



Commercial Series TriTech Motion Detector



BOSCH

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Safety

Changes or modifications not expressly approved by Bosch Security Systems, Inc. can void the user’s authority to operate the equipment.

At least once per year, vary the range and coverage. To ensure continual daily operation, instruct the end user to walk through the far end of the coverage pattern. This ensures an alarm output prior to arming the system.



Old electrical and electronic appliances

Electrical or electronic devices that are no longer serviceable must be collected separately and sent for environmentally compatible recycling (in accordance with the European Waste Electrical and Electronic Equipment Directive).

To dispose of old electrical or electronic devices, you should use the return and collection systems put in place in the country concerned.

ROHS

For use in China: CHINA ROHS DISCLOSURE TABLE

Sensors

Hazardous substance table according to SJ/T 11364-2014						
	Pb (Pb)	Hg (Hg)	Cd (Cd)	Cr 6+ (Cr 6+)	PBB (PBB)	PBDE (PBDE)
PCB	X	○	○	○	○	○
Electronic components	X	○	X	X	○	○
PCBA	X	○	X	○	X	X
Cables	X	○	X	○	X	X
Plastic materials	○	○	○	○	X	X
Metal materials	X	○	X	X	○	○
Glass material (lenses)	X	○	○	○	○	○
Terminal block	X	○	X	X	○	○
This table was created according to the provisions of SJ/T 11364						
○: The content of such hazardous substance in all homogeneous materials of such component is below the limit defined in GB/T 26572						
X: The content of such hazardous substance in a certain homogeneous material is above the limit defined in GB/T 26572						

The manufacturing datecodes of the products are explained in:
<http://www.boschsecurity.com/datecodes/>

2 Introduction

This document provides installation, configuration, and operation information for Commercial Series motion detectors. Throughout this document, the words "motion detectors" refer to all motion detectors covered by this document (ISC-CDL1-W15G, ISC-CDL1-W15H, ISC-CDL1-W15K, ISC-CDL1-W15G-CHI).

Review the content within the following sections before installing the motion detector:

- *Detector overview, page 7*
- *Installation considerations, page 8*
- *Wiring, page 15*

2.1 About documentation

Copyright

This document is the intellectual property of Bosch Security Systems, Inc. and is protected by copyright. All rights reserved.

Trademarks

All hardware and software product names used in this document are likely to be registered trademarks and must be treated accordingly.

Notifications

This document uses Notices, Cautions, and Warnings to draw your attention to important information.



Notice!

These include important notes for successful operation and programming of equipment, or indicate a risk of damage to the equipment or environment.



Caution!

These indicate a hazardous situation which, if not avoided, could result in minor or moderate injury.




Warning!

These indicate a hazardous situation which, if not avoided, could result in death or serious injury.


2.2 Bosch Security Systems, Inc. product manufacturing dates


Use the serial number located on the product label and refer to the Bosch Security Systems, Inc. website at <http://www.boschsecurity.com/datecodes/>.

The following image shows an example of a product label and highlights where to find the manufacturing date within the serial number.

 **BOSCH**

Model Number
Mat/N: F01Uxxxxxx

7  9
82695 11xxx

8  0921608202193xxxx
717332 311xxx

PRODUCT QTY= 1

3 Detector overview

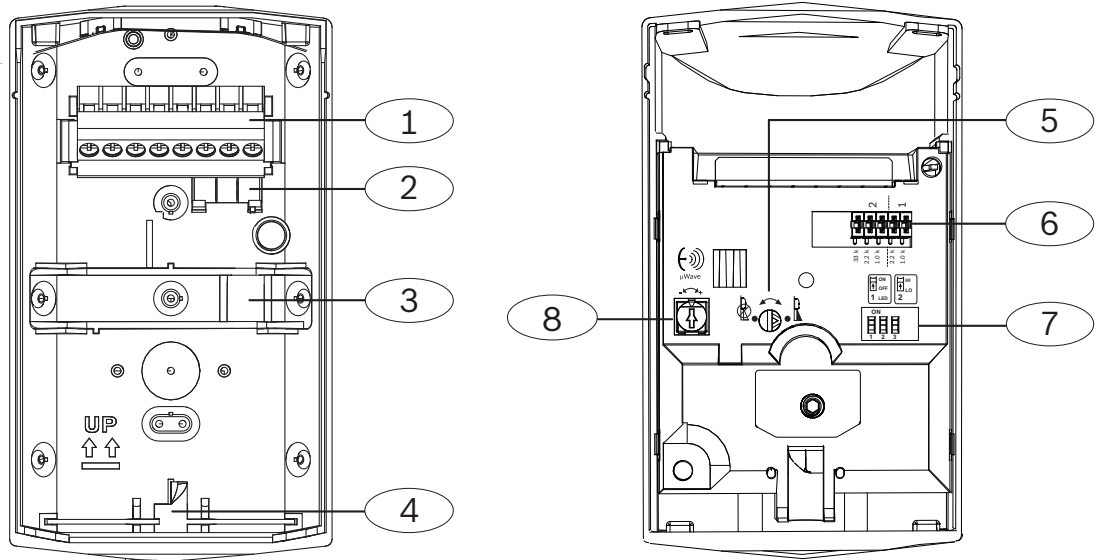


Figure 3.1: Interior view - base (left), Interior view - body (right)

Callout – Description	Callout – Description
1 – Removable terminal block	5 – Look-down adjustment
2 – Removable bubble level	6 – Resistor jumpers
3 – Wall Tamper	7 – Configuration switches
4 – Self-locking cam lock	8 – Microwave adjustment

4 Installation considerations

When installing the detector, observe the following installation considerations.



Notice!

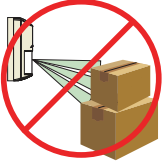

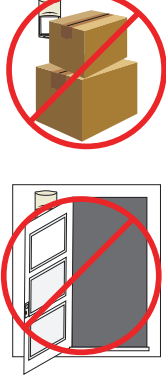

Bracket use

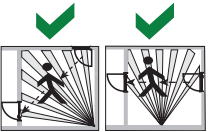
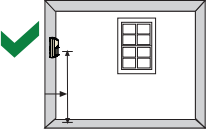

Using a mounting bracket might reduce catch performance. Reduced catch performance might invalidate regulatory certification on the installation. Regulatory agencies do not approve bracket use.


