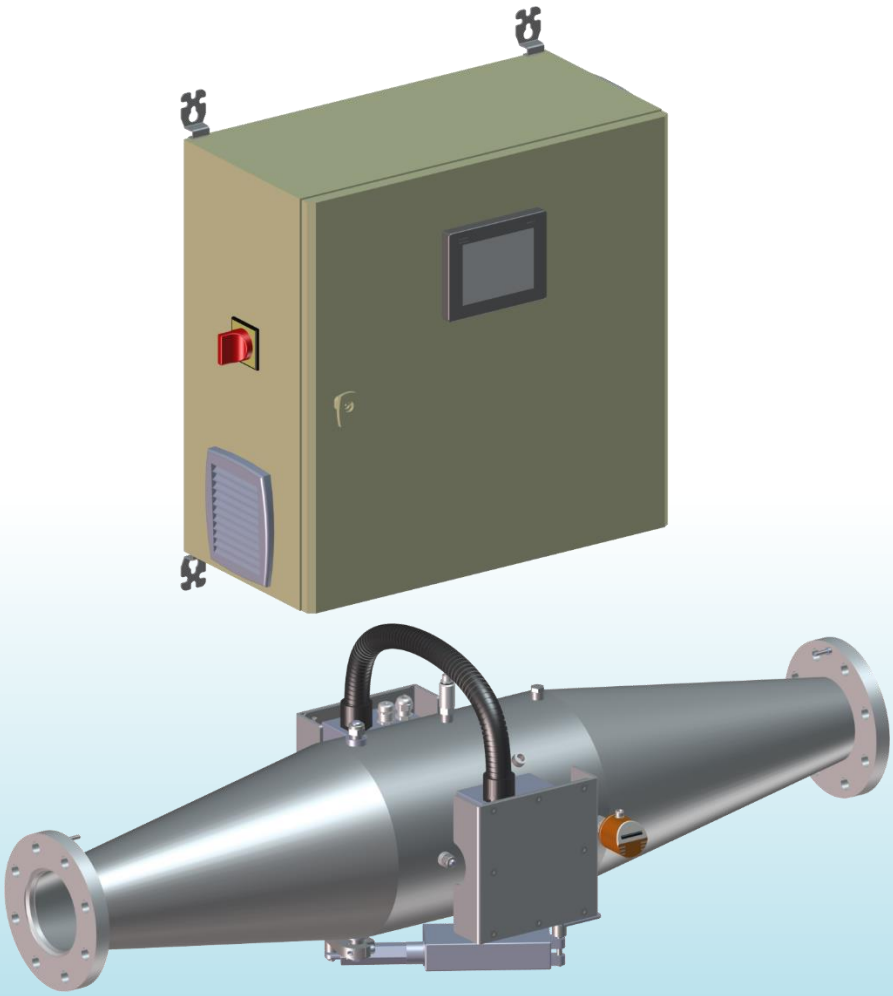
ATECPOOL MP Series Reactors
MPTS Series

INSTALLATION AND MAINTENANCE MANUAL



We thank you for choosing a Atecpool reactor.
Our equipment has been designed to give you reliable and safe operation for many years to come.
The Atecpool reactors have been designed for speed and ease of installation.
Their design also makes them easy to maintain.
Read these instructions carefully in order to optimize the operation of your reactor.

TABLE OF CONTENTS:

A. TECHNICAL CHARACTERISTICS

MP TS	UNIT	MP100 TS	MP125 TS	MP140 TS	MP240 TS	MP340 TS	MP440 TS
REACTOR							
Material	-	SS316L	SS316L	SS316L	SS316L	SS316L	SS316L
Finishing	-	Sand Blasted	Sand Blasted	Sand Blasted	Sand Blasted	Sand Blasted	Sand Blasted
A) Full Length	mm	1175	1152	1244	1020	725	824
B) Width	mm	450	450	528.2	528.2	528.2	528.2
C) Depth	mm	482.7	482.7	561	561	561	561
D) Service spacing	mm	450	450	528.2	528.2	528.2	528.2
Weight	kg	45	49	64	67	67	72
Type of connection	-	Flanges	Flanges	Flanges	Flanges	Flanges	Flanges
Connection	-	DN 125	DN 150	DN 200	DN 250	DN 300	DN 300
Drain in high point	-	Yes	Yes	Yes	Yes	Yes	Yes
Drain in low point	-	Yes	Yes	Yes	Yes	Yes	Yes
Flowmeter	-	Yes	Yes	Yes	Yes	Yes	Yes
Max Service Pressure	bar	10	10	10	10	10	10
Standard mounting	-	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical
CABINET							
Material	-	Painted steel	Painted steel	Painted steel	Painted steel	Painted steel	Painted steel
F) Height	mm	600	600	600	600	800	1000
G) Width	mm	600	600	600	600	600	800
H) Depth	mm	300	300	300	400	400	400
Cabinet / reactor cable length	m	10	10	10	10	10	10
Weight	kg	44	48	57	61	67	72
Cabinet ventilating	-	Yes	Yes	Yes	Yes	Yes	Yes
Ventilation filter	-	disposable filter	disposable filter	disposable filter	disposable filter	disposable filter	disposable filter
Power supply	V	220-240	220-240	220-240	380-415	380-415	380-415
Frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60
Type of power supply	-	1P+N	1P+N	1P+N	3P+N	3P+N	3P+N
Cable Type/Gauge	mm^2	3G1.5	3G6	3G6	5G6	5G6	5G6
Section of the earth cable	mm^2	6	6	6	6	6	6
Nominal amperage	A	4,88-4,48	14,65-13,43	14,65-13,43	14,65-13,43	14,65-13,43	29,97-27,45
Power	W	1053	3158	3158	6316	9474	12632
Differential protection	-	30 mA	30 mA	30 mA	30 mA	30 mA	30 mA
Magnetothermic protection	-	10A	20A	20A	20A	20A	40A
Trigger curve	-	Curve C	Curve C	Curve C	Curve C	Curve C	Curve C
Ingress Protection	-	IP54	IP54	IP54	IP54	IP54	IP54
UV LAMPS							
Number of lamps	-	1	1	1	2	3	4
Power unitary	W	1000	3000	3000	3000	3000	3000
Type of lamp	-	Medium pressure	Medium pressure	Medium pressure	Medium pressure	Medium pressure	Medium pressure
UV Power unitary	W	150	475	475	475	475	475
Total UV Power	W	150	475	475	950	1 425	1 900
Average life expectancy for 1 start/stop per day	h	9 000 to 12 000	9 000 to 12 000	9 000 to 12 000	9 000 to 12 000	9 000 to 12 000	9 000 to 12 000

B. SAFETY WARNINGS

- Switch off the device 30 minutes before any intervention to let it cool down.
- **Stop the system in the event of a prolonged stop of the water flow**

- **Never expose yourself to the radiation of the ultraviolet lamps when lit.** This may cause severe injuries or burns and may even lead to loss of eyesight.
- When the lamps are running, **do not take the lamps of the reactor out or remove the protection covers**

- When dismounting UV lamp or quartz tube, it is necessary to wear **protection gloves** not to let fingerprints that could affect the UV emissions quality

- **Even when stopped, power is present in the electrical unit** so make sure that the main power supply upstream of the electrical cabinet is switched off before carrying out any work on the equipment.
- Do not use the reactor if the **power supply wire is worn or damaged**. In this case it should be replaced.
- To avoid electric short-circuits, **do not place the electric wires or the reactor in the pool water** or in any other maintenance or cleaning fluid.
- Do not perform electrical measurement on ballast output (risk of overvoltage)

- Never unscrew the quartz tube sealing nut **when the reactor is loaded.** Because of pressure, the quartz tube could be blown out of the reactor with force and injure you.
- In case of a microleakage, the reactor must be isolated and drained to perform maintenance as soon as possible.
- Do not use the Atecpool reactor for any other use than that for which it was designed.

C. INSTALLATION GUIDE

1. Foreword

Atecpool reactors are ready to install, no works is required inside the reactor.

It is necessary to read all the instructions in this manual before switching on the reactor.

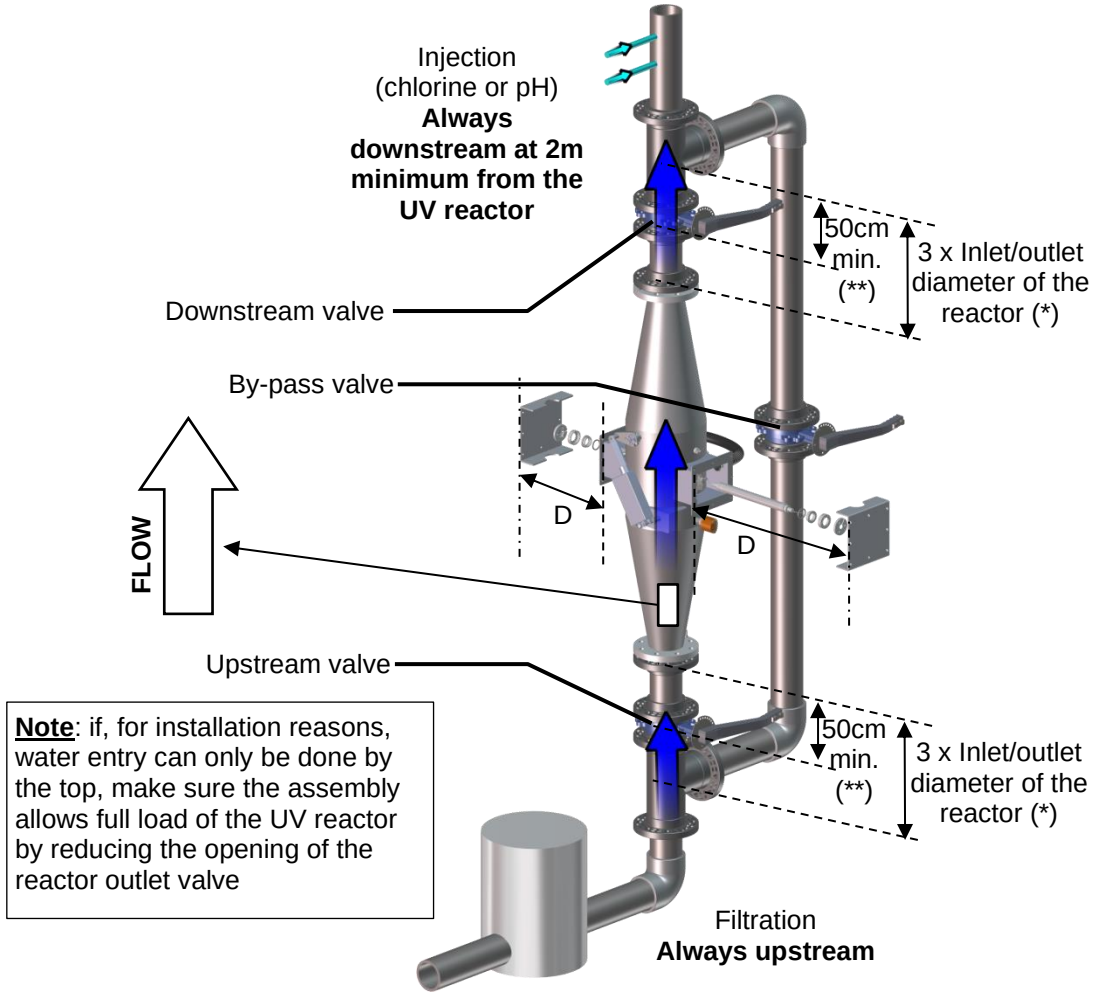
2. Usage environment

Location	Room protected from direct sunlight and bad weather
Ambient temperature	between 5°C et 40°C
Corrosive environment	Protect the electrical cabinet and the reactor from any corrosive emanations (chlorine, salt…)
Ambient humidity	< 80% without condensation

