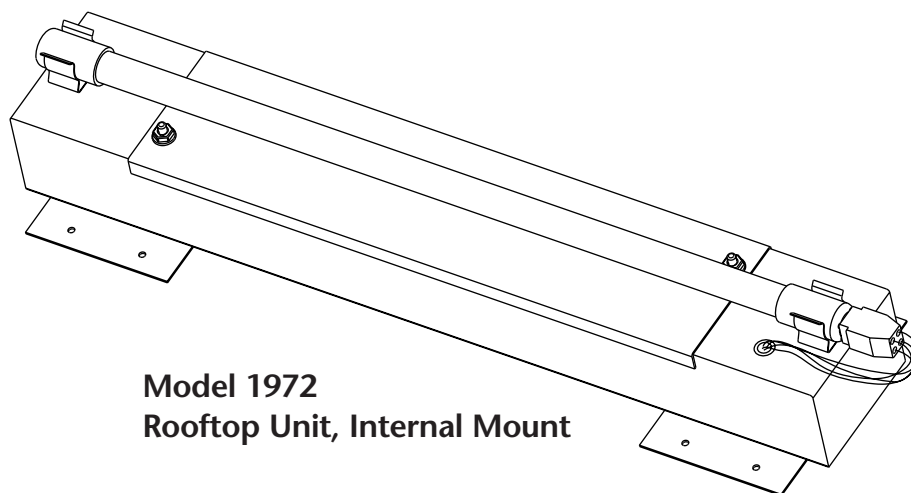


**Model 1952  
24" Rooftop Unit**  
**Model 1953  
32" Rooftop Unit**



**Model 1972  
Rooftop Unit, Internal Mount**

# **Safety, Installation and Service Manual**

## **Models 1952, 1953 & 1972**

**READ AND SAVE THIS MANUAL**

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## I. SAFETY INSTRUCTIONS

Please read the safety and installation instructions carefully to help ensure a correct and SAFE installation of the Aprilaire Ultraviolet Germicidal Lamp.

### WARNING

**Ultraviolet light is harmful to eyes and skin.** Never look at light produced by this lamp. Shut off power to lamp before servicing.

**Electrical shock from 120 - 277 VAC may cause serious injury.** Shut off power before starting installation and do not turn power back on until complete.

**Sharp edges may cause personal injury.** Use care when cutting and handling sheet metal.

**Lamp may cause personal injury in the form of burns or cuts.** Wear protective gloves and safety glasses when handling lamp. To prevent burns, shut off power to lamp and allow to cool for several minutes before servicing. If lamp is broken, refer to lamp disposal section of this manual.

### CAUTION

**UV light can cause color changes or structural degradation of plastics, rubber, paper, and other non-metallic materials used in the HVAC system.**

- Install lamp in location that prevents exposure of plastics, rubber, paper, and other non-metallic materials to UV light, or shield such materials with aluminum tape, sheet metal, or metal conduit.
- Shield electrical wires that receive direct or reflected UV radiation with aluminum tape, sheet metal, or conduit.
- Install lamp at least 8 inches away from equipment or components made with UV resistant plastic. If equipment or components are not made with UV resistant plastic – or if the UV resistance of the material is unknown – shield with aluminum tape or sheet metal.

**Water may damage lamp.**

- Install lamp at least 3 inches away from evaporator coil.
- Do not install lamp below a humidifier or any source of water.

## II. APPLICATION

Models 1952, 1953, and 1972 Aprilaire Ultraviolet Germicidal Lamps are designed for the treatment of evaporator coils used in rooftop HVAC air handling units or in larger split systems used in the light commercial market. The UV germicidal light emitted from the lamps will kill microorganisms growing on evaporator coils and drain pans and prevent further growth. The units use 120 -277 VAC / 60 Hz / single phase power, and are designed for continuous lamp operation.

### External Mount Rooftop Units

Model 1952 24" Rooftop Unit

Model 1953 32" Rooftop Unit

The External Mount Rooftop Units incorporate a NEMA 4 enclosure for protection against the elements. These units are intended primarily for installation on rooftop air handling units.

### Internal Mount Rooftop Unit

Model 1972 Rooftop Unit, Internal Mount

The Internal Mount Rooftop Unit is intended primarily for rooftop applications in which it is preferred to mount the unit entirely within the air handler rather than penetrating the outer cabinet. This unit is 18" in length and is mounted using supports supplied with the lamp.

## III. INSTALLATION

### NOTES FOR ALL MODELS

- The installation should be done by a licensed professional trained in the installation and servicing of HVAC equipment. Unit must be installed in accordance with all applicable national and local codes.
- Read all safety instructions at the beginning of this manual. Failure to do so could lead to personal injury and/or equipment damage.
- Read the installation manuals for the equipment on which the lamps are being installed for additional information and warnings.
- In cases where fungi and/or bacteria are already present on the evaporator coil, it is recommended that a qualified HVAC service technician clean the coil before the installation of the UV Lamp. Because the Aprilaire Ultraviolet Germicidal Lamp quickly kills fungi and bacteria, there could be an initial period of temporarily increased levels of airborne decay products if the coil is not cleaned before installation.
- The tools and equipment required to complete this installation include: Drill, drill bits (3/32 in. & 'Unibit'), holecutter (2 in.), Phillips screwdriver, #10 nut driver, tape measure, sealant, aluminum tape, multimeter with clamp-on ammeter, alcohol & wipes, and safety glasses. Some installations may also require weatherproof conduit and conduit connectors.
- **Shut off power to HVAC unit at the main disconnect switch before starting installation.**

