HERAguard Model HPH

Clean Benches

with Horizontal Airflow

Operating instructions

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Part of Thermo Fisher Scientific

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This instruction manual applies to the various versions of the HERAguard model series:	
Models	Equipment
HPH 9 HPH 12 HPH 15 HPH 18	This edition of the instruction manual applies to series manufacture clean workbench. These instructions can be modified to reflect specific options or accessories.
HPH 12/95 HPH 18/95	Models with taller working space

Read this instruction manual and keep it near the equipment for reference purposes! Failure to understand or to follow these instructions can result in reduced performance, damage to the unit, or endanger the health and safety of operating personnel.

Only authorized, knowledgeable service personnel may perform maintenance, adjustment, and repair work on this unit.

Below please find a list of contacts within the Thermo Sales Structure.

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The safety of this device with respect to persons, the environment, and the material being processed depends to a great extent on the behavior of those working with the device.
Health hazards in particular cannot, however, be ruled out.
This residual risk depends on the work being performed on a case-by-case basis.

These operating instructions contain important information for your safety, the setup and installation of the unit, and for the unit's operation and maintenance!

Please read these instructions carefully before operating this unit, and follow all instructions in order to avoid errors and resulting damage or hazards, particularly health hazards.

ALWAYS:

Wear protective gear (clothing, gloves, safety glasses...) appropriate to the level of risk involved.

Initiate and follow hygienic measures.
Each individual is responsible for his or her personal safety and health.

Control Panel

ALL switch elements and all optical and acoustic signal generators for operation and fault required to operate the unit are located on the control panel:

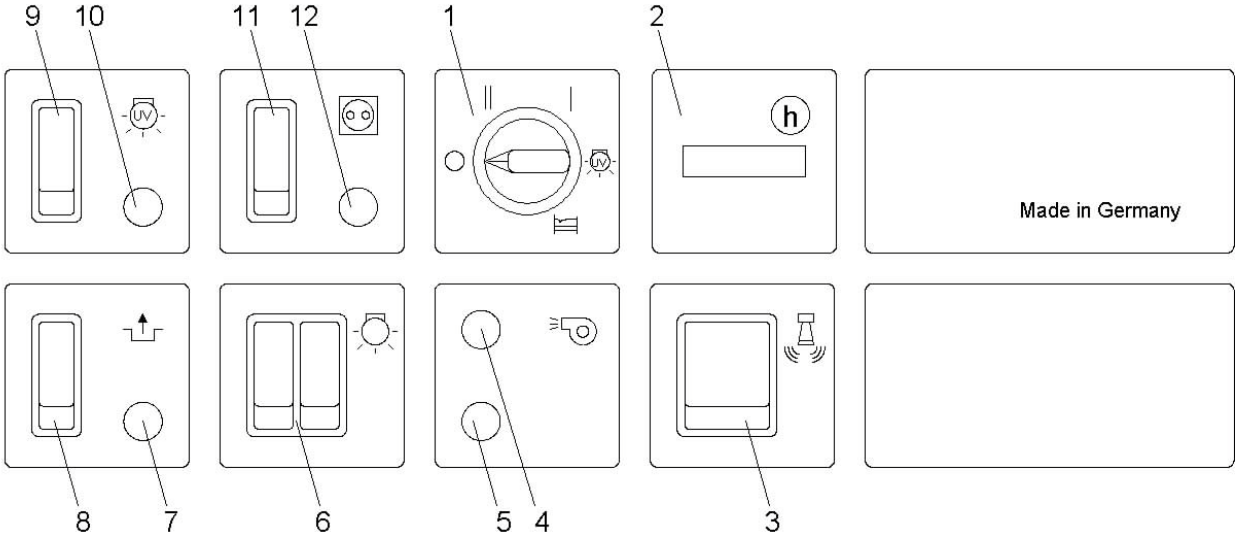


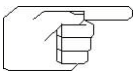
Figure 1: Control Panel

Control Panel Elements

Item-No.	Symbol	Message / Comment
	Power switch / Function selection switch, with key activation:	
	○	Unit off
	II	Unit on: Work / normal position
1	I	Unit on: Reduced ventilation
		Unit on: Operation with UV surface disinfectant lamp (optional)
		Unit on: Sleep mode, Ventilation off
Note: In any switch position, the key can be removed and held by an authorized individual to prevent the unit from being used by unauthorized individuals.		

Item-No.	Symbol	Signal	Message / Comment
2			Operating hours counter (e.g., for maintaining a unit log)
3			Acknowledge acoustic alarm button
4		green	Ventilation system operating correctly: **Run**
5		red	Ventilation system **Fault**
6			Sample chamber light ON/OFF switch Stage I and II
7		yellow	Release active
8			Release / unlock switch (optional, e.g., error message system release, unlock magnetic valves, etc.)
9			Start UV-lamp (optional)
10		yellow	UV lamp on (optional)
11			Outlet ON/OFF switch
12		white	Outlet on

Explanation of Symbols

Warning / Note / Quality Symbol	
	Chapters and sections within the operating instructions that relate to safety are indicated by this symbol.
	This symbol denotes a comment for optimum utilization of the unit.
	This symbol indicated a note concerning regulated disposal / recycling of raw materials.
	EU symbol that denotes conformity with all relevant European guidelines.

