DATA SHEET

T035-EN-03-Optiaqua 200-350

DESCRIPTION

The Optiaqua range is specially designed for the instanr production of DHW. The energy is stored in a buffer tank filled with dead water. The purpose of the Optiaqua unit is to transfer the energy contained in the dead water to the DHW as it is consumed. There is therefore no storage of heated or pre-heated domestic water in this installation. These systems provide a real solution to the problem of legionellosis or bacterial development.

Advantages :

- Protection against legionella and bacterial growth.
- Station for high flow rates: 200 l/min, 350 l/min. With the possibility of cascading two stations, thus enabling installations of up to 700 l/min.
- Pre-assembled and pre-wired station.
- Floor installation with all connections accessible from above.
- Possible stratification of the return flow to the storage tank for optimisation of the solar heat input.
- Optional solar heat supply to the sanitary loop.

TECHNICAL FEATURES

Overall description

Optiaqua is a pre-assembled unit for the instant production of domestic hot water. It has been designed to be fed by systems that can exploit renewable energy sources such as solar thermal systems.
Domestic hot water (DHW) is produced directly thanks to the plate heat exchanger and avoids water stagnation in the tanks or in the boiler. This reduces the risk of legionella and bacteria proliferation.
The station is delivered pre-wired. Optiaqua adapts its speed from 30 to 100% depending on the required DHW production. The circulation speed is modulated in such a way as to obtain the required output temperature, whatever the temperature of the storage tank and the cold water.
A 3-way directional valve allows the stratification of the dead water return to the storage tanks. This option is mandatory when supplying heat to the domestic hot water loop.

Technical features	**Optiaqua 200**	**Optiaqua 350**
Nominal withdrawal flow rate (in l/min)	200	350
Max power consumption (in W)	300	590
Single-phase power supply	1 ~ 230 V	1 ~ 230 V
Tapping (gas thread)	6/4F	2"F
Sanitary loop (secondary)		
Nominal flow rate (in l/min)	5	5
Maximum withdrawal temperature (in °C)	300	450
Maximum secondary pressure (in bar)	70	70
Pressure drop at nominal flow rate (in mbar)	6	6
Materials	166	224
Matériaux	copper, stainless steel and brass	
Dead water loop (primary)		
Maximum operating temperature (in °C)	95	95
Maximum working pressure (in bar)	4	4
Plate heat exchanger	copper brazed stainless steel plates	

Water quality

In order to limit corrosion and scaling of the Optiaqua station components, it is necessary to ensure that the water is of good quality.

To do this, it is necessary to control the pH and the hydrometric titre (or hardness) of the water expressed in °fH. It is advisable to use water with a water content of less than 12°fH and a pH of between 7 and 8.5.

If the water content is higher than 12°fH, the water will be very hard. It is therefore recommended to install a water treatment system. The controls as well as the water treatment must be carried out upstream of the station and will protect the Optiaqua unit and the rest of the hydraulic installation.

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Components

n°	Components
1*	Stratification electrovalve (optional)
2	Variable speed pump
3	Immersion sleeve
4	Filling/drainage valve
5	Electrical connection box
6	2 in 1 Vortex flowmeter: flow + temperature
7	Plate heat exchanger

Tab. 1: Optiaqua 200-350 components

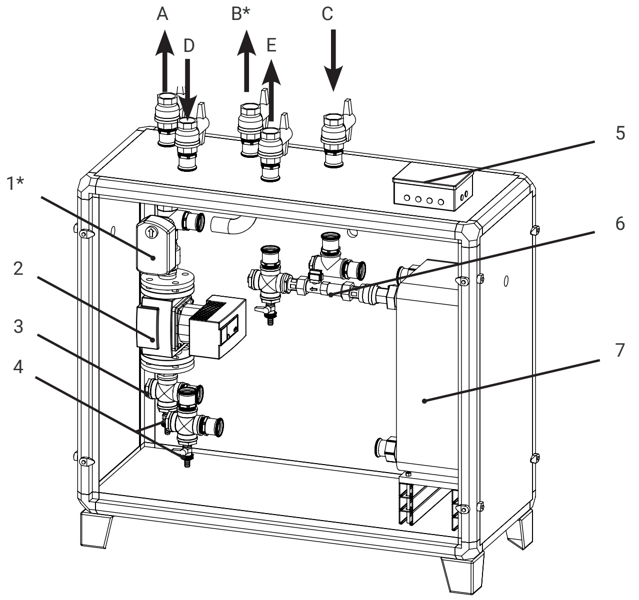

Fig. 1: Optiaqua 200-350 components

* The elements marked with an asterisk are only present in the version with the stratification option.

