GE Lighting Controls

INSTALLATION INSTRUCTIONS

Model #

CDT-05-180-R
CDT-20-360-R

LISTED APPLIANCE CONTROL 36T0

California Title 24 Compliant

Dual Technology Ceiling Low Voltage Occupancy Sensor

General Information

- Read all instructions on both sides of this sheet first.
- Plan all component locations carefully.
- For indoor use only.
- Install in accordance with ALL local codes.
- For use with GE switchpacks and systems only. For use with other systems contact technical support.
- Do not run Low Voltage wiring in the same conduit as power conductors.

Specifications

Technology: Passive Infrared (PIR) and Ultrasonic (US)

Electrical Ratings:

Input:
- 10-30VDC from GE Switchpack or GE System. Maximum current needed is 25mA per sensor.

Output:
- Open collector ouput to switch up to ten GE Switchpacks.
- Isolated Form C Relay (-R models)
- Isolated Form C Relay Ratings: 1A 30VDC/VAC

Operating Environment:
- Temperature: 32° F – 104° F (0° C – 40° C)
- Relative Humidity: up to 90% non-condensing
- For indoor use only

Time Delays: Self-Adjusting, 15 Second/Test (10 min Auto) Selectable 30 minute lock

Housing:
- Medium impact injection molded housing. ABS resin complies with UL 94V0. Paintable off-white.

Size:
- 1.42"H x 3.75"W x 6.5"D (36.1mm x 95.3mm x 165.1mm)

LED Indicators: Red LED indicates PIR detection Green LED indicates US detection.

Description

The CDT ceiling mounted low voltage occupancy sensor is a Passive Infrared (PIR) and Ultrasonic (US) motion sensing lighting control, used for energy savings and convenience. PIR is used to turn the lights ON and then either or both technologies are used to keep the lights ON. When motion is detected, the blue wire is electronically connected to the red wire, energizing the relay in the switchpack to turn the load on. If vacancy is detected, the blue wire is disconnected from the red, causing the relay to open turning off the load. The red lead is 10-30VDC supply, the black lead is common, and the blue is the relay control.

The sensor includes self-adaptive technology that continually adjusts to conditions by adjusting sensitivity and time delay in real-time.

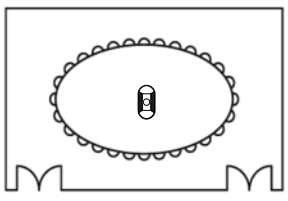
Two Methods of Detection:
Lights are activated when the PIR portion of the sensor detects occupancy. The sensor is set at the factory to the Either Mode. In this mode, lighting is maintained when either technology detects motion. If the ultrasonic portion detects occupancy, the ultrasonic time delay resets. The same is true for the PIR portion of the sensor. Lights deactivate when the last time delay elapses. A 10-second "grace period" allows lights to be turned on by motion anywhere in the room after being turned off due to inactivity. The CDT can be configured to require both technologies to maintain lighting. This is achieved by selecting the Both Mode DIP switch option. In Both Mode, ultrasonic detection and PIR detection resets the time delay. Lights deactivate when the first time delay elapses followed by a 10-second "grace period".

Model	Coverage	Field of View	Field of View
CDT-05-180-R	Up to 450 sq. ft.	180° (one way)	32 kHz
CDT-20-360-R	Up to 1200 sq. ft.	360°(two way)	32 kHz

Location

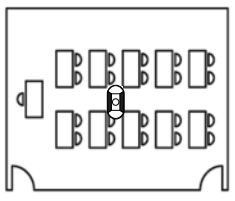
The maximum coverage areas may vary somewhat according to the room shape and the presence of obstacles. Follow the coverage diagram concerning major and minor motion coverage. Decrease total coverage area by 15% for "soft" rooms (for example, heavy draperies or heavy carpeting). The sensor must have a clear view of the area to be controlled. The sensor will not "see" through glass. Mounting height should not exceed 12 feet. Optimum mounting height is 10 feet. Avoid pointing outside of space. To prevent false activation, the sensor should be mounted away from the air supply duct a minimum of 4 to 6 feet. For typical placement refer to Location Diagrams.

