

Installation and Operation Instructions

ACCUMULATION TANKS
with immersed DHW tank
**DUO-E2 600/150, DUO-E2 750/200,
DUO-E2 1000/220, DUO-E2 1500/300**



CE

EN
v. 1.4

Regulus

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1 - Description

DUO-E2 Accumulation Tanks are intended for accumulation and subsequent distribution of thermal energy of heating water with an immersed DHW tank and two steel heating coils from solid-fuel fired boilers, heat pumps, solar collectors, electric boilers etc. The accumulation tank shall always be connected to a closed heating circuit. There are 2 coils with 1" connection installed inside the tank. The tanks are further fitted with two G 6/4" sleeves for connection to heat sources, four G 1/2" sleeves to accommodate sensor sheaths and six sleeves for other heat sources. The G 6/4" sleeves can be used for direct installation of el. heating rods.

In order to reach proper working of the tank, it is necessary to design optimum hydraulics of the whole system, i.e. position of circulation pumps for sources and heating circuits, valves, non-return 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 load sides of a heating circuit, i.e. also for charging and discharging the accumulation tank.

1.1 - Models

Four models of 600/150, 750/200, 1000/220 and 1500/300 l enabling installation of an electric heating rod and other heat sources.

1.2 - Tank protection

The inner surface of the DHW tank is enameled according to DIN 4753. Further improvement is ensured by a magnesium anode fitted in the tank. The accumulation tank has no inner surface finish, the outer surface is lacquered in gray.

1.3 - Thermal insulation

For easy handling, the tanks are supplied with a detachable soft insulation 100 mm thick, with a zippered outer leatherette mantle.

1.4 - Connection points on the tank

2× sleeve with G 6/4" inner thread

6× sleeve with G 1" inner thread

4× sleeve for installation of lateral sensor sheaths, G 1/2" inner thread; DUO-E2 1500/300 has 5 sleeves

4× 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. It is forbidden to transport and/or store the storage tanks in a horizontal position.

2 - General Information

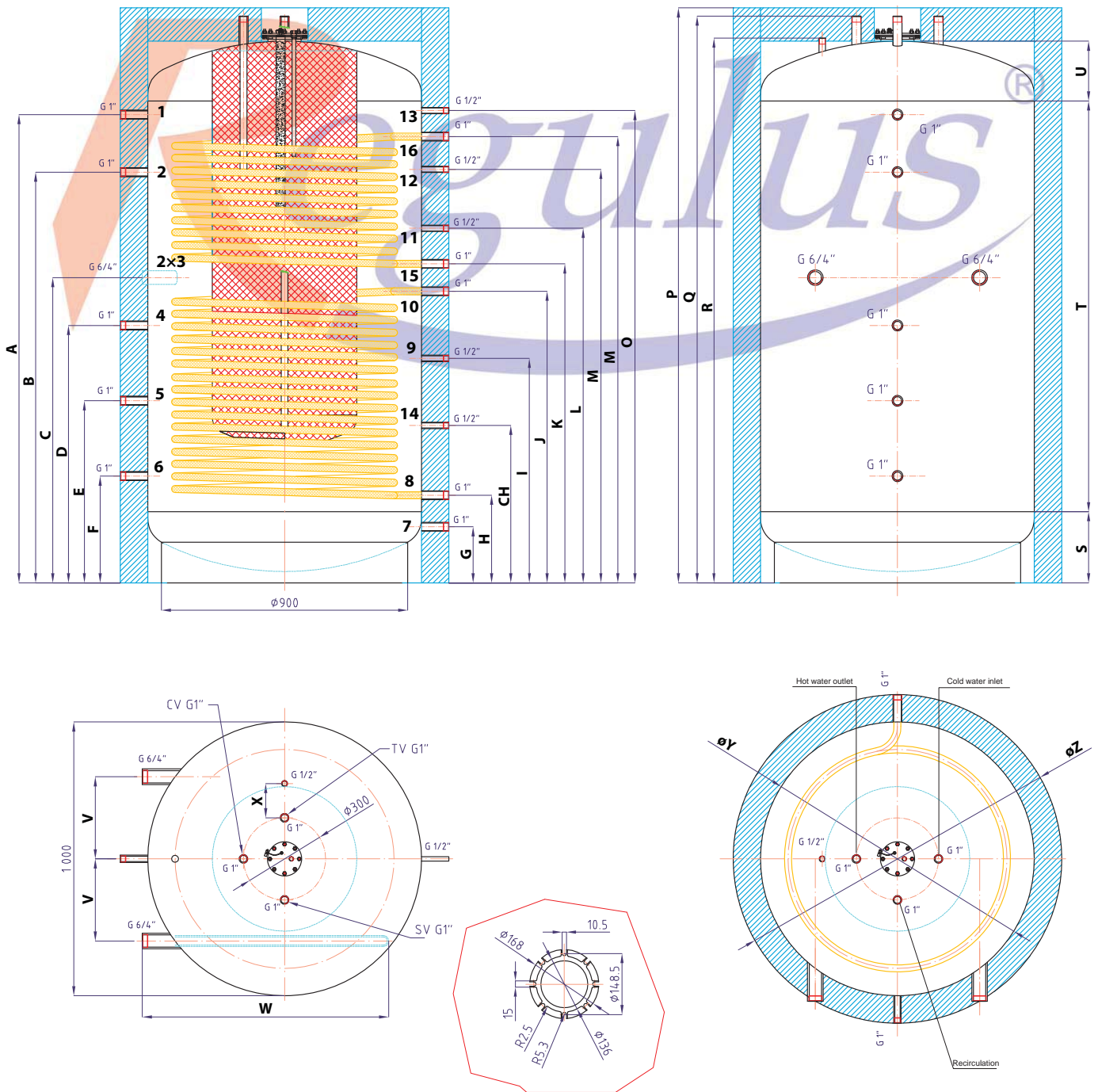
This Owners Manual is an integral and important part of the product and must be handed over to the User. Read carefully the instructions in this Manual as they contain important information concerning safety, installation, operation and maintenance. Keep this Manual for later reference. The appliance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

