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DUO PR

Installation and Operation Manual

DUO Thermal Store with Immersed DHW Tank

DUO 600/200 PR, DUO 750/200 PR, DUO 1000/200 PR, DUO 1700/200 PR

EN

DUO PR

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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 bottom section is fitted with a solar steel heat exchanger. 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

DUO 600/200 PR, DUO 750/200 PR, DUO 1000/200 PR and DUO 1700/200 PR models 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 fleece, 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 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 qualified staff according to valid rules and Manufacturer‘s Instructions.

This appliance is designed to accumulate heating water and distribute it subsequently. It shall 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.

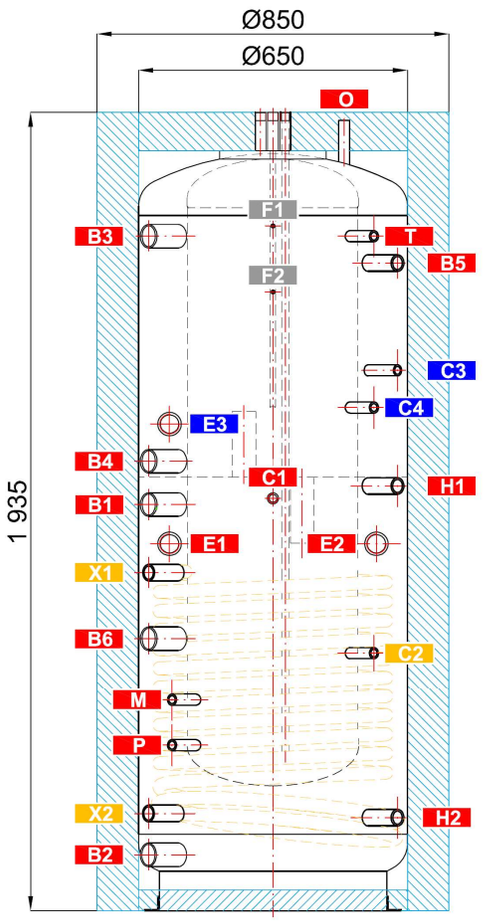
Before filling the thermal store, fill and pressurize the inner DHW tank first!!!

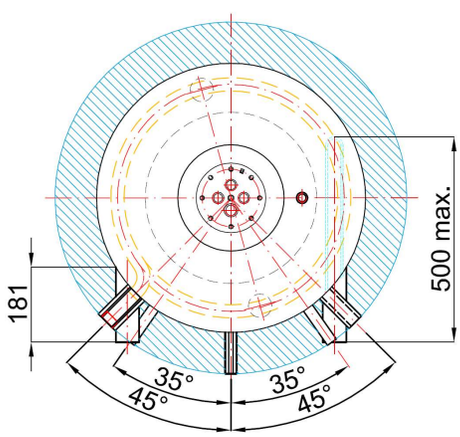
3 - Technical Data and Dimensions
Regulus DUO PR

Thermal Store Regulus DUO 600/200 PR (code: 14219, insulation - code: 16302)

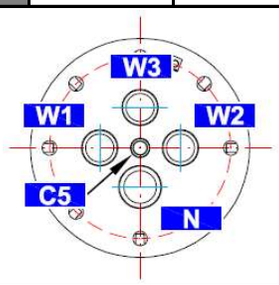
Dimensions

Tipping height without insulation 1970 mm.





TAPPINGS		
pos.	connection	height [mm]
Heat sources		
B1	G 6/4" F	985
B2	G 6/4" F	135
B3	G 6/4" F	1635
B4	G 6/4" F	1090
B5	G 1" F	1570
B6	G 6/4" F	660
Heating system		
H1	G 1" F	1030
H2	G 1" F	225
Solar thermal system		
X1	G 1" F	1030
X2	G 1" F	225
Electric immersion heaters		
E1	G 6/4" F	1055
E2	G 6/4" F	1055
E3	G 6/4" F	1295
DHW heating		
W1	G 3/4" M	1935
W2	G 3/4" M	1935
W3	G 3/4" M	1935
N	G 3/4" F	1835
Control and safety		
C1	G 1/2" F	1000
C2	G 1/2" F	625
C3	G 1/2" F	1310
C4	G 1/2" F	1220
C5	Ø 10,5 mm	1935
T	G 1/2" F	1635
M	G 1/2" F	510
P	G 1/2" F	400
Air release		
O	G 1/2" F	1915
Pump station support		
F1	M 6	1660
F2	M 6	1500

