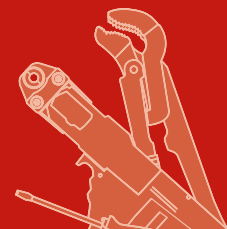
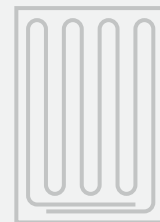
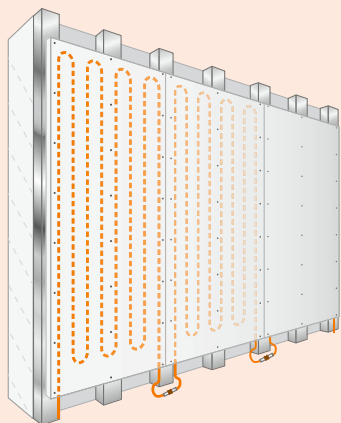
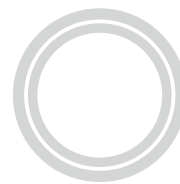


MWHC

INSTALLATION
MODULAR WALL. HEATING AND COOLING.

ModuleWall.



PDF

1. Safety information	3
1.1 General.....	3
1.2 Guarantee conditions	3
1.3 Maximum flow temperature.....	3
1.4 Humidity.....	3
1.5 Fire protection	3
1.6 Load bearing wall	3
1.7 Visible side/rear side of the ModulePanel.....	3
1.8 Standards.....	3
1.9 ModulePanels storage	4
1.10 Variomodular pipe 11.6x1.5 Laser (in ModulePanel)	4
1.11 Storage of pre-insulated Variomodular pipe 16x2 Laser	4
2. Preparation	5
2.1 Tools.....	5
2.2 Other work documents.....	5
3. Substructure	6
3.1 General	6
3.2 Vertical stud construction (standard variant)	6
3.3 Stud construction with full-surface FERMACELL planking	7
3.4 Stud construction with plasterboard planking	8
3.5 Full cladding or chipboard panel planking	9
3.6 Recessed formwork.....	9
3.7 Pitched roof substructure	10
3.8 Substructure variant for existing floors.....	11
4. ModulePanels	12
4.1 Panel overview	12
4.2 Fastening area of the ModulePanels-Classic	13
4.3 Installing the ModulePanels	14
4.4 ModuleExpansionPanels (panel transitions).....	16
4.5 Transitions from ModulePanels to other panel materials.....	17
4.6 Movement joints	17
4.7 Installation of panels between installed ModulePanels	18
4.8 Hydraulic connection & pressing.....	19
5. Surface	21
5.1 Stopping	21
5.2 Fastening loads to the ModuleWall.....	21
5.3 Painting	21
5.4 Tiling.....	22
6. Protocols	23
6.1 Leak-tightness test.....	23
6.2 Preheating Protocol.....	23

1.1 General

These installation instructions are intended for authorised specialist personnel.
Observe the applicable local regulations and standards for electrical and heating installations.

1.2 Guarantee conditions

If the heating system is installed or commissioned incorrectly, all claims on the basis of the manufacturer's warranty and guarantee become void. Our currently applicable installation instructions are an integral part of our guarantee!

1.3 Maximum flow temperature

The maximum flow temperature for the ModulePanels is 50 °C.

1.4 Humidity

The relative humidity must not exceed 70 % during storage, installation and additional processing of the ModulePanels and during the construction phase and normal use of the building. Wet plaster and wet screed must be applied and have dried before installation of the ModulePanels.

The ModulePanels can be used in rooms up to moisture class W3 (ÖNORM B 3407). They are not approved for installation from moisture class W4 (e.g. canteens and shower blocks) upwards.

1.5 Fire protection

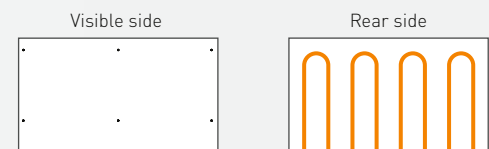
From a fire protection perspective, the 18 mm Variotherm ModulePanels correspond to a 12.5 mm FERMACELL Gypsum fibre-board panel (Test IBS-Linz No. VFA2001-0389.01, fire protection assessment file number 10111710). Please observe the corresponding FERMACELL regulations and FERMACELL fire protection assessments.

1.6 Load bearing wall

Caution: With load bearing wall construction the Variotherm ModulePanels must not carry any static ceiling loads and must not be used for building reinforcement.

1.7 Visible side/rear side of the ModulePanel

The visible side of the ModulePanel (the smooth side) faces into the room and the rear side (with the integrated Variomodular pipe) faces the substructure.



1.8 Standards

The validity of the standards specified in these installation instructions was last verified on 9 May 2019!
If necessary, amendments to standards must be checked!



1.9 ModulePanels storage

The ModulePanel consists of:

- The gypsum fibreboard 18 mm
- The pre-integrated Variomodular pipe 11.6x1.5 Laser (aluminium multi-layer composite pipe)

The ModulePanels are supplied on pallets.

When storing the ModulePanel pallets, you should ensure that the storage area can support them.

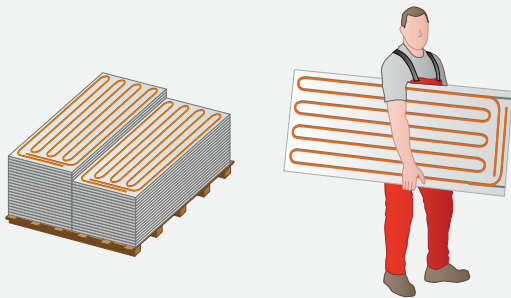
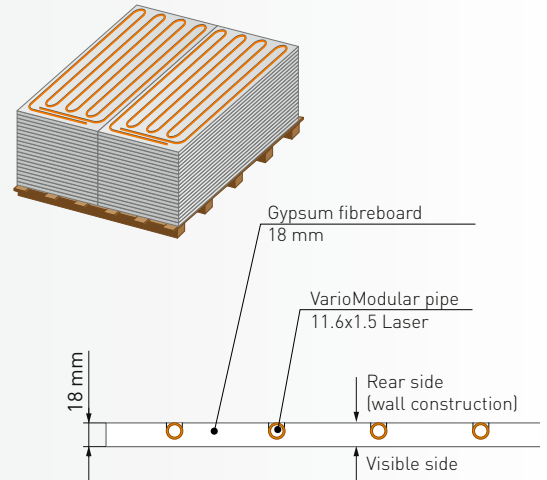
Each ModulePanel weighs 20.5 kg/m².

The ModulePanels must be laid flat on a level surface.

They should be protected from moisture. Panels that have become damp for a short time should only be used after they have completely dried out.

If they are re-stacked during transport on the building site, the visible side of the ModulePanels should be laid so that they face downwards.

Vertical storage deforms the panels and damages the edges. It is possible to transport the panels horizontally inside the building with a lift truck or other panel transportation vehicle.



It is best to carry individual ModulePanels vertically.

1.10 Variomodular pipe 11.6x1.5 Laser (in ModulePanel)

The Variomodular pipe 11.6x1.5 Laser is an aluminium multi-layer composite pipe (100% oxygen diffusion-tight). It is pre-integrated in the ModulePanels.

In order to prevent the Variomodular pipe from being damaged by drilling or chiselling during the construction phase, high-visibility warning signs should be placed at appropriate locations.

In terms of weather resistance, the same instructions apply to the Variomodular pipe 11.6x1.5 Laser as to the pre-insulated Variomodular pipe 16x2.

1.11 Storage of pre-insulated Variomodular pipe 16x2 Laser

The pre-insulated Variomodular pipe is an aluminium multi-layer composite pipe (100 % oxygen diffusion-tight) which includes insulation.

Damage (e.g. denting and scratching) is to be avoided during storage, transport, unloading, unwinding and laying. This type of damage has a detrimental effect on the creep behaviour.

In order to prevent damage to the Variomodular pipe during the construction phase, high-visibility warning signs should be placed at appropriate locations.

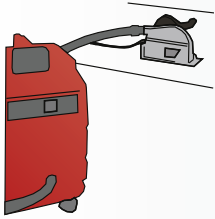
The interaction of the air's oxygen with UV rays damages the pipes, which should not be stored in the open air. Normal temporary storage on the construction site for a few days is permissible.

At low temperatures (≤ 5 °C) the Variomodular pipe should be stored in heated rooms prior to processing.

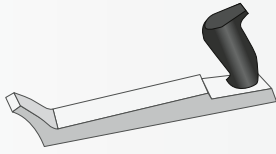


2.1 Tools

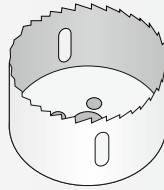
Tools for installing the ModulePanels to the substructure (on-site):



Circular saw with vacuum attachment



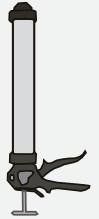
Plane for visible edges



Hole saw



Power screw gun, preferable with latching depth stop

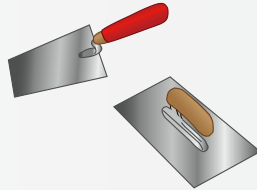


Cartridge gun for joint adhesive

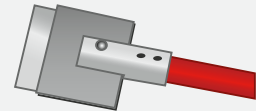
Tools for stopping the ModulePanel seams (on-site):



Clean buckets

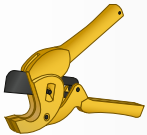


Trowel and plastering knife



Adhesive scraper

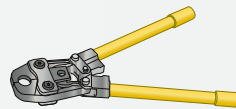
Variotherm tools for connecting the Variotherm pipes:



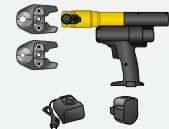
Pipe cutting pliers



Calibration and chamfering tool



EcoPress or AkkuPress Mini pressing tool, incl. press-fitting jaws



2.2 Other work documents

Please also follow up-to-date FERMACELL planning and installation instructions!



Fermacell
Planning and preparation



Fermacell
Processing instructions



Variotherm
Distribution and control

3.1 General

Depending on the requirements, substructures are made of wood and/or metal, with or without surface planking, cavity insulation and vapour retarders (vapour barriers).

Please observe the planning and installation guidelines of the manufacturer of the wooden or drywall system used for your wall and pitched roof ceiling construction.

- With wooden constructions, the timber used must be sufficiently dry and straight, and conform to the Austrian standard EN 338 (sorting class C24).
- With metal constructions, the profiles must be made of soft, non-alloyed steel with double-sided galvanising of at least 100 g/m² according to the Austrian standard DIN 18 182-1.

Before installing the ModulePanels it must be ensured that the construction is designed to carry the weight of the ModulePanels (20.5 kg/m²) and any eventual cladding (tiles).

