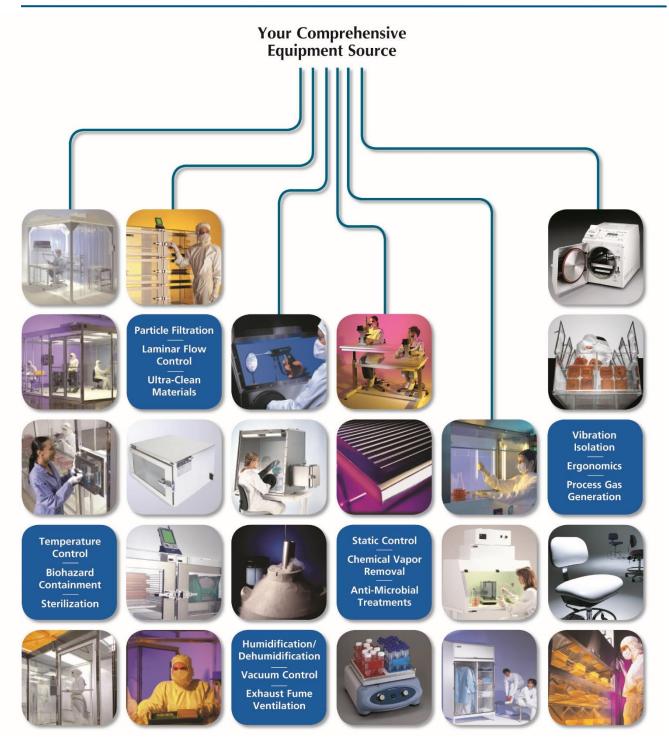




Quick-Start Operating Guide Document No. 1800-96 Germicidal UV-C Lamp Fixture

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Quick-Start Operating Guide Germicidal UV-C Lamp Fixture

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CAUTION

WARNING

Proprietary Notice

This manual pertains to proprietary devices manufactured by Terra Universal, Inc. Neither this document nor any portion of it may be reproduced in any way without prior written permission from Terra Universal.

Safety Notice

A thorough familiarity with all operating guidelines is essential to safe operation of the product. Failure to observe safety precautions could result in poor performance, damage to the system or other property, or serious bodily injury or death.

The following symbols are intended to call your attention to two levels of hazard involved in operation:

The information presented here is subject to change without notice.

1.0 Introduction

This manual provides information on installing and operating your Terra Universal Germicidal UV-C Light Fixture. By studying this document carefully, you can be assured of a long, safe, efficient service life from your system.

2.0 Description

The Germicidal UV-C Light Fixture uses short-wave (254nm) ultraviolet light to perform efficient disinfection of cleanroom or other laboratory environments. UV-C light has been proven to kill up to 99.9% of germs (D99 dosage with adequate dwell time and exposure distance; refer to chart in Appendix A). The light sanitizes the surrounding environment by permanently damaging the DNA of any exposed germs, which kills them in the process. Although UV-C lamps may not produce an entirely sterile surface, they can maintain consistently low microbial loads throughout a wide range of operations and eliminate bioburden spikes that could necessitate extensive testing and decontamination measures.

The UV-C lamps are mounted in a mirror-finished 304 stainless steel housing, which offers superior light reflections and better UV-C light density than powder-coated aluminum reflectors.



Terra Universal makes no warranties applying to information contained

in this manual or its suitability for any implied or inferred purpose.

Terra Universal shall not be held liable for any errors this manual

Cautions are used when failure to observe instructions could result in significant damage to equipment.

Warnings are used when failure to observe instructions

or precautions could result in injury or death.

contains or for any damages that result from its use.





WARNING: Never attempt to service the unit without first ensuring that the UV-C lights are shut off and the unit has been disconnected from its power source. Before use, verify that the Occupancy Sensor is operational: the unit should not turn on if any motion in the target enclosure is detected.

Occupancy sensor is based on motion detection; however, humans, as well as other organisms, that remain motionless may be exposed to harmful UV-C radiation. DO NOT allow operators or test animals in the enclosure during operation.



3.0 Installation

The Germicidal UV-C Light Fixture is designed for operation in Terra cleanrooms. It seals against closed-cell gasketing installed on the 2-ft x 4-ft ceiling grid. Complete this installation before installing the lamps or connecting the unit to power.

To install the unit, insert the housing through a vacant 2-ft. x 4-ft. ceiling opening and position the unit securely on the flange along the perimeter of the grid opening.

