

The Robertshaw logo is written in a red, cursive script font. A registered trademark symbol (®) is located at the end of the word.

Robertshaw®

Indoor Air Quality Ultra Violet Light Systems UNI-LINE® PRODUCT KNOWLEDGE

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invensys®
Controls

Subjects We Will Cover In This Session

- Acronyms and Technical Knowledge
- Applications
- Product Line & Features
- Manufacturer Analysis
- Installation Steps
- Where to Find Information
- Q&A

Indoor Air Quality Opportunities

UV Lamps



Ventilators

Air Cleaners

Humidifiers

Acronyms

BRI	=	Building Related Illness
CFM	=	Cubic Feet per Minute of airflow
EPA	=	Environmental Protection Agency
HEP	=	High Efficiency Particulate Air Filters
IAQ	=	Indoor Air Quality
IEQ	=	Indoor Environmental Quality
nm	=	Nanometers (10^{-9})
SBS	=	Sick Building Syndrome
UV	=	Ultra Violet
UVC	=	Ultra Violet in the C band
UVGI	=	Ultra Violet Germicidal Irradiation

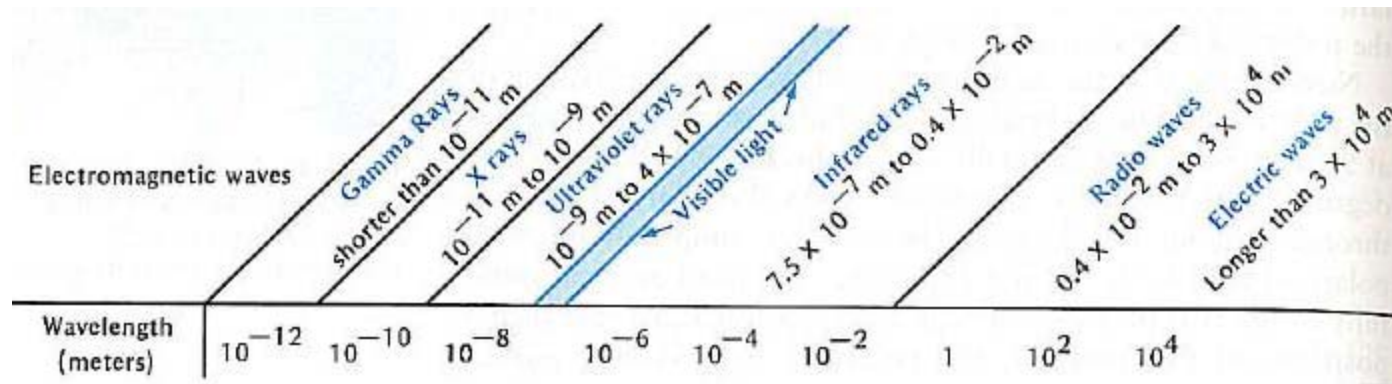
IAQ Problem

- Since the energy crisis of 1970's, homes built tighter and tighter
- New construction materials consist of more synthetic or man-made materials
- These building techniques have developed problems
 - Asthma
 - Allergic Responses
 - Infectious Diseases
 - Respiratory Problems
- According to the EPA, indoor air quality is one of the top five environmental health risks of our time

IAQ Opportunity with UV Lights

- In Florida, contractors offering UV lights installed for \$700-\$1200
- For retrofit and new home construction
- UV lights installed at the coil can provide more efficient and healthier air conditioning systems
- Annual maintenance checks help provide a reduction in surface disinfection and increased coil efficiency

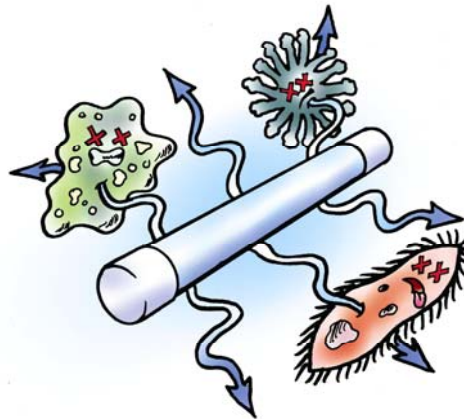
What is Ultraviolet Light?



