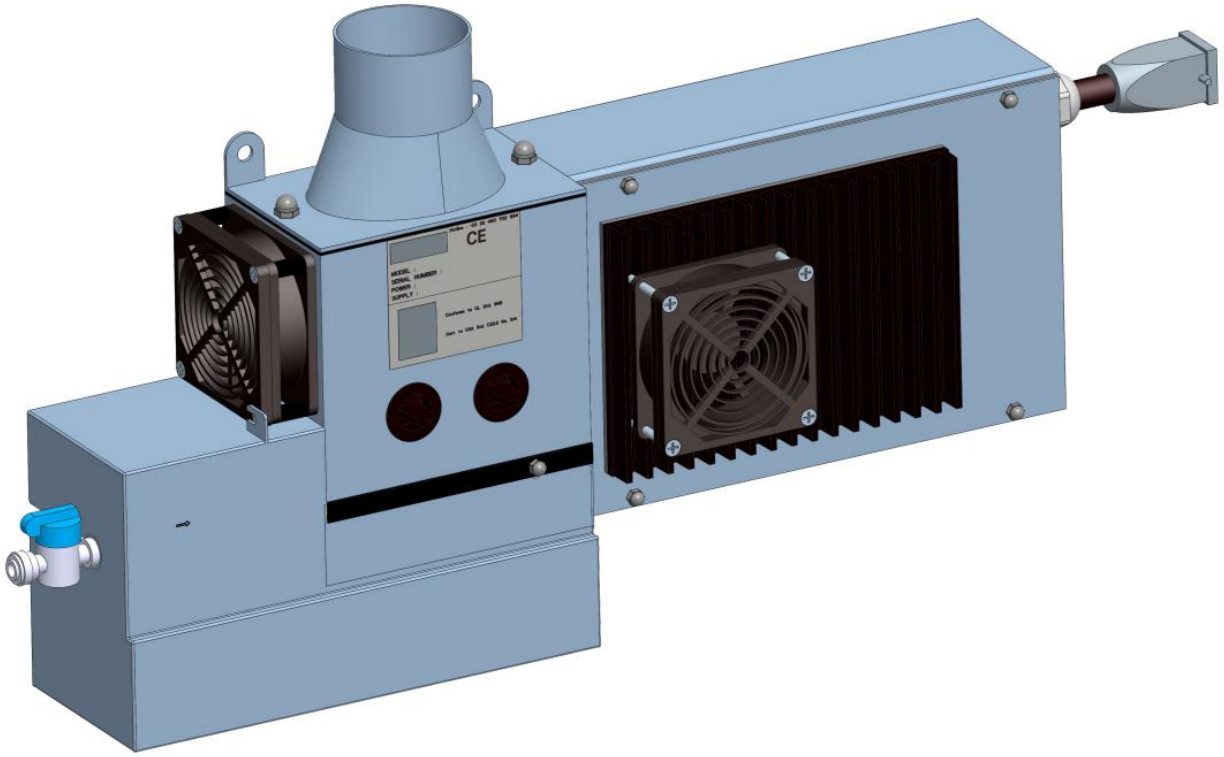
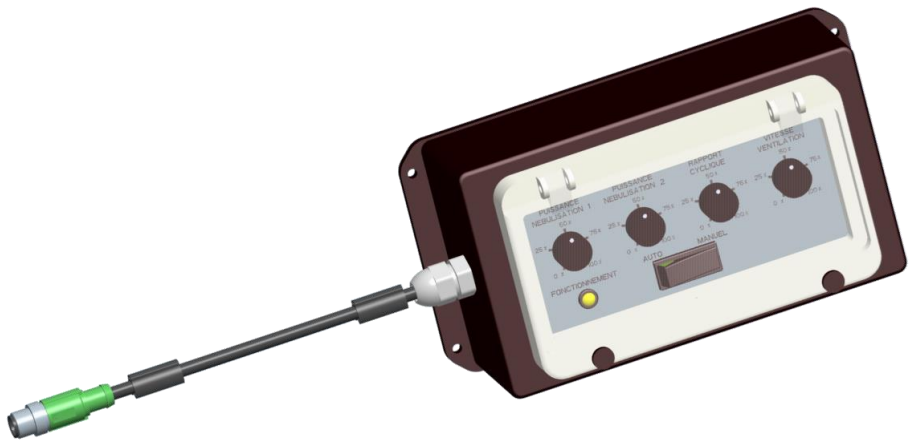
USER MANUAL
FOR HUMIDITY GENERATORS
ODV7 / OD V7+ UL





READ AND SAVE THESE INSTRUCTIONS

Document version	Type of machine	Creation date / Revision date	Creator / Modifier
1.2	OD V7+ UL	08/03/2016	ALT / CG
2.0	Update OD V7 & OD V7 +	15/02/23	RTA / FR

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I. Technical description:

Mechanical data:

- Dimensions (inch) Length*Width*Height
- Weight (lbs)
- Material
- Power supply box (inch) : 11 x 8 x 3
  Power supply box : ABS or Galvanised steel
  Power supply Weight (lbs) :
  ABS : 4.4 lbs / Steel : 8.8lbs

OD
24.9*5*12
11.9
stainless steel 304L and 316L, passivated, brushed or machined according to the part

Humidification data:

- Generation frequency: 1.66 MHz (95% of droplets are less than 5µm)
- Flow rate (gal/h) at 77°F (without outlet tube and external ventilation)

ODV7+
Up to 0.8

- Maximum water temperature in operation: 158°F during the decontamination cycle
- Flow rate control: By control unit: knobs for adjusting the operating cycle ratio, fogging power and ventilation speed.
- Humidity control: *By mechanical humidity controller **
  *By PID regulation with analogue humidity sensor **
- Temperature control: Real time control of water temperature

Hydraulic data:

- Draining the device: Automatic by NO solenoid valve with pinching of Ø 15/64 in tube
  Draining on stopping and by cycles
  Drain outlet nipple Ø 10/32 in
- Filling the reservoir: Automatic by stainless steel solenoid valve 5/64 in, 14.5PSI (1.2 MPa).
  Inlet tube ¼" John Guest quick-disconnect fitting
- Reservoir capacity: 0.13 gallons
- Water circuit: Stainless steel or food-quality plastic (polypropylene, silicon)
- Filtration: *Osmosis membrane 74 gallons/day **
- Disinfection: Decontamination by automatic thermal shock and rinsing
  Requirement of the order dated 23 June 1978 on fixed installations intended for water supplies in public places

The options are marked in italic and with the symbol *

Electrical data:

- Power supply voltage (V)

OD
24

- Heating resistance protected by fuse (A) 10
- PLC protection (+ inputs/outputs) by fuse (A) 2

- Machine power (W) : 150
- Consumption in operation (Wh) :
  On standby, outside operation times : 30
  Fog system with knob and ratio cycle at 100 % : 115
  Heating : 150

Software data:

- Controlled by PLC — Programmable on / off
  Memorisation of events
- Operating fault generated — Water loss
  Generation failure
  Non-effective draining
  Water temperature too high
  Heating cycle operation
- Human machine interface — Control unit (auto/manual mode, operating LED and flow rate adjustment knobs) or by *offset screen **

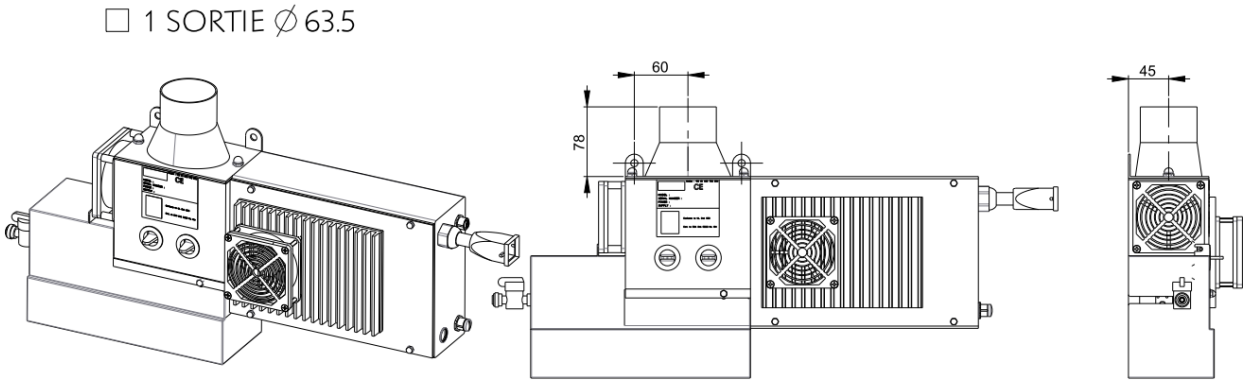
Air data:

- Ventilation

OD
One electronics cooling fan and one fog extraction fan (ventilation speed adjustment is possible)

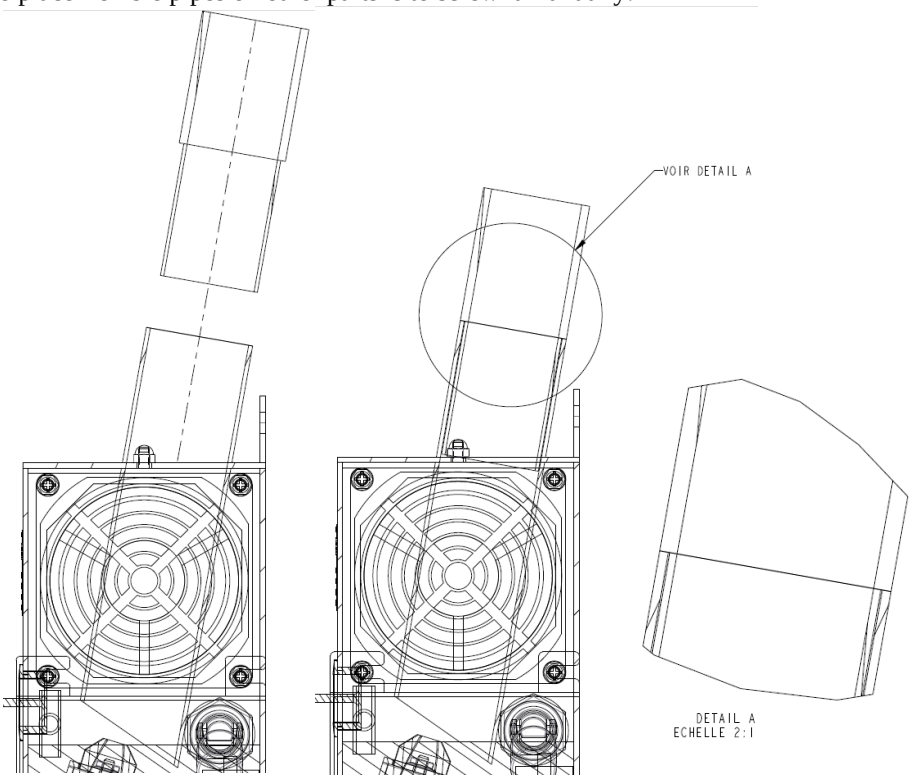
- Extraction, possible options:

2 stainless steel tubes Ø 1.57 in	1 stainless steel tube Ø 2.48 in	2 stainless steel elbow tubes Ø 1.57 in



Sealing extraction and device backflow:

Insertion of a manufactured PVC pipe into the diffusing exit. This permits a quick waterproof plug and play connection avoiding leaks. Flexible pipes are linked to the PVC pipe or directly on the diffusing exit (so silicone paste is needed for sealing).
The easiest way to place flexible pipes on other parts is to screw it manually.



