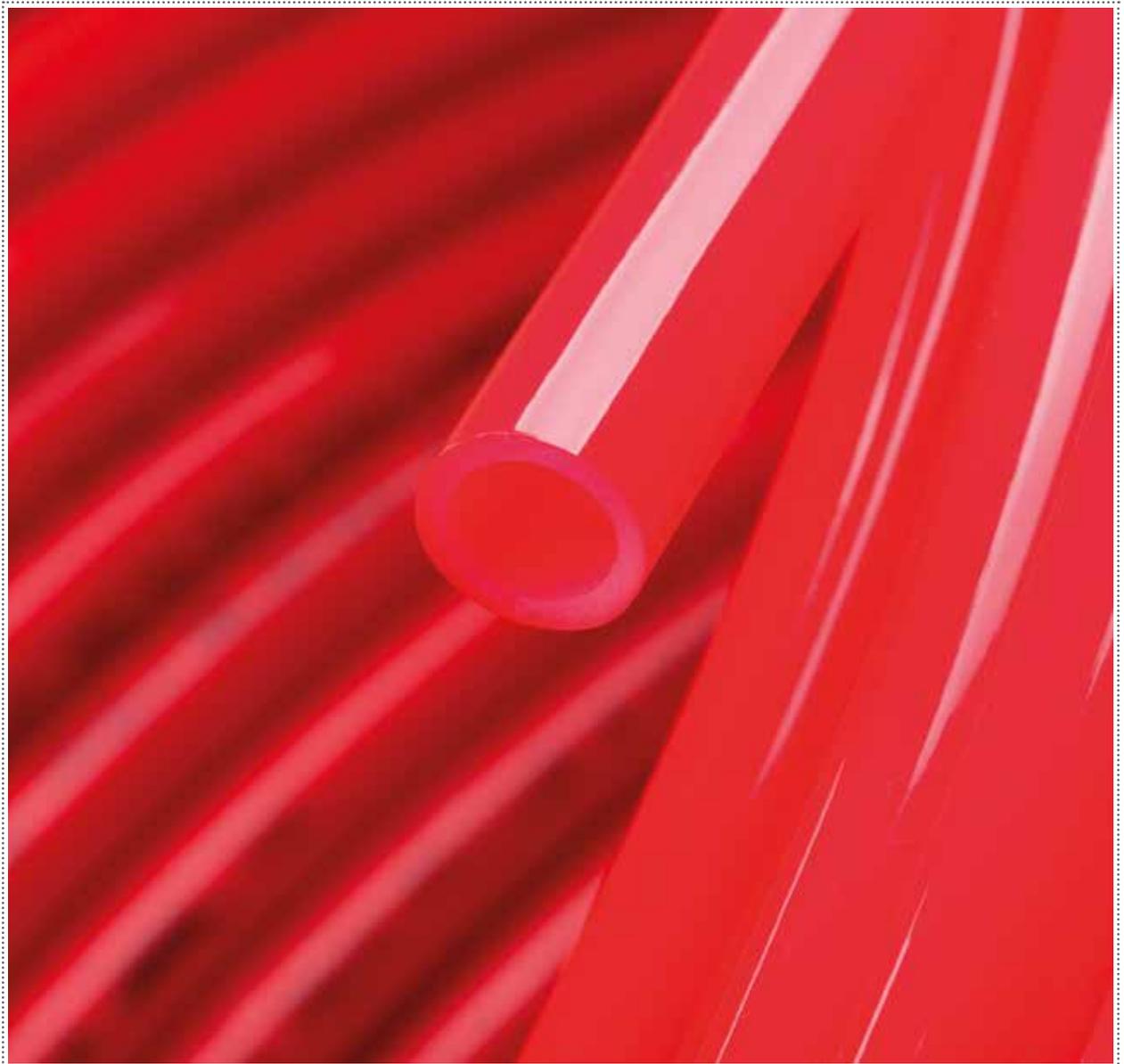


**INSTALLATION INSTRUCTIONS  
FOR COMB PANEL SYSTEMS**  
HEATING PIPE HR

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**DIMENSIONING**

	requirement of DIN 4726	effidur heating pipe
Design Stress $\sigma$ (licit stress)	3,34 Mpa	3,60 Mpa
Max. operating pressure for pipe 8 x 1,1 mm	9,5 bar	10,3 bar
Max. operating pressure for pipe 10 x 1,3 mm	9,5 bar	10 bar

