

AeroLogic®

AIR DUCT DISINFECTION

Model AD18-1, AD24-1, AD30-1, AD36-1
& AD18-2, AD24-2, AD30-2, AD36-2



Installation, Operation & Maintenance

ATLANTIC  ULTRAVIOLET
CORPORATION®

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Owner's Manual

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The information and recommendations contained in this publication are based upon data collected by the Atlantic Ultraviolet Corporation® and are believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. Specifications and information are subject to change without notice.



SAFETY WARNINGS

- All personnel should be alerted to the potential hazards indicated by the product safety labeling on this unit.
- The following conventions are used to indicate and classify precautions in this manual and on product safety labeling. Failure to observe precautions could result in injury to people or damage to property.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



This symbol/pictorial is used to identify an **ELECTRICAL SHOCK** or **ELECTROCUTION** hazard.

DANGER

Danger indicates an **IMMINENTLY** hazardous situation, which, if not avoided, **WILL** result in death or serious injury.



This symbol/pictorial is used to identify an **ULTRAVIOLET LIGHT** hazard.

WARNING

Warning indicates a **POTENTIALLY** hazardous situation, which, if not avoided, **COULD** result in death or serious injury.



This symbol/pictorial is used to identify the need to wear approved ultraviolet resistant face shield.

CAUTION

Caution indicates a **POTENTIALLY** hazardous situation, which, if not avoided, **MAY** result in minor or moderate injury.



This symbol/pictorial is used to identify the need to wear approved ultraviolet resistant eyewear.

CAUTION

Caution used without the safety alert symbol indicates a potentially hazardous situation, which, if not avoided, may result in property damage.






This symbol/pictorial is used to identify the need to wear protective gloves.

- Product safety labels should be periodically inspected and cleaned, as necessary, to maintain good legibility. Always replace illegible safety labels. Contact factory to obtain replacement safety labels.

SAFETY INSTRUCTIONS

WARNING: To guard against injury, basic safety precautions should be observed, including the following:

1. Read and follow **ALL** safety instructions.
2.  **WARNING: Avoid exposure to direct or strongly reflected germicidal ultraviolet rays. Germicidal ultraviolet rays are harmful to the eyes and skin.**
3. Intended for indoor use only.
4. Do not alter the construction or design.
5. Do not use this unit for other than its intended purpose, as described in this manual.
6. Do not mount under any source of moisture or condensation, such as humidifiers, cooling coils, etc.
7. Do not mount this unit so that ultraviolet light is visible after installation.
8. **CAUTION:** Germicidal ultraviolet rays may break down plastic, rubber or other non-metallic materials, with inadequate resistance to ultraviolet. Shield all plastic, rubber or other non-metallic parts such as; plastic drain pans, wire insulation, flex ducts, humidifiers, filters, etc. which may be exposed to direct or reflected germicidal ultraviolet rays.
9. Do not remove safety labels or devices.
10.  **CAUTION: Do not operate without proper electrical ground.**
11. Do not operate the unit if the power cord and/or plug are damaged, or if any other damage to the unit is visible or suspected.
12. Utility power supplied, to the unit, **MUST** match power requirements listed on the unit label.
13.  **WARNING: Always disconnect power, to the unit and unplug, before performing any service or maintenance.**
14. Read and follow all notices and warnings on the unit.
15. **SAVE THESE INSTRUCTIONS.**

PRODUCT APPLICATION

PRINCIPLE OF OPERATION

The **AeroLogic**[®] design has been carefully conceived to provide adequate germicidal dosage for air stream or surface disinfection. The dosage, as it applies to ultraviolet disinfection, is a function of time, and the intensity, of ultraviolet radiation, to which the air stream or surface is exposed. The exposure time, in seconds, is the total time it takes the air to move through the ultraviolet field, produced by the germicidal lamp(s). Exposure time is related to the airflow rate; the higher the airflow, the lower the exposure time or the lower the airflow, the higher the exposure time. The UV intensity is the amount of energy, per unit time, emitted by the germicidal lamp.

CONSTRUCTION

The **AeroLogic**[®] Air Duct Disinfection Units consists of:

- Germicidal ultraviolet lamp(s), which deliver ultraviolet energy in the specific wavelength of 254 nanometers (nm) which effectively destroys airborne microbes including: virus, bacteria, and mold spores.
- Switchable, electronic ballast(s) capable of operating at 120v/60Hz or 230v/50Hz set by the factory at the time of purchase.
- Lamp operation indicator(s), which provide positive indication, when lit, of germicidal lamp operation. Lamp operation indicator(s), which are not lit, or are dimly lit, indicate faulty germicidal lamp(s) or ballast(s).
- A standard, NEMA 5-15, three-prong plug, and operates on 120VAC 50/60Hz single-phase standard household current, with properly grounded outlet.
- A sight glass assembly, mounted to the unit base plate, provides visual indication of germicidal lamp operation without the risk of ultraviolet exposure.
- All electronics and wiring are housed in an enclosure constructed of stainless steel. Stainless steel construction provides strength, durability and will withstand most harsh environments.

