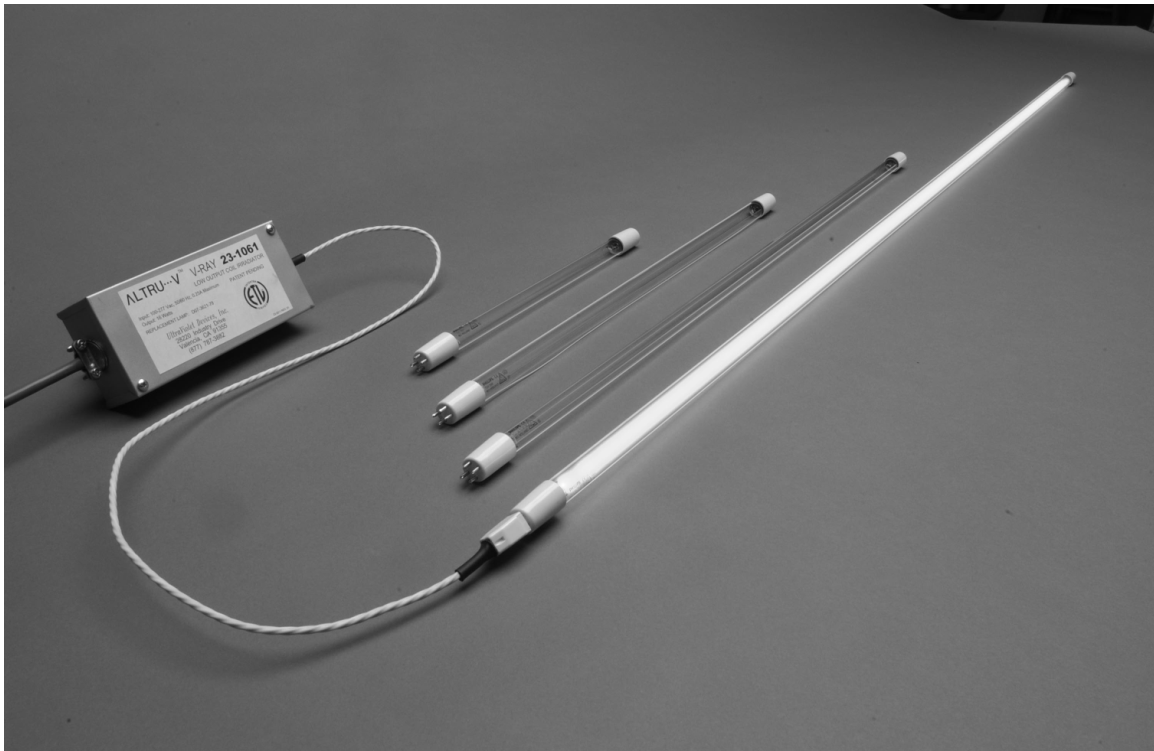


# V-Ray<sup>®</sup>

## UV Device

### INSTALLER/OWNER'S MANUAL



**ALTRU...V**  
REAL SCIENCE FOR HVAC MAINTENANCE

*Specifications subject to change without notice.*

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## SPECIFICATIONS

### Electrical Ratings:

#### Power Ratings:

V-Ray<sup>®</sup> SUS has an input circuit capable of operation at 120Vac – 277 Vac, and 50/60Hz.

V-Ray<sup>®</sup> FO has an input circuit capable of operation at 120Vac – 277 Vac, and 50/60Hz.

V-Ray<sup>®</sup> WD has an input circuit capable of operation at 120Vac – 277 Vac, and 50/60Hz.

#### Temperature Ratings: (for all three units)

Ambient Temperature Range: 40°F to 135°F (4°C to 57°C).

Lamp Temperature Range: 40°F to 135°F (4°C to 57°C).

Relative Humidity: Up to 95%, non-condensing.

#### Power Consumption:

Model	AMPS		
	120Vac	240Vac	277Vac
23-1012	.1	.1	.1
23-1021	.2	.1	.1
23-1033	.2	.1	.1
23-1100	.25	.1	.1
23-1110	.35	.15	.15
23-1120	.7	.27	.27
23-1200	.25	.1	.1
23-1210	.35	.15	.15
23-1220	.7	.27	.27

#### Approvals:

ETL Listed and Certified against the following UL and CSA Standards:

- UL 1598 – UL Standard for Safety for Luminaries – First Edition, CSA C22.2 No. 205.0
- UL 1995 – UL Standard for Safety Heating and Cooling Equipment – Second Edition; CAN/CSA C22.2 NO. 236-95; Reprint with Revisions Through and Including 08/31/1999
- UL 482 – UL Standard for Safety Portable Sun/Heat Lamps Seventh Edition; June 24, 1996
- UL484 – UL Standard for Safety Room Air Conditioners Seventh Edition; June 24, 1997

