



GRIFOX

Indoor/outdoor advanced
dual-technology detector
with volumetric protection

090031032



IMQ-SISTEMI DI SICUREZZA

IT08020000001624



EL.MO. SPA



FOREWORD

FOR THE INSTALLER:

Comply strictly with current standards governing the installation of electrical systems and security systems, and with the manufacturer's directions given in the manuals supplied with the products.

Provide the user with full information on using the system installed and on its limitations, pointing out that there are different levels of security performance that will need to suit the user's requirements within the constraints of the specific applicable standards. See that the user looks through the warnings given herein.

FOR THE USER:

Check the system's operation thoroughly at regular intervals, making sure the equipment can be armed and disarmed properly. Make sure the system receives proper routine maintenance, employing the services of specialist personnel who meet the requirements prescribed by current regulations.

Ask your installer to check that the system suits changing operating conditions (e.g. changes in the extent of the areas to be protected, change in access methods, etc...).

This device has been designed, built and tested with the utmost care and attention, adopting test and inspection procedures in accordance with current legislation. Full compliance of the working specifications is only achieved in the event the device is used solely for its intended purpose, namely:

Indoor/outdoor advanced dual-technology detector with volumetric protection

The device is not intended for any use other than the above and hence its correct functioning in such cases cannot be assured. Consequently, any use of the manual in your possession for any purpose other than those for which it was compiled - namely for the purpose of explaining the product's technical features and operating procedures - is strictly prohibited.

Production processes are closely monitored in order to prevent faults and malfunctions. However, the componentry adopted is subject to an extremely modest percentage of faults, which is nonetheless the case with any electronic or mechanical product. Given the intended use of this item (protection of property and people), we invite you to adapt the level of protection offered by the system to suit the actual situation of risk (allowing for the possibility of impaired system operation due to faults or other problems), while reminding you that there are specific standards for the design and production of systems intended for this kind of application.

We hereby advise you (the system's operator) to see that the system receives regular routine maintenance, at least in accordance with the provisions of current legislation, and also check on as regular a basis as the risk involved requires that the system in question is operating properly, with particular reference to the control unit, sensors, sounders, dialler(s) and any other device connected. You must let the installer know how well the system seems to be operating, based on the results of periodic checks, without delay.

Work involved in the design, installation and maintenance of systems incorporating this product should be performed only by personnel with suitable skills and knowledge required to work safely so as to prevent any accidents. It is vital that systems be installed in accordance with current legislation. The internal parts of certain equipment are connected to the mains and therefore there is a risk of electrocution when maintenance work is performed inside without first disconnecting the primary and emergency power supplies. Certain products include batteries, rechargeable or otherwise, as an emergency backup power supply. If connected incorrectly, they may cause damage to the product or property, and may endanger the operator (explosion and fire).



DISPOSAL INSTRUCTIONS - INFORMATION FOR USERS

In accordance with Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), please be advised that the EEE was placed on the market after 13 August 2005 and must be disposed of separately from normal household waste.

IT08020000001624



1. GENERAL INFORMATION

The GRIFOX detector is an advanced high-performance miniaturized dual-technology model designed to be installed indoors/outdoors to provide large spaces with volumetric protection. It can be wall mounted, corner mounted or installed so that it can swivel using the optional accessories.

The detector features special cable entries in the base of the housing and in the swivel mount for easy installation and comes with rubber seals to stop water getting in when inserting the cable for connection to the control unit.

The detector's operation and control features are settable using an internal switch.

One of the key pluses of this detector is its use of digital PIR to achieve extremely high interference immunity and detection accuracy.

The unit's particularly attractive appearance means it sits well in any kind of setting.

GRIFOX is IMQ-Security Systems certified.

2. FEATURES

2.1 General features

- High-performance miniaturized dual-technology detector.
- Features relay output for connection with traditional control units.
- Detector has an extremely small attractive plastic housing designed to be wall mounted.
- IR lens with volumetric protection with coverage pattern of 7 degrees horizontally, max. 7 m range for maximum protection of the area to be protected, though it can also be adjusted using internal switches.
- Infrared section with high-sensitivity digital PIR sensor, silicon white light filter. Optics are sealed to reduce false alarms from insects getting inside.
- Fully microprocessor-based detector management.
- Detector configurable via relevant internal DIP switch.
- Settable parameters: sensitivity, integration, AND/OR function, enabling of operating status LEDs, masking, blinding, look-down (orientation change detection), microwave section disabling with system disarmed.
- Advanced firmware with analysis of noise detected by IR and microwave section and temperature compensation of IR section properties for detector operation even in critical situations.
- Management of IR section fault conditions.
- Sophisticated calculation algorithm used by environmental monitoring circuit with microprocessor conversion of signals from IR section.
- Active anti-blinding circuit in IR section with coded IR RXTX and anti-masking circuit in microwave section.
- Microwave section with ETSI EN30044024-certified 24GHz planar antenna, low noise, small size, pulsed circuiting with neon light filter, coverage pattern 80° in horizontal plane, 32° in vertical plane.
- Protection against disturbances applied to supply terminals.
- Look-down function: orientation change is detected by means of 2-axis accelerometer sensor - always active - and results in tamper alarm being triggered.
- Housing base features knockout cable entries and relevant rubber grommets for feeding connecting cables through.
- Optional extras: ANSGX bracket for corner mounting, CUPSGX sunshield for outdoor installation and SNDSGX swivel mount for mounting at an angle.



