

Cole-Parmer®



Cole-Parmer®

DLF-400 Series
Laminar Flow Ductless
Bench

USER OPERATION MANUAL

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Specifications are subject to change without notice or obligation

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Safety Warnings

- This cabinet offers no operator protection, only product protection.
- This cabinet is capable of achieving ISO Class 4 air cleanliness within work zone as per ISO 14644.1 (equivalent to Class 10 as per US Federal Standard 209E).
- Read all instructions before proceeding and observe the installation procedure and environmental/electrical requirements.
- Anyone working with, on or around this equipment should read this manual. Failure to read, understand and follow the instructions given in this documentation may result in damage to the unit, injury to operating personnel and/or poor equipment performance.
- Any internal adjustment, modification or maintenance to this equipment must be undertaken by qualified service personnel.
- The use of any hazardous material in the cabinet must be monitored by an industrial hygienist, safety officer or some other suitably qualified individual.
- Explosive or inflammable substances should never be used in the cabinet unless a qualified safety professional has evaluated the risk involved.
- If chemical, radiological or other non-microbiological hazards are being used in the cabinet, additional protective measures should be taken. The operation should also be monitored by a suitably trained individual.
- Before you proceed, you should thoroughly understand the installation procedures and take note of the environmental/electrical requirements of the cabinet.
- If the equipment is used in a manner not specified by this manual, the protection provided by this equipment may be impaired.
- Even with the benefits they provide, germicidal ultraviolet lamps pose imminent danger if used without taking the proper precautions. You **MUST** avoid exposure to direct or reflected germicidal ultraviolet rays, since they cause painful eye irritation and reddening of the skin. In order to use our direct germicidal UVC products, you **MUST** wear personal protection equipment—gloves, a long sleeve shirt with no gaps between cuffs and gloves and an ultraviolet-blocking face shield to protect eyes and exposed skin. Under no circumstances should any direct germicidal UVC unit be permitted to operate with humans, plants or animals present in the operation area.

Symbols



Warning of hazardous area or situation



Warning of dangerous electric voltage

Limitation of Liability

The disposal and/or emission of substances used in connection with this cabinet may be governed by various local regulations. Familiarization and compliance with any such regulations are the sole responsibility of the users of the cabinet. The liability of Cole-Parmer is limited with respect to user compliance with such regulations.

European Directive on Waste Electrical and Electronic Equipment (WEEE)



At the end of your product / accessories life, it must not be discarded as domestic waste. Ref: EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment Directive (WEEE). Please contact your distributor / supplier for further information. For end users outside of the EU consult applicable regulations.

Warranty

The manufacturer agrees to correct for the original user of the product, either by repair (using new or refurbished parts), or at the manufacturer's election, by replacement (with a new or refurbished product), any defects in material or workmanship which develop during the warranty period. The standard warranty is twelve (12) months after delivery of the product for Non-Consumable and Electrical parts, excluding Filters and other Consumables. In the event of replacement, the replacement unit will be warranted for the remainder of the original warranty period or ninety (90) days, whichever is longer. For purposes of this limited warranty, "refurbished" means a product or part that has been returned to its original specifications. In the event of a defect, these are your exclusive remedies.

If the product should require service, contact the manufacturer's/supplier's office for instructions. When return of the product is necessary, a return authorization number is assigned and the product should be shipped, transportation charges pre-paid, in either its original packaging or packaging affording an equal degree of protection to the indicated service center. To ensure prompt handling, the return authorization number must be placed on the outside of the package. A detailed explanation of the defect should be enclosed with the item. The warranty shall not apply if the defect or malfunction was caused by accident, neglect, unreasonable use, improper service, acts of God, modification by any party other than Cole-Parmer, or other causes not arising out of defects in material or workmanship.

EXCLUSION OF IMPLIED WARRANTIES. THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THOSE OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHICH EXTEND BEYOND THE DESCRIPTION AND PERIOD AS STATED IN THE OPERATOR'S MANUAL INCLUDED WITH EACH PRODUCT. LIMITATION ON DAMAGES. THE MANUFACTURER'S SOLE OBLIGATION UNDER THE WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT OF A DEFECTIVE PRODUCT AND THE MANUFACTURER SHALL NOT, IN ANY EVENT, BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND RESULTING FROM USE OR POSSESSION OF THIS PRODUCT.

