

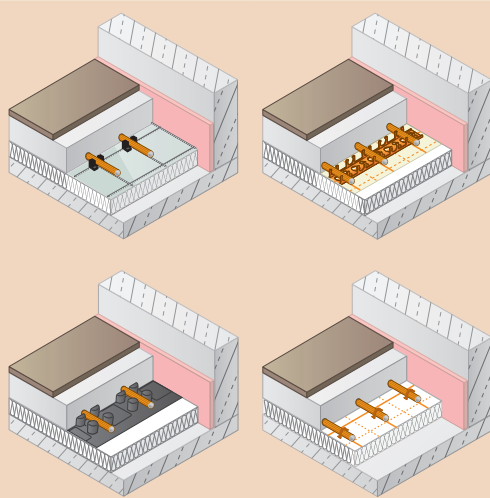
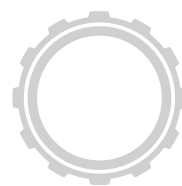
UFH

INSTALLATION

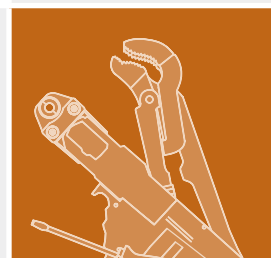
SCREED FLOOR HEATING SYSTEMS

VarioClip.

VarioRast.



VarioFix.



VarioRoll.



PDF



1. Safety information	3
1.1 General	3
1.2 Guarantee conditions	3
1.3 VarioProFile pipe 16x2 plus+ storage	3
1.4 Coordination of floor construction	3
1.5 Standards.....	3
2. Preparation	4
2.1 Tools	4
2.2 Rooms	4
2.3 Vapour barrier/retarder.....	4
2.4 Edge insulation strip	4
2.5 Movement joints	5
3. System installation	6
3.1 VarioClip system	6
3.2 VarioRast system	8
3.3 VarioFix system.....	10
3.4 VarioRoll system	12
4. Pipe installation	14
4.1 General.....	14
4.2 Laying patterns	14
4.3 Pipe spacing to other components	15
4.4 Pipe installation at movement joints	15
4.5 Bending	15
4.6 Press-fit connections	16
5. Screed	18
5.1 Preparation	18
5.2 Screed material and thickness	18
5.3 Screed admixture	19
5.4 Laying screed.....	19
5.5 Screed residual moisture	19
5.6 Floor covering	19
6. Protocols	20
6.1 Leak-tightness test in accordance with DIN/ÖNORM EN 1264-4	20
6.2 Functional heating in accordance with DIN/ÖNORM EN 1264-4.....	21
6.3 Dry heating in accordance with BVF (Federal Association of Surface Heating and Surface Cooling).....	22

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 VarioProFile pipe 16x2 plus⁺ storage

The VarioProFile pipe is an aluminium multi-layer composite pipe (100 % oxygen diffusion-tight).

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 VarioProFile pipe during the construction phase, high-visibility warning signs should be placed at appropriate locations. The VarioProFile pipe is only weather-resistant to a limited extent, must be shielded from direct sunlight and must not be stored outdoors.

The interaction of the air's oxygen with UV rays damages the pipes. Normal temporary storage on the construction site for a few days is permissible.

1.4 Coordination of floor construction

The following items must be coordinated between the architect, construction manager, installation technician, screed layer and floor layer:

- Horizontal marking
- Floor structure with the required vapour retarders/barriers and trickle protection sheet, respectively
- Load-bearing capacity or max. bending with wooden beam ceiling
- Any height compensation layers that may be required
- Floor heating system
- Type and thickness of screed
- Expansion joints in screed
- Measurement points for moisture measurement
- Floor covering, with heat sensors if necessary

1.5 Standards

The validity of the standards specified in these installation instructions was last verified on 15 October 2020!
If necessary, amendments to standards must be checked!

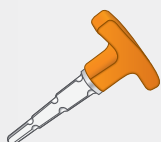


2.1 Tools

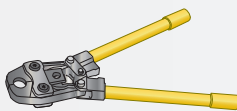
The following Variotherm tools are required/recommended for installation work:



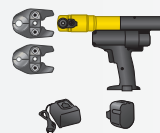
Pipe cutting pliers



Calibration and chamfering tool



EcoPress or AkkuPress Mini pressing tool, incl. press-fitting jaws
(e. g. for residual pipes)



Bending model 16/100

2.2 Rooms

- The rooms must be cleared out, clean and dry. Residual plaster and mortar must be removed.
- During laying work, no other tradespeople may be working in the rooms.
- To prevent the screed from drying out too quickly, there must be no draughts on the construction site (windows, exterior doors and door frames should be installed).
- No conduits (cold water pipes, drainage pipes, electrical conduits) that exceed the height of the thermal insulation may be present on the raw slab. In particular, no conduits may run across the room.

2.3 Vapour barrier/retarder

Depending on the installation situation and the floor covering, either vapour barriers or vapour retarders must be installed in the floor structure. The necessity of these intermediate layers must be agreed upon in a coordination meeting between the contractors (construction company, screed layer, installation technician etc.).

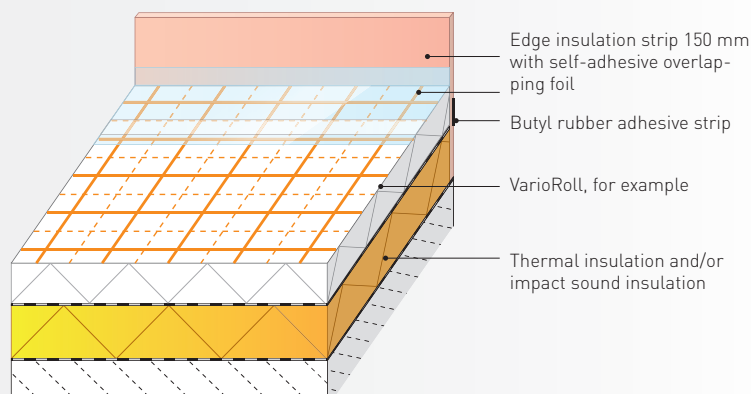
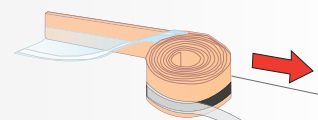
2.4 Edge insulation strip

An edge insulation strip is to be installed with the butyl rubber adhesive strip along the exterior walls and also around columns, steps, door frames, pillars, shafts etc. before the screed floor heating is installed. As per DIN/ÖNORM EN 1264-4, the edge insulation strip must allow screed movement of at least 5 mm.

The edge insulation strip runs from the load-bearing subsurface (or the lower edge of the upper insulation) to the upper edge of the covering.

The foil of the edge insulation strip is affixed to the surface of the floor heating system using the adhesive strip.

After the upper covering has been completed, the protruding remainder of the edge insulation strip is removed (by folding down).

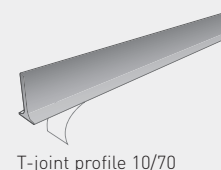


2.5 Movement joints

Cement screed expands by about 0.01 mm per metre of length for every temperature increase of 1 K [°C].

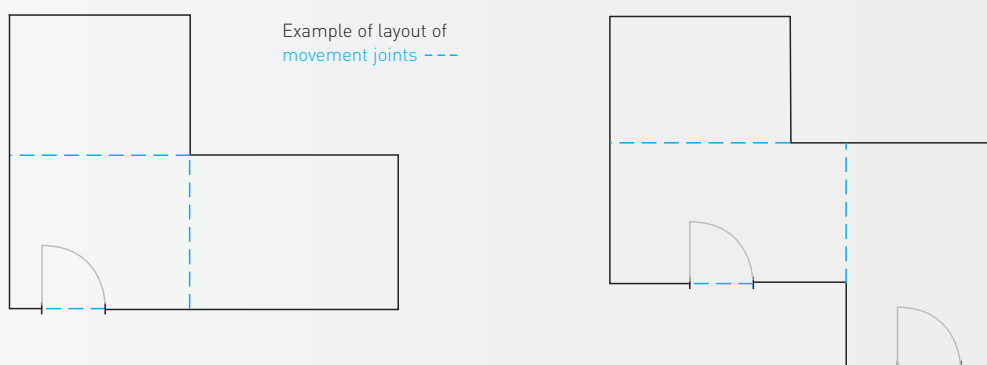
To ensure tension-free accommodation of this change in length, it is necessary to provide movement joints in the floor structure as defined by the architect or planner.

Variotherm T-joint profiles are used as movement joints.

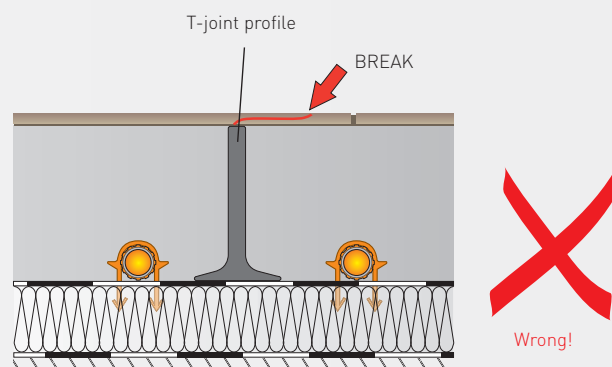
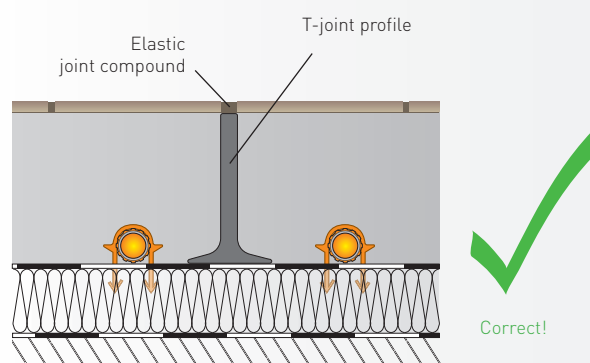


Requirements for movement joints:

- The number of joints and size of the screed area depend on the screed material and floor covering
- The heating installation technician must, as part of the specifications, receive a plan on which the position of the joints is displayed (as per DIN/ÖNORM EN 1264-4)
- Movement joints must always be provided in the case of building joints
- Heating pipe feed-throughs are to be fitted with flexible sleeve tubes (approx. 400 mm) and the number of feed-throughs is to be kept to the minimum possible
- Unheated screeds must be separated from heated screeds by a movement joint.