Microwave energy passes through glass and most common non-metallic construction walls. The PIR detector reacts to objects rapidly changing temperature within its field-of-view. Detectors utilizing passive infrared (PIR) detector technology make use of the fact that all objects give off (emit) infrared energy, and that the warmer an object is, the greater the amount of infrared energy emitted. The PIR receiver technology is designed to detect the change in infrared energy caused when a target of a different temperature from a stable background passes through its field of coverage.

Point the motion detector away from:	
	Glass exposed to the outdoors.
	Objects that might change temperature rapidly such as heat sources, air conditioning outlets, or surfaces heated by sunlight.
	Objects that small animals such as birds and mice might climb on (stairs, shelves, ledges, furniture) and appear in the upper zones of the PIR which are more sensitive. Small animals in close proximity in the field of view of the detector might also cause false alarms.

Do not install:	
	In a location where direct sunlight shines onto the detector.
	Outdoors.
	Near rotating machines or other moving objects within the coverage pattern.

Do not install:	
	Near objects that can block the field of view.
	Where an intruder would walk only directly toward or away from the detector.
	In a location where the detector's field of view is blocked by movable objects such as boxes, furniture, doors or windows. The PIR detector does not detect through glass.
	Near doors and windows or other openings where cold or warm air can flow onto the detector.

Do install:	
	Where an intruder is most likely to cross through the coverage pattern.
	Within recommended installation height range measured from the floor. [2.3 m - 2.75 m (7.5 ft - 9 ft)]
	On solid, vibration-free surface.

Additional notes:	
 <p>≤ 4.5 kg (10 lb)</p>	The detector is immune to small animals such as rodents up to 4.5 kg (10 lbs) when installed according to the installation considerations listed in this document.

5 Installation

This section includes hardware details and the instructions you need to install the motion detector base.

5.1 Self-locking cam

The detector includes a self-locking cam for easy installation. Refer to the following information to open and close the detector.

Open the detector and remove the base

1. Insert a flathead screwdriver into the locking tab hole.
2. Turn to the unlock position.
3. Slide, then lift the detector from the base.

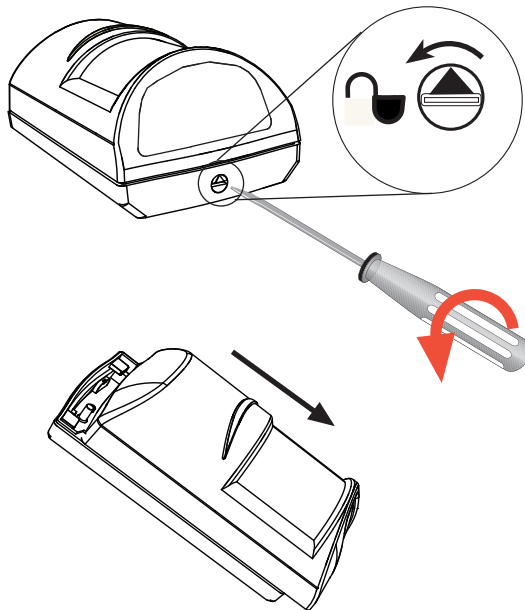


Figure 5.1: Unlocking the base and removing the detector

Put the detector onto the base



Notice!

When you remove the detector from the base, the cam automatically returns to the locked position. When you place the detector onto the base, the cam must remain in locked position. Do not manually change the cam once you remove the detector from the base; doing so unlocks the detector and prevents you from putting the detector correctly onto to base.

1. Put detector onto the base.
2. Slide the detector up until you hear it "click."

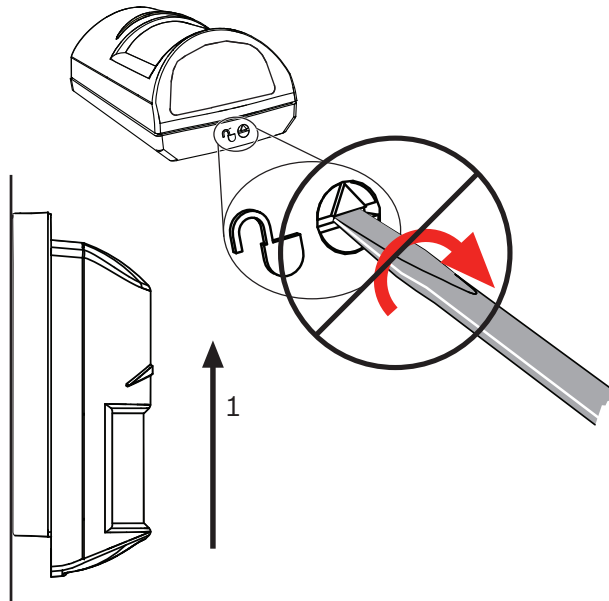


Figure 5.2: Putting the detector onto the base

5.2 Install options

The following table is an overview of install information and options.

	<p>Install the detector using the detector base.</p>
	<p>Install the detector on a flat wall or in a corner. Refer to .</p>
	<p>Install the detector using a bracket. Refer to .</p>
	<p>Detector coverage patterns are designed for optimal performance when installed vertically. The detector base includes a removable bubble level which helps you align the unit. Before drilling the installation holes, use the bubble level to align the detector. Refer to <i>Bubble level</i>, page 14.</p>

Install directly to the surface

When installing onto a flat surface mounting, select the installation holes shown in the figure. Drill the holes or tap them out with a screwdriver.

To use the wall tamper feature, use one of the installation holes shown in red in the following figure.

