BAKER
Environments For Science™

P. O. Drawer E / 161 Gatehouse Road / Sanford, Maine 04073 / USA
800-992-2537 / 207-324-8773 / Fax: 207-324-3869 / bakerco@bakerco.com / bakerco.com

OPERATOR'S MANUAL

SterilGARD® e3

Class II, Type A2
Biological Safety Cabinet

MODELS:

SG404 / SG504 / SG604
SG404-INT / SG504-INT / SG604-INT
SG404-J / SG504-J / SG604-J

Revision	Date	Description
B	11/12/14	Changed Warranty Statement

This manual includes information for proper operation of this cabinet.
We recommend that it be kept near the cabinet for ready reference.

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INTRODUCTION AND WELCOME

It is a pleasure to welcome you to the growing number of customers who own and operate Baker laboratory products. As the inventors of the laminar flow biological safety cabinet and the leaders in the field, Baker people take special pride in providing a product that is designed for maximum performance.

Your new SterilGARD® e^3 cabinet includes many unique features which are included to give you superior performance, more simple maintenance and lower life cycle cost. The SterilGARD® e^3 is a Class II, Type A2 biosafety cabinet that provides personnel, product, and environmental protection. The SterilGARD® e^3 is suitable for research and clinical diagnostic work involving tissue culturing of possibly infectious samples, IV drug preparations and other pharmaceuticals that could have adverse health effects on operators and other techniques requiring a contamination-free atmosphere.

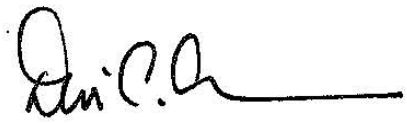
In addition to the high quality you expect from all Baker equipment, this model has been designed to provide the lab user with the most comfortable work environment possible. The ergonomic design will help prevent repetitive motion injury, reduce fatigue and lab accidents and enhance productivity.

Baker's exclusive e3 (Energy Efficient Engineered) product line also offers reductions in noise and electrical power consumption without sacrificing the superior performance of a Baker cabinet.

The adequacy of a cabinet for user safety should be determined on-site by an industrial hygienist, safety officer or other qualified person. Remember that you, the owner and user, are ultimately responsible and that you use your cabinet at your own risk.

We recommend that this manual, along with the factory test report, be kept near the cabinet for convenient reference by operators and qualified maintenance personnel. If you have any questions about the use or care of your new SterilGARD® e^3 cabinet, please do not hesitate to contact our Customer Service Department at **1-800-992-2537** for assistance or e-mail us at **bakerco@bakerco.com**.

Sincerely,



David Eagleson
President
The Baker Company, Inc.

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I – FUNCTION OF THE SterilGARD® e^3

The SterilGARD® e^3 is a Class II, Type A2, Biological Safety Cabinet (BSC) as classified by NSF/ANSI Standard 49. This Class of BSC may operate with or without an external facility exhaust system. The cabinet relies on the flow of air to provide personnel, product and environmental protection. Personnel protection (containment) is provided by a minimum intake air velocity at the front access opening. Product protection is provided by the HEPA filtered supply air in the cabinet work area. Environmental protection is provided by the exhaust HEPA filter.

Room air enters the front access opening of the cabinet at a minimum of 100 FPM [0.508m/sec] then enters the front work surface perforation. Most of the HEPA filtered supply air passes through a diffuser but some of the air is directed down the back side of the view screen creating a high velocity air curtain at the front access opening. The HEPA filtered supply air in the work area splits at the work surface. Some of the air enters the rear work area perforation while the remainder of the air enters the front work surface perforation. The air is pulled through the drain pan area, up the rear and side wall plenums, to the cabinet blower. The blower pushes the air into the positive pressure plenum. At that point most of the air is pushed through the supply HEPA filter while the remainder is exhausted out the exhaust HEPA filter and through a perforated filter protector at the top of the cabinet. [Reference Figure1]