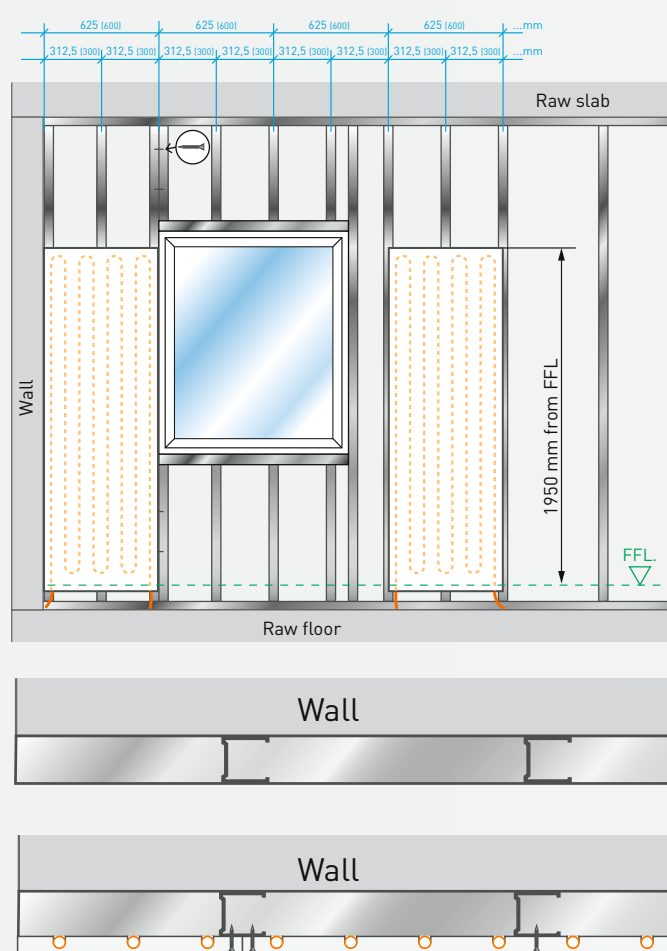
Caution: Do not glue the ModulePanels directly to solid wall structures (plaster).

3.2 Vertical stud construction (standard variant)

Substructure with wooden or metal profiles, with or without insulation as required. With larger existing stud clearances, extra vertical studs are used at the intended heating/cooling surfaces.

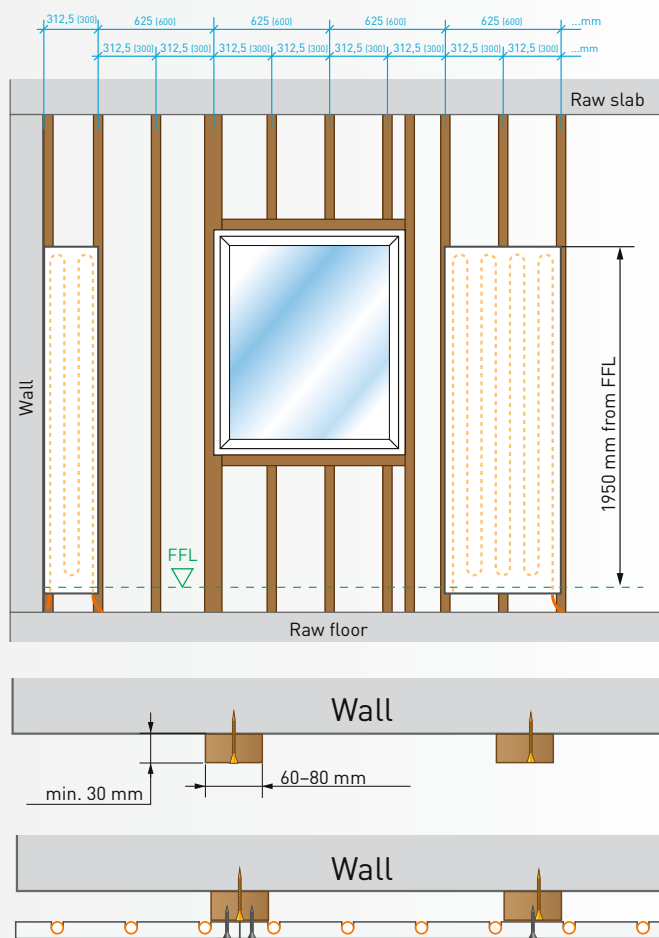
Stud spacing: 312.5 mm (panel thickness of 625 mm) or 300 mm (for panel thickness of 600 mm)

Example of CW stud construction



Section through a CW/UW profile steel substructure with a 312.5 mm stud clearance, without cavity insulation.

Example of wooden stud construction



Section through a softwood wooden construction with a 312.5 mm stud clearance, without cavity insulation.

3.3 Stud construction with full-surface FERMACELL planking

Under the following conditions, the ModulePanels can be screwed directly to the FERMACELL planking:

- The substructure is fully planked with FERMACELL panels (minimum thickness 12.5 mm).
- The stud clearance of the FERMACELL substructure corresponds to the values in the table:

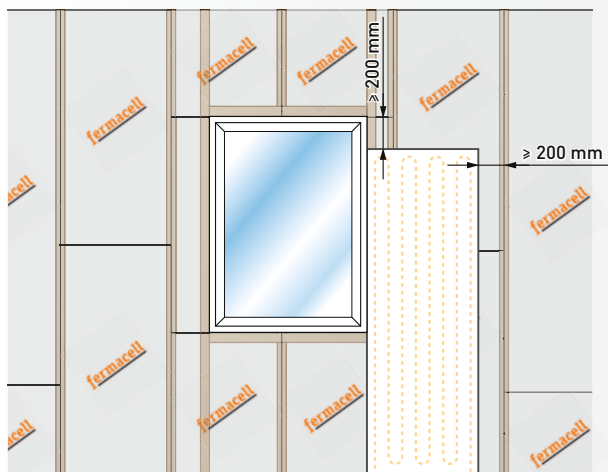
Application area / Construction type	Max. stud clearances of the substructure in mm for the following thicknesses of FERMACELL panels ¹⁾		
	12.5 mm	15 mm	18 mm
Vertical surfaces (partition walls, wall cladding, single wall panels)	625	750	900
Pitched roof ceiling cladding (10–50° pitch)	420	500	550

¹⁾ Limiting conditions:

- In the case of fire protection requirements, the specifications of the test verification/certification should be observed.
- Not possible in rooms where use results in constant high humidity (wet rooms etc.)

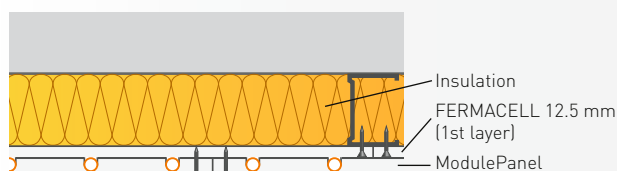
Caution:

- Ensure a minimum seam offset of 200 mm to the FERMACELL planking.
- Avoid cross joints.
- With multi-layer Fermacell planking only the ModulePanels (last layer) are glued and stopped.

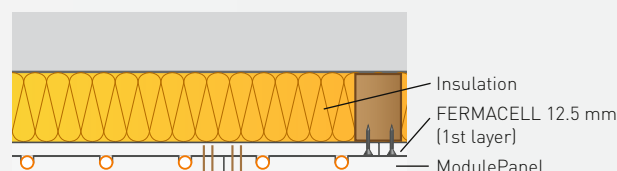


The ModulePanels are attached directly to the FERMACELL planking (minimum panel thickness of the first layer: 12.5 mm) with the following fasteners:

- Dry wall screw
 - See the table in section 4.1 for the number of screws
- Straddle staples
 - Galvanised and treated with resin
 - Wire diameter ≥ 1.5 mm
 - Saddle width: ≥ 10 mm
 - Leg length 2-3 mm shorter than the thickness of both panel layers (ModulePanel + FERMACELL panel)
 - Distance between staples: max. 150 mm
 - Distance between rows of staples: as fastening area (see section 4.2)

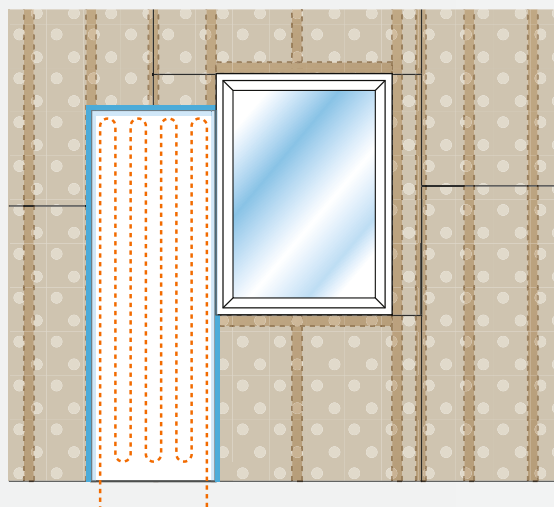


Section through a CW/UW profile **steel construction**, single-sided with **12.5 mm thick FERMACELL** panels, single-layer planking with cavity insulation and installed ModulePanel (**screwed**).



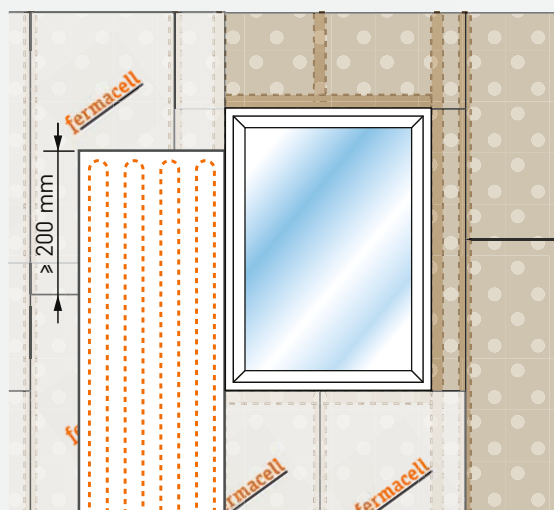
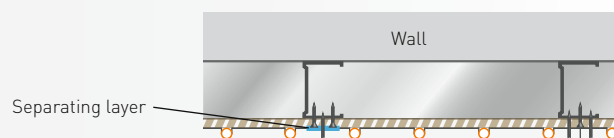
Section through a softwood **wooden construction**, single-sided with **12.5 mm thick FERMACELL** panels, single-layer planking with cavity insulation and installed ModulePanel (**clip fasteners**).

3.4 Stud construction with plasterboard planking



The lack of screw retention strength in the plasterboard panels means that the ModulePanels can only be directly fastened to the underlying stud construction with offset seams. A separating layer (adhesive tape) is always inserted in the glued seam area.

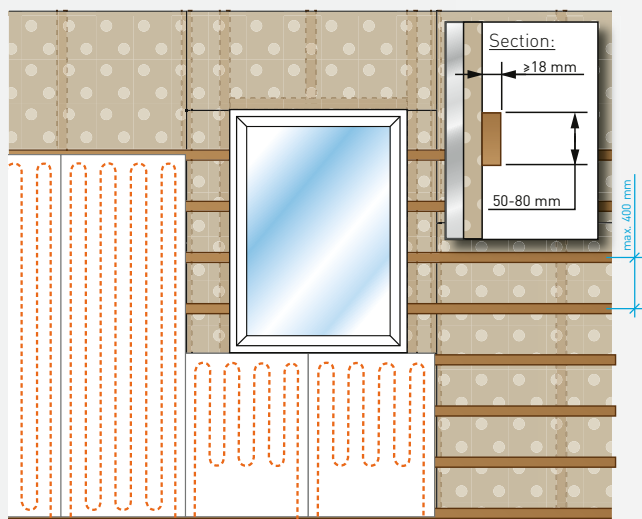
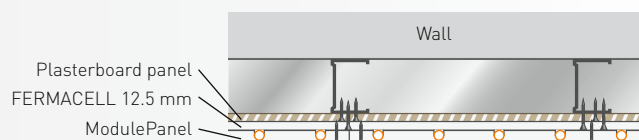
The stud clearance of the plasterboard stud construction must be as specified in section 3.2 (stud clearance of 312.5 mm).



If the substructure can no longer be changed, appropriately thick FERMACELL panels (see table in chapter 3.3) are screwed to the stud construction behind the plasterboard planking.