*The effidur heating pipe securely meets the requirements of DIN 4726!*

**INSTALLATION**

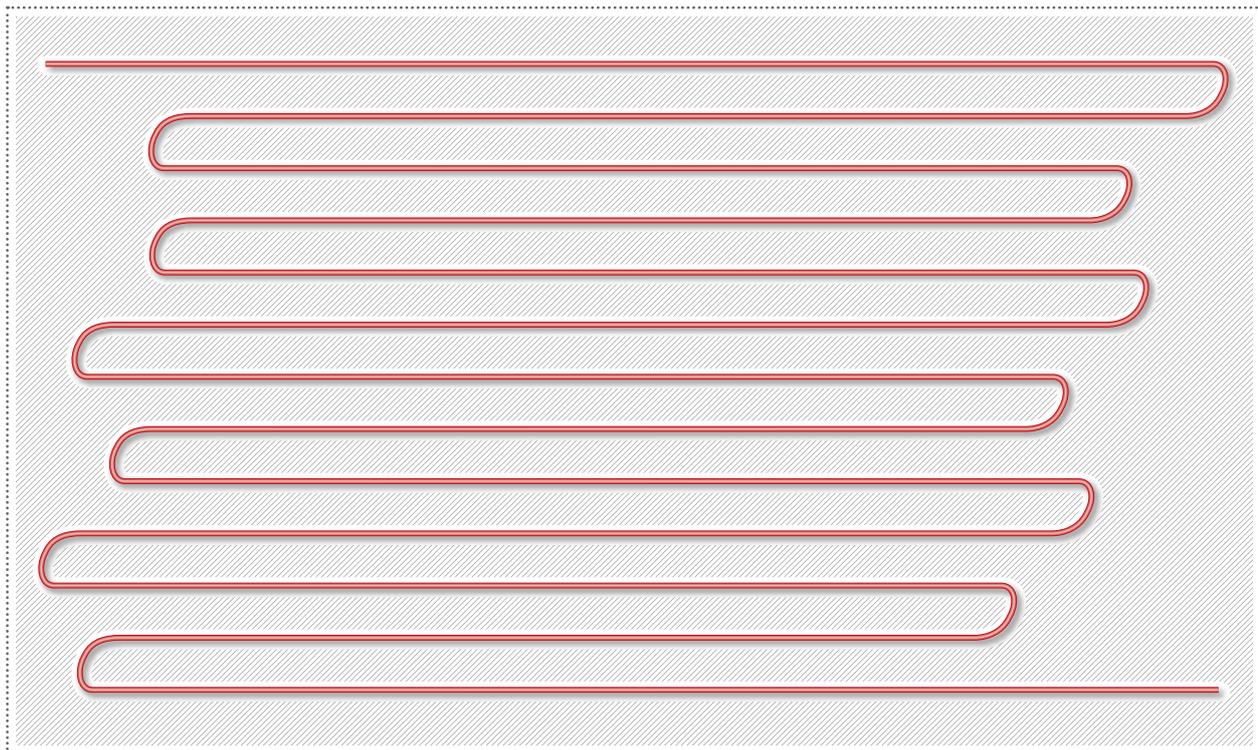
	heating pipe $\phi$ 8	heating pipe $\phi$ 10
Dimension of heating pipe	8 x 1,1 mm	10 x 1,3 mm
Application within effidur system	WP 1000 + WP 2000	WP 2000
Max. length of heating loop	35 m	70 m
Max. area per heating loop	4 m <sup>2</sup>	8 m <sup>2</sup>
Material consumption incl. cut-offs	approx. 8,5 m / m <sup>2</sup>	approx. 8,5 m / m <sup>2</sup>

**FITTING IN MEANDER FORM**

- » Fitting distance approx. 12 cm = each second row within the comb panels,
- » Fit pipe in a meander form,
- » Heating pipes can be inserted lengthwise, crossways and diagonally,
- » Larger pipe dimensions (max. outer diameter 16 mm) are in fact possible for system version WP 2000, but can only conditionally be recommended due to the increased stiffness and consequently an increased installation effort.