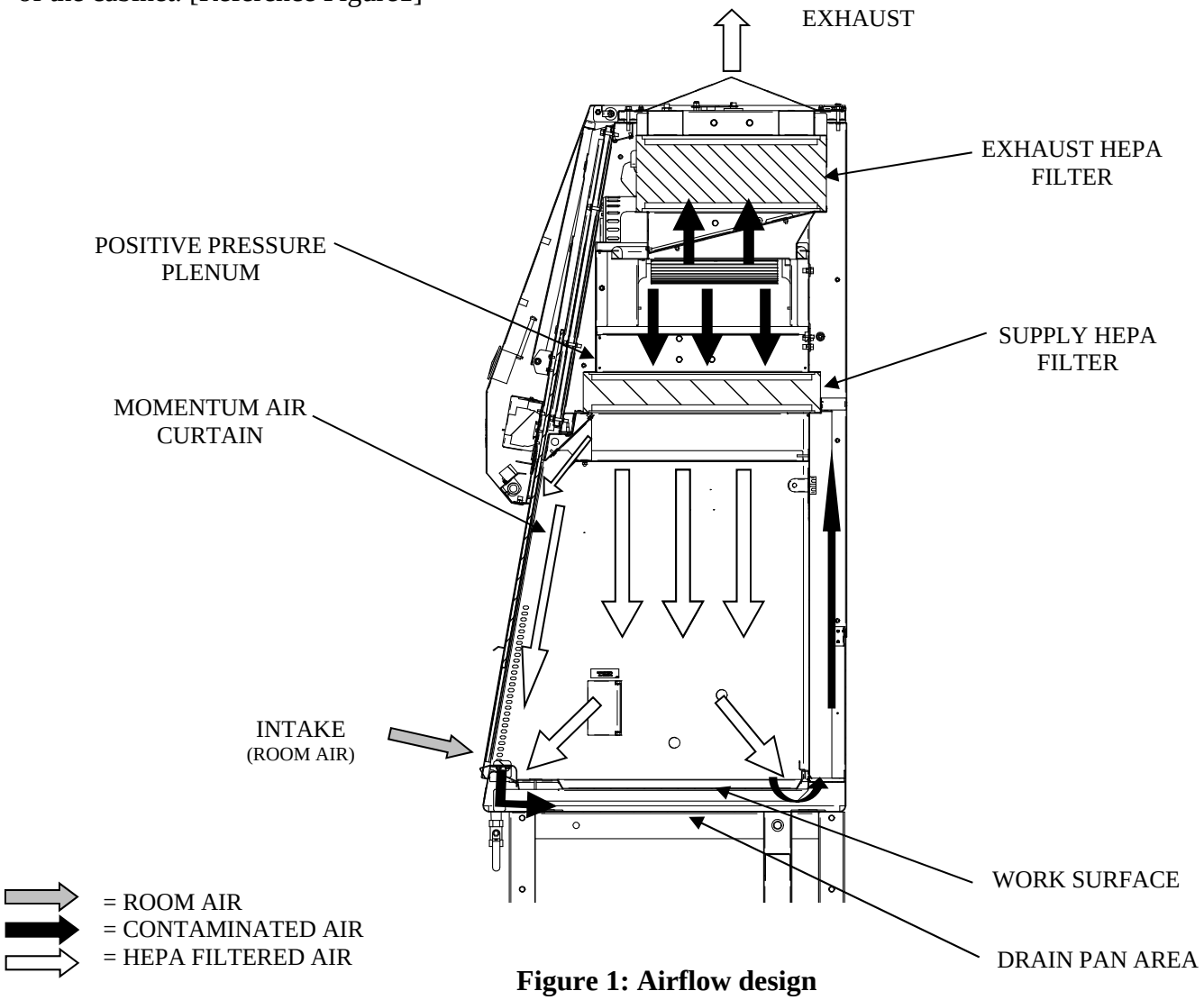

Figure 1: Airflow design

II - CABINET DESIGN

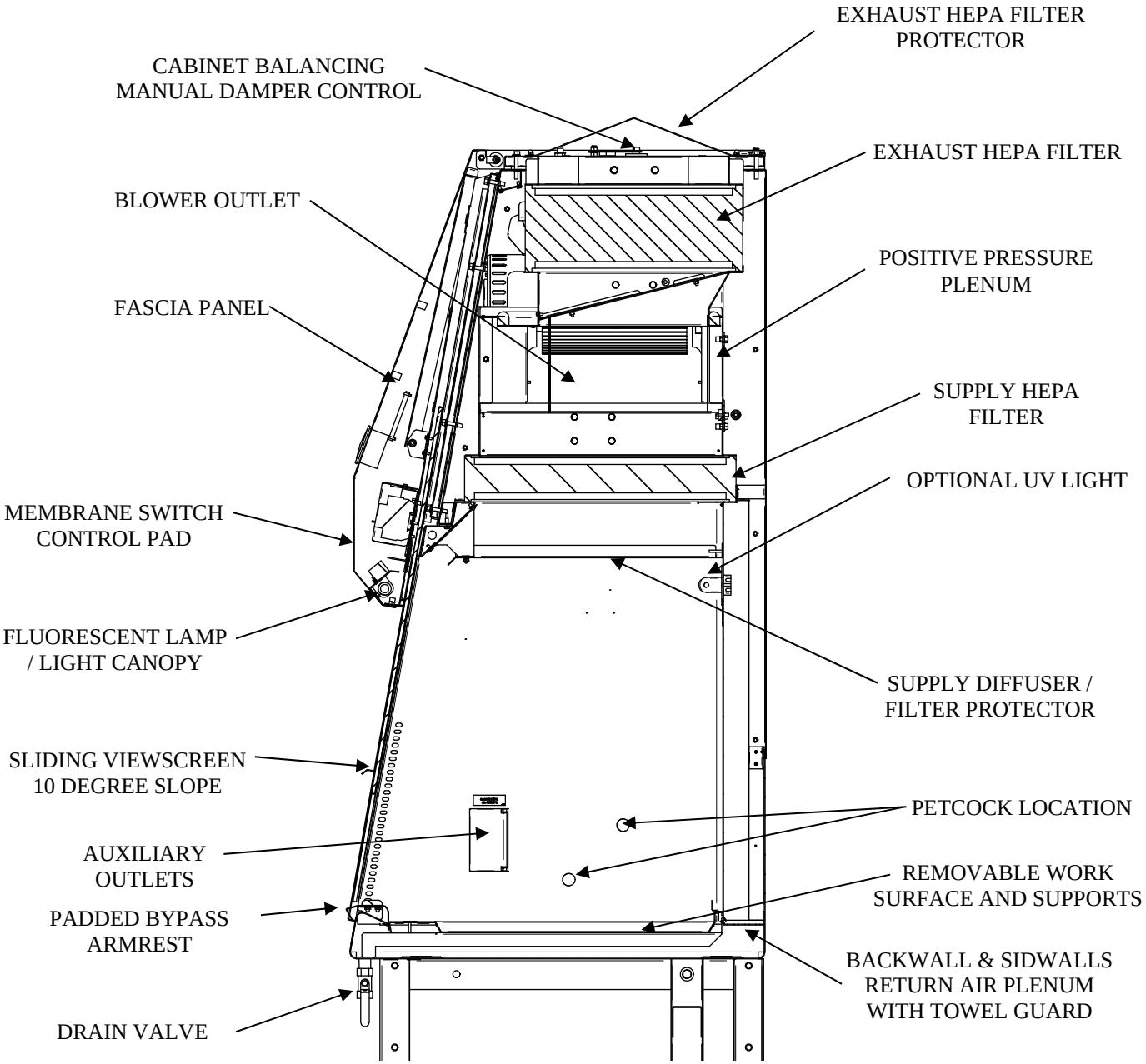

Figure 2: Cabinet Feature Locations

Standard Features

Cabinet Primary Function

The SterilGARD® e^3 is designed as a Class II, Type A2, Biological Safety Cabinet (BSC) as classified by NSF/ANSI Standard 49. This Class of BSC may exhaust to the room or through a canopy exhaust connection located at the top of the cabinet into an external facility exhaust system.

Applicable Standards

Except as noted elsewhere in this document or in the factory test report, this cabinet meets the requirements of and is tested to UL61010-1, 2nd Edition, CAN/CSA-C22.2 No. 61010-1, 2nd Edition, NSF/ANSI Standard 49-2012 and IEC/EN61326-1(2006), IEC/EN61000-3-2(2000), IEC/EN61000-3-3(2001) providing NSF listing and CE Mark (APPROVAL PENDING)

Cabinet Pressure Plenums

The cabinet work area is surrounded by negative pressure plenums, all external seals are under negative pressure, and all internal positive pressure plenum seals are surrounded by negative pressure plenums. All pressure plenums are ruggedly constructed in order to provide strength, durability, air tight seals and resistance to deterioration.

Motor/Blower Capacity, Cabinet Supply Blower

The SterilGARD® e^3 cabinet is designed to automatically compensate for an increase in pressure drop across the filters without reducing 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.

Manual Air Balance

The SterilGARD® e^3 cabinet has a manual internal balancing damper that compensates for down flow and exhaust/intake imbalances.

WARNING
This damper must only be adjusted by a qualified technician who has had proper training and has the proper equipment for checking the air balance inside the cabinet.

Cabinet Filters

