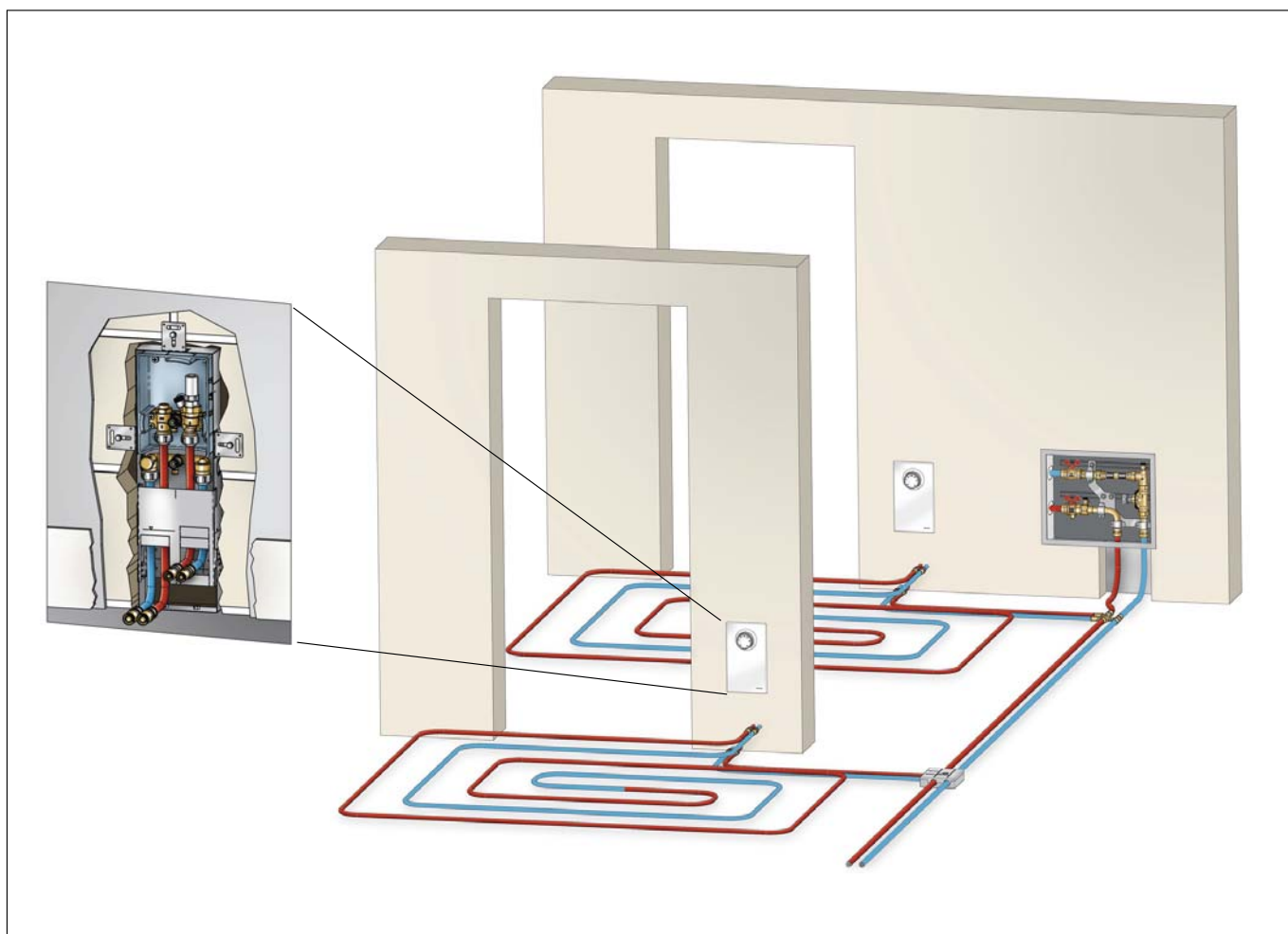


for an improved energy efficiency ...



Content

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Summary

The surface heating is becoming standard in housing constructions. In the Energy Saving Directive, the legislator calls for improved insulation measures which allow an operation of the surface heating at the lowest temperatures.

A low operating temperature is paramount for an economical operation with modern heat generators such as heat pumps, solar thermal energy, CHP, etc.

Positive characteristics of the surface heating:

- cosy and comfortable
 - hygienic – low air circulation, no burning of dust due to low heating surface temperatures
 - healthy room climate due to a reduced air temperature and an increased relative air humidity
 - long service life and low maintenance
 - energy-saving and environmentally friendly
- The listed preconditions lead the customer to expect up to date comfort.

Concept

The conditions for the new surface heating system "Unidis" were created by a systematic and successful evolution of the Oventrop valves and controls.

Oventrop succeeded to develop the "Unidis" system from a heat radiating distributor/collector into a flow line distributor in form of a pipe network on the unfinished floor. Thermal curtains in front of the distributor/collector cabinets and the resulting energy wastage in indoor hallways are avoided.

The "Unidis" system complies with the legal specifications of a "thermostatic individual room temperature control". The thermostatic sensor and controller for each room are combined in one appliance. This way, the electrical installation or wireless communication between sensor and controller in conventional systems can be omitted. Electric smog does not prevail.

The specific inertia of a storage heater and undesirable temperature fluctuations of the floor surface are reduced considerably by

the "Unidis" system. This was achieved by the patented bypass of the "Unibox E BV" which may be adjusted by the user for each room according to requirements.

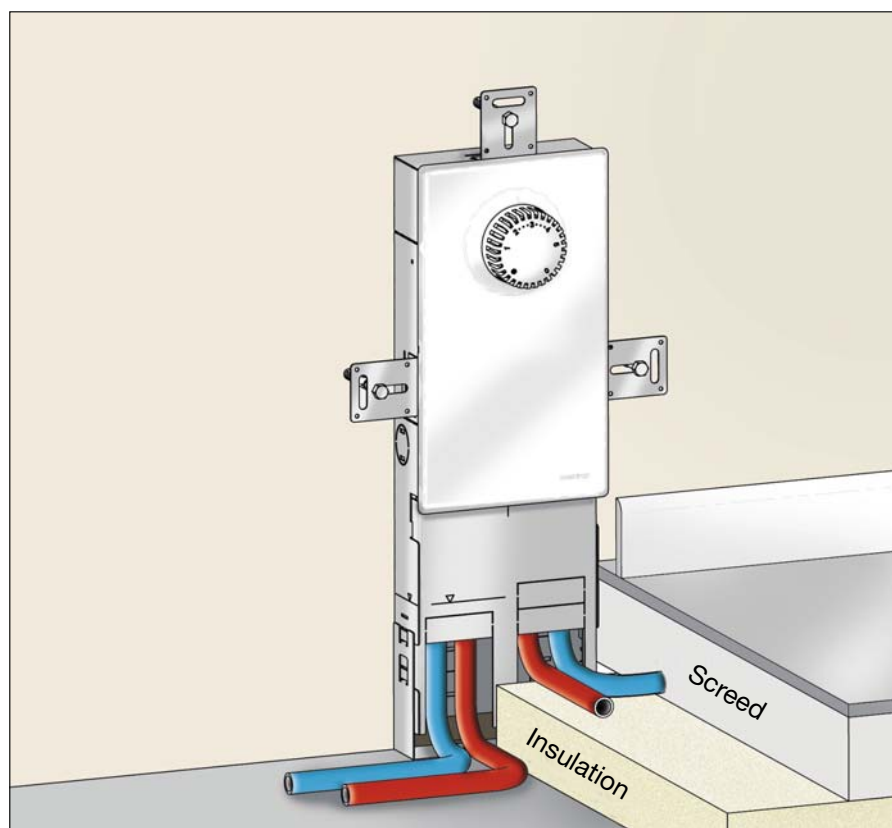
The objectives of the "Unidis" systems are as follows:

- optimum comfort
- lowest possible energy and operating cost
- ecological operation
- support of a trouble-free operation of heat pump systems

Advantages

(of the "Unidis" system compared with a conventional surface heating systems):

- no central gathering of hot supply pipes in front of the distributor/collector cabinets
- no uncontrolled heat output of distributor/collector cabinets and supply pipes
- separate heating circuit in hallways
- room temperature control via room thermostats without auxiliary energy
- no electric smog
- maintenance-free room thermostats
- steady controllers instead of "on/off" controllers
- the self-regulating effect is improved by a mechanically controlled bypass
- temperature fluctuations of the floor surface are reduced (only with bypass)
- overdimensioning is avoided by larger minimum pipe distances in the screed (only with bypass)
- quicker heating up after a setback period (only with bypass) by maintaining a basic heat which avoids a complete cooling down of the floor
- ideal for use with heat pumps due to the minimum flow rate (only with bypass)



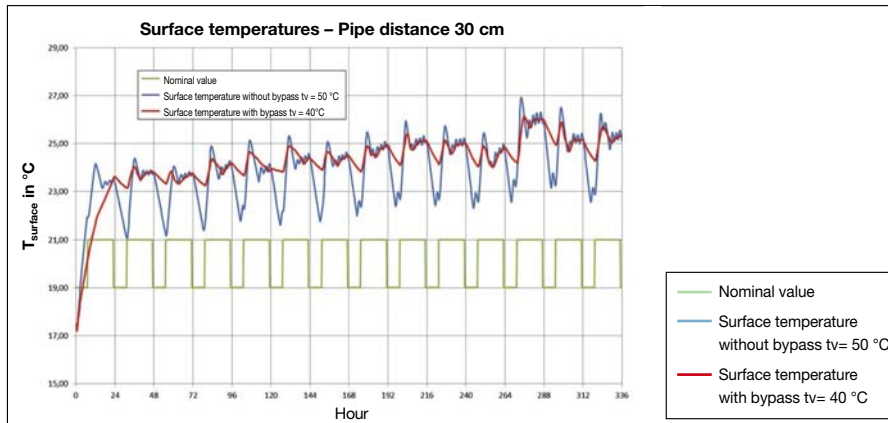
Example of installation



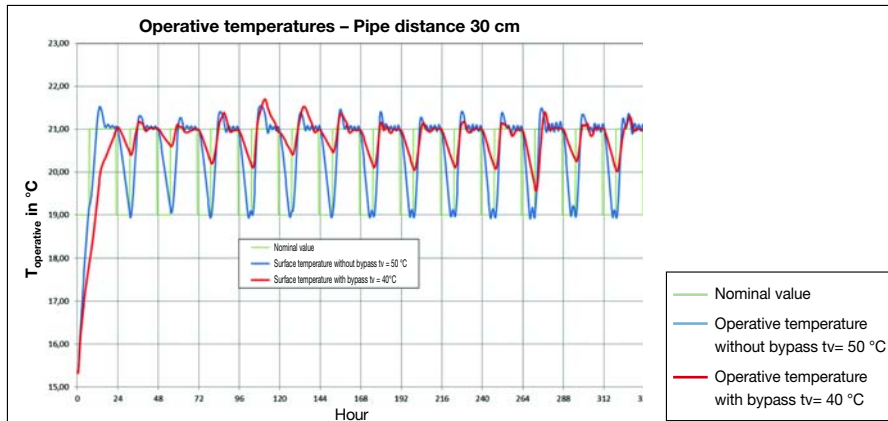
1 "Unibox E BV"



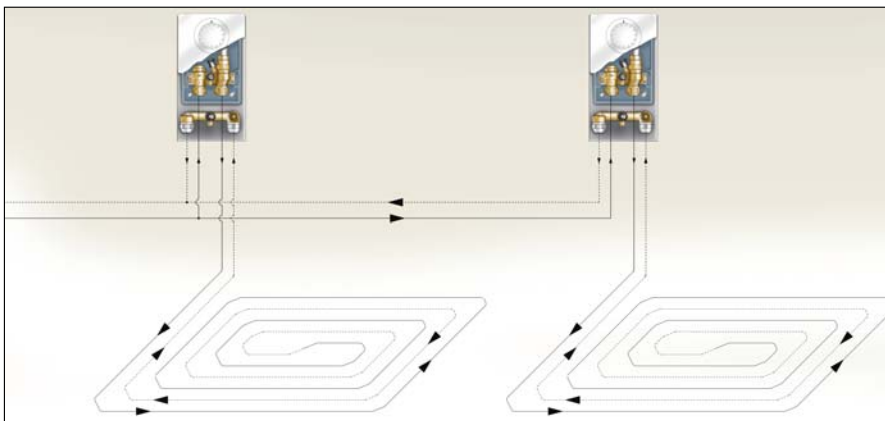
2 Bypass valve



3 Surface temperatures - Pipe distance 30 cm - Supply 50°C/40°C without/with bypass



4 Operative temperatures - Pipe distance 30 cm - Supply 50°C/40°C without/with bypass



5 System illustration

System components

- "Unibox E BV" including fixing channel
- Return collector "Floorbox MH"
- System boards and pipes

The surface heating control via the "Unibox E BV" is the centrepiece of the new surface heating system "Unidis". This "Unibox" features an integrated bypass (illustr. 1 and 2). The individually adjustable bypass allows an increased comfort in rooms which are influenced by other heat sources as a cooling down of the screed is avoided. This phenomena especially applies to rooms with south or west orientation as they are influenced by external heat supplied by sunshine.

If the thermostatic valves in these rooms are closed for a longer period and the screed cools down, a quicker heating up will be necessary afterwards. The room temperature shall be reproduced as quickly as possible.

Saving potential of up to 9% by using the new surface heating system "Unidis"

The bypass operation does not only increase comfort but energy can also be saved. The energetic evaluation of Prof. Dr.-Ing. Rainer Hirschberg shows that the installation of the "Unibox E BV" with bypass in surface heating systems produces the following effects (illustr. 3 and 4):

- The constant flow volume leads to a constant floor temperature.
- The design flow temperature can be reduced as the constant flow volume maintains the basic heat load in the surface heating at a constant level.
- The constant floor temperature entailed by the basic heat load allows larger pipe distances during design.

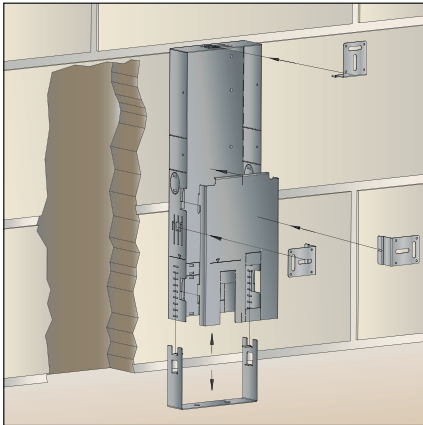
Energetic evaluation of expenses according to DIN V 48599.