The crossing of heating pipes within the system WP 2000 is only possible when using heating pipe dimension  $\phi$  8 x 1,1 mm.

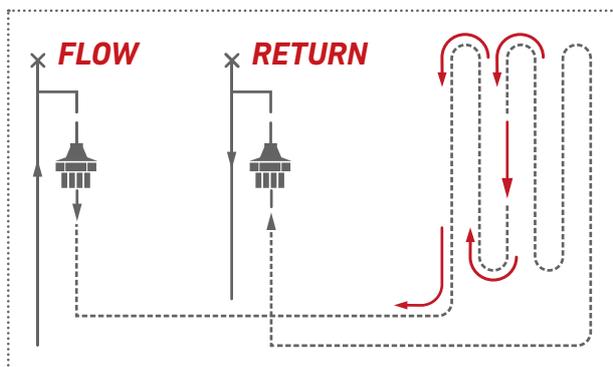
**The heating pipe shall not be connected through couplings or other elements within the floor area!**



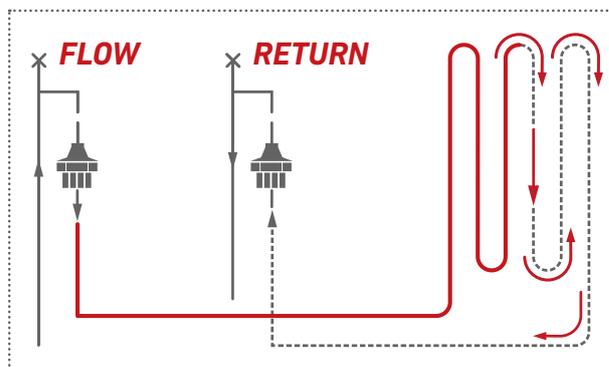
## AUXILIARY TOOLS

- » Pipe threader (steel spring) for threading into the heating pipe (RE 8 / RE 10)
- » Turning roll (UR)
- » Sheet metal shears (HBS)
- » Pipe cutter (ROS / RC)

We recommend to start fitting the pipe in the middle of the heating loop!



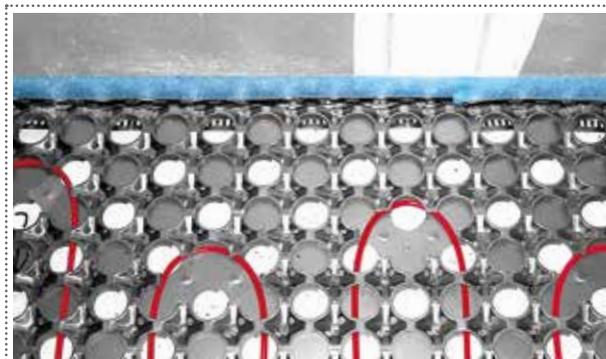
1. HALF



2. HALF

**ADVICE» You will find further / detailed fitting schemes at the end of this document!**

In general the heating pipe is fitted into the systems panels in a meander form (fig. 1 to 5), fitting in a helical form is not necessary due to the excellent heat distribution of the heating elements and is technically difficult to be executed.



1

Staggered cut-out for pipe bends; with feed for flow / return flow.

The ideal pipe distance of 120 mm can be met by fitting the pipe into every second punched row of the comb panels.

