

# ADEMCO

# INSTALLATION INSTRUCTIONS

## Nos. 1990 and 1992 PASSIVE INFRARED MOTION DETECTORS

N4673-1D1 8/90

### GENERAL INFORMATION

These passive infrared motion detectors are versatile wall-mounted units employing Fresnel lenses and offering efficient protection patterns for commercial and residential applications. The detectors sense sudden and slight changes in temperature within the area of detection; thus, when an intruder crosses or enters any zone, the resulting change in infrared energy is detected for alarm reporting. Best coverage will be obtained if mounting is selected such that the likely direction of intruder motion is across the pattern. The No. 1990 is a Dual unit, with 2 fields of view in each zone; the No. 1992 is a Quad unit, with 4 fields of view in each zone (see figure 1).

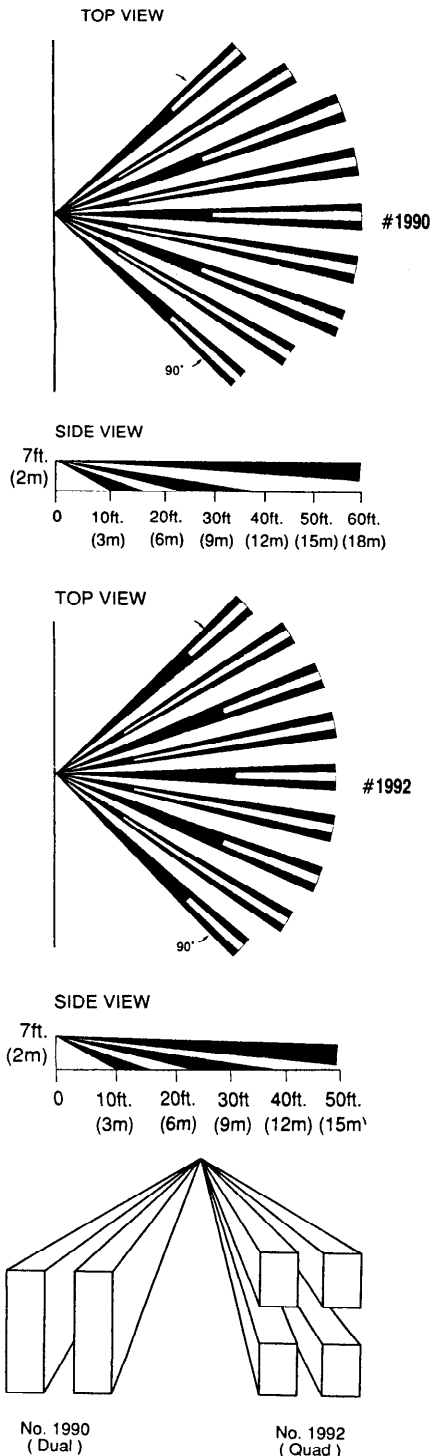


Figure 1: Nos. 1990 & 1992 PROTECTION PATTERNS

### INSTALLATION HINTS

- Do not install where the detector is exposed to direct sunlight or directly above strong sources of heat.
  - Make sure the detection area does not have obstructions (curtains, screens, large pieces of furniture, plants, etc.) which may block the pattern of coverage.
  - Avoid locating a unit in areas which contain objects likely to produce a rapid change in temperature, such as central heating, radiators or ducts (or heaters of any kind), air conditioners, open flame, etc.
  - Do not mount on an unstable surface.
- Important:** Avoid running alarm wiring close to heavy-duty electrical power cables.