This appliance is designed to accumulate heating water and distribute it subsequently. It must be connected to a heating system and heat sources. This appliance is also suitable for accumulator 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.

Before filling the accumulation tank, fill the inner tank first!!!

3 - Technical Data and Dimensions



Total tank volume:	a [l]
Volume of the inner DHW tank:	b [l]
Upper heating coil volume:	c [l]
Lower heating coil volume:	d [l]
Upper heating coil surface area:	e [m ²]
Lower heating coil surface area:	f [m ²]
Max. working temperature of the tank and heat exchanger:	95 [°C]
Max. working pressure of the heating coils:	10 [bar]
Max. working pressure of the outer tank:	3 [bar]
Max. working pressure of the inner DHW tank:	10 [bar]
Empty weight:	g [kg]

Model		DUOE 2 600/150	DUOE 2 750/200	DUOE 2 1000/220	DUOE 2 1500/300
Tank code		10579	10580	10581	10582
Total tank volume [l]	a	600	750	1000	1500
Volume of the inner DHW tank [l]	c	150	200	220	300
Upper heating coil volume [l]	c	7.4	9	12	14.7
Upper heating coil volume [l]	d	12	12	13,8	19
Lower heating coil volume [m ²]	e	1.5	1.8	2.4	3
Upper heating coil surface area [m ²]	f	2.4	2.5	2.8	3.9
Lower heating coil surface area [kg]	g	176	221	261	364
Dimensions [mm]	A	1315	1570	1700	1710
	B	1060	1220	1350	1500
	C	880	1025	1075	1115
	D	750	745	900	940
	E	475	468	600	665
	F	235	235	270	390
	G	155	155	170	205
	H	245	245	270	320
	CH	-	-	-	575
	I	520	730	800	820
	J	835	975	1000	1065
	K	930	1075	1150	1165
	L	1030	1185	1270	1295
	M	1125	1345	1490	1510
	N	1255	1455	1610	1630
	O	1315	1565	1730	1725
	P	1625	1880	2090	2100
	Q	1570	1825	2010	2070
	R	1515	1770	1980	1990
	S	195	195	220	265
	T	1160	1415	1600	1500
	U	170	170	170	235
	V	250	250	250	300
	W	650	650	700	900
	X	90	90	90	125
	Y	750	750	790	1000
	Z	950	950	990	1200

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 DHW tank is heated from heating water inside the accumulation tank. The immersed DHW tank shall be connected to cold water with threaded fittings, and to outlet points with threaded fittings for hot water. When hot water is drawn from the outlet point, cold water flows into the immersed tank and heats up from the heating water in the accumulation tank to the temperature set by the thermostat placed in the DHW tank sheath. Hot water temperature should be set to 60-65 °C. This temperature guarantees the best operation and at the same time, it prevents formation of Legionella bacteria.

