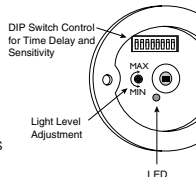


SENSOR ADJUSTMENT

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. For testing, set the **Time Delay** to minimum (15 secs.).

3. Set **Sensitivity** to maximum.

4. Turn **Light Level** Adjustment trimpot to maximum.

5. Replace the sensor's cover then move away from sensor and be still. The lights should go off after 15 seconds.

If lights remain on, see Unwanted Sensor Activations under Troubleshooting.

With movement in the area, the lights should turn back on.

6. If using the **light level** feature (otherwise skip to step 7), turn the adjustment trimpot to minimum, and repeat step 5.

Unless it is very dark, when the lights turn off, the lights controlled by light level should not turn back on even with movement in the area.

Until ready to make the final adjustment, leave the setting at maximum. The controlled lights will then not be affected by ambient light levels.

To make the light level adjustment: (The final light level setting for normal operation should be made at a time when... with the lights off, the ambient light level is at the point where it is desired for the lights to turn on.)

Set the Time Delay and the Light Level to minimum, then be still until the lights turn off (about 15 seconds). Slowly turn the light level adjustment toward maximum until the lights turn on—then turn it back slightly. At this setting the lights will not turn on if ambient light levels are above the current level.

7. Set the desired **Time Delay** for operation (DIP switches #1 – 6). 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
Time Delays						
15 seconds	●	●	●	●	●	●
2 minutes	-	-	●	●	●	●
4 minutes	-	●	●	●	●	●
6 minutes	-	-	●	●	●	●
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						-

DIP Switch #	7	8
Sensitivity		
Minimum	-	-
Medium Low	-	●
Medium High	●	-
▶ Maximum	●	●

● = ON - = OFF
▶ = Factory Presets

TROUBLESHOOTING



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, next page. And 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.

Isolated relay not functioning properly:

CAUTION: Use proper high voltage precautions, if applicable.

1. Check that Time Delay settings are correct (DIP switches #1 – 6).
2. Check Sensitivity setting. Also see, Unwanted Sensor Activations, next page.
3. Verify all wire connections from sensor are correct and secure.
4. Check that there is voltage to the Isolated Relay.
5. Check for +24VDC at RED wire from the power pack to sensor.
6. Use an ohmmeter to check the function of the Isolated Relay:
 - Turn off the power connected to Isolated Relay wires (if applicable).
 - With motion in front of the sensor's lens, check that the connection between the BROWN and RED wires is open.
 - With motion in front of the sensor's lens, check that the connection between the ORANGE and RED wires is closed.
 - Turn Sensitivity and Time Delay to minimum, cover the sensor's lens with a cloth (not your hand), be still and allow the sensor to time-out.
 - Check that the connection between the BROWN and RED wires is closed.
 - Check that the connection between the ORANGE and RED wires is open.

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 its 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
CI-200	20–30VDC Occupancy Sensor with Extended Range Lens (Standard)
CI-200-1	20–30VDC Occupancy Sensor with High Density /Reduced Range Lens
B120E-P	Power Pack: 120VAC, 60Hz, 150mA 20A ballast/13A incandescent
B230E-P	Power Pack: 230VAC, 50/60Hz, 150mA 20A ballast/13A incandescent
B277E-P	Power Pack: 277VAC, 60Hz, 150mA, 20A ballast
B347D-P	Power Pack: 347VAC, 60Hz, 150mA, 15A ballast
S120/277/347E-P	Slave Pack: 120/277VAC, 60Hz, 20A ballast 347VAC, 60Hz, 15A ballast

WARRANTY INFORMATION

The Watt Stopper®, Inc. warrants its products to be free of defects in materials and workmanship for a period of five years. There are no obligations or liabilities on the part of The Watt Stopper, Inc. for consequential damages arising out of or in connection with the use or performance of this product or other indirect damages with respect to loss of property, revenue, or profit, or cost of removal, installation or reinstallation.

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86-0474-00r3 9/99

CI-200

version 2

360° PIR Occupancy Sensor



SPECIFICATIONS

Voltage Supply 20–30VDC (24VDC Typical)
 Current Consumption @24VDC, 24mA Maximum
 Isolated Relay Rating 1A @24VDC or 24VAC
 Time Adjustment 15 seconds–30 minutes
 Sensitivity Adjustment minimum-maximum
 Light Level Adjustment 1–190FC



Santa Clara, CA 95050 USA
 1(800)879-8585 1(972)578-1699

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

DESCRIPTION

The CI-200 is a 24VDC Passive Infrared (PIR) occupancy sensor which controls lighting or HVAC systems based on occupancy and/or ambient light levels in a given area.

