opentrons FLEX

HEPA/UV Module

Quickstart Guide

Opentrons Labworks Inc.

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Product Description

The Opentrons Flex HEPA/UV Module is a positive-pressure clean air and ultraviolet (UV) disinfectant accessory for the Flex liquid handling robot. It contains a mesh pre-filter, a HEPA filter, and two UV lights. Running the module's filtration and lighting for 15 minutes creates an ISO-5 clean bench environment within the Flex enclosure.

Review this guide for information about the features of the HEPA/UV Module, including installation, maintenance, and warranty information.

Warning: Biohazard!

The HEPA/UV Module is not a biosafety cabinet.

- Do not use it with pathogens.
- Do not use it in situations where volatiles or hazardous aerosolized materials are present.
- Do not use it to filter particles smaller than 0.3 micrometers (µm).

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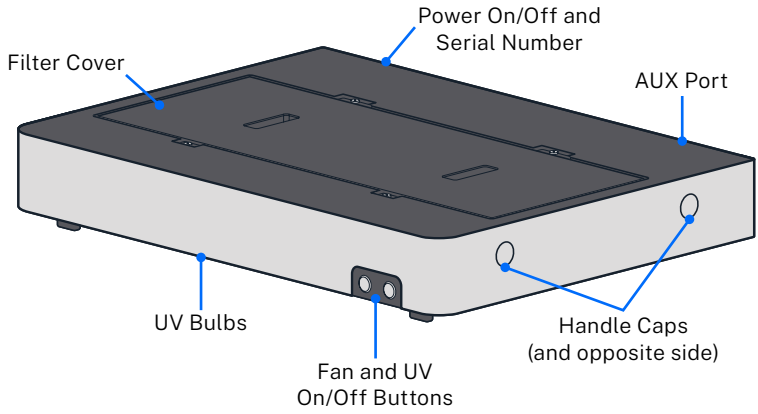
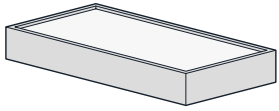
Product Elements



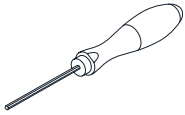
INCLUDED PARTS

(1) HEPA/UV Module

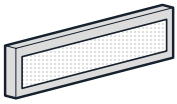
(1) M12 AUX Cable



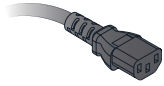
(1) HEPA Filter



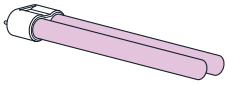
(1) 2.5 mm Hex Screwdriver



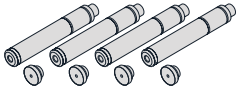
(1) Pre-Filter



(1) Power Cable



(2) UV Bulbs



(4 each) Carrying Handles
and Caps

HEPA SPECIFICATIONS

The Flex HEPA/UV Module uses a 2-stage filtration system to purify air pulled into the enclosure. This system includes a reusable pre-filter and a disposable H14 HEPA main filter. The pre-filter traps large particles while the HEPA filter captures up to 99.99% of airborne particulate matter at ≥ 0.3 micrometers (µm). Vertical air flow from the HEPA filter creates a positive-pressure environment within the enclosure. This air boundary helps protect samples inside the Flex from external contamination. The air cleaning system of the Flex HEPA/UV Module meets ISO-5 clean bench standards.

UV SPECIFICATIONS

The HEPA/UV Module holds two compact fluorescent UV bulbs. When on, the bulbs emit ultraviolet light (UV-C) at the 254 nm wavelength. At this wavelength, UV-C disinfects by killing or damaging the genetic material found in cells, viruses, bacteria, mold, and other microorganisms.

After a 15-minute exposure cycle, the ultraviolet light produced is sufficient to achieve log-4 (99.99%) inactivation of commonly targeted microorganisms within the enclosure. See the HEPA/UV Module Instruction Manual for more information.

UV SAFETY FEATURES

The HEPA/UV Module produces high-intensity UV-C. The Flex and the HEPA/UV Module come with features that protect you from UV-C exposure and prevent it from operating in an unsafe manner.

Safety feature	Description
Panels	The robot's polycarbonate door and side panels block UV spectrum light to below a level which represents an exposure risk. ***Never operate the UV lights with the robot's door or side panels removed.***
Door switch	Flex uses a mechanical switch to tell if the front door is open or closed. The UV lights only work when the front door is closed. Opening the door deactivates/disables the UV lights. This safety interlock works even when Flex is turned off.
Attachment sensor	The Flex and HEPA/UV Module each have a built-in sensor to detect if it is attached properly. The sensors deactivate/disable the UV lights if the module is not mounted on the robot, removed while in operation, or misaligned.

Warning:

- Direct exposure to UV-C light can damage your eyes and exposed skin. Always take care to protect your eyes and skin from exposure while the UV lights are on.
- Properly attach a fixture or deck plate cover in every deck slot before turning the UV lights on. Never operate the UV lights with empty deck cutouts.

