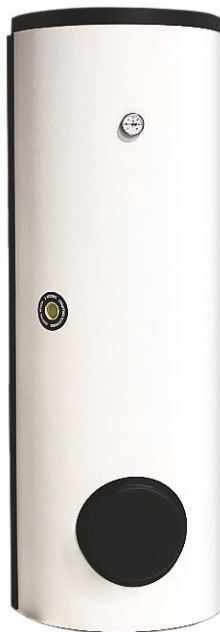


Installation manual Operating instructions

DHW storage tank

WBO 406 UNO/DUO/H/WPSOL



Installation and commissioning must be undertaken by a specialist.

General terms and conditions of warranty state that all installations must be carried out by a suitably trained and qualified plumber who observes the local norms and regulations.

The installation and maintenance record must be entirely completed and the user has to be instructed accordingly.

Efficient operation can only be guaranteed if the instructions of this manual are followed.

Warranty does not cover any damage caused due to non-observance of this manual and the technical rules in force.

The system is to be checked annually by a specialized company. In addition, occurring defects must be repaired immediately.

This document should be handed over to the client on completion of the installation.

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1 General

Depending on the type and design, the tanks are suitable for heating and / or storing DHW and / or heating water. The heating is achieved indirectly via heat generators, if applicable, from different heat sources. The maximum working pressure and working temperature can be found in the technical data.

Set-up, installation and commissioning must be undertaken by a qualified specialist, who must observe these instructions.

The site of installation must be frost-protected according to DIN 4753 and should be in direct proximity to the heat generator.

When setting-up and installing the tank, the following regulations should be considered:

In addition to the technical rules in force DIN 1988, DIN 18160, DIN 4753, DIN 4109, DIN 4708, DIN 4751 section 2-4 energy conservation law and VDE regulations are to be observed. Moreover, the relevant regulations of the suppliers as well as legal building regulations are to be considered.

DHW requirements:

- Minimum hardness:
 - 2° dh (sum of alkaline earths 0,4 mmol/l)
- Conductivity
 - if external current anode is used $\geq 100 \mu\text{s/cm}$
 - if Mg-anode is used $130 \mu\text{s/cm} - 1500 \mu\text{s/cm}$
- pH-value according to Drinking Water Ordinance (6,5-9,5)

Important: The exhaust pipe must be at least as big as the safety valve outlet in width. It may not have more than 2 bends and should not be longer than 2 m. If for any compelling reasons 3 bends or a length up to 4 m are required, then the entire exhaust line must be designed one nominal size larger. More than 3 bends, or a length exceeding 4 m is prohibited. The exhaust pipe must be installed with downward gradient. The drain line behind the funnel must feature at least the double width of the valve entrance. A sign is to be attached close to the exhaust pipe of the safety valve or on the safety valve itself. „For safety reasons water may leak from the exhaust pipe during the heating process! Do not lock! "The operability of the safety valve is to be checked at regular intervals by means of de-ventilation.

2 Transport and installation

In order to prevent damage during transport, the packaging should only be removed at the site of installation. During shipment, it should be ensured that the tank does not come in contact with any spiky or sharp items, nor is damaged through dropping or knocks.

During installation, the tank must be disconnected from any humidity carrying components. Moreover, sufficient space for maintenance and cleaning purposes should be kept free in front of, beside, above and behind the tank.

Important information for the specialist:

1. **Screw the provided anode loosely in the corresponding socket before tank installation. Once the tank is filled and vented, the anode must be screwed tightly and hermetically sealed.**
2. **If the tank is not equipped with an electric heating element, the corresponding IG 11/2" socket must be sealed on site with a red brass screw plug. Please remove the existing protection cap and replace it with this plug.**
3. **The sleeves IG 1/2 "for venting and emptying must be sealed with suitable plugs or venting / draining valves. Please remove the existing protective caps and replace them with these plug or vent / drain valves.**

