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Chilled Ceiling Elements Installation Methods and Mounting Instructions

PL-M1/EN/3



Figure 1: Mounting of WK-D-UM

Easy installation combines both the functional and the design requirements of a ceiling.

The architect has unrestricted planning options with respect to the room and ceiling design since the chilled ceiling elements are not integral parts of the conventional ceiling. Items installed in the ceiling, such as air diffusers, lighting fittings and sprinkler systems plus fulfilling the acoustic requirements do not pose any problems. The ceiling void remains accessible.

The designer is free to choose from various types of chilled ceiling elements the most economically suited to his project.

The intended ceiling layout determines the capacity of the chilled ceiling. Subsequently the water volume flow rate can be defined and the water pressure drop can be optimised.

The WK-D-UM and WK-D-UL series ceiling cooling elements are delivered at the same time as the ceiling panels so that the cooling elements are smoothly integrated into the ceiling panels at the construction site.

The successful application of chilled ceilings relies on the well coordinated teamwork of architect, consultant, installer and manufacturer.



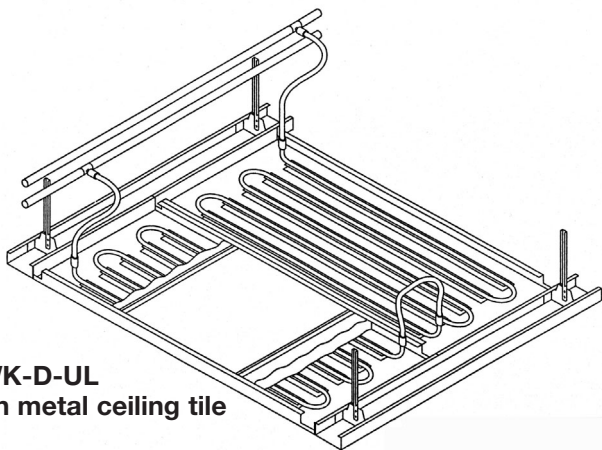
Figure 2: Hinged chilled ceiling with ceiling cooling element type WK-D-UM (e. g. for inspection)

Survey of Technical Data

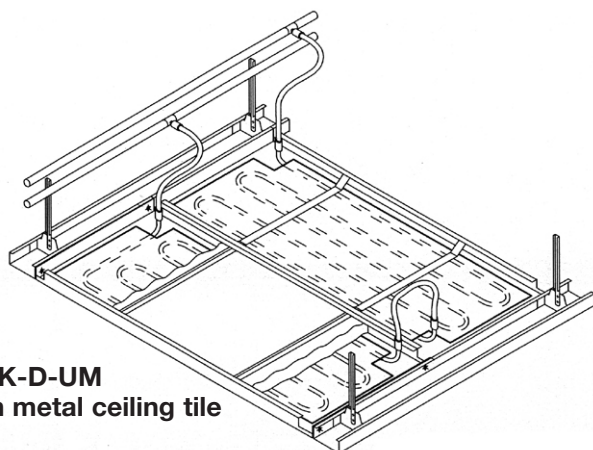
Standard cooling capacity according to DIN EN 14240 for continuous ceilings	up to 80 W/m ²
Standard cooling capacity according to DIN EN 14240 for open ceilings	up to 125 W/m ²
Temperature difference chilled water	2-4 K
Recommended water flow temperature	16°C
Operating weight	WK-D-UM up to 6.0 kg/m ² WK-D-UL up to 9.0 kg/m ² WK-D-WF up to 18 kg/m ² WK-D-EL up to 14 kg/m ²
Water content	approx. 1 l/m ²
Pressure drop	10-50 kPa
Connection	10 or 12 x 1.0
Overall heights	50-150 mm

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**WK-D-UL
on metal ceiling tile**



**WK-D-UM
on metal ceiling tile**

Installation

The chilled ceiling elements are inserted or stuck into the ceiling tiles and, in relation to the system, secured against falling out by means of clamping strips. Flow and return water connections to headers and panel to panel are made hydraulically plastic hoses.

