Haase GFK-Technik GmbH

Haase Energy Tank

Operating and

Installation Manual

As at 20/07/2010

Thank you for purchasing a Haase Energy Tank.

This Operating and Installation Manual is designed to provide you with a brief overview of how to use this accumulator. By following the instructions outlined in this manual, you will be able to enjoy use of your new accumulator for a long time.

To ensure that the heat accumulator is connected properly, please give a copy of this Operating and Installation Manual to the installer.

Contents

1 Product description

1.1 General

Fig. 1 shows a drawing of three Haase Energy Tank. Figure 1a shows a Haase Energy Tank with three standard heat exchangers, Figure 1b shows a Haase Energy Tank with a layer addition system, and Figure 1c shows a Haase Energy Tank that has been designed as buffer Tank.

The standard heat exchangers or layer addition systems are as follows:

- Solar heat exchanger (S) or solar layer addition system (S) for heat input
- Heating system heat exchanger (H) for reheating (heat sources: oil, gas and solid fuel heating units and similar) and heating support or heating system layer unloading system (H) for heating support
- Process water heat exchanger (B) for warning up process and drinking water

The configuration of heat exchangers or the layer addition system in the Haase Energy Tank, and the configuration of Tank connections and temperature sensor tubes for your Tank can be found in the Appendix!

All heat exchangers - each with a supply and return line - are guided to the outside through the top and the insulation of the Haase Energy Tank, and feature a 1½" IG screw connection (installation-ready, flat sealing). Special liquid- and steam-tight seals prevent unwanted leakages from the Tank. The heat exchangers function according to the continuous-flow heater principle, resulting in short holding periods in the system and the hygienic and hence ideal heating of drinking water in particular (no legionella formation).

The connections for the layer addition system, also with 1½" IG screw connections (flat sealing), are guided through the jacket below the water surface. Sealing action is achieved with a rubber compression seal.

