Installation Instructions

Part No. 20000100, 20000200, 20000400 and CRUVCKIT029A00 - CRUVCKIT032A00
Used in Cooling Coil Sections

SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions such as changing lamps. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, on tags and labels attached to the unit or accessory, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses that are marked to comply with ANSI (American National Standards Institute) Z87.1 standard and gloves.

⚠ WARNING

Before installing an accessory or performing maintenance or service on an accessory, turn off main power switch to unit. Electrical shock can cause injury or death. There may be more than one disconnect switch.

⚠ CAUTION

Never expose eyes or skin to ultraviolet light from any source. The lamp must be off before entering the unit to perform maintenance or service. Personal injury may result. Field-supplied interlock switches are required in the cooling coil's access panels to prevent this hazard. Their installation is outlined in the instructions.

⚠ CAUTION

Ultraviolet band C (UV-C) energy may cause damage to non-metallic components except for UV-rated and HVAC-style drain pans. Select mounting locations that prevent exposure to vulnerable components. If mounting locations are limited, such components shall be protected with UV resistant material such as aluminum foil, aluminum duct tape, metallic shields, etc.

⚠ CAUTION

Do not touch emitter glass without gloves. Damage to lamp may result. Oil from fingerprints will permanently etch the glass of the lamp and weaken the structure. Clean the lamp after handling with 99% isopropyl alcohol and a lint free cloth.

⚠ CAUTION

Use only specified high-output, low temperature lamps with this accessory. Use of a lower wattage or incorrect lamp can result in damage to the accessory or lamp. Correct lamps have a blue end cap.

⚠ CAUTION

The lamp contains a small quantity of mercury. If a lamp breaks, clean and dispose of with care.

NOTE: The health aspects associated with the use of this product and its ability to aid in disinfection of environment air have not been investigated by UL (Underwriters Laboratories).

GENERAL

Carrier's commercial air handler ultraviolet lamp seen in Fig. 1 is designed to neutralize odor causing mold and fungus that may develop in the wet sections of an HVAC (heating, ventilation, and air conditioning) unit. The high-output, low temperature UV-C lamps are installed in the cooling coil section of the 48/50K and 48/50V Series rooftop unit, and are pointed directly at the cooling coil and condensate pan.

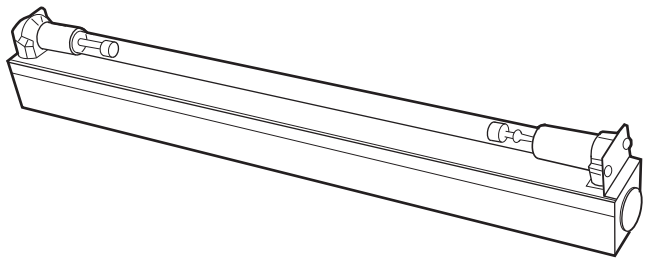


Fig. 1 — UV-C Lamp

Carrier's UV-C lamps have been specifically designed and optimized to provide output per one inch arc length of not less than 9μW/cm^2 at 1 meter in a 400 fpm airflow of 50°F.

UV-C lamp installation requires a separate, dedicated source of power.

The 48/50K, 48/50V Series cooling coil section can be shipped with UV-C lamp fixtures only as a factory-installed option. The UV-C bulb kit will need to be ordered separately for field installation.

Refer to Tables 1-4 for lamp only ordering information.

INSTALLATION

Location

The UV-C lamps are installed downstream of the cooling coil. Vertical supports and angle supports (fused to lamps) are provided to support the UV-C lamps.

Remove Shipping Assembly (Factory Installed)

Remove the shipping assembly included in the separately shipped UV-C sections before making any field connections. The shipping assembly includes: protective shipping channels, shipping channel braces, shipping covers, and section brace angles in the corners of the sections. The shipping channel is mounted immediately upstream of the fixtures to block the fixtures from damage during shipping. The braces maintain clearance between the shipping channel and the fixtures to prevent the channel from flexing into the fixtures.

Before Installing UV-C Lamp Kit

NOTE: A separate, dedicated, 115-208/230-v power source will need to be field-supplied and routed to the junction and switch boxes per applicable codes. Power source must be suitably fused, grounded, and protected with the correct voltage. Use of a ground-fault circuit interruptor (GFCI) is highly recommended. Any power source and lamp voltage conflict (misalignment) will permanently damage the UV-C lamp.

