

Single Pole (One Location) or Multi-Location Multi-Technology Designer Wall Switch Occupancy Sensor

California Title 24 2005 Compliant

Cat. No. LRS22200X (X= 0 White, 1 Ivory)

Incandescent/Tungsten: 800W @ 120V Ballast: 1200VA @ 120V Ballast: 2700VA @ 277V Motor: 1/4hp @ 120V

Operating Temperature Range: 0°C to 50°C

Relative Humidity: 20% to 90% non-condensing

No Minimum Load Required

Compatible with incandescent lamps, low-voltage lighting with electronic and magnetic transformers, electronic and magnetic fluorescent ballasts, and fans.

INSTALLATION INSTRUCTIONS

WARNINGS AND CAUTIONS:

- **TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER** at circuit breaker or fuse when servicing, installing or removing fixture.
- To be installed and/or used in accordance with appropriate electrical codes and regulations.
- If you are unsure about any part of these instructions, consult an electrician.
- **Controlling a load in excess of the specified ratings** will damage the unit and pose **RISK OF FIRE OR ELECTRIC SHOCK**. Check your load ratings to determine suitability for your application.

WARNINGS AND CAUTIONS:

- Do not install this unit to control a receptacle.
- The LRS22200X Occupancy Sensor is intended to replace a standard single-pole wall switch.
- Do not touch the surface of the lens. Clean outer surface with a damp cloth only.
- Use this device with **copper or copper clad wire only**.

TOOLS NEEDED TO INSTALL YOUR SENSOR

Slotted/Phillips Screwdriver
Pliers
Small Slotted Screwdriver

Electrical Tape
Cutters

FEATURES

- Sensor can be ganged together with other units in a multiple-switch wall plate.
- Self-Adaptive Technology adjusts to occupancy patterns of use in auto adapt mode.
- The Adapting Time-out walk-through feature prevents lights from remaining ON for an extended period after only a momentary occupancy.
- Switches a single load circuit.
- One Push-Button which provides manual ON/OFF switching at any time.
- Adjustable horizontal field of view.
- Integrated photocell prevents lights from turning ON when room is adequately illuminated by natural light.
- True Zero-Cross relay provides maximum contact life and compatibility with electronic ballasts.
- Dual detection technology, both Passive Infrared and Ultrasonic. Can be configured as Ultrasonic Only by disabling Passive Infrared.

DESCRIPTION

Cat. No. LRS22200X, the Designer Multi-Technology Wall Switch Occupancy Sensor by Philips, is designed to detect motion using the passive infrared (PIR) sensor from sources (such as a person entering a room) within its field-of-view (monitored space) and automatically switch lights ON. The Occupancy Sensor senses motion within its maximum coverage area of 2400 sq. ft (223 m²). The ultrasonic (US) sensors work with the PIR to keep the lights ON when occupied. The controlled lights will remain ON until no motion is detected and the scheduled time-delay has expired, at which point the lights will be turned OFF. In adapting time-out mode the sensor adapts its time delay settings to the occupancy patterns of a room.

The Cat. No. LRS22200X is an Occupancy Sensor that is designed to control a single lighting control circuit and provide the energy savings of an occupancy sensor. This device does not contain a neutral conductor. It is intended for use in retrofit applications where a neutral is not available in the wall box.

The LRS22200X is a single relay device, which can be Auto ON or Manual ON. The device contains a photocell that provides an Ambient Light Hold Off function. The device is configurable for either Ultrasonic with PIR or Ultrasonic Only modes of operation.

Cat. No. LRS22200X is ETL listed, cETL listed and conforms to California Title 24 requirements.

The PIR Occupancy Sensor uses a small semiconductor heat detector that resides behind a multi-zone optical lens. This Fresnel lens establishes dozens of zones of detection. The Sensor is sensitive to the heat emitted by the human body. In order to initially trigger the Sensor, the source of heat must move from one zone of detection to another. The device is most effective in sensing motion across its field-of-view and it is less effective sensing motion towards or away from its field-of-view. Keep this in mind when selecting the installation location (refer to **Field-of-View diagrams**).

