CS Series

360° PIR Occupancy Sensor

Installation Instructions

Specifications

Voltages	20–30VDC (24VDC Typical)
Current Consumption	@24VDC, 11mA Maximum
Time Adjustment	15 seconds–30 minutes
Sensitivity Adjustment	Minimum/Maximum

Pass & Seymour

legrand

U.S. Patents:
4,757,204 • 4,787,722
Des360,842

Syracuse, NY 13221
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DESCRIPTION

The CS Series sensor is a 24VDC Passive Infrared (PIR) occupancy sensor which controls lighting or HVAC systems based on occupancy in a given area.

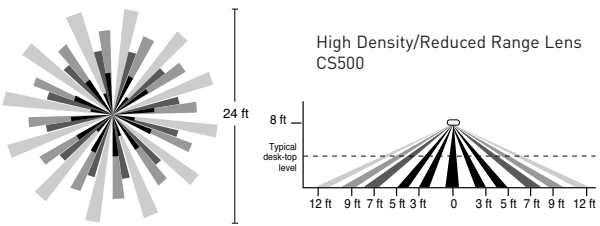
PIR sensing systems are passive systems which react to changes in infrared energy (moving body heat) within the coverage area. PIR sensors must directly "see" motion of an occupant to detect them, so careful consideration must be given to sensor placement.

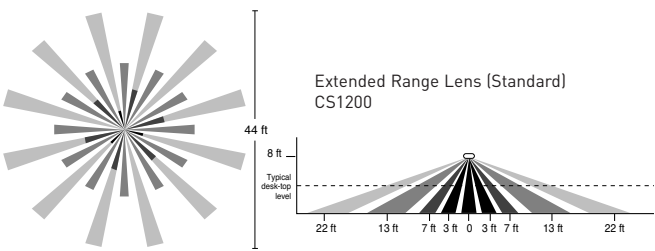
COVERAGE PATTERNS

The CS sensor has a multi-cell, multi-tier Fresnel lens with a field of view of 360°. The sensor has two lens pattern options. The Extended Range Lens will cover up to 1200 sq ft and 22 feet from the sensor when mounted at 8 feet. The High Density/Reduced Range Lens will cover up to 500 sq ft and 12 feet from the sensor when mounted at 8 feet.

Coverage shown in the diagrams below is maximum and represents coverage for half-step, walking motion, with no barriers or obstacles.

DRAWING NOT TO SCALE





PLACEMENT

The effective coverage distances may be slightly less than the maximum sensing distance (see Coverage Patterns), depending upon obstacles such as furniture or partitions, and this must be considered when planning the number of sensors and their positioning. See the list below for approximate coverage distances for different types of motion.

Approximate coverage, for a mounting height of 8 feet:

Lens option	Walking motion	Workstation (hand motion)
High Density	up to 12 ft radius (500 sq ft)	9 ft radius (300 sq ft)
Extended Range	up to 22 ft radius (1200 sq ft)	12 ft radius (500 sq ft)

The CS sensor can be mounted at various heights. When mounting at heights other than 8 feet, be aware that as you decrease the mounting height, you will decrease the range and increase the sensitivity to smaller motions. Conversely, when you increase the height, you will increase the range and decrease the sensitivity to smaller motions. At heights of more than 12-14 feet, you may start to significantly reduce sensitivity.

Often the best location to install a CS sensor in a **closed office** is off-center (see fig.1). Avoid placing a sensor directly in line with an open door in which it has a clear view out, as the sensor may detect people walking by. For **open office** areas with partitions it is best to place sensors over intersections of four workstations (see fig. 2).

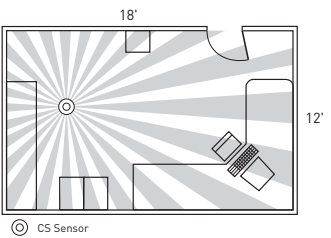


fig. 1

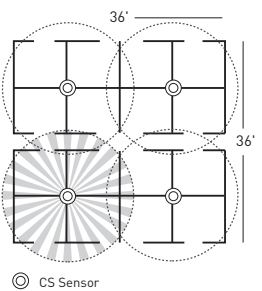


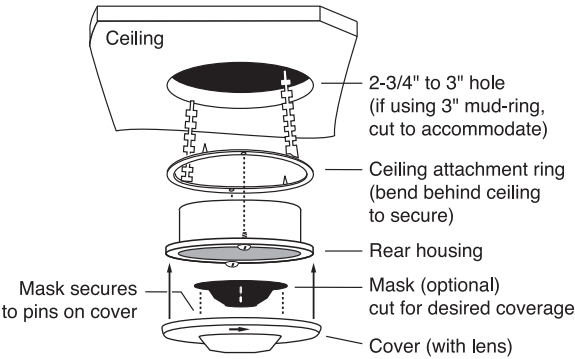
fig. 2

Also avoid placing the sensors close to **air ducts**, as rapid air currents or the differences in temperatures may cause false activations. For large areas of coverage use multiple sensors.

