

Storatherm Aqua Compact

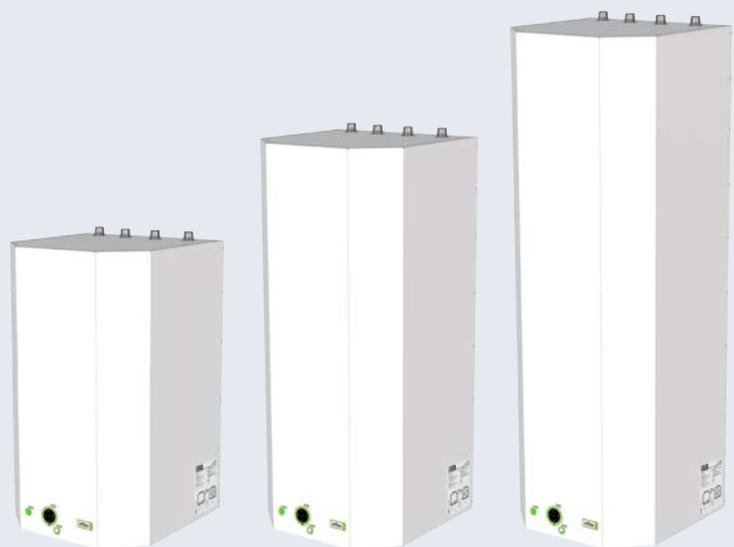
With heat exchanger: AC 60/1-W, AC 110/1-W, AC 160/1-W

With electric heating element: AC 60/E-W, AC 100/1-W, AC 160/1-W

With electric heating element and heat exchanger: AC 60/1E-W, AC 110/1E-W, AC 160/1E-W

GB Operating manual

Original operating manual



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1 Notes on the operating manual

This operating manual is an important aid for ensuring the safe and reliable functioning of the device.

The operating manual will help you to:

- avoid any risks to personnel.
- become acquainted with the device.
- achieve optimal functioning.
- identify and rectify faults in good time.
- avoid any faults due to improper operation.
- cut down on repair costs and reduce the number of downtimes.
- improve the reliability and increase the service life of the device.
- avoid causing harm to the environment.

Reflex Winkelmann GmbH accepts no liability for any damage resulting from failure to observe the information in this operating manual. In addition to the requirements set out in this operating manual, national statutory regulations and provisions in the country of installation must also be complied with (concerning accident prevention, environment protection, safe and professional work practices, etc.).



Notice!

Every person installing this equipment or performing any other work at the equipment is required to carefully read this operating manual prior to commencing work and to comply with its instructions. The manual is to be provided to the device operator and must be stored near the device for access at any time.

2 Liability and guarantee

The device has been designed using state-of-the-art technology and in accordance with generally recognised technical safety regulations. Nevertheless, its use can pose a risk to life and limb of personnel or third persons as well as cause damage to the system or other property.

It is not permitted to make any modifications at the device, such as to the hydraulic system or the circuitry.

Warranty and liability claims will not be accepted by the manufacturer if these can be traced back to one or more of the following causes:

- Improper use of the device.
- Improper start-up, operation, maintenance, servicing, repair or installation of the device.
- Failure to observe the safety information in this operating manual.
- Operation of the device with defective or improperly installed safety/protective equipment.
- Failure to perform maintenance and inspection work according to schedule.
- Use of unapproved spare parts and accessories.

The proper installation and start-up of the device is a prerequisite for the making of warranty claims.

3 Safety

3.1 Explanation of symbols

3.1.1 Symbols and notes used

The following symbols are used in this operating manual.



Danger

- Danger to life and/or severe damage to health
 - The corresponding warning symbol in combination with the "Danger" signal term indicates an imminent threatening danger which will result in death or severe (irreversible) injuries.



Warning

- Severe damage to health
 - The corresponding warning symbol in combination with the "Warning" signal term indicates a threatening danger which may result in death or severe (irreversible) injuries.



Caution

- Damage to health
 - The corresponding warning symbol in combination with the "Caution" signal term indicates a danger which may result in minor (reversible) injuries.



Attention!

- Damage to property
 - This symbol in combination with the "Attention" signal word indicates a situation that may cause damage to the product itself or objects in its vicinity.



Notice!

This symbol in combination with the "Notice" signal word indicates useful tips and recommendations regarding the efficient use of the product.

3.1.2 Safety symbols used

The following safety symbols are used in this operating manual. They are also attached to the equipment or in its vicinity.



This symbol warns of electric.voltage.



