

TECHNICAL MANUAL

INSTALLATION AND MAINTENANCE

X-FOG

Security fog generator

ENGLISH / VERSION 2.5

INSTALLER MANUAL

Installation and connections

Configuration and commissioning

Diagnostics and maintenance



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Part A - Installer quick guide

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Manufactured by XFOG Security srl

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PART A - INSTALLER QUICK GUIDE

A.1 Purpose and intended users

This manual is intended for authorised, qualified installers and maintenance technicians. It describes installation, connection, configuration, commissioning, maintenance and fault diagnosis of the X-FOG security fog generator, which reduces visibility and obstructs an intruder's actions.

A.2 Essential safety information

Burn hazard: Avoid contact with hot components during operation. Areas adjacent to the front and rear nozzles and some internal parts of the heat exchanger may reach 100 °C. Wait at least 3 hours after switching off before carrying out any work.

Ventilation: Avoid discharging fog in excessively air-conditioned or cold rooms without adequate ventilation. Fog must be able to clear within 30 minutes of activation. Very cold surfaces (shop windows, mirrors) may develop temporary residues that evaporate within 24 hours with ventilation.

Absence of residues: Under normal ambient conditions (>22 °C) and with correct sizing for the volume to be filled, complete absence of residues is guaranteed. Avoid repeated or excessive discharges without adequate ventilation between them (for example, do not run cycles designed for 150 m³ in a 50 m³ room). Effectiveness and cleanliness depend on correct planning by the installer. The manufacturer accepts no responsibility for improper or incorrect use.

A.3 Mechanical installation (quick guide)

Wall mounting: A height of 200-250 cm above the floor is recommended for optimum fog distribution and effective coverage.

Ceiling mounting: Possible by ordering the version with a straight, non-angled nozzle and its mounting support, designed to support the fluid bag and facilitate insertion and removal of the drawer.

Secure the supplied black brackets with 4 screws and wall plugs suitable for the substrate. Allow for a total weight of approximately 10 kg and an adequate safety margin when sizing the fixings. After hooking the unit onto the brackets, it is strongly recommended to anchor the rear panel to the wall at the points shown on the drilling template.

A.4 Connections at a glance

Power supply: The system uses separate supplies for power and logic. The heating element heats the exchanger at 230 V AC; the logic operates at 12 V DC.

Input operation IN1-IN5 (default factory configuration):

- **IN1: system status.** 12 V present → system armed (ARM), red LED on. 0 V (no voltage) → system disarmed (DISARM), green LED on.
- **IN2: full discharge.** 12 V present → fog discharge for the configured time. 0 V → idle, no discharge.
- **IN3: pre-alarm/reduced discharge (if enabled).** 12 V present → 5-second fog discharge. 0 V → idle, no discharge.
- **IN4: anti-robbery (if enabled), full discharge.** 12 V present → fog discharge for the configured time. 0 V → idle, no discharge.
- **IN5: maintenance (if enabled).** 12 V present → fog discharge inhibited; the flashing white LED simulates the activation cycle without emitting fog. 0 V → idle, no discharge.

A.5 Quick configuration (visible menu)

The device has an 8-position DIP-switch bank and jumper JP6 (visible/hidden menu). During normal operation: **JP6 fitted (visible menu).**

Discharge time (DIP 1-2):

- OFF/OFF = 40 s
- OFF/ON = 20 s
- ON/OFF = 10 s
- ON/ON = 5 s

Function enabling in the visible menu:

- DIP 3: IN3 pre-alarm (OFF disabled / ON enabled).
- DIP 4: IN4 anti-robbery (OFF disabled / ON enabled).
- DIP 5: IN5 maintenance (OFF disabled / ON enabled).
- DIP 6: tank capacity (OFF 160 s / ON 600 s, optional on request).
- DIP 7: multiple discharge (OFF disabled / ON enabled).
- DIP 8: fluid reset (OFF manual only / ON automatic reset within 24 h of low fluid).

A.6 Commissioning (quick checklist)

1. Connect the 230 V supply and check the LED.
2. Connect the backup battery, if provided.
3. Wait for stable DISARM status (steady green LED).

Warning: If the LED immediately turns steady red at switch-on while the alarm panel is disarmed, the device is already in ARM. It will discharge automatically when the discharge temperature is reached. Check and, if necessary, invert the alarm panel contact logic to ensure 0 V at rest and 12 V in ARM.

Actual fog discharge test: Set ARM, wait for a steady red LED (approximately 10 minutes after green stabilisation), then activate discharge. Return to DISARM to interrupt it. After deactivation: automatic 60 s pause.

Test without fog (recommended in occupied premises): Activate IN5 with 12 V to enter maintenance mode. The pump is disabled; discharge is simulated by the RGB LED flashing white.