Some states do not allow: (A) limitations on how long an implied warranty lasts; or (B) the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may have other rights that vary from state to state.

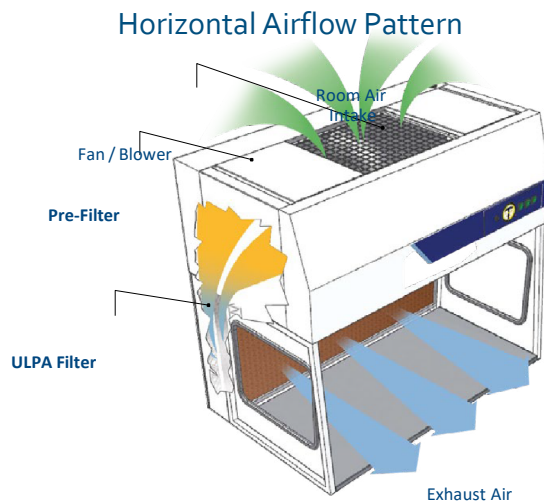
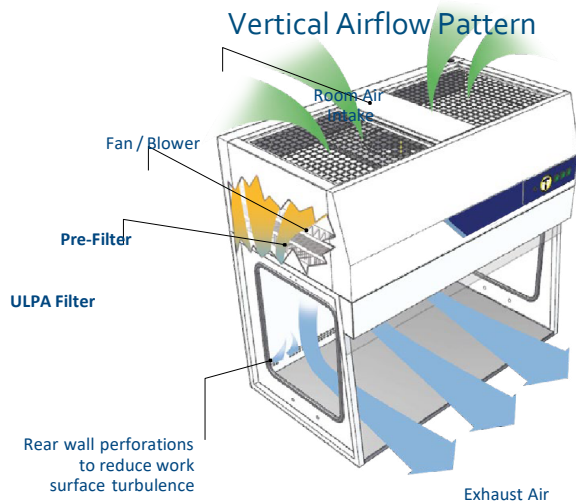
I. Product Information

DLF-400 Series laminar flow cabinets offer proven protection for your products and processes where operator protection is not necessary. They are suitable for applications which require ISO Class 4 air cleanliness within the work zone as per ISO 14644-1 (equivalent to Class 10 per US Federal Standard 209E).

Visit our website for DLF-400 Series Laminar Flow Cabinet specifications.

Airflow Pattern Inside the Cabinet

Room air is taken in from the top of the cabinet through a disposable pre-filter with 85% air resistance, serving to trap larger particles and increase the life of the main filter. Air is forced evenly across an H14 HEPA/ULPA- filtered laminar flow air stream within the cabinet, diluting and flushing all airborne contaminants from the interior, resulting in a stream of clean laminar air within the work area. A nominal filter face velocity of 0.4 to 0.5 m/s (80 to 100 fpm) ensures that there is a sufficient number of air changes within the enclosed area of the cabinet in order to maintain cleanliness. The purified air travels across the internal work zone of the cabinet in a vertical or horizontal unidirectional stream, leaving the main work chamber across the entire open front of the cabinet.



II. Unpacking Your Cabinet

This chapter aims to provide relevant information on how to handle the cabinet properly upon receipt. Failure to follow these instructions may damage the cabinet. We strongly advise you to read this chapter carefully before proceeding further.

