

UV-C surface disinfection control system

When using UV-C lighting, the building occupant's safety should be the priority. That's why the **Philips Dynalite UV-C control system** is designed to enable operation of UV-C solutions in a safer way.

Safety first – why controls

While UV-C light offers significant benefits in inactivating the DNA and RNA of micro-organisms*, it must be used with care and consideration for the safety of people and animals. Direct exposure to UV-C damages skin and the retina, therefore it must only be used when people are outside of the areas irradiated by the UV-C light.

This solution includes safety mechanisms such as authorized activation, warning alerts before activating UV-C lamps, movement sensors and emergency stop switches to deactivate in case of potential hazards. The Philips Dynalite UV-C control system helps ensure that authorized operators can use and manage the UV-C solution in a safer way. The control system's multiple mechanical and network safeguards are designed with safety in mind and help prevent exposure to harmful UV rays while at the same time applying the appropriate UV-C dosage.

A proper UV-C disinfection system performs the following control functions:

- Confirms that the area is clear of human beings and/or animals before allowing the UV-C lamps to turn on.
- Signals the activation of the disinfection cycle to people in the neighborhood of the target area.
- Provides an easy way of locally stopping the disinfection cycle.
- Runs the UV-C lamps for the prescribed dosage and signals if the system was unable to complete the disinfection cycle due to premature stopping.
- Monitors the UV-C lamp run-time so that the system can advise the site that the UV-C lamps are reaching the end of their economic life and require a re-lamp.
- The system self-checks that all network devices such as occupancy sensors and internal control components are connected and responding correctly. If any issue is detected the system will prevent the UV-C lamps from turning on.
- Ensures that an unforeseen system fault cannot unintentionally activate the system.

This means:

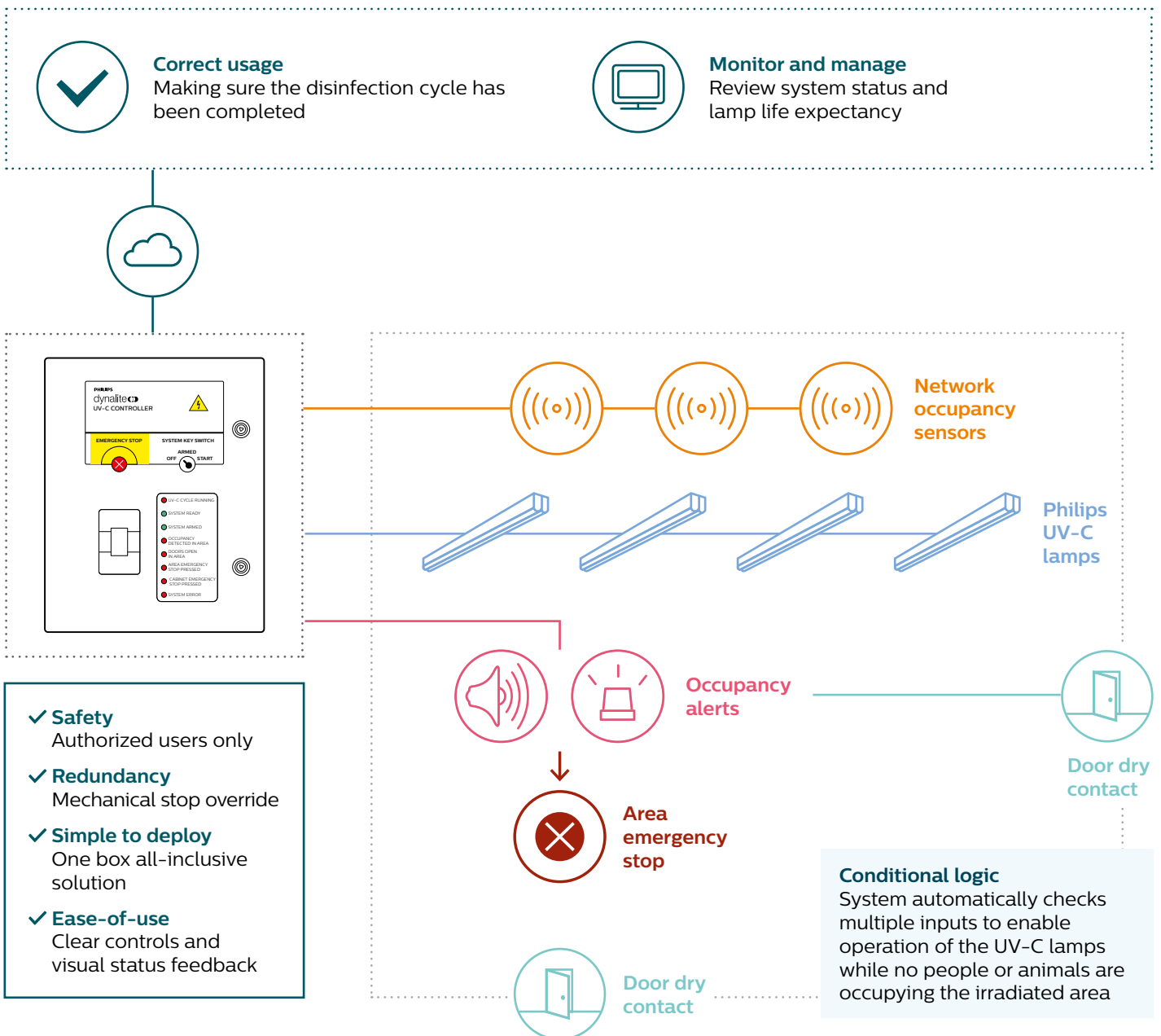
- ✓ Area entrances must be monitored.
- ✓ Multiple strategically mounted motion sensors need to be used for determining occupancy. A single motion sensor cannot be used for occupancy.
- ✓ The system can only be activated manually by a local authorised person. The authorized person will be required to review and comply with the instructions provided in the product documentation.
- ✓ Alarms (visible and audible are recommended) will be mounted to warn occupants that the system will be turning on and running the UV-C lamps.
- ✓ Emergency stop switches are mounted within the irradiated space to enable occupants to stop the cycle.
- ✓ The power circuit is physically interrupted when the system is not armed.

*Data shows that Signify's UV-C light sources irradiating the surface of a material inoculated with SARS-CoV-2 at a UV-C dose of 5 mJ/cm² (exposure time 6 seconds) resulted in a 99% reduction of the SARS-CoV-2 virus present on that surface. This study determined that a UV-C dose of 22 mJ/cm² results in a reduction of 99.9999% of SARS-CoV-2 virus on that surface (exposure time 25 seconds). Research details and variables are available upon request.



