VWR® PCR Workstation: An ideal environment for PCR sample preparation and other sensitive protocols

When it comes to molecular biology research PCR method is the base of everything. There are thousands of different protocols for many different applications but basically it is all about the same thing – creating reliable results by working in a clean environment. To provide a clean and contamination-free environment there are several parameters to control: air flow and quality, potential airborne and surface-bound contaminants in the environment and the cleanliness of the sample itself.

FIGURE 1: VWR PCR Workstation Pro HEPA with enough space for different tools to prepare a PCR

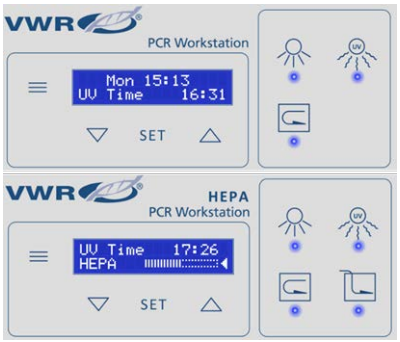

FIGURE 2: Modern control unit of PCR Workstation Pro (top image) and PCR Workstation Pro HEPA (bottom image)

FIGURE 3: Image of UV light indicators on top of the hood of PCR Workstation Pro HEPA

INTRODUCTION

When it comes to molecular biology research PCR method is the base of everything. There are thousands of different protocols for many different applications but basically it is all about the same thing – creating reliable results by working in a clean environment. To provide a clean and contamination-free environment there are several parameters to control: air flow and quality, potential airborne and surface-bound contaminants in the environment and the cleanliness of the sample itself. A dedicated special PCR room could be the best solution but only if there are space and resources available. A more flexible and more comfortable way to provide such a protective environment is a bench-top PCR Workstation where air flows are being controlled and equipment can be sterilized by internal UV light.

VWR® PCR Workstations do provide these features and give laboratories all over the world the utmost flexibility and highest German-manufactured quality to a competitive price.

PERFECT SIZE AND COMFORT

VWR® PCR Workstations are designed to create the perfect environment for a PCR setup and other sensitive protocols. With a working surface of 72cm x 54 cm, it is large enough to harbor all necessary equipment like pipettes, tip boxes as well as technical equipment to prepare all steps in one enclosed working space avoiding potential contamination. Four power outlets inside the cabinet allow the user to plug in different tools that will need an individual power connection (Vortexer, centrifuge, etc). The workstation can be set up anywhere in the lab as it fits easily on a lab bench and only needs a power outlet. The touch-sensitive and user-friendly control unit at the front of the hood (figure 2) can be used with or without lab gloves. As the system tracks the duty hours of all consumables (UV light, carbon and HEPA filters) there is no worry about missing the changing routine: the system automatically reminds the operator to change consumables once their lifespan has elapsed.

SAFETY FIRST

It is well known that UV irradiation leads to severe damages in the skin and other body parts. The front and side panels of the VWR® PCR Workstations are made of 8 mm Makrolon® working as a protector shield from UV irradiation and will not bleach overtime with UV exposure. In addition to the safety glass the door is provided with a magnetic security switch that automatically stops UV irradiation of the working space as soon as the front door is being opened, preventing hands and arms being exposed directly to the UV light.

Together with this integrated safety mechanism, UV light indicators (figure 3) at the top of the hood, visualize if the UV tubes in the air recirculatory and in the HEPA air flow (only for VWR® PCR Workstation Pro HEPA) are switched on. The inspection windows are also made of 8 mm Makrolon®.

HIGH FLEXIBILITY IN USE

If possible, all equipment dedicated to PCR experiments should be kept inside the workstation to be auto-decontaminated every day and in between the experiments. The system provides users with the utmost flexibility as they can program an automatic decontamination routine before the daily lab routine starts –simply set up the auto-decontamination timer for 30 min of UV irradiation at 7:30 am and start the lab day with a clean and ready-to-use working environment at 8 am. For more space one or two removable shelves can be installed to create additional storage on a 2nd level inside the hood.

FIGURE 4: Visualization of the air flows inside the HEPA workstation with fresh air intake (blue arrows) and UV air recirulator (green arrows); A) cross section through the hood; B) workstation in decontamination mode (door is closed); C) workstation in operation mode (door is open)

CHOOSE THE CLEANLINESS YOU NEED

VWR® PCR Workstations are equipped with several features for active and passive decontamination by design.

To provide a clean environment for PCR setup or any other sensitive assay, VWR® PCR Workstation Pro HEPA offers three independent decontamination functions.

