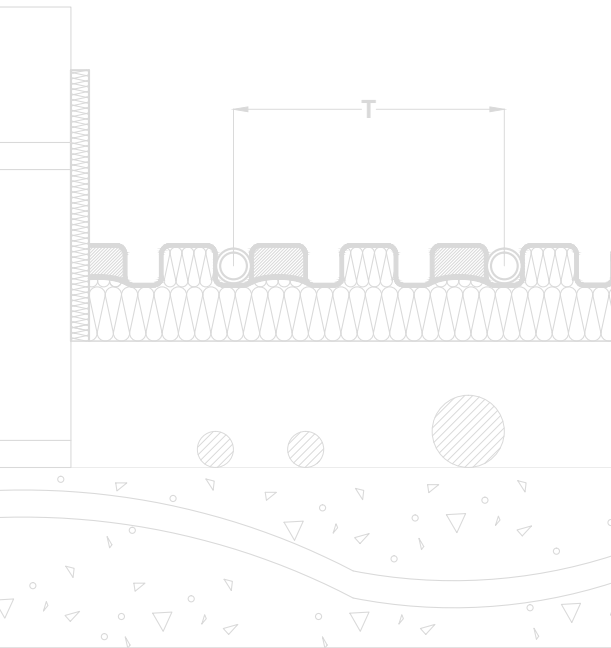
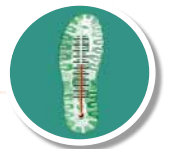


HENCOFLOOR TECHNICAL MANUAL



FLOOR





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Foreword

Quality

Quality is the standard. Henco Industries produces and distributes a complete and coordinated range of top quality products that stand out with their continuous technological innovation. All system components exude Henco's famous reliability.

Multilayer pipe

The heart of the comprehensive range is without doubt the patented multilayer pipe. Under the motto "only the best is good enough", the Henco multilayer pipe was conceived and designed to satisfy the most demanding and diverse possible uses. The result is still the most innovative, multifunctional as well as the most reliable pipe on the international market.

Wide assortment

In addition to this, Henco provides a wide range of top quality products such as manifolds, control units, press, push and compression fittings and tools. In short, everything to be able to offer a complete assortment. All these products are guaranteed for the best quality and are perfectly coordinated to each other.

Inspection certificates

The high level of quality and the reliability of the pipe system is established internationally by the numerous inspection certificates.

Hencofloor

The Henco underfloor heating systems are a logical application of the high quality Henco multilayer pipe and fit perfectly in the Henco product range. The Hencofloor department was set up specially for the underfloor heating systems. Hencofloor is the specialist in the field of underfloor heating and all derived forms of this. Hencofloor has its own engineering department for the technical development of these projects. To be able to guarantee good communication and service to the customer, Hencofloor has its own outside service.

WHY HENCOFLOOR UNDERFLOOR HEATING



1.1 Why Hencofloor underfloor heating

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1.1 Why Hencofloor underfloor heating

Hencofloor offers a full package of high quality products, led by the Henco multilayer pipe. The installation of a high quality pipe with a long lifespan is of paramount importance in an underfloor heating system. After all, the replacement of a pipe system is an expensive job.

In addition to this assortment of top quality products, Hencofloor has an experienced and customer-friendly design office that guarantees the necessary support in all areas.

- Technically supported consulting.
- Detailed layout plan to scale.
- Technical file, full underfloor heating system calculations.
- In-house engineering insurance.
- Close follow-up in consultation with all the involved parties.

This package makes Hencofloor the best partner for your underfloor heating project.



- The underfloor heating system must be 100% oxygen tight, which is guaranteed by providing the Henco multilayer pipe with an aluminium core. This eliminates corrosion in the system.
- The aluminium gives the Henco multilayer pipe excellent conductivity, which is necessary for low-temperature systems.
- The Henco multilayer pipe is very easy to shape due to the aluminium core. This makes it possible to work with the pipe at very low temperatures (to -20°C).

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ADVANTAGES OF UNDERFLOOR HEATING



2.1 Advantages of underfloor heating

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2.1 Advantages of underfloor heating



Energy source

An underfloor heating system works very well with a low supply water temperature. This is possible due to a large radiant surface, in our case the floor surface. Due to the low supply temperature, underfloor heating systems are perfect for combination with energy-efficient heating applications, such as heat pumps, solar panels, etc.



Space-saving

With the application of an underfloor heating system, radiators are often unnecessary.



Hygienic

An underfloor heating system is also more hygienic than a conventional heating system with elements that may or may not be placed against the walls. Dust collects in these elements (radiators, convectors, etc) that is kept circulating in the space by the rising air. This is not the case with underfloor heating.



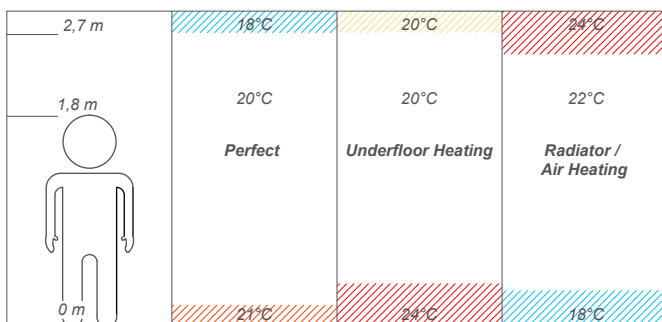
Aesthetic

It is obvious that a space looks better without the interference of heating elements.



Reduced energy consumption

An underfloor heating system approaches the most ideal heat distribution. Other heating systems are much less ideal in this regard. See below.



This property of underfloor heating makes it possible to decrease the room temperature by 2°C relative to other heating systems to produce the same comfort temperature.

A comparison is given here, taking into account that about 50% of radiance that warms the body comes from the floor surface. The comparison illustrates the influence of the floor temperature.

Comfort temperature **without** underfloor heating

- average room temperature of 20°C
- average floor temperature of 18°C

$$\text{Comfort temperature is } \frac{20+18}{2} = 19^\circ\text{C}$$

Comfort temperature **with** underfloor heating

- average room temperature of 20°C
- average floor temperature of 22°C

$$\text{Comfort temperature is } \frac{20+22}{2} = 21^\circ\text{C}$$



Comfort

An underfloor heating system provides a very pleasant heat that perfectly meets our human needs. Once you have experienced this form of heat, you will be convinced that underfloor heating offers a higher level of comfort.

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2 ADVANTAGES OF UNDERFLOOR HEATING

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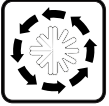
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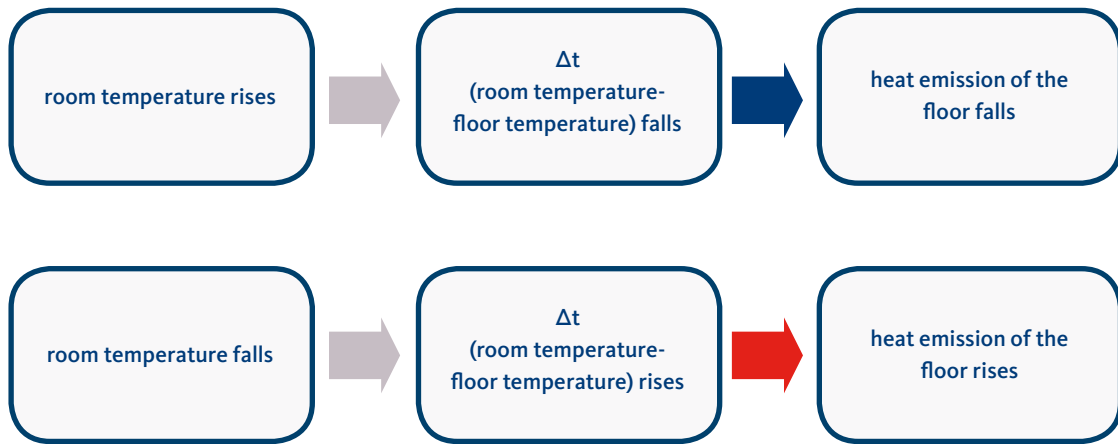
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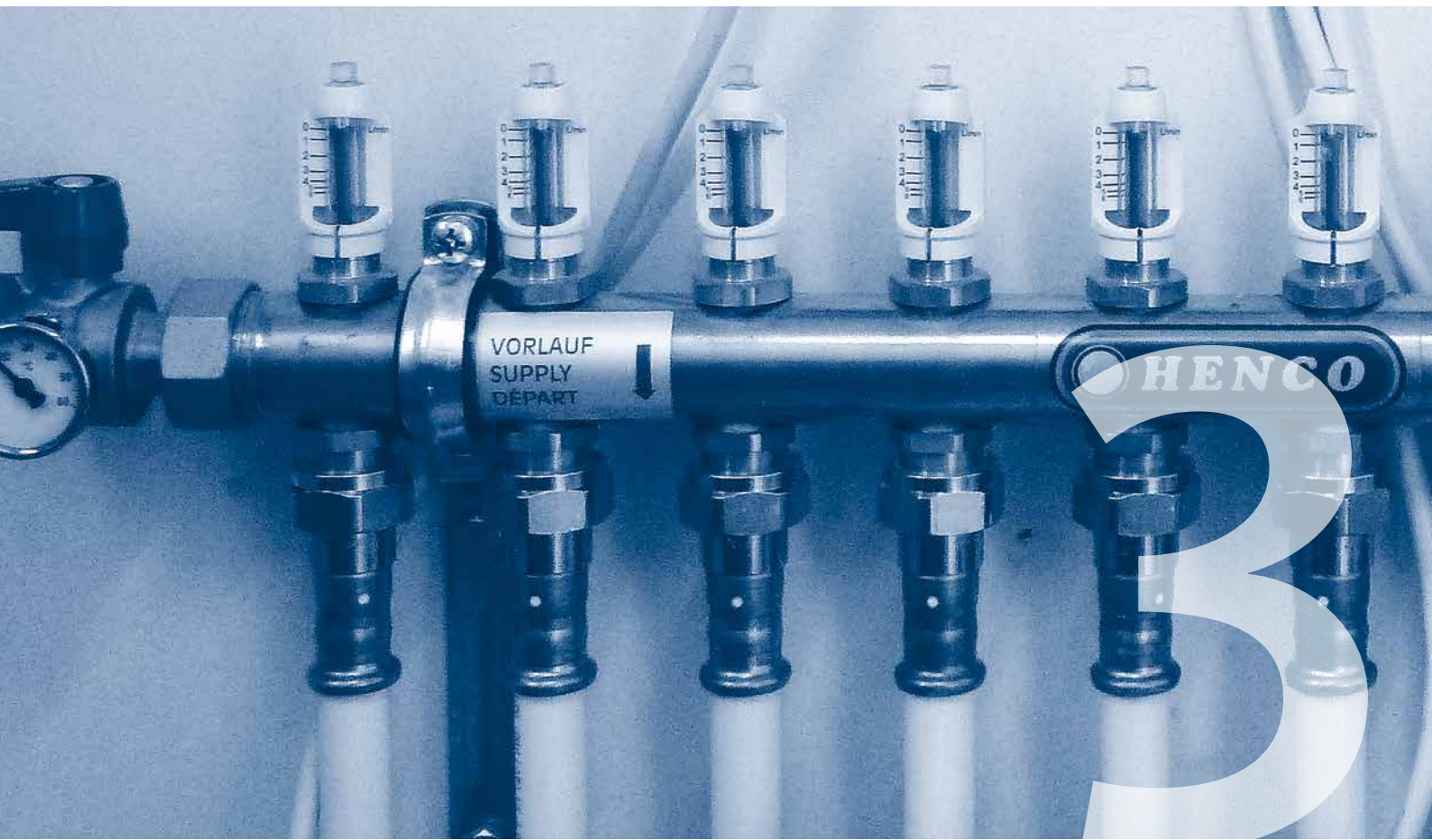


Self-regulating operation

Underfloor heating has a self-regulating effect with regard to the room temperature. This is due to the fact that the heat emission is determined directly by the difference between the room temperature on the one hand and the floor temperature on the other.



SIZING AN UNDERFLOOR HEATING SYSTEM



3.1 Sizing an underfloor heating system

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3 SIZING AN UNDERFLOOR HEATING SYSTEM

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3.1 Sizing an underfloor heating system

When determining how an underfloor heating system must be designed, there are fixed guidelines to follow.

- The basis is a correct heat loss calculation.
- The floor construction is determined.
- The supply temperature is determined on the basis of the heat source.
- The pipe spacing is determined on the basis of the supply temperature and the heat loss to be compensated.

The final design of a project is done by Hencofloor's engineering department. If there is a preliminary design, a heat loss table (calculated according to prEN 1264-2) can be consulted that gives an indicative power per m². Some important information regarding an underfloor heating project is further explained below:

Screed

The screed contains the pipe network and distributes the heat to the room. The screed is floating (a separate whole) and is fully insulated from the supporting construction and the surrounding walls. The weight load of a screed for residential use is between 2 and 4 kN/m² in function of the screed thickness and the compressibility of the underlying insulation (prEN 13163). The advice from Hencofloor assumes a cement-bound screed with minimal coverage of 4.5 cm above the pipe. Reinforcement must be applied in the form of wire with mesh size 50x50-3 mm). This reinforcement can also consist of fibres that are incorporated into the screed. For industrial floors (e.g. concrete) and flowing floors (e.g. anhydrite floors), consultation with the Hencofloor engineering department is always necessary. Other standards may apply with regard to the Hencofloor recommendations.

You must therefore ensure that the specifications of the screed meet these standards.

Centre to centre distance (c.t.c.)

This is the distance between the underfloor heating pipes, measured to the centre points. This distance is determined in relation to the desired heat emission, the desired response time and the foreseen supply water temperature (heat source). The lower the required heat emission, the greater the centre-to-centre distance. The smaller the centre-to-centre distance of the pipe network, the more easily the heat

transmission can take place between the medium (water) and the space to be heated. This will also enable the system to react more quickly.

Edge zone

This is a zone where the pipes are placed at a smaller centre-to-centre distance from each other. The purpose of this is to obtain a higher floor temperature, giving higher heat emission. This is applied as standard at a cold bridge at an outer wall (e.g. windows and doors) in order to compensate the heat loss in this area. An edge zone preferably consists of a separate group and may be a maximum of 1 m wide with regard to the outside wall.

In contemporary residential construction in which residences must meet high insulation and energy requirement, edge zones are not necessary.

- Cold bridges do not occur in today's new construction and renovation.
- The floor temperature is limited.
- When using low temperature sources, the centre-to-centre distance is generally set at the minimum.

Floor temperature

The floor temperature may not become too high, as this can have a negative effect on the human body. With an excessively high floor temperature, the body cannot release sufficient heat at the level of the feet, which causes unnecessary discomfort (swollen feet). That is why the floor temperature is limited according to the function of the space.

<i>Local</i>	<i>maximum floor temperature</i>
• <i>Living room</i>	29 °C
• <i>Passageway/edge zone</i>	33 °C
• <i>Bathroom</i>	33 °C



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Delta T

This is the temperature difference between supply and return. The lower the supply temperature, the smaller the delta T and the greater the required flow will be through a group. For sizing, it is therefore necessary to take into account the working regime of the chosen heat source.

Rtb value (m²K/W)

This value gives the thermal resistance measured above the underfloor heating pipe to the top side of the floor covering. The better the heat conductivity of the screed and the floor covering, the lower the Rtb value will be. Hencofloor recommends always limiting this value to a maximum of 0.20 m²K/W.

The Rt value is the heat resistance of the floor covering. This resistance has a large share in the total thermal resistance Rtb. It is therefore recommended to use a floor covering with good heat conduction properties.

A number of floor finishes are given below with the associated Rt values.

Floor covering	Rt (max. 0.15m ² K/W, Hencofloor recommendation)
• tile (8 mm)	0.015m ² K/W (average)
• linoleum (3 mm)	0.02m ² K/W (average)
• glued parquet (10 mm)	0.05m ² K/W (average)
• laminate (8 mm)	0.07m ² K/W (average)
• carpet (7 mm)	0.1m ² K/W (average)

Remark When a parquet floor is combined with underfloor heating, it is necessary to verify whether the parquet is actually suitable for this and whether or not special requirements need to be met. Hencofloor will always limit the surface temperature of a parquet floor to 27°C.

Supply water temperature

This is the temperature of the supply water that circulates through the groups via the manifold. Changing this temperature has a major effect on the final heat emission. This temperature is determined in relation to the heat source. The supply temperature is always limited. Too high

temperatures can cause damage to the screed and floor covering.

Application	Supply water temperature (prEN1264-4)
• underfloor heating	55°C (maximum)*
• wall heating	50°C (maximum)*
*In practice this value seldom reaches more than 45°C.	

Construction height

This is the height measured from the structural floor to the top side of the finished floor. This includes a concrete slab, an insulation layer, the screed and the floor covering. When sprayed insulation is applied, this may also serve as the levelling layer. In the design of a residence, it is important that the necessary construction height of an underfloor heating system is taken into account.

Floor insulation

The floor insulation is the insulation under the screed. This must be continuous and meet the set requirements. If there is a heated space below, thermal resistivity of 0.75 m²K/W is enough. If the space below is not heated or there is direct contact with the ground, then this value must be at least 1.25 m²K/W. In the case that there is an outside temperature under the screed, a thermal resistivity of at least 2m²K/W is required. (prEN 1264-4).



3 SIZING AN UNDERFLOOR HEATING SYSTEM

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Heat emission table

The parameters to ensure correct use are given here. The heat emission table is **indicative**, the actual heat emission is calculated by the Hencofloor engineering department.

The table gives the heat emission in Watts per m² with the corresponding surface temperature below.

Θ_v supply water temperature in °C / delta T in °C

R_t thermal resistivity of the floor finishing in m²K/W

Θ_u room temperature in °C

T centre-to-centre distance in cm

	Θ_v	45	
Θ_u	R_t	0,02	0,05
16		135	115
		28	27
18		124	105
		29	28
20		112	95
		30	29
		100	



Heat emission table for PE-Xc/AL/PE-Xc multilayer pipe 16 mm

	Θ_v		45°C / ΔT 10°C				40°C / ΔT 8°C				35°C / ΔT 5°C			
	Θ_u	Rt	0,02	0,05	0,1	0,15	0,02	0,05	0,1	0,15	0,02	0,05	0,1	0,15
	T10	16		135	115	90	75	113	96	75	62	94	80	62
			28	27	25	23	27	25	23	22	25	24	22	21
18			124	105	82	68	101	86	67	56	82	70	55	45
			29	28	26	25	28	26	25	24	26	25	24	23
20			112	95	74	62	90	76	60	50	71	60	47	39
			30	29	27	26	29	28	26	25	27	26	25	24
22			100	85	66	55	78	66	52	43	59	50	39	33
			32	30	29	28	30	29	27	27	28	27	26	26
24			89	75	59	49	66	56	44	37	47	40	31	26
			33	31	30	29	31	30	29	28	29	28	28	27

	Θ_v		45°C / ΔT 10°C				40°C / ΔT 8°C				35°C / ΔT 5°C			
	Θ_u	Rt	0,02	0,05	0,1	0,15	0,02	0,05	0,1	0,15	0,02	0,05	0,1	0,15
	T15	16		121	105	81	68	101	88	68	57	84	73	56
			27	26	24	23	26	24	23	22	24	23	22	21
18			110	96	74	63	90	79	61	51	73	64	49	42
			28	27	25	24	27	26	24	23	25	24	23	23
20			100	87	67	68	80	70	54	45	63	55	42	36
			30	28	27	27	28	27	26	25	26	26	25	24
22			90	78	60	51	70	60	47	39	53	46	35	30
			31	30	28	27	29	28	27	26	28	27	26	25
24			79	69	53	45	59	51	40	33	42	37	28	24
			32	31	30	29	30	29	28	28	29	28	27	27

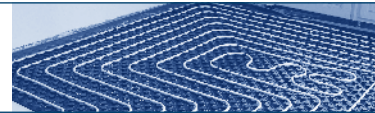
	Θ_v		45°C / ΔT 10°C				40°C / ΔT 8°C				35°C / ΔT 5°C			
	Θ_u	Rt	0,02	0,05	0,1	0,15	0,02	0,05	0,1	0,15	0,02	0,05	0,1	0,15
	T20	16		108	96	73	63	90	80	61	52	75	67	51
			26	25	23	22	25	24	22	21	23	23	21	21
18			99	88	69	57	81	72	55	47	66	58	44	38
			27	27	25	24	26	25	24	23	25	24	23	22
20			90	80	60	52	72	64	48	41	56	50	38	33
			29	28	26	25	27	26	25	25	26	25	24	24
22			80	71	54	46	62	55	42	36	47	42	32	27
			30	30	28	27	28	28	27	26	27	27	26	25
24			70	63	48	41	53	47	36	31	38	34	26	22
			31	30	29	28	30	29	28	28	28	28	27	27

	Θ_v		45°C / ΔT 10°C				40°C / ΔT 8°C				35°C / ΔT 5°C			
	Θ_u	Rt	0,02	0,05	0,1	0,15	0,02	0,05	0,1	0,15	0,02	0,05	0,1	0,15
	T22.5	16		102	92	69	60	85	77	58	50	71	64	48
			26	25	23	22	24	24	22	21	23	22	21	21
18			94	84	64	55	77	69	52	45	62	56	42	36
			27	26	24	24	26	25	23	23	24	24	23	22
20			85	76	57	50	68	61	46	40	53	48	36	31
			28	28	26	25	27	26	25	24	26	25	24	24
22			76	68	52	45	59	53	40	34	45	40	30	26
			30	29	27	27	28	28	26	26	27	26	26	25
24			67	60	45	40	50	45	34	29	36	32	24	21
			31	30	29	28	29	29	28	27	28	28	27	27

OVERVIEW OF THE DIFFERENT SYSTEMS



4.1	Overview of the different systems	15
4.2	System plate	16
4.3	Tacker	25
4.4	U-profile	28
4.5	Steel mesh	31
4.6	Dry system	34
4.7	Special applications	37



4.1 Overview of the different systems

Hencofloor has a wide range of underfloor heating systems in its product assortment. An overview of the different systems is given below together with the Hencofloor system names.

a) System plate

■ PRO – 30	p. 16
■ PRO – 11	p. 19
■ PRO – budget	p. 22

b) Tacker

■ CLIP	p. 25
■ CLIPQ (flowing floors)	p. 25

c) U-profile

■ U-ONE	p. 28
■ U-DOUBLE	p. 28

d) Steel mesh

■ MAZE – K (clamps)	p. 31
■ MAZE – V (ties)	p. 31

e) Dry system

■ OMEGA	p. 34
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f) Special applications

INDUSTRIAL APPLICATIONS

■ WORK	p. 37
■ WORK PRO	p. 38

CONCRETE CORE ACTIVATION

■ CCA	p. 39
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TUNNEL CONSTRUCTION

■ CLIP-C	p. 39
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SNOW AND ICE CLEARING

■ F ²	p. 39
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OUTDOOR APPLICATIONS

■ SPORTS	p. 39
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WALL HEATING

■ U-ONE	p. 40
■ OMEGA	p. 41

Special applications are always worked out in detail by the Hencofloor engineering department.

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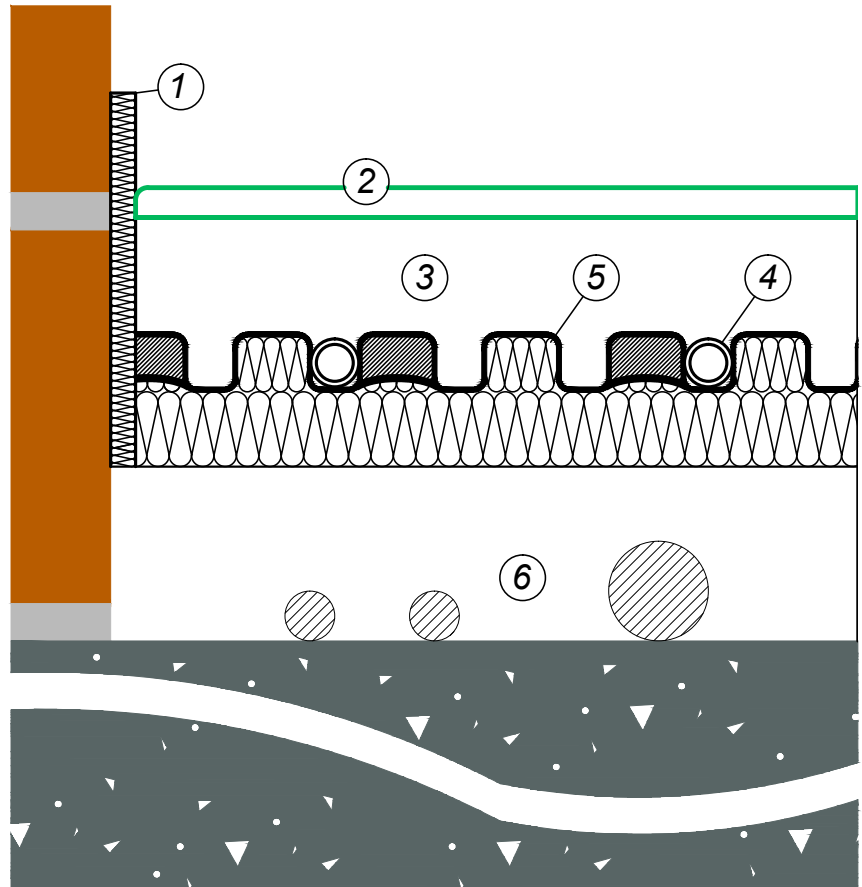
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4 OVERVIEW OF THE DIFFERENT SYSTEMS

4.1 System plate

4.2.1.1 PRO-30

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed
- 4 Underfloor heating pipe
- 5 System plate
- 6 Concrete slab



- Construction height:
 - Thickness of the concrete slab (e.g. 6 cm)
 - System plate thickness (3 cm)
 - Screed thickness (*)
 - Floor covering thickness (e.g. 1 cm)
- Centre-to-centre distance
 - horizontal/vertical: 100, 150, 200 mm
 - diagonal: 70, 140, 210 mm
- Pipe diameter: $\varnothing 16$, $\varnothing 17$ mm

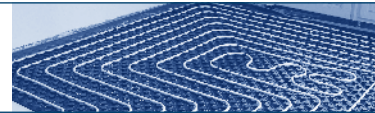
Description

This is an underfloor heating system in which the pipe is mounted in a pre-formed system plate. The system can be installed quickly and requires no specialized tools. It is important that the system plate is installed on a completely flat surface. A maximum of **one extra insulation layer** can be applied under the system plate.

The system name is extended with an additional number when an extra flat insulation board is applied underneath the system plate.

PRO - 30	without additional insulation
PRO - 302	with flat insulation sheet 2 cm
PRO - 303	with flat insulation sheet 3 cm

*Thickness of the screed in accordance with the applicable standard. Hencofloor advises a minimal cover of 4.5 cm above the pipe.



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4.2.1.2 System materials

The following materials are part of the PRO-30 system.
The underfloor heating pipe diameters 16 and 17 mm can both be used with this system plate.

UFH-ISOPRO30	system plate 30 mm
UFH-ISO20	¹ flat insulation sheet 20 mm (PRO-302)
UFH-ISO30	¹ flat insulation sheet 30 mm (PRO-303)
UFH-ISOBOARD	² edge insulation
UFH-DH40	joint put-through casing
UFH-ADN10	² additive for sand cement screed
UFH-DP200	expansion joint
UFH-PRO-DIA	³ diagonal holder for system plate
UFH-ISOPRO-AD30	³ 30 mm insulating threshold piece for system plate
UFH-ISOPRO-ADA	³ threshold piece made of PS for system plate
UFH-PLUG80	⁴ installation plug for flat insulation sheet

1) Change of system name with use of extra flat insulation board.

2) This product is available in several models.

3) These products are accessories for the system plate.

4) These products are accessories for the flat insulation sheet.

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4.2.1.3 Installation guidelines for system plate

Installation (see chapter 5)

The space must be provided clean. If there is a flat insulation sheet under the system plate, this must be installed first. Now apply the edge insulation along all the walls and constructions that come into contact with the screed. The PE flap of the edge insulation must be placed on the inner side of the space. The system plate is then applied to the cleaned supporting floor or on the flat insulation sheet that has already been installed. System plates are connected together with the PS flap provided with matching knobs. The PE flap of the edge insulation is pressed onto the system plate and then further clipped into the system plate with the pipe.

After approval of the layout plan and the associated technical appendix, you can start placing the underfloor heating pipe. The pipe is laid from the outside toward the centre (spiral pattern). A distance between the pipes of 2 times the given centre-to-centre distance is maintained until the middle point of the area has been reached. A 180° loop is then made to then work back outwards between the pipe already laid. In this way the pipes are spaced according to the specified centre-to-centre distance.

Pressure test

Once the underfloor heating pipes are connected to the manifold, the installation is filled. In this, each group is filled separately to remove all air from the installation. A pressure test is then done at a pressure of a minimum of 6 and a maximum of 10 bar (according to the properties of the manifold). This pressure will be maintained for 24 hours and may drop by about 1 bar.

Screed (sand cement)

An additive is used in the cement of the screed to improve the wear resistance and the viscosity of the screed. In this way an optimal contact between the pipe and cement is obtained. The cement is applied in the lengthwise direction and pressed against the pipe.

The correct quantity of additive is specified by Hencofloor. The minimum thickness of the screed above the pipe is 4.5 cm. The screed is provided with a reinforcing mesh (mesh size: 50 x 50 - 3 mm) or with reinforcing fibres. The underfloor heating pipe must cross the expansion joint as little as possible. Where this does occur, the pipe is kept loose over a length of 50 cm centred on the expansion gap. The pipe is provided here with a joint put-through housing that resists the weight of the screed. In this way, the pipe can move freely across the expansion joint.

The expansion joints are placed as indicated in the layout plan. As standard, these are provided in areas larger than 40 m². An area must always be rectangular. If necessary, expansion joints can be used to divide an area into rectangles. The length - width proportion of such a rectangle may not be more than 2 to 1.

Expansion joints must be provided at corners of the building structure that cut into a surface with underfloor heating.

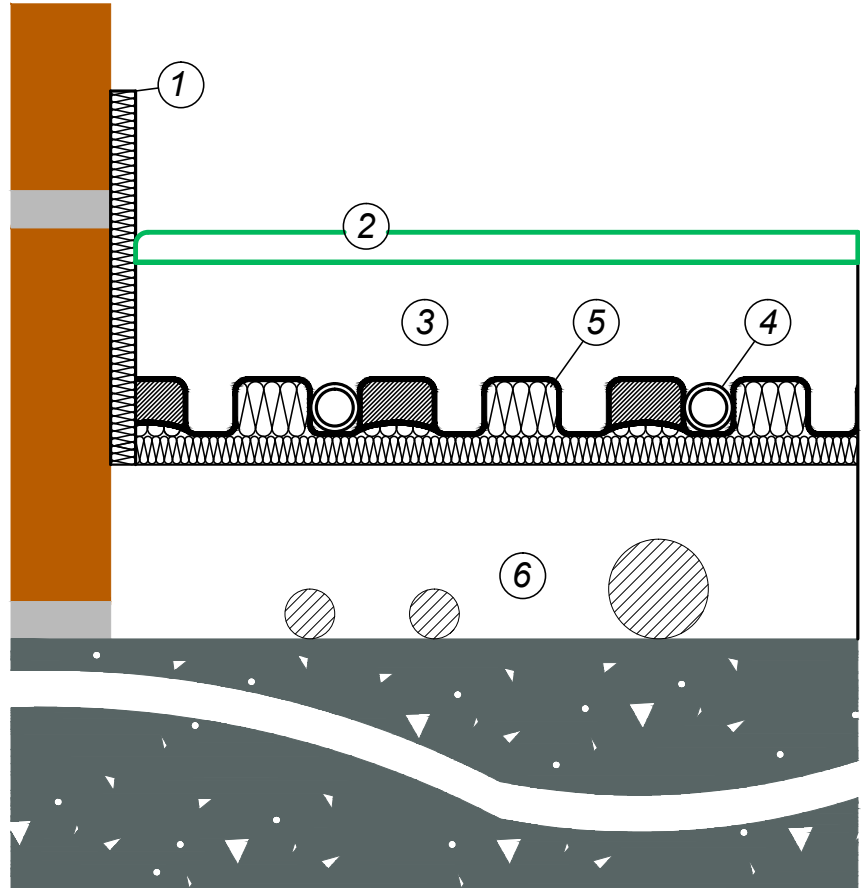
Starting up the installation

This operation may only be done after the screed has cured. The curing time is about 4 days per 1 cm thickness of the screed with a minimum of 28 days. The underfloor heating installation may in no case be used before the screed has cured. When starting up, begin with a supply temperature equal to the room temperature. The supply water temperature is increased by 5 °C per day until the maximum operational temperature is then maintained for 3 days. The supply water temperature is then lowered in the same way to the desired level.



4.2.2.1 ■ PRO-11

- | | |
|---|-------------------------|
| 1 | Edge insulation |
| 2 | Floor finishing |
| 3 | Screed |
| 4 | Underfloor heating pipe |
| 5 | System plate |
| 6 | Concrete slab |



- Construction height:
 - Thickness of the concrete slab (e.g. 6 cm)
 - System plate thickness (1.1 cm)
 - Screed thickness (*)
 - Floor covering thickness (e.g. 1 cm)
- Centre-to-centre distance
 - horizontal/vertical: 100, 150, 200 mm
 - diagonal: 70, 140, 210 mm
- Pipe diameter: $\varnothing 16$, $\varnothing 17$ mm

Description

This is an underfloor heating system in which the pipe is mounted in a pre-formed system plate. The system can be installed quickly and requires no specialized tools. It is important that the system plate is installed on a completely flat surface. A maximum of **one extra insulation layer** can be applied under the system plate.

The system name is extended with an additional number when an extra flat insulation board is applied underneath the system plate.

PRO - 11	without additional insulation
PRO - 112	with flat insulation sheet 2 cm
PRO - 113	with flat insulation sheet 3 cm

*Thickness of the screed in accordance with the applicable standard. Hencofloor advises a minimal cover of 4.5 cm above the pipe.

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4.2.2.2 System materials

The following materials are part of the PRO-11 system.

The underfloor heating pipe diameters 16 and 17 mm can both be used with this system plate.

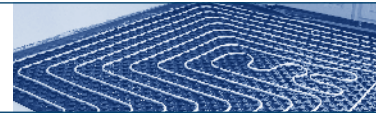
UFH-ISOPRO11	system plate 11 mm
UFH-ISO20	¹ flat insulation sheet 20 mm (PRO-112)
UFH-ISO30	¹ flat insulation sheet 30 mm (PRO-113)
UFH-ISOBOARD	² edge insulation
UFH-DH40	joint put-through casing
UFH-ADN10	² additive for sand cement screed
UFH-DP200	expansion joint
UFH-PRO-DIA	³ diagonal holder for system plate
UFH-ISOPRO-AD11	³ threshold piece 11 mm made of insulation for system plate
UFH-ISOPRO-ADA	³ threshold piece made of PS for system plate
UFH-PLUG80	⁴ installation plug for flat insulation sheet

1) Change of system name with use of extra flat insulation board.

2) This product is available in several models.

3) These products are accessories for the system plate.

4) These products are accessories for the flat insulation sheet.



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4.2.1.3 Installation guidelines for system plate

Installation (see chapter 5)

The space must be provided clean. If there is a flat insulation sheet under the system plate, this must be installed first. Now apply the edge insulation along all the walls and constructions that come into contact with the screed. The PE flap of the edge insulation must be placed on the inner side of the space. The system plate is then applied to the cleaned supporting floor or on the flat insulation sheet that has already been installed. System plates are connected together with the PS flap provided with matching knobs. The PE flap of the edge insulation is pressed onto the system plate and then further clipped into the system plate with the pipe.

After approval of the layout plan and the associated technical appendix, you can start placing the underfloor heating pipe. The pipe is laid from the outside toward the centre (spiral pattern). A distance between the pipes of 2 times the given centre-to-centre distance is maintained until the middle point of the area has been reached. A 180° loop is then made to then work back outwards between the pipe already laid. In this way the pipes are spaced according to the specified centre-to-centre distance.

Pressure test

Once the underfloor heating pipes are connected to the manifold, the installation is filled. In this, each group is filled separately to remove all air from the installation. A pressure test is then done at a pressure of a minimum of 6 and a maximum of 10 bar (according to the properties of the manifold). This pressure will be maintained for 24 hours and may drop by about 1 bar.

Screed (sand cement)

An additive is used in the cement of the screed to improve the wear resistance and the viscosity of the screed. In this way an optimal contact between the pipe and cement is obtained. The cement is applied in the lengthwise direction and pressed against the pipe.

The correct quantity of additive is specified by Hencofloor. The minimum thickness of the screed above the pipe is 4.5 cm. The screed is provided with a reinforcing mesh (mesh size: 50 x 50 - 3 mm) or with reinforcing fibres. The underfloor heating pipe must cross the expansion joint as little as possible. Where this does occur, the pipe is kept loose over a length of 50 cm centred on the expansion joint. Here, the pipe is provided with a joint put-through housing that resists the weight of the screed. In this way, the pipe can move freely across the expansion joint.

The expansion joints are placed as indicated in the layout plan. As standard, these are provided in areas larger than 40 m². An area must always be rectangular. If necessary, expansion joints can be used to divide an area into rectangles. The length - width proportion of such a rectangle may not be more than 2 to 1.

Expansion joints must be provided at corners of the building structure that cut into a surface with underfloor heating.

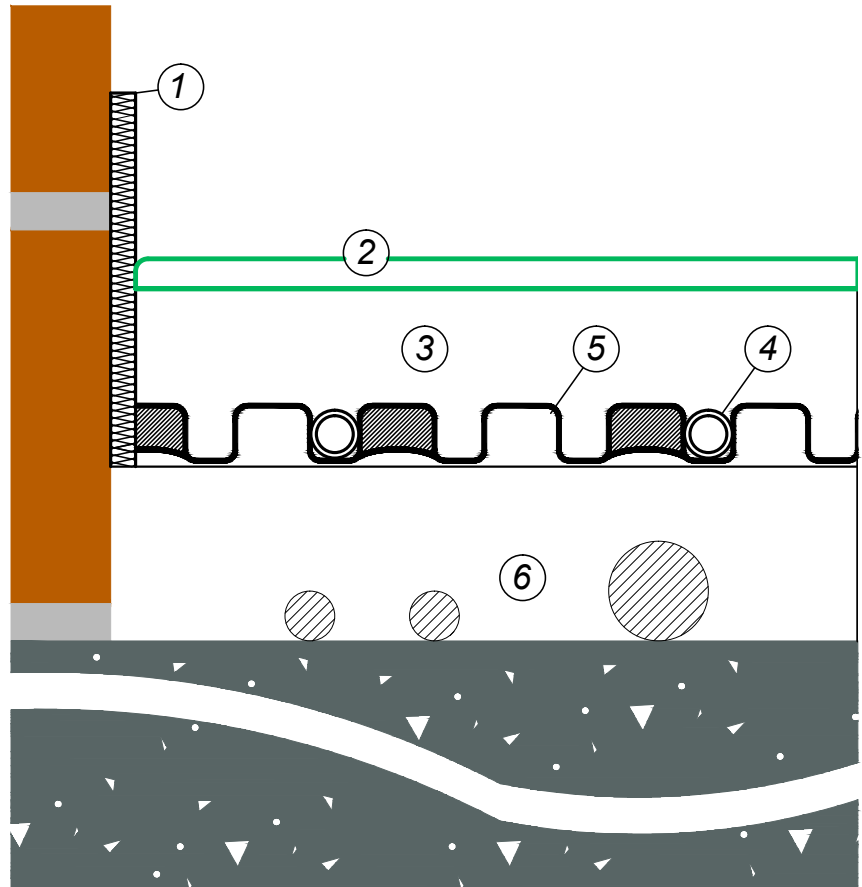
Starting up the installation

This operation may only be done after the screed has cured. The curing time is about 4 days per 1 cm thickness of the screed with a minimum of 28 days. The underfloor heating installation may in no case be used before the screed has cured. When starting up, begin with a supply temperature equal to the room temperature. The supply water temperature is increased by 5 °C per day until the maximum operational temperature is then maintained for 3 days. The supply water temperature is then lowered in the same way to the desired level.

