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Installation and Operation Instructions

ACCUMULATION TANKS
with immersed DHW tank
DUO-E 380/120 G0 E2, DUO-E 380/120 G1 E2
DUO-E 380/120 G2 E2



Models: DUO E 380/120 G0
DUO E 380/120 G1
DUO E 380/120 G2

Serial number:

Checked by:

Date of Manufacture:



EN
v. A1.2

Regulus

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1 - Description

DUO E Accumulation Tanks are intended for accumulation and subsequent distribution of thermal energy of heating water with an immersed DHW tank and a steel heating coil (e.g. for connection to a solar system) 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 is one coil with 1" connection installed inside the lower part of DUO E 380/120 G1 tank, while the tank DUO E 380/120 G2 has one coil with 1" connection installed inside its lower part and a coil with ¾" connection installed in the immersed DHW tank. The tanks are further fitted with G 5/4" sleeves for connection to heat sources, G 1/2" sleeves to accommodate sensor sheaths and one G 1" sleeve for a bleed valve. The G 6/4" sleeve can be used for direct installation of an el. heating rod.

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

Three models of 380/120 l volume enabling installation of up to two electric heating rods (3 kW, 4.5 kW, 6 kW) 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 rod fitted in the DHW tank. The accumulation tank has no inner surface finish, the outer surface is painted.

1.3 - Thermal insulation

For easy handling, the tanks are supplied with a detachable soft insulation 75 mm thick, with a zippered outer leatherette mantle.

1.4 - Connection points on the tank

2× sleeve with G 6/4" inner thread

1× sleeve with G 1" inner thread

3× (2×)* sleeve for installation of lateral sensor sheaths, G 1/2" inner thread;

5× (6×)* sleeve for heat sources, G 5/4"

(2× sleeve for connecting a heating coil, G 1" inner thread)*

** applies to tanks with heating coils DUO E 380/120 G1 and G2*

1.5 - Packing

Tanks are delivered standing, each screwed to its pallet, packed in bubble wrap. Tank and pallet are packed together in shrink film. 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.

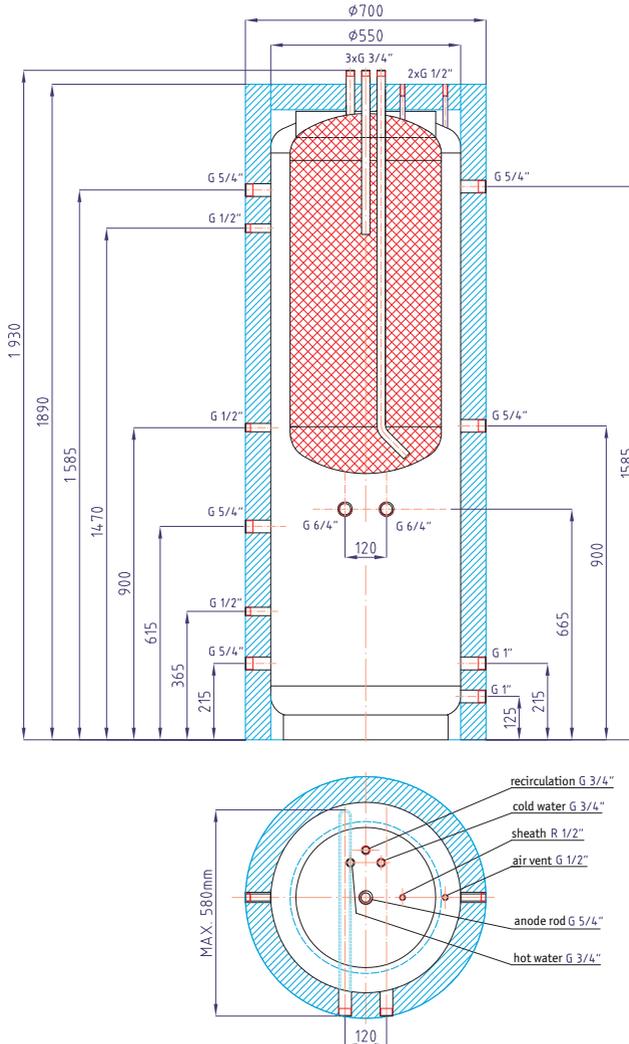
Using the accumulation tank for other purposes than above described is forbidden and the manufacturer accepts no responsibility for damage caused by improper or wrong use or filling procedure.

