

# DESIGN AND INSTALLATION MANUAL

## GP-Cool Speed Ceiling – Cooling and Heating System



### COOL RACER

- robot-assisted pipe laying
- quick & easy
- budget-friendly
- patented system





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## General Guidelines and Applicable Standards



The B+M GP-Cool Speed ceiling cooling and heating system is generally a classic gypsum board ceiling. Installation should comply with the applicable local building standards and regulations, and also to follow the supplemental guidelines for use below in order. (e.g ON B3415, DIN 18168, DIN 18181, etc.)

### Before installation:

All information corresponds to the current version at the time of printing.

- Prior to installation, the installer is required to know all applicable local regulations and follow installation methods outlined in the current GP-Cool Speed installation guidelines. These guidelines are available at any Baustoff+Metall GmbH branch.
- The substructure components were tested according to EN 13964. All system components mentioned in these instructions must be mounted according to the installation guidelines. In the event of any noncompliance with the above, or if unapproved components are used, any and all legal claims against Baustoff+Metall GmbH shall be extinguished.

An electrical grounding of the substructure is for the respective construction project to be checked, and if necessary, to be carried out. The respective regulations of the different plasterboard manufacturers that are related to grounding the substructure in connection with the respective plate types should also be considered.

### Service:

For further technical information and to clarify other requirements, we are available to provide advice and further clarification.

[www.gpcoolspeed.com](http://www.gpcoolspeed.com)

### Required conditions for installation:

Mounting the GP-Cool Speed system requires a dry room with a closed facade or windows and a room temperature between 7C° and 25C° with a relative air humidity between 40% and 70%. Do not expose the rooms and the ceilings to wide temperature fluctuations after construction and never allow the minimum temperature to fall below 5C°. Also be sure to comply with the board manufacturer's conditions of use and storage.

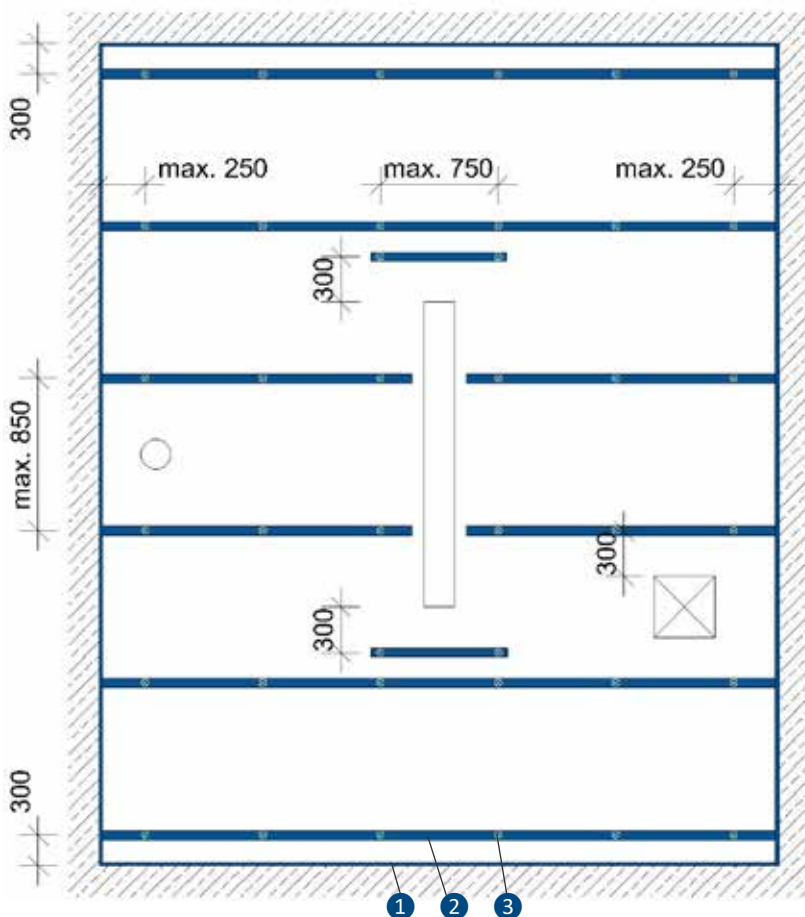
# CHAPTER 1

## INSTALLATION GUIDELINES FOR THE SYSTEM

### Making of the substructure system

The B+M GP-Cool Speed ceiling system is generally a classic plasterboard ceiling. Define the support structure and the perimeter channels according to the applicable standards where installation takes place and bear in mind any outlets and built-in units as well as the system-inherent dimensions and loading data illustrated under Step 1 below.

## STEP 1



Key: ① UD-profile ② CD-60/27 profile ③ Hanger part

### Please note:

Only a compression-rigid suspension assembly with the system components is allowed.

The UD-profile ① must be fastened to the wall in a friction-locked manner. This can be done by fastening the channels to the wall using screws and appropriate screw anchors.

The substructure must correspond to the 15 to 30kg/m<sup>2</sup> load class. (ON B3415)

Plan to use expansion joints for ceiling panels longer than 10 meters, according to the principal sketches DA 3-4. The maximum panel size is 10 x 10 meters.

Design and position the building expansion joints accurately according to expected movement.

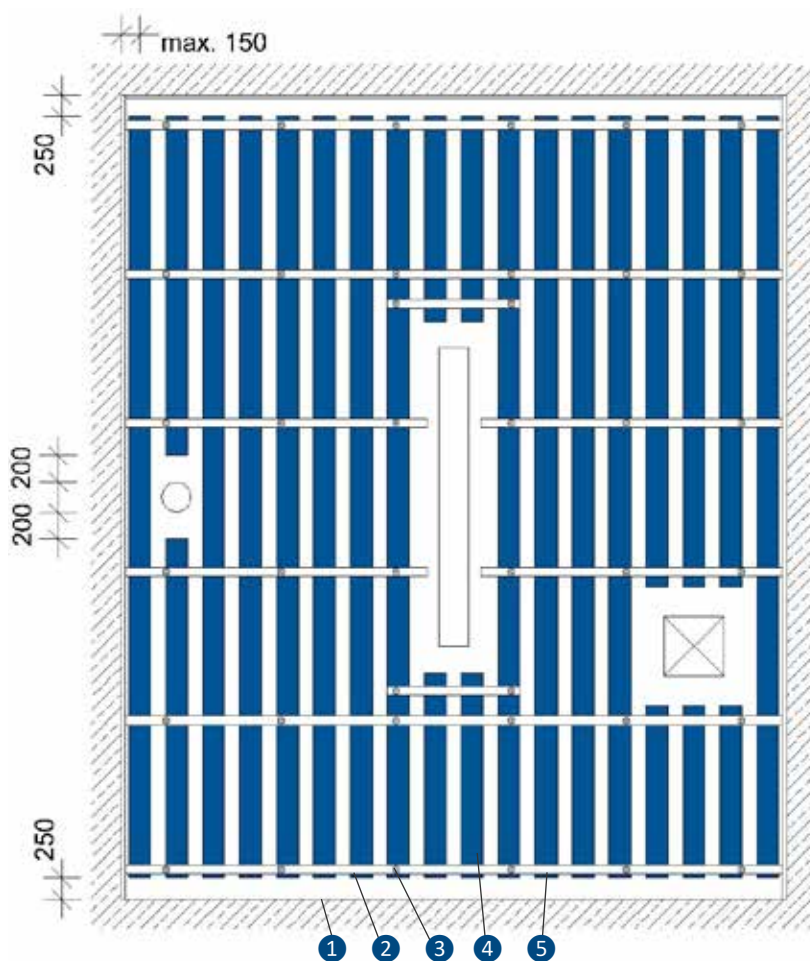
**Please note the following construction details:** Perimeter trim WA 1 - 4, apron blanket design DA 1.0, ceiling connection to normal ceiling DA 2.0, expansion joint design DA 3 - 4, built-in units DA 5 - 6, as well as the load class tables and the pipework details.

**Note:** Perform an anchor pullout test and make a record of it. Re-check the fit of the Nonius hanger lower parts and Nonius pin and center-to-center distances of the support structure and distances to any built-in units after completion.

## Mounting of GP-Cool Speed profiles

Mount the heat transfer plates to the support structure using two of the angle brackets per intersection point according to the system requirements shown in illustration no. 2 (art.no. ANKERWINKEL). Every heat conductor profile has to be mounted at least to 2 substructure profiles.

### STEP 2



Key: ① UD-profile ② CD-profile ③ Hanger part  
④ GP-Cool heat transfer - profile ⑤ anchor angle

#### Please note:

The profile distances to the wall must be made according to the selected perimeter detail (see WA 1-4).

The profiles gap must not exceed the maximum stipulated by the board manufacturer, however, it may be reduced or distributed flexibly according to the performance requirements.

The minimum practicable grid spacing is 166.7mm; the maximum is 416.7mm for smooth panels and 333mm for perforated panels. You must comply with the board manufacturer's requirements.

The following grid spacing generally applies: for 2000mm long panels placed crosswise 166.7, 200, 250, 333.3 and 400mm, and for 1250mm long panels placed lengthwise (look after the manufacturer informations of plasterboards!) 178.6, 208.3, 250, 312.5 and 416.7mm.

The profile spacing will define the subsequent output of the cooling ceiling. (on this, see Chapter 2)

**Note:** The angle brackets must be completely bent and they need to be used on both sides for each suspension grid fastening. Please notice the system details DA 1-6 for different kinds of ceiling solutions.

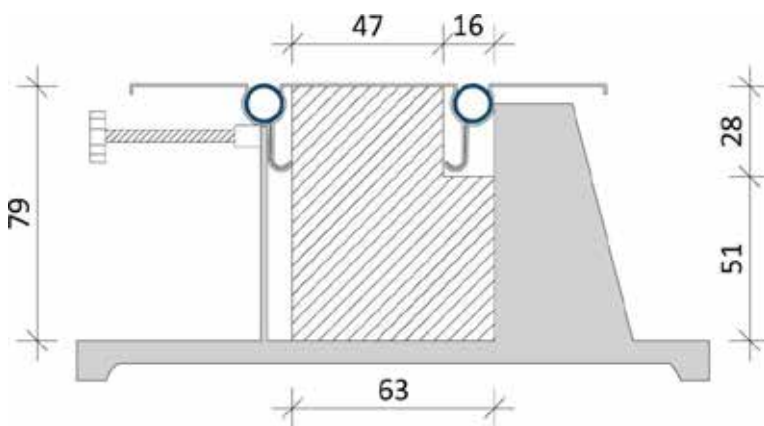
**Important:** The areas where no cooling ceiling will be added should first be set aside and then assembled during Step 4.

First plan where to put the supply and return pipework for the heating and cooling ceilings before mounting the heat transfer plates. Mount the supply and return pipework in the above-ceiling plenum space first, if necessary.



## Details on using GP-Cool Speed profiles

Like the CD profiles, the GP-Cool Speed profile can be extended as desired using integral splices (art. no. CDECKENPROFVERB), which prevents waste. Keep a minimum profile length of 30 cm and an offset of joints of minimum 100 cm. Observe the following specifications and tool recommendations when cutting the plates.



Fixing the profile for the cutting process



### Please note:

Use a cutting saw for cutting metal plates. The Makita cutting saw, model LC1230, is recommended.

Always use a saw blade that is appropriate for metal plates. The model Makita 305mm SAWBLADE combined with the recommended cutting saw is an optimal combination.

Observe the health and work safety regulations regarding saws and always secure the plate before cutting.

Check the burr formation on the plate after cutting and deburr specifically the pipe channel as required. For deburring, the tool with the article no. PROFILENTEGRAT16 is recommended.

**Note:** All GP-Cool Speed heat-conducting profiles must be checked for burrs at the ends, especially in the duct pipe and, if necessary, machined with the deburrer.

The profiles have to be cut to the correct angle and placed together end to end without gaps.

