Installation and Operation Instructions

VEGA 390
THERMAL STORE
with stainless steel DHW coil

CE

Regulus

EN
v. 1.3

CONTENTS

1 - Description

VEGA 390 Thermal Store is intended for accumulation and subsequent distribution of heating water thermal energy. It is fitted with a stainless steel immersed DHW heat exchanger, a flange in the lower section permitting installation of a solar heat exchanger, enabling to install electric heating rods and to connect other heat sources (a heat pump or gas boiler). The Thermal Store shall be always 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 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 IR12, for both the source and load sides of a heating circuit, i.e. also for charging and discharging the Thermal Store.

1.1 - Models

VEGA 390 with stainless steel DHW heat exchanger.

1.2 - Tank protection

The Thermal Store comes with no inner surface finish, its outside painted in grey. Its DHW heat exchanger is made of stainless steel.

1.3 - Thermal insulation

Thermal insulation is included in the supply. It consists of 3 layers: the first one is soft insulation fitting tightly on the tank; the second, main layer, features thermal conductivity l=0.032 W/m.K; the third layer is a hard, glossy washable surface. The total insulation thickness is 100 mm.

1.4 - Connection points

1 top sleeve with G 1/2“ F thread
7 side sleeves with G 1/2“ F thread
2 side sleeves with G 6/4“ thread
6 side sleeves with G 1“ thread
2 G 1” sleves - stainless-steel heating coil inlet and outlet

1.5 - Packaging

Tanks are delivered standing, each screwed to its pallet, packed in bubble wrap.
Included in the package are all components to be fitted on the tank. Insulation is packaged separately.

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.

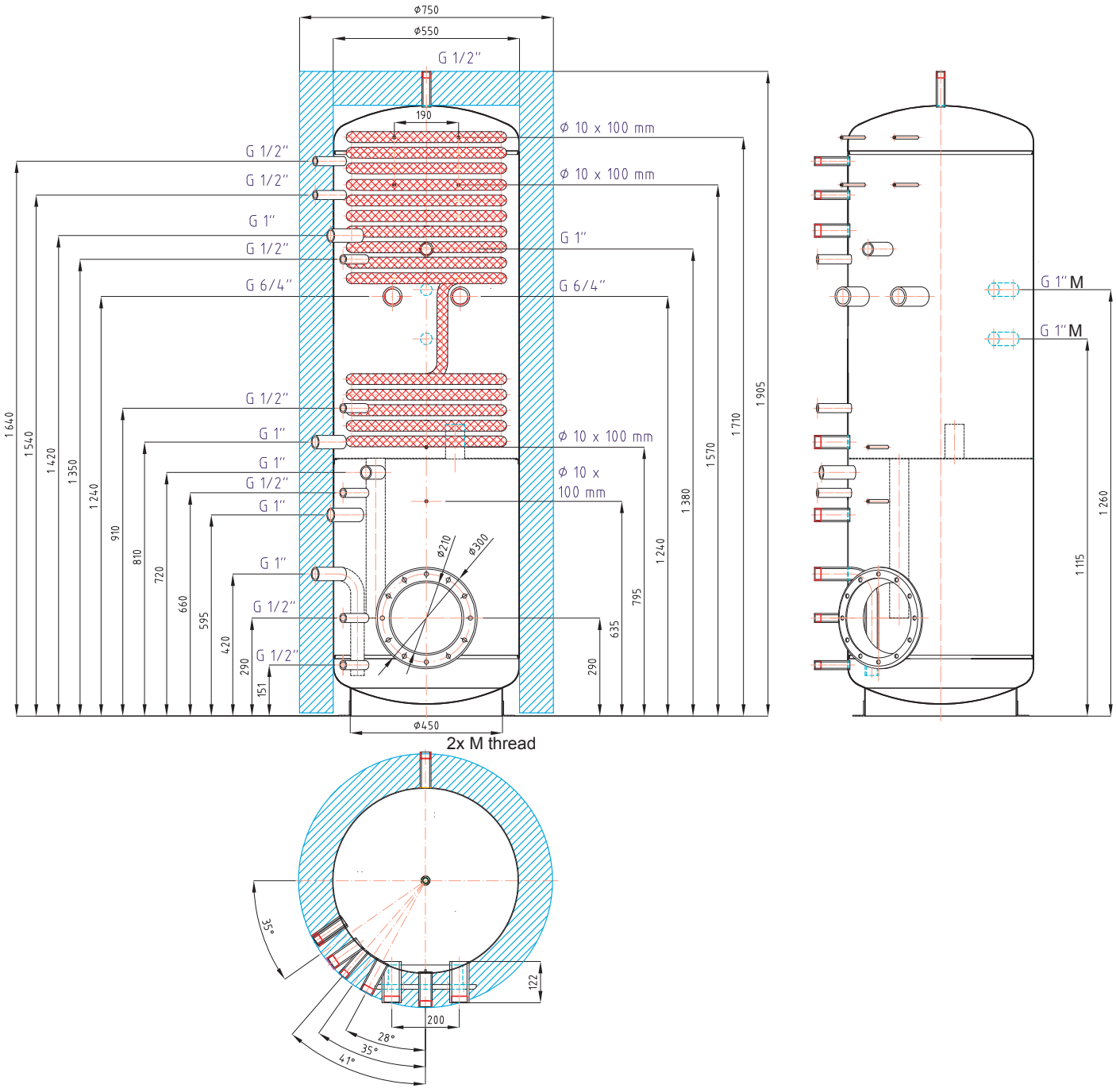
This appliance is designed to accumulate heating water and distribute it subsequently. It shall be connected to a heating system and heat sources. This appliance is also suitable for instantaneous water heating.