Other data:

- Operating temperature — 33.8°F to 95°F (for below 32°F please consult us)
- Storage temperature — -4 to 158°F (without water)
- Certification and standards — RoHS validation
  WEEE declaration of conformity
  NF 60335 (Safety of household and similar electrical appliances)
  Order dated 23 June 1978 on fixed installations intended for water supplies in public places

The options are marked in italic and with the symbol *

II. Implementation:

1. Layout and spaces:

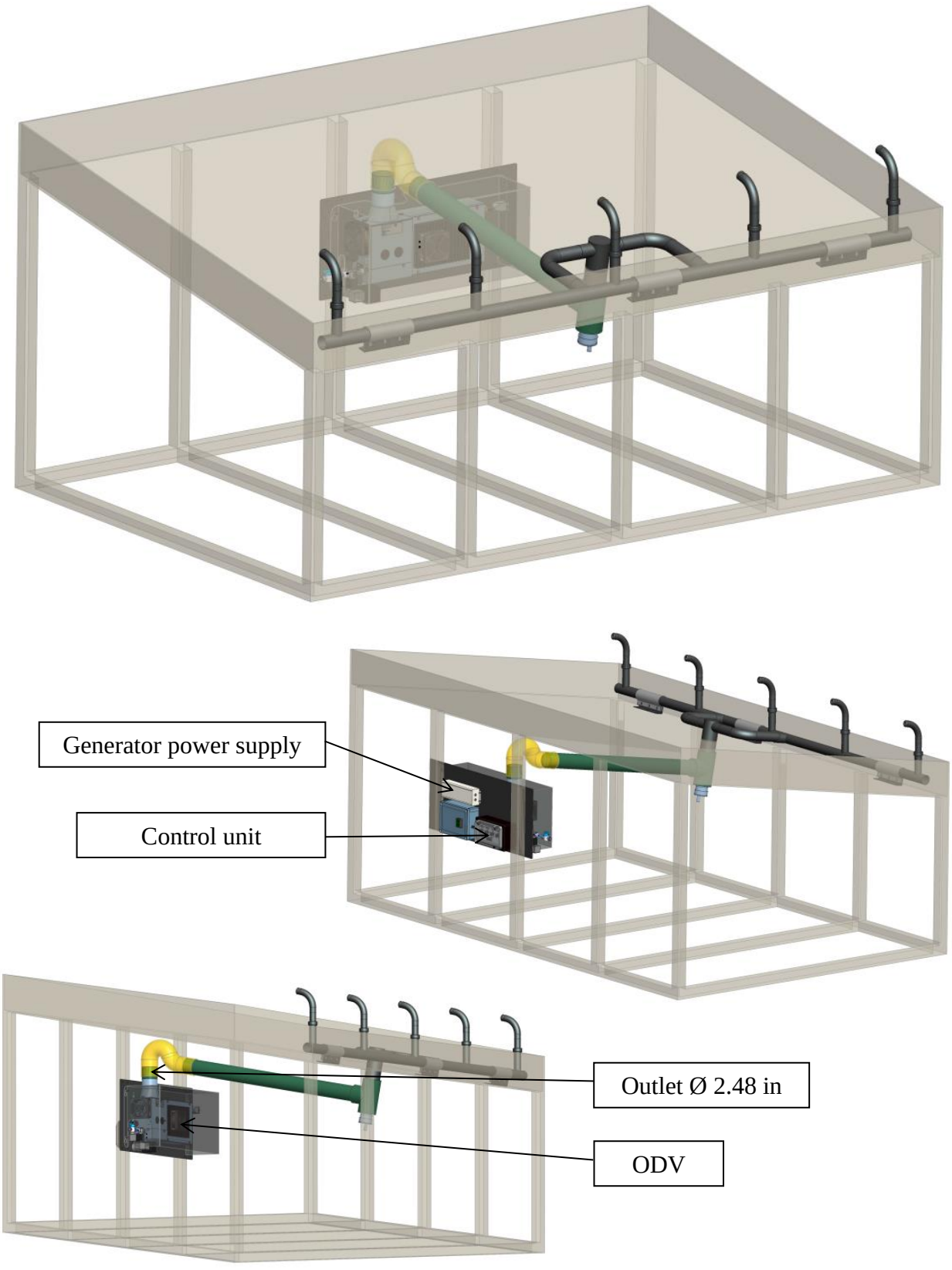
- The device should be put on a support with maximum angle +/- 1° horizontally and vertically, or directly on the furniture.
- The control unit should be located in a zone with easy access for the client to adjust the system.
  To comply with the machine IP rating, follow these instructions when installing the machine:
  - Attach the machine to a solid plate.
  - Use the appropriate fixing holes of the control unit and the ODV.
  - Attach these items with M4 screws for the control unit and M8 for the ODV.

- Provide three electric socket outlets 110V/60Hz with 20A protection, 30mA differential near the device:
  - One socket for the generator power supply.
  - One socket for filtration power supply.
  - One socket for the lift pump (optional).

- One water filtration kit is available with optional suppressor. Install it near the control unit and the electric socket outlets.
- Provide a cold water supply (temperature < 64°F) with constant pressure between 58 and 87 PSI (0.4 MPa to 0.6 MPa) with a female 3/8" valve (12/17) near the filtration kit.

- Provide a PVC outlet Ø1.57 in with siphon, under the installation. If not, as an option, a lift pump is available.
- As the device drains by gravity, we recommend a minimum height of 2 in between the drain outlet and the siphon input. The overflow is also to be connected to the siphon. According to the configuration of the machine layout, the drain water can be output to an evaporation-pan.
- If a non-dedicated wastewater circuit is used, make a draining rupture, to avoid any contamination of the device.
- Do not put any obstacle within one metre of the droplets outlet.
- Do not locate above wires or electrical devices.
- Do not use materials that can corrode in demineralised water in the zone that the device is liable to make wet.
- In preference, put an elbow on the outlet, to guide the droplets. A hose can also be connected, note that this entails a loss of flow rate. This will depend on the tube diameter, its surface state (prefer a smooth tube and avoid tight elbows) and the fan flow rate. Note that the flow rate does not increase with the ventilation speed.

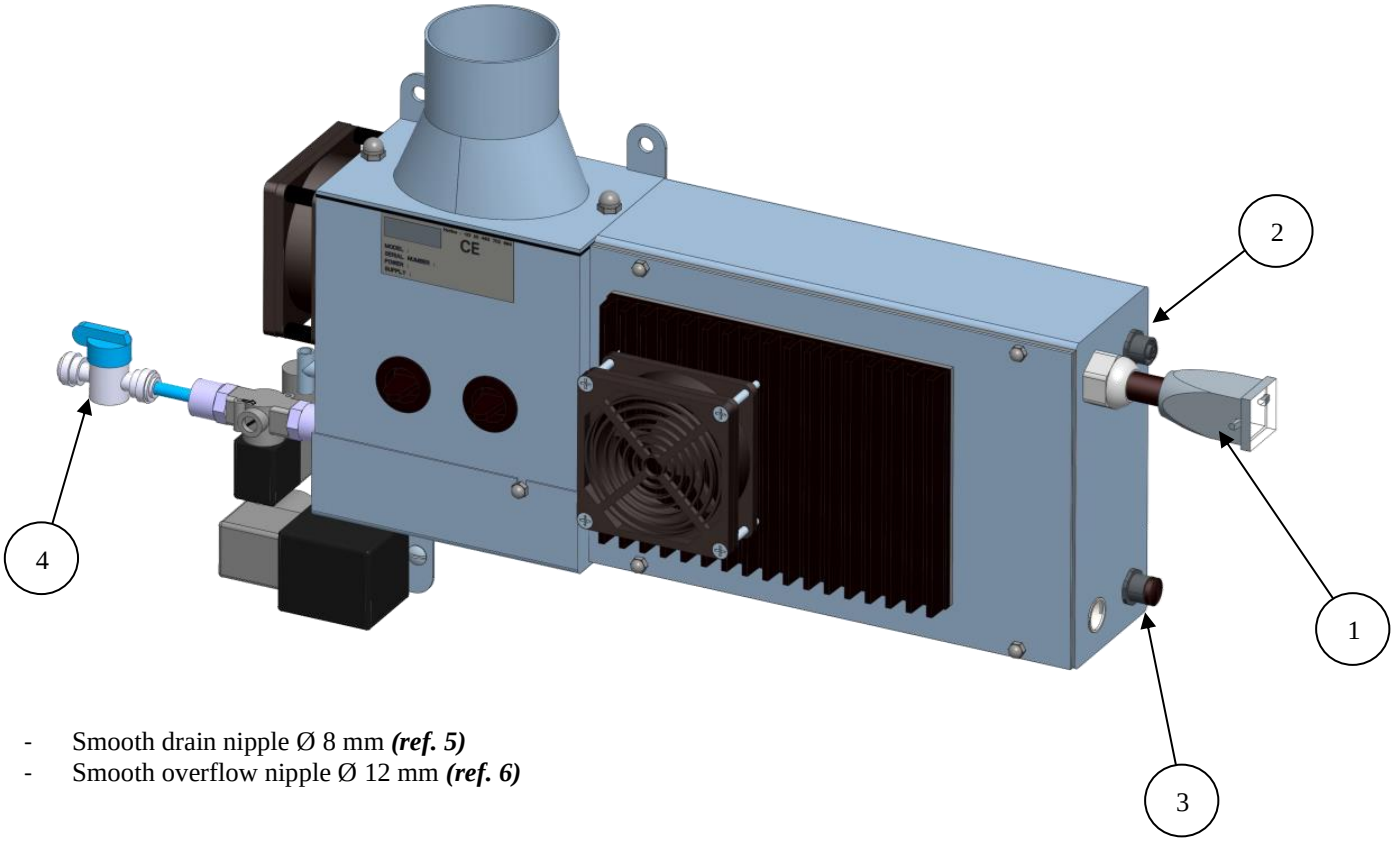
INSTALLATION EXAMPLE:



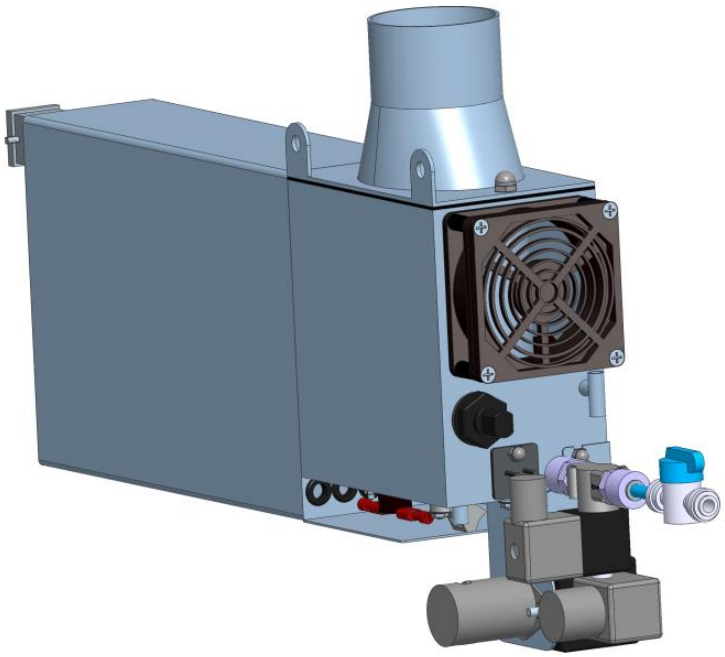
2. Connections:

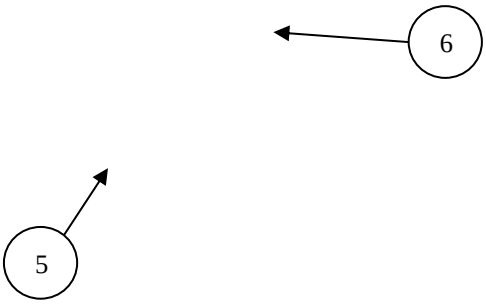
a. ODV:

- Cable gland power supply ***(ref. 1)***
- Female connector M12 8pts Control unit ***(ref. 2)***
- Female connector M12 8pts Technician unit ***(ref. 3)***
- Quick-disconnect water inlet fitting for tube Ø ¼" (John Guest©) ***(ref. 4)***