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

3 - Technical Data and Dimensions

Accumulation tank Regulus DUO E 380/120 GO

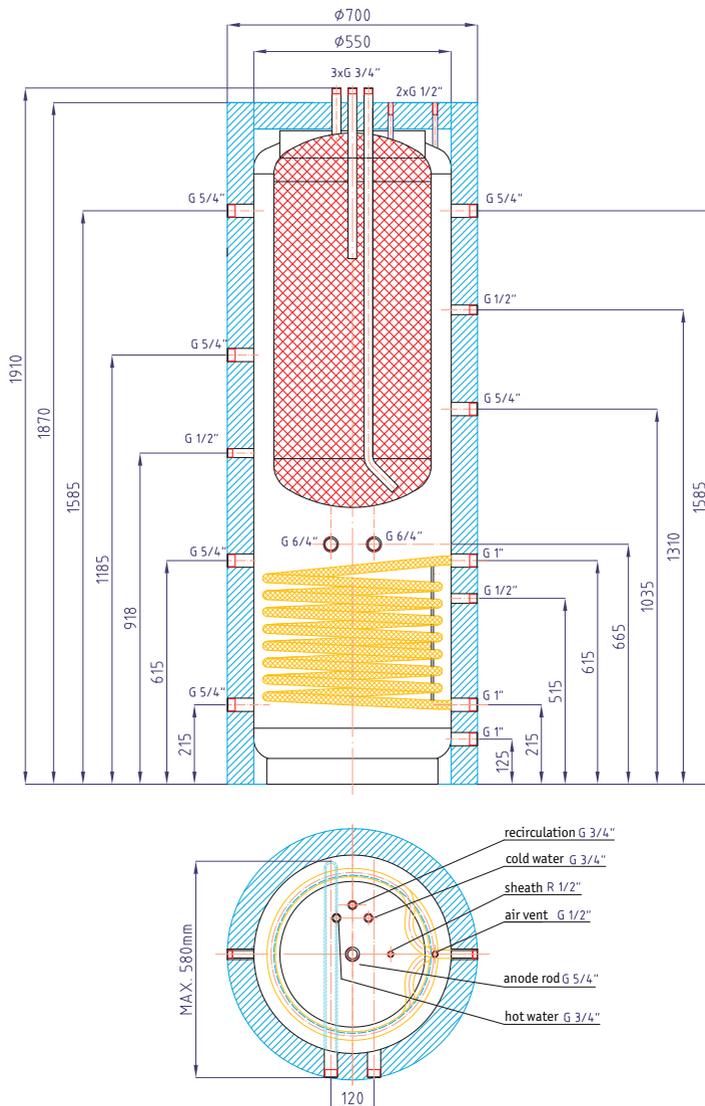
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Total tank volume:	380l
Objem kapaliny v nádrži:	260l
Volume of the inner DHW tank:	120l
Max. working temperature of the tank:	100 °C
Max. working pressure of the outer tank:	3 bar
Max. working pressure of the inner DHW tank:	6 bar
Empty weight:	140 kg

Accumulation tank Regulus DUO E 380/120 G1

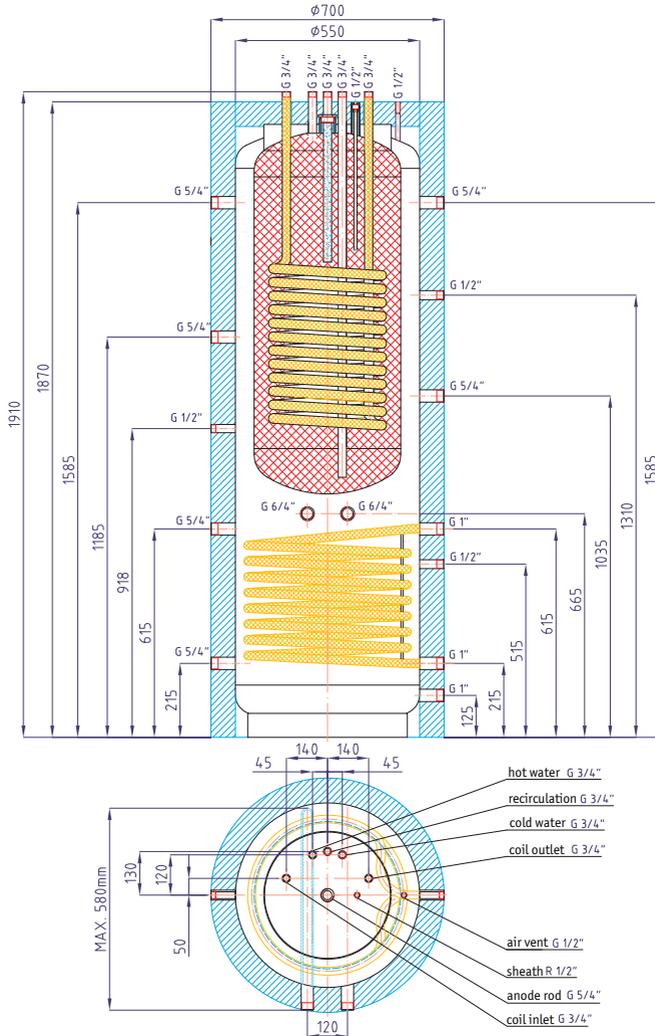
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Celkový objem kapalin v nádrži:	3801
Objem kapaliny v nádrži:	2511
Volume of the inner DHW tank:	1201
Heating coil volume:	8,81
Heating coil surface area:	1,6 m ²
Max. working temperature of the tank and heat exchange:	100 °C
Max. working pressure of the outer tank:	3 bar
Max. working pressure of the inner DHW tank:	6 bar
Max. working pressure of the heat exchanger:	10 bar
Empty weight:	177 kg

