


BANDIT World leader
in active security

INSTALLATION MANUAL

BANDIT 320



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INTRODUCTION

By selecting this device, you have acquired advanced active access-prevention technology. With **BANDIT** we offer you an affordable system which guarantees operational reliability, top performance and a discrete design.

More and more private and public buildings are being equipped with a protection system against burglary. When armed, these systems detect a burglary attempt. The detection is generally communicated by means of a siren and/or strobe or sometimes an automatic phone call to an alarm control centre or police station. In real terms these notifications are satisfying, but the subsequent human intervention often arrives more than 10 minutes after the event! Burglars are aware of this and use this time to steal the most valuable things and get away in time.

BANDIT offers a unique and active solution to this problem. For this system is totally capable of filling a large office, store or other room, within a few seconds, with a non transparent fog. This fog prevents persons from entering the room for at least 10 minutes after setting off the alarm, since they cannot see a thing. The ejected fog has a mild mint smell (to avoid possible fire interpretation by outsiders), it is colourless and leaves no traces. So the fog safely and quickly disables the vision capabilities of unwanted visitors.

BANDIT is installed in those rooms that contain the most valuable objects; by doing so, burglary damage is effectively limited to a strict minimum.

Advantages:

- The device may include two cartridges and automatically selects which available cartridge is activated.
- Extremely compact, sturdy, lightweight, discreet and dustproof HD aluminum body.
- A totally maintenance free unit, designed and built for a reliable life span of +10 years (warranty of three years).
- The standard integrated "Power saver" feature and good thermal insulation, means that 230 VAC power consumption is limited to 24 Wh.
- Self-monitoring of reliability and availability / type of cartridges.
- In case of interrupted power supply voltage (230 VAC), operation is guaranteed: (electronics ~ 24 hours, fog generator > 1 hour).
- It can be oriented in all directions (wall, ceiling or floor). When securely mounted in position, this position is monitored by a built-in multi-axis solid-state gyroscope system.
- The device contains highly efficient electronics so no battery is needed as an emergency back-up power supply (sufficient emergency power is maintained within the electronics).
- It is completely set up and controlled by the connected controller This has the advantage that no wiring of sensors, signal wires, etc. to the unit need to be installed.
A thin three-wire communications cable is the only necessary electrical connection between the controller and the fog generator.

For information about available controllers, see: www.bandit.be

Options:

For more information on available models and option choices, see the brochure: BANDIT 320 - finishes and optional extras. This brochure provides the available colours for the casing and front pad, fog ejection patterns and the option menus.

Standards:

- Certified to highest class T5 with the European standard for security fog generators: EN-50131-8. Valid for all CE countries.
- Certified to SFVP-grading (www.sfvp.eu) qualification:



SFVP Grade 3 <280 m3 / Grade 4 <200 m3. For more info, see p.12.

Industrial property:

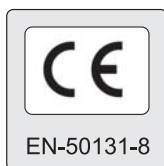
- **BANDIT** is a registered trademark.
- The **BANDIT** fog generator process is internationally protected by several patents.

Manufacturer:

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This product developed and produced by the BANDIT factory in Belgium. This factory is ISO 9001:2008 certified for the development and production of fog generators for security applications.



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SAFETY PRECAUTIONS

Location:

- To prevent fire or shock hazard, do not expose this appliance to rain or moisture.
- Install the device in such a way to allow a good airflow.
- System malfunction is possible at ambient temperatures above 55°C. Keep the appliance away from heat sources such as radiators, heating elements, stoves or other heat producing devices.
- Ensure the unit is mounted on or against a sufficiently solid surface or background. Observe the installation process (see p. 8). If for any reason different fixings need to be used, then ensure these have at least the same strength as the original ones provided. For example, minimum 2 x M6 steel bolts (galvanized steel).

Electrical connection:

- This device may only operate on 230 VAC / 50 - 60Hz (210-240 VAC) supply voltage with grounding. Check the voltage on the label in the cartridge compartment.
- This unit has a maximum peak consumption of 2 A @ 230 VAC. For connection to the mains use flexible connection of at least 0.75 mm² + earth with ferrules, this according to local laws and installation instructions.
- If the unit emits an abnormal smell or smoke, the appliance must be switched off immediately by turning the main supply fuse to "off".
- When in doubt, immediately contact your **BANDIT** dealer or manufacturer, mentioned on the back page of this manual.
- There are no internal serviceable parts. Leave all repairs to the manufacturer.
- For further connection instructions, see p. 9.

Cleaning:

- Do not use volatile solvents such as alcohol, paint thinner, benzine or thinner. To clean the exterior of the unit use a clean, damp cloth.