- Smooth drain nipple Ø 8 mm ***(ref. 5)***
- Smooth overflow nipple Ø 12 mm ***(ref. 6)***

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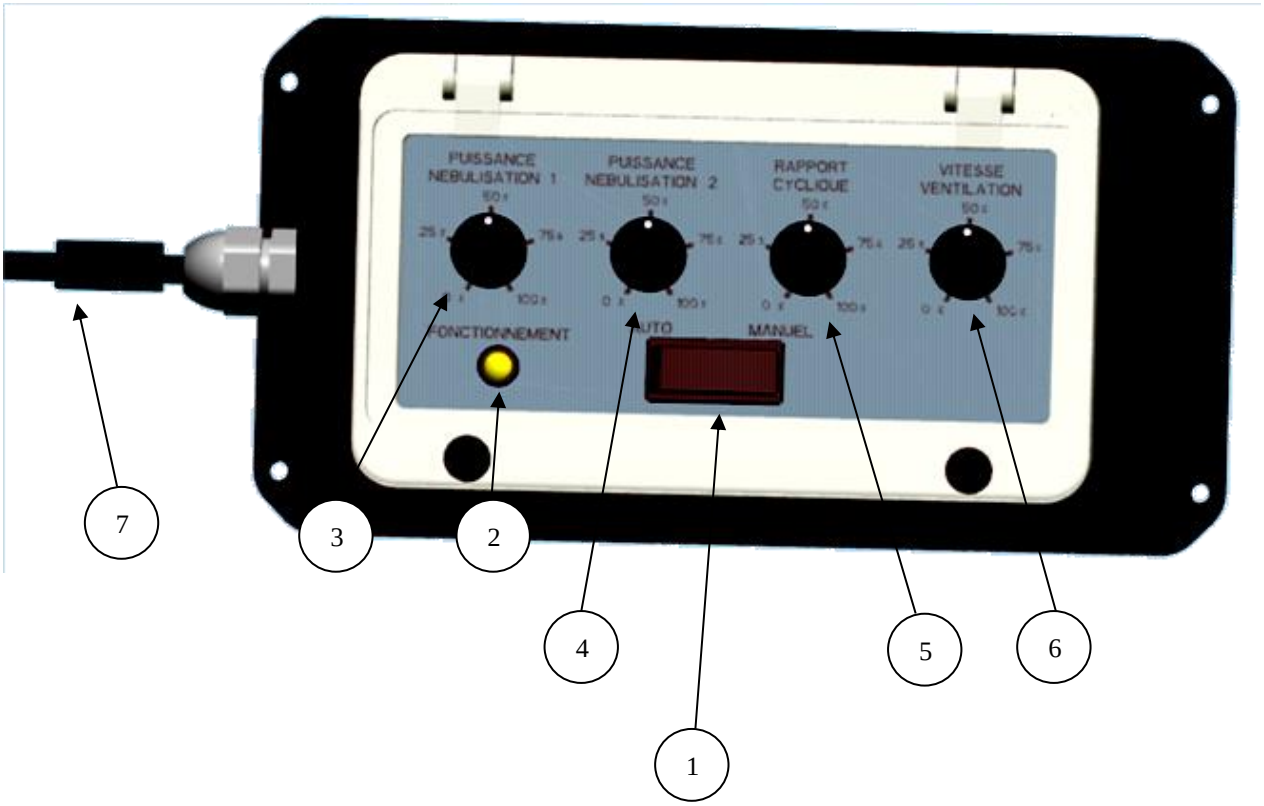
b. Control unit:

- Auto/Manual button ***(ref. 1).***
- Operating LED indicator (indicates faults according to the flashing) ***(ref. 2)***
- Fogging power setting knob Track 1 ***(ref. 3)***
- Fogging power setting knob Track 2 ***(ref. 4)***
- Cycle ratio setting knob (Optional => Cycle ratio setting knob Track 1) ***(ref. 5)***
- Ventilation speed setting knob (Optional => Cycle ratio setting knob Track 2) ***(ref. 6)***
- Connector M12, machine cable link ***(ref. 7)***

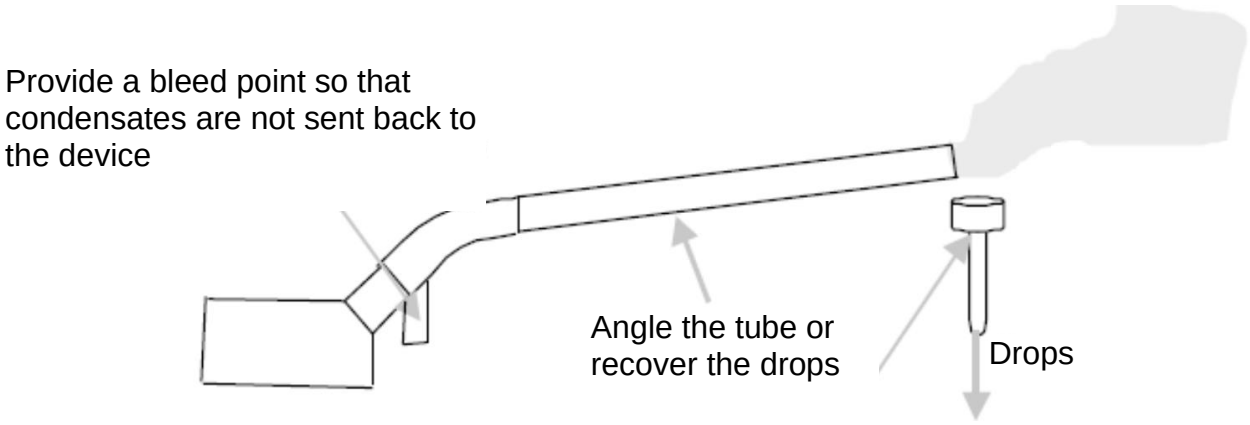


c. Fluid:

Use demineralised water TH< 35; if above, provide pre-filtration. As an option, ARECO supplies a filtration designed to deliver excellent quality water to the machine.

d. Fog outlet:

A tube diameter 2.48 in or 1.57 in should be connected to the stainless steel tube outlet.
Bond the end fittings with a seal that can be removed and is food-quality.
A longer sleeve can be connected to convey the fog over a greater distance. Provide a reverse slope to prevent drops from running. In this case, for reasons of hygiene, it is preferable to provide a return water outlet with a siphon system as shown in the figure below.
In this case, a small loss of flow rate of about 5% per metre of tube is found; prefer smooth tubes to limit these losses. (see Figure above). With the standard fan, supplied with the device, it is not recommended to use a length of tube more than 39ft.



e. Settings:

Fogging power: power setting of two separate tracks.

Cycle ratio: setting of the fogging time based on 30 seconds (by default).
e.g. Setting 35% => fogging: ON 10s / OFF 20s.

Ventilation speed: setting of the diffusion fan speed, which acts on the fog output speed.

Auto/Manual mode: Auto mode enables fogging operation according to the programmed times, while manual mode forces fogging (operation 24h/24h). However, the heating cycle always takes priority; thus it runs in all cases at the programmed times.

3. Starting the generator:

- **Step 1:** Connect the generator power supply to the grid.
- **Step 2:** Wait for 10 minutes and for the machines to fill.
- **Step 3:** Set the running time value (Knob 3).
  Set the ventilation speed (Knob 4).
- **Step 4:** Set the fogging power of each track (Knob 1 and 2).
- **Step 5:** Check that the fog system operates.

If not:

- Check that the "cycle ratio" knob is not set on 0%, and wait at least 30 seconds to get a full fog system cycle.
- Check that the PLC time is correctly within the machine operating times.
- If you are outside the default operating times, set the machine to Manual operation.
- Check the correct operation of the blower fan.

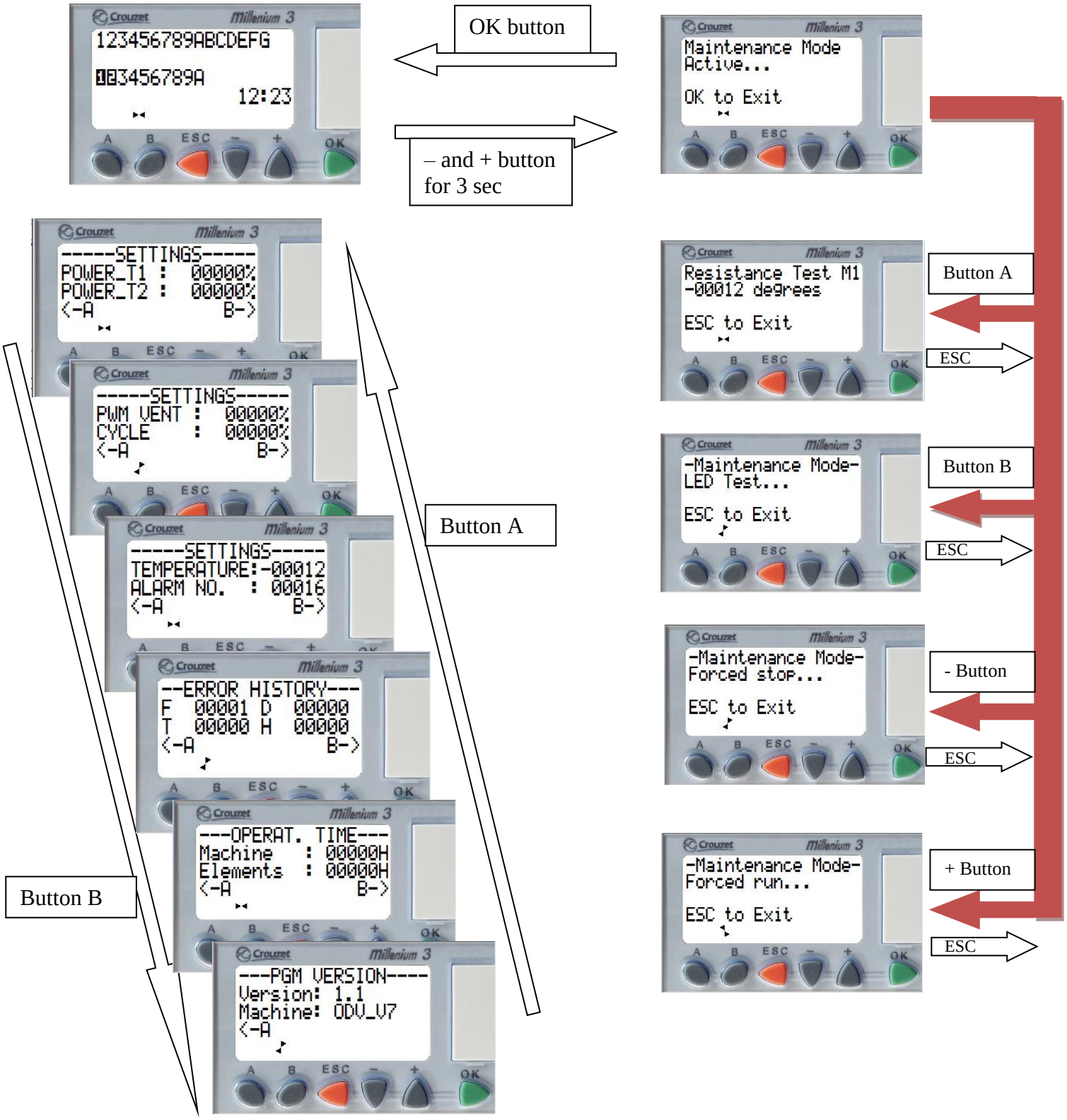
III. Description and configuration of the PLC:

1. Layout of the inputs/outputs:

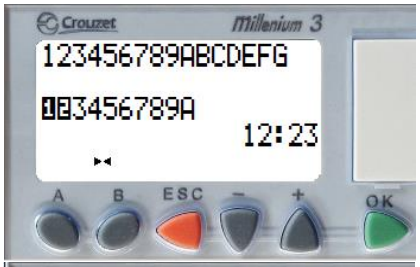
PLC XB26 static outputs			
Inputs:		***Outputs:***	
I1	Float	**O1**	Filling Solenoid valve
I2	Auto/Manual switch	**O2**	Draining Solenoid valve
I3	Humidity Controller Option	**O3**	Control Relay Track 1
I4	NC	**O4**	Control Relay Track 2
I5	NC	**O5**	Immersion Heater Control Relay
I6	NC	**O6**	Diffusion fan (PWM)
I7	NC	**O7**	Operating indicator
I8	NC	**O8**	NC
I9	NC	**O9**	NC
IA	NC	**OA**	NC
IB	NTC sensor		
IC	Card error		
ID	Cycle Ratio Knob		
IE	Ventilation PWM		
IF	Power Track 1		
IG	Power Track 2		

2. Menu display structure:

0251741696 Requires offset screen



3. Diagnostic menu:

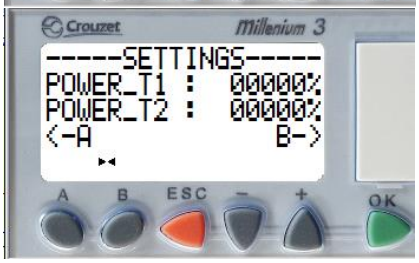


Access by pressing the 

button, whichever menu is activated.