### APPROXIMATE COIL AREA COVERAGE FOR EACH MODEL

Coil Area	Model 1972 18" Lamp	Model 1952 24" Lamp	Model 1953 32" Lamp
(sq. in.)	792	1008	1296
(sq. ft.)	5.5	7.0	9.0

### GUIDELINES FOR THE NUMBER OF LAMPS REQUIRED FOR A GIVEN COIL AREA

Coil Area (sq. in.)	Coil Area (sq. ft.)	Model 1972 18" Lamp	Model 1952 24" Lamp	Model 1953 32" Lamp
750	5.2	1	1	1
1000	6.9	2	1	1
1250	8.7	2	2	1
1500	10.4	2	2	2
1750	12.2	3	2	2
2000	13.9	3	2	2
2250	15.6	3	3	2
2500	17.4	4	3	2
2750	19.1	4	3	3
3000	20.8	4	3	3
3250	22.6	5	4	3
3500	24.3	5	4	3

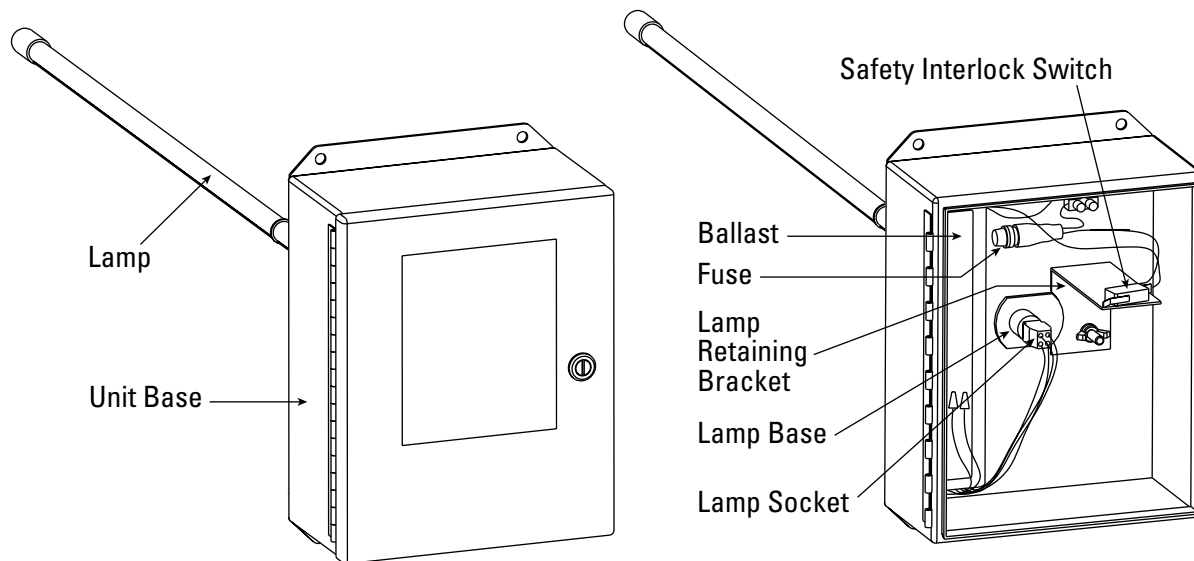
**IMPORTANT NOTES:** The above tables are guidelines only. The most important requirement for an effective UV Lamp installation is complete illumination of the coil and drain pan. Install UV Lamps as required to fully illuminate the coil and drain pan.

The guidelines above are based on the following assumptions:

- UV Lamps to be installed 3 in. – 12 in. from coil
- Coil thickness in the range of 2 in. – 4 in.

## INSTALLATION OF EXTERNAL MOUNT ROOFTOP UNITS (MODELS 1952 & 1953)

FIGURE 1 – Model 1952/1953



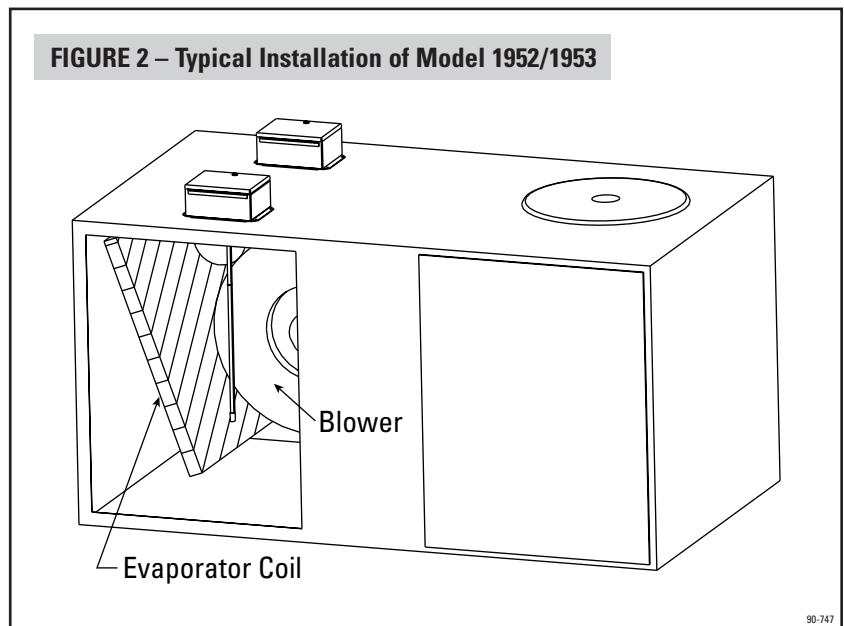
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### DETERMINE MOUNTING LOCATION