2.2 Specifications

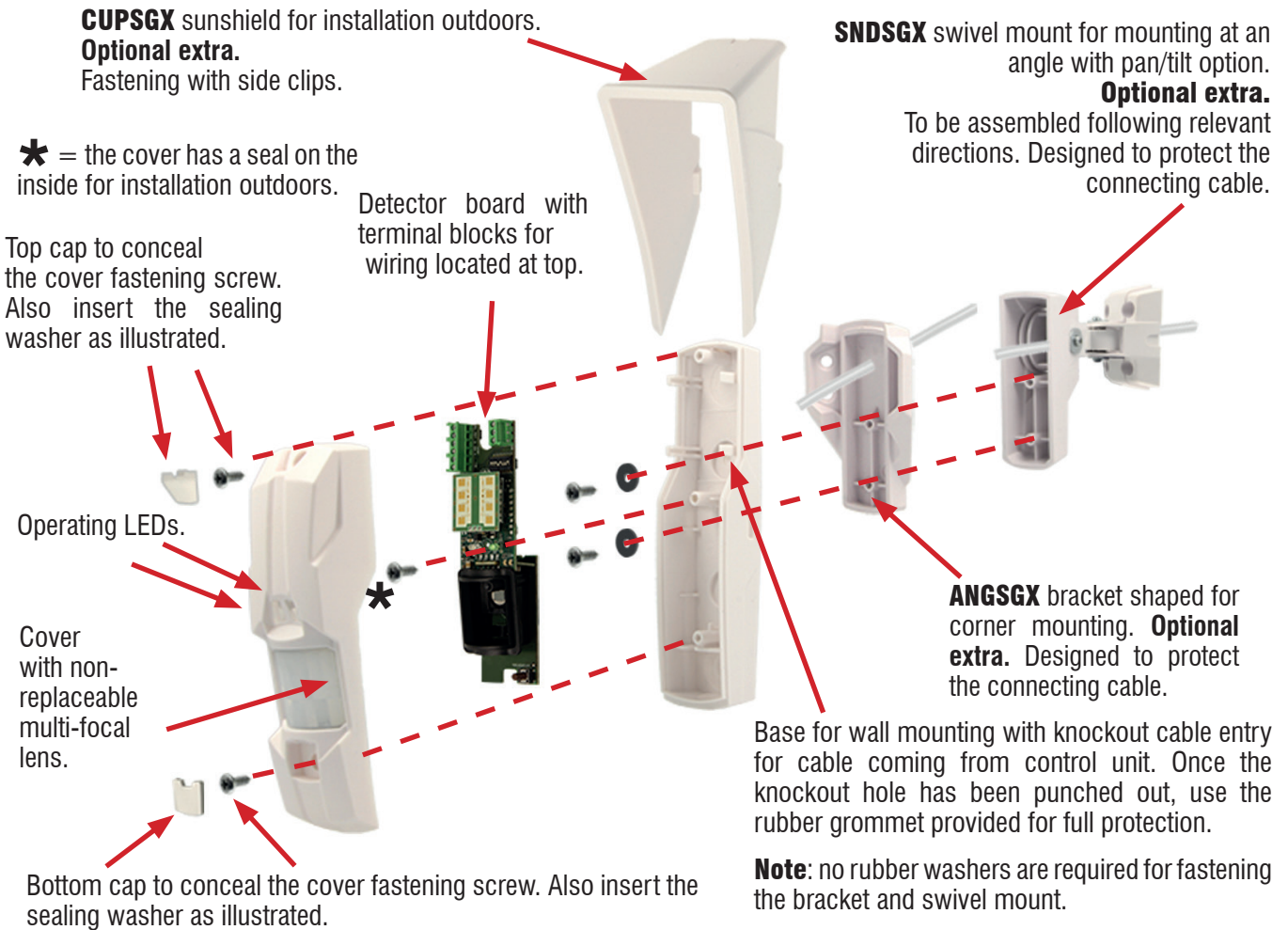
Model:	GRIFOX		
Protection rating:	IP55 with mandatory use of sealing washers provided.		
IMQ certified:	EN50131-2-4: grade 3.		
Environmental class:	4.		
Power supply:	12 V (range 7.7(8) to 15 V).		
Permissible ripple:	200 mVpp		
Minimum operating voltage:	7.7 V with fault event generation with change in state of MASC (masking) output terminals.		
Detector current draw @12V			
Idle:	31 mA		
Alarm, look-down, blinding:	25 mA		
Microwave disabled:	21 mA		
Function settings:	via internal DIP switch with 8 switches.		
Operating timers			
Initial power-up:	20 s		
Alarm and 24H:	5 s for each output.		
Blinding alarm:	for as long as cause of blinding remains.		
Integration:	5 s wait for integration of individual IR and microwave technology alarm.		
Prealarm between microwave and IR:	10 s wait for other technology to confirm		
IR disabling time after alarm:	1 s		
Microwave section		Infrared section	
Dig. noise filter:	for neon lights.	Lens type:	volumetric protection.
TX frequency:	24.125 GHz.	N° of detection zones:	see coverage diagrams.
Range:	maximum 7 metres, adjustable in 4 steps using internal switch.	Coverage area:	see installation diagrams.
		Range:	maximum 7 metres; see installation diagrams
Sensitivity:	2 IR pulses + 4 microwave pulses.	PIR sensor:	digital model with high RF noise immunity. Features Silicon white light filter
		IR section gain:	optimized with temperature.
Indicators:	Blue LED: Power On, alarm, MW section, alarm and tamper with different flashing patterns. Green LED: Power On, alarm, IR section.		
Status indicator examples:	both LEDs steadily lit indicate initial power-up; both LEDs flash to indicate alarm during operation; green LED single flash indicates IR detection during operation; blue LED single flash indicates microwave detection during operation.		
Wiring:	terminal block for connecting to control unit.		
Protection:	protection against housing being opened.		
Operating temp. and humidity:	-10 / +55 °C - 93% R.H.		
Dimensions and weight:	H 155 - W 39 - D 44 mm, 102 g without accessories.		
Parts supplied:	screws, rubber washers, screw anchors, technical manual, rubber grommet, rubber washers for sealing front screws, S4 dowel for protection against removal		

Hereby, EL.MO. Spa declares that the radio equipment GRIFOX is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following Internet address: elmospa.com – registration is quick and easy.

