

VoglThermotop



Highly Efficient

in Energy Conservation

Modern heating and cooling from above

The use of cooling and heating ceilings

Today's buildings have to satisfy a wide variety of demands. The focus is always on the users of the building. The building must provide the best possible conditions for them to work efficiently and productively. People can achieve optimum performance only in an optimum environment. A crucial requirement for pleasant and performance-oriented work is an efficiently designed workplace. A prevalent aspect here is the feel-good factor. It is achieved by maintaining agreeable room temperatures. This condition is realised by integrating cooling and heating systems with high radiation effect into suspended ceilings. In this process, ventilation is reduced to the absolutely necessary and induced with the lowest possible speed. An excellent way to realise this is to use the VoglThermotop system. Together with our system partner, RiLO Systemtechnik, we support you in your cooling and heating ceiling project from the design through the tendering process to the execution.



System description, VoglThermotop

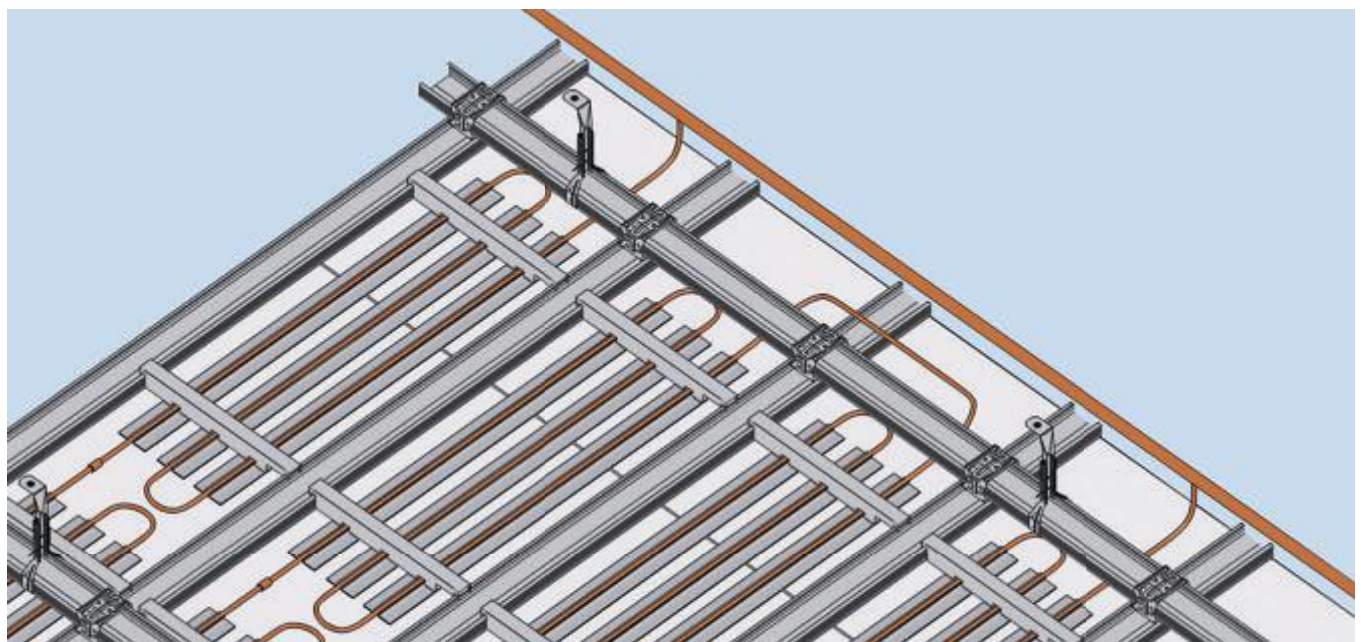
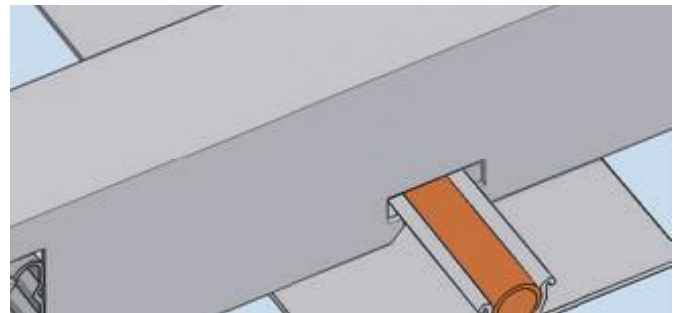
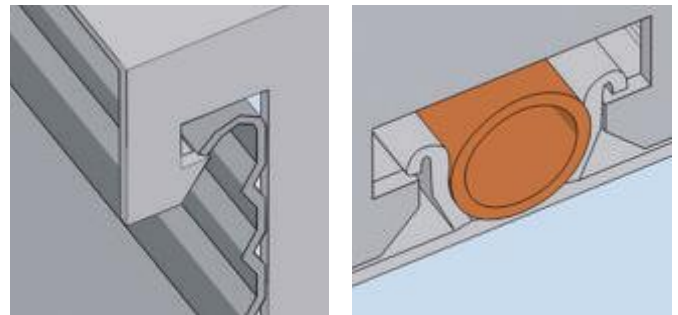
All system components of the VoglThermotop system are perfectly harmonised to ensure optimum application and result reliability.

