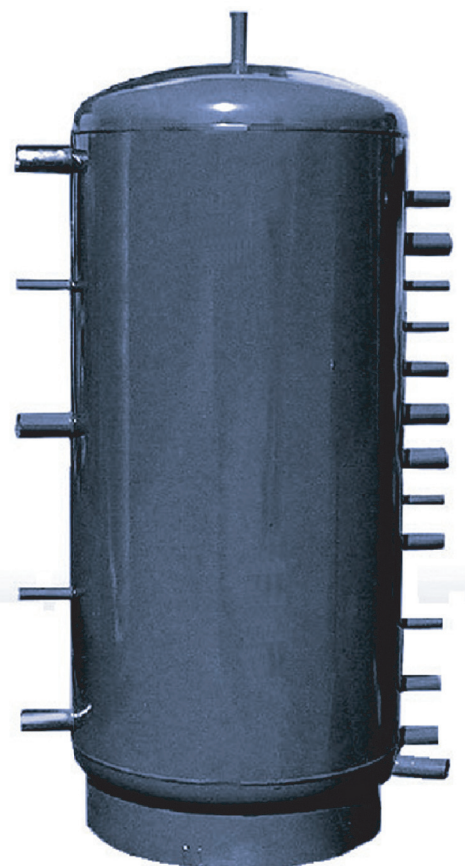


Owners Manual

ACCUMULATION TANKS
with DHW stainless-steel heat exchanger
HSK 500, HSK 800, HSK 1000,
HSK 1500, HSK 2000



CE

EN
v. 1.1

Regulus

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1. Description

HSK Accumulation Tanks are intended for accumulation and subsequent distribution of thermal energy of heating water. They are equipped with an immersed DHW stainless-steel heat exchanger (further "DHW" only), a stratification cylinder for the heating circuit return line, two steel heating coils (e.g. for connecting solar collectors), with the possibility to insert an el. heating rod, and enabling to connect further heat sources. The accumulation tank shall be always connected to a closed heating circuit. The tanks are further fitted with two G 6/4" sleeves for connection to heat sources, four G 1/2" sleeves to accommodate probe sheaths and 6 sleeves for other heat sources. The G 6/4" sleeves can be used for direct installation of el. heating rods. The tanks have one sleeve on the top for an air vent valve, five G 6/4" side sleeves for connection to a heating system, one G 6/4" side sleeve for installation of an el. heating rod, six side sleeves with 1/2" thread for placing sensors and four threaded G 1" side sleeves for connecting two heating coils.

For proper operation of a tank, it is necessary to have a hydraulic design of the entire heating system, i.e. position of circulation pumps for both heat sources and heating circuits, valves, clack valves etc. When more heat sources shall be combined, it is recommended to use an intelligent controller, e.g. Regulus IR09 KTP, for both the source and consumer sides of a heating circuit, i.e. also for charging and discharging an accumulation tank.

1.1 Models

Five models of 500, 800, 1000, 1500 and 2000l capacity with a stainless steel DHW heat exchanger.

1.2 Tank protection

The accumulation tank 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

For easy handling, tanks are supplied with a detachable soft insulation 120mm thick, with a zippered leatherette mantle.

1.4 Connection points on the tank

1x upper sleeve with G 1" inner thread
6x side sleeve with G 6/4" inner thread
6x (7x) side sleeve with G 1/2" thread
4x G 1" side sleeve
2x G 5/4" side sleeve

1.5 Packing

Tanks are delivered standing, each screwed to its pallet, packed in bubble wrap.

