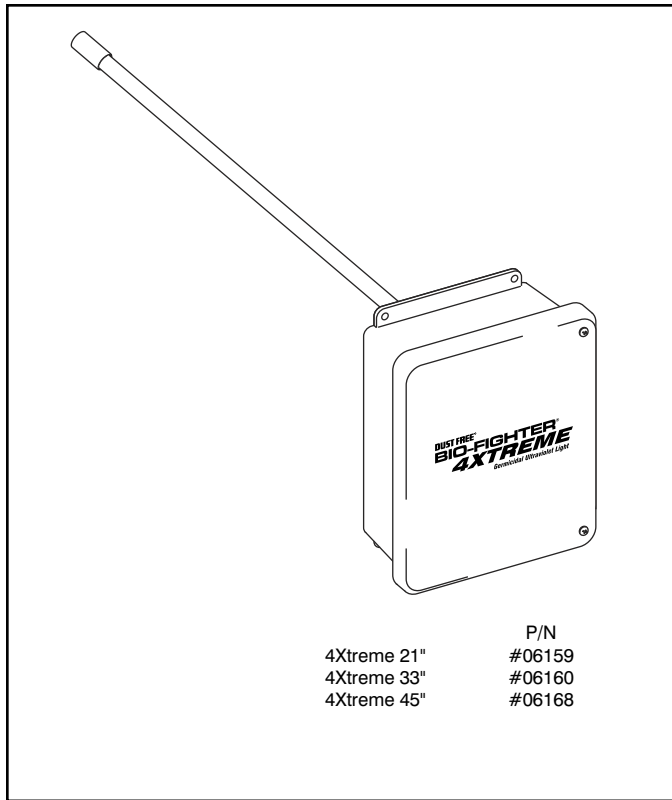


# **BIO-FIGHTER®**

## **4Xtreme 21", 33", 45"**

### **Ultraviolet Light Systems**

#### **Installation & Operation Manual**



## **GENERAL**

This product is designed to help disinfect the internal surfaces of heating, ventilation, and air conditioning systems. Bacteria and viruses that are in the air stream that passes through the system will also be reduced. The result is an improved level of indoor air quality for occupants and improved system hygiene.

The Bio-Fighter® emits ultraviolet(UV-C) radiation at a frequency of 254 nanometers, which has been proven effective in damaging the DNA of microorganisms such as viruses, bacteria, yeast and molds. This process either destroys the microorganism or neutralizes its ability to reproduce.



PO Box 519  
Royse City, TX 75189  
PH: 1-972-635-9564  
[Http://www.dustfree.com](http://www.dustfree.com)

## **FEATURES**

- Reduces or prevents mold growth on HVAC coils, allowing them to operate at peak efficiency. Also significantly reduces bacteria, viruses, fungi, and yeasts.
- NEMA 4X weatherproof enclosure.
- High output, long life UV-C lamps.
- Multi-voltage electronic ballast.
- Low maintenance and reduced costs.

## **INCLUDED INSIDE BOX**

- Bio-Fighter® 4Xtreme ultraviolet light system (UV-C lamp shipped separately.)
- Installation & operation manual
- UV-C warning label for duct

## **TOOLS REQUIRED FOR INSTALLATION**

- Electric drill
- Phillips screw bit or screwdriver
- 1.125"-1.25" uni-bit or holecutter
- 3/32" drill bit
- Weatherproof conduit & conduit connector
- Weatherproof sealant
- Cotton cloth and rubbing alcohol
- Eye protection

## **BEFORE INSTALLING**

- Read all instructions carefully. Failure to do so could damage the equipment or cause harm to yourself or others.
- Read all warnings and cautions.
- Only qualified technicians should perform the installation.

# BIO-FIGHTER® 4XTREME INSTALLATION &

## SPECIFICATIONS

### Base Dimensions

All Models - 11.563"L x 8"W x 4.25"H

### Weight:

All Models - 8.2 lbs.