In order to keep the pressure loss of the pipe system low, do not exceed a maximum pipe length of 35 m for pipe (Ø 8 x 1,1 mm) resp. 70 m for pipe (Ø 10 x 1,3 mm) per heating loop, this corresponds to an area of approx. 4 m<sup>2</sup> (pipe Ø 8 mm) resp. 8 m<sup>2</sup> (pipe Ø 10 mm).

Any area size is feasible by parallel installation of several heating circuits.

Pay attention to pressure loss diagram (see COMB PANEL SYSTEM - TECHNICAL DESCRIPTION)!

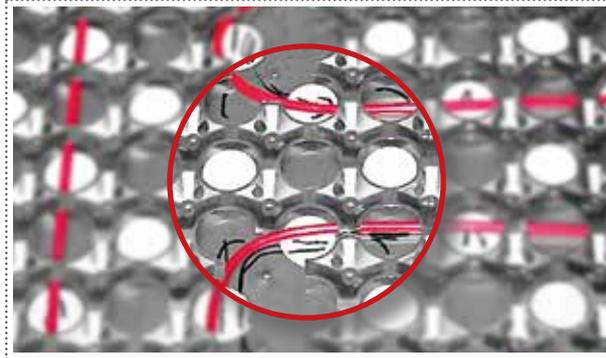
A hydraulic balancing of each part of the sub-manifolds (UV) resp. manifold units (VBG) is not intended, therefore the pipe lengths of the different heating loops shall approximately be equal. In order to simplify the installation the heating pipe contains consecutive meter marks.

Choose long and straight lines with few bends for fitting the pipe. Furthermore it is recommend for a better overview to mark the single heating loops on the comb panels before fitting, e.g. with a pen or by placing the turning rolls at the intended changes of direction (see fig. 3).

Check the pipe visually for defects when cutting to length and fitting into the panels. Take care not to damage and kink the pipe. Furthermore apply a pipe protection cap (SK 8 / SK 10) to each pipe end (after the removal of the pipe threader (RE 8 / RE 10) and until the connection to the manifold) in order to avoid the input of dirt that could lead to the clogging of the pipe.

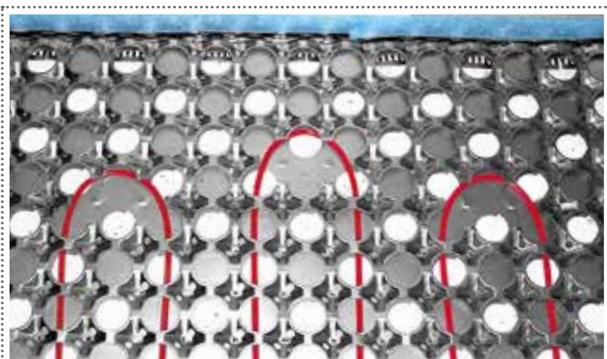


**2** Fitting of the heating pipe into the panels.

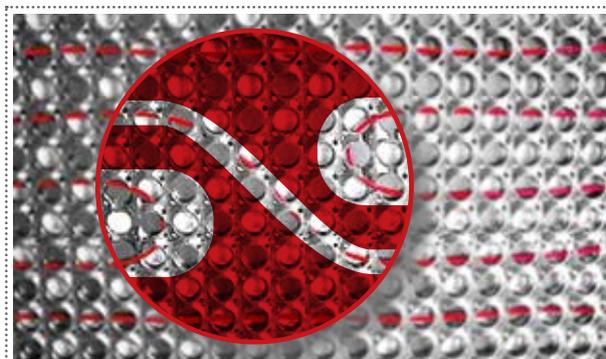


**3** Fitting of the heating loop according to marked course of the pipe.

For fitting the pipe use the effidur tool sets WS 8 / WS 10 (consisting of pipe theader, twisting tool and turning rolls for pipe  $\varnothing$  8 mm /  $\varnothing$  10 mm). Besides the possibility of purchase, the tools may also be rented. The use of the tools is shown by figures **6** to **11**.



