

DIRRVE / DIRFE

OUTDOOR DUAL-IR SENSOR



“AND” version
Installation and use manual

[SMD] [Serie 100] [48bit] [SPV] [AN] [IP54]

15.12-M:5.0-H:x.x-F:x.x

DIRRVE / DIRFE is an innovative passive infrared sensor for outdoor use, which has two completely independent and individually adjustable detection heads. This allows obtaining a great functioning versatility and at the same time, if correctly installed, an excellent decreasing of false alarms.

The sensor operates with the IR heads in AND mode: it generates alarm only when both IR heads detect intrusion. It is possible to select the priority of the head which causes alarm.

The two versions are identical concerning functionality and optical settings. They differ from each other just for the alarm transmission mode:


DIRRVE: RADIO version

DIRFE: WIRED version

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1. TECHNICAL

	DIRRVE	DIRFE
POWER SUPPLY	n. 2 lithium batteries, 3 V, CR123A type	12 V 
CONSUMPTION	STAND-BY < 22 µA ALARM < 10 mA	STAND-BY < 8 mA ALARM < 24 mA
AUTONOMY * (estimated)	about 2 years with 10 alarms/day + supervision	-
BOOT TIME	About 30 s (with blinking LED)	
DETECTION TECHNOLOGY	Double PIR (passive infrared) Mounting on jointed heads	
HEADS ADJUSTING	Orientation completely independent vertically and horizontally	
SENSITIVITY ADJUSTING	Completely independent for each head from 30% (L) to 100% (H) (by trimmer)	
DETECTION AREAS	10	
RANGE **	MAX 12 m linear 100° radial opening for each head	
LOGIC	Selectable: normal AND, directional AND	
WIRELESS CODE	433,92 MHz	-
WIRELESS RANGE	100 m (open field)	-
SIGNALLING	TX alarm Tamper (cover and anti-removal opening) Low Battery Supervision	-
OUTPUTS	-	Alarm: OptoMOS NC (40 V _{DC} /100 mA MAX) Tamper: NC, cover and anti-removal opening
SIGNALLING (can be disabled)	2 LED for infrared heads detection 1 LED for alarm transmission 1 acoustic BUZZER	
WALK TEST	Selectable from dip-switch LED and Buzzer displaying	
MOUNTING HEIGHT	100 ÷ 220 cm	
TEMPERATURE RANGE	- 20 ÷ +50 °C	
HUMIDITY	MAX 95%	
OUTDOOR PROTECTION	IP54	
IMPACT RESISTANCE	IK10 (impact of 5 kg from 40 cm)	
WEIGHT	328 g	410 g
DIMENSIONS (H x L x P)	190 x 85 x 75 mm	
ACCESSORIES INCLUDED	N° 2 cover lenses for curtain effect N° 2 adhesive masks N° 1 protection visor	
OPTIONAL ACCESSORIES	KIT-STA: Kit for pole mounting diameter 60 mm KIT-STAM: Kit for wall mounting inclining downwards of 10°	

* The battery duration is proportional to:

- thermal cycles (heating and cooling) the battery is subject to
- working temperature
- number of detections of the sensor

** The max range depends strictly to environment temperature

2. PRECAUTIONS

This sensor has been designed to guarantee a very high immunity to light interference; however, a very bright light can produce a range decrease.

It is recommended to pay attention during the installation and avoid, as much as possible, that direct or reflected solar light or very intense lights are oriented towards the two sensitive elements.

Avoid directing the sensor towards moving objects such as bushes, flags, trees etc., in order to avoid unwanted detections.

In particularly difficult environments it's suggested to set the "pulse count" function to 2 (DIP5 = ON), to increase immunity to false alarms.

The estimated battery life of DIRRVE detector is proportional to:

- the thermal cycles (heating and cooling) the battery is subject change its capacity and autonomy
- the working temperature of the battery (e.g.: at temperature lower than 0 °C the battery duration can be reduced to 50 %)
- the detection number to which the sensor is subject (independently from system arming status): if the detector is installed in high crossing frequency area the battery autonomy is dramatically reduced.

The sensor has a IP54 protection level against dust and water.

If possible, it is recommended to avoid installing the sensor in areas directly exposed to rain or snow. Do not spray any high pressure water on the sensor. When possible, install the sensor in covered areas.

For IP54 level maintaining it is mandatory to insert the O-RINGS included in the package.

If you do not comply with the above mentioned recommendations, it may occur a malfunctioning of the sensor and, in this case, the manufacturer will decline any responsibility.

The sensor may detect pets.

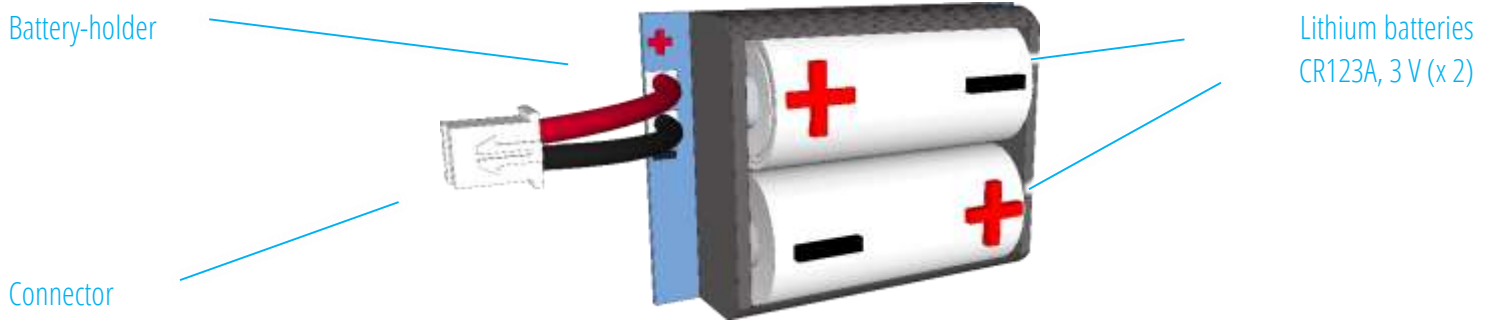
3. POWER ON THE SENSOR

Set **DIP4** to **ON** and **DIP6** to **ON**, adjust the sensitivity trimmers **R25** and **R26** to minimum and then connect the battery. When the sensor is powered, it starts the stabilization phase: the sensor makes the transmission LED blinking and emits "beep" during all the phase. It is important to leave the sensor "at rest" (no detection) for example placing it in its box. Wait the sensor is stabilized before proceed with installation: the sensor will be active and stable only after about 20 s the red LEDs blinking.

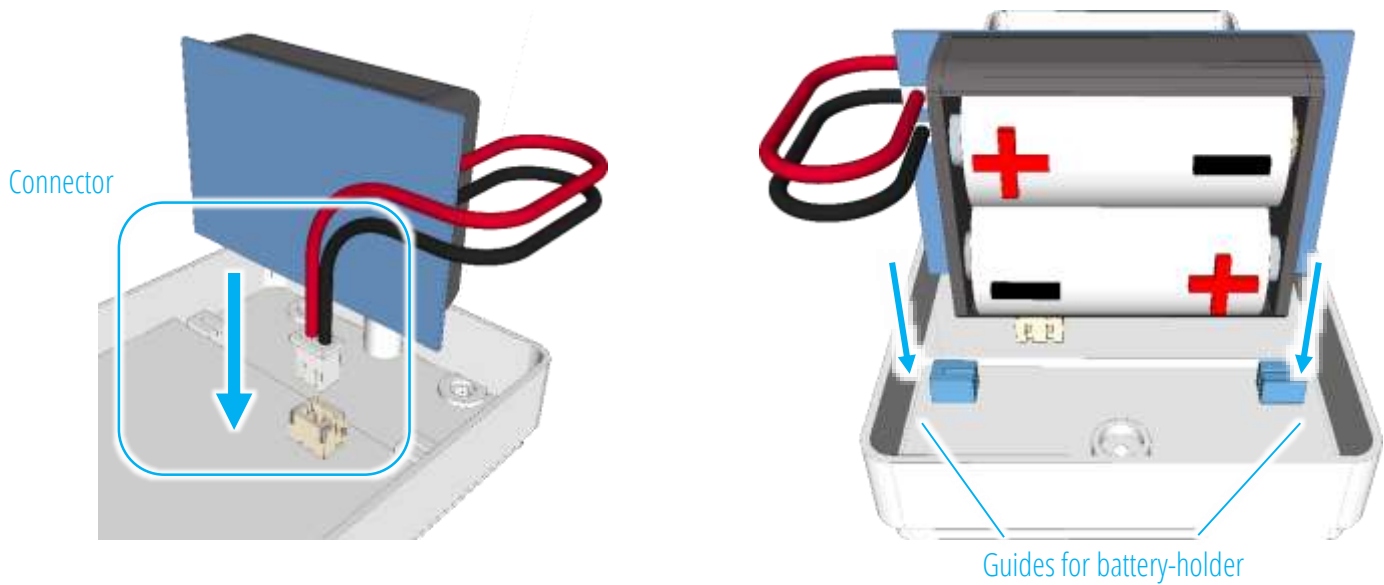
This phase occurs also at battery replace.

4. BATTERY (ONLY DIRRVE)

To power the sensor, insert two 3 V lithium CR123A type batteries inside the battery-holder respecting the polarity:



Plug the connector of the battery-holder to the terminal on sensor, then insert the battery-holder on the guides:



4.1. LOW BATTERY

When the battery is low, the sensor alerts in two ways:

- It sends a radio code of low battery LWB
The code is sent after each alarm or supervision transmission.
Depending on the control panel or receiver model, the alert is visualized on display or LED.
Furthermore, if enabled, an SMS is sent to telephone numbers stored.
- It blinks 9 times the transmission LED (must be enabled by closing the jumper **JP7**): the LED blinks after each alarm or supervision transmission.

