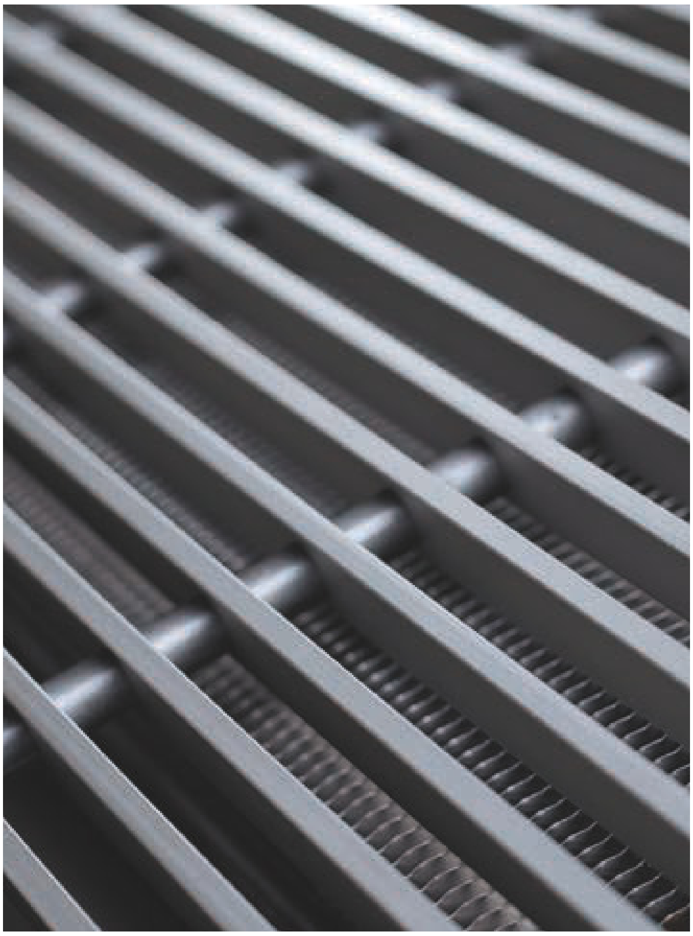
DYNAMIC

CONTENT:



ECONOMY, ENERGY SAVING AND SAFETY

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

24V DC

Termo Dynamic 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.

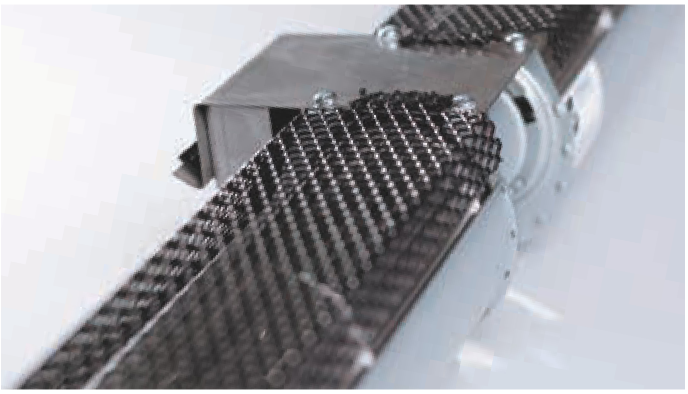
Floor convector control:
- room thermostat
- in convector installed regulator

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 convector 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).



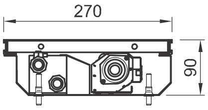
230V AC, 50HZ

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.

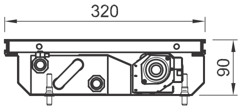
TERMO DYNAMIC TYPES

FCT FLOOR CONVECTOR WITH FAN

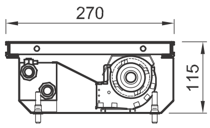
24V DC FLOOR CONVECTORS, DIRECT-CURRENT VOLTAGE



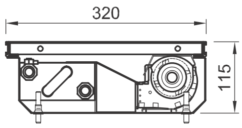
FCT20-09
270×90×800-4800 mm
Q 75/65/20 °C: 394-4779 W
Q 55/45/20 °C: 226-2748 W
heating, 2 pipe system
page 12



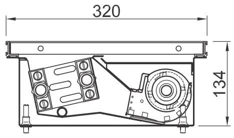
FCT40-09
320×90×800-4800 mm
Q 75/65/20 °C: 578-7039 W
Q 55/45/20 °C: 345-4198 W
heating, 2 pipe system
page 13



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

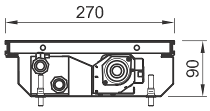


FCT40-11
320×115×800-4800 mm
Q 75/65/20 °C: 738-8122 W
Q 55/45/20 °C: 435-4787 W
heating, 2 pipe system
page 15

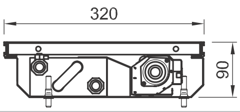


FCC2A, FCC 4A
320×134×1200-2800 mm
Q75/65/20 °C: 2001-6003 W
Q55/45/20 °C: 1191-3574 W
heating, cooling, 2 and 4 pipe system
page 20

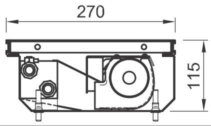
230V AC FLOOR CONVECTORS, ALTERNATING-CURRENT VOLTAGE



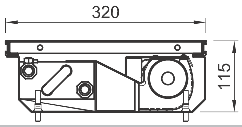
FCT20-09
270×90×800-3600 mm
Q 75/65/20 °C: 488-3902 W
Q 55/45/20 °C: 280-2244 W
heating, 2 pipe system
page 24



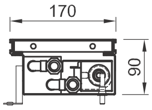
FCT40-09
320×90×800-3600 mm
Q 75/65/20 °C: 762-6094 W
Q 55/45/20 °C: 434-3471 W
heating, 2 pipe system
page 25



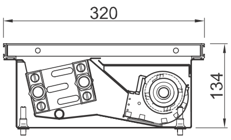
FCT20-11
270×115×800-4800 mm
Q 75/65/20 °C: 457-4839 W
Q 55/45/20 °C: 264-2795 W
heating, 2 pipe system
page 26



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



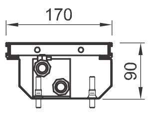
FCT20-08
170×90×800-4800 mm
Q 75/65/20 °C: 450-4950 W
Q 55/45/20 °C: 260-2863 W
heating, 2 pipe system
page 23



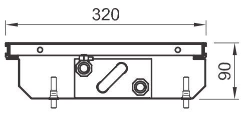
FCC2A, FCC 4A
320×134×1200-2800 mm
Q75/65/20 °C: 1579-4737 W
Q55/45/20 °C: 940-2821 W
heating, cooling, 2 and 4 pipe system
page 38

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

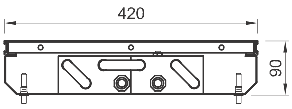
FCK FLOOR CONVECTOR WITH NATURAL CONVECTION



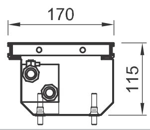
FCK20-09
170×90×800-4800
Q 75/65/20 °C: 70-656 W
Q 55/45/20 °C: 34-318 W
heating, 2 pipe system
page 46



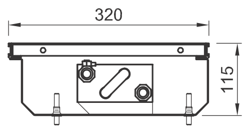
FCK40-09
320×90×800-4800 mm
Q 75/65/20 °C: 142-1323 W
Q 55/45/20 °C: 66-614 W
heating, 2 pipe system
page 46



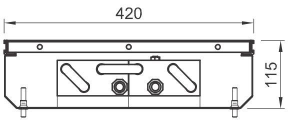
FCK80-09
420×90×800-4800 mm
Q75/65/20 °C: 175-1637 W
Q55/45/20 °C: 82-768 W
heating, 2 pipe system
page 46



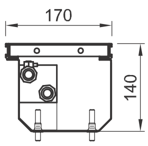
FCK20-11
170×115×800-4800 mm
Q 75/65/20 °C: 91-848 W
Q 55/45/20 °C: 44-407 W
heating, 2 pipe system
page 48



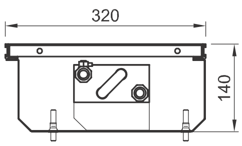
FCK40-11
320×115×800-4800 mm
Q 75/65/20 °C: 174-1624 W
Q 55/45/20 °C: 83-777 W
heating, 2 pipe system
page 48



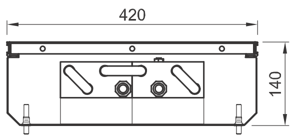
FCK80-11
420×115×800-4800 mm
Q 75/65/20 °C: 230-2149 W
Q 55/45/20 °C: 111-1034 W
heating, 2 pipe system
page 48



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



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



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

CONSTRUCTION

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.

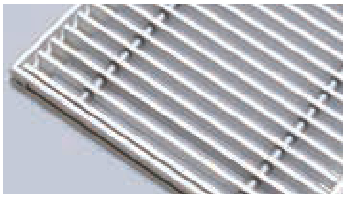
GRILLS

Convector 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 convector.

ALUMINIUM GRILLS

ROLL-UP GRILLS

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

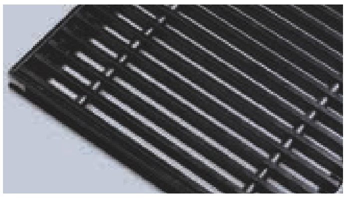


R1-1

Al-roll grill, natural
Al-frame, natural

R2-1

Al-roll grill, bronze
Al-frame, bronze



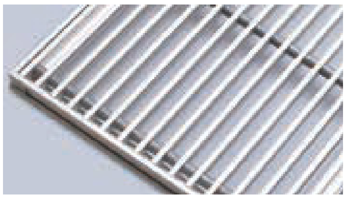
R3-1

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

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

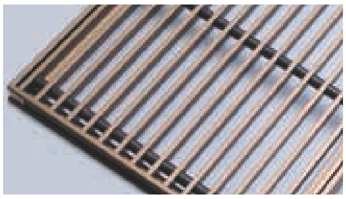
LINEAR GRILLS

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



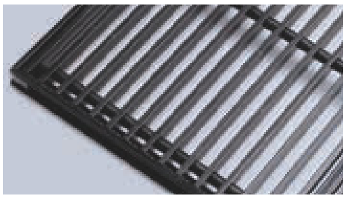
R1-2

Linear Al-grill, natural
Al-frame, natural



R2-2

Linear Al-grill, bronze
Al-frame, bronze



R3-2

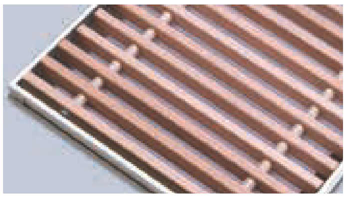
Linear Al- grill, black (coloured)
Al-frame black (coloured)

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

WOODEN GRILLS

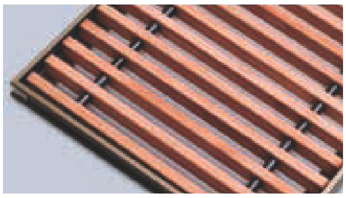
ROLL-UP GRILLS

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



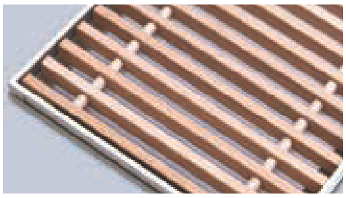
R6-1

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



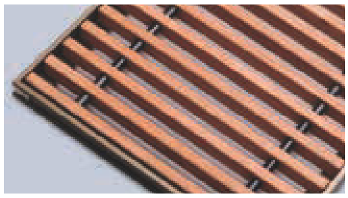
R6-2

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 delimitated by residual metal rollers. A fix non-rolling grill.

R5-1

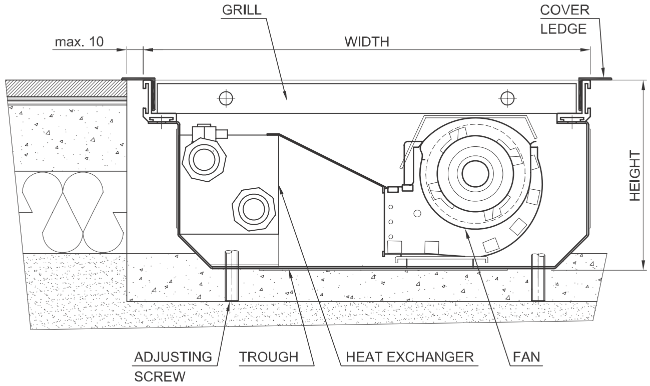
stainless steel grill, transverse

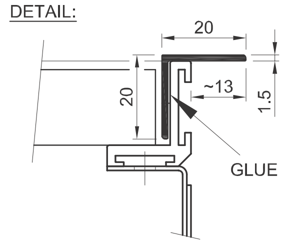
A grill available to order, calculation as per the convector type.