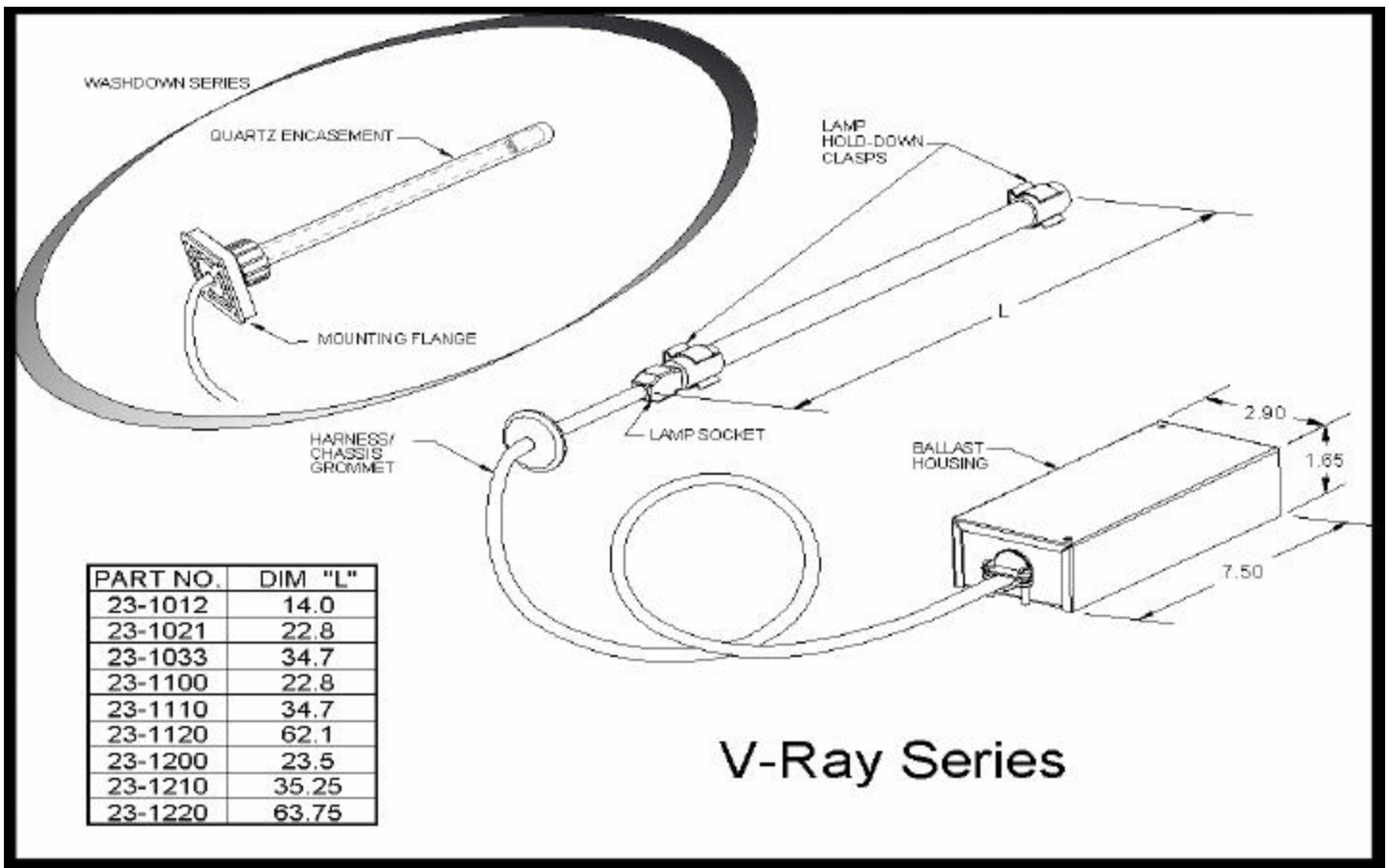


Figure 1. Shown: V-Ray® Series (with Dimensions.)

### A. SAFETY CONCERNS



Read and understand these instructions before proceeding.

This system is suitable for damp locations. This system is to be installed in ventilation or cooled air applications only. Install only in environmental air handling spaces where a complete metal enclosed wiring system is provided.

This product must be installed in accordance with local building codes by a person familiar with the construction and operation of the product and the hazards involved. Use copper supply wires. Consult a qualified electrician to ensure correct branch circuit installation.

 **CAUTION**

**Personal Injury Hazard**

**Disconnect input power before beginning installation.  
Professional installation required per NEC standards.**

 **WARNING**

**UV Light Hazard**

**Harmful to bare skin and eyes.  
Can cause temporary or permanent loss of vision.  
Never look at the lamps while illuminated.**

 **WARNING**

**The power supply to this ultraviolet appliance must be disconnected before opening or servicing the unit. Any access panels or doors, within site of the UV lamps, must be interlocked so as to disconnect power to the UV appliance upon opening or removal.**

  **WARNING**

**UV Lamp Burn Hazard**

**Harmful to bare skin.  
Can cause severe burns.**

## **IMPORTANT**

**Keep lamp surface clean.**

**Use clean dry cloth (not bare hands) or clean the lamp with alcohol or window cleaner after handling.**

## **B. PLANNING THE INSTALLATION**

**(Refer to Figures 2-5)**

Determine the location of the Lamp and Ballast.

This appliance is designed to keep the air conditioning coil operating efficiently for small unit systems (SUS) and larger systems (FO, WD) with higher output needs. The UV Low output models are regulated to provide sufficient power to maintain the coil in many applications. The UV output is consistent for the Full Output and Washdown models to produce a higher power level for demanding applications. The Washdown also is designed for applications where the coil needs to be sanitized with other means, such as caustic chemicals, water, or for environments that would otherwise destroy the lamp.

It is essential that the lamp be mounted properly. If UV light can be emitted from the grills, the lamp must be installed on the side of the coil opposite the grill. For example, Figure 2 shows a unit ventilator (or low profile fan coil) with a supply grill into the occupied space. The lamp must be installed on the upstream side of the coil, away from the supply grill.