### Electrical:

120V-240V, 50/60 Hz. 3 amp-250V fuse.

### Listings:

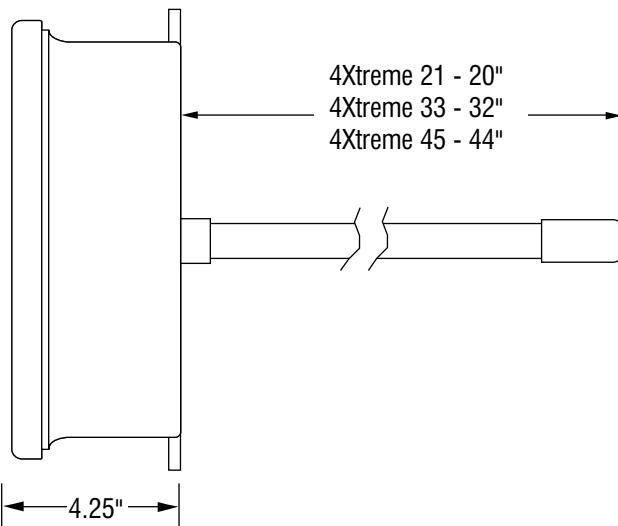
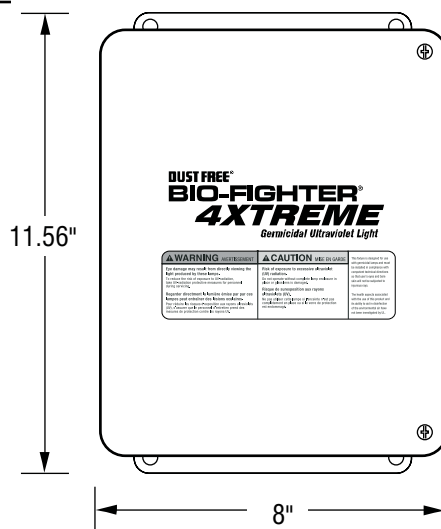
ETL Safety Listing - File #2002554

FIFRA - File #73316

(Federal Insecticide Fungicide Rodenticide Act)

U.S. Patent Nos. 5,334,347, 5,817,276, 6,245,293, 6,267,924, 6,280,686, 6,313,470, 6,627,000, 6,539,727, 6,932,494, 6,550,257.

Specifications subject to change without notice.



## INSTALLATION GUIDELINES

This device installs on the air handling system. Installation location must be at least 12" wide and deep enough to allow a minimum of 1" clearance at the tip of the lamp when installed. Allow sufficient clearance in front of the device to remove the lamp.

120V or 240V power must be available at the installation location. Hard-wire device to electrical service in accordance with NEC.

## SIZING & PLACEMENT

Use a lamp length that covers the largest area of the coil while maintaining a minimum clearance of 1" from coil and duct. Lamp should not touch or be closer than 1" to any surface along the length of the lamp. For coil disinfection applications, install the device no closer than 1" from coil.

### IMPORTANT:

**The 4Xtreme 45" should not be installed in applications where air flow velocity exceeds 3,000 FPM. Lamp breakage may occur.**

**For optimum coil and drain pan disinfection efficiency, the following placement guidelines are recommended.**

**Each foot of lamp length irradiates:**

**1 sq. ft. of coil area when installed 1"-2" from coil.**

**2 sq. ft. of coil area when installed 3"-6" from coil.**

**3 sq. ft. of coil area when installed 7"-12" from coil.**

## ⚠ CAUTION

### Professional Installation Only.

Only a qualified technician should install and maintain UV-C lighting or service equipment in which it is installed. Improper installation could cause human injury or equipment damage. Always disconnect electrical power prior to any HVAC maintenance. THIS INCLUDES FILTER MAINTENANCE.

