OPERATOR'S MANUAL

BioPROTECT®

Class II Bio-Containment Enclosure

MODELS:

Bio-Containment Enclosure

175 Gatehouse Road / Sanford, Maine 04073 / USA
800-992-2537 / 207-324-8773 / Fax: 207-324-3869 / bakerco@bakerco.com / bakerco.com

Environments For Science™

Based on model BP-504-5 and BP-504-5-200

175 Gatehouse Road / Sanford, Maine 04073 / USA
800-992-2537 / 207-324-8773 / Fax: 207-324-3869 / bakerco@bakerco.com / bakerco.com

Environments For Science™

Welcome to Baker

Thank you for choosing to join the growing number of people who are achieving excellence in science and clinical care through clean air, containment, and incubation solutions from Baker. As a fixture in laboratories and clinical settings around the world, Baker takes special pride in helping people just like you to create optimal environments for their work, while providing a safe and comfortable user experience.

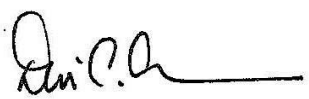
At Baker, nothing is more important to us than the trust you place in our solutions to help you achieve your goals. Whether you are involved with basic scientific research, drug discovery, or patient care, Baker has a proven record of delivering high-performing equipment through an uncompromising commitment to safety, testing, quality, and craftsmanship. Additionally, as a Maine-based family owned business in operation for more than 60 years, you can rest assured that Baker will be there for you throughout the life cycle of your new equipment.

Baker is a pioneer in the field of biological safety, and our reputation is built on taking no shortcuts and making no compromises when it comes to user safety. We are the only manufacturer to routinely subject our own equipment to extensive microbiological aerosol testing in the most challenging conditions – above and beyond what the average user would ever encounter. However, the adequacy of any equipment for user safety in a specific application should always be evaluated. This risk assessment should be performed by an industrial hygienist, safety officer, or other qualified person representing the purchasing organization. Remember that you, the owner and user, are ultimately responsible and that you use this equipment at your own risk.

I recommend that you keep a copy of this manual, along with the factory test report (if applicable), near your new equipment for convenient reference by operators and qualified maintenance personnel. If you have any questions about the use or care of your Baker equipment, please do not hesitate to contact our Technical Service Department for assistance at (800) 992-2537 (+1 207 324-8773 outside the United States) or techsupport@bakerco.com.

Thank you for placing your trust in Baker.

Sincerely,



Environments For Science™
David Eagleson
President
The Baker Company, Inc.

175 Gatehouse Road / Sanford, Maine 04073 / USA
800-992-2537 / 207-324-8773 / Fax: 207-324-3869 / bakerco@bakerco.com / bakerco.com

Table of Contents

175 Gatehouse Road / Sanford, Maine 04073 / USA
800-992-2537 / 207-324-8773 / Fax: 207-324-3869 / bakerco@bakerco.com / bakerco.com

Function of the BioPROTECT®

The BioPROTECT® BP-504-5 is a Class II type bio-containment enclosure designed to house laboratory robotics or machine apparatus that would not ordinarily fit inside a traditional Class II biosafety cabinet. It provides personnel, product and environmental protection. Personnel protection is provided by the intake air velocity entering the front access opening, product protection is provided by HEPA filtered supply air delivered to the work area and environmental protection is provided by the exhaust HEPA filter. This Class II type bio-containment enclosure may vent back to the room or externally (outdoors) through a properly functioning exhaust canopy connected to the facility exhaust system. Although the BioPROTECT® BP-504-5 has passed all microbiological tests, it is not currently listed with NSF/ANSI Standard 49 for a Class II type designation.

In operation, the BioPROTECT® BP-504-5 delivers HEPA filtered, unidirectional down flow air to the work area. Most of the HEPA filtered air passes through an air diffuser; flows down into the work area and splits at the working level entering the front and rear perforations. Some of the HEPA filtered air is diverted down behind the viewscreen creating a downward high velocity momentum air curtain along the rear surface of the viewscreen and into the door perforations. Concurrently, intake room air is pulled inward through the front access opening at a minimum of 100 feet per minute (FPM) (0.53 meters per second (m/s)) where it merges with the down flow air entering the door perforation. All of the air is drawn up the cabinet exterior walls under negative pressure and enters the motor blower inlet where it is then discharged into an internal plenum. The air from within that internal plenum has two possible flow paths. Most of the air is recirculated back to the work area through the supply HEPA filter and diffuser while the remaining is discharged through the exhaust HEPA filter exiting the top of the cabinet. (See Figure 1)