LIMITATIONS

- The **AeroLogic**[®] requires professional installation so all wiring complies with applicable state, local and national electrical and mechanical codes. Installation is permanent, and relatively inflexible.
- **AeroLogic**[®] requires knowledgeable planning for: location, installation, and supervision to prevent ultraviolet exposure of personnel.
- Overexposure to germicidal ultraviolet rays will result in the irritation of the eyes and reddening of the skin. For that reason, it is of the utmost importance that your ultraviolet application be carefully planned and implemented so as to avoid exposure, of personnel, to direct or reflected ultraviolet rays.
- The American Conference of Governmental Industrial Hygienists (**ACGIH**) has established a Threshold Limit Value (**TLV**) for occupational exposure to radiant ultraviolet energy.
- Currently the ultraviolet radiant exposure incident for unprotected eyes or skin should not exceed 0.2 microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$) at 254 nanometers (**nm**) for an eight (8) hour period.
- Safety and maintenance procedures should be implemented to prevent accidental exposure of personnel, who maintain the HVAC system. All work performed on the HVAC system must be monitored to insure that it does not adversely impact the safety or effectiveness of the installation

UNPACKING

- Remove the **AeroLogic®** Air Duct Disinfection Unit from its shipping carton.
- Atlantic Ultraviolet Corporation takes all possible precautions when packaging this unit to prevent damage. Carefully inspect the unit, power cord and plug for damage, report all damage immediately. Do not assemble or operate if there is any damage, visible or suspected.
- Germicidal lamp(s) are packed separately, to ensure maximum protection for the lamp(s). Keep the lamp(s) aside until ready for installation.
- Carefully inspect all packing materials to prevent the loss of accessories, mounting hardware, spare parts or instructions.
- Do not discard packing materials until unit is assembled and check out is complete.

The AeroLogic® Air Duct Disinfection Units AD18-1, AD24-1, AD30-1, AD36-1, unit includes:

- 1 - Single lamp unit with 8-foot line cord
- 1 - Duct Sealing Gasket
- 1 - Germicidal Ultraviolet Lamp
- 4 - No. 8-18 x 1/2" Self-Drilling Screws
- 1 - Mounting Template
- 1 - Operating Instructions
- 2 - Duct Warning Labels
- 1 - Warranty Card

The AeroLogic® Air Duct Disinfection Units AD18-2, AD24-2, AD30-2, AD36-2, unit includes:

- 1 - Dual lamp unit with 8-foot line cord
- 1 - Duct Sealing Gasket
- 2 - Germicidal Ultraviolet Lamps
- 4 - No. 8-18 x 1/2" Self-Drilling Screws
- 1 - Mounting Template
- 1 - Operating Instructions
- 2 - Duct Warning Labels
- 1 - Warranty Card

OPTIONAL ACCESSORIES

1. ArmorLite™ Safety Shield

Protective coating applied to **STER-L-RAY™** Lamps

Insures protection by eliminating the dangers associated with fragments of broken quartz and mercury contamination.

2. Zenith™ Ultraviolet Meter

A sensitive, hand-held, ultraviolet meter; used to check the intensity of aging ultraviolet lamps and survey rooms utilizing an ultraviolet air sanitizer to ensure that the ultraviolet radiant exposure of personnel within the treated area is within acceptable limits.

