HUNTER / HUNTER VdS

Anti-Masking, Self-Testing PIR Motion Detectors

Visonic Ltd

Installation Instructions

1. INTRODUCTION

1.1 Description

The HUNTER and HUNTER VdS are sophisticated PIRs that utilize an advanced motion analysis algorithm, the latest anti-masking technology and motion simulation self-test routines.

The advanced motion analysis algorithm - **True Motion Recognition™** - provides both models with better distinction between true motion of a human body and any other disturbance that would cause other detectors to produce false alarms.

Masking or internal circuit malfunction cause trouble indications to appear: the green LED flashes and the TRB (trouble) relay drops out. At power up, a unique software routine adapts the detector to its immediate surroundings. Despite this, if an object is too close to the lens or the field of view is too narrow, the detector will respond as it does upon masking.

Both models include temperature compensation circuits - for maximum catch performance and optimum protection from false alarms. A built-in motion event verification counter can be programmed to trigger an alarm as a result of 1 or 2 consecutive motion events, depending on the detection sensitivity required.

A "TEST" (T) input permits switching the detector to the walk-test mode and back without removing the front cover. The test input polarity can be selected with a DIP switch (see Para. 3.6).

Long-term stability and high reliability are assured by a special self-adapting algorithm, that continuously compensates for environmental changes. The entire electronic circuitry is enclosed in a protective sealed module, with the sensor element practically isolated from gusts of wind and insects.

Important! *From this point on, information pertaining to HUNTER VdS only will be given in shaded boxes.*

1.2 HUNTER VdS Special Features

The HUNTER VdS features alarm and trouble memories that are automatically enabled upon arming the control panel. The red and green LEDs are automatically disabled throughout the armed period. If the control panel is disarmed after an alarm, the red LED will light (alarm memory indication). If the control panel is disarmed after a masking event, the green LED will light (masking memory indication). Memory indications remain visible throughout the disarm period, but may be cleared by rearming/disarming.

An additional "SET" (S) input allows the HUNTER VdS to receive arm/disarm signals from the control panel. A SET polarity selector adapts the SET input to the SET output logic of the control panel in use (see Para. 3.6).

Detection of masking or internal circuit malfunction in the armed state cause the TRB (trouble) relay to drop out for as long as the trouble condition lasts. Masking or circuit malfunction in the disarmed state cause the TRB (trouble) relay and the alarm relay to drop out concurrently, thus ensuring that the control panel can not be armed until the problem is rectified (see Para. 4.3).

2. SPECIFICATIONS

GENERAL

Sensor Type: Low-noise dual-element pyroelectric unit.
Alarm Relay: N.C. contacts with 18-ohm resistor in series; contacts rated at 0.1 A resistive / 30 VDC
Alarm Period: 2-3 seconds minimum
Tamper Switch: N.C. contacts, 50 mA resistive / 30 VDC
TRB Relay: N.C. contacts with 18-ohm resistor in series; contacts rated at 0.1 A resistive / 30 VDC
True Motion Event Verification Counter: 1 or 2 events
Masking Detection Delay: 30 seconds

POWER SUPPLY

Input Voltage: 9 - 16 VDC
Standby Current Drain: 17 mA @ 12 VDC

OPTICAL

Lens Type: 90° (wide angle), 34 beams in 3 detection layers.
Coverage Area: 15 x 15 m (50 x 50 ft).
Adjustment:
Vertical: 0° to - 12° with built-in calibrated scale.
Horizontal: ±7.5° by shifting the lens left or right in the front window (greater shift is possible with optional swivel brackets).

MOUNTING

Configurations: Surface or corner (without swivel brackets)
Height: Up to 3.6 m (12 ft)
Optional Accessories: BR-1: Swivel bracket for surface mounting, adjustable 30° downward and 45° left, 45° right. **BR-2:** BR-1 with corner mounting adapter.
BR-3: BR-1 with ceiling mounting adapter.

ENVIRONMENTAL

Operating Temperatures:
-10° to 50°C (14° to 122°F)
Storage Temperatures:
-20° to 60°C (-4° to 140°F)
RFI protection: Greater than 20 V/m up to 1000 MHz.

