

# VARICOOL AP

Radiant ceiling jointless



## QUICK FACTS

- Thermal comfort according to EN ISO 7730
- High heating & cooling capacity
- Acoustically effective (class C)
- Can be used as a closed radiant ceiling or sail
- Activation profiles are easy to install
- Profiles replace parts of the substructure
- Flexible profile arrangements possible
- Integration of various components
  - Different lighting designs
  - Sprinklers
  - Smoke detectors
  - Supply / extract air elements

Output (water)	
Cooling	Heating
Up to 82 W/m <sup>2</sup> (8 K), EN 14240:2004	Up to 118 W/m <sup>2</sup> (15 K), EN 14037:2016
Acoustics	
α <sub>w</sub> : up to 0,70	

# Technical description

## General

The jointless VARICOOL AP radiant ceiling is suitable for properties in which a combination of aesthetics and thermal comfort is required. It is visually indistinguishable from a conventional drywall ceiling. Full-surface ceiling activation, the flexible arrangements of profiles, installations and customised ceiling designs with 3D elements are all possible with this solution. VARICOOL AP can also be used as a sail. Perforated plasterboard panels with acoustic fleece applied to the back can be used to satisfy the acoustic requirements. An additional insulation layer can be provided in order to increase sound absorption in particularly sensitive areas.

The activation profiles for jointless radiant ceilings are adapted to the standard substructure and replace parts of it. The system is suitable for use with plasterboard, expanded glass granulate and aluminium honeycomb panels.

The panelling is bolted directly to the activation profiles. This ensures very good heat transfer and consistent quality.

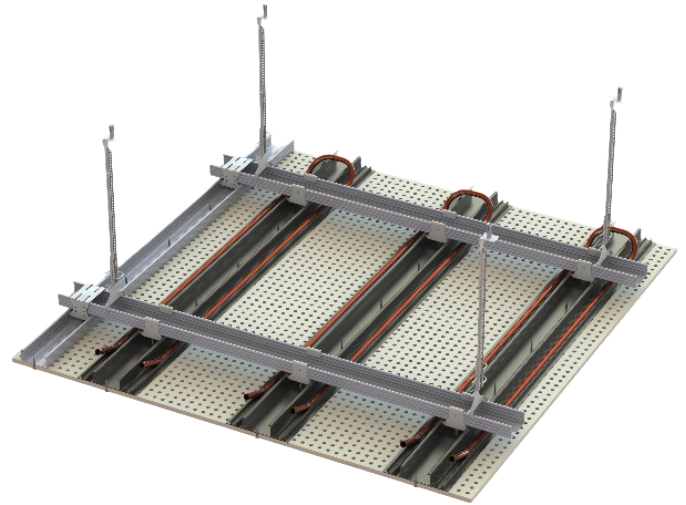
## Activation

**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.

The activation element of the VARICOOL AP radiant ceiling system comprises copper pipe meanders (external diameter 12 mm) which are pressed into aluminium heat conducting profiles. The activation element is installed as part of the ceiling substructure. The plasterboard panels are bolted directly to the heat conducting profiles. This creates an optimum connection between activation element and ceiling, and eliminates the need for fixing profiles for the ceiling panels where the active surfaces are located. The system enables coverage of up to 100 %. This allows maximum thermal efficiency to be achieved in relation to the room areas.

## Functions

The VARICOOL AP radiant ceiling is multifunctional. In addition to the thermal functions of cooling/heating, there is the possibility of further integration: various built-in components (e.g. smoke detectors, lighting).



