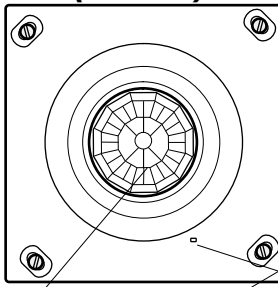
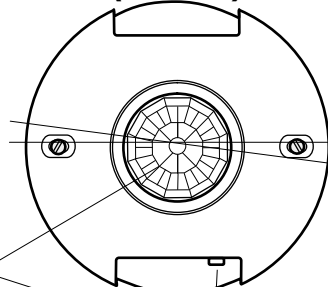
	PART No. CEILING MOUNT CM-PDT-DL (standard range PIR lens) CM-PDT-10-DL (extended range PIR lens) CM-6-DL (high-ceiling range PIR lens) RECESSED MOUNT RM-PDT-DL (standard range PIR lens) RM-PDT-10-DL (extended range PIR lens) OPTIONS -2P (2 Douglas relay outputs) -R (1 Douglas relay output, 1 output for BAS or device) -2P-R (2 Douglas relay outputs, 1 output for BAS or device) -LT (low temperature/high humidity operating range)	DESCRIPTION <ul style="list-style-type: none"> Ceiling or recessed mount PIR and sound occupancy detectors designed to switch Douglas 2-wire relays or signal other systems. Use indoors only. The detectors are designed to mount on ceilings. The detectors utilize Passive Infrared (PIR) technology to optically sense motion within the surrounding area. All detectors, except the CM-6-DL Model, also utilize Microphonics™ sound detection for detection around obstructions. The sound detector filters out background noise and detects only noises typical of human activity. Upon sensing motion, the detectors signal ON and start an internal timer. Whenever motion is seen or heard, the timer is reset. If no motion occurs and the timer expires, the detectors signal OFF. The time delay period is selectable from 30 seconds to 20 minutes. 	SPECIFICATION Inputs <ul style="list-style-type: none"> Power: 24VAC 12-34mA. Class 2 Low Voltage device. Use #18 AWG wire. Outputs <ul style="list-style-type: none"> CM/RM-PDT-DL, CM-PDT-10-DL, CM-6-DL 1 Douglas 2-wire relay output. Maximum relays per sensor: 4. CM/RM-PDT-2P-DL, CM-PDT-10-2P-DL 2 Douglas 2-wire relay outputs. Maximum relays per sensor: 4. CM/RM-PDT-R-DL, CM-PDT-10-R-DL 1 Douglas 2-wire relay output. Maximum relays per sensor: 4. 1 contact output for external system or device. 1A / 40VAC Rating. Form C: NC-COM-NO. CM/RM-PDT-2P-R-DL, CM-PDT-2P-R-DL 2 Douglas 2-wire relay outputs. Maximum relays per sensor: 4. 1 contact output for external system or device. 1A / 40VAC Rating. Form C: NC-COM-NO. Maximum wire length per output (all models): 1 relay: 2000'/600m; 2 relays: 1500'/450m; 3 relays: 1000'/300m; 4 relays: 500'/150m.
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RM-PDT-DL Series (cover off)



CM-PDT-DL Series (cover off)



Mounting Screw Axis (CM Series only)

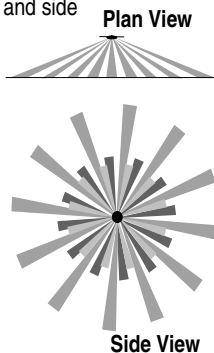
Direction of maximum PIR sensitivity.
 (standard range PIR lens) When mounting in a room, position sensor so mounting screws are aligned in same direction as room entrance.
 (extended range PIR lens) When mounting in a room, position sensor so axis of mounting screws points 7.5° counter clockwise from room.

PIR Lens

Detects motion by sensing passive infrared light waves emitted by people.

The PIR lens in each CM or RM Sensor model provides a view angle in a complete 360° conical pattern. The diagrams show the plan and side views of the detection zones.

As they produce some infrared waves, heat-producing sources, such as incandescent lights, controlled by the sensor must not be in the sensor's PIR lens view pattern. This will cause the sensor to cycle or continually stay ON. If this happens, it will be necessary to move the sensor or to mask the lens segments that view the heat source.