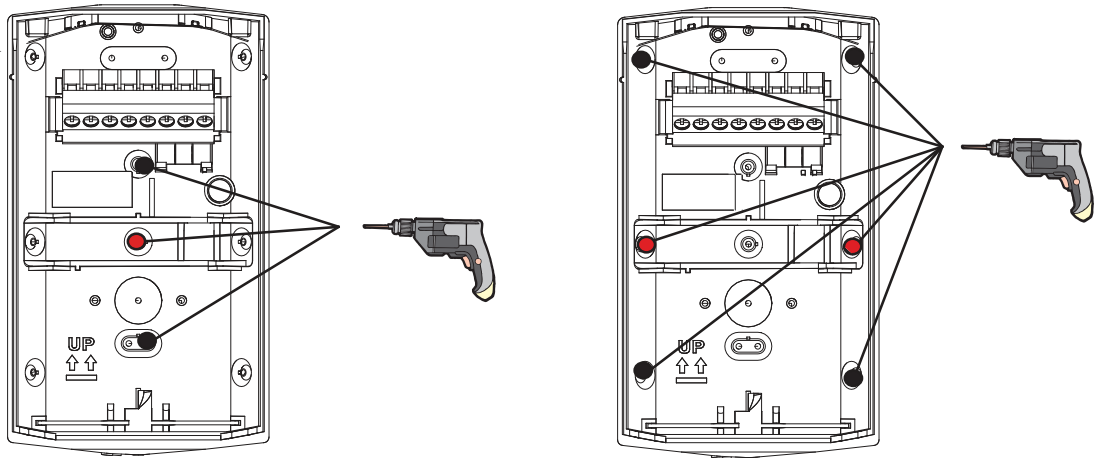


Figure 5.3: Left: wall installation; right: corner installation

Install on a bracket

Mounting brackets help align the detector to a vertical angle and to correct imperfections (non-perpendicular angles) of installation surfaces.

Choosing a mounting bracket:

- The B335 bracket allows a vertical pivot range of +10° to -20° and a horizontal pivot range of ±25°.
- The B328 bracket installs on a single-gang box and allows rotation of the detector. The bracket allows you to insert the wiring through the black tube section in the center of the bracket mounting plate and through the back of the detector base.
- The B338 bracket designed for ceiling mounting allows a vertical pivot range of +7° to -16° and a horizontal pivot of ±45°. The bracket allows you to insert the wiring through the ceiling cavity and into the detector base.

When using a mounting bracket, pre-drill or tap out all of the mounting holes shown for that bracket in the following figure.

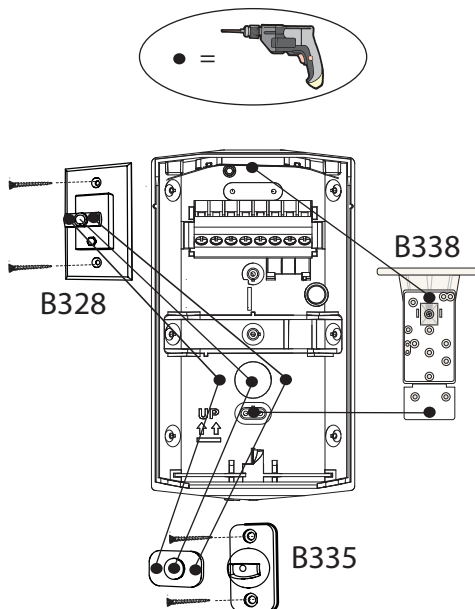


Figure 5.4: Installation holes used with optional brackets

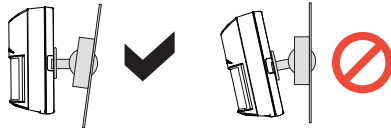


Notice!

Using a mounting bracket might reduce catch performance.
 Always mount the detector within the recommended mounting height, with or without a mounting bracket.
 Brackets are not investigated by UL.
 Brackets are not EN50131 compliant.



Notice!



Do not use the bracket to tip the detector vertically, unless you intend to compensate for a non-vertical surface. It may cause false alarms or reduced catch performance.

5.3 Wire knockouts

Use the following figure to determine the knockouts to use for the desired installation.

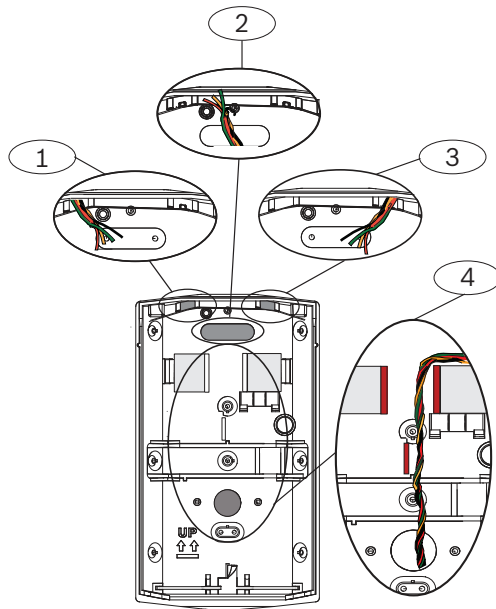


Figure 5.5: Wire knockout locations

Callout	Description
1	Surface wiring knockout, detector's left side
2	Through-the-wall wiring knockout
3	Surface wiring knockout, detector's right side
4	Through-B328-bracket wiring knockout*
* If you use the bracket mount knockout for wires, run the wires between the walls marked in red in the figure. With the wiring between the walls and behind the terminal block, other features, such as EOL resistor jumper pins, cannot interfere with or puncture the wires.	

5.4 Bubble level

The detector's coverage pattern performs optimally when installed vertically. The detector base includes a removable bubble level which helps you align the unit. Before drilling the mounting holes in the surface, use the bubble level to align the detector.