n°	Connection
A	Dead water loop - Tank return (cold)
B*	Dead water loop - Tank return (lukewarm)
C	Dead water loop - Tank outflow (hot)
D	Sanitary loop - Cold water
E	Sanitary loop - Pre-heated water

Tab.2: Pipes to be connected

Item code	Name	Nominal DHW withdrawal rate	Stratification	Heat exchanger code (as spare part)
106.037	Optiaqua 200 l/min , with stratification	200 l/min	Yes	105.296
106.044	Optiaqua 200 l/min , without stratification	200 l/min	No	105.296
106.056	Optiaqua 350 l/min , with stratification	350 l/min	Yes	105.297
106.053	Optiaqua 350 l/min , without stratification	350 l/min	No	105.297

Tab. 3: Optiaqua 200-350 range

SIZING

The choice of the accurate Optiaqua for the project is very important. An undersized or oversized unit will not provide the expected comfort. An undersized station will not be able to guarantee the temperature of the DHW during peaks, while an oversized station will not be able to deliver water at a stable temperature for the low primary input withdrawals of the plate exchanger.
Great care must therefore be taken when choosing the station and its suitability for the building's use must be carefully checked.

It is important to know the instantaneous peak flows encountered in the installation. For renovation projects, these flows can be measured during the design phase. For new projects, the peak flows will be estimated according to the number of draw-off points, their instantaneous flows and a simultaneity coefficient.

Example of peak flow estimation:
Let's take a building with 35 dwellings, 25 of which are equipped with conventional showers, 10 with baths and all with a kitchen. The cold water temperature is 10°C and the DHW flow temperature is 65°C.
In case of simultaneous tapping, the flow rate is measured as below:

10 x 8 [l/min]	(shower)
+ 25 x 12 [l/min]	(bathtub)
+ 35 x 7 [l/min]	(sink)
= 625 [l/min]	

It is now necessary to apply the simultaneity coefficient from the graph opposite. For 35 dwellings we obtain a coefficient of 0.35. The peak flow of this building will be:

0,35 x 625 = 218 [l/min] at 45°C

As the DHW flow is 65°C, the flow rate found at 45°C must be translated into a flow rate at 65°C

218 / (65-10) * (45-10) = 139 [l/min] at 65°C

For this example, we choose the Optiaqua 200 unit.

Peak flows (DHW at 45°C)	
Classic shower	8 l/min
Balneo shower	12-15 l/min
Bathtub	10-15 l/min
Washbasin	4-6 l/min
Sink	4-10 l/min

Tab. 4: DHW withdrawal rate for different tapping points

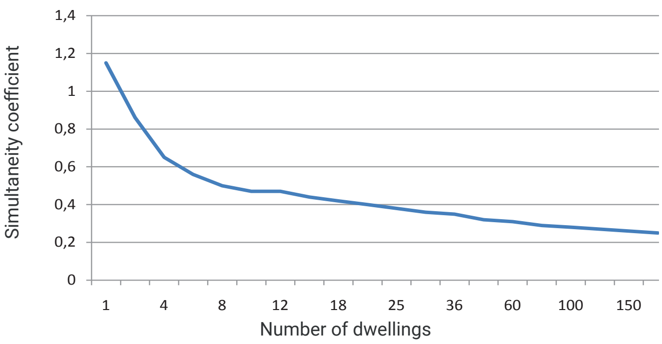

Fig. 2: Simultaneous drawing coefficient for a block of flats (3-4 people per flat).

