Installation and maintenance manual

High-performance hot water storage tank

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High-performance hot water storage tank

English

EKHWP300B
EKHWP300PB
EKHWP500B
EKHWP500PB

1 Safety

1.1 Observing instructions

These instructions are a >> ***translation of the original version*** << in your language.

Please read this manual carefully and thoroughly before proceeding with the installation or modification of the heating system.

These instructions are intended for authorised and trained heating and sanitation experts who have experience in the proper installation and maintenance of heating systems and hot water storage tanks by virtue of their technical training and knowledge.

This manual provides all the necessary information for installation, start-up and maintenance, as well as basic information on operation and settings. Please go through the attached documents for a detailed description of operation and control.

Relevant documents

– When connecting to an external heat generator; the associated installation and operating instructions.
– When connecting to a Daikin solar system; the associated installation and operating instructions.

The guides are included in the scope of supply for the individual units.

1.2 Warning signs and explanation of symbols

1.2.1 Meaning of the warnings

Warnings in this manual are classified according into their severity and probability of occurrence.

DANGER!

Draws attention to imminent danger.

Disregarding this warning can lead to serious injury or death.

WARNING!

Indicates a potentially dangerous situation.

Disregarding this warning may result in serious physical injury or death.

CAUTION!

Indicates a situation which may cause possible damage.

Disregarding this warning can lead to damage to property and the environment.

This symbol identifies user tips and particularly useful information, but not warnings or hazards.

Special warning signs

Some types of danger are represented by special symbols:

Electric power

Risk of burning or scalding

1.2.2 Validity

Some information in this manual has limited validity. The validity is highlighted by a symbol.

Pay attention to the stipulated tightening torque (see chapter 8.3 "Tightening torque").

p=0 Only applicable for the unpressurised system (drain-back)

+p Only applicable for the pressurised system

1.2.3 Handling instructions

- Instructions on actions are shown as a list. Actions of which the sequential order must be maintained are numbered.
  ➔ Results of actions are identified with an arrow.

1.3 Avoid danger

The Daikin EKHWP is state-of-the-art and is built to meet all recognised technical requirements. However, improper use can lead to serious injuries or death, as well as causing material damage.

To prevent such risks, install and operate Daikin EKHWP only:
– as stipulated and in perfect condition,
– with an awareness of the safety and hazards involved.

This assumes knowledge and use of the contents of this manual, the relevant accident prevention regulations and the recognised safety-related and occupational medical rules.

WARNING!

This unit is not intended for use by persons (including children) with impaired physical, sensory or mental faculties or persons with insufficient experience and/or expertise unless supervised by a person responsible for ensuring their safety or are given instruction by this person on how to use the unit.

- Keep flammable materials away from the Daikin EKHWP.

1.4 Proper use

The Daikin EKHWP may only be used as a hot water storage tank. The Daikin EKHWP must be installed, connected and operated only according to the information in this manual.

When connecting to a Daikin heat pump you must use only the storage tank connection kits (E-PAC) provided for the purpose.

Daikin Only those electric immersion heaters supplied by ROTEX may be used.

Any other use outside the intended use is considered as improper. The operator alone shall bear responsibility for any resulting damage.

Intended use also includes compliance with the maintenance and service conditions. Spare parts must at least satisfy the technical requirements defined by the manufacturer. This is the case, for example, with the use of original replacement parts.

1.5 Instructions for operating safety

1.5.1 Before working on the hot water storage tank and the heating system

- Work on the hot water storage tank and heating system (e.g. installation, connection and initial start-up) should only be carried out by authorised and trained heating experts.
- Switch off the main switch before starting any work on the domestic hot water storage tank and heating system and secure it against unintentional switch-on.
- Seals must not be damaged or removed.
- Make sure that the safety valves comply with the requirements of EN 12828 when connecting on the heating side, and with the requirements of EN 12897 when connecting on the domestic water side.
- Only original Daikin replacement parts may be used.

1.5.2 Electrical installation of optional accessories

- Before beginning work on live parts, disconnect them from the power supply (switch off main switch, remove fuse) and secure against unintentional restart.
- Electrical installations may only be carried out by qualified electrical technicians under observance of the relevant electrical guidelines and the regulations of the electric utilities company.
- For each hardwired power connection, install a separate disconnector system compliant with EN 60335-1 for all-pole disconnection from the power mains.
- Compare the mains voltage indicated on the nameplate with the supply voltage before connecting to the mains.

1.5.3 Installation room

For safe and fault-free operation, it is necessary that the installation location of the Daikin EKHWP fulfils certain criteria. Information about the installation location for the high-performance hot water storage tank can be found in High-performance hot water storage tank chapter 3.2 "Installation".

Information on the installation site of other components can be found in the associated documentation supplied with them.

1.5.4 Requirements of the heating and filling water

Observe the relevant regulations of technology to prevent creation of corrosion products and deposits.

Minimum requirements regarding the quality of filling and supplementary water:
- Water hardness (calcium and magnesium, calculated as calcium carbonate): ≤ 3 mmol/l
- Conductivity: ≤ 1500 (ideal ≤ 100) µS/cm
- Chloride: ≤ 250 mg/l
- Sulphate: ≤ 250 mg/l
- pH value (heating water): 6,5 - 8,5

Using filling water and top-up water which does not meet the stated quality requirements can cause a considerably reduced service life of the equipment. The responsibility for this lies solely with the operator.

1.5.5 Heating and sanitary side connection

- Create a heating system according to the safety requirements of EN 12828.
- With sanitary connection, you must observe;
  - EN 1717 - Protection of domestic water from contamination in domestic water installations and general requirements concerning safety equipment for the prevention of domestic water contamination by back-flow
  - EN 806 - Technical regulations for domestic water installations (TRWI)
  - and, in addition, the country-specific legal regulations.

The domestic water quality must comply with the EU Guideline 98/83 EC and the regionaly-applicable regulations.

The connection of a solar installation, an electric heating rod or an alternative heat generator may cause the storage temperature to exceed 60 °C.
- For this reason you should fit scalding protection (e.g. VTA32 + Screw connection set 1") during installation.
- Use a pressure reducer if the cold water connection pressure >6 bar.

If the Daikin EKHWP is connected to a heating system with steel pipes, radiators or non-diffusion-proof floor heating pipes, slurry and swarf could enter the hot water storage tank and cause blockages, local overheating or corrosion.
- To prevent possible damage, fit a dirt filter or sludge separator into the heating return flow of the system.
  - SAS 1

1.5.6 Operation

- Only operate the Daikin EKHWP;
  - After all installation and connection work has been completed.
  - With fully installed equipment covers and service accesses.
  - With sanitary side pressure reducers installed (max. 6 bar).
  - With heating side pressure reducers installed (max. 3 bar).
  - With completely filled storage containers (fill level display).

The specified servicing intervals should be adhered to and inspection work must be carried out.

1.5.7 Instructing the user/owner

- Before you hand over the heating system and the hot water storage tank, explain to the owner how he/she can operate and check the heating system.
- Provide the operator with the technical documentation (this documentation and all its references) and indicate that these documents must be available in the immediate vicinity of the unit at all times.
- Document the hand-over by filling in and signing the checklist in chapter 4 "Start-up", together with the operator.

1.5.8 Documentation

The technical documentation included in the scope of supply is a constituent part of the equipment. It must be stored in such a way that it can be consulted at any time by the operator or the technicians.

2 Product description

2.1 Design and components

Item	Explanation	Connection marking cover (Storage tank type)		Applicable to hot water storage tank
		(300 l)	(500 l)	
1	Storage tank (polypropylene double walled jacket with PUR hard foam heat insulation)			all
2	Mount for solar R4 controller / handle			all
3	Type plate			all
4	Fill level indicator			all
5	Safety overflow connection (1¼" AG, 1" IG)			all
6	Pressure-free storage tank water			all
7	Hot water zone			all
8	Solar zone			S#B
9	Connection for electric immersion heater / booster heater (R 1½" IG)			all
10	Optional: Electric immersion heater (designated as a booster heater in heat pump systems.)			all
11	Corrugated stainless steel pipe heat exchanger for domestic hot water using depressurised storage tank water			all
12	Stainless steel corrugated pipe heat exchanger for charging storage tank (SL-WT1) via 1st. heat source			S#B / S#D - S#G
14	Corrugated pipe stainless steel heat exchanger for heating support			S#B / S#F
15	Heat insulating jacket for heat exchanger to provide support for the heating			S#B / S#F
16	Stainless steel corrugated pipe heat exchanger for charging pressurised solar storage tank (SL-WT3)			S#F / S#G
17	Thermal insulation shell for pressurised solar heat exchanger (SL-WT3)			S#F
18	Solar inflow layering pipe			S#B
19	Sensor pocket for tank temperature sensor	8	10	all
20	Drain-back solar - Return flow			S#B
	Filling and draining connection for storage tank water			all
21	Drain-back solar - Flow	7	9	S#B
22	Pressurised solar - Return flow	5	9	S#F / S#G
23	Pressurised solar - Flow	6	11	S#F / S#G
24	Hot water connection *	2		all
25	Cold water connection *	1		all
26	Storage tank charging return flow (via 1st. heat source) *	3		S#B / S#D / S#F / S#G
27	Storage tank charging flow (via 1st. heat source) *	4		S#B / S#D / S#F / S#G
30	Except Altherma LT: Heating support outlet ↓* (connect to heating return!) Only Altherma LT: Storage tank conditioning/heating support return flow ↑ (connect to flow for heating)	7		S#B / S#F
31	Except Altherma LT: Heating support inlet ↑* (connect to return flow heat generator!) Only Altherma LT: Storage tank conditioning/heating support flow ↓ (connect to flow Altherma LT)	8		S#B / S#F
S#B	Hot water storage tank EKHWP500B			
S#D	Hot water storage tank EKHWP300B			
S#F	Hot water storage tank EKHWP500PB			
S#G	Hot water storage tank EKHWP300PB			
X	Recommended wall distance 200 mm			all
AG	Outer thread			all
IG	Internal thread			all
*	Recommended accessories (ZKB (2 in number))			all