Disposal of Shipping Materials

The packaging is intended to protect the unit against damage during shipping. Aside from suitability for performing this protective function, packaging material selection is primarily based on environmental and disposal aspects to ensure that the material can be recycled.

- The corrugated cardboard is made of recycled paper.
- Molded plastic parts (Styrofoam) are FCCH-free.
- Wood crating / palettes are made of recycled, untreated boards.
- The polyethylene shrink-wrap (PE) is made from recycled material.
- Strapping is made of polypropylene (PP).

Returning the packaging material to the material flow for reuse saves raw materials and reduces the amount of waste generated by your operation. In general, you can return the packaging materials to your dealer.
If you prefer recycling the packaging materials yourself, contact your local municipal government for the location of the nearest recycling center.

Disposal of old Units

Prior to their proper disposal, used microbiological equipment must be thoroughly cleaned and disinfected. A corresponding certification that this has been done must be included with the equipment being disposed of.
Older units contain valuable materials. Do not simply send your used equipment to the nearest landfill, instead, contact your local municipal government authorities to determine what cleaning/ disinfection measures are required, or contact your nearest scrap metal dealer to determine whether your unit can be recycled.

Disposal of Used Filter Elements

The service life of filters depends primarily on the cleanliness of the air in the setup location.
Dirty filters can be treated as domestic waste and be disposed of accordingly.

For separate disposal, the filter medium (domestic waste) can be removed from the aluminium frame (recyclable waste). Discuss the various possibilities for disposal with your firm's waste management section.
Further, observe all applicable federal. state, and local regulations (FRG: BImSchG, AbFG...).

-Caution –

Thermo Electron LED GmbH **warns** against the handling of this possibly hazardous filter waste by individuals who do not possess the necessary federal, state, or local certificates for transporting and/or disposing of waste (possible a hazardous materials handling license).
As the source, you are responsible for this waste material.

Failure to observe all proper disposal regulations may make you liable to civil and/or criminal charges.

Should you encounter difficulties in disinfecting and thus neutralizing the filter elements in question, please contact us, and we will be pleased to have our service organization prepare an offer.

Energy Consumption

This unit is designed for **continuous operation** in order to minimise the risk of contamination.
The retention capabilities of the filters can only be ensured when they are in operation, that is, when air is flowing through them.

⇨ Therefore, never turn the unit's ventilation off immediately after completing your work. Otherwise any contaminants that are still floating free cannot be trapped by the filter. We recommend running the unit for a further 20 minutes in the low-power mode.

⇨ To save electricity, turn the test chamber light off whenever you are not working with the unit.

If necessary, surface disinfection of the test chamber should be performed.

Safety Notes

Read the operating instructions carefully before beginning work with the unit in order to prevent errors and resultant damage, particularly to the health of personnel.

The unit may only be employed for its intended purpose, that is, for work with non-hazardous substances or vapors with the highest requirements for production safety.
The use of the bench for any other purpose may present unknown risks and hazards, and is not permitted.
Using these operating instructions as a basis, the operator (company) is to prepare written, understandable instructions in the local language, and tailored to the work to be performed on or with these clean benches.

In order to minimize the risk of contamination during operation:
The unit may only be operated by trained and fully instructed personnel.

In case of damage:
A damaged unit can endanger the safety of the operator and present a hazard to the surrounding environment!
Take all necessary steps to prevent contamination, and immediately shut the affected unit down.
⇨ **Prerequisite:**

- Proper installation
- Unit repair or replacement of parts in case of recognized damage;
- Disinfection and cleaning in accordance with an appropriate disinfection/cleaning schedule and prior to extensive periods of non-use.
- Regular safety inspections:
  INSPECTION INTERVAL: AT LEAST ANNUALLY

Any necessary repairs may only be carried out by properly trained specialists. Improper repairs can result in significant hazards to the user and the environment.
The operability and safety of the workbench can only be guaranteed if all necessary inspections, maintenance, and repair work are performed by the Thermo Electron LED GmbH Service Department or be individuals authorized by Thermo Electron LED GmbH.
Follow all applicable federal, state, and local guidelines when setting up and operating the unit.
The unit s electrical safety can only be assured if it is connected to a properly installed and operated grounded power supply.
It is vital that this basic safety requirement is met.

If in doubt, have the in-house circuits examined by a qualified electrician.

Thermo Electron LED GmbH cannot be liable for damages, particularly personal injuries, resulting from a missing or interrupted ground circuit.

It may be necessary to perform suitable disinfection/ cleaning work before beginning maintenance.

Disconnect the unit from the electrical and other supply networks before beginning maintenance/repair work, and pull the unit's power plug out of the wall socket or remove or turn off the fuse or circuit breaker. Lock the unit out to prevent the power from being accidentally turned on to it. Shut off and lock the gas connection, and secure it.