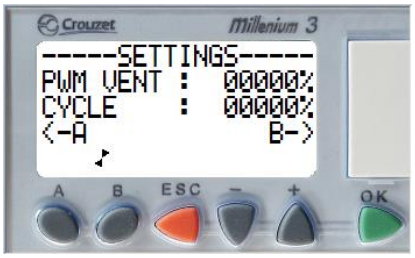
This menu shows the state of the PLC inputs and outputs and the controller time.

4. Settings menu:



Access with one press on the 

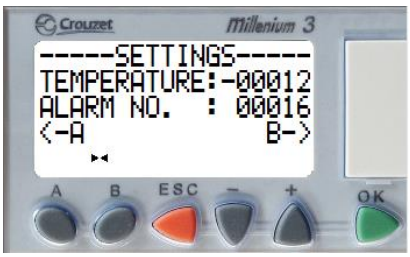
button from the default menu.
Displays the fogging power for each of the tracks.
Modification of values only by the control unit knobs.



Access with two presses on the 

button from the default menu.
Displays the ventilation power and the cycle ratio.
Modification of values only by the control unit knobs.

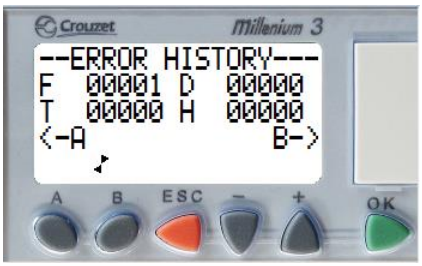
The time base for the cycle ratio can be adjusted in the parameters menu:
MACRO 009 FBD 002, its default value is 100 seconds.



Access with three presses on the 

button from the default menu.
Displays the current water temperature reading and any fault present.

5. Error history menu:



Access with four presses on the 

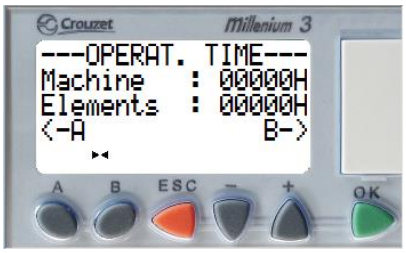
button from the default menu.
Gives the history of errors arising during machine operation (F: float, D: draining, T: temperature, H: heating).

To reset the counters, press the 

button for 3 seconds.

Note: For maintenance or troubleshooting, reset all the counters.

6. Operating time menu:



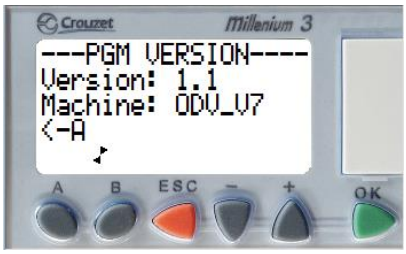
Access with five presses on the  button from the default menu.
Gives the history of the operating times of the actuators: elements and machine. The displayed time unit is the hour.

Machine counter: Press the  button for 3 seconds.

Elements counter: Press the  button for 3 seconds.

Note: For maintenance or troubleshooting (changing the elements), reset the relevant counter.

7. Program version menu:



Access with six presses on the  button from the default menu.
Gives the version of the program loaded in the PLC.

8. Parameters menu:

Access with one press on the 

or 

button, when the diagnostic menu (home screen) is enabled.

- To exit the page, press 

.

A. Program start / stop:

This function is for starting or stopping the program contained in the PLC:

- STOP mode: the program is stopped, the outputs are disabled
- START mode (with or without initialisation of the saved parameters): the program is run.

In STOP mode, when you access the START / STOP menu, you are offered the following three choices to start the program:

- START: the current values, for which the Save option was activated when cutting off the supply, are kept.
- RESET THE SAVED VALUES & START: all the current values (counters, timers, etc.) are reinitialised before starting the program (default selection).
- CANCEL: the program is not run.

In START mode, when you access the START / STOP menu, you are asked to confirm the request to stop the program:

- The ESC button (red) cancels.
- The OK button (green) confirms

IMPORTANT: STOP THE PROGRAM BEFORE ANY ALTERATION OF THE PARAMETERS MENU.
THE USER IS RESPONSIBLE FOR ANY INCORRECT OPERATIONS.

B. Parameters:

This menu is for entering and modifying the application parameters directly on screen using the controller buttons. The program parameters that can be modified are the following:

Modifiable parameters			
Function number	**Type**	**Description**	**Default values**
MACRO 000 FBD 038	TIME PROG WEEK	Modification of the operating times	***Tab:*** n00 0830 ON D: MTWTFS_ W: 12345 n02 2100 OFF D: LMMJVS_ S : 12345
MACRO 000 FBD 046	TIME PROG	Modification of the heating times	***Tab:*** n00 0000 ON D: MTWTFSS W: 12345 n01 0025 OFF D: LMMJVSD S : 12345
MACRO 000 FBD 116	TIME PROG	Modification of the operating times at X %	***Tab :*** n00 20H30 ON D: ------- W : 12345 n01 6H30 OFF JD: ------- W : 12345
MACRO 000 FBD 108	NO	Ventilation servoing	00000
MACRO 000 FBD 112	NUM	Option Hygrostat	00000
MACRO 000 FBD 117	NUM	Constant divison for a Functioning at X%	00002
MACRO 000 FBD 224	NUM	OD2 operation	00001
MACRO 001 FBD 004	GAIN	Calculation for 20°C<T<40°C	A: 00024 B: 00245 C: -00012
MACRO 001 FBD 005	GAIN	Calculation for 40°C<T<60°C	A: 00022 B: 00123 C: -00070
MACRO 003 FBD 004	NUM	Float Error Timing	00300
MACRO 005 FBD 008	NUM	Temperature Error Timing	00300
MACRO 005 FBD 009	NUM	Temperature Error Set point	00035
MACRO 006 FBD 000	NUM	Heating Error Set point	00060
MACRO 007 FBD 003	NUM	Threshold 2 tracks OS	00190
MACRO 007 FBD 004	NUM	Threshold 1 track OS	00070
MACRO 008 FBD 011	NUM	Draining Error Timing	00060
MACRO 009 FBD 002	NUM	Adjustment of the time base	00030

C. Others:

The OTHERS menu gives access to the following functions:

- VERSION: This function is for clearly identifying the version of all the components of the system.
- CLOCK: This function is for configuring the controller date and time.

- FAULT: When a fault is detected by the controller software, an icon appears at the bottom of the LCD screen. The FAULT menu is for displaying the fault type: error or warning, cycle overrun, duration of the base cycle too high, etc.).

9. Operating times:

Because of where devices are located, please note that the following modifications should be carried out by qualified personnel.

1. If you choose the offset display option, you can modify the operating times on site yourself. On request **at no extra cost** we can send you an operations tutorial. Our telephone help service is available to operators who wish to carry out this modification. However, any wrong operation will affect the functioning: If the times are not entered correctly, the device will not be in operation at the right times. This fault will not be detectable in the event of a hot line call. Any intervention by the after-sales service will then be ex-contract.

2. The operating times can also be modified using memory cartridges. You should have one per time type (e.g. summer and winter times) and per machine type. These will be factory programmed and installed by the operator. For information on the price of the memory pack including the memory cartridge, programming, installation instructions and transport, please contact ARECO. However please note that, because of where devices are located and the "complexity" of the procedure, this should be carried out by qualified personnel. Our telephone help service is available to operators who wish to carry out this modification.

3. Using the "Manual" function forces operation until this function is disabled by the operator. This operation is simple and satisfies a one-off need, such as a Sunday opening or an inauguration evening. (Note: the heating cycle is nevertheless carried out during the programmed times)

Here is a summary of the different processes with an evaluation:

Criteria / Processes	Flexibility	Cost	Complexity
On site modification (§1)	☺	?	☹
Memory cartridge (§2)	😐	☹	😐
"Manual" function (§3)	☹	☺	☺

10.Programming the operating times:

The operating times of the machine can be programmed using the PLC. To do this, follow the instructions below and take into account the different parameters involved.

- Definition of the time ranges:

Firstly, in table form, note the times, days and weeks during which you want the machine to change its operating state. The PLC is set up to have a maximum of five time ranges, i.e. 10 settable time tabs.

Example:

The machine is to operate:

- From 0800 to 1200 and from 1400 to 2000 during the week for every week of the month
- From 1000 to 1800 Saturday and Sunday in the 1st, 3rd and 5th week of the month

According to the type of machine, the reservoir takes more or less time to refill. So that the fog system starts at the required time, an adjustable timing (59 minutes by default) was set. This ensures complete filling of the reservoir for better control of the fog system start.
Remember to take this value into account for the times ranges*.

Example: for a 0800 startup, set the time to 0700

Here is the table to suit the needs:

Number	Change to	Daily	Day(s)	Week(s)
00	ON	07:00	MON,TUE,WEDS,THURS,FRI	1,2,3,4,5
02	OFF	12:00	MON,TUE,WEDS,THURS,FRI	1,2,3,4,5
03	ON	13:00	MON,TUE,WEDS,THURS,FRI	1,2,3,4,5
04	OFF	20:00	MON,TUE,WEDS,THURS,FRI	1,2,3,4,5
05	ON	09:00	SAT,SUN	1,3,5
06	OFF	18:00	SAT,SUN	1,3,5

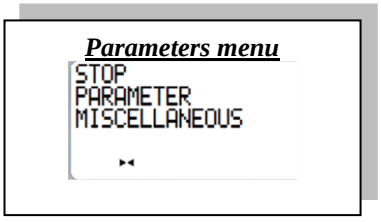
Do not programme a machine shutdown if the cut-off time is less than or equal to 1hr*.
Take care not go into the heating times.

- Setting the PLC:

Once the operating times are available, the machine can be set.

