



# PHOTO-CATALYTIC AIR PURIFIER

Models: Duo-2000



## ITEMS INCLUDED:

- 1 - Duo-2000 Air Purifier
- 1 - 120V Quick Connect Power Cord
- 1 - UVC Germicidal Lamp
- 4 - #8 Sheet Metal Mounting Screws
- 1 - Instruction Sheet
- 1 - Duct Board Mounting Plate

The Duo-2000 produces germicidal UVC Band light rays, which sterilize and reduce airborne microorganisms and reduce Volatile Organic Compounds (VOC's) by a combination of photocatalytic chemical reaction and carbon absorption as air passes through a heating or air conditioning system. They are installed in the main supply or return duct and operate continuously to automatically purify the air in the home 24 hours a day.

**This product is not sold as a medical device and is not for the purpose of diagnosis of any disease or condition, nor for use in the mitigation, treatment, or prevention of any disease or condition.**

### READ THESE INSTRUCTIONS CAREFULLY AND COMPLETELY BEFORE PROCEEDING WITH THE INSTALLATION.



**WARNING: Do not exceed voltage rating. Severe damage to device and or fire could result. Verify proper voltage.**

This device **MUST** be installed by a qualified agency in accordance with the manufacturer's installation instructions. The definition of a qualified agency is: any individual, firm, corporation or company which either in person or through a representative is engaged in, and is responsible for, the installation and operation of HVAC appliances, who is experienced in such work, familiar with all the precautions required, and has complied with all the requirements of the authority having jurisdiction.

Please retain these instructions after installation.

Installed By: \_\_\_\_\_ Phone: \_\_\_\_\_ Installation Date: \_\_\_\_\_



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P/N 46638600 09/18 Rev E

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# SAFETY CONSIDERATIONS



**WARNING: Never expose eyes or skin to UVC light from any source.**

- Looking directly at the UVC light may cause permanent eye damage or blindness.
- Never operate the Duo-2000 Air Purifying System out of the plenum.
- Designed for a closed duct system. Do not mount near a supply or a return air opening.
- All duct openings in direct line of site of the UV light must be sealed with aluminum tape or equivalent sealing methods.



**WARNING: UV light will break down plastic materials not rated for UV exposure:**

(Examples: wire insulation, flex duct, drain pans and humidifiers)

- The unit must be mounted at least 30" from the above stated type of materials.
- If it is necessary to mount the unit in direct line of site of these types of materials, they must be shielded with aluminum foil, aluminum foil tape, or sheet metal.



**WARNING: DO NOT mount this unit outdoors.**

- This product is designed for indoor installation only (i.e. attics, crawl spaces, basements, etc.).



**WARNING: Never touch broken lamp or internal contents of lamp. The lamp contains mercury.**

- After opening the carton, unpack and inspect the unit and lamp for damage. Do not install this unit if any damage is noticeable. If lamp is damaged, cracked or broken, do not touch lamp or other contents in carton. Close carton and return to seller immediately.
- In case of accidental exposure to internal contents of lamp, wash hands and any other affected skin area with mild detergent. Remove affected clothing immediately. If skin surface is pierced, seek medical attention immediately.

**NOTE:** If you touch the glass of the lamp, you should wipe the glass clean with isopropyl alcohol and a lint free wipe. If the lamp is not cleaned, the film of hand oils causes a reduction in the light intensity.



**WARNING: Before installing or servicing a humidifier, air filter, HVAC system, or this unit, etc., always turn all power OFF and have unit unplugged. Electrical shock can cause personal injury or death. Never expose eyes or skin to direct UVC light from any source.**



**WARNING: To prevent water damage or electric shock, do not mount unit under a humidifier.**



**WARNING: This product is designed for indoor installation only (i.e. attics, crawl spaces, basements, etc.). For use on gas fired, oil fired, electric and split system heat pump forced air systems.\* This product is NOT designed to be mounted outside on gas fired or heat pump packaged units.\*\***