## SPECIAL UV-C INSTALLATION NOTES

- Do not install in closet return grille applications.
- Do not expose wiring or plastic parts to UV-C light.
- Do not install where UV-C light can be seen after installation.
- Do not install beneath a humidifier.
- If the UV device is installed on the inlet side (return air side) of a coil, make sure that the HVAC system is configured such that the blower is located between the return air filter and the inlet side (return air side) of the coil, such as would be found in a traditional up-flow, or horizontal furnace with the coil placed after the heat exchanger.
- If the UV device is installed near an air filter, check with filter manufacturer for UV-C resistance properties.
- If the desired UV installation location is intended to irradiate an air filter, to neutralize the microbiological matter on the air filter surface, such as would be found in the return air drop of a basement application or in the return plenum of a horizontal system in an attic; take precautions as described in note above, and make sure the UV fixture is placed on the return side of the filter. **DO NOT INSTALL THE UV FIXTURE ON EITHER SIDE OF THE FILTER IN HALL / CLOSET RETURN AIR APPLICATIONS.** (See ATTENTION! Warning sheet #212945-00).

## TROUBLESHOOTING

Maintenance and troubleshooting should be performed by a qualified technician.

Device fails to operate.

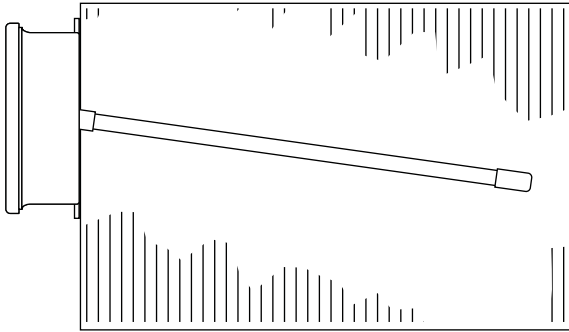
1. Check proper power is being supplied to the device, and that the switch lights when unit is turned on.
2. Check that the lamp connector is securely attached to the lamp.
3. Check that ballast is receiving correct power. Replace ballast if necessary.
4. Check continuity of lamp filaments. (Replace lamp if necessary.)
5. Check that wires are properly connected to lamp and ballast.

**DEVICE ORIENTATION**

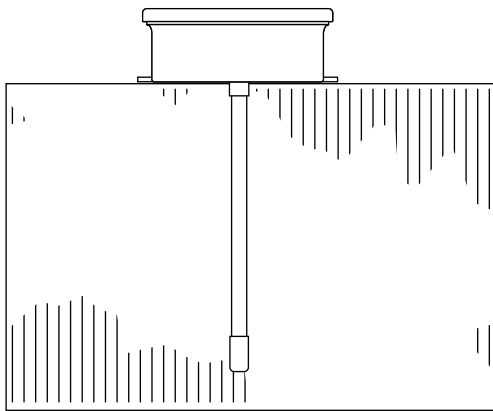
The NEMA 4X enclosure of the device allows it to be installed outdoors, either horizontally or vertically, and remain weatherproof.

For applications where the device is mounted horizontally, the tilt-lamp configuration is recommended. The device comes pre-configured for tilt-lamp operation. This configuration provides greater UV-C exposure into the drain pan condensate. (See Fig. 1)

For vertical applications the device may be installed in its tilt-lamp or straight-lamp configuration. (See Fig. 2)



**Fig. 1** For horizontal installations use the tilt-lamp configuration for greater UV-C exposure into the drain pan.



**Fig. 2** For vertical installations use either the straight-lamp or tilt-lamp configuration. **Note: Removal of lower slide clip is required for straight-lamp configuration.**

**⚠ CAUTION**

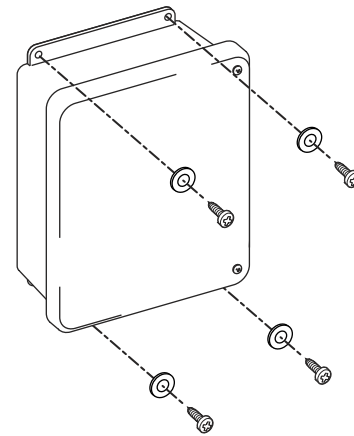
**UV-C Light May Degrade Plastic and Rubber.** Shield exposed plastic drain pans, wire insulation, flex duct, or other plastic/rubber components from UV-C light.