3. Reactor installation

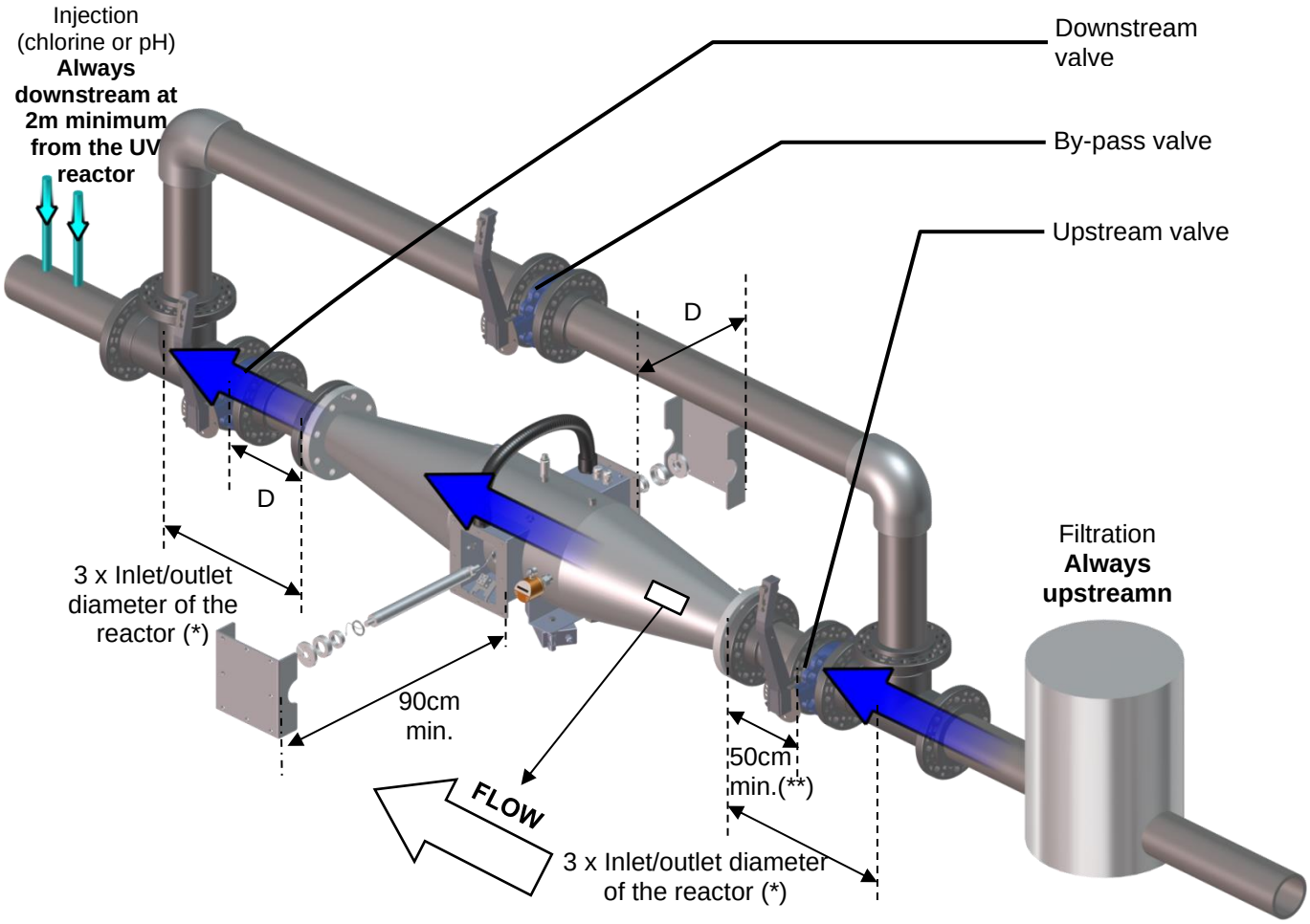
a.) Recommendations for an optimal installation

- **The reactor can be installed from two different ways:**
  - **In vertical position (water inlet downward) with draining point on the lower part**



Note: if, for installation reasons, water entry can only be done by the top, make sure the assembly allows full load of the UV reactor by reducing the opening of the reactor outlet valve

- **In horizontal position always keeping the lamp horizontal, the UV sensor on the top and the draining point below the reactor**



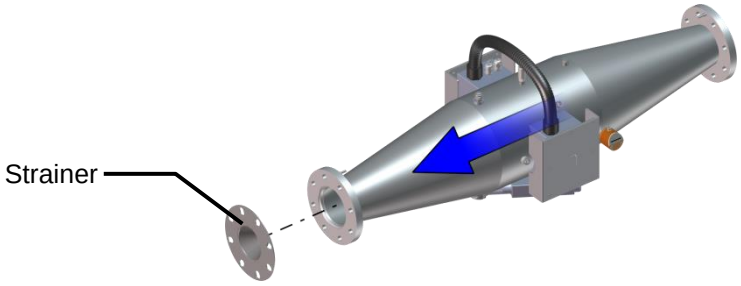
➢ For an easier maintenance, we recommend to install a By-pass.

➢ In order to avoid turbulence phenomena driving to vibrations that could affect the proper functioning of the device, it is recommended to:

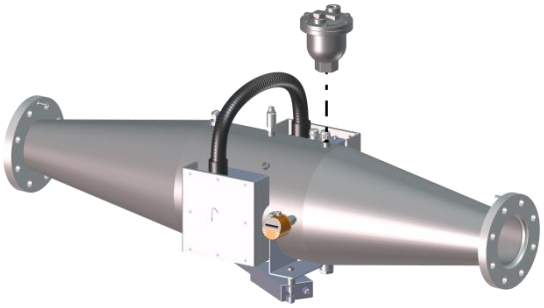
- ❖ Observe a straight length of at least 3 times the piping diameter (*) between the inlet/outlet of the reactor and a T or an angle connection
- ❖ Install reducers at a minimum distance of 50cm (**) from the inlet/outlet of the reactor

➢ (**) Do not install upstream or downstream shut-off valves or reducers directly on the UV reactor but close enough to make the reactor draining and the maintenance operations easier: 50cm recommended

➢ To protect the pool in case of quartz sleeve breakage, install a strainer on the outlet flange of the UV reactor



➢ In case of risk of microbubbles and to avoid draining the reactor regularly, install an automatic drain at the place of the upper draining plug (Optional automatic stainless-steel drain ref: OPT004710)



b.) Requirements

➢ **The reactor must be always located after the filtration**

➢ Whatever the installation way of the reactor (horizontal or vertical), **the lamps must always be perfectly horizontal**

➢ **It is necessary to provide a service space (D) required to remove the lamp and the quartz on each side of the reactor**

MP TS	UNIT	MP100 TS	MP125 TS	MP140 TS	MP240 TS	MP340 TS	MP440 TS
D) Service space	mm	450	450	528.2	528.2	528.2	528.2

➢ Flow direction must be observed (see marking on the UV reactor: ⇨FLOW)

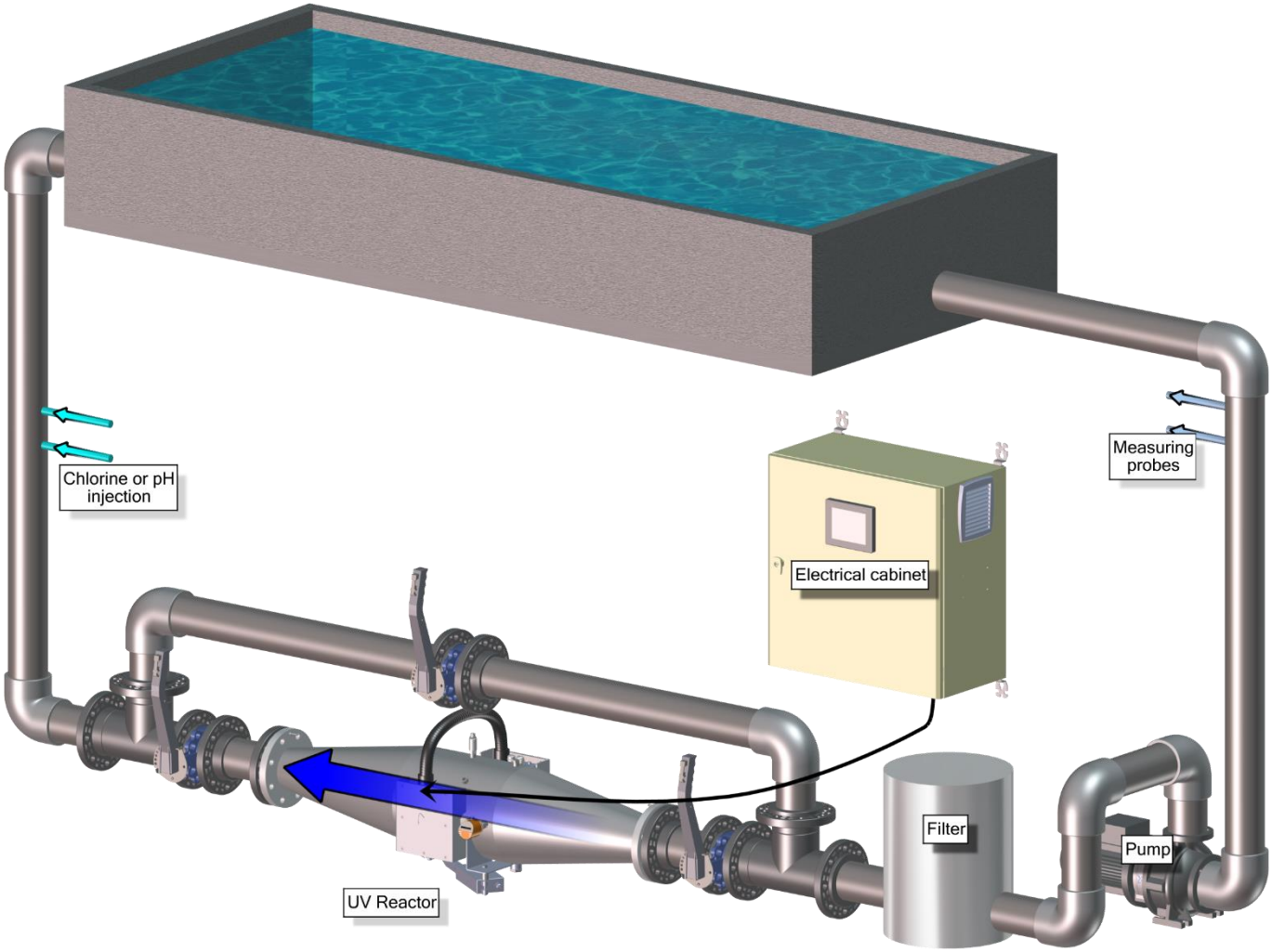
➢ The maximum pressure of the piping should never be higher than the reactor maximum pressure (see Technical characteristics table, page 3)

➢ The drains must be located in the lower position: If the direction of water flow is observed, then they will be correctly positioned

➢ **The reactors must be installed to run continuously in full hydraulic load,** especially if the reactor is located above the pool (siphon risks, reactor half filled…)

➢ In case of horizontal installation, position the reactor so as to the UV sensor is on the top and the cleaning system is below. If a temperature sensor is used, it must be above too.

4. Installation example



Note: There is no problem to install the UV reactor before or after the heater.

5. Instructions for electrical connections

a.) Cabinet installation

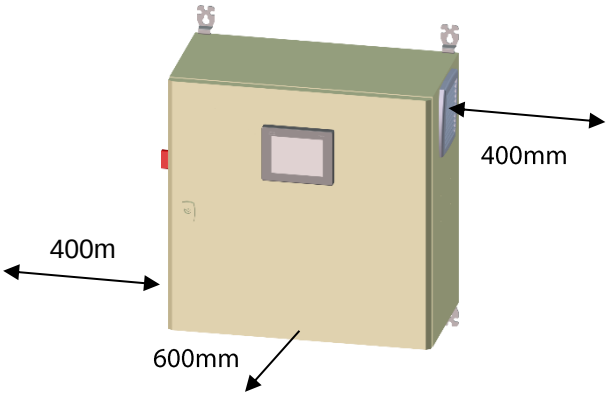
IMPORTANT:

- Wirings must be performed by a qualified technician.
- **A suitable thermal circuit breaker (see table paragraph b.)) must be installed on the power supply of the device. This breaker must be able to cut phase and neutral**
- The supply voltage must meet specifications indicated on the label on the side of the device.
- **Before proceeding to the wiring, switch off the power supplies.**
- Disconnect means must be provided on the power supply of the unit to allow a complete break in accordance with the installation rules. This must be tagged in order to be quickly identified.

➢ **The electrical unit should be positioned** in order to be protected from water at eye level

Fix the cabinet to the wall, observing the clearances around the ventilation grills (400mm) and a sufficient space in front of the cabinet to open the door (600mm).

➢ **The air vent** of fan must not be obstructed and accessible to dismount or clean the filtering elements.



Dimensions of the electrical cabinets

MP TS	Unit	MP100 TS	MP125 TS	MP140 TS	MP240 TS	MP340 TS	MP440 TS
F) Height	mm	600	600	600	600	800	1000
G) Width	mm	600	600	600	600	600	800
H) Depth	mm	300	300	300	400	400	400
Weight	kg	44	48	57	61	67	72

b.) Electrical cabinet wiring

➢ The electrical cabinet must be connected to a constant power source inside the LVMDP (Low Voltage Main Distribution Panel) on its assigned breaker. It is necessary to provide a protection reserved for the UV reactor inside the LVMDP cabinet with suitable power breaker.