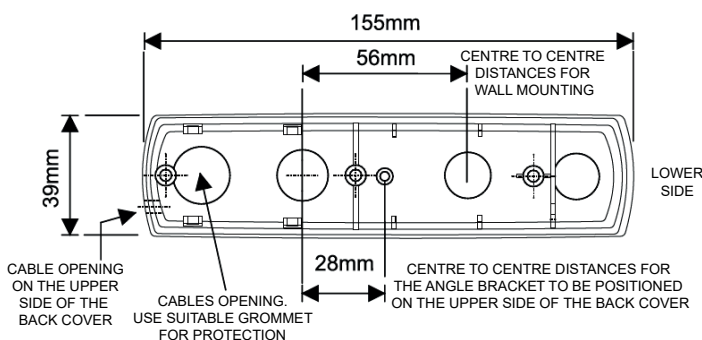


3. VIEW OF DETECTOR

Exploded view of detector with all accessories.

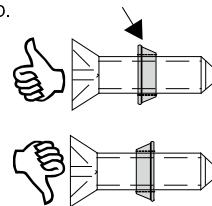


View of base with centre-to-centre distances for fastening.



Detail of sealing washers for front screws.

TO GUARANTEE THE STATED IP PROTECTION CLASS, PLACE THE WASHERS ON THE FRONT SCREWS AS SHOWN IN THE FIGURE, DIRECTION INCLUDED.



CAUTION

The detector is also suitable for installation outdoors provided it is installed with the seals as illustrated. Whatever the case, running a line of silicone around the holes can improve the seal.

4. INSTALLATION

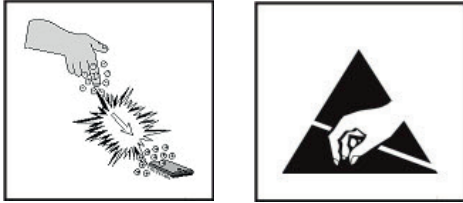
4.1 General installation advice

- Do not touch the PIR sensor with your fingers while installing and handling the board.
- When installing indoors with the detector aimed at glazing or plastic curtains, you must ensure that the microwave range does not extend beyond them: where necessary, adjust the microwave range to the minimum setting.



- Do not fit sensors so that they are directly next to each other or so that they are aimed directly at each other without enough distance between them: keep them at least 15 m apart.
- Do not install near swaying metal shutters or vibrating metal walls (e.g. chillers).
- Check the range selection based on the end assembly position.

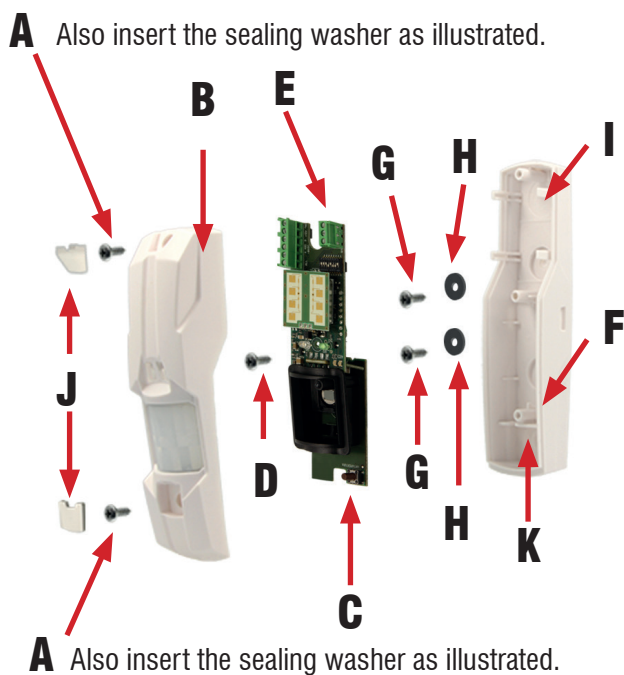
4.2 How to open, fasten and refit the cover on the housing



Installers must ensure that they are entirely free of static electricity before even opening the housing: exercise care as the detector's circuit board can be damaged by electrostatic discharge.

These precautions must be taken while installing the unit and during its maintenance.

How to open/close the housing:



- 1) Unscrew the cover's fastening screws with the sealing washers found at the top and bottom of the housing, marked **A**.
- 2) Pull off the front cover **B**.
- 3) To refit the cover, repeat the procedure described above in reverse, making extra sure that the Tamper protection microswitch closing spring marked **C** is sitting properly in its slot. Complete the fastening procedure by screwing the self-tapping screw into the cover. Lastly, fit the caps marked **J** to conceal the front screws.

How to release and reattach the board:

- 1) Remove the fastening screw, marked **D**, securing the printed circuit board.
- 2) Remove the printed circuit board **E** by tilting it carefully forwards and pulling it out until it comes free from the bottom peg marked **F** (also refer to the details on page 11 for slotting the board back in).
- 3) To reattach the board on the base of the housing, repeat the procedure described above in reverse.

Drilling and wall mounting

Position and fasten the detector's base using the holes illustrated in the figure on page 5 as your template (centre-to-centre distance 56 mm). Also slip on the rubber washers **H** provided under the screws **G**.

Please also read the caution note at the bottom of this page.

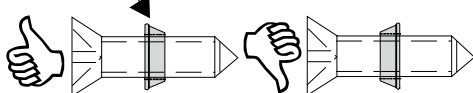
Refer to the specific explanatory sheet for information on using the optional corner bracket and swivel mount. Before fastening the detector, make sure you have examined the possible installation options thoroughly and **fully understood** the warnings and limitations set out herein.

Cable routing

Feed the cables:

- through the **I** hole using the provided gasket, in case of mounting without bracket or joint;
- through the **K** hole, in case of mounting with bracket or joint; to pass the cable, refer to the pictures in paragraph 4.3.2 on page 7.

TO GUARANTEE THE STATED IP PROTECTION CLASS, PLACE THE WASHERS ON THE FRONT SCREWS AS SHOWN IN THE FIGURE, DIRECTION INCLUDED.



