

Interceptor®
Biological Safety Cabinet
Class II B2
120 VAC

**Maintenance and
Technical Manual**

INT-1400B & INT-1400B-1
INT-2000B & INT-2000B-1

KEWAUNEE®

...encouraging new discovery

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NOTICE:

The Interceptor® Biological Safety Cabinet offers many features to enhance performance, safety, and operator comfort.

Due to the nature of work performed in a Biological Safety Cabinet, it is very important to read the User and Operation Manual and Maintenance and Technical Manual and follow standard operating procedures to avoid infection and other potential injuries.

If this equipment is used in a manner not specified by the manufacturer in this manual, the protection provided by the equipment may be impaired.

Also, any maintenance or service to an Interceptor® product must be done according to the instructions contained herein. Maintenance of this product shall be carried out by technicians trained in the mechanical details of this unit.



WARNING

Class II B2 Biological Safety cabinets must be certified before initial use, after being moved, and after any service, including required annual recertification. Service must be performed by an NSF accredited certifier using NSF/ ANSI 49 criteria and should include, at minimum, the following test:

- **Downflow Velocity Profile Test**
- **Inflow Velocity Test**
- **Airflow Smoke Pattern Test**
- **HEPA Filter Leak Test**

CHAPTER 1

Technical Specifications for Interceptor®

Product Number	Width of Superstructure	Height of Superstructure	Depth of Superstructure	Fan Max HP	Fan and Light Amps / Power	Outlet Rating Amps / HZ
INT -1400B 120 VAC	1400 mm 55.1"	1610 mm 63.4"	813 mm 32"	0.5	5.4 Amps 650 VA	20 Amps 60hz
INT- 2000B 120 VAC	2000 mm 78.7"	1610 mm 63.4"	813 mm 32"	0.0	10.9 Amps 1320 VA	20 Amps 60hz

Table 1.1: Product Descriptions

For exhaust requirements see Table 3.3

NOTES:

All power values measured at 8 inch operating sash height.

The powered base stand, if ordered, will take an additional 8.6 amps at 120 VAC; 60 Hz.

The electrical outlets inside the Interceptor® are grounded. This is particularly important since all internal surfaces are stainless steel and conduct electricity. Under NO CIRCUMSTANCES use ungrounded plugs in these outlets. It is not recommended to use in excess of 1500 watts of power. Exterior power plugs must not be removed until unit fan and lights are turned off. The unit is to be disconnected from the main voltage by unplugging both plugs to remove power. For electrically-powered base stands, power for disconnect is also accomplished by plug removal from a waste-high or lower plug outlet.

The Interceptor® has one power cord. If a power base is employed, a total of two power cords are used. When positioning the BSC, always connect BSC and stand power plugs in waste-high or floor-positioned outlets to facilitate disconnection in an emergency. Never block these outlets.

If UV option is on your BSC, be sure safety overrides are never immobilized! UV lamp should NEVER be on while sash is open.

Based on the following UL definitions, the Interceptor® may be used in a room with pollution degree 1 or pollution degree 2 conditions:

Pollution Degree 1 No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.

Pollution Degree 2 Normally only non-conductive pollution occurs. Occasionally, a temporary conductivity caused by condensation must be expected.

Pollution Degree 3 Conductive pollution occurs, or dry, non-conductive pollution occurs which becomes conductive, which is expected.

Be aware that the dimensions of a Biological Safety Cabinet may exceed doorway limitations.

CHAPTER 2

Replacement and Repair of Key Parts



Figure 2.1 BSC with Top Front Panel open

Conditions 1, 2 and 3 mentioned in this section are all behind the Air Chamber Access Panel, which is accessible by lifting the Top Front Panel. Before opening the Air Chamber Panel, a complete decontamination of the upper plenum area is required. This decontamination step is essential since the filters and surfaces of the upper chamber will be contaminated.



WARNING

Opening the Air Chamber Access Panel requires a complete decontamination of the upper plenum area. Decontamination may only be performed by an NSF Accredited Technician.

Air Chamber Maintenance Item Locations



Figure 2.2 BSC with Air Chamber Access Panel removed

Conditions Requiring Removal of the Air Chamber Access Panel

- 1) **Filter Replacement**
Loading of the filters to a level where an inflow face velocity of at least 100 FPM cannot be attained.
- 2) **Fan Failure**
Fan fails to operate.
- 3) **Pressure Transducer Failure**
The control panel displays **Sensor Error** and/or erratic velocity readings.



WARNING

Opening the Air Chamber Access Panel requires a complete decontamination of the upper plenum area. Decontamination may only be performed by an NSF Accredited Technician.

Filter Loading

Over time, as the Interceptor's filters load up, inflow velocity shown on the control screen will begin to drop. NSF 49 recommends that the building exhaust fan RPM be increased when this occurs until the control unit again shows 105 FPM.

Before considering filter replacement, the building exhaust fan speed control should be adjusted to increase the air flow. Increase the building exhaust fan speed to attain 105 FPM on the control screen. Check the exhaust/downflow balance after such an adjustment is made. The cabinet downflow fan speed may need adjustment to rebalance the cabinet. The cabinet fan speed control is located inside the Electrical Junction Box located behind the cabinet front panel. Turn the High Speed Control Potentiometer to adjust the cabinet downflow fan speed.



WARNING

Be aware that parts inside the Electrical Junction Box may hold a dangerous charge.

High Speed Control Potentiometer

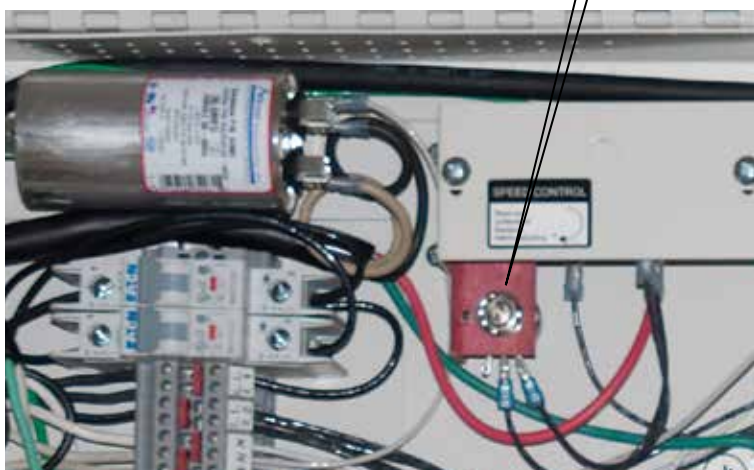


Figure 2.3 Electrical Junction Box – Control Potentiometers

Filter is loading up, but increasing building fan speed allows 105 FPM to be reached.

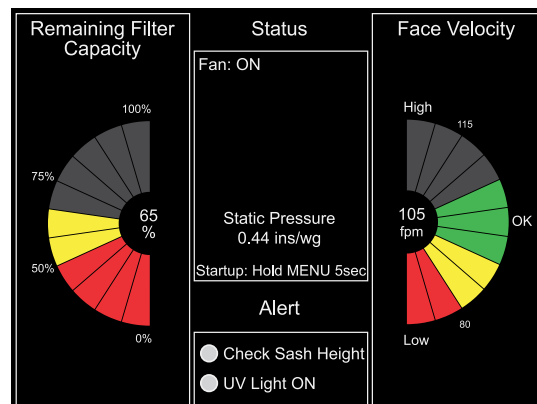


Figure 2.4 Monitor – Filter Loading

Filters should be changed when they load up to the point that further adjustment of the building exhaust will not increase face velocity to 100 FPM. NSF accepts a range of inflow between 100-110 FPM at operating height (8" for the Interceptor).

When the static pressure difference between the negative and positive pressure plenums reaches a certain level the net inflow will continue to drop over time and no further adjustment of the building exhaust fan speed will bring the face velocity back to 100 FPM.

The Filters should be replaced at this time. An inability to maintain 100 FPM mandates filter change-out according to NSF 49.

See Chapter 3 for Filter Replacement procedures.

Fan Failure

Fan failure is uncommon. First check the Motor Capacitor which is located in the junction box under the front panel and can be replaced by a qualified electrician without opening the Air Chamber Access Panel.



WARNING

Be aware that parts inside the Electrical Junction Box may hold a dangerous charge. Only a qualified electrician should replace this capacitor.

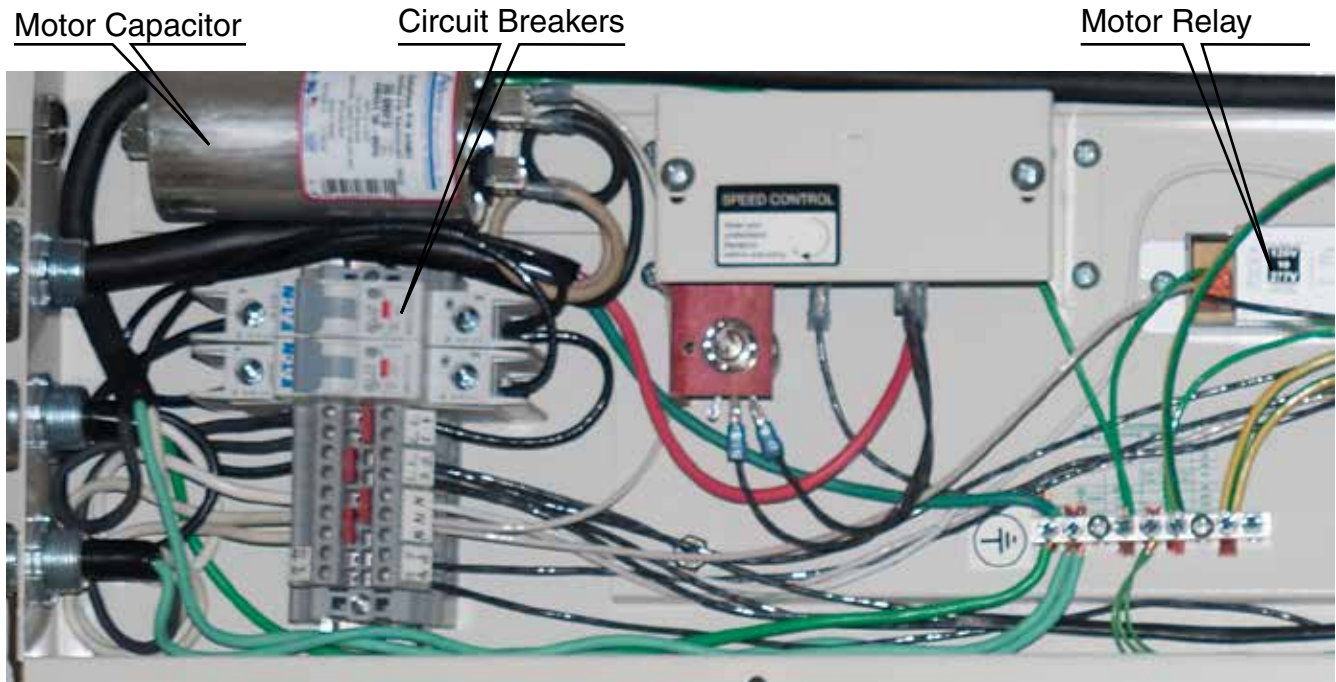


Figure 2.5 Electrical Junction Box – Motor Capacitor & Motor Relay

Next, check the Motor Relay. Input should be either 0 or 24 VDC; Output should be 0 or line voltage