The US Occupancy Sensor uses a non-audible, high frequency (40kHz) to sense Doppler shifts caused by motion in the space. The US is more sensitive to small motion and does not rely on line of sight for detection. If both sensors have not detected any motion for the set timeout period, the relay and its corresponding load will be turned OFF.

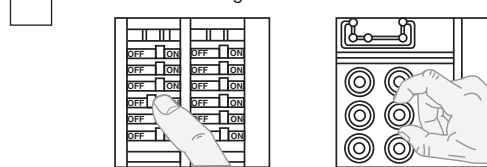
Note that occupancy sensors respond to rapid changes in temperature, so care should be taken not to mount the device near a climate control source (i.e. radiators, air exchanges, and air conditioners). Hot or cold drafts will look like body motion to the device and will trigger it if the unit is mounted too close. **It is recommended to mount the Occupancy Sensor at least 6 feet away from a climate control source.**

In addition, it is also recommended NOT to mount the Occupancy Sensor directly under a large light source. Large wattage bulbs (greater than 100W incandescent) give off a lot of heat and switching the bulb causes a temperature change that can be detected by the device. Mount the Occupancy Sensor at least 6 ft. away from large bulbs. If it is necessary to mount the device closer, lower the wattage of the bulb directly overhead.

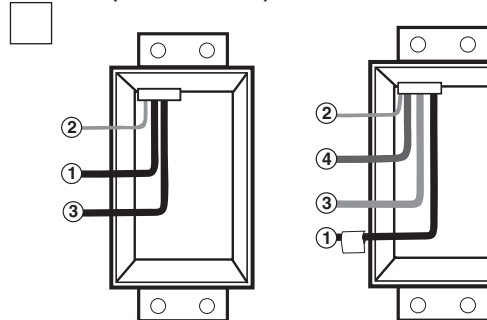
INSTALLING YOUR SENSOR

NOTE: Use check boxes when Steps are completed.

Step 1 **WARNING: TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER** at circuit breaker or fuse and test that power is off before wiring!



Step 2 **Identifying your wiring application (most common):**



Single-Pole

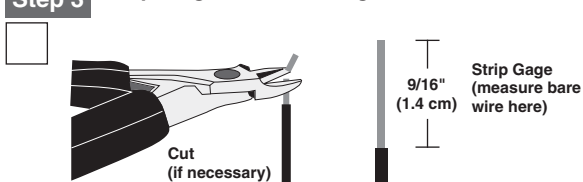
1. Line (Hot)
2. Ground
3. Load

3-Way

1. Line or Load (See important* instruction)
2. Ground
3. First Traveler – note color
4. Second Traveler – note color

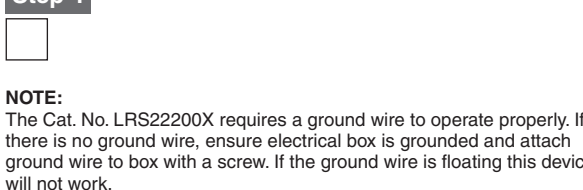
IMPORTANT: For 3-Way applications, note that one of the screw terminals from the old switch being removed will usually be a different color (Black) or labeled Common. Tag that wire with electrical tape and identify as the common (Line or Load) in both switch wall boxes.