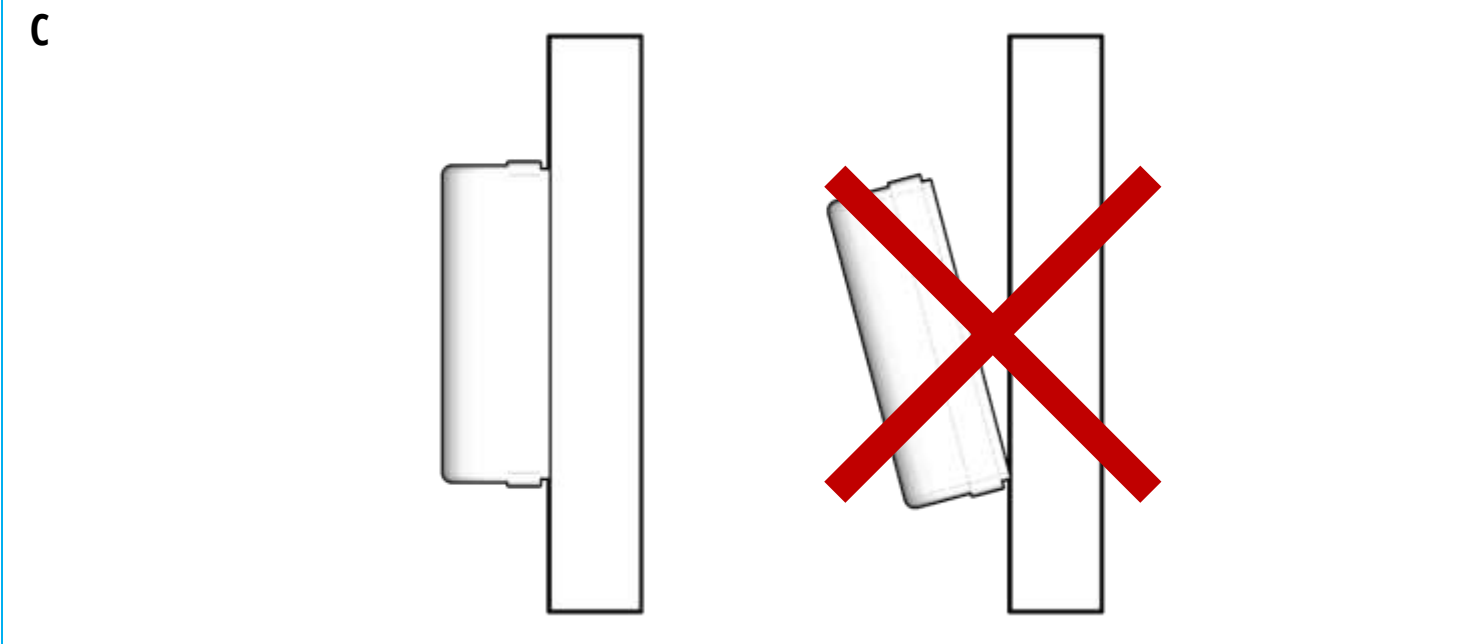
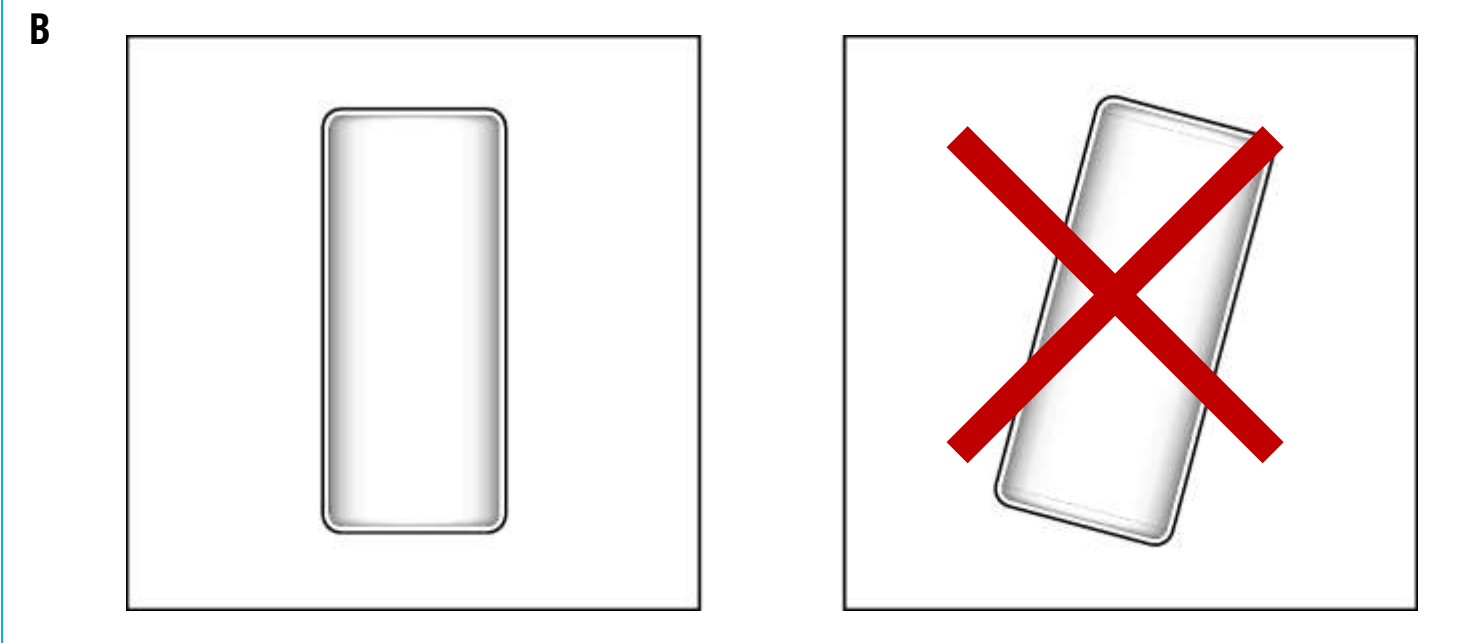
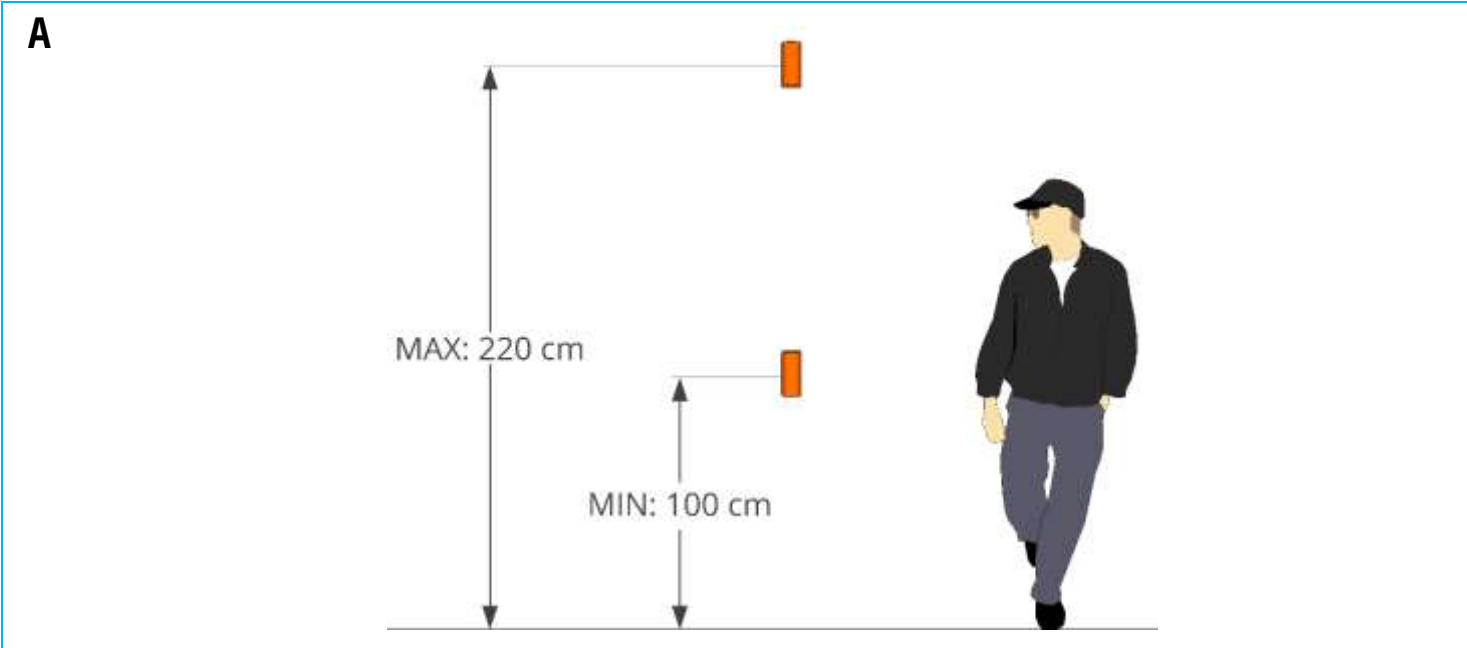
Note: the low battery alerts will continue until the battery is replaced.