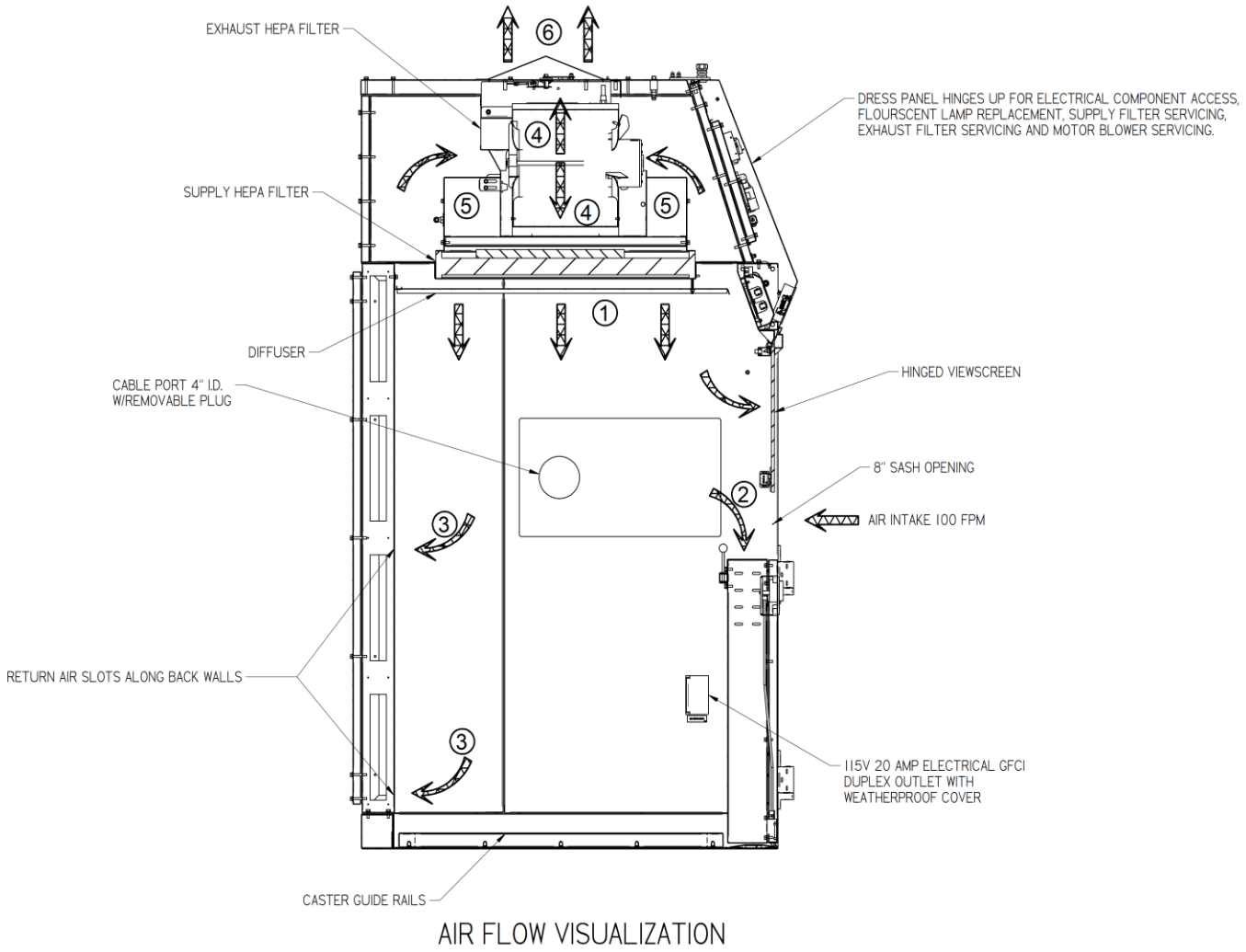


Figure 1- BioPROTECT® BP-504-5 Airflow

Cabinet Design

Figures 2 and 3 below show the standard construction and components of the cabinet.

