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HSK PV

Installation and Operation Instructions
THERMAL STORES with stainless-steel DHW tube heat exchanger
HSK 600 PV, HSK 750 PV, HSK1000 PV, HSK 1700 PV

EN

HSK PV

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1 - Description

HSK PV 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 a better thermal layering, the tank volume is separated by a baffle.

For proper operation of a tank, it is necessary to have an optimum hydraulic design of the entire heating system, i.e. position of circulation pumps for both heat sources and heating circuits, valves, check valves etc. When more heat sources shall be combined, it is recommended to use a smart controller for both the heat source and heat sink sides of a heating circuit, i.e. also for charging and discharging a thermal store.

1.1 - Models

Four models of 557, 757, 922 and 1684 l total volume, with stainless-steel tube DHW heat exchanger.

1.2 - Tank protection

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. This is a fleece insulation, 100 mm thick, with a PUR leather surface. It closes with a zipper.

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 suitable for continuous heating of domestic hot water.

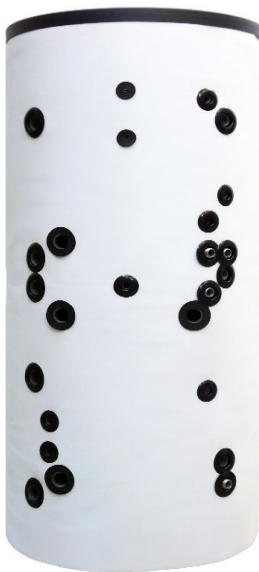
Using the thermal store for other purposes than above described is forbidden and the manufacturer accepts no responsibility for damage caused by improper or wrong use or filling procedure.

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

HSK 600 PV Thermal Store

Main features	
Application	storage of thermal energy for DHW and space heating
Description	this combination Thermal Store utilizes a heat pump with PV panels as a heat source for both space and DHW heating; DHW is being prepared in 2 integrated stainless-steel heat exchangers; a tightly fitting separating metal plate increases the heat pump's seasonal coefficient of performance, a dedicated PV heating element is placed in the lower tank section; more electric heating elements can be installed if needed
Working fluid	water (tank), water, water/glycol mixture (max. 1:1) or water/glycerine mixture (max. 2:1) (heat exchangers)

HSK 600 PV



Code	
Thermal Store	16 158
Insulation	16 160

Energy Efficiency Data (as per EC Regulation No. 812/2013)	
HSK 600 PV with insulation	
Energy efficiency class	N/A
Standing loss	101 W
Storage volume	557 l

Technical data	
Total tank volume	557 l
Fluid volume in tank	525 l
Upper DHW heat exchanger volume	21 l
Lower DHW heat exchanger volume	11 l
Upper DHW heat exchanger surface area	6 m ²
Lower DHW heat exchanger surface area	3 m ²
Max. working temp. in thermal store	95 °C
Max. working temp. in DHW heat exchangers	95 °C
Max. working pressure in thermal store	4 bar
Max. working pressure in DHW heat exchangers	6 bar

Tank Materials	
Tank material	S235JR
DHW heat exchanger material	S235JR+N

Materials	
Tank perimeter insulation	fleece
Tank perimeter insulation outer surface	PU leather
Top and bottom tank insulation	fleece

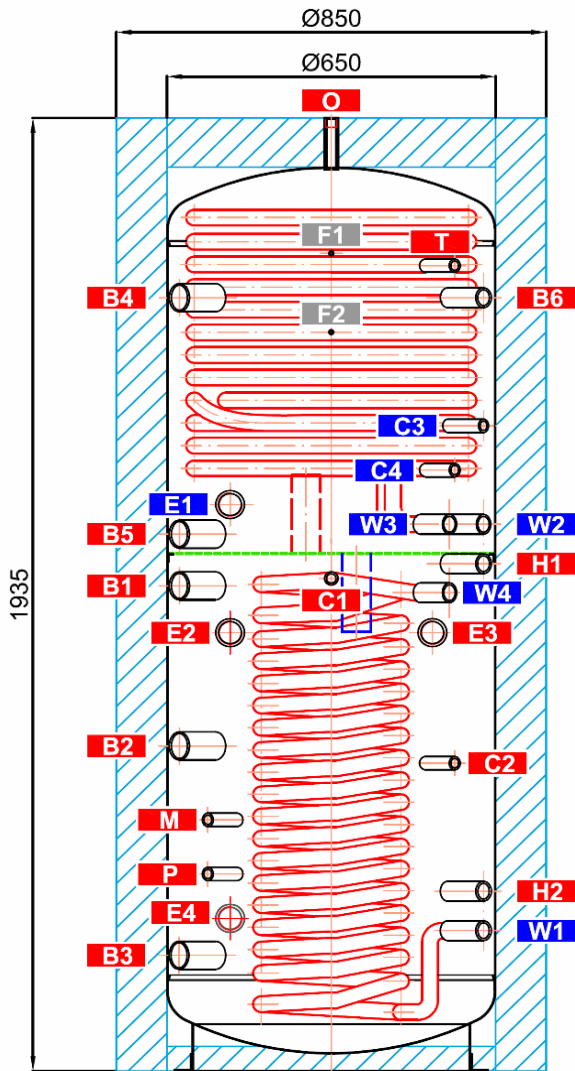
Dimensions, Tipping height, Weight	
Tank diameter	650 mm
Tank diameter with insulation	850 mm
Tank overall height	1935 mm
Tipping height without insulation	2050 mm
Tank perimeter insulation thickness	100 mm
Bottom insulation thickness	50 mm
Top insulation thickness	120 mm
Empty weight without insulation	157 kg