**ENCLOSURE MOUNTING (Fig.3 )**

Tape the provided mounting template at the desired installation location. Use this template to mark locations for the lamp hole and mounting screw pilot holes. Remove the template after use.

Use a 1.125" - 1.25" drill bit or holecutter to make the lamp hole. Use a 3/32" drill bit to make the pilot holes for the mounting screws.

Once the holes are drilled apply a sealer suitable for outdoor use around the mounting holes. Check to make sure the surface is flat to provide a good seal for the gasket and position the enclosure so that all holes align. Use #10 x 5/8" or longer sheet metal screws and washers to mount the device to the air handling system.



**Fig. 3** Mount the device using #10 x 5/8" or longer sheet metal screws and washers. Be sure to use weatherproof sealant around the mounting holes if installing outdoors.

**⚠ WARNING**

**UV-C Light Hazard.** UV-C light can cause temporary or permanent loss of vision, and sunburn. To prevent exposure, do not install device in any applications that allows UV-C light to be visible after installation.

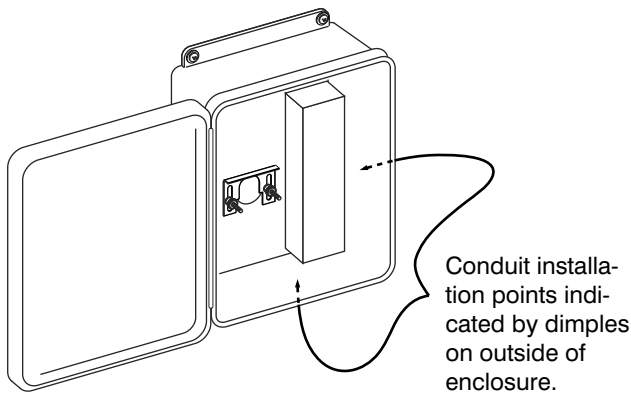
**IMPORTANT:**

The device must be installed in compliance with all national and local electrical and mechanical codes. Failure to do so will void Dust Free® warranty.

**CONDUIT INSTALLATION** (Fig.4 )

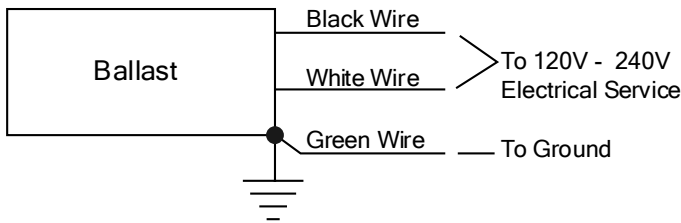
Remove the two cover retaining screws and swing open the cover to access ballast and wiring. Install an appropriate weatherproof conduit on the side of the enclosure. **Drill points are marked on two sides of the enclosure where it is safe for conduit installation.**

Connect the electrical service, through the conduit, to the ballast wires. Connect the black and white wires to power and the green wire to ground. Refer to Fig. 5 for wiring diagram.



Conduit installation points indicated by dimples on outside of enclosure.

**Fig. 4** Install weatherproof electrical conduits at either of the locations marked by dimples on the outside of the enclosure.



