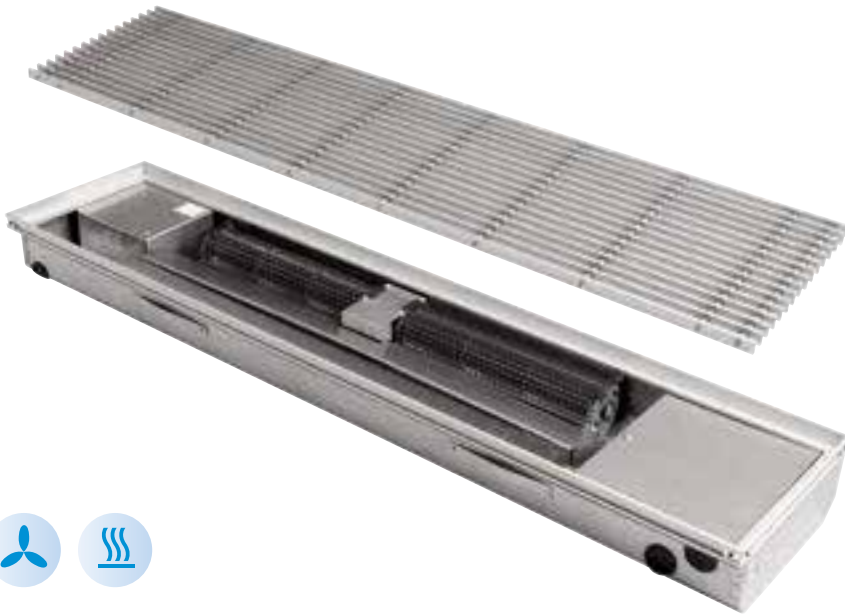
Convector	Width	320 mm
	Height	90 mm
	Length	800-3600 mm v kroku po 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	300 mm
	Grill type	cross / linear
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	120 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 x G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 40 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
Operating conditions	Regulation	by output voltage modification (regulation Z-VD...)
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70%



	SPEED	LENGTH [mm]							
		800	1200	1600	2000	2400	2800	3200	3600
ACOUSTIC PRESSURE L _{pAmax} [dB(A)]	1	23	24	24	25	25	25	25	26
	2	35	35	37	38	39	40	41	41
	3	42	42	46	46	49	51	51	51
AIR VOLUME [m ³ /h]	1	22	48	71	97	119	145	167	193
	2	46	100	146	200	200	301	347	401
	3	61	132	193	265	265	397	458	529

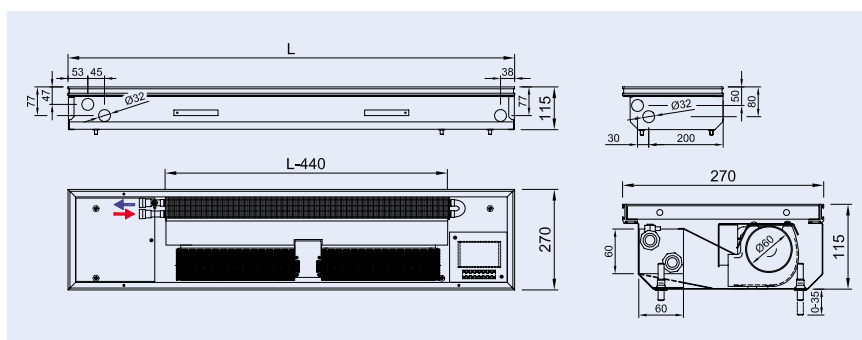
Code example	FCT40-09200-NR111	Floor convector FCT40-09, H=90 mm, W=320 mm, L=2000 mm, stainless steel trough, Al natur frame, Al natur cross roll-up grill, installed regulation Z-VD001, Convector 230 V AC
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Ordering, see the page 53



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
Exchanger	Grill material	anodized aluminium, wood, stainless steel
	Width	60 mm
	Height	60 mm
	Finned length	L-440mm
	Heat medium connection	2 x G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 60 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
Operating conditions	Regulation	by output voltage modification (regulation Z-VD...)
	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	23	23	24	25	26	26	27	26	27	28	28	28
	2	29	29	30	32	33	33	34	33	34	34	34	34
	3	42	43	44	47	47	47	48	48	48	48	48	48
AIR VOLUME [m³/h]	1	31	76	107	151	179	227	269	303	358	358	389	
	2	48	119	167	239	258	358	387	477	516	516	564	
	3	79	171	249	341	428	512	643	682	857	857	936	

Code example **FCT20-11320-NR120** Floor convector FCT20-11, H=115 mm, W=270 mm, L=3200 mm, stainless steel trough, Al natur frame, Al natur linear grill, without regulation, Convector 230 V AC

SPECIFICATIONS

- Offices, corridors, halls
- Optimal rating output
- Forced convection by tangential fans
- Smooth running
- Dry ambience

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
rpm	0	433	631	967
LENGTH [mm]	HEATING OUTPUT [W]			
800	81	321	555	675
1200	172	642	1111	1351
1600	262	963	1666	2026
2000	352	1283	2221	2702
2400	443	1540	2665	3242
2800	533	1925	3332	4053
3200	623	2310	3998	4863
3600	714	2567	4442	5404
4000	804	3080	5330	6485
4400	894	3164	5415	6569
4800	985	3401	5886	7160

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
rpm	0	433	631	967
LENGTH [mm]	HEATING OUTPUT [W]			
800	62	264	457	555
1200	132	528	913	1111
1600	201	791	1370	1666
2000	271	1055	1826	2221
2400	340	1266	2191	2666
2800	410	1583	2739	3332
3200	479	1899	3287	3999
3600	549	2110	3652	4443
4000	618	2532	4382	5331
4400	687	2602	4452	5401
4800	757	2796	4839	5887

Q [W] 70/55/20 °C

SPEED	0	1	2	3
rpm	0	433	631	967
LENGTH [mm]	HEATING OUTPUT [W]			
800	49	222	383	466
1200	104	443	767	933
1600	159	665	1150	1399
2000	214	886	1534	1866
2400	269	1063	1840	2239
2800	324	1329	2300	2798
3200	379	1595	2760	3358
3600	434	1772	3067	3731
4000	489	2127	3680	4477
4400	544	2185	3739	4536
4800	599	2348	4064	4944

Q [W] 55/45/20 °C

SPEED	0	1	2	3
rpm	0	433	631	967
LENGTH [mm]	HEATING OUTPUT [W]			
800	30	152	264	321
1200	63	305	527	642
1600	96	457	791	962
2000	130	610	1055	1283
2400	163	731	1266	1540
2800	196	914	1582	1925
3200	229	1097	1899	2310
3600	262	1219	2110	2567
4000	296	1463	2532	3080
4400	329	1503	2572	3120
4800	362	1615	2795	3401

SPECIFICATIONS

- Offices, corridors, halls
- Optimal rating output
- Forced convection by tangential fans
- Smooth running
- Dry ambience

HEATING OUTPUT

Q [W] 90/70/20 °C

SPEED	0	1	2	3
rpm	0	433	631	967
LENGTH [mm]	HEATING OUTPUT [W]			
800	156	749	1015	1377
1200	330	1499	2030	2754
1600	504	2248	3045	4131
2000	678	2997	4060	5508
2400	852	3597	4872	6609
2800	1025	4496	6090	8261
3200	1199	5395	7307	9914
3600	1373	5995	8119	11015
4000	1547	7194	9743	13218
4400	1721	7356	9906	13380
4800	1894	7943	10758	14595

Qn [W] 75/65/20 °C

SPEED	0	1	2	3
rpm	0	433	631	967
LENGTH [mm]	HEATING OUTPUT [W]			
800	120	616	834	1132
1200	254	1232	1669	2264
1600	387	1848	2503	3396
2000	521	2464	3338	4528
2400	655	2957	4005	5434
2800	788	3696	5007	6792
3200	922	4436	6008	8150
3600	1055	4929	6675	9056
4000	1189	5914	8010	10867
4400	1322	6048	8144	11001
4800	1456	6530	8845	11999

Q [W] 70/55/20 °C

SPEED	0	1	2	3
rpm	0	433	631	967
LENGTH [mm]	HEATING OUTPUT [W]			
800	95	517	701	951
1200	201	1035	1402	1901
1600	306	1552	2102	2852
2000	412	2070	2803	3803
2400	518	2483	3364	4563
2800	623	3104	4205	5704
3200	729	3725	5046	6845
3600	835	4139	5606	7605
4000	940	4967	6727	9127
4400	1046	5079	6840	9239
4800	1152	5484	7428	10077

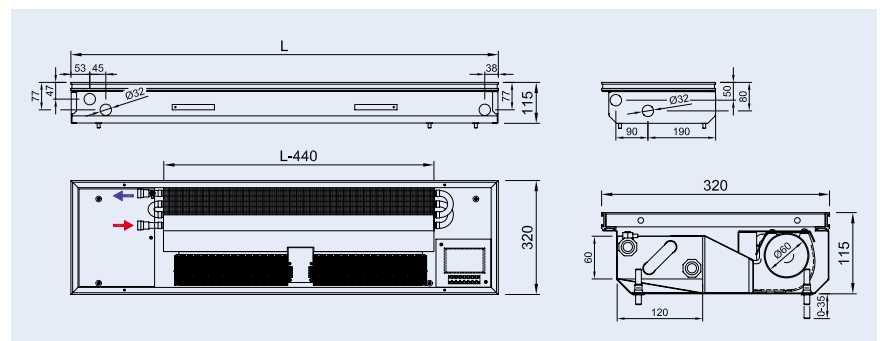
Q [W] 55/45/20 °C

SPEED	0	1	2	3
rpm	0	433	631	967
LENGTH [mm]	HEATING OUTPUT [W]			
800	58	356	482	654
1200	121	712	964	1308
1600	185	1068	1446	1962
2000	249	1424	1928	2616
2400	313	1708	2314	3139
2800	377	2135	2892	3924
3200	441	2563	3471	4709
3600	505	2847	3856	5232
4000	569	3417	4628	6278
4400	633	3494	4705	6355
4800	696	3773	5110	6932



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	120 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 x G1/2" female thread
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 60 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
Operating conditions	Regulation	by output voltage modification (regulation Z-VD...)
	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	23	23	24	25	26	25	27	26	27	28	28
	2	29	29	30	32	33	33	34	33	34	34	34
	3	43	43	44	47	47	47	48	48	48	48	48
AIR VOLUME [m³/h]	1	29	71	100	142	168	213	252	284	336	336	365
	2	45	112	157	224	242	336	363	448	484	484	529
	3	74	160	234	320	402	480	603	640	804	804	878

Code example	FCT40-11320-NR223	Floor convector FCT40-11, H=115 mm, W=320 mm, L=3200 mm, stainless steel trough, Al bronze frame, Al bronze linear grill, installed regulation Z-VD003, Convector 230 V AC
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Ordering, see the page 53

Floor convectors equipped with tangential fans excel in a high heating and cooling output. They are proper complements of cooling devices and air conditioning, influence of which does not reach up to window surfaces.