PART B - DETAILED MANUAL

1. Introduction

This technical manual is intended for authorised, qualified installers and maintenance technicians. It describes correct installation, connection, configuration, commissioning, maintenance and fault diagnosis of the X-FOG security fog generator, which reduces visibility and obstructs an intruder's actions.

2. Safety and conditions of use

2.1 General warnings

The device must be installed exclusively by qualified technical personnel, such as professional electricians or installers specialising in alarm systems.

2.2 Thermal hazards

Avoid contact with hot components during operation. Areas adjacent to the front and rear nozzles and some internal parts of the heat exchanger may reach 100 °C, despite the insulation. Wait at least 3 hours after switching off before carrying out any work.

2.3 Ventilation and residues

Avoid discharging fog in excessively air-conditioned or cold rooms without adequate ventilation. Fog must be able to clear within 30 minutes of activation. Very cold surfaces (shop windows, mirrors) may develop temporary residues that evaporate within 24 hours with ventilation.

Under normal ambient conditions (>22 °C) and with correct sizing for the volume to be filled, complete absence of residues is guaranteed. Repeated or excessive discharges without adequate ventilation between them must be avoided. For example, cycles intended for 150 m³ must not be run in a 50 m³ room. Effectiveness and cleanliness depend on correct planning by the installer. The manufacturer accepts no responsibility for improper or incorrect use.

3. Mechanical installation

3.1 Wall mounting

The product is designed for wall mounting, preferably 200-250 cm above the floor, to ensure optimum fog distribution and effective room coverage.

3.2 Ceiling mounting

The device may also be ceiling-mounted, provided the dedicated version is ordered with a straight, non-angled nozzle and the specific mounting support. This support holds the fluid bag correctly and facilitates insertion and removal of the drawer.

For ceiling installation, secure the supplied black brackets with four screws and wall plugs suitable for the substrate. Allow for a maximum total device weight of approximately 10 kg and an adequate safety margin when sizing the fixings. After hooking the unit onto the brackets, it is strongly recommended to anchor the rear panel directly to the wall using the fixing points shown on the supplied drilling template.

The combination of the main support and additional fixings provides reliable, stable mechanical retention over time, offering maximum resistance even under mechanical stress, accidental impacts or vibration during use.

4. Operation: intrusion, anti-robbery, ECO and maintenance

4.1 Intrusion protection (IN1-IN2)

The device is primarily designed as an active intrusion protection system integrated with conventional alarm installations. In this configuration, it automatically generates fog following an intrusion signal, obstructing the offender's actions and helping protect property and people.

Intrusion protection relies on three specific inputs:

- IN1 manages system status: ARM (armed) and DISARM (disarmed).
- IN2 activates full discharge. Its duration is set using DIP 1 and DIP 2, for use with a confirmed alarm.

4.2 Reduced discharge / pre-alarm (IN3 - DIP 3 ON)

X-FOG provides a reduced discharge function (pre-alarm) for specific events that do not require full fog discharge.

The function is available only when enabled through hardware configuration:

- DIP 3 OFF → IN3 pre-alarm disabled.
- DIP 3 ON → IN3 pre-alarm enabled.

Without DIP 3 enabling, the system ignores IN3. When enabled and IN3 is activated, the device performs:

- a fixed 5-second discharge, independent of the discharge durations configured using DIP 1 and DIP 2.

The function is suitable for:

- partial or unconfirmed events;
- limited-risk zones;
- selective access points;
- pre-alarm logic managed by the alarm panel.

A dedicated function allows discharge intensity and method to be clearly differentiated according to event type, increasing system flexibility and adaptability to different installation scenarios.

4.3 Anti-robbery mode (IN4 / DIP 4)

X-FOG can be configured as an anti-robbery system, with immediate fog discharge upon a dedicated manual command.

WARNING: In anti-robbery mode, discharge may occur in the presence of people. All necessary safety measures must therefore be taken and applicable regulations followed to avoid risks to the user.

The function is available only when enabled through hardware configuration:

- DIP 4 OFF → IN4 anti-robbery disabled.
- DIP 4 ON → IN4 anti-robbery enabled.

Without DIP 4 enabling, the system ignores IN4. When the function is enabled:

- IN4 (anti-robbery) keeps the heater at discharge temperature even in DISARM;
- fog is discharged immediately when the anti-robbery button connected to IN4 is pressed;
- IN4 is independent of intrusion inputs IN1, IN2 and IN3, which continue to operate according to normal intrusion protection logic.

4.4 Using DIP 4 to disable ECO mode

If anti-robbery is not required but ECO mode is to be disabled, keeping the heater continuously at discharge temperature even when the alarm system is DISARM:

- set DIP 4 to ON;
- do not connect any command to IN4.

In this configuration:

- anti-robbery is logically enabled;
- IN4 is not used;
- ECO mode is automatically disabled;
- discharge temperature is maintained continuously, regardless of alarm system status.