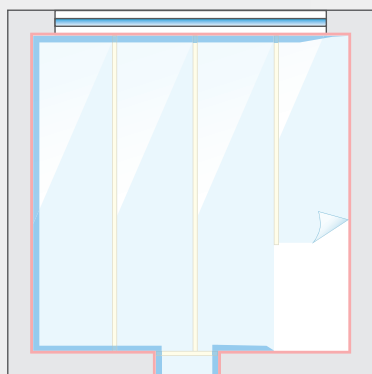
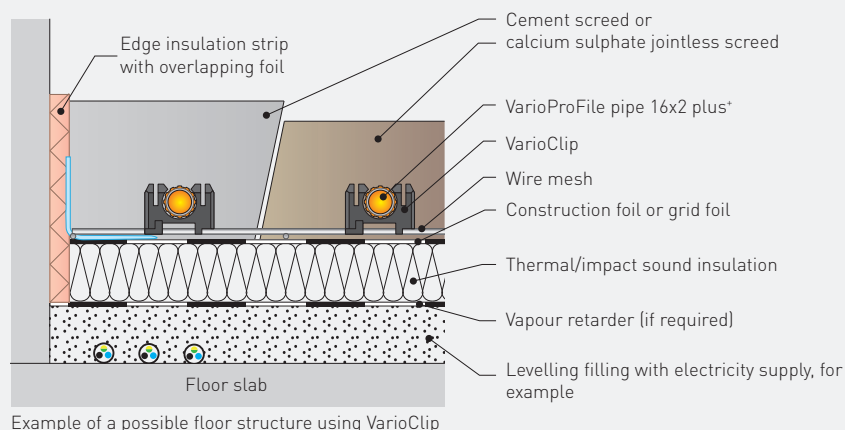
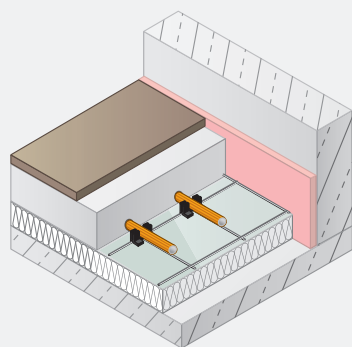


The movement joints are particularly important in the case of ceramic coverings. It is crucial that the movement joints run congruently in all layers above the insulation.



>> For details regarding pipe installation at movement joints, see Section 4.

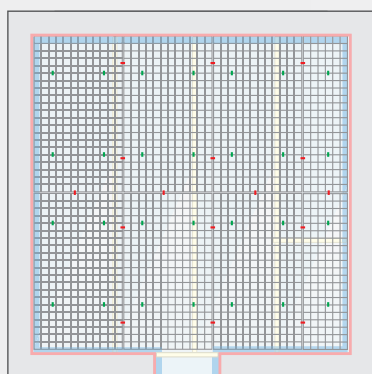
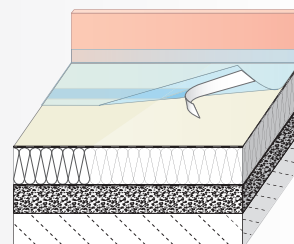
3.1 VarioClip system



- 1** Before installation of the wire mesh, the installed thermal / impact sound insulation is to be covered by **construction foil** (thickness: 0.1 mm) or **grid foil** (thickness: 0.2 mm, in accordance with DIN/ÖNORM EN 1264-4) with an overlap of 30 mm. This prevents damage to the insulation layer and stops screed and screed water from penetrating it. Thermal bridges and sound bridges are avoided.

The overlaps are stuck together using adhesive tape.

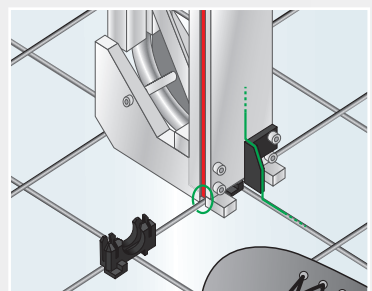
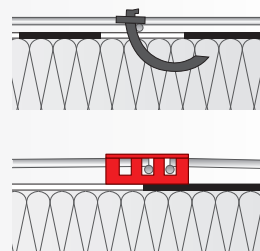
The self-adhesive, welded-on overlapping foil of the edge insulation strip is affixed to the installed foil. >>



- 2** After the separating layer has been fully laid and glued, the **wire mesh** is laid on.

To prevent the wire mesh from moving out of position, the wire can, if required, be attached to the underlying insulation with **fixing anchors** [-].

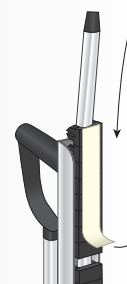
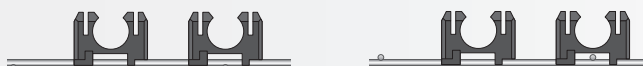
The wire mesh is joined together using **wire mesh connectors** [-]



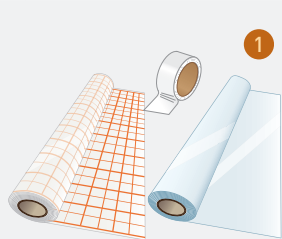
- 3** The **VarioClips** are installed onto the wire mesh, with necessary grid spacing, using the **laying device** (2 pcs./m).

Insert the magazines of the VarioClips into the laying device as shown. Then remove the adhesive strip from the magazine. Finally, the weight is attached. >>

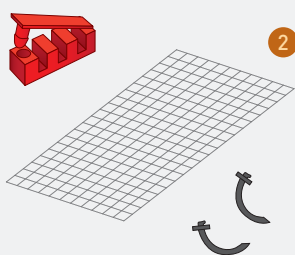
It is also possible to place VarioClips on intersection points:



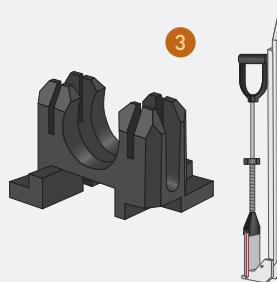
System components:



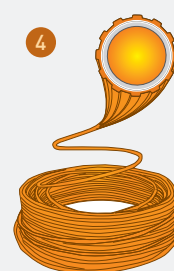
Grid foil or construction foil



Wire mesh + fasteners



VarioClip + laying device



VarioProFile pipe 16x2 plus+

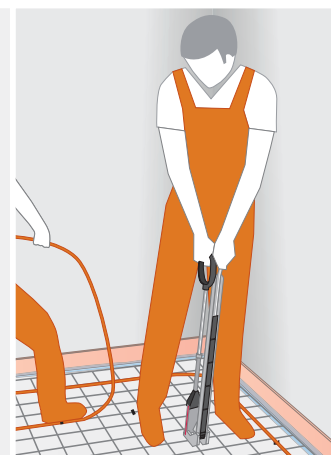
Use laying devices in such a way that the magazine is turned away from the installer. >>

A tip from Variotherm: Install the VarioProFile pipe immediately after positioning the VarioClips. >>

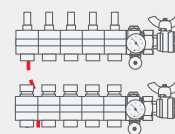
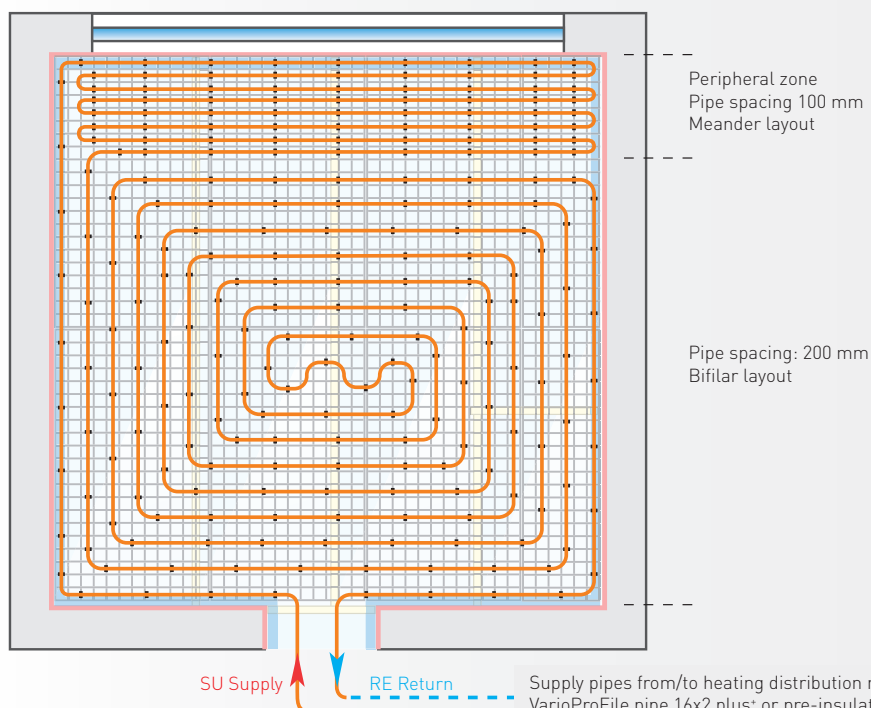
4 The **VarioProFile pipe** is routed with no twisting from the heating distribution manifold to the room in question. The VarioProFile pipe is clamped into the clips, in accordance with the specified layout system, and is thus fastened.