### INSTALLATION

#### A. Normal Mounting:

- Mount the unit to a firm vertical surface (flat on wall or in corner). The wall wiring hole should be no more than 5/16" (8mm) diameter.
- Remove the front cover as shown in Figure 2.
- Remove the screw holding the PC board in the detector base (the screw is located at the center of the board) and temporarily remove the board (handle PC board carefully).
- Refer to Figure 3. Knockout holes in the base are available for normal surface mounting on a wall (holes "A"), or for corner mounting (holes "B"). Break out only those mounting holes required.
- Feed wiring emerging from the wall through the wire access slot at the bottom of the detector base. Make sure wires have sufficient slack to allow the PC board to slide up and down freely when the wires are subsequently connected to the terminals on the board. Then mount the base.
- Re-install the PC board (with terminal block closest to the wiring access slot in the base). Before fully tightening the holding screw, make sure the board is positioned so that the arrow is in line with the appropriate setting on the graduated scale (see Table 1, and Figure 5).
- Refer to **WIRING CONNECTIONS** before replacing the front cover.

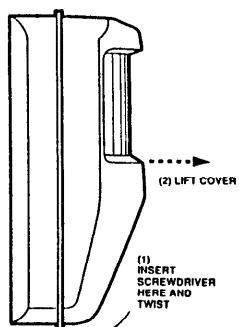


Figure 2: COVER REMOVAL

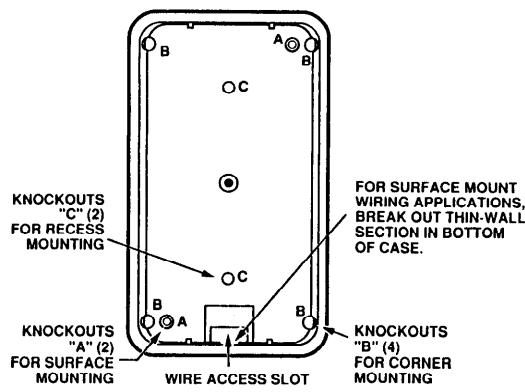


Figure 3: DETECTOR BASE

#### B. Recess Mounting

Recessed mounting requires the use of the optional No. 1990MK Recess Mounting Kit. Complete instructions for the use of this kit accompany it. **Note:** Holes "C" in the detector base are used for recessed mounting.

#### C. Changing Lenses (if required)

- Remove front cover by inserting a screwdriver blade (or small coin) in the groove between cover and base at the location shown in Figure 2, rotating blade to override snap fit, and then lifting cover off.
  - Squeeze upper lens lock located in front cover to release upper Fresnel lens support. Squeeze lower lens lock to release lower Fresnel lens support (see Figure 4).
  - Note how the lens supports are positioned, then remove the supports.
  - Carefully remove the existing lens and replace with an optional coverage replacement lens. *The lens must be installed with the smooth side facing outward.* Also, the lens should be oriented with its part number on the upper right-hand side (see Figure 4). Be sure to center the lens.
  - Replace top and bottom lens supports and then press downward so that the lens locks snap into position, thus securing the lens in place.
- NOTE:** Lens surface should be free of dirt, foreign matter and finger-prints. Use a clean dry soft cloth to wipe lens surfaces, if required.
- Refer to Table 1 for recommended PIR mounting height, sensitivity, pulse count settings, and pattern setting for the lens in use.
  - Replace the front cover (make sure the cover snaps tightly).

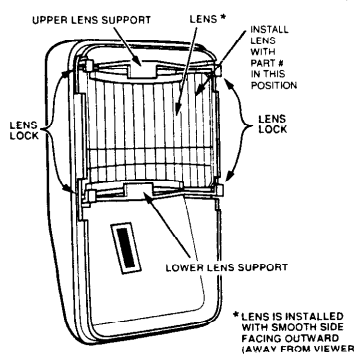


Figure 4: CHANGING LENSES

#### D. Horizontal Adjustment of Lens

The protection pattern provided by the lens in use can be moved to the left or right by horizontal adjustment of the lens, as follows:

- Remove front cover.
- Press inward on the upper and lower lens locks at the left or right side only to release the lens supports on one side. Now slide the lens to the left or right, as needed. The lens may be moved as much as 8" (from center) in either direction.
- When the lens is in the desired position, press the lens locks downward (on the released side) to lock the supports in place.
- Replace the front cover (make sure the cover snaps tightly).

