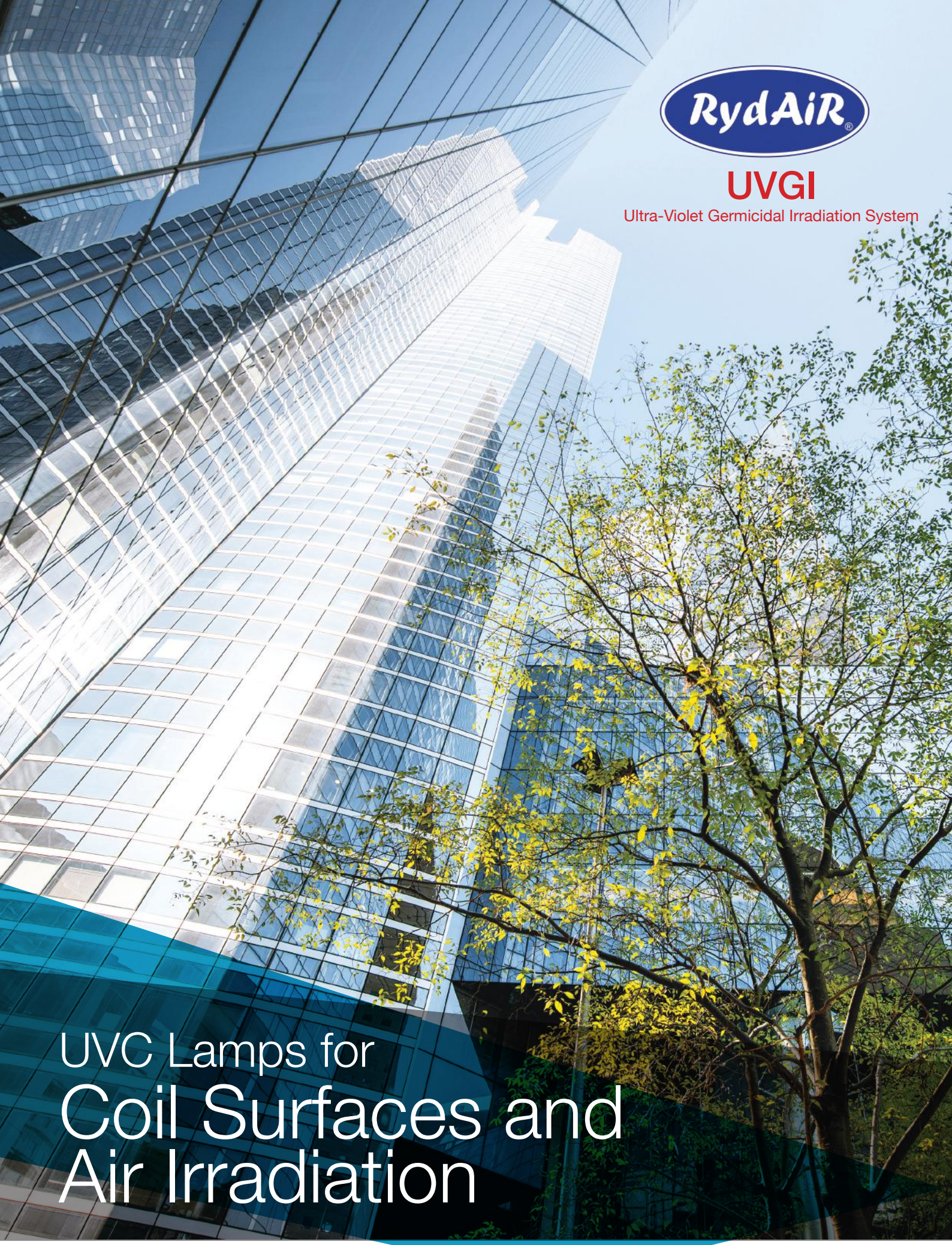


RydAiR®

UVGI

Ultra-Violet Germicidal Irradiation System

UVC Lamps for Coil Surfaces and Air Irradiation

Formerly Known as: UV-Lux

UL Listed Ballast

The value of UV-C

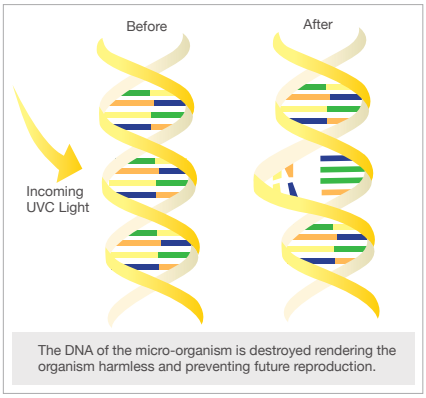
UV-C is a low cost solution to disinfect cooling coils, drain pans and duct surfaces that have accumulated mold and bacteria growth. The technology disrupts a micro-organism's DNA, triggering a chain reaction that leads to cellular death. Because the lamps operate continuously, biofilms are unable to regenerate, provided the UV-C source is properly maintained. This technology is frequently used to address many sources of poor indoor air quality that contribute to employee discomfort and absenteeism.

Contaminants, particularly the presence of fungi (mycotoxins), can trigger serious health problems to building occupants. As noted in an Applied and Environmental Microbiology study, "fungi have been found growing on air filters, insulation and cooling coils, as well as in ducts. The contamination often contributes to building related diseases, including both infectious diseases and hypersensitivity diseases such as allergic rhinitis, asthma and hypersensitivity pneumonitis. HVAC system can also inadvertently transmit rhinoviruses (common cold), tuberculosis, measles, SARS Also acute toxicosis and cancer have been attributed to respiratory exposure to mycotoxins.