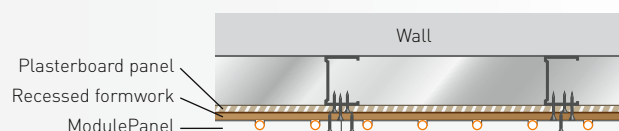
The seams of the FERMACELL planking are not glued or stopped.

See section 3.3 on fastening the ModulePanels to the FERMACELL planking!

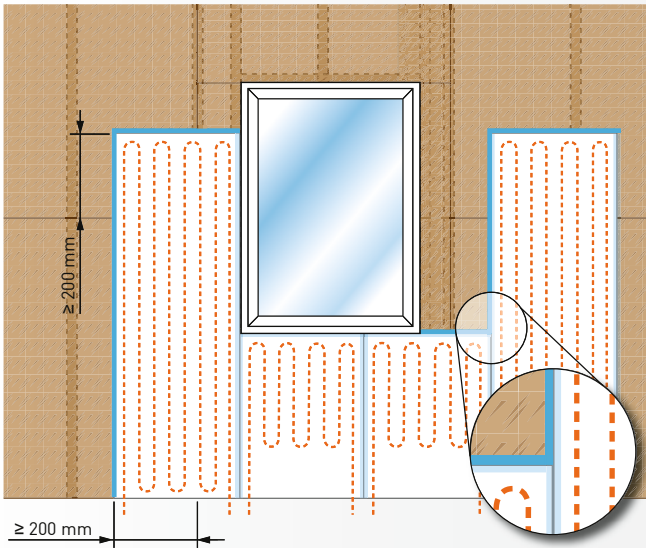


If the substructure is also unsuitable for full-surface FERMACELL planking, additional horizontal battens (recessed formwork) are screwed to the underlying stud construction instead.

See section 3.6 for information on installing the recessed formwork and fastening the ModulePanels!



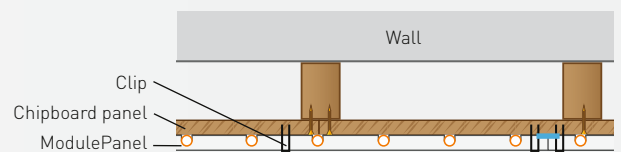
3.5 Full cladding or chipboard panel planking




Chipboard panels and ModulePanels (FERMACELL gypsum fibreboards) have different expansion and contraction behaviour under climatic fluctuations. The fastening variants described below can be recommended when the chipboard panels are not subjected to moisture loads.


Caution:

- Ensure a minimum seam offset of 200 mm to the planking.
- Avoid cross joints.
- A separating layer (adhesive tape) is always inserted into the glued seam area.

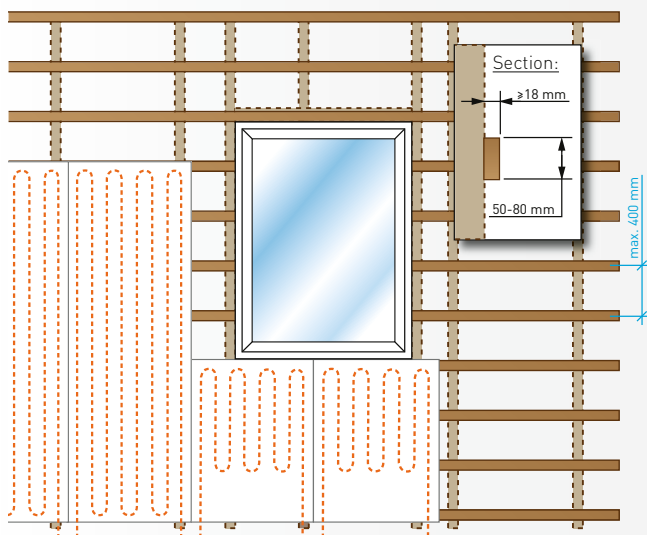


The ModulePanels are installed with the following  staple staples:

- galvanised and treated with resin
- wire diameter ≥ 1.5 mm
- Saddle width: ≥ 10 mm
- Leg length 2 – 3 mm shorter than the thickness of both panel layers
- Distance between staples: max. 150 mm
- Distance between rows of staples: as fastening area (see section 4.2)

The ModulePanels can be screwed to the  planking (special case):

With chipboard panels having expansion and contraction values of max. 0.02 % (for changes to the material moisture of 1 % below the fibre saturation) the Module Panels can also be screwed to the planking. According to DIN EN 1995 Table NA.7 this includes plywood, cross-laminated timber and OSB/4 panels. In this case it is important that the panels have adjusted to the relative humidity of the working climate. The humidity during installation, construction and used of the building must be 30 – 65 %.

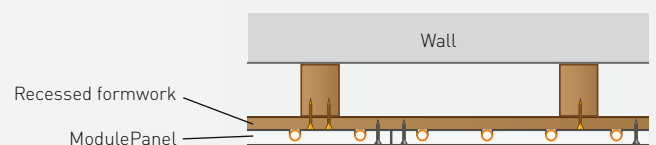


3.6 Recessed formwork

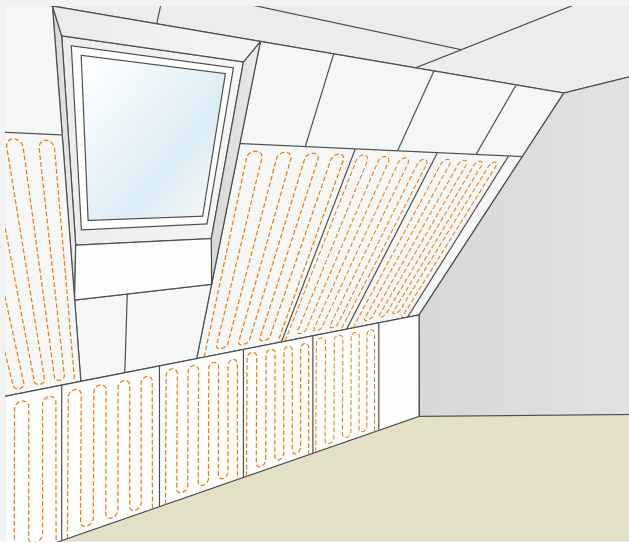
Extra recessed formwork is installed if the substructure does not have the correct batten clearance (300 or 312.5 mm). Horizontal wooden battens and ModulePanels have different expansion and contraction behaviour.

Batten guidelines (recessed formwork):

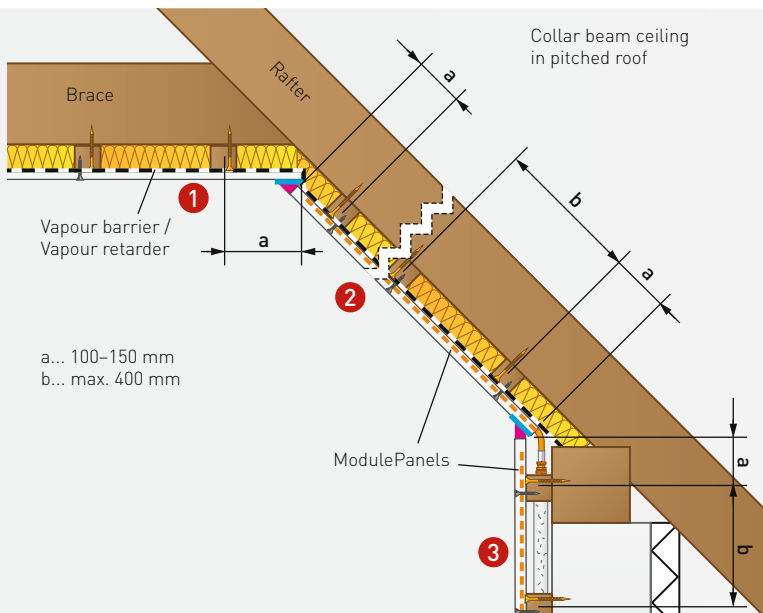
- Height: 50–80 mm
- Thickness: min. 18 mm
- Stud clearance: max. 400 mm, see section 4.2



3.7 Pitched roof substructure



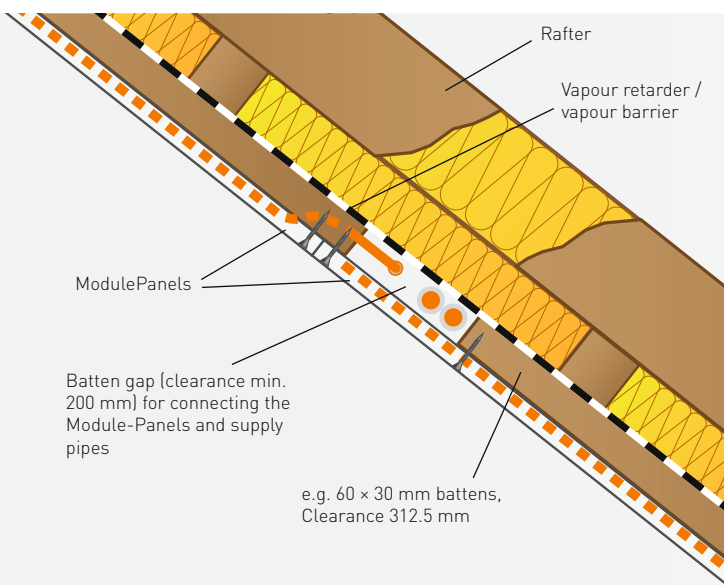
For a pitched roof, the same substructure possibilities apply as for walls (chapters 3.1–3.6).



Cross-section – horizontal battens

Installation process:

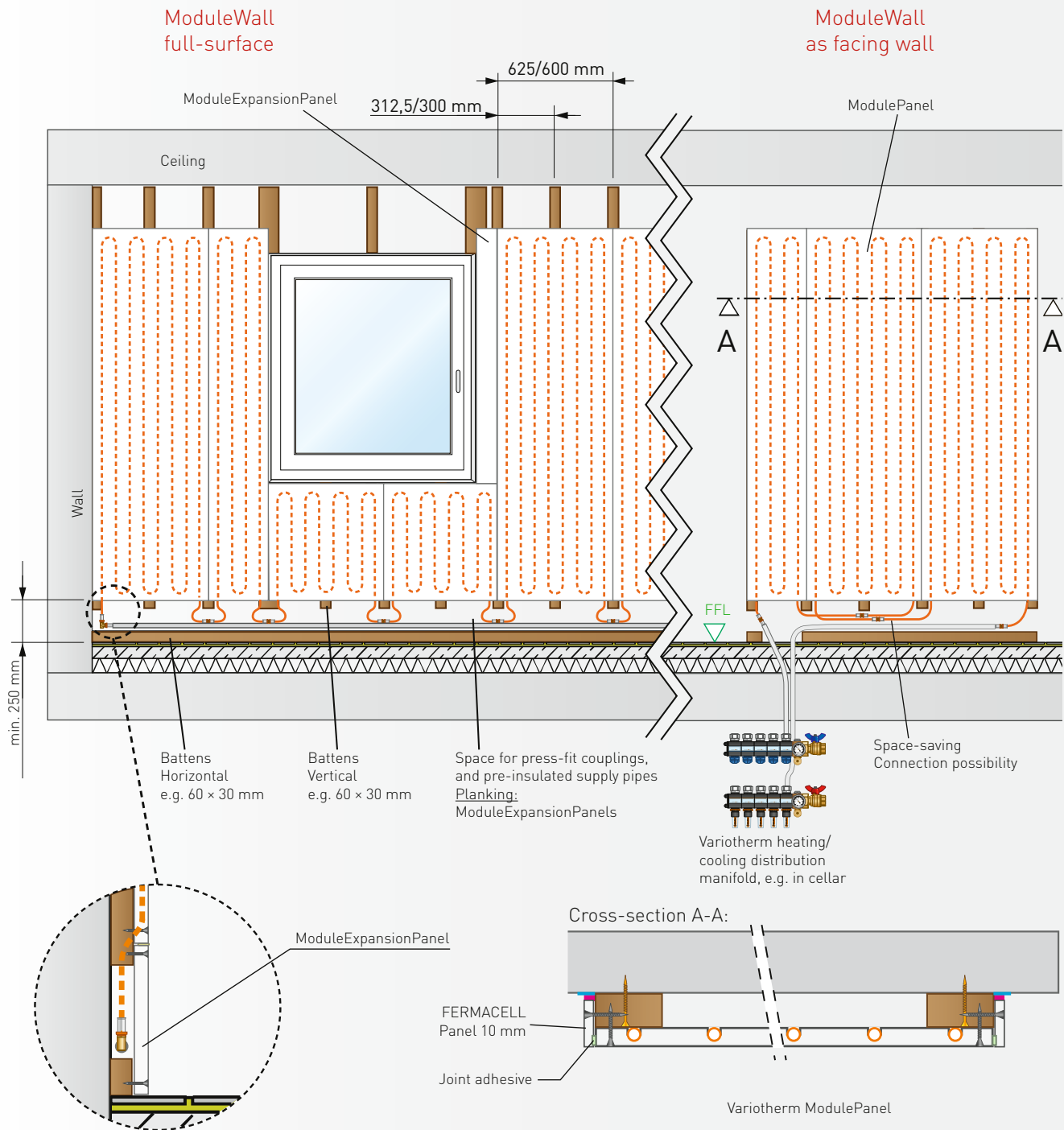
- 1 Horizontal surfaces
- 2 Pitched surfaces
- 3 Vertical surfaces



