

TECHNICAL MANUAL



NEBUCLEAN4000

Sanitizing fog systems



SUMMARY:

1	Package contents.....	page 2
2	Introduction of the product.....	page 3
3	Conditions of use and warnings.....	page 3
4	Installations tips for fogging systems.....	page 4
5	Technical specifications.....	page 5
6	How to activate the system.....	page 6
7	Mains power supply and connections.....	page 7
8	Description of input and output connections.....	page 8
9	Connection examples.....	page 10
10	Front LEDS Meaning.....	page 14
11	Shooting time settings and fog flow direction.....	page 15
12	Nozzle tamper.....	page 16
13	Installation, exchange and reset.....	page 17
14	Maintenance.....	page 18
15	Reset from fault conditions.....	page 19
16	Defects and possible solution.....	page 20
17	Warranty.....	page 22
18	Maintenance.....	page 23

The conditions of use will be automatically accepted by breaking the security labels on the product.

1 PACKAGE CONTENT

Inside the package you will find:

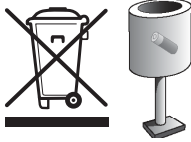
1. The machine NEBUCLEAN4000.
2. One 4000 ml bag.
3. A label to indicate the device presence.
4. Installation and use manual.

DATE	BATTERY EXCHANGE		BAG EXCHANGE		SIGNATURE
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	
	YES	NO	n.	NO	



It is mandatory to fill out this table in accordance with the law

The warranty of **NEBUCLEAN** is two years and is handled directly from the dealer or authorized installer, so please contact your supplier to take advantage of warranty with the copy of the purchase document that contains the serial number of the machine. Not included in the warranty: moving parts and/or damages depending on the incorrect use unless it is found a manufacturing defect in origin. Liquid and bags are not covered by warranty.



We recommend to throw away the batteries in the appropriate waste containers for recycling. Heavy metals contained in them are recyclable.



BY BREAKING THE SECURITY LABELS AND THE OPENING OF THE MACHINE YOU WILL ACCEPT WHAT IS WRITTEN ON THIS MANUAL.

Serial number.....
Date of installation.....
Signature of installer



At the end of the installation, write down the identification number of the machines, the date of the installation and sign in the dedicated spaces.

Thank you for purchasing NEBUCLEAN product.

NEBUCLEAN4000 is the most powerful and fastest system in the world, ideal to protect wide areas like big shops, warehouses or superstores. It shoots in one shot up to 4000 m³ of dense fog in about 3 minutes.

This fogging system is able to work without mains power up to 5 hours so it is ideal to protect isolated areas or where mains power, fades away of ten. With patented technological innovations too, NEBUCLEAN products are the best fog generators with the best performances.

- **Simple:** Machine easy to install and able to be integrated to any existing alarm system.


The fog generated by **NEBUCLEAN** does not create particular problems or injuries for a human being for a short stay in a fogged room if the system is used according to the manufacturer's recommendations. Generated fog is certified as safe for people and animals from an authorized international certification company and is proved that it does not leave any residual. **NEBUCLEAN** systems are certified respecting European laws and regulations. Any certifications required in specific countries are a responsibility of the distributor of that specific country. It is not guaranteed by the manufacturer the use of **NEBUCLEAN** system in the presence of objects that may be damaged anyway by the contact with substances based on glycol, water and alcohol. Any employee or worker that may be exposed to fog must be warned in advance and must be checked for any allergy to the sub-stances listed above. At the date of printing of this manual it has never been pointed out any problem related to any allergy. **The company** is in no way responsible for any damage or condition of use that has not been required and specifically approved by any specific written request prior to the installation of its products. Contact a doctor if for any reason you swallow fog fluid or if after contact with eyes or skin you have any kind of reaction, and in any case wash it immediately with water and soap. Do never stay for a long time in a room filled with fog. Do not use charged bags that are not the ones suggested by **NEBUCLEAN** and never try to recharge them, they are made for a single use. Follow your national rules for the dispose of empty bags. Keep **NEBUCLEAN** bags out of reach of babies and animals. The nozzle may be hot and touching it may cause burns. Do not look directly into the nozzle. Never use **NEBUCLEAN** products for any purpose that is not related to protection from thief or robbery (the choice of the conditions of use in case of robbery will be suggested by your security consultant). Never use different fog fluids or add any other substance into the cylinders. Do not use or keep charged **NEBUCLEAN** machines in vehicles and do never transport **NEBUCLEAN** before 24 hours since it has been shut off. During transport it must be not armed.

4 INSTALLATION TIPS FOR FOGGING SYSTEMS



Please observe the following instructions for installing **NEBUCLEAN**:

1. The machine must be installed avoiding to obstruct escape routes.
2. Verify the fog does not limit the visibility near: stairs, landings, moving objects that may cause: falls down, injuries or any damage to persons.
3. Do not look directly into the nozzle. Do not add any other substance into the bags.
4. The nozzle may reach high temperatures, touch it may cause burns.
5. When **NEBUCLEAN** produces fog avoid staying closer than 1 meter from the machine.
6. When **NEBUCLEAN** is armed avoid staying closer than 50 cm from the nozzle.
7. Before testing **NEBUCLEAN**, remember to report it in advance to the firefighters in your area to avoid false alarms.
8. Remember to put warning labels about the presence of **NEBUCLEAN** on the windows.
9. Report its installation to the firefighters in your area and eventually to other institutions if needed.
10. It is necessary to add an external switch to separate the fog generator from the alarm system and it should be activated before the maintenance to avoid that input tests, for example, can activate the fog generator.
11. Never direct the fog jet towards an object or a wall less than 2 meters away and if possible increase the suggested minimum distance. Thanks to the power of the jet, **NEBUCLEAN** reaches and exceeds more than 10 meters away in the first 3 seconds from the point where the machine is installed.
12. Setting the shooting time interval between the minimum and maximum shown in the shooting table, avoid "overshooting" even if the produced fog is dry and generally doesn't leave residue. A shot that goes far beyond the recommended seconds can create a residue problems in the room.
13. **NEBUCLEAN** continues to be effective for up to 5 hours without 220V or 110V main power thanks to the insulation system which maintains the temperature in the heating system.
14. Install at an height of about 2,5 meters not to let it be reached, avoiding possible tampering.
15. Install with no inclination.
16. Do not move the machine when it is still hot.
17. The main body of **NEBUCLEAN**, which has the heating system enclosed inside a metal frame, should not be opened unless by specific and authorized service centers. Do not open and touch for any reason the insulation before 24 hours **NEBUCLEAN** has been shut off. The internal part may reach really high temperature.
18. Do not activate the **NEBUCLEAN** machine before the installation is completed.
19. Insert the cylinders as the last procedure and verify the anti-tampering function.
20. When the installation is finished, always test the system.
21. From the moment of **NEBUCLEAN** activation, at least one hour is necessary to reach the minimum temperature needed for the fog shooting.
22. Install **NEBUCLEAN** avoiding any obstacles in front of it which can prevent the spreading of the fog.
23. The external temperature of **NEBUCLEAN** can change from room temperature to 50 °C.
24. The tip of a stranded conductor should not be soft-soldered where the conductor is subjected to contact pressure.
25. The **NEBUCLEAN** machine should not be exposed to water spray or dripping.
26. Request to take part in courses for installers to ensure the optimal installation of the equipment.

DEFECT FOUND	POSSIBLE CAUSE	POSSIBLE SOLUTION
BLUE LED is flashing The buzzer emits a continuous sound BLUE and RED LEDS are flashing alternately	Overvoltage power line (110/220 V)	Try to reset. See paragraph 15 In case of unsuccessful restore the PCB can be damaged, contact the assistance service.
	Overtemperature of the PCB	Check there is a sufficient ventilation around the machine. See paragraph 15 To reset see paragraph 15
	Disturbance/ interference or potential differences between devices	In the case of strong interference (lightning) can occur a thermocouple reading error, make a reset. See paragraph 15. In case of unsuccessful restore can be occurred a potential difference or a fault.
		In large size plants or with more than on fogging system connected with the same central, in rare situations, it may occur that there are potential differences between the equipments and it could be necessary to uncouple them.
Error in the thermal loop	Possible fault of: thermocouple, resistance or fuse cable. Don't try to repair Contact the assistance service center.	
Impossible to arm the machine BLUE LED doesn't switch on	Wiring error	Check on the terminal with a tester that when the alarm system is tuned on there is a minimum voltage of 11 V between - GND (5) + ARM (3).
When you press the reset button you don't hear the sound of the buzzer, the frontal LED are flashing but the RED LED does not reset	The Jumper P3 is in the "SET" position	 Warning in this case shooting time is reset to zero Bag reset - Paragraph 13 Shooting time setting - Paragraph 11
Setting the shooting time, the buzzer does not sound and the LEDs do not flash	The jumper P3 stands in the "RESET" position	See the setting mode of the shooting time at paragraph 11

DEFECT FOUND	POSSIBLE CAUSE	POSSIBLE SOLUTION
When you arm the machine you hear an internal buzz, like a motor	The compressor is checking that there are no obstructions in the circuit of fog emission	When the machine is armed, for 15 minutes the compressor will monitor the nozzle. After this time it will deactivate automatically: if the fogging system is disarmed, the compressor will go on with it reaches 15 minutes. If the machine is disarmed and then armed again, the count will start again from zero.
When you arm the fogging system, a little fog flow goes out from the nozzle even if the machine has never shot before	During testing phase in the factory, we also test the quality of fog in all produced systems, a little quantity of the fog liquid remains in the ducts	This emission occurs just at first activation, it will decrease visibly with any activation, until disappearing completely. After an eventual disassembly and reinstallation or after the transport of the machine, with the first activations a little flow of fog can occur again.
The 3 frontal LED are flashing and the buzzer emits 1 beep per minute	The tension on +12 V input is too low or too high	Check the external power supply or the alarm unit
The buzzer emits 2 beep per minute	Low battery but possible shot	Verify/replace battery - See paragraph MAINTENANCE
The buzzer emits 3 beep per minute	Low battery but possible shot	Verify/replace battery - See paragraph MAINTENANCE
The buzzer emits 10 continuous beep per minute	Battery not present	Insert battery
	Connector not inserted correctly	Remove and reinsert the connector
	Verify that jumper W5 is inserted	Insert jumper W5
The machine is armed (BLUE LED ON) but doesn't shoot	The front RED LED is on	Bag reset has not been made Reset as described in paragraph 15 Bag is in reserve or empty-Change the bag as described in paragraph 15
	The front GREEN LED flashes	The heat exchanger has not yet reached the minimum temperature of shooting, wait for the led to stop flashing standard heating time: 60 min.
	The machine doesn't shoot immediately after arming	For safety reasons and to avoid false fog emissions during power on, when the machine is armed, it becomes operative only after 20'. After this time, the emission is instantaneous.
	Wiring error	Verify that the alarm, once activated has tension on connectors of at least 12 V between GND(5) + SHOOT(4)