Accessories	
El. heating element	ETT-C, J, L
Heating elem. max. length / output	3x 555 mm / 6 kW

HSK 600 PV Thermal Store

Dimensions

Tipping height without insulation 2050 mm.



TAPPINGS

pos.	connection	height [mm]
Heat sources		
B1	G6/4" F	985
B2	G6/4" F	135
B3	G6/4" F	1570
B4	G6/4" F	1090
B5	G1" F	1570
B6	G6/4" F	660
Heating system		
H1	G1" F	1030
H2	G1" F	365
EI. heating elements		
E1	G6/4" F	1150
E2	G6/4" F	890
E3	G6/4" F	890
E4	G6/4" F	310
DHW heating		
W1	G1" M	285
W2	G1" M	1110
W3	G1" M	1110
W4	G1" M	970
Control and safety		
C1	G1/2" F	1000
C2	G1/2" F	625
C3	G1/2" F	1310
C4	G1/2" F	1220
T	G1/2" F	1635
M	G1/2" F	510
P	G1/2" F	400
Air release		
O	G1/2" F	1935
Pump station support		
F1	M6	1660
F2	M6	1500

3 - Technical Data and Dimensions of HSK PV Model Line

HSK 750 PV Thermal Store

Main features	
Application	storage of thermal energy for DHW and space heating
Description	this combination Thermal Store utilizes a heat pump with PV panels as a heat source for both space and DHW heating; DHW is being prepared in 2 integrated stainless-steel heat exchangers; a tightly fitting separating metal plate increases the heat pump's seasonal coefficient of performance, a dedicated PV heating element is placed in the lower tank section; more electric heating elements can be installed if needed
Working fluid	water (tank), water, water/glycol mixture (max. 1:1) or water/glycerine mixture (max. 2:1) (heat exchangers)