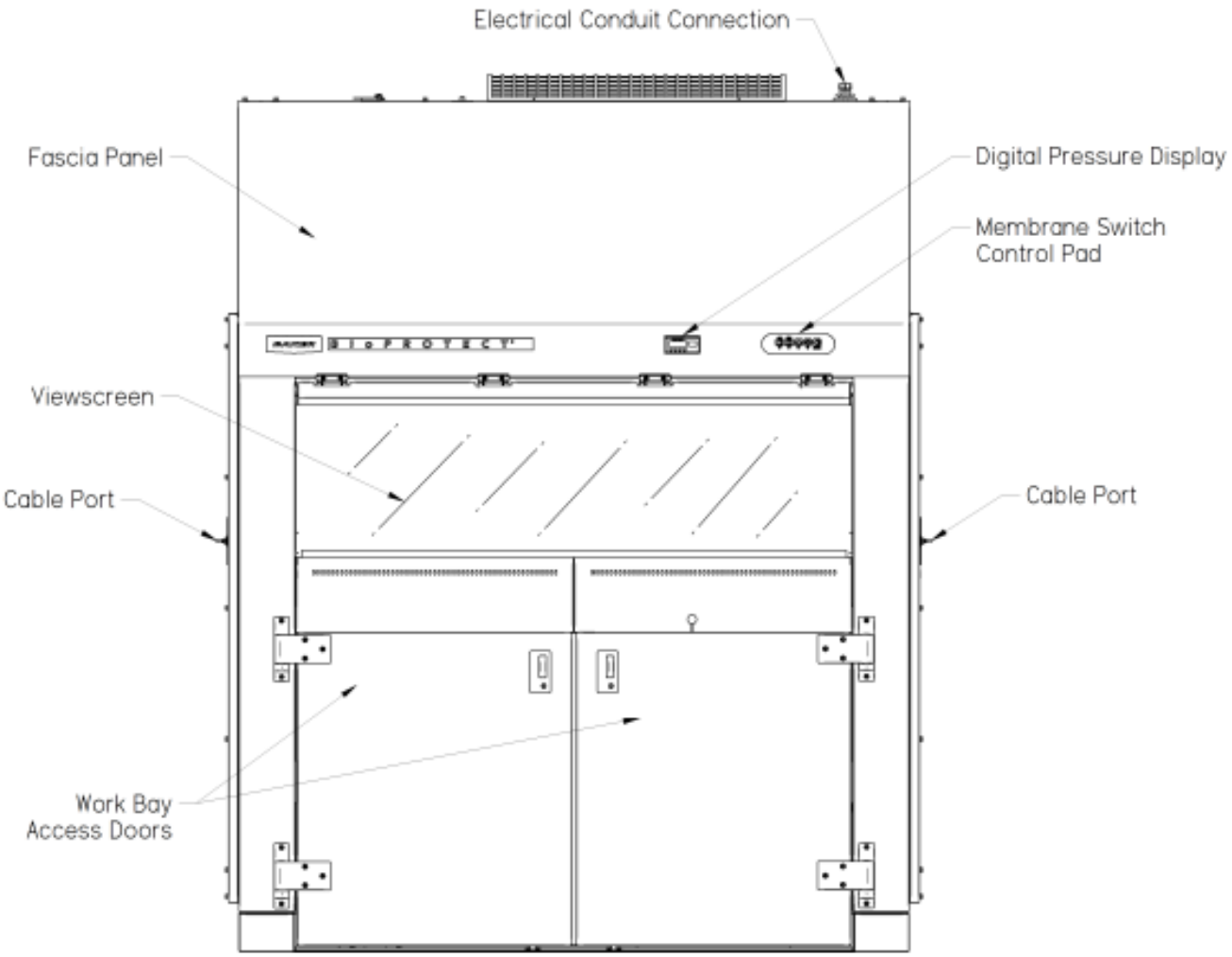


Figure 2- BioPROTECT® BP-504-5 Features (External)

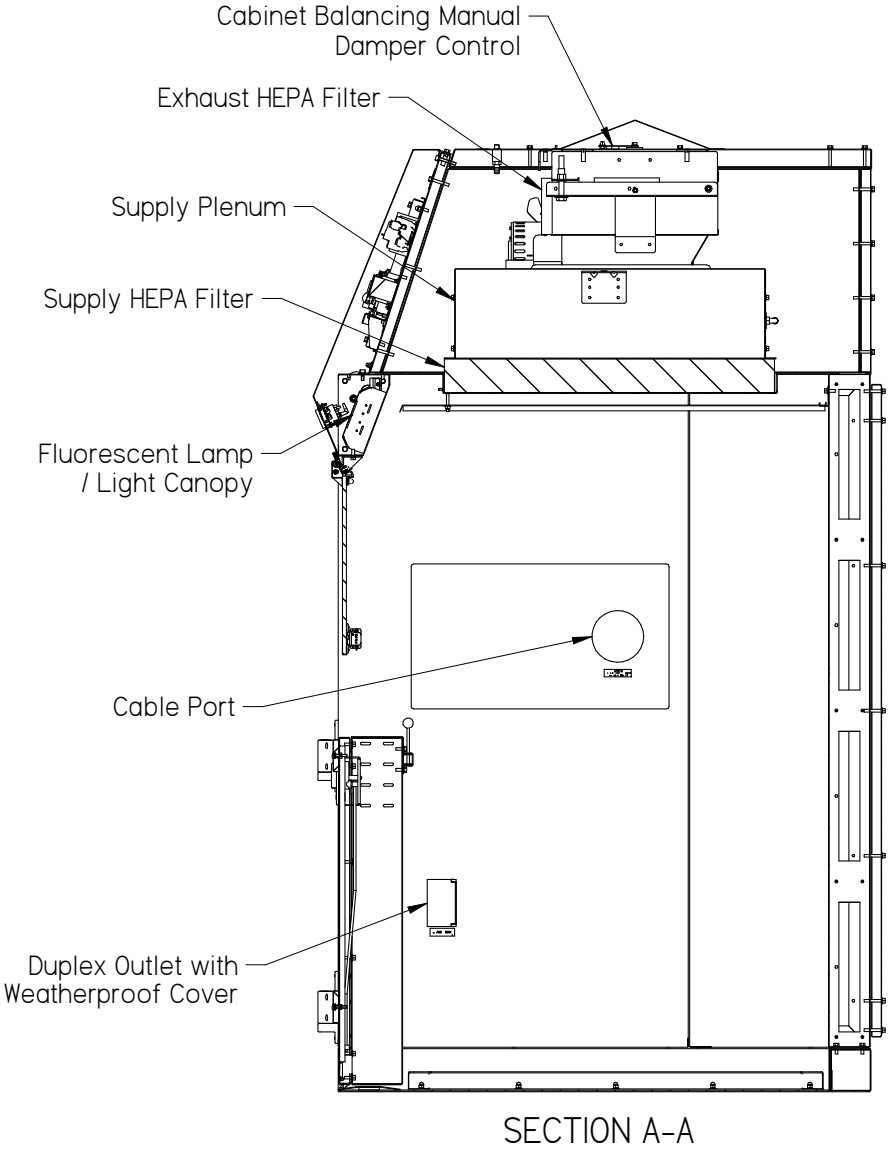


Figure 3- BioPROTECT® BP-504-5 Features (Internal)

Regulatory Compliance

Standards

This Baker product has been designed, manufactured and tested to comply with the following regulatory standards **where applicable.** Unless stated otherwise, the most recent edition of these standards has been applied.