Step 3 **Preparing and connecting wires:**

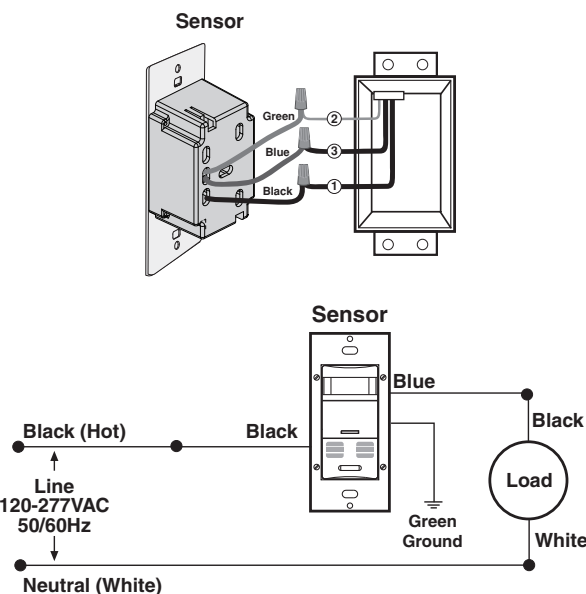


- Pull off pre-cut insulation from sensor leads.
- Make sure that the ends of the wires from the wall box are **straight (cut if necessary)**.
- Remove insulation from each wire in the wall box as shown.

Step 4 **Installing your Sensor – Single-Pole Application:**



NOTE: The Cat. No. LRS22200X requires a ground wire to operate properly. If there is no ground wire, ensure electrical box is grounded and attach ground wire to box with a screw. If the ground wire is floating this device will not work.



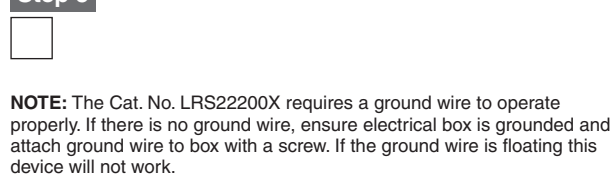
WIRING SENSOR:

Connect wires per WIRING DIAGRAM as follows: Screw wire connector on clockwise making sure there are no bare conductors below the wire connectors. Secure each connector with electrical tape.

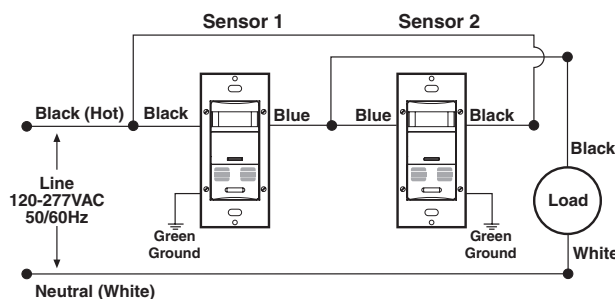
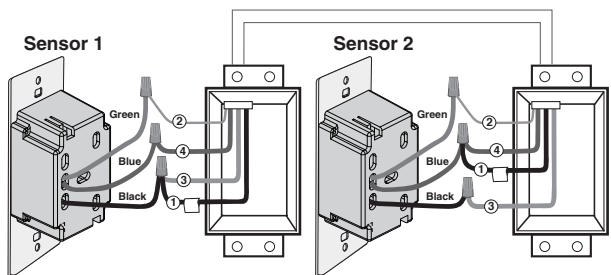
- Green or bare copper wire in wall box to Green lead.
- Line Hot wall box wire to Black lead.
- Load wall box wire to Blue lead.

NOTE: Allow 1 minute for warm-up after connecting and energizing.

Step 5 **Installing your Sensor – 3-Way Wiring Application:**



NOTE: The Cat. No. LRS22200X requires a ground wire to operate properly. If there is no ground wire, ensure electrical box is grounded and attach ground wire to box with a screw. If the ground wire is floating this device will not work.



NOTE: Sensor 1 **must** be installed in a wall box that has both a LINE Hot and a Ground connection. Sensor 2 **must** be installed in a wall box that has both a Load and a Ground connection. If you are unsure about any part of these instructions, consult a qualified electrician.

NOTE: Either sensor can turn the lights ON. Both sensors must time out to OFF or both manual buttons must be pressed for the lights to go OFF

WIRING SENSOR 1:

Connect wires per WIRING DIAGRAM as follows:

- Green or bare copper wire in wall box to Sensor 1 Green lead.
- Line Hot (common) wall box wire identified (tagged) when removing old switch and First traveler from Sensor 2 to Sensor 1 Black lead.
- Second Traveler wall box wire from Sensor 2 to Sensor 1 Blue lead.

