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HSK 400 P+

Installation and Operation Instructions

EN

THERMAL STORE
with stainless-steel DHW tube heat exchanger
HSK 400 P+

HSK 400 P+

CONTENTS

1 - Description

HSK 400 P+ Thermal Stores are intended for storing and subsequent distribution of thermal energy of heating water. They are fitted with a stainless-steel tube DHW heat exchanger, permitting installation of electric heating elements and connection of other heat sources. For better thermal stratification of heating water, the tank is divided by a separating metal sheet.

1.1 - Models
One model of 408 litres total volume with stainless-steel tube DHW heat exchanger.

1.2 - Tank protectione
The thermal store has no inner surface finish, the outer surface is painted in gray. The DHW heat exchanger is made of stainless steel.

1.3 - Thermal insulation
Thermal insulation is available as a separate item. For easier handling, the insulation shall not be fitted on the tank until it reaches its definite place of installation. The insulation is 100 mm thick, with a hard polystyrene surface. It is closed by quick locks.

1.4 - Packaging
Thermal stores are delivered standing, each screwed to its pallet, packed in bubble wrap.
It is forbidden to transport and/or store the thermal stores in a horizontal position.

2 - General Information

This Owners Manual is an integral and important part of the product and must be handed over to the User. Read carefully the instructions in this Manual as they contain important information concerning safety, installation, operation and maintenance. Keep this Manual for later reference. The appliance shall be installed by a qualified person according to valid rules and Manufacturer‘s Instructions.

This appliance is designed to accumulate thermal energy and distribute it subsequently. It must be connected to a heating system and heat sources. This appliance is designed for continuous DHW heating.

Using the thermal store for other purposes than above described is forbidden and the manufacturer accepts no responsibility for damage caused by improper or wrong use or filling procedure.

The appliance shall be installed by a qualified person according to valid rules, otherwise the warranty becomes null and void.

3 - Technical Data and Dimensions

Main Features	
Application	Combination thermal store with DHW heating in an integrated stainless-steel heat exchanger, fitted with a tight separating metal plate that increases Seasonal coefficient of performance (SCOP) of a heat pump. Thermal stores are supplied uninsulated. Thermal insulation is available as a separate item, see the codes below.
Working fluid	Water (heat exchanger), water; water–glycol mixture (max. 1:1) or water/glycerine mixture (max. 2:1 (thermal store).
Thermal store code	19607
Insulation code	19609

Energy Efficiency Data (as per EC Regulation No. 812/2013)	
	valid for a thermal store with insulation
Energy efficiency class	C
Static loss	81 W
Storage volume	408 l

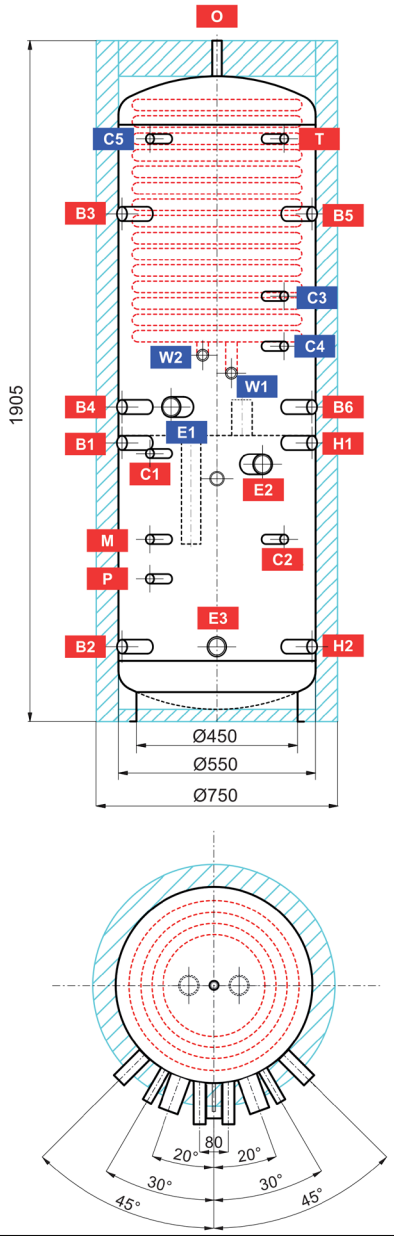
Technical data	
Total thermal store volume	408 l
Fluid volume in thermal store	387 l
Fluid volume above separating plate	220 l
Fluid volume below separating plate	167 l
Fluid volume of DHW heat exchanger above the separating plate	21.0 l
Surface area of DHW heat exchanger above the separating plate	6.0 m²
Max. working temperature in thermal store	95 °C
Max. working temperature in DHW heat exchanger	95 °C
Max. working pressure in thermal store	4 bar
Max. working pressure in DHW heat exchanger	10 bar
Thermal store diameter	550 mm
Thermal store diameter with insulation	750 mm
Thermal store overall height	1905 mm
Tipping height without insulation	1940 mm
Thermal store perimeter insulation thickness	100 mm
Thermal store bottom insulation thickness	50 mm
Thermal store top insulation thickness	100 mm
Empty weight without insulation	85 kg