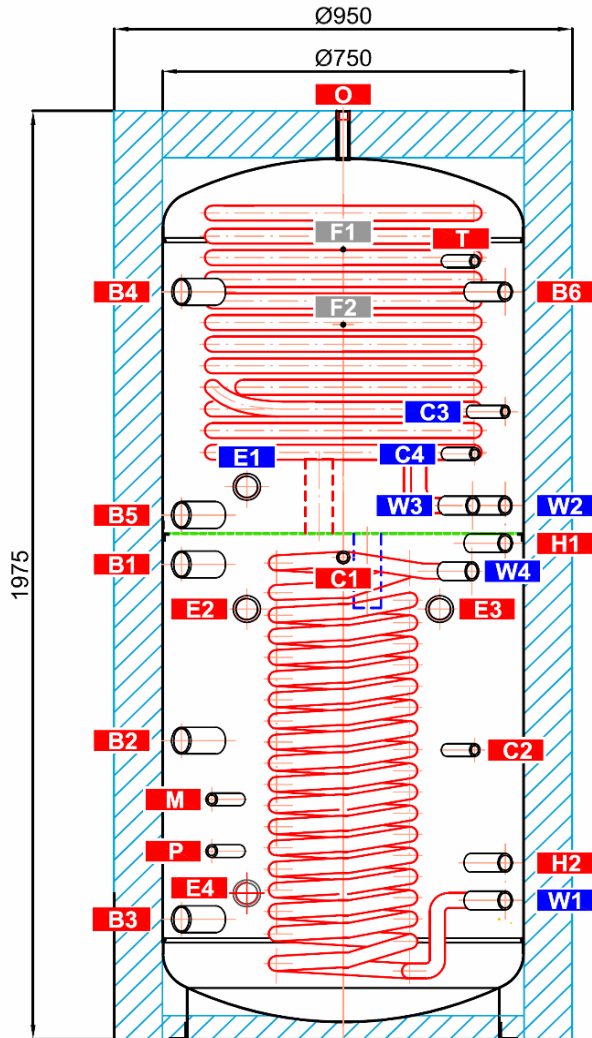


Code	
Thermal Store	16 177
Insulation	16 179
Energy Efficiency Data (as per EC Regulation No. 812/2013)	
	HSK 750 PV with insulation
Energy efficiency class	N/A
Standing loss	119 W
Storage volume	757 l
Technical data	
Total tank volume	757 l
Fluid volume in tank	725 l
Upper DHW heat exchanger volume	21 l
Lower DHW heat exchanger volume	11 l
Upper DHW heat exchanger surface area	6 m ²
Lower DHW heat exchanger surface area	3 m ²
Max. working temp. in thermal store	95 °C
Max. working temp. in DHW heat exchangers	95 °C
Max. working pressure in thermal store	4 bar
Max. working pressure in DHW heat exchangers	6 bar
Tank Materials	
Tank material	S235JR
DHW heat exchanger material	S235JR+N
Materials	
Tank perimeter insulation	fleece
Tank perimeter insulation outer surface	PU leather
Top and bottom tank insulation	fleece
Dimensions, Tipping height, Weight	
Tank diameter	750 mm
Tank diameter with insulation	950 mm
Tank overall height	1975 mm
Tipping height without insulation	2120 mm
Tank perimeter insulation thickness	100 mm
Bottom insulation thickness	50 mm
Top insulation thickness	120 mm
Empty weight without insulation	170 kg
Accessories	
El. heating element	ETT-C, J, L
Heating elem. max. length / output	3x 700 mm / 8,2 kW

HSK 750 PV Thermal Store

Dimensions

Tipping height without insulation 2120 mm.



TAPPINGS

pos.	connection	height [mm]
Heat sources		
B1	G6/4" F	1010
B2	G6/4" F	155
B3	G6/4" F	1590
B4	G6/4" F	1115
B5	G1" F	1590
B6	G6/4" F	635
Heating system		
H1	G1" F	1055
H2	G1" F	375
El. heating elements		
E1	G6/4" F	1175
E2	G6/4" F	915
E3	G6/4" F	915
E4	G6/4" F	310
DHW heating		
W1	G1" M	295
W2	G1" M	1135
W3	G1" M	1135
W4	G1" M	995
Control and safety		
C1	G1/2" F	1025
C2	G1/2" F	615
C3	G1/2" F	1335
C4	G1/2" F	1245
T	G1/2" F	1655
M	G1/2" F	510
P	G1/2" F	400
Air release		
O	G1/2" F	1975
Pump station support		
F1	M6	1680
F2	M6	1520

HSK 1000 PV Thermal Store

Main features	
Application	storage of thermal energy for DHW and space heating
Description	this combination Thermal Store utilizes a heat pump with PV panels as a heat source for both space and DHW heating; DHW is being prepared in 2 integrated stainless-steel heat exchangers; a tightly fitting separating metal plate increases the heat pump's seasonal coefficient of performance, a dedicated PV heating element is placed in the lower tank section; more electric heating elements can be installed if needed
Working fluid	water (tank), water, water/glycol mixture (max. 1:1) or water/glycerine mixture (max. 2:1) (heat exchangers)