- First, active decontamination of the working space during non-working time is ensured by two UV tubes that are placed in the hood, right next to the white light tube. UV can be exposed to the work surface and all material / equipment prior to use (figure 4B).
- In operation mode, an additional inactivation of aerosol-bound contaminants is achieved by a shielded UV Air Recirculator (figure 4C, green arrows). Any potential air-borne contaminant will be sucked up into the hood and enters the UV Air Recirculator system to be inactivated. Furthermore, this recirculatory air flow is pushed back into the working space after decontamination in the hood and creates an additional clean stream directly above the floor towards the door opening.
- The third and most effective decontamination action of the VWR® PCR Workstation Pro HEPA is the HEPA filter system (H14 standard) with integrated UV. It provides a barrier against dust, bacteria and mold. This three-stage filter system (figure 5) enables a clean working space. It features a fresh air input that is decontaminated by a pre-filter, a carbon filter and the HEPA filter (figure 4, blue arrows) in addition to the air recirculatory that cleans the used air from the inside of the PCR chamber reducing the chance of contamination by air that may blow into the PCR chamber. The HEPA air flow speed can be set individually and ranges from 0.3 m/s to 1.2 m/s, leaving the user to choose the intensity (s)he needs.

When the lab itself has already a good standardized clean environment for preparation of PCR assays, for example a dedicated PCR room, the risk of contamination through the surrounding air can be neglectable. In such a favorable environment the HEPA and carbon filter might be overkill. In this case the VWR® Workstation Pro in its basic version would be the equipment of choice (figure 6). It comes with dual decontamination routine (UV Air Recirculator and UV for surface decontamination) but without the HEPA filter and is therefore a more cost-effective solution.

FIGURE 5: Filter system inside the HEPA hood (from top to bottom): active charcoal filter, HEPA filter (H14) and metal chassis; pre-filter is not included in the picture

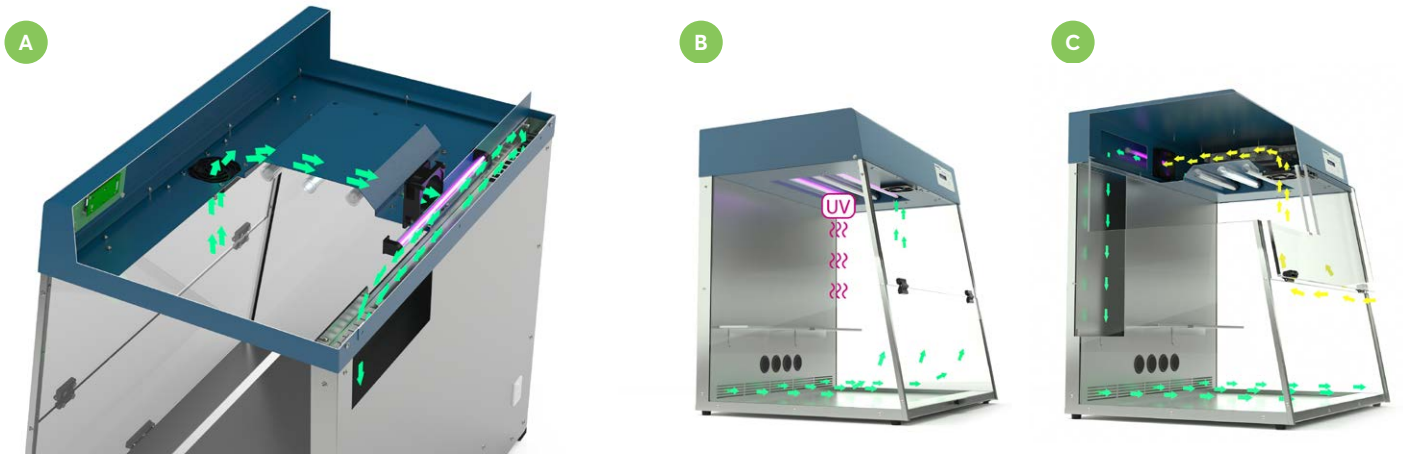

FIGURE 6: Visualization of the air flows inside the PCR workstation with UV air recirculatory (green arrows); A) cross section through the hood; B) workstation in decontamination mode (door is closed); C) workstation in operation mode, yellow arrows display contaminated air from the outside (door is open)

CONCLUSION

Learn more "VWR PCR thermal cyclers"

Choose the workstation with the cleanliness your lab applications need, to ensure reliable results. For more details see table below.

Once the PCR experiment is set up, use VWR® PCR thermal cyclers to ensure precise temperature control for highest yields of specific PCR product.

	PCR Workstation	PCR Workstation HEPA
UV tubes:		
Surface decontamination (2x)	✓	✓
Air Recirculator (1x)	✓	✓
Overpressure air (1x)	✗	✓
Auto-Decontamination Timer	✓	✓
UV safety protection	✓	✓
Filters:		
Air Recirculator filter	✓	✓
Pre-filter	✗	✓
Carbon	✗	✓
HEPA filter	✗	✓
White light sources (1x)	✓	✓
Work surface	720 x 540 mm (L x D)	720 x 540 mm (L x D)
Weight	48 kg	52 kg

Ordering information

Description	Cat. No.
VWR PCR Workstation Pro (EU-plug)	**732-2541**
VWR PCR Workstation Pro HEPA (EU-plug)	**732-3409**
VWR PCR Workstation Pro (UK-plug)	**732-2542**
VWR PCR workstation Pro HEPA (UK-plug)	**732-3410**

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