**Fig. 5** Wiring diagram.

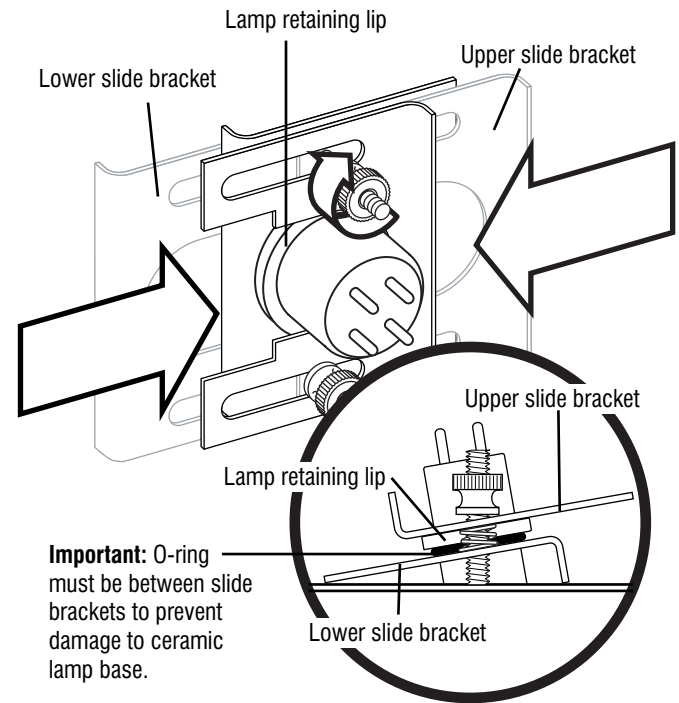
**⚠ WARNING**

**Electrical shock hazard.**  
Can cause injury or death. Before performing any service or maintenance disconnect electrical service to the unit.

**TILT-LAMP INSTALLATION** (Fig.6 )

To maximize the efficiency and life of the UV-C lamp, clean each lamp prior to installation. Use isopropyl alcohol and cotton cloth to wipe dust and fingerprints from the lamp.

Gently insert the lamp into the lamp hole. While holding the lower slide bracket under the retaining lip of the lamp, push the upper slide bracket over the retaining lip of the lamp and tighten the two knurled nuts until the lamp is securely fastened.



**Fig. 6** Hold lower slide bracket in place under lamp retaining lip while pushing upper slide bracket over lamp retaining lip. Secure with two knurled nuts.

**⚠ WARNING**

**UV-C Light Hazard.**  
UV-C light can cause temporary or permanent loss of vision, and sunburn. Take precautions to protect eyes and skin from direct exposure.

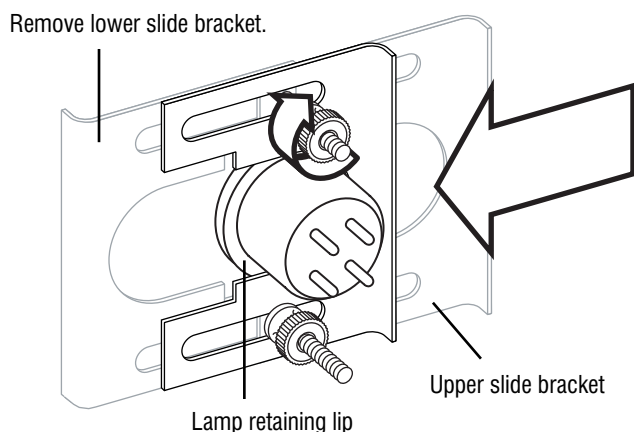
**⚠ WARNING**

**Mercury Hazard. Do Not Break.**  
Each UV-C lamp contains a small amount of Mercury. May cause redness or irritation. Use proper disposal techniques in case of breakage.

### STRAIGHT-LAMP INSTALLATION (Fig.7 )

To maximize the efficiency and life of the UV-C lamp, clean each lamp prior to installation. Use isopropyl alcohol and cotton cloth to wipe dust and fingerprints from the lamp.