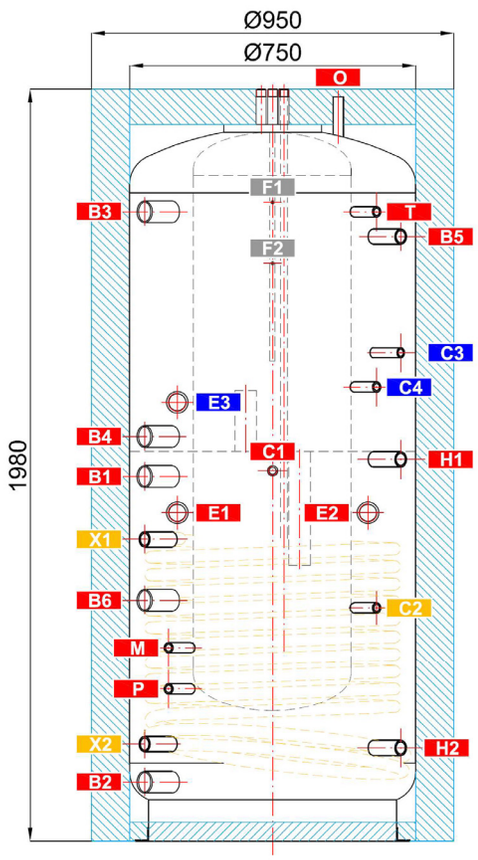


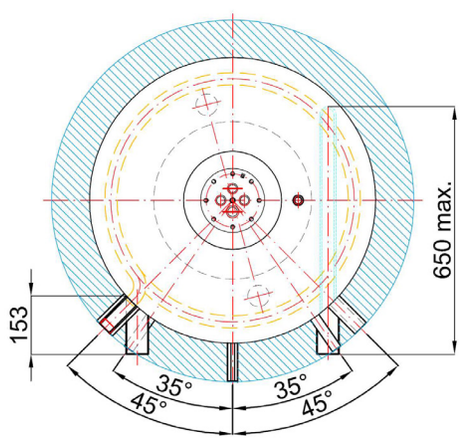
Total volume:	534l
Immersed DHW tank volume:	190 l
Fluid volume in Thermal Store:	331 l
Heat exchanger (HE) volume:	10 l
Heat exchanger surface area:	2,4 sqm
Max. working temp. in thermal store:	95 °C
Max. working temperature in heat exchanger:	95 °C
Max. working temperature in DHW tank:	95 °C
Max. working pressure in DHW tank:	6 bar
Max. working pressure in thermal store:	3 bar
Max. working pressure in HE:	10 bar
Empty weight:	164 kg

Thermal Store Regulus DUO 750/200 PR (code: 14222, insulation - code: 16305)

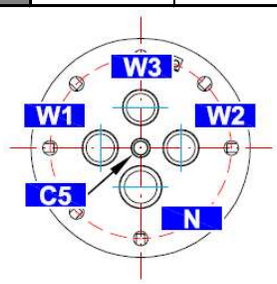
Dimensions

Tipping height without insulation 2040 mm.





TAPPINGS		
pos.	**connection**	**height [mm]**
Heat sources		
B1	G 6/4" F	960
B2	G 6/4" F	155
B3	G 6/4" F	1655
B4	G 6/4" F	1065
B5	G 1" F	1590
B6	G 6/4" F	635
Heating system		
H1	G 1" F	1005
H2	G 1" F	245
Solar thermal system		
X1	G 1" F	795
X2	G 1" F	255
Electric immersion heaters		
E1	G 6/4" F	1055
E2	G 6/4" F	1055
E3	G 6/4" F	1295
DHW heating		
W1	G 3/4" M	1980
W2	G 3/4" M	1980
W3	G 3/4" M	1980
N	G 3/4" F	1880
Control and safety		
C1	G 1/2" F	975
C2	G 1/2" F	615
C3	G 1/2" F	1285
C4	G 1/2" F	1195
C5	Ø 10,5 mm	1980
T	G 1/2" F	1655
M	G 1/2" F	510
P	G 1/2" F	400
Air release		
O	G 1/2" F	1960
Pump station support		
F1	M 6	1680
F2	M 6	1520