PERFORMANCES

Optiaqua 200

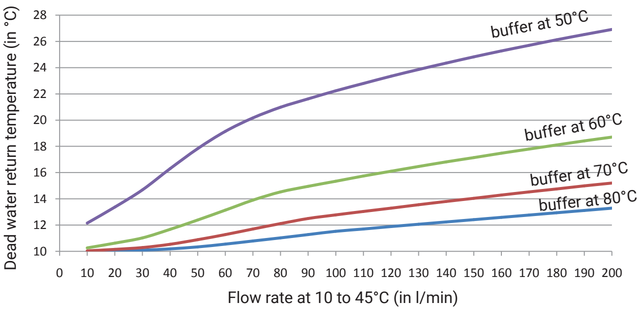

Fig. 3: Return flow temperature in the dead water circuit for different storage temperatures in the buffer tank

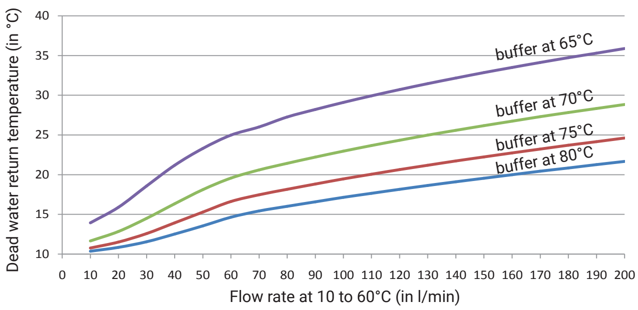

Fig. 4: Return flow temperature in the dead water circuit for different storage temperatures in the buffer tank

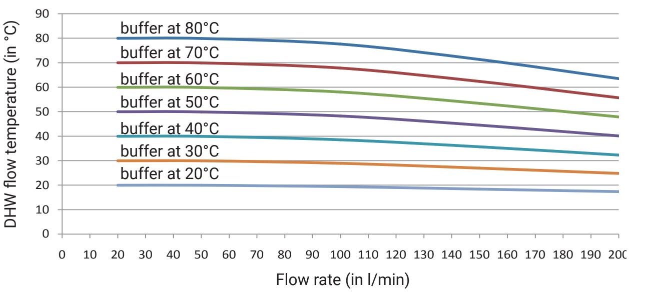

Fig. 6: DHW temperature for different storage temperatures in the buffer tank

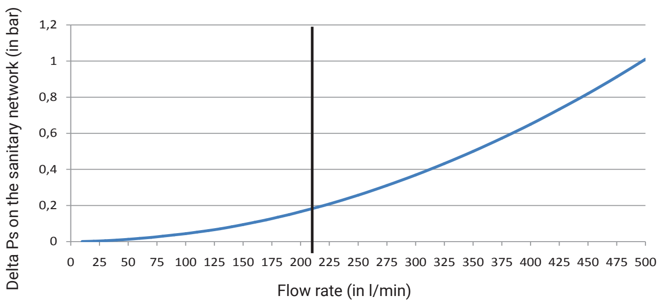

Fig. 7: Evolution of pressure losses in the sanitary circuit as a function of the draw-off rate.

Optiaqua 350

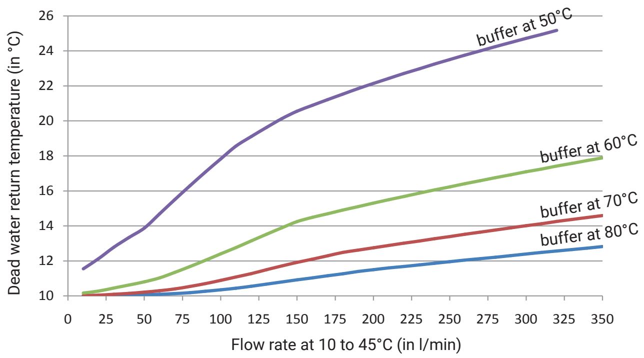

Fig. 8: Return flow temperature in the dead water circuit for different storage temperatures in the buffer tank

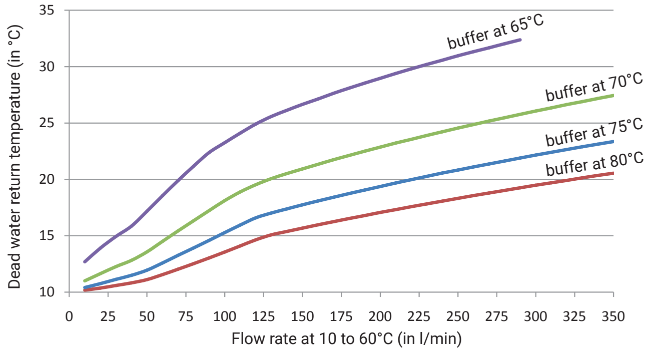

Fig. 9: Return flow temperature in the dead water circuit for different storage temperatures in the buffer tank