Electrical, Mechanical, Fire and Personal Safety:
Electrical Equipment for Measurement, Control and Laboratory Use, General Requirements
US: UL61010-1
CANADA: CAN/CSA C22.2 No. 61010-1
INTERNATIONAL: Low Voltage Directive 2006/95/EC; EN61010-1

Safety for Laboratory Hoods and Cabinets
US: UL 1805

ANSI/ASHRAE 110-1995: Method of Testing Performance of Laboratory Fume Hoods
American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
1791 Tullie Circle, NE, Atlanta, GA, 30329
www. ashrae.org.

Electromagnetic Compatibility:
Electrical Equipment for Measurement, Control and Laboratory Use, EMC Requirements
INTERNATIONAL: Directive on Electro Magnetic Compatibility, EMC Directive 2014/30/EU; EN61326-1

Hazardous Waste Abatement:
Directive on Restriction of Hazardous Substances, RoHS Directive, 2011/65/EU; EN50581

Directive on Waste Electrical and Electronic Equipment, WEEE Directive, 2012/19/EU

Biological Safety:
US: Biosafety Cabinetry Certification; NSF/ANSI 49
INTERNATIONAL: Biotechnology – Performance criteria for microbiological safety cabinets; EN 12469

Industry Guideline References:
IEST-RP-CC002.3: Unidirectional Flow Clean-Air Devices,
Institute of Environmental Sciences and Technology
2340 S. Arlington Heights Road, Suite 100, Arlington Heights, IL 60005-4516, USA

www.iest.org.
Compounding Isolators:
CAG-001-2005 (revised 12/08/2008): Applications Guide for the use of Compounding Isolators in Compounding Sterile Preparations in Healthcare Facilities, Controlled Environment Testing Association, 1500 Sunday Drive, Suite 102, Raleigh, NC 27607, www.cetainternational.org.

CAG-002-2006: CETA Compounding Isolator Testing Guide, Controlled Environment Testing Association, 1500 Sunday Drive, Suite 102, Raleigh, NC 27607, USA, www.cetainternational.org.

Cautionary Notes

Hazards may still exist, especially if the cabinet is not installed, operated and maintained according to the instructions in this manual and the service manual.

This cabinet may be affected by high levels of electromagnetic radiation from other electronic devices that are being used in close proximity or connected to the same facility power system.

This cabinet may cause radio interference or affect the operation of other equipment in close proximity. Mitigation measures such as relocation, re-orientation, or shielding may be required.

Standard Features

Alarms

The cabinet has audible and visual alarms to alert the operator of some unsafe conditions as defined in this manual. The standard annunciated alarms, in order of priority, are power/processor fault alarm, viewscreen alarm, and cabinet pressure fault alarm. See the **Alarm Conditions** section in this manual for detailed descriptions of the alarms.

Cabinet Pressure Monitor

The cabinet pressure monitor provides a digital indication of the cabinet operating pressure as well as local audible and visual alarms for unsafe air flow conditions in the cabinet.

Cable Ports

The cabinet has cable ports located in the left and right sidewalls which provide a safe means of introducing power cables, vacuum aspiration tubing or other similar items into the work area. It is designed with flexible neoprene seals. The cable port passageway is under negative pressure and has been microbiologically tested and validated to prevent the escape of aerosols from the cabinet work area and the introduction of contaminants into the cabinet work area. See the **Cable Port Usage** section of this manual for more information.

Filters

CAUTION
Filter media is very delicate and should never be touched.
Only qualified technicians should replace HEPA filters.

The High Efficiency Particulate Air (HEPA) filters consist of a continuous sheet of glass fibers pleated and mounted in a rigid frame. Both the supply and exhaust filters inside the cabinet are scan-tested HEPA filters. They are 99.99% effective on removal of the most penetrating particle size (mpps) (0.3 micron). Each filter is leak checked after installation in the cabinet and prior to shipment. HEPA filters are not intended to filter gasses or vapors. Since this cabinet is partially recirculating, there could be gaseous buildup to the point of

equilibrium if gasses or vapors are used. Misuse of chemicals, Bunsen burners, or a heavy dust load will shorten the filter's life.

Lighting

The work area is illuminated to provide a typical average illuminance of 70 foot-candles [754 lux] at the typical work surface elevation. This cabinet features solid-state electronic ballasts. These ballasts increase reliability, efficiency and service life with lower heat output.

Motor/Blower

The motor and blower are built as a single assembly and balanced to minimize vibration. The motor control automatically compensates for normal increases in pressure drop across the filters without reducing the total air flow rate by more than 10%. The air flow capacity of the cabinet is measured by the ability to provide a nearly constant volume of air as the filter resistance to airflow increases.

Motor Speed Control

The StediFLOW™ speed controller compensates for normal fluctuations in line voltage and is programmed to maintain relatively consistent air flow when the cabinet filters load. This helps to maintain correct airflow in the cabinet.

Outlets

The cabinet has two 220 Volt/16 Amp circuits for powering instruments inside the work area. One circuit feeds the right sidewall receptacle(s) and one circuit feeds the left sidewall receptacle(s).

Viewscreen

The BioPROTECT® BP-504-5 is provided with two modes of access to the work area: via the hinged doors that can be opened to access the entire work area and the hinged viewscreen (providing access to the work surface) or from the 8 in x 60 in (203 mm x 1524 mm) access (sash) openings between the bottom of the closed viewscreen and the air intake grille. The primary means of access when working must be through the 8 in (203 mm) sash opening. This is the only means of access that will ensure the user protection from contaminants within the enclosure.