FINISHING COVER LEDGE

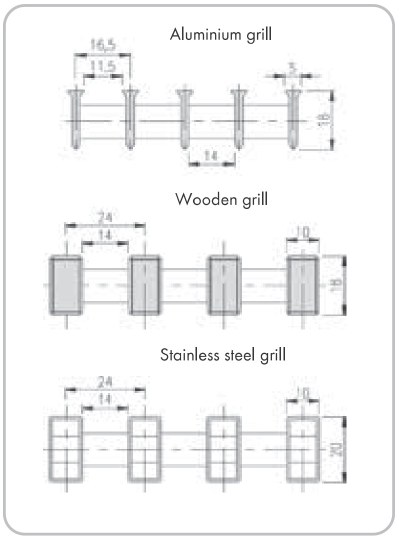
- for installation in wooden and floating floors to cover the dilatation joints
- variants available: Al natural, Al bronze (anodized aluminium) or coated with powder colour acc. to RAL Chart
- covers dilatation joints up to 10mm
- profile 20x20x1.5 mm
- ledge is a part of convector package
- installation 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.

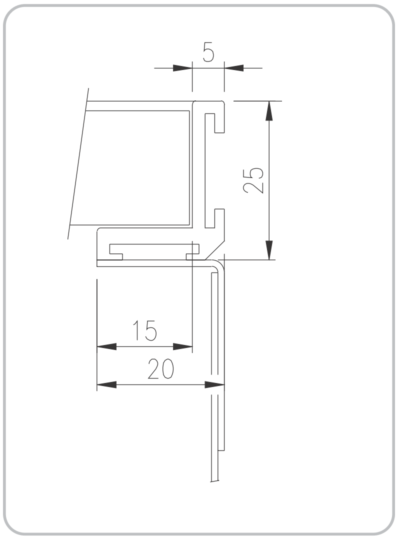




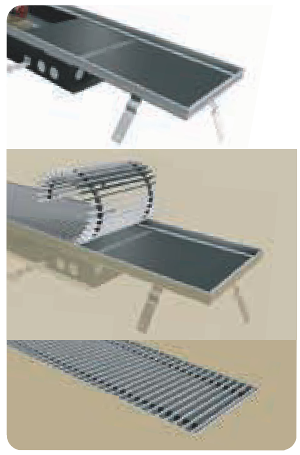
Grill cross section



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

CONVECTOR WITH FANS 24V DC

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

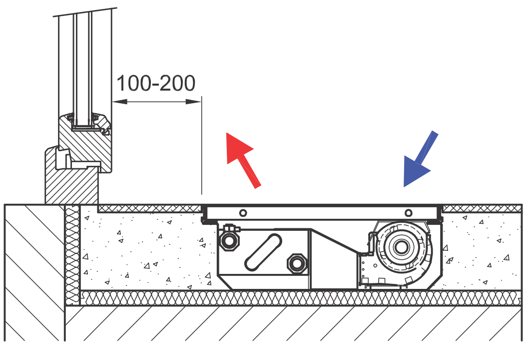
Table of fans electric power input (FCT types)

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

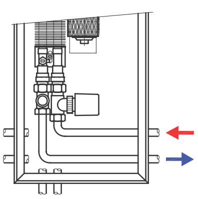
RECOMMENDED STANDARD INSTALLING IN FLOOR

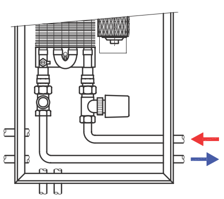
- Convector installation with exchanger towards window
- ideal position 100–200 mm distance from window
- fan draws in the room air
- the air is warmed up by flowing through exchanger
- hot air is mixed with cold air flowing off the window surface
- air circulation: warms up the room air
  screens the window surface
  secondary demisters the window surface

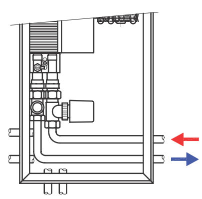


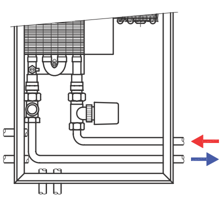
CONVECTOR CONNECTION TO THE HEATING SYSTEM

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

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

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

m=1,083 pro FCT20-09	m=1,100 pro FCT20-11
m=1,012 pro FCT40-09	m=1,040 pro FCT40-11

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

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

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

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

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

HEATING WATER FLOW RATE THROUGH EXCHANGER

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

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

CONVECTOR DIMENSIONING BASED ON ACOUSTIC PARAMETERS

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

EXCHANGER HYDRAULIC LOSSES

TYPE	Length [mm]	Volume [l]	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
Kv (m^3/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 (m^3/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

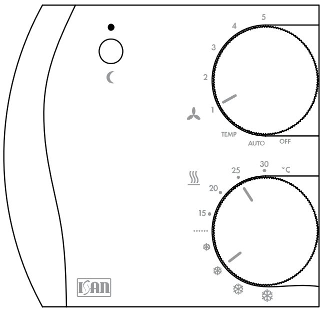
parameters of free packed in lockshield valves

FCT 24V DC FLOOR COVECTOR REGULATION

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

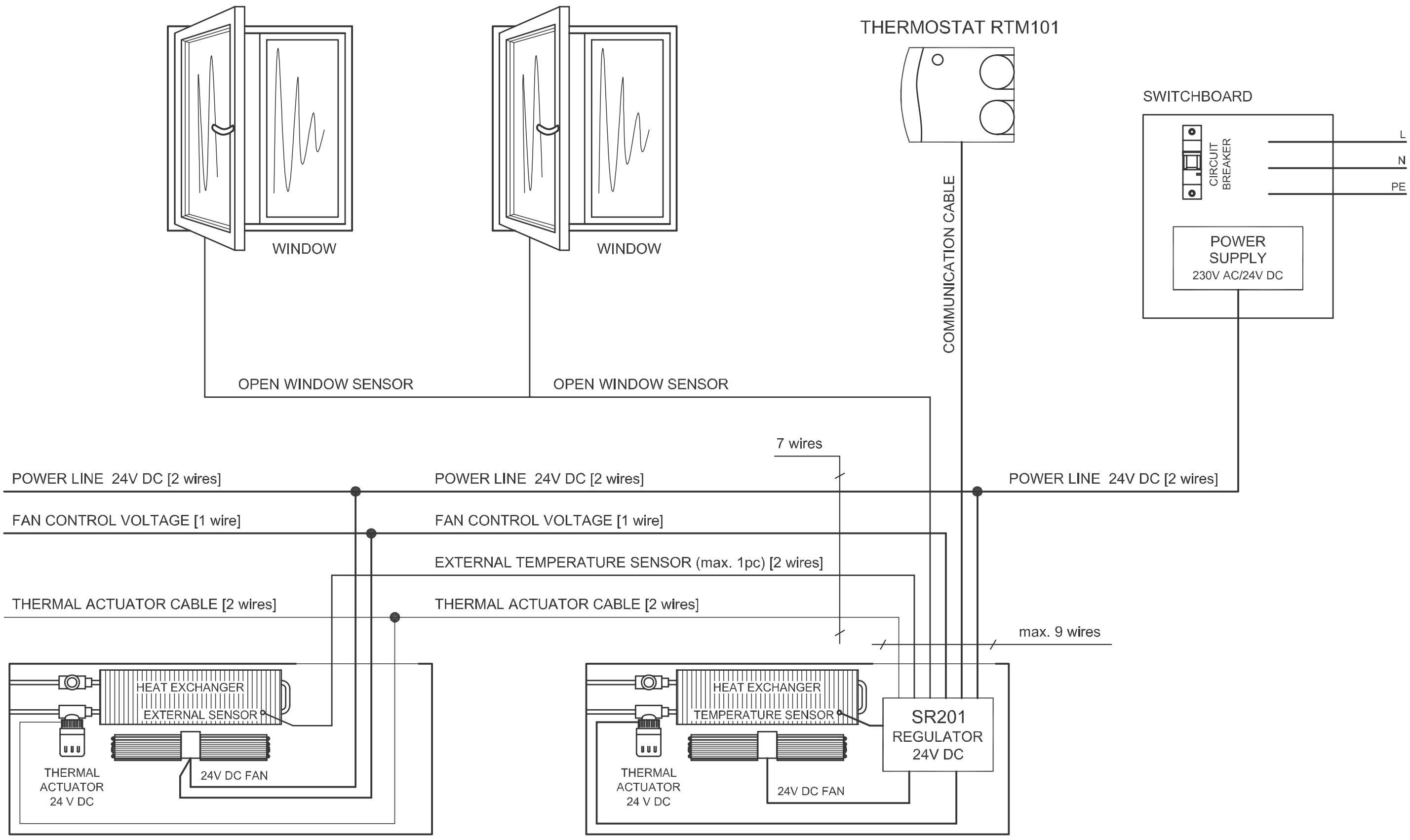
Decreases the demand for thermostat setting by –2 °C (heating) or +2 °C (cooling). It is not necessary to reset the thermostat parameters for the night or for a period of absence in the house. The sleep mode is signalized by LED diode on the thermostat cover.

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.

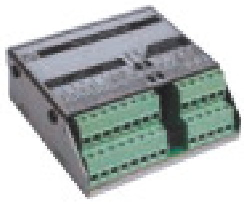
ACCESSORIES FOR 24V DC CONVECTORS

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 FCT convectors

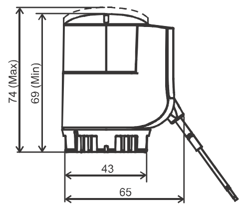
Operating voltage:	24V DC
Communication:	CIB protocol
Inputs:	24V DC, control signal from bus-bar and sensors
Outputs:	control signals for fans, 24V DC for thermal actuators

DR60-24, DR100-24

24V DC power supply unit, placing on DIN ledge

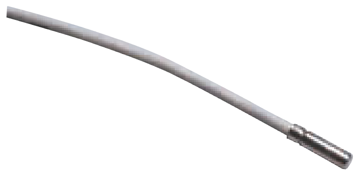
Input voltage:	240V /50Hz
Output voltage:	24V DC
Final nominal output / current	DR60-24 **60W**/2.5A
	DR100-24 **100W**/4.2A

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

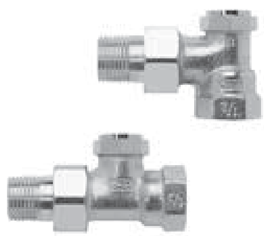
Z-TD001 direct, Z-TE001 corner

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 (m³/h)	0,1	0,2	0,31	0,45	0,69	0,89

Z-RD002 direct, Z-RE002 corner



Lockshield valves

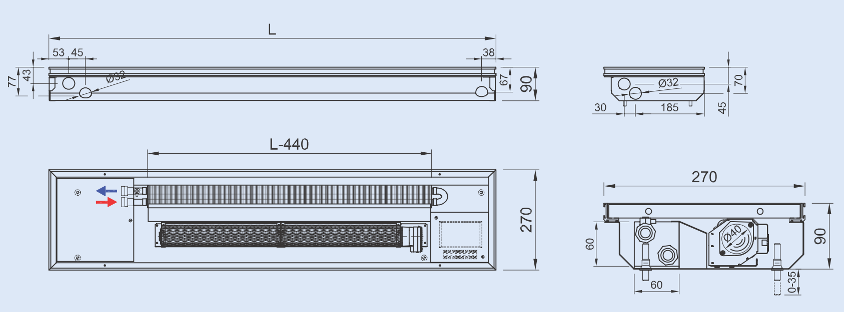
Dimension:	DN15, NF norm
Connection thread:	M30×1,5 mm
Max. working temperature:	120 °C
Max. working overpressure:	PN10

T- turns	0,25	0,5	1,0	1,5	2,0	3,0	4,0
k_V (m³/h)	0,13	0,22	0,43	0,65	0,85	1,25	1,7

FCT20-09 **24V** | CROSS-FLOW FAN CONVECTION

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
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	60 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 40 mm
	Operating voltage	**Safe voltage 24V DC**
	Ingress protection	IP20
	Regulation	control voltage **0–10V** (regulation SR201, ...)
Operating conditions	Ambient temperature	+2 to +40 °C
	Relative humidity	20–70%



	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE L_{pAmax} [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	40
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

