

Floor convectors

Technical
Catalogue



General

All measurements of floor convectors for heating and cooling are performed in conformance with European directives and European standards, which prescribes operation and usage of heating and cooling devices.

Heating characteristics of floor convectors for heating (TK-13, TKV-13, TK-S-13, TKV-S-13) have been measured according to european standard EN 442, which precisely prescribes process of definition of nominal Heating capacity by temperature conditions 75 °C, 65 °C, 20 °C.

Laboratory for hat exchangers at Lindab Institute Klima with certified measurement equipment is the sixth suchlike in Europe for measurements of heating characteristics of heating devices and it has to provide repeatability and reparability.

Heating and cooling characteristics of floor convectors for heating and cooling (TKH-13, with roll-up grille) have been measured according to EUROVENT standard 6/3 under the following conditions:

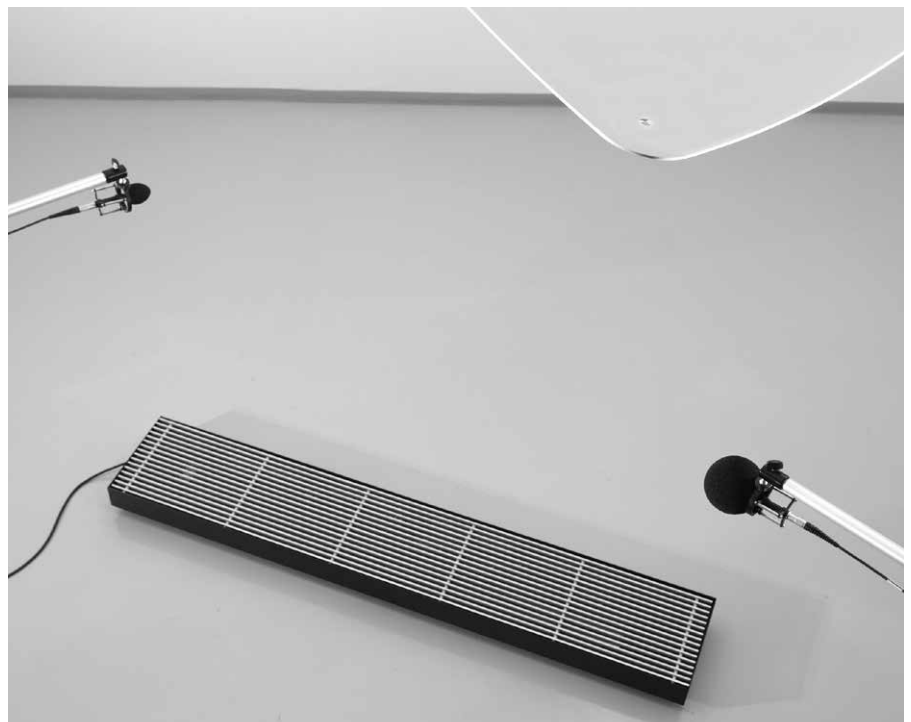
2-pipe systems:

cooling 7 °C / 12 °C / 27 °C / 47 % RH,
heating 50 °C / 20 °C, water flow equal
to water flow at cooling

4-pipe systems:

cooling 7 °C / 12 °C / 27 °C / 47 % RH,
heating 70 °C / 60 °C / 20 °C.

Sound power level L_{WA} (dB), A weighted according to IEC 61672 and calculated in accordance with the recommendation of the EN ISO 3741 standard. Sound pressure level L_{pA} (dB), A weighted at certain distance in specific room can be calculated from sound power level data of device.



Benefits

In rooms with large glazing envelope surfaces or cold envelope walls, it is difficult to establish comfortable heating by means of conventional heating bodies only. Temperature differences between the glass surfaces and bulk air temperature lead to cooling of air in the boundary layer along the wall and in turn, to its downwards flow and spreading across the entire room floor area, the result being occupants' discomfort. Especially when outside temperatures drop below 10°C, it is virtually impossible to maintain occupational comfort in rooms with large surface windows unless auxiliary floor convector heating is used. Floor convectors further prevent condensation build-up on glass, as they maintain a layer of warm humid air adjacent to the glass surfaces. Floor convectors (in particular the forced convection types) also prevent inlet of cold outside air.

Functions

- Room heating (primary or secondary heating),
- Maintenance of uniform air circulation field in the room, and thereby, uniform distribution of heat throughout the room,
- Increasing of cold areas surface temperature,
- Prevention of condensation build-up on glass surfaces,
- Prevention of ingress of cold outside air through big glass surfaces,
- Room cooling (TKH-13 models),
- Heating of areas with increased humidity (TK-S-13, TKV-S-13).

