Regulus

VEGA
THERMAL STORES

ENERGY-SAVING SOLUTIONS

are compact tanks with a whole boiler room placed on them, that were developed with regard to the best possible utilization of energy from various sources.

VEGA 1000 is optimized for operation with a large solar thermal system and enables the most efficient utilization of heat gained from a biomass boiler, hydronic fireplace insert or a heat pump.

VEGA 390 is optimized primarily for operation with a heat pump; it can be retrofitted with an integrated tube coil heat exchanger for heat transfer from a solar thermal system.

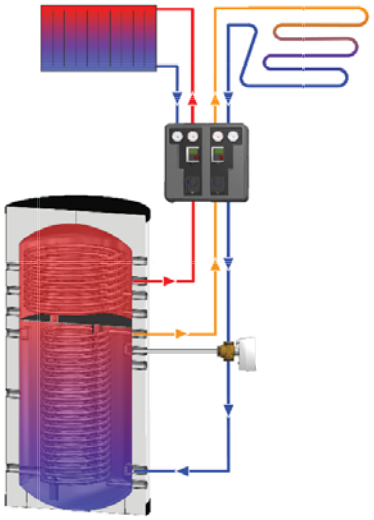
VEGA is not just a tank but a sophisticated entity comprised of a series of solutions that brings significant energy savings and is environmentally friendly.

Principal features common for both the models

Compact design of the tank, with an entire boiler room fitted on it, saves room in the house. A complete supply containing all components and connecting pipes makes the installation time shorter, bringing savings in installation costs. Pre-defined connections for separate heat sources and a system of drawing heat from the tank brings together with an intelligent controller maximum savings and optimal operation without limiting user comfort.

Special inner arrangement of the tank ensures most efficient operation and comfort in hot water or space heating. Division of the inner space into two separate sections makes it possible to keep different temperature in each section without mutual blending. Special passages in the separator sheet enable heat transfer from a solar thermal system or other sources between both the tank sections.

Pump station fitted for one or two independent heating circuits, e.g. living rooms and bedrooms, enables to adjust heating levels to the needs of the user. A different time schedule and temperatures can be selected independently for each of the circuits. The pump station contains high efficiency pumps with very low energy consumption and special mixing valves.



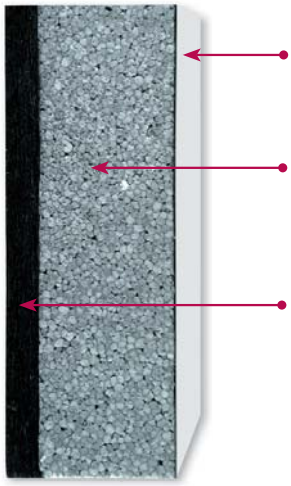
- One or two independent heating circuits
- High efficiency circulation pumps
- Special mixing valves for priority use of solar heat for space heating by means of continuous control of energy drawn from both the tank sections.
- Zone valve can be used to divert heating circuit return water in such a manner that the maximum of solar heat is used for space heating

Domestic hot water is heated up in an integrated stainless steel heat exchanger. Since DHW heating is continuous, there is no risk of Legionella bacteria formation. Variants with recirculation are marked in the connection diagrams below. The large heat transfer area of the heat exchanger guarantees sufficient hot water supply even with lower temperatures in the tank. The amount of hot water supplied is specified in the tables below.

VEGA 390 - hot water supplied in liters					
Cold water, 10 °C	Flow rate	15 l/min		25 l/min	
	Hot water temp.	>40 °C	>45 °C	>40 °C	>45 °C
Thermal store temp. and backup heat. used	55 °C, no backup	142	96	102	65
	55 °C, with backup, 10kW	172	126	123	76

VEGA 1000 DVS - hot water supplied in liters					
Cold water, 10 °C	Flow rate	15 l/min		25 l/min	
	Hot water temp.	>40 °C	>45 °C	>40 °C	>45 °C
Thermal store temp. and backup heat. used	55 °C, no backup	596	458	485	329
	55 °C, with backup, 10kW	787	614	559	400

New sandwich-type insulation is comprised of 3 layers of advanced insulation materials. These ensure excellent insulation properties, high thermal resistance, nice appearance and easy cleaning. In order to reduce heat loss into the floor, Vega is insulated at its bottom as well.