4.2. BATTERY REPLACEMENT

When the battery must be replaced:

- Disconnect the old battery
- Press and hold the tamper switch for about 3 seconds (discharge of the circuit)
- Connect the new battery
- Wait the stabilization time before the use of the sensor

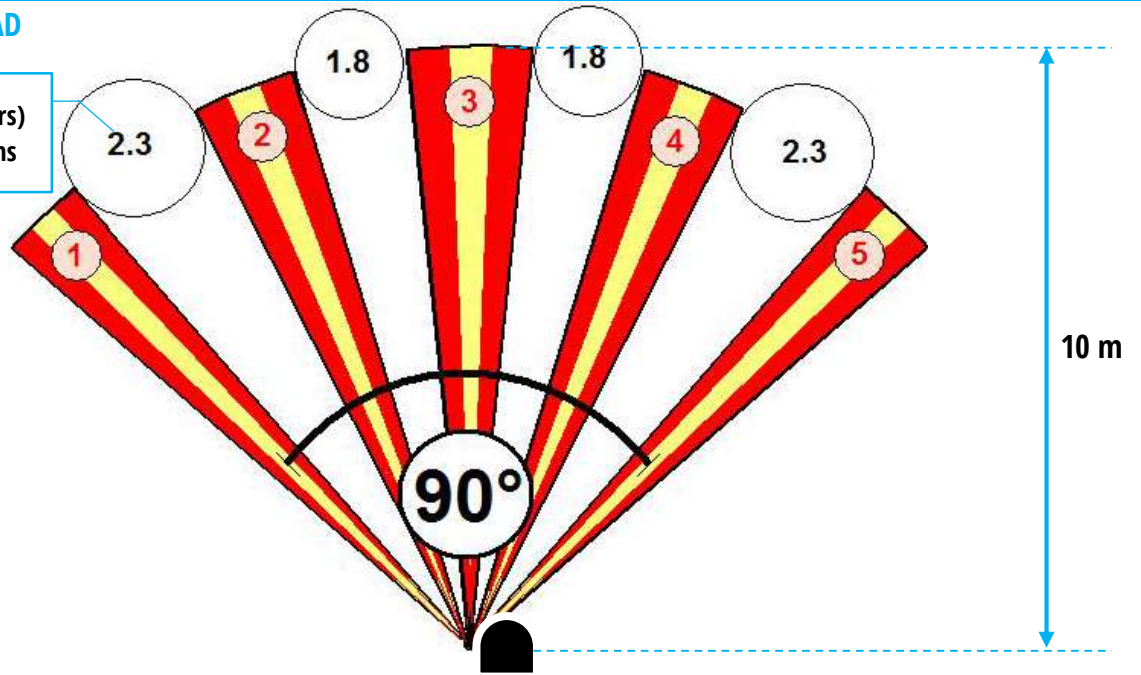
5. CORRECT USE OF THE SENSOR



D

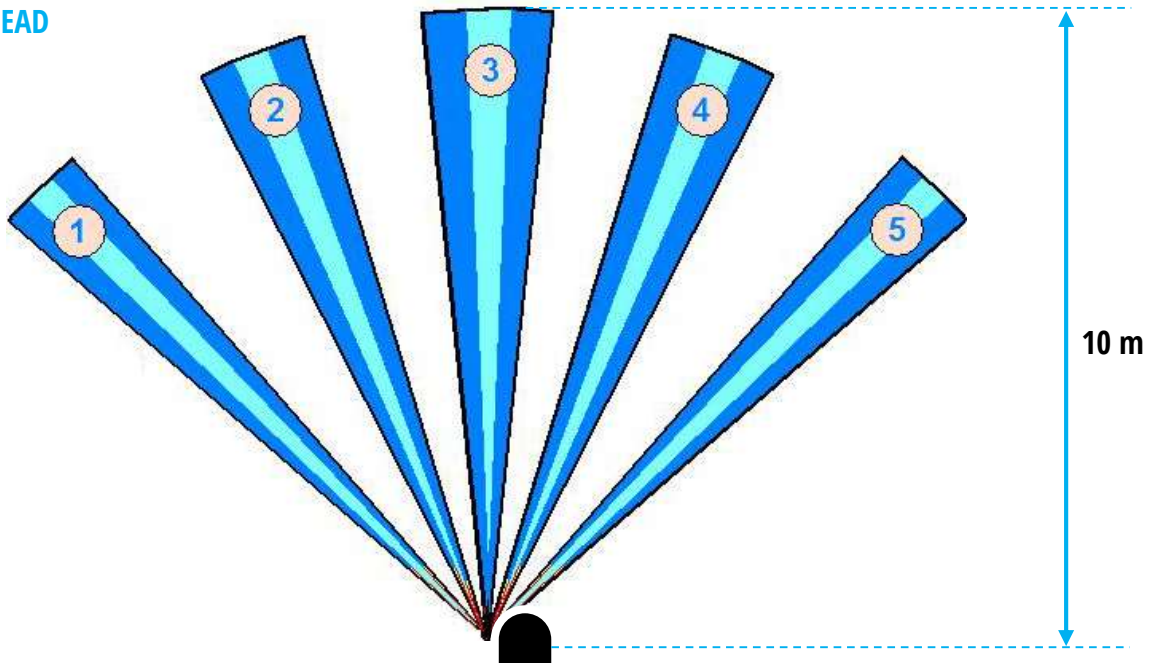
UPPER IR HEAD

Distance (in meters)
between IR beams



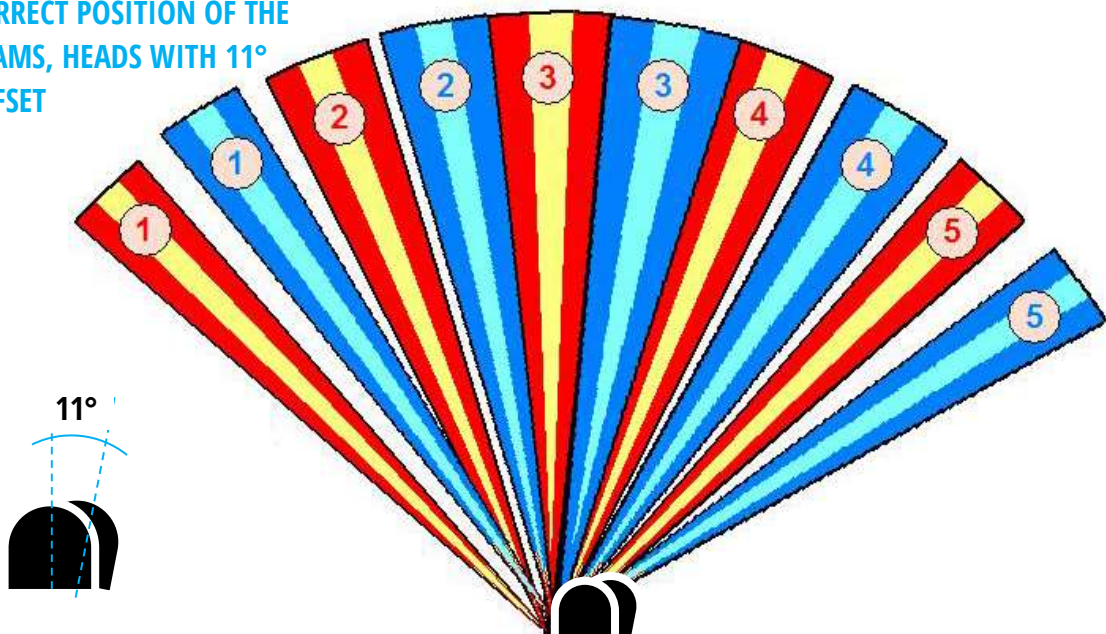
E

LOWER IR HEAD



F

CORRECT POSITION OF THE
BEAMS, HEADS WITH 11°
OFFSET



Install the sensor:

- Height: between **100 cm** and **220 cm** from the floor
- Installation surface: vertical (wall or pole)
- Install protecting visor
- The beams must be oriented so to end towards ground or against a wall

Each detection head is equipped with a Fresnel lens that builds 5 double sectors beams horizontally oriented with a **100°** radial aperture (Fig. 1).

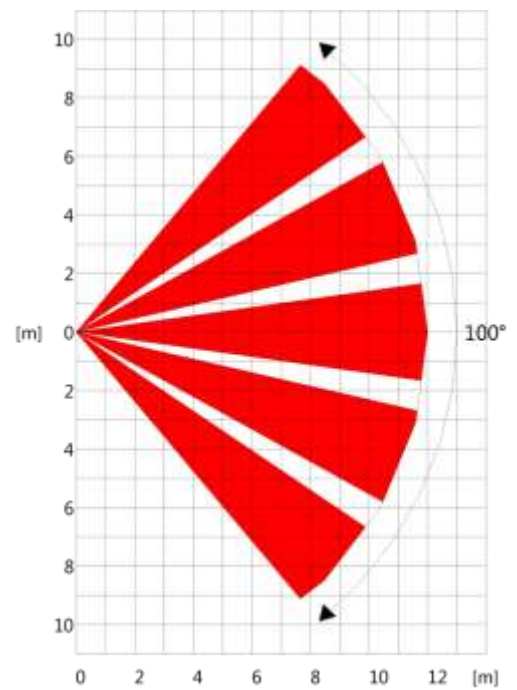
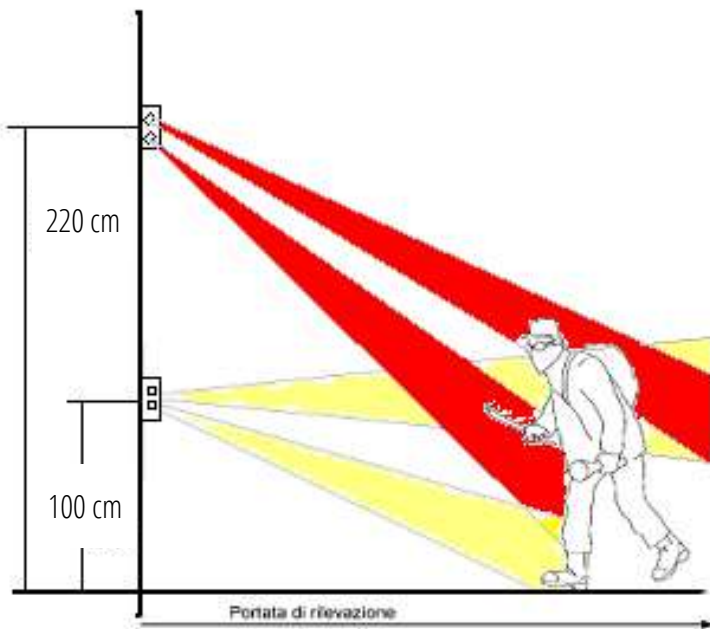
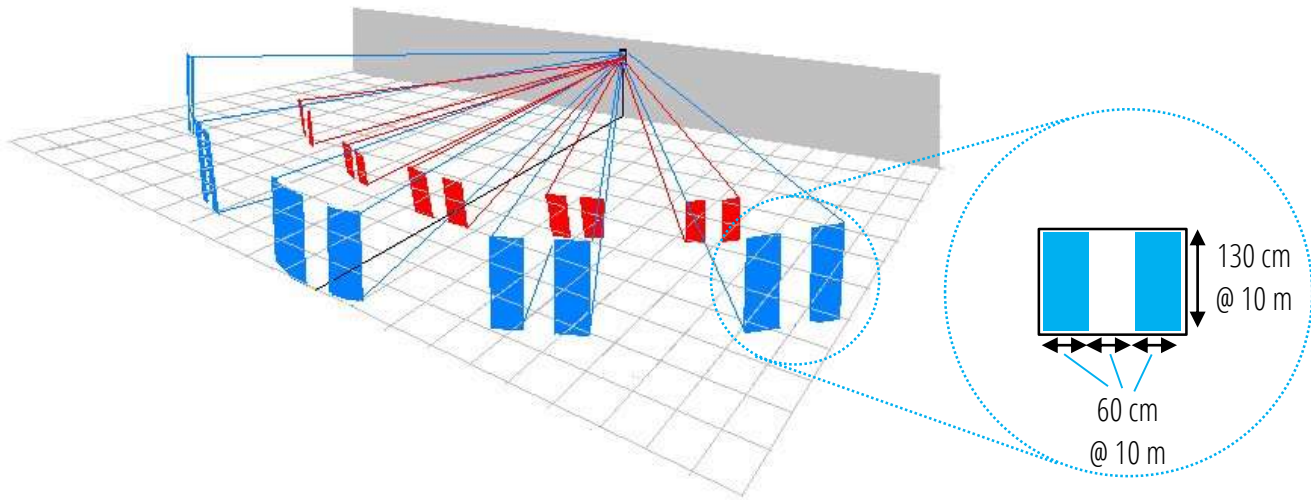