Once the capacitor is verified and the relay found normal, the Fan Access Panel must be removed to inspect/replace the Fan.



WARNING

Opening the Air Chamber Access Panel requires a complete decontamination of the upper plenum area. Decontamination may only be performed by an NSF Accredited Technician.

Fan Removal and Replacement

Once the BSC is decontaminated and the Fan Access Panel is removed, removal and replacement of the fan requires the unbolting of the fan from inside the Fan Chamber as outlined in the steps below:

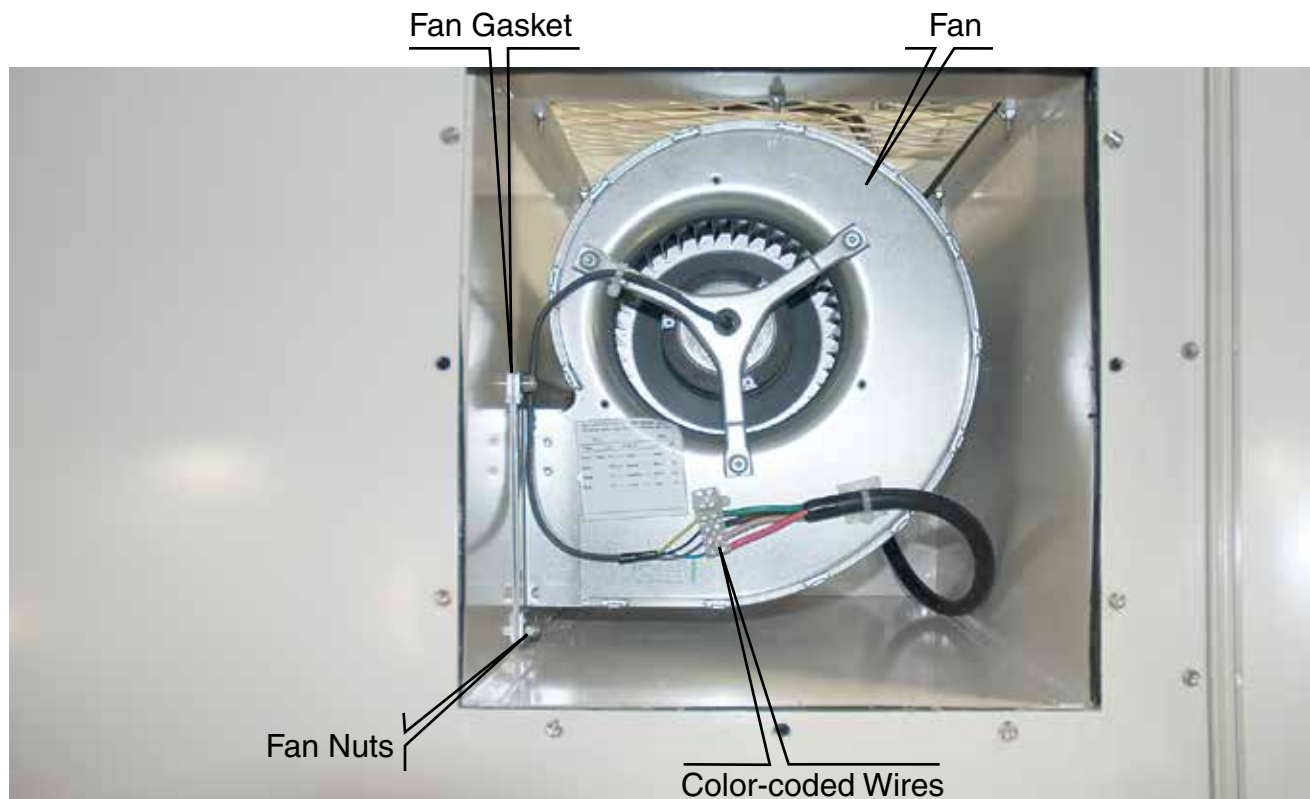


Figure 2.6 Attachment of Fan to Fan Chamber

- 1) Remove the Fan Access Cover Panel and remove the Color-coded Wires from the Fan.
- 2) Remove the Blower Intake Shroud, Filter, and Fan Guard from the top of the hood.
- 3) Remove the Nuts holding Fan in place. The four lower Nuts are accessible from inside the Fan Chamber. Note: INT-2000B cabinets have two more Nuts at the top of the fan flange.
- 4) Carefully dislodge the Fan from its cushioned Gasket and remove from the Fan Chamber.
- 5) Inspect the Fan mounting surface on the Fan Chamber and remove any Gasket material that may have stuck to the surface.
- 6) Install replacement Fan by reversing the steps above.
(Make sure new Fan has been fitted with new Gasket).

Replacement fans are available from Kewaunee Scientific Corporation.
See page 3.7 for part numbers.

Pressure Transducer Failure

Check the security of the connection at indicated location on the BSC Control Board. If the connection is secure, proceed with replacing the transducer.

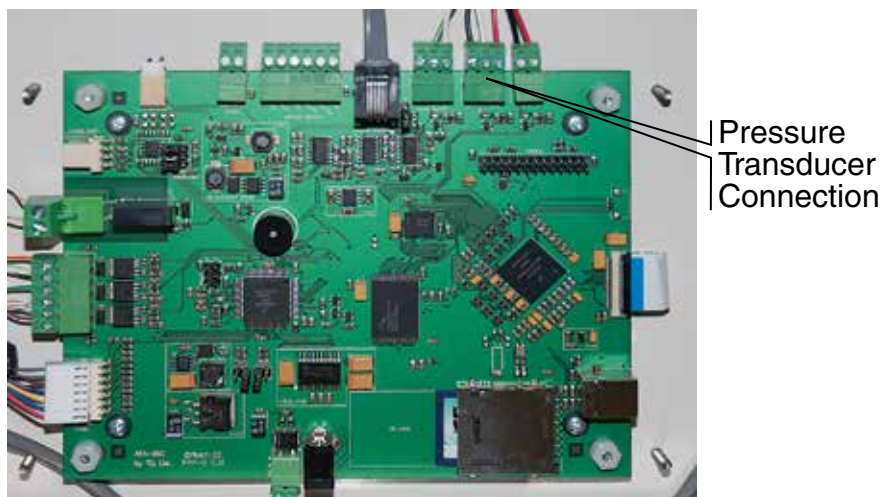


Figure 2.7 BSC Control Board with cover removed – located on back of Front Panel

Pressure Transducer Replacement

After removing the Air Chamber Access Panel, the Pressure Transducer is located in the far right hand side of the Air Chamber. Replacement requires disconnecting, then reconnecting all wires and the pressure hose.



WARNING

Opening the Air Chamber Access Panel requires a complete decontamination of the upper plenum area. Decontamination may only be performed by an NSF Accredited Technician.



Figure 2.8 Pressure Transducer Location

Pressure
Transducer
Location



Figure 2.9 Pressure Transducer

CHAPTER 3

Decontamination / Repairs

Decontamination

Upon leaving the factory, the BSC Control Monitor was calibrated and fan voltage adjusted to the proper values:

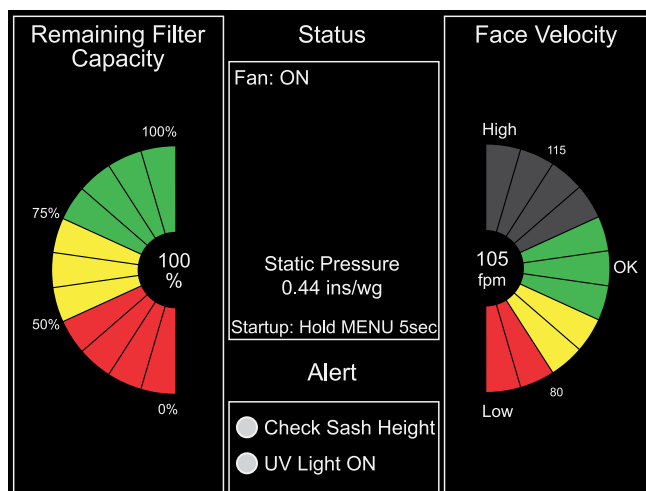


Figure 3.1 Control Monitor – Remaining Filter Capacity 100% – Face Velocity 105 FPM

When new, the Interceptor® Biological Safety Cabinet Control Panel shows key values on the two pie charts shown above. Remaining Filter Capacity should be 100%; Face Velocity should read 105 FPM (± 5 FPM).

After much use, these values (remaining Filter Capacity and Face Velocity) will both decrease. When this inevitable change occurs, some adjustment of building exhaust can restore face velocity, but will not restore the filter capacity readout. (see Chapter 2)

Below the 50% filter capacity level, it may no longer be possible to achieve 105 FPM by simply raising the building exhaust. Since NSF 49 requires the minimum operating average face velocity be between 100 FPM and 110 FPM, velocity readings below 100 FPM require filter replacement.