Characteristics

- High quality of material and production,
- High heating and cooling capacities,
- Good sound characteristics,
- Small water content in the heat exchanger and fast heating/cooling of the room,
- Installation into the floor, hence no occupation of the space,
- Installation in humid areas (TK-S-13 and TKV-S-13 models),
- Wide range of control accessories,
- Much flexibility to the needs of the project with specific versions (corner designs, rounded contours, variety of tread-on grilles),
- Easy installation, operation and maintenance.

Pressure and temperature limitation of heat exchanger

- Maximal operating pressure: 11 bar.
- Maximal allowed pressure: 16 bar.
- Maximal water temperature: 110 °C.



Samples of heat exchangers have been tested by an accredited test laboratory.

Floor convectors for humid conditions with forced convection TKV-S-13

Application

TKV-S-13 floor convectors operate in the same way as the types TKV-13. They are particularly suitable for heating of areas with increased level of humidity such as swimming pools or similar. For safety, low voltage fan (12 V) is installed in the TKV-S-13 model.

Setting up into the room and installation is the same as floor convectors TKV-13. They are used for prevention of condensation on glass surfaces, reduction of the convection effect from cold surfaces, and prevention of ingress of cold outside air. Because of the potential ingress of water into the interior of the housing, collection tray is mounted to collect and drain water, but we do not recommend installing floor convector directly at the pools, hot tubs, ... (recommended distance > 1 m), or in a place with the greater possibility of ingress of water into the interior of the floor convector.

Operation

Operation is similar to the operation of TKV-13 floor convectors.

Important:

Technical characteristics are the same as catalogue technical characteristics of TKV-13 floor convectors of 105 mm height.

Component parts (basic design)

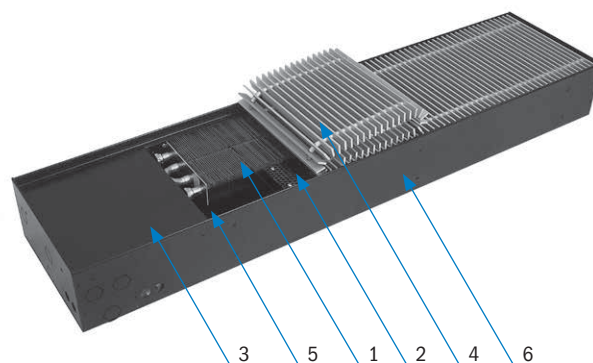
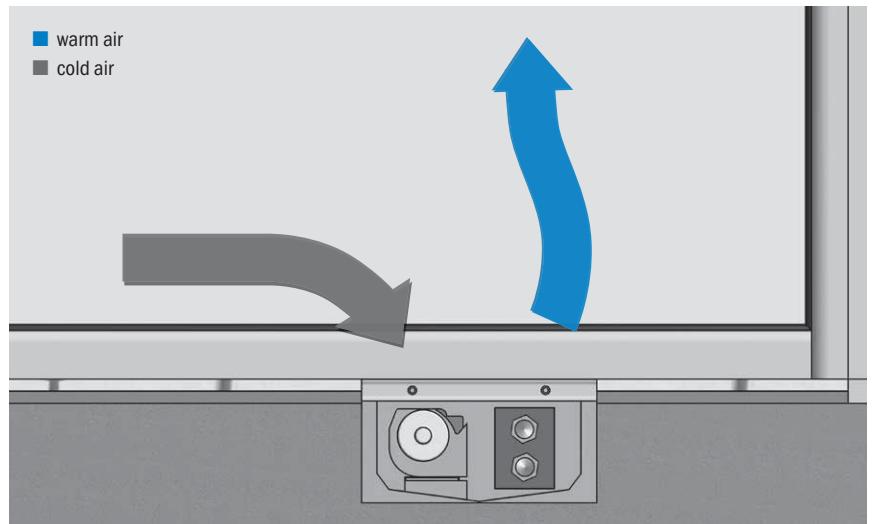
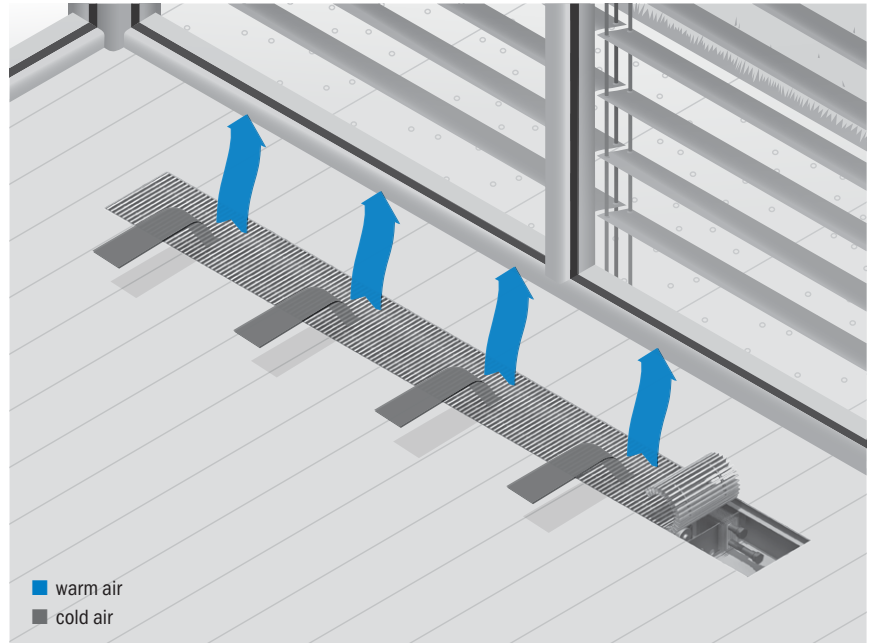
1. Heat exchanger,
2. Tangential fan 12 V (for TKV-S-13 only), up to 2 fans
3. Electric connection socket (for TKV-S-13 only),
4. Tread-on grille,
5. Condensation collection drip tray,
6. Housing.