This symbol warns of a hot surface.



This symbol warns of overpressure in conduits and connections.

3.2 Personnel requirements

Only specialist personnel or specifically trained personnel may install and operate the equipment.

The electric connections and the wiring of the device must be executed by a specialist in accordance with all applicable national and local regulations.

3.3 Personal protective equipment

When working at the system, wear the stipulated personal equipment such as hearing and eye protection, safety boots, helmet, protective clothing, protective gloves.



See the national regulation of your country for personal protective equipment required.

3.4 Intended use

This storage tank is to be used solely for the heating of drinking water.

Any other use is regarded as improper use, and no liability will be accepted for any resulting damage.

3.5 Inadmissible operating conditions

The device is not suitable for the following applications:

- Mobile system operation
- Outdoor operation
- Usage with mineral oils
- Usage with flammable media
- Usage with distilled water or water with a conductivity $< 100 \mu\text{S}/\text{cm}$



Note!

It is not permitted to make any modifications to the hydraulic system or the circuitry.

3.6 Residual risks

This device has been manufactured to the current state of the art. However, some residual risk cannot be excluded.



Caution – risk of burning!

- Excessively hot surfaces in heating systems can cause burns on the skin.
 - Wear protective gloves.
 - Please place appropriate warning signs in the vicinity of the device.



Caution – risk of injury!

- If installation, removal or maintenance work is not carried out correctly, there is a risk of burns and other injuries at the connection points, if pressurised hot water or hot steam suddenly escapes.
 - Ensure proper installation, removal or maintenance work.
 - Ensure that the system is de-pressurised before performing installation, removal or maintenance work at the connection points.



Warning – large weight!

- The devices are very heavy. Thus, there is a risk of physical damage and accidents.
 - Use only lifting gear suitable for transport and installation.

4 Description of the device

4.1 Regulations

Concerning the installation and operation of the device, the following standards, regulations and directives have to be complied with:

- DIN EN 806 / DIN EN 1717 / DIN 1988 / DIN 4708 / EN 12975
- DVGW Worksheet W 551 / Worksheet W 553 (German Technical and Scientific Association for Gas and Water)
- EnEG (German energy saving act)
- EnEV (German ordinance on energy-saving thermal protection and energy-saving plant technology in the case of buildings)
- Local regulations
- VDE regulations

4.2 Transportation

The storage tank must under no circumstances be transported on its side to the installation location. Comply with package labelling! The storage tank is not to be removed from its packaging until the installation location has been reached. Move the storage tank carefully during transportation and set it down gently.

4.3 Corrosion protection

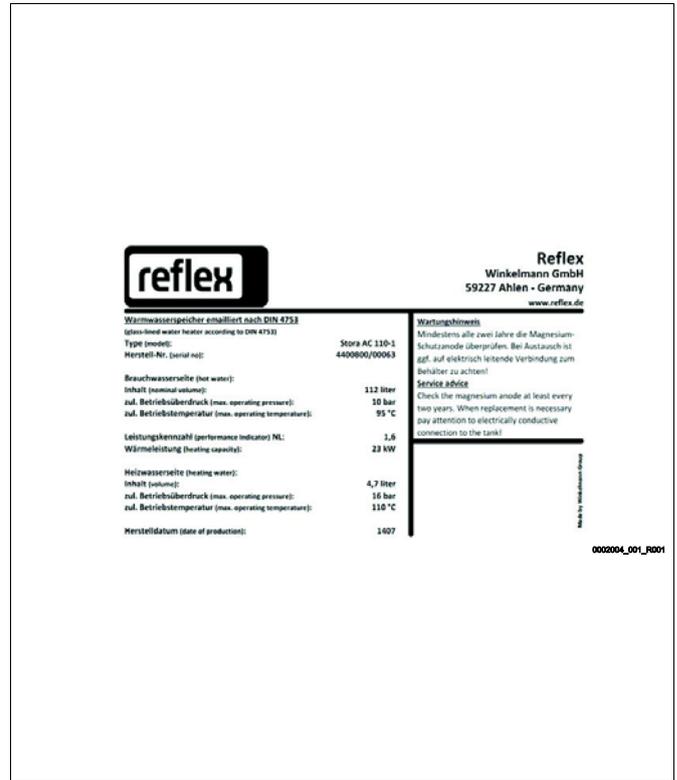
This hot-water storage tank has an enamel coating on the "drinking water" side in compliance with DIN 4753, Part 3. This coating is neutral to conventional installation materials and industrial water. A magnesium anode is installed to provide additional protection. The drinking water must have a minimum conductivity of 100 $\mu\text{S}/\text{cm}$; otherwise, anode-based protection cannot be guaranteed.