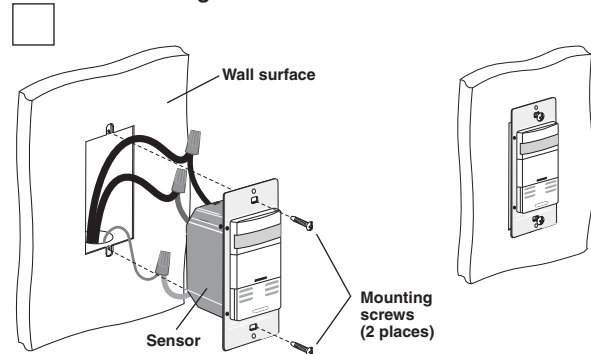
WIRING SENSOR 2:

Connect wires per WIRING DIAGRAM as follows:

- Green or bare copper wire in wall box to Sensor 2 Green lead.
- Load wall box wire identified (tagged) when removing old switch and Second Traveler from Sensor 1 to Sensor 2 Blue lead.
- First Traveler Line Hot from Sensor 1 to Sensor 2 Black lead.

NOTE: Allow 1 minute for warm-up after connecting and energizing.

Step 6 **Testing your Sensor prior to completely mounting in wall box:**



NOTE: Dress wires with a bend as shown in diagram to relieve stress when mounting device.

- Position all wires to provide room in outlet wall box for device.
- Partially secure device using long mounting screws provided.
- Restore power at circuit breaker or fuse.

NOTE: Allow 1 minute for warm-up after energizing.

NOTE: All models of the LRS22200X are factory preset to work without any adjustments. If necessary, adjust the Blinders and PIR Range Control to stop any unwanted activation of the lights (refer to **FEATURES** section).

• For additional Time Control Settings (refer to the **SETTINGS** section). **NOTE:** To avoid PERMANENT DAMAGE to the unit, be careful NOT TO OVERTURN the control knobs or levers when setting the Sensor. The controls can be accessed by removing the wallplate (if applicable) and control panel cover (refer to **Control Panel Diagram**). Use a small straight blade screwdriver to adjust knobs and blinder levers.

NOTE: DO NOT press in on blinder levers or use excessive force (refer to **Control Panel Diagram**).

• Attach the Control Panel cover when the desired settings are complete.

If lights do not turn ON, refer to the TROUBLESHOOTING section.

FEATURES

NOTE: To access control settings, remove the control panel cover. If necessary, remove the warning label that covers the adjustment dials (refer to Control Panel Diagram).

Factory Settings: The sensor is shipped from the factory to work in almost all situations, without any added adjustments. The factory settings are: Blinders open, 10 minutes fixed Time-Out, Lights always turn ON regardless of existing light levels, Medium passive infrared (PIR) range, and High Ultrasonic range. The PIR and ultrasonic technologies are both active.

Blinders: The blinders are two independent shutters that can narrow the field-of-view from a maximum of 180° down to 32°. The blinders are operated by moving the blinder levers towards or away from the center of the Sensor. The blinder levers can be found above the control dials in the control panel (refer to **Control Panel Diagram**).

Time-Outs: The Sensor has three types of Time-Outs: Fixed, Adapting, and Walkthrough.

- **Fixed Time-Out:** The value of this Time-Out is user selected through the use of the Time Control Setting (refer to **Control Panel Diagram** and **Time-Out Settings**).

- **Adapting Time-Out:** When activated, the value of this Time-Out (30 minutes) is changed by the Sensor based on room occupancy and lighting conditions.
- **Walk-through Time-Out:** The value of this Time-Out is preset to 2.5 minutes and only exists in the Adapting Time-Out mode.

Fixed Time Delay: The fixed Time-Out value is selected by rotating the Time Control dial. There are four (4) values from which to choose. Each mark around the dial corresponds to a different value as indicated below (refer to Control Panel Diagram).

NOTE: All time durations are approximate within ±10 seconds.