Developed in cooperation with



2 x Rigips angle anchor  
Combination CD with CD profile

2 x Barcol-Air angle anchor  
Combination CD profile with VARICOOL AP



Standard CD profile 60 x 27 mm

VARICOOL AP for jointless radiant ceiling  
with 12 mm copper pipework

# Technical data

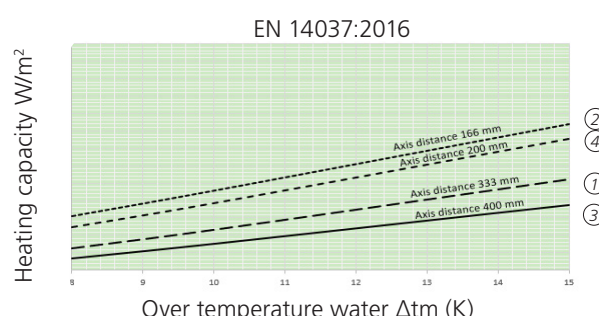
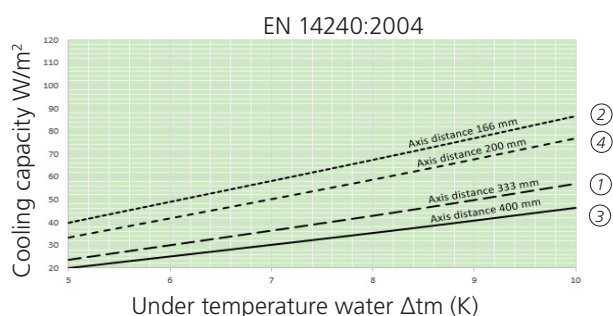
## Capacity

Initial data is presented below with graphite panels:

Closed ceiling system	High density plasterboard with graphite perforated	High density plasterboard with graphite or expanded glass granulate panels non perforated
Edge joint	with	with
Distance heat conducting rails (hcr)	333 mm --- ② 166 mm - ③	400 mm ..... ① 200 mm — ④
Acoustic inlay	without	without

(Capacity information without project-specific performance-influencing factors.)

(The distance between the heat conducting rails (hcr) varies by 3 mm or 1 mm for 2 types of perforated plasterboard)

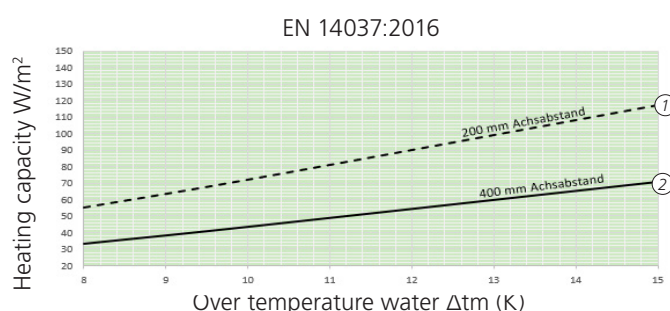
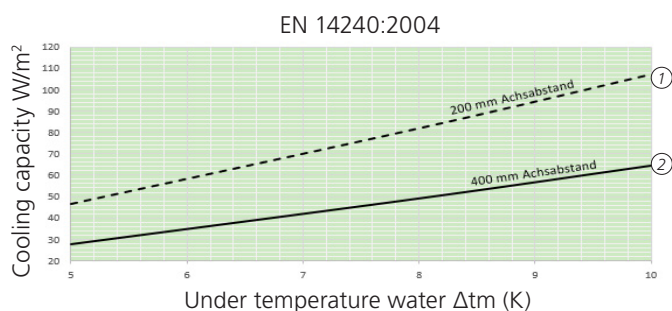


Version	Cooling 8 K	Cooling 10 K	Heating 15 K
① Graphite WLS 333 mm	up to 43 W/m <sup>2</sup>	up to 57 W/m <sup>2</sup>	up to 72 W/m <sup>2</sup>
② Graphite WLS 166 mm	up to 67 W/m <sup>2</sup>	up to 87 W/m <sup>2</sup>	up to 104 W/m <sup>2</sup>
③ Graphite WLS 400 mm	up to 35 W/m <sup>2</sup>	up to 46 W/m <sup>2</sup>	up to 58 W/m <sup>2</sup>
④ Graphite WLS 200 mm	up to 59 W/m <sup>2</sup>	up to 77 W/m <sup>2</sup>	up to 95 W/m <sup>2</sup>

Initial data is presented below with aluminum honeycomb panel:

Closed ceiling system	Aluminum honeycomb panel with acoustic plaster	Aluminum honeycomb panel with acoustic plaster
Edge joint	with	with
Distance heat conducting rails (hcr)	200 mm --- ①	400 mm — ②
Acoustic inlay	without	without

(Capacity information without project-specific performance-influencing factors.)