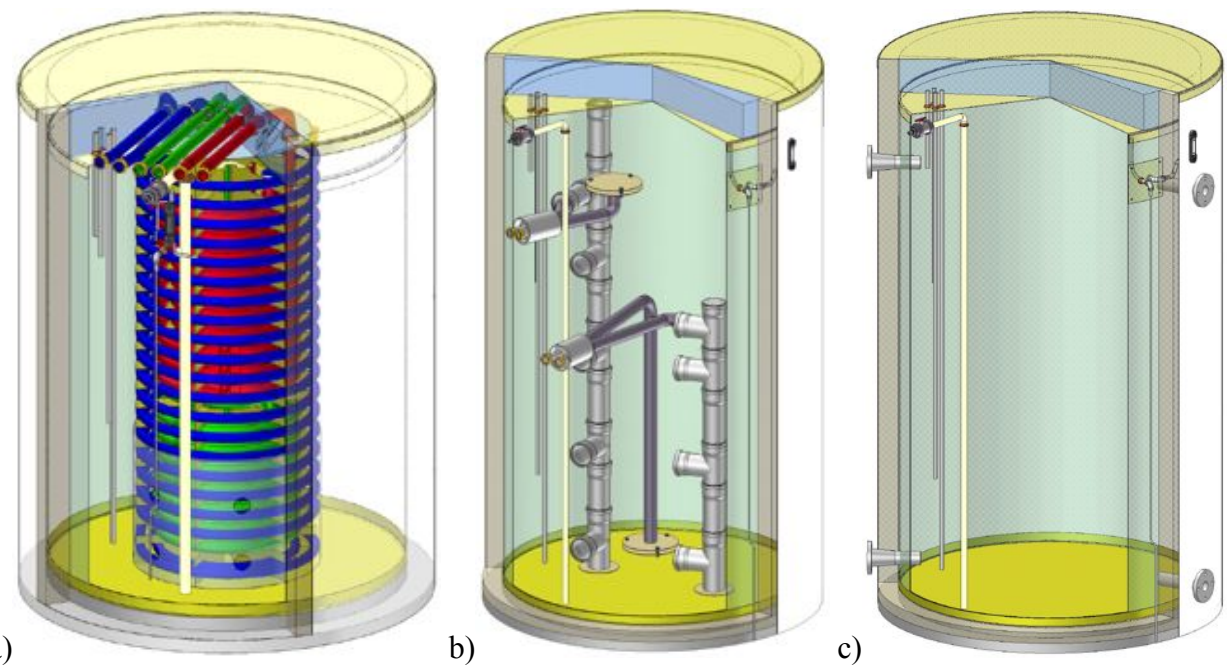

Fig. 1: Cross-sectional diagram of three Haase Haase Energy Tanks (a: stainless steel heat exchangers; b: with layer system / stratification Tank ; c: as buffer Tank)

The floor of the Haase Energy Tank is insulated with a 100 mm (4”)thick pressure-resistant PU foam sheet. Walls and ceiling are covered with inorganic batt insulation with a minimum thickness of 100 mm and 200 mm (4” to 8”) (respectively). The insulation is protected to the outside with a laminated aluminium composite film and a GRP jacket as well as a top. In addition, GRP (glass fibre reinforced plastic) also fulfils a heat insulating function as a material for the interior tank and outside covering.

The fill level of the Haase Energy Tank can be read via a special sight glass - the level indicator (see Fig. 2/Pos. 7). Fill levels may fluctuate slightly due to expansion of the liquid. In addition, the level indicator also features overfill protection. If the fill level is too high, extra water is removed from the heat accumulator through the drill hole (see Fig. 2/Pos. 8).

A ventilating line in the bottom area of the Haase Energy Tank (see Fig.3/Pos. 10) prevents pressure build-up in the Tank. The ventilation line, which also serves as additional overfill protection, enters the Tank through the tank wall insulation and **must never be closed**. It must flow into a container (i.e. a bucket) or drain as a free outlet. To this end, the container or drain must generally be positioned **below** the height shown in Fig.3/Pos. 10. It is recommended that the container or drain is located at the same level as the base of the heat exchanger.

Attention - the temperature of the water draining from the accumulator may be as high as 95 C (203F.)!!

The fill connection (see Fig. 2/Pos. 9) consists of a blocking valve with a ½" hose connection. The fill line ends inside the Tank, directly above the floor of the Tank. A suction pump can be used to empty the Tank using this fill connection.

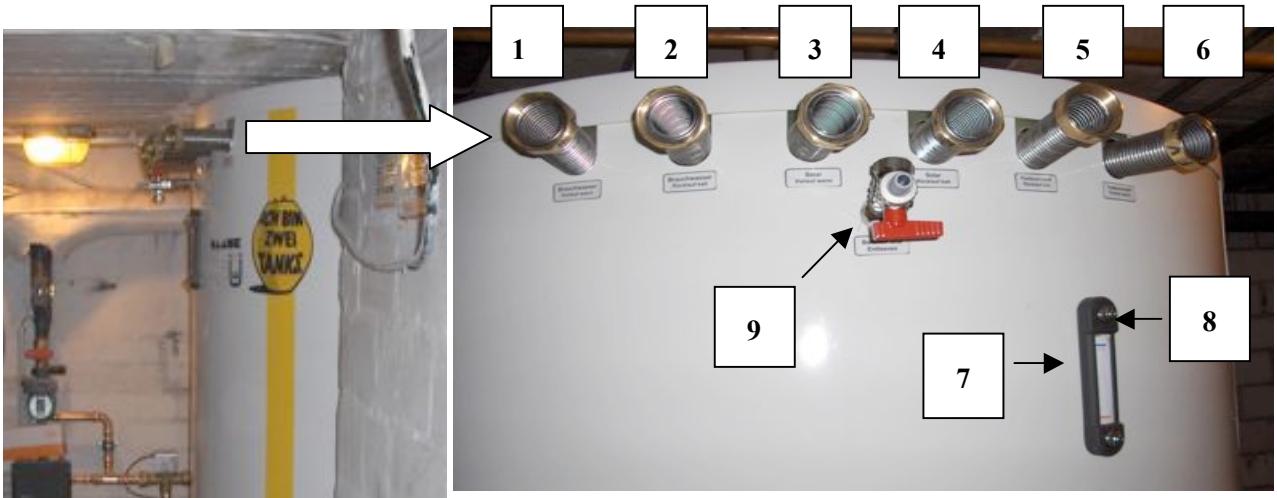

Fig. 2: Connection assembly for Haase Energy Tank

Fig.3 : Haase Energy Tank - front view

Sample configuration of external connections:

- 1: Process water supply - Hot water (BO);
- 2: Process water feed - Cold water (BU);
- 3: Solar supply - Hot (SO);
- 4: Solar return - Cold (SU);
- 5: Heating system (reheating) return - Cold (HU);
- 6: Heating system (reheating) supply - Hot (HO)

Other components

- 7: Level indicator
- 8: Overfill protection integrated into level indicator
- 9: Fill connection
- 10: Ventilation line

1.2 Fill level inspection

The operator is responsible for ensuring that the entire building equipment including the Haase Energy Tank is inspected on a regular basis. Regular in this sense means that the fill level of the building equipment and Tank is inspected at least once per month, and water is added via the fill connection if required (see Fig. 2/Pos. 9). This is necessary since temperature fluctuations can result in changes in volume and hence fluctuations in the fill level of the Haase Energy Tank.

Typical accumulator fill levels

1. At maximum fill level and full energetic load status:
   - upper blue marker
2. At normal operating status (during regular addition and withdrawal processes)
   - upper half between red and blue marker
3. At first fill (**only fill with drinking water from water main)**
   - exactly at red marker

If the fill level for a filled Haase Energy Tank appears in the lower half between the red and blue marker, **water can be added** (**only fill with drinking water from water main**). If the fill level falls below the red marker, **water must be added**. Please add water up to the upper half between the red and blue marker). The filling process must be continuously monitored to prevent overfilling of the Tank. In general, this process only takes a few minutes.

Continuing to operate the Haase Energy Tank despite the fill level falling below the minimum level may result in overheating and damage to the Haase Energy Tank.

1.3 Ventilation line and overfill protection

Do not close or modify!

The ventilation line (see Fig.3/Pos. 10) and overfill protection (see Fig. 2/Pos. 8) must **never** be closed! Failure to comply with this requirement may lead to excess pressure and hence damage to the Haase Energy Tank.

2 Installation Instructions

2.1 Temperature sensor installation

The responsibility for determining the installation height of temperature sensors and installation of the same rests with the installation company. Leading manufacturers of heating technology components offer special temperature sensor packages. The length of the sensor tubes can be obtained from the information sheets in the appendix. **The installation company must document the configuration and height of the temperature sensors that are installed.**

Depending on the equipment configuration, the sensors (usually 1 to 4 pieces) are inserted into the sensor tubes (e.g. FSM, FHU, FHO, FBO) all the way to the end and fixed in place to prevent movement. **The use of spring clips is recommended, so that the temperature sensors lie against the wall of the tube.**

To ensure safe operation of the system, a sensor must be installed at position FBO (see Appendix A) **in all cases**. This sensor supplies the upper temperature limit for all addition systems. **If the maximum admissible operating temperature of 95 °C (203F.) is exceeded, the heat transfer to the Haase Energy Tank must be disconnected**!

2.2 Pipe connection for Haase Energy Tank and heat exchangers

For the purpose of connecting to existing or newly installed heat generators and heat consumers, the 1½" inside thread connections must be prepared accordingly. Please check for the existence and proper fit of the clamp rings, coupling nuts and seals prior to connection. The connection to the 1½" flat-sealing outside thread of the heating unit is performed with the careful tightening of the coupling nut with an SW52 wrench (second wrench is required for countering).

In the case of Haase Energy Tank with multiple heat supporting columns, the heat exchangers are switched in parallel. To this end, Haase GFK Technik offers manifolds with 2 and 3 outlets as a connection element for multiple heat exchangers. These manifolds greatly facilitate the connection of simultaneously operated heat exchangers.

