DT-355
v3

360° Dual Technology • Line Voltage
Occupancy Sensor
with Light Level feature

SPECIFICATIONS

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Voltages . . . . . . . . . . . . . . . . .120//230/277/347VAC, 50/60Hz
Load Requirements
   @120VAC. . . . . . . . . . . . . . . 0-800W Ballast/Tungsten/LED
   @230VAC (Single Phase) . . . . . . . . .0-1200W Ballast/LED
   @277VAC . . . . . . . . . . . . . . . . . . . .0-1200W Ballast/LED
   @347VAC . . . . . . . . . . . . . . . . . . . .0-1500W Ballast/LED
Operating Temperature . . . . . . . . . 32° to 131°F (0° to 55°C)
Terminal Torque Rating . . . 4.428 inch pound-force. (0.5Nm)
Light Level One-Step Adjustment . . . . . . . . . . . 10FC–300FC
Time Delay Adjustment. . . . . . . . . 30 seconds to 30 minutes
   Walk-Through Mode .3 minutes if no activity after 30 sec.
   Test Mode . . . . . . . . . . . . . . .5 sec. upon DIP switch reset
PIR Coverage (Typical) . . . . . . . . . . . . . . . . . . . . . . . . . 1200 ft2
   Sensitivity Adjustment. . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
                        High or Low (DIP switch setting)
Ultrasonic Coverage (Typical) . . . . . . . . . . . . . . . . . . . 1200 ft2
   Sensitivity Adjustment. . .Minimum to Maximum (trimpot)
   Frequency. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .40kHz
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WattStopper®

US Patents: 7,277,012

Santa Clara, CA 95050

UNIT DESCRIPTION

The WattStopper DT-355 360° Dual Technology occupancy sensors combine advanced passive infrared (PIR) and ultrasonic technologies into one unit. The combination of these technologies helps to eliminate false triggering problems even in difficult applications.

The DT-355 turns lighting systems on and off based on occupancy and ambient light levels. The light level feature can be used to keep lights from turning on if the ambient light level is sufficient.
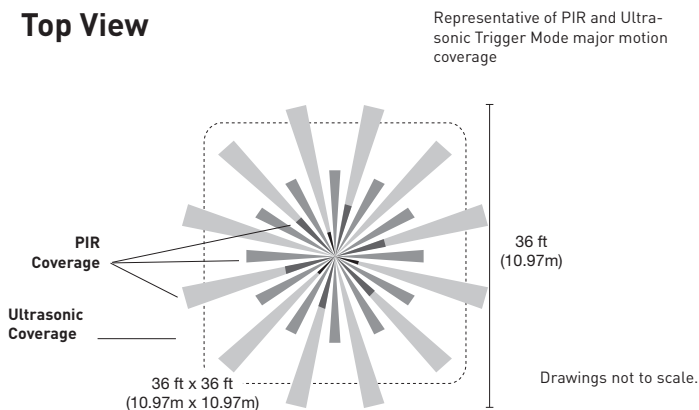
The DT-355 offers numerous operating modes that can be combined to create the ideal custom control. The sensors can be configured to turn lighting on, and hold it on as long as either or both technologies detect occupancy. After no movement is detected for the user-specified time the lights are switched off. A "walk-through" mode can turn lights off after only 3 minutes, if no activity is detected after 30 seconds of an occupancy detection.

The DT-355 operates on 120VAC, 230VAC (1Ø), 277VAC, or 347VAC line voltage.
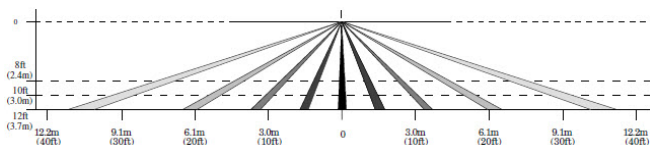
COVERAGE PATTERN

The DT-355 provides a 360° coverage pattern. The coverage shown represents walking motion at a mounting height of 10 feet. For building spaces with lower levels of activity or with obstacles and barriers, coverage size may decrease.