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

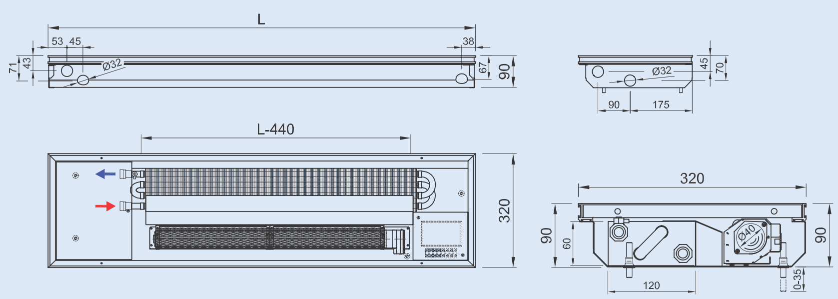
SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	77	383	**490**	648
1200	163	767	**980**	1296
1600	249	1150	**1470**	1944
2000	335	1534	**1961**	2592
2400	421	2301	**2941**	3888
2800	506	2388	**3029**	3975
3200	592	3068	**3921**	5184
3600	678	3451	**4411**	5832
4000	764	3835	**4902**	6480
4400	850	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
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	120 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 40 mm
	Operating voltage	**Safe voltage 24V DC**
	Ingress protection	IP20
	Regulation	control voltage **0–10V** (regulation SR201, ...)
Operating conditions	Ambient temperature	+2 to +40°C
	Relative humidity	20–70%



	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE L_{pAmax} [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 frame, Al natur cross roll-up grill, installed regulation SR201, convector 24V DC

Ordering, see the page 53

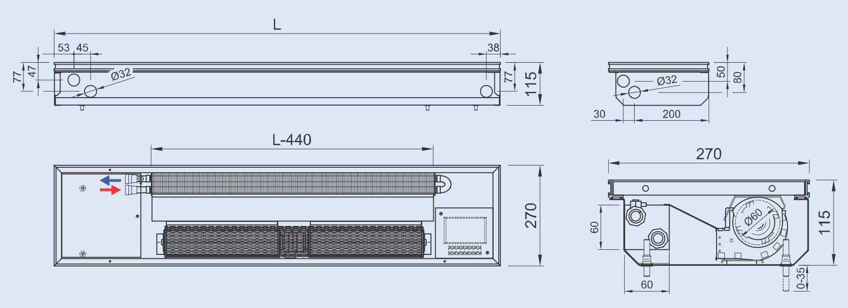
FCT20-11 **24V** | CROSS-FLOW FAN CONVECTION

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

PARAMETERS

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



	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE L_{pAmax} [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

Ordering, see the page 53

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

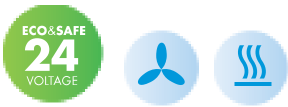
SPEED	0	1	2	3
LENGTH [mm]	HEATING OUTPUT [W]			
800	120	584	**738**	946
1200	253	1167	**1477**	1891
1600	386	1751	**2215**	2837
2000	520	2335	**2953**	3783
2400	653	2918	**3692**	4728
2800	786	3502	**4430**	5674
3200	920	4086	**5168**	6620
3600	1053	4669	**5907**	7565
4000	1186	5253	**6645**	8511
4400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

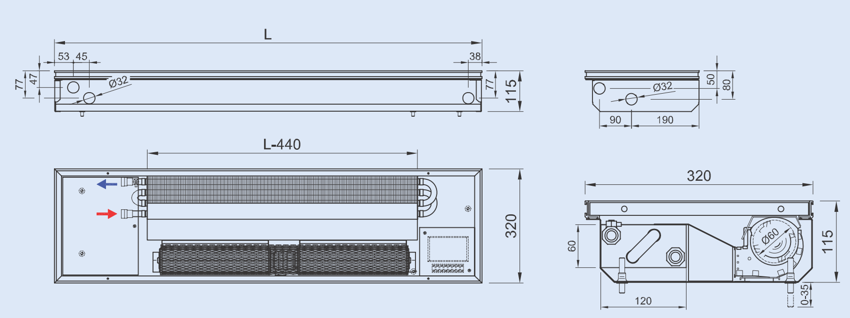
Q [W] 55/45/20°C

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
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	120 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 60 mm
	Operating voltage	**Safe voltage 24V DC**
	Ingress protection	IP20
	Regulation	control voltage **0–10V** (regulation SR201, ...)
Operating conditions	Ambient temperature	+2 to +40°C
	Relative humidity	20–70%



	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE L_{pAmax} [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

Ordering, see the page 53

HEATING/COOLING CONVECTORS 24V DC

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

input power of installed fans, speed regulator and power supply

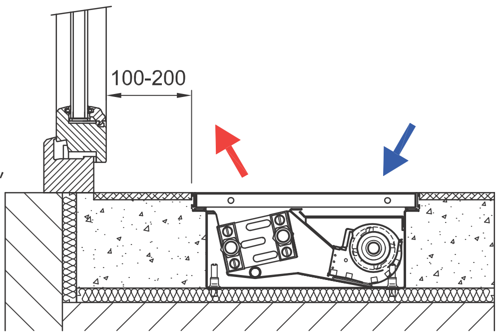
Add considered accessories to the power input of FCC:

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

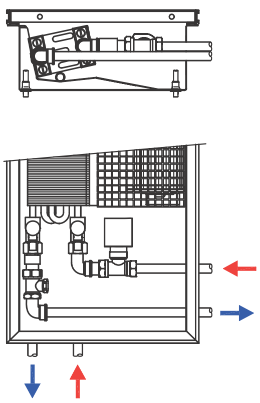
Condensate pump:
+16 W (switching-on at sufficient amount of condensate)

RECOMMENDED STANDARD INSTALLING IN FLOOR

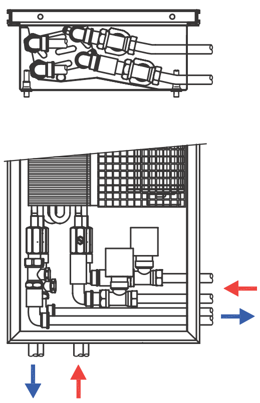
Convector installation with exchanger towards window, ideal position 100–200 mm distance from window, fan draws in the room air.



CONVECTOR CONNECTION TO THE HEATING SYSTEM



2 pipe system



4 pipe 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

DESIGNING OF FCC 24V DC

HEATING OUTPUT RECALCULATION FOR ANOTHER TEMPERATURE GRADIENT

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

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

m=1,015 for FCC2A, FCC4A

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

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

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

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

for Ti=15°C, k=1.12
E.g.: Q [75/65/15 °C] = 1.12 * Qn [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.

HEATING WATER FLOW RATE THROUGH EXCHANGER

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

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

CONVECTOR DIMENSIONING BASED ON ACOUSTIC PARAMETERS

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

EXCHANGER HYDRAULIC LOSSES

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 (m^3/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 (m^3/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

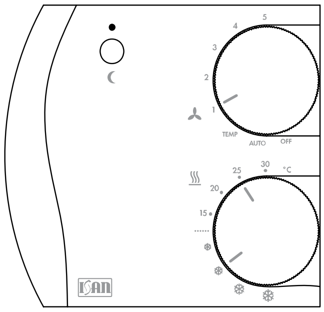
parameters of free packed in lockshield valves

REGULATION OF FCC 24 V DC

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 Foxtrot-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 ☾

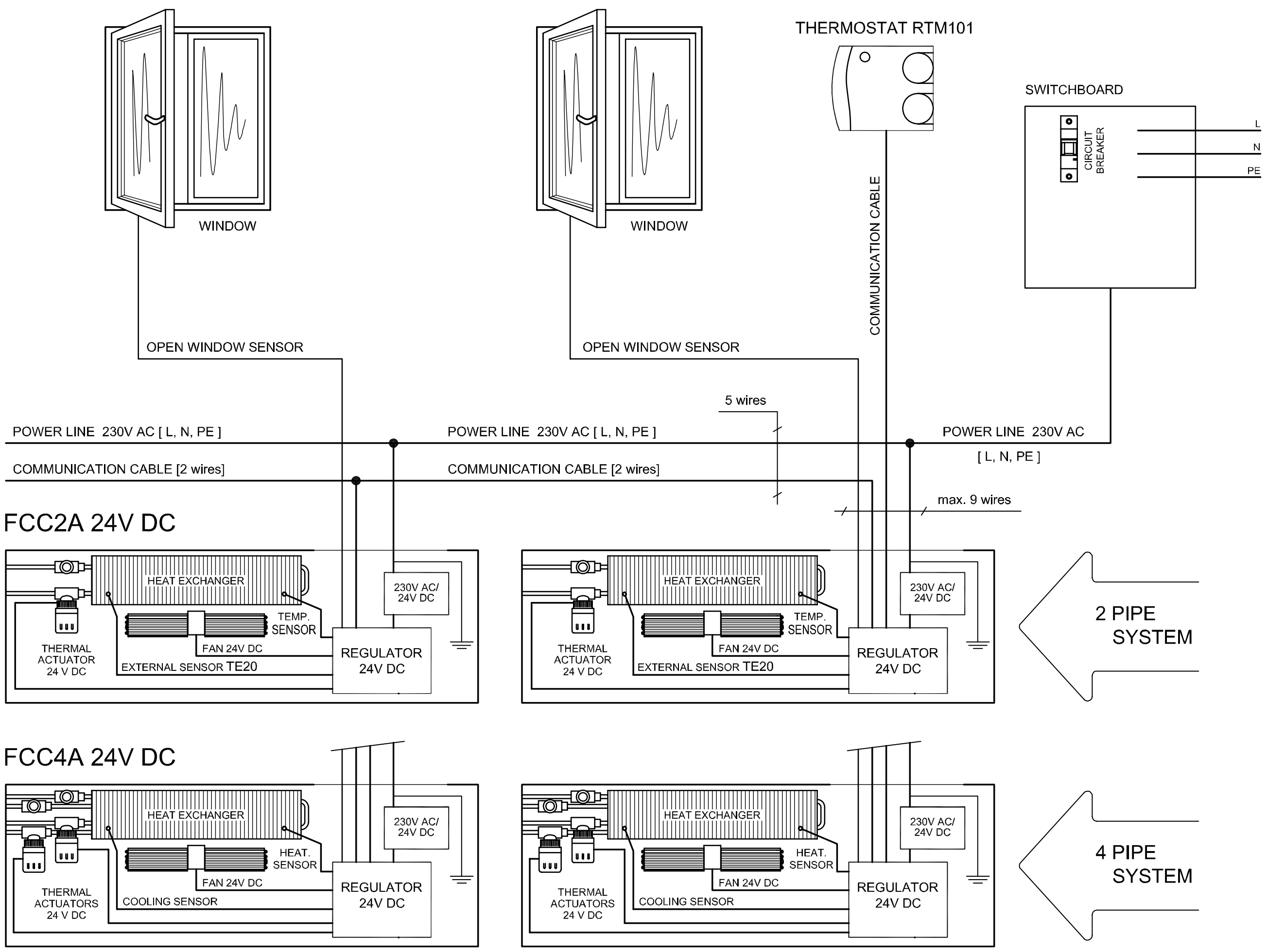
Decreases the demand for thermostat setting by –2 °C (heating) or +2 °C (cooling). It is not necessary to reset the thermostat parameters for the night or for a period of absence in the house. The sleep mode is signalized by LED diode on the thermostat cover.

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.



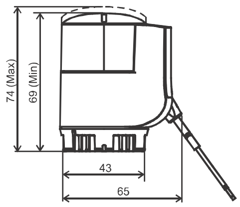
ACCESSORIES FOR FCC 24V DC

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

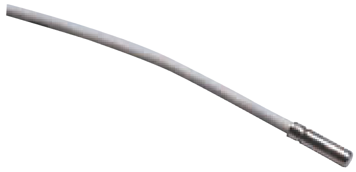
Z-TS24, Z-TS24-5m, thermal actuator



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)

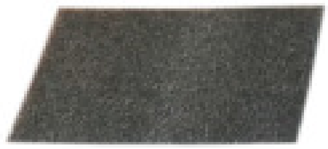
External temperature sensor as "antifreeze protection"



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 1m:	21 dB(A)
Voltage-free contact - alarm:	3 A induction, contacts N.O., N.C.