3 Dimensions and connections

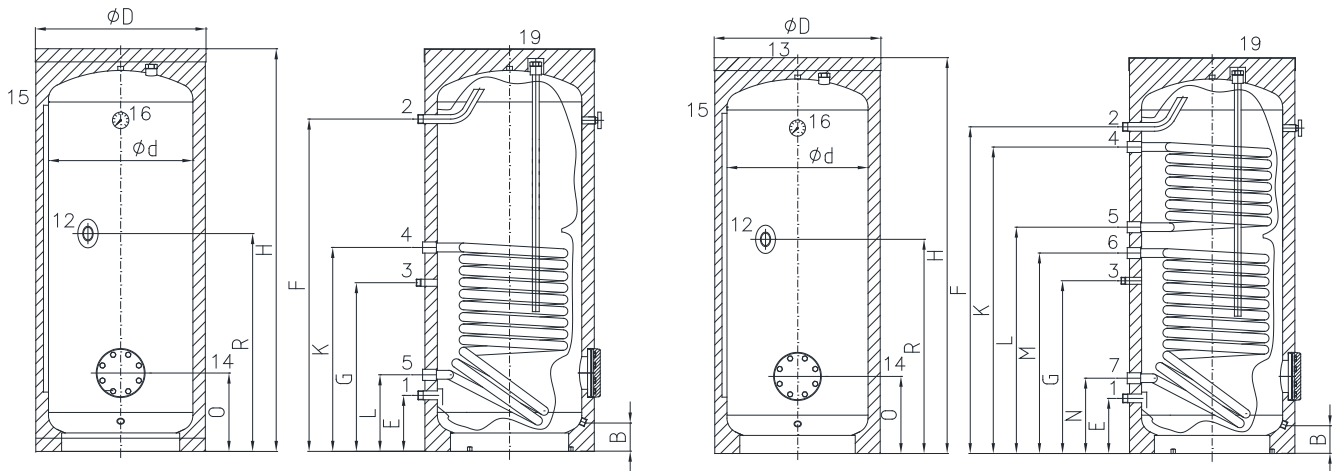


Illustration1

Dimensions:

Type	∅ d	∅ D	E	F	G	H	K	L	M	N	O	R	W	B
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
WBO 406 UNO	600	840	250	1420	670	1760	770	330	-	-	335	822	1800	145
WBO 406 DUO	600	840	250	1420	670	1760	1398	870	770	330	335	822	1800	145
WBO 406 H	600	840	250	1420	998	1760	1098	285	-	-	335	1155	1800	145
WBO 406 WPSOL	600	840	250	1420	670	1760	1398	870	770	330	335	822	1800	145

Chart1

W = Tilting dimension

Connections:

Type	WBO 406 UNO	WBO 406 DUO	WBO 406 H	WBO 406 WPSOL
Cold water / hot water	1/2	Ga	1	1
Circulation	3	Ga	3/4	3/4
Aux boiler flow / return	4/5	Gi	1	5/4
Solar flow / return	6/7	Gi	-	1
Plug for electric heater	12	Gi	6/4	6/4
Inspection flange	14	NW	116	116
Sensor tube	15	∅mm	10	10
Anode	19	Gi	5/4	5/4
Vent / Drain	13/B	Gi	1/2	1/2

Chart 2

Ga = male thread
Gi = female thread
NW = nominal size

4 Technical data

Description		WBO 406 UNO	WBO406 DUO	WBO406 H	WBO 406 WPSOL
Storage volume (real) acc. to DIN EN 12897	[litre]	428	427	423	423
Max. working temperature DHW / Heating	[°C]	95 / 130	95 / 130	95 / 110	95 / 110
Max. working pressure DHW / Heating	[bar]	10 / 16	10 / 16	10 / 16	10 / 16
Capacity of heat exchanger lower / upper	[litre]	10,5	10,5 / 5,9	32,7	10,5 / 19,6
Surface of heat exchanger lower / upper	[m ²]	1,6	1,6 / 0,9	5,0	1,6 / 3,0
Flow rate of heat exchanger lower / upper	[m ³ /h]	2,5	2,5 / 2,5	2,5	2,5 / 2,5
Pressure drop of heat exchanger lower / upper	[mbar]	60	60 / 35	26	60 / 20
Insulation	[mm]	120 - Neopor / fleece			
Performance lower heat exchanger DHW 80 °C / 60 °C / 10 °C upper heat exchanger	[l/h (kW)]	600 (35)	600 (35) 370 (22)	1390 (81)	600 (35) 990 (58)
Standing loss	[Watt]	73	76	73	76
Willingness to heat	Kwh/ 24h	1,76	1,82	1,76	1,82
Energyefficiency class		B	B	B	B
Weight (empty)	[kg]	ca. 155	ca. 176	ca. 216	ca. 209

