EL.MO. SPA

TECHNICAL MANUAL

TRES01

Indoor triple-technology detector for intrusion detection systems.

IMQ-SISTEMI DI SICUREZZA

Addressee for this information: (U) User | (I) Installer

1   DESCRIPTION

TRES01 is a triple-technology detector.
The device features two sections working in AND mode.
Infrared section (IR): 2 digital PIR sensors with temperature compensation and lens with white light protection.
Microwave section (MW): 10,525 GHz DRO planar antenna. For side-by-side mounting, differentiated frequencies can be used.
The device features the function against disorientation, and also anti-blinding, anti-masking, anti-sneak functions.
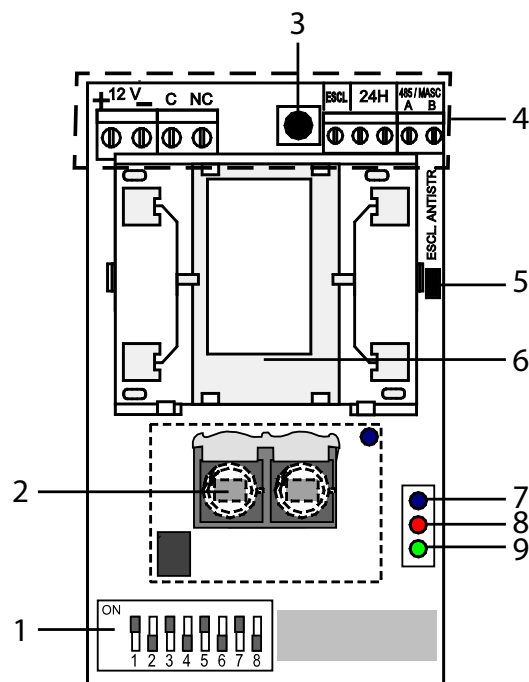LEDs indicate device working activity.
TRES01 can be set with board dip switch.
Optional joint available.
TRES01 is certified IMQ - Security Systems.

2   PCB   (I)

1   Dip switches
2   PIR sensors
3   Tamper button
4   Terminal board
5   Jumper to exclude protection against removal
6   MW antenna
7   Blue LED
8   Red LED
9   Green LED

3   TECHNICAL DATA   I

Model	TRES01	
Identification		
Technology	2 IR + MW	
Coverage type	Volumetric	
IR section		
PIR sensors number	2	
Max range	15 (1)	m
Pulse count	5	s
Opening	81° (1)	°
No. of IR sensitive zones	2 × 18 zones on 4 levels. 2 × 3 creep zones on one level (1)	
MW section		
MW max range	15	m
Pulse count	5	s
Standard TX frequency	10,525	GHz
Differentiated TX frequency	9,900	GHz
Max power output	13	dBm
MW horizontal coverage	95°	°
MW vertical coverage	60°	°
Noise filter (neon lamps)	-21	dB
General features		
Operating voltage	Power supply	12	V
Consumption at power voltage	Idle mode	19	mA
	Alarm mode	21	mA
	MW excluded mode	17	mA
Operating times	Power-on stand-by	20	s
	Pre-alarm time	10	s
	Alarm	5	s
Working temperature	-10 / +55	°C
Humidity	93% r.h.	
Protection class	IP3X	
IMQ certified	EN50131-2-4: grade 3	
Environmental class	2	
Dimensions and weight	W65 × H111 × D48 mm, 109 g	

(1)   with TRL15 standard lens

Parts supplied

Screws, inserts, S4 screw and insert for microswitch against removal, technical manual.

Optional accessories

SN/D99 joint, TRLTO lens.
Optional accessories are not IMQ - Security Systems certified.

4   PRECAUTIONS BEFORE DEVICE MOUNTING   I

⚠️ *The table of contents and general warnings are at the end of this manual.*

Before installing the product, please read the following indications carefully.

4.1   General considerations

- Make sure the device operating field is free and devoid of zones darkened by obstacles.
- Adjust microwave range so that it does not extend beyond glazing or plastic curtains. If necessary, set the range to the minimum and disable anti-sneak function.
- Do not install the device near swaying or vibrating metal objects (ex. fridge/refrigerators groups, window blinds, metal roller shutters).
- Avoid installation near heat sources or drafts.
- Do not touch PIR sensor silicon filter.
- In case of two detectors installed one close to the other, the second must have differentiated frequency:

	Standard freq. (10,525 GHz) model code	Differentiated frequency (9,9 GHz) model code
TRES01	RCRTT01010#00	RCRTT01011#00

- Detectors with the same frequency pointing one towards the other shall be installed at 5 metres distance minimum.

