





Installation, service and operating instruction Alfa Laval AquaFirst

Domestic hot water supply



Contents

1	General	3
1.1	Product overview AquaFirst	4
2	Operating principle	5
3	Installation.....	6
3.1	Unpacking/Preparation/Mounting	6
3.2	Commissioning	6
3.3	Installation of an AquaFirst Direct (Instantaneous) units	7
3.4	Installation of an AquaFirst Indirect (Semi-Instantaneous) unit	8
3.5	Measure sketch Aqua First 2000 & 4000 Direct version*	9
3.6	Measure sketch Aqua First 2000 & 4000 Indirect version*	10
3.7	Measure sketch Aqua First 6000 & 8000 Direct version*	11
3.8	Measure sketch Aqua First 6000 & 8000 Indirect version*	12
4	Electrical installation	13
4.1	Regulator Components	13
4.2	Electrical wiring diagram	14
5	User instruction operator control panel Micro 3000.....	15
5.1	Home screen	16
5.2	Command symbols.....	16
5.3	Setting the time and date	17
5.4	Changing the Date format	17
5.5	Setting the Daylight Saving Time	17
5.6	Saving changes	17
6	End user mode.....	18
6.1	Time programs	18
6.2	Changing time and temperature in a time program.....	19
6.2.1	Special days	19
6.3	Making a Quick temperature change	20
7	Technician menu, total read and write level	21
7.1	Login.....	21
7.2	The technician Main menu	21
7.3	Configuration menu	22
7.4	S1 Menu Secondary Outlet	23
7.5	Thermal Treatment Menu	23
7.6	Safety Function.....	24
7.7	Eco-Booster Function	24
7.8	Fouling function	25
7.9	230V Triac menu	25
7.10	Pumps Menu	26
7.11	Autotest menu	27
7.12	Clear alarm menu	28
8	Service Menu 	29
8.1	Change password for technician level	29
8.2	Login installer	29
8.3	Menu Continue	30
8.4	Operating hours.....	31
8.5	Trending parameters.....	32
8.6	Display the trend buffer	33
9	Alarm menu 	34
10	Parameter list	35
11	Factory RESET	36

12	Modbus add on	37
12.1	Modbus communication	37
12.2	Connecting multiple Micro 3000 control boxes	37
12.3	Modbus slave communication parameters.....	38
13	Declaration of conformity.....	39
14	Trouble shooting.....	40
15	Maintenance and repairs	41
15.1	Open the control box	42
15.2	Change fuses	42
15.3	Pumps' number	43
15.4	Add a recycling pump to an AquaFirst Direct.....	43
15.5	Add an extra pump	43
15.6	Add an extra sensor	43
15.7	230V Triac output	44
15.8	Relay 1 and 2 contacts	44
15.9	Remote Control contact.....	44
15.10	Change plate heat exchangers	45
15.11	Technical data	45
15.12	Spare parts-Aqua First 2000 & 4000.....	46
15.13	Spare parts Aqua First 6000 & 8000	47
16	Commissioning report.....	48
17	Warranty	49
17.1	How to contact Alfa Laval	49

1 General

Alfa Laval AquaFirst is a compact tap water system product including a heat exchanger, motorised control valve and managed primary and secondary pumps, as per versions. It is equipped with a control box including a dedicated PCB and communicant temperature controller. Piping is made of specially designed brass parts. AquaFirst has been tested hydraulically and electrically at the factory.

The AquaFirst is available in two plate sizes:

- M3H for model FI2000 and FI4000. Difference between the two models is the primary pump.
- M6M MH/ML for model FI6000 and FI8000. Difference between the two models is the secondary pump.

There are in total 40 models of the AquaFirst, 12 direct and 24 indirect. All types can have single or double pumps.

Option:

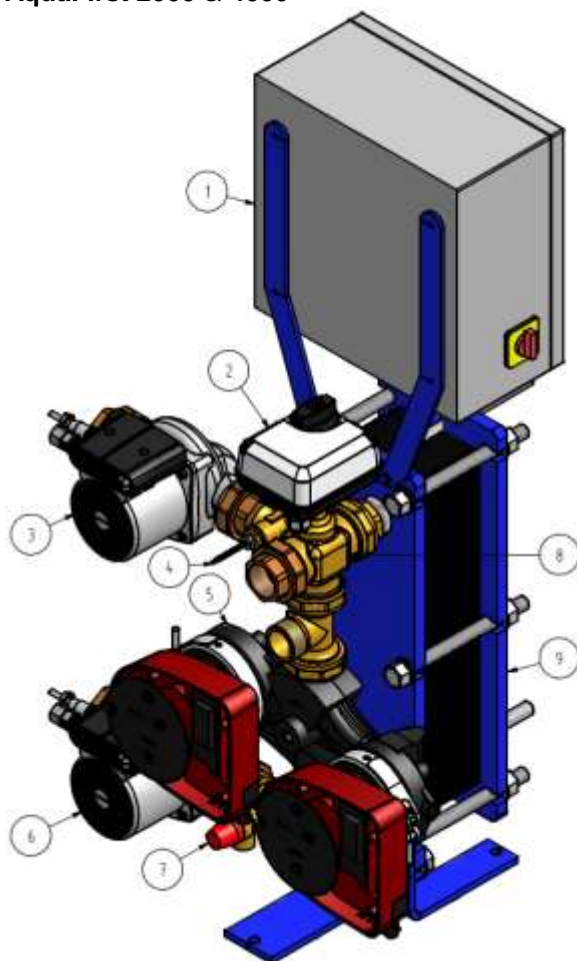
- insulation

The AquaFirst has to be connected to a primary heating source, like a boiler or a heat exchanger. The secondary side is connected to cold water inlet and to domestic hot water network, see flowcharts for more details.

The tap water module is designed for indoor installation, for example in a plant room. The ambient temperature in the room must be min 0°C and max 40°C, max humidity 85% without condensation.

1.1 Product overview AquaFirst

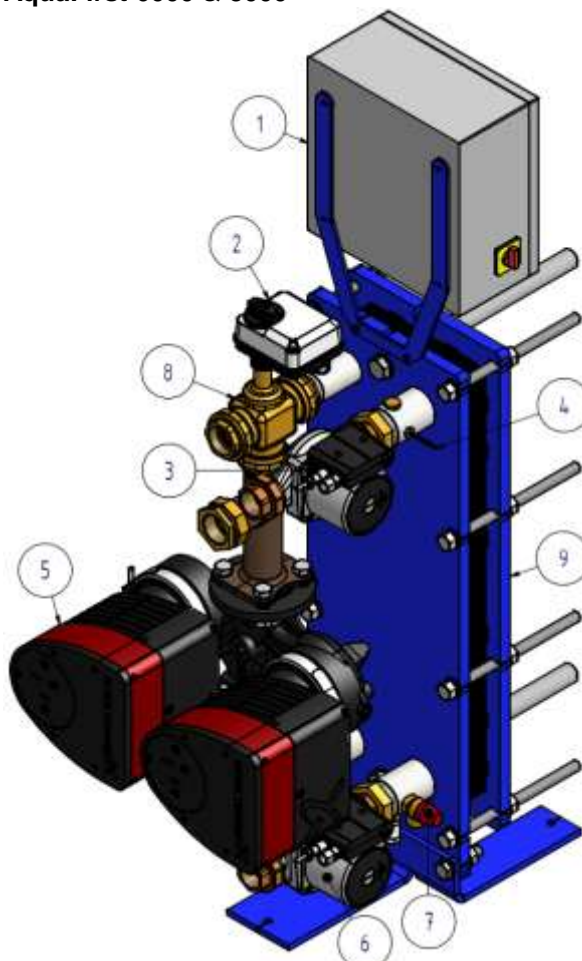
AquaFirst 2000 & 4000



Picture 1

- 1 Control Box including Micro3000
- 2 Signal actuator
- 3 Secondary charging pump
- 4 Temperature sensor S1
- 5 Primary single or double pump (as per version)

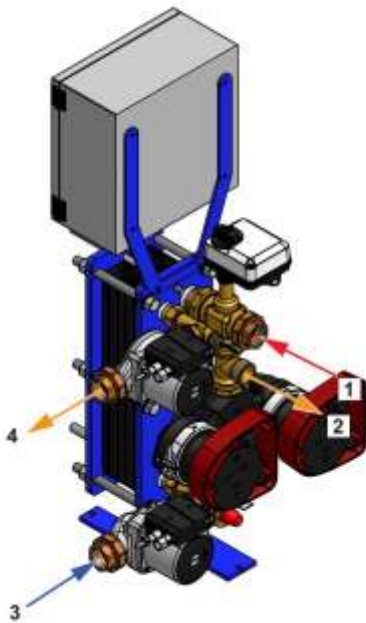
AquaFirst 6000 & 8000



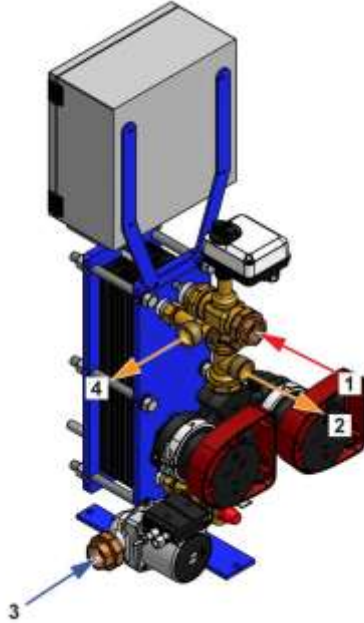
Picture 2

- 6 Secondary charging pump
- 7 Safety valve
- 8 3-port mixing control valve
- 9 Plates Heat Exchanger with Insulation (optional)

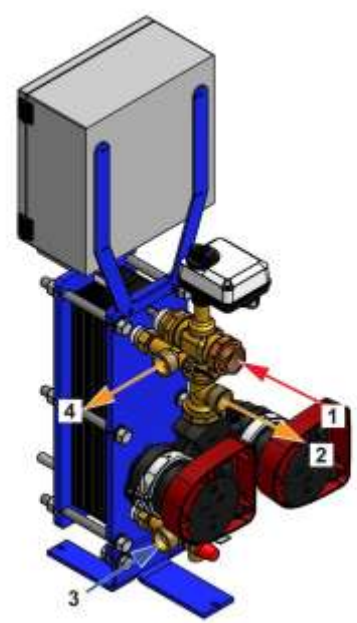
2 Operating principle



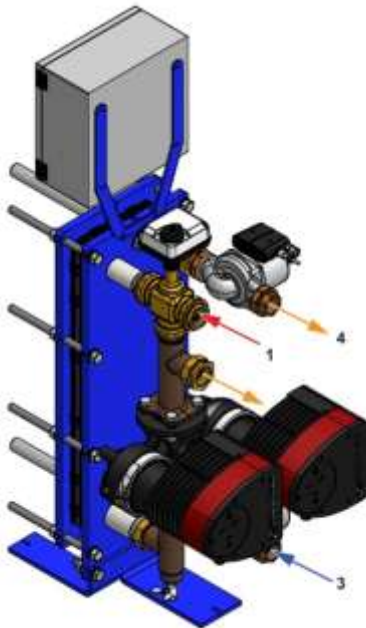
Picture 3



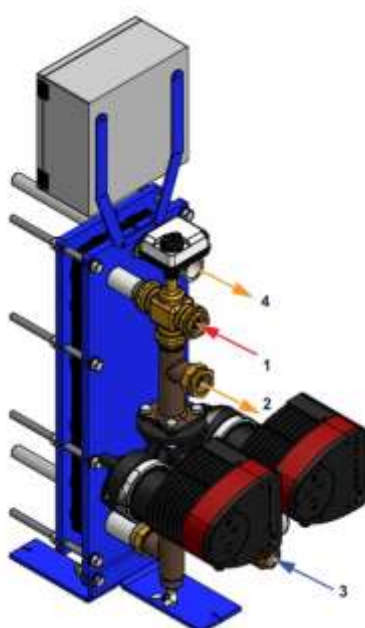
Picture 4



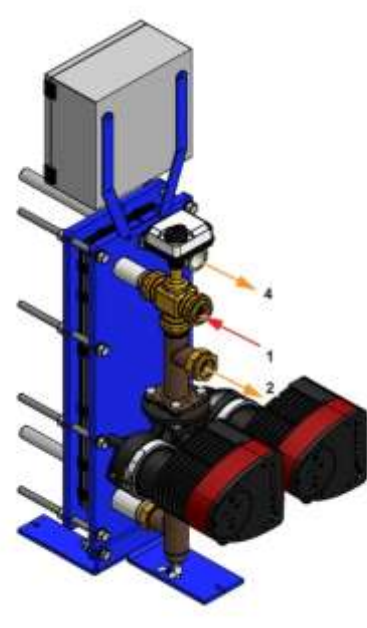
Picture 5



Picture 6



Picture 7



Picture 8

- The primary water enters the 3 port modulating valve (1) and leaves through the fitting (2).
- Cold water enters at bottom part (3) and leaves at the required temperature at high part (4).
- The secondary circuit should be equipped with a recirculation or a charging pump,
- Modules suitable for 230V 1 phase / 50 Hz + Earth,
- Make sure power supply in the field corresponds to the above voltage,
- A fuse protection should be provided on site.
- Relays: Volt Free Contacts (VFCs), 2 Amps maxi, each under 230 V.

3 Installation



The installation work must be carried out by an authorized installation contractor.



The temperature and the pressure of the water are very high. Only qualified technicians are allowed to work with the AquaFirst. Incorrect operation may cause serious personal injury and result in damage to the building.



Minimum pressure/temperature on primary side : 1.0 bar/ 2°C, 1.5 bar / 110°C

Maximum pressure/temperature on primary side :10 bar /110°C

Maximum pressure on secondary side : 10 bar/ 100°C

3.1 Unpacking/Preparation/Mounting

- Rinse the pipes, before connecting them to the tap water module.
Pipe works may contain solid particles that could block or prevent the modulating valve to operate correctly.
- Pipe the primary and the secondary of the module.
- Fill-up both sides progressively with water.
- Purge air at high parts.
- Purge all the pump bodies.
- Switch the power on.
- Check controller setting and enable the required functions.