4.5 Identification

4.5.1 Nameplate

The nameplate provides information on manufacturer, year of manufacture, part number and technical data. The nameplate can be found on the right side of the storage tank.

Information on nameplate	Meaning
Hot water tank, enamelled acc. to DIN 4753	
Type	Device name
Serial No.	Serial number
Hot water	Service water
Nominal volume	Fill volume
Max. operating pressure	Maximum working pressure
Max. operating temperature	Maximum working temperature
Performance Indicator	Duct number
Heating capacity	Thermal output
Heating water	Hot water end
Volume	Capacity
Max. operating pressure	Maximum working pressure
Max. operating temperature	Maximum working temperature
Date of production	Date of manufacture



4.5.2 Type code

No.	Type (model)	Type code
1	Storatherm Aqua Compact AC .../1-W	Storage water heater with straight-tube heat exchanger
2	Storatherm Aqua Compact AC .../E-W	Storage water heater with electric heating element
3	Storatherm Aqua Compact AC.../1E-W	Storage water heater with straight-tube heat exchanger and electric heating element

5 Technical data

		Type	AC60/1-W	AC110/1-W	AC160/1-W	AC60/1E-W	AC110/1E-W	AC160/1E-W	AC60/E-W	AC110/E-W	AC160/E-W
Nominal capacity		l	67	112	166	65	110	164	71	117	171
Diameter		mm	398								
External dimensions		mm	461 x 461								
Height	H	mm	700	1065	1492	700	1065	1492	700	1065	1492
Height of wall fastening	H1		533	855	1225	533	855	1225	533	855	1225
Weight		kg	52	65	91	58	71	97	51	64	90
Connection point size for drinking water											
Cold water	KW	R	3/4"			3/4"			3/4"		
Hot water	WW	R	3/4"			3/4"			3/4"		
Connection point size for heater											
Supply flow	VL	R	3/4"			3/4"			-		
Return flow	RL	R	3/4"			3/4"			-		
Electric heater											
Voltage		U	-			400 V / 230 V					
Power		P	-			3000 W / 1000 W					
Control range			-			7 °C - 85 °C					
Shut-off device			-			110 °C					
Flange	TK	mm	150 (8 x M10)								
Heating surface		m ²	0.75	0.95		0.75	0.95		-	-	
Continuous power	KW (10°C)	kW	18	23		18	23		-	-	
	tWW = 45°C	l/h	440	566		440	566		-	-	
Heat exchanger capacity		l	3.6	4.7		3.6	4.7		-	-	
Performance indicator (standard litres)			1	1.5	2.2	1	1.5	2.2	-	-	-
Insulation thickness		mm	30								
Permissible operating pressure	Heating water	bar	10						-		
	Drinking water	bar	10								
Permissible operating pressure	Heating water	°C	110						-		
	Drinking water	°C	95								

6 Installation



Danger – electric shock!

- Risk of serious injury or death due to electric shock.
 - Ensure that the system is voltage-free before installing the device.
 - Ensure that the system is secured and cannot be reactivated by other persons.
 - Ensure that installation work for the electric connection of the device is carried out by an electrician, and in compliance with electrical engineering regulations.



Caution – risk of injury!

- If installation, removal or maintenance work is not carried out correctly, there is a risk of burns and other injuries at the connection points, if pressurised hot water or hot steam suddenly escapes.
 - Ensure proper installation, removal or maintenance work.
 - Ensure that the system is de-pressurised before performing installation, removal or maintenance work at the connection points.



Caution – risk of burning!

- Excessively hot surfaces in heating systems can cause burns on the skin.
 - Wear protective gloves.
 - Please place appropriate warning signs in the vicinity of the device.

6.1 Installation conditions



Note!

Following receipt of the goods, please check the delivery for completeness and damage. Document any damage sustained during transportation, and contact the forwarding agent to register a complaint accordingly.

6.1.1 Installation location

Install the storage tank in a frost-proof room. If the storage tank is wall-mounted, ensure that the wall has sufficient load-bearing capacity. If the storage tank is installed below the roof, it is recommended to use a water-collecting pan. If the storage tank is installed in a cabinet, ensure a sufficiently dimensioned opening for ventilation.

6.1.2 Installation

Self-circulation is to be avoided. In all storage tank circuits, the pipes should be laid out so that self-circulation cannot occur. To this end, it is recommended to install a non-return valve or check valve with return-flow preventer at all storage tank circuits.