Green LED (behind PIR Lens)

Flashes when time delay setting is programmed or monitored.
 Flashes when unit is sensing motion.

Sound Detector (microphone inside unit)

Activated when the PIR lens senses motion, then detects normal human activity up to 20 feet away. It can detect at greater distances in spaces with hard floors or in very quiet rooms with little or no background noise.

The sensor should not be placed near HVAC air diffusers because the noise generated by air flow will decrease the sensitivity of the sound detector.

Time Delay

Programming Button

Press this button to monitor the time delay setting or to change the time delay setting.

To monitor the time delay setting, press the button twice. The green LED will flash the number of times that corresponds to the time delay setting, as shown in the table below.

The LED will flash the current setting number 3 times. For instance, if the current setting is 10 minutes (factory default) the LED will flash 5 times, then flash 5 times again, then flash 5 times again.

To change the time delay setting:

1. Press the button twice to have the LED flash the current setting 3 times.
2. Press the button the number of times that corresponds to the new time delay setting. The green LED will then flash that number 3 times.

Number	Time Delay	Number	Time Delay
1	30 seconds	6	12.5 minutes
2	2.5 minutes	7	15 minutes
3	5 minutes	8	17.5 minutes
4	7.5 minutes	9	20 minutes
5	10 minutes (factory default)		

Mounting

- CM/RM-PDT-DL: Ceiling 8'-15' high.
- CM/RM-PDT-10-DL: Ceiling 7'-15' high.
- CM-6-DL: Ceiling 15'-45' high.
- Align screw holes so their axis points to room entrance for maximum PIR range.

Adjustments

- Adjustable time out (30 sec, 2.5 min, 5 min, 10 min, 12.5 min, 15 min, 17.5 min or 20 min).

Color

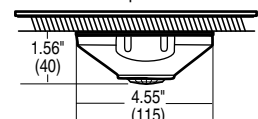
- Unit with cover plate available in white.

Environment

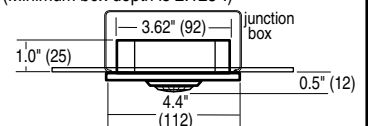
- Indoors, stationary, non-vibrating, non-corrosive atmosphere and non-condensing humidity.
- Ambient temperature: +14° to +160°F (-10°C to 70°C).
- LT Models: moisture resistant, operate down to -4°F (20°C).

DIMENSIONS & MOUNTING

- CM unit attaches to the ceiling surface with the 2 self-tapping screws provided.
- When mounting to ceiling tile, take care to only penetrate the tile to allow for the mounting screws and wires as the tile provides sound insulation.



- RM unit attaches to 4" square junction box. (Minimum box depth is 2.125".)

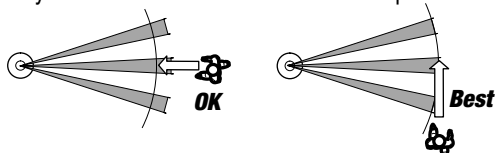


CM/RM-PDT-DL Models

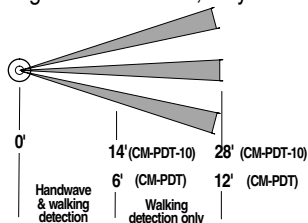
Optical Method of Detection - PIR

- The optical portion of the CM and RM Dual Technology occupancy sensors utilize **Passive Infra Red (PIR)** technology. All objects emit an infra-red energy that is dependent upon the temperature of the object. PIR occupancy detectors are optical devices that are tuned to detect the infra-red energy emitted from people (98°F).
- It is the **movement** of the infra-red source (walking or a handwave) that is "seen" by the detector. The detector accomplishes this by having several small lens segments that each focus a zone onto a sensing element. As the person travels into and out of a zone, the amount of infra-red energy focused on the element changes. This is interpreted as motion.
- Movements **across** a focus zone cause a stronger motion signal than movements **parallel** to a detection zone.

