Regulus

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Installation and Operation Instructions

DHW Tank Immersed in Thermal Store
DUO 390/130 K

EN

DUO 390/130 K

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1 - Description

DUO Thermal Stores are intended for accumulation and subsequent distribution of heat from various heat sources like solid-fuel fired boilers, heat pumps, solar thermal collectors, electric boilers etc. There is an immersed DHW tank integrated in the Thermal Store (tank in tank) for automatic DHW heating. The Thermal Store is divided by a separating metal sheet for better thermal stratification. The Thermal Store shall always be connected to a sealed heating circuit.
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 heat sources and heating circuits, valves, non-return valves etc. When more heat sources are combined, some intelligent controller should be used to control the heat sources and sinks, incl. the Thermal Store charging and discharging.

1.1 - Models

A DUO 390/130 K model enabling installation of electric heating rods and other external 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 Thermal Store has no inner surface finish, its outer surface is lacquered.

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 insulation is made of soft polyurethane foam, 100 mm thick, with PUR leather surface, and closes with a zipper.

1.4 - Packaging

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 shall 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 qualified staff 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 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.

Before filling the thermal store, fill and pressurize the inner DHW tank first!!!

3 - Technical Data and Dimensions
Regulus DUO J
Thermal Store
Regulus DUO 390/130 K

Main features	
Application	storage of thermal energy for DHW and space heating; the overall height of these tanks is reduced compared to the standard ones, making them a suitable alternative for spaces with a low ceiling
Description	combination Thermal Store with immersed DHW tank; a tight separating sheet increases seasonal performance factor of a heat pump
Working fluid	water, water/glycol mixture (max. 1:1) or water/glycerine mixture (max. 2:1) (thermal store), water (immersed DHW tank)

DUO 390/130 K

DUO 390/130 K with insulation

Code	
Thermal Store	**16070**
Insulation	**16297**

Energy Efficiency Data (as per EC Regulation No. 812/2013)	
	DUO 390/130 K with insulation
Energy efficiency class	C
Standing loss	91 W
Storage volume	399 l

Technical data	
Total volume	399 l
Fluid volume in thermal store	265 l
Immersed DHW tank volume	134 l
Max. working temp. in thermal store	95 °C
Max. working temp. in DHW tank	95 °C
Max. working pressure in thermal store	3 bar
Max. working pressure in DHW tank	6 bar

Materials	
Thermal store material	S235JR
DHW tank material	S235JR + DC01EK

Insulation materials	
Tank perimeter insulation	fleece
Perimeter insulation´s outer surface	PU leather
Top and bottom tank insulation	fleece

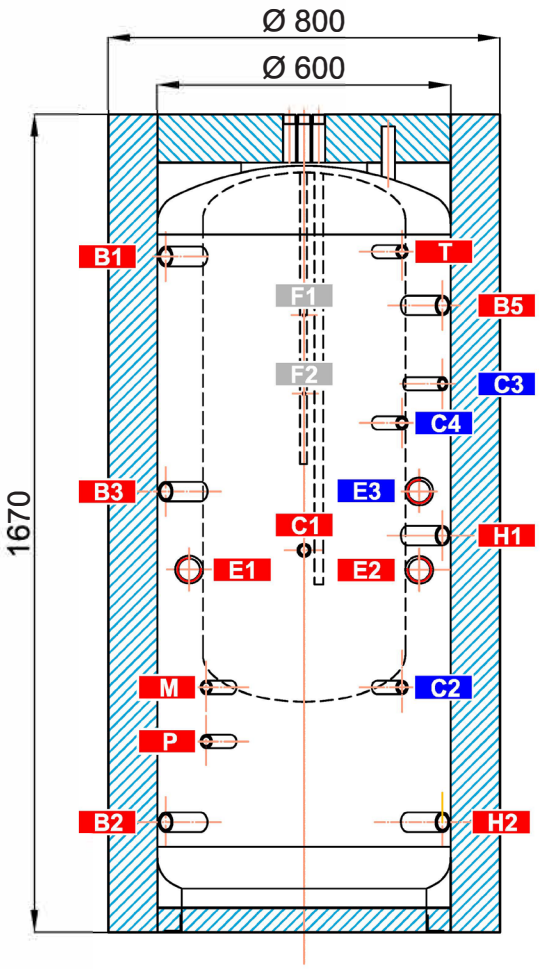
Dimensions, tipping height, insulation thickness, weight	
Tank diameter	600 mm
Tank diameter with insulation	800 mm
Tank overall height	1670 mm
Tipping height without insulation	1780 mm
Tank perimeter insulation thickness	100 mm
Bottom insulation thickness	50 mm
Top insulation thickness	120 mm
Empty weight without insulation	94 kg