Determine a mounting location for the lamp. Use the criteria below to select a proper location:

- The lamps are intended for evaporator coil treatment. See Figure 2 for typical installation. If a single Lamp cannot illuminate the majority of the evaporator coil, two or more units might be required as shown. To the extent possible, the Lamp(s) should be centered on the coil (or section thereof) being illuminated.
- Install lamp in location that prevents exposure of plastics, rubber, paper, and other non-metallic materials to UV light, or shield such materials with aluminum tape, sheet metal, or metal conduit. **See CAUTION statements at beginning of manual for more details.**
- To protect lamp, do not install lamp below any source of water.
- Install units so that Lamp is at least 3 in., but not more than 36 in., away from evaporator coil surface.
- Install lamp in a location that can be easily accessed. Allow clearance to slide lamp in and out of rooftop unit. Model 1952 lamp is 24 in. and Model 1953 lamp is 32 in.

FIGURE 2 – Typical Installation of Model 1952/1953



90-747

- Be certain the area in the equipment where you intend to drill and cut is free of any obstructions or components that would be damaged by the installation or interfere with the installation.
- While keeping these guidelines in mind, note that the more direct exposure the coil and drain pan receive, the greater the benefit the lamps will have.**

## INSTALL THE UNIT BASE

1. Using the Unit Base as a guide, mark the locations for the lamp and mounting holes on the rooftop unit cabinet.
2. Carefully inspect the inside of the rooftop unit and make sure that no damage to any components will occur as a result of drilling the holes.
3. Drill hole for the lamp using a 2 in. hole cutter. At the mounting hole locations, use 3/32 in. drill bit to make pilot holes for mounting screws.
4. Apply weatherproof sealant (not provided) to the side of the Unit Base that is in contact with the rooftop unit housing. Mount the Unit Base to the rooftop unit using #10 sheet metal screws.