PHYSICAL DATA

Dimensions (H x W x D):
116 x 60 x 45 mm

(4-9/16 x 2-3/8 x 1-3/4 in.)
Weight: 112 g (4 oz)

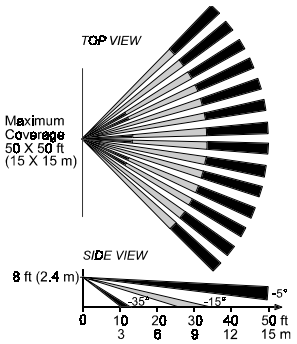

Figure 1. *Coverage Pattern*

3. INSTALLATION

3.1 Construction Details

The electronic circuitry of both models is enclosed in a sealed module, attached to the base with a single screw (see Figure 2).

The electronic module may be shifted up or down along the base for vertical adjustment of the detection beam angle.

The front cover accommodates the Fresnel lens, that can be unfastened for horizontal adjustment or for replacement. The LEDs, which are positioned behind the lens, are visible when illuminated.

3.2 Selecting the Mounting Location

Always mount the detector unit on a firm and stable surface.

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

B. Avoid aiming the detector at heaters, sources of bright light and windows that are subject to direct sunlight. Also avoid running the wiring close to high-power electrical cables.

C. Make sure not to install the unit where obstacles are present 0.5 meter (1.5 ft) away from the lens or closer.

3.3 Mounting

A. Remove the screw located at the bottom and then take the front cover off (see Figure 2).

B. Remove the vertical adjustment screw and detach the module from the base.

C. Mount the base (with the wiring entry knockouts up) 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 (see Figure 3).

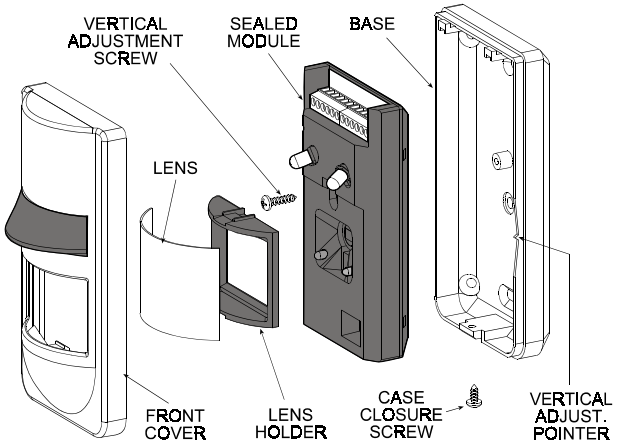

Figure 2. *Exploded View of the HUNTER*

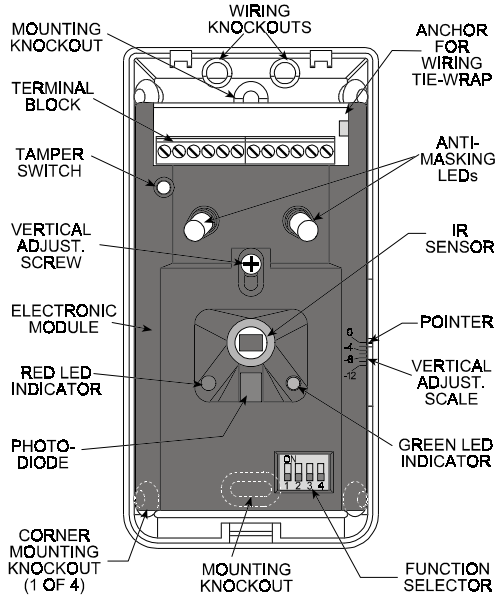

Figure 3. *HUNTER as Viewed with Cover Removed*

D. Put the electronic module back in place and remount the vertical adjustment screw (but do not tighten it fully yet).

E. Set the DIP switch function selector as required for the particular application (see Paragraph 3.6 for details).

F. Carry out the necessary wiring operations as outlined in Paragraph 3.5).

3.4 Optional Swivel Brackets

Three optional swivel brackets are available for the HUNTER and HUNTER VdS. They are intended to enhance the flexibility of installation. Each bracket comes complete with detailed installation instructions in its own packing box.

BR-1 - a surface-mounted swivel bracket (see Fig. 4).

BR-2 - corner mounting swivel bracket (see Fig. 5).

BR-3 - ceiling mounting bracket (see Fig. 5).