Since both filters lie inside the contaminated Air Chamber, the BSC must be decontaminated before opening up the panel to replace these filters.



WARNING

Opening the Air Chamber Access Panel requires a complete decontamination of the upper plenum area. Decontamination may only be performed by an NSF Accredited Technician.

Filter Replacement

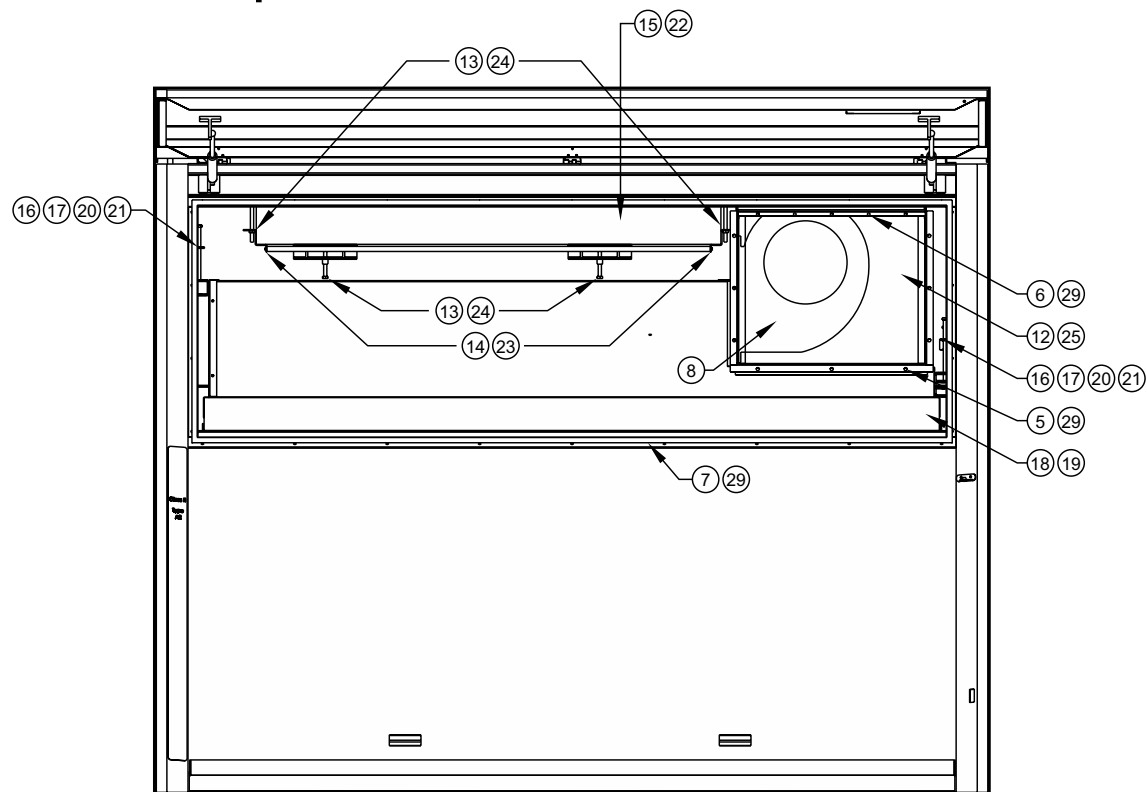


Figure 3.2 Filter Replacement Front View

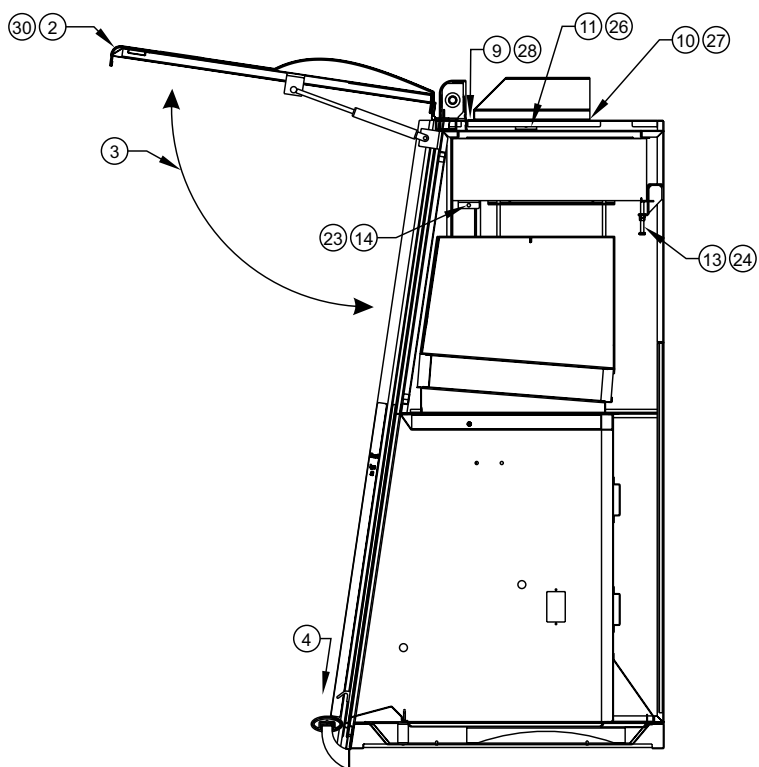


Figure 3.3 Filter Replacement End View

Supply and Exhaust Filter Removal Instructions

1. Unplug unit from power source.
2. Remove screws from underside edge of Front Panel.
3. Raise Front Panel. (Note: Front Panel is equipped with gas struts to assist.)
4. Lower Sash to lowest point.
5. Using 5/16" hex driver, loosen and remove all hex bolts from Blower Access Panel.
6. Using 1/2" hex driver, loosen and remove the two nuts from blower access panel studs and then remove blower access panel.
7. Using 5/16" hex driver, loosen and remove all hex bolts and then remove Plenum Access Panel.
8. Using small flathead screwdriver, remove color coded wires from fan.
9. On top of hood at the blower intake, using 7/16" wrench, loosen nuts and remove the intake hood.
10. Remove the pre-filter and blower guard.
11. Using 7/16" wrench, remove bolts connecting blower box to top frame.
12. The blower box can now be removed by sliding it out the front of the hood.
13. Using 1/2" wrench, loosen all four (4) exhaust filter support bracket bolts.
14. Remove screws attaching the front exhaust filter support rod to the front support brackets.
15. The exhaust filter can now be removed.
16. Loosen supply filter nuts, relieving pressure on the Plenum.
17. Tighten top nuts to raise Plenum slightly.
18. Remove Supply Filter

Supply and Exhaust Filter Replacement Instructions

19. Install Supply filter. Ensure airflow direction is downward and filter label faces out.
20. Loosen top nuts, then tighten bottom nuts, until Supply Filter is sealed.
21. Tighten top nuts to lock adjustment of Supply Filter.
22. Insert new exhaust filter. Ensure airflow direction of filter is upward and filter label faces out.
23. Reattach the front exhaust filter support rod between the front support brackets.
24. Tighten all four (4) exhaust filter support bracket bolts.
25. Re-install blower box on right side of plenum.
26. On top of the hood, install and tighten bolts connecting blower box to top frame.
27. Insert blower guard and pre-filter.
28. Install intake hood and tighten nuts.
29. Replace plenum access panel and blower access panel.
30. Close and secure front panel.

Exhaust requirements

The building ventilation system must be verified that it can handle the required exhaust volumes of the cabinet before connection. Building exhaust CFM should be 1.3 times (130%) of the Biological Safety Cabinet Inflow CFM.

Size of Biological Safety Cabinet	Inflow CFM	Required Building Exhaust CFM *	Clean Static Pressure †	Dirty Static Pressure †
1400mm	755	982	0.90"	2.00"
2000mm	1120	1456	1.10"	2.25"

Table 3.3 * allow building exhaust to compensate for filter loading

† Static Pressure is measured 2" above duct connection. These figures are for B2 connection only and do not select the requirement of the whole HVAC system.



WARNING

A Biological Safety Cabinet connected to a building ventilation system may become dysfunctional if the ventilation system fails. Check building ventilation system before using cabinet!

Replacement of Face Velocity Sensor

The thermal velocity sensor, located in the exhaust output box at the BSC top left, is designed to measure exhaust velocity and translate it into average face velocity at a 8" opening. If the velocity readout starts being irregular, the thermal sensor may need replacement.

