DS308EA

Security Systems

EN | Installation Guide
Quad PIR Detector

BOSCH

1.0 Specifications

Table 1: Specifications

Input Power	6.0 VDC to 15.0 VDC 25 mA @ 12.0 VDC
Standby Power	There is no internal standby battery. Connect unit to DC power sources capable of supplying standby power if primary power fails. For each hour of standby time needed, 25 mAh are required.
Coverage	Broad (standard): 15.3 m x 15.3 m (50 ft. x 50 ft.) Barrier (optional): 24.4 m by 5 m (80 ft. x 16 ft.) Long Range (optional): 36.6 m by 3.1 m (120 ft. x 10 ft.)
Sensitivity	Standard or Intermediate.
Alarm Relay	Form "C" (NC/C/NO) reed relay with contacts rated at 28 VDC, 125 mA maximum for DC resistive loads.
Tamper Switch	Normally Closed (with cover in place) tamper switch. Contacts rated at 28 VDC, 125 mA maximum.
Trouble Output	Normally Closed contact opens when the detector is in a trouble condition. The contact is rated for 125 mA @ 28 VDC.
Anti-Mask	Anti-Mask detection circuitry with Spray Detect option detects attempts to sabotage the detector and provides a trouble output.
Temperature	Storage and operating range is -29°C to +49°C (-20°F to 120°F) .
Options	B328 Gimbal Mount Bracket, B335 Low Profile Mount Bracket, B338 Ceiling Mount Bracket, TC6000 Test Cord, OMB77-3 Barrier Mirror, and OMLR77-3 Long Range Mirror.
Pointability	The mirror is adjustable from +1° to -17° vertically and ±10° horizontally.
Patents	This device is covered by one or more of the following U.S. patents: #4,764,755 and #5,083,106.

2.0 Quick Installation Guide

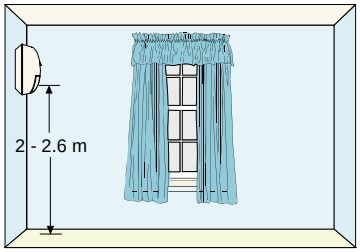
1. Mount the baseplate to the wall (see *Section 3.0 Mounting*).
2. Connect the wiring (see *Section 4.0 Wiring*).
3. Configure the DIP switches (see *Section 5.0 Configuration Switches*).
4. Adjust the mirror (see *Section 6.0 Mirror Alignment*).
5. Perform a Walk Test (see *Section 7.0 Walk Test*).

3.0 Mounting

3.1 Mounting Considerations

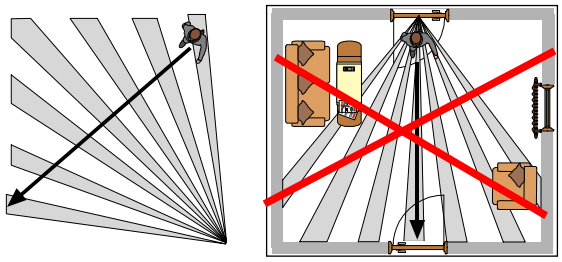
The recommended mounting height for mounting the detector is 2 m to 2.6 m (6.6 ft. to 8.5 ft.). See *Figure 1*.

Figure 1: Mounting Height



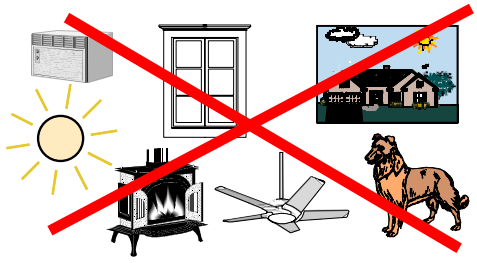
Select a location most likely to intercept an intruder moving **across** the coverage pattern (see *Figure 2*).

Figure 2: Coverage Pattern



Do not point the detector at air conditioning outlets, windows, direct heat sources or moving objects. Avoid hot and/or cold drafts, direct sunlight and small animals. Do not mount the detector outdoors (see *Figure 3*).