4.5 Maintenance mode (IN5 / DIP 5)

X-FOG has a maintenance mode for functional checks, integration tests with the alarm panel and inspections without actual fog emission.

The function is available only when enabled through hardware configuration:

- DIP 5 OFF → IN5 maintenance disabled.
- DIP 5 ON → IN5 maintenance enabled.

Without DIP 5 enabling, the system ignores IN5. When enabled and the input is activated:

- the pump is disabled, preventing actual fog discharge;
- emission is simulated using the RGB LED in white;
- all other operating logic remains active, allowing complete tests with the alarm panel (intrusion, pre-alarm, anti-robbery and relays).

Maintenance mode remains active for as long as the signal is present on IN5.

4.6 Tank capacity configuration (DIP 6)

X-FOG automatically manages the total available discharge time according to the capacity of the installed tank. Total time is progressively deducted according to the discharge cycles actually performed and their duration.

Tank capacity is selected exclusively through hardware configuration:

- DIP 6 OFF → standard tank (800 ml).
- DIP 6 ON → extended tank (3 litres).

With DIP 6 OFF, the device is configured for the standard 800 ml tank, corresponding to 160 seconds of total fog discharge.

The total available time is divided according to actual discharge cycles and their configured durations.

When the estimated remaining fluid is sufficient for a maximum discharge of 30 seconds, the device activates the low-fluid indication through:

- activation of Relay 2;
- a yellow LED alternating with red or green, depending on ARM or DISARM status.

The remaining-time counter must be reset manually after replacing or refilling the tank.

To reset, press BOOT for at least 5 seconds and wait for the blue LED to light up.

This restores the counter to the nominal value of 160 seconds, unless the automatic reset function provided by DIP 8 and described in the next section is enabled.

With DIP 6 ON, the device is configured for the extended 3-litre tank, corresponding to 600 seconds of total fog discharge.

In this configuration, the low-fluid threshold is reached when the estimated remaining fluid is sufficient for approximately 120 seconds.

Counting and indication logic remain unchanged; only the configured nominal discharge-time capacity changes.

4.7 Multiple discharge operation (DIP 7)

X-FOG can be configured for multiple discharge, allowing several consecutive discharge cycles automatically while IN2 (full discharge) receives a continuous activation command. Discharge requires ARM status, managed by IN1.

The function is available only when enabled through hardware configuration:

- DIP 7 OFF → multiple discharge disabled.
- DIP 7 ON → multiple discharge enabled.

With DIP 7 OFF, the device performs one discharge per IN2 activation cycle. A cycle means a complete arming and subsequent disarming sequence through IN1 (ARM → DISARM).

To allow another discharge:

- disarm the system through IN1 (DISARM);
- arm it again (ARM);
- reactivate the discharge command on IN2.

A continuous IN2 signal does not generate additional discharges.

With DIP 7 ON and IN2 active at 12 V, automatic multiple discharges are possible under the following conditions:

- A mandatory 1-minute pause applies between discharges.
- If the internal heater temperature is above 300 °C, the next discharge starts automatically at the end of the pause.
- If the temperature is below 300 °C, the device waits until the minimum operating temperature is reached, then automatically starts a new discharge.

Multiple discharges continue while:

- the system remains in ARM (IN1 active);
- the discharge command on IN2 remains active (12 V);
- thermal safety conditions are satisfied.

Multiple discharge does not modify the device's other safety and control logic.

4.8 Automatic fluid counter reset after 24 h (DIP 8)

X-FOG has an automatic reset function for the fluid remaining-time counter.

This function is not recommended for normal use. It is intended exclusively for specific applications where the end user is to be allowed to replace the fluid independently.

The function is available only when enabled through hardware configuration:

- DIP 8 OFF → automatic reset disabled.
- DIP 8 ON → automatic reset enabled.

In the standard configuration (DIP 8 OFF), qualified technical personnel must open the device and reset the counter manually by pressing BOOT on the electronic board.

With DIP 8 ON, when the estimated fluid level falls below the reserve threshold:

- 30 seconds remaining with the standard 800 ml tank;
- 120 seconds remaining with the extended 3-litre tank;

the device keeps the low-fluid indication active (alternating yellow LED and Relay 2 activation).

24 hours after low fluid is detected, the system automatically resets the remaining-time counter, removing:

- the visual low-fluid indication;
- Relay 2 activation associated with the reserve condition.

Automatic reset restores the nominal available discharge time configured by DIP 6.

The function is intended to allow the end user to replace the tank without opening the device or working directly on the electronic board.

Nevertheless, manual reset by specialised technical personnel remains recommended because it ensures direct verification of the actual system condition.

