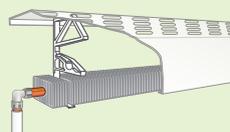
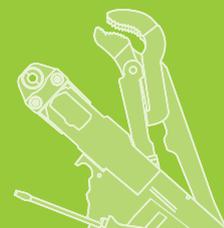
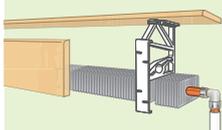


SH INSTALLATION

SKIRTING HEATING. INDIVIDUAL.

Classic.



Delta.



PDF

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1.1 General ⚠

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

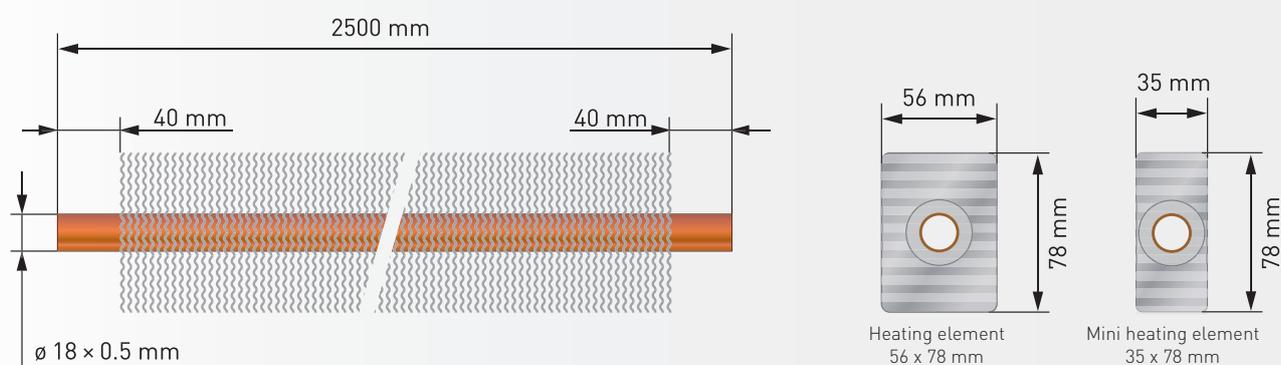
1.2 Guarantee conditions ⚠

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 Storage of the heating elements ⚠

The heating elements are delivered packaged in boxes with a length of 2.5 m. They should be protected against damage or unintended bending of the louvres, and should only be removed from the packaging shortly before installation.

The heating elements consist of a copper pipe $\varnothing 18 \times 0.5$ mm (DIN EN 12449) with aluminium louvres 56 x 78 mm or 35 x 78 mm (mini).



1.4 Storage of the cladding ⚠

The claddings are delivered packaged in boxes with a length of 1.5 m. They should be protected against damage and only be removed from the packaging shortly before installation.

1.5 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.

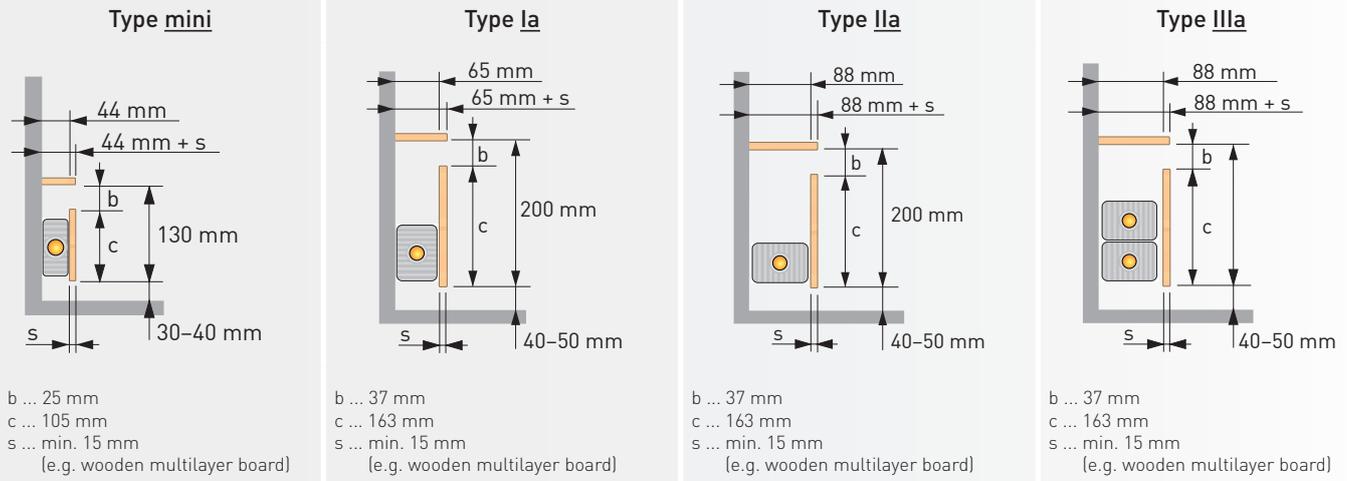
1.6 Maximum operating pressure ⚠

With Variotherm manifold system: max. 6 bar

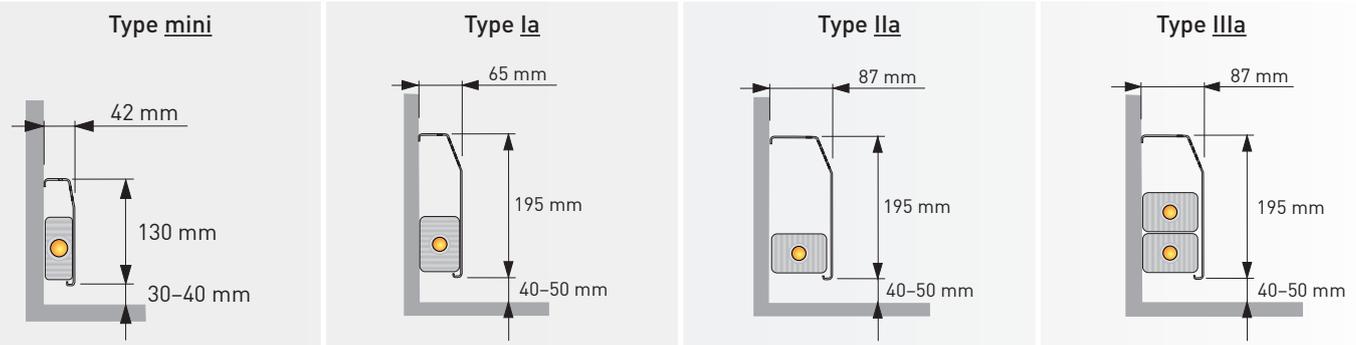
With 2-pipe system: max. 6 bar if using a flexible pipe bend, otherwise 10 bar

2.1 Overview of skirting heating types

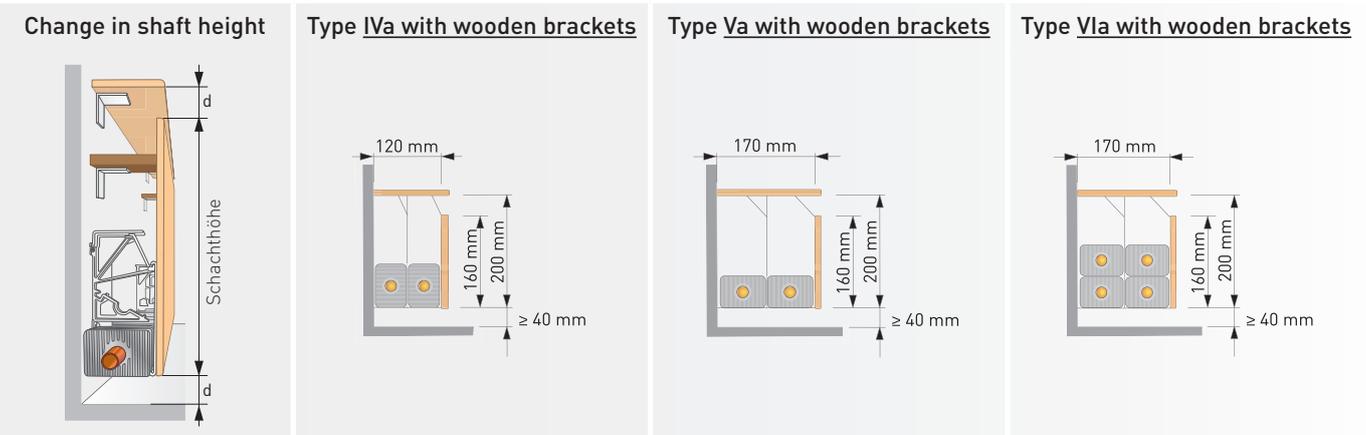
Classic skirting heating for wooden cladding (provided by the customer)



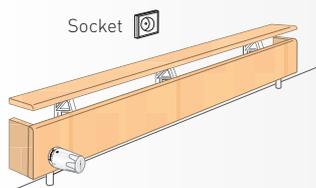
Delta skirting heating with metal cladding



Special types of Classic skirting heating for wooden cladding (provided by the customer)



2.2 General



Skirting heating systems are installed in the manifold system with preinsulated Variomodular pipes or in the 2-pipe system with copper pipes, for example.