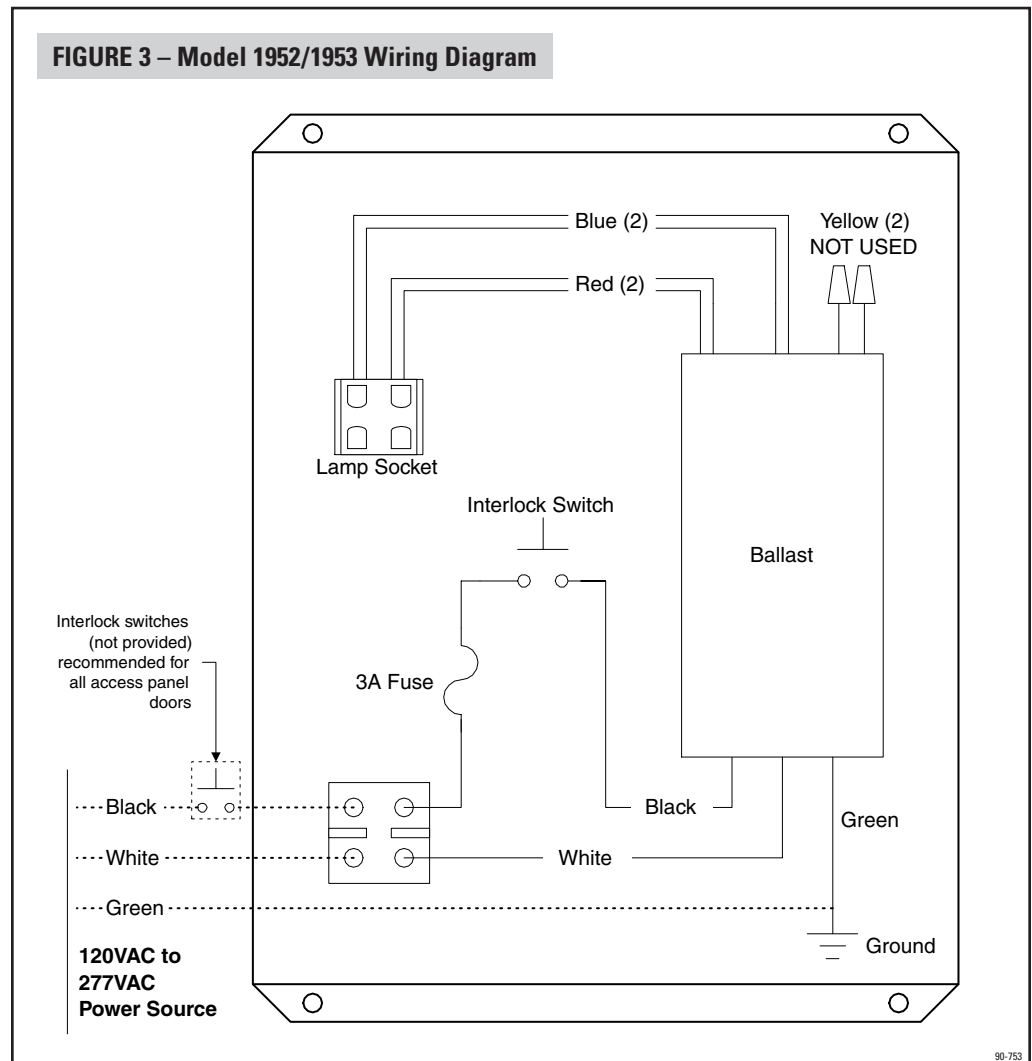
## MAKE ELECTRICAL CONNECTIONS

1. **Verify power to the HVAC equipment is shut off.** Determine where the power for the unit will come from. The units can use any voltage from 120 VAC up to 277 VAC (single phase), 60 Hz. The ballast automatically adjusts to whatever voltage is supplied in that range. **The units must be wired such that the disconnect switch of the air handler is also the disconnect switch for the UV lamp. Additionally, to prevent accidental exposure to UV germicidal light, it is recommended that safety interlock switches (not provided) be installed on any access panel door within view of the UV lamp.** See Figure 3 for Model 1952/1953 wiring diagram.

2. Use the hole in the bottom of the Unit Base and a corresponding hole through the rooftop unit housing for the electrical wiring. Be certain the area in the rooftop unit where you intend to drill and cut is free of any obstructions or components that would be damaged by the installation or interfere with the installation.

3. If space limitations prevent running the wires through the hole in the bottom of the Unit Base, drill holes in the side of the Unit Base as well as the rooftop housing for watertight conduit connectors. Install the connectors and run conduit from the Unit Base to the rooftop unit penetration.

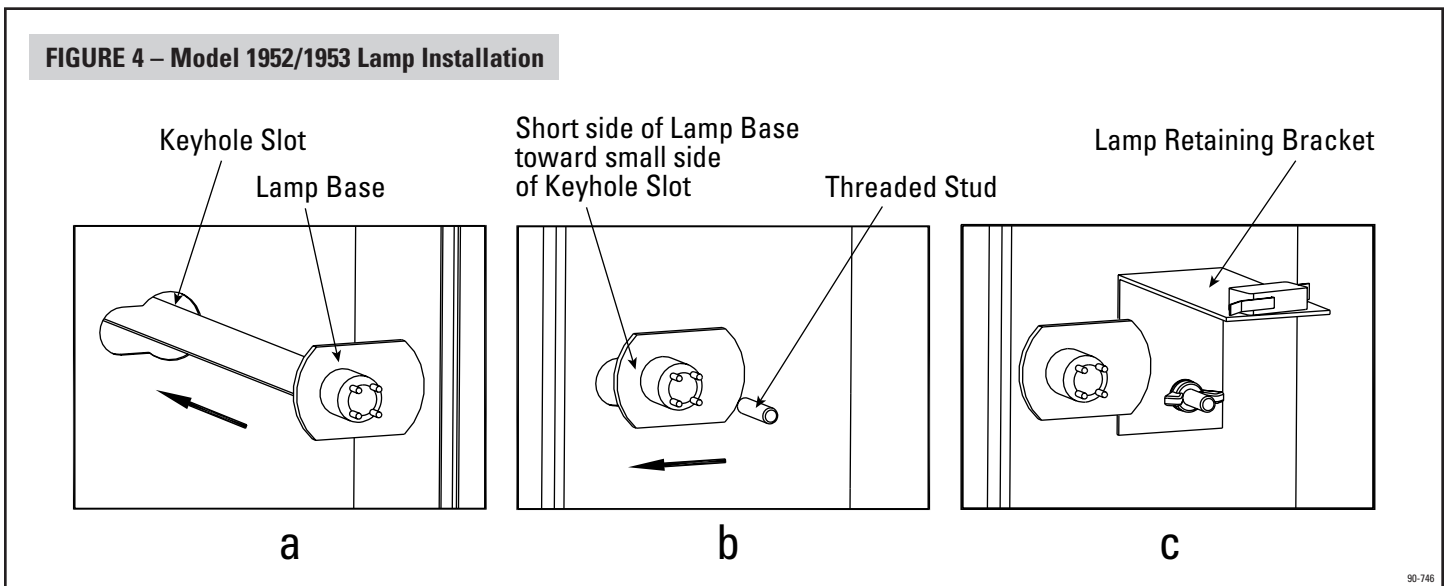
4. Run wiring from the power source through the conduit, if applicable, and into the Unit. Connect wiring to terminals provided. Refer to wiring diagram, Figure 3. Unit must be grounded.



5. Shield non-metallic components (such as electrical wires and fan belts) that receive direct or reflected UV radiation with aluminum tape, sheet metal, or conduit.

## INSTALL LAMP

1. Remove Lamp from shipping tube. Use ceramic ends of Lamp when handling – do not touch the glass tube of Lamp. Use alcohol to remove any dirt and/or fingerprints from the Lamp.
2. Referring to Figure 4, follow the steps below to install Lamp:
  - a. First, with the Lamp Retaining Bracket removed, slide the Lamp into the large side of the keyhole slot.
  - b. Next, with the shorter side of the ceramic Lamp Base facing the small side of the keyhole slot, slide the Lamp over and into the end of the keyhole slot. You should feel the Lamp Base engage the metal base of the keyhole slot.
  - c. Finally, return the Lamp Retaining Bracket onto the threaded stud of the Unit Base, securing with the washer and wing nut provided. (Note: the Lamp Retaining Bracket butts up against, but not onto, the Lamp Base.)