Coarse dirt on the underside of the profile must be removed before using the Cool Racer when mounting on the supporting structure.

## CHAPTER 2

# DETERMINING CAPACITY

## Technical Data Sheets: B + M GP-Cool Speed COOLING

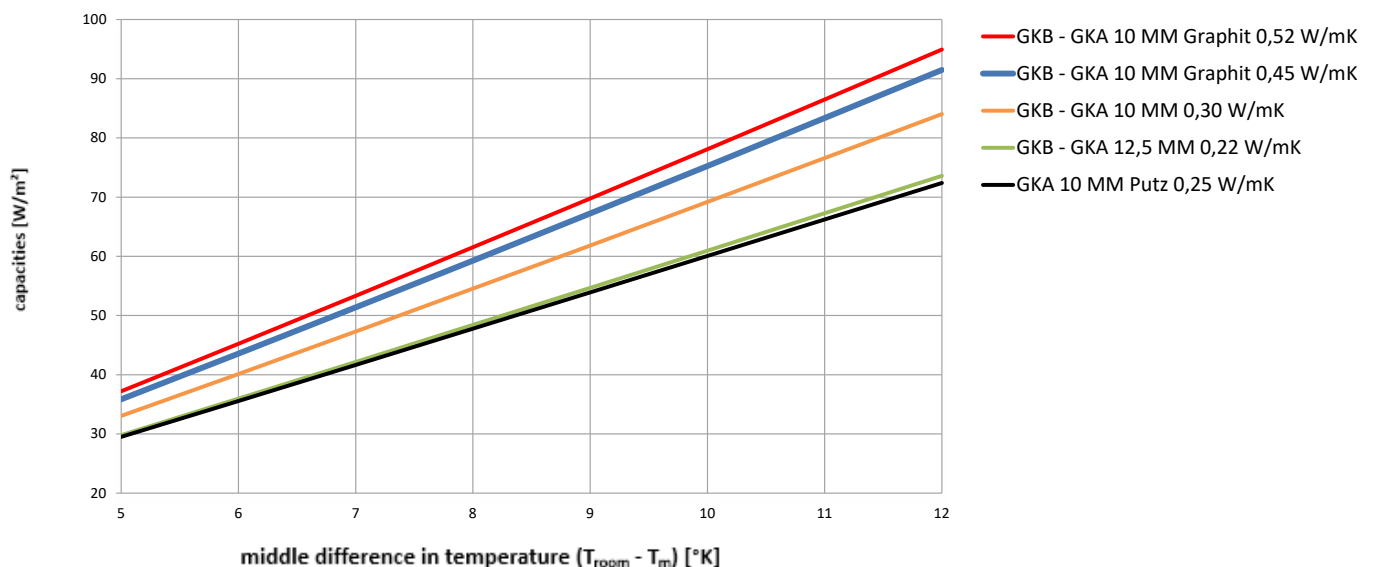
Cooling capacity measurement according to DIN EN 14240 (test reports FTZ\_2014\_KF2270, FTZ\_2014\_KF2200a, VUT-F-656.10.14, FTZ\_2014\_KF2266, FTZ e.V. of Westsächsische Hochschule Zwickau, Germany)

### Test specimen:

B+M GP-Cool Speed gypsum board cooling ceiling.

Heat transfer profiles made of galvanized sheet steel, 0,7mm thick, 150 mm wide; 12 x 1,3mm, 2 pipes each clamped into profile from below.

**Construction type of test specimen:** closed ceiling





**Rated cooling capacities:** (relative to active surface)

- Plasterboard ceiling or acoustical ceiling board 12.5mm ( $\lambda = \text{ca. } 0,25 \text{ W/mK}$ )
 

Rated cooling capacity with temperature difference $\Delta\theta_N =$	8.0 K	:	47,6 W/m <sup>2</sup>
Rated cooling capacity with temperature difference $\Delta\theta_N =$	10.0 K	:	59,9 W/m <sup>2</sup>
  
- Plasterboard ceiling or acoustical ceiling board - heating and cooling ceiling board 10 mm ( $\lambda = \text{ca. } 0,30 \text{ W/mK}$ )
 

Rated cooling capacity with temperature difference $\Delta\theta_N =$	8.0 K	:	54,5 W/m <sup>2</sup>
Rated cooling capacity with temperature difference $\Delta\theta_N =$	10.0 K	:	69,2 W/m <sup>2</sup>
  
- Acoustical ceiling board - heating and cooling ceiling board plaster coating 10 mm ( $\lambda = \text{ca. } 0,25 \text{ W/mK}$ )
 

Rated cooling capacity with temperature difference $\Delta\theta_N =$	8.0 K	:	47,8 W/m <sup>2</sup>
Rated cooling capacity with temperature difference $\Delta\theta_N =$	10.0 K	:	60,0 W/m <sup>2</sup>
  
- Gypsum plasterboard - heating and cooling ceiling board graphite addition 10 mm ( $\lambda = \text{ca. } 0,45 \text{ W/mK}$ )
 

Rated cooling capacity with temperature difference $\Delta\theta_N =$	8.0 K	:	59,3 W/m <sup>2</sup>
Rated cooling capacity with temperature difference $\Delta\theta_N =$	10.0 K	:	75,3 W/m <sup>2</sup>
  
- Gypsum plasterboard - heating and cooling ceiling board graphite addition 10 mm ( $\lambda = \text{ca. } 0,52 \text{ W/mK}$ )
 

Rated cooling capacity with temperature difference $\Delta\theta_N =$	8.0 K	:	61,5 W/m <sup>2</sup>
Rated cooling capacity with temperature difference $\Delta\theta_N =$	10.0 K	:	78,1 W/m <sup>2</sup>

## Technical Data Sheets: B + M GP-Cool Speed HEATING

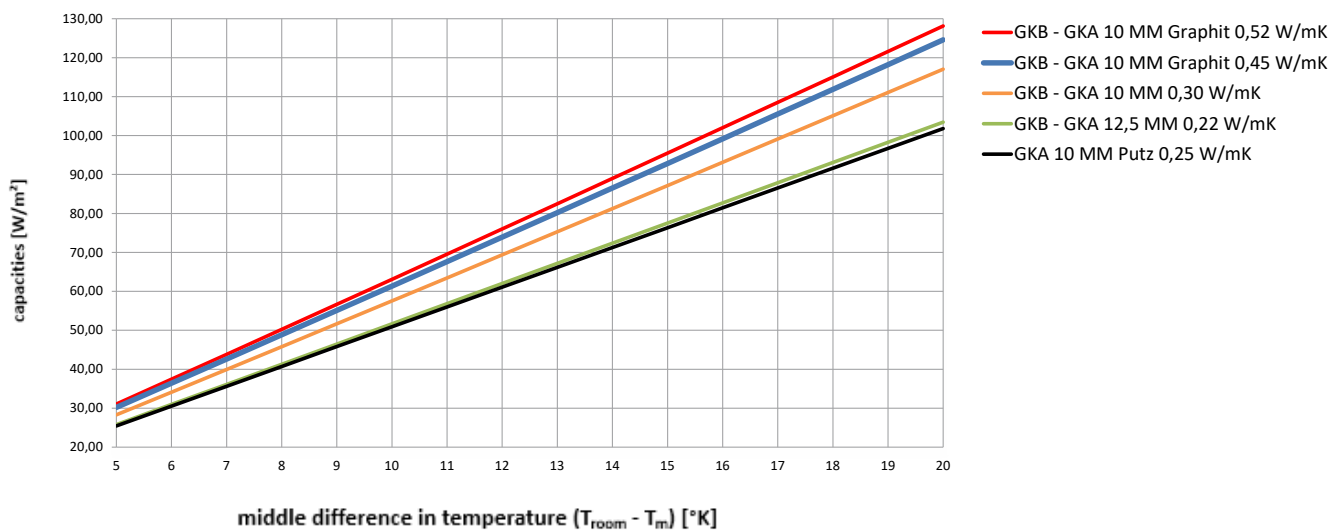
Heating capacity measurement analogously to DIN EN 14037-5  
(test reports FTZ 2012\_HF1074, FTZ e.V. of Westsächsische Hochschule Zwickau, Germany).

### Test specimen:

B+M GP-Cool Speed gypsum board cooling ceiling.

Heat transfer profiles made of galvanized sheet steel, 0,7 mm thick,  
150 mm wide; 12 x 1.3mm, 2 pipes each clamped into profile from  
below.

**Construction type of test specimen:** closed ceiling



**Rated heating capacities:** (relative to active surface)

- Plasterboard ceiling or acoustical ceiling board 12.5mm ( $\lambda = \text{ca. } 0.25 \text{ W/mK}$ )  
Rated heating capacity with temperature difference  $\Delta\theta_N = 15.0 \text{ K}$  : 77,5 W/m<sup>2</sup>
  
- Plasterboard ceiling or acoustical ceiling board - heating and cooling ceiling board 10 mm ( $\lambda = \text{ca. } 0.30 \text{ W/mK}$ )  
Rated heating capacity with temperature difference  $\Delta\theta_N = 15.0 \text{ K}$  : 87,2 W/m<sup>2</sup>
  
- Acoustical ceiling board - heating and cooling ceiling board plaster coating 10 mm ( $\lambda = \text{ca. } 0.25 \text{ W/mK}$ )  
Rated heating capacity with temperature difference  $\Delta\theta_N = 15.0 \text{ K}$  : 77,7 W/m<sup>2</sup>
  
- Gypsum plasterboard - heating and cooling ceiling board graphite addition 10 mm ( $\lambda = \text{ca. } 0.52 \text{ W/mK}$ )  
Rated heating capacity with temperature difference  $\Delta\theta_N = 15.0 \text{ K}$  : 92,9 W/m<sup>2</sup>
  
- Gypsum plasterboard - heating and cooling ceiling board graphite addition 10 mm ( $\lambda = \text{ca. } 0.52 \text{ W/mK}$ )  
Rated heating capacity with temperature difference  $\Delta\theta_N = 15.0 \text{ K}$  : 95,5 W/m<sup>2</sup>

## CHAPTER 3

# CALCULATING SUPPLY AND RETURN PIPES

## Hydraulic design and installing pipes for the system

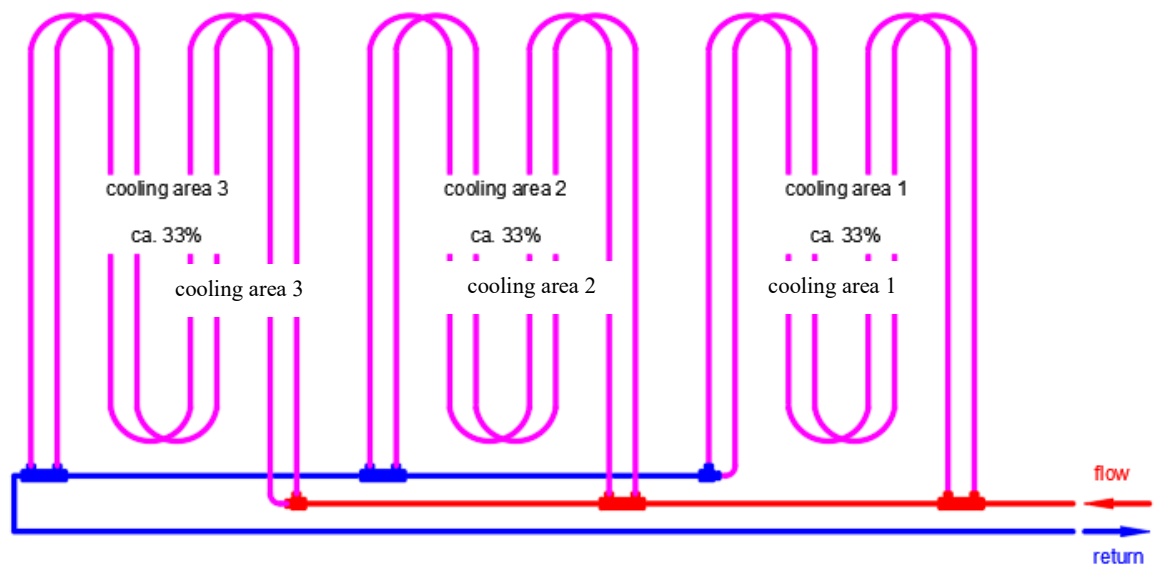
After the ceiling plates have been fastened to the support structure, lay the pipes in the B+M GP-Cool Speed heating and cooling ceiling using a press-fit carriage.