A reduction of the design temperature by about 10 K leads to:

- a reduction of the expenses for distribution by 3% for residential buildings
- a reduction of the expenses for heat generation by about 1% for gross calorific appliances and by about 6% for heat pumps (brine/water)

Theoretical total saving potential:

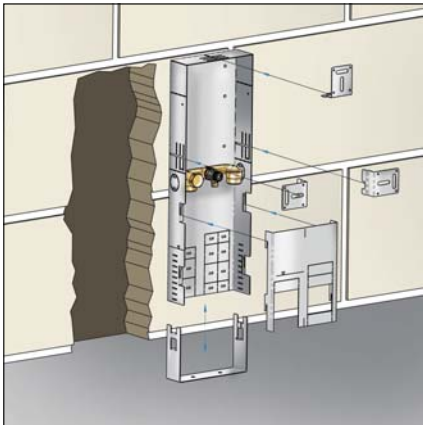
- for gross calorific appliances up to 4 %
- for heat pumps up to 9%



1 Fixing channel for installation option 1



2 Return collector "Floorbox MH"



3 Fixing channel with isolating facility for installation option 2



4 "Floorbox UH" horizontal riser connection

1 Fixing channel

The fixing channel will facilitate a quick and secure positioning of the "Unibox E BV" into the wall and was developed for the installation into standard walls, such as brickwork, lightweight walls and concrete walls as well as prefabricated house walls etc. The "Unibox E BV" can be installed during a later building phase. Assembly of the fixing channel was adapted to the rough conditions on site and can be carried out without screws. Rated break points allow for a number of different installation positions. The lower bracket with different adjustment options allows the adaptation to different floor construction heights. The channel can be connected from the front and the back. Connection through the reverse side for instance allows connecting the "Uniboxes" of all rooms from the bare floor of the hallway.

2 Return collector "Floorbox MH"

The return collector which is installed in a flush-mounted cabinet features all necessary components. The return pipes of all heating circuits and additional radiators are directed to the return collector in the screed and are connected to the collector. Hydronic balancing of all circuits is carried out at the regulating inserts (flow measuring and regulating insert). The supply connection from the heating generator at the upper ball valve leads to a supply connection pipe with draining and venting valve. The supply distributions on the bare floor to the "Uniboxes" are connected to the two outlets of the pipe. The return connection from the heating generator features

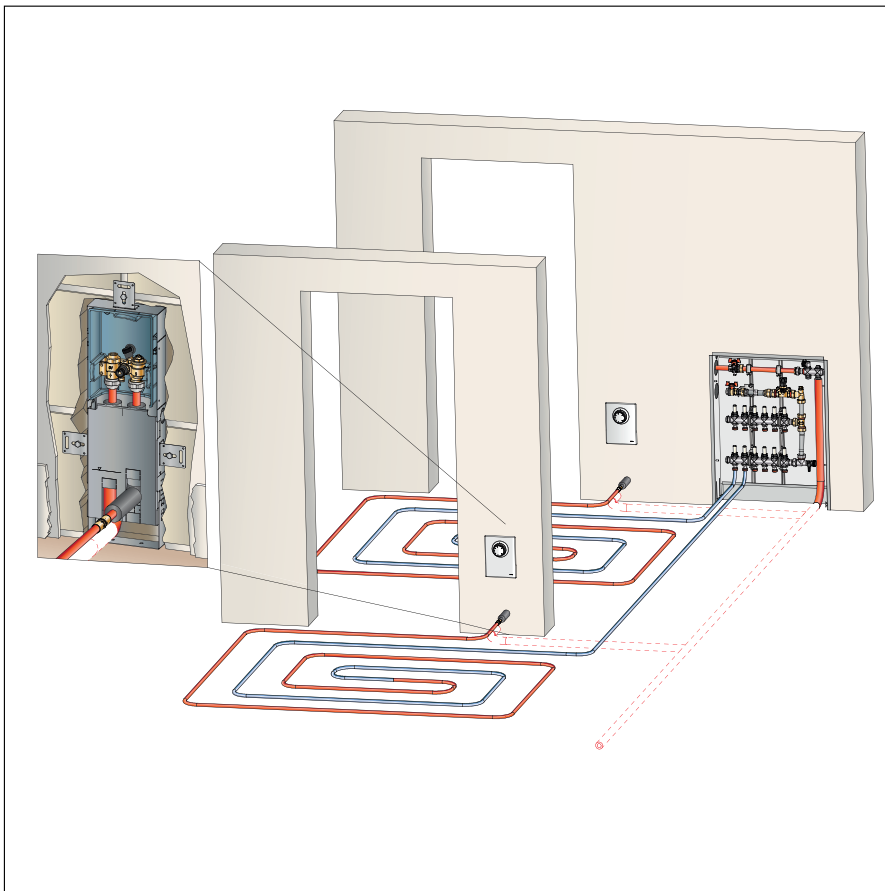
- a ball valve for the isolation of the dwelling
- a heat meter stool piece
- a double regulating and commissioning valve for the hydronic balancing of several return collectors
- a draining facility.

3 Fixing channel with isolating facility

Apart from the above fixing channel, Oventrop offers a fixing channel with isolating facility. It allows a connection without distributor/collector and the room to room isolation of surface heating circuits. For this purpose, the lower part of the fixing channel features a pre-assembled body with an integrated regulating stem. Apart from the two supply pipes which are connected to the "Unibox" installed on top, the return pipe from the heating circuit can be integrated into the fixing channel and be connected to the right hand side of the isolating body. The return pipe is fed out of the fixing channel on the left hand side.

4 "Floorbox UH/UV"

The connection set "Floorbox UH/UV" is the "central" device for the isolation, regulation and measurement of heat consumption of each dwelling. It can be connected from below or laterally. The supply pipe is laid from room to room after installation of the "Floorbox UH/UV". The "Unibox E BV" and the surface heating circuits are connected to the supply pipe via branch pipes.

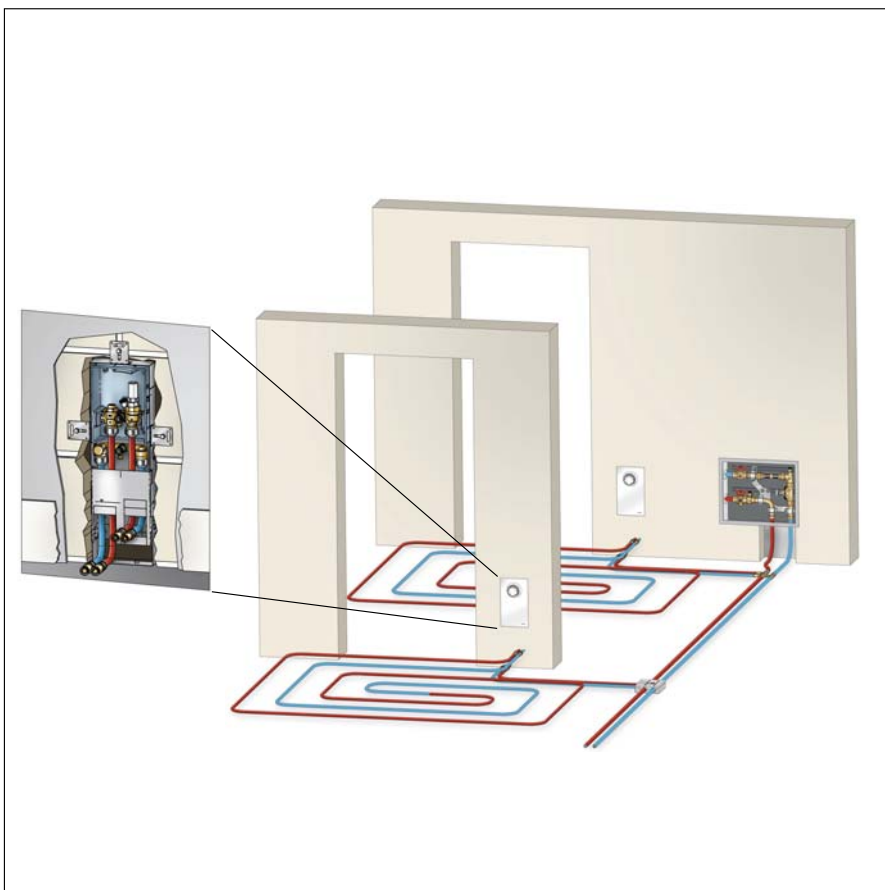


Installation option 1

Installation option 1

“Unidis” system with central isolation in the return collector consisting of:

- “Unibox E BV”
Combination room temperature control and presettable bypass
- Fixing channel
- “Floorbox MH”
Return collector

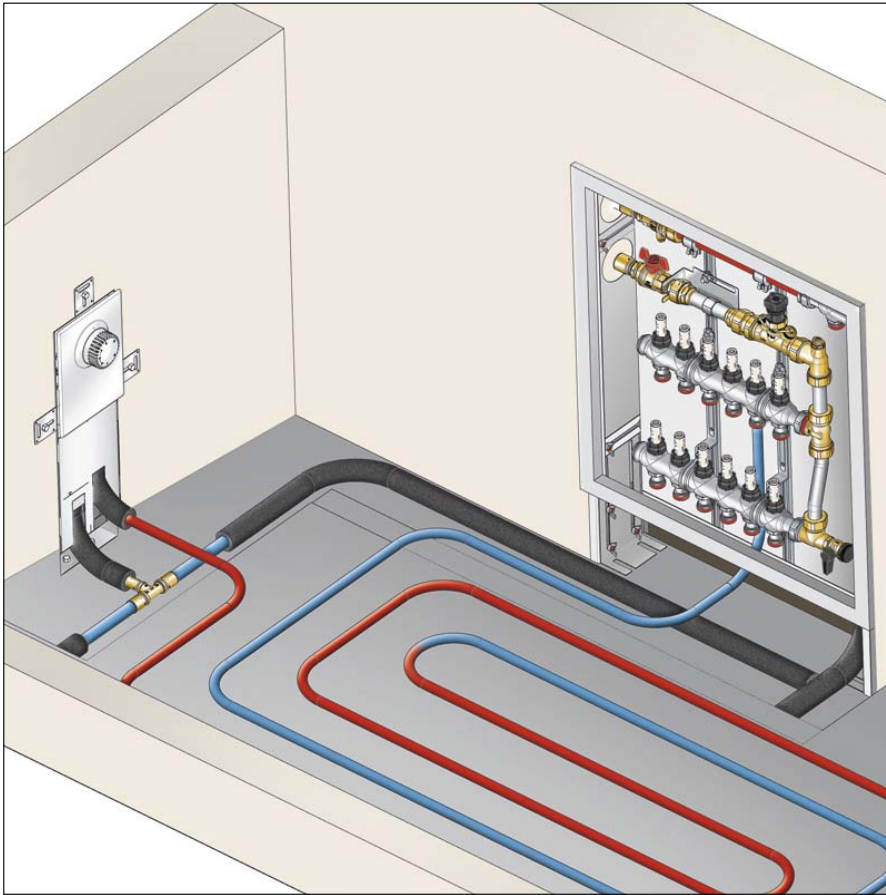


Installation option 2

Installation option 2

“Unidis” system with local isolation in the fixing channel consisting of:

- “Unibox E BV”
Combination room temperature control and presettable bypass
- Fixing channel with isolating facility
- “Floorbox U”
Connection for underfloor heating systems without distributor/collector



Installation option 1

Construction phase

The flexible system allows responding to different constructional conditions on site. The installation and operating instructions enclosed with the different components must be observed when installing a surface heating system.

The following installation steps have to be performed during the individual construction periods.

1 Adaptation of the fixing channel to the planning specifications. The installation height is set to the triangular marking by adjusting the lower bracket. The marking should be in line with the planned height of the screed.

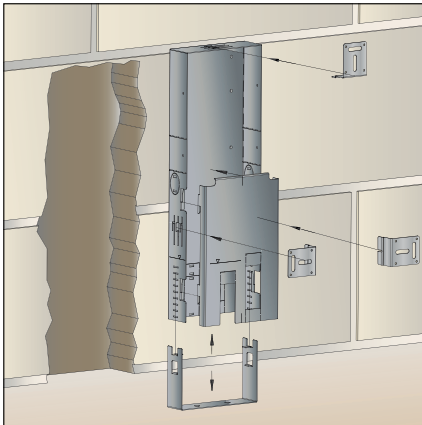
The installation depth is adjusted to the finished wall via the lateral adjustable angled brackets.

2 Insertion and adjustment of the fixing channel into the provided wall recess with fixing screws.

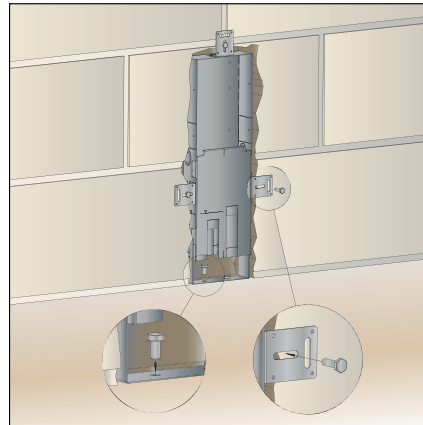
3 Insertion, adjustment and fixing of the cabinet of the return collector "Floorbox MH". Adjustment of the height of the cabinet to the overall height of the finished floor. The installation depth relates to the finished wall.

Lateral connection of the supply pipe (red) and return pipe (blue) from the heating generator to the ball valves of the return collector.

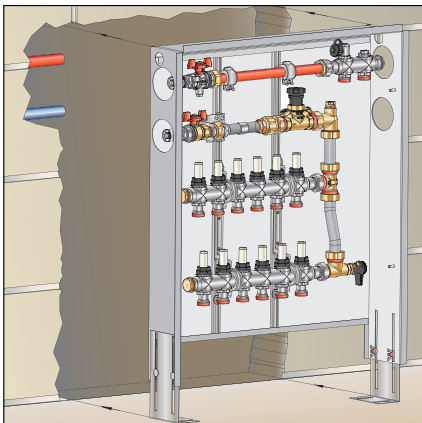
4 Installation and adjustment of the "Unibox E BV" and fixing of the pre-formed insulated supply connection fittings.