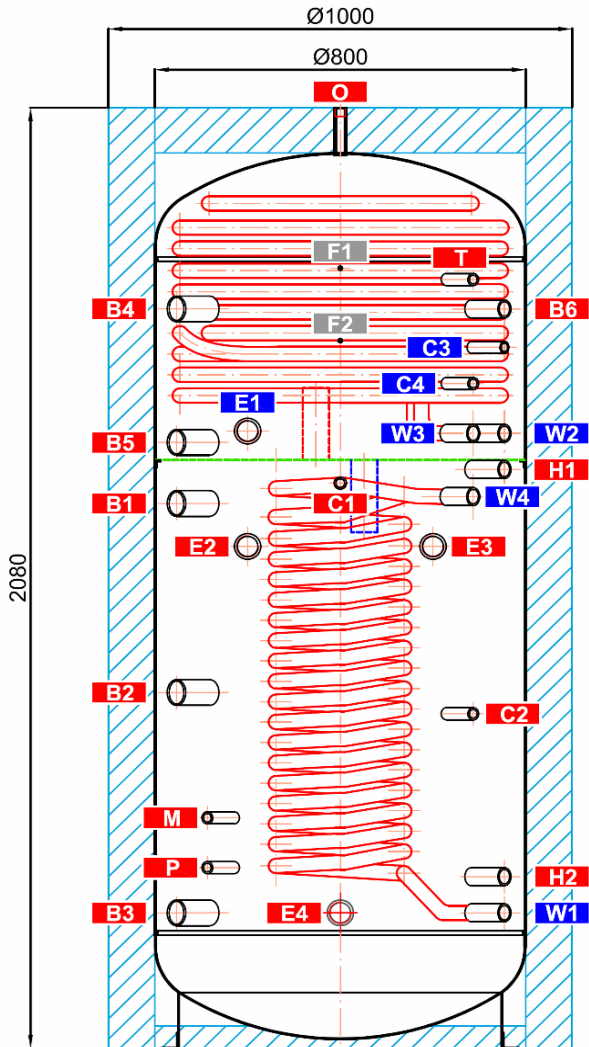


Code	
Thermal Store	16 180
Insulation	16 312
Energy Efficiency Data (as per EC Regulation No. 812/2013)	
	HSK 1000 PV with insulation
Energy efficiency class	N/A
Standing loss	132 W
Storage volume	922 l
Technical data	
Total tank volume	922 l
Fluid volume in tank	890 l
Upper DHW heat exchanger volume	21 l
Lower DHW heat exchanger volume	11 l
Upper DHW heat exchanger surface area	6 m ²
Lower DHW heat exchanger surface area	3 m ²
Max. working temp. in thermal store	95 °C
Max. working temp. in DHW heat exchangers	95 °C
Max. working pressure in thermal store	4 bar
Max. working pressure in DHW heat exchangers	6 bar
Tank Materials	
Tank material	S235JR
DHW heat exchanger material	S235JR+N
Materials	
Tank perimeter insulation	fleece
Tank perimeter insulation outer surface	PU leather
Top and bottom tank insulation	fleece
Dimensions, Tipping height, Weight	
Tank diameter	800 mm
Tank diameter with insulation	1000 mm
Tank overall height	2080 mm
Tipping height without insulation	2230 mm
Tank perimeter insulation thickness	100 mm
Bottom insulation thickness	50 mm
Top insulation thickness	120 mm
Empty weight without insulation	192 kg
Accessories	
El. heating element	ETT-C, J, L
Heating elem. max. length / output	3x 755 mm / 9 kW

HSK 1000 PV Thermal Store

Dimensions

Tipping height without insulation 2230 mm.



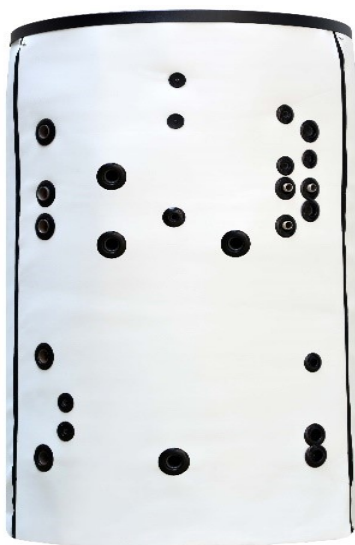
TAPPINGS

pos.	connection	height [mm]
Heat sources		
B1	G6/4" F	1205
B2	G6/4" F	200
B3	G6/4" F	1635
B4	G6/4" F	1340
B5	G1" F	1635
B6	G6/4" F	787
Heating system		
H1	G1" F	1280
H2	G1" F	380
EI. heating elements		
E1	G6/4" F	1365
E2	G6/4" F	1110
E3	G6/4" F	1110
E4	G6/4" F	300
DHW heating		
W1	G1" M	300
W2	G1" M	1360
W3	G1" M	1360
W4	G1" M	1220
Control and safety		
C1	G1/2" F	1250
C2	G1/2" F	740
C3	G1/2" F	1550
C4	G1/2" F	1470
T	G1/2" F	1700
M	G1/2" F	510
P	G1/2" F	400
Air release		
O	G1/2" F	2080
Pump station support		
F1	M6	1725
F2	M6	1565