From the diagnostic menu, press the **button** 

to access the parameters menu. The following menu should appear:



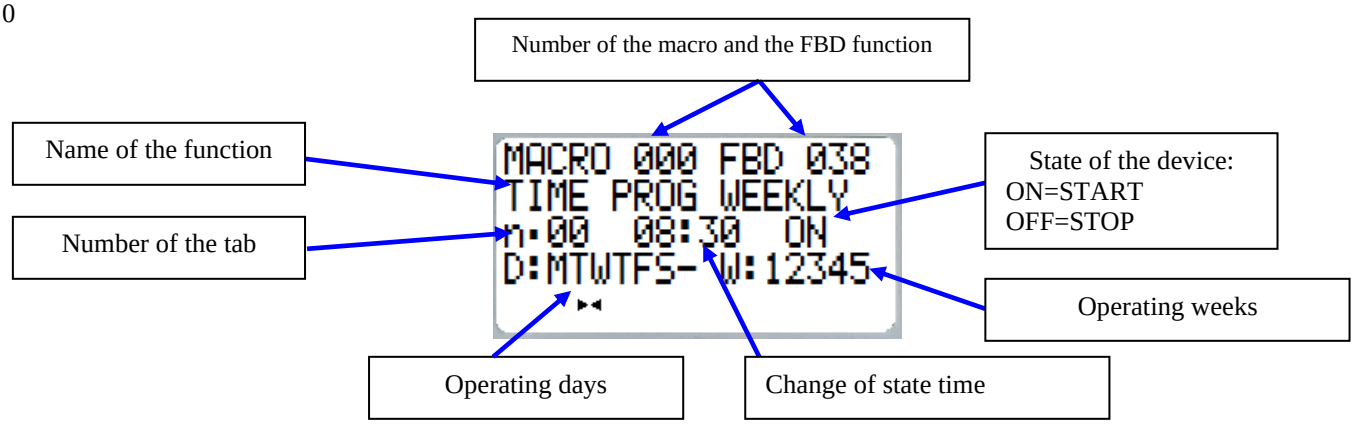
STOP THE PROGRAM BEFORE ANY MODIFICATIONS

Select **PARAMETERS** using the **+ or – buttons** and confirm with **OK.** The list of modifiable functions is then available.

You can navigate these functions using the **+ and – buttons** of the PLC. The selection cursor is shown black and flashing. If you want to change a parameter, put the black flashing cursor on the required parameter and press **OK**, the flashing cursor goes white. Then, change the parameter using the **+ or - buttons** to get the required state or value. Finally confirm with **OK**.

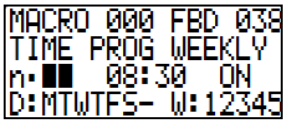
To modify the operating times, select the following function (FBD): ***MACRO 000 FBD 024***
This function should be "**TIME PROG WEEK**" type
If the screen does not show this function, select the number of the FBD function, change it and confirm with **OK**.

Here is the description of the "**TIME PROG WEEK**" function:
0

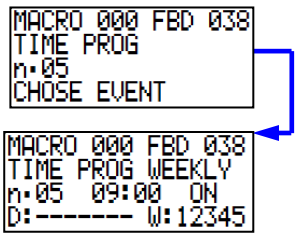


Example: Next program the time range No.5, that is device startup at 1000 on Saturday and Sunday of the 1st, 3rd and 5th weeks of the month (counting approximately 59 minutes timing which means setting the clock to 0900).

First select the **number of the time range** by putting the flashing cursor on it as shown opposite.

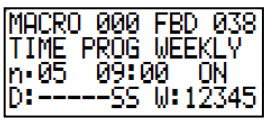


Go to the menu by pressing **OK** then use the **+ or - button** to get time range (or tab) No.5. Confirm with **OK**.

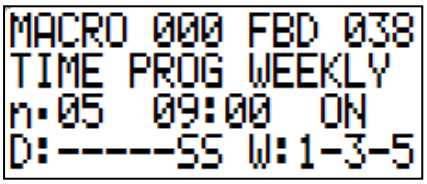


Next do the same operation but to **set the time**.
Select the time, press **OK**, change its value using the **+ or - buttons** of the PLC and confirm with **OK**. The following screen should appear:
Do the same for the minutes as required.
Next **set the state** the machine should be in at 1000 (in this case **ON**). Select the state, confirm with **OK**, then set this state to **ON** by pressing the **+ button** (in the other case the **- button** would be used to set the state to **OFF**). Confirm with **OK**.

To finish, select **the days and weeks** when the machine is to activate the set state, i.e. Saturday and Sunday of weeks 1, 3 and 5. Do this by putting the cursor on the days and confirm with **OK**.



Now Monday is flashing. In this menu, the day can be **activated** with the **+ button** or **deactivated** with the **- button** (in this case all the days except Saturday and Sunday are deactivated). So deactivate Monday and confirm with **OK**. The cursor goes to the next day automatically. Redo this operation for each day of the week and take care to comply with the constraints defined in the 1st step.
Do the same for the weeks, once finished the following result should be seen:



The screen should show:
Tab No.5 will activate the machine at 0900 on the Saturday and Sunday of weeks 1, 3 and 5.
Press **ESC** several times to exit the menu.

Do this operation for all the remaining time ranges, and the PLC will be set.

Remember to check for consistency between consecutive states of the programmer. Two similar states should not follow, hence the need to make a specific table giving the different time ranges.
RESTART THE PROGRAM

- Heating times:

The operation is the same for the heating times.
The following parameters are modified:

- Heating times: ***MACRO 000 FBD 046***

It is important to program these times outside the operating ranges. By default the configuration is the following:

- Module times ON 0000 OFF 0025

THE HEATING TIMES ARE SEPARATE FROM THE DRAINING TIMES.

11.Setting the controller time:

While the PLC manages summer and winter times, you may want to do this operation for a different reason. To set the date and time of the PLC, use the following instructions:

1	Press the ESC or OK button from the home screen	STOP PARAMETER MISCELLANEOUS
2	Select **STOP** then confirm twice with OK →	▮▮▮▮ PARAMETER MISCELLANEOUS
3	Select the line **MISCELLANEOUS**, then confirm with OK, a second menu appears →	RUN PARAMETER MISCELLANEOUS
4	Select **CLOCK** in the menu, confirm with OK →	VERSION CLOCK FAULT
5	Select **DATE/HOUR SETUP** then confirm with OK →	DATE/HOUR SETUP SUMMER TIME SETUP
6	The **DATE** menu appears To select the minutes, seconds or the date to modify, navigate using the + and − buttons. Confirm with OK to make the modification on the value Increment or decrement the value by pressing the + and − buttons. Confirm the modification by pressing OK	DATE THURSDAY 24 NOVEMBER 2011 09:36 36 CALIBRAT.:+00s/WEE
7	Press ESC three times to return to the parameter menu	RUN PARAMETER MISCELLANEOUS
8	Select **START** then press OK →	RUN PARAMETER MISCELLANEOUS
9	Select **RESET LATCHED VALUES & RUN** then confirm with OK →	RUN program RESET LATCHED VALUES & RUN CANCEL

12.Programming with a memory cartridge:

A machine can be programmed using a memory cartridge. Use the following instructions to do this:

1. Switch off the device (green button) then insert the cartridge in the slot provided.
2. Switch on the fog system device.
3. Press the 

or 

button from the home screen to get the parameter menu.

Slot for the memory cartridge

4. In the menu, select ‘STOP’, press 

twice
5. Select ‘MEMORY CARD’, press 

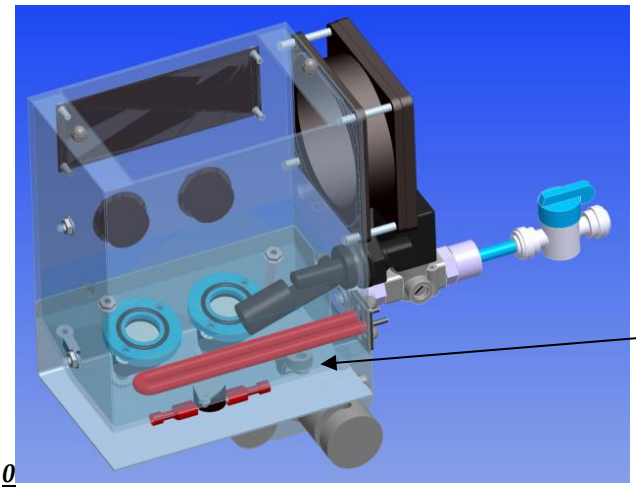
6. Scroll the menu 
, select ‘RECOVERY’, press 

7. When the download is finished, press 

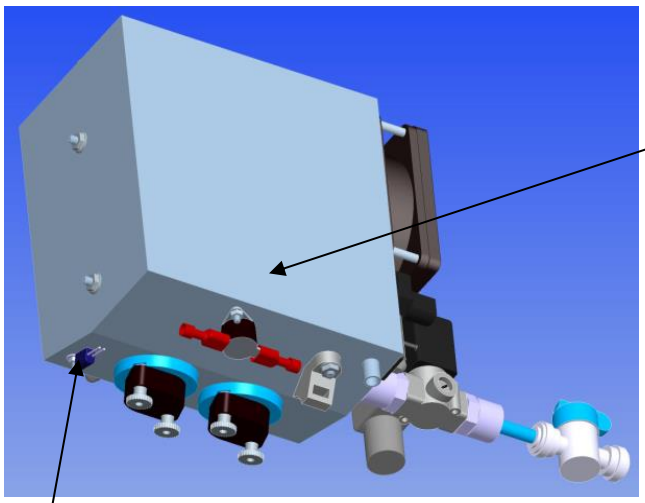
8. Switch off the device
9. Remove the memory cartridge
10. Switch on the fog system device
11. Return to the parameter menu.
12. Select ‘Start’ then ‘RESET SAVED VALUES & START’
13. Exit from the menu
14. Check the operation

IV. Description of the thermal shock:

The thermal shock is provided by a heating resistance located in the diffusion tank. During the heating cycle, the water is raised to a temperature of 70°C for 30 minutes. The temperature is measured by an NTC sensor located in the diffusion tank. The temperature is regulated by the PLC. If the cycle fails (incorrect sensor operation, regulation problem, etc.), a safety thermal switch located near the sensor cuts off power to the resistance if the temperature is higher than 85°C.

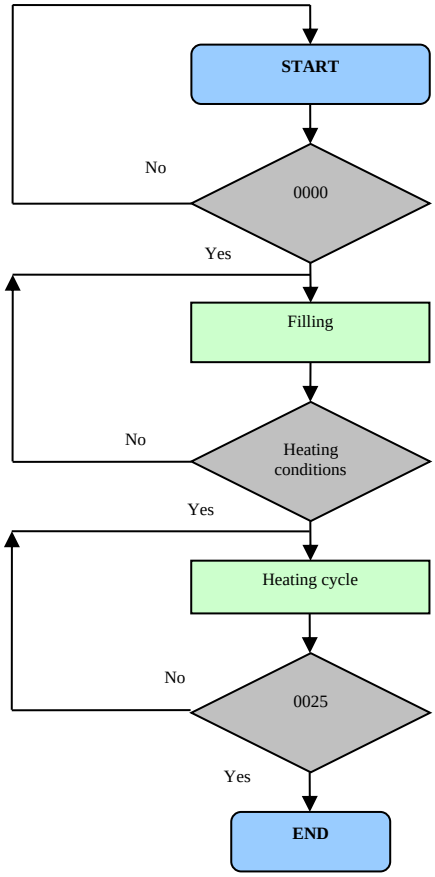


0



Operating flow chart:

Module heating time: 0000->0025



V. Maintaining the device:

1. Routine Checks:

- **Every month**, check the **water filters**:

The filters should be changed when they start to look yellow (**see paragraph VI.3**)

Water filter in good state

Water filter in bad state

When the filters have been changed, contact ARECO to deliver a new set of filters.

Regular servicing of the filtration is the only way to ensure the optimum operation and hygiene of a fogger.

- regularly **clean the place around the machine** (e.g. under the benches)
- Check correct **operation of the UV lamp** on the filtration.
- Check the settings of the fogging parameters **(see paragraph IV.3).**
- Carry out a **visual inspection** every week

The following checks and operations should be carried out by personnel who are aware of the chemical hazards
In the event of an incident, ARECO cannot be held responsible.
In the event of deterioration of the equipment, ARECO is not liable to undertake any repairs.
This servicing is undertaken if you take out a maintenance contract.