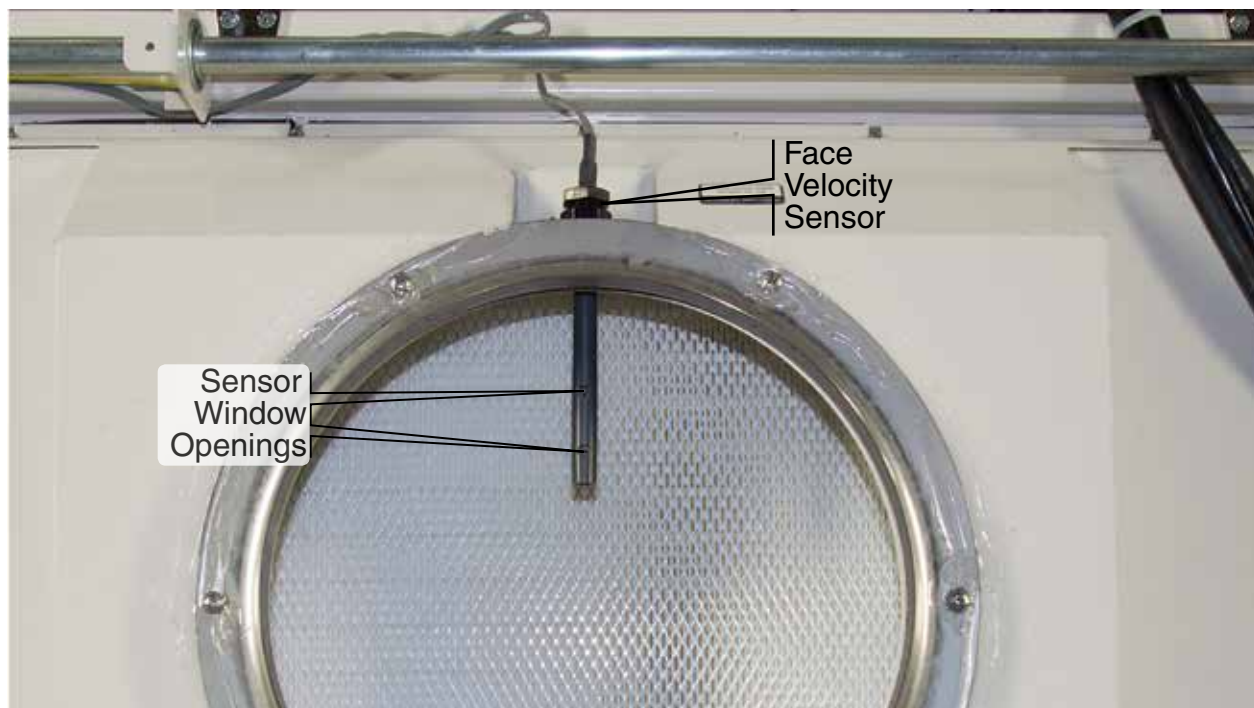


Figure 3.5 Face Velocity Sensor

Be sure the sensor window openings are perpendicular to the exhaust plane. Repair and/or replacement of the thermal sensor can be done without decontamination by replacing the sensor with a new unit. Once this has been done, velocity must be recalibrated using the controller calibration program outlined in Chapter 5.

Replaceable Parts List

Parts	Part Numbers	
	INT-1400B	INT-2000B
30/40 μ F Motor Capacitor	F-7262-05	F-7262-00
Micro Switch	F-7242-00	F-7242-00
Fluorescent / UV Relay	F-7232-00	F-7232-00
10 Amp Circuit Breaker	F-7240-04	F-7240-04
20 Amp Circuit Breaker	F-7240-00	F-7240-00
Motor Solid State Relay	F-7233-00	F-7233-00
Potentiometer	F-7239-00	F-7239-00
Variable AC Power Control	F-7238-00	F-7238-00
UV Lamp	F-7249-00	F-7249-00
T5 Lamp	F-6347-46	F-7248-00
Removable Work Tray	050007-48	050007-72
Tray Handle	F-7209-00	F-7209-00
Bottom Intake Grille	050008-48	050008-72
Sash Glass with Handles Ass'y	050009-48-FIN	050009-72-FIN
Electric Junction Box	050031-00	050031-00
Exhaust HEPA filter	F-7275-48-B	F-7275-72-B
Supply HEPA filter	F-7276-48	F-7276-72
Removable Work Tray Support	050063-00	050063-00
Sash Sweeper Plate	050076-48	050076-72
Top Exhaust Enclosure	050142-48W-B	050142-72W-B
12" Air Tight Damper	INT-DAMPER	INT-DAMPER
Downflow Perforated Grille	050079-48	050079-72
Arm Rest Bracket	050195-0A	050195-0A
Arm Rest Plastic End Cap	F-7279-00	F-7279-00
Aluminum Arm Rest	F-7280-48	F-7280-72
Drain Valve Plate	050110-00	050110-00
316 SS Pipe Fitting	F-7211-11	F-7211-11
316 SS Ball Valve	F-7211-00	F-7211-00
Safety Labels 120 VAC	F-8200-00	F-8200-00
Pressure Transducer	F-7225-06	F-7225-06
Velocity Sensor	F-7225-05	F-7225-05
Fan Assembly	F-7247-01-D	F-7247-00-D
Gas Spring Assembly	F-7224-00	F-7223-00
Belt Drive to Counterweight	F-6343-00	F-6343-00

Table 3.2

CHAPTER 4

Cabinet Operation

Theory of Operation

The Interceptor® is a Class II, B2 Biological Safety Cabinet. Its function is to isolate bacterial samples from cross-contamination and protect the user and the environment around the cabinet from being contaminated by biological or particulate material inside the cabinet.

It accomplishes this objective by bathing biological samples in HEPA filtered clean air while keeping contaminants contained by having a continuous substantial inflow of air through the 8" cabinet sash opening.

The BSC will safely operate at a temperature range of 55°F to 85°F (13°C - 29°C) and a relative humidity of 10% to 70%.

Class II, B2 Biological Safety Cabinets are made to safely contain bacterial samples that fall into the Biological Safety levels 1, 2, 3, and 4 if accompanied by level appropriate protection garments (see Protective Clothing on page 6.1). The following is a description of each level as published in the *CDC BMBL 5th edition*:

“Biological Safety level 1 (BSL-1) is the basic level of protection and is appropriate for agents that are not known to cause disease in normal, healthy humans. Biological Safety level 2 (BSL-2) is appropriate for handling moderate-risk agents that cause human disease of varying severity by ingestion or through percutaneous or mucous membrane exposure. Biological Safety level 3 (BSL-3) is appropriate for agents with a known potential for aerosol transmission, for agents that may cause serious and potentially lethal infections and that are indigenous or exotic in origin. Exotic agents that pose a high individual risk of life-threatening disease by infectious aerosols and for which no treatment is available are restricted to high containment laboratories that meet biosafety level 4 (BSL-4) standards.”

Startup Procedure

Raise the vertical sash to the 8" operating line. Push the **Menu/OK** button on Control Panel Touch Pad (Figure 4.1) while at Startup/Home Screen (Figure 4.2), then press the **Fan** button once and the fan motor will start. The Interceptor® is now intercepting all dust, bacteria, and viral matter and delivering HEPA filtered, clean air to the Biological Safety Cabinet work zone. The air flow pattern is shown in Figure 4.3 on following page.



Figure 4.1 Control Panel Touch Pad



Figure 4.2 Monitor Startup/Home Screen



WARNING

Class II B2 Biological Safety cabinets must be certified before initial use, after being moved, and after any service, including required annual recertification. Service must be performed by an NSF accredited certifier using NSF/ ANSI 49 criteria and should include, at minimum, the following test:

- **Downflow Velocity Profile Test**
- **Inflow Velocity Test**
- **Airflow Smoke Pattern Test**
- **HEPA Filter Leak Test**

Interceptor Class II, B2 Air Flow Patterns

It is recommended that the cabinet fan be turned on and allowed to operate for several minutes removing any suspended particulates. Cabinet interior should then be wiped down with 70% ethanol (EtOH), or other approved disinfectant.

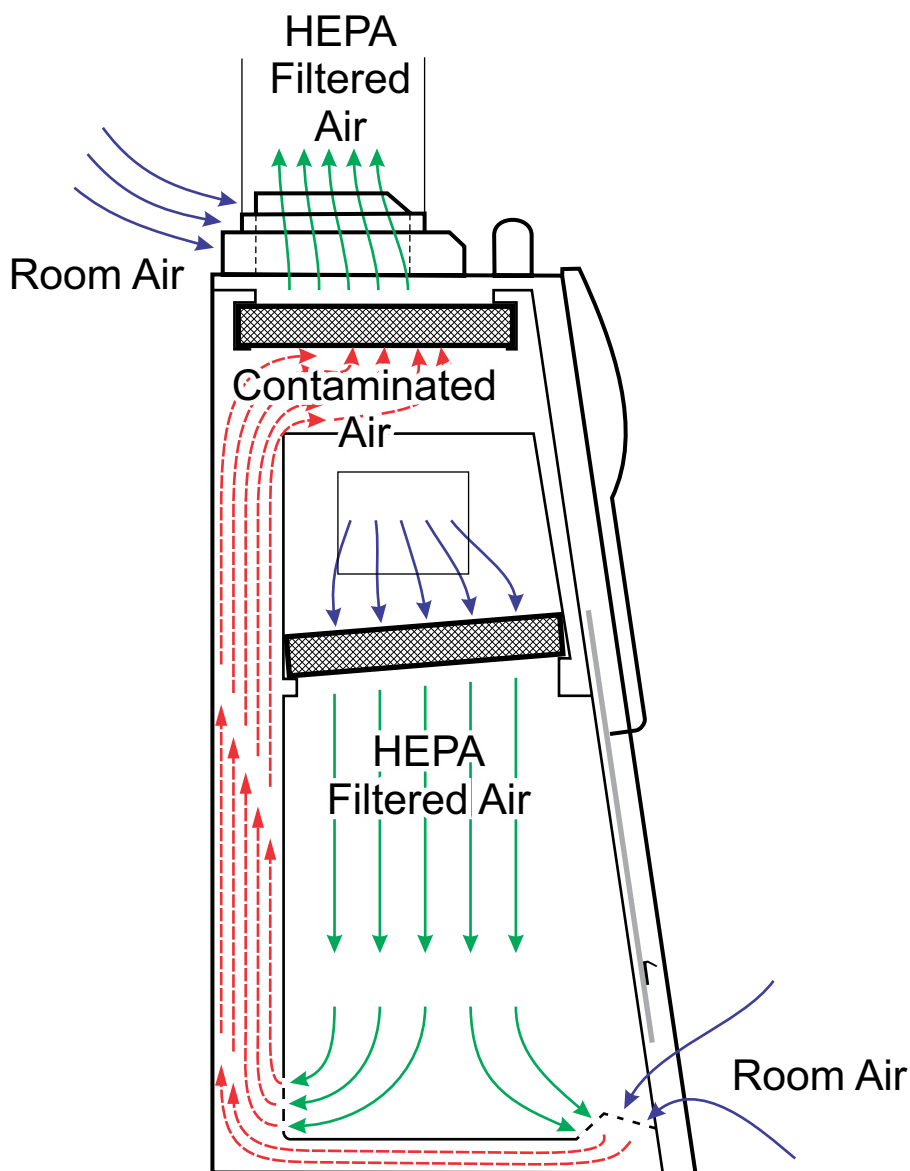


Figure 4.3 B2 Interceptor Biological Safety Cabinet Air Flow Patterns

Operating the Interceptor® BSC

When the Interceptor® cabinet is plugged in, the Control Monitor displays the Startup/Home Screen, Figure 4.4. Press the **Menu/OK** button on the Control Panel (Figure 4.5) to take you to the **Run Screen**. Pressing ▲ (up arrow button) displays the **Configuration Menu**; pressing ▼ (down arrow button) selects **Help**, which displays an instructional slide show.