Types

Floor convectors are available in 15 lengths from 1100 mm to 2500 mm, 200mm, 300 mm or 400 mm width and 140 mm height. Three level fan speed is available.

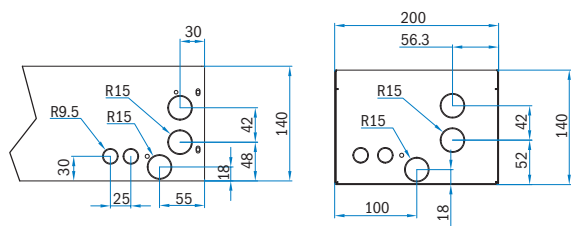
Control accessories

Water side regulation is possible with manual valves 01-04 only. Two-way valve VP2-2C is not appropriate because of thermal actuator 230 V. Air supply side regulation (sets 09S) is defined separately, according to the order conditions.

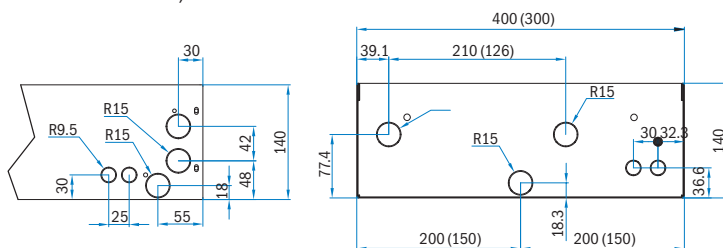


Dimensions of connectors

TKV-S-13 Lx20x14



TKV-S-13 Lx30x14, Lx40x14



Basic requirements and information for ordering of TKV-S-13 regulation

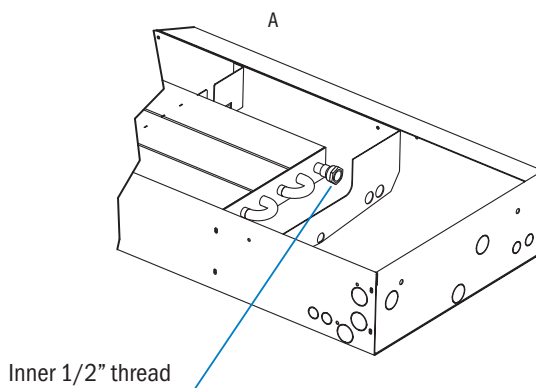
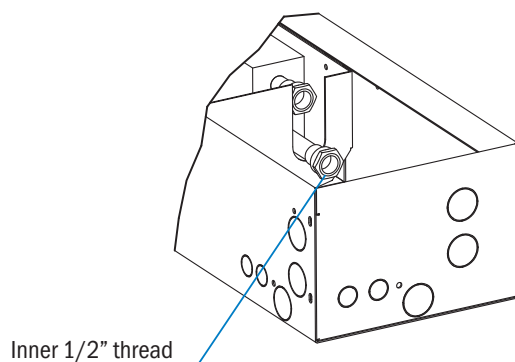
Up to 6 pieces 12 VAC ventilation fans can be controlled with a single 09S regulation unit. Three TKV-S-13 250x20x14/2/, units, up to six TKV-S-13-160x20x14/1/ units or any combination of these with no more than six ventilation fans in all TKV-S-13 units can be connected this way. Correct cross section selection for cables, connecting 09S regulation units with each TKV-S-13 unit is an important factor in the electrical installation phase. The cable cross section depends on the total power of each TKV-S and the cable length - the distance between each TKV-S and 09S the regulation box. Regulation box 09S which must be placed out of humid place!