Top View

Representative of PIR and Ultrasonic Trigger Mode major motion coverage

PIR Coverage

Ultrasonic Coverage

36 ft (10.97m)

36 ft x 36 ft (10.97m x 10.97m)

Drawings not to scale.

Side View

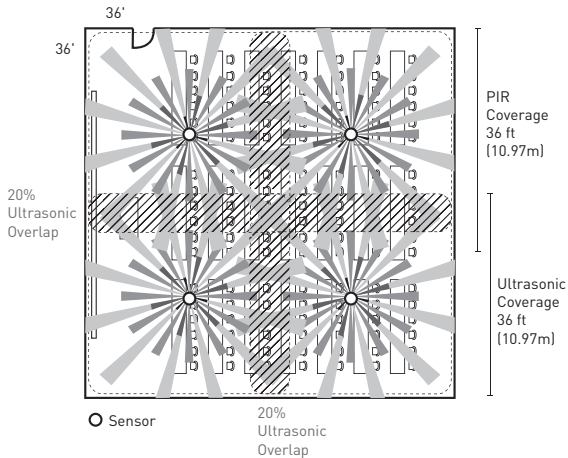|								
0								
8ft (2.4m)								
10ft (3.0m)								
12ft (3.7m)	12.2m (40ft)	9.1m (30ft)	6.1m (20ft)	3.0m (10ft)	0	3.0m (10ft)	6.1m (20ft)	9.1m (30ft)	12.2m (40ft)

PIR ONLY Coverage

PLACEMENT GUIDELINES

Depending upon obstacles such as furniture or partitions, the area of coverage may be less or more than the sensing distances shown in the coverage pattern. This must be considered when planning the number of sensors and their placement. It is also recommended to place the sensor **4 to 6 feet away from air supply ducts**. Mount the sensor to the ceiling. The DT-355 is designed for a ceiling height of about 8-12 feet. Mounting above or below this range will significantly affect the coverage patterns. As a general rule, each occupant should be able to clearly view the sensor.

Masking the PIR Lens: Opaque adhesive tape is supplied so that sections of the PIR lens can be masked. This restricts the sensor's view and allows you to eliminate PIR coverage in unwanted areas such as hallways outside of the desired coverage area. Since masking removes bands of coverage, remember to take this into account when troubleshooting coverage problems. The Ultrasonic coverage cannot be masked, but you can adjust its sensitivity to reduce the coverage area.

Optimizing Coverage: Position the sensor so that the maximum coverage is achievable. Be sure that the sensor is not pointing out the door. To get complete coverage in an open office area, install multiple sensors so that there is approximately 20% overlap with each adjacent sensor's ultrasonic coverage area.
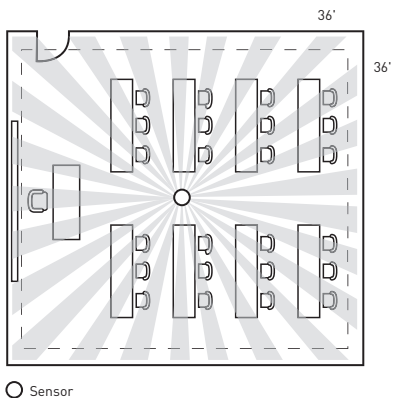
O Sensor

If the space is larger than 30' x 30' it will be necessary to use more than one sensor to ensure complete coverage.

36'

36'

PIR
Coverage
36 ft
(10.97m)

20%
Ultrasonic
Overlap

Ultrasonic
Coverage
36 ft
(10.97m)

O Sensor

20%
Ultrasonic
Overlap

Call 800.879.8585 for Technical Support
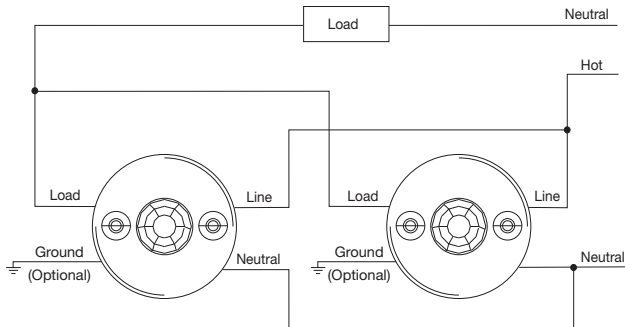
WIRING DIRECTIONS