**\* Split system heat pumps are systems where the air handler and the air conditioning compressor are separate units.**

**\*\*Packaged units are systems where the air handler and the air conditioning compressor are built together and are installed outside of the building.**

## GENERAL INFORMATION

The Duo-2000 unit uses technology that is recommended by doctors who state that "ultraviolet radiation, properly integrated with heating, ventilating, and air conditioning systems, shows the most promise as a widely applicable means of air disinfection".<sup>1</sup>

<sup>1</sup> Richard Riley, M.D. "Airborne Infection: The American Journal of Medicine, September 1974, Vol. 57 - 5/16/01

The health aspects associated with the use of these products and their ability to aid in disinfecting of environmental air have not been investigated by UL.



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# DUO-2000 INSTALLATION INSTRUCTIONS

## INSTALLATION INSTRUCTIONS FOR DUO-2000 LAMP

**NOTE:** : Due to directional airflow installation options, the Healthy Home System 3x3 Product Brand Label is enclosed for proper upright placement at the field installation. The Duo-2000 installation is specific to direction of airflow and must be properly positioned when choosing upflow, downflow, or horizontal airflow application. Pay attention to directional airflow arrow for proper installation. The installation of the Duo-2000 may be on the return air side, supply air side, or above the AC-Coil in the supply plenum of the HVAC system. For best results, the HVAC air filter should be upgraded to a Field Controls High Efficiency FC8 or FC11 pleated media air cleaner. Do not locate the Duo-2000 within 24 inches (direct exposure) of plastic materials or air filters. UVC radiation will degrade many plastic materials over time with direct exposure. The Duo-2000 is designed to be installed on indoor HVAC forced air ducted systems. Do Not install outdoors. Product is not designed to be exposed to outdoor elements.



**WARNING:** Disconnect power to all equipment before beginning this installation! Refer to all warning and cautionary statements as given in the included main installation instructions!



**WARNING:** Make sure unit is unplugged before installing the lamp

1. The ballast is factory set to 120 VAC. The voltage can be changed in the field to 230 VAC by sliding the voltage selector switch in (Figure 1) to the 230 volt position. The plug must be replaced and wiring must be done to applicable electrical codes.
2. Remove the front electrical cover from the Duo-2000.
3. Do not touch the bulb lamp glass section with bare hands. Wear oil-free cotton type gloves when handling germicidal glass bulb.
4. Remove Lamp (LT015) from packaging and slide non-pinned end through grommet.
5. Loosen lamp clip and insert lamp so that the end of the lamp is inside the unit.
6. Tighten lamp clip using the brass knurl. Make sure the lamp clip tightens around the plastic part of the lamp and not the glass. See Figure 2.
7. Connect ballast to the four pins on the lamp using the connector. See Figure 3.
8. Wipe down the lamp with the supplied alcohol wipe.



FIGURE 1



FIGURE 2



FIGURE 3



**WARNING:** Never expose eyes or skin to UVC light from any source. Looking directly at the UVC light may cause permanent eye damage or blindness. Never operate the Duo-2000 Air Purifying System out of the plenum. Avoid touching the glass portion of the lamp with your hands.

## DUO MODEL INSTALLATION INSTRUCTIONS

1. Choose a location for the Duo unit, with the following considerations:
  - a. The Duo unit will reduce organic buildup on an HVAC cooling/heating coil by illumination with UVC germicidal rays. Locate the Duo such that the maximum surface area of the coil is illuminated, while installing as close to the coil as possible without damage to the coil.

**CAUTION: Use care to avoid damage to the coil and any wiring or other components while installing the Duo-2000.**

**⚠ WARNING: To prevent water damage or electric shock, do NOT mount unit under a humidifier.**

- b. The Duo unit may be installed on either the supply or return plenum.
- c. The Duo unit may be installed in upflow, downflow, or horizontal flow ducts and plenums.
- d. The Duo unit may be installed directly onto a sheet metal air duct or plenum, or onto fiberglass ductboard when installed using the included Ductboard Adapter Plate (see Figure 4)

Attach the quick connect power cord and plug in to any any standard 120 volt electrical outlet. Verify lamp operation by looking through the view port on front cover. Continuous UVC germicidal lamp operation is recommended. At .09 cents per kilowatt hour, continuous lamp operation cost 10.5 cents per day. Cycling the UVC germicidal lamp on and off degrades lamp performance much faster and shortens the filament life.