Tab. 2-1 Legend designation for images in section 2.1.1 and 2.2.

2.1.1 High-performance hot water storage tank for heat pump systems

Unpressurised system - DrainBack p=0

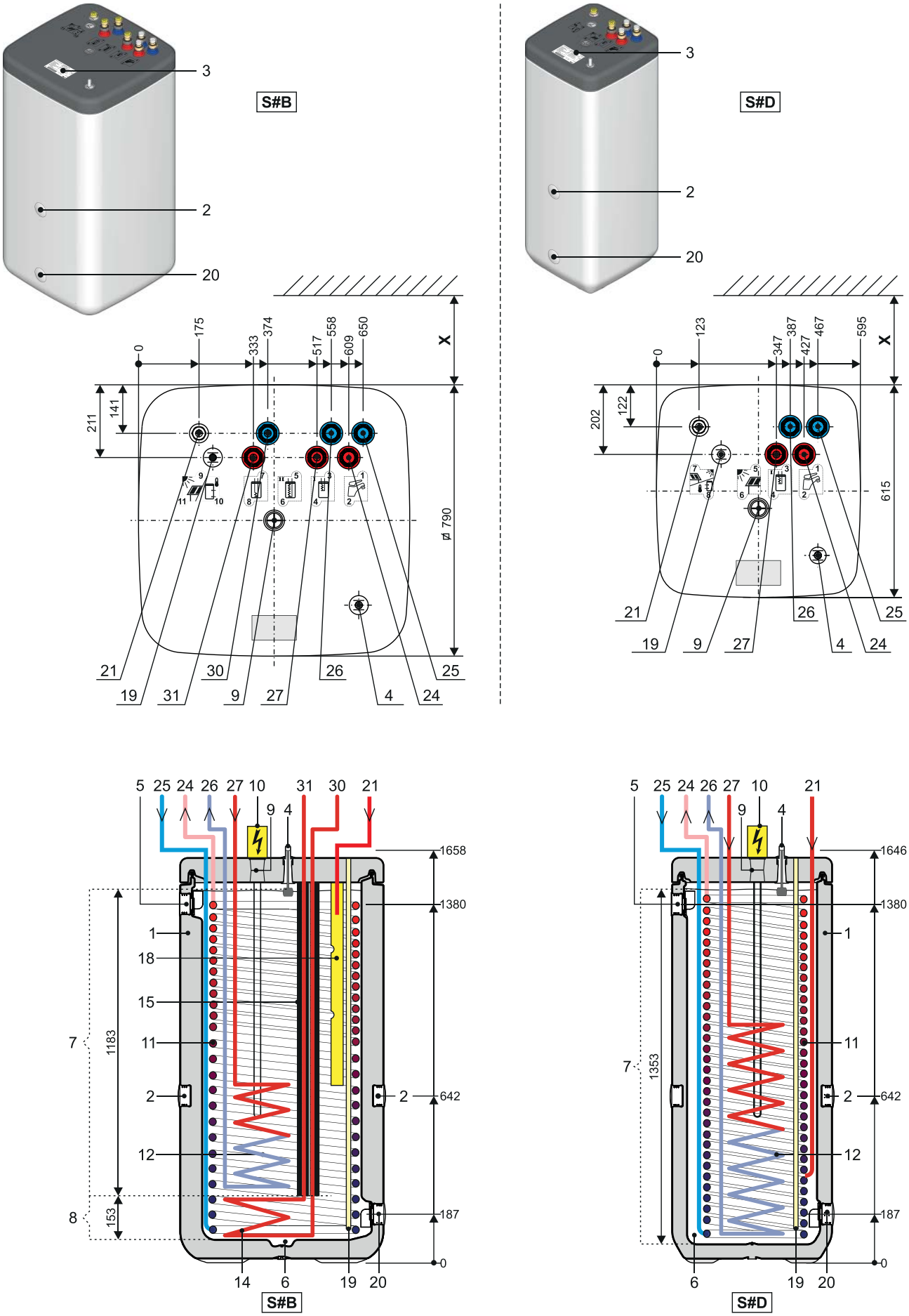


Fig. 2-1 Connections and dimensions, High-performance hot water storage tank with solar support - p=0 Type EKHWP 300/500B

Pressurised system +p

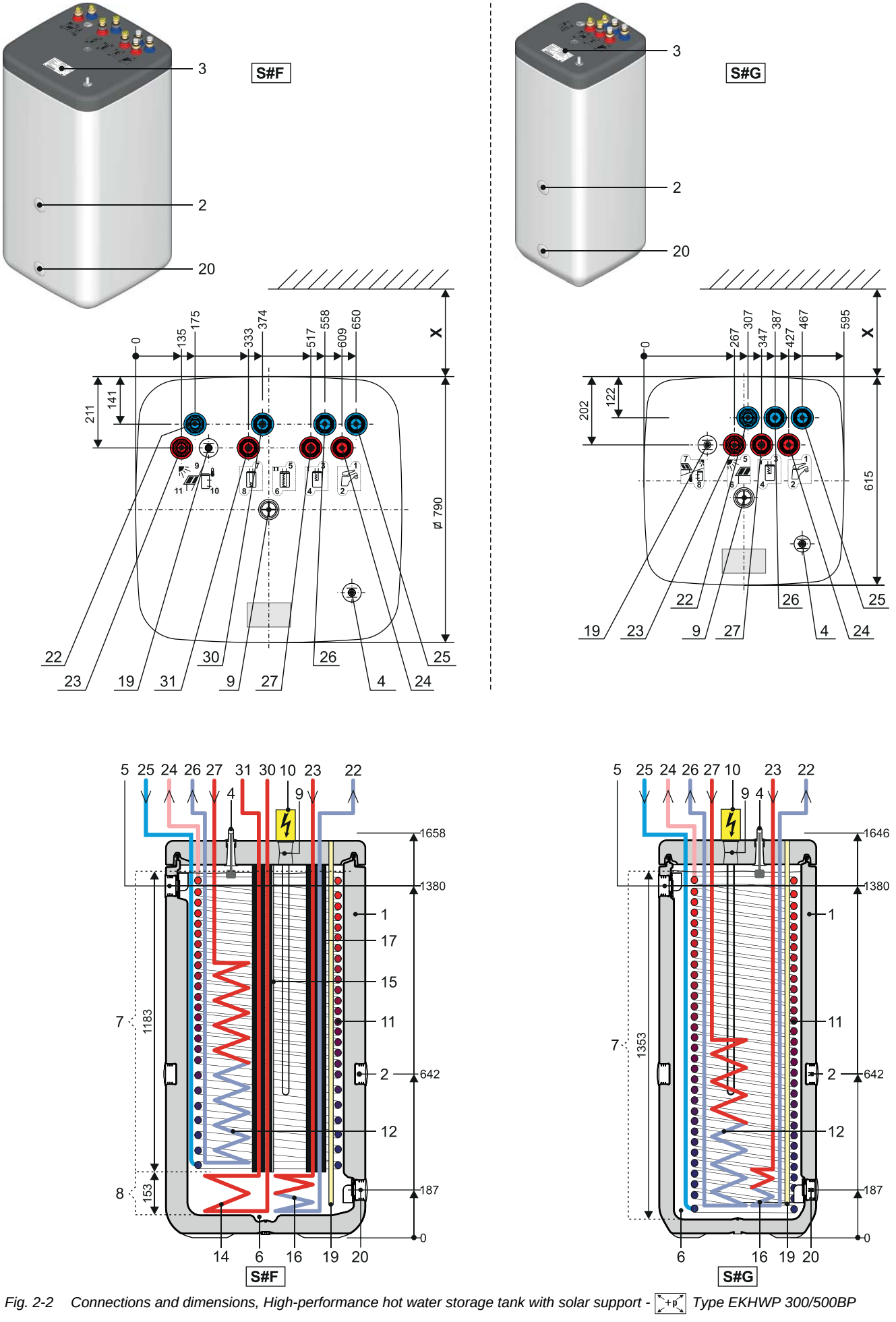


Fig. 2-2 Connections and dimensions, High-performance hot water storage tank with solar support - +p Type EKHWP 300/500BP

2.2 Brief description

The Daikin High-performance hot water storage tank is a combination of heat storage tank and instantaneous water heater.