When two ModulePanels are abutted above each other in a pitched roof then additional vertical battens for the supply pipes are absolutely necessary!

3.8 Substructure variant for existing floors

When retrofitting the modular wall heating/cooling the supply pipes are laid in the batten layer.

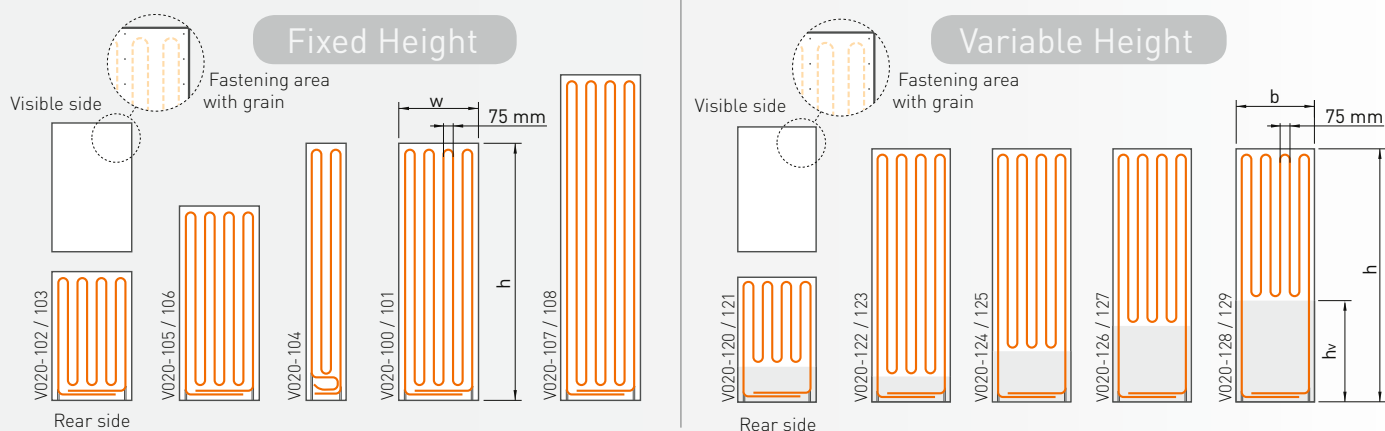


Connect a maximum heating/cooling area of 6.25 m² to a circuit!

FFL ... Upper edge of the finished floor

4.1 Panel overview

Fixed and variable ModulePanels have been developed to accommodate the different local conditions on building sites.



Fixed height:

The entire surface of the ModulePanel serves as a heating/cooling area.

Variable height:

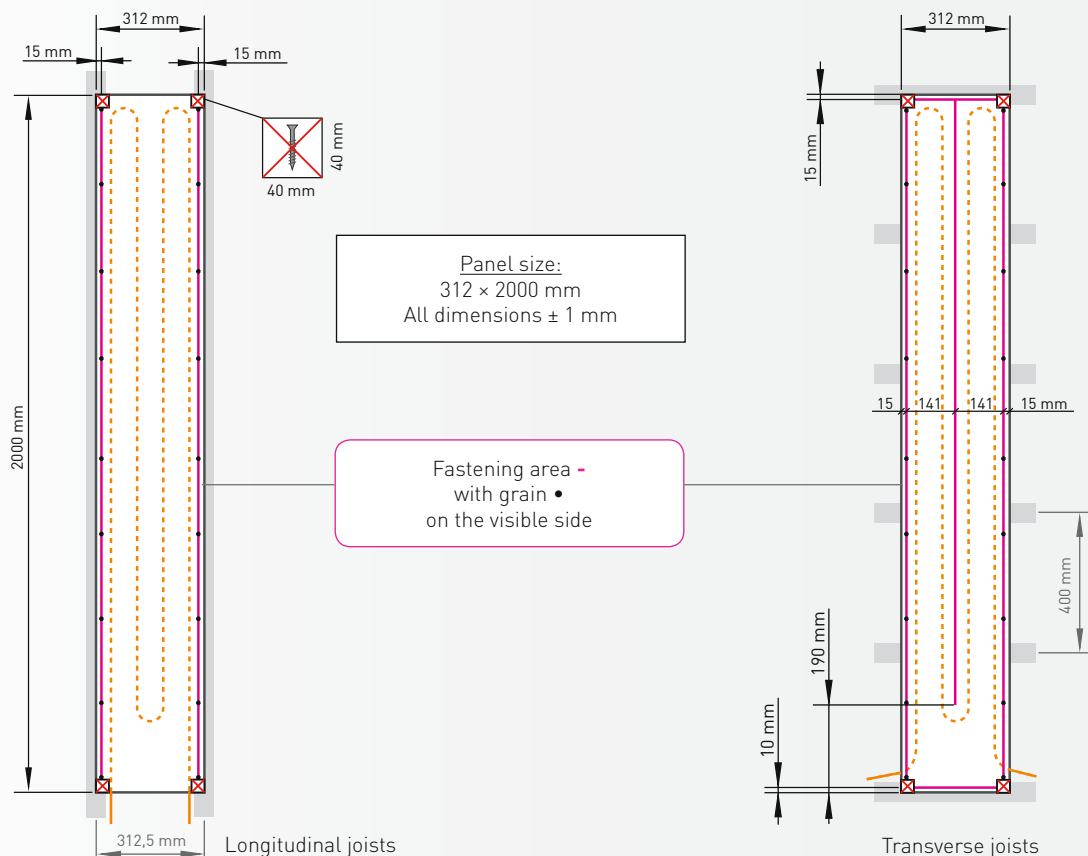
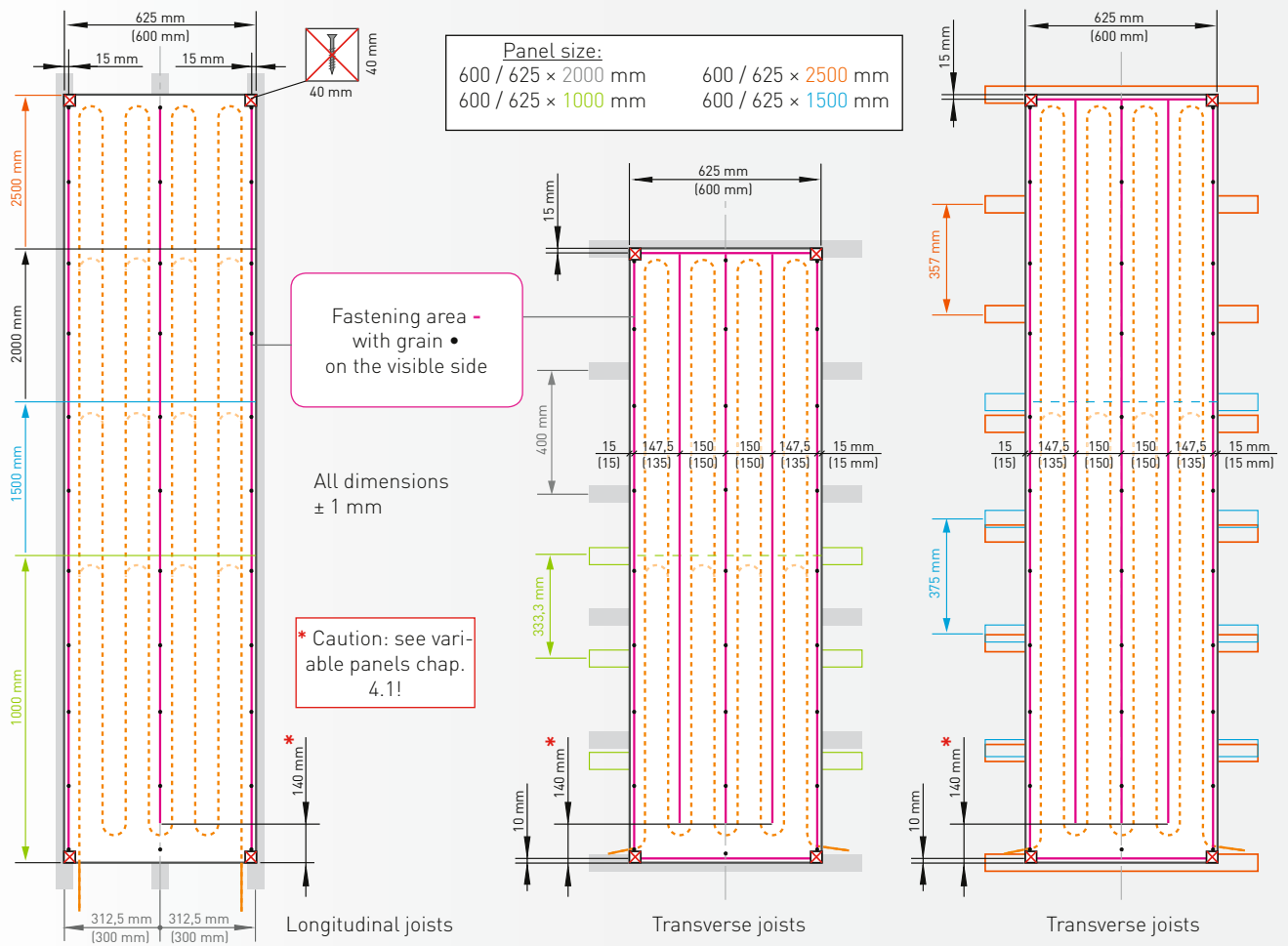
Only part of the panel surface is used as a heating/cooling area, the unused area (grey) can be individually cut to size.