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.

The output of heat sources not equipped with their own safety valve and connected to the tank fitted with the enclosed safety valve shall never exceed 110 kW.

3 - Technical Data and Dimensions of Regulus VEGA 390

code: 12967, 12968



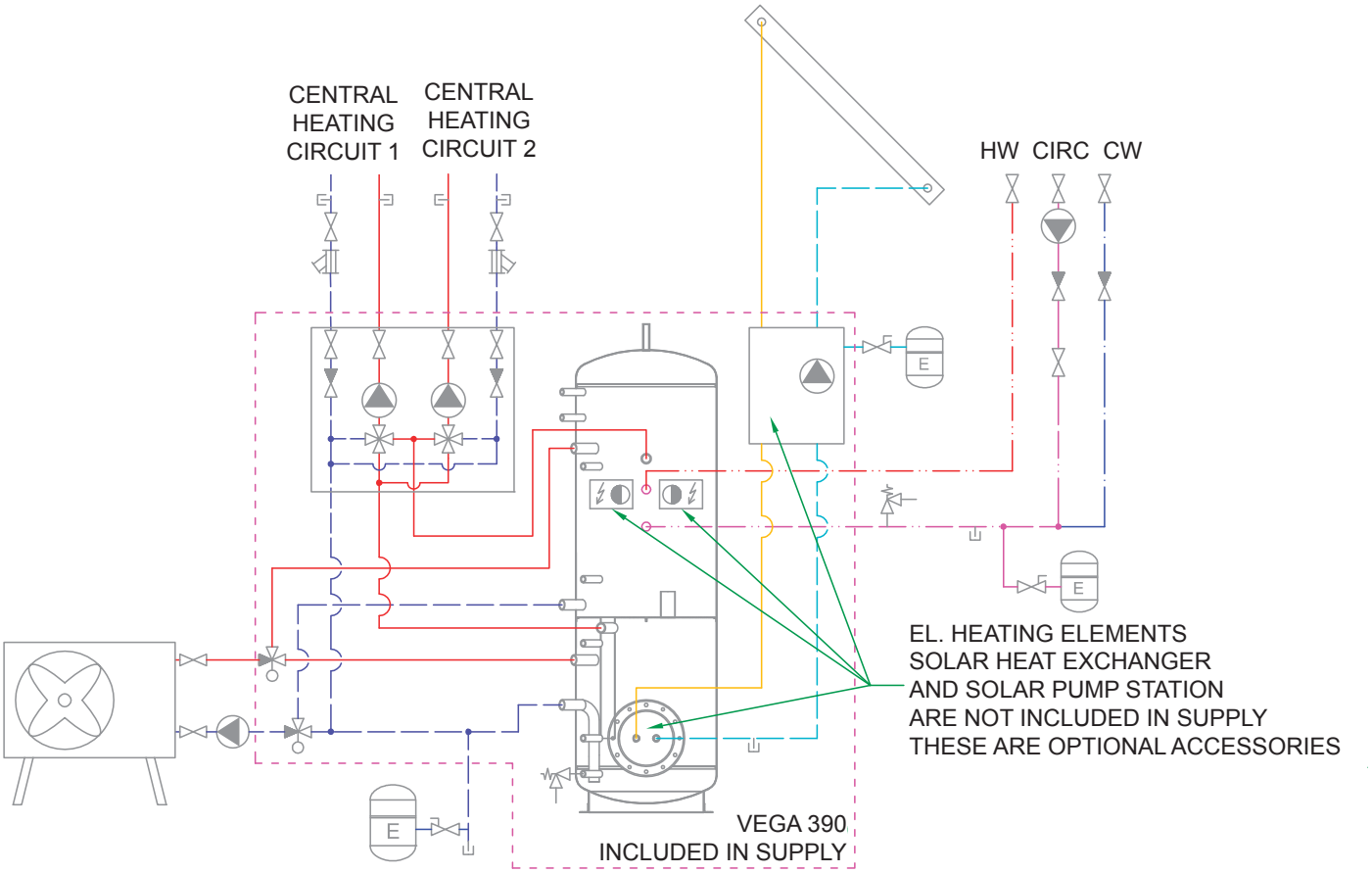
Total fluid volume in tank	396 l
Fluid volume outside heat exchanger	373 l
DHW heat exchanger volume	23 l
DHW heat exchanger surface area	6 sqm
Max. working temperature in tank	95 °C
Max. working temperature in DHW heat exchanger	95 °C
Max. working pressure in tank	4 bar
Max. working pressure in DHW heat exchanger	6 bar
DHW heating from 10° to 45°C at 60°C heating water temp.	3644 l/h (148 kW)
Empty weight	91 kg
Tipping height without insulation	1920 mm