Chart 3

5 Installation

All pipes connecting to the tank should have removable connections (fitting/flange). Pipe thread seals with teflon are to be avoided.

All tank connecting pipes are to be planned, constructed and tested according to the technical rules in force, as well as to the corresponding norms and regulations in accordance with their application and supply medium.

Appropriate filters should be used to prevent dirt or particles from entering the tanks. Moreover, the tank should be ensured against pressure fluctuations and excess pressure through the installation of tested pressure reducing valves and safety valves.

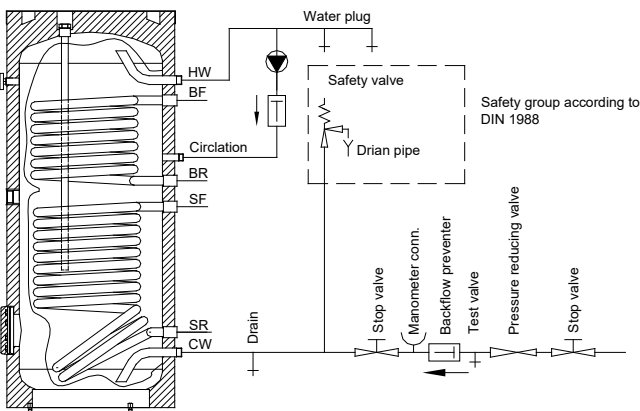
Sensors and thermostats necessary for temperature control must be securely and permanently positioned on the tank (immersion sleeve and sensor rail).

The tank's venting and draining facilities must have the appropriate dimensions and be correctly installed.

The installation company is responsible for the correct execution of work and for the safe and careful insulation of the pipes.

- When connecting to a solar plant, a temperature limiter is required and must be installed on site at the hot water outlet in order to prevent scalding.

Connection Scheme (according to DIN 1988)



Connection Scheme (according to DIN 1988)

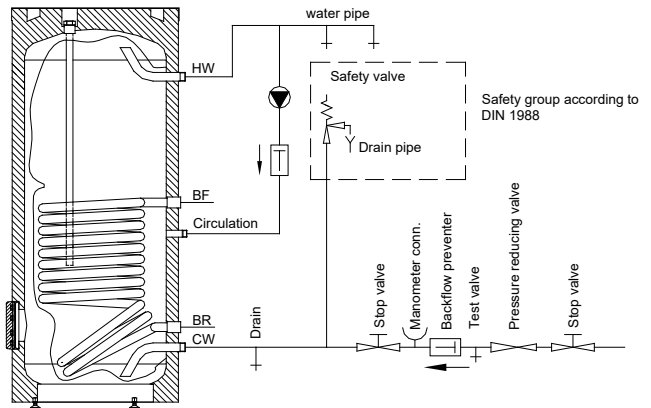


Illustration 2 (Schematic diagram)

The size of the DHW safety valve is shown below:

Content of DHW space	Min. valve size	Max. heating performance
up to 200 l	NW 15 (1/2")	75 kW
above 200 to 1000 l	NW 20 (3/4")	150 kW