**4** Staggered cut-out for pipe bends.



**5** Heating loops fitted interleaving into each other.

For forming 180° bends you need to cut out two dies of the upper metal panel (fig. **6**) with a sheet metal shear or similar in order to insert the turning rolls in a staggered manner (fig. **1** and **4**).

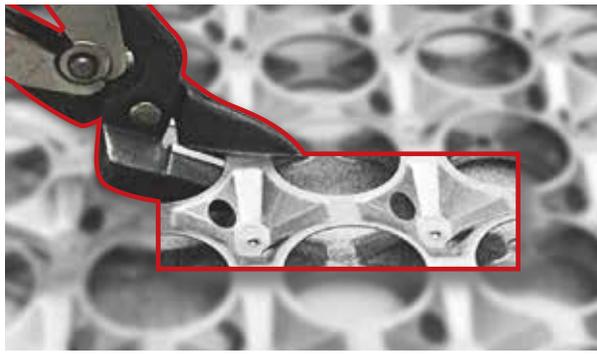
These cut-outs allow to lead the heating pipe out of the comb panels, to bend it outside and to lead the pipe back into the panels without damaging it. It is recommended to let the pipe stick out of the turning rolls (fig. **9**) until the final fixing in order to facilitate the terminal fine adjustment.

Finally the pipe is pushed through the turning roll (fig. **10**). The tool can now be removed and the pipe can be fit into its final position (fig. **11**). When forming 90° bends the cut-out of dies is not necessary, but recommended when several 90° bends shall be fit consecutively. When connecting the heating pipe to the sub-distributor pay attention to form a pipe loop for the compensation of alterations in length and tensile stress so that the heating pipe is not kinked or damaged.

The bends for pipe guiding RFB 8 (for pipe  $\varnothing$  8 - 10 mm) resp. RFB 12 (for pipe  $\varnothing$  10 - 14 mm) can be used as anti-kink device when forming 90 ° bends and when the pipe is outside of the comb panels.

In order to avoid damages, put a piece of flexible corrugated pipe over the heating pipe as protection (SR 8 / SR 10) at emersion points of the pipe within the floor area as well as at joint and other duct areas. Before connecting to the manifold, the pipe ends are to be cut to length free of burrs and right angles to the axis with e.g. pipe shears (ROS) / pipe clipper (RC) and equipped with the according supporting sleeves (SHK 8 / SHK 10). Subsequently the system is pressure tested using the pressure test protocol.

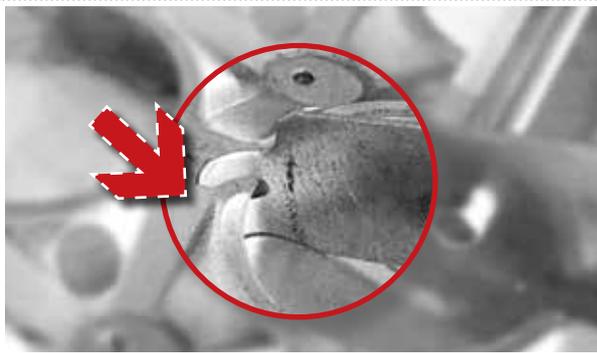
If the pressure test is successful the effidur heating loops can be connected to the heating system. Depending on the installation situation an individual connection is possible (see chapter CONNECTION OPTIONS).



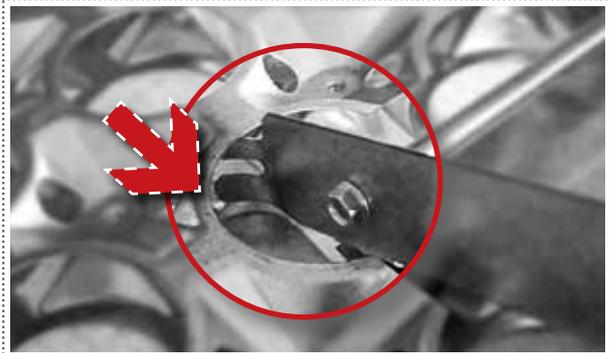
**6** Cut-out of dies for the insert of turning rolls.