Adapting Time Delay: The Sensor has built in adapting intelligence that changes the Adapting Time-Out duration in response to the occupancy conditions of the room it is installed in. If the Sensor detects "large," infrequent motion it will INCREASE the Adapting Time-Out duration. If the Sensor detects "large," frequent motion (as in several persons in a room during a meeting), it will DECREASE the time-out duration only if it was NEVER increased (this is because the builtin intelligence will always proceed in the direction of "increasing" adapting Time-Out once it has increased it for any of the occupancy conditions sensed). The Adapting Time-Out duration will range from 10 to 30 minutes in time plus the Walk-Through Time Delay.

Walk-Through Time Delay: The walk-through feature which is only active in the Adapting Time-Out mode, is useful when a room is momentarily occupied. With this feature, the Sensor will turn the lights OFF shortly after the person leaves the room. The walk-through feature works in the following manner: When a person enters the room, the lights will turn ON. If the person leaves the room before the walk-through time-out of 2.5 minutes, the Sensor will turn the lights OFF after 2.5 minutes. If the person stays in the room for longer than 2.5 minutes, the Sensor will instead use the stored Adapting Time-Out Delay setting.

If the Sensor detects motion within 30 seconds after the lights turn OFF, it will turn the lights ON and increase the time-out value by 1.5 times the existing value.

The Adapting Time-Out may be reset to the base value of 30 minutes by rotating the Time Control to a new time selection value and then back to the Adapting Time-Out value (refer to Control Panel Diagram).

Ambient Light Override: The Ambient Light Override is used to keep the lights OFF if there is already enough natural light in the room.

For proper operation, the Ambient Light Override adjustment must be performed when there is enough natural light (refer to the SETTINGS section). If the adjustment is made when there is less natural light, the lights may not turn ON even though they are needed and will require manual activation of the push-buttons to turn the lights ON.

NOTE: The ambient light level in the center of a room will be different than the level at the wall where the switch is located.

Ambient Light Dial: The ambient light setting is adjusted with the Ambient Light Dial (refer to Control Panel Diagram). Turning the Light Dial fully counter-clockwise (CCW), sets the Sensor to manual ON mode (see following section). If the light control is in the fully CW position, the lights will turn ON whenever motion is detected, even in full daylight. Intermediate settings will cause the lights to turn ON only when the ambient light is below the level selected by the light control.

NOTE: When the setting is at the minimum CCW level, the lights will stay OFF when the room is dim. When the setting is at the maximum level clockwise (CW), the lights will turn ON when the room is bright.

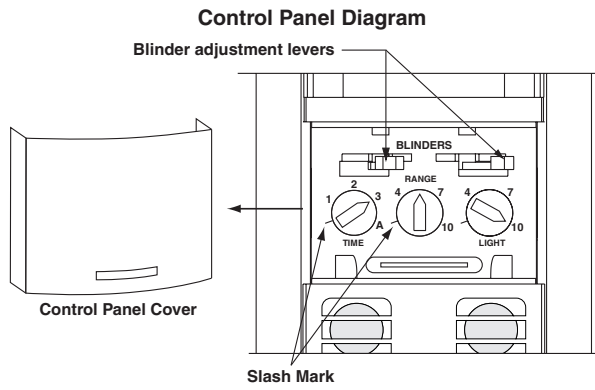
Manual ON Mode: When the light control is in the fully CCW position the lights will never automatically turn ON. In this mode the lights need to be manually turned ON by the push-button, and will turn OFF with the absence of motion.

PIR RANGE: To decrease PIR detection range and sensitivity, rotate the knob CCW (refer to Control Panel Diagram). The detection range can be adjusted from 100% down to 30%.

ULTRASOUND (US) SENSITIVITY AND PIR DISABLE: US sensitivity can be adjusted to HIGH-MEDIUM- LOW by holding the ON button for 15 seconds. The LED will flash to represent the Ultrasonic sensitivity and PIR status. Tapping the ON button during the desired LED flash indication will set the Ultrasonic sensitivity and PIR status. Use the following chart:

US Sensitivity and PIR Disable	
3 amber flashes	High ultrasonic sensitivity, PIR enabled
2 amber flashes	Medium ultrasonic sensitivity, PIR enabled
1 amber flash	Low ultrasonic sensitivity, PIR enabled
3 green flashes	High ultrasonic sensitivity, PIR disabled
2 green flashes	Medium ultrasonic sensitivity, PIR disabled
1 green flash	Low ultrasonic sensitivity, PIR disabled

NOTE: The program times out in 30 seconds from the last button press. The factory setting for the US sensitivity is HIGH with PIR and Ultrasonic technologies enabled.



