Heating oil deaerator TIGER LOOP

Tender specification:

Oventrop heating oil deaerator for use in one pipe systems with return flow feed (suction systems) for effective deaerating of heating oil. Body of deaerator made of metal with wall bracket. Case of float made of transparent plastic for easy function control of the security float.

Connection for suction and return pipe ¼" female thread with two double nipples (¼" male thread x ⅜" male thread with inner taper for hose connection) and a flexible hose (one port ¼" male thread, one port loose collar nut ⅜" and seal)
Item no. 212 29 00

All connections ¼" female thread (without accessories)
Item no. 212 29 01

Connections for suction and return pipe (pump): ⅜" male thread with inner taper for hose connection.

Connection for suction pipe (tank): ¼" female thread with flexible hose (one port ¼" male thread, one port with loose collar nut ⅜" with seal)
Item no. 212 29 51

- for **suction systems** only
- the installation is possible **above** and **below** the oil level
- **installation instructions must be observed**

Technical data:

Max. nozzle capacity	80 kg/h heating oil type EL
Max. return flow of heating oil	100 kg/h heating oil type EL
Max test pressure	6 bar
Max. working temperature	40 °C
Max. ambient temperature	60 °C

- TÜV tested, No. 133 3860
- DIN approved, Reg. No. 2 Y 05 594
- BAM test certificate No. 3.12/2933/88 (Federal Institute for Material Control)

* max. temperature of heating oil in oil pipes in heating oil installations according to DIN 4755

Function:

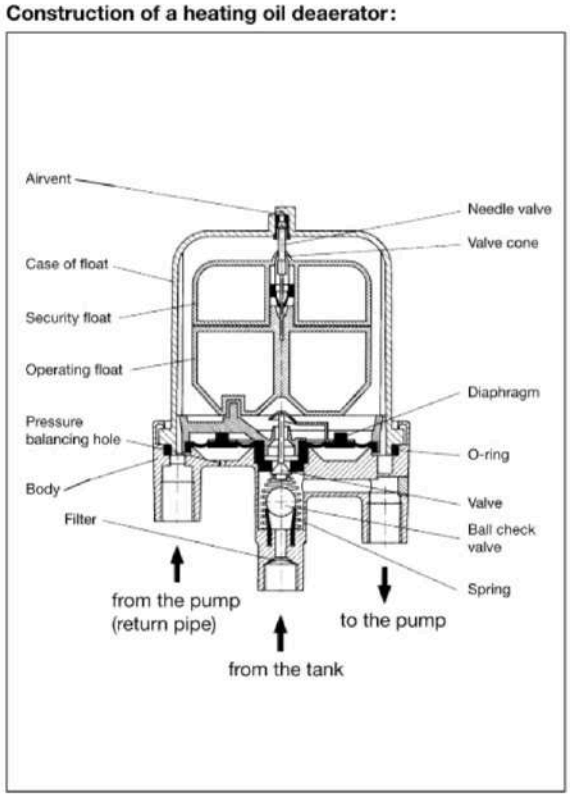
Oventrop heating oil deaerator for the automatic deaeration of heating oil installations.

As an oil pump always supplies the same volume of oil, irrespective of the quantity of oil being used, the return flow feed can be significantly higher than the burnt oil volume. The returned oil is pumped into the Oventrop heating oil deaerator. There, the excess pressure produced by the pump, is limited by a diaphragm controlled valve and the deaerated heating oil is fed into the suction pipe. The result is, that only the oil which is actually required for the burner is drawn from the tank via the Oventrop one pipe heating oil filter. This oil, still containing air, is drawn into the pump together with the return oil which is already deaerated. The air is expelled into the atmosphere through the float valves inside the deaerator and a constant oil level is thus achieved inside the heating oil deaerator. At the same time, the working temperature of the oil pump is used for pre-warming the oil.

Application:

The Oventrop heating oil deaerator is only used for heating oil installations (suction systems) which are operated as one pipe systems with return flow feed. It is installed between the one pipe heating oil filter and the burner. A return pipe back to the tank is no longer required. This is not only more cost effective, but also more secure.

Construction of a heating oil deaerator:



Important notes:

The pipe connections (supply and return) must not be mixed up (not even for a short period while the system is put into operation) as this can damage the heating oil deaerator "TIGER LOOP" and the burner pump.

The heating oil deaerator must be replaced with a new one after 10 years of being in operation.