CAUTION

The detector is also suitable for installation outdoors provided it is installed with the seals as illustrated. Whatever the case, running a line of silicone around the holes can improve the seal.



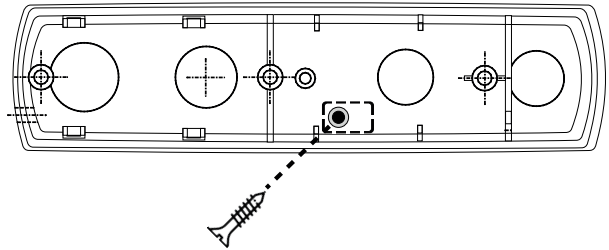
4.3 Protection against removal from the mounting surface

Compliance with EN 50131 regulation grade 3 requires that the device is protected against removal from the mounting surface.

4.3.1 Mounting without bracket or joint

In case of direct mounting on a wall, only:

- remove jumper S3 on device board
- insert a screw (with its dowel) into the indicated hole

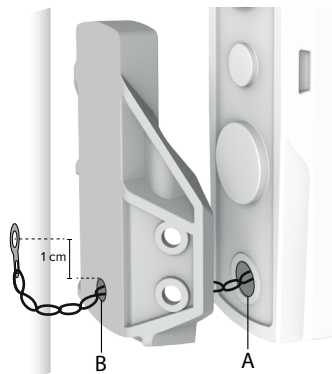


4.3.2 Mounting with bracket or joint

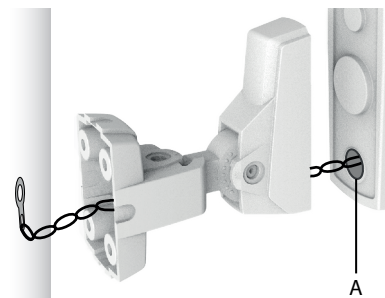
It is necessary to use the proper kit for protection against removal.

Warning: the joint can only be installed on the device lower side.

Install the proper kit before fixing the ANGSGX bracket or the SNDSGX joint to the wall.



KSAS1013 kit (GREEN)



KSAS1032 kit (WHITE)

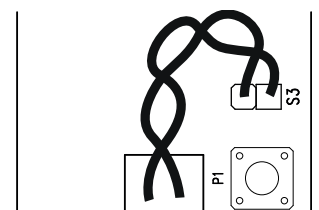
- remove the plate for protection against removal from detector bottom
- drill a hole (diameter: 6,5 mm) on the detector base (A). If you are using ANGSGX, drill a hole on it as well (B)
- feed the cable in the hole, from the eyelet end. If you are using the ANGSGX bracket or the SNDSGX swivel mount, feed the cable as illustrated above.
- also feed the system cables into the drilled hole, laying them on board side as indicated



- arrange the board under the supporting hook and block it with the screw



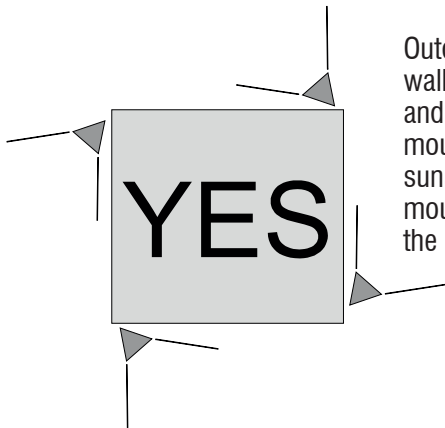
- fix a S4 dowel to the wall at a height of 1 cm from the hole
- fix the eyelet to the dowel
- fix the detector base (and also the bracket/swivel mount if this is the case) to the wall
- perform wiring to the terminals
- open jumper S3 on device board
- wire the cable connector to S3



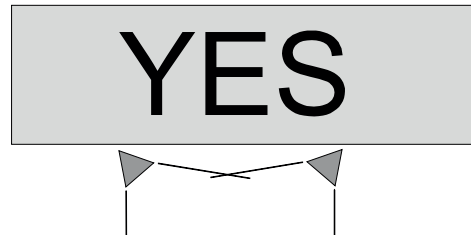


4.4 Installation examples

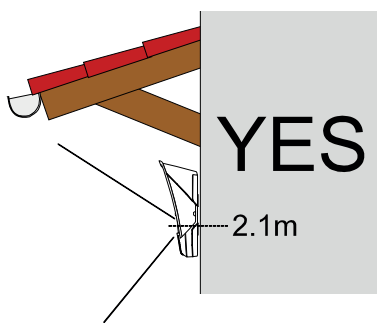
For installation outdoors, with optional sunshield and swivel mount, refer to the following illustrations, which show what mounting positions are and are not allowed:



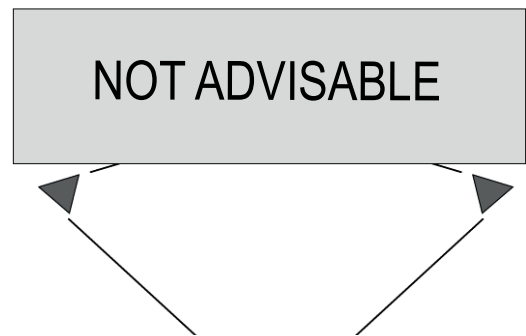
Outdoors to cover walls, with sunshield and corner bracket for mounting at 90° or with sunshield and swivel mount at an angle, as the situation demands.



Outdoors, overlapping slightly, to cover walls, with sunshield and corner bracket for mounting at 90° or with sunshield and swivel mount at an angle, as the situation demands.