3.2 Commissioning

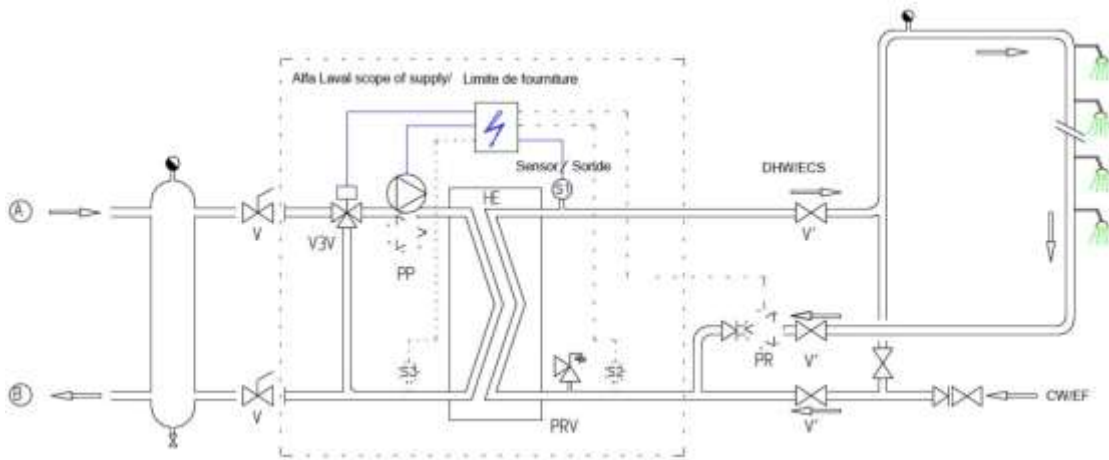
Before installation this manual must be read.

The controller has been set at the factory. If any function needs tuning, values can be changed with reference to this manual for parameter setting. Initially, the commissioning process should be carried out with the factory settings.

Fill out the form in chapter [16 Commissioning report](#).

3.3 Installation of an AquaFirst Direct (Instantaneous) units

The tap water modules should be installed according to the following schematics.



Picture 9

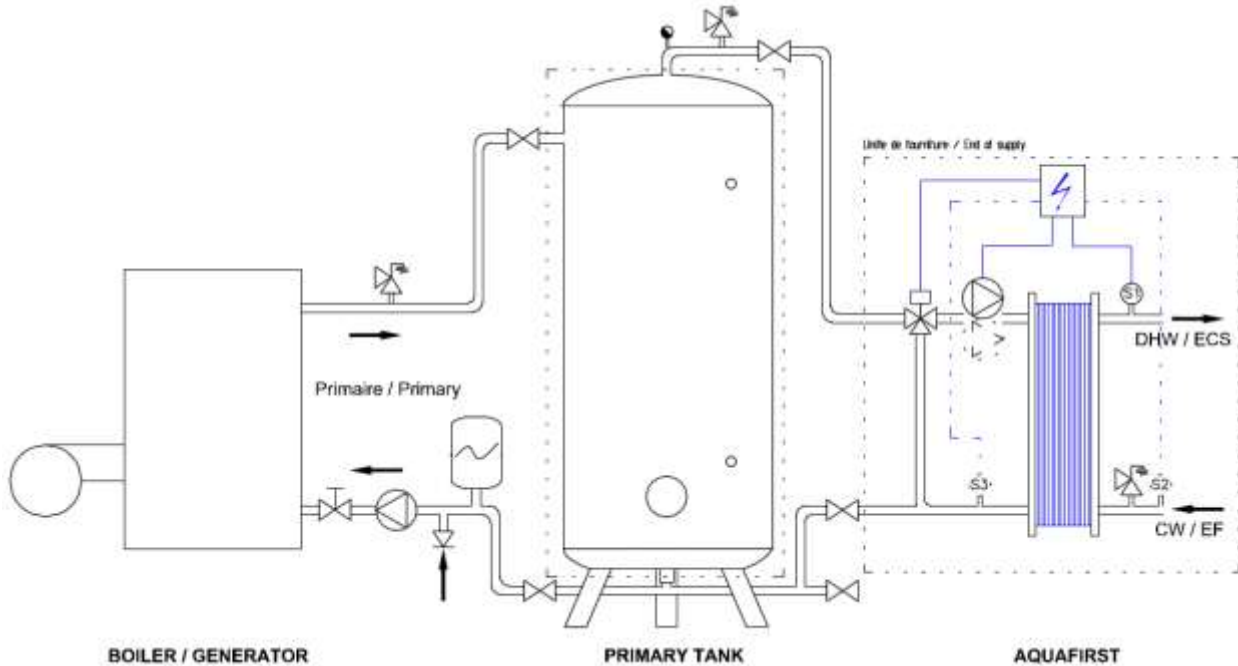
REP DESIGNATION

A	Primary inlet
B	Primary Outlet
CW	Cold water inlet
V3V	Mixing 3 port control valve with actuator
PRV	Pressure relief valve

REP DESIGNATION

HE	Heat Exchanger (PHE)
PP	Primary pump (single/double)
PR	Recycling pump (option)
V	Manual gate valve
S1	DHW temperature sensor (master)

The primary water tank limits available generator capacity.



Picture 10

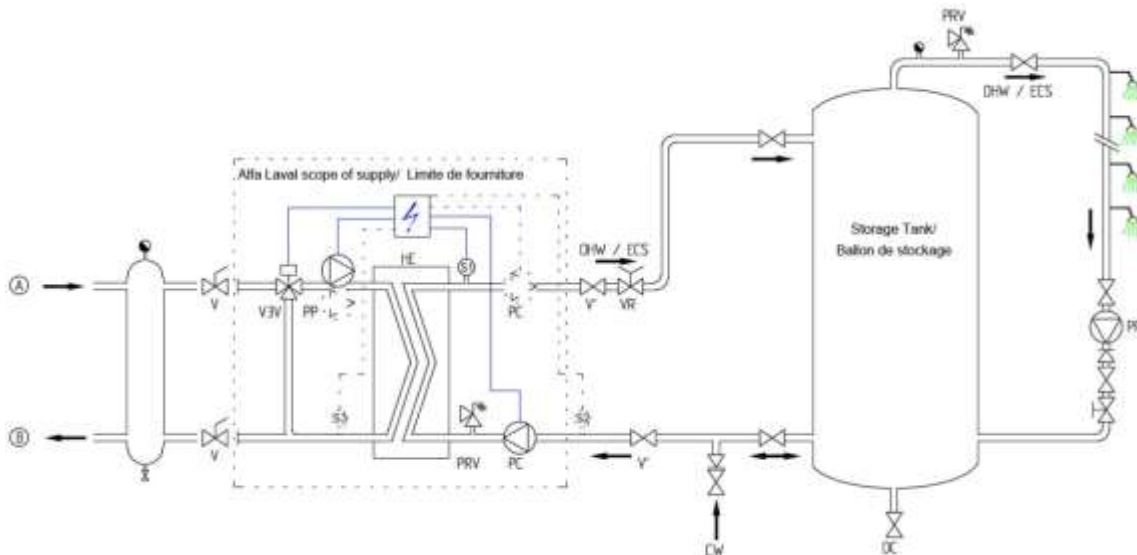
3.4 Installation of an AquaFirst Indirect (Semi-Instantaneous) unit



Flow rate PR must be < 60% PC flow rate.

Protect the storage tank by installing the added safety valve. Pressure gage=tank MAX working pressure and can be different from tap water module's safety valve pressure gauge. The safety valve protects the storage vessel and not the tap water system.

Secondary charging pumps have the following limitations as per water quality:
pH 6 to 9 and TH<25 French degrees (25°TH) or 14 German degrees (14°dH).



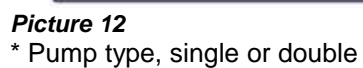
Picture 11

REP DESIGNATION

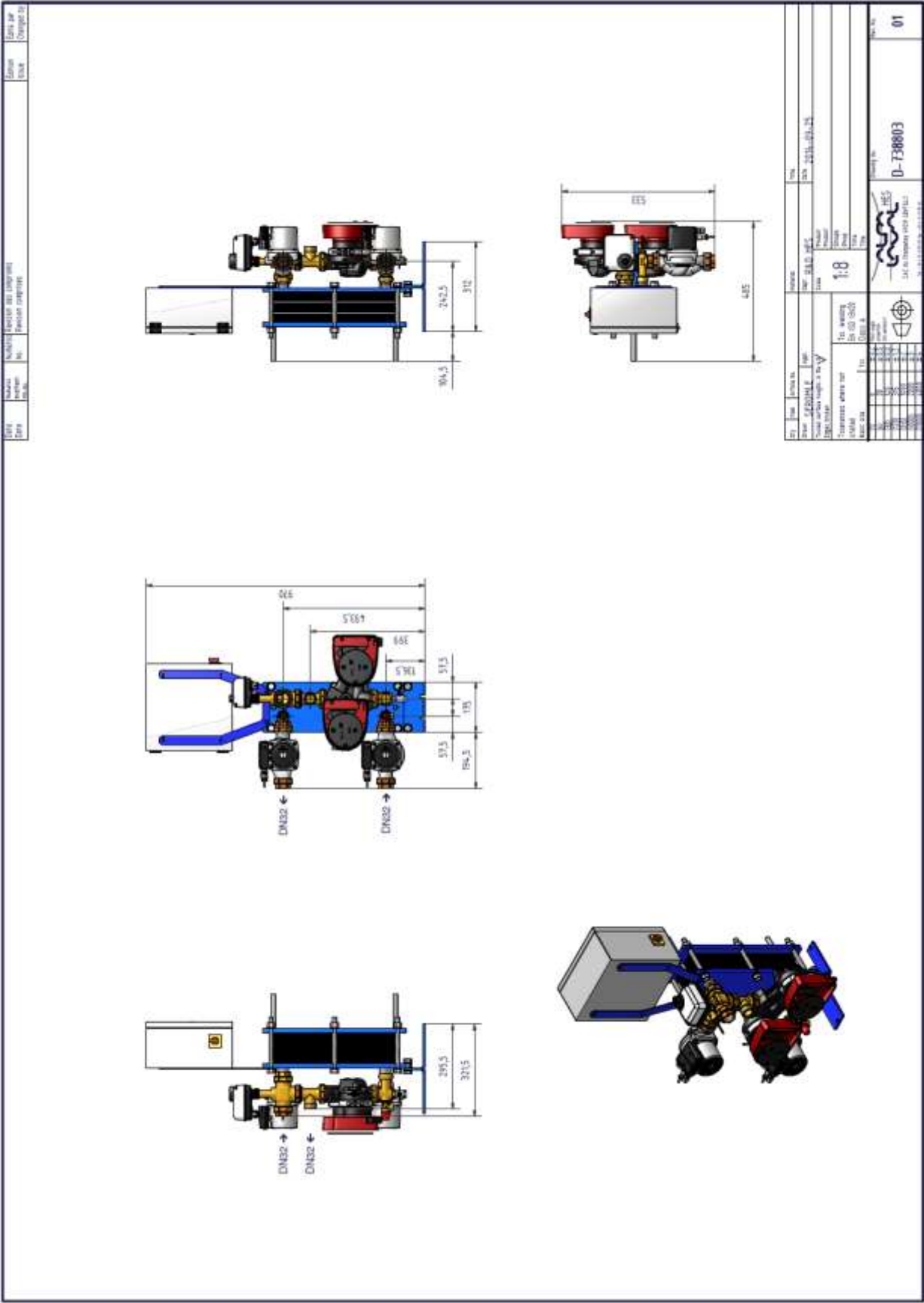
A	Primary inlet
B	Primary Outlet
VR	Setting valve
CW	Cold water inlet
V3V	Mixing 3 port control valve with actuator
PRV	Pressure relief valve

REP DESIGNATION

HE	Heat Exchanger (PHE)
PP	Primary pump (single/double)
PC	Charging Pump (1 or 2)
PR	Recycling pump (on installation)
V	Manual gate valve
S1	DHW temperature sensor (master)