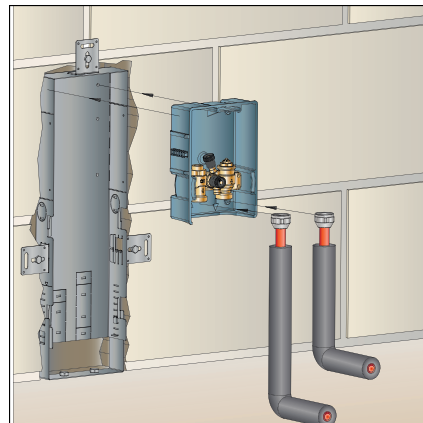
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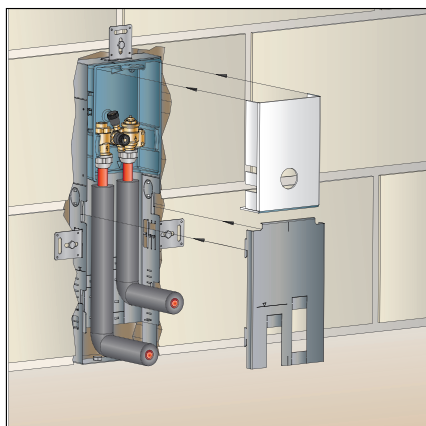
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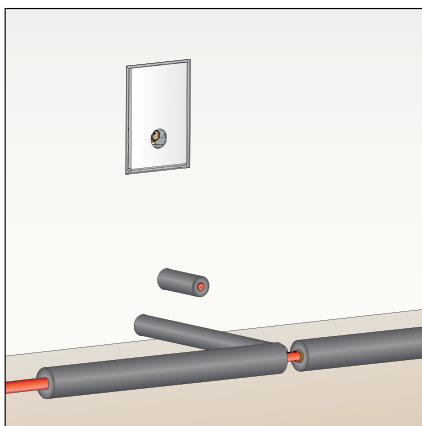
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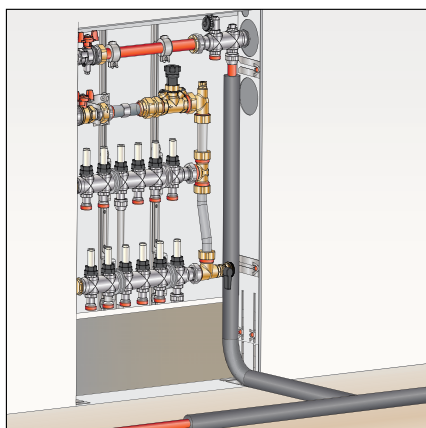
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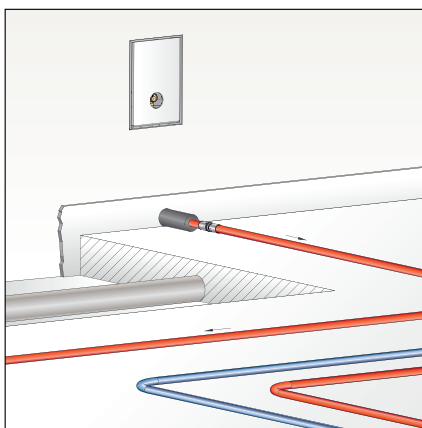
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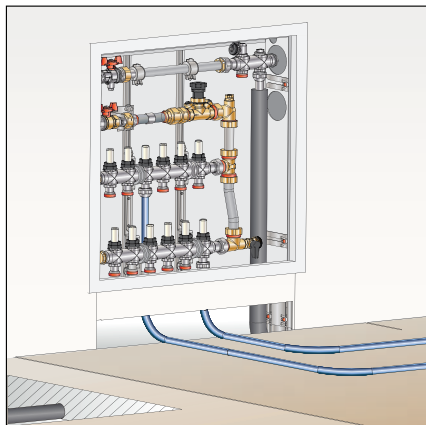
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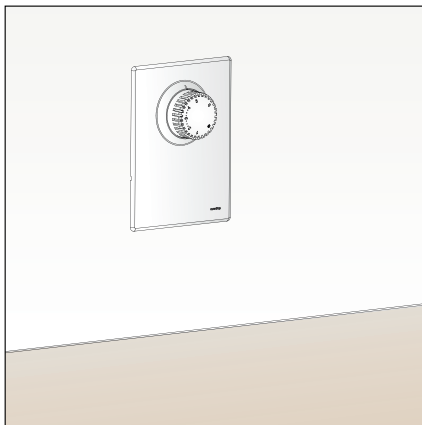
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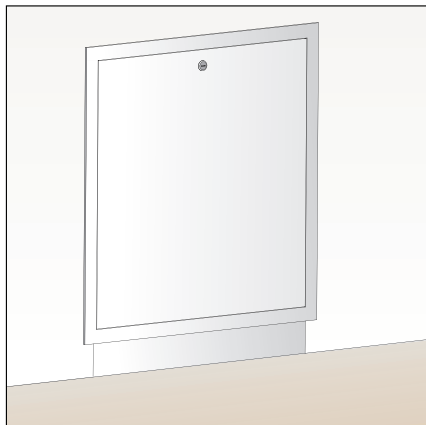
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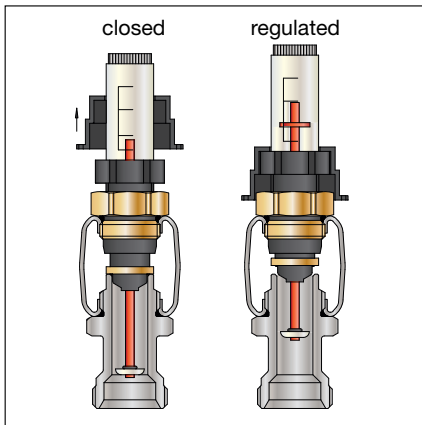
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5 Fix the protection covers onto the "Unibox E BV" and the fixing channel.

6 After plastering has been completed, the two insulated supply pipes will protrude out of the wall. The lower supply pipe on the bare floor is connected to the supply connection pipe of the return collector. The insulation of this pipe depends on the installation location and has to comply with the relevant standards.

7 Connect the supply pipe on the bare floor with the supply connection pipe of the return collector "Floorbox MH".

8 Lay the surface heating construction on the bare floor with foils, edge isolating strips, insulation boards and/or system boards. Lay the pipes for the surface heating circuit which is connected to the second supply connection fitting of the fixing channel.

9 Fix frame and screed screen onto the cabinet of the return collector "Floorbox MH".

The return of the surface heating circuit is connected to a regulating insert of the return collector.

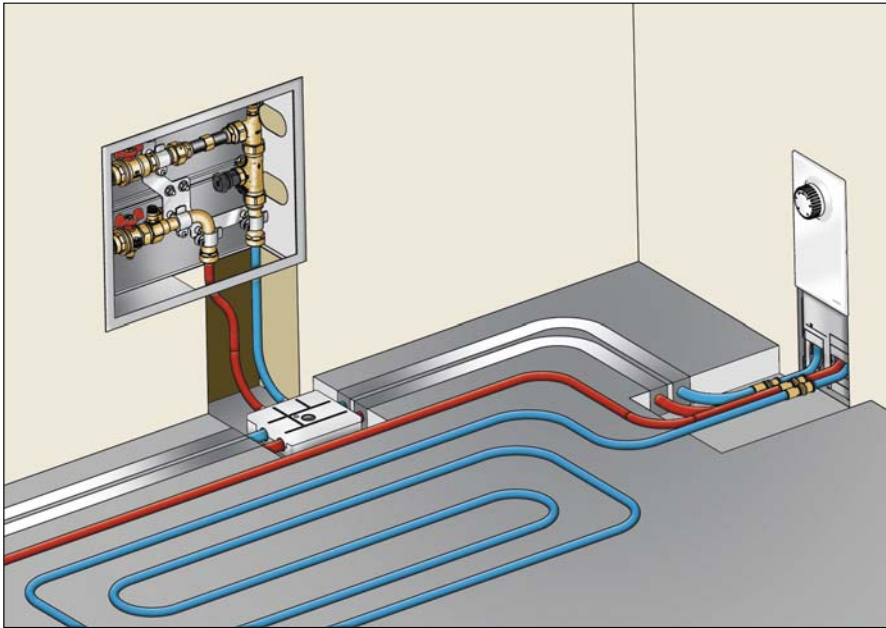
10 Mounting design cover with thermostat onto "Unibox E BV" once the heating screed is accessible.