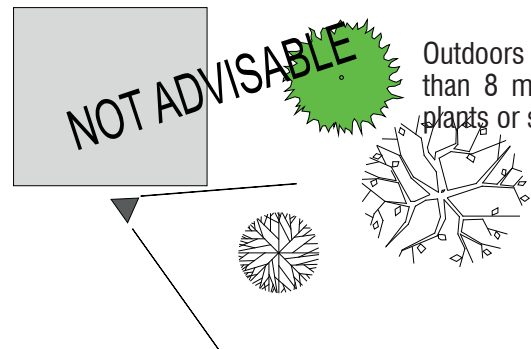
Outdoors in a position protected by a portico or balcony, with sunshield. Use the corner bracket for mounting at 90° or sunshield and swivel mount as the situation demands.



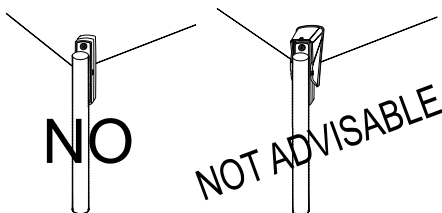
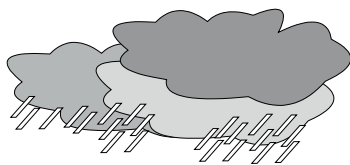
To cover walls outdoors, with coverage overlapping completely and units placed less than 15 metres apart.



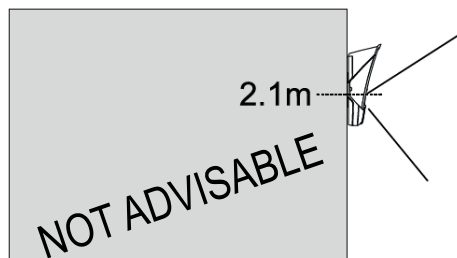
Outdoors placed less than 8 metres from an alley or road with vehicle traffic.



Outdoors placed less than 8 metres from plants or shrubs.



Outdoors mounted on a pole without or with sunshield. **The elements or heavy rain, hail, etc. can cause false alarms.**



Installation outdoors in an area that animals are likely to pass through

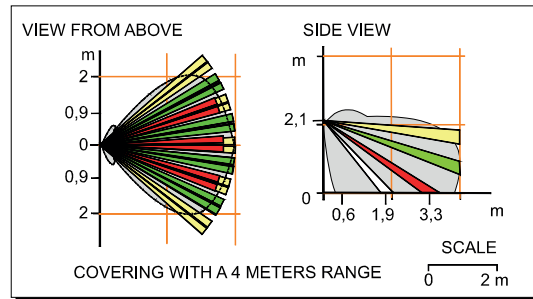
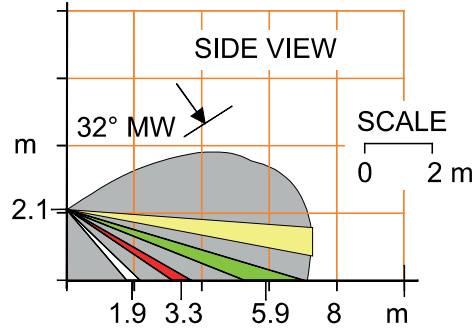
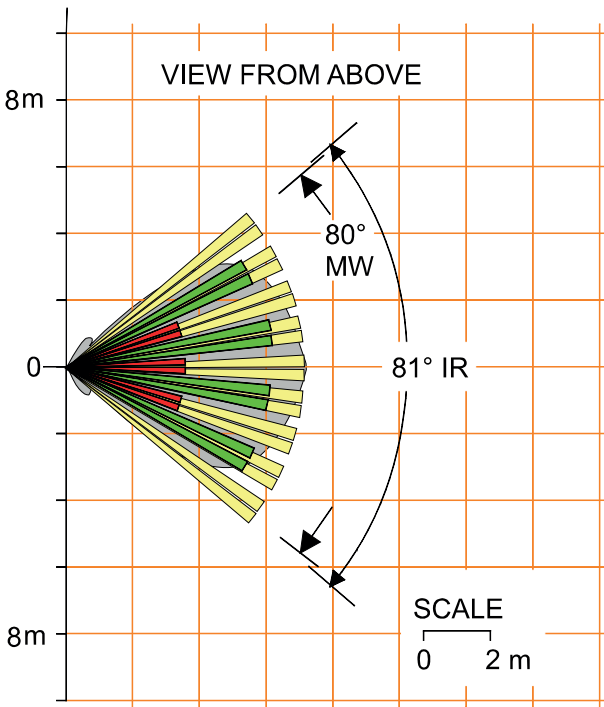


IMPORTANT: do not install the detector so that it is pointing directly at the sun.



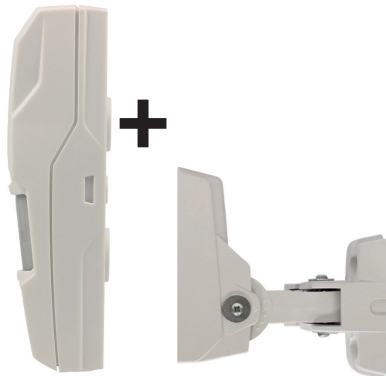
5. COVERAGE DIAGRAM

Range: 7 - 4 m **Coverage:** volumetric, 81° **Coverage pattern:** 18 zones arranged over 4 planes
Note: the coverage diagram refers to wall mounting without the corner bracket at a height of 2.1m.

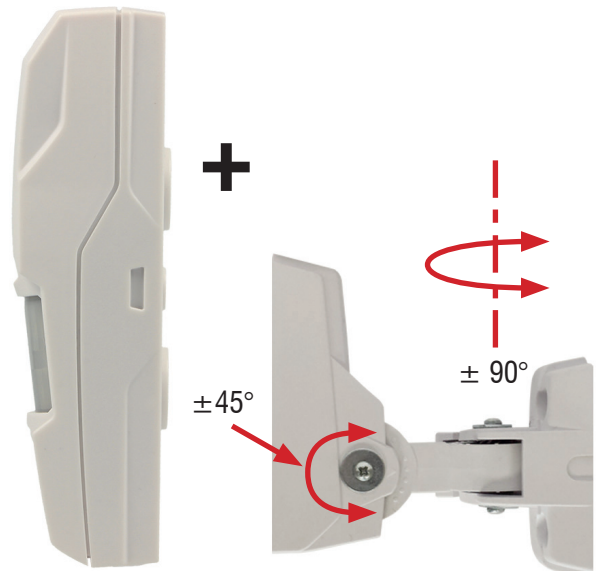


Use of optional **ANGSGX** corner bracket and **SNDSGX** swivel mount:

Fastening with bracket for corner mounting at a height of 2.1 m.