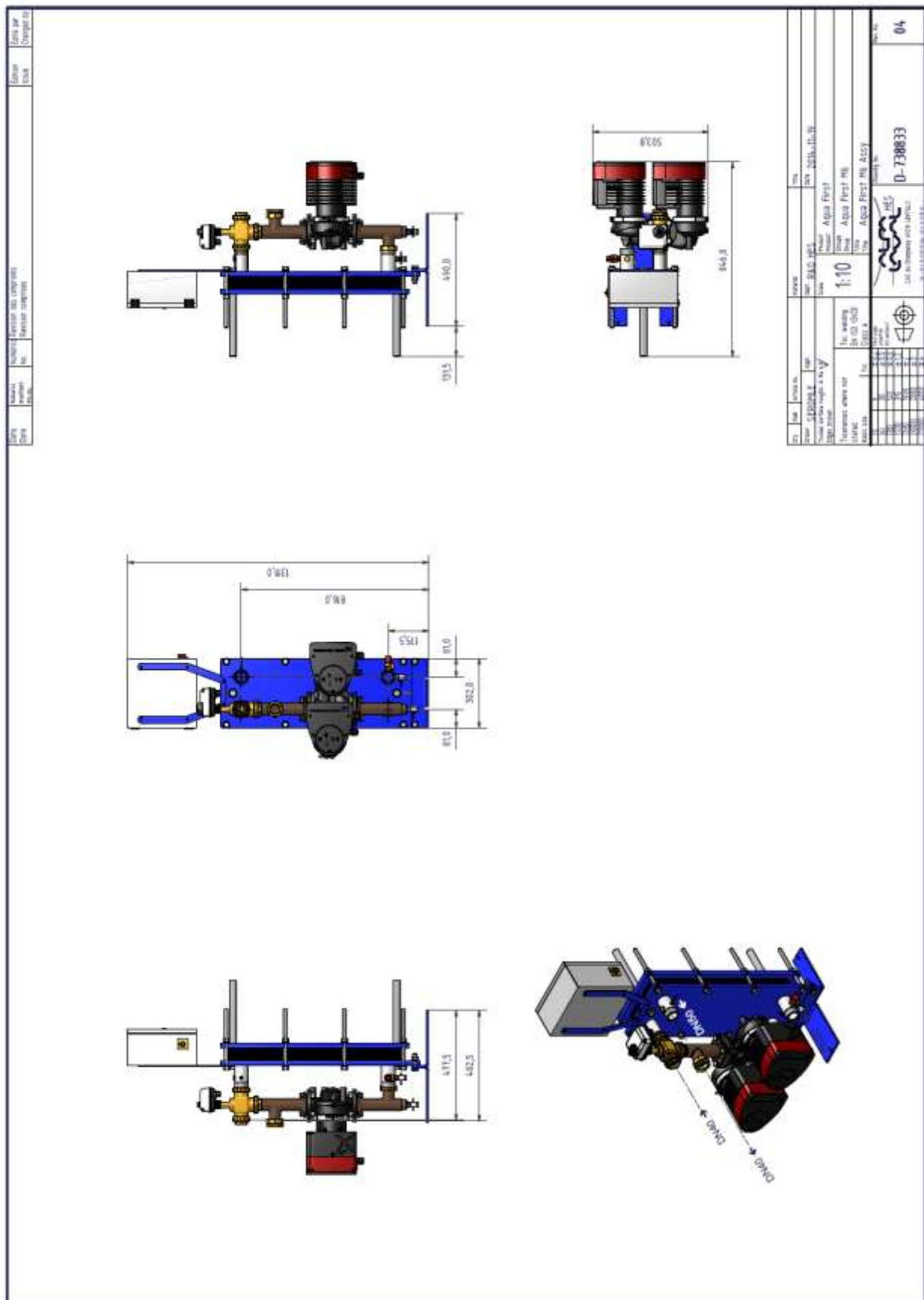


3.6 Measure sketch Aqua First 2000 & 4000 Indirect version*



Picture 13
* Pump type, single or double

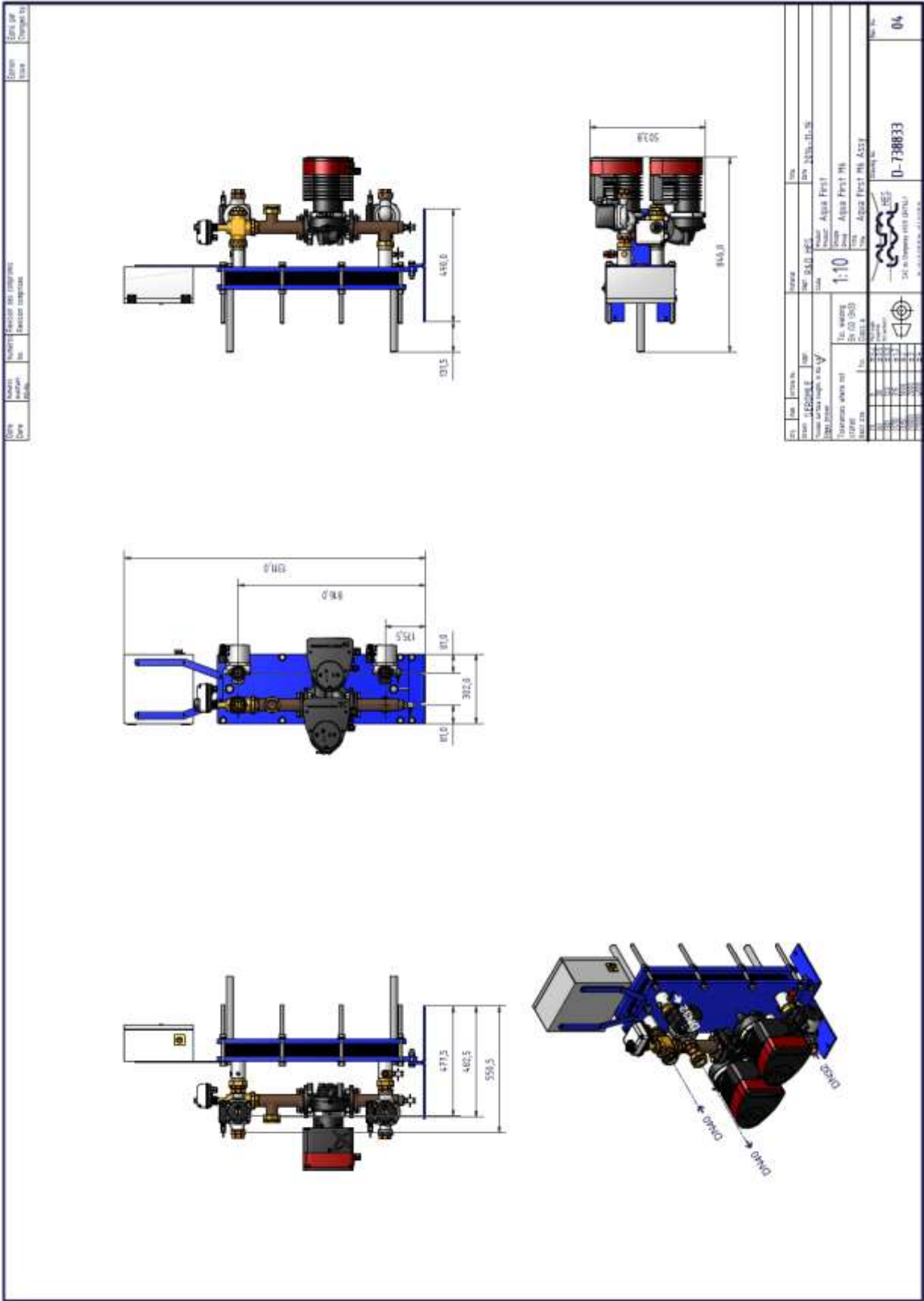
3.7 Measure sketch Aqua First 6000 & 8000 Direct version*



Picture 14

* Pump type, single or double

3.8 Measure sketch Aqua First 6000 & 8000 Indirect version*



Picture 15
* Pump type, single or double

4 Electrical installation



Power supply the control box with 230V 50 Hz + Earth, using electric protection in the main electric power box. Micro 3000 box is a secondary electrical control box. Human protections and protection against short circuits and over intensity must be installed in the main electric box.

4.1 Regulator Components

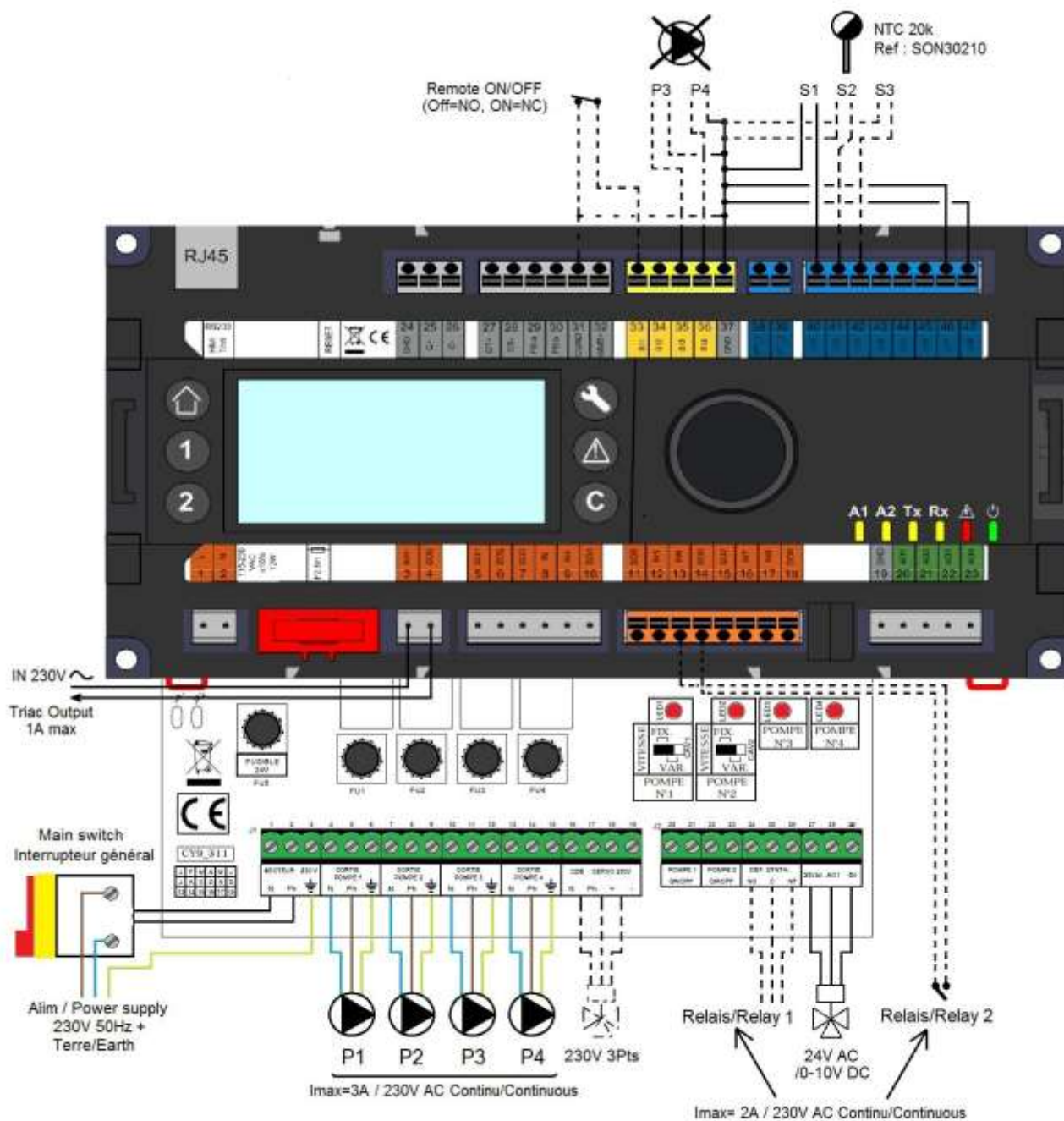


Picture 16

- 1 Controller, Micro 3000
- 2 Main switch

- 3 Power Supply
- 4 Printed Circuit Board

4.2 Electrical wiring diagram



Picture 17

5 User instruction operator control panel Micro 3000



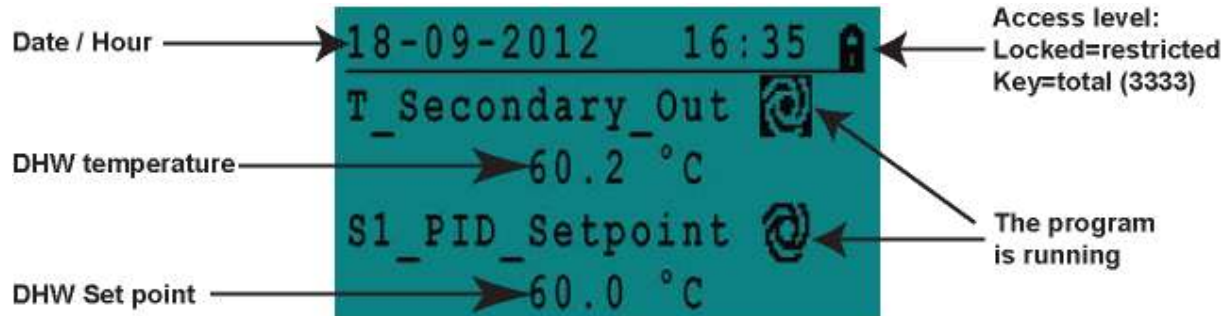
Picture 18

Button	Function
	Rotary button for scrolling through the menus. Access sub-menus and change settings by pressing it. To activate the line or change a highlighted value, simply press the wheel. Works like an Enter key.
	Press to exit a level and return to the previous menu/parameter. Works like an ESC key.
	Press to access the maintenance / monitoring menu. NOTE: Requires a password.
	Press to go to the Home screen, Main Menu
	Press to access the Alarm Menu.
	Not used
	Not used
	Relay 1 activated
	Relay 2 activated
	Active data transmission
	Active data reception
	Alarm indicator
	The Control box is switched on.

5.1 Home screen

When starting up the Micro 3000 controller this menu displays on them screen.
The menu is called the Home screen.

The screen shows the following information:



Picture 19

The controller has password protection, allowing accesses to different menus.

- End user level- requires no login. Marked with a locker in the upper right corner.
- Technician level- access to all menus requires login. Marked with a key in the upper right corner.

NOTE: if there is an ongoing alarm when starting up the AquaFirst, an alarm text will be displayed on the screen. Press the House button to enter the Home screen.

5.2 Command symbols



Auto

Datapoint is in automatic operation and can be switched into manual operation.



Manual

Datapoint in manual operation and can be switched into automatic operation.



Today function

Datapoint value can be overridden for a particular time period within the next 24 hours. Datapoint must have a daily time program assigned.



Time Program

Datapoint has a daily time program assigned. Daily time program can be selected and edited.



Edit

Item (datapoint, time program etc.) can be edited.



Add

Item (datapoint, time program etc.) can be added to a list e.g. datapoint can be put to a list of trended datapoints.



Deleted

Item can be deleted

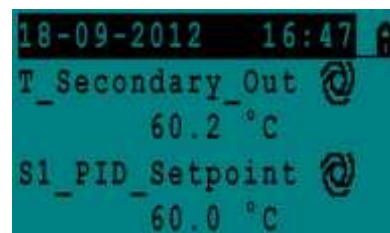


Enable/disable

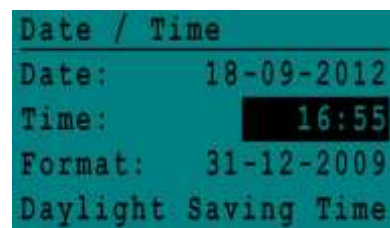
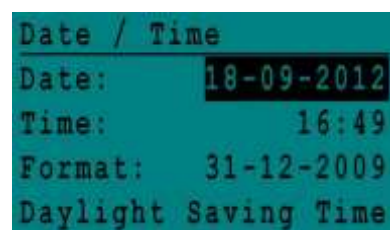
- Checked: item is enabled
- Unchecked: item is disabled

5.3 Setting the time and date

1. Turn the wheel anticlockwise to highlight the line with time and date at the top of the screen. Press the wheel to enter the Date/Time menu.