When planning electric sockets, ensure that they are located above the skirting heating.

2.3 Tools

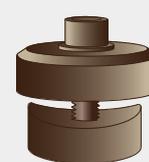
Variotherm tools



Pipe cutting pliers



Calibration and chamfering tool



Round hole punch

Additional tools that are required/recommended for installation work:



Pipe cutter for copper pipes



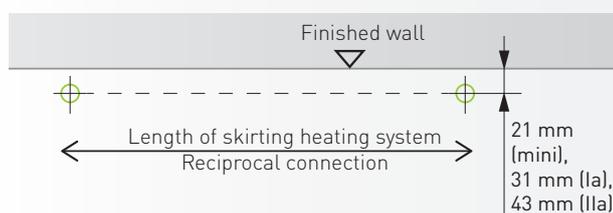
Open-end wrench (size 21)



Drill / battery-powered screwdriver

2.4 Positioning of the supply pipe

Classic & Delta skirting heating: mini, Ia, IIa



Classic & Delta skirting heating: IIIa



2.5 Maximum skirting heating length per heating circuit

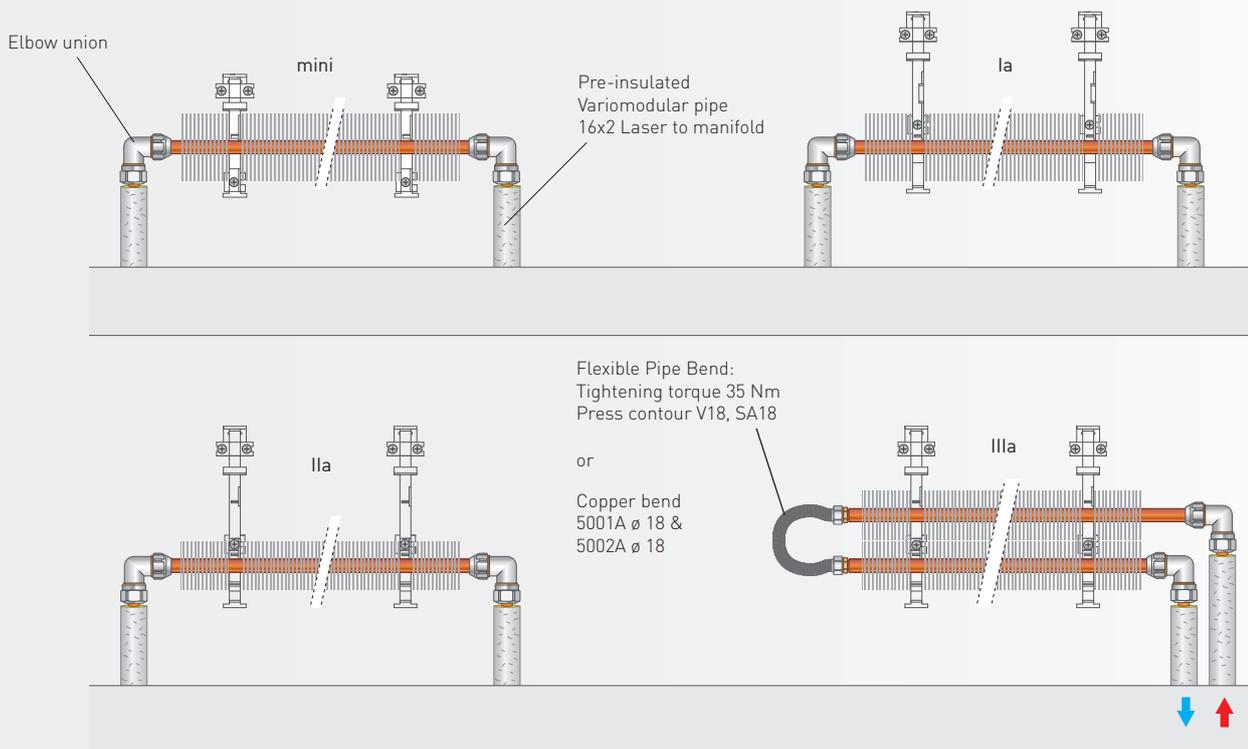
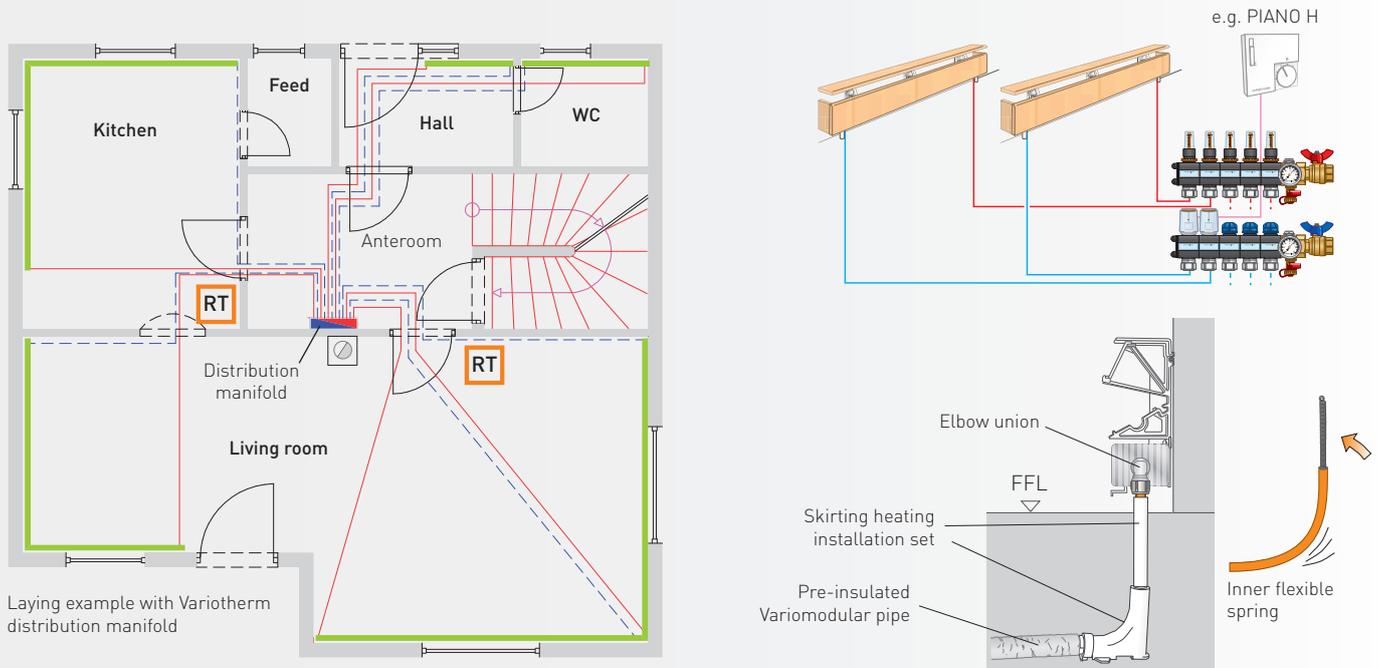
Skirting heating mini, Ia und IIa: max. 7.5 m per heating circuit