To prevent static electricity buildup and the hazards associated with it, it may be necessary to conned any supply lines (e.g., gas, water...) to your building's ground circuit.

If flammable materials/solvents are used or released during work in the test chamber, remember that, after a point that is specific to the material involved, these materials form a flammable, and in some cases explosive, vapour/air mixture.
This mixture can result in fires or explosions.
If such work cannot be avoided, make sure that the release of such materials only occurs if there is adequate ventilation. Releases are to be controlled in such a way that they stay well below the limits with respect to the ventilation/volume flow of the unit and the laboratory ventilation system, as set forth in the regulations concerning primary explosion protection.
In order to ensure the stability of the unit, only laboratory benches with an appropriate degree of stability and adequate capacity, or the bases and stands available as accessory parts may be employed.

If in doubt and were the unit is subject to rough treatment, additional anchors should be installed. Suitable wall-mounting hardware is available to prevent the unit from being tipped.

Disinfect all no longer used units and make them unusable by cutting their power cord.
Carefully file these operating instructions for subsequent reference to safety instructions and other Important Information.
Please include the model and manufacturing numbers from the nameplate in all Inquiries and when ordering spare parts.

Operating Instructions

Using these operating instructions as a basis, the operator (company) or an authorized individual is to prepare written, understandable instructions in the local language, and tailored to the work to be performed on or with these clean benches. (FRG: BGV A1)

All affected employees are to receive regular instruction with respect to the safety issues involved in the employment of these units.

Those sections of this manual that may be reproduced (for internal use only) for this purpose are indicated in the contents.

Unit Log

Thermo Electron LED GmbH. recommends the maintenance of a unit logbook.
Test reports, reports concerning maintenance, repairs, relocations, etc., related to the unit are to be documented in this log which may be filed separately from the operating instructions.

Personnel training/instruction activities should also be documented here.
Thermo Electron LED GmbH recommends filing reports regarding the materials processed in the bench in the log as well, in order to be able to develop and carry out targeted sterilization/ disinfection plans.
A recommendation for such a log is included with the device.

Test Chamber Power Outlets

1/PE AC, 230 V power outlets are installed in the test chamber to connect any necessary tools or instruments.

Power to the outlets can be turned on and off from the control panel.
The outlets are equipped with T 5 A fuses to prevent short circuits or overloads from interrupting power to the unit and thus shutting down the technical ventilation (contamination hazard).

Thus, the maximum load that can be connected to the secondary outlets is 1,100 Watts.
A higher level of protection may endanger the selectivity of the unit's internal protection with regard to the protection to be provided (by the customer) by a T 16 A fuse.

This jeopardizes the effectiveness of the unit. If in doubt, provide a dedicated connection. Under no circumstances (e.g., in case of fuse replacement) may a higher level of protection be provided.

If more power is required for instruments/tools, the unit can be correspondingly retrofitted. In this case, a dedicated connection must be provided.

Application Area

The clean bench with horizontal airflow is a laboratory-quality unit, that:

- Protects the material being processed against hazardous influences from the test area.
- In general, clean benches are suitable for setup and operation in the following areas:
- In laboratories performing microbiological and biotechnology work;
- In pharmacy laboratories;
- In medical/microbiological laboratories in accord. with DIN 58956;
- In laboratories in the central areas of clinics and hospitals;
- In optical industry laboratories;
- In electronics industry laboratories.

The unit may not be used to process hazardous substances or vapors.

Follow all applicable federal, state, and local ordinances with respect to setup.

Clean benches provide no protection against hazardous gases or vapors.

Unit Construction

Fig. 1 / 4: Device Construction, front view

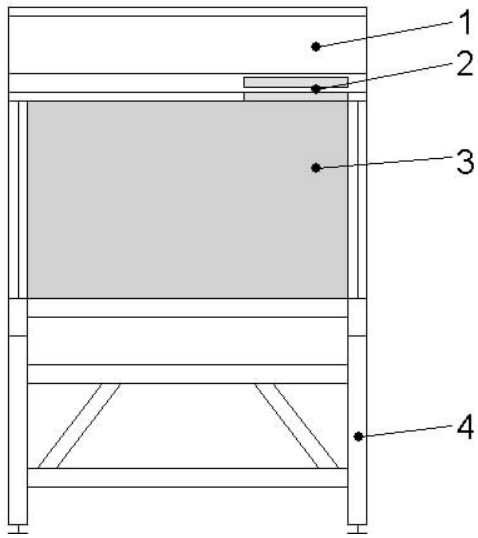
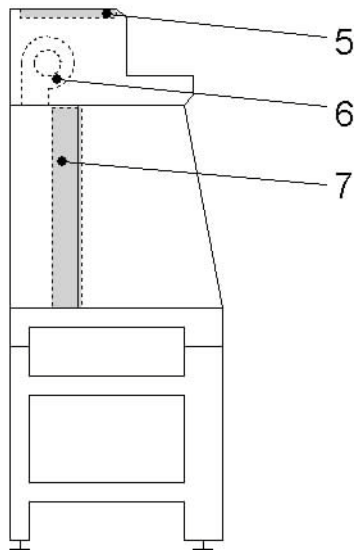