Following the framework installation, GKH system suspenders are used to attach the cooling/heating coils to the framework. The GKH system suspender locks in place in the CD profile audibly. This way of locking the coils ensures their accurate positioning within the framework.

The special "RiLO GKH system suspenders" which hold the copper tube bundle and are locked into bearing framework between the CD profiles are structurally pre-stressed – which ensures the contact between the heat-conducting profiles and the covering panels.

The heat is transmitted by heat conducting profiles shaped in a way to both hold the copper tube and ensure the greatest possible area of contact to the outside of the copper tube.

The heat conducting profiles are located on the straight stretches of the tubing, in between the opposite 180-degree elbows.



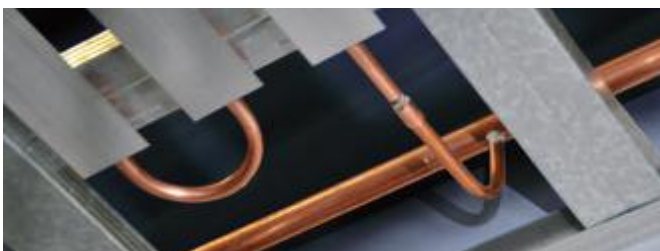
Less energy, more performance

To conserve the fossil resources, it makes good sense to put major energy consumers on a diet. Highly efficient systems are in demand for the heating and cooling of buildings. The VoglThermotop system combines acoustic design ceilings with the additional function of a very effective cooling and heating ceiling. Compared to conventional air handling systems, the operating costs can be reduced by up to 40 %, and, from an aesthetic point of view, the harmonious appearance of the ceiling is not compromised. When it comes to shape and functionality, VoglThermotop offers unlimited freedom of design.



The cooling and heating ceiling for maximum efficiency:

- Perfectly easy to install the pre-assembled units in the finished ceiling framework by simply hooking and snapping them into place
- Tested complete system from one source with integrated result reliability
- Available as smooth cooling and heating ceiling, perforated cooling and heating ceiling, cooling and heating ceiling with acoustic plaster system or floating cooling and heating ceiling
- Individual design and execution to achieve maximum efficiency from the surfaces available for activation
- Low operating costs due to low-maintenance complete system, minimum susceptibility to failure thanks to the use of long-time tested materials
- Highly flexible system for multi-functional expansions – such as lighting, sound and safety systems – as well as more building services



Flush level installation

The completely pre-assembled coil units are simply hooked into the bearing grid from above.



Undisrupted flow

All tube ends are protected for transport and intermediate storage. Tube ends free of chips from cutting, with no outer burr or deformation, ensure a perfect permanent bond in the brazing process.

Primary profiles are rigidly hung from structural soffit with suspended brackets using fixing materials approved by the relevant building authorities. Centre distance and number of suspended brackets, as well as fixation, are subject to site requirements and EN 13964/DIN 18181. CD 60/27 secondary profiles are attached to CD 60/27 primary profiles using cross connectors.

CD 60/27 are extended using straight connectors. For primary grid profiles, always ensure that joint is close to a suspended bracket (max. 100 mm). For primary and secondary profiles, joints are generally offset from each other.