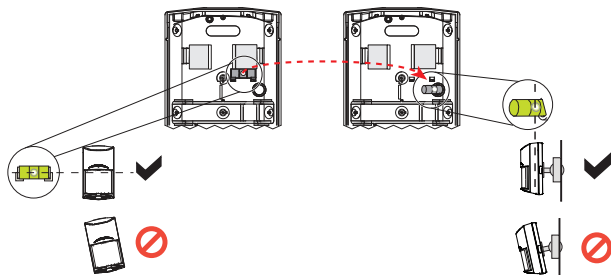


Figure 5.6: Leveling the detector

Using the bubble level:

1. Position the detector base on the surface and install it in place using one screw only. Do not over-tighten the screw.
2. Make sure the base is level from side to side.
3. Remove the bubble level and place it into the round cavity on the right side of the base. Make sure the base is level and not tipped forwards or back.
4. Make adjustments until the base is level, and mark the remaining surface hole locations.
5. Remove the bubble level and place it back to its original position.



Notice!

Do not leave the bubble level in the circular holder. You cannot properly place the detector body onto the mounting base with the bubble level in the circular holder.

Do not use a bracket to tip the detector in any direction as it might cause false alarms or reduced catch performance.

6. Secure the detector body with the remaining screws.

6 Wiring



Caution!

Apply power only after you have made and inspected all connections. Do not coil excess wiring inside the motion detector.

6.1 Wiring overview

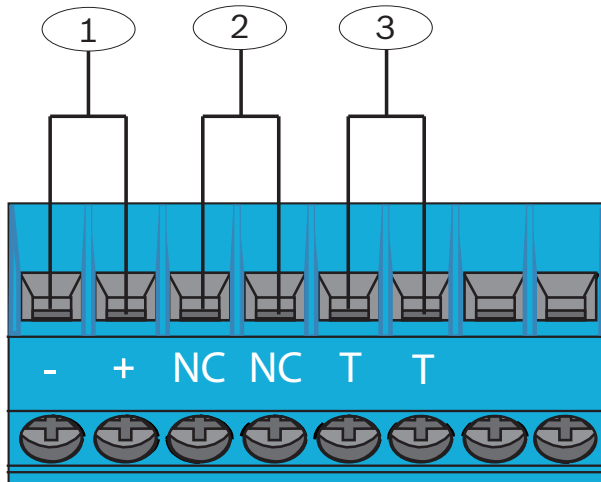


Figure 6.1: Terminal strip overview

Callout – Description
1 – Input power terminals. Voltage limits are 9 to 15 VDC. Use no smaller than 0.4 mm (26 AWG) wire pair between the detector and the power source.
2 – Alarm terminals. Solid State output. Use these terminals for Normally Closed relay rated at 25 VDC, 100 mA, 2.5 W. Do not use with capacitive or inductive loads.
3 – Tamper terminals. Tamper contacts rated at 28 VDC, 125 mA.

6.1.1 Input Power terminals

Input power must use only an approved limited power source.

6.1.2 Alarm terminals

- Normally closed solid state voltage-free (dry contact) relay. The contacts are closed (shorted) during the warm-up period and during normal operation when no alarm is detected, or if only one technology (PIR or Microwave) is active.
- The alarm contacts change to open status under the following conditions:
 - Insufficient input power
 - Motion alarm condition (both PIR and microwave activity)



Notice!

When using the built-in resistors between the alarm terminals, there is a resistance value instead of an open circuit. Jumper selection determines the resistance value.

6.1.3 Tamper terminals

- Normally closed voltage-free (dry contact) switch. The tamper terminals change to an open state if the motion detector is separated from the mounting base.
- When using the appropriate wall tamper mounting holes, the tamper terminals change to an open state if the motion detector is removed from the wall surface and the wall tamper block separates from the mounting base.



Notice!

The wall tamper feature is not functional when the motion detector is mounted on a bracket.



Caution!

Connect the alarm and tamper contacts to a SELV (Safety Extra-Low Voltage) circuit only. Do not use with capacitive or inductive loads.

Apply power only after all connections have been made and inspected. Do not coil excess wiring inside the motion detector.

6.2 EOL resistors overview

The detector includes multiple built-in status resistors to simplify the wiring when matching the alarm outputs with the control panel input loop resistance specifications. Use the selection pin block by placing jumpers across specific pins to match the loop circuit shown in the alarm control panel documentation.



Notice!

Built-in resistor values cannot meet every control panel resistor value requirement. If the connected control panel resistor values and loop structure do not match the combinations allowed by the built-in resistors, make sure to remove the jumpers and use only external resistors.

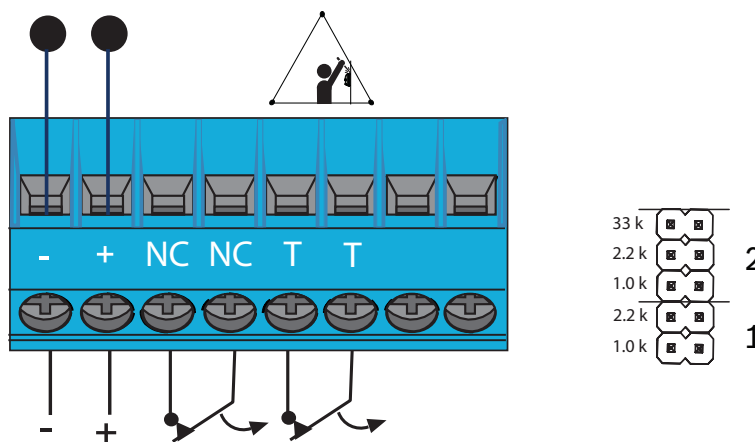


Figure 6.2: EOL resistors overview

Follow the instructions and figures in this document to ensure proper jumper installation.

Alarm resistors (pin block section 1)

Use the selection pins labeled 1 when wiring to control panels with the following configuration: dual EOL resistor.

When placing a jumper across the desired pins, the corresponding resistance value is connected in parallel with the alarm contact.

During normal operation the alarm contact is either in shorted condition or alarm resistance value condition.

The available resistance values are 1 kΩ and 2.2 kΩ.