Figure 3: Improper Detector Positioning/Locations



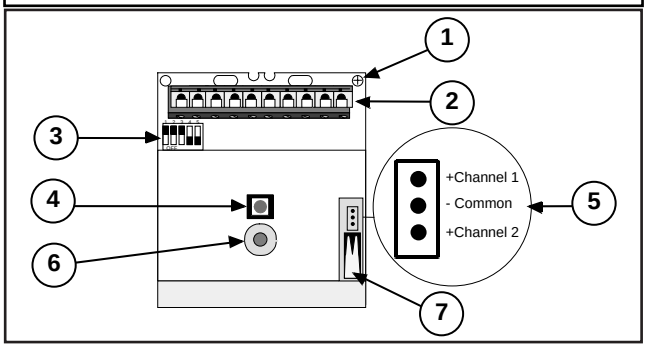
Observe the Keep Out Zone around the detector: **Do not mount** the unit within 60 cm (24 in.) of any moving object such as doors or curtains (see *Figure 14*).

The mounting surface should be solid and vibration free. This detector **does not** detect through glass.

3.2 Surface or Corner Mounting

1. Remove the cover. Insert a thin flathead screwdriver into the notch at the bottom of the cover and pry up.
2. Loosen the chassis (circuit board/mirror unit) screw (see *Figure 4*).

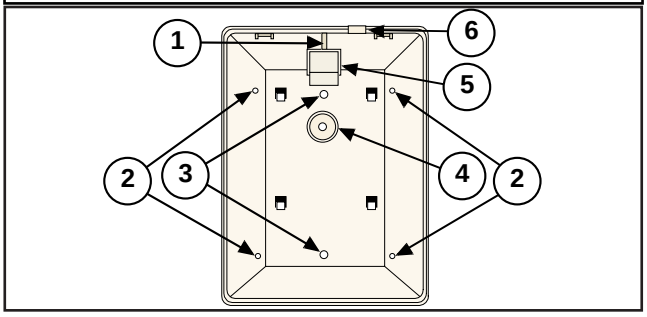
Figure 4: Circuit Board



1 - Chassis screw
2 - Terminal strip
3 - Configuration switches
4 - Anti-mask transmitter
5 - Noise voltage pins (behind metal flap)
6 - LED
7 - Cover tamper switch

3. Remove the chassis from the baseplate, pushing it towards the top of the enclosure until it clears the four retainer tabs. Then lift out.
4. Open two holes for surface or corner mounting in the baseplate (see *Figure 5*).

Figure 5: Mounting Holes in the Baseplate

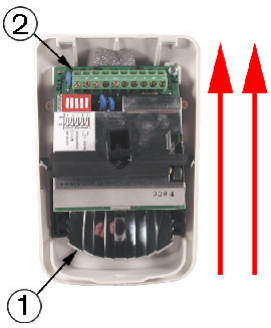


1 - Cable tie, strain relief
2 - Corner mounting holes
3 - Bracket mounting holes
4 - Bracket mounting hole
5 - Wire entrance
6 - Test cable opening

5. Using the enclosure as a template, mark the location for the mounting screws.
6. Mount the unit with the mirror at the bottom and the terminal strip at the top (see *Figure 6*).
7. Open the knockout wire entrance and route the wiring.
8. Securely attach the baseplate to the mounting surface.
9. Slide the chassis back onto the baseplate and secure with chassis screw.

For optional bracket mounting, refer to the installation instructions supplied with the bracket.

Figure 6: Mounting Orientation



1 - Mirror *2 - Terminal strip*

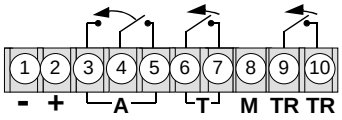
Misaligning the detector when using an optional mounting bracket can reduce the range.

4.0 Wiring

Only apply power after all connection are made and inspected.

Connect wiring as shown in *Figure 7*.

Figure 7: Terminal Connections



4.1 Terminal Descriptions

1 (-) and 2 (+) Input Power: Use no smaller than 0.80 mm wire pair.

3 Normally Open (NO), 4 Common (C), 5 Normally Closed (NC) Relay Contacts: Reed relay for silent operation. Contacts rated at 3 W, 125 mA, 28 VDC maximum for DC resistive loads and protected by a 4.7 Ω resistor in the common "C" leg of the relay. Do not use with capacitive or inductive loads.

6 and 7 Tamper Contact: Normally Closed (NC), rated 28 VDC, 125 mA.

8 Memory Input: Connect the (+) or (-) input for memory control. (See *Section 9.1 Memory, Day Mode, Night Mode, and Walk Test*).