Fog Ejection Control:


- The ejection nozzle is normally about 20°C warmer than the temperature of the environment, so not warm enough to get burned by. However during fog ejection and the first minute after, this nozzle can reach a temperature up to 70° C. Avoid direct contact with the nozzle immediately after a fog ejection to prevent skin burns.
- A fog ejection test only should be performed when
 - a) All persons in the surrounding area and fire safety personnel have been notified.
 - b) There is nobody in the immediate surroundings and/or direction of ejection.
- During a fog ejection test it is essential that any bystanders within a 2 metre distance of the Bandit unit do NOT look in the direction of the ejection nozzle and avoid exposing bare skin to the ejected fog within a 40cm range of the ejection nozzle.

SPECIFICATIONS

Characteristics:

- Dimensions: 410 mm height x 197 mm width x 145 mm deep.
- Weight: 7 kg (without cartridges).
- Max. power failure: +1 Hour for fog generator and 24 hours for electronics.
- Response time: 0.25 second between alarm signal and fog ejection.
- Fog ejection pattern: Choose from two available patterns of fog ejection.

Fog Generator

- Max. fog ejection capacity:  Grade 3 <280 m³ / Grade 4 <200 m³
- Fog ejection pressure: >20 BAR (2 Mpa).
- Fog ejection period: About 4 seconds.
- Initial warm up time: 30 minutes from cold condition.
- Max./min. ambient temperature: minimum -10°C en maximum 50°C.
- Maximum heat loss: 24 Watt (at ambient temperature 21 ° C).
- Heat exchange capacity: 100 kJ/s.
- Nominal ejected droplet size: Ø 200 à 400 nm (99,8% fully aerosol).
- Protection: IP52 - IK08
- Weight: 7 kg (up to 9 kg incl. cartridges)

Electrical:

- Min./max supply voltage: 220 tot 240 VAC at 50 tot 60 Hz.
- Maximum peak current at 230VAC: 2 Ampère.
- Average power consumption: 24 W.
- Communication: Tamper-secure and interference protected 3-wire low voltage 2-way serial communication with the controlling controller.
- Emergency Supply >24h: Supercap 300F

Cartridges: The unit contains 2 cartridges.

A cartridge communicates with the fog generator via its three electrical contacts .

During a fog ejection the fog fluid is expelled under high pressure via the hydraulic connection nipple, which subsequently empties the cartridge of fluid.

After activation the empty cartridge must be replaced by a new cartridge of the same "size".

The empty cartridge is recyclable metal.



Appropriate fog cartridges may be ordered from Bandit NV at: www.bandit.be → Products → Cartridges.

They are also available from your local Bandit distributor, which can offer a faster, local delivery at favourable purchase prices.



More info:
see page 13

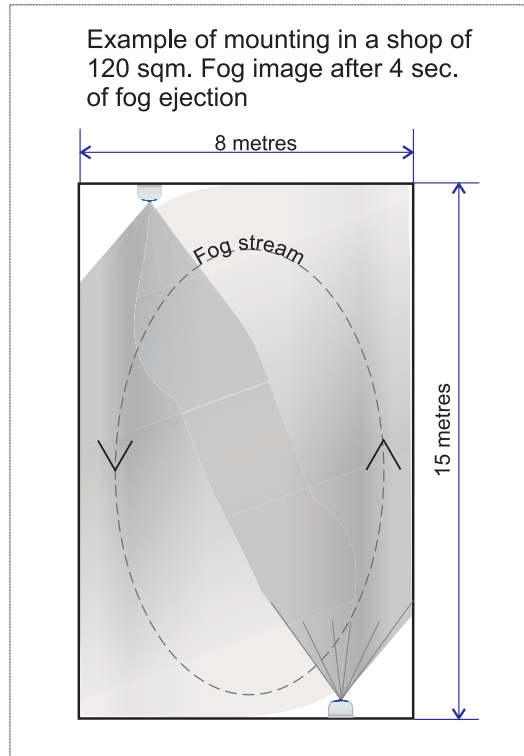
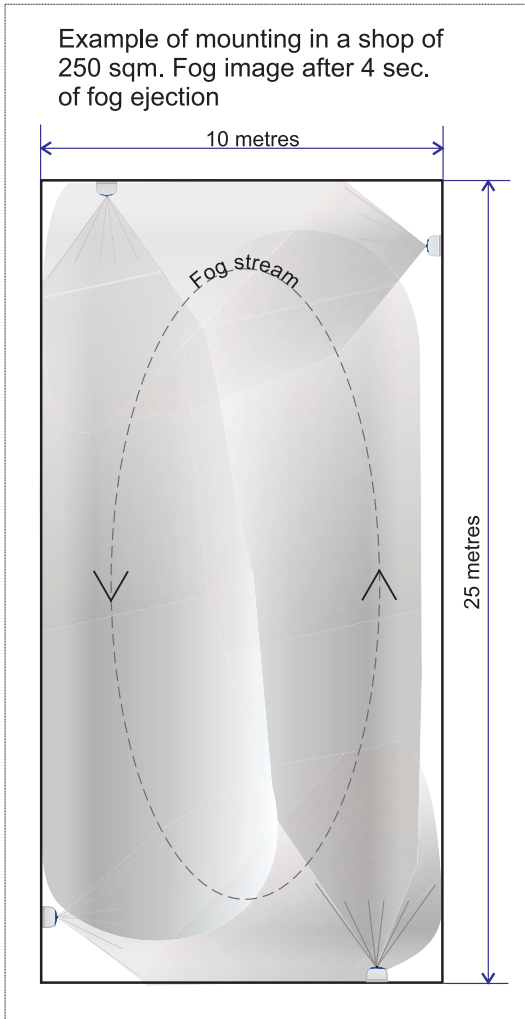
INSTALLATION