MPL TS	UNIT	MP100 TS	MP125 TS	MP140 TS	MP240 TS	MP340 TS	MP440 TS
Power	W	1053	3158	3158	6316	9474	12632
Min section of power cable	mm²	3G1.5	3G6	3G6	5G6	5G6	5G6
Differential protection	-	30 mA	30 mA	30 mA	30 mA	30 mA	30 mA
Minimum suitable protection (according to NF C15-100 standard)	A	10	20	20	20	20	40
	-	Curve C	Curve C	Curve C	Curve C	Curve C	Curve C

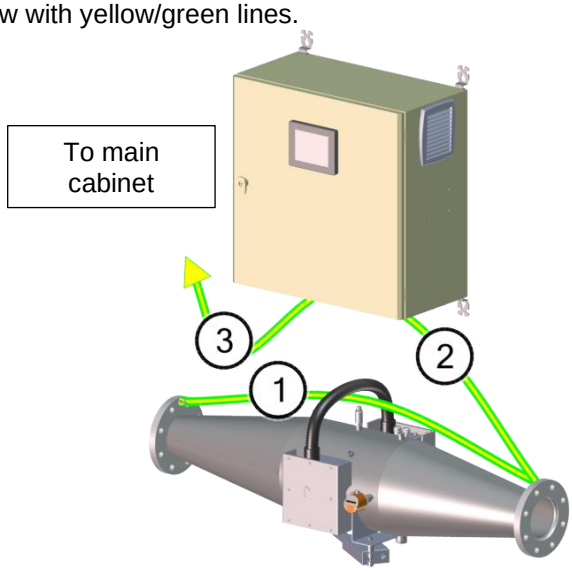
➢ The lamps and sensors cables are already connected inside the cabinet. These cables have a standard length of 10m and should not be shortened but completely unwinded in long loops to prevent any malfunction caused by parasites and inductive effects.

It is possible to disconnect the lamps and sensors cables from the electrical cabinet (wall crossing, cable tray…). So, it will be necessary to mark each wire and cable to properly wire back the same way as originally.

➢ To make the connections, refer to the wiring diagram so as to identify the corresponding terminal strips.

c.) Reactor connection to earth

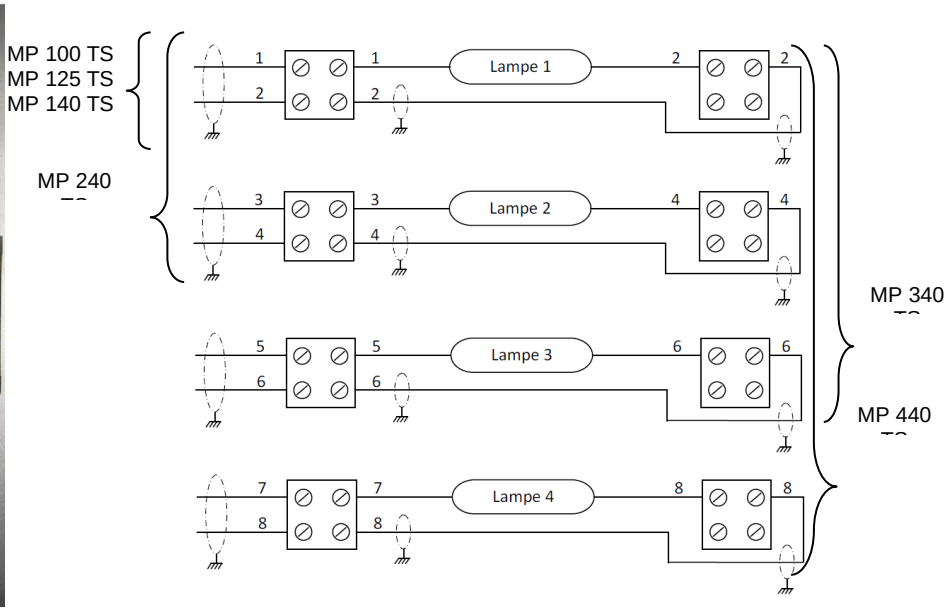
The reactor should always be connected to main earth of the room through the ATECPOOL cabinet as indicated on the picture here below with yellow/green lines.



The cables 1and 2 are provided with the reactor. All cables have a **6mm²** cross section.
Any reactor earthing fault will lead to guarantee exclusion in the event of electrolytic corrosion.

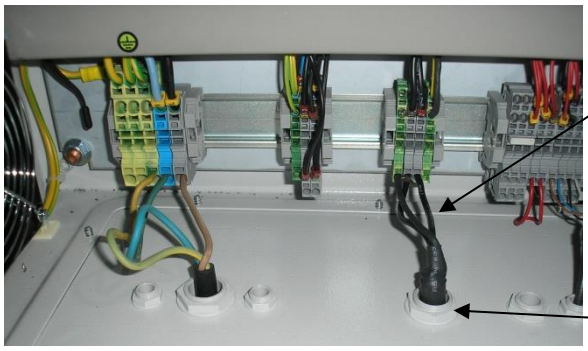
d.) Lamps wiring

The following diagrams give the correspondences for lamps wiring according to the unit type



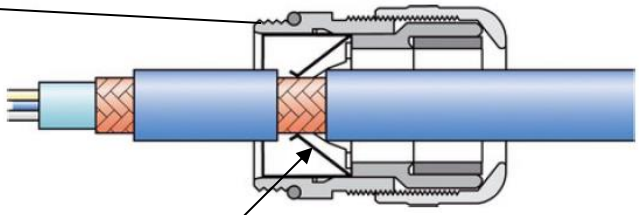
e.) Connection/Disconnection of lamp cable inside the electrical cabinet

To facilitate installation, it is possible to disconnect the power supply cable of the lamp(s), in order to insert it into a cable tray for example. **In this case, it is recommended to disconnect the cable in the electrical cabinet**, and not on the UV reactor.



Lamp cable to be disconnected in the cabinet using a screwdriver

CAUTION! When reconnecting:



You must take care to reposition the cable shielding on the metal strips in the cable gland and not the cable sheath, and to screw the cable gland up tightly on the cable penetration plate.

Caution: If you do not carry out this operation, problems of electromagnetic interference may occur on the electrical equipment near to the lamp cable and may in some cases lead to malfunctions in the equipment resulting in the lamp switching off.

f.) Wiring of remote control for operation authorization

- When using remote control, make sure to remove the bridge on the terminal strips.

- The remote control should be wired with 2x1mm² cable (recommended). The cable must be potential free (dry contact). Refer to the electrical diagram in order to identify the corresponding terminals.

g.) Alarms wiring

- The alarm outputs are dry contacts which must be powered from the outside in order to receive and return the signal. They are configured with positive safety, that is to say the contacts are closed as long as there is no fault, so the contacts open when a fault occurs.

- There are several types of Alarm / Warning contact output
  - Alarm 1 and Alarm 2 contact outputs: Configurable alarm contacts to be selected between UV alarm, cabinet temperature alarm, reactor temperature alarm, flow controller alarm or flowmeter alarm.
  - General alarm contact output: Non-configurable alarm contact. It opens in case of UV alarm, cabinet temperature alarm, reactor temperature alarm, flow controller alarm or flowmeter alarm.
  - Warning contact output: Non-configurable warning contact. It opens in case of UV warning, cabinet temperature warning, reactor temperature warning, flow controller warning or flow meter warning.

- The contacts can tolerate a maximum of 12-24Vdc, 90-250Vac, 3A.

- To make the connections, refer to the wiring diagram so as to identify the corresponding terminal strips. A 2x0.75mm² cable is sufficient to connect up an alarm.

h.) Modbus TCP communication

- Modbus communication allows transferring all information collected by the PLC to the customer's cabinet

- The connection must be made with a minimum category 6 Ethernet cable, with a minimum diameter of 4mm min / 8mm max and a maximum length of 80m. This cable must be equipped with RJ45 connectors after being installed through the cable glands.

- The RJ45 connectors must be connected directly to the PLC, see the wiring diagram for more details

- To the use and program Modbus communication, please contact the ATECPOOL support to get the corresponding documentation

i.) Wiring of 4-20mA outputs (UV and temperature (option))

- The 4-20mA outputs are out puts the send a signal between 4 and 20mA according to the measured UV value as well as temperature when option exists.

- To make the connections, refer to the wiring diagram so as to identify the corresponding terminal strips. A 2x0.25mm² (mini) shielded cable is required to connect the 4-20mA output.

j.) 4-20mA input

j-1. Combined chlorine analyser (option)

- This 4-20mA input allows receiving a signal coming from the chlorine analyser module of the installation and to control the lamps power according to the combined chlorine rate.

- It should be selected in the dimming menu on the touch screen

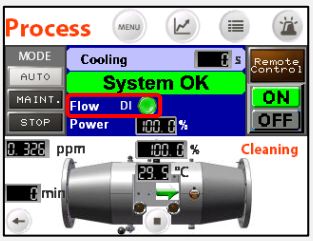
j-2. Wiring

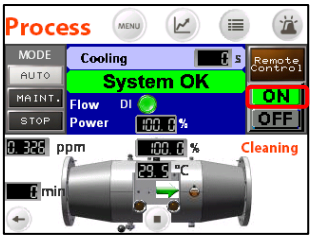
- To make the connections, refer to the wiring diagram so as to identify the corresponding terminal strips.

- A 2x0.25mm² (mini) shielded cable is required to connect the 4-20mA output.

D. STARTING UP

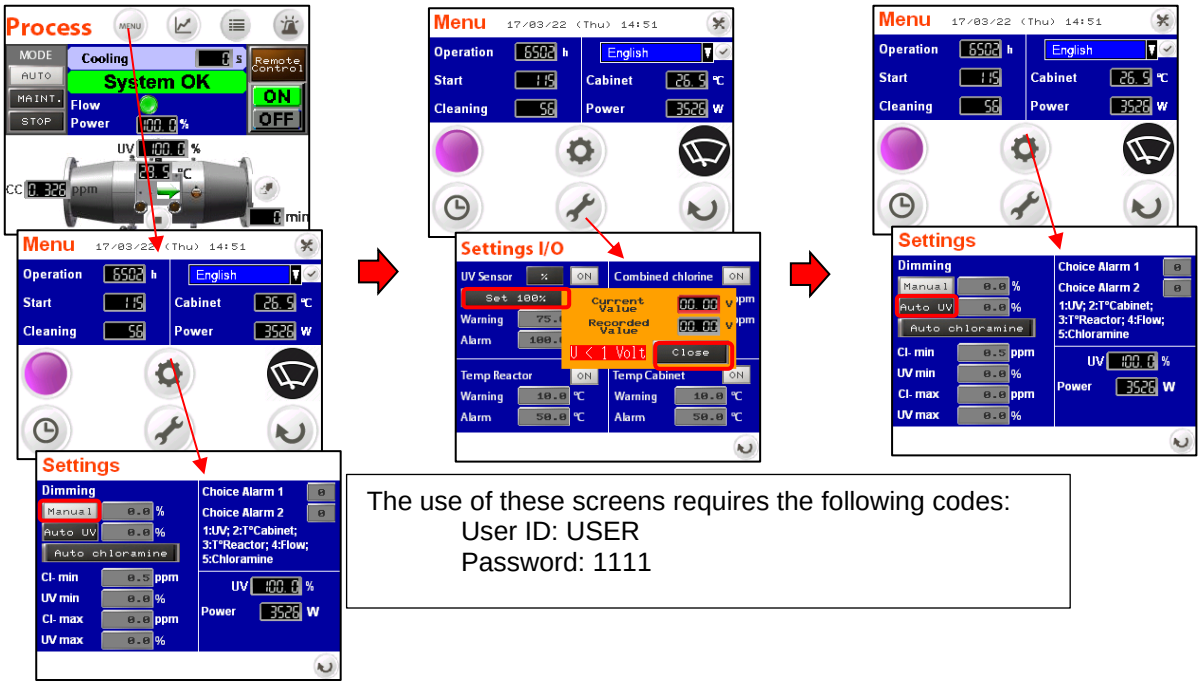
1	First, check the reactor and the electrical cabinet has been correctly installed (see C. Installation guide)
2	Fill the reactor with water, by-pass open and check there is no leak.
3	Start the pumps, then slowly close the by-pass still checking there is no leak.
4	Slightly open the upper draining plug until water is forced out under pressure Close the plug. If water is not forced out and, at the opposite, air comes into the reactor, then a siphon phenomenon occurs somewhere in the piping: reduce the opening of the UV outlet to reduce this phenomenon.
5	Power on the cabinet: the touch screen lights on
6	Check good functioning of the manual (handle) or automatic cleaning (use touch screen with buttons and in the process screen in AUTO mode)
7	Proceed to the flow controller calibration (see E. Flow controller adjustment, page 15). On the touch screen: red light= no flow, green light= flow OK
8	Power on the lamps by pressing the red On/off button on the screen.
9	Test functioning of the enslavement to the flow controller by stopping the pumps: the lamps should power off and the red light “Lamp fault” should be on. Start again the pumps and wait 30mn the lamps lights on a gain





If a UV sensor is installed, set the manual regulation to 100%, then proceed to UV sensor calibration (for the first commissioning or after a lamp replacement, see F.3.d.) Input/Output parameters screen, page 22).
Note: this step must be done when the lamp has been switched on for at least 10 minutes in circulating water and at the required temperature
Once the calibration is complete, return to the automatic/UV regulation mode. The regulation should change be at 70% after few minutes.