After any adjustment, you must conduct a walk test to ensure proper coverage of the area to be protected, as indicated under "Test Procedures".

#### E. Vertical Pattern Adjustment

The protection pattern provided by the lens in use can be raised or lowered by re-positioning the PC board in the detector. A graduated scale to the left of the board (see Figure 5) indicates the approximate number of degrees by which the pattern can be raised (max. +10°) or lowered (max. -20°). The detector is normally shipped with the board set to the 0° position. To make this adjustment, remove the cover on the detector and loosen the screw holding the PC board (the screw is located at the approximate center of the board). Slide the board upward or downward by the number of degrees required, then tighten the holding screw again. After any adjustment, you must conduct a walk test to ensure proper coverage of the area to be protected, as indicated under "Test Procedures".

#### F. Lens Masking

The masking strips that have been supplied are designed for application to one or more lens segments to produce a protection pattern that suits the particular requirements of the protected area. Individual masking strips have been provided for each of the lens segments on the standard lens supplied with the PIR. Simply peel off the appropriate pressure-sensitive adhesive strip(s) and apply over the desired lens segment(s). Be sure to affix the masking strips to the *inside* of the lens (not the outer, smooth side). Each lens segment that is masked results in the elimination of one zone of protection from the coverage pattern. By masking segments of the lens, you can adjust the coverage to suit the area to be protected, or eliminate coverage from areas where you anticipate environmental disturbances that might reduce the PIR's stability (a heater or other heat-producing object for example).

**IMPORTANT:** When hallway pattern masking is used, be sure the PIR is set for single event pulse count (instant response).

#### WIRING CONNECTIONS

Bring all wires in through the wire access slot near the terminal block and connect to the screw terminals (see Figure 5 for wiring details). Seal all openings in the base with foam or RTV (not supplied) to prevent drafts or insects from entering the unit. *Apply power only after all connections have been made and are inspected.*

#### PULSE COUNT OPTION

Each detector includes Pulse Count circuitry that is designed to provide stability in adverse environments to minimize false alarms. Selectable 1-, 2-, or 3-event pulse count is provided by positioning a jumper across the appropriate pulse count terminals shown in Figure 5. When programmed for 2- or 3-event pulse count, the detector will signal an alarm within 3 or 4 steps, since the processing logic requires more complex motion than just a momentary event. When the detector verifies an intrusion, the LED (which serves as an alarm indicator) will light and the alarm relay contacts will transfer, both conditions lasting for approximately 1 to 3 seconds (dependent upon signal strength).

#### LED DISABLE

The detector is shipped with the Alarm LED enabled (LED CTRL jumper in the "ON" position). If desired, the LED may be disabled (after the "Walk-Test" is complete) by positioning the LED CTRL jumper in the "OFF" position (see Figure 5). When the jumper is in the "OFF" position, the LED will not illuminate, but the relay will transfer to report alarms when the PIR senses motion.