As a professional, you'll have to consider properly, what would be the most effective place to install the appliance. Here are some guidelines which can help you with your decision:

- ☑ Logically, you'll place the appliance so that the fog expulsion points in the direction of the supposed burglary entrance or in the area which contains the most valuable objects. Should this entrance provide a potential air passage to outside (i.e. a garage door, a glass frontage which is sensitive for break-in, etc.), you'll need to prevent the ejection nozzle being pointed in this direction to avoid the potential fog ejection being blown outside. In this case, you'll need to point the nozzle towards a side wall to break the ejection pressure. This way, the fog will "cloud out" and only a small amount of fog will be blown directly to the outside.
- ☑ Avoid the ejected fog forming a one-way trap (man-trap). The ejected fog is supposed to form a strong barrier to force the intruder into retreat. Burglars are not supposed to be caught. Further, if there is a false alarm, the chances of trapping innocent persons is greater than catching burglars in a real burglary!
- ☑ Determine the location in such a way that the ejection nozzle does not point in the direction of fragile objects. The powerful fog expulsion could blow down these objects.
- ☑ There has to be a free passage area for the ejected fog, of at least 5 to 6 metres before it bounces against a fog blocking obstacle, e.g. a front wall. The space of about 6 metres in front of the ejection nozzle will be the first to be filled out with fog, and this within 2 seconds.
- ☑ If there are already PIR-sensors installed in the room to be guarded and you don't want to take any risks with false triggering because of fog ejection, you'll have to replace these PIR's with combi-sensors (PIR/radar). If you are installing a new installation, always use combi-sensors for volumetric detection in areas where **BANDIT** is installed. Radar never detects the floating clouds of fog, but most PIR's do sporadically.
- ☑ If the customer's alarm system has an entrance delay period, make sure that no burglar can come near the unit without being detected first by a sensor. This sensor has to start a fog ejection, independently of an eventual entrance delay.
- ☑ The **BANDIT** is certainly no stranger to burglars. Always make sure the unit is mounted securely so it cannot be pulled quickly from the wall, otherwise there is a real chance that the unit may be thrown through a window out onto the street, resulting in a successful break-in, which we do not want.
 - When mounted against a solid brick wall, use plugs and screws (2 screws and plugs dia. 8 mm). See also p. 8.
 - When installing against a double plaster partition (Gyproc), use special metal plasterboard plugs (Gyproc plugs are available in any hardware store).
 - When installing against a single plaster finishing-retention wall (some Gyproc), place the unit in the inner corner and use the optional "Plaster inner corner support plate." Do not place the appliance with the normal wall mount against a single plasterboard, because the weight of the complete fog generator (approx. 9 kg), will cause the plasterboard to break after a while and the device will fall to the ground.

- ☑ A **BANDIT** 320 fog generator requires two cables:
 - a) A mains power cable 230 VAC with earth, which must be fused with a separate 4A fuse or breaker. See p. 9.
 - b) From the controller, a three-wire communications cable. See p. 9

Mounting more than one *BANDIT* 320 devices in one large room.



The space-filling ability of a **BANDIT** 320 is dependent on the security (grading) which is desired for the area to be protected (for more info about grading see: www.sfvpeu) and the installed cartridge with its settings via the connected controller. See also page 12.

For larger areas such as large shops and office spaces, multiple devices will need to be installed. Install the units in such a way that the fog stream of one device points next to, but not in the direction of, the next unit. This way, there is a circular stream of fog throughout the entire place. This guarantees the fastest filling of the room.

While mounting, keep in mind to provide an unhindered passage for the fog stream. After a while, the store keeper has forgotten about the units and stacks boxes and displays right in front of the fog ejector of the devices.

Basic principle for installation.