Accessories	
Electric heating element	types ETT-A, D2, R, S, C, F2, M, P, U
Heating element max. length	635 mm

Materials	
Thermal store material	S235JR
Thermal store perimeter insulation	fleece
Thermal store outer surface insulation	hard polystyrene
Top and bottom thermal store insulation	fleece
DHW heat exchanger	AISI 316 L

Volume of supplied DHW (heated from 10 °C to 40 °C)												
Heated volume	Entire			Entire			Entire			Above metal sheet		
Backup heater	10 kW			none			none			10 kW		
Flow rate [l/min]	8	12	20	8	12	20	8	12	20	8	12	20
Temperature in thermal store	50 °C			50 °C			-			50 °C		
Hot water volume [l]	363	237	120	222	187	101	-	-	-	195	132	106
Temperature in thermal store	60 °C			60 °C			80 °C			60 °C		
Hot water volume [l]	534	359	268	321	290	266	567	528	516	253	235	208

Dimensions



CONNECTIONS

pos.	description	connection	height [mm]
Heat sources			
B1	Supply from heat source	G 1" F	780
B2	Return to heat source	G 1" F	210
B3	Supply from heat source	G 1" F	1420
B4	Return to heat source	G 1" F	880
B5	Supply from heat source	G 1" F	1420
B6	Return to heat source	G 1" F	880
Heating system			
H1	Flow to heating system	G 1" F	780
H2	Return from heating system	G 1" F	210
Electric heating element			
E1	El. heating element (DHW)	G 6/4" F	880
E2	El. heating element (space heating)	G 6/4" F	720
E3	El. heating element (for PV system)	G 6/4" F	210
DHW heating			
W1	Cold water	G 1" M	975
W2	Domestic hot water	G 1" M	1025
Control and safety			
C1	Temperature sensor	G 1/2" F	750
C2	Temperature sensor	G 1/2" F	510
C3	Temperature sensor	G 1/2" F	1190
C4	Temperature sensor	G 1/2" F	1050
C5	Temperature sensor	G 1/2" F	1630
T	Thermometer	G 1/2" F	1630
M	Pressure gauge	G 1/2" F	510
P	Safety valve	G 1/2" F	400
Air discharge			
O	Air vent valve	G 1/2" F	1905