5. Technical specifications

5.1 Power supply and power rating

X-FOG uses separate power and logic supplies. The heat exchanger's heating element is supplied at 230 V AC, draws approximately 4 A and develops 1000 W during heating.

The logic operates at 12 V DC through an open-frame module with an 80-264 V AC input. The power supply provides 9.5 A continuously and 11.8 A peak, efficiency up to 94 % and passive cooling. The board has a 12 V DC auxiliary output limited to 300 mA. Powering external devices that could compromise stability is not recommended.

Maximum power consumption: 1000 W at 230 V, required for a few minutes during DISARM → ARM transition.

5.2 Recommended electrical protection

Maximum current draw: approximately 4.3 A at 230 V AC for a few minutes during heating. Recommended:

- copper cable, minimum 1.5 mm²;
- 6 A type C RCBO, 30 mA;
- mandatory protective earth connection.

For complex installations, damp environments or outdoor cable routes, provide mechanical protection and cable containment according to applicable standards.

5.3 Thermal system and components

This section describes the X-FOG system architecture and its main functional components for technical information and support.

The system is based on a high-efficiency heat exchanger comprising an AISI 304 stainless-steel coil integrated into a gravity-cast aluminium block. The brass atomising nozzle is available angled at 30 degrees for wall installation or straight for ceiling installation.

The logic is powered by a passively cooled open-frame switching supply with universal 80-264 V AC input and stabilised 12 V DC output. It delivers 9.5 A continuously and up to 11.8 A peak to the main board and control circuits. The main board's 12 V DC auxiliary output, limited to 300 mA, is exclusively for supplying input signals.

System management is provided by MAIN R0, with five 12 V inputs, three potential-free relay outputs, a multicolour RGB LED for operating and diagnostic status, RESET for restarting the device and BOOT for resetting the fluid counter to 160 seconds. The board also includes JP6 for access to visible and hidden DIP menus, a SLOT interface for the HV R0 power board and a SLOT interface for an optional SmartConnect WiFi communication module.

Heat exchanger heating is managed by the HV R0 power board, a 230 V module with TRIAC solid-state switches. In X-FOG, TRIAC 1 controls the main heating element.

Temperature is measured by two type J thermocouples with a 0-750 °C operating range; their readings are processed by MAIN R0. A manually resettable TK32 bimetal thermal protector safeguards the system. If the safety threshold is exceeded, it interrupts the circuit with a response time of 50 milliseconds or less.

5.4 Temperature management and timing

230 V / 1000 W heating element with PID control.

Initial heating time: approximately 20 minutes at first switch-on to reach DISARM (steady green LED).

At first switch-on, wait until the full DISARM setpoint is reached before switching to ARM; otherwise a timeout error may occur (2 purple flashes).

Subsequent heating time: approximately 10 minutes. DISARM is about 50 % of discharge temperature; ARM is 100 %.

5.5 Fog and fluid performance

Discharge capacity: up to 200 m³, visibility reduced to a few centimetres in approximately 40 s. Required fluid: 1-1.5 ml/m³.

Fluid based on demineralised water and food-grade glycol. Average consumption approximately 5 ml/s; up to 4 complete cycles with reserve.

Fluid tank: 800 ml bag = 160 s. Low fluid: yellow LED and output Relay 2.

Fluid counter reset:

1. Manual: press BOOT for approximately 5 s (blue LED).
2. Automatic: DIP 8 ON, reset within 24 h of low fluid, with the bag replaced.

Materials: double-stabilised PA66.

Weight: <7 kg during installation, approximately 10 kg complete.

Dimensions: 300 × 600 × 100 mm.

6. Connections

6.1 230 V connections

Heating power consumption up to 1000 W at 230 V AC (approximately 4.3 A).

Recommended:

- copper cable, minimum 1.5 mm²;
- 6 A type C RCBO, 30 mA;
- mandatory protective earth connection.

In critical or outdoor environments, provide mechanical protection according to CEI standards.

6.2 Input signal connections (IN1-IN5)

All X-FOG inputs are read as 0/12 V logic levels and are activated by a change of state.

The factory configuration uses direct logic: 0 V at rest and 12 V active. Each input's logic can be individually inverted using DIP-switch configuration.

The default input functions are:

IN1 manages system status. At 12 V, the device is ARM, indicated by a red LED; at 0 V it is DISARM, indicated by a green LED. In DISARM, fog discharge is inhibited.

IN2 commands full fog discharge for the configured duration.

IN3 commands a reduced 5-second discharge for use as a pre-alarm function.

IN4 is dedicated to anti-robbery. If enabled by DIP 4, it generates a full discharge when receiving 12 V.

IN5 activates maintenance mode when receiving 12 V, allowing discharge simulation without actual fluid emission.