**The system consists of 2 different pipe dimensions:**

- 12x2 MM PB heating pipe (for use in the heating and cooling ceiling plate)
- 20x2,8 MM PE-RT aluminum composite pipe (for the supply and return pipework)

These two types of pipes meet applicable standards and are manufactured with an oxygen-diffusion barrier according to DIN 4726.

The hydraulic pipework follows a two pipe reverse return system. This means that the „shortest“ B+M 12x2mm PB pipe supply route connected to the supply conduit pipe must have the „longest“ return flow in the return conduit pipe.



This design of the pipework ensures that water is distributed evenly in the respective circuits.

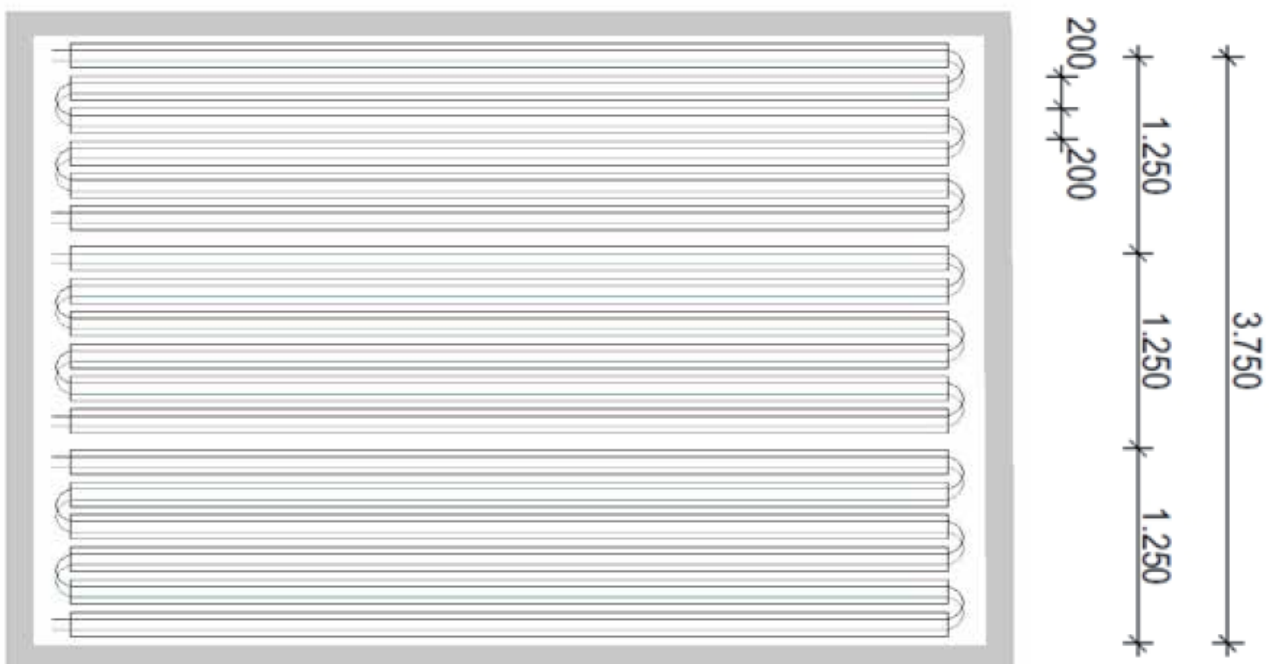
You must ensure that all register circuits have pipes of the same length. (e.g. (e.g. 6 x 30 RMT, or 4 x 50 RMT, etc.)

The maximum length of the individual circuits should not exceed 60 [RMT] / circuit.

## Calculating pressure loss of individual ceiling areas

To determine the pressure loss in the individual heating and cooling ceiling circuits, you need the output of the ceiling system (W/m<sup>2</sup>) and the volume flow rate (kg/h) for the individual areas:

**Example of assignment of air-conditioning ceiling area with laying distance 200:**



### Assumption:

- Supply temperature: 17 [°C]
- Return temperature: 19 [°C]
- Spread: 2 [°K]
- Room temperature: 26 [°C]
- Average water lower temperature: 8 [°K]
- Spacing between heating and cooling ceiling plates: 200mm (5 RMT 12x2 mm PERT heating pipe/m<sup>2</sup>)
- Cooling capacity: active surface ca. 55 [W/m<sup>2</sup>] (see Expected Capacity of Heating and Cooling Ceiling Plates 10mm)
- Pipe circuits: 3 ceiling heating and cooling circuits per 6m<sup>2</sup> active ceiling area each and with 2 x 30 RMT 12x2,0mm PB heating pipes each
- Length of supply and return pipework: 20 RMT 20x2,8mm ALU-PERT heating pipe
- Length from the connecting group (e.g. distributor) to the shortest supply + length from longest return to connecting group, e.g. distributor

Determining capacity for this 6 [m²] heating and cooling ceiling area: 330 [W]

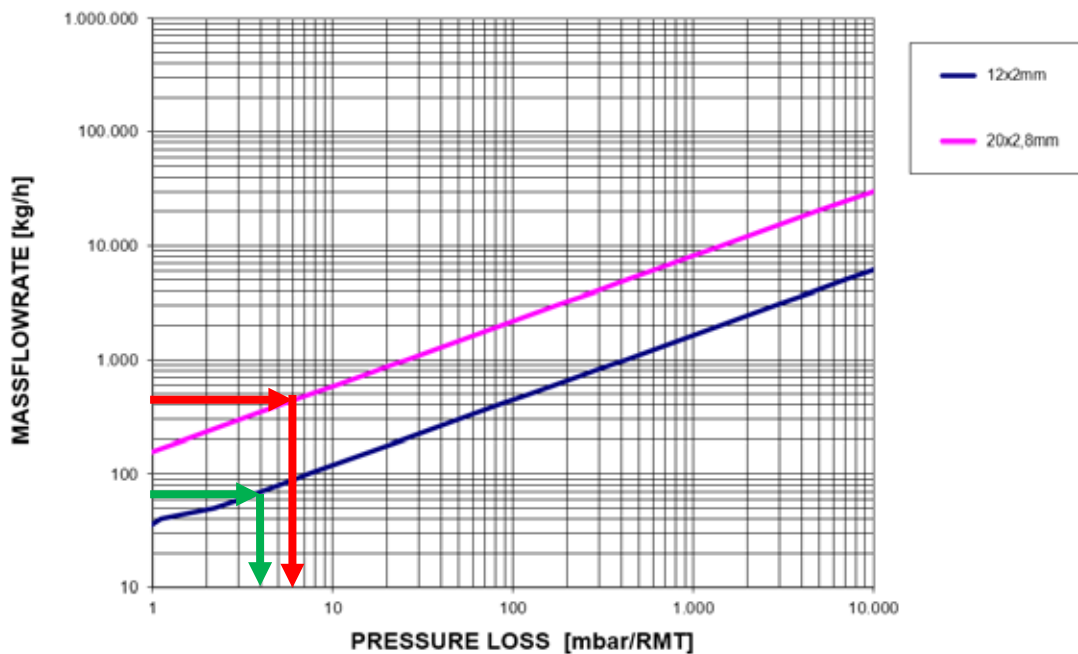
Determining volume flow rate: 142 [kg/h]

$$\dot{m} = \text{massflow} = \left[ \frac{\text{kg}}{\text{h}} \right]$$

$$c = \text{thermal} - \text{capacity} = 4200 \left[ \frac{\text{J}}{\text{kg}^\circ\text{K}} \right] = \frac{4200 \left[ \frac{\text{J}}{\text{kg}^\circ\text{K}} \right]}{3600 \left[ \frac{\text{s}}{\text{h}} \right]} = 1,1667 \left[ \frac{\text{Wh}}{\text{kg}^\circ\text{K}} \right]$$

$$\Delta T = \text{difference} - \text{in} - \text{temperature} = [^\circ\text{K}]$$

$$\dot{m} = \frac{Q}{c\Delta T} = \left[ \frac{\text{kg}}{\text{h}} \right] = \frac{330}{1,1667 \times 2} = 142 \left[ \frac{\text{kg}}{\text{h}} \right]$$



**Pressure loss in 12x2 mm PB heating pipe: (30 RMT pipe length)**

**71 [kg/h] ----- around 4,00 [mbar/RMT]**

**120 [mbar]**

**Pressure loss in 20x2,8 mm ALUPERT heating pipe: (20 RMT pipe length)**

**426 [kg/h] for total area ----- 6 [mbar/RMT]**

**120 [mbar]**

**TOTAL PRESSURE LOSS: 240 [mbar]**



## CHAPTER 4 WORKING WITH PIPES

### Prepare pipes and fittings:

Cut the pipe at the right angles with a tube scissors or a pipe cutter. Select matching sliding sleeve to pipe dimension and pipe type and push onto the pipe so far that the sliding sleeve does not lie in the expansion zone when expanding.



#### BE CAREFUL:

For hygienic reasons and to prevent damage, only use the pipes, fittings and sliding sleeves from the original packaging. Clean dirty fittings and do not use damaged ones. Only use PRINETO original tools to make the sliding sleeve connection.

Do not work with a defective tool, for example an expanding head with broken segment. All tools should be kept as clean as possible and must be cleaned regularly, moving parts should then be greased (eg grease for MSZ).

Before putting the tools into operation, read their operating instructions. The safety instructions must be observed.

#### PIPE widening:



(Image IVT)

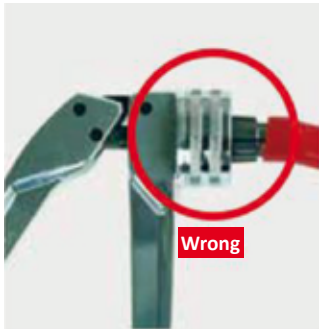
Select the proper expander head according to pipe dimension and screw it all the way to the relaxed expander, compact expander or expander bit. All segments of the expander must be in order.

The widening process will be facilitated and the wear should be reduced if the sliding cone of the widening tools is cleaned regularly and greased thin with tool grease (eg grease for MSZ, item number 878800203). Do not use oil. When expanding, no grease should get inside the tube.

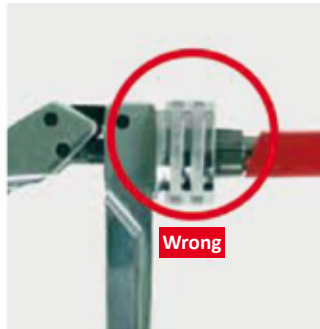
Push the expander head straight into the tube until it stops. Close the manual expansion pliers slowly and evenly all at once.

#### BE CAREFUL:

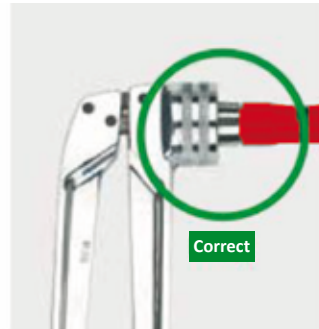
Do not tear, do not pump! When expanding, do not tilt the pipe or widen it under bending stress. Do not widen the sliding sleeve.



