Wattstopper®

Occupancy Sensor • Low Temperature Indoor/Outdoor Low Voltage PIR (version 2)

No: 24771 – 03/25 rev. 3

Installation Instructions • Instructions d'Installation • Instrucciones de Instalación

Catalog Number • Numéro de Catalogue • Número de Catálogo: CB-100

Country of Origin: Made in China • Pays d'origine: Fabriqué en Chine • País de origen: Hecho en China

SPECIFICATIONS

Voltage 24VDC
Compatible with Wattstopper PLUS Sensor Interface Module (EN-SIM-AI/SPS-GB2-BK).*
Current Consumption 20mA
Power Supply .....Wattstopper Power Packs
..... BZ series power packs supply power for up to 7 sensors
Isolated Relay Rating ..... 1A @30VDC
Operating Temperature .....-40° to 95°F (-40° to 35°C)
Time Delay Adjustment ..... 15 seconds, 5 minutes, 10 minutes
Sensitivity Adjustment .....4 settings

*Note: Unless powered by 24VDC, isolated relay will not function

DESCRIPTION AND OPERATION

The CB-100 is a Passive Infrared (PIR) occupancy sensor which can operate at low temperatures to control indoor or outdoor lighting and/or HVAC systems based on occupancy in the coverage area. PIR sensing systems are passive systems that react to changes in infrared energy (heat), within their coverage areas. These sensors are specifically engineered to be installed in cold and damp conditions and are suitable for outdoor use when used with a light level sensor.

The CB-100 is rated for temperatures as low as -40ºF and damp conditions. The CB-100 provides a 24VDC Isolated Relay with contacts that are Normally Open (NO), or Normally Closed (NC), based on occupancy.

The CB-100 is a 24VDC sensor designed for use with Wattstopper Power Packs.

PLACEMENT GUIDELINES

When deciding the placement of these sensors, the most important point to remember is that the sensor must be able to "see" the coverage area clearly. Any obstacles, such as walls, shelves, partitions, or trees, will block the sensor's view. Also remember, when placing these sensors, that they are more sensitive to motion across the field of view, than motion moving directly toward or away from the sensor.

Do not place sensor within 15' of any high powered blowers or heaters, as this will cause the sensor to function improperly. These sensors should not be placed so that they are directly exposed to rain, ice, or direct sunlight.

Warehouse and Storage Areas

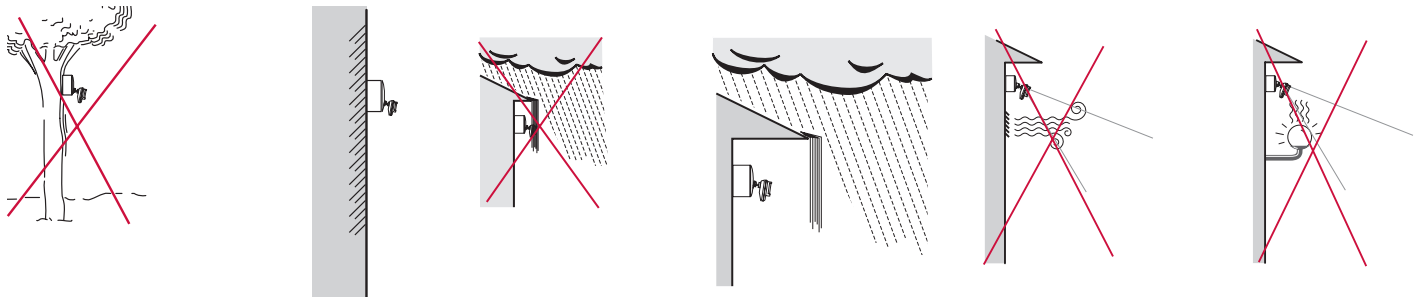
When using sensors in warehouses and storage areas that have long shelves and aisles, there are two lens options: the Long Range Lens (CB-100-1) and the Aisleway Lens (CB-100-3). Depending on the building's construction and ceiling height, the sensor can be mounted on the wall or the ceiling.

High Mounting Heights (over 15')

As the mounting height of the CB-100 (standard) and CB-100-1 sensor increases over 15', the maximum coverage distance will decrease. At 15', the coverage area is, in most cases, as described in the Coverage Patterns section. For every 2' increase in mounting height over 15', assume the coverage area will decrease 10-15%. The maximum mounting height for CB-100 (standard) and CB-100-1 sensors is 30'. Coverage at that height is half the area shown in the Coverage Patterns diagrams.