The installation of ceiling lights, spot-lights, fire detectors, loudspeakers, etc. is no problem when TROX chilled ceiling elements are used.

Metal Ceiling Systems

A chilled ceiling system combined with a modular grid ceiling consists of the following assemblies:

- Modular grid sections
- Metal ceiling tiles
- Cooling elements including clamping strips, e.g., WK-D-UM or WK-D-UL
- Pipe connections up to the control valve
- Control components

No additional load-bearing structure is required because the weight of the chilled elements including all accessories does not exceed the load-bearing capacity of a normal suspension system of modular grid ceilings.

A hook structure can also be combined with the inserted ceiling elements WK-D-UM or the bonding chilled ceiling elements WK-D-UL. As with the normal modular grid ceiling, the clamping strips are positioned in the return edge of the ceiling tile.

A spring clip system can also be used with the WK-D-UM and WK-D-UL chilled ceiling elements.

If the ceiling tiles are to hinge down the flow and return connections of the chilled ceiling elements are arranged on the hinge axis.

The ceiling tiles usually consist of galvanised sheet steel with various perforation patterns which offer a large variety of design options to the architect.

An additional acoustic fabric on the inside of the panel or a rear insulation mat above the chilled elements provides good sound absorption properties.

Standard colour: a) Ceiling panel – RAL 9010 or on request
b) Chilled ceiling elements – raw or RAL 9005

Dimensions:

Ceiling panel length: 600 mm to 3000 mm

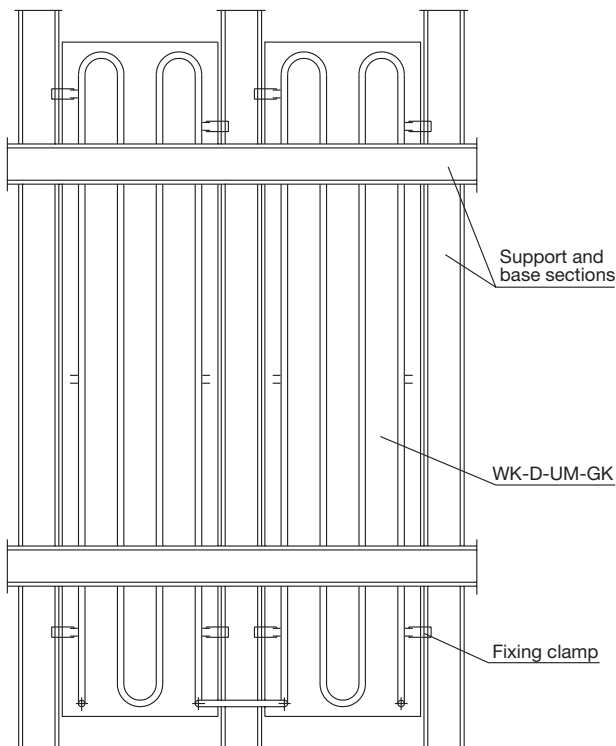
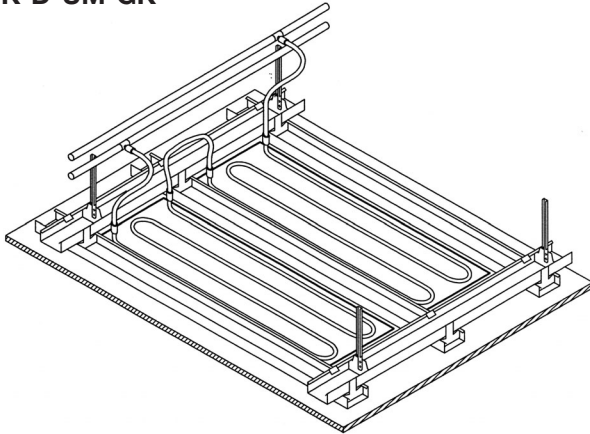
Ceiling panel width: 200 mm to 1250 mm

Width and length to be combined according to supplier's instructions with regard to sagging.