1. Turn off and lock out all existing power to unit.

IMPORTANT: Ensure that lamp is installed before power is applied. Installing lamp after power has been applied will trigger the "end-of-lamp-life circuit" and the lamp will fail to light. If this happens, shut off power for 10 seconds and then turn power back on. Lamp will then light.

2. Ultraviolet light may damage certain plastics. Wrap exposed plastic and wiring with aluminum tape or metal conduit.

⚠ CAUTION

Do NOT use any polyester or cotton filters in the cooling coil section when using ultraviolet light. Just as any other plastic exposed to UV light, they can be damaged. Replace any polyester or cotton filters with fiberglass-based filters.

Table 1 — UV-C Lamps Required for K-Series 20-60 Tons

48/50K UNIT SIZE	LAMP TYPE	QTY REQUIRED FOR UV KIT
20-50	Single - 24"	2
	Single - 36"	4
60	Single - 24"	4
	Single - 36"	6

Table 2 — UV-C Lamps Required for V-Series 27-50 Tons

48/50V UNIT SIZE	LAMP TYPE	QTY REQUIRED FOR UV KIT
27-35	Single - 18"	1
	Single - 24"	5
40-50	Single - 18"	0
	Single - 24"	6

Table 3 — UV-C Lamps and Kit for K-Series 20-60 Tons

UNIT SIZE	LAMP TYPE	PART NUMBER
ALL	Single - 24"	20000200
	Single - 36"	20000400
20-50	Full Kit	CRUVCKIT029A00
60	Full Kit	CRUVCKIT030A00

NOTE: Do not touch emitter glass without gloves. Oil from fingerprints may result in permanent damage.

Table 4 — UV-C Lamps and Kit for V-Series 27-50 Tons

UNIT SIZE	LAMP TYPE	PART NUMBER
ALL	Single - 18"	20000100
	Single - 24"	20000200
27-35	Full Kit	CRUVCKIT031A00
40-50	Full Kit	CRUVCKIT032A00

NOTE: Do not touch emitter glass without gloves. Oil from fingerprints may result in permanent damage.

UV-C Lamp Installation (Factory-Installed Fixture)

⚠ CAUTION

Do not touch emitter glass without gloves. Damage to lamp may result. Oil from fingerprints will permanently etch the glass of the lamp and weaken the structure. Clean the lamp after handling with 99% isopropyl alcohol and a lint free cloth.

Perform the following procedure to install replacement UV-C lamps.

1. Determine which side panel (not the top panel) of the cooling coil section has the junction and switch boxes installed. Remove or open the adjacent panel to access the cooling coil section. See Fig. 2 or 3.
2. Remove a lamp from its packaging and align with a fixture fastened to an angle support. Push the lamp in until seated. Rotate the lamp 90 degrees until one distinct click is heard. Repeat for each fixture until all lamps are installed.
3. Replace or close the access panel.

NOTE: Once this is completed, the top panel will no longer be removable. On the external side of the cooling coil section top panel, place in easy view the Panel Removal Warning Sticker, Fig. 4.

Replace or close the access panel. On this panel, place in easy view one of the UV-C Light Warning labels. See Fig. 5.