It must be ensured that the VarioProFile pipe is surrounded by screed material on all sides and that good heat transfer is guaranteed.

>> For further details regarding pipe installation, see Section 4!

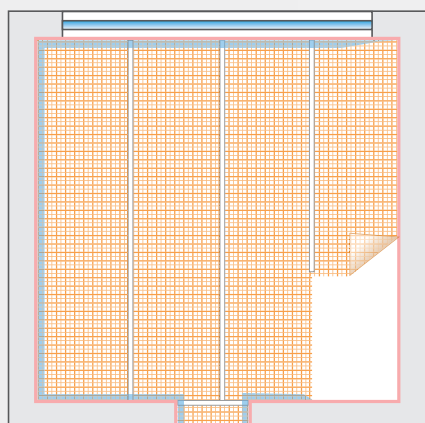
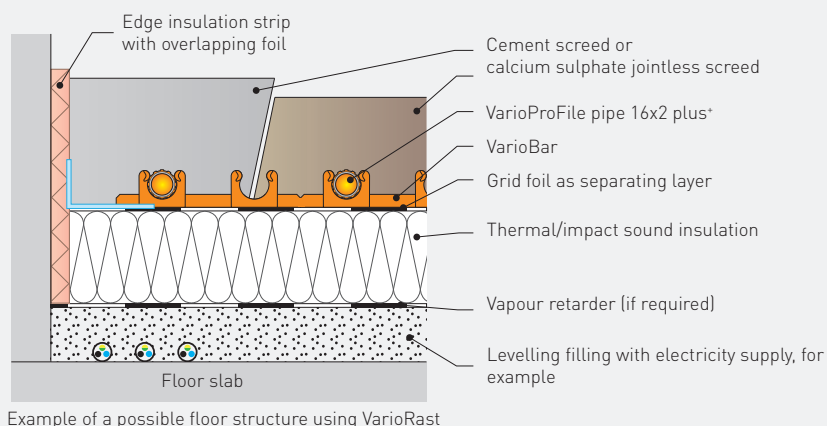
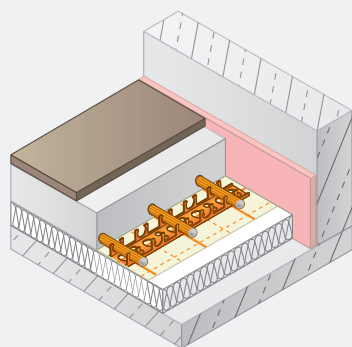


Laying example:



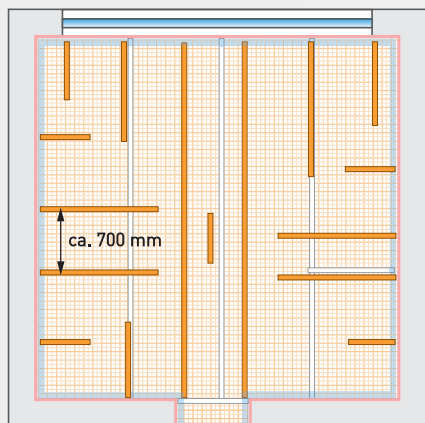
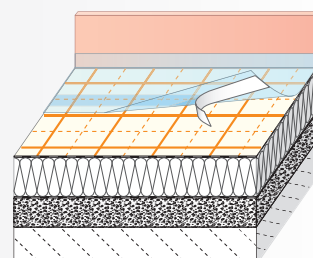
Supply pipes from/to heating distribution manifold:
VarioProFile pipe 16x2 plus+ or pre-insulated
Variomodular pipe 16x2 Laser

3.2 VarioRast system



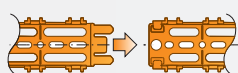
- 1** The installed thermal/impact sound insulation is to be covered by **grid foil** (thickness: 0.2 mm) with an overlap of 30 mm. This prevents damage to the insulation layer and stops screed and screed water from penetrating it. Thermal bridges and sound bridges are avoided.

The overlaps are stuck together using adhesive tape. For easier installation of the pipes, the grid foil markings should match. The grid spacing is 50 mm. The self-adhesive, welded-on overlapping foil of the edge insulation strip is affixed to the installed foil. >>

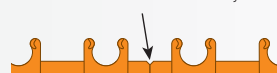


- 2** The **VarioBars** are installed on the thermal insulation and impact sound insulation, which is covered by grid foil. The possible grid spacing is, like the grid foil, 50 mm. Around 1.5 m of VarioBars are required per m².

Click technology:

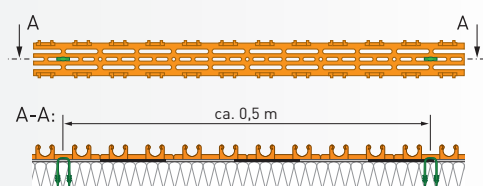


Break here if necessary

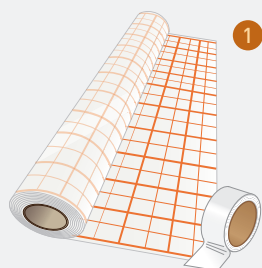


- 3** They are fastened using the rear adhesive strip and the **fixing needles** (3 pcs./m² or 2 pcs./m).

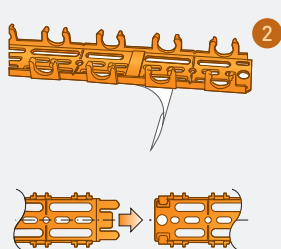
A tip from Variotherm: Install fixing needles at an angle for improved retaining power! >>



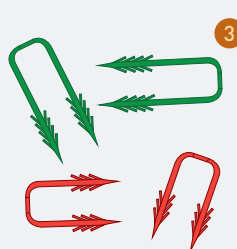
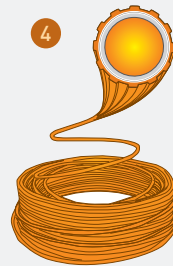
System components:



Grid foil



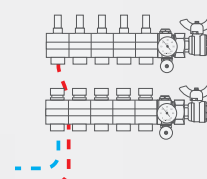
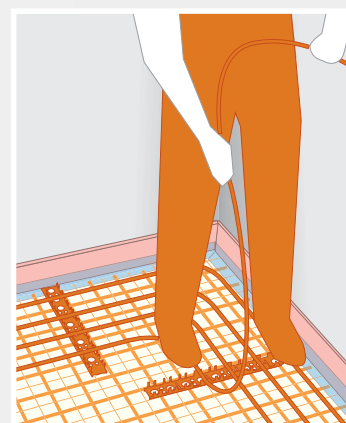
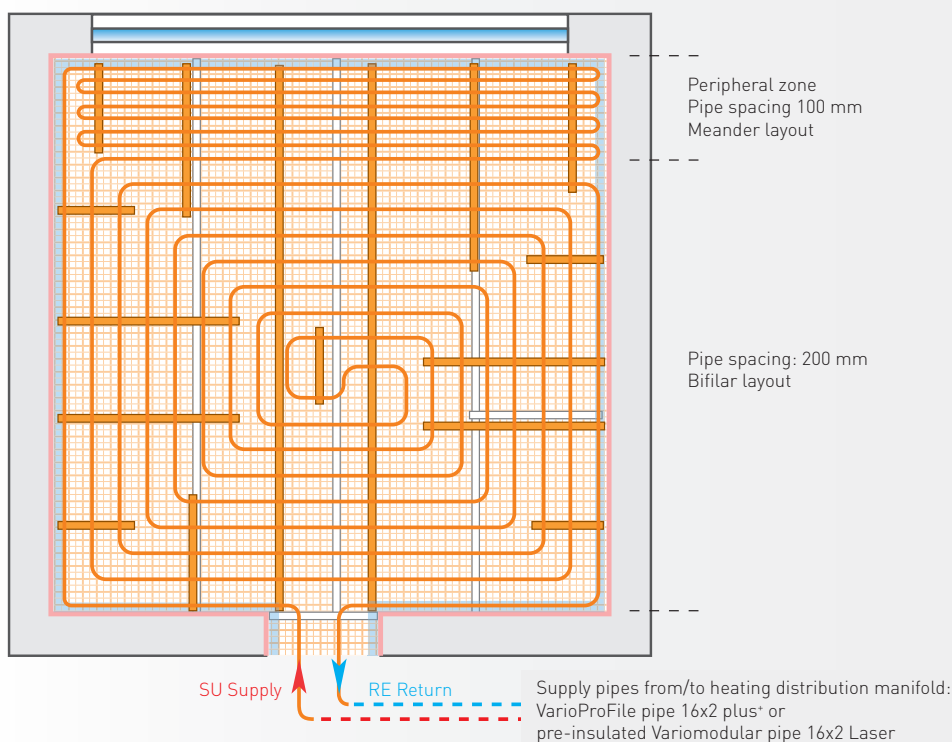
VarioBar K16/100

45 or 60 mm fixing needles
(red or green)VarioProFile pipe
16x2 plus+

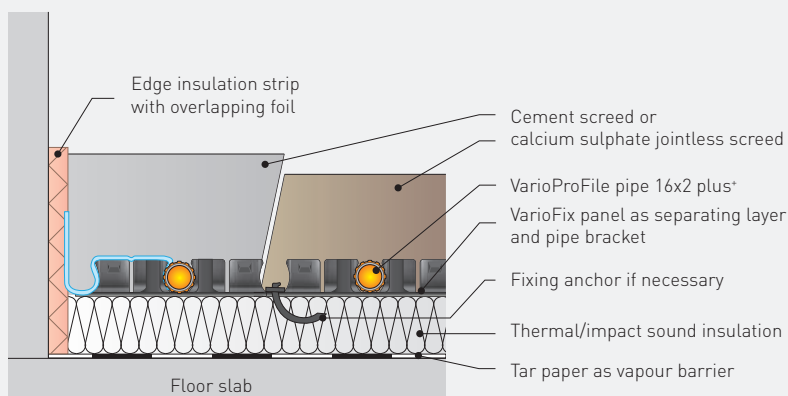
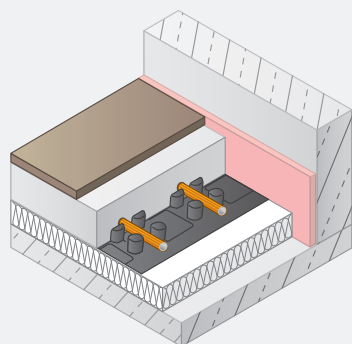
4 The **VarioProFile pipe** is routed with no twisting from the heating distribution manifold to the room in question. The VarioProFile pipe is clamped into the already fastened VarioBar step by step, in accordance with the specified pipe spacing. It must be ensured that the VarioProFile pipe is surrounded by screed material on all sides and that good heat transfer is guaranteed.