HSK 1700 PV Thermal Store

Main features	
Application	storage of thermal energy for DHW and space heating
Description	this combination Thermal Store utilizes a heat pump with PV panels as a heat source for both space and DHW heating; DHW is being prepared in 2 integrated stainless-steel heat exchangers; a tightly fitting separating metal plate increases the heat pump's seasonal coefficient of performance, a dedicated PV heating element is placed in the lower tank section; more electric heating elements can be installed if needed
Working fluid	water (tank), water, water/glycol mixture (max. 1:1) or water/glycerine mixture (max. 2:1) (heat exchangers)

HSK 1700 PV

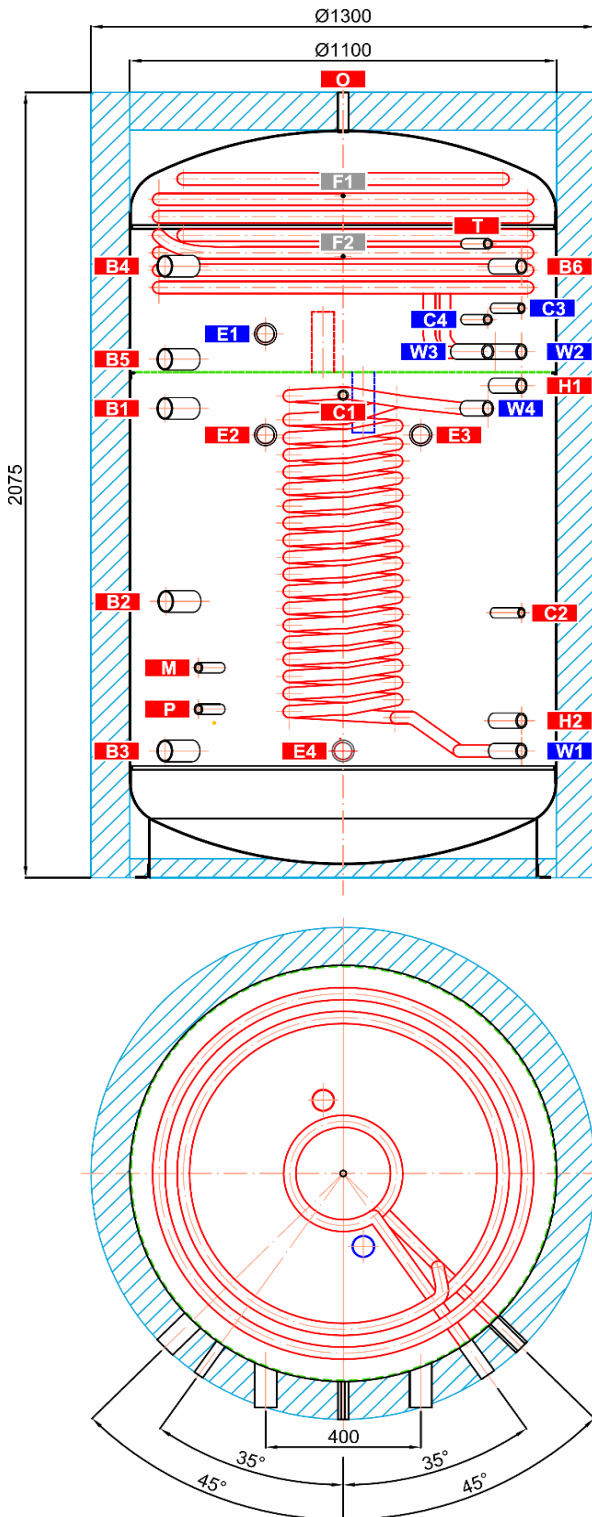


Code	
Thermal Store	16 183
Insulation	16 185
Energy Efficiency Data (as per EC Regulation No. 812/2013)	
	HSK 1700 PV with insulation
Energy efficiency class	N/A
Standing loss	179 W
Storage volume	1684 l
Technical data	
Total tank volume	1684 l
Fluid volume in tank	1652 l
Upper DHW heat exchanger volume	21 l
Lower DHW heat exchanger volume	11 l
Upper DHW heat exchanger surface area	6 m ²
Lower DHW heat exchanger surface area	3 m ²
Max. working temp. in thermal store	95 °C
Max. working temp. in DHW heat exchangers	95 °C
Max. working pressure in thermal store	3 bar
Max. working pressure in DHW heat exchangers	6 bar
Tank Materials	
Tank material	S235JR
DHW heat exchanger material	S235JR+N
Materials	
Tank perimeter insulation	fleece
Tank perimeter insulation outer surface	PU leather
Top and bottom tank insulation	fleece
Dimensions, Tipping height, Weight	
Tank diameter	1100 mm
Tank diameter with insulation	1300 mm
Tank overall height	2075 mm