INSTALLATION

CAUTION

TURN POWER OFF AT CIRCUIT BREAKER BEFORE INSTALLING SENSOR



A 4-S junction box can be used with a 3" mud-ring when local building codes mandate that low voltage connections be contained in a junction box.

Otherwise a 3" mud-ring or the provided ceiling attachment ring can be used.

IMPORTANT: If the lens will be masked, the junction box or mud-ring may need to be positioned so that the mask is oriented properly when the sensor is installed (see Masking).

Cut a hole in the ceiling tile—if using a:

- Ceiling attachment ring (provided)—cut about 2-3/4" to 3" in diameter.
- 3" mud-ring—cut the hole to accommodate.

To assemble the sensor:

1. If using the ceiling attachment ring, bend the securing straps up so the sensor housing can be inserted, and attach it to the sensor with the provided screws.
2. Attach the mask, if using, into the lens recess and onto the securing pins of the cover.
3. Attach the cover to the rear housing—align tabs on inside of cover to notches on outside perimeter of rear housing, place cover on sensor, and twist clockwise to lock.
4. Insert the assembled sensor into the ceiling hole, and **if using the mask**, turn the sensor so that the unmasked part of the lens is toward and centered on the area to be covered.
5. Bend the ceiling attachment ring straps behind the hole to secure (or attach sensor to mud-ring with screws).

MASKING

An insert (mask) is supplied to allow elimination of coverage in unwanted areas.

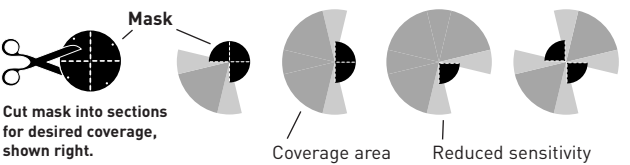
The mask is cut as needed and mounted onto anchor pins in the sensor's cover.

IMPORTANT: Do not use the mask if full coverage is desired.

IMPORTANT: Before securing the sensor in the mounting location, the assembled **sensor must be turned so the unmasked portion of the lens faces the coverage area** (the blue masked area is visible through the lens).

IMPORTANT: For an **already installed sensor**—If the sensor can NOT be turned, then the mask must be cut so that when installed it will be oriented correctly (note the **location of the securing pins** in the cover and note that the **cover turns** as it locks into position).

Note: At the edges of the masking, there is a small area of **reduced sensitivity**, illustrated as the lighter area in the examples below.



WIRING DIRECTIONS

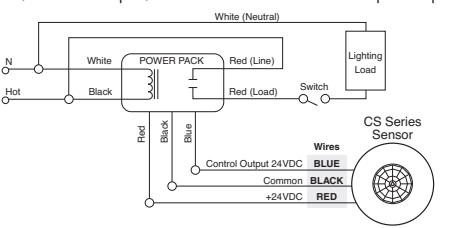
⚠ CAUTION ⚠

TURN POWER OFF AT CIRCUIT BREAKER BEFORE WIRING SENSOR

Pass & Seymour PWP2 series **power packs** supply power for up to 10 CS Sensors.
When using more sensors than this, multiple power packs are required.

To connect the **low voltage wires from the power pack** to the sensor:

- RED wire on sensor to RED wire (+24VDC) on power pack.
- BLACK wire (Common) on sensor to BLACK wire on power pack.
- BLUE wire (Control Output) on sensor to BLUE wire on power pack.



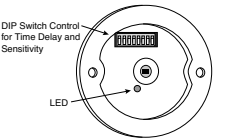
Call 800.223.4185 for Technical Support

SENSOR ADJUSTMENT

The sensor comes factory preset and ready for operation.
If testing of operation is desired:

- Remove the sensor's cover (twist).
- Refer to the **DIP switch settings chart** below for switch configurations.
- Make sure that office furniture and fixtures are in place.