The pressureless storage water serves as heat storage medium. Useful heat is supplied and removed via the spiral corrosion-resistant heat exchanger, which is made from a corrugated stainless steel pipe (1.4404), and is completely immersed in the storage tank water. In the heat exchanger for domestic hot water generation, domestic hot water is stored at the temperature level of the preparation zone.

The cold water which flows in when the hot water is drawn off is first routed to the storage tank at the very bottom of the heat exchanger, where it cools the lower zone of the storage tank down as much as possible. The readiness zone is heated by an external heat generator (condensing boiler, heat pump, solar system, electric immersion heater). Water flows through the heat exchanger for storage charging (SL-WT) from top to bottom.

On its way to the top, the domestic water continuously absorbs the heat of the storage tank water. The flow direction, operating on the principle of counter-flow, and the coil-shaped heat exchanger create a pronounced temperature layering in the hot water storage tank. As high temperatures can be maintained for a very long time in the upper section of the storage tank, a high hot water output is achieved even if water is drawn off over a long period of time.

Listed in section 2.1.1, those Daikin High-performance hot water storage tank can also be heated by solar systems, in addition to an external heat generator. Depending on the available heat from the sun, the entire hot water storage tank can be heated up. The stored heat is now used both for hot water generation and for heating support. The high total storage capacity also temporarily allows time without sunshine to be bridged.

Optimum water hygiene

Low flow or unheated zones on the domestic water side are completely excluded with the Daikin High-performance hot water storage tank. It is impossible for sludge, rust or other sediments to be deposited, as can be the case with other large volume tanks. The water which is fed into the system first is also discharged first (first in, first out principle).

Low maintenance and corrosion

The Daikin High-performance hot water storage tank is made of plastic and is completely corrosion free. No sacrificial anode or similar corrosion protection system is necessary.
This means that associated maintenance work, e.g. changing the protective anodes or cleaning the storage tank, does not need to be carried out on the Daikin High-performance hot water storage tank. Only the fill level of the storage tank water needs to be checked.

The corrugated stainless steel pipe heat exchangers on the heating and potable water side are made from high quality stainless steel (1.4404).

Low scaling

On the storage tank side only one deposition of scale is possible. The immersion heater therefore remains clean, as do all the stainless steel heat exchanger pipes in the storage tank water. This means that no scale can build up which would continuously reduce the efficiency of heat transfer in the course of operation (as is the case with other storage tank designs).

The thermal and pressure expansion and high flow rates in the domestic water heat exchanger release any possible scale deposits, which are then flushed away.

Economical operation

The full area heat insulation of the storage tank ensures very low heat losses in use and means that the best use is made of the heat energy being applied.

Modular extension facility

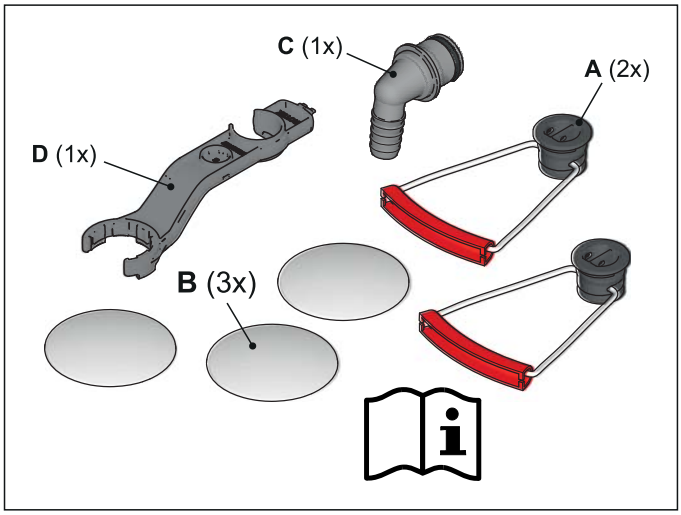
If the heat output of a single Daikin High-performance hot water storage tank is not adequate, you can interconnect several storage tanks in a modular manner.

Electronic control

A control system integrated in the heat generator controls all heating and hot water functions for the direct heating circuit, a mixed heating circuit which can be connected as an option and a storage tank charging circuit.

2.3 Scope of delivery

– Daikin EKHWP hot water storage tank
– Bag of accessories (see fig. 2-3)



A	*Carrier loops (only required for transport)*	*C*	*Hose connection piece for safety overflow*
B	*Cover screen*	*D*	*Spanner*

Fig. 2-3 Content of bag of accessories

2.4 Optional accessories

2.4.1 Electric immersion heaters

In addition to the heating possibilities via the corrugated stainless steel pipe heat exchanger from various different heat sources and energy carriers, the Daikin High-performance hot water storage tank can also be charged using an electric immersion heater.

For EKHWP (Booster Heater)

Type	BO3s F
Operating voltage	230 V / 50 Hz
Heating output	3 kW
Temperature range	35-65°C
Cable length	—
Heating element length	0.9 m
Screw-in thread	R 1½"
Suitable for	all EKHWP

Tab. 2-2 Booster Heater - Overview and technical data

2.4.2 Non return valves

To prevent heat loss from the connection pipes when the heating pump is switched off and during periods when no domestic water is drawn off (gravity circulation), you should fit circulation brakes in the connections on the Daikin High-performance hot water storage tank (see tab. 2-1).

2.4.3 Dirt filter

If the Daikin High-performance hot water storage tank is connected to a heating system with steel pipes, radiators or non-diffusion-proof floor heating pipes, slurry and swarf could enter the hot water storage tank and cause blockages, local overheating or corrosion. This can be prevented by fitting a dirt filter or sludge trap (see ROTEX Daikin price list).

2.4.4 Scalding protection

There is a danger of scalding at hot water temperatures over 60°C. Fitting scalding protection enables the hot water temperature to be varied continuously and limited from 35 - 60°C.

– Protection against scalding VTA32
– Screw connection set 1"

2.4.5 Solar storage tank extension kit

If the heat output of a single Daikin hot water storage tank is not adequate you can interconnect several EKHWP modules.

This means that both the stainless steel heat exchangers for post-heating and the hot water heat exchangers are interconnected in accordance with the Tichelmann principle (chapter 6 "Hydraulic connection").

With seasonal variations in demand these individual units can be added or taken out of service accordingly. In this way the total hot water output can be manually matched to the actual demand.

The following components are offered:

– Solar storage tank extension kit CON SX
– Solar storage tank extension kit 2 CON SXE
– FlowGuard FLG

The installation and operation of this accessory component is described in detail in the individual operating and installation instructions provided.

2.4.6 KFE filling connection

For convenient filling and draining of the Daikin hot water storage tank, you can connect the KFE filling connection (KFE BA).

3 Set-up and installation

3.1 Set-up

3.1.1 Important information

WARNING!

The storage tank plastic wall on the Daikin EKHWP can melt under the effects of external heat (>90°C) and, in the extreme case, can catch fire.

- Erect the Daikin EKHWP only at a minimum distance of 1 m to other heat sources (>90°C) (e.g. electric heater, gas heater, chimney) and flammable materials.

CAUTION!

- Only erect the Daikin EKHWP if an adequate **ground load-bearing capacity of** (**1050 kg/m²** plus a safety factor) is guaranteed. The ground must be flat and level.
- Erection outdoors is only possible to a limited extent. The storage tank must **not be** exposed **to continuous direct sunlight**, as the UV radiation and the effects of the weather will damage the plastic.
- The Daikin EKHWP must be **protected from frost**.
- Make sure that the supply company **does not provide corrosive domestic water**.
  - Suitable water treatment may be required.

CAUTION!

p=0

If the difference in height between the hot water storage tank and the solar panels is not great enough, the depressurised solar system cannot drain fully in the exterior section.

- On depressurised solar systems, observe the minimum gradient of the solar connection lines.