>> For further details regarding pipe installation, see Section 4!

Laying example:

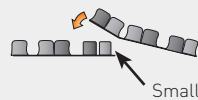
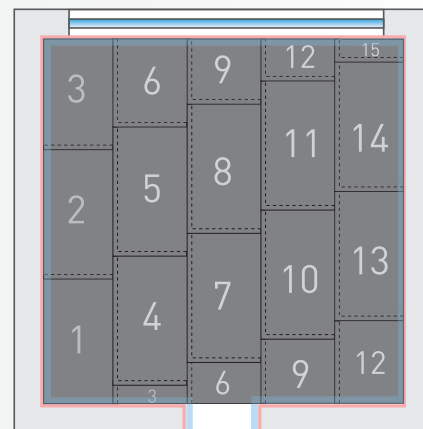
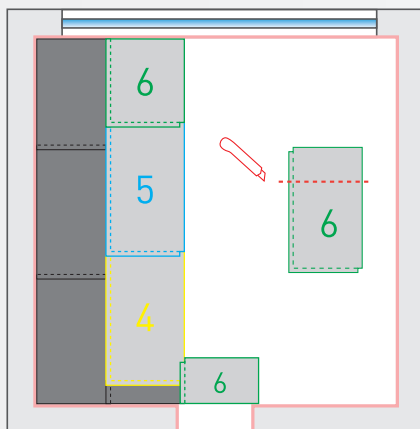
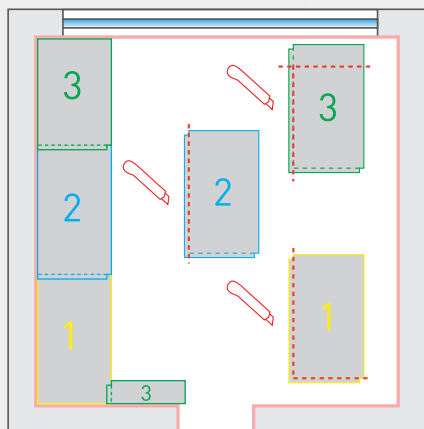


3.3 VarioFix system



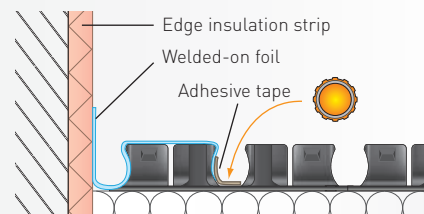
Example of a possible floor structure using VarioFix

- 1** The **VarioFix panels** are used to attach the VarioProFile pipe 16x2 plus* and as a separating layer.
Usable area: 1400 × 800 mm (50 mm overlap), dimensions: 1450 × 850 mm



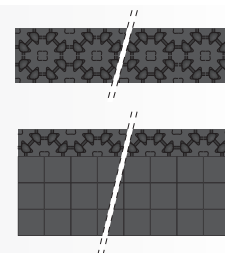
<< A form-fitting panel assembly is formed by means of the snap fastening system.

The self-adhesive, welded-on overlapping foil of the edge insulation strip is affixed to the VarioFix panel and is clamped under the VarioProFile pipe (may additionally be affixed with wide adhesive tape). **Hollow spaces between the overlapping foil and the VarioFix panel are to be avoided.** >>

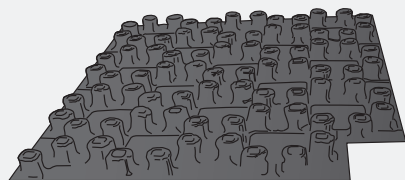


- 2** At transition points without overlapping strips, the VarioFix panels are to be joined together using the **connecting element**. Dimensions: 1400 × 100 mm

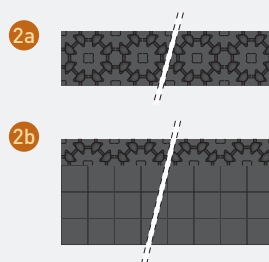
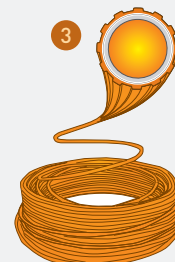
At transition points to pipeless zones such as door areas, or from more densely laid pipe zones (e.g. heating distribution manifold), **adjustment elements** are laid. Dimensions: 1400 × 200 mm



System components:



VarioFix panel

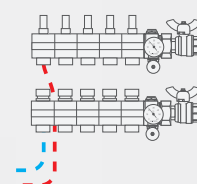
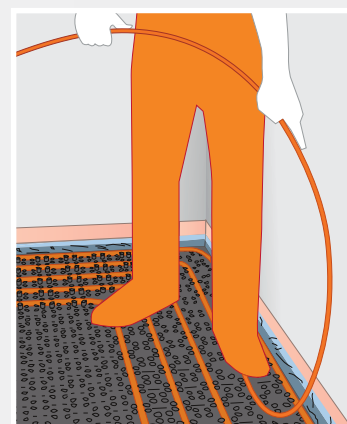
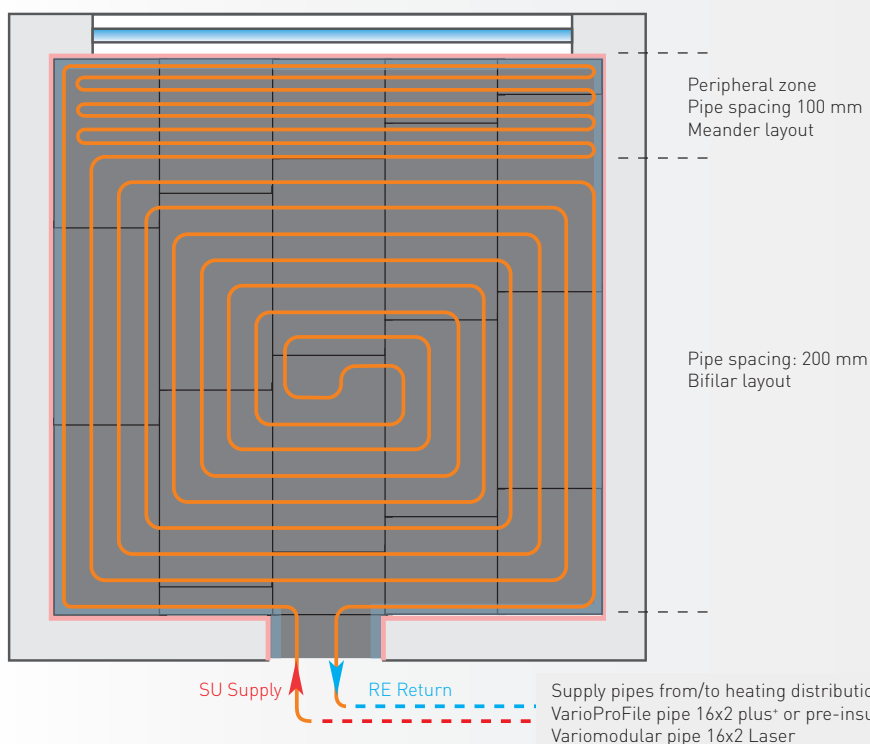
Fixing anchors for
VarioFix (as needed)Connecting element (a)
and adjustment element (b)VarioProFile pipe
16x2 plus*

- 3** The **VarioProFile pipe** is routed with no twisting from the heating distribution manifold to the room in question. The VarioProFile pipe is clamped between the naps of the panels at the required pipe spacing step by step, and is thus fastened.

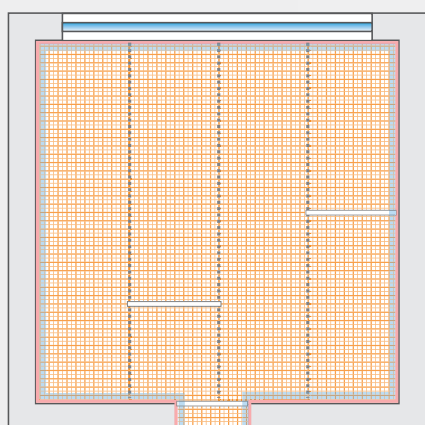
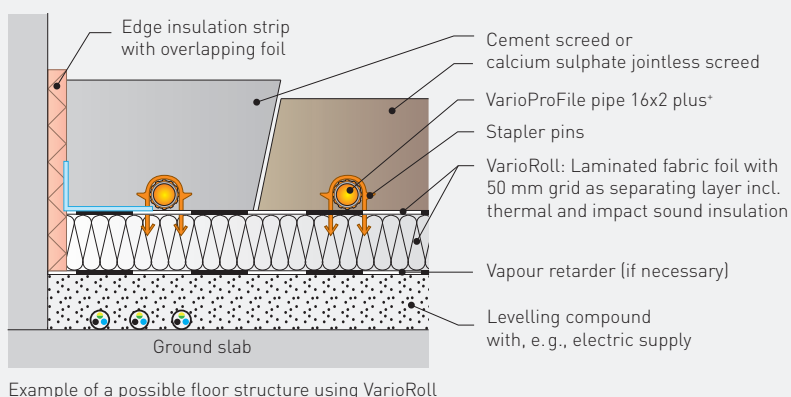
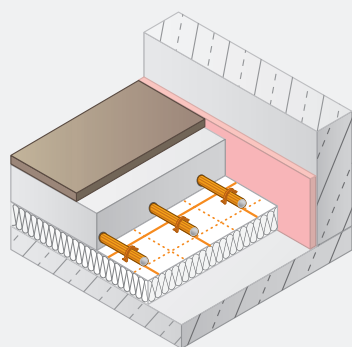
It must be ensured that the VarioProFile pipe is surrounded by screed material on all sides and that good heat transfer is guaranteed.