2. Press the wheel to change the first variable, the year.
3. When the year flashes, increase or reduce the set value by rotating the wheel. Once the right value is displayed, press the wheel to confirm the setting. Next parameter to change starts to flash.
4. Proceed in the same way to set the month, date and time (hour: minute).

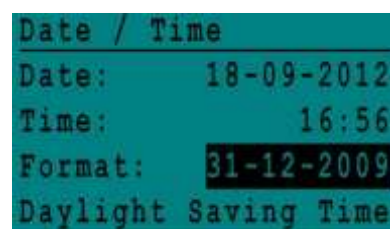


5.4 Changing the Date format

In the Date/Time menu the date format can be changed. Choose between the following formats:

- yyyy-mm-dd
- mm-dd-yyyy
- **dd-mm-yyyy**
- **dd.mm.yyyy**
- **dd/mm/yyyy**

The formats in bold are the most commonly used in France.

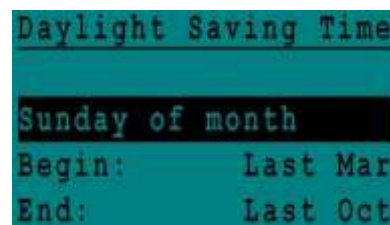


5.5 Setting the Daylight Saving Time

Summer time

Changing between summer/winter time can be automatic or turned off. You can also define the dates for changes if they are altered.

The default settings for summertime is:
Last Sunday in March to last Sunday in October.



5.6 Saving changes

Once a value has been changed and confirmed by pressing the wheel, the corresponding change will be immediately updated.

Press the or to return to the home screen.

6 End user mode

The following changes can be done in end user mode:

- Settings which are identical/different for each day of the week at defined times
- Normal temperature(s)
- Lower temperature(s)
- Special period of defined duration during the current year
- Waiver with change of setting at a specific time.

Please set a hot water production temperature in line with current national legislation and recommendations (UTD, Standards EN, ISO etc.)

All countries have different rules for how hot or cold tap water should be.

Alfa Laval recommends the hot water temperature is at least 55°C and a hot water circulation not less than 50°C.

At a temperature below 50°C there is a risk of bacterial growth.

Note that at temperatures above 60°C the risk of scalding increases.

Set points above 63°C result in an increased risk of precipitation of lime scaling on the surfaces of the heat exchanger.

6.1 Time programs

The time programs used in AquaFirst are adjusted the same way.

The time programs:

- SP_T_Sec_Outlet, to be found in the menu [S1 Menu Secondary Outlet](#). It is to set the DHW temperature
- ThTr_Activated to be found in [Thermal Treatment Menu](#), to activate a thermal treatment (1 sensor mode).

The time program has two different temperature modes, week-temperature or weekend-temperature.

Define for each day of the week which mode to use.

By default has the weekend-temperature mode the same settings as the week-temperature mode.

It is even possible to customize the temperature programs with special dates (holidays periods or free days).

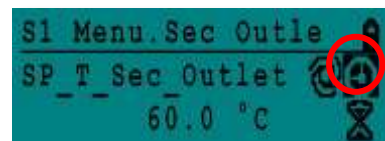
Each temperature mode can have a number of different times set per day. For each time a different temperature can be selected that are then in effect until the next time occurs. If only one time is set, the program will run with the selected temperature.

6.2 Changing time and temperature in a time program

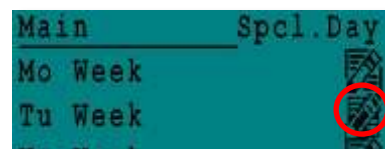
By default the DHW set point SP_T_Sec_Outlet, set to 60°C by default, at any time, all the days of the week.
Add extra temperature set points at different times of the day.

These changes will be reported to all days with the time program week, excluding the time program; weekend.




1. Use the wheel and mark the clock logo. Press the wheel.

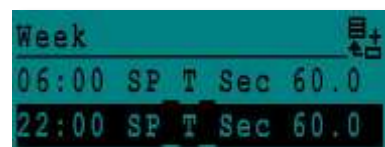
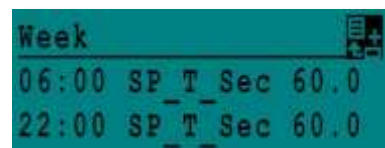


2. Mark the day you want to change. Press the wheel.



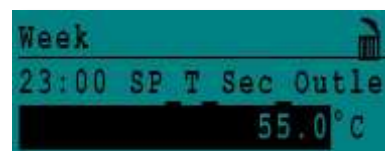
Now you can choose to:

- a) Change a time or temperature.
Mark the line and press the wheel. Change the value by turning the wheel.
Confirm the new setting by pressing the .
- b) Add a new time or set point; choose .
- c) To delete a time or set point; choose; .



In this example the set point is 60°C at 22h00.

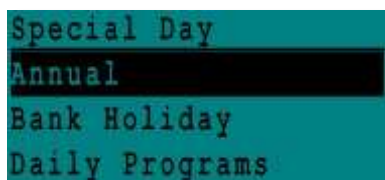
You can choose to reduce the temperature during the night, in this example the night temperature is set to 55°C.



6.2.1 Special days

Exception days, so called special days, can be defined. The calendar in the controller controls the exceptions that can be selected in the Time program. Exception days override the weekly schedule.

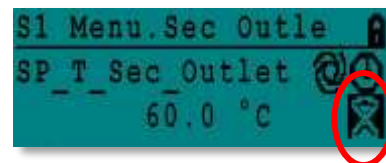
1. In the Main screen menu, mark 'Spcl.Days' and press the wheel.
Choose between:
 - Annual - holiday periods where you have to specify beginning date, end date and DHW set point. This mode is applicable to schools, offices and so on.
 - Bank Holiday - special days during the year where set points can be different ex: Christmas, New Year.
 - Daily programs - particular days where you want to change the temperature set point.



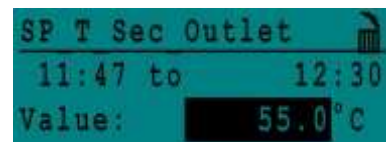
6.3 Making a Quick temperature change

You can quickly define a “one time” temperature change, a period of the day with a different setting. When the change period has expired, the temperature set point goes back to standard time schedule program.

1. In the home-screen, mark the hourglass icon and choose it, by pressing the wheel.



2. Define the starting and ending time, and the temperature set point value.



7 Technician menu, total read and write level


In the technician menu you can:

- make settings for the secondary outlet temperature
- enable/disable functions like Eco, booster, thermal treatment
- enable/disable the fouling function (option)
- start an auto test
- clear alarm.

You need to be logged in to:


- see all submenus and change pre-set values
- have full read and write access in the technician menu

7.1 Login

1. Mark the lock  in the upper right corner of the screen and press the wheel.
2. Enter: 3333, to access the technician level.

NOTE: You will be automatically logout after ten minutes if no data has been entered.

7.2 The technician Main menu

To enter the Main menu you press the  key.

The grey marked parameters or menus are not available in the AquaFirst application. Their value does not have any impact on the AquaFirst.

Main Menu		
T_Secondary_Out	<i>Read Only</i>	Measured temperature ECS
S1_PID_Setpoint	<i>Read Only</i>	DHW temperature setpoint
T_Secondary_Inlet	<i>Read Only</i>	N/A
T_Primary_Outlet	<i>Read Only</i>	The temperature measured by S3 (option)
T_Primary_Inlet	<i>Read Only</i>	N/A
T_Renewable1	<i>Read Only</i>	N/A
T_Renewable2	<i>Read Only</i>	N/A
T_Outdoor	<i>Read Only</i>	N/A
Configuration	<i>Sub Menu</i>	See 7.3 Configuration menu
S1 Menu Sec.Outlet	<i>Sub Menu</i>	See 7.4 S1 Menu Secondary Outlet
S2 Menu Sec.Inlet	<i>Sub Menu</i>	N/A
Delta T (S3-S2)	<i>Sub Menu</i>	N/A
S4 Menu Prim Inlet	<i>Sub Menu</i>	N/A
S5 Menu Outdoor T	<i>Sub Menu</i>	N/A
Thermal Treatment	<i>Sub Menu</i>	See 7.5 Thermal Treatment Menu
SAFETY Function	<i>Sub Menu</i>	See 7.6 Safety Function
Eco Booster Fcts	<i>Sub Menu</i>	See 7.7 Eco-Booster Function
Fouling Function	<i>Sub Menu</i>	See 7.8 Fouling function
Pumps Menu	<i>Sub Menu</i>	See 7.10 Pumps Menu
Solar Menu	<i>Sub Menu</i>	N/A
Aquaprot_Heating	<i>N/A</i>	N/A
230V Triac Menu	<i>Sub Menu</i>	See 7.9 230V Triac menu
Auto Test	<i>Sub Menu</i>	See 7.11 Autotest menu
Clear Alarm(s)	<i>Sub Menu</i>	See 7.12 Clear alarm menu


7.3 Configuration menu

NOTE: After resetting the controller, this sub menu should be accessed to configure pumps' number.

Parameter	Factory Default Setting	Optional setting	Description
S1 activated	1	0 Disables / 1 Enables sensor	Set to 1
S2 activated	0	0 Disables / 1 Enables sensor	Set to 0
S3 activated	0	0 Disables / 1 Enables sensor	Set to 0
S4 activated	0	0 Disables / 1 Enables sensor	Set to 0
S5 Active heating	0	0 Disables / 1 Enables heat curve	Set to 0
Cooling Mode AO1	0	0=Heating/	Set to 0
P12 Nbr of Pumps	2	0/1/2	Primary pump(s) number
P34 Nbr of Pumps	2	0/1/2	Secondary pump(s) number
Modbus Coeff	1	1/10/100	1=integer value, eg:58°C 10=1 decimal, e.g. 583/10=58,3°C 100=2 decimals, e.g. 5836/100=58,36°C
Relay 1 function*	1	0..7	0=No action 1=General Default (GD) 2=High temp Alarm (HA) 3=Eco function (E) 4=Booster function (B) 5=Thermal Treatment (TT) 6=Pump Fault (PF) 7=Tank loaded (TL). Requires sensor S2.
Relay 2 function*	2	0..7	
Renewable Config	Keep 0	N/A	N/A
AlfaPilot Inverted	Keep 0	N/A	N/A
SP distrib	i	N/A	N/A
ALAFALAVAL_Version	xx	N/A	Firmware Version

- Both relay 1 and 2 are programmable.


7.4 S1 Menu Secondary Outlet

Parameter	Factory Default Setting	Optional setting	Description
SP_T_Sec_Outlet 	60°C	DHW Setpoint	Change setpoint value in clock program
Delta T S1 HiAlm	10°C	0-50	High Temperature Alarm if Ts1 \square SP_T_Sec_Outlet+Delta Ts1 HiAlm
High T Alarm Tempo	1 min	0-60	High temp alarm is effective after this temporisation
High Alarm Auto Reset	0	0/1	0=MANUAL alarm clear / 1=AUTO alarm clear
High_Alm_Reset	Off	Off/On	Put ON to clear an high temp alarm, then put Off
P_Main Prop Band	20	In general 20<P<40°C	↑P to be less reactive
	(-100 à 100)	Negative values in cooling	↓P to be more reactive (be careful of "pumping" effect)
I Main Integral	50	0-120	↑P to be less reactive
			↓P to be more reactive (be careful of "pumping" effect)
D Main Derivative	2 sec	0-50	
Séq_Vanne_Vit	N/A	Internal settings	Not accessible

7.5 Thermal Treatment Menu

This function is activated as per a time program. It is disabled by default.

The user has to define a one sensor mode - fixed duration as per Therm.Tr duration parameter.

Parameter	Factory Default Setting	Optional setting	Description
ThTr_Setpoint	70°C		Usual value
TrTh_Activated 	Off	Off/On	Enable or Disable the function as per clock program
Sensor_Nbr	Auto	Auto/1 sensor/2 sensors	Use 1 sensor
ThermTr Duration	1 min	1-240 min (4 hours max)	Adjust value according to the installation + buffer vessel capacity
Fixed duration (1 sensor)	0	0/1	Set to 1
TT Max try time	1 min	1-240 min (4 hours max)	Not used
DeltaT S1S2 ThTr	7°C	1 - 20°C	Not used
Inhibition time	30 min	0-180 (0 à 3 hours)	High temp alarm inhibition time after thermal treatment

7.6 Safety Function

This function activates the four pumps' power relays at the same time without considering isothermal contacts' inputs.

NOTE: This function can be enabled from base access level.

Parameter	Factory Default Setting	Optional Setting
SAFETY_Speed	75%	Not used
SAFETY_FCT	Off	Off/On



In case of high temperature alarm on S1, the primary pumps are stopped, even if the function is activated.

7.7 Eco-Booster Function

One or both functions can be activated at the same time.

- **ECO:** Activates a temporisation Eco Temporisation as soon as valve is closed less than hysteresis valve (called Eco Valve Hyst.) and DHW is higher than {Setpoint - "Eco Hysteresis"} parameter. After this temporisation, the start/stop contact of primary variable speed pumps OR primary cst speed pumps' power supply is stopped.
- **Booster:** If DHW temperature is dropping down faster than "Booster Gradient", the second primary pump (if existing) is energized, to increase the primary flow rate. Function stops when DHW temperature is back to the setpoint value and after "Booster Tempo" parameter.