4 OVERVIEW OF THE DIFFERENT SYSTEMS

4.2.3.1 ■ PRO-Budget

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed
- 4 Underfloor heating pipe
- 5 System sheeting
- 6 Insulated concrete slab



- Construction height:
 - Thickness of the concrete slab (e.g. 6 cm)
 - Thickness of system sheeting
 - Screed thickness (*)
 - Floor covering thickness (e.g. 1 cm)
- Centre-to-centre distance
 - horizontal/vertical: 100, 150, 200 mm
 - diagonal: 70, 140, 210 mm
- Pipe diameter: $\varnothing 16$, $\varnothing 17$ mm

Description

This is an underfloor heating system in which the pipe is mounted in a pre-formed system sheeting. The system can be installed quickly and requires no specialized tools. This application works very well where an insulating substrate has already been applied. This system is however not recommended with underfloor cooling (to prevent possible condensation forming in the hollow knobs).

*Thickness of the screed in accordance with the applicable standard. Hencofloor advises a minimal cover of 4.5 cm above the pipe.



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4.2.3.2 System materials

The following materials are part of the PRO-Budget system.
The underfloor heating pipe with diameters 16 and 17 mm can both be used with this system sheeting.

UFH-PRO	system sheeting
UFH-ISOBORD	¹ edge insulation
UFH-DH40	joint put-through casing
UFH-ADN10	¹ additive for sand cement screed
UFH-DP200	expansion joint
UFH-PRO-DIA	² diagonal holder for system sheeting
UFH-ISOPRO-ADA	² threshold piece made of PS for system plate
UFH-FOIL-CLIP25	² sheeting clip

*1) This product is available in several models.
2) These products are accessories for the system sheeting.*

4.2.1.3 Installation guidelines for system plate

Installation (see chapter 5)

The space must be provided clean. If there is a flat insulation sheet under the system plate, this must be installed first. Now apply the edge insulation along all the walls and constructions that come into contact with the screed. The PE flap of the edge insulation must be placed on the inner side of the space. The system plate is then applied to the cleaned supporting floor or on the flat insulation sheet that has already been installed. System plates are connected together with the PS flap provided with matching knobs. The PE flap of the edge insulation is pressed onto the system plate and then further clipped into the system plate with the pipe.

After approval of the layout plan and the associated technical appendix, you can start placing the underfloor heating pipe. The pipe is laid from the outside toward the centre (spiral pattern). A distance between the pipes of 2 times the given centre-to-centre distance is maintained until the middle point of the area has been reached. A 180° loop is then made to then work back outwards between the pipe already laid. In this way the pipes are spaced according to the specified centre-to-centre distance.

Pressure test

Once the underfloor heating pipes are connected to the manifold, the installation is filled. In this, each group is filled separately to remove all air from the installation. A pressure test is then done at a pressure of a minimum of 6 and a maximum of 10 bar (according to the properties of the manifold). This pressure will be maintained for 24 hours and may drop by about 1 bar.

Screed (sand cement)

An additive is used in the cement of the screed to improve the wear resistance and the viscosity of the screed. In this way an optimal contact between the pipe and cement is obtained. The cement is applied in the lengthwise direction and pressed against the pipe.

The correct quantity of additive is specified by Hencofloor. The minimum thickness of the screed above the pipe is 4.5 cm. The screed is provided with a reinforcing mesh (mesh size: 50 x 50 - 3 mm) or with reinforcing fibres. The underfloor heating pipe must cross the expansion joint as little as possible. Where this does occur, the pipe is kept loose over a length of 50 cm centred on the expansion joint. Here, the pipe is provided with a joint put-through housing that resists the weight of the screed. In this way, the pipe can move freely across the expansion joint.

The expansion joints are placed as indicated in the layout plan. As standard, these are provided in areas larger than 40 m². An area must always be rectangular. If necessary, expansion joints can be used to divide an area into rectangles. The length - width proportion of such a rectangle may not be more than 2 to 1.

Expansion joints must be provided at corners of the building structure that cut into a surface with underfloor heating.

Starting up the installation

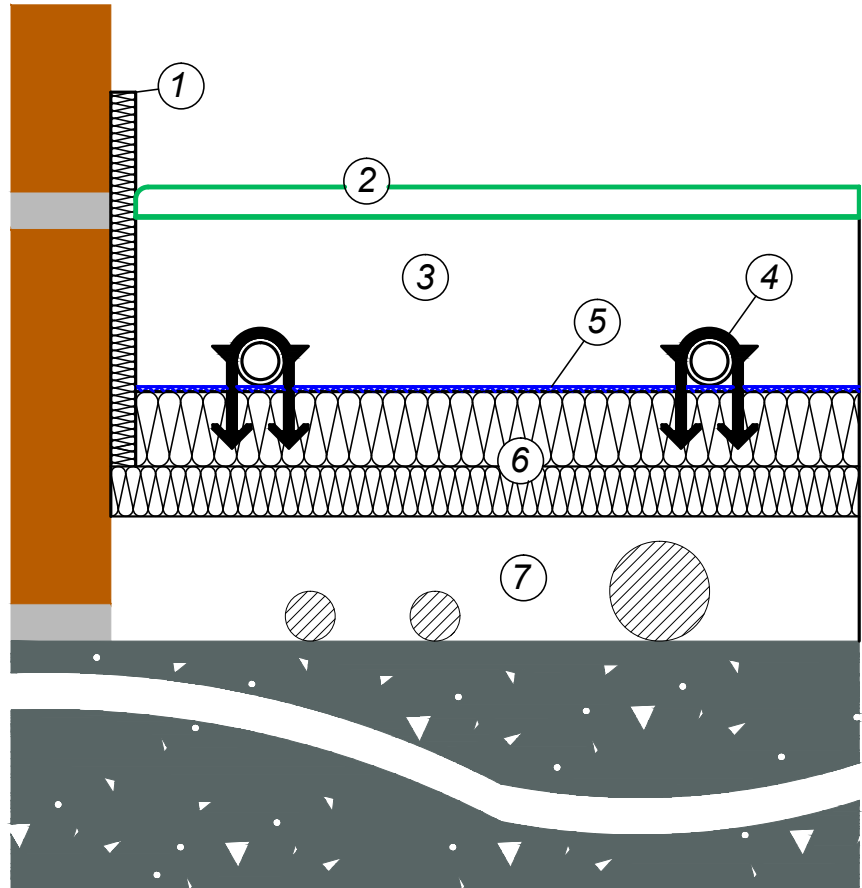
This operation may only be done after the screed has cured. The curing time is about 4 days per 1 cm thickness of the screed with a minimum of 28 days. The underfloor heating installation may in no case be used before the screed has cured. When starting up, begin with a supply temperature equal to the room temperature. The supply water temperature is increased by 5 °C per day until the maximum operational temperature is then maintained for 3 days. The supply water temperature is then lowered in the same way to the desired level.



4.3 Tacker

4.3.1 ■ CLIP / CLIPQ (liquid floors)

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| 1 | Edge insulation |
| 2 | Floor finishing |
| 3 | Screed |
| 4 | Underfloor heating pipe with tacker clip |
| 5 | Vapour barrier |
| 6 | Flat insulation sheet |
| 7 | Concrete slab |



- Construction height:
 - Thickness of the concrete slab (e.g. 6 cm)
 - Thickness of the insulation (e.g. 5 cm)
 - Screed thickness (*)
 - Floor covering thickness (e.g. 1 cm)
- Centre-to-centre distance: 100, 150, 200 mm
- Pipe diameter: $\varnothing 16$, $\varnothing 17$, $\varnothing 18$, $\varnothing 20$ mm

Description

This is an underfloor heating system in which the pipe is secured by means of tacker clips, a commonly used system to install underfloor heating in large areas. For the placement of the tacker clips, it is necessary to use a corresponding tacker tool. An average of 3 tacker clips are needed for one metre of pipe. The length of the tacker is determined by the underlying insulation thickness.

The system name is extended with an additional number 20, 30, 40, 50 or 60. This number indicates the thickness (mm) of the underlying flat insulation.

CLIP - 20	CLIP - 30
CLIP - 40	CLIP - 50
CLIP - 60	

*Thickness of the screed in accordance with the applicable standard. Hencofloor advises a minimal cover of 4.5 cm above the pipe.

4.3.2 System materials

The following materials are part of the CLIP system.
The underfloor heating pipe with diameter 16, 17, 18, 20 mm can be used with this application.

UFH-TACK-40	tacker clip 40 mm (pipe diameters 16, 17, 18, 20 mm)
UFH-TACK-60	tacker clip 60 mm (pipe diameters 16, 17, 18, 20 mm)
UFH-TACK-38	¹ tacker clip 38 mm (pipe diameter 16 mm) (CLIPQ-20 to 60)
UFH-ISO20	² flat insulation sheet 20 mm (CLIP-20 to 60)
UFH-ISO30	² flat insulation sheet 30 mm (CLIP-20 to 60)
UFH-TACK-KLS	³ tacker sheet insulation
UFH-TACK-ROL	³ roll insulation
UFH-SCOTCH-66	sticky tape for folding board insulation in roll
UFH-FOIL-R5050	PE sheeting with grid marking
UFH-FOIL-CLIP25	⁴ sheeting clip
UFH-ISOBORD	³ edge insulation
UFH-DH40	joint put-through housing
UFH-ADN10	³ additive for sand cement screed
UFH-DP200	expansion joint
UFH-PLUG80	⁵ installation plug for flat insulation sheet

1) Tacker clip for flowing floors (this requires the appropriate tacker tool).

2) Change of system name with use of extra flat insulation board.

3) This product is available in several models.

4) These products are accessories for the PE sheeting.

5) These products are accessories for the flat insulation sheet



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4.3.3 Tacker installation instructions

Installation (see chapter 5)

The space must be provided clean. First apply the edge insulation along all the walls and constructions that come into contact with the screed. The PE flap of the edge insulation must be placed on the inner side of the space. If two layers of insulation are provided, the underlying insulation layer must be placed prior to installation of the edge insulation. For two layers of flat insulation, always place these two layers crosswise to each other. Where necessary the insulation is anchored to the construction floor with the plugs designed for this.

PE sheeting is then placed on the insulation (min. 15 cm overlapping). This PE sheeting must be provided with grid marking, in order to enable clear orientation when installing the pipe. Anchor the PE sheeting with the clips for this. The flap of the edge insulation is placed on top of the PE sheeting. After approval of the layout plan and the associated technical appendix, you can start placing the underfloor heating pipe. The pipe is laid from the outside toward the centre (spiral pattern). A distance between the pipes of 2 times the given centre-to-centre distance is maintained until the middle point of the area has been reached. A 180° loop is then made to then work back outwards between the pipe already laid. In this way the pipes are spaced according to the specified centre-to-centre distance.

Once the underfloor heating pipe is placed, secure it to the insulation with the tacker clips. Ensure that enough tacker clips are used so that the pipe lies against the insulation at all points.

Pressure test

Once the underfloor heating pipes are connected to the manifold, the installation is filled. In this, each group is filled separately to remove all air from the installation. A pressure test is then done at a pressure of a minimum of 6 and a maximum of 10 bar (according to the properties of the manifold). This pressure will be maintained for 24 hours and may drop by about 1 bar.

Screed (sand cement)

An additive is used in the cement of the screed to improve the wear resistance and the viscosity of the screed. In this way an optimal contact between the pipe and cement is obtained. The cement is applied in the lengthwise direction and pressed against the pipe.

The correct quantity of additive is specified by Hencofloor. The minimum thickness of the screed above the pipe is 4.5 cm. The screed is provided with a reinforcing mesh (mesh size: 50 x 50 - 3 mm) or with reinforcing fibres. The underfloor heating pipe must cross the expansion joint as little as possible. Where this does occur, the pipe is kept loose over a length of 50 cm centred on the expansion joint. The pipe is provided here with a joint put-through housing that resists the weight of the screed. In this way, the pipe can move freely across the expansion joint.

The expansion joints are placed as indicated in the layout plan. As standard, these are provided in areas larger than 40 m². An area must always be rectangular. If necessary, expansion joints can be used to divide an area into rectangles. The length - width proportion of such a rectangle may not be more than 2 to 1.

Expansion joints must be provided at corners of the building structure that cut into a surface with underfloor heating.

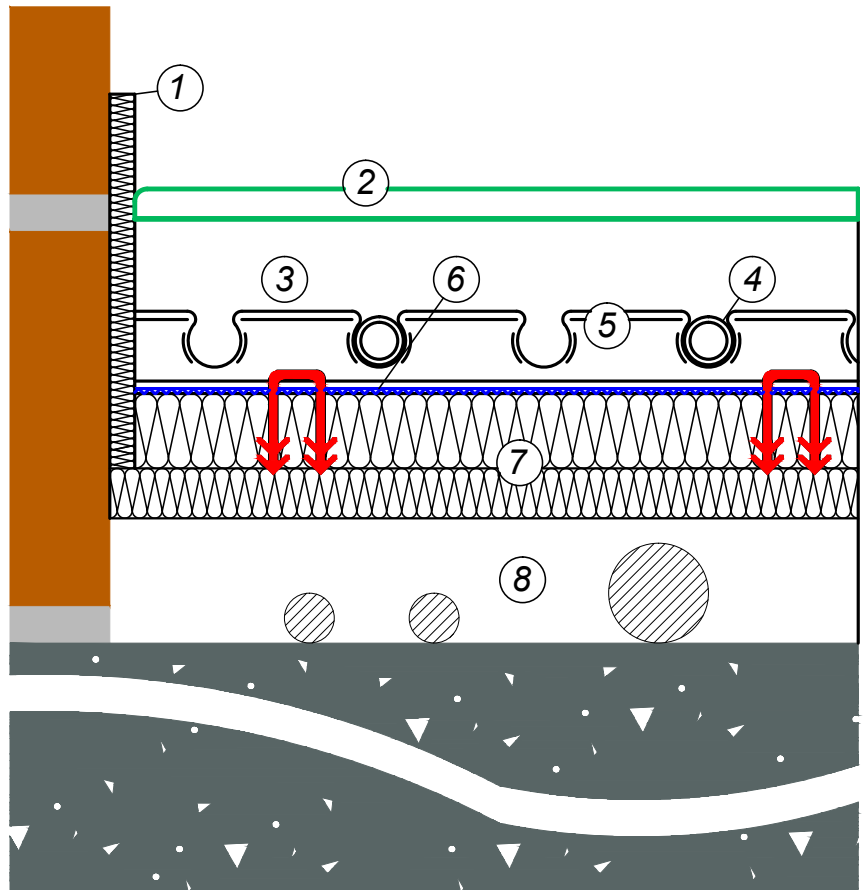
Starting up the installation

This operation may only be done after the screed has cured. The curing time is about 4 days per 1 cm thickness of the screed with a minimum of 28 days. The underfloor heating installation may in no case be used before the screed has cured. When starting up, begin with a supply temperature equal to the room temperature. The supply water temperature is increased by 5 °C per day until the maximum operational temperature is then maintained for 3 days. The supply water temperature is then lowered in the same way to the desired level.

4.4 U-profile

4.4.1 U-ONE / U-DOUBLE

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|---|-------------------------|
| 1 | Edge insulation |
| 2 | Floor finishing |
| 3 | Screed |
| 4 | Underfloor heating pipe |
| 5 | U-profile |
| 6 | Vapour barrier |
| 7 | Flat insulation sheet |
| 8 | Concrete slab |



- Construction height:
 - Thickness of the concrete slab (e.g. 6 cm)
 - Thickness of the insulation (e.g. 5 cm)
 - Screed thickness (*)
 - Floor covering thickness (e.g. 1 cm)
- Centre-to-centre distance: 100, 150, 200 mm
- Pipe diameter: $\varnothing 16$, $\varnothing 17$, $\varnothing 18$, $\varnothing 20$ mm

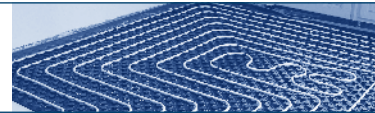
Description

This is an underfloor heating system in which the pipe is mounted in a U-profile. The system can be installed quickly and requires no specialized tools. The U-profile can be secured with fixing tacks.

The system name is extended with an additional number 20, 30, 40, 50 or 60. This number indicates the thickness (mm) of the underlying flat insulation.

U-ONE - 20	U-DOUBLE - 20
U-ONE - 30	U-DOUBLE - 30
U-ONE - 40	U-DOUBLE - 40
U-ONE - 50	U-DOUBLE - 50
U-ONE - 60	U-DOUBLE - 60

*Thickness of the screed in accordance with the applicable standard. Hencofloor advises a minimal cover of 4.5 cm above the pipe.



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4.4.2 System materials

The following materials are part of the U-ONE or U-DOUBLE system.

The underfloor heating pipe with diameter 16, 17, 18, 20 mm can be used with this application.

UFH-UP-16M1	U-profile 1 m (pipe diameter 16 mm) (U-ONE)
UFH-UP	U-profile 2.5 m (pipe diameter 16, 17, 18, 20 mm) (U-DOUBLE)
UFH-UP-CUP50	fixing tack for U-profile
UFH-ISO20	¹ flat insulation sheet 20 mm (U-ONE-20 to 60) (U-DOUBLE-20 to 60)
UFH-ISO30	¹ flat insulation sheet 30 mm (U-ONE-20 to 60) (U-DOUBLE-20 to 60)
UFH-FOIL-R5050	PE sheeting with grid marking
UFH-FOIL-CLIP25	² sheeting clip
UFH-ISOBORD	³ edge insulation
UFH-DH40	joint put-through housing
UFH-ADN10	³ additive for sand cement screed
UFH-DP200	expansion joint
UFH-PLUG80	⁴ mounting plug for flat insulation sheet

1) Change of system name with use of extra flat insulation board.

2) These products are accessories for the PE sheeting.

3) This product is available in several models.

4) These products are accessories for the flat insulation board.

4.4.3 U-profile installation instructions

Installation (see chapter 5)

The space must be provided clean. First apply the edge insulation along all the walls and constructions that come into contact with the screed. The PE flap of the edge insulation must be placed on the inner side of the space. If two layers of insulation are provided, the underlying insulation layer must be placed prior to installation of the edge insulation. For two layers of flat insulation, always place these two layers crosswise to each other. Where necessary the insulation is further anchored to the structural floor with the plugs designed for this.

PE sheeting is then placed on the insulation (min. 15 cm overlapping). This PE sheeting must be provided with grid marking, in order to enable clear orientation when installing the pipe. Anchor the PE sheeting with the clips for this. The flap of the edge insulation is placed on top of the PE sheeting. After approval of the layout plan and the associated technical appendix, you can start placing the underfloor heating pipe.

Then place the U-profiles in accordance with the postulated layout plan. The pipe is laid from the outside toward the centre (spiral pattern). A distance between the pipes of 2 times the given centre-to-centre distance is maintained until the middle point of the area has been reached. A 180° loop is then made here to then work back outwards between already laid pipe. In this way the pipes are spaced according to the specified centre-to-centre distance.

Pressure test

Once the underfloor heating pipes are connected to the manifold, the installation is filled. In this, each group is filled separately to remove all air from the installation. A pressure test is then done at a pressure of a minimum of 6 and a maximum of 10 bar (according to the properties of the manifold). This pressure will be maintained for 24 hours and may drop by about 1 bar.

Screed (sand cement)

An additive is used in the cement of the screed to improve the wear resistance and the viscosity of the screed. In this way an optimal contact between the pipe and cement is obtained. The cement is applied in the lengthwise direction and pressed against the pipe.

The correct quantity of additive is specified by Hencofloor. The minimum thickness of the screed above the pipe is 4.5 cm. The screed is provided with a reinforcing mesh (mesh size: 50 x 50 - 3 mm) or with reinforcing fibres. The underfloor heating pipe must cross the expansion joint as little as possible. Where this does occur, the pipe is kept loose over a length of 50 cm centred on the expansion joint. The pipe is provided here with a joint put-through housing that resists the weight of the screed. In this way, the pipe can move freely across the expansion joint.

The expansion joints are placed as indicated in the layout plan. As standard, these are provided in areas larger than 40 m². An area must always be rectangular. If necessary, expansion joints can be used to divide an area into rectangles. The length - width proportion of such a rectangle may not be more than 2 to 1.

Expansion joints must be provided at corners of the building structure that cut into a surface with underfloor heating.

Starting up the installation

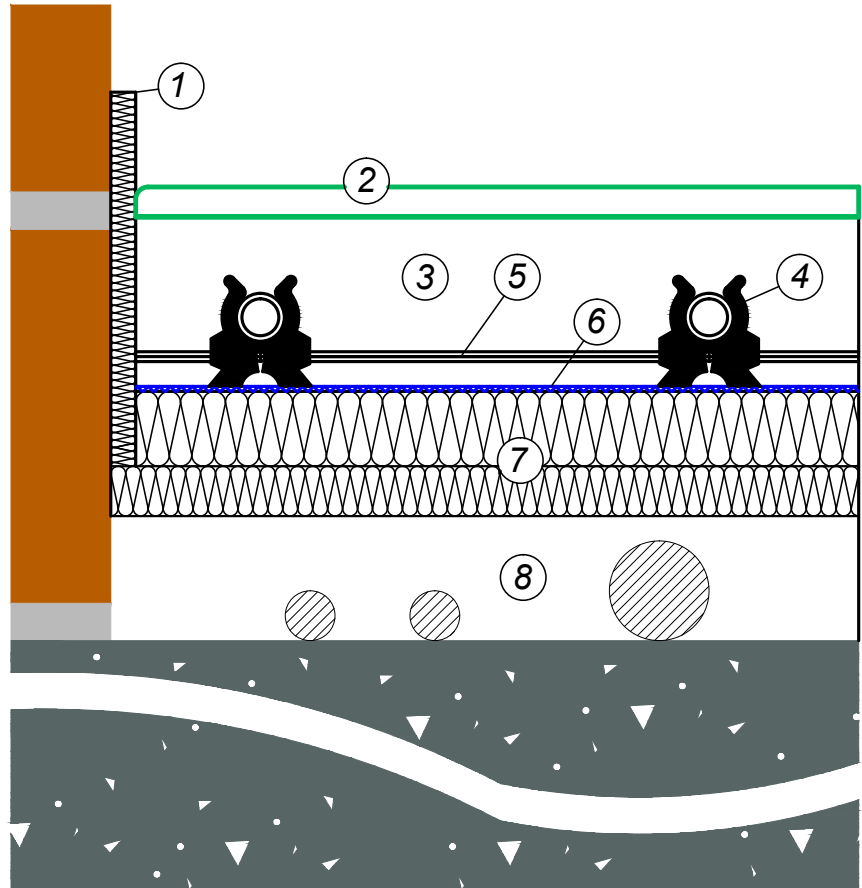
This operation may only be done after the screed has cured. The curing time is about 4 days per 1 cm thickness of the screed with a minimum of 28 days. The underfloor heating installation may in no case be used before the screed has cured. When starting up, begin with a supply temperature equal to the room temperature. The supply water temperature is increased by 5 °C per day until the maximum operational temperature is then maintained for 3 days. The supply water temperature is then lowered in the same way to the desired level.



4.5 Steel mesh

4.5.1 MAZE

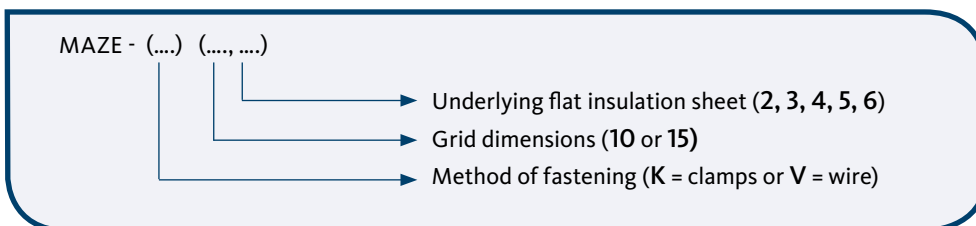
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|---|---|
| 1 | Edge insulation |
| 2 | Floor finishing |
| 3 | Screed |
| 4 | Underfloor heating pipe with fastening clip |
| 5 | Steel mesh |
| 6 | Vapour barrier |
| 7 | Flat insulation sheet |
| 8 | Concrete slab |



- Construction height:
 - Thickness of the concrete slab (e.g. 6 cm)
 - Thickness of the insulation (e.g. 5 cm)
 - Screed thickness (*)
 - Floor covering thickness (e.g. 1 cm)
- Centre-to-centre distance: 100, 150, 200, 300 mm
- Pipe diameter: $\varnothing 16$, $\varnothing 17$, $\varnothing 18$, $\varnothing 20$ mm

Description

This is an underfloor heating system in which the pipe is mounted to a Steel mesh by means of fastening clips or fastening wire. The Steel mesh is available in grid sizes 15 cm x 15 cm and 10 cm x 10 cm. The system names a further explained below.



*Thickness of the screed in accordance with the applicable standard. Hencofloor advises a minimal cover of 4.5 cm above the pipe.

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4.5.2 System materials

The following materials are part of the MAZE system.

The underfloor heating pipe with diameter 16, 17, 18, 20 mm can be used with this application.

UFH-RAS10	wire mat with 10 cm mesh
UFH-RAS15	wire mat with 15 cm mesh
UFH-RAS-RB3	fastening clip for wire mats
UFH-RAS-CLIP16	plastic fastening clip for 16 mm pipe
UFH-RAS-CLIP18	Plastic fastening clip for 17 mm and 18 mm pipe
UFH-RAS-CLIP20	plastic fastening clip for 20 mm pipe
UFH-RAS-BIND15B	steel fastening wire 160 mm for all pipe diameters
UFH-ISO20	¹ flat insulation sheet 20 mm (MAZE-2 to 6)
UFH-ISO30	¹ flat insulation sheet 30 mm (MAZE-2 to 6)
UFH-FOIL-N	PE sheeting
UFH-ISOBORD	² edge insulation
UFH-DH40	joint put-through housing
UFH-ADN10	² additive for sand cement screed
UFH-DP200	expansion joint
UFH-PLUG80	³ mounting plug for flat insulation sheet

1) Change of system name with use of extra flat insulation board.

2) This product is available in several models.

3) These products are accessories for the flat insulation board.



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4.5.3 Steel mesh installation instructions

Installation (see chapter 5)

The space must be provided clean. First apply the edge insulation along all the walls and constructions that come into contact with the screed. The PE flap of the edge insulation must be placed on the inner side of the space. If two layers of insulation are provided, the underlying insulation layer must be placed prior to installation of the edge insulation. For two layers of flat insulation, always place these two layers crosswise to each other. Where necessary the insulation is further anchored to the structural floor with the plugs designed for this.

PE sheeting is then placed on the insulation (min. 15 cm overlapping). The flap of the edge insulation is placed on top of the PE sheeting.

The wire mats are placed beside each other, such that the wire mats must be fastened to each other by means of fastening clips or wire. Where expansion joints are provided, the wire mats must be cut.

After approval of the layout plan and the associated technical appendix, you can start placing the underfloor heating pipe. The pipe is laid from the outside toward the centre (spiral pattern). A distance between the pipes of 2 times the given centre-to-centre distance is maintained until the middle point of the area has been reached. A 180° loop is then made to then work back outwards between the pipe already laid. If the underfloor heating pipe is secured to the Steel mesh with clamps, they must first be placed in accordance with the planned layout. When using the fastening wire, this is applied as the pipe is laid.

Pressure test

Once the underfloor heating pipes are connected to the manifold, the installation is filled. In this, each group is filled separately to remove all air from the installation. A pressure test is then done at a pressure of a minimum of 6 and a maximum of 10 bar (according to the properties of the manifold). This pressure will be maintained for 24 hours and may drop by about 1 bar.

Screed (sand cement)

An additive is used in the cement of the screed to improve the wear resistance and the viscosity of the screed. In this way an optimal contact between the pipe and cement is obtained. The cement is applied in the lengthwise direction and pressed against the pipe.

The correct quantity of additive is specified by Hencofloor. The minimum thickness of the screed above the pipe is 4.5 cm. The screed is provided with a reinforcing mesh (mesh size: 50 x 50 - 3 mm) or with reinforcing fibres. The underfloor heating pipe must cross the expansion joint as little as possible. Where this does occur, the pipe is kept loose over a length of 50 cm centred on the expansion joint. The pipe is provided here with a joint put-through housing that resists the weight of the screed. In this way, the pipe can move freely across the expansion joint.

The expansion joints are placed as indicated in the layout plan. As standard, these are provided in areas larger than 40 m². An area must always be rectangular. If necessary, expansion joints can be used to divide an area into rectangles. The length - width proportion of such a rectangle may not be more than 2 to 1.

Expansion joints must be provided at corners of the building structure that cut into a surface with underfloor heating.

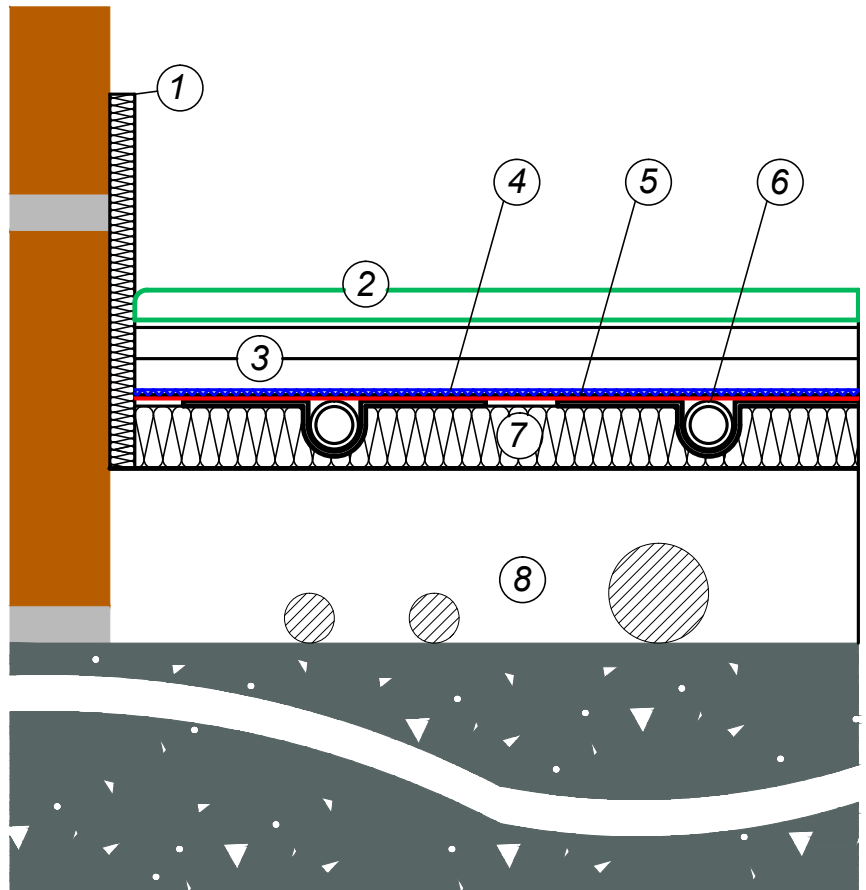
Starting up the installation

This operation may only be done after the screed has cured. The curing time is about 4 days per 1 cm thickness of the screed with a minimum of 28 days. The underfloor heating installation may in no case be used before the screed has cured. When starting up, begin with a supply temperature equal to the room temperature. The supply water temperature is increased by 5 °C per day until the maximum operational temperature is then maintained for 3 days. The supply water temperature is then lowered in the same way to the desired level.

4.6 Dry system

4.6.1 OMEGA - 25

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|---|---|
| 1 | Edge insulation |
| 2 | Floor finishing |
| 3 | Plasterboard |
| 4 | Vapour barrier |
| 5 | Heat diffusion plate |
| 6 | Underfloor heating pipe with heat diffusion profile |
| 7 | Dry system plate |
| 8 | Concrete slab |



- Construction height:
 - Thickness of the concrete slab (e.g. 6 cm)
 - Thickness of dry system sheeting (2.5 cm)
 - Thickness of plasterboard (2.5 cm)
 - Thickness of floor covering (1 cm)
- Centre-to-centre distance: 100, 200 mm
- Pipe diameter: $\varnothing 16$ mm

Description

This is an underfloor heating system for cases in which there is little height available for the construction. Another important characteristic is the low weight of the total dry system. As a result, the system can be used where the supporting construction is not as strong (e.g. frame construction).

The system name is extended with an added number of 2 or 3. This number indicates the thickness (mm) of the underlying flat insulation.

OMEGA - 25	without additional insulation
OMEGA - 252	with flat insulation sheet 2 cm
OMEGA - 253	with flat insulation sheet 3 cm



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4.6.2 System materials

The following materials are part of the OMEGA system.
The underfloor heating pipe with diameter 16 mm can be laid with this application.

UFH-ISODRY-25	dry system plate
UFH-DRY-GP100	heat diffusion profile for dry system
UFH-DRY-VD100	radiance distribution plate for dry system
UFH-DRY-B	plastic bracket to secure pipe in bends
UFH-ISO20	¹ flat insulation sheet 20 mm (OMEGA-252)
UFH-ISO30	¹ flat insulation sheet 30 mm (OMEGA-253)
UFH-FOIL-N	PE sheeting
UFH-ISOBORD	² edge insulation
UFH-PLUG80	³ mounting plug for flat insulation sheet

*1) Change of system name with use of extra flat insulation board.
2) This product is available in several models.
3) These products are accessories for the flat insulation board.*

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4.6.3 Dry system installation instructions

Installation (see chapter 5)

The space must be provided clean. First apply the edge insulation along all the walls and constructions that come into contact with the screed. The PE flap of the edge insulation must be placed on the inner side of the space. The system plate is then applied to the cleaned supporting floor or to the flat insulation sheet that has already been installed. The system plates are placed in the correct formation relative to each other so that the pipe can be extended continuously.

After approval of the layout plan and the associated technical appendix, you can start placing the underfloor heating pipe.

The heat diffusion profiles are placed in accordance with the planned layout (3 cm overlapping). Where necessary, bend brackets are placed that prevent the pipe from lifting up. The underfloor heating pipes are laid in a meandering pattern. After the pipe is placed in the heat diffusion profiles, the heat diffusion plates must be installed. These distribution plates are also placed with a 3 cm overlap. The PE sheet is then placed on the heat diffusion plates, again overlapping. The PE flap of the edge insulation is placed on top of the sheeting.

Pressure test

Once the underfloor heating pipes are connected to the manifold, the installation is filled. In this, each group is filled separately to remove all air from the installation.

A pressure test is then done at a pressure of a minimum of 6 and a maximum of 10 bar (according to the properties of the manifold). This pressure will be maintained for 24 hours and may drop by about 1 bar.

Screed

The screed consists of plasterboard and has a minimum thickness of 2.5 cm. The floor covering can be installed directly onto this plasterboard.

The use of a sand cement screed must be discussed in advance with the Hencofloor engineering department.

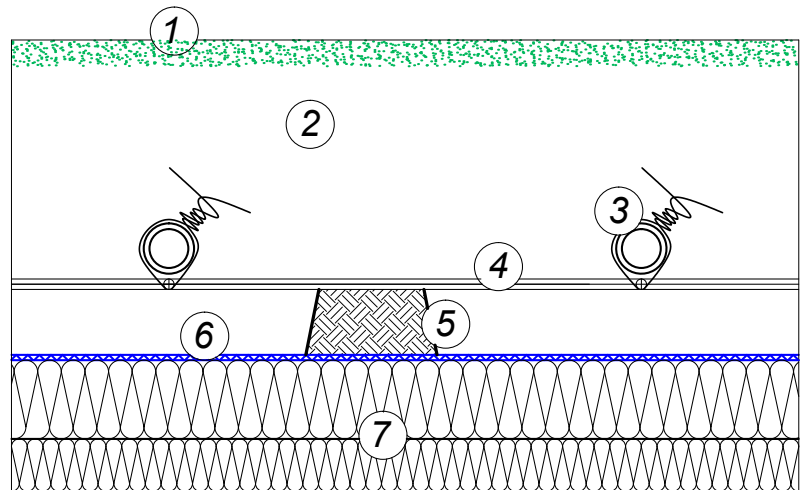


4.7 Specific applications

4.7.1 Industrial use

4.7.1.1 WORK

- 1 Wear layer
- 2 Concrete floor
- 3 Underfloor heating pipe
- 4 Construction mesh
- 5 Supporting element
- 6 Vapour barrier
- 7 Insulation layer



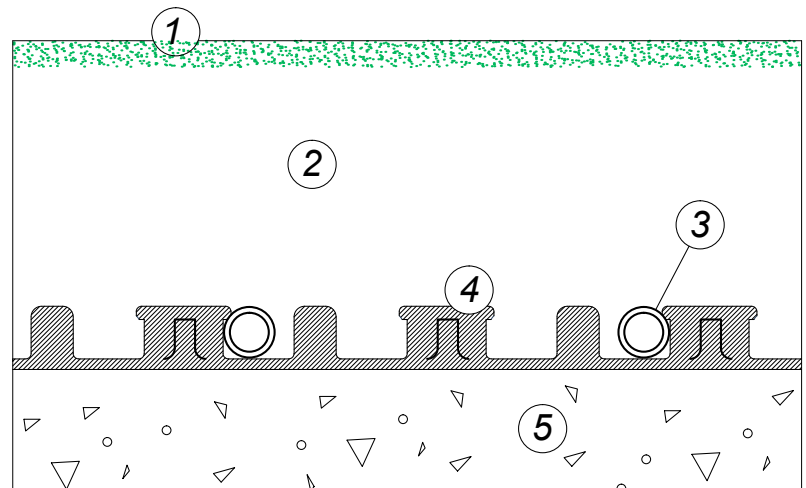
Description

This is an underfloor heating system for concrete floors in which the pipe is affixed to the construction grids of the concrete floor using fastening wire.

- Concrete thickness: 100 - 200 mm
- Centre-to-centre distance: 150, 200, 250, 300 mm
- Pipe diameter: $\varnothing 20$ mm

4.7.1.2 WORK PRO

- 1 Wear layer
- 2 Concrete floor
- 3 Underfloor heating pipe
- 4 System sheeting
- 5 Substrate



Description

This is an underfloor heating system for concrete floors in which the pipe is secured by a pre-formed system sheeting.

- Concrete thickness: 100 - 200 mm
- Centre-to-centre distance: 75, 150, 225, 300 mm
- Pipe diameter: $\varnothing 20$ mm

4 OVERVIEW OF THE DIFFERENT SYSTEMS

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Characteristics of industrial applications

These applications are intended for all kinds of industrial applications and require a minimum concrete thickness of 10 cm. The floor construction must be specified by a specialized consulting agency. This will be done on the basis of intended use and taking into account the applicable standards for compression load and floor strength. Hencofloor advises a pipe diameter of 20 mm for industrial applications. This allows the groups to be extended up to 140 m in length.