⚠️ *The electronic board of the detector may be damaged by electrostatic discharges. The installer must completely avoid any presence of electrostatic discharges.*

4.2   Definition of installation position

Choose installation position taking into account coverage ranges shown in the following diagrams.
TRES01 is IMQ certified with TRL15 standard lens.
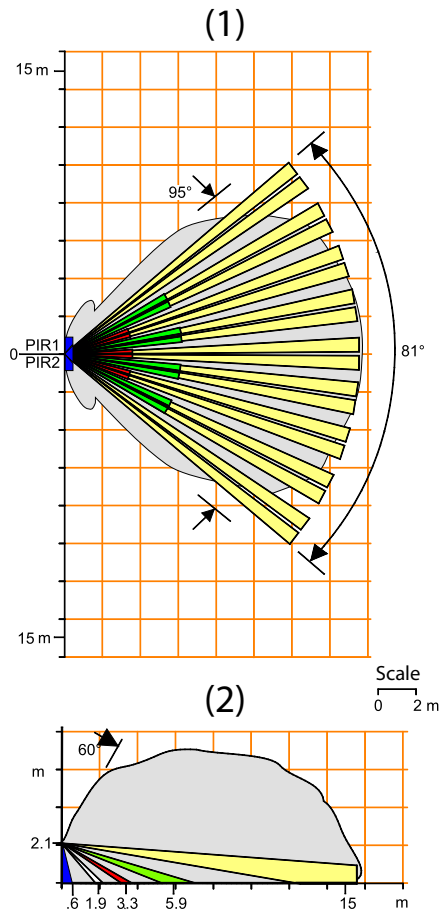
- **Standard lens TRL15**

Diagrams refer to detectors mounted at 2.1m height.
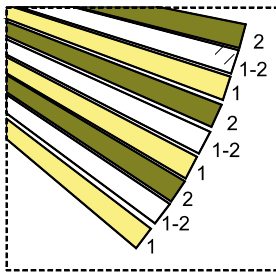**Range**: 15 metres
Coverage: volumetric, aperture 81°
Beams arrangement: 2 x 18 zones on 4 levels, 2 x 3 creep zones on one level
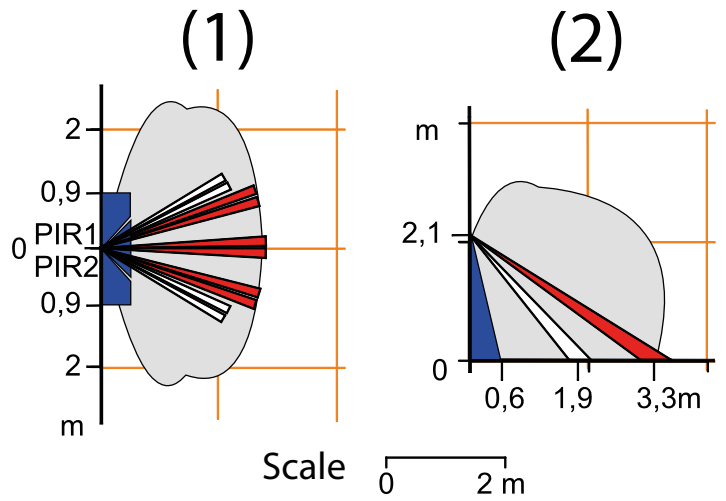
Maximum range diagram

(1)

(2)

1 Top view
2 Side view

The drawing shows the resulting aperture of the two PIR sensors working in AND mode. Below you'll find the details on PIR sensors diagram positioning.

