



CLASS II TYPE B1 & B2 QUICK START GUIDE

NU-427 | NU-560 | NU-565



The Safer Choice



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ISO 13485:2016 Fernbrook
ISO 9001:2015 & Niagara
CERTIFIED Locations



GENERAL INFORMATION

The LabGard® Energy Saver (ES) Biosafety Cabinet (BSC) Series are bench/table top models, optionally available with a telescoping or mechanical auto-rising base stand for operation as a full console model. The LabGard® ES Series utilize a single Energy Saver DC ECM motor with an optimally determined forward-facing curved fan for each model size/width to maximize both energy efficiency and filter loading capacity. The Energy Saver DC ECM motor is controlled to airflow setpoints via a solid-state DC motor controller with a digital thermistor airflow sensor and a differential velocity pressure flow grid that automatically compensates for both filter loading and line voltage variances.

The Biosafety Cabinet is a product resulting from the development of the "laminar airflow" principle and the application of environmental controls as required in the field of biological research or chemical containment. The BSC, when used with proper workflow techniques, is an effective laboratory aid in obtaining the optimum control over product quality while reducing potential risk of exposure of both products and personnel to airborne biological or chemical particulate agents in low to moderate risk-hazard research and drug preparation, as prescribed by the Center for Disease Control (CDC) in Atlanta, Georgia.

The LabGard® ES Series meet the requirements of a Class II, Type B1 & B2 (model depending) and provide ISO Class 5 Air Protection by conforming to the following biosafety requirements:

- Maintains a minimum average inflow velocity of 100 fpm (0.51 m/s) through the work access opening.
- Contains HEPA filtered downflow air drawn from the laboratory or outside air (i.e. downflow air is not re-circulated from the cabinet exhaust air).
- Exhausts all inflow and downflow air to the outside atmosphere through a hard connection to the facility exhaust duct system after HEPA filtration without recirculating into the cabinet or laboratory.
- Maintains all contaminated ducts and plenums under negative pressure or fully encapsulated by directly exhausted (non-re-circulated through the work area) negative pressure ducts and plenums.

The NU-565 ES Total Exhaust (TE) Class II, Type B2 BSC may also be used for working with flammable, explosive, or volatile chemicals and radionuclides if permitted by your chemical risk assessment.

SAFETY INFORMATION

The biosafety cabinet has been manufactured using the industry's latest technological developments and has been thoroughly tested before delivery. However, **the biological safety cabinet may still present potential hazards if it is not installed and used as instructed for its intended purpose** or outside of its operating parameters. The following procedures must always be observed:

- The safety cabinet must be operated only by properly trained and authorized personnel.
- For any operation of this cabinet, the operator must prepare clear and concise written instructions for operating and cleaning, utilizing applicable safety data sheets, plant hygiene guidelines, and technical regulations.
- Repairs to the device must be carried out only by properly trained and authorized expert personnel.
- Keep these operating instructions close to the cabinet so that safety instructions and important information remain visible and are always accessible to personnel.
- Should you encounter problems that are not detailed adequately in the operating instructions, please contact your NuAire representative or NuAire technical services.

BSC AIRFLOW AND WORK ZONE DYNAMICS

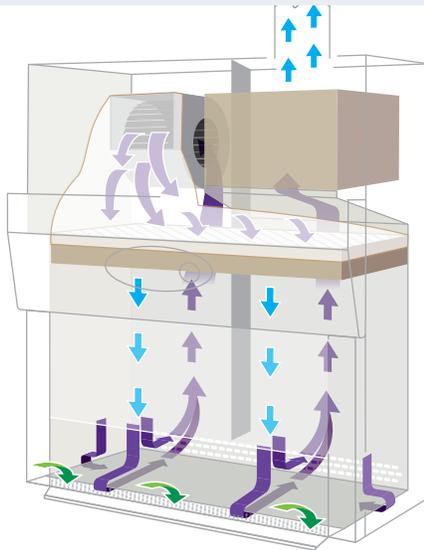


true laminar

True laminar (unidirectional) downward moving air, utilized in class II biosafety cabinets, flushes the work surface at 60 fpm (0.30 m/s) minimizing cross-contamination within the work zone.

dynamic air barrier

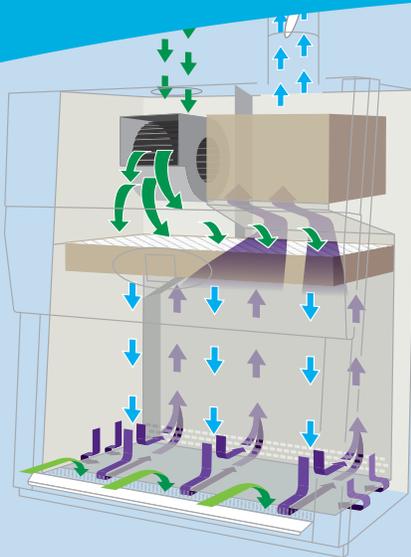
Class II BSCs create a dynamic air barrier at the front of the cabinet, which separates the laboratory from the work zone environment at a constant air speed of 105 fpm (0.53 m/s).



