Density®
INSTANT FOG PROTECTION

Installation and user manual

DENSITY UNIK

Version 1.3 - May 2024

WARNING!

All DENSITY fogging systems should only be used with DENSITY-branded fluids.
It is strictly forbidden to use any fluid not previously authorized in writing by DENSITY.

Summary

1. Package contents page 3

2. Product presentation page 3

3. Conditions of use and warnings page 4

4. Installation page 5

5. Mounting page 7

6. Technical specifications page 8

- **6.1** Physical features page 8
- **6.2** Electrical characteristics, consumption and heating time page 8
- **6.3** Performance page 8

7. Batteries page 9

- **7.1** Insert or change the batteries page 9

8. Low power mode & Always on mode tables page 11

9. Electronic Board - Input and Outputs signals page 13

- **9.1** Inputs connection page 14
- **9.2** Outputs connection page 14

10. Shooting time setting page 15

11. Fluid Cartridge page 15

12. How to insert the UNIK fog refill page 16

13. Front LEDs page 16

14. Errors page 17

15. Final test - Yearly maintenance page 17

16. Warnings page 18

17. Warranty page 19

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:
A fogging unit Density® UNIK model
A warning label to indicate the device installation
Installation and user manual

NOTE: Special batteries 12V 9Ah, cartridge of 125 ml fog fluid are both NOT INCLUDED.

The Density® swarning labels must be positioned on the window close to the protected premise, to notify fogging system presence.
These warning labels are self-adhesive, double side printing.

2. Product presentation

Density® UNIK is a battery operated device able to generate fog up to 60 seconds in a single shot with a proprietary battery technology that allows to remain in working condition for 6 months without mains power while still being able to shoot for the maximum time.
Density® UNIK can shoot a maximum of 100 m3 of dense fog with zero visibility.
The fluid used for the fog is certified as safe for humans and animals, not toxic with "food grade" approved certification.

3. Conditions of use and warnings

DENSITY products are certified respecting European laws and regulations.
Any specific certifications for local markets are responsibility of the distributor of that country.
The documents related to certifications can be requested by mail to: **support@densityglobal.eu**

It is not guaranteed by the manufacturer the use of DENSITY system in the presence of objects that may be damaged in any way by the contact with substances present in the fluid formula (glycol, water and alcohol).
Any employee or worker that may be exposed to the fog must be warned in advance and must be checked for any allergy to the substances listed on the toxicological evaluation (available on request), anyway at the date of printing of this manual it has never been pointed out any problem related to any allergy.
DENSITY 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.
Please refer to DENSITY fluid safety data sheet published on the website and carefully read it at **www.densityglobal.eu**

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.
The fog generated by DENSITY Unik does not create any problem or injuries to people during a short stay in a filled room, if the system is used according to the manufacturer's recommendations.
The generated fog is certified as safe for people and animals from an authorized international certification body and it is proven that it does not leave any residual.

Do not use refill cartridges that are not the ones suggested by DENSITY and never try to recharge them, they are designed for a single use.
Follow your national rules for the dispose of empty cartridges. Keep DENSITY cartridge out of reach of babies or animals. The nozzle may be hot and touching it may cause burns. Do not look directly into the nozzle.

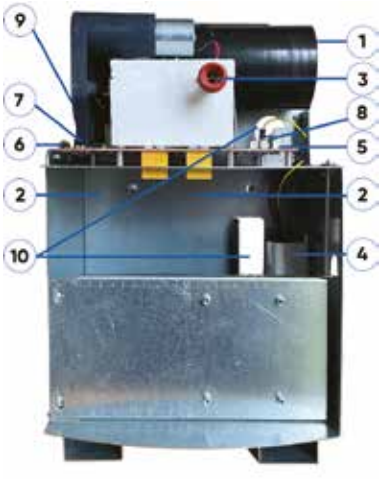
Never use DENSITY products for any purpose that is not related to protection from theft or robbery (the choice of the conditions of use in case of robbery will be suggested by your security consultant).

For any application on moving vehicles, and in general on vehicles circulating on roads and public areas:

- It is necessary to refer to the regulations in the respective Country where the device will be used
- Take all precautions so that the fog cannot invade the driver's cab. Keep goods to be protected in a separate compartment.
- The device should be installed in a way that, for any reasons, cannot generate fog when the vehicle is in motion.

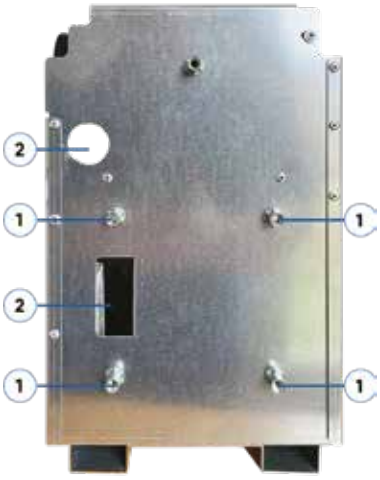
4. Installation

Lay down the Density® UNIK, remove the two screws on each side of the cover and lift the cover up to remove it.