Attention! *With swivel brackets in use, the effective detection range may differ from that indicated in Table 2.*

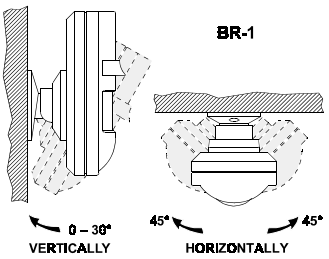

Fig. 4. *Hunter with BR-1*

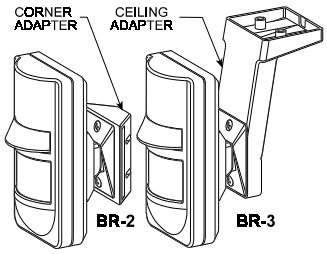

Fig. 5. *Hunter with BR-2 / BR-3*

3.5 Wiring

A. Terminal Assignments

N.C. relay output:

- Both Models: The normally closed alarm relay contacts open upon detection of motion (alarm) or during a power failure.
- HUNTER VdS: Upon detection of masking or internal malfunction in the disarmed state, the alarm relay contacts open.

TAMP (tamper output): The TAMP (tamper) contacts, which are normally closed, open when the unit's front cover is removed.

TRB (trouble) Relay: The normally closed trouble relay contacts open when masking is sensed or when trouble is detected by the unit's self test circuitry.

T (TEST) input: Used to remotely switch the detector into the walk-test mode and back to normal, by applying +12 VDC or 0 VDC to this terminal (see SW-4 in Para. 3.6).

E.O.L. terminals: The two "floating" E.O.L. terminals serve only as connection points for E.O.L. (end-of-line) resistors.

S (SET) input - HUNTER VdS only: Receives status (armed/disarmed) signaling by applying +12 VDC or 0 VDC from the alarm control panel (see SW-3 in Para. 3.6).

C. Wiring Procedure

Refer to Figure 6 and use #22 AWG or larger conductors to wire the detector as follows:

(1) Connect one N.C. output terminals of the detector to a burglar zone terminals of the alarm control panel.

(2) Connect the detector's TAMP terminals across the terminals of a 24-hour zone of the alarm control panel.

Note: *If the control panel is set for E.O.L. and you are wiring the most distant detector in the loop, use the closest E.O.L. terminal to connect an E.O.L. resistor of the correct value in series with the loop.*

(3) Connect the detector's TRB relay terminals across the terminals of a 24-hour trouble zone of the control panel.

(4) Connect a single wire between the detector's **T** terminal and the walk-test control voltage source (see Para. 3.6 for TEST input polarity).

(5) Connect the 12 V (+) and (–) terminals to a 9 - 16 VDC power source and check for correct polarity. The power supply must have at-least 4 hours of battery backup. The standby current drain of each detector unit is about 17 mA.

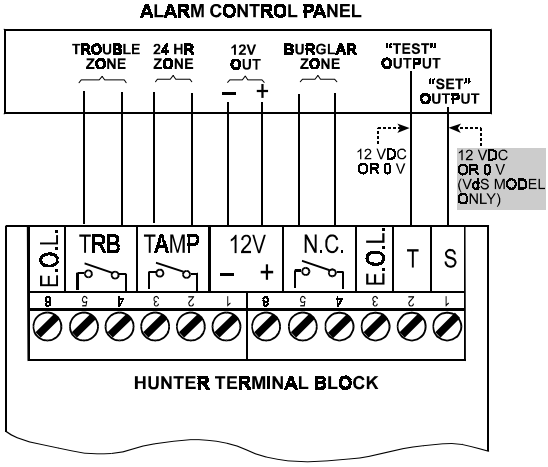

Figure 6. *Terminal Block Wiring*

(6) HUNTER VdS: Connect a single wire between the detector's **S** terminal and the control panel's Set/Unset (Armed/ Disarmed) output (see Para. 3.6 for SET input polarity).

3.6 The Function Switches

A. Switch Tasks

Both HUNTER models are equipped with a 4-position DIP switch function selector (see Fig. 3). Each switch lever allows you to select one of two options, as explained below:

Table 1. *Setting the Function Selector*

Switch	Function	Pos.	Selected Option
SW-1	Motion event Counter	ON OFF	2 motion events to alarm 1 motion event to alarm
SW-2	LED control	ON OFF	Both LEDs are enabled Both LEDs are disabled*
SW-3	**HUNTER VdS 0nly:** Selects the SET ("S") input signal polarity	ON OFF	"Armed" signal is 0 V "Disarm" signal is +12 VDC** "Arm" signal is +12 VDC** "Disarmed" signal is 0 V
SW-4	Selects the TEST ("T") input signal polarity	ON OFF	0 V disables walk test +12 VDC enables walk test** +12 VDC disables walk test** 0 V enables walk test**

** For HUNTER VdS, OFF is effective in the disarmed state only.*

For both models OFF is not effective in the walk test mode and during the power-up adaptation period.