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WK-D-UM-GK



Plasterboard Ceiling

A chilled ceiling system combined with a plasterboard ceiling comprises the following assemblies:

- Support sections according to DIN 18 181
- Chilled ceiling elements WK-D-UM-GK, adjusted to the support sections grid
- Plasterboards, perforated or non-perforated
- Internal piping up to the control valve
- Control components

The elements are made to a length which is related to the existing structure and feasible dimensions. The width of the elements is determined by the centres of the support sections. No additional load-bearing structure is required because the weight of chilled ceiling elements including all accessories do not exceed the maximum load-bearing capacity of a normal suspension structure for a plasterboard ceiling.

By means of the ceiling plan, the installation location is clearly identified with stickers affixed to each individual element.

Because of their own weight, the chilled ceiling elements are in contact with the plasterboard ceiling across their entire surface and thereby ensuring good thermal transfer.

Installation

The support and base sections of a plasterboard ceiling are conventionally mounted by the ceiling installer. Simple hanging of the support grid with fixing brackets makes quick installation on site possible. Once the chilled ceiling elements have been installed according to the ceiling plan and connected to the flow and return headers, the pressure test is performed before the plasterboards are screwed into position. After the successful completion of the pressure test, the ceiling installer can close the ceiling with plasterboard and skim the ceiling.

Advantage: The trades can work separately.

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Series WK-D-WF and WK-D-EL Open ceiling systems

The WK-D-WF and WK-D-EL series cooling elements are especially suited for open ceiling systems. Both types combine the high cooling capacity of a convective chilled ceiling with the advantage of a low installation height.

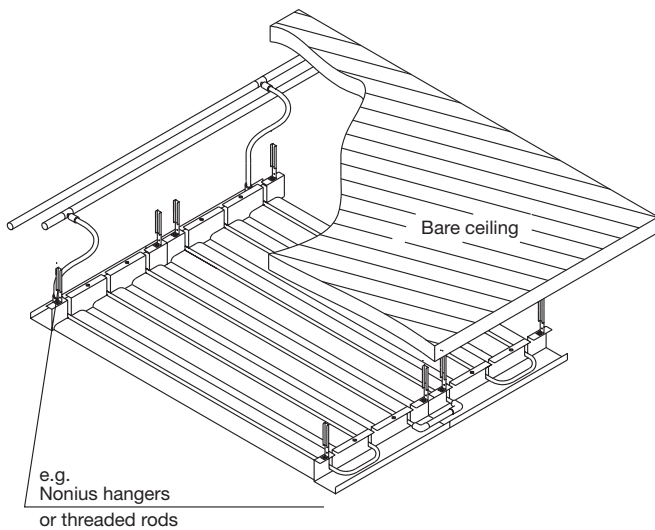
Owing to their pleasant panel design the cooling elements are suitable for all-over installation as well as for creative integration in metal or gypsum plasterboard ceilings and also as freely suspended chilled ceiling sail. With additional open grid ceilings suspended underneath the effective free area should be rather high in order to maintain the high efficiency of the convective chilled ceiling.

Mounting

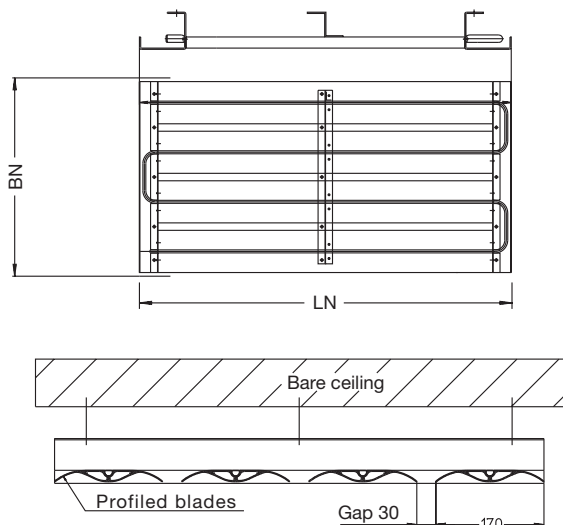
The WK-D-WF and WK-D-EL series cooling elements are made with profiles for suspension from the bare ceiling. They can be suspended with threaded rods or nonius hangers as well as a suitable substructure system.