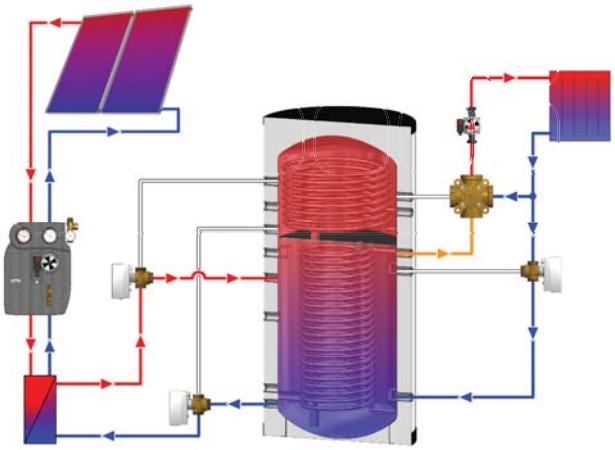


PREFERRED HEAT SOURCES

Solar Thermal System

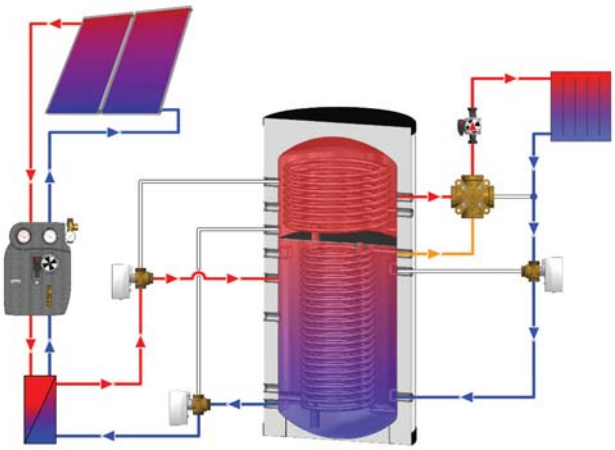
Vega Thermal Stores work with special functions that permit operating the entire system in such a way that solar heat is utilized as much as possible, reaching high efficiency. Its large volume enables storing solar heat for several days of DHW heating, with minimum heat loss thanks to its advanced insulation.

1) Space heating from solar thermal system only



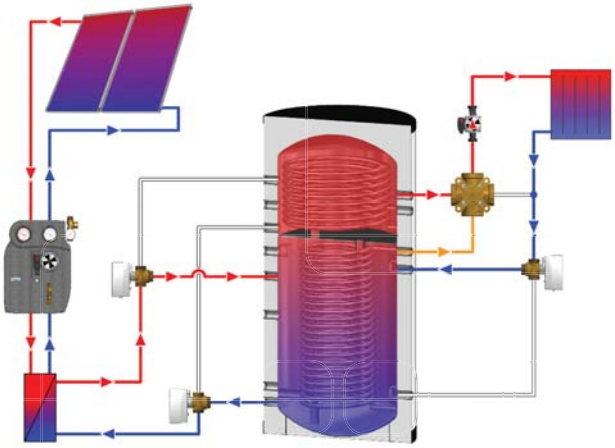
- Only solar heat is drawn from the tank, from its lower section
- The valve mixes water from the lower tank section with return water as needed in order to reach optimum heating water temperature
- Cool return water returns to the lower tank section and is heated up again

2) Space heating from solar thermal system with backup heating



- Water drawn from the lower tank section is mixed with water from the upper tank section to the desired temperature
- Only a small amount of hot water and energy is drawn from the tank upper section, needed to increase the temperature of water drawn from the lower, solar tank section
- Cool return water returns to the lower tank section and is heated up again

3) Space heating from upper tank section only



- During long periods of lack of sunshine the lower tank section will be cold and entire heat will be drawn from the upper tank section heated by a traditional source.
- Return water is run through the electronic controlled diverter valve just below the upper tank section.
- As a result, the bottom section is not uselessly heated up from the return water. As soon as the sun starts shining, solar thermal system will start heating up the cold bottom section with high efficiency.