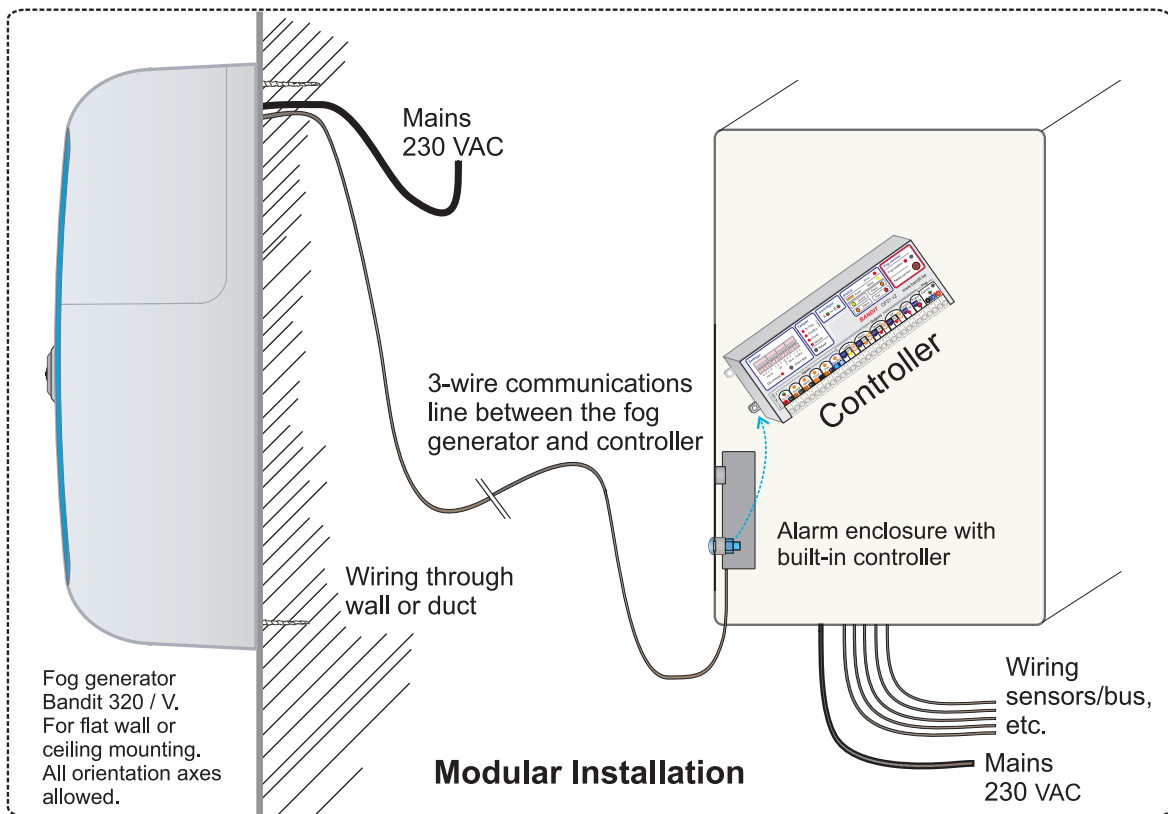
Making a modular design fog generator for the active security sector is a major step forward. This technology creates a **BANDIT** that's reliable and flexible in deployment, provides ease of installation, and offers aesthetics and performance to the end user.

This modular design means that the fog generator is separated from the controlling electronics. The connection consists of just a 3-wire communications line and all settings, controls and connections are made on the controller and therefore do not need to be carried out on the fog generator itself. There are several versions of the controller and the following is an overview of the configuration set up:

The diagram below shows the basic principle.

The controller shown is an example of a CF31 controller (built into alarm control panel), but this may be any **BANDIT** controller.