Tipping height without insulation	2350 mm
Tank perimeter insulation thickness	100 mm
Bottom insulation thickness	50 mm
Top insulation thickness	120 mm
Empty weight without insulation	295 kg
Accessories	
El. heating element	ETT-C, J, L
Heating elem. max. length / output	3x 955 mm / 12 kW

HSK 1700 PV Thermal Store

Dimensions

Tipping height without insulation 2350 mm.



TAPPINGS

pos.	connection	height [mm]
Heat sources		
B1	G6/4" F	1240
B2	G6/4" F	235
B3	G6/4" F	1615
B4	G6/4" F	1370
B5	G1" F	1615
B6	G6/4" F	730
Heating system		
H1	G1" F	1300
H2	G1" F	415
El. heating elements		
E1	G6/4" F	1437
E2	G6/4" F	1170
E3	G6/4" F	1170
E4	G6/4" F	335
DHW heating		
W1	G1" M	335
W2	G1" M	1390
W3	G1" M	1390
W4	G1" M	1240
Control and safety		
C1	G1/2" F	1275
C2	G1/2" F	700
C3	G1/2" F	1505
C4	G1/2" F	1475
T	G1/2" F	1675
M	G1/2" F	555
P	G1/2" F	445
Air release		
O	G1/2" F	2075
Pump station support		
F1	M6	1802
F2	M6	1642

4 - Operation

This tank is designed for heating and storing heating water in household or industrial applications, however always in closed pressure circuits with forced circulation. Hot water is heated inside the thermal store from several possible heat sources like various kinds of heating boilers, renewable energy sources or also electric heating elements. A stainless-steel tube DHW heat exchanger is heated by heating water inside the thermal store. It connects through 1" threaded fittings. When hot water is drawn from the outlet point, cold water flows into the immersed heat exchanger and heats up by the heating water.

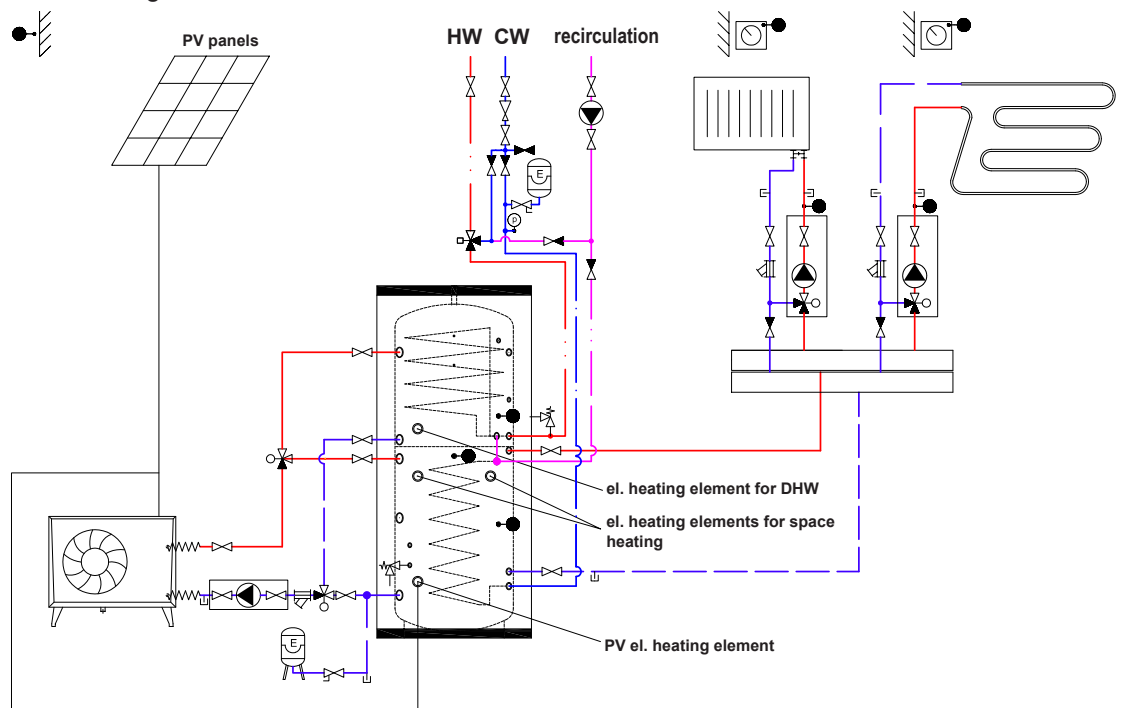
The thermal store shall be connected to heat sources through connecting threaded fittings.