For a unit, similar to that shown in Figure 3, where the return air grill leads to the coil, the lamp must be installed on the downstream side, away from the grill.

Proper lamp location will assure that the coil utilizes the UV energy properly and reduces the amount of energy emitted from the grill to safe levels.

In a ducted unit (Figure 4) where the UV cannot be seen from the return or supply grill, the lamp may be installed on either side.

The ballast may be installed in the air stream or in an electrical plenum outside the air stream. Consider where the supply power will be obtained to make the installation easier. For the Washdown units, it is highly recommended that the Ballast be installed in the electrical box or in an area that is not sprayed with the cleaning solution/water.

The Lamp is to be mounted in the device, so the face of the coil is completely exposed to the UV light emitted, by the Lamp. Choose the longest lamp the V-Ray unit will accommodate. To provide optimum performance, the lamp should be oriented as close to perpendicular to the coil fans as possible.

The Ballast may be mounted internally or externally on the device, near the Lamp location, on a VERTICAL surface only. If mounted internally, the Ballast can be mounted within the air stream or an electrical compartment if available.

Care should be taken to avoid any areas that may accumulate water.

To prevent damage or a short circuit, take care that there are no wires or critical components mounted on the surfaces behind where ballast and lamp are to be mounted.

Connections to the external power source of the facility should be in accordance with NEC standards, and state and local building codes. Use of flexible conduit and fittings is recommended.

## C. INSTALLATION DETAILS

### Part 1: Small Unit System (SUS) and Full Output (FO)

1. Install the Mounting Clips on a suitable mounting surface. The distance between the Mounting Clip holes depends on the model of Lamp being installed:

Model	Distance Between Holes	Overall Lamp Length
1012	11"	14.0"
1021	20"	22.8"
1033	32"	34.7"
1100	20"	22.8"
1110	32"	34.7"
1120	60"	62.7"

Mount the clips using the 2 - #8 (smaller) sheet metal screws provided.

2. If the Ballast is to be mounted externally or outside the air stream, determine the location where the lamp supply wires will pass through the device enclosure and into the air plenum. Drill or punch a 1/2" diameter hole.

If the ballast is to be mounted inside the air plenum, determine where the electrical supply input will connect to the ballast.

3. Insert Lamp into Clips.
4. Remove Cover from Ballast enclosure.

If the ballast is mounted in the air plenum, it is not necessary to disconnect the lamp supply wires.

If the ballast is mounted in another plenum or area, disconnect the lamp output wire. Install the grommet into the ½ inch hole drilled in #2 above. Route the lamp output wire through the grommet and reconnect to the ballast. Refer to the schematic in Figure 5.

5. Place ballast base on its mounting surface and using the two holes on base as a guide, use the #10 self-drilling screws provided to secure the ballast to the unit. It is recommended that once the mounting location for the ballast is established, connection to the facility input power, conduit hardware, and lamp supply wires be connected before finally securing the ballast. A hole is provided in the ballast case to accommodate a standard ½” conduit fitting.
6. Connect supply cable with its receptacle to the Lamp. See Wiring Diagram in Figure 5.

## Part 2: Washdown (WD)

1. Flange must be attached to a suitable mounting surface. The length of the lamp with flange is listed below:

Model	Distance Between Mounting Support Holes	Overall Lamp Length
1200	20”	23.8”
1210	32”	35.7”
1220	60”	63.7”

Mount the Flange using the 4 - #10 (larger) sheet metal screws provided. Note: While mounting the flange to the selected surface, make sure to apply the gasket to the back of the flange before mounting. This gasket is required to ensure a water-tight seal. The preferred way of applying this gasket is to disconnect ballast from Washdown lead and lacing the white lead through the center hole in the gasket. Remove the adhesive backing and apply gasket to flange.

2. Ballast **must** be mounted outside the air stream, determine the location where the lamp supply wires will pass through the device enclosure and into the air plenum. If using Mounting Method #1 (Figure 8); cut a 1” diameter hole. If using Mounting

Method #2 (Figure 9 & 10); cut a hole that can accommodate all ballast harness wires. (On average: 1" diameter hole = 4 ballast harness wires.) If using Mounting Method #3 (Figure 11); cut a 2 1/2" diameter hole.

3. Remove Cover from Ballast enclosure.

If ballast is mounted in another plenum or area, disconnect the lamp output wire. Route the lamp output wire through the grommet and reconnect to the ballast. Refer to the schematic in Figure 5.

4. Place ballast base on its mounting surface and using the two holes on base as a guide, use the #10 self-drilling screws provided to secure the ballast to the unit. It is recommended that once the mounting location for the ballast is established, connection to the facility input power, conduit hardware, and lamp supply wires be connected before finally securing the ballast. A hole is provided in the ballast case to accommodate a standard 1/2" conduit fitting.
5. Connect supply cable with its receptacle to the Lamp. See Wiring Diagram in Figure 5.