Fig. 2 / 4: Device Construction, side view

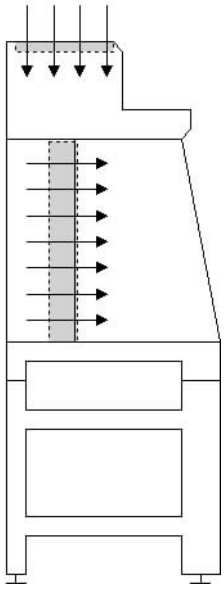


Key to Figure 1/4 and 2/4:

1. Housing
2. Control panel
3. Working space
4. Base
5. Air intake protector
6. Fan
7. Filter

Operating Principle

Fig. 3 / 4: Airflow through the system



The clean bench for product protection is a laboratory-grade unit into which ambient air is drawn through a prefilter in the top of the unit. This air passes through filters and is distributed horizontally over the entire work surface.

Safety Equipment

At regular intervals, but at least annually, all safety equipment is to be checked by properly qualified personnel for proper operation.

⇨ Power switch with key lock (Function Selection Switch)

In order to minimize the risk of contamination, the unit - from a technical ventilation aspect - is designed for continuous operation, and is equipped with a power switch with a key lock.

Use of the power switch assumes that only authorized individuals will consciously turn the unit on.

The use of a key allows the responsible operator to protect defined functions/modes by removing the key, thus preventing accidental or unauthorized operation of the unit. The key can be removed in any switch setting.

Air Monitoring

The air and volume flowrates are continuously monitored.

Problems in any of the flows will initiate optical and acoustic alarms. The monitoring function performs a self-test (monitoring of the system at rest) when the unit is switched on. The optical and acoustic alarms will only turn off at the successful conclusion of this test.

- If the unit signals a persistent problem with the airflow (RED indicator light on):

the unit may be faulty. Check the ventilation ratios, or have the unit inspected by an authorized service technician.

⇨ Fuel Gas Shutoff (Optional)

If the unit is equipped with a fuel gas connection, an additional magnetic valve that closes when there is no current can be installed in the in-house gas line or directly on the outside of the gas connector to provide a secondary shutoff. (Accessories: magnetic valve and connection for an external monitoring system).

If the unit's ventilation fails, a signal/contact is generated by the clean bench, shutting off the fuel gas supply.

This same lock can also prevent fuel gas from being accidentally released when the power to the unit is turned off (power switch position "O").

Only laboratory-grade safety Bunsen burners may be used in the unit.

⇨ UV-Lock (optional)

Before turning on the UV lamp, remove the shipping protector cover from the UV tubes.

The UV lamp in the test chamber can only be employed if it is consciously selected with the key switch (special tool setting of the power/mode selection switch).

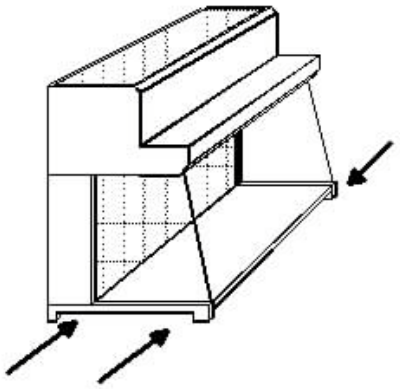
Pressing the start button turns the UV lamp on for a predefined period of time (60 min.).

Always wear appropriate safety glasses and protective clothing.

Transport

To move the unit, it can be lifted at the locations shown in the sketch.
We recommend the use of transport aids such as wood strips to provide support and protection.

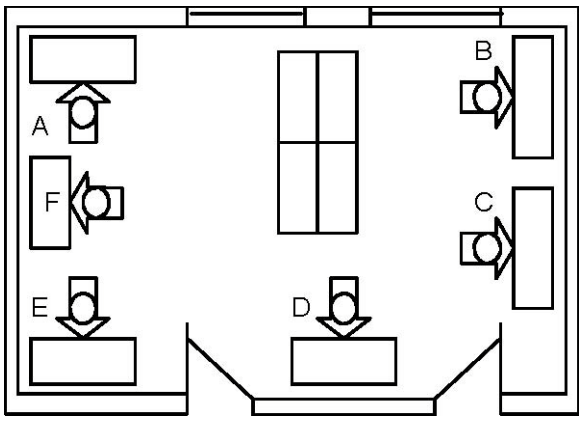
Fig. 1/5: Transport aids attachment points



Setup Location

Follow all applicable federal, state, and local guidelines pertaining to the setup and installation of the clean benches.