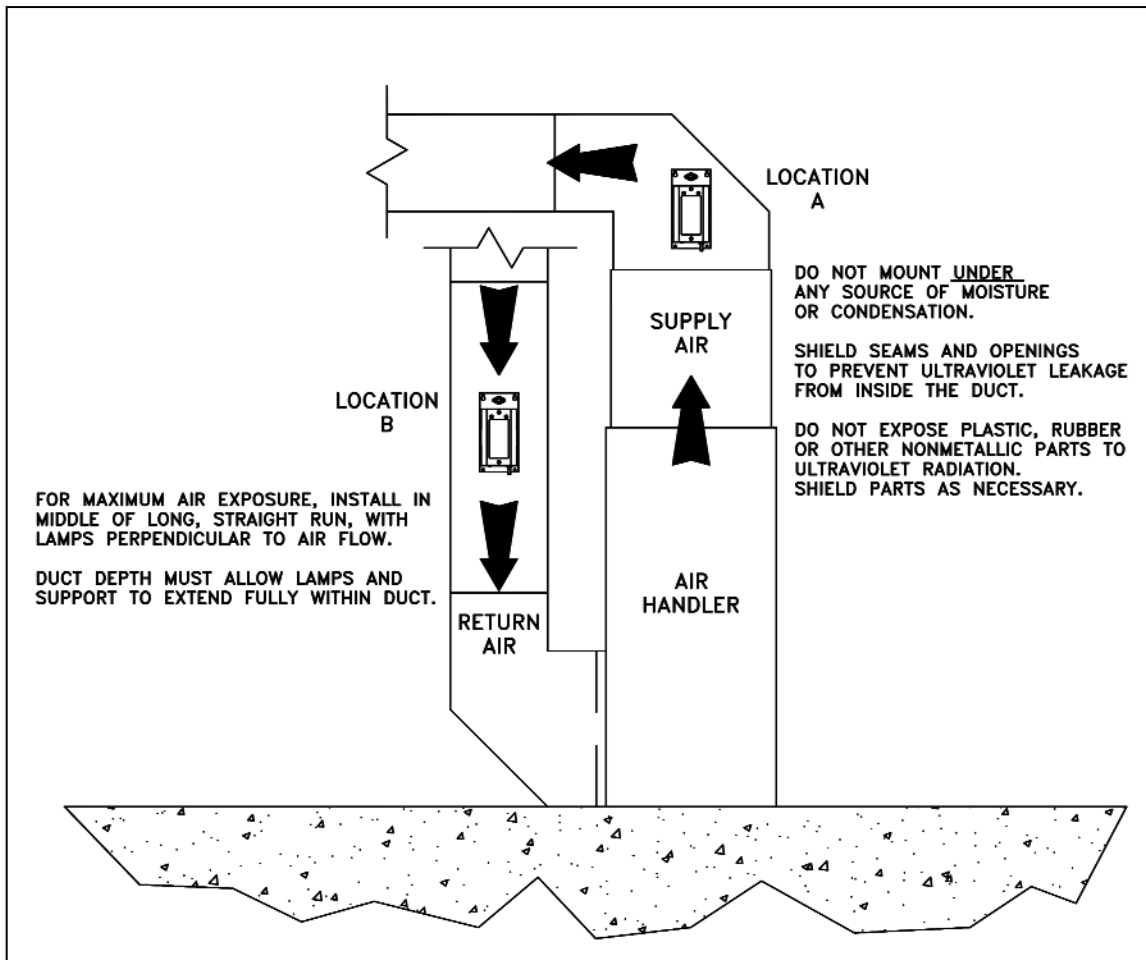
INSTALLATION

UNIT PLACEMENT

Proper unit placement is essential. To ensure safe and effective operation, the location should:

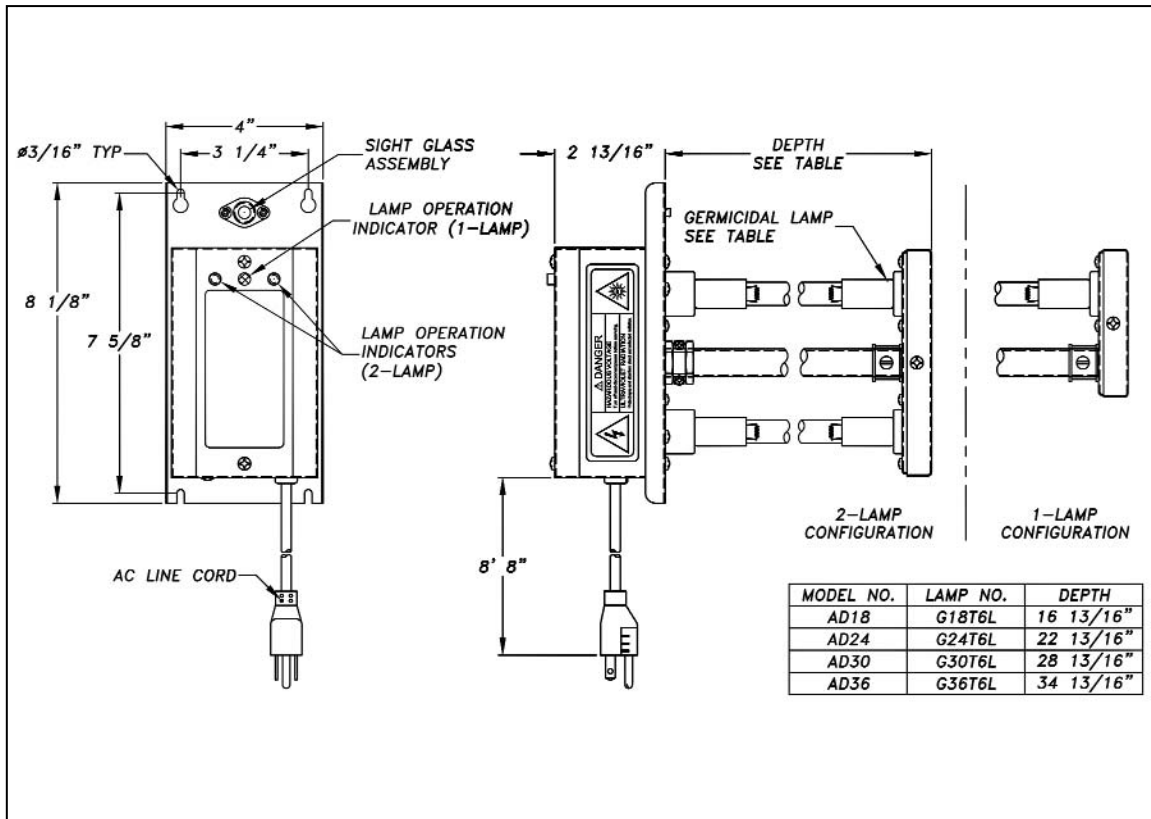
- Have enough duct width to mount unit with lamp(s) perpendicular to airflow, with the longest duct length for increased exposure time.
- Be on the supply air plenum, LOCATION A, or on the return air plenum, LOCATION B.
- Have a properly grounded, electrical outlet within approximately 8-feet of the unit.
- Not be mounted under any source of moisture or condensation, such as humidifiers, cooling coils, etc.
- Not be mounted near any duct openings, joints, seams, etc. If necessary, seal all openings, joints, seams, etc. using aluminum tape or equivalent ultraviolet resistant material.
- Prevent exposure of any plastic, rubber or other non-metallic materials, with inadequate resistance to ultraviolet, such as; plastic drain pans, wiring insulation, flex ducts, humidifiers, filters etc. If necessary, shield all plastic, rubber or other non-metallic parts using aluminum tape, conduit, sheet metal or equivalent ultraviolet resistant material.
- Be free of any components that would be damaged by or interfere with the installation.
- Be easily accessible for viewing lamp operation indicator(s) and/or sight glass assembly and allows enough clearance for routine cleaning or maintenance.
- Be down stream from air filters. Dust particles absorb ultraviolet reducing the effectiveness of the unit.