#12 to #16 AWG

Strip Gauge

Cu Wire Only
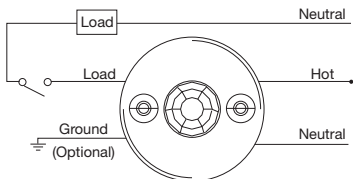
Single Sensor, Single Load

**Multiple Sensors Connected in Parallel**

WARNING: This application does not allow for Load to increase

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MOUNTING THE SENSOR

Using a 4-Inch Square Junction Box

1. Pull the high voltage wires into the J-Box through the conduit knockout.
2. Run the wires through the CA-1 adapter then connect the high voltage wires to the appropriate terminals on the sensor.
3. Align the CA-1 and the sensor with the J-Box so that the mounting screw tabs on the box match the mounting holes on the sensor's rear housing and the CA-1.
4. Use two machine screws (included with the sensor) to attach the sensor to the mounting tabs on the J-Box.
5. Snap the front cover onto the sensor.

Ceiling

4" Square Wiremold #V5752 box

CA-1 Adapter

Rear Housing

Sensor Flange

Screws

Front Cover
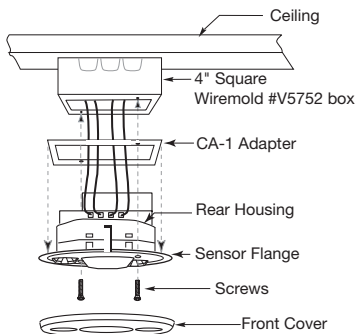
Mounting to a 4" Square Wiremold V5752 box or 4" Square Junction Box with Double-Gang Mudring

Using an Octagonal Junction Box

1. Pull the high voltage wires into the J-Box through the conduit knockout.
2. Connect the high voltage wires to the appropriate terminals on the sensor.
3. Align the sensor in the J-Box so that the mounting screw tabs on the box match the key holes on the sensor's rear housing.
4. Use two machine screws (included with the J-Box) to attach the sensor to the mounting tabs on the J-Box.
5. Snap the front cover onto the sensor.

4" Octagonal, 2.25" Deep* Junction Box

Ceiling

Sensor

Screws

Front Cover
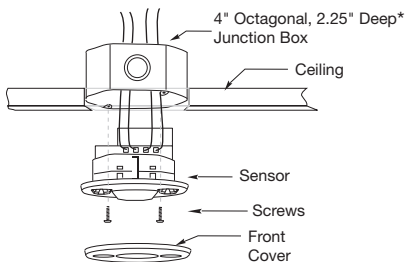
Mounting to an Octagonal Junction Box

* The Junction Box must be at least 2.25" deep. If it is not, an extension ring is required.

SENSOR ADJUSTMENT

This unit is pre-set for basic operation as described in this guide.
Adjustment is optional.

The sensors are factory preset to allow for quick installation in most applications. Verification of proper wiring or coverage, or customizing the sensor's settings can be done using the following procedures. To make adjustments, open the Front Cover with a small screwdriver.

There is a 30 second warm-up period when power is first applied.

Before making adjustments, make sure the office furniture 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. Set the Logic Configuration and Time Delay to the desired settings. See "Logic Configuration Chart", next page.
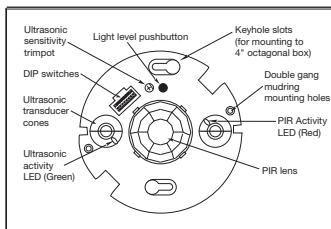
To Test Occupancy Sensors

1. Ensure the Time Delay is set for **Test Mode*** using the "Test Mode/20 minutes" setting. (DIP switches 1, 2, & 3 are OFF).

2. Ensure that the Light Level is at default (maximum). Press and hold the pushbutton over 5s (LEDs will be ON and then OFF). After pushbutton is released, LEDs will flash quickly over 10s.