Design

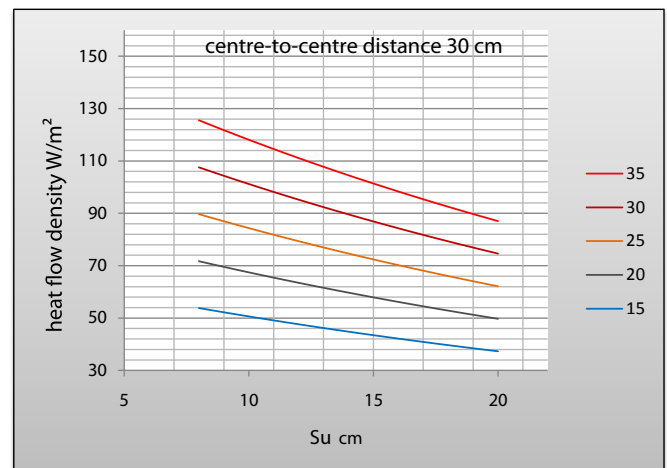
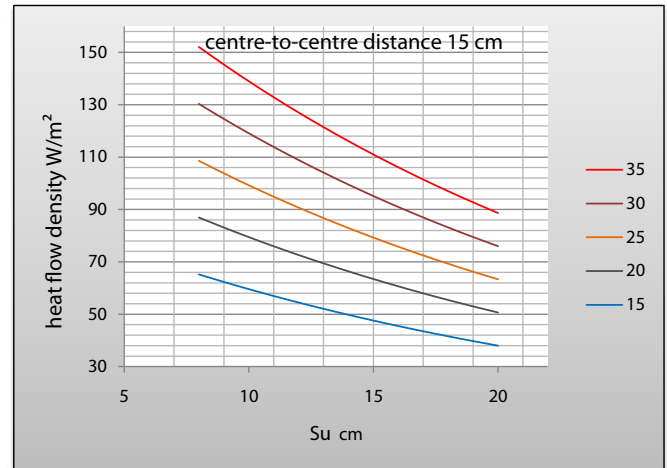
The expansion joints are taken into account when determining the pipe layout. For business spaces, a standard room temperature of 16°C is maintained.

The centre-to-centre distance has a major effect on the ultimate heat emission. Another important parameter is the concrete thickness above the pipe. The following diagrams give an indicative heat emission in relation to the centre-to-centre distance and the concrete thickness above the pipe (calculation according to prEN 1264-2).

The logarithmic average water temperature is calculated using the formula below. The logarithmic average water temperature is given for 15, 20, 25, 30 and 35 °C. Use the calculated value to determine the heat emission using the following formula:

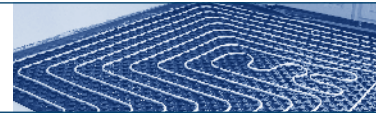
$$\Theta_h = \frac{\Theta_v - \Theta_r}{\ln [(\Theta_v - \Theta_u) / (\Theta_r - \Theta_u)]}$$

- Θ_v supply water temperature in °C
- Θ_r return water temperature in °C
- Θ_u ambient temperature in °C
- Θ_h logarithmic average water temperature in °C



- The calculation is based on a pipe diameter of 20 mm and a wear layer with 0.02 m²K/W.
- The value S_u gives the concrete thickness above the pipe in cm.
- Θ_h is given for five different values.

*The structure of the concrete floor must always be discussed with the engineering department.



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4.7.3 Concrete core activation

4.7.3.1 ■ CCA

Description

Concrete core activation is an application that is implemented in many different forms. This primarily concerns controlling the climate of concrete constructions in buildings. As required by the application, the pipes have a different position (height) in the floor construction.

In this way, buildings become more energy efficient.

4.7.4 Tunnel construction

4.7.4.1 ■ CLIP-C

Description

These are curved supporting structures that make greater loads possible. Because the supporting construction is not flat, the insulation plate must be close-fitting.

4.7.5 Snow and ice prevention

4.7.5.1 ■ F²

Description

Nothing is more inconvenient than an impassable road or driveway. This can be prevented by installing an underground pipe network. The pipe network is embedded under the pavement. The pipes are secured with fastening wire to a Steel mesh or with a U-profile.

4.7.6 Outdoor application

4.7.6.1 ■ SPORTS

Description

Maintaining the safety of a game-ready sports field is a fact of life these days. The Henco multilayer pipe comes fully into its own for this task. This application demands good coordination because various installations are integrated into one sports field (e.g. sprinkler installation, drainage system, heating network). The soil treatment specialist is partly involved in the total design.



KVC-Westerlo football field

4 OVERVIEW OF THE DIFFERENT SYSTEMS

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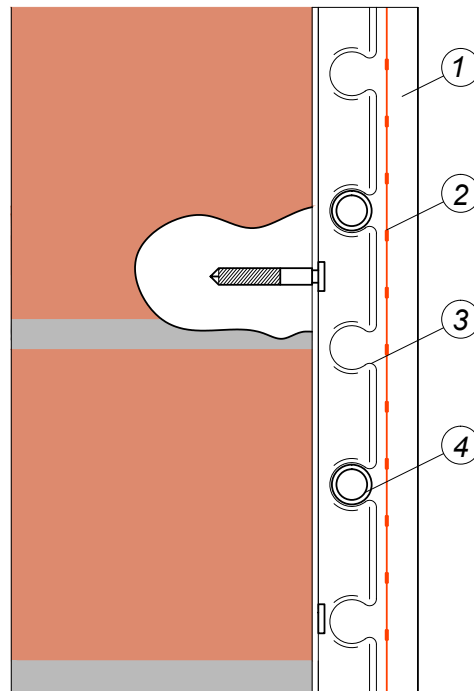
4.7.7 Wall heating

4.7.7.1 U-ONE

- 1 Plaster layer
- 2 Reinforcing mesh
- 3 U-profile
- 4 Wall heating pipe

- Centre-to-centre distance: 150 mm

- Pipe diameter: $\varnothing 16$ mm



Description

The wall heating pipes are installed using U-profiles. The wall heating pipes are placed at a centre-to-centre distance of 15 cm. The pipe network is preferably placed horizontally and in a meandering pattern. The system is embedded in a plaster layer that covers the pipe by at least 15 mm.

This plaster layer is also provided with reinforcement to prevent cracking.

Heat emission

Under normal conditions ($\Theta_v = 40^\circ\text{C}$, $\Delta t 8^\circ\text{C}$) the heat emission is approx. 99 W/m^2 at a room temperature of 20°C .

Remark

The thermal conductivity of an outside wall is a maximum of 0.35 W/mK .

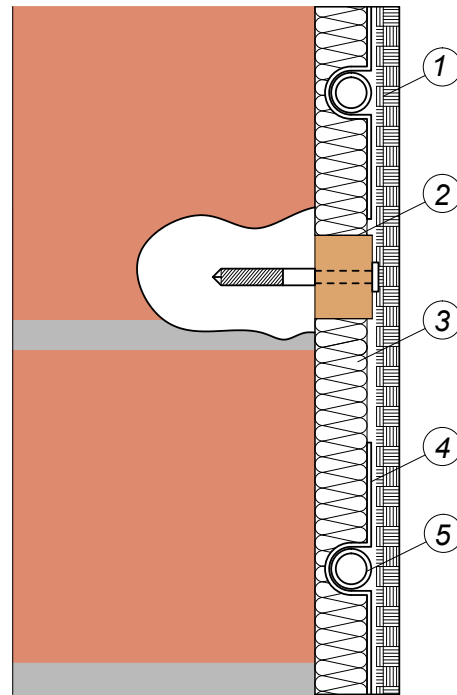
The wall temperature is a maximum of 35°C .



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4.7.8.2 ■ OMEGA

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|--|
| <ol style="list-style-type: none"> 1 Plasterboard 2 Wooden support (3 x 2.5 cm) 3 Dry system plate 4 Heat diffusion profile 5 Wall heating pipe |
|--|



- Centre-to-centre distance: 200 mm
- Pipe diameter: $\varnothing 16$ mm

Description

The dry system can be applied for wall heating. The wall heating pipes are placed horizontally at a centre-to-centre distance of 20 cm. To keep the dry system plates in place, wooden supports are used. The wall finishing consists of plasterboard that is secured to the wooden supports.

Heat emission

Under normal conditions ($\Theta_v = 40^\circ\text{C}$, $\Delta t 8^\circ\text{C}$) the heat emission is approx. 83 W/m^2 at a room temperature of 20°C .

Remark

The thermal conductivity of an outside wall is a maximum of 0.35 W/mK .
The wall temperature is a maximum of 35°C .

INSTALLATION OF UNDERFLOOR HEATING



5.1 Installation of underfloor heating

43



5.1 Installation of underfloor heating

5.1.1 Edge insulation



The edge insulation has a PE flap that is always oriented toward the interior of the room. The tear-off strips are on the top side.



Depending on the type of edge insulation, the back has an adhesive strip for fastening to the walls.



All the walls and fixed constructions are provided with edge insulation. The edge insulation must be applied tightly and extra fastening must be used if necessary.



Where two layers of flat insulation or a combination of flat insulation plate is used with a system plate, the edge insulation must be applied to the bottom insulation plate.

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5 INSTALLATION OF UNDERFLOOR HEATING

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5.1.2 Flat insulation board



The flat insulation plates are applied to a flat and clean substrate.



If a second layer of flat insulation plates are applied, these are placed crosswise to the first layer of flat insulation plates.

5.1.3 Folding insulation board



The folded insulation plates are applied to a flat and clean substrate.



The overlapping flaps should preferably be taped over.



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5.1.4 Roll insulation



The insulation by roll is applied to a flat and clean substrate.



The overlapping flaps should preferably be taped over.

5.1.5 PE sheeting



The PE sheeting is installed on the walls: when doing this, there must be a good overlap with the PE flap of the edge insulation.



The PE sheeting is applied with a 15 cm overlap.



If desired, a sheeting tack can be used. This prevents the sheeting moving during the work.

5 INSTALLATION OF UNDERFLOOR HEATING

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5.1.6 System plate



Remove the PS flaps with knobs from the system plates that are placed against the wall.



This results in the easy placement of all subsequent system plates. When the system plates are placed against the wall, the PS flaps of subsequent system plates will fall over the ones already in place.



The cutting loss is limited because the cut system plate can be used with the next row of system plates.



The PE flap pressed onto the system plate is held in place when laying the pipe into the system plate.



The pipe is laid in a **spiral pattern**.

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5 INSTALLATION OF UNDERFLOOR HEATING

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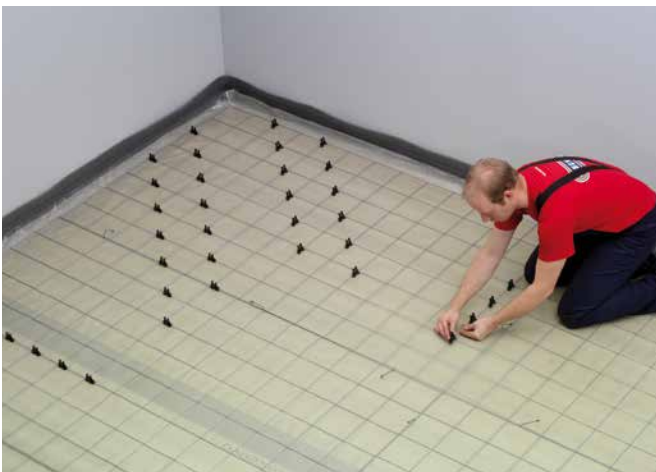
5.1.7 Steel mesh



The underlying flat insulation plate is covered with a neutral PE foil. The Steel mesh mats are placed on this, maintaining a distance of approx. 5 cm from the walls.



The wire mats are secured to each other using the clips for this or using fastening wire.



Once the wire mats have been put in place, the fastening clips are applied in the correct places.



The pipe is then laid in the fastening clips. When fastening using wire, the pipe is tied to the Steel mesh.



5.1.8 U-profile



The profiles are affixed to the PE sheeting by the adhesive strip. The placement is done in accordance with the layout plan.



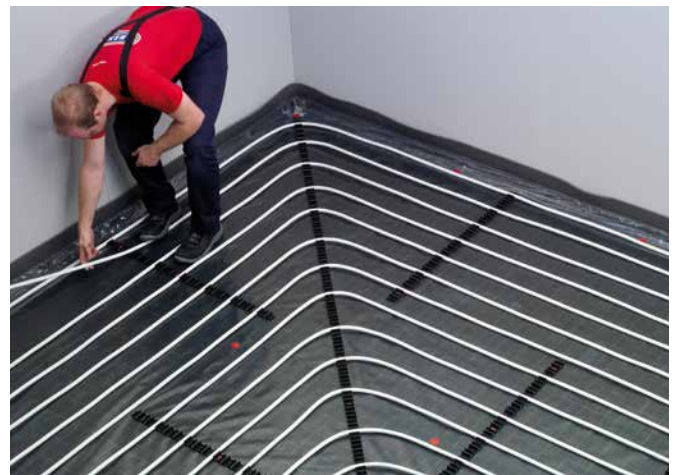
The profiles are connected to each other by a linking mechanism at the ends.



A fastening clip ensures that the profiles cannot lift up due to any tension on the pipe.



The curves are made with the necessary care.



The end result is a beautifully laid surface.

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5 INSTALLATION OF UNDERFLOOR HEATING

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5.1.9 Tacker



The tacker tool is filled with tacker clips and calibrated if necessary. An important tip to remove the adhesive strip once the tacker clips have been placed on the guide bracket. This adhesive strip can cause a malfunction if glue accumulates in the tacker tool.



The pipe is attached by shooting the tacker clips over the pipe.



The curves are made with the necessary care.



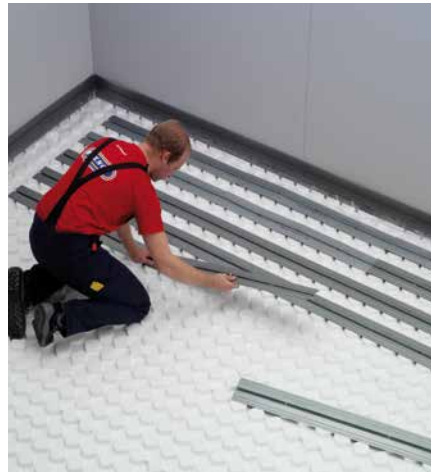
The end result is a beautifully laid surface.



5.1.10 Dry system



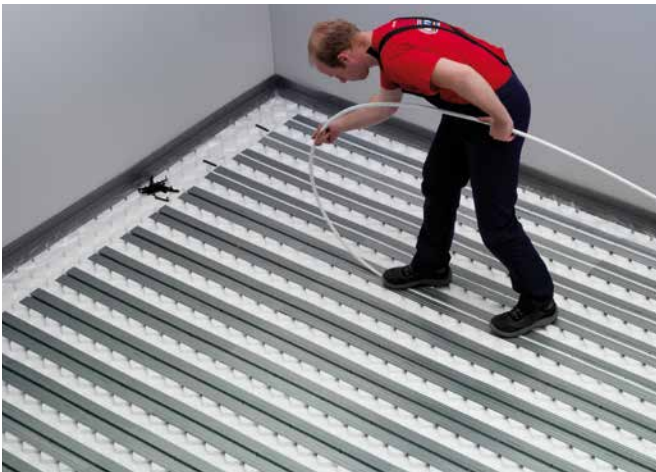
The dry system plate is installed on a flat and clean substrate after the edge insulation has been installed. The cutting loss is limited because the cut dry system plate can be used with the next row of dry system plates.



The heat diffusion profiles are installed following a planned layout. Sufficient spacing must be provided at the location of the curves.



The heat diffusion profiles are installed with approximately a 3 cm overlap.



The pipe is laid once the heat diffusion profiles have been installed.



Extra attention must be paid when placing the curves. Any curve brackets must be installed to prevent the pipe from lifting up.

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5 INSTALLATION OF UNDERFLOOR HEATING

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The radiance distribution plates are then placed on the whole. These are installed with a 3 cm overlap.



Lastly, a PE sheet is applied over the radiance distribution plates.



5.1.11 Expansion joint



The corresponding U-profile is installed by means of the adhesive strip on the back.



Where the pipes cross an expansion joint, the pipes are provided with joint put-through housings.



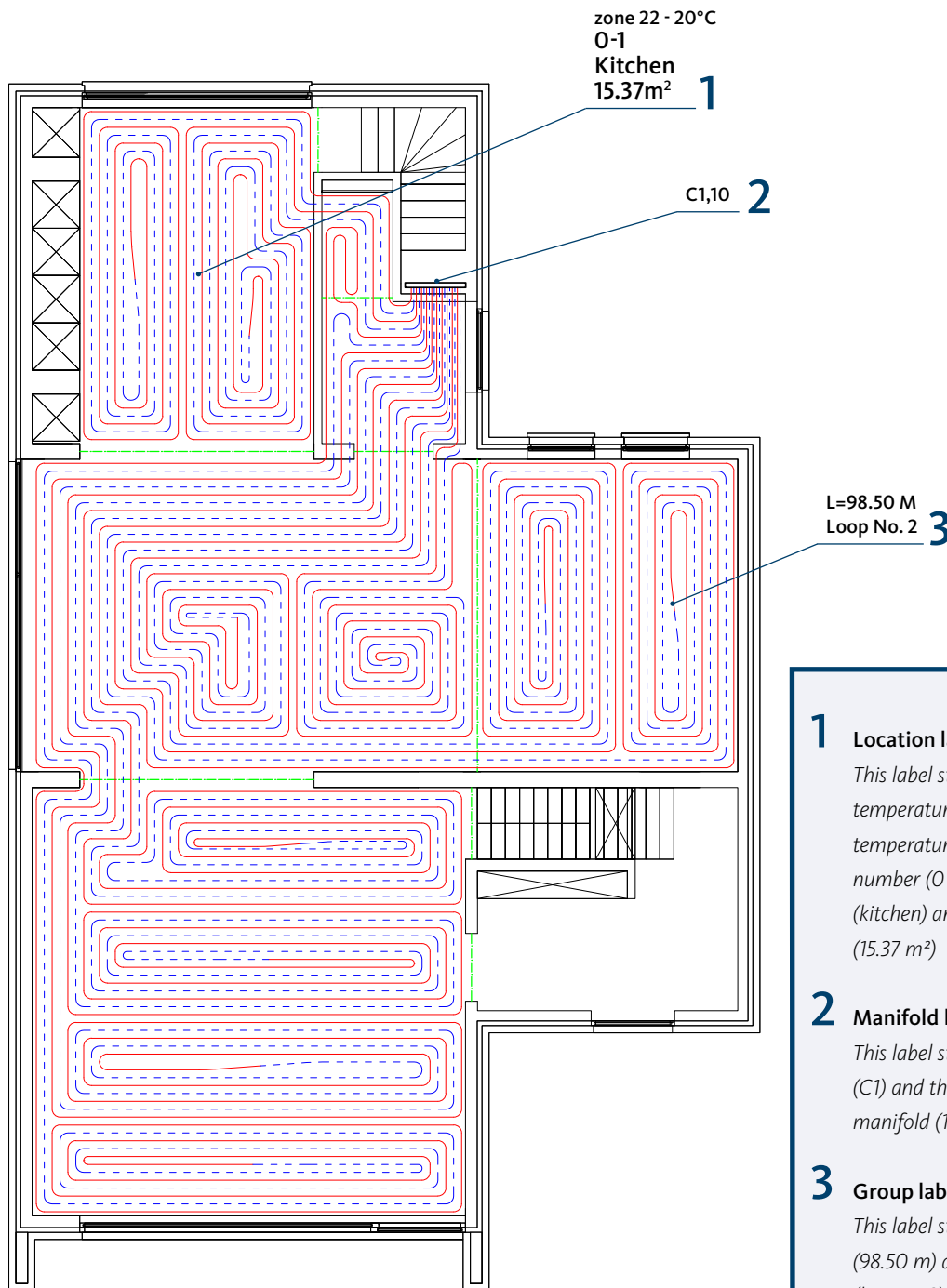
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6.1 Technical file notes

A fully technical file includes the layout plan with the pipe routing and the manifold locations. All groups are numbered with the group lengths indicated. A technical appendix shows

all the parameters per room and per manifold. The technical appendix also includes a role division of the group lengths such that the loss from underfloor heating pipe is minimal.



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6 INSTRUCTIONS

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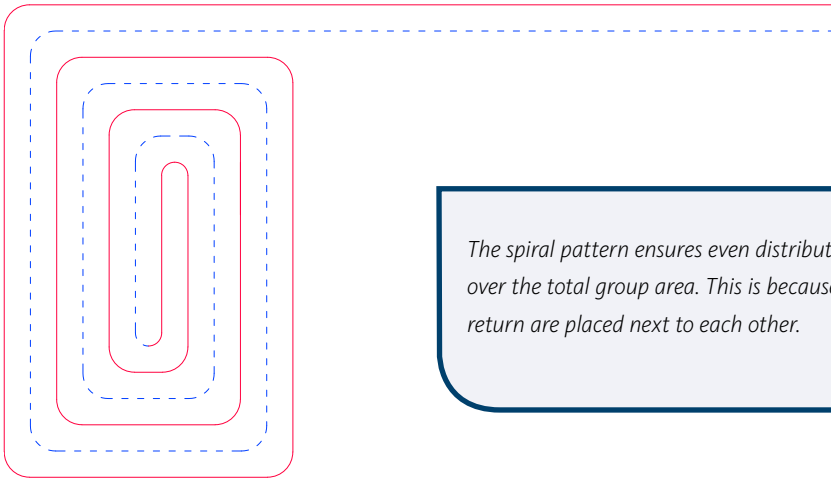
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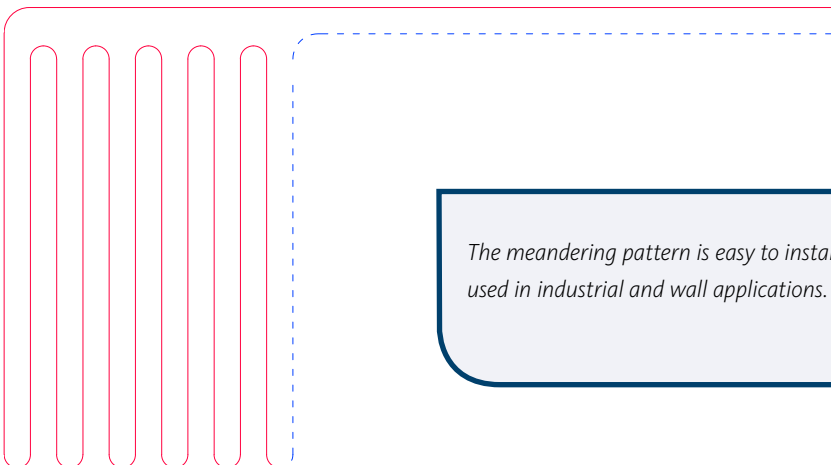
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The underfloor heating group is plotted according to a well-considered pattern. There are several patterns that can be plotted in a layout plan. The choice of pattern depends on

the application and the underfloor heating system being used. The most commonly used patterns are the spiral pattern and the meandering pattern.



The spiral pattern ensures even distribution of the heat over the total group area. This is because the supply and return are placed next to each other.



The meandering pattern is easy to install and is primarily used in industrial and wall applications.



6.2 Explanation of underfloor heating pipe

Hencofloor recommends the underfloor heating pipe with the best characteristics. This is the Henco multilayer pipe (PE-Xc/AL/PE-Xc). Hencofloor also has the full plastic pipe in its product range.

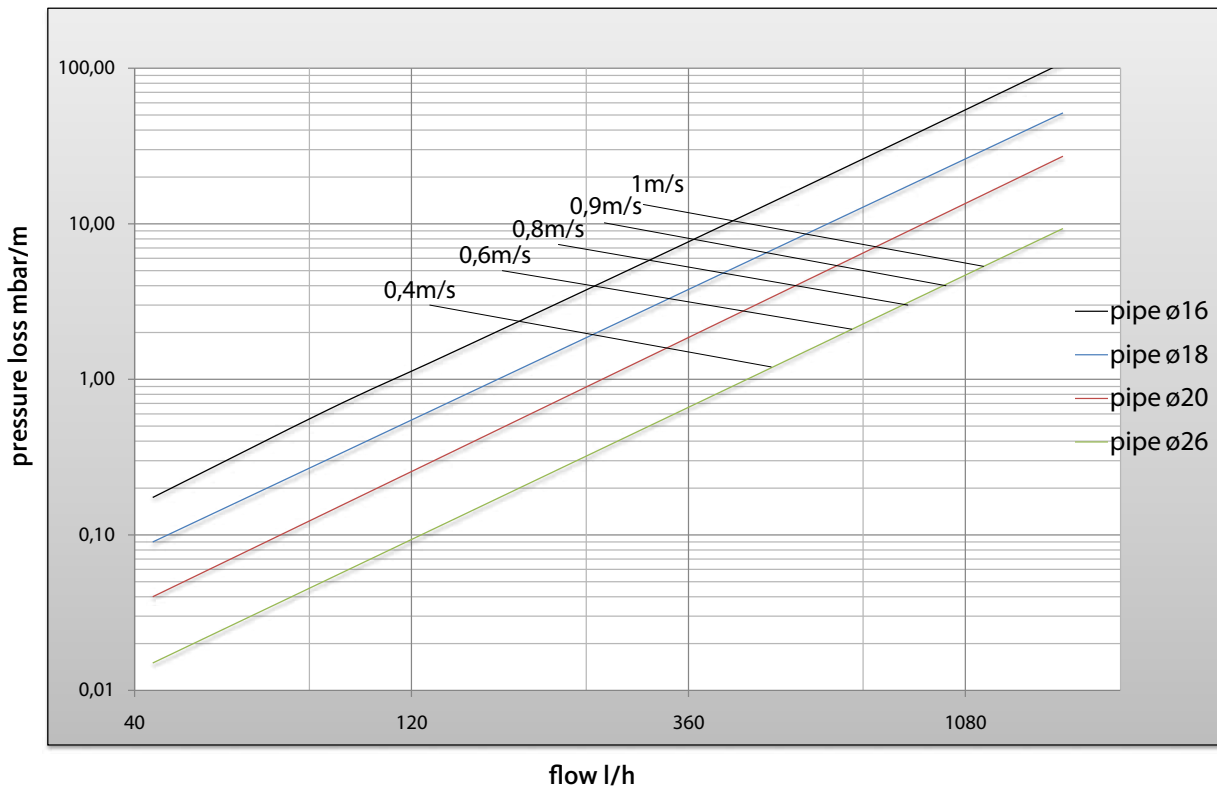
For residences (pipe diameter 16 mm) the group length is always limited to 110 metres. For other applications, larger groups lengths can be used, in relation to the pipe diameter.

The pressure losses are directly dependent on the chosen pipe diameter. The greater the chosen pipe diameter, the lower the pressure loss.

An underfloor heating group always consists of one uninterrupted length of pipe. Repair connectors may only be installed in the case of damage of a pipe that has already collapsed.

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Pressure loss diagram



MANIFOLDS



7.1	Manifolds	59
7.2	Brass manifold	60
7.3	Pump group for brass manifold	64
7.4	Steel manifold	65
7.5	Synthetic manifold	71
7.6	Pump group for synthetic manifold	72



7.1 Manifolds

The manifold provides the controlled supply of warm water to the groups. Hencofloor offers a wide range of manifolds.

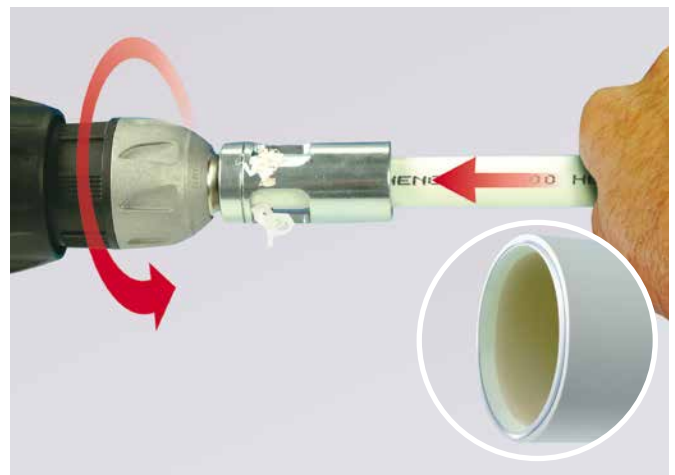
Each manifold has its own specifications and accessories. A given manifold is selected depending on the installation.

The following issues apply for all manifolds:

- 1 Install the manifold in a place that will always be accessible.
- 2 Install the manifold sufficiently high.
- 3 Provide a shutoff possibility for the hydraulic installation.
- 4 The group outlets are provided with 3/4" Eurocone connectors.



- 5 Multilayer pipe to be connected with Henco press or compression fittings.



- 6 Always cut the pipe 90° square and calibrate it.
- 7 a Connect multilayer pipe (PE-Xc/AL/PE-Xc) with Henco press or compression fittings.
b Only connect full plastic pipe with Henco compression fittings.

7 MANIFOLDS

7.2 Brass manifold

The brass manifold can be used in both residential and utility applications. It can be used in the most diverse underfloor heating applications. The accessories for this distributor are shutoff valves for the hydraulic connection (may be fitted with a thermometer) and end pieces.

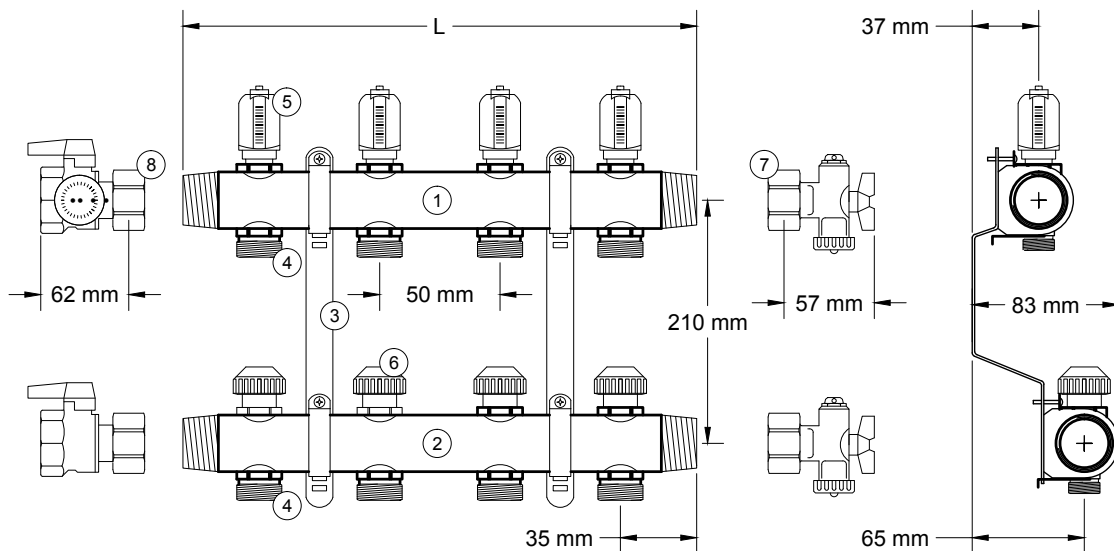
The end pieces make it possible to bleed and fill and drain the installation. This manifold is available for 2 to 12 groups. The brass manifold is provided with flow meters and a capacity of 0 – 6 L/h thanks to the low Kvs value of 1.7.

The material consists of Ms63;CW508N brass and the material of the accessories is MS58;CW614N brass.

All seals in the manifold are made of EPDM.
The mounting bracket is made of galvanized steel.

Technical information

maximum operational temperature (°C)	80
minimum operational temperature (°C)	-10
maximum operational pressure (bar)	6
maximum test pressure (24h, <30°C) (bar)	10



- 1 Supply, connection 1"
- 2 Return, connection 1"
- 3 Mounting bracket
- 4 Group outlet, 3/4" eurocone
- 5 Flow meter 0 – 6 L/Min (can be shut off)
- 6 Control valve (M30 x 1.5)
- 7 End piece 1"
- 8 Shutoff valve 1"

Groups	L (mm)
2	120
3	170
4	220
5	270
6	320
7	370
8	420
9	470
10	520
11	570
12	620

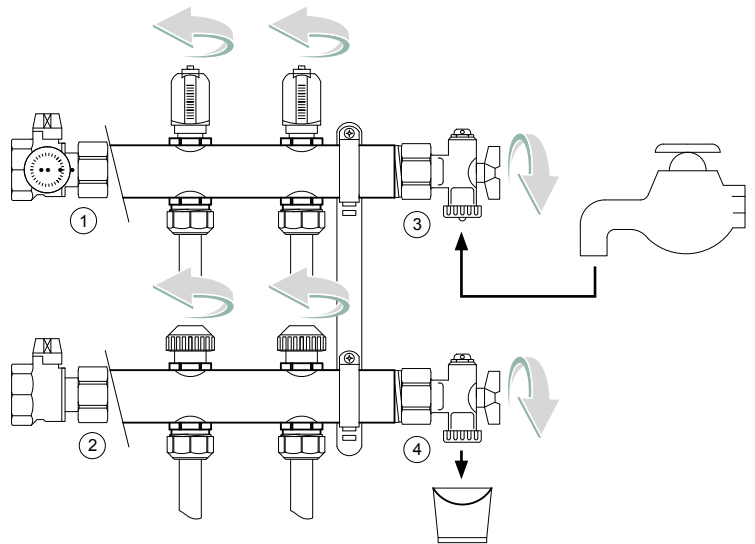


Mounting instructions for the brass manifold:

Filling procedure:

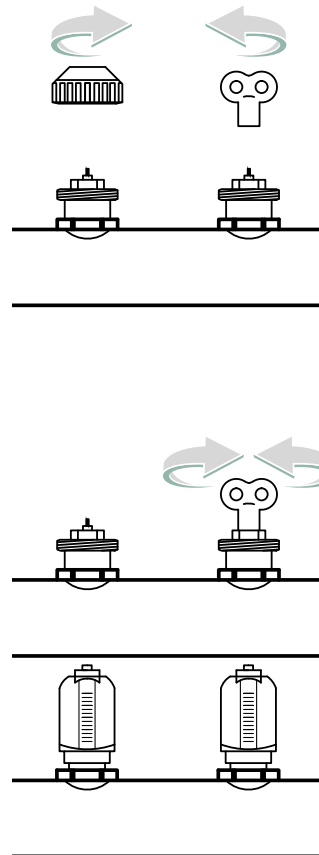
First shut off all valves and open all flow meters with the included key. Connect the water hose to end piece 3. Then open end pieces 3 and 4. Ensure that the water from end piece 4 is contained.

Open the valve for the first group. Then through flush through the pipe until the all the air has been removed. Close the valve and repeat this procedure for each group separately. Finish by first closing end piece 4 and then closing end piece 3 such that the entire installation is under pressure.



Adjustment procedure:

Remove the black covering cap. Use an air bleed key to fully close the regulator (turn to the right).



Set the desired flow rate.

The flow can be read on the flow meter (the adjustment status is stated on the layout plan).

Fully flow is reached after it has been opened 2.5 to 3 turns.

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7 MANIFOLDS

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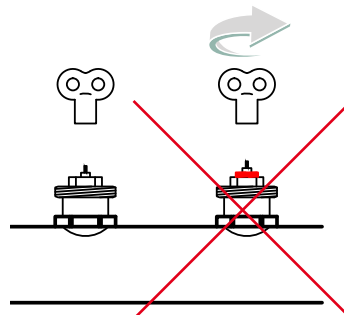
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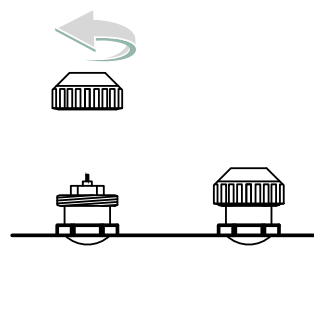
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Never turn more than 2.5 to 3 turns to the left.
Ensure that the thread of the regulator never becomes visible.
If this is the case, you have opened it too much.

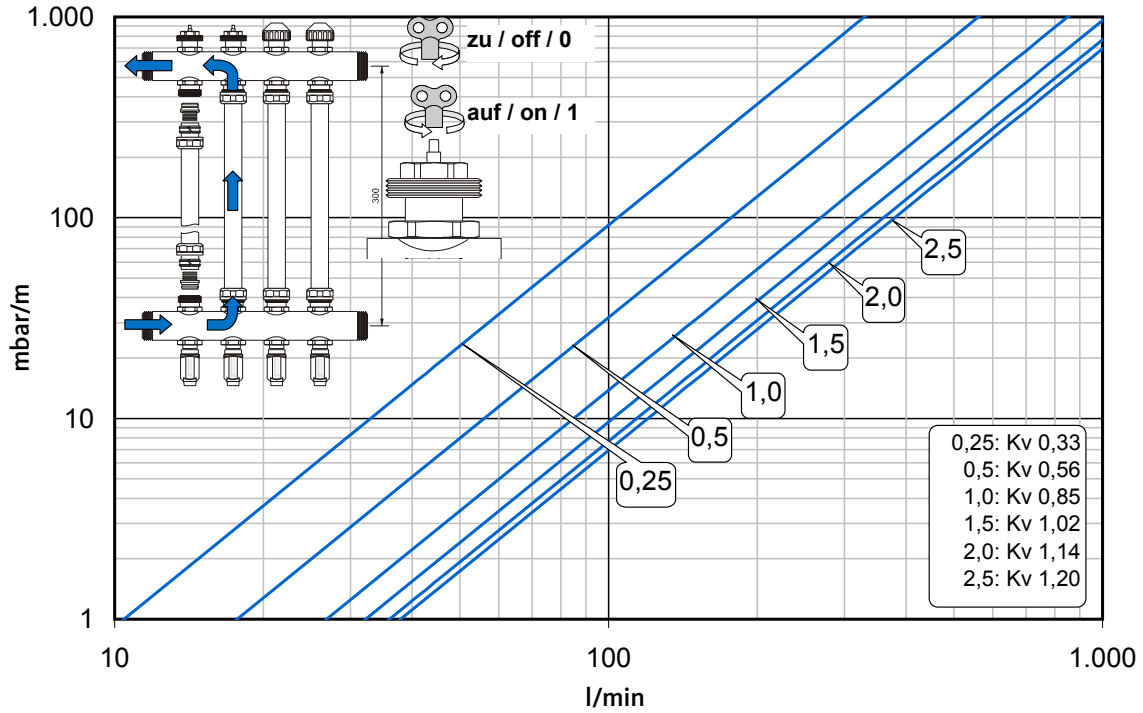


After adjustment, always replace the cover cap to protect the regulator and the spindle. One little turn is enough to keep the cover cap in its place. The cover cap can close the group if it is turned completely shut.