Figure 1 - Unit Placement

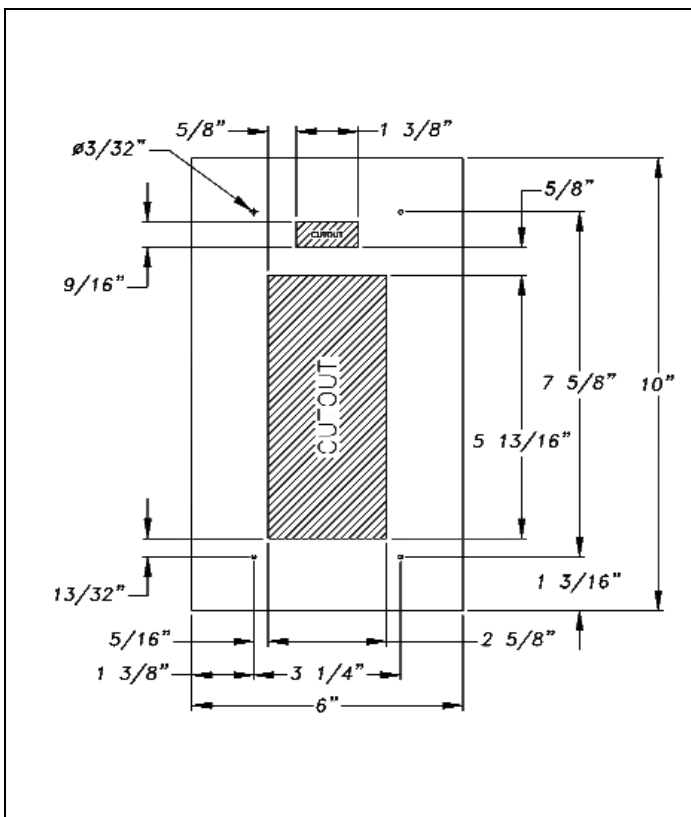


DIMENSIONAL DATA

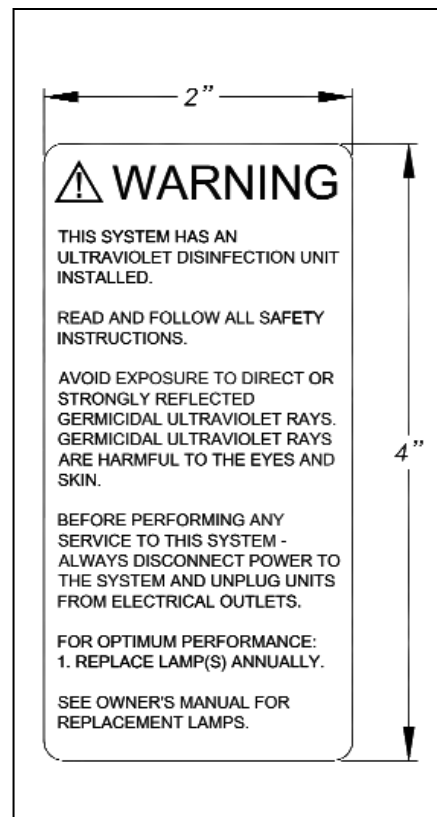
Figure 2 - Dimensional Data



Mounting Template (supplied)