9



The use of these screens requires the following codes:
User ID: USER
Password: 1111

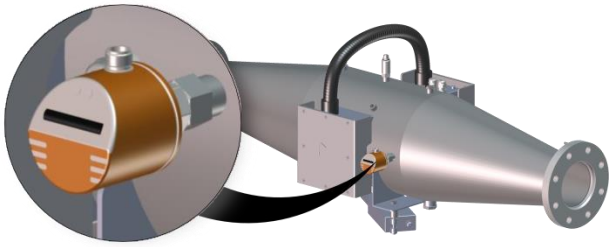
10 Fill maintenance file (see I. Maintenance file, page 35)

- **The device should always run**
  - Filled with circulating water
  - Bled from air,
  - By-pass closed,
- **The device is supposed to run nonstop, 24h/24h,** but it is recommended to switch off the reactor in the event of prolonged halt of the water flow (risk of overheating or deposits on the quartz sleeve) despite the enslavement to the pumps. However**, it would be better to limit the run/stop of the lamp** to optimize their time of efficiency.
- In case of reactor stop, wait for 30 minutes the lamp is cooled before restarting it in order to spare its lifetime.
- When the lamp is switched on, it works automatically at full power (100%) during 10 minutes to pre-heat the lamp before dimming according the selected mode.
- The cleaning system has to be operated at least once a day

E. FLOW CONTROLLER ADJUSTMENT

The function of the flow controller is to stop the UV reactor when there is no flow (overheating risk).

The flow controller is on the reactor as indicated here below.



- During reactor start up, it is **necessary** to perform the calibration of the flow controller on the **minimum flow** of the installation (e.g.: functioning with only one pump or with the by-pass open.
- During the filters cleaning, the lamp should not have to be stopped by the switch but check this is the flow controller that switches it off
- The good functioning of the flow controller should be checked at least once a month.

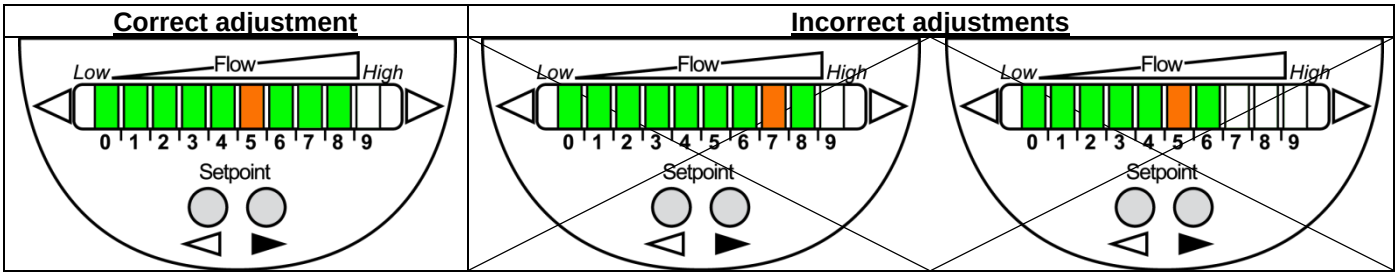
1. Calibration

1. Power on the cabinet, **lamp off**
2. Start up the filtration (pumps)
3. Set filtration flow to the minimum (e.g.: By-Pass opening or 1 pump on 2)
4. Press on button ▶ of the flow controller and **hold it** until the LED nr 9 flashes (about 5 seconds).
5. Release the button, calibration is over (lights **0 to 8 are on fixed, nr 9 flashes; if not, carry out again operations 4 to 5**)

2. Adjustment of the triggering threshold

To avoid too many stops/starts of the lamp due to flow variation, the triggering threshold (orange LED) should be positioned in the middle, on nr 4 or 5. If not, proceed as following:

1. Press briefly on ◁ or ▶ ,several times to move the orange light to the LED nr 4 or 5
2. The device is operational. Set back the flow to the maximum (By-pass closing, all pumps on). The lamp can be started again.

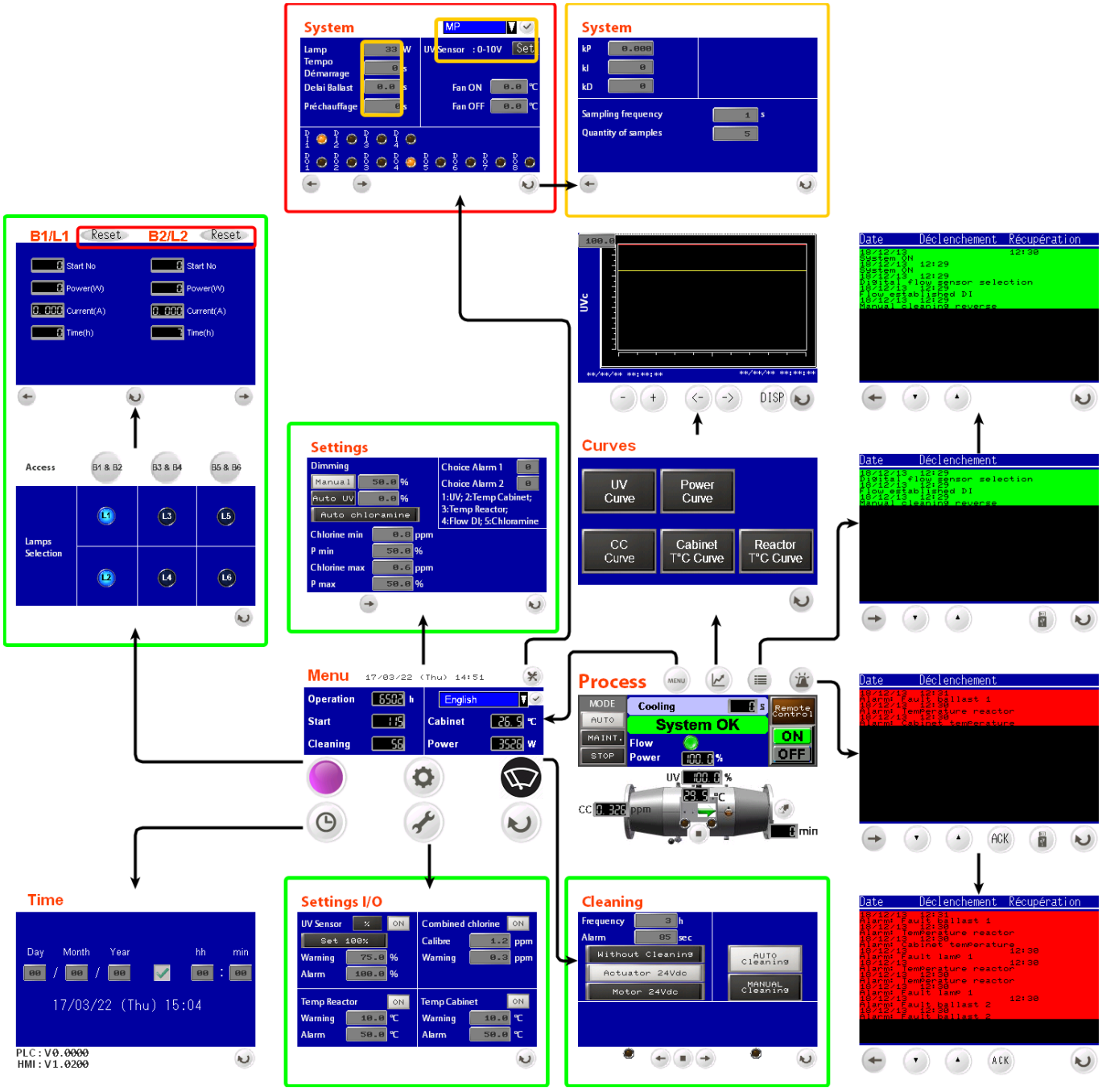


Checking:

- **Stop the filtration:** check the lamp stops in a delay of 60seconds maximum, the green lights should turn off one by one until below the threshold that lights on red
- **Restart the filtration:** the lamp restart will only be done after a delay of 30 minutes.

F. INSTRUCTIONS FOR USE OF THE TOUCH SCREEN

1. Screens tree view



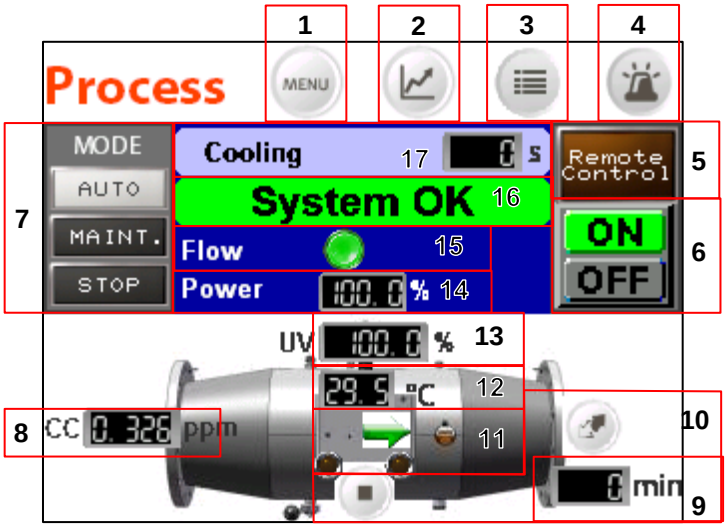
: means that a "USER" level identification is required. This level is intended for personnel performing the device maintenance. The codes corresponding to this level are: User ID = USER / Password = 1111

: means that a level identification "SUSER" is required. This level is intended for personnel performing the device installation.

: means that an "ADMIN" level identification is required. This level is reserved for ATECPOOL personnel

2. Process screen

The process screen allows an overall visualization of the system and controlling it



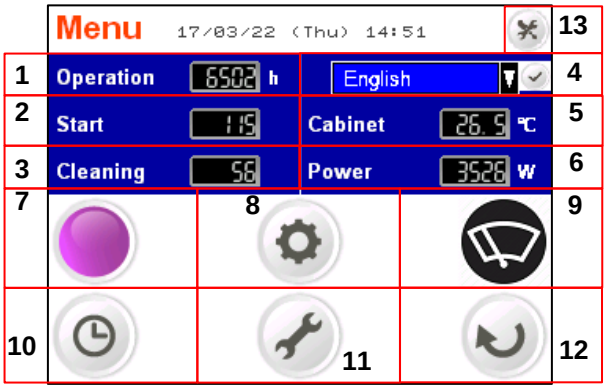
Nr	Description	Nr	Description	
1	Access to main menu	**10**	Buttons to stop/start automatic cleaning: • launches automatic cleaning cycle • stops the cleaning cycle	Only appear if the option or parameter is selected
2	Access to curves screen (UV, power, temperature, combined chlorine)	**11**	Status indicator of automatic cleaning operation and limit switches	
3	Access to events screen	**12**	Reactor temperature display (option)	
4	Access to alarms screen	**13**	UV measurement display (in % or in W/m²) (option)	
5	Indicator button of the active command type: • "Local": ○ Control exclusively by the touch screen. ○ Control by Modbus TCP not possible • "Remote control": ○ Navigation via touch screen possible but control not possible. ○ Taking control by Modbus TCP authorized but command not possible • "Remote TCP" (Modbus TCP): ○ Modbus TCP communication has taken control. ○ Navigation via touch screen possible but control not possible. However, taking control by the touch screen is still possible. Refer to the table next page for controls details	**14**	Display of electric power percentage to apply on the lamps	
6	Lamp Start (ON) / stop (OFF) buttons	**15**	Flow detection: Green = flow OK, Orange = no flow	
7	Selection of running mode: • AUTO (automatic), • MAINT. (maintenance) • STOP	**16**	Visualization of system general status with warnings and alarms	

Nr	Description	Nr	Description
8	Information of installation combined chlorine rate (option 4-20mA Customer)	**17**	Visualization of remaining time before being able to power on the lamps in order to let them cool down NB: When timer is over, an indicator of system operation status appears (System ON, remote control disconnected…)
9	Remaining time before next automatic cleaning (option)		

State of button « Remote » (5)	LOCAL		REMOTE CONTROL		REMOTE TCP	
Active/inactive command from	Touch screen	Modbus TCP	Touch screen	Modbus TCP	Touch screen	Modbus TCP
Start up the lamps	X	O	O	O	O	X
Launch a cleaning cycle	X	O	X	O	X	X
Screen navigation	X	O	X	O	X	X
Parameters modification	X	O	X	O	X	X
Resetting lamp counters	X	O	X	O	X	X
Defect acknowledge	X	O	X	X	X	X
Access to alarms and events	X	X	X	X	X	X
Access to displayed values	X	X	X	X	X	X
Changing mode	X	O	O	O	O	X
Changing login	X	O	X	O	X	O
X = Active / O = Inactive						

3. Main menu screen

Menus screen allows to access to the whole menus of the interface.