30′ x 28′



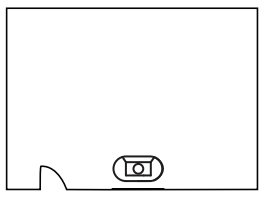
CDT-20-360-R

30′ x 28′



CDT-20-360-R

15′ x 20′

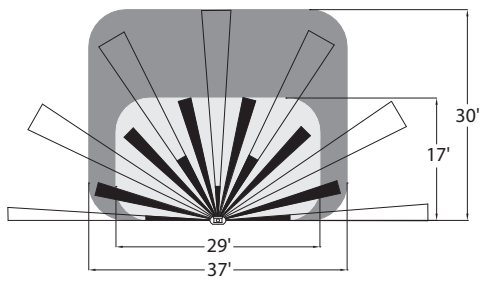


CDT-05-180-R

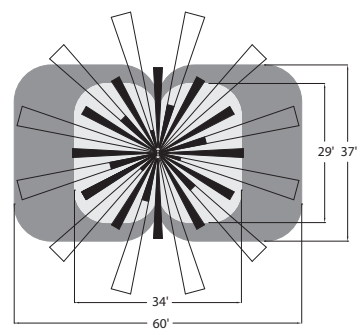
imagination at work

Coverage

CDT-05-180-R



CDT-20-360-R



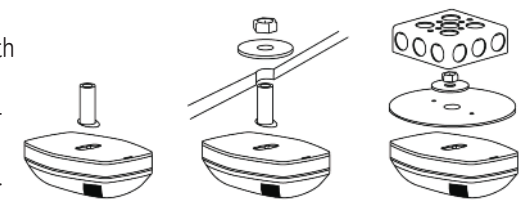
Installation

NOTE: Before you begin, read these instructions completely and carefully.

⚠ WARNING
Risk of electric shock
- Turn power off before servicing
- Install per National Electric Code

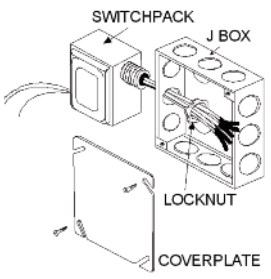
Sensor:

Step 1: Pass wires through the threaded mounting post and interlock to the backplate.
Step 2: Sensor mounts to normal ceiling tile through a single 3/4" hole.
Step 3: When mounted, the sensor's slotted grills must point along the path where motion is to be detected.
Step 4: An adapter plate (CPLATE) is available to allow mounting to a standard fixture ring and junction box.
Step 5: The threaded mounting post may be cut down if it is too long to fit into the junction box.



CAUTION: Finger-tighten the nut to avoid stripping the mounting post.

Switchpack:
Designed to be mounted externally to any junction box. When mounted, line connections are inside the box and the Class 2 wiring exits through the rear of the switchpack housing. In areas where Class 2 wiring is not permitted, the switchpack can be mounted internally to any standard electrical box.



Wiring

CAUTION: Before installing or performing any service on a GE system, the power MUST be turned off at the branch circuit breaker. According to NEC 240-83(d), if the branch circuit breaker is used as the main switch for a fluorescent lighting circuit, the circuit breaker should be marked "SWD." All installations should be in compliance with the National Electric Code and all state and local codes.

NOTE REGARDING COMPACT FLUORESCENT LAMPS: The life of some compact fluorescent lamps (CFLs) is shortened by frequent automatic or manual switching. Check with CFL and ballast manufacturer to determine the effects of cycling.

1. Make sure power is turned OFF at the branch circuit breaker.
2. Wire units as shown in wiring diagrams per applicable voltage requirements. (Use twist-on wire connectors for all connections)
3. Mount unit to ceiling.
4. Turn power back ON at the branch circuit breaker and wait 2 minutes for the unit to stabilize.
5. If needed make necessary adjustments. (See Checkout and Adjustments section)

Wiring Diagram 1: One switchpack, one sensor (-D model)