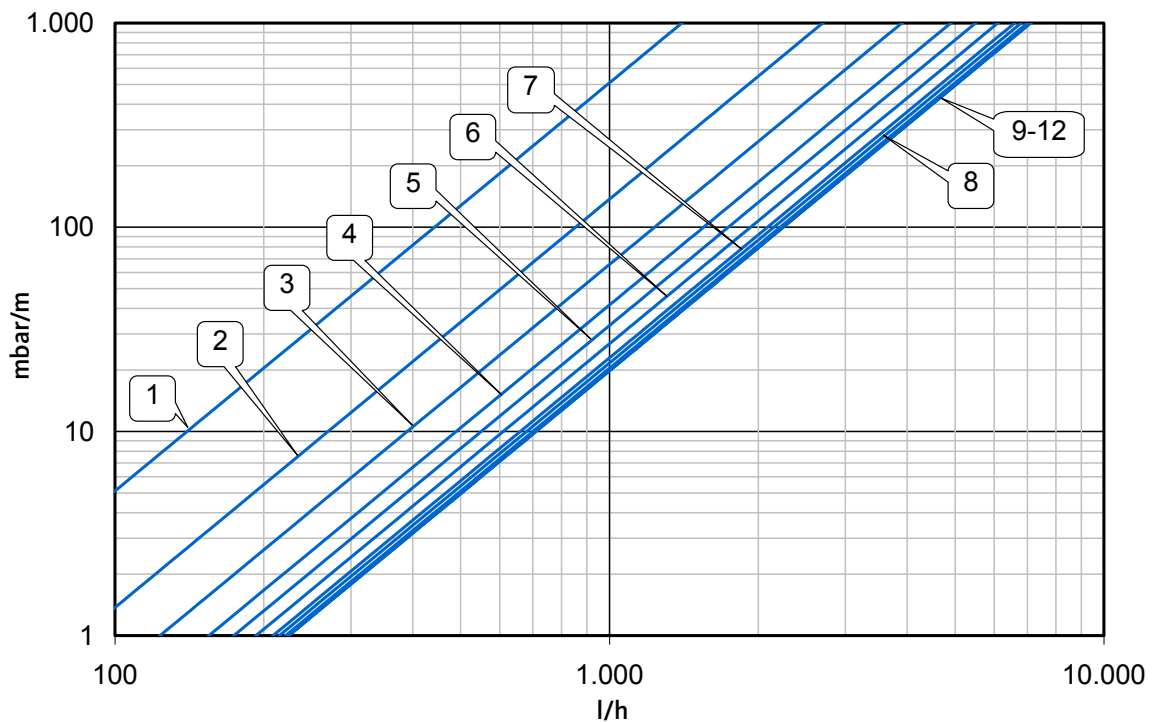




Adjustment diagram per group



Pressure loss diagram for a number of groups (set open)

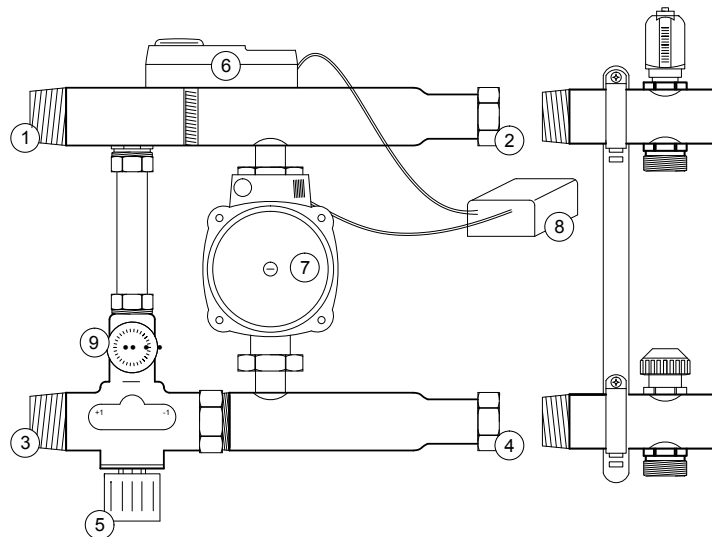


7.3 Pump group for brass manifold

The pump group maintains a constant (supply) water temperature over the groups of the brass manifold. The pump group will mix supply water from the heat source according to the set supply water temperature. The supply water from the heat source must have a temperature that is at least 15°C higher than the desired supply water temperature of the manifold. A maximum thermostat switches off the pump in

case of excessively high supply water temperature.

The pump group is hydraulically neutral. It is necessary that a primary pump provides the necessary pressure difference over the supply and return of the pump group. The supply water temperature can be adjusted using the thermostat valve (5). One click (audible when the knob is turned) corresponds to an adjustment of 1 °C.



- 1 Return heat source, 1" connection
- 2 Supply manifold, 1" connection
- 3 Supply heat source, 1" connection
- 4 Return manifold, 1" connection
- 5 Thermostatic regulator valve (range 30 – 50°C)
- 6 Maximum thermostat (30 – 90°C)
- 7 Pump (RS25/6-3)
- 8 Electrical connection (230V)
- 9 Supply thermometer (range 30 – 60°C)

Nominal power is 10 KW



7.4 Steel manifold

The steel manifold is available in a number of versions. Each model has its own characteristics and areas of application.

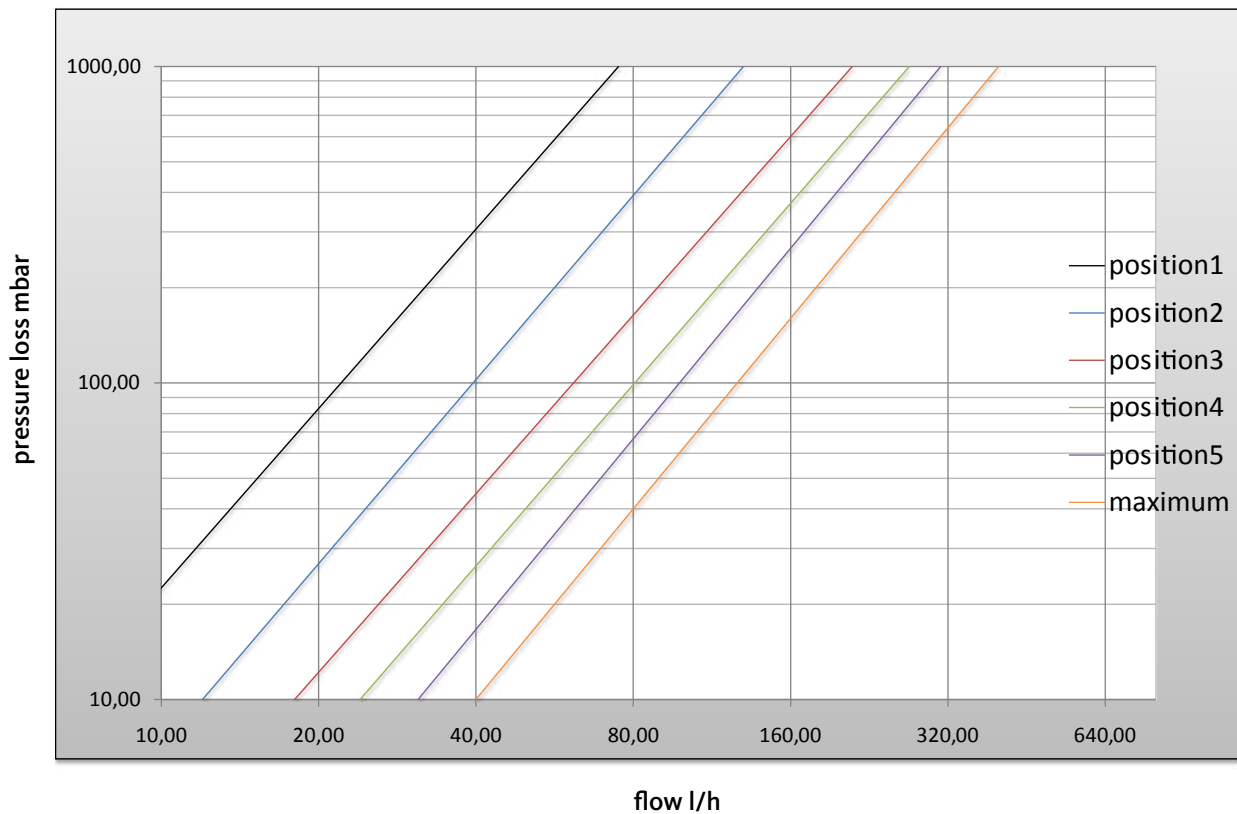
There are a number of shared characteristics:

- 1 For up to 8 groups, the connectors are 1/2".
For 9 groups or more, the connectors are 3/4".
- 2 The steel manifolds are provided with an integrated pump with constant temperature control by means of a thermostat valve and a sensor.
- 3 The steel manifolds have a maximum thermostat on the supply bar.
- 4 The steel manifolds have a maximum thermometer mounted on the supply bar.
- 5 The foot valves of the groups can be closed.
- 6 The taps of the groups are adjustable. Close the circuits completely before adjusting.

Up to 8 groups, pump type RS 25/4-3.

From 9 groups, pump type RS 25/5-3.

Pressure loss diagram of taps for the steel manifold

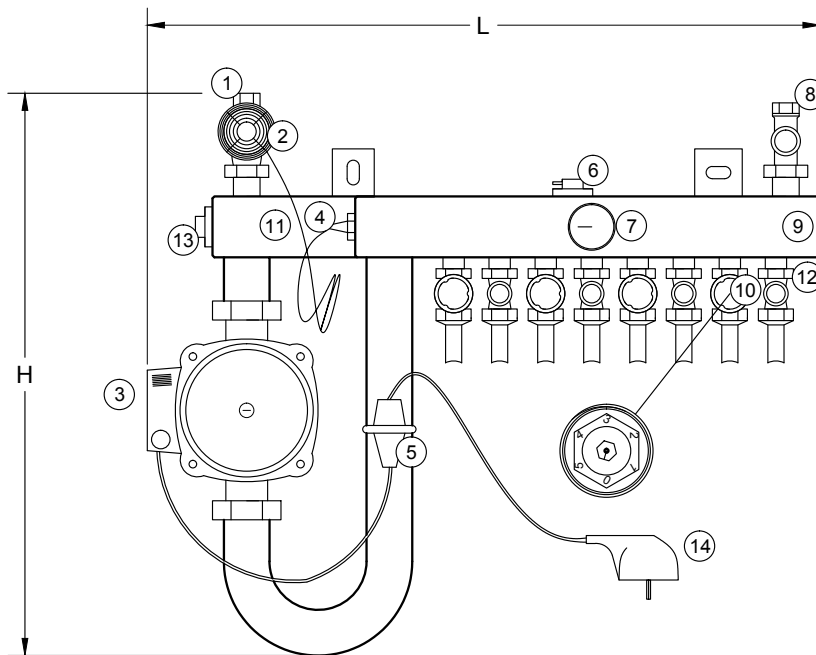


7 MANIFOLDS

7.4.1 Steel manifold type "UFH-05-S"

Description

Steel manifold with a curve, such that the return bar is positioned behind the supply bar.



- 1 Thermostat tap 1/2" or 3/4" (Kvs 1.2)
- 2 Thermostat head (range 20 – 60°C)
- 3 Pump (RS 25/4-3 or RS 25/5-3)
- 4 Supply sensor
- 5 Maximum thermostat (shuts off at 55°C)
- 6 Air bleed valve
- 7 Supply thermometer
- 8 Return connection 1/2" or 3/4"
- 9 Supply bar
- 10 Supply group, 3/4" eurocone
- 11 Return bar
- 12 Return group, 3/4" eurocone
- 13 Regulator valve (hydraulic adjustment)
- 14 Electrical connection (230V)

Groups:	L (mm):
1	320
2	320
3	380
4	440
5	500
6	560
7	620
8	680
9	740
10	800
11	860
12	920
13	980
14	1040
15	1100
16	1160

Depth (mm): 160
Height (H) (mm): 430

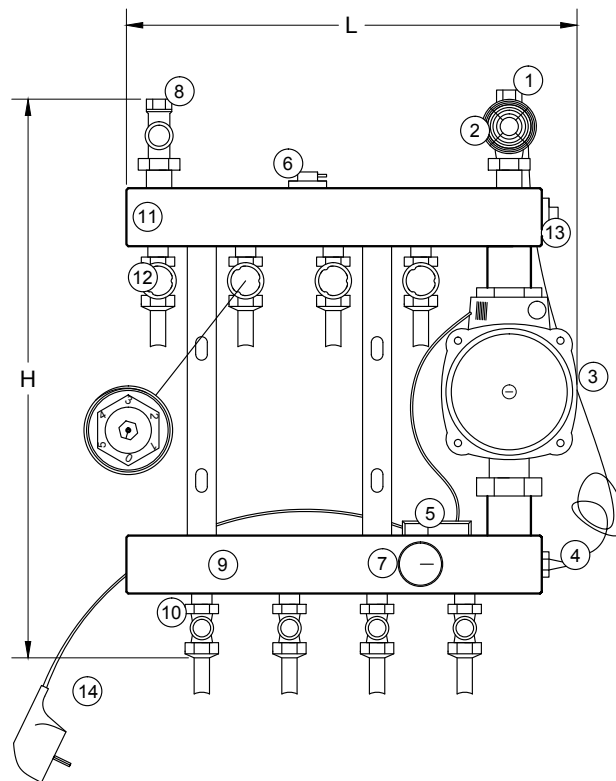


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7.4.2 Steel manifold type "UFH-05-SC"

Description

Steel manifold in which the supply bar is positioned underneath with the return bar above.



- 1 Thermostat tap 1/2" or 3/4" (Kvs 1.2)
- 2 Thermostat head (range 20 – 60°C)
- 3 Pump (RS 25/4-3 or RS 25/5-3)
- 4 Supply sensor
- 5 Maximum thermostat (shuts off at 55°C)
- 6 Air bleed valve
- 7 Supply thermometer
- 8 Return connection 1/2" or 3/4"
- 9 Supply bar
- 10 Supply group, 3/4" eurocone
- 11 Return bar
- 12 Return group, 3/4" eurocone
- 13 Regulator valve (hydraulic adjustment)
- 14 Electrical connection (230V)

Groups:	L (mm):
1	185
2	185
3	245
4	305
5	365
6	425
7	485
8	545
9	605
10	665
11	725
12	785
13	845
14	905
15	965
16	1025

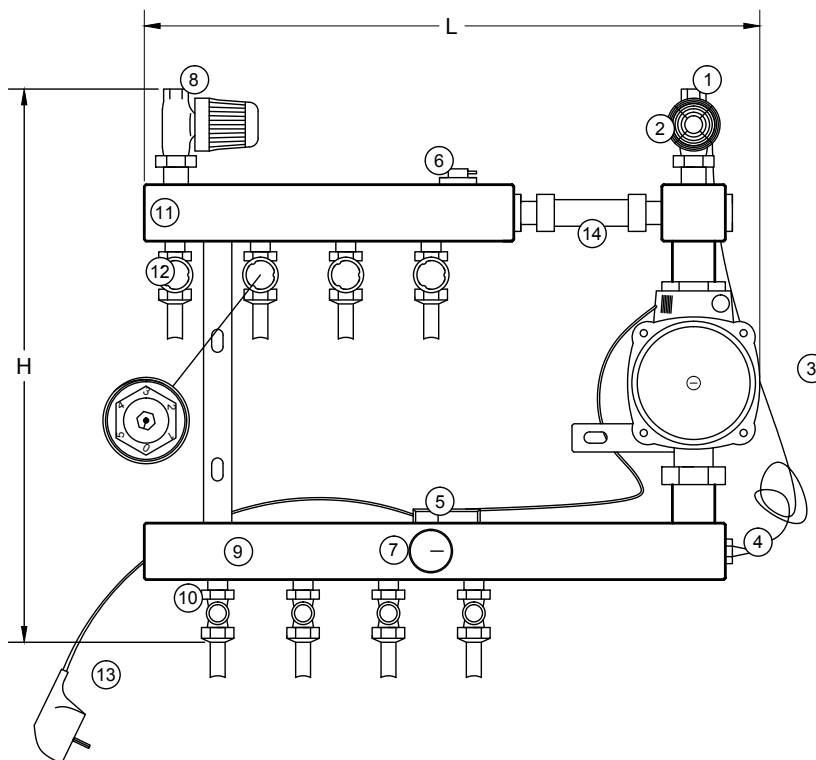
Depth (mm): 160
Height (H) (mm): 430

7 MANIFOLDS

7.4.3 Steel manifold type "UFH-05-ST"

Description

Steel manifold that is modified for district heating (Nuon, Essent).



- 1 Thermostat tap 1/2" or 3/4" (Kvs 1.2)
- 2 Thermostat head (range 20 – 60°C)
- 3 Pump (RS 25/4-3 or RS 25/5-3)
- 4 Supply sensor
- 5 Maximum thermostat (shuts off at 55°C)
- 6 Air bleed valve
- 7 Supply thermometer
- 8 RTL-tap 1/2"
- 9 Supply bar
- 10 Supply group, 3/4" eurocone
- 11 Return bar
- 12 Return group, 3/4" eurocone
- 13 Electrical connection (230V)
- 14 Non-return valve 1/2"

Groups:	L (mm):
1	300
2	300
3	420
4	420
5	540
6	540
7	660
8	660
9	780
10	780
11	900
12	900
13	1020
14	1020
15	1140
16	1140

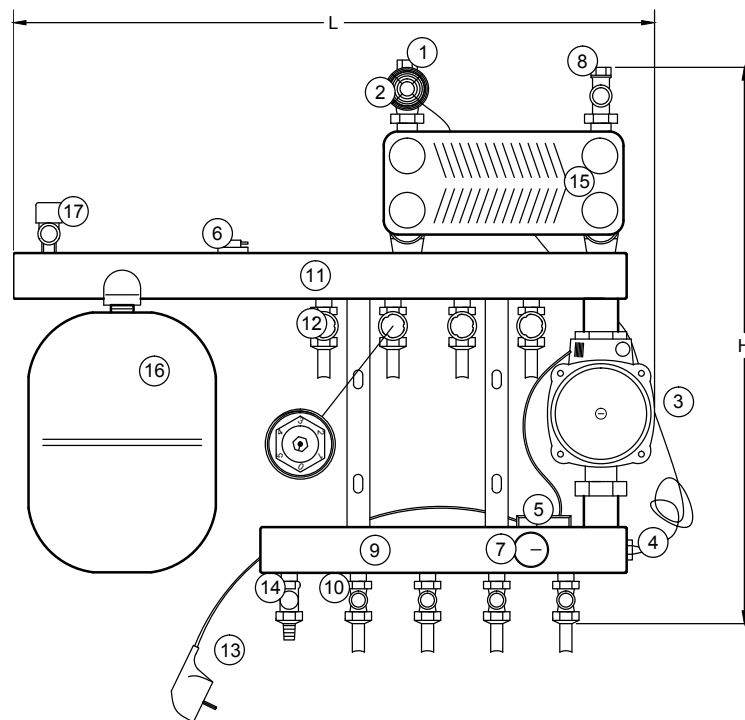
Depth (mm): 160
Height (H) (mm): 460



7.4.4 Steel manifold type "UFH-05-SWE"

Description

Steel manifold is fitted with a heat exchanger and an expansion tank. The manifold is fully separate from the primary installation. This manifold is also available in stainless steel "UFH-05-SRWE".



- 1 Thermostat tap 1/2" or 3/4" (Kvs = 1.2)
- 2 Thermostat head (range 20 – 60°C)
- 3 Pump (RS 25/4-3 or RS 25/5-3)
- 4 Supply sensor
- 5 Maximum thermostat (shuts off at 55°C)
- 6 Air bleed valve
- 7 Supply thermometer
- 8 Return connection 1/2" or 3/4"
- 9 Supply bar
- 10 Supply group, 3/4" eurocone
- 11 Return bar
- 12 Return group, 3/4" eurocone
- 13 Electrical connection (230V)
- 14 Drainage tap
- 15 Heat exchanger
- 16 Expansion tank (8.5 L)
- 17 Overpressure safety (3 bar)

Groups:	L (mm):
1	580
2	580
3	580
4	580
5	700
6	700
7	820
8	820
9	940
10	940
11	1060
12	1060

Depth (mm): 270
Height (H) (mm): 500



7 MANIFOLDS

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7.4.3 Steel manifold type "UFH-05-SK

Description

Steel manifold with 2 pairs of connections for heating and cooling. The connections are each fitted with separate adjustment options. Depending on the system, a heat exchanger is fitted. This manifold is custom made in consultation with the customer.



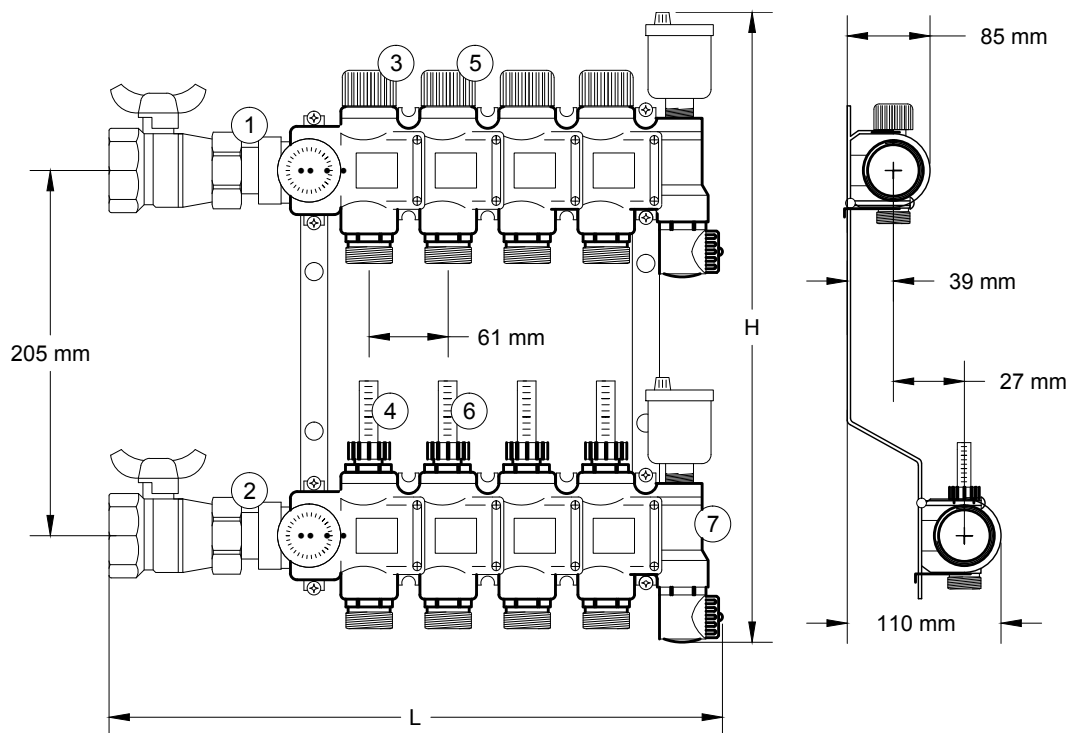
7.5 Synthetic manifold

The synthetic manifold has a modular construction. This makes the manifold easy to set up with regard to the number of groups. The manifold is suitable for underfloor cooling. The choice of "polyamide" material reduces the chance of condensation forming. It is available for 2 to 10 groups. The flow adjustment per group is done by setting the flow meters,

such that the flow rate can be read off instantly.

Technical information

maximum operational temperature (°C)	50
maximum operational pressure (bar)	6



- 1 Supply shutoff valve 1"
- 2 Return shutoff valve 1"
- 3 Supply module with valve with 5/4" swivel
- 4 Return module with flow meter 0 – 4 L/Min and 5/4" swivel
- 5 Supply module with valve
- 6 Return module with flow meter 0 – 4 L/Min
- 7 End module with auto air bleeder

Groups:	L (mm):
2	280
3	331
4	382
5	433
6	484
7	535
8	586
9	637
10	688



7 MANIFOLDS

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7.6 Pump group for synthetic manifold

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The pump group maintains a constant (supply) water temperature over the groups of the synthetic manifold.

3

The pump group will mix supply water from the heat source according to the temperature set on the thermostat head.

4

The supply water from the heat source must have a temperature that is at least 15°C higher than the desired supply

5

water temperature of the manifold. A maximum thermostat switches off the pump in case of excessively high supply water temperature. The pump group is hydraulically neutral. It is necessary that a primary pump provides the necessary pressure difference over the supply and return of the pump group.

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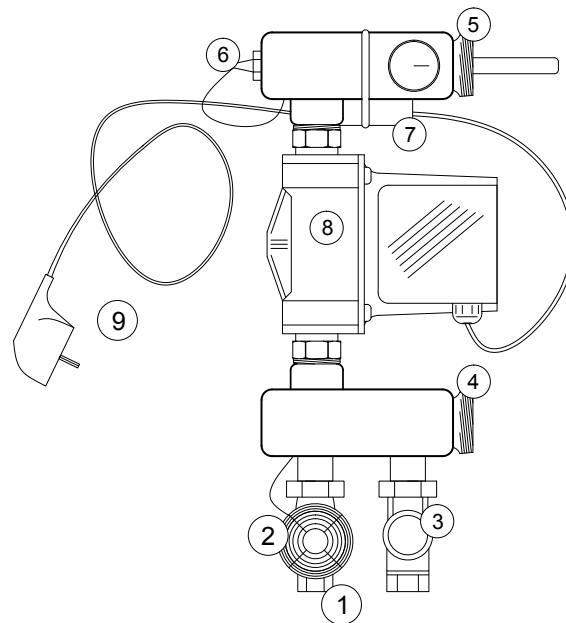
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- 1 Thermostat tap 3/4" (Kv 0.95 / Kvs 2.5)
- 2 Thermostat head (range 20 – 50°C)
- 3 Return tap 3/4" (Kv 0.025-0.5 / Kvs 0.78)
- 4 Return manifold, 4/5" connection
- 5 Supply manifold, 4/5" connection
- 6 Supply sensor
- 7 Maximum thermostat (shuts off at 55°C)
- 8 Pump (RS15/6-3)
- 9 Electrical connection (230V)

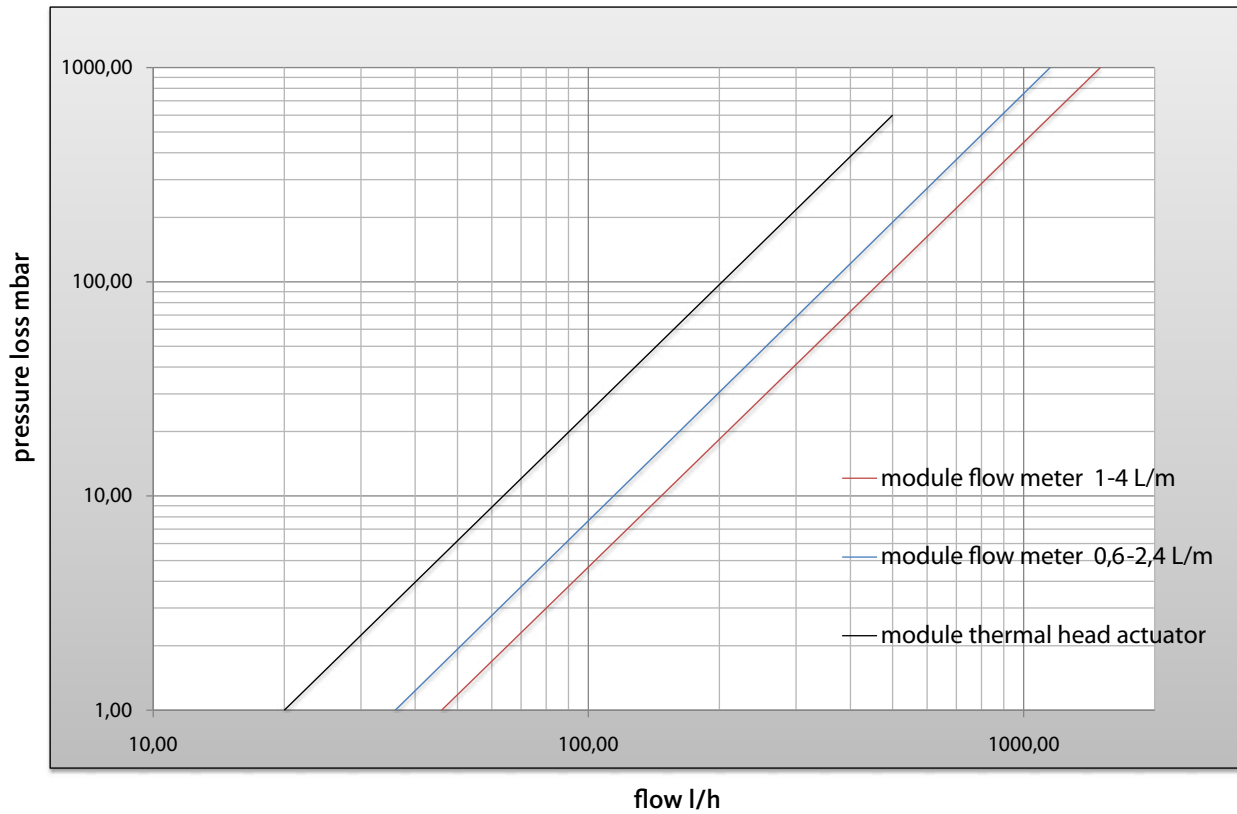
Nominal power is 10 KW



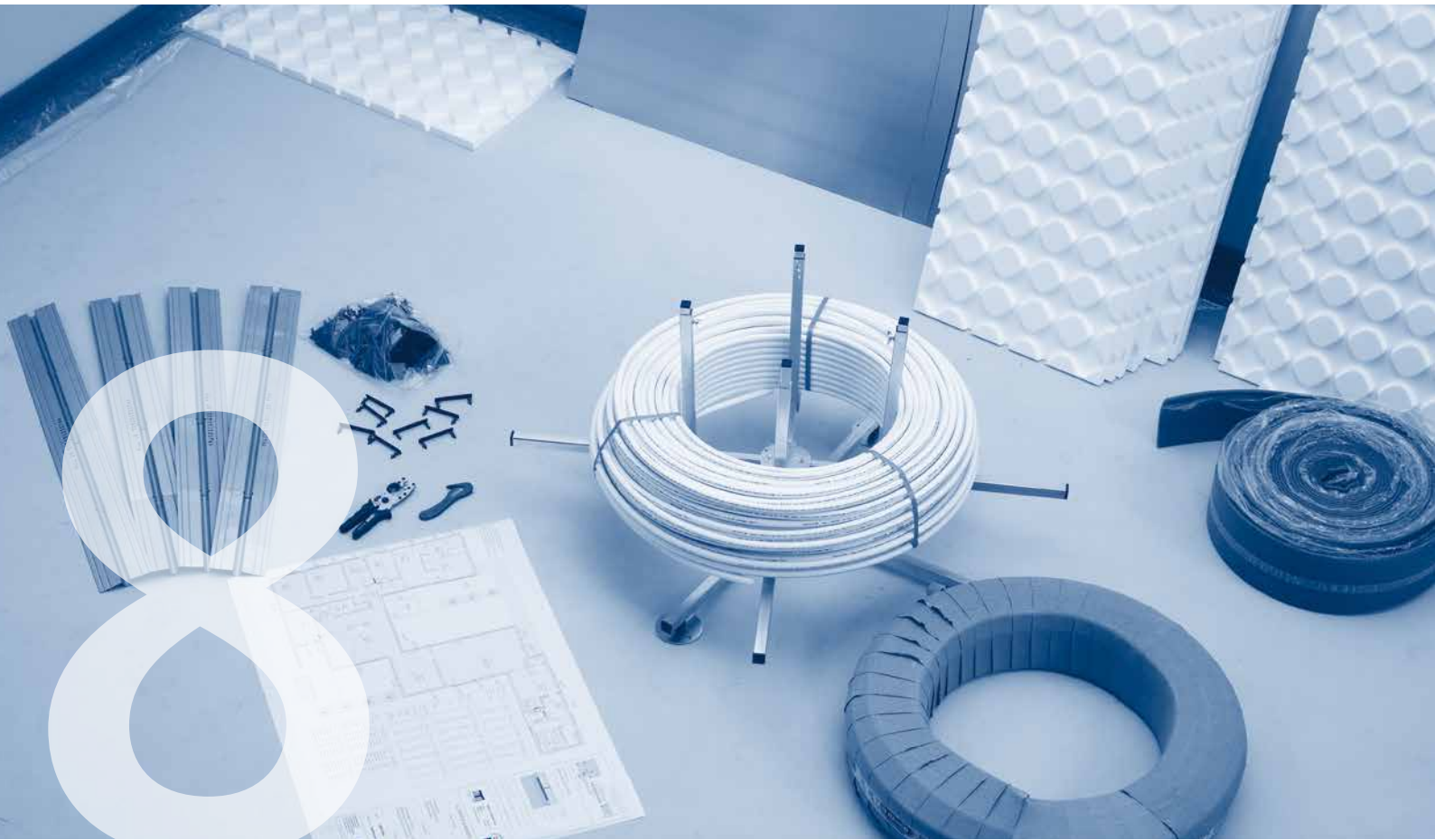
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The following diagram shows the pressure loss from:
UFH-K-EM supply module (module expandable with thermal head actuator)
UFH-K-MDA return module (module with flow meter 1-4 L/min)
UFH-K-MDB return module (module with flow meter 0.6-2.4 L/min)

Pressure loss diagram



PRODUCT SHEETS



8.1 Materials

75

8.2 Tools

125



8.1 Materials

TYPE: STANDARD

multilayer pipe PE-Xc/AL/PE-Xc



DESCRIPTION	16	18	20	26
outer diameter (mm)	Ø16	Ø18	Ø20	Ø26
inner diameter (mm)	12	14	16	20
wall thickness (mm)	2	2	2	3
aluminium thickness (mm)	0,4	0,4	0,4	0,5
max. operating temperature (°C)	95	95	95	95
max. operating pressure (bar)	10	10	10	10
application class (ISO10508)	2 - 4 - 5			
heat conduction coefficient (W/mK)	0,43	0,43	0,43	0,43
linear expansion coefficient (mm/mK)	0,025	0,025	0,025	0,025
min. curve radius, manual outer spring (mm)*	5 X Du	5 X Du	5 X Du	5 X Du
min. curve radius, inner spring (mm)*	3 X Du	3 X Du	3 X Du	3 X Du
surface roughness of inner pipe (µ)	7	7	7	7
oxygen diffusion (mg/L)	0	0	0	0
degree of cross-linking (%)	60	60	60	60
weight (kg/m)	0,125	0,132	0,147	0,261
content (L/m)	0,113	0,154	0,201	0,314

*Du = outside diameter

Specifications

Type STANDARD

The pipe meets the technical requirements ATG, KIWA KOMO and DVGW.

The construction consists of 5 layers:

- The inner pipe is made of high-density polyethylene granulates cross-linked by electron beams (PE-Xc)
- High quality glue layer (20 N/cm²)
- Aluminium pipe (seamlessly welded lengthwise)
- High quality glue layer (20 N/cm²)
- The outer pipe is made of high-density polyethylene granulates cross-linked by electron beams (PE-Xc)

8 PRODUCT SHEETS

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TYPE: RIXc

multilayer pipe PE-Xc/AL/PE-Xc



DESCRIPTION	16	18	20	26
outer diameter (mm)	Ø16	Ø18	Ø20	Ø26
inner diameter (mm)	12	14	16	20
wall thickness (mm)	2	2	2	3
aluminium thickness (mm)	0,2	0,2	0,28	0,28
max. operating temperature (°C)	95	95	95	95
max. operating pressure (bar)	10	10	10	10
application class (ISO10508)	2 - 4 - 5			
heat conduction coefficient (W/mK)	0,43	0,43	0,43	0,43
linear expansion coefficient (mm/mK)	0,025	0,025	0,025	0,025
min. curve radius, manual outer spring (mm)*	8 X Du	8 X Du	7 X Du	7 X Du
min. curve radius, inner spring (mm)*	8 X Du	8 X Du	5 X Du	5 X Du
surface roughness of inner pipe (µ)	7	7	7	7
oxygen diffusion (mg/L)	0	0	0	0
degree of cross-linking (%)	60	60	60	60
weight (kg/m)	0,101	0,118	0,129	0,252
content (L/m)	0,113	0,154	0,201	0,314

*Du = outside diameter

Specifications

Type RIXc

Construction consists of 5 layers:

- The inner pipe is made of high-density polyethylene granulates cross-linked by electron beams (PE-Xc)
- High quality glue layer (20 N/cm²)
- Aluminium pipe (seamlessly welded lengthwise)
- High quality glue layer (20 N/cm²)
- The outer pipe is made of high-density polyethylene granulates cross-linked by electron beams (PE-Xc)



TYPE: FLOOR

multilayer pipe PE-Xc/AL/PE-Xc



DESCRIPTION	16	20
outer diameter (mm)	Ø16	Ø20
inner diameter (mm)	12	16
wall thickness (mm)	2	2
aluminium thickness (mm)	0,2	0,28
max. operating temperature (°C)	60	60
max. operating pressure (bar)	6	6
application class (ISO10508)	4	
heat conduction coefficient (W/mK)	0,43	0,43
linear expansion coefficient (mm/mK)	0,025	0,025
min. curve radius, manual outer spring (mm)*	8 X Du	7 X Du
min. curve radius, inner spring (mm)*	8 X Du	5 X Du
surface roughness of inner pipe (µ)	7	7
oxygen diffusion (mg/L)	0	0
degree of cross-linking (%)	60	60
weight (kg/m)	0,101	0,129
content (L/m)	0,113	0,201
color	red - white	white

*Du = outside diameter

Specifications

Type FLOOR

Construction consists of 5 layers:

- The inner pipe is made of high-density polyethylene granulates cross-linked by electron beams (PE-Xc)
- High quality glue layer (20 N/cm²)
- Aluminium pipe (seamlessly welded lengthwise)
- High quality glue layer (20 N/cm²)
- The outer pipe is made of high-density polyethylene granulates cross-linked by electron beams (PE-Xc)

8 PRODUCT SHEETS

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TYPE: 5L PE-Xc

full synthetic pipe PE-Xc/EVOH/PE-Xc



DESCRIPTION	16	17	18	20
outer diameter (mm)	Ø16	Ø17	Ø18	Ø20
inner diameter (mm)	12	13	14	16
wall thickness (mm)	2	2	2	2
max. operating temperature (°C)	95	95	95	95
max. operating pressure (bar)	6	6	6	6
application class (ISO10508)	4 - 5			
heat conduction coefficient (W/mK)	0,36	0,36	0,36	0,36
linear expansion coefficient (mm/mK)	0,18	0,18	0,18	0,18
surface roughness of inner pipe (µ)	7	7	7	7
degree of cross-linking (%)	60	60	60	60
oxygen concentration according to DIN4726 (g/m ³ .d)	< 0,1	< 0,1	< 0,1	< 0,1
weight (kg/m)	0,088	0,091	0,095	0,117
content (L/m)	0,113	0,133	0,154	0,201

Specifications

Type 5L PE-Xc

The pipe meets the technical requirements of DIN 16892.

The construction consists of 5 layers:

- The inner pipe is made of high-density polyethylene granulates cross-linked by electron beams (PE-Xc)
- High quality glue layer
- EVOH layer
- High quality glue layer
- The outer pipe is made of high-density polyethylene granulates cross-linked by electron beams (PE-Xc)



TYPE: 5L PE-RT

full synthetic pipe PE-RT/EVOH/PE-RT



DESCRIPTION	16	17	18	20
outer diameter (mm)	Ø16	Ø17	Ø18	Ø20
inner diameter (mm)	12	13	14	16
wall thickness (mm)	2	2	2	2
max. operating temperature (°C)	95	95	95	95
max. operating pressure (bar)	6	6	6	6
application class (ISO10508)	4 (6 bar) - 5 (4 bar)			
heat conduction coefficient (W/mK)	0,36	0,36	0,36	0,36
linear expansion coefficient (mm/mK)	0,18	0,18	0,18	0,18
surface roughness of inner pipe (µ)	7	7	7	7
oxygen concentration according to DIN4726 (g/m ³ .d)	< 0,1	< 0,1	< 0,1	< 0,1
weight (kg/m)	0,088	0,091	0,095	0,117
content (L/m)	0,113	0,133	0,154	0,201

Specifications

Type 5L PE-RT

The pipe meets the technical requirements of DIN 16833.