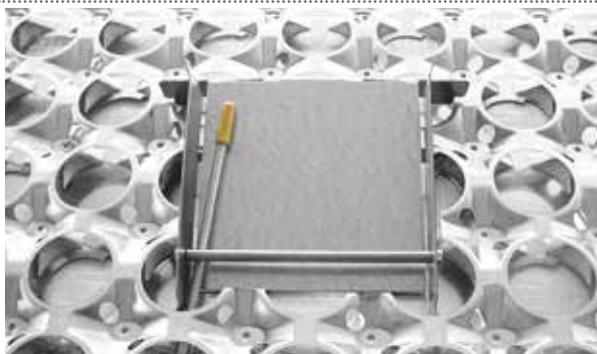
**7** Rear anchorage of the turning roll for 180° bend fitting.



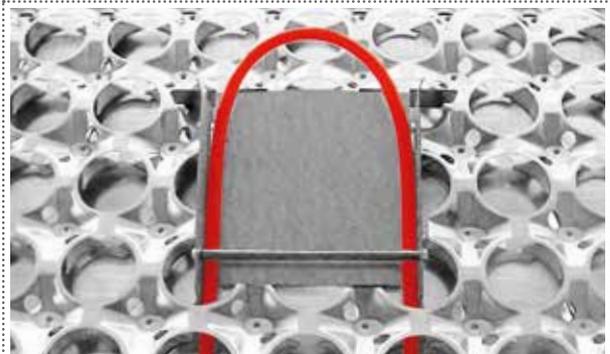
**7** Front anchorage of turning roll for system WP 1000.



**7** Front anchorage of turning roll for system WP 2000.



**8** Principle of turning roll» lead pipe out of the system – bend it outside of the floor system – fit pipe back into comb panels.

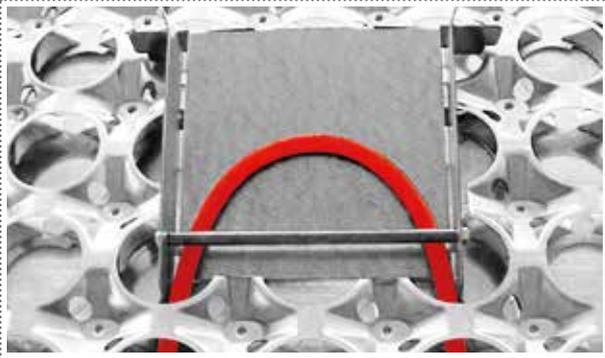


**9** Let pipe stick out for final adjustment.

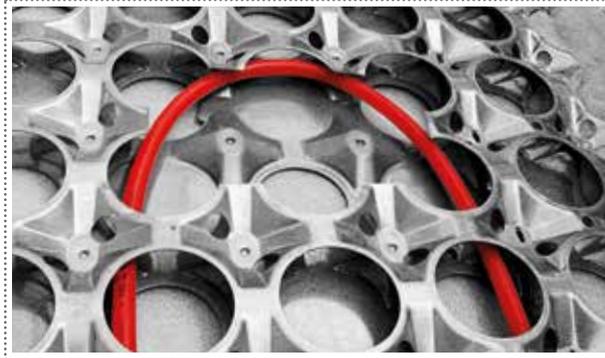
**ADVICE!**

Make sure that the floor heating system has successfully passed a pressure and functional test before the backfilling with system screed or other coverings!

(See chapter PROTOCOLS!)