Duct Warning Label (2 - supplied)



REQUIRED TOOLS

- Mounting template (supplied)
- Duct tape
- Pencil
- Ultraviolet protective eyewear with side shield
- Protective gloves
- Power drill with drill bits and drivers
- Tin snips, hole saw, etc. for cutting duct sheet metal
- No. 8-18 x ½" long self-drilling screws (supplied)
- Soft, clean, lint-free cloth
- Alcohol, or suitable glass cleaner

INSTALLATION

1. Disconnect power to the HVAC system.
2. Using mounting template provided, mark the centers of the four (4) mounting holes and edges of the rectangular openings for lamp assembly and sight glass assembly.

▲ CAUTION: Mechanical hazard. Duct sheet metal has sharp edges. Wear protective gloves when working on or around duct sheet metal.

3. Cutout the rectangular openings for lamp assembly and sight glass assembly. Remove burrs and sharp edges where possible.
4. Test fit unit to duct. Lamp assembly should pass through rectangular opening, with no interference. Base plate should fit flush to duct and mounting holes of the base plate should be aligned with the center marks on duct.
5. Remove unit from duct; make any adjustments necessary until unit fits correctly.

▲ CAUTION: Ultraviolet lamps are easily damaged and may cause injury if broken. Exercise care when handling lamps.

6. Install lamp(s). To install; insert lamp pin into spring-loaded lamp holder. Carefully press lamp against the spring-loaded lamp holder. Align upper lamp pin with stationary lamp holder. Slowly ease the pressure until lamp is fully seated in lamp holders.
7. Verify that the lamp is properly seated.
8. Repeat until all lamps have been properly installed.
9. Moisten a clean, lint-free cloth with alcohol, or suitable glass cleaner, and clean lamp(s).
10. Clean the outer surface of duct around cutouts, and apply gasket to duct.
11. Insert No. 8-18 x ½" mounting hardware into each of the marked centers, screw in approximately half their length.
12. Fit **AeroLogic®** to duct, align large keyhole openings with the mounting hardware. Pass over hardware, through keyhole, allow unit to settle down onto the hardware.
13. Finish tightening hardware.
14. Apply warning labels, in a conspicuous location, near the **AeroLogic®** unit and at the air handler. Clean duct surface before applying warning labels.
15. Plug **AeroLogic®** into properly grounded, electrical outlet.
16. Restore power to the HVAC system.
17. Verify operation by viewing lamp(s) through sight glass assembly and lamp operation indicator(s). If the unit is not operating properly, go to **“Troubleshooting”** section.
18. While wearing protective eyewear, inspect HVAC system for any ultraviolet light leakage. No ultraviolet light should be visible from any duct opening, joint, seam, or the **AeroLogic®** unit itself. The installation should also be inspected using a sensitive ultraviolet meter, to insure that the ultraviolet radiant exposure of personnel is within acceptable limits. If necessary, seal any openings, joints, seams, etc. using aluminum tape or equivalent ultraviolet resistant material.

PRECAUTIONS

- Procedures should be adopted to insure that the **AeroLogic®** is disconnected from power whenever personnel work on the HVAC system. Personnel who work in and around the system should be briefed on the precautions to be observed.
- The HVAC system should be re-inspected for any ultraviolet light leakage whenever any maintenance or modifications are performed.
- If there are any doubts or concerns about the safety or the effectiveness of the installation, or if a sensitive ultraviolet meter is required, please contact our application specialists.

TECHNICAL ASSISTANCE

Atlantic Ultraviolet Corporation maintains a qualified team of application specialists that can provide any technical assistance, which may be required during the use of this unit. For any questions, concerns, or technical assistance, regarding this unit or any of our other products, contact our application specialists. Contact options can be found in the **“User Assistance”** section of this manual.

MAINTENANCE

- The **AeroLogic®** is designed to operate with a minimal amount of maintenance.
- A regular cleaning schedule of the ultraviolet lamp(s) and sight glass assembly should be established, and carefully maintained, based on visual inspection and experience. The time between cleanings will vary with the conditions surrounding each installation. It is recommended that the ultraviolet lamp(s) be cleaned whenever dust deposits are observed on lamp(s).
- Dust can accumulate on the ultraviolet lamp(s). Dust particles absorb ultraviolet radiation reducing the effectiveness of the **AeroLogic®**.
- The germicidal ultraviolet lamp(s) used in the **AeroLogic®** have a manufacturer's rated average effective life of 10,000 hours. Lamps may operate longer than their rated effective life, but the reduction in ultraviolet output will make it impractical to use past the manufacturer's rated life. For maximum efficiency lamp replacement is recommended every 10,000 hours of operation.
- Unless lamp replacement is due to failure or breakage, it is recommended that all lamps be replaced at the same time.