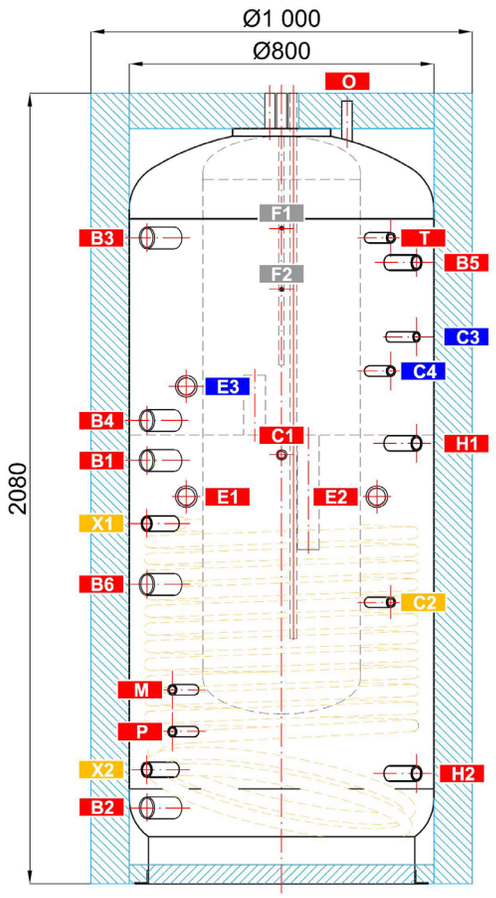


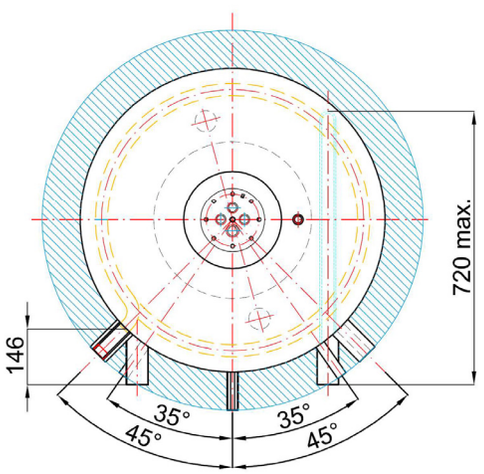
Total volume:	743l
Immersed DHW tank volume:	190 l
Fluid volume in Thermal Store:	538 l
Heat exchanger (HE) volume:	15 l
Heat exchanger surface area:	2,5 sqm
Max. working temp. in thermal store:	95 °C
Max. working temperature in heat exchanger:	95 °C
Max. working temperature in DHW tank:	95 °C
Max. working pressure in DHW tank:	6 bar
Max. working pressure in thermal store:	3 bar
Max. working pressure in HE:	10 bar
Empty weight:	187 kg

Thermal Store Regulus DUO 1000/200 PR (code: 14125, insulation - code: 16258)

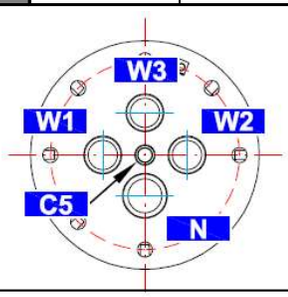
Dimensions

Tipping height without insulation 2120 mm.





TAPPINGS		
pos.	connection	height [mm]
Heat sources		
B1	G 6/4" F	1115
B2	G 6/4" F	200
B3	G 6/4" F	1700
B4	G 6/4" F	1220
B5	G 1" F	1635
B6	G 6/4" F	785
Heating system		
H1	G 1" F	1160
H2	G 1" F	290
Solar thermal system		
X1	G 1" F	950
X2	G 1" F	300
Electric immersion heaters		
E1	G 6/4" F	1055
E2	G 6/4" F	1055
E3	G 6/4" F	1295
DHW heating		
W1	G 3/4" M	2080
W2	G 3/4" M	2080
W3	G 3/4" M	2080
N	G 3/4" F	1980
Control and safety		
C1	G 1/2" F	1130
C2	G 1/2" F	740
C3	G 1/2" F	1440
C4	G 1/2" F	1350
C5	Ø 10,5 mm	2080
T	G 1/2" F	1700
M	G 1/2" F	510
P	G 1/2" F	400
Air release		
O	G 1/2" F	2060
Pump station support		
F1	M 6	1725
F2	M 6	1565

