MODEL HAA51

PASSIVE INFRARED INTRUSION DETECTOR

PASSIVE INFRAROOD DETECTOR

DETECTEUR D’INTRUSION PASSIF INFRAROUGE
INTRODUCTION

HAA51 Passive Infrared Intruder Detector is designed for indoor use in advanced residential and commercial security systems. It detects the movement caused by a human target moving across the detection field. The detector employs many features that are only available in the most advanced intrusion detectors.

HAA51 is designed with the most up-to-date electronic circuitry for high performance and reliability. It employs a dual-element, pyroelectric sensor incorporating a "daylight" filter designed to provide immunity from common-mode signals such as the effect of strong hot or cold air currents, variations in ambient temperature, background radiation and acoustic noise. The dual-element sensor provides substantial immunity to false alarms. The HAA51 also employs a pulse-count triggering circuit which provides further improvement in this respect. HAA51 can also be selected for single-shot triggering.

HAA51 is designed to be surface mounted or corner mounted on a wall at the height of 2m above the floor. It provides the illustrated protection pattern without calibration or adjustment.

THE CASE ASSEMBLY

THE PRINTED CIRCUIT BOARD

Fresnel Lens - an optical system for focusing the infrared radiation on the heat sensitive elements of the sensor.

Alarm/Walk Test Indicator - It lights up for approximately 2 seconds whenever movement is detected.

Knock-Outs - Entry holes for running connection wires in and out.

Mounting holes - Prepared for fixing the unit to the wall.

PCB Support Post - For supporting and fixing the printed circuit board firmly in the case.

Locator - For convenient observation of the detection zones.

Sensor - The infrared signal detection device. DO NOT TOUCH.
* LED Function Mode Selector -
This selector consists of a 4-pin connector and a jumper which can be inserted between 2 pins, enabling 3 operational modes:

a. OFF - Link pins 1 and 2 with jumper. -
This mode can be used to disable the ALARM/WALK test LED and LOCATOR LED after all testing is completed in order to prevent unauthorised persons from tracing the protection area.

b. ZONE - Link pins 2 and 3 with jumper. -
This mode is used for locating the beam. The locator LED lights continuously to enable convenient observation of the detection zones.

c. ALARM - Link pins 3 and 4 with jumper. -
This mode is used for ALARM/WALK testing. The ALARM/WALK indicator lights up whenever movement is detected.

NOTE: Factory setting in for the ALARM mode.

* Triggering Mode Selector
The detector can be selected for single-shot triggering or pulse-count triggering. This selector consists of a 3-pin connector and a jumper which can be inserted between 2 pins, enabling the 2 operational modes:

a. Single Shot - Link pins 1 and 2 with jumper. -
Single-shot trigger mode makes the detector go immediately into the alarm condition whenever an intruder moves in or out of the detection zone. The detection circuit requires 1 pulse to activate it. It is recommended to use single-shot operation for narrow corridor protection.

b. Pulse Count - Link pins 2 and 3 with jumper.
Pulse-count trigger mode further improves immunity against false alarms. The circuit first senses an alarm (pulse 1) and then goes into alarm stand-by mode for 30 seconds. If during the 30 second stand-by period a second alarm event occurs (pulse 2), the detector immediately goes into alarm mode and the stand-by period will be extended for another 30 seconds. If there is no second alarm pulse during the 30 second stand-by mode, the detector returns to normal condition.

NOTE: Factory setting for pulse-count operation.

* Tamper Switch 
Protects the unit from tampering. The contact of the switch is normally closed when the cover is closed; and is connected to the "TAMPER" terminals of the terminal block.

* Reed Relay
This is a silent relay with its contact connected to the "ALARM" terminals. The contact is normally closed (fail safe) and will open when an intruder is detected or during power loss.

* Terminal Block
For connecting wires to the sensor.
WIRING

TAMPER
Connect the "TAMPER" terminals to a normally closed 24-hour protection area of the control panel. The tamper contact will open when the cover is removed.

12V DC
Connect the 12V DC terminals to a power source of 8-16VDC, making sure that they are connected with the correct polarity.

ALARM
Connect the "ALARM" terminals to a normally closed burglar protection zone of the control panel. The contact will open when an intruder is detected or during power loss.

TEST POINT (T.P.)
The T.P. is an auxiliary terminal which provides a useful means for the technician to analyse the detector in the event of an environment problem or a suspected faulty detector. Connect a DC voltmeter (with minimum input impedance of 20KOhm/V) with its positive lead to the T.P. terminal and the negative lead to the (-) 12V DC terminal as shown in the following diagram.

The meter should read approximately 2.7V DC when no movement is detected. Any movement into or out of the detection zone will cause the meter to deflect above or below the 2.7 volt level. Any meter variation of +/- 1V will be considered as one pulse which will trigger an alarm output when the detector is in single-shot operation. If pulse-count operation is selected, the detector will require a second pulse within 30 seconds after of the end of the first pulse for the alarm to be triggered.

Using this feature during installation, the alarm contactor can learn of potential false-alarm problems before permanent fitting of the detector.
The detector can be surface mounted or corner mounted. Always mount the unit on a sturdy surface.