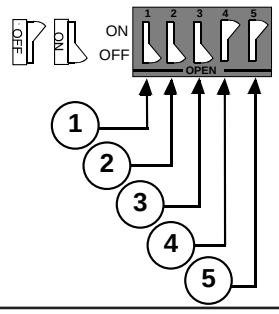
9 and 10 Trouble: Normally Closed (NC) trouble contact. Rated for 125 mA @ 28 VDC.

Seal the wire entrance with the foam plug provided.

5.0 Configuration Switches

Configure the detector using the appropriate switch settings (see *Figure 8*).

Figure 8: Configuration Switch Settings



1 ON = LED on; 1 OFF = LED off
2 ON = Standard; 2 OFF = Intermediate
3 ON = Spray detect on; 3 OFF = Spray detect off
4 ON and 5 ON = 30 day motion monitor and 25 seconds anti-mask timer on.
4 ON and 5 OFF = One day motion monitor and 25 seconds anti-mask timer on.
4 OFF and 5 ON = Motion monitor off and 25 seconds anti-mask timer on.
4 OFF and 5 OFF = Motion monitor and 25 seconds anti-mask off.

5.1 LED Operation (Switch 1)

ON: Allows the LED to operate when the alarm is activated.

OFF: The LED does not operate on alarm.

5.2 Sensitivity Mode (Switch 2)

Standard Sensitivity: Recommended setting for maximum false alarm immunity. Tolerates environment extremes on this setting. Not recommended for Long Range or Barrier type patterns.

Intermediate Sensitivity: Recommended setting for any location where an intruder is expected to cover only a small portion of the protected area. Tolerates normal environments on this setting.

The detector is shipped in Intermediate Mode.

Although the sensitivity modes provide different degrees of tolerance to environmentally caused alarms, the installer should assure peak background noise voltage readings do not exceed ±0.15 VDC from reference levels (see *Figure 4* and *Section 10.0 Final Tests*).

5.3 Spray Detect (Switch 3)

When enabled (Switch 3 **ON**), the detector gives a trouble output if the detector lens is coated with a foreign substance.

5.4 Motion Monitor/Anti-Mask Timer (Switch 4 and Switch 5)

Set the desired Motion Monitor Time and the Anti-Mask Timer. See *Figure 8* and *Section 8.0 Supervision Functions* for motion monitor times. Refer to *Section 9.2 Anti-Masking/Spray Detection* for additional information.

The detector is shipped with the Motion Monitor and 25-second Anti-Mask Timer features disabled.

6.0 Mirror Alignment

Touching the mirror surfaces can lead to performance degradation.

The mirror is adjustable +1 to -17° vertically and ±10° horizontally.

For the best performance, the mirror must be adjusted vertically for the maximum desired detection range (distance) and mounting height. There are angle adjustment markings on both sides of the mirror (see *Figure 9*). To adjust, slide the mirror forward or back until the angle adjustment markings are in line with the markers on each side of the frame.

Figure 9: Alignment Marks for Vertical Mirror Setting

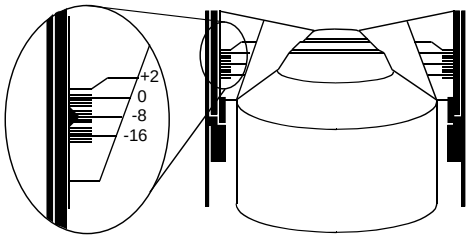
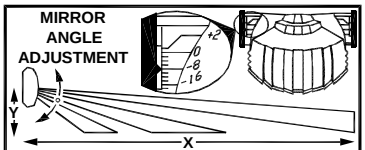


Figure 10 helps you to identify the correct vertical angle depending on the mounting height "Y" and desired maximum range "X." For your convenience, this chart is also located inside the front cover.

Figure 10: Mounting Height/Range Chart



Y m (ft) \ X m (ft)	5 (16)	7 (23)	9 (30)	11 (36)	13 (43)	15 (50)
2.0 (6.5)	-15°	-9°	-7°	-6°	-5°	-4°
2.3 (7.5)	-16°	-10°	-8°	-7°	-6°	-5°
2.6 (8.5)	-17°	-15°	-10°	-8°	-7°	-6°

To achieve the desired horizontal protection coverage, adjust the mirror ±10° horizontally by rotating (aiming) it from side to side.

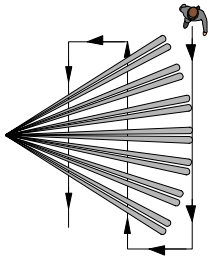
Walk test the unit as described in *Section 7.0 Walk Test* to verify the desired protection coverage.