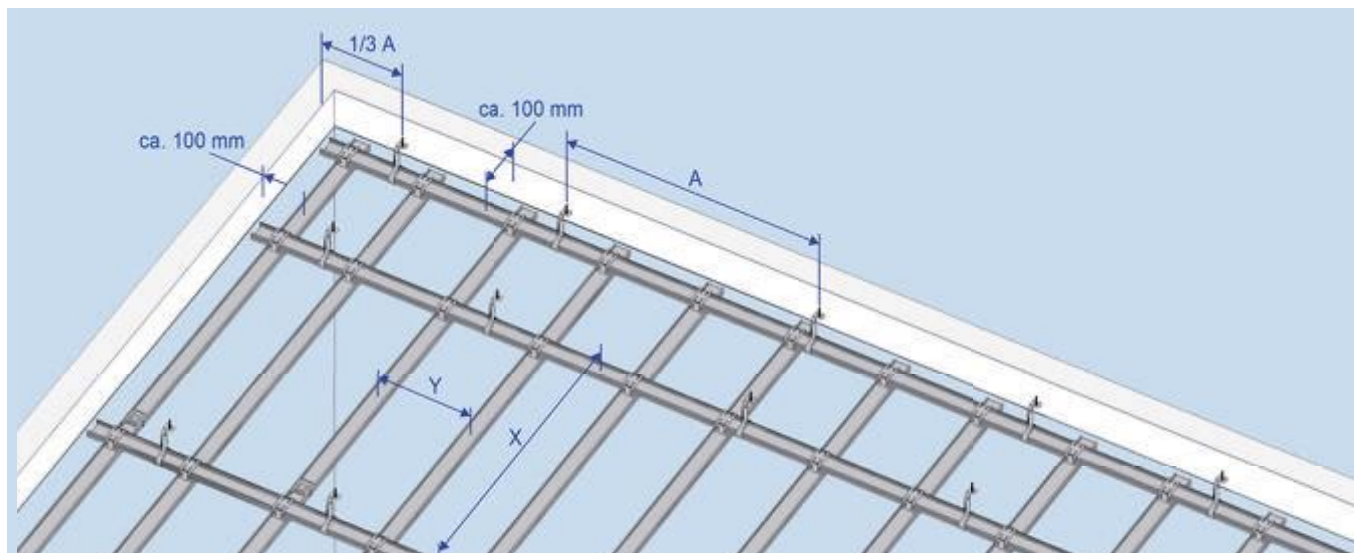
Plasterboards should be installed in accordance with EN 13964/DIN 18181 and manufacturer's guidelines.

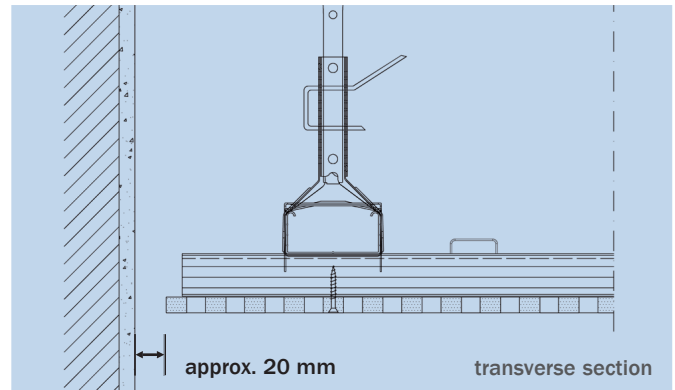
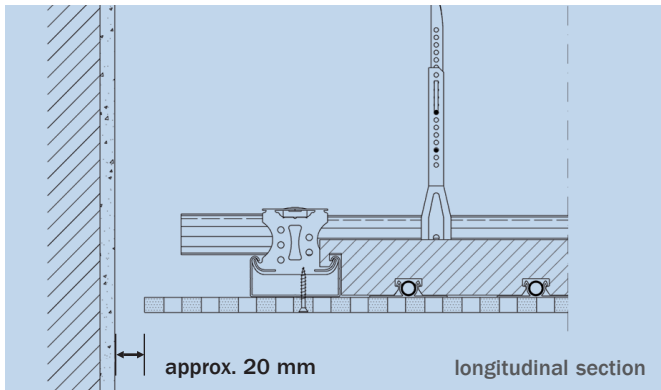
Additional items such as lighting, ventilation, sprinkler systems etc. must be individually suspended.

Any changes in framework owing to integrated ceiling components must be considered.

VoglThermotop framework								
Technical data	Unit	Perforated panel ceiling						
Panel thickness	mm	10.0						
Distributed load	kN/m ²	≤ 0.15					≤ 0.30	
Centre distance of suspended bracket A	mm	1,150	1,050	1,000	950	900	900	750
Centre distance of primary profiles X	mm	600	800	900	1,000	1,100	600	1,000
Centre distance of secondary profiles Y	mm	see table below						

Item	Unit	Centre distance of secondary profiles Y
Acoustic Design Panel 6/18; 8/18; 8/18Q; 10/23; 12/25; 12/25Q; 8/12/50; 8/15/20; 12/20/35	mm	333
Acoustic Design Panel 15/30 12/20/66	mm	330
VoglToptec (Acoustic Plaster System) 8/18R 12/25Q Reflexio (smooth)	mm	334
VoglToptec (Acoustic Plaster System) Ultracoustic panel 12/25R DLV	mm	325