Although VEGA 1000 is shown above diagrams, all the functions and possible conditions described are equally valid for VEGA 390.

Heat Pump

A Heat Pump is an advanced source for space and DHW heating. However, in order to work under optimum conditions, i.e. with the best possible parameters, a heat pump shall be coupled with technologies that permit such operation.

The main pre-condition for such optimization is to connect the heat pump to a thermal store. There are several reasons why a heat pump should be coupled with a thermal store.

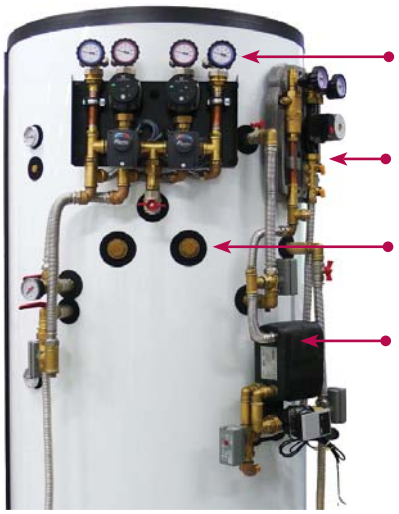
The first reason is reducing the frequency of heat pump starts. Thanks to the volume of the thermal store, the heat pump heats for a longer period and subsequently remains longer off, i.e. so called cycling is avoided, which results in a longer service life of the heat pump.

The second reason is separating the flow through the heat pump from flow through the heating system itself (floor heating or radiators). An intelligent controller will ensure that exactly the heat quantity needed will always go to the heating system. The necessary constant flow through the heat pump is then ensured by the thermal store.

The third reason is connected with evaporator defrosting in air source heat pumps; energy balance and heating comfort are secured by the thermal store.

VEGA Thermal Store will provide not only the highest possible heating comfort but also sufficient hot water supply, and together with an intelligent controller it will optimize heat pump operation and maximize savings.

Whole boiler room in modules on the tank



A pump station for one or two independent mixed heating circuits

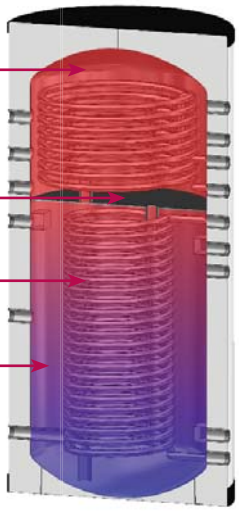
Solar pump station

Electric heating elements can be installed here

Solar plate heat exchanger with diverter valves

Valves and connecting pipes

Energy saving technology inside the tank



UPPER ZONE
for instantaneous water heating kept at higher temperature than the lower zone

SEPARATING METAL SHEET
prevents water mixing between zones

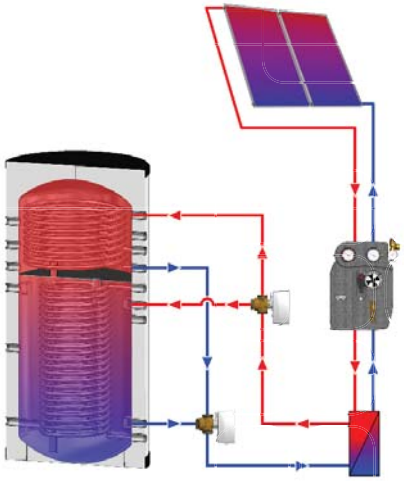
Hot water heating
via integrated stainless steel heat exchangers

LOWER ZONE
large volume to store energy

Heating by solar thermal system via plate heat exchanger

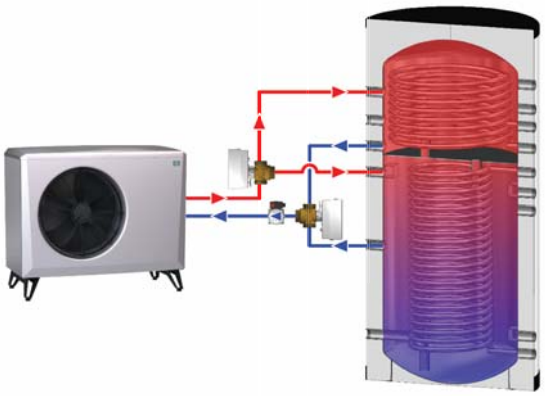
Solar Thermal System

Heat from the solar thermal system is transferred into the tank via a plate heat exchanger.