7.0 Walk Test

The Walk Test can also be activated by switching the memory control voltage. See *Section 9.1 Memory, Day Mode, Night Mode, and Walk Test.*

1. Replace the cover on the unit. The cover should be in place before testing the unit.
2. Apply power to the unit. The LED flashes until the detector is ready for testing.
3. Wait for the LED to stop flashing (approximately 2 minutes if no motion is detected in the coverage pattern). Then start walk testing.
4. Walk test **across** the coverage pattern as shown in *Figure 11*. The edge of the coverage is determined by activation of the LED.

Figure 11: Coverage Pattern



5. Walk test the unit from both directions to determine the boundaries.
6. If the desired range **cannot** be achieved, try angling the mirror up or down to assure the coverage pattern is not aimed too high or low.

8.0 Supervision Functions

The LED shows a supervision trouble condition at the detector and indicates the cause of the trouble using coded pulses. The trouble signal activates the trouble relay on Terminals 9 and 10, which may be connected to a 24-hour zone. The supervision functions are:

PIR: PIR operation is checked electronically approximately every 12 hours. If the circuit fails, the LED pulses four times in a sequence and the Trouble output activates.

Motion Monitor Supervision: This function verifies the detector has a clear view of the detection area.

When selected, a supervision timer is activated. A trouble condition is indicated if the detector has not alarmed at least once during the selected time period. This function can be disabled by placing both switches S4 and S5 in the OFF position or by placing switch S4 OFF and switch S5 ON if the Anti-Mask Timer is desired. The time period selected should be long enough to allow adequate time for holiday weekends.

If the time period selected elapsed from the last alarm, the LED flashes two times in a sequence and Trouble output activates.

If Memory is being used (see *Section 9.1 Memory, Day Mode, Night Mode, and Walk Test*), the Motion Monitor timer stops while the control is placed in the Armed (Night) Mode. The timer resumes when the control is subsequently placed in the Disarmed (Day) Mode.

Trouble Reset: An alarm activation resets a Motion Monitor trouble condition and an Anti-Mask trouble condition. These trouble conditions can also be reset by temporarily removing power. A 10-second quiet time is needed before resetting the Anti-Mask.

Table 2 shows LED responses to the supervision features.

Table 2: LED Responses to the Supervision Feature

LED	Cause
ON	Unit alarm
Two flashes	Motion monitor timeout
Three flashes	Anti-masking
Four flashes	PIR self test failure (detector needs replacement)

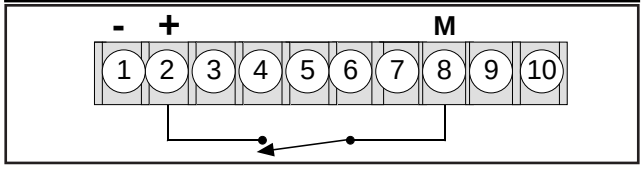
9.0 Other Features

9.1 Memory, Day Mode, Night Mode, and Walk Test

Memory, Night Mode, and Walk Test require a control voltage on Terminal 8 to activate these features (see *Table 3 Mode Switching* for switching specifics). The control voltage must be between 6 VDC and 18 VDC.

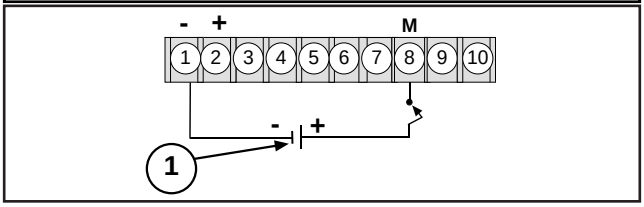
Use the supply voltage for applying a control voltage to Terminal 8 as shown in *Figure 12*.

Figure 12: Supply Voltage-A



An external power supply can be used alternatively as shown in *Figure 13*.

Figure 13: Supply Voltage-B



1 - Control panel or external DC power supply as control voltage
+6 VDC to +18 VDC = ON (switch closed)
0 VDC = OFF (switch open)

Day Mode: Disables the alarm memory and allows the LED (if activated) to operate normally.

Memory: When DS308EA is in the Night Mode, the memory is activated, allowing the detector to store an alarm for display when switched to Day Mode.

Night Mode: Enables the alarm memory and disables the LED operation.

Walk Test: When DS308EA is in the Walk Test Mode, the LED indicates the current alarm status regardless of the setting of the LED ON/OFF switch (Switch 1). A stored alarm is displayed when the memory input is switched to Day Mode.