Class II, Type B1 Airflow

Class II, Type B1 Biosafety Cabinets exhausts 70% of airflow. Approximately 30% of the air that passes through the work zone gets recirculated, which lessens the strain on your facility's ventilation system. The NU-427 may also be used for work with minute quantities of volatile chemicals and trace amounts of radionuclides in the directly exhausted portion of the work zone or, if it does not interfere with product samples, in the re-circulated down flow areas.

- ➡ HEPA Filtered Air
- ➡ Contaminated Work Zone Air
- ➡ Contaminated Room Air



Class II, Type B2 Airflow

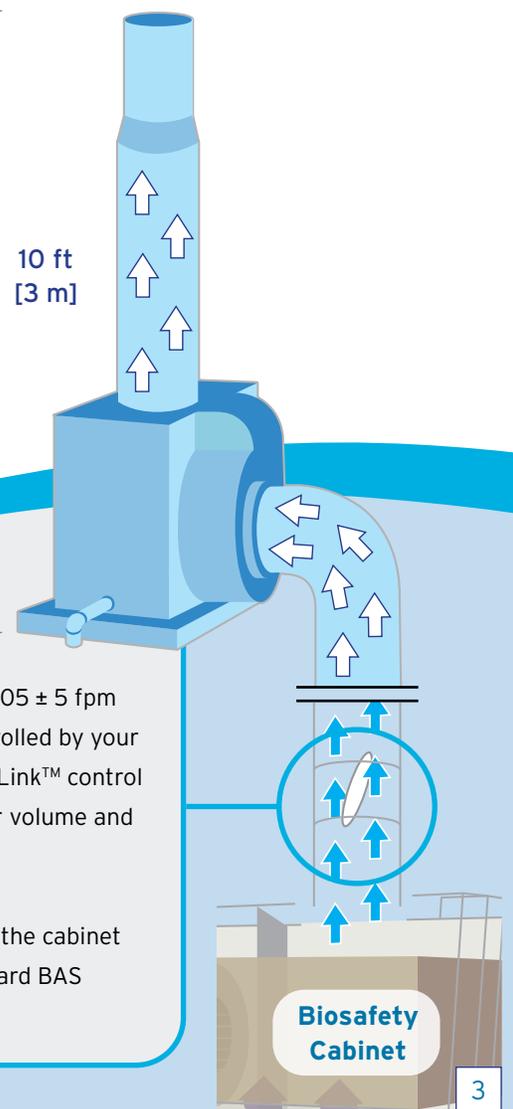
Understanding the Class II, Type B2 airflow system is critical to the safe operation of your biosafety cabinet. Class II, Type B2, often referred to as Total Exhaust, Biosafety Cabinets recirculate 0% of the air passing through the work zone and must be connected to a dedicated ventilation system via a closed duct attachment. NuAire also offers a Type B2 BSC that can be optimized to work with volatile/toxic chemicals and radionuclides. All of our Type B2 models also come standard with two-point dual digital thermistor airflow sensors and our TouchLink™ LCD control center. Scientific professionals working with biosafety level 3 products and in pharmaceutical research often prefer our B2s for their superior level of airflow monitoring and control.

EXHAUST DUCT CONSIDERATIONS

The exhaust/supply systems must provide conditions similar to which the cabinet was certified to meet its stated performance. The following guidelines should be observed when installing exhaust/supply air ductwork for existing facility exhaust systems, or creating an entirely new exhaust system.