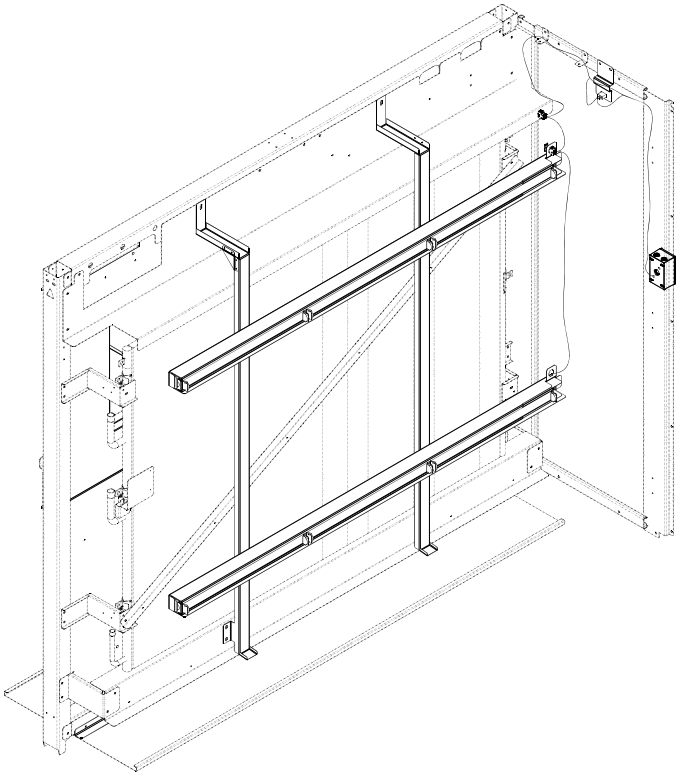


Fig. 2 — Typical UV-C Lamp and Fixture Kit Installation on 48/50V 27-50 Tons

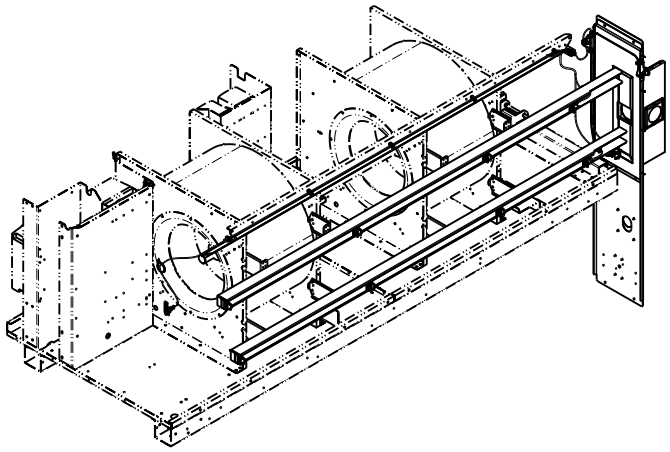


Fig. 3 — Typical UV-C Lamp and Fixture Kit Installation on 48/50K 20-60 Tons



Fig. 4 — Panel Removal Warning Sticker — Factory Placed on External Side of Cooling Coil Section Top Panel

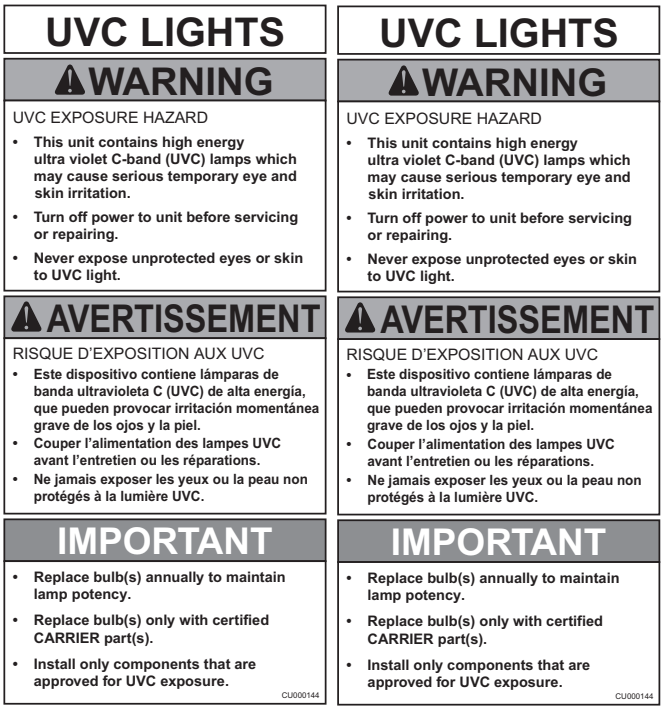


Fig. 5 — UV-C Light Warning Labels — Factory placed on External Side of Cooling Coil Section Access Panels

⚠ WARNING

Ensure safety equipment is being worn for UV-C lamp operational testing. **WEAR A FULL FACE MASK AND COMPLETE COVERAGE CLOTHING.** Exposure to UV-C lamps WITHOUT safety glasses and protective clothing is limited to 15 seconds in any 24-hour period.