**NOTE: TO INSURE PROPER ELECTRICAL CONNECTIVITY AND AVOID DAMAGE TO FIXTURE AND LAMP, FIGURE 6 DEMONSTRATES THE CORRECT AND INCORRECT INSTALLATION OF WIRES INTO RECEPTICALS. MAKE SURE WIRE IS STRIPPED PROPERLY AND NO WIRE INSULATION INTERFERES IN CONNECTION TERMINAL.**

**NOTE: Be sure the supply wire to the ballast has been run through an interlock switch which removes the supply power if access panels or doors are removed or opened.**

 **CAUTION**

**Personal Injury Hazard**  
**Verify input supply power has been disconnected.**

 **IMPORTANT**

**Connections to external power source or facility should be in accordance with NEC standards, and state and local building codes. Use of flexible conduit and fittings is recommended.**

6. Attach Enclosure Cover to Base and secure.

## D. LAMP REPLACEMENT



### **Personal Injury Hazard**

**Disconnect input power before beginning lamp replacement.**



### **UV Light Hazard**

**Harmful to bare skin and eyes.**

**Can cause temporary or permanent loss of vision.**

**Never look at the lamps while illuminated.**

### **For Full Output (FO) and Small Unit Systems (SUS) only:**

1. Verify input power has been disconnected.
2. Disconnect lamp supply cable from lamp, and remove lamp from clips.
3. Handle replacement lamp with care. Use clean dry cloth (not bare hands) or clean the lamp with alcohol or window cleaner after handling. Insert replacement lamp into clips.
4. Secure lamp supply cable connector to lamp.

### **For Washdown (WD) only:**

1. Verify input power has been disconnected.
2. Disconnection of lamp from flange:
  - a. For Mounting Method #1; unscrew the Compression Flange Nut till quartz comes free. Slide quartz in opposite direction of flange till lamp is completely exposed. Disconnect Lamp from Lamp Connector.
  - b. For Mounting Method #2; unscrew the Compression Flange Nut till quartz comes free. Slide quartz in opposite direction of flange till lamp is completely exposed. Disconnect Lamp from Lamp Connector. If Quartz cannot be moved in opposite direction of flange due to plenum or other obstructions. Remove the Compression Flange from the mounting surface to allow slack. This should aid in the lamp replacement process.
  - c. For Mounting Method #3; unscrew the 4 - #10 screws from the Compression Flange and slide entire unit out of the Coil unit. Unscrew the Compression Flange Nut till quartz comes free. Slide quartz in opposite direction of flange till lamp is completely exposed. Disconnect Lamp from Lamp Connector.
3. Replacement Lamp Reconnection and care:
  - a. For Mounting Method #1; handle replacement lamp with care. Use clean dry cloth (not bare hands) or clean the lamp with alcohol or window cleaner after handling. Insert replacement lamp pins into Lamp

- Connector. Slide Quartz back into place and tighten Compression Flange till snug.
- b. For Mounting Method #2; handle replacement lamp with care. Use clean dry cloth (not bare hands) or clean the lamp with alcohol or window cleaner after handling. Insert replacement lamp pins into Lamp Connector. Slide Quartz back into place and tighten Compression Flange till snug. If Compression Flange needed to be removed, reconnect it using the same 4 - #10 screws provided.
  - c. For Mounting Method #3; handle replacement lamp with care. Use clean dry cloth (not bare hands) or clean the lamp with alcohol or window cleaner after handling. Insert replacement lamp pins into Lamp Connector. Slide Quartz back into place and tighten Compression Flange till snug. Replace entire Compression Flange unit into the Plenum. Make sure Gasket is in the correct position and reattach screws.
4. Reseal Coil unit if needed and reconnect input power.