Both supply and exhaust filter inside the cabinet are scan-tested HEPA filters. They are 99.99% effective on removal of most penetrating particles (mpp) of 0.3 micron size. Each filter is leak checked after installation in the cabinet and prior to shipment.
Optional factory installed Supply and exhaust ULPA Filters are available. The proven efficiency of ULPA filters is 99.999% for removal of most penetrating particles (mpp) 0.1 to 0.2 microns in size.

Easy Filter Access

All filters are front accessible for ease of service. The supply and exhaust filters can be removed from the front of the cabinet through an access panel located behind the fascia panel in the front of the cabinet.

WARNING
Only qualified technicians should replace filters.

Work Area Design

The interior side and rear work area walls are constructed from a single piece of stainless steel. Inside corners are constructed with a smooth radius to help prevent buildup of contaminants and facilitate cleaning.

Front Access High Velocity Air Slots

High velocity air slots are placed around the perimeter of the cabinet access opening. Slots are located at the front of each sidewall at the access opening, and horizontally along the top of the access opening behind the view screen. The purpose of the slots is to improve the cabinet integrity by capturing any particulates at these critical transitions.

Towel Guard
The towel guards are located under the work surface at the bottom rear and sides of the return-air plenums. Acting as a protective screen, integral to the interior walls, they help prevent wipes and other paper materials from being drawn into the blower system. They need to be kept clean at all times.

Work Surface
The work surface is constructed of corrosion resistant stainless steel. This surface is finished to reduce light reflection. It is also recessed to retain spills. The work surface and work surface supports are removable allowing access to the drain pan.