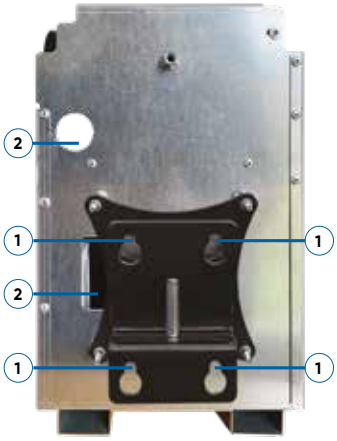
Identification of main components:

1. Location of the Density® UNIK fog refill. (Cartridge 125 ml)
2. Battery holder 2x12V 9A.
3. Density® UNIK nozzle.
4. 12V-1.25 A (220V) power supply option
5. Status LED.
6. RESET button.
7. FAST CHARGER selection jumper.
8. Input/ Output connections.
9. Shooting time switches.
10. Holes for cables.



Fastening screws:

1. Density® UNIK fastening screws.
2. Holes for cables.

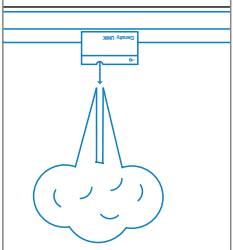
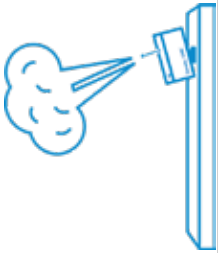
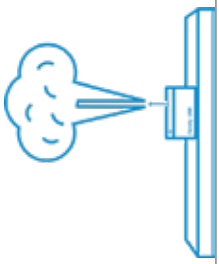


Adjustable mounting bracket:

1. Screws to fix the mounting bracket.
2. Holes for cables.

Choose the surface for a correct installation, identify a surface (shef, wall, ceiling or other) that guarantees a safe seal. Use screws, anchors and other restraint systems suitable for the purpose and for the surface.
For wall installation use the orientable bracket to direct the fog downwards.

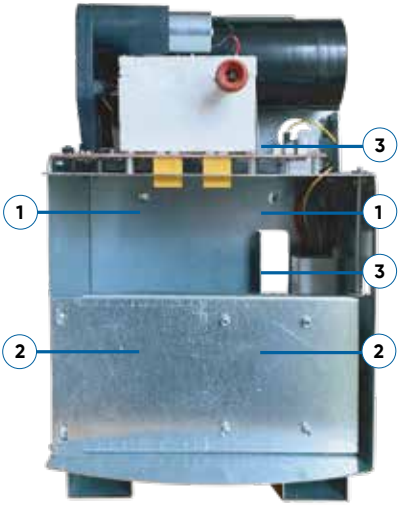
Density® UNIK Fog Generator
Recommendations of installation

MODEL	CEILING INSTALLATION	WALL INSTALLATION	
		With adjustable wall bracket	Without adjustable wall bracket
			
Density® UNIK	2,50 meters max	2,50 meters max	1,50 meters max

For greater efficiency, we recommend the use of the adjustable mounting bracket.
This element will allow you to orient the Density® UNIK Fog Generator and therefore the fog shot.

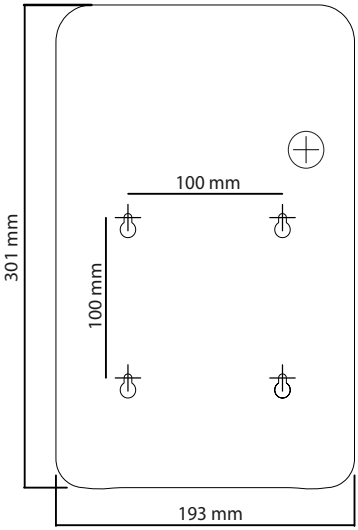
5. Mounting

Density® UNIK®

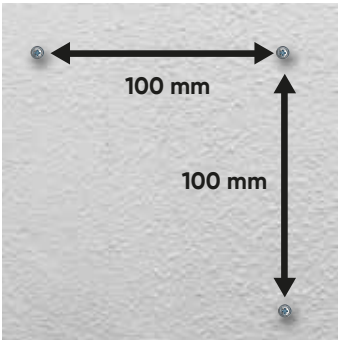


Fastening screws:

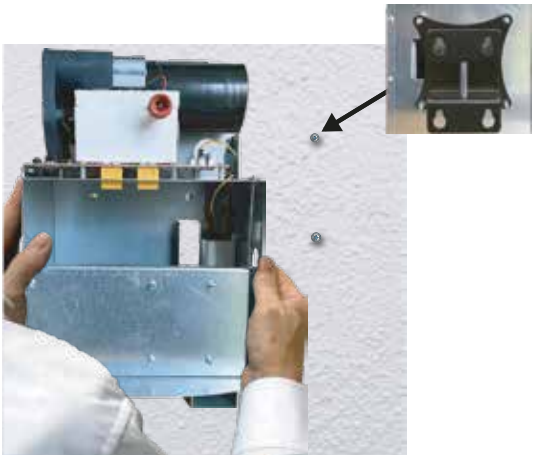
1. Visible fastening screws.
2. Fastening screws behing the POWER PACK hatch.
3. Holes for cables.



Dimensions between holes.
(Drilling template available)



Screws for a wall installation without the Density® UNIK adjustable mounting bracket.



Hang the Density® UNIK Fog Generator by placing the «lock holes» of the adjustable mounting bracket* on the screws.

*Adjustable mounting bracket available, in option.

6. Technical specifications

The Density® UNIK is a battery-operated Fog unit that can shoot a maximum of 100 m3 of fog with zero visibility (Density standard). It is powered by two lead acid VRLA 12 V - 9 Ah batteries. With healthy and fully charged batteries it can remain operational without recharging for more than 6 months.
At 6 months it is still able to perform a full shot of 60 seconds.

6.1 Physical features

Dimensions (height x width x depth) mm	300 x 200 x 150
Weight included batteries (Kg)	7,6
Weight without batteries (Kg)	1,9
Lid color	Pure white RAL 9010

6.2 Electrical characteristics, consumption and heating time

Power supply	Battery
Battery model	n° 2 custom built lead acid VRLA 12 V - 9 Ah batteries
Autonomy without external power supply	About 6 months (at 6 months a full time shoot is guaranteed). See Chapter 7
Autonomy with external optional power supply	No limit. Batteries replacement recommended every 2 years
Inbuilt battery charger	Yes with two external charging current options: 10-16 V / 350 mA and 1 A
Average power consumption	Low power mode: 2-3 mW Always on mode: 1,2 W
Heating time from cold	Immediate at the time of shot
Temperature management	Self-balancing of shot with patented system
Operating temperature range	-10°C +50°C

6.3 Performance

Performance (m^3) visibility 1 meter (Standard EN 50131-8: 2019)	100 m^3 with zero visibility (Density standard) in 60 seconds
Number of shots with one cartridge	25 m^3 (8 shots) - 50 m^3 (4 shots) - 100 m^3 (2 shots) + 1 extra test shot
Shot times (sec)	2s (test shot) - 15s (25 m^3) - 30s (50 m^3) - 60s (100 m^3)

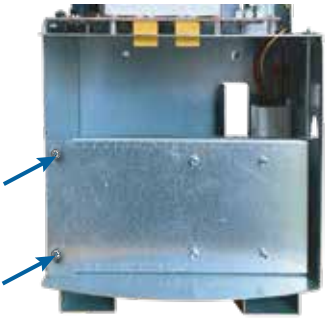
7. Batteries

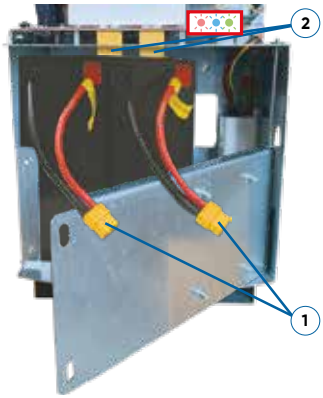
Density® UNIK unit is powered by two lead acid VRLA 12 V - 9 Ah batteries.
With healthy and fully charged batteries it can remain operational without recharging for more than 6 months.
At 6 months it is still able to perform a full shot of 60 seconds.

For use in the absence of power supply (stand alone mode) it is necessary to fully charge the batteries before the first activation.

NOTE: NO OTHER BATTERIES, DIFFERENT FROM THE DENSITY UNIK POWER PACK, WILL BE OPERATIONAL.

7.1 Insert or change the batteries





To insert and replace the batteries, follow the steps as below:

1. Remove the plastic lid
2. Open the compartment cover unscrewing the two screws as in picture 1.
3. Disconnecting and removing the old batteries (if present)
4. Insert the new batteries into the compartment
5. Close the compartment cover
6. Connect the batteries connectors (1) firmly to the connectors (2)

Note : the battery connector cannot be inserted in reverse position.
The buzzer plays three notes and the three LEDs blink for 5 seconds (Low power mode) or steady on (Always on mode)

NOTE: 2 minutes after connection the electronic board performs a short battery test powering the heating system. At this time a small quantity of fog might come out from the nozzle. Don't stand in front of the nozzle in this conditions.
In any case, don't stand less than one meter away from the nozzle when the device is switched on.