>> For further details regarding pipe installation, see Section 4!

Laying example:

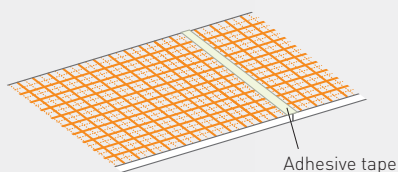
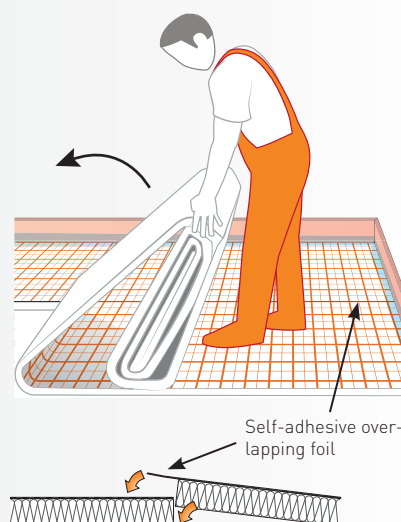


3.4 VarioRoll system



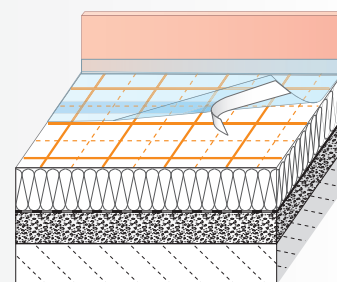
1 Roll out the VarioRoll thermal and impact sound insulation.

One-sided overlapping with self-adhesive foil results in a sealed containment structure for the screed. >>

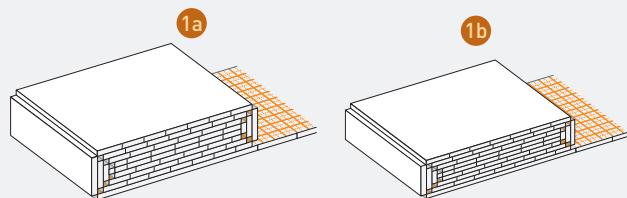


<< At VarioRoll joints without self-adhesive strips, adjacent insulation strips are joined using adhesive tape.

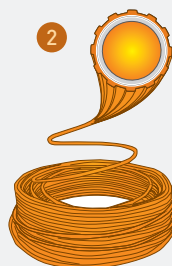
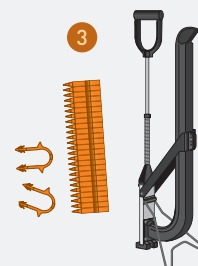
The self-adhesive, welded-on overlapping foil of the edge insulation strip is affixed to the installed VarioRoll. >>



System components:



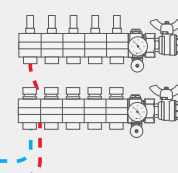
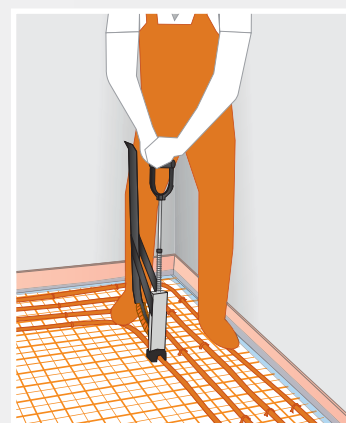
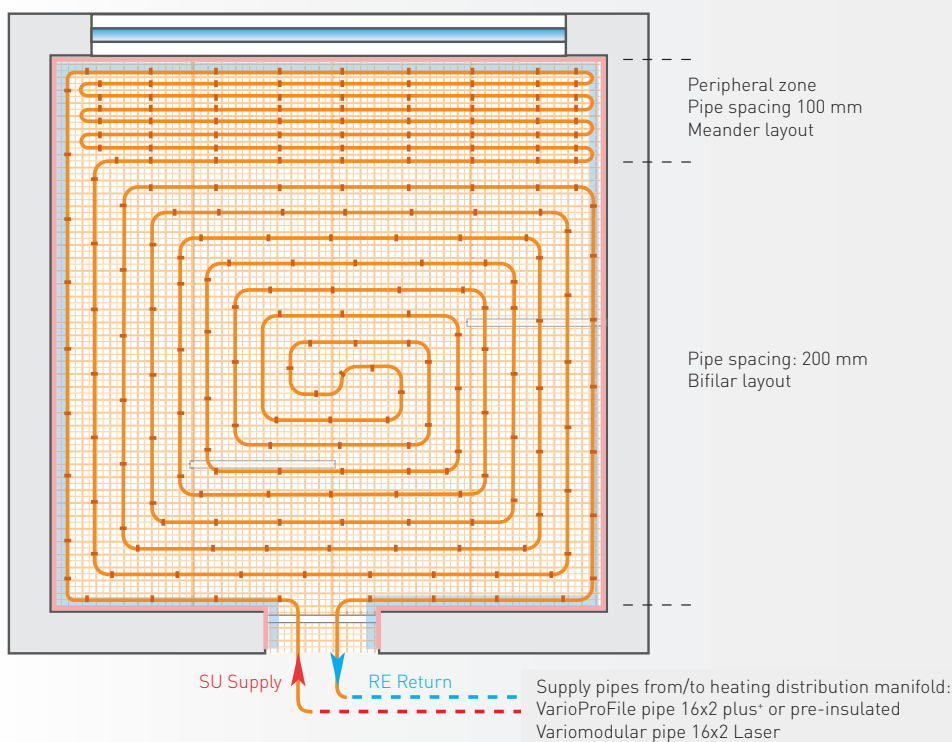
VarioRoll 30-2 (a) or VarioRoll 20-2 (b)

VarioProFile pipe
16x2 plus⁺Stapler pins
and stapler

- 2** The **VarioProFile pipe** is routed with no twisting from the heating distribution manifold to the room in question.
>> For further details regarding pipe installation, see Section 4!

- 3** The VarioProFile pipe is fastened to the VarioRoll thermal insulation and impact sound insulation with **stapler pins** using a **stapler** approx. every 500 mm, in accordance with the specified pipe spacing and layout. The grid that is printed on the VarioRoll helps you to adhere to the intended pipe spacing.

Laying example:



4.1 General

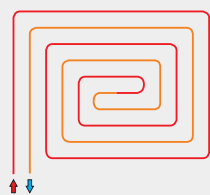
In the case of Variotherm floor heating systems for screed floors, the VarioProFile pipe 16x2 plus^{*} is always located in the screed itself. The VarioProFile pipe is routed with no twisting from the heating distribution manifold to the room in question.

Maximum pipe length per heating circuit including supply pipes: 120 m

Required pipe lengths per m²:

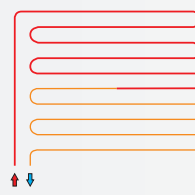
Pipe spacing:	100 mm	150 mm	200 mm	250 mm	300 mm
Pipe requirement:	10.0 m/m ²	6.7 m/m ²	5.0 m/m ²	4.0 m/m ²	3.4 m/m ²