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

A version of the exchanger for 2-pipe and 4-pipe systems. The convectors may be equipped with a pump of condensate that occurs with cooling.

- optimum heating/cooling output
- 230 V AC / 50 Hz fans
- speed control in three levels
- may be completed with a condensate pump

TABLE OF ELECTRIC POWER INPUTS OF FCC 230 V AC CONVECTORS

TYPE	Speed	FCC convector length [mm]				
		1200	1600	2000	2400	2800
FCC2A FCC4A	1	46W	72W	72W	98W	98W
	2	51W	82W	82W	113W	113W
	3	65W	110W	110W	155W	155W

input power of installed fans and speed regulator

TYPES FCC 230V AC:

- FCC2A (320×134×1200-2800 mm) 2 pipe system
- FCC4A (320×134×1200-2800 mm) 4 pipe system

FANS 230V AC / 50HZ

The floor convectors have built-in fans with tangential rotors. The heating output of floor convector is regulated by alteration of engine speed enabling to reach optimized heating output under a low noisiness. The safety of convector working under a low voltage is ensured by grounding of components as well as by manufacturer's break-down and contact resistance control tests.

TABLE OF ELECTRIC POWER INPUTS

- Convectors have installed fans for alternating voltage of 230V
- The revs control follows by regulation of input voltage
- Standard running is limited by engine speed regulator

Add considered accessories to the power input of FCC:

Thermo-drive

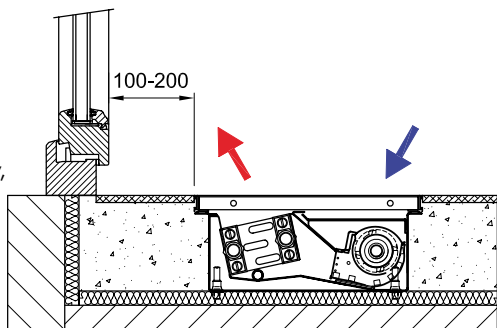
+58 VA power input at switching-on (operation consumption is 2.5 W)

Condensate pump

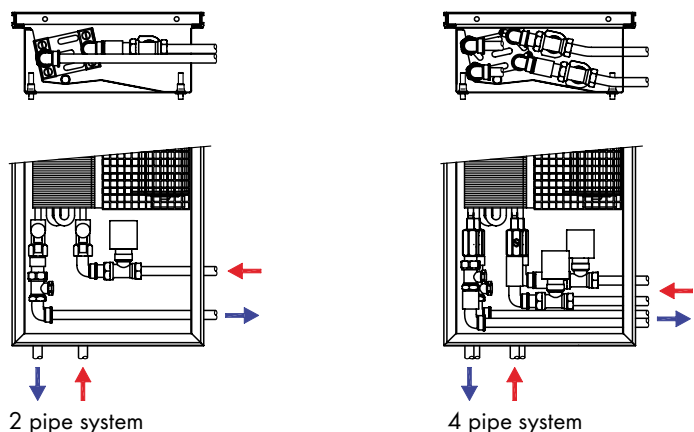
+16 W (switching-on at sufficient amount of condensate)

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.



CONVECTOR CONNECTION TO THE HEATING SYSTEM



The floor convector is provided with entry holes for connection to the heating system. Connection is possible from the face side and from the side to the room.

CONVECTOR FUNCTIONS

Heating:

- 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

Cooling:

- air is cooled by flowing through the exchanger
- cool air is mixed with warm air rising up on a window surface
- condensate occurs with low temperatures of cooling water, that is drained out of the convector
- air circulation:
 - it cools air in the area of the window surface
 - it decreases radiation of the window surface
- only local cooling
- it does not replace but completes the cooling device or air-conditioning, influence of which does not reach up to the window surfaces

HEATING OUTPUT RECALCULATION FOR ANOTHER TEMPERATURE GRADIENT

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

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

$m = 1,015$ for FCC2A, FCC4A

Q_n [W]	heating output for temperature gradient $T1/T2/T_i = 75/65/20$ °C
Ψ [-]	mass rate of flow coefficient (for current flow rate $\Psi = 1$)
$T1$ [°C]	input water temperature
$T2$ [°C]	output water temperature
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 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 $T_i = 22$ °C, $k = 0.95$

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

for $T_i = 15$ °C, $k = 1.12$

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

COOLING OUTPUTS

Cooling outputs for the common used temperature gradients are shown in the tables for each type of FCC. To get outputs on other parameters please contact the technical department.

EXCHANGER HYDRAULIC LOSSES

Typ FCC	Length [mm]	Volume [l]	M – mass rate of flow in piping (kg/h) / R – hydraulic loss in exchanger (kPa)																
			M=50	60	70	80	90	100	120	150	200	250	300	350	400	450	500	550	
2 pipe system	FCC2A heating and cooling	1200	0,647	0,14	0,17	0,21	0,25	0,30	0,35	0,46	0,66	1,07	1,58	2,19	2,91	3,72	4,63	5,64	6,75
		1600	0,934	0,20	0,25	0,30	0,37	0,43	0,50	0,67	0,96	1,55	2,29	3,18	4,21	5,38	6,70	8,16	9,77
		2000	1,257	0,27	0,34	0,41	0,49	0,58	0,68	0,90	1,29	2,09	3,09	4,28	5,67	7,26	9,03	11,01	13,18
		2400	1,582	0,34	0,42	0,52	0,62	0,73	0,86	1,13	1,62	2,64	3,89	5,40	7,15	9,14	11,38	13,87	16,60
		2800	1,868	0,40	0,50	0,61	0,73	0,87	1,02	1,34	1,92	3,12	4,61	6,39	8,46	10,83	13,48	16,43	19,67
4 pipe system	FCC4A heating circle	1200	0,202	0,49	0,68	0,89	1,12	1,38	1,65	2,27	3,37	5,64	8,45	11,82	15,73	20,20	25,22	30,78	36,90
		1600	0,297	0,71	0,99	1,30	1,64	2,01	2,41	3,32	4,92	8,23	12,35	17,26	22,98	29,51	36,84	44,97	53,90
		2000	0,405	0,97	1,34	1,76	2,22	2,73	3,28	4,51	6,69	11,19	16,78	23,46	31,24	40,10	50,06	61,11	73,26
		2400	0,512	1,22	1,69	2,22	2,80	3,44	4,13	5,68	8,42	14,08	21,12	29,53	39,32	50,48	63,02	76,93	92,21
		2800	0,609	1,44	2,00	2,62	3,31	4,07	4,89	6,72	9,96	16,66	24,98	34,94	46,51	59,72	74,55	91,00	109,08
	FCC4A cooling circle	1200	0,409	0,16	0,23	0,31	0,39	0,48	0,58	0,81	1,20	2,00	2,99	4,18	5,56	7,12	8,88	10,83	12,97
		1600	0,599	0,24	0,34	0,45	0,57	0,70	0,85	1,17	1,74	2,90	4,34	6,07	8,06	10,34	12,89	15,72	18,83
		2000	0,816	0,32	0,45	0,60	0,77	0,95	1,14	1,58	2,35	3,92	5,87	8,20	10,90	13,98	17,43	21,25	25,45
		2400	1,029	0,40	0,57	0,76	0,97	1,20	1,45	2,00	2,97	4,97	7,44	10,38	13,80	17,70	22,07	26,91	32,23
		2800	1,223	0,48	0,69	0,91	1,16	1,44	1,73	2,39	3,55	5,94	8,90	12,42	16,51	21,17	26,40	32,19	38,56

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

HEATING WATER FLOW RATE THROUGH EXCHANGER

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

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)

REGULATION OF FCC 230 V AC / 50 HZ FLOOR CONVECTORS

Regulation of floor convectors with installed tangential fans for alternating-current voltage of 230 V AC in the basic version enables speed switching in three levels. Silent run at 1st level, 2nd level for common daily operation and 3rd level for fast heating or maximum level for cooling.

- Every FCC 230V AC convector is equipped with an installed auto-transformer control.
- Always one thermostat is considered for a room.
- Thermo actuator is installed in case the convector is operated both for heating and cooling.