Fig. 1 - Infrared heads beams placement

Place the detector considering to cover an area of maximum **12 m** depth and an angular opening of **100°**.

To obtain a reliable detection, it is recommended to mount the detector in the way that the intruder crosses beams perpendicularly and not with frontal approach.

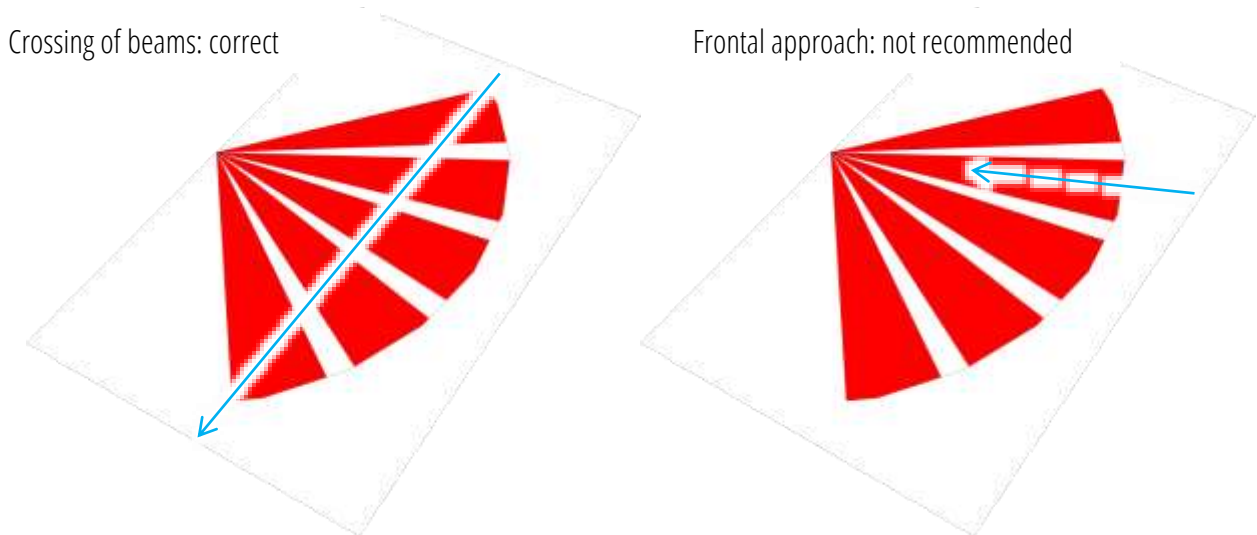


Fig. 2 – Detection area crossing types

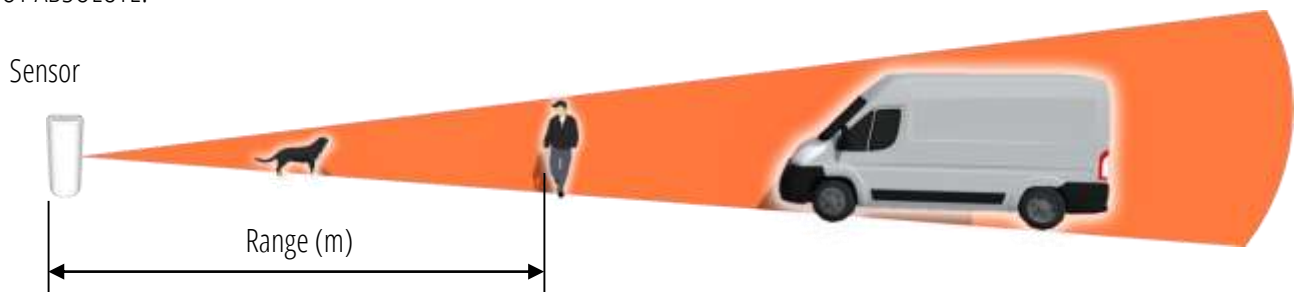
Once fixed the detector, to orient the heads, it is recommended to slightly loosen screws closing of joints. Proceed with the “calibration” of detectors sensitivity, starting from a low sensitivity condition (trimmer rotated completely counter-clockwise) and heads oriented downwards. Increase progressively sensitivity and heads orienting until you obtain a detection only in the area to be protected and no alarm outside the protected area. Once finished the orienting operation, close tightly joints screws.

Detector cover gives a decreasing of about 30% of beams length.
Maximum range declared already considers cover decreasing.

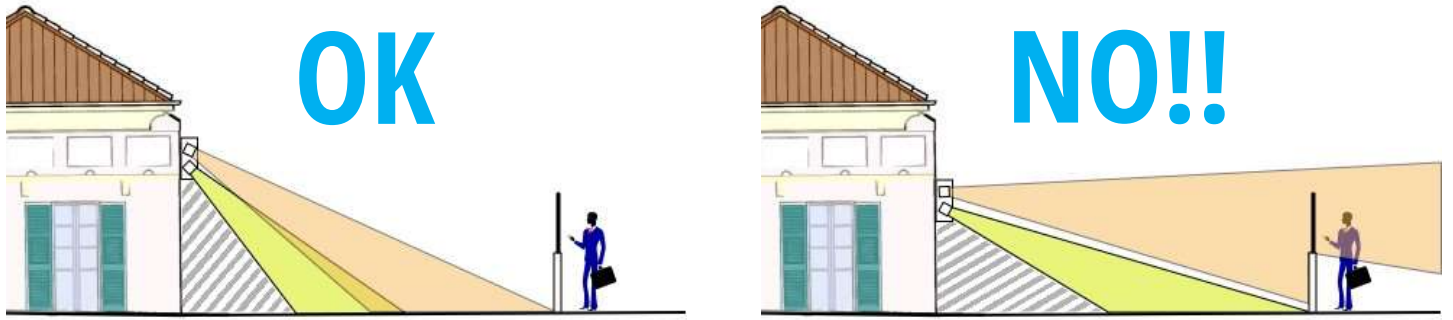
During adjustment, perform each test with the cover on the sensor.

Infrared detector is sensitive to the “amount of heat” produced by a moving body. The maximum range of the sensor (measured in meters) is referred to a **human body**.

However the same “amount of heat” may be produced by a smaller body at lower distances, or by a larger one at greater distances. It should be considered therefore that the range of any passive infrared sensor is a RELATIVE measure (referring to a human body) and NOT ABSOLUTE.



6. HEADS ORIENTATION



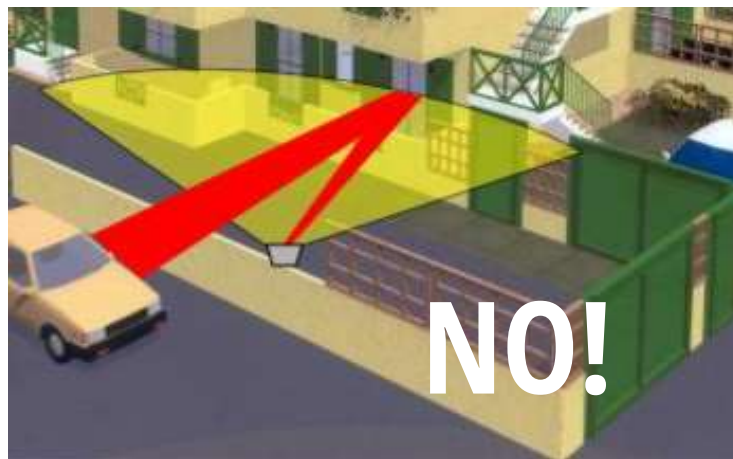
The detection heads **MUST** be oriented to direct the IR beams downwards, **NEVER** towards the up. Furthermore, the beams must end against a surface (wall, terrain) so to define the detection area and not point towards open space. All this to avoid the sensor blinded by direct sun lights or unwanted heat sources.