- Standard plate heat exchanger for 21 sqm of collector surface area, optionally up to 31 sqm.
- Separated heating of the upper section via 3-way valves permits to shut down a traditional heat source quickly, giving priority to solar energy
- After the upper section gets heated up, heating is diverted to the lower section where energy is being accumulated for a longer period, also to overcome several days with no sunshine
- During sunny periods, the tank is heated up from a solar thermal system without any other sources

Heat Pump



- Alternating heating of the lower and upper tank sections to different temperatures via 3-way valves
- Sufficient temperature for DHW heating in the upper section without any other backup source
- The upper section and half the lower section are used for heat accumulation
- Diverter valves included in delivery
- A heat pump can be connected to the tank in any combination with other sources
- If a heat pump works with a solar thermal system, the solar system preheats the coldest water in the bottom tank section
- If the solar output is sufficient, the heat pump remains off
- The heat pump also gets turned off when heat from a manually loaded source starts flowing into the tank (hydronic fireplace insert, wood-fired boiler etc.)

WOOD AND COAL

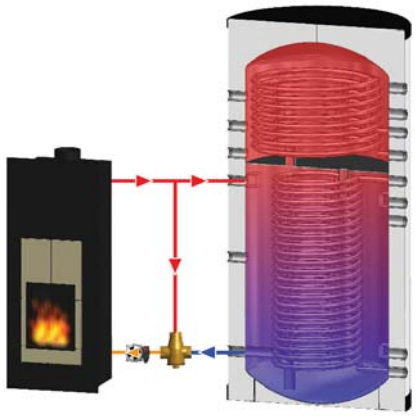
Wood stove, hydronic fireplace insert, wood fired boiler, other solid fuel boilers

Vega permits heat accumulation from manually loaded sources in its entire volume. The stored heat is subsequently used for both hot water heating and space heating.

The heat source is fitted with a thermostatic valve protecting the boiler from flue gas condensation and subsequent corrosion. The thermostatic valve enables the boiler flow temperature to be kept very high and the tank being filled with slowly flowing hot water from the top. Thanks to that, heat from a solar thermal system can be supplied simultaneously, heating the tank from the bottom.

An automatic heat source (el. heating rod, traditional gas boiler, oil boiler etc.) can be operated simultaneously with these manually loaded heat sources.

When a manually loaded boiler fires, the automatic source turns off; after the accumulated heat from a manually loaded source or a solar thermal system gets exhausted, the automatic source will start by itself.

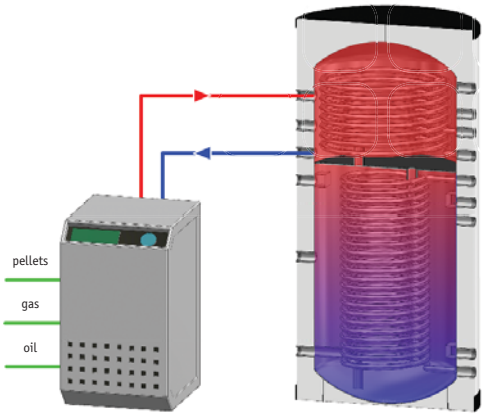


- The entire tank volume can be used for heat accumulation
- Combination with an automatically started source possible
- Simultaneous charging by a solar thermal system possible

ELECTRICITY, WOOD PELLETS, GAS AND OIL

Automatic heat sources – oil-fired or traditional gas-fired boiler, electric heating elements, pellet-fired boiler

These are used either with a solar thermal system, or with a manually loaded boiler, or with both together. They heat the upper tank section only, the lower section remains available for accumulation of solar heat or heat form manually loaded sources.



- They store heat only in the upper section with backup heating that works as a storage tank for hot water heating as well.
- 2 electric heating elements of total output up to 24 kW can be fitted directly into the upper section.
- The entire lower section is used to accumulate heat gained from a solar thermal system and other sources.