- The Ultraviolet 10^{-9} molecules section is the region of the electromagnetic spectrum that exists between visible light and X-rays
- The range of UV light is between 90 - 400 nm. UV light is most effective at sterilizing in the C band range 200 – 280 nm

How Does UV Light Disinfect?

- By altering the molecular bonds in a microbe's DNA
- The 254nm wavelength of ultraviolet light will penetrate the membrane and nucleus of a micro-organism
- Breaks apart the molecular bonds of the DNA
- This disruption or breakage leaves the cell unable to reproduce, rendering it harmless



What UV Disinfection *Does Not* Do

- Disinfection vs. Purification
UV *does not* filter the air or remove any particles or contaminants. It works with filters, humidifiers and other equipment to disinfect the air.
- Disinfection vs. Sterilization
Sterilization is the killing of 100% of living organisms. UV is used to disinfect the air by reducing infectious organisms to non-harmful levels.
- UV Light Not for Human Exposure
Always turn Off UV light before installation or maintenance is preformed. Wear eye protection!

UV Lights Operate at What Wavelength?

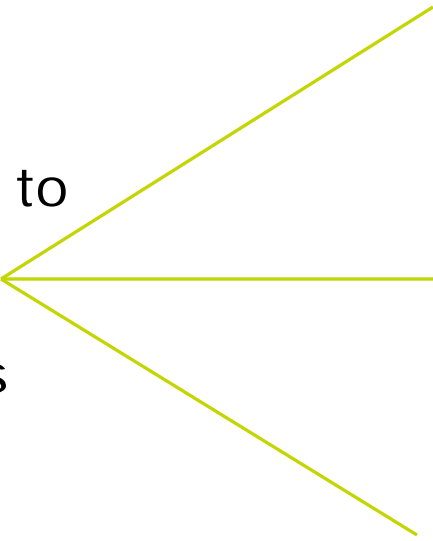
- A. 2.4 Giga Hertz
- B. 254 nano meters
- C. 254 pico meters
- D. None of the above

Applications

- Homes and offices
- Schools and locker-rooms
- Food and beverage processors
- Laboratories and clean rooms
- Water treatment facilities
- Hospitals and doctors' offices
- Prisons or holding cells
- Airports
- Almost anyplace with a concern for clean air

Why Install UV Lights?

Benefits to
HVAC
Systems



Inactivates airborne bacteria and viruses

Inactivates allergy causing molds and mildew

Helps optimize HVAC efficiency

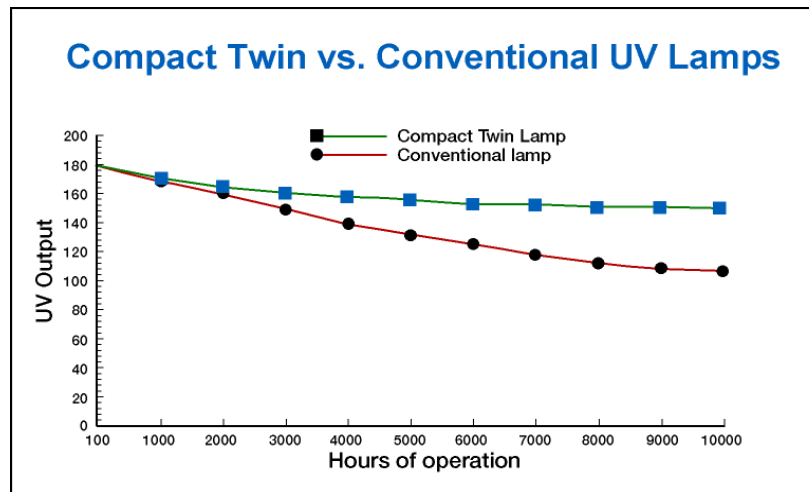
New Product Indoor Air Quality (IAQ)

- Ultra Violet Light System 7602-002
- Replacement Bulb for UV light 7602-006
- Compact design fits tight spaces
- 35 watt 16" twin-tube lamp design
- Will not produce Ozone
- Safety interlocked mounting ring
- Emits UVC radiation at a frequency of 254 nanometer
- Operates on standard 120V power
- LED light indicates proper unit operation
- Replacement Light available
- 24V available mid-November
- Brand name is MicroPure™ - distributed by Robertshaw®



Premium Compact-Twin UV lamps

- Robertshaw® twin lamps deliver more UV disinfection than longer single lamps.
- Robertshaw lamps deliver 85% of disinfection power at end of lamp life. Conventional lamps lose up to 40%.
- Below the 70% level, optimum disinfection may not be achieved.



