Owners Manual

ACCUMULATION TANKS
PSW 200, PSWF 300, PSWF 500, PSWF 800, PSWF 1000, PSWF 1500, PSWF 2000, PSWF 3000, PSWF 4000, PSWF 5000

CE

Regulus®

EN
v. 1.2

CONTENTS

1. Description

PSWF Accumulation Tanks are intended for accumulation and subsequent distribution of thermal energy from solid-fuel fired boilers, heat pumps, solar collectors, electric boilers etc. An accumulation tank shall be always connected to a closed heating circuit. A PSWF tank is fitted with a flange in its upper part that can be used to accommodate a suitably sized tube heat exchanger. In the bottom part there is a heating coil with 1” connection point. Flanges for installation of heat exchangers with either G 1” or G 3/4” connection are supplied separately. When no heat exchanger is be used, a blind flange shall be installed. Heat exchangers consist of copper pipes with fins that increase their overall surface and improve heat transfer. The tanks are further fitted with nine G 6/4” sleeves for connection to heat sources and four G 1/2” sleeves to accommodate probe sheaths. The G 6/4” sleeves can be used for direct installation of el. heating rods.
For example, the tube heating coil can be connected to a solar system and the upper heat exchanger to a domestic hot water system, or tube heating coil can be connected to a heat source and the upper heat exchanger will serve for instantaneous water heating. Heating domestic hot water in this manner limits significantly the risk of Legionella formation.
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, non-return 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
Ten models of 200, 300, 500, 800, 1000, 1500, 2000, 3000, 4000 and 5000 l capacity.

1.2 Tank protection
The inner surface has no finish, no anticorrosion protection, the outer surface is lacquered in gray.

1.3 Thermal insulation
For tanks of volume up to 1000 l inclusive, the type of insulation can be selected. For the sake of easier handling, both the types available are installed on the spot. The insulation is either made of hard polystyrene with a plastic surface or melanin, or made of soft polyurethane foam. For tanks of bigger volumes (model PSWF 1500 and over) only the soft polyurethane insulation is available. The insulation is also 100 mm thick and is fitted with a zippered outer leatherette jacket.

1.4 Connection points on the tank
1x flange of 210mm inner diameter (does not apply to PSW 200)
8x sleeve with a lateral connection in a 90° sector, G 6/4“ inner thread
1x sleeve with upwards connection, G 6/4“ inner thread
4x sleeve for installation of lateral sensor sheaths, G 1/2“ inner thread
2x sleeve for connecting a heating coil, G 1“ inner thread

1.5 Packing
Tanks are delivered standing, each screwed to its pallet, packed in bubble wrap. Gaskets and screws for fixing a flange are enclosed.