To facilitate integration with the alarm panel, use of the device's auxiliary 12 V supply is recommended. It is available at the terminal immediately after IN5. Connect the negative pole to the input “–” terminals, which act as the common reference. Connect the positive pole to the common terminal of the alarm panel relay. Then connect the panel's NC or NO contact to the “+” terminal of the required X-FOG input.

Alternatively, open-collector signals from the alarm panel may be used. These signals must not be mixed with the 12 V supply provided by the device, to avoid electrical conflicts or malfunctions.

6.3 Output signal connections

X-FOG has three status outputs named SPARO (discharge), FLUIDO BASSO (low fluid) and GUASTO GENERICO (general fault).

They use internal potential-free relays, allowing direct connection to alarm panels, supervision systems or external signalling devices without polarity or voltage constraints.

Each output provides common (C), normally open (NO) and normally closed (NC) contacts, allowing the installer to choose the appropriate logic for the installation and panel. Outputs are preconfigured as bistable and retain their state until normal conditions are restored or the opposite event occurs.

In the factory configuration, status outputs have the following functions.

SPARO indicates activation of fog discharge, for example as confirmation to the alarm panel or to activate external signalling.

FLUIDO BASSO indicates minimum fluid level or depletion, allowing maintenance warnings or signalling and blocking logic at the alarm panel.

GUASTO GENERICO indicates abnormal system conditions, including temperature errors, loss of supply or other situations diagnosed by the device.

Output behaviour can be modified through the hidden DIP menu described in the configuration chapter. Depending on installation requirements and alarm panel logic, alternative functions include mains failure, distinguishing reserve fluid from fully depleted fluid, or indicating tamper conditions.

6.4 Backup battery (note)

A 12 V / 1.2 Ah battery is recommended but not mandatory. If installed, it is monitored; insufficient voltage activates the general fault relay. An absent battery is not considered a fault.

7. DIP-switch configuration: JP6, visible and hidden menus

7.1 General configuration and hidden menu access

8-position DIP-switch bank and JP6 jumper. Two logical banks:

- visible DIP menu (normal operation);
- hidden DIP menu (special procedure).

Access to the hidden menu:

1. Press RESET (steady blue LED).
2. While the blue LED is steady, remove JP6 (steady purple LED).
3. Set the DIP switches.
4. Refit JP6 to save (restart: blue LED, then green/red).

7.2 Hidden menu (JP6 removed)

The hidden menu is accessible exclusively by removing JP6 and is intended for the device's structural configuration.

These settings define basic input and output behaviour and are not normally changed during ordinary system operation.

DIP 1 to 5 set the resting logic of IN1-IN5. With DIP OFF, the input is at rest at 0 V; with DIP ON, it is at rest at 12 V. This allows adaptation to alarm panels with different output logic.

DIP 6 configures output Relay 1. In OFF, it switches during fog discharge (SPARO). In ON, it indicates tampering or removal of the fluid drawer.

DIP 7 defines output Relay 2 behaviour. In OFF, it indicates fluid reserve. In ON, it indicates completely depleted fluid.

DIP 8 defines output Relay 3 behaviour. In OFF, it indicates a general system fault. In ON, it indicates loss of mains supply.

Hidden menu settings are stored and remain active after restart until a new configuration procedure is performed through JP6.

7.3 Visible menu (JP6 fitted)

The visible menu is active with JP6 fitted and is intended for operating settings. These may also be modified during installation, testing or maintenance.

DIP 1 and 2 set fog discharge duration. Depending on the selected combination, discharge times of 40, 20, 10 or 5 seconds are possible, allowing adaptation to the room volume to be filled.

DIP 3 enables or disables the IN3 pre-alarm input. In OFF, pre-alarm is disabled. In ON, it is active and IN3 generates a reduced 5-second discharge.

DIP 4 enables or disables the IN4 anti-robbery function. In OFF, it is disabled. In ON, it is active and IN4 generates full discharge.

DIP 5 enables or disables the IN5 maintenance function. In OFF, maintenance mode cannot be activated even with a command on IN5. In ON, the maintenance function is active.

DIP 6 sets fluid tank capacity. In OFF, the device is configured for a 160-second tank. In ON, for an optional 600-second tank available on request.

DIP 7 configures multiple discharge. In OFF, only one discharge is allowed per arming/disarming cycle. After discharge, the unit must return to DISARM and then be set to ARM again to allow another discharge.

With DIP ON, the device can perform multiple discharges within the same arming/disarming cycle. A mandatory 1-minute pause is still observed between discharges to ensure correct temperature management.

DIP 8 manages fluid counter reset. In OFF, reset is exclusively manual through BOOT. In ON, automatic reset is enabled: the counter can reset automatically within 24 hours of the low-fluid indication, provided the bag has been replaced.

8. RGB LED indications

X-FOG has a multicolour RGB LED on the main board that immediately indicates operating status, heating phases, operating modes and any abnormal conditions.