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. The Thermal Store is designed and primarily intended for systems with a heat pump and a solar thermal system as an option. In the Thermal Store, water is heated up from a heat pump for space heating in its lower section and for DHW in is upper section. Up to 2 electric heating elements can be installed in the upper section.
The immersed stainless steel DHW heat exchanger is heated up by heating water inside the tank. The heat exchanger connects to a cold water inlet with a G1” nipple and to DHW with the other one. As soon as hot water is drawn from an outlet, cold water flows into the immersed heat exchanger, getting warm from the heating water.
The Thermal Store connects to energy sources using G1” nipples. A solar thermal system connects to an optional tube heat exchanger.
The individual tank outlets are assigned depending on the circuits to be connected. There are many variants, the following one shown as an example.

5 - Connection Diagram

Example I.
Heat pump + solar thermal system + electric heating elements.



5.1 Mounting pump stations and accessories onto VEGA 390

SCOPE OF SUPPLY:

Vega 390 Thermal Store, code 12968 (the other one, code 12967, differs only in the number of heating circuits):

12968 - VEGA 390 2 circ.

Code	Name	Qty
12104	HSK 390 V Thermal Store, no insul., 1 stainless steel DHW coil	1 pcs
12036	Insulation for HSK390 V Thermal Store - NEODUL - code 12104	1 pcs
12224	Pump Station for Thermal Store - 2 circuits	1 pcs
12690	Angled Ball Valve Assy for LYRA	1 pcs
13494	1” Elbow Assy out to HP, for VEGA 390	1 pcs
13476	Zone Valve Assy in from HP, for VEGA 390	1 pcs
13477	Zone Valve Assy out to HP, for VEGA 390	1 pcs
13478	1” Elbow Assy in from HP, for VEGA 390	1 pcs
13479	1” Elbow Assy in from h. circuit, for VEGA 390	1 pcs
13497	1” Valve Assy out to h. circuit, for VEGA 390	1 pcs
13529	Safety & Drain Valve Assy for VEGA 390	1 pcs
13237	Accessory Kit for LYRA and VEGA	1 pcs
6230	Flange for PS2F tank, d=312, no holes	1 pcs
13485	Kit for connection of assys onto VEGA 390	1 pcs
154	Sheath 7x8-100, 1 sensor, 1/2"	3 pcs
10845	Capillary spring, small, 1/2", stainless steel	3 pcs
12714	Cover for 2-circuit pump station, for 380l Thermal Store	1 pcs
12223	Front insulation for cover for 2-circuit pump station	1 pcs
12721	Top insulation for 2-circuit pump station, 380l	1 pcs
12713	Black knurled screw, M6x1-10 PA 6.6	4 pcs
9097	Plug 1/2“ + gasket, brass	1 pcs