When positioned, install the four T8 UV-C lamps into the housing by inserting each end into the fixture receptacle and rotating the lamp 90 degrees, until it seats against the contactor. Plug the unit into a 120VAC or 240VAC, 50/60 power outlet.

4.0 Operation

The Germicidal UV-C Light Fixture uses four UV-C bulbs to disinfect the surrounding environment. In order to eliminate any possible UV-C exposure and to ensure the safety of all bystanders, an occupancy sensor is built in that automatically turns the unit off when any movement is detected.

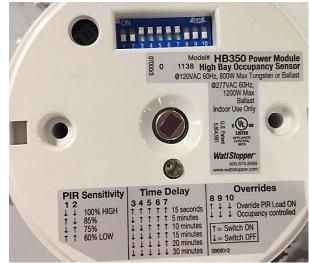
A small wireless remote RF control switch is included that allows the user to manually turn on or turn off the UV-C lights. This remote can be mounted on a wall or cleanroom upright post by means of a peel-off adhesive strip; you can also mount it in a standard light switch wall plate to function as a permanent switch.

This unit is compatible with 120VAC or 240VAC 50/60Hz power sources.

To operate,

- 1. Connect the system to an appropriate power source.
- 2. Turn the wireless remote switch on.
- 3. After a 15-second activity delay, the UV-C bulbs should turn on. If they do not, complete the programming operation described under 5.3 below.

The Occupancy Sensor is factory programmed at the highest sensitivity level and the lowest Motion Time Delay setting (15 seconds). You can change these settings by removing the cover of the Occupancy Setting Sensor and adjusting the DIP switches, as indicated at right.





5.0 Trouble Shooting

The Germicidal UV-C Light Fixture is designed to provide years of reliable efficient operation. If you should experience any problems with your system, refer to the appropriate troubleshooting procedure below. If the problem persists, call Terra Universal for assistance.

Problem: Lights won't turn on.

Possible Cause:

- 1. Unit's power supply has been interrupted. Check to be sure unit is properly connected to power source.
- 2. Occupancy sensor is detecting movement. Check to be sure that nothing is moving that could be triggering the sensor to keep the lights turned off.
- 3. The unit is factory-programmed before shipping to synchronize the unit's Electronic Control Switch and the Wireless Remote Switch. If the unit has not been programmed for operation with the wireless remote switch, or if the Wireless Remote fails to operate the system properly, complete these steps:
 - A. Press and hold the Electronic Switch Tap Button, located on the rear of the UV-C light housing, for approximately 6 seconds. Once the LED starts to blink slowly, release the Tap Button and go to Step B.
 - B. Press and hold the Off Button on the Wireless Controller for approximately 6 seconds.
 - C. Once the Electronic Switch learns the Wireless Controller, its LED and load will flash 3 times and the Switch will exit Set-Up mode. The unit can now be operated with the Wireless Controller.

Problem: Lights won't turn off.

Possible Cause:

Unit's occupancy sensor has malfunctioned due to damage. Disconnect unit from power source and contact Terra for instructions.



6.0 Maintenance

The Germicidal UV-C Light Fixture requires minimal maintenance as long as normal operating instructions are followed.

The UV-C bulbs will need to be replaced periodically. Replace with a standard 48" T8 UV-C lamp.

The 304 stainless steel reflector may require periodic cleaning. This material is compatible with most standard cleaning solutions, including alcohol-based mixtures.

7.0 Specifications

Construction:	Mirror-finished 304 stainless steel
Dimensions:	24" W x 48" L x 6.25" Thick
UV-C Lamp:	Four 48", 36W Germicidal UV-C T8 lamps, Bi-Pin Base, 8,000 hour
Power:	120VAC or 240VAC 50/60Hz
Occupancy Sensor:	Refer to Appendix.



8.0 Warranty

Products Manufactured by Terra: Terra Universal, Inc., warrants products that it manufactures to be free from defects for a period of 12 months for parts and 90 days for labor, commencing from the date of shipment. Terra's sole responsibility is to repair or replace, at its option, any part of the product that proves defective or malfunctioning during this time limit. In some cases, components incorporated in Terra Universal products are covered by additional warranties from component manufacturers; obtain specific information from Terra sales representatives. This warranty is void if the equipment is abused or modified by the customer, is operated outside Terra's operating instructions or specifications, or is used in any application other than that for which it is specified. This warranty does not include routine maintenance or service procedures, breakage of quartz baths after 60 days, shipping damage, nor damage from misuse, intentional or unintentional abuse, neglect, natural disasters, or acts of God.

