

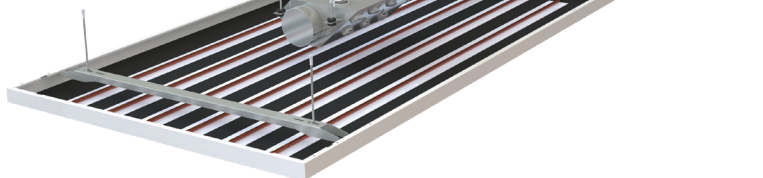
FAVO

Hybrid system with building mass connection



QUICK FACTS

- In combination with A11-S, SPECTRA M-S
- Very high heating & cooling capacity
- Superior sound absorption values (class A)
- Enhanced energy efficiency thanks to active building mass connection
- Sound power level L_w : < 30 dB (A)
- Fresh air intake is silent and draught-free
- Connection to conventional ventilation ducts



Technical description

General

Thanks to its comprehensive functionality, the hybrid system FAVO plus the A11-S or SPECTRA M-S heating & cooling sails achieves an optimum room climate in any environment. It has very high cooling and heating capacities, a comfortable air supply and superior acoustic properties. According to the principle of the thermoactive component system, it also includes the storage mass for the dissipation of heat loads in the overall room thermal concept. This reduces energy requirements and operating costs.

Activation

Water system: The radiant ceiling is a passive system that in the case of cooling absorbs heat from the room via the ceiling surface, transfers it to the water, which is conducted in activation registers, and dissipates it, respectively emits heat in the case of heating.

Two variants of activation registers are available for activating the radiant metal ceiling system:

Activation register A11-S

- Copper pipe meanders welded to aluminum heat-conducting rails.
- Connected to the ceiling panel using adhesive technology.

Activation register SPECTRA M-S

- Copper pipe meanders pressed into aluminum heat-conducting profile with magnetic tape.
- Connected to the ceiling panel using magnet technology. Advantages: The registers can be supplied, fixed and hydraulically connected independently of the ceiling panels. These can be assembled at the end of the installation work. This reduces construction time and the risk of contamination.

Optional performance plus: Convector Wings

When using the activation register A11, a further increase in performance can be achieved by using the Convector Wings developed by Barcol-Air.

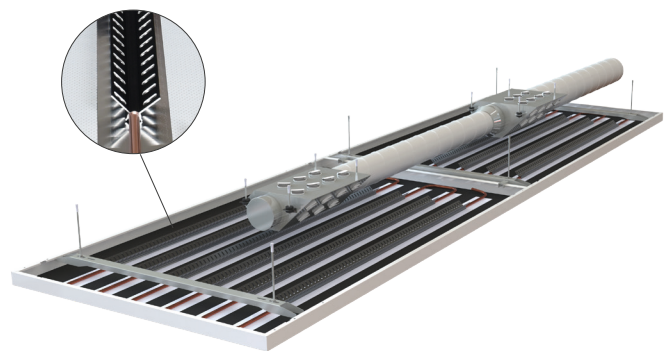
Convector Wings are matt black anodized aluminum profiles with slotted «wings» on both sides. With the profile that opens downwards, the Convector Wings can be attached to the straight sections of a pipe meander. This multiplies the heat exchange surface of the radiant ceiling sail, which leads to an increase in water capacity.

Functions

In addition to the thermal functions of cooling/heating and the active concrete management, there is the possibility of further integration: acoustically effective inserts or baffles (ARCHISONIC®), various built-in components (e.g. smoke detectors, lighting).

Combination

- FAVO + A11-S + ARCHISONIC®
- FAVO + SPECTRA M-S



Optional performance plus: Convector Wings

Functional description building mass connection

With supply air quantities of up to $120 \text{ m}^3/\text{h} \cdot \text{lm}$ per sail, the supply air is introduced horizontally into the room on one side of the sail above the ceiling panels. The warm room air is drawn in by specially developed high-performance induction nozzles on the opposite side of the sail, accelerated above the supply air channel and thereby achieved a high energy transfer into the concrete. The temporarily stored energy can be dissipated at night – if possible with free cooling. Due to the high ventilation efficiency in the room, a draft-free and complete room mixing with a homogeneous temperature profile is created within a very short time.