Skirting heating IIIa: max. 5.0 m per heating circuit

2.6 Laying of the supply pipe with Variotherm manifold

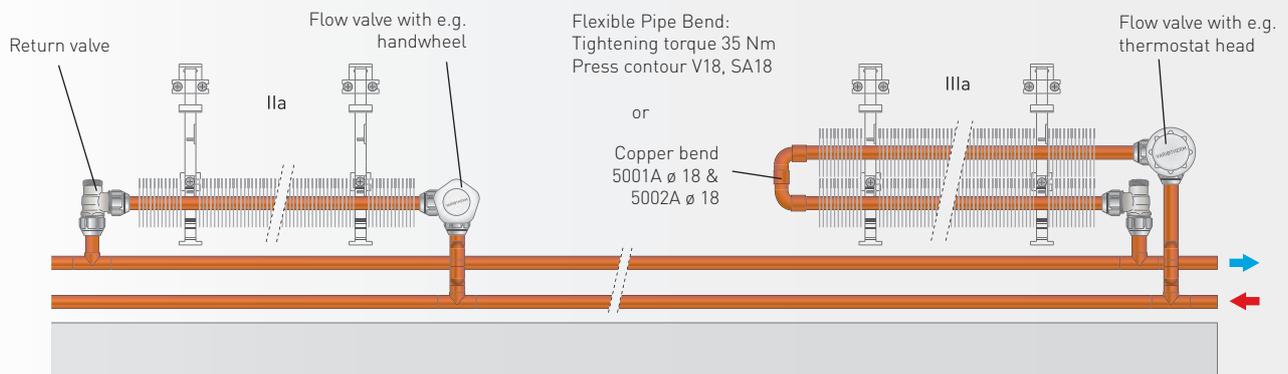
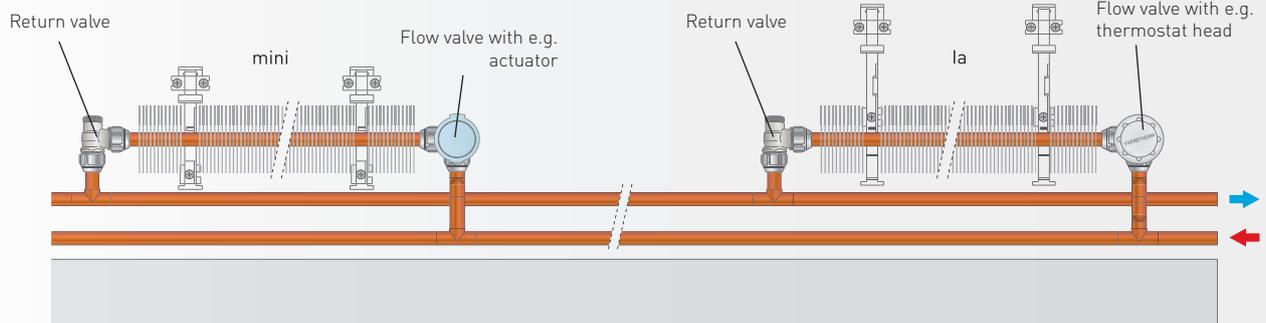
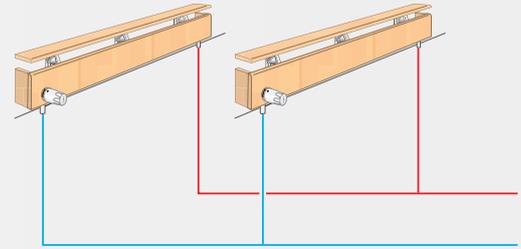
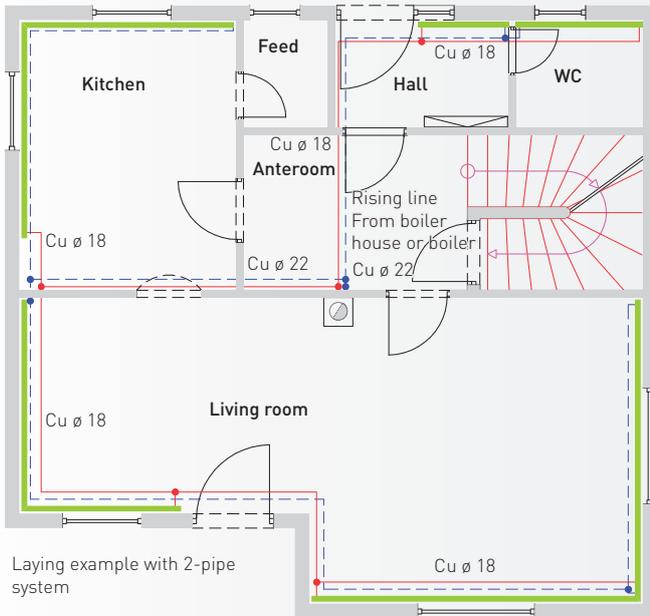
For installations with manifold systems, first lay the **pre-insulated Variotherm pipes 16x2 Laser** from the manifold to the skirting heating and back, and then connect them to the manifold via a screw fitting. There must not be any kinks in Variotherm pipes when laying them. The Variotherm pipe should be routed endlessly (i.e. without additional connection points) from the manifold to the skirting heating. The pipe is positioned near the skirting heating with the skirting heating connection set.

Electronic room thermostats and actuators are used to control the room temperature.



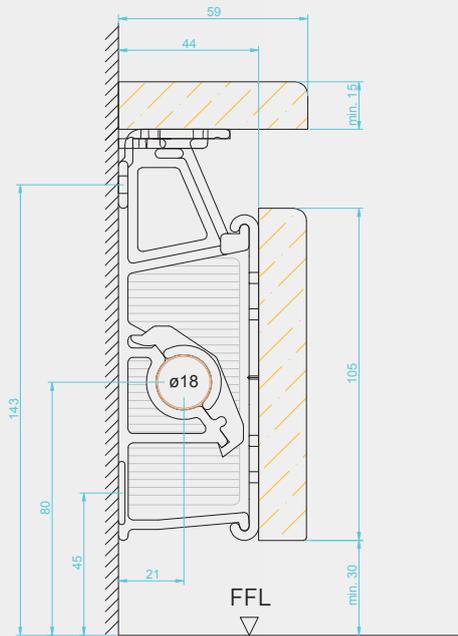
2.7 Laying of the supply pipe with 2-pipe system

For installation in the 2-pipe system, flow valves with an integrated deaeration system are used to control the room temperature. The return valves are used to shut off and set the water quantity (hydraulic balancing). For the flow valves, a valve insert for automatic hydraulic balancing is provided (see Chapter 4.2.5).