The construction consists of 5 layers:

- Inner pipe made of high quality polyethylene
- High quality glue layer
- EVOH layer
- High quality glue layer
- Outer pipe made of high quality polyethylene

8 PRODUCT SHEETS

Overview of article codes and roll lengths

ITEM CODE	type	pipe diameter (mm)	roll length (m)
100-160212	STANDARD	16	100
200-160212	STANDARD	16	200
500-160212	STANDARD	16	500
100-180214	STANDARD	18	100
200-180214	STANDARD	18	200
500-180214	STANDARD	18	500
100-200216	STANDARD	20	100
200-200216	STANDARD	20	200
100-R160212	RIXc	16	100
200-R160212	RIXc	16	200
500-R160212	RIXc	16	500
100-R180214	RIXc	18	100
200-R180214	RIXc	18	200
500-R180214	RIXc	18	500
100-R200216	RIXc	20	100
200-R200216	RIXc	20	200
500-R200216	RIXc	20	500
100-F16R-RO	FLOOR	16	100
200-F16R-RO	FLOOR	16	200
500-F16R-RO	FLOOR	16	500
100-F16R	FLOOR	16	100
200-F16R	FLOOR	16	200
500-F16R	FLOOR	16	500
100-F20R	FLOOR	20	100
200-F20R	FLOOR	20	200
400-F20R	FLOOR	20	400
90-PXC1620	5L PE-Xc	16	90
120-PXC1620	5L PE-Xc	16	120
200-PXC1620	5L PE-Xc	16	200
600-PXC1620	5L PE-Xc	16	600
90-PXC2020	5L PE-Xc	20	90
120-PXC2020	5L PE-Xc	20	120
200-PXC2020	5L PE-Xc	20	200
400-PXC2020	5L PE-Xc	20	400
90-PRT1620	5L PE-RT	16	90
120-PRT1620	5L PE-RT	16	120
200-PRT1620	5L PE-RT	16	200
600-PRT1620	5L PE-RT	16	600
200-PRT2020	5L PE-RT	20	200
400-PRT2020	5L PE-RT	20	400

Remark:

The stated articles are standard products in the Hencofloor assortment.
Other pipe diameters (ø17 and ø26) and other roll lengths are available by request.



Table application classe (ISO 10508)

Classification of service conditions (ISO 10508)							
Application class	T_D		T_{max}		T_{mal}		Typical field of application
	°C	Time ^a years	°C	Time years	°C	Time h	
1 ^b	60	49	80	1	95	100	Hot water supply (60 °C)
2 ^b	70	49	80	1	95	100	Hot water supply (70 °C)
3 ^c	20 30 40	0,5 20 25	50	4,5	65	100	Low-temperature under-floor heating
4	20 40 60	2,5 20 25	70	2,5	100	100	Under-floor heating and low-temperature radiators
5	20 60 80	14 25 10	90	1	100	100	High temperature radiators

NOTE This International Standard is only applicable to sealed systems which do not have values of TD, Tmax and Tmal in excess of those stated for class 5.

- a Where more than one design temperature appears for any class, the times should be aggregated (e.g. the design temperature profile for 50 years for class 5 is 20 °C for 14 years, followed by 60 °C for 25 years, 80 °C for 10 years, 90 °C for 1 year and 100 °C for 100 h).
- b Depending upon international, national or local regulations.
- c Only allowed when the malfunction temperature cannot rise above 65 °C.

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8 PRODUCT SHEETS

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TYPE: 19P

brass press fitting with eurocone connector, nickel plated



DESCRIPTION	19P-1605	19P-1805	19P-2005
connection	3/4"EK	3/4"EK	3/4"EK
pipe diameter (mm)	16	18	20
package (pcs.)	10	10	10

Only suitable for multilayer pipe PE-Xc/AL/PE-Xc

TYPE: EK

brass compression fitting with eurocone connector, nickel plated



DESCRIPTION	EK16	EK16L *	EK17	EK18	EK20
connection	3/4"EK	3/4"EK	3/4"EK	3/4"EK	3/4"EK
pipe diameter (mm)	16	16	17	18	20
package (pcs.)	10	10	10	10	10

*Nut is 24 mm long and not nickel plated.

TYPE: 15PK

PVDF press fitting



DESCRIPTION	15PK-1616	15PK-1818	15PK-2020
pipe diameter (mm)	16	18	20
package (pcs.)	10	10	10

Only suitable for multilayer pipe PE-Xc/AL/PE-Xc



TYPE: 15P

brass press fitting



DESCRIPTION	15P-1616	15P-1818	15P-2020
pipe diameter (mm)	16	18	20
package (pcs.)	10	10	10

Only suitable for multilayer pipe PE-Xc/AL/PE-Xc

TYPE: 2

brass compression connector



DESCRIPTION	2-1616	2-1818	2-2020
pipe diameter (mm)	16	18	20
package (pcs.)	10	10	10

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8 PRODUCT SHEETS

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TYPE: UFH-ISOPRO

system plate



DESCRIPTION	UFH-ISOPRO-30	UFH-ISOPRO-11
dimensions (mm)	1450 X 850	1450 X 850
effective dimensions (mm)	1400 X 800	1400 X 800
total thickness (mm)	55	31
insulation thickness dL (mm)	30 - 2	11
insulation according to EN 13163	EPS-EN 13163-T4-L1-W1-S1-P3-DS(N)5-BS100-SD20-CP2	EPS-EN13163-T1-L1-W1-S1-P3-DS(N)5-DLT(2)5-BS250-CS(10)150
quality type	PST-TK 5000	EPS W 30
thermal conduction coefficient (W/mK)	0,04	0,035
thermal resistivity (m ² K/W)	0,75	0,31
density (kg/m ³)	/	> 30
max. compression load (kPa)	5 (500 kg/m ²)	75 (7500 kg/m ²)
bend strength (kPa)	> 100	/
dynamic stiffness (MN/m ³)	20	/
application according to DIN 4108-10	DESsg	DEO
fire class according to DIN 4102	B2	B2
fire class according to EN 13501-1	E	E
noise improvement	28 DB	/
retains form up to (°C)	80	80
centre-to-centre distance (ctc, vert) (mm)	50	50
centre-to-centre distance (dia) (mm)	70	70
pipe diameter (mm)	16 - 17	16 - 17
moisture resistance according to DIN 18560	PS 0.6 mm	PS 0.6 mm
packaging (m ²)	6,72	14,56

Specifications

Item UFH-ISOPRO30

Pre-formed EPS insulation plate, 30 mm thick, with filled knobs and finished with a 0.6 mm thick PS sheeting.

The system plate has 2 preformed PS flaps with hollow knobs 50 mm wide.

Suitable for pipe diameters 16 and 17 mm.

Item UFH-ISOPRO11

Pre-formed EPS insulation plate, 11 mm thick, with filled knobs and finished with a 0.6 mm thick PS sheeting.

The system plate has 2 preformed PS flaps with hollow knobs 50 mm wide.

Suitable for pipe diameters 16 and 17 mm.



TYPE: UFH-PRO

system plate



DESCRIPTION	UFH-PRO-IND
dimensions (mm)	1450 X 850
effective dimensions (mm)	1400 X 800
total thickness (mm)	22,5
max. compression load (kPa)	5 (500 kg/m ²)
centre-to-centre distance (ctc, vert) (mm)	50
centre-to-centre distance (dia) (mm)	70
pipe diameter (mm)	16 - 17
moisture resistance according to DIN 18560	PS 1 mm
packaging (m ²)	13,44
package (pcs.)	12

Specifications

Article UFH-PRO

Preformed PS sheeting, 1 mm thick, with knobs

The system plate has 2 preformed PS flaps with hollow knobs 50 mm wide.

Suitable for pipe diameters 16 and 17 mm.

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8 PRODUCT SHEETS

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TYPE: UFH-PRO-DIA

diagonal holder for system plate



DESCRIPTION

UFH-PRO-DIA

centre-to-centre distance (mm)

70

package (pcs.)

40

TYPE: UFH-PRO-ADA

door threshold sheeting for system plate



DESCRIPTION

UFH-PRO-ADA

dimensions (mm)

1450 x 210

package (pcs.)

1

TYPE: UFH-ISOPRO-AD

threshold piece made of EPS insulation plate



DESCRIPTION

UFH-ISOPRO-AD30

UFH-ISOPRO-AD11

dimensions (mm)

1000 x 200

1000 x 200

thickness (mm)

30

11

package (pcs.)

1

1



TYPE: UFH-PRO-IND

industrial system plate



DESCRIPTION	UFH-PRO-IND
dimensions (mm)	1275 X 975
effective dimensions (mm)	1200 X 900
total thickness (mm)	23
centre-to-centre distance (ctc, vert) (mm)	75
centre-to-centre distance (dia) (mm)	38 - 69
pipe diameter (mm)	14 - 20
moisture resistance according to DIN 18560	PS 1 mm
packaging (m ²)	19,44

Specifications

Article UFH-PRO-IND

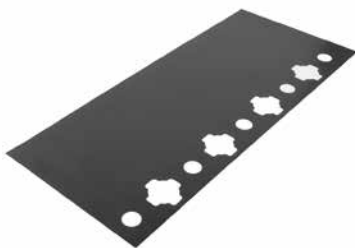
Preformed PS sheeting, 1 mm thick, with knobs

The system plate has 2 preformed PS flaps with hollow knobs 75 mm wide.

Suitable for pipe diameters 14 to 20 mm.

TYPE: UFH-PRO-IND-B

curve plate for industrial system plate



DESCRIPTION	UFH-PRO-IND-B
dimensions (mm)	1200 x 575
material	PS 0.9 mm
package (pcs.)	1

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TYPE: UFH-ISO

flat insulation plate



DESCRIPTION	UFH-ISO-20	UFH-ISO-30
dimensions (mm)	1000 X 500	1000 X 500
total thickness (mm)	20	30
quality type	EPS 150	EPS 150
thermal conduction coefficient (W/mK)	0,032	0,035
thermal resistivity (m ² K/W)	0,55	0,85
density (kg/m ³)	25	25
max. compression load (kPa)	40	40
compression strength 10% deformation (kPa)	150	150
compression strength 3% deformation (kPa)	50	50
compressive strength max. 2% deformation (kPa)	40	40
water uptake of cube 5/5/5 - 7 days	2.2 % vol	2.2 % vol
water uptake of cube 5/5/5 - 1 year in accordance with DIN 53457	3.8 % vol	3.8 % vol
E - modulus according to DIN 53457 (kPa)	8000	8000
bend strength (kPa)	200	200
fire class according to EN 13501-1	E	E
retains form (°C)	-110 / + 70	-110 / + 70
packaging (m ²)	15	10

Specifications

Item UFH-ISO20

Flat EPS insulation plate, 20 mm thick.

The insulation plate is 1 metre long and 0.5 metres wide.

The insulation plate has a completely smooth finish.

Item UFH-ISO30

Flat EPS insulation plate, 30 mm thick.

The insulation plate is 1 metre long and 0.5 metres wide.

The insulation plate has a completely smooth finish.



TYPE: UFH-TACK-KLS15

tacker plate



DESCRIPTION	UFH-TACK-KLS15
dimensions (mm)	2000 X 1000
total thickness (mm)	15
grid marking □	100
quality type	EPS 035 DEO dm + PE Foam 5 mm
thermal conduction coefficient (W/mK)	0,035
thermal resistivity (m ² K/W)	0,28
max. compression load (kPa)	4 (400 KG/M ²)
noise improvement	17 DB
retains form (°C)	80
packaging (m ²)	10

Specifications

Item UFH-TACK-KLS15

Double folded 10 mm thick EPS isolation board + PE foam
5 mm thick, with a grey vapour barrier with blue grid marking
100 x 100 mm.

The tacker plate has 2 flaps 50 mm wide.

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TYPE: UFH-TACK-KLS

tacker plate



DESCRIPTION	UFH-TACK-KLS20	UFH-TACK-KLS25	UFH-TACK-KLS30	UFH-TACK-KLS35
dimensions (mm)	2000 X 1000	2000 X 1000	2000 X 1000	2000 X 1000
total thickness (mm)	20	25	30	35
grid marking □	100	100	100	100
quality type	EPS 045 DES sm	EPS 045 DES sm	EPS 045 DES sm	EPS 045 DES sm
thermal conduction coefficient (W/mK)	0,045	0,045	0,045	0,045
thermal resistivity (m ² K/W)	0,44	0,55	0,66	0,77
max. compression load (kPa)	4 (400 kg/m ²)	4 (400 kg/m ²)	4 (400 kg/m ²)	4 (400 kg/m ²)
noise improvement*	to 30 dB	to 30 dB	to 33 dB	to 33 dB
dynamic stiffness (MN/m ²)	≤ 20	≤ 20	≤ 15	≤ 15
retains form (°C)	80	80	80	80
packaging (m ²)	10	10	10	10

* DIN4109 depending on floor covering

Specifications

Item UFH-TACK-KLS20

Double folded 20 mm thick EPS insulation plate, with a grey vapour barrier with blue 100 x 100 mm grid markings.

The tacker plate has 2 flaps 50 mm wide.

Item UFH-TACK-KLS25

Double folded 25 mm thick EPS insulation plate, with a grey vapour barrier with blue 100 x 100 mm grid markings.

The tacker plate has 2 flaps 50 mm wide.

Item UFH-TACK-KLS30

Double folded 30 mm thick EPS insulation plate, with a grey vapour barrier with blue 100 x 100 mm grid markings.

The tacker plate has 2 flaps 50 mm wide.

Item UFH-TACK-KLS35

Double folded 35 mm thick EPS insulation plate, with a grey vapour barrier with blue 100 x 100 mm grid markings.

The tacker plate has 2 flaps 50 mm wide.



TYPE: UFH-TACK-ROL

tacker roll



DESCRIPTION	UFH-TACK-ROL20	UFH-TACK-ROL25	UFH-TACK-ROL30	UFH-TACK-ROL35
dimensions (m)	10 X 1	10 X 1	10 X 1	10 X 1
total thickness (mm)	20	25	30	35
grid marking □	100	100	100	100
quality type	EPS 045 DES sm	EPS 045 DES sm	EPS 045 DES sm	EPS 045 DES sm
thermal conduction coefficient (W/mK)	0,045	0,045	0,045	0,045
thermal resistivity (m ² K/W)	0,44	0,55	0,66	0,77
max. compression load (kPa)	4 (400 kg/m ²)	4 (400 kg/m ²)	4 (400 kg/m ²)	4 (400 kg/m ²)
noise improvement*	up to 30 dB	up to 30 dB	up to 33 dB	up to 33 dB
dynamic stiffness (MN/m ³)	≤ 20	≤ 20	≤ 15	≤ 15
retains form up to (°C)	80	80	80	80
packaging (m ²)	10	10	10	10

* DIN4109 depending on floor covering

Specifications

Item UFH-TACK-ROL20

EPS insulation plate on roll 20 mm thick, with a grey vapour barrier with blue grid markings 100 x 100 mm.

The tacker plate has 1 side flap 50 mm wide.

Item UFH-TACK-ROL25

EPS insulation plate on roll 25 mm thick, with a grey vapour barrier with blue grid markings 100 x 100 mm.

The tacker plate has 1 side flap 50 mm wide.

Item UFH-TACK-ROL30

EPS insulation plate on roll 30 mm thick, with a grey vapour barrier with blue grid markings 100 x 100 mm.

The tacker plate has 1 side flap 50 mm wide.

Item UFH-TACK-ROL35

EPS insulation plate on roll 35 mm thick, with a grey vapour barrier with blue grid markings 100 x 100 mm.

The tacker plate has 1 side flap 50 mm wide.



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TYPE: UFH-TACK-38K

tacker clip 38 mm

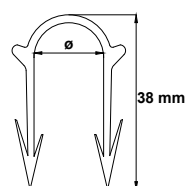


Specifications

Item UFH-TACK-38K

Black polypropylene tacker clip, 38 mm long.
 Required minimum 25 mm underlying insulation.
 Suitable for 16 mm pipe diameter.

DESCRIPTION	UFH-TACK-38K
length (mm)	38
pipe diameter (mm)	16
package (pcs.)	300



TYPE: UFH-TACK

tacker clip



Specifications

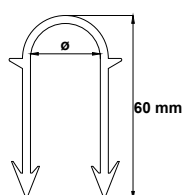
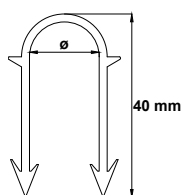
Item UFH-TACK-40

Black polypropylene tacker clip, 40 mm long.
 Required minimum 25 mm underlying insulation.
 Suitable for pipe diameters 16 to 20 mm.

DESCRIPTION	UFH-TACK-40	UFH-TACK-60
length (mm)	40	60
pipe diameter (mm)	16 - 20	16 - 20
package (pcs.)	300	300

Item UFH-TACK-60

Black polypropylene tacker clip, 60 mm long.
 Required minimum 40 mm underlying insulation.
 Suitable for pipe diameters 16 to 20 mm.





TYPE: UFH-UP

U-profile



Specifications

Item UFH-UP-16M1

The black U-profile is provided with a clamp system that connects the profiles. The U-profile has a

DESCRIPTION	UFH-UP-16M1
length (cm)	100
width (cm)	4
centre-to-centre distance (mm)	50
pipe diameter (mm)	16
packaging (m)	1

self-adhesive strip on the back and is provided with holes for fastening.

Suitable for 16 mm pipe diameter.

TYPE: UFH-UP

U-profile



Specifications

Item UFH-UP-16

The grey U-profile has a self-adhesive strip on the back and is provided with holes for fastening.
Suitable for 16 mm pipe diameter.

Item UFH-UP-17

The grey U-profile has a self-adhesive strip on the back and is provided with holes for fastening.
Suitable for 17 mm pipe diameter.

DESCRIPTION	UFH-UP16	UFH-UP17	UFH-UP18	UFH-UP20
length (cm)	250	250	250	200
width (cm)	4,2	4,2	4,2	4,2
centre-to-centre distance (mm)	50	50	50	50
pipe diameter (mm)	16	17	18	20
packaging (m)	2,5	2,5	2,5	2

Item UFH-UP-18

The grey U-profile has a self-adhesive strip on the back and is provided with holes for fastening.
Suitable for 18 mm pipe diameter.

Item UFH-UP-20

The grey U-profile has a self-adhesive strip on the back and is provided with holes for fastening.
Suitable for 20 mm pipe diameter.



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TYPE: UFH-UP

U-profile



DESCRIPTION	UFH-UP-1826M1Z
length (cm)	100
width (cm)	5
centre-to-centre distance (mm)	50
pipe diameter (mm)	18, 20, 26
packaging (m)	1

Specifications

Item UFH-UP-1826M1Z

The U-profile has holes for fastening.
Suitable for pipe diameters 18 to 26 mm.

TYPE: UFH-UP-CUP50

fixing tack for U-profile

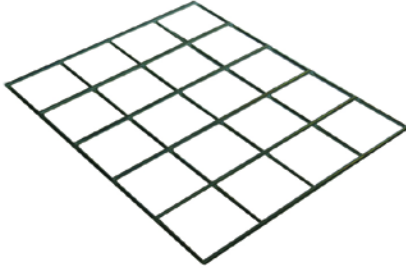


DESCRIPTION	UFH-UP-CUP50
length (mm)	50
package (pcs.)	500



TYPE: UFH-RAS

galvanized steel Steel mesh



DESCRIPTION	UFH-RAS10	UFH-RAS15
dimensions (cm)	215 x 120	210 X 120
surface area (m ²)	2,58	2,52
wire thickness (mm)	3	3
mesh □	100	150
package (pcs.)	10	10

Specifications

Item UFH-RAS10

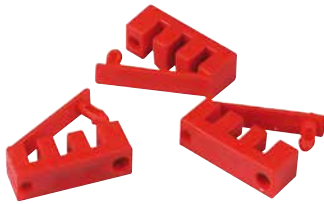
Wire mat made of galvanized steel, 3 mm thick, with mesh pattern 100 x 100 mm.

Item UFH-RAS15

Wire mat made of galvanized steel, 3 mm thick, with mesh pattern 150 x 150 mm.

TYPE: UFH-RAS-RB3

fastening clip for steel mesh



DESCRIPTION	UFH-RAS-RB3
package (pcs.)	30

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TYPE: UFH-RAS-BIND

steel fastening wire



DESCRIPTION	UFH-RAS-BIND15A	UFH-RAS-BIND15B
length (mm)	160	160
package (pcs.)	250	2500

Specifications

Item UFH-RAS-BIND

Steel fastening wire, green plasticized, 160 mm long for fastening of pipe to steel mesh.

Suitable for fastening with fastening hook.

TYPE: UFH-RAS-CLIP

fastening clip for underfloor heating pipe



DESCRIPTION	UFH-RAS-CLIP16	UFH-RAS-CLIP18	UFH-RAS-CLIP20
pipe diameter (mm)	16	18	20
package (pcs.)	200	200	200

Specifications

Item UFH-RAS-CLIP16

Black plastic clip for fastening of pipe to steel mesh with wire thickness 3 mm.

Suitable for 16 mm pipe diameter.

Item UFH-RAS-CLIP18

Red plastic clip for fastening of pipe to steel mesh with wire thickness 3 mm.

Suitable for 18 mm pipe diameter.

Item UFH-RAS-CLIP20

Red plastic clip for fastening of pipe to steel mesh with wire thickness 3 mm.

Suitable for 20 mm pipe diameter.



TYPE: UFH-ISODRY-25

dry system plate



Specifications

Item UFH-ISODRY-25

Preformed EPS insulation plate, 25 mm thick, with bumps.

DESCRIPTION	UFH-ISODRY-25
dimensions (mm)	1000 X 500
total thickness (mm)	25
insulation thickness (mm)	6
insulation according to EN 13163	EPS-EN13163-T1-L1-W1-S1-P3-DS(N)5-DLT(2)5-BS250-CS(10)150
quality type	EPS W 30
thermal conduction coefficient (W/mK)	0,035
thermal resistivity (m ² K/W)	0,6
density (kg/m ³)	> 30
max. compression load (kPa)	35 (3500 kg/m ²)
bend strength (kPa)	> 100
application according to DIN 4108-10	DEO
fire class according to DIN 4102	B1
fire class according to EN 13501-1	E
retains form (°C)	80
centre-to-centre distance (ctc, vert) (mm)	100
pipe diameter (mm)	16
packaging (m ²)	10

TYPE: UFH-DRY-GP100

heat diffusion profile for dry system



Specifications

Item UFH-DRY-GP100

Galvanized plate steel radiance profile, 0.4 mm thick, with 3 break lines.

DESCRIPTION	UFH-DRY-GP100
dimensions (mm)	997 X 120
pipe diameter (mm)	16
thickness (mm)	0,4
package (pcs.)	1

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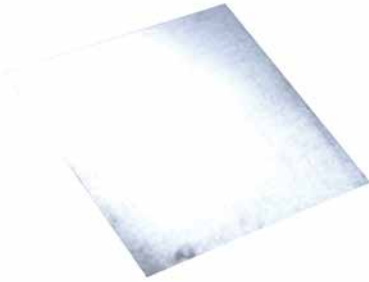
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TYPE: UFH-DRY-VD100

radiance distribution plate for dry system



DESCRIPTION	UFH-DRY-VD100
dimensions (mm)	1000 X 1000
thickness (mm)	0,5
package (pcs.)	1

Specifications

Item UFH-DRY-VD100

Aluminium radiance distribution plate, 0.5 mm thick.

TYPE: UFH-DRY-B

bracket for dry system



DESCRIPTION	UFH-DRY-B
dimensions (mm)	88 X 29
package (pcs.)	100

TYPE: UFH-ISOBOARD

edge insulation with PE flap



DESCRIPTION	UFH-ISOBOARD
length (m)	25
height (mm)	150
thickness (mm)	7
packaging (m)	25

Specifications

Item UFH-ISOBOARD

PE foam edge insulation with PE flap.

The edge insulation has 5 crack strips on the top side.



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TYPE: UFH-ISOBORD-S

edge insulation with PE flap and adhesive strip



DESCRIPTION	UFH-ISOBORD-S
length (m)	25
height (mm)	150
thickness (mm)	7
packaging (m)	25

Specifications

Item UFH-ISOBORD-S

PE foam edge insulation with PE flap.

The edge insulation has 5 crack strips on the top side and an adhesive strip on the back.

TYPE: UFH-ISOBORD-G

edge insulation for liquid floors with PE flap and adhesive strip



DESCRIPTION	UFH-ISOBORD-G
length (m)	25
height (mm)	150
thickness (mm)	8
packaging (m)	25

Specifications

Item UFH-ISOBORD-G

PE foam edge insulation with PE flap.

The edge insulation has 5 crack strips on the top side and adhesive strips on the back and on the PE flap.

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TYPE: UFH-PLUG80

mounting plug for flat insulation plate



DESCRIPTION	UFH-PLUG80
dimensions (mm)	80
bore diameter (mm)	ø 8
package (pcs.)	100

TYPE: UFH-FOIL-N

neutral PE sheeting



DESCRIPTION	UFH-FOIL-N
length (m)	50
width (m)	2
thickness (mm)	0,2
packaging (m ²)	100

Specifications

Item UFH-FOIL-N

Neutral PE sheeting vapour barrier, 0.2 mm thick.

TYPE: UFH-FOIL-R5050

PE sheeting with grid marking



DESCRIPTION	UFH-FOIL-R5050
length (m)	50
width (m)	1,8
thickness (mm)	0,2
packaging (m ²)	90

Specifications

Item UFH-FOIL-R5050

Black PE vapour barrier sheeting, 0.2 mm thick with 50 x 50 mm grid marking.



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TYPE: UFH-FOIL-ALU

PE sheeting with aluminium reflection



DESCRIPTION	UFH-FOIL-ALU
length (m)	50
width (m)	1
thickness (mm)	3
packaging (m ²)	50

Specifications

Item UFH-FOIL-ALU

PE vapour barrier, 3 mm thick with flap and provided with aluminium reflection.

TYPE: UFH-FOIL-CLIP25

mounting clip for foil



DESCRIPTION	UFH-FOIL-CLIP25
length (mm)	25
package (pcs.)	100

TYPE: UFH-SCOTCH-66

adhesive strip for foil



DESCRIPTION	UFH-SCOTCH-66
length (m)	66
width (mm)	50
package (pcs.)	1

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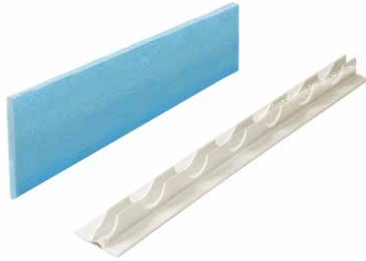
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TYPE: UFH-DP200

expansion joint



DESCRIPTION	UFH-DP200
length (mm)	2000
height (mm)	150
width (mm)	8
packaging (m)	2

Specifications

Item UFH-DP200

Expansion joint made of PE foam with white U-profile with adhesive strip on the back and pipe put-throughs.

TYPE: UFH-DH40

joint put-through housing



DESCRIPTION	UFH-DH40
length (mm)	400
inner diameter (mm)	19
outer diameter (mm)	23
package (pcs.)	20

TYPE: UFH-BEND

guide curve for plastic pipe



DESCRIPTION	UFH-BEND1218	UFH-BEND20
pipe diameter (mm)	12 - 18	20
package (pcs.)	1	1



TYPE: UFH-ADN10

additive for sand cement screed



DESCRIPTION	UFH-ADN10
minimal pipe coverage (cm)	4,5
percentage quantity relative to dry cement weight (%)	1
packaging (kg)	10

Specifications

Item UFH-ADN10

The additive improves the workability of the cement and makes the cement more mouldable. The quantity of additive to be used is 1 % of the total dry cement weight.

Processing

- Cement / sand (sharp sand, 0/8mm) ratio by weight is 1 : 5.
- The additive must comprise 1 % of the total dry cement weight.
- Example: 50kg cement – 250 kg sand – 0.5 kg additive.
- The quantity of water is dependent on the moisture content of the sand.

The additive is used as follows (mixer):

- ▶ 8 – 10 scoops of sand (approx. 30 litres)
- ▶ add 50 kg cement
- ▶ add 10 litres of water
- ▶ 0.5 kg additive
- ▶ 26 scoops of sand (approx. 110 litres)
- ▶ Add additional water (approx. 6 – 8 litres)
- ▶ Allow the mixer to run until the cement is mouldable
- ▶ Apply the cement along the length of the underfloor heating pipe and compact well

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TYPE: UFH-ADN10-PLUS

additive for sand cement screed



DESCRIPTION

UFH-ADN10-PLUS

minimal pipe coverage (cm)	2,5
percentage quantity relative to dry cement weight (%)	10
packaging (kg)	10

Specifications

Item UFH-ADN10-PLUS

The additive improves the workability of the cement and makes the cement more mouldable. The quantity of additive to be used is 10 % of the total dry cement weight.

Processing

- Cement / sand (sharp sand, 0/8mm) ratio by weight is 1 : 4,5.
- The additive must comprise 10 % of the total dry cement weight.
- Example: 50kg cement – 225 kg sand – 5 kg additive.
- The quantity of water is dependent on the moisture content of the sand.

The additive is used as follows (mixer):

- ▶ 8 – 10 scoops of sand (approx. 30 litres)
- ▶ add 50 kg cement
- ▶ add 10 litres of water
- ▶ 0.5 kg additive
- ▶ 26 scoops of sand (approx. 110 litres)
- ▶ Add additional water (approx. 6 – 8 litres)
- ▶ Allow the mixer to run until the cement is mouldable
- ▶ Apply the cement along the length of the underfloor heating pipe and compact well



TYPE: UFH-06-MD

brass manifold with flow meter



ITEM CODE	groups	dimensions			fitting		
		L	H	depth			
UFH-060502-MD	2 X 3/4"EK	120	X	320	X	100	1" M
UFH-060503-MD	3 X 3/4"EK	170	X	320	X	100	1" M
UFH-060504-MD	4 X 3/4"EK	220	X	320	X	100	1" M
UFH-060505-MD	5 X 3/4"EK	270	X	320	X	100	1" M
UFH-060506-MD	6 X 3/4"EK	320	X	320	X	100	1" M
UFH-060507-MD	7 X 3/4"EK	370	X	320	X	100	1" M
UFH-060508-MD	8 X 3/4"EK	420	X	320	X	100	1" M
UFH-060509-MD	9 x 3/4"EK	470	x	320	x	100	1" M
UFH-060510-MD	10 x 3/4"EK	520	x	320	x	100	1" M
UFH-060511-MD	11 X 3/4"EK	570	X	320	X	100	1" M
UFH-060512-MD	12 X 3/4"EK	620	X	320	X	100	1" M

Specifications

Type UFH-06-MD

Brass manifold with flow meter.

2 to 12 groups.

Material of pipe fittings	Brass Ms63; CW508L
Tap material	Brass Ms58; CW614N
Seals	EPDM
Mounting bracket	Galvanized steel
Operating temperature	-10°C to 80°C
Operating pressure	6 bar
Connection, zone control per group	M30 x 1.5
Flow meter per group	0 – 6 L/min with Kvs value 1.7
Adjustment and shutoff options per group	yes

8 PRODUCT SHEETS

TYPE: UFH-06-MR

brass manifold without flow meter



ITEM CODE	groups	dimensions			fitting		
		L	H	depth			
UFH-060502-MR	2 X 3/4"EK	120	X	320	X	100	1" M
UFH-060503-MR	3 X 3/4"EK	170	X	320	X	100	1" M
UFH-060504-MR	4 X 3/4"EK	220	X	320	X	100	1" M
UFH-060505-MR	5 X 3/4"EK	270	X	320	X	100	1" M
UFH-060506-MR	6 X 3/4"EK	320	X	320	X	100	1" M
UFH-060507-MR	7 X 3/4"EK	370	X	320	X	100	1" M
UFH-060508-MR	8 X 3/4"EK	420	X	320	X	100	1" M
UFH-060509-MR	9 X 3/4"EK	470	x	320	x	100	1" M
UFH-060510-MR	10 x 3/4"EK	520	x	320	x	100	1" M
UFH-060511-MR	11 X 3/4"EK	570	X	320	X	100	1" M
UFH-060512-MR	12 X 3/4"EK	620	X	320	X	100	1" M

Specifications

Type UFH-06-MR

Brass manifold without flow meter.

2 to 12 groups.

Material of pipe fittings	Brass Ms63; CW508L
Tap material	Brass Ms58; CW614N
Seals	EPDM
Mounting bracket	Galvanized steel
Operating temperature	-10°C to 80°C
Operating pressure	6 bar
Connection, zone control per group	M30 x 1.5
Flow meter per group	none
Adjustment and shutoff options per group	yes



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TYPE: UFH-BT-M

shutoff valve with thermometer for brass manifold



DESCRIPTION	UFH-BTM0606-M
fitting	1" F X 1" F
thermometer (°C)	0 - 60
number per package (set)	1 (= 2 pcs)

TYPE: UFH-B-M

shutoff valve for brass manifold



DESCRIPTION	UFH-B0606-M
fitting	1" F X 1" F
number per package (set)	1 (= 2 pcs)

TYPE: UFH-ES-M

end piece for brass manifold



DESCRIPTION	UFH-ESK060303-M
fitting	1" F X 1/2" F X 3/8"
package (set)	1 (= 2 pcs)



8 PRODUCT SHEETS

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TYPE: UFH-AO-M

automatic air vent with water seal



DESCRIPTION	UFH-AO03-M
fitting	3/8" M
package (pcs.)	1

TYPE: UFH-TM-M

circuit thermometer



DESCRIPTION	UFH-TM050-M
fitting	3/4" EK - 3/4" EK
thermometer (°C)	0 - 50
package (pcs.)	1

TYPE: UFH-BS-M

blind stop



DESCRIPTION	UFH-BS05-M
fitting	3/4"
package (pcs.)	1



TYPE: UFH-PGKT

pump group for brass manifold



DESCRIPTION	UFH-PGKT
fitting	1" M
adjustment range (°C)	30 - 50
maximum safety valve (°C)	55
package (pcs.)	1

Specifications

Item UFH-PGKT

Pump group suitable for Hencofloor brass manifold. The supply water temperature is determined by a thermostat valve.

The pump group maintains a supply water temperature of 30 to 50°C.

Material of pipe fittings	Brass Ms63; CW508L
Tap material	Brass Ms58; CW614N
Seals	EPDM
Operating temperature	up to 80 °C
Operating pressure	6 bar
Adjustable maximum thermostat	yes

8 PRODUCT SHEETS

TYPE: UFH-05-S

steel manifold S



ITEM CODE	groups	dimensions			pump	fitting		
		L	H	depth				
UFH-0405-S1	1 X 3/4"EK	320	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-S2	2 X 3/4"EK	320	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-S3	3 X 3/4"EK	380	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-S4	4 X 3/4"EK	440	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-S5	5 X 3/4"EK	500	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-S6	6 X 3/4"EK	560	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-S7	7 X 3/4"EK	620	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-S8	8 x 3/4"EK	680	x	430	x	160	RS 25/4-3	1/2" F
UFH-0505-S9	9 x 3/4"EK	740	x	430	x	160	RS 25/5-3	3/4" F
UFH-0505-S10	10 X 3/4"EK	800	X	430	X	160	RS 25/5-3	3/4"F
UFH-0505-S11	11 X 3/4"EK	860	X	430	X	160	RS 25/5-3	3/4"F
UFH-0505-S12	12 x 3/4"EK	920	x	430	x	160	RS 25/5-3	3/4" F
UFH-0505-S13	13 x 3/4"EK	980	x	430	x	160	RS 25/5-3	3/4" F
UFH-0505-S14	14 x 3/4"EK	1040	x	430	x	160	RS 25/5-3	3/4" F
UFH-0505-S15	15 x 3/4"EK	1100	x	430	x	160	RS 25/5-3	3/4" F
UFH-0505-S16	16 x 3/4"EK	1160	x	430	x	160	RS 25/5-3	3/4" F

Specifications

Type UFH-05-S

Steel manifold with pump group and regulator valve.

Extra compact; supply and return behind each other.

1 to 16 groups.

The supply water temperature of the steel manifold is determined by a thermostat head with sensor.

The manifold is standard hydraulically neutral and can be switched to hydraulically active.

Material	Steel
Paint layer	70μ (epoxy-polyester coating)
Operating temperature	up to 55 °C
Operating pressure	2 bar
Connection, zone control per group	M30 x 1.5
Flow meter per group	none
Adjustment and shutoff options per group	yes
Maximum thermostat	yes
Kvs value of thermostat tap	1,2



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TYPE: UFH-05-SC

steel manifold SC



ITEM CODE	groups	dimensions			pump	fitting		
		L	H	depth				
UFH-0405-SC1	1 X 3/4"EK	185	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-SC2	2 X 3/4"EK	185	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-SC3	3 X 3/4"EK	245	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-SC4	4 X 3/4"EK	305	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-SC5	5 X 3/4"EK	365	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-SC6	6 X 3/4"EK	425	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-SC7	7 X 3/4"EK	485	X	430	X	160	RS 25/4-3	1/2"F
UFH-0405-SC8	8 x 3/4"EK	545	x	430	x	160	RS 25/4-3	1/2" F
UFH-0505-SC9	9 x 3/4"EK	605	x	430	x	160	RS 25/5-3	3/4" F
UFH-0505-SC10	10 X 3/4"EK	665	X	430	X	160	RS 25/5-3	3/4"F
UFH-0505-SC11	11 X 3/4"EK	725	X	430	X	160	RS 25/5-3	3/4"F
UFH-0505-SC12	12 x 3/4"EK	785	x	430	x	160	RS 25/5-3	3/4" F
UFH-0505-SC13	13 x 3/4"EK	845	x	430	x	160	RS 25/5-3	3/4" F
UFH-0505-SC14	14 x 3/4"EK	905	x	430	x	160	RS 25/5-3	3/4" F
UFH-0505-SC15	15 x 3/4"EK	965	x	430	x	160	RS 25/5-3	3/4" F
UFH-0505-SC16	16 x 3/4"EK	1025	x	430	x	160	RS 25/5-3	3/4" F

Specifications

Type UFH-05-SC

Steel manifold with pump group and regulator valve.

1 to 16 groups.

The supply water temperature of the steel manifold is

determined by a thermostat head with sensor.

The manifold is standard hydraulically neutral and can be switched to hydraulically active.

Material	Steel
Paint layer	70μ (epoxy-polyester coating)
Operating temperature	up to 55 °C
Operating pressure	2 bar
Connection, zone control per group	M30 x 1.5
Flow meter per group	none
Adjustment and shutoff options per group	yes
Maximum thermostat	yes
Kvs value of thermostat tap	1,2

8 PRODUCT SHEETS

TYPE: UFH-05-SWE

steel manifold SWE



ITEM CODE	groups	dimensions			pump	fitting		
		L	H	depth				
UFH-0405-SWE1	1 x 3/4"EK	580	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SWE2	2 x 3/4"EK	580	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SWE3	3 x 3/4"EK	580	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SWE4	4 x 3/4"EK	580	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SWE5	5 x 3/4"EK	700	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SWE6	6 x 3/4"EK	700	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SWE7	7 x 3/4"EK	820	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SWE8	8 x 3/4"EK	820	x	500	x	270	RS 25/4-3	1/2" F
UFH-0505-SWE9	9 x 3/4"EK	940	x	500	x	270	RS 25/5-3	3/4" F
UFH-0505-SWE10	10 x 3/4"EK	940	x	500	x	270	RS 25/5-3	3/4" F
UFH-0505-SWE11	11 x 3/4"EK	1060	x	500	x	270	RS 25/5-3	3/4" F
UFH-0505-SWE12	12 x 3/4"EK	1060	x	500	x	270	RS 25/5-3	3/4" F

Specifications

Type UFH-05-SWE

Steel manifold with pump group, heat exchanger and expansion tank.