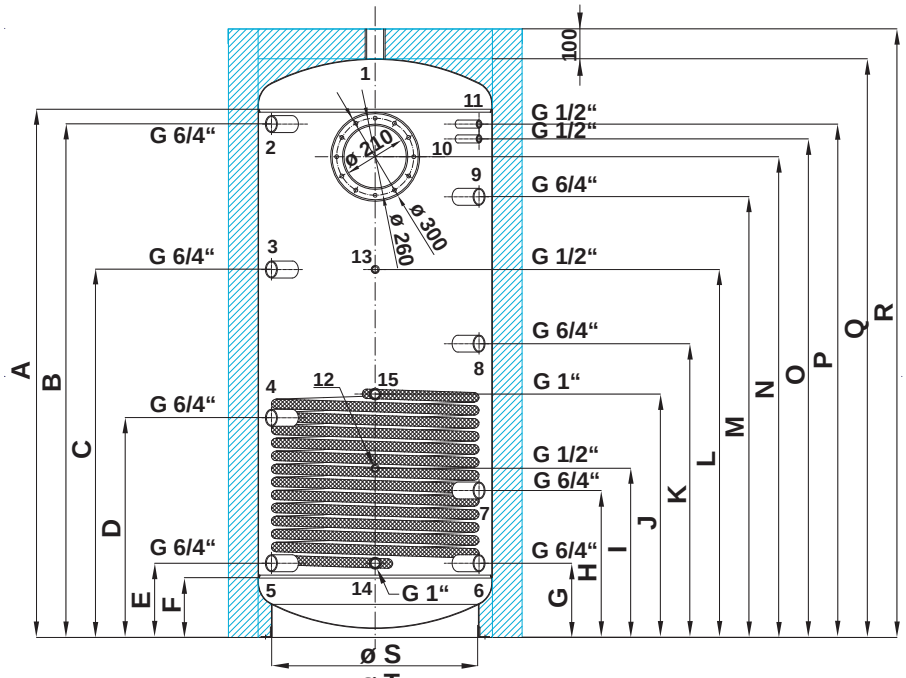
2. General Information

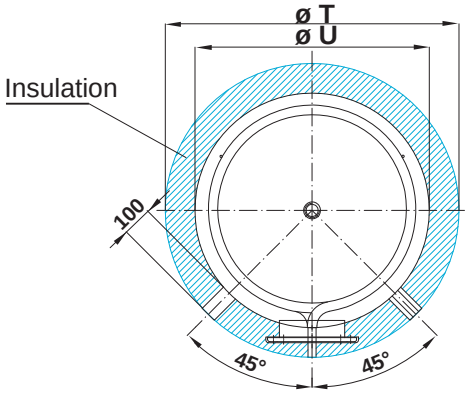
This Owners Manual is an integral and important part of the product and must be handed over to the User. Read carefully the instructions in this Manual as they contain important information concerning safety, installation, operation and maintenance. Keep this Manual for later reference. The appliance 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 also suitable for continuous heating of domestic hot water. For this purpose a suitably sized heat exchanger is needed as an accessory that shall be installed to the flange (does not apply to PSW 200).

Using the accumulation tank for other purposes than above described (e.g. as a storage water heater) is forbidden and the manufacturer accepts no responsibility for damage caused by improper or wrong use.
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 PSWF (PSW) Models





Tank code	**a**
Hard insulation code	**b**
Soft insulation code	**c**
Total tank volume	**d**
Empty weight	**e**
Max. working pressure -	
PSW200, PSWF300 to PSWF1000	**6 bar**
PSWF1500 to PSWF5000	**4 bar**
Max. working temperature	**95 °C**
Heating coil surface	**f**
Heating coil volume	**g**
Max. working pressure - heating coil	**10 bar**
Max. working temperature - heating coil	**110 °C**

Model		PSW 200	PSWF 300	PSWF 500	PSWF 800	PSWF 1000	PSWF 1500	PSWF 2000	PSWF 3000	PSWF 4000	PSWF 5000