Minimum range diagram

(1)   (2)

Scale 0 ___ 2 m

1 Top view
2 Side view

- **Optional lens TRLTO**

Diagrams refer to detectors mounted at 1.5m height.
Set detector height according to protection to realise.
Range: 15 metres
Coverage: aperture 88°
Beams arrangement: horizontal curtain

Maximum range diagram
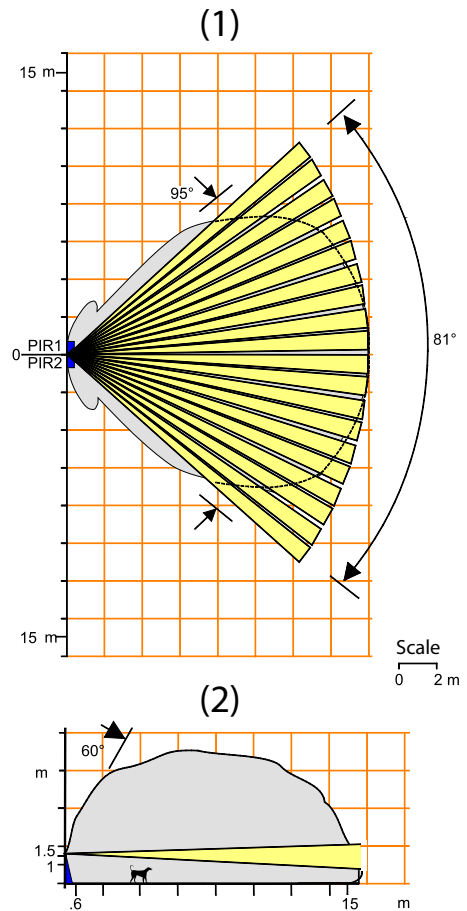
(1)
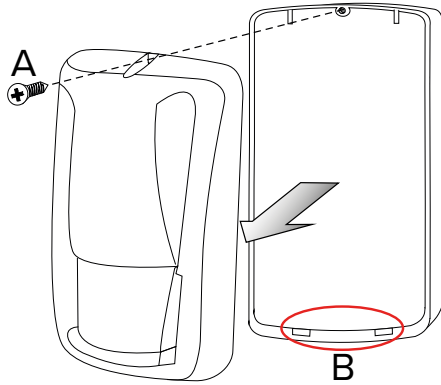

(2)

1 Top view
2 Side view

The drawing shows the resulting aperture of the two PIR

sensors working in AND mode. For details on PIR sensors diagrams positioning see details on the standard lens.

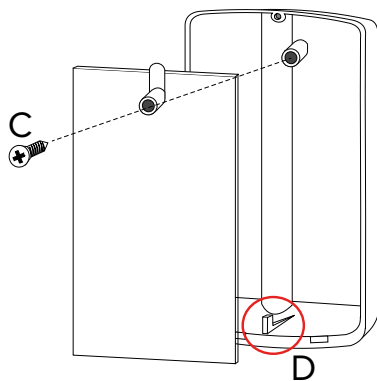⚠ *Creep zone coverage is active with the use of TRLTO lens too.*

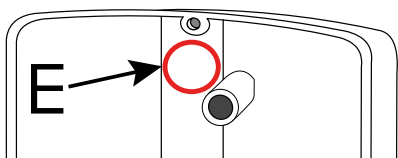## 5   DEVICE MOUNTING   **I**

- **Opening the housing**

– unscrew cover fixing screw
– separate the front cover by pulling it away from the stops (B)
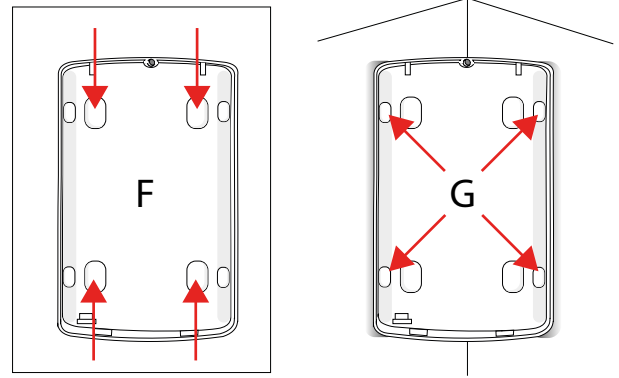
- **Removing the electronic board**

– remove the screw fixing the board to the base (C)
– remove the board from the lower hook (D)

- **Base wall mount**

– drill a hole in area E (pre-drilled plastic in the external part) for cables passage

– using a screwdriver, open the 4 pre-drilled areas of the support suitable for flat mount (F) or corner (G) mount
– In case of corner mount, move the lever against removal from wall as indicated in paragraph 5.1 *p. 5*
– insert a screw with the supplied S4 dowel where the microswitch against removal is located
– adjust the depth level of the screw so that the lever will keep the switch pressed