Accumulation tank Regulus DUO E 380/120 G2

code: 10521



Total tank volume:	380 l
Objem kapaliny v nádrži:	248 l
Volume of the inner DHW tank:	120 l
Lower heating coil volume:	8,8 l
Lower heating coil surface area:	1,6 m ²
Upper heating coil volume:	3,7 l
Upper heating coil surface area:	0,8 m ²
Max. working temperature of the tank and heat exchanger:	100 °C
Max. working pressure of the outer tank:	3 bar
Max. working pressure of the inner DHW tank:	6 bar
Max. working pressure of the heat exchanger:	10 bar
Empty weight:	178 kg

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. In DUO E 380/120 G1 and G2 tanks, the solar system connects to the connection points of the heating coil through G 1" threaded fittings.

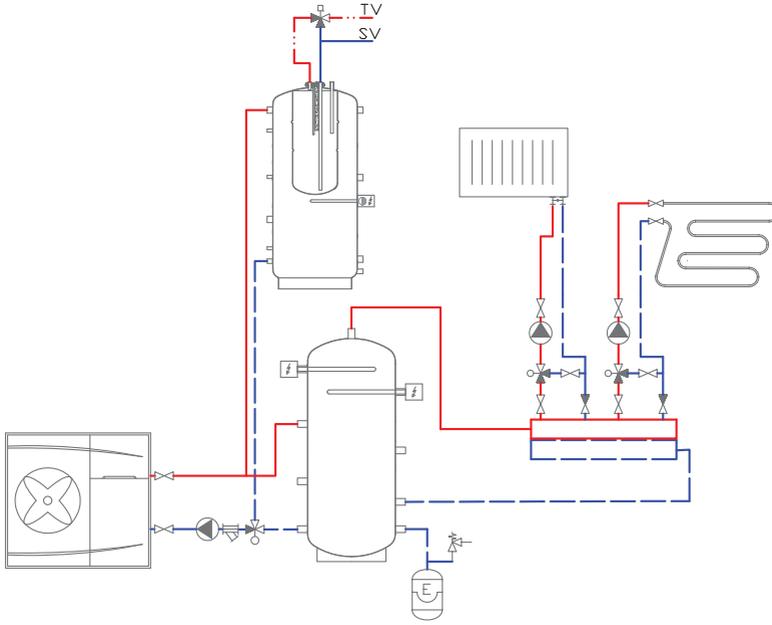
Individual connection points are assigned according to the circuits to be connected. There is a wide choice of combinations.

Table of limit values for total dissolved solids in hot water.

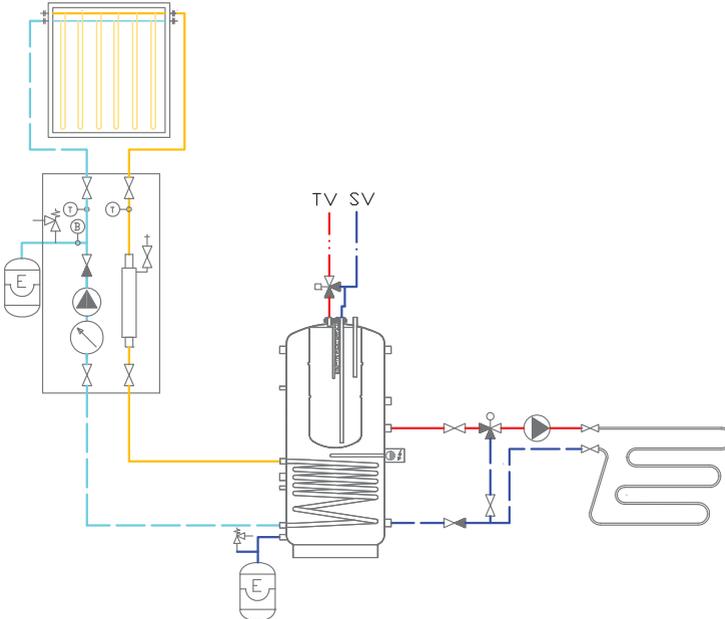
Description	pH	Total dissolved solids (TDS)	Ca	Chlorides	Mg	Na	Fe
Max. value	6.5 - 9.5	600 mg/l	40 mg/l	100 mg/l	20 mg/l	200 mg/l	0.2 mg/l