2.1 Step-By-Step Procedure

1. Inspecting the Crate, Pallet, Boxes.
 - » Upon receipt of your new cabinet, inspect all cartons. If there is any visible damage to the exterior please contact us.
2. Moving the Pallet.
 - » The pallet is designed to protect the cabinet from any foreseeable circumstances. However, excessive impact on the boxes or pallet may also damage the cabinet. Prevent any direct impact or hitting to the pallet when moving.
 - » When lifting the pallet, always ensure that the floor jack or mechanical lift truck has fully entered under the pallet in order to achieve stability. Failure to do so will increase the risk of the pallet falling off the floor jack or mechanical lift truck during handling. Please use a suitable extension bar when necessary.
3. Opening the Boxes.
 - » If you did not receive one or more of the parts listed on the packing checklist, or if any of the items are damaged, please contact us.
4. Removing the Packaging Material.
 - » The cabinet is protected by foam, cardboard and/or shrink-wrap.
 - » If you find any damage during this stage of unpacking please refer to please contact us.
 - » We recommend leaving the cabinet secured with straps to the pallet until the cabinet is located in its approximate final position to facilitate ease and safety in handling.

NOTE: Choosing the best location for your cabinet in order to achieve optimum operating performance is determined by a number of factors. Please refer to the next chapter for some guidelines.

5. Moving the Cabinet.

- » When lifting the pallet with the cabinet, always ensure that the floor jack or mechanical lift truck has fully entered under the pallet. This is to increase the stability of the cabinet and reduce the risk of the cabinet falling down. Please use a suitable extension bar when necessary. During the moving of the cabinet, ensure there is enough distance between the supports of the pallet and the ground. Dragging the pallet against the ground will damage the pallet and possibly your new cabinet.
- » When removing cabinet from pallet or placing cabinet onto pallet, use at least two people.

6. Removing the Strapping.

- » Remove the strapping by cutting it at a safe position to prevent scratching the surface of your new cabinet.
- » Do not discard the packaging material for your cabinet until you have checked all of the components, installed and tested the unit.

7. Lifting the Cabinet.

- » The cabinet can be lifted in two sections: The HEAD unit and ENCLOSURE.
- » Install the cabinet on the existing work surface or Cole-Parmer support stand (if ordered).

NOTE:

- » When installing the cabinet onto an existing work surface, ensure that the structure can safely support the combined weight of the cabinet and any related equipment. Some modifications to the work surface may be necessary.
- » The work surface should be smooth, non-porous and resistant to the disinfectants and chemicals used in conjunction with the cabinet.

2.2 Packaging Contents

The following items are included with your manual:

- Test Certificate
- Test Report

In case this manual and/or test report is lost or misplaced, Cole-Parmer retains a copy in our files. A replacement copy can be obtained by contacting Cole-Parmer and providing the cabinet model, serial number and a brief description of the information desired.

III. Installing Your Cabinet

3.1 Choosing a Suitable Location

Location impacts the nature and extent of external airflow disturbances, which may affect performance of the cabinet when it is exposed to these disturbances.

When installing the cabinet, it should be located as far away as possible from sources of airflow disturbance and in an orientation which optimally shields the airflow of the cabinet from all external airflow disturbances. Please note that the cabinet should not be placed close to another cabinet.

Please follow these guidelines when choosing a suitable location for your cabinet.

- The location must be far away from:
 - » Personnel traffic flows.
 - » Air vents (in and out).
 - » Doors and windows.
 - » Any other sources of disruptive air currents or air drafts.
- If drafts or other disruptive air currents exceed the face velocity of the filter, the potential exists for contaminated air to enter the work zone of the cabinet.
- A minimum distance of 50 cm (20 in) to the top of the ceiling is recommended for blower changing purposes.
- A clearance of 183 cm (6 ft) in front of the cabinet is strongly advised in order to maintain proper airflow.
- Please permit adequate space for cleaning behind the cabinet.

3.2 Environmental / Electrical Conditions

The equipment is designed to be safe for at least the following conditions:

- » Indoor use.
- » Altitude < 2,000 m (6,562 ft).
- » Temperature range 20°C to 30°C (68°F to 86°F). It is recommended that the temperature in the laboratory be maintained within +/- 2°C under all conditions.
- » Relative humidity 20% to 60%.
- » UL Installation Category II.
- » UL Pollution Degree 2.
- » Electrical supply tolerance of -10% / +10%.
- » 120VAC, 60Hz, 10A or 230VAC, 50Hz, 5A.
- » Fuse: 250V, 10A, Time Lag for 120VAC or Fuse: 250V, 5A, Time Lag for 230VAC.
- » Always ensure unit is connected to a reliable and properly grounded receptacle.