For integration into other ceilings the means of hanging can be adapted to the existing system.

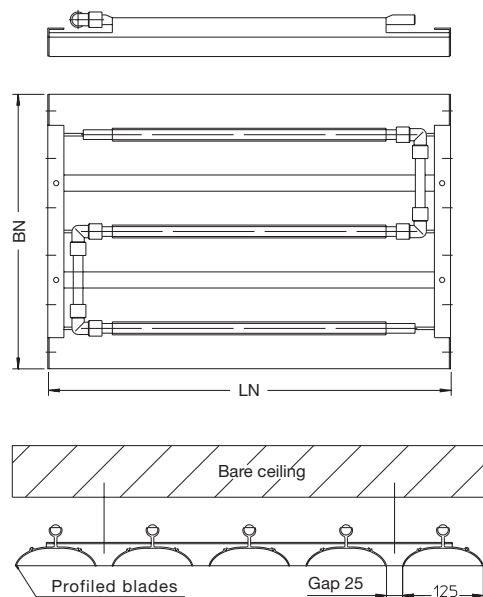
The chilled ceiling modules are then interlinked according to the tubing plan and connected to the supply and return pipes of the chilled water system, followed by a pressure test.



Series WK-D-WF



Series WK-D-EL



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Figure 3: Thermal conduction bars with changing pitch according to the ceiling tiles

Examples of project-related special constructions

Chilled ceilings in special design can be supplied in any case. An example are the TROX thermal conduction bars with aluminium panels screwed to the underside, see figure 3.

Please contact TROX.

When there are different cooling elements in a chilled ceiling, every single element carries a label identifying it clearly. Then, based on the ceiling layout each element can be perfectly fitted in its designated place, see figure 4.