Control of the floor convector:

- a manual thermostat with a speed switch (Z-RT004, Z-RT007) or a digital one (Z-RT006)
- the controller, a power element located in the convector, controls the fan speed and opening of thermo-electric drives (the controller is a part of the convector at FCC types)

Recommended accessories:

Thermo-electric drive:

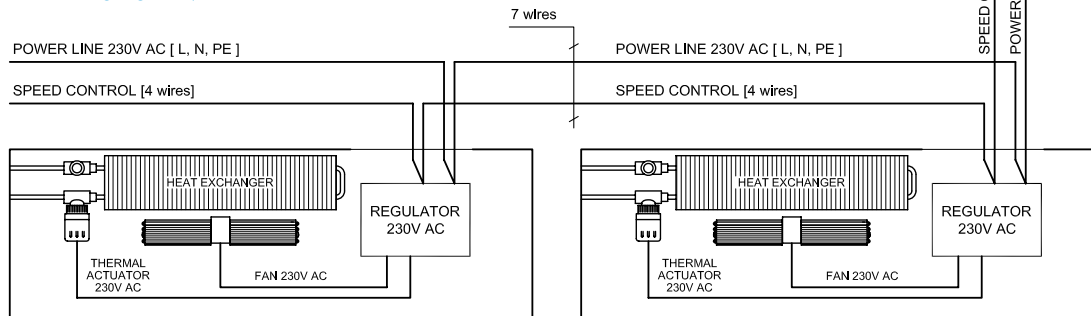
- opens and closes flow of heating or cooling media through the exchanger according to a thermostat signal

- the drive is mounted on a thermostatic valve located on the inlet pipeline to the exchanger
- if the cooling flow is not controlled by any different way, it is necessary to use the thermo-drive for this circuit

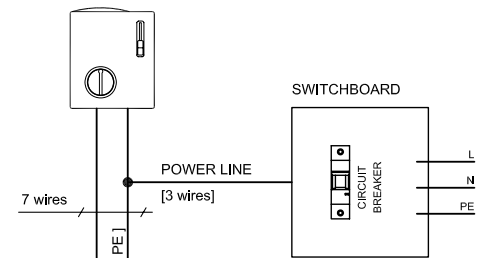
Condensate pump:

- if conditions at cooling enable condensate origin and we do not have possibility to drain it with a gravity flow
- if condensate needs to be delivered to a common collecting condensate container
- if condensate needs to be delivered to higher floors (max. 10 meters)

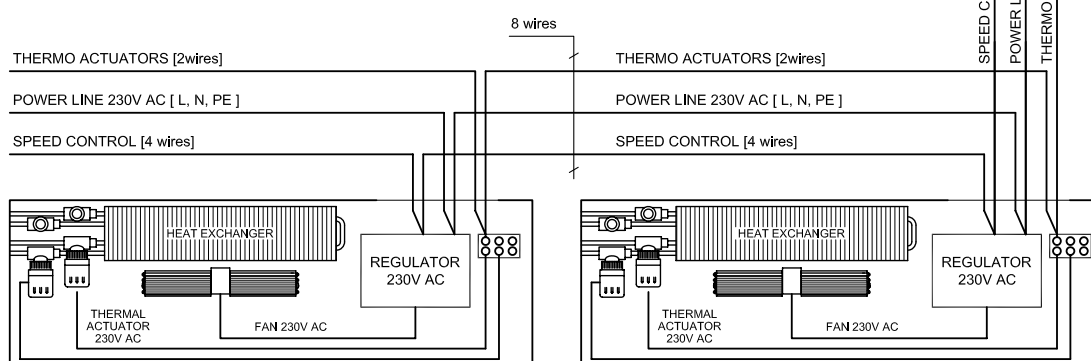
2 PIPE SYSTEM



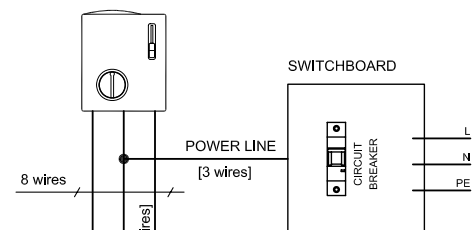
THERMOSTAT Z-RT004



4 PIPE SYSTEM



THERMOSTAT Z-RT007



Z-RT004 – 2 pipe system heating/cooling; Z-RT007 – 4 pipe system heating/cooling

pokořový termostat, topení/chlazení, plynulá změna otáček, útlumový režim, nastavení OFF, AUTO, TEMP, plynulé otáčky 1–5
pokořový termostat s přepínačem 3 stupňů otáček, pro topení a chlazení

Temperature range:	8–30 °C
Switch levels:	Otáčky: 0, 1, 2, 3 Přepínač: topení / chlazení
Operating voltage:	230V / 50Hz
Max. rating:	6 (2) A
Protection:	IP30
Colour:	bílá
Dimension:	96×110×36 mm



Z-RT006 – heating, cooling

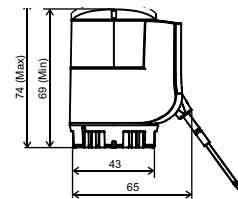
Room thermostat with backlit LCD, 7-day time program, 8 programmable timers, manual or automatic speed switching, mode heating/cooling for 2-pipe and 4-pipe floor convectors

Temperature range:	0–49 °C
Modes:	Comfort, Economy, Protection
Speeds:	1,2,3 or automatic
Operating voltage:	230V / 50Hz
Power consumption:	Max 3.5 VA / 0.8 W
Max. total load current through terminal L:	7A
Outputs rating:	5 (2)A
Protection:	IP30
Colour:	RAL9003 white
Dimension:	86 × 86 × 46



Z-TS230, Z-TS230-5m, thermoactuator

Input voltage:	230V / 50Hz
Power input when switch on:	58VA
Power input during operating:	2.5W
Period of switching ON/OFF:	210 s
Ingress protection:	IP54 (housing)
Connection thread:	M30×1.5mm
Cable length:	Z-TS230 3 meters Z-TS230-5m 5 meters
Max. height when opened:	74 mm



DF10

Filter of fan suction

Colour:	black
Filter dimensions:	please mention in the order the length of the FCC convector (e.g. DF10 for FCC l=2000 mm)



CP10

A membrane pump of condensate that may occur at cooling, connection to the convector drain pipe

Operation voltage:	230 V/50 Hz
Power input:	16 W / 0.17 A
Max. recommended delivery:	10 m
Capacity l/h:	12 l (0 m) – 4.5 l (10 m)
Acoustic pressure at delivery of 1m:	21 dB(A)
Voltage-free contact - alarm:	3 A induction, contacts N.O., N.C.



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

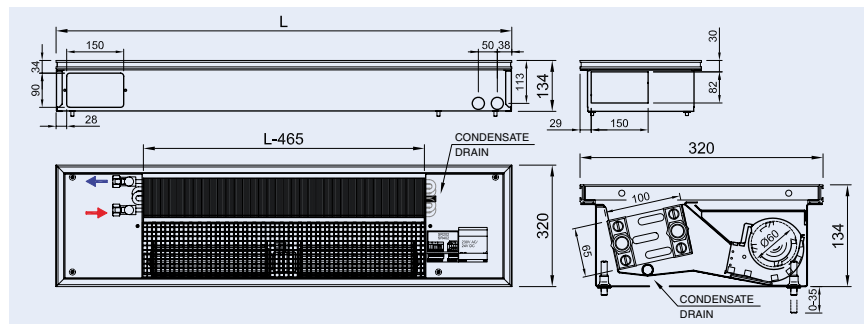


Note: A speed controller is always part of the FCC floor convector (2 pipe system and 4 pipe system)



PARAMETERS

Convector	Width	320 mm
	Height	134 mm
	Length	1200-2800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	280 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	100 mm
	Height	65 mm
	Finned length	L-465 mm
	Heat medium connection	2 x G1/2" female thread (2 pipe system)
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 60 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
Operating conditions	Regulation	installed speed regulator
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70 %



	SPEED	LENGTH [mm]				
		1200	1600	2000	2400	2800
ACOUSTIC PRESSURE LpAmax [dB(A)]	1	<20	22	23	24	24
	2	25	28	31	33	35
	3	34	38	42	43	44
AIR VOLUME [m³/h]	1	70	98	150	170	220
	2	112	155	225	245	335
	3	161	230	321	405	475

Code example	FCC2A-13200-NR123	Floor convector FCC2A-13, H=134 mm, W=320 mm, L=2000 mm, stainless steel trough, Al natur frame, Al-natur linear grill, installed regulation, convector with fans 230V AC
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Regulation is always a part of the convector, black covers of water and electricity. Ordering, see the page 53

SPECIFICATION

- Fully glazed rooms with big heat gains
- Flats, villas, residences, hotels
- High heat output
- Optimum after-cooling output
- Convection with tangential fans
- Silent operation
- Dry environment
- Easy operation

HEATING OUTPUT

Q [W] 90/70/20 °C

Speed level	Minimal	Middle	Maximal
SPEED	1	2	3
LENGTH [mm]	HEATING OUTPUT Q _H [W]		
1200	1288	1900	2851
1600	1931	2850	4276
2000	2575	3800	5701
2400	3219	4750	7126
2800	3863	5700	8552

Qn [W] 75/65/20 °C

Speed level	Minimal	Middle	Maximal
SPEED	1	2	3
LENGTH [mm]	HEATING OUTPUT Q _H [W]		
1200	1070	1579	2369
1600	1605	2369	3554
2000	2140	3158	4738
2400	2675	3948	5923
2800	3210	4737	7107

Q [W] 70/55/20 °C

Speed level	Minimal	Middle	Maximal
SPEED	1	2	3
LENGTH [mm]	HEATING OUTPUT Q _H [W]		
1200	907	1339	2009
1600	1361	2008	3013
2000	1815	2678	4017
2400	2268	3347	5022
2800	2722	4017	6026

Q [W] 55/45/20 °C

Speed level	Minimal	Middle	Maximal
SPEED	1	2	3
LENGTH [mm]	HEATING OUTPUT Q _H [W]		
1200	637	940	1411
1600	956	1410	2116
2000	1274	1880	2821
2400	1593	2350	3526
2800	1911	2821	4232