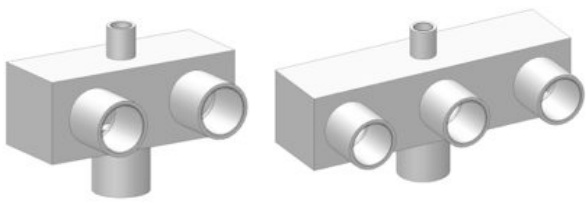

Fig. 4: Illustration of a manifold with 2 and 3 outlets

In the case of hard drinking water (more than 14 ° German hardness (dH)), it is highly recommended that you install a softening system between the house service connection (for drinking water) and the process water heat exchanger to prevent the Haase Energy Tank of calcium deposits in the heat exchanger. Information on the hardness of your drinking water can be obtained from your water plant.

After the heat exchanger has been connected to the piping system, the corrugated pipe must be insulated against heat loss with pipe insulation.

2.3 Pipe connection to Haase Buffer Tank and layer addition system

The layer addition system layers the hot water directly into the Tank. It is slowly added to the respective layer until it reaches the same temperature.

The Tank may only be operated without pressure. For this reason, an external heat exchanger and a pump are required for a connection to a solar or heating system, namely to ensure a separation between systems.

The pump and heat exchanger must be placed correctly to prevent gas accumulations. Depending on the configuration of connections on the Tank, we recommend that the connection assembly is designed as shown in Fig. 5 or Fig. 6.

Please note that the connection lines in Fig. 5 are installed at an ascending slope to the container, so that gas can escape into the Tank.

The pump should be mounted at least 50 cm (20”) under the minimum fill level of the Tank to ensure inflow pressure.

The layer addition system only reaches optimum performance with specific volume flows, therefore a balancing valve (volume flow control) is required to regulate the volume flow.

Volume flow range for the layer addition system:

DN 100 (4”): 1 to 2.5 m³/h

The entire connection assembly must be vented manually using the ball valves after filling and prior to initial start-up.

After the layer addition system has been connected to the piping system, the corrugated pipe and the entire connection assembly must be insulated against heat loss with pipe insulation.

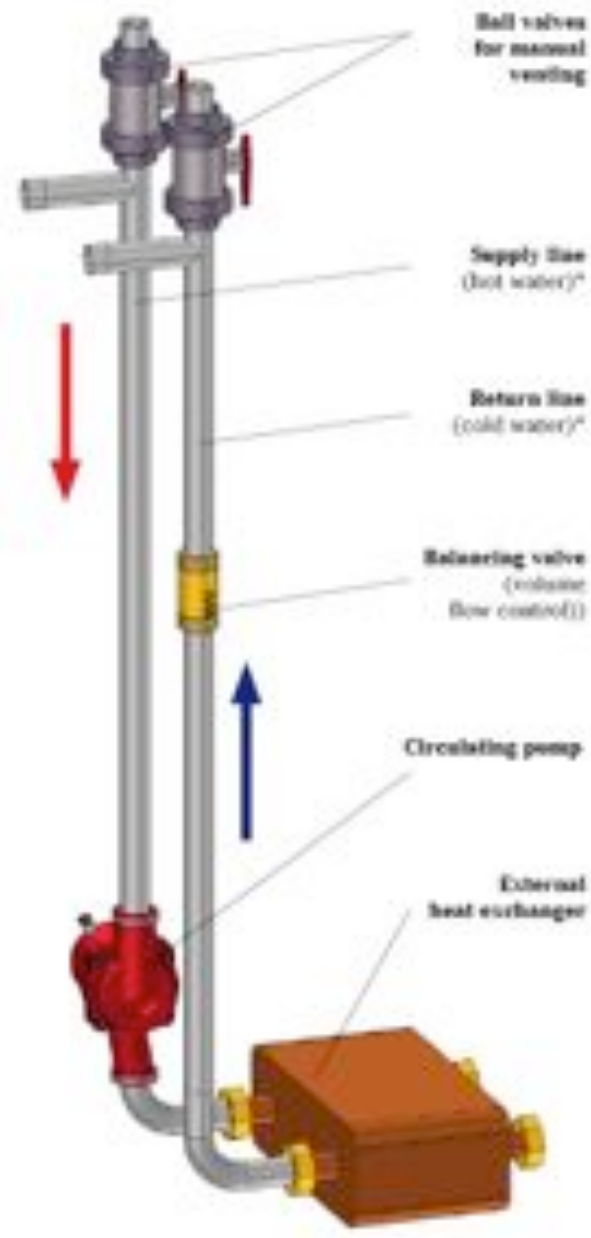

Fig. 5: Connection assembly for layer addition system (unloading) (This connection assembly design represents a non-binding example and must always be verified by the customer.)