2. General Information

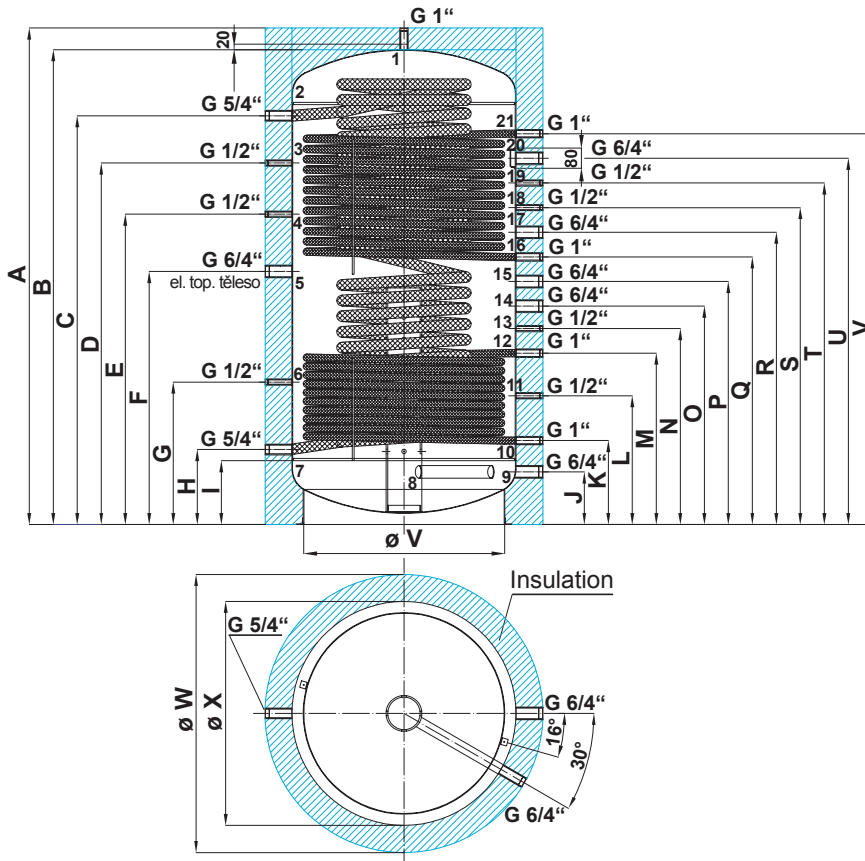
This Owners Manual is an integral and important part of the product and must be handed over to the User. Read carefully the instructions in this Manual as they contain important information concerning safety, installation, operation and maintenance. Keep this Manual for later reference. The appliance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

This appliance is designed to accumulate heating water 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 accumulation tank 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 Models



- Tank code a
- Insulation code b
- Total volume - tank + DHW heat exch. c
- Tank volume d
- Volume - DHW heat exch. e
- Volume - upper coil f
- Volume - lower coil g
- Surface - upper coil h
- Surface - lower coil i
- Surface - DHW heat exch. j
- Max. working temperature - tank+h.exch. 95 °C
- Max. working pressure - DHW h.exch. 6 bar
- Max. working pressure - tank 6 bar
- Empty weight k

Model		HSK 500	HSK 800	HSK 1000	HSK 1500	HSK 2000
Tank code	a	7662	7663	7506	7686	7687
Insulation code	b	7664	7665	7507	7688	7689
Total volume - tank + DHW heat exch. [l]	c	488	805	897	1478	1915
Tank volume [l]	d	443	750	842	1408	1825
Volume - DHW heat exch. [l]	e	45	55	55	70	90
Volume - upper coil [l]	f	-	7,8	12,1	12,3	18,1
Volume - lower coil [l]	g	10	12,1	12,3	12,3	23,7
Surface - upper coil [m²]	h	-	2	3	3,5	4,2
Surface - lower coil [m²]	i	2,3	3	3,5	3,5	5,5
Surface - DHW heat exch. [m²]	j	5,7	7,2	7,2	8,5	11,5
Empty weight [kg]	k	130	200	250	285	325
Dimensions [mm]	A	1720	1930	2110	2240	2380
	B	1640	1830	2010	2120	2260
	C	1420	1580	1760	1825	1950
	D	1150	1290	1500	1500	1730
	E	-	-	-	-	1470
	F	820	920	1130	1130	1210
	G	440	570	580	600	750
	H	240	270	270	335	350
	I	190	220	220	285	300
	J	150	170	170	235	250
	K	280	310	310	375	390
	L	490	465	495	520	630
	M	700	670	730	765	870
	N	800	770	840	875	970
	O	910	870	950	975	1080
	P	1020	980	1060	1085	1190
	Q	1150	1090	1210	1195	1300
	R	-	-	-	1305	1410
	S	-	1190	1350	1415	1520
	T	-	1290	1450	1525	1640
	U	1400	1390	1520	1635	1760
	V	-	1500	1680	1745	1870
	ø W	850	1030	1030	1240	1340
	ø X	650	790	790	1000	1100

4. Operation

This tank is designed for heating and accumulation of heating water in household or industrial applications, however always in closed pressure circuits with forced circulation. Hot water is heated inside the accumulation tank from several possible heat sources like various kinds of heating boilers, renewable energy sources (heat pumps, solar collectors), or also electric heating elements.