4.2 Laying patterns



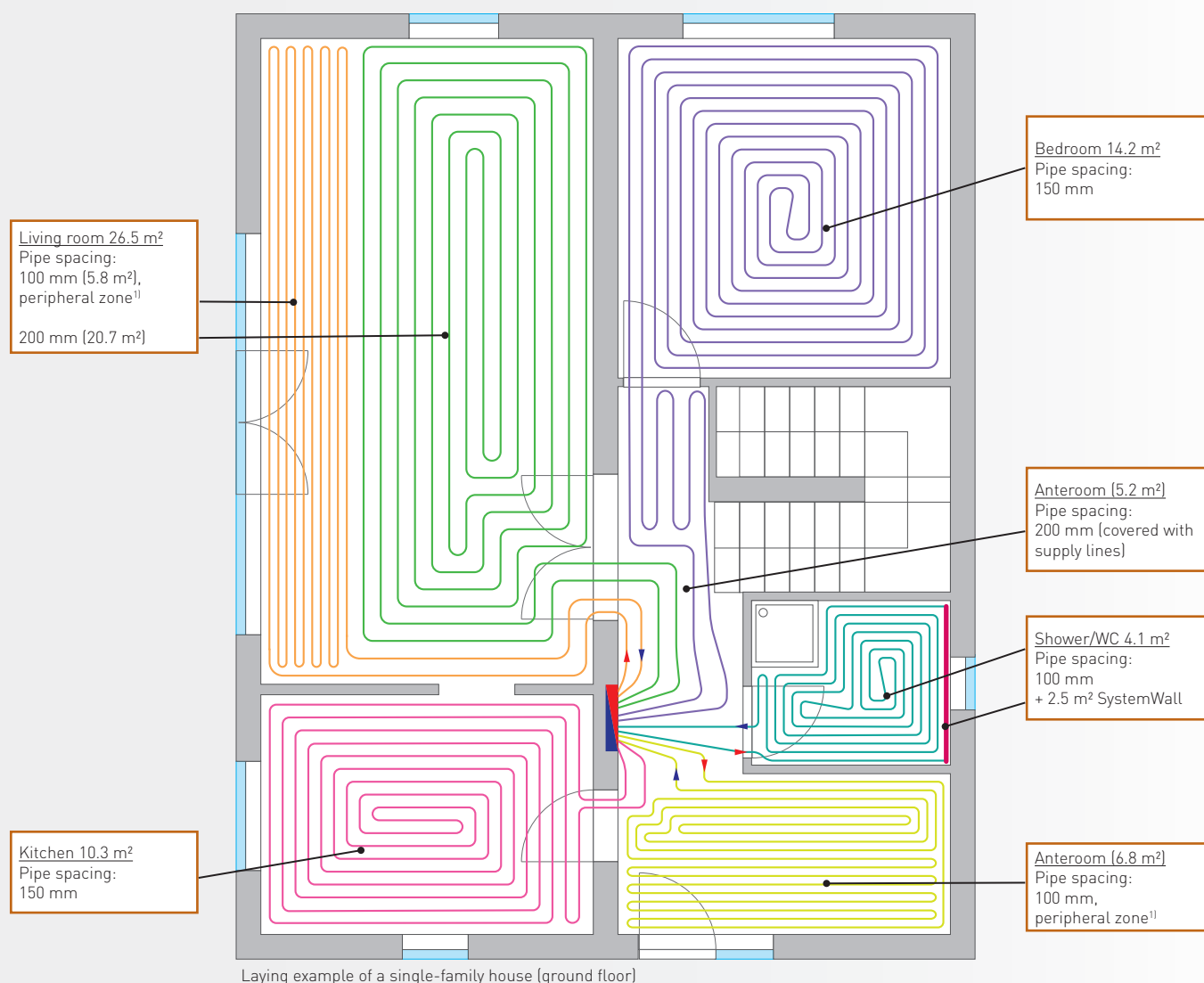
Bifilar

Uniform distribution of surface temperature as the supply is located next to the return.



Meandering

Less uniform distribution of surface temperature, for small, ancillary rooms and peripheral zones.



¹⁾ Peripheral zone: Starting in front of a large glass surface or glass doors, a meander pattern layout goes along the glass surface, reaching into the room by about 1 metre. This will lead to a higher surface temperature in front of the glass surfaces (Variotherm comfort tip).

4.3 Pipe spacing to other components

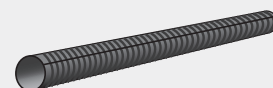
In accordance with DIN/ÖNORM EN 1264-4:

- Between the VarioProFile pipe and vertical structural components: ≥ 50 mm
- Between the VarioProFile pipe and chimneys, open fireplaces, open or brick-lined shafts, as well as lift shafts: ≥ 200 mm

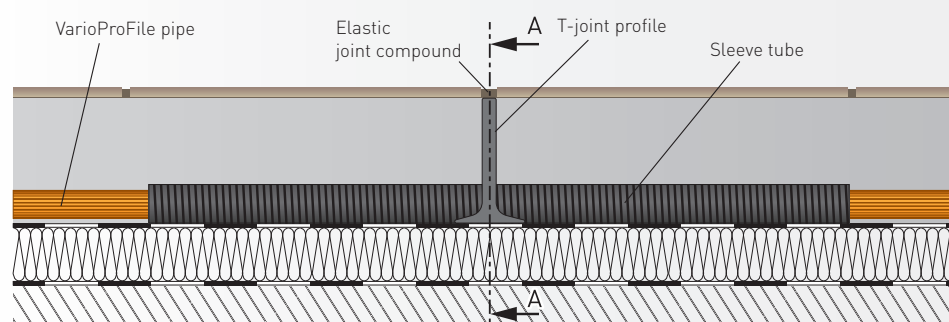
4.4 Pipe installation at movement joints

In the case of pipe installation through a movement joint (e. g. under a door leaf), sleeve tubes are used.

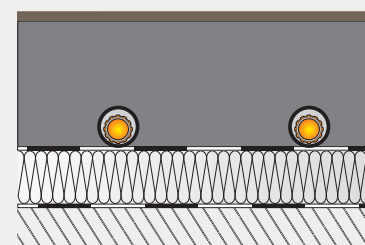
>> For preparation of movement joints, also see Section 2.



Sleeve tube

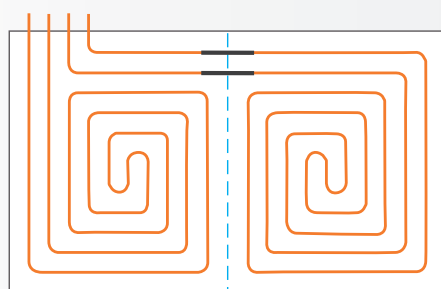


Pipe installation through movement joint

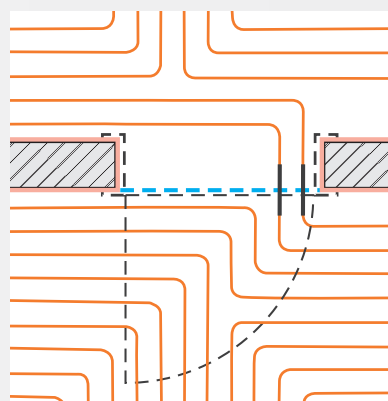


Cross-section through movement joint

- Movement joint
- Sleeve tube
- VarioProFile pipe



Movement joint and pipe installation

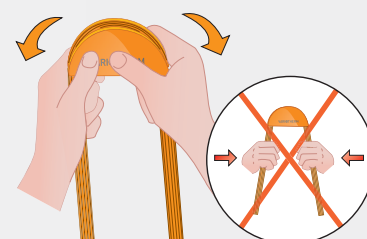


Movement joint in door area

4.5 Bending

For bending with small radii down to 50 mm, the bending model 16/100 is used. During bending, the pipe must be securely positioned in the groove of the pipe bending tool. If the temperature of the material < 5 °C, the VarioProFile pipe must be pre-heated.

Caution: During bending, the technician's hands must be as close as possible to the pipe bending tool in order to prevent kinks from forming.



4.6 Press-fit connections

VarioProFile pipes can be joined in a permanent, non-detachable manner using a press-fit coupling connection in order to use residual lengths of pipe or for repairs.

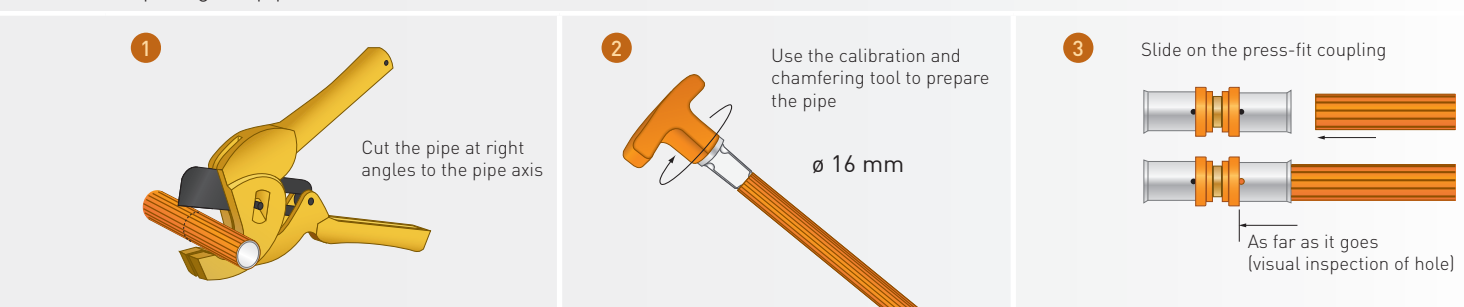
Caution: A permanent, tight connection is only guaranteed if original Variotherm system components are used:

- VarioProFile pipe 16x2 plus⁺
- Variotherm calibration and chamfering tool
- Variotherm press-fit couplings and Variotherm pressing 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:

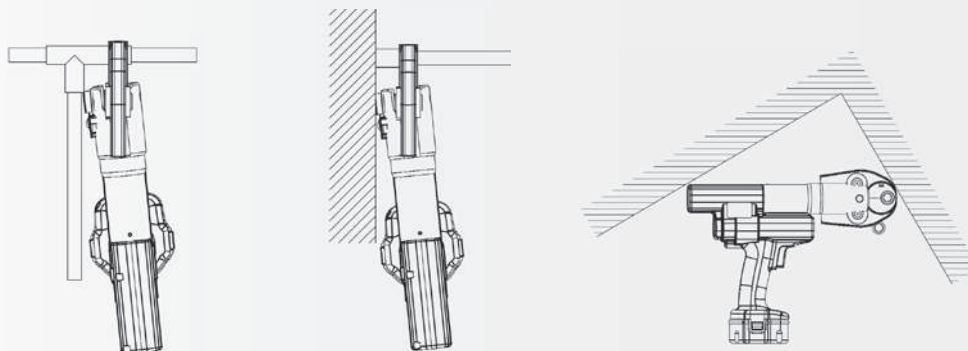


Pressing procedure for AkkuPress:

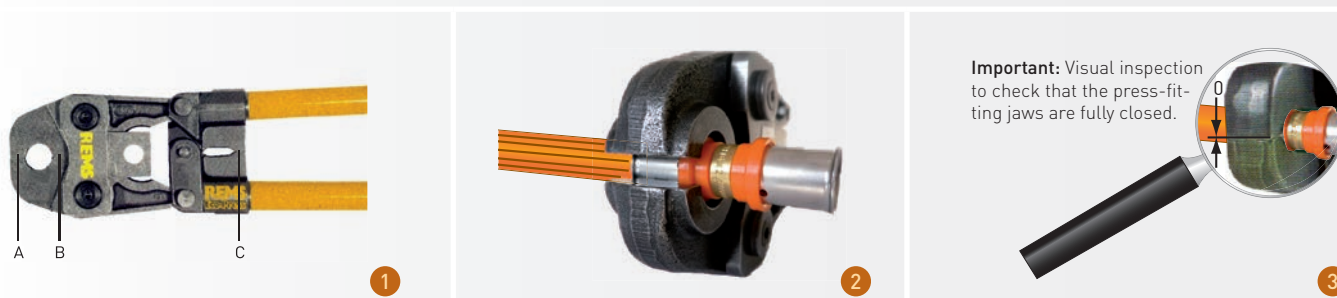


- Push the press-fitting jaws [Z] together by hand (causing the press-fitting jaws to open) far enough so that the press-fitting jaws can be placed over the press-fit coupling ②. Place the pressing tool with press-fitting jaws on the press-fit coupling at a right angle to the pipe axis.
- Release the press-fitting jaws so that they close around the press-fit coupling ③.
- Hold the pressing tool at the housing grip [G] and at the motor grip [M]. When using a REMS AkkuPress, hold the switch [S] pressed until the press-fitting jaws are fully closed. This is indicated by an audible click.
- Press the reset lever [R] until the pressing rollers [P] have retracted completely. Press the press-fitting jaws [Z] together by hand so that the jaws can be removed from the press-fit coupling (see also the REMS AkkuPress operating manual).