Parameter	Factory Default Setting	Optional setting	Description
1:Eco 2:Booster 3:EcoBoost	0	0/1/2/3	0 = No function 1 = Eco Function only 2 = Booster function only 3 = Accumulated two functions
Fct_Selection	Normal	Normal/Eco/Boost/ EcoBoost	Playback function selected in 1:Eco 2:Booster 3:EcoBoost
Eco Delay	10 min	1-30 min	Scan time before switching function to the extent possible
Eco Hysteresis	5°C	1-20°C	Temperature range in which the function is applicable
Valve Hysteresis.	4%	1-10%	Maximum opening of the valve before switching function
Booster Delay	2 sec	0-30 sec	Additional holding time of the second pump back to stop the function
Booster Gradient	1°C/s	1 à 5°C/sec	Minimum temperature fall speed at which the function operates

7.8 Fouling function

Fouling function can be activated when the sensor S3 is connected.
Accessing the fouling-menu requires login at Technician level.


If the temperature in S3 is too high for a long time this function activates an alarm that consider the heat exchanger fooled.

Parameter	Factory Default Setting	Optional setting	Description
Fooling alm activ	0	0/1	0=disabled / 1=enabled
Fooling_alarm	Normal/Default		Read only
SP_Fooling	65°C	60-80	Depends on the HE type and Primary inlet temperature

7.9 230V Triac menu

Accessing the 230C Triac-menu requires login at Technician level.

This menu allows using a 230VAC Triac output.

Parameter	Factory Default Setting	Optional setting	Description
Multi P 	Off	Off / On	Enable or Disable the 230V output as per clock program
Pulse Duration	5 sec	1-3600	230V pulse duration in seconds
BypassS4S3	N/A	N/A	N/A
DeltaT Bypass	N/A	N/A	N/A

7.10 Pumps Menu

P12=Primary pump(s) P34=Secondary pump(s) Parameter	Factory Default Setting	Optional setting	Description
P12 Diff.work time	100 hrs	1 - 1000 hours	P1 or P2 Working time
P12 Permut.Type	2	0=Fixed time 1=Fixed time+ diff.work time 2=Immediately after Diff.hrs	0 : See P12 Permut Hour 1 : If diff reached at this time, pump shift 2 : Don't care of permutation day+hour
P12 Permut.Period	0	0=None 1=Daily 2=Weekly 3=Monthly	
P12 Permutation day	1	From 1st to 31st	
P12 Permutation Hour	10h00 pm	00h00 - 23h59 (11h59 pm)	Pump shift time
P1P2 Superposition	6	0-10 seconds	Time to start P2(P1) before stopping P1(P2), to let the other pump start
Parameter	Factory Default Setting	Optional setting	Description
P34 Diff.work time	100 hrs	1 - 1000 hours	P1 or P2 Working time
P34 Permut.Type	2	0=Fixed time 1=Fixed time+ diff.work time 2=Immediately after Diff.hrs	0 : See P12 Permut Hour 1 : If diff reached at this time, pump shift 2 : Don't care of permutation day+hour
P34 Permut.Period	0	0=None 1=Daily 2=Weekly 3=Monthly	
P34 Permutation day	1	From 1st to 31st	
P34 Permutation Hour	10h00 pm	00h00 - 23h59 (11h59 pm)	
P3P4 Superposition	6	0-10 seconds	Time to start P2(P1) before stopping P1(P2), to let the other pump start
Pump_Fault_Reset	Off	Off/On	To clear a pump default, set to On, then Off

7.11 Autotest menu

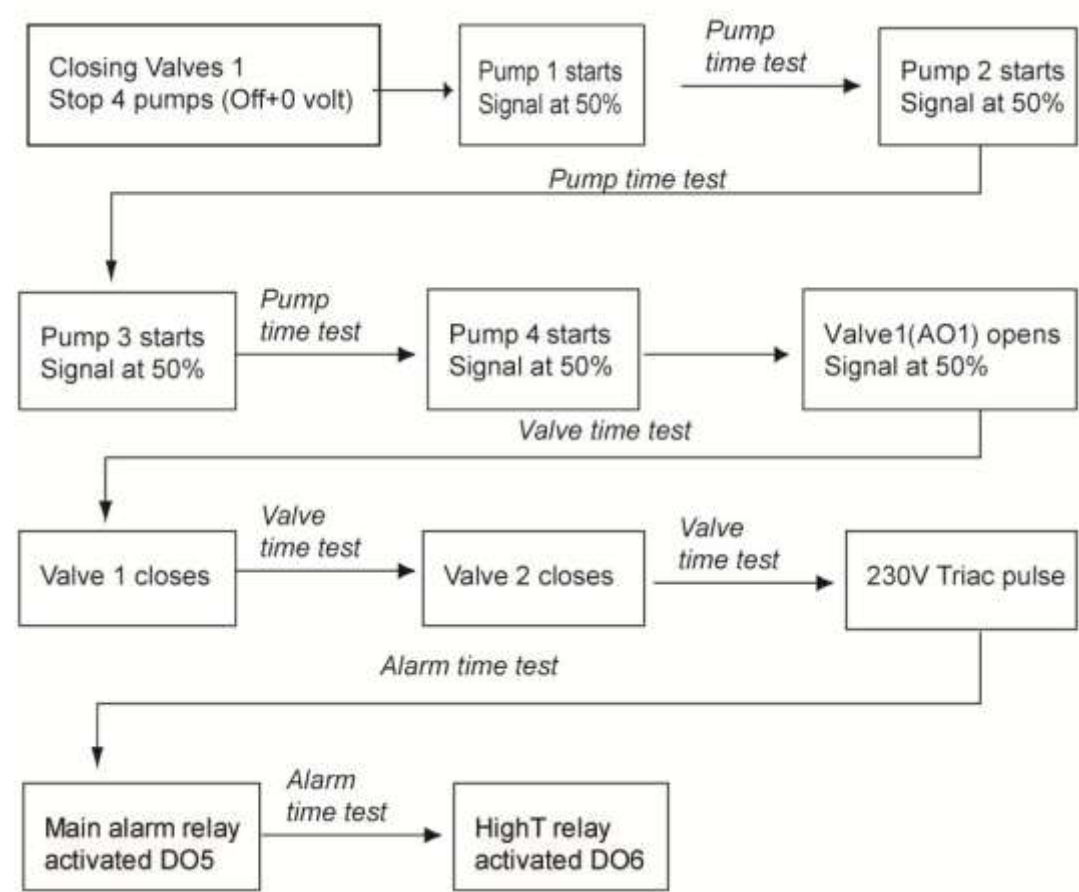
This submenu allows testing analog and digital outputs. It is possible to run an automatic sequence or to test manually each output individually.

In case of Auto test (automatic sequence), it is possible to reduce or increase tests' temporizations. Pump, valve and relays test times can be adjusted individually. The time test value will impact on the total auto test time sequence.

Accessing the Autotest menu requires login at Technician level.

In this menu an auto test can be started that will activate binary and analog outputs, to activate valve, alarm relays, 230V Triac. It is also possible to read/write these different values manually.

Parameter	Factory Default Setting	Optional Setting	Description
Start AutoTest	0	0/1	Set 1 to start auto test. When finished, the value goes back to zero.
Pump time test	16 sec	1-60 sec	Not used
Valve time test	16 sec	1-60 sec	Temporisations to adjust test duration.
Alarm time test	5	1-60 sec	Individual output reading / writing
Cmd_P1	On/Off		Activate relay 1 (pump 1)
Cmd_P2	Off/On		Activate relay 2 (pump 2)
Speed_P1P2	xx %	0-100 %	Not used
Cmd_P3	On/Off		Activate relay 3 (pump 3)
Cmd_P4	Off/On		Activate relay 4 (pump 4)
Speed_P3P4	xx %	0-100 %	Not used
High_Temp_Alarm	Off	On/Off	} Individual output reading / writing
Main_Alarm	Off	On/Off	
Triac_Output	Off	On/Off	
Valve signal	xx %	0-100 %	
Valve2 signal	xx %	0-100 %	
3 Pts valve signal	xx %	0-100 %	



NOTE: A pump fault may occur after Auto test. In this case, clear the alarm according to 7.12 Clear alarm menu.


7.12 Clear alarm menu

Accessing the Clear Alarm menu requires login at Technician level.

All alarms are cleared the same way.

Parameter	Factory Default Setting	Optional Setting	
High_Alm_Reset	Off	Off/On	Select On to clear the alarm, then return to Off or wait a few seconds for automatic return to Off
Pump-Fault_Reset	Off	Off/On	Select On to clear the alarm, then return to Off or wait a few seconds for automatic return to Off

8 Service Menu


Press the  key to enter the Service menu. In the service menu you can:

- change password for technician level
- trending parameters
- display the trend buffer
- check operating hours.

From Point Data sub-menu you can, read or change binary or analog outputs to start/stop a pump, open/close control valve for example.

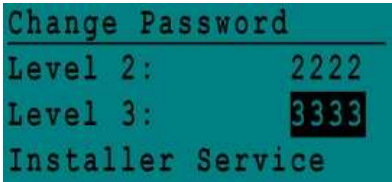
8.1 Change password for technician level

NOTE: To change the password you need the password for the Technician level, level 3.

1. Press  key to access to Service Menu, go to “Login Installer”, press the wheel.
2. Enter the current password, press the wheel to validate.
3. Mark “Change Password” then press the wheel.



4. Go to Level 3 line and then click on the password to change it. Press the wheel to validate.



NOTE: Level 2 password is not in use.

8.2 Login installer

Login Installer	****		Enter 3333 if not in technician mode
	Change password		

8.3 Menu Continue

Menu	Sub-menu	Sub-menu	Description
Continue	Operating hours		Viewing operating hours of internal parameters
	Trending	Points in trend	Select variables to trend for example temperature sensors
		Display Trend buffer	View the records
	Interface Config (com)	C-Bus active	Factory pre-set
		Ctr#1 9600	Factory pre-set
		B-port 9600	Factory pre-set
		Append bus	Factory pre-set
		RF Teach in (N/A)	Factory pre-set
	Time Program	Solar	Not used
		Main	It is SP_T_Sec_Oulet (main temperature program). See 7.4 S1 Menu Secondary Outlet.
		TSP_Amb	Not used
		Multi Pulse	Not used
		Therm. treatment	See 7.5 Thermal Treatment Menu
	Point Data		Internal parameters +I/O visualisation
		Analog input	Sensor values
		Pseudo Analog	Can be set points or internal parameters
		Analog Output	Valve and pump output signals
		Binary input	Ipsothermic contacts from pumps, remote contact
		Pseudo Binary	Internal flags
		Binary Output	Pump start/stop contacts, relays contacts, 230V Triac
		Totalizer	N/A
		Remote Analog	N/A
		Remote Binary	N/A
	System Data		System information
		Parameters	N/A
		Date/Time	Clock settings
		System Info	Hardware/Software info (version, date)
		Interface Config	Hardware/Software info (version, date)
		DDC Times	Program's time constant
		Flash memory	Info on flashing

8.4 Operating hours

Operating hours for the following variables can be checked:

- Therm_Protec_P1/P2/P3/P4
- Cmd_P1/P2/P3/P4
- High_Temp_Alarm
- Main_Alarm
- AFF_leg_active
- SAFETY_FCT
- ThTr_Activated


For more information and description see 10 Parameter list.

1. Press  key to access to Service Menu, then click on "Continue".

```
Service Menu
Continue
Login Installer
```

2. Select "Operating Hours" in the menu.
The first time you enter this menu, the list is empty.

```
Service
Operating Hours
Trending
Interface Config
Time Program
```


3. To add a variable to trend; choose  .


```
Activate Oper. Hours
Cmd Distant
Therm_Protec_P1
Therm_Protec_P2
Therm_Protec_P3
```


4. Mark one variable to follow and press the wheel.


```
Activate Oper. Hours
Therm Protec P4
Cmd P1
Cmd P2
```

5. Validate the variable by ticking in the Operating Hours box. If this box is empty the variable is in the list but it is not recorded.


```
Operating Hours: 
```

When you go back in the menu ( key), you can see the list with "Cmd_P1" parameter, and on the right side, the operating hours.

```
Cmd P1
Operating Hours: 
```

```
Operating Hours (h) 
Cmd P1 0
```

For more details, click on the line to open the sub-menu.
Here you can read that P1 has been operating less than 1 hour, has been switched one time and status is On.

```
Cmd P1
Operating Hours: 
Hours: 0
Switches: 1
Status: On
```

Proceed the same way to add extra variables.

8.5 Trending parameters

A lot of different variables can be recorded or trended. It can be temperatures' measurement, valves or pumps' signals, isothermal contacts, alarms, thermal treatments etc.

1. Press  key to access to Service Menu, then click on "Continue."

```
Service Menu
Continue
Login Installer
```

2. Select "Trending" in the menu

```
Service
Operating Hours
Trending
Interface Config
Time Program
```

3. Select "Points in Trend".
The first time you enter this menu, the list is empty.

```
Trending
Points in Trend
Display Trend Buffer
```

4. To add a variable to trend; choose  .

5. Mark the variable to follow and press the wheel.
In this example the Secondary outlet temperature, S1.

```
Set Points in Trend
Pilot_Signal
Pt1
Pt2
S1
```

6. Validate the variable by ticking in the Trend Log box. If this box is empty the variable is in the list but it is not record.

There are two different ways to record:

- a) Only the temperature change is recorded. This saves memory and allows a longer sampling period compared to method 2.
Select the record hysteresis. In our case, every 1°C temperature change is recorded. You can change the hysteresis value by clicking on it.
- b) Record on a time base, whatever the temperature changes or not.
Note that this method consumes memory, especially if a long time base is selected. Here is the time base selected to 10 minutes recording (1 record every 10 minutes).

```
S1
Trend Log: ☒
Trend Hyst: 1
Trend Cycle: 0min
```

```
S1
Trend Log: ☒
Trend Hyst: 1
Trend Cycle: 10min
```

For method a1 set "Trend cycle" to zero, for method 2, set "Trend Hyst" to zero.

