

TECHNICAL MANUAL



TRIALV

Outdoor double-technology detector with vertical lens equipped with under-crawl and anti-masking function

090051111



IT08020000001624



IMQ-SISTEMI DI SICUREZZA



FOREWORD

FOR INSTALLERS

Please follow carefully the specifications about electric and security systems realization further to the manufacturer's prescriptions indicated in the manual provided.

Provide the user the necessary indication for use and system's limitations, specifying that there exist precise specifications and different safety performance levels that should be proportioned to the user needs. Have the user read carefully the instructions provided in this document.

FOR USERS

Carefully check the system functionality at regular intervals making sure all enabling and disabling operations were made correctly.

Have skilled personnel make the periodic system's maintenance. Contact the installer to verify correct system operation in case its conditions have changed (e.g.: variations in the areas to protect due to extension, change of the access modes, etc.)

.....

This device has been designed, assembled and tested with the maximum care, adopting control procedures in accordance with the laws in force. The full correspondence to the functional characteristics is given exclusively when it is used for the purpose it was projected for, which is as follows:

Outdoor double technology detector with vertical lens and under-crawl and anti-masking

Any use other than the one mentioned above has not been forecasted and therefore it is not possible to guarantee the correct functioning of the device. Similarly, any other use of this technical manual other than the one it has been compiled for - that is: to illustrate the devices technical features and operating mode - is expressly prohibited.

The manufacturing process is carefully controlled in order to prevent defaults and bad functioning. Nevertheless, an extremely low percentage of the components used is subjected to faults just as any other electronic or mechanic product.

As this item is meant to protect both property and people, we invite the user to proportion the level of protection that the system offers to the actual risk (also taking into account the possibility that the system was operated in a degraded manner because of faults and the like), as well reminding that there are precise laws for the design and assemblage of the systems destined to these kind of applications.

The system's operator is hereby advised to see regularly to the periodic maintenance of the system, at least in accordance with the provisions of current legislation, as well as to carry out checks on the correct running of said system on as regular a basis as the risk involved requires, with particular reference to the control unit, sensors, sounders, dialler(s) and any other device connected. The user must let the installer know how well the system seems to be operating, based on the results of periodic checks, without delay.

Design, installation and servicing of systems which include this product, should be made by skilled staff with the necessary knowledge to operate in safe conditions in order to prevent accidents. These systems' installation must be made in accordance with the laws in force. Some equipment's inner parts are connected to electric main and therefore electrocution may occur if servicing was made before switching off the main and emergency power. Some products incorporate rechargeable or non rechargeable batteries as emergency power supply. Their wrong connection may damage the product, properties and the operator's safety (burst and fire).

EU DECLARATION OF CONFORMITY

Hereby, EL.MO. Spa declares that the radio equipment TRIALV 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.

DISPOSAL INSTRUCTIONS - USER INFORMATIONS



According to Directive 2012/19/EU on the Waste of Electric and Electronic Equipment (WEEE), it is here specified that this Electrical-Electromechanic Device started to be commercialized after 13th August 2005, and it shall be disposed of separately from ordinary waste products.

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1. GENERALS

TRIALV is an outdoor high-performance detectors. It is able to perform accurate analysis of the received signal through sophisticated algorithms. The detector is designed also for outdoor and indoor installation.

A TRIALV key point is the use of a digital PIR detector to obtain a very high detection precision and great noise immunity.

The control and the analysis process is programmed, with proper selections, for general alarm with "AND" operation (generated when the two MW and IR detection systems go in alarm), or with "OR" operation that is, when just the alarm from a single section of the TRIALV detection.

The MW section is equipped with with DRO device and low-absorption pulse-function planar antenna and with anti-masking device while the IR section is equipped with FRESNEL lens with vertical curtain protection and lower under-crawl lens.

Version available in different frequency for side mounting

In the IR section there is a sophisticated monitoring device for the environmental control and its thermal perturbations; the section has two digital PIR high-immune sensors to obtain the optimal response to the signal caused by the human body motion and then to discard all the little warming phenomena that can lead to not justified alarms; the PIR are protected by a particular silicon filter for white light protection, the optical unit sealed for the false alarms reduction due to insects entry. The detector is protected by two separate circuits for the detection of masking and blindness attempts, the anti-blinding device is active type, both circuits are activated via dipswitch.

The masked and/or blinded detector is proper signalled with the slow flash of blue LED (masking) and green LED (blinding), while the relay output is active during the masking/blinding of the detector; the operation restart occurs at the next motion detection of the technologies. The detector generates an alarm also if is disoriented thanks to a high sensitivity accelerometer sensor in the circuit with operation on two axis.

The particular shape of the TRIALV housing simplifies the installation also with 6° angled bracket (supplied), for outdoor installation is supplied a protective sunshield. The tilt adjustment is facilitated adding a joint. The joint can be ordered with the **SNDTRIAL** code. **The TRIALV is not equipped with interchangeable lens.**

TRIALV is IMQ - Security Systems certified.