3. Attach the Lamp Socket to the Lamp.
4. Close the cover of the Unit Base using the latch mechanism on the front of the unit.
5. **It is recommended that safety interlock switches (not provided) be installed on any access panel door within view of the UV lamp.**
6. Return all panel doors on the rooftop unit to their closed position.
7. Place three WARNING labels (included) on the rooftop unit: one by the Lamp, one on the main access panel, and one near the main disconnect switch.
8. Turn on the power to the rooftop unit.

## CHECK LAMP OPERATION

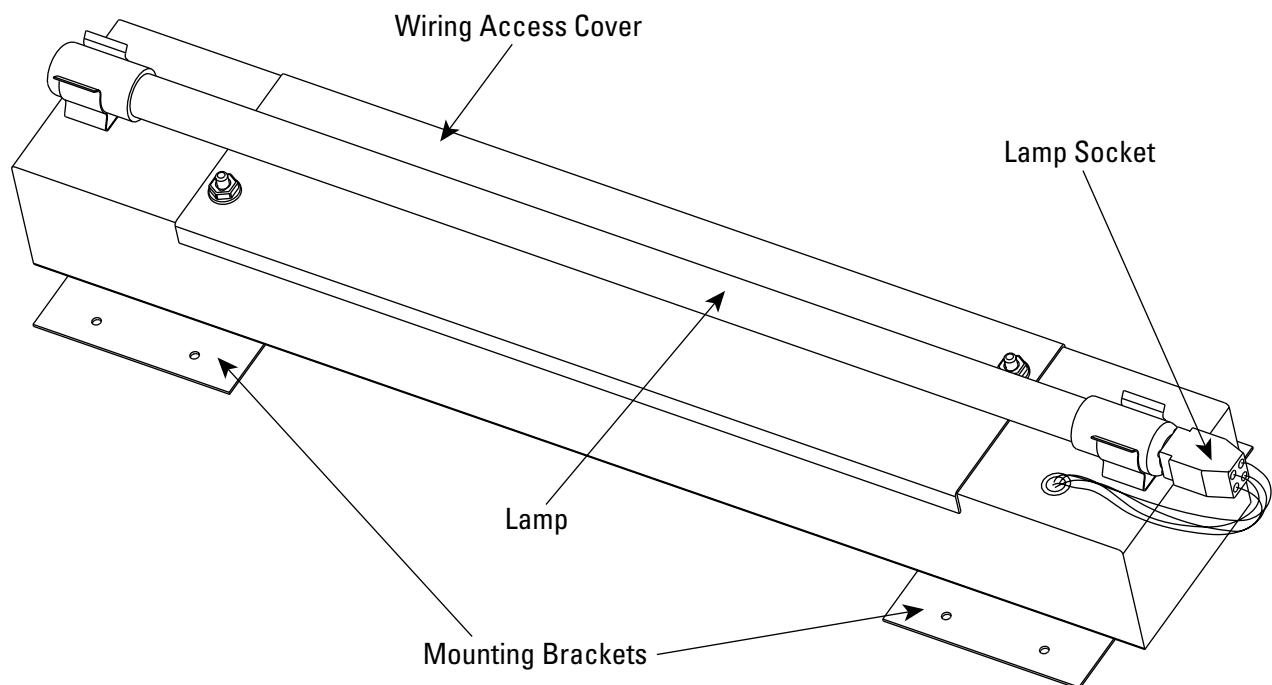
The preferred method for checking lamp operation is to measure the current draw of the lamp using a clamp-on ammeter. To detect the low current of the UV lamp, the ammeter must be capable of measuring 100 mA and above. **To prevent accidental exposure to harmful UV germicidal light during this procedure, the location where the amperage measurement is taken must be in a separate compartment from where the UV lamp is installed.** To measure the current draw of the lamp:

- a. First, shut off power to the HVAC equipment.
- b. Next, in the control panel for the HVAC equipment, locate the hot and neutral wires that were installed to provide power to the lamp.
- c. Place the clamp-on ammeter around either the hot or neutral wire. Make sure the ammeter is set to read amps in the mA range. Again, make sure that the UV lamp – or light from it, if it were on – is not visible from where the ammeter is placed.
- d. Next, turn the power to the HVAC equipment back on.
- e. If the lamp has been installed correctly and is drawing power, the amp reading will be a minimum of 150 mA. For multiple lamps, the reading would be a multiple of this value, i.e., with two lamps installed, the amp reading will be at least 300 mA.
- f. If the lamp is operating correctly, remove the ammeter from the wiring and put back any access panels that were removed during this procedure. If the lamp is not operating correctly, refer to the 'Troubleshooting' section of this manual.

**Note:** If other electrical components or accessories share the same circuit as the UV lamp(s), the current draw will be higher and the above method may not be an accurate indication of lamp operation.