GERMICIDAL LAMP CLEANING OR REPLACEMENT

⚠ WARNING: Always disconnect power, to the AeroLogic® and unplug, before performing any service or maintenance.

1. Disconnect power to the HVAC system and **AeroLogic®**, and unplug **AeroLogic®** from electrical outlet.
2. Loosen the four (4) mounting screws used to mount unit to duct. Note: Always support the **AeroLogic®** if removing mounting screws completely; this will help prevent damage to the lamp(s) if the unit were to fall as mounting screws are removed.
3. Carefully remove the **AeroLogic®** from the duct by sliding up until mounting hardware is in the larger opening of keyhole and pulling away from duct. NOTE: It is recommended, when performing any maintenance on the **AeroLogic®**, to work in a clean, dry area.

⚠ CAUTION: Ultraviolet lamps are easily damaged and may cause injury if broken. Exercise care when handling lamps.

4. Remove lamp(s), carefully press lamp against the spring-loaded lamp holder, when upper lamp pin clears the stationary lamp holder pull lamp out, and away from **AeroLogic®**.
5. Moisten a clean, lint-free cloth with alcohol, or suitable glass cleaner, and clean lamp(s).
6. Install lamp(s), insert lamp pin into spring-loaded lamp holder. Carefully press lamp against the spring-loaded lamp holder. Align upper lamp pin with stationary lamp holder. Slowly ease the pressure until lamp is fully seated in lamp holders.
7. Verify that lamp(s) is properly seated.
8. Inspect gasket. Gasket should be replaced if worn or damaged.
9. Carefully re-install **AeroLogic®** onto the duct.
10. Tighten the four (4) mounting screws.
11. Plug **AeroLogic®** into electrical outlet and restore power.
12. Verify operation by viewing lamp(s) through sight glass assembly and lamp operation indicator(s). If the unit is not operating properly, go to “**Troubleshooting**” section.

BREAKAGE

⚠ CAUTION: Broken Quartz is SHARP. Wear protective gloves when handling broken ultraviolet lamps. In the event of breakage, **DO NOT use a household vacuum cleaner to pick up fragments of the lamp.** Sweep up debris into a plastic bag and dispose of properly.

DISPOSAL OF MERCURY ADDED LAMPS

Germicidal ultraviolet lamps, like standard fluorescent lamps contain small amounts of mercury. Mercury added lamps should not be placed in the trash. Dispose of properly.

For further information regarding the disposal and recycling of lamps containing mercury, along with Federal and State requirements visit <http://www.lamprecycle.org>. Product Data Sheets for germicidal ultraviolet lamps can be found in the “PDF Library for **Ster-L-Ray™** Germicidal Ultraviolet Lamps” section of <http://www.ultraviolet.com>.

LAMP-OUT PROTECTION

If power is applied to the **SaniRay™** without a lamp connected or if the lamp fails, the fixture ballast's lamp-out protection will prevent the fixture from operating.

To reset: disconnect the **SaniRay™** from power and install/replace the lamp. The fixture must remain disconnected from power for two (2) minutes to reset. After 2 minutes restore power, fixture should resume proper operation.

TROUBLESHOOTING

⚠ CAUTION: Always disconnect power to the unit, before performing any service.



Use **personal protection equipment**, such as gloves; long sleeves with no gaps between cuffs and gloves, and ultraviolet resistant face shield, if troubleshooting **AeroLogic®** outside of duct.

- **IMPORTANT:** This unit is to be serviced **ONLY** by qualified, and appropriately licensed, personnel.

Table 1 - Troubleshooting

Problem	Possible Cause	Corrective Action
Unit not operating.	No electrical power...	Verify that the purifier is connected to a live power source.
	Power connections, to unit, loose or disconnected...	Verify power connections to unit are fully engaged.
Germicidal lamp not operating.	Ballast Lamp-out Protection . . .	Disconnect the purifier from utility power. Replace lamp. The purifier must remain disconnected from power for two (2) minutes to reset.
	Lamp(s) not installed...	Install lamp(s).
	Germicidal lamp not properly seated...	Confirm connection of lamp and lamp holder, make sure connection is tight and lamp is making full contact with lamp holder.
	Germicidal lamp faulty...	Swap suspect lamp, with lamp known to be good. If suspect lamp does not operate, replace lamp
	Ballast not functioning...	Locate ballast and replace.