Correct, "draught-free" setup of the unit in the laboratory is an essential requirement for safe operation.
Fig. 2/5: Examples of good and bad setup locations in a room:



Locations A, E, and F are well selected. Here, neither draughts nor traffic can be expected to affect the unit.
Location B is significantly influenced by draughts.
Location C is influenced by both draughts and traffic.
Location D is also influenced by both draughts and traffic.

The bench must be set up horizontally on a low-vibration, secure stand, capable of supporting it.

Select the setup location so that air moving in front of or around the bench does not negatively impact its ventilation system. The setup location should face away from doors or windows in order to eliminate as much draught as possible. The location should also be selected to avoid traffic near the cabinet or behind the user.

Room Ventilation

The laboratory in which the unit is to be set up must be adequately ventilated.

This should be a technical ventilation system that exchanges the room air at least 8-12 times per hour.

Setup

If the unit is set up on a workbench, it should not overhang the bench edges.

If the unit is to be set up as a freestanding device, additional measures to secure it may be necessary.

- When using the optionally available stand: Assemble the stand at the intended setup location and level it. The underside of the bench is equipped with openings that fit over the mounting studs on the top of the stand to center the bench on the stand.

Check the adjustable feet on the stand and, if necessary, adjust them to provide a secure, horizontal base.

Normally, no additional connections to secure the bench to the stand are required. Should additional security be desired, mounting brackets that hold the bottom of the bench to the base are available.

To prevent the bench from being accidentally tipped over, additional measures to secure it may be required (e.g., wall mounting, floor mounting).

To prevent damage that would impair the unit's safety or operation, additional holes for the installation of wall-mounting hardware may only be drilled in accordance with express instructions provided by Thermo Electron LED GmbH.

Spacing

Minimum lateral spaces for any installed hardware must be observed in order to ensure accessibility for maintenance/repair work.

If several units are to be set up in a row, a minimum distance of 5 - 10 mm between benches must be maintained in order to avoid the transmission of vibrations and other factors. To prevent dirt from building up between units, these gaps should be sealed. Use an elastic sealant for this.

Before setting up the units in a row, always check that there will be adequate access for any necessary inspection, maintenance, and repair work.

Connections

⇨ Power supply

For Austria: The unit may only be connected to an electrical system that meets the requirements set forth in ÖVE - EN 1.

For Switzerland: The unit must be connected to the electrical system via a switch or circuit breaker. Installation must be performed by a qualified electrician, and be in accordance with the SEV guidelines.

Before establishing the power connection, make sure the specifications on the unit's nameplate agree with those of the power supply.

- Required mains protection: circuit breaker or T 16 A fuse.

The bench is equipped with a permanently installed, flexible power cord.

To prevent contamination, the unit is designed for continuous operation.
The connection to the power supply can be either by means of hardwired connection or a grounded outlet with a cover (to prevent the unit from being accidentally unplugged).

The unit's electrical safety can only be assured if it is connected to a properly installed and operated grounded power supply. If in doubt, have the in-house circuits examined by a qualified electrician.

Thermo Electron LED GmbH cannot be liable for damages or injuries resulting from a missing or interrupted in-house ground circuit.

The unit is designed to be free of mains feedback, in accord. with EN 55 014.

⇨ **Fittings** (accessory equipment)

Follow all applicable federal, state, and local technical ordinances pertaining to the establishment of supply connections to the fittings provided on the unit.

To prevent static electricity buildup and the hazards associated with it, it may be necessary to connect any supply lines (e.g., gas, water...) and the unit itself to your building's ground circuit.

A voltage compensation connection on the top of the unit and on the stand are provided for this purpose.

⇨ **Monitor connection / connection to external monitoring systems (optional)**

The connection can be activated/deactivated by the release/unlock key.

The intake protection must be removed to establish this connection:

- Remove the intake protection mat from the top of the unit.
- Remove the grid screen.
- Perform the installation.

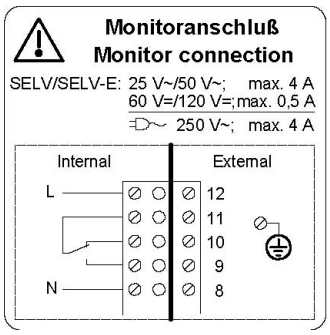


Fig. 3 / 5: Direct connection of a magnetic gas valve with power supplied (= mains power) from the workbench

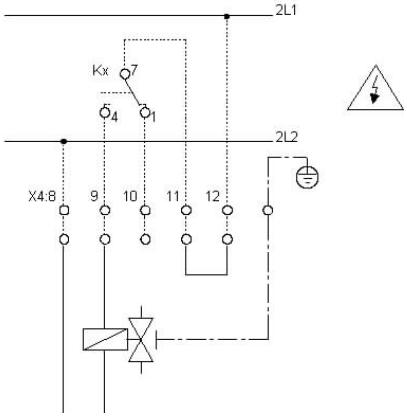


Fig. 4 / 5 Connection of an external fault alarm system with an external power supply (Example: horn, indicator lamp)