⚠ *The lever is not active in case of mounting onto the optional swivel. Disable the tear-protection function as indicated in the following chapter.*

– fix the base to the surface using screws and dowels

⚠ *In case of corner mount, to ensure the right value of max range, it is necessary to tilt the detector suitably by inserting a 2-3mm-thick shim under the two upper fixing holes.*
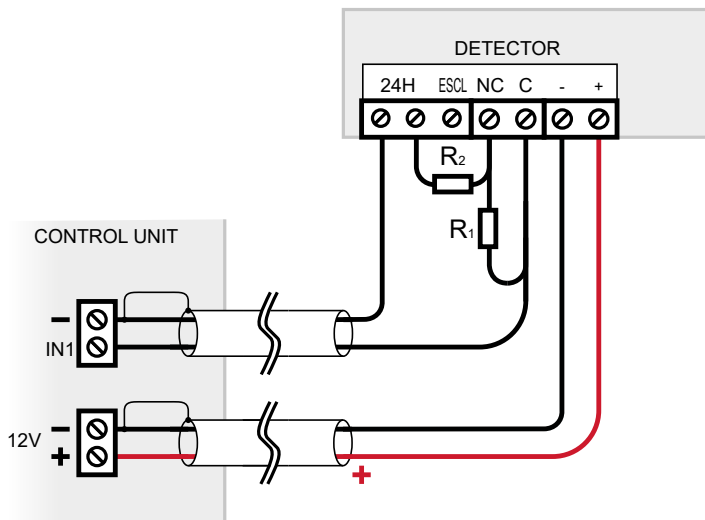
- **Wirings**

Detector terminal board:
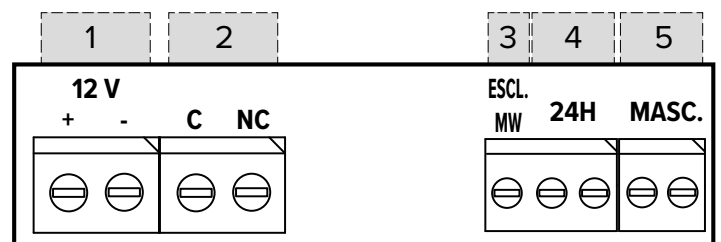
1   Power supply (+12 V)
2   Alarm relay output C-NC (with 10 Ω resistor and 100 mA voltage)
3   Activate LED / MW section exclusion
4   Tamper output (NC)
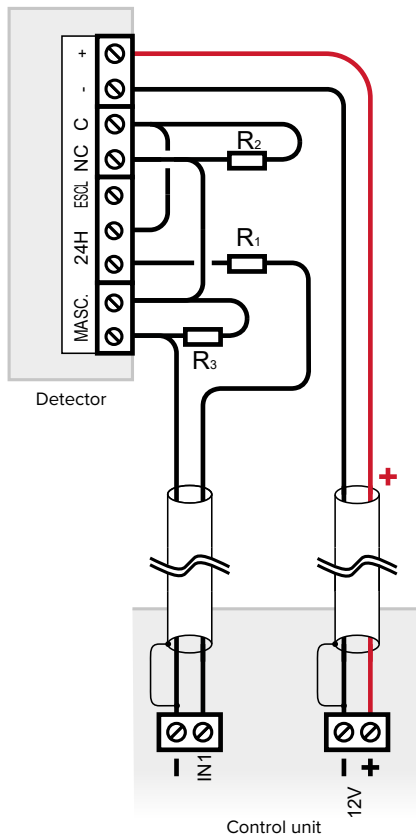**5**   Fault/masking/blinding output

– wire terminals

Dual-balancing drawing:

Resistors R1 = R2 = 1500 Ω are supplied with the control unit.

Triple-balancing drawing:

Verify the unit supports triple-balancing setup.
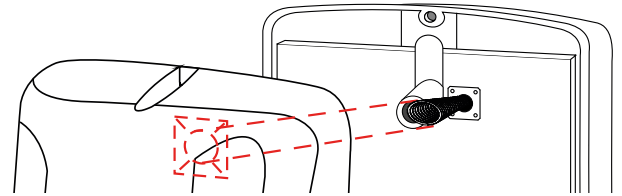Resitors R1 = 1000 Ω, R2 = 680 Ω, R3 = 1200 Ω are supplied with the unit.