2. FEATURES

2.1 General features

- Sturdy plastic housing for indoor/outdoor installation. Its design is simple and elegant.
- IR section with digital PIR high sensitivity detector with silicon filter for white light protection.
- Sealed lens to reduce false alarms due to insects entry.
- Detector completely managed by microprocessor.
- Anti-blinding active circuit in the IR section with encoded RXTX IR and anti-masking circuit in the MW section, alarm output on relay dedicated MASK/FAULT. The function can be activated with proper dipswitch.
- MW section with DRO device and planar antenna certified RTTE/99-05 with pulsed operation.
- Disorientation detection with accelerometer sensor on 2-axis always active and consequent generation of tamper alarm.
- Sophisticate algorithm used by the environmental monitoring circuit with microprocessor conversion on IR stage.
- AND/OR operation can be selected with dipswitch.
- 3D function.
- Exclusion dipswitch of front LEDs indicators according to the functions of the IR, MW sections and of the alarm circuit.
- MW section with dipswitch for the range adjustment.
- Fresnell lens and lower lens with under-crawl device ultrasonically welded and non-replaceable.
- Static alarm relay against tamper attempts with external magnets.
- Terminal for the MW section exclusion when is connected to +12V for consumption reduction.
- Protections against noise applied to the power terminals, also the alarm relay has output contact protected with supplied resistance.
- Termic compensation of the IR section features for the detector operation also in critical situations.
- Selection of the detector sensitivity settable with Min and Max dipswitch to improve the operation.




- The TRIALV detector is equipped with protection sunshield for outdoor installation and 6° angled bracket for installations at 2,1m.

- On request can be ordered the TRIALV version with differentiated frequency.
For correct alphanumeric codes, please consult the chapter "General installation recommendations" on page. 6.

- For the TRIALV detector is available SNDTRIAL optional accessories that allows to compose a swivel fixing on wall or at 90° to orient carefully its position in relation to the protection area.

2.2 Electrical features

Model:	TRIALV	Views:	operation of the MW section, operation of the IR section, alarm status, faults, disorientation, masking/blinding.
Performance level:	II° or without with joint	LEDs exclusion:	through dipswitch.
IMQ certified:	EN50131-2-4: grade 3.	Adjustments:	dipswitch for setting the various operation modes.
Environmental class:	4	Alarm relay:	normally energized, NC contacts with 10 ohms resistance, 500 mA contacts range.
Protection class:	IP55	Masking relay:	NC contacts only with enabled function with 10 Ohm resistance, 500 mA contacts range.
Power supply:	12 V  (from 7,5 to 15 V).	Tamper:	NC contacts with 10 Ohm resistance, 500 mA contacts range for protection against the cover opening and the tear of the internal fixing base, this function can be excluded with jumper.
Admitted ripple:	200 mVpp.	IR gain stage:	optimized with the temperature.
Detector consumption @12V:		Operation temperature:	-10 / +55 °C.
Idle:	19 mA (excited relay).	Humidity:	93% Ur.
In alarm:	21 mA (no excited relay).	Dimensions, weight:	H 167 - W 95 - D 75 mm only body detector, 270 g without joint accessories.
In stand-by, excl. MW:	17 mA.	Parts supplied:	screws, bolts, tilted plate to 6° and sunshield, technical manual.
Voltage of terminal command:	MW EXCL., MW exclusion, active when is connected at +12V.	Options:	SNDTRIAL joint combinable also at 90°.
Functions selection:	dipswitch on board, see attached electrical scheme.		
Timer:			
<i>Alarm or for disorientation:</i>	5s		
<i>Stand by at power on:</i>	20s		
<i>Waiting alarm AND function:</i>	10s		

MW SECTION

Adjustments:	dipswitch for the range adjustment.
Sensitivity:	dipswitch for the selection between min 8 pulses and max 4 pulses with waiting of 5s. Note: single selector for MW and IR.
Noise filter:	neon lamps -21 dB, power supply -65 dB.
TX frequency:	10,525 GHz for standard version. 9,9 GHz for version with differentiated frequency.
Emitted power:	13 dBm E.I.R.P.
Emitted spurious:	<-30 dBm.
Emitted signal:	pulsed.
Range:	from 3 to 15 m +/-20% adjustable.
Coverage area:	95° horizontal, 60° vertical.
Timings:	single alarm with confirmation waiting from the IR section for 10s, with AND operation, direct alarm to the general relay for OR operation.

IR SECTION

Lens type:	VB 1.2 GIV1 lens Separated lens for under-crawl
No. sensitive areas:	1 zone on vertical 3 zone under-crawl on 1 floor.
Coverage area:	wall protection IR opening at 5,6°.
Range:	15m with mounting at 2.10 m, the coverage can change based on mounting solutions adopted with angled bracket and/or SNDTRIAL, see manual.
Sensitivity:	dipswitch for selection between min 4 pulses and max at 2 pulses with waiting of 5s. Note: the selector is unique for IR and MW.
Timings:	single alarm with confirmation waiting from the MW section for 5s, with AND function, direct alarm to general relay for OR operation.