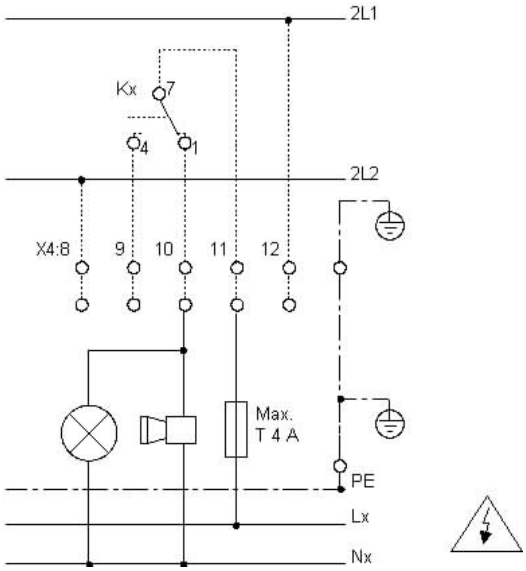
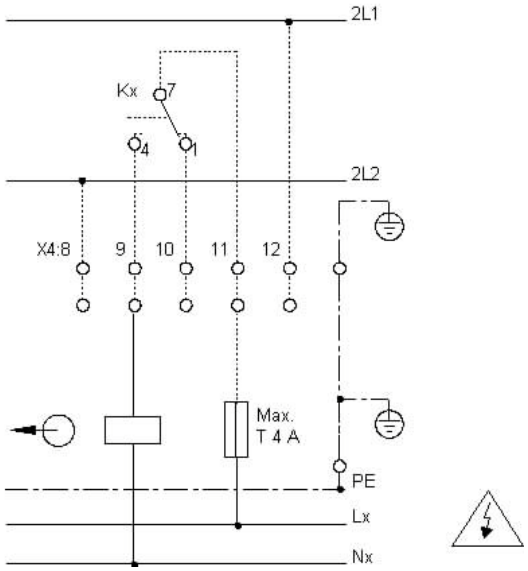


Fig. 5 / 5: Connection of an external signal processor (central monitoring)



Sound Dampening

Less than ideal setup conditions may result in excessive noise levels.

Additional sound dampening measures may be required in-house to counteract this.

For information concerning noise levels, refer to the Section TECHNICAL SPECIFICATIONS.

Safety check, initial startup

Before starting the unit:

After the unit has been properly set up and installed, a safety check of the bench must be performed.

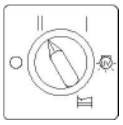
Only a unit that is operating properly can provide the necessary degree of operator protection and protection against contamination.

During startup, parameters such as:
- Airflow rates,
- Cleanliness zones/cleanliness classes,

should be determined and noted in the unit log.

Properly connect the unit to the mains power supply.

Starting the clean bench

Switch	State
	Power switch (keyswitch) = "II“, Operation: After the airflow monitor self-test (approx. 5 - 10 sec.), the green indicator light indicates that the airflow monitor is ready.
An optical (red indicator light) and acoustic alarm will warn of problems with the circulation or exhaust air systems. The optical alarm will only go out once the problem has been rectified.	
	The acoustic alarm can be turned off by pressing the acknowledge alarm button.
To reduce the risk of contamination as much as possible: Wait approx. 15 to 20 minutes after turning the unit on. This will allow the safety cabinet to reach its proper ventilation equilibrium. You can now commence work in the test chamber.	

Working Guidelines

Aside from the information previously provided in the "Safety Information" section, please also note the following:

The effectiveness and safety of the unit depends primarily on the proper behavior of individuals working at he clean bench.
Turn the clean bench on at least 15 minutes prior to starting work in order for the test chamber ventilation to reach proper equilibrium.

Always wear appropriate protective gear, e.g., gloves, face protector, and protective clothing. Remove all jewelry.

Disinfect and clean the test chamber surfaces regularly.

Use only lint-free materials to wipe down test chamber surfaces. Always run the ventilator during all disinfecting work. Recommended disinfecting agent: one based on aldehyde.

When using alcohol-based disinfectants, please note: avoid EXPLOSION HAZARDS caused by alcohol vapors in the air. Use as little alcohol as possible. Follow all applicable federal, state, and local ordinances.

Only place clean, disinfected tools/aids in the test chamber. Limit the tools/aids to a minimum, e.g., no writing utensils, packaging, or similar materials. Placing larger objects in the test chamber may impair the product protection offered by the bench.

Avoid any negative influences on the airflow while working in the test chamber.

- When shutting the unit down:

Remove all objects placed in the cabinet, and disinfect and clean them, as required.

Disinfect and clean the test chamber, as required.

Disinfect and remove any residue from the test chamber.

Cleaning and disinfecting agent residue may be damaging to subsequent work. As far as possible, ensure that no residue remains.

After disinfecting, operate the bench for at least an additional 15 minutes.

Error Messages

Limit the risk of contamination:
Allow the ventilation to operate continuously.

Possible causes:
- Inadequate airflow
  (e.g., air vent covered)

If the problem cannot be rectified, inform your maintenance department. Do not attempt to repair the unit yourself.