13485 - Assemblies Connection Kit for VEGA 390

Code	Name	Qty
6969	1" hex nipple, MM, thick wall	1 pcs
13481	DN 20 pipe (1" nut) l=1010 mm	1 pcs
13489	DN 20 pipe (1" nut) l=690 mm	1 pcs
13488	DN 25 pipe (5/4" nut) l=490 mm	1 pcs
13484	DN 25 pipe (5/4" nut) l=125 mm	1 pcs
7187	Insulation DNa 35, 13 mm thick (2 m)	1 m
6447	Insulation DNa 28, 13 mm thick (2 m)	2 m
12996	M6x16 stainless steel bolt (hex socket) DIN 912/A2	4 pcs
7853	6.5 washer (large diameter 3d)	8 pcs
9980	1" nut gasket - 18,5x30x2 PTFE	4 pcs
9981	5/4" nut gasket - 25x39x2 PTFE	4 pcs

13437 - Expansion Vessel Connection Kit

Code	Name	Qty
11969	6/4" FF ball valve	1 pcs
7627	6/4“ Hex nipple, MM, thick wall	2 pcs
8757	6/4" T-piece in brass, FFF	1 pcs
8766	Reducing hex nipple 1"x6/4" MM	1 pcs
7049	1" T-piece in brass, FFF	1 pcs
6969	1" Hex nipple, MM, thick wall	1 pcs
7701	Reducing hex nipple, 1“x1/2“, MM, brass	1 pcs
11713	1/2“ drain valve, no handle, with cap	1 pcs

MOUNTING INSTRUCTIONS

WARNING! At least 20 °C and 2-3 persons are necessary to mount the insulation. All threaded connections shall be sealed either with a thread sealant or with the gaskets included in separate kits.

1. Remove the tank from its pallet and place it to its approximate position, shift the bottom insulation under the tank.

2. Slide the insulation inserts into the openings for connections.

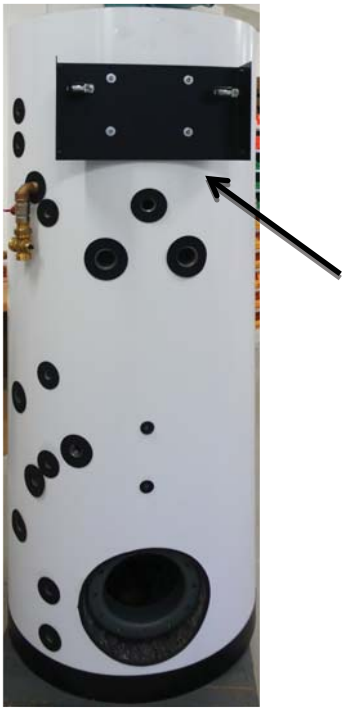



3. Fit on the insulation and check its proper position towards the sockets prior to final fixing. Use the jig to close the locks.

4. Peel off the protective foil from the insulation, apply the self-adhesive annuluses around the openings for connections. From this point on, it is important to stick to the sequence of installation steps described below!

5. Fit the Zone Valve Assy in from HP, code 13476. Remove the zone valve actuator from the assembly prior to mounting. Port A of the zone valve shall be oriented upwards.

6. Loosen the clamps, fit the metal sheet against the four pins, code 12710 from Kit code 12224, and fix using 4 screws M6x16 with washers (codes 12996 and 7853) - both these components are included in the Kit code 13485. Do not forget to place insulation washers under and on the metal sheet. The single-circuit variant is fitted with the left clamp only.