Part no.	Colour code	Product code	h [mm]	b [mm]	A [m ²]	Height h _v [mm]	Heating/cooling area A _{HC} [m ²]	Weight/ Panel	Required quantity ¹⁾²⁾ dry wall screws 3,9 × 40 mm	
									Longitudinal joists	Transverse joists
V020-100		MWC-2000-625	2000	625	1,25	-	1.25	25.5 kg	3 × 9 pcs.	6 × 5 pcs.
V020-101		MWC-2000-600	2000	600	1,20	-	1.20	24.5 kg		
V020-102		MWC-1000-625	1000	625	0,63	-	0.63	12.8 kg	3 × 5 pcs.	4 × 5 pcs.
V020-103		MWC-1000-600	1000	600	0,60	-	0.60	12.2 kg		
V020-104		MWC-2000-312	2000	312	0,62	-	0.62	12.6 kg	2 × 9 pcs.	6 × 3 pcs.
V020-105		MWC-1500-625	1500	625	0,94	-	0.94	19.2 kg	3 × 7 pcs.	5 × 5 pcs.
V020-106		MWC-1500-600	1500	600	0,90	-	0.90	18.4 kg		
V020-107		MWC-2500-625	2500	625	1,56	-	1.56	33.8 kg	3 × 11 pcs.	8 × 5 pcs.
V020-108		MWC-2500-600	2500	600	1,50	-	1.50	30.6 kg		
V020-120		MWC-1000-625-V300	1000	625	0,63	300	0.48	13.0 kg	3 × 5 pcs.	4 × 5 pcs.
V020-121		MWC-1000-600-V300	1000	600	0,60	300	0.46	12.5 kg		
V020-122		MWC-2000-625-V200	2000	625	1,25	200	1.17	25.7 kg	3 × 9 pcs.	6 × 5 pcs.
V020-123		MWC-2000-600-V200	2000	600	1,20	200	1.12	24.6 kg		
V020-124		MWC-2000-625-V400	2000	625	1,25	400	1.04	25.8 kg		
V020-125		MWC-2000-600-V400	2000	600	1,20	400	1.00	24.8 kg		
V020-126		MWC-2000-625-V600	2000	625	1,25	600	0.92	26.0 kg		
V020-127		MWC-2000-600-V600	2000	600	1,20	600	0.88	24.9 kg		
V020-128		MWC-2000-625-V800	2000	625	1,25	800	0.79	26.2 kg		
V020-129		MWC-2000-600-V800	2000	600	1,20	800	0.76	25.1 kg		

¹⁾ Apart from the quantity, in the case of fire protection requirements test verification/certification may result in different specifications!

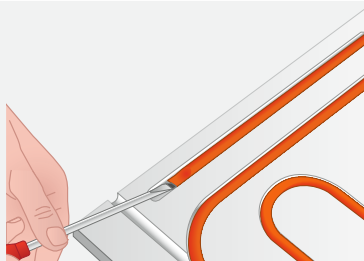
²⁾ Spread out bolts evenly across the length/width of the panel.

4.2 Fastening area of the ModulePanels-Classic

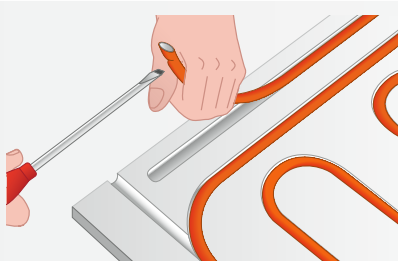


4.3 Installing the ModulePanels

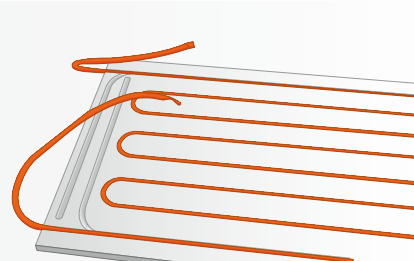
1 Fold out the pipe:



Move the Variomodular pipe out of its "parking position".

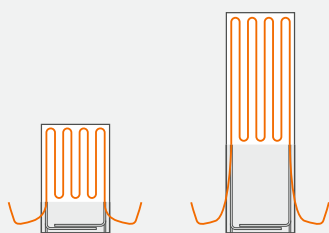


....

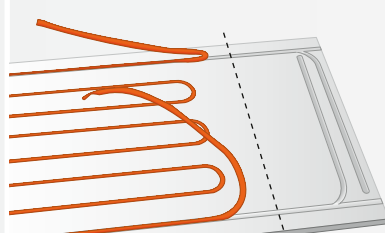


.... and insert it into the groove along the long side of the panel.

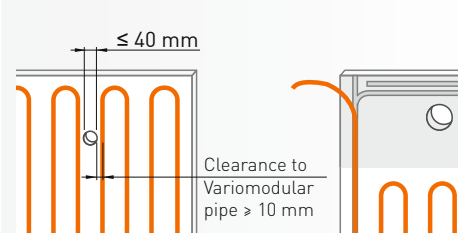
2 Trimming variable ModulePanels (if necessary):



Fold out the Variomodular pipe.

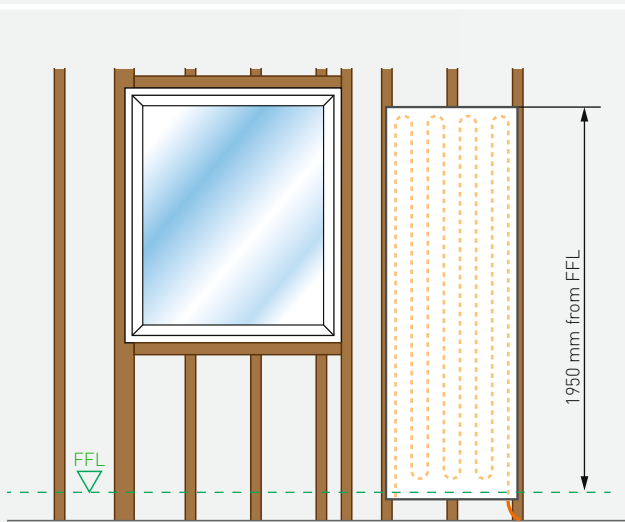


Cut the ModulePanel straight (preferably using a circular saw with vacuum attachment).

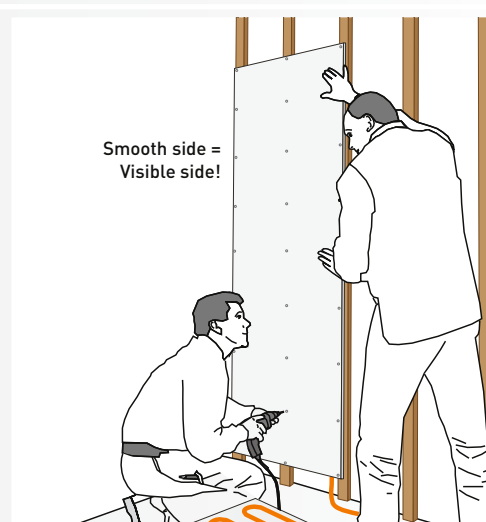


If necessary, drill a hole for ducting (e.g. lighting cables), max. 40 mm diameter.

3 Install the first panel:



Align the lower edge of the ModulePanel to be level (spirit level), 50 mm below the level of the finished floor.

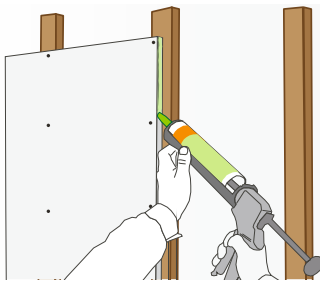


Smooth side =
Visible side!

The ModulePanel is installed in the fastening area (see section 4.2) using original 3.9 x 40 mm screws or staples.

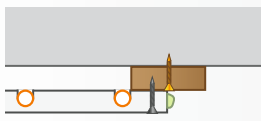
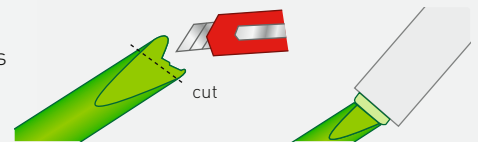
A tip from Variotherm: Use a power screw gun if possible and set the penetration depth of the screw head to approx. 0.1 mm.

4 Apply joint adhesive:

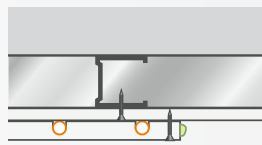


The Greenline joint adhesive from the cartridge is applied to the dust-free vertical edge of the panel as a flat bulge (width approx. 14 mm). The working temperature of the adhesive must be greater than 10 °C and the room temperature must be greater than 5 °C.

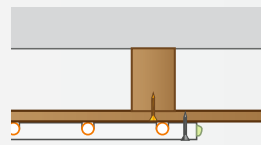
A tip from Variotherm: Cut off the cartridge tip as shown in the illustration. >>



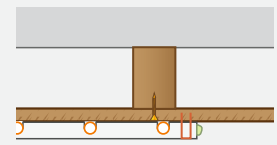
Single-layer



with Fermacell panel as substructure (see section 3.3)

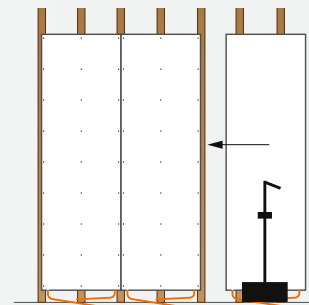
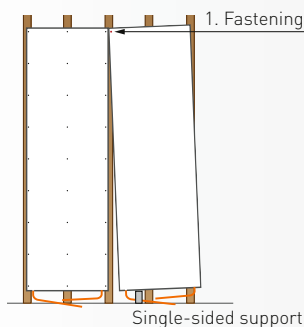


recessed formwork as substructure (see section 3.6)



chipboard panel and full cladding as substructure (see section 3.5)

5 Installation of the other ModulePanels (max. 6.25 m² heating/cooling surface area per heating/cooling circuit):



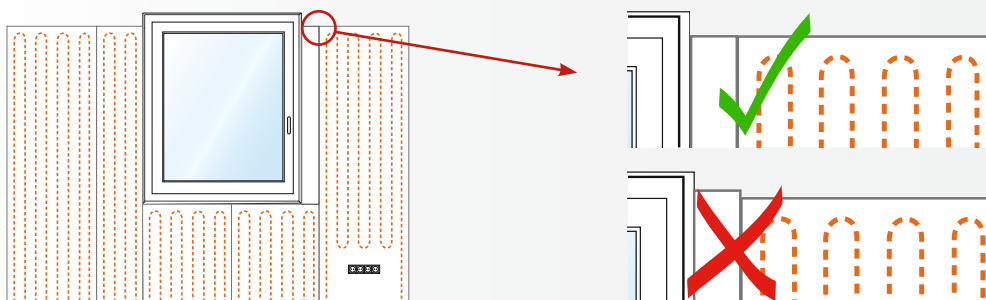
Variant:
Installation with a panel lifter

One side of the second ModulePanel is laid under so that the panel edges at the top touch each other and a small wedge-shaped gap exists downwards between the two panels. Fasten the ModulePanel to the substructure at the uppermost screw marking (corner).

After this, the second ModulePanel is pressed against the first ModulePanel so that the seam is closed. The seam width must not exceed 1 mm. Do not remove soft joint adhesive; leave it to set for approximately 18 to 36 hours (set adhesive will be scraped off later – see section 5.1).

Now screw or staple the ModulePanel into the fastening area (see section 4.2).