	NEBUCLEAN4000
Weight without bag	46 Kg
Max fog emission in a single shot	4000 m ³
Total fog emission capacity	6000 m ³
Fog bag capacity	1 x 4000 ml
Working time without mains power	4000 m ³ after 2 hours and 2500 m ³ after 3 hours
Max power on heating system	600 W
Average power consumption during heating	500 W
Heating time	5 hours to reach the minimum temperature of shooting and 10 hours to reach the max
Average power consumption	110 W
Batteries type suggested	FIAMM FG 20721 or similar
Door tamper	Screw to ground
Anti-tear off and anti-shift	Accelerometer



The “empty” signal doesn't mean only that the bag is empty, but also warns you that the system has shot at least 150 seconds. For this reason is very important to make the “reset” only when you actually exchange the bag, or you will lose seconds counting. (See paragraph 13)

WARNING :

- Loosened ferrule can cause dropping
- Do not disconnect the machine immediately after the shot
- Change the battery every two years
- Change the bag as soon as the “empty” signal appears
- The machine cannot be activated on a surface that does not allow air circulation from lower slots.



It is always recommended to fix the fog generator to a wall. The bracket can also simplify standard installation, by allowing to use back holes for the passage of cables. Remember to use a screw in the fixing hole placed in the bag compartment.

Always verify that the bracket or the support surface are suitable for the weight of the machine. It must be verified that the machine has the correct air circulation.

CAUTION: to avoid injuries please securely fix the fogging machine to the wall according to the installation instructions.

After removing the machine from the package, unscrew the two screws that stop the right side panel and remove it. Remove tamper screw and shell screws from inside.

At this point it is possible to remove frontal shell and see electronic circuit, from here on called PCB.

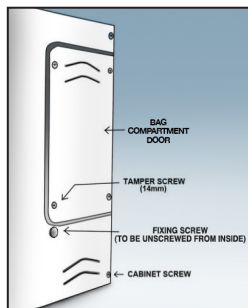
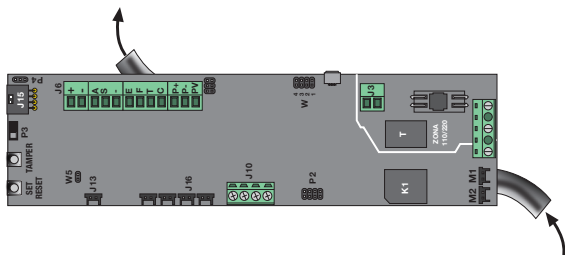
To open the side compartment, it is necessary to remove bag compartment and take off the frontal shell, unscrew and remove the screws below.

The screw in lower left part of bag compartment's door is longer than the others and its removal activates the tamper output. After the screw has been positioned correctly, the machine emits 4 beeps and deactivate tamper output.

The fogging system NEBUCLEAN4000 must only be installed vertically.



TUBE FOR CABLES TO INSERT IN THE TERMINALS



IT'S ADVISABLE TO USE GLOVES

- 1 – Obstruct the nozzle with soft and insulating material (for example an eraser).
- 2 – Keep the nozzle obstructed, press the button P3 previously moved in RESET position (see paragraph 14) and keep it pressed until you hear that the pump is activated.
- 3 – Wait for the activation of the buzzer (Max 30")
- 4 – Remove the obstruction taking away your hand quickly to avoid to be in contact with the hot emission of air. The buzzer must stop.
 - If after 30" you don't hear the buzzer, may be a loss inside the circuit; please contact the service center.
 - If after removing the obstruction the buzzer doesn't stop, it means that there is an obstruction; please contact the service center.

Annually verify the functioning of the pump

The test can be done by letting the fog generator shoot. If you do not want to shoot during the whole shooting time set, you can just disarm the machine and the shot will stop immediately.

Cleaning the system after using NCBAG series bags

When using NCBAG series bags it is necessary to periodically clean the system: remove the NCBAG bag and mount an NCSP1000 cleaning bag instead, set the ejection time to 4-5 seconds and cause an ejection. After cleaning, bring NEBUCLEAN's ejection time back to its previous state and mount the usual bag again.

This process is useful to discriminate false interpretations of faults caused by electrical shocks or serious problems on power supply from thermal loop problems.

- 1) Serious fault signal occurs with a first phase when the buzzer emits a continuous sound for 20 minutes and blue led flashes, the output FAULT immediately switch (if the generator is disconnected and connected again you can go directly at point 3)
- 2) After 20 minutes, the buzzer stops, while blue led goes on flashing, the FAULT output remains closed. This phase remains permanently, until the machine is completely disarmed.
- 3) When you connect again the machine, blue and red leds flash alternately and no sound is emitted. This phase lasts up to 30 minutes, then, the output FAULT is reset and the generator start to work again. If during this process the generator is disconnected, when you connect it again the time start again from the beginning and for 30 minutes.

If at the end of this process, the generator start to work again regularly is not necessary any further operation. If occurs again the fault condition within the following 20 minutes, it's necessary a check from the assistance center, or to send the machine back to the factory.