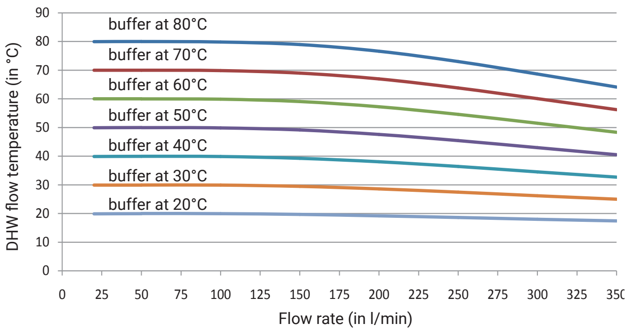

Fig. 10: DHW temperature for different storage temperatures in the buffer tank

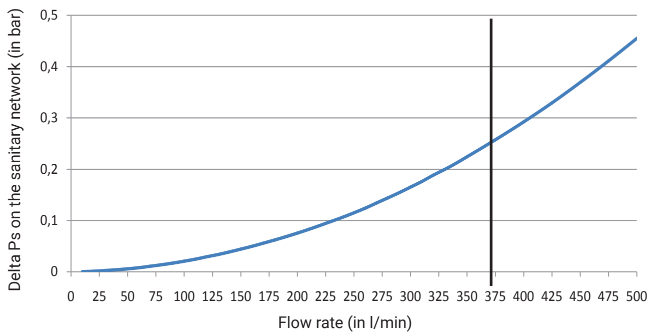

Fig. 11: Evolution of pressure losses in the sanitary circuit as a function of the draw-off rate.

MOUNTING

Space requirements

Before connecting the Optiaqua unit, it is necessary to ensure that the ground is flat. It is also necessary to provide sufficient space for the installation and maintenance of the station.

Name	Fittingd A-E	Length L (in mm)	Depth P (in mm)	Height H (in mm)
200 with stratification	6/4"F	1100	500	1100
200 without stratification	6/4"F	1100	500	1000
350 with stratification	2"F	1600	500	1200
350 without stratification	2"F	1600	500	1100

Tab. 6: Optiaqua 200-350 dimensions.

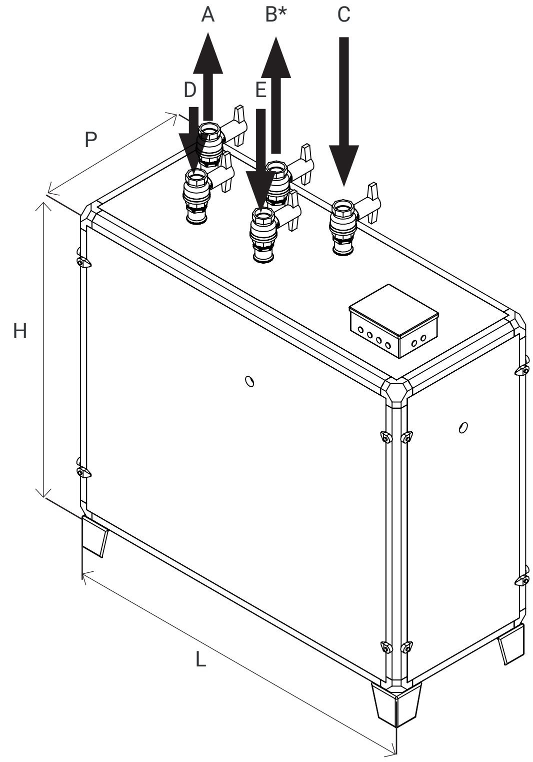

Fig.12: Space requirements for Optiaqua 200-350.

Selection of materials

To ensure the durability of the installation and to avoid any risk of corrosion of the pipes, it is necessary to respect certain rules in the choice of materials during installation. In a hydraulic network, you can only go from the least noble material to the most noble and not the other way round. The reason for this is that the water is loaded with metal particles as it passes through, which can form a galvanic pile and lead to corrosion of the pipes. Table 7 ranks the materials from the most noble to the least noble.

The sanitary part of the plant is made of copper and brass, so it is not possible to use galvanised steel for the sanitary circuit downstream of the plant. However, it is possible to use multilayer plastic, copper or stainless steel to make these connections.