The following tables is a useful reference to correctly identify and choose the best connection method.
The estimated on-time is calculated taken into account a couple of brand new and fully charged original batteries.
The impact of a low power PIR sensor connected and powered by the device is evaluated as not significant.

Estimated recharge time required of the batteries, after a 60 sec shot, depending on the chosen operation mode of your Density® UNIK

	Operation mode	Active Cloud (Density cloud)	Low consumption PIR sensor	Estimated time
Density® UNIK running only on the POWER PACK (no external power supply)	Low consumption mode = W3 not inserted	No	No	6 months
			Yes	4 months
	Always ON mode = W3 inserted	No	No	4-5 days
			Yes	4-5 days
		Yes	No	2 days
			Yes	2 days

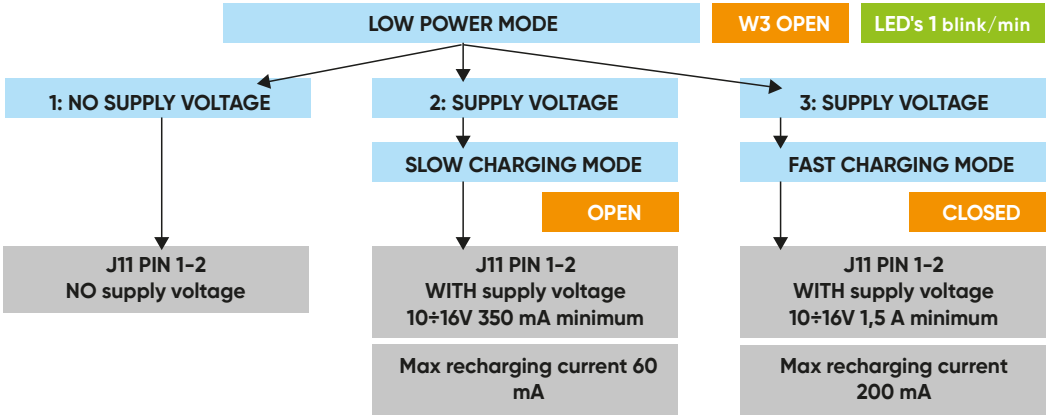
Table 1 - Estimated on-time in low power mode / always on mode, internal batteries only

Estimation of the duration of the batteries according to the chosen mode of operation of the Density® UNIK, with external power supply

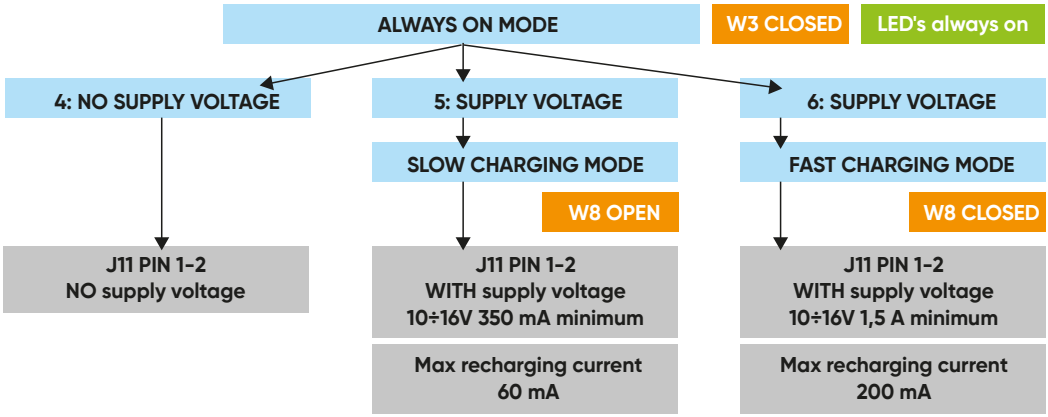
	Charging mode (jumper on FAST CHG)	Operation mode	Active Cloud (Density cloud)	Estimated recharge time (60s shot)
Density® UNIK running with external power supply	Slow charge = Jumper FAST CHG not inserted	Low consumption mode	No	20H
		Always ON mode	No	3 Days
	Fast charge = Jumper FAST CHG inserted	Low consumption mode	No	6H
		Always ON mode	No	8H
			Yes	10H