Taking the unit out of service

Desinfect and dispose of any residue from the test chamber.

Continue to operate the clean bench for at least 15 minutes after cleaning.

The operability and safety of the safety cabinet can only be guaranteed if all necessary inspections, maintenance, and repair work are performed by authorized Thermo Electron LED GmbH Service personnel.

Maintenance must be performed every 5,000 operating hours or annually, whichever comes first.

The operating time counter can assist in determining the maintenance interval. We recommend concluding a maintenance contract.

Routine Maintenance Tasks

Under normal operating conditions, little is required to maintain the clean bench in proper working order.

⇨ Cleaning

For cleaning, use only small amounts of commercially available, domestic dish-washing detergent dissolved in water. Abrasives/scouring powders can destroy surfaces. Never clean any glass areas with abrasives or agents that can lead to abrasion.

- **Daily or weekly, depending on utilisation level:**

Disinfect and clean the test chamber.
As a disinfectant, we recommend Barrycidal 36.

Clean the exterior bench surfaces and glass areas with a mild detergent solution or glass cleaner.

Using these operating instructions, perform a functional inspection of the unit's equipment.

Document all work performed in the unit log.

- **Monthly (or more often, as required):**

Using a lint-free cloth and the above-described cleaners, remove any dust accumulation from the exterior of the unit.

Perform the previously described disinfection of the interior.

Perform a functional inspection and check the safety equipment during normal operation.

Document all work performed in the unit log.

- **Annually:**

Safety inspection in accord. with locally applicable technical standards, and performed by trained personnel authorized by Thermo Electron LED GmbH.

Replace the UV radiation element (if equipped with this option).

Document all work performed in the unit log.

- **Every two years:**

Replace the test chamber light bulbs.

Replacing Electrical Parts

Work on the unit's electrical equipment may only be carried out by a qualified electrician and with the bench in a safe condition (power turned off).

Only original replacement parts tested and authorized by Thermo Electron LED GmbH may be employed.

The operator's trained electrotechnical personnel may replace the test chamber lighting unit.

Filter Replacement

⇨ General information

Because of the possibility of contamination, filter replacement may be the most serious maintenance task you will need to perform on this device. Aside from a knowledge of the applicable ordinances and standards, detailed knowledge concerning the modalities of the unit in question is vital for this task.

Only trained and authorized Thermo Electron LED GmbH Service Technicians can perform this task properly. This is the only way to keep the contamination risk in the setup area to a minimum.

Only accessories and corresponding replacement parts tested and authorized by Thermo Electron LED GmbH may be employed. The use of other parts carries unknown risks and hazards for personnel and equipment, and is not permitted.

Authorised Replacement Parts

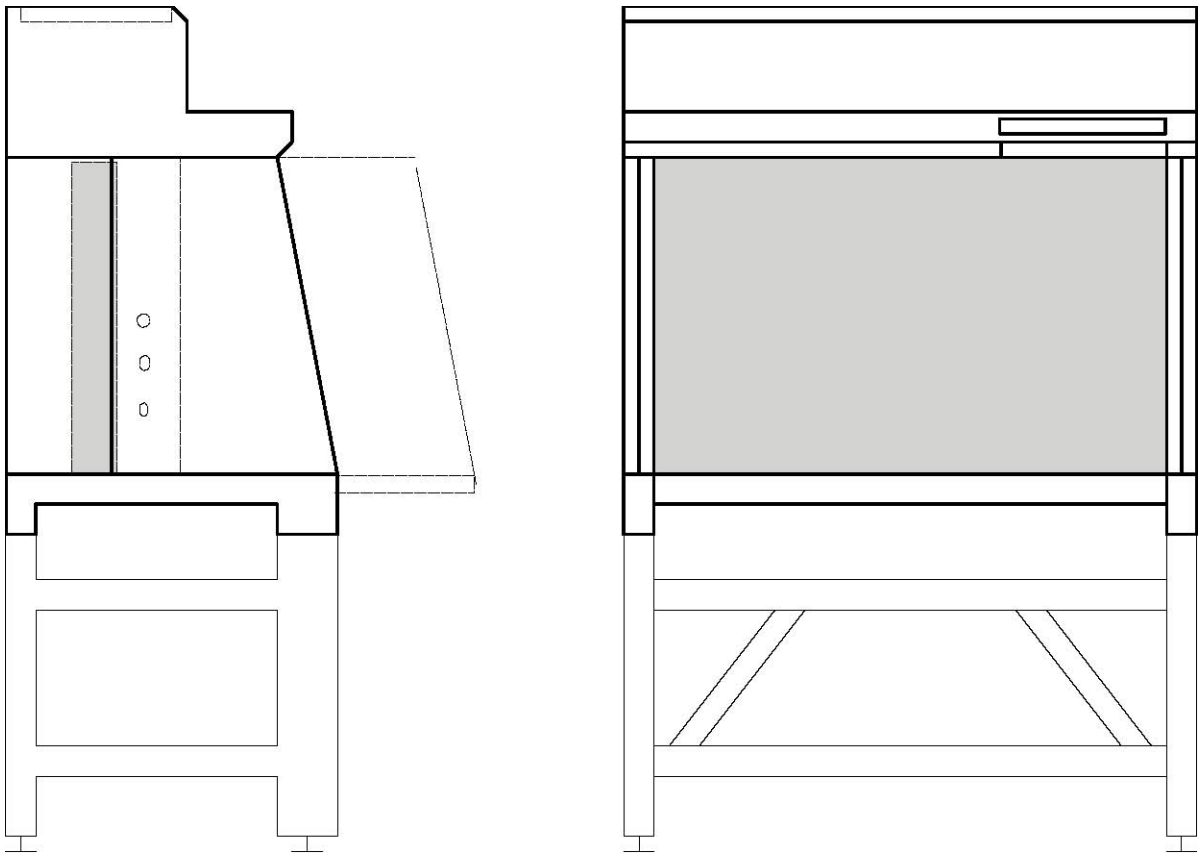
Models	HPH 9	HPH 12	HPH 15	HPH 18
Parts	Order number			
Intake protector	50051735	50050797	50051736	50050798
Filter	50120094	50120126	50120127	50120128
Power circuit fuses	56052523	56052523	56052523	56052523
T 5 A, fuse for outlets	50046843	50046843	50046843	50046843
Instruction manual	50131894	50131894	50131894	50131894