Figure 11 shows the different possible combinations of metal piping.

Material	Nobility
Stainless steel	++
Copper, brass	+
Galvanized steel	-

Tab. 7: Classification of materials according to their nobility

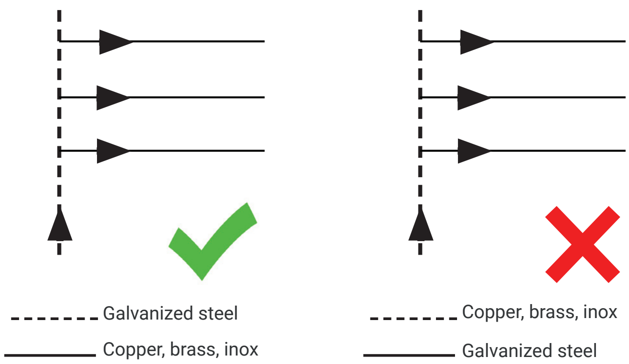

Fig. 13: Choice of materials according to their position

Hydraulic connection

For the pipe sections and their connections, please refer to the hydraulic diagram provided with the order confirmation. Regardless of the type of piping used, the connection to the station must be made using removable three-piece fittings.

Bypass

It is advisable to create a bypass that allows work to be carried out on the Optiaqua station without having to cut off the hot water supply to the customer. This system also simplifies the intervention during the construction phase.

Safety valve

A safety valve must be installed on the dead water system and on the sanitary system to protect the system from pressure fluctuations. The maximum pressure of the dead water network is normally 4 bar and that of the sanitary network is 6 bar. However, check the resistance of all the installed components.

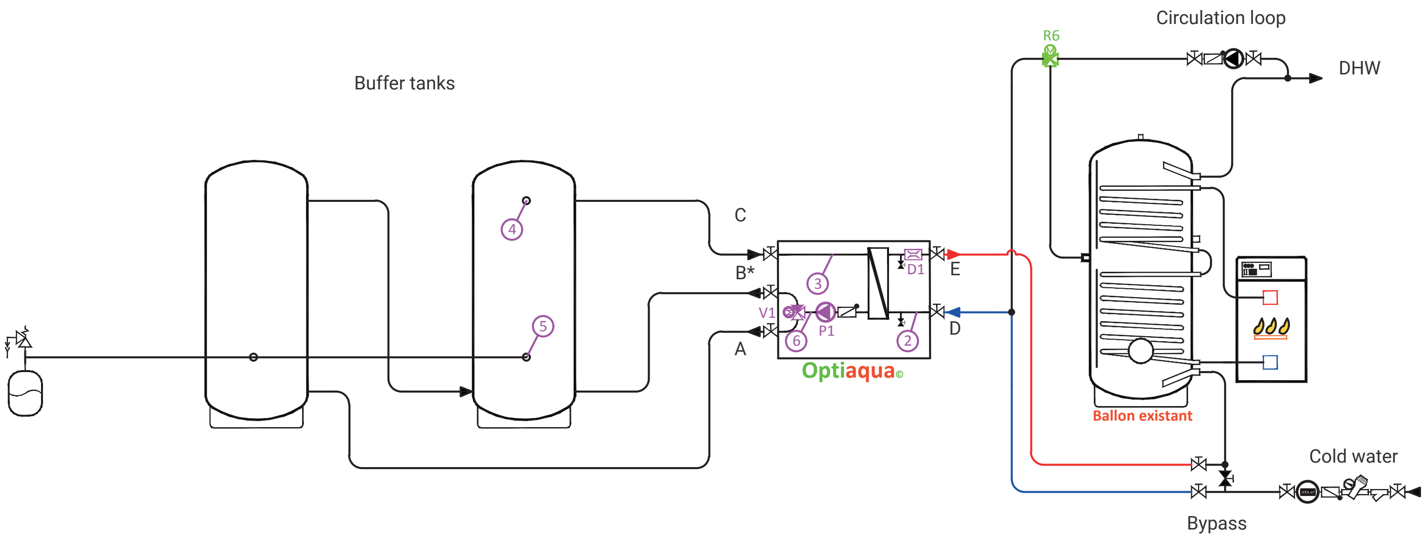

Fig. 14: Hydraulic diagram of an installation with stratification and circulation loop