Z-TD001 direct, Z-TE001 corner

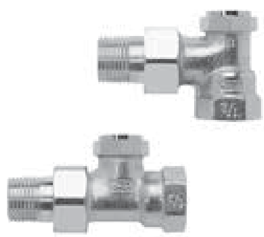
Thermostatic valve installed on the exchanger input tube regulates the flow rate of heating medium through the heat exchanger

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

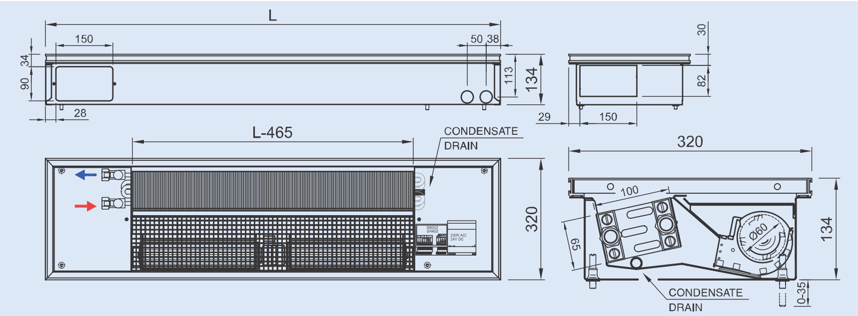
Note: A speed controller and a power supply are always parts of the FCC floor convector

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

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 × G1/2" female thread (2 pipe system)
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 60 mm
	Operating voltage	input to convector 230V AC, fans 24V DC
	Ingress protection	IP20
	Regulation	control voltage **0–10V** (installed regulation)
Operating conditions	Ambient temperature	+2 to +40 °C
	Relative humidity	20–70 %



	SPEED	LENGTH [mm]				
		1200	1600	2000	2400	2800
ACOUSTIC PRESSURE L_{pAmax} [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

Regulation is always a part of the convector, black covers of water and electricity. Ordering, see the page 53

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

FCC2A-13 **24V** | CROSS-FLOW FAN CONVECTION

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
	24	50	110	83	326	252	661	524	773	627	898	747
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
	24	50	165	124	489	377	992	786	1159	941	1346	1120
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
	24	50	220	166	652	503	1323	1049	1545	1255	1795	1493
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
	24	50	275	207	814	629	1653	1311	1931	1568	2244	1867
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	330	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
	24	50	78	69	229	209	465	441	554	537	678	678
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
	24	50	117	103	344	314	698	662	831	805	1018	1018
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
	24	50	156	137	459	418	931	883	1108	1074	1357	1357
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
	24	50	195	172	574	523	1163	1104	1385	1342	1696	1696
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
	24	50	58	58	175	175	369	369	448	448	528	528
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
	24	50	88	88	263	263	554	554	672	672	791	791
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
	24	50	117	117	351	351	738	738	897	897	1055	1055
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
	24	50	146	146	439	439	923	923	1121	1121	1319	1319
2800	30	45	342	263	1012	804	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

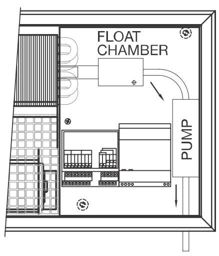
Speed level			Minimal		Standard level						Maximal	
SPEED			1		2		3		4		5	
LENGTH [mm]	Ti [°C]	r.v.[%]	COOLING OUTPUT [W]									
			Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	30	45	72	72	222	222	473	473	584	584	693	693
	28	50	61	61	189	189	402	402	495	495	587	587
	26	**50**	51	51	156	156	**330**	**330**	407	407	481	481
	24	50	40	40	122	122	259	259	317	317	374	374
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
	24	50	59	59	184	184	388	388	475	475	561	561
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
	24	50	79	79	245	245	518	518	633	633	748	748
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
	24	50	99	99	306	306	647	647	791	791	935	935
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 (Qs<Qk), 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



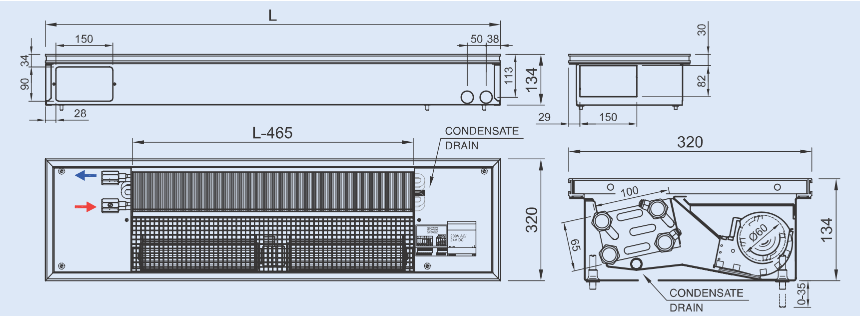
FCC4A-13 **24V** | CROSS-FLOW FAN CONVECTION

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

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
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 60 mm
	Operating voltage	input to convector 230V AC, fans 24V DC
	Ingress protection	IP20
	Regulation	control voltage **0–10V** (installed regulation)
Operating conditions	Ambient temperature	+2 to +40 °C
	Relative humidity	20–70 %



	SPEED	LENGTH [mm]				
		1200	1600	2000	2400	2800
ACOUSTIC PRESSURE L_{pAmax} [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, stainles steel trough, Al bronze frame, Al bronze cross roll-up grill, installed regulation, convector with fans 24V DC

Regulation is always a part of the convector, black covers of water and electricity. Ordering, see the page 53

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

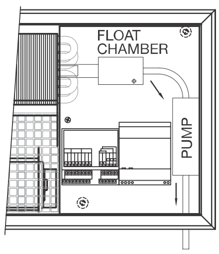
Speed level			Minimal		Standard level						Maximal	
SPEED			1		2		3		4		5	
LENGTH [mm]	Ti [°C]	r.v.[%]	COOLING OUTPUT [W]									
			Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	30	45	67	67	211	211	442	442	529	529	583	583
	28	50	57	57	179	179	374	374	447	447	493	493
	26	**50**	48	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 (Qs<Qk), 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



CONVECTORS WITH FANS 230V AC

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

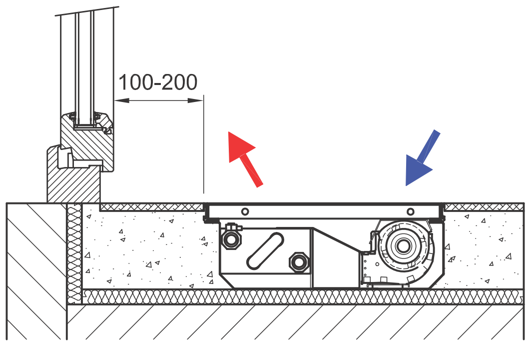
Maximal electric input at voltage 230V AC (without speed regulator) and number of installed fans

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 FCT20-09 FCT40-09 FCT20-11 FCT40-11	230V = max.	6	1	17	1	23	2	34	2	40	3	51	3	57	4	68	4	74	5	85	5	91	6
		41	1	41	1	82	2	82	2	123	3	123	3	164	4	164	4	–	–	–	–	–	–
		41	1	41	1	82	2	82	2	123	3	123	3	164	4	164	4	–	–	–	–	–	–
		25	1	45	1	70	2	90	2	90	2	135	3	135	3	180	4	180	4	180	4	205	5
		25	1	45	1	70	2	90	2	90	2	135	3	135	3	180	4	180	4	180	4	205	5
		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)

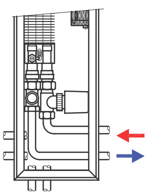
RECOMMENDED STANDARD INSTALLING IN FLOOR

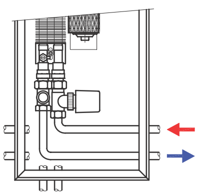
- Convector installation with exchanger towards window
- Ideal position 100–200 mm distance from window
- Fan draws in the room air
- The air is warmed up by flowing through exchanger
- Hot air is mixed with cold air flowing off the window surface
- Air circulation: warms up the room air
  screens the window surface
  secondary demisters the window surface

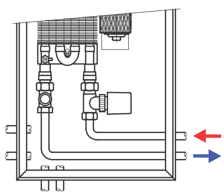


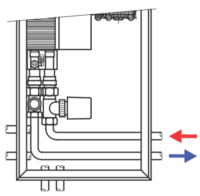
CONVECTOR CONNECTION TO THE HEATING SYSTEM

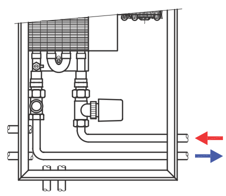
Floor convector is fitted with openings for connection to the heating system. There are three connection possibilities, from the room, side or window wall.


FCT20-08


FCT20-09


FCT40-09


FCT20-11


FCT40-11

DESIGNING OF 230V AC / 50HZ

HEATING OUTPUT RECALCULATION FOR ANOTHER TEMPERATURE GRADIENT

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

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

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

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

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

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

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

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

HEATING WATER FLOW RATE THROUGH EXCHANGER

M = 0.86Q/(T1-T2) [kg/h]

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

CONVECTOR DIMENSIONING BASED ON ACOUSTIC PARAMETERS

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

EXCHANGER HYDRAULIC LOSSES

TYPE	Length [mm]	Volume [l]	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 (m^3/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 (m^3/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

FCT 230V AC FLOOR CONVECTOR REGULATION

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

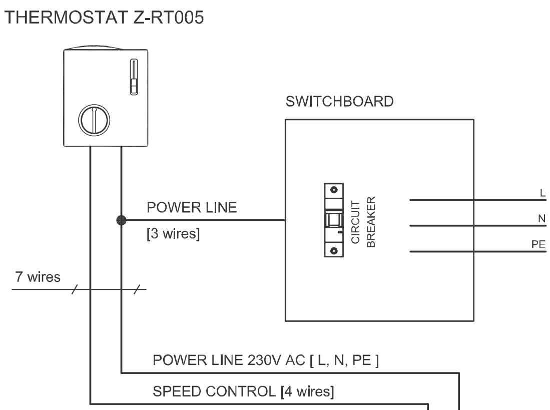
All regulation elements are available to order, as per the project demands. The manufacturer's offers reckon with one thermostat per a room, the number of regulators depends on the system capacity and convector length. Thermophone installation is influenced by consideration, whether it is necessary to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

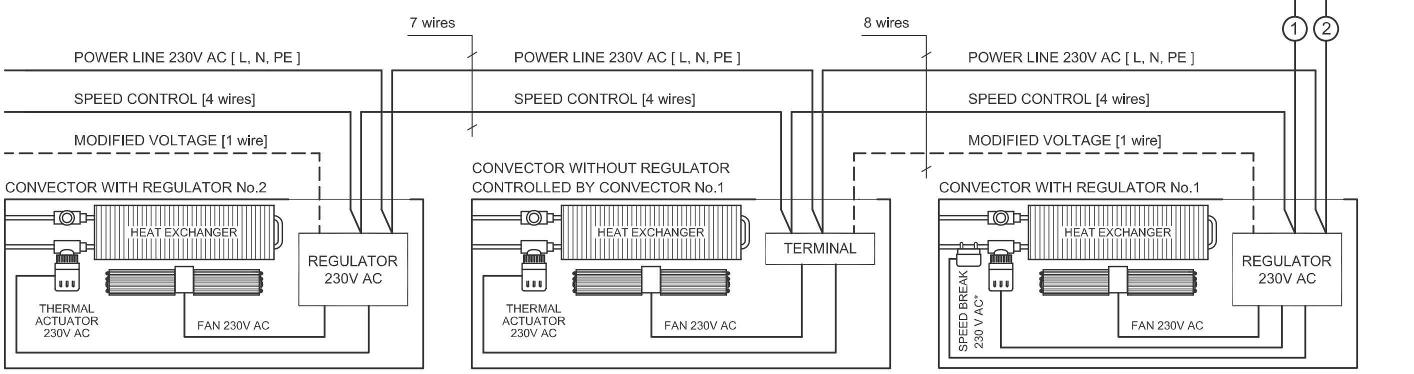
0–30 °C range for heating or cooling

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

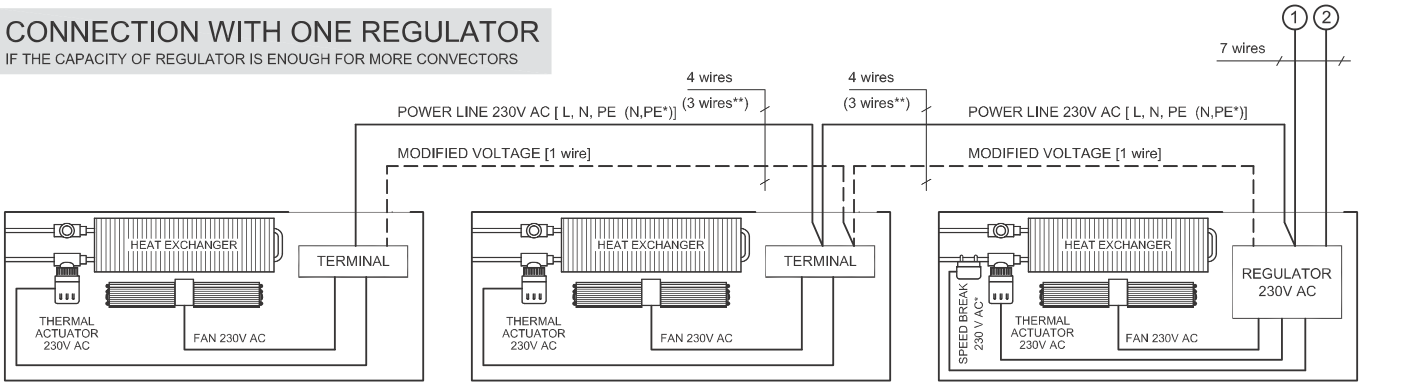
IF THE CAPACITY OF THE REGULATOR IS OVER USE NEXT REGULATOR



* 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.