Table 3: Mode Switching

Desired Action	Control Voltage (Terminal M)
Turn on Night Mode/Reset Stored Alarm	ON (for more than 20 seconds)
Turn off Night Mode/Reset Stored Alarm	OFF
Turn on Walk Test (if off)	ON (for more than 5 seconds, but less than 20 seconds)
Turn off Walk Test (if on)	OFF (for more than 1 second, but less than 20 seconds)

9.2 Anti-Masking/Spray Detection

The Anti-Masking/Spray Detection option prevents accidental or intentional blocking of the detector by detecting an object placed in close proximity of the detector or detectors sprayed with a foreign substance.

The Anti-Mask function is always enabled. If you want to disable this function, cover the Anti-Mask Transmitter (see *Figure 4*) with masking tape.

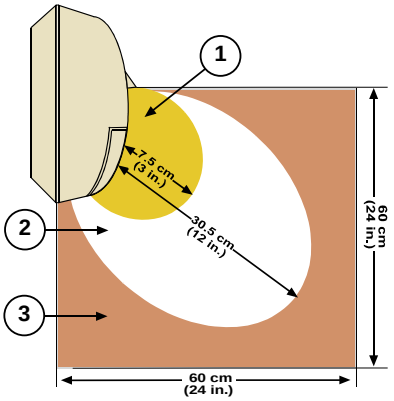
It takes approximately 25 seconds for the detector to react to a masked or sprayed condition if the Anti-Mask Timer is enabled. See *Section 5.3 Spray Detect (Switch 3)*.

If the Anti-Masking circuitry activates, a supervision trouble condition occurs, the Alarm/Test LED flashes three times, and the trouble relay activates.

The Anti-Masking circuitry may interpret removing and replacing of the cover as an attempt to mask the detector. After a 10-second quiet period, the trouble condition automatically resets upon the next alarm activation. Also, momentarily removing power from the detector resets the trouble condition.

The size of the Anti-Mask Detection Zone varies depending on the setting of Switch 3 (Spray Detect ON/OFF). See *Figure 14*.

Figure 14: Anti-Masking Coverage



1 - Anti-Mask Detection Zone with Switch 3 (Spray Detect) OFF.
2 - Anti-Mask Detection Zone with Switch 3 (Spray Detect) ON.
3 - Keep Out Zone. Do not mount moving objects (such as curtains or doors) within this area.

10.0 Final Tests

For better results, particularly in noise-prone environments, the detector noise level can be measured at the noise voltage pins, which are included behind a metal flap on the circuit board (see *Figure 4*). This feature can also be used for troubleshooting false alarms generated by environmental changes. When performing final tests, test both channels one at a time.

1. Connect a DC voltmeter to the Noise Voltage pins using the Bosch TC6000 test cable (see *Figure 4*).
2. Set meter scale for 3.0 VDC.

   The base reference level for reading background noise is approximately 2.5 VDC.

   Installations in quiet environments result in a steady reading between 2.4 VDC and 2.6 VDC.

   During the Walk Test, voltage changes greater than 0.75 VDC from the reference level are desirable for good catch performance. If changes are less than 0.75 VDC, the device may fail to respond if the temperature difference between the intruder and the background is minimal.
3. Turn on all heating and cooling sources that are normally in operation during times of protection.
4. Stand away from the unit and outside the coverage pattern. Then monitor the background noise for at least 3 minutes.

   Readings should not deviate from the reference level by more than ±0.15 VDC.

   For readings outside these limits; eliminate the cause, re-point the unit slightly, or mask off the affected zones.

11.0 Maintenance

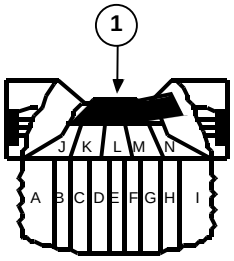
At least once a year, check the range and coverage in accordance with *Section 9.1 Memory, Day Mode, Night Mode, and Walk Test*. To ensure proper daily operation, instruct the end user to walk through the outer edge of the coverage pattern daily. This assures an alarm output prior to arming.

12.0 Coverage Patterns

This product is factory assembled with the look down zones (O, P, and Q) masked out. If you want to use these zones, remove the masking tape from the lens (see *Figure 15* and *Figure 16*).