The following information must be specified upon ordering in order to select the correct 09S regulation box size and related wiring (connection between 09S and TKY-S-13):

- Number and type of floor convectors (TKV-S-13) – the number of ventilation fans in each TKV-S-13, connected to a specific O9S regulation box is the most critical,
- Distance between electrical connection box of each TKV-S-13 and O9S regulation box (cable length),
- If more O9S regulation boxes are controlled using one T01 thermostat, this
- needs to be specified, which TKV-S-13 units are going to be connected to each O9S regulation unit.

Each TKV-S-13 must be connected to the 09S regulation box with its own cable.

Parallel connection of more TKV-S-13 units with one cable is not allowed.



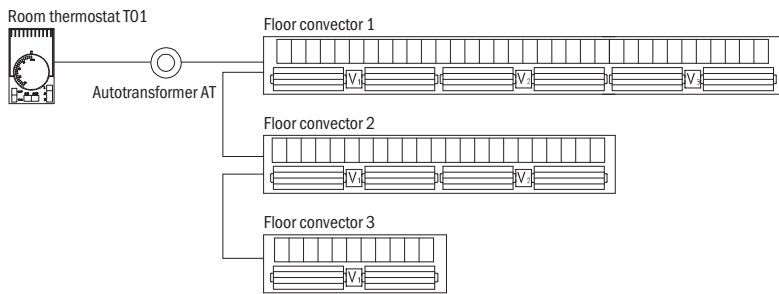
Examples

Cross section of wires	2,5 mm ²	4 mm ²	6 mm ²
No. of ventilation fans	max. length [m]	max. length [m]	max. length [m]
n=1	25	40	60
n=2	12,5	20	30
n=3	8,5	13,5	20

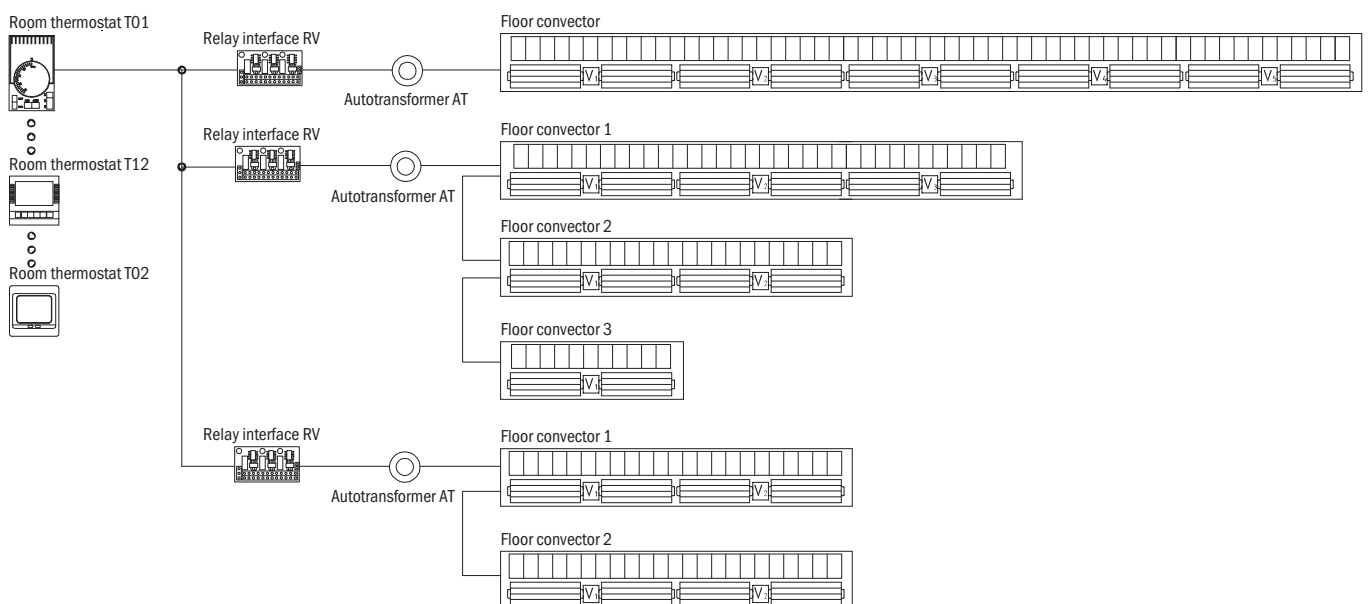
NOTE: Examples are valid for copper wiring only.