- Adequate room air inflow to replace all exhausted air. Air diffusion rate must not exceed 100 fpm (.51 m/s) to minimize disruptive air currents. If your laboratory is pressurized, follow ANSI/AIHA Z9.5 lab ventilation guidelines.
- Ensure your facility has adequate exhaust airflow and static pressure.
- For a new exhaust system (i.e. duct diameter, length and number of elbows, etc.), all duct losses must be considered and added to the BSC loss when selecting an exhaust blower.
- Any supply air must be interlocked with the cabinet's internal downflow blower in order to prevent air being forced out of the front of the work zone when powered off or during night setback conditions.
- All ductwork should be securely anchored to the building's construction and be free of vibration and swaying during operation.
- Sheet metal gauges and seams should be in accordance with the current edition of the ASHRAE guide. A minimum of 20 gauge for round duct is required to prevent duct collapse due to high static pressure conditions.
- All ductwork should maintain negative pressure within the building.
- The exhaust blower and corresponding duct work should be sealed in a way that holds 2 inches (51 mm) w.g. pressure for 30 minutes with no more than a 10% drop in internal pressure and be properly vented to disperse exhausted air out in the atmosphere.
- It is recommended that the cabinet operation be interlocked with the exhaust blower. Fan relay contacts are provided for this purpose. However, it is also recommended to have a manual exhaust override switch near the cabinet for certification and servicing.
- It is recommended that when using an automatic butterfly valve, the system's air volume must remain within 10% of the given nominal setpoint volume to optimize the measurement and control performance.
- It is not recommended to hard connect (i.e. weld) the exhaust connection to the cabinet. This may damage the exhaust filter and/or the butterfly valve. A silicon sleeve should be banded between the cabinet's and your facility's exhaust duct with no more than a 2 inch (51 mm) gap between the ducts.

Your facility's exhaust blower should rise 10 ft (3 m) above the top of the roof.



A Constant Air Volume (CAV) valve or damper must be placed downstream

of the cabinet to assure a steady rate of exhaust flow. The work zone access barrier 105 ± 5 fpm [$.53 \pm .025$ m/s] is maintained by the CAV valve. The CAV valve, in most cases, is controlled by your Building Automation System (BAS), but could also be directly controlled by the TouchLink™ control system via the digital differential velocity pressure flow grid that monitors exhaust air volume and optionally controls an actuated gas-tight damper.

NOTE: It is also recommended to use a manual gas-tight damper mounted just above the cabinet for sealing of the exhaust duct during the cabinet decontamination process if a standard BAS controlled CAV is used.

BSC INSTALLATION GUIDE

1 INSPECT, UNPACK, CLEAN

INSPECT

Upon delivery, inspect both the packing crate and product for potential damage.



CLEAN EXTERIOR

Wipe down exterior of cabinet prior to placing in your lab or clean room.

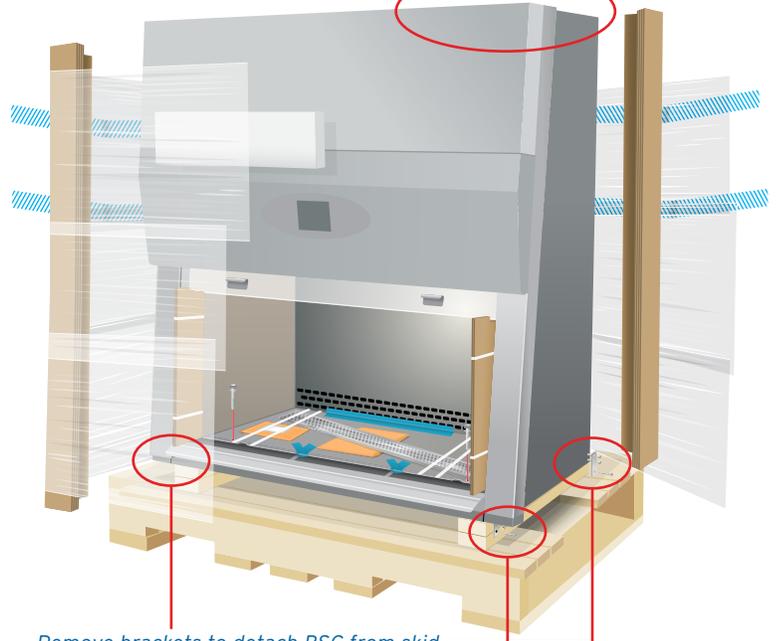
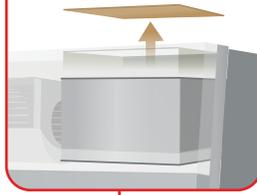
CAUTION: Do NOT use CHLORINATED or HALOGEN cleaning agents. 70% isopropyl or other disinfectant compatible with construction of the chamber is recommended.

Disclaimer: NuAire does not warrant any product with respect to cleaning material compatibility. Use at your own risk.