*** +12 VDC or open circuit.*

B. Setting the Switches

Set the function switches as desired prior to applying power. **The ON position is indicated on the switch body.**

SWITCH SW-1: If you set this switch to OFF (1 motion event), the detector's sensitivity will be increased, and if you set this switch set to ON (2 motion events), you will get the highest immunity against false alarms.

SWITCH SW-2: You may enable or disable the LED walk-test indicators. However, even if disabled, they will be automatically enabled when the detector is switched to the test mode.

SWITCH SW-3 (HUNTER VdS only): Select ON or OFF in accordance with the set/unset voltage levels provided by the control panel (see Table 1)

The HUNTER VdS memory function will be enabled each time the control panel is armed. Both LEDs will be disabled for the duration of the armed state.

SWITCH SW-4: Set this switch in accordance with the control panel's TEST output. If there is no such output, simply wire the control panel's 0 VDC (ground) to the detector's "T" terminal through a TEST switch installed at a convenient location.

Set SW-4 to OFF if you do not intend to use the **T** input.

3.7 Vertical Pattern Adjustment

To adjust the vertical pattern, loosen the vertical adjustment screw slightly and slide the electronic module up or down to the desired angle. Adjust the scale according to Table 2 for the desired mounting height and coverage range. Once the module is aligned correctly, tighten the screw firmly.

Table 2*. Vertical Adjustment Chart*

Mounting Height		Coverage Range									
ft →		7	10	13	17	20	23	26	30	40	50
↓	m	2	3	4	5	6	7	8	9	12	15
3	1	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°
4	1.2	-8°	-6°	-5°	-4°	-3°	-2°	-2°	-2°	-1°	-1°
5	1.5	–	-12°	-9°	-7°	-6°	-5°	-5°	-4°	-3°	-2°
6	1.8	–	–	–	-11°	-9°	-8°	-7°	-6°	-5°	-4°
7	2	–	–	–	–	-12°	-10°	-9°	-8°	-6°	-5°
8	2.5	–	–	–	–	–	–	-11°	-10°	-7°	-6°
10	3	–	–	–	–	–	–	–	–	-10°	-9°
12	3.6	–	–	–	–	–	–	–	–	-12°	-10°

Example: if you require coverage range of 40 ft (12 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 -5°.

3.8 Horizontal Pattern Adjustment

The coverage pattern may be adjusted ±7.5° by shifting the lens off its centered position:

A. Remove the lens holder as shown in Figure 7.

B. Shift the lens in the desired direction (right or left).

C. Hold the lens in position and re-insert the lens holder - bottom end first. Next, push the top end against the front cover until the lens holder snaps into place.

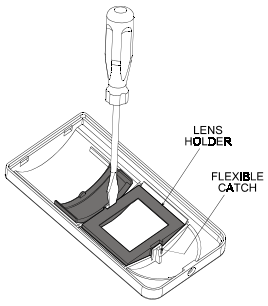

Figure 7. *Releasing the Lens*

4. OPERATION AND TESTING

4.1 Output Circuit Behavior

A. Alarm Relay

Both Models: When an alarm occurs, the alarm relay contacts open for 2-3 seconds.

HUNTER VdS: If a masking attempt or self-test malfunction are detected in the disarmed state, the alarm relay drops out (its contacts open) and remain open until the trouble is eliminated).

B. TRB Relay

HUNTER: The TRB relay drops out (its contacts open) whenever masking is detected, or upon detection of an internal malfunction by automatic self test routine. The relay pulls in as soon as the cause for trouble is removed.

HUNTER VdS: The TRB relay drops out irrespective of the state of the system - armed or disarmed. In the **armed** state, the relay will pull in as soon as the cause for trouble is removed. In the **disarmed** state, the relay contacts will remain open until the unit is reset by special walk testing (see Para. 4.3).