TECHNICAL SPECIFICATIONS

Table 2 Technical Specifications

MODEL	AD18		AD24		AD30		AD36	
	-1	-2	-1	-2	-1	-2	-1	-2
Volts: ①	120v	120v	120v	120v	120v	120v	120v	120v
Hertz:	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Amps (120v):	.29A	0.58A	.42A	0.84A	.53A	1.06A	.65A	1.3A
Amps (220-240v):	.15A	0.3A	.22A	0.44A	.28A	0.56A	.34A	0.68A
Length:	8-1/8"	8-1/8"	8-1/8"	8-1/8"	8-1/8"	8-1/8"	8-1/8"	8-1/8"
Width:	4"	4"	4"	4"	4"	4"	4"	4"
Height:	2-13/16"	2-13/16"	2-13/16"	2-13/16"	2-13/16"	2-13/16"	2-13/16"	2-13/16"
Depth:	16-13/16"	16-13/16"	22-13/16"	22-13/16"	28-13/16"	28-13/16"	34-13/16"	34-13/16"
Lamp Model:	G18T6L	G18T6L	G24T6L	G24T6L	G30T6L	G30T6L	G36T6L	G36T6L
Lamp Quantity:	1	2	1	2	1	2	1	2
Power Consumption: ②	17W	34W	25W	50W	32W	64W	39W	78W
Ultraviolet Output: ③	5.8W	11.6W	8.5W	17W	11.2W	22.4W	13.8W	27.6W
Ave. Effective Life: (Hrs)	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

① 220-240v 50/60Hz units are also available. Consult Atlantic Ultraviolet Corporation for specific voltage requirements.

② Wattage is lamp watts only and does not include ballast loss.

③ Ultraviolet output at 254nm at 100 hours and 80°F (approximate).

REPLACEMENT PARTS

Figure 3 - Exploded View(AD18-2)