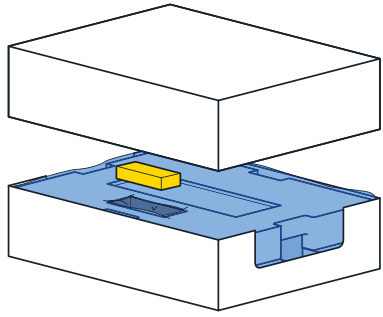
Unboxing and Installation

Ask a lab partner for help with unboxing, lifting, and attaching the module. For tools, you will need scissors and the 2.5 mm hex screwdriver that comes in the Module User Kit.

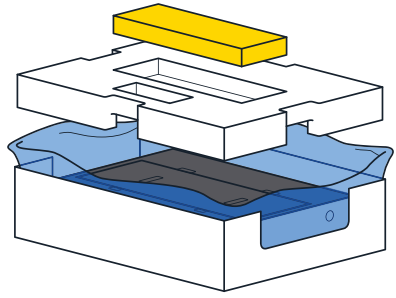
Note: When attached, the HEPA/UV Module requires 20 cm (8”) of top and side clearance to operate properly.

UNBOXING

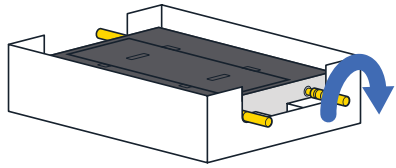
1. Open the box and remove the power cable.



2. Cut open the blue shipping bag. Remove the foam padding and the Module User Kit.

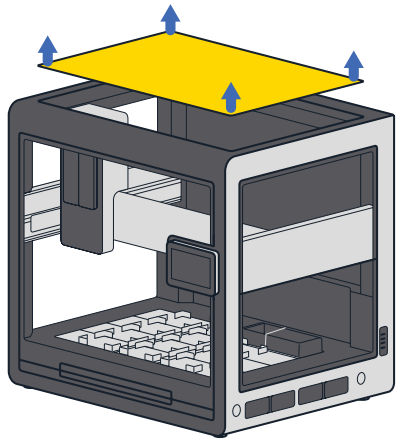


3 Remove the four aluminum handles from the Module User Kit. Screw the handles into the sides of the module. The bottom half of the box has side cutouts so you can attach the handles while the module is still in the box.

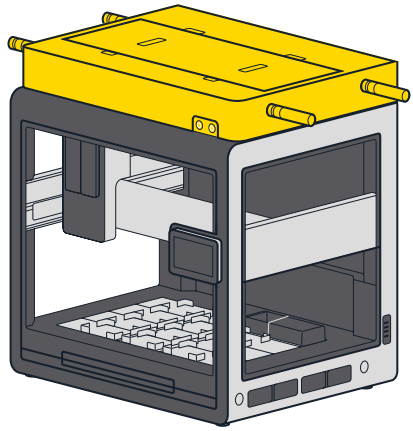


INSTALLATION

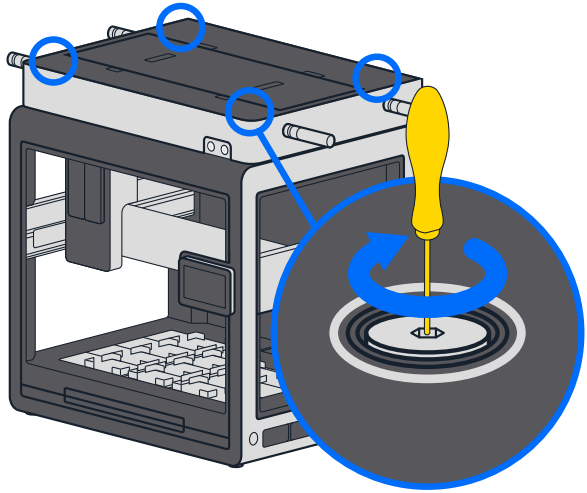
4 Using the 2.5 mm hex screwdriver, remove the top window panel from your Flex. Store the window panel and screws in a safe place for future reassembly.



5 Working with a lab partner, lift the module from its box by the handles. Lower the module onto the top of the robot. Chamfered corner pins on the module help guide it into place.