- **Board positioning**

Disconnect the battery following the steps above in reverse order: position the electronic board under the lower hook then fix it with the screw.

- **Device setup**

Now proceed with detector setup (see following chapter).

- **Closing the housing**

– position the front cover on the base making sure the tamper protection spring fits correctly to its place

⚠ *The wrong housing closing will trigger a tamper alarm for all supervision transmissions.*

– hook the cover to base stops again
– fix the cover with the screw

5.1 Protection against removal for corner mount
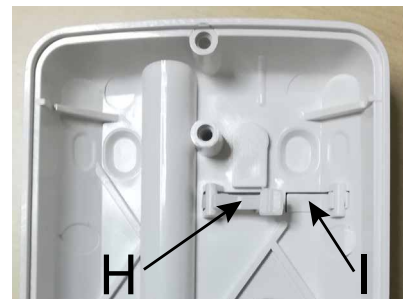
In case of corner mount, in order to ensure protection against removal from wall, move H lever (acting on the microswitch on the rear of the board) to the position of the plastic plug I that closes the detector angle.
Proceed as follows (images show the internal view of the detector base):
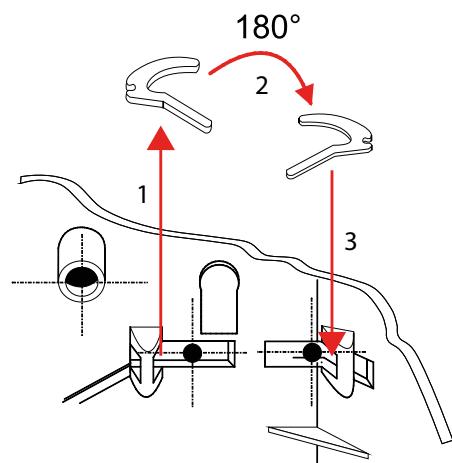
– detach the lever from the rotation pin
– detach the plastic plug that closes the detector angle
– rotate the lever by 180°
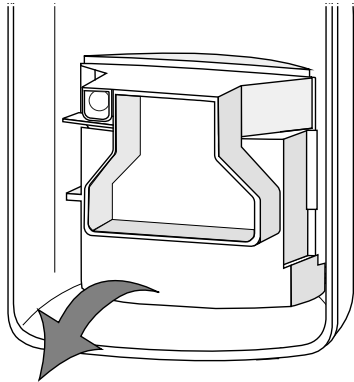– insert the lever were the plug was, firmly attaching it to the pin
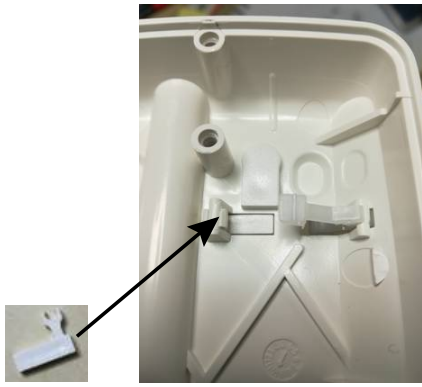
You can close the gap where the lever was before using the second plastic plug provided.

5.2 Lens replacement

To replace the lens, follow this procedure.
Following images show the internal side of the detector cover.

- **Lens removal**
  – unhook side slots

  – remove the protective cap
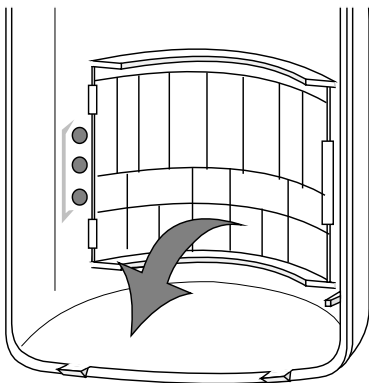
  – remove LEDs guide and keep it in a safe place
  – remove the lens to be replaced

- **Lens positioning**

  – place the lens with the rough side towards the internal side of the cover and placing it in place with the largest number of sectors face up
  – position LEDs guide