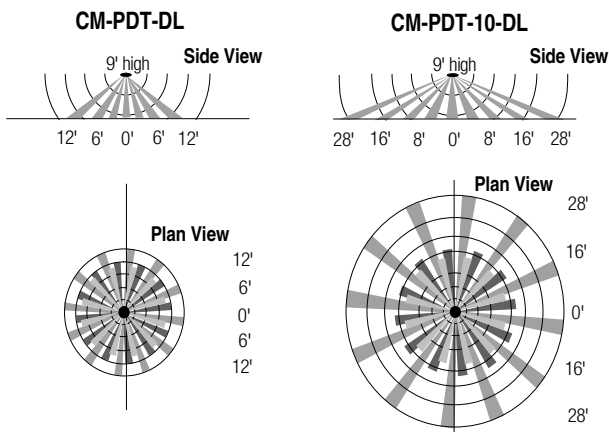
For example, when mounted on a 9' high ceiling, a CM/RM-PDT-10-DL Sensor's range for movement into a beam is 24 feet, while its range for movement across a beam is 28 feet. When locating PIR occupancy detectors, try to maximize the probability of movements across the detection pattern.



- The amount of infra-red energy focused on the sensing element is greater from objects that are close than from objects that are distant. Only at close range (half of maximum) is handwave motion detectable. At greater distances, only walking motion is detectable.



- The PIR lens used in the CM/RM-PDT-DL Series Sensors provides a maximum view angle of 56° in a complete 360° conical pattern. The PIR lens used in the CM/RM-PDT-10-DL Series Sensors provide a maximum view angle of 67° in a 360° conical pattern.
- These diagrams show the side and plan views of the detection zones with each sensor mounted on a 9' ceiling.



Sound Method of Detection - Microphonics™

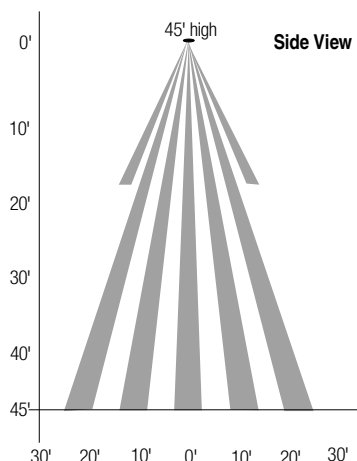
- The acoustic portion of the CM and RM Dual Technology occupancy sensor utilizes an internal microphone to detect noise typical of human activity. The microphone is triggered whenever the PIR lens detects motion. The sensor first 'sees' motion using the Passive Infra-Red lens then 'hears' sounds that indicate continued occupancy using the Microphonics. This, provides a reliable and completely passive method of detecting motion.
- When the microphone detects any sounds, the sensor uses Automatic Gain Control circuitry to dynamically adapt to its environment to filter out constant background noise and detect only leading edge noises, such as paper shuffling, keyboard pounding, talking, walking, etc., typical of human activity.
- The Microphonics sound detection can detect human activity within 20 feet of the sensor, or further away in spaces with hard floors or with very little background noise. The Microphonics sound detector can also detect human activity through solid obstructions. This is useful in rooms with obstructions such as bathrooms with stalls or open office cubicle areas.

Solid Objects

- PIR Detection cannot be made through solid objects (partitions or bookshelves). Sound detection, however, can occur up to about 20 feet away, but must first be triggered by the PIR detecting motion. Position the sensor(s) so that obstructions do not block a large, continuous area of the PIR's field of view.

CM-6-DL Model

- The CM-6-DL is designed for use on high ceilings, 15' to 45' above floor level. It utilizes a special PIR lens which has narrower viewing angles than the PIR lens used in the CM/RM-PDT Models, but with a much longer range. There is no sound detection component in the CM-6-DL.
- The PIR lens used in the CM-6-DL views in 4 separate 360° conical patterns. The outermost cone views at an angle 45° and is effective up to 20'. The inner 3 cones view at an angle of 30° up to 45', but only detect major motions, such as a moving forklift truck, at distances greater than 35'.
- The following diagram shows the side view of the detection zones with the CM-6-DL mounted on a 45' ceiling.