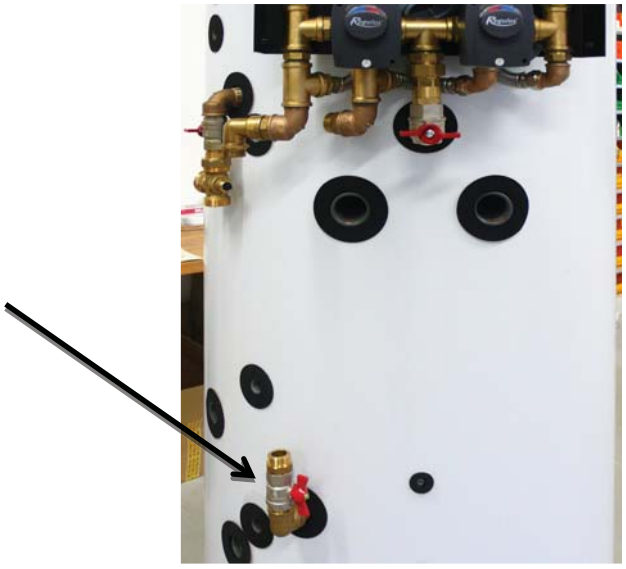


7. Fit the Angled Ball Valve Assy, code 12690.

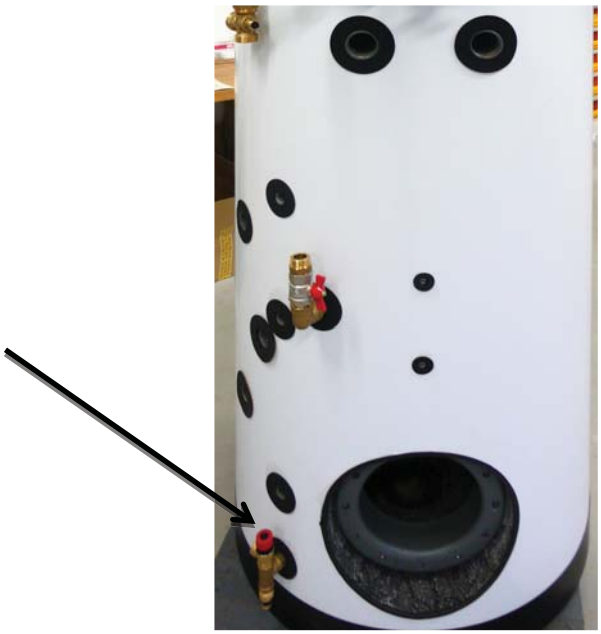
8. Fit the pump station with 4-way mixing valves, code 12224 or 12225. Join it with the earlier fitted Angled Ball Valve Assy and tighten the clamps.

9. Fit 1” Valve Assy out to h. circuit, code 13479, and 1“ hex nipple, code 6969, from the Kit 13485.

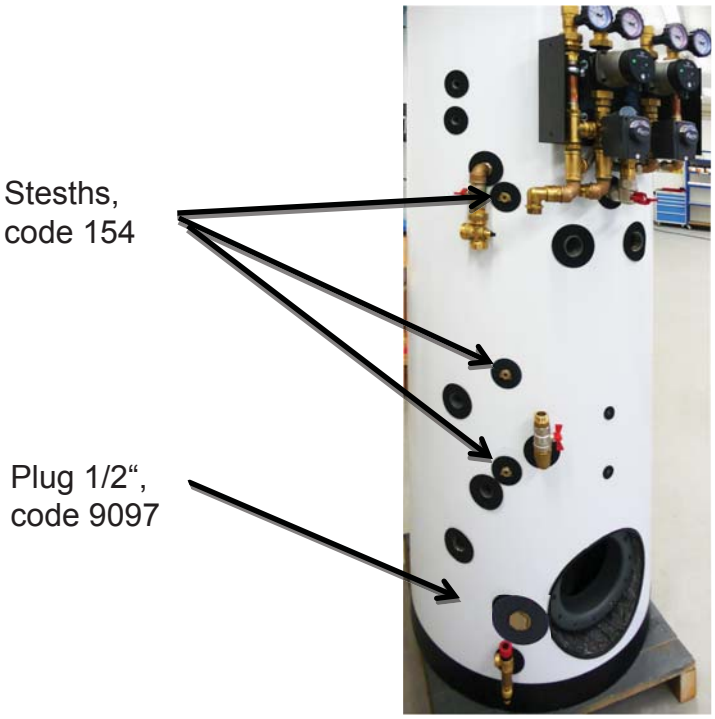
10. Fit the 1” Valve Assy out to h. circuit, code 13497.