For more information see: www.bandit.be: heading Products -> controllers

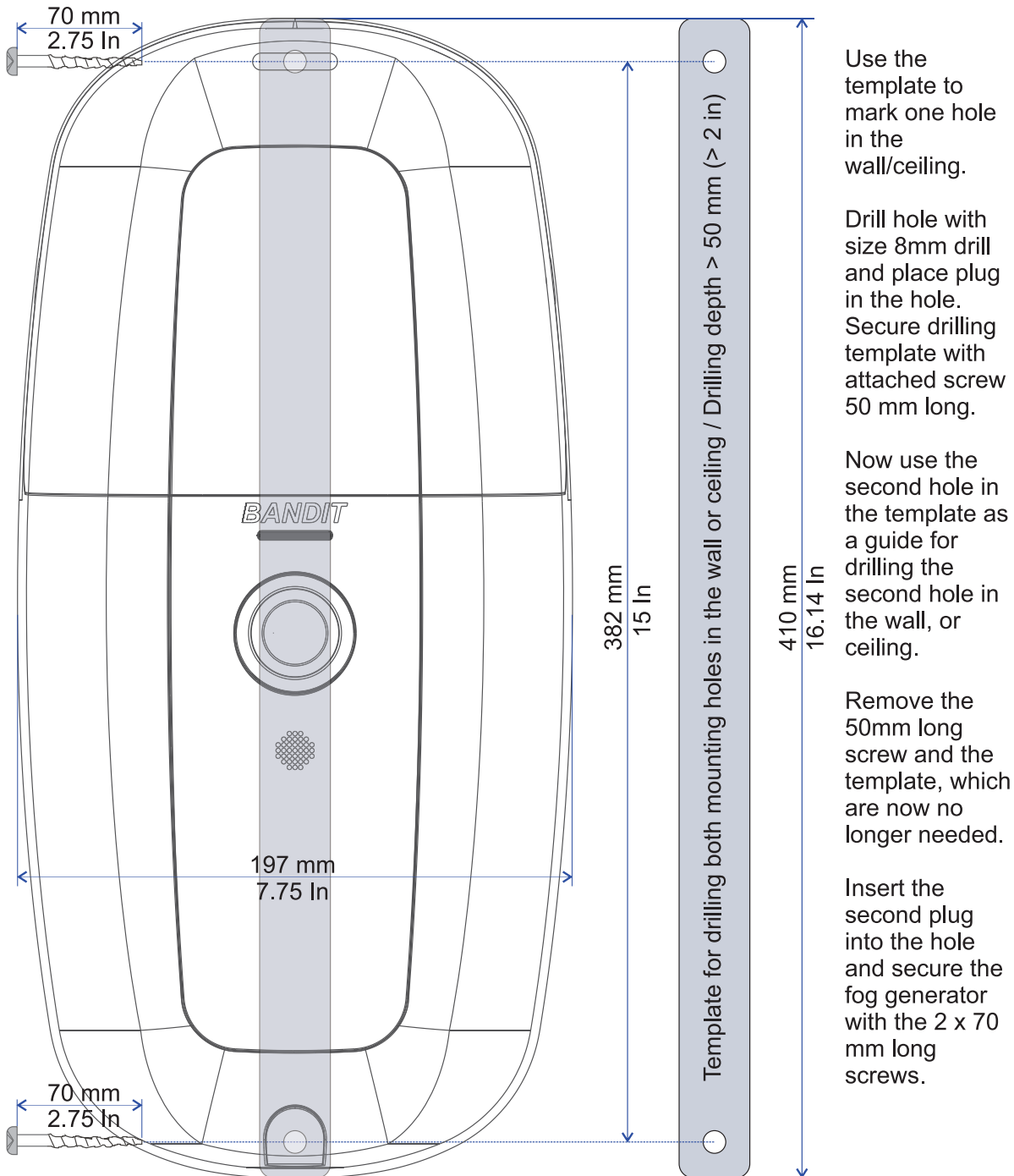


The 3-wire communication line (between fog generator and controller):

- For a length of cable up to a maximum of 20 meters, the wire should have at least a section of $3 \times 0.2 \text{ mm}^2$ (24 AWG alarm cable) of regular flexible copper wire.
- For a length of cable up to a maximum of 100 meters, the wire should have at least a section of $3 \times 0.75 \text{ mm}^2$ (19 AWG).

Keep in mind that this cable is the "lifeline" between the controller and its connected fog generator. Install this cable in such a way that the risk of sabotage (cutting) or accident breakage or damage is minimised as much as possible.

Use the attached metal fitting as a template for the correct locations to drill the two holes of dia. 8 mm (0.315 In or 5/16") in the wall or ceiling.
 A drilling template, 2 x size 8 plug, 2 x 70 long screws and one screw of 50 mm in length are included in the package of the fog generator.



Use the template to mark one hole in the wall/ceiling.

Drill hole with size 8mm drill and place plug in the hole. Secure drilling template with attached screw 50 mm long.

Now use the second hole in the template as a guide for drilling the second hole in the wall, or ceiling.

Remove the 50mm long screw and the template, which are now no longer needed.

Insert the second plug into the hole and secure the fog generator with the 2 x 70 mm long screws.

If a corner mounting is required, an optionally available 30° wall bracket may be ordered. This is pre-wired and offers a perfect solution for obtaining a spraying direction which is not perpendicular relative to the mounting surface. The 30° wall bracket can be used for horizontal, vertical and ceiling mounting. See brochure: **BANDIT 320** - finishes and optional extras -

ELECTRICAL CONNECTIONS

The fog generator incorporates a compartment with 2 connection blocks having 3 terminals on each.

a) 3 terminal block for Mains AC:



The 230 VAC mains and earthing is connected to these terminals using a power supply cable with wires of minimum 0.75 mm² to maximum 2.5 mm² section. Use flexible conductors with appropriate ferrules.