UNPACK

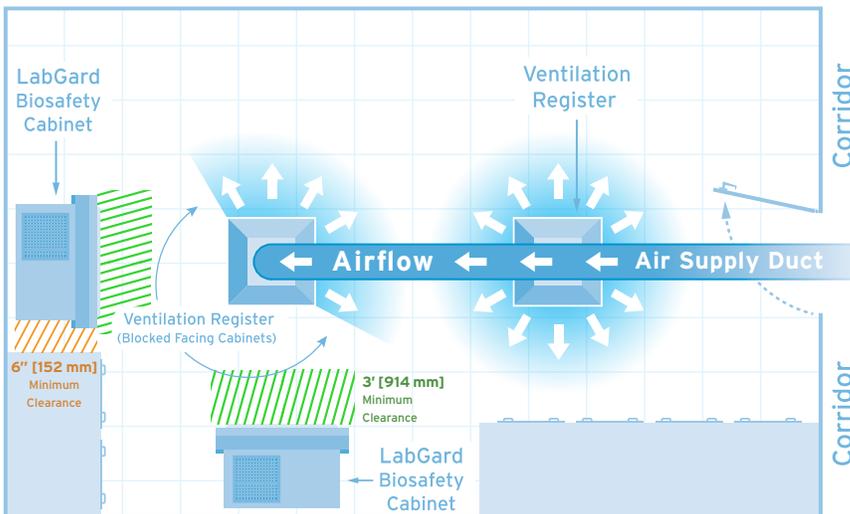
Remove packaging. If possible, leave the BSC secured to shipping pallet until moved to desired location. Remove bolts securing BSC to pallet.

Remove top diffuser and cardboard covering. Return diffuser when done.



Remove brackets to detach BSC from skid.

2 PLACEMENT IN LAB



- Place in area with motionless ambient air to avoid any interference with the dynamic air barrier and exhausted out flow.
- Ensure your BSC is at least 6 in [152 mm] of space between walls and other devices to ensure your personnel remain unobstructed
- Avoid locating your cabinet near any heating or cooling registers. If units must be placed near a register, block the flow in the direction of the BSC.
- Leave at least 3 ft (914 mm) in front of the work zone to allow clearance for personnel.
- The BSC location should allow easy access to an approved power outlet.
- The control center electronics should remain accessible for maintenance and service.

3 PLACE ON BASE STAND, LEVEL

A) Carefully slide your cabinet onto mechanical lifting device.

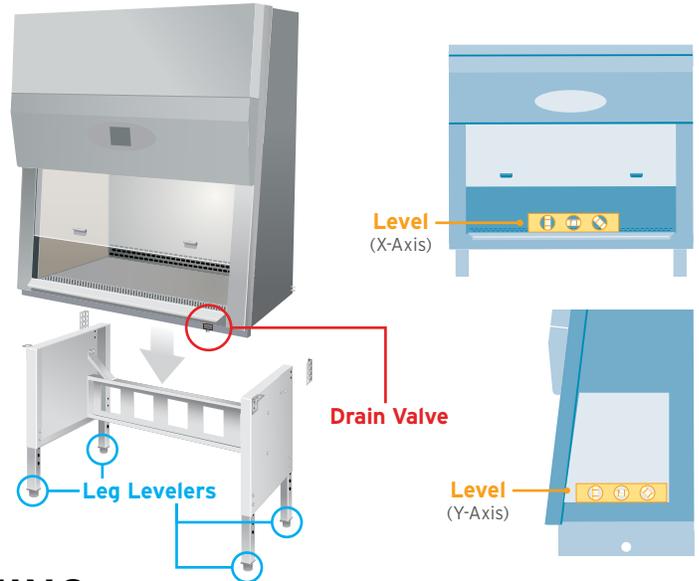
Be weary of the drain valve located in the front-right corner directly under the work zone.

B) Using your mechanical lifting device, slowly drop BSC onto base stand. Do not attach rear mounting brackets until BSC is placed onto base stand.

C) Attach Mounting Brackets on each corner of cabinet/base stand.

D) Level unit by placing level in center of work zone.

Adjustable leg levelers are located at bottom of base stand. Read level along X & Y axis of unit.



4 FINAL ASSEMBLY & CLEANING

A) Remove part components from included envelope.

B) Brush over Drain Valve threading using the included sealant.

Screw on Drain Valve until unit is firmly tightened to desired location.

C) Remove any remaining packaging materials from the work zone.