EKHWP

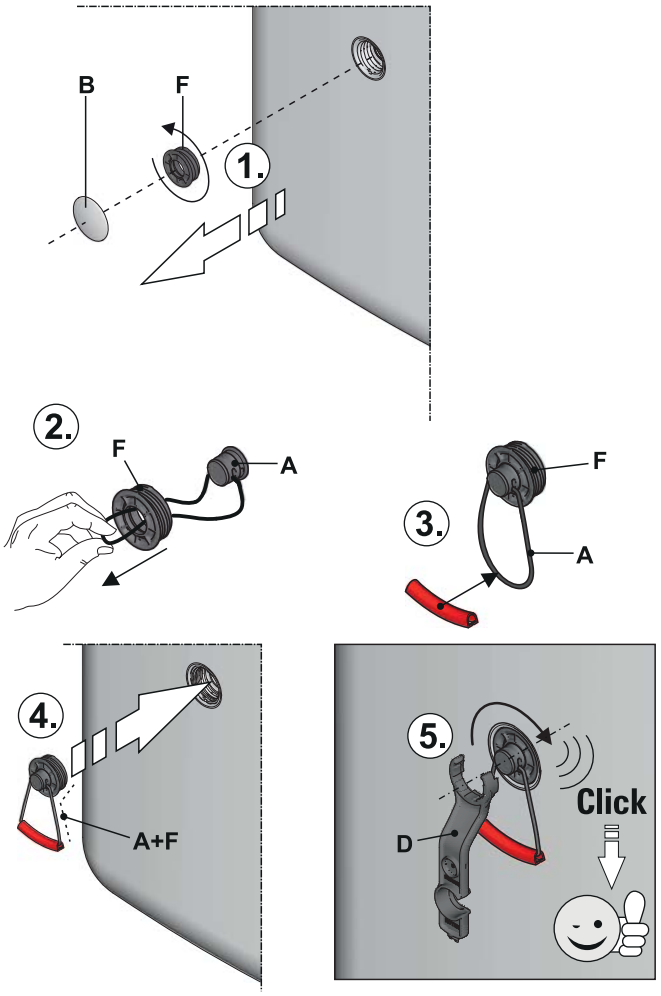
Observe the permitted lengths of pipes between the hot water storage tank and the hydraulic connections on the heat pump (see installation and operating instructions of the heat pump and the relevant storage tank connecting kit "E-PAC").

Requirement: The installation site meets the applicable country-specific requirements.

Incorrect set-up and installation would render the manufacturer's guarantee for the unit void. If you have questions, please contact our Technical Customer Service.

3.1.2 Installing the hot water storage tank

- Remove the packaging and dispose of it in an environmentally sound manner.
- Remove the cover plates on the storage tank (fig. 3-1, item B) and unscrew the threaded pieces (fig. 3-1, item F) from the apertures on which the handles are to be mounted.
- Pull the carrier loops (fig. 3-1, item A) through the threaded pieces.
- Screw the threaded pieces with the fitted carrier loops (fig. 3-1, item A+F) using a fitting spanner (fig. 3-1, item D) into the openings.



A Carrier loop
B Cover screen
D Spanner
F Threaded piece

Fig. 3-1 Mounting the handles

- Transport the hot water storage tank carefully to the site of erection, using the **carrier loops** provided.
- Install the domestic hot water storage tank at the installation site. **Recommended distance** to the wall (s1): ≥200 mm (fig. 3-2).

For the installation of an optional **electrical immersion heater** (see chapter 2.4) you will need a **minimum distance** "X" of ≥1200 mm **to the ceiling**.

When setting up the unit in a cabinet, behind panels or in other restricted conditions, sufficient ventilation (e.g., using ventilation gratings) must be ensured.

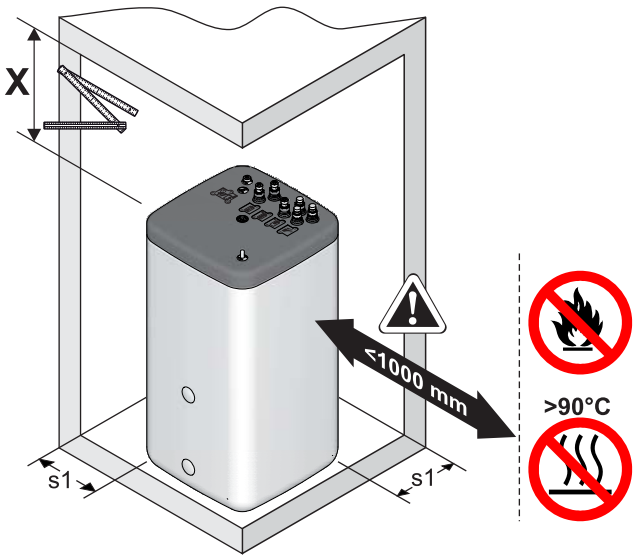


Fig. 3-2 Erecting the hot water storage tank (shown on the EKHWP)

3.2 Installation

3.2.1 Important information

WARNING!

There is a danger of scalding at water temperatures >60 °C. This can arise with solar energy utilisation, if the Legionella protection is activated or if the target temperature is set to >60 °C.

- Fit scalding protection (**see chapter 2.4.4 "Scalding protection"**).

CAUTION!

If the hot water storage tank is connected to a heating system with **steel pipes**, **radiators** or non-diffusion-proof underfloor heating pipes, sludge and swarf could enter the hot water storage tank and cause **blockages**, local **overheating** or **corrosion**.

- Flush the feed pipes before filling the heat exchanger.
- Rinse out the heat distribution network (in the existing heating system).
- Fit a dirt filter or sludge catcher in the heating return pipe (**see chapter 2.4.3**).

- For **domestic water pipes** observe the stipulations of EN 806 and EN 1717.
- The position and dimensions of the connections can be taken from fig. 2-1.
- Check the cold water connection pressure (maximum 6 bar).
  – At higher pressure in the drinking water line, a pressure reducer must be installed.
- Connect the pressure relief line to the safety pressure relief valve (customer supply) and connect the diaphragm expansion tank as per EN 12828.
- Note tightening torque (see chapter 8.3 "Tightening torque").
- Observe the requirements for the heating and filling water (see chapter 1.5.4).

To prevent heat loss from the connection pipes when the heating pump is switched off and during periods when no domestic water is drawn off (gravity circulation), you should fit **circulation brakes** (see **chapter 2.4.2**) in the connections to the ROTEX Daikin hot water storage tank.

3.2.2 Hydraulic system connection

1. Only with connection of an EKHWP hot water storage tank to a Daikin heat pump:
   - Mount the Daikin heat pump compatible storage tank kit "E-PAC" to the EKHWP hot water storage tank (see the individual installation and operating instructions included for the storage tank connection kit).
2. When using **circulation brakes**, fit them into the pipe connections on the Daikin EKHWP.
3. Connect the drain hose to the connector of the safety overflow (fig. 2-1, item 15) on the hot water storage tank.
   – Use transparent drain hose (draining water must be visible).
   – Connect the drain hose to an adequately dimensioned waste water installation.
   – Drain should not be lockable.

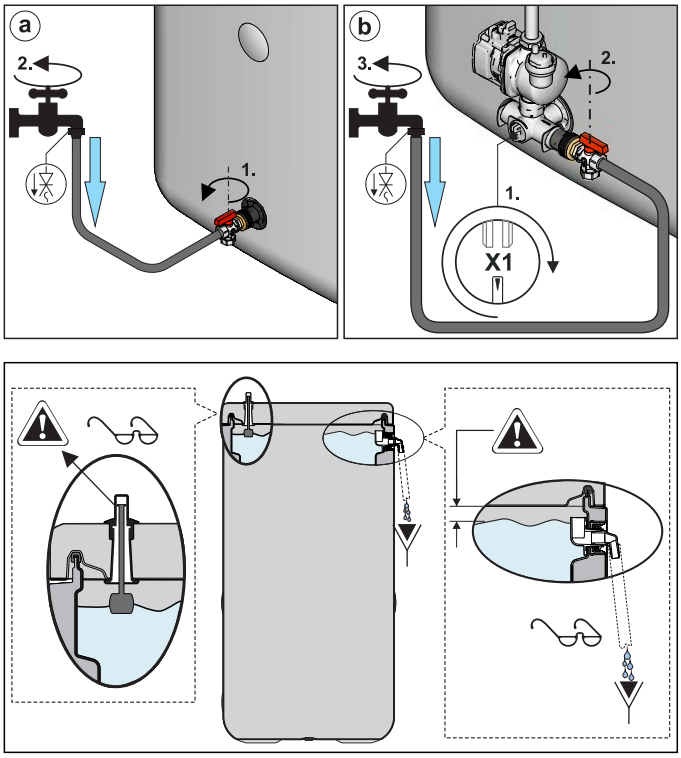


Fig. 3-3 Installation of drain hose at safety overflow

4. Check the water pressure at the cold water connection (<6 bar).
   ➔ If the pressure in the domestic water supply is greater then fit a pressure reducer and limit the water pressure to <6 bar.
5. Create connection of the cold water inlet to the hot water storage tank (fig. 2-1, item 25).