Q [W] 6/12 °C

Speed level			Minimal		Middle		Maximal	
SPEED			1		3		5	
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]					
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	480	312	883	584	1189	806
	28	50	446	283	819	528	1104	726
	26	50	365	252	668	472	901	651
	24	50	286	221	522	414	707	574
1600	30	45	720	469	1324	876	1784	1208
	28	50	669	424	1229	792	1656	1089
	26	50	547	379	1002	707	1352	977
	24	50	429	332	783	621	1060	861
2000	30	45	960	625	1766	1168	2379	1611
	28	50	892	566	1638	1056	2208	1453
	26	50	730	505	1336	943	1803	1303
	24	50	572	442	1044	827	1414	1148
2400	30	45	1200	781	2207	1460	2973	2014
	28	50	1116	707	2048	1320	2760	1816
	26	50	912	631	1671	1179	2254	1629
	24	50	716	553	1305	1034	1767	1435
2800	30	45	1440	937	2649	1752	3568	2417
	28	50	1339	848	2457	1584	3312	2179
	26	50	1095	757	2005	1415	2704	1954
	24	50	859	663	1565	1241	2121	1722

Q [W] 8/14 °C

Speed level			Minimal		Middle		Maximal	
SPEED			1		3		5	
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]					
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	405	279	741	524	1001	728
	28	50	370	249	677	466	915	649
	26	50	285	218	521	409	709	571
	24	50	202	184	367	348	507	491
1600	30	45	607	419	1112	786	1501	1092
	28	50	555	373	1015	699	1372	973
	26	50	428	326	782	614	1063	857
	24	50	302	276	551	523	761	737
2000	30	45	809	559	1482	1048	2002	1456
	28	50	740	498	1353	933	1829	1298
	26	50	571	435	1042	818	1417	1143
	24	50	403	367	734	697	1014	982
2400	30	45	1012	699	1853	1310	2502	1820
	28	50	925	622	1691	1166	2287	1622
	26	50	713	544	1303	1023	1772	1428
	24	50	504	459	918	871	1268	1228
2800	30	45	1214	838	2223	1572	3003	2184
	28	50	1110	747	2030	1399	2744	1946
	26	50	856	653	1563	1228	2126	1714
	24	50	605	551	1101	1045	1521	1474

Q [W] 12/16 °C

Speed level			Minimal		Middle		Maximal	
SPEED			1		3		5	
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]					
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	296	235	541	444	734	627
	28	50	261	205	476	387	648	547
	26	50	175	174	348	348	493	493
	24	50	154	154	291	291	410	410
1600	30	45	445	353	812	667	1101	940
	28	50	391	307	714	581	972	820
	26	50	263	260	523	523	739	739
	24	50	231	231	437	437	615	615
2000	30	45	593	471	1083	889	1468	1254
	28	50	522	410	952	775	1296	1093
	26	50	351	347	697	697	986	986
	24	50	308	308	583	583	820	820
2400	30	45	741	588	1353	1111	1835	1567
	28	50	652	512	1190	969	1620	1367
	26	50	438	434	871	871	1232	1232
	24	50	385	385	728	728	1026	1026
2800	30	45	889	706	1624	1333	2203	1880
	28	50	782	615	1428	1162	1944	1640
	26	50	526	521	1045	1045	1479	1479
	24	50	462	462	874	874	1231	1231

Q [W] 16/18 °C

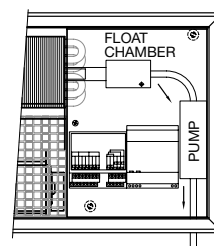
Speed level			Minimal		Middle		Maximal	
SPEED			1		3		5	
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]					
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	195	195	373	373	534	534
	28	50	166	166	317	317	453	453
	26	50	137	137	261	261	372	372
	24	50	108	108	204	204	290	290
1600	30	45	292	292	560	560	802	802
	28	50	249	249	475	475	680	680
	26	50	206	206	391	391	559	559
	24	50	161	161	306	306	434	434
2000	30	45	390	390	746	746	1069	1069
	28	50	332	332	634	634	907	907
	26	50	274	274	521	521	745	745
	24	50	215	215	408	408	579	579
2400	30	45	487	487	933	933	1336	1336
	28	50	415	415	792	792	1133	1133
	26	50	343	343	651	651	931	931
	24	50	269	269	511	511	724	724
2800	30	45	584	584	1119	1119	1603	1603
	28	50	498	498	951	951	1360	1360
	26	50	412	412	782	782	1117	1117
	24	50	323	323	613	613	869	869

Qk [W] - total cooling output, Qs [W] - sensible cooling output RH [%] - relative humidity

CONDENSATE

If the cooling system is dimensioned so that condensate may occur ($Q_s < Q_k$), it is necessary to drain it from the convector. Condensate drips from lamellas of the exchanger to a drain chute, from which it flows out through a pipe on the convector right side. If condensate needs to be delivered to a collecting container or to a position above the convector, please use the condensate pump. Before use, check correct operation of the pump and its tightness by filling it with a small water amount through the exchanger. A float chamber must be cleaned from deposit dirt from time to time. Please follow instructions in the attached user manual.

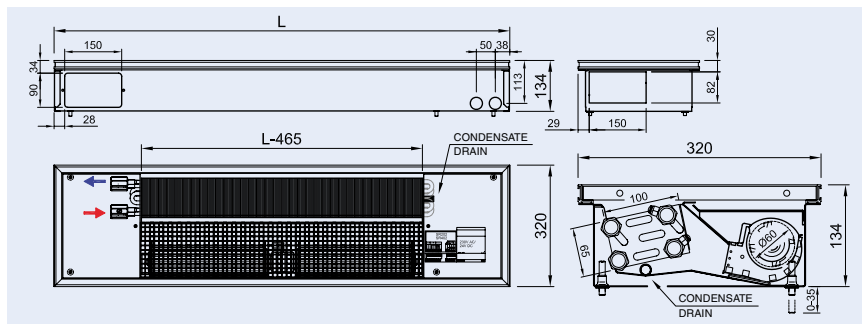
EXAMPLE OF CONNECTION OF A FLOOR CONVECTOR WITH A CONDENSATE PUMP





PARAMETERS

Convector	Width	320 mm
	Height	134 mm
	Length	1200-2800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	280 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	100 mm
	Height	65 mm
	Finned length	L-465 mm
	Heat medium connection	4 × G1/2" female thread (4 pipe system)
	Max. working temperature	110 °C
Fan	Max. working overpressure	1 MPa
	Rotor diameter	∅ 60 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
Operating conditions	Regulation	installed speed regulator
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70 %



	SPEED	LENGTH [mm]				
		1200	1600	2000	2400	2800
ACOUSTIC PRESSURE LpAmax [dB(A)]	1	<20	22	23	24	24
	2	25	28	31	33	35
	3	34	38	42	43	44
AIR VOLUME [m³/h]	1	70	98	150	170	220
	2	112	155	225	245	335
	3	161	230	321	405	475

Code example	FCC4A-13240-NR213	Floor convectors FCC4A-13, H=134 mm, W=320 mm, L=2400 mm, stainless steel trough, Al bronze frame, Al-bronze roll-up grill, installed regulation, convector with fans 230V AC
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Regulation is always a part of the convector, black covers of water and electricity. Ordering, see the page 53

SPECIFICATION

- Fully glazed rooms with big heat gains
- Flats, villas, residences, hotels
- High heat output
- Optimum after-cooling output
- Convection with tangential fans
- Silent operation
- Dry environment
- Easy operation

HEATING OUTPUT

Q [W] 90/70/20 °C

Speed level	Minimal	Middle	Maximal
SPEED	1	2	3
LENGTH [mm]	HEATING OUTPUT Q _H [W]		
1200	874	1187	1865
1600	1310	1781	2798
2000	1747	2375	3730
2400	2184	2968	4663
2800	2621	3562	5595

Qn [W] 75/65/20 °C

Speed level	Minimal	Middle	Maximal
SPEED	1	2	3
LENGTH [mm]	HEATING OUTPUT Q _H [W]		
1200	726	987	1550
1600	1089	1480	2325
2000	1452	1973	3100
2400	1815	2467	3875
2800	2178	2960	4650

Q [W] 70/55/20 °C

Speed level	Minimal	Middle	Maximal
SPEED	1	2	3
LENGTH [mm]	HEATING OUTPUT Q _H [W]		
1200	616	837	1314
1600	923	1255	1971
2000	1231	1673	2629
2400	1539	2092	3286
2800	1847	2510	3943

Q [W] 55/45/20 °C

Speed level	Minimal	Middle	Maximal
SPEED	1	2	3
LENGTH [mm]	HEATING OUTPUT Q _H [W]		
1200	432	588	923
1600	648	881	1384
2000	865	1175	1846
2400	1081	1469	2307
2800	1297	1763	2769

Q [W] 6/12 °C

Speed level			Minimal		Middle		Maximal	
SPEED			1		3		5	
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]					
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	433	288	766	528	1025	737
	28	50	400	260	708	475	948	661
	26	50	324	232	572	425	765	595
	24	50	250	202	440	373	587	526
1600	30	45	649	433	1150	793	1538	1105
	28	50	600	390	1063	713	1422	992
	26	50	486	348	857	637	1147	892
	24	50	375	303	659	560	881	789
2000	30	45	865	577	1533	1057	2051	1474
	28	50	801	521	1417	950	1896	1323
	26	50	649	464	1143	850	1529	1189
	24	50	500	405	879	746	1175	1052
2400	30	45	1082	721	1916	1321	2563	1842
	28	50	1001	651	1771	1188	2370	1653
	26	50	811	580	1429	1062	1911	1486
	24	50	625	506	1099	933	1469	1315
2800	30	45	1298	865	2299	1585	3076	2211
	28	50	1201	781	2125	1425	2844	1984
	26	50	973	696	1715	1275	2294	1784
	24	50	750	607	1319	1119	1762	1578