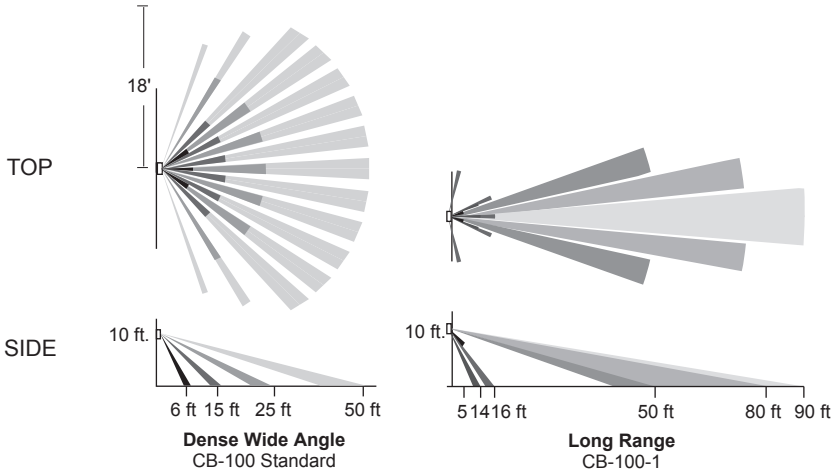
The CB-100-3 two-sided aisleway lens pattern is optimized at a ceiling mounting height of 30' as shown in the Coverage Patterns section.

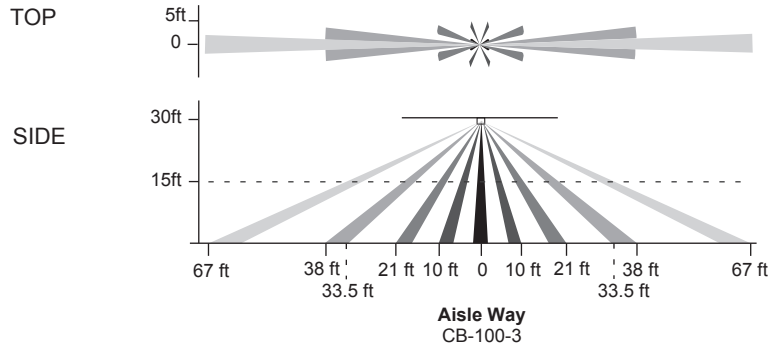
Mount to flat, stable, vibration-free surface. **Avoid runoff; sheltered locations preferred.** **Do not mount by vents or above lamps**



COVERAGE PATTERNS

NOTE: Coverages shown are maximum and represent coverage for half-step, walking motion. For building spaces with lower levels of activity or with obstacles and barriers, coverage size may decrease.





Note: Coverages shown are maximum and represent coverage for half-step, walking motion. For building spaces with lower levels of activity or with obstacles and barriers, coverage size may decrease.

MOUNTING THE SENSOR

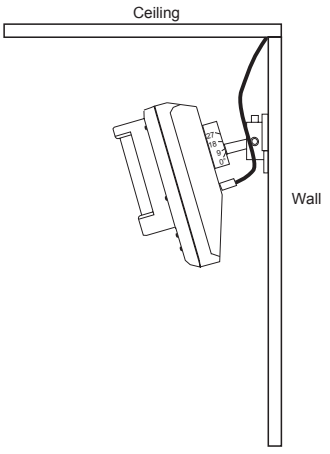
CB-100 and CB-100-1 Mounting

The CB-100 (standard) and CB-100-1 are designed to be mounted at a height of 10-15'.

The sensors come with a swivel bracket already installed.

This swivel mount allows the installer to adjust the sensor as needed to get proper coverage. Firmly secure the swivel bracket to a wall or box and wire as described in the Wiring Directions.

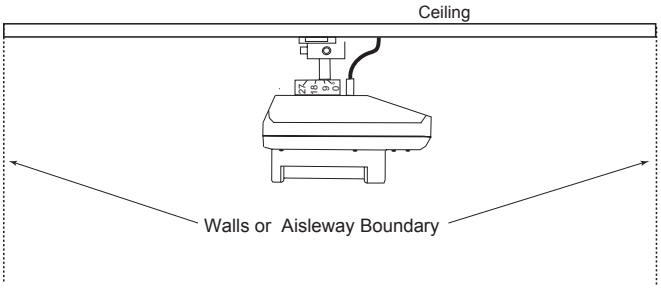
NOTE: Do not tighten set screws on swivel mount bracket until sensor has been adjusted following the Adjustment Procedures.