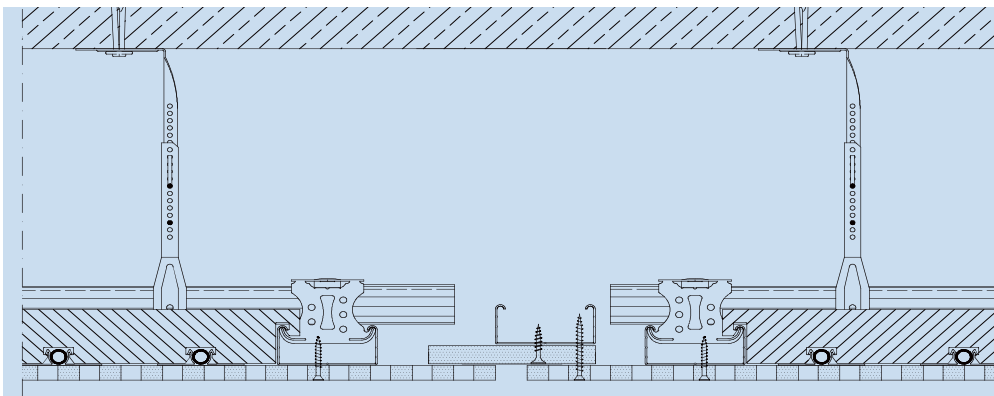




Wall connection:

Due to the thermally induced expansions of the cooling/heating ceiling, we recommend creating wall connections in a way to allow the absorption of movements, for example by providing an open shadow gap (approx. 20 mm).

Please contact us if you require additional standard details concerning the VoglThermotop system.



Expansion joints:

In order to avoid cracking in ceiling surface, provide appropriate expansion joints for cooling ceilings every 10 running metres/100 m² and for combined cooling and heating ceilings even with a side length of 7.5 linear metres.

Framework must be completely severed (see illustration) and panel strips above joint fixed to one side of ceiling structure only.

Material required per m² based on a ceiling of 100 m² (10 m x 10 m, not considering loss or waste, approximate values):

Metal framework, suspended bracket centre distance 1,000 mm, primary profile spacing 900 mm, secondary profile spacing 333 mm

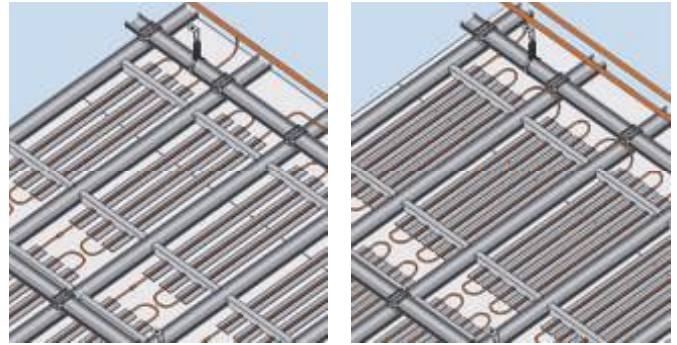
Item number	Item description	Unit	Quantity
Fixation			
Standard	Safety nail, DN 6 x 35	piece	1.3
52150000	Perforated panel screw, gold, TB 23	piece	22
Suspended brackets			
2016X000	Direct suspended bracket 50/120/200 and	piece	1.3
50809000	Tapping screw LN 3.5 x 9.5	piece	2.6
or			
20128 / 20151	Vernier hanger / vernier bottom part and	piece	1.3
25501000	Vernier security pin and	piece	1.3
25XXX000	Vernier top part, 200 - 2,000 mm, custom lengths on request	piece	1.3
Profiles and connectors			
100X000	CD profile 60/27/0.6 rK, l=XXX mm	m	4.1
20159000	Connector, lengthwise, CD 60/27	piece	0.8
20135000	Cross connector, CD 60/27	piece	3.3

Various designs and surfaces – individually tuned to your project

Whether low, medium or high cooling capacity, whether perforated or smooth surfaces: All options are open to you with the VoglThermotop cooling and heating ceiling. The variations our system offers suit your requirements perfectly and guarantee you a complete solution from one source, ideally tuned to your project.

Maximum efficiency through individual coil configuration per area

Versatility and flexibility are given through the use of three- or four-row cooling coils combined with various widths of heat conducting profiles.



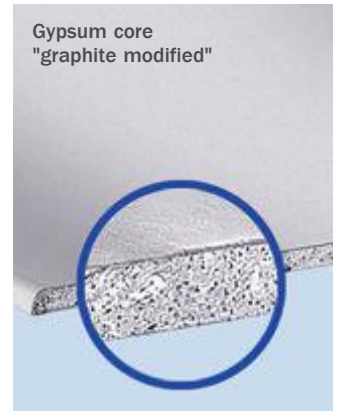
The right type of panel for every demand

When designing your project, you have the choice between two panel types – the VoglThermotec panel or the VoglThermotec panel PLUS. With a panel thickness of 10.0 mm, both panels have an increased thermal conductivity. The VoglThermotec panel PLUS is, moreover, equipped with a graphite-modified gypsum core for enhanced performance.