In addition to the checks above, clean the device **every 6 months**:

- Switch off the fog system. (set the power knob to 0%)
- Circulate a cleaning solution and then a disinfectant, diluted 1% (phosphonitric acid, acetic acid, hydrochloric acid, bleach, hydrogen peroxide).
- Put the required dose in the outlet of the fog diffusion tube.
- Leave the device for 10 minutes with no fogging.
- Rinse with successive fillings and drainings. Draining is caused by stopping the device using the on/off button, wait for about 3 minutes for complete draining before restarting the device. Repeat the operation three or four times to make sure that no disinfectant remains.
- Restart the fog system by changing the fogging power.

If the rinsing is insufficient, the device will not immediately recover its optimum flow rate.

Check the fogging level visually. If, one hour after cleaning, performance has not returned to normal, stop the device and prepare to replace the elements.

2. Annual maintenance:

The following checks and operations should be carried out by personnel who have electrical qualifications.
In the event of an incident, ARECO cannot be held responsible.
In the event of deterioration of the equipment, ARECO is not liable to undertake any repairs.
This servicing is undertaken if you take out a maintenance contract.

- In addition to the previously mentioned checks, remove the protective cover and check the state of the internal piping. Check that there are no deposits or that the tubes are not crushed. If this is the case, replace them with new tubes.
- Check the operation of the fan; it should be clean and rotate with no noise. Its lifetime (MTBF) is 70,000 hours, i.e. about 8 years, but very damp conditions or moisture laden air can deteriorate it rapidly.
- Check the general state inside, test the electrical connections, tighten them (with power off), check the state of the electrical insulation and fuses. Look for any sources of corrosion, especially around the fan and the DIN rail. In normal use these components should not corrode, but if the device was stored in a cellar or damp place with no power, corrosion of these components can be very quick. In this case remind the user of the conditions of use.
- If the device operates for more than 5000 hours, change the piezoelectric elements. These deteriorate gradually and in general it is possible to anticipate their loss by observing a gradual decrease of the flow rate. However, if usage is intensive, in industrial processes, it is often preferable to carry out a preventive change once a year.
- Take water samples and carry out a potability analysis at least twice a year, and whenever a problem is suspected.

Do not hesitate to contact the ARECO services if you are in any doubt or for further information.

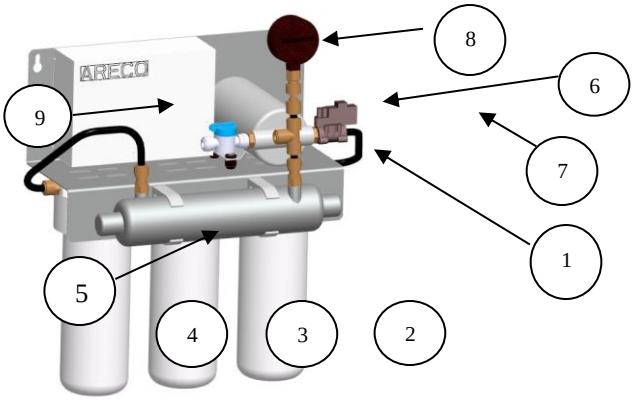
If the power supply cable is damaged, it must be replaced by the manufacturer, the after-sales service or personnel with similar qualifications in order to avoid any danger.

3. How to change the water filters:

Use precautions: Wear safety glasses and gloves
Every six months disinfect the filtration pots (service included in our maintenance contracts)

Key:

1: Water inlet valve
2: 25µm filter
3: 5µm filter
4: Active carbon filter
5: UV filter
6: Suppressor
7: Pressure switch
8: Pressure gauge
9: Electrical box



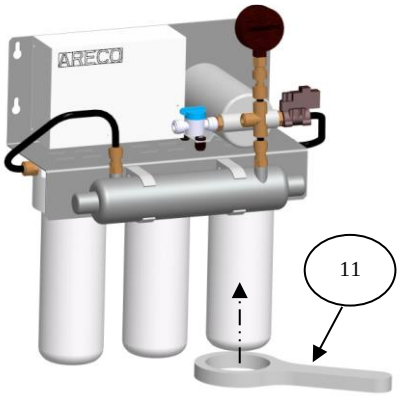
Filter replacement steps:

Valve closed *Valve open*

1: Quarter-turn the blue valve to closed ***(Ref. 1)***.

2: Wait a few minutes for the pressure to drop in the water circuit. Use the gauge to check the pressure.

3: Unscrew the pot containing the 25µm filter ***(Ref. 2)*** using the tool provided ***(Ref. 11)***.



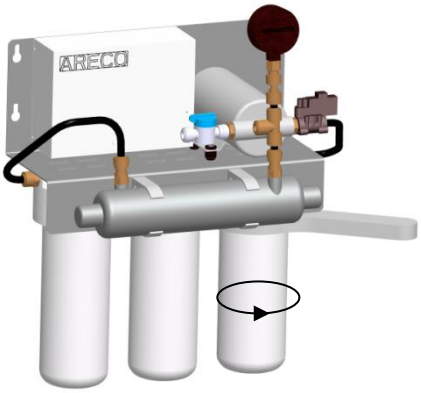
4: Drain the water and discard the used filter.

5: Wipe the pot using a clean sponge, do not forget the head of the pot and the o-ring.

6: Rinse these parts with plenty of water. Clean your hands.

7: Remove the plastic covering from the new filter. Change the filter then check the correct position of the o-ring.

8: Screw the filtration pot and tighten by hand, the tool is not required. Do the same for the 5µm filter ***(Ref. 3)*** and then the active carbon filter ***(Ref. 4)***.



9: Quarter-turn the blue valve to open ***(Ref. 1)***.

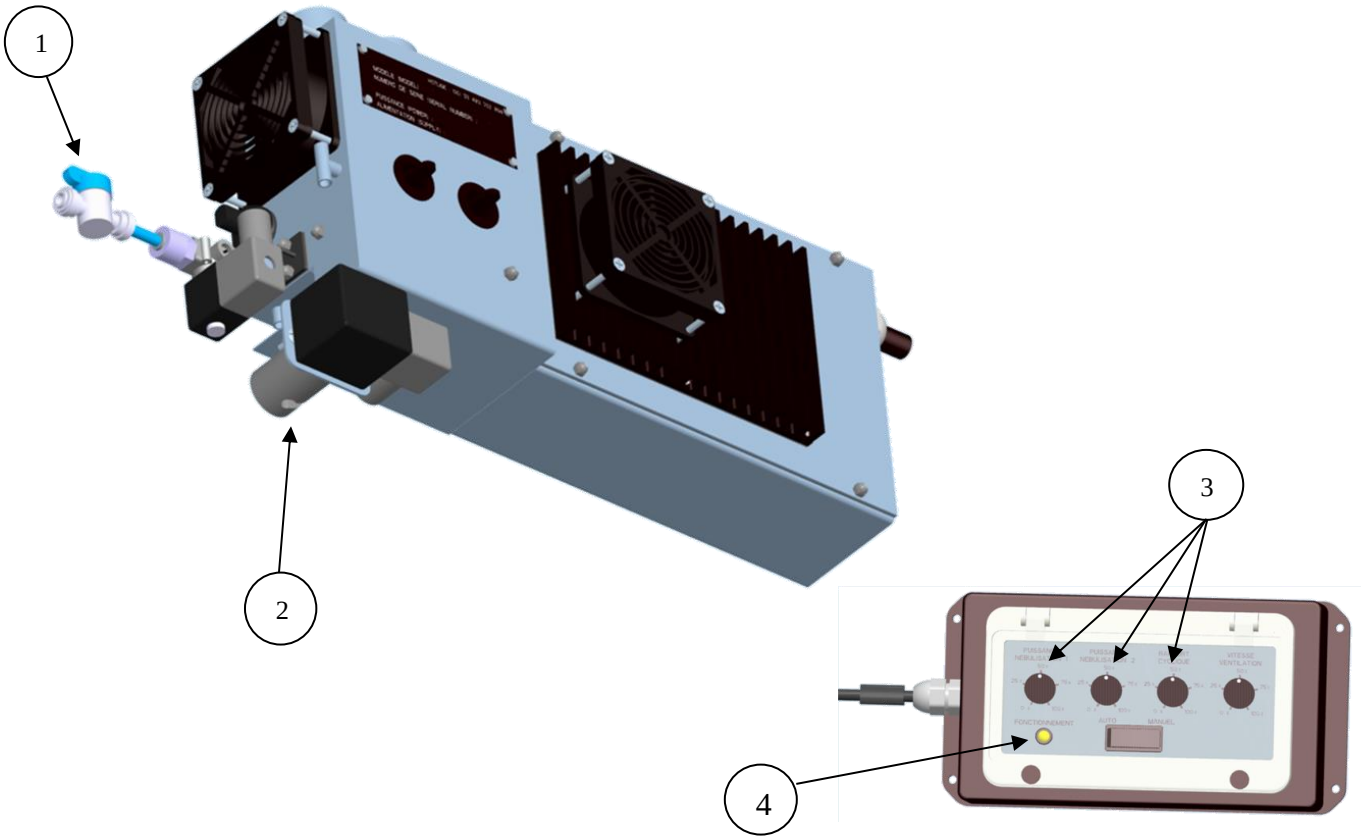
Check that there are no leaks

VI. Inspection in the event of malfunction:

In order to keep personnel and equipment safe, the machine detects any operating errors. This chapter describes the inspection procedure to carry out in the event of failure.

1. List of checkpoints:

- The **green LED of the 24V electrical power supply** should come on. If not, check the cable is correctly connected and the socket works.
- The machine **water supply valve** must be open ***(Ref. 1)***.
- The **drain tube** is connected to the water outlet ***(Ref. 2)***.
- The **cycle ratio and power knobs** must not be set to minimum position ***(Ref. 3)***.



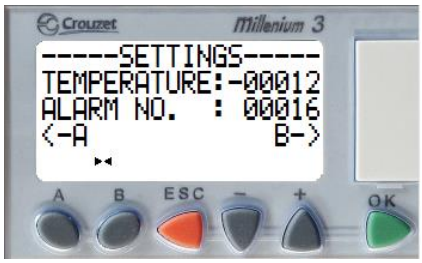
State of the machine:

The yellow **LED of the control unit** ***(Ref. 4)*** shows the state of the machine:

- On steady: no error, generating
- 3 blinking / OFF 5 sec: Power card error
- 2 blinkings / OFF 5 sec: Hygiene error (draining or water temperature or heating cycle)
- 1 blinkings / OFF 5 sec: Float error

2. Operating errors:

The LED on the control unit shows which fault is present on the machine, however it can only display one at a time, so there is an order of priority for faults:
Card error > Hygiene error > Float error > No error



The offset display (optional and depending on the machine version) shows in more detail which fault is present on the machine: On the home screen (diagnostic menu) press the 

button three times. The "ALARM NO." line gives the error code.

For example, the error code here shows a Float fault and a Temperature fault.

The following table gives the error code meanings:

Code	Float	Draining	CP 1V HS	CP 2V HS	Temp.	Heating
0						
1	X					
2		X				
3	X	X				
4			X			
5	X		X			
6		X	X			
7	X	X	X			
8				X		
9	X			X		
10		X		X		
11	X	X		X		
12			X	X		
13	X		X	X		
14		X	X	X		
15	X	X	X	X		
16					X	
17	X				X	
18		X			X	
19	X	X			X	
20			X		X	
21	X		X		X	
22		X	X		X	
23	X	X	X		X	
24				X	X	
25	X			X	X	
26		X		X	X	
27	X	X		X	X	
28			X	X	X	
29	X		X	X	X	
30		X	X	X	X	
31	X	X	X	X	X	
32						X

Code	Float	Draining	CP 1V HS	CP 2V HS	Temp.	Heating
33	X					X
34		X				X
35	X	X				X
36			X			X
37	X		X			X
38		X	X			X
39	X	X	X			X
40				X		X
41	X			X		X
42		X		X		X
43	X	X		X		X
44			X	X		X
45	X		X	X		X
46		X	X	X		X
47	X	X	X	X		X
48					X	X
49	X				X	X
50		X			X	X
51	X	X			X	X
52			X		X	X
53	X		X		X	X
54		X	X		X	X
55	X	X	X		X	X
56				X	X	X
57	X			X	X	X
58		X		X	X	X
59	X	X		X	X	X
60			X	X	X	X
61	X		X	X	X	X
62		X	X	X	X	X
63	X	X	X	X	X	X

This error code is applicable for program versions 1.2 and higher.