Check the abutting seam of the panels:

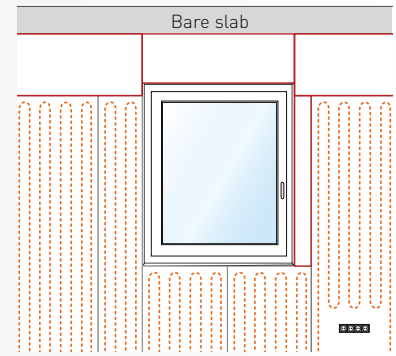


4.4 ModuleExpansionPanels (panel transitions)

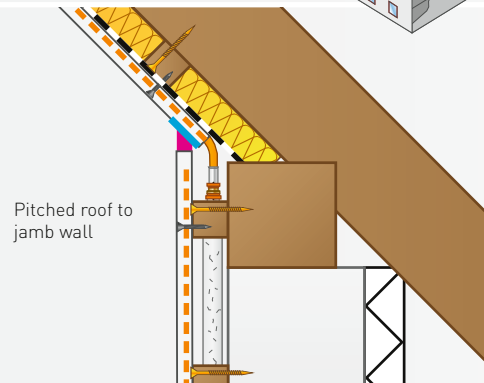
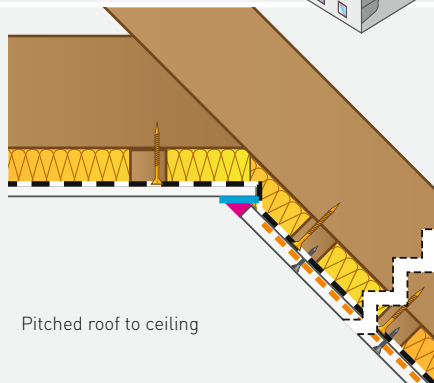
The areas at the sides of or above the ModulePanels are filled out using ModuleExpansionPanels with offset seams (please observe the FERMACELL guidelines). The Modular Expansion Panels are also glued with joint adhesive on the front side. >>

Cut panel edges (circular saw) must always be cleaned of all dust immediately before applying the joint adhesive.

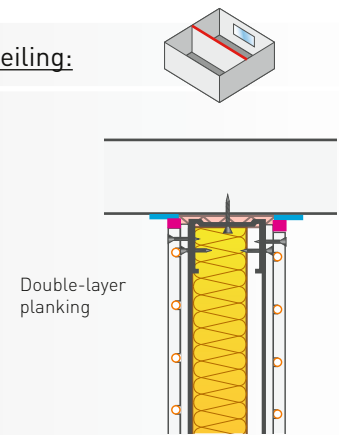
Cross joints are to be avoided. Inner and outer corners and T-joints are to be constructed as grouted joints (approx. 7 mm) with a separating layer (decoupled connection).



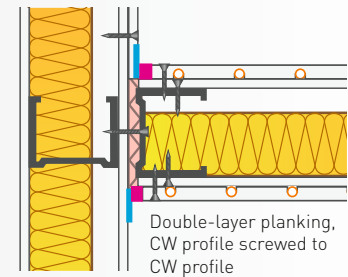
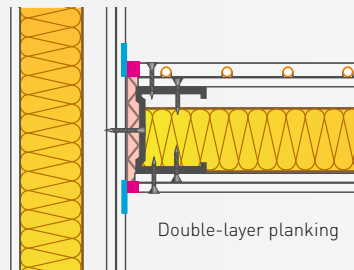
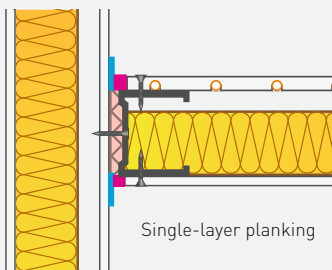
Pitched surfaces:



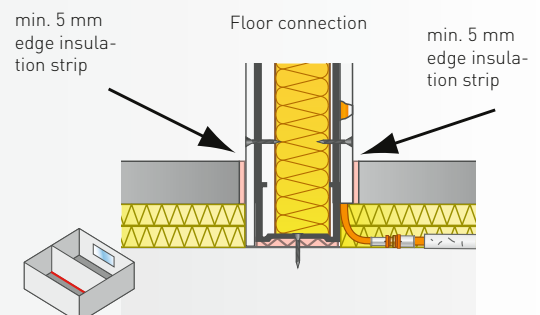
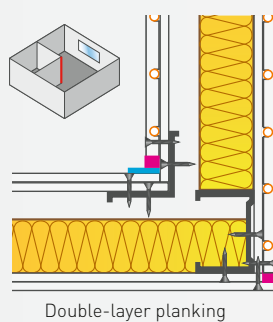
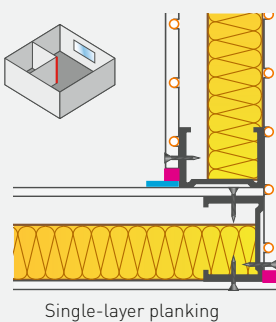
Ceiling:

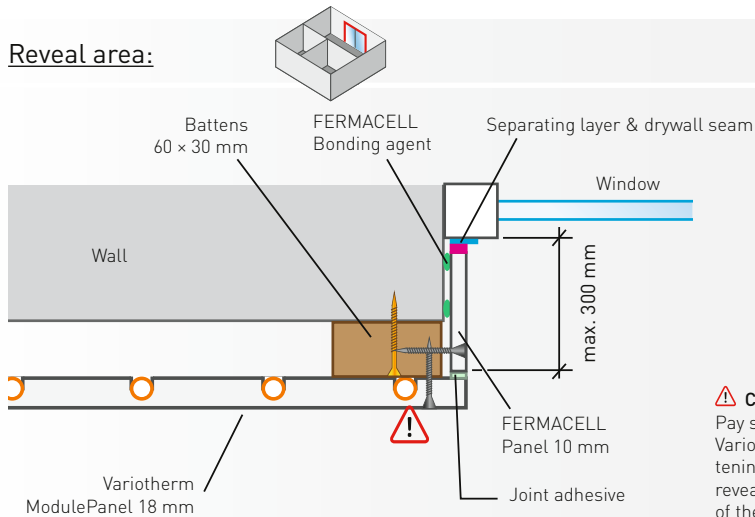


T-connections:

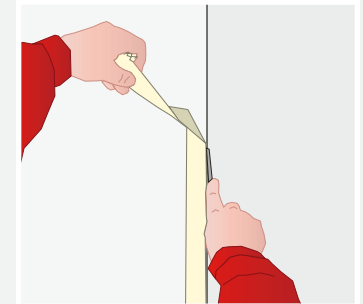


Corner joints



Reveal area:

Remove the excess separating layer (adhesive tape) at inner corners after stopping.



Caution:
Pay special attention to the Variomodular pipes when fastening the ModulePanels in the reveal area. (Fastening outside of the fastening area!)

4.5 Transitions from ModulePanels to other panel materials

Variotherm provides no guarantee for transitions to panel materials (e.g. plasterboard panels).

Please observe the specifications of the respective (panel) manufacturer.

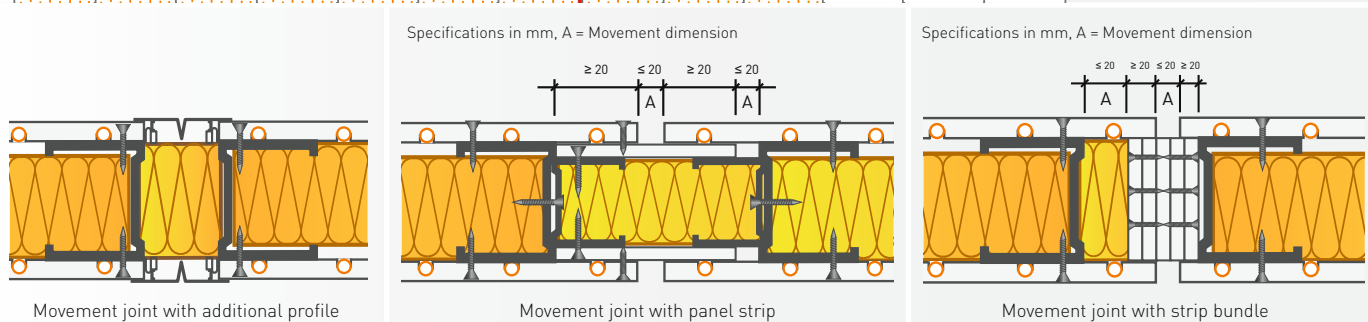
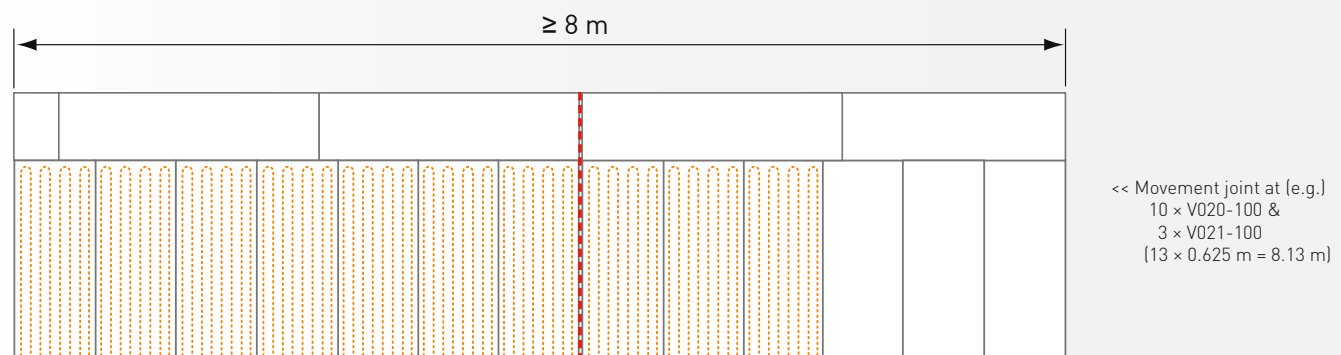
We can, however, provide you with the following practical examples of transition methods:

- Grouted joints (approx. 7 mm) with a separating layer (decoupled connection). Advantage: intentional straight crack (usually hardly visible)
- Elastic seam (acrylic mass), (maintenance seam, not suitable for fire prevention constructions)
- Fascia
- Wooden strip fastened on one side for covering the transition

4.6 Movement joints

Movement joints are to be provided every 8 m in wall constructions and pitched roofs.

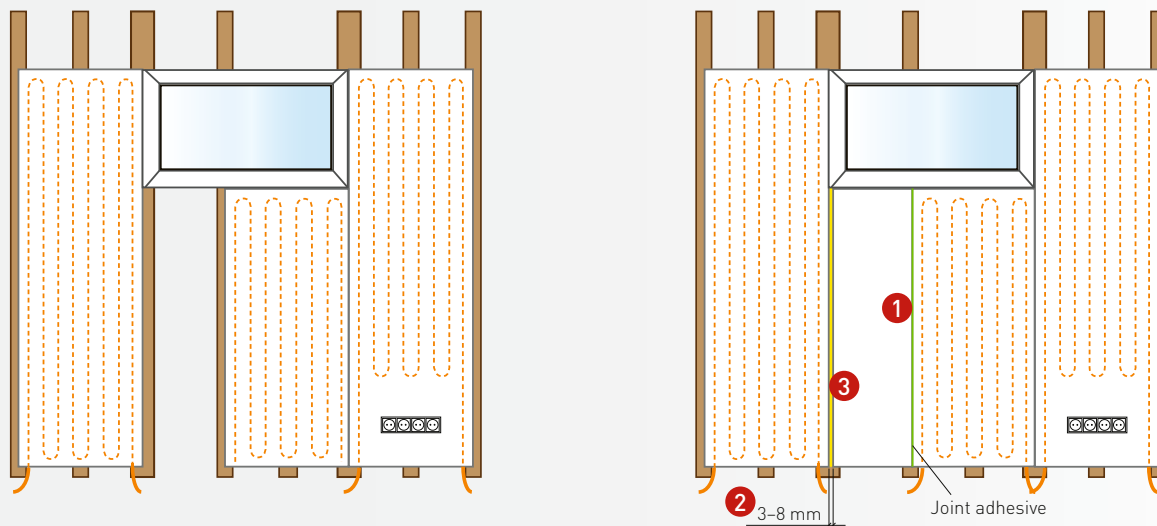
Caution: Pay special attention to the Variomodular Pipes when fastening the ModulePanels in the area of the movement joints!