Tank code	**a**	9163	7387	7388	7389	7390	7391	7392	7393	7394	7395
Soft insulation code	**c**	9164	7509	7510	7511	7512	7400	7401	7402	7403	7404
Tank volume [l]	**d**	200	300	500	800	1000	1500	2000	3000	4000	5000
Empty weight [kg]	**e**	74	91	113	144	169	250				
Heating coil surface [m²]	**f**	1,0	1.5	2	2.4	2.8	3	3.6	4.8	5	5
Heating coil volume [l]	**g**	6,4	10.5	13.5	15.5	22	19.5	23,5	31,5	33	33
Dimensions [mm]	**A**	1232	1275	1400	1460	1780	2025	1985	1860	1895	2395
	B	1160	1215	1355	1410	1730	1975	1925	1815	1840	2235
	C	710	885	1010	1020	1240	1420	1400	1350	1365	1705
	D	-	550	610	620	740	865	875	885	910	1075
	E	220	210	210	250	250	310	350	420	445	445
	F	170	160	165	200	200	260	300	360	395	395
	G	220	210	210	250	250	310	350	420	445	445
	H	-	380	410	435	495	590	610	650	675	760
	I	410	540	540	570	570	730	690	760	785	920
	J	600	660	770	760	820	1030	950	1070	1065	1065
	K	645	720	810	820	990	1145	1135	1115	1140	1390
	L	810	885	1010	1020	1240	1420	1400	1350	1365	1705
	M	1050	1050	1190	1215	1485	1700	1660	1580	1605	2020
	N	-	1115	1240	1300	1620	1850	1805	1695	1720	2220
	O	1060	1165	1305	1360	1680	1925	1875	1765	1790	2285
	P	1160	1215	1355	1410	1730	1975	1925	1815	1840	2335
	Q	1340	1410	1550	1630	1950	2240	2235	2190	2255	2755
	R	1440	1510	1650	1730	2025	2340	2335	2290	2355	2855
	ø S	380	450	550	700	700	850	1000	1300	1500	1500
	ø T	650	750	850	990	990	1150	1300	1600	1800	1800
	ø U	450	550	650	790	790	950	1100	1400	1600	1600