Table 2 - Estimated single shot (60 s) recharge time

8. Low power mode & Always on mode tables



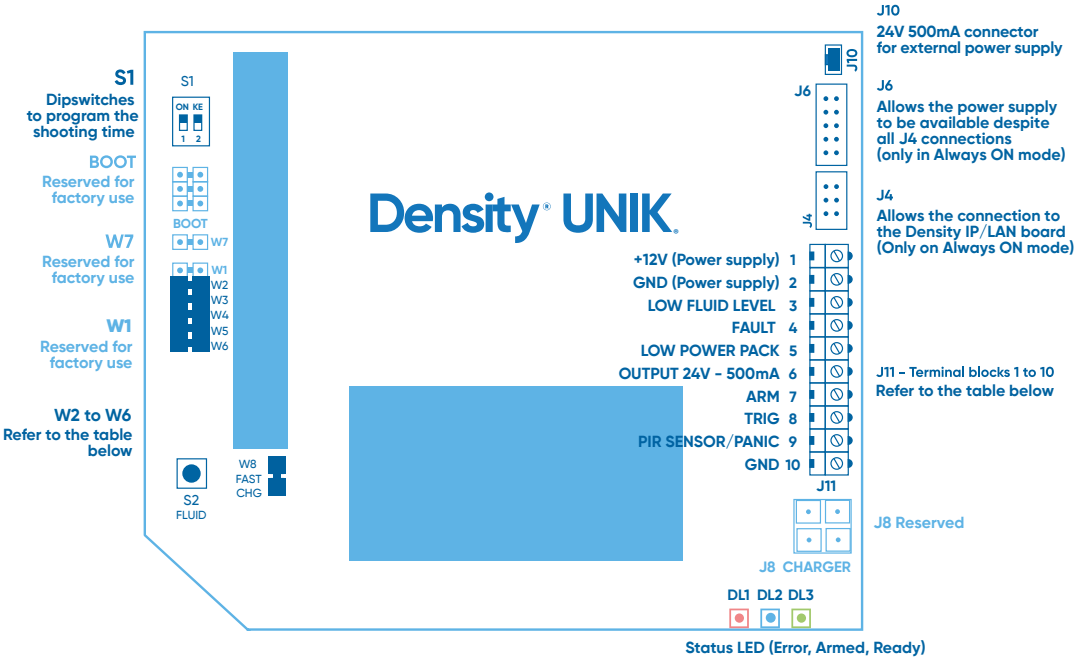
Serial interface disabled / no network connection / Active Cloud board CANNOT be connected		
Density Unik should be able to work for at least 6 months while still being able to make a full time shot with the remaining charge	20 hours to completely recover the energy lost in a full time shot of 60 sec	6 hours to completely recover the energy lost in a full time shot of 60 sec
Every other device draining current from onboard batteries will decrease the working time from 6 months to some days / some hours. With a low power PIR sensor: 4 months	The external voltage can be delivered by the alarm panel itself. Minimum current available from the alarm panel supply output must be greater than or equal to 350 mA	The external current CANNOT be delivered by the alarm panel (minimun available current must be greater than or equal to 1 A). An external power supply is necessary



Serial interface enabled / network connection / Active Cloud board CAN be connected

The electronic board has all its subsystems always powered on. Estimated on-time with new and fully charged batteries: 4-5 days. With Cloud board connected: 2 days	Up to 3 days to completely recover the energy lost in a full time shot of 60 sec	Up to 8 hours to completely recover the energy lost in a full time shot of 60 sec With Cloud board connected: around 10 hours
Every other device draining current from onboard batteries will decrease the working time from 4-5 days to some days / hours	The external voltage could be delivered by the alarm panel itself. Care must be taken to ensure the minimum current available from the alarm panel supply output must be greater than or equal to 350 mA, increasing to 500 mA with Cloud board connected	Because of the higher current requirements, it could not be possible to supply the Density Unik machine from an alarm panel thus making an external power supply a necessary part
A 24V→12V DC/DC converter is necessary to supply the cloud board or any other piece of equipment that requires +12 V DC	No current can be drawn from the machine so any add-onboard must be powered from an external source	A 24V→12V DC/DC converter is necessary to supply the cloud board or any other piece of equipment that requires +12 V DC