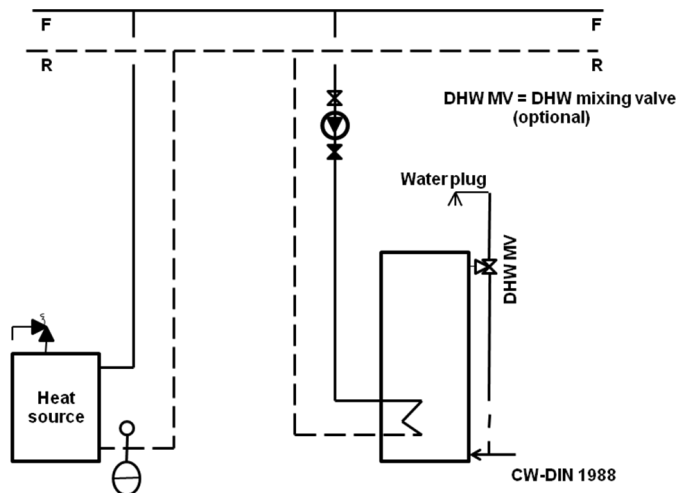
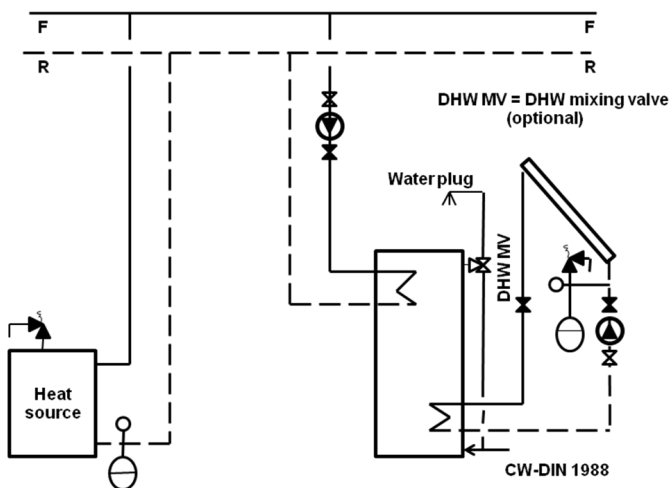


Illustration 3 (Schematic drawing– example hydraulic system heating)

6 Commissioning

- Before putting into operation, the entire system should be flushed through. Particles in the system compromise the operating reliability.
- Fill the heating system slowly with water and vent all the air.
- Open the **cold water stop valve** and all hot water nozzles. The hot water heat exchanger is full when water leaks out of all hot water nozzles. Then close all nozzles again.
- Start-up the heating system.
- Set the DHW temperature and supervise the system while heating up.
- While the System is heating up, water will leak out of the safety valve.
- **Before the handover of the system to the end user/owner, the plumbing contractor should ensure that the system is tested to full load, controls are set and that pipe work and connections are without leaks.** Afterwards, the end user has to be instructed in the operation and handling of the tank, as well as the system. The instruction must be documented in the installation and maintenance record.,
- Please note that the operation and lifetime of the system depend decisively on a regular maintenance.

7 Maintenance and wear parts

Regular maintenance increases the lifetime and operation reliability of the system. Decalcification at regular intervals may be necessary in highly calcareous water areas.

1. Close the cold water stop valve and drain the tank to check the inner tank as well as the heat exchanger. Disconnect any electrical devices from the appliance. Then, carefully remove the insulation of the flange cover and unscrew the flange cover. Limescale and rough residues can be crushed by a wooden bar. Only use an approved decalcifier. Screw the flange cover hermetically after the cleaning process by using a new flange seal. Fill the tank and check all connections for tightness. Finally, replace the insulation and, if necessary, remount the electrical devices accordingly.
A chemical decalcification can be carried out by a specialist using an approved decalcifier and taking the appropriate precautions. Please note that the tank must be disconnected from the DHW installation (cold water / hot water / circulation).
2. For protection purposes, the tank is equipped with a magnesium protection anode. Its transmission depends on the local water properties. It should be examined for the first time after 2 years and afterwards annually in order to check its transmission. The diameter should be at least 1/3 of the original diameter, the surface should be homogenous and without any limescale crust. If necessary, it should be replaced by an original anode of the manufacturer to protect the tank against corrosion.
2.a. Alternatively, the tanks can be equipped with an external current anode. Please note that a protection against corrosion is only guaranteed if the anode is energized and connected accordingly.
If the protection anode is neglected, this can cause damage through corrosion and lead to a loss of warranty.
3. The safety valve protects the tank against excess pressure. The functional capacity must be checked at regular intervals by venting. If an expansion vessel is used, the safety valve is not, or only rarely, required. Over a longer period of time therefore, it can become blocked and not function when needed.
4. If there is a danger of freezing, the DHW tank should be permanently heated or completely emptied.
5. A damp cloth is sufficient to clean the outer parts. Please avoid using any abrasive or solvent cleaning agents.

