QUATRO+

QUAD Passive Infra Red Detector

Visonic Ltd

Installation Instructions

1. INTRODUCTION

The QUATRO+ is a QUAD passive infrared detector which employs a quad element pyroelectric sensor, providing two completely separate dual element PIR detectors for increased reliability (Fig. 1).

A choice of four interchangeable lenses is provided: wide angle, long-range, ultra-wide angle and pet alley.

The two separate dual passive infrared detectors use the same optical system to cover the same area. The zones monitored by detector 1 are positioned slightly above the zones monitored by detector 2.

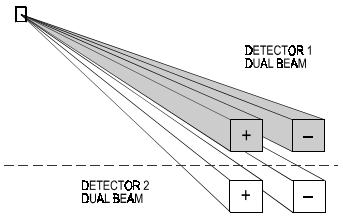
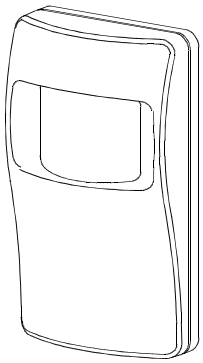


Figure 1- *QUATRO+ Quad Elements*

Both detectors must be tripped simultaneously to activate an alarm. This provides a high immunity against false alarms caused by various heat sources or rodents, which are located in the field of view of only one detector and not in the other. The QUATRO+ principle of operation and its unique special processing method increase the immunity to internal circuit noise and random environmental disturbances, without compromising detector sensitivity.



Both dual PIR detectors (1 and 2) have independent, alternate polarity pulse count signal processing circuits – one for each detector.

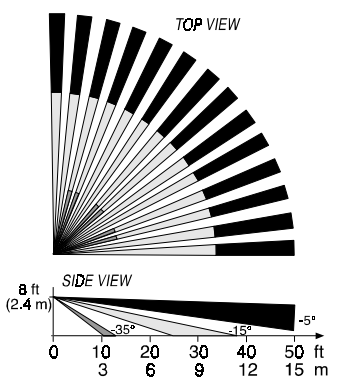
When alternate polarity pulse count signal processing is selected, each PIR (1 and 2) must detect motion in both of their fields (+) and (–).

This means that motion must be detected in all four fields (beams) of a zone to report an alarm - see Figure 1. This signal processing provides QUATRO+ with unprecedented protection against false alarms.

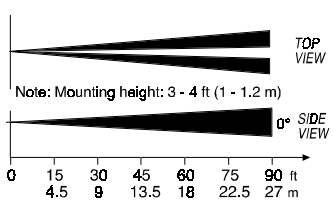
A special QUATRO+/S model, with form C contacts (N.O. + N.C.) is also available.

2. SPECIFICATIONS

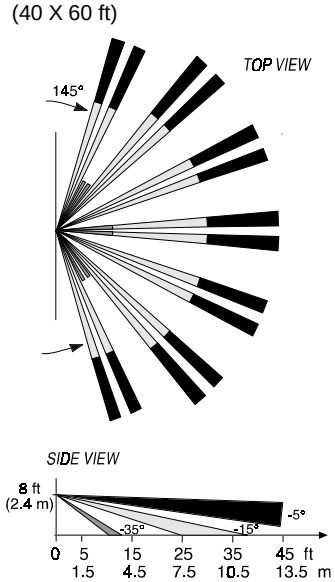
Lens A. Wide Angle (standard)
Maximum Coverage 12 X 12 m (40 X 40 ft)



Lens B. Long Angle
Maximum Coverage 3 X 27 m (10 X 90 ft)



Lens C. Ultra Wide Angle
Maximum Coverage 12 X 18 m (40 X 60 ft)



Lens D. Pet Alley
Maximum Coverage 13.5 X 13.5 m (45 X 45 ft)

Note: *To allow extra free height for pets, set the vertical adjustment scale to +2°. Install the detector at a height that places the detection pattern at least 30 cm (1 ft) above the pet's activity.*