Q [W] 8/14 °C

Speed level			Minimal		Middle		Maximal	
SPEED			1		3		5	
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]					
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	361	258	635	474	846	667
	28	50	328	229	576	420	768	590
	26	50	249	200	436	369	582	522
	24	50	172	169	340	340	481	481
1600	30	45	542	387	953	710	1270	1000
	28	50	492	343	864	630	1152	885
	26	50	374	300	655	554	873	784
	24	50	257	253	510	510	721	721
2000	30	45	722	515	1270	947	1693	1333
	28	50	655	457	1153	840	1536	1180
	26	50	498	399	873	739	1164	1045
	24	50	343	338	680	680	961	961
2400	30	45	903	644	1588	1184	2116	1667
	28	50	819	572	1441	1051	1920	1475
	26	50	623	499	1091	923	1455	1306
	24	50	429	422	850	850	1202	1202
2800	30	45	1083	773	1905	1421	2539	2000
	28	50	983	686	1729	1261	2304	1770
	26	50	748	599	1309	1108	1746	1567
	24	50	515	507	1020	1020	1442	1442

Q [W] 12/16 °C

Speed level			Minimal		Middle		Maximal	
SPEED			1		3		5	
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]					
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	263	219	463	409	617	582
	28	50	230	191	404	355	538	506
	26	50	172	172	319	319	454	454
	24	50	143	143	265	265	376	376
1600	30	45	394	329	694	613	925	873
	28	50	346	287	606	532	808	758
	26	50	259	259	479	479	681	681
	24	50	215	215	397	397	565	565
2000	30	45	526	439	925	817	1234	1164
	28	50	461	382	808	709	1077	1011
	26	50	345	345	638	638	908	908
	24	50	287	287	530	530	753	753
2400	30	45	657	548	1157	1022	1542	1455
	28	50	576	478	1010	886	1346	1264
	26	50	431	431	798	798	1135	1135
	24	50	358	358	662	662	941	941
2800	30	45	789	658	1388	1226	1850	1746
	28	50	691	574	1212	1064	1615	1517
	26	50	517	517	957	957	1362	1362
	24	50	430	430	795	795	1129	1129

Q [W] 16/18 °C

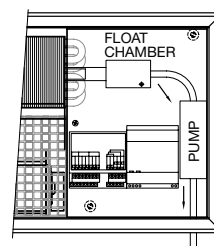
Speed level			Minimal		Middle		Maximal	
SPEED			1		3		5	
LENGTH [mm]	Ti [°C]	r.v. [%]	COOLING OUTPUT [W]					
			Qk [W]	Qs [W]	Qk [W]	Qs [W]	Qk [W]	Qs [W]
1200	30	45	185	185	348	348	499	499
	28	50	157	157	294	294	422	422
	26	50	130	130	242	242	346	346
	24	50	102	102	188	188	269	269
1600	30	45	278	278	521	521	749	749
	28	50	236	236	441	441	633	633
	26	50	195	195	363	363	519	519
	24	50	152	152	283	283	403	403
2000	30	45	370	370	695	695	999	999
	28	50	314	314	589	589	844	844
	26	50	259	259	484	484	692	692
	24	50	203	203	377	377	538	538
2400	30	45	463	463	869	869	1248	1248
	28	50	393	393	736	736	1055	1055
	26	50	324	324	604	604	866	866
	24	50	254	254	471	471	672	672
2800	30	45	556	556	1043	1043	1498	1498
	28	50	471	471	883	883	1266	1266
	26	50	389	389	725	725	1039	1039
	24	50	305	305	565	565	806	806

Qk [W] - total cooling output, Qs [W] - sensible cooling output RH [%] - relative humidity

CONDENSATE

If the cooling system is dimensioned so that condensate may occur ($Q_s < Q_k$), it is necessary to drain it from the convector. Condensate drips from lamellas of the exchanger to a drain chute, from which it flows out through a pipe on the convector right side. If condensate needs to be delivered to a collecting container or to a position above the convector, please use the condensate pump. Before use, check correct operation of the pump and its tightness by filling it with a small water amount through the exchanger. A float chamber must be cleaned from deposit dirt from time to time. Please follow instructions in the attached user manual.

EXAMPLE OF CONNECTION OF A FLOOR CONVECTOR WITH A CONDENSATE PUMP



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 Al-Cu lamellar 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.

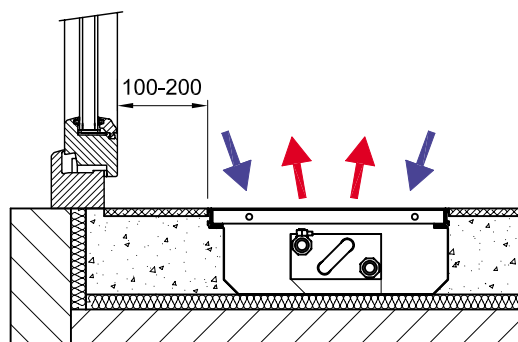
- Tempering of rooms
- Small water volume
- Quick heating up
- Broad assortment

RECOMMENDED STANDARD INSTALLING IN FLOOR

- Ideal position 100–200 mm distance from window
- 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

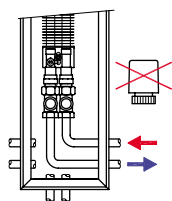
AVAILABLE 24V DC TYPES:

FCK20-09	(170×90×800–4800 mm)
FCK20-11	(170×115×800–4800 mm)
FCK20-14	(170×140×800–4800 mm)
FCK40-09	(320×90×800–4800 mm)
FCK40-11	(320×115×800–4800 mm)
FCK40-14	(320×140×800–4800 mm)
FCK80-09	(420×90×800–4800 mm)
FCK80-11	(420×115×800–4800 mm)
FCK80-14	(420×140×800–4800 mm)

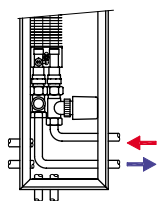


CONVECTOR CONNECTION TO THE HEATING SYSTEM

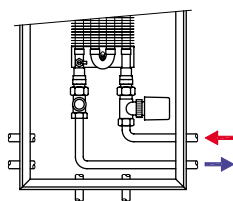
Floor convector is fitted with openings for connection to the heating system. There are three connection possibilities, from the room, side or window wall.



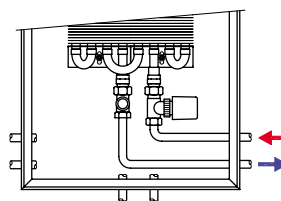
FCK20-09



FCK20-11,14



FCK40-09,11,14



FCK80-09,11,14

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=1,415 pro FCK20-09
m=1,502 pro FCK40-09
m=1,482 pro FCK80-09

m=1,439 pro FCK20-11
m=1,443 pro FCK40-11
m=1,432 pro FCK80-11

m=1,426 pro FCK20-14
m=1,484 pro FCK40-14
m=1,449 pro FCK80-14

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]	M – mass rate of flow in piping (kg/h) / R – hydraulic loss in exchanger (kPa)												
			M=20	40	60	80	100	120	150	200	250	300	350	400	450
FCK20-09 FCK20-11 FCK20-14	800	0,15	0,01	0,02	0,04	0,07	0,10	0,15	0,23	0,40	0,62	0,88	1,19	1,54	1,93
	1200	0,27	0,01	0,02	0,06	0,09	0,14	0,20	0,30	0,52	0,81	1,13	1,52	1,98	2,46
	1600	0,39	0,01	0,03	0,07	0,12	0,17	0,25	0,37	0,65	0,99	1,38	1,86	2,41	3,00
	2000	0,52	0,01	0,03	0,09	0,14	0,21	0,30	0,45	0,77	1,18	1,63	2,20	2,84	3,53
	2400	0,64	0,01	0,04	0,10	0,16	0,24	0,35	0,52	0,89	1,36	1,89	2,54	3,28	4,06
	2800	0,76	0,01	0,05	0,11	0,19	0,28	0,40	0,59	1,01	1,55	2,14	2,87	3,71	4,59
	3200	0,89	0,01	0,05	0,13	0,21	0,31	0,45	0,66	1,14	1,73	2,39	3,21	4,15	5,12
	3600	1,01	0,02	0,06	0,14	0,23	0,34	0,50	0,73	1,26	1,91	2,64	3,55	4,58	5,66
	4000	1,13	0,02	0,06	0,16	0,26	0,38	0,55	0,81	1,38	2,10	2,89	3,88	5,01	6,19
FCK40-09 FCK40-11 FCK40-14	800	0,30	0,01	0,05	0,13	0,21	0,32	0,46	0,69	1,21	1,86	2,62	3,54	4,59	5,74
	1200	0,54	0,01	0,05	0,13	0,21	0,32	0,46	0,69	1,21	1,86	2,62	3,54	4,59	5,74
	1600	0,79	0,02	0,06	0,15	0,26	0,39	0,56	0,84	1,45	2,23	3,12	4,21	5,46	6,80
	2000	1,03	0,02	0,07	0,18	0,31	0,45	0,66	0,98	1,70	2,60	3,63	4,89	6,33	7,86
	2400	1,28	0,02	0,09	0,21	0,35	0,52	0,76	1,13	1,94	2,97	4,13	5,56	7,20	8,93
	2800	1,53	0,03	0,10	0,24	0,40	0,59	0,86	1,27	2,19	3,34	4,63	6,23	8,06	9,99
	3200	1,77	0,03	0,11	0,27	0,45	0,66	0,96	1,41	2,43	3,71	5,14	6,91	8,93	11,05
	3600	2,02	0,03	0,12	0,30	0,49	0,73	1,06	1,56	2,68	4,08	5,64	7,58	9,80	12,12
	4000	2,27	0,04	0,13	0,33	0,54	0,80	1,16	1,70	2,92	4,45	6,15	8,26	10,67	13,18
FCK80-09 FCK80-11 FCK80-14	800	0,59	0,02	0,10	0,25	0,42	0,64	0,92	1,39	2,42	3,72	5,24	7,07	9,18	11,47
	1200	1,08	0,03	0,10	0,25	0,42	0,64	0,92	1,39	2,42	3,72	5,24	7,07	9,18	11,47
	1600	1,58	0,04	0,13	0,31	0,52	0,77	1,12	1,68	2,91	4,46	6,24	8,42	10,92	13,60
	2000	2,07	0,04	0,15	0,37	0,61	0,91	1,32	1,96	3,40	5,20	7,25	9,77	12,65	15,73
	2400	2,56	0,05	0,17	0,43	0,70	1,05	1,52	2,25	3,89	5,94	8,26	11,12	14,39	17,85
	2800	3,05	0,06	0,19	0,49	0,80	1,18	1,72	2,54	4,38	6,68	9,27	12,47	16,13	19,98
	3200	3,55	0,06	0,22	0,55	0,89	1,32	1,92	2,83	4,87	7,42	10,28	13,82	17,86	22,11
	3600	4,04	0,07	0,24	0,61	0,99	1,46	2,11	3,12	5,35	8,16	11,28	15,16	19,60	24,24
	4000	4,53	0,08	0,26	0,66	1,08	1,59	2,31	3,41	5,84	8,90	12,29	16,51	21,33	26,36
4400	5,02	0,08	0,28	0,72	1,18	1,73	2,51	3,69	6,33	9,64	13,30	17,86	23,07	28,49	
4800	5,52	0,09	0,31	0,78	1,27	1,86	2,71	3,98	6,82	10,38	14,31	19,21	24,80	30,62	