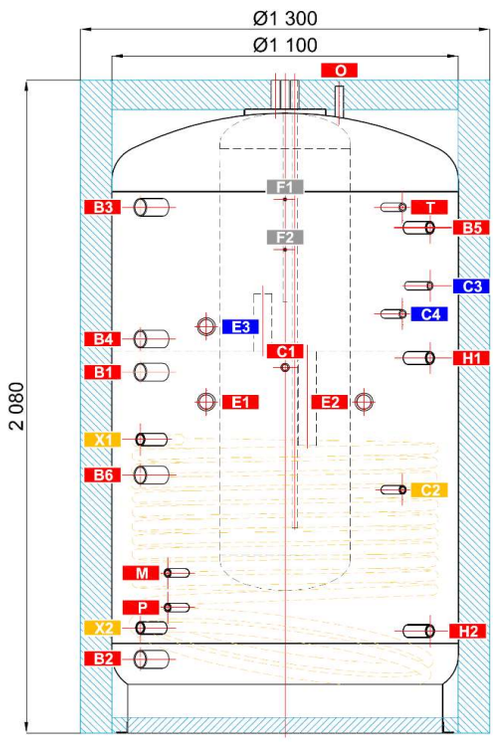


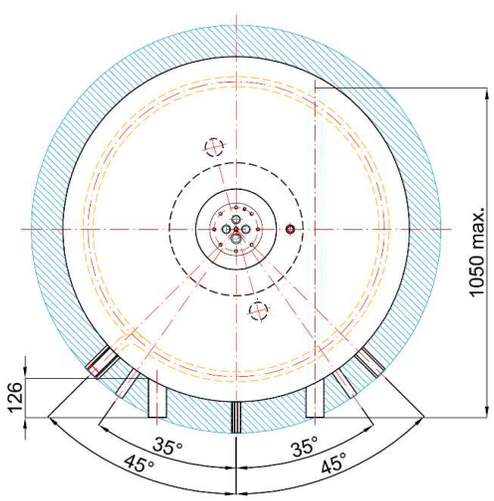
Total volume:	913 l
Immersed DHW tank volume:	190 l
Fluid volume in Thermal Store:	705l
Heat exchanger (HE) volume:	18 l
Heat exchanger surface area:	3,2 sqm
Max. working temp. in thermal store:	95 °C
Max. working temperature in heat exchanger:	95 °C
Max. working temperature in DHW tank:	95 °C
Max. working pressure in DHW tank:	6 bar
Max. working pressure in thermal store:	3 bar
Max. working pressure in HE:	10 bar
Empty weight:	210 kg

Thermal Store Regulus DUO 1700/200 PR (code: 14228, insulation - code: 16293)

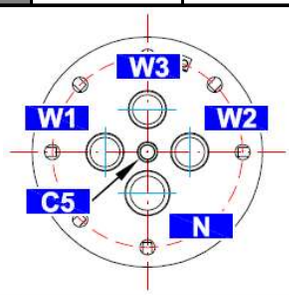
Dimensions

Tipping height without insulation 2200 mm.





TAPPINGS		
pos.	**connection**	**height [mm]**
Heat sources		
B1	G 6/4" F	1150
B2	G 6/4" F	235
B3	G 6/4" F	1675
B4	G 6/4" F	1255
B5	G 1" F	1610
B6	G 6/4" F	820
Heating system		
H1	G 1" F	1195
H2	G 1" F	325
Solar thermal system		
X1	G 1" F	935
X2	G 1" F	335
Electric immersion heaters		
E1	G 6/4" F	1055
E2	G 6/4" F	1055
E3	G 6/4" F	1295
DHW heating		
W1	G 3/4" M	2080
W2	G 3/4" M	2080
W3	G 3/4" M	2080
N	G 3/4" F	1980
Control and safety		
C1	G 1/2" F	1165
C2	G 1/2" F	775
C3	G 1/2" F	1425
C4	G 1/2" F	1335
C5	Ø 10,5 mm	2080
T	G 1/2" F	1675
M	G 1/2" F	510
P	G 1/2" F	400
Air release		
O	G 1/2" F	2060
Pump station support		
F1	M 6	1700
F2	M 6	1540