Examples of floor convectors connections into groups

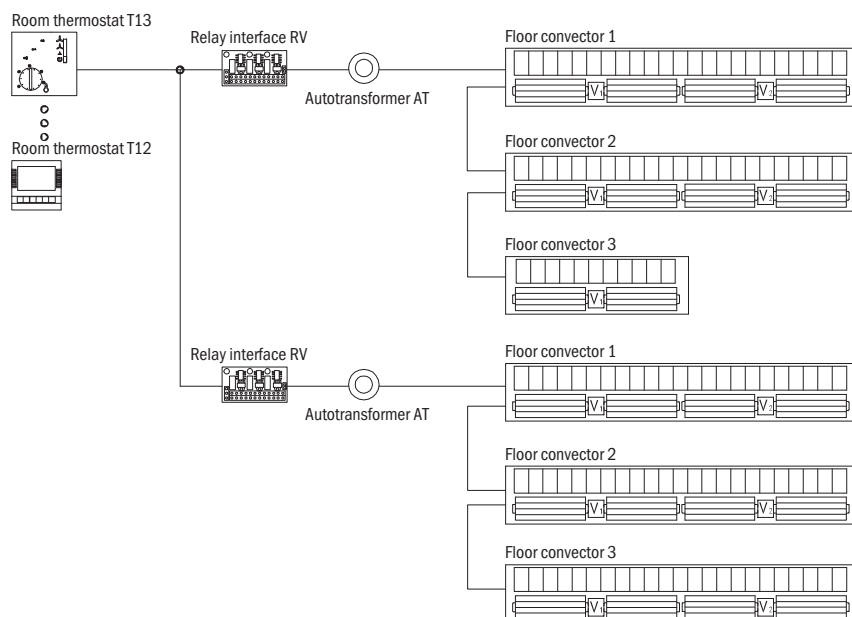
Example 1: 2-2-pipe system, room thermostat, up to 6 fans



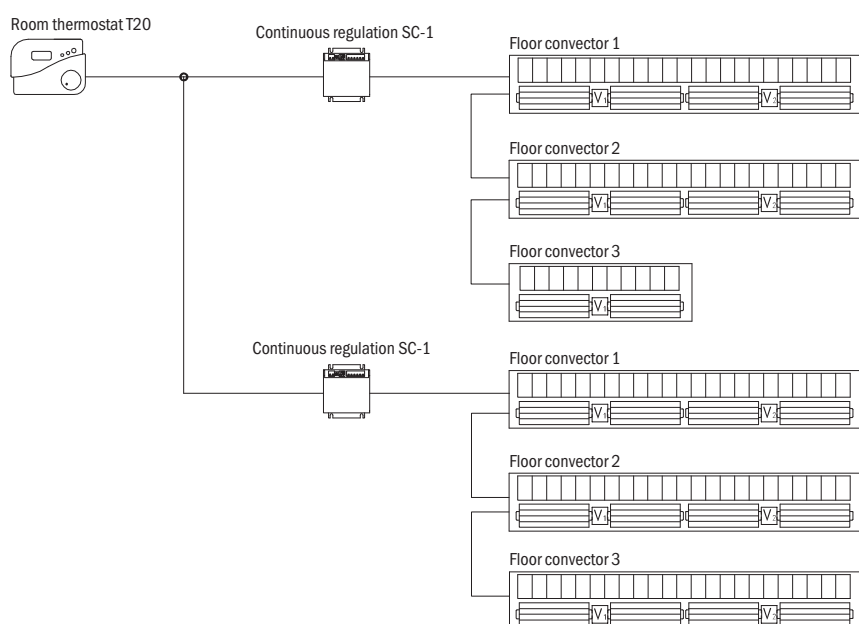
Example 2: 2-pipe system, room thermostat, more than 6 fans



Example 3: 4-4-pipe system, room thermostat, more than 6 fans



Example 4: Continuous regulation



Accessories

Code	Tread-on grille	
111	Standard tread-on grille design: Longitudinal fixed aluminium grille	Anodised Standard: natural aluminium colour, black, brass colour On request: chocolate, bronze
114	Roll-up aluminium grille	Anodised Standard: natural aluminium colour, black, brass colour On request: chocolate (114E), bronze (114F)
114W	Roll-up wooden grille	Wood type Standard: oak, ash, walnut, mahogany, On request: wenge (114W5), cherry (114W6)
114SS	Roll-up grille	Stainless steel

Code	Control accessories
	Water side control (control of the warm water flow rate into the convector)
01	Thermostat valve R1/2", R3/4", straight
02	Thermostat valve R1/2", R3/4", angular
03	Radiator shut-off cock R1/2", R3/4", straight
04	Radiator shut-off cock R1/2", R3/4", angular
VP2	Two-way valve with ET actuators ON-OFF (2-pipe set)
VP4	Two-way valve with ET actuators ON-OFF (4-pipe set)
VT2	Three way valve with ET actuator ON-OFF (2-pipe set)
VT4	Three way valve with ET actuator ON-OFF (4-pipe set)

	Air side control (fan operation control)
T01	Room thermostat for 2-pipe systems, surface installation
T02	LCD room thermostat for 2-pipe systems, semi-flush installation
T12	LCD room thermostat for 2- and 4-pipe systems, semi-flush installation
T13	Room thermostat for 4-pipe systems, surface installation
T20	Room thermostat for continuous regulation of AC fans, surface installation
RV	Relay interface for 2- and 4-pipe systems
09S	Fan speed controller for TKV-S-13
SC 1	Room thermostat for continuous regulation of AC fans
AT45	Autotransformer for AC fans control for TKV-13 and TKH-13/45
AT60	Autotransformer for AC fans control TKH-13/60