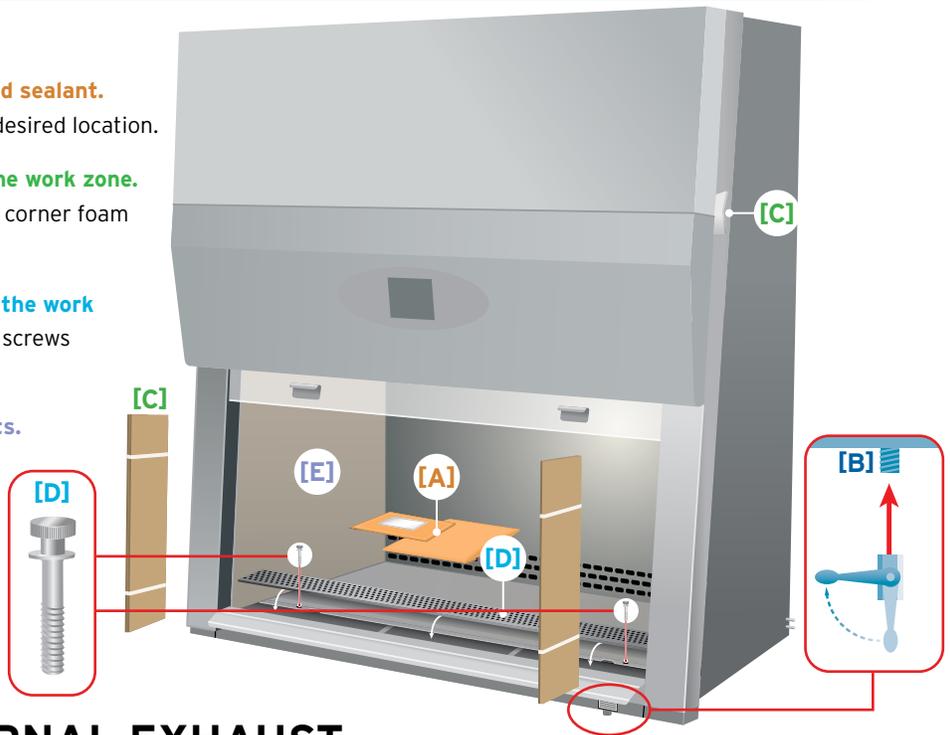
Remove cardboard window sash guards and the small corner foam pieces from inside the control panel.

D) Place airfoil grill in front of work zone, then center the work surface. Hold work surface in place with two included screws located in front corners of work tray.

E) Clean interior of cabinet with approved disinfectants.

CAUTION: Do NOT use CHLORINATED or HALOGEN cleaning agents. 70% isopropyl or other disinfectant compatible with construction of the chamber is recommended. Wipe down exterior of BSC.

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5 CONNECT TO EXTERNAL EXHAUST

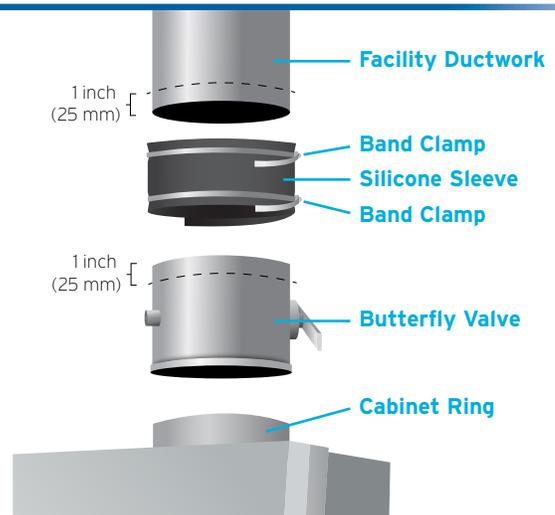
A) Clean the inside ring of the butterfly valve and the outside ring of the cabinet with alcohol or acetone.

B) Apply 1/4 inch (6 mm) bead of silicone around the inside edge of the butterfly valve.

C) Press fit butterfly valve assembly onto cabinet ring. Note that the actuator point towards the right side of the cabinet. Additional use of duct tape may be required.

D) Connect existing ductwork to butterfly valve using a silicone sleeve.

Overlap the sleeve by at least 1 inch (25 mm) to the valve and ductwork. Remove any remaining sleeve material and glue overlapped seam with silicone sealant. Ensure seal is air-tight.



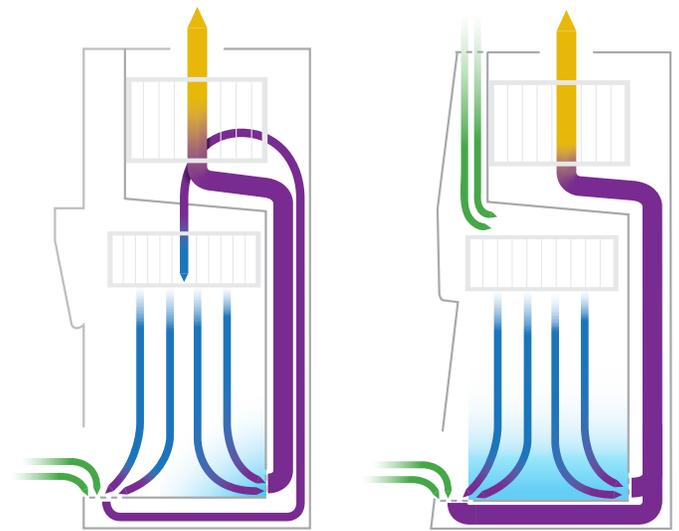
USER OPERATION GUIDELINES

Know Your “Safe Work Area”

The cabinet's safe working area is basically the work tray or depressed area. All work should be performed on or above the work tray. The the front grill and the area above it is *not* a safe work area. It is important to maintain an air gap on both sides of the work tray before fastening in place. The work tray as being part of the cabinet has been designed to load up to 100 lbs. (45.4 kg.) of work materials. Any additional loading should be evaluated by appropriate safety personnel. Any flammable or volatile chemicals and radionuclides should be handled in the directly exhausted portion of the safe working area.