Total volume:	1670 l
Immersed DHW tank volume:	190 l
Fluid volume in Thermal Store:	1458 l
Heat exchanger (HE) volume:	22 l
Heat exchanger surface area:	4,0 sqm
Max. working temp. in thermal store:	95 °C
Max. working temperature in heat exchanger:	95 °C
Max. working temperature in DHW tank:	95 °C
Max. working pressure in DHW tank:	6 bar
Max. working pressure in thermal store:	3 bar
Max. working pressure in HE:	10 bar
Empty weight:	286 kg

4 - Operation

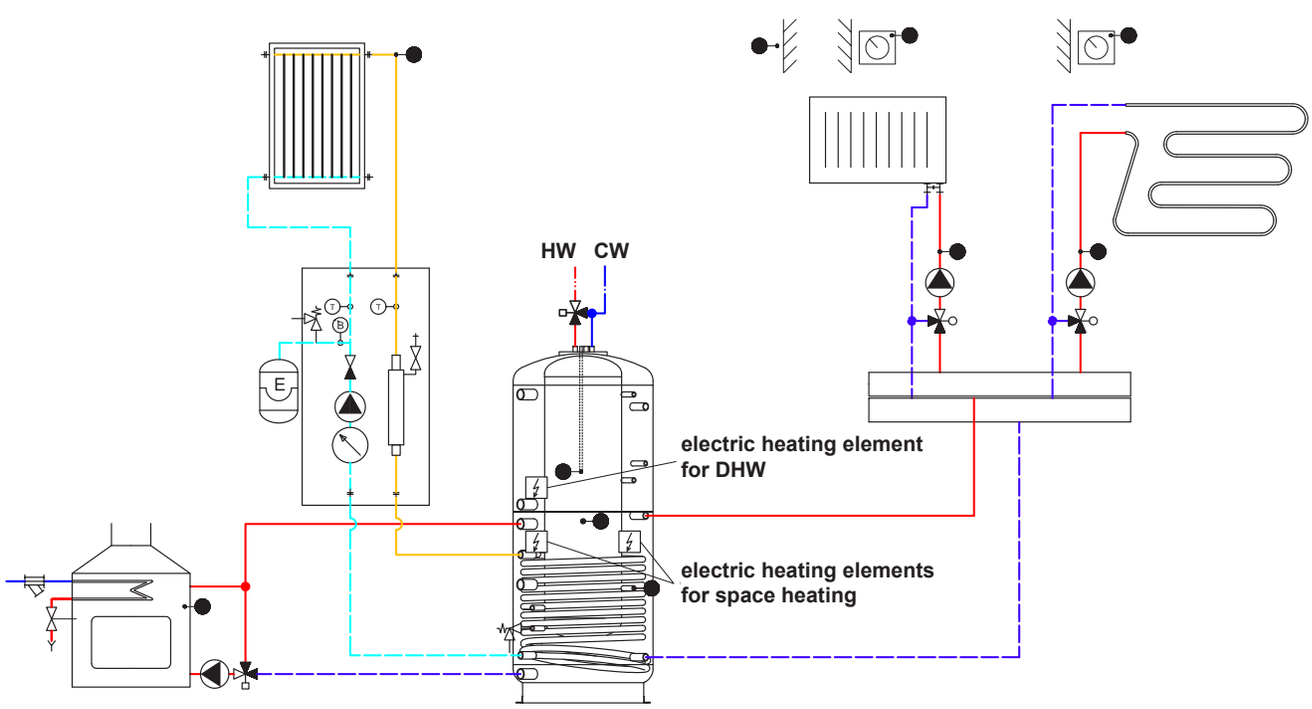
This Thermal Store is designed to heat water and accumulate heat for space heating in domestic or industrial applications, however always in sealed pressure circuits with forced circulation. In the thermal store, heating water is heated up from several heat sources like various types of hot-water boilers, renewable energy sources (heat pumps, solar thermal collectors), 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. A solar thermal 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.