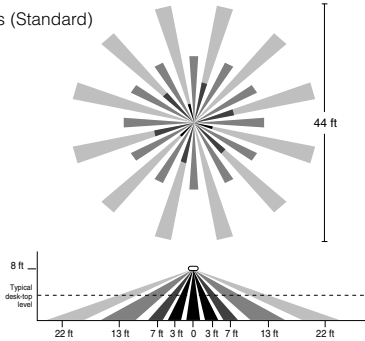
PIR sensing systems are passive systems which react to changes in infrared energy (moving body heat) within the coverage area. PIR sensors must directly "see" motion of an occupant to detect them, so careful consideration must be given to sensor placement.

COVERAGE PATTERNS

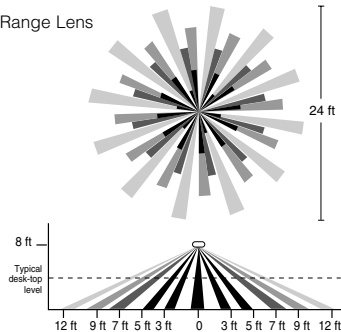
The CI-200 has a multi-cell, multi-tier Fresnel lens with a field of view of 360°. The sensor has two lens pattern options. The Extended Range Lens will cover up to 1200 sq ft and 22 ft from the sensor when mounted at 8ft. The High Density/Reduced Range Lens will cover up to 500 sq ft and 12 ft from the sensor when mounted at 8ft. 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

Extended Range Lens (Standard)
CI-200



High Density/Reduced Range Lens
CI-200-1



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PLACEMENT

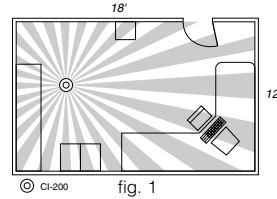
The effective coverage distances may be slightly less than the maximum sensing distance (see Coverage Patterns), depending upon obstacles such as furniture or partitions, and this must be considered when planning the number of sensors and their positioning. See the list below for approximate coverage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

Approximate coverage, for a mounting height of 8 feet:

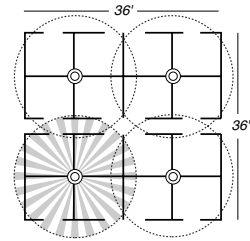
Lens option	Walking motion	Workstation (hand motion)
Extended Range	up to 22ft radius (1200 sq ft)	12ft radius (500 sq ft)
High Density	up to 12ft radius (500 sq ft)	9ft radius (300 sq ft)

The CI-200 sensor can be mounted at various heights. When you will be mounting at heights other than 8ft, 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 -14ft, you may start to significantly reduce sensitivity.

Often the best location to install a CI-200 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).



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



TURN POWER OFF AT CIRCUIT BREAKER BEFORE INSTALLING SENSOR

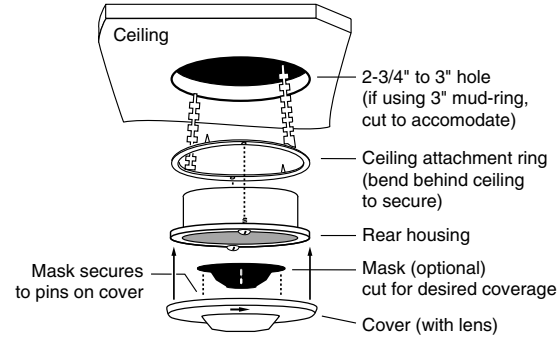
A 4-S junction box can be used with a 3" mud-ring when local building codes mandate that low voltage connections be contained in a junction box. Otherwise a 3" mud-ring or the provided ceiling attachment ring can be used.

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.

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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.

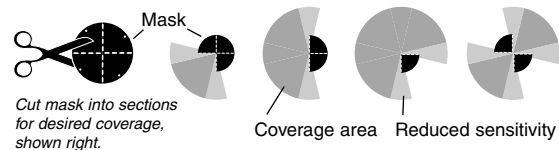
The mask is cut as needed and mounted onto anchor pins in the sensor's cover.