Code	Other accessories
010(xx°)	Corner design of convector and grille
017	Housing thermal insulation
018	Wooden protection cover (protection of the convector during the installation)
020(Rxxxx)	Round shaped convector and grille
021	Aluminium frame, fixed to the housing
028	Level adjusting legs, leveling height 20 – 70 mm
029	Level adjusting and support legs, with reinforced housing (upon request)
032	Connection for fresh air supply, without damper (upon request)
033	Connection for fresh air supply, with damper (upon request)

■ Types and colours of tread-on grilles

Longitudinal aluminium tread-on grilles

111D longitudinal fixed grille, anodised in natural aluminium colour



111B longitudinal fixed grille, anodised in black colour



111C longitudinal fixed grille, anodised in brass colour



111E longitudinal fixed grille, anodised in chocolate colour

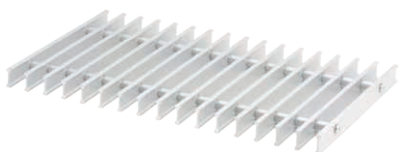


111F longitudinal fixed grille, anodised in bronze colour



Aluminium and stainless steel roll-up grilles

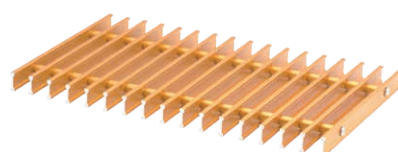
114D roll-up grille, anodised in natural aluminium colour



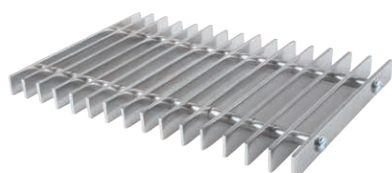
114B roll-up grille, anodised in black colour



114C roll-up grille, anodised in brass colour



114SS roll-up grille, stainless steel



114E roll-up grille, anodised in chocolate colour

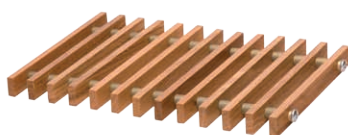


114F roll-up grille, anodised in bronze colour

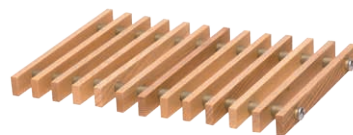


Wooden roll-up grilles

114W1 oak wood



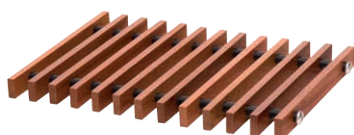
114W2 ash wood



114W3 walnut wood



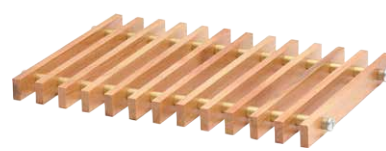
114W4 mahogany wood



114W5 wenge wood



114W6 cherry wood



Note: Longitudinal tread-on grilles are designed to withstand the weight of an individual person, while in case of larger loads roll-up grilles are recommended.

■ Water side control

01 Thermostat valve R1/2" ali R3/4", straight



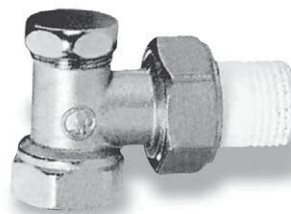
02 Thermostat valve R1/2" or R3/4", angular



03 Radiator shut-off cock R1/2" ali R3/4", straight



04 Radiator shut-off cock R1/2" or R3/4", angular



VP2 Two-way valve with ET actuators ON-OFF (2-pipe set)



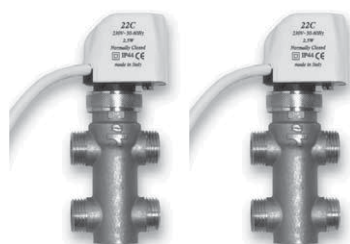
VP4 Two-way valve with ET actuators ON-OFF (4-pipe set)



VT2 Three way valve with ET actuator ON-OFF (2-pipe set)



VT4 Three way valve with ET actuator ON-OFF (4-pipe set)



Notes:

- valve size (R1/2", R3/4") depends on the size of heat exchanger connector size (not necessary to state),
- manual valves 01-04 are only supplied with the convector but not installed, sets of two- and three-way valves are installed,
- sets of three-way valves VT2 and VT4 require more space for installation, possibility of installation should be confirmed by the producer before an order.