As an added value, its ability to constantly clean the interior workings of the AHU can extend the equipment's life for prolonged savings. Bio-films on coil fins adversely affect heat transfer to/from the airstream, if mechanical cleanings are incomplete or ignored, up to 25% of cooling capacity can be lost in as little as five years. Another factor is the lack of personnel or labor hours to routinely address coil maintenance. UV-C sources help restore an AHU to its original operating capacity.

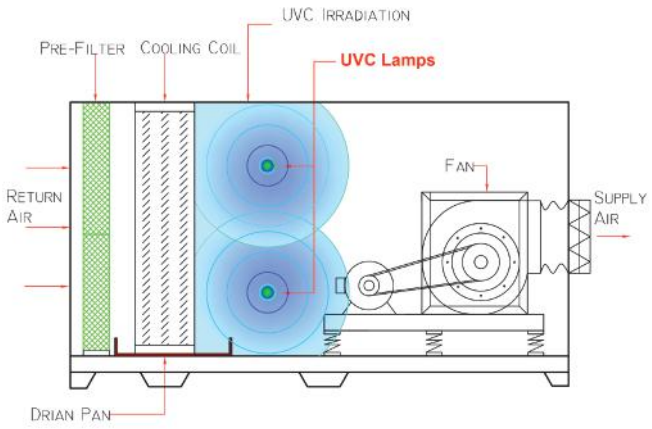
The HVAC application of UV-C is nearly universal, including offices, schools, hospitals, correctional facilities, laboratories and assisted living facilities. UV-C represents a small investment (roughly 3%) relative to overall cost of AHU and are easy to retrofit. Building owners can achieve 10%-25% increase in HVAC efficiency by adding a UV-C device.

(adapted from ASHRAE Journal, Jan 2017, HVAC UV Germicidal Irradiation UV-C Fixtures, by Brian Rodgers, Dean Saputa, Associate member, ASHRAE)



The DNA of the micro-organism is destroyed rendering the organism harmless and preventing future reproduction.

AHU Application (RL TYPE)



RL Type UVC Lamps for AHU Coil Irradiation

RL Type is designed for easy and flexible installation and maintenance inside the AHU. The UVC lamps and ballasts are separated, with only the UVC lamps being installed inside the AHU. The ballasts and other ancillary components are assembled in a Control Panel Housing, attached to the external wall of the AHU, keeping them away from the moist environment inside the AHU. This make it very easy for service and maintenance.