The immersed stainless-steel DHW heat exchanger is heated by heating water inside the accumulation tank. The immersed DHW heat exchanger shall be connected to cold water inlet with one 5/4" threaded fittings, and to hot water with the other one. When hot water is drawn from the outlet point, cold water flows into the immersed heat exchanger and heats up from the heating water in the accumulation tank.

The accumulation tank shall be connected to heat sources through G 6/4" threaded fittings. A solar system connects to the connection points of the heating coils through G 1" 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.

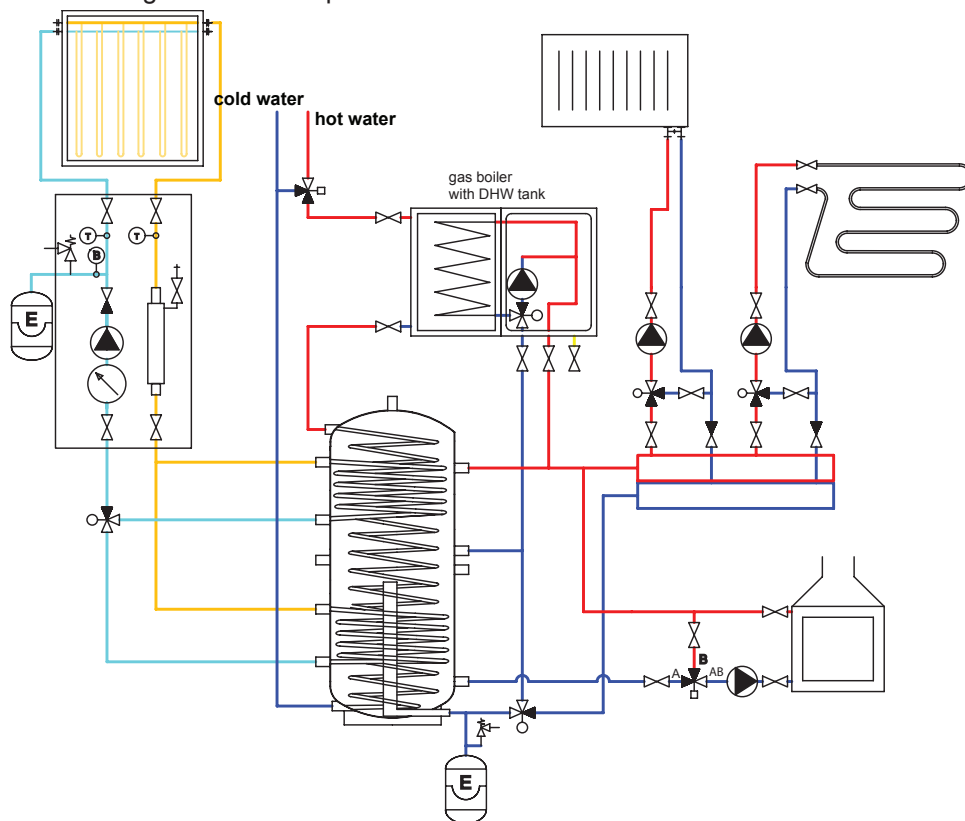
5. Examples of Assigning Connection Points

Connection point	Example I. Solar collector + combination gas boiler + fireplace	Example II. Solar collector + heat pump + el. heating rod.	Example III. Solar collector + gas boiler + solid fuel boiler.
1	1 plug / recirculation heat exchanger	1 plug / recirculation heat exchanger	1 plug / recirculation heat exchanger
2	outlet to a gas boiler's DHW tank	outlet of a DHW storage tank	outlet of a DHW storage tank
5	plug	el. heating rod	plug
7	cold water inlet	cold water inlet	cold water inlet
8	inlet from a manifold, expansion tank, safety valve	inlet from a manifold, expansion tank, safety valve	inlet from a manifold, expansion tank, safety valve
9	outlet to a fireplace	plug	outlet to a solid-fuel boiler
10	outlet to solar panels	outlet to solar panels	outlet from solar panels
12	inlet from solar panels	inlet from solar panels	inlet from solar panels
14	plug	plug	plug
15	outlet to a combination gas boiler	outlet to a heat pump	outlet to a heat pump
16	outlet to solar panels	outlet to solar panels	outlet to solar panels
17	plug	plug	plug
20	inlet from a comb. gas boiler, to manifold	inlet from a heat pump, to manifold	inlet from a gas boiler, solid-fuel boiler
21	inlet from solar panels	inlet from solar panels	inlet from solar panels
3, 4, 6, 11, 13, 18, 19	thermometers, sensors, plugs	thermometers, sensors, plugs	thermometers, sensors, plugs