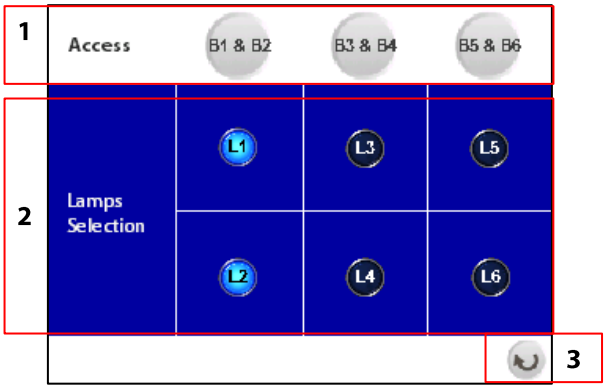
Nr	Description		Nr	Description
1	Counter of reactor operating time since commissioning	These counters cannot be reset	**8**	Access to system settings screen
2	Counter of system start-up since commissioning		**9**	Access to cleaning system setting screen (a password is required to reach this screen)
3	Counter of automatic cleaning cycle performed since commissioning (only appears if the option or the parameter has been selected)		**10**	Access to time and date adjustment screen
4	Selection of the interface language. Use ▼ to display the languages list. Once the language is selected, validate with ✓		**11**	Access to sensors configuration screen
5	Cabinet temperature display (Only appears if the option or the parameter has been selected)		**12**	Return to process screen
6	Display of cumulated instantaneous electric power of the lamps		**13**	Access to ATECPOOL specific settings screen. This screen is only accessible by a ATECPOOL technician
7	Access to lamps selection screen (Ballast/Lamp setting)			

a.) Login screen with password

When using the equipment, it is not necessary to connect with a password. Only operators approved by ATECPOOL can access parameters or screens. For this purpose, please contact ATECPOOL to obtain the name and password

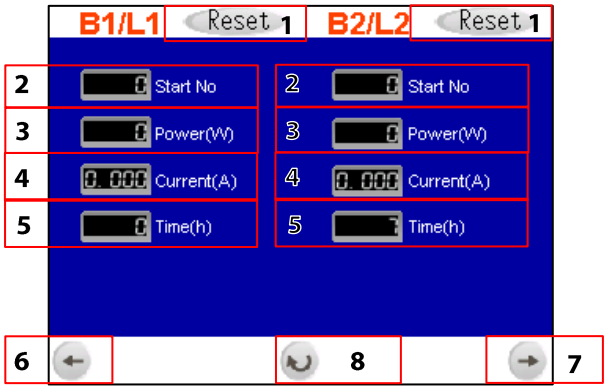
b.) Ballast/lamp setting screens

b-1. Lamps selection screen



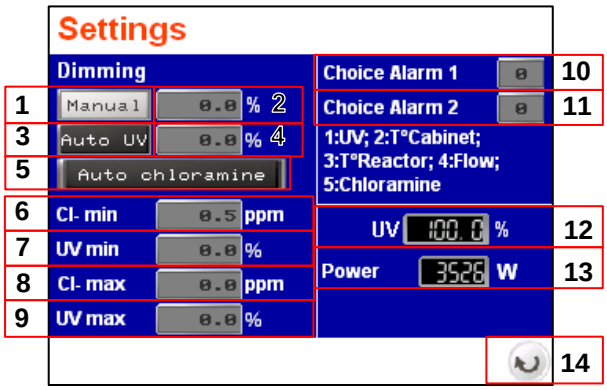
Nr	Description	Nr	Description
1	Buttons to access information screen of the corresponding lamp (e.g.: B1 for L1) These buttons require a password	**3**	Return to process screen
2	Lamp selection/unselection button: black = lamp unselected, blue = lamp selected. La lamp number (Lx) refers to ballast number (Bx) where it is connected NB: the lamp must be selected to be operated		

b-2. Lamp information screen



Nr	Description	Nr	Description
1	Reset lamp counters. These buttons can only be used with a specific login level 2. Please contact ATECPOOL to get required login codes.	**5**	Counter of lamp operating time
2	Counter of lamp start-up	**6**	Access to information screen of lamps Ln-2 and Ln-1
3	Instantaneous power absorbed by the lamp	**7**	Access to information screen of lamps Ln+2 and Ln+1
4	Instantaneous current absorbed by the lamp	**8**	Return to lamp selection screen

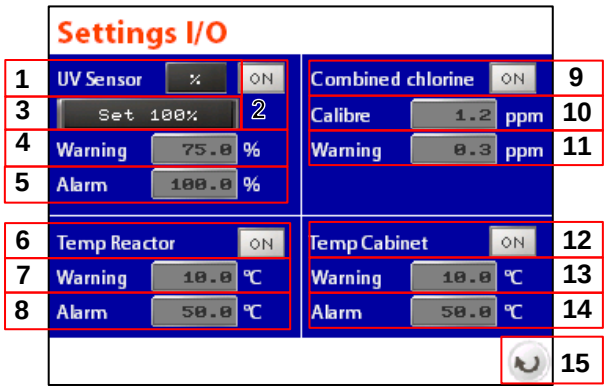
c.) Power dimming screen



Nr	Description	Nr	Description
1	Selection of manual dimming. This dimming allows fixing the power (2) to apply constantly	**8**	Maximum threshold value of combined chlorine rate
2	Adjustment of manual dimming level (100% by default)	**9**	Adjustment of lamp power level to apply when maximal threshold of combined chlorine rate is reached
3	Selection of automatic dimming regarding the UV measurement. This dimming allows adjusting the lamp power regarding the specified UV value. This dimming is only possible if the reactor is equipped with a UV sensor	**10**	Assignation of the alarm to apply for alarm 1 output. By default, set at 1 (UV alarm)
4	Adjustment of the UV measurement level to get during Auto/UV dimming (75% by default)	**11**	Assignation of the alarm to apply for alarm 2 output. By default, set at 2 (Cabinet temperature alarm)
5	Selection of the automatic dimming regarding the combined chlorine rate. This dimming allows adjusting the lamp power regarding the combined chlorine rate measured by an external analyser. This dimming is only possible if corresponding 4-20mA input has been wired.	**12**	UV measurement display (in % or in W/m²) (option)
6	Minimum threshold value of combined chlorine rate	**13**	Display of cumulated instantaneous electric power of the lamps
7	Adjustment of lamp power level to apply when minimal threshold of combined chlorine rate is reached	**14**	Return to main menu screen

NB: Only one dimming mode can be selected at time

d.) Input/Output parameters screen



Nr	Description	Nr	Description
1	Selection of the UV sensor measurement mode: W/m² or % (Default value: %)	**9**	Validation / de-validation of combined chlorine rate information. If the 4-20mA input option is not installed, this parameter must be Off (for authorized personal)
2	UV sensor validation / deactivation. If the reactor is not equipped with a UV sensor, this parameter must be Off (Default value: On)	**10**	Max value setting for the 4-20mA input: 20mA refers to the installation maximum rate (to be adjusted according to the parameters of the chlorine analyser)
3	UV sensor calibration button when configured in%. This button should be used after each lamp replacement, at the end of preheating, to reset the UV measurement to 100%. (see procedure below)	**11**	Warning threshold for combined chlorine rate too high
4	Pre-alarm threshold setting. Warning of UV low level threshold close.	**12**	Validation / deactivation of cabinet temperature sensor
5	Main alarm threshold setting: UV measurement too low. Lamp efficiency limit is reached: replace the lamp.	**13**	Warning threshold setting: warning of cabinet high temperature threshold close.
6	Reactor temperature sensor validation / deactivation. If the reactor is not equipped with a temperature sensor, this parameter must be Off.	**14**	Alarm threshold setting: cabinet temperature measurement too high. In case of alarm, the reactor stops.
7	Warning threshold setting: warning of the reactor high temperature threshold close.	**15**	Return to main menu screen
8	Alarm threshold setting: reactor temperature measurement too high. In case of alarm, the reactor stops.		

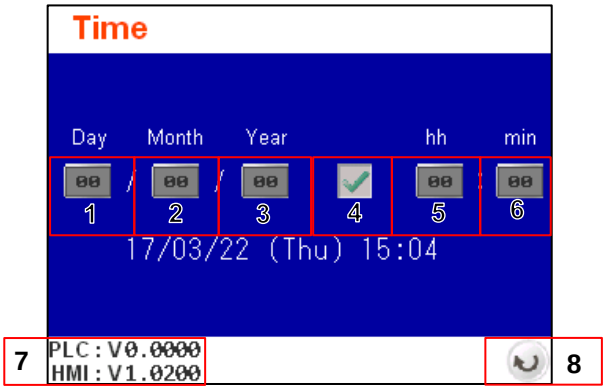
When the UV sensor is configured in W/m², it is no use to calibrate it because the read value is the image if the UV irradiance of the lamp.
If the UV sensor is configured in %, it is necessary to calibrated again the UV sensor at each lamp replacement.
This calibration must be done with a new lamp, lamp switched on for 10 minutes in the liquid at the required temperature.
Steps to follow:

1. Set the manual dimming to 100% (paragraph F.3.c.) tag 1, page 21).
2. Start the lamp
3. Press on « Set 100 % » (3) and wait for the end of the preheating when the displayed value reaches its maximum and remains stable (between 5 and 10 minutes)
4. Press “Set” to confirm and to carry out the calibration.
5. Finally, set again the Auto dimming on UV (paragraph F.3.c.) tag 3, page 21).

e.) Automatic cleaning screen

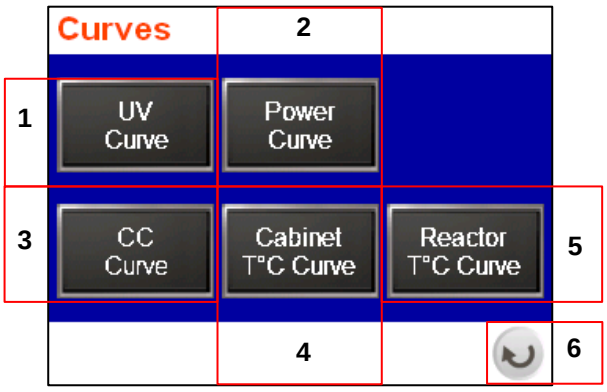
Nr	Description	Nr	Description
1	Time interval between 2 cleanings	4	Cleaning type selection buttons: Manual or automatic. If the device is not equipped with a cleaning system, “MANUAL cleaning” must be selected
2	Monitoring time of the automatic cleaning cycle. If the cycle time is greater than this parameter, an alarm is triggered.	5	Manual activation buttons for automatic cleaning: • and move the cleaning system to the left or right • stop the cleaning cycle • indicates the state of a limit switch
3	Selection buttons for automatic cleaning type	**6**	Return to main menu screen

f.) Date and time setting screen

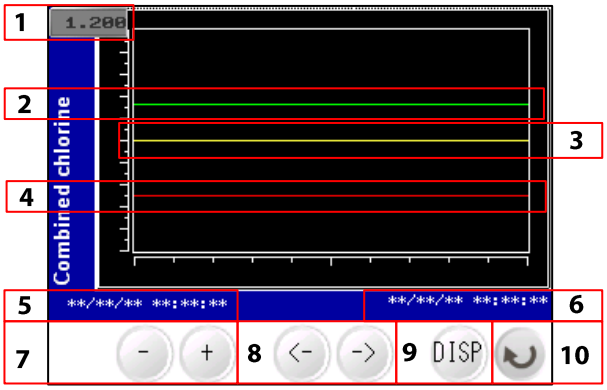


Nr	Description	Nr	Description
1	Day setting field	**5**	Hour setting field
2	Month setting field	**6**	Minutes setting field
3	Year setting field	**7**	Indication of software version inside the PLC or the screen (HMI)
4	Button to validate date end time setting into the PLC	**8**	Return to main menu screen