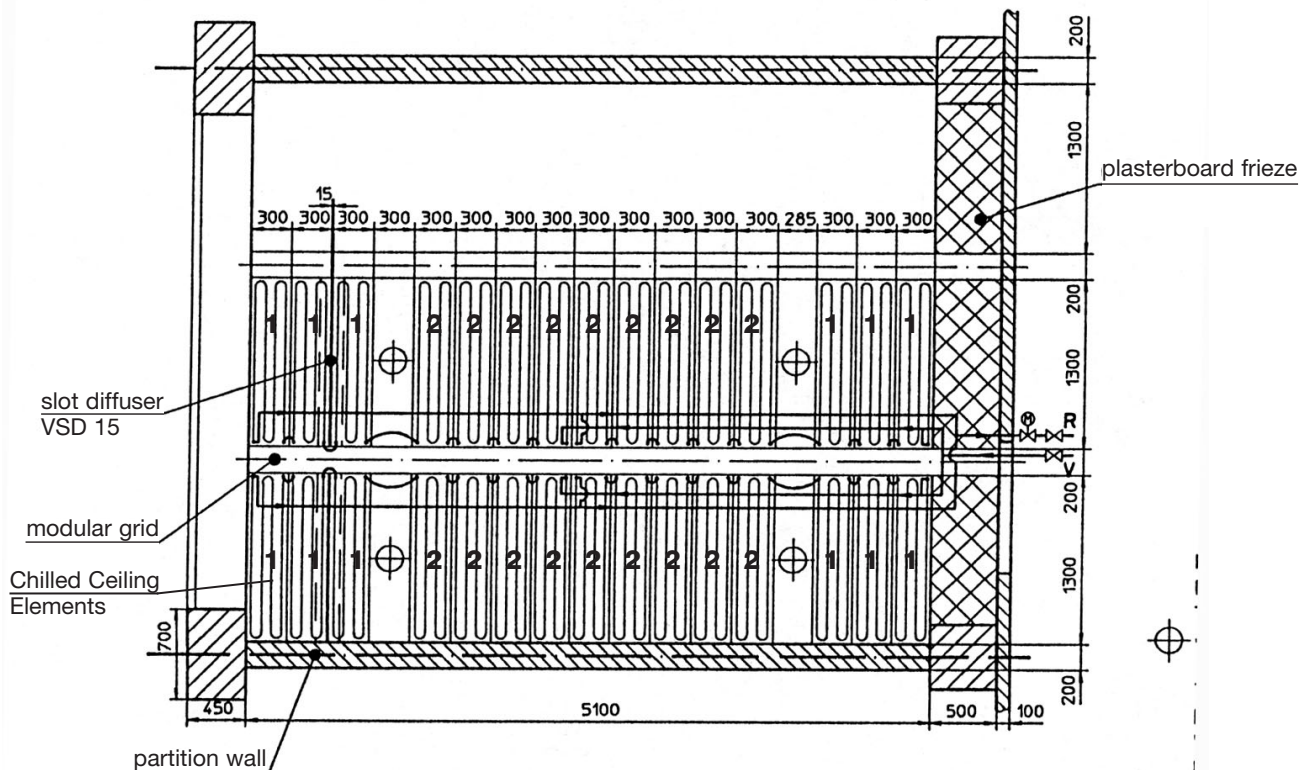


Figure 4: Example of a ceiling plan

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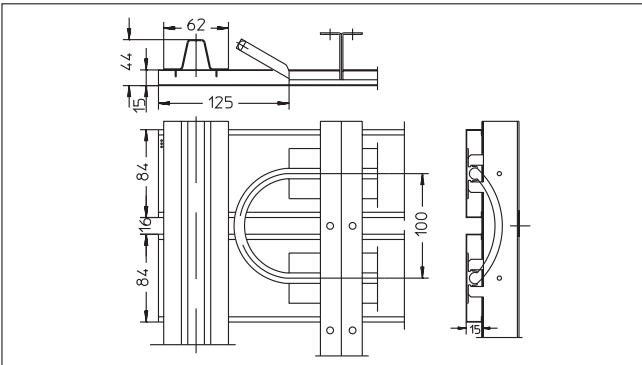
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Figure 5: WK-D-UL combined with panel ceilings



Figure 6: Chilled panel ceiling

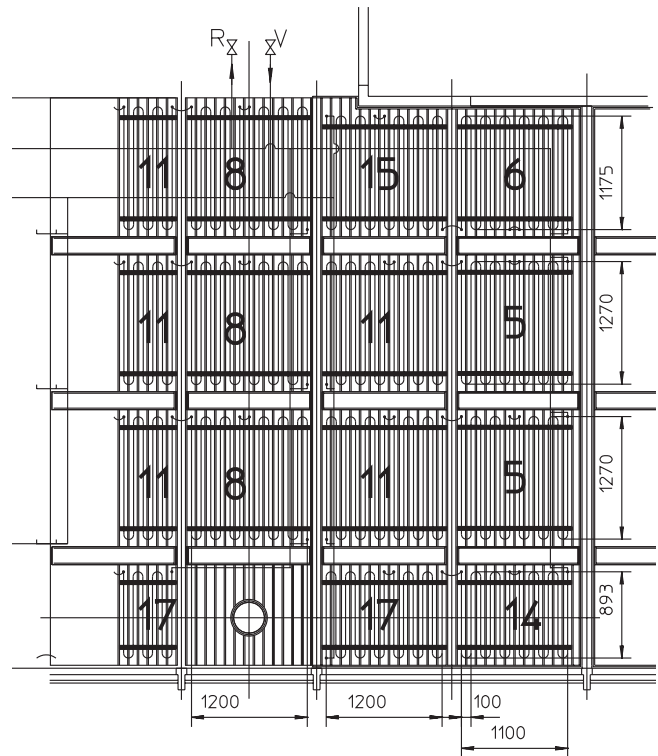


Detail: WK-D-UL

Special constructions, e. g. panel ceilings

Cooling elements have to be adapted to common ceiling designs if the visible ceiling has already been planned or if restoration work has to be done.