The lamps are installed on an aluminum skeletal structure secured to the AHU's internal frame support. The skeletal structure is not supplied, and is to be determined and fabricated by the installer.

Sizing Criteria for Coil Maintenance

The RydAiR /UV Lux lamp sizing complies with guidelines set in the 2020 ASHRAE Handbook of at least 100 microwatt/cm^2 striking the furthest point of the cooling coil and drain pans. The lamp watts (power consumption of the UVC lamp) to cooling coil surface area shall be at least 70 lamp watts for every square meter of coil surface to be irradiated to meet ASHRAE's guidelines.

Sizing criteria for In duct Air Disinfection to reduce transmissibility of virus, including COVID-19.

UV-C lamps installed inside HVAC equipment and associated ductworks require "high UV dosages due to limited exposure time and a minimum target dosage of 1500 microwatt S/cm^2 with system designed at 500 fpm or 2.5m/sec." (adapted from ASHRAE's guidelines to COVID-19).

For UVC lamps installed near cooling coil (at 2.5m/sec), the lamp watts required for every 1 sq meter of cooling coil surface is approximately 300 lamp watts (power consumption of the UVC lamp(s) to meet ASHRAE's recommended dosage, due to lower temperatures (approximately 10°C) at this location.

For UVC installed in associated supply ductworks (2.5m/sec velocity), the ratio is approximately 200 lamp watts for 1 sq m of duct cross section as the temperature is higher compared to in-coil temperature. *(Note higher velocity affects exposure time, hence higher UVC intensity is required)*

Items supplied are:

1) Control Panel Housing for required number of lamps.
2) Required number of Lamps
3) 2 Stainless Steel Clips per Lamp
4) A 5m long wire loom with 4 pin socket and special lamp–to-socket silicone seal to keep moisture out of lamp contacts.

The basic features of Control Panel Housing are:

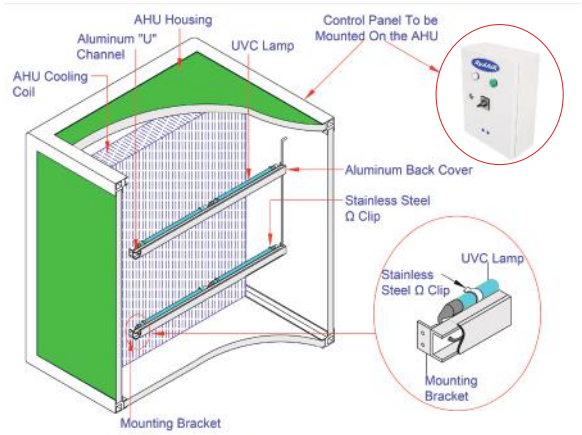
- Power on/off switch
- Power indicator lamps
- LEDs for each ballast/lamp set

Optional features include:

- Building Management System (BMS) feature
- Door Safety switch function (230VAC)
- Fan Interlocking function (230VAC)
- Radiometer Monitoring

Benefits:

- Destroy DNA of microorganism, mold spores, bacteria, viruses, yeast etc.
- No ozone output, safe for occupants
- Improves indoor air quality
- Reduces need for regular washing
- Keeps cooling coil in "like new" condition
- Clean coil reduces load on blowers
- Keep airconditioning systems efficient, last longer and lower maintenance costs
- Results in overall energy savings
- Low payback on investment



Proposed Installation of UVC Lamp in AHU

Models	Part Number	Lamp Dia	Lamp Length	Arc Length	Lamp Wattage	UV Watts (UV Power)	UVC intensity at 1m
RL22T5HO	UVLHO546T5L	15mm/0.6"	546mm/22"	442mm/17.4"	55	20	170 microwatt/cm^2
RL33T5HO	UVLHO846T5L	15mm/0.6"	846mm/33"	726mm/28.6"	80	29	265 microwatt/cm^2
RL61T5HO	UVLHO1554T5L	15mm/0.6"	1554mm/61"	1434mm/56.5"	145	50	425 microwatt/cm^2