NEBUCLEAN generators do not require special care, however, it is recommended the support of qualified and authorized personnel for periodic annual monitoring, taking into account the following:

- 1- Verify that in the lower slots there is no dust impeding air circulation
- 2- Verify the good working condition of the power supply and battery
- 3- Verify the lock of the nozzle ferrule
- 4- Verify the entirety of the nozzle sphere
- 5- Check the air tightness of the circuit and the switch functioning
- 6- Annually verify the functioning of the fluid pump
- 7- Intervention report redaction and release of conformity declaration according to 37/08 order in case of provision

Check the efficiency of the power supply and of the battery

Verify that the tension of the no-load voltage power supply (disconnected battery) is 13,8 V. If tension is different, regulate it using the trimmer placed on the power supply. Verify the efficiency of the battery (it should not be hot and bloated); it is suggested to change it every two years due to the heavy and prolonged charge during the shot without mains power.

Entirety of the nozzle sphere

Verify that the nozzle hole is cylindrical. The average duration of the nozzle sphere depends on the number and duration of the shooting, around 8L of glycol. Change the sphere only with original ones of 7 mm.

CHECKING OF THE PNEUMATIC CIRCUIT AND THE PRESSURE CONTROL SYSTEM



THE TEST CAN BE DONE JUST BY QUALIFIED PERSONNEL

Before starting the test of the pressure control it's necessary:

- to remove the bag
- to be sure that the nozzle is cold
- to be sure that the nozzle tamper pump is activated

The pneumatic seal test must be done within a few seconds when the pump for nozzle tamper control is turned on, as the nozzle temperature rises rapidly reaching temperatures that may cause serious burns.

The air coming out of the nozzle exceeds 200° C.

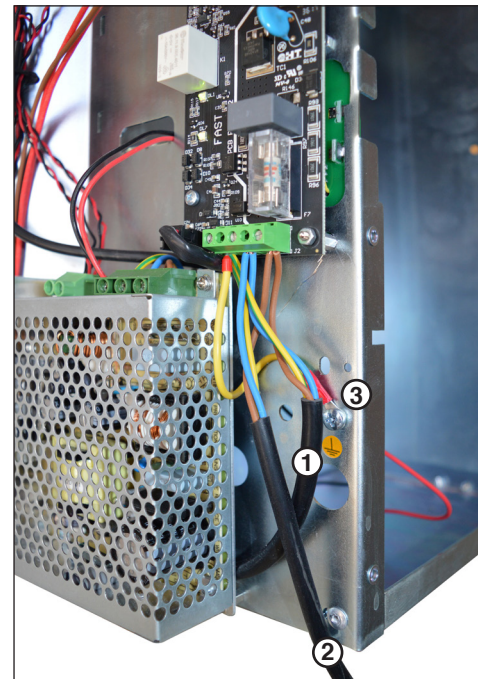
230V power source supplies energy only to the heating system. The electronic board and the bag's pump are supplied from the alarm system and batteries. The heating element is of 600 W, at the very beginning power consumption is about 500 W and in some minutes it goes down reaching average consumption of about 110 W.



Do not use inverter or UPS if you are not sure that they generate a true sine wave, not a rebuilt one. Ask please to the UPS manufacturer the correspondence of such features before proceeding with the connection.

- The max current to be considered for the system is 4A
 - The connection to the 230V electricity grid must be performed by a qualified technician.
 - Connect the equipment to the electricity grid only after you have completed the installation.
 - It is necessary to connect the ground terminal.
 - The system must be connected to the mains trough on automatic switch (automatic switch, curie C, with $I_n = 10 A$ and $I_{dif} = 30 mA, \dots$) with breching capacity based on the assumed fault current of the fogging system in the sampling point.
- PLEASE NOTE THAT, AS ALL POWERED EQUIPMENT FROM THE ELECTRICITY GRID REQUIRING INSTALLATION, IT IS SUBJECT TO COMPLIANCE WITH RULES OF THE COUNTRY IN WHICH IT IS INSTALLED
For section and types of wires, fuses, suitability of materials to installation sites etc..

IF YOU NEED TO REPLACE THE FUSE, USE ONLY FUSE WITH THE FOLLOWING SPECIFICATIONS:
CERAMIC BODY FILLED WITH QUARTZ, REF. STD. EN60127-2-3/DIN41660 3,15AH (EXAMPLE OMEGA GT520231)

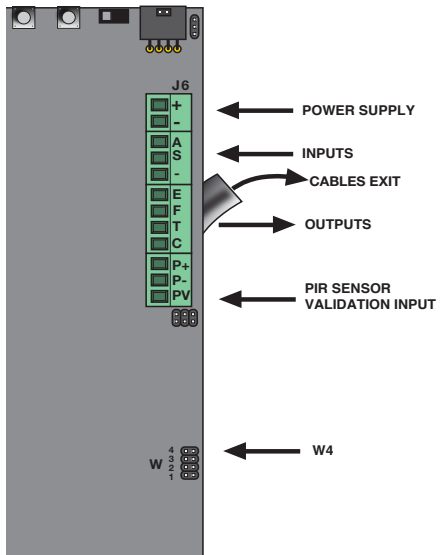


- ① - Power supply mains connections
- ② - Mains power
- ③ - Ground connection
- ④ - Battery holder (battery not included)



While connecting the machine to the mains power, it is recommended to never disconnect existing ground cable. The fact of disconnecting or modifying existing cables voids the warranty and can cause troubles or accidents related to the temperature control. Connect ground cable from the system to the screw on the metal sheet.

8 DESCRIPTION OF INPUT AND OUTPUT CONNECTIONS



INPUTS

- + Power supply input
- Power supply input
- ARM Arming input
- SHOOT Shooting input
- Negative

OUTPUTS

- EMPTY Empty bag output
- FAULT Fault output
- TAMPER Tamper output
- CONFIRM Shot confirmation output

PIR SENSOR VALIDATION INPUT

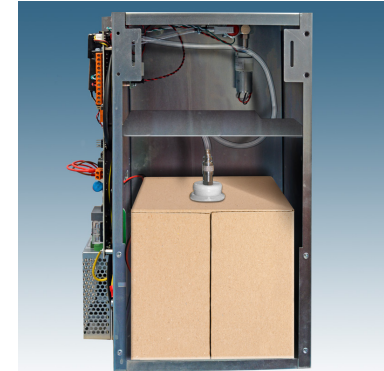
- P+ Positive power supply output
- P- Negative power supply output / COM. PIR
- PV N.C. PIR

13 INSTALLATION, EXCHANGE AND BAG RESET

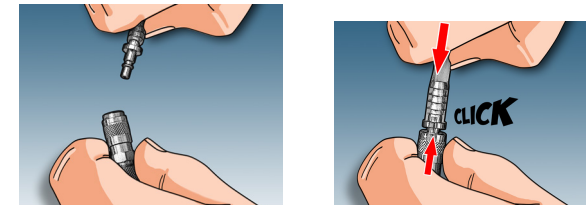
Open the door.

Attention: Before opening the side doors, make sure that the alarm control panel is in "service" mode, so that the opening of the "anti-sabotage or tamper" circuit does not cause any alarm.

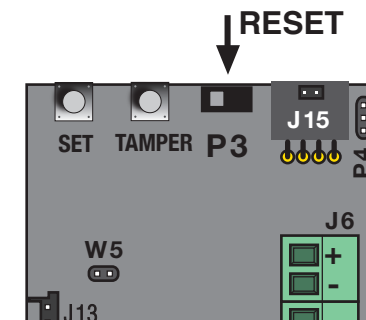
Insert the bag in the compartment as shown in the picture.



Connect the metal plugs until you hear a "click".



In order to make the reset the jumper P3 must be on the right position as you can see in the picture.



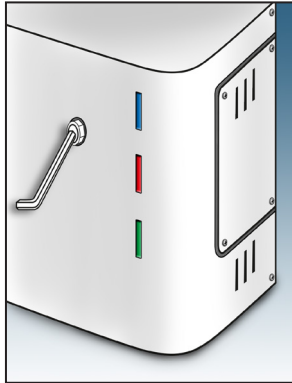
Press and release SET/RESET button on the board and check the Fault LED resets. Once done, set jumper P3 back to its starting position.

When finished, close the door. When you close the door, the buzzer will make a sound to confirm the tamper is closed.

Any residue usually goes away by itself within 24/48 hours, otherwise, being soluble in water, it is enough to use a wet cloth for cleaning.

If you desire to obtain an average of 1 meter visibility after 60 seconds, as specified by the standard, as used as reference by all manufacturers of Fog generators, the number of shooting seconds must be reduced by half.

FOG FLOW DIRECTION



To ensure the right direction of the fog flow, it is recommended to insert a screwdriver of the diameter of the hole and, without forcing, orient the nozzle in the correct fog emission direction.

This allows you to clearly see the direction and keep it in place while tightening.

To screw and unscrew the nozzle you should use a pair of pliers in good condition to avoid damaging the plating.

Do not overscrew the nozzle, it is sufficient that the teflon nozzle does not move.

Do not direct the fog jet towards objects and walls less than 2 meters away or to the floor if it is installed at a height lower than 2.50 meters (we advise against the installation on the floor).



WARNING! After the fog emission, and for a few minutes the nozzle is very hot RISK OF BURNS IF TOUCHED by bare hands.

12

NOZZLE TAMPER

The check of the obstruction of the nozzle is done with a little air flow, while a sensor check the pressure of the internal circuit. In case the sensor detect an increase of the internal pressure, means that there is an obstruction inside the nozzle. In the meantime, the output of Tamper will be activated, the buzzer will emit a sound with a fast frequency with the flash of the red LEDs.

This condition of the alarm will continue until the system is disarmed and armed again.

As the little compressor that introduces the air flow emits some vibrations, its activation occurs only in the following cases:

- When you press the button RESET for more than 5 seconds, besides the activations of the drop of the motors, will start a cycle of monitoring of 15 minutes, in order to simulate the obstruction and check the correct working.
- When the system is armed the cycle of monitoring starts. This cycle is the most important, because as the system was disarmed probably was easier to go near the machine and obstruct the nozzle. After 15 minutes, the compressor will stop automatically. If the system is disarmed and armed again, the cycle will start again for 15 minutes.
- After the emission of the fog, as normally the zone where the machine is installed is the last where the visibility is reduced, the generator remains vulnerable, giving the possibility to who generated the alarm to attempt the sabotage. For this reason, after the emission of the fog the compressor will be activated for 15 minutes.



Do not obstruct the nozzle when the generator is armed and bag is in.

16

INPUTS

+ 12V Power input

The power supply is connected to those inputs.

INPUT SIGNALS

A By connecting this input to positive, NEBUCLEAN4000 is armed, blue frontal LED is switched on and when the machine reaches proper temperature it means that it is ready for shooting.

In case of alarm, opening ARM input, the fog emission stops immediately, even if the time set wasn't reached.

S Putting this input to positive, if NEBUCLEAN4000 is hot and armed, starts fog emission for the set time (see paragraph 12).

VALIDATION INPUT

In order to validate this input, it's necessary to insert the jumper W4 **with the unit switched OFF**.

This input automatically generates AND function with input S.

If any input receives the shooting command, the generator doesn't emit fog if within 1 minute doesn't receive the command also from the second input.

P+ Output positive to give power to a validation sensor or a remote control receiver, max 300 mA.

P- Output negative to give power to a validation sensor or a remote control receiver, max 300 mA.

PV Validation input. It's possible to connect to this input a validation sensor with a contact normally closed connected to the terminal P-.

The PV input can be connected to external devices such as PIR or door sensors and behaves as an additional firing validation input. When the PV function is active, by closing the W4 jumper, the emission of fog will be possible **ONLY** if the SHOOT and PV commands have both been received, in any order, in a time interval not exceeding 60 seconds. After the shooting in these conditions both inputs will be inhibited for 2 minutes to avoid false activations.

OUTPUTS

E This output (NPN Open Collector) closes towards negative direction when the bag is empty. This output (NPN open collector) closes towards negative when the fogging machine emitted fog for at least 100" or when the bag is empty. The signal is activated by a sensor that detects the absence of liquid just while shooting.

The empty bag signal is deactivated only making the RESET (see paragraph 15). For this reasons, if the bag is not inserted, or there

is an empty bag inside, NEBUCLEAN4000 will detect it just after a shot.

F This output (NPN Open Collector) closes towards negative when there is a malfunction (such as batteries expired, fault of power supply or temperature control fault), which compromises the functioning of the device and which requires a technical action.

T This output (NPN Open Collector) closes towards negative direction when you open the bag door or when the accelerometer detects a sudden movement (such as the detachment from the wall).

C This output (NPN open collector) closes towards negative only after that the system has emitted fog for the set time. If the emission of fog is interrupted (if there is an interruption of ARM command, if the glycol finishes, if there is not thermal autonomy anymore) this output will not change its status.



Remember, it is necessary to connect all three outputs to an alarm central or an electronic panel that can see all those information in real time and take proper action.

In order to avoid accidental activation with subsequent fog emission, the inputs are in "negative security", for this reason the disconnection of a wire does not cause activation.

So it is necessary to check carefully the reliability of connections and protect the cables to the control panel to avoid the risk of accidental damages.

9



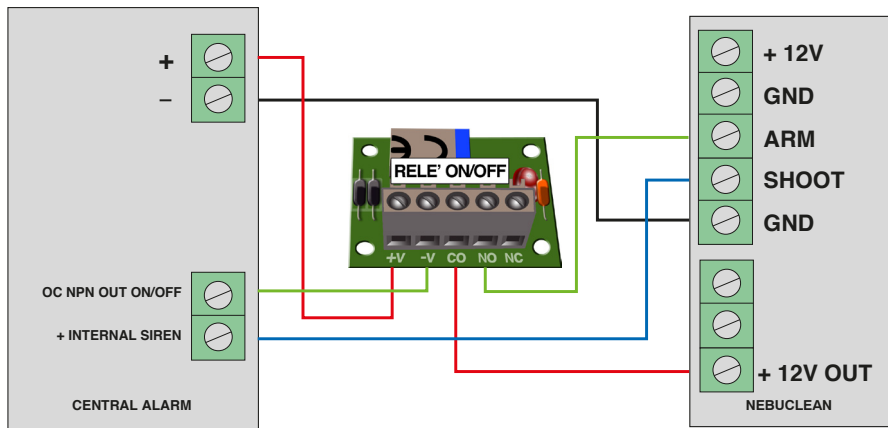
The diagrams and examples below are intended only for a “better understanding” of the operation of the inputs / outputs. None of the diagrams below represents the “single scheme to perform” as, in respect of the reference standard EN50131-8, there are precise indications and only using all inputs and outputs on the PCB it is possible to abide by the standard.



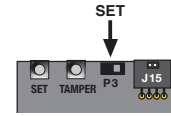
For safety reasons and to avoid false fog emissions, after arming, NEBUCLEAN4000 becomes operative only after 20 “. After this time , fog emission is immediate.

- A Example of connection of NEBUCLEAN4000 inputs with outputs of a standard alarm system.
- B Example of connection of NEBUCLEAN4000 inputs to an alarm with relay outputs.
- C Example of connection of NEBUCLEAN4000 inputs with outputs of an alarm with open collector outputs.
- D Example of connection of NEBUCLEAN4000 outputs to drive LEDs and / or relays.
- E Example of connection of NEBUCLEAN4000 outputs with inputs of an alarm normally opened.
- F Example of connection of NEBUCLEAN4000 outputs with balanced inputs of an antitheft.
- G Example of connection of NEBUCLEAN4000 outputs with antirobbery connection.
- H Example of connection of NEBUCLEAN4000 outputs with relay board.

A - Example of connection of NEBUCLEAN4000 inputs with outputs of a standard alarm system



In the diagram above the control panel, as example, provides to NEBUCLEAN power supply between 11 and 14V DC 250 mA max. The ON/OFF output of this alarm is an Open Collector NPN opened when the system is off and it is stably closed to negative as long as the system turned on. The alarm output of the alarm is normally open and becomes positive during the alarm time.



To set the shooting time, after opening the bag compartment door, at the top of the PCB, facing the board you must move the jumper in left position P3 (closer to the buttons S1/S2). Then, holding down the button S1 “SET”, 6 leds on the front will flash and each flash is equivalent to 10 seconds. If you press the button again, the shooting time is not added to the one previously set, but will restart from zero.

N.B. Before opening side door ensure that the control panel is set to “service”, so that the opening of “anti-sabotage or tamper” circuit does not cause any shooting.

N.B. To correctly dimension the machines it is needed to verify that the saturation of the area occurs in faster time than the one supposed for the theft.

RECOMMENDED SHOOTING SECONDS ACCORDING TO THE VOLUME SPACE TO PROTECT (m³)

Fogging systems NEBUCLEAN4000 are able to produce fog for a maximum 180 seconds per single shot. The maximum quantity of 14,7 ml/s allows to fill an area of about 4000 m³. There might be cases in which, due to specific characteristic of the location, nozzle type, levels of temperature and air pressure, degree of the fog density and light in the target area, the shooting time should be increased or decreased. For example, above 5 m of height the shooting time must be integrated and above 7 m , every additional meter should be considered as double.

$$(H \times L \times P) \times D \times V \times R \times I$$

- H×L×P -----Height × Width × Depth of the area to protect
- D-----Density of the produced fog
- V-----Temperature and air pressure
- R-----Acceptable residue in case of saturation of V parameter
- I-----Intensity of the surface light

The following tables indicate the suggested fog emission in relation to the number of seconds of shooting set in average condition of temperature, air pressure and humidity.

SHOOTING TABLE NEBUCLEAN4000

m³ to protect	Seconds of emission	m³ to protect	Seconds of emission
221 - 265	10	2205 - 2646	100
441 - 529	20	2426 - 2911	110
662 - 794	30	2646 - 3175	120
882 - 1058	40	2867 - 3440	130
1103 - 1323	50	3087 - 3704	140
1323 - 1588	60	3308 - 3969	150
1544 - 1852	70	3528 - 4234	160
1764 - 2117	80	3749 - 4498	170
1985 - 2381	90	3969 - 4763	180

The value in the first column indicates the volume of the room to be protected, with respective seconds of emission reported in the second column. The value in m³ varies depending on the density to be obtained. Within the second column, the first value allows to get the maximum density recommended to ensure the absence of any residual, while with the second value you get minimum recommended visibility of according to the standard CENELEC, whereas a higher visibility would make the fog superfluous. In places where a little residual causes no problems, it is possible to increase the shooting time. Please note that the higher the fog released, the more the time required to recover visibility. High levels of fog, over recommended limits, can leave residual.



ARM
FAULT

BLUE LED

When on: the machine is armed and, if hot, it's ready to shoot.

When flashing: something is wrong (see paragraph 17 "DEFECTS AND POSSIBLE SOLUTIONS")

EMPTY
RESERVE

RED LED

When on: the bag is empty or it is in reserve.

When flashing: something is wrong (see paragraph 17 "DEFECTS AND POSSIBLE SOLUTIONS")

HEATING

GREEN LED

When on: the machine is hot and ready for the fog emission.

When flashing: the heating process is in progress. In this step the machine is heating but is not ready to shoot.

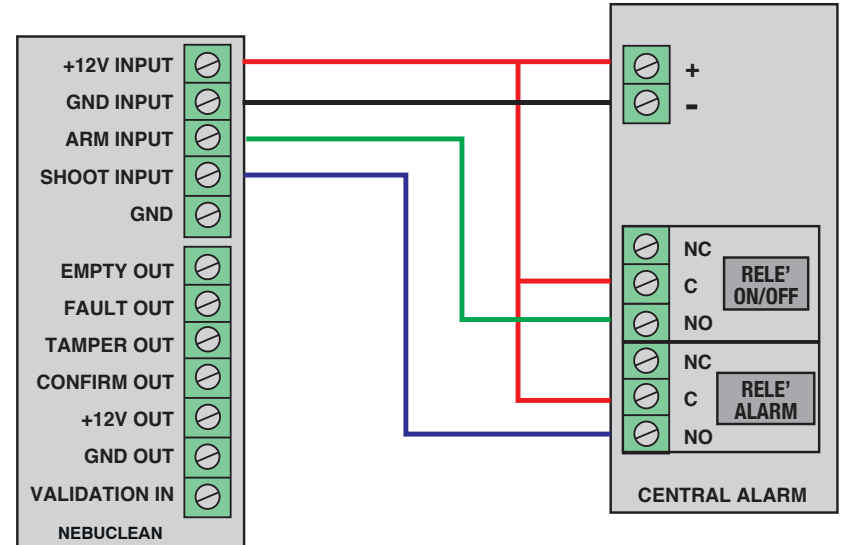


IF THE BLUE LED IS FLASHING, TOGETHER WITH A CONTINUOUS SOUND FROM THE BUZZER, A PROBLEM IS DETECTED. SEE PARAGRAPH 17



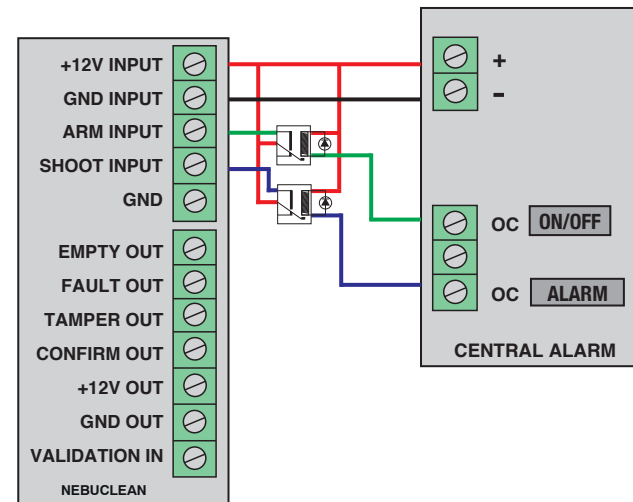
The symbol of empty bag, has the meaning of "RESERVE" too. It means that, since the last bag reset the machine consumed at least 50% of the estimated range of the bag. The machine already shot for 150 seconds.

B - Example of connection of NEBUCLEAN4000 inputs to an alarm with relay outputs



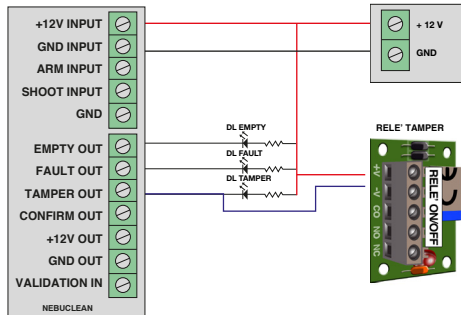
ON/OFF output of this alarm central is an open relay when the system is off and it is stably closed to positive as long as the system is turn on.

C - Example of connection of NEBUCLEAN4000 inputs with outputs of an alarm with open collector outputs



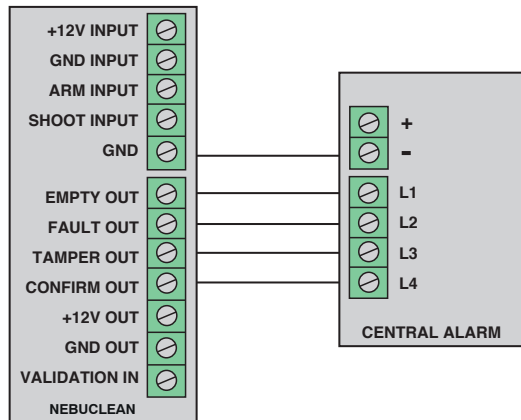
Compared to B diagram, this alarm central has only open collector outputs. The simplest action to take is to use 2 relays to create a connection similar to the one shown in the previous diagram.

D - Example of connection of NEBUCLEAN4000 outputs to drive LEDS and/or relays



In case of an empty bag, the EMP LED (EMPTY) will switch on.
 In case of a fault, the FLT LED (FAULT) will switch on.
 By opening the cylinders door, besides the TPR (TAMPER) turning on, the relay will switch as well.
Max power applicable on the outputs is 100mA

E - Example of connection of NEBUCLEAN4000 outputs with inputs of an alarm normally opened

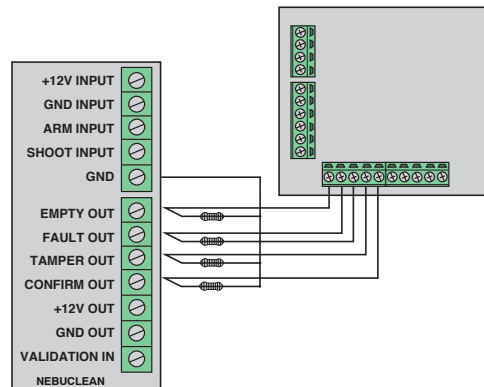


The outputs shown in the diagram are not always necessary, but only in cases where the voltage of pull-up resistance is lower than that of power supply.

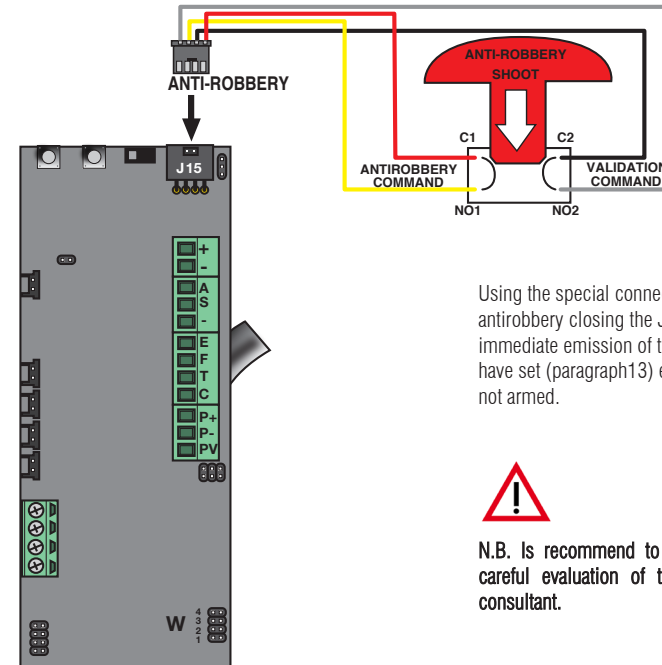
The NEBUCLEAN outputs are normally opened and connected with input zones of the alarm control panel normally opened.

F - Example of connection of NEBUCLEAN4000 outputs with balanced inputs of an antitheft

In this diagram, by putting a resistance with a value required by the alarm control panel used, in NEBUCLEAN terminal with not used outputs the central will see the correct resistance. After the activation of an output, a pull-down will occur causing the alarm in the corresponding zone.



G - Example of connection of NEBUCLEAN4000 outputs with antirobbery connection.



Using the special connector and enabling the option antirobbery closing the Jumper W2, you will obtain the immediate emission of the fog for the seconds that you have set (paragraph13) even if the fogging system is not armed.



N.B. Is recommend to use this function after a careful evaluation of the risks from a security consultant.

H - Example of connection of NEBUCLEAN4000 outputs with relay board.