9. Electronic Board – Input and Outputs signals

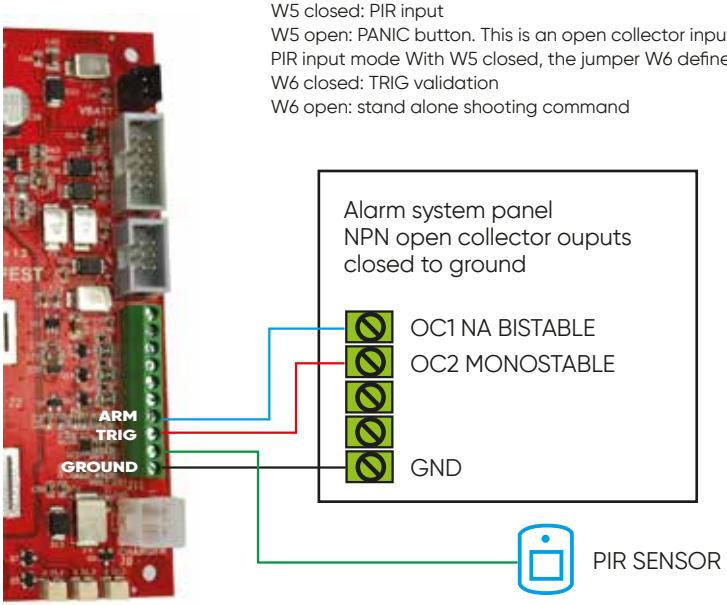


W2 to W6		JUMPERS FUNCTIONS	J11	TERMINAL BLOCKS 1 to 10 FUNCTIONS	
W2	Close	Partial maintenance mode enabled by pressing S2 button	1	+12V INPUT POWER SUPPLY	If W8 closed= 1500 mA If W8 open= 350 mA
	Open	Normal operation of the Density UNIK Fog Generator	2	GND INPUT POWER SUPPLY	
W3	Close	Always ON mode (recommended if using external power supply)	3	OUTPUT - LOW LEVEL OF FLUID - The Density UNIK	
	Open	Low consumption mode	4	OUTPUT - FAULT	
W4	Close	NC - Normally Closed Inputs ARM - TRIG and Outputs LOW FLUID, FAULT and LOW batteries level	5	OUTPUT - LOW batteries LEVEL	
	Open	NO - Normally Open Inputs ARM - TRIG and Outputs LOW LIQUID, FAULT and LOW batteries level	6	OUTPUT 24V - 500 mA	
W5	Close	PIR Sensor Input	7	INPUT - ARM (Dry contact on GND)	
	Open	PANIC Input	8	INPUT - TRIG (Dry contact on GND)	
W6	Close	Normal operation to trigger the fog (ARM + TRIG + PIR)	9	INPUT - PIR/ PANIC (Dry contact on GND) depending on the W5 jumper	
	Open	Operation in «direct mode» to trigger the fog on information from the TRIG or the PIR sensor (autonomous)	10	GROUND	

9.1 Inputs connection

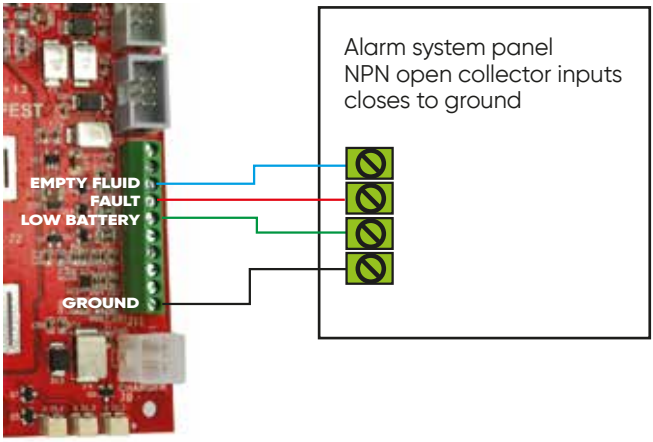
The ON/OFF output of the alarm panel in the example is an NPN Open collector, it is open when the system is OFF and closes permanently to ground (GND) for as long as the same remains in ON. This output is connected to the pin 7 "ARM".
The ALARM output of the alarm panel in the example is an NPN Open collector, it is open when the system is at rest and closes to ground (GND) giving a pulse in case of intrusion.
This output is connected to the pin 8 "TRIG".
The PIR sensor is a normally closed to ground (GND) contact wich open in case of detection.
It's connected to the pin 9 "PIR".
The ground (GND) of the alarm panel is permanently connected to the pin 10 "GND" of Density Unik.
PIR/Panic input 9 can be defined as PIR verification or Panic by adding a jumper on W5.

W5 closed: PIR input
W5 open: PANIC button. This is an open collector input. (Dry contact to Gnd).
PIR input mode With W5 closed, the jumper W6 defines the function of the PIR input.
W6 closed: TRIG validation
W6 open: stand alone shooting command



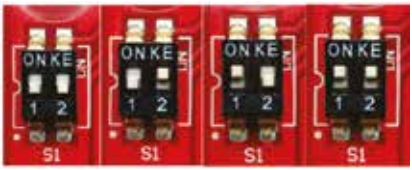
9.2 Outputs connection

The EMPTY FLUID (NPN Open collector) output closes to ground (GND) when the fluid cartridge is empty or in reserve (one shoot still available).
The FAULT (NPN Open collector) output closes to ground (GND) when maintenance is required.
The LOW BATTERY (NPN Open collector) output closes to ground (GND) when batteries needs to be recharged.



10. Shooting time setting

There are 4 possible configurations to program the shooting time via the S1 dipswitch. The dipswitch can be set before any shot and there is no need to power cycle the device to set the shooting time.