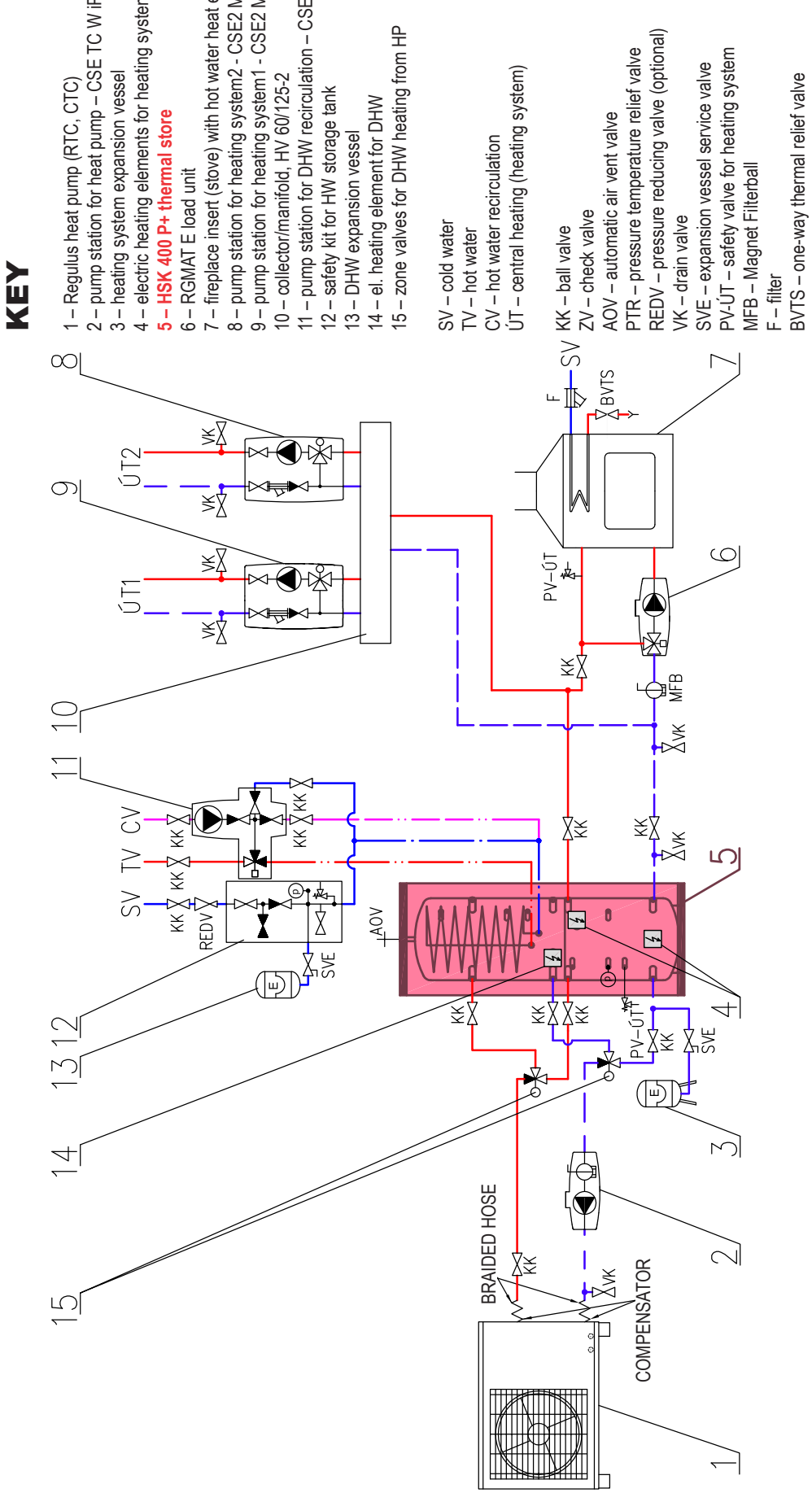
4 - Operation

This tank is designed to accumulate thermal energy for heating. Heating water transfers the accumulated heat to DHW via an integrated heat exchanger. Hot water is therefore heated in a continuous manner.