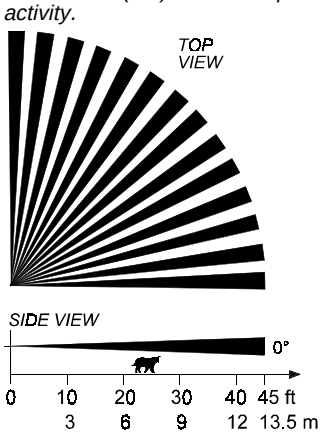


Figure 2- *QUATRO+ Coverage Patterns*

OPTICAL

Detection Patterns:

LENS-A: 90° Wide Angle. Provides 34 beams in 3 detection layers with maximum coverage area of 12 x 12 m (40 x 40 ft).

LENS-B: Long Range. Provides narrow angle corridor pattern with maximum coverage area of 3 x 27 m (10 x 90 ft).

LENS-C: 145° Ultra-Wide Angle. Provides 34 beams in 3 detection layers with max. coverage area of 12 x 18 m (40 x 60 ft).

LENS-D: 90° Pet Alley. Provides 14 beams in a single layer with maximum coverage area of 13.5 x 13.5 m (45 x 45 ft).

Optical Adjustment: Vertical 0° to -12° calibrated scale.

COVERAGE PATTERNS

The QUATRO+ has a selection of four interchangeable lenses: wide angle, long range, ultra-wide angle and pet alley.

The appropriate lens can be selected for each particular application according to the area to be covered (Fig. 2).

ELECTRICAL

Voltage: 9 to 16 VDC.
Current: 17 mA at 12 VDC.
Alarm Output: Normally closed (fail-safe) contacts. 18 ohm resistor in series with contacts. Rating - 0.1A resistive / 24 VDC.
Tamper Output: Normally closed. Rating - 0.5A resistive / 24 VDC.
Alarm Period: 2-7 seconds.
Pulse Counter: Alternate polarity pulse count operation.
LED: Walk Test enabled or disabled with internal link.
Detector: Quad-element low noise pyroelectric detector.

MOUNTING
Flat or corner mounting (no additional brackets required).
Mounting Height: Up to 3.6 m (12 ft).
Optional Mounting Accessories:
BR-1 - Swivel bracket (optional), adjustable 30° downward and 45° left, 45° right.
BR-2 - Same as BR-1, with corner adapter.
BR-3 - Same as BR-1, with ceiling adapter.

ENVIRONMENTAL
Note: *The unit shall be mounted indoors*
Operating Temperature: -10°C to 50°C (14°F to 122°F).
Storage Temperature: -20°C to 60°C (-4°F to 140°F).
RFI Protection: Greater than 20V/m to 1000 MHz.

PHYSICAL
Dimensions: 60 x 104 x 32 mm (2-3/8 x 4-1/8 x 1-5/16 in).
Weight: 95 g (3.3 oz).
Color: White.

MODELS AVAILABLE
QUATRO+ - Standard version
QUATRO+/S - Same as standard version, but with form C relay contacts.

3. INSTALLATION

3.1 Changing Lenses

To change a lens: insert a small screwdriver into the lens holder side locking tab and rotate the screwdriver handle downward. The lens holder will release (Fig. 3).

Insert the new lens with the smooth surface outside and the lens designation letter in the upper right corner (Fig. 4). Carefully center the lens so that the distance from its edges to the edge of the cover is the same on each side of the cover. Holding the lens firmly in place install the lens holder, pushing it toward the cover until a click is heard.

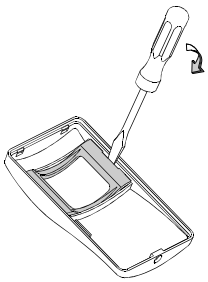


Figure 3. *Removing the Lens Holder*

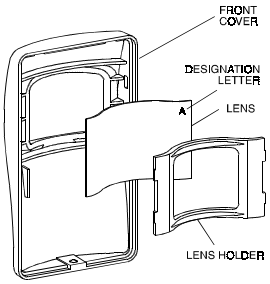


Figure 4. *Construction and Assembly*

3.2 Mounting

Attention! This unit is designed for indoor use only.