4. Curves menu



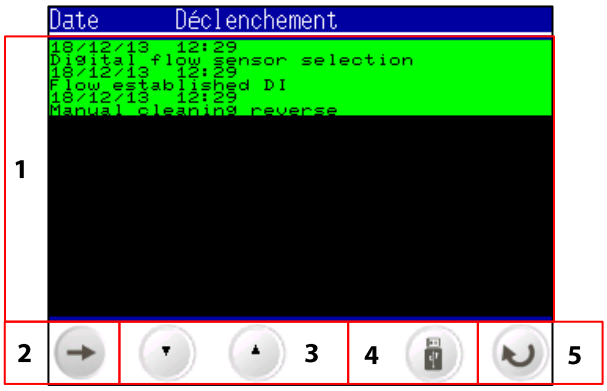
Nr	Description	Nr	Description
1	Button to access to UV curves	**4**	Button to access to cabinet temperature curves
2	Button to access to power curves	**5**	Button to access to reactor temperature curves
3	Button to access to combined chlorine curves	**6**	Return to process screen



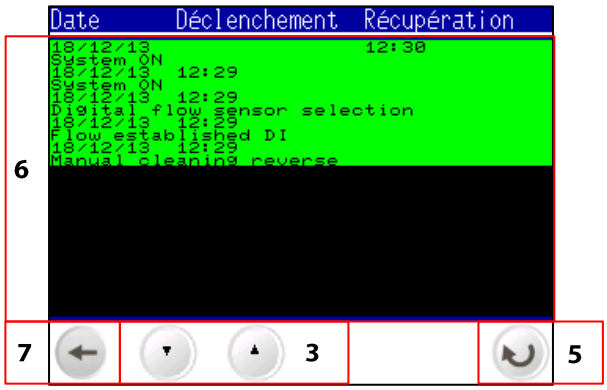
Nr	Description	Nr	Description
1	Max value	**6**	Date corresponding to the newest value
2	Measurements curve	**7**	Buttons to reduce / increase time range
3	Alarm parameter level (main-alarm)	**8**	Button to move forward/backward the readings in the timeline
4	Warning parameter level (pre-alarm)	**9**	Button to return to the reading in real time
5	Date corresponding to the oldest value	**10**	Return to the curves menu

The screens run in the same way for UV curves, temperature and combined chlorine

5. Events register screen



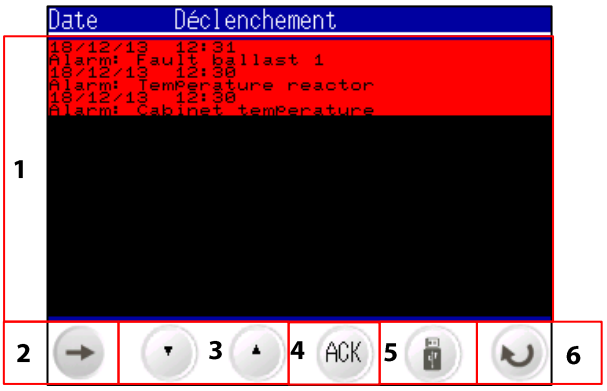
Screen of events in progress



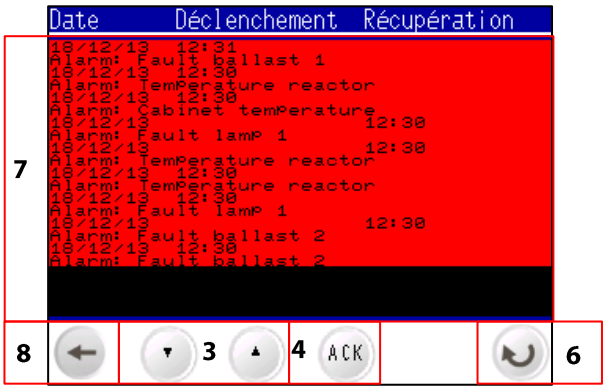
Screen of events history

Nr	Description	Nr	Description
1	Visualization of events in progress	**5**	Return to process screen
2	Access to events history screen	**6**	Visualization of past events
3	Buttons to scroll messages	**7**	Return to screen of events in progress
4	Button to recover events data on USB stick		

6. Alarms register screen



Screen of alarms in progress



Screen of alarms history

Nr	Description	Nr	Description
1	Visualization of alarms in progress	**5**	Button to recover alarms data on USB stick
2	Access to alarms history screen	**6**	Return to process screen
3	Buttons to scroll messages	**7**	Visualization of past alarms
4	Button to acquit the alarms	**8**	Return to screen of alarms in progress

G. SERVICING RECOMMENDATIONS

When work is carried out on the UV reactor, ensure that the personnel are qualified and approved.

1. Recommendations for operations checking

The following points must be regularly checked in order to ensure the perfect operation of the UV reactor:

- Check the **operation of the lamps**: Green indicator lamp lit
- Check the correct operation of the **fans** in the electrical cabinet, so as to prevent any risk of overheating. Check that the grid is not obstructed.
- Check the good operation of the **flow controller** at least once a month: If the flow rate is interrupted (filter back-washing operation for example), the UV lamps must switch off automatically within 15 seconds, and restart 30 min after restarting the reactor.
- Check **UV intensity**: the display on the screen must indicate a value greater than 50%
- **Actuate the MANUAL cleaning system** on the UV reactor every day (not applicable for automatic systems: in this case check that the system is operating)
- Check the number of **lamp start-ups/stops** on the screen, which must be consistent with the number and frequency of the maintenance operations (filter back-washing, etc.).

If the UV intensity is faulty (<50%); do not perform the UV sensor calibration procedure which must only be carried out with: new lamp(s), clean quartz(es), clean UV sensor
Reminder: if the UV measure is carried out in W/m², the sensor calibration is useless.

2. Checking instructions and preventive maintenance

	OPERATIONS	FREQUENCY
1	Check the general state of the UV reactor	Once a week
2	**Replacement of the UV lamps**	When end of lifetime: • Either once a year, • Or the main UV alarm screen displays: UV intensity <50% • Or combined chlorine rate in the pool
3	Replacement of quartz sleeve seals	At each replacement of the lamp and at least once a year
4	Cleaning or replacement of the quartz sleeve Check presence of Teflon shim of the quartz sleeve	At each replacement of the lamp if necessary or at least once a year
5	Replacement of the scraper seals	Recommended at each lamp replacement
6	Check flow meter operation	At least once a week
7	Check operation of the fans: - Clean the grilles - Replace the filters (if applicable)	Cleaning: once a week Filters replacement: at least once a year
8	UV sensor cleaning	At each lamp replacement or at least once a year
9	UV sensor calibration (if measure in %)	At each lamp replacement. Only with a new lamp, a clean or new quartz sleeve, UV sensor cleaned
10	Check circuit-breaker operation	At least once a year
11	Check the tightness of: - terminals in the cabinet - connectors - UV lamps connections - earth connections	Recommended at each lamp replacement

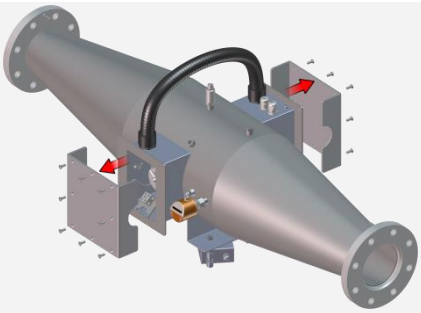
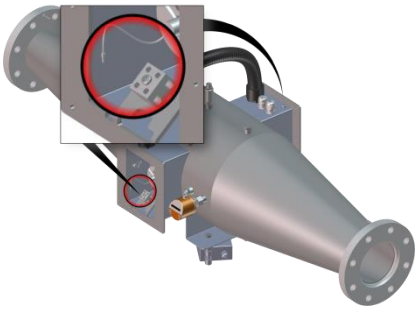
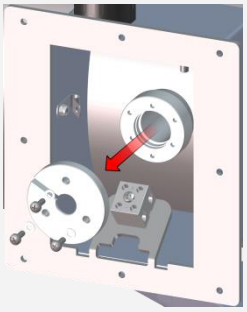
H. MAINTENANCE

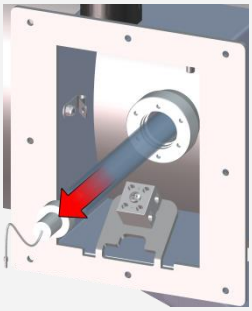
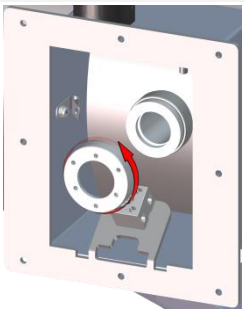
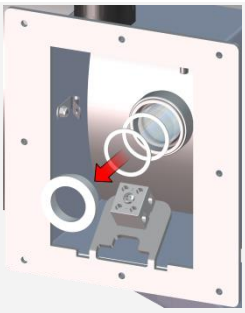
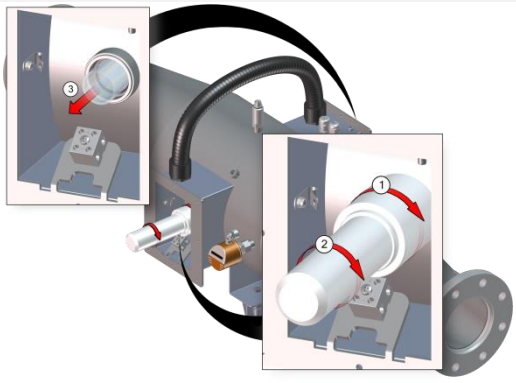
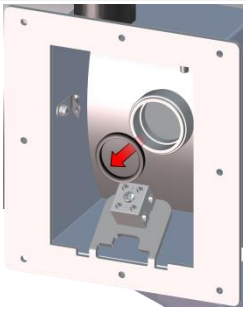
1. Dismounting UV lamp and quartz sleeve

- These operations must be carried out for:
  - The dismounting/changing of the lamp or the quartz sleeve
  - The checking/cleaning of the quartz sleeve
  - The replacement of the tightening seals of the quartz sleeve

- During the replacement of a lamp before its efficiency limit, we recommend to change all the lamps and to keep those still valid for the next repairs.

- Before any operation on the device, the touch screen should be in mode “LOCAL” and “MAINTENANCE”

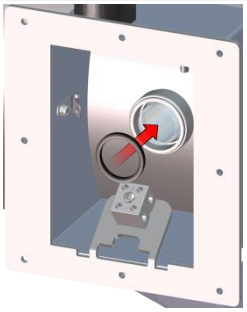
1		Make sure to have at least one set of new quadring seals in spare before starting the operations
2		**Stop the lamp, then the electrical cabinet, at least 15 minutes before operating on the reactor**
3		**Open the bypass** **Isolate and drain the reactor. If the reactor is horizontal, unscrew the upper and lower draining plugs**
4		Unscrew and remove the 2 reactor covers.
5		Remove the cables from the lamp on both sides of the reactor (only the white cables supplying power to the lamp).
6		On each side, remove the lamp supports by unscrewing the 3 screws.

7		Mark the number of each lamp (see Table of lamp cabling) so as to re-wire the new lamps correctly.
8		Remove the lamp and lay it on a clean and smooth surface. **Carry out this operation carefully** without touching the glass on the lamp with your hands.
9		On both sides of the reactor, unscrew the stainless-steel nuts
10		Remove the shims and the PTFE rings on both sides.
11		To get the quartz sleeve out, use first the quartz dismounting tool following these steps: 1. Screw the tool at the place of a knurled nut 2. Screw the handle of the tool until the quartz unsticks from the quadring seals from at least 2mm 3. Remove the quartz dismounting tool and finish to get carefully the sleeve out with the hands, while remaining well aligned with the axis
12		**Clean the quartz sleeve** with acid or white vinegar or replace it if necessary (throw away the old quadring seals)
13		Remove the quadring seals on each side

14

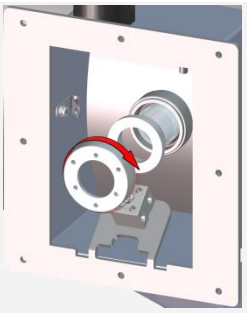
Keeping exactly in the centre, insert the clean quartz sleeve into the reactor **observing the assembly direction shown** on the label on the body of the equipment. Centre the quartz sleeve so that it projects out equally on both sides.

