

VO Water heaters

Operating Conditions

The heated air must be without solid, fibrous, sticky, aggressive impurities, free of corrosive chemicals or chemicals aggressive to aluminium, copper and/or zinc.

Maximum allowed operating parameters of heating water:

- Maximum allowed water temperature: **+130 °C**
- Maximum allowed water pressure: **1,6 MPa**

Position and Location

When projecting the layout of the heater location, we recommend observing the following principles:

- If water is used as the heating medium then the heater can be situated only in an indoor environment where the temperature is maintained above freezing point (this does not apply for heated air).
 - Outdoor use is allowed only if antifreeze solution is used as the heating medium (mostly ethylene glycol solution). However, the temperature limit of the used actuating mechanism must be taken into account.
 - Water heaters can work in any position in which air-venting of the heater is possible.
 - Free access to the heater must be ensured to enable control and service.
 - An air filter must be installed in front of the heater to avoid its fouling.
 - The counter-current connection of the heater is needed to achieve maximum output.
 - The heater can be situated either in front of or behind the fan. However, if the heater is in front of the fan, the heater output must be controlled so that the air temperature will not exceed the maximum allowed value for the given fan.
 - If the heater is situated behind the fan, we recommend inserting between the fan and the heater a spacer (e.g. 1-1.5 m long straight duct) to steady the air flow.
- Accessories are not included in the heater delivery and must be ordered separately.

Air-Venting of the Heater

To ensure proper operation of the heater, it is necessary to install reliable air-venting, the best being automatic. The TACO automatic air-venting valve with outer G1/2" thread is designed to be screwed directly into the heater header pipe. It must be installed on the very top of both header pipes. Thanks to its small dimensions, it is suitable when using the heater just below the ceiling. The heater can be vented either manually or automatically. With regard to the fact that the heater is mostly installed in places difficult to access, at height or on ceilings, automatic air-venting is a necessity. The TACO automatic air-venting valve with outer G1/2" thread (see fig. #27) is designed to be screwed directly into the heater header pipe. It is installed on the very top of both header pipes. Maximum allowed operating parameters of heating water:

- Maximum operating water temperature: **115 °C**⁽¹⁾
- Maximum operating water pressure: **0,85 MPa**
- Minimum operating water pressure: **20 kPa**

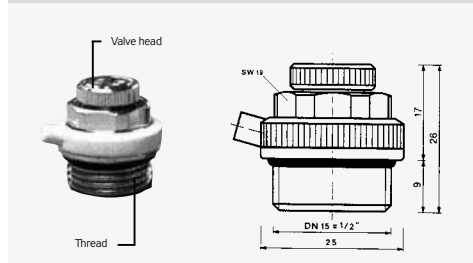
The valve must be installed in the vertical position or aslant with its head upwards, respectively horizontally; by no means downwards!

Minimum water pressure in the system ensures that even if the pressure in the intake part of the mixing set drops, the air-venting valve will not take up air into the outlet heater header pipe.

Warning! The following antifreeze solutions can be used as heating media:

- **water and ethylene glycol (Antifrogen N)**
 - **water and 1.2 - ethylene glycol (Antifrogen L)**
- They enable the freezing temperature of the heating media to be dropped depending on the solution concentration. Other antifreeze agents can be used only upon presenting confirmation of the manufacturer confirming their compatibility with swelling materials (ring, inserts).**

Figure 27 – TACO air-venting valve



Installation

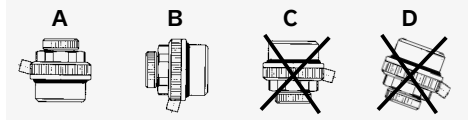
- The heater must be checked carefully before its installation, especially if it was stored for a longer time. It is necessary to check parts for damage, and in particular whether the pipes, heater vanes and header pipes, insulation of conductors of the mixing set pump, etc are in good condition.
- If water is used as the heating medium, then the heater can be situated only in an indoor environment where the temperature is maintained above freezing point (this does not apply for heated air).
- Outdoor use is not recommended. It is allowed only if antifreeze solution is used as the heating medium (mostly ethylene glycol solution). However, the temperature limit of the used actuating mechanism must be taken into account.
- There is no need for individual suspensions to install the water heaters. The heater can be inserted into the duct line, but it must not be exposed to any strain or torsion caused by the connected duct line.
- Before installation, paste self-adhesive sealing onto the connecting flange face. To connect individual parts of the Vento system, use galvanized screws and nuts M8. It is necessary to ensure conductive connection of the flange using fan-washers placed on both sides at least on one flange connection, or use Cu conductor wiring.