Operation

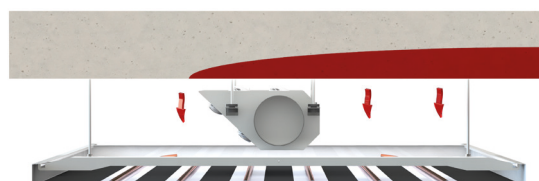
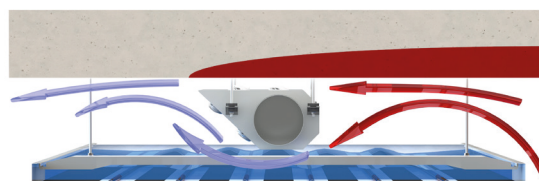
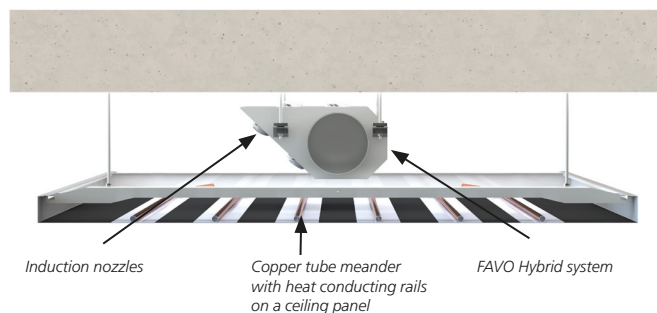
The hygienically required air volume flow is discharged through the high-performance induction nozzles. As a result, warm room air is induced from behind the sail. The shape of the patented FAVO supply air outlet makes it possible to discharge the “cold air pool” from the ceiling panel. This significantly increases the energy transfer to the water.

Day

In addition to the portion of energy directly transferred to the water, warm air also flows above the FAVO supply air outlet along the concrete, heating it in the process. This energy does not need to be dissipated during the day but is temporarily stored until the night.

Night

At night, no supply air is required in the building. The water can be cooled by free cooling (without the use of the refrigerator). Through the exchange of radiation between warm concrete and cold heat conducting rails, the energy is extracted from the concrete and prepared for the absorption of excess energy the next day.



Technical data

Capacity

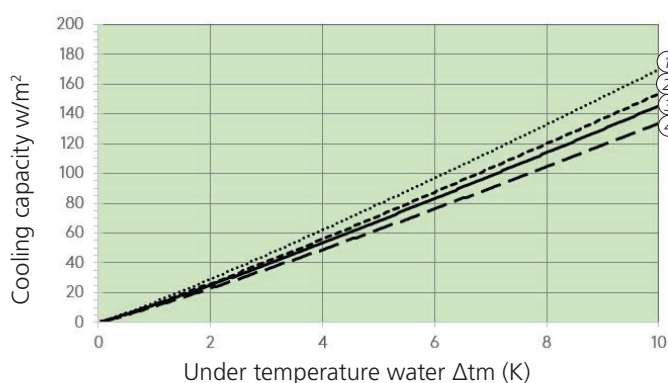
Water

Initial data is presented below.

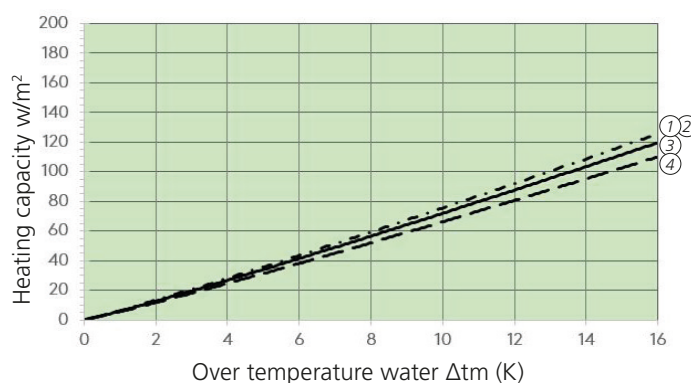
Material ceiling panel	Aluminium	Steel
Perforation	Rg 1,5 – 11 %	Rg 1,5 – 11 %
Activation (Distance heat conducting rails hcr: 100 mm)	A11 ---- ②	A11 + Convector Wings ① A11 ——— ③ Spectra M - - - ④
Activation method	on fleece	on fleece

(Capacity specifications without object-specific performance-increasing factors. Depending on the configuration, an additional output of 20 w/m² of panel area is achieved through concrete management.)