4.7 Installation of panels between installed ModulePanels

If "drop to drop" installation of the ModulePanels is not possible, proceed as follows:

- 1 Glue one side of the Modular Expansion Panel using joint adhesive
- 2 Leave a 3 to 8 mm gap on the other side.
- 3 Completely fill the gap with **Variotherm Duo adhesive** (special **W048 manual applicator** required!).

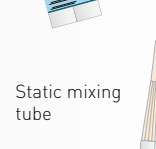


Processing:

- The surfaces of the ModulePanels must be clean, dry, dust-free and grease-free.
- Open the cartridge – screw on the static mixing tube.
- Insert the cartridge into the Duo manual applicator.
- For safety reasons, do not use the first amount of mixed adhesive for gluing (20 g, approx. walnut-sized).
- Completely fill the joint from the top to the bottom using the static mixing tube.
- For a better filling result, use a pointing trowel (or similar) to slightly hollow out the fresh joint.
- Remove excess adhesive when still fresh. Hardened adhesive can only be removed with great effort.
- The static mixing tube remains on the cartridge unit at the end of work/during breaks – the static mixing tube is then replaced the next time work begins again.
- The joint can be covered with filler 4 hours after gluing the panels (working temperature > +15 °C).



Duo adhesive



Static mixing tube



Manual applicator

Safety information:

Keep out of the reach of children! For further information see the product label or the safety data sheets according to Regulation 1907/2006/EC, Annex II, available at www.variotherm.com/en/service/info-centre/safety-data-sheets.html.

Wear suitable protective gloves. Protect your skin, eyes, clothing and tools from coming into contact with unhardened Duo adhesive. In the case of skin contact clean immediately with soap and water. Clean contaminated tools immediately with universal thinner. Hardened adhesive can only be removed mechanically.

Technical data:

Basis:	2-component PUR reaction adhesive
Colour when hard:	beige
Viscosity at +20 °C:	low-viscosity paste
Working time (at +10/+20/+30 °C):	approx. 60/30/15 minutes
Hardening time (+20 °C, 50 % relative humidity):	approx. 24 hours, final hardness after approx. 7 days
Working temperature:	minimum of +7 °C to a maximum of +30 °C
Net weight:	900 g (2 × 310 ml tandem cartridge)
Usage:	1 cartridge is sufficient for an approx. 7 m joint (with a breadth of 4 mm and a height of 18 mm)
Storage:	unopened, in a dry place at +15 °C to +25 °C approx. 15 months

4.8 Hydraulic connection & pressing

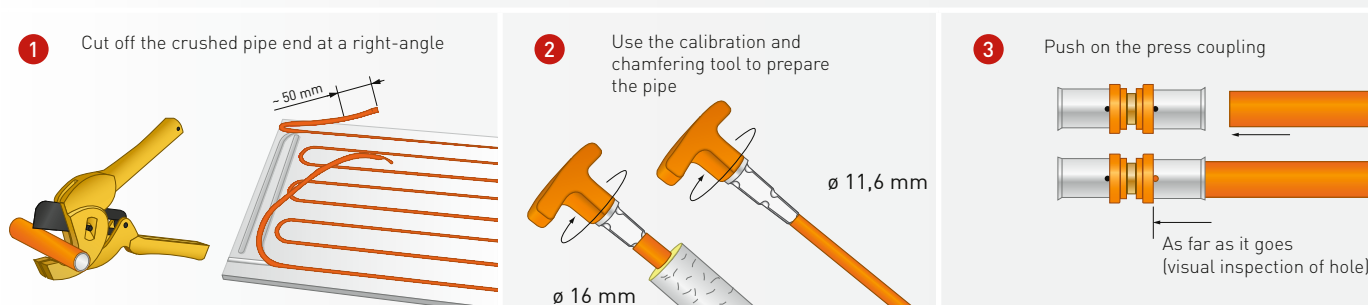
Once the panels and the heating/cooling manifolds are installed, the panels are connected to the desired circuits. The pre-insulated Variomodular pipe 16x2 is used as the supply pipe.

Caution: A permanent, tight connection is only guaranteed if original Variotherm system components are used: Variotherm pipes + calibration and chamfering tool + press couplings + press tool

Maintenance

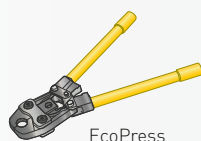
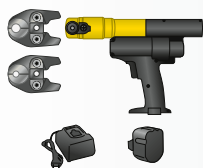
The press-fitting jaws and pressing tool must be checked at least once a year for correct operation by REMS or an authorised REMS customer service workshop.

Preparing the pipe:

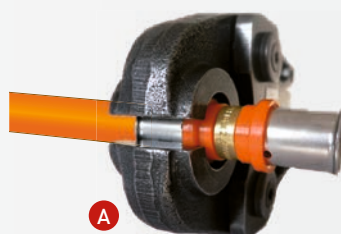


Pressing procedure:

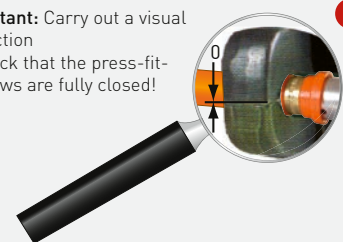
AkkuPress (mini)



EcoPress



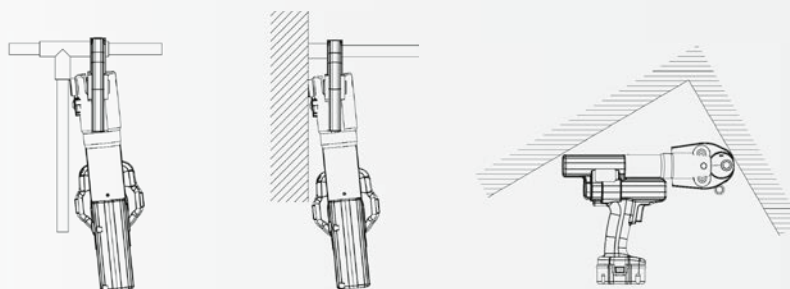
Important: Carry out a visual inspection to check that the press-fitting jaws are fully closed!



Please follow the operating instructions for the drive units used!

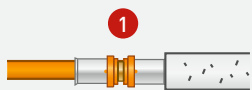
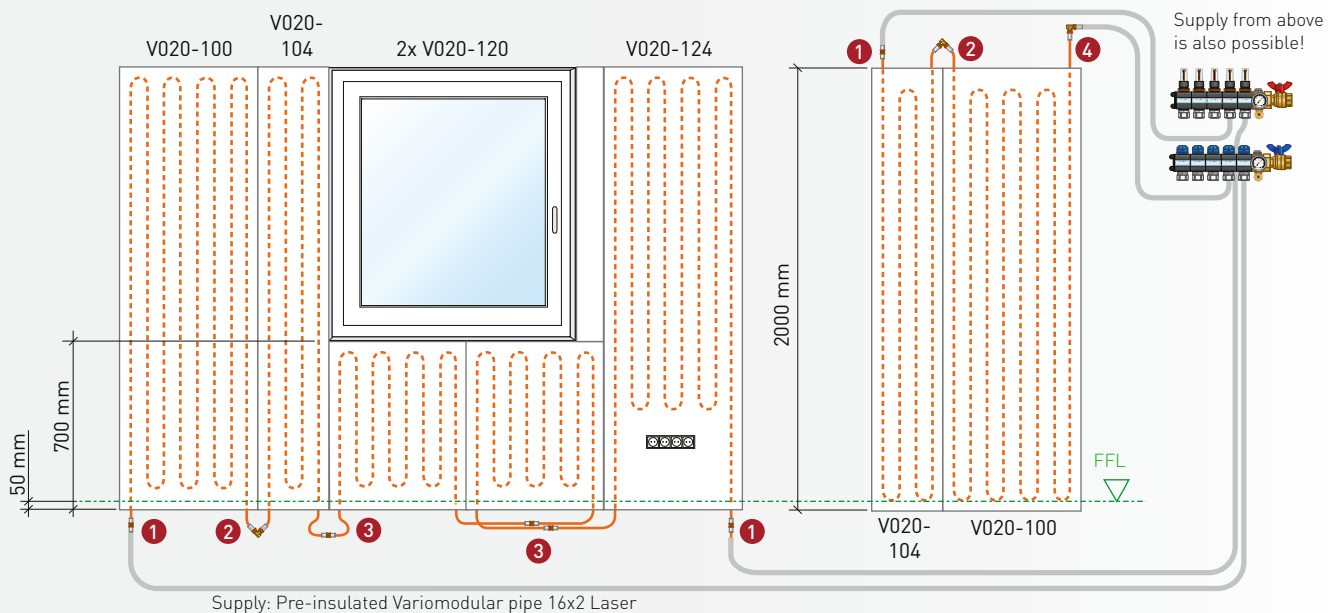
- The lever length of the EcoPress can be adjusted to suit the pressing force and the available space on site. Use the provided pipe arms with sleeve sockets for extension. Always screw pipe arms tight before use (danger of accidents!). Secure the selected press-fitting jaws with plug-in bolts.
- Open the press-fitting jaw by hand (AkkuPress) or using the pipe arms (EcoPress) wide enough for the press-fitting jaw to be pushed over the press coupling **A**. Set the press-fitting jaw onto the press coupling at right-angles to the pipe axis.
- With the AkkuPress, release the press-fitting jaw so that it closes around the press coupling.
- Hold the AkkuPress by the handle on the housing and on the motor. When using an AkkuPress, hold the switch pressed down until the press-fitting jaw is fully closed. This is made apparent by an audible click. With the EcoPress, push the pipe arms together until they reach the stop position (they make a click sound when they reach the stop).
- A perfect press is only achieved when the press-fitting jaw is fully closed. > Visual inspection **B**.