5 - Typical examples of accumulation tank installation

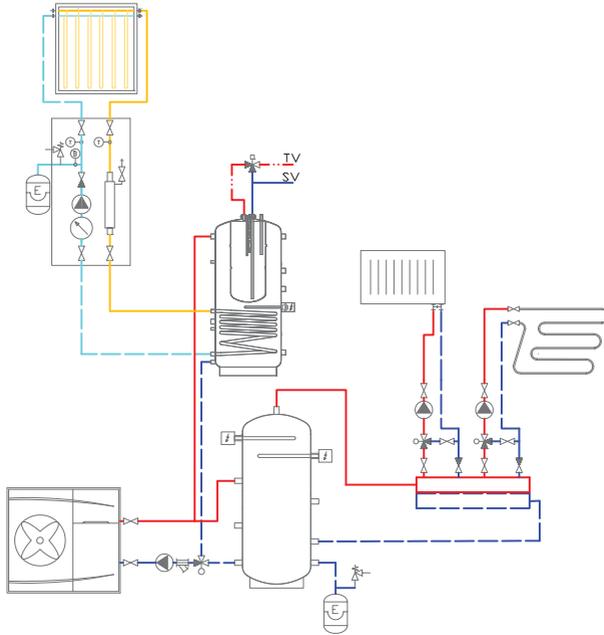
Hydraulic variant 1: Set for DHW heating with a heat pump



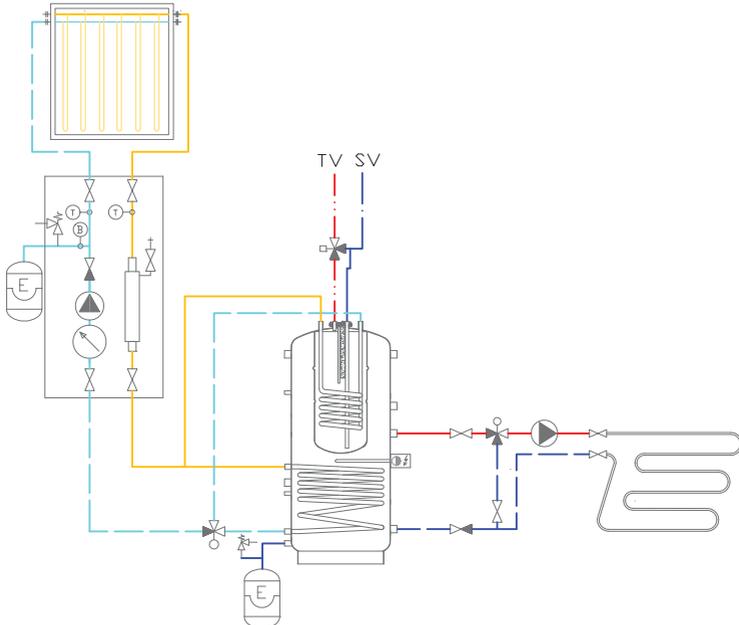
Hydraulic variant 2: Combined solar set for DHW heating and auxiliary space heating in a passive house



Hydraulic variant 3: Set for DHW heating with a heat pump with solar water heating



Hydraulic variant 4: Combined solar set for DHW heating and auxiliary space heating in a passive house with direct solar water heating



6 - Installation and Commissioning

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

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. 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.

The tank may be fitted with electric heating rods up to 6 kW 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 tanks DUO-E 380/120 G1 and G2 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 meticulously 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, 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. In order to prevent water loss, installation of a min. 8l expansion vessel is recommended at the cold water inlet to the immersed tank. Expansion vessel 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 - 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 the proper function of all control and adjusting elements.

7 - 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 one third 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. If damage to a tank occurs due to the neglected substitution of a magnesium anode rod, the warranty cannot be claimed.

8 - 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.

9 - Warranty

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



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