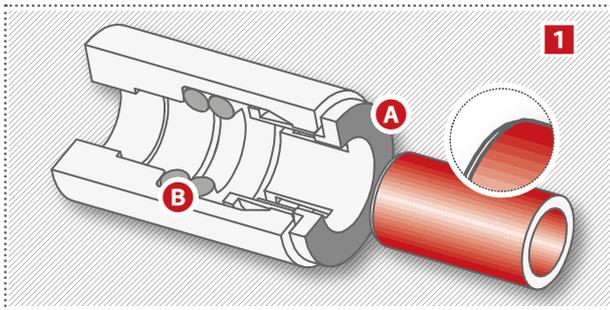


**10** After final adjustment push pipe through turning roll.



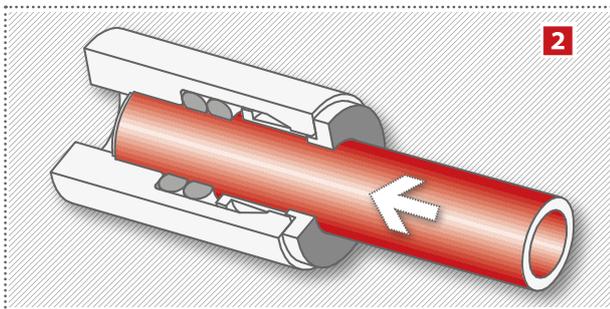
**11** Subsequently remove turning roll and push pipe back under the upper metal sheet.

CREATION OF A PLUG CONNECTION

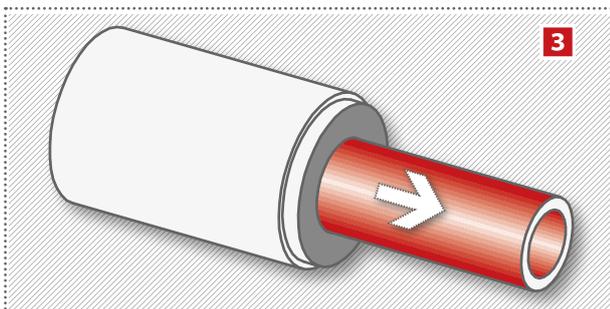


**1** Cut pipe to length free of burrs and right angles to the axis (ROS / RC) and equip pipe ends with the according supporting sleeves (SHK 8 / SHK 10).

- A** holding clamp with stainless steel teeth
- B** O-ring (2x)



**2** Push pipe into the fitting up to the stop. Cartridge grips before o-ring seals! Make sure that the fitting is free to plug and not restrained by obstacles from the building site.



**3** Pull at pipe to check, if connection is safe. The pipe is now in an assured position. The stainless steel teeth grip while the o-ring guarantees a permanently tight connection.

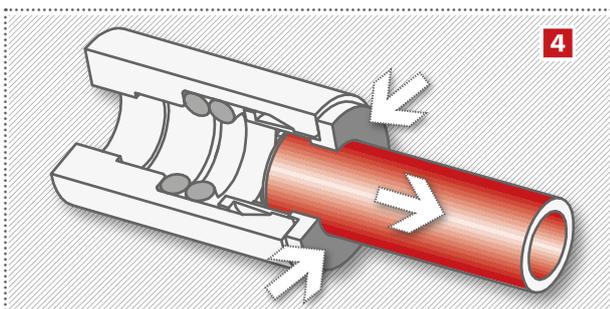
The system shall be checked this way before each use.

**TEST OF PLUG CONNECTION SYSTEM**

For commissioning check the plug connection, no matter if it is a new or an existing one, according to the following procedure (according to DIN 18380 and with cold water 10 – 23 °C)»

Charge	p = 2 bar / 10 min
Pressure Discharge	p = 0 bar
Charge	p = 10 bar / 10 min