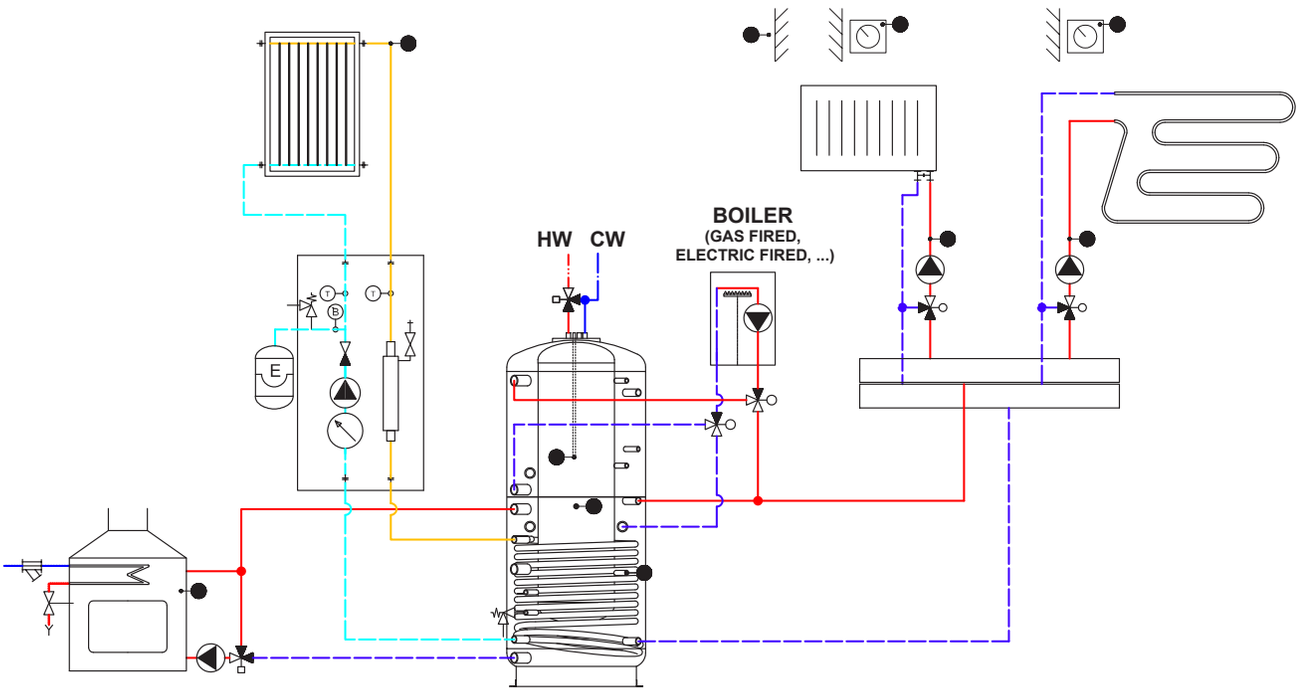
Description	pH	Total dissolved solids (TDS)	Ca	Chlorides	Mg	Na	Fe
Max. value	6.5 - 9.5	600 mg/l	40 mg/l	100 mg/l	20 mg/l	200 mg/l	0,2 mg/l

5 - Typical Layout Examples with Thermal Store

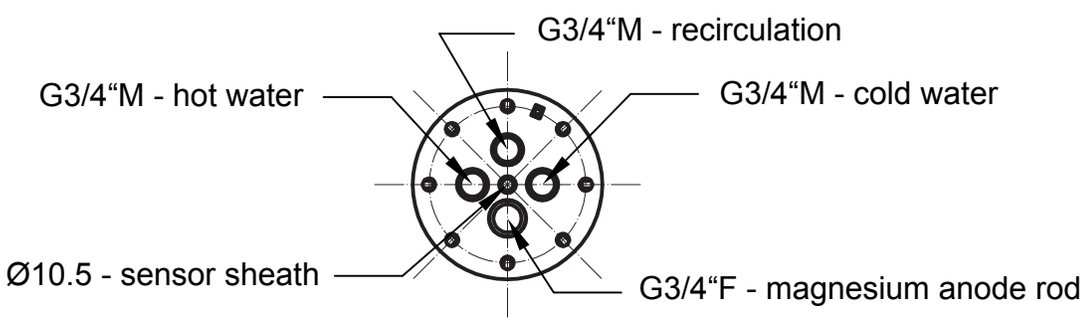
Hydraulic variant 1: Solar space heating support kit, combined with electric heating elements and a fire.



Hydraulic variant 2: Solar space heating support kit, combined with a switched boiler (gas fired, electric fired..) and a fire.



FLANGE CONNECTION DETAIL



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 - Connection to a solar thermal 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 thermal system shall be connected to the G 1” upper sleeve of the heating coil. The lower G 1” heating coil outlet shall be connected to the return solar piping through which cooled solar fluid returns to solar collectors. Insulate meticulously all the piping between the tank and the solar thermal system.

6.3 - 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.

6.4 - 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 and pressurized 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 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 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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