The QUATRO+ PIR can be installed directly on a wall (surface mounted) or in a corner. An optional PIR mounting bracket (BR-1) is also available,(para. 3.3 and Fig. 5.) Always mount the unit on a firm and stable surface.

A. Select the mounting location so that the expected motion of an intruder will cross the beams of the coverage pattern.

B. Select the most convenient mounting height. Built-in installation aids enable you to mount the unit anywhere up to 3 m (10 ft) height. An accurate adjustment table determines the recommended angles for various combinations of range and mounting height (Table 1)

C. QUATRO+ is extremely immune to air turbulence and RFI interference. However, to minimize possible false alarms, it is highly recommended to avoid aiming the detector at heaters, sources of light, or windows subjected to direct sunlight. Also avoid running wiring close to high power electrical cables.

D. Remove the front cover (Fig. 3). Mount the base (equipped with the printed circuit board) in the location and height selected for optimum coverage. For surface mounting use the two knockouts at the back of the base; for corner mounting use the knockouts on the angled sides. The unit must be fastened firmly to the mounting surface to avoid possible vibrations.

E. Seal all openings in the base with RTV to prevent insects and air drafts from entering the unit.

3.3. Optional Swivel Brackets

The BR-1 is a swivel, surface-mounted bracket for greater flexibility when setting the desired detection range. It is adjustable as shown in Figure 5.

The BR-2 is a swivel bracket that consists of the BR-1 and a corner mounting adapter.

The BR-3 is a swivel bracket kit that consists of the BR-1 and a ceiling mounting adapter.

ATTENTION: with swivel brackets in use, the effective detection range may differ from that indicated in Table 1 – the vertical adjusting scale.

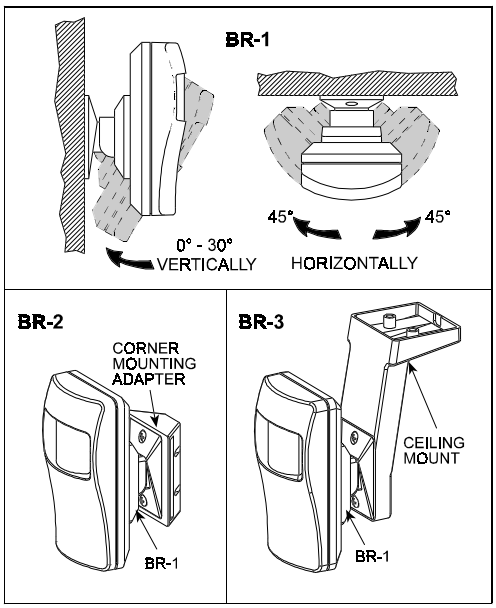


Figure 5 - *Optional Swivel Brackets*

3.4 Wiring

To route wires into the detector, use either the wiring knockouts located at the bottom of the unit base, or the channel on the backside of the base and its knockout. The channel allows wire routing under the detector from the ceiling side (Fig. 6). Refer to Figure 7 and connect wires to the terminal block in the following order.

A. Connect **TAMP** N.C. terminals to a normally closed 24-hour protection zone of the control panel. Tamper contact will open when cover is removed.

B. Connect **RELAY** N.C. terminals to a normally closed burglar zone of the control panel. Relay contacts will open when motion is detected or during power loss.

C. Connect the **12VDC** (+) and (–) terminals to a 9

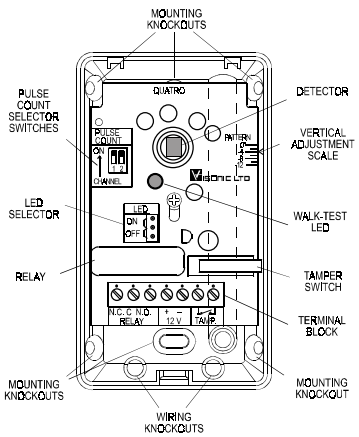


Figure 6 - *Printed Circuit Board Layout*

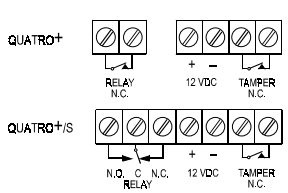


Figure 7 - *Terminal Block Wiring*

to 16 Volt DC power source and check for correct polarity. It is advisable that the power supply be battery backed-up. Current drain of each sensor is approximately 15 mA.