Here is the list of detectable errors:

- **Float error:**

Stop the machine; the fault most probably comes from the water filtration, in this case:

- Check that the machine is supplied with water.
- Check the state of the water filters and change them as required.

After at least 5 minutes stopped, you can restart the machine. If the error persists, call the after-sales service.

- **Draining error:**

This error is a safety device for machine hygiene.
Stop the machine; check that the outlet tubes are not pinched. After at least 5 minutes stopped, you can restart the machine. If the error persists, call the after-sales service.

- **Temperature error:**

This error is a safety device for machine hygiene.
Switch off and restart the machine after a complete draining has taken place. If the problem persists, call the after-sales service.

WHEN AN ERROR CODE IS DISPLAYED, CALL THE AFTER-SALES SERVICE FOR ANY FURTHER ADVICE.

VII. Standards and certifications:

1. RoHS declaration of conformity:

European Directive 2002/95/EC restricts the use of 6 substances (see list below) in the manufacture of certain types of electrical and electronic equipment.

"RoHS" conformity means that the product contains no substance listed below in concentrations higher than the maximum permitted by the Directive.

Substance	Concentration
Lead	0.1%
Mercury	0.1%
Hexavalent chromium	0.1%
Polybromobiphenyls (PBB)	0.1%
Polybromodiphenylethers (PBDE)	0.1%
Cadmium	0.01%

ARECO machines are RoHS conform

2. Disposal of waste product WEEE:

European law, applied in all member states, requires electrical and electronic products bearing the mark (see to right) to be disposed of separately from other household waste.
When you dispose of these products, please comply with the recommendations of the local authorities.
Once disposed of, they are recycled appropriately.

This effort will help us reduce waste and its negative consequences.
The mark shown on electrical and electronic products only applies to current member states of the European Union.

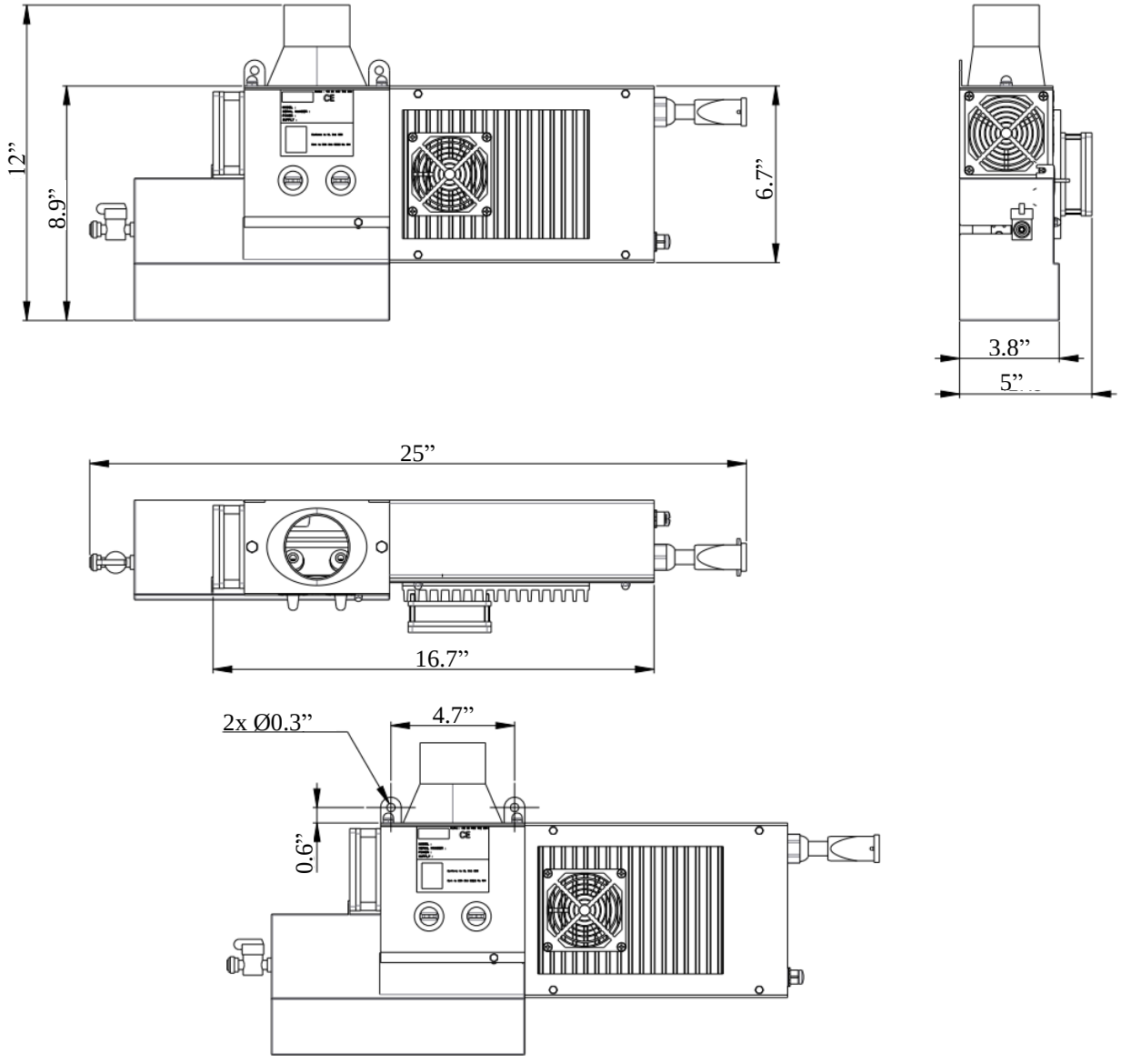
3. Standards:

- Conforms with UL 998, issue: 2011/04/25 Ed:5 Rev:2011/05/19 UL Standard for Safety Humidifiers
- Conforms with CSA C22.2 No. 104-11, issue:2011/04/25 Ed:4 Standard for Safety for Humidifers
- Conforms with standard EN 60335-2-98: Household and similar electrical appliances – Safety – Part 2-98: Particular requirements for humidifiers.
- Conforms with the directive of the French Ministry of Health for the prevention of Legionella in water tanks. Order dated 30/11/2005 of the French Ministry of Health and Solidarity.
- Conforms with the Low Voltage Directive 2006/95.
- Conforms with standard NF EN 61000-6-1 and NF EN 61000-6-3 Immunity and emissions for residential environments.
- Conforms with the Low Voltage Directive 2006/95.

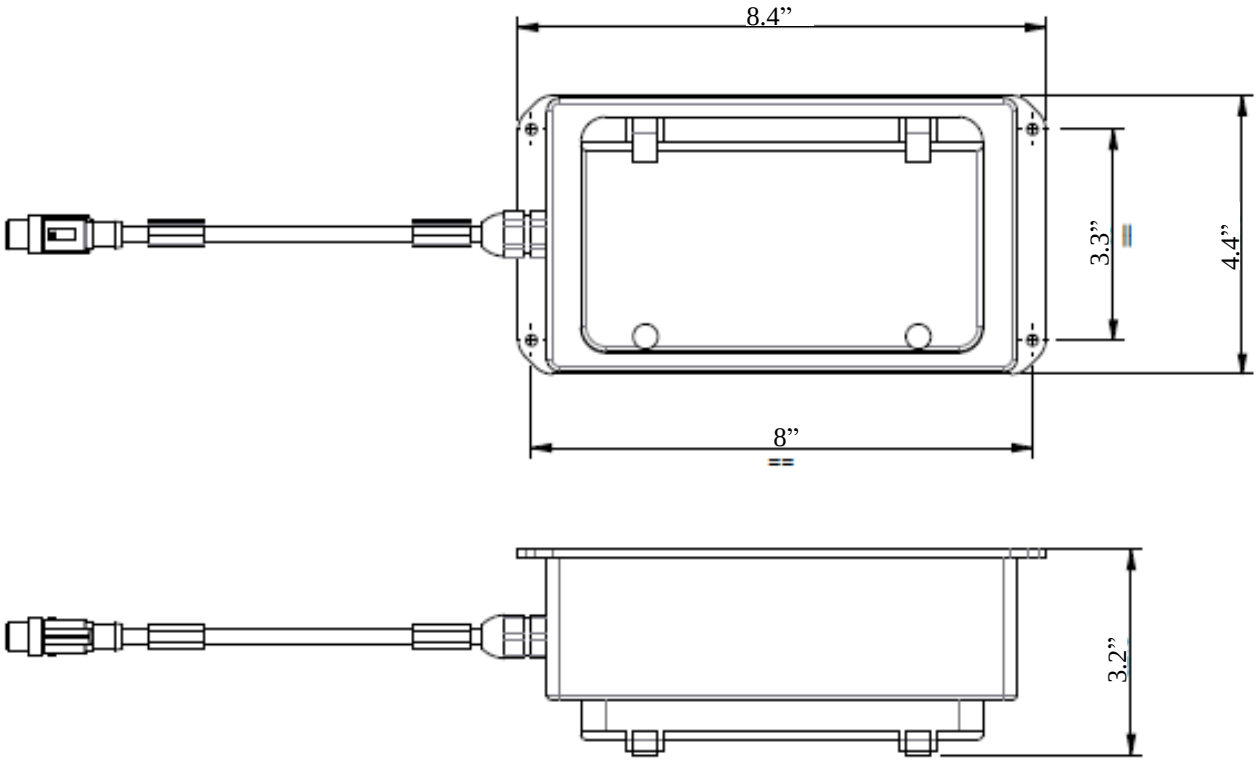
4. Patents:

FP 94 08 204, 96 00 048
EP 95 401 602, 8 97 400008.5 , 98 400152.9.
US and CANADA 5 624 608, 08 778 632 and 2 153 087
JP 189707,356725
0102618 PCT-WP and 0602687 PCT-WP
378377-004 and 06: 1323

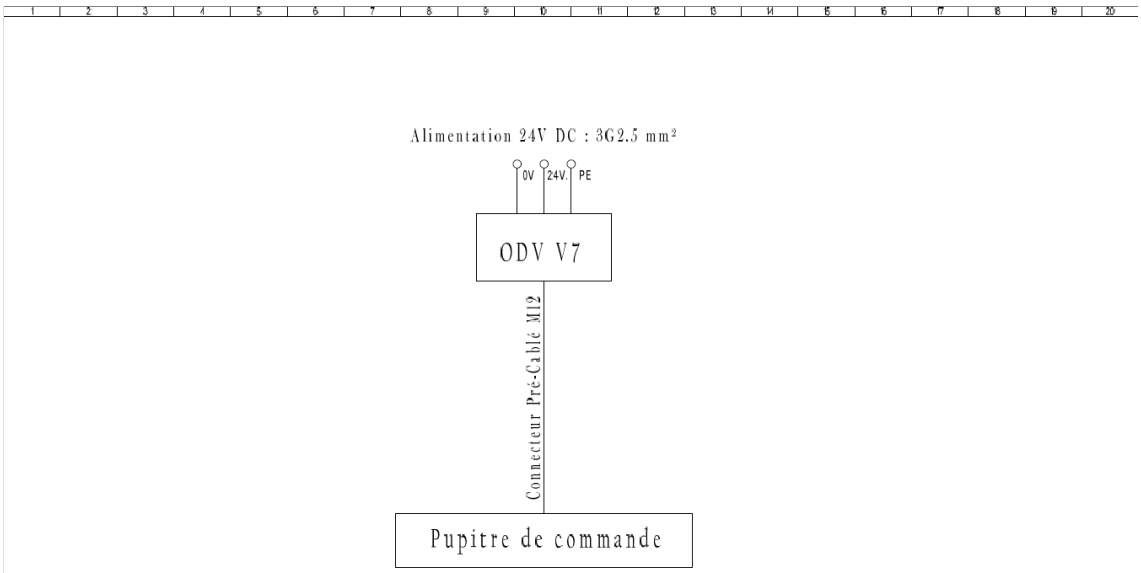
VIII. ODV general layout drawings:

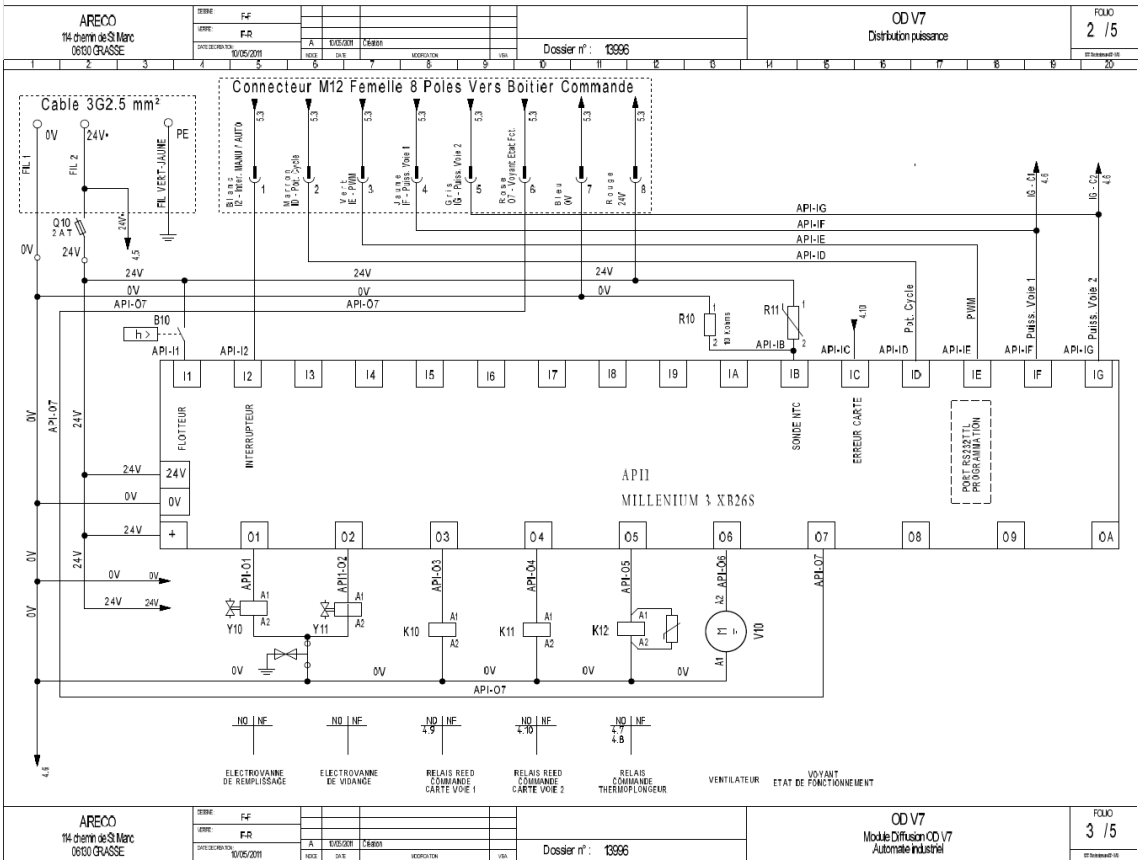


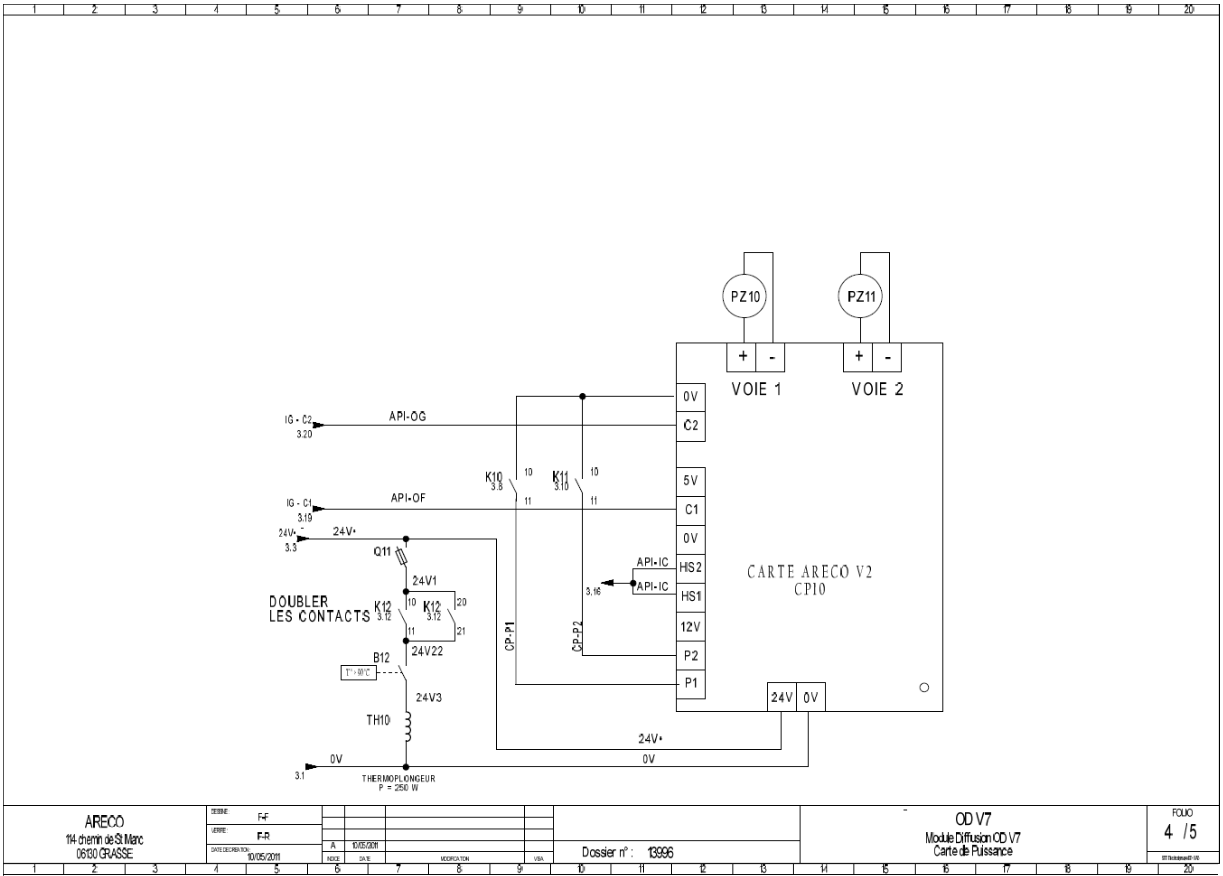
IX. Control unit general layout drawings:

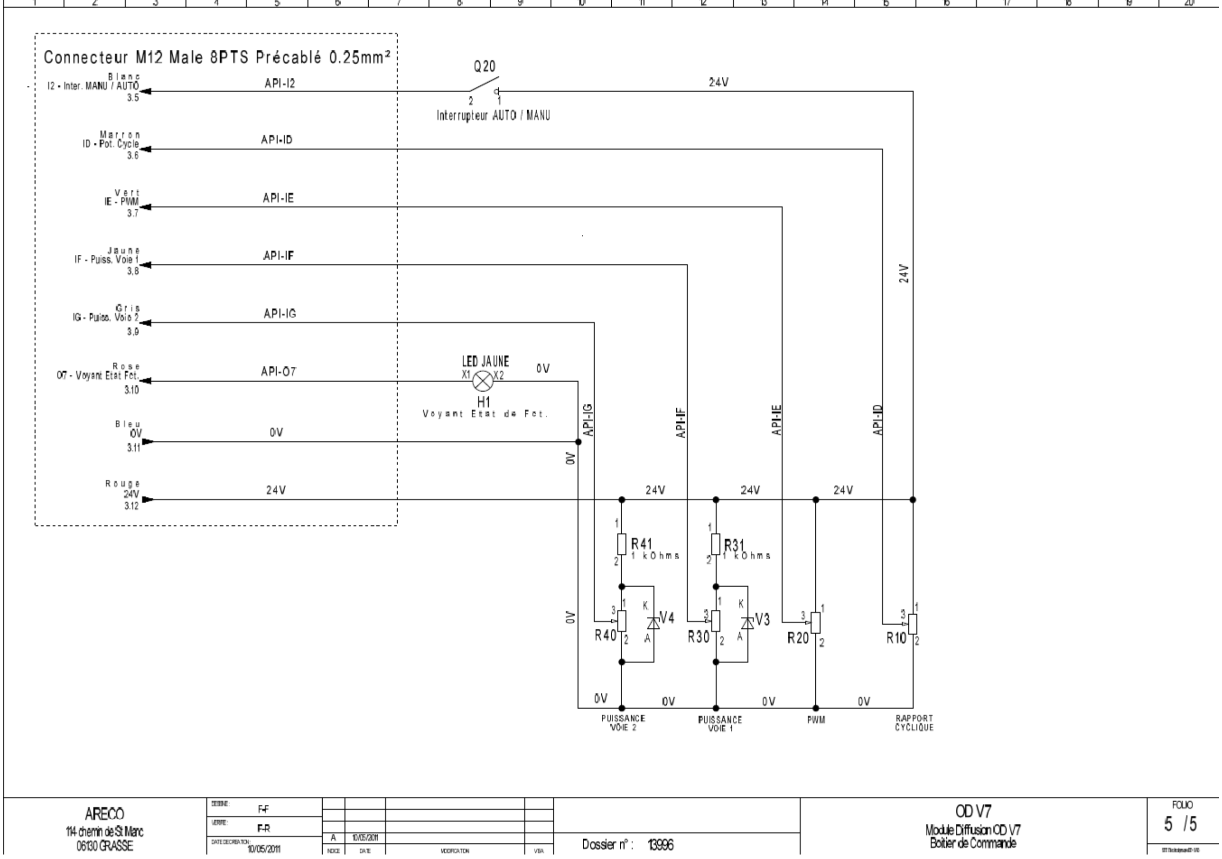


X. Electrical diagram:






PZ10
PZ11
VOIE 1
VOIE 2
CARTE ARECO V2
CP10
API-OG
API-OF
24V+
Q11
24V1
DOUBLER LES CONTACTS
K12
24V22
B12
24V3
TH10
THERMOPLONGEUR P = 250 W
API-IC
CP-P1
CP-P2
0V
C2
5V
C1
HS2
HS1
12V
P2
P1
AREcO
114 chemin de St Marc
06130 GRASSE
Dossier n° : 13996
OD V7
Module Diffusion OD V7
Carte de Puissance
FOLIO 4 /5


Connecteur M12 Male 8PTS Précablé 0.25mm²
I2 - Inter. MANU / AUTO
ID - Pot. Cycle
IE - PWM
IF - Puiss. Voie 1
IG - Puiss. Voie 2
O7 - Voyant Etat Fct.
API-I2
API-ID
API-IE
API-IF
API-IG
API-O7
Q20
Interrupteur AUTO / MANU
LED JAUNE
H1
Voyant Etat de Fct.
R41 1 kOhms
R31 1 kOhms
R40
R30
R20
R10
V4
V3
PUISSANCE VOIE 2
PUISSANCE VOIE 1
PWM
RAPPORT CYCLIQUE
AREcO
114 chemin de St Marc
06130 GRASSE
Dossier n° : 13996
OD V7
Module Diffusion OD V7
Boîtier de Commande
FOLIO 5 /5