In order to be able to flush out the stainless steel corrugated heat exchanger for domestic hot water heating in the event of bad water quality, install a removal facility to each of the cold water and hot water connections on the storage tank (T-piece with draw-off cock).

Above a hardness level of >3 mmol/l we recommend also fitting a dirty water filter that can be back-flushed into the cold water connection.

6. Connect the connections to the hot water distribution network (fig. 2-1, item 24).
7. Establish connections to the heating circuit.
   You must always ensure proper de-aeration of the storage tank lines (fig. 2-1, items 26-29)
   – Use storage tank connection kit (E-PAC, see price list).
8. Establish connections to the heat generator.
   – In combination with a Daikin heat pump, the heating side connection of the hot water storage tank must be carried out in accordance with the installation and operating instructions of the individual storage tank connection kit (E-PAC).
   – **Optional:** Create the connections to the **solar system** (see solar installation and maintenance instructions).
9. Carefully lag the hot water pipes to prevent heat loss. Install heat installation in accordance with country-specific guidelines. Daikin recommends a lag thickness of at least 20 mm.

3.3 Filling / Topping Up

Any optional accessories must be fitted before filling.

The heat exchangers must be filled before the buffer storage tank.

3.3.1 Hot water-heat exchanger

1. Open the shutoff valve for the cold water supply pipe.
2. Open the hot water tap connections so that the draw-off volume can be set as high as possible.
3. Once water has been discharged from the tap connections, do not interrupt the cold water flow; this will ensure that the heat exchanger will be fully vented and that any impurities or residue will be discharged.

3.3.2 Buffer tank

WARNING!

Live parts can cause an electric shock on contact and cause fatal burns or injuries.

- If there is a Booster Heater or regulation and pump station installed in the hot water storage tank then these components must be isolated from the power supply before starting the work (e.g. fuse, main switch switched off and secured against inadvertent switching on again).

CAUTION!

UK only!

If filling or topping up the storage tank is done by means of the boiler filling and drain valve, a temporary filling loop must be used with the appropriate backflow prevention device in accordance with clause G24.2, Guidance to the Water Supply (Water Fittings) Regulations 1999.

Fill the solar circuit, heating system and storage tank charging circuit in accordance with the operating instructions for the individual components.

EKHWP hot water storage tank without p=0 solar system and without KFE filling connection (KFE BA)

- Connect the filling hose with backflush prevention (1/2") to the connection "DrainBack solar - feed" (fig. 3-4, item 21).
- Fill the storage tank on the Daikin EKHWP **until water comes out of the safety overflow** (fig. 3-4, item 5)**.**
- Disconnect the filling hose with backflush prevention (1/2") again.

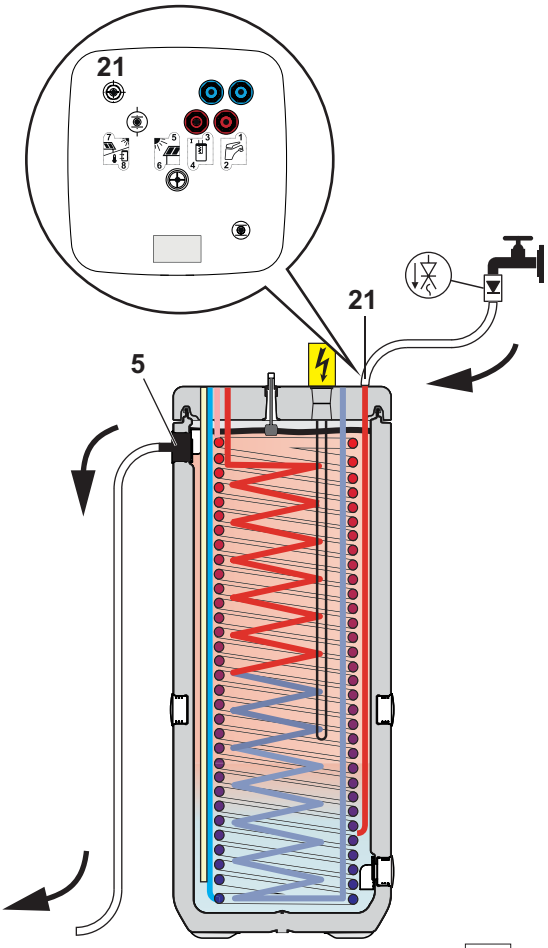


Fig. 3-4 Filling the buffer storage tank - without p=0 solar system and without KFE filling connection

EKHWP hot water storage tank with solar system

- Install KFE filling connection (accessory KFE BA):
  a) **With p=0 solar system:** On the connection bracket of the p=0 regulation and pump unit (EKSRPS3).
  b) **With solar system:** On the filling and draining connection of the Daikin EKHWP.

- Connect the **filling hose** with backflush prevention (1/2") **to** the previously installed **KFE filling connection**.
- Only with p=0 solar system:
  Adjust the valve insert on the connecting angle so that the path to the filling hose is opened (fig. 3-5).
- Open the KFE cock on the **KFE filling connection** and the cold water inlet and fill the storage tank on the Daikin EKHWP **until water comes out of the safety overflow** (fig. 3-5, item 5).

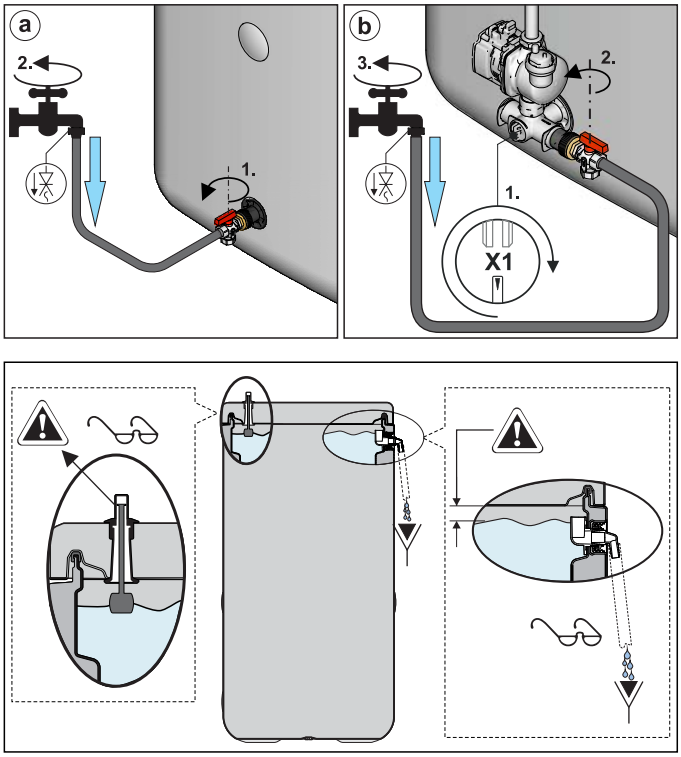


Fig. 3-5 Filling the buffer storage tank - with KFE filling connection

4 Start-up

WARNING!

- Units which have been set-up and installed incorrectly may not operate properly and can be a health and safety risk endangering human life.
- Installation commissioning may only be carried out by authorized and trained heating technicians following the installation and maintenance manual included.
- Only original Daikin replacement parts may be used.

CAUTION!

A hot water storage tank commissioned improperly can lead to property damage.

- Observe the regulations in VDI 2035 in order to avoid corrosion and deposits.
- **If the filling and top-up water has a high degree of hardness**, measures must be taken to **stabilise this hardness or soften the water**.
- Set **the pressure reducer** on the cold water connection to a **maximum** of **6 bar**.

CAUTION!

If the booster heater is started with the storage tank empty or not completely full, it can lead to a reduction in performance of the electric heating (tripping of the safety temperature limiter).

- Operate the booster heater only with the storage tank completely full.

Incorrect start-up makes the manufacturer's guarantee for the unit void. If you have questions, please contact our Technical Customer Service.

- Check all the points on the enclosed checklist. Make a record of the test results and sign it, together with the operator.
- If an electric immersion heater / booster heater is fitted, set the desired storage tank water temperature.
- Switch on the mains supply switch on the heat generator. Wait for the start phase.

Only if **all points** on the checklist can be answered with **Yes** may the Daikin EKHWP be started up.