Connect:

- The blue wire (N) to neutral terminal
- The yellow / green ground wire (PE) to the ground
- The brown or black (L) with the mains phase 230 VAC.

The interchanging of the L phase and N conductor has no effect for the operation of the **BANDIT**.

The device is protected against mains failures and is in essence an Ohmic power load.

Use a separate supply fuse in spur of 4 AT.

Directly tapped from the main power supply or a branch off the existing power supply circuit of installed alarm system (**BANDIT 320** consumes 2 Amp. peak power per unit).

The device is provided with a non-replaceable internal PCB fuse 4 Amp./slow blow (back to factory if this blows).



b) 3 terminal block for Communication: 1 2 3

The communication cable is the <12 V low-voltage communication link between the unit and its controller.

- The 3-wire communication line (between fog generator and controller):
 - ▶ For a length of cable up to a maximum of 20 meters, the wire should have at least a section of 3 x 0.2 mm² (24 AWG alarm cable).
 - ▶ For a length of cable up to a maximum of 100 meters, the wire should have at least a section of 3 x 0.75 mm² copper (19 AWG).
- These three communications terminals 1, 2 and 3 are polarity and short circuit protected relative to each other. For proper connection / operation each wire should be connected to the same terminal number on the connected controller.
- Communication is insensitive to EMC interferences to about 120 meters of cable length.
- The quality of communication between the device and its controller is continuously monitored. The mutually encrypted messages are monitored by both the unit and its controller.

Use the provided red Allen key to open the transparent access window, and after completing the electrical connections to re-attach it again.



SECURITY PROTECTION

From our years of experience with fog generators we know that "burglars" have little defense against the efficient functioning of the **BANDIT** fog generator. Globally we record how and how many units were rendered prematurely inoperative:

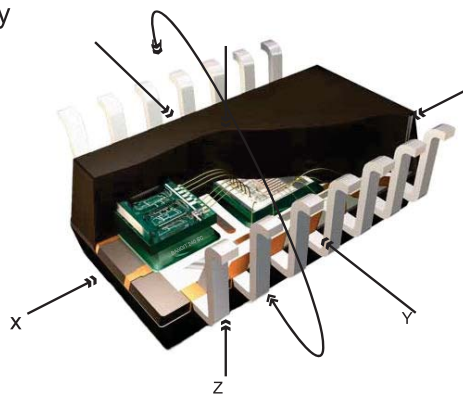
- 49% of the cases; e.g., during a ram raid the entry delay time is used to an advantage so that the unit may be interfered with or even, e.g., hit of the wall with a sledgehammer.
- 50% of the cases include internal pre-manipulations (inside job).
To protect against twisting and reorientation this model 320 incorporates a special integrated tamper feature.

There are two built-in tamper detections:

1. Using a stylus which detects the presence of the removable cartridge-cover.
2. Using a multi-axis solid-state gyroscope sensor. This sensor detects any rotation and / or relocation of the unit.

These data are continuously transmitted to the controller.

In any case, each detected abnormality will be immediately reported to the controller for evaluation as a tamper alarm.



STATUS COMMUNICATION

The device indicates the following visual information to its immediate surroundings:

- **Front LED** The front LED is continuous green:
Device is in its normal state and is operational.
- - - **The front LED flashes green [warming]:**
Everything is in order, but the unit is still warming up (the progress of the warming cycle is monitored by the internal processor). Warming starts from when the mains voltage 230 VAC was applied. Warming up from cold takes up to 35 minutes for the unit to become operational.
- **The front LED is continuous amber [monitoring]:**
The device is put into monitoring mode by its controller

☞ One of the features of the monitoring mode is that any error or fault message will not be displayed via this front LED. So as long as the device is in monitoring mode any failure or an empty cartridge will not be visible to the "outside world".

- - - **The front LED flashes orange [alarm or panic mode]:**
As long as the fog generator:
 - Alarm mode is switched by its controller, or
 - Panic mode is switched by its controller.

For exact description of the conditions for alarm or panic mode, see manual of the connected controller.

- - - **The front LED flashes red [Problem / fault notification]:**
An abnormal situation or condition has been detected. Find out the cause by examining the controller. As long as a fault is active, the unit should be regarded as unreliable.



MALEFUNCTION

☞ All controllers offer the ability to turn off the front LED of the fog generator (always off). This is to comply with the EN 50131-8 and EN 50131-1 Parent: 2006 / clause 8.5.2 (Access level 1).