Gypsum core
"standard"

VoglThermotec panel

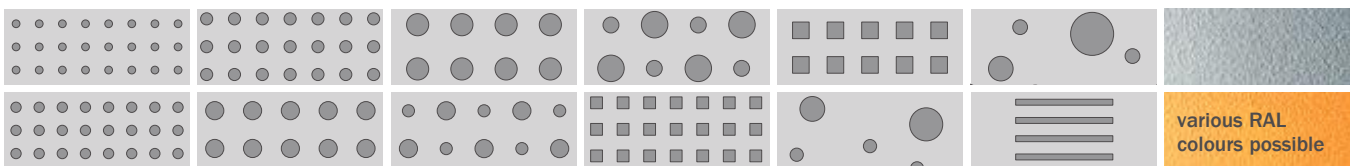


Gypsum core
"graphite modified"

VoglThermotec panel PLUS

Surface diversity into the bargain

Whether you desire one of our 12 perforation patterns or a finish with VoglToptec Acoustic Plaster System – you have all options open with the VoglThermotop cooling and heating ceiling system. Of course, it is also no problem to have your ceiling finished as a smooth plasterboard ceiling.

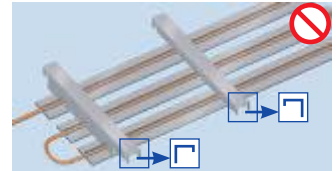
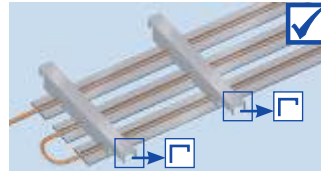


Cooling coils and GKH system suspenders are delivered in separate packaging. GKH system suspenders are installed on site.

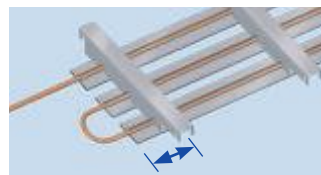
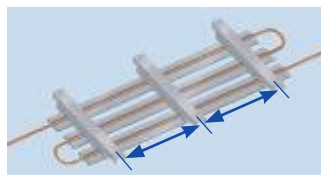


Note:
Observe system specifications by RiLO Systemtechnik when installing tubing and commissioning cooling and heating ceiling system! Furthermore, we refer to the requirements and guidelines of the Federal Registered Association of Surface Heating and Surface Cooling Systems.

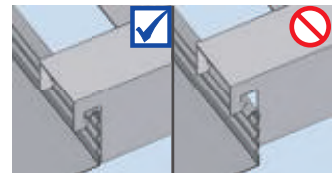
Slip GKH system suspenders onto cooling coils evenly, with cooling coil holders always pointing in same direction.



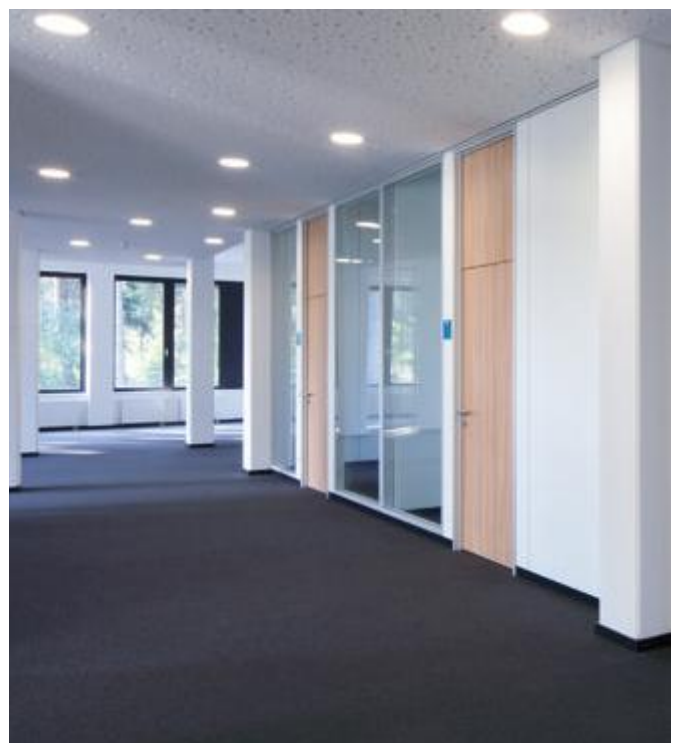
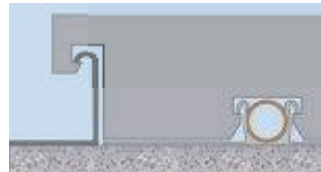
Centre distances of the GKH system suspenders < 900 mm; maximum distance to edge of cooling coil < 100 mm.



Hook cooling coil into CD secondary profile at an angle while pushing it up evenly and snapping it into place. Check to make sure GKH system suspender has “clicked” into CD profile, otherwise snap it in manually.



Cooling coil is pushed upward minimally during panel installation so as to provide full contact with Thermotec panel.