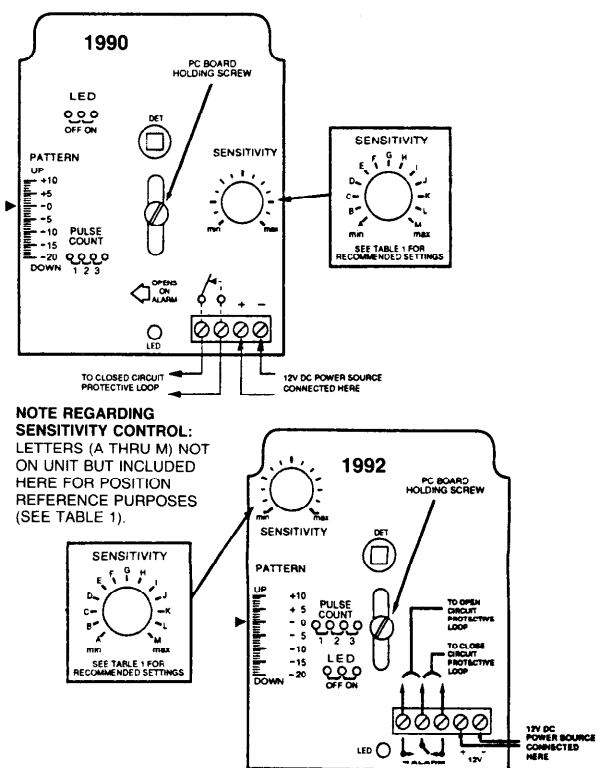


Figure 5: PC BOARDS, Nos. 1990 and 1992

### INTERCHANGEABLE OPTIONAL LENSES

In addition to the standard lens supplied with Nos. 1990 and 1992, several optional lenses are available which may be used with these PIRs to provide a variety of protection patterns. Information for these optional lenses is provided in Table 1. Refer to **C. Changing Lenses** in this document if one of the optional lenses is being installed in place of the standard lens.

Lenses currently available from Visonic for its SRN2000 may also be used with this PIR. The sensitivity and pulse count settings used with these lenses will have to be determined by the installer during the walk test of the unit. If Visonic lenses are used, they must be installed with smooth side in (grooves outward).

**NOTE:** Visonic lenses are not UL Listed for use with Nos. 1990 and 1992.

### TEST PROCEDURES

**Important:** Two-minute warm-up time is required after applying power. Testing should be conducted with the protected area cleared of all people. Disarm the protective system's control during the test procedure to prevent reporting of unwanted alarms.

#### Walk-Test:

- Remove front cover and set the Pulse Count jumper in the detector in the single-event (instant response) mode. The Alarm LED must be enabled at this time.
  - Replace front cover and walk through protective zones, observing that the detector's LED lights whenever motion is detected (the LED serves as a Walk-Test indicator during this procedure).
- NOTE:** In the single-event pulse mode, the LED stays lit (and the alarm relay contacts remain open) for approximately 1 to 3 seconds after detecting motion.
- If pulse count is to be used in this application, set the pulse count jumper to the desired pulse count setting and repeat the walk test procedure. In 2- or 3-event pulse count, the LED serves as an alarm indicator.

The absolute range of all PIR units is subject to variation because of different types of clothing, backgrounds and ambient temperature. For this reason, ensure that the most likely intruder routes are well within the PIR's protective zones and that walk-testing is carried out along these routes. After the "Walk-Test" is complete, the LED may be disabled.

### MAINTAINING PROPER OPERATION:

In order to maintain the detector in proper working condition, it is important that the following be observed by the user.

- Power should be provided at all times. Loss of power to the unit will result in the alarm contacts reverting to an alarm state. The unit's DC source should have standby power available for at least 4 hours of operation during emergencies.
- Units should never be re-aimed or relocated without the advice or assistance of the alarm service company.
- The physical surroundings of the protected area should not be changed. If furniture or stock is moved, or air-conditioning or additional heating is installed, the system may have to be readjusted by the alarm service company.
- Walk-tests should be conducted frequently (at least weekly) to confirm continued proper coverage by each detector.

### TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
Intermittent Alarm (LED operative)	Rapid temperature change. Check for electric or gas heaters, open flames, electric arcs, etc.	Locate source and reposition detector.
	Drafts causing drapes, light fixtures, display material to move.	Eliminate source of motion.
Intermittent or Continuous Alarm	DC voltage supplied to detector is inadequate, intermittent, or polarity reversed.	Ensure that proper polarity and adequate voltage is supplied and that wiring is intact (no opens or shorts) and connection secure.
	Protective loop is interrupted (open).	Determine whether interruption is in protective loop wiring or at detector's alarm relay contacts. Disconnect protective loop at detector relay contact terminals and check continuity across terminals. If absent at detector terminals (and proper voltage is supplied to the detector), return unit for service. If present, check protective loop wiring.
LED Inoperative	LED control jumper set to OFF.	Reposition jumper to ON position.
	LED malfunction. Check for broken/shorted leads.	Return unit for service.
Detection Area Changes	Repositioned furniture or equipment in the protected area.	Caution customer about layout changes. Reposition detector.
	Mounting surface is unstable. A few degrees of vertical shift can change range substantially.	Mount on secure surface.
Control Panel Indicates Continuous Fault in Zone or Protection Containing 1990s (PIR'S Alarm LED Not Lit)	Too many No. 1990 detectors being used in the zone. Each detector adds 22 ohms of series resistance and the zone's allowable loop resistance is being exceeded.	Reduce the number of detectors used in the zone until the series resistance is within the allowable loop resistance permitted by the control.

**TO THE INSTALLER**

Regular maintenance and inspection (at least annually) by the installer and frequent testing by the user are vital to continuous satisfactory operation of any alarm system.

The installer should assume the responsibility of developing and offering a regular maintenance program to the user, as well as acquainting the user with the proper operation and limitations of the alarm system and its component parts. Recommendations must be included for a specific program of frequent testing (at least weekly) to insure the system's operation at all times.

**SPECIFICATIONS**

**Detection Method:** Passive Infrared.  
**Coverage:** No. 1990 (Dual) No. 1992 (Quad)  
 (with standard 60 ft x 60 ft, 90° Fresnel Lens) (18.3m x 18.3m) (15.2m x 18.3m)  
 For interchangeable optional Fresnel lenses, see Table 1.  
**Detection Zones:** 18 zones (9 long, 5 intermediate, and 4 short range)  
**Pulse Count:** Installer-selectable, 1-, 2-, or 3-event.  
**Detectable Walk Rate:** 0.5 - 5ft/sec (.15 - 1.5m/sec).  
**Mounting Height:** 7ft nominal (2.1m)  
**Indicator:** Red LED with enable/disable link.  
**Alarm Relay:** No. 1990 No. 1992  
 Form A, N.C., Form C, SPDT,  
 0.13A max. contact 1A@ 30V DC rating @ 28V DC.  
 22-ohm internal; resistor in series.  
**Input Voltage:** 12 VDC nominal (voltage reversal makes PIR inoperative).  
**Current Drain:** 15 mA.  
**Standby Capability:** Power source should be capable of at least 4 hours of battery standby.  
**Operating Temperature:** No. 1990 No. 1992  
 32°F - 122°F 14°F - 122°F  
 (0°F - 50°C) (-10°C - 50°C)  
**Operating Humidity:** Up to 95% RH (max.), non-condensing.\*  
**Dimensions:** 2-1/16"W x 4-3/4"H x 1-7/8"D; (68mm x 120mm x 48mm).  
 \*UL tested to 85% RH.

**THE LIMITATIONS OF YOUR PASSIVE INFRARED MOTION DETECTOR**

While the Intrusion Detector is a highly reliable intrusion detection device, it does not offer guaranteed protection against burglary. Any Intrusion Detection device is subject to compromise or failure to warn for a variety of reasons:

- Passive Infrared Motion Detectors can only detect intrusion within the designed ranges as diagrammed in this installation manual.
- Passive Infrared Motion Detectors do not provide volumetric area protection. They do create multiple beams of protection, and intrusion can only be detected in unobstructed areas covered by those beams.
- Passive Infrared Detectors cannot detect motion or intrusion that takes place behind walls, ceilings, floors, closed doors, glass partitions, glass doors, or windows.
- Mechanical tampering, masking, painting or spraying of any material on the lenses, windows or any part of the optical system can reduce the detection ability of the Passive Infrared Motion Detector.
- Passive Infrared Detectors sense changes in temperature; however, as the ambient temperature of the protected area approaches the temperature range of 90° to 105°F (32° to 40° C), the detection performance can decrease.
- This Passive Infrared Detector will not operate without appropriate DC power connected to it, or if the DC power is improperly connected (i.e., reversed polarity connections).
- Passive Infrared Detectors, like other electrical devices, are subject to component failure. Even though this equipment is designed to last as long as 10 years, the electronic components in it could fail at any time.