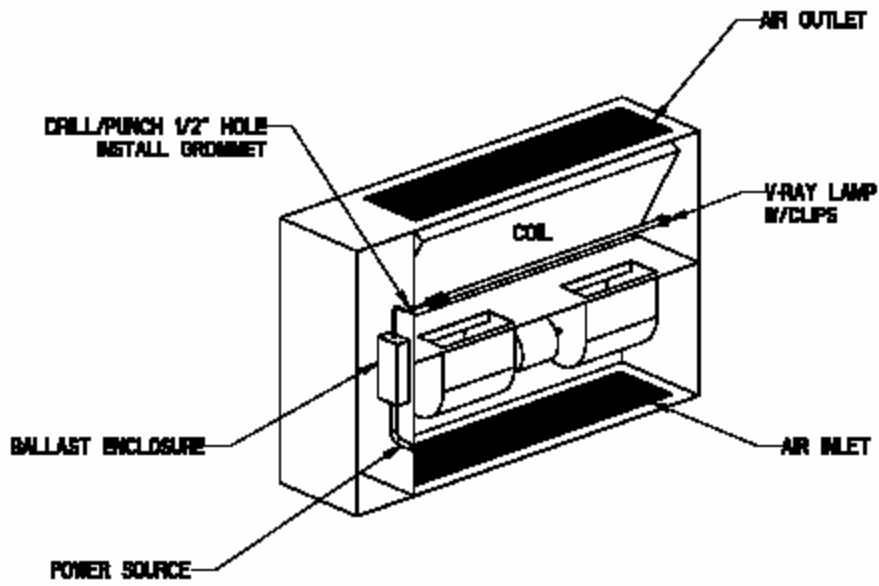


**Hg LAMP  
CONTAINS MERCURY**

**Manage in accordance with local disposal laws.**

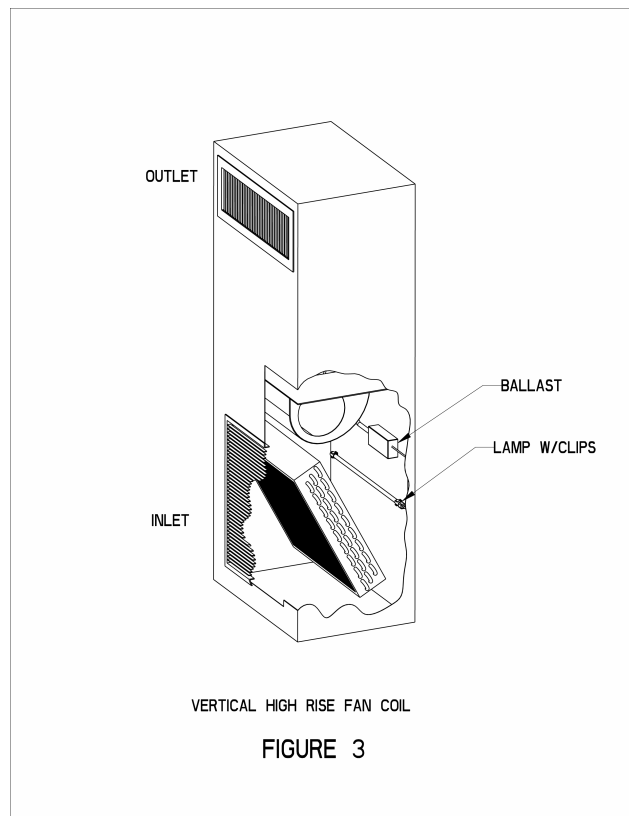
See [www.lamprecycle.com](http://www.lamprecycle.com)

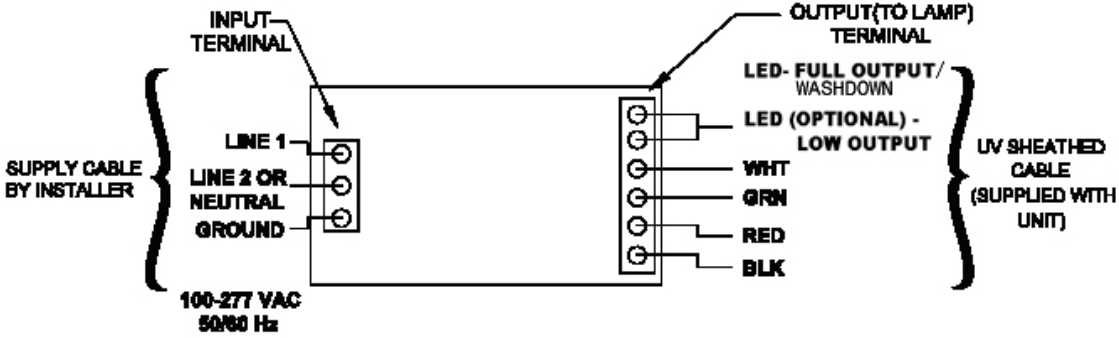
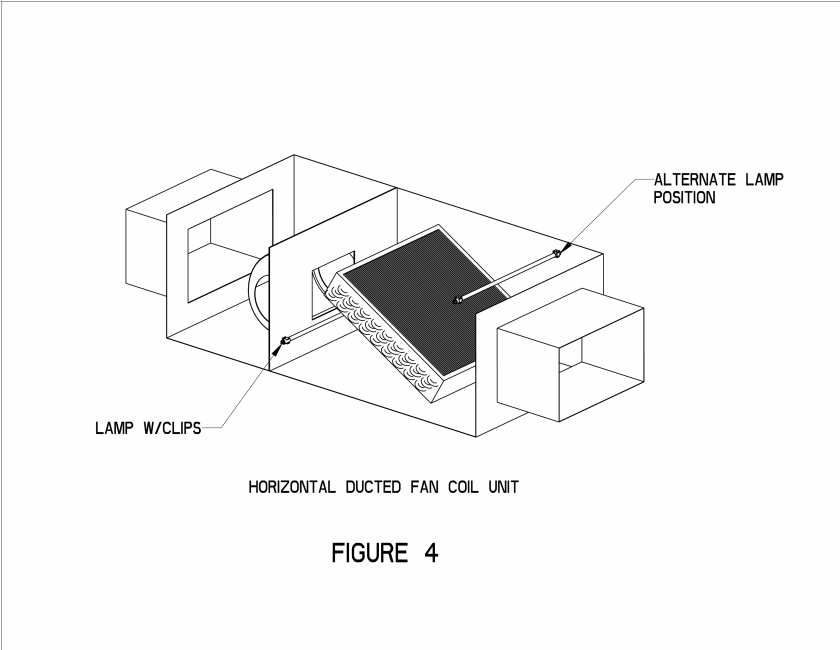
**Or call 877-PUREUVC (in North America)**