EN 14240:2004



EN 14037:2016



Activation	Version	Cooling 8 K	Cooling 10 K	Heating 15 K ⁽¹⁾
A11-S	① Steel + Convector Wings	up to 133 w/m ²	up to 170 w/m ²	up to 117 w/m ² (---)
A11-S	② Aluminium	up to 120 w/m ²	up to 154 w/m ²	up to 117 w/m ² (---)
A11-S	③ Steel	up to 114 w/m ²	up to 145 w/m ²	up to 112 w/m ²
Spectra M-S	④ Steel	up to 104 w/m ²	up to 133 w/m ²	up to 102 w/m ²

¹⁾ When the supply air is running, there is a 20 to 40 % higher heating capacity.

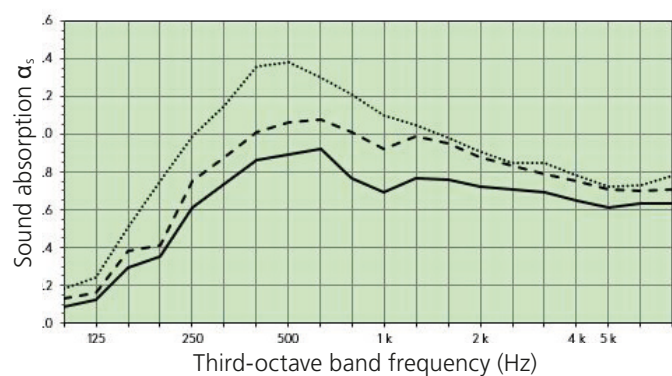
Notice

- SN EN 14240: The cooling capacity is related to the active area according to SN EN 14240:2004. The active area is calculated according to SN EN 14240 from the number of heat-conducting rails x length of heat conducting rail x distance between heat-conducting rails.
- SN EN 14037: The heating capacity is related to the active area according to SN EN 14037:2016. The active area is calculated according to SN EN 14037 from the length of the ceiling panel x the width of the ceiling panel.

Acoustics

Sound absorption (Ceiling panel)

Initial data: Radiant metal ceiling sail perforated, distance hcr 100 mm, installation height 205 mm.



Perforation 1,5 mm – 11 %, with acoustic fleece

Additional inlay	without ————	1 strip on the long sides of cp -----	Strips bet- ween hcr
Practical sound absorption α_p	250: 0,55 500: 0,90 1k: 0,75 2k: 0,75 4k: 0,65	250: 0,70 500: 1,00 1k: 0,95 2k: 0,90 4k: 0,75	250: 0,95 500: 1,00 1k: 1,00 2k: 0,90 4k: 0,80
sound absorption α_{pw}	α_w : 0,75	α_w : 0,90	α_w : 0,95
Sound absorption class	C	A	A

Sound power level L_{WA} / Pressure loss

Air volume per outlet	Air volume per nozzle with 14 nozzles	Pressure loss [Pa]	Sound power level [dB(A)]
120 m ³ /h	8.5 m ³ /h	12.3	30.7
90 m ³ /h	6.5 m ³ /h	8.8	29.2
60 m ³ /h	4.3 m ³ /h	4.6	26.9

System

Ceiling system

- Sail
 - Rectangular panels

System components

- Nozzle channel with induction nozzles

Installation systems

- Installation high: min. 205 mm
 - Hook-on systems
 - Threaded rods or ropes

Installation high

Panel height	Ø Connection nozzle	min. installation high
30 – 50 mm	100 mm	205 mm
30 – 50 mm	125 mm	230 mm
30 – 50 mm	160 mm	265 mm

Materials, weight and dimensions

Materials and weight

Activation	Material	Weight (incl. activation, water)	Building material class ⁽¹⁾ (EN 13501-1)
A11-S	Aluminium 1,00 mm	3,8 – 6,5 kg/m ²	A2-s1, d0
A11-S	Steel 0,70 mm	6,5 – 9,0 kg/m ²	A2-s1, d0
Spectra M-S	Steel 0,70 mm	10,0 – 13,3 kg/m ²	B-s2, d0

¹⁾ Also depends on the acoustic inserts.

Dimensions

Sail length	Sail width	Sail height
min. 800 mm	min. 400 mm	min. 30 mm ⁽¹⁾
project specific	max. 1200 mm	max. 50 mm

¹⁾ System structure without tolerance of the concrete ceiling.