8 Recycling and disposal

The products are specified and manufactured according to VDI 2243. The products are mechanically separable and 100% recyclable. Make sure that the components are disposed according to the relevant regulations.

9 Warranties and guarantee

The warranty for our products is based on the legal provisions of the general Civil Code and the Consumer Protection Act.

In addition, defective appliances are replaced within the framework of our full warranty within 1 year, as of the date of the invoice, including the replacement, procurement and incidental costs. As far as our hot-water heaters and pressurized boilers are concerned, the warranty amounts for 6 months, as of the date of the invoice.

Subsequent to the full warranty, defective tanks are replaced within the framework of our guarantee. The guarantee of the different products and the conditions are shown in the table below.

All other claims are excluded. Repairs and costs which occur due to damage, inappropriate installation, chemical, electrochemical or electrical influences, incorrect operation or improper manipulation, are excluded. Furthermore, the warranty becomes invalid if the appliance has been modified through the installation of externally supplied parts or through irregular professional maintenance.

Subject to our general terms and conditions.

Products	Legal warranty 2 years	Guarantee years*	Conditions
DHW storage tanks			
WBO T/ToF/TB/TOFB	•	5	20 / 27
WBL	•	5	20 / 27
WBO Uno	•	5	20 / 27
WBO Duo	•	5	20 / 27
WP/Sol	•	5	20 / 27
WBO H	•	5	20 / 27
GS	•	5	20 / 27
Combi buffer tanks			
Wikosol Twin	•	10	27
Wikosol	•	10	27
WPKR H Twin	•	5	20 / 27
WPKR Twin	•	5	20 / 27
WPKR	•	5	20 / 27
WPK	•	5	20 / 27
WPH-FW (tank)	•	5	27
WPR-FW (tank)	•	5	27
Buffer tanks			
WPS	•	5	20 / 27
WPH	•	5	-
WPR	•	5	-
WPRR	•	5	-
WKS	•	5	-
Tank accessories			
Cu-finned tube heat exchanger	•	-	27
Electric heating element	•	-	-

Conditions:

20	Under condition that the limits of the valid DHW regulations have been respected, the anode has been examined for the first time after 2 years and afterwards annually and that the anode has been replaced by an original anode of the manufacturer (individual receipts needed) by a specialized company.
27	Coverage Germany: Compliance with the limits of the valid DHW regulations (TrinkwV 2001), especially the limits in accordance with Appendix 2, Part 1-2 and Appendix 3 Coverage EU : Compliance with the limits of the EG-Regulations 83/98

* Start of guarantee at date of invoice

10 Installation record

The installation has been completed according to DIN and the technical rules in force. In addition, the customer has received instruction concerning the operation and maintenance.

Place..... Date.....

Customer Installer

..... Signature Signature

Place of installation:

Name:

ZIP Code/Place:

Street:

Phone:

Tank model: Serial number

Date of invoice

Anode maintenance record

Date	Visual examination of anode	Exchange of anode	Signature + stamp of installer

In the case of reclamation, the receipts for maintenance must be provided as proof. Please complete the data sheet, including the reason for reclamation, and submit to Wikora.

Submitting the maintenance record does not ensure any promise of guarantee or claim.