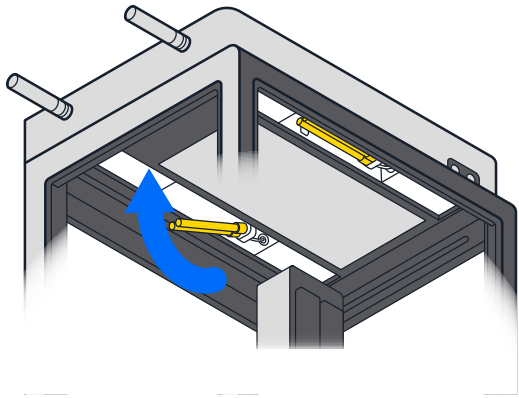


6 Use the 2.5 mm hex screwdriver to tighten the module's captive screws and fasten it to the robot.

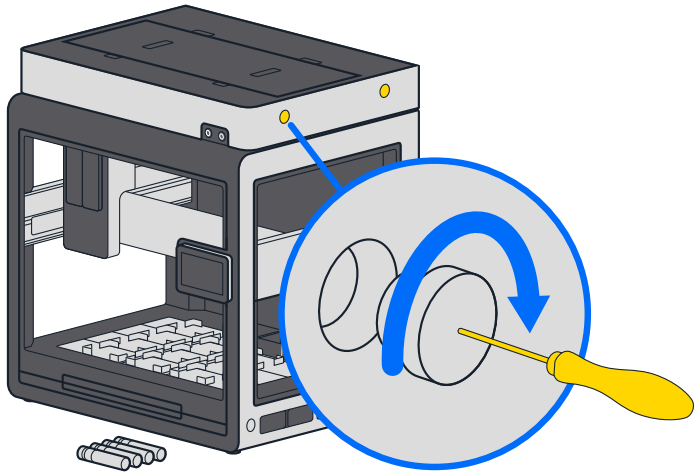


7 Remove the UV bulbs from the Module User Kit. Unwrap and install them in recessed receptacles on the underside of the module.

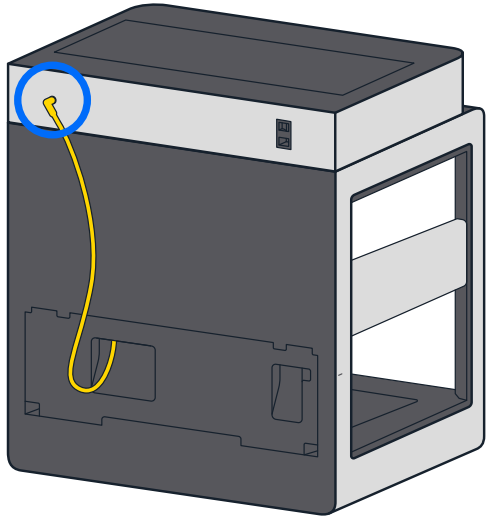
- If necessary, move the gantry to its home position at the back right. When Flex is powered off, the gantry should move easily by hand.
- Each bulb has 4 prongs that fit into the power receptacle. Push the prongs into the receptacle.
- Retaining clips hold the free ends of the bulbs in place. Press the bulbs gently until they snap into the clips.



8 Remove the carrying handles and replace them with the finishing caps. Fasten the caps using the 2.5 mm hex screwdriver. The caps close the handle openings and give the HEPA/UV Module a clean, finished appearance. Store the handles in the Module User Kit for future use.



9 Remove the M12 AUX cable from the Module User Kit. Attach the cord's right-angle connector to the AUX port on the back of the HEPA/UV Module. Attach the other end to an AUX port on the back of the Flex.



10 Connect the power cord to the module and to a wall outlet.

11 Press the rear power switch to turn on the HEPA/UV Module. The ring lights around the on/off buttons should glow white.

With everything secure, connected, and powered on, your HEPA/UV Module is ready for use. This module does not require calibration.

Hardware Controls

Separate on/off buttons on the front of the HEPA/UV Module control the fan and UV lights. You can operate these systems simultaneously or independently of each other.

See the following table for the information on how to operate the HEPA and UV systems.

Function	Operation
HEPA filtration on	Press **Fan** once.
HEPA filtration off	Press **Fan** again.
UV lights on	Press **UV Light** once. Do not turn on the lights during a protocol run.
UV lights off	Lights turn off automatically after 15 minutes. Or press **UV Light** again.

Ring lights around the on/off buttons change colors to indicate the operational status of the HEPA fan and UV lights.

LED color	LED pattern	HEPA/UV status
○ White	Solid	Idle
● Green	Solid	Normal operation
	Pulse	An operation cycle has been completed or canceled. Returns to white/idle state after pulse.
● Blue	Solid	Indicates user intervention required or an unsafe condition (e.g., the door opens while the UV lights are on).

Additional Product Information

MAINTENANCE

Aside from replacing the UV bulbs and filters, users should not attempt to service or repair the HEPA/UV Module themselves. See the HEPA/UV Module Instruction Manual for more information about bulb and filter maintenance.

If you have concerns about the module's performance or require maintenance, please contact Opentrons Support (support@opentrons.com).

CLEANING

Clean the outside of the unit with a soft cloth and diluted alcohol or distilled water. Do not use acetone or other aggressive solvents. See the HEPA/UV Module Instruction Manual for more information about cleaning and decontamination.

WARRANTY

All hardware purchased from Opentrons is covered under a 1-year standard warranty. Opentrons warrants to the end-user of the products that they will be free of manufacturing defects due to part quality issues or poor workmanship and also warrants that the products will materially conform to Opentrons' published specifications.

SUPPORT

Opentrons Support can help you with questions about our products and services. If you discover a defect, or believe your product is not functioning to published specifications, contact us at support@opentrons.com.

Please have the unit's serial number available when contacting support. You can find the serial number on the back of the unit by the power switch.

For a PDF of the complete **Opentrons Flex HEPA/UV Module Instruction Manual**, scan this QR code:

Post-sales service & contacting Opentrons

If you have any questions about the use of the system, abnormal phenomena, or special needs, please contact: support@opentrons.com. Also visit www.opentrons.com.