11. Fit the Safety & Drain Valve Assy, code 13529, into the sleeve.

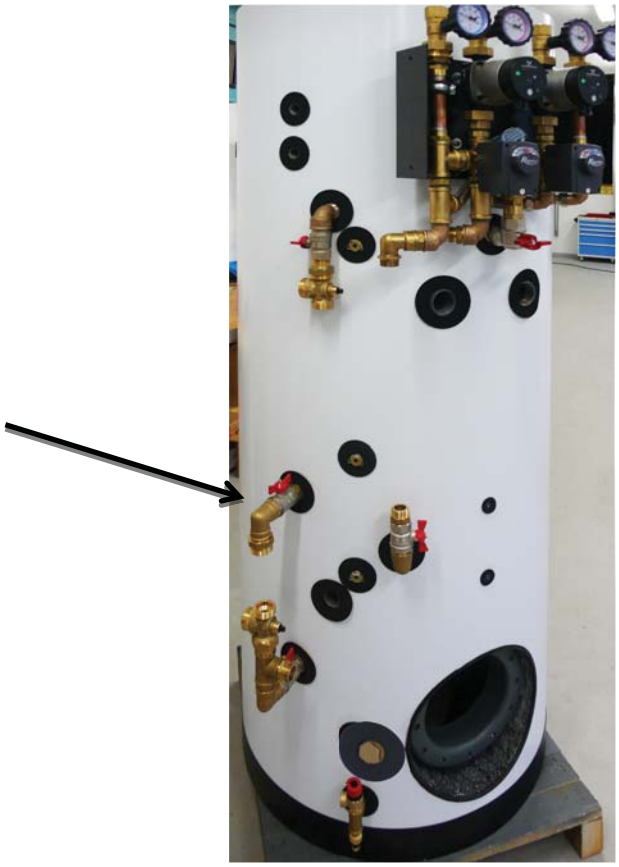


12. Fit the sheaths, code 154, into the dedicated sleeves and plug 1/2” with gasket, code 9097.



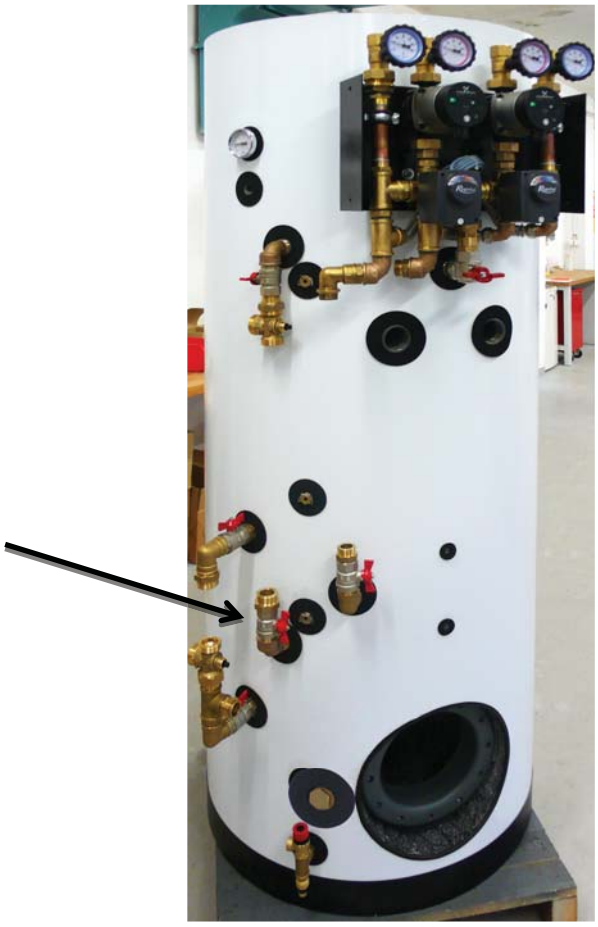
13. Fit the Zone Valve Assy out to HP, code 13477. Remove the zone valve actuator prior to fitting. Port A of the zone valve shall be oriented upwards.

14. Fit the 1” Elbow Assy out to HP, code 13494.



15. Fit the thermometer, code 10474, from the Kit 13237.

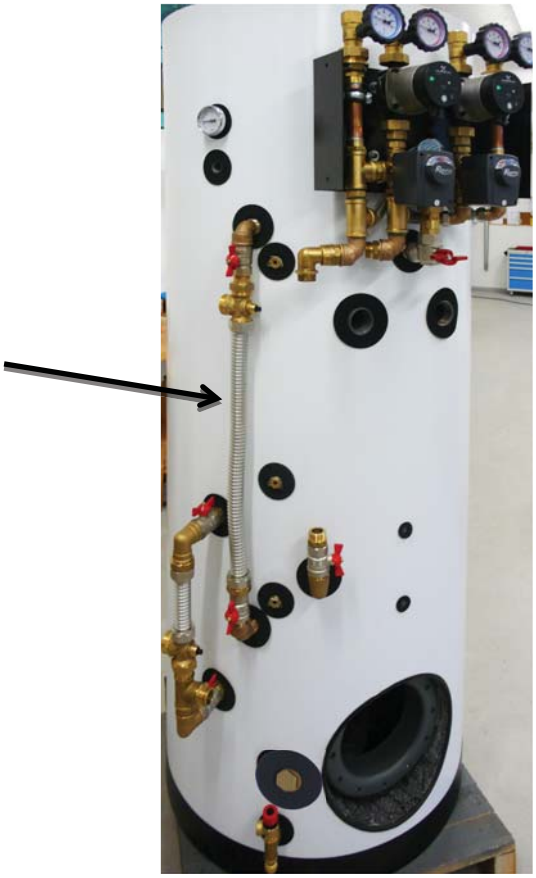
16. Fit the 1” Elbow Assy in from HP, code 13478.