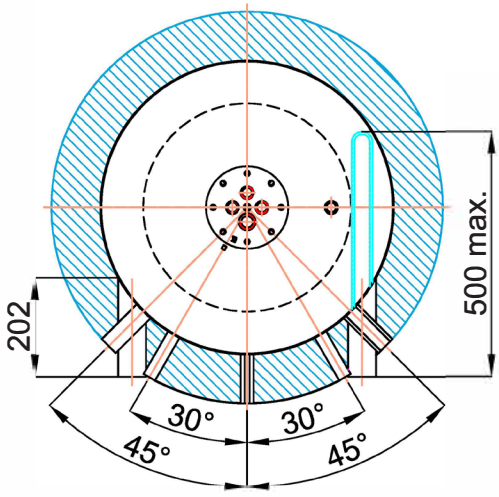
Accessories	
El. heating elements	models ETT-C, F, L, M
Heating elements max. lenght / output	3 x 500 mm / 5 kW
Pump station	solar, S1 and S2 models
Plate heat exchanger	kits with heat exchanger and accessories for connection to a solar pump station
Electronic anode rod	code 13793
Expansion vessel (drinking water)	model HW 8 l and bigger

Spare parts	
Magnesium anode rod	code 13959

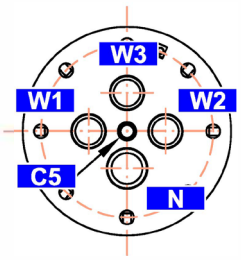
Dimensions

Tipping height without insulation 1780 mm.





TAPPINGS		
pos.	connection	height [mm]
Heat sources		
B1	G1" F	1380
B2	G1" F	225
B3	G1" F	900
B4	-	-
B5	G1" F	1280
Heating system		
H1	G1" F	810
H2	G1" F	225
Electric immersion heaters		
E1	G6/4" F	740
E2	G6/4" F	740
E3	G6/4" F	900
DHW heating		
W1	G1" M	1670
W2	G1" M	1670
W3	G1" M	1670
N	G3/4" F	1570
Control and safety		
C1	G1/2" F	780
C2	G1/2" F	500
C3	G1/2" F	1120
C4	G1/2" F	1040
C5	Ø 10,5 mm	1670
T	G1/2" F	1390
M	G1/2" F	500
P	G1/2" F	390
Air release		
O	G1/2" F	1645
Pump station support		
F1	M6	1260
F2	M6	1100



4 - Operation

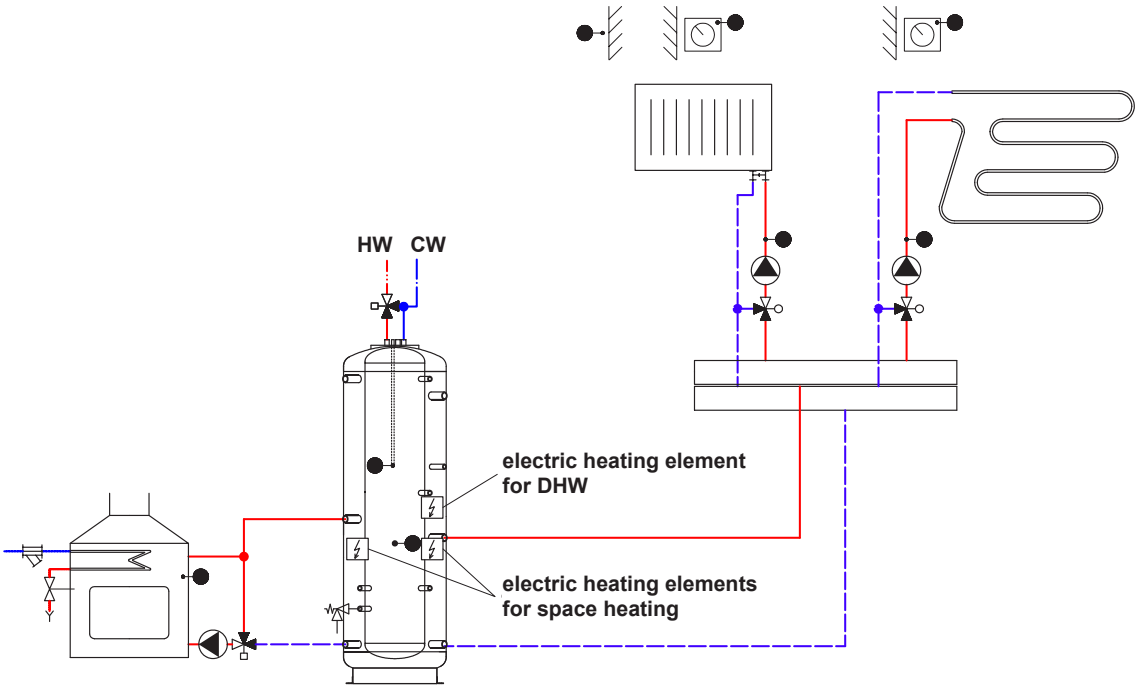
This Thermal Store is designed to heat water and accumulate heat for space heating in domestic or industrial applications, however always in sealed pressure circuits with forced circulation. In the thermal store, heating water is heated up from several heat sources like various types of hot-water boilers, fires, gas boilers sources or electric heating elements.
The immersed DHW tank is heated from heating water inside the Thermal Store. The immersed DHW tank shall be connected to cold and hot water with threaded fittings. When hot water is drawn from an outlet point, cold water flows into the immersed tank and heats up from the heating water in the thermal store 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 Thermal Store shall be connected to a heat source 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.

