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HSK PR 600-1700

Installation and Operation Manual

THERMAL STORES with stainless-steel DHW tube heat exchanger

HSK 600 PR, HSK 750 PR, HSK 1000 PR, HSK 1700 PR

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HSK PR 600-1700

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1 - Description

HSK PR 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. The lower section is equipped with a steel solar heat exchanger. This thermal store shall be always connected to a sealed heating circuit.
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 553, 753, 916 and 1676 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. The fleece insulation is 100 mm thick, with hard polystyrene surface, and closes with a lock.

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

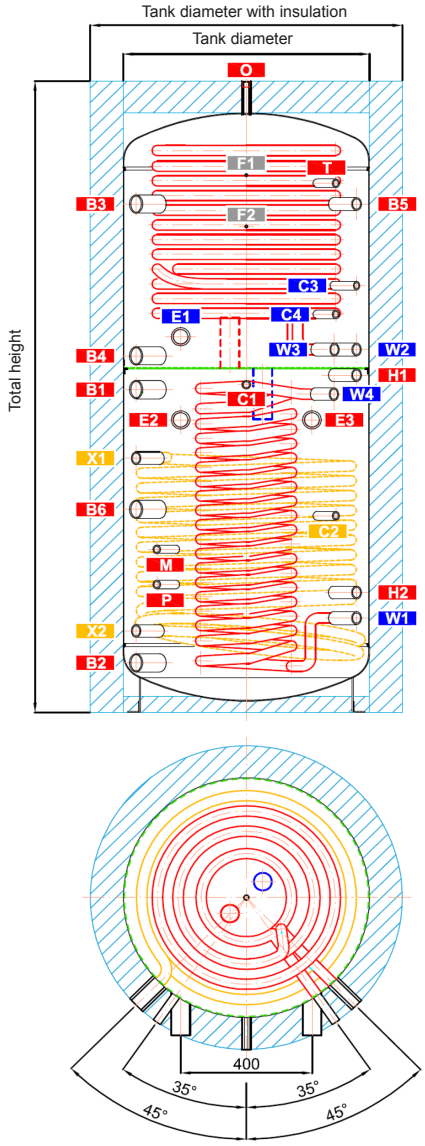
This Owners Manual is an integral and important part of the product and must be handed over to the User. Read carefully the instructions in this Manual as they contain important information concerning safety, installation, operation and maintenance. Keep this Manual for later reference. The appliance 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.

3 - Technical Data and Dimensions of HSK PR Model Line



pos.	conn.	HSK 600 PR	HSK 750 PR	HSK 1000 PR	HSK 1700 PR
		height [mm]			
heat sources					
B1	G6/4"F	985	1010	1205	1240
B2	G6/4"F	135	155	200	235
B3	G6/4"F	1570	1590	1635	1615
B4	G6/4"F	1090	1115	1340	1370
B5	G1"F	1570	1590	1635	1615
B6	G6/4"F	660	635	787	730
heating system					
H1	G1"F	1030	1055	1280	1300
H2	G1"F	365	375	380	415
solar thermal system					
X1	G1“F	820	795	950	935
X2	G1“F	235	255	300	335
electric heating elements					
E1	G6/4"F	1150	1175	1365	1437
E2	G6/4"F	890	915	1110	1170
E3	G6/4"F	890	915	1110	1170
DHW heating					
W1	G1“M	285	295	300	335
W2	G1"M	1110	1135	1360	1390
W3	G1"M	1110	1135	1360	1390
W4	G1“M	970	995	1220	1240
control and safety					
C1	G1/2"F	1000	1025	1250	1275
C2	G1/2"F	625	615	740	700
C3	G1/2"F	1310	1335	1550	1505
C4	G1/2"F	1220	1245	1470	1475
T	G1/2"F	1635	1655	1700	1675
M	G1/2"F	510	510	510	555
P	G1/2"F	400	400	400	445
air release					
O	G1/2"F	1935	1975	2080	2075
pump station mount					
F1	M6	1660	1680	1725	1802
F2	M6	1500	1520	1565	1642