☞ Some controllers have the setup option, "In monitoring is front LED off". When this setting is selected, the front LED will be extinguished 3 minutes after the start of the monitoring mode. The intention is that in darkness the exact location of the device will not be revealed to "the outside world" by its glowing front LED.



CLASSIFICATION Security Fog Visibility Protection (SFVP)

The fog generator models **BANDIT** 320 / V (vertical mounting) and 320 / H (horizontal assembly and 320 / C (ceiling mount) are certified to the standard for SFVP:



Grade 3 <280 m³ / Grade 4 <200 m³

This fog generator can fill a space with a volume of up to 200 m³ (with a cartridge of size 180-200 m³, see also p. 13) with a fog fill to SFVP-grade 4, or a space with a volume of up to 280 m³ with a fog fill to SFVP grade 3.

The SFVP security level is defined in the following table:

Classification (grade / security level)

The use of a fog generator for security purposes is intended to rapidly limit the visibility in a room to be protected.

The security level is determined by two main factors:

- a) speed in seconds, with which the space is filled with fog.
- b) the density of the fog in the area to shield off (visibility).

The SFVP security level is defined in the following table:

Security level (grade)	Time (seconds)	Visibility (b/w cross)	Indication of visibility restriction
1	< 60 s	≤ 100 cm	Little restriction in sight and time.
2	< 30	≤ 65	Limited visibility with minor time constraints.
3	< 20	≤ 45	Severely limited visibility with time constraints.
4	< 10	≤ 40	Severely limited visibility with large time constraints (flee behavior).

Explanation:

- A Grade 2 level of security provides sufficient protection where removal of valuable assets is likely to take longer than 30 seconds to achieve.
- Insurers and professional security managers will normally recommend a Grade 3 or 4.
- For panic button operation a Grade 4 will always be chosen.

For additional information about this grading please see: www.sfvpeu

FOG CARTRIDGE

Mechanically, the inside of **BANDIT** 320 consists of two main components:

- The heat exchanger: this chrome-steel cylinder is filled with hot gasifying channels, which ensures that the injected fog liquid is rapidly converted into a dry fog.
- The fog cartridge (s): consists of a steel cylinder containing a gas spring (N₂) and a piston which propels the separately retained fog liquid from the cartridge into the fog generator.

The cartridge is single-use and must be replaced by a new one once activated.

The empty cartridge can be recycled as iron / metal.

A cartridge has a certain content of fog fluid. This content is sufficient to fill a space having a specific volume of fog. Typically, the volume of the area to be secured is configured in the controller of the fog generator. The cartridges in the fog generator should therefore match the corresponding type as set in the controller (the fog generator and therefore controller will recognise an inserted cartridge via its three electrical contacts

The table below shows the different available sizes of cartridges:

Volume of fog production	
M ³ Cubic metre	ft ³ cubic foot
40 - 60 m ³	1400 - 2100 ft ³
60 - 80	2100 - 2800
80 - 100	2800 - 3500
100 - 120	3500 - 4200
120 - 140	4200 - 5000
140 - 160	5000 - 5600
160 - 180	5600 - 6000
180 - 200	6000 - 7000

For example:
Retail space
6 x 11 x 2.8 m high
is 185 m³ (6530 Ft³).
In order to fill this volume
to SFVP Grade 4 a cartridge of
180 - 200 m³ should be selected.



If a fog cartridge of the incorrect size is installed the corresponding LED will flash red / green.



The controller will detect this abnormality and will indicate this, although a cartridge of the incorrect size will still be activated at the time of an activation. However:

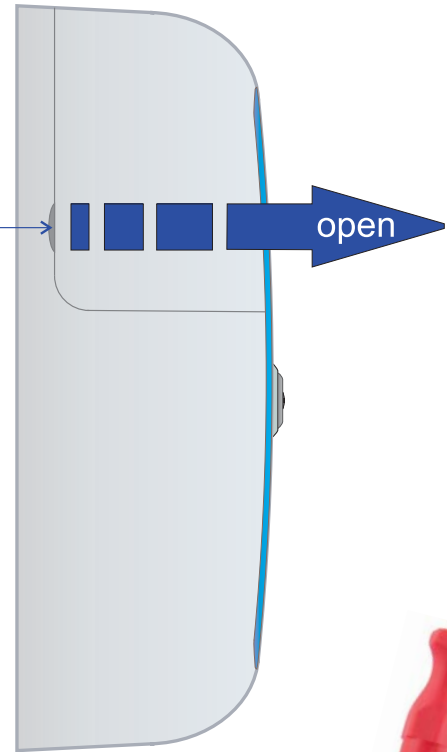
- If too small a cartridge for the space to be fogged is fitted then there will not be enough fog produced, resulting in thinner fog and greater visibility.
- In the case of too large a cartridge being fitted, it will eject too much fog relative to the size of the space, thereby creating the potential risk of a thin film forming as condensation from the fog on some surfaces. In the event of this occurring, washing with lukewarm water is the perfect solution (fog liquid is 100% water soluble).