Version	Cooling 8 K	Cooling 10 K	Heating 15 K
① Aluminum WLS 200 mm	up to 82 W/m <sup>2</sup>	up to 107 W/m <sup>2</sup>	up to 118 W/m <sup>2</sup>
② Aluminum WLS 400 mm	up to 49 W/m <sup>2</sup>	up to 65 W/m <sup>2</sup>	up to 71 W/m <sup>2</sup>

# VARICOOL AP

## Capacity

- Implemented as a ceiling sail, the result is an approximately 9 % higher capacity than with a full-surface plaster ceiling.
- Expanded glass granulate panels achieve the same cooling / heating capacity as high-density plasterboard with graphite, under the condition of a value of 0,52 w/m\*K.
- System-specific factors (warm facade / asymmetrical loads) can increase capacity by up to 12 %.

### 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.

## Recommendations for operation

### Water

- Temperature
  - Cooling 16 – 18 °C
  - Heating 28 – 37 °C
- Temperature distance  $\Delta t$  (VL-RL): 2 – 3 K
- Pressure drop: 20 – 25 kPa
- Water flow: 80 – 150 l/h
- Max. operating pressure up to 9 bar
- Water quality according to: SWKI BT 102-01, BTGA 3.003, VDI 2035

### Surrounding

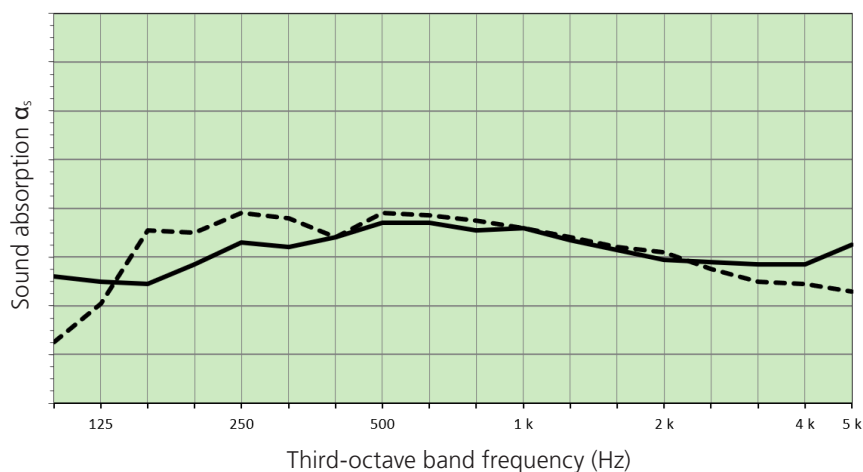
- Ambient temperatures: +5 – 50 °C
- Humidity: up to 90 % relative humidity

## Acoustics

Initial data is presented below.

Axis distance activation profile	333 mm	333 mm
Ceiling system	closed	closed
Ceiling underside	High density plasterboard with graphite ——①	Alu honeycomb panel with acoustic plaster ----②
Perforation plasterboardmit	with (8/18 R)	with (not visible from below)
Edge joint	with	with
Acoustic inlay	fleece	fleece
Additional inlay (30 mm, 80 kg/m <sup>3</sup> )	mineral wool	mineral wool
Sound absorption $\alpha_p$	250: 0,60 500: 0,70 1k: 0,70 2k: 0,60 4k: 0,60	250: 0,75 500: 0,75 1k: 0,70 2k: 0,60 4k: 0,50
Sound absorption $\alpha_w$	$\alpha_w$ : 0,70	$\alpha_w$ : 0,65 (L)
Sound absorption class	C	C

EN ISO 11654



# System

## Ceiling system

- Closed ceiling (can also be used as a sail)

## Installation systems

- Installation height: min. 120 mm (incl. plasterboard 10 mm)
  - Base construction: CD profiles
  - Supporting construction: Heat conducting profiles of the activation element and CD profiles