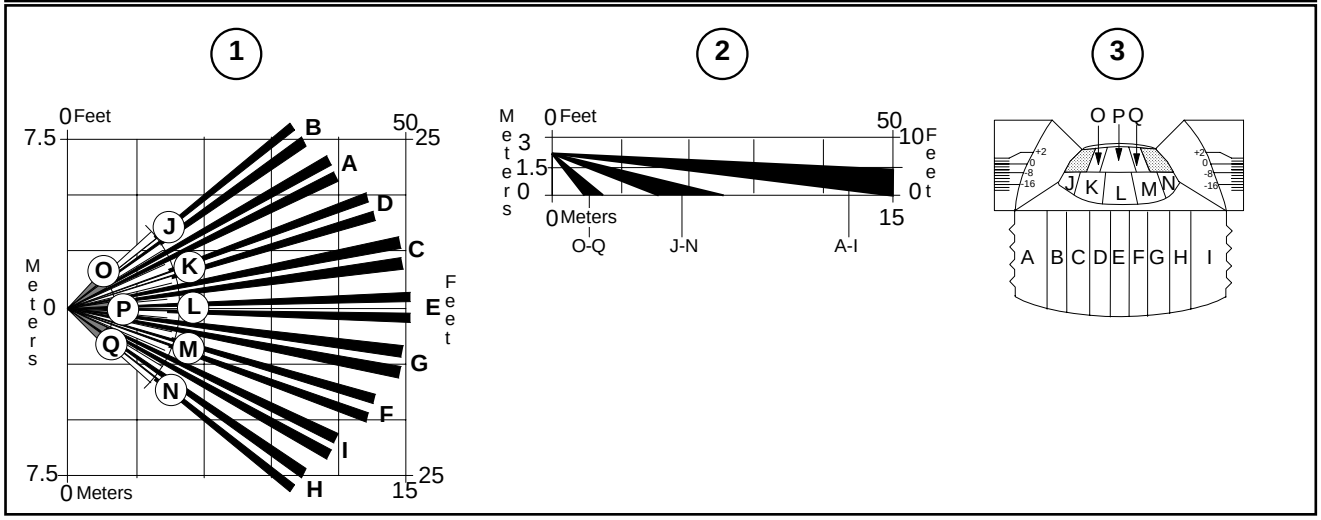
Figures 17 and 18 show the optional barrier and long range coverages.

Figure 15: Coverage Patterns



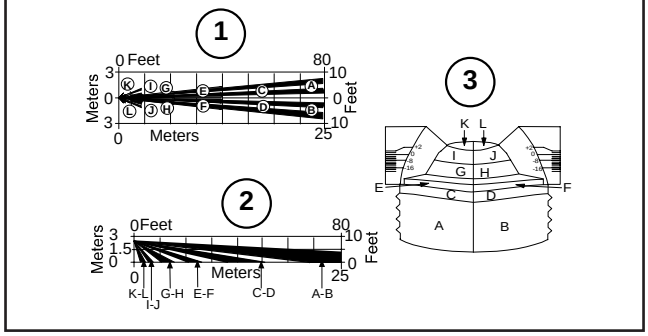
1 - Peel back tab to remove mask on the look-down zones if desired.

Figure 16: Standard Mirror - Broad Coverage



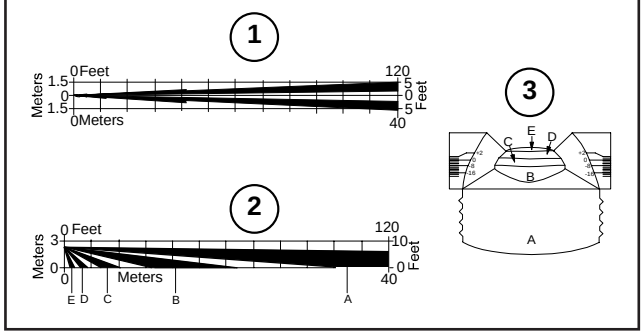
1 - Broad coverage top view
2 - Side view with mirror adjusted to -5°
3 - Mirror segment to pattern reference with view of front polished surface

Figure 17: Optional Mirror OMB77-3, Barrier



1 - Barrier coverage top view
2 - Side view with mirror adjusted to -2°
3 - Mirror segment to pattern reference with view of front polished surface

Figure 18: Optional Mirror OMLR77-3, Long Range



1 - Long range coverage top view
2 - Side view with mirror adjusted to -1°
3 - Mirror segment to pattern reference with view of front polished surface

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