Surface

Versions

- Powder coating
- Digital printing on request

Colors

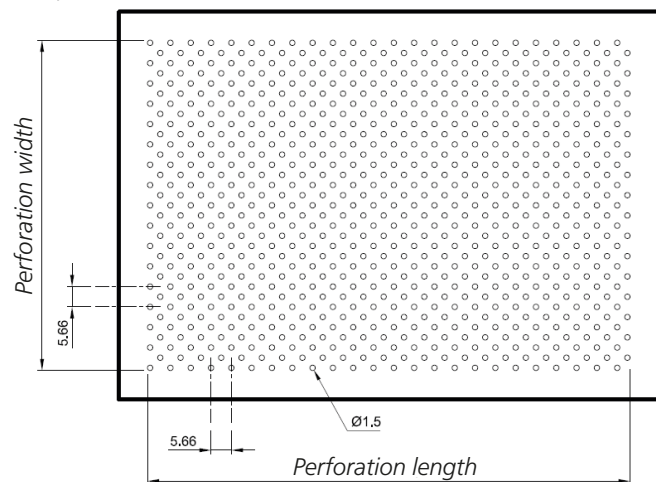
- Standard RAL 9010
- Other RAL / NCS colors on request

Perforations

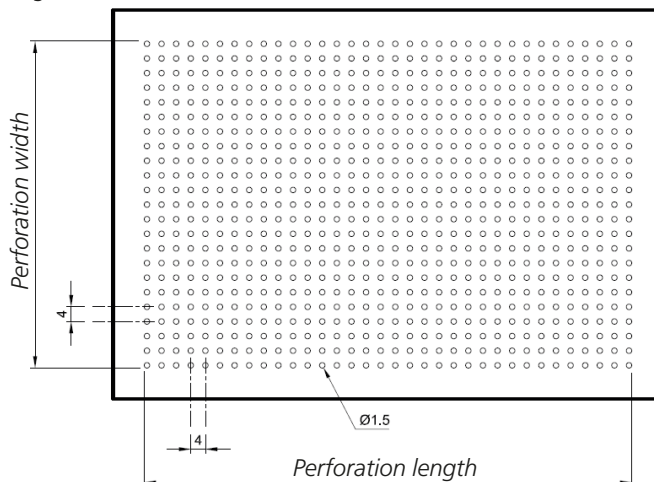
- Standard perforations
- Other perforations on request

Standard perforations:

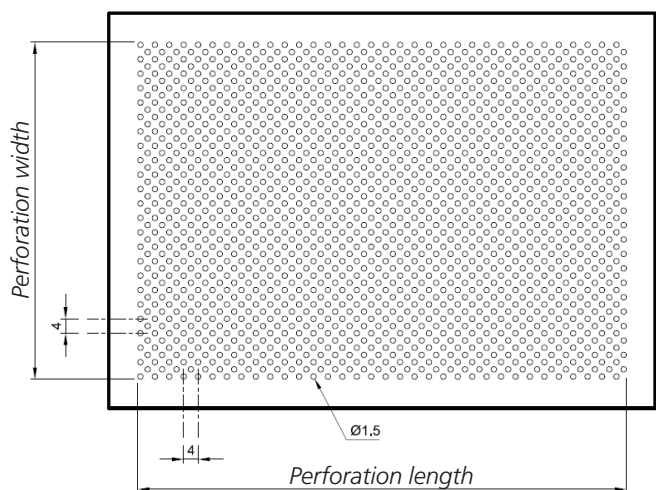
Rd 1,5 – 11 %



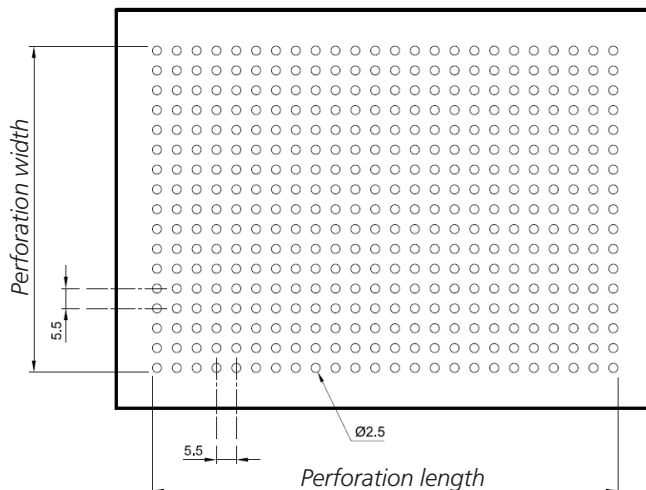
Rg 1,5 – 11 %



Rd 1,5 – 22 %



Rg 2,5 – 16 %



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