Products Manufactured by Others: Terra Universal, Inc., warrants that, to the best of its ability, Terra's representations of products that are manufactured by others reflect the manufacturer's representations, subject to change without notice. Sole warranty for these products is the original manufacturer's warranty that is passed forward to the purchaser and constitutes the customer's sole remedy for these products. Detailed warranties for distributed products are available through Terra sales representatives.

Freight Shortage or Damage: Upon receipt of any equipment from Terra Universal, Inc., customer shall immediately unpack and inspect for damage or shortage. The customer shall not accept a damaged package or a short shipment until the carrier makes a "damage or shortage" notation on both the carrier's and customer's copy of the freight bill or delivery receipt. Service title passes when the shipment is loaded, so customer is responsible for filing and collecting a freight claim. Any replacement products must be ordered and paid for separately. For Terra's "Policy and Procedures for Returning Goods," see Terra's Internet site: www.TerraUniversal.com.

Generally, customers can improve the chance of collecting on a freight claim by following these procedures: 1) formally requesting that the carrier inspect the shipment immediately upon suspecting damage or shortage to verify condition; 2) notifying the carrier upon discovery of concealed damage and requesting an inspection within 15 days of receipt, both in person or phone and following up via mail; 3) keeping the shipment as intact as possible, including retaining original packaging materials and keeping the product as close to the original receiving location as possible; 4) holding salvage for disposition by the carrier.

All Claims: Terra Universal expressly disclaims all other warranties, expressed or implied or implied by statute, including the warranties of merchantability or fitness for intended use. Terra Universal is not responsible for consequential or incidental damages arising out of the purchase or use of the products supplied by Terra Universal. Terra Universal is not liable for damage to facilities, other equipment, products, property or personnel of others, or of their agents, suppliers, or affiliated parties, which is caused or alleged to have been caused by products supplied by Terra Universal. In any event or series of events, Terra Universal's total liability for any and all damages whatsoever is limited to the lesser of the actual damages or the original invoice cost of the items alleged to have caused the damage. The customer's sole and exclusive remedy for any cause of action whatsoever is repair or replacement of the non-conforming products or refund of the actual purchase price, at the sole option of Terra Universal. All claims must be made in writing within 90 days of the date the product was shipped. Any claims not made within this time limit shall be deemed waived by the customer. Terra Universal is not responsible for any additional costs of repair caused by poor packaging or in-shipment damage during return.

Warranty Returns: All warranty returns must be authorized in advance by Terra Universal and approved under an RMA. Unless approved in advance for good reason, all returns must be in original condition, including all manuals, and must be packaged in original packaging materials. All returned goods are to be shipped to Terra Universal, freight prepaid at customer's expense. See Terra's "Policy and Procedure for Returned Goods."

Thank you for ordering from Terra Universal!



Appendix A: Typical D99 "Kill" Dosage Exposure Time and Distance

licroorganism	D99% (1) Dose Req'd MicroWatts - sec/c	:m²	Time to read Direct D				
Virus and Bacteria		5 ft	8 ft	11 ft	14 ft	17 ft	
Influenza A	3,880	2	2	3	3	4	
Vaccinia	3,014	2	2	2	3	3	
Coxsakievirus	4,156	2	2	3	3	4	
Staphylococcus A	1,324	2	2	2	2	2	
Tuberculosis	2,160	2	2	2	2	3	
Legionella	2,250	2	2	2	2	3	
Average Virus and Bacteria from above	2,797	2	2	2	3	3	1
Fungal- Spores Aspergillis niger spores	270,892	39	52	77	114	152	
Penicillium italicum spores	63,960	10	13	19	28	37	
	121,188	18	24	35	52 65	69 86	
Cladosporium spores Average airborne Fungal spores from above	e 152,013	20					I
, , , , , , , , , , , , , , , , , , ,	40,000	7	9	13	18	24	(Minutes)
Average airborne Fungal spores from above					18		(Minutes)

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Appendix B: Occupancy Sensor Specifications



Occ Sensor, PIR, High Bay, 40 Ft H, 120/277V

Occupancy Sensor, Sensor Type PIR, Coverage (Square-Ft.) 2826, Installation Type High Bay Fixture Mount, Up To 40 ft. Ceiling, Viewing Angle (Deg.) 360, Timer Range (Minutes) 15 Seconds to 30, Time Delay Manual, Watts @ 120V 800, Watts @ 277V 1200, Voltage 120/277, Color White, For Use With Fluorescent And Incandescent Lighting Loads, Standards UL and cUL Listed, Description/Special Features Zero Crossing Circuitry Reduces Stress On Relay And Extends Sensor Life

Additional Info

High Bay Occupancy Sensors

Passive infrared sensors are compatible with all T8 and T5 fixtures; with electronic or magnetic ballasts. Extender Module No. 2HTF8 adjusts up to 4" maximum and ensures sensor is not blocked by the fixture.