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

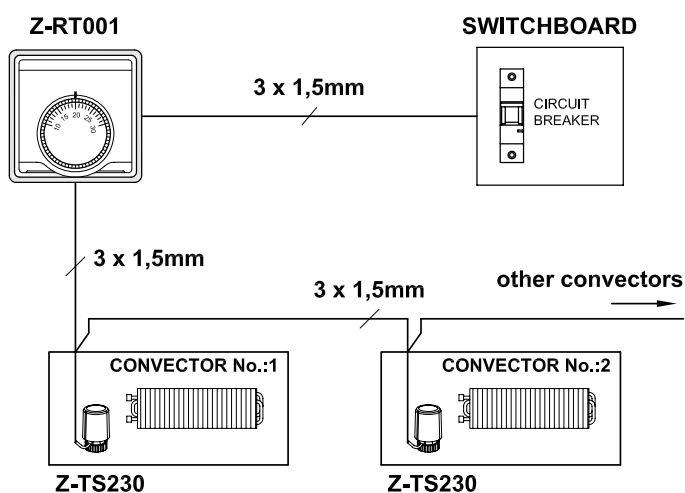
FCK convectors are regulated by means of thermo-drive opening or closing the heating medium circulation on the base of information by thermostat. The thermo-drive works in ON / OFF mode. Full circulation of heating medium follows within 3 minutes after the thermostat is activated.

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.

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

FCK- CABLING EXAMPLE FOR FLOOR CONVECTOR WITH Z-TS230



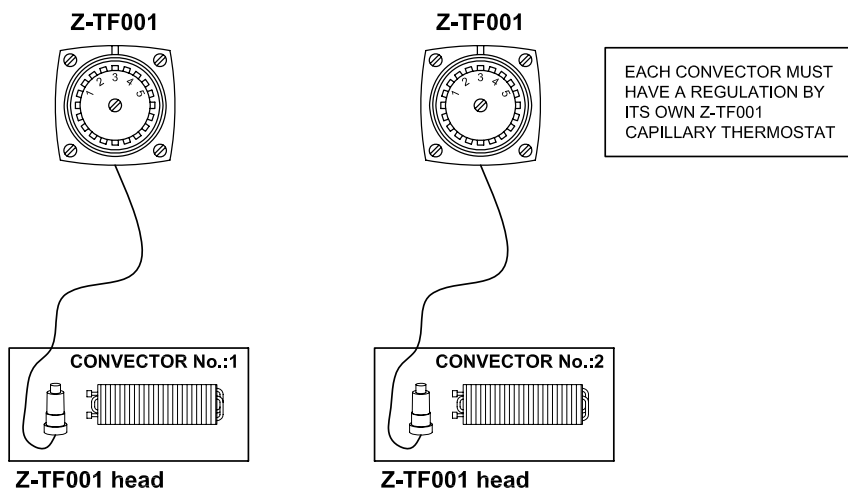
CAPILLARY THERMOSTAT Z-TF001

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.

FCK- 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



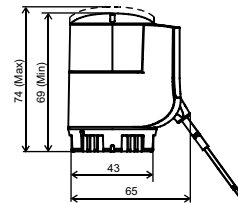
Z-TF001 (available for FCK only)

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-TS230, Z-TS230-5m, thermoactuator

Input voltage: 230V / 50Hz
 Power input when switch on: 58VA
 Power input during operating: 2.5W
 Period of switching ON/OFF: 210 s
 Ingress protection: IP54 (housing)
 Connection thread: M30×1.5mm
 Cable length: Z-TS230 3 meters
 Z-TS230-5m 5 meters
 Max. height when opened: 74 mm



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



FCR20-09 / *NATURAL CONVECTION*



SPECIFICATIONS

- Width 170 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience



FCR40-09 / *NATURAL CONVECTION*



SPECIFICATIONS

- Width 320 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience



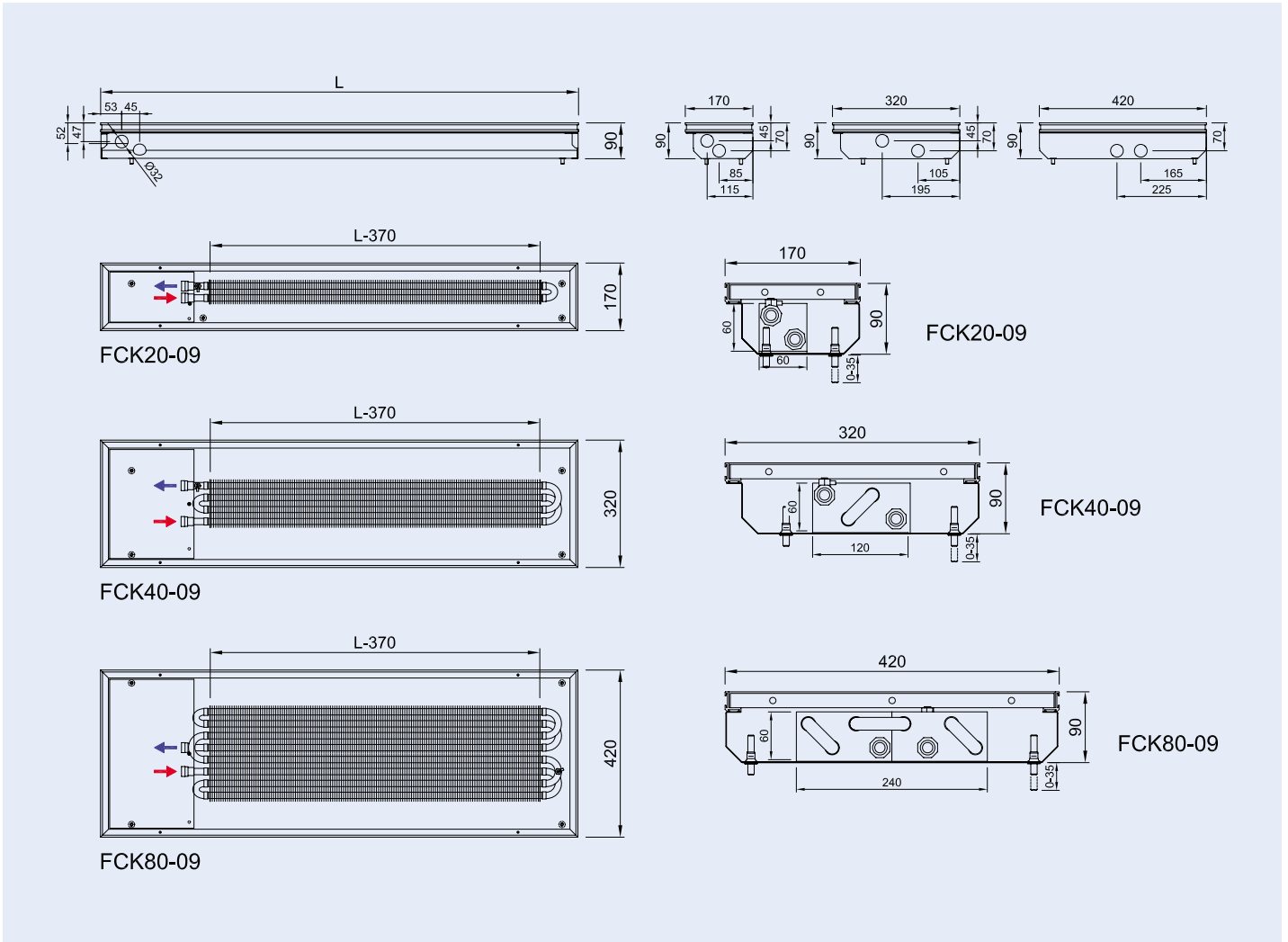
FCR80-09 / *NATURAL CONVECTION*



SPECIFICATIONS

- Width 420 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience





HEATING OUTPUT

Q [W] 90/70/20°C

TYPE	FCR20-09	FCR40-09	FCR80-09
LENGTH [mm]	HEATING OUTPUT [W]		
800	91	186	230
1200	167	342	421
1600	243	497	613
2000	318	652	804
2400	394	808	996
2800	470	963	1188
3200	546	1118	1379
3600	622	1273	1571
4000	697	1429	1762
4400	773	1584	1954
4800	849	1739	2145