The two detecting heads **MUST** be adjusted in order to create slightly divergent beams: the one pointed upwards towards the most distant area, the one pointed downwards towards a nearer area: in this way the sensor generates alarm only when a human intruder is detected by both beams.

The alarm is not generated if only one of the two beams detects (example: animals).

Small alterations in the heads position correspond to big alterations (at 12 m distance) of the beams detection areas: a 1° lateral rotation of the head corresponds to a 20 cm shift of the beams at a distance of 12 m.

It is therefore recommended to execute a meticulous adjustment and several tests in order to obtain the result desired.



NEVER POINT the heads directly towards reflective surfaces, in order to avoid unwanted detections. Typical examples of reflective surfaces are: windows, glass walls, water puddles, wet roads, smooth concrete surfaces, paved roads.

The reflection level of these surfaces is not at 100%, anyway if the source of heat is very strong, the reflection may be enough to alarm the sensor.

7. DIRECTIONAL AND

The "directional AND" function allows to further refine the alarm is generated. This function set the sensor to generate alarm only under a precise detection order of the heads: first the upper head (farther beam) and then, within the AND time, the lower head (closer beam).

This function allow a directional detection, that is the sensor can detect an approaching to the protected area without generate alarms when people just move inside the upper head area without move towards the inner zone.

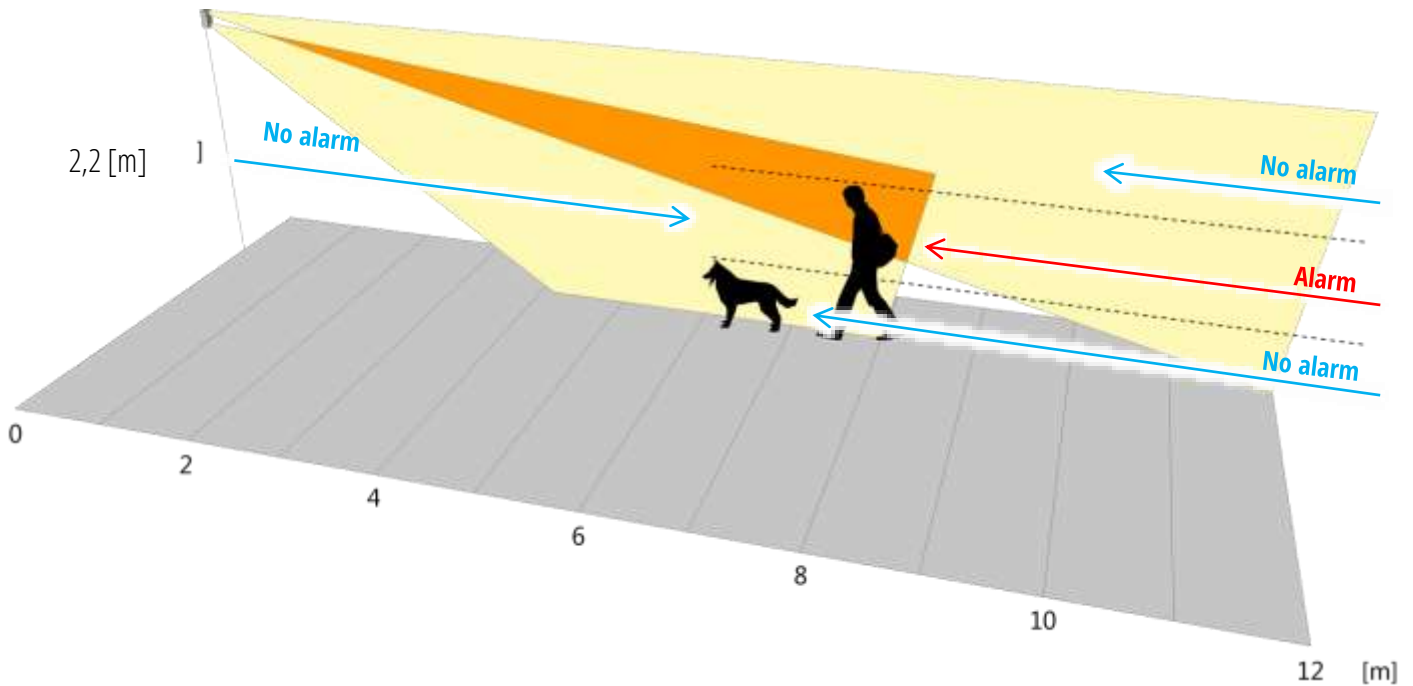
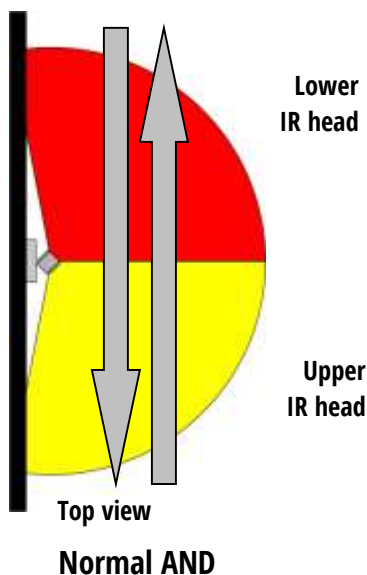


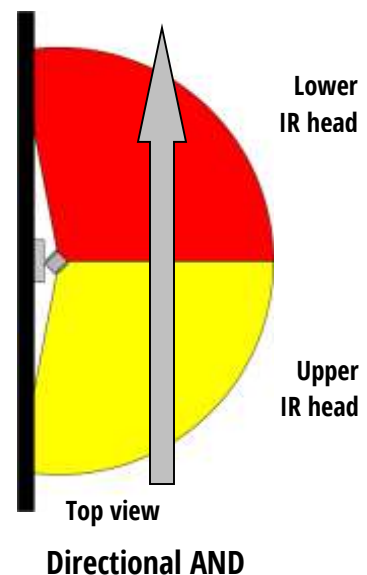
Fig. 4 - Directional AND: the man generates alarm, the dog doesn't

It is also possible to orient the IR heads on opposite sides to obtain a directional detection:



The sensor generates alarm only when an intruder moves from one area to the other, no matter in which direction. A movement inside of one single area does not generate alarm.

DIP3=OFF



The sensor generates alarm only an intruder moves from the upper head detection area to the lower head one.

DIP3=ON

8. LIMIT THE DETECTION APERTURE (PARTIAL LENS COVERING)

Sometimes the heads detection area can be too wide and it can be a potential trouble if in the area to be protected there are tree branches, curtains, windows, etc.

In this case, it is possible to reduce the detection area by appropriately masking the lateral or intermediate beams with adhesive tape places over the sectors of the heads lenses (beams blinding), letting them able to detect only the beams oriented towards stable zones of the areas to be protected.

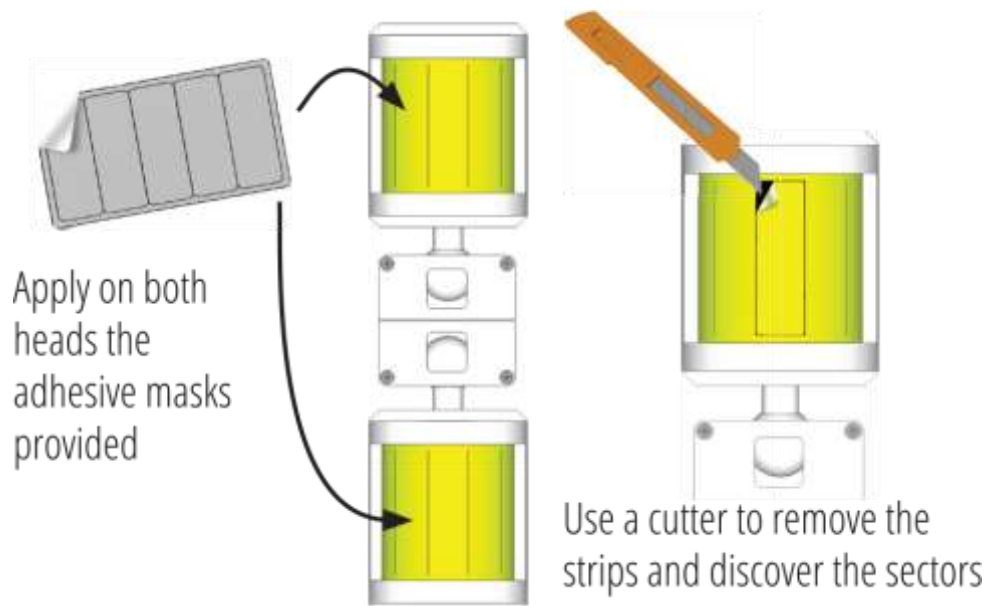
8.1. LENS COVER

The two plastic lens covers applied over the IR heads obtain a CURTAIN EFFECT. With this lens cover, the detection opening beam of the lens is reduced to 20° , keeping the same detection range.

The lens cover needs to be inserted on the detection head as indicated in the following figures, paying attention that the two lateral hooks are correctly locked to the two head grooves and that the lens-cover stays well fixed to the detection head.