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

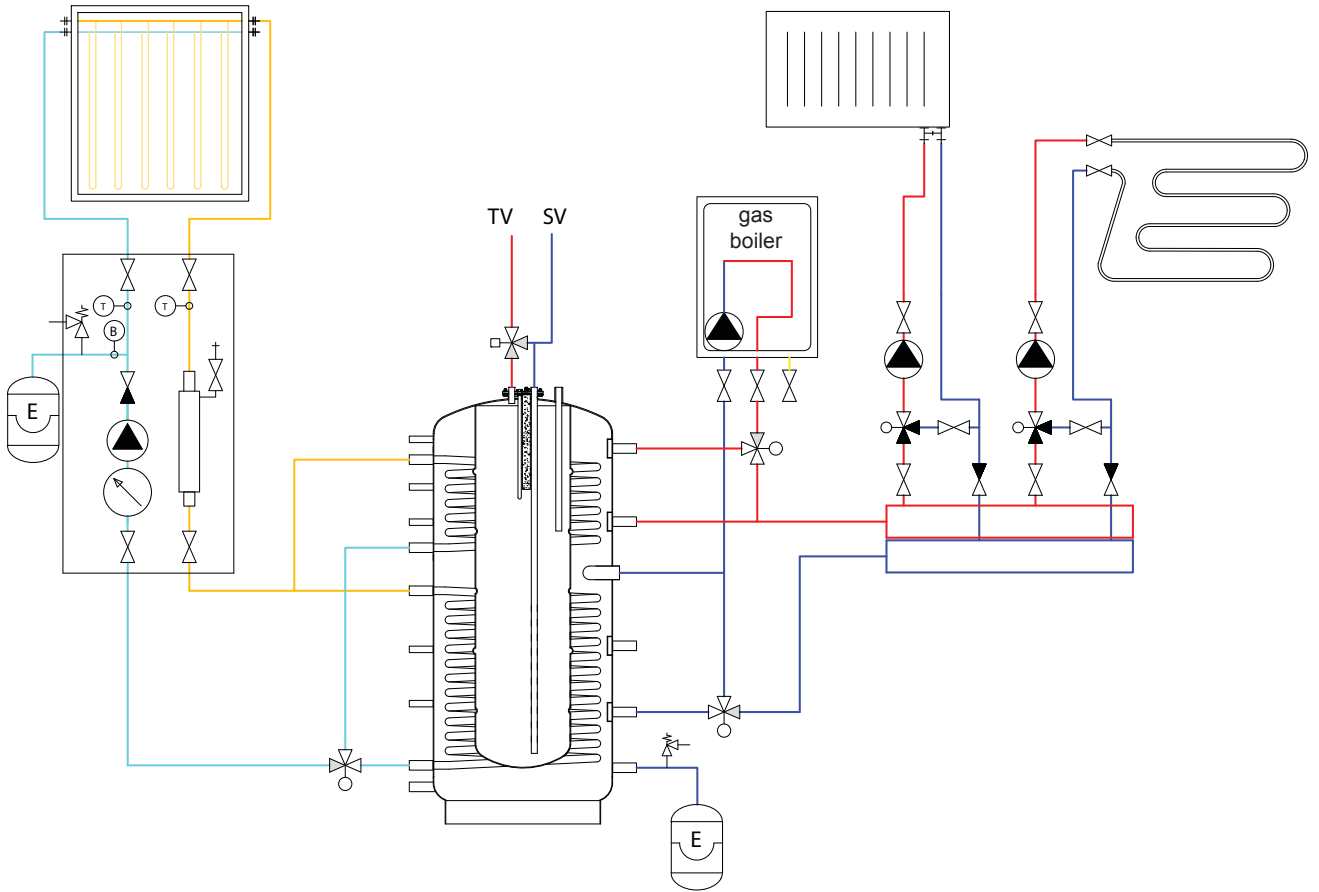
Individual connection points are assigned according to the circuits to be connected. There is a wide choice of combinations, the following chapter describes just some examples.