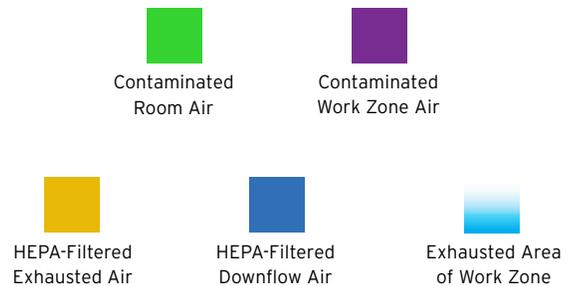
Minimize Penetration of “Air Curtain”

The minimum number of necessary items should be placed into the cabinet to prevent overloading, but the work should also minimize the number of times the operator’s hands and arms must enter and leave the air curtain. The ideal situation is to have everything needed for the complete procedure placed in the hood before starting, so that nothing need pass in or out through the dynamic air barrier until the procedure is fully completed. This is especially important in working with moderate risk agents. Unnecessary rising of the hands inside the cabinet above the level of the work opening should also be avoided. This presents an inclined plane from hands to elbows along which the downflow of air may run across and possibly completely out of the work zone.



Class II Type B1
(30% Recirculated / 70% Exhausted)

Class II Type B2
(100% Exhausted)



Utilize the Unidirectional Airflow

The air is supplied to the work area through filters from the top, is contaminant free and airborne contamination generated in the work area is controlled by top-to-bottom unidirectional air streams. A solid object placed in a laminar air stream will disrupt the parallel airflow and consequently, the capability of controlling lateral movement of airborne particulates. A cone of turbulence extends below the object and laminarity of the air stream is not regained until a point is reached downstream, approximately equal to three to six times the diameter of the object. Within the parameters of this cone, particles may be carried laterally by multidirectional eddy currents.

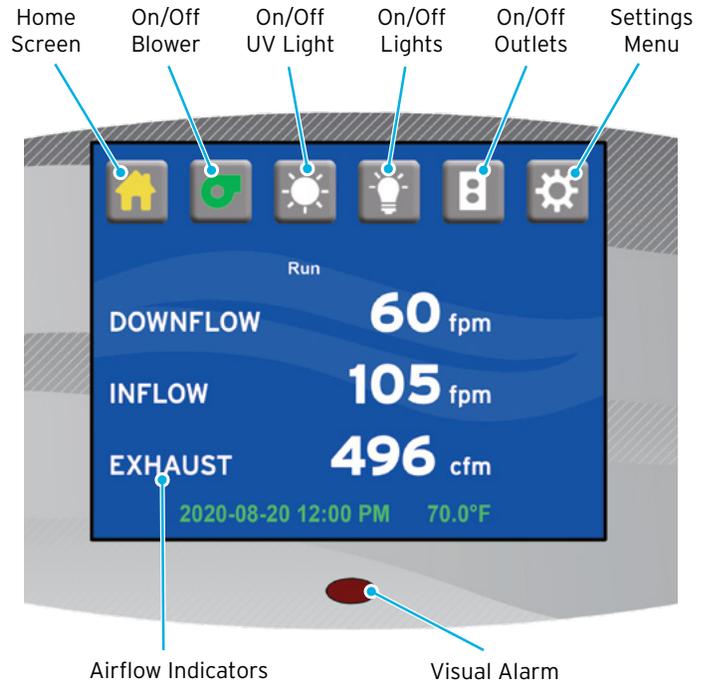
Minimize Ambient Room Activity

Activity in the room itself should be held to a minimum. Unnecessary activity around the cabinet may create disruptive air currents and interfere with the workflow of the operator. If drafts or other disruptive air currents exceed the inflow velocity of the cabinet through the access opening, the potential exists for contaminated air to exit or enter the work zone area of the BSC. It depends on the severity of the air current. A person simply walking past the front of a cabinet can cause draft velocities up to 175 fpm (.89 m/s), which are sufficient enough to disrupt the air balance of the dynamic air barrier.