TYPICAL UNIT VENTILATOR INSTALLATION  
BALLAST OUTSIDE AIR STREAM

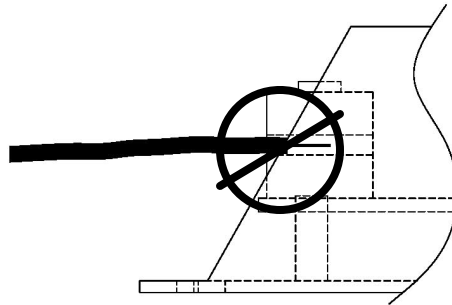
FIGURE 2



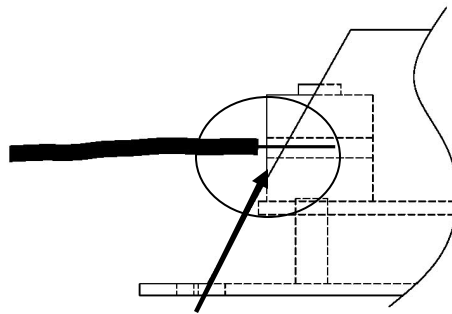


WIRING DIAGRAM

FIGURE 5



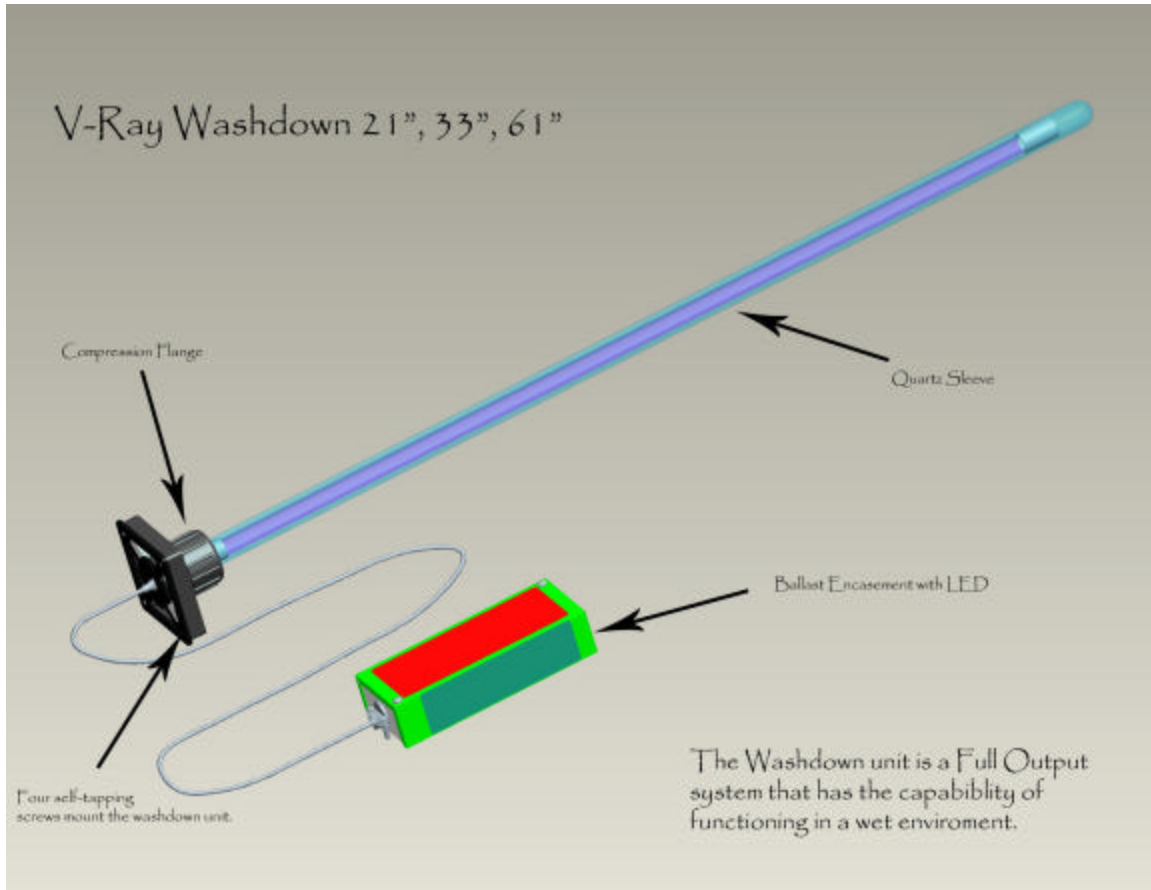
**INCORRECT INSTALLATION**



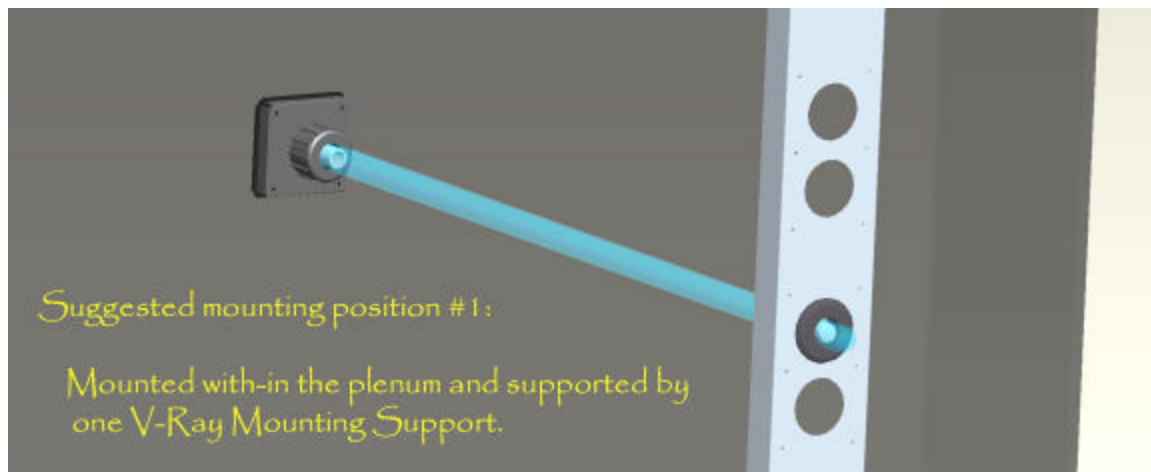
**CORRECT INSTALLATION**

**Note: Insert wire such that terminal is secured to the stripped conductor only and not to the insulation.**

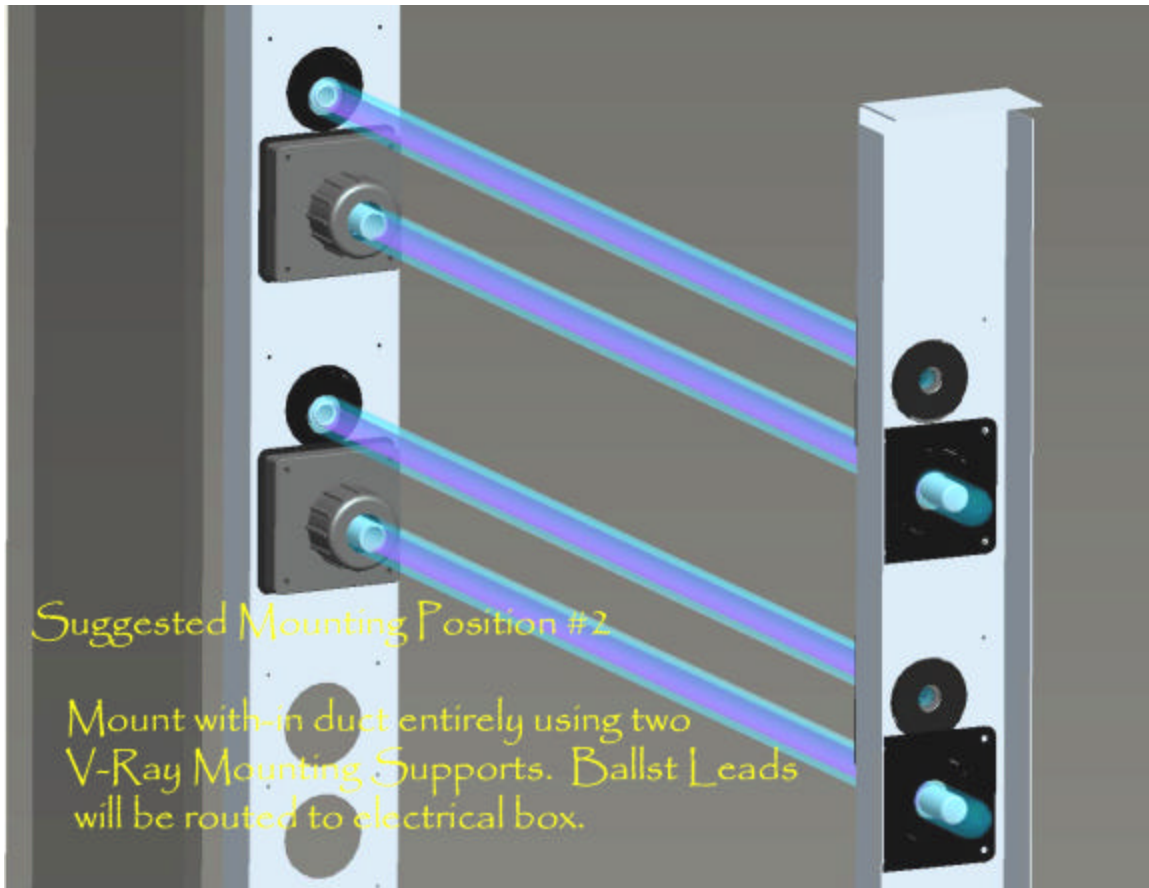
Figure 6



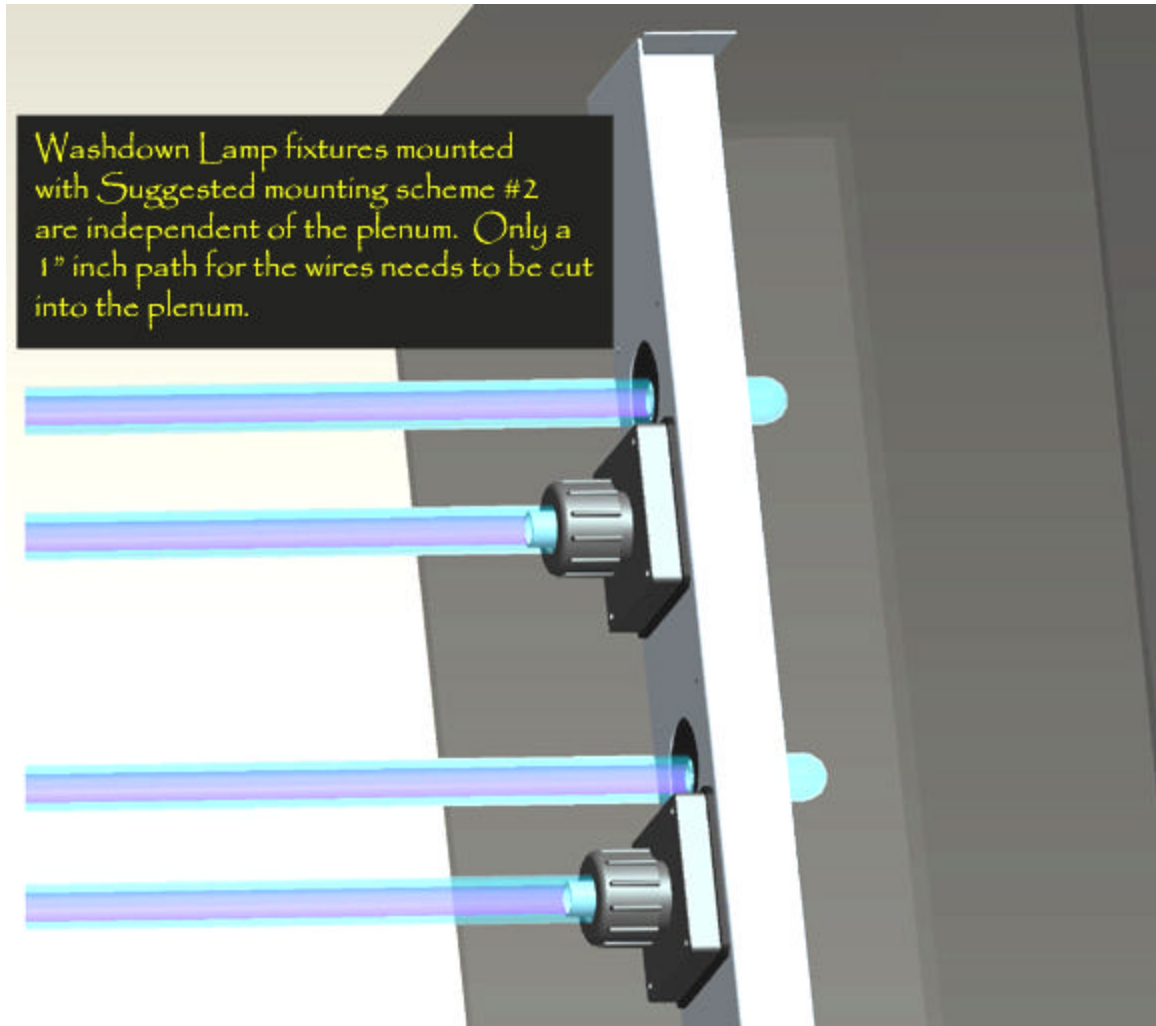
**Figure 7**



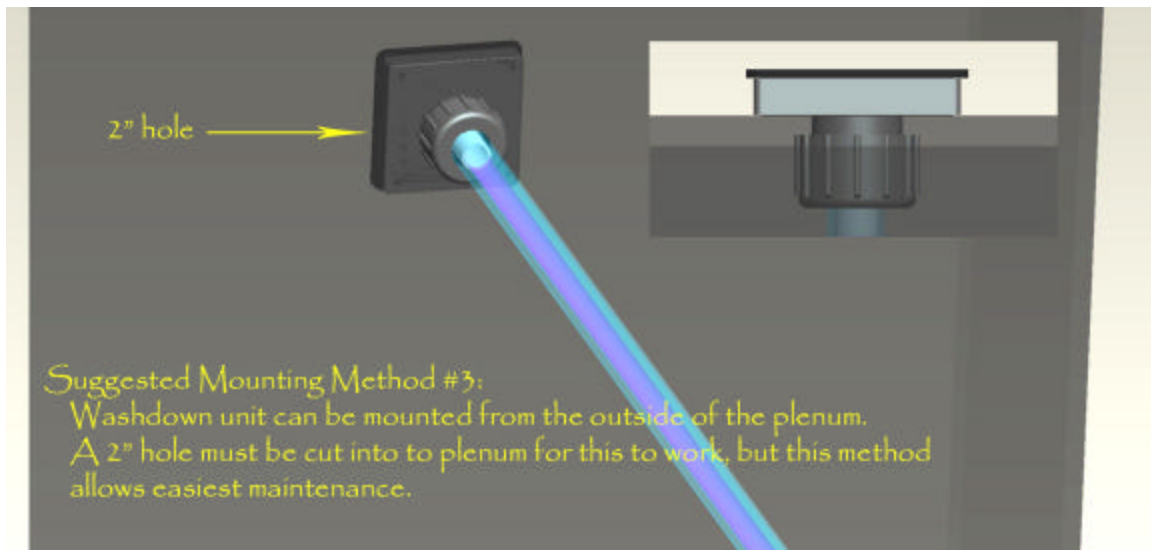
**Figure 8**



**Figure 9**



**Figure 10**



**Figure 11**

# NOTES

## EQUIPMENT WARRANTY

**UltraViolet Devices, Inc. (UVDI), warrants to original Buyer for one year** from the date of original installation, or eighteen (18) months from date of shipment, whichever comes first, that its goods are free from defect in material and workmanship under normal use and service. **UVDI's** obligation under this warranty shall be limited to the repair or replacement of those goods which prove defective, provided that such products are installed, maintained, and operated for the purpose and in the manner intended and for which **UVDI** instructs or recommends. Neither **UVDI** nor its dealers shall be liable for any special or consequential damages directly or indirectly arising from the design, construction, installation, servicing, or operation of the goods. THIS IS **UVDI'S** SOLE WARRANTY. NEITHER **UVDI** NOR ITS DEALERS MAKE ANY OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED **UVDI'S** AFFORESTATED OBLIGATIONS ARE HEREBY DISCLAIMED AND EXCLUDED FROM THIS WARRANTY.

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Manufactured by:



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