5 - Examples of Assigning Connection Points

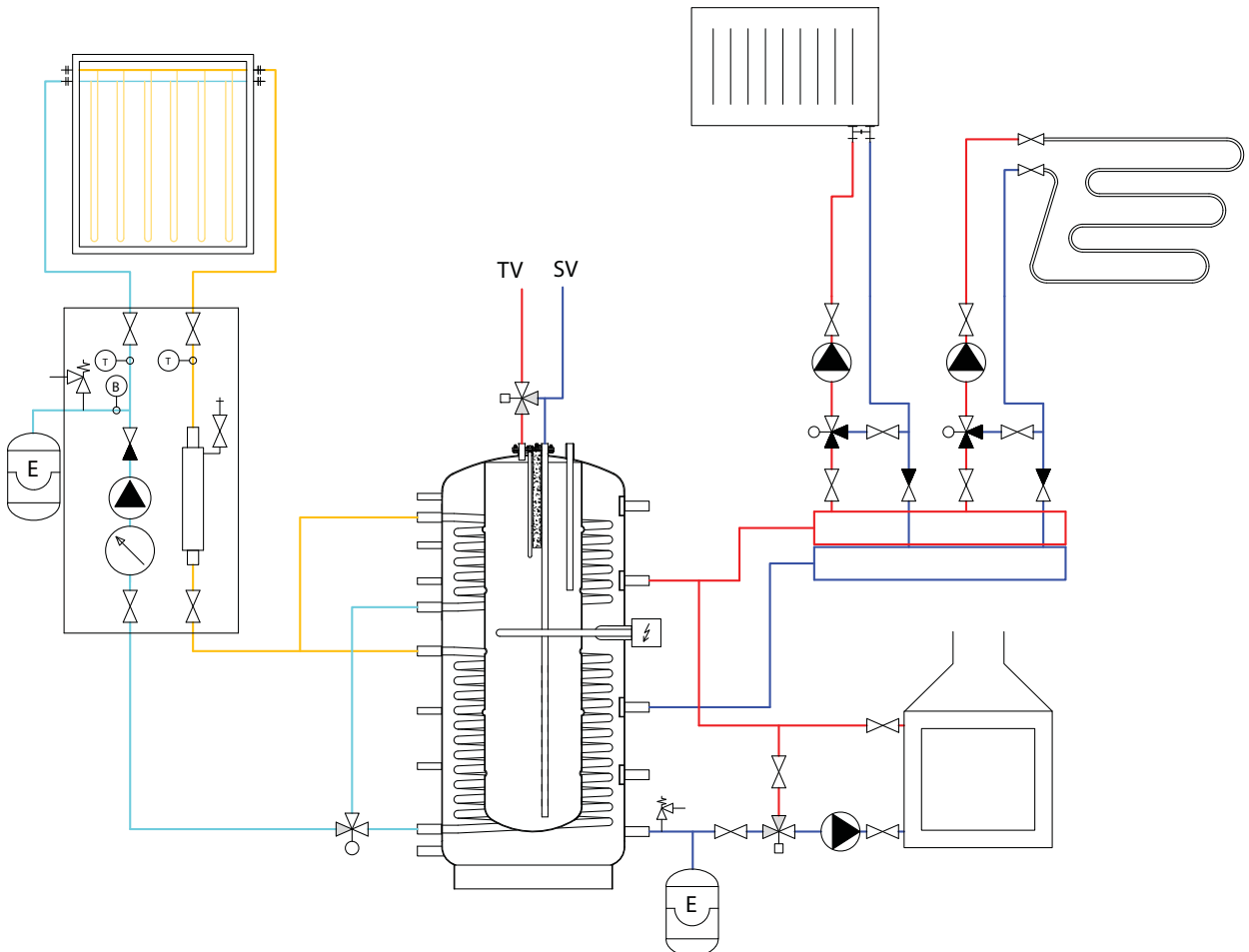
Conn. point	Example I. Solar collector + gas boiler	Example II. Solar collector + fireplace + el. heating rod	Example III. Solar collector + gas boiler + solid fuel boiler
1	inlet from a gas boiler	plug	inlet from a gas boiler
2	outlet to a manifold	outlet to a manifold, inlet from a fireplace	inlet from boilers, outlet to a manifold
3	outlet to a gas boiler	electric heating rod	outlet to a gas boiler
4	plug	inlet from a manifold	plug
5	return line	plug	return line
6	plug	outlet to a fireplace	outlet to a solid-fuel boiler
7	expansion vessel, drain valve	expansion vessel, drain valve	expansion vessel, drain valve
8 + 15	outlet to a solar system	outlet to a solar system	outlet to a solar system
10 + 16	inlet from a solar system	inlet from a solar system	inlet from a solar system
9, 11, 12, 13, 14	plug, sheath, thermostat ... controller dependent	plug, sheath, thermostat ... controller dependent	plug, sheath, thermostat ... controller dependent
flange	CW inlet and HW outlet, anode, recirculation	CW inlet and HW outlet, anode, recirculation	CW inlet and HW outlet, anode, recirculation