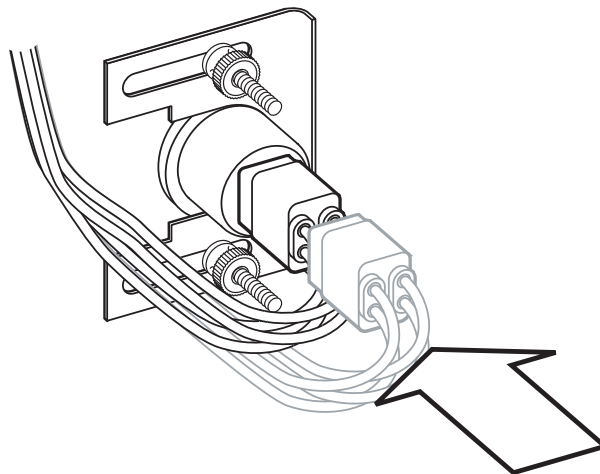
**To install the lamp in its straight-lamp configuration the lower slide bracket must be removed.** After the lower slide bracket has been removed gently insert lamp into lamp hole and push upper slide bracket over the retaining lip of the lamp and tighten the two knurled nuts until the lamp is securely fastened.



**Fig. 7** After lower slide clip is removed, slip upper slide bracket over retaining lip of lamp and tighten two knurled nuts.

### CONNECTING THE HARNESS (Fig.8 )

After lamp has been installed, attach electrical harness. The harness connector is asymmetrical and can only be attached one way. If the harness does not attach easily, rotate 90 degrees and try again.



**Fig. 8** Attach electrical harness to lamp.

### FINISH INSTALLATION

Close the cover, reinstall the cover retaining screws, and turn on the electrical service. Apply included warning label on nearby maintenance access panel.

**Note:** This device uses a cover safety interlock. The cover must be closed for the device to operate.

### OPERATION

The device operates continuously. It is recommended that the device be interlocked with a power disconnect to prevent inadvertent UV-C exposure when access panels are removed.

## ⚠ WARNING

### Electrical disconnect required.

Areas where UV fixtures are installed must have access panel/door disconnect switches installed. Never view UV-C light without protective eyewear.

### IF THE LAMP DOES NOT ILLUMINATE

- Check that the lamp connector is securely attached to lamp.
- Check that the fuse is in good working order. Replace if necessary.
- Check that electrical service is operating.

### LAMP REPLACEMENT(Annually)

The lamp should be replaced annually even if it appears to be operating normally. UV-C energy production diminishes over time.

1. Obtain the correct replacement lamp for your model.
2. Disconnect electrical service
3. Open the cover of the device. *Allow lamp to cool 10 minutes before touching.*
4. Disconnect the electrical connector to the lamp.
5. Unscrew the two knurled nuts of the lamp retaining bracket and slide the bracket away from the lamp retaining lip.
6. Carefully remove the UV-C lamp and replace it with the new lamp. Be sure to clean the lamp of dust and fingerprints prior to installation.
7. Slide the retaining bracket back in place and tighten knurled nuts.
8. Reconnect electrical connector to the lamp.
9. Close the cover.
10. Reconnect electrical service.

**⚠ WARNING**

**Burn Hazard.**  
During replacement, allow lamps to cool 10 minutes before removing them. Personal injury may result.

**⚠ WARNING**

**Mercury Hazard. Do Not Break.**  
Each UV-C lamp contains a small amount of Mercury. May cause redness or irritation. Use proper disposal techniques in case of breakage.

### FUSE REPLACEMENT

1. Disconnect electrical service.
2. Open cover.
3. Remove fuse from fuseholder.
4. Install new fuse. Only use a 250V/3 amp fuse.
5. Close cover.
6. Reconnect electrical service.