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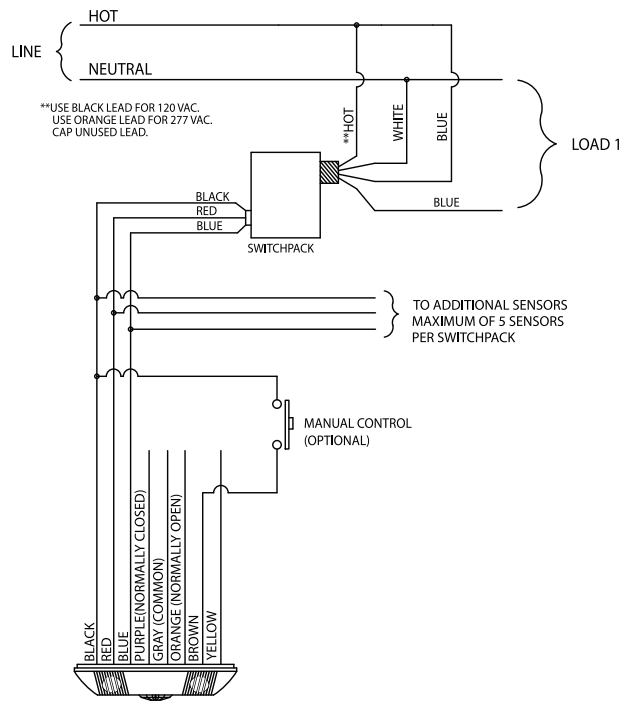
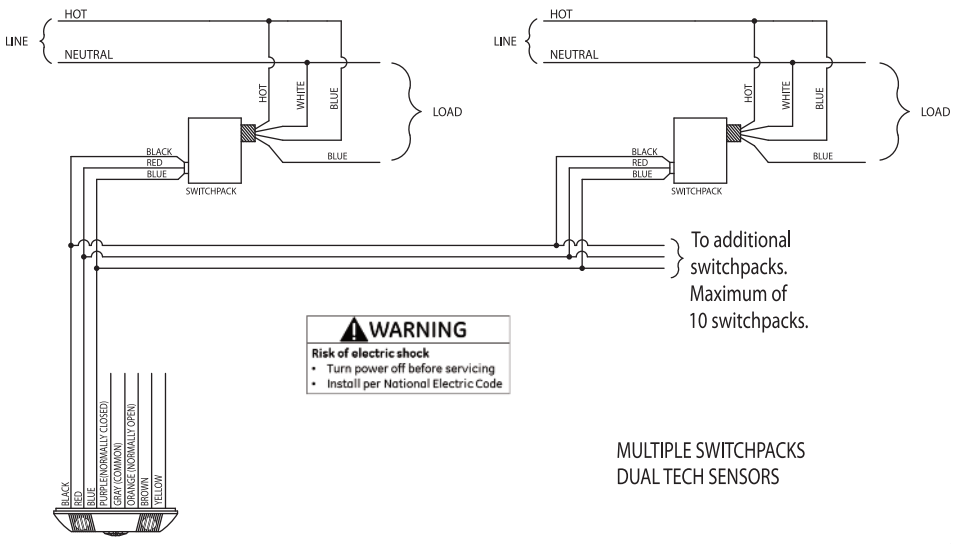
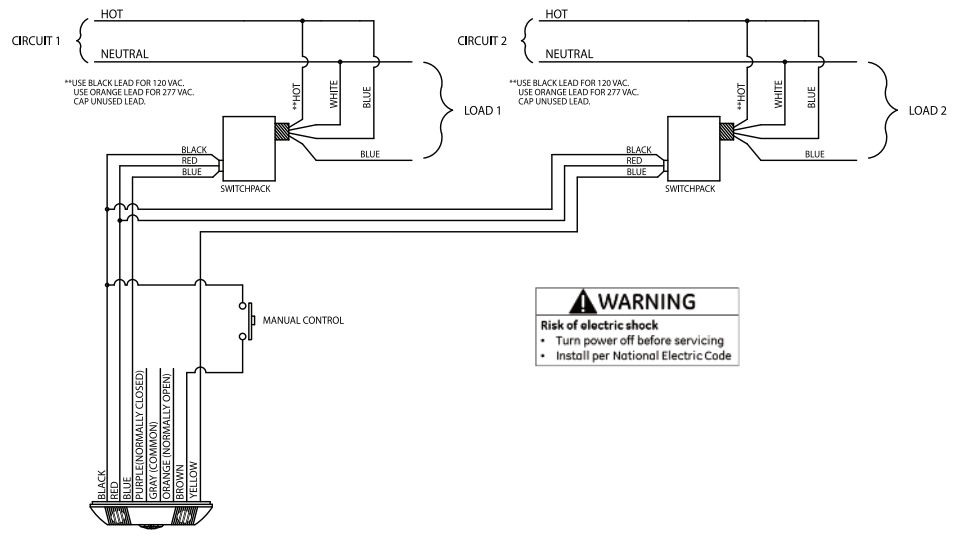
Risk of electric shock
- Turn power off before servicing
- Install per National Electric Code



Wiring Diagram 2: Multiple switchpacks, one sensor



Wiring Diagram 3: Bi-level switching with energy saver mode feature enabled



Checkout and Adjustment

Adjustments should be made with the HVAC system ON. Use only insulated tools to make adjustments.

Sensor is shipped in the Self-Adjust mode. This applies to time delay, US, and PIR sensitivity. In preparation for the Installer Test, the time delay is set to 15 seconds, after the sensor is installed, powered-ON and has stabilized, the unit will time-out 15 seconds after the last motion detected. Coverage and sensitivity can be confirmed by watching the Green (US) and Red (PIR) indicator LEDs on the front of the sensor, while moving around the room.