8.6 Display the trend buffer

1. Press  key to access to Service Menu, then click on "Continue".

```
Service Menu
Continue
Login Installer
```

2. Select "Trending" in the menu.

```
Service
Operating Hours
Trending
Interface Config
```

3. Select "Display Trend Buffer".

```
Trending
Points in Trend
Display Trend Buffer
```

4. Select the variable to display, S1 in this case, and press the wheel.

```
Trend Buffer
S1
```


Date, time and temperature at the time can be read.

For example on 21st of September at 14h22 was the temperature in S1 58°C.

```
S1
21-09 14:22 58
21-09 14:22 60
21-09 14:22 59
21-09 14:22 57
```

9 Alarm menu

Alarm indication: Is volt Free Contacts (VFCs), 2 Amps maxi, each under 230 V.

Press  key to access to Alarm menu. The menu contains four different lists:

- **Alarm Buffer**
Lists all events with; date, time and type of event.
- **Points in Alarm**
Lists all events with alarm condition.
- **Critical Alarms**
Lists all alarms with critical alarm condition.
Critical alarms are important alarms, like high temp.
- **Non-Critical Alarms**
Lists all non-critical alarm condition.
These alarms are more information, like power failure.

For example, in the alarm buffer you can read:

15:52	SAFETY_FCT
15:51	SAFETY_Speed
15:41	SAFETY_Speed
15:40	SAFETY_FCT

Note that the alarms are listed with the latest at the top.

Press a line to see more information about the alarm.

Displayed	Meaning
19-06-2012 15:52 SAFETY_FCT On Auto operation	The safety function has been set to auto mode, stopping the safety function at 15h52.
19-06-2012 15:51 SAFETY_Speed 100% Auto operation	The safety speed has been set in Auto mode at 100% at 15h51.
19-06-2012 15:41 SAFETY_Speed 75% Manual operation	The speed pump has been set manually to 75% at 15h41.
19-06-2012 15:40 SAFETY_FCT On Manual Operation	The safety function has been activated manually the 19th of June 2012 at 15h40.



10 Parameter list

There are more than 100 different variables used in the controller. Most of them are used for internal programs and calculations. Here we describe the main points.

Name	Description	Unit	Modbus Address*
Therm_Protec P1	Ipsothermic input from P1 pump	0/1	11
Therm_Protec P2	Ipsothermic input from P2 pump	0/1	12
Therm_Protec P3	Ipsothermic input from P3 pump	0/1	13
Therm_Protec P4	Ipsothermic input from P4 pump	0/1	14
Cmd_P1	P1 command. It is the pump Start/Stop output	On/Off	15
Cmd_P2	P2 command. It is the pump Start/Stop output	On/Off	16
Cmd_P3	P3 command. It is the pump Start/Stop output	On/Off	17
Cmd_P4	P4 command. It is the pump Start/Stop output	On/Off	18
PriP1_Alarm_On	Primary pump 1 default	0/1	21
PriP2_Alarm_On	Primary pump 2 default	0/1	22
Sec_P3_Fault	Secondary pump3 default	0/1	25
Sec_P4_Fault	Secondary pump4 default	0/1	26
Main_Alarm	General Alarm	0/1	28
High_Temp_Alarm	High temperature alarm on S1 sensor	0/1	29
Fooling_Alarm	Fouling heat exchanger Alarm	0/1	30
Ret_High_Alarm	High temperature alarm on S2	0/1	31
ThermTr_Alarm	Thermal treatment failed	0/1	32
SAFETY_FCT	The safety function state	0/1	35
ThTr_Activated	Thermal treatment running	0/1	36
Remote_Control	The unit is remotely controlled	0/1	37
BOOSTER	Booster function activated	0/1	41
ECO	ECO function activated	0/1	42
Tank_load	Tank loaded (sensor S2 need to be connected)	0/1	44
Valve	Primary valve actuator	0-100%	47
S1_10	Secondary Outlet temperature measurement (S1 sensor)	°C	50
S2_10	Secondary Inlet temperature measurement (S2 sensor if present)	°C	51
S3_10	Primary Outlet temperature measurement (S3 sensor if present)	°C	52
S1_PID_Setpoint	Current temperature set point of the main control loop on S1	°C	62
High_Alm_Reset	To Reset an high temperature alarm	On/Off	201
Pump_Fault_Reset	Resets a pump fault	On/Off	202
AFF_Legio	Thermal treatment function On/Off	On/Off	203
SP_T_Sec_Outlet	Domestic Hot Water Setpoint (S1)	°C	211
ThTr_Setpoint	Thermal treatment temperature set point	°C	213

* Please refer to "MODBUS" section in next pages.

11 Factory RESET

Press both  and  for 5 seconds. Display appears as shown here. Rotate the wheel; select the last line (program name with a star at the end). Press the wheel a few seconds and the program will start after 1 minute. Settings are now factory settings. Adjust if necessary the pumps' number and sensors influence in the configuration menu.



15-10-2012 13:41
Wiring Check
C-Bus: ☒
CTR# 1 19200
AL_09_2ST 12-10-12 *

Note that on some software versions, the displayed language can be changed. Rotate the wheel clockwise to display English or French. Select and press the wheel. Then, press on "Factory" line to start the controller.



02/07/2013 15:27
Alfa Laval Startup
C-Bus config: ☒
CTR# 2 38400
Select Language:
English (1)
French



After a reset must the controller be configured, see [7.3 Configuration menu](#). Especially the number of pumps must be configured.

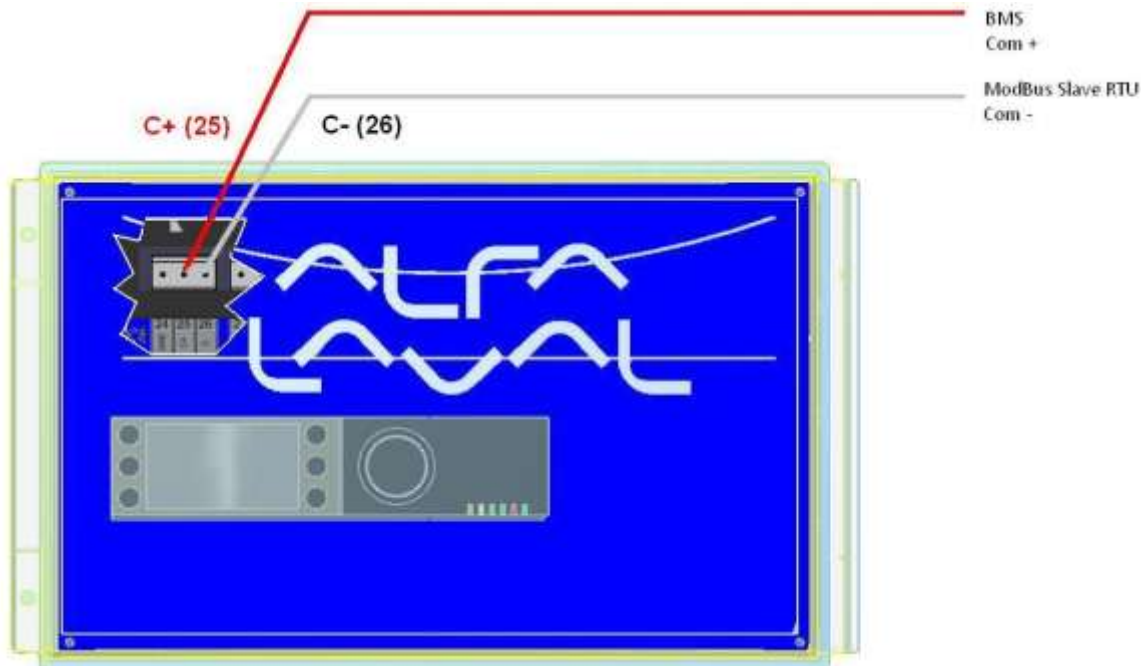
12 Modbus add on

12.1 Modbus communication

The controller includes a Modbus slave communication protocol. Connection between BMS (building management system) and Micro 3000 requires two polarized wires on C+ and C-, respectively labelled 25 and 26 on controller C Bus terminal. Cable shield connection is not mandatory, but can be done help with 24 terminals. To do this, it is necessary to unscrew the front panel.



Picture 20



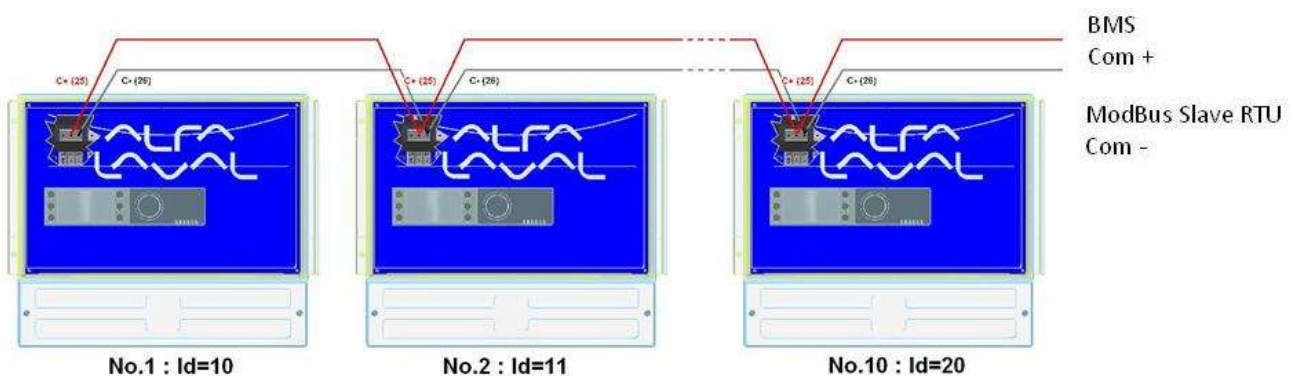
Picture 21

12.2 Connecting multiple Micro 3000 control boxes



Rules to respect

Max length between BMS and farer control box: 500 meters
Connection continuity (C+ and C-) has to be done directly on the controller C Bus terminal, without using derivation boxes. Respecting this, there are two wires per terminal, except the farer control box.



Picture 22



12.3 Modbus slave communication parameters

MODBUS	Speed / Vitesse :	38400
PARAMETERS /	Bit number / Nbre de	8
PARAMETRES	Stop bit / Bit de stop	1
MODBUS :	Parity / Parité :	None / Aucune
	Mode :	RTU

In case of multiple controllers, change ModBus slave number
En cas d'échangeur en cascade changer le N° d'esclave du mode bus

ModBus Points (English)	Points ModBus (Français)	MODBUS address* Adresse ModBus**	Type	Sub-type Sous-type	Mode	Value Valeur	Comment Commentaire
----------------------------	-----------------------------	-------------------------------------	------	-----------------------	------	-----------------	------------------------

Read Only digital / Lecture seule Digitaux							
PD_Cmd_P1	PD_Cmd_P1	15	HR_16	BOOL	R	0=Off, 1=On	Command(e) P1
PD_Cmd_P2	PD_Cmd_P2	16	HR_16	BOOL	R	0=Off, 1=On	Command(e) P2
PD_Cmd_P3	PD_Cmd_P3	17	HR_16	BOOL	R	0=Off, 1=On	Command(e) P3
PD_Cmd_P4	PD_Cmd_P4	18	HR_16	BOOL	R	0=Off, 1=On	Command(e) P4
PriP1_Alarm_On	PriP1_Alarme_Ma	19	HR_16	BOOL	R	0=OK, 1=Alarm	P1 Fault / Défaut P1
PriP2_Alarm_On	PriP2_Alarme_Ma	20	HR_16	BOOL	R	0=OK, 1=Alarm	P2 Fault / Défaut P2
SecP3_Alarm_On	SecP3_Alarme_Ma	23	HR_16	BOOL	R	0=OK, 1=Alarm	P3 Fault / Défaut P3
SecP4_Alarm_On	SecP4_Alarme_Ma	24	HR_16	BOOL	R	0=OK, 1=Alarm	P4 Fault / Défaut P4
PD_High_Alarm	PD_Alarme_Hte	27	HR_16	BOOL	R	0=OK, 1=Alarm	S1 High Temp Alarm/Alarme haute S1
PD_Main_Alarm	PD_Alarme_Synt	28	HR_16	BOOL	R	0=OK, 1=Alarm	General default / Défaut synthèse
Fooing_Alarm	Alarme_Encrasst	30	HR_16	BOOL	R	0=OK, 1=Alarm	Fooing alarm (S3) / Alarme encrassement (S3)
ThermTr_Alarm	Alarme_TrTh	32	HR_16	BOOL	R	0=OK, 1=Alarm	Therm. Treat. Failed / Echec traitement therm.
PD_Triac_Output	PD_Sortie_Triac	33	HR_16	BOOL	R	0=Off, 1=On	230V Triac output / Sortie triac 230V
SAFETY_FCT	FCT_SECOURS	35	HR_16	BOOL	R	0=Off, 1=On	Safety function / Fonction Secours
AFF_Leg_active	AFF_TrTh_actif	36	HR_16	BOOL	R	0=Off, 1=On	Therm. Treat. On going / Trait. Therm. En cours
Remote_Control_Rev	Contrl_Distant_Inv	37	HR_16	BOOL	R	0=Off, 1=On	Remote control / Contrôle distant
AFF_FD20	AFF_FD20	39	HR_16	BOOL	R	0=Off, 1=On	Heating mode / Mode chauffage
AFF_FD22	AFF_FD22	40	HR_16	BOOL	R	0=Off, 1=On	Cooling mode / Mode froid
BOOSTER	BOOSTER	41	HR_16	BOOL	R	0=Off, 1=On	BOOSTER active
ECO	ECO	42	HR_16	BOOL	R	0=Off, 1=On	ECO activated
PD_Pumps_Fault	PD_Defaut_pompes	43	HR_16	BOOL	R	0=Off, 1=On	Synthesis pump(s) fault / Défaut synthèse pompe(s)
Tank_load	Charge ballon	44	HR_16	BOOL	R	0=Off, 1=On	Tank loaded / Ballon chargé
(16 bit integer/Entier 16 bit)*							