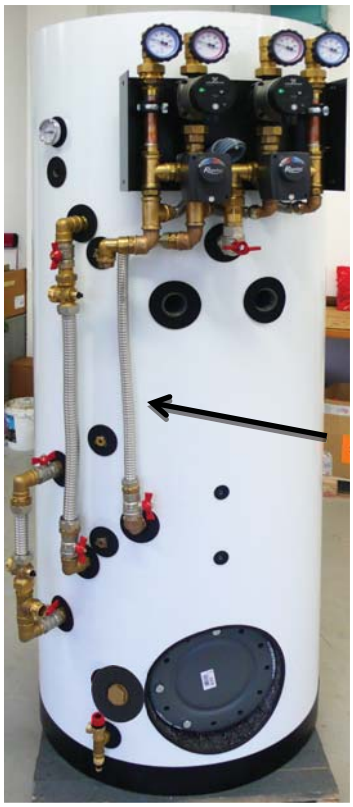
17. Cut the insulation and slide it onto the pipes from the Kit 13485.
    - 1 tube 1” DN 20, 1010 mm long, code 13481, insulation circa 1100 mm long.
    - 1 tube 1” DN 20, 690 mm long, code 13489, insulation circa 750 mm long.
    - 1 tube 5/4” DN 25, 490 mm long, code 13488, insulation circa 550 mm long.
    - 1 tube 5/4” DN 25, 125 mm long, code 13484, insulation circa 200 mm long.

18. Locate the Zone Valve Assy fitted as shown in point 13 and the Elbow Assy fitted as shown in point 14. Connect these two using the dedicated 5/4” DN 25 pipe, 125 mm long, code 13484.

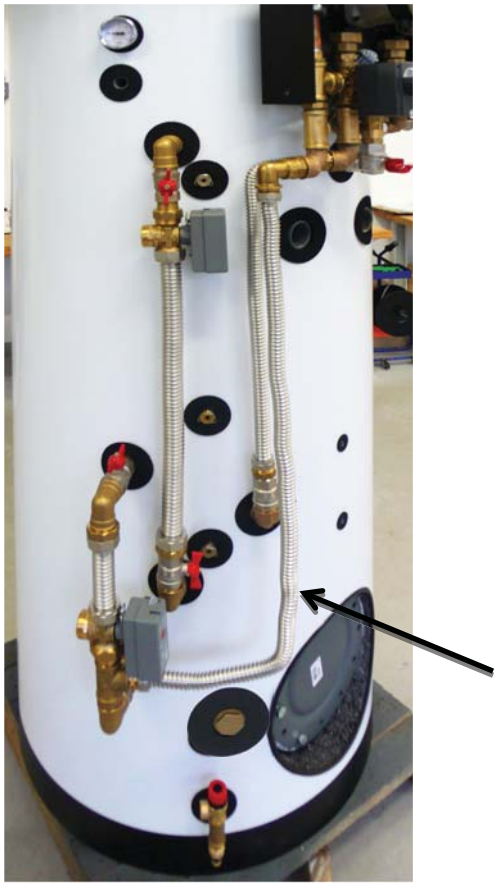
19. Locate the Zone Valve Assy fitted as shown in point 5 and the Elbow Assy fitted as shown in point 16. Connect these two using the dedicated 5/4” pipe, 490 mm long, code 13488.



20. Locate the 1” hex nipple (in the pump station with 4-way mixing valves) fitted as shown in point 9 and the 1” Valve Assy fitted as shown in point 11. Connect these two using the dedicated 1” pipe, 690 mm long, code 13489.