6.1.3 Connection on "heating water" side

Connect the heating coil in counterflow mode. Do not swap supply- and return-flow connection elements. Ensure that the charging line is as short as possible and well insulated. Provide the charging line with a drain valve.

6.1.4 Connection on "water" side

Make the connection to the cold-water pipe in accordance with DIN 1988, using suitable individual fittings or a complete safety assembly.



Attention! – Contact corrosion at the connections

Plastic inserts in the connection may be damaged during welding work.

- Ensure that the plastic inserts are neither removed nor damaged during welding work.
- For copper drinking-water connection points, use connection fittings made of brass or red bronze.



Attention! – Equipment damage

Equipment damage due to incorrect installation of the safety valve.

- Install only a type-approved safety valve.
- Adjust the safety valve settings so that the permissible working pressure cannot be exceeded.
- Install the blow-off pipe of the safety valve so that its end is positioned above a drainage point in a frost-proof area, and is clearly visible.
- The blow-off pipe must match at least the outlet cross-section of the safety valve.

6.2 Preparatory work

Conditions for device installation:

- Frost-free, well-ventilated room.
 - Room temperature range: 5 °C to 45 °C.
- Electric connection: 400 V~, 50 Hz, max. 20A. Alternatively, 230 V~, 50 Hz.
- Usage of approved transport and lifting equipment only.

6.3 Execution



Attention! – Damage due to improper installation

Bear in mind that the device may be subject to additional stresses through the connection of piping or system equipment.

- Ensure that pipes are connected from the device to the system without stresses being induced.
- If necessary, provide support structures for the pipes or devices.

Proceed as follows when installing the device:

- Position the device.



Note!

During installation, pay attention to the operability of the valves and the inlet options for the connecting lines.

6.3.1 Hydraulic connection



Attention! – Equipment damage

Install the supplied flow pipe as required by the connection position to ensure proper functioning.



Note!

Use blind plugs to close all unused connections.

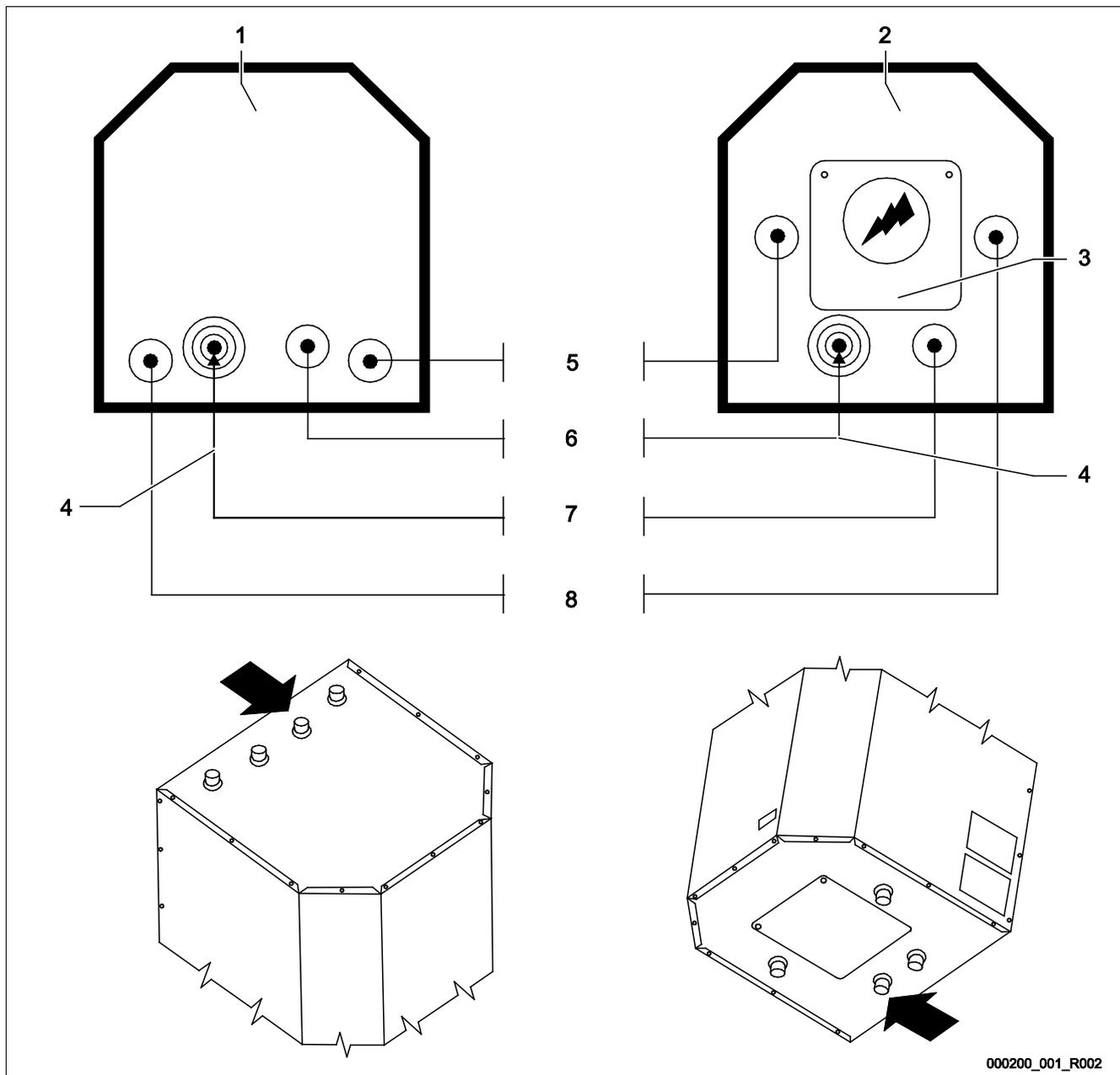
- Ensure that all connections are sufficiently sealed by the blind plugs.
- Blind plugs are not included in the scope of delivery.