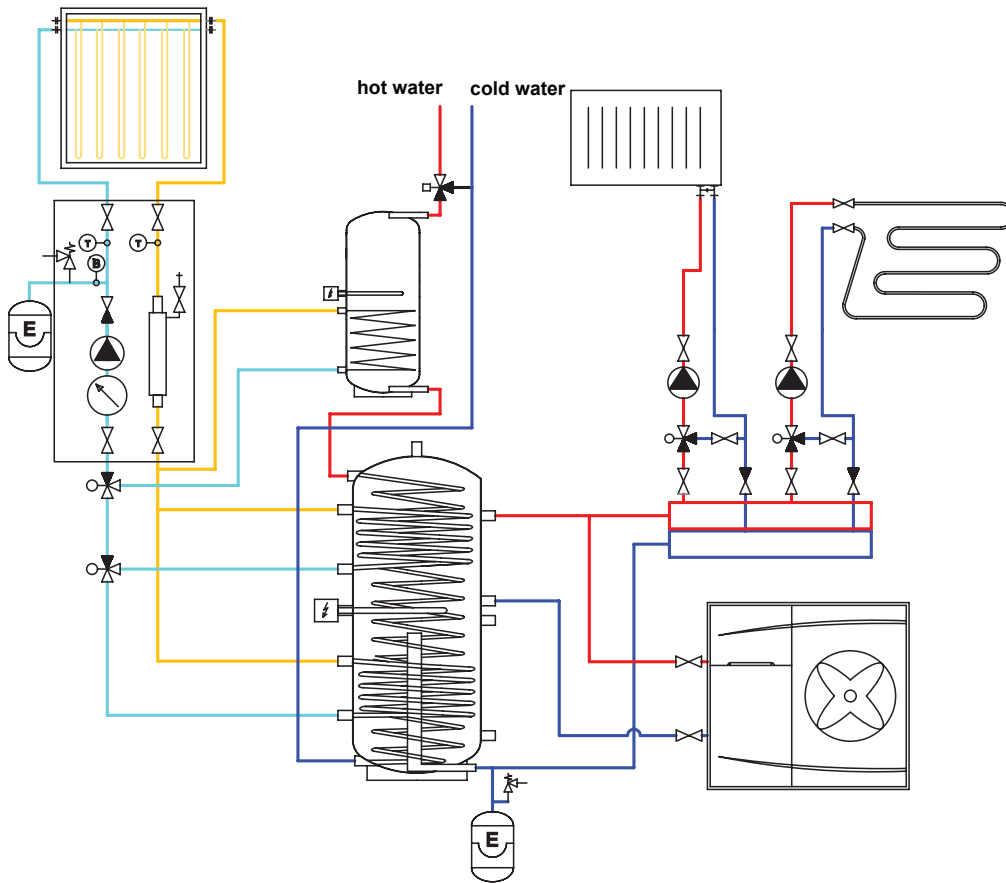
Connections depend on the circuits to be connected, the a.m. examples are informative only.

Example I.