Figure 4.4 Control Monitor — Startup/Home Screen

When at the Run Screen, Press the **Fan** button on the Control Panel (Figure 4.5) to begin the warm-up cycle. After 5 minutes, the Control Monitor should look like Figure 4.6. The fluorescent light is controlled by the **Light** button and may be pressed anytime after the fan is started.



Figure 4.5 BSC Control Panel

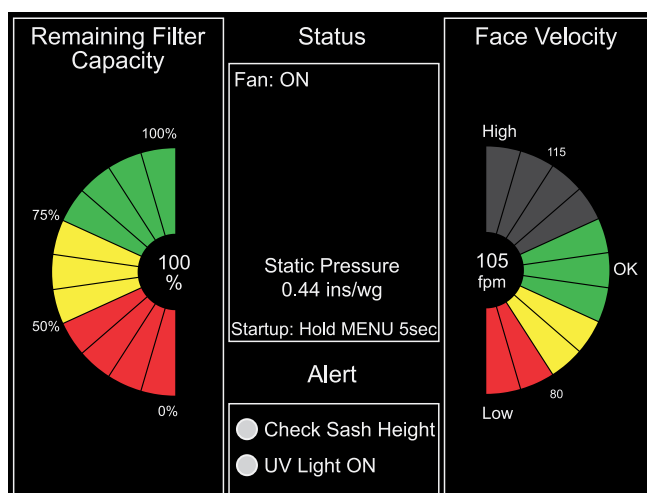


Figure 4.6 Control Monitor — Run Screen after warm-up

A brand new BSC is set for 100% filter capacity and 105 FPM. When face velocity drops below 100 FPM, trained personnel should make adjustments to the system.

Suggested or Recommended Workflow

Once skilled in your lab's Standard Operating Procedure (SOP), don appropriate protective garments and gear suitable to the level of safety required. Place items for use in the procedure in the left section of the work area. Place equipment in the center of the work area. Designate the right section of the BSC for waste to be disposed of at the procedure's end.

As you perform the procedure, waste materials will accumulate on the right side of the cabinet.

After the procedure is finished, remove waste materials, disinfect as is customary at your facility, and place materials away. Each time the unit is used, it should be left clean.

Control Monitor

The Control Monitor Run Screen can alert you to several possible problems as you proceed:

- 1) Low inflow velocity (Face Velocity).
- 2) Filter system full (Remaining Filter Capacity)
- 3) Check Sash Height. Always set the sash at the 8" line when conducting experiments. This is the setting that has received NSF certification.
- 4) UV Light On

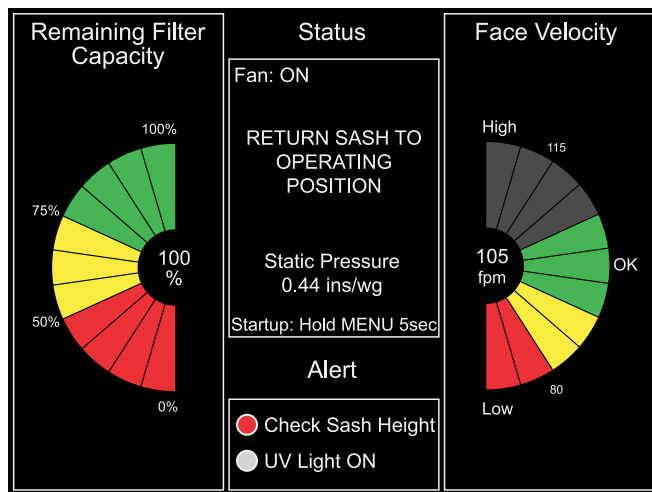


Figure 4.8 Control Monitor Run Screen — Warning – Sash not at 8"

UV Light

The UV germicidal disinfecting light may be used if one has been installed; simply turn off the fan, fully close the sash, and turn on the light using the UV Light button. Because UV rays are dangerous, the light will not operate unless the sash is fully closed. Glass stops UV radiation. If the UV light is not turned off before the sash is raised, the safety interlock will disable the UV light, but the fan will not operate until the UV light is turned off at the control panel.



WARNING

If the UV option is on your BSC, be sure safety overrides are never immobilized! UV light should NEVER be on while sash is open.

Control Monitor Messages and Meanings

Variable	Measurement Method	Importance	Recommended Action
Airflow (optimal value is 105 FPM)	Since the inflow at any point of the 8" sash opening can vary widely, it is the average inflow (CFM/sq ft) that is actually measured. Since the "air in" through the 8" sash opening and blower intake exactly equals "air out", the exhaust port, the Interceptor® converts the FPM exhaust port velocity into FPM inflow velocity at the sash opening.	Proper inflow at 8" assures containment of contaminants within the cabinet. NSF 49 requires a minimum inflow velocity of 100 FPM.	The Run Screen shows airflow on the right pie graph. Any velocity between 100 FPM and 110 FPM is acceptable. If face velocity falls below 100 FPM, discontinue work and contact your Accredited Technician for remediation.
Filter	The static pressure differential between the negative and positive pressure is proportional to filter loading. It is measured by the Pressure Sensor and converted by the Control Module to a filter loading percentage.	The Interceptor® exceeds NSF requirements for maximum static load.	An Accredited Technician may need to adjust fan speed to maintain face velocity or change filter.
Sash ≠ 8"	A micro switch interaction with the counterweight activates this warning.	The cabinet is designed to be used at a 8" sash opening. Any other opening is inappropriate. If the fan is on at any height other than 8", the Check Sash Height red warning light displays.	Return the sash to 8" or turn the unit off and close the sash.
UV Light (when installed)	When the sash is closed and the fan is off, the disinfecting UV Light may be activated using the UV Light button on the Control Panel Touch Pad.	Be sure UV Light Safety Overrides are never immobilized! UV light should NEVER be on while sash is open.	Close sash and turn fan off to reactivate UV.
UV Hours Remaining	Internal countdown timer. Setting of 2000 hours can be reset to manufacturers recommendations.	When the hood UV light is on, it is important to know how much life is remaining in the UV lamp before its UV output diminishes. The "hours remaining" notation will show in the middle column while this information screen is showing.	Replace UV lamp, even if it still glows, when '0' hours remaining is indicated.

Table 4.1

Touch Pad Control Functions

	Function Button	Operations
	Menu/OK (Select)	1. Access Menu 2. Enter Data 3. End routine
	▲	1. Increase programmed value 2. Access menu 3. Increment up on menu
	▲	1. Decrease programmed value 2. Access Instructional Video 3. Increment down on menu
	UV Light Button	Activates UV light ONLY when sash is closed and fan is off
	Alarm Mute	Mutes audible alarm
	Fan	Turns BSC air fan on and off
	Light	Turns work light on and off when the sash is open

Table 4.2

Monitor Run Screen

Pie Chart	Display Explanation
Remaining Filter Capacity	Shows remaining filter capacity
Face Velocity	Shows face velocity at 8" opening (100 FPM to 110 FPM is optimal)

Table 4.3

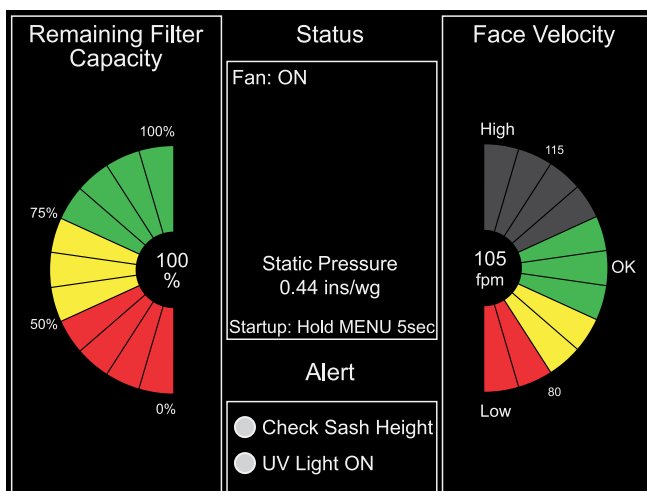


Figure 4.9 BSC Control Screen

Monitor Screen Displays

The Kewaunee Interceptor® Biological Safety Cabinet employs a sophisticated control system using a built in color VGA screen to display menus and options. The following pages illustrate the different states of the monitor with illustrations of the various screens and schematics of each of the menus. The schematic charts show all options for each menu item as well as the factory setting. Please note that it is recommended that menu items highlighted with an asterisk and shaded in grey be changed only by a factory authorized technician.

The menus and options are controlled by the BSC Touch Pad Control located at the bottom of the right facia post and shown on page 4.4, Figure 4.5.