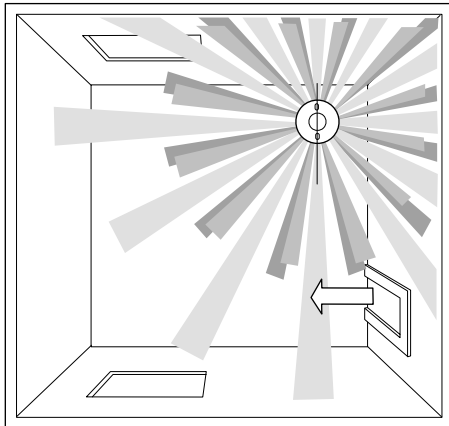


INSTALLATION

Installing in Smaller Room (CM/RM-PDT-DL)

- Locate the sensor near the entrance door wall to prevent it from viewing out into the hallway.
- (CM models) rotate the sensor so its screw axis is pointing toward the area in front of the entrance door.

Positioning the sensor in this manner ensures that an occupant moves across the longest detection beam upon entrance, utilizing the sensor's maximum PIR range.

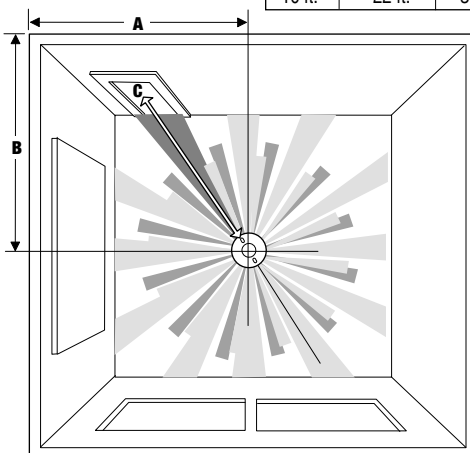


Typical Enclosed Office

Installing in Larger Room (CM/RM-PDT-10-DL)

- Place the sensor near the center of the room ceiling. Locate it so the approximate distance in and over (A and B in the diagram) are appropriate for the ceiling height. Refer to the chart for the distance.
- (CM models) rotate the sensor so that the axis of its mounting screws is pointing approximately 7.5° clockwise from the corner. (arrow C in the diagram).
- The maximum beam distance will then line up with the door entrance. Refer to the chart for the approximate maximum distance for the ceiling height.

Ceiling Height	Distance in & over (A and B)	Maximum Beam Distance
8 ft.	17 ft.	24 ft.
9 ft.	20 ft.	28 ft.
10 ft.	22 ft.	31 ft.



Typical Classroom

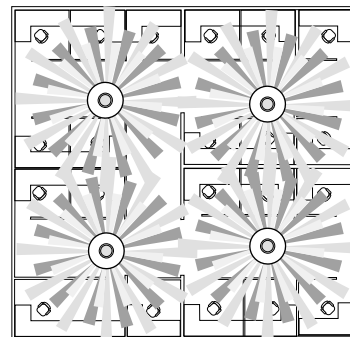
INSTALLATION

Multiple Detectors to Increase Coverage Area

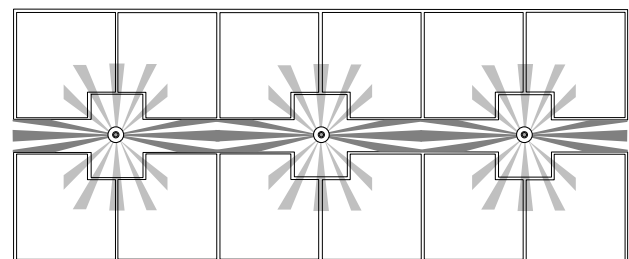
- To increase the coverage area, extra detectors can be installed. The auxiliary detectors are all connected in parallel.
- If any one of the detectors changes to the ON state, an ON signal will be sent to the output relay(s). For an OFF signal to occur, all of the detectors' no-motion timers must have expired. When the last expires, an OFF signal is issued.
- To signal another system such as a BAS, one of the sensors in the zone can be a CM/RM-PDT-R-DL-/CM-PDT-10-R-DL or a CM/RM-PDT-2P-R-DL/CM-PDT-10-2P-R-DL. These models have an auxiliary contact that connects to the external system. The contact is closed and remains closed until all interconnected sensors detect no motion and their timers have expired.