Hydraulic connection from the top:

→ Install the flow pipe at the cold water connection (KW).

Hydraulic connection from the ground:

→ Install the flow pipe at the hot water connection (WW).



000200_001_R002

No.	Component
1	Top side
2	Bottom side
3	Anode
4	Flow pipe

No.	Component
5	Heating water flow
6	Hot water connection
7	Cold water connection
8	Heating water return

6.3.2 Drinking-water expansion vessel

Install a Reflex expansion vessel in the cold water pipe between storage and safety assembly. Each time water is drawn, drinking water must flow through the expansion vessel.

The table below serves as a guide concerning the design of the expansion vessel. Sizes can differ, depending on the net capacities of the individual makes of the vessels. The specifications are based on a storage temperature of 60 °C or 70 °C.

Safety-valve response pressure	6 bar		7 bar		8 bar		10 bar	
Storage-tank temperature	60°C	70°C	60°C	70°C	60°C	70°C	60°C	70°C
Storage-tank capacity	Type		Type		Type		Type	
50	DD8	DD8	DD8	DD8	DD8	DD8	DD8	DD8
110	DD8	DD8	DD8	DD8	DD8	DD8	DD8	DD8
160	DD18	DD25	DD8	DD8	DD8	DD12	DD8	DD12
200	DD18	DD25	DD12	DD12	DD8	DD12	DD8	DD12

6.4 Electrical connection



Danger – electric shock!

- Risk of serious injury or death due to electric shock.
 - Ensure that the system is voltage-free before installing the device.
 - Ensure that the system is secured and cannot be reactivated by other persons.
 - Ensure that installation work for the electric connection of the device is carried out by an electrician, and in compliance with electrical engineering regulations.