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



Pressing procedure for EcoPress:



- The pressing tool's lever length 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.
- Pull the pipe arms far enough apart (press-fitting jaws open) so that the press-fitting jaws can be slid over the press-fit coupling ②. Place the press-fitting jaws on the press-fit coupling at a right angle to the pipe axis.
- Push pipe arms together until they reach the stop position (C) (a click is heard when they reach the stop). Only if the press-fitting jaws are fully closed at (A) and at (B) has a correct press connection been carried out → Visual check ③.
- Re-open the pipe arms so that the jaws can be removed from the press-fit coupling (see also the REMS EcoPress operating manual).

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.

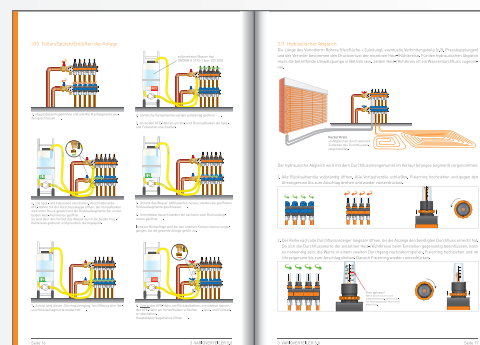


5.1 Preparation

Before laying the screed, the floor heating is checked for leak-tightness, filled, flushed, and deaerated.

Details regarding the system and heating circuit pipes, commissioning and room temperature control are provided in the “**DISTRIBUTION and CONTROL**” design and installation manual. >>

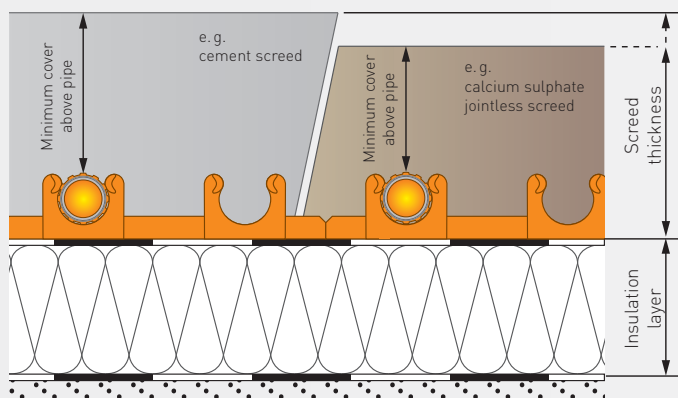
After commissioning, the Variotherm screed floor heating system can be considered maintenance-free. (Subject to technical modifications without notice.)



The pipes should be pressurised at 2–3 bar when laying the screed (planning and implementation guidelines for jointless screed on a calcium sulphate basis: ÖNORM B 2232, ÖNORM B 3732, DIN 18353 and DIN 18560). The installed VarioProFile pipes must be protected against damage (by spreading boards over them, for example). Doors and windows are to be closed. This will allow screed to harden in a uniform manner.

Caution: Concrete (screed) heats up during the binding process, increasing the pressure in the heating system. Always use an expansion tank and a safety valve!

5.2 Screed material and thickness



The screed material must be suitable for the floor heating system and compatible with the VarioProFile pipe (no bitumen or asphalt screeds!). The VarioProFile pipes must be surrounded by the screed mortar to the maximum extent possible in order to achieve optimum thermal conductivity.

The minimum cover above pipes in the case of floating screeds, e.g. according to ÖNORM B 3732 and DIN 18560-2 (approximation), is presented in the table below:

Type of screed and national designation	Flexural strength classification as per ÖNORM EN 13813	Minimum cover above pipe			
		Insulation layers 0 to 25 mm		Insulation layers > 25 mm	
		Surface load ≤ 2 kN/m ²	Surface load ≤ 3 kN/m ²	Surface load ≤ 2 kN/m ²	Surface load ≤ 3 kN/m ²
Cement screed E 225	F4	45 mm	60 mm	50 mm	65 mm
Cement screed E 300	F5	40 mm	50 mm	45 mm	55 mm
Calcium sulphate screed E 225	F4	45 mm	60 mm	50 mm	65 mm
Magnesia screed E 225	F4	45 mm	60 mm	50 mm	65 mm
Jointless cement screed/ calcium sulphate jointless screed E 225 F	F4	40 mm	50 mm	45 mm	55 mm
Jointless cement screed/ calcium sulphate jointless screed E 300 F	F5	35 mm	45 mm	40 mm	50 mm
Cement screed E 400	F7	35 mm	45 mm	35 mm	50 mm
Calcium sulphate screed E 400	F7	35 mm	45 mm	35 mm	50 mm

5.3 Screed admixture

The Variotherm screed admixture (5 or 10 kg canisters) for cement screed should be used with the specified mixture ratio (approximately 0.5–1 vol. % of cement fraction ≈ 0.1 – 0.2 kg/m^2 for 70 mm screed thickness) and has the following properties:

- Improvement of water retention (tempering water can be reduced by approximately 12 %)
- Increased plastification of the screed mortar
- Increased flexural strength
- Increased pressure resistance – the screed becomes more compact and therefore more abrasion-resistant



You can find the safety data sheet at www.variotherm.com/en/service/info-centre/safety-data-sheets.html

5.4 Laying screed

Only heating screeds are to be used. If cement screed or calcium sulphate jointless screed is used, the manufacturer's specifications must be observed. The installation is to be protected against frost damage. If there is a risk of freezing, appropriate measures are to be taken. Draughts should be prevented during the hardening period. The screed is to be heated in accordance with the protocols in Section 6.

5.5 Screed residual moisture

The residual moisture of the screed is determined using CM measurement before the floor covering is laid. Depending on the floor covering, the following values must not be exceeded:

Floor surface/floor covering	Max. residual moisture Cement screed	Max. residual moisture Calcium sulphate screed
Textile and elastic coverings	1.8 %	0.3 %
Parquet	1.8 %	0.3 %
Laminate floor	1.8 %	0.3 %
Ceramic tiles or natural/concrete slabs	2.0 %	0.3 %

Where measurements are below these values, dry heating should be applied, e.g. in accordance with BVF (see Section 6).

5.6 Floor covering

Suitable floor covering

All floor coverings suitable for floor heating systems may be used on top of screed floor heating systems.

Variotherm recommends a cover with a maximum thermal resistance of $0.1 \text{ m}^2\text{K/W}$.

The evenness of the screed must correspond to DIN 18202.

6.1 Leak-tightness test in accordance with DIN/ÖNORM EN 1264-4

Construction project: _____

Building owner/Occupant: _____

Client: _____

Heating installation technician: _____

Architect: _____

Other: _____

The leak-tightness test can be carried out using water or compressed air. Before the screed is installed, the heating circuits are to be tested for leak-tightness by means of a pressure test. The test pressure must be no less than 4 bar and no greater than 6 bar. Leak-tightness and test pressure must each be listed separately in a test report (see log below). If there is a risk of frost, appropriate measures must be taken, such as the use of antifreeze and controlling the building's temperature.

At the start of normal operation, all antifreezes can be bled off and disposed of in accordance with national occupational safety regulations; the system must then be flushed three times with clean water.

- Floor heating system incl. connection and piping completed on: ____ . ____ . ____
- Pressure test started on: ____ . ____ . ____ with test pressure of ____ bar
- Pressure test completed on: ____ . ____ . ____ with test pressure of ____ bar
- Installation of screed, start on: _____ Completed on: ____ . ____ . ____
- The system water was treated (e. g. as per ÖNORM H 5195-1) ☐ Yes ☐ No
- Antifreeze was added to the system water ☐ Yes ☐ No
- System pressure during the completion work was ____ bar
- The system was checked for leak-tightness on ____ . ____ . ____ and approved

Approval:

Building owner/Occupant/Client

Construction management/Architect

Heating installation technician

6.2 Functional heating in accordance with DIN/ÖNORM EN 1264-4

Construction project: _____

Building owner/Occupant: _____

Client: _____

Heating installation technician: _____

Architect: _____

Other: _____

Functional heating is used as evidence of a fault-free delivery for heating installers and screed layers, and not of readiness for coverage! For dry heating following functional heating, see Chapter 6.3.

With cement screeds, functional heating begins 21 days after laying at the earliest, and after 7 days for calcium sulphate screeds. The manufacturer's specifications must be observed for all screed materials.

Functional heating begins with a flow temperature of between 20 and 25 °C, which is to be maintained for at least 3 days. After this, the temperature is set to the maximum design temperature and maintained at this value for at least 4 days. The functional heating procedure must be documented (see log below).