3. DETECTOR VIEW

Exploded view of the detector with all the accessories.



Note: the joint, supplied with the **SNDRTRIAL** product, are to be mounted according to the needs and it is equipped with rubber washers with special clutch function. For the assembly see the specific data sheet.

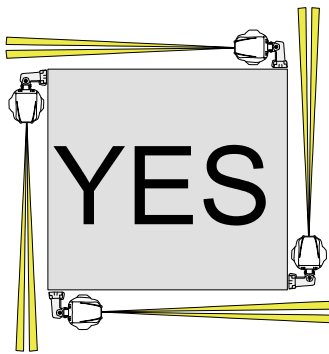


4. INSTALLATION

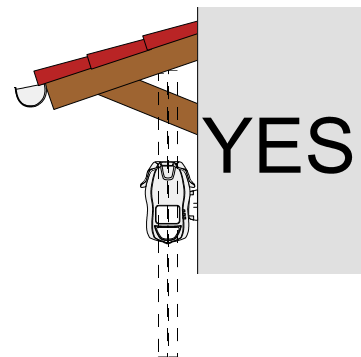
4.1 General installation recommendations

- During the installation and during the board handling , don't touch the PIR sensor with your fingers.
- In case of indoor installation with pointing toward the windows or plastic curtains is required to make sure that the adjustment of MW range does not exceed (if necessary put the MW range to the minimum).
- In case of installation of close detectors is required to choose the second with differentiated frequency as follows:
- TRIALV standard RCRDTMP022#00 and TRIALV with differentiated frequency RCRDTMP026#00.
- Do not mount the detectors with close direct pointing but you have to separate them by at least 5 m.
- Do not install near oscillating metal shutters, vibrating metal walls (e.g. refrigeration units).
- For outdoor installations observe the following cartoons showing the allowed and not allowed cases.

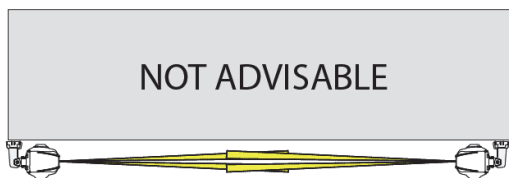
Perimeter with coverage not overlapping.



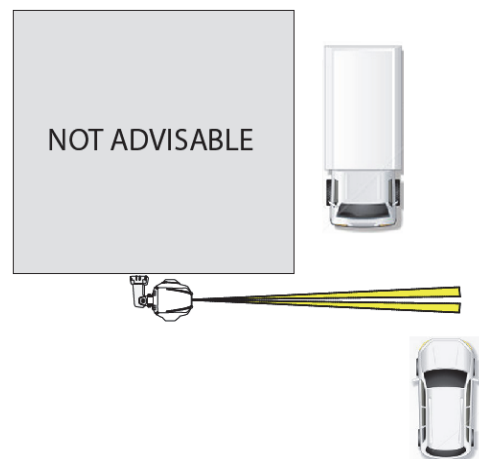
Outdoor protected by a porch or terrace. (Recommended).



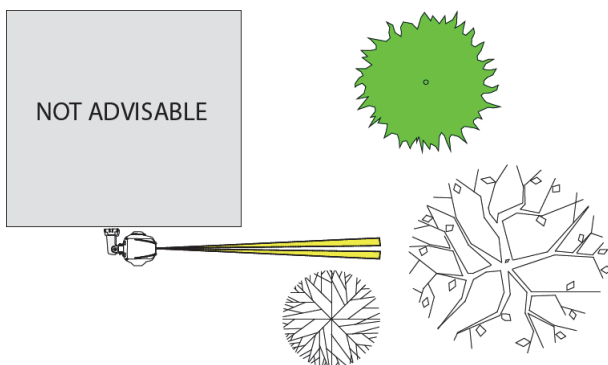
Side with completely overlapping coverage.



Pointing towards areas affected by the passage of cars or trucks with distances auto-trucks >> 15m.



Pointing towards trees or shrubs, the minimum distance should be > 15m.

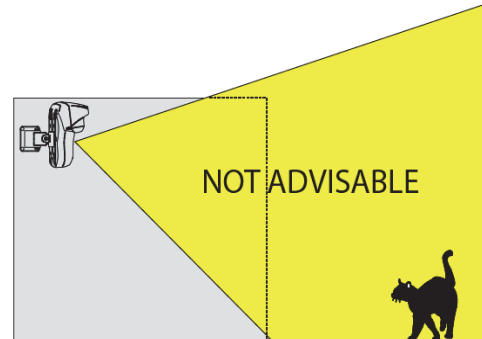
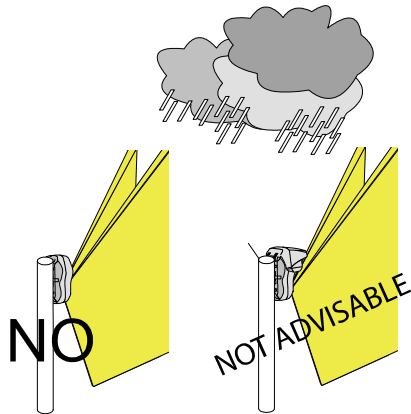




Outdoor installation on pole with or without protection.