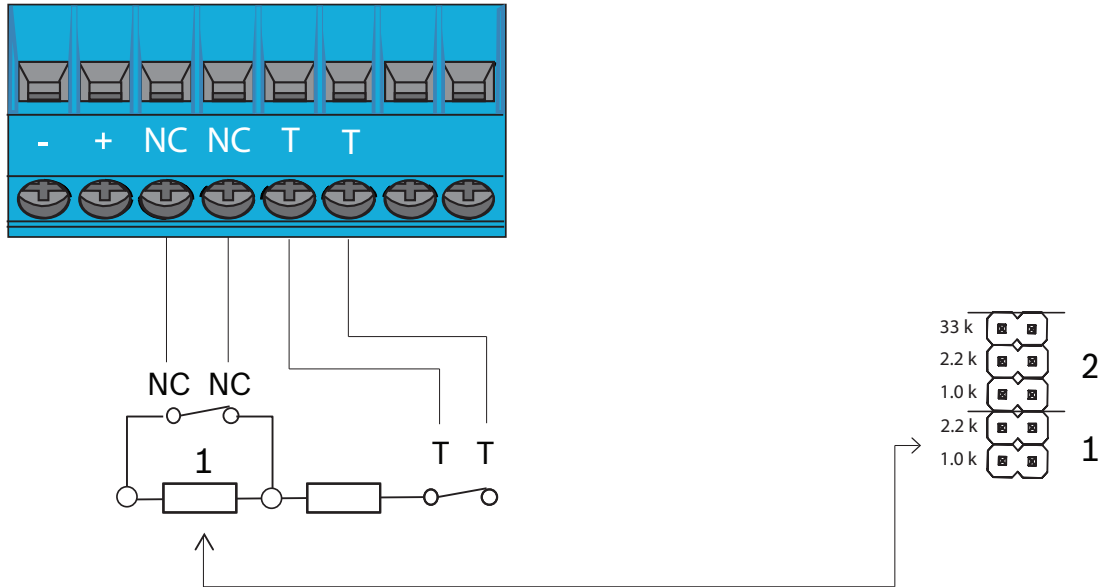


Figure 6.3: Alarm resistors overview

Tamper/EOL resistors (pin block section 2)

Use the selection pins labeled 2 when wiring to control panels with the following configuration: single or dual EOL resistor.

When placing a jumper across the desired pins, the corresponding resistance value is connected in series with the alarm and tamper terminals adjacent to each other (from left to right the fourth (NC) and fifth (T) terminals).

During normal operation, the control panel verifies the continuity of the alarm loop with the help of this resistor. The loop continuity breaks and indicates a tamper condition if any of the following occurs: the tamper switch opens, the detector body is removed from the base, or the wire is cut.

The available resistance values are 1 kΩ, 2.2 kΩ, and 33 kΩ.



Notice!

When using single EOL loops, this resistor represents: EOL resistor. Refer to the control panel documentation to verify whether individual outputs signaling different conditions (alarm, tamper, or trouble) should be connected on the same loop. Single EOL loops with multiple outputs connected in series with the resistor cannot determine which output contacts opened the loop.

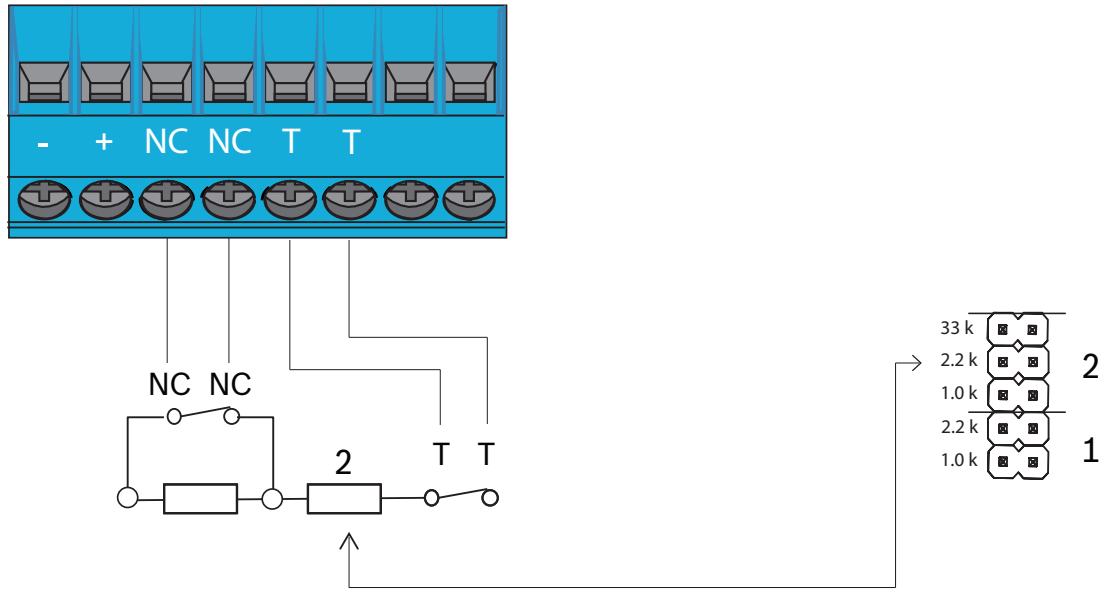


Figure 6.4: Tamper resistors overview

6.3 EOL resistor loop combinations



Notice!

When wiring the detector, use either external resistors wired into the terminals, **or** the built-in resistors for the same output. Do not use both.