Optional Features

Anchoring Systems

Anchors

Floor restraints are available without California OSHPD approval.

FlexAIR™ Canopy Exhaust Connection (CEC)

The FlexAIR™ canopy exhaust connection with integrated alarm provides the cabinet with a safe exhaust connection to building exhaust systems when working with volatile toxic chemicals and radionuclides.

Convenient, Space-Saving Cart

The BioPROTECT® BP-504-5 has a heavy duty stainless steel cart to support instrumentation and properly position it within the cabinet. This hydraulic lift cart is on casters, so that it can be completely removed from the enclosure for service.

Proper Cabinet Use

CAUTIONS

Explosive or flammable substances should never be used in this cabinet.

If cabinet is used for work with volatile chemicals and radionuclides adjunct to microbiological studies it must be exhausted outdoors through a properly functioning canopy exhaust system.

If the operator does not operate the cabinet correctly, it may not provide an adequate protective barrier. To ensure personnel, product and environmental protection the cabinet must be operated per the manufacturer's instructions.

Baker biosafety cabinets are designed for continuous operation. It is recommended that the blower be left on at all times to provide containment and keep the interior work area clean and free of particulates.

Reference sources are *National Sanitation Foundation Standard 49* Annex E, *The Biosafety in Microbiological and Biomedical Laboratories* (BMBL), 5th edition published by the U.S. Department of Health & Human Services as HHS Publication No. (CDC) 21-1112 and *United States Pharmacopeia* chapters <795>, <797>, and <800> as an advisory document for safe work practices.

The facility industrial hygienist, pharmacist or biosafety officer shall ensure that:

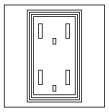
The biosafety cabinet is appropriate for all operations and procedures to be performed.

All operators are thoroughly trained and competent regarding cabinet operation and all procedures they are required to perform.

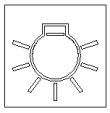
The cabinet operation, procedures, and operators are monitored at regular intervals to ensure that safety is maintained.

Controls

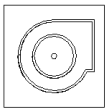
Figure 4- BioPROTECT® BP-504-5 Operator Controls



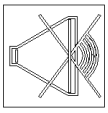
Outlet Power On/Off – These pushbuttons control the power to the outlets in the work area. A blue indicator light located below the pushbutton will illuminate when it is on.



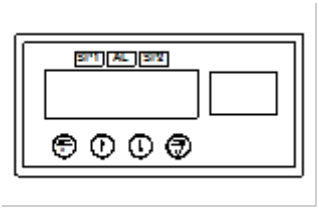
Fluorescent Light On/Off – This pushbutton controls operation of the fluorescent light. A blue indicator light located below the pushbutton will illuminate when it is on.



Blower On/Off – This pushbutton controls the operation of the cabinet blower. A green indicator light located below the pushbutton will illuminate when it is on.



Alarm Mute (Alarm Reset) – This pushbutton mutes any audible alarm. A red indicator light located below the pushbutton will flash when an alarm condition exists.



Pressure Monitor - The pressure monitor displays the operating pressure in the cabinet air return plenum. It will also display alarm conditions when present.

Operation

Outlets

The two 220 Volt/16 Amp receptacles for powering instruments inside the work area are located on the right sidewall and left sidewall. Receptacle(s) are controlled via the receptacle control pushbutton located on the operator control panel. See **Controls** section above for receptacle pushbutton details.

Fluorescent Light

The fluorescent lighting is designed to provide an average illuminance of 70 foot-candles (754 lux) at the typical work surface elevation.

The cabinet blower must be on for the fluorescent light to operate.

Motor/Blower

The motor and blower are built as a single assembly and balanced to minimize vibration.

The blower motor control is designed to automatically compensate for typical variations in pressure drop across the filters without reducing total air flow rate by more than 10%. The airflow capacity of the cabinet is measured by the ability to provide a nearly constant volume of air as the filter resistance to airflow increases. The motor control also compensates for normal variations in power to the cabinet.

The cabinet blower must be turned on for the fluorescent light to operate.

Cabinet Pressure Monitor

The cabinet pressure monitor provides a digital display of the operating pressure in the return air plenum for the cabinet motor/blower. When the cabinet is certified, high and low alarm limits are determined and set in the pressure monitor by the certifier. When an alarm condition exists it is annunciated by indicators on the pressure monitor. SP1 for a high pressure alarm condition. SP2 for a low pressure alarm condition. The pressure monitor is connected to the cabinet control board to also provide an audible and visual alarm at the control panel.

The cabinet pressure monitor is not operational when the cabinet blower is off.

Changes to the alarm set points should only be made by a trained and qualified person using calibrated test equipment as a reference.

FlexAIR™ Canopy Exhaust Connection (CEC)

The FlexAIR™ is a canopy style exhaust connection required when working with volatile chemicals. The FlexAIR™ has two side flaps for the exhaust of room air and one front flap for cabinet exhaust relief in the case of inadequate building exhaust. In normal operation, with proper building exhaust airflow, the front flap is closed and the side flaps are partially open allowing the minimum required airflow from the room to enter and be exhausted along with the normal intake air of the cabinet. Variations in the building exhaust air are compensated for by the side flaps opening or closing as needed to automatically maintain the cabinet intake air balance. If the building exhaust decreases to a level that does not allow proper intake airflow, the side flaps would close which triggers an audible and visual alarm condition. Simultaneously, the front flap will open because of the increase in static pressure in the FlexAIR™ canopy thereby providing air relief, exhausting cabinet HEPA filtered air back into the room, allowing the cabinet to maintain an acceptable level of intake airflow for worker protection.