## INSTALLATION OF INTERNAL MOUNT ROOFTOP UNITS (MODEL 1972)

FIGURE 5 – Model 1972

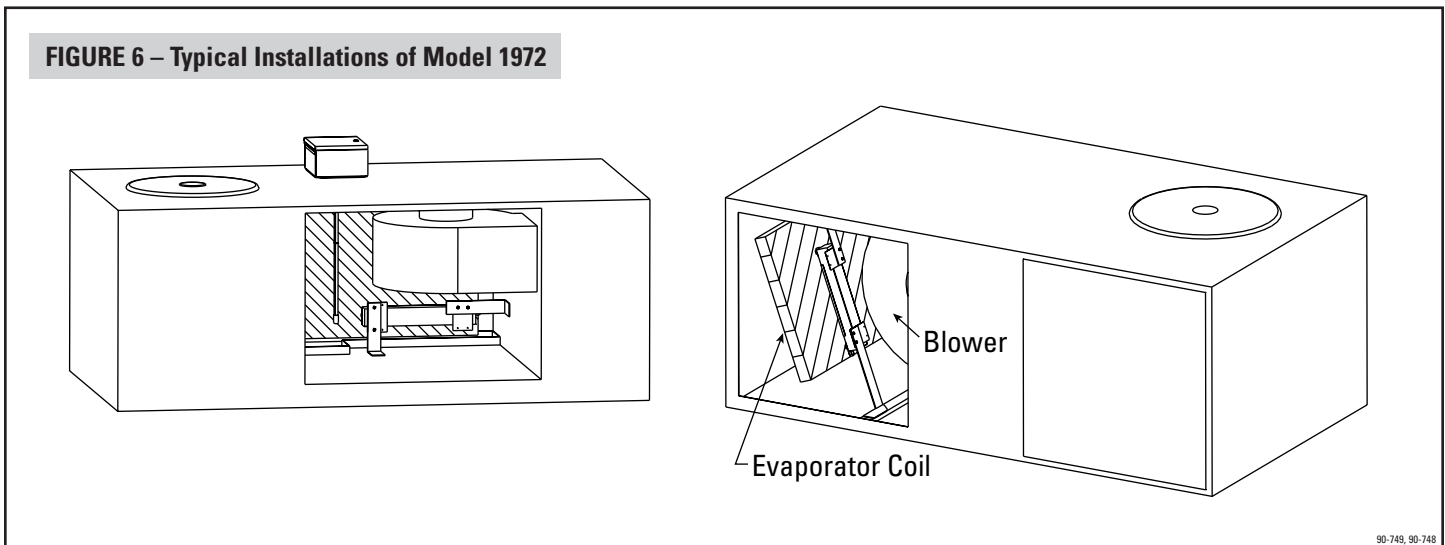


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## DETERMINE MOUNTING LOCATION

Verify that power to the HVAC equipment is off before continuing. To determine a mounting location for the lamp, use the criteria below to select a proper location:

- a. The lamps are intended for evaporator coil treatment. See Figure 6 for typical installations. If a single Lamp cannot illuminate the majority of the evaporator coil, two or more units might be required. To the extent possible, the Lamp(s) should be centered on the coil (or section thereof) being illuminated. Note that a Model 1972 Internal Mount Unit can be installed in conjunction with a Model 1952/1953 External Mount Unit as shown.
- b. Install lamp in location that prevents exposure of plastics, rubber, paper, and other non-metallic materials to UV light, or shield such materials with aluminum tape, sheet metal, or metal conduit. **See CAUTION statements at beginning of manual for more details.**
- c. To protect lamp, do not install lamp below any source of water.
- d. Install units so that Lamp is at least 3 inches away from evaporator coil surface.
- e. Install lamp in a location that can be easily accessed. Allow clearance to slide lamp in and out of duct. Model 1972 lamp is 18 in. long.
- f. Be certain the area in the equipment where you intend to drill and cut is free of any obstructions or components that would be damaged by the installation or interfere with the installation.
- g. **While keeping these guidelines in mind, note that the more direct exposure the coil and drain pan receive, the greater the benefit the lamps will have.**