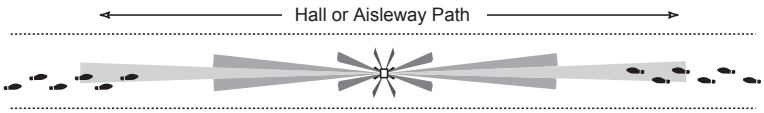
CB-100 Wall Mount

CB-100-3 Ceiling Mount

The CB-100-3 coverage pattern is designed for aisle and hallway applications. It is typically mounted to the ceiling. Position the sensor so that its view is straight down and the coverage pattern flows along the length of the aisle or hallway.



CB-100-3 Ceiling Mount



WIRING DIRECTIONS

WARNING: TURN THE POWER OFF AT THE CIRCUIT BREAKER BEFORE WIRING.

Each Wattstopper BZ power pack can supply power for up to 7 CB-100 sensors. When using more sensors than this, multiple power packs are required.

The CB-100 is designed to work with the Wattstopper Power Packs and Auxillary Relay Packs. Please read the instructions that came with the Power Pack or Auxillary Relay Pack before proceeding.

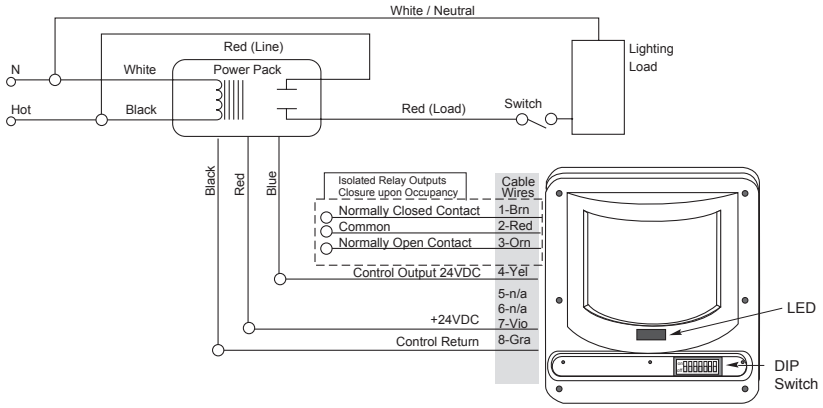
Isolated Relay Note:

- The Normally Closed Contact is OPEN when occupancy is detected, and until the Time Delay has timed out after occupancy is no longer detected.

Conversely.

- The Normally Open Contact is CLOSED when occupancy is detected, and until the Time Delay has timed out after occupancy is no longer detected.

WIRING DIAGRAM



Normal Installation

Connect the:

BLUE wire from the Power Pack to YELLOW wire from the sensor.

RED wire from the Power Pack to PURPLE wire from the sensor.

BLACK wire from Power Pack to GREY wire from the sensor.

Using the isolated relay in the unit, as well as the relay in the Power Pack

Wire as described for Normal Installation plus:

For NORMALLY OPEN (NO) contacts - use the ORANGE and RED (Common) wires from the sensor.

For NORMALLY CLOSED (NC) contacts - use the BROWN and RED (Common) wires from the sensor.

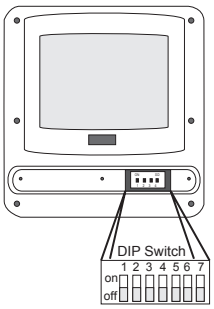
Using just the isolated relay in the unit and not the relay in the Power Pack

Follow the instruction above, except:

DO NOT connect the BLUE wire from the Power Pack to the YELLOW wire from the sensor. Tape or cap the ends of the wires to prevent sparking.

DIP SWITCHES

All sensor adjustments are made using the DIP Switches located under the unit's front panel.



Sensitivity	1	2	
Minimum	↑	↑	
Med Low	↑	↓	
Med High	↓	↑	
Maximum	↓	↓	◀

Time Delay	3	4	
15 seconds	↑	↑	
5 minutes	↓	↑	
10 minutes	↓	↓	◀

↑ = ON
↓ = OFF
◀ = Factory Setting

Sensitivity

There are four sensitivity adjustment settings. The CB-100 is shipped from the factory preset at maximum sensitivity.

Time Delay

The CB-100 uses a digital timer and comes with three time delay wiring choices. The CB-100 is shipped from the factory preset at 10 minutes.

NOTE: For best operation, do not leave the time delay set at 15 seconds. The 15-second time delay is for testing purposes only.