Alarm Mute (Alarm Reset)

The alarm reset pushbutton is used to mute any audible alarm. The mute period is five minutes. The alarm indicator located below the pushbutton continues to flash while the audible alarm is muted as long as an unsafe condition exists. If the alarm condition is not corrected when the mute period is complete the audible alarm will sound.

Alarm Conditions

The cabinet has audible and visual alarms to alert the operator of some unsafe conditions as defined in this manual. The standard annunciated alarms, in order of priority, are power/processor fault alarm, viewscreen alarm, cabinet pressure alarm, and the optional exhaust flow alarm.

Power/Processor Fault Alarm

The power/processor fault alarm occurs when the system is initially powered, experiences a power outage or the microprocessor/controller has a fault. The indication of this fault is a visual and audible alarm of three, one-second alarms followed by a two-second delay. This cycle is repeated until the alarm condition is cleared by pressing the alarm reset pushbutton.

Viewscreen Position Alarm

The viewscreen position alarm occurs when the viewscreen is not at a safe operating position. There is a three-second delay before the alarm activates, to allow the operator time to move between safe operating positions. A visual and audible alarm occurs once per second and alerts the user of an unsafe condition. There

is one safe viewscreen level defined for this cabinet: the closed position, providing an 8 in (203 mm) sash opening for the operator. Pressing the alarm reset pushbutton will mute the audible alarm for 5 minutes. The visual alarm will continue until the unsafe condition is corrected. If the unsafe condition is not corrected, the audible alarm will return.

Cabinet Pressure Alarm

The cabinet pressure alarm occurs when there is a variation in pressure in the negative air plenum due to filter loading or a change in supply air. There is no delay for this alarm. A visual and audible alarm, four per second for one second followed by a one-second delay, repeating, will alert users of this condition. Pressing the alarm reset pushbutton will mute the audible alarm for 5 minutes. The visual alarm will continue until the unsafe condition is corrected. If the unsafe condition is not corrected, the audible alarm will return. This alarm is only active when the cabinet blower is on.

When the cabinet motor/blower is first started, a pressure alarm condition will typically exist. Once the cabinet pressure reaches a safe level the alarm condition will clear indicating a safe operating condition.

Low Exhaust Flow Alarm (FlexAIR™ Canopy Exhaust Connection option)

The low exhaust flow alarm occurs when there is a loss of capture air flowing into the canopy air intake openings due to low exhaust airflow. There is no delay for this alarm. A visual and audible alarm, twice per second, will alert users of this undesirable operating condition. Pressing the alarm reset pushbutton will mute the audible alarm for 5 minutes. The visual alarm will continue until the unsafe condition is corrected. If the unsafe condition is not corrected, the audible alarm will return.

Alarm Summary Table

Alarm Type	Visual/Audible Annunciation	Comments	Action
Power/Processor Fault Alarm	Three one-second alarms followed by two-second delay.	Cycle will repeat until acknowledged by pushing the alarm reset pushbutton.	Check power distribution to the cabinet.
Viewscreen Alarm	Three-second delay then: *Once per second	Takes precedence over other alarms. Audible alarm can be muted for 5 minutes.	Return viewscreen to correct position.
Cabinet Pressure Alarm	No delay: *Four times per second for one	Audible alarm can be muted for 5 minutes.	Call a technician to determine the

	second followed by a one-second delay.		problem.
Low-flow Exhaust Alarm (FlexAIR Option)	No delay: *Twice per second.	Audible alarm can be muted for 5 minutes.	Check building exhaust system.

Optional Cart Installation Procedure

The heavy duty, stainless steel, manually operated hydraulic lift cart is adjustable in height. The cart front is the side located with the manual lift handle (see Figure 5). The cart is used within the BioPROTECT® BP-504-5 to support and centrally locate instrumentation used in the cabinet.

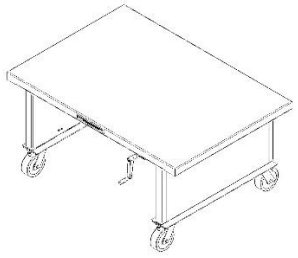


Figure 5- BioPROTECT® BP-504-5 Cart

CAUTION

The handle must be folded and stowed under the cart when not in use.

1. Open both front doors of the BioPROTECT® BP-504-5 to install/operate the cart.

2. Using the cart guide rails mounted to the floor of the cabinet, roll the cart into the BioPROTECT® BP-504-5. The floor mounted guide rails will aid in positioning the cart left to right within the BioPROTECT® BP-504-5. Carefully push the cart into the cabinet opening until the cart is approximately one inch from the backwall.

3. Using the manual lift handle, slowly raise or lower the cart to the desired working height. The cart **must be at least one inch below the grille** at the bottom of the sash opening.

4. Fold and stow the manual crank handle and close the front doors of the BioPROTECT® BP-504-5.

Start-up Procedure

All front access opening doors shall be closed and viewscreen latched in its downward operation position. All cabinet operators shall have read and understood the controls and operation section of this manual prior to performing this procedure.