The following situations must be avoided (danger of gearbox breakage!):



ModulePanel connection options:

Maximum heating/cooling surface area per circuit: 6.25 m² (e.g. 5x V020-100)



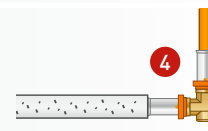
Press-fit coupling 16x11.6



Press-fit angled coupling 90° 11.6x11.6



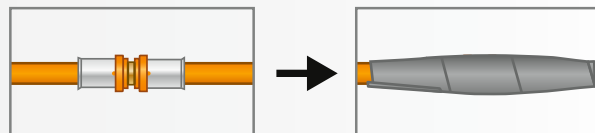
Press-fit coupling 11.6x11.6



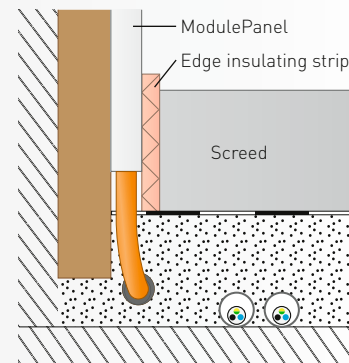
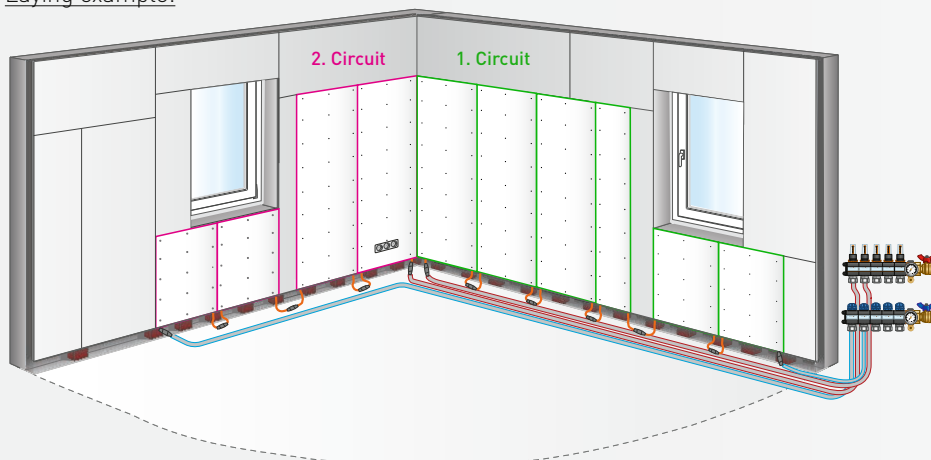
Press-fit angled coupling 90° 16x11.6

Corrosion prevention notice:

The connecting elements are to be protected (after the pressure test) in accordance with ÖN H 5155. For example, using cold shrink tape or corrosion protection tape.



Laying example:



Cross-section - floor structure



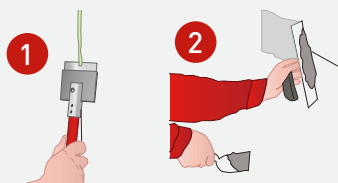
Details regarding the system and heating circuit pipes and the room temperature control are provided in the "DISTRIBUTION and CONTROL" design and installation manual.

5.1 Stopping

After installation, the ModulePanels and the Modular Expansion Panels are stopped using FERMACELL grouting or fine stopper. However, before this happens the set joint adhesive must be fully scraped off (the joint adhesive hardens after approx. 18 to 36 hours, depending on the room temperature). Attempting to remove joint adhesive that is still soft will result in smearing.

Caution: Stopping must not be performed until all wet work has dried out (wet screed, plastering work, etc.)!

- Scrape off the joint adhesive, e.g. using an adhesive scraper or wooden chisel
- Stop the seam area and recessed fasteners using FERMACELL grouting (Q1)



The following work is to be performed, depending on the surface quality required:

Q1	• Stopping of visible joints and adhesive seams with FERMACELL grouting
Q2	• Q1 + burr-free and step-free stopping of the seams and joints
Q3	<p><u>Full-surface stopping:</u></p> <ul style="list-style-type: none"> • Stopping of the visible joints with FERMACELL grouting or plaster • Wide stopping of the seams • Full-surface coating and sharp pulling-off using FERMACELL grouting or fine stopper or other suitable stopping material
Q4	<p><u>Full-surface coating:</u></p> <ul style="list-style-type: none"> • Stopping of the visible joints with FERMACELL grouting or plaster • Wide stopping of the seams • Full-surface coating and smoothing using FERMACELL fine stopper or plaster or other suitable stopping material

5.2 Fastening loads to the ModuleWall

Single loads hanging on the wall

Picture hooks ¹⁾ fastened with nails	Permissible load per hook on ModulePanel ²⁾ (≅ 12.5 mm FERMACELL panel), (100 kg = 1 kN)
	0.17 kN
	0.27 kN
	0.37 kN

Light single loads parallel to the wall surface with low outreaches, such as (e.g.) pictures or decorations, can be fastened directly to the FERMACELL planking using commonly available fasteners without using an additional sub-structure. Suitable for this are (e.g.) nails, picture hooks with single or double nail mounts, or screws and dowels.

¹⁾ Breaking force of the hooks per brand. Hooks fastened corrosion-neutral only in the planking

²⁾ Safety factor 2 (constant load at rel. humidity up to 80 %)

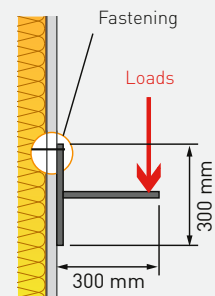
Cabinet loads on ModuleWall³⁾

Cabinet loads fastened with dowels or screws ⁴⁾	Permissible loads for individual hanging on ModulePanel (≅ 12.5 mm FERMACELL panel), (100 kg = 1 kN)
	0.50 kN
	0.30 kN

The listed loading values can be added when the dowel clearance is ≥ 500 mm. At lower dowel clearances, 50% of the respective maximum permissible load for each dowel is used. The sum of the individual loads must not exceed 1.5 kN/m for walls and must not exceed 0.4 kN/m for free-standing single wall panels and double stud walls that are not connected to each other. Higher loads must be specially checked and approved.

³⁾ Introduced as per DIN 4103, safety factor 2

⁴⁾ Observe the instructions of the dowel manufacturer.



Introduction of the loads

5.3 Painting

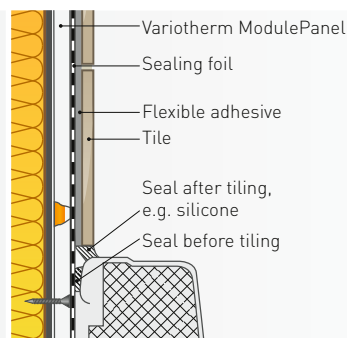
Commonly available paints such as (e.g.) latex, emulsion or enamel paint can be applied to the ModulePanels. Mineral-based paints such as (e.g.) limewash and silicate paints must be approved by the manufacturer for use on gypsum fibreboards. The paint is usually applied in two steps.

5.4 Tiling

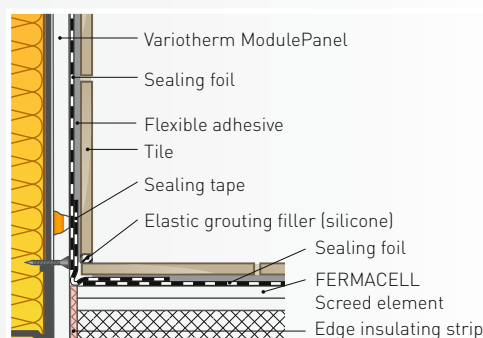
See also the appropriate standards for laying tiles, panels and mosaics.

Points to be observed:

- The weight of the tiles (incl. adhesive) must not exceed 56 kg/m².
- The surface of the ModulePanels must be dust-free.
- The moisture content of the ModulePanels must be less than 1.3 % (min. 48 h at 70 % humidity and room temperature > 15 °C).
- Sealing systems must be used on surfaces subject to the effects of moisture (see table below). The wall boundaries must be sealed using appropriate sealing tape.
- A flexible adhesive is used to bond the tiles. A primer must be applied if this is stated by the adhesive manufacturer. This is particularly the case for flexible cement adhesives.
- Flexible grouting mortar must be used for grouting.
- After laying the tiles, boundaries with the walls are additionally sealed with silicone.



Connections between shower or bath and Variotherm ModulePanels



Wall-screed structure in areas subjected to water loads

Use of primer and sealing system: [composite waterproofing]:

Operational demands group		Which room?	Adhesive mortar with tile coverings	Sealing system	Primer
ÖN B 3407	ZDB composite waterproofing (Germany)				
W1	-	Residential sector: living rooms, corridors, toilets, offices and the like	Calcium sulfate flexible adhesive mortar	Not required	Not required
			Cement flexible adhesive mortar	Not required	Required
W2	-	Residential sector: kitchen and rooms with similar usage Commercial sector: toilet systems	Only cement flexible adhesive mortar	Recommended	In addition to the sealing system, when recommended by the manufacturer
W3	A0	Wall and floor surfaces without drainage (e.g. bathroom with shower tub), toilet systems without floor drainage, porch	Only cement flexible adhesive mortar	Required	In addition to the sealing system, when recommended by the manufacturer
W4 – W6	B0, A, B, C	Wall and floor surfaces with drainage (e.g. shower with flush drain at the same level as the floor), shower systems, industrial kitchen, balconies, terraces ...	No ModuleWall possible.		

Product examples for primer or sealing system [composite waterproofing]:

Manufacturer/Brand	Primer	Sealing system
FERMACELL	Deep primer	Liquid foil
Ardex	Ardex P51	Ardex 8 + 9
Murexin	Deep primer LF1	Shower sealant / Liquid foil 1KS
Cimsec	Plaster primer	Flexible sealant DU15
PCI	Gisogrund	Lastogum
Schönox	Schönox KH	Schönox HA oder 1K-DS
Mapei	Primer G	Mapegum WPS
Weber	weber.prim 801	weber.sys 822
Ceresit	Solvent-free deep primer	Ceresit shower & bath sealant

Construction project: _____

Building owner/Occupant: _____

Client: _____

Heating installation technician: _____

Architect: _____

Other: _____

6.1 Leak-tightness test

After installation and before completion work (plastering, painting, wallpapering, tiling), the circuits of the Variotherm ModuleWall are to be checked for leak-tightness via a water pressure test. The test pressure should be min. 4 bar and max. 6 bar. If there is a risk of freezing, appropriate measures should be taken, e.g. use of antifreeze and controlling the building's temperature.

- Installation of ModulePanels finished on: _____
- Installation of pipe connections finished on: _____
- Pressure test started on: _____ with test pressure ____ bar
- Pressure test finished on: _____ with test pressure ____ bar
- Start of completion work (plastering, painting, wallpapering, tiling) on: _____
- System pressure during the completion work was ____ bar
- The system water was treated (e.g. per ÖNORM H 5195-1) Yes No
- Antifreeze was added to the system water Yes No
- The system was checked for leak-tightness on: _____ and approved

Approval:

Building owner/Occupant/Client

Construction management/Architect

Heating installation technician

6.2 Preheating Protocol

Preheating of the Variotherm ModuleWall

- Completion work finished on: _____
- Preheating started on: _____
- Supply temperature set to 23 – 30 °C and retained for 1 day completed
- Increase to a supply temperature of 30 – 40 °C and maintained for ½ day completed
- Set to maximum calculated supply temperature plus 5 °C
(Caution: The maximum supply temperature of the ModuleWall is: 50 °C) completed
- Maintained for ½ day, set falling supply temperature to 30 °C, maintain for 1 day completed
- Heating switched off on: _____
- Operating state and outdoor temperature on handover:

Approval:

Building owner/Occupant/Client

Construction management/Architect

Heating installation technician

ENJOY THE COMFORT AND SAVE ENERGY

That's why our customers love us:

Heating and cooling optimised for COMFORT in all rooms!

Fast and friendly service, ANSWERS backed up with expertise!

Always in tune with the latest technology, INNOVATION guaranteed!

Everything CLEAR and SIMPLE, in writing of course!

PROFESSIONALISM at all times, from the first contact to the reference list!

VARIOTHERM SINCE 1979

Variotherm is an Austrian model plant with hundreds of partners in Austria, Europe and around the world.

All rights pertaining to distribution and translation, in whole or in part, including film, radio, television, video recording, Internet, photocopying and reprinting, are reserved. Subject to mistakes and printing errors.



Your Variotherm partner:

MWHC



Austria's
Leading
Companies
2014



eco
INSTITUT

VARIOTHERM HEIZSYSTEME GMBH

GÜNSELSDORFER STRASSE 3A
2544 LEOBERSDORF
AUSTRIA

Phone: +43 [0] 22 56 - 648 70-0

Fax: +43 [0] 22 56 - 648 70-9

office@variotherm.com www.variotherm.com