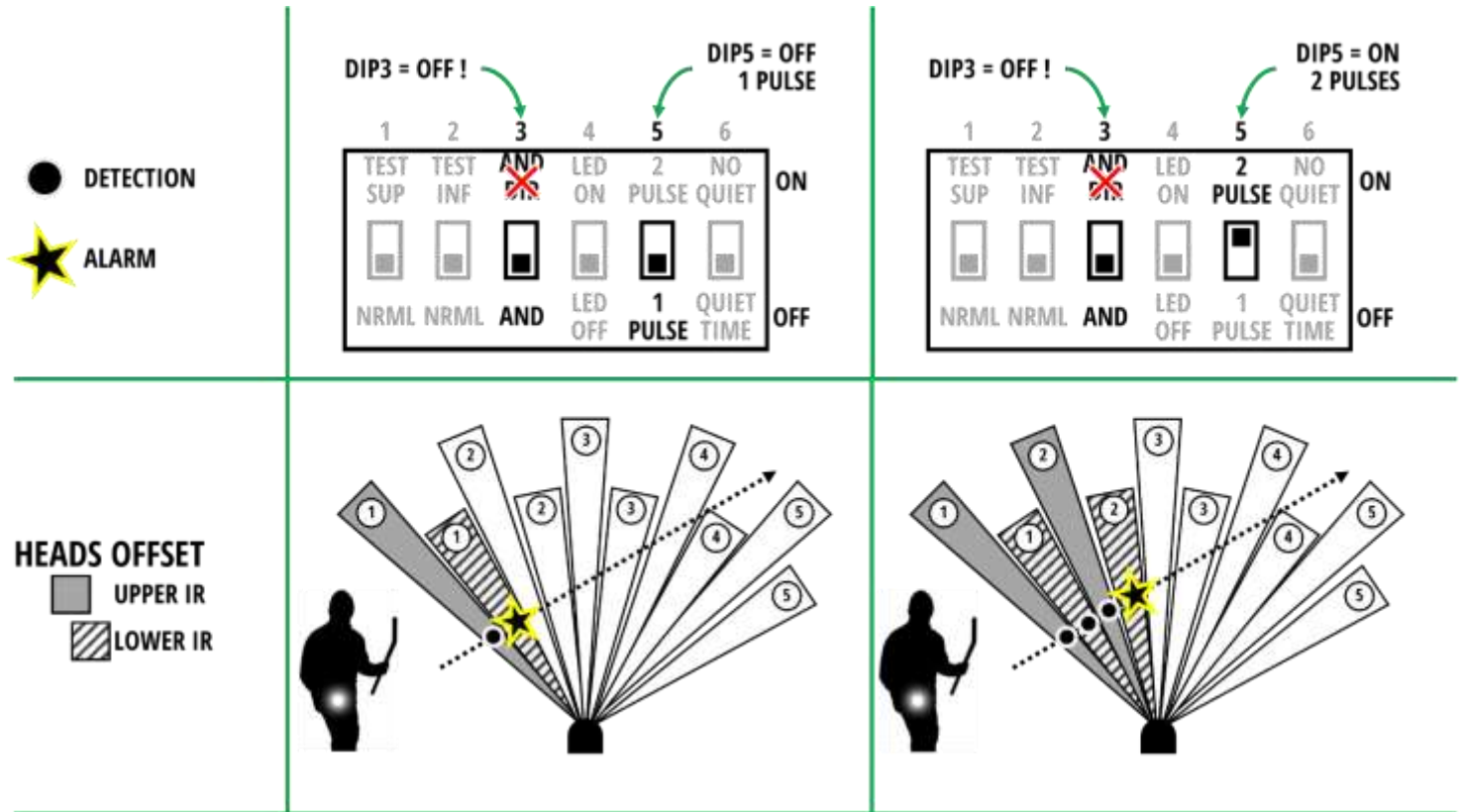
8.2. ADHESIVE MASK



9. PULSE COUNT

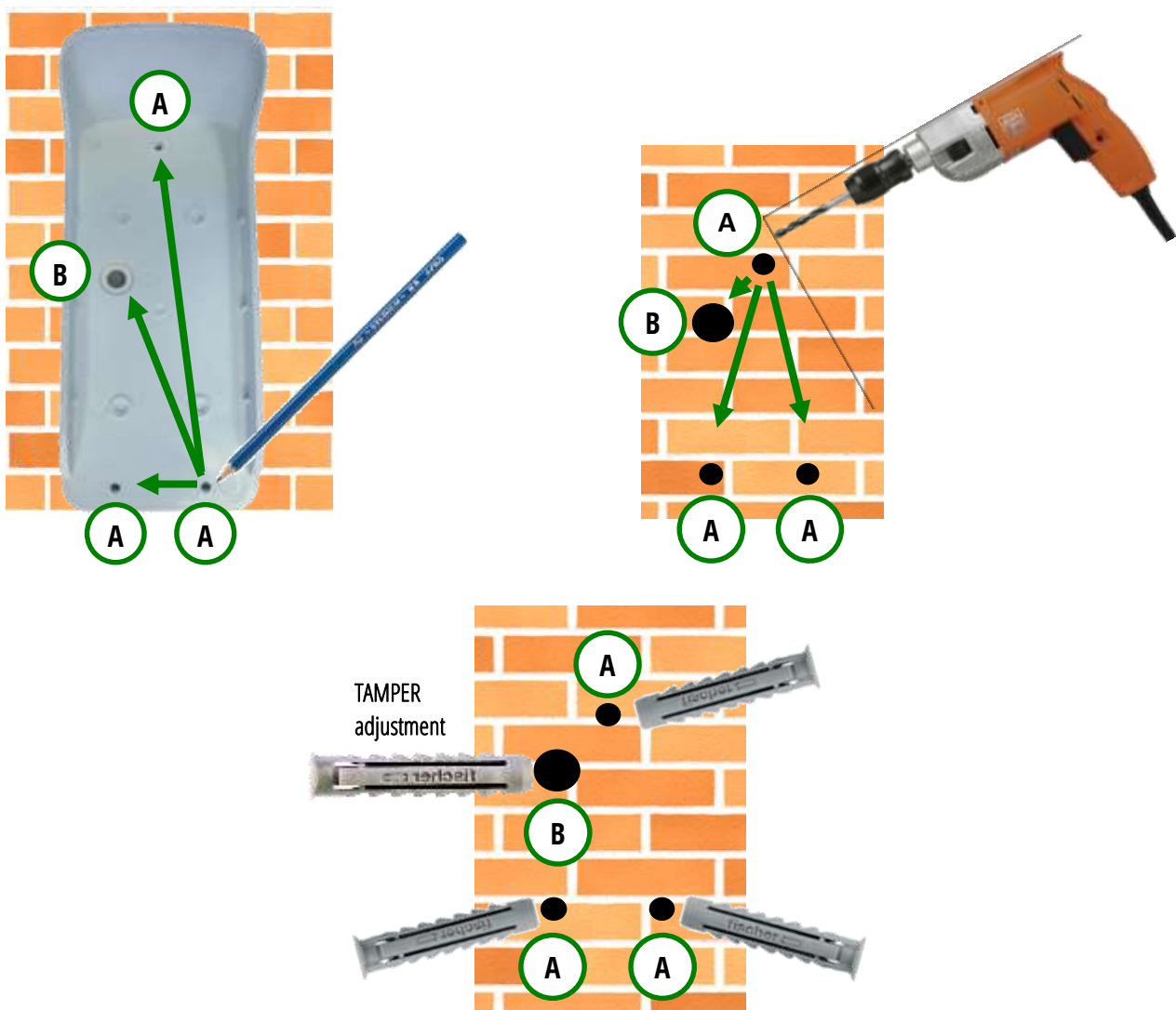
By factory settings, the sensor is programmed to give alarm at first intrusion detection (AND of both upper and lower IR heads, "pulse count" = 1).

To increase the immunity to false alarms in harsh environment, it is possible to set the "pulse count" to 2 (**DIP5 = ON**): in this way the sensor will give alarm at the second intrusion detection (each detection is the AND of both upper and lower IR heads).

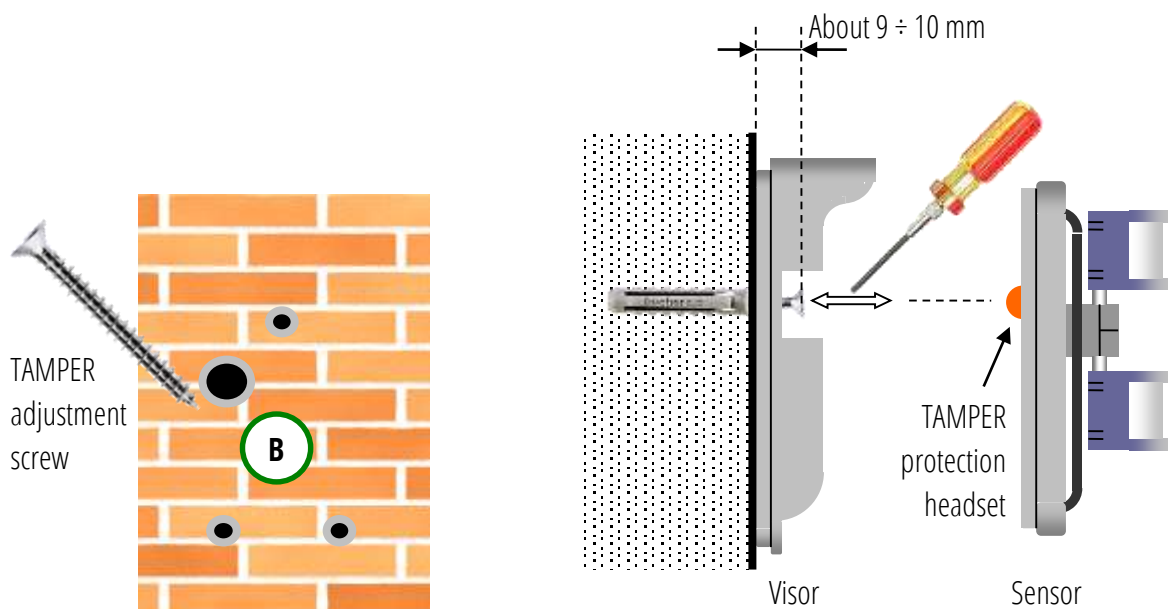


10. WALL MOUNTING

1. Use the visor as mask to mark the position of the holes (**A** and **B**) on wall, then drill and insert provided dowels:



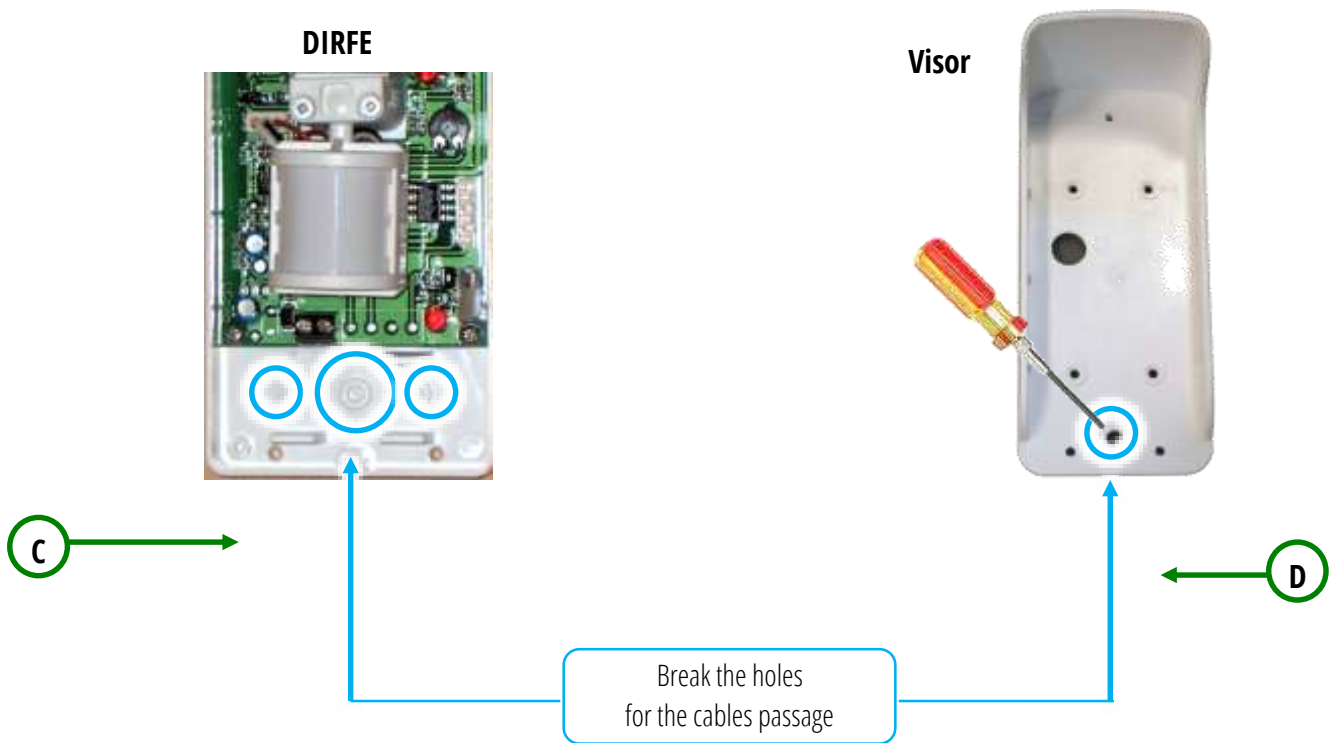
2. Insert the TAMPER adjustment screw in the dowel (B) leaving out its head for about $9 \div 10$ mm from the wall surface. Overlap the visor and the sensor: adjust the TAMPER screw so that fixing the sensor, the switch is pressed without breaking the circuit:



NOTE FOR THE DIRFE MODEL

Before fixing the sensor to the wall, it is necessary to make the cables pass through the appropriate holes.

The case has some holes for the cables passage: break one or more (as you need) on the visor (D) and on the sensor base (C):



The bigger hole is done for the breaking-cable insertion:

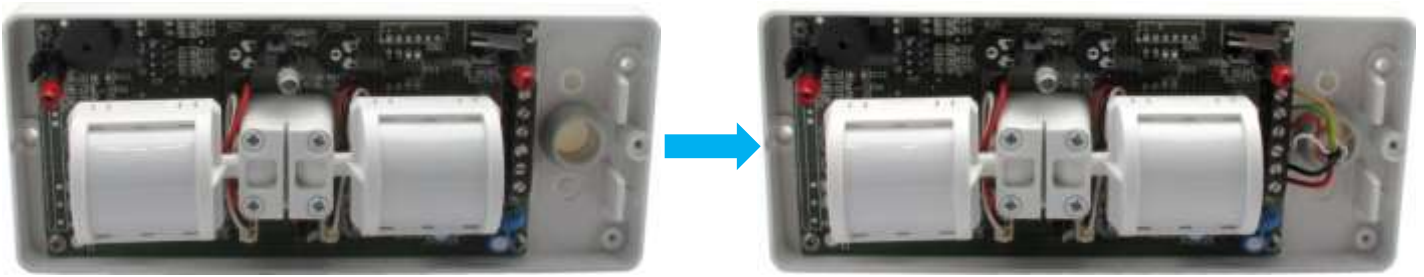


Insert the grommet cable gland as show in the picture:

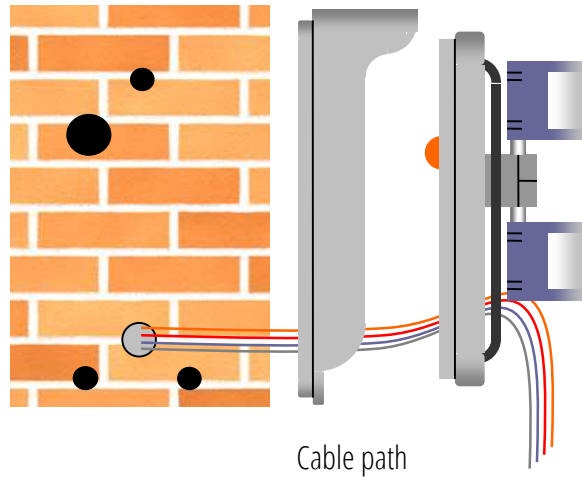


DO NOT CUT the grommet cable gland membrane!

Pass the cable through gland membrane and make connections:

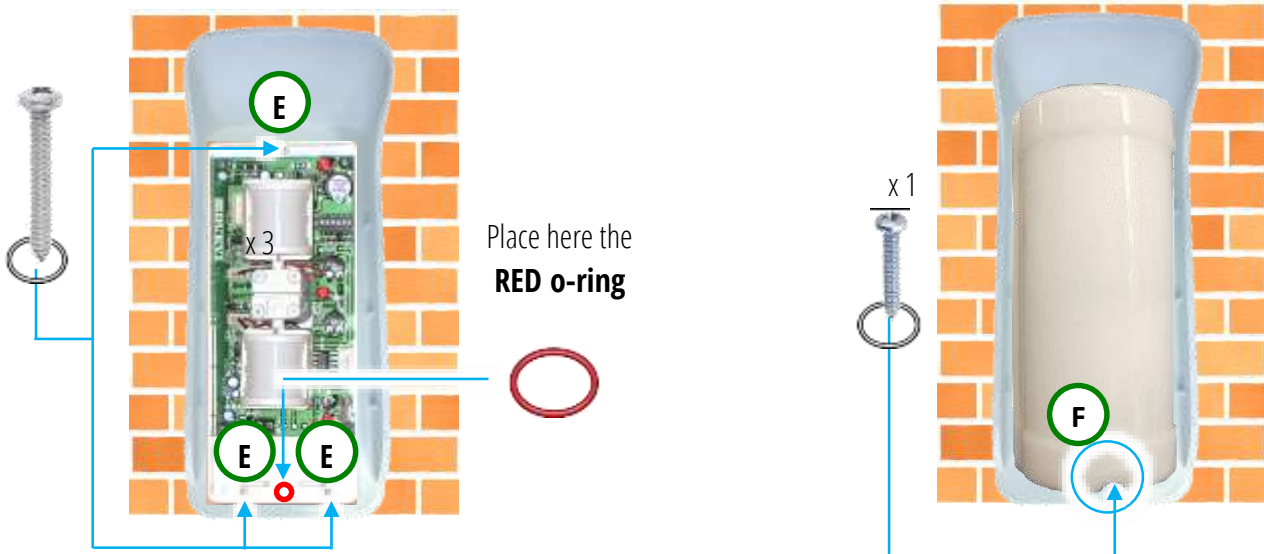


Pull wires through the holes and proceed with installation.