1. Restore power to the lighting circuits and turn the lights on.
   - There is a **one minute warm-up** when power is initially restored to the sensor before the sensor works properly.
2. Set **Time Delay** to minimum: DIP switches #1 through 6 set to ON (15 secs.).
3. Set **Sensitivity** to maximum: DIP switches #7 and #8 to ON.
4. Replace the sensor's cover.
5. Move away from sensor and be still.
   The lights should go off after 15 seconds.



Note: If lights remain on, move farther away or out of sight of the sensor. If lights still remain on, set the Sensitivity to medium high by setting DIP switches #7 to ON and #8 to OFF, or see Unwanted Sensor Activations under Troubleshooting.

6. Set the appropriate **Time Delay** (DIP switches #1 through 6).
   The factory preset Time Delay is 18 minutes; other suggestions are:

   Offices and conference rooms: 10 minutes.
   Classrooms: 10 minutes.
   Warehouses: 6 minutes.
   Hallways: 4 minutes.

DIP SWITCH SETTINGS

DIP Switch #	1	2	3	4	5	6		7	8
Time Delays							**Sensitivity**		
15 seconds	●	●	●	●	●	●	Minimum	–	–
2 minutes	–	–	●	●	●	●	Medium Low	–	●
4 minutes	–	●	–	●	●	●	Medium High	●	–
6 minutes	–	–	–	●	●	●	▶ Maximum	●	●
8 minutes	–	●	●	–	●	●			
10 minutes	–	–	●	–	●	●			
12 minutes	–	●	–	–	●	●			
14 minutes	–	–	–	–	●	●			
16 minutes	–	●	●	●	–	●			
▶ 18 minutes	–	–	●	●	–	●			
20 minutes	–	●	–	●	–	●			
22 minutes	–	–	–	●	–	●			
24 minutes	–	●	●	–	–	●			
26 minutes	–	–	●	–	–	●			
28 minutes	–	●	–	–	–	●			
30 minutes	–	–	–	–	–	●			
Override						–			

● = ON – = OFF

▶ = Factory Presets

TROUBLESHOOTING

⚠ CAUTION ⚠

USE PROPER SAFETY PRECAUTIONS WHEN WORKING WITH OR NEAR HIGH VOLTAGE

Lights will not turn on:

1. Verify the lens is not masked in the direction being tested (see Masking).
2. Adjust Sensitivity settings up if needed (DIP switches #7 & 8).
3. Verify power pack and sensor connections are correct and secure.
4. Check for +24VDC at RED wire from the power pack to sensor.
   - If present, the problem may be with the sensor. Try another sensor (if available).
   - If there is no voltage, see Power Pack High Voltage Checklist, below.

Lights will not turn off:

1. Check that Time Delay settings are correct (DIP switches #1 – 6).
2. Decrease Sensitivity settings if needed (DIP switches #7 & 8).
3. Verify power pack and sensor connections are correct and secure.
4. Disconnect BLUE wire on power pack from sensor.
   - If the lights turn off, the problem may be in the sensor. Turn Sensitivity and Time Delay to minimum and allow the sensor to time-out.
     - If the lights turn off, the sensor is working correctly. See Unwanted Sensor Activations, below. Go through the Sensor Adjustment process again.
   - If the lights stay on, the problem may be in the power pack. See Power Pack High Voltage Checklist, below.

Power Pack High Voltage Checklist:

CAUTION: Use proper high voltage precautions.

1. Check that power pack high voltage wire connections are correct and secure.
2. Check that the power pack is rated at the correct voltage.
3. Check that there is high voltage going into the power pack.
4. Try another power pack (if available).

Unwanted sensor activations (LED flashes):

Possible causes

1. People moving or walking outside of the desired coverage area, but in view of the sensor and within it's range (see Coverage Patterns and Placement).
2. HVAC vents with heavy air flow.

Possible solutions

1. Masking (see Masking).
2. Setting the Sensitivity lower.
3. Relocating the sensor.

Sensor Override:

If the sensor fails, set DIP switch #6 to OFF. This overrides the sensor and sets the circuits to "on".

ORDERING INFORMATION

Catalog#	Description
CS500	20–30VDC Occupancy Sensor with High Density/Reduced Range Lens
CS1200	20–30VDC Occupancy Sensor with Extended Range Lens (Standard)
PWP2120	Power Pack: 120VAC, 60Hz, 150mA 20A ballast/13A incandescent
PWP2277	Power Pack: 277VAC, 60Hz, 150mA, 20A ballast
AR120/277	Slave Pack: 120/277VAC, 60Hz, 20A ballast

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This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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