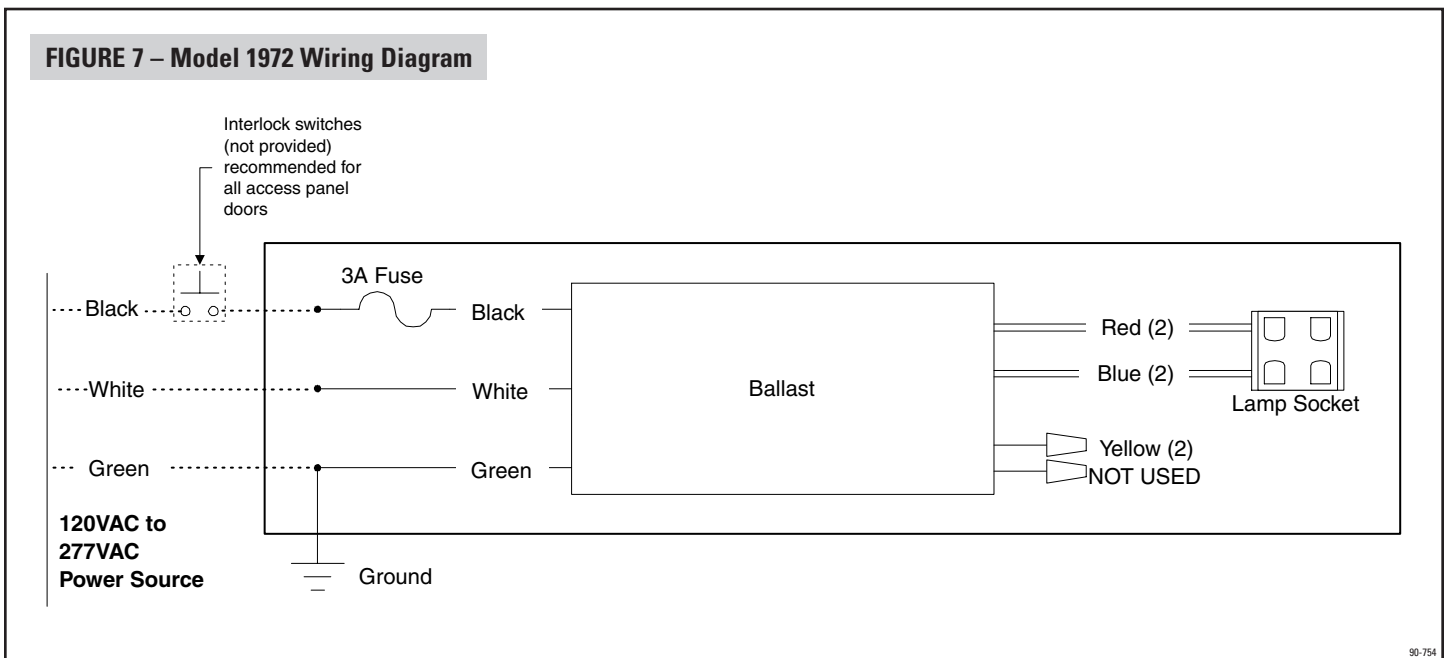
## INSTALL THE UNIT BASE

Using the supplied brackets and supports, mount the unit to solid, non-moving structural components within the rooftop unit. As every application is different, custom supports or brackets (such as 'Unistrut') may be required. Note that multiple Model 1972 units can be assembled end-to-end, if desired. To do so, connect each unit with a nipple or similar conduit connector. Note that the units must be wired in parallel circuits.



## MAKE ELECTRICAL CONNECTIONS

1. **Verify power to the HVAC equipment is shut off.** Determine where the power for the unit will come from. The units can use any voltage from 120 VAC up to 277 VAC (single phase), 60 Hz. The ballast automatically adjusts to whatever voltage is supplied in that range. **The units must be wired such that the disconnect switch of the air handler is also the disconnect switch for the UV lamp.** Additionally, to prevent accidental exposure to UV germicidal light, it is recommended that **safety interlock switches (not provided) be installed on any access panel door within view of the UV lamp.** See Figure 7 for Model 1972 wiring diagram.
2. Run wiring from the power source through conduit, if used, and into the Lamp.
3. Shield non-metallic components (such as electrical wires and fan belts) that receive direct or reflected UV radiation with aluminum tape, sheet metal, or conduit.



## INSTALL LAMP

1. Remove Lamp from shipping tube. Use ceramic ends of Lamp when handling – do not touch the glass tube of Lamp. Use alcohol to remove any dirt and/or fingerprints from the Lamp.
2. Snap the Lamp into the two Lamp Brackets.
3. Attach the Lamp Socket to the Lamp.
4. **It is recommended that safety interlock switches (not provided) be installed on any access panel door within view of the UV lamp.**
5. Return all panel doors on the rooftop unit to their closed position.
6. Place three WARNING labels (included) on the rooftop unit: there are two for access panels and one to be placed near the main disconnect switch.
7. Turn on the power to the rooftop unit.

## CHECK LAMP OPERATION

The preferred method for checking lamp operation is to measure the current draw of the lamp using a clamp-on ammeter. To detect the low current of the UV lamp, the ammeter must be capable of measuring 100 mA and above. **To prevent accidental exposure to harmful UV germicidal light during this procedure, the location where the amperage measurement is taken must be in a separate compartment from where the UV lamp is installed.** To measure the current draw of the lamp:

- a. First, shut off power to the HVAC equipment.
- b. Next, in the control panel for the HVAC equipment, locate the hot and neutral wires that were installed to provide power to the lamp.
- c. Place the clamp-on ammeter around either the hot or neutral wire. Make sure the ammeter is set to read amps in the mA range. Again, make sure that the UV lamp – or light from it, if it were on – is not visible from where the ammeter is placed.
- d. Next, turn the power to the HVAC equipment back on.
- e. If the lamp has been installed correctly and is drawing power, the amp reading will be a minimum of 150 mA. For multiple lamps, the reading would be a multiple of this value, i.e., with two lamps installed, the amp reading will be at least 300 mA.
- f. If the lamp is operating correctly, remove the ammeter from the wiring and put back any access panels that were removed during this procedure. If the lamp is not operating correctly, refer to the 'Troubleshooting' section of this manual.

**Note:** If other electrical components or accessories share the same circuit as the UV lamp(s), the current draw will be higher and the above method may not be an accurate indication of lamp operation.

## IV. ANNUAL LAMP REPLACEMENT

The Aprilaire Ultraviolet Germicidal Lamp is designed for the lamp to be on at all times. After 9,000 hours of operation – 1 year of constant use – the effectiveness of the lamp inside the unit diminishes and needs to be replaced. Rarely will a lamp burn out in one year of continuous use; replacement is necessary because the lamp's intensity decreases. Installation of the replacement lamp is best handled by a qualified HVAC Service Contractor.

### LAMP REPLACEMENT INSTRUCTIONS (EXTERNAL & INTERNAL MOUNT UNITS):

- a. Shut off power to the rooftop unit. Wait several minutes for lamp to cool before proceeding. Remove access panel(s) to the rooftop unit.
- b. Remove Lamp from Unit. For External Mount Units, open the cover of the Unit Base, disconnect Lamp Retaining Bracket, and slide the Lamp to the large side of the keyhole slot and then pull straight out. For the Internal Mount Unit, simply disconnect Lamp Socket and remove Lamp.
- c. Use alcohol to remove any dirt and/or fingerprints from the new Lamp. Insert Lamp into the unit and attach Lamp Socket to the Lamp.
- d. For External Mount Units, close and secure the cover of Unit Base.
- e. Put access panels of the rooftop unit back in place.
- f. Turn power to rooftop unit back on.
- g. Refer to 'Check Lamp Operation' of the previous section to verify operation.
- h. Record the date the lamp was replaced in this manual so that the date for next replacement is clear.