1. Walk around the room and monitor LEDs. LEDs should only turn ON with each motion. (If LEDs do not turn ON, go to Troubleshooting section.)
2. Stand still six to eight feet away from the sensor for five seconds. LEDs should not turn ON without motion. (If any LED turns ON, note LED and go to Troubleshooting Section)
3. Walk outside the room and wait 15 seconds for the lights to turn OFF. (If lights do not turn OFF go to Troubleshooting Section)
4. Re-enter the room to activate sensor. (If lights do not turn ON, go to Troubleshooting Section)
5. The unit will remain in test mode until it times out and remains inactive for five consecutive minutes. After this it will automatically set the time delay to 10 minutes. (To adjust Time delay manually go to Time Delay adjustment section)

Installer Adjustments

Manual On Mode (See DIP Switch Legend and Wiring Diagram section for Manual On Mode Setup)

In Manual On Mode momentary pushbutton switch is required to turn the load ON. The Isolated Relay will also change state. The sensor will turn the load OFF, after no motion is detected and the time delay expires.

After the sensor turns the load OFF, the person in the space has ten seconds to move again to re-activate the unit. Once the Grace Period expires, the switch will be required to turn the load back ON. (The Isolated Relay will turn off, after both, the time delay and the Grace Period have elapsed)

In either Automatic or Manual ON Mode, the load can be turned-OFF using the pushbutton switch. The sensor is fully self-resetting; lights turned OFF manually in Automatic ON mode stay off while the sensor detects occupancy. After the room is vacated and the time delay and grace period have elapsed, lights turn ON automatically the next time someone enters.

Use of the low voltage option:

Using Blue control lead only- pressing and releasing the momentary switch will turn lights on or off. (see wiring diagram)

Using Blue and Yellow control leads- pressing and releasing momentary switch will turn lights on or off. Pressing and holding momentary switch will cycle loads – A ON B OFF, A ON B ON, A OFF B ON. (see wiring diagram)

Lighting Sweep Option

If selected, this DIP Switch option forces an initial 50 second delay upon "power up" to prevent false activation in buildings with computer control systems.

Time Delay Adjustments

If room is not vacant and sensor will not be allowed to remain inactive for five consecutive minutes due to persons moving in the space, time delay can be set manually to a ten minute delay, by turning DIP Switch 3 ON for one second and

turning it back OFF. (TIP- make all other adjustments first and make time delay adjustment last)

People who remain very still for long periods of time may need a longer Time Delay than the default setting of 10 minutes. As long as Auto is enabled, the sensor will respond to each pair of false offs with no normal off in between, by alternately making slight adjustments to either time delay (by 2 minute increments) or sensitivity, so there should be no need for manual adjustment. If manual adjustment is desired move DIP Switch 3 to ON for 30 Minute delay.

Energy Saver Mode

Use of the Energy Saver Mode, which can be selected by a DIP Switch under the cover, ensures that the sensor always activates one load only. If both loads are ON when the sensor times out and automatically switches OFF the lights, only the primary load will be activated. If only the primary or secondary load is ON when the sensor times out and automatically switches out the lights, the sensor will reactivate only the load that was on.

Sensitivity

Sensor ships from the factory in Normal Sensitivity Mode. Should there be a need to decrease the sensitivity DIP Switch 6 can be set to ON to provide a Low Sensitivity setting.

Maintain Lights ON – Either or Both Mode

Lights are activated when the PIR portion of the sensor detects occupancy. The sensor is set at the factory to EITHER Mode. In this mode, lighting is maintained when either technology detects motion. If the ultrasonic portion detects occupancy, the ultrasonic time delay resets. The same is true for the PIR portion of the sensor. Lights deactivate when the last time delay elapses. A 10-second "grace period" allows lights to be turned on by motion anywhere in the room, after being turned off due to inactivity. The dual technology ceiling sensor can be configured to require BOTH technologies to maintain lighting. This is achieved by selecting the BOTH mode DIP Switch option. In BOTH Mode, ultrasonic detection and PIR detection resets the time delay. Lights deactivate when the first time delay elapses followed by a 10-second "graceperiod".

Override

The override setting (DIP Switch 8 ON) allows the lights to remain ON in the unlikely event of sensor failure.