(1) In case that the water heater operates with water at 116 °C or higher, it is necessary to ensure the float valve venting

VO Water heaters

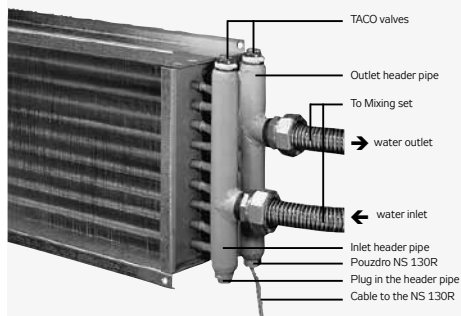
- To brace the flanges with a side longer than 40 cm, it is advisable to connect them in the middle with another screw clamp which prevents flange bar gapping.
- Water heaters can work in any position in which air venting of the heater is possible. The most common heater positions are shown in figure #34. Positions A, B and C show the most suitable places for the TACO air-venting valve mounting (marked with arrows). Position D shows non-permissible installation of the heater which does not allow air venting.
- The TACO air-venting valves must be installed as shown in figure #32, i.e. vertically (upright) with their heads up – view A, or horizontally – view – B, by no means downwards or slanted with their heads down – C, D.
- The TACO air-venting valves must be mounted onto the highest point of the inlet/outlet header pipe (see fig. #30). The openings in the header pipes have G1/2" inner thread and they were closed with plugs in the plant.

Figure 28 – TACO valve positions



- The casing of the antifreeze protection NS 130 sensor can be mounted on the bottom side of the header pipe.
- To allow faster air venting while filling the system with water, loosen the knurled screw on the TACO valve by one or two turns. After finishing the filling of the system, tighten the knurled screw firmly, and the valve will then work automatically.
- During the first air venting, a couple of water drops can leak through the air-venting valve. This will not happen again during normal operating conditions.
- When cleaning the TACO valve inside, it is necessary to replace the swelling parts (rings and inserts). The TACO valve is equipped with a back valve so there is no need to drain the heater.
- When connecting the mixing set hoses, thermal sensor

Figure 29 – TACO valve installation



NS 130 casing, or air-venting valve, be careful. Do not use excessive force, otherwise the pipes situated between the header pipes and sidewall of the heater could be damaged!

- An air filter must always be placed in front of the heater to avoid heater fouling.
- The heater can be situated either in front of or behind the fan. However, if the heater is in front of the fan, the heater output must be controlled so that the air temperature will not exceed the maximum allowed value for the given fan.
- If the heater is situated behind the fan, we recommend inserting a 1-1.5 m long straight duct between the fan and the heater to calm the air flow down.
- The counter-current connection of the heater is needed to achieve maximum output (see fig. #35). The concurrent connection provides lower output, but it is more frost resistant.
- The sophisticated design of the heaters enables you to turn on one heater arbitrarily, and you will always be able to arrange counter-current connection and to install the valves and thermal sensor in the right place.
- If the heater is covered by a ceiling, it is necessary to ensure access to the entire heater to enable checking and maintenance, especially of air-venting valves.
- Connection to the water side: G 1 thread (applies to all heaters).

Figure 30 – Heater positions

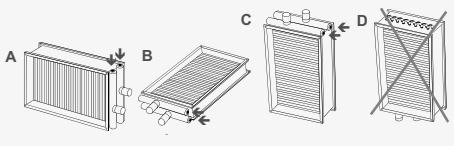


Figure 31 – Heater connection