11 Installation of cabinet door into the frame of the return collector "Floorbox MH".

Regulation and initial operation

The complete surface heating system has to be hydraulically balanced after having flushed, bled and leak tested the heating circuits and after having applied and heated up the heating screed in accordance with the manufacturer's specifications. Depending on the size of the building, regulation of the heating circuits (rooms), the return collectors (dwellings) and the risers is carried out in the basement. The settings result from the pipework calculation which can be carried out with the help of the Oventrop software "OVplan" (www.ventrop.com).

12 Hydronic balancing of the heating circuits of a dwelling is carried out at the regulating inserts of the return collector. These inserts feature a flow measuring and isolating device.



Installation option 2

Construction phase

The flexible system allows responding to different constructional conditions on site. The installation and operating instructions enclosed with the different components must be observed when installing a surface heating system.

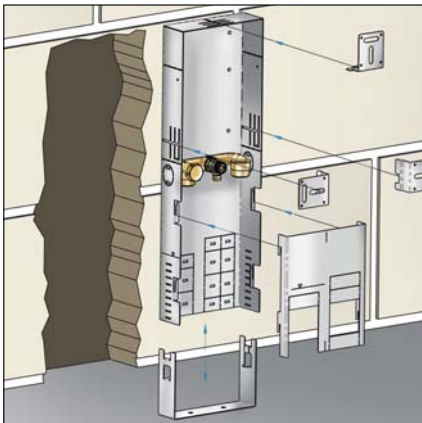
The following installation steps have to be performed during the individual construction periods.

1 Adaptation of the fixing channel to the planning specifications. The installation height is set to the triangular marking by adjusting the lower bracket. The marking should be in line with the planned height of the screed. The installation depth is adjusted to the finished wall via the lateral adjustable angled brackets.

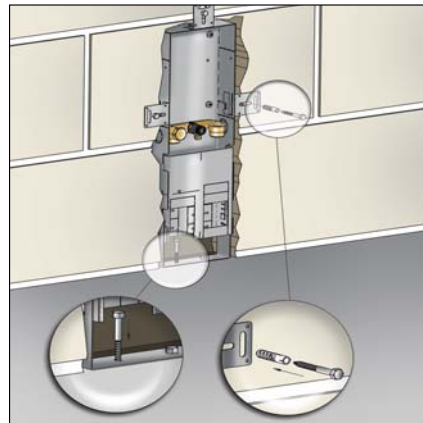
2 Insertion and adjustment of the fixing channel into the provided wall recess with fixing screws.

3 Installation of the "Unibox E BV".

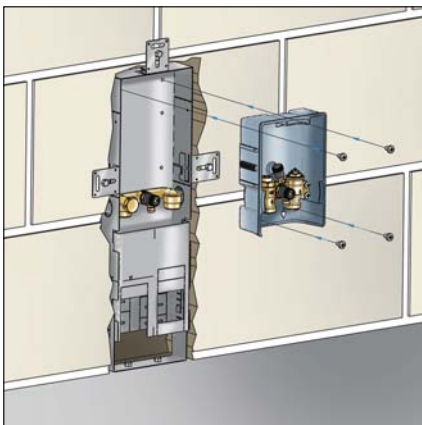
4 Adjustment and installation of the pre-formed connection fittings to the heating circuit isolation.



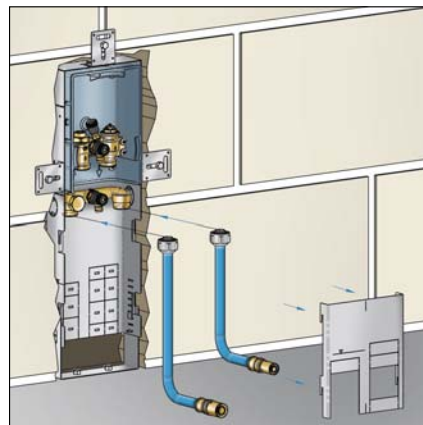
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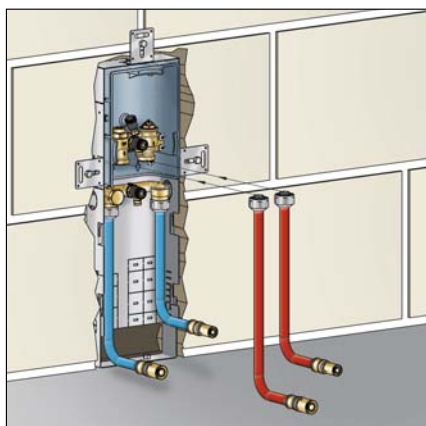
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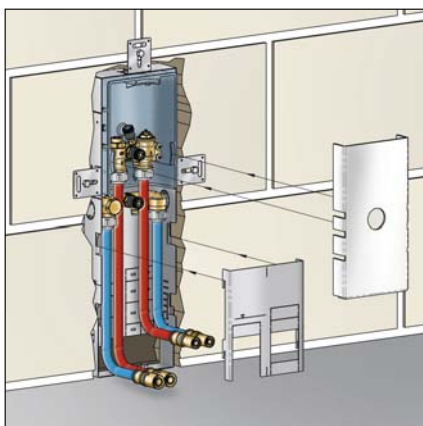
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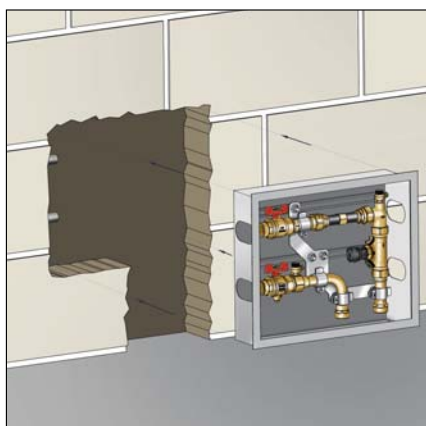
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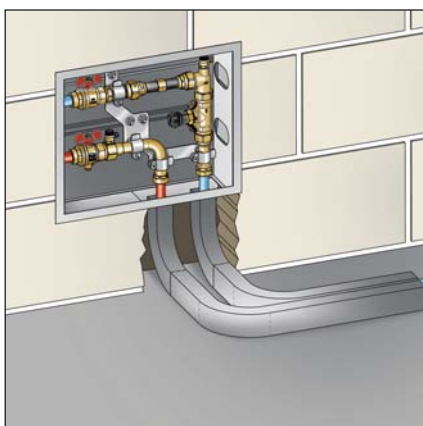
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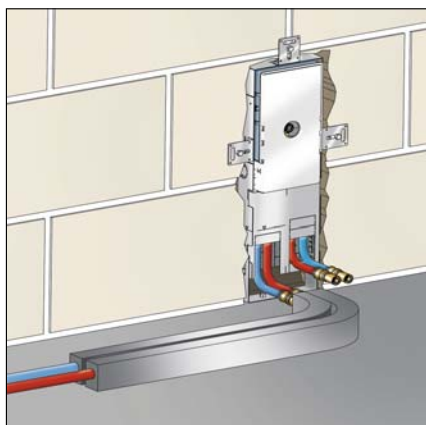
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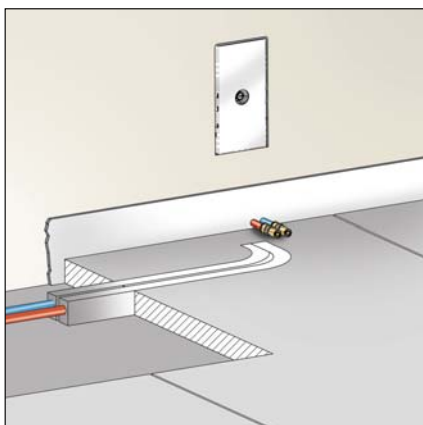
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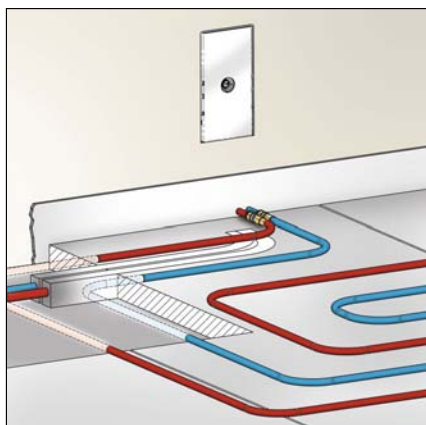
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5 Adjustment and connection of the pre-formed connection fittings to the "Unibox E BV" body.