Testing Lamp Kit

1. Return power to UV-C section ONLY for lamp operation verification.
2. Verify all UV-C lamps glow in a blue hue when the exterior disconnect box is in ON position and both safety panel interlock switches are depressed. A UV-C safe view port is installed in the access door to verify if the emitter is operational.
3. Verify lamps deenergize when the exterior disconnect box is in OFF position or either safety panel interlock switch is in the extended, "panel open" position.
4. Turn off power when proper operation is verified. If lamp(s) did not glow, check switch box wiring, junction box wiring, safety panel interlock switches, and lamp(s).
5. Close unit access panel, turn on the switch box and return all power to the unit.

See Fig. 6 and Fig. 7 for Wiring.

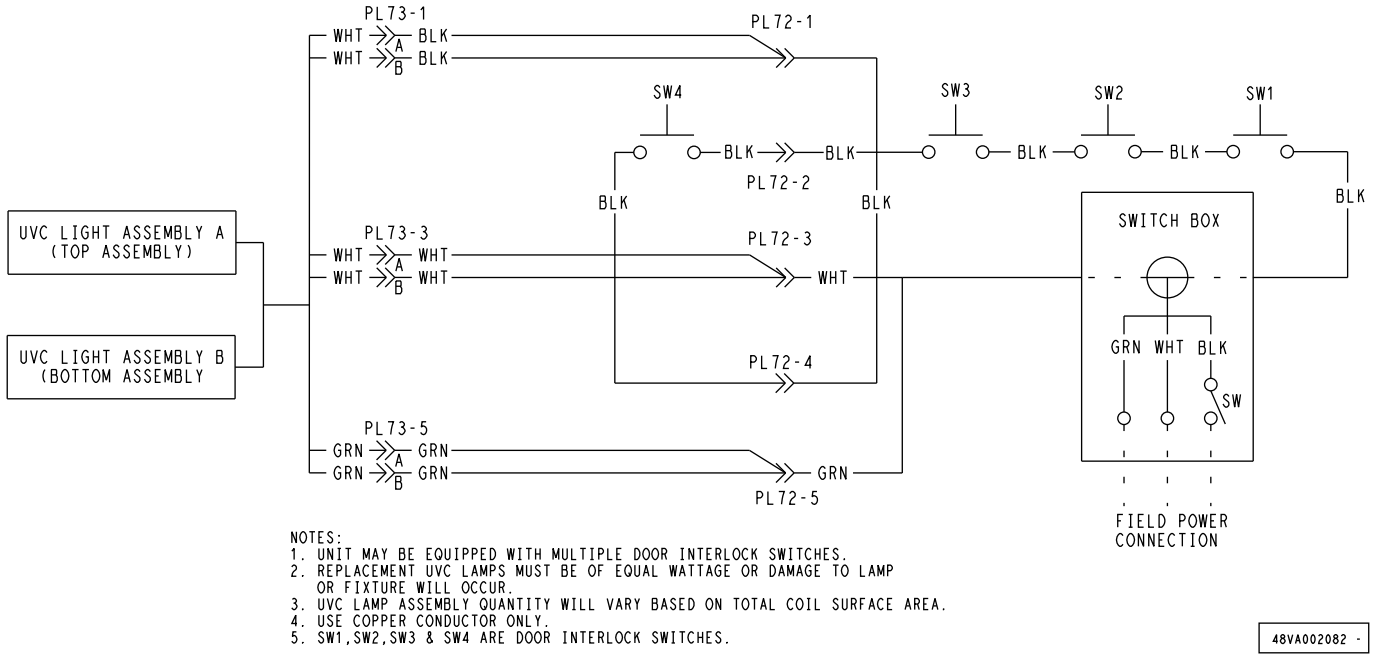


Fig. 6 — 48/50K UV-C Section Wiring Diagram

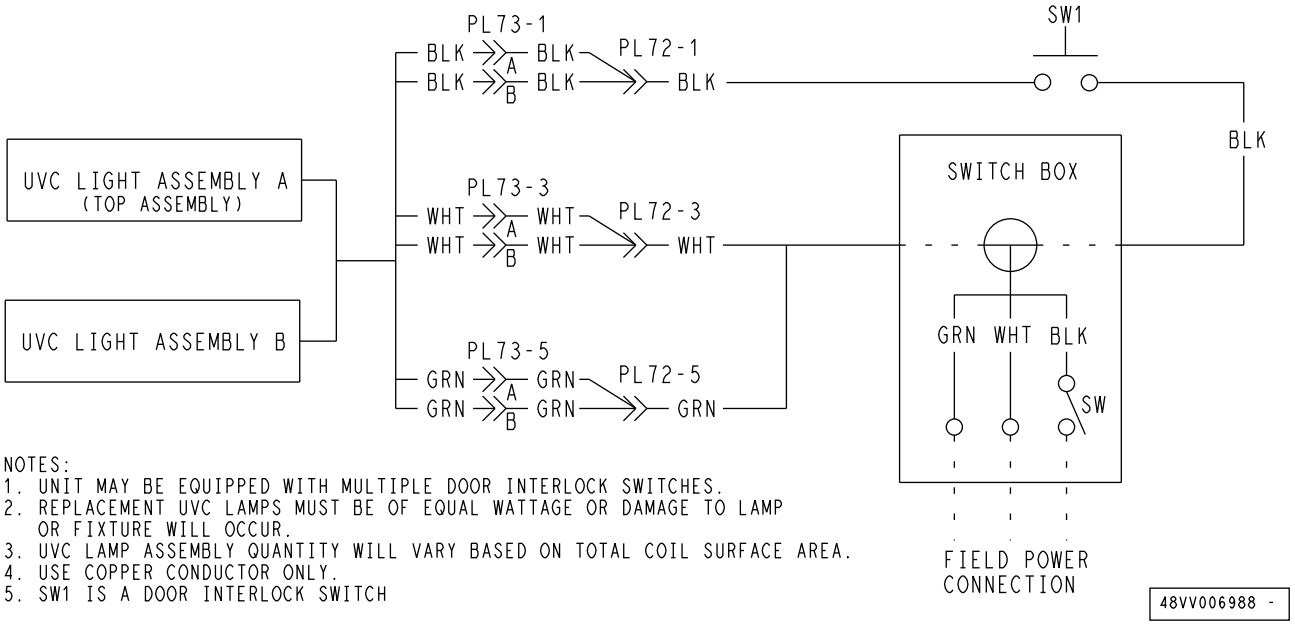


Fig. 7 — 48/50V UV-C Section Wiring Diagram

MAINTENANCE

Turn off and lock out ALL unit power before performing any maintenance or service.

Lamps need periodic replacement to maintain design specifications. Replace lamps after 1 year. For optimum performance, replace lamps at the beginning of each cooling season. Lamp output may also be checked with a UV-C radiometer. Replace lamp when output falls below 50% of initial radiometer reading.

⚠ CAUTION

Use only specified high-output, low temperature lamps with this accessory. Use of a lower wattage or incorrect lamp can result in damage to the accessory or lamp. Correct lamps have a blue end cap.