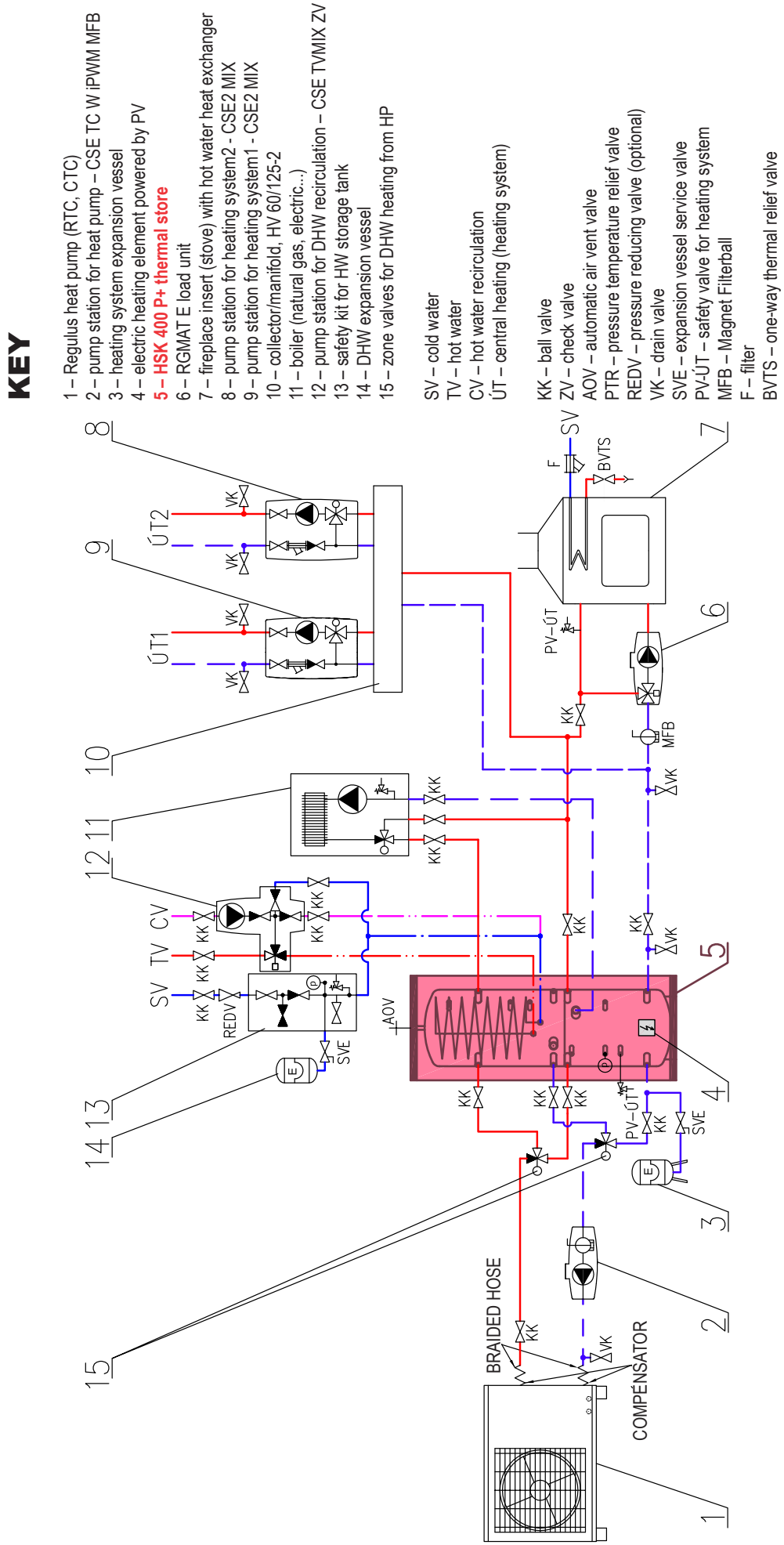
5 - Thermal Store Connection to a Heating System

Example I.

Heat pump + el. heating element
+ fireplace + PV possible



Example II.
Heat pump + gas-fired boiler + fireplace + PV possible



6 - Installation and Commissioning

Installation must meet valid rules and may be done only by qualified staff.

Defects caused by improper installation, use or handling are not covered by warranty.

After the tank is installed and connected to an existing heating system, it is recommended to clean the entire heating system using a suitable cleaning agent, e.g. BP 400.
Anti-corrosion protective liquid should be also used, e.g. BP 100 Plus.