  – put the protective cap back in place

6 STARTING THE DEVICE   I

6.1 DIP switch settings

Detector functions can be set using board DIP switch.
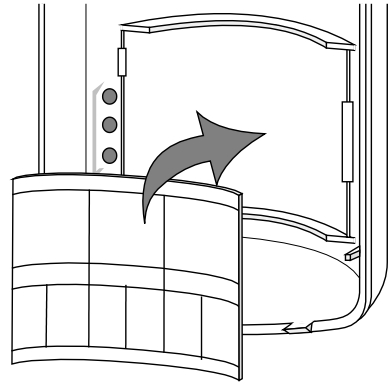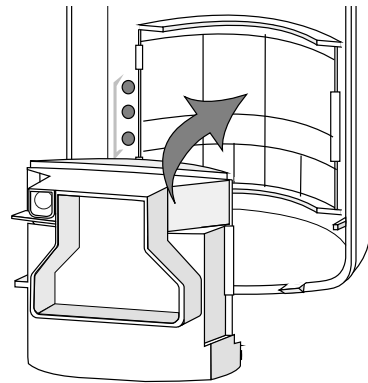To access it, open the cover as illustrated in the mounting procedure.

▼ **Activate LED / MW section exclusion**

DIP 1	Function
ON	LED exclusion enabled on **ESCL.** terminal
OFF	MW section exclusion enabled on **ESCL.** (default) terminal

▼ **Activate/deactivate anti-blind, anti-mask, and anti-sneak functions.**

DIP 2	DIP 3	Functions enabled
OFF	OFF	None (default)
OFF	ON	Anti-masking function
ON	OFF	Anti-masking, anti-blinding
ON	ON	Anti-masking, anti-blinding, anti-sneak

▼ **Sensitivity adjustment**

DIP 4	Sensitivity
ON	Minimum: 8 MW pulses, 4 IR pulses
OFF	Maximum: 4 MW pulses, 2 IR pulses (default)

▼ **AND/OR**

DIP 5	Mode
ON	AND (default)
OFF	OR

▼ **Activate/deactivate disorientation protection.**

DIP 6	Enable disorientation detection
ON	Enabled (default)
OFF	Disabled

▼ **MW range adjustment**

DIP 7	DIP 8	Range
ON	ON	25%
ON	OFF	50% (default)
OFF	ON	75%
OFF	OFF	100%

6.2 ESCL. terminal settings

The detector features a ESCL. terminal input that can be used to disable the MW section or the LED indicators.

Disable MW section
– set dip 1 to OFF
– wire ESCL. terminal to +12V

MW section will be disabled regardless of dip 5 position.

Disable LED indicator
– set dip 1 to ON
– wire ESCL. terminal to +12V

7 OPERATING MODE   Ⓤ

The detector detects motion inside the covered area.

7.1 AND/OR mode

The way the alarm notification is given differs depending on operating mode set:

AND mode
To activate it, set dip 5 to ON.
The alarm relay is activated only when both IR and MW technologies trigger an alarm.
One of the two technologies detects a movement and switches to pre-alarm status (IR or MW) for the set time.
If within such time the other technology does not confirm the detection, the technology in pre-alarm status will reset.

OR mode
To deactivate it, set dip 5 to OFF.
The alarm relay is activated when either of the two technologies sends an alarm notification due to movement within the controlled area.

7.2 Anti-blinding function

TRES01 features anti-blinding function.
The function detects blinding attempts made by placing a reflective body before the lens. Use dip switches 2 and 3 to activate the function.
When the device enters a "blinded" condition, the green LED will start blinking slowly.
When the reflective body is removed, the standard operating mode will be restored.

⚠ *We recommend to disable anti-blinding function if the detector is installed in places with people passing often at less than 20 cm distance.*

7.3 Anti-masking function

TRES01 features anti-masking function.
The function detects attempts to obscure/cover the vision by placing an object in front of the detector.
In order to activate the anti-masking function, the device shall be operating in AND mode and the MW mode shall be enabled.
Use dip switches 2 and 3 to activate the function.
When the device enters a "detector masked" condition, the blue LED will start blinking slowly.
The standard operating mode will be restored when one of

the technologies confirms the first movement.

Activation status of the anti-masking function can be controlled with indications only during stabilisation at power on: if someone passes close to the sensor, blue and green LEDs will blink.

It is advisable to connect MASC output to an independent alarm input, or in series to the detector alarm output. In any case, when possible, connect the detector to a control unit that individuates alarm, tamper and fault events separately. If using 24H input, set it to silent mode.

⚠️ *We recommend to disable anti-masking function if the detector is installed in places with people passing often close to the detector.*

7.4   Anti-sneak

TRES01 features anti-sneak function.