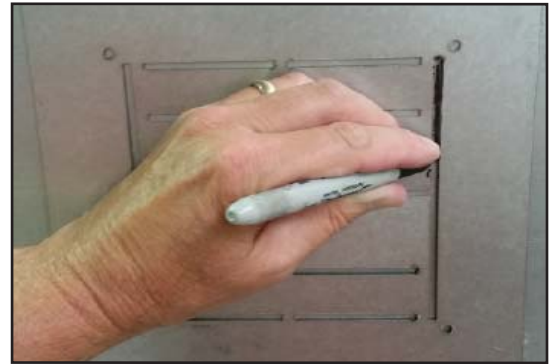


FIGURE 4

2. Install the Duo unit:
  - a. Remove front electrical cover by removing 2 sheet metal screws on sides.
  - b. Hold or temporarily tape the included Ductboard Adapter Plate in the location chosen for installation, and using the plate as a template, mark the mounting surface using the outermost slots in the plate (see Figure 1). Alternatively, a 5-3/8" square may be marked on the mounting surface.
  - c. Cut out the opening for the Duo unit in the mounting surface, making sure to cut slightly outside the marked lines if the Ductboard Adapter Plate was used as a template.
  - d. If mounting the Duo unit on ductboard: attach the Ductboard Adapter Plate to the opening by folding the inner flaps of the plate into the opening and fully back against the inside of the opening in the ductboard, either from the sides or from top and bottom of the plate. Finish the Plate Adapter installation by sealing around the edges of the plate to the ductboard, using mastic foil tape or other material suitable for sealing duct joints.
  - e. Insert the Duo unit into the duct opening and attach it to the duct (or Ductboard Adapter Plate) with the four included sheet metal screws. The wider side of the V-shape of the Duo unit panels should face into the oncoming airstream, see Figure 2.
  - f. The Duo models are configured for upward or horizontal air flow direction as shipped. If the direction of airflow in the duct is downward, the whole Duo unit may be rotated, so that airflow matches Figure 5.
  - g. Reattach cover using 2 sheet metal screws previously removed in step 2a.
  - h. Attach the quick connect power cord and plug in to any standard 120 volt electrical outlet. Verify lamp operation by looking through the view port on front cover. Continuous UVC germicidal lamp operation is recommended. At .09 cents per kilowatt hour, continuous lamp operation cost 10.5 cents per day. Cycling the UVC germicidal lamp on and off degrades lamp performance much faster and shortens the filament life, see Figure 6.



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FIGURE 5



FIGURE 6

## MAINTENANCE

**⚠ WARNING: Disconnect power to the transformer before commencing inspection and cleaning.**

**NOTE: Wear disposable, non-absorbent protective gloves prior to inspection procedure in case of accidental breakage of glass.**

1. We recommend inspecting and cleaning the lamp at least every 6 months. Frequency depends upon the environment. Such as: the type of air filter, duration of use and replacement cycle.
2. To maintain maximum output intensity, replace the UV-Aire lamp annually. The lamp should operate continuously for maximum lamp life and light effectiveness.
3. Do not attempt to clean the catalytic honeycomb core with cleaning solutions. The catalyst is radiated with short wave ultraviolet light during period of non-air flow and is self-cleaning. If there is build up blocking the catalytic cells, sit the unit on end, on a flat surface, with electrical enclosure facing up. Use low-pressure, compressed air to blow the surface of the catalytic cells free of blockage.