ACCESSORIES FOR 230V AC CONVECTORS

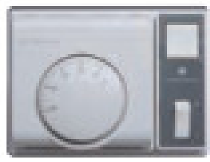
Z-DS002

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

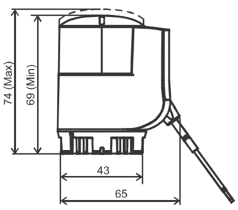
Convector type:	**FCT20-08**
Number of controlled fans:	**7**
Convector type:	**FCT20-09, 40-09**
Number of controlled fans:	**4**
Dimension:	114×70×65 mm

Z-VD003

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

ACCESSORIES FOR 230V CONVECTORS

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

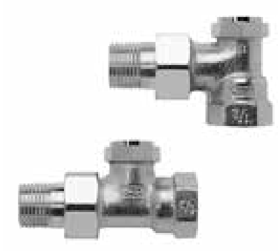
Z-TD001 direct, Z-TE001 corner

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 (m³/h)	0,1	0,2	0,31	0,45	0,69	0,89

Z-RD002 direct, Z-RE002 corner



Lockshield valves

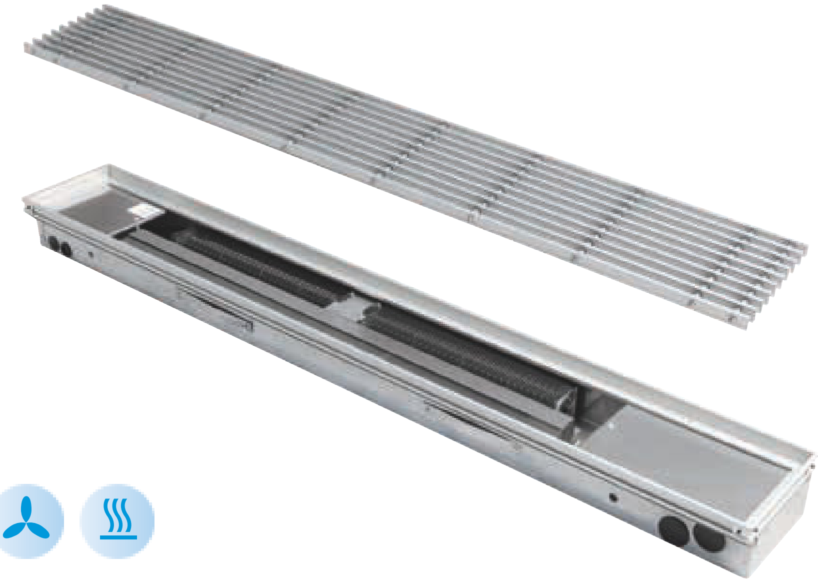
Dimension:	DN15, NF norm
Connection thread::	M30×1,5 mm
Max. working temperature:	120 °C
Max. working overpressure:	PN10

T- turns	0,25	0,5	1,0	1,5	2,0	3,0	4,0
k_V (m³/h)	0,13	0,22	0,43	0,65	0,85	1,25	1,7

FCT20-08 **230V** | CROSS-FLOW FAN CONVECTION

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

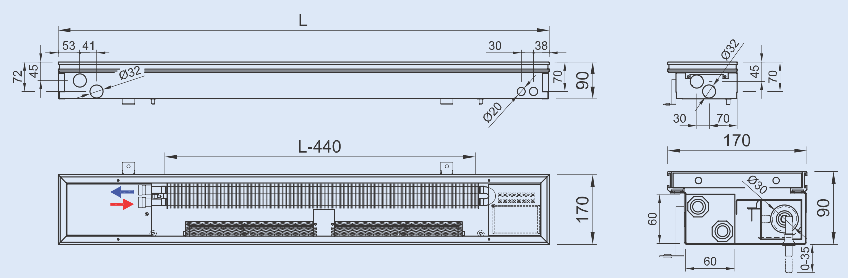
SPEED	0	1	2	3
rpm	0	1692	**1928**	2455
LENGTH [mm]	HEATING OUTPUT [W]			
800	38	327	**378**	410
1200	81	654	**756**	820
1600	123	981	**1134**	1231
2000	166	1308	**1512**	1641
2400	209	1635	**1890**	2051
2800	251	1962	**2268**	2461
3200	294	2289	**2646**	2871
3600	336	2616	**3024**	3282
4000	379	2943	**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
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	60 mm
	Height	60 mm
	Finned length	L-440mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 30 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
	Regulation	by output voltage modification (regulation Z-VD...)
Operating conditions	Ambient temperature	+2 to +40°C
	Relative humidity	20–70%

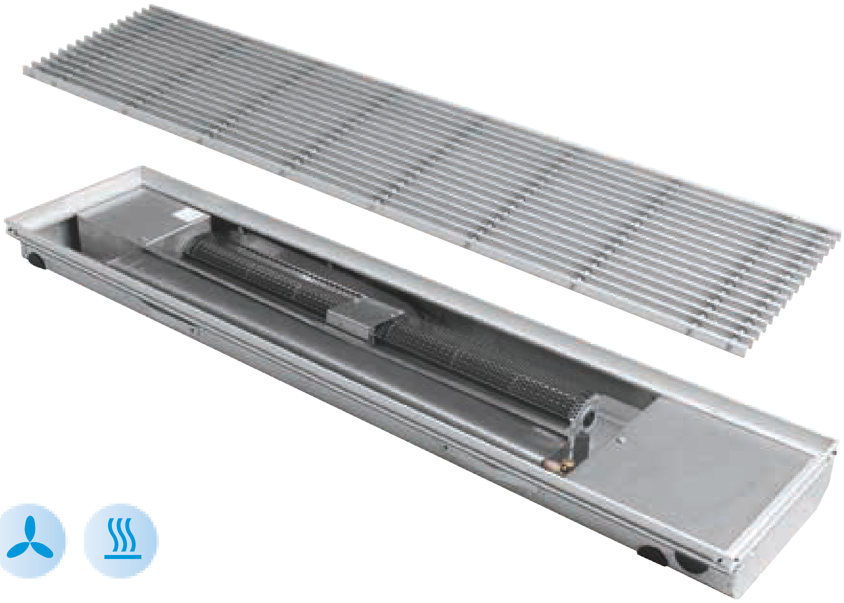


	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE L_{pAmax} [dB(A)]	1	33	34	35	35	35	36	37	37	37	38	39
	2	41	41	42	43	43	43	44	45	45	46	46
	3	46	47	47	48	48	46	49	50	50	51	51
AIR VOLUME [m³/h]	1	32	66	99	133	165	199	232	266	298	332	365
	2	41	86	127	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

Ordering, see the page 53

FCT20-09 **230V** | CROSS-FLOW FAN CONVECTION

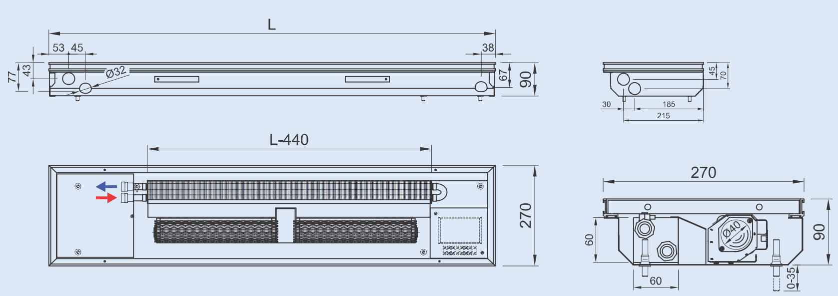


SPECIFICATIONS

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

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
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	60 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 40 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
	Regulation	by output voltage modification (regulation Z-VD...)
Operating conditions	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	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

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

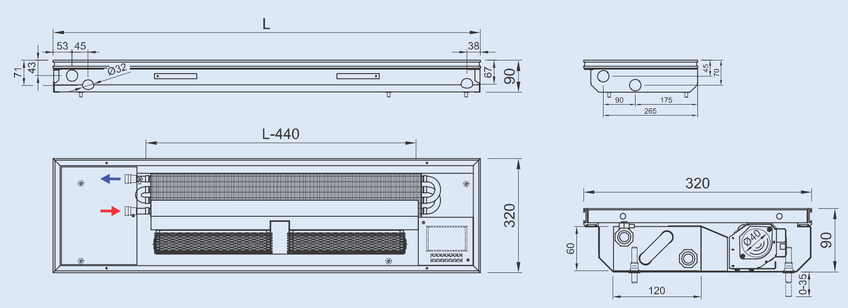
SPEED	0	1	2	3
rpm	0	576	**972**	1183
LENGTH [mm]	HEATING OUTPUT [W]			
800	77	376	**637**	740
1200	163	752	**1274**	1480
1600	249	1127	**1911**	2220
2000	335	1503	**2547**	2960
2400	421	1879	**3184**	3699
2800	507	2255	**3821**	4439
3200	593	2631	**4458**	5179
3600	679	3006	**5095**	5919

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

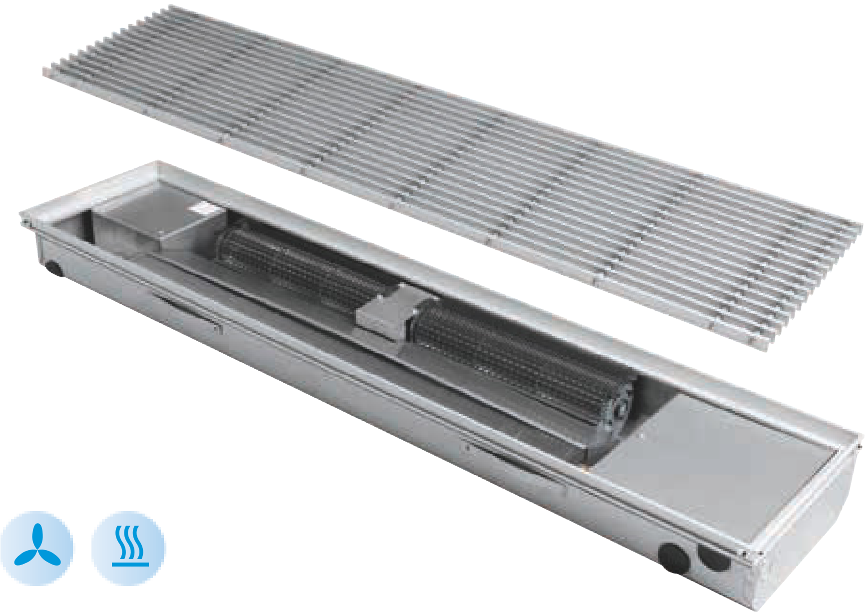
Convector	Width	320 mm
	Height	90 mm
	Length	800–3600 mm v kroku po 400 mm
	Height adjusting	0–35 mm
	Stainless trough width	300 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	120 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 40 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
	Regulation	by output voltage modification (regulation Z-VD...)
Operating conditions	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 [m³/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

Ordering, see the page 53

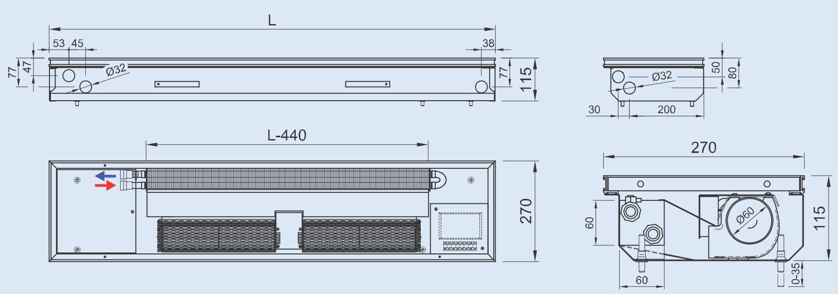


SPECIFICATIONS

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

PARAMETERS

Convector	Width	270 mm
	Height	115 mm
	Length	800–4800 mm in step 400 mm
	Height adjusting	0–35 mm
	Stainless trough width	250 mm
	Grill type	cross / linear
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	60 mm
	Height	60 mm
	Finned length	L-440mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 60 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
	Regulation	by output voltage modification (regulation Z-VD...)
Operating conditions	Ambient temperature	+2 to +40°C
	Relative humidity	20–70%



	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE L_{pAmax} [dB(A)]	1	23	23	24	25	26	26	27	26	27	28	28
	2	29	29	30	32	33	33	34	33	34	34	34
	3	42	43	44	47	47	47	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