6.1 - Connection to heat sources

Place the tank on the floor, as close to your heat source (heat pump, boiler) as possible. Fit the insulation, cf. Installing Insulation on the tank. Connect the heating circuits to inlets and outlets respecting the thermal stratification in the tank. Install a drain valve at the lowest point of the tank. Install an air vent valve at the highest point of the system. Insulate all the connection piping.

6.2 - Installation of an el. heating element

The thermal store can be equipped with el. heating elements. They can be power-supplied either directly (thermostat--equipped elements), or via a controller for the entire heating system.
Warning: Electric heating elements shall be protected by a safety thermostat.
The electric heating element shall be wired by a professionally qualified person only.

6.3 - Connection to water mains

DHW piping shall be done according to valid rules. Connections to the tank, including placing the components, is shown in the diagrams of the recommended connection in Chap. 5. Installation of a pressure reducing valve on the immersed tank inlet is recommended. For water mains pressure above 6 bar a pressure reducing valve is necessary. Install a DHW expansion vessel (min. 2 l volume) at the cold water inlet. Installation of the expansion vessel is a precondition for the warranty to be valid. Should the water be too hard, install a water softener before the tank. In case the water contains mechanical impurities, install a strainer.

Table of limit values for total dissolved solids in hot water.

Description	pH	Total dissolved solids (TDS)	Ca	Chlorides	Mg	Na	Fe
Max. value	6,5 - 9,5	600 mg/l	40 mg/l	100 mg/l	20 mg/l	200 mg/l	0,2 mg/l

6.4 - Commissioning

Ground the tank before commissioning.
The tank shall be filled up together with the heating system, respecting valid standards and rules. In order to minimize corrosion, special additives for heating systems should be used. The quality of heating water depends on the quality of filling water at commissioning, on the top-up water and on the frequency of topping up. This has a strong influence on the lifetime of heating systems. Poor quality of heating water may cause problems like corrosion or incrustation, esp. on heat transfer surfaces.

Quality of DHW shall meet the conditions shown in the Table of limit values for total dissolved solids in hot water on this page.

Fill the heating circuits with the appropriate fluids and air-bleed the entire system. Check all connections for leaks and verify the system pressure. Set the heating controller in compliance with the documentation and manufacturer’s recommendations. Check regularly the proper function of all control and adjustment elements.

7 - Installing Insulation on the Tank

Product description
Thermal insulation is a part of thermal stores, preventing heat loss. For easier handling, the insulation shall not be fitted on the tank until it reaches its definite place of installation.

Warning
Insulation installation shall be done in two or three persons, depending on its size.
Do not use any tools for installation.
Keep away from open fire.

Installing Insulation
1. Fix the tank following installation instructions.
2. Wrap the insulation around the tank carefully. Check that the insulation adheres to its body perfectly. This can be reached by rubbing and patting the insulation by hand from its center evenly in both directions until the insulation adheres to the tank's surface completely and no bubbles are left.
3. Use the holes for connections as a rest during the insulation installation.
4. At least one person presses the insulation to the tank, pulling both ends together. The other person closes the insulation lock from the side.
5. Put on the upper insulation and cover
6. Push on the covering plastic rosettes depending on the size of connections.
7. Finish the tank installation in compliance with the respective instructions and valid standards and rules.

Warranty on insulation
□ Warranty shall become null and void if:
- the procedure described in the Installation Manual was not respected,
- the product was used for other purposes than intended.