## CLEANING THE LAMP

**⚠ WARNING: Disconnect power to the transformer or unplug the 120V power cord before starting replacement procedure.**

**NOTE: Wear disposable, non-absorbent protective gloves prior to replacement procedure in case of accidental breakage of glass.**

1. Unplug the quick disconnect power cord from the Duo-2000.
2. Remove the (2) Phillips head screws on the left and right hand side of the front electrical cover and remove the cover.
3. Remove 4 mounting screws.
4. Remove the Duo-2000 body by sliding out of the duct mounting plate.
5. Use a cotton cloth with isopropyl alcohol and gently clean the surface of the lamp.
6. Replace the Duo-2000 back into the duct mounting plate and tighten the mounting screws. Replace the front electrical cover and plug the quick connect power cord back into the unit mounting screws.



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## REPLACING THE LAMP

Recommended every (24) months of continuous service.

Replace only with a Part # 46636300 17.5 LAMP UVC germicidal replacement lamp. This is a custom manufacture lamp designed only for high output thermal compensating electronic ballast.

Follow the above steps and after (step - 4) loosen the brass knurl nut on the clamp at the rear of the lamp. Unplug the lamp electrical connector from the end of the lamp shown in Figure 3 and gently slide the lamp out the front of the Duo-2000 housing. Reinstall by reversing the above steps.

**NOTE: If blue light leaks through any portion of plenum and/or around mounting plate, unplug power supply cord immediately and seal affected areas.**

UV lamps contain a small amount of mercury, like a typical fluorescent lamp. Check with your local waste management authority for local disposal or recycling requirements. According to the EPA's Universal Waste Rule, these types of lamps may be disposed of into household waste.

**⚠ WARNING: Never touch broken lamp or internal contents of lamp. The lamp contains mercury.**

**NOTE: In case of accidental exposure to internal contents of lamp, wash hands and any other affected skin area with mild detergent. Remove affected clothing immediately. If skin surface is pierced, seek medical attention immediately.**



FIGURE 7

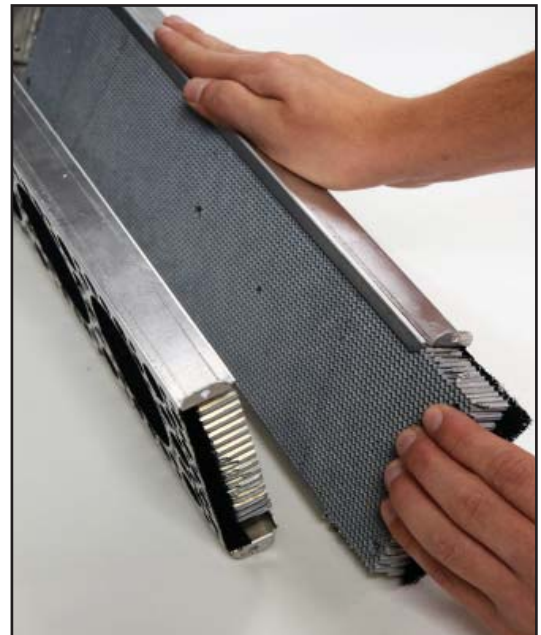


FIGURE 8



**WARNING:** Never expose eyes or skin to UVC light from any source. Looking directly at the UVC light may cause permanent eye damage or blindness. Never operate the Duo-2000 Air Purifying System out of the plenum. Avoid touching the glass portion of the lamp with your hands.

# HONEYCOMB AND CARBON REPLACEMENT

If there is a need to replace the Pro-Cell honeycomb or carbon media, the subsequent procedure should be followed.