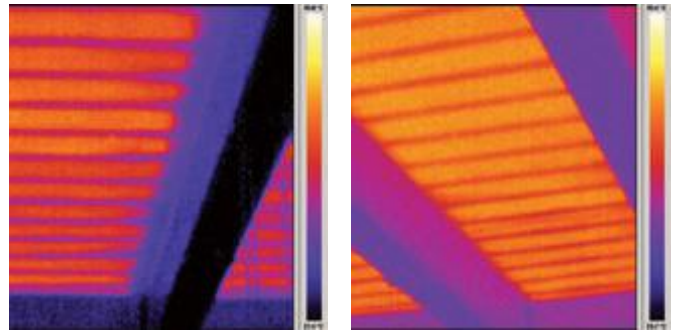
The specified performance values of the VoglThermotop and VoglThermotop PLUS systems are based on the following:

Cooling performance of a room cooling surface

Determination of performance values according to DIN EN 14240:2004-04

The tests in accordance with DIN EN 14240 were carried out by a certified, recognised German testing institute.

(The figure on the right shows a thermographic image when heating)



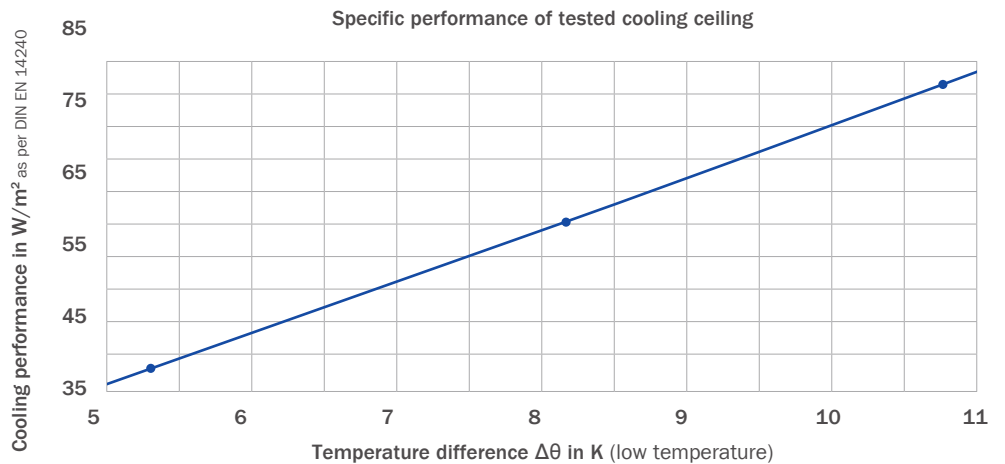
VoglThermotop, smooth, RiLO coil CU50-GK

Type: Non-perforated plasterboards 10 mm with meander elements of heat conducting aluminium profiles with pressed-in meandering copper tube

Cooling performance per m²
 as per DIN EN 14240

$\Delta\theta_N = 8 \text{ K} \Rightarrow 59.2 \text{ W/m}^2$

$\Delta\theta_N = 10 \text{ K} \Rightarrow 75.0 \text{ W/m}^2$



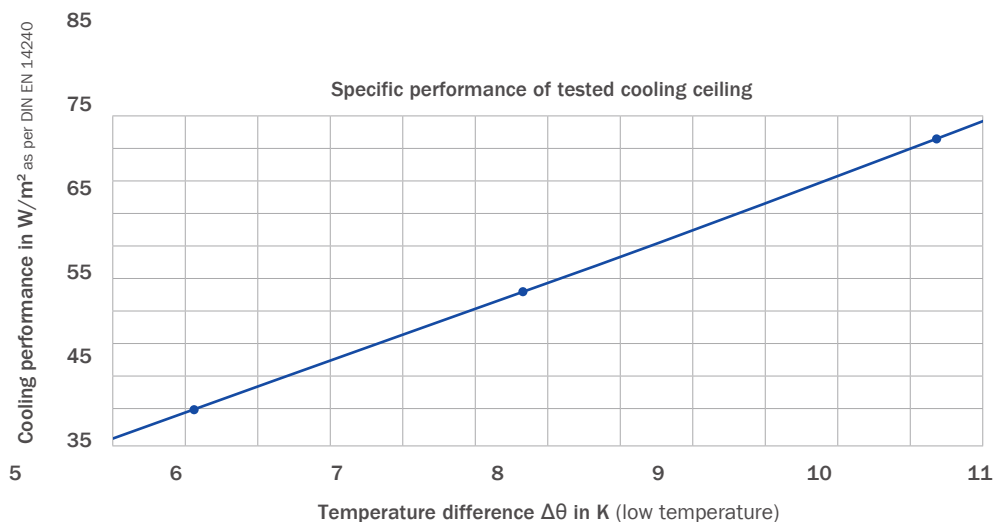
VoglThermotop, perforated, perforation pattern 12/25Q, RiLO coil CU50-GK