Read Only Analogic / Lecture seule Analogiques							
PA10_valve1	PA10_Vanne1	47	HR_16	int16	R	%	Control valve 1 signal / Signal servomoteur 1
S1_10	S1_10	50	HR_16	int16	R	°C	Sensor 1 measurement / Mesure Sonde S1
S2_10	S2_10	51	HR_16	int16	R	°C	Sensor 2 measurement / Mesure Sonde S2***
S3_10	S3_10	52	HR_16	int16	R	°C	Sensor 3 measurement / Mesure Sonde S3***
S1_PID_SP_10	PC_S1_PID_10	62	HR_16	int16	R	°C	Calculated S1 setpoint / Pt de consigne calculé S1
(16 bit integer/Entier 16 bit)*							

Read-Write digital / Lecture-Ecriture Digitaux							
High_Alm_Reset	Reset_Alm_Hte	201	HR_16	BOOL	R/W	1=Reset fault. Pulse point necessary 30 seconds On/Off	
Pump fault Reset	Reset_Def_Ppes	202	HR_16	BOOL	R/W	1=Acquittement. Point impulsif On/Off pendant 30 secondes	
(16 bit integer/Entier 16 bit)*							

Read-Write Analogic / Lecture-Ecriture Analogiques							
SP_T_Sec_Outlet	Consigne_S1	211	HR_16	int16	R/W	°C	S1 fixed setpoint (DHW) / Consigne fixe S1 (ECS)
ThTr_setpoint	PC_TrTh	213	HR_16	int16	R/W	°C	Thermal treatment setpoint / Consigne trait. thermique
(16 bit integer/Entier 16 bit)*							

* For some supervisors, it is necessary to implement BOOL as int16

** For some supervisors, remove 1 to adress number (ex: S1_10 adress=49)

*** If present

* Sur certains superviseurs, renseigner les digitaux comme entiers 16 bit

** Sur certains superviseurs, enlever 1 au numéro du point modbus (ex: S1_10 à l'adresse 49)

*** Si présente

13 Declaration of conformity

Declaration of Conformity Déclaration de conformité

Manufacturer/ Fabricant

Alfa Laval HES sas

Route du Stade ZI du Moulin, FR 69490 Pontcharra sur Turdine, France

* Heat exchanger system for plates and gaskets for the production of hot water

* Système à échangeur de chaleur à plaques et joints pour la production d'eau chaude sanitaire

<u>Products/ Produits</u>	<u>Models/ Modèles</u>
Alfa Laval AquaFirst	Honeywell/ Grundfos

Above mentioned products are in article 3.3 according to PED 97/23

Les produits susmentionnés figurent à l'article 3.3 conformément à la DESP 97/23

- Used directives / Directives utilisées
Pressure Equipment Directives (PED) 97/23/CE/
Directive sur les équipements sous pression 97/23/CE
- Low Voltage Directive (LVD) 73/23/EEC followed by 2006/95/EEC/
Directive Basse tension 73/23/EEC suivie de 2006/95/EEC

Following norms have been applied/ Les normes suivantes ont été appliquées :

- EN 60335-1 partly/ EN 60335-1 en partie
- EN 60204-1 partly/ EN 60204-1 en partie

Conformity Assessment procedure:
Procédure d'évaluation de conformité:

Sound Engineering practice
Règle d'ingénierie sonore



Pontcharra sur Turdine, 2014-11-25

Matthieu Perrin

DHW/R Product manager/ Responsable de la conformité

14 Trouble shooting

FINDINGS	PROBABLE CAUSES	REMEDIES
Pump not operating	Locked rotor or damaged	Force to rotate. Replace if required
	Corresponding led is not lit	Replace Power Board
	Pump relay damaged	Replace Power Board
	Pump protection fuse blown	Check then replace if necessary
	High Alarm condition detected	Clear alarm then reset system
	No voltage to control board terminals	Check power supply cable and fuses
	No voltage to pump motor terminals	Check protection fuse on main board, cable condition and connections
	Controller improperly set	Contact After Sales Service
Low temp alarm condition	Primary pump stopped	See "Pump not operating"
	Too low primary temperature	Check for a closed valve in the primary
	Too high tap water flow rate (SI)	Reduce buffer vessel charging flow rate
	Set point too high 3 way valve remains closed	See "Modulating valve does not operate"
Modulating valve does not operate	Damaged or broken actuator	Test and replace if necessary
	Broken or improperly tightened coupling	Check and replace if necessary
	Valve blocked	Replace
	No signal from the controller	Check then replace if necessary
	Supply wires improperly tightened	Check wires, re-tighten connections
	Actuator stroke restricted	Dismount then clean the valve
High alarm condition detected	Charging pump stopped (SI versions)	Refer to "Pump not operating" above
	Low recirculation flow rate (I versions)	Check and fix problem
	Alarm differential too low	Check and set the controller
	Modulating valve not closing	Refer to previous box above
	Too much differential of pressure across the modulating valve	Check the way the TWM is piped-up. Mixing arrangement should be used
Correct temperatures across the exchanger not obtained. Valve and pumps operating satisfactorily	Excessive exchanger scaling at the primary or secondary side	Open and clean the exchanger according to cleaning instructions
	Primary pipe work obstructed or strainer upstream clogged	Inspect primary pipe work. Clean strainer on the primary side
	Isolation valve closed	Open isolation valves
	Air presence in the primary	Purge. Check no high parts where air could be trapped exist
	Excessive pressure drops	Check pipe size is suitable for nominal flow rate
Temperature does not increase in the buffer vessel and the tap water value is correct.	Recirculation flow rate exceeds charging flow rate.	Check and measure charging and recirculation flow rates. Adjust when necessary
		Recirculation FR < 0.6 x Charging FR

15 Maintenance and repairs

Alfa Laval AquaFirst does not require any specific maintenance.

The frequency of the inspections depends on the water hardness, temperature and flow rate.

- Weekly inspection to check for leaks from pipes or components.
- Weekly inspection to make sure that the operation control systems is stable and that the temperature does not fluctuate. Temperature hunting causes unnecessary wear of valves, actuators.
- The control box does not require any specific maintenance; annually check the electrical connections tightening.
- Annually check the control valve that no leaks are detected.
- Lime scaling on the connected devices.

Scaling of the secondary side will be evidenced by:

- a high pressure drop on the secondary side of the exchanger
- improper temperature range on the secondary side of the exchanger
- low temperature difference between inlet and outlet on the primary side of the exchanger when the control valve is fully open.



Only replace any defective parts with the **original** spare parts.
Please contact your Alfa Laval distributor for spare parts, note serial number and model designation.



Maintenance work must be carried out by a qualified and authorized technician.



Hazard of severe electrical shock or burn.
Before cleaning and servicing, disconnect power supplies.



Risk of burns. Let the pipes cool down before starting out with maintenance work.

15.1 Open the control box

Remove the front panel by turning the lock button counter clockwise and lift up the cover.



Picture 23

Unscrew the two screws in bottom and lift up the black panel.



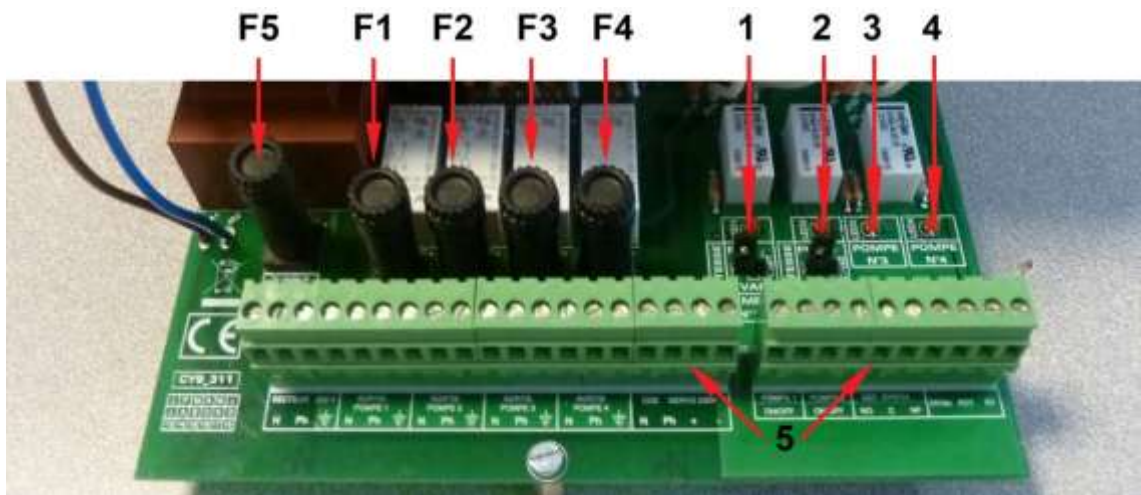
Picture 24

15.2 Change fuses

The control box is fitted with a set of fuses to protect the different components against overload. Extra fuses are included in the control box for quick servicing.



The service work must be carried out by an authorized service technician.
Turn off the power supply before starting to work.



Picture 25

- | | | | |
|----|---------|---|---|
| F5 | Fuse F5 | 1 | Led 1, lit when pump P1 is power supplied |
| F1 | Fuse F1 | 2 | Led 2, lit when pump P2 is power supplied |
| F2 | Fuse F2 | 3 | Led 3, lit when pump P3 is power supplied |
| F3 | Fuse F3 | 4 | Led 4, lit when pump P4 is power supplied |
| F4 | Fuse F4 | 5 | Terminal block |

Fuse	FU1	FU2	FU3	FU4	FU5
Protection	PUMP 1	PUMP 2	PUMP 3	PUMP 4	Power card
Size	6.3 x 32	6.3 x 32	6.3 x 32	6.3 x 32	6.3 x 32
Rating	2,5 A	2,5 A	2,5 A	2,5 A	250 mA
Voltage	250 V	250 V	250 V	250 V	250 V

15.3 Pumps' number

The pumps' configuration and connections is factory made.
In a servicing situation the correct pump must be identified.

Codification	Meaning	Connected pump(s)
FlxxxIS	Instantaneous Single	P1
FlxxxID	Instantaneous Double	P1+P2
FlxxxSS	Semi-instantaneous Single / Single	P1+P3
FlxxxDS	Semi-instantaneous Double / Single	P1+P2+P3
FlxxxxDD	Semi-instantaneous Double / Double	P1+P2+P3+P4

15.4 Add a recycling pump to an AquaFirst Direct

A recycling pump can be added to an AquaFirst Direct. The pump must be connected to P3.

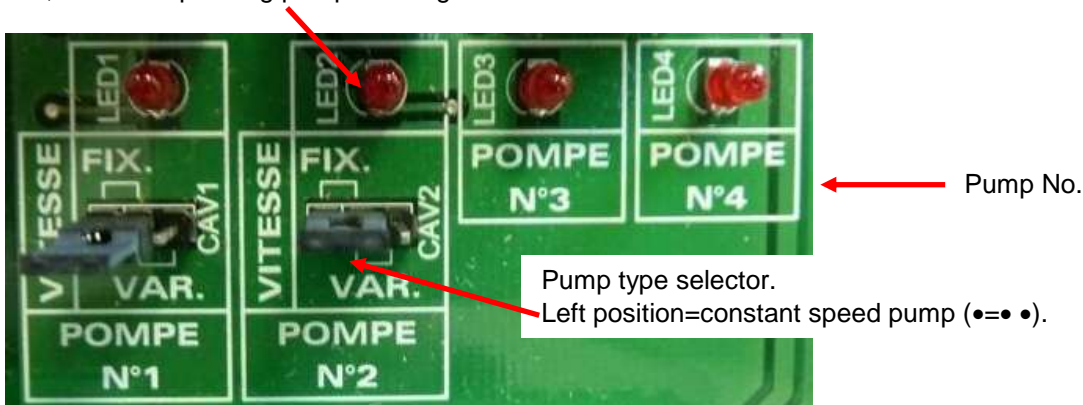
15.5 Add an extra pump

AquaFirst uses Class A constant speed pumps.

NOTE: After adding a pump, make sure that the pump selector is correctly set.

1. Open the Control Box.
2. On the right side of the printed circuit board, PCB; find the selector for the actual pump.
3. Place the pump type selector to the left, constant speed pump.

If lit, the corresponding pump is energized.



Picture 26

15.6 Add an extra sensor



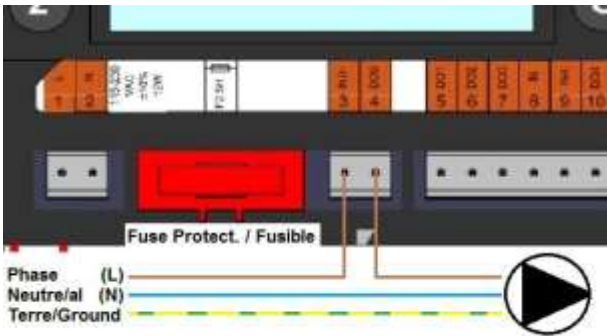
Please see [4.2 Electrical wiring diagram](#).
S1-S3 are temperature sensors, NTC20k.

15.7 230V Triac output

The 230V electrical output can be configured as a pulse function. For example it can be used to shortly activate an electrical drain valve.
In this configuration, you can program pulse duration, day, week or special days you want this to happen.
For example each Sunday at 10h00 for 5 seconds.

See [7.9 230V Triac menu](#).

Connected device must not exceed 230VAC 1A.



Picture 27

15.8 Relay 1 and 2 contacts

Relay 1 can be NO (normally open) or NC (normally closed).
Relay 2 is always NO (normally open).

Connect the relay 1:

Operating mode	Connections on PCB bottom terminal
NO	C-NO (25-24)
NC	C-NF (25-26)

Connect relay 2 to the controller terminal 13(IN6) and 14 (OUT6).
See 4.2 Electrical wiring diagram.



If using 230V phase through this contact, do not exceed 2A load.

15.9 Remote Control contact

The AquaFirst can be operated by a remote controller. To enable that connect a volt free contact between BI1 and GND.

Wire terminal name	Wire terminal number
BI1	33
GND	31 or 37

See 4.2 Electrical wiring diagram.