Condensing Gas Boiler

A condensing gas boiler works at its highest efficiency under low temperatures and low outputs. In order to reach the optimum utilization in connection with a solar thermal system and other heat sources connected to Vega Thermal Store, it is inevitable that the control board of the condensing boiler enables communication with the control system of Vega.

Therefore we shall check in advance if the control systems are capable of mutual communication, which depends on the desired type of condensing boiler, and prepare a special version of Vega Thermal Store.

So if you wish to utilize a Vega together with a condensing boiler, please contact us in advance.

Whole boiler room in modules on the tank

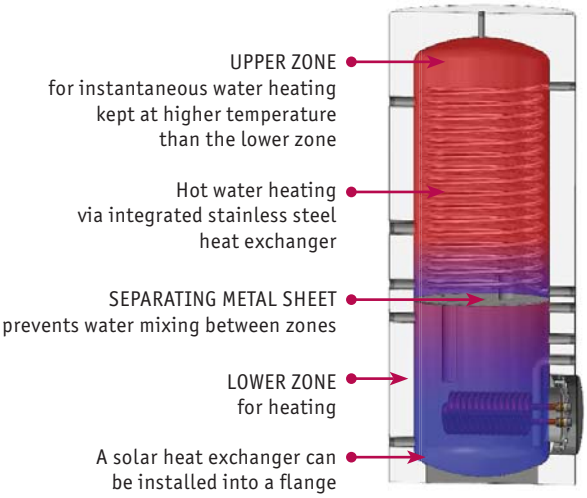
A pump station for one or two independent mixed heating circuits

Electric heating elements can be installed here

Diverter valves for HDW heating by a heat pump

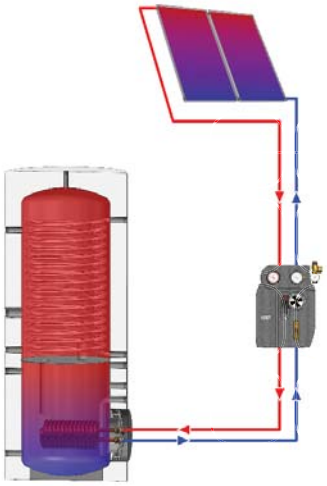
Valves and connecting pipes

Energy saving technology inside the tank



Solar Thermal System

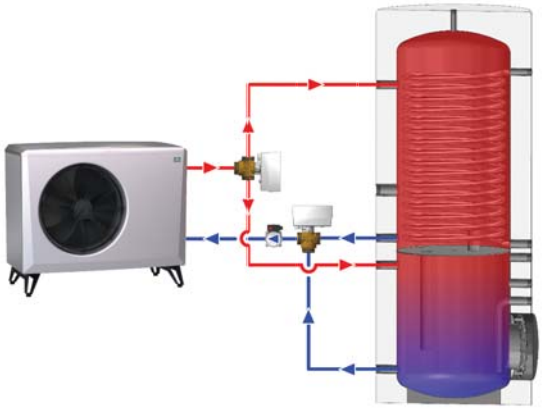
VEGA 390 can be completed with an internal tube heat exchanger for heat transfer from a solar thermal system and with a solar pump station.



- The heat exchanger shall be sized depending on the number of solar collectors installed
- Solar heat can rise to the upper section through the special passages in the metal separator sheet

Heat Pump

VEGA 390 is optimized for preferred operation with a heat pump.