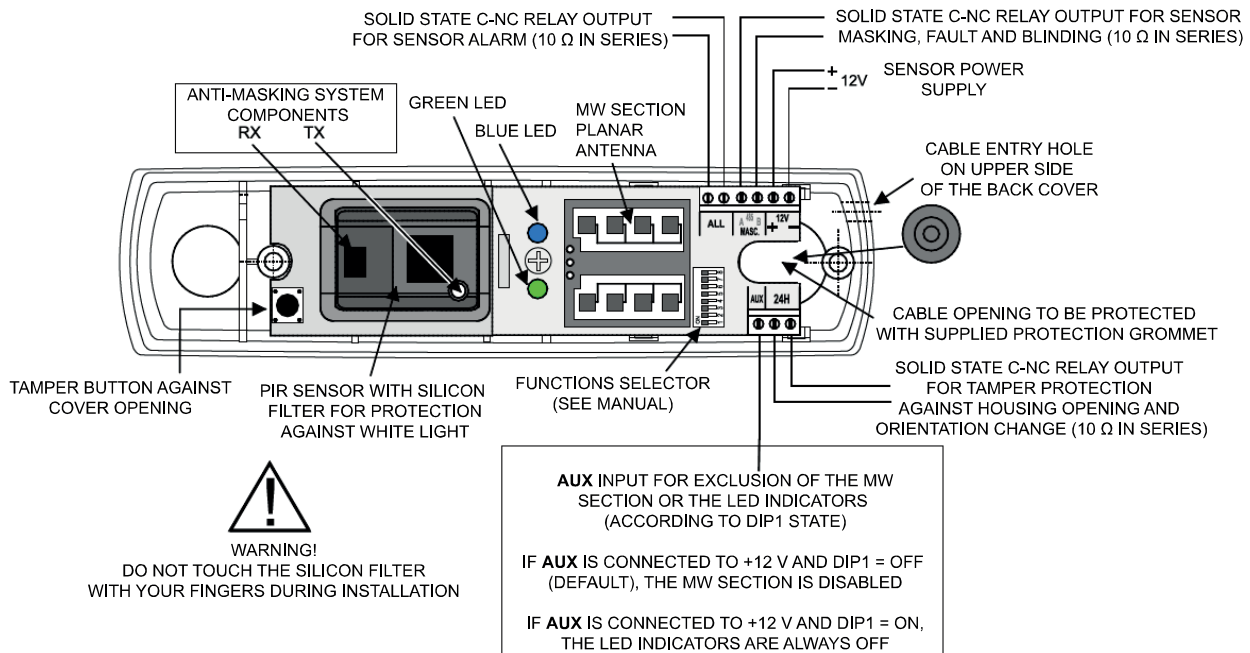
Fastening with swivel mount for mounting with vertical and horizontal angle adjustment.



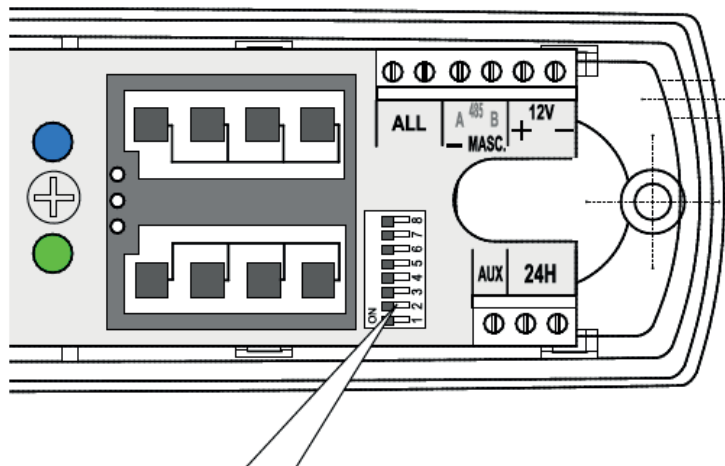


6. WIRING

View of the board inside:



Meaning of internal DIP-switch switches.