ELECTRONIC CONTROL SYSTEM



The TouchLink™ LCD Electronic Control System (ECS) utilizes a digital dual thermistor airflow sensor in the downflow stream to monitor and control airflow to your setpoints. The control system automatically compensates for variances in filter loading and voltage and other environmental effects. A digital differential velocity pressure glow grid in the exhaust air stream monitors for exhaust volume and subsequent inflow velocity. The TouchLink™ ECS also simplifies biosafety cabinet maintenance by recording detailed diagnostics. Step-by-step decontamination procedures can also be controlled via the on-board control center. The TouchLink™ ECS can even warm up the blower motor before you arrive and set all lights on a customizable schedule for optimal efficiency.



Before You Start:

Turning on your Biological Safety Cabinet (BSC) is as simple as tapping the Blower icon. Please allow the blower motor to warm up for 150 seconds before beginning your workflow. After a sterile environment has been created, your BSC airflow speeds will be displayed on the Home screen through the use of the intelliflow™ sensors. The window sash must be completely closed before the UV Light will activate. The Lights icon toggles the LED lights positioned over the work zone. The Outlets icon activates/deactivates your cabinet's power outlets. The Settings icon opens various settings and menu items; tapping the Settings icon will also return you to previous menu screen.

Alarms - Visual and audible alarms will occur if considerable changes occur to the sterile environment.
(ex. Low / High Airflow, Low / High Sash Height)

intelliflow™

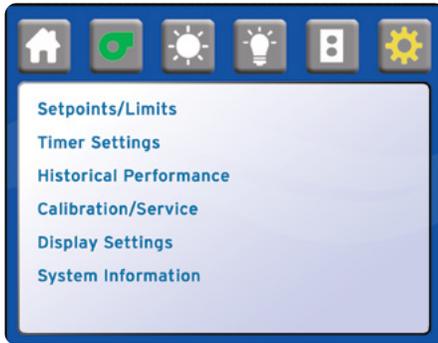
The intelliflow™ Airflow Sensor and Digital Differential Velocity Grid are strategically placed under your biosafety cabinet's supply filter and over the exhaust filter(s) to measure airflow speeds in real-time. After your local certifier performs the initial calibration process, the TouchLink™ Electronic Control System (ECS) maintains consistent airflow through the use of thermal anemometer airflow sensor technology. Airflow data is then digitally communicated to the internal fan and motor, which automatically adjusts output to provide you with a constant true laminar airflow. The TouchLink™ ECS can also record and store all airflow data onto an attachable USB drive located behind the drop-down control panel above the cabinet work zone.

nitecare™

The nitecare™ Night Setback Program will reduce your lab's energy consumption while maintaining work zone sterility when your cabinet is not in use. The nitecare™ mode can be programmed via the TouchLink™ ECS LCD screen with a few easy steps. Once programmed, the nitecare™ mode will be initiated by closing your front access window. Once the sash has been closed, the automated nitecare™ system turns off on-board lights and reduces fan/motor speeds. The additional feature "UV Light Timer" also allows the Ultraviolet (UV) light to be activated during this time to assist with maintaining work zone sterility. The nitecare™ mode reduces energy consumption while maximizing workflow efficiency.

NAVIGATING THE SETTINGS MENU

Main Menu



Setpoints/Limits - This controls the inflow & downflow air speeds and their allowable variance before sounding the visual/audible alarm.

Timer Settings - Allows users to set timers for the blower motor (purge), LED lights, UV light, and cabinet outlet(s).

Historical Performance - Line graph detailing the inflow & downflow speed history.

Calibration/Service - Password protected certifier menu for blower & sensor setup/diagnostics. Decontamination and nitecare™ functions can be accessed from this menu.

Display Settings - Screen brightness, system language, date/time functions.

System Information - Unit model & serial numbers are displayed here.

Setpoints/Limits



Downflow Setpoint - Displays and changes current downflow air speed; NuAire does not recommend changing from default values unless advised to do so by your local certifier.

Downflow High Limit - Activates alarm if downflow air speed exceeds displayed value.

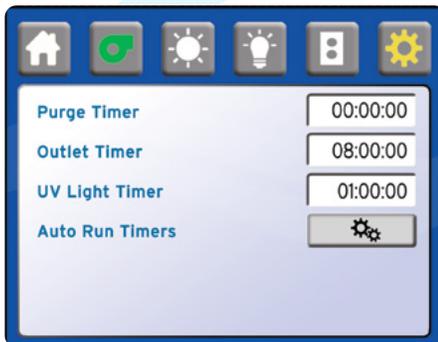
Downflow Low Limit - Activates alarm if downflow air speed falls below displayed value.

Exhaust Setpoint - Displays and changes current exhaust air pressure; NuAire does not recommend changing from default value unless advised to do so by your local certifier.

Exhaust High Limit - Activates alarm if exhaust air pressure exceeds displayed value.