6.3.1 Single EOL loop – Alarm and Tamper

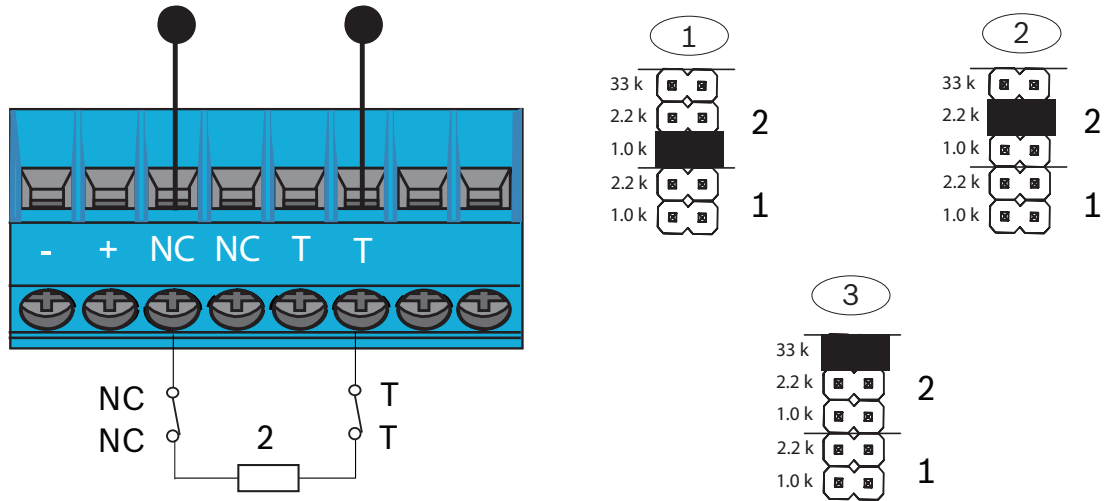


Figure 6.5: Single EOL Loop

Callout	Description
1	1 kΩ
2	2.2 kΩ
3	33 kΩ

6.3.2 Double EOL loop – Alarm and Tamper

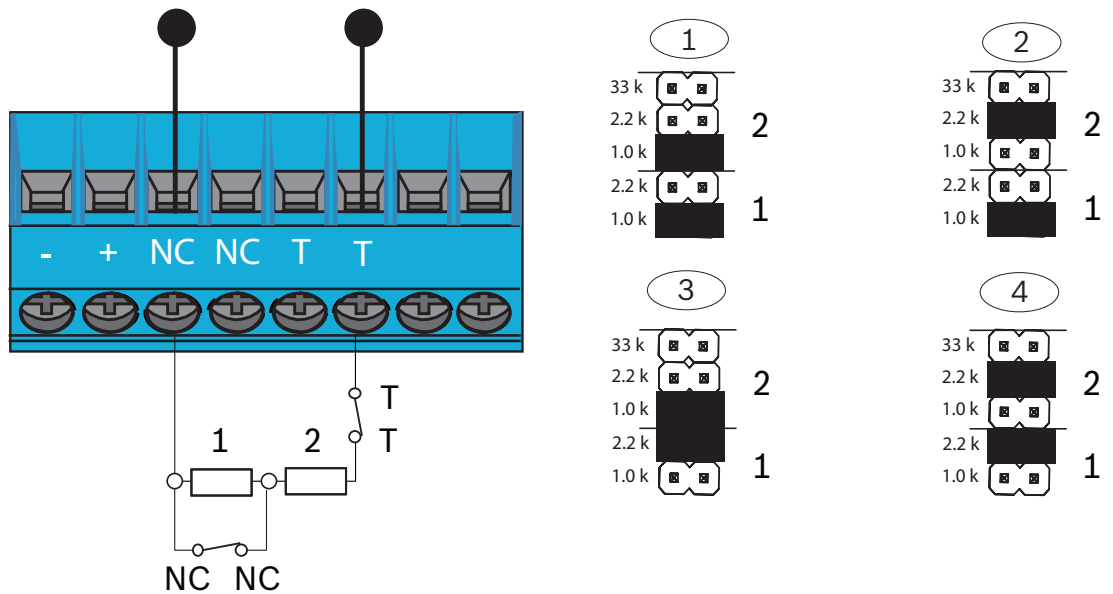


Figure 6.6: Double EOL Loop

Callout — Description
1 — 1 kΩ Alarm + 1 kΩ Tamper
2 — 1 kΩ Alarm + 2.2 kΩ Tamper
3 — 2.2 kΩ Alarm + 1 kΩ Tamper
4 — 2.2 kΩ Alarm + 2.2 kΩ Tamper

7 Configuration and walk test

Before placing the detector body on the base, and before performing a walk test, configure the features and options located on the detector body.

7.1 Look-down zone

The motion detector has a manual cam to enable or disable the look-down zone. When the motion detector must detect motion in the area under the sensor, enable the look-down zone. To reduce false alarms, disable the look-down lens for locations where small animals are likely to cross the look-down zone.

The following figure shows how to enable and disable look-down zone. Turn left to disable the look-down zone. Turn right to enable the look-down zone.

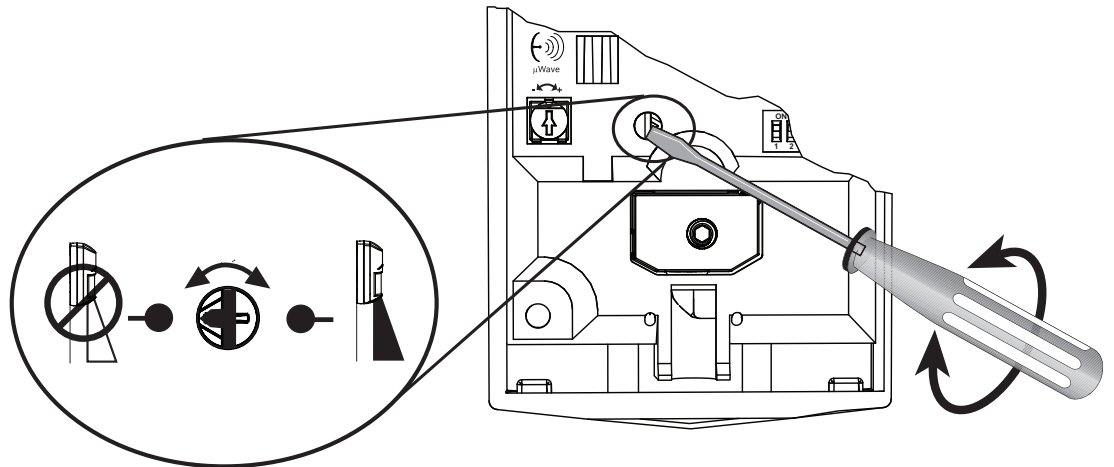


Figure 7.1: Setting the optional look-down zone

7.2 Walk test LED

The walk test LED indicates the motion detector condition, depending on status.