* The detector should be mounted indoors, in areas that do not have openings constantly exposed to the outside environment.
* Select the mounting location so that the expected movement of an intruder will cross the detection beams.
* Do not locate detectors where hot or cold moving air will blow directly onto the unit.
* Avoid aiming the detector at heating or air conditioning vents or ducts, exterior metal walls, exterior windows or curtains covering windows, refrigerator or freezer grills or any other surface that may change temperature rapidly.
* Avoid putting large objects in front of the detector which will cause significant changes in the area or volume protected.
* Select a location that the detector can provide the largest coverage.

The installation location in figure A gives a larger protection area.
INSTALLATION

a. Open the cover by inserting a small screwdriver into the edge of the unit and turn clockwise or anti-clockwise slightly to release the cover from the back plate.

b. Remove the Printed Circuit Board carefully by releasing the two fixing screws from the PCB support post.

CAUTION: DO NOT DROP OR DAMAGE THE PCB ASSEMBLY.

c. Numerous "knockouts" are provided on the back plate. Select the one which will provide the best location for feeding cables through.

d. Select a location 2 m above the floor for mounting the back plate.

e. The two fixing holes on the back of the back plate are for surface mounting. The two fixing holes on the left and right of the back plate are for corner mounting.

Fix the back plate firmly on the wall by using the two screws supplied.

f. Put the PCB back into the back plate and fix it firmly.

g. Connect the wires to the terminal block.

h. Clip the front cover back in place on the back plate.

CAUTION: BE SURE TO FIT THE ALARM/WALK TEST LED INDICATOR INTO THE INDICATOR HOLE AND KEEP THE HINGED LEVER OF THE TAMPER MICRO-SWITCH PRESSED WHEN CLIPPING THE FRONT COVER.

TESTING

a. Set the LED selector to "ALARM" for testing purposes and replace the cover.

b. Apply 12V DC power and allow 3-5 minutes for the detector to warm up and stabilise before testing.

c. Walk into the protected area at a speed of 1 step per second, across the protection beams, and watch the LED. The LED will light up whenever you enter or exit a protection beam if the detector is set to single-shot operation.

You may need to take 3 to 4 steps for the first alarm trigger and for the LED to light up if the detector is set to pulse-count operation.

The detector converts to single-shot operation (stand-by mode) for 30 seconds after the first trigger. The LED will light up whenever you enter or exit a protection beam area. The single-shot operation will be extended for 30 seconds after each trigger, but if there is no trigger during this 30 second period, the detector will return to normal pulse-count operation.

d. If proper detection does not occur during the walk tests, relocating or re-aiming the detector may be required.
I. Alarm/Walk test LED does not light when unit is walk-tested:
   a. No power to detector
      - Check cable, connection and power source.
   b. LED selector not set to "ALARM"
      - Check jumper position.
   c. Not walking into detection pattern
      - Check location of zones using pattern locator and re-test.
   d. Background temperature equal or close to body temperature
      - Reduced range can be expected when background and body temperature come close
        or are equal to each other.
   e. Defective unit
      - Replace the circuit board.

II. Alarm/Walk test LED lit continuously:
   a. The detector is seeing changing levels of infrared energy
      - Clear area of all people and pets.
      - If LED remains lit, cover detector with heavy paper and wait 1 to 2 minutes.
        If LED extinguishes, check each detection zone to locate source of energy.
   b. Defective unit
      - If LED remains lit after detector has been covered with heavy paper, replace circuit
        board.

III. Detector randomly alarms:
   a. Power source being interrupted
      - Check wiring and connection.
   b. Cover not properly secured or excessive mounting surface vibration
      - Make sure that the cover is firmly in position and that the detector is free from
        vibrations.
   c. The detector is seeing changing levels of infrared energy
      - Switch all known sources, such as heaters, lights, air conditioning vents, etc.
        See precautions listed in the section "Selecting mounting location".
### SPECIFICATIONS

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<th>Specification</th>
<th>Details</th>
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<tr>
<td>Detection pattern:</td>
<td>84.2° beam, 12m range.</td>
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<td>Detection zones:</td>
<td>24 dual-element zones in 3 layers.</td>
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<td>LED indicators:</td>
<td>One pattern locator, one Walk/Alarm test indicator. (3-mode operation</td>
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<tr>
<td></td>
<td>selectable, factory preset to ALARM/WALK position)</td>
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<tr>
<td>Mounting height:</td>
<td>2m above floor, 13.96° angle of tilt on back-plate, no height</td>
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<td></td>
<td>adjustment required in installation.</td>
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<td>Mounting location:</td>
<td>Indoors only; flat surface or corner mounting.</td>
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<td>Operating voltage:</td>
<td>10.5-16V DC.</td>
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<td>Quiescent current:</td>
<td>12mA typical.</td>
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<td>Sensor:</td>
<td>Dual-element pyroelectric sensor with day-light filter.</td>
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<td>Triggering mode:</td>
<td>Pulse-count or single-shot selectable. (Factory preset for pulse count)</td>
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<td>Alarm output:</td>
<td>Normally closed (fail safe) contacts, 0.5A/24V rating.</td>
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<td>Alarm delay:</td>
<td>2 seconds typical.</td>
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<td>Tamper contact:</td>
<td>Normally closed when depressed, 0.5A/24V rating.</td>
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<td>Test output:</td>
<td>Test point analysis.</td>
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**SPECIFICATIONS ARE SUBJECT TO MODIFICATIONS WITHOUT NOTICE**