Important note: the installation is not recommended because the bad weather, heavy rain, hail may cause a false alarms.

Installation with standard lens in an environment with the presence of animals.



4.2 Opening operations and housing reclosing



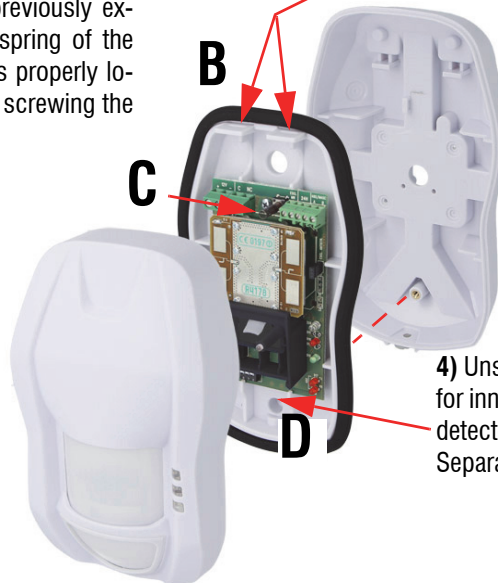
The installer must operate completely without static electricity already from the housing opening, make sure that the electronic board of the detector can be damaged by electrostatic discharge. The precautions must be observed during the installation phase and during maintenance.

1) Unscrew the fixing screw of the cover on the bottom of the housing, indicated with **A** by the arrow.



2) Separate the front cover by turning it from below with pivot on the top of the detector by releasing the latches indicated with **B** by the arrow in the below image.

3) The reclosing operation of the cover requires the inverse performing of the operations previously exposed. Pay attention that the closing spring of the Tamper microswitch indicated with **C** is properly located. Conclude the fixing operation by screwing the **A** screw to the base of the cover.



4) Unscrew the screw indicated by the **D** arrow for inner base fixing with seal perimeter and the detector circuit. Disconnect the internal base. Separate the fixing base.

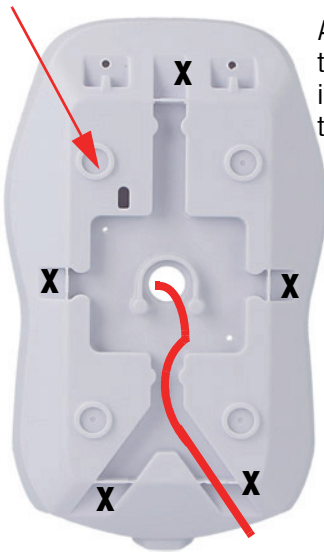


4.3 Cables routing

Internal view and indications of the cables routing.

Arrangements for drilling and support pin for wall mounting.

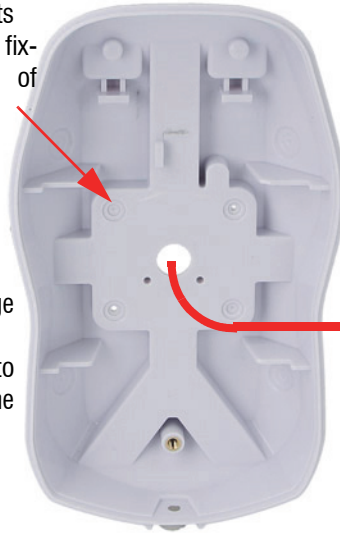
The cables must be introduced through the hole indicated upward direction.



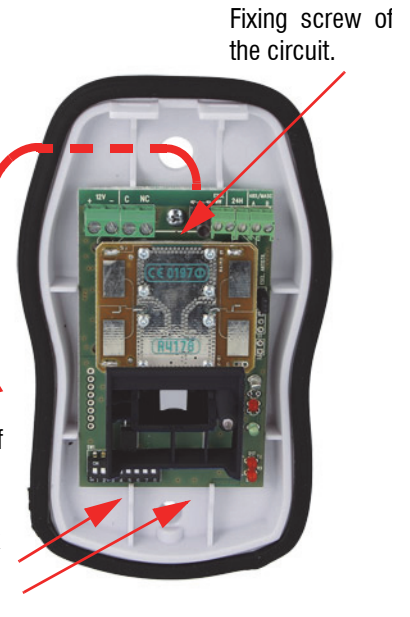
Arrangements to insert the fixing screws of the joint.