Drain Pan
The drain pan is constructed of corrosion resistant, stainless steel. The drain pan is designed with a smooth radius along all four bottom corners to facilitate cleaning and disinfection. Drainage is provided by a stainless steel ball valve located on the underside of the drain pan.

View Screen
The cabinet view screen is constructed of UV resistant safety plate glass. It is designed to move vertically to allow access to the work area and it is counterbalanced for ease of movement. The proper work access opening is clearly marked with arrows on each side of the view screen and the position of the view screen is monitored by an optical sensor activating the sash alarm when not properly positioned.

View screen Access Opening
The SterilGARD® e3 standard view screen access opening is 8”[203 mm].
Other optional factory configurations available with NSF listing are 10”[254 mm] and 12”[305 mm] access openings.

Work Area Lighting
The work area is illuminated with one fluorescent lamp external to the work area that provides a typical light intensity of 100 foot-candles [1076 lux] at the work surface.

Electronic Ballast
The SterilGARD ® e^3 features solid-state electronic ballasts for the fluorescent light and optional UV light. These ballasts increase reliability, efficiency and service life with lower heat output.

Ground Fault Circuit Interrupter (115V only)
The outlets on the cabinet are protected by a ground fault circuit interrupter (GFCI).

Laboratory services
The cabinet is equipped with one petcock and one plugged penetration located in the right sidewall.
Additional factory installed services are available on either side wall.
The standard external plumbing connections are located at the bottom of the right side of the cabinet.
Other optional configurations available from the factory are located on the rear or top of the cabinet as well as on the left side of the cabinet.

Alarms
The cabinet has an audible and visual alarm to alert the operator of unsafe conditions. The annunciated alarms are Sash Alarm, Power Fault Alarm and Double Sash Sensor Fault Alarm.

Timers
The cabinet has programmable timers to control the operation of the Fluorescent lights, Accessory Outlets, and UV Light Option. The timers can be programmed in 15 minute or 1 hour increments.

Padded Bypass Armrest
The Armrest pad is made out of EPDM sponge material which is resistant to most chemicals as well as UV exposure. The pad is held in place with an adhesive and can be easily removed for cleaning. It can also be autoclaved. When the view screen is fully closed, the perforated armrest provides an air bypass that allows air to continue to enter the front Work Surface perforations. This helps minimize noise.

UniPressure™ Plenum
The telescoping positive pressure plenum provides a more even clamping force on the HEPA filter frames and provides more uniform down flow air.

Motor/Blower Assembly
The motor and blower are built as a single assembly in order to minimize vibration.

Air Pressure Gauge
The cabinet has an analog air pressure gauge which displays the cabinet's negative static pressure.
The displayed value during operation should remain consistent with the recorded value in the most recent certification report. However if drastic change is noted, this should be cause for investigating the reason.
This device is not intended to be used for air flow set-point verification.

Cable Port
One cable port is located in the cabinet's right side wall. Cable ports provide a safe means of introducing power and/or data cables, siphoning tubes, etc. into the work area of the cabinet without having to use the front view screen access opening. A sealing plug is provided for each port, for use when the port is not required or when the cabinet is being decontaminated.

Additional cable ports are available in either left or right side walls.

ReadySAFE™ Mode
The "ReadySAFE™ Mode" is a feature that reduces the total airflow and energy consumption when the cabinet is not being used. Operation of the cabinet in "ReadySAFE™ Mode" maintains personnel, product and environmental protection.

Power/Processor Fault Alarm
The Power/Processor Fault Alarm provides a visual and audible alarm when the system experiences a power outage or the microprocessor/controller has a fault.

Optional Features

Adjustable Cabinet Stand
The channel stand has adjustable legs and leg levelers. The legs provide three fixed height adjustments of 24 $^{1}/_{8}$" [613 mm], 28 $^{5}/_{8}$" [727 mm] and 34 $^{5}/_{8}$" [880 mm] with leg levelers in minimum position. The leg leveler provides an additional 2" [51 mm] of height adjustment.

IV Bar
The cabinet can be equipped with an intravenous (IV) Bar to facilitate hanging required materials.

UV light
The SterilGARD® e^3 can be equipped with an ultraviolet (UV) light that provides a minimum intensity of 40 microwatts per cm^2 at the work surface with a new bulb.

Floor and Wall Seismic Anchoring
Floor and Wall Seismic anchoring plates are available with and without California OSHPD pre-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.

Digital Display Package Option (DDP)
The Digital Display Package provides a durable touch screen display for cabinet controls, cabinet monitoring and cabinet alarms. One digital pressure monitor is included for airflow monitoring.

Auxiliary Wiring Options
Additional wiring options are available to provide external connection of the status of certain cabinet conditions to an external HVAC system. The following wiring options are offered:

- Blower Switch Status Wiring Package which provides an external analog signal regarding the status of the cabinet blower (either ON or OFF)
- Cabinet Monitor Wiring Package which provides the blower operational status as well as sash alarm status or ReadySAFE™ status.