4.2 LED Display

Two LEDs, red and green, convey status information (and memory data in the HUNTER VdS) by various signaling combinations, as detailed in Table 3 below. However, the following rules must be taken into account:

A. The LED indicators may be enabled by setting DIP switch SW-2 to ON or applying "test enable" voltage to the "T" terminal. **While being enabled by one, the LEDs can not be disabled by the other.**

B. Even if the LEDs are disabled, they will still function throughout the power-up adaptation period and as trouble and memory indicators (HUNTER VdS).

Table 3. *LED Displays*

State of RED LED	State of GREEN LED	Interpretation
Flashing	Flashing	Adaptation period (about 40 s) upon power up.
OFF	OFF	Ready to detect. There are presently no alarm/trouble events **(both models)** or memorized events **(HUNTER VdS).**
ON (2-3 s)	N/A	Motion is being detected.
N/A	Flashing	Masking or internal failure state **(both models)**; masking or internal failure occurred earlier **(HUNTER VdS).**
ON - steadily (**HUNTER VdS**)	N/A	Alarm memory - an alarm occurred during the recent arming period.
N/A	ON - steadily (**HUNTER VdS**)	Trouble memory - masking or circuit trouble occurred during the recent arming period.

4.3 Resetting after Trouble

A. HUNTER

Flashing of the green LED indicates that masking or internal circuit trouble are being sensed. While the green LED flashes, the TRB relay contacts are open.

To determine the cause for trouble, you must first check for masking.

- Foreign material may be glued to the lens or sprayed on it.
- An object may have been placed less than 0.5 m (1.5 ft) away from the detector.

Note: *Erratic behavior of the detector may result from partial masking - check the lens very carefully.*

Remove masking if found. This should reset both the green LED and the TRB relay. If there is no masking, the trouble is probably due to internal circuit trouble. The only remedy for this is replacing the detector unit.

B. HUNTER VdS (in the disarmed state)

Resetting of the HUNTER VdS is achieved only by successful walk testing (3 times):

(1) Switch the detector into the walk test mode by applying the required voltage to the T terminal (see Para. 3.6).

(2) Carry out a short walk test at the far end of the coverage pattern, causing the detector to alarm at least 3 times. The green LED should stop flashing and the TRB relay should pull in (it must revert to the original normally closed state).

(3) If the green LED stops flashing, exit the walk-test mode by applying the required voltage to the "T" terminal.

(4) If the green LED continues flashing, recheck for masking. With no masking, the trouble is probably due to internal circuit malfunction - replace the defective detector unit.

4.4 Testing procedure

A. Set SW-2 to ON, or leave it OFF but apply the "test enable" voltage to the "T" terminal. Remount the detector's cover.

B. Power up the system. The red and green LEDs will flash alternately, indicating that the detector is adapting itself to its environment. Wait for the 40-second startup period to end - both LEDs should extinguish.

C. Perform these steps exclusively with the HUNTER VdS:

- Arm the control panel, thereby enabling the detector's alarm memory via the **S** terminal.
- Enter the detector's coverage area and verify that the control panel's associated zone alarms when your motion is detected. The detector provides no visual indication of detection - both LEDs are automatically disabled upon arming.
- Disarm the control panel. The detector's red LED should now light steadily, indicating that an alarm occurred while the system was in the armed state.
- Arm the control panel and immediately disarm it. This will erase the alarm memory (the red LED extinguishes).
- Make sure that the "test enable" voltage is applied to the "T" terminal.

D. Enter the detector's field of view and walk test the entire coverage area, while observing the red LED. The LED will light for 2-3 seconds each time your motion is detected.

E. Tape a piece of cardboard to the detector's front to deliberately mask the lens. 30 seconds later, the green LED should start flashing, and the trouble zone of the control panel should go into alarm (the TRB relay drops out).

HUNTER VdS Note: *The detector's alarm relay contacts open automatically upon detection of masking. The burglar zone to which the detector is connected will therefore be in the "not ready" state.*

F. Remove the masking from the detector's front. Each model responds differently:

HUNTER: The green LED should extinguish (after a few seconds).

HUNTER VdS: The green LED should continue flashing, indicating that a masking event occurred during the "disarm" period. However, the burglar zone should revert to the "ready" state a few seconds after removal of the cause for masking.

G. HUNTER VdS: Reset the detector to normal operation by walk testing the coverage area again, causing the detector to alarm at least 3 times. The green LED should now extinguish.

H. Apply the desired voltage to the "T" terminal, or set SW-2 as desired to enable/disable the LEDs. The detector is ready.

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