1. If the cabinet has not been left running continuously, turn on the blower. An indicator light located below the pushbutton will illuminate when it is on. Listen for the sound of the cabinet blower running. An alarm condition will typically exist on startup, once the cabinet reaches a safe operating condition

the alarm condition should clear automatically.

2. Place the viewscreen in its latched (closed) position and turn on the fluorescent light. The indicator light below the pushbutton will illuminate along with the interior work area. The fluorescent light will not operate unless the cabinet blower is on.

3. Wipe down all interior surfaces of the cabinet work area with an appropriate surface disinfectant.

IMPORTANT

Some disinfectants, such as bleach or iodine, may corrode or stain the steel surfaces. Good practice is to thoroughly clean the surface afterward with a detergent, rinse with sterile water and wipe completely dry to prevent corrosion.

4. Disinfect the exterior of all materials to be used for the procedure and then place them inside the cabinet. This may require raising the viewscreen. Blocking the front and rear perforated grilles must be avoided. Everything required, and only what is required, should be placed in the cabinet before beginning work so that nothing passes in or out through the air barrier until the procedure is completed. Implements should be arranged in the cabinet's work area in logical order so that clean and dirty materials are segregated, preferably on opposite sides of the work area. If wipes or absorbent towels are used on the work surface, be sure to keep them away from the grilles.

5. After equipment is in place inside the cabinet, close the viewscreen to the safe design opening. An alarm will signal if it is not at the proper opening. This position is important to maintain proper cabinet airflow.

6. Before beginning the initial procedure, allow a minimum of three minutes to purge any contaminants or suspended particulates that may have been introduced during the work area setup procedure.

Working in the Cabinet

This section contains some suggested basic work practices that should be observed when using this unit. It is not intended to be a comprehensive list for all applications. A good reference source is *The Biosafety in Microbiological and Biomedical Laboratories* (BMBL) 5th edition published by the U.S. Department of Health and Human Services as HHS Publication No. (CDC) 21-1112 advisory document for safe work practices.

The operator's hands and arms should be washed thoroughly with soap both before and after working in the unit. It is recommended that long-sleeved gowns or lab coats with tight-fitting cuffs and sterile gloves are

worn, to minimize the shedding of skin, or related contaminates, into the work area and to protect hands, arms, and clothing from contamination.

It is important that used pipettes be discarded into a tray or other suitable container inside the unit. This reduces unnecessary movement in and out of the work area. Because of the restricted access, pipetting within the unit will require the use of pipetting aids.

Work should be performed using slow movements, and the number of movements should be limited as much as possible. All materials required should be placed in the unit prior to starting a procedure.

When a procedure has been completed, all equipment that has been in contact with the research agent should be enclosed and the entire work surface decontaminated. Trays of discarded pipettes, glassware, etc., should be covered. Once this has been done, remove all equipment from the unit through the pass-through chamber.

WARNING

Never use the unit to store non-essential supplies or laboratory equipment.

After removing all materials, compounding agents, etc. from the unit, decontamination of the interior surfaces should be repeated. Check the work area carefully for spilled or splashed liquids that might support bacterial growth.

It is recommended that the unit be left running continuously to ensure cleanliness.

Cable Port Usage

CAUTION!

Conduct a risk assessment prior to removing or introducing cables or tubing through the cable port passageway. Cabinet decontamination may be required.

The cable port provides a safe means of introducing power, cables, vacuum aspiration tubing, etc. into the cabinet work area. These items should be installed prior to initial cabinet use. Removing or introducing items through the cable port after cabinet use shall require a risk assessment as the cable port passageway may be contaminated. Caution labels are provided on the interior and exterior of the cabinet to remind the operator of potential hazards.

Using Ancillary Equipment

The more equipment and material that is placed in the unit, the greater the possibility of disrupted airflow. The resulting turbulence can alter the designed airflow and reduce the effectiveness of the unit. When equipment which rotates, vibrates or heats is used, be sure to place it at the rear of the work area if possible. This will help minimize the turbulence within the unit.

Reacting to Spills

CAUTION

An emergency spill containment and clean-up procedure should be established prior to use.

Even when good work practices are used, occasional spills may occur. All spills should be dealt with immediately to prevent contamination and to avoid any damage to the stainless steel surfaces. It is recommended that the operator, in coordination with the facility safety professional, have a written plan available in case of an accidental exposure or spill. The safety plan should include all of the emergency procedures to be followed in the event of an accident. All employees who use the cabinet should be familiar with the safety plan.

Cleaning and Disinfecting Stainless Steel

IMPORTANT

After cleaning and disinfection, all surfaces should be rinsed with sterile water and wiped completely dry.

Simple Cleaning

IMPORTANT

Do not use steel wool or steel pads when cleaning stainless steel.

Dirt deposits on stainless steel (dust, dirt and finger marks) can usually be removed using warm water, with or without detergent. If this does not remove the deposits, a mild, non-abrasive household cleaner can be used with warm water and bristle brushes, sponges or clean cloths.

Iron rust discoloration can be treated by rubbing the surface with a solution of 15% to 20% by volume of nitric acid and water and letting it stand for one to two minutes to loosen the rust. The proper safety equipment should always be used when handling acids.