Refer to 'Troubleshooting' section if the Lamp does not operate.

Under normal conditions, the Aprilaire Ultraviolet Germicidal Lamp should not require any maintenance other than annual lamp replacement.

## V. LAMP DISPOSAL

As with a fluorescent light bulb, the UV lamp contains mercury and must be disposed of properly. **Do not throw old lamps into the trash.** Many communities have agencies that take in mercury along with other materials – such as old paints, solvents, etc. – that require special disposal. Please contact your municipal or county waste collection agency for proper disposal procedures.

If a lamp is broken, **do not use a vacuum cleaner to pick up the waste.** Instead, sweep up the waste into a plastic bag and seal. Contact your municipal or county waste collection agency for proper disposal procedures.

## VI. TROUBLESHOOTING

If the Lamp does not operate, check the following:

- Electrical Connections** – Verify that the Lamp has been wired correctly. The power to lamp must be always 'on' during normal operation. On External Mount Units, verify that safety switch inside the cover of Unit Base has not been damaged. The voltage into the units should be in the range of 120 - 277 VAC / 60 Hz / single phase. If it is not in that range, re-check the wiring or contact an electrician.
- Fuse** – If the lamp is still not illuminated, turn off power to the rooftop unit, and check the Fuse. Look to see if Fuse is darkened or visibly blown (i.e., wire broken) or check fuse continuity with multi-meter.
- Lamp** – Verify that Lamp is not broken and is properly seated into Lamp Socket. To check this, shut off power to the rooftop unit and wait several minutes for lamp to cool before proceeding. Then remove access panels in order to look at Lamp. Verify that lamp tube is not broken and that it is firmly pushed into its' Lamp Socket. If necessary, use alcohol to remove any dirt and/or fingerprints from the lamp. If the lamp is broken read the 'Lamp Disposal' section of this manual for proper disposal.
- Ballast** – If all of the above is okay, but the light still does not illuminate, the starter in the Ballast is likely shorted out and the Ballast must be replaced.

## LIST OF REPLACEMENT PARTS

Model 1952 Replacement Lamp	#94	Multi-Voltage High Output Ballast (for 1952, 1953, and 1972)	#4466
Model 1953 Replacement Lamp	#96	Fuse (3 Amp, slow burn)	#4412
Model 1972 Replacement Lamp	#90	Fuse Cap	#4413
		Lamp Socket	#4414

## VII. LAMP REPLACEMENT RECORD

Date	Dealer Name

Date	Dealer Name

## VIII. LIMITED WARRANTY

Your Research Products Corporation Aprilaire Ultraviolet Germicidal Lamp Model 1952, 1953 or 1972 is expressly warranted for three (3) years from the date of installation to be free from defects. However the replaceable lamp is expressly warranted for only one (1) year from the date of installation to be free of defects. Research Products Corporation's exclusive obligation under this warranty shall be to supply, without charge, a replacement for any part of the Ultraviolet Germicidal Lamp, which is found to be defective within a three (3) year period (excluding Lamp which will be replaced if defective within one (1) year period) and which is returned no later than thirty (30) days after the three (3) year period by you or your original supplier to Research Products Corporation, Madison, WI53701, together with the model number and installation date of the Ultraviolet Lamp.

THIS WARRANTY SHALL NOT OBLIGATE RESEARCH PRODUCTS CORPORATION FOR ANY LABOR COSTS AND SHALL NOT APPLY TO DEFECTS IN WORKMANSHIP OR MATERIALS FURNISHED BY YOUR INSTALLER AS CONTRASTED TO DEFECTS DISCOVERED IN THE ULTRAVIOLET GERMICIDAL LAMP ITSELF.

IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED IN DURATION TO THE AFORESAID THREE-YEAR PERIOD. RESEARCH PRODUCTS CORPORATION'S LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, OTHER THAN DAMAGES FOR PERSONAL INJURIES, RESULTING FROM ANY BREACH OF THE AFORESAID IMPLIED WARRANTIES OR THE ABOVE LIMITED WARRANTY IS EXPRESSLY EXCLUDED. THIS LIMITED WARRANTY IS VOID IF DEFECT(S) RESULT FROM FAILURE TO HAVE THIS UNIT INSTALLED BY A QUALIFIED HEATING AND AIR CONDITIONING CONTRACTOR. IF THE LIMITED WARRANTY IS VOID DUE TO FAILURE TO USE A QUALIFIED CONTRACTOR, ALL DISCLAIMERS OF IMPLIED WARRANTIES SHALL BE EFFECTIVE UPON INSTALLATION.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE EXCLUSION OR LIMITATIONS MAY NOT APPLY TO YOU.

This warranty gives you specific legal rights and you may also have other rights, which vary, from state to state.

## WARRANTY REGISTRATION

Please... Take a few minutes to visit us on-line at

**[www.aprilaire.com](http://www.aprilaire.com)**

to register your Aprilaire product.

If you do not have on-line access, please mail a postcard with your name, address, phone number, product purchased and date of purchase to:

Research Products Corporation  
P.O. BOX 1828  
Madison, WI 53701

**Thank you!**

**Your Warranty Registration information will not be sold or shared outside of this company.**

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