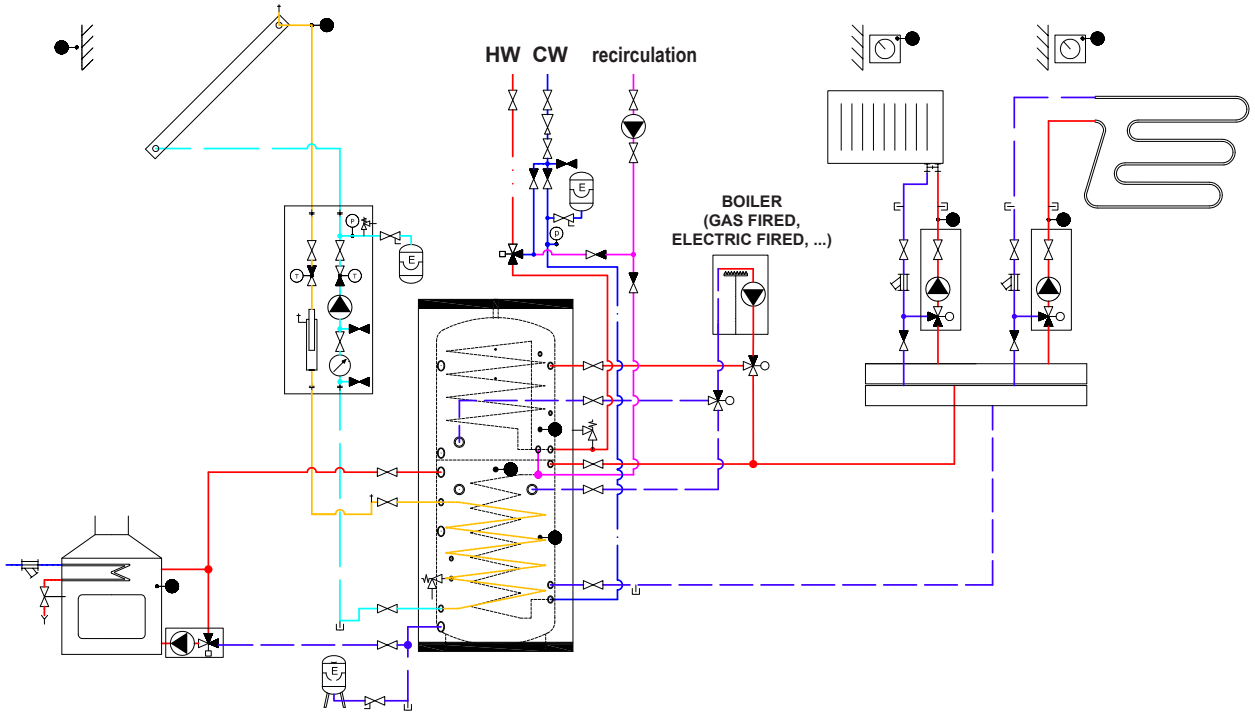
	HSK 600 PR	HSK 750 PR	HSK 1000 PR	HSK 1700 PR
Code - TANK	21188	21182	21200	21194
Code - INSULATION (accessory)	18 383	18 841	18 844	18 847
Thermal Store	HSK 600 PR with insulation	HSK 750 PR with insulation	HSK 1000 PR with insulation	HSK 1700 PR with insulation
Standing loss	100 W	118 W	131 W	178 W
Celkový objem	553 l	753 l	916 l	1676 l
Fluid volume in tank	508 l	706 l	866 l	1622 l
Solar heat exchanger volume	13 l	15 l	18 l	22 l
DHW HE heat exchanger volume above separating metal sheet	21 l	21 l	21 l	21 l
DHW HE heat exchanger volume below separating metal sheet	11 l	11 l	11 l	11 l
Solar heat exchanger surface area	2,4 m²	2,5 m²	3,2 m²	4,0 m²
DHW HE surface area above separating metal sheet	6 m²	6 m²	6 m²	6 m²
DHW HE surface area below separating metal sheet	3 m²	3 m²	3 m²	3 m²
Max. working temperature in tank	95 °C	95 °C	95 °C	95 °C
Max. working temperature in solar HE	95 °C	95 °C	95 °C	95 °C
Max. working pressure in solar HE	95 °C	95 °C	95 °C	95 °C
Max. working pressure in tank	4 bar	4 bar	4 bar	3 bar
Max. working pressure in solar HE	10 bar	10 bar	10 bar	10 bar
Max. working pressure in DHW HE	10 bar	10 bar	10 bar	10 bar
Immersion heater max. length	3x 555 mm	3x 700 mm	3x 755 mm	4x 955 mm
Tank material	S235JR			
Solar heat exchanger material	S235JR+N			
DHW heat exchanger material	AISI 316 L			
Tank diameter	650 mm	750 mm	800 mm	1100 mm
Diameter with insulation	850 mm	950 mm	1000 mm	1300 mm
Total tank height	1935 mm	1975 mm	2080 mm	2075 mm
Tipping height without insulation	1970 mm	2030 mm	2120 mm	2190 mm
Empty weight	136 kg	158 kg	180 kg	295 kg
Electric heating element	typ ETT-C, P, M, U			