Ordering, see the page 53

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

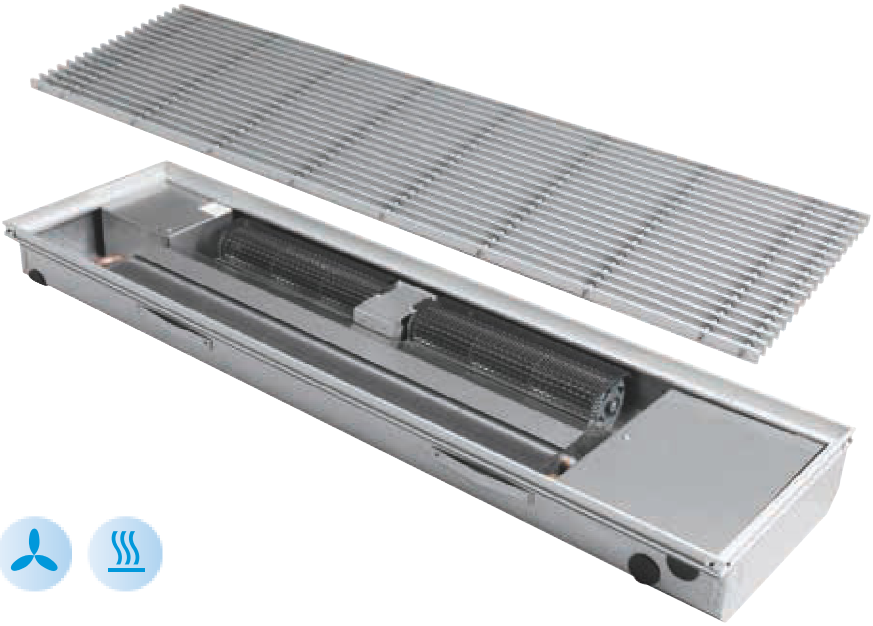
SPEED	0	1	2	3
rpm	0	433	**631**	967
LENGTH [mm]	HEATING OUTPUT [W]			
800	120	616	**834**	1132
1200	254	1232	**1669**	2264
1600	387	1848	**2503**	3396
2000	521	2464	**3338**	4528
2400	655	2957	**4005**	5434
2800	788	3696	**5007**	6792
3200	922	4436	**6008**	8150
3600	1055	4929	**6675**	9056
4000	1189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

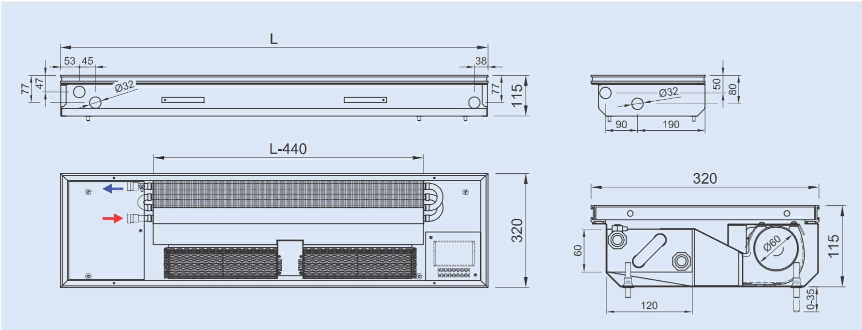
Q [W] 55/45/20°C

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
	Grill material	anodized aluminium, wood, stainless steel
Exchanger	Width	120 mm
	Height	60 mm
	Finned length	L-440 mm
	Heat medium connection	2 × G1/2" female thread
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 60 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
	Regulation	by output voltage modification (regulation Z-VD...)
Operating conditions	Ambient temperature	+2 to +40°C
	Relative humidity	20–70%



	SPEED	LENGTH [mm]										
		800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
ACOUSTIC PRESSURE L_{pAmax} [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

Ordering, see the page 53

HEATING/COOLING CONVECTORS 230V AC

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

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

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

Add considered accessories to the power input of FCC:

Thermo-drive

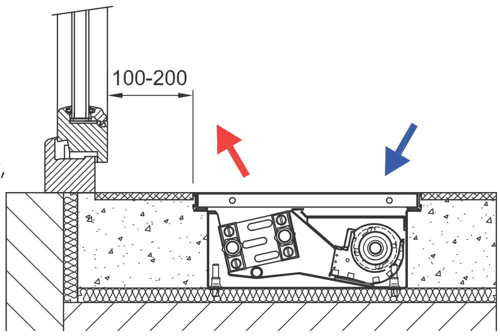
+58 VA power input at switching-on (operation consumption is 2.5 W)

Condensate pump

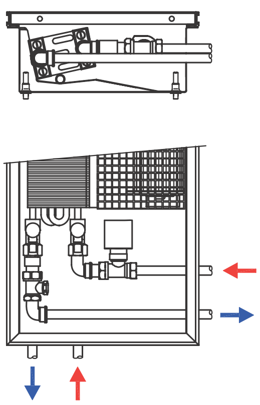
+16 W (switching-on at sufficient amount of condensate)

RECOMMENDED STANDARD INSTALLING IN FLOOR

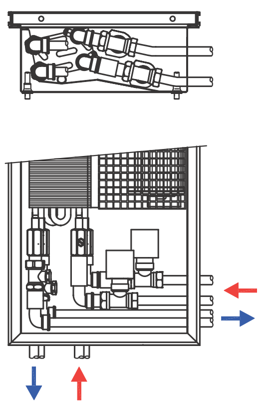
Convector installation with exchanger towards window, ideal position 100–200 mm distance from window, fan draws in the room air.



CONVECTOR CONNECTION TO THE HEATING SYSTEM



2 pipe system



4 pipe 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

DESIGNING OF FCC 230V DC

HEATING OUTPUT RECALCULATION FOR ANOTHER TEMPERATURE GRADIENT

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

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

m=1,015 for FCC2A, FCC4A

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

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

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

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

for Ti=15°C, k=1.12
E.g.: Q [75/65/15 °C] = 1.12 * Qn [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.

HEATING WATER FLOW RATE THROUGH EXCHANGER

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

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

CONVECTOR DIMENSIONING BASED ON ACOUSTIC PARAMETERS

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

EXCHANGER HYDRAULIC LOSSES

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 (m^3/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 (m^3/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 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.

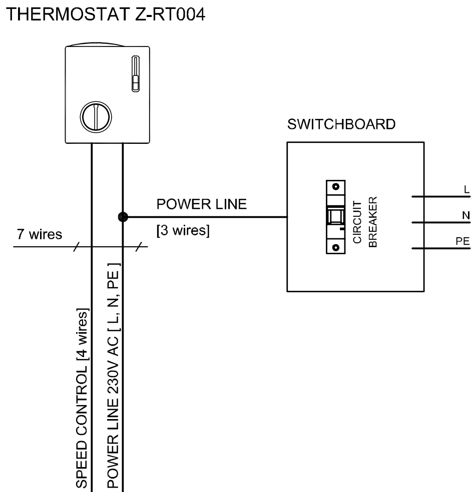
- Every FCC 230V AC convector is equipped with an installed autotransformer control.
- Always one thermostat is considered for a room.
- Thermo actuator is installed in case the convector is operated both for heating and cooling.

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)

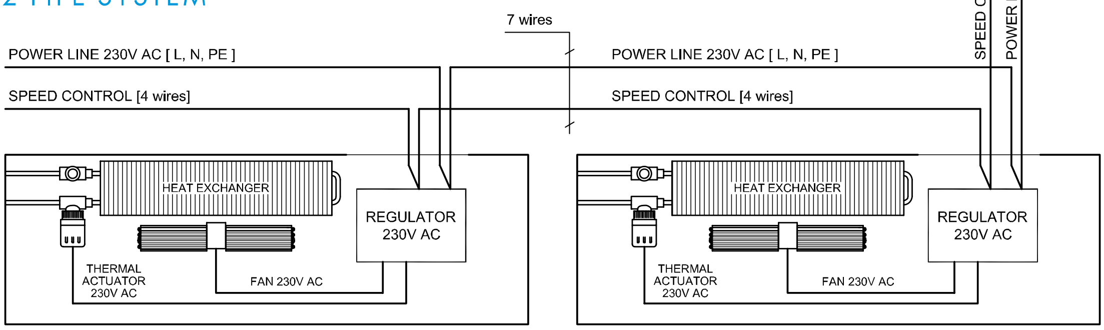
Recommended accessories:

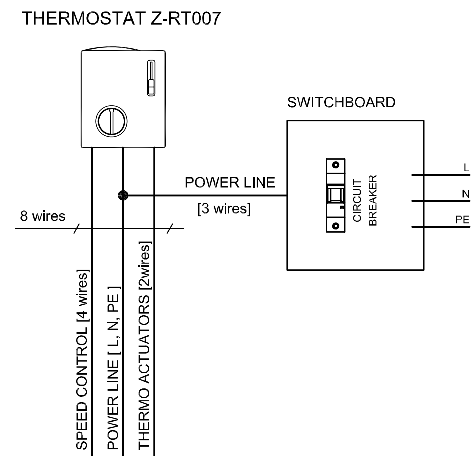
Thermo-electric drive:
- opens and closes flow of heating or cooling media through the exchanger according to a thermostat signal
- the drive is mounted on a thermostatic valve located on the inlet pipeline to the exchanger
- if the cooling flow is not controlled by any different way, it is necessary 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)

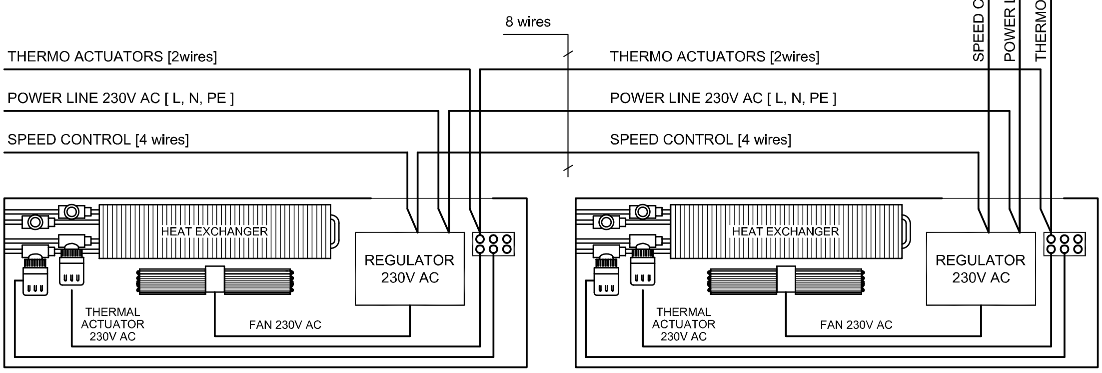


2 PIPE SYSTEM





4 PIPE SYSTEM



ACCESSORIES FOR FCC 230V AC

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

Manual room thermostat with 3-speed switch, heating and cooling

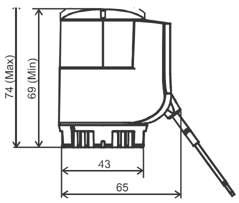
Temperature range:	8–30 °C
Switch levels:	Speeds: 0, 1, 2, 3 Switcher: heating / cooling
Operating voltage:	230V / 50Hz
Max. rating:	6 (2) A
Protection:	IP30
Colour:	white
Dimension:	96×110×36 mm

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-TS230, Z-TS230-5m, thermoactuator



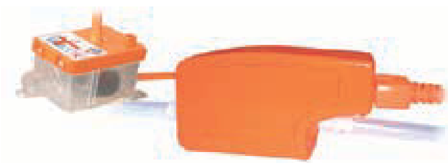
Input voltage:	230V / 50Hz
Power input when switch on:	58VA
Power input during operating:	2.5W
Period of switching ON/OFF:	210 s
Ingress protection:	IP54 (housing)
Connection thread:	M30×1.5mm
Cable length:	Z-TS230 3 meters Z-TS230-5m 5 meters
Max. height when opened:	74 mm

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 (m³/h)	0,1	0,2	0,31	0,45	0,69	0,89

Z-RD002 direct, Z-RE002 corner

Lockshield valves

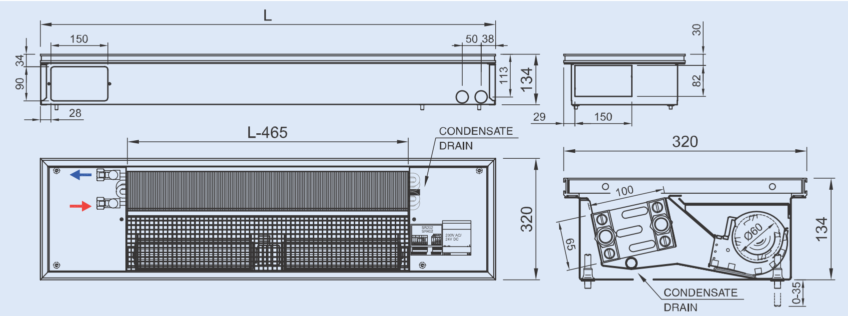
Dimension:	DN15, NF norm
Connection thread:	M30×1,5 mm
Max. working temperature:	120 °C
Max. working overpressure:	PN10

T- turns	0,25	0,5	1,0	1,5	2,0	3,0	4,0
k_v (m³/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 × G1/2" female thread (2 pipe system)
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 60 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
	Regulation	installed speed regulator
Operating conditions	Ambient temperature	+2 to +40 °C
	Relative humidity	20–70 %



	SPEED	LENGTH [mm]				
		1200	1600	2000	2400	2800
ACOUSTIC PRESSURE L_{pAmax} [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