We have cited some of the most common reasons that a Passive Infrared Motion Detector can fail to catch intrusion. However, this does not imply that these are the only reasons, and therefore it is recommended that weekly testing of this type of unit, in conjunction with weekly testing of the entire alarm system, be performed to ensure that the detectors are working properly.

Installing an alarm system may make the owner eligible for lower insurance rates, but an alarm system is not a substitute for insurance. Homeowners, property owners and renters should continue to act prudently in protecting themselves and continue to insure their lives and property.

We continue to develop new and improved protection devices. Users of alarm systems owe it to themselves and their loved ones to learn about these developments.

**LIMITED WARRANTY**

Alarm Device Manufacturing Company, a Division of Pittway Corporation, and its divisions, subsidiaries and affiliates ("Seller"), 165 Eileen Way, Syosset, New York 11791, warrants its products to be in conformance with its own plans and specifications and to be free from defects in materials and workmanship under normal use and service for 18 months from the date stamp control on the product or, for products not having an Ademco date stamp, for 12 months from date of original purchase unless installation instructions or catalog sets forth a shorter period, in which case the shorter period shall apply. Seller's obligation shall be limited to repairing or replacing, at its option, free of charge for materials or labor, any part which is proved not in compliance with Seller's specifications or proves defective in materials or workmanship under normal use and service. Seller shall have no obligation under this Limited Warranty or otherwise if the product is altered or improperly repaired or serviced by anyone other than the Ademco factory service. For warranty service, return product transportation prepaid, to Ademco Factory Service, 165 Eileen Way, Syosset, New York 11791.

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Seller does not represent that its product may not be compromised or circumvented; that the product will prevent any personal injury or property loss by burglary, robbery, fire or otherwise; or that the product will in all cases provide adequate warning or protection. Buyer understands that a properly installed and maintained alarm may only reduce the risk of a burglary, robbery or fire without warning, but it is not insurance or a guarantee that such will not occur or that there will be no personal injury or property loss as a result. CONSEQUENTLY, SELLER SHALL HAVE NO LIABILITY FOR ANY PERSONAL INJURY, PROPERTY DAMAGE OR OTHER LOSS BASED ON A CLAIM THE PRODUCT FAILED TO GIVE WARNING. However, if Seller is held liable, whether directly or indirectly, for any loss or damage arising under this Limited Warranty or otherwise, regardless of cause or origin, Seller's maximum liability shall not in any case exceed the purchase price of the product, which shall be the complete and exclusive remedy against Seller. This warranty replaces any previous warranties and is the only warranty made by Seller on this product. No increase or alteration, written or verbal, of the obligation of this Limited Warranty is authorized.

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**TABLE 1. Installation Guide For Fresnel Lenses**