UL and C-UL Listed.

Tech Specs

Item: Occupancy Sensor Sensor Type: PIR Coverage (Square-Ft.): 2826 Installation Type: High Bay Fixture Mount, Up To 40 ft. Ceiling Viewing Angle (Deg.): 360 Timer Range (Minutes): 15 Seconds to 30 Time Delay: Manual Watts @ 120V: 800 Watts @ 277V: 1200 Voltage: 120/277 Color: White For Use With: Fluorescent And Incandescent Lighting Loads Standards: UL and cUL Listed Description/Special Features: Zero Crossing Circuitry Reduces Stress On Relay And Extends Sensor Life

Notes & Restrictions

There are currently no notes or restrictions for this item.

MSDS

This item does not require a Material Safety Data Sheet (MSDS).

Optional Accessories

Extender Module, High Bay, Use/w 2HTF5



Item #: 2HTF8 Brand: WATT STOPPER Usually Ships: Typically in Stock Price (ea): S19.49

Alternate Products



Occ Sensor, PIR, High Bay, 20 Ft H, 120/277V

Item #: 6MPR7 Brand: WATT STOPPER Usually Ships: Typically in Stock Price (ea): \$101.35

Repair Parts

A Repair Part may be available for this item. Visit our Repair Parts Center or contact your local branch for more information.



Watt Stopper[®]

HB3x0B-Lx

High Bay • Line Voltage • Passive Infrared • Occupancy Sensor



DESCRIPTION AND OPERATION

The HB3x0B-Lx occupancy sensors are designed for automatic lighting control in warehouse high bay applications. All models contain a passive infrared sensor (PIR). The HB3x0B-Lx series sensors are modular and are made up of a Power Module and a Lens. The coverage area is determined by the lens module. There are three different lens available. See the Coverage section for more information.

All models in the HB3x0B-Lx series use a set of DIP switches to set the time delay and PIR sensitivity, as explained on page 3.

COVERAGE

Coverage patterns, density and range, are determined by the type of Lens attached to the HB3x0B-Lx.

HB3x0B-L1

The L1 Lens offers linear patterns best suited for high bay aisleway applications. The Fresnel lens is designed to detect walking motion when mounted at or around 40'. In optimal conditions, the lens has a 60' linear detection range.

HB3x0B-L3

The L3 Lens offers 360° coverage and is best suited for open area and aisleway coverage in high bay applications. The L3 is a multi-cell, multi-tier Fresnel lens offering a high density coverage pattern that spreads over a 40' diameter area at a height of 20'.

HB3x0B-L4

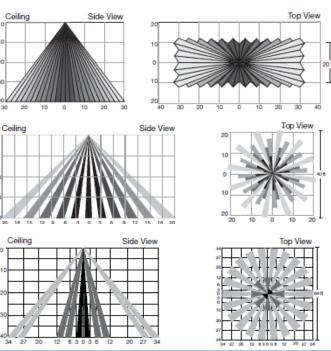
Similar to the L3 Lens, the L4 offers 360° coverage, and is best suited for open areas and aisleways in high bay applications. The L4 is a multi-cell, multi-tier Fresnel lens offering a high density coverage pattern. The L4 is designed for mounting at heights between 20' to 40', with a coverage area up to 60' in diameter when mounted at 40'.