Type: Perforated plasterboards 10 mm, perforation 12/25Q, with meander elements of heat conducting aluminium profiles with pressed-in meandering copper tube

Cooling performance per m²
 as per DIN EN 14240

$\Delta\theta_N = 8 \text{ K} \Rightarrow 59.2 \text{ W/m}^2$

$\Delta\theta_N = 10 \text{ K} \Rightarrow 75.1 \text{ W/m}^2$



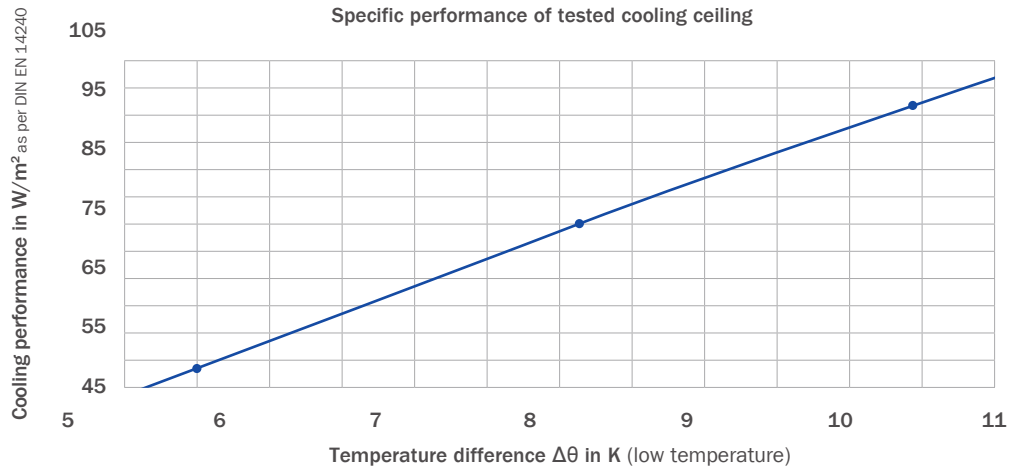
VoglThermotop PLUS, smooth, RiLO coil CU50-GK

Type: Non-perforated plasterboards 10 mm (including share of graphite) with meander elements of heat conducting aluminium profiles with pressed-in meandering copper tube

Cooling performance per m²
 as per DIN EN 14240

$\Delta\theta_N = 8 \text{ K} \Rightarrow 72.8 \text{ W/m}^2$

$\Delta\theta_N = 10 \text{ K} \Rightarrow 92.8 \text{ W/m}^2$



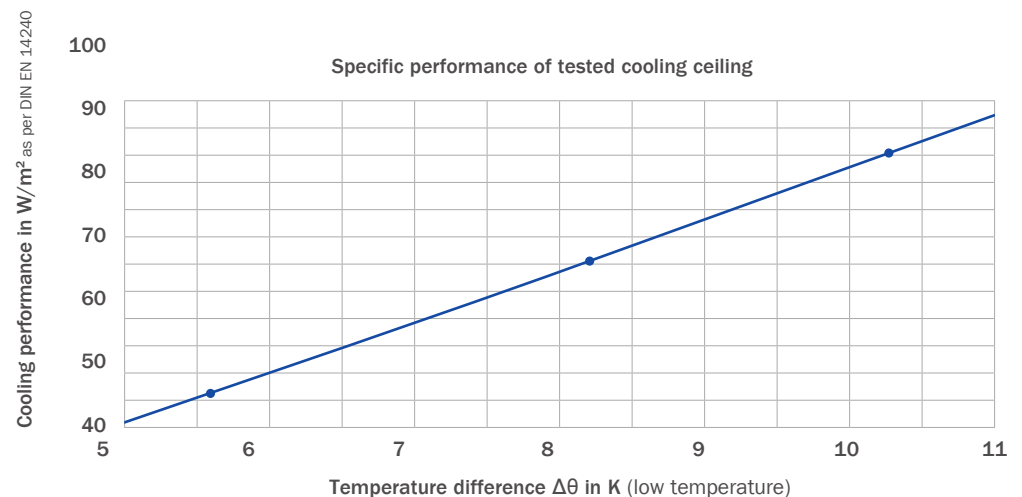
VoglThermotop PLUS, perforated, perforation pattern 12/25Q, RiLO coil CU50-GK

Type: Perforated plasterboards 10 mm (including share of graphite), perforation 12/25Q, with meander elements of heat conducting aluminium profiles with pressed-in meandering copper tube

Cooling performance per m²
 as per DIN EN 14240

$\Delta\theta_N = 8 \text{ K} \Rightarrow 68.7 \text{ W/m}^2$

$\Delta\theta_N = 10 \text{ K} \Rightarrow 87.2 \text{ W/m}^2$



Please contact us if you require more performance values of our system, (e. g. calculations of heating performance).