III - PROPER CABINET USE

CAUTION

A Biological Safety Cabinet is a valuable supplement to, but not a replacement for, good laboratory technique and safe practice.

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

The facility industrial hygienist or safety officer shall ensure that:

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

A good reference source is 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 as an advisory document for safe work practices.

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.

Operation and Controls

The operator controls with indicators are arranged on the front electrical panel of the cabinet. A number of switches are arranged in a single membrane switch assembly. [Reference Figure 3]

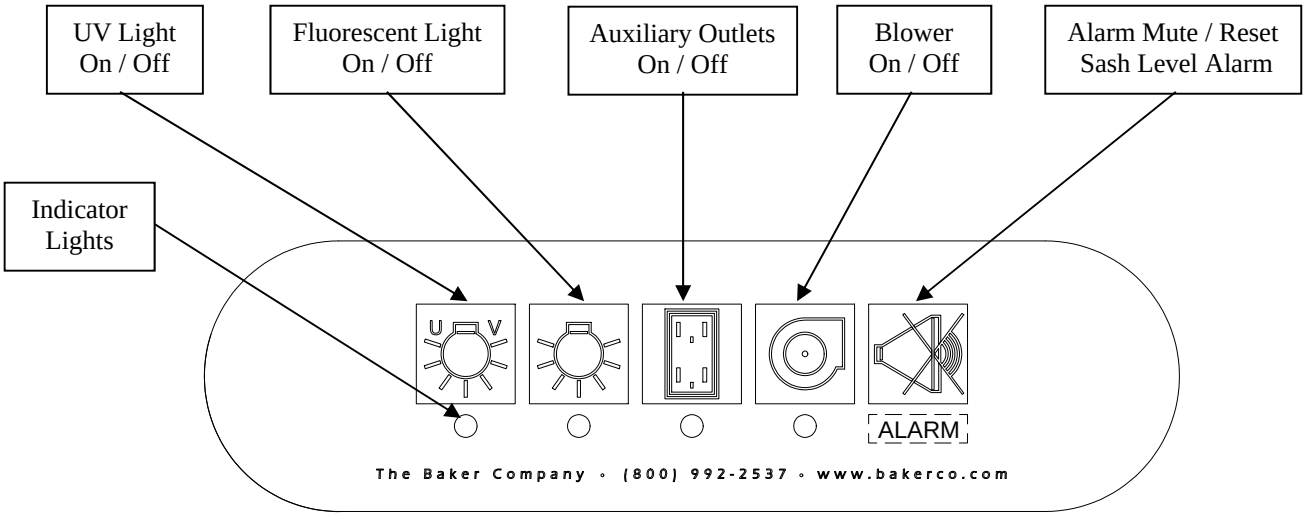

Figure 3: Operator Controls

Blower

This pushbutton switch controls the cabinet blower. Pressing the Blower pushbutton switch will turn the blower ON. A green indicator light located below the switch will illuminate when the switch is on. Pressing the Blower pushbutton switch when the blower is running will turn the blower OFF. If the cabinet blower is turned off, the Fluorescent Lights will turn off.

Fluorescent Light

The cabinet blower switch must be in the ON position for the fluorescent light to operate.

This pushbutton switch controls the visible lighting inside the cabinet's work area. Pressing the Fluorescent Light pushbutton switch will turn the light ON. A blue indicator light located below the switch will illuminate when the switch is on. Pressing the Fluorescent Light pushbutton switch when the light is on will turn the light OFF. If the cabinet blower is turned off, the Fluorescent Light will turn off. The Fluorescent Light and the optional UV light are interlocked so that they cannot be on simultaneously.

Auxiliary Outlets

This pushbutton switch controls the power to the outlets in the work area. Pressing the Outlet pushbutton switch will turn on the power to the outlets. A blue indicator light located below the switch will illuminate when the switch is on. Pressing the Outlet pushbutton switch when the outlets are on will turn the power to the outlets off.

The outlet circuit is protected by a self-resetting circuit breaker which allows a total of 5 Amps on all outlets. This helps protect the cabinet controls from inadvertent overloads of the cabinet outlets.

For 115V AC/ 60Hz cabinets the outlets are also protected by a Ground Fault Circuit Interrupter [GFCI]. The GFCI outlet is typically installed in the left sidewall. If it is 'tripped' a red indicator on the GFCI is On and the RESET button on the front of the GFCI will be 'extended.' Once the fault condition is corrected press the RESET button to reset the GFCI. There is also a TEST button on the front of the device. It is recommended that the GFCI device be tested periodically to assure safe operation.

Ultraviolet (UV) Light [Optional]

!!! WARNING !!!