Individual connection points are assigned according to the circuits to be connected. There is a wide choice of combinations; the following chapter describes just some examples.

5 - Typical Layout Examples with Thermal Store

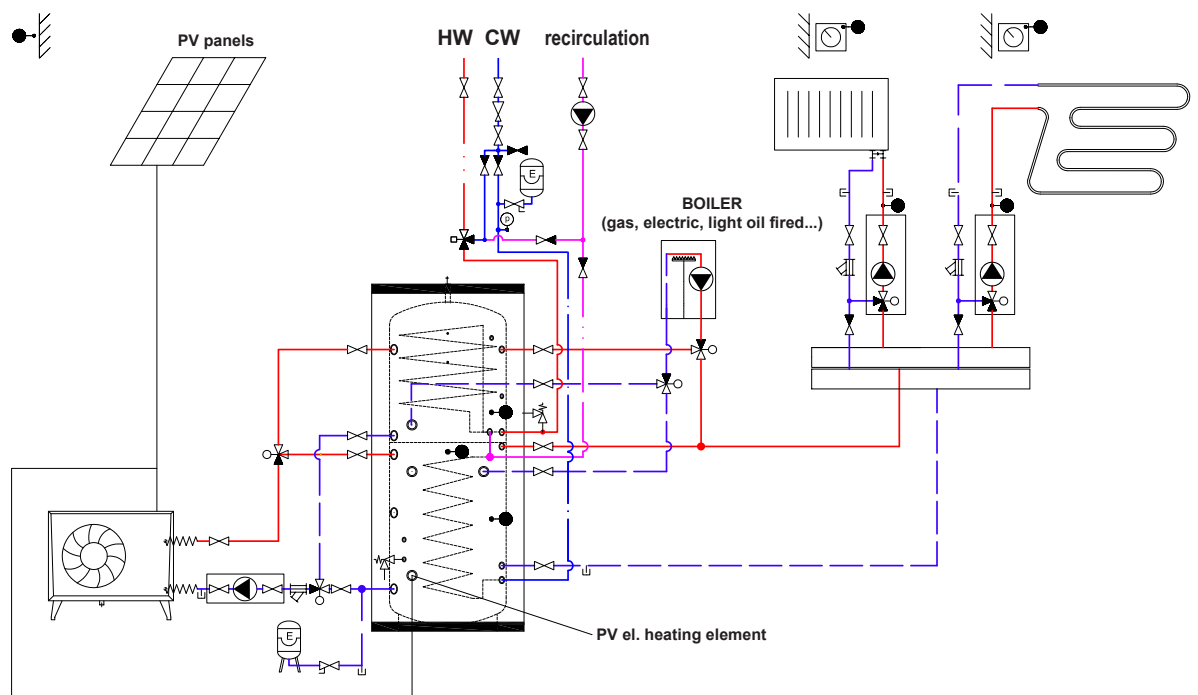
Example I.

Heat pump + PV panels + el. heating elements



Example II.

Heat pump + PV panels + gas boiler



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. MR-501/R.

Anti-corrosion protective liquid should be also used, e.g. MR-501/F.

6.1 - Connection to heat sources

Place the tank on the floor, as close to your heat source as possible. 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 G 6/4" side tapplings are designed to accommodate electric heating rods. They can be connected either directly to the mains (thermostat-equipped rods), or to a heating system controller. The installation may be done by qualified staff only.

Warning: Electric heating elements shall be protected by a safety thermostat.

6.3 - Connection to water mains

DHW piping shall be done according to valid rules. 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. To prevent water loss, we recommend installing an expansion vessel at the cold water inlet with a minimum volume of 4% of the total volume of water in the DHW piping, including heat exchangers, circulation pipes, etc. (usually 8 l). 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

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 this type of thermal store until it reaches its definite place of installation. Fleece insulation with a PUR leather surface and a zipper is used.