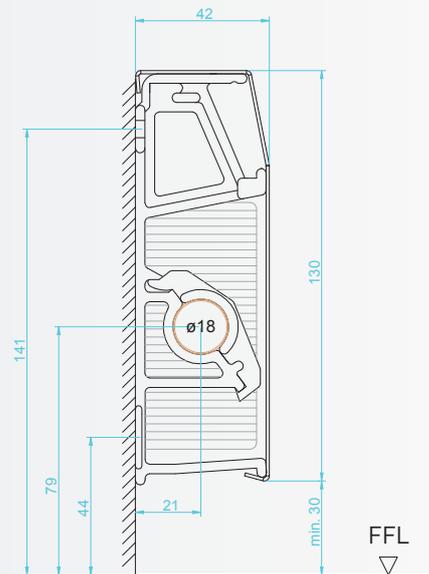
2.8 Detail drawings

mini Classic

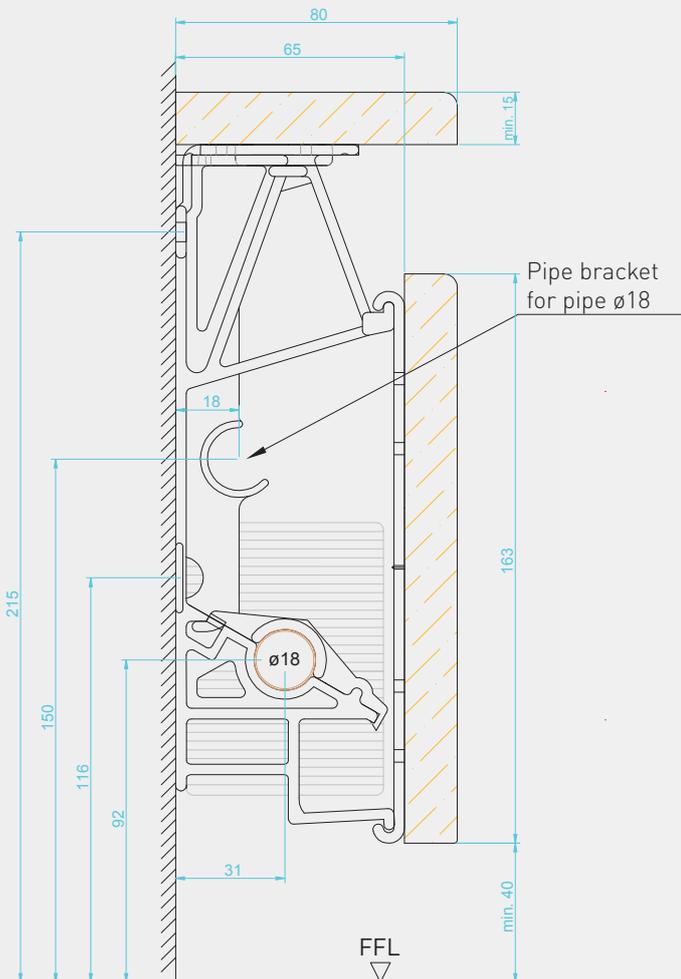


All dimensions in mm

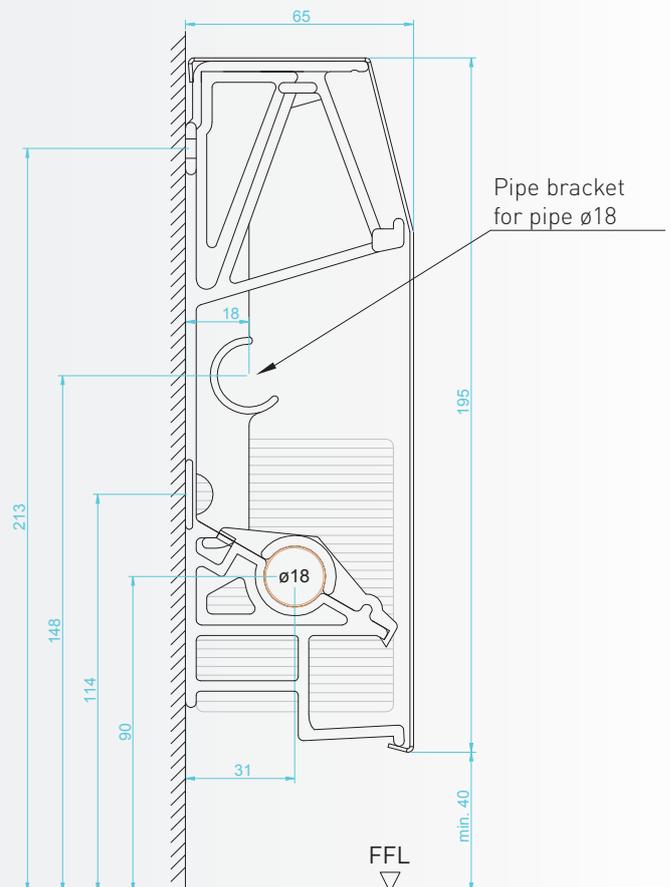
mini Delta

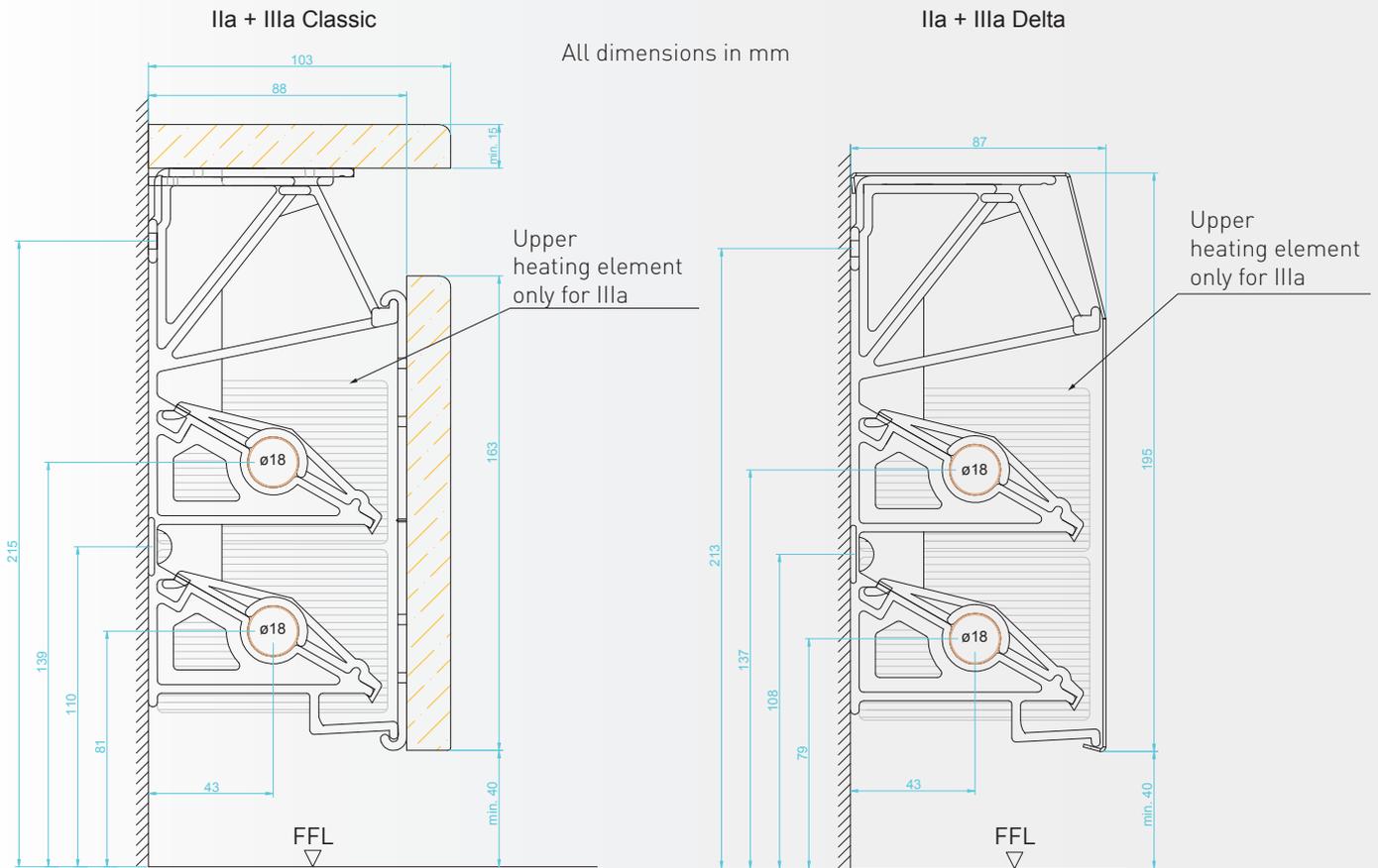


1a Classic



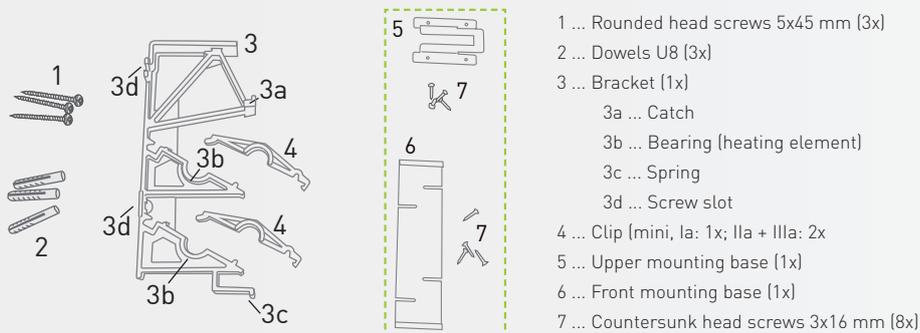
1a Delta



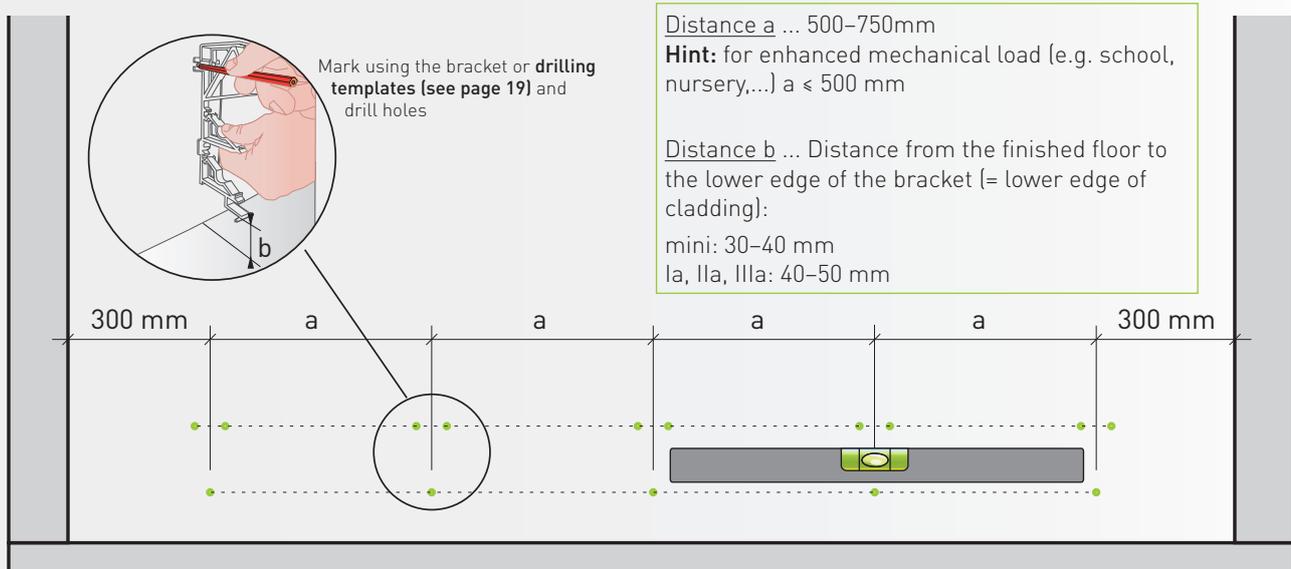


3.1 Bracket components

The brackets for the Classic and Delta skirting heating systems are identical. For the Classic skirting heating system, a mounting plate and a mounting base are supplied for each bracket, to allow the cladding provided by the customer to be attached to the bracket. (Parts in green frame for Classic only).