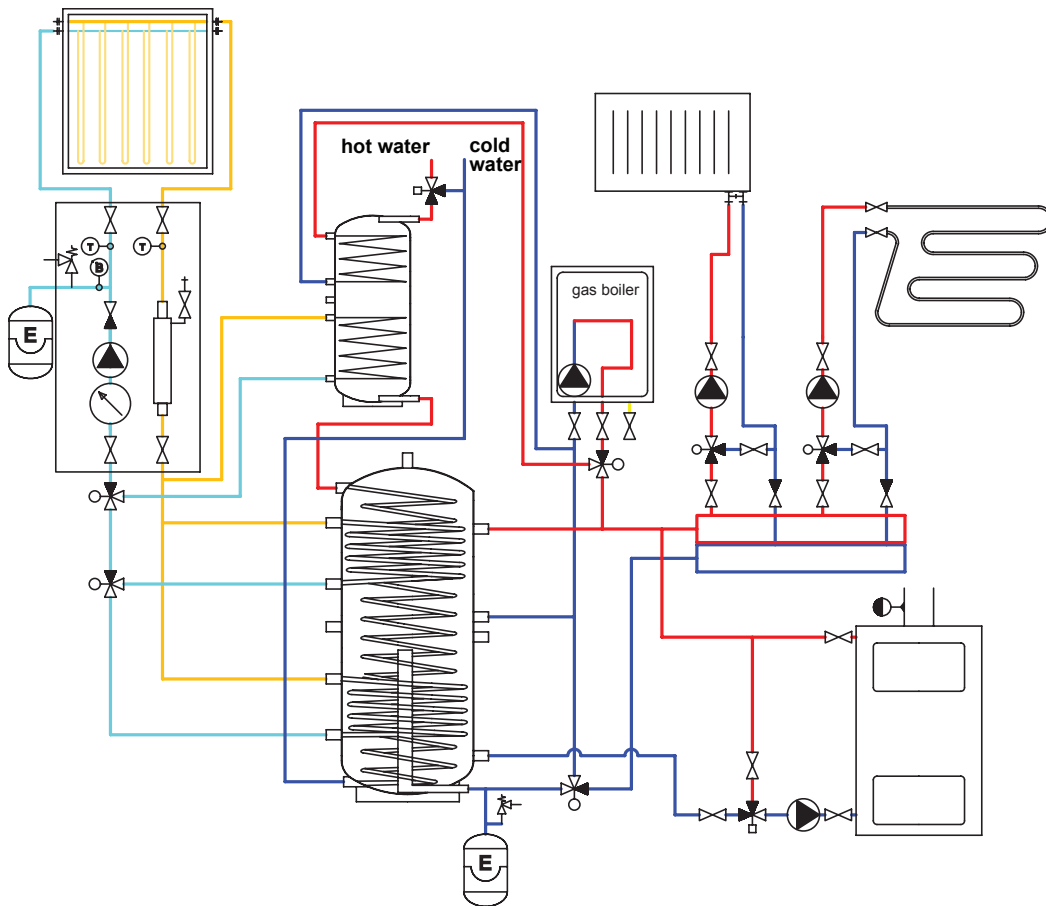
Solar collector + combination gas boiler + fireplace.



Example II.
Solar collector + heat pump + el. heating rod.



Example III.
Solar collector + gas boiler + solid fuel 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.

Connection to heat sources

Place the tank on the floor, as close to your heat source as possible. Mount the insulation, cf. Installing Insulation on the Tank. Connect the heating circuit 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 connecting piping.

The tank may be fitted with electric heating rods up to 12kW output. They can be power-supplied either directly (elements with built-in thermostat) or via a controller for the entire heating system.

All electric heating elements shall be protected by a safety thermostat.

Connection to a solar system

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

Connection to a water pipeline

Connect the tank to a water main according to valid rules. Installation of a pressure reducing valve on the tank inlet is recommended. For a water main with pressure above 6 bar a pressure reducing valve is necessary. Should the water be too hard, install a water softener before the tank. In case the water contains mechanical impurities, install a strainer.

Commissioning

The tank shall be filled up 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.

The quality of top-up and heating water is set by ČSN 07 7401/1992Sb.

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 proper function of all control and adjusting elements.

7. Installing Insulation on the Tank

Description

Thermal insulation is a component of accumulation tanks that prevents heat losses. For these types of accumulation tanks, insulation is supposed to be installed on the spot for easier handling. Insulation made of soft polyurethane foam with a zippered PVC layer is used.

Warning

Insulation installation shall be done in two or three persons, depending on its size. The zippered soft-foam 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.

How to install soft foam insulation with a PVC layer

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 sleeves 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, see pics.
5. Put on the upper insulation and cover.
6. Push on the covering plastic rosettes depending on the size of sleeves, 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.



Pictures showing how to mount soft-foam insulation with a PVC sheet on a storage water heater.

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.