3.5. Vertical Adjustment

The vertical adjustment scale (printed on the upper right corner of the p.c. board) and the plastic pointer on the base indicate in degrees the approximate vertical angle between the horizontal line of the unit and the upper detection layer.

Table 1 gives the recommended scale adjustment for various combinations of mounting height and coverage distance. The scale enables fast, easy pattern adjustment from 0° to -12° downward according to the installation height and the required coverage range.

Table 1. *Vertical Adjusting Scale*

Mounting Height		Coverage Range											
ft ⇒		7	10	13	17	20	23	26	30	36	45	60	90
⇓	m	2	3	4	5	6	7	8	9	11	13.5	18	27
3	1	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°
4	1.2	-8°	-6°	-5°	-4°	-3°	-2°	-2°	-2°	-1°	-1°	-1°	0°
5	1.5	–	-12°	-9°	-7°	-6°	-5°	-5°	-4°	-3°	-2°	-2°	-1°
6	1.8	–	–	–	-11°	-9°	-8°	-7°	-6°	-5°	-4°	-3°	-2°
7	2	–	–	–	–	-12°	-10°	-9°	-8°	-8°	-5°	-4°	-3°
8	2.5	–	–	–	–	–	–	-11°	-10°	-8°	-7°	-5°	-3°
10	3	–	–	–	–	–	–	–	–	-11°	-9°	-7°	-4°

Example: if you require coverage range of 30 ft (9 m) and wish to install the sensor at a height of 6 ft (1.8 m) from the ground, set the Vertical Adjustment Scale to –6°.

All QUATRO+ sensors are factory preset to -4°. To change the vertical pattern adjustment, loosen the screw which fastens the printed circuit board to the rear cover. Slide the p.c. board up or down to the desired angle and tighten the screw firmly.

In operation, a person must cross both the upper and lower PIRs together to initiate an alarm (Fig. 1).

It is of utmost importance that a walk test be made over the entire coverage area to assure that both upper and lower beams will be crossed. This is of particular importance when using the long range lens (Lens B).

3.6. QUATRO+ Pulse Counter

The QUATRO+ QUAD PIR is equipped with two independent alternate polarity pulse count circuits and controls (Fig. 6).
The Upper Detector (1) is controlled with pulse count switch 1.
The Lower Detector (2) is controlled with pulse count switch 2.
Placing both switches to ON selects the alternate polarity pulse count operation for both detectors. A person is required to cross both the (+) and (–) beams of both dual element detectors (1 and 2) before activation of the alarm relay. This means that motion must be detected by all 4 beams (Fig. 1). Use of the pulse count is recommended only in a temperature controlled environment where the temperature does not exceed 28°C (82°F).

Placing both switches at OFF actually disables the pulse counters of both detectors. This should be done if it is necessary to activate an alarm in the first crossing of a vertical pair of beams, such as with a long range lens or in high security installations when high 'catch' performance is required. Still, both detectors (one beam each) must be triggered.

To ensure proper detection when using the long range lens, pulse count one must be selected for both the upper and lower detectors. Set both switches to OFF.

With two pulse count switches you can select pulse count operation on only one detector (1 or 2). This flexibility may prove useful in certain applications which require different catch performance levels in the same area.

3.7. Walk Testing

A. Apply 12 VDC power and allow five minutes for the unit to warm up and stabilize before testing.

B. Adjust the vertical pattern angle according to Table 1.
Note: *be careful to position the printed circuit board so that the upper and lower beams reach the maximum required distance. This can be achieved by careful vertical adjustment and walk testing.*

C. Place the LED jumper at ON (across the middle and top pins) to activate the LED.

D. Set the pulse counter per para 3.6 above.

E. Walk-test the range and coverage area by walking slowly across the field of view (in opposite directions) and observe the LED. The LED lights up whenever you cross a pair of vertical sensitive beams. Allow 10 seconds between each test for the unit to stabilize**.**

F. After testing, the LED can be disabled to prevent unauthorized persons from tracing the coverage pattern. To disable the LED, remove the LED jumper from the ON position (across the middle and upper pins) and place it in the OFF position (across the middle and lower pins).