15



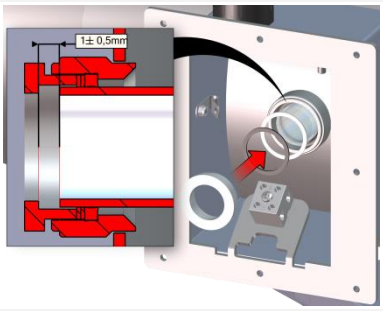
Soap or grease (silicon, food grease) the new quadring seals.
Install them cautiously on each side of the reactor, without tool.

17



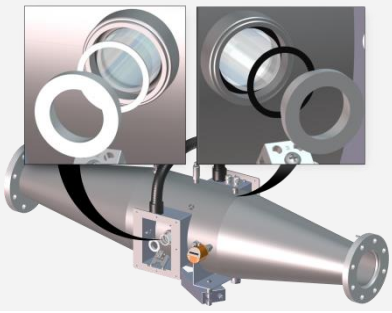
If the quartz sleeve has not been replaced, skip directly to step 19.
On one side only, fit the PTFE ring and screw on the stainless-steel nut by hand without the shims.

18



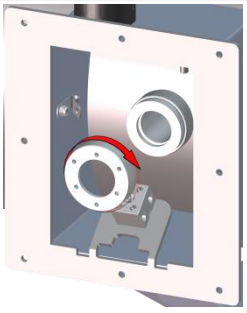
Place the second PTFE ring on the other side.
The longitudinal gap between the quartz and this ring must be about 1 mm +/- 0,5.
According to the size of this gap, use the different combinations of shims supplied in the kit to fill the surplus gap by inserting shims. In this kit, 3 types of shims can be found: 1mm, 2mm or 3mm.

19

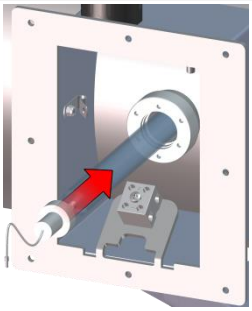
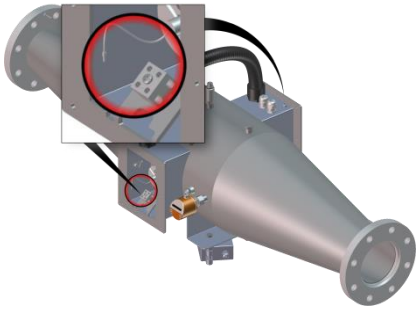
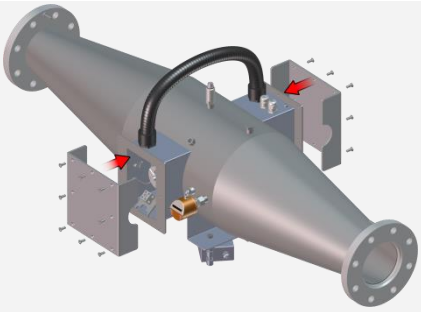
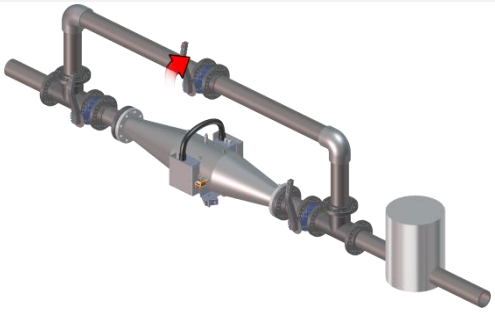


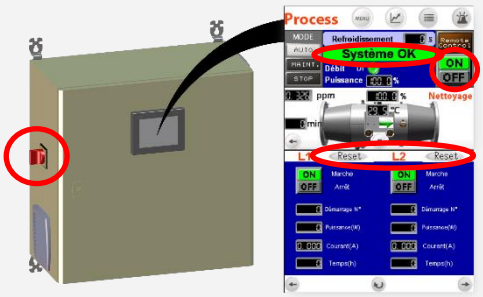
Split up the shims on each side, then mount the PFTE rings on each side of the reactor.

20



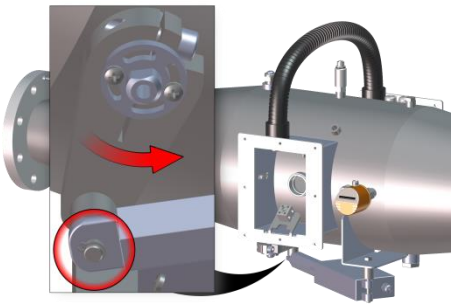
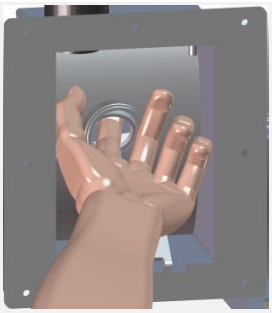
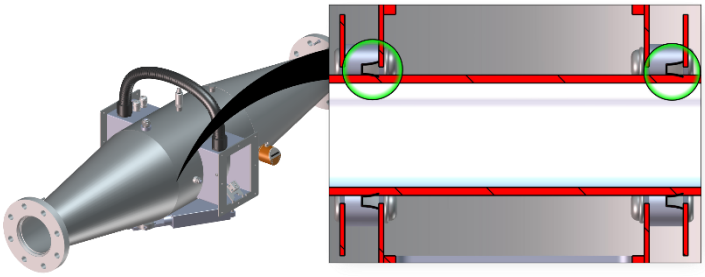
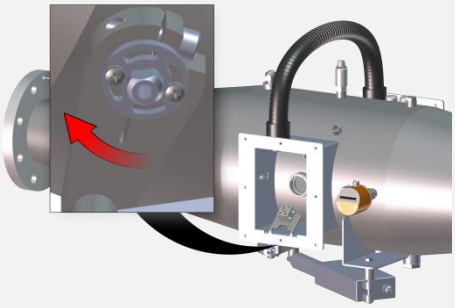
On each side of the reactor, screw the stainless-steel nut with hands.

21		If the reactor is horizontal, screw back the lower draining plug and unscrew the upper draining plug. Fill the reactor with water and then tighten the upper draining plug as soon as water escapes from the draining hole Let the installation under pressure **before** the reassembly of lamps and **check during at least 5 minutes that there is no leakage in the quartz sleeve**.
22		Take hold of the new lamp taking care not to place your fingers outside the cap. (if you do, clean the lamp with a soft cloth and some methylated spirits). Carefully and fully insert the lamp into the quartz tube.
23		On each side, mount the lamp supports by screwing the 3 screws. Position the lamp support in order to make the slot facing down
24		Reconnect the UV lamp with the same numbering and cabling of the lamps (See **C.5.d.)Lamps wiring**,page10).
25		Reposition and screw on the two reactor covers.
26		If the by-pass is in the open position, to isolate the system, close it again to allow the water to circulate after opening the inlet and outlet valves.

27		Push up the breakers and switch On the main power switch to electrically supply the cabinet. Please refer to the user manual of the touch screen for the following operations: • Acknowledge error messages • Start the lamp. • Check the lamp is ON • Check the system is correctly operating (Flow, alarms...). • Rest counter (Only if the lamp has been changed).
28		After each installation of a new lamp, do not forget to recalibrate the UV sensor and to check the flow controller if installed. If the UV sensor gives a measure in W/m², this calibration is useless.
29		The device is ready for operation.
30		Do not just throw the old lamps in the waste bin because they contain mercury and must be recycled.

2. Replacement of scraper seals of the cleaning system

The wiper seal has two faces, which are easy to identify: - one has a flat white surface, - the other has a metal reinforcement.	

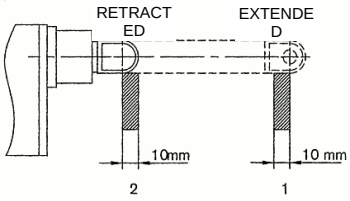
1	**Carry out all the lamp and quartz sleeve disassembly operations.**
2	 Use the handle of manual cleaning to draw the carriage **to you** as far as the mechanical stop. To do the same thing in case of an automatic cleaning system, disconnect the motor by removing the circlips
3	 Using your index finger, take hold of the wiper seal and disengage it from its housing. (The wiper seal is flexible, do not hesitate to squash it into an oval shape in order to remove it) **Note the mounting position** of the scraper seal already in place**.**
4	 Take a new scraper seal. With your index, introduce the new scraper seal into its housing by respecting the direction of assembly. The both scraper seals must be mounted in the same direction 
5	 For the 2nd scraper seal, move the cleaning carriage to the other end. Repeat the previous operations for the scraper seal replacement.
6	**Carry out every lamp and quartz sleeve remounting operations.**

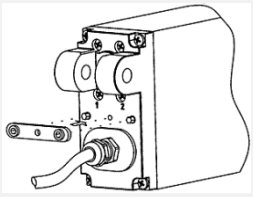
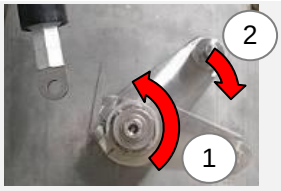
3. Setting the electric actuator stops (automatic cleaning option)

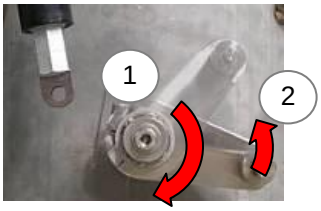
If the electric actuator of the cleaning system is replaced, it is necessary to readjust the actuator stops. This operation is explained in the procedure below.

Careful:

The beginning and end of the piston stroke may be adjusted by a maximum of 10mm.



1		Unscrew and remove the locking bar on the actuator stop set screws.
2		Engage the actuator with the casing on the reactor side (do not close the circlips for the moment).
3		1- Move the arm of the cleaning system by hand to the "retracted" position. 2- Then move it back by a few degrees so as to have at least 1 centimetre between the cleaning mechanism and the inside of the equipment body.
4		Assess the distance to be made up between the piston attachment pin and that of the arm.
5		Turn end of stroke set screw number 2: - In the " + " direction to move the piston into the actuator. - In the " - " direction to move the piston out of the actuator. One turn of the screw represents approximately a change of 1mm of the piston's stroke. Remark: a 6mm Allen key is required for this operation (if not use the locking bar).
6		Switch the automatic cleaning system off and on from the MIII monitor. Wait until the end of the electric actuator cycle and try to attach the piston to the cleaning system arm. The attachment of the actuator to the cleaning arm must be carried out easily without forcing it, if this is not the case then repeat the above steps to improve the adjustment
7	When the "retracted" position has been adjusted, set the "extended" position:	