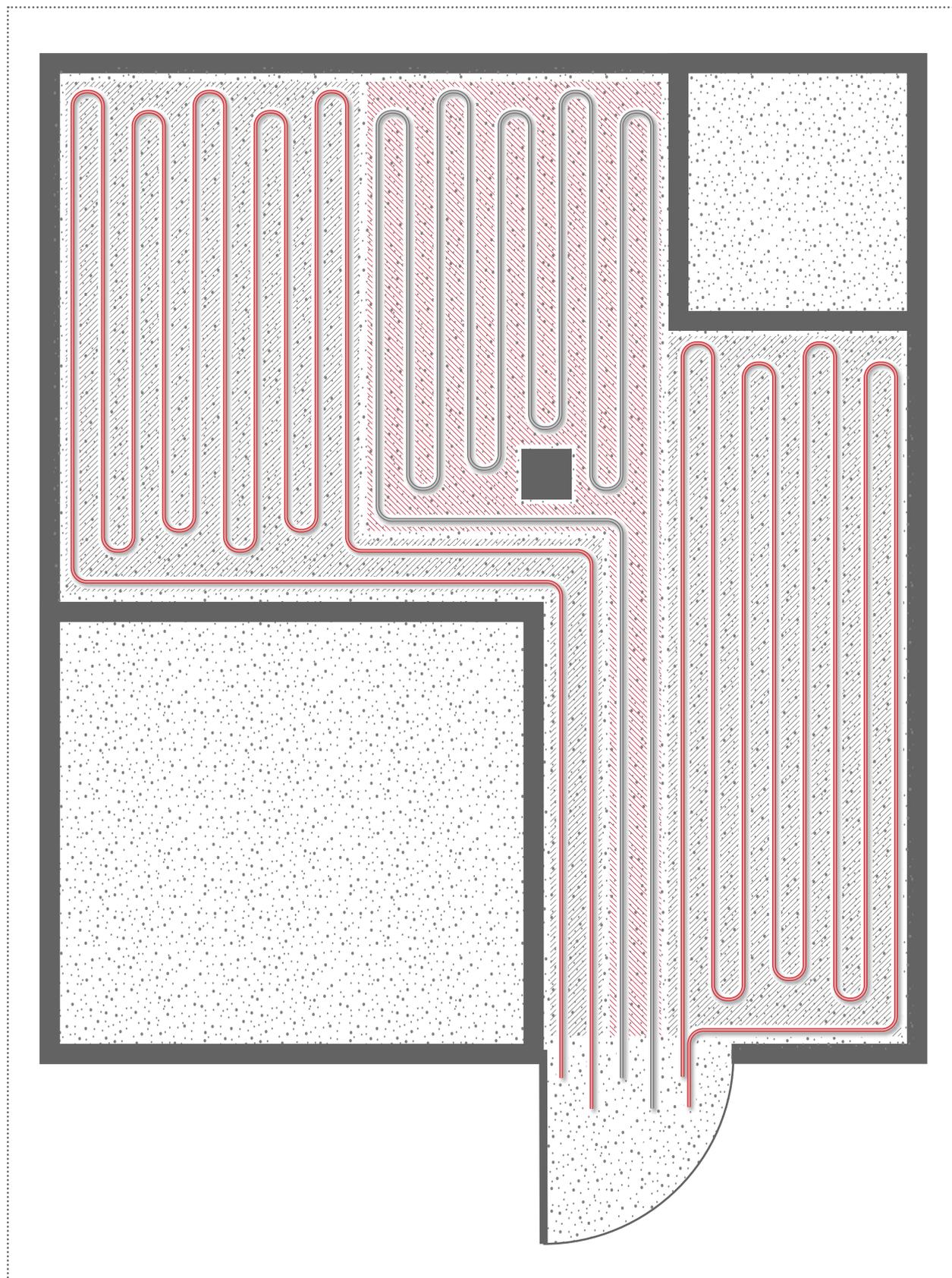
The plug connectors are ready for operation if no leakage occurs at the connecting areas during the entire testing period. When operating with warm water, the leak tightness needs to be checked after the cold water test with the highest expectable temperature. (see pressure test protocol under PROTOCOLS). The commissioning of the plug connections does not replace additional testing instructions for other parts of the facility!



**4** Simple disconnecting of the connection – Make sure that the system is depressurized. Push the cartridge square against the face of the fitting. The pipe can now easily be removed.

EXAMPLES OF INSTALLATION SCHEMES

Example 1» room with column and 3 heating loops, installed parallelly.



Example 2» room with 4 heating loops , thereof 2 fitted interleaving into each other.