Qn [W] 75/65/20°C

TYPE	FCR20-09	FCR40-09	FCR80-09
LENGTH [mm]	HEATING OUTPUT [W]		
800	70	142	175
1200	129	260	322
1600	187	378	468
2000	246	496	614
2400	305	614	760
2800	363	732	906
3200	422	850	1053
3600	480	968	1199
4000	539	1086	1345
4400	597	1205	1491
4800	656	1323	1637

Q [W] 70/55/20°C

TYPE	FCR20-09	FCR40-09	FCR80-09
LENGTH [mm]	HEATING OUTPUT [W]		
800	56	111	138
1200	102	204	253
1600	149	296	368
2000	195	388	482
2400	242	481	597
2800	289	574	712
3200	335	666	827
3600	382	759	942
4000	428	851	1057
4400	475	944	1172
4800	521	1036	1287

Q [W] 55/45/20°C

TYPE	FCR20-09	FCR40-09	FCR80-09
LENGTH [mm]	HEATING OUTPUT [W]		
800	34	66	82
1200	63	121	151
1600	91	175	219
2000	119	230	288
2400	148	285	357
2800	176	340	425
3200	205	395	494
3600	233	450	562
4000	262	504	631
4400	290	559	699
4800	318	614	768

PARAMETERS

Convector	Parameter	Value
Convector	Width	170, 320, 420 mm
	Height	90 mm
	Length	800-4800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	150, 300, 400 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	60, 120, 240 mm
	Height	60 mm
	Finned length	L370 mm
	Heat medium connection	2 × G1/2" inner
	Max. working temperature	110 °C
Operating conditions	Max. working overpressure	1 MPa
	Ambient temperature	+2 to +40 °C
	Relative humidity	20-70 %

FCR 20-11 / *NATURAL CONVECTION*



SPECIFICATIONS

- Width 170 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience



FCR 40-11 / *NATURAL CONVECTION*



SPECIFICATIONS

- Width 320 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience



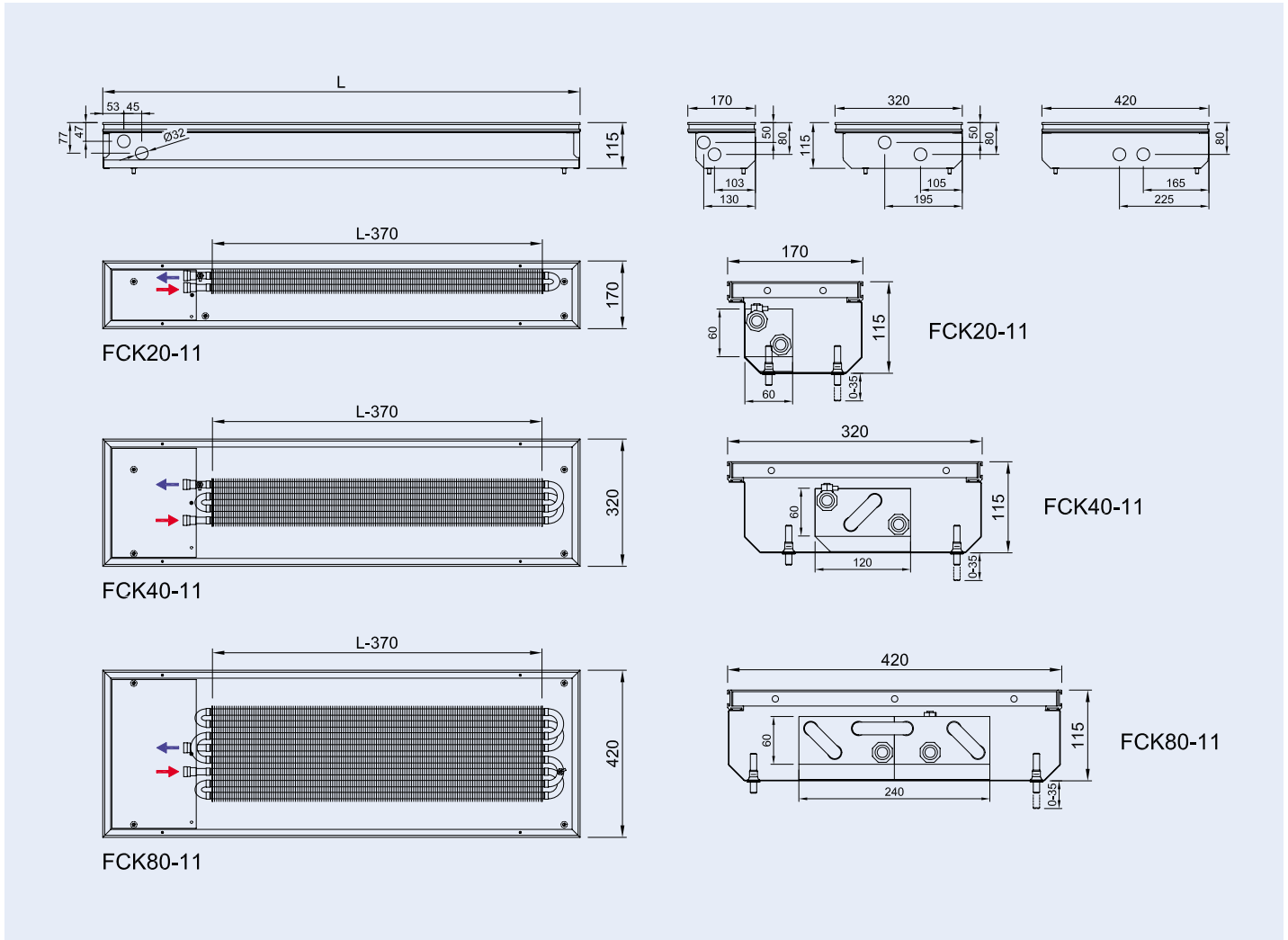
FCR 80-11 / *NATURAL CONVECTION*



SPECIFICATIONS

- Width 420 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience





HEATING OUTPUT

Q [W] 90/70/20 °C

TYPE	FCK20-11	FCK40-11	FCK80-11
LENGTH [mm]	HEATING OUTPUT [W]		
800	118	226	299
1200	217	415	548
1600	315	604	797
2000	414	793	1047
2400	512	981	1296
2800	610	1170	1545
3200	709	1358	1794
3600	807	1547	2043
4000	906	1736	2292
4400	1004	1924	2541
4800	1102	2113	2790

Qn [W] 75/65/20 °C

TYPE	FCK20-11	FCK40-11	FCK80-11
LENGTH [mm]	HEATING OUTPUT [W]		
800	91	174	230
1200	167	319	422
1600	242	464	614
2000	318	609	806
2400	394	754	998
2800	469	899	1190
3200	545	1044	1382
3600	621	1189	1574
4000	697	1334	1766
4400	772	1479	1957
4800	848	1624	2149

Q [W] 70/55/20 °C

TYPE	FCK20-11	FCK40-11	FCK80-11
LENGTH [mm]	HEATING OUTPUT [W]		
800	72	138	182
1200	132	252	335
1600	192	367	487
2000	252	482	639
2400	312	596	791
2800	372	711	943
3200	431	826	1095
3600	491	940	1247
4000	551	1055	1399
4400	611	1170	1551
4800	671	1284	1703

Q [W] 55/45/20 °C

TYPE	FCK20-11	FCK40-11	FCK80-11
LENGTH [mm]	HEATING OUTPUT [W]		
800	44	83	111
1200	80	153	203
1600	116	222	296
2000	153	291	388
2400	189	361	480
2800	225	430	573
3200	261	499	665
3600	298	569	757
4000	334	638	850
4400	370	707	942
4800	407	777	1034

PARAMETERS

Parameter Group	Parameter	Value
Convector	Width	170, 320, 420mm
	Height	115mm
	Length	800-4800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	150, 300, 400 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	60, 120, 240 mm
	Height	60 mm
	Finned length	L370 mm
	Heat medium connection	2 × G1/2" inner
	Max. working temperature	110 °C
Operating conditions	Max. working overpressure	1 MPa
	Ambient temperature	+2 to +40 °C
Operating conditions	Relative humidity	20-70 %