□ Warranty does not cover:
- usual wear and tear,
- damage caused by fire, water, electricity or a natural disaster,
- defects caused by failure to use the product in compliance with its intended purpose, by improper use and insufficient maintenance,
- defects caused by mechanical damage to the product,
- defects caused by tampering or incompetent repair.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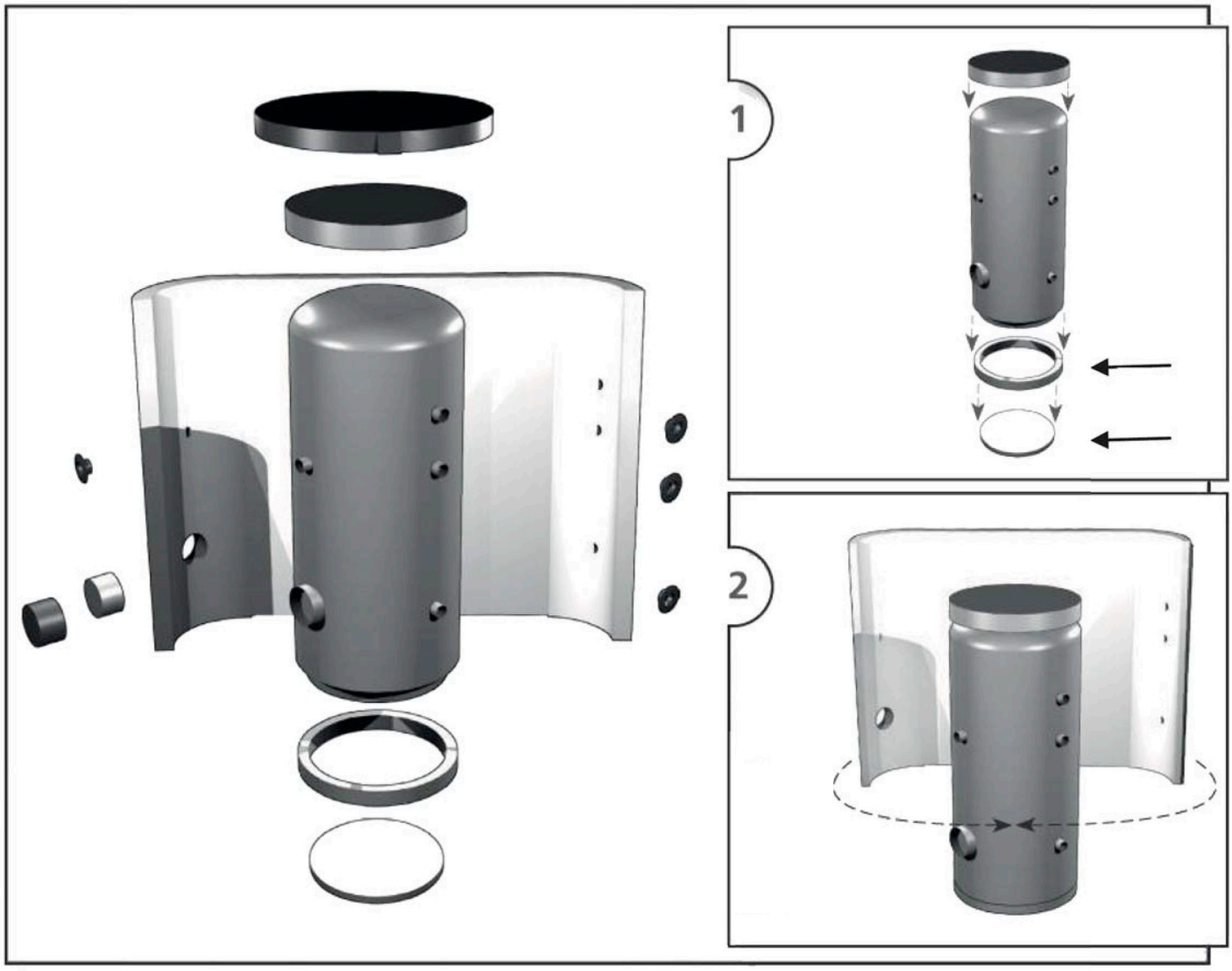
+ 20.0° C
+ 68.0° F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8 - Maintenance

If the tank is fitted with a heating element, disconnect it from the mains first. Clean the exterior of the tank with a soft cloth and a mild detergent. Never use abrasive cleaners or solvents.
Check all connections for leaks.

9 - Disposal

Packaging shall be disposed of in compliance with the valid rules. When the product reaches the end of its life, it shall not be disposed of as household waste. It shall be dropped off at a Local Waste Recycling Center. Insulation shall be recycled as plastic and the steel vessel as scrap iron.

10 - Warranty

This product is covered by warranty under conditions specified in this Manual and the respective Warranty Certificate. The Warranty Certificate is an integral part of supply of this Thermal Store.

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