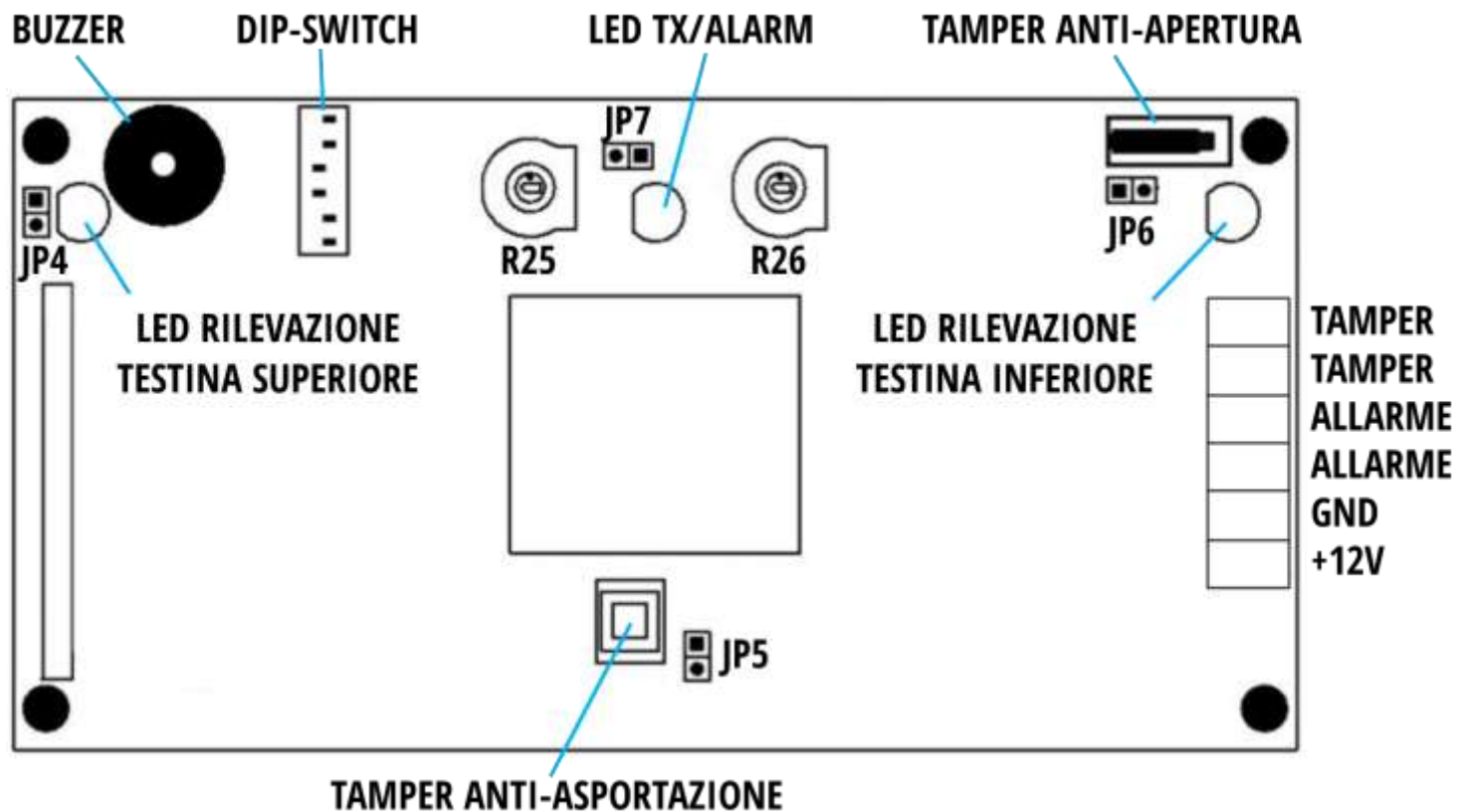


3. Fix the sensor and the visor to the wall (**E** points matching with **A** holes) by the three appropriate screws, adding the **BLACK o-ring** on each, and place the **RED o-ring** in the appropriate position.

Insert the cover over the sensor base starting from the top (hook the two joints). Fix the cover (F) with the appropriate screw inserting the **BLACK o-ring**:



11.SETTINGS



JUMPER

		Closed	Opened
JP5	Anti-removal tamper	Tamper OFF	Tamper ON
JP6	Anti-opening tamper	Tamper OFF	Tamper ON
JP4	Buzzer for test (only with DIP4 = ON)	Buzzer ON	Buzzer OFF
JP7	Alarm/transmission LED	LED ON	LED OFF

HEADS RANGE TRIMMER

R25	Upper head	Trimmer to adjust the detection depth of the upper head. Turn clockwise to increase the detection range.
R26	Lower head	Trimmer to adjust the detection depth of the lower head. Turn clockwise to increase the detection range.

DIP-SWITCH

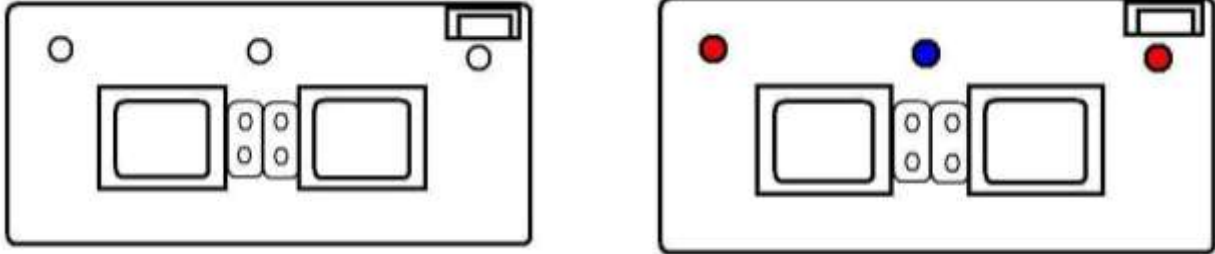
DIP1	Test UPPER head	OFF = Normal working	} DIP1 + DIP2 = ON Test both heads
		ON = test the upper head At each detection of this head, the upper LED lights on and the buzzer emits a “beep”	
DIP2	Test LOWER head	OFF = Normal working	
		ON = test the lower head At each detection of this head, the lower LED lights on and the buzzer emits a “beep”	
DIP3	AND mode	OFF = NORMAL AND Alarm is generated by a detection that starts from any head and, within the AND time, ends by the detection of the other head. If during the “AND” time the second head does not detect anything, the sensor returns in stand-by mode.	
		ON = DIRECTIONAL AND Alarm is generated only by a detection that starts from the upper head and, within the AND time, ends by the detection of the lower head. If during the “AND” time the lower head does not detect anything, the sensor returns in stand-by mode.	
DIP4	Test	OFF = Normal working (Test OFF)	
		ON = Test mode It enables the detection led of the single heads, the alarm led and the buzzer (if JP4 is closed), useful during the detection area testing phase.	
DIP5	Pulse count	OFF = 1 pulse: alarm at the first AND detection of the upper and lower heads	
		ON = 2 pulses: alarm at the second AND detection of the upper and lower heads	
DIP6 (*)	DIRRVE: continuous alarm	OFF = Alarm with quite time The alarm is generated only if occurs a time gap of more than 30 seconds (quiet time) from a detection and the other. If within this time another detection occurs, the sensor resets to zero the quiet time. If there is no other movement, after this time, the sensor is ready for a new alarm transmission.	
	DIRFE: NOT USED	This function is useful in particularly crowded places in order to extend the battery autonomy. ON = Continuous alarm The alarm is triggered every time heads detect a movement, following the logic programmed.	

(*) Changing the status of the DIP6 from OFF to ON, before obtaining a real function change it is necessary to wait until the end of the quiet time without any detection made by the sensor, otherwise the sensor will continue to work, as if the DIP6 is programmed on OFF.

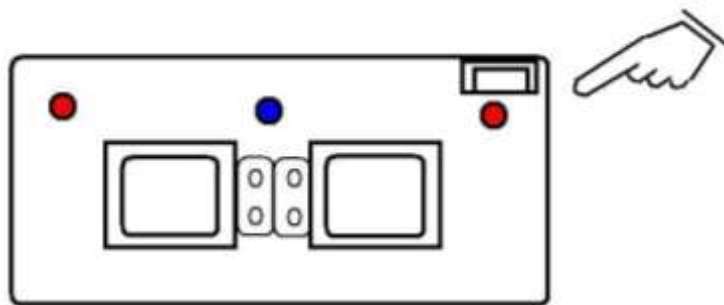
12.LEARNING (ONLY DIRRVE)

To learn DIRRVE detector:

1. Give power supply to detector and wait until the end of starting stabilization (about 30 s) until all LED are off.
2. On the control panel, enter in radio zone learning “**by tamper**”, ready to receive wireless codes of the detector.
3. Let both heads detect.



4. As soon as all three LEDs are on, press and hold tamper button:



Check on the control panel that the learning is done properly.

Note: it is possible to learn the detector also “by detection” on devices not compatible with “by tamper” mode.

13.SUPERVISION (ONLY DIRRVE)

When the supervision is enabled, the sensor sends regularly the “in life” code.

The control panel and/or the receiver (if enabled) verify continuously this “presence” of the sensor: in case the “in life” code is not received they activate all the “missed supervision” alerts.

The supervision code is sent by sensor after about 1 hour from last transmission. The alarm transmission is also a “in life” code.

ENABLE THE SUPERVISION	DISABLE THE SUPERVISION
<ul style="list-style-type: none">• Disconnect the battery• Open the JP6 jumper (cover anti-opening)• Connect the battery: the supervision is enabled	<ul style="list-style-type: none">• Disconnect the battery• Close the JP5 (anti-removal) and JP6 (cover anti-opening) jumpers• Connect the battery: the supervision is enabled

Note: to have supervision control it is necessary to enable such feature on control panel and receiver



Dichiarazione di Conformità Declaration of Conformity

La società:
The company:

DUEVI S.n.c. di Mora e Santese
Via Bard, 4 - 10142 Torino - ITALY

in qualità di produttore, dichiara sotto la propria responsabilità che i seguenti prodotti:
in quality of manufacturer, declares under its responsibility that the following products:

Outdoor Wireless Dual Infrared Detector (mod. DIRRVE)

se installati in accordo alle istruzioni del produttore, sono in conformità con quanto previsto dalle direttive comunitarie riguardanti la normativa CE.
if installed in accordance with the manufacturer instructions, are in conformity with what provided by European Directives regarding the CE rules.

In particolare sono state applicate le seguenti norme:
In particular there have been applied the following standards:

EN 50130-4 + A1 + A2
EN 301 489-1 V1.8.1
EN 301 489-3 V1.4.1
EN 300 220-1 V2.1.1
EN 300 220-2 V2.1.2
EN 300 220-3 V1.1.1
EN 50371
EN 60950-1 +A11
EN 60529 +A1
EN 60068-2-1
EN 60060-2-78

Torino - ITALIA, 7 gennaio 2010
Turin - ITALY, January 7, 2010

Mr. **Ciro Santese**
Production Manager



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Outdoor Wire Dual Infrared Detector (mod. DIRFE)

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EN 301 489-1 V1.8.1
EN 301 489-3 V1.4.1
EN 61000-6-3
EN 60950-1

Torino - ITALIA, 18 dicembre 2009
Turin - ITALY, December 18, 2009

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Production Manager



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This manual may be subject to change without notice