NOTE: *The range and coverage area should be checked at least once a year. To assure proper continuous functioning, the user should be instructed to perform a walk test at the far end of the coverage pattern to assure an alarm signal.*

WARRANTY

Visonic Ltd. and/or its subsidiaries and its affiliates ("the Manufacturer") warrants its products hereinafter referred to as "the Product" or "Products" to be in conformance with its own plans and specifications and to be free of defects in materials and workmanship under normal use and service for a period of twelve months from the date of shipment by the Manufacturer. The Manufacturer's obligations shall be limited within the warranty period, at its option, to repair or replace the product or any part thereof. The Manufacturer shall not be responsible for dismantling and/or reinstallation charges. To exercise the warranty the product must be returned to the Manufacturer freight prepaid and insured.
This warranty does not apply in the following cases: *improper installation, misuse, failure to follow installation and operating instructions, alteration, abuse, accident or tampering, and repair by anyone other than the Manufacturer.*
This warranty is exclusive and expressly in lieu of all other warranties, obligations or liabilities, whether written, oral, express or implied, including any warranty of merchantability or fitness for a particular purpose, or otherwise. In no case shall the Manufacturer be liable to anyone for any consequential or incidental damages for breach of this warranty or any other warranties whatsoever, as aforesaid.
This warranty shall not be modified, varied or extended, and the Manufacturer does not authorize any person to act on its behalf in the modification, variation or extension of this warranty. This warranty shall apply to the Product only. All products, accessories or attachments of others used in conjunction with the Product, including batteries, shall be covered solely by their own warranty, if any. The Manufacturer shall not be liable for any damage or loss whatsoever, whether directly, indirectly, incidentally, consequentially or otherwise, caused by the malfunction of the Product due to products, accessories, or attachments of others, including batteries, used in conjunction with the Products.

The Manufacturer does not represent that its Product may not be compromised and/or circumvented, or that the Product will prevent any death, personal and/or bodily injury and/or damage to property resulting from burglary, robbery, fire or otherwise, or that the Product will in all cases provide adequate warning or protection. User understands that a properly installed and maintained alarm may only reduce the risk of events such as burglary, robbery, and fire without warning, but it is not insurance or a guarantee that such will not occur or that there will be no death, personal damage and/or damage to property as a result.
The Manufacturer shall have no liability for any death, personal and/or bodily injury and/or damage to property or other loss whether direct, indirect, incidental, consequential or otherwise, based on a claim that the Product failed to function. *However, if the Manufacturer is held liable, whether directly or indirectly, for any loss or damage arising under this limited warranty or otherwise, regardless of cause or origin, the Manufacturer's maximum liability shall not in any case exceed the purchase price of the Product, which shall be fixed as liquidated damages and not as a penalty, and shall be the complete and exclusive remedy against the Manufacturer.*
Warning: *The user should follow the installation and operation instructions and among other things test the Product and the whole system at least once a week. For various reasons, including, but not limited to, changes in environmental conditions, electric or electronic disruptions and tampering, the Product may not perform as expected. The user is advised to take all necessary precautions for his /her safety and the protection of his/her property.*

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VISONIC LTD. (ISRAEL): P.O.B 22020 TEL-AVIV 61220 ISRAEL. PHONE: (972-3) 645-6789, FAX: (972-3) 645-6788
VISONIC INC. (U.S.A.): 10 NORTHWOOD DRIVE, BLOOMFIELD CT. 06002-1911. PHONE: (860) 243-0833, (800) 223-0020 FAX: (860) 242-8094
VISONIC LTD. (UK): UNIT 1, STRATTON PARK, DUNTON LANE, BIGGLESWADE, BEDS. SG18 8QS. PHONE: (01767) 600857 FAX: (01767) 601098

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