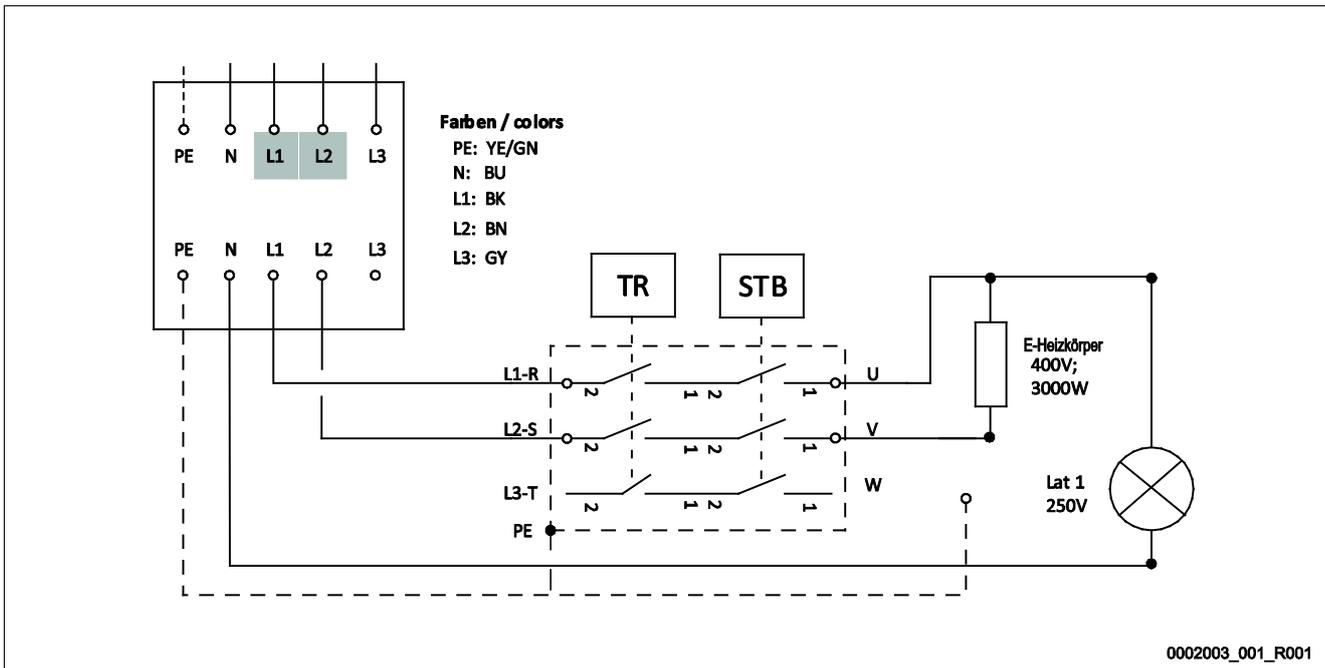
Danger – electric shock!

- Risk of serious injury or death due to electric shock. Some parts of the main board may still carry 230V voltage even with the device physically isolated from the 230 V power supply.
 - Before you remove the covers, completely isolate the device controller from the power supply.

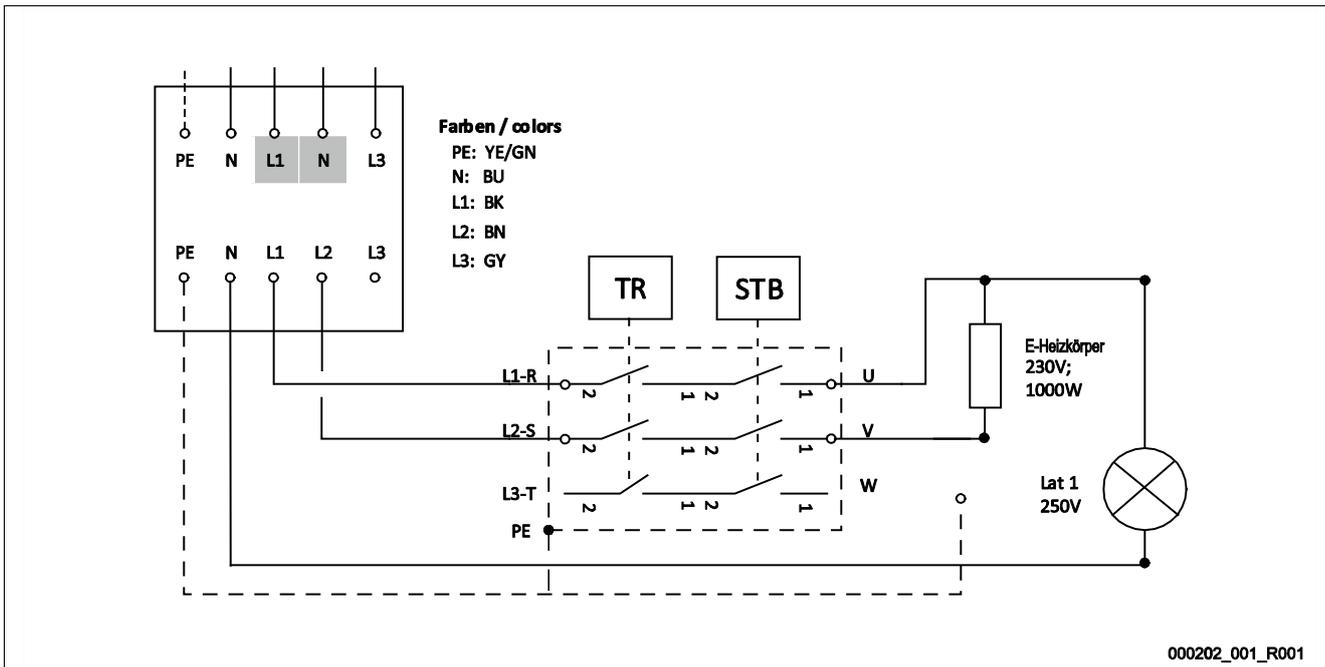
The following descriptions apply to standard systems and are limited to the necessary user-provided connections. Shut down the system and secure it against unintentional reactivation. When all connections have been made according to the terminal diagram, install the cover and connect the the mains cable with the appropriate power supply (400 V, 3000W heating power or 230 V, 1000W heating power).

