

Installation Instructions

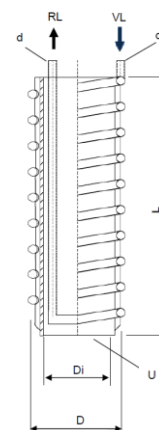
FRANK VTP® / Vertical Thermpipe

General information:

- The FRANK VTP® are completely factory assembled and tested.
- Each VTP® is marked with its own probe number.
- The VTP® must be installed professionally according to the corresponding state of the technology and according to the applicable guidelines (e.g. VDI 4640 and DVGW W-120)
- The respective guidelines of the countries on the use of geothermal energy and the requirements of the licensing authorities must be observed.

Dimensions:

Type		260			360		
Length	L	6 m	9 m	12 m	6 m	9 m	12 m
Outer Diameter	D	260 mm			360 mm		
Pipe Diameter	d	25 mm			32 mm		
Core Diameter	Di	185 mm			260 mm		
Pipe Length	-	54 m	80 m	107 m	65 m	98 m	130 m
Connection (PE 100, SDR 11)	-	Pipe socket 25 mm			Pipe socket d 32 mm		
Filling quantity of heat transfer medium	-	17,8 l	26,5 l	35,3 l	35,1 l	52,9 l	70,2 l
VTP displacement	-	48,7 l	72,8 l	96,9 l	79,1 l	118,2 l	157,4 l



Unloading, transport, inspection:

- Check each VTP® for transport damage.
- When unloading, make sure that the media pipe is not damaged by hoists and tools.
- The intermediate storage of the VTP® on the construction site should take place on a level surface.
- There must be no pointed or sharp-edged objects on the storage surface that could damage the media pipe.
- To avoid damage, the VTP® must not be transported by pulling or rolling over the surface.

Preparation for installation:

- Before installation we recommend a flow and leak test with water.
- The pipe ends for flow and return must be closed during installation.

Installation:

- The installation can be done with a hollow auger drill or with an auger drill and protective piping.
- Depending on the substrate, other drilling methods are also suitable.
- The VTP® must be inserted immediately after completion of each individual drilling.
- To avoid floating in water-filled boreholes, the interior of the carrier pipe of the VTP® must be filled with soil, gravel or sand and the media pipe filled with water.
- The minimum distance between 2 VTP® is 4 m.
- Depending on the local conditions and the design of the extraction capacity, a larger distance of up to 10 m may be required.

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- Minimum installation depth is 1.20 m below ground surface to top edge of VTP® (trench depth for horizontal connection pipe).
- Due to local conditions, the paving depth can also be selected deeper in order to achieve complete paving in water-rich layers.
- Only pull the protective tubing or hollow auger drill after filling the VTP® carrier tube.

Filling of the borehole:

- In order to ensure a good connection of the VTP® to the surrounding soil, we recommend that the backfill material is gradually slurried in.
- The existing soil material or sand can be used for backfilling. If the existing soil is used, it must be suitable for slurring.
- If the fine grain content of the existing soil is too high, a mixture with sand can be used.
- It must be ensured that no cavities are created during backfilling which would impair the thermal connection and thus the extraction capacity.
- If necessary, official requirements for borehole filling/sealing must be observed.

Pressure test:

- After installation and backfilling, a pressure and flow test must be carried out on each VTP®.
- Pressure tests must be carried out in accordance with VDI 4640 and DVGW Code of Practice W 400 - 2 or DIN EN 805.
- The data shall be recorded in a pressure test and acceptance report.
- Before commissioning, the entire system must be subjected to a pressure test with 1.5 times the operating pressure in accordance with the specifications of VDI 4640.
- In order to avoid contamination of the brine circuits, all pipe ends must be sealed tightly until further connection.

Pipeline Connection:

- We recommend a parallel connection of the VTP® individually to a chamber manifold or manifold beam.
- A hydraulic series connection or the connection of several VTP® without manifold is not recommended.
- The connection inside the carrier pipe is the return flow (to the heat pump), the connection to the pipe spiral is the flow (coming from the heat pump).
- The connection to the horizontal connecting pipe can be made by means of heating coil fittings or press fittings.
- We recommend the connection by welding with 90°/45° angle fittings or multibow.
- The pipe ends of the connection pipes must be cut at right angles using a suitable tool.
- In preparation for welding, the pipe ends must be peeled with a rotary peeling machine.
- The welded joints must be made in compliance with the applicable DVS and DVGW guidelines for welding work on plastic pipes.
- The manufacturer's processing instructions for the components used must always be observed.

Rinse, vent, adjust:

- The individual brine circuits must be flushed and vented until they are completely free of air.
- The individual VTP® must be adjusted to equal flow rates at the manifold.