Cut the edge indicated with X to pass with the cable.

Rear view of the fixing base with facilitators paths for cables.



Internal view of the fixing base.



Example of cable entry.

Lower hook of the circuit.

Note: to proceed to the wiring, don't remove the board from the base. In case of necessity pay attention at the spring of the internal against-tear system.

4.4 6° tilt base

The use of the 6° inclined base is required for the detector mounting at 2.1m height

The base must be fixed to the wall or corner before passing the cable to the proper length, then it will also pass on the basis that you will have to fix it with the provided four screws.

ATTENTION

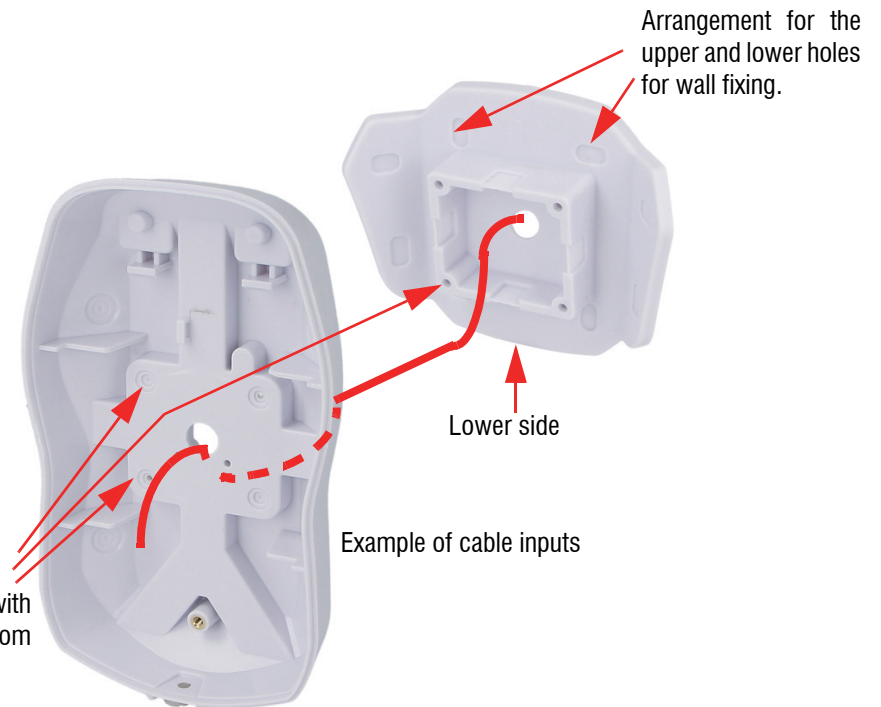
With a wrong mounting you will get a protection of the detector moved upwards.



YES

NO

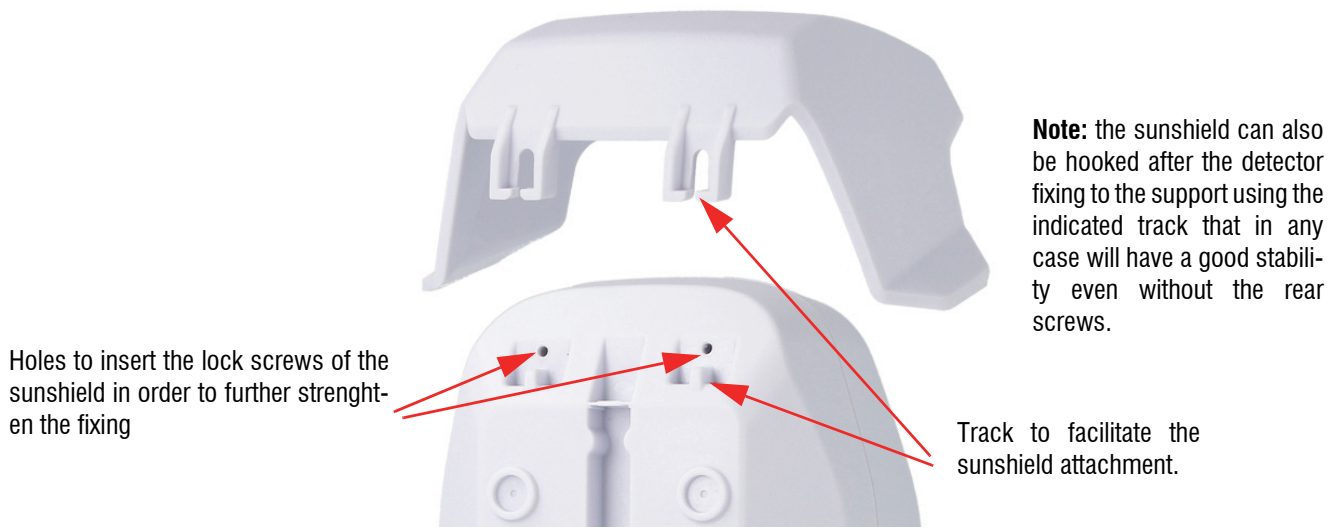
Fix the angled base with four screws inserted from the inside of the base.