Part No.	Description/Coverage	Pulse Count Setting	Recommended Mounting Height (Ft) (See Note Below)	Recommended Sensitivity Setting*	Pattern Setting (Deg)†	Correction (in °) per Ft if not mounted at Recommended Height (Pattern Up or Down)‡	
						Mounting Height	Pattern Correction
	Δ STANDARD WIDE ANGLE LENS 60' x 60' (1990) (18M x 18M) 50' x 60' (1992) (15M x 18M)	2 - 3**	7 (2.1M)	D (D) G (Q)	-5° (D) -6° (Q)	Higher: Lower:	Down 1°/ft (1°/30cm) Up 1°/ft (1°/30cm)
— OPTIONAL FRESNEL LENSES —							
Δ 199PA	PET ALLEY LENS 60' x 90' (1990) (18M x 27M) 50' x 70' (1992) (15M x 21.3M)	2 - 3**	3 - 3.5 (0.9M - 1.1M)	D (D) G (Q)	+2° (D) 0° (Q)	Higher: Lower:	Down 1°/ft (1°/30cm) Up 1°/ft (1°/30cm)
Δ 199LR	LONG RANGE LENS 120' x 12' (36.5M x 3.6M) (1990 & 1992)	1 - 2***	6 (1.8M)	D (D) G (Q)	-3° (D) -2.5° (Q)	Higher: Lower:	Down .5°/ft (0.5°/30cm) Up .5°/ft (0.5°/30cm)
199HL	HALLWAY (LEFT) & ROOM 70' x 70' (1990) (21.3M x 21.3M) 70' x 60' (1992) (21.3M x 18.3M)	1 - 2***	7 (2.2M)	D (D) G (Q)	-3° (D) -4° (Q)	Higher: Lower:	Down 1°/ft (1°/30cm) Up 1°/ft (1°/30cm)
199HR	HALLWAY (RIGHT) & ROOM 70' x 70' (1990) (21.3M x 21.3M) 70' x 60' (1992) (21.3M x 18.3M)	1 - 2***	7 (2.2M)	D (D) G (Q)	-3° (D) -4° (Q)	Higher: Lower:	Down 1°/ft (1°/30cm) Up 1°/ft (1°/30cm)
199H2R	HALLWAY & 2 ROOMS 80' x 70' (1990) (24.3M x 21.3M) 75' x 65' (1992) (23M x 20M)	1 - 2***	7 (2.2M)	D (D) G (Q)	-3° (D) -3.5° (Q)	Higher: Lower:	Down .75°/ft (0.75°/30cm) Up .75°/ft (0.75°/30cm)
199WD	SUPER WIDE LENS 50' x 90' (1990) (15.2M x 27M) 45' x 80' (1992) (13.7M x 24.3M)	2 - 3**	7 (2.2M)	D (D) G (Q)	-5° (D) -5° (Q)	Higher: Lower:	Down 1°/ft (1°/30cm) Up 1°/ft (1°/30cm)

**NOTE:** A mounting height greater than 12 Ft. is not recommended.

(D) = Dual (1990); (Q) = Quad (1992)

† See Figure 5 for location of adjustment scale on PC board (refer also to "E. Vertical Pattern Adjustment")

\* The sensitivity settings may be reduced from those recommended above to eliminate potential sources of false alarms that cannot be corrected by lens masking or PIR positioning. To reduce sensitivity, rotate sensitivity control counter-clockwise. However, settings may be reduced (from those recommended) only when the PIR is used in a temperature-controlled environment where the temperature does not exceed 75°F (24°C). If the PIR is to operate in high ambient temperatures, the sensitivity control may be increased (clockwise rotation) as required. **The protected area must always be walk-tested after any sensitivity adjustment is made.**

\*\* The 3-event pulse count setting provides maximum protection against false alarms caused by environmental disturbances. It may be programmed for wide angle lens applications only when range of the protected area is no greater than 30 ft (approx. 9m).

\*\*\* Normally set for 1-event pulse count. 2-event pulse count setting may be used if you are assured that the intruder path will cross left and right fields of view on the long range protective zone.

Δ Nos. 1990 and 1992 are UL Listed for use with these lenses only.

**Example of the use of Table 1:**

Lens 199PA is installed in No. 1990 which is mounted at a height of 4.5 feet (1 ft higher than recommended). From Table 1, settings for No. 1990 (D) are as follows: Pulse Count setting is 2 or 3, Sensitivity setting is position D, Pattern setting is +1° (down 1° from +2° shown for recommended height of 3.5 ft).

**PROTECTION PATTERNS FOR OPTIONAL LENSES**