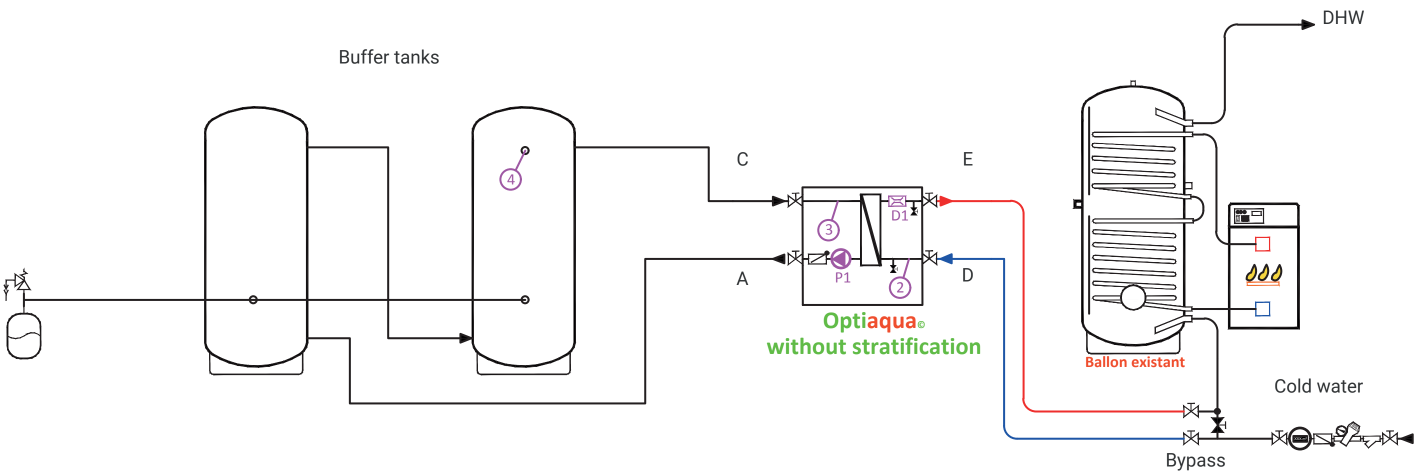

Fig. 15: Hydraulic diagram of an unstratified system

Electric wiring

Each station is delivered with all the active elements (pump, electrovalve, sensors) pre-wired on a terminal block. Pull the cables between the electrical control panel and the station, respecting the characteristics listed in the table below.
The power cables and the sensor cables must not be placed in the same sheath/duct. If they run parallel, they must be at least 20 cm apart to avoid distorting the measurement values.

Caution: Never energise the pumps / circulators before commissioning is complete. When the control system is switched on, a control relay may switch on. No-load operation will result in damage not covered by the warranty. Wait until commissioning is complete before applying power to the pumps / circulators.

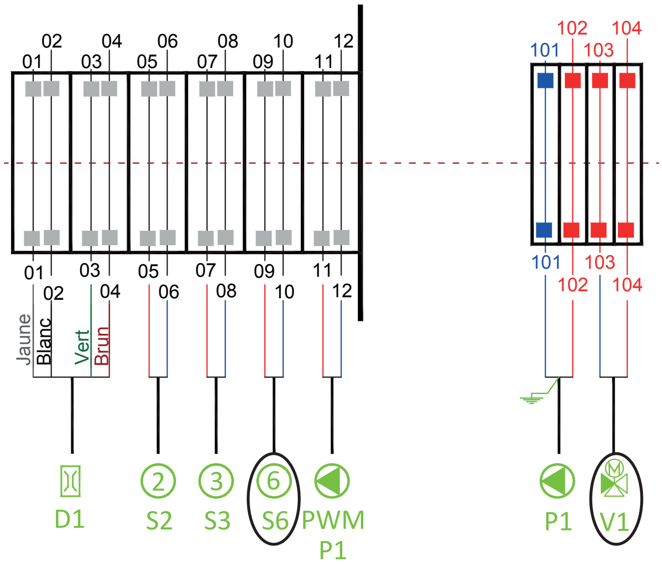

Fig. 16: Electrical terminal block for Optiaqua 200 350 litres/min stations with stratification

* The elements marked with an asterisk are only present in the version with the stratification option.