3. Ensure that the Ultrasonic Sensitivity trimpot is set to about 70%, clockwise.

4. Remain still. The red and green LEDs should not flash. The lights should turn off after 5 seconds. (If not, see "Troubleshooting.")

5. Move around within the coverage area. The lights should come on. Adjust the Ultrasonic Sensitivity as necessary to provide the desired coverage (Green LED indicates activation from the ultrasonic sensor).

When testing and adjustment is complete, reset DIP switches and Light Level to the desired settings, and replace the cover on the sensor.

* Test Mode is a temporary state that starts when you first set the sensor's DIP switches for the "Test Mode/20 minutes" (switches 1, 2, 3 **OFF**). If you need to invoke the **Test Mode** and the DIP switches are already set for Test Mode/20 minutes, toggle DIP switch 1 **ON** then back to the **OFF** position. This provides a 10 minute test period. During the test period, the Time Delay is only 5 seconds.

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LIGHT LEVEL FEATURE

The Light Level feature holds lights off upon initial occupancy if adequate ambient light exists. It will not turn the lights off if they are on. The default setting is for maximum, meaning that even the brightest ambient light will not hold the lights off.

Notes on Functionality

- Avoid mounting the sensor close to lighting fixtures
- Adjust during daylight hours when ambient light in the area is at desired level.
- Light Level cannot be enabled while Test Mode is active. Either wait for Test Mode to expire or select any of the other Time Delay settings before enabling the Light Level feature.
- The ultrasonic occupancy indicator LED is disabled when the Light Level feature is enabled. LEDs will also flash periodically to indicate the sensor has Light Level enabled.
- Light Level settings are only saved in the event of a power loss. Disabling Light Level and then reenabling it will not return it to previous settings.
- If Test Mode is enabled after Light Level has been set, Light Level functionality will cease to function throughout the duration of Test Mode. When Test Mode period expires, the Light Level functionality will resume, even if the Dip Switches remain set to Test Mode.

Setting Light Level

1. Make sure Test Mode is not active.
2. Toggle the state of the sensor, by briefly pressing the Light Level button, to include or exclude the lighting load from the light level calibration. Open the Front Cover and locate the LIght Level pusbbutton. See Sensor Adjustment.
3. Press and hold the Light Level button between 2s and 5s. LEDs will be ON showing 2s is reached and then be OFF showing 5s has passed.* The sensor enters setup mode, as indicated by the rapidly flashing LEDs. The LEDs will flash throughout the setup process. Occupancy indications from the LEDs is disabled during setup.
4. Move away from the sensor to avoid interference with light level detection. The sensor measures the light level for a 10 second period, then averages the readings and automatically sets the level that will be used as the new setting. The sensor will hold lights off when the ambient light exceeds this setting.

5.   When the LEDs stop flashing, replace the Front Cover.

*Disabling Light Level

Pressing the pushbutton for 5 seconds or more resets the light to default (maximum).

Press and hold the Light Level button over 5s, the LEDs will be ON and the OFF showing 5s mark has passed.

SERVICE

To override all sensor functions, set the Ultrasonic Sensitivity trimpot to the fully counterclockwise (Service) position.

This bypasses the occupancy control functions of the sensor.

DIP SWITCH SETTINGS

TIME DELAY: SWITCHES 1, 2, 3

The sensor will hold the lights ON as long as occupancy is detected. The time delay countdown starts when no motion is detected. After no motion is detected for the length of the time delay, the sensor will turn the lights OFF.

WALK-THROUGH: SWITCH 4

Walk-through mode turns the lights OFF three minutes after the area is initially occupied, if no motion is detected after the first 30 seconds. If motion continues beyond the first 30 seconds, the selected time delay applies.

PIR SENSITIVITY: SWITCH 5

- Minimum forces a reduced detection range for the PIR.
- Maximum forces the sensitivity to the maximum coverage area. This setting is constantly updated.