LED colour and steady or flashing behaviour allow the technician to quickly identify the current condition during installation, commissioning, operation and maintenance.

8.1 DISARM states (green LED)

8.1.1 Slowly flashing green LED: The device is DISARM and the heater is warming up but has not yet reached holding temperature, approximately 50 % of discharge temperature.

8.1.2 Steady green LED: The device is DISARM and holding temperature has been reached. The system is stable and ready to switch to ARM.

8.2 ARM states (red LED)

8.2.1 Slowly flashing red LED: The device is ARM and the heater is warming up towards discharge temperature.

8.2.2 Steady red LED: The device is ARM and discharge temperature has been reached. The system is ready to discharge fog.

8.3 Low-fluid indication (yellow LED)

Insufficient or nearly depleted fluid is indicated by yellow flashes alternating with green in DISARM or red in ARM.

This indicates that fluid is low or depleted, discharge may not complete correctly, and maintenance must be scheduled.

8.4 Maintenance mode (white LED)

Maintenance mode allows functional testing without actual fog emission. Its activation is not indicated by a permanent LED signal.

The white LED activates only during a simulated discharge test commanded by the installer. Maintenance is activated through IN5 if enabled by DIP 5. Only when a test discharge command is given does the device simulate discharge, flashing the RGB LED white throughout the simulated discharge time.

The pump is disabled during the test. Discharge is simulated only visually; the remaining system logic stays operational, allowing complete checks with the alarm panel.

Maintenance mode is timed and lasts a maximum of 1 hour. This prevents it from inadvertently remaining active after work and leaving the device unavailable during a real alarm.

To extend maintenance time, deactivate IN5 and activate it again, starting a new maintenance period of up to 1 hour.

If maintenance remains active after this interval, the device automatically enters a safety lockout, indicated by 6 purple flashes and activation of the general fault output (Relay 3).

Restore normal operation by deactivating IN5 and resetting the device.

8.5 Restart and configuration (blue/purple LED)

8.5.1 Steady blue LED: Restart or initialisation, for example after pressing RESET or BOOT.

8.5.2 Steady purple LED: Configuration mode, typically when accessing the hidden menu by removing JP6. Refit JP6 to exit; the device restarts automatically.

8.6 Error indications (purple flashes)

Errors are indicated by purple flashes of the RGB LED. Their number identifies the detected fault.

8.6.1 Heating timeout (2 purple flashes): The heater has not reached the required temperature within the maximum permitted time. Pressing RESET is recommended, checking that at first switch-on

the full stable DISARM setpoint was reached before switching to ARM. If the fault persists, installer intervention is required.

8.6.2 Overtemperature (3 purple flashes): The maximum safety threshold has been exceeded. Heating is automatically blocked and the system enters a protection state to prevent damage.

8.6.3 Temperature sensor T1 error (4 purple flashes): An abnormal or missing reading from T1 has been detected. The installer must check the sensor and its connections.

8.6.4 Temperature sensor T2 error (5 purple flashes): An abnormal or missing reading from T2 has been detected. Installer intervention is required.

8.6.5 Prolonged maintenance (6 purple flashes): Maintenance mode has remained active beyond the maximum permitted time. The device enters safety lockout, activating the general fault output (Relay 3) until restored.

9. Commissioning

Commissioning must be performed exclusively by authorised, qualified technical personnel, following the safety instructions and sequence below to ensure correct operation and avoid unwanted activation.

9.1 Switching on the device

Connect the device to the 230 V supply. At switch-on, the RGB LED indicates system startup and the initial heating phase as described in the LED chapter. Do not give any discharge command during this phase.

9.2 Connecting the backup battery (if provided)

If specified for the installation, connect the 12 V backup battery in its compartment and check the dedicated terminal connections. The device automatically recognises the battery and monitors its condition. No fault is indicated if the battery is absent.

9.3 Checking initial status

Wait until stable DISARM is reached, indicated by a steady green LED. The heater has then reached holding temperature, approximately 50 % of discharge temperature. Proceed with subsequent tests only after this state is reached.

9.4 Warning: steady red LED at switch-on

If the LED immediately turns steady red at switch-on despite the alarm panel being disarmed, the device is already in ARM. In this condition, fog discharge starts automatically once discharge temperature is reached.

To avoid unwanted activation, check the panel output configuration and invert its logic if necessary, ensuring:

- 0 V at rest (DISARM);
- 12 V only in ARM, as required by the factory configuration.

9.5 Actual fog discharge test

After completing electrical connections and checking correct initial status, set ARM through the alarm panel or dedicated input.

The LED flashes red while heating; it becomes steady red when discharge temperature is reached. Transition from holding to discharge temperature typically takes approximately 10 minutes.

Then activate the discharge input to perform an actual fog discharge. It can be interrupted at any time by returning to DISARM; fog production stops immediately.