Expansion under bending stress



Sloping pipe section



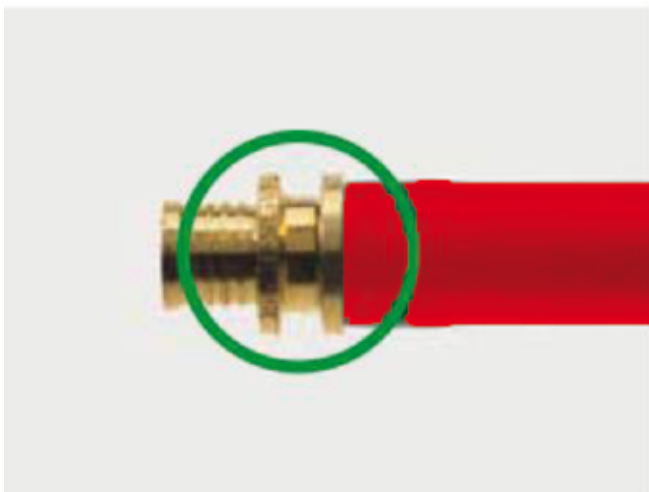
Tube completely plugged on the expander head



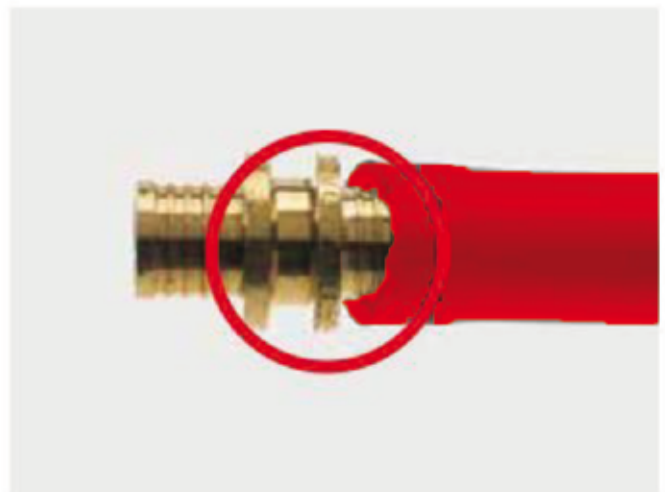
Tube **not correctly** plugged on the expander head

Depending on the pipe dimension and pipe type, it must be widened in different ways. In case of multiple expansion, turn the expansion tool or the tube about 30 ° before the second expansion process.

#### FITTING THE PLUG:



Correctly plugged fitting



Tilted plugged fitting

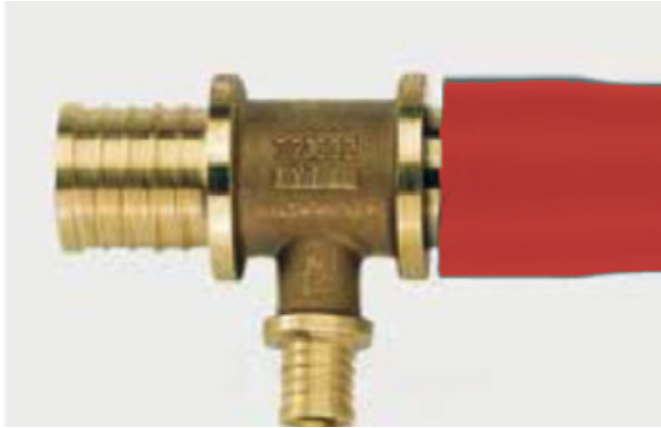
After expanding the pipe, insert the fitting into the pipe socket and align. The pipe socket must touch the fitting collar (exception: Pipes 20 !!). For flexible pipes, the time is limited because the expanded pipe sleeve shrinks again. In this case, widen the tube again.

(Image IVT)

# B+M GP-COOL SPEED

## Design and Installation Manual

In the case of the tube dimension 20, the expansion length is determined by the expander head so that a gap remains between the pipe end and the fitting collar after the fitting has been completely inserted.



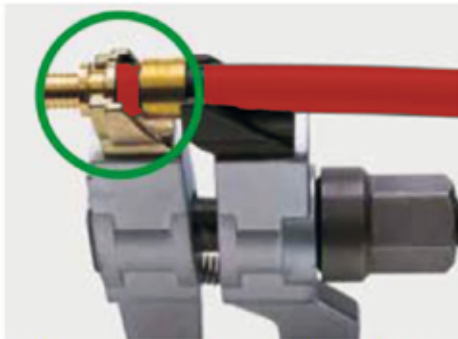
### Gap widths between fitting collar and pipe end:

PERT 12x2,0 pipe	0 mm
PE-X 20x2,8 pipe	1,0 mm

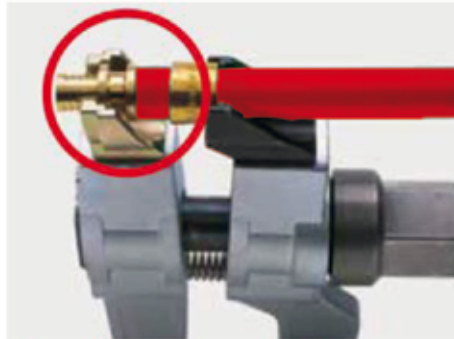
### Postpone the sliding sleeve:

Push the sliding sleeve by hand up to the pipe socket. Equip the sliding pliers with the matching sliding jaws. Always put the yellow F sliding rack on the fitting only. Place the sliding jaws on both sides of the prepared connection.

Make sure that the fitting collar and the sliding sleeve are correctly seated in the centering of the sliding jaws, do not tilt. Slide the sliding sleeve up to the fitting collar.



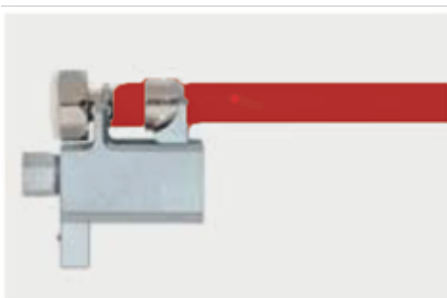
Correctly aligned in MSZ sliding block F



Sliding saddle F attached to the wrong fitting collar. Connection is overpressed.



Manual postponement with KSZ



Manual postponement with PSZ in function

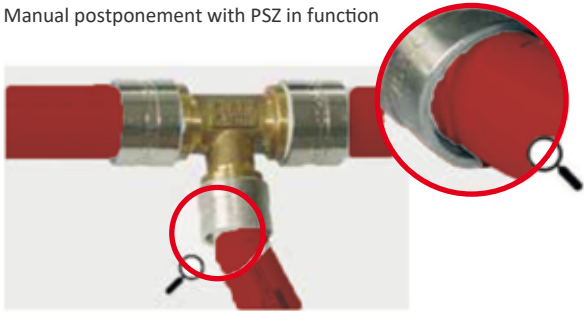
### BE CAREFUL:

The connection must remain in the bottom of the sliding jaws until the completion of the compression. The sliding jaws must not slip out of the tool during pressing. To do this, keep the tool pressed against the connection.

For  $\varnothing$  12 - 20, perform the sliding action by fully squeezing the levers in one go.

(Image IVT)

Manual postponement with PSZ in function



### BE CAREFUL:

Bending immediately at the joint may result in a pipe wall crack!

### TO BE AWARE OF:

First bend the pipe, then press it!

### NOTE regarding temperature and operating pressure ranges:

▪ permanent operating temperatures	20x2,8	bis 80	[°C]
	12x2	bis 60	[°C]
▪ max. operating pressures	20x2,8	10	[bar]
	12x2	8	[bar]
▪ min. working temperature	20x2,8	0	[°C]
	12x2	0	[°C]

(Image IVT)

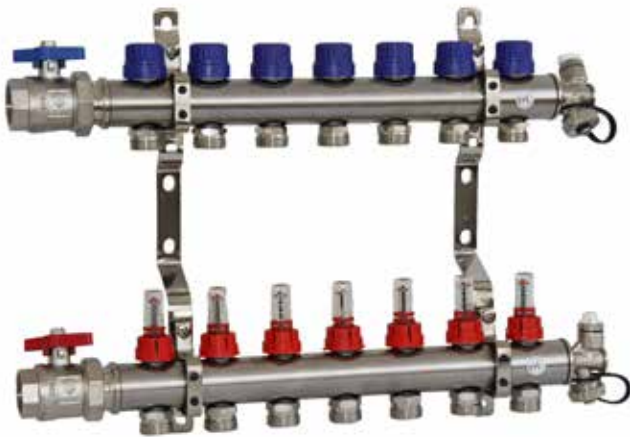
### Transitions between 20x2.8 and 12x2 mm tube:



## CEILING HEATING AND COOLING DISTRIBUTOR AS CENTRAL FITTING UNIT

A ceiling heating and cooling distributor mounted in the above-ceiling plenum space is best suited as a central transfer interface to the plumbing.

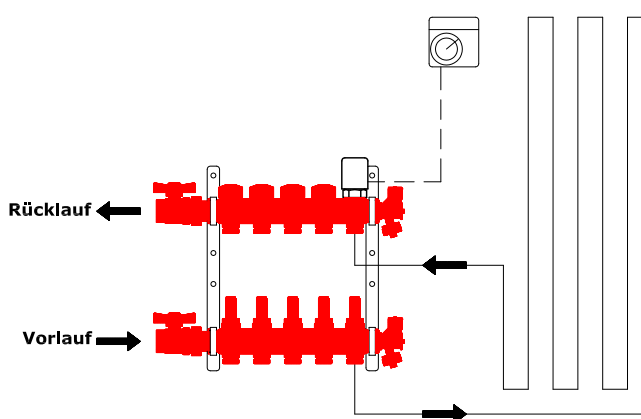
The maximum possible ceiling heating and cooling coverage for each manifold outlet connection is approx. 12-15 m<sup>2</sup>.



- Solid construction of the manifolds
- Hydronic balancing by the proven top meter
- Heating circuit fittings ¾" Euroconus standardized
- Filling and purging by variable end fitting
- Fastening bow with rubber sound insulation
- Easy to install with offset manifold blocks
- Function and leakage test before shipping

Modern heating circuit distributors ensure perfect distribution of heat and cooling in the entire house. Thanks to their technology, they work reliably, suitably and efficiently. The manifold valves are prepared to accommodate actuators. The manifolds are pre-assem-

bled and packed with the ball valve connection set, manifold end units and fastening bow in a solid cardbox.



### Mode of operation:

Connect the supply and return manifolds to the heating or cooling system. The heating and cooling circuits 1-8 outlet connections can be connected with ease and according to applicable standards with the ¾" Euroconus union joint.

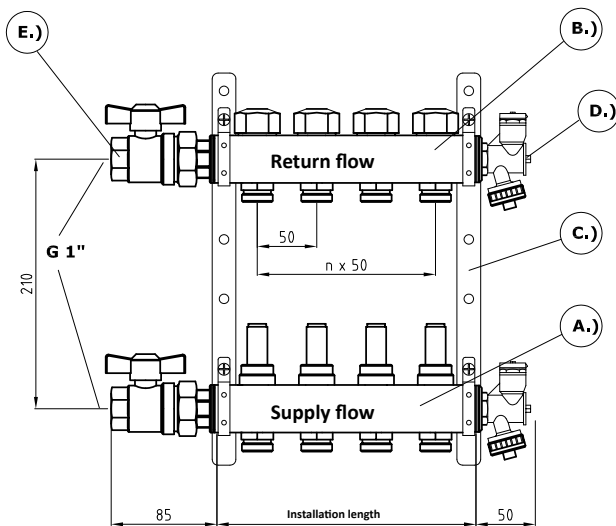
Setting the design flow rate of each heating circuit is done at the top meter (flow indicator) in the supply manifold.

The temperature of individual rooms is controlled through a combination of room thermostat and actuator on the distributor in the return manifold.