FCR 20-14 / *NATURAL CONVECTION*



SPECIFICATIONS

- Width 170 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience



FCR 40-14 / *NATURAL CONVECTION*



SPECIFICATIONS

- Width 320 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience



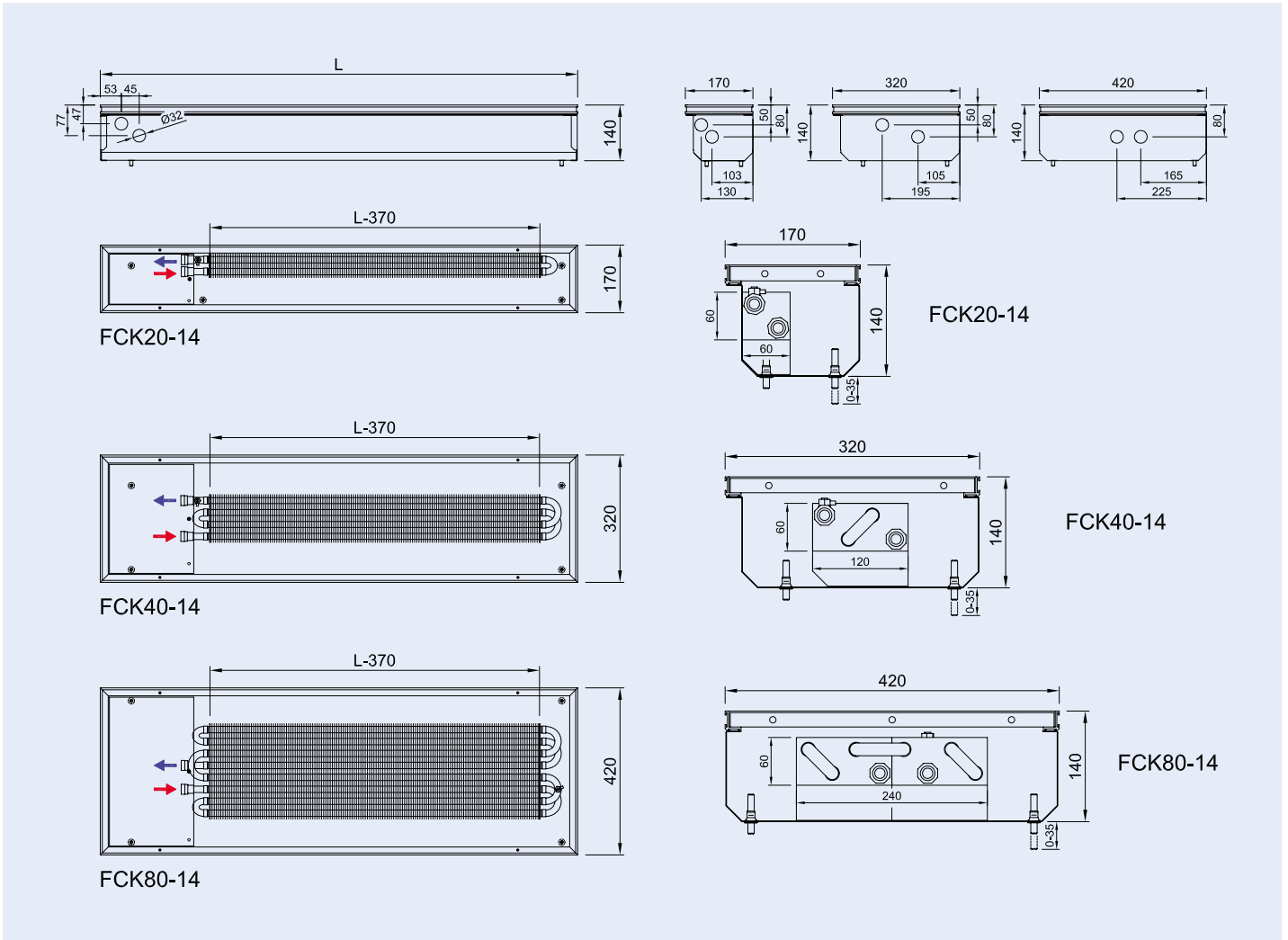
FCR 80-14 / *NATURAL CONVECTION*



SPECIFICATIONS

- Width 420 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience





HEATING OUTPUT

Q [W] 90/70/20 °C

TYPE	FCK20-14	FCK40-14	FCK80-14
LENGTH [mm]	HEATING OUTPUT [W]		
800	122	243	342
1200	223	446	627
1600	324	649	912
2000	426	852	1197
2400	527	1055	1482
2800	628	1258	1767
3200	729	1461	2052
3600	831	1663	2337
4000	932	1866	2622
4400	1033	2069	2907
4800	1134	2272	3191

Qn [W] 75/65/20 °C

TYPE	FCK20-14	FCK40-14	FCK80-14
LENGTH [mm]	HEATING OUTPUT [W]		
800	94	186	263
1200	172	340	481
1600	250	495	700
2000	328	650	919
2400	406	805	1138
2800	484	960	1357
3200	562	1114	1575
3600	640	1269	1794
4000	718	1424	2013
4400	797	1579	2232
4800	875	1733	2451

Q [W] 70/55/20 °C

TYPE	FCK20-14	FCK40-14	FCK80-14
LENGTH [mm]	HEATING OUTPUT [W]		
800	74	146	207
1200	136	268	380
1600	198	389	553
2000	260	511	726
2400	322	632	899
2800	384	754	1072
3200	446	875	1245
3600	508	997	1418
4000	570	1119	1591
4400	632	1240	1764
4800	694	1362	1937

Q [W] 55/45/20 °C

TYPE	FCK20-14	FCK40-14	FCK80-14
LENGTH [mm]	HEATING OUTPUT [W]		
800	45	87	125
1200	83	160	230
1600	121	232	334
2000	158	305	438
2400	196	377	543
2800	234	450	647
3200	271	522	752
3600	309	595	856
4000	347	667	960
4400	384	740	1065
4800	422	812	1169

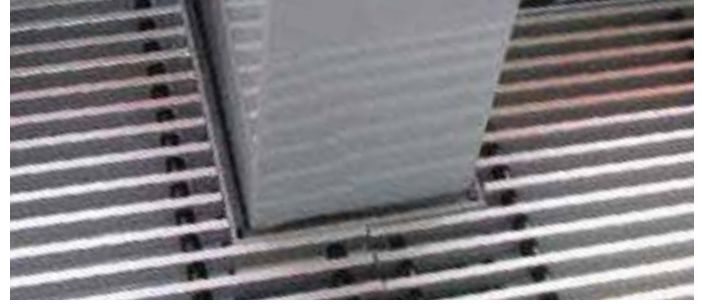
PARAMETERS

Convector	Width	170, 320, 420 mm
	Height	140 mm
	Length	800-4800 mm in step 400 mm
	Height adjusting	0-35 mm
	Stainless trough width	150, 300, 400 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	60, 120, 240 mm
	Height	60 mm
	Finned length	L370 mm
	Heat medium connection	2 × G1/2" inner
	Max. working temperature	110 °C
Operating conditions	Max. working overpressure	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

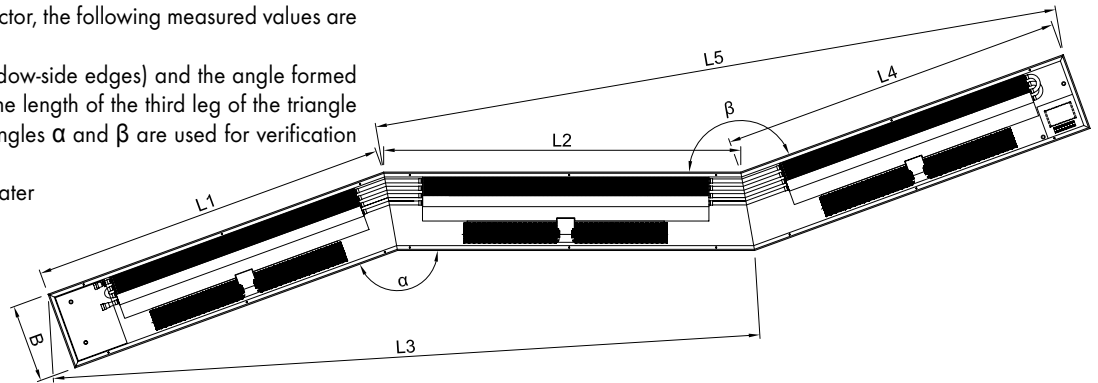
the customer and technical details are agreed (water connection side, power connection). Following that, the manufacturing of the floor convector starts.



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



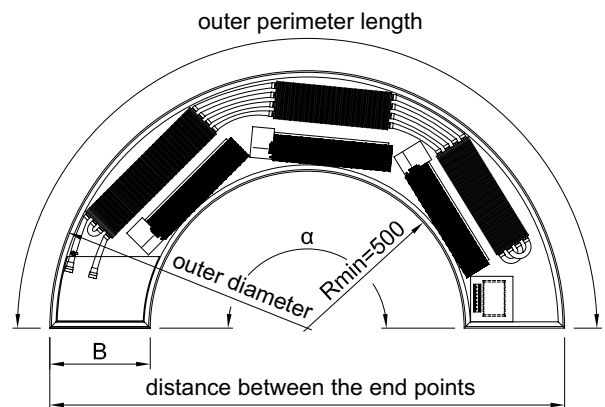
ARCHED CONVECTORS

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.



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
F	C	T	4	0	-	1	1	1	6	0	-	N	R	1	2	1	-	
Model Dynamic			Convector type			Free position		Height [cm]		Length [cm]			Atypical lengths	Surface finish of trough	Type and colour combination of the frame and grill		Regulation type 24V DC, 230V AC 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	
FCT20	FCT20-09, FCT20-11
FCT40	FCT40-09, FCT40-11
FCC2A, FCC4A	FCC2A-13, FCC4A-13
230V AC with fan	
FCT20	FCT20-08, FCT20-09, FCT20-11
FCT40	FCT40-09, FCT40-11
FCC2A, FCC4A	FCC2A-13, FCC4A-13
with natural convection	
FCK20	FCK20-09, FCK20-11, FCK20-14
FCK40	FCK40-09, FCK40-11, FCK40-14
FCK80	FCK80-09, FCK80-11, FCK80-14

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)
B	spray painting of a tank and an exchanger to RAL 9005 matt
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 B, 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 DYNAMIC convectors
230V AC with fan	
0	without regulator, convector with 230V AC fans, control by another convector or custom regulation
1	Z-VD001 , regulator for FCT20-08, FCT20-09, FCT40-09 (230V AC), placed in the convector
2	free position
3	Z-VD003 regulator for FCT20-11, FCT40-11, FCC2A*, FCC4A* (230V AC) placed in the convector
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 FCT20-09, FCT40-09, FCT20-11, FCT40-11 (24V DC) placed in the convector
7	regulator 24V DC pro FCC2A*, FCC4A*
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.

* FCC 230 V convectors have number 3 at position 17, FCC 24 V DC convectors number 7, the controller is always a part of the convector





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