After every deactivation, the device automatically imposes a 60-second safety pause. Discharge cannot be reactivated during this interval, to prevent accidental or repeated activation.

9.6 Maintenance mode test

As an alternative to actual discharge, or where the room cannot be filled with fog, perform functional checks in maintenance mode.

Activate IN5 with 12 V. The device enters maintenance mode, disables the pump and simulates discharge through white flashing of the RGB LED. Inputs, outputs and control logic can thus be tested without fog emission.

9.7 Recording tests

Record all commissioning tests in the dedicated system test form. The responsible technician must complete and sign it; keep it with the system documentation.

Correct recording is an integral part of the technical documentation and is essential for maintenance and future inspections.

10. Maintenance

Regular scheduled maintenance is necessary to ensure optimum performance and a long service life for X-FOG.

All maintenance must be carried out exclusively by authorised, qualified technical personnel, following this manual's safety instructions.

Disconnect the device from its electrical supply before any work. Work with the device powered is permitted only for qualified personnel and only for strictly necessary checks.

10.1 Routine maintenance

Routine maintenance should be performed approximately every 3-6 months to verify correct operation and prevent faults.

It includes general visual inspection, checking mechanical fixings and casing integrity, checking wiring and electrical terminals, and ensuring there is no oxidation or evidence of overheating.

A short discharge of approximately 5 seconds or a maintenance mode test is recommended to check correct response and thermal circuit efficiency.

Also check fluid condition, external nozzle cleanliness and correct operation of the RGB LED status indicator.

10.2 Annual maintenance

Annual maintenance must be performed at least every 12 months and involves more thorough work.

Operations include replacing the backup battery if installed, removing dust or moisture deposits from the electronics compartment, checking current consumption in DISARM and ARM, and inspecting wear of the main components.

If necessary, top up or replace discharge fluid using exclusively certified original fluid.

After servicing, reset the fluid counter manually through BOOT or through automatic reset if enabled, to restore correct tracking of remaining capacity.

10.3 Unscheduled maintenance

Unscheduled maintenance is required after abnormal events, such as unexpected activation, overheating indications, temperature errors, input/output malfunctions or faults detected by diagnostics.

In these cases, inspect the device completely, including signal management, thermal conditions of the exchanger and heating elements, and integrity of the electronic board and temperature sensors.

Replace damaged or non-conforming components exclusively with original parts or parts approved by the manufacturer.

10.4 Service records

Record every routine or unscheduled maintenance operation in the dedicated test and maintenance form accompanying the system documentation.

The responsible technician must complete and sign the form; the person responsible for the installation must retain it.

Failure to document maintenance may invalidate device warranties and prejudice any insurance cover.

11. Disposal

Dispose of X-FOG and its components in accordance with applicable environmental regulations. The installer and end customer are responsible for ensuring all end-of-life system parts are disposed of correctly.

11.1 Electrical and electronic equipment

The device is classified as WEEE (Waste Electrical and Electronic Equipment). Deliver it to authorised collection facilities or licensed electronics disposal operators in accordance with Directive 2012/19/EU.

Disposal with ordinary municipal solid waste is prohibited.

11.2 Discharge fluid

The fog-generating fluid is certified, biodegradable and not classified as hazardous.

It may be disposed of as non-hazardous waste according to the manufacturer's safety data sheet and applicable local regulations.

11.3 Batteries

Any installed backup batteries must be disposed of separately through dedicated collection channels, in accordance with Directive 2006/66/EC.

Do not dispose of batteries with household waste. Deliver them to collection centres, recycling facilities or authorised retailers.

12. Conformity

X-FOG is designed, manufactured and tested in accordance with the main European directives and applicable technical standards to ensure safe use, electromagnetic compatibility and the environmental requirements prescribed by current legislation.

12.1 Directive 2014/35/EU - Low Voltage (LVD)

The system complies with Directive 2014/35/EU (Low Voltage Directive - LVD), governing the electrical safety of low-voltage equipment.

When installed and used correctly according to the manufacturer's instructions, this conformity ensures the device presents no electrical hazards to people, domestic animals or property.

12.2 Directive 2014/30/EU - Electromagnetic Compatibility (EMC)

The device complies with Directive 2014/30/EU on electromagnetic compatibility, ensuring electromagnetic emissions remain within permitted limits and adequate protection against external interference that could compromise correct operation.

12.3 Directive 2011/65/EU - RoHS

Regarding restrictions on hazardous substances, X-FOG complies with Directive 2011/65/EU (RoHS), which regulates certain substances in electrical and electronic equipment, helping protect the environment and human health.

12.4 Directive 2012/19/EU - WEEE

For end-of-life management, the device falls within Directive 2012/19/EU (WEEE), governing collection, treatment and disposal of discarded electrical and electronic equipment, as described in the disposal chapter.