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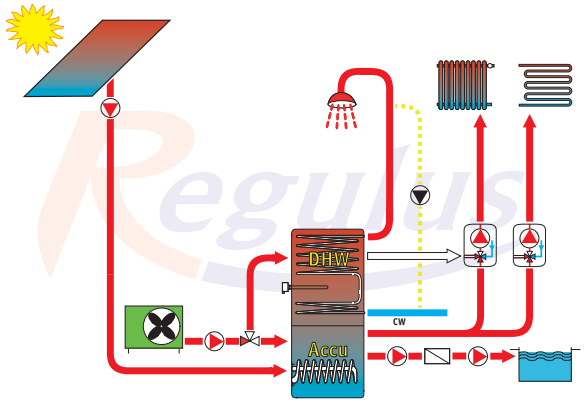
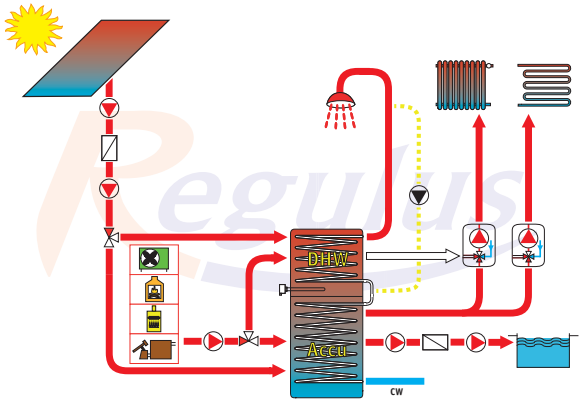
CONNECTING THE THERMAL STORES INTO A SYSTEM AND ITS CONTROL

VEGA 390



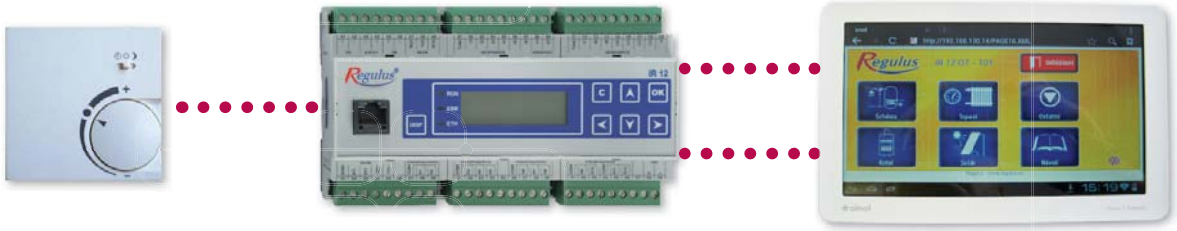
VEGA 1000



INTELLIGENT CONTROLLER

In order to control systems with a Vega Thermal Store it is recommended to use an IR12 Intelligent Controller (special accessory). The controller controls heat sources for your system in an optimal manner, giving priority to the maximum possible utilization of alternative energy sources, DHW heating and space heating that can be split into 2 independent zones. The controller itself is located in a power distribution box, however you can make all adjustments comfortably from your living room via your domestic LAN or from anywhere over the Internet. You can access the controller like any other website from your computer, tablet or smartphone, and after entering a password you have a complete overview of your entire heating system – you can see a diagram with temperatures, operation of sources, indoor temperature and other data. You can change temperature settings, a heating schedule, temperatures and schedule for DHW heating and other parameters.

Besides that, you can immediately increase or decrease the temperature in your home by simple turning a knob on the room unit. Our technicians can run a diagnostic check and help to reveal a possible problem in your system just over the Internet, without the need of a personal visit.



TECHNICAL DATA AND PRODUCT CODES

		Vega 390	Vega 1000 DVS
Tank diam. without insulation	[mm]	550	800
Tank height	[mm]	1905	2080
Max. oper. tank temper.	[°C]	95	95
Max. oper. tank pressure	[bar]	4	4

		Vega 390	Vega 1000 DVS
Total fluid volume in tank	[l]	396	921
Fluid volume in DHW HE	[l]	23	10+20
Empty weight	[kg]	91	160
DHW stainless steel HE surface area	[sqm]	6	3+6

Code	Model	Heating circuits	Soalr heat exchanger	Possible pool heating
12967	Vega 390	1	possible, flange mount	by solar fluid or tank water *
12968	Vega 390	2	possible, flange mount	by solar fluid or tank water *
13453	Vega 1000 DVS	1	external plate-type	by tank water
13278	Vega 1000 DVS	2	external plate-type	by tank water
13454	Vega 1000 DVS	2	external plate-type	by solar fluid or tank water

** For pool heating optional kits are available permitting to connect a pool heat exchanger to the tank*

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Regulus spol. s r.o., Czech Republic
Do Koutů 1897/3, 143 00 Praha 4
Tel.: +420 241 765 191, Fax: +420 241 763 976
E-mail: sales@regulus.eu
Web: www.regulus.eu