# Materials, weight and dimensions

## Materials and weight

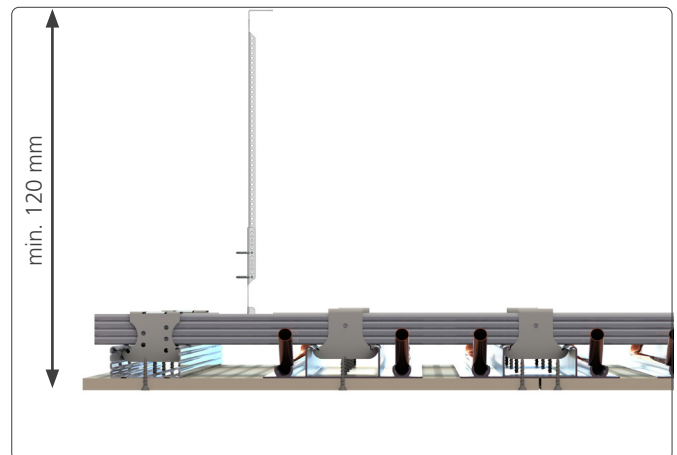
## Dimensions

Material	Weight (incl. water)	Axis distance	Length	Width
Plasterboard with graphite perforated	17 kg/m <sup>2</sup>	166 / 333 mm	1980 - 2001 mm	1188 - 1200 mm
Plasterboard with graphite non-perforated	18,2 kg/m <sup>2</sup>	200 / 400 mm	2000 mm	1250 mm
Alu honeycomb panel with acoustic plaster	14 - 16 kg/m <sup>2</sup>	200 / 400 mm	project specific	project specific
Expanded glass granulate panels with acoustic plaster	12,5 - 13,5 kg/m <sup>2</sup>	max. 417 mm	625 / 1250 / 1875 / 2500 mm	415 / 625 / 1250 mm

Building material class: A2-s1, d0, EN 13501-1 (depending on the acoustic solution).

### Construction

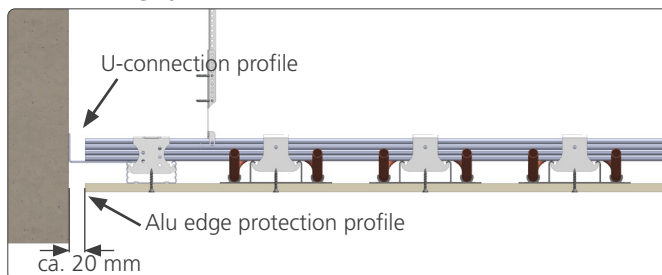
The activation profile is an extruded profile 135 mm wide and 1 to 3 m long with a pressed-in copper tube meander. The dimensions of the suspension correspond to the CD profiles 60 x 27 mm and 50 x 27 mm. This means that the activation profile can be used as a fine grid in combination with the CD profile.



### Wall connection installation situation

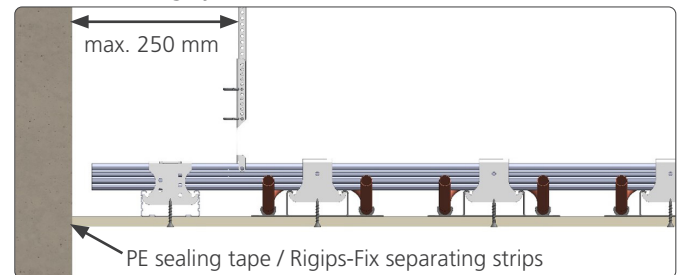
Wall connections are to be installed in accordance with the applicable specifications of the panel manufacturer.

- with edge joint



The overhang after the last screw point may be a maximum of 100 mm.

- without edge joint



### Material variants ceiling underside

- Plasterboard
  - Only plasterboards in accordance with DIN EN 520 and DIN EN 14190 are to be used. Primarily suitable are:
    - Rigips® RB 12,5 mm, vario or equivalent
    - Rigips Rigiton® Ambience RB 12,5 mm, perforated or equivalent
    - Rigips® Climafit 10 mm, perforated / non-perforated or equivalent
- Aluminum honeycomb panel with Sto acoustic plaster:
  - Acoustic white plaster (standard)
  - Acoustic colored plaster on request
- Expanded glass granulate panel with Sto acoustic plaster:
  - Acoustic white plaster (standard)
  - Acoustic colored plaster on request

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