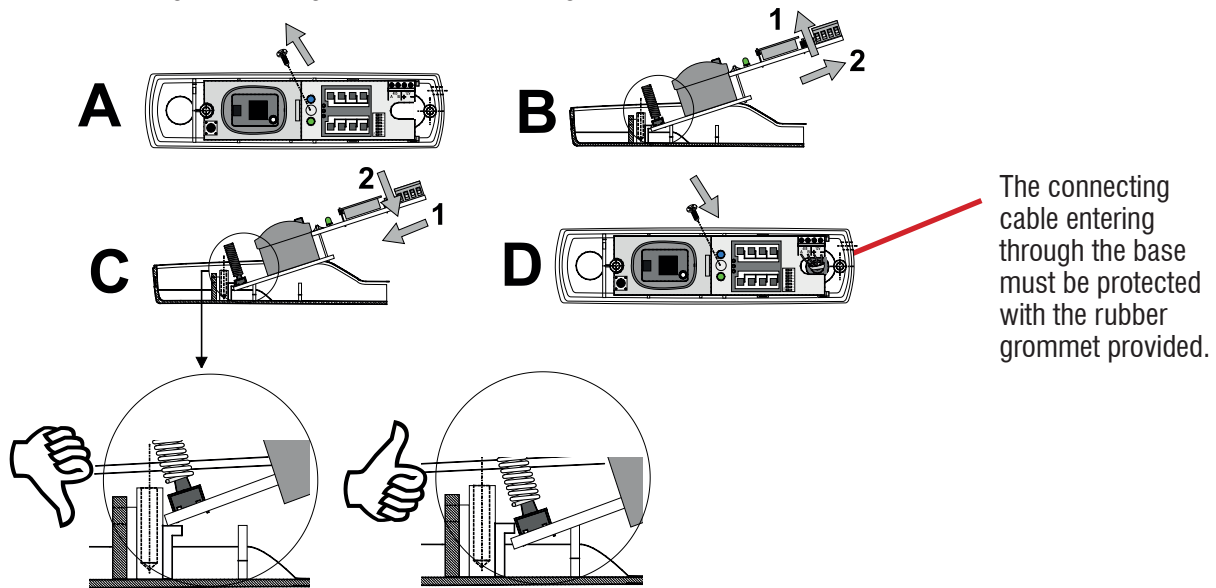


MEANINGS OF THE SINGLE DIPS

MW/LED EXCL.	ANTI-MASKING ANTI-BLINDING	SENSITIVITY	AND/OR	LOOK-DOWN FUNCTION	MW RANGE
<p>ON LED EXCL.</p> <p>1</p> <p>OFF MW EXCL. (DEFAULT)</p> <p>1</p> <p>(SEE MANUAL)</p>	<p>ON ANTI-MASK. AND ANTI-BL.</p> <p>2 3</p> <p>OFF ANTI-MASK. ONLY</p> <p>2 3</p> <p>ON ANTI-BL. ONLY</p> <p>2 3</p> <p>OFF BOTH FUNC. DISABLED (DEFAULT)</p> <p>2 3</p>	<p>ON MIN</p> <p>4</p> <p>OFF MAX (DEFAULT)</p> <p>4</p>	<p>ON AND MODE (DEFAULT)</p> <p>5</p> <p>OFF OR MODE</p> <p>5</p>	<p>ON FUNCTION ACTIVE (DEFAULT)</p> <p>6</p> <p>OFF FUNCTION NOT ACTIVE</p> <p>6</p>	<p>ON 25% RANGE</p> <p>7 8</p> <p>OFF 75% RANGE</p> <p>7 8</p> <p>ON 50% RANGE (DEFAULT)</p> <p>7 8</p> <p>OFF 100% RANGE</p> <p>7 8</p>



Sequence for removing and refitting the board when wiring the detector.



7. OPERATION

7.1 Environmental monitoring

The IR section of the GRIFOX detector features a sophisticated environmental monitoring device (3D) for detailed control of the environment and its temperature disturbances with microprocessor-based analysis of the signals coming from the PIR sensor. This circuit performs its task for the purpose of analysing motion thoroughly and thus drastically reducing false alarms.

7.2 Detection of low supply voltage

When detected, only the "Fault" event is generated with the change in state of the MASC (masking) output terminals. The alarm and 24H circuits are disabled.

7.3 Disabling the microwave section

The GRIFOX detector can be set so that the microwave section is disabled, usually in order to reduce energy usage when the control unit/area is disarmed. To disable the section, set DIP switch 1 to OFF (**default**) and apply +12V to the AUX terminal by means of an output belonging to the control unit/area that is disarmed; in this case, detection takes place with the PIR sensor only and the unit automatically switches to **OR** mode.

If the control unit/area is armed again, the microwave section resumes operation in the resulting **AND** mode.

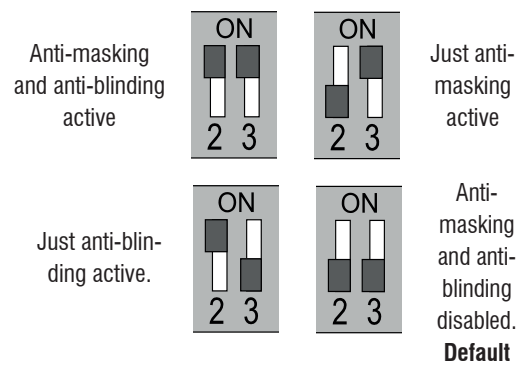
Note: if the microwave section is disabled, the anti-masking feature, where applicable, is disabled and only the anti-blinding function, where applicable, will be active. Masking will be enabled again when at least one of the sectors associated with the sensor is armed.

7.4 Disabling the front indicator LEDs

The GRIFOX detector can be set so that the front operating status LEDs are disabled with the control unit/area disarmed. To disable the LEDs, set DIP switch 1 to ON and apply +12V to the AUX terminal by means of an output belonging to the control unit/area that is disarmed; in this case, the detector will appear not to react to the motion detected. If the control unit/area is armed again, the indicators become active again.



7.5 Anti-masking/Anti-blinding function



The GRIFOX detector features an anti-masking and anti-blinding device. The anti-masking section can be enabled using DIP switches 2 and 3, only when the detector is fully operational and in AND operating mode, and provided the Disable MW function is not active.

The microwave section's blue LED will flash slowly to indicate masking status.

The IR section's green LED will flash slowly to indicate blinding status.

Return to normal operating conditions occurs when the first movement is confirmed by the technologies or when the cause is removed.

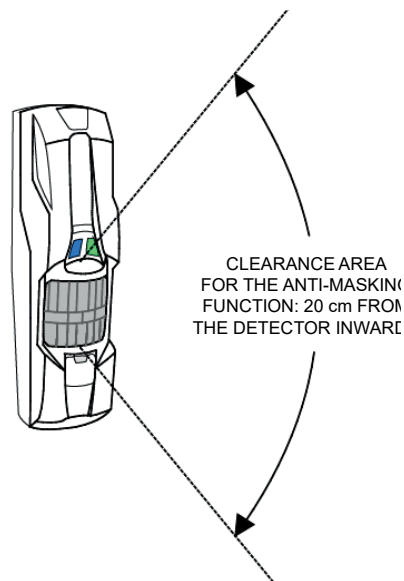
Note: the anti-masking function is operational only provided the microwave section is enabled (AUX input not connected to +12V with DIP switch 1 = OFF).