4.5 Sunshield installation

Fixing example of the protection sunshield.



4.6 Optional SNDTRIAL joint

The details of the **SNDTRIAL** joint are supplied with a data sheet of the various installation modes for all possible combinations.

Summary of the installation types of the joint according to the fixing heights and the detector type.

Installations options:

- A. Direct fixing at 1m TRIALV (without joint and without 6° bracket).
- B. Direct fixing at 2.1m with 6° bracket for TRIALV (without joint).

Possible installations with **SNDTRIAL** optional joint:

- 90° joint fixing for TRIALV at any height up to 3m 90° rotation (right or left depending on bracket mounting) and pan/tilt up to +/-45°.



4.7 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. Install the proper kit for protection against removal before fixing the tilted plate or the joint to the wall.

Use KSAS1032 kit (white) in case of tilted plate use, KSAS1055 kit (red) in case of joint use.

- fix a S4 dowel (supplied) to the wall
- fix the eyelet to the dowel



KSAS1032 kit, white



KSAS1055 kit, red

If you are using the tilted plate:

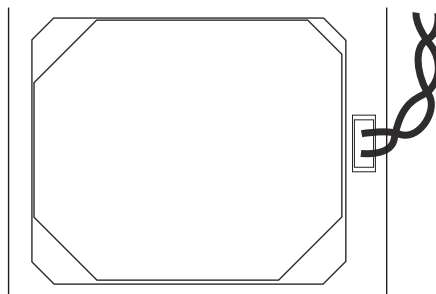
- drill a hole (diameter: 6,5 mm) on the centre of the tilted plate
- feed the cable in the hole
- fix the plate to the surface

If you are using the joint:

- feed the cable in the joint, as indicated in picture below
- fix the joint to the surface, covering the eyelet

Once the plate or the joint have been installed:

- feed the cable through the hole on device housing back
- fix the housing back to the plate or to the joint
- feed the cable through the upper hole on device inner base
- lean the inner base on the back, hooking it to the tabs



- remove ESCL. ANTISTR. jumper on device board
- connect the cable connector to the jumper



5. OPERATION

5.1 Environmental installation

In the IR section of the TRIALV there is a sophisticated environmental monitoring (3D) for the environmental control and its thermal perturbations with microprocessor analysis of the signals from the PIR sensor. This circuit performs its function in order to reach a precise motion analysis and a drastic reduction of false alarms.

5.2 Exclusion of the MW section

The TRIALV detector is equipped with **EXCL.MW** termination input to exclude the MW section and reduce the consumption. If this is connected to +12V, the MW section is not active and works only the PIR sensor detection, it is performed the automatic switching to **OR** operation also if the selectors no. 5 is ON (active AND function).

When the **EXCL.WM** terminal is no longer connected to +12V or to any potential or when it is connected to the negative power supply, it is restored the operation of the MW section with the consequent **AND** operation or anyway as set by the dipswitch no. 5.

5.3 AND operation

The AND operation is obtained by the dipswitch no. 5 on ON.

In this mode is activated the alarm relay only when both the technologies (IR and MW) give alarm signal within a max time of 10s; if this does not happen, which reported the alarm, after 10s is restored.

5.4 OR operation

With the dipswitch no. 5 on OFF is obtained the OR operation. In this mode is activated the alarm relay when one of the two technologies (PIR or MW) provides an alarm signal for the motion in the monitored area.

5.5 Anti-masking/Anti-blinding function

TRIALV is equipped with an anti-masking and anti-blinding device with separated relay output, the anti-masking section is enabled only if the detector is in operation, the EXCL.MW terminal is not connected to +12V and TRIALV is in AND mode.

The functions are selectable with dipswitch no. 3.

In case of masking/blinding will be active the "ALARM" relay simultaneously to "MASK/FAULT" relay for the event duration and the relay contacts will pass to C-NO.

The masking status will be highlighted by the slow flashing of the blue LED of the MW section.

The blinding status will be highlighted by the slow flashing of the green LED of the IR section.

The return to normal operation conditions occurs on the first motion confirmed by the technologies or at the removal of the cause.

Note: the anti-blinding section detects the darkening attempt with a reflective/opaque body supported near of the lens.

The anti-masking section detects a reflective interferer body placed near of the detector

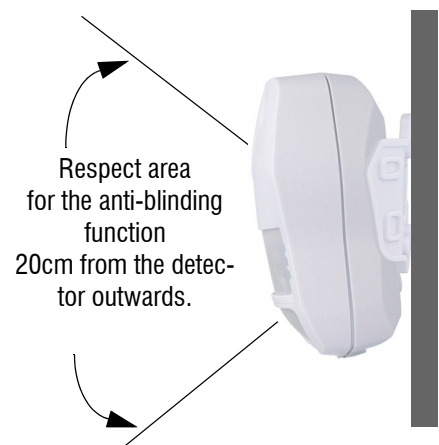
Note: the view control of the activation status of the "Anti-Mask" function, only with dip-switch No. 3 on **ON**, occurs only during the stabilization phase at the power detector (red LED fix ON). In this phase, if a person approaches close to the sensor, the two blue and green LEDs flash simultaneously.