- **UV light is hazardous, DO NOT defeat the interlock!**
- **Eyes and skin should not be exposed to direct ultraviolet light.**
- **Ultraviolet light should not be relied upon as the sole decontaminating agent.**
- **NSF/ANSI 49 does not recommend the use of Ultraviolet Lighting for decontamination purposes. Additional surface disinfection should be performed both before and after every cabinet use.**

This pushbutton switch controls the operation of the UV light inside the work area. Pressing the UV pushbutton switch will turn the UV light ON. A yellow indicator light located below the switch will illuminate when the switch is on. . Pressing the UV pushbutton switch when the UV light is on will turn the UV light OFF. The UV light will automatically shut off if the view screen is opened. The UV light and Fluorescent light are interlocked so that they cannot be on simultaneously.

The operation of the UV lamp is interlocked with the view screen position. The view screen sash must be fully closed for the UV lamp to be used.

UV lamps lose their effectiveness over time. UV lamp intensity should be checked at least annually by a qualified certification technician.

The view screen must be fully closed before the UV light can be energized.

Alarm Reset

This pushbutton switch is used to mute all audible alarms. Pressing the pushbutton switch will silence the current active alarm. There is a red LED located below the switch as a visual indication of an alarm condition. The LED indicator will continue to flash as long as an alarm condition exists. The Mute time is set for 5 minutes. If the alarm condition is not corrected the audible alarm will reactivate at the end of the 5 minute mute time.

Alarm Conditions

Any alarm condition indicates a potential hazardous condition that needs to be addressed immediately. The alarms below are listed in order of precedence.

Sash Alarm

There are two safe sash levels defined for this cabinet, normal operating position and fully closed position. For normal operation, the viewscreen sash must be placed at the safe design opening indicated by marker arrows on both the right and left sash guide. The sash alarm occurs when the view screen is not at a safe operating position, and alerts the user with a visual and audible alarm once per second. There is a 3 second delay before the alarm activates, to allow the operator time to move between safe operating positions. Pressing the Alarm Reset pushbutton will mute the audible alarm for 5 minutes. The visual alarm will continue to flash until the viewscreen is placed at safe level. If the unsafe sash position is not corrected, the audible alarm will return.

Power/Processor Fault Alarm

The Power/Processor Fault Alarm occurs when the system 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.

Double Proximity Sensor Fault Alarm

The Double Proximity Sensor Fault alarm occurs when both Sash Position proximity sensors are activated simultaneously. This is a condition that should not be able to occur in normal operation. A visual and audible alarm four times per second indicates this fault condition. This alarm can be muted for five minute periods by pressing the Alarm Reset pushbutton.

Low-flow Exhaust Alarm (with FlexAIR canopy exhaust connection only)

The Low-flow alarm, (optional components required) occurs when there is a loss of capture air flowing into the canopy air intake openings due to low exhaust air flow. A visual and audible alarm, twice per second, will alert users of this undesirable operating condition. The Low-flow alarm can be muted, however a visual alarm will remain until the problem is resolved. If the FlexAIR exhaust system has not been corrected, the audible alarm will return.

Alarm Summary Table

Alarm Type	Acknowledgement	Comments	Action
Sash Alarm	Once per second after three second delay	Takes precedence over other alarms; audible alarm can be muted for 5 minutes	Return sash to correct position
Power/Processor Fault Alarm	Three one second alarms followed by two second delay	Cycle will repeat until cleared by pushing alarm reset button	Check power distribution to cabinet
Double Proximity Sensor Fault Alarm	Four times per second	Can be muted for 5 minutes	Return sash to one of the two correct positions
Low-flow Exhaust Alarm	Twice per second	Audible alarm can be muted	Check building exhaust system

Cabinet Timer Functions

The cabinet Fluorescent Light, Accessory Outlets and UV Light [Optional] can be programmed to operate for a predetermined time period. This can be set in 15 minute or 1 hour increments. There is no time period programmed when the unit is shipped from the factory.

NOTE - The device to be programmed should be in the OFF condition before you start programming.

15 minute increment programming:

1. Press and hold the pushbutton of the device you want to program.
2. In about 3 seconds you will hear a short 'beep'. This indicates that you have turned the timer function ON, are in the programming mode for the device, and have programmed it to turn OFF in 15 minutes. Release the pushbutton.
3. Each subsequent press of the device pushbutton while in the programming mode will add 15 minutes to the Delay Off time. (e.g. pressing the pushbutton 3 additional times would set the delay to 60 minutes, 15 min. initially plus 3 x 15 minutes additional delay times).
4. The device control will remain in the programming mode for about 4 seconds if the pushbutton is not pressed.
5. Once the programming mode for the device has ended the device can be turned OFF normally, if desired, by pressing the device pushbutton.
6. The programmed device will turn OFF automatically at the end of the Delay Time.
7. Each time a programmed device is turned off manually or automatically the programming is cleared and must be reentered, if desired.