1 to 12 groups.

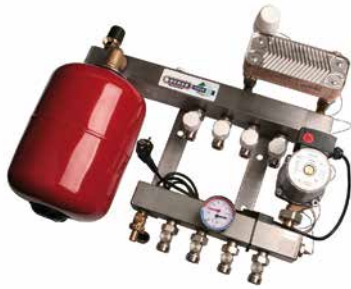
The supply water temperature of the steel manifold is determined by a thermostat head with sensor.

Material	Steel
Paint layer	70μ (epoxy-polyester coating)
Operating temperature	up to 55 °C
Operating pressure	2 bar
Connection, zone control per group	M30 x 1.5
Flow meter per group	none
Adjustment and shutoff options per group	yes
Maximum thermostat	yes
Kvs value of thermostat tap	1,2
Expansion tank	8 litres
Overpressure valve	3 bar



TYPE: UFH-05-SRWE

stainless steel manifold SRWE



ITEM CODE	groups	dimensions			pump	fitting		
		L	H	depth				
UFH-0405-SRWE1	1 x 3/4"EK	580	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SRWE2	2 x 3/4"EK	580	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SRWE3	3 x 3/4"EK	580	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SRWE4	4 x 3/4"EK	580	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SRWE5	5 x 3/4"EK	700	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SRWE6	6 x 3/4"EK	700	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SRWE7	7 x 3/4"EK	820	x	500	x	270	RS 25/4-3	1/2" F
UFH-0405-SRWE8	8 x 3/4"EK	820	x	500	x	270	RS 25/4-3	1/2" F
UFH-0505-SRWE9	9 x 3/4"EK	940	x	500	x	270	RS 25/5-3	3/4" F
UFH-0505-SRWE10	10 x 3/4"EK	940	x	500	x	270	RS 25/5-3	3/4" F
UFH-0505-SRWE11	11 x 3/4"EK	1060	x	500	x	270	RS 25/5-3	3/4" F
UFH-0505-SRWE12	12 x 3/4"EK	1060	x	500	x	270	RS 25/5-3	3/4" F

Specifications

Type UFH-05-SRWE

Stainless steel manifold with pump group, heat exchanger and expansion tank.

1 to 12 groups.

The supply water temperature of the steel manifold is determined by a thermostat head with sensor.

Manifold with a heat exchanger and expansion tank.

Material	Stainless steel
Operating temperature	up to 55 °C
Operating pressure	2 bar
Connection, zone control per group	M30 x 1.5
Flow meter per group	none
Adjustment and shutoff options per group	yes
Maximum thermostat	yes
Kvs value of thermostat tap	1,2
Expansion tank	8 litres
Overpressure valve	3 bar

8 PRODUCT SHEETS

TYPE: UFH-05-ST

steel manifold ST



ITEM CODE	groups	dimensions			pump	fitting		
		L	H	depth				
UFH-0405-ST1	1 x 3/4"EK	300	x	460	x	160	RS 25/4-3	1/2" F
UFH-0405-ST2	2 x 3/4"EK	300	x	460	x	160	RS 25/4-3	1/2" F
UFH-0405-ST3	3 x 3/4"EK	420	x	460	x	160	RS 25/4-3	1/2" F
UFH-0405-ST4	4 x 3/4"EK	420	x	460	x	160	RS 25/4-3	1/2" F
UFH-0405-ST5	5 x 3/4"EK	540	x	460	x	160	RS 25/4-3	1/2" F
UFH-0405-ST6	6 x 3/4"EK	540	x	460	x	160	RS 25/4-3	1/2" F
UFH-0405-ST7	7 x 3/4"EK	660	x	460	x	160	RS 25/4-3	1/2" F
UFH-0405-ST8	8 x 3/4"EK	660	x	460	x	160	RS 25/4-3	1/2" F
UFH-0505-ST9	9 x 3/4"EK	780	x	460	x	160	RS 25/5-3	3/4" F
UFH-0505-ST10	10 x 3/4"EK	780	x	460	x	160	RS 25/5-3	3/4" F
UFH-0505-ST11	11 x 3/4"EK	900	x	460	x	160	RS 25/5-3	3/4" F
UFH-0505-ST12	12 x 3/4"EK	900	x	460	x	160	RS 25/5-3	3/4" F
UFH-0505-ST13	13 x 3/4"EK	1020	x	460	x	160	RS 25/5-3	3/4" F
UFH-0505-ST14	14 x 3/4"EK	1020	x	460	x	160	RS 25/5-3	3/4" F
UFH-0505-ST15	15 x 3/4"EK	1140	x	460	x	160	RS 25/5-3	3/4" F
UFH-0505-ST16	16 x 3/4"EK	1140	x	460	x	160	RS 25/5-3	3/4" F

Specifications

Type UFH-05-ST

Steel manifold with pump group, low temperature valve on return and one-way valve between supply and return.

1 to 16 groups.

The supply water temperature of the steel manifold is determined by a thermostat head with sensor.

Material	Steel
Paint layer	70μ (epoxy-polyester coating)
Operating temperature	up to 55 °C
Operating pressure	2 bar
Connection, zone control per group	M30 x 1.5
Flow meter per group	none
Adjustment and shutoff options per group	yes
Maximum thermostat	yes
Kvs value of thermostat tap	1,2



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TYPE: UFH-05-SK

steel manifold SK

ITEM CODE	groups	pump	fitting
UFH-0405-ST1	1 x 3/4"EK	RS 25/4-3	1/2" F
UFH-0405-ST2	2 x 3/4"EK	RS 25/4-3	1/2" F
UFH-0405-ST3	3 x 3/4"EK	RS 25/4-3	1/2" F
UFH-0405-ST4	4 x 3/4"EK	RS 25/4-3	1/2" F
UFH-0405-ST5	5 x 3/4"EK	RS 25/4-3	1/2" F
UFH-0405-ST6	6 x 3/4"EK	RS 25/4-3	1/2" F
UFH-0405-ST7	7 x 3/4"EK	RS 25/4-3	1/2" F
UFH-0405-ST8	8 x 3/4"EK	RS 25/4-3	1/2" F
UFH-0505-ST9	9 x 3/4"EK	RS 25/5-3	3/4" F
UFH-0505-ST10	10 x 3/4"EK	RS 25/5-3	3/4" F
UFH-0505-ST11	11 x 3/4"EK	RS 25/5-3	3/4" F
UFH-0505-ST12	12 x 3/4"EK	RS 25/5-3	3/4" F

Specifications

Type UFH-05-SK

Steel manifold with pump group, one connection for heating and one connection for cooling.

1 to 12 groups.

The supply water temperature of the steel manifold is determined by a thermostat head with sensor.

Material	Steel
Paint layer	70μ (epoxy-polyester coating)
Operating temperature	up to 55 °C
Operating pressure	2 bar
Connection, zone control per group	M30 x 1.5
Flow meter per group	none
Adjustment and shutoff options per group	yes
Maximum thermostat	yes
Kvs value of thermostat tap	1,2

The SK manifold is only available upon request

8 PRODUCT SHEETS

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TYPE: UFH-05-KD

synthetic manifold



ITEM CODE	groups	dimensions			fitting		
		L	H	depth			
UFH-060502-KD	2 x 3/4"EK	280	x	420	x	130	1" F
UFH-060503-KD	3 x 3/4"EK	331	x	420	x	130	1" F
UFH-060504-KD	4 x 3/4"EK	382	x	420	x	130	1" F
UFH-060505-KD	5 x 3/4"EK	433	x	420	x	130	1" F
UFH-060506-KD	6 x 3/4"EK	484	x	420	x	130	1" F
UFH-060507-KD	7 x 3/4"EK	535	x	420	x	130	1" F
UFH-060508-KD	8 x 3/4"EK	586	x	420	x	130	1" F
UFH-060509-KD	9 x 3/4"EK	637	x	420	x	130	1" F
UFH-060510-KD	10 x 3/4"EK	688	x	420	x	130	1" F

Specifications

Type UFH-05-KD

Synthetic manifold with automatic air vent and draining tap.

The manifold has a modular construction.
2 to 10 groups.

Material	Polyamide
Seals	EPDM
Mounting bracket	Galvanized steel
Operating temperature	up to 60 °C
Operating pressure	6 bar
Connection, zone control per group	M30 x 1.5
Flow meter per group	0 – 4 L/min with Kvs value 1.5
Thermometer on supply – return	yes
Adjustment and shutoff options per group	yes



TYPE: UFM-05-KDP

synthetic manifold with pump group



ITEM CODE	groups	dimensions			pump	fitting		
		L	H	depth				
UFH-060502-KDP	2 x 3/4"EK	320	x	450	x	180	RS 15/6-3	3/4" F
UFH-060503-KDP	3 x 3/4"EK	371	x	450	x	180	RS 15/6-3	3/4" F
UFH-060504-KDP	4 x 3/4"EK	422	x	450	x	180	RS 15/6-3	3/4" F
UFH-060505-KDP	5 x 3/4"EK	473	x	450	x	180	RS 15/6-3	3/4" F
UFH-060506-KDP	6 x 3/4"EK	524	x	450	x	180	RS 15/6-3	3/4" F
UFH-060507-KDP	7 x 3/4"EK	575	x	450	x	180	RS 15/6-3	3/4" F
UFH-060508-KDP	8 x 3/4"EK	626	x	450	x	180	RS 15/6-3	3/4" F
UFH-060509-KDP	9 x 3/4"EK	677	x	450	x	180	RS 15/6-3	3/4" F
UFH-060510-KDP	10 x 3/4"EK	728	x	450	x	180	RS 15/6-3	3/4" F

Specifications

Type UFH-05-KDP

Synthetic manifold with automatic air vent, draining tap and pump group.

The manifold has a modular construction.

2 to 10 groups.

The supply water temperature is determined by the thermostat head with sensor.

The pump group maintains a supply water temperature of 20 to 50°C.

Manifold material	Polyamide
Pump group material	Steel
Seals	EPDM
Mounting bracket	Galvanized steel
Operating temperature	up to 60 °C
Operating pressure	6 bar
Connection, zone control per group	M30 x 1.5
Flow meter per group	0 – 4 L/min with Kvs value 1.5
Thermometer on supply – return	yes
Adjustment and shutoff options per group	yes
Maximum thermostat	yes



8 PRODUCT SHEETS

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TYPE: UFH-K-PUMP

pump group for synthetic manifold



DESCRIPTION	UFH-K-PUMP
fitting	3/4" F
adjustment range (°C)	20 - 50
maximum safety valve (°C)	55
package (pcs.)	1

Specifications

Item UFH-K-PUMP

Pump group, suitable for Hencofloor synthetic manifold.
The supply water temperature is determined by a

thermostat head with sensor.

The pump group maintains a supply water temperature of 20 to 50°C.

Material	Steel
Operating temperature	up to 60 °C
Operating pressure	6 bar
Maximum thermostat	yes



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TYPE: UFH-K-K

shutoff valve for synthetic manifold



DESCRIPTION	UFH-K-K
fitting	5/4" M X 1" F
package (pcs.)	1

TYPE: UFH-K-TM060

thermometer for synthetic manifold



DESCRIPTION	UFH-K-TM060
temperature range (°C)	0 - 60
package (pcs.)	5

TYPE: UFH-K-EM

module for thermal head actuator



DESCRIPTION	UFH-K-EM
type	KVS 2.2
package (pcs.)	1



8 PRODUCT SHEETS

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TYPE: UFH-K-VD

module for flow meter



DESCRIPTION	UFH-K-VD
type	KVS 1.8
package (pcs.)	1

TYPE: UFH-K-MDA

module with flow meter, 1 – 4 L/min



DESCRIPTION	UFH-K-MDA
type	KVS 1.5
flow (L/min)	1 - 4
number per package (pcs.)	1

TYPE: UFH-K-MDB

module with flow meter, 0,6 – 2,4 L/min



DESCRIPTION	UFH-K-MDB
type	KVS 1.15
flow (L/min)	0,6 - 2,4
number per package (pcs.)	1



TYPE: UFH-K-EI

end and input module



DESCRIPTION	UFH-K-EI
shutoff valve connection	1" F
drain/fill connection	3/4" EK
package (pcs.)	1

TYPE: UFH-K-B

mounting bracket for synthetic manifold



DESCRIPTION	UFH-K-B
package (set)	1 (= 2 pcs.)

TYPE: UFH-K-D

flow meter for synthetic manifold



DESCRIPTION	UFH-K-D
flow (L/min)	1 - 4
package (pcs.)	1

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8 PRODUCT SHEETS

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TYPE: UFH-K-FIX

adhesive clamp for synthetic manifold

DESCRIPTION

UFH-K-FIX

package (pcs.)

10



TYPE: UFH-K-O

O ring for synthetic manifold

DESCRIPTION

UFH-K-O

package (pcs.)

10



TYPE: UFH-K-07M-M

connection nipple for synthetic manifold

DESCRIPTION

UFH-K-07M05M

UFH-K-07M06M

fitting

5/4"M x 3/4"M

5/4"M X 1"M

package (pcs.)

1

1





TYPE: UFH-K-07M-F

connection nipple for synthetic manifold



DESCRIPTION	UFH-K-07M05F	UFH-K-07M06F
fitting	5/4"M x 3/4"F	5/4"M X 1"F
package (pcs.)	1	1

TYPE: UFH-K-B07M06F

connection bend for synthetic manifold



DESCRIPTION	UFH-K-B07M06F
fitting	5/4"M X 1"F
package (pcs.)	1

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8 PRODUCT SHEETS

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TYPE: UFH-CAB-I

built-in manifold cabinet for brass manifold



DESCRIPTION	UFH-CAB-I400	UFH-CAB-I600	UFH-CAB-I800	UFH-CAB-I1000
width (mm)	400	600	800	1000
height (mm)	700 - 800	700 - 800	700 - 800	700 - 800
depth (mm)	112 - 152	112 - 152	112 - 152	112 - 152
colour	RAL 9016	RAL 9016	RAL 9016	RAL 9016
usable width (mm)	396	596	796	996
package (pcs.)	1	1	1	1

The distributor cabinet is only to be used with the brass manifold.

Specifications

Item UFH-CAB-I400

Steel distribution cabinet to be built in.
Suitable for Hencofloor brass manifold.

Sideways connection max. 4 groups
Bottom connection max. 3 groups

Item UFH-CAB-I800

Steel distribution cabinet to be built in.
Suitable for Hencofloor brass manifold.

Sideways connection max. 11 groups
Bottom connection max. 10 groups

Item UFH-CAB-I600

Steel distribution cabinet to be built in.
Suitable for Hencofloor brass manifold.

Sideways connection max. 7 groups
Bottom connection max. 6 groups

Item UFH-CAB-I1000

Steel distribution cabinet to be built in.
Suitable for Hencofloor brass manifold.

Sideways connection max. 12 groups
Bottom connection max. 12 groups

TYPE: UFH-CAB-O

add-on manifold cabinet for brass manifold



DESCRIPTION	UFH-CAB-O400	UFH-CAB-O600	UFH-CAB-O800	UFH-CAB-O1000
width (mm)	400	600	800	1000
height (mm)	720	720	720	720
depth (mm)	112	112	112	112
colour	RAL 9016	RAL 9016	RAL 9016	RAL 9016
usable width (mm)	396	596	796	996
package (pcs.)	1	1	1	1

The distributor cabinet is only to be used with the brass manifold.

Specifications

Item UFH-CAB-O400

Steel distribution cabinet to be added on.
Suitable for Hencofloor brass manifold.

Sideways connection max. 3 groups
Bottom connection max. 2 groups

Item UFH-CAB-O800

Steel distribution cabinet to be added on.
Suitable for Hencofloor brass manifold.

Sideways connection max. 10 groups
Bottom connection max. 9 groups

Item UFH-CAB-O600

Steel distribution cabinet to be added on.
Suitable for Hencofloor brass manifold.

Sideways connection max. 6 groups
Bottom connection max. 5 groups

Item UFH-CAB-O1000

Steel distribution cabinet to be added on.
Suitable for Hencofloor brass manifold.

Sideways connection max. 12 groups
Bottom connection max. 12 groups



8.2 Tools

TYPE: SAFECUT

knife for opening packages of rolled pipe



TYPE: UFH-VLA

spool for underfloor heating pipe, basic model



DESCRIPTION	UFH-VLA
roll length (m)	25 - 600

TYPE: UFH-VLG

spool for underfloor heating pipe, mobile and adjustable



DESCRIPTION	UFH-VLG
roll length (m)	25 - 600

TYPE: RSPRESS

pipe cutters



DESCRIPTION	RS1420PRESS	RS2640PRESS
pipe diameter (mm)	14 - 20	26 - 40

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8 PRODUCT SHEETS

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TYPE: KS-M

bit for calibration of multilayer pipe



DESCRIPTION	KS16M	KS18M	KS20M	KS26M
pipe diameter (mm)	16	18	20	26

TYPE: UFH-TACK

tacker tools for tacker clips



DESCRIPTION	UFH-TACK	UFH-TACK-TA38
tacker clip	UFH-TACK-40 / UFH-TACK-60	UFH-TACK-38K

TYPE: UFH-RAS-VLE

fastening hook for fastening wire



TYPE: UFH-RAS-CUT

cutter for wire mat





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TYPE: UFH-SCOTCH-ROL

handheld dispenser for tape



TYPE: UFH-MP01

measurement aid for residual moisture measurement of the screed



TYPE: KS-K

quick-release handle for Kalispeed



TYPE: KS-MSET1

quick-release handle set for Kalispeed for pipe \varnothing 16,18 and 20



8 PRODUCT SHEETS

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TYPE: M-BMINI2

press machine for multilayer pipe



Description

Hydraulic battery-powered press machine with press security and a linear force of approx. 15 kN. The press machine is fitted with 1 18V/1.5Ah Li-ion battery, a jaw and switchable inserts for pipe \varnothing 16, 20 and 26 (type BE-H). The press machine and accessories are stored in a plastic case.

TYPE: M-BMINI

press machine for multilayer pipe



Description

Hydraulic battery-powered pinch machine with press security and a linear force of approx. 15 kN. The press machine is fitted with 1 18V/1,5Ah Li-ion battery, a jaw and switchable inserts for pipe \varnothing 16, 20, 26 and 32 (type BE-H). The press machine and accessories are stored in a plastic case.

CONTROL UNITS



9.1	Wired control units	130
9.2	Wireless control units	144
9.3	Technical data on shared materials	151

9.1 Wired control units

9.1.1 Wired control unit 230V

Description

The purpose of the controller is to control thermal head actuators mounted on the groups of an underfloor heating manifold.

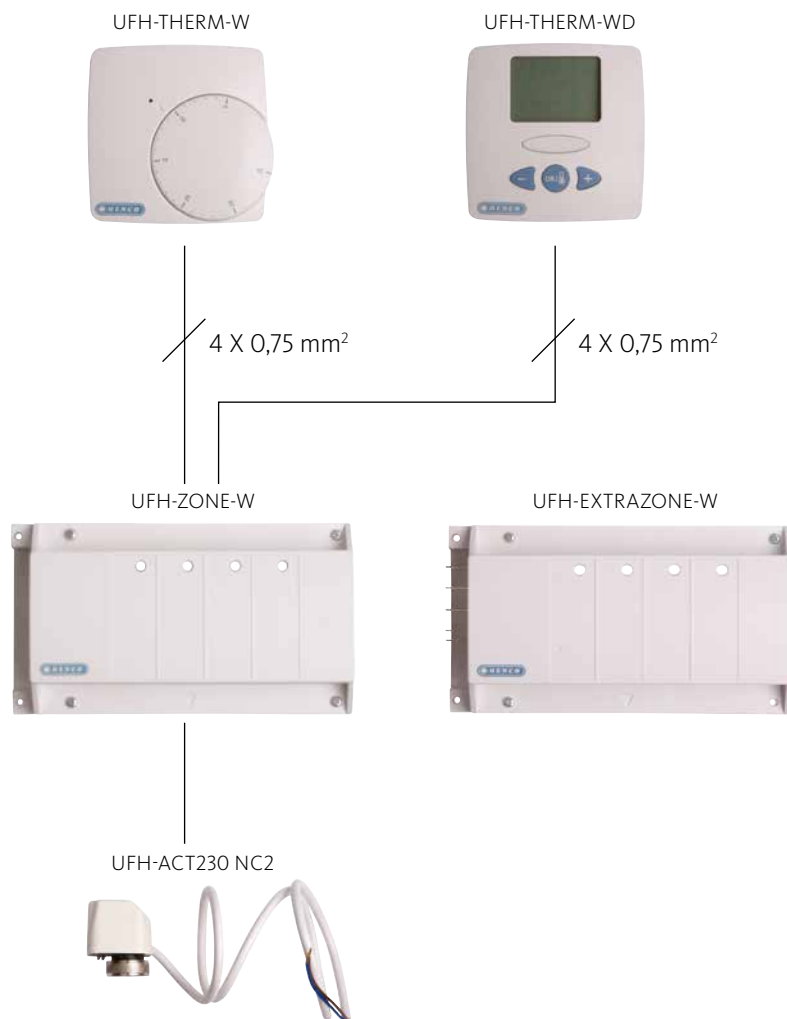
The groups are controlled with room thermostats and a control unit at the position of the manifold.

The control unit is suitable for 4 zones and can be expanded to 12 zones. This is done by connecting expansion modules of 4 zones each to the control unit.

Each zone can be controlled separately by a thermostat, but a thermostat can also control up to 3 zones. A maximum of 4 thermal head actuators are connected to one zone.

The control unit is fitted with two voltage free contacts that connect when a zone demands heat. The total number of thermal head actuators is limited to 24.

Diagram





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Materials

The following materials are part of a cabled 230V control unit.

UFH-ZONE-W	230V control unit for 4 zones
UFH-EXTRAZONE-W	230V expansion module for 4 zones
UFH-THERM-W	analogue room thermostat 230V
UFH-THERM-WD	digital room thermostat 230V
UFH-ACT230NC2*	thermal head actuator 230V
UFH-ACT230NC4*	thermal head actuator 230V with auxiliary contact
UFH-SENSOR*	¹ external sensor for thermostat

*1) The analogue and digital thermostat can be equipped with an external sensor.
Remark Technical data listed under shared materials.

Technical data for materials

TYPE: UFH-ZONE-W

control unit, 230V



DESCRIPTION	UFH-ZONE-W
working temperature	0 - 50 °C
protection	IP 20
supply voltage	230 VAC, +/- 10%
fuse	2.5 AT, 5x20mm
outlet (free contact 1)	230 VAC, 8 A
outlet (free contact 2)	230 VAC, 8 A
outlet (zone 1)	max. 4 actuators
outlet (zone 2)	max. 4 actuators
outlet (zone 3)	max. 4 actuators
outlet (zone 4)	max. 4 actuators
outlet (zone 1 - 12)	max. 24 actuators

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TYPE: UFH-EXTRAZONE-W

expansion module, 230V



DESCRIPTION	UFH-EXTRAZONE-W
working temperature	0 - 50 °C
protection	IP 20
supply voltage	230 VAC, +/- 10%
outlet (zone 1)	max. 4 actuators
outlet (zone 2)	max. 4 actuators
outlet (zone 3)	max. 4 actuators
outlet (zone 4)	max. 4 actuators

TYPE: UFH-THERM-W

analogue room thermostat, 230V



DESCRIPTION	UFH-THERM-W
measurement accuracy	0.1°C
working temperature	0 - 50 °C
adjustment range	5 - 30 °C (1 - 5)
control characteristic	differential 0.5 °C
protection	class 2, IP30
supply voltage	230 VAC, +/- 10%
outlet	230 VAC (TRIAC)
	75 W (15 actuators)
external sensor	UFH-SENSOR

TYPE: UFH-THERM-WD

digital room thermostat, 230V



DESCRIPTION	UFH-THERM-WD
measurement accuracy	0.1°C
working temperature	0 - 50 °C
adjustment range	5 - 37 °C
control characteristic	proportional
protection	class 2, IP30
supply voltage	230 VAC, +/- 10%
outlet	230 VAC (TRIAC)
	75 W (15 actuators)
external sensor	UFH-SENSOR



9.1.2 Wired control unit 24V

Description

The regulator has the purpose of controlling thermal head actuators mounted on the groups of an underfloor heating manifold.

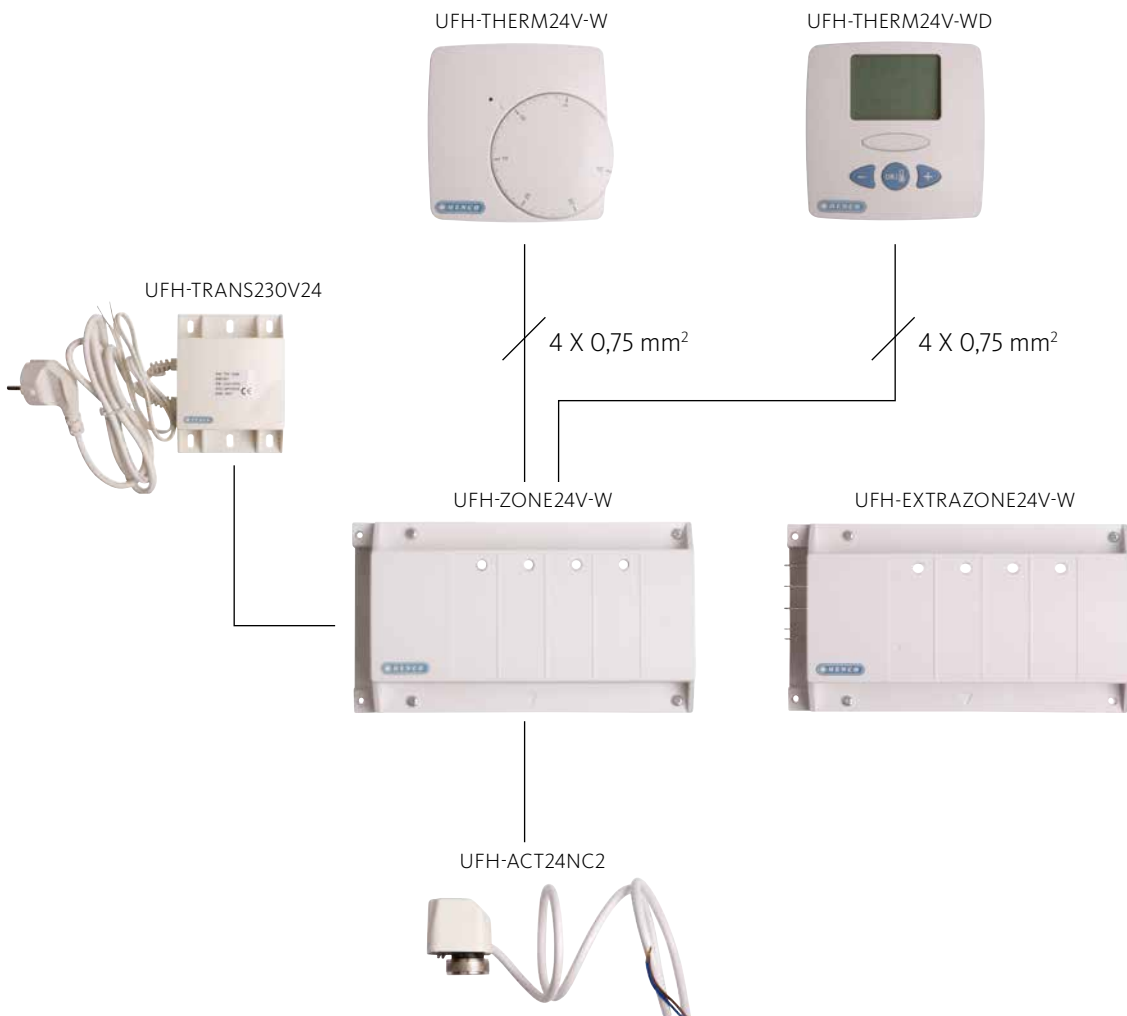
The regulator uses a transformer that reduces a supply voltage of 230V to a supply voltage of 24V.

The groups are controlled with room thermostats and a control unit at the position of the manifold. The control unit has 4 zones and can be expanded to 12 zones.

This is done by connecting expansion modules of 4 zones each to the control unit. Each zone can be controlled separately by a thermostat, but a thermostat can also control up to 3 zones. A maximum of 4 thermal head actuators are connected to one zone.

The control unit is fitted with two voltage free contacts that connect when a zone demands heat. The total number of thermal head actuators is limited to 24.

Diagram



9 CONTROL UNITS

Materials

The following materials belong to a wired 24V control unit.

UFH-TRANS230V24	230V – 24V transformer
UFH-ZONE24V-W	24V control unit for 4 zones
UFH-EXTRAZ24V-W	24V expansion module for 4 zones
UFH-THERM24V-W	analogue room thermostat 24V
UFH-THERM24V-WD	digital room thermostat 24V
UFH-ACT24NC2 *	thermal head actuator 24V with auxiliary contact
UFH-SENSOR*	¹ external sensor for thermostat

1) The analogue and digital thermostat can be equipped with an external sensor.

*Remark Technical data listed under shared materials.

Technical data for materials

TYPE: UFH-ZONE24V-W

control unit, 24V



DESCRIPTION	UFH-ZONE24V-W
working temperature	0 - 50 °C
protection	IP 20
supply voltage	24 VAC, +/- 10%
fuse	2.5 AT, 5x20mm
outlet (free contact 1)	230 VAC, 8 A
outlet (free contact 2)	230 VAC, 8 A
outlet (zone 1)	max. 4 actuators
outlet (zone 2)	max. 4 actuators
outlet (zone 3)	max. 4 actuators
outlet (zone 4)	max. 4 actuators
outlet (zone 1 - 12)	max. 24 actuators



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TYPE: UFH-EXTRAZONE24V-W

expansion module, 24V



DESCRIPTION	UFH-EXTRAZONE24V-W
working temperature	0 - 50 °C
protection	IP 20
supply voltage	24 VAC, +/- 10%
outlet (zone 1)	max. 4 actuators
outlet (zone 2)	max. 4 actuators
outlet (zone 3)	max. 4 actuators
outlet (zone 4)	max. 4 actuators

TYPE: UFH-THERM24V-W

analogue room thermostat, 24V



DESCRIPTION	UFH-THERM24V-W
measurement accuracy	0.1°C
working temperature	0 - 50 °C
adjustment range	5 - 30 °C (1 - 5)
control characteristic	differential 0.5 °C
protection	class 2, IP30
supply voltage	24 VAC, +/- 10%
outlet	24 VAC (TRIAC)
	15 W (4 actuators)
external sensor	UFH-SENSOR

TYPE: UFH-THERM24V-WD

digital room thermostat, 24V



DESCRIPTION	UFH-THERM24V-WD
measurement accuracy	0.1°C
working temperature	0 - 50 °C
adjustment range	5 - 37 °C
control characteristic	proportional
protection	class 2, IP30
supply voltage	24 VAC, +/- 10%
outlet	24 VAC (TRIAC)
	15 W (4 actuators)
external sensor	UFH-SENSOR



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TYPE: UFH-TRANS230V24

transformer, 230V - 24V



DESCRIPTION	UFH-TRANS230V24
primary	230V/50HZ
secondary	24V/60VA



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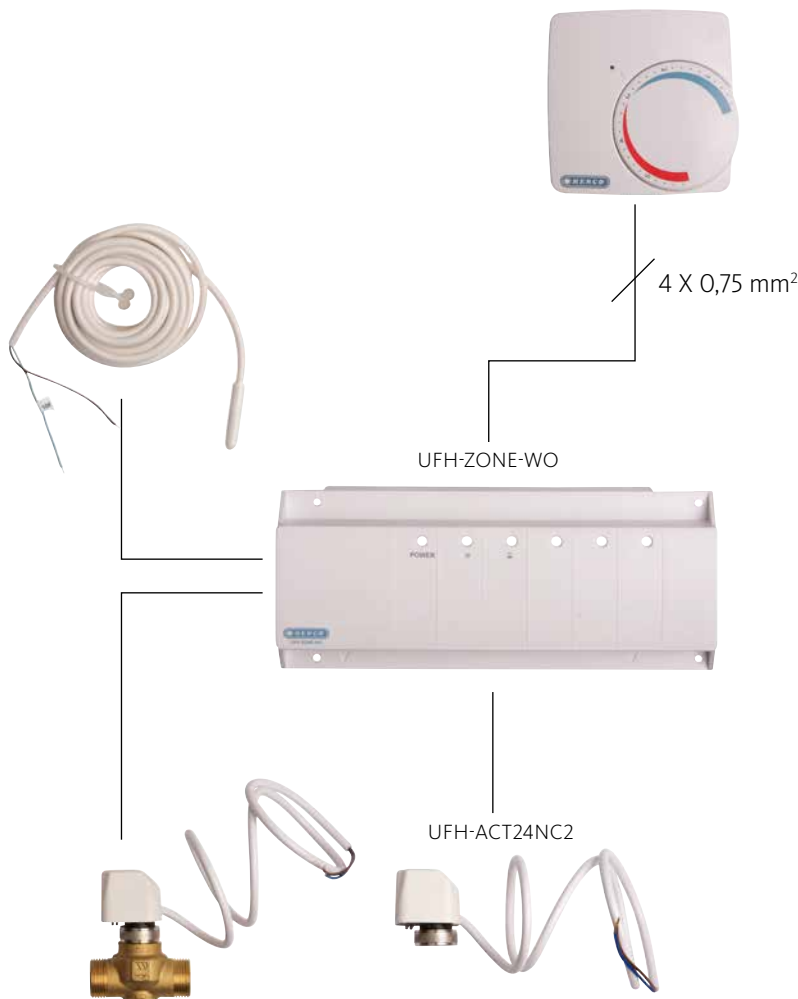
9.1.3 Wired control unit ONE ZONE

Description

The regulator consists of one room thermostat and a control unit at the position of the manifold. The regulator controls valves that are installed on the supply pipes of the underfloor heating manifold. The regulator can be applied in different configurations (e.g. heat pump system or double group heating/cooling). According to the configuration, the thermostat or an external signal determines the operating mode (heating/cooling).

The control unit has one voltage free contact and two 230V outlets. According to the chosen setting on the control unit, the function of the voltage free contact and the two 230V outlets changes. The regulator can protect the installation from too low supply water temperature by means of an advance sensor.

Diagram



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Materials

The following materials belong with a wired ONE-ZONE control unit.

UFH-ZONE-WO	230V control unit with 24V thermostat
UFH-ANC-06*	zone valve 1"
UFH-ACT230NC2*	thermal head actuator 230V
UFH-ACT230NC4*	thermal head actuator 230V with auxiliary contact
UFH-SENSOR*	¹ external sensor for thermostat
	² advance sensor for control unit

1) The thermostat can be equipped with an external sensor.

2) The regulator can be equipped with an advance sensor.

*Remark Technical data listed under shared materials.

Technical data for materials

TYPE: UFH-ZONE-WO

control unit, 230V



DESCRIPTION	UFH-ZONE-WO
working temperature	0 - 50 °C
protection	IP 20
supply voltage	230 VAC, +/- 10%
fuse	2.5 AT 5x20mm
outlet B1 (L - N)	230 VAC, 2 A
outlet B2 (L - N)	230 VAC, 2 A
outlet B3 (free contact)	230 VAC, 2 A
outlet B4 (L - N)	230 VAC, 0.5 A
advance sensor	UFH-SENSOR



TYPE: UFH-ZONE-WO

analogue room thermostat



DESCRIPTION	UFH-ZONE-WO
measurement accuracy	0.1°C
working temperature	0 - 50 °C
adjustment range	5 - 35 °C
control characteristic	proportional band 2°C
	cycle 10 min.
dead zone range	1 - 10 °C
protection	class 2, IP30
supply voltage	via UFH-ZONE-WO
external sensor	UFH-SENSOR

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9.1.4 Wired control unit (heating/cooling)

Description

The purpose of the controller is to control thermal head actuators mounted on the groups of an underfloor heating manifold.

The groups are controlled by means of room thermostats and a control unit at the position of the manifold.

The control unit is suitable for 4 zones and can be expanded to 12 zones. This is done by connecting expansion modules of 4 zones each to the control unit.

Each zone can be controlled separately by a thermostat, and a thermostat can also control a number of zones. A maximum of 4 thermal head actuators are connected to one zone.

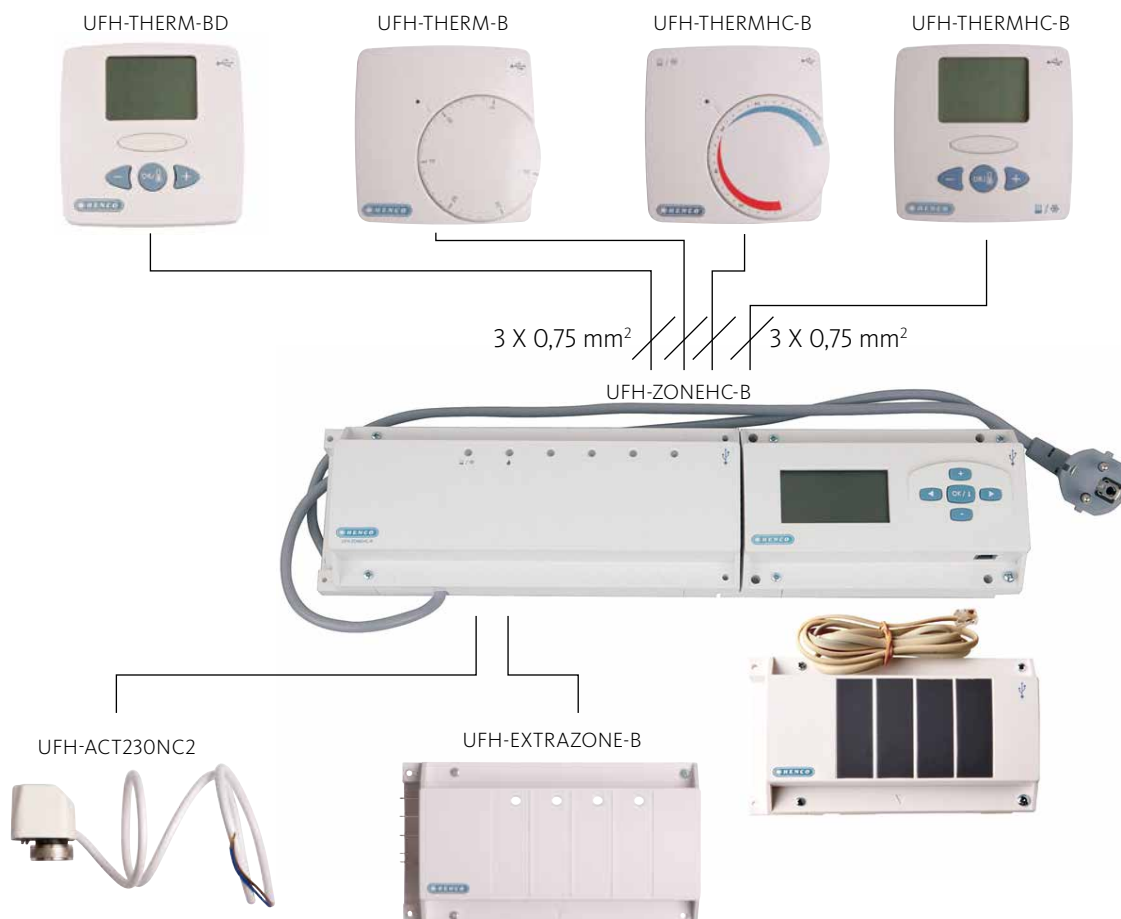
The control unit has two voltage free contacts that close according to the demand for heat or cold and one voltage free contact controlled by the inlet sensor.