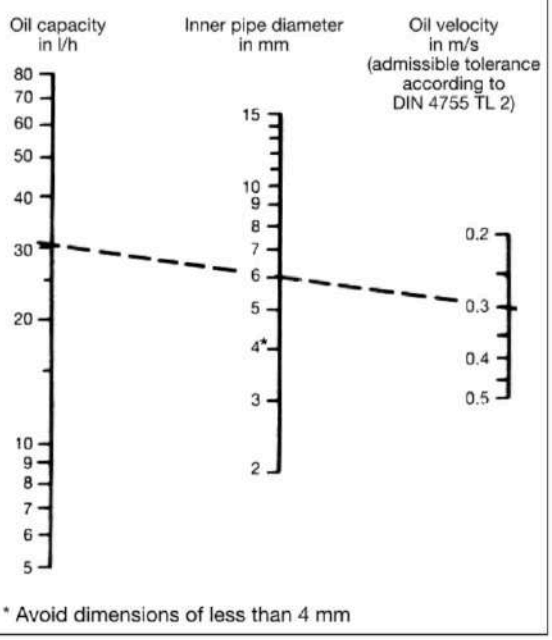
Do nut use solvents when cleaning the plastic parts.

Sizing of the suction pipe:

When sizing the suction pipe from the tank to the burner, it is important that the velocity, according to DIN 4755 part 2, is between 0.2 and 0.5 m/s. The capacity of the suction pipe is identical to the nozzle capacity in one pipe systems.

Nomogram:

The nomogram determines the pipe dimension of the heating oil pipes.



* Avoid dimensions of less than 4 mm

Example:

For a flow feed of 30 l/h and a medium velocity of 0.3 m/s, a pipe 8 x 1 with an inner pipe diameter of 6 mm is required.

Self-monitoring suction pipe:

The supply pipe can be easily installed in such a way that it acts as a self-monitoring suction pipe. This method is often used when the supply pipe is underground or cannot be checked due to other local conditions.

The suction pipe must than be designed in such a way that:

- the column of liquid breaks off in case of a leakage
- the suction pipe is installed with an even decline towards the tank
- apart from the check valve inside the heating oil deaerator there is no other check valve installed in the declining pipe or in the tank (not even a foot valve)

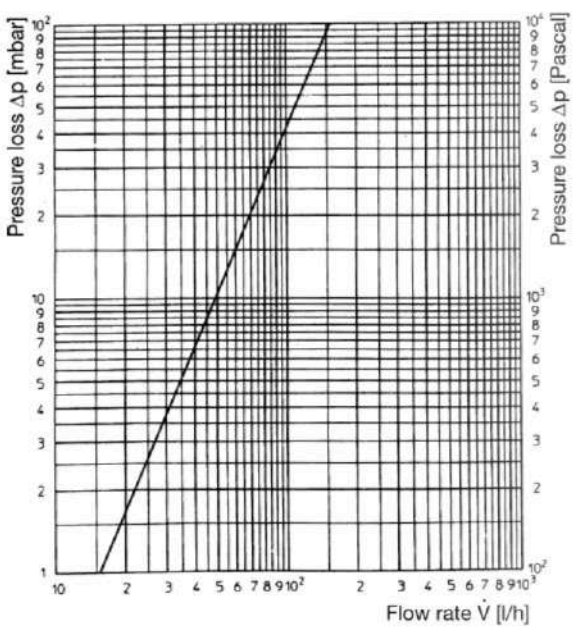
If the suction pipe is not self-monitoring (e.g. copper pipe above ground level), then a foot valve may be installed.

Note:

For the function of the heating oil deaerator it is of no consequence whether a foot valve or a further check valve is installed.

Performance data:

Pressure loss of the suction system



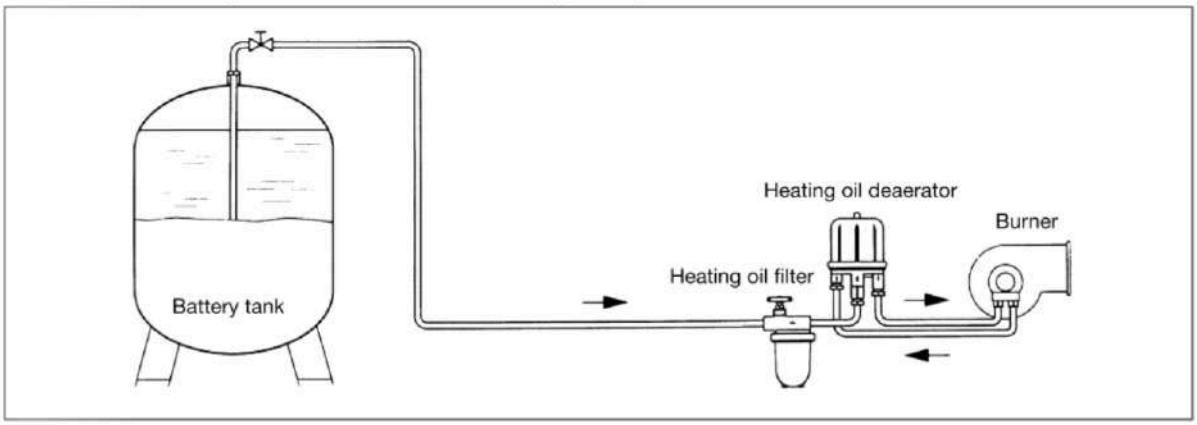
Installation of the heating oil deaerator above and below the oil level in the tank:

Results of the extensive tests carried out (TÜV, DIN and BAM) allow the installation of the heating oil deaerator above and below the oil level.