Note: the MASK/FAULT output must be connected preferably to an alarm input independently or in series to an alarm output of the same detector. If you decide to use an input 24H this must always be programmed in silent mode. In any case the maximum detector performance will be obtained if the detector is connected to a control unit that can distinguish separately the alarm events, tampering/fault.

For more information, see "General installation" chapter.

Warnings

- If the TRIALV is mounted near people motion, it is recommended to disable the "anti-masking/blinding" function, dipswitch no. 3 **OFF**.
- If the distance is less than 20cm is recommended to disable the "Anti-masking/blinding" function, dipswitch No. 3 **OFF**.





5.6 3D function

3D function is the integration of IR and MW section. If both detect a motion start the alarm.

5.7 Against disorientation

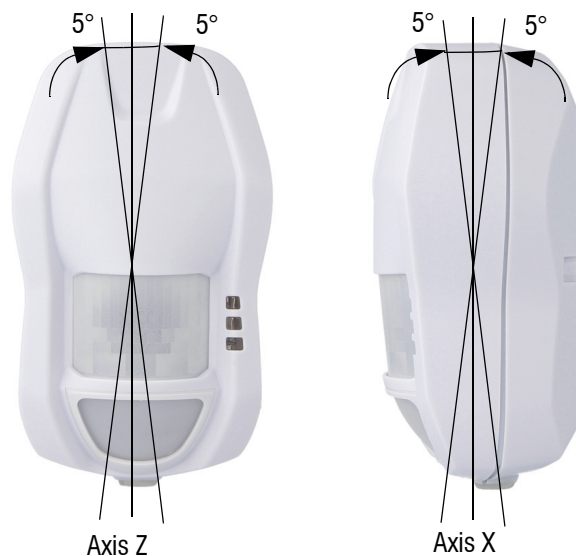
TRIALV is equipped with a protection circuit always active against disorientation with operation on 2-axis detected by an accelerometer detector.

If TRIALV is rotated of 5° on the **Z** or **X** axis, compared to its initial mounting position, is produced an alarm with output on 24H terminals of the duration of 5s highlighted simultaneously by a flashing red LED

ATTENTION:

The circuit is well immunized by occasional vibrations but must always be taken these precautions:

- The wall on which it is installed must be firm and stable.
- Fix well the possible joint. First place the detector and then turned on. During installation is possible to move the detector also after the switch-on of the system, this will involve a 24H alarm.
- However, avoid drilling and beat near the detector without turning off the system.
- If is necessary to disable the against-disorientation circuit, move in OFF the dipswitch no. 6.



5.8 Detection with low power voltage

During the detection is generated only the "Fault" event. The alarm circuit is inhibited.



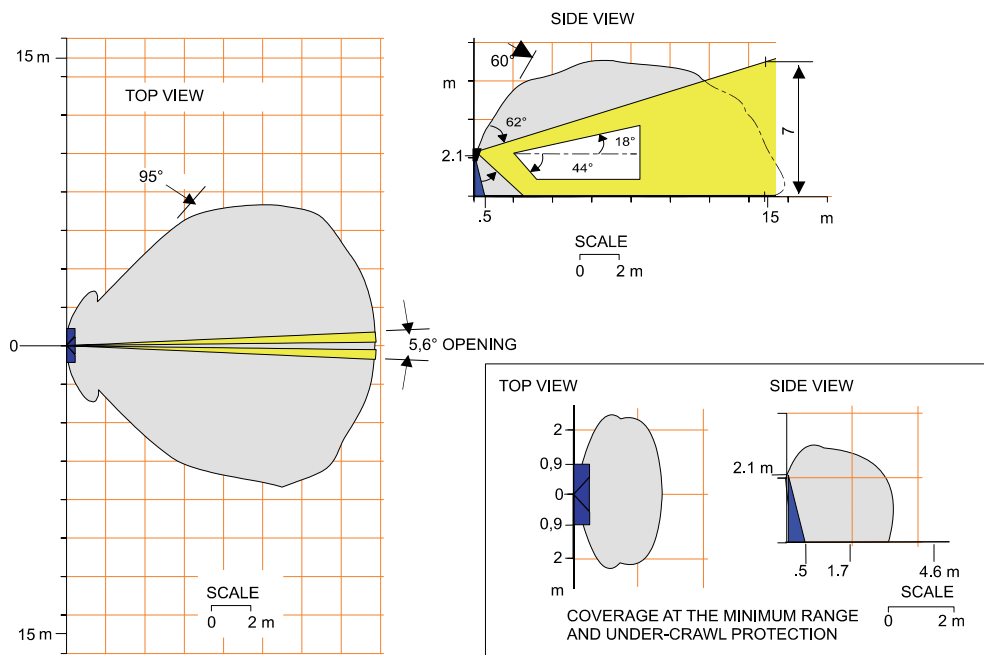
6. COVERAGE DIAGRAM

Coverage diagrams of the detector mod. TRIALV with lens with wall protection (VB 1.2 GIV1).