2 seconds **15 seconds** **30 seconds** **60 seconds**

Note:
After a shot the processor introduces a cooling time during which any subsequent shot is not allowed until after a specific time has elapsed:

2 s shot – 1 min delay
15 s shot – 5 min delay
30 s shot - 10 min delay
60 s shot - 20 min delay

The device will not accept a shooting command before this time interval expires FOR SAFETY REASONS.
Bypassing waiting time can create malfunctions on the device.

11. Fluid Cartridge

The cartridge 125ml is sold separately.

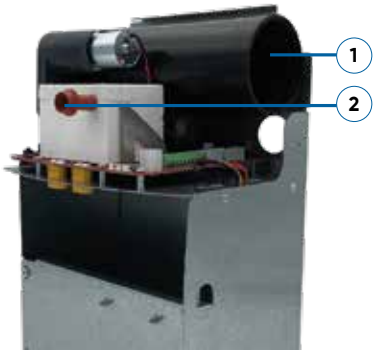
The fluid solution is provided in non-pressurized cartridge making it easy to substitute.
A self-aligning mechanism ensures that the cartridge is always fitted correctly.
The contents of the cartridges are mechanically determined and may vary + or - 5%, and each cartridge contains enough fluid to allow for 2 full time shots (60 s) and at least one test shot (2 s).
Fluid cartridges are disposable and CANNOT be recharged.

Technical data

Fluid cartridge capacity (ml)	125 ml
Certified White Out Food Grade fluid	yes
Number of shots with one cartridge	25 m³ (8 shots) - 50 m³ (4 shots) - 100 m³ (2 shots) + 1 extra test shot
Shot times (sec) (100 m³)	2s (test shot) - 15s (25 m³) - 30s (50 m³) - 60s (100 m³)

* The cubic meters of generated fog are as defined by the EN 50131-8:2019 standard which prescribes a visibility of less than 1 meter for 60 seconds. The cubic meters of generated fog mentioned in the table is higher, based on the Density standard which prescribes a visibility of 50 cm.

12. How to insert the UNIK fog refill



1. Density UNIK refill location (side).
2. Silicone protection of the Density UNIK nozzle.

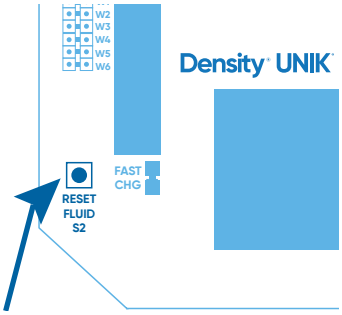
The Density UNIK fluid refill is a non-pressurized recharge.
A self-aligning mechanism for the refill ensures that it is inserted correctly at all times. Density UNIK refills cannot be refilled.

Before removing the lid of your Density UNIK to change the cartridge, **check that the alarm system is in maintenance mode** not to risk a false alarm. Then **disconnect the batteries**.

You can then change the cartridge, as shown in the pictures.
Don't forget **to disconnect the batteries and to prime the system's fluid pipe (next page)**.
Once primed, it is necessary to perform a **test shot of 2 seconds**.

Remove the white cap and insert the refill into the compartment.

Insert the Density UNIK fog refill and screw it clockwise.



Finally, press the «RESET FLUID» button for 5 seconds until the buzzer BEEPs*.

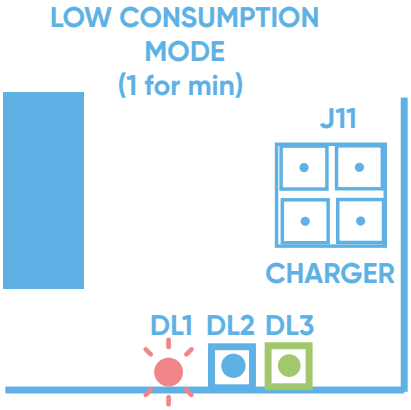
*When activating the «RESET FLUID» (S2) button, it is possible that a small shot of fog emerge from the device.
DO NOT STAND IN FRONT OF THE NOZZLE WHEN CHANGING THE REFILL. Be sure to prepare a small cloth to pick it up.
IMPORTANT: After each refill remplacement, ensure that the silicone tube on the nozzle is checked. If this protection is easily removable, it is preferable to change it.

13. Front LEDs

The Density UNIK has 3 LEDs on the front of the unit. In «Low consumption» mode these will flash once per minute and in «Always On» mode these will be stay on continuously.