Name	0-10 V sensors (nb of conductors)	Pump	Voltage 240 V (nb of conductors)
Optiaqua 200 l/min, with stratification	12 x 0.75mm² faradiséséd	Single-phase	4 x 1.5mm² + ground
Optiaqua 200 l/min, without stratification	10 x 0.75mm² faradised	Single-phase	2 x 1.5mm² + ground
Optiaqua 350 l/min, with stratification	12 x 0.75mm² faradised	Single-phase	4 x 1.5mm² + ground
SOptiaqua 350 l/min, without stratification	10 x 0.75mm² faradised	Single-phase	2 x 1.5mm² + ground

Tab. 8: Number of conductors required for the electrical connection

SAFETY INSTRUCTIONS

Transport and storage

Transport
- Optiaqua units must remain in their original packaging during transport. Any modification of the packaging during transport will void the manufacturer's warranty.
- The stations must be transported in a vehicle that provides optimum protection against weather and impact.
- No loads should be placed on the stations during transport or storage.

Handling and storage
- When receiving the products, be sure to handle them with care.
- Avoid any shock when handling Optiaqua stations to avoid damage to the cover and components (electronic regulation, vortex flowmeters, valve, pump ...).
- The packaging should only be removed when the station is finally installed. Before this step, keep all products in their original packaging!
- No loads should be placed on the stations during storage.
- When storing or warehousing the products, choose a dry, dust-free room that is protected from frost and the elements.
- The last one should be secured with a screw in the space provided (note 2).

Once the station is fixed, place the insulating cover over the station.

Qualification of the installer

The installation and commissioning of an Optiaqua station must be carried out by a qualified professional installer approved by Sunoptimo. Reminder: the warranty will only be valid once a qualified installer has carried out the installation and regular maintenance of the station. Activation of the warranty takes effect upon receipt of the commissioning report.

Local standards and guidelines

- The installation must comply in all respects with the European, national and local regulations in force at the time of commissioning.
- The manufacturer's instructions for the connection of the auxiliary system to the storage tank must be observed.
- The guidelines of the local water supplier as well as the European guidelines for the prevention of legionella risks must be observed.
- The following standards must also be observed:
- DIN 4753: Hot water tanks and systems for the preparation of hot water
- DIN 1988: Technical regulations for drinking water systems
- DVGW 551/552: Technical guidelines for the prevention of legionella risks in water heating and transport
- EN 12977-3: Solar thermal systems and components. Performance test of the DHW storage tank for solar systems.
- For France: Decrees of 23 June 1978 and 30 November 2005 concerning fixed installations for heating and domestic hot water supply in residential buildings, workplaces or premises open to the public.

Safety devices

The protection devices for the secondary network (sanitary) must be installed: valves, expansion vessel, pressure reducer, thermostatic mixing valve, etc.

MAINTENANCE

It is imperative to carry out regular maintenance of the Optiaqua station and to regularly check the proper functioning of the exchanger.

Check the heat exchanger regularly for dirt:

Regularly check the exchanger for clogging: Connect a hose with a pressure gauge between the two drain/fill valves F and G.
Read the pressures upstream and downstream of the exchanger for different withdrawal rates.
Compare the pressures obtained with those recorded during commissioning. If the pressures increase, the exchanger is clogging due to scaling or dirt.

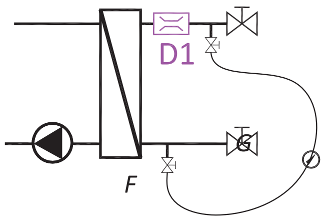

Fig. 14: Fouling measurement.

Descale the exchanger:

To descale the exchanger, isolate the station by closing valves D and E and opening the bypass.
Then open the filling valves F and G.
Circulate a descaling solution as shown in the figure opposite. After circulating the fluid several times through the exchanger, rinse thoroughly by circulating domestic water. Re-open valves A and B and the bypass to put the station back into production.

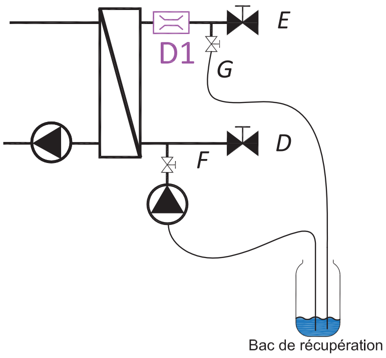

Fig. 15: Descaling of the exchanger of the Optiaqua station

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