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

Example I.
Solar collector + gas boiler



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



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

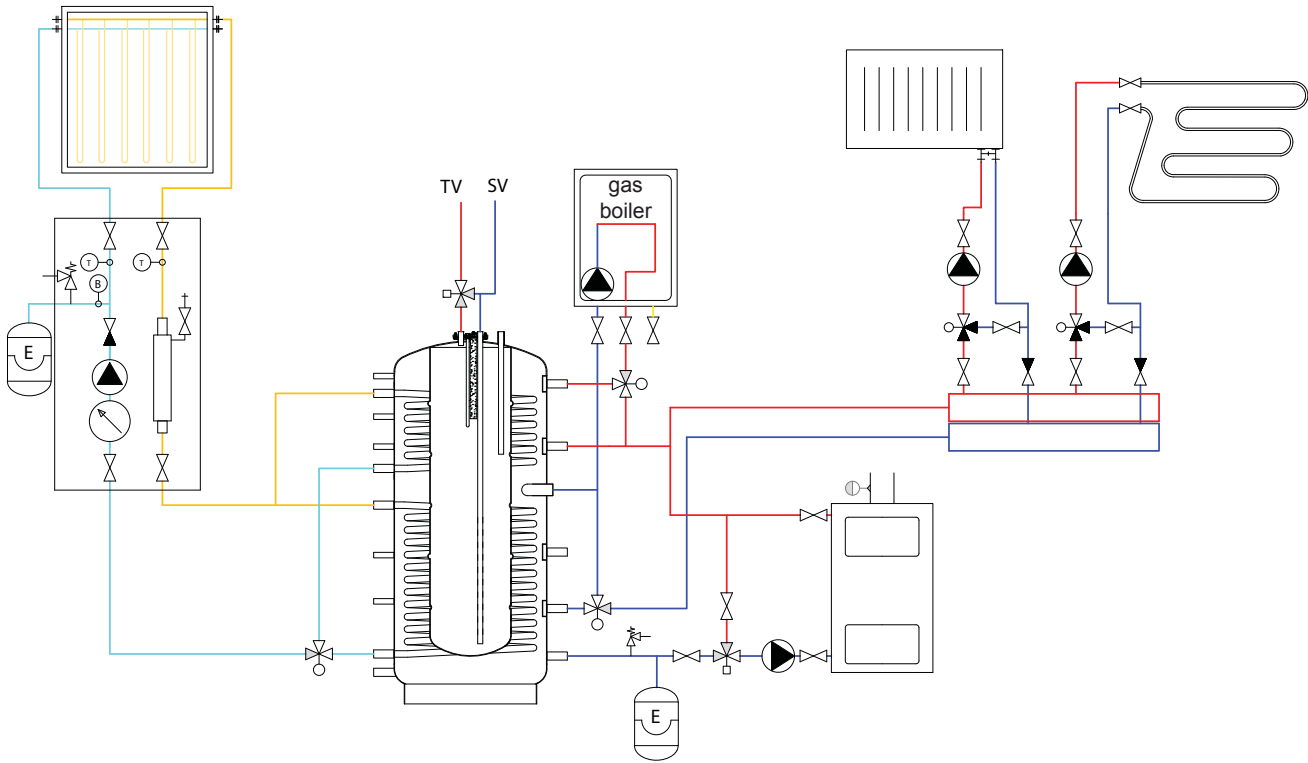


Table of limit values for total dissolved solids in hot water

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 - Installation and Commissioning

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

Installation of an el. heating rod may be done by qualified staff only.