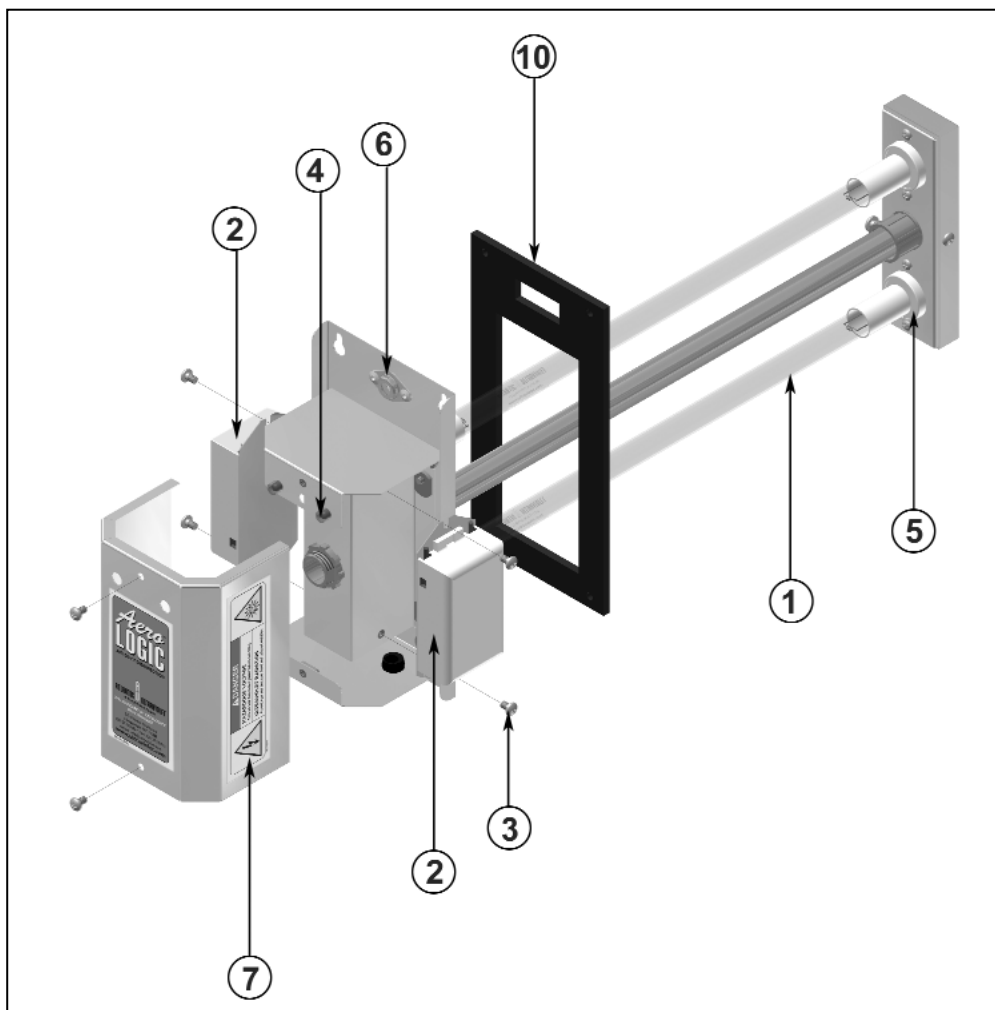


Table 3 - Replacement Parts

ITEM NO.	DESCRIPTION	QUANTITY		MODEL			
		-1	-2	AD18	AD24	AD30	AD36
1	Germicidal Ultraviolet Lamp	1	2	05-1340	05-1348	05-1352	05-1343
2	Ballast, 120v/60Hz 230v/50Hz	1	2	10-1327	10-1036	10-1036	10-1036
3	Pan Head Screw, 8-32x1/4"	4	6	50-1182	50-1182	50-1182	50-1182
4	Lamp Operation Indicator	1	2	35-1757A	35-1757A	35-1757A	35-1757A
5	Lamp Holder Set w/Brackets	1	2	05-0074	05-0074	05-0074	05-0074
6	Sight Glass Assembly, 1/2"	1	1	40-1216A	40-1216A	40-1216A	40-1216A
7	Label, Danger	2	2	00 0199A1	00 0199A1	00 0199A1	00 0199A1
8	Line Cord, 120v	1	1	35-1100	35-1100	35-1100	35-1100
	Line Cord, 220-240v	1	1	35-1452	35-1452	35-1452	35-1452
9	Gasket	1	1	40-0368A1	40-0368A1	40-0368A1	40-0368A1
10	Mounting Template	1	1	40-0373A1	40-0373A1	40-0373A1	40-0373A1
11	Pan Head Screw, 8-18x1/2"	4	4	50-0016	50-0016	50-0016	50-0016
12	Label, Duct Warning	2	2	00-0222A	00-0222A	00-0222A	00-0222A

Other Other replacement parts are available. Consult the Atlantic Ultraviolet Corporation for specific requirements.

USER ASSISTANCE

Atlantic Ultraviolet Corporation makes every effort to ensure that the **AeroLogic**® Air Duct Disinfection Units are products of superior quality and workmanship. This manual describes the installation, operation and maintenance of the **AeroLogic**® Air Duct Disinfection Units.

Please read and become familiar with the contents of this manual before installing or using this unit. If after reading the manual you still have questions, or concerns, regarding the installation or use of this unit, contact our offices, week-days between 8:30 am and 5:00 pm Eastern time, at:

Atlantic Ultraviolet Corporation
375 Marcus Boulevard
Hauppauge, New York, 11788

Tel: 631.273.0500
Fax: 631.273.0771

E-mail: info@ultraviolet.com
Website: www.ultraviolet.com

Please fill out and return the Owner Registration card immediately. If the card is missing from this manual, please contact any of our application specialists to obtain one.

Atlantic Ultraviolet Corporation takes all possible precautions when packaging equipment to prevent damage. Carefully inspect and report all damage. **Do not** install damaged equipment. Follow all instructions on any labels or tags. Carefully inspect all packing materials before discarding to prevent the loss of accessories, mounting hardware, spare parts or instructions.

For your convenience, record the following information below. The model and serial number can be found on a label located on the **AeroLogic**® Air Duct Disinfection Units. Keep this manual, along with proof of purchase, handy when contacting our offices.

Purchased From:	Date:
Model:	Serial No.:

WARRANTY

We warrant that this product will be free from defects in material and workmanship for a period of one year from the date of shipment thereof or the product's total rated life, whichever first occurs. Within the warranty period we shall repair or replace such products, which are returned to us with shipping charges prepaid, and which are determined by us to be defective. This warranty will not apply to any product, which has been subjected to misuse, negligence, or accident; or misapplied; or modified; or repaired by unauthorized persons; or improperly installed.

The Buyer shall inspect the product promptly after receipt and shall notify us at our main office in writing of claims, including claims of breach of warranty, within thirty (30) days after the Buyer discovers or should have discovered the facts upon which the claim is based. Failure of the Buyer to give written notice of a claim within the time period shall be deemed to be a waiver of such claim.

The provisions of the above warranty are our sole obligation and exclude all other remedies or warranties, expressed or implied, including warranties of merchantability and fitness for a particular purpose, whether or not purposes or specifications are described herein. We further disclaim any responsibility whatsoever to the customer, or to any person, for injury to person, damage to, or loss of property or value caused by any product which has been subjected to misuse, negligence, accident; or modified or repaired by unauthorized persons; or improperly installed.

Under no circumstances shall the Company be liable for any incidental, consequential or special damages, losses or expenses arising from the contract for this product, or in connection with the use of, or inability to use, our product for any purpose whatsoever.

PATENT NOTICE

No attempt has been made to determine the patent status of applications illustrated or described in this publication. Inclusion in this publication of any design or method of use, which may be patented, is not to be construed as promoting or sanctioning unauthorized use.