Power Cord:

- » 1) For units intended to be operated at 120 volts (North America): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.
- » 2) For units intended to be operated at 230 volts: Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

3.3 Installing Your Cabinet

1. Please refer to [Unpacking Your Cabinet](#).
2. Inspect your cabinet carefully. Should you find any defect please contact us.
3. Peel off any protective masking that was left on the cabinet during manufacturing.
4. Wipe down the interior and exterior of the cabinet with water or a mild household detergent.
5. Connect cabinet to the main power supply and turn on the blower. Each cabinet requires its own dedicated 13A (230V) or 15A (115V) power outlet which should not be shared with other appliances. Please leave cabinet on for 3 minutes in order to purge airborne contamination from the work area.



WARNING! Do not move the cabinet without observing the following precautions:

- Observe the necessary precautions when relocating the cabinet, as it is heavy.
- **Warning - Tipping Hazard.** Pushing high up on the unit may cause system to tip over. Be careful when moving. Move with assistance only.

3.4 Performance Validation / Certification

After installation and prior to use, cabinet performance must be validated and certified to factory standards.

The following tests should be performed:

- » Airflow Velocity
- » Filter Leak Test (filter media leak test and filter gasket leak test)
- » Site Installation Assessment Test
- » Noise Level Test
- » Optional Tests
 - Electrical Safety
 - Light Intensity Test
 - UV Intensity Test

These testing methods are specified on the test report. It is recommended that these tests be performed only by a qualified technician who is familiar with the methods and procedures for certifying laminar flow cabinets.

NOTE:

Besides the noise level test prescribed in the test report, the following noise level test is recommended. Weighted, sound pressure level measurements should be taken at both the operator's position in normal use and several points which are 1 meter (3.3 feet) from the enclosure in order to determine the highest sound pressure level at 1 meter. Many authorities regard sound pressure level of 80 dBA above a reference sound pressure of 20 uPa as the threshold at which a hazard may be caused. Therefore, if the recorded sound pressure level reading exceed this value, it is recommended that the operator consider the use of noise-reducing baffles. The use of ear pieces can make a higher level non-hazardous for an operator.

34.1 Importance of Performance Validation / Certification

An airflow velocity value that falls below the value specified inside the test report will not provide adequate product protection. Possible product contamination may occur when the filter is leaking.

The testing methods and equipment required are specified on the test report. It is recommended that these tests be performed only by a qualified technician who is familiar with the methods and procedures for certifying these types of cabinets.

34.2 Recertification

After the initial certification, the cabinet shall be recertified in the following situations:

1. Relocation of cabinet.
2. When performance is suspect.
3. Major maintenance or service (filter changing, blower changing, etc.).
4. At least annually.

34.3 Disclaimer

The performance of the cabinet, while rigorously evaluated at the factory, cannot be guaranteed after transit and installation. Therefore on-site testing is always recommended.

IV. Operating Your Cabinet

4.1 Laminar Flow Control System



Standard Control Panel

Fan / Light Switches

To turn on and turn off the fan and lights.

Outlet Button

Controls power to electrical outlets in the work zone.

Pressure Gauge

To indicate pressure drop across the filter, to maintain nominal airflow velocity as specified inside the test report.



UV Controller

The standard UV control panel includes the same features as the standard control panel with the addition of a UV lamp key.

UV Key Switch

Permits UV to be activated. Switch Fan to OFF position. Wait 2 minutes. Install front cover. Switch Light to ON position. Turn key switch. UV lamp will activate. Factory default time is 15 minutes once UV is activated.



WARNING! Eyes and skin should not be exposed directly to ultraviolet light. Always install front cover before activating to prevent risk of UV exposure.