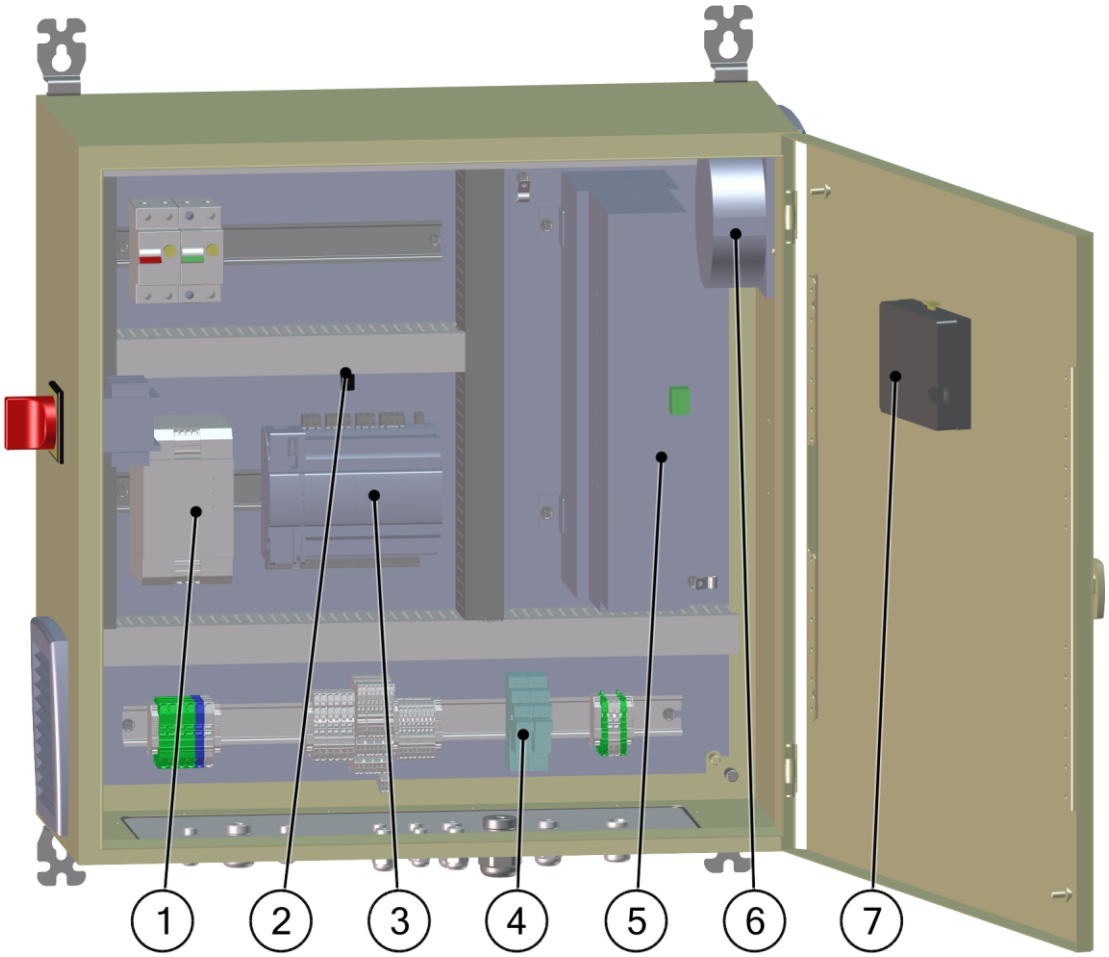
8		1- Move the arm of the cleaning system by hand to the "extended" position. 2- Then move it back by a few degrees so as to have at least 1 centimetre between the cleaning mechanism and the inside of the equipment body.
9	Disconnect the cable "I5" (24Volts dc) from the electric actuator box.	
10	Switch the automatic cleaning system off and on from the touch screen.	
11	Assess the distance to be made up between the piston attachment pin and that of the arm.	
12	 "Too far out"	**If the piston is extended too far**, turn the set screw number 1 in the " - " direction so that the piston is "too far in". Reconnect the cable " I5 " to allow the piston the come back to the "retracted" position. Then disconnect this cable again and switch on the automatic cleaning from the MIII monitor. If the piston is too far in, go to the next step or repeat this step.
13	 "Too far in"	**If the piston is too far in,** turn set screw number 1 in the " + " direction until the Piston/Arm attachments are perfectly aligned. → Any movement of the set screw simultaneously moves the piston (only in the "+ » direction) The attachment of the actuator to the cleaning arm must be carried out easily without forcing it, if this is not the case then repeat the above steps to improve the adjustment.
14	Once the setting of the two stops has been adjusted, **reconnect** the cable " I5".	
15	Fix the electric actuator to the reactor with the circlips and switch the automatic cleaning back on from the touch screen to check that the system is operating correctly.	

I. MAINTENANCE FILE

CAUTION:
This sheet must be kept up to date.
It provides a record of the **reactor's operating cycle**.

Date	Action	done by

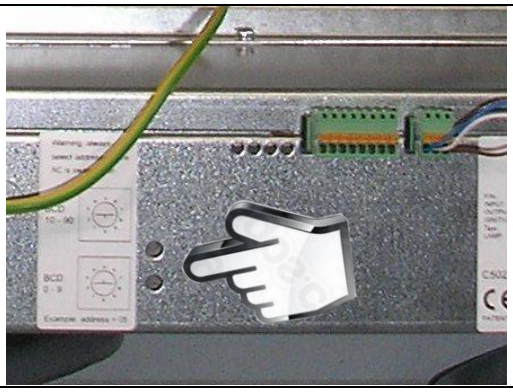
J. ELECTRICAL DESCRIPTION



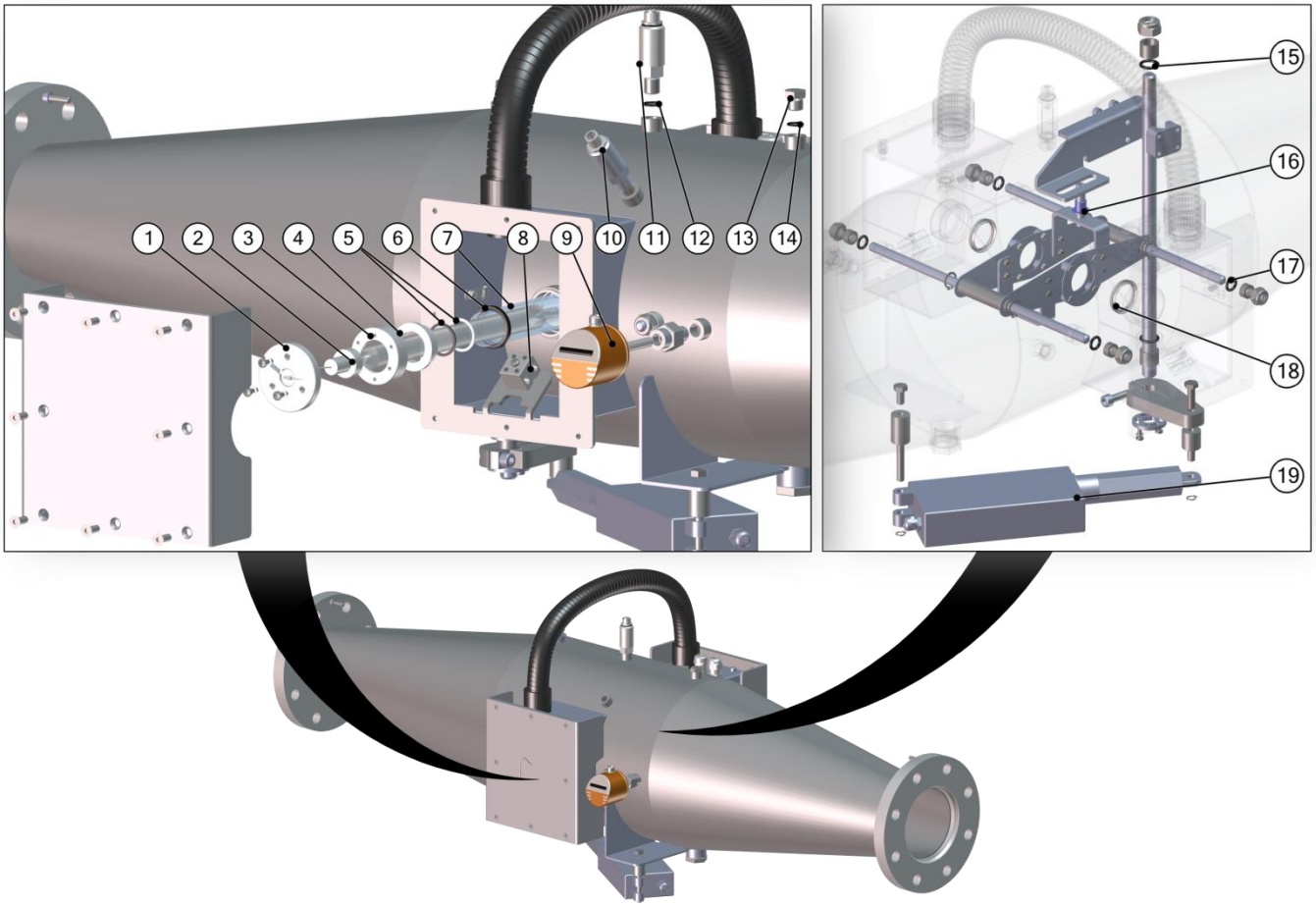
N°	Designation	TAG	CODE
1	24VDC supply	U1	ELE004934
2	Probe NTC 10Kohm	R1	ELE007897
3	PLC M172	I0	ELE013953
4	Relay for automatic cleaning (option)	KA1	ELE001060
5	Ballast	B	BAL007896
6	Fan (see models on the electrical diagram)	M1	ELE000894 (filtering element: ELE015098)
7	Touch screen 5.7in	I1	ELE013943
	USB stick 4GO	-	ELE008077

Ballasts addressing

Address ballast when power is OFF		
Ballast Address	BCD 0-9	BCD 10-90
Ballast 1	1	0
Ballast 2	2	0
Ballast 3	3	0
Ballast 4	4	0
Ballast 5	5	0
Ballast 6	6	0



K. EXPLODED VIEW



N°	Designation		MP100	MP125	MP140	MP240	MP340	MP440
1	Lamp support ring		PIE000500					
2	UV lamp		LPE000010	LPE004371	LPE004372	LPE004372	LPE004372	LPE004372
3	Stainless steel nut		USI000019					
4	PTFE ring		PIE000487					
5	PTFE Shim kit		PDP003478					
6	Quadring seal		JTS000098					
7	Quartz sleeve		QUA007124	QUA007124	QUA002693	QUA002693	QUA002693	QUA002693
8	Ceramic terminal		ELE000068					
9	Flow controller		ELE000057					
	Flow controller cable		ELE000306					
10	Temperature sensor		ELE002289					
	Temperature sensor cable		ELE002701					
11	Display in %	UV sensor	ELE014094				ELE014301	
		UV sensor cable	ELE002800					
	Display in W/m²	UV sensor	Contact ATECPOOL	ELE007269			Contact ATECPOOL	
		UV sensor cable		ELE011647-10M				
12	O-ring		JTS000230					
13	Draining plug		ACC000410					
14	O-ring		JTS000230					
15	O-ring		JTS000095				JTS000584	
16	Bushing		STD001265					
17	O-ring		JTS000094					
18	Scraper seal		JTS000099					
19	Electric actuator		ELE000691					

L. TROUBLESHOOTING AND ALERT MESSAGES

1. Alarms

Alarm

The following message appears on the process screen for all alarm messages
The alarm messages are always shown in the Alarm menu:

Display	Meaning of the alert	Solutions
Alarm: Ballast fault (X)	This message appears when there is a ballast defect or a communication problem between the Ballast and the PLC. The “x” indicates the defective ballast	• Perform a diagnosis to determine the origin of the failure.
Alarm: Ballast missing (X)	This message appears when a ballast is no longer detected by the PLC. The “x” indicates the defective ballast	• Check ballast connection • Check ballast addressing and/or ballast model
Alarm: Lamp(x) fault	This message appears when one or several lamps are faulty. The numbers indicate the defective lamp.	• Perform a diagnosis to determine the origin of the failure.
Alarm: Cabinet temperature	This message appears when the cabinet temperature exceeds 40°C. The reactor is stopped automatically.	• Check that the cabinet's ventilation slots are not blocked. • Check that the fans are operating correctly.
Alarm: Cleaning	This message appears when the automatic cleaning system did not complete its cycle in time or jammed because of a too high load level.	• Check the cleaning system is not jammed by an element inside the UV reactor • Check the nut of the trapezoidal screw (part which drive the trolley on the trapezoidal screw) is not damaged or broken
Alarm: Reactor temperature	This message appears when the reactor temperature exceeds 55°C. The lamps are automatically stopped.	• Check that the flow rate in the installation is sufficient. • If a flow meter is installed, check it is correctly calibrated.
Alarm: UVI too low	This message appears when UVC radiation intensity falls below the alarm threshold.	• Check the cleanliness of the quartz sleeves. • Check the cleanliness of the UV sensor. • Replace the UV lamp(s).
Alarm: No flow or flow rate too low	This message appears when there is not enough flow into the reactor.	• Check your installation to check if the reactor has not been by-passed.
Alarm: Overflow	This message appears if the flow rate is higher than the maximum treatment flow rate of the device.	• Adjust your flow rate
Alarm: No remote TCP	This message appears when a communication low occurs between the ATECPOOL device and your Modbus TCP connection	• Check wiring or switch off Remote control TCP
Alarm: UV sensor (only 4-20mA), or combined chlorine analyser	This message appears when the sensor is defective or not wired	• Check the sensor is well wired

2. Warnings

Warning The following message appears on the process screen for all warning messages

The warning messages are always shown in the Alarm menu:

Display	Meaning of the alert	Solutions
Warning: Cabinet temperature	This message appears when cabinet temperature exceeds 35°C	• Check that the cabinet's ventilation slots are not blocked. • Check that the fans are operating correctly.
Warning: Reactor temperature	This message appears when cabinet temperature exceeds 40°C	• Check that the flow rate in the installation is sufficient.
Warning: Low UVI	This message appears when UVC radiation intensity falls below the warning threshold.	• Check the cleanliness of the quartz sleeves. • Check the cleanliness of the UV sensor. • Replace the UV lamp(s).
Warning: Low flow	This message appears when there is few flow into the reactor	• Check your installation to check if the reactor has not been by-passed.
Warning: Waiting for USB stick	This message appears when datalog USB stick has been removed	• Check USB stick is present on the back of the screen
Warning: High flow	This message appears when if the flow is slightly higher than the maximum treatment flow rate of the device.	• Adjust your flow rate