SPECIFICATIONS

HB350B-Lx

HB350B		1
Voltag	jes120/277VAC, 60Hz	
Load I	Requirements	
	ର 120VAC, 60Hz0-800W ballast or tungsten	1
	ର 277VAC, 60Hz0-1200W ballast	1
	ାରି 120VAC1/6 hp	ì
HB340B	-Lx	1
Voltag	es347/480VAC, 60Hz	
Load I	Requirements	
	ାର 347VAC, 60Hz0-1200W ballast	1
	@ 480VAC, 60Hz0-1200W ballast	ì
	@ 120VAC1/6 hp	
Lens		
L1	40 ft. mounting height, 60 ft. x 20 ft.	l
L3	20 ft. mounting height, 40 ft. diameter	1
L4	40 ft. mounting height, 60 ft. diameter	

US Patent 5,640,113 • 5,804,991





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INSTALLATION

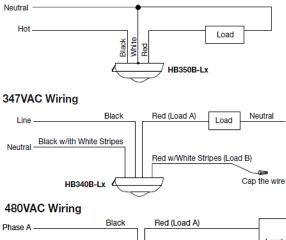


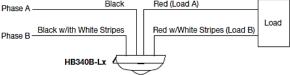
- Determine the mounting location appropriate to the features of the power module and the coverage area. Careful consideration must be given to sensor placement. Avoid placing the sensor where the edge of the fixture, shelving or other obstructions may block the sensor's line of sight. Mount the sensor below the edge of the fixture and away from the fluorescent lamps so that the heat from the lamps does not affect the sensor.
- 2. Make sure that you have the appropriate accessories for the sensor mounting configuration. (See Mounting Options.)
- Assemble any necessary mounting accessories and attach them to the power module, making sure that the flying leads from the power module are accessible.
- Connect the line voltage and load wires to the sensor leads as shown in the Wiring Diagram for the unit's application.
 - Do not allow bare wire to show.
 - Make sure all connections are secure.
 - Restore power from the circuit breaker.

WIRING

5.







MOUNTING OPTIONS

The HB3x0B-Lx can be attached to the fixture or junction box using the back box and chase nipple or directly to the fixture surface via the two screw holes provided in the Power Module (see Surface mounting below). The Extender Module (HBEM3) allows attaching the sensor to the side of the fixture in a number of configurations using provided chase nipples.

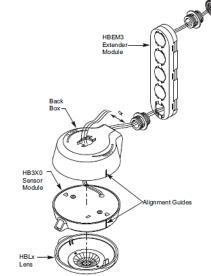
Call 800.879.8585 for Technical Support

Back box mounting requires a standard 1/2" knockout for the chase nipple. The Power Module mounts to the back box with a bayonet type fitting requiring a slight twist of the units to separate them or lock them into place. The box comes ready for side mounting. It can be modified for rear mounting as follows:

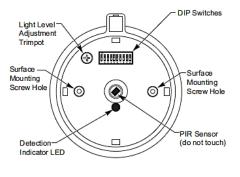
- 1. Pop out the cap in the rear knockout.
- 2. Un-snap the chase nipple from the side mount and snap into the rear mounting hole.
- 3. Use the cap to close the side mount hole.
- 4. The chase nipple provided can be pushed into a standard 1/2" knockout in a metal fixture [max of 1 mm (0.04") thick metal] without the need for the included internal nut. The nut can be used for added security if necessary.

The HBEM3 extender module allows threading the wires through its chase nipples and into the fixture for connection. The two sides of the HBEM3 are then snapped together to protect the wires. The short chase nipple is designed to snap into the HBNB3 connection box while the longer chase nipple snaps into any metal fixture or connection box with a standard knockout. The caps on the HBEM3 can be removed in various configurations to allow moving the chase nipples and adjusting the height of the sensor on the fixture.

Using the back box and HBEM3 Extender Module



Surface mounting requires holes in the fixture to pass wires and attach two #6-32 screws through the surface mounting screw holes on the component side of the Power Module as shown.



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ADJUSTMENTS

Sensor factory pre-sets are as follows (default settings are **bold**): Factory Switch Settings

ractor	, 50010	Jen	iliyə							
1	2	3	4	5	6	7	8	9	10	
ON	0FF	0FF	0FF	OFF	ON	ON	0FF	0FF	0FF	
PIR Se	nsitivi	ty (swi	tches 1	& 2)	Mediu	um 85	%			
Time [)elay (switch	es 3-7)		15 mi	nutes				
Overri	des (sv	vitches	s 8-10)						ch mod o effec	

PIR Sensitivity (Switches 1-2)

The factory setting of 85% is suitable for most applications, but it may be necessary to adjust the PIR sensitivity if there is any environmental interference causing false triggers or if sensitivity needs to be increased for your particular application. Use DIP switches 1 & 2 to adjust sensitivity.

Switch	1	2	PIR SENSITIVITY
	OFF	OFF	100% (HIGH)
	ON	0FF	85% (MEDIUM)
	OFF	ON	75% (LOW)
	ON	ON	60% (LOW)

Time Delay (Switches 3-7)

Use DIP switches 3 to 7 to adjust the time delay.