The performance description of the cooling and heating ceiling refers to 60 % radiation and 40 % convection. What does that mean with respect to the finished object?

The radiation proportion of a cooling ceiling is ideally approx. 60 %. The remaining proportion of 40 % is performed by means of free convection. In this process, the air warmed up by the heat sources rises, i.e. natural buoyancy causes the developed heat not dissipated due to radiation exchange to flow below the ceiling. This is why we generally recommend an open shadow gap of approx. 20 mm for cooling ceilings. The warmed-up air is cooled there and falls back diffusely, mixed with room air, into the occupied zone.

What is the minimum structural height that has to be considered in the design process for installing a cooling and heating ceiling?

At least 65 mm overall height must be available for the installation. Experience has shown that a structural height of approx. 150 - 200 mm is recommendable since the installation of lighting, safety and service equipment as well as access for inspection also have to be considered.

Is a cooling and heating ceiling sufficient for fully air-conditioning a room?

Cooling and heating ceilings contribute essentially to the air-conditioning of modern buildings in an energy-efficient manner. But depending on the project, it may be necessary to combine them with a ventilation system and/or additional cooling and heating surfaces. For this reason, specialist engineers have to be involved in the detailed planning to achieve the best possible result for the end user.

Does the effect of the acoustic ceiling / acoustic plaster ceiling in terms of sound absorption remain unchanged despite the cooling and heating system installed on its back?

The cooling and heating system installed behind the acoustic ceiling (heat conducting profiles resting on the panel and reducing the effect of the acoustic fleece) does have a negative impact on the acoustic performance of the ceiling. We have, therefore, commissioned both TÜV Rheinland and LGA Products GmbH Nuremberg to conduct several echo chamber measurements with and without heat conducting profiles in order to determine the deviation. The tests have revealed that the acoustic performance of the ceiling is reduced by an average of approx. 15 - 20 %.

Does the cooling and heating system at the back of the panel pose an increased risk of cracking?

There is no increased risk of cracking if our manufacturer's instructions for the installation of framework and panels are observed (e.g. expansion joints). However, we generally recommend to use our tested complete systems from Vogl Deckensysteme.

What fire rating class does the finished cooling and heating ceiling system fulfil?

Framework and cooling system can be classified as fire rating A1 in accordance with the EN standards. The acoustic design / Thermotec panels below fulfil fire rating A2,s1,d0 as per EN 13501.



VoglThermotop system

Plasterboard cooling and heating ceiling system VoglThermotop, for the dissipation of thermal loads through radiation by approx. 60 % and through convection by 40 %. Cooling and heating coils are hooked in between CD secondary profiles using special GKH system suspenders; rigid framework of galvanised metal profiles is hung with horizontally and vertically aligned suspended brackets and installed using materials and fixtures approved by the relevant building authorities, all in compliance with manufacturer's instructions.

System structure

Framework in accordance with DIN 18181:2007-02

Profiles:

Pressure-resistant design made from galvanised sheet steel profiles CD 60/27 as primary and secondary profiles in accordance with EN 14195

Suspended brackets:

- Suspend with vernier systems (top part, vernier hanger)*
- Suspend with vernier systems (top / bottom part)*
- Suspend with direct suspended brackets*
- Use fixing materials approved by the relevant building authorities.

Connection:

For primary-secondary profile connection with cross connectors, use suspended brackets and cross connectors in accordance with EN 13964.

Suspended bracket centre distance: max. 900 mm,
 Primary profile centre distance: max. 1,100 mm,
 Secondary profile centre distance: ____ mm* (depending on panel type)

Cooling and heating system:

Cooling and heating system in accordance with RiLO processing instructions and technical documentation.

Cooling and heating coils are hooked in between the CD secondary profiles using special GKH system suspenders. The cooling system thus hangs approx. 3 mm below the bottom edge of the secondary profile.

This results in a homogeneous, heat-conducting contact between the RiLO system and the plasterboard panel.

Design of coil: Type CU50-GK* / type CU65-GK*
 Design of copper tube: 10 mm* / 12 mm*

Technical data:

- Cooling performance active as per EN 14240: ____ W/m²
- Room temperature: ____ °C
- Cooling water supply: ____ °C
- Cooling water return: ____ °C
- Designed cooling performance with regard to the active surface as per EN 14240: ____ W/m²
- Heating performance as per VDI 4706: ____ W/m²
- Room temperature: ____ °C
- Hot water supply: ____ °C
- Hot water return: ____ °C
- Designed heating performance with regard to the active surface as per EN 14240: ____ W/m²

Follow-up services:

- Covering with VoglThermotec panels*

Complete system: Vogl Deckensysteme, or equivalent

* Delete as applicable