DIP Switch Settings

	DIP Switch Legend															
DEFAULT	**Activation**		**Lighting Sweep**		**Time Delay**		**Energy Saver**		**Not used**		**Sensitivity**		**Maintain Lights ON**		**Override**	
DIP SWITCH		**1**		**2**		**3**		**4**		**5**		**6**		**7**		**8**
	Auto	▼	Disabled	▼	Self-Adjust*	▼	Disabled	▼	Not used	▼	Normal Sensitivity	▼	Either Technology	▼	Enabled	▼
	Manual	▲	Enabled	▲	30 Minute Lock	▲	Enabled	▲		▲	Low Sensitivity	▲	Both Technologies	▲	Disabled	▲
*Self-Adjusts to 10 min user mode	CAUTION: TURNING ANY DIP SWITCH ON/OFF, EXCEPT DIP SWITCH 3, WILL RESET TIME DELAY BACK TO 15 SECOND TEST MODE. TURNING DIP SWITCH 6 ON FOR THREE SECONDS AND BACK TO OFF WILL NOT ONLY RESET TIME DELAY, BUT WILL ALSO RESET UNIT BACK TO FACTORY SETTINGS. TO MANUALLY SET SENSOR TO 10 MINUTE DELAY, TURN DIP SWITCH 3 ON FOR ONE SECOND AND BACK TO OFF.															

Troubleshooting

Issue	Possible Causes	Suggestions
Lights Will Not Turn ON automatically	Wall switch turned-Off	Turn wall switch On.
	If low voltage switch option is used, lights may have been turned-off manually or sensor is set to Manual On mode (DIP Switch 1 ON).	Check low voltage switch.
	Sensor requires PIR activation first to operate.	Make sure there are no obstructions to sensor's field of view. Rotate sensor ten degrees either clockwise or counterclockwise to point sensor PIR zones at entrance.
	Bad Switchpack	To check switchpack, short blue and red low voltage leads. The relay coil should energize and the load should turn on. If this does not occur check line voltage connections.
	Power interruption	Check incoming voltage and/or wiring
If lights still not turn ON, set sensor to override mode and call Technical Services at 1-877-584-2685		
Lights Will Not Turn OFF automatically	Override	Make sure sensor is not in overide mode. DIP switch 8 ON.
	Application	Make sure correct sensor is being used: CDT-05-180-R for 300-700 sq ft CDT-20-260-R for 700-2000 sq ft If multiple sensors are installed make sure the distance between units is not less than 25 ft
	Airflow activation, Sensor installed less than 4 feet away from an air vent	To check for airflow activation: 1. Make sure no other person is in the area. 2. Stand six feet away from sensor. 3. Stand still for 5 seconds watching LEDs. 4. If LEDs blink or are constantly on without actual motion move sensor away from airflow source. 5. If sensor still activates with airflow, set low sensitivity DIP switch 6 to ON.
	30 Minute Delay	Check DIP switch 3 setting. If ON, lights should turn OFF in 30 minutes after last motion.
	Self-Adjust	It may be possible for the unit to have self-adjusted the time delay to a 30 minute delay. If the lights do not turn off after 30 minutes follow next step.
	Sensor or switchpack wiring bypass	Disconnect sensor from switchpack, if lights remain ON, verify switchpack wiring.
	Bypass	Check wiring to make sure sensor or switchpack are not bypassed.
Lights Will Not Turn OFF manually	Enabled	Make sure sensor override is not enabled.
If lights will still not turn OFF, call Technical Services at 1-877-584-2685		

Limited Warranty

GE warrants that the product will be free from defects in material, workmanship, and title. This warranty applies only to defects that appear within five (5) years from the date of GE's invoice (except for defects in title, which shall have no time limitation). If the product fails to meet the above warranties and if Purchaser notifies GE in writing within thirty (30) days after discovery of the defect, then GE shall correct such defect by either (at GE's option) replacing the defective part or product (f.o.b. GE's plant or other point of shipment, with freight allowed to destinations within the continental United States, Alaska and Hawaii) or refunding the price. The foregoing warranties apply only to product purchased directly from GE, and do not apply to failures caused by acts of God or as a result of any improper installation, maintenance, storage or service, any accident, abuse, misuse, abnormal use, modification, misapplication, use in violation of any applicable standard or code, any failure attributable to any associated or complementary products not supplied by GE, or any failure to comply with any applicable recommendations of GE. GE reserves the right to examine the failed product to determine the cause of failure. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND SHALL CONSTITUTE THE SOLE REMEDY OF PURCHASER AND THE SOLE LIABILITY OF GE WITH REGARD TO DEFECTS IN, OR FAILURE OF, THE PRODUCT WHETHER THE CLAIM IS IN CONTRACT, INDEMNITY, WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE. GE MAKES NO OTHER WARRANTY, STATUTORY OR OTHERWISE, AND NONE IS TO BE IMPLIED. IN PARTICULAR, WITHOUT LIMITING THE FOREGOING, NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE OR IS TO BE IMPLIED.

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Res. #9590325

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