Range: 15 m.

IR coverage: wall protection,
IR opening at 5,6°.

Beams arrangement: 1 zone vertical.



The coverage diagram refers to the bracket mounting angled to 6° at 2.1m.

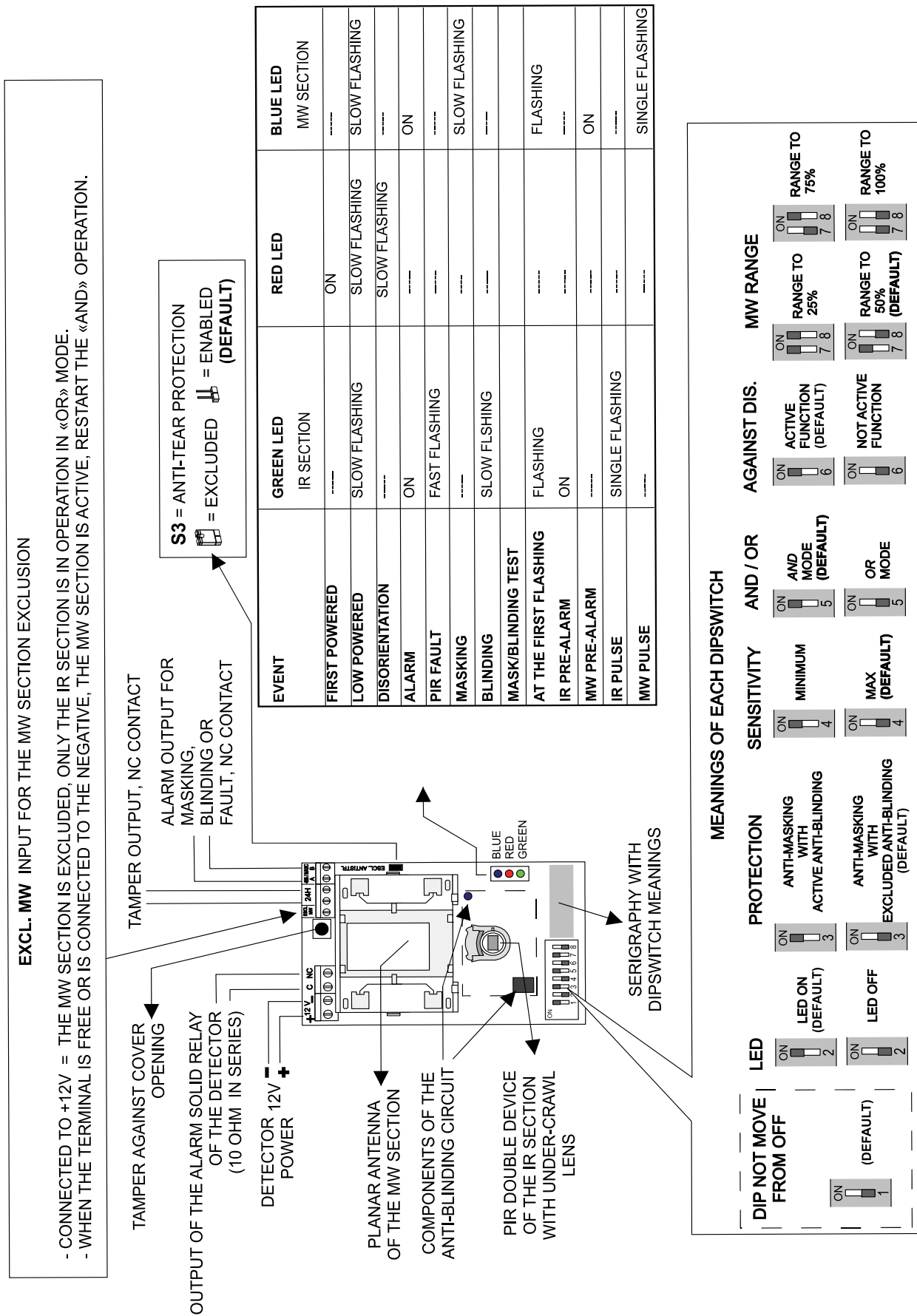
For further details see "6° tilt base" paragraph on p. 8

IMPORTANT: the user must check that the field of view of the detector is not obscured partially or totally.



7. ELECTRICAL CONNECTIONS

View of the detector board.





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Products features as described above do not bind the manufacturer and may be modified without prior notice.

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