3.2 Marking the bracket position

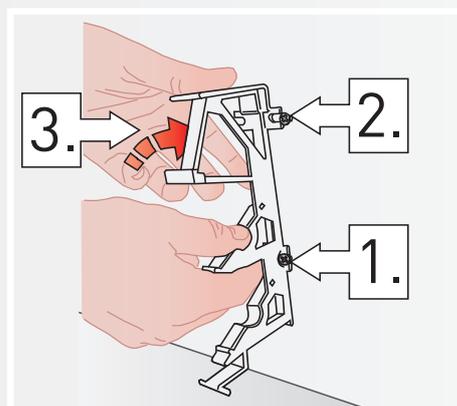


3.3 Fastening the brackets

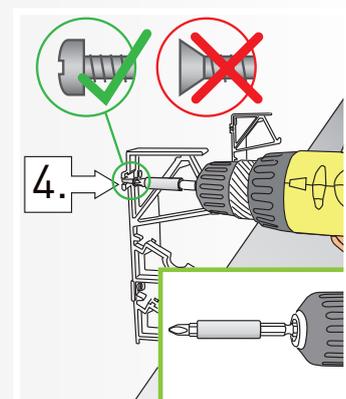
Use spacers to smooth uneven parts of the wall. The upper and front edge of the bracket should be aligned (test with bar).

Screw the lower and one of the two upper screws into the positions marked previously, but not fully (allow space of approx. 5 mm). Fit the missing screw, align the bracket and fasten (tighten all screws).

Attention: Use only the delivered rounded head screws! Don't use countersunk screws!

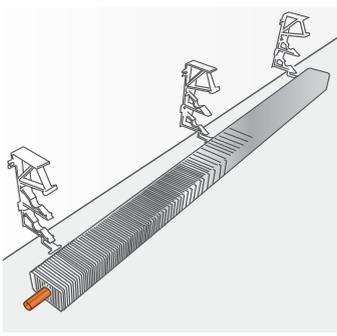


Fit the bracket to the screws

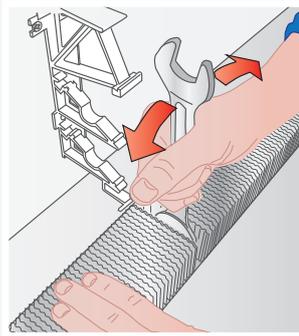


Align the brackets and tighten all screws

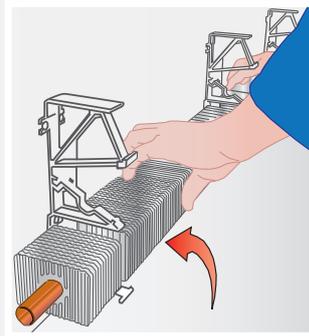
3.4 Inserting the heating elements



Lay the heating elements parallel to the wall...

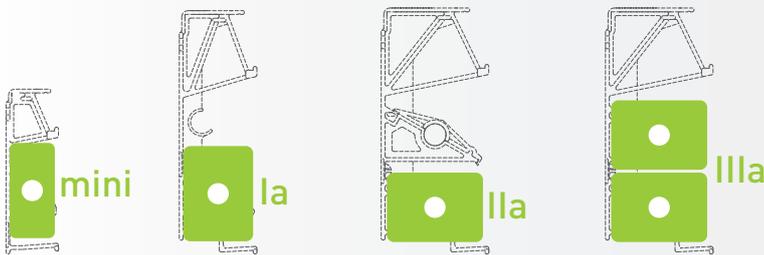


... and push the aluminium plates on the brackets to one side with an open-end wrench (size 21), for example.n.



Insert the heating element

The heating elements are cut to length according to the diagram using pipe cutters. Segments are either soldered to one another or press-fit (see table below for suitable press fittings).

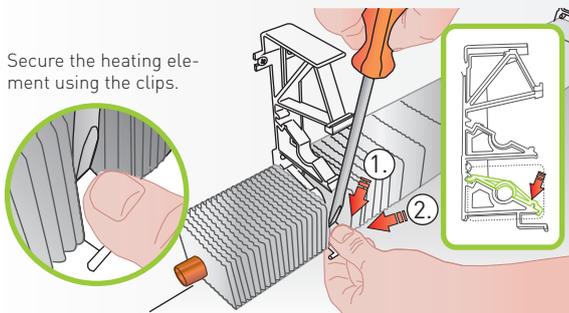


<< Keep in mind the correct installation position of the heating elements!

Table of suitable press fittings:

Pipe material	Support sleeve	Viega		Sanha	
		Press fitting	Press-fitting jaws	Press fitting	Press-fitting jaws
Copper	Yes	Profipress Sanpress	V18	Pressfitting Serie 6000/8000	SA18

3.5 Securing the heating elements



Secure the heating element using the clips.

<< The clip of the respective type is pushed down at the points marked with an arrow, and then latched into position using the thumb.

The clip can be removed easily using a multigrip pliers. >>



<< Clips for securing the skirting heating.

4.1 Hydraulic connection on manifold system

4.1.1 Cutting to length, calibrating and bevelling the pre-insulated Variomodular pipe

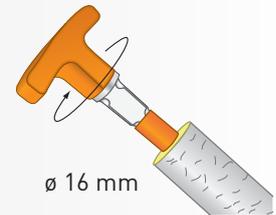
The Variotherm pipe cutting pliers is used to cut the pipe to length.

Caution: The pipe must be cut at a right angle.

Rotate the calibration tool into the pipe to the stop angle to calibrate and bevel the end of the pipe. Visually check that the face of the pipe is smooth, clean and free of chips.

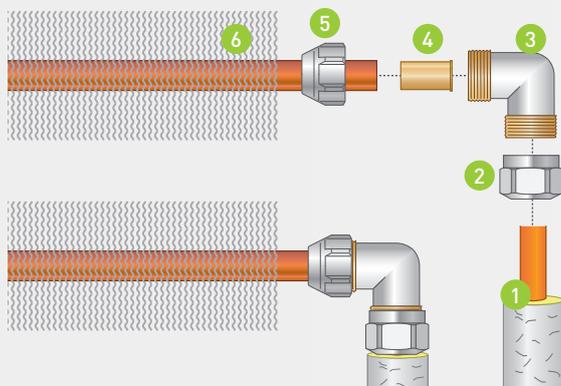


Pipe cutting pliers



Calibration and bevelling tool

4.1.2 Feed to flow and return



- 1 Pre-insulated Variomodular pipe 16x2 Laser
- 2 3/4"EUROx16 clamping screw fitting
- 3 90° angle piece 3/4"EURO
- 4 18 x 17 mm support sleeve (only necessary with heating element with copper pipe!)
- 5 3/4"EUROxCu18 clamping screw fitting
- 6 Heating element (with copper pipe)

Connecting the supply pipe:

Push the clamping screw fitting 2 over the pre-insulated Variomodular pipe. 1 Then screw the clamping screw fitting with the angle piece 3 and tighten with 35 Nm.

Connecting the skirting heating:

Push the assembled clamping screw fitting 5 loosely over the copper pipe. Insert the support sleeve 4 into the copper pipe of the heating element. **Important:** Push the copper pipe into the angle piece until it stops 3 and tighten the screw fitting in this position with 40 Nm.

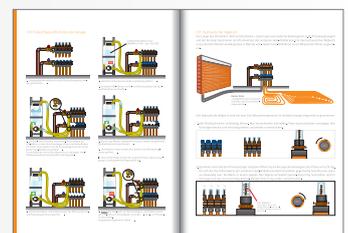
4.1.3 Deaeration

Deaeration is performed by flushing and the deaerators installed on the distribution manifold

4.1.4 Control and pressure test

Once all circuits have been connected to the heating manifold, the system can be filled downstream of the manifold and pressurised. The pre-insulated Variomodular pipes are to be kept under water pressure prior to applying the screed so that any damage becomes immediately visible.