2.4 Pipe connection to Haase Buffer Tank

The Haase buffer Tank supplies hot water or withdraws cold water at a defined height.

The Haase Buffer Tank may only be operated without pressure. For this reason, an external heat exchanger and a pump are required for a connection to a solar or heating system, namely to ensure a separation between systems.

To prevent gas accumulations, we recommend that the heat exchanger and pump are configured as shown in Fig. 6. The connection lines must be installed from the bottom connection with a continuous ascending slope towards the top connection, so that gas can escape into the Tank.

To guarantee inflow pressure, the pump should be mounted at least 50 cm under the minimum fill level of the Haase Buffer Tank.

The entire connection assembly must be vented manually using the ball valve after filling and prior to initial start-up.

After the Haase Buffer Tank has been connected to the piping system, the corrugated pipe and the entire connection assembly must be insulated against heat loss with pipe insulation.

Fig. 6: Connection assembly for buffer accumulator and layer addition system (loading) (This connection assembly design represents a non-binding example and must always be verified by the customer.)

2.5 Filling requirements

To prevent overfilling of the Haase Buffer Tank, water should be added using a water meter. In the case of hard drinking water **(more than 14 ° German hardness)** we recommend the use of a softener system for filling purposes, and hence prevent the build-up of calcium deposits in the heat accumulator. The following filling steps must be performed in the indicated sequence prior to starting up the Haase Buffer Tank:

1. The ventilation line must be installed at an incline (free outward flow) over a drain or into a container that is standing on the floor.

2. Heat exchanger loops are filled with water via the heating system return (reheating) **HU** and process water feed **BU**, or with a heat carrier liquid via the solar return **SU**, until the medium emerges on the other side! **Layer addition systems and Haase buffer Tank do not have to be filled via the connections!**

Loop	Type	Material	Content in l	Length in m
S/H/B 4	DN 32	Stainless steel corrugated pipe	approx. 25	22
S/H/B 6			approx. 38	35
S/H/B 9			approx. 50	45

3. Fill the Haase Energy Tank no earlier than 24 hours after installation, using the fill connection (see Fig. 2/ Pos. 9)! For initial filling, **only fill with drinking water from the water main** (approx. 8 to 10°C) exactly up to the **red marker** of the level indicator.

The filling process must be continuously monitored!

Fig. 7: Level indicator

If the Haase Energy Tank is overfilled, water will leak from the ventilation line during the filling process, and in extreme cases also from the overfill protection that has been built into the level indicator. In that case, excess water must be siphoned off using the fill connection, until the fill level is exactly at the lower red marker.

When the Haase Energy Tank is heated, it is possible that a small amount of storage medium escapes from the overfill protection as a result of the heat expansion of the water in the Tank. However, the system will again balance out in a short time period.

The ventilation line also acts as additional overfill protection. The overfill protection on the level indicator and the ventilation line must therefore never be closed or changed in any way by way of a hose extension or other modifications. They must always allow for the free outflow of water.

3 Maintenance and service

The Haase Energy Tank is mostly maintenance-free, and only requires regular inspections of and adjustments to the fill level. To warrant a high standard of quality, factory customer service personnel will conduct a final quality inspection (sampling) of the Haase Energy Tank following start-up.

If you notice any irregularities with regard to the Haase Energy Tank, please contact your service and maintenance support team.

Attention: A minimal amount of odour may form following initial start-up. This is the result of the evaporation of the remaining styrene that occurs when the Haase Energy Tank is heated. These vapours are not dangerous. The evaporation process ends once the Haase Energy Tank has been heated to 95°C (203F.) for the first time. Please ensure that the installation location receives adequate ventilation during the evaporation process.