Note: the anti-blinding section detects an attempt to obscure the unit's vision with a reflective body placed in the immediate vicinity of the lens. The anti-masking section detects an interfering body placed near the detector.

Note: the indicator lights to indicate that the "Anti-masking" feature is on - where DIP switch 2 is set to OFF and DIP switch 3 to ON - only while the detector's power supply is stabilizing. During this stage, if a person comes close to the sensor, the green and blue LEDs will go off for a moment.

Note: when there is a Masking / Blinding event, the ALARM relay is activated in addition to the MASC (masking) relay. For further information, refer to the "General installation advice" chapter.

Warnings



- If the GRIFOX detector is mounted somewhere that people are going to pass near, it is best to disable the "anti-masking" feature by setting DIP switch 2 to ON and DIP switch 3 to OFF, which corresponds to "just anti-blinding".
- If the distance is less than 20 cm, it is best to disable the "blinding" function as well, setting DIP switch 2 to OFF and



DIP switch 3 to OFF.

7.6 AND mode

The GRIFOX detector's **default** setting is AND mode with DIP switch 5 set to ON.

In this mode, the alarm is triggered only when both technologies (IR and microwave) report an alarm within a maximum software-set time: default setting 10 s. In the event this does not happen, the technology reporting the alarm resets once this time has elapsed.

7.7 OR mode

The GRIFOX detector can be set to OR operating mode by setting DIP switch 5 to OFF.

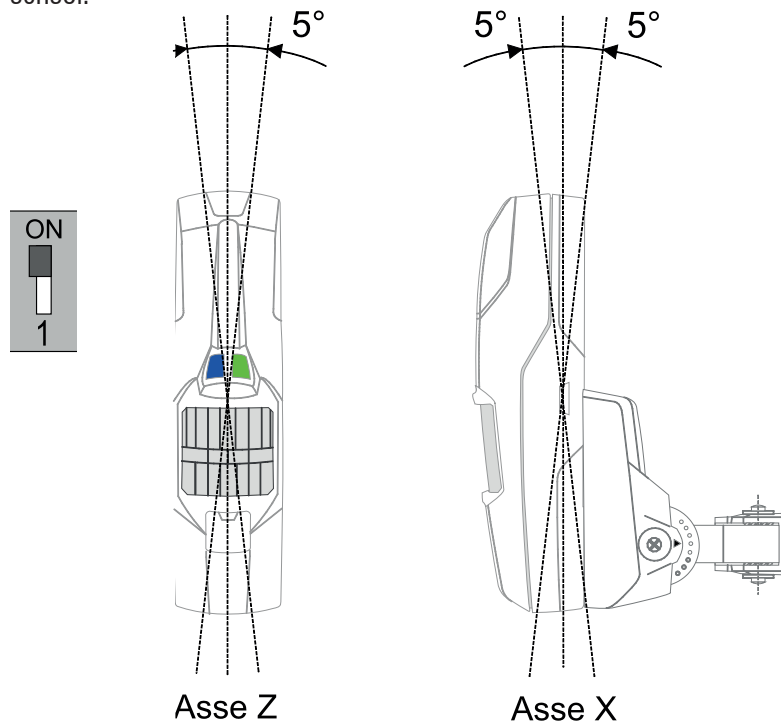
In this mode, the alarm is triggered when either of the two technologies (PIR or microwave) report an alarm due to motion in the area being covered with the transition from C-NC to C-NO at the alarm relay output terminals.

7.8 3D function

The term **3D function** refers to the combination of circuits integrating the motion detected by the PIR sensor and by the microwave section versus time, with the resulting signal activating the alarm relay with output terminals.

7.9 Look-down function

The GRIFOX detector features a circuit that protects, with 2-axis operation, against any change in orientation detected by an accelerometer sensor.



If the GRIFOX detector is rotated 5° around its Z-axis or X-axis relative to the position it was originally mounted in, a tamper alarm lasting 5 s is produced with the 24H output terminals changing state. Change in orientation is indicated by the green and blue LEDs flashing in an alternating pattern.

The **default** setting is protection ON, i.e. DIP switch 6 set to ON.

CAUTION: despite the circuit's good immunity to random vibrations, these precautions must still be taken:

- The wall it is installed on must be solid and stable.
- The swivel mount, where used, must be fastened securely. The detector must be positioned first, then switched on. Of course, during installation, the sensor may be moved even after the system has been switched on and this will



inevitably result in a 24H alarm. Consequently, when conducting tests and/or maintenance, the warning/indicator devices will need to be disabled.

- Whatever the case, do not drill or hammer in the immediate vicinity of the detector unless you have switched the system off first.
- Where necessary, the look-down function circuit can be disabled via software.

8. INDICATORS

The GRIFOX detector's LEDs indicate the following operating statuses:

Green LED = during operation, it flashes when the IR section signals a prealarm status; it lights up together with the microwave section's blue LED to indicate alarm status.

Blue LED = during operation, it flashes when the microwave section signals a prealarm status; it lights up together with the IR section's green LED to indicate alarm status.

Details of information provided by the LEDs' lighting patterns:

- **Blue and green LEDs steadily lit** = stabilizing following initial power-up.
- **Blue and green LEDs single flash** = microwave masking test during power-up.
- **Blue and green LEDs flashing fast** = low power fault.
- **Alternating slow flashing** = orientation change (look-down function).
- **Both LEDs light up for approx. 2s** = alarm.
- **Green LED flashing fast** = PIR fault.
- **Green LED flashing slow** = blinding.
- **Blue LED flashing fast** = MW fault.
- **Blue LED flashing slow** = masking.
- **Green LED on** = IR section prealarm.
- **Blue LED on** = microwave section prealarm.
- **Green LED single flash** = motion detected by IR section.
- **Blue LED single flash** = motion detected by microwave section.



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