Examples for the adaptation to a visible panel ceiling are demonstrated in pictures 5 and 6.



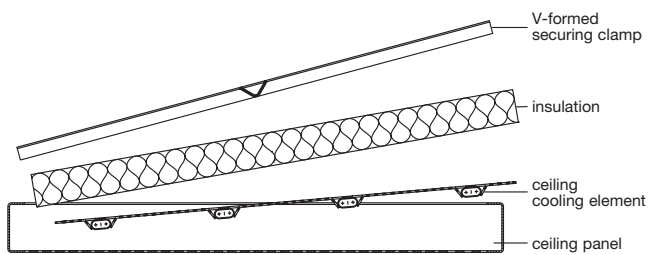
Ceiling plan WK-D-UL

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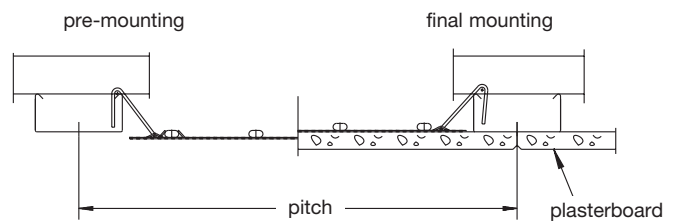
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Installation Details (Examples)

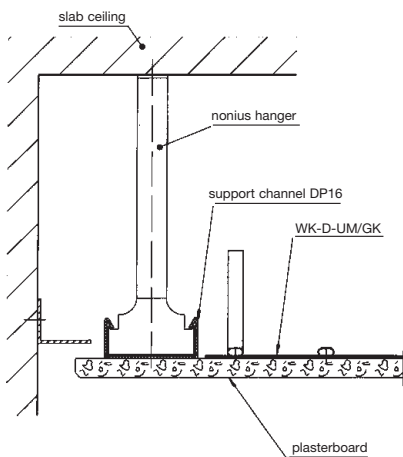
WK-D-UM metal ceiling



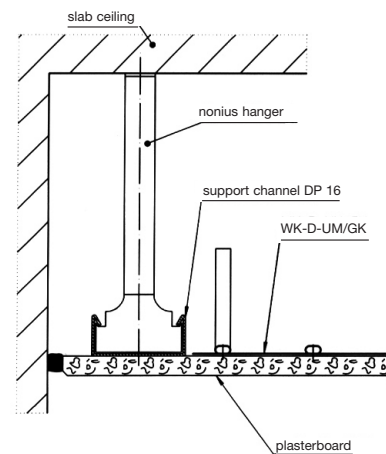
WK-D-UM-GK plasterboard ceiling



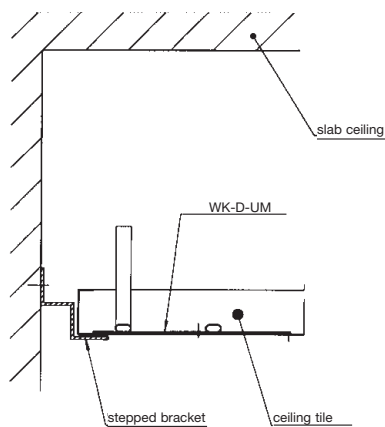
WK-D-UM-GK with gap



WK-D-UM-GK without gap



WK-D-UM metal ceiling with gap



WK-D-UM metal ceiling without gap