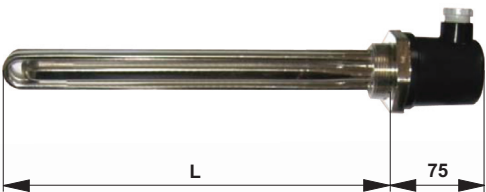
9. Disposal

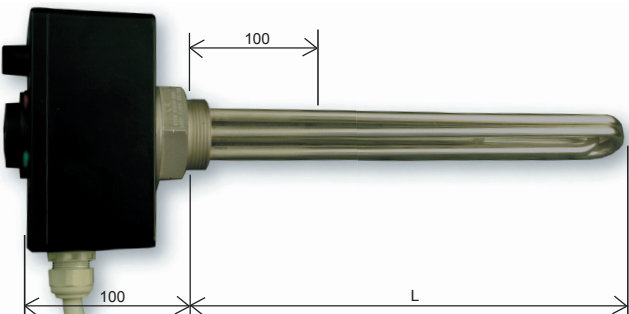
Packing shall be disposed of in compliance with the valid rules. When the product reaches the end of its life, it shall not be disposed of as household waste. It shall be dropped off at a Local Waste Recycling Center. Insulation shall be recycled as plastic and the steel vessel as scrap iron.

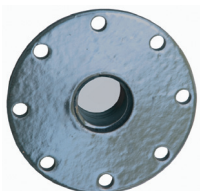
10. Recommended Accessories

10.1 Electric heating rods

Electric heating rods can be used in domestic storage water heaters and accumulation tanks. They can be power-supplied either by 230V or 3x230V/400V. Heating rods of output 2-12 kW can be installed into accumulation tanks, into the sleeves with G 6/4" inner thread (the right type should be selected with respect to its length and the tank diameter). Electric heating rods are currently made of nickel-plated copper. They can be also supplied in a copper or stainless-steel version. Heating rods with an integrated electronic thermostat and a safety thermostat are also available.

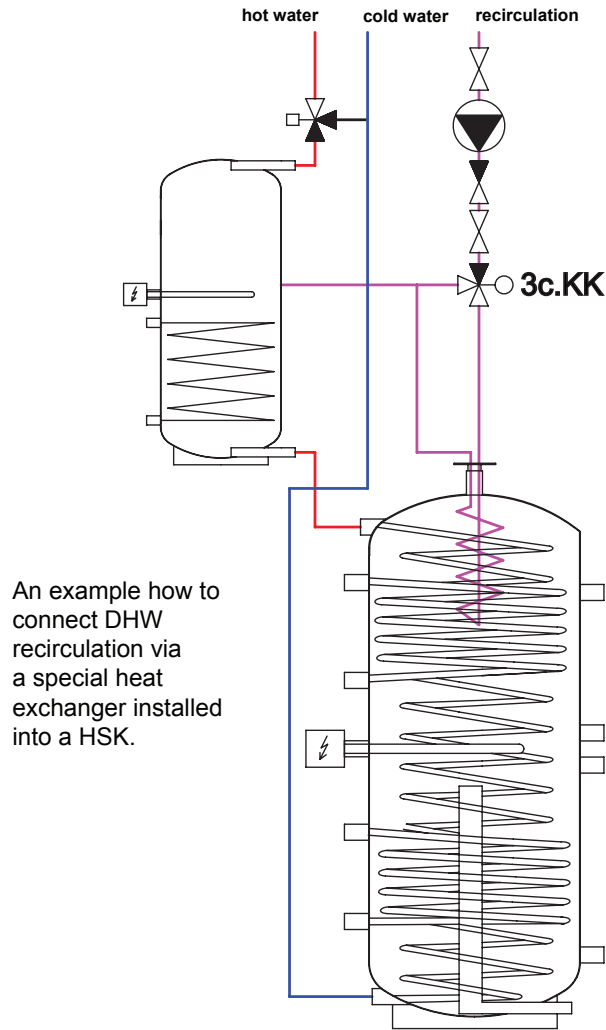
G 6/4" thread, nickel-plated copper	power output (kW)	voltage (V)	length L (mm)	code
	2	230	245	8935
	3	230	305	8936
	4.5	3 × 230	370	8937
	6	3 × 230	495	8938
	7.5	3 × 400	585	8939
	9	3 × 400	680	8940
	12	3 × 400	815	8941