1 hour increment programming:

1. Press and hold the pushbutton of the device you want to program.
2. In about 3 seconds you will hear a short 'beep'. Continue to hold the pushbutton. In about an additional 3 seconds you will hear a longer 'beep'. This indicates that you have turned the timer function ON, are in the programming mode for the device, and have programmed it to turn OFF in 1 hour. Release the pushbutton.
3. Each subsequent press of the device pushbutton while in the programming mode will add 1 hour to the Delay Off time. (e.g. pressing the pushbutton 3 additional times would set the delay to 4 hours, 1 hour initially plus 3 x 1 hour additional delay times).
4. The device control will remain in the programming mode for about 4 seconds if the pushbutton is not pressed.
5. Once the programming mode for the device has ended the device can be turned OFF normally, if desired, by pressing the device pushbutton.
6. The programmed device will turn OFF automatically at the end of the Delay Time.
7. Each time a programmed device is turned off manually or automatically the programming is cleared and must be reentered, if desired.

Cable Ports

Cable Ports may be located in the cabinet left and/or right side walls. Cable Ports provide a way of introducing power and/or data cables, siphoning tubes, etc. into the work area of the cabinet without routing them through the front view screen access opening. It is important to not overload the port with too many cables, tubing, etc. to minimize air turbulence at the Cable Port location. Cables/tubing in the work area should be suspended on cable hooks provided with the cabinet. The hooks should be located along the interior rear wall in designated slots. This will help to keep the cables and tubing from affecting the airflow in the work area and placing unwanted stress on the cable port gaskets.

A plug is provided for each port location. It is recommended the port plug be installed when the port is not being used or when the cabinet is being decontaminated.

Cable Ports (continued)

CAUTION

When removing cables and/or tubes from the interior of the work area, make sure these items are properly decontaminated first before being removed to the room through the cable port

Start-up Procedure

1. If the cabinet has not been left running continuously, turn on the blower. An indicator light located below the switch will illuminate when the switch is on and the running blower will make an audible sound. Check the readings on the analog pressure gauge; it should read a pressure consistent with the last time the cabinet was on.
2. Turn on the fluorescent light. The indicator light below the switch will illuminate along with the interior work area. (**NOTE: The fluorescent light will not come on unless the blower switch is on. The fluorescent light and UV light are interlocked so they cannot operate simultaneously.**)
3. Check to determine that the drain valve is in the closed position or the drain coupling is capped.
4. If your cabinet has been purchased with the optional UV light, lower the viewscreen to its fully closed position and turn the UV light on to make sure it is operational. (**NOTE: The UV light option features an interlock that prohibits its operation unless the viewscreen is fully closed. The fluorescent light and UV light are also interlocked so they cannot operate simultaneously; see also step #2**)
5. Wipe down the interior area of the cabinet with surface disinfectant. (**NOTE: 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 and rinse with sterile water to prevent corrosion.)**
6. Place all materials to be used for the next procedure inside the cabinet on the solid work surface. **Disinfect the exterior of these materials prior to placing them on the work surface.** Everything required (and nothing more) should be placed in the cabinet before beginning your 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. Blocking the front and rear perforated grilles must be avoided. If wipes or absorbent towels are used on the work surface, be sure to keep them away from the grilles.
7. After your equipment is in place inside the cabinet, adjust the sliding viewscreen so it is open to the correct opening height (8", 10" or 12" [203mm, 254mm, or 305mm]). An alarm will signal if you are not at the proper opening. This is important to maintain proper cabinet airflow.
8. Ensure that the padded armrest assembly is properly installed. You can begin working in the cabinet after it has run for at least three minutes with the viewscreen in the proper position.

Working in the Cabinet

WARNING
Never work inside the cabinet when an alarm indicator light is on

This section contains some suggested basic work practices that should be observed when using a Biological Safety Cabinet. 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 & 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 germicidal soap both before and after working in the cabinet. It is recommended that long-sleeved gowns or lab coats with tight-fitting cuffs and sterile gloves are worn. This minimizes the shedding of skin, or related contaminants, into the work area and protects hands, arms and clothing from contamination.
- Avoid using floor-type pipette discard canisters. It is important that used pipettes be discarded into a tray or other suitable container inside the cabinet. This reduces the need to move in and out of the work area unnecessarily.
- Because of the restricted access, pipetting within the cabinet will require the use of pipetting aids.
- All work should be performed using the recessed area of the solid work surface. Work should be performed using slow movements. The number of movements should be limited as much as possible. All of the materials required should be placed in the cabinet prior to starting a procedure to reduce the need for the operator to move arms in and out of the cabinet through the air barrier.
- Room airflow can significantly affect cabinet operation. Opening and closing doors in the laboratory can cause air disturbances which might interfere with cabinet airflow. This kind of activity should be kept to a minimum while the cabinet is in use. Personnel should avoid walking by the front of the cabinet while it is in use. The location of facility air diffusers and personal fans can have an adverse effect on cabinet safety.
- Use good aseptic technique
- The operating position of the sash is either an 8" [203mm], 10" [254mm], or 12" [305mm] access opening as determined by the certification of the cabinet. This defined opening provides optimum operating conditions for the cabinet. Because operators will not all be the same height, it is suggested that the operator use a height adjustable chair or similar device when working in the cabinet.
- 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. The cabinet should then be allowed to run for a minimum of three minutes, with no activity, so that the airborne contaminants will be purged from the work area. Once this has been done remove all equipment from the cabinet.