4. Operation

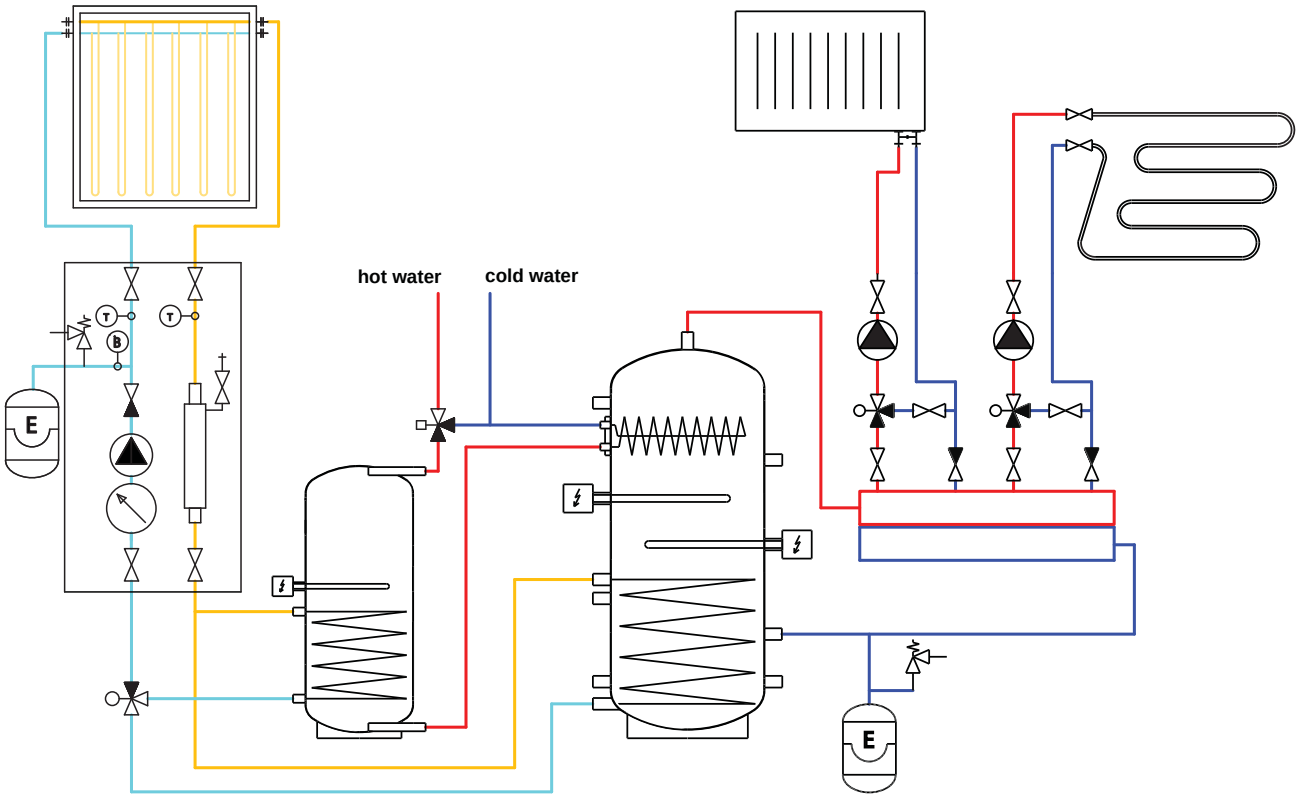
This accumulation tank is designed for heating and accumulation of heating water in domestic or industrial applications, however always in closed pressure circuits with forced circulation. In the accumulation tank, heating water is heated up from several heat sources like various types of hot-water boilers, renewable energy sources (heat pumps, solar collectors), or electric heating rods.
The accumulation tank shall be connected to a heat source with G 6/4" threaded fittings. A solar system connects to the outlets of the built-in heating coils with 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