SETTINGS

NOTE: To avoid PERMANENT DAMAGE to the unit, be careful NOT TO OVERTURN or use excessive force when setting the control knobs or levers of Cat No. LRS22200X. Use a small straight blade screwdriver to adjust the knobs and your finger to adjust the blinder levers.

1. Remove wallplate and Control Panel Cover from Sensor.
2. Rotate the Time dial to select the desired fixed Time-Out value.
3. If the Sensor is installed within 6 feet of an air duct, rotate the Range Control 1/4 turn counter-clockwise (CCW).

4. **Set the Ambient Light Level - AMBIENT LIGHT:** Cat. No. LRS22200X has an adjustment to determine at what minimum ambient light level the unit will operate. The adjustment should be made when the ambient light is at the level where no artificial light is needed. Follow these steps to make a more accurate adjustment of the light control. This feature will not work in Manual-On mode.

A. With the lights ON, rotate the Time Control fully CCW to the set the Time-Out to the thirty (30) second test mode (refer to Control Panel Diagram).

B. Rotate the Light Control fully CCW.

C. Manually turn OFF the lights.

D. Rotate the Light Control clockwise (CW) SLOWLY, until the lights turn ON. This is the setting for the current level of light in the room. Adjust the light control back (CCW) a little so the lights will not turn on with the current room lighting level. Leave the room and wait for the 30-second timeout and 30-second vacancy confirmation to expire. Perform a walk through to see if the lights turn on with the new ambient light level adjustment. Repeat this adjustment as needed to keep the lights from turning on under conditions when enough light is present.

NOTE: When the light control is in the fully CCW position the lights will never automatically turn ON. This is the Manual-On mode, where the lights need to be manually turned ON by the push-button, and will turn OFF with the absence of motion.

If the light control is in the fully CW position, the lights will turn ON whenever motion is detected, even in full daylight.

Intermediate settings will cause the lights to turn ON only when the ambient light is below the level selected by the light control.

NOTE: The ambient light in a room will change with the time of day and the season of the year.

5. Time-Out Settings:

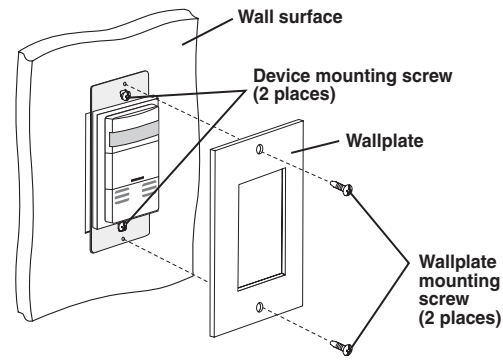
A. Adjust the Time dial. The Sensor Amber LED will flash twice each time the Time dial is pointed at a new Time-Out value. The Time-Out values for non-adapting mode are:

NOTE: To return to adapting mode, rotate the Time dial to full CW position (A setting). Be sure the Time dial is rotated until an Amber LED flash is issued to be sure a new setting was selected.

Face Marking	Value of Time
(/) Slash Mark	30 second fixed time-out for performing a walk test
1	10 minutes fixed time-out
2	20 minutes fixed time-out
3	30 minutes fixed time-out
A	Auto Adapting

6. If desired, adjust the blinders to block any unwanted motion.

7. Replace the Control Panel Cover and wallplate.



- Secure device by firmly tightening mounting screws.
- Install wallplate (sold separately).