6.4.1 Terminal diagram

400 V terminal plan



230 V terminal plan



7 Commissioning

7.1 Checking the requirements for commissioning

The device will be ready for commissioning when the tasks described in the "Installation" chapter have been completed. The system designer or an assigned expert is responsible for carrying out the commissioning. Commission the storage tank according to the information in the corresponding installation manual. Note the following information on commissioning:

7.2 Information from system designer



Attention! – Equipment damage

Device damage due to a closed safety valve.

- Do not close the safety valve.

The responsible installer shall explain to the operator how the hot-water storage tank functions and how it is to be used. He/She shall draw attention to maintenance work that has to be carried out at regular intervals (which has a bearing on service life and operational reliability). If at risk from frost, or prior to being shut down, the storage tank is to be emptied. During the heating phase, water escapes at the safety valve - this is perfectly normal.

7.3 Filling the storage tank

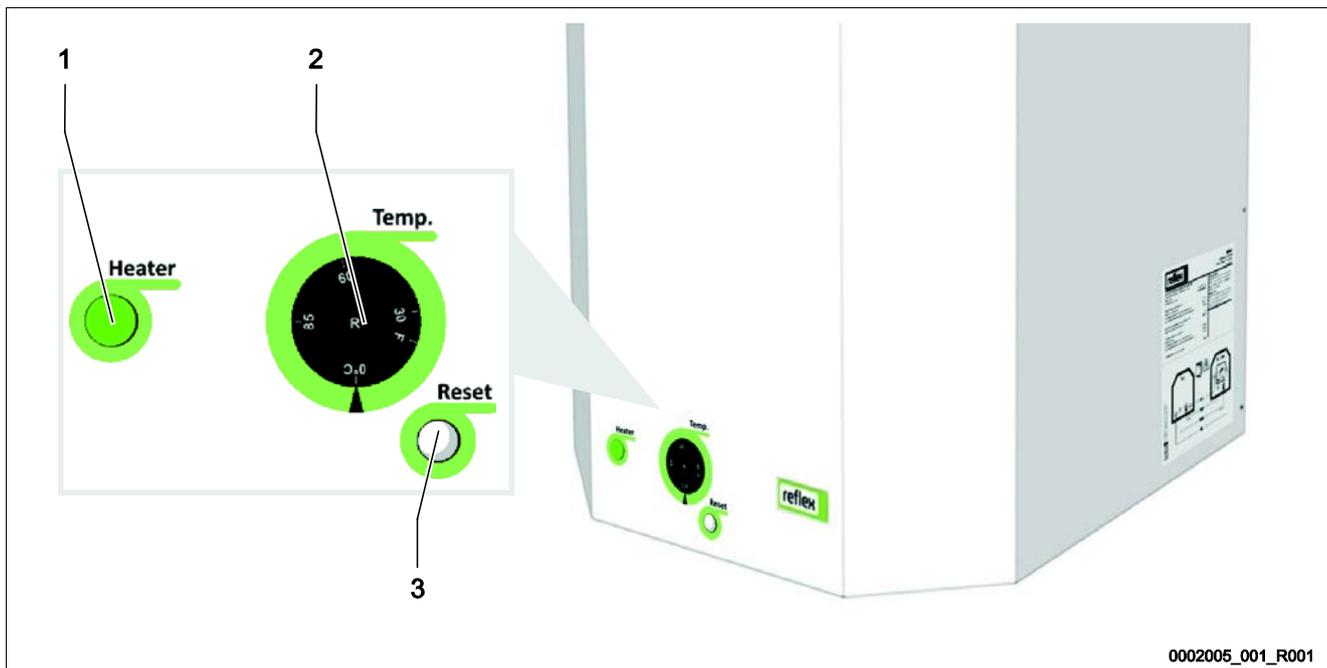
Prior to the storage tank being filled for the first time, rinse out the piping and connect the storage tank. With the hot water tap open, the storage tank is to be filled until water starts to escape. The threaded connection fittings are to be checked for tightness, and re-tightened as necessary.