### Technical data for the ceiling heating and cooling distributor:

- Manifold: made of premium steel AISI304
- Dimensions: DN25 (1")
- Heating circuit outlet connections:  $\frac{3}{4}$ " Euroconus
- Permissible working temperature:  $-10^{\circ}\text{C} - 70^{\circ}\text{C}$
- Maximum working pressure: 6 bar
- Top meter measuring range: 0 – 8 l/min
- Top meter measuring accuracy:  $\pm 10\%$  of full scale

(Consider changed viscosity with antifreeze agent mix)



A.) Supply manifold with top meter

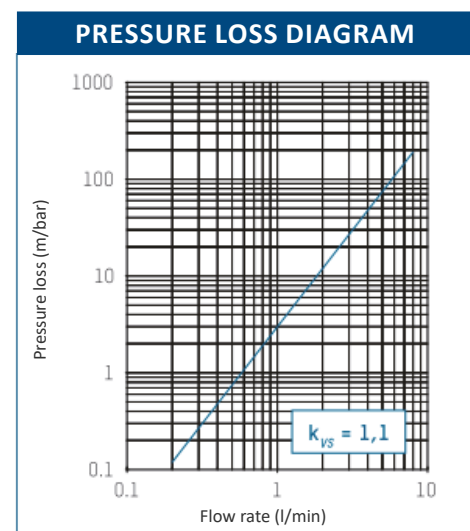
B.) Return manifold with valve inserts M30x1.5 (3 mm travel) for actuator

C.) Wall support with rubber sound insulation

D.) End fitting with fill/drain cock and air vent valve, rotary

E.) Ball valve DN25, 1", inside thread union

### Top meter pressure loss diagram:



### Individual ceiling heating and cooling distributor length:

Heating circuit	L in mm
1	60
2	110
3	160
4	210
5	260
6	310
7	360
8	410

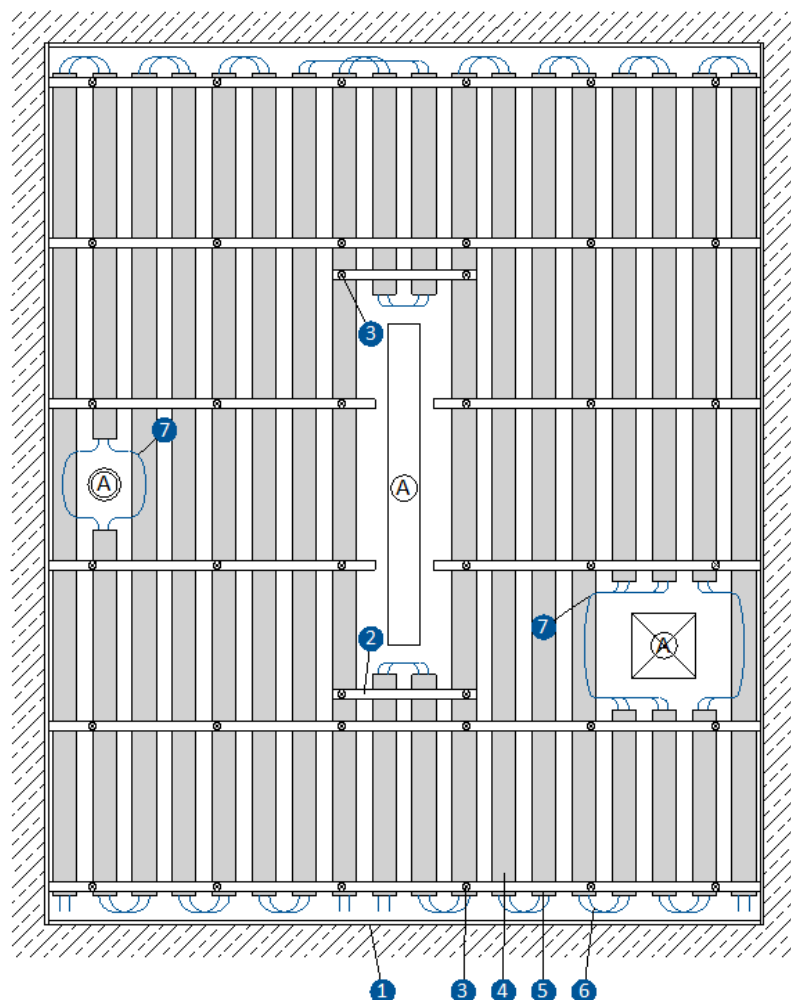
## CHAPTER 5

# PIPE INSTALLATION METHOD

## Work sequence for pipe installation

Regarding the design and work with pipes, observe the relevant Chapter on planning contained in this Installation Manual. Regarding the work sequence, these activities will be performed after the mounting of the registers and before the completion of the support structure.

### STEP 3



(A) Warning! Consider additional UK for components!

Key:

- ① UD-profile
- ② CD-60/27 profile
- ③ Hanger part
- ④ GP-Cool heat transfer - profile
- ⑤ Angle connector
- ⑥ PERT pipe
- ⑦ Curved pipe guide

#### Please note:

Before installing the pipes, check that the pipe channels have no burring.

Keep a minimum distance of 20mm between perimeter UD- profile ① and pipe loop.

Use curved pipe guides in the area of change elements (art.no. ROHR-FÜHRUNGSBOG) ⑦

After installation of the pipes, perform a pressure test and document it with a Pressure Test Record (see Chapter 3). Only then may the ceiling be approved and the panels be mounted.

#### TO KNOW:

The register rows are following the Tichelmann System, whereby the maximum pipe length per register circuit is limited to 60 meters (depending on power and pressure drop). It must be ensured that all register lines have the same tube length. The tube is pressed in with the system's own press-in carriage. The calculation of the hydraulics and the pipe dimensions shall be carried out according to Chapter 3 and the pipe processing according to Chapter 4.



## Pipe uncoiler



### Cool Racer 2.0:

The Cool Racer 2.0 is a self-propelled robot with 18 V battery operation and serves to force the two tubes into the B + M GP-Cool Speed Profile without any effort.

Running speed approx. 12-13 running meters / min.

To clean the roller sets, a commercial brake cleaner (not oil-based) can be used.



### Cool Racer Junior:

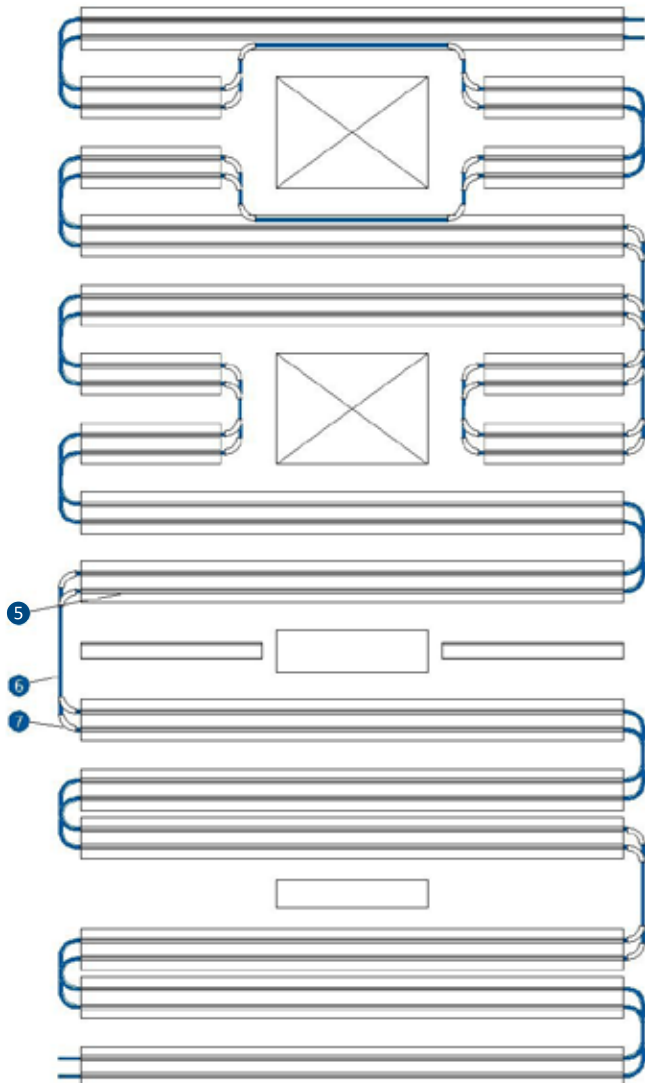
The junior is an attachment device for cordless screwdrivers with standardized drill chuck holder. As an additional support for larger ceiling heights, an included retractable telescopic pole can be used.

Running speed varies depending on the type of cordless screwdriver, but a maximum speed of 8-10 lpm / min must be maintained.

## Working around built-in units

Always take account of built-in units when installing the piping and the support structure. Observe the requirements described in Steps 1 and 2 (pages 5 and 6) and the principal sketches DA 5 - 6.

To avoid any damage to pipes during installation of the board, use curved pipe guides **7** (art.no. ROHRFÜHRUNGSBOGEN) and additional channels, see Step 4 (page 27).



### Variant 1 - Pipe deflection

Pipes can be deflected around built-in units. This applies regardless of the number of registers.

### Variant 2 - Hairpin design

A hairpin design is an alternative to Variant 1 with paired plate interruptions.

### Variant 3 - Skipping

With sufficient reserve capacity, skipping is an easy solution. Mounting of the C channel to complete the substructure can only be done after the pipes have been installed in Step 4.

### Variant 4 - Grid repositioning

Repositioning the grid is ideal with narrow built-in units. When doing this, be sure to properly align the screwing axes of the board ends.

Key: **5** Angle connector **6** PERT pipe **7** Curved pipe guide

## Handling the press-fitting carriage



1. Put the register pipe rolls (art.no. ROHRPB1214) into the spool-out device (art.no. ABROLLHASPEL) and position centrally in the room.

2. Remove all „tripping hazards“ and materials from the working area and provide a stable scaffold / ladder according to applicable regulations for the work to be performed on the ceiling.

3. Before installing the pipes, the installer must be satisfied that the cut edges have no burrs in the area of the pipe channels. If necessary, re-work with the deburring tool (art.nr. PROFILENTGRAT16).



4. Open the tension lever on the press-fitting carriage and hang the machine with the device top rolls centered on the plate. The rollers are now at the exterior pipe channel. Always keep hold of the press-fitting carriage until it has been fixed into place with the tension lever.

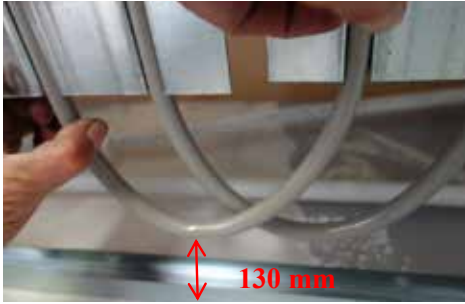


5. Starting from one end of the room, guide the system pipes between the machine's feed rollers and the plate, allowing for an excess length according to the distance to the conduit pipe plus 10cm. Each pipe can now be clamped into the pipe channel by raising the plate wings. Hold on to the device to keep it from moving or dropping.

6. Close the tension lever on the press-fitting carriage and start the device for press-fitting the pipes according to the instructions contained in the operating manual.

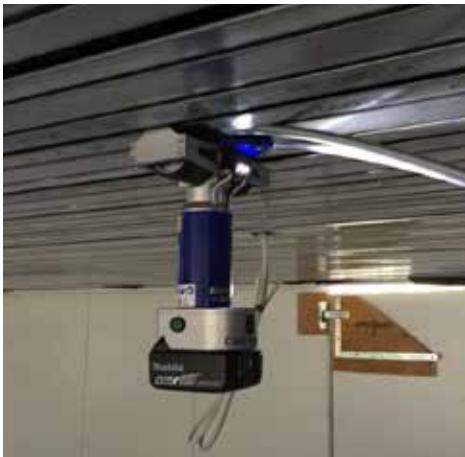


7. During the press-fitting process, the pipes must be fed to the machine. Carefully watch the press-fitting process, ensuring that you can stop it at any time by pushing the red emergency button (or possibly using a cable remote control). The device will stop automatically at the end of the plate.