15.10 Change plate heat exchangers

Disassembling of the exchanger can be done very quickly according to the following procedure:

1. Isolate primary and secondary hydraulic circuits.
2. Open the purge cocks to drop the internal pressure of each sides,
3. Measure the distance between the two frames of the exchanger (Plate pack thickness) and note it down.
4. Open the exchanger by unscrewing and removing the frame compression bolts.



Plates' package thickness PHE in between frames

M3H FI2000 & FI4000

N type thickness	7	17	27	45
M3H 0,5mm SS316	21,8	50,8	79,8	132,0

M6M MH/ML FI6000 & FI8000

N type thickness	11	17	31	55
M6M MH/ML 0,5mm SS316	40	61	110	194

NOTE: To avoid injuries owing to sharp edges, protective gloves should always be worn when handling plates and protective sheets (like the ones for insulation).

5. Remove the plates without damaging the gaskets and note their orientation and position.
6. Clean the plates using a soft plastic brush and water or a solution of diluted acid in accordance with PHE plate general cleaning instructions.



DO NOT USE hydrochloric acid or any acid that could corrode stainless steel plates.

DO NOT USE water with more than 330 ppm Cl when making a cleaning solution. Nitric (for calcium carbonate), sulfamic (for calcium sulphate) or citric (for silt) acids can be used. Concentration should not exceed 4% at 60°C. Protective gloves and glasses should always be worn while these operations.

Carefully rinse the plates with clean water after cleaning.

7. Remount the plates in the same order and at the same position they were before.
8. Screw the frames to the same distance they were before (Plate pack thickness dimension).
9. Clean the control sensor pocket.

For further information please refer to Alfa Laval Instruction Manual Ref. 1644725-01.

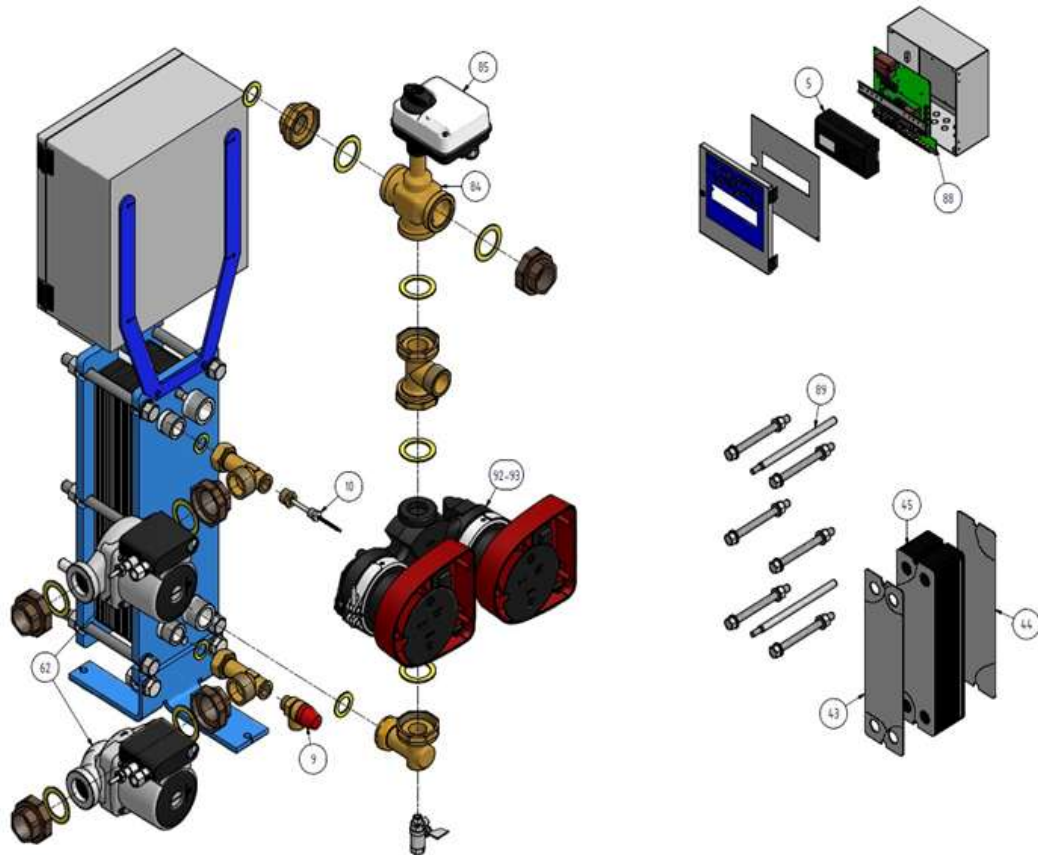
15.11 Technical data

	Model 2000 & 4000	Model 6000 & 8000
Electrical data:	230V 50Hz 1-phase	230V 50Hz 1-phase
Main measurements:	Max. 485x535x970mm (LxWxH)	Max. 850x505x1315mm (LxWxH)
Weight:	70-103 kg	153-226 kg
Electric consumption, Pmax (W)	Pmax (W) 85-750* Imax (A) 1,2-5,7*	Pmax (W) 380-1440* Imax (A) 2,2-6,8*

*With Booster function activated

15.12 Spare parts-Aqua First 2000 & 4000

Only replace any defective part with the **original** spare part. Please contact your local Alfa Laval agency.



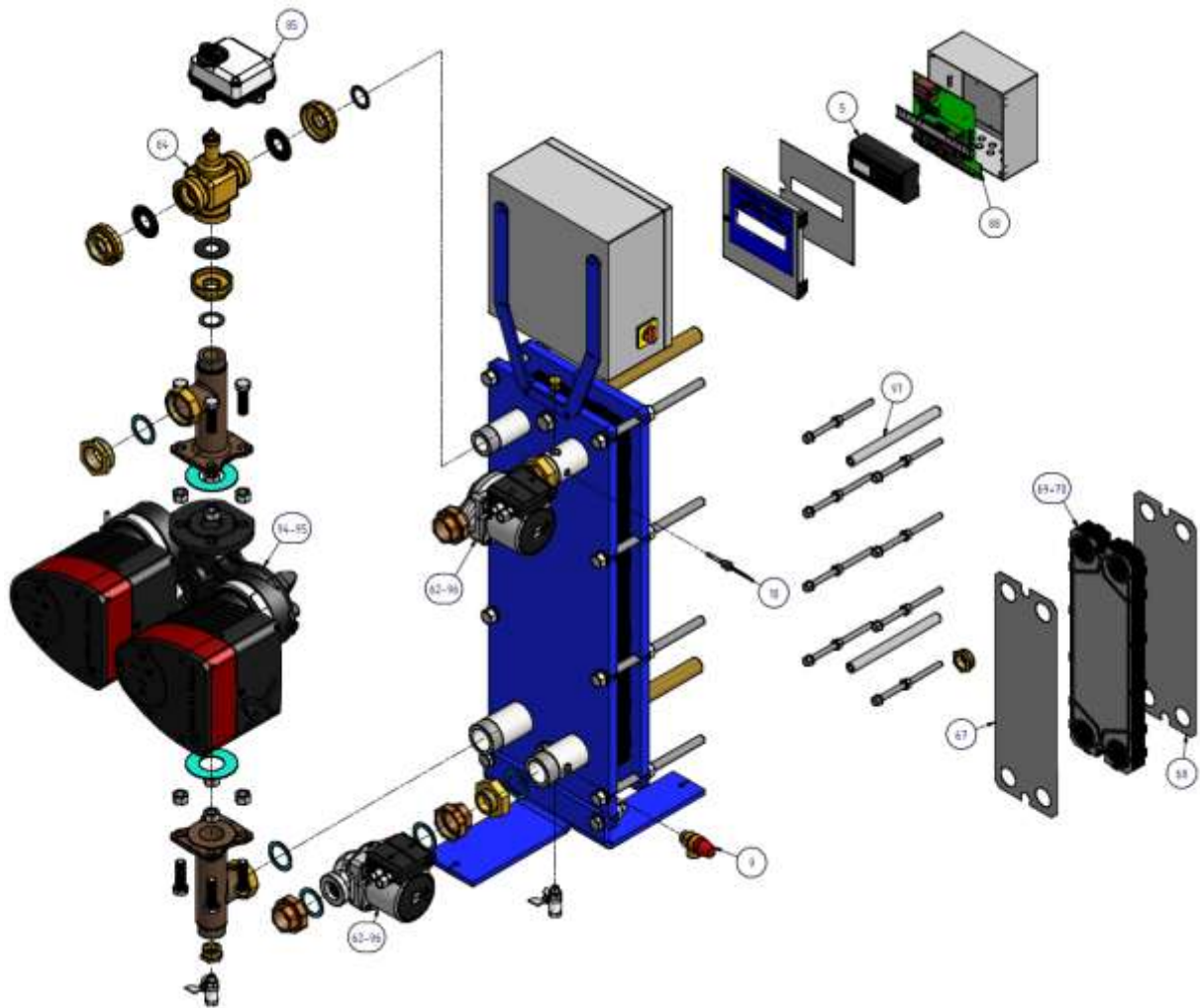
Picture 28

Position	Description Spare parts AquaFirst 2000 & 4000	Part number
5	Micro 3000 controller	REG30910
9	Safety valve - Male - DN 15 - 10 Bar	SOU29011
10	NTC20k temp sensor + 2m cable	SON30210
43	Plate - M3 H 316 - 0,5mm - EDPM 1st plate	PLAM3H316E4B
44	Plate - M3 H 316 - 0,5mm - EDPM. End plate	PLAM3H316E4F
45	Plate - M3 H 316 - 0,5mm - EDPM std plate	PLAM3H316EST
62	UPS 32.80N AL 230V SS316 wired	POM2002601C
84	3 Port valve body DN32 Kvs 16	COR21261
85	Actuator ML7430E1005 0-10 Volts	MOT21272
88	ArmaFirst interface card with connectors	KITREG02
89	Set of tightening bolts AquaFirst M3	KITVIS25
92	MAGNA1 32-80, 1*230 pump*	POM202410
93	MAGNA1 D 32-80, 1*230 pump*	POM202450
	Insulation for AquaFirst M3	CALM3FI

* Magna1 (D) 32-40 of FI2000 range is replaced by Magna1 (D) 32-80 on spare parts for standardization reasons

15.13 Spare parts Aqua First 6000 & 8000

Only replace any defective part with the **original** spare part. Please contact your local Alfa Laval agency.



Picture 29

Position	Description Spare parts AquaFirst 6000 & 8000	Part number
5	Micro 3000 controller	REG30910
9	Safety valve - Male - DN 15 - 10 Bar	SOU29011
10	NTC20k temp sensor + 2m cable	SON30210
62	UPS 32.80N AL 230V SS316 wired for FI6000	POM2002601C
67	Plate M6M H 316 - 0,5 EPDM gasket - 1st plate	PLAM6MH316E4B
68	Plate M6M H 316 - 0,5 EPDM gasket - End plate	PLAM6MH316E4F
69	Plate M6M H 316 - 0,5 EPDM gasket - Std plate	PLAM6MH316EST
70	Plate M6M L 316 - 0,5 EPDM gasket - Std plate	PLAM6ML316EST
85	Actuator ML7430E1005 0-10 Volts	MOT21272
88	ArmaFirst interface card with connectors	KITREG02
94	MAGNA1 40-100 1*230V pump	POM202414
95	MAGNA1 D 40-100 1*230V pump	POM202454
96	UPS 32.100N IMU 230V SS316 wired for FI8000	POM200262C
97	Set of tightening bolts AquaFirst M6	KITVIS30
98	3 Port valve body DN40 Kvs 25	COR21262
	Insulation for AquaFirst M6	CALM6FI

16 Commissioning report

COMMISSIONING REPORT									
Installation									
Tightening dimension control									
Air vent position									
Settling Pot presence on primary									
Boiler Brand, installation and power									
Mixing bottle required / Presence									
Balancing valve presence on Indirect (Semi Instantaneous) installations									
Close drain valves									
Primary conformity:									
Secondary conformity:									
Accessibility of unit and components									
Configuration menu									
Sensors									
Pumps									
Other									
Primary Pumps:					Secondary Pumps:				
Pump 1		Pump 2		Pump 3		Pump 4			
Electrical bridges control for pumps on power plate									
Pump1		Pump2		Pump3		Pump4			
Control valve working									
Settings									
DHW secondary outlet T° setting: S1									
PID setting									
High alarm setting		Manual			Auto				
Thermal Treatment		Type		Setting		Time			
Eco function activation									
Booster function activation									
Other functions activated									
Relay 1 function									
Relay 2 function									
Trending and/or Modbus value activated									
Volt free Remote contact wired or not									
TRIAC 230 V connections wired or not									
Other comments:									
Identification of the unit:									
Unit ID N°	Installer / Company Name			Installation site			Date		

17 Warranty

Our equipment comes with a 12-month warranty from the date of shipment. This may be extended to 6 months from the date of commissioning of the equipment, subject to commissioning report being mailed to Alfa Laval. The warranty period is limited to 18 months from the actual date of shipment from the factory.

The manufacturer's liability is limited to the replacement of any defective part that cannot be repaired. No other financial compensation may be claimed in any case under the warranty

The nature and probable cause of the defect must be reported to the manufacturer before any action is taken. The defective part should then be returned to our Lentilly factory in France for assessment unless written agreement to proceed otherwise has been obtained from Alfa Laval. The results of the assessment can only state whether or not the terms of the warranty apply

Exclusion factors:

Non-compliance with the guidelines for installation, configuration and maintenance:

Over pressures, water-hammer, scaling, noncompliant water quality

Also excluded from the warranty:

- Fitting costs, refitting costs, packaging, transport, and any accessories or equipment not manufactured by Alfa Laval, which will only be covered by any warranties issued by said third-party manufacturers.
- Any damage caused by connection errors, insufficient protection, misapplication or faulty or careless operations.
- Equipment disassembled or repaired by any other party than Alfa Laval.

Non-payment will lead to all operational warranties covering the delivered equipment being terminated.

17.1 How to contact Alfa Laval

Our contact details are updated on our website www.alfalaval.com.