Switch	3	4	5	6	7	TIME DELAY
	ON	ON	ON	ON	ON	15 seconds
	OFF	ON	ON	ON	ON	5 minutes
	OFF	OFF	ON	ON	ON	10 minutes
	0FF	0FF	OFF	ON	ON	15 minutes
	OFF	0FF	OFF	OFF	ON	20 minutes
	OFF	0FF	0FF	OFF	OFF	30 minutes

PIR Override (Switches 8-10)

Overrides can disable control features of the HB3x0B-Lx power module. The table at the bottom of this page describes the override functions of each HB3x0B-Lx model.

IMPORTANT START-UP INFORMATION

A 60-second start-up period occurs during initial installation and after a power failure of 5 minutes or more. After applying power to the sensor wait at least 60 seconds for the sensor to begin detecting occupancy and the load to turn ON. It may turn ON during the start-up period, depending on the state of the relay when power was off.

- If the sensor detects occupancy during the start-up, when the load turns ON it stays ON as long as the sensor continues to detect motion, plus the Time Delay.
- If no occupancy is detected during the 60-second startup, the load may come on anyway during the start-up. If no occupancy is detected by the time the start-up is complete, the relay opens and the load turns OFF.

TROUBLESHOOTING

If you suspect improper operation, review the Start-Up information. After start-up, the sensor will open or close the relay to correspond to the occupancy status of the area. When power to the sensor is lost, the relay(s) close, turning on the load if the load still has power.

To quickly test the unit, set the time delay to minimum. Wait for the start-up period to end. Move out of the sensor's view. Lights should turn OFF after 15 seconds. Move into the sensor's view. The sensor's Red LED should blink and the lights should turn ON.

Red LED on power module does not blink:

Check sensor wire connections. Verify the neutral wire is tightly secured.

Red LED blinks but lights do not turn ON:

- 1. Make sure that power to the sensor has been ON continuously for at least one minute, then
 - a) Turn OFF power to the sensor.
 - b) The relay(s) will close.
 - c) Turn ON power to the sensor.
- d) The load should come ON. If not, continue with step 2.
- 2. Check power connections to the light fixture.
- Check all sensor wire connections. Verify the load wire is tightly secured.

Lights will not turn OFF:

- If there is no motion from people or equipment in the sensor's view but the red LED blinks, look for any nearby source of infrared energy (heat) in motion, such as turbulent air from a heating or cooling supply, or other sources such as heat from the fluorescent lamps in the fixture.
 - Mount the sensor so that it's lens is below the edge of the fixture and does not directly view the lamps.
 - Divert the air supply away from the sensor, or move the sensor.
- 2. Verify time delay set in switches 3-7. The time delay can be set from 15 seconds to 30 minutes. Ensure that the time delay is set to the desired delay and that there is no movement within the sensor's view for that time period.
- Check PIR and Light Level Override DIP switch settings. If all control functions are overridden the load stays ON.
- Check sensor wire connections. Verify load and neutral wires are secure.

MODEL/SWITCH #	8	9	10	FUNCTIONALITY	LOAD EFFECT
HB-3x0B-Lx	OFF	N/A	N/A	Occupancy control enabled	Controlled by Occupancy.
PIR sensor, 1 load relay	ON	N/A	N/A	Override PIR	Load always ON.

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Call 800.879.8585 for Technical Support



ORDERING INFORMATION

Catalog #	Description					
A complete hi	A complete high bay line voltage occupancy sensor consists of:					
HB340B-L1	High Bay Sensor 347/480 VAC with coverage @ 40' mounting height, 60' x 20'.					
HB340B-L3	High Bay Sensor 347/480 VAC with coverage @ 20' mounting height, 40' diameter.					
HB340B-L4	High Bay Sensor 347/480 VAC with coverage @ 40' mounting height, 60' diameter.					
HB350B-L1	High Bay Sensor 120/277 VAC with coverage @ 40' mounting height, 60' x 20'.					
HB350B-L3	High Bay Sensor 120/277 VAC with coverage @ 20' mounting height, 40' diameter.					
HB350B-L4	High Bay Sensor 120/277 VAC with coverage @ 40' mounting height, 60' diameter					
НВЕМЗ	Extender module with 2 chase nipples and nuts 1 short (0.88") for connection to plastic, 1 long (1.24") for connection to metal					

All units 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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Please