Access to the cartridge compartment:

- a) Turn on the controller function: Fog isolation ON ●.
- b) Slide open the plastic cover. Please note that this will generate a tamper alarm which is reported to the controller.
- c) You will see the lock screw and LED for both cartridges A and B.

The LED's indicate the status of their respective cartridge:

- Green LED: Cartridge is OK.
- ⊕ Cartridge does not have the same size (m³) as is set on its controller.
- ⊕ Not locked, or insufficiently fastened.
- Red LED: Cartridge empty.

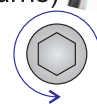


Set screw and LED ● for Cartridge A

Set screw and LED ● for Cartridge B

Removing a cartridge:

- d) Use the red hex wrench to undo the screw securing the end of the empty cartridge (approx. 12 turns) counter-clockwise to the end of its travel.
- e) Pull the cartridge to remove. A firm pull may be required because the O-ring creates a tight seal.



Recycling a cartridge:

Once it's been activated a cartridge contains no fog liquid or any more pressurised gas. It should be replaced by a new cartridge of equal size (m³) cartridge.

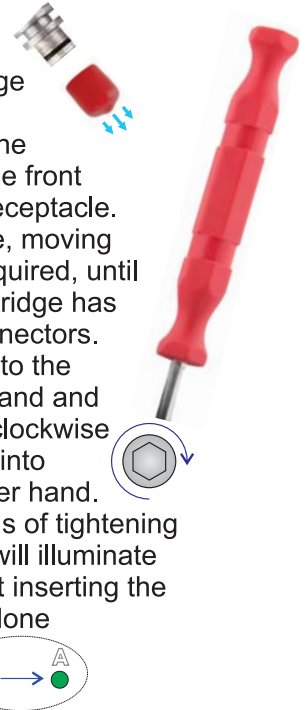
The empty steel cartridge can be recycled as: Non-hazardous metal waste (Dir. 2008-98-EC).





Inserting a cartridge:

- f) Remove the red cap and align the cartridge so that the black horizontal line is to the front and is above the front flat lip of the black receptacle.
- g) Push in the cartridge, moving it around a little if required, until you feel that the cartridge has engaged into its connectors. Apply light pressure to the Cartridge with one hand and turn the lock screw clockwise to lock the cartridge into position with the other hand.
- h) After approx. 12 turns of tightening the screw, the LED will illuminate green to confirm that inserting the cartridge has been done successfully.



Closing the cartridge compartment:

- ▶ Slide the plastic cover over the cartridge compartment.
- ▶ Reset the tamper alarm indication via the controller.
- ▶ Turn off the controller function: Fog isolation ○.
- ▶ Manufacturer's Warranty: Mfd. (Date of manufacture, mm/yyyy) + 3 years.

MAINTENANCE

Because the **BANDIT** is classed as a security product, it is advisable to carry out an annual function check.

See also Safety p. 3 and the manual of the connected controller.

Otherwise, this fog generator is maintenance-free.

FIRST AID



The ejected fog is completely harmless for human beings and warm-blooded animals (although it is harmful for flying insects), even when staying more than 10 minutes in a completely sealed area ($< 1 \text{ ml HY-3 aerosol} / \text{m}^3 \text{ air}$).

The only problem to be considered may arise from the power of the fog expulsion and possible panic reaction to this sudden event.

It's recommended that the following persons should avoid staying in those spaces filled with fog:

- persons suffering from claustrophobia (panic instantly).
- persons who are over sensitive to stressing situations, e.g. hyperventilate, racing pulse, etc....
- persons who are strong asthmatic or exceptionally sensitive to irritation of the respiratory system.
- children beneath the age of 9 (possible traumatic experience)

Although harmless, experience tells us that dogs (even trained guard dogs) may refuse to enter a room filled with fog.

The ejected fog is accredited by being tested according to ISO 16000-1: 2004 and meets the EU guidance values for acute and accidental exposure (AEGs) and the Annotated OSHA PELs.

If you or the user wishes, you can always request a copy of the SDS from your **BANDIT** distributor.

INSTALLATION MANUAL *BANDIT* 320

Manufacturer:

BANDIT World leader
in active security

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web: www.bandituk.co.uk

First Aid  see p. 16

To complete your installation:

Record the serial number of the device (label in the cartridge space) in the space provided below.

Model: **320 /** - Serial number:

If you need to call your dealer for information, service or in case of any technical problem, always provide them with the model and serial number shown here.