Power Supply

- The 120 V power supply is a critical component to the optimum operation of a UV Light system.
- Electronic advances result in high frequency techniques designed into solid-state power supplies for UV light systems.
- Unit has a low profile to fit in more spaces.
- Lamp has a safety kill switch to turn off power.

UV System Features

- 3 Year Power Supply Warranty
- 1 Year Lamp Warranty
- 24 / 7 Operation
- Electronic High Efficiency Operating Head for long-life
- 9,000 hours per bulb
- 120V AC plug provided
- Safety interlock for worry-free bulb replacement
- Fixed Mount
- 1 Meter Kill Zone
- LED indicator for proper functionality

Manufacturer Analysis - Pros and Cons

Feature	Robertshaw®	Competition
Single Twin Lamp	Greater end of life lamp efficiency and eliminates the cost for multiple bulbs	Greater cost and less effective lamps at end of 9000 Hrs of operation
External Mounting	Unit mounts to desired location without removing panels	Longer install time
Bulb Replacement Kill Switch	Safer to replace bulb to prevent UV Light exposure to technician	No fail safe kill switch
Low Profile Head	Easier install and opens options for external mounted lamps	Not as flexible
External LED Light for Working System	Quick visual inspection for proper working system	Not as convenient and a non working light not replaced

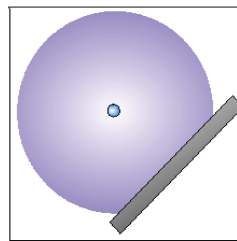
Manufacturer Comparison



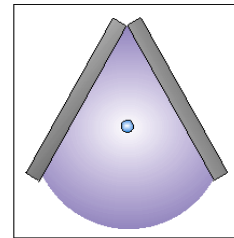
Feature	Robertshaw® MicroPure™	Fresh-Aire	Steril-Aire	Ultravation
Family Model or SKU	7602-002	TUV-100S-I	RSE-I	UME1900T
Single Twin Lamp	✓	✗	✗	✗
External Mounting	✓	✗	✓	✗
Bulb Replacement Kill Switch	✓	✗	✗	✗
Low Profile Head	✓	✗	✓	✗
LED Light for Working System	✓	✗	✓	✗

Examples of UV Placement in Typical Air Handlers

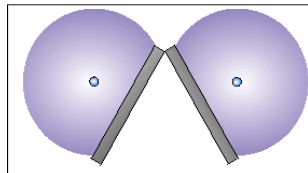
- Installs in central heating and air conditioning systems
- Installation options for an HVAC system with **A** coil
- Fits all types of AC coils



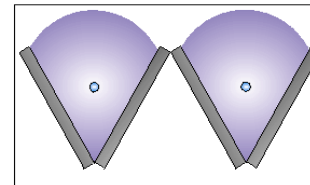
Single Lamp "Slab"
Coil Mounting



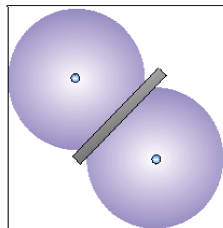
Single Lamp "A"
Coil Mounting



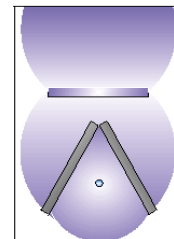
Dual Lamp "A"
Coil Mounting



Dual Lamp "W"
Coil Mounting



Dual Lamp "Slab"
Coil Mounting



Dual Lamp "A"
Coil Perpendicular
Mounting

Installation Setup

1. Best location for UV lamp is at the coil
2. Cut-out templates are provided for easy installation
3. Drill 2" diameter lamp access hole



Installation Setup

4. Fasten Mounting Ring to plenum with supplied self-tapping screws
5. Install Plastic Locking Ring to Mounting Ring with supplied self-tapping screws



Installation Setup

6. Install lamps into head of unit and slide into Plastic Locking Ring
7. Line up arrow to hollow circle and turn counter-clockwise



Installation Steps

8. Connect power cord to 120V and verify LED is on
9. Apply warning sticker to duct in highly visible location



The 7602-002 Operates At What Voltage?

- A. 240 Volts
- B. 24 Volts
- C. 480 Volts
- D. 120 Volts

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