6 Fix protection covers onto the "Unibox E BV" and the fixing channel.

7 Insertion, adjustment and fixing of the "Floorbox UH". Adjust the cabinet height to the overall height of the finished floor. The installation depth relates to the finished wall. Connection of the supply pipe (red) and return pipe (blue) from the heating generator to the ball valves of the "Floorbox UH".

8 Connection of the distribution pipe (supply and return) to the "Floorbox UH". Laying of the pipes on the bare floor.

9 Connection of the distribution pipe to the supply and return pipe connections of the respective "Unibox E BV".

10 Laying of the insulation and system board after plastering has been completed.

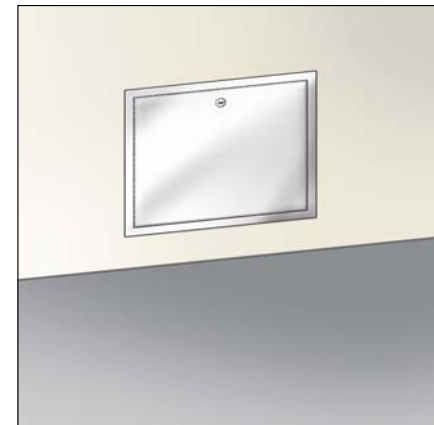
11 Laying of pipes for the surface heating circuit. Connection of the supply and return pipe to the connection fittings protruding out of the wall at system board level.

12 Mounting of design cover with thermostat onto the "Unibox E BV" once the heating screed is accessible.

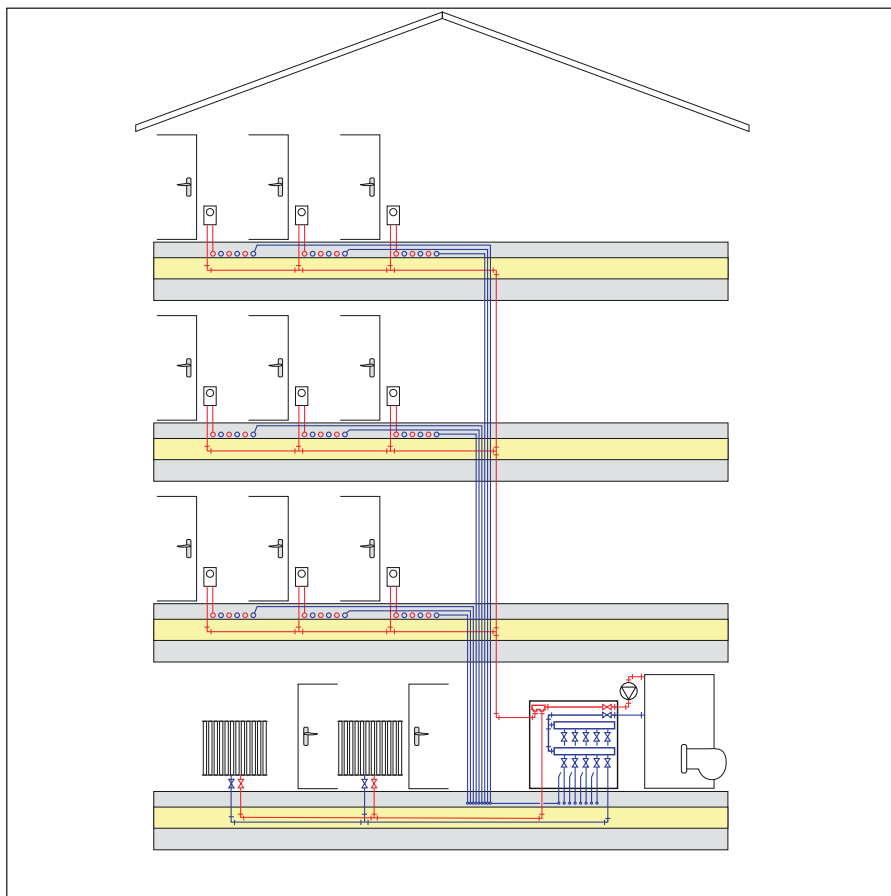
13 Installation of cabinet door into the frame of the return collector "Floorbox MH".

Regulation and initial operation

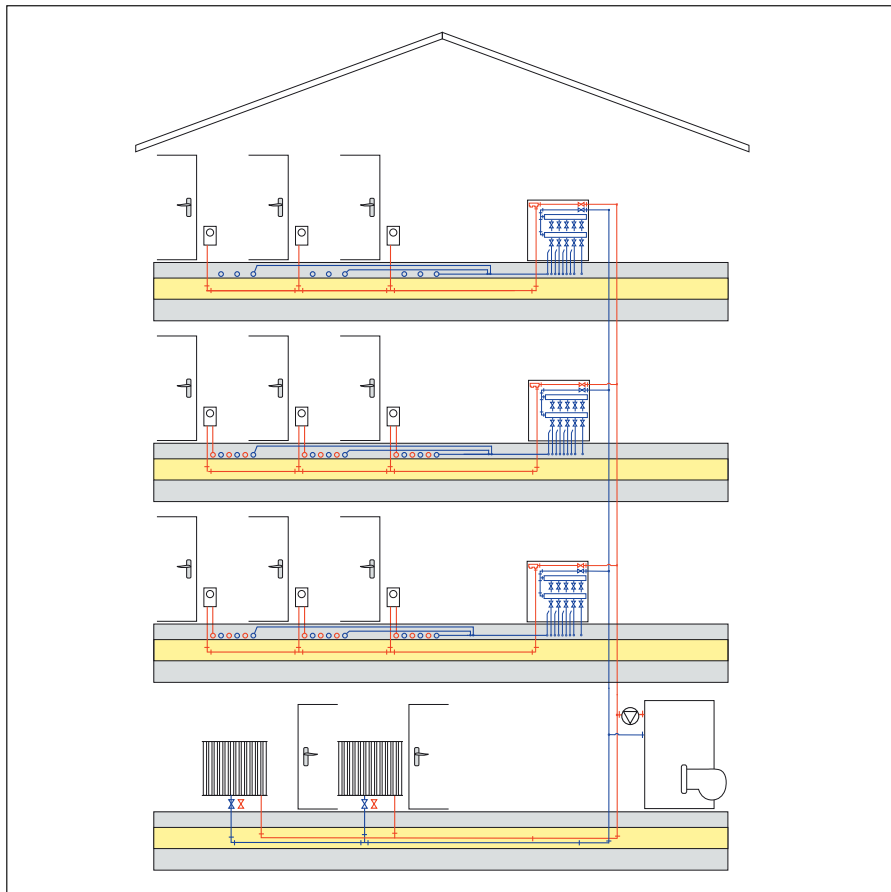
The complete surface heating system has to be hydraulically balanced after having flushed, bled and leak tested the heating circuits and after having applied and heated up the heating screed in accordance with the manufacturer specifications. The settings result from the pipework calculation which can be carried out with the help of the Oventrop software "OVplan" (www.ventrop.com).