Check list for start-up		
1.	Is the hot water storage tank is correctly set up according to an admissible set up variant and without visible damages?	❑ **Yes**
2.	Minimum distance between the hot water storage tank and other heat sources (>90 °C) of 1 m?	❑ **Yes**
3.	Hot water storage tank fully connected, including optional accessories?	❑ **Yes**
4.	If Booster Heater installed: – Does the mains connection comply with the regulations and is the mains voltage 230 volts at 50 Hz? – Has the residual current device been fitted in accordance with the individual country-specific regulations? – Only when using non-flammable power supply cable: Has the electric cable not been laid directly to the hot water storage tank?	 ❑ **Yes** ❑ **Yes** ❑ **Yes**
5.	The storage tank is filled with water to the overflow point?	❑ **Yes**
6.	On restoration: Has the heat distribution network been cleaned? Is a dirt filter installed in the heating return flow?	❑ **Yes**
7.	Is the safety overflow connection connected to an open drain?	❑ **Yes**
8.	Heating system and hot water system full?	❑ **Yes**
9.	Is the water pressure on the sanitary side < 6 bar?	❑ **Yes**
10.	Is the water pressure on the heating side < 3 bar?	❑ **Yes**
11.	Are the heat generator and heating system vented?	❑ **Yes**
12.	Are all hydraulic connections tight (leaks)?	❑ **Yes**
13.	Does the installation operate without faults?	❑ **Yes**
14.	In the case of new installations: Has the operating manual been handed over, and has the owner been instructed?	❑ **Yes**

Location and Date: _____ *Signature of installer:* _____

Signature of owner: _____

5 Taking out of service

If installed: Switch off the power supply to the Daikin Booster Heater.

5.1 Temporary shutdown

CAUTION!

A heating system which is shut down can freeze in the event of frost and may suffer damage.

- In the event of a danger of frost, start the entire Daikin heating system up again and activate the frost protection function or take the appropriate frost protection measures for the hot water storage tank (e.g. by draining).

If the danger of freezing will only last for a few days, the very good heat insulation of the Daikin EKHWP means that it need not be drained, as long as the storage tank temperature is observed regularly and not permitted to fall below +3 °C. This does not, however, provide any protection against frost for the connected heat distribution system!

If a storage tank temperature of less than +3 °C is reached, the STB of the Booster Heater triggers automatically. This prevents consequential damage to the electric immersion heater caused by frost when starting up again.

5.2 Draining the storage tank

WARNING!

Danger of scalding caused by emerging hot water from the storage tank.

- Allow the hot water storage tank to cool down adequately before any installation work.
- Wear protective gloves.

5.2.1 With pre-mounted KFE filling connection

- Connect the drain hose to the **KFE filling connection** (fig. 5-1 / fig. 5-2) and to a waste water drainage point which is at least at ground level.
- Only with p=0 solar system:
  Adjust the valve insert on the connecting angle so that the path to the drain hose is opened (fig. 5-2).
- Open the **KFE filling connection** and drain the water out of the storage tank fig. 5-1 / fig. 5-2).

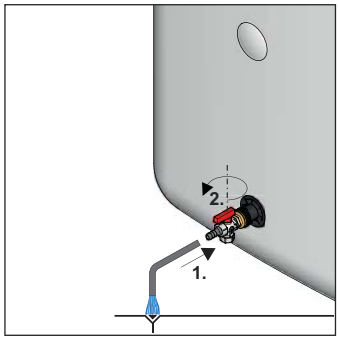


*Fig. 5-1 Draining process **without** p=0 solar system*

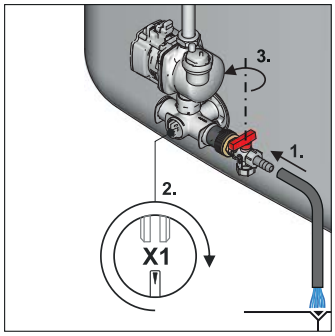


*Fig. 5-2 Draining process **with** p=0 solar system*

5.2.2 With subsequently fitted KFE filling connection

- Subsequent fitting of the **KFE filling connection** (accessory KFE BA).
- Drain the storage tank content as described in section 5.2.1.

5.2.3 Without KFE filling connection

With p=0 solar system

Draining only possible only with KFE filling connection (accessory KFE BA) (see section 5.2.1).

Without p=0 solar system

Draining with KFE filling connection (accessory KFE BA) is **recommended**.

Alternative:

1. Remove hose connection piece (fig. 5-3, item C) from safety overflow (fig. 5-3, item B).

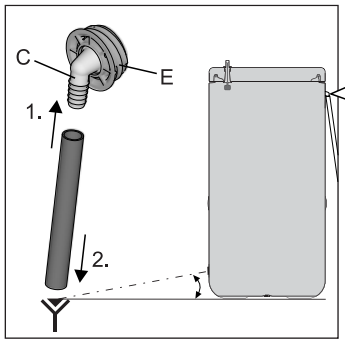
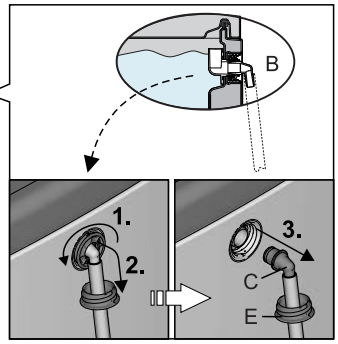


Fig. 5-3 Work step 1



Optional: Removing the connection piece from the safety overflow

2. Remove the cover plate from the filling and emptying fitting.
3. Remove the cover plate from the handle and unscrew the threaded piece (fig. 5-4, item E) from the storage tank container.

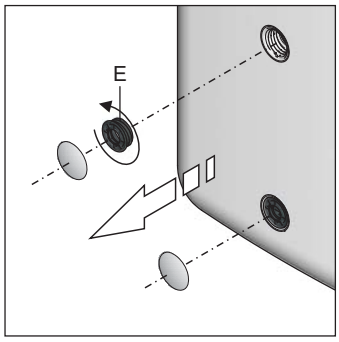


Fig. 5-4 Working steps 2 + 3

4. Place a suitable collection trough beneath the filling and emptying fitting.

CAUTION!

Storage water will gush out as soon as the sealing plug is removed.

There is no valve and no non-return flap on the filling and draining connection.

5. Unscrew the threaded piece (fig. 5-5, item E) at the filling and draining connection, and remove the plug (fig. 5-5, item F) and immediately screw in the pre-assembled hose connector (fig. 5-5, item C) into the filling and draining connection again.

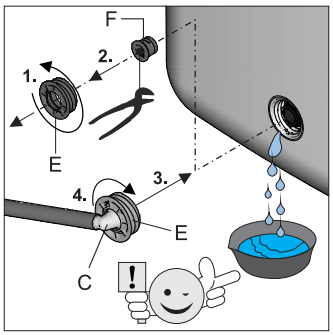


Fig. 5-5 Working steps 4 + 5

5.2.4 Draining the heating circuit and hot water circuit

- Connect the drain hose to the Daikin heat generator.
- Allow the heating and hot water circuits to drain using the suction lifter method.
- Disconnect the heating flow and return and the cold water feed and hot water discharge from the Daikin EKHWP.
- Connect the discharge hose on the heating flow and return flow as well as the cold water inflow and hot water outflow so that the hose opening is at ground level.
- Allow the individual heat exchangers to run empty one after the other, using the suction lifter method.

5.3 Final shutdown

- Daikin EKHWP disconnected from all electrical and water connections.
- Daikin EKHWP to be dismantled in accordance with the instruction manual (chapter 3 "Set-up and installation") in reverse order.
- Daikin EKHWP disposed off in a professional manner.

Recommendations for disposal

Daikin, thanks to the environmentally friendly design of the EKHWP hot water storage tank, has established the preconditions to ensure environmentally friendly disposal. Proper disposal in compliance with the respective national regulations of the country of use is the responsibility of the user/owner.

The designation of the product means that electrical and electronic products may not be disposed of together with unsorted domestic waste.

Proper disposal in compliance with the respective national regulations of the country of use is the responsibility of the user/owner.

- Only a qualified technician may disassemble the system.
- Disposal may only be carried out by an organization that specialises in reuse, recycling and recovery.

Further information is available from the installation company or the responsible local authorities.