4.2 Cabinet Start-Up Procedure

1. Adjust the seating position so that the user's face is above the front opening. Adjustable stool is recommended.
2. Turn on the fan. Leave the cabinet on for 5 minutes before beginning work in order to purge airborne contamination from the work area.
3. Prepare a written checklist of materials/apparatus necessary for immediate usage and surface-decontaminate before loading them into the work zone. This is to prevent overloading and to minimize the number of arm movements that might disrupt the airflow.
 - » Never use the cabinet to store supplies or laboratory equipment.
 - » Keep the back air grilles unobstructed by arms or objects.
 - » Always surface-decontaminate all items before inserting into the work zone.
4. Load and arrange the materials/apparatus to minimize the movement of contaminated items over clean items by segregating the contaminated items from the clean items.
5. A clean, long-sleeved laboratory coat may be used to protect personal clothing.
6. Wash hands thoroughly using germicidal soap. Wear gloves for hand protection. Gloves should be pulled over the knitted wrists of the gown rather than worn inside.
7. Minimize room activity (personnel movements, closing and opening doors, etc.).
8. Thoroughly surface decontaminate the work surface, inner back walls and interior surface of the window using 70% ethanol or other disinfectant depending on the requirements of the user.

4.3 Working In The Cabinet

1. Work from clean to dirty by following the segregation of clean and dirty materials/apparatus as described in the Start-Up Procedure above.
2. Particularly critical objects may be arranged such that air flows directly against them while the back air grilles remain unobstructed by arms or objects.
3. Do not use a gas flame, if possible, as it interferes with airflow.
4. Do not use writing materials inside the work area as they generate aerosols.
5. Do not change the original blower speed of the cabinet unless the change is required by a decrease in measured air velocity. Adjustment should be made only by a qualified technician.
6. Do not operate the cabinet if fan fails to run.
7. Do not cough or sneeze into the work zone.
8. Minimize arm movement. Move arms in and out of the cabinet slowly to avoid disrupting cabinet airflow. Surface-decontaminate prior to inserting arms into the cabinet.
9. Use absorbent pads on the work surface where appropriate to minimize splatter and aerosol generation in case of spillage.
10. Clean materials should be at least 150 mm away from aerosol generating objects to minimize the chance for cross contamination.
11. Hold lids/covers above dishes/sample plates in order to prevent air impingement where appropriate.
12. Arrange objects to avoid airflow turbulence.
13. Keep arms as far away as possible from items in the work zone.
14. Keep heads (large potential for aerosol generation) out of the work zone.
15. It is recommended that the cabinet be operated continuously whenever possible to ensure cleanliness.

4.4 Cabinet Shutdown Procedure

1. Install front cover (optional) and activate UV lamp (optional) when present.
 - a. Eyes and skin should not be exposed to direct ultraviolet light.
 - b. Ultraviolet light should not be relied upon as the sole disinfecting agent.
 - c. Check the UV interlock regularly for correct operation.
 - d. Use of the UV lamp in laminar flow cabinets is explicitly discouraged in all major international standards and recommendations.
2. Once complete, turn off the cabinet, remove laboratory gloves and coat and thoroughly wash hands.

4.5 Ergonomics

During cabinet operation, you will most likely be seated.

Advantages of the sitting position:

1. Physiological energy costs and fatigue are reduced.
2. Body is provided with stable support.

Disadvantages of the sitting position:

1. Limited working area.
2. Possible risk of being constrained in a fixed posture for a long period of time.
3. One of the most stressful positions for the back.

Create a more comfortable and healthier working condition by following these simple steps:

1. Ensure that there is enough space for your legs and feet.
2. Keep the lower back comfortably supported by your chair. Adjust the chair or use a pillow behind your back when necessary.
3. Position your feet flat on the floor or on a footrest. Do not dangle your feet and compress your thighs.
4. Vary your sitting position throughout the day. Do not sit in one fixed posture all day.

Guidelines for eyes:

1. Give your eyes frequent breaks. Periodically look away from the work area and focus on a distant point.
2. Keep your glasses clean.
3. Arrange and position frequently used work materials to minimize the possibility of eye strain.

V. Maintaining Your Cabinet

5.1 Maintenance Schedule

Please follow the suggested maintenance schedule in order to maintain your Cole-Parmer cabinet at its optimum performance.

Daily

Thoroughly surface-decontaminate the work surface, inner back walls, interior window surface using 70% ethanol or mild disinfectant. Surface decontaminate UV lights also. Do not insert any body part except hands into work zone.