Warning

Insulation installation shall be done in two or three persons, depending on its size. The zippered, PVC coated fleece insulation **must not be installed at temperatures below 20 °C**. If this cannot be avoided, the insulation shall be pre-warmed in another room to at least 20 °C. It is impossible to install insulation of lower temperature, there is a risk of damage, esp. to the zipper.

Do not use any tools for installation.

Keep away from open fire.

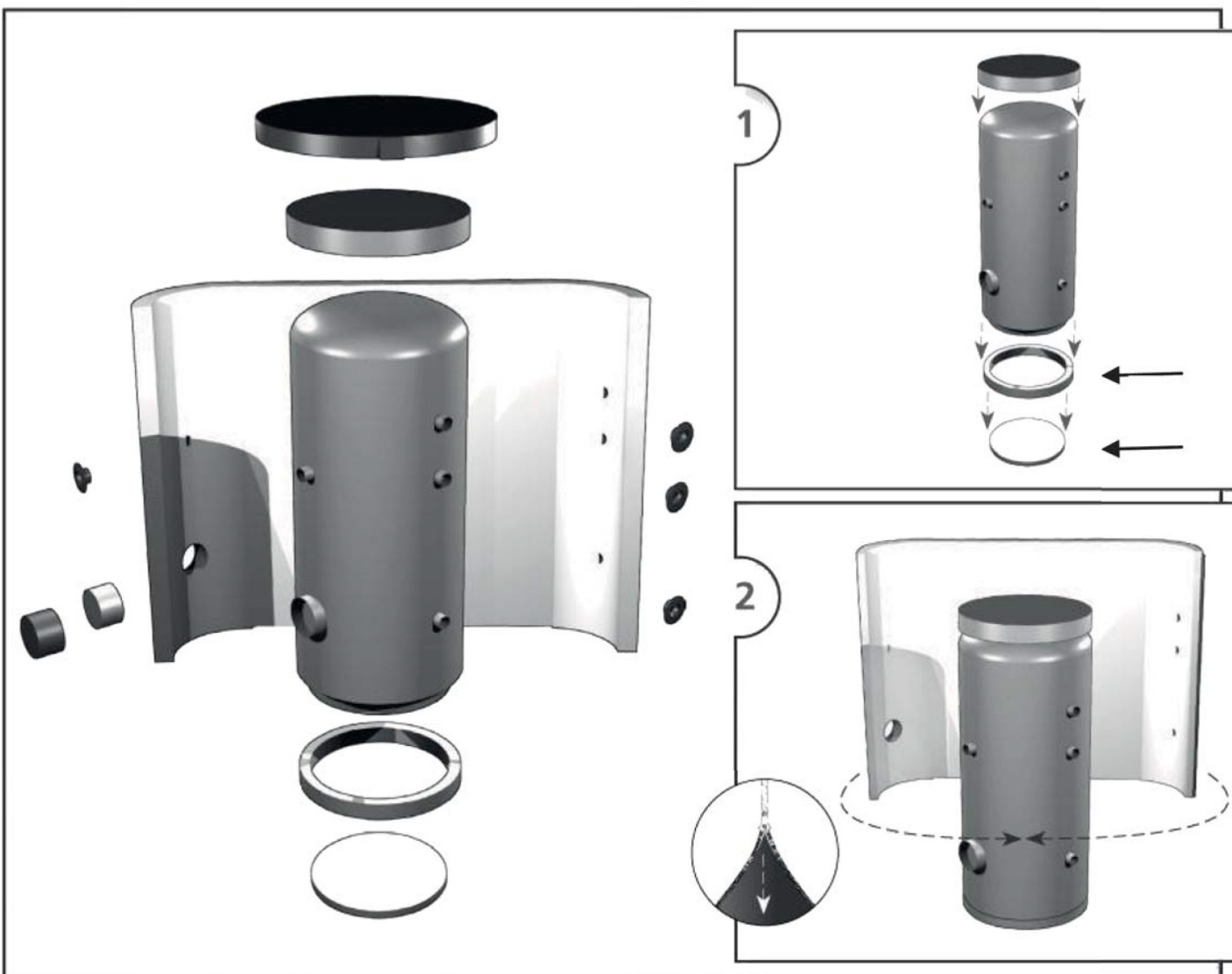
Installing Fleece Insulation

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 tappings 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 zipper.
5. Put on the upper insulation and cover
6. Push on the covering plastic rosettes depending on the size of tappings, or put on the flange plug(s) with insulation.
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.



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.