6 Hydraulic connection

6.1 Connection diagrams

6.1.1 Solution for low-temperature heat pumps

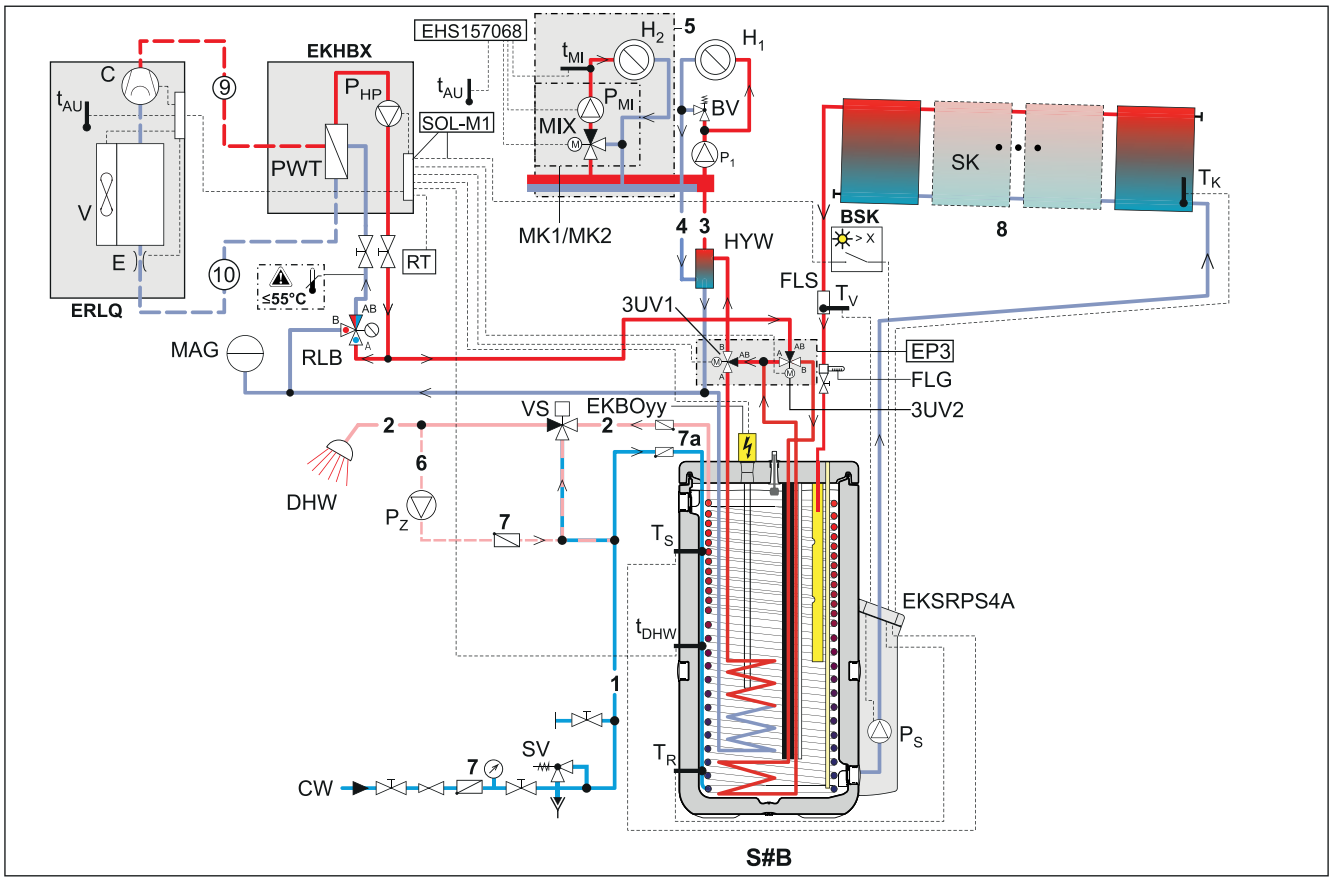


*Fig. 6-1 Standard connection layout with heat pump and drain-back solar[1)] p=0 (shown in the version with **just room heating function**) [1)] (legend see tab. 6-1)*

Short name	Meaning
1	Cold water distribution network
2	Hot water distribution network
3	Heating inflow
4	Heating return flow
5	Mixer circuit (optional)
6	Circulation (optional)
7	Check valve, return valve
7a	Non return valves
8	Solar circuit
9	Gas pipe (refrigerant)
10	Fluid pipe (refrigerant)
3UV1	3-way switch valve (DHW)
3UV2	3-way switch valve (cooling)
EKBOyy	Booster heater
BSK	Burner blockage contact in EKSRPS4
BV	Overflow valve
C	Refrigerant compressor
CW	Cold water
DHW	Domestic hot water
E	Expansion valve
EP3	Hot water module E-PAC LT (heating/cooling)
FLG	FlowGuard - Solar regulating valve
FLS	FlowSensor - Solar flow and flow temperature measurement
H_1, H_2 ... H_m	Heating circuits
HYW	Low loss header
MAG	Diaphragm expansion vessel
MIX	3-way-mixer with drive motor
MK1	Mixer group with high-efficiency pump
MK2	Mixer group with high-efficiency pump (PWM controlled)
P_1	Central heating pump
P_{HP}	Heating circulation pump
P_{Mi}	Mixing circuit pump
P_S	Solar operating pump p=0
P_Z	Circulation pump
PWT	Panel heat exchanger (condenser)
RLB	Return temperature limiter
EHS157068	Mixer circuit regulation
EKSRPS4	Solar regulating and pump unit p=0
ERLQ	Heat pump external unit LT
EKHBX	Heat pump internal unit LT
RT	Room thermostat
S#B	Hot water storage tank EKHWP500B
SOL-M1	Solar communication module SOL-PAC2 LT
SK	Solar panel field
SV	Safety overpressure valve
t_{AU}	Outside temperature sensor
t_{DHW}	Storage tank temperature sensor (heat generator)
t_{Mi}	Mixer circuit flow temperature sensor

Short name	Meaning
T_K	Solar collector temperature sensor
T_R	Solar return flow temperature sensor
T_S	Solar storage cylinder temp. sensor
T_V	Solar flow temperature sensor
V	Fan (vaporiser)
VS	Protection against scalding VTA32

Tab. 6-1 Short names in hydraulic drawings

7 Service and maintenance

The Daikin EKHWP is practically maintenance free as a result of its design. No corrosion protection equipment is required (such as sacrificial anodes). This means there is no need for maintenance work such as changing the protective anodes or cleaning the inside of the storage tank.

Regular inspection of the domestic hot water storage tank guarantees a long working life and fault-free operation.

WARNING!

Live parts can cause an electric shock on contact and cause fatal burns or injuries.

- If there is a Booster Heater or regulation and pump station installed in the hot water storage tank then these components must be isolated from the power supply before starting the inspection and maintenance work (e.g. fuse, main switch switched off and secured against inadvertent switching on again).

WARNING!

All work performed on live components must be carried out in accordance with the proper procedures, otherwise there may be a danger to the life and health of individuals and the function may be impaired.

- Rectification of damage to live components may only be carried out by heating specialists authorised and recognised by the energy supply company.

7.1 Periodic Checks

The filling water can evaporate slightly over a period of time as a result of the design. This process does not represent a technical fault, but is rather a physical property which requires periodic checking and correction of the water level, if necessary, by the operator.

- Visual check of the water storage tank level (filling level indicator)
  ➔ Top up the water if necessary (see chapter 3 "Set-up and installation", section 3.3.2), and also determine the cause of the low water level and rectify it.

7.2 Annual inspection

- Carry out a functional check of the Booster Heaters by checking the temperature display and the switching states in the individual modes:
  – Electric immersion heater: see the associated installation and operating instructions.
  – Booster Heater: see chapter "Operation" in the associated installation and operating instructions.
- If a solar system is connected and is in operation, switch it off and empty the solar panels.
- Visual inspection of the general condition of the domestic hot water storage tank.
- Visual check of the water storage tank level (filling level indicator)
  ➔ Top up the water if necessary (see chapter 3 "Set-up and installation", section 3.3.2), and also determine the cause of the low water level and rectify it.
- Check the connection of the safety overflow and drain hose for leaks, free drainage and gradient.
  ➔ If necessary, clean the safety overflow and drain hose and relay it; replace damaged parts.
- Visual check of connections and pipes. In the event of damage, determine the cause.
  ➔ Replace defective parts.
- Check all electrical components, connections, and cables.
  ➔ Repair damaged parts or replace them.
- Check the water pressure of the cold water supply (<6 bar)
  ➔ and if necessary the fitting or adjustment of the pressure reducer.
- Clean the plastic storage tank **with soft cloths and a mild cleaning agent**. Do not use cleaning agents containing aggressive solvents, as this will damage the plastic surface.

8 Technical data

Not all the hot water storage tanks listed here are offered certain countries.