4 - Operation

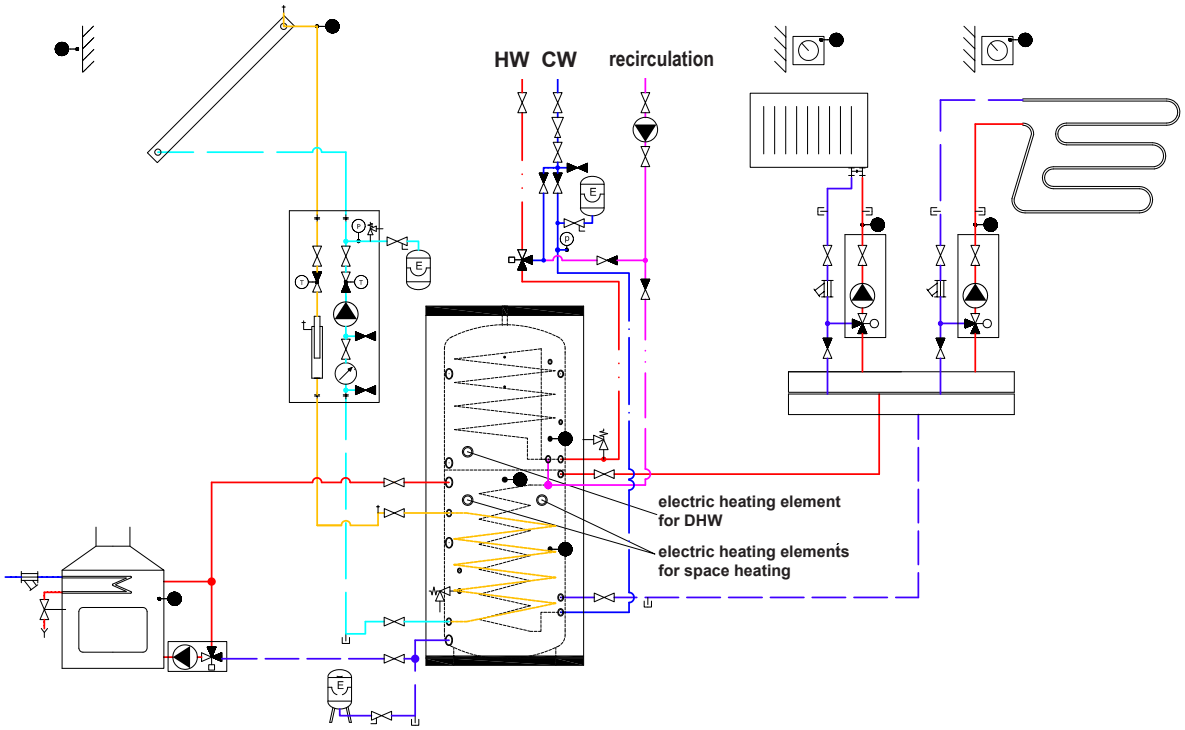
This tank is designed for heating and storing heating water in household or industrial applications, however always in closed pressure circuits with forced circulation. Hot water is heated inside the thermal store from several possible heat sources like various kinds of heating boilers, renewable energy 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.
Solar collector + gas-fired boiler+ fireplace



Example II.
Solar collector + el. heating element+ fireplace



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 - Connection to a solar thermal system

The tank can be used with a solar thermal system. In such a case, the inlet for hot solar fluid coming from the solar thermal system shall be connected to the upper tapping of the G 1" heating coil and the lower outlet to the return piping to the solar thermal system. Insulate meticulously all the piping between the tank and the solar thermal system.

6.3 - Installation of an el. heating element

The G 6/4" side tappings 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.

6.4 - 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. Install a DHW expansion vessel of 2 l min. volume at the cold water inlet. Installation of the expansion vessel is a condition 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

6.5 - 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

Warning

Insulation installation shall be done in two or three persons, depending on its size. Fleece insulation with a hard polystyrene surface **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.
Do not use any tools for installation.
Keep away from open fire.

Installing Insulation

1. Fix the tank following installation instructions.
2. Fit the bottom insulation parts.

3. 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.
4. Use the holes for tappings as a rest during the insulation installation.
5. At least one person presses the insulation to the tank, pulling both ends together. The other person closes the lock.
6. Put on the upper insulation and cover
7. Push on the covering plastic rosettes depending on the size of tappings, or put on the flange plug(s) with insulation.
8. 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.

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