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



TURN POWER OFF AT CIRCUIT BREAKER BEFORE WIRING SENSOR

Watt Stopper B series **power packs** supply power for up to 5 CI-200s. When using more sensors than this, multiple power packs are required.

For all configurations—connect the low voltage:

- RED wire (+24VDC) from power pack to VIOLET wire on sensor.
- BLACK wire (Return) from power pack to GREEN wire on sensor.

Connections for the following configurations: (refer to wiring diagram below)

Single lighting load controlled by occupancy only—connect:

- BLUE wire from power pack to YELLOW wire on sensor.

Single lighting load controlled by occupancy,

dependent on light level (ambient light)—connect:

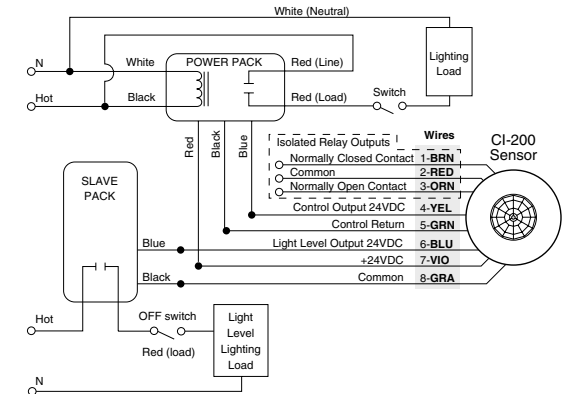
- BLUE wire from power pack to BLUE wire on sensor.

One lighting load for occupancy control, and a second load for occupancy and light level (ambient light) control—connect:

- BLUE wire from power pack to YELLOW wire on sensor.
- BLUE wire from **slave pack** to BLUE wire on sensor.
- BLACK wire from **slave pack** to GRAY wire on sensor.

Isolated Relay: (The Isolated Relay is rated for 1A @24VDC or 24VAC) Connect the wires necessary to the application that requires this output.

- RED (Common) (must be used for proper operation)
- BROWN (Normally Closed)—Open when occupancy is detected.
- ORANGE (Normally Open)—Closed when occupancy is detected.

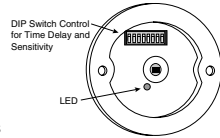


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SENSOR ADJUSTMENT

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.
- 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.
 - Set **Time Delay** to minimum: DIP switches #1 through 6 set to ON (15 secs.).
 - Set **Sensitivity** to maximum: DIP switches #7 and #8 to ON.
 - Replace the sensor's cover.
 - 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.

- 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								
15 seconds	●	●	●	●	●	●	—	—
2 minutes	—	—	●	●	●	●	—	●
4 minutes	—	●	●	●	●	●	—	—
6 minutes	—	—	●	●	●	●	▶	●
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



USE PROPER SAFETY PRECAUTIONS WHEN WORKING WITH OR NEAR HIGH VOLTAGE

Lights will not turn on:

- Verify the lens is not masked in the direction being tested (see Masking).
- Adjust Sensitivity settings up if needed (DIP switches #7 & 8).
- Verify power pack and sensor connections are correct and secure.
- 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:

- Check that Time Delay settings are correct (DIP switches #1 – 6).
- Decrease Sensitivity settings if needed (DIP switches #7 & 8).
- Verify power pack and sensor connections are correct and secure.
- 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. And 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.

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

Unwanted sensor activations (LED flashes):

Possible causes

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

Possible solutions

- Masking (see Masking).
- Setting the Sensitivity lower.
- 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
CI-205	20–30VDC Occupancy Sensor with Extended Range Lens (Standard)
CI-205-1	20–30VDC Occupancy Sensor with High Density /Reduced Range Lens
B120E-P	Power Pack: 120VAC, 60Hz, 150mA 20A ballast/13A incandescent
B230E-P	Power Pack: 230VAC, 50/60Hz, 150mA 20A ballast/13A incandescent
B277E-P	Power Pack: 277VAC, 60Hz, 150mA, 20A ballast
B347D-P	Power Pack: 347VAC, 60Hz, 150mA, 15A ballast
S120/277/347E-P	Slave Pack: 120/277VAC, 60Hz, 20A ballast 347VAC. 60Hz, 15A ballast

WARRANTY INFORMATION

The Watt Stopper®, Inc. warrants its products to be free of defects in materials and workmanship for a period of five years. There are no obligations or liabilities on the part of The Watt Stopper, Inc. for consequential damages arising out of or in connection with the use or performance of this product or other indirect damages with respect to loss of property, revenue, or profit, or cost of removal, installation or reinstallation.