■ Air side control

T01 Room thermostat

- for 2-pipe systems
- wall installation
- room temperature setup
- manual speed selection
- manual regime (heating – cooling) selection



T02 Electronic LCD room thermostat (touch screen)

- for 2-pipe systems
- semi-flush installation into the enclosed electrical socket
- setup and display of room temperature
- manual or auto speed selection
- manual regime (heating – cooling) selection



T13 Room thermostat

- for 4-pipe systems
- wall installation
- room temperature setup
- manual speed selection
- automatic regime (heating – cooling) switching



T12 Electronic LCD room thermostat

- for 2-pipe and 4-pipe systems
- semi-flush installation into standard electrical socket $\Phi 60$ mm (not enclosed)
- setup and display of room temperature
- manual or auto speed selection
- automatic regime (heating – cooling) selection
- possibility to connect an external temperature sensor



T20 Electronic LCD room thermostat for continuous control of AC or EC fans

- for 2-pipe and 4-pipe systems
- wall installation
- display of room temperature, set room temperature and parameters
- manual 3-step (MIN-MED-MAX) or continuous (2-10 Vdc) fan speed regulation
- manual regime selection (heating – cooling – auto)



AT45 Autotransformer AT45 is designed for 3-step speed control of 1 to max. 6 fans type 45 installed in TKV-13 or TKH-13 floor convectors.



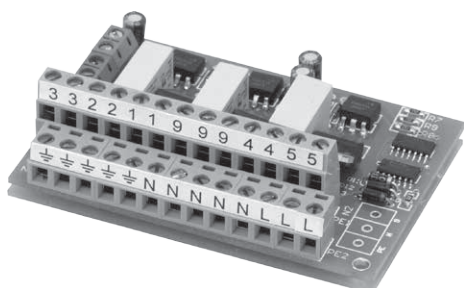
AT60 Autotransformer AT60 is designed for 3-step speed control of 1 to max. 6 fans type 60 installed in TKH-13 floor convectors.



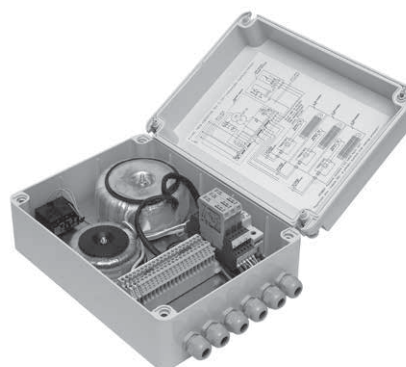
RV Relay interface is designed to attach autotransformer AT45 or AT60 in 2- or 4-pipe models of TKV-13 or TKH-13 floor convectors:

- connection to a room thermostat to control several groups of floor convectors connected to one room thermostat (more than 6 fans in a group)
- connection to a room thermostat or BMS with 3-step (MIN-MED-MAX) outputs 230 Vac output for fan speed

In case when 6 or less ventilators are controlled with a single T01 room thermostat, RV is not needed.



09S This fan speed controller for the TKV-S-13 is used for 3-step regulation of 12V fans, mounted into the TKV-S-13, in connection with the T01 thermostat. We can connect max. 6 fans to one 09S.



SC 1 Controller for continuous control of max. 6 AC fans:

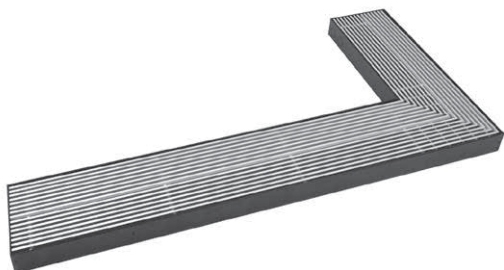
- connection to room thermostat T20
- connection to CNS with 2-10 V output for fan speed control



Note: Floor convectors with EC fans and control are available upon request only.

■ Other

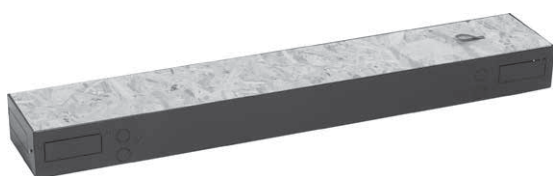
010(xx°) Corner design of convector and grille according to drawing



017 Housing thermal insulation

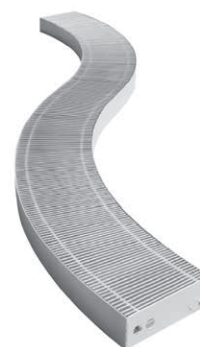


018 Wooden protection cover

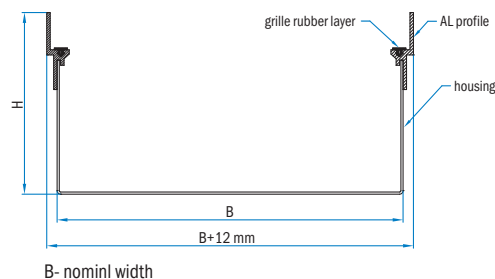
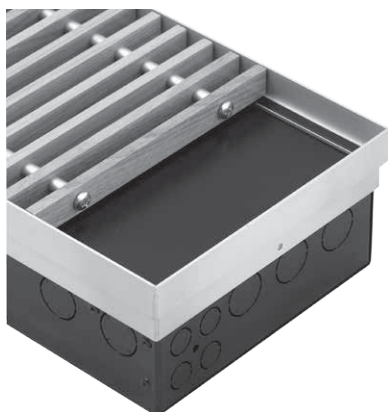