G 6/4" thread, stainless steel, thermostatic head, adjustable by a knob	power output (kW)	voltage (V)	length L (mm)	code
	2	230 V	473	8932
	3	230 V	350	8933
	2	3 × 230 V	225	8930
	3	3 × 230 V	285	8931
	4.5	3 × 230 V	382	8464
	6	3 × 400 V	478	8465
	7.5	3 × 400 V	570	8582
	9	3 × 400 V	665	8466

Flange enabling installation of an electric heating rod into the lower inspection hole.	flange diameter	flange thread	code
	170 mm	inner G 6/4"	7376

10.2 Heat exchanger for DHW recirculation

It is designed to preheat the circuit of DHW recirculation, enabling to cover the heat loss of the recirculation circuit from the solar system directly. This heat exchanger can be installed in place of the top plug of the accumulation tank. It has a G 1" connection thread and is 710 mm long. Inlet to and outlet from the heat exchanger are done through threaded fittings with G 1/2" outer thread. Its plug incorporates a manual air discharge valve for the accumulation tank.



Before installing recirculation, it is advisable to consider if it pays off. There are two aspects, mutually contradicting. Faster supply of hot water to an outlet point and always hot water of a comfortable temperature, for the price of increased energy consumption (power for a recirculation pump and heat losses in piping). On the other hand, thanks to a faster supply of hot water, losses caused by drawing cold water from the hot-water tap are eliminated and water savings are reached. The connecting pipes of the recirculation heat exchanger and recirculation circuit inside a building shall be well insulated to prevent heat loss. In case of a poor insulation or a more distant outlet point, the output of the heat exchanger might be insufficient due to its limited size.



10.3 Watersoft N electromagnetic water treatment device

The device for electromagnetic water treatment, Watersoft N, uses no chemicals. It softens water, prevents scale formation and dissolves existing sediments. It is particularly suitable for use with devices with thermally stresses spots like heat exchangers and storage water heaters. Among its advantages is a quick and easy installation, no need for plumber's intervention and min. operation costs (consumption of el. energy 2W).

Model	WATERSOFT N
Operation indication	green LED
Version	wall mount
Power supply	230V / 50Hz
Power input	max. 2W
El. protection	IP 65
Dimensions	70 x 50 x 34 (mm)
Max. pipe diam.	1 1/2"
Max. water flow	4m ³ /h



10.4 Additives for heating systems

MR-501/F

Protective liquid made of organic compounds, intended for use in heating and cooling systems, solar collectors and heat pumps. It prevents corrosion of metals (iron, copper, aluminum etc.) and their alloys by creating a film on the surface that is in touch with the heating liquid. It can be mixed with antifreeze fluids. Recommended use: after cleaning the system with M 501.

MR-501/96P

Liquid agent of balanced efficiency for underfloor heating, solar panels and plastic piping. It creates a protective film and prevents growth of algae and gas formation. The system is also protected against calcareous sediments. This well-balanced mixture of corrosion inhibitors and protective film creating compounds ensures a max. protection of underfloor heating and solar panel circuits.

MR-501/R (1kg)

Concentrated alkaline anti-corrosion liquid removing scale and calcareous sediments from heating systems. It dissolves scale and rust and makes it possible to remove them by flushing the system. 2 liters of MR-501/R shall be added to every 80-100 l of heating water and let to act for 2-3 weeks depending on the degree of sedimentation. Then the heating system shall be drained and flushed. When filling new water, it should be treated by adding the protective liquid MR 501/F.

WARRANTY CERTIFICATE

for HSK Accumulation Tank

Model:

Serial number:

WARRANTY CONDITIONS

1. The warranty period is 60 months from the date of purchase.
2. When claiming warranty, this Warranty Certificate must be submitted together with the purchase receipt.
3. The warranty is valid only when the technical conditions set by this Manual are maintained and installation is done by an authorized person (confirmed in the Warranty Certificate).
4. The claimed defect must not be caused by tampering, improper installation and operation, using the product for other purposes than intended, placing the product in improper environment, or by a natural disaster.
5. Claims shall be settled by your dealer at the address shown below.

Date of purchase:.....

Stamp print, signature of the salesman and address of the shop:

Date of a professional installation by plumber:

Stamp print, signature and address of the authorized person:

08/2008



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