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86-0476-00r3 9/99

CI-205

version 2

360° PIR Occupancy Sensor



SPECIFICATIONS

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



Santa Clara, CA 95050 USA
 1(800)879-8585 1(972)578-1699

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

Installation Instructions

DESCRIPTION

The CI-205 is a 24VDC Passive Infrared (PIR) occupancy sensor which controls lighting or HVAC systems based on occupancy in a given area.

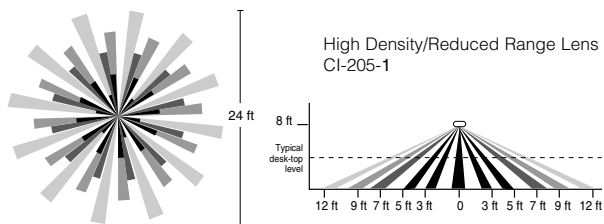
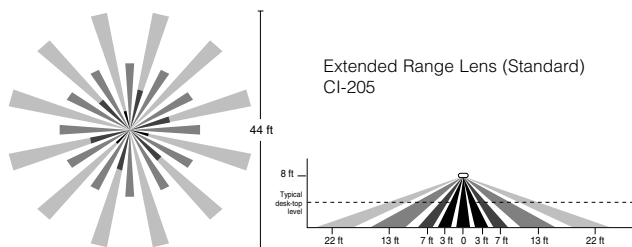
PIR sensing systems are passive systems which react to changes in infrared energy (moving body heat) within the coverage area. PIR sensors must directly "see" motion of an occupant to detect them, so careful consideration must be given to sensor placement.

COVERAGE PATTERNS

The CI-205 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)
Extended Range	up to 22 ft radius (1200 sq ft)	12ft radius (500 sq ft)
High Density	up to 12 ft radius (500 sq ft)	9ft radius (300 sq ft)

The CI-205 sensor can be mounted at various heights. When you will be 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 CI-205 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.

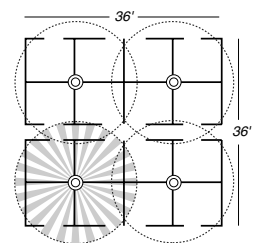
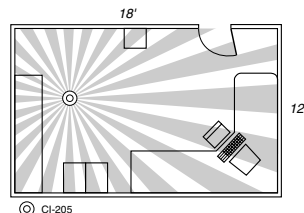


fig. 1



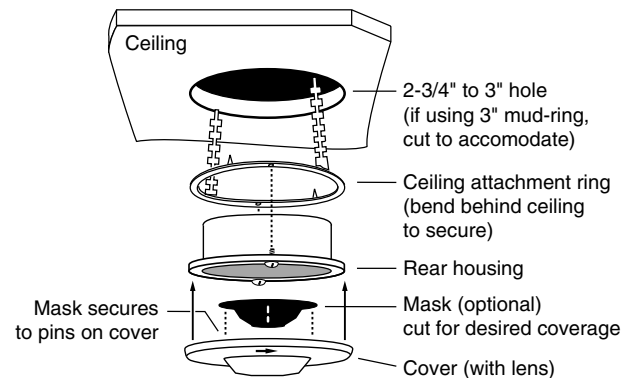
For **open office** areas with partitions it is best to place sensors over intersections of four workstations (see fig. 2).

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



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

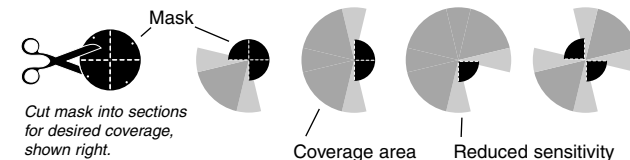
An insert (mask) is supplied to allow elimination of coverage in unwanted areas. The mask is cut as needed and mounted onto anchor pins in the sensor's cover.

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



TURN POWER OFF AT CIRCUIT BREAKER BEFORE WIRING SENSOR

Watt Stopper B series **power packs** supply power for up to 10 CI-205s. 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.