8.1 Basic data

Unpressurised (DrainBack) - DB p=0	Unit	EKHWP300B	EKHWP500B
Energy labelling Regulation: (EU) 811/2013 / Ecodesign Regulation: (EU) 813/2013			
Energy efficiency class	—	B	
Standing loss	W	64	72
Hot water storage tank volume	litres	294	477
Basic data			
Empty weight	kg	58	82
Total filled weight	kg	359	593
Dimensions (L x W x H) without switching unit from E-PAC	cm	59.5 x 61.5 x 164.6	79 x 79 x 165.8
Tilt dimension	cm	163	167
Maximum permissible storage water temperature	°C	85	
Heat consumption at stand-by and at 60°C	kWh/24h	1.3	1.4
Drinking water heat exchanger (stainless steel 1.4404)			
Potable water capacity	litres	27.9	
Maximum operating pressure	bar	6	
Domestic water heat exchanger surface	m^2	5.8	6.0
Storage tank charging heat exchanger (stainless steel 1.4404)			
Water capacity heat exchanger	litres	13.2	18.5
Heat exchanger surface area	m^2	2.7	3.8
Solar heating backup (stainless steel 1.4404)			
Water capacity heat exchanger	litres	—	2.3
Heat exchanger surface area	m^2	—	0.5
Thermal output data			
Volume of hot water without reheating at draw-off rate (8 l/[3]/12 l/min[4]) (T_{KW} = 10°C/T_{WW} = 40°C/T_{SP} = 50°C)	litres	184 [3] / 153 [4]	364 [3)7)] / 318 [4)7)] 328 [3)8)] / 276 [4)8)]
Volume of hot water without reheating at draw-off rate (8 l/[4]/12 l/min[4]) (T_{KW} = 10°C/T_{WW} = 40°C/T_{SP} = 60°C)	litres	282 [3] / 252 [4]	540 [3] / 494 [4]
Volume of hot water without reheating at draw-off rate (8 l/[4]/12 l/min[4]) (T_{KW} = 10°C/T_{WW} = 40°C/T_{SP} = 65°C)	litres	352 [3] / 321 [4]	612 [3] / 564 [4]
Reheating time (Wh) with a draw-off quantity (bathtub: 140 l [5] / shower: 90 l [6]) (T_{KW}=10°C / T_{WW}=40°C / T_{SP}=50°C)	min	45 [5)9)] / 30 [6)9)]	25 [5)10)] / 17 [6)10)]
Pipe connections			
Cold and hot water	inches	1" AG	
Heating flow / Return flow	inches	1" IG / 1" AG	
Solar connections	inches	1" IG	

Tab. 8-1 Basic data EKHWP - Drain-Back p=0

7) Charging by heat pump and electric booster heater.
8) Charging only by heat pump without electric booster heater.
9) With heat pump 8 kW.
10) With heat pump 16 kW.

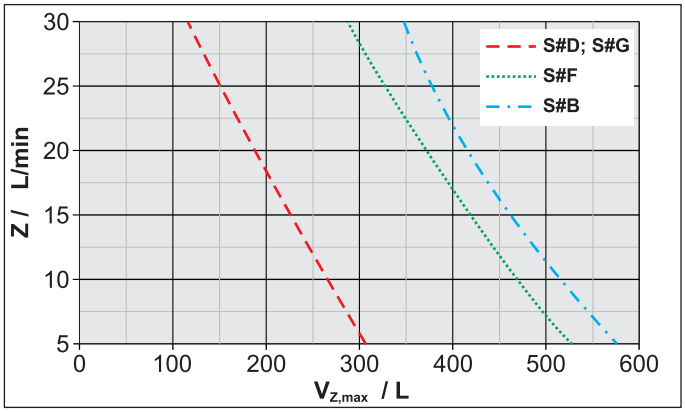
Pressurised system - P	Unit	EKHWP300PB	EKHWP500PB
Energy labelling Regulation: (EU) 811/2013 / Ecodesign Regulation: (EU) 813/2013			
Energy efficiency class	—	B	
Standing loss	W	64	72
Hot water storage tank volume	litres	294	477
Basic data			
Empty weight	kg	58	89
Total filled weight	kg	364	598
Dimensions (L x W x H) without switching unit from E-PAC	cm	59.5 x 61.5 x 164.6	79 x 79 x 165.8
Tilt dimension	cm	170	167
Maximum permissible storage water temperature	°C	85	
Heat consumption at stand-by and at 60°C	kWh/24 h	1.3	1.4
Domestic hot water (stainless steel 1.4404)			
Potable water capacity	litres	27.9	29.0
Maximum operating pressure	bar	6	
Domestic water heat exchanger surface	m^2	5.8	
Storage tank charging heat exchanger (stainless steel 1.4404)			
Water capacity heat exchanger	litres	13.2	18.5
Heat exchanger surface area	m^2	2.7	3.8
Pressurised solar heat exchanger (stainless steel 1.4404)			
Water capacity heat exchanger	litres	4.2	12.5
Heat exchanger surface area	m^2	0.8	1.7
Solar heating backup (stainless steel 1.4404)			
Water capacity heat exchanger	litres	—	2.3
Heat exchanger surface area	m^2	—	0.5
Thermal output data			
Volume of hot water without reheating at draw-off rate (8 l/[3]/12 l/min[4]) (T_{KW} = 10°C/T_{WW} = 40°C/T_{SP} = 50°C)	litres	184 [3] / 153 [4]	324 [3)7)] / 282 [4)7)] 288 [3)8)] / 240 [4)8)]
Volume of hot water without reheating at draw-off rate (8 l/[4]/12 l/min[4]) (T_{KW} = 10°C/T_{WW} = 40°C/T_{SP} = 60°C)	litres	282 [3] / 252 [4]	492 [3] / 444 [4]
Volume of hot water without reheating at draw-off rate (8 l/[4]/12 l/min[4]) (T_{KW} = 10°C/T_{WW} = 40°C/T_{SP} = 65°C)	litres	352 [3] / 321 [4]	560 [3] / 516 [4]
Reheating time (Wh) with a draw-off quantity (bathtub: 140 l [5] / shower: 90 l [6]) (T_{KW}=10°C / T_{WW}=40°C / T_{SP}=50°C)	min	45 [5)9)] / 30 [6)9)]	25 [5)10)] / 17 [6)10)]
Pipe connections			
Cold and hot water	inches	1" AG	
Heating flow / Return flow	inches	1" IG / 1" AG	
Solar connections	inches	3/4" IG / 1" AG	

Tab. 8-2 Basic data EKHWP - pressurised system

7) Charging by heat pump and electric booster heater.
8) Charging only by heat pump without electric booster heater.
9) With heat pump 8 kW.
10) With heat pump 16 kW.

8 Technical data

8.2 Performance diagrams



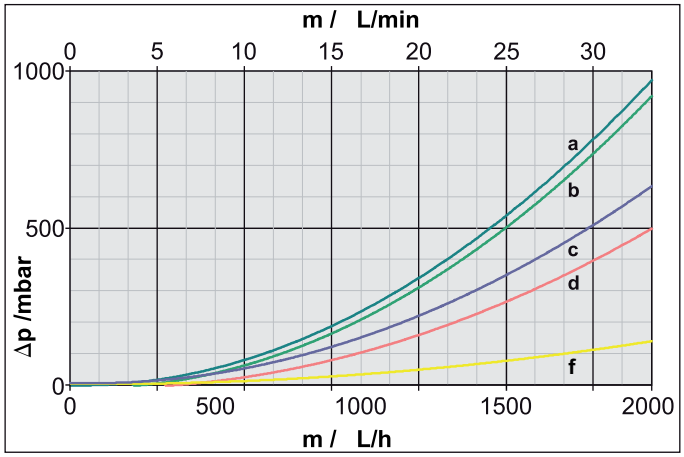
S#B EKHWP500B
S#D EKHWP300B
S#F EKHWP500PB
S#G EKHWP300PB

Z/ L/min
Draw-off rate in litres per minute
V_{Zmax}/L
Maximum draw-off rate in litres

Hot water volume without re-heating (T_{KW} = 10°C, T_{WW} = 40°C, T_{SP} = 60°C).

Fig. 8-1 Hot water performance as a function of the draw-off rate

Draw-off rates >36 l/min can, in certain rare circumstances, lead to noises in the domestic water heat exchanger of the hot water storage tank.



a Domestic water heat exchanger (EKHWP500B, EKHWP500PB)
b Domestic water heat exchanger (EKHWP300B, EKHWP300PB)
c Storage tank charging heat exchanger 1 (EKHWP500B, EKHWP500PB)
d Storage tank charging heat exchanger 1 (EKHWP300B, EKHWP300PB)
f Heating support heat exchanger (EKHWP500B, EKHWP500PB)

Δp/mbar Pressure drop in millibar
m/ L/h Flow rate in litres per hour
m/ L/h Flow rate in litres per minute

Fig. 8-2 Pressure drop characteristic for the heat exchanger

8.3 Tightening torque

Designation	Thread size	Tightening torque
Hydraulic line connections (water)	1"	25 to 30 Nm
Booster heater	1.5"	max. 10 Nm (hand-tight)
Cabling on terminal rail K1 (EHS)	all	0.5 - 1.5 Nm
Tension release (EHS)	M20	6 Nm
Cover flap fixing screws (EHS)	4.2 x 19	1.5 Nm

Tab. 8-3 Tightening torque

9 Notes

9 Notes

10 List of keywords

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