8. The pipes will be bent by 180° to reach the next plate and clamped into the plate end by pulling up the plate wings. Press against it using a thump to avoid any kinks in the pipes. At the 180° bend, install the pipes crossed over such that the pipe at the right-hand side of the room is still on the right-hand side after the change in direction.

**Important:** Maintain a minimum distance of 130 mm to the wall channel



9. After the bend is made and the pipe clamped to the next plate, the machine can be turned along the pipe bend and hung up on the next plate. Removing the press-fitting carriage from the ceiling is not necessary. The next press-fitting step occurs in Step 5.

**NOTE: THE WORK SEQUENCE DESCRIBED HERE IS NO SUBSTITUTE FOR THE OPERATING INSTRUCTIONS FOR THE PRESS-FITTING CARRIAGE. MACHINE OPERATION REQUIRES FOLLOWING OPERATING INSTRUCTIONS.**



The specifications for the register circuits can be found in Chapter 3 „Calculating Supply and Return Pipes“. Further information on working with pipes, fittings and the pressure test record can be found in Chapter 4 „Working with Pipes“.



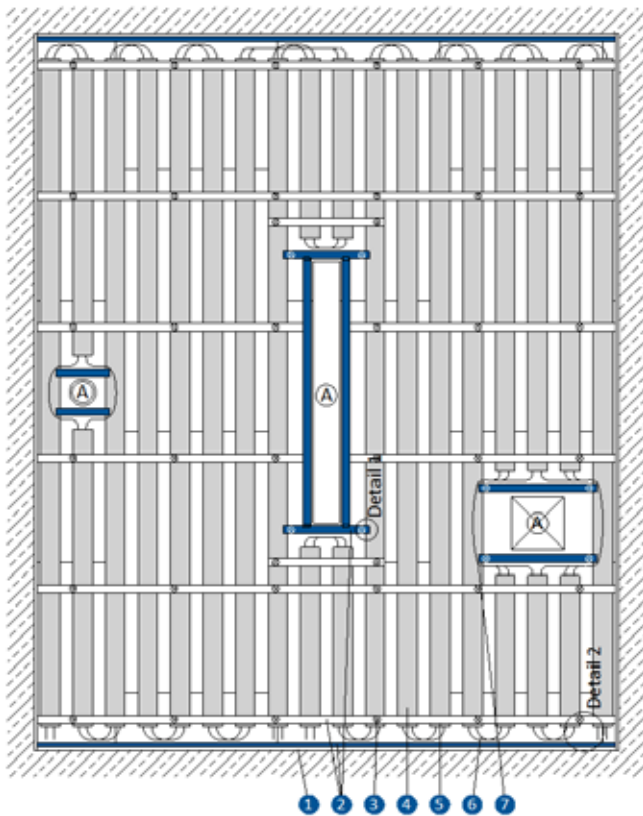
## CHAPTER 6 COMPLETION

### Completion with C channels

After installation of the pipes and completion of the pressure test, add CD-60/27 profiles to any empty areas in the fine grid to construct a classic gypsum board ceiling.

Use the special connectors if it is necessary (see Detail DA 2.0). At the front ends put over the whole length a CD-60/27 profile **2** into the UD-profile **1** and do not screw them together.

### STEP 4



(A)

Warning! Consider additional UK for components!

Legend: **1** UD-Profile **2** CD-Profile **3** Hanger part  
**4** GP-Cool heat transfer - profile **5** Angle connector  
**6** PERT Pipe **7** Curved pipe guide  
**8** Connection seal to U-profile and wall

**Note:** Always follow the board manufacturer's instructions with regard to resistance or loading capacity of board material and mounting instructions for mounting parts used.

#### Please note:

In the area of the perimeter channels, check the distance to pipe loops. It should be around 20mm from the cd-profile, which is put into the ud-profile, to avoid any damage to pipes when profiles are fastened. Bend pipes into above-ceiling plenum space, if necessary.

Where the support grid is interrupted due to built-in units and openings install fittings according to the principal sketches DA5.0 and DA6.1/2. You must ensure that all pipes in cut-out areas are bordered by profiles.

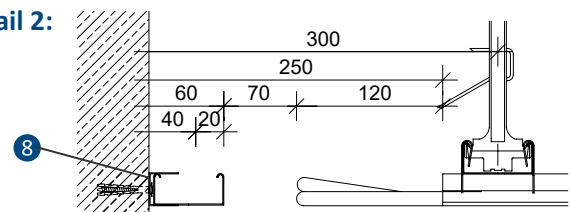
Additional suspension components and fittings, if necessary, must be provided where the support grid is interrupted due to the built-in units.

If a build-in unit has more than 1 kg furthermore hangers are necessary, resp. the weight has to be transferred to the substructure or the raw ceiling. (when acoustic boards are used, it is forbidden to mount any weight on it. (look after ON B3415)

Detail 1:



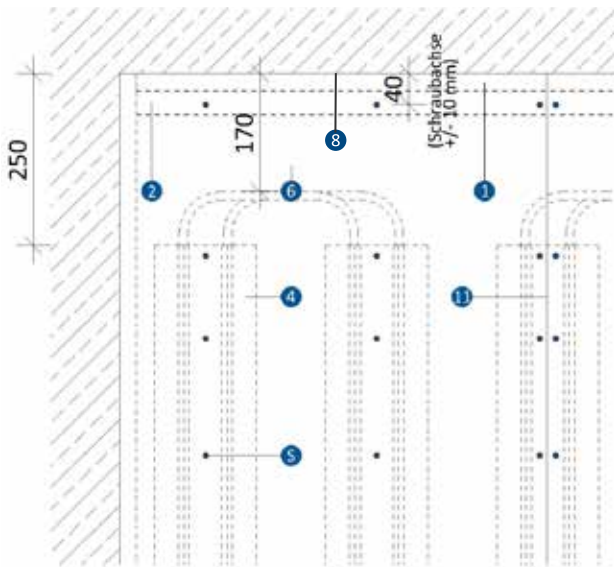
Detail 2:





## Boards fixing

The boards must be secured according to standard ON B 3415 or the board manufacturer's instructions, unless tighter screw spacing is required according to local standards or building regulations.



Key: ① UD-profile ② CD profile  
④ GP-Cool heat transfer - profile ⑥ PERT pipe  
⑧ Connection seal to U-profile and wall  
⑪ Plasterboard S Screw

**Note:** The screw face at the plate is 50mm wide!

### Please note:

With the GP-Cool Speed system, the board must be screwed to the CD-60/27-profile.

Securing the cooling ceiling plates can be done using dry wall screws. We recommend using original screws from the board manufacturer.

Install boards by offsetting joints according to the board manufacturer's instructions.

Perform smoothing work according to board manufacturer's instructions. Observe application instructions for surface filler.



# CHAPTER 7

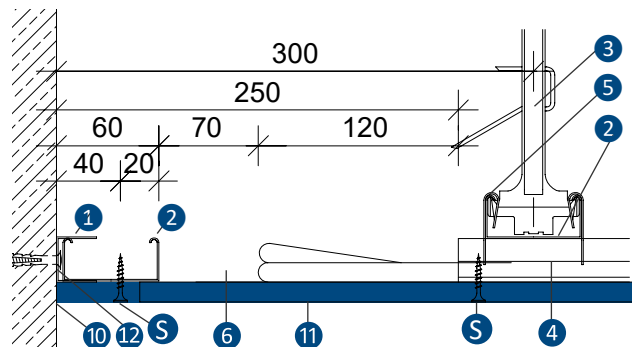
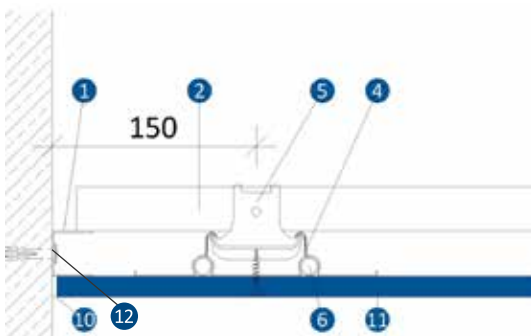
## DESIGN VERSIONS AND DETAILS

### Perimeter

The GP Cool Speed system may be constructed choosing from a multitude of perimeter design versions. The versions shown are just a small selection of possibilities and the related recommended dimensions. As basis for these versions, consult applicable standards and local mounting regulations and the board manufacturer's guidelines.

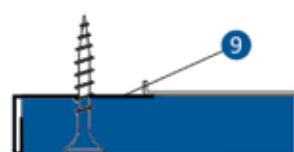
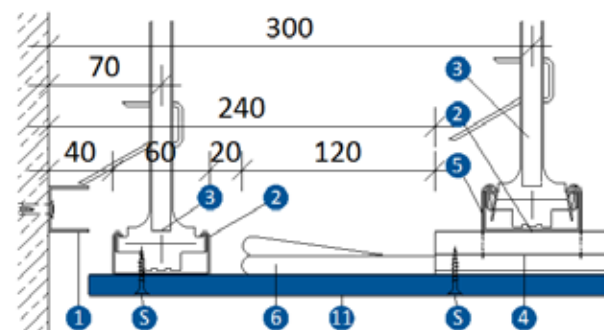
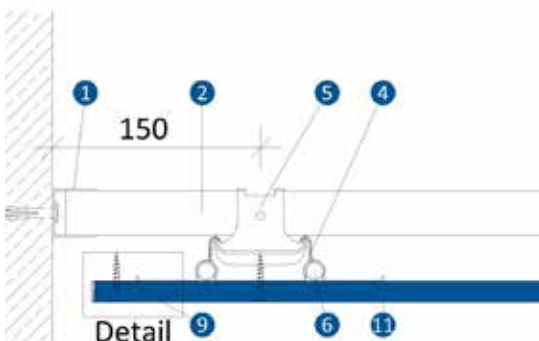
#### WA1.0 - STANDARD WALL JUNCTION

Rigid standard wall junction with UD-profile mounted in a friction-locked manner. Insert a separator strip between wall and ceiling.



#### WA2.0 – WALL STOP END WITH OPEN JOINT

Perimeter with open joint and backed with edge protector.