Disinfection

The purpose of disinfection is to destroy any organisms that could pose a potential hazard to humans or compromise the integrity of the process. To ensure an organism is killed it is important to use a disinfectant in the proper concentration that is known to be effective for the specific organism. Standard disinfectants include: Iodophor-Detergent, Ethanol, Phenol and Alcohol. Hypochlorite (chlorine bleach) can also be used in dilute concentrations. Caution should be used, as Hypochlorite can cause pitting and/or cracking of stainless steel if it is either too concentrated or not completely removed from the surface in a timely manner. Allow an appropriate time to lapse for deactivation purposes (ref. *BMBL* 5th Edition) depending on the type of disinfection agent used. Follow up with a sterile water rinse and wipe completely dry to protect the stainless steel surface.

IMPORTANT

To avoid damage, all chemical disinfectants should be evaluated for compatibility with the polycarbonate access doors prior to use. Ammonia containing cleaning agents are not recommended.

Disinfect the work area, work surface, and glove sleeves before and after every procedure.

Disinfect surfaces of all equipment used.

Remove all items from the inside of the unit.

Place all items that may have come in contact with the agent(s), such as used pipettes, in a plastic bag or other suitable container.

Disinfect the entire inside surface of the unit.

For additional information on cleaning and disinfecting stainless steel, please refer to: "Decontamination, Sterilization, Disinfection, and Antisepsis," Vesley, Donald and Lauer, James L., *Laboratory Safety Principles and Practices,* 2nd edition, 1995, Fleming, D.O., Richardson, J.H., Tulis, J.J. and Vesley, D., editors, ASM Press, Washington, D.C., pp. 219-237; and *Biosafety Reference Manual*, 2nd edition, 1995, Heinsohn, P.A., Jacobs, R.R. and Concoby, B.A., editors, AIHA Publications, pp.101-110.

Cleaning Spills

CAUTION

An emergency spill containment and clean-up procedure should be established prior to use.

Spilled fluid on the floor of the BioPROTECT® BP-504-5 is contained within the stainless steel work area of the cabinet via the threshold placed under the unit's door. The threshold will contain a volume of approximately 1.5 gallons (5.6 liters) of fluid. The cabinet sits directly on the user's floor, there is no drain provided.

It is recommended that the researchers, in coordination with their consulting safety professional, have a written plan available in case of an accidental exposure or spill prior to beginning work in the BioPROTECT® BP-504-5.

In the case of biological spill, for example, the area containing the spill may be flooded with an appropriate disinfectant. After the disinfectant has had time for a complete kill, remove the residue. If you have used a disinfectant which is harmful to stainless steel (hypochlorite bleach solutions, for example) be sure that none remains to corrode cabinet surfaces. Clean the surfaces with sterile water.

The Center for Disease Control has published "Biosafety in Microbiological and Biomedical Laboratories." If you have a spill involving a hazardous Biosafety Level 2 or 3 agent, then you are advised to leave the cabinet running to let the aerosols settle before you start cleanup procedures. With some spills, it may be necessary to decontaminate the room with an agent such as vaporized hydrogen peroxide. Biosafety Level 4 agents should never be used in this type of cabinet.

If the spill contains volatile liquids which generate vapors creating a danger of fire or explosion, turn off the unit and other electrical equipment. Evacuate and seal the room and call for immediate help from a safety professional.

If the agent is a hazardous chemical, it is recommended that a spill kit be kept readily available. This kit should be clearly labeled and might include such items as a respirator, chemical splash goggles, two pairs of gloves, two sheets of absorbent material, spill control pillows, a solution to clean the contaminant and waste disposal bags or other containers. Consult a safety professional for proper procedures and treatment of the specific agents in use.

Space Decontamination

WARNING

The unit must be decontaminated with an appropriate agent prior to conducting maintenance, service or repairs in any contaminated area of the unit. Before using decontamination agent, the user and certifier must verify compliance with local, state and federal regulations. Any specialized equipment within the unit work area should be evaluated for material compatibility prior to using the decontamination agent.

The National Institute of Health, National Cancer Institute and the Centers for Disease Control have shown hydrogen peroxide vapor to be successful against most microbiological agents. All space decontamination activities shall be performed by individuals experienced in the handling and use of decontamination agents such as an accredited biosafety cabinet certifier. The selected decontamination agent should be determined effective against all the biological agents within the unit. Personnel should always use the proper safety equipment (gas masks, protective clothing, etc.) for the specific hazard. The antidote for the selected agent should be immediately available, in a visible and nearby location.

A good reference for understanding space decontamination procedures is provided in the most current version of the NSF/ANSI Standard 49 in Annex G "Recommended Microbiological Decontamination Procedures," NSF International, 789 North Dixboro Road, P.O. Box 130140, Ann Arbor, Michigan, 48113-0140.

Carcinogens and other toxins present a unique chemical deactivation problem and standard biological decontamination will not be effective against chemicals or other non-biological materials. A qualified safety professional, knowledgeable of the hazard, should be consulted to determine the proper procedure in these cases. Relocation of a cabinet must involve a risk assessment to determine the need and space decontamination method.

175 Gatehouse Road
Sanford, Maine 04073
Tel: (207) 324-8773 / (800) 992-2537
Fax: (207) 324-3869
Email: bakerco@bakerco.com
www.bakerco.com

Patent pending – Air Bypass Armrest, Cable Port

This manual includes information for proper biosafety cabinet operation.

We recommend that the manual be kept near the cabinet for ready reference.