Figure 4.10

Startup/Home Screen

displays when cabinet is plugged in

Press OK to Run

Press Up Arrow for Configuration

Press Down Arrow for Help

Monitor Screen Displays

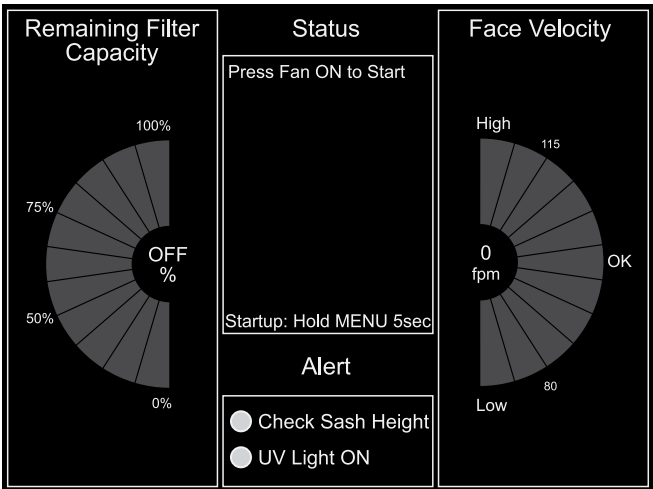


Figure 4.11

Run Screen

Fan OFF

displays when Fan is Off

Press Fan Switch to Start
Press Menu/OK for 5 seconds
to return to Startup Screen

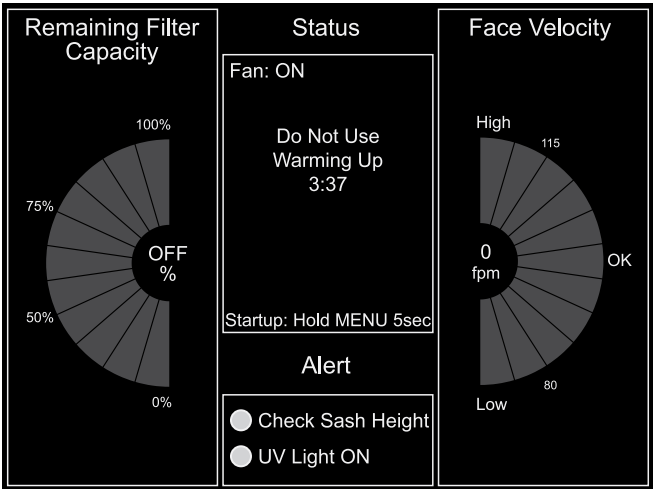


Figure 4.12

Run Screen

Fan Warmup

*displays when Fan is On
during warmup period*

Press Menu/OK for 5 seconds
to return to Startup Screen

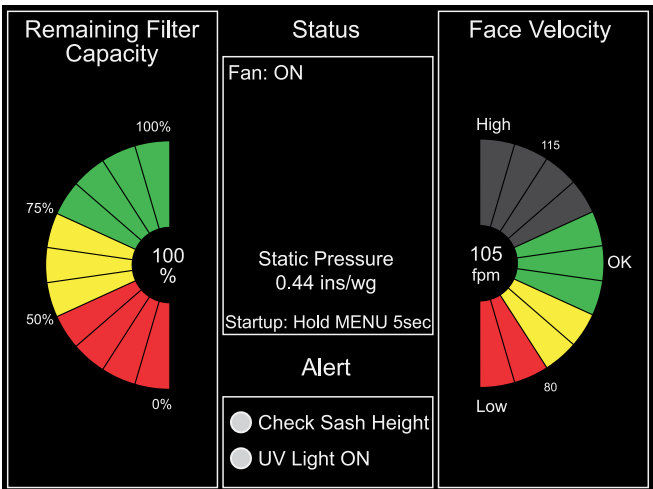


Figure 4.13

Run Screen

Fan On

*displays when Fan is On
after warm up period*

Press Menu/OK for 5 seconds
to return to Startup Screen

Monitor Screen Displays

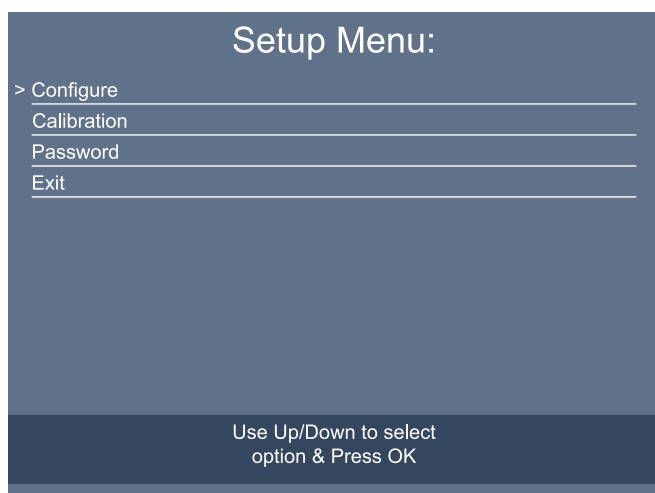


Figure 4.14

Configuration Setup Menu

Main Menu

Press Up or Down Arrow to select option, then Press OK

See Page 4.13

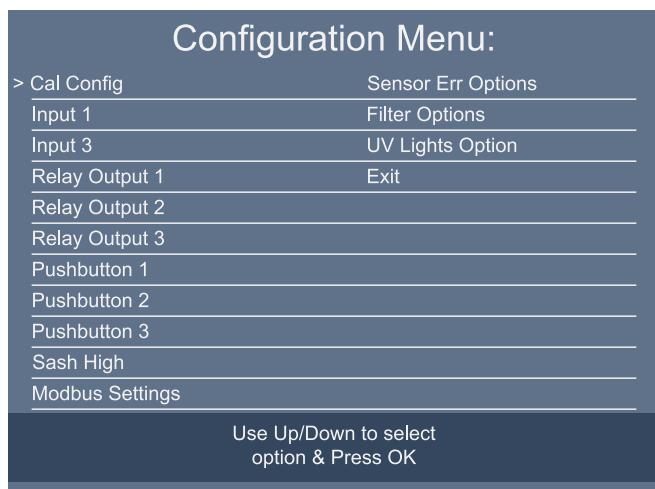


Figure 4.15

Configuration Menu

Use to set Calibration, Filter, and UV Light Options

Press Up or Down Arrow to select option, then Press OK

See Page 4.14



Figure 4.16

Calibration Configuration Menu

Use to set Calibration Options

Press Up or Down Arrow to select option, then Press OK

See Page 4.15

Monitor Screen Displays

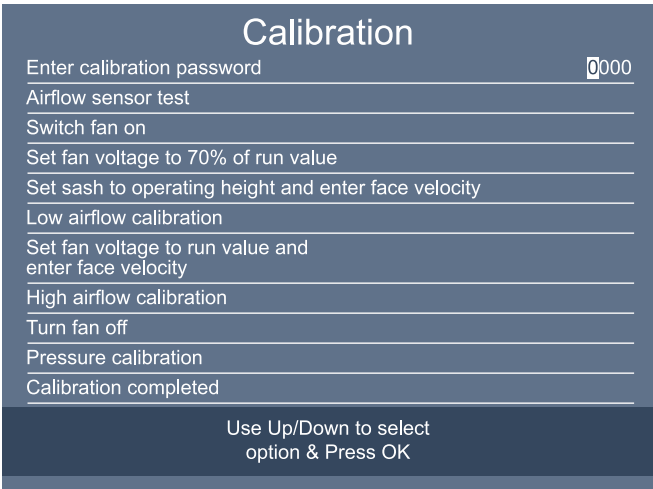


Figure 4.14

Calibration Screen

Use to Calibrate Cabinet at time of installation and after filter changes

Enter Password, then follow screen prompts

Note: To Be Performed by Certified Technician Only

see Page 4.20

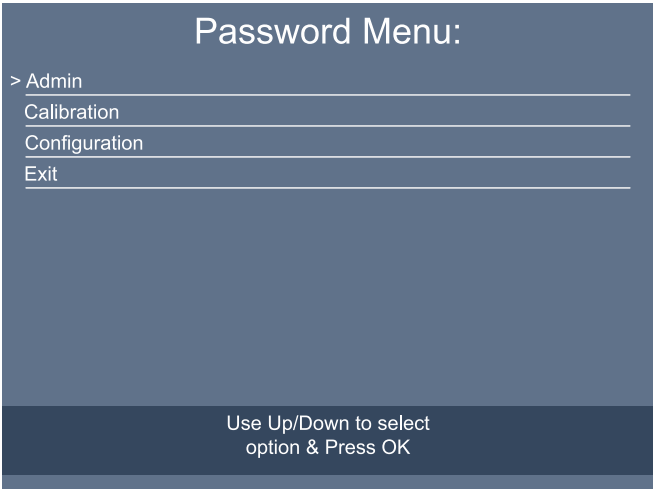


Figure 4.15

Password Menu

Use to change Passwords

Press Up or Down Arrow to select option, then Press OK

see Page 4.13

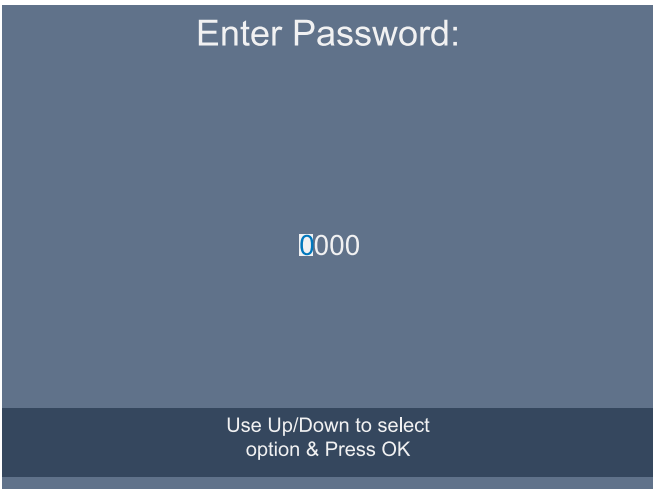


Figure 4.16

Password Screen

Used to enter Configure and Password Menus and change Passwords

Press Up or Down Arrow to select digit
Press OK to advance to next digit
Press OK with complete

Monitor Menus

Setup Menu Schematic

Menu Item			
Configure	→ to Configuration Menu →	See Page 4.14	
Calibration	→ to Calibration Steps →	See Page 4.20	
Password	→ to Password Menu →	See Page 4.13 below	
Exit	→ return to Startup Screen		

Table 4.4

Password Menu Schematic

	Input Screen Title	Input Option	Factory Setting
Password	Enter Password:	XXXX	contact Kewaunee

Menu Item	Input Screen Title	Input Option	Factory Setting
Admin	Enter Password:	XXXX	contact Kewaunee
	New Password:	XXXX	
	Confirm New Password:	XXXX	
Configure	New Password:	XXXX	9999
	Confirm New Password:	XXXX	
Calibration	New Password:	XXXX	9999
	Confirm New Password:	XXXX	
Exit	→ return to Setup Menu		