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

6.1 - 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 powered 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.

6.2 - 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.

6.3 - Heating rod installation

The G 6/4" side sleeve is designed to accommodate an electric heating rod. Two heating rods of output up to 6 kW can be used (depending on the tank diameter and rod length), 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 a water main with pressure above 6 bar a pressure reducing valve is necessary. In order to prevent water loss, installation of a min. 12l expansion tank is recommended at the cold water inlet to the immersed tank. Expansion tank installation is one of the essential preconditions for warranty extension. Should the water be too hard, install a water softener before the tank. In case the water contains mechanical impurities, install a strainer.

6.5 - Electronic anode rod installation

A so called electronic anode rod can be used instead of the magnesium one for the immersed tank. Its principle advantage is that its proper function is signaled by a control lamp while a magnesium anode rod needs to be taken out for check. In this case, just visual check of the electronic anode is sufficient. However, in order to meet warranty conditions, only the respective electronic anode kit shall be used that is listed in the table below. A space of about 75 cm is needed between the tank top and ceiling to install/exchange the electronic anode rod.

Code	Anode rod length [mm]	For tanks
9172	750 (550/200)	DUO-E2 600/150, DUO-E2 750/200, DUO-E2 1000/220, DUO-E2 1500/300

6.6 - Commissioning

The DHW tank must be filled prior to filling the accumulation tank. Filling heating water first would cause damage to the protective layer of the DHW tank!!!

Fill the heating circuits with the appropriate fluids and air-bleed the entire system. Check all connections for leaks and verify the system pressure. The quality of top-up and heating water is set by ČSN 07 7401:1992.

Hot water quality must meet the conditions shown in the Table of limit values for total dissolved solids in hot water, page 7 of this Manual.

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 a 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.

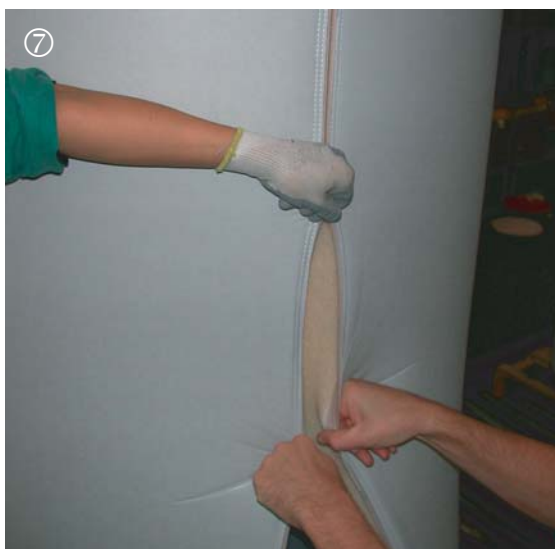
Keep away from open fire.

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.
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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.
- The 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.

The tanks are equipped with an anti-corrosion sacrifice magnesium anode rod. The anode rod shall be checked within 12 months after commissioning and subsequently always not later than 12 months after the last check. In locations where water contains more ferrites or calcites, it is recommended to check the anode every 6 months. If more than 1/3 of its total volume is consumed, the anode shall be replaced with a new one. Disregarded of its state, the anode rod shall be replaced with a new one within 24 months from commissioning. In case an electronic anode is used, the above described procedures are not necessary. Then only a visual check of the indication lamp is necessary every 3 months. Proper working of the Electronic Anode is described in its Installation Manual.

If damage to a tank occurs due to neglected substitution of a magnesium anode rod or a non-working electronic anode, the warranty cannot be claimed.

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 - Warranty

This product is covered by warranty according to the conditions described in this Manual and according to the Warranty Certificate. A Warranty Certificate is an integral part of the supply. Tank transport or storing in a horizontal position is considered a warranty violation!

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