Recommended: Time Delay Settings:

General Outdoors	5 minutes
Small Garages	5 minutes
Large Garages	10 minutes
Small Cold Storage	5 minutes
Large Cold Storage	10 minutes
Large Cold Storage with Forklifts in use	10 minutes

SENSOR ADJUSTMENT

The sensors are factory preset to allow for quick installation in most applications. However, verification of proper wiring or coverage, or customizing of the sensor's settings can be done through the following steps.

Before starting the adjustment process, make sure that furniture, shelving, signs, and anything that may obstruct the view of the sensor is installed, lighting circuits are turned on, and the HVAC systems are in the overridden/on position. VAV systems should be set to their highest airflow.

Refer to "DIP Switches" for DIP Switch location and Time Delay and Sensitivity settings.

There is a warm-up period when power is first applied to the sensor of up to one and a half minutes.

1. Set the time delay to minimum, 15 seconds.
2. Aim the sensor toward the desired coverage area. Use the alignment marks on the swivel mount to assure that the sensor is level and not tilted toward one side. Tighten the set screws just enough to prevent the sensor from moving.
3. Confirm that sensitivity is set at maximum.
4. Move out of the coverage area and wait for the lights to turn off (about 15-30 seconds). If the lights do not turn off, verify that there is no one in the coverage area and try again. If the lights still do not turn off, set the sensitivity to medium high and try again. If the lights still do not turn off, refer to the troubleshooting section for more in depth procedures.
5. Walk around the desired coverage area to confirm that the sensor is aligned correctly. Watch the RED LED. The LED blinks when movement is detected. Move the sensor up or down, or from side to side until the desired coverage is achieved. Tighten the set screws. **Make sure that the sensor is not tilted right or left. Use the alignment lines on the swivel bracket to determine if the sensor is tilted.**
6. Set the Time Delay.

TROUBLESHOOTING

Lights will not turn on.

LED does not flash with motion:

1. Check sensitivity settings. Adjust up as needed (DIP Switches #1 & 2)
2. Check that wire connections from sensor to power pack are correct and secure.
3. Check for +24VDC at the Red wire from the power pack to the sensor.
   If 24 VDC is present, call 800.879.8585 for Technical Support.
   If there is no voltage, see "Power Pack High Voltage Checklist" on the next page.

LED flashes with motion:

1. Check that wire connections from sensor to power pack are correct and secure.
2. Try another sensor (if available).
   See "Power Pack High Voltage Checklist" on the next page.

Lights will not turn Off:

1. Check that Time Delay settings are correct (DIP Awitches #3 & 4).
2. Check Sensitivity settings. Decrease as needed (DIP Switches #1 & 2).
3. Check that wire connections from sensor to power pack are correct and secure.
4. Disconnect Blue wire on power pack from Yellow on sensor.

   If the lights turn off, the problem may be in the sensor. Reconnect the blue wire. 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” on the next page, then 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” on the next page.

Isolated relay not functioning properly:

Use proper high voltage precautions, if applicable.

1. Check that Time Delay settings are correct (DIP Switches #3 & 4).
2. Check Sensitivity setting.
   Also see “Unwanted Sensor Activations” below.
3. Check that all wire connections from sensor are correct and secure.
4. Check that there is voltage to the Isolated Relay.
5. Check that +24VDC is at the Red wire from the power pack to the sensor.

Power Pack High Voltage Checklist:

1. Use proper high voltage precautions.
2. Check that power pack high voltage wire connections are correct and secure.
3. Check that the power pack is rated at the correct voltage.
4. Check that there is high voltage going into the power pack.
5. 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 “Sensor Placement”).
2. HVAC vents with heavy air flow.

Possible solutions:

1. Masking: place opaque tape over the edge of the lens to block sensitivity in certain directions.
2. Set the sensitivity lower.
3. Relocate the sensor.

Sensor Override:

If the sensor fails, connect the power pack’s 24VDC blue and red wires together. This will bypass the sensor and allow the lights to work manually.

ORDERING INFORMATION

Catalog Number	Description
CB-100	Occupancy Sensor, Dense Wide Angle Lens (Std)
CB-100-1	Occupancy Sensor, Long Range Lens
CB-100-3	Occupancy Sensor, Aisleway Lens
BZ-100	Power Pack: 120/277VAC, 60Hz, 150mA with relay connected, 20A ballast/incandescent,1HP@120/240VAC
S120/277/347E-P	Auxiliary Relay Pack: 120/277VAC, 60Hz, 20A Ballast 347VAC, 60Hz, 15A Ballast

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