Table 4.5

Configuration Menu Schematic

	Input Screen Title	Input Option	Factory Setting
Password	Enter Password:	XXXX	9999
Menu Item	Input Screen Title	Input Option	Factory Setting
Cal config menu	→ to Calibration Configuration Menu →		see page 4.15
Input 1 *	Input 1 Activation:	open contact close contact	close contact
Input 3 *	Input 3 Activation:	open contact close contact	close contact
Relay Output 1 *	Relay 1 Activation:	open contact close contact	close contact
Relay Output 2 *	Relay 2 Activation:	open contact close contact	close contact
Relay Output 3 *	Relay 3 Activation:	open contact close contact	close contact
Pushbutton 1 *	PB 1 Activation:	Not Enabled Enabled	Enabled
Pushbutton 2 *	PB 2 Activation:	Not Enabled Enabled	Enabled
Pushbutton 3 *	PB 3 Activation:	Not Enabled Enabled	Enabled
Sash = 10 inches *	Sash High Alarm:	Repeat Timer Off Repeat Timer On	Repeat Timer On
	if On → Sash High Timer:	Xmin	5min
Modbus Settings *	→ to Modbus Settings →		see page 4.18
Sensor Err Options *	→ to Sensor Err Options →		see page 4.18
Filter Options	→ to Filter Menu →		see page 4.19
UV Light Options	→ to UV Light Menu →		see page 4.19
Exit	→ return to Setup Menu		

Table 4.6

* Should only be changed by Factory Authorized Technician

Configuration Menu > Calibration Configuration Menu Schematic

Menu Item	Input Screen Title	Input Option	Factory Setting
Pressure Calib Delay	Pressure Calibration Delay:	Xsec	5sec
Low Air Alarm	Low Air Alarm:	XXfpm	89fpm
Low Air Cutoff	Low Air Cutoff:	OFF ON	OFF
	if ON Low Air Cutoff:	XXfpm	
Warning Air Alarm	Warning Air Alarm:	XXfpm	99fpm
	Warning Air Reset:	Xfpm	4fpm
High Air Alarm	High Air Alarm:	OFF ON	OFF
	if ON High Air Alarm:	XXXfpm	150fpm
Low Air Fluc *	Low Air Fluc:	XX%	5%
High Air Fluc *	High Air Fluc:	XX%	10%
Low High Diff	Low High Air Diff:	XXfpm	30fpm
Warning-Alarm Time	Warning-Alarm Time:	Xsec	5sec
Alarm-Warning Time	Alarm-Warning Time:	Xsec	1sec
Show Air Flow	Show Airflow:	OFF ON	Inactive For future use
Show Time Line	Show Time Line:	OFF ON	Inactive For future use
Audible Alarm	Audible Alarm:	Not Enabled Enabled	Enabled
Sensor Difference	Sensor Difference:	XX%	10%
Sensitivity	Sensitivity:	XX%	100%
Fan Run Up Timer	Fan Run Up Timer Duration:	Xmin	5min
Exit	return to Configuration Menu		

Table 4.7

Configuration Menu > Pushbutton 1 Options Schematic

Menu Item		Input Screen Title	Input Option	Factory Setting
Select O/P Relay *	→	PB 1 Relay:	None Output 1 Output 2 Output 3	<i>Output 1</i>
Interlock *	→	PB 1 Interlock:	Not Active Off enable Pb 2 On enable Pb 2 On RU enable Pb2	<i>Not Active</i>
Run Up Timer *	→	PB 1 Run Up Timer:	Not Enabled Enabled	<i>Not Enabled</i>
	if Enabled →	PB 1 Run Up Timer Relay:	None Output 1 Output 2 Output 3	
	→	PB 1 Run Up Time:	XXsec	
Run Down Timer *	→	PB 1 Run Down Timer:	Not Enabled Enabled	<i>Not Enabled</i>
	if Enabled →	PB 1 Run Down Time:	XXsec	
Icon display *	→	PB 1 Icon:	Fan On/Off Set Back OR Not Enabled	<i>Fan On/Off</i>
Sticky Button *	→	PB 1 Sticky:	Not Enabled Enabled	<i>Not Enabled</i>
Exit	→	<i>return to Configuration Menu</i>		

Table 4.8

* Should only be changed by Factory Authorized Technician

Configuration Menu > Pushbutton 2 Options Schematic

Menu Item	Input Screen Title	Input Option	Factory Setting
Select O/P Relay *	PB 2 Relay:	None Output 1 Output 2 Output 3	<i>Output 2</i>
Icon display *	PB 2 Icon:	Not enabled Pump Lights Services UV Lights	<i>UV Lights</i>
Sticky Button *	PB 2 Sticky:	Not Enabled Enabled	<i>Not Enabled</i>
Exit	→ <i>return to Configuration Menu</i>		

Table 4.9

* Should only be changed by Factory Authorized Technician

Configuration Menu > Pushbutton 3 Options Schematic

Menu Item	Input Screen Title	Input Option	Factory Setting
Select O/P Relay *	PB 3 Relay:	None Output 1 Output 2 Output 3	<i>Output 3</i>
Icon display *	PB 3 Icon:	Not enabled Scrubber On/Off Purge On/Off VAV Min/Norm/Max VAV Min/Norm	<i>Scrubber On/Off</i>
Sticky Button *	PB 3 Sticky:	Not Enabled Enabled	<i>Not Enabled</i>
Exit	→ <i>return to Configuration Menu</i>		

Table 4.10

* Should only be changed by Factory Authorized Technician

Configuration Menu > Modbus Setting Schematic

Menu Item	Input Screen Title	Input Option	Factory Setting
Slave ID *	Slave ID:	X	1
Baud Rate *	Baud Rate:	1200 2400 4800 9600 14400 19200	9600
Parity Type *	Parity Type:	None Odd Even	None
Exit	return to Configuration Menu		

Table 4.11

* Should only be changed by Factory Authorized Technician

Configuration Menu > Sensor Err Options Schematic

Menu Item	Input Screen Title	Input Option	Factory Setting
Buzzer On/Off *	Sensor Error Buzzer:	Off On	On
Exit	return to Configuration Menu		

Table 4.12

* Should only be changed by Factory Authorized Technician

Configuration Menu > Filter Menu Schematic

Menu Item	Input Screen Title	Input Option	Factory Setting
Clean Pressure	Clean Pressure:	X.XX ins wg	0.62 ins wg
Dirty Pressure	Dirty Pressure:	X.XX ins wg	1.86 ins wg
Warning %	Filter Warning:	XX%	49%
Alarm %	Filter Alarm:	XX%	30%
Pressure Fluc	Pressure Fluc:	XX%	25%
Pressure Filter	Pressure Averaging Period:	Xsec	1sec
Low Pressure Alarm	Low Pressure Alarm:	Not Enabled Enabled	Not Enabled
Low Pressure Alarm Setpoint	Low Pressure Alarm Setpoint:	XX%	30%
Exit	return to Configuration Menu		

Table 4.13

Configuration Menu > UV Lights Menu Schematic

Menu Item	Input Screen Title	Input Option	Factory Setting
UV Lifetime	UV Lifetime:	XXXXhrs	2000hrs
Reset UV Hours	Confirm Reset	This cannot be undone!	
UV Time Duration	UV Timer Duration:	XXmin	33min
Exit	return to Configuration Menu		

Table 4.14

Calibration — *Should only be performed by Certified Technician*

Calibration step	possible error message	input screen/progress	status
Enter Password			XXXX
		Use arrow keys to set Press OK to go to next digit	
Airflow sensor test		checking	OK
	Sensor error	Press OK to repeat Up Arrow to Quit	
Switch Fan On		Press Fan Button	OK
		Press Fan Button	
Set fan voltage to 70% of run value			OK
		Adjust fan voltage Press OK to Continue	
Set sash to 10" and enter measured face velocity		XXfpm	OK
		Use arrow keys to set measured value Press OK to Continue	
Low airflow calibration		Calibrating, please wait	OK
	Deviation too high	Press OK to repeat Up Arrow to Quite	
Set fan voltage to run value and enter measured velocity		XXfpm	OK
	Increase face velocity	Use arrow keys to set desired value Press OK to Continue	
High airflow calibration		Calibrating please wait	OK
	High and Low samples too close Deviation too high	Press OK to repeat Up Arrow to Quit	
Turn Fan Off		Press Fan Button	OK
		Press Fan Button	
Pressure Calibration		Sampling pressure XX%...	OK
Calibration complete			OK

Table 4.15

CHAPTER 5

Troubleshooting

Problem	Possible Cause	Recommended Fix
No lights or fan	a. Unit unplugged b. BSC breaker open c. Building breaker open	Plug it in Reset breaker Check outlet breaker
No fans	a. Sash is full closed b. Fan breaker/overload tripped c. Sash-activated fan kill relay broken	Open sash to 8" Overload will reset if unit disconnected. If condition persists, motor may need to be replaced. Contact Kewaunee Scientific Corporation for assistance. Replace
Fluorescent light not working	a. Lamp burnt out (look for dark rings at opposite ends of glass fluorescent tube) b. Lamp wiring defective c. Bad lamp ballast (symptom is intermittent light)	Replace lamps Inspect and repair Replace ballast located inside rooftop circuit box
UV light does not illuminate	a. Sash must be closed for UV light to work (regular glass blocks UV rays) b. Lamp burnt out c. Lamp wiring defective d. Bad lamp ballast (symptom is intermittent light)	Close sash Replace lamp Inspect and repair Replace ballast located in electrical box under front panel
Reduced face velocity	a. HEPA filter loaded b. Towels have clogged towel screen or visible baffle louvers c. Exhaust outlet clogged with debris	Increase building exhaust or replace filter if 105 fpm face velocity is no longer achievable Clean towel screen (see Chapter 5 User & Operation Manual) Clear outlet
Contamination of work inside the cabinet	a. Loaded downflow filter b. Torn downflow filter c. Cabinet inflow not being captured by front grill d. Room turbulence	Replace filters Replace filters Remove grill, inspect, repair Decrease turbulence or move cabinet

Table 5.1

Technical Support

For further technical assistance, contact Kewaunee at 704-873-7202 or www.kewaunee.com.