Details regarding the system and heating circuit pipes and the room temperature control are provided in the [DISTRIBUTION](#) and [CONTROL](#) planning and installation instructions >>



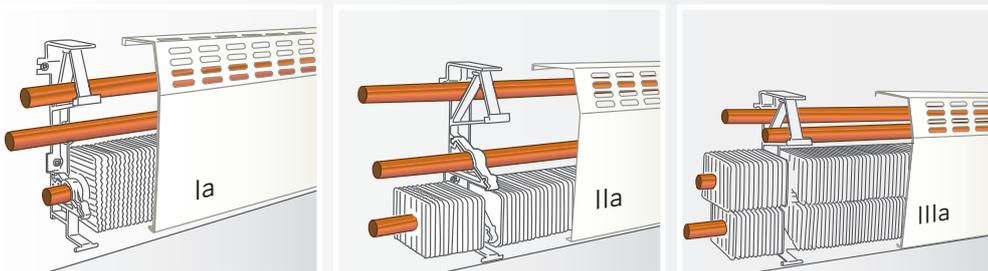
4.2 Hydraulic connection on 2-pipe system

In the 2-pipe system, the skirting heating is piped in accordance with the laying diagram using copper pipes, for example. The flow valve is installed with integrated deaeration in the flow side and the return valve is installed in the return side.

4.2.1 Soldering the copper piping

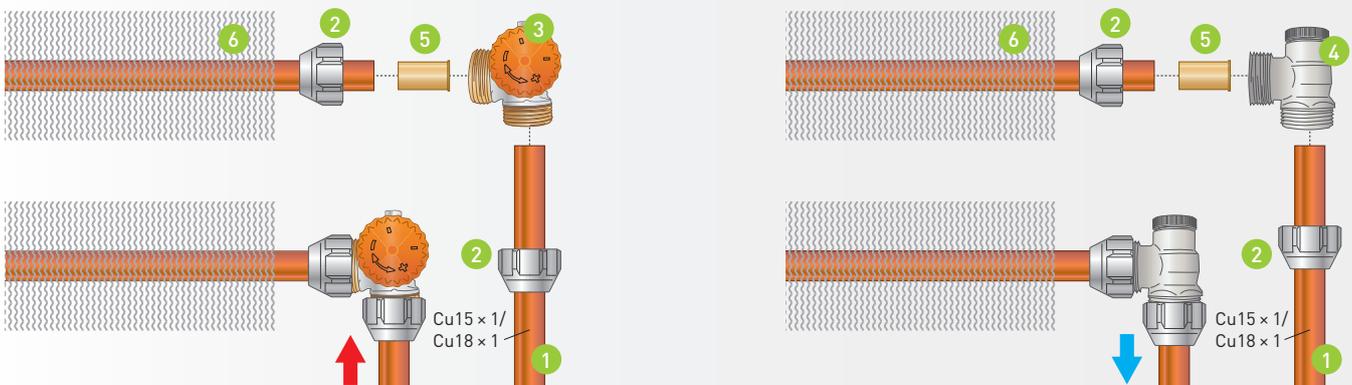
Before soldering, prepare a cover to protect the floor and wall from flames. Clean the pipes and fittings at the solder contact points with a cleaning cloth and inner brush. Apply solder paste evenly to both parts. Join the two contact points and solder them. It is important that the soldering point is kept clear of dirt particles such as masonry dust etc.

4.2.2 Tip for piping



If necessary (old building with finished floors etc.), additional uninsulated pipes to max. 18 mm external diameter can also be held in the brackets.

4.2.3 Feed to flow and return

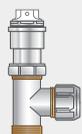


- ① E.g. copper pipe \varnothing 18x1 mm
- ② 3/4"EUROxCu18 clamping screw fitting
- ③ Flow valve
- ④ Return flow valve
- ⑤ 18 x 17 mm support sleeve (only necessary with heating element with copper pipe!)
- ⑥ Heating element (with copper pipe)

Push the assembled clamping screw fitting ② loosely over the copper pipe. Insert the support sleeve ⑤ into the copper pipe of the heating element. **Important:** Cut the pipe straight/at right-angles, and push into the flow valve ③ or return flow valve ④ until the stop is reached. In this position, tighten the clamping screw fittings with 40 Nm.

4.2.4 Deaeration

The individual skirting heating systems are deaerated via the flow valves with integrated manual deaeration systems. The deaeration elbow is inserted in the return for valves without integrated deaeration systems. >>



4.2.5 Flow valve

The flow valve with integrated deaeration is available in left, right or continuous versions.

On delivery, there is a protective plastic cap on the valve spindle. This allows the valve to be opened or closed without a valve head. Before mounting the valve head or the handwheel, the protective plastic cap is removed.



Straight-flow

left-handed

right-handed

Valve heads for flow valves



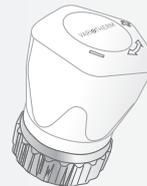
Thermostat head



Extension for thermostat head 20 mm, from a cladding thickness of 10 mm for IIa + IIIa Classic



Thermoelectric actuator

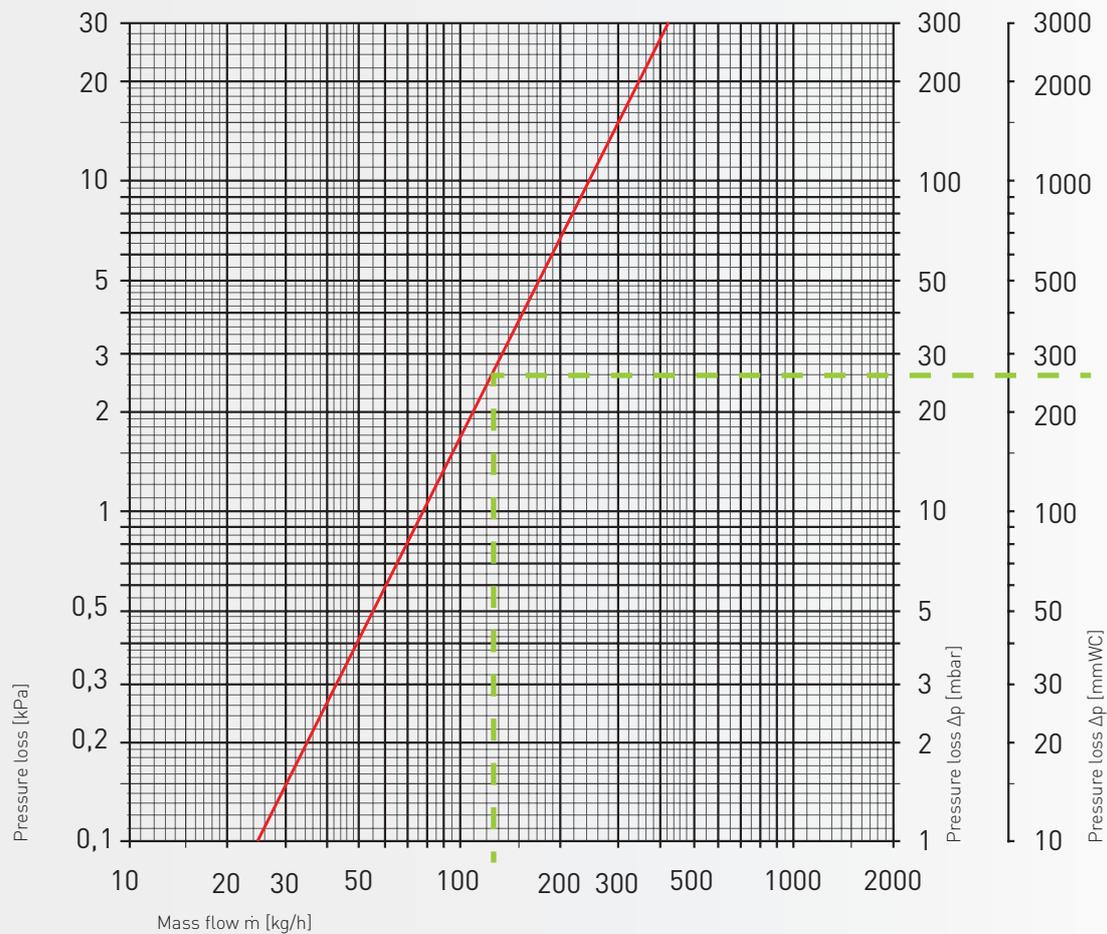


Handwheel



Thermostat head with remote sensor

Characteristic curve for flow valve DN15 (1/2") with thermostat head; kv value 0.79; control difference $x_p \cdot 2 \text{ K}$



Sample calculation:

Required: Pressure loss for valve 1/2" at 2 K control difference

Given: Heat flow $Q = 1450 \text{ W}$, temperature spread $\Delta t = 10 \text{ K}$ (55/45 °C)

Solution: Mass flow $m = Q / (c \cdot \Delta t) = 1450 / (1.163 \cdot 10) = 125 \text{ kg/h}$

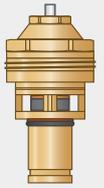
>> Pressure loss from diagram $\Delta p = 26 \text{ mbar} / 260 \text{ mmWC}$ [0.26 mWC] / 2600 Pa

Valve insert for automatic hydronic balancing

For all 1/2" flow valves delivered by Variotherm from 2013 onwards, an optional valve insert can be retrofitted.