7.4 Removal from service

The storage tank is to be shut down according to the information in the operating manual for the heating device. If at risk of damage from frost, or prior to being shut down, the storage tank is to be emptied.

8 Electric operation

8.1 Operating modes



0002005_001_R001

No.	Component	
1	Pilot light	Indicator for the electric heater operation. Light ON = Heater in operation
2	Temperature controller	Setting range: 7 °C - 85 °C – Recommended: 65 °C (Eco operation)
3	Reset switch	Switch to restart after temperature safety shut-down. Restart of the temperature controller after a temperature shut-down > 110 °C

9 Maintenance



Caution – risk of burning!

- Risk of burning due to escaping medium.
 - Maintain a sufficient distance from the escaping medium.
 - Wear suitable personal protective equipment (safety gloves and goggles).



Danger – electric shock!

- Risk of serious injury or death due to electric shock.
 - Ensure that the system is voltage-free before installing the device.
 - Ensure that the system is secured and cannot be reactivated by other persons.
 - Ensure that installation work for the electric connection of the device is carried out by an electrician, and in compliance with electrical engineering regulations.

9.1 Protective anode

The protective magnesium anode provides a minimum degree of protection in case of cracks in the enamel coating, in accordance with DIN 4753. A first inspection should be made after two years of operation at the latest.

The drinking water must have a minimum conductivity of 100 $\mu\text{S}/\text{cm}$; otherwise, anode-based protection cannot be guaranteed.

If the anode has worn down by more than 2/3, it must be replaced immediately. The storage tank must be de-pressurised while doing this. Pay attention to the existing electrical connections when making the replacement.

9.2 Draining

Prior to cleaning or repairing the storage tank, disconnect it from the water network and drain it. If necessary, drain the heating register too.

9.3 Cleaning & decalcification

The degree of calcification of a hot-water storage tank depends on the usage duration, the operating temperature and the water hardness.

9.4 Restarting

Thoroughly rinse out the storage tank following cleaning or repair work. Vent the individual water circuits.

9.5 Disassembly

Prior to dismantling, block off all "water"-side connections to the device. De-pressurise the device by venting it. Then disconnect the device from all electrical power sources.

- Disconnect the system from all electrical power sources and secure it against inadvertent reactivation.
- Drain all water from the device.
 - The device must be de-pressurised and empty.
- Detach the power cable of the device from the power supply point.
- Disconnect all cables from the terminals of the device control unit and remove them.

10 Annex

10.1 Reflex Customer Service

Central customer service

Switchboard: Telephone number: +49 (0)2382 7069 - 0
 Customer Service extension: +49 (0)2382 7069 - 9505
 Fax: +49 (0)2382 7069 - 523
 E-mail: service@reflex.de

Technical hotline

For questions about our products
 Telephone number: +49 (0)2382 7069-9546
 Monday to Friday, 8:00 a.m. – 4:30 p.m.

10.2 EC Declaration of conformity

For the following product:

Device: Drinking water heater, hot water tank
 Type Storatherm Aqua Compact: AC 60-E; AC 110-E; AC 160-E;
 AC 60-1E; AC 110-1E; AC 160-1E

We hereby confirm that the product meets the requirements and the essential protection requirements in particular, as established in the Council Directive to approximate the laws of the Member States relating to electromagnetic compatibility (89/336/EEC), the amending CE Marking Directive (93/69/EEC) and the German Act on the Electromagnetic Compatibility of Equipment, 18 September 1998 version. The device has been tested according to DIN EN 60335-2-21 VDE 0700-21:2009-06.

This declaration applies to all identical units of the product manufactured in accordance to the attached development, design and manufacturing drawings and descriptions that form part of this declaration.

All relevant harmonised European standards as published in the Official Journal of the European Communities have been used to evaluate the product in respect to electromagnetic compatibility.

The signatory is authorised to collate the technical documentation and undertakes to provide this documentation in a suitable format, if required by the competent authority.

This declaration is made for and on behalf of the following manufacturer and/or importer.

Manufacturer Reflex Winkelmann GmbH Gersteinstraße 19 D - 59227 Ahlen - Germany Telephone: +49 (0)2382 7069-0 Fax: +49 (0)2382 7069-588 E-mail: info@reflex.de		
	Norbert Hülsmann	Volker Mauel
	Members of the Board of Directors	

10.3 Guarantee

The respective statutory guarantee regulations apply.



Thinking solutions.

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