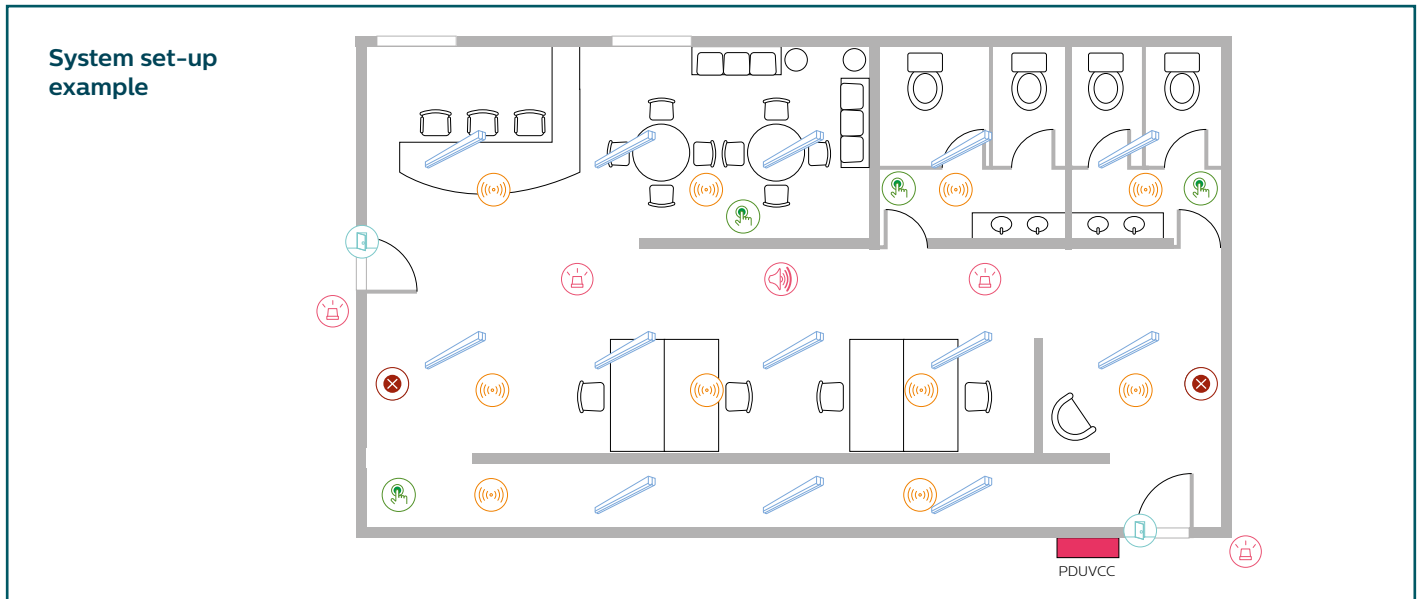
System architecture

An easy to install, integrated cabinet implements the required control, monitoring and logging functionality to enable the operation of the UV-C surface cleaning luminaires in a safer way, while maintaining flexibility for an installer to adapt the system to a specific room configuration.



Specifications

The system utilizes a range of components that work together to enable the operation of the UV-C lighting without any people or animals occupying the irradiated space.



Network sensors

Working with Dynalite sensors, the system self-discovers connected sensors and then monitors their status. 30 sensors is the maximum for a single system installation. The network sensor detects motion to determine occupancy. If any of the sensors detect motion within the area the system will consider it occupied and automatically deactivate the UV-C lamps initially or switch them off immediately when already activated.



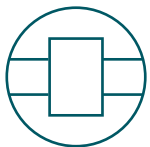
Door switches

The system takes an input from the area access door switches. Switches are connected in series, so that if any one door is open the system will detect it. If a door is open during the UV-C cycle then the system turns off the UV-C lighting immediately. The system also prevents the UV-C cycle from starting if any door is open. Door switches can be mounted up to 75m away. Door switches are a mandatory part of the system.



Area emergency stop buttons

The system takes an input from the area emergency stop buttons. Area emergency stop buttons are connected in series, so that if any one of the buttons is pressed the system will detect it. If an emergency button is pressed during the UV-C cycle, then the system turns off the UV-C lighting immediately. Emergency stop buttons can be mounted up to 75m away. Emergency buttons are a mandatory part of the system.



AntumbraDisplay

The AntumbraDisplay allows system operators to adjust the dosage of UV-C light needed. This will be in 30 minute blocks with a maximum of 5 dosages in a single cycle. The AntumbraDisplay also indicates UV-C lamp run-time. The system informs the system operator if the lamps have exceeded 9,000 hours and they will need to perform a re-lamp. If the lamp run-time exceeds 10,000 hours the system will change its status to a system error and stop the UV-C cycle from running. The AntumbraDisplay lets system operators reset the lamp run-time once the re-lamp has been completed.



Warning

Alarms (visible and audible are recommended) warn occupants that the system is about to run the UV-C lamps.

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