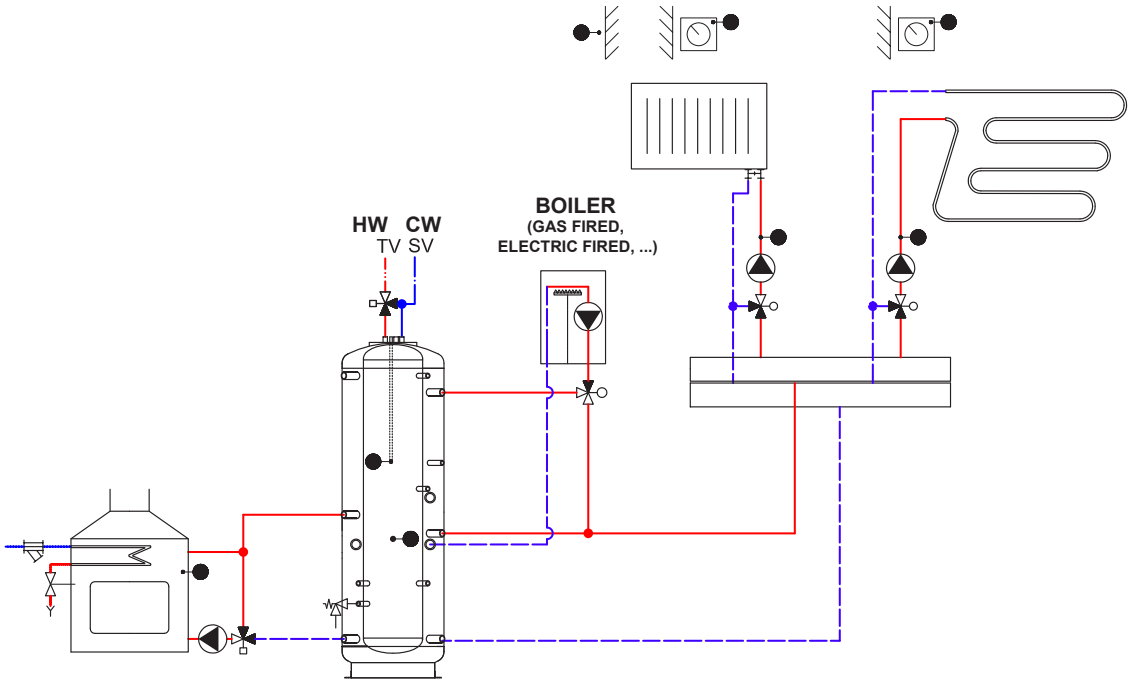
Description	pH	Total dissolved solids (TDS)	Ca	Chlorides	Mg	Na	Fe
Max. value	6.5 - 9.5	600 mg/l	40 mg/l	100 mg/l	20 mg/l	200 mg/l	0,2 mg/l

5 - Typical Layout Examples with Thermal Store

Hydraulic variant 1: Fireplace combined with electric heating elements



Hydraulic variant 2: Fireplace combined with a switched boiler (gas-fired, electric...)



6 - Installation and Commissioning

Installation shall 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.

6.2 - Heating rod installation

The G 6/4“ side sleeves 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.

6.3 - 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.

6.4 - Commissioning

The DHW tank must be filled prior to filling the thermal store. 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 5 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 adjustment 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.

In order to replace a magnesium anode rod, decrease the pressure inside the Thermal Store to the atmospheric value first, then the pressure inside the hot water tank. Replace the anode rod and pressurize the inner hot water tank first, then pressurize the Thermal Store.

If damage to a tank occurs due to the neglected substitution or a wrong replacement procedure of a magnesium anode rod, the warranty cannot be claimed.

8 - 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.

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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