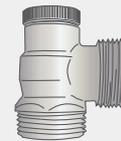
The desired flow quantity is set between 1 and 15 using a hex (size 11) (corresponds to 10-150 l/h) and is then automatically maintained at a constant level by the valve. Balancing via the return flow valve is therefore no longer necessary. The following pressure loss occurs via the valve:

- Range 10-100 l/h: 10 kPa (= 1.0 mWC)
- Range 100-150 l/h: 15 kPa (= 1.5 mWC)

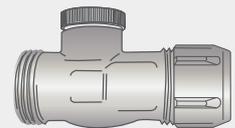


4.2.6 Return valve

The return valve is used for hydronic balancing and as a shut-off valve if the heating elements have to be dismantled (e.g. for painting). The valve spindle is under the protective cap. The return valve can be closed by rotating it.

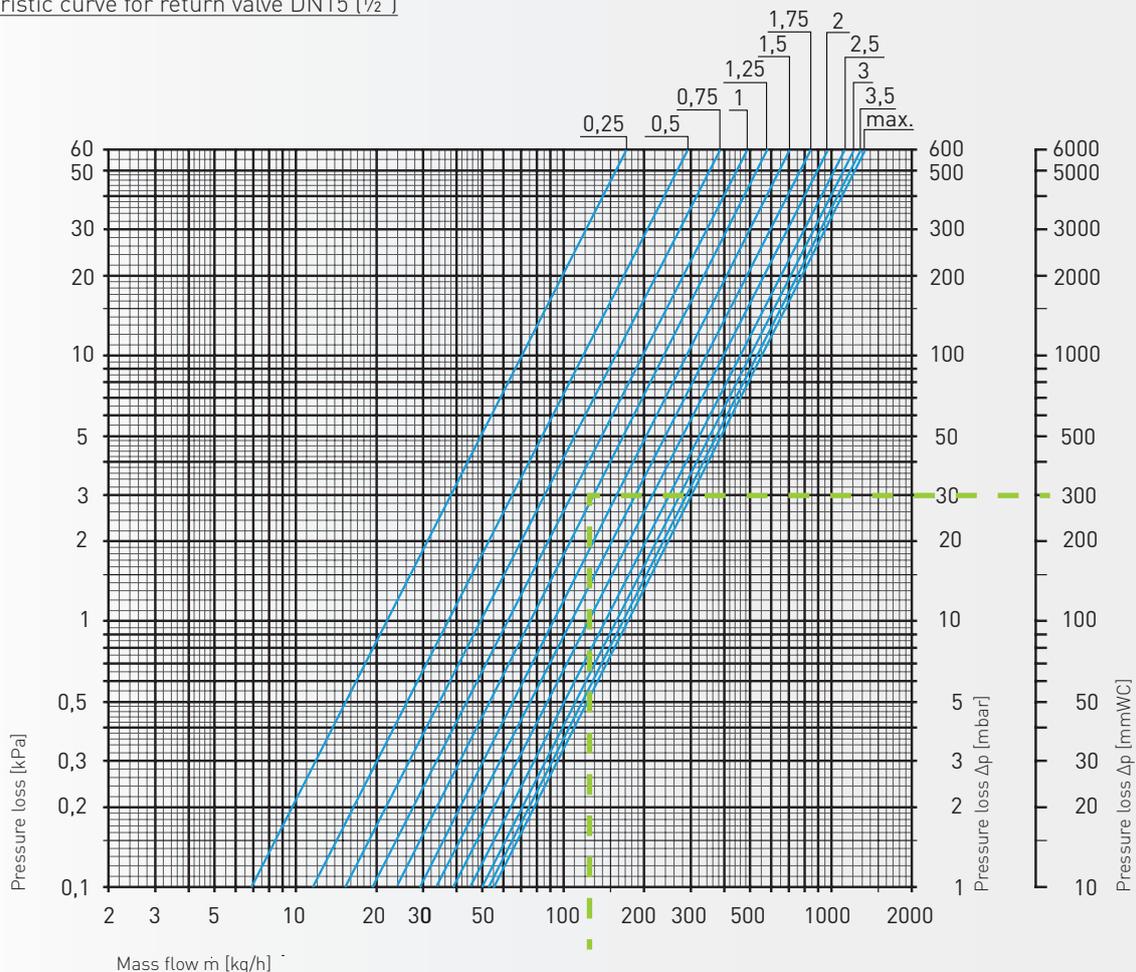


90° corner



Straight-flow

Characteristic curve for return valve DN15 (1/2")



Sample calculation:

Required: valve opening (rotations) at a pressure loss via the return valve of $\Delta p = 30 \text{ mbar}$ (0.30 mWC, 3000 Pa)

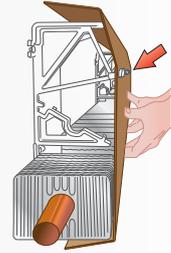
Given: Heat flow $Q = 1450 \text{ W}$, temperature spread $\Delta t = 10 \text{ K}$ (55/45 °C)

Solution: Mass flow $m = Q / (c \cdot \Delta t) = 1450 / (1.163 \cdot 10) = 125 \text{ kg/h}$

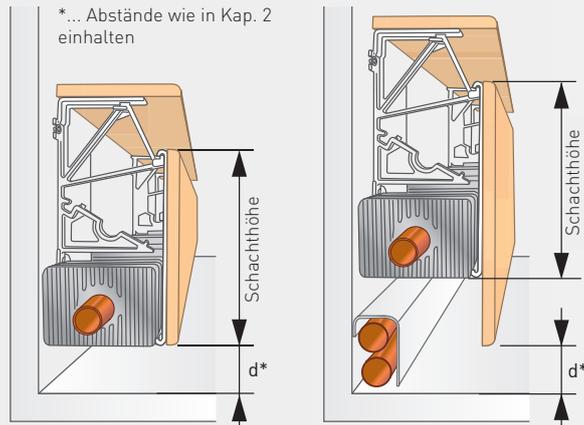
>> Open the return valve **1.25 rotations**

5.1 General

If the required skirting heating cladding is not mounted immediately, protect the mounted heating elements using their packaging boxes, for example (cut slits in the box, pass the bracket catches through). This effectively protects the heating elements from damage. >>



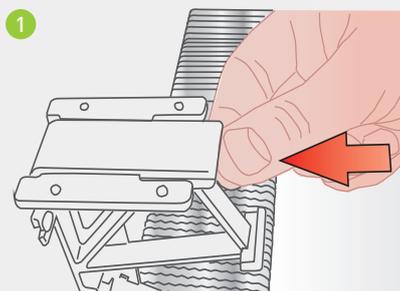
5.2 Classic skirting heating



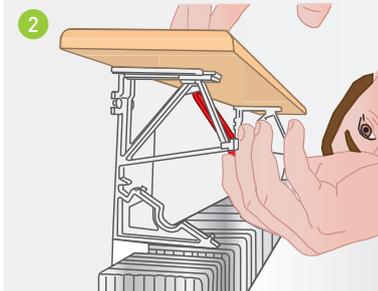
Please note the dimensions of the cladding in chapter 2.1. If the wooden skirting is mounted further from the floor (e.g. due to wall-mounted pipes), you must still comply with the air vent spacing (extend cladding further down)

For cladding of the Classic skirting heating provided by the customer, each bracket includes a mounting plate and mounting base with fastening screws (see also Chap. 3.1).

Virtually any wood is suitable as wooden cladding. It should be torsion free and dry (e.g. 3-layer board).



1 Push the mounting base into the bracket ...



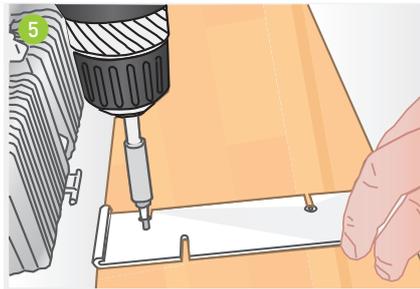
2 ... and transfer the outline to the upper cladding.