12.5 Harmonised technical standards

The device complies with the provisions of CEI EN 60335-1 applicable to its product type, concerning the safety of electrical appliances for household and similar use.

X-FOG is also designed taking into account EN 50131-8 requirements for security fog systems, regarding volumetric room coverage, visibility reduction and integration with intrusion alarm systems.

Conformity with the above directives and standards is conditional on installation, configuration, use and maintenance as described in this manual, using exclusively original accessories, components and spare parts or those expressly approved by the manufacturer.

13. FAQ - Frequently asked questions

Why does the device not discharge even though I have commanded IN2?

Discharge is allowed only in ARM through IN1 (red LED). Check that discharge temperature is reached (steady red LED) and no safety pause or lockout/error is active (purple LED).

What is the correct factory logic for 12 V inputs?

Direct logic: 0 V at rest, 12 V active. IN1 manages ARM/DISARM; IN2 full discharge; IN3 5 s pre-alarm if enabled; IN4 anti-robbery if enabled; IN5 maintenance if enabled.

The LED is steady red immediately at switch-on, but the panel is disarmed. What does this mean?

The device is receiving 12 V on IN1 and is therefore ARM. Once discharge temperature is reached, it may discharge automatically if it receives a discharge command. Check the panel output logic and correct wiring so IN1 is at 0 V when the panel is disarmed.

How long does DISARM to ARM take before discharge is ready?

After stable DISARM (steady green LED), ARM typically needs approximately 10 minutes to reach discharge temperature (steady red LED). First switch-on may require longer to stabilise temperature.

Can I interrupt a discharge?

Yes. Remove ARM status (IN1 at 0 V) or deactivate the discharge command, depending on the installed logic. Switching to DISARM stops discharge immediately.

Why can I not discharge again immediately?

Every deactivation is followed by an automatic 60-second safety pause. During this interval, new discharges are inhibited to prevent closely repeated activation.

What is the difference between full discharge IN2 and pre-alarm IN3?

IN2 produces full discharge for the duration set by DIP 1-2. IN3, if enabled through DIP 3, produces a fixed 5-second reduced discharge independent of DIP 1-2 settings.

Can I change the fixed 5-second IN3 pre-alarm?

No. Its duration is fixed and cannot be configured through DIP switches.

What is maintenance mode IN5 for, and what does it do?

It allows functional and panel integration tests without actual fog. The pump is disabled and discharge is simulated by a flashing white LED.

Why is the LED white during maintenance but no fog comes out?

This is correct. The pump is disabled and emission is only simulated, allowing tests without filling the room with fog.

What does yellow LED flashing alternating with green or red mean?

Low fluid. Yellow alternates with green in DISARM or red in ARM. In standard configuration, Relay 2 also activates to signal the panel.

When is low fluid indicated, and what does Relay 2 mean?

With the standard tank (DIP 6 OFF), when estimated fluid remains for a maximum 30-second discharge. With the extended tank (DIP 6 ON), at approximately 120 seconds remaining. Relay 2 signals low fluid/reserve to the panel.

I replaced or refilled the bag. How do I reset the fluid counter?

Press BOOT for at least 5 seconds and wait for the blue LED. The counter returns to the nominal value for the DIP 6 tank configuration.

When should DIP 6 select standard or extended tank?

DIP 6 OFF for 800 ml (160 s nominal capacity). DIP 6 ON only for 3 litres (600 s nominal capacity). The setting must match the tank actually installed.

When is multiple discharge DIP 7 useful, and what constraints apply?

When IN2 is to remain active to allow several automatic discharges. A mandatory 1-minute pause separates discharges; the next occurs only if thermal conditions are suitable.

Why does the device sometimes wait longer in multiple discharge mode?

If heater temperature is below the operating threshold, it waits to heat up before automatically discharging again. If temperature is already suitable, discharge resumes after the mandatory pause.

When is automatic reset DIP 8 useful, and why is it not recommended?

It allows the end user to replace fluid without opening the device or performing manual BOOT reset, which is reserved for technicians. It is not recommended because reset occurs automatically 24 hours after low fluid, clearing the indication even if fluid replenishment has not been technically verified.

What happens with DIP 8 enabled when fluid falls below the threshold?

At low fluid (30 s remaining with standard tank, 120 s with extended tank), the yellow LED and Relay 2 stay active. After 24 hours, the device automatically resets the counter and deactivates the low-fluid indication.

What do purple flashes and their number mean?

They indicate an abnormal condition. The number identifies the error type, such as heating timeout, overtemperature, sensors or prolonged maintenance. Refer to "Error indications" for diagnosis.

Heating timeout, 2 purple flashes: what should I check?

Check that stable DISARM was fully reached at first switch-on before changing to ARM. Check supply, protection devices and ambient conditions. If the error persists, technical intervention is required.