Monthly

- Using a damp cloth, clean the exterior surfaces of the cabinet, particularly the front and top of the cabinet, to remove any accumulated dust. When needed use soap or other mild household detergent.
- Check all service fixtures for proper operation.
- All daily activities.

Quarterly

- Replace pre-filters.
- All monthly activities.

Semiannually

- Replace HEPA/ULPA filters.
- All quarterly activities.

Annually

- Have cabinet recertified by qualified technician.
- Replace UV lamp, if present.
- All semiannual activities.

Biennially

- Replace the fluorescent lamps.
- All annual activities.

User Monthly Maintenance Schedule

Model:	Year:
Serial Number:	Responsible Person:

Month	Clean Exterior Surface	Notes	By Who
Jan			
Feb			
Mar			
Apr			
May			
Jun			
Jul			
Aug			
Sep			
Oct			
Nov			
Dec			

5.2 Disinfecting Agents

1. For stainless steel, all common disinfecting agents except chlorine-based agents are suitable.
2. For powder coated surfaces, all common disinfecting agents are suitable. The cabinet has been specifically evaluated for use with the following:
 - » 1N hydrochloric acid
 - » 1N sodium hydroxide
 - » 1% quarternary ammonium compound
 - » 5% formaldehyde
 - » 2% iodophor
 - » 5% phenol
 - » 70% ethyl alcohol

NOTE:

- » Never spray chemicals directly onto the surface of the unit; spray onto a wipe or cloth first.
- » Do not spray any cleaning agents onto acrylic panels as this will cause damage.



WARNING!

Do not use any disinfectant containing a chlorine-based substance as this will cause corrosion to steel and stainless steel, resulting in irreparable damage to the cabinet structure.

VI. Maintenance By Service Personnel Only

6.1 Cabinet Airflow Balancing

After some period of usage, the pressure drop across HEPA/ULPA filters will increase, otherwise known as “filter loading”. Compensate for this effect by increasing the fan speed, however the limit to this increment in speed is the maximum supply voltage according to the fan performance curve. If this happens and the required cabinet performance cannot be achieved, the filters must be changed. Please refer to the filter changing section below. Follow the steps described below to adjust the fan speed:

1. Remove front control panel.
2. Adjust speed control to achieve desired velocity.
3. Recertify the cabinet after speed is adjusted.

6.2 Filter Changing

The HEPA/ULPA filter, under normal usage and barring an accident such as a puncture, does not need replacement until the airflow velocity cannot be maintained at the specifications required by the test report, even though the fan has been set to maximum speed. The filter changing procedure is described below. The cabinet must undergo recertification after filter changing. Before the new filters are installed, all surfaces should be thoroughly cleaned of silicon and/or adherent gasket material. The new filter should be carefully handled and examined prior to fitting. It is important that the filters and the gaskets be checked for leaks prior to use.

Vertical Cabinet Filter Changing:

1. Remove the cover, held in position by screws in front and thumb screws in rear.
2. Remove the filter clamps by releasing the bolts.
3. Carefully remove the supply filter.
4. Replace new filter by reversing the above steps.

Horizontal Cabinet Filter Changing:

1. Remove the back cover, held in position by screws.
2. Remove the nuts located on the two sides (top and bottom) of the vertical clamps.
3. Remove all vertical clamps along with the u-plates.
4. Carefully remove the supply filter.
5. Replace new filter by reversing the above steps.

NOTE: THE FOLLOWING APPLIES FOR BOTH VERTICAL AND HORIZONTAL LAMINAR FLOW CLEAN BENCHES.

- The nuts that are used to clamp the filter must be tightened until 50% compressed with alternating pattern after the new filter is installed. The nuts must be equally tightened to provide uniform compression. This prevents over compression on one side of the filter that may cause filter leakage.
- Pre-filters (all units) - Remove pre-filter from top of cabinet and replace.