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

FCC2A-13 **230V AC** | CROSS-FLOW FAN CONVECTION

Q [W] 6/12 °C

Speed level			Minimal		Middle		Maximal	
SPEED			1		2		3	
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		2		3	
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		2		3	
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

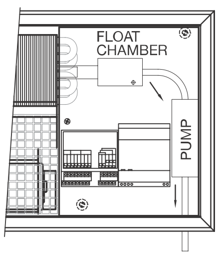
Speed level			Minimal		Middle		Maximal	
SPEED			1		2		3	
LENGTH [mm]	Ti [°C]	r.v.[%]	COOLING OUTPUT [W]					
			Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	30	45	195	195	373	373	534	534
	28	50	166	166	317	317	453	453
	26	**50**	137	137	**261**	**261**	372	372
	24	50	108	108	204	204	290	290
1600	30	45	292	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 (Qs<Qk), 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



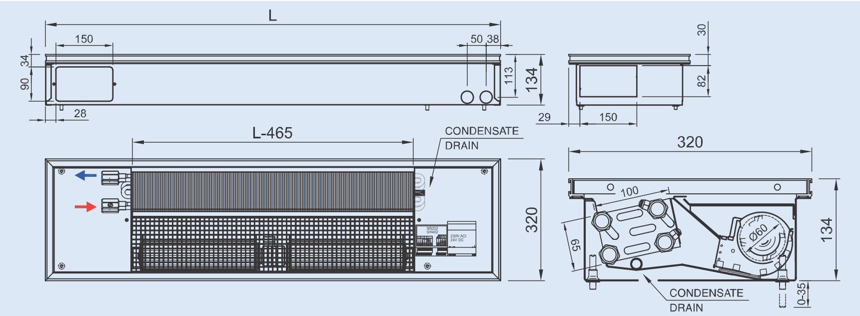
FCC4A-13 **230V AC** | CROSS-FLOW FAN CONVECTION

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

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
	Max. working overpressure	1 MPa
Fan	Rotor diameter	∅ 60 mm
	Operating voltage	230V AC / 50Hz
	Ingress protection	IP20
	Regulation	installed speed regulator
Operating conditions	Ambient temperature	+2 to +40 °C
	Relative humidity	20–70 %



	SPEED	LENGTH [mm]				
		1200	1600	2000	2400	2800
ACOUSTIC PRESSURE L_{pAmax} [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

Regulation is always a part of the convector, black covers of water and electricity. Ordering, see the page 53

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		2		3	
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		2		3	
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		2		3	
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

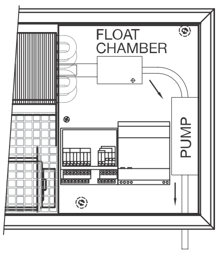
Speed level			Minimal		Middle		Maximal	
SPEED			1		2		3	
LENGTH [mm]	Ti [°C]	r.v.[%]	COOLING OUTPUT [W]					
			Qk[W]	Qs[W]	Qk[W]	Qs[W]	Qk[W]	Qs[W]
1200	30	45	185	185	348	348	499	499
	28	50	157	157	294	294	422	422
	26	**50**	130	130	**242**	**242**	346	346
	24	50	102	102	188	188	269	269
1600	30	45	278	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 (Qs<Qk), 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



CONVECTORS WITH NATURAL CONVECTION

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

The convectors are equipped with an 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.

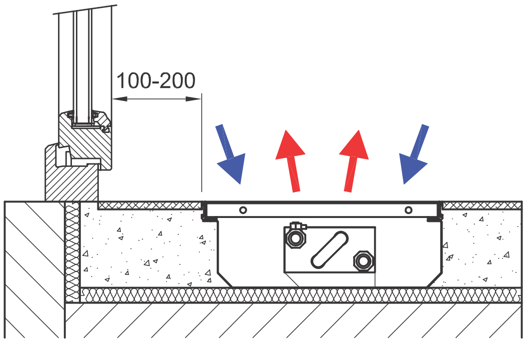
- Tempering of rooms
- Small water volume
- Quick heating up
- Broad assortment

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)

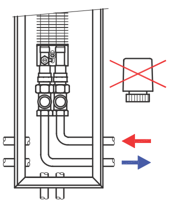
RECOMMENDED STANDARD INSTALLING IN FLOOR

- 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

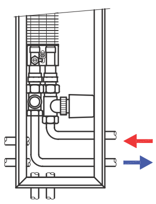


CONVECTOR CONNECTION TO THE HEATING SYSTEM

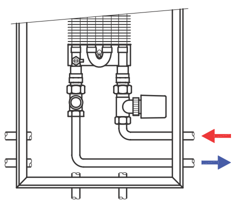
Floor convector is fitted with openings for connection to the heating system. There are three connection possibilities, from the room, side or window wall.



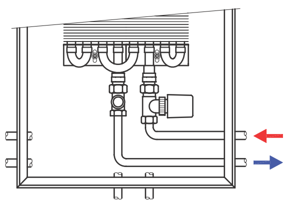
FCK20-09



FCK20-11,14



FCK40-09,11,14



FCK80-09,11,14

HEATING OUTPUT RECALCULATION FOR ANOTHER TEMPERATURE GRADIENT

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

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

m=1,415 pro FCK20-09	m=1,439 pro FCK20-11
m=1,502 pro FCK40-09	m=1,443 pro FCK40-11
m=1,482 pro FCK80-09	m=1,432 pro FCK80-11
m=1,426 pro FCK20-14	
m=1,484 pro FCK40-14	
m=1,449 pro FCK80-14	

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

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

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

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

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

HEATING WATER FLOW RATE THROUGH EXCHANGER

M = 0.86Q/(T1-T2) [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

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
	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
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
	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
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

FCK CONVECTOR REGULATION

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

ROOM THERMOSTAT Z-RT001 AND THERMAL ACTUATOR Z-TS230

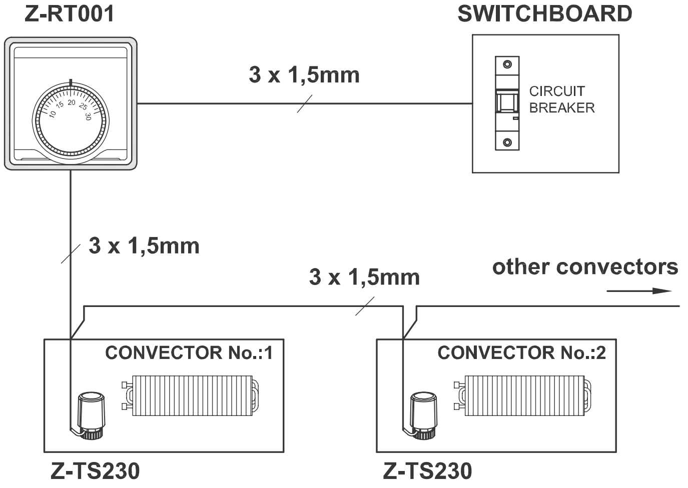
FCK convectors are regulated by means of thermo-drive opening or closing the heating medium circulation on the base of information by thermostat. The thermo-drive works in ON / OFF mode. Full circulation of heating medium follows within 3 minutes after the thermostat is activated.

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

COMBINED USING OF CONVECTORS

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

FCK- CABLING EXAMPLE FOR FLOOR CONVECTOR WITH Z-TS230

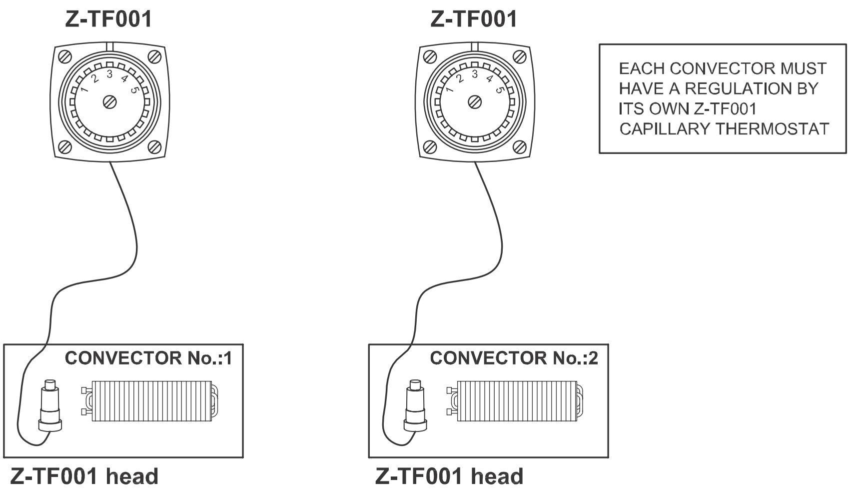


CAPILLARY THERMOSTAT Z-TF001

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



ACCESSORIES FOR FCK CONVECTORS

Z-RT001

Room thermostat

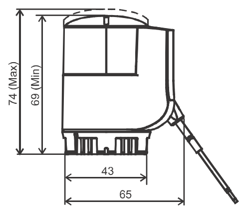
Temperature range:	10 to 30 °C
Operating voltage:	230V/50Hz
Max. rating:	10 (3) A
Protection:	IP30
Colour:	white
Dimension:	83 × 83 × 40 mm

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 ∅ 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 (m³/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 (m³/h)	0,13	0,22	0,43	0,65	0,85	1,25	1,7

FCK20-09 | 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

FCK40-09 | NATURAL CONVECTION

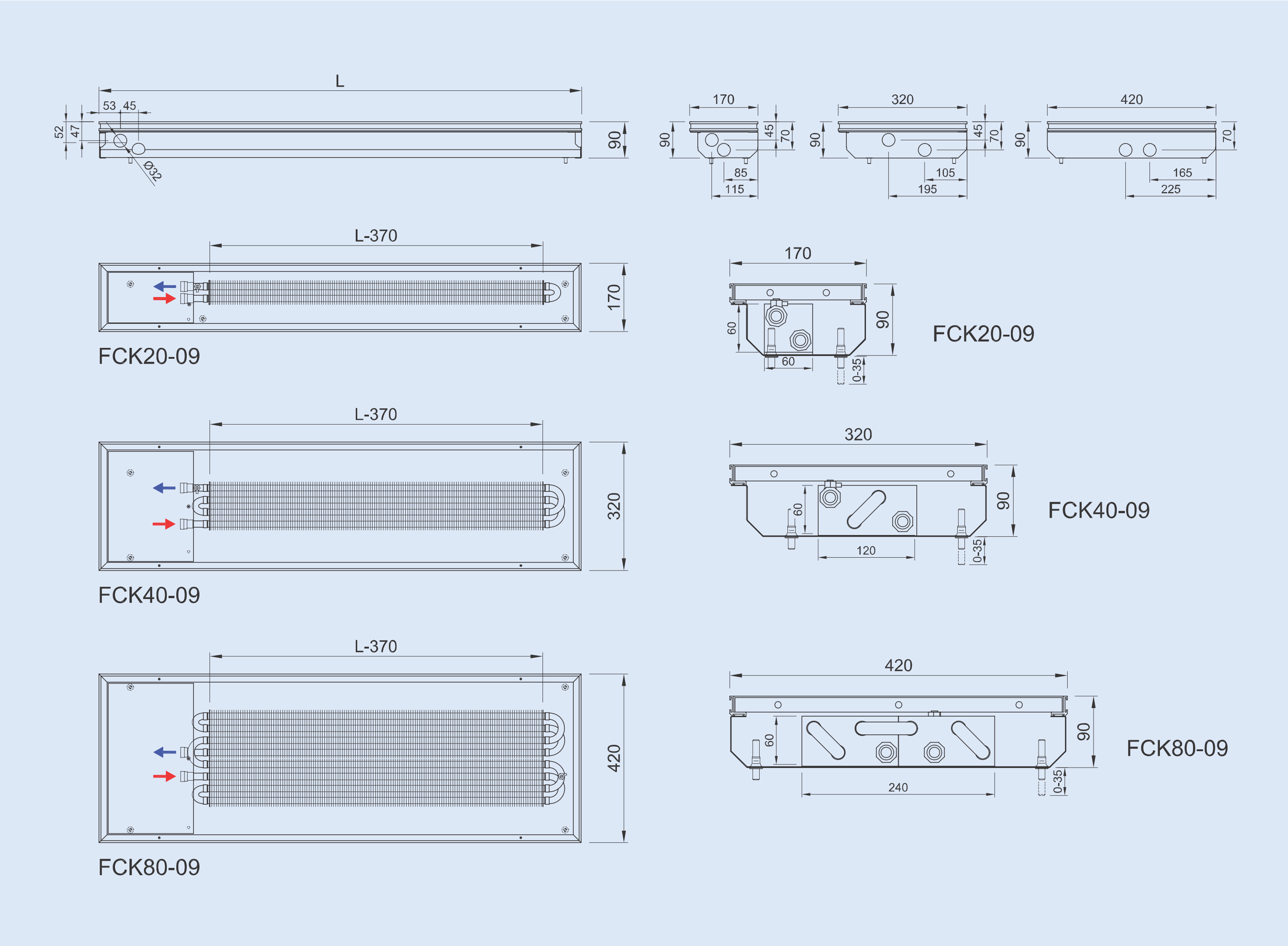
SPECIFICATIONS

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

FCK80-09 | 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	FCK20-09	FCK40-09	FCK80-09
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	FCK20-09	FCK40-09	FCK80-09
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	FCK20-09	FCK40-09	FCK80-09
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	FCK20-09	FCK40-09	FCK80-09
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	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	L-370 mm
	Heat medium connection	2 × G1/2" inner
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Operating conditions	Ambient temperature	+2 to +40 °C
	Relative humidity	20–70 %