WARNING
Never use the cabinet to store supplies or laboratory equipment.

- When all materials have been removed, all interior surfaces should be decontaminated. Check the work area carefully for spilled or splashed nutrient that might support bacterial growth.
- It is recommended that the cabinet be left running continuously to ensure containment and cleanliness. The sash alarm is not activated when the window is in the fully closed position.

Using Ancillary Equipment

The more equipment and material that is placed in the cabinet, the greater the possibility of disrupted air flow. The resulting turbulence can alter the designed airflow and reduce the effectiveness of the cabinet. 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 at the access opening.

Reacting to Spills

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 hot 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 experiment. 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. Hypochloride (chlorine bleach) can also be used in dilute concentrations. Caution should be used, as Hypochloride 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.

Disinfect the work area and work surface before and after every procedure.

1. Disinfect surfaces of all equipment used.
2. Remove all items from the inside of the cabinet.

3. 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.
4. Disinfect the entire inside surface of the cabinet.

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, Second 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, Second Edition, 1995, Heinsohn, P.A., Jacobs, R.R. and Concoby, B.A., editors, AIHA Publications, pp.101-110.

Cleaning the Drain Pan

CAUTION
It must be assumed that the Drain Pan is contaminated.

Spills that fall through the perforated grilles in the work surface should be mopped up and put in a disposal container inside the work area to reduce the amount of liquid. The remainder can be removed through the drain valve in the Drain Pan after proper decontamination of the work area. To clean the drain pan under the work surface, lift the work surface, completely surface decontaminate the work surface and work surface supports, then remove them from the work area. Removing these parts provides unobstructed access to the drain pan for easy cleaning. The drain valve must be closed when cleaning of the drain pan is completed.

Decontamination

The cabinet must be decontaminated with an appropriate agent prior to maintenance, service or repairs in any contaminated area of the cabinet. The National Institute of Health, National Cancer Institute and the Centers for Disease Control have all recommended the use of formaldehyde gas for most microbiological agents. Only individuals experienced in the decontamination of cabinets should use this substance since the gas itself is toxic.

A good reference for this procedure is the most current NSF/ANSI Standard 49-Annex G "Recommended Microbiological decontamination Procedures", NSF International, 789 North Dixboro Road, P.O. Box 130140, Ann Arbor, Michigan, 48113-0140. NSF/ANSI 49 describes procedures for decontamination using either depolymerized paraformaldehyde or chlorine dioxide. Decontamination using alternative methods, such as vaporous hydrogen peroxide (VHP) should be thoroughly evaluated prior to use.

The gas to be used should be determined to be effective against all of the biological agents within the cabinet. Personnel should always use the proper safety equipment (PPE) (gas masks, protective clothing, etc.) for the specific gas. The antidote for the selected gas should be immediately available, in a visible and nearby location.

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.

WARNING
Prior to usage of any decontamination agent, the user needs to check compliance with local, state and federal environmental regulations

About the HEPA Filters

CAUTION

- **The HEPA filter consists of a continuous sheet of glass fibers pleated and mounted in a rigid frame. It is very delicate and the filter media should never be touched.**
- **HEPA filters are not intended to filter gasses or vapors. Since this cabinet is partially recirculating, there will 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.**

The High Efficiency Particulate Air (HEPA) filter is one of the essential components of a clean air cabinet. It is the shield, which stands between the product and the environment.

Proven efficiency in all HEPA filters used in Baker cabinets are 99.99% for particles 0.3 microns in diameter. The 0.3 micron particle is used as the basis for filter definition because theoretical studies have shown that filtration efficiency should be at a minimum for particles of this diameter, with efficiency increasing for particles either larger or smaller. Experiments with various viruses and microbial agents have proven the effectiveness of HEPA filters.

Warranty

The Baker Company, Inc., expressly represents and warrants all goods (a) to be as specified (and described) in The Baker Company catalogues and literature, and (b) to be free under normal use, service and testing (all as described in The Baker Company, Inc., catalogues and literature) from defects in material and workmanship from a period of seventy-two (72) months from the invoice date [US/Canada only] and Twelve (12) month warranty for international.

The exclusive remedy for any breach or violation of this warranty is as follows: The Baker Company, Inc., will F.O.B. Sanford, Maine, furnish without charge repairs to or replacement parts or equipment which proved defective in material or workmanship. No claim may be made for any incidental or consequential damages.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTIBILITY OR FITNESS FOR A PARTICULAR PURPOSE UNLESS OTHERWISE AGREED IN WRITING SIGNED BY THE BAKER COMPANY. THE BAKER COMPANY SHALL NOT BE RESPONSIBLE FOR ANY IMPROPER USE, INSTALLATION, SERVICE OR TESTING OF GOODS

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Patent pending – Air Bypass Armrest, Cable Port