020(Rxxxx) Round shaped convector and grille:

- according to drawing
- TK-13 and TKV-13 models
- roll-up grille only



021 Aluminium frame



Note:

when ordering accessory 021, length and width of housing increase for 12 mm. According to this, the length and width of the grille change also.

028 Level adjusting legs

- Leveling height (distance to the bottom of floor convector) is 20–70 mm.
- Installation possible in models of 105 and 140 mm height only.
- different project solutions upon request



029 Level adjusting and support legs

- recommended for installation into false floor
- set with reinforced housing bracket
- available upon request



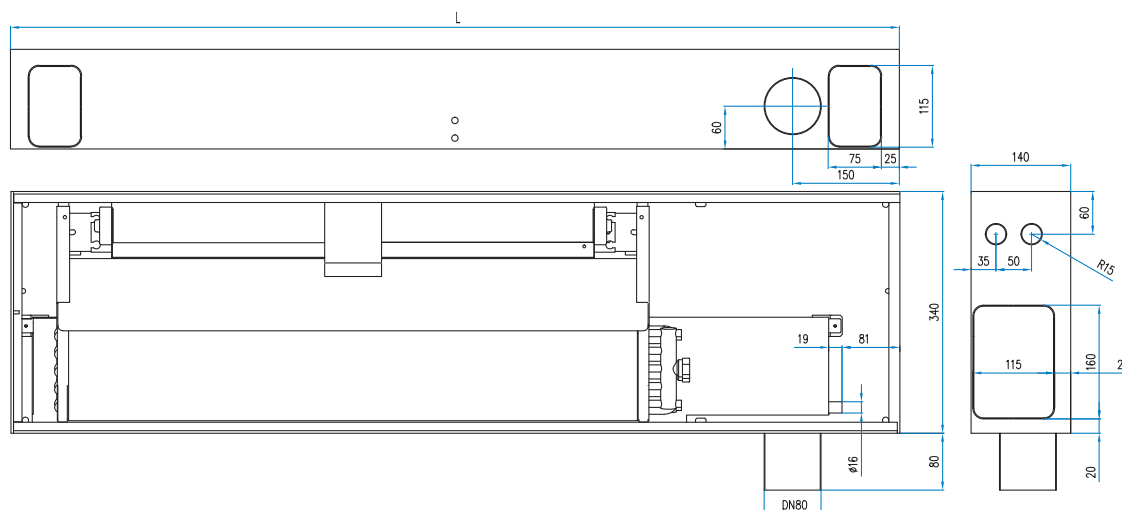
Connection for fresh air supply

032 Connection for fresh air supply, size DN 80, without damper. Installation on TK-13, TKV-13 and TKH-13 models, with 140 mm height. Max. air flow rates up to 80 m³/h per connection. Different project solutions possible.

033 Connection for fresh air supply with damper, size DN 80. Installation on TK-13, TKV-13 and TKH-13 models, with 140 mm height. Max. air flow rates up to 80 m³/h per connection. Available upon request only.



Example: TKH-13 125x34x14/D/2C/45/032



Custom - made convectors

Special versions of floor convectors with non-standard dimensions and technical characteristics can be produced on customer's request and specifications.

Ordering key for TK-13, TKV-13, TK-S-13, TKV-S-13 floor convector types:

Type	
TK -13, TKV -13, TK-S -13, TKV-S -13	Floor convector length
090-300 (increment 100 mm) 320-500 (increment 200 mm)	Floor convector width
15, 20, 30, 40	Floor convector height
07, 08, 10, 11**, 14	Water connection side*
D - right L - left	Designation of fans installed
(different types of room thermostats and fan speed controllers)	Air side control accessories
(different types of valves)	Water side control accessories
114SS stainless steel roll-up grille	114W wooden roll-up grille
114 roll-up aluminium grille, anodised	111 longitudinal aluminium grille, anodised
Tread-on grille	021 aluminium frame
018 wooden protection cover	020(Rxxx) round shaped convector
010(xx') corner design	029 level adjusting and support legs, with reinforced housing
028 level adjusting legs	017 housing thermal insulation
033 fresh air connection (with damper)	032 fresh air connection (without damper)

** Possible only with Floor convector width 150 mm.



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