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Practical examples for a more comfortable and economical surface heating system:

Disadvantages of conventional surface heating systems:

- limited space for the distributor/collector cabinets in hallways
- no own regulating circuit
- undesirable and uncontrolled heat output of the distributor/collector cabinets and the circuit connections
- unnecessary power consumption of the actuators
- slow heating up of the surface heating after a setback period
- high temperature fluctuations of the floor surface
- undesirable electric smog

These problems are largely solved by the "Unidis" system.

Examples of installation:

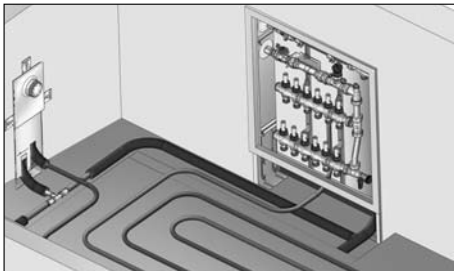
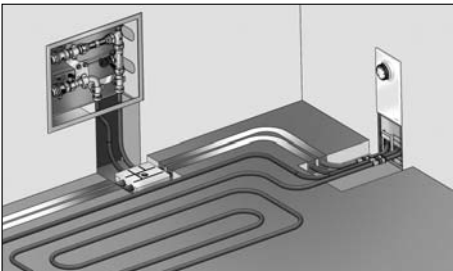
1 In DETACHED HOUSES, the installation of floor distributors/collectors is renounced. The known flow distributor is replaced by one "distribution" which is installed from the basement as an insulated vertical riser. On the individual floors, the distribution to each room is laid horizontally on the bare floor under the heating screed.

An expensive electrical installation for room temperature control is not necessary. The "Unibox E BV" replaces the "on/off" actuator.

Installation of the "Unibox E BV" is optimised by the fixing channel.

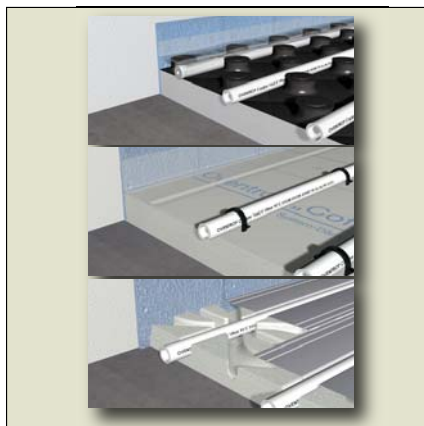
The return pipes of the heating circuits and the additional radiators of all floors are connected to a single newly designed central return collector - the "Floorbox MH" - where the required hydronic balancing for the complete building is carried out centrally. The bundled insulated return pipes are housed in the vertical shaft next to the supply riser.

2 In MULTIPLE DWELLINGS, one return collector "Floorbox MH" per dwelling is installed next to the vertical riser. All functions required by law are combined here. The "Floorbox MH" features isolating ball valves, a regulating valve for the hydronic balancing of the dwelling, a venting and draining facility as well as a heat meter stool piece. In detached houses, the "Unibox E BV" is installed in each room by use of the new fixing channel.

Building/Project			
Builder			
Address, phone number			
Installer			
Person in charge			
Address, phone number			
<p>Systems: <input type="checkbox"/> Base mat (14/16 mm pipe) <input type="checkbox"/> Tacker system (16 mm pipe) <input type="checkbox"/> Clamping rail system (14/16 mm pipe)</p> <p><input type="checkbox"/> Dry-build system (14 mm pipe)</p> <p>Base mat: <input type="checkbox"/> Base mat NP-35 <input type="checkbox"/> Base mat NP-11 <input type="checkbox"/> Base mat NP</p> <p>Foil mat (roll: 10 x 1 m for tacker or clamping rail system) <input type="checkbox"/> (20 x 2 mm) <input type="checkbox"/> (25 x 2 mm) <input type="checkbox"/> (30 x 2 mm) <input type="checkbox"/> (30 x 3 mm) <input type="checkbox"/> (35 x 3 mm)</p> <p style="padding-left: 40px;">or <input type="checkbox"/> Folded board (2 x 1 m)</p> <p>Dry-build system with dry flooring board: <input type="checkbox"/> Spiral pattern <input type="checkbox"/> Serpentine pattern</p> <p>Dry-build system with concrete/liquid screed: <input type="checkbox"/> Spiral pattern <input type="checkbox"/> Serpentine pattern</p>			
Pipes:	<input type="checkbox"/> "Copex"	<input type="checkbox"/> "Copert"	<input type="checkbox"/> "Copipe HSC" <input type="checkbox"/> "Copipe HS"
Dimension:	<input type="checkbox"/> 14 x 2 mm	<input type="checkbox"/> 16 x 2 mm	
Length of roll:	<input type="checkbox"/> 120 m	<input type="checkbox"/> 240 m	<input type="checkbox"/> 600 m
(Due to the low expansion coefficient during heating periods, Oventrop recommends to use only "Copipe" 14 x 2 mm for dry-build system.)			
<p>System "Unidis":  </p> <p><input type="checkbox"/> "Unidis" system with central isolation in the return collector <input type="checkbox"/> "Unidis" system with local isolation in the fixing channel</p> <p><input type="checkbox"/> "Unibox E BV" <input type="checkbox"/> "Unibox E BVC" <input type="checkbox"/> "Unibox E T" <input type="checkbox"/> "Unibox E TC"</p>			
<p>Flow temperature: max. 55 °C</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>- Room sizes in m²:</p> <p>- (Enumeration and surfaces of all rooms with UFH):</p> <p>- Surface covering: (The details must be legible!)</p> </div> <div style="width: 48%;"> <p>- Heat demand (in the room), if any:</p> <p>- Position of the distributor/collector:</p> </div> </div>			
<p>Local conditions:</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><input type="checkbox"/> unheated basement</p> <p><input type="checkbox"/> heated basement (underfloor heating or radiator)</p> <p><input type="checkbox"/> without basement</p> </div> <div style="width: 48%;"> <p>Floor coverings:</p> <p>Heat pump existing: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> </div> </div>			
Remarks:			
Offer submitted by wholesaler:			
Place	Date	Signature	
OVENTROP GmbH & Co. KG, Paul-Oventrop-Straße 1, D-59939 Olsberg, Phone: +49 (0) 29 62 / 82-0; Fax: +49 (0) 29 62 / 82 400, Internet: www.oventrop.de, E-Mail: mail@oventrop.de			



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1 The "Floorbox MH" and the "Floorbox UH/UV" can be combined with the "Unibox E BV" or "Unibox E T" as well as the "Unibox E BVC/E TC" with additional cooling position.

A hidden "Unibox" with a closed cover plate can be upgraded with a temperature control, e.g. with a thermostat with remote control "Uni FH" or "Uni FHC".

2 With the "Cofloor" system Oventrop offers all further components required for the economic installations of the "Unidis" system with local flow distribution. These include base mats as well as the tacker system (base mat rolls and folded boards) and the dry-build system.

3 The Oventrop "Combi-System" consisting of the fittings "Cofit P", "Cofit PD" and "Cofit S" as well as the composition pipe "Copipe" is used for the "Unidis" surface heating system. The "Combi-System" is DVGW registered (reg.-no. DW-8501AT2407).

4 The "Unibox" is connected to the supply and return pipe or heating loop via the fixing channel with the help of pipe connection elbows or pipe connection T-pieces. The pipes have to be cut to length according to the required installation height.