6.3 Blower Replacement

Blower Replacement for a Vertical Cabinet

1. Mesh and mesh separator must be removed before proceeding to the blower replacement instruction.
2. Disconnect electrical connections as necessary to free blower.
3. Remove screws and lift up blower assembly from the supply plenum.
4. The blower is secured to the mounting plate, which is held in position by 4 aluminum profiles. First, remove the mounting plate from the 4 profiles, then remove the blower from the mounting plate.
5. Disconnect electrical connections as necessary to free blower.
6. Reinstall blower by reversing above steps.

Blower Replacement for a Horizontal Cabinet

1. Pre-filter and mesh must be removed first before proceeding to the blower replacement instruction.
2. Disconnect electrical connections as necessary to free blower.
3. Remove nuts, which clamp to the blower.
4. Carefully pull out and lift up blower.
5. Reinstall blower by reversing above steps.

6.4 Recertification

The following tests should be performed:

- Airflow Velocity
- Filter Leak Test (filter media leak test and filter gasket leak test)
- Site Installation Assessment Test
- Noise Level Test
- Optional Tests
 - » Electrical Safety
 - » Light Intensity Test
 - » UV Intensity Test

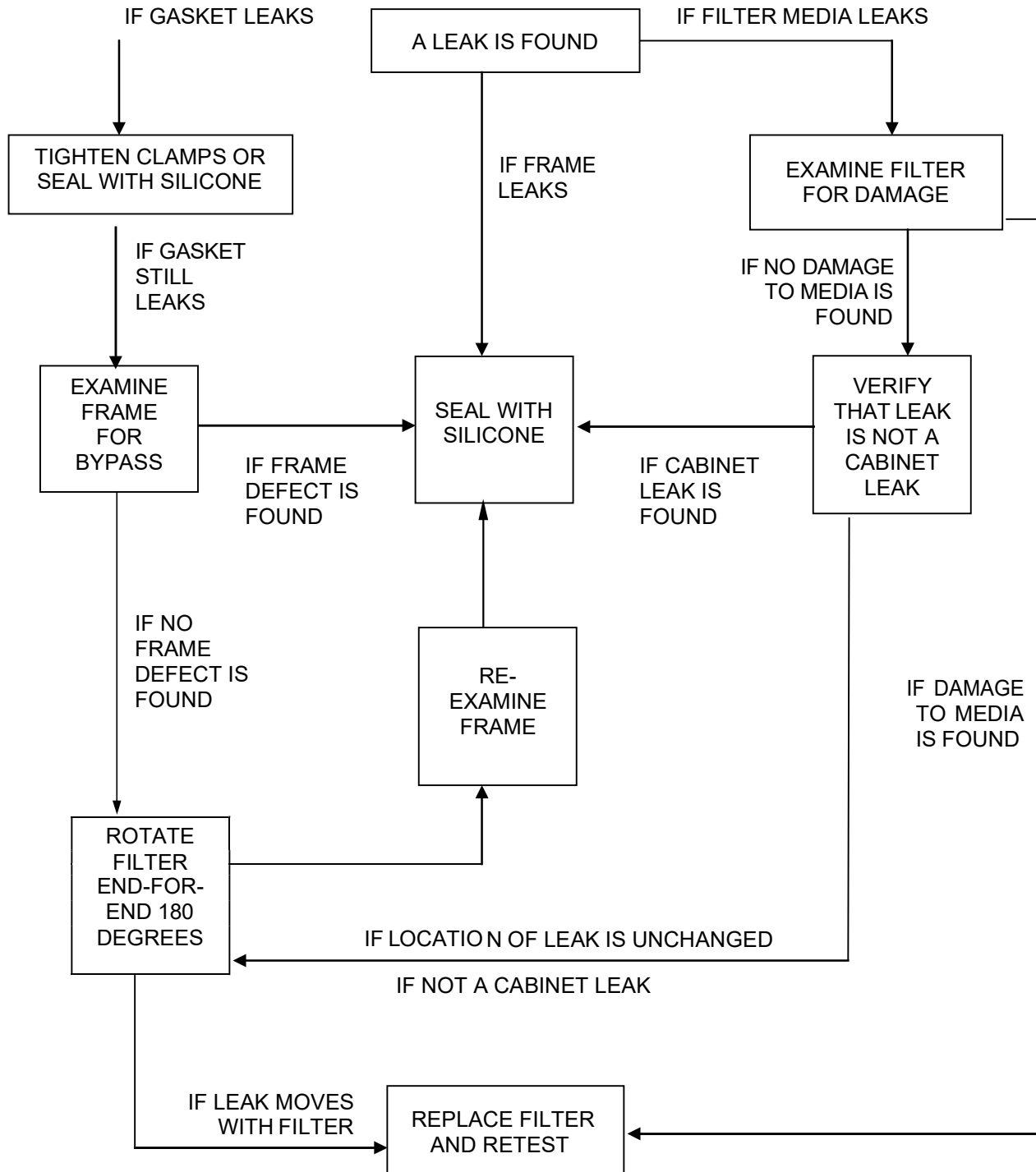
The testing methods and equipment required are specified on the test report. It is recommended that these tests be performed only by a qualified technician who is familiar with the methods and procedures for certifying laminar flow cabinets.