FCK20-11 | 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

FCK40-11 | NATURAL CONVECTION

SPECIFICATIONS

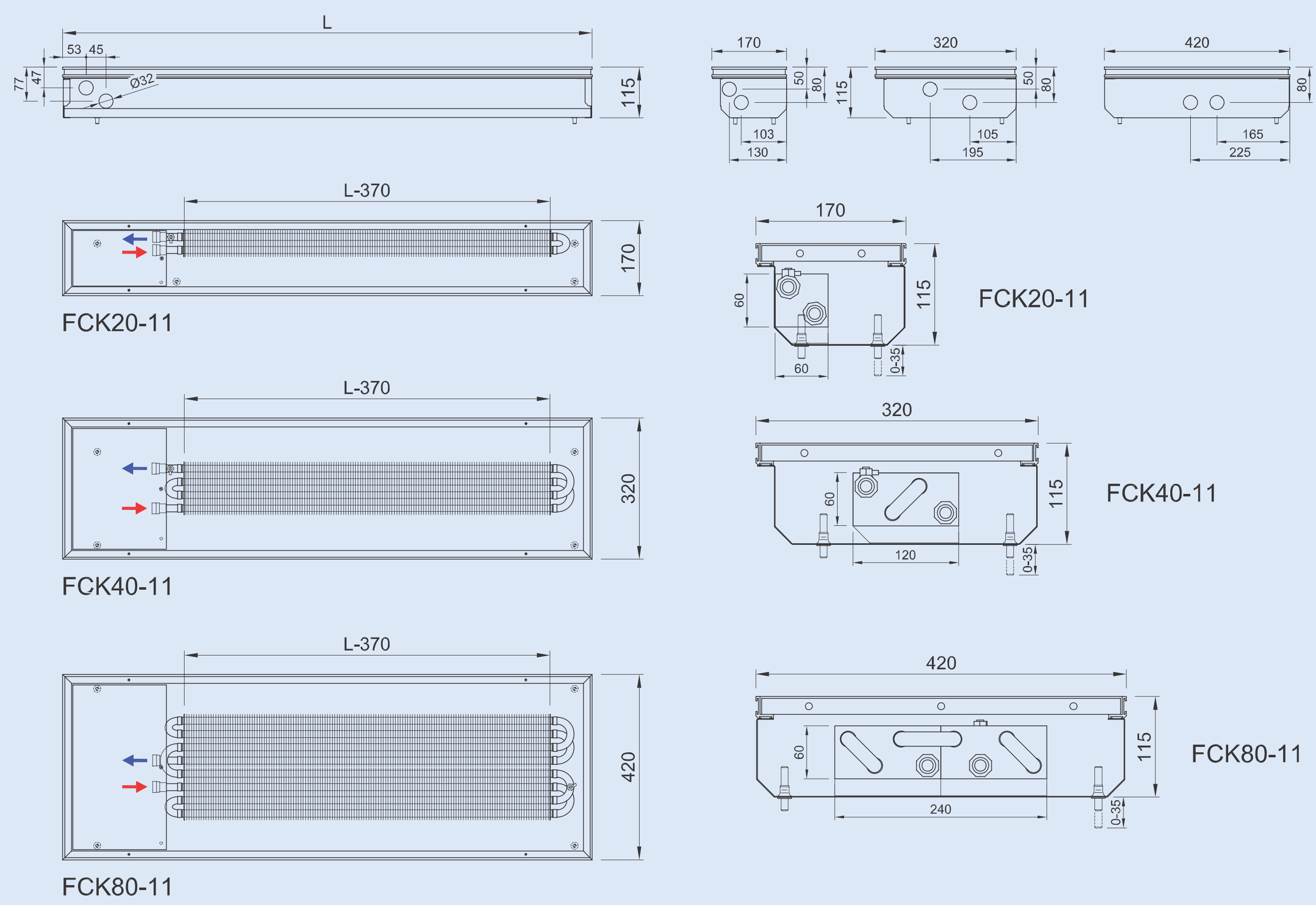
- Width 320 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience

FCK80-11 | 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

FCK20-11, FCK40-11, FCK80-11 | TECHNICAL DATA



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

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	L-370 mm
	Heat medium connection	2 × G1/2" inner
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Operating conditions	Ambient temperature	+2 to +40 °C
	Relative humidity	20–70 %

FCK20-14 | 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

FCK40-14 | NATURAL CONVECTION

SPECIFICATIONS

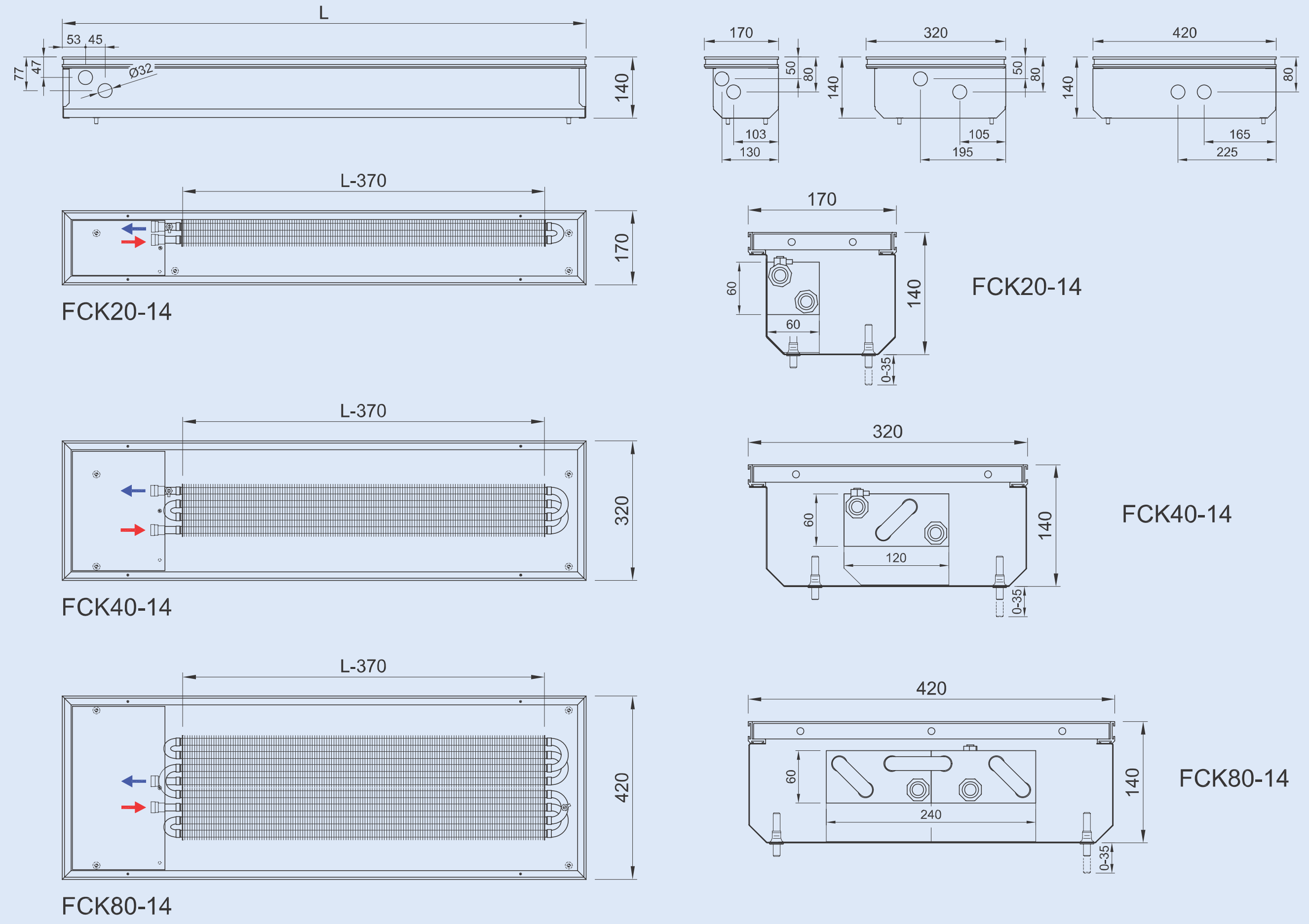
- Width 320 mm
- Offices, corridors, halls, flats, winter gardens
- High heating output of natural convection
- Suitable for combining with other heating systems
- Dry ambience

FCK80-14 | 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

FCK20-14, FCK40-14, FCK80-14 | TECHNICAL DATA



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

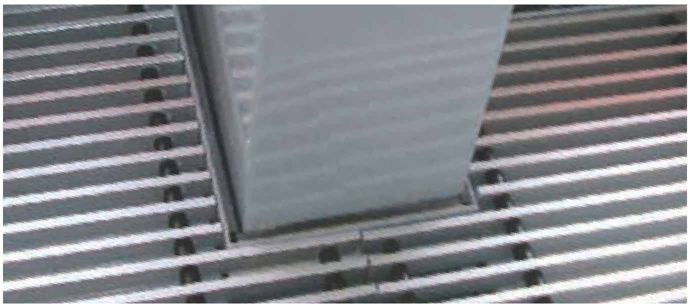
PARAMETERS

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	L-370 mm
	Heat medium connection	2 × G1/2" inner
	Max. working temperature	110 °C
	Max. working overpressure	1 MPa
Operating conditions	Ambient temperature	+2 to +40 °C
	Relative humidity	20–70 %

ATYPICAL CONVECTORS

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.

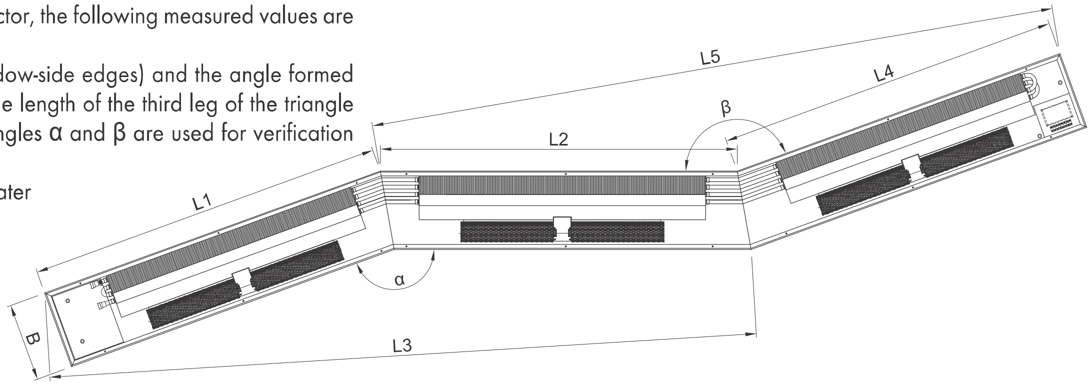
The measurement of the convector, performed by the customer or by an Radiátory specialist, must be carried out on site on the actual structure (not based on the design). The level of completeness of the structure required for the measurement is as follows: final shape of the wall along which the convection 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

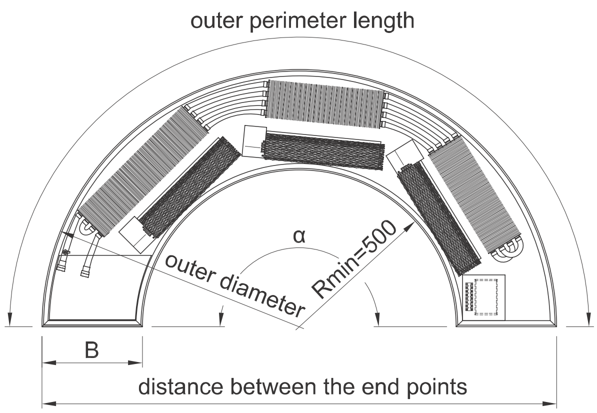
To allow for the design of an arched convector, the following measured values are necessary:

- 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 recommenced that the measurements are performed by Radiátory specialists. The convection heaters are delivered within individually agreed deadlines, usually in 15 to 20 working days.

ORDERING FORM

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
F	**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 connectors
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