Exhaust Low Limit - Activates alarm if exhaust air pressure falls below displayed value.

Timer Settings



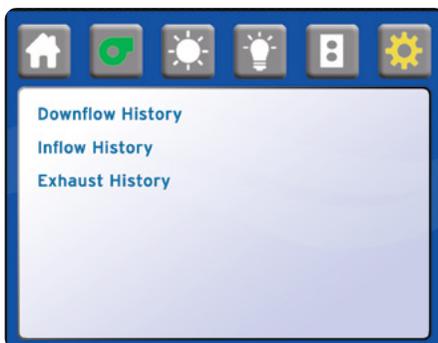
Purge Timer - This timer controls how long the blower will continue to purge the work zone after the Blower icon has been tapped by user to stop the blower motor.

Outlet Timer - This timer controls how long the power outlet(s) remain active after user taps the Outlet icon. The outlet(s) will automatically shut off when timer expires.

UV Light Timer - This timer controls how long the UV light remains lit after user taps the UV Light icon. The UV light will automatically shut off when timer expires.

Auto Run Timers - This timer provides the ability to program on a daily basis the start/stop times of the cabinet's blower motor and LED lights.

Historical Performance

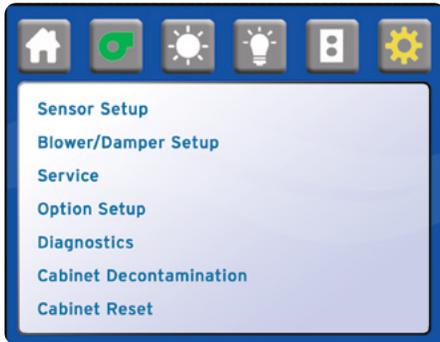


Downflow History - Displays downflow air speed setpoint and measured history from the last 7 days in the form of a line graph.

Inflow History - Displays inflow air speed setpoint and measured history from the last 7 days in the form of a line graph.

Exhaust History - Displays exhaust air pressure setpoint and measured history from the last 7 days in the form of a line graph.

Calibration/Service*



**Please note: Only properly trained certifiers and service professionals should be accessing this menu.*

Sensor Setup - Used to calibrate both inflow and downflow thermistor sensors.

Blower/Damper Setup - Access manual blower options, such as manual blower controls and password protect blower power button. The nitecare™ setback options are accessed here. Exhaust damper controls are also accessed here.

Service - UV light and blower run times can be accessed here. You can check your last certification date and set a reminder for your next certification period here. You can also check your estimated remaining filter life here.

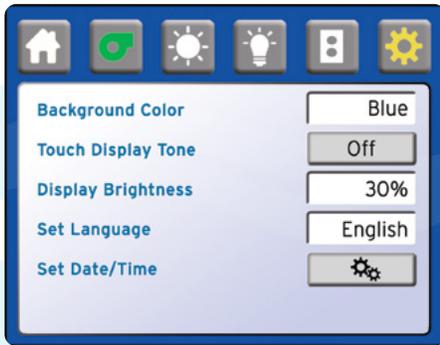
Option Setup - Alarm, feature interlock, and auxiliary settings are accessed here.

Diagnostics - Various airflow, power window, and unit features diagnostic tools.

Cabinet Decontamination - Decon setup and auto-run options are accessed here.

Cabinet Reset - Resets all setpoints, optional features, system calibrations, and motor/sensor data to factory default.

Display Settings



Background Color - Changes background color of the Home Screen.

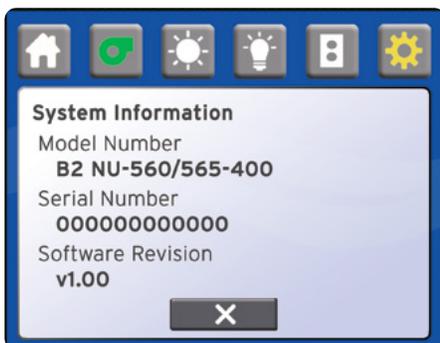
Touch Display Tone - Icons & menu items make audible tone when tapped by user.

Display Brightness - Controls brightness of the LCD screen.

Set Language - Changes displayed language of Home screen and menu items.

Set Date/Time - Changes displayed date & time on Home Screen.

System Information



Displays your Biosafety Cabinet's:

Model number

Serial number

Current software version

INITIAL WARM UP OF BSC BLOWER

Lower window sash to your work settings (denoted by sticker on left side of sash window) and turn on the blower. Let the blower motor warm up for at least one hour before beginning your workflow. After using your BSC for the first time, only a 150 second warm-up is necessary before beginning your workflow.

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The Safer Choice

For more information please visit:

www.nuaire.com or call **1.800.328.3352**



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