Cabinet Calibration Instructions

Primary Method

Setup and Measurements

1.	Install a Flow Hood on Interceptor® BSC per NSF #49 methodology A9.3
2.	Use tape and cardboard or plastic to seal Down Flow Blower Air Intake on top right side of hood.
3.	Turn on building exhaust system.
4.	Set building exhaust CFM to 755 for INT-B1400 or 1120 for INT-B2000 (prior to BSC blower operation)
5.	Remove the tape and cardboard or plastic to open the Down Flow Blower Air Intake.
6.	Turn on Interceptor® fan and let cabinet stabilize 3-5 minutes. (If you are at the Kewaunee Startup/Home Screen, press Menu/OK to get to the Run Screen)
7.	Set Inflow CFM based on Data label on left Fascia. Adjust CFM by turning High Speed Control Potentiometer. (Potentiometer is located inside the Electrical Junction Box under cabinet front panel) see page 5.6
8.	Adjust the building exhaust system to produce an inflow of 171 CFM for INT-B1400 or 224 CFM for INT-B2000. This setting will produce an inflow velocity of 62 FPM which is used for the Low Airflow Calibration.
9.	Leave Flow Hood in place. Leave cabinet and exhaust system fans at this setting.

Calibration

10.	Press and hold OK/Menu button for 5 seconds to return to Startup/Home Screen.
11.	Press the Up Arrow Button to go to Configuration Setup Menu .
12.	Select Calibration and press OK .
13.	Enter password 9999 by pressing Up and Down Arrow Buttons. If this password does not work, contact building personnel or Kewaunee Scientific.
14.	Cabinet will now perform an Airflow sensor test . This indicates the cabinet is communicating from the sensor to the display.
15.	Follow instructions on Monitor to complete Calibration process. First step — Switch Fan On . Allow cabinet to stabilize – 3-5 minutes
16.	Set fan voltage to 70% of run value . You have already done this at line 8 — Press OK to proceed to next step.
17.	Set sash to 8" and enter measured face velocity From line 8, enter 62 using Up and Down Arrow Buttons. Press OK when complete. Cabinet will perform a Low airflow calibration . Press OK when complete.
18.	Set fan voltage to run value and enter measured face velocity Reset building exhaust system to inflow value from line 7. Enter 105 using Up and Down Arrow Buttons.
19.	High airflow calibration allows cabinet to calibrate. Press OK when prompted.
20.	Turn BSC Fan Off . Press Fan Button. & Close damper or turn Building Exhaust Off .
21.	Cabinet will perform Pressure Calibration .
22.	Cabinet will automatically return to Setup/Home Screen. Calibration is complete.
23.	Remove Flow Hood.
24.	Open Damper or Turn Building Exhaust On & Press Fan Button to begin operation.

Cabinet Calibration Instructions

Secondary Method

Setup and Measurements

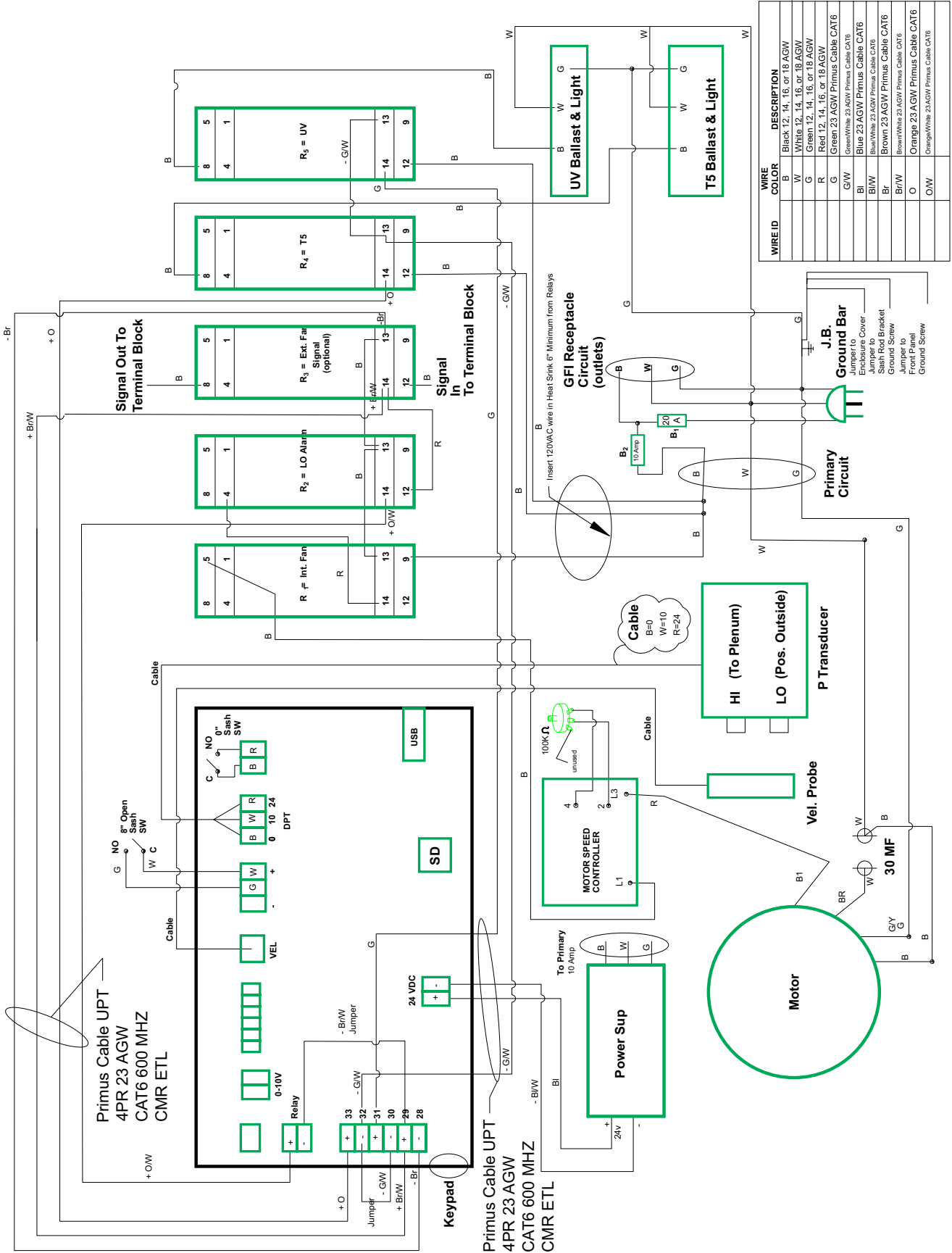
1.	Use tape and cardboard or plastic to seal the Down Flow Blower Air Intake on top right side of hood.
2.	Turn on building exhaust system.
3.	Take inflow readings at 3" sash opening per NSF 49 section A.9.3.3.2. Average the readings and using the formula listed in step 4 on label, calculate the Alternative Face Velocity (V Alt). Be sure to adjust readings using air density corrections for Temperature, Pressure and Humidity, or use an instrument that makes adjustments automatically.
4.	Adjust building exhaust system to achieve a V Alt of 278 FPM (prior to BSC blower operation)
5.	Repeat lines 3 and 4 as required to achieve required Alternate Face Velocity.
6.	Remove the tape and cardboard or plastic to open the Down Flow Blower Air Intake.
7.	Turn on Interceptor fan and let cabinet stabilize 3-5 minutes. (If you are at the Kewaunee Startup/Home Screen, press Menu/OK to get to the Run Screen)
8.	Following the procedure in step 3, measure and average readings again to calculate the new Alternate Face Velocity with both the exhaust system and cabinet fans now on.
9.	Adjust the Speed Control Potentiometer to achieve a V Alt of 105 ± 5 FPM. (Potentiometer is located inside the Electrical Junction Box under cabinet front panel) See page 5.6
10.	Repeat lines 8 and 9 as required to achieve required Alternate Face Velocity . Value must be 105 ± 5 FPM
11.	Adjust building exhaust system to produce an Alternate Face Velocity of 62 FPM.
12.	Repeat lines 11 and 12 as required to achieve required Reduced Face Velocity . Value must be 62 FPM.
13.	Leave fan at this setting.

Calibration

15.	Press and hold OK/Menu button for 5 seconds to return to Startup/Home Screen.
16.	Press the Up Arrow Button to go to Configuration Setup Menu .
17.	Select Calibration and press OK .
18.	Enter password 9999 by pressing Up and Down Arrow Buttons. If this password does not work, contact building personnel or Kewaunee Scientific.
19.	Cabinet will now perform an Airflow sensor test . This indicates the cabinet is communicating from the sensor to the display.
20.	Follow instructions on Monitor to complete Calibration process. First step — Switch Fan On . Allow cabinet to stabilize – 3-5 minutes
21.	Set fan voltage to 70% of run value. You have already done this at line 11 — Press OK to proceed to next step.
22.	Set sash to 8" and enter measured face velocity — using Up and Down Arrow Buttons enter Reduced Face Velocity from line 12 (62 FPM). Press OK when complete. Cabinet will perform a Low airflow calibration — Press OK when complete.
23.	Set fan voltage to run value and enter measured face velocity Reset building exhaust system to inflow value from line 10 (105 FPM). Using Up and Down Arrow Buttons enter Full Face Velocity (105 FPM).
24.	High airflow calibration allows cabinet to calibrate. Press OK when prompted.
25.	Turn BSC Fan Off . Press Fan Button. & Close damper or turn Building Exhaust Off .
26.	Cabinet will perform Pressure Calibration .
27.	Cabinet will automatically return to Setup/Home Screen. Calibration is complete. Remove Flow Hood
28.	Open Damper or Turn Building Exhaust On & Press Fan Button to begin operation.