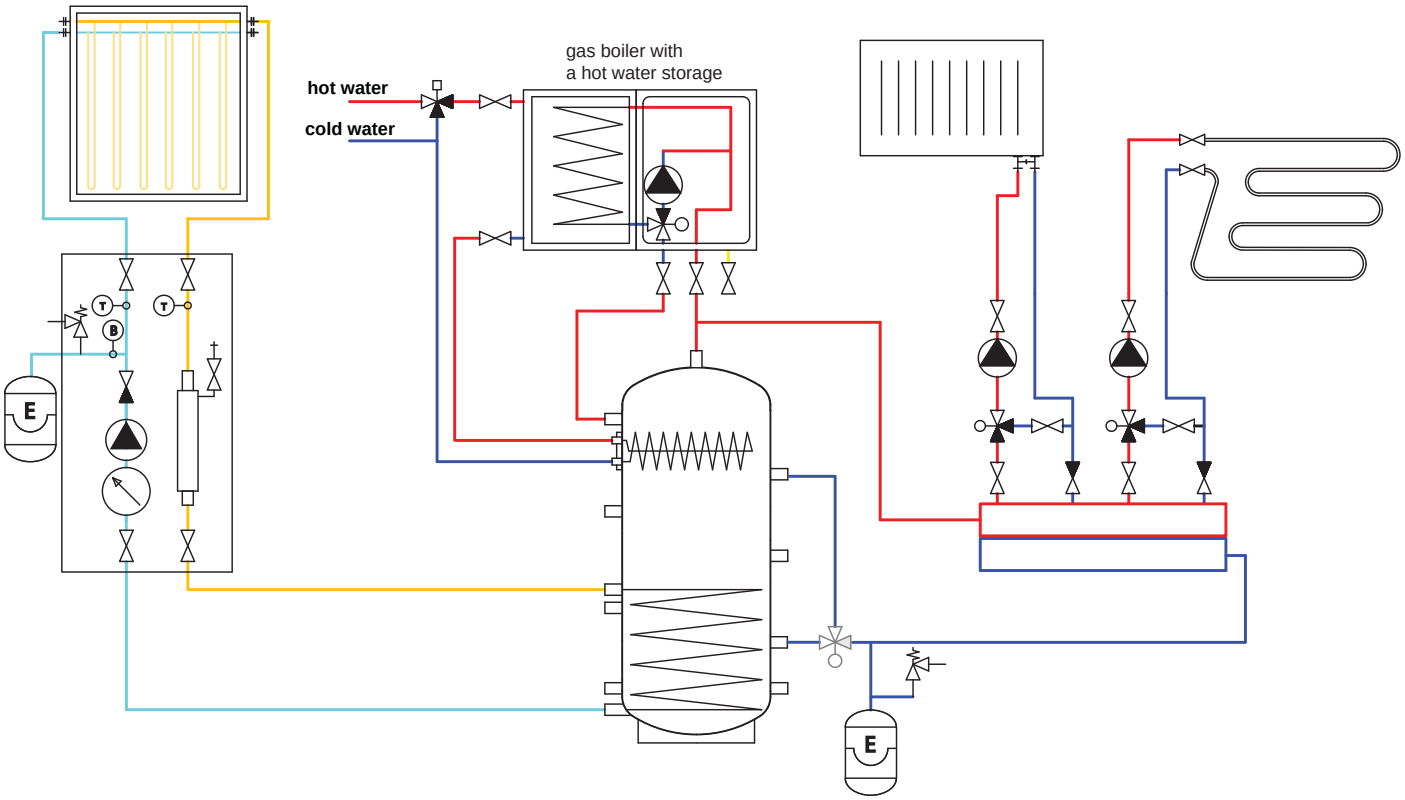
Connection point	Example I. Solar collectors + el. heating rods	Example II. Solar collectors + gas boiler	Example III. Solar collectors + solid fuel boiler + el. heating rods
1	outlet to a heating system	outlet to a heating system	outlet to a heating system
2	plug (inlet from a fireplace)	outlet to a gas boiler	inlet from a boiler
3	electric heating rod	plug (inlet from a heat pump)	electric heating rod
4	plug (outlet from a heat pump)	plug	plug
5	plug (outlet to a fireplace, heat pump)	plug (outlet to a fireplace, heat pump)	outlet to a boiler (fireplace)
6	drain cock	drain cock	drain cock
7	inlet from a heating system	inlet from a heating system	inlet from a heating system
8	electric heating rod	plug	electric heating rod
9	plug	plug (inlet from a fireplace), from a heating system	plug (inlet from a fireplace)
10	temperature sensor for heating control	thermometer	temperature sensor for heating control
11	heating rod thermostats (adj.+safety)	temperature sensor for heating control	heating rod thermostats (adj.+safety)
12	temperature sensor for solar control	temperature sensor for solar control	temperature sensor for solar control
13	thermometer	plug	thermometer
14	outlet from a solar system	outlet from a solar system	outlet from a solar system
15	inlet from a solar system	inlet from a solar system	inlet from a solar system
upper flange	pre-heat coil for sanitary water heater	pre-heat coil for sanitary water heater	pre-heat coil for sanitary water heater