Refer to Tables 1-4 for Carrier lamp only ordering information that can be safely used. Other lamps should not be substituted. Use of non-approved lamps will cause overheating of the lamp and power source.

OPERATION

Ultraviolet lamps should be operated continuously (24 hours a day, 7 days a week) from a separate, dedicated, 115-208/230-v power source. Lamps should not be connected to the indoor fan power source or any power source where the lamps would be cycled more than twice a day.

While lit, lamp color should be light blue. If lamp color changes to red or flickers, replace the lamp. Lamps that are not light blue or lamps exceeding 9000 hours of operation will not emit ultraviolet radiation.

Fiberglass filter media are recommended for operation of HVAC when filters are directly exposed to ultraviolet lamps. Polyester or cotton filters are subject to ultraviolet degradation and are not recommended.

TROUBLESHOOTING

Refer to Table 5 for troubleshooting information.

Table 5 — Troubleshooting

FAULT	SOLUTION
Lamp Does Not Light	Turn off power for 10 seconds, and then turn power back on.
	Replace lamp with new unit. Normal replacements recommended once per year.
	Check line voltage.
	Check wiring to lamp.
	Replace power supply.
Low Output (Radiometer Reading) or Visibly Weak Light	Replace lamp with new unit.
	Check line voltage.
	Check wiring to lamp.
Red/Orange Light	Check ambient temperature. If the temperature is at or below 35°F, lamp is too cold to operate properly.
	If ambient temperature is in excess of 35°F, follow actions for the Low Output fault.

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