A pump outlet controls a circulation pump when there is demand for heat or cold. There is a connection to which a release contact can be connected.

The controller can be used in a number of configurations (e.g. heat pump system or double heating/cooling group). Depending on the configuration, the master thermostat or an external voltage free contact determines the function mode (heating/cooling).

The control unit has a timer and antenna. The timer with BUS connection box maintains datacommunication between the room thermostats and the control unit. The timer can associate a clock program with a zone and gives the option of reading out all the temperatures. The total number of thermal head actuators is limited to 24.

Diagram





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Materials

The following materials are part of the wired controlled "heating and cooling" zone controls.

UFH-ZONEHC-B	control unit with timer "radio-controlled – 230V" for 4 zones
UFH-EXTRAZONE-B	expansion module for 4 zones
UFH-THERM-B	analogue room thermostat "BUS-connection"
UFH-THERM-BD	digital room thermostat "BUS-connection"
UFH-THERMHC-B	analogue room thermostat "BUS-connection, heating-cooling"
UFH-THERMHC-BD	digital room thermostat "BUS-connection, heating-cooling"
UFH-ANC-06*	zone valve 1"
UFH-ACT230NC2*	thermal head actuator 230V
UFH-ACT230NC4*	thermal head actuator 230V with auxiliary contact
UFH-SENSOR*	inlet sensor for control unit with timer

1) The control unit with timer can be equipped with an inlet sensor.
 *Technical data listed under shared materials.

Technical data for materials

TYPE: UFH-ZONEHC-B

control unit, BUS connection (heating/cooling)



DESCRIPTION	UFH-ZONEHC-B
working temperature	0 - 50 °C
control characteristic	parameter menu
protection	IP 30
supply voltage	230 VAC, +/- 10%
fuse	2,5 AT 5x20mm
in accordance with	EN300220-1,-2/EN301489-1,-3
outlet (free contact 1)	230 VAC, 5 A
outlet (free contact 2)	230 VAC, 5 A
outlet (zone 1)	230 VAC, 5 A
outlet (zone 2)	230 VAC, 5 A
outlet (zone 3)	230 VAC (brug verwijderen)
outlet (zone 4)	max. 4 actuators
outlet (zone 5)	max. 4 actuators
outlet (zone 6)	max. 4 actuators
outlet (zone 1 - 14)	max. 4 actuators

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TYPE: UFH-EXTRAZONE-B

expansion module



DESCRIPTION	UFH-EXTRAZONE-B
working temperature	0 - 50 °C
protection	IP 20
supply voltage	230 VAC, +/- 10%
outlet (zone 1)	max. 4 actuators
outlet (zone 2)	max. 4 actuators
outlet (zone 3)	max. 4 actuators
outlet (zone 4)	max. 4 actuators

TYPE: UFH-THERM-B

analogue room thermostat, BUS-connection



DESCRIPTION	UFH-THERM-B
measurement accuracy	0,1°C
working temperature	0 - 50 °C
adjustment range	5 - 30 °C (1 - 5)
control characteristic	proportional band 2°C
	cycle 15 min.
protection	class 2, IP30
supply voltage	via UFH-ZONEHC-B
in accordance with	EN300220-1,-2/EN301489-1,-3

TYPE: UFH-THERM-BD

digitale kamerthermostaat, BUS-connection



DESCRIPTION	UFH-THERM-BD
measurement accuracy	0,1°C
working temperature	0 - 50 °C
adjustment range	5 - 37 °C
control characteristic	proportional (adjustable)
protection	class 2, IP30
supply voltage	via UFH-ZONEHC-B
in accordance with	EN300220-1,-2/EN301489-1,-3



TYPE: UFH-THERMHC-B

analogue room thermostat, BUS-connection (heating/cooling)



DESCRIPTION	UFH-THERMHC-B
measurement accuracy	0,1°C
working temperature	0 - 50 °C
adjustment range	5 - 30 °C (1 - 5)
control characteristic	proportional band 2°C
	cycle 15 min.
protection	class 2, IP30
supply voltage	via UFH-ZONEHC-B
in accordance with	EN300220-1,-2/EN301489-1,-3
setting	heating/cooling

TYPE: UFH-THERMHC-BD

digital room thermostat "heating and cooling"



DESCRIPTION	UFH-THERMHC-BD
measurement accuracy	0,1°C
working temperature	0 - 50 °C
adjustment range	5 - 3
adjustment	heating and cooling
control characteristic	proportional (adjustable)
protection	class 2, IP30
supply voltage	via UFH-ZONEHC-B
in accordance with	EN300220-1,-2/EN301489-1,-3

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9.2 Wireless control units

9.2.1 Wireless zone regulator (heating)

Description

The purpose of the controller is to control thermal head actuators mounted on the groups of an underfloor heating manifold.

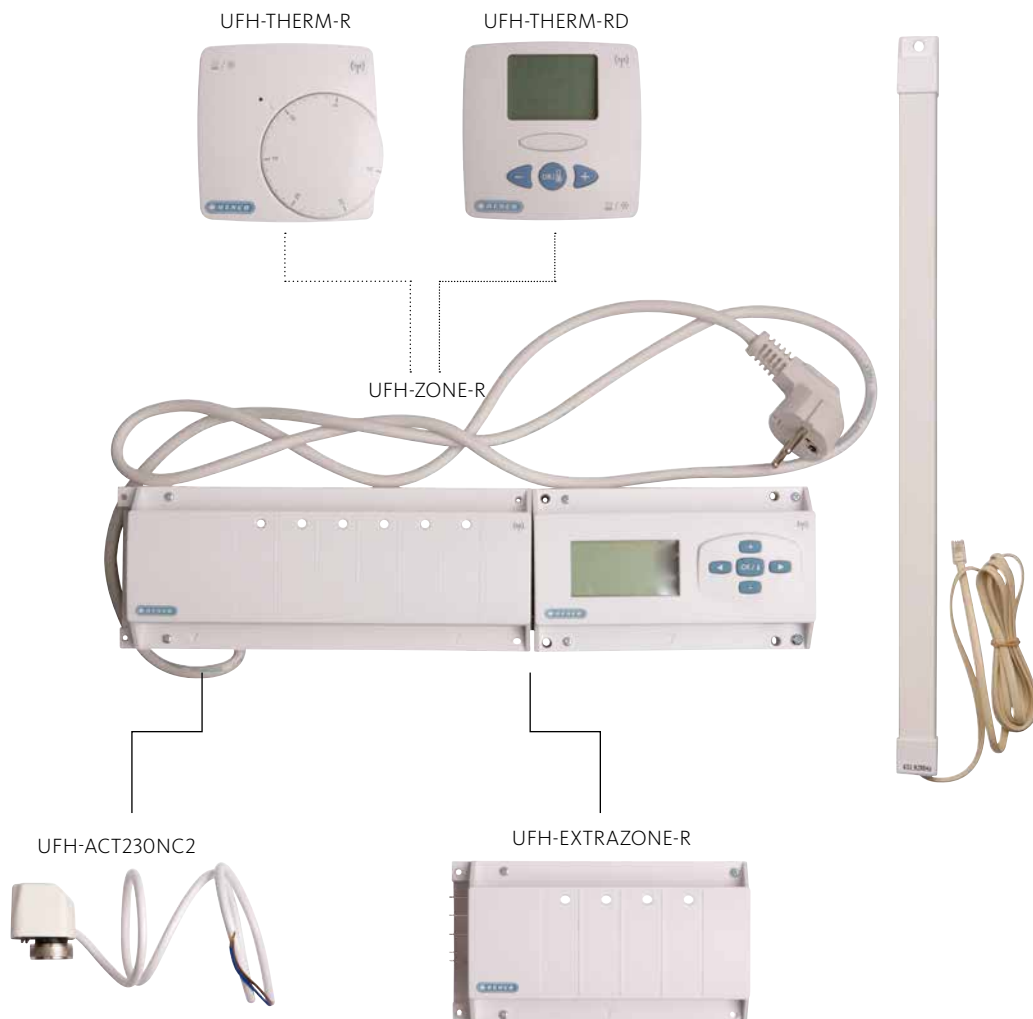
The groups are controlled with room thermostats and a control unit at the position of the manifold.

The control unit has 6 zones and can be expanded to 14 zones. This is done by connecting expansion modules of 4 zones each to the control unit. Each zone can be controlled separately by a thermostat, but a thermostat can also control a number of zones.

A maximum of 4 thermal head actuators are connected to one zone.

The control unit is fitted with two voltage free contacts that connect when a zone demands heat. The control unit is fitted with a timer and antenna. The timer with antenna maintains radio communication between the room thermostats and the control unit. The timer can associate a clock program with a zone and gives the option of reading out all the temperatures. The total number of thermal head actuators is limited to 24.

Diagram





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Materials

The following materials are part of the radio-controlled control unit for "heating".

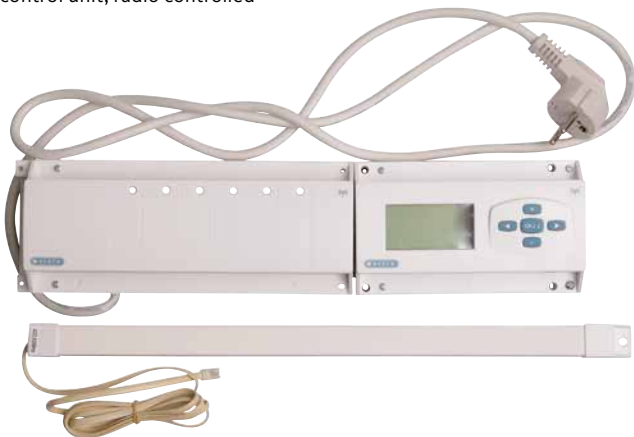
UFH-ZONE-R	control unit with "radio controlled" timer for 6 zones
UFH-EXTRAZONE-R	"radio-controlled" expansion module for 4 zones
UFH-THERM-R	"radio controlled" analogue room thermostat
UFH-THERM-RD	"radio-controlled, heating-cooling" digital room thermostat
UFH-ACT230NC2*	thermal head actuator 230V
UFH-ACT230NC4*	thermal head actuator 230V with auxiliary contact
UFH-SENSOR*	¹ external sensor for thermostat

1) The digital thermostat can be equipped with an external sensor.
*Remark Technical data listed under shared materials.

Technical data for materials

TYPE: UFH-ZONE-R

control unit, radio controlled



DESCRIPTION	UFH-ZONE-R
working temperature	0 - 50 °C
control characteristic	parameter menu
protection	IP 30
supply voltage	230 VAC, +/- 10%
fuse	2.5 AT 5x20mm
radio frequency	433.92MHz, <10mW
in accordance with	EN300220-1,-2/EN301489-1,-3
outlet (free contact 1)	230 VAC, 8 A
outlet (free contact 2)	230 VAC, 8 A
outlet (zone 1)	max. 4 actuators
outlet (zone 2)	max. 4 actuators
outlet (zone 3)	max. 4 actuators
outlet (zone 4)	max. 4 actuators
outlet (zone 5)	max. 4 actuators
outlet (zone 6)	max. 4 actuators
outlet (zone 1 - 14)	max. 24 actuators

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TYPE: UFH-EXTRAZONE-R

expansion module, radio-controlled



DESCRIPTION	UFH-EXTRAZONE-R
working temperature	0 - 50 °C
protection	IP 20
supply voltage	220 VAC, +/- 10%
outlet (zone 1)	max. 4 actuators
outlet (zone 2)	max. 4 actuators
outlet (zone 3)	max. 4 actuators
outlet (zone 4)	max. 4 actuators

TYPE: UFH-THERM-R

analogue room thermostat, radio controlled



DESCRIPTION	UFH-THERM-R
measurement accuracy	0.1°C
working temperature	0 - 50 °C
adjustment range	5 - 30 °C (1 - 5)
control characteristic	proportional band 2°C cycle 15 min.
protection	class 2, IP30
supply voltage	2 X 3V (CR2430), approx. 2 years
radio frequency	433.92MHZ, <10MW
in accordance with	EN300220-1,-2/EN301489-1,-3

TYPE: UFH-THERM-RD

digital room thermostat, radio controlled



DESCRIPTION	UFH-THERM-RD
measurement accuracy	0.1°C
working temperature	0 - 50 °C
adjustment range	5 - 37 °C
control characteristic	proportional
protection	class 2, IP30
supply voltage	2 X 3V (CR2430), approx. 2 years
radio frequency	433.92MHZ, <10MW
in accordance with	EN300220-1,-2/EN301489-1,-3
external sensor	UFH-SENSOR



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9.2.2 Wireless control unit (heating / cooling)

Description

The purpose of the controller is to control thermal head actuators mounted on the groups of an underfloor heating manifold.

The groups are controlled by means of room thermostats and a control unit at the position of the manifold.

The control unit is suitable for 4 zones and can be expanded to 12 zones. This is done by connecting expansion modules of 4 zones each to the control unit.

Each zone can be controlled separately by a thermostat, and a thermostat can also control a number of zones. A maximum of 4 thermal head actuators are connected to one zone

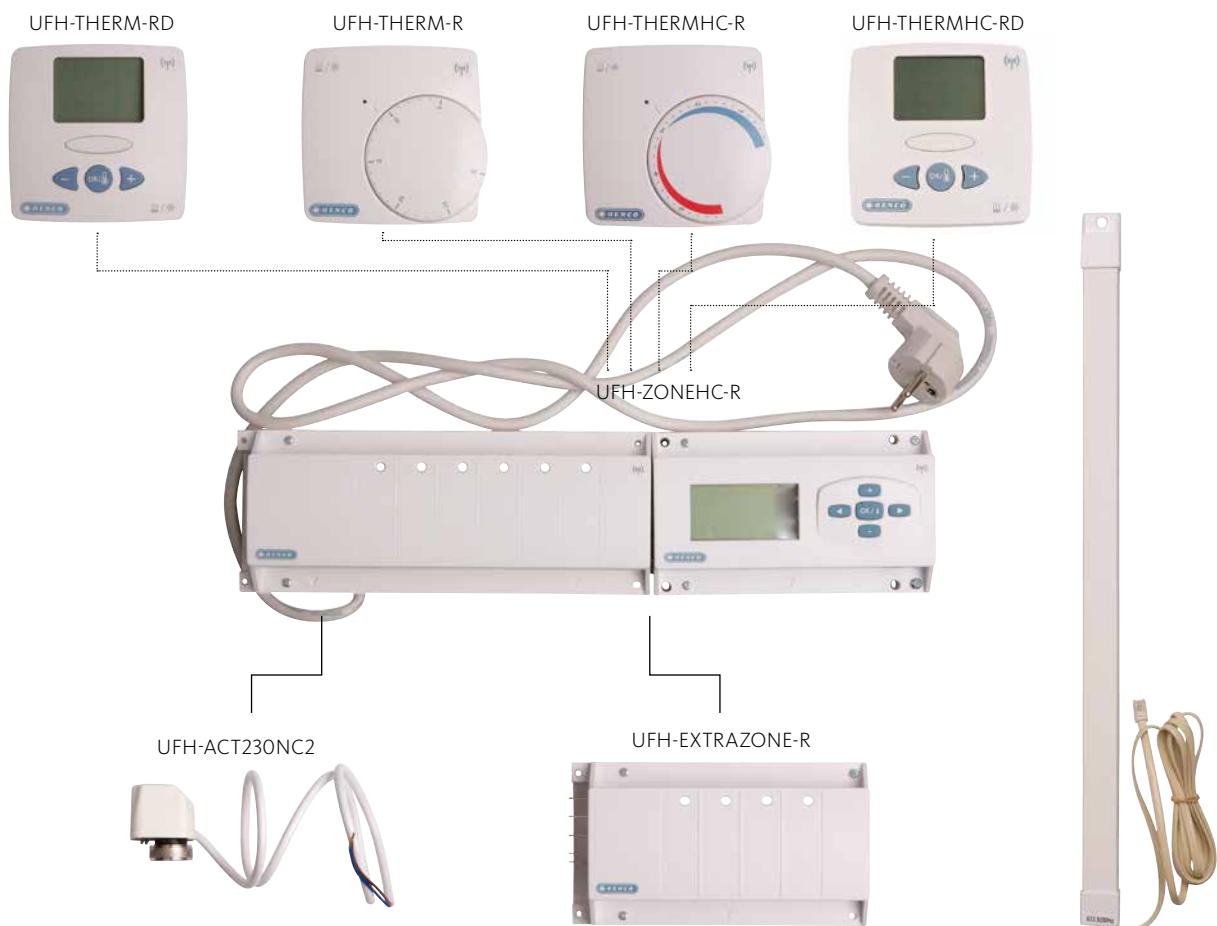
The control unit has two voltage free contacts that close according to the demand for heat or cold and one voltage free contact controlled by the inlet sensor.

A pump outlet controls a circulation pump when there is demand for heat or cold. There is a connection to which a release contact can be connected.

The controller can be used in a number of configurations (e.g. heat pump system or double heating/cooling group). Depending on the configuration, the master thermostat or an external voltage free contact determines the function mode (heating/cooling).

The control unit has a timer and antenna. The timer with antenna maintains radio communication between the room thermostats and the control unit. The timer can associate a clock program with a zone and gives the option of reading out all the temperatures. The total number of thermal head actuators is limited to 24.

Diagram



9 CONTROL UNITS

Materials

The following materials are part of the radio-controlled "heating and cooling" zone controls.

UFH-ZONEHC-R	control unit with timer "radio-controlled – 230V" for 4 zones
UFH-EXTRAZONE-R	"radio-controlled" expansion module for 4 zones
UFH-THERM-R	"radio controlled" analogue room thermostat
UFH-THERM-RD	"radio controlled" digital room thermostat
UFH-THERMHC-R	"radio-controlled, heating-cooling" analogue room thermostat
UFH-THERMHC-RD	"radio-controlled, heating-cooling" digital room thermostat
UFH-ANC-06*	zone valve 1"
UFH-ACT230NC2*	thermal head actuator 230V
UFH-ACT230NC4*	thermal head actuator 230V with auxiliary contact
UFH-SENSOR*	¹ external sensor for thermostat ² advance sensor for control unit with timer

1) The digital thermostats can be equipped with an external sensor.

2) The control unit can be equipped with an advance sensor.

*Technical data listed under shared materials.

Technical data for materials

TYPE: UFH-ZONEHC-R

control unit, radio controlled (heating/cooling)



DESCRIPTION	UFH-ZONEHC-R
working temperature	0 - 50 °C
control characteristic	parameter menu
protection	IP 30
supply voltage	230 VAC, +/- 10%
fuse	2.5 AT 5x20mm
radio frequency	433.92MHz, <10mW
in accordance with	EN300220-1,-2/EN301489-1,-3
outlet pump (L - N - PE)	230 VAC, 5 A
outlet cooling (free contact)	230 VAC, 5 A
outlet heating (free contact)	230 VAC, 5 A
outlet dehumidification (free contact)	230 VAC, 5 A
release contact	230 VAC (remove bridge)
outlet (zone 1)	max. 4 actuators
outlet (zone 2)	max. 4 actuators
outlet (zone 3)	max. 4 actuators
outlet (zone 4)	max. 4 actuators



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TYPE: UFH-EXTRAZONE-R

expansion module, radio-controlled



DESCRIPTION	UFH-EXTRAZONE-R
working temperature	0 - 50 °C
protection	IP 20
supply voltage	230 VAC, +/- 10%
outlet (zone 1)	max. 4 actuators
outlet (zone 2)	max. 4 actuators
outlet (zone 3)	max. 4 actuators
outlet (zone 4)	max. 4 actuators

TYPE: UFH-THERM-R

analogue room thermostat, radio controlled



DESCRIPTION	UFH-THERM-R
measurement accuracy	0.1°C
working temperature	0 - 50 °C
adjustment range	5 - 30 °C (1 - 5)
control characteristic	proportional band 2°C cycle 15 min.
protection	class 2, IP30
supply voltage	2 x 3V (CR2430), approx. 2 years
radio frequency	433.92MHz, <10mW
in accordance with	EN300220-1,-2/EN301489-1,-3

TYPE: UFH-THERM-RD

digital room thermostat, radio controlled



DESCRIPTION	UFH-THERM-RD
measurement accuracy	0.1°C
working temperature	0 - 50 °C
adjustment range	5 - 37 °C
control characteristic	proportional (adjustable)
protection	class 2, IP30
supply voltage	2 x 3V (CR2430), approx. 2 years
radio frequency	433.92MHz, <10mW
in accordance with	EN300220-1,-2/EN301489-1,-3
external sensor	UFH-SENSOR

9 CONTROL UNITS

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TYPE: UFH-THERMHC-R

analogue room thermostat, radio controlled (heating/cooling)



DESCRIPTION

UFH-THERMHC-R

measurement accuracy	0,1°C
working temperature	0 - 50 °C
adjustment range	5 - 30 °C (1 - 5)
control characteristic	proportional band 2°C
	cycle 15 min.
protection	class 2, IP30
supply voltage	2 x 3V (CR2430), approx. 2 years
radio frequency	433.92MHz, <10mW
in accordance with	EN300220-1,-2/EN301489-1,-3
setting	heating/cooling

TYPE: UFH-THERMHC-RD

digital room thermostat, radio controlled (heating/cooling)



DESCRIPTION

UFH-THERMHC-RD

measurement accuracy	0,1°C
working temperature	0 - 50 °C
adjustment range	5 - 37 °C
adjustment	heating and cooling
control characteristic	proportional (adjustable)
protection	class 2, IP30
supply voltage	2 x 3V (CR2430), ca. 2 jaar
radio frequency	433,92MHz, <10mW
in accordance with	EN300220-1,-2/EN301489-1,-3
external sensor	UFH-SENSOR



9.3 Technical data on shared materials

TYPE: UFH-ACT230NC4

thermal head actuator, 230V, NC, with auxiliary contact



DESCRIPTION	UFH-ACT230NC4
installation	M30 X 1.5
type	NC
working temperature	0 - 50 °C
protection	IP 44
supply voltage	230 VAC, +/- 10%
consumption	2.5 W
starting current	0.25 A x 0.5 sec
initial opening/closing time	90 sec
final opening/closing time	3 min
max. fluid temperature	110 °C
nominal closing force	140 N
auxiliary contact	230 VAC, 700 mA

TYPE: UFH-ACT230NC2

thermal head actuator, 230V, NC



DESCRIPTION	UFH-ACT230NC2
installation	M30 X 1.5
type	NC
working temperature	0 - 50 °C
protection	IP 44
supply voltage	230 VAC, +/- 10%
consumption	2.5 W
starting current	0.25 A x 0.5 sec
initial opening/closing time	90 sec
final opening/closing time	3 min
max. fluid temperature	110 °C
nominal closing force	140 N

TYPE: UFH-ACT24NC2

thermal head actuator, 24V, NC



DESCRIPTION	UFH-ACT24NC2
installation	M30 X 1.5
type	NC
working temperature	0 - 50 °C
protection	IP 44
supply voltage	24 VAC, +/- 10%
consumption	2.5 W
starting current	0.25 A x 0.5 sec
initial opening/closing time	90 sec
final opening/closing time	3 min
max. fluid temperature	110 °C
nominal closing force	140 N

9 CONTROL UNITS

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TYPE: UFH-SENSOR

temperature sensor



DESCRIPTION	UFH-SENSOR
length	3000 mm
R25	10 K
type	NTC

TYPE: UFH-H5004

copper shroud for UFH-sensor



DESCRIPTION	UFH-H5004
connection	1/2"
length	50 mm

TYPE: UFH-ANC

zone valve

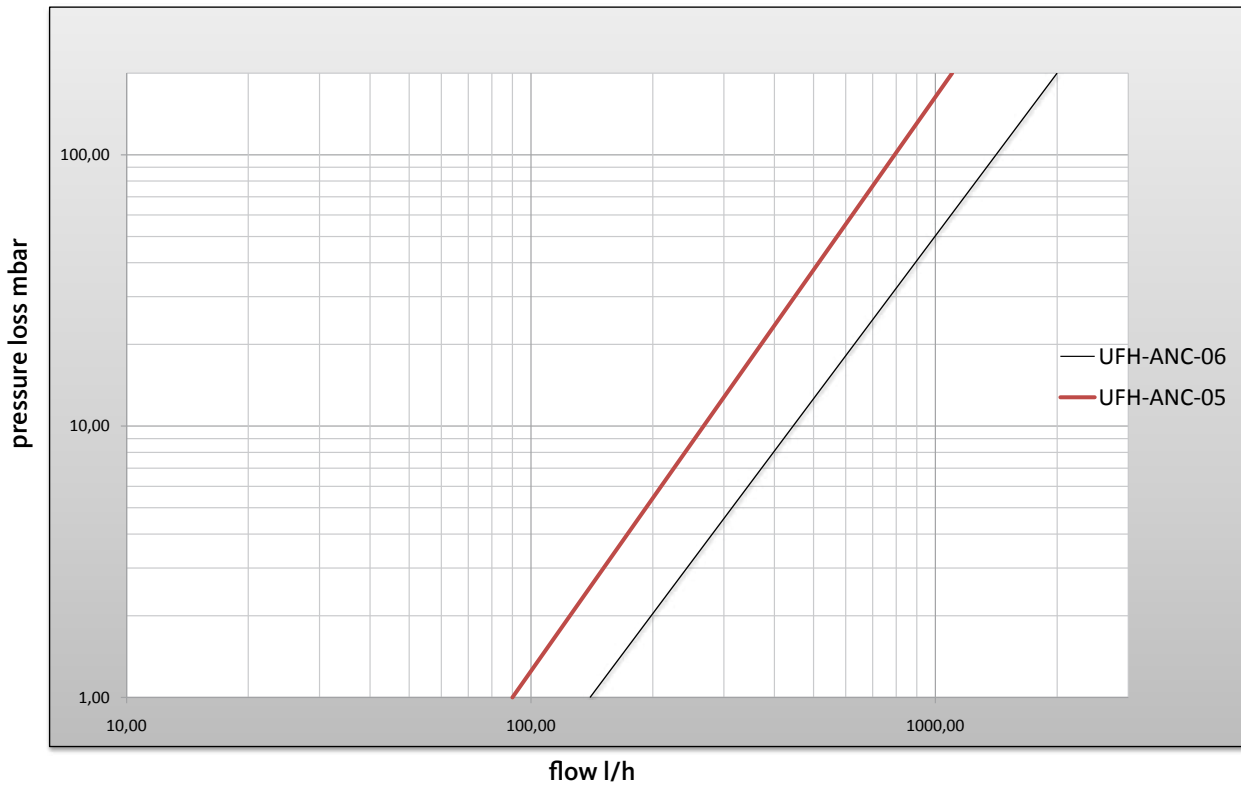


DESCRIPTION	UFH-ANC-05	UFH-ANC-06
connection	3/4" M	1" M
max. working pressure difference across valve (noise <38dB) (bar)	0,7	0,6
max. closing pressure across valve (bar)	1,5	0,7
actuator connection	M30 x 1,5	M30 x 1,5
type	Kvs 2,8	Kvs 4,5



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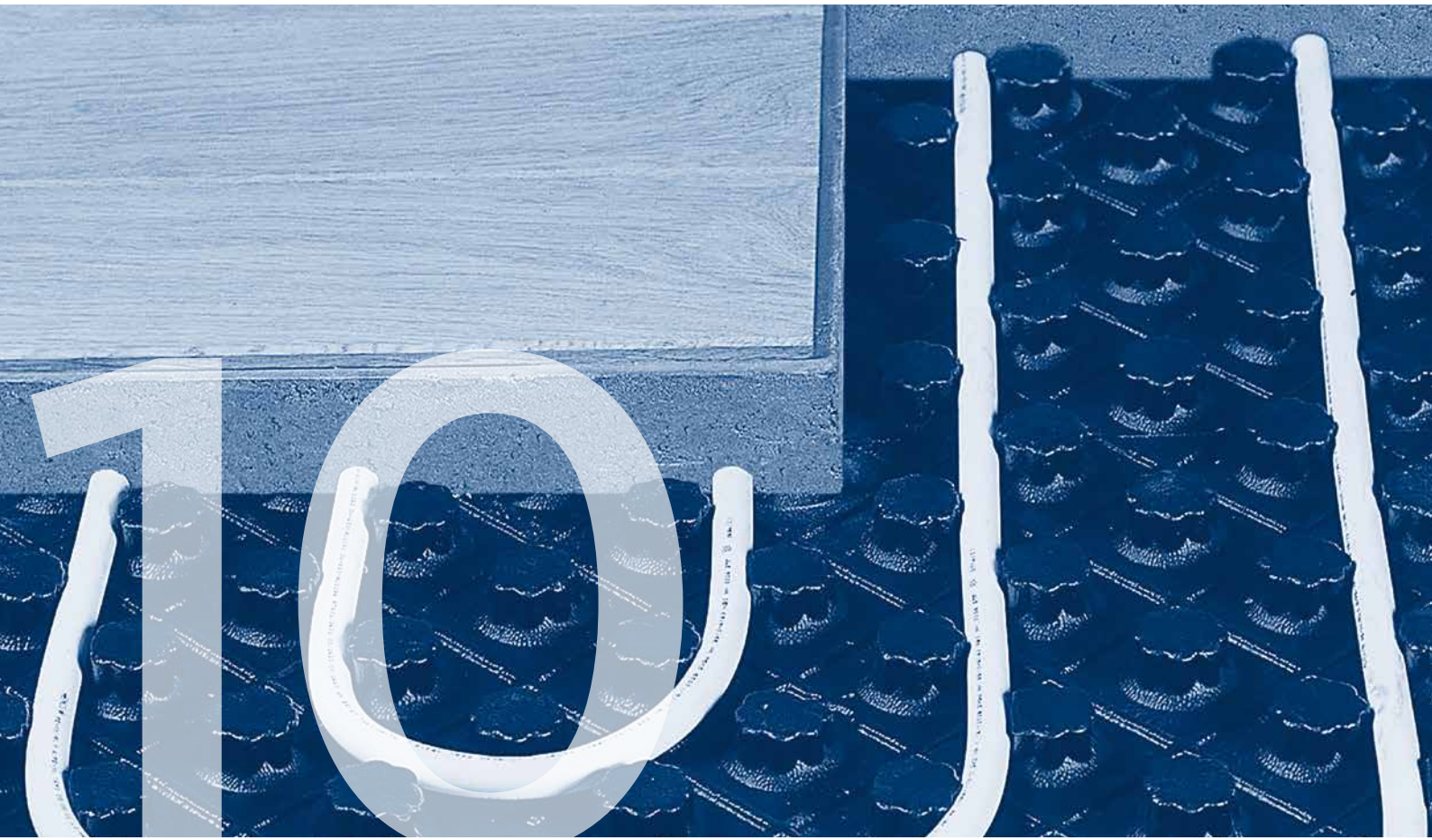
Pressure loss diagram



Remarks

When setting up the groups of an underfloor heating manifold, the hydraulic equilibrium of the manifold must be taken into account. There are different ways to maintain this equilibrium:

- Not all groups (approx. 20%) are provided with zone control.
- The use of a pump with automatic speed regulation.
- The use of a bypass with a pressure difference valve.



10.1 Floor construction methods

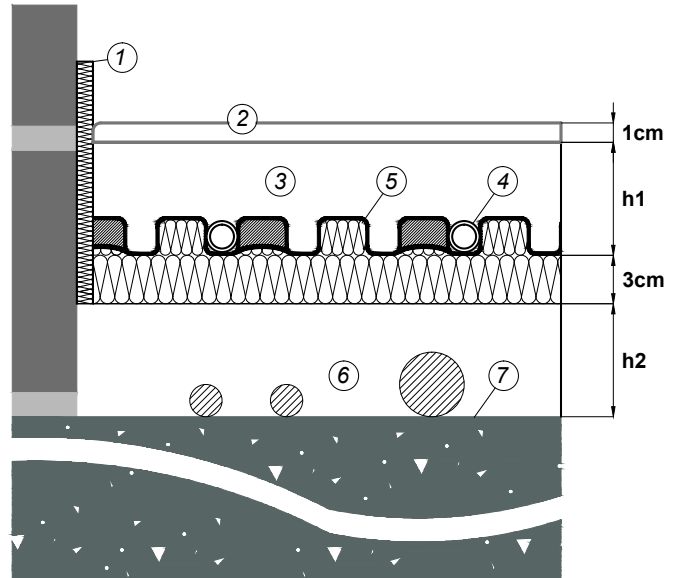
155



10.1 Floor construction methods

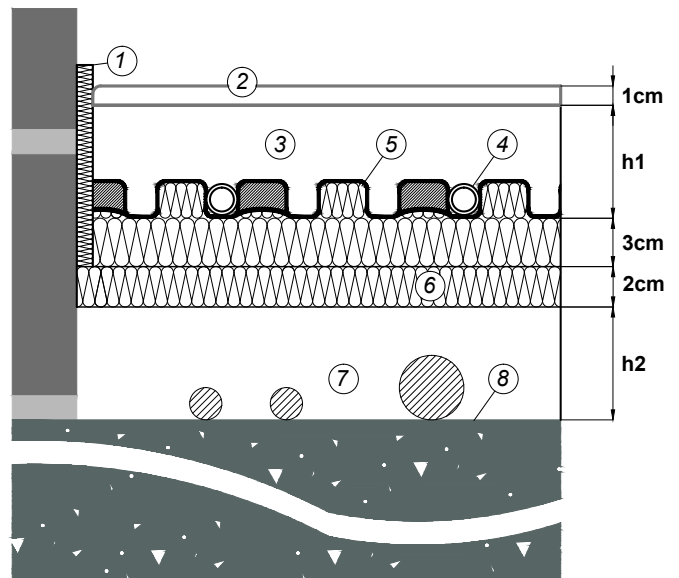
10.1.1 ■ PRO-30

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h_1
- 4 Underfloor heating pipe
- 5 System plate 3 cm
- 6 Concrete slab h_2
- 7 Supporting floor



10.1.2 ■ PRO-302

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h_1
- 4 Underfloor heating pipe
- 5 System plate 3 cm
- 6 Flat insulation board 2 cm
- 7 Concrete slab h_2
- 8 Supporting floor

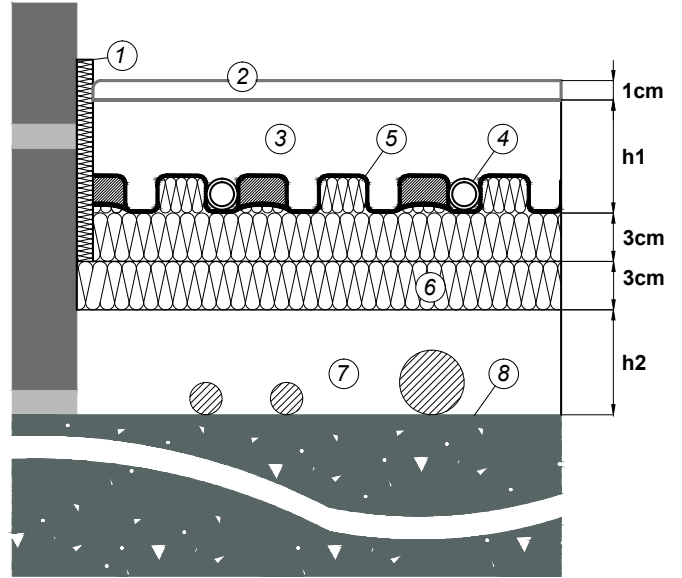


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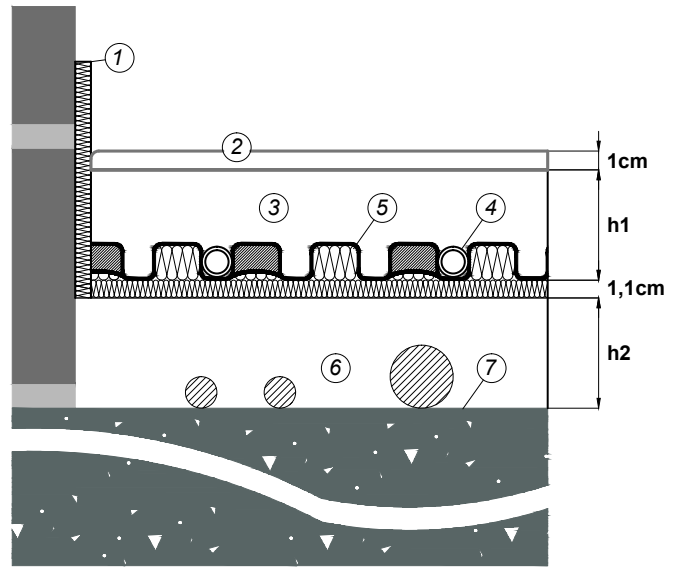
10.1.3 ■ PRO-303

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe
- 5 System plate 3 cm
- 6 Flat insulation board 3 cm
- 7 Concrete slab h2
- 8 Supporting floor



10.1.4 ■ PRO-11

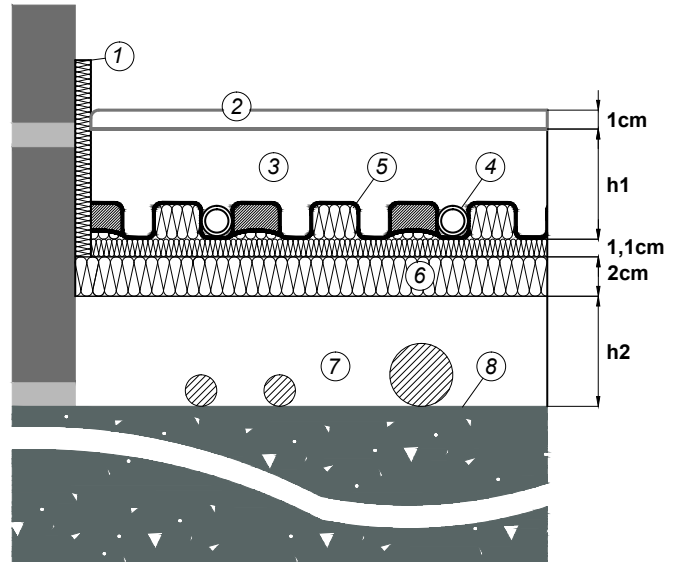
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe
- 5 System plate 1.1 cm
- 6 Concrete slab h2
- 7 Supporting floor





10.1.5 ■ PRO-112

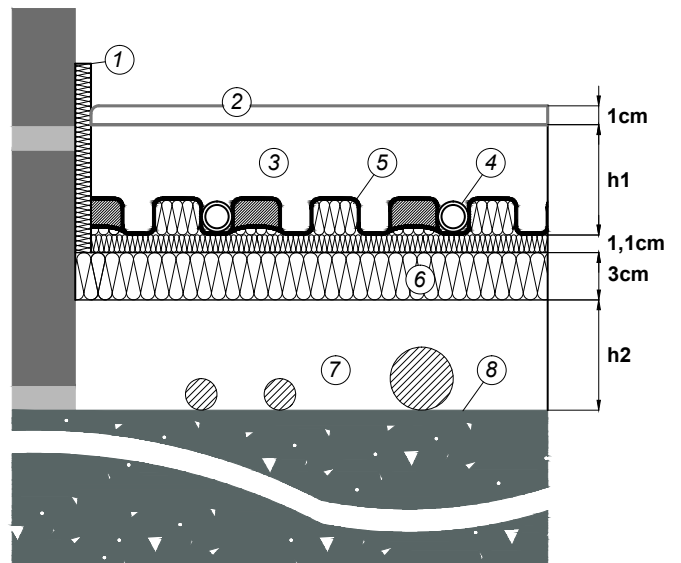
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe
- 5 System plate 1.1 cm
- 6 Flat insulation board 2 cm
- 7 Concrete slab h2
- 8 Supporting floor