### LAMP DISPOSAL

Dispose of your spent UV-C lamps at your local recycling center. You may also send your spent lamps in the same container you received your replacement lamps to:

**Dust Free® Lamp Reclamation**  
**1112 Industrial Drive**  
**Royse City, TX 75189**

### PROPER CLEAN-UP TECHNIQUE IN CASE OF LAMP BREAKAGE

- Wear protective gloves, eyewear and mask.
- Sweep the broken glass and debris into a plastic bag, seal the bag, and dispose of properly. Contact your local waste management office for proper disposal.
- **Do not use a vacuum cleaner. Do not incinerate.**

Replacement Parts	Part No.
UV-C Lamp - 21"	06180
UV-C Lamp - 33"	06182
UV-C Lamp - 45"	06184
Ballast - Multi-voltage	06190
Cover Interlock Switch	212108-00
Slide Bracket Springs (2)	210-0005-001
Slide Bracket	212147-00
Knurled Nuts (2)	210226-00
Fuseholder	750-0052-001
Fuse	750-0108-001

For information on the dealer in your area call: 1-972-635-9564.  
 Visit us at <http://www.dustfree.com>

## LIMITED LIFETIME WARRANTY

Dust Free® warrants this Bio-Fighter® UV-C Light to be free from defects in materials and workmanship under normal use and service, for as long as it is owned by the original purchaser. This warranty does not cover UV-C lamp(s), which carry a one (1) year warranty from the date of installation, or the ballast(s) which carry(s) a three (3) year warranty.

This warranty does not cover cosmetic damage, damage due to acts of God, damage as a result of handling or shipment, negligence, misuse, connection to improper voltage, improper maintenance, or abuse. This warranty is void if defect(s) result from failure to have this unit installed by a qualified, properly licensed, heating and air conditioning contractor in compliance with all local building and construction codes.

Dust Free®'s exclusive obligation under this warranty shall be to supply, without charge, a replacement for any covered component of the Bio-Fighter® UV-C Light which is found to be defective within the parameters defined herein. Dust Free® reserves the right to replace or repair the defective part or component.

DUST FREE® SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE OF ANY KIND, INCLUDING ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING, DIRECTLY OR INDIRECTLY, FROM ANY BREACH OF WARRANTY, EXPRESS OR IMPLIED, OR ANY OTHER FAILURE OF THIS PRODUCT. (Some states do not allow the exclusion or limitation of incidental or consequential damages, so this limitation may not apply to you.) THE WARRANTIES SET FORTH HEREIN ARE EXCLUSIVE AND DUST FREE® EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, IMPLIED OR STATUTORY, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY, WORKMANSHIP, OR FITNESS FOR A PARTICULAR USE. If the limited warranty is void due to failure to use a qualified contractor all disclaimers of implied warranties shall be effective upon installation.

How to make a warranty claim or have questions answered:

Should you have a warranty claim or questions about the warranty policy, contact the distributor or dealer from which you purchased the product. Proof of original purchase and proof of identity that the original purchasing party is filing the claim is required in order to initiate a warranty claim. Defective parts must be returned no later than thirty (30) days after the failure to the installing contractor together with the model number, serial number, and date of installation. All service and removal must be performed by a licensed HVAC contractor. You must pay shipping charges and all other costs of warranty service. Warranty is only valid the United States and Canada.

THIS WARRANTY SHALL NOT OBLIGATE THE MANUFACTURER FOR ANY LABOR COSTS AND SHALL NOT APPLY TO DEFECTS IN WORKMANSHIP OR MATERIALS FURNISHED BY THE INSTALLING CONTRACTOR AS CONTRASTED TO DEFECTS IN THE GERMICIDAL LIGHT ITSELF.

NOTE: Do not return any products or parts to the factory without a factory issued Return Authorization number issued by the Dust Free® customer service department.

In the event you have any questions concerning the use and care of this product or this warranty which have not been answered to your satisfaction by the distributor or dealer, please call or write the factory.

**Dust Free®**  
**PO Box 519**  
**1112 Industrial Drive**  
**Royse City, TX 75189**  
**1-972-635-9564**