6.5 UV Timer Adjustment



WARNING! The UV timer is located behind the front control panel. Disconnect unit from power. Remove screws to access the control panel and on top of the pre-filter grid.

6.6 Leak Testing of HEPA Filters





VII. Troubleshooting Common Problems

Problem	Potential Cause	Corrective Action
Cabinet does not start / no power	<ul style="list-style-type: none"> • Wrong electrical connection 	<ul style="list-style-type: none"> » Check that electrical cord is connected properly. » Check that wall socket is operational. » Reset circuit breaker on top of unit.
Motor silent	<ul style="list-style-type: none"> • Blown fuse • Faulty relay • Faulty speed control • Auto-thermal cut-off engaged • Faulty fan capacitor • Motor failure 	<ul style="list-style-type: none"> » Switch off cabinet and check. » Short out control by placing jumper wire directly across connections to the two speed control leads. » If fan operates, speed control is defective. » If fan does not run, speed control is not the problem. » Blower was overheated. » Shut off, wait 30 minutes and try to restart. » Replace fan capacitor. » Disconnect two motor leads at motor. Connect a proper AC voltage source directly to motor. » If motor starts to run, problem is in the wiring connection. Refer to blown fuse or faulty relay section. » If motor does not run, motor is defective. Replace motor.
Inoperative switches	<ul style="list-style-type: none"> • Connection problem 	<ul style="list-style-type: none"> » Check if cable from electrical panel is properly connected to switch.
Low airflow / high airflow	<ul style="list-style-type: none"> • Adjust speed control setting • Faulty fan capacitor (low airflow) • Faulty speed control 	<ul style="list-style-type: none"> » Adjust speed control as needed. » Replace fan capacitor. » Short out control by placing jumper wire directly across connections to the two speed control leads. » If fan operates, speed control is defective. » If fan does not run, speed control is not the problem.
Excessive fan noise	<ul style="list-style-type: none"> • Loose motor or blower wheel mount 	<ul style="list-style-type: none"> » Check tightness of set screw holding blower wheel. » Check tightness of all blower and motor mounting bolts.
Light always off	<ul style="list-style-type: none"> • Faulty bulb • Faulty relay 	<ul style="list-style-type: none"> » Tighten bulb to ensure proper fit. » Replace bulb. » Switch off cabinet and check.
UV lamp always off	<ul style="list-style-type: none"> • Faulty bulb • Faulty relay 	<ul style="list-style-type: none"> » Ensure fan and light buttons are in OFF position. » Tighten bulb to ensure proper fit. » Replace bulb. » Switch off cabinet and check.
Contaminated samples	<ul style="list-style-type: none"> • Filter leaking • Low airflow 	<ul style="list-style-type: none"> » Repair or replace filters. » Readjust airflow setting.

VIII. Filter Information

Filter Types

HEPA Filters may need replacing approximately every 5 years depending on the application and usage. Contact Cole-Parmer customer service for new filters.

Cole-Parmer, an Antylia Scientific company

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Vernon Hills, IL 60061-1844

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Fax: 1-847-247-2929

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