 **WARNING: Make sure power is disconnected from the unit before removing the unit.**

**NOTE: Wear disposable non-absorbent protective gloves prior to replacement procedure in case of accidental breakage of glass.**

1. Disconnect the Duo Model from any power source. Look through the round sight glass hole and verify the UV lamp is off before removing the unit from the duct or Ductboard Adaptor Plate. There should be no blue glow along the length.
2. Remove the (2) Phillips head screws on the left and right hand side of the front electrical cover and remove the cover.
3. Detach the unit from the duct or Ductboard Adaptor Plate by removing the four sheet metal screws. Save the sheet metal screws for reattaching the unit. Carefully slide unit out of duct.
4. Remove the lamp with the following steps. Disconnect the ballast from it by unplugging the connector, see Figure 3. Loosen lamp clip and slide through the front end of the unit, see Figure 2. Be careful no to break lamp.
5. Unscrew the end bracket by removing the hex screws, See Figure 7. Save the hex screws for reattaching the end bracket. The end bracket is located on the opposite side of the Model than the power source.
6. With the end bracket taken off, the Pro-Cell honeycomb and carbon media can be slid out of the opening in the back of the unit, see Figure 8. The honeycomb panel and the carbon media insert must be removed together even if only one needs replacing.
6. Replace any removed pieces of either Pro-Cell honeycomb or carbon media with the specified replacement parts only. When sliding the replacement pieces back into the unit, check and make sure the Pro-Cell honeycomb is placed on the inside while the carbon media is touching the outside side panel.
7. Once the replacements are slid all the way into the opening, attach the end bracket with previously removed hex screws.
8. Carefully insert the lamp through the grommet on the front end of the unit. Re-attach the lamp clip by tightening down on the plastic end cap of the lamp. Re-attach ballast by plugging connector into the four pins of the lamp. Use a cotton cloth with isopropyl alcohol and gently clean surface of lamp.
9. Insert Duo unit back into duct opening and attach to duct or Ductboard Adaptor plate using the four sheet metal screws that were previously removed. The V shape of the Duo unit should face into the panel, see Figure 5. Replace Front electrical cover and plug the quick connect power cord back into the unit.
10. Look through the round sight glass hole and verify the UV lamp is lit. There should be a blue glow along the length. If the lamp is not lit, follow the Troubleshooting guide.



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## TROUBLESHOOTING GUIDE

1. Check to be sure there is correct voltage to the unit and the ballast is set for the correct voltage.
2. Be sure the lamp connector is fastened securely.
3. Check for loose electrical connections.
4. Test with new lamp and if lamp still does not light, replace ballast.

## SPECIFICATIONS Duo-2000 UVC Photo-Catalytic Air Purifier

Part# 17.5LAMP UVC Germicidal Lamp	50 watts UVC
Length in Duct	17-3/4 inches
Duo-2000 PCO TiO2 Semiconductor	3500 sq inches
Weight	3.6 lbs
Adjustable Voltage	120 or 230 volts
Lamp Life Efficiency Output	2 years
Average static pressure drop	.02 in wg (4.9817 pascals)
Application range for DUO-2000	up to 2000 cfm (5.0 tons)



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# REPLACEMENT PARTS LIST

Replacement Part Number	
46636300	18" Lamp Assy Duo
625001003	120/240V Rep Ballast Assy
730118175	Carbon, Duo-2000
80213041175	Pro-Cell Honeycomb 4.125 x 17.625

For replacement parts, contact Field Controls at:  
Phone: 252-522-3031 • Fax: 252-522-0214  
Email: sales@fieldcontrols.com

## CLEAN-UP OF BROKEN LAMPS

(see warnings on page 3 of this manual)

UV lamps contain a small amount of mercury, like a typical fluorescent lamp. DO NOT touch any of the mercury with your bare hands.

1. While wearing disposable, non-absorbent protective gloves, carefully pick up the large pieces of glass with your hands.
2. Vacuum the entire area with a standard household vacuum cleaner ensuring the removal of all lamp material.
3. Dispose of the pieces of glass, the vacuum cleaner bag, and the disposable gloves in a sealed garbage bag.
4. Check with your local waste management authority for local disposal or recycling requirements. According to the EPA's Universal Waste Rule, these types of lamps may be disposed of into household waste.
5. Wash hands, and remove and wash clothes for added safety measures.



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**This manual may be downloaded and printed from the Field Controls website ([www.fieldcontrols.com](http://www.fieldcontrols.com))**

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