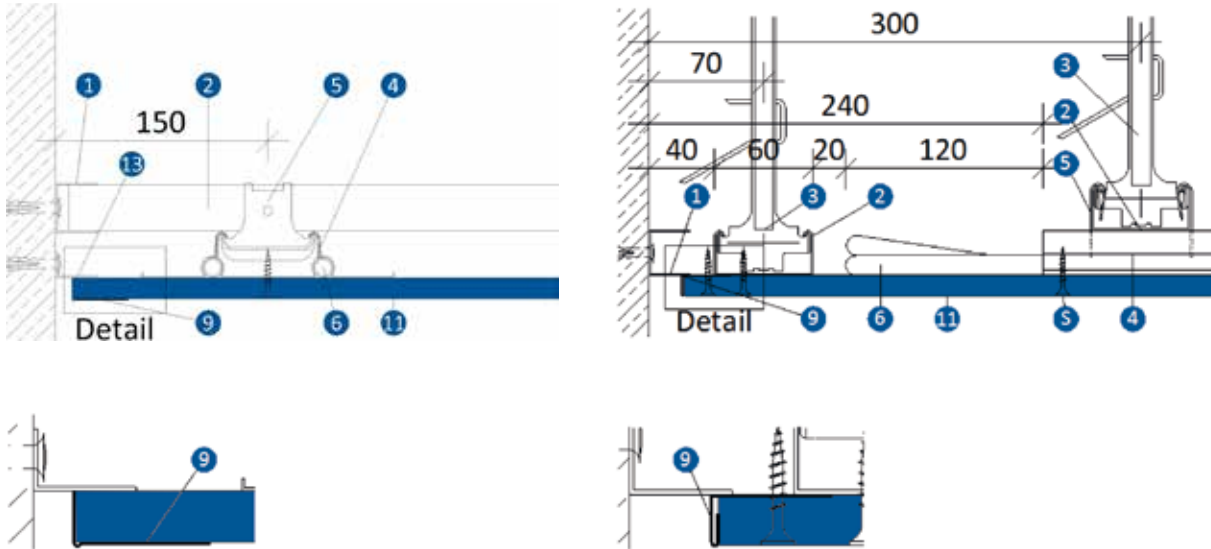
Key:

- ① UD-profile    ② CD profile    ③ Hanger part
- ④ GP-Cool heat transfer - profile
- ⑤ Angle connector    ⑥ PERT pipe    ⑨ Edge protection
- ⑩ Separator strip    ⑪ Plasterboard    S Screw
- ⑫ Connection seal to U-profile and wall



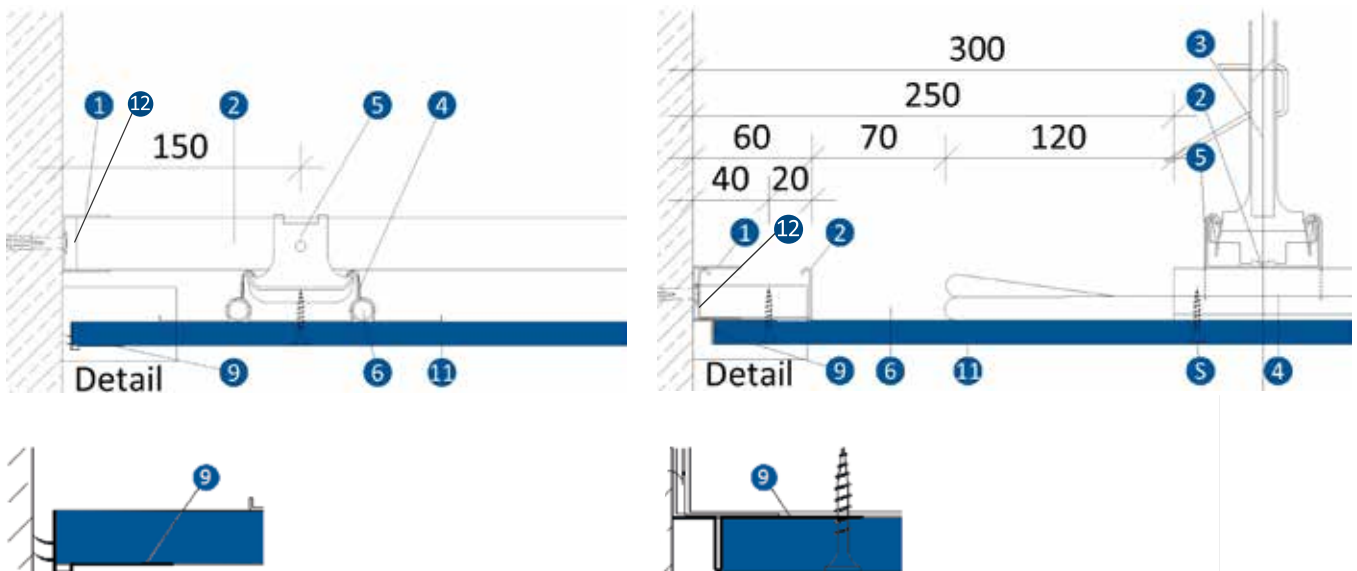
### WA3.0 – PERIMETER TRIM WITH SHADOW GAP

Perimeter trim with variable shadow gap width. With bendable edge can be constructed with a backed or filled edge protector. L-bracket 13 perimeter trim is also suitable for curved walls. The



### WA4.0 – PERIMETER TRIM WITH SHADOW GAP PROFILE

Perimeter trim with shadow gap or sealing profiles



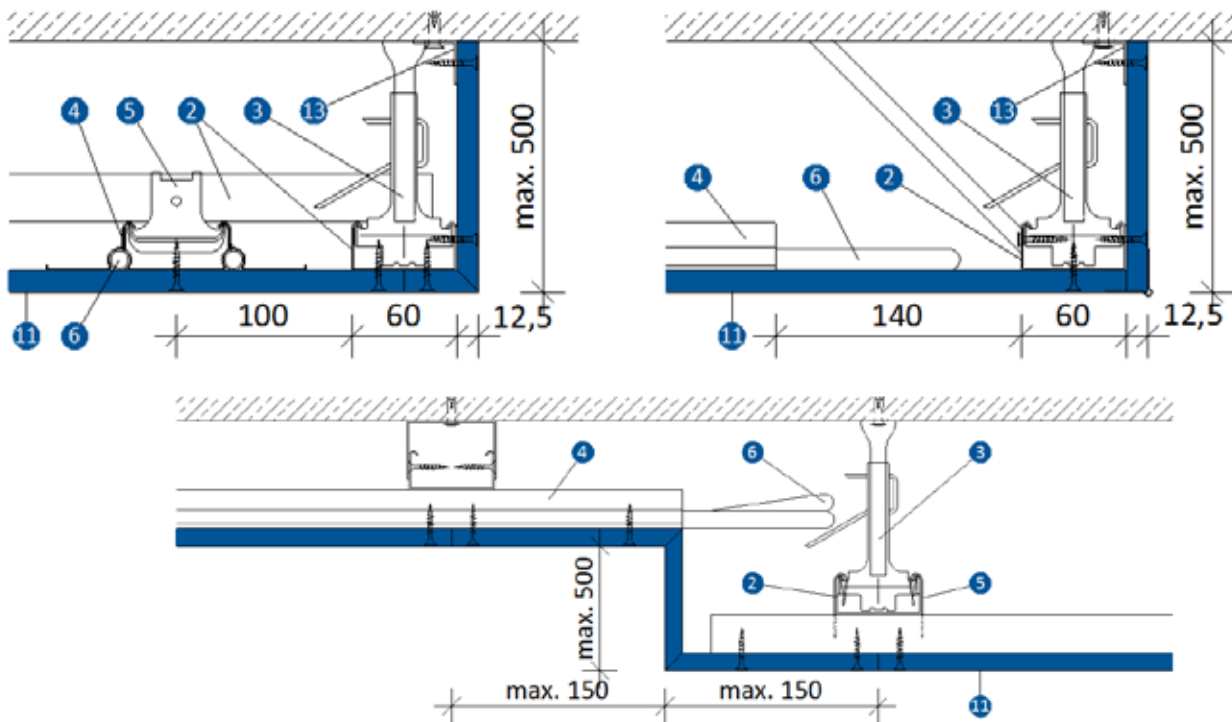
Key: 1 UD-profile 2 CD profile 3 Hanger part 4 GP-Cool heat transfer - profile 5 Angle connector 6 PERT pipe 8 GP-connector 9 Edge protection 10 Separator strip 11 Plasterboard 12 Connection seal to U-profile and wall 13 L-bracket S Screw

## Ceiling edges

### DA1.0 – CEILING EDGE DESIGNED AS APRON BLANKET

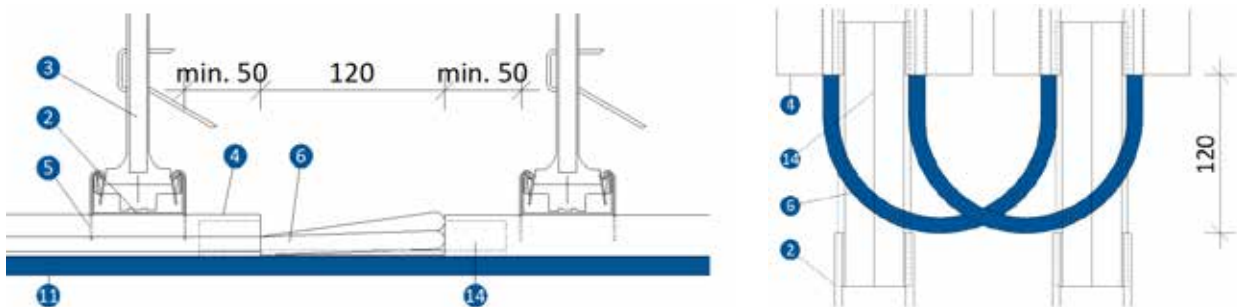
The GP-Cool Speed system can be combined with gypsum board apron blankets in a wide variety of versions. The schematic examples shown are just a small selection of possible versions. Height and

reinforcement measures must be performed according to the requirements contained in ONR 23416.



### DA2.0 – CEILING EDGE TO „NORMAL“ CEILING

With the special profile connector it is possible to connect the GP-Cool profile to a CD-60/27 - profile.



Key: ② CD-60/27 profile ③ Hanger part ④ GP-Cool heat transfer - profile ⑤ Angle connector ⑥ PERT pipe ⑪ Plasterboard ⑬ L-bracket ⑭ Special connector

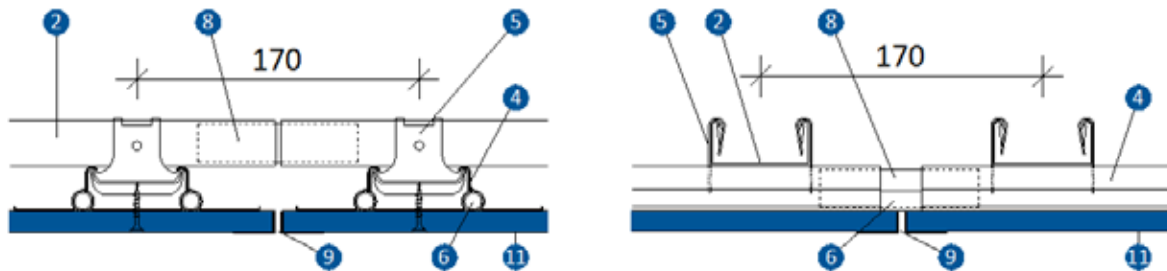
## Expansion joint design

The GP-Cool Speed system must be provided with expansion joints starting from a room length of 10 meters or from a panel size of 10 x 10m in cooling, and 7.5 x 7.5m in heating and cooling.

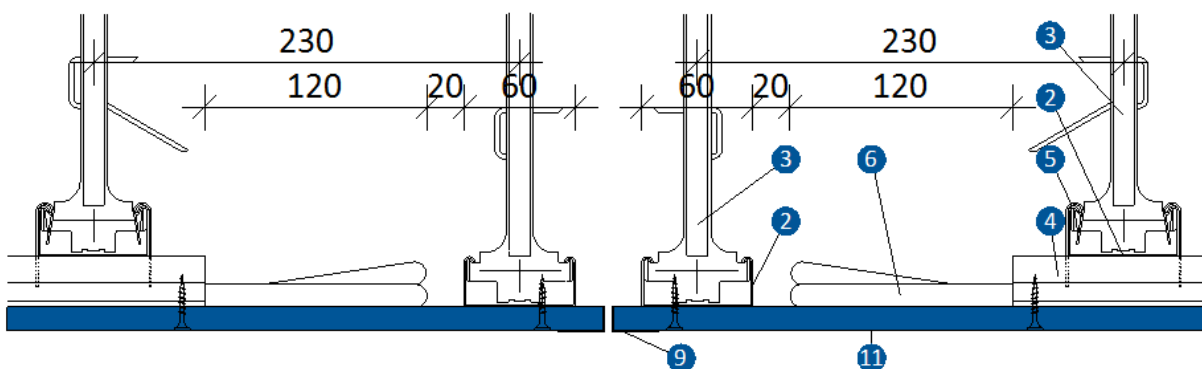
The optimal detail has to be chosen based on movement requirement.

As a basis for the many variants of ceiling edges, consult applicable standards and local building regulations as well the board manufacturer's guidelines.