Models		HPH 12/95		HPH 18/95
Parts	Order number			
Intake protector		50050797		50050798
Filter		50120094		50120094
Power circuit fuses		56052523		56052523
T 5 A, fuse for outlets		50046843		50046843
Instruction manual		50131894		50131894

Authorised Accessories

Models	HPH 9	HPH 12 HPH 12/95	HPH 15	HPH 18 HPH 18/95
Parts	Order number			
Stand	50118458	50118459	50118460	50118461
Circuit diagram	50050553	50050553	50050553	50050553

Fig. 1/8:Overview of unit dimensions, with base (accessory item).
Models with a deeper test chamber are indicated by cross-hatching.



	Models	HPH 9	HPH 12 HPH 12/95 [1)]	HPH 15	HPH 18 HPH 18/95 [1)]	
Geometry						Unit
Exterior dimensions	Width	1000	1300	1600	1900	mm
	Height [2)]	1170	1170 / 1470	1170	1170 / 1470	mm
	Depth [2)]	800	800 / 1000	800	800 / 1000	mm
Test chamber	Width	920	1220	1520	1820	mm
	Height [2)]	650	650 / 950	650	650 / 950	mm
	Depth [2)]	580	580 / 780	580	580 / 780	mm
Minimum space to ceilings		~150	~150	~150	~150	mm

Weights, Performance					
Unit weight	110	125/135	140	160/170	kg
Max. surface load for one-piece work panel	30	30	30	30	kg

1) Models with higher test chamber
2) Varies by model

Models	HPH 9	HPH 12 HPH 12/95 [1)]	HPH 15	HPH 18 HPH 18/95 [1)]	Unit
Electrical Parts					
Reference voltage	1/PE AC, 230	1/PE AC, 230	1/PE AC, 230	1/PE AC, 230	V
Reference frequency	50	50	50	50	Hz
Power consumption	0,75	0,75	0,75	1,3	KW
Current consumption	3,3	3,3	3,3	5,7	A
Protection class	I	I	I	I	
Grounding method	Ground wire connection	Ground wire connection	Ground wire connection	Ground wire connection	
Protection type	IP 20	IP 20	IP 20	IP 20	
Individual protection to be provided by the customer	**T 16 A** fuse (slow-blow) or **B 16** line circuit breaker. All applicable federal, state, and local ordinances pertaining to electrotechnology and the individual connection conditions must be observed.				
Fuses for the protected outlets in the test chamber	230 V, T 5 A				
	The individual outlets can be connected to a load of up to 5 amps and are protected by T 5 A fuses. When all outlets are employed simultaneously, the maximum total load may not exceed 5 amps.				
Radio interference shielding	Mains-interference-free in accord. with EN 55 014				

Filtration		
Primary filter		
Type		High-performance, suspended particle filter (HOSCH)
Separation level		99.999% at a particle size of 0.3 µm
Filter classes	[EN 1822	H 14
	[Eurovent 4/4]	EU 14
		EU 14 (ULPA)
		Class S preferred
Intake protector		
Type		Dust filter
Separation level		Coarse - Medium
Filter class	[EN 779]	G 3

VENTILATION			
Air speed	II	I	
	0.32 - 0.48	0.18 -0.32	m / s
Noise generation	II	I	Unit
Sound level	< 60	< 55	dB (A)

Illumination Strength				Unit
Test chamber		> 500	> 1000	lx

Ambient Conditions			Unit
Operation	Temperature	+ 5... + 40	°C
	Humidity	90%	r. H.
Storage	Temperature	-20... + 60	°C
	Humidity	70%	r. H.

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