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10.1.6 ■ PRO-113

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe
- 5 System plate 1.1 cm
- 6 Flat insulation board 3 cm
- 7 Concrete slab h2
- 8 Supporting floor



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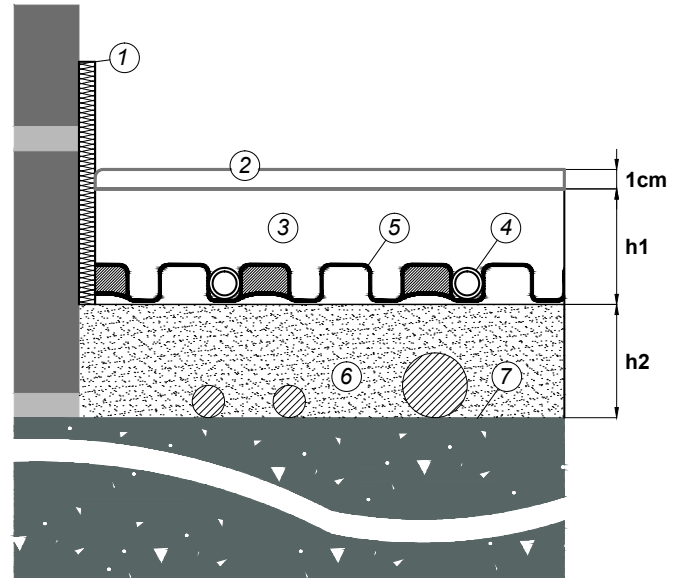
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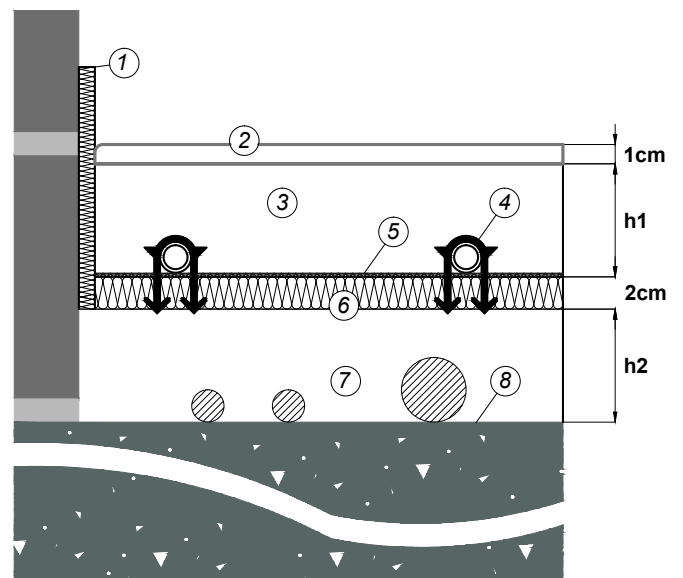
10.1.7 ■ PRO-BUDGET

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h_1
- 4 Underfloor heating pipe
- 5 System sheeting
- 6 Insulated concrete slab h_2
- 7 Supporting floor



10.1.8 ■ CLIP-20

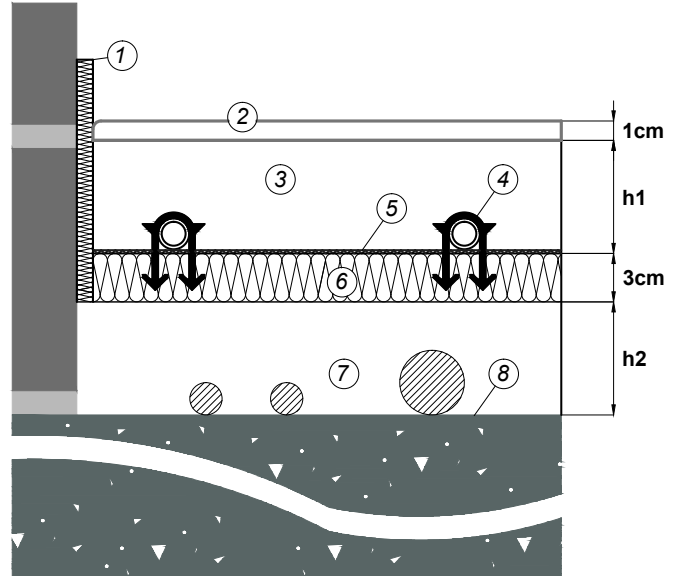
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h_1
- 4 Underfloor heating pipe with tacker clip
- 5 PE sheeting with grid marking
- 6 Flat insulation board 2 cm
- 7 Concrete slab h_2
- 8 Supporting floor





10.1.9 ■ CLIP-30

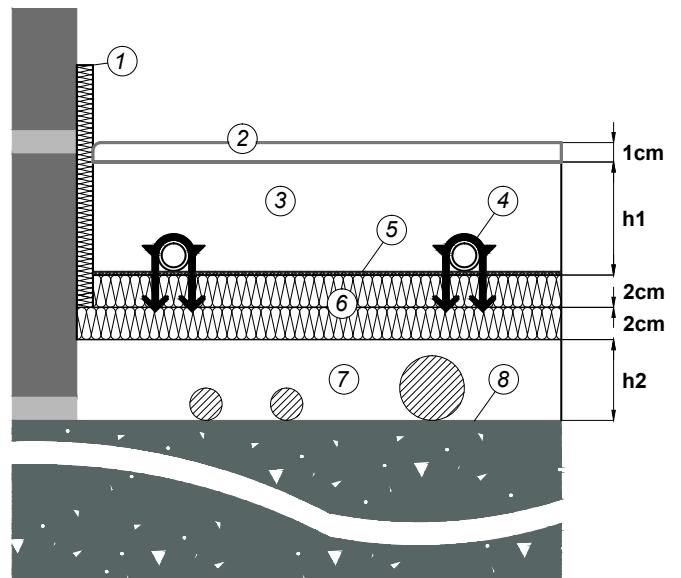
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe with tacker clip
- 5 PE sheeting with grid marking
- 6 Flat insulation board 3 cm
- 7 Concrete slab h2
- 8 Supporting floor



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101.10 ■ CLIP-40

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe with tacker clip
- 5 PE sheeting with grid marking
- 6 Flat insulation board 2 + 2 cm
- 7 Concrete slab h2
- 8 Supporting floor



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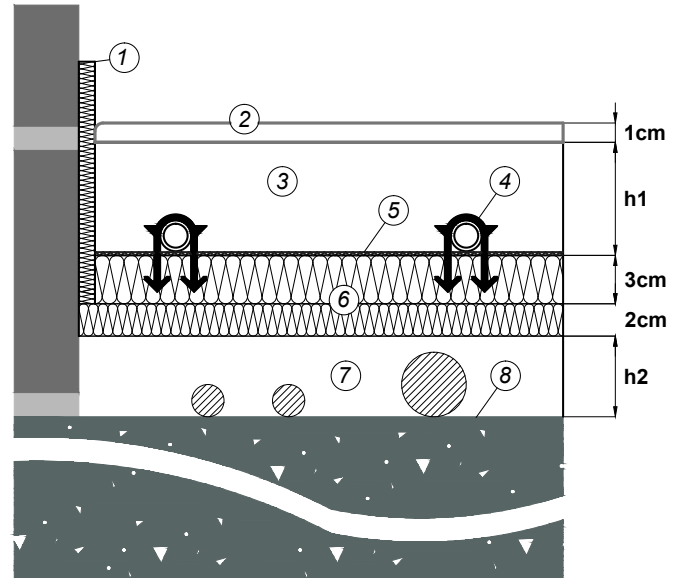
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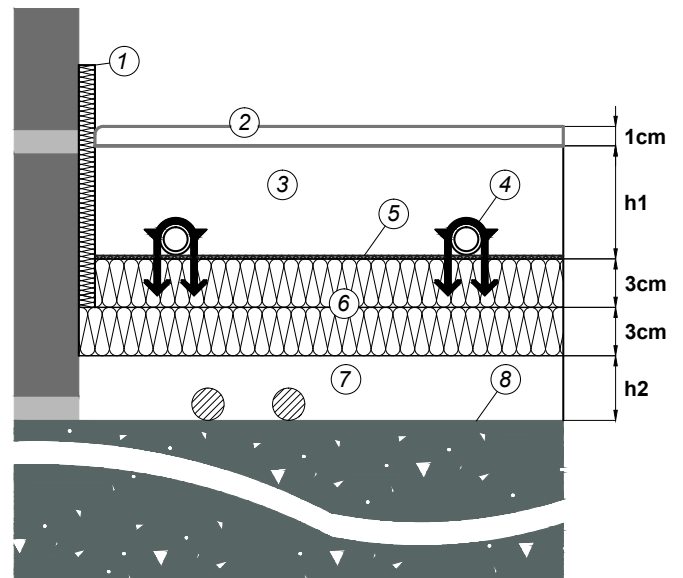
10.1.11 ■ CLIP-50

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h_1
- 4 Underfloor heating pipe with tacker clip
- 5 PE sheeting with grid marking
- 6 Flat insulation board 2 + 3 cm
- 7 Concrete slab h_2
- 8 Supporting floor



10.1.12 ■ CLIP-60

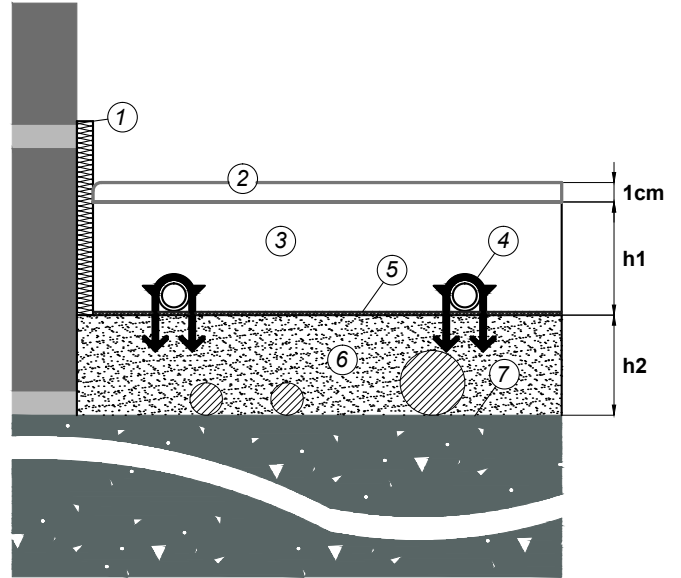
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h_1
- 4 Underfloor heating pipe with tacker clip
- 5 PE sheeting with grid marking
- 6 Flat insulation board 3 + 3 cm
- 7 Concrete slab h_2
- 8 Supporting floor





10.1.13 ■ CLIP (SPRAYED INSULATION)

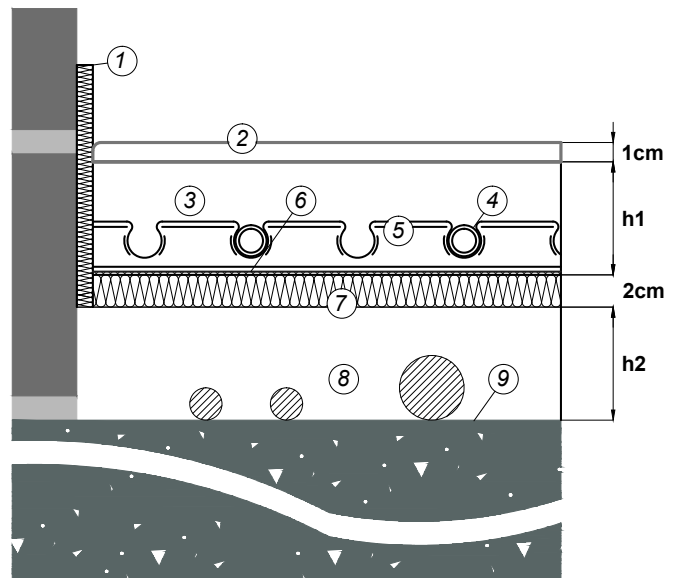
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe with tacker clip
- 5 PE sheeting with grid marking
- 6 Insulated concrete slab h2
- 7 Supporting floor



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10.1.14 ■ U-ONE-20 /U-DOUBLE-20

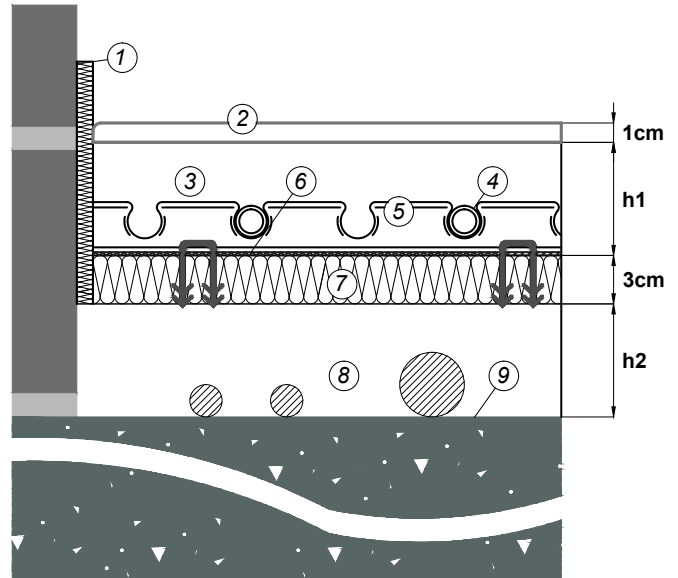
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe
- 5 U-profile
- 6 PE sheeting with grid marking
- 7 Flat insulation board 2 cm
- 8 Concrete slab h2
- 9 Supporting floor



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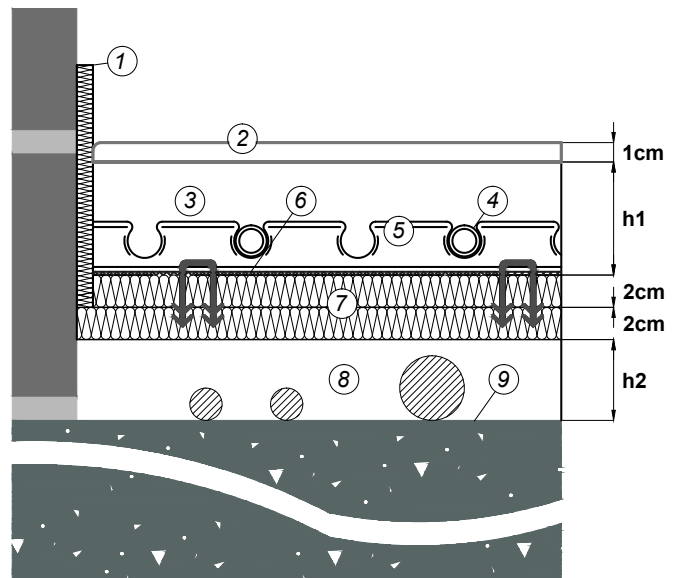
10.1.15 ■ U-ONE-30 /U-DOUBLE-30

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe
- 5 U-profile
- 6 PE sheeting with grid marking
- 7 Flat insulation board 3 cm
- 8 Concrete slab h2
- 9 Supporting floor



10.1.16 ■ U-ONE-40 /U-DOUBLE-40

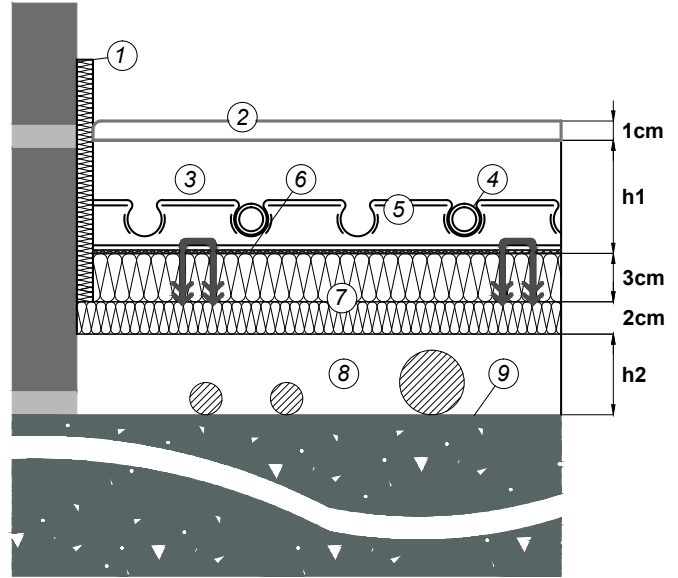
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe
- 5 U-profile
- 6 PE sheeting with grid marking
- 7 Flat insulation board 2 + 2 cm
- 8 Concrete slab h2
- 9 Supporting floor





10.1.17 ■ U-ONE-50 /U-DOUBLE-50

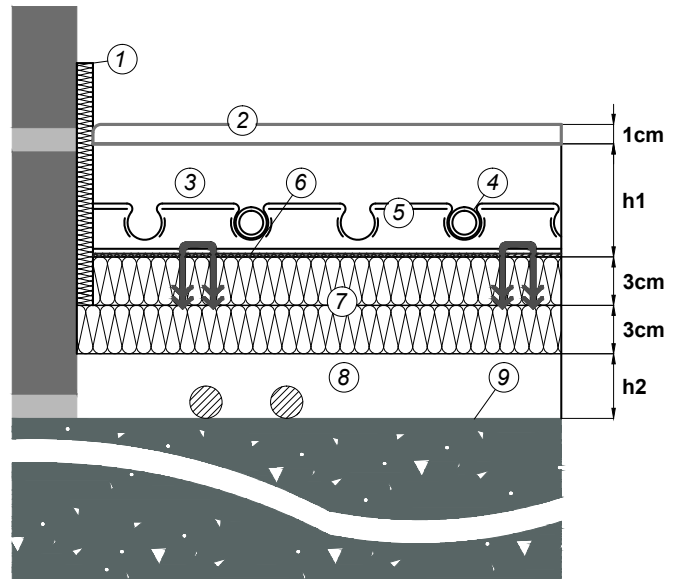
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe
- 5 U-profile
- 6 PE sheeting with grid marking
- 7 Flat insulation board 2 + 3 cm
- 8 Concrete slab h2
- 9 Supporting floor



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10.1.18 ■ U-ONE-60 /U-DOUBLE-60

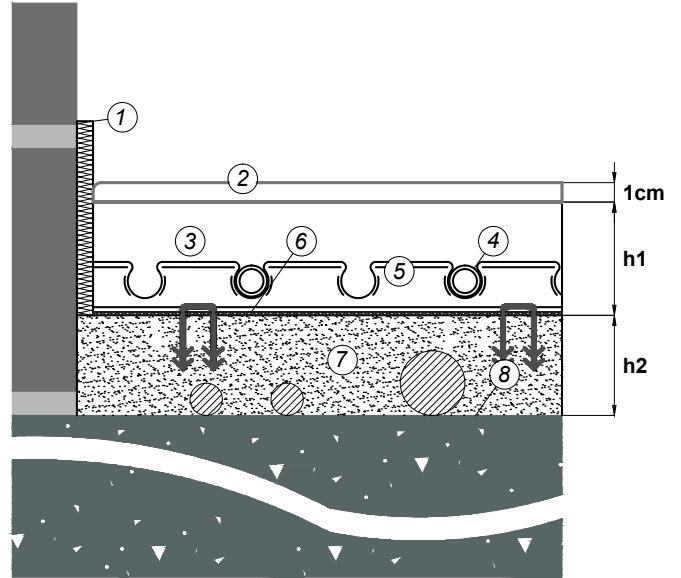
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe
- 5 U-profile
- 6 PE sheeting with grid marking
- 7 Flat insulation board 3 + 3 cm
- 8 Concrete slab h2
- 9 Supporting floor



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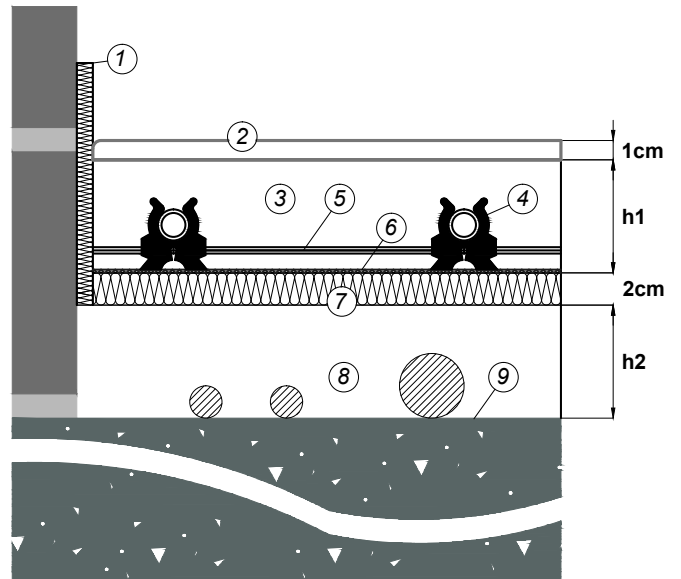
9.7.19 ■ U-ONE/U-DOUBLE (SPRAYED INSULATION)

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe
- 5 U-profile
- 6 PE sheeting with grid marking
- 7 Insulated concrete slab h2
- 8 Supporting floor



9.7.20 ■ MAZE-K..2

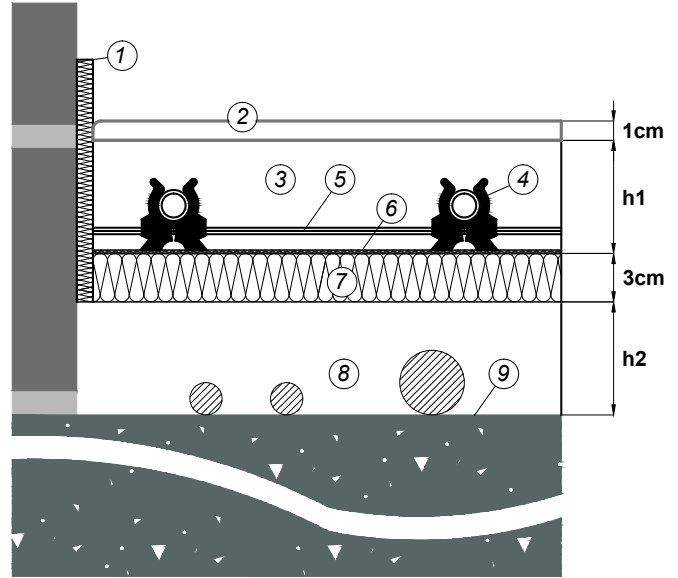
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Floor heating pipe with pipe clip
- 5 Steel mesh
- 6 PE sheeting
- 7 Flat insulation board 2 cm
- 8 Concrete slab h2
- 9 Supporting floor





9.7.21 ■ MAZE-K..3

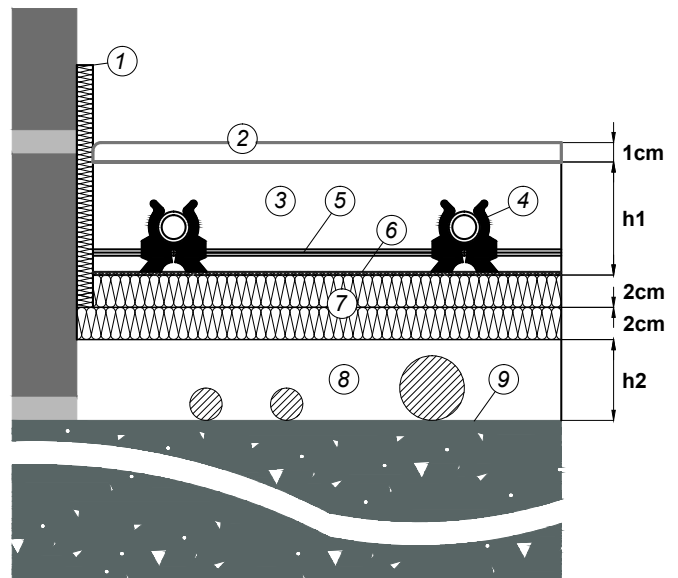
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe with clip
- 5 Steel mesh
- 6 PE sheeting
- 7 Flat insulation board 3 cm
- 8 Concrete slab h2
- 9 Supporting floor



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9.7.22 ■ MAZE-K..4

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe with clip
- 5 Steel mesh
- 6 PE sheeting
- 7 Flat insulation board 2 + 2 cm
- 8 Concrete slab h2
- 9 Supporting floor



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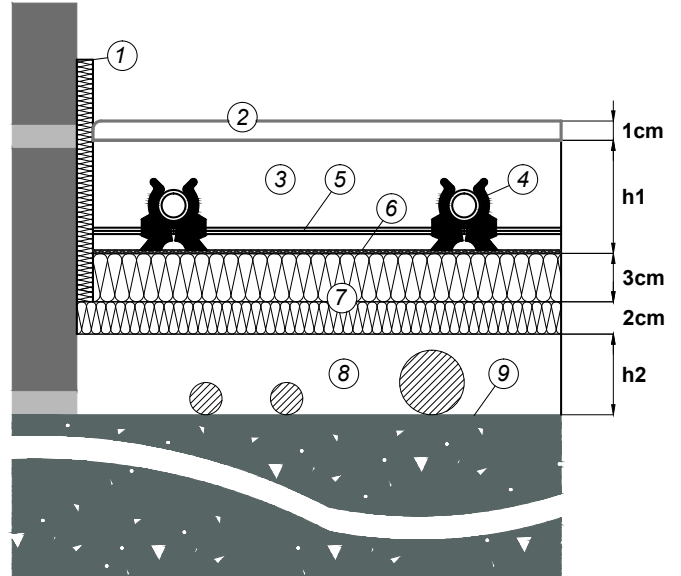
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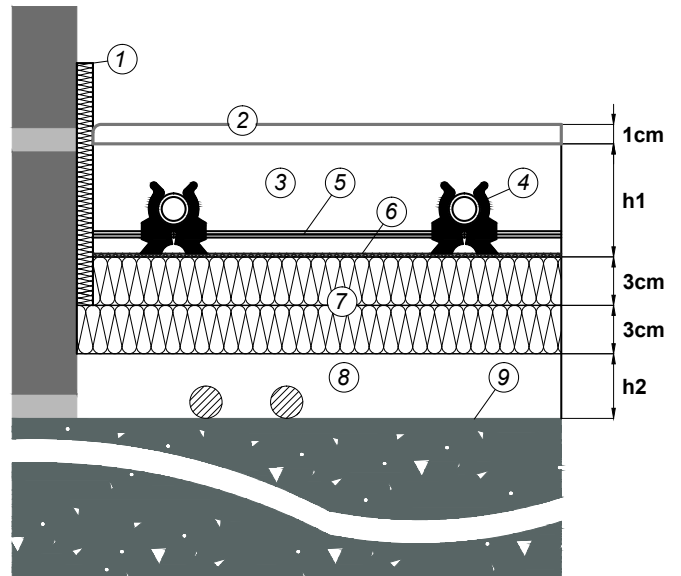
10.1.23 ■ MAZE-K..5

- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe with clip
- 5 Steel mesh
- 6 PE sheeting
- 7 Flat insulation board 2 + 3 cm
- 8 Concrete slab h2
- 9 Supporting floor



10.1.24 ■ MAZE-K..6

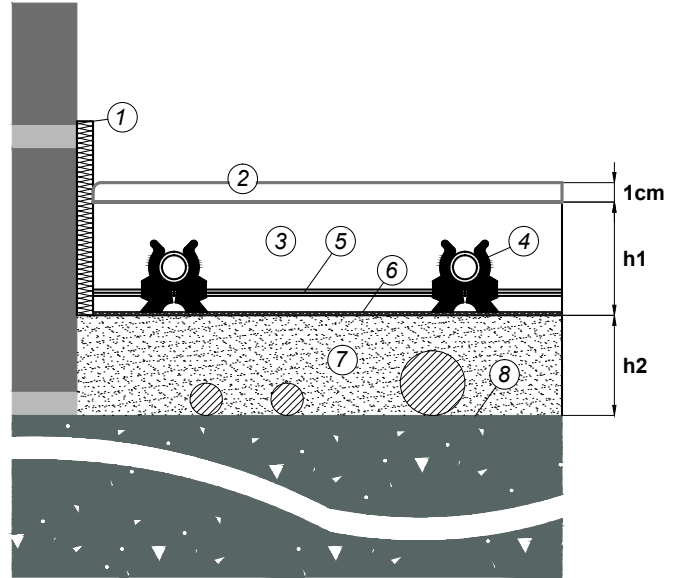
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe with clip
- 5 Steel mesh
- 6 PE sheeting
- 7 Flat insulation board 3 + 3 cm
- 8 Concrete slab h2
- 9 Supporting floor





10.1.25 ■ MAZE (SPRAYED INSULATION)

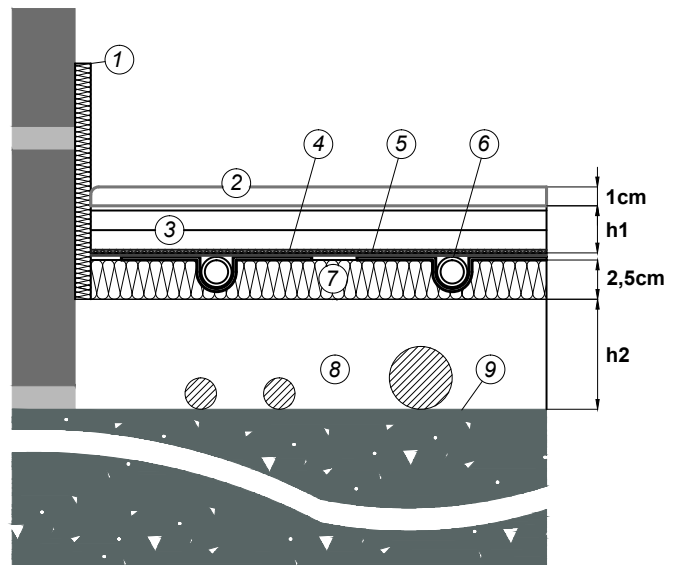
- 1 Edge insulation
- 2 Floor finishing
- 3 Screed h1
- 4 Underfloor heating pipe with clip
- 5 Steel mesh
- 6 PE sheeting
- 7 Insulated concrete slab h2
- 8 Supporting floor



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10.1.26 ■ OMEGA-25

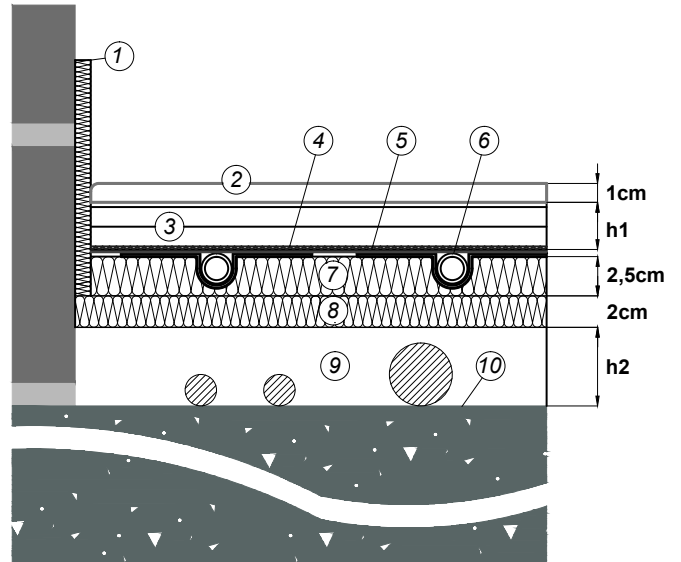
- 1 Edge insulation
- 2 Floor finishing
- 3 Plasterboard h1
- 4 PE sheeting
- 5 Heat diffusion plate
- 6 Underfloor heating pipe in heat diffusion profile
- 7 Dry system plate 2.5 cm
- 8 Concrete slab h2
- 9 Supporting floor



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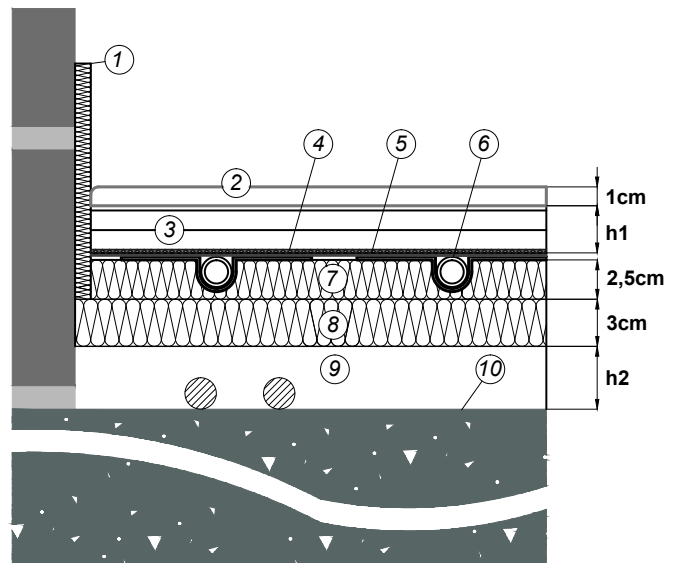
10.1.27 ■ OMEGA-252

- | | |
|----|---|
| 1 | Edge insulation |
| 2 | Floor finishing |
| 3 | Plasterboard h_1 |
| 4 | PE sheeting |
| 5 | Heat diffusion plate |
| 6 | Underfloor heating pipe in heat diffusion profile |
| 7 | Dry system plate 2.5 cm |
| 8 | Flat insulation board 2 cm |
| 9 | Concrete slab h_2 |
| 10 | Supporting floor |



10.1.28 ■ OMEGA-253

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|----|---|
| 1 | Edge insulation |
| 2 | Floor finishing |
| 3 | Plasterboard h_1 |
| 4 | PE sheeting |
| 5 | Heat diffusion plate |
| 6 | Underfloor heating pipe in heat diffusion profile |
| 7 | Dry system plate 2.5 cm |
| 8 | Flat insulation board 3 cm |
| 9 | Concrete slab h_2 |
| 10 | Supporting floor |



INSURANCE POLICIES AND GUARANTEES

ouscrit la police n° 00067-2020 0561 3238-42 garantissant la responsabilité civile qu'il
 pourrait encourir du fait de son activité, pour la(les) couverture(s) suivante(s):

Risk

Insured amount

De maatschappij bevestigt bij deze dat
 Het bedrijf heeft de polis n° 00067-2020 0561 3238-42
 TOEKOMSTLAAN 27
 2200 HERENTALS

que(s)

Sommes assurées

met als activiteit

C. Exploitation

Public Liability

Fabricatie van leidingen voor centrale verwarming, vloerverwarming, sanitair en fittings zonder
 plaatsing.

mmages corporels et matériels confondus

Unternehmenshaftpflichtversicherung 3.000.000

C. Après Livraison

Bodily injuries

polis nr 00067-2020 0561 3238-42 aangaande de burgerlijke aansprakelijkheid waarborgt u
 hoofde van zijn activiteit, voor de volgende dekkingen:

3.000.000 EUR

mmages corporels et matériels confondus

Material injuries

Die Versicherungsgesellschaft bestätigt hiermit, dass die Fir

Verzekerde bedr

3.000.000

combined

tte attestation est valable sous réserve du paiement des primes trimestrielles pour l'année
 05.

mit nachstehender Tätigkeit:
 B.A. Na Levens

prochaine échéance du contrat est le 31/12/2005

Products Liability

Sanitäreinrichtungen und materielle schade vermengd-, Fußbodenheizung-
 Sanitäreinrichtungen sowie von Fittings, ohne Installation

3.000.000 EUR

estation établie à Bruxelles, le 31/08/2005.

den folgenden Vertrag Nr. 56 12338 abgeschlossen hat, welche
 Haftung mit Bezug auf Ihre Tätigkeit mit nachstehenden Su
 deckt.
 Opgemaakt te Brussel, op 25/08/2005

3.000.000 EUR

11 INSURANCE POLICIES AND GUARANTEES



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info@protect.be - www.protect.be

Contactpersoon: Lut DEBREAEMAKER
Tel.: 02/412.06.06
E-mail: lut.debreaemaker@protect.be

HENCO FLOOR
TOEKOMSTLAAN, 27
2200 HERENTALS

Uw referentie:
Onze referentie: 00/A.5292
Klant: HENCO FLOOR

Brussel, 20/05/2010

CERTIFICATE

The N.V. Protect, Jetsesteenweg 221 at 1080 BRUSSEL, hereby confirms that HENCO FLOOR, TOEKOMSTLAAN 27 te 2200 HERENTALS, is holder of a policy "professional liability" under the number 00/A.5292.

This policy guarantees the financial consequences of the public and professional liability of the insured for all his activities which concern the practice of his profession, within the limits of the general and special conditions.

Insured sum: 350.000 EUR per claim and 700.000 EUR per insurance year.
For bodily injury the insured sum is extended up to 1.250.000 EUR per claim and per insurance year.

Undersigned declares that this policy will normally be valid until 31/12/2010, that is if no changes occur from now to the end of the year which may entail suspension of the guarantee.

Rebecca Ramboer
Administrator-General



THIRD PARTY LIABILITY INSURANCE CERTIFICATE

The insurance company AXA Belgium, authorised under no. 0039 with registered office in 1170 Brussels, boulevard du Souverain 25, acknowledges that in accordance with the stipulations of the policy no. 200.705.538.140, it covers for the following legal entity or natural person :

**NV HENCO
TOEKOMSTLAAN 27
2200 HERENTALS**

- the extra-contractual liability for damage caused to third parties during the activity of its business. This cover is granted within the limits of the stipulations of the policy up to the following amounts:

Bodily injury and property damage combined, per loss 3.000.000,00 EUR

- the extra-contractual and contractual liability governed by the stipulations of Belgian and foreign law for damage caused to third parties by products after delivery or by works after execution. This cover is granted within the limits of the stipulations of the policy up to the following amounts:

Bodily injury and property damage combined, per loss and per insurance year 3.000.000,00 EUR

It is stipulated that this certificate does not commit the company beyond the clauses and limits of the contract to which it refers.

Brussels, on 15 January 2010

François Lemonnier
Corporate Manager

CERTIFICATION





GERMANY



ITALY



AUSTRIA



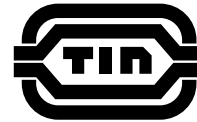
AUSTRIA



FRANCE



THE NETHERLANDS



POLAND



DANMARK
DENMARK



Australian
Standard



RUSSIA



SLOVAKIA



ATG SYSTEM CERTIFICATE BELGIUM



SPAIN



FINLAND



HUNGARY



SWEDEN



SWEDEN



ENGLAND



SWITZERLAND



ESTONIA



NORWAY



BYGGINGARÍÐNAÐARINS
THE ICELANDIC BUILDING RESEARCH INSTITUTE

ICELAND



CZECH REPUBLIC



ROMANIA



PORTUGAL



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