### DA3.0 – EXPANSION JOINT DESIGN WITHOUT INTERRUPTION OF REGISTER CIRCUIT



### DA4.0 – EXPANSION JOINT FORMATION WITH REGISTER INTERRUPTION



Key: ② CD-60/27 profile ③ Hanger part ④ GP-Cool heat transfer - profile ⑤ Angle connector ⑥ PERT pipe  
⑧ Connector GP-Cool profile ⑨ Edge protection ⑪ Plasterboard

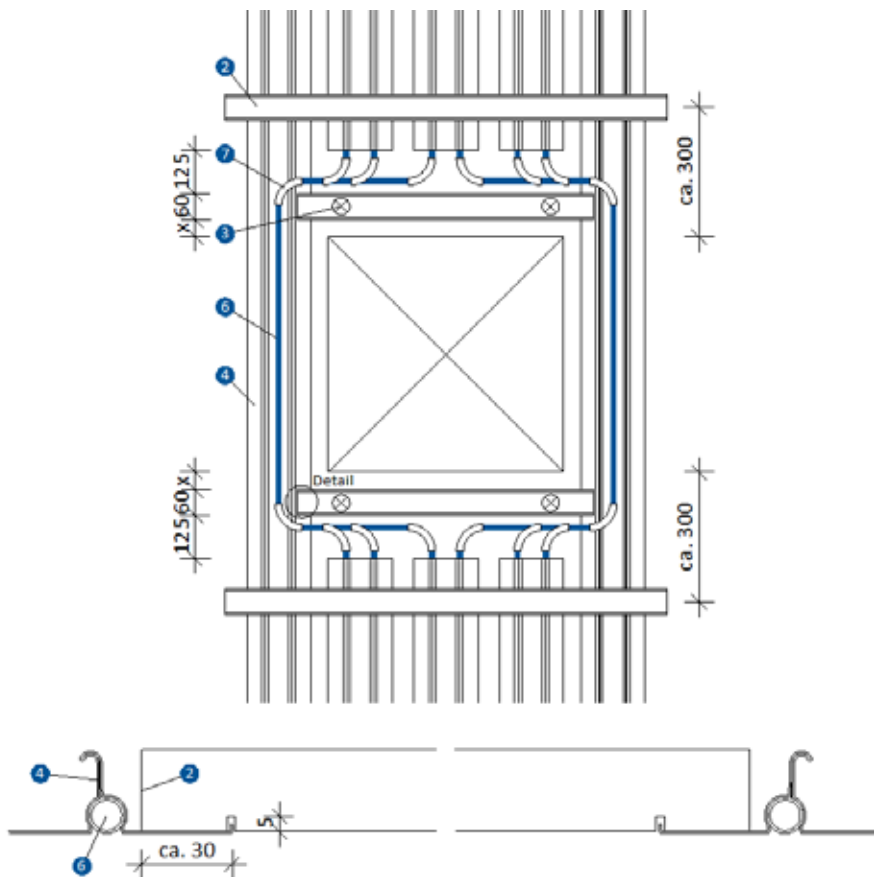
## Ceiling openings and built-in units

Like any other gypsum board ceiling, the GP-Cool Speed system allows for built-in units, manholes or cut-outs to be integrated. The distances required due to the system and the construction measures are shown here as principle sketch. In this context, consider any applicable standards and local building regulations and the board manufacturer's guidelines for the boards selected, as well as mounting guidelines for the parts to be mounted.

### DA5.0 – PRINCIPLE SKETCH FOR MANHOLES

As an example, these sketches show the construction change for a manhole and the required pipe routing. The cross C channels must be mounted after installing the pipes but before the mounting of the boards. They serve as support structure and protect the pipes from any damage during the cutting of the openings. During the last step, insert and secure the man hole into place by screws according to

the manufacturer's guidelines. Additional hangers or struts may be required depending on weight. Insert curved pipe guides as shown during the installation of pipes ⑦ (Art.nr. ROHRFÜHRUNGSBOG).



x = depends on the installation part

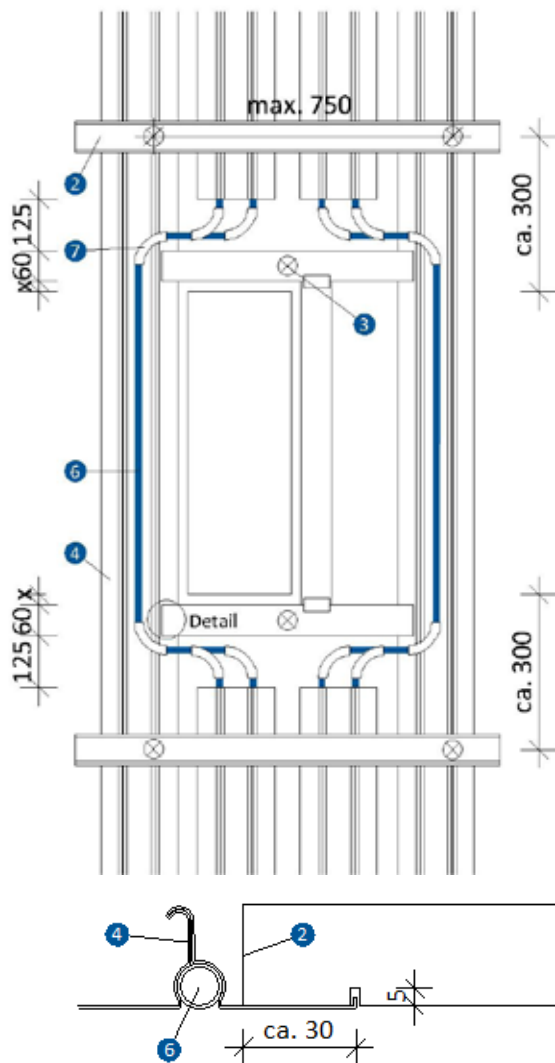
Key: ② CD-60/27 profile ③ Hanger part ④ GP-Cool heat transfer - profil ⑥ PERT pipe ⑦ Curved pipe guide

# B+M GP-COOL SPEED

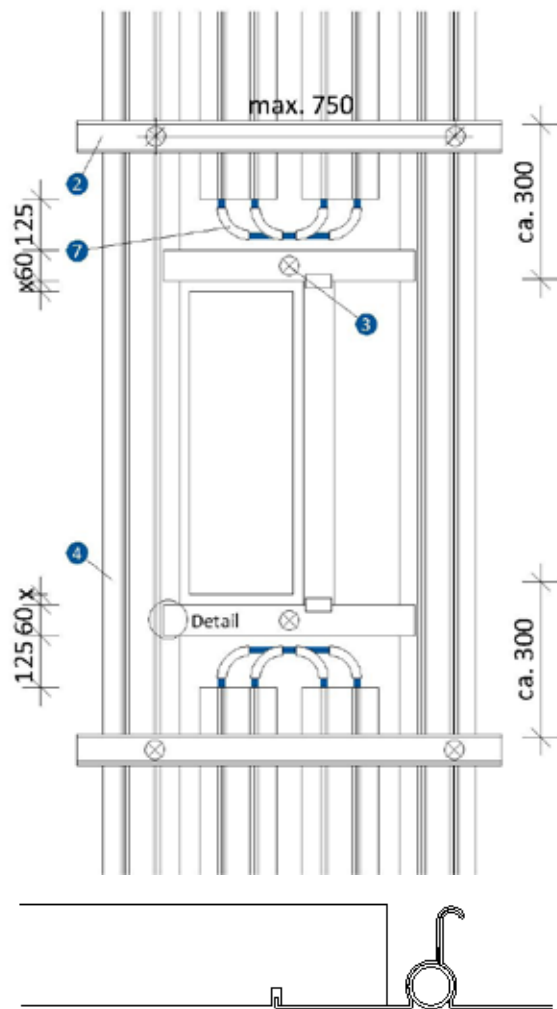
## Design and Installation Manual

These details show a light fixture as an example. The work sequence is similar to that in DA5.0. With changes to 2 or 4 plates, a hairpin design as shown in Figure 2 is a possibility for installing the pipes.

### DA6.1 – PRINCIPLE SKETCH OF CHANGE FOR LAMP WITH DEFLECTING INSTALLATION OF PIPES



### DA6.2 – PRINCIPLE SKETCH OF CHANGE FOR LAMP WITH HAIRPIN INSTALLATION OF PIPES



x = depending on built-in part

Key: 2 CD-60/27 profile 3 Hanger part 4 GP-Cool heat transfer - profile 6 PERT pipe 7 Curved pipe guide

## CHAPTER 8

# TECHNICAL SYSTEM DETAILS

## Declaration of weight

GP-Cool Speed System with CD-60/27 profiles for the underconstruction  
incl. climate ceiling plate 10 mm:

VA 167	VA200	VA250	VA333	VA400
kg/m <sup>2</sup>	kg/m <sup>2</sup>	kg/m <sup>2</sup>	kg/m <sup>2</sup>	kg/m <sup>2</sup>
ca. 22,5	ca. 21,5	ca. 20,0	ca. 18,5	ca. 17,5

Please look after the allowable distances of the hanger and underconstruction profiles. Therefore informations are mentioned in ÖNORM B 3415 spreadsheet 4 bzw. 8 or DIN 18168 and supplemental guidelines for use.

Installation should comply with applicable local building standards and regulations.

## CHAPTER 9

# Pressure Text Record

Construction project: .....

Floor: .....

Distributor number: .....

Pressure test medium: ☐ Water or ☐ Air

(With use of air, no 100% guarantee of being sealed)

Pressure gauge reading: Start .....

End .....

After mounting and installation, the sanitation system seal must be tested with a pressure of 6 bar for a 24 hour period.

Afterward the pressure can be lowered to working pressure (e.g. 2 – 3 bar).

Record the result in writing and submit a copy to the person responsible for the construction site.

This is to confirm that the sanitation system for the above construction project was pressure-tested at at design pressure of

..... bar

for a duration of

..... hours

and was found to be sealed.

.....

Company performing the test

Place, date

.....

Client

Place, date



## Construction site information board

# ATTENTION!!!



**B+M GP-COOL SPEED**  
**CEILING HEATING AND COOLING SYSTEM**  
HAS BEEN INSTALLED HERE.

PLEASE CONFER WITH INSTALLER WITH RESPECT TO INSTALLATION  
OF SUBSEQUENT SYSTEMS.

TAKE GUIDELINES FOR APPLICATION AND INSTALLATION INTO  
ACCOUNT!!!!!!

# Anchor pullout test

according to ÖNORM B 3415:2012

**Company:** .....

**Project:** .....

**Date:** .....

**Place** (building part, floor, etc.): .....

**Existing bare ceiling:**

☐ Reinforced concrete ceiling ☐ Brick ceiling ☐ Porous concrete ceiling ☐ Miscellaneous .....

**Outside skin:** .....

**Panel layers:** .....

**Panel thickness:** .....

**Direct mount:** .....

☐ Direct mount ☐ Dropped ceiling

Type of suspension components used (Nonius hanger, resilient brackets, etc.) and fastening devices (anchors, etc.):

.....

Test load: ☐ 0,75 kN (min. 75kg) ☐ 1,2 kN (min. 120 kg) ☐ .....

**Fastening devices were marked with:**

.....

**Fastening devices tested met the test load:** ☐ yes ☐ no

**Defective fastening devices were replaced:** ☐ yes ☐ no

**Notes on Checking Fastening Devices:**

- Plastic dowels and dry wall screws are not permitted for fixing suspension components to the bare ceiling.
- Loading capacity of the fastening devices in the bare ceiling must be tested on at least 5 of all fastening devices.
- If a slip occurs in doing so, a further 20 fastening devices must be tested.
- If a slip occurs again, all fastening devices must be tested.
- The fastening devices that were tested shall be marked (at the bare ceiling and fastening device).



**WWW.GPCOOLSPEED.COM**

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