<p>2 min</p>	<p>During the warm-up period (after providing power to the device), the LED flashes continuously until the device is ready for use.</p>
	<p>During walk test, the LED indicates PIR and microwave activity activity and also a motion alarm condition (dual alarm).</p>
	<p>If the motion detector is in a self test fault condition, the LED flashes 4 times repeatedly.</p>
	<p>If the motion detector is in a low power supply fault condition, the LED flashes 5 times repeatedly.</p>



Notice!

The walk test switch does not affect the warm-up flash after power-up or any of the trouble flash patterns. During the warm-up period, the blue LED flashes continuously until the unit has stabilized (approximately 2 minutes) and has seen no movement for at least 5 seconds.

Enable or disable the walk test LED feature using the switch labeled 1.

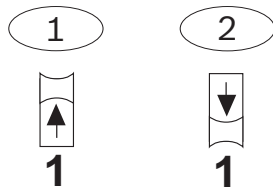


Figure 7.2: Walk test LED switch settings

Callout - Description
1 – Walk test LED on
2 – Walk test LED off

The ON position enables the LED. If you do not want LED indication after you finish the setup and walk tests, place the switch in the OFF position. The OFF position does not prevent the LED from indicating supervision trouble conditions.

If you do not want the LED to light when the device detects a possible alarm event, disable the LED after you complete the walk test.



Notice!

Some regulations require that you disable the LED after the walk test.

Automatic brightness

To improve LED visibility in any lighting environment, the walk test LED automatically changes brightness. In dark environments, the LED intensity lessens; in bright environments, the LED intensity increases.

7.3

Walk test

Before you begin the walk test, review the walk test LED indicator statuses. Refer to *Walk test LED, page 21*.

At the beginning of the test, with no motion in the protection area, the LED should be OFF. If you observe LED activity without movement, check for disturbances affecting the microwave or PIR technologies.

7.3.1

Establish the PIR and microwave coverage

The motion detector PIR and microwave factory settings are optimal for most installations. If you must adjust the PIR and microwave coverages, use the microwave potentiometer and walk test to do so.



Notice!

PIR only models

The microwave information in this section does not apply to ISC-PPR1-W16x models. These models have a blue LED that indicates PIR alarms. These models do not have a microwave potentiometer.

Preparing for the PIR and microwave walk test:

1. Remove the motion detector body from the base.
2. Turn the microwave potentiometer to the minimum range (to the left, counterclockwise).
3. Place the motion detector body onto the base.

4. Wait at least 2 minutes.

Performing the walk test and making adjustments:

1. Begin the walk test and observe the walk test LED.
2. If you do not observe LED activity while walking along the farthest edge of the desired coverage area, increase the microwave range. Remove the motion detector body from the base and increase the range by turning the potentiometer clockwise. (Refer to *Adjustable microwave sensitivity*, page 24 for detailed instructions.)
3. Place the motion detector body onto the base.
4. Wait at least 2 minutes.
5. Repeat walk test procedures and range increase until the PIR and microwave detection range is as desired.
6. If on the last walk test, you observe LED activity while walking outside the coverage area, decrease the microwave range and repeat the walk test.



Notice!

Do not adjust the microwave range higher than required. Doing so might cause the motion detector to catch movement outside of the intended coverage pattern.

Microwave signals penetrate certain surfaces such as drywall, wood, and glass. If the protected area is significantly smaller than the motion detector's nominal range, reduce the microwave range so that it can still detect motion on the near side, but not on the other side of the surface.

7.3.2 Establish the coverage pattern



Notice!

Wait at least 10 seconds between the tests listed in this section.

Establishing the coverage pattern with the walk test:

1. Place the motion detector body onto the base.
2. Walk test across the coverage pattern at its farthest edge, then several times closer to the motion detector.
3. Start walking from outside of the intended protection area, and observe the LED.
4. Walk test from the opposite direction across the pattern to determine both boundaries. The center of the pattern should be pointed toward the center of the intended protection area.
5. Walk test the unit from all directions across the pattern to determine all the detection pattern boundaries.

7.3.3 Adjustable Cloak and Camouflage Detection Technology sensitivity

The motion detector includes two Cloak and Camouflage Detection Technology (C²DT) sensitivity modes: high and low.

- High sensitivity. The recommended setting for any location where an intruder might cover only a small portion of the protected area. C²DT tolerates normal environments on this setting. This setting improves catch performance.
- Low sensitivity. The recommended setting for maximum false alarm immunity. C²DT tolerates environmental extremes on this setting.

Select the mode using switch 2. ON is high. OFF is low.

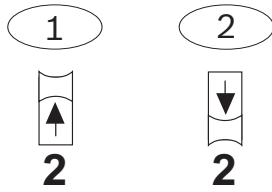


Figure 7.3: C²DT switch settings

Callout – Description

1 – For improved catch performance or EN Grade 2 installations, select the high C²DT sensitive setting.

2 – For better false alarm immunity, select the low C²DT sensitivity setting.

7.3.4 Adjustable microwave sensitivity

The motion detector has a microwave sensitivity adjustment potentiometer. Use this feature to adjust the microwave detection range, if necessary.



Notice!

The product ships with the potentiometer pre-set to meet the rated range. In most cases, you do not need to adjust the potentiometer during the installation. You might adjust the potentiometer, as instructed, to reduce the potential for false alarms or for very large rooms.

The following figure shows how to adjust the setting using the potentiometer. Turn counterclockwise to reduce sensitivity.