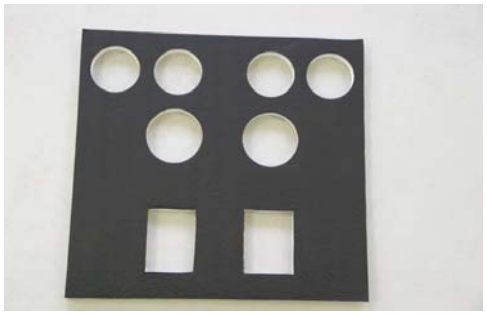


21. Locate the 1” hex nipple (in the Zone Valve Assy) fitted as shown in point 13 and the 1” Elbow Assy fitted as shown in point 9. Connect these two using the dedicated 1” pipe, 1010 mm long, code 13481. Fit the actuators to zone valves.



22. Fit the automatic air release valve (code 11708) with ball valve (code 11965) and hex nipple (code 6971), all included in Kit 13237.

23. Push the front insulation onto the pump station with 4-way valves.



24. Connect the terminals of the pumps, push the cables behind the insulation.

25. Fit the plastic cover onto the pump station with 4-way valves and fix it with 4 plastic screws M6x10 (code 12713).

Completely fitted tank:

Safety high-limit thermostat for electric heating elements (optional part).

5.2 Connecting heating circuits

1. Return line from Heating Circuit 1 – G1”F
2. Flow to Heating Circuit 1 – G1”F
3. Flow to Heating Circuit 2 – G1”F
4. Return line from Heating Circuit 2 – G1”F

As a variant, VEGA can be supplied with a pump station for one heating circuit only.

1. Return line from Heating Circuit 1 – G1”F
2. Flow to Heating Circuit 1 – G1”F

5.3 Connecting a solar circuit

This tank can be also connected to a solar thermal system. An extra flange and a tube heat exchanger (coil) will be needed, depending on the output of the solar thermal system.
All connecting pipes between the tank and solar collectors shall be insulated meticulously.
The solar pump station shall be connected using M6x16 screws with washers for pins, see Fig.

1. Inlet from solar collectors – G3/4” M
2. Return line to solar collectors – G3/4” M

6 - Installation and Commissioning

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

6.1 - Connecting heat sources

The tank shall be placed on the floor, as close to the heat source as possible. Mount the insulation, see Chapter Mounting insulation onto the tank. Connect heating circuits to the inlets and outlets respecting the temperature distribution in the tank. Insulate all the connecting piping.

6.2 - Connecting a solar thermal system

This tank can be also connected to a solar thermal system. An extra flange and a tube heat exchanger (coil) will be needed, depending on the output of the solar thermal system. All connecting pipes between the tank and solar collectors shall be insulated meticulously.

6.3 - Installing a heating element

The Thermal Store can be fitted with two 3-phase electric heating elements with a longer non-heating end (ETT-C or ETT-L), 6 kW max. output each, or with two single-phase electric heating elements with a longer non-heating end (ETT-M), 3 kW max. output each. They can be wired directly to the mains (heating elements equipped with own thermostat), or via a Controller for the entire heating system.
All el. heating elements shall be installed together with a safety temperature limiter.
An el. heating element shall be wired by qualified staff only.

6.4 - Connecting sanitary water piping

DHW piping shall be done according to valid rules. Installation of a pressure reducing valve to the tank inlet is recommended. If the pressure from water mains exceeds 6 bar, a reducing valve is necessary. Should the water be too hard, install a water softener before the tank. In case the water contains mechanical impurities, install a strainer.

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

6.5 - Commissioning

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.

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

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 - Mounting insulation onto the tank

Product description

Thermal insulation is a part of Thermal Stores that prevents heat loss. For these Thermal Store models, the insulation is delivered separated for easier handling and needs to be mounted on the spot. The insulation consists of 3 layers: the first one is soft insulation fitting tightly on the tank; the second, main layer, features thermal conductivity l=0.032 W/m.K; the third layer is a hard, glossy washable surface. The total insulation thickness is 100 mm.

Caution

Insulation mounting shall be done in two or three persons, depending on its size. **It must be done at temperatures of at least 20 °C**. If this cannot be respected, the insulation shall be pre-warmed in another room to at least 20 °C. It is impossible to install insulation under lower temperature, there is a risk of damage. Do not use any tools for installation.
Keep away from open fire.

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.

□ 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.

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

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.

10 - Warranty

This product is covered by warranty under the conditions listed in this Manual and in compliance with the Warranty Certificate. A Warranty Certificate is an integral part of this Thermal Store scope of supply.

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