Connections depend on the circuit to be connected, the a.m. examples are informative only.
**possible variants with a fireplace and a heat pump shown in brackets*

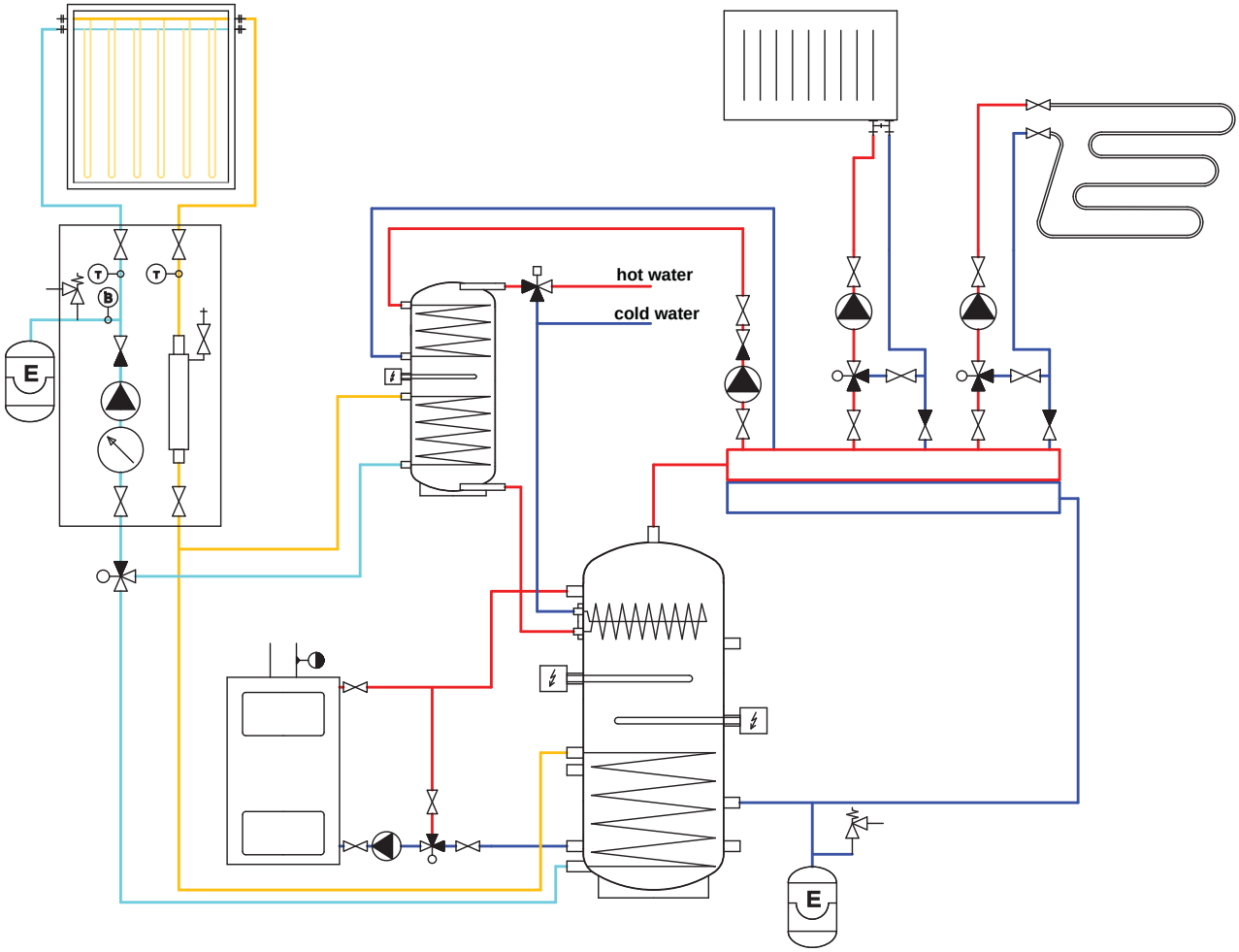
Example I.
Solar collectors and el. heating rods.



Example II.
Solar collectors and a combination gas boiler.



Example III.
Solar collectors, a solid fuel boiler and el. heating rods.



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 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 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.

Commisioning

When the upper flange is fitted with a properly sized heating coil, this tank can be used as a continuous water heater. This does not apply to PSW 200 that is not fitted with a top flange. For this reason installation of a heat exchanger for continuous water heating is not possible which means PSW 200 cannot be used as a domestic water heater.
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.

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

Instructions

Product description

Thermal insulation of soft polyurethane foam with a zipped PVC layer, or melamine or polystyrene boards with a batten and hard PS sheet, with a lid and a set of rosettes.

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.

How to install insulation with a hard PS foil

1. Fix the tank following installation instructions.
2. Apply the self-adhesive spacer strips on the tank in a top, middle and bottom positions, if supplied. Cut away the overlapping pieces.
3. Place soft-foam inserts into the holes for sleeves.
4. Place the insulation on sleeves, flanges etc. and wrap it around the tank evenly. For insulation consisting of 2 parts, lock the battens on one side and secure them with two (top and bottom) auxiliary plastic clamps. Rubbing and patting the insulation by hand will make it adhere to the tank's surface completely, leaving no bubbles.
5. Press the surface of the insulation slowly, pushing the batten to interlock with its counterpart. Make the lock as tight as possible. For a two-piece insulation, remove the auxiliary clamps and push the batten to interlock in its tightest position.
6. Put on the upper insulation and the lid.
7. Glue the cover rosettes respecting the sleeve sizes, put on insulated flange cover(s) where needed.
8. Finish the tank installation in compliance with the respective instructions and valid standards and rules.

Warranty on insulation

The insulation is covered by a 24-month warranty. This period starts the next day after the insulation is sold.

□ 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.

REGULUS spol. s r.o.
Do Koutů 1897/3
CZ-143 00 Praha 4
http://www.regulus.eu
E-mail: sales@regulus.cz