OCCUPANCY LOGIC: SWITCHES: 6, 7, 8

The DT-355 has 6 logic configurations for occupancy triggers, set with DIP switches 6, 7 & 8. Determine the appropriate Occupancy Logic Option using the Trigger matrix, then set the DIP switches accordingly.

Initial Occupancy: The method that activates a change from "Standby" (area unoccupied and loads are OFF) to "Occupied" (area occupied and loads are ON).

- **Both** requires detection by PIR **and** Ultrasonic.
- **Either** requires detection by only one technology.
- **PIR** requires detection by the PIR.

Maintain Occupancy: The method indicating that the area is still occupied and the lights should remain ON.

Re-trigger: After the time delay elapses and the lights turn OFF, detection by the selected technology within the number of seconds indicated turns the lights back ON.

Feature	Switch#		
Time Delay	**1**	**2**	**3**
Test Mode/20 min	↓	↓	↓
30 seconds	↓	↓	↑
5 minutes	↓	↑	↓
10 minutes	↓	↑	↑
15 minutes	↑	↓	↓
20 minutes	↑	↓	↑ ◀
25 minutes	↑	↑	↓
30 minutes	↑	↑	↑

Walk-Through	**4**
Enabled	↑
Disabled	↓ ◀

PIR Sensitivity	**5**
Minimum	↑
Maximum	↓ ◀

Settings	**6**	**7**	**8**
Standard	↓	↓	↓ ◀
Option 1	↑	↓	↓
Option 2	↓	↑	↓
Option 3	↑	↑	↓
Option 4	↓	↓	↑
Option 5	↑	↓	↑
Standard	↓	↑	↑
Standard	↑	↑	↑

Trigger	Initial Occupancy	Maintain Occupancy	Re-trigger (seconds duration)
Standard	Both	Either	Either(5)
Option 1	Either	Either	Either(5)
Option 2	PIR	Either	Either(5)
Option 3	Both	PIR	Both(5)
Option 4	PIR	PIR	PIR(5)
Option 5	Either	PIR	Either(5)
Standard	Both	Either	Either(5)
Standard	Both	Either	Either(5)

◀ = Factory Setting

↑ = ON
↓ = OFF

Call 800.879.8585 for Technical Support

TROUBLESHOOTING

For any unexpected operation

1. Check DIP switch settings.
2. Make sure the switches are set according to the defined settings in the DIP Switch Setting chart.

Lights do not turn on when entering the room.

Neither LED Flashes

1. Check that the circuit breaker has been turned back on.
2. Check all sensor connections.

Red LED does not flash

1. When power is initially applied to the sensor, there is a warm-up period of 30 to 60 seconds before the LED becomes active.
2. Make sure PIR sensitivity is set to 100% (DIP switch #5 is in the "OFF" position).

Green LED does not flash

Ultrasonic sensitivity setting may need to be increased. Turn adjustment trimpot clockwise until the LED begins to flash when movement occurs.

Green LED is on continuously

Check ultrasonic sensitivity trimpot. Fully counterclockwise position is the override for the sensor. Turn trimpot clockwise until LED flashes only when movement occurs in the desired coverage area.

Red and Green LEDs flash

1. Check all sensor connections.
2. Check if Light Level is enabled.
   - If occupancy indicator LEDs blink every few seconds, sensor is using Light Level feature.
   - If Light Level functionality is not desired, press and hold for 5 seconds to return sensor to the default setting (maximum).

Lights do not turn off automatically.

Green LED flashes

Reduce ultrasonic sensitivity by turning adjustment pot counter-clockwise until it only flashes when movement occurs.

Red LED randomly flashes

Reduce PIR sensitivity by turning DIP switch 5 to the "ON" position.

Lights do not turn off

1. Check all sensor connections.

ORDERING INFORMATION

Catalog #	Description
DT-355	360° Dual Technology Occupancy Sensor, Line Voltage, w/light level sensor
CA-1	Cosmetic adapter for ceiling installation with 4″ square j-box or Wiremold #V5752 box.

All sensors are white.

WARRANTY INFORMATION

WattStopper warranties its products to be free of defects in materials and workmanship for a period of five (5) years. There are no obligations or liabilities on the part of WattStopper 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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