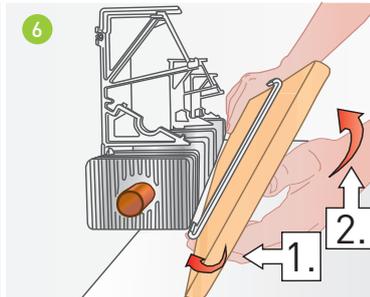
3 Screw the mounting base onto the upper cladding.



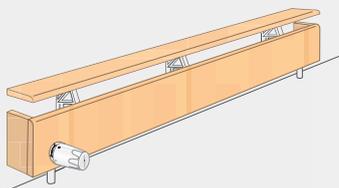
4 The upper cladding can now be pushed into place.



5 For the front cladding, the mounting plate is secured after adaptation to the brackets.



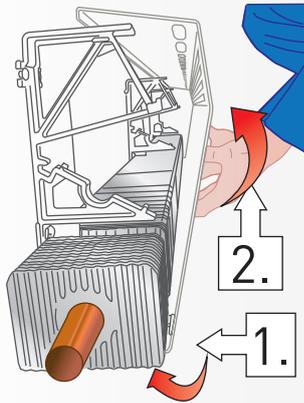
6 Attach the front cladding to the bottom spring and click it into the catch. Simple galvanized metal brackets are used for end connections.



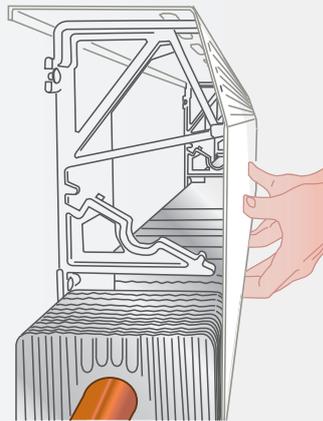
<< Drill a hole in the cladding in the axis of the valve head for the flow valves.

5.3 Delta skirting heating

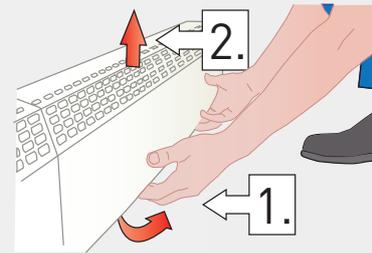
If uneven walls cause problems when snapping the upper edge into place, loosen the upper bracket screws. After locking the cladding into place, the screws can then be tightened again through the upper front hot air slit.



Fit the Delta at the bottom near the tension spring and click it into place at the top



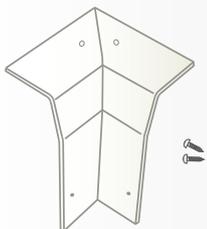
Delta cladding which has been clicked into place.



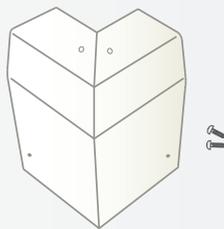
To remove the cladding, first pull it out at the bottom and lift it out upwards.

Connections etc.

The connecting elements are clipped in, inner corners, outer corners and the end caps are fastened subsequently using the enclosed screws to the front cladding (do not forget to drill).



Inside corner 90° & 135°



Outside corner 90°



Connecting element



End cap left



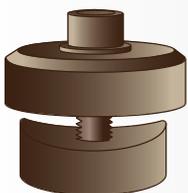
End cap right

The formed parts are attached with the supplied screws.

Use the Variotherm paint pen to paint the screw heads after mounting. >>



Round hole punch

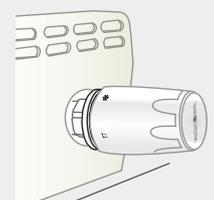


For the flow valves, punch a hole into the Delta cladding in the axis of the valve head using the appropriate round hole punch. The thermostat head will later protrude through this hole.

Hole diameter required:

ø 40 mm for mini skirting heating system,

ø 55 mm for Ia, IIa + IIIa skirting heating system, and valves with actuator



Example

6.1 Leak-tightness test

Construction project: _____

Building owner/Occupant: _____

Client: _____

Heating installation technician: _____

Architect: _____

Other: _____

The Variotherm skirting heating circuits are to be tested for leak-tightness using a water pressure test. The test pressure must be no less than 4 bar and no greater than 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.

- Skirting heating incl. cladding, connection and piping completed on: _____
- Pressure test started on: _____ with test pressure of ____ bar
- Pressure test finished on: _____ with test pressure of ____ bar
- The system water was treated (e.g. per ÖNORM H 5195-1, VDI 2035) Yes No
- Antifreeze was added to the system water Yes No
- Heating started on: _____

Approval:

Building owner/Occupant/Client

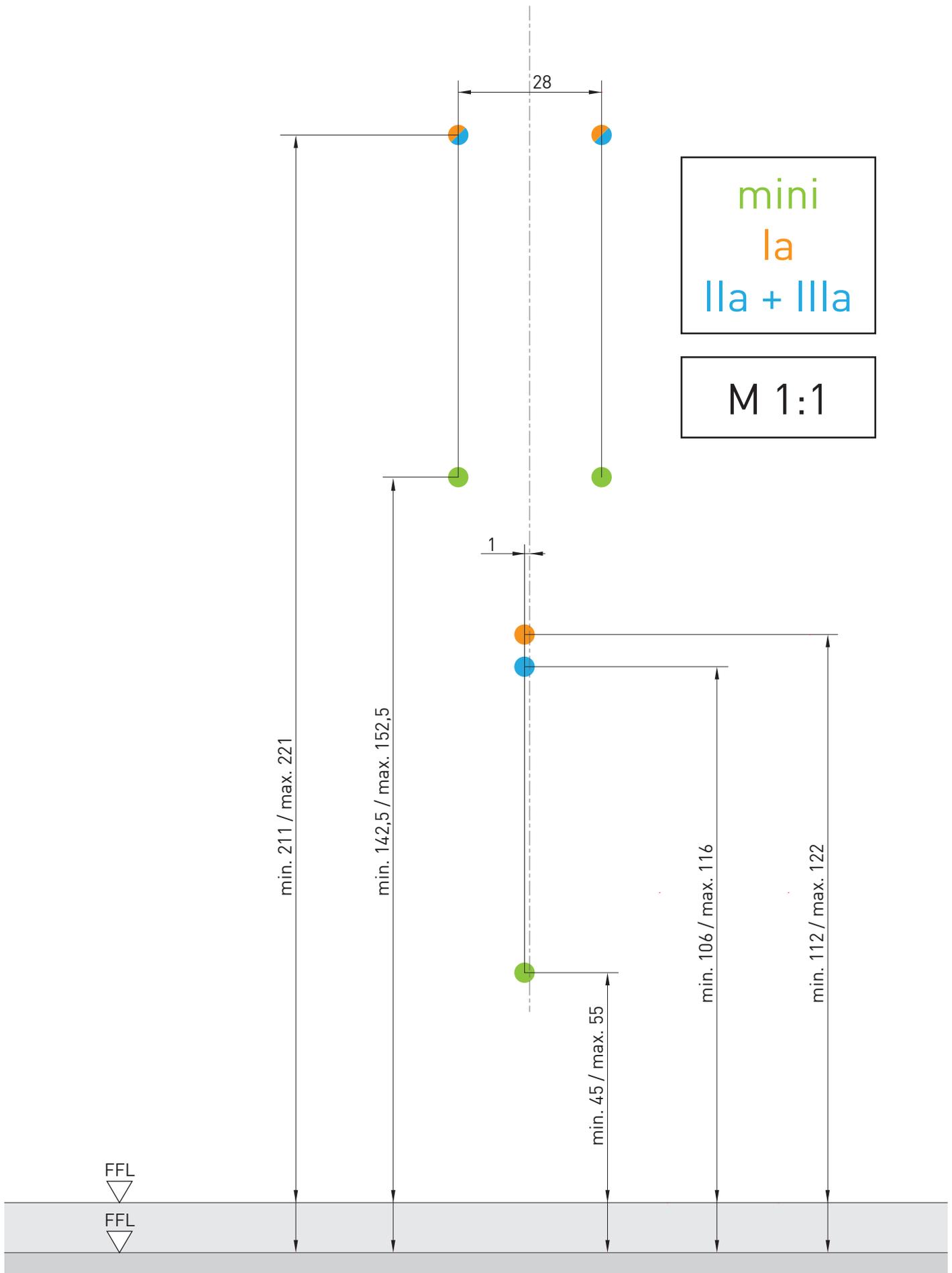
Construction management/Architect

Heating installation technician

6.2 Commissioning

The flow and return valves or the heating circuit shut-offs on the manifold must be opened. The entire system is to be deaerated thoroughly. The circulation pump may be switched on after deaeration. After commissioning, the Variotherm skirting heating system can be considered maintenance-free.

[Subject to technical modifications without notice.]



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