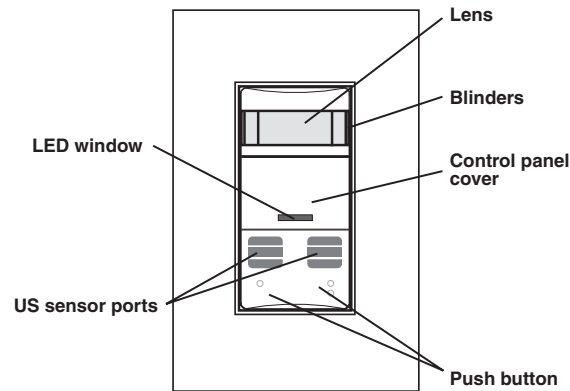
OPERATION

PUSH BUTTON(S)

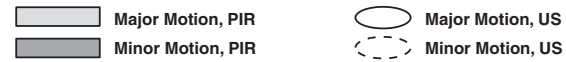
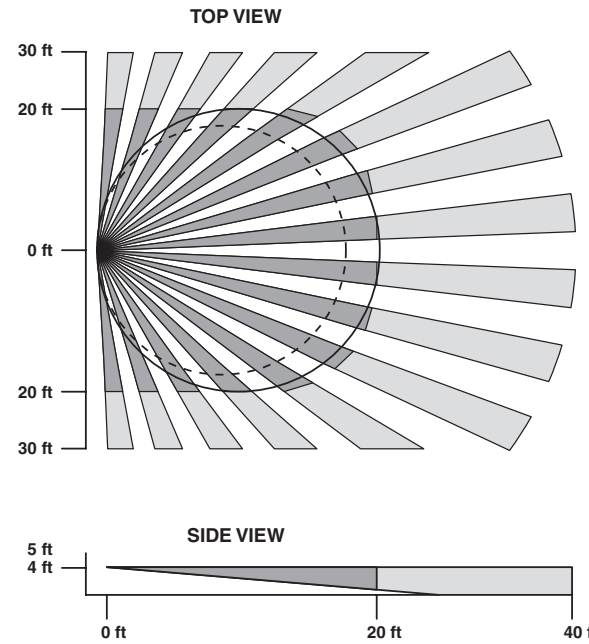
Cat. No. LRS22200X has a single push-button switch that toggles the relay and its corresponding load, ON and OFF (refer to figure). If the relay is OFF, the relay will turn ON when the push-button is pressed, and remain ON in the presence of motion. In the absence of motion, the Sensor Unit will Time-Out and turn the relay OFF.

NOTES:

- The Motion Indicator LED will blink every second while motion is detected. A red blink represents PIR detection, a green blink represents Ultrasonic detection.
- When the Time-Out expires and the relay turns OFF a 30 second vacancy confirmation exist to turn the relay back ON. After this time the device will be placed into a lower detection threshold mode.
- In Manual-ON mode, the button must be pressed to turn the lights ON. In the absence of motion, the unit will Time-Out and turn the lights OFF.
- If Manual-On mode is desired, keep the Light knob in the fully counter-clockwise (CCW) position.



Field - of - View



Minor Motion - Dual Technology coverage. This also represents the maximum ultrasonic range coverage.

TROUBLESHOOTING

1. If there is no response from the unit and the LED never blinks or the push button does not activate the lights 1-1/2 minutes after power is applied, then uninstall device and verify wiring (Step 4).
2. If the lights constantly stay ON, even when the room is unoccupied:
 - A.** Check the Time setting. See how this time compares to how long the lights stay ON.
 - B.** Try lowering the PIR Range Control. Rotate the knob counterclockwise about 30°.
 - C.** If the problem persists, try reducing again.

NOTE: Do not reduce so much that the Sensor Unit cannot see normal occupancy.
 - D.** Try lowering the Ultrasonic Sensitivity.
 - E.** Be sure to use the Blinders to block any unwanted hallway traffic.
 - F.** Check for reflected heat/motion as the Sensor Unit may be seeing motion through a window.
 - G.** Check for adjacent HVAC and/or heater ducts.

PRODUCT INFORMATION

- For technical assistance contact us at 1-800-372-3331
- Visit our website at www.philips.com

FCC COMPLIANCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.