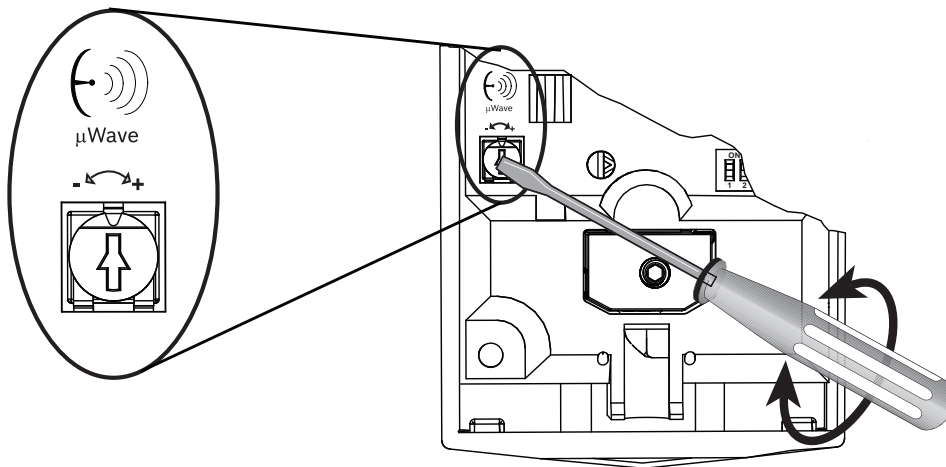


Figure 7.4: Microwave potentiometer adjustment

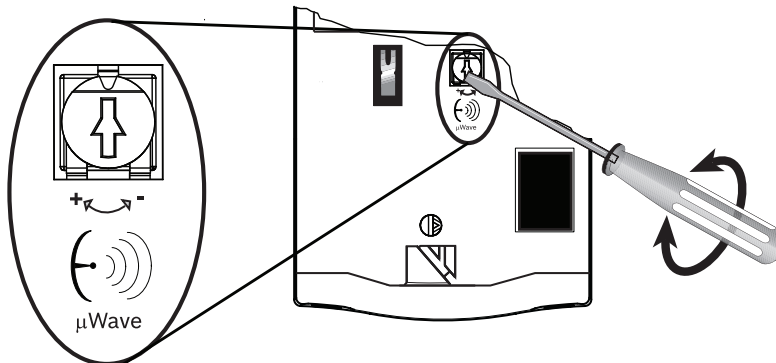


Figure 7.5: Microwave potentiometer adjustment

7.4 Self test

The motion detector performs a routine self test every 7 hours, testing both the PIR and microwave circuit. If either technology fails the self test, the motion detector indicates a trouble condition by activating the trouble output and the LED 4 flash pattern.

**Notice!**

A self test fail condition indicates that the motion detector cannot perform as expected. Replace the motion detector.

8 Troubleshooting

This section includes trouble conditions and the potential causes.

8.1 Motion detector does not appear to respond to motion

Potential causes

- Insufficient power
- Loose wires in the terminals
- Cabling or wiring error
- Defective unit
- Walk test LED is disabled



Notice!

Some regulations require that you disable the LED after the walk test.

8.2 Motion detector is in continuous alarm

Potential causes

- Mounting location does not meet the recommendations listed in this document
- Insufficient power
- Input loop continuity broken
- Incorrect alarm loop resistance configuration
- Defective unit

8.3 Motion detector does not appear to detect motion in the space directly under it

Potential causes

- The look-down zone is disabled

8.4 Motion detector does not appear to detect motion near the edge of the coverage area

Potential causes

- Microwave range too short
- Mounting height does not meet the recommendation listed in this document
- Level alignment does not meet the requirement noted in this document
- C²DT sensitivity too low*

8.5 Motion detector does not appear to detect motion in the farther section of the coverage area

Potential causes

- Microwave range is too short
- C²DT sensitivity too low

8.6 Motion detector LED flashes continuously

Potential causes

- Warm-up mode requires a certain amount of time with no motion in the area to settle the PIR and microwave circuit
- Defective unit

8.7 Motion detector LED flashes four times in a row repeatedly

Potential causes

- The motion detector failed during the routine self test

8.8 Motion detector LED flashes five times in a row repeatedly

Potential causes

- The supply voltage is too low

9 Coverage pattern

The protected coverage area is where the microwave and PIR patterns overlap.

For the following:

- Dark green = PIR detection zone
- Light green = microwave range
- Yellow = look-down zone

15 meter motion detectors

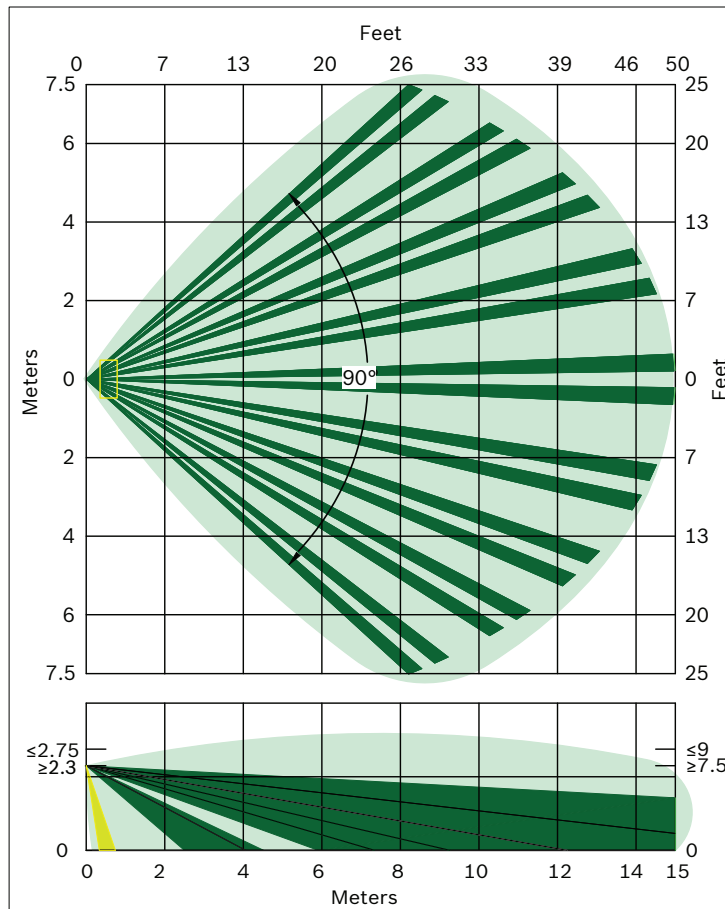


Figure 9.1: Coverage pattern

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