- Used screed:

☐ Cement screed ☐ Calcium sulphate jointless screed ☐ Other: _____

- Binding agent used: _____

- Screed work finished on: ____ . ____ . ____

- Average screed thickness: ____ mm

- Functional heating started on: ____ . ____ . ____

- Set flow temperature to 25 °C and maintain this value for 3 days ☐ Completed

- Set to max. design temperature and maintain for 4 days ☐ Completed

- Functional heating finished on: ____ . ____ . ____

Note:

- Depending on the heating capacity of the heat generator, functional heating can be conducted in sections, if required. However, all heating circuits must be heated at the same time here for a given screed area.
- When switching off the floor heating after the warming up phase, the screed must be protected against forced air and too rapid cooling until it has cooled down completely.

Approval:

Building owner/Occupant/Client

Construction management/Architect

Heating installation technician

6.3 Dry heating in accordance with BVF (Federal Association of Surface Heating and Surface Cooling)

Construction project: _____

Building owner/Occupant: _____

Client: _____

Heating installation technician: _____

Architect: _____

Requirements

Dry heating is generally carried out right after functional heating. In this case, the heating should not be switched off and the flow temperature should not be reduced. Cement screed will then generally be at least 28 days old, calcium sulphate screed at least 14 days old. These durations must be added to the dry heating durations given below when estimating the point at which the screed is ready to have a covering fitted. A duration of at least 14 days should generally be planned for dry heating for screed thicknesses up to 70 mm, with correspondingly longer durations for screed thicknesses greater than 70 mm.

The screed is ready to have a covering fitted when the requirements in Table 4 have been fulfilled. The CM measurement is decisive here.

Dry heating or any necessary variants and foil tests must be agreed upon separately and separate contracts awarded for this work.

Caution: Depending on the heat output of the heat generator, it may be necessary to carry out dry heating on an area-by-area basis. However, all heating circuits must be heated at the same time here for a given screed area.

The amount of energy required is approx. 50 kWh per m² of screed. The screed should not be baked out with a brine heat pump (with deep borehole, ditch/ground collector), since after baking out, it is unlikely that any energy will still be available for the next heating period.

Documentation

- Dry heating started right after functional heating?
 - ☐ Yes, then proceed to Table 2
 - ☐ No, then proceed to Table 1
- Dry heating started on ____ . ____ . ____ (Overnight reduction and outdoor temperature regulation switched off)

Table 1:

Dry heating duration	Target flow temperature	Measured flow temperature	Date, time	Tester
1st day	25 °C			
2nd day	35 °C			
3rd day	45 °C ¹⁾			
4th day	55 °C ¹⁾			

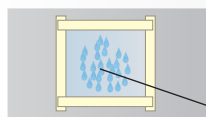
¹⁾ Or the maximum design temperature

Table 2:

Dry heating duration	Target flow temperature	Measured flow temperature	Date, time	Tester
.....day	55 °C			
.....day	55 °C			
.....day	55 °C			
.....day	55 °C			
.....day	55 °C			
.....day	55 °C			
.....day	Foil test carried ^{2) 3)}			
.....day	55 °C			
.....day	55 °C			
.....day	55 °C			
.....day	Repeated foil test carried out ^{2) 3)}			
.....day	Readiness for covering tested ²⁾	CM measurement		

²⁾ As per specifications/contract from building owner/architect

³⁾ If moisture is detected, continue with heating; if no moisture is detected, carry out CM measurement



Foil test: Affix approx. 500 × 500 mm transparent foil to the screed in an air-tight manner (using adhesive tape or silicone)

Moisture Yes/No

Table 3: Reduction of heating after readiness of screed for covering (without overnight reduction):

Days since start of heating	Target flow temperature	Measured flow temperature	Date, time	Tester
..... day	45 °C ⁴⁾			
..... day	35 °C			
..... day	25 °C			
..... day	Heating in automatic mode			

⁴⁾ Or the maximum design temperature

- Dry heating with automatic regulation? ☐ No ☐ Yes (regulator make: _____)
- Dry heating finished on ____ . ____ . _____
- Have rooms been ventilated in accordance with specifications of the screed manufacturer during dry heating? ☐ Yes ☐ No
- Was the heated floor surface free of covers/objects during functional heating? ☐ Yes ☐ No
- Did more than 7 days elapse between the last day of heat reduction/detection of screed moisture and the start of installation? ☐ Yes ☐ No
- If yes, then repeat heating for at least two days before the start of installation as appropriate or with the maximum design flow temperature, and then repeat the moisture measurement. Maximum moisture values as per Table 4 not exceeded? ☐ Yes ☐ No

Table 4: Requirements regarding maximum moisture in screed:

	Floor surface	Cement screed Target [%]	Calcium sulphate screed Target [%]
Floor surface 1	Textile and elastic coverings	1.8	0.3
Floor surface 2	Parquet	1.8	0.3
Floor surface 3	Laminate floor	1.8	0.3
Floor surface 4	Ceramic tiles or natural/concrete slabs	2.0	0.3

Table 5: Measured moisture values

Room no.	Room	Floor surface	Meas. point (if appl.)	Target value [%]	Actual value [%]

- Floor covering installation started on ____ . ____ . _____
- Floor covering installation completed on ____ . ____ . _____

Approval with date/signature (if involved, contracted, monitored or carried out):

	Contracted by building owner/client	Monitored by constr. mgmt./architect	Carried out by heating engineer	Carried out by floor surface layer
Dry heating				
Foil test				
Moisture measurement				

ENJOY THE COMFORT & 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!

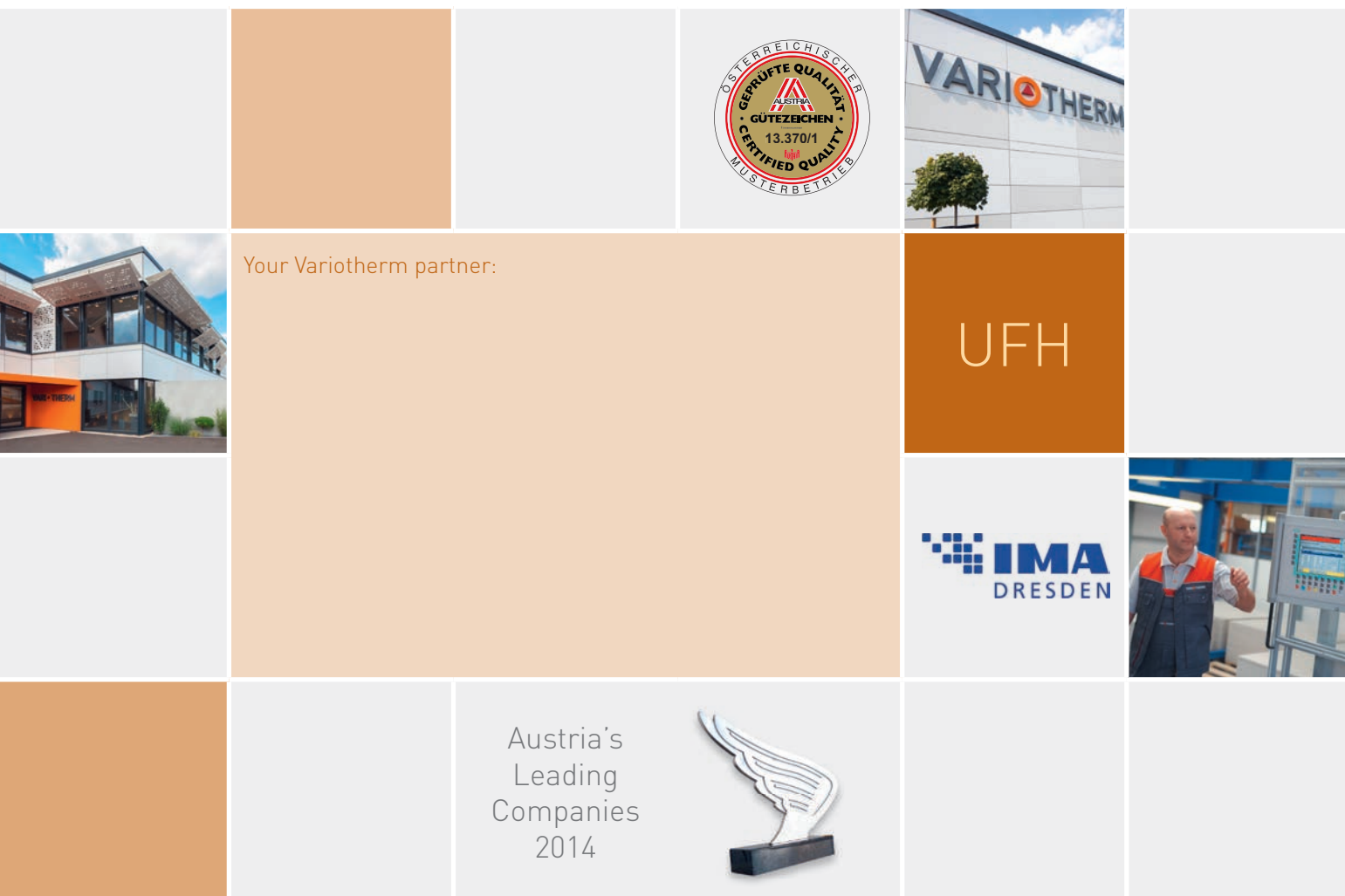
Everything CLEAR and SIMPLE, in writing of course!

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.



VARIOTHERM HEIZSYSTEME GMBH

GÜNSELSDORFER STRASSE 3A
2544 LEOBERSDORF
AUSTRIA

Phone: 0043 22 56 - 648 70-0

Fax: 0043 22 56 - 648 70-9

office@variotherm.com www.variotherm.com