Placement of Multiple Detectors

- Determine if the detection requirement is for walking or handwave motion. Consider traffic patterns and/or where the occupants will be sitting when laying out the detectors.
- For larger open areas such as a cafeteria or open office plan, a grid of CM/RM-PDT-DL sensors is recommended. Modify the grid arrangement if there are partitions or obstructions beyond the range of a sensor's sound detector.



- For longer hallway applications, it is recommended that the extended-range CM/RM-PDT-10-DL sensors be used spaced approximately 50' apart.



	PART No.	DESCRIPTION
<p>*Blue wire not needed if only single sensor is used</p>	<p>CM-PDT-DL CM-PDT-10-DL CM-6-DL RM-PDT-DL RM-PDT-10-DL</p>	<ul style="list-style-type: none"> Ceiling or recess mounted occupancy sensor to interface with Douglas low voltage relay(s). Up to 4 relays can be connected in parallel. For override, which control all relays collectively, two Douglas switches may be connected in parallel to the sensor output. Sensor output can also be connected to a Douglas relay scanner input rather than to relays. Sensor provides PIR line-of-sight detection in a circular pattern combined with sound detection through obstructions. For larger spaces, multiple sensors can be combined to cover a zone and control the same relay(s). When any sensor sends an ON signal, the relay(s) switch ON. When all the sensors are OFF with their time delay period expired, the relay(s) switch OFF.

	PART No.	DESCRIPTION
<p>*Blue wire not needed if only single sensor is used</p>	<p>CM-PDT-2P-DL CM-PDT-10-2P-DL RM-PDT-2P-DL RM-PDT-10-2P-DL</p>	<ul style="list-style-type: none"> Ceiling or recess mounted occupancy sensor with the added functionality of interfacing with 2 separate Douglas relays or 2 separate relay groups (whose combined relay total is 4 or less) in parallel. Ideal for areas where local override control is desired for two different circuits. For larger spaces, multiple sensors can be combined to cover a zone and control the same relays. When more than 2 sensors are used, they should all be connected to the panel transformer via their blue wire to receive 24V. When multiple sensors are used, the red control wires from only 1 sensor should be connected to the relays and the orange wires from all the sensors should be jumpered.

	PART No.	DESCRIPTION
<p>*Blue wire not needed if only single sensor is used</p> <p>to external system or device</p> <p>Grey/Brown: some occupied Violet/Brown: all unoccupied (relay energized)</p>	<p>CM-PDT-R-DL CM-PDT-10-R-DL RM-PDT-R-DL RM-PDT-10-R-DL</p>	<ul style="list-style-type: none"> Occupancy sensor like the CM/RM-PDT-DL or CM/RM-PDT-10-DL with the added functionality of an output signaling an external system like a BMS or an external device such as a Douglas photo sensor. The output is from a dry-contact SPDT relay internal to the sensor. The relay changes state when all connected sensors are OFF and their time delay period expired. If other sensors are combined with the CM/RM-PDT-R-DL or CM/RM-PDT-10-R-DL to cover the zone, they should all be connected to the panel transformer via their blue wire to receive 24V. When multiple sensors are used, the red control wires from only the main sensor should be connected to the relays and the orange wires from all the sensors should be jumpered.

	PART No.	DESCRIPTION
<p>*Blue wire not needed if only single sensor is used</p> <p>to external system or device</p> <p>Grey/Brown: some occupied Violet/Brown: all unoccupied (relay energized)</p>	<p>CM-PDT-2P-R-DL CM-PDT-10-2P-R-DL RM-PDT-2P-R-DL RM-PDT-10-2P-R-DL</p>	<ul style="list-style-type: none"> Ceiling or recess mounted occupancy sensor with the added functionality of interfacing with 2 separate Douglas relays or 2 separate relay groups(whose combined relay total is 4 or less) in parallel. It also has an auxiliary output signaling an external system like a BMS or an external device such as a Douglas photo sensor. The output is from a dry-contact SPDT relay internal to the sensor. The relay changes state when all connected sensors are OFF and their time delay period expired. If other sensors are combined with the CM/RM-PDT-2P-R-DL or CM/RM-PDT-10-2P-R-DL to cover the zone, they should all be connected to the panel transformer via their blue wire to receive 24V. When multiple sensors are used, the red control wires from only the main sensor should be connected to the relays and the orange wires from all the sensors should be jumpered.