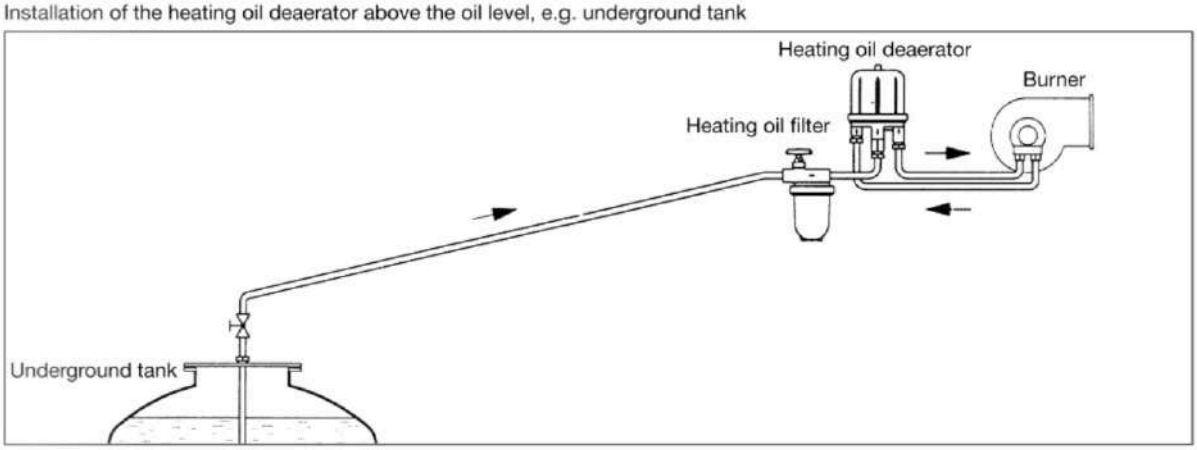
Below the oil level, the equipment may be installed in the supply pipe up to a maximum pressure of 0.7 bar. The height difference resulting from the maximum pressure between the oil level in the tank and the connection of the heating oil deaerator is approximately 8 m depending on the density of the heating oil.

Examples of installation:

Installation of the heating oil deaerator below the oil level, e.g. battery tank



Installation of the heating oil deaerator above the oil level, e.g. underground tank



Reasons for the discharge of oil froth from the vent bore:

A froth like oil/air mixture forms in the case of the float every time the volume of air which has entered the deaerator, is exceeding the maximum output capacity of 4 litres per hour. This oil/air mixture may escape through the vent bore.

When all technical instructions and regulations are adhered to, this oil/air mixture may only escape if:

- there is a leakage in the suction pipe.
  A permanent discharge will take place during the operation time of the burner.
- To rectify:
  Check pipes for leakage, retighten fittings etc.
- the size of the suction pipe is too big.
  Oil/air mixture will escape spasmodically. This can occur at irregular intervals.
- To rectify:
  According to DIN 4755 part 2, the inner pipe diameter of the suction pipe must be chosen so that the velocity is between 0.2 and 0.5 m/s. If the suction pipe is too big, then air pockets will develop especially in upper parts of the system because the velocity is too low. This will lead to the air pockets flowing to the burner and deaerator at irregular intervals.

Air pockets in the filter cup of the heating oil filter:

The heating oil is filtered before deaeration and during this process it is possible that some of the air in the oil is retained by the filter insert, so that an air pocket forms in the filter cup.

This is especially noticeable where a large proportion of air is in the oil. This air cushion is the cause of a sinking oil level in the filter cup when an underlying pressure is built up. As the inside of the filter insert is, however, totally filled with oil, a continuous flow of oil is ensured and operational problems cannot occur.

The size of the airpocket depends on the air permeability of the filter insert. The sintered plastic insert (Siku) has a high air permeability and should be used for the heating oil filter.

Pressure operation:

The heating oil deaerator must not be used under pressure, e.g. with an additional pump in the supply pipe. This is also not recommended as air is only emitted in suction operated systems.

According to DIN 4755 standard it must be ensured that a rise in pressure due to an increase in temperature of the heating oil is balanced off (e.g. by removing check valves in the suction pipe). Increased pressure can lead to damage of the heating oil deaerator or other installed equipment.