The function detects attempts to elude the IR section from far off with special physical expedients.

In order to activate the function, the device shall be operating in AND mode.

Use dip switches 2 and 3 to activate the function.

When the function activates, blue LED indicator will start blinking quickly.

The standard operating mode will be restored when one of the technologies confirms the first movement.

7.5   Function against disorientation

TRES01 features the function against disorientation.

An accelerometric sensor with operation on two axes detects device moving attempts.

Use dip switch 6 to activate the function.

Z-axis   X-axis
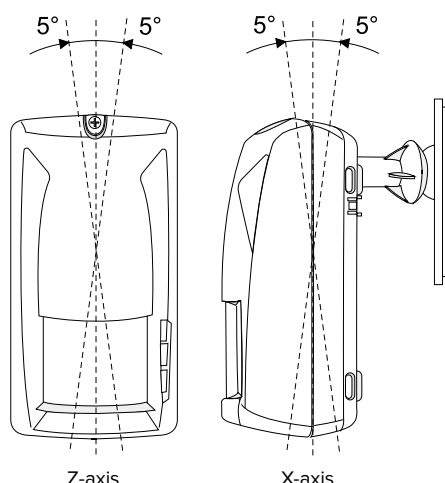
If the detector is rotated by 5 degrees compared to its initial position, 24H relay will enter the alarm condition for 5 s and red LED will start blinking slowly.

The circuit is protected against accidental vibrations; however it is advisable to take the following precautions:
- Verify that the mounting wall is solid and stable.
- Verify that the joint is installed properly.

- Avoid drilling and beating in the area near the detector without having previously disarmed the system.

7.6   Fault detection

The device manages the detection and signalling of the following faults:
- power fault: when power low voltage is detected a fault event is generated.
- PIR 1 and PIR 2 fault
- microwave section fault

Detector LED indicators will light on as shown in the table of paragraph 7.7 *p. 8*.
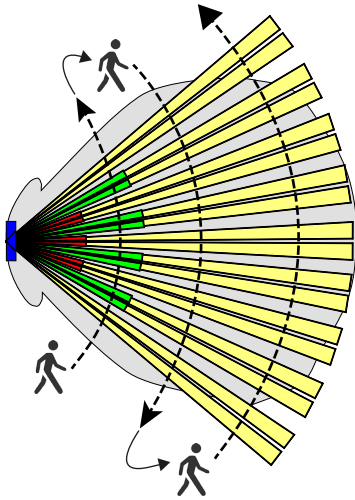
7.7   LED indications

Condition	Red LED	Green LED	Blue LED
Stabilisation at power on	ON steady		
Anti-masking test at power on		Blinking	Blinking
IR pulse		Single blinking	
MW pulse			Single blinking
Pre-alarm IR		ON steady	
Pre-alarm MW			ON steady
General alarm		ON 5 s	ON 5 s
Power failure	Slow blinking	Slow blinking	Slow blinking
Default performed	Fast blinking	Slow blinking	Slow blinking
PIR 1 fault		Fast blinking	
PIR 2 fault	Fast blinking		
MW fault			Fast blinking
Blinding		Slow blinking	
Sneak/Masking			Slow blinking
Orientation change	Slow blinking		

8.1   Periodic test

Carry out a simple test regularly to verify the functionality and the coverage limits of the detector.

– taking detector position as the point of reference, make half-circle movements from opposite directions to check coverage from both sides

Detector LED indicators shall respond as shown in the table of 7.7 *p. 8* paragraph.

Table of contents

EU DECLARATION OF CONFORMITY

Hereby, EL.MO. Spa declares that the radio equipment TRES01 is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: www.elmospa.com – registration is quick and easy.

$C\epsilon$

GENERAL WARNINGS

This device has been designed, built and tested with the utmost care and attention, adopting test and inspection procedures in compliance 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 triple-technology detector for intrusion detection systems.

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 components adopted are 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).

INSTALLER WARNINGS

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.

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).

USER WARNINGS

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...)

MAIN SAFETY RULES

The use of the device is forbidden for children and unassisted disabled individuals.

Do not touch the device when bare footed, or with wet body parts. Do not directly spray or throw water on the device.

Do not pull, remove or twist the electric cables protruding from the device even if the same is disconnected from the power source.

DISPOSAL WARNINGS

IT08020000001624

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.

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