READY	Green LED	**Always on or flashing:** The Density UNIK is ready to shot fog.
ARMED	Blue LED	**Always on or flashing:** The Density UNIK is arm and ready to shoot (TRIG).
FAULT/ LOW FLUID	Red LED	**Always on or flashing:** Something is wrong. This may be due to a default or the indication of low fluid in the fog refill. (See section 14. Errors on the next page)

14. Errors



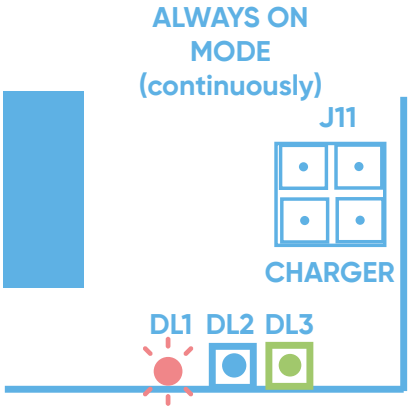
In «Low Power» mode the green LED of your Density UNIK will flash **once per minute**.

If the **red LED doesn't flash** there are **no errors** on the device

When the **red LED flashes**, it is either an error concerning the Density UNIK refill or the batteries:
- Either **the refill is in low level or empty**.
- Either **the batteries is in low charge level**.

In both cases, **the element concerned** (either the refill or the batteries) must be replaced.

When the **red LED is on continuously**, it is either **a software fault or the batteries that are not functional**.



In «Always on» the green LED of your Density UNIK will be on continuously.

If **the red LED doesn't light** there are **no errors** on the device.

When the **red LED flashes**, it is either **a software fault or the batteries that are not functional**.
When the **red LED is on continuously**, it's an error on the Density UNIK refill or the batteries:
- Either **the refill is in low level or empty**.
- Either **the batteries charge level is low**.

In both cases, **the element concerned (either the refill or the batteries) must be changed**.

15. Final test - Yearly maintenance

At the end of each installation it is essential to test the entire safety system (alarm panel, fog generator, other devices).

Here's a CHECKLIST example for finalizing the installation:

- Check all signals to and from the alarm system
- Check that the fog device is READY before carrying out the test (System READY = GREEN LED on)
- Make a FULL TEST SHOOTING at the installation site, to ensure that the fog quantity is enough.
- If ActiveCloud optional lan board is installed , register it on the web platform.
- Make sure to give a full INSTRUCTION to the end-user on how to use the device.

16. Warnings

Please observe the following instructions for installing DENSITY:

1. This appliance is not intended for use by person (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
2. Children should be supervised to ensure that they do not play with this appliance.
3. The unit must be installed without blocking escape routes.
4. Verify the fog does not limit the visibility near: stairs, moving objects that may cause falls, injuries or any damage to people.
5. When using the product in multi-storey buildings, if the escape route runs through an area which is protected by a fogging system, it is recommended to install a vocal warning that provides instructions on the behaviour to follow.
6. Do not look directly into the nozzle. Do not add any other substance into the bags.
7. The nozzle may reach high temperatures, touching it may cause burns.
8. When DENSITY produces fog avoid staying closer than 1 meter from the unit.
9. Before testing DENSITY, remember to report it in advance to the firefighters in your area to avoid false alarms.
10. Remember to put warning labels about the presence of DENSITY on the windows.
11. Report its installation to the firefighters in your area and to other institutions if needed.
12. It is necessary to add an external switch to separate the fog generator from the alarm system, it should be activated before the maintenance to avoid that input tests, for example, it can activate the fog generator.
13. 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, DENSITY reaches and exceeds more than 10 meters away in the first 3 seconds from the point where the unit is installed.
14. When 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 residue problems in the room.
15. Install it at an height of about 2,5 meters to not let it be reached, avoiding possible tampering.
16. Do not move the unit when it is still hot.
17. Do not activate the DENSITY unit before the installation is completed.
18. Insert the fluid bag as the last procedure and verify the anti-tampering function if present.
19. When the installation is finished, always test the system.
20. Install DENSITY avoiding any obstacles in front of it which can prevent the spreading of the fog.
21. The DENSITY unit should not be exposed to water spray or dripping.
22. Request to DENSITY or its distributors to take part in courses for installers to ensure the optimal installation of the equipment.
23. The content of the bags is mechanically predetermined and can be subject to variations +/- 10%.

17. Warranty

The warranty of DENSITY is one year 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 unit. Not included in the warranty: moving parts and/or damages depending on the incorrect use unless it is found a manufacturing defect in origin.
Fluid and bags are not covered by warranty.

BY BREAKING THE SECURITY LABELS AND THE OPENING OF THE UNIT
YOU WILL ACCEPT WHAT IS WRITTEN ON THIS MANUAL AND
ON THE WEB SITE: www.densityglobal.eu

RESELLER/INSTALLER STAMP
(company to contact for the warranty)

Serial number _____

Date of installation _____

Signature of installer _____

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

Density®
INSTANT FOG PROTECTION

Version 1.3 - May 2024