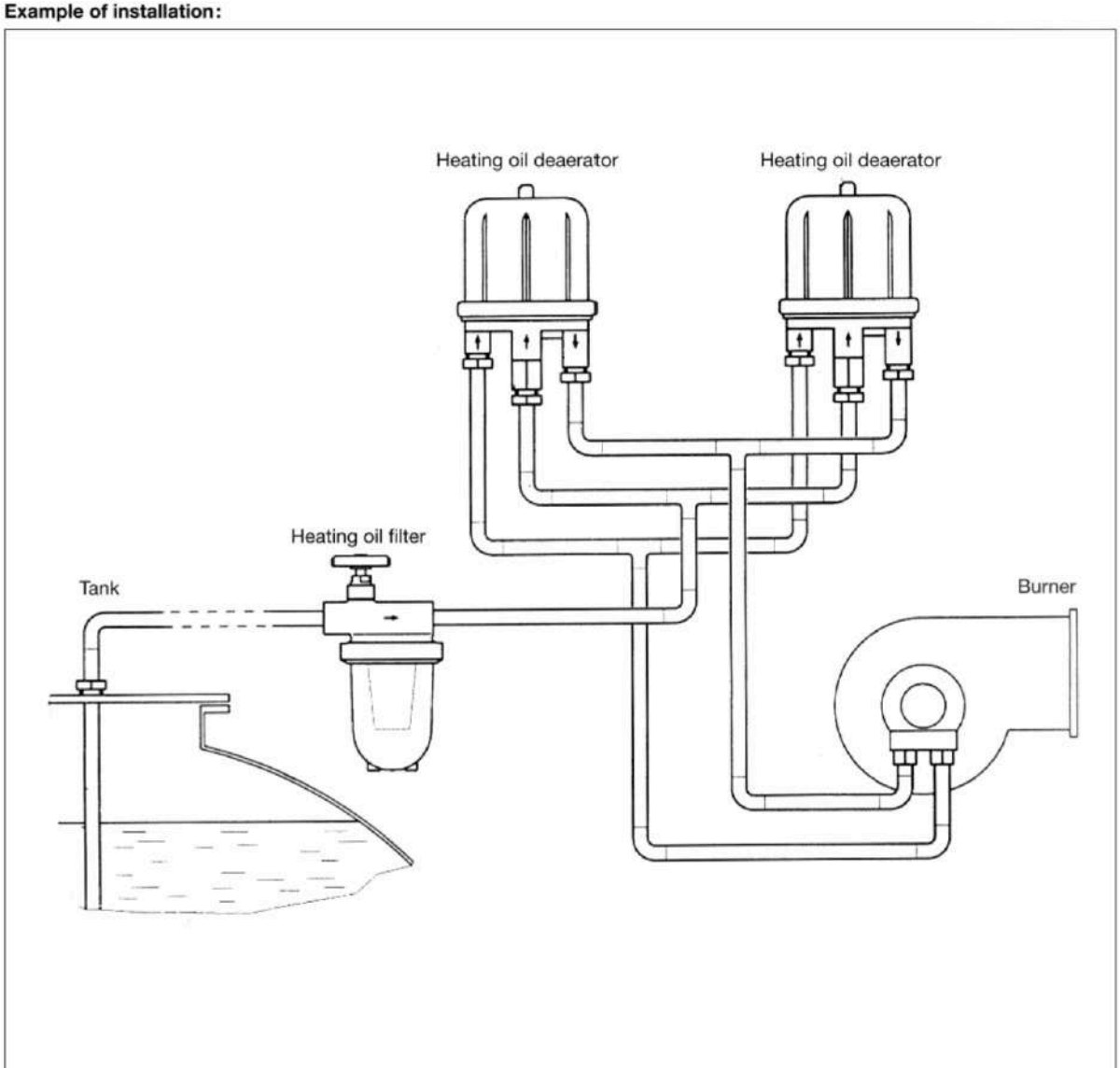
Parallel installation of heating oil deaerators:

If higher nozzle capacities than 80 kg/h are required, it is possible to install two or even more deaerators in parallell. It must be ensured that the maximum return flow does not exceed 100 kg/h per installed deaerator. The return flow is the pump output minus the volume of burnt oil.
The parallel operating deaerators must be installed at the same level.

Case of float filled up with oil:

When the suction pipe is absolutely airtight due to the installation conditions (e.g. when the tank is at a higher level) and there is no air carried in the oil, then the existing air pocket in the case is reduced slowly by emission through the burner nozzle together with the oil. The float case will then be completely filled with oil. However, no oil can escape since the venting holes are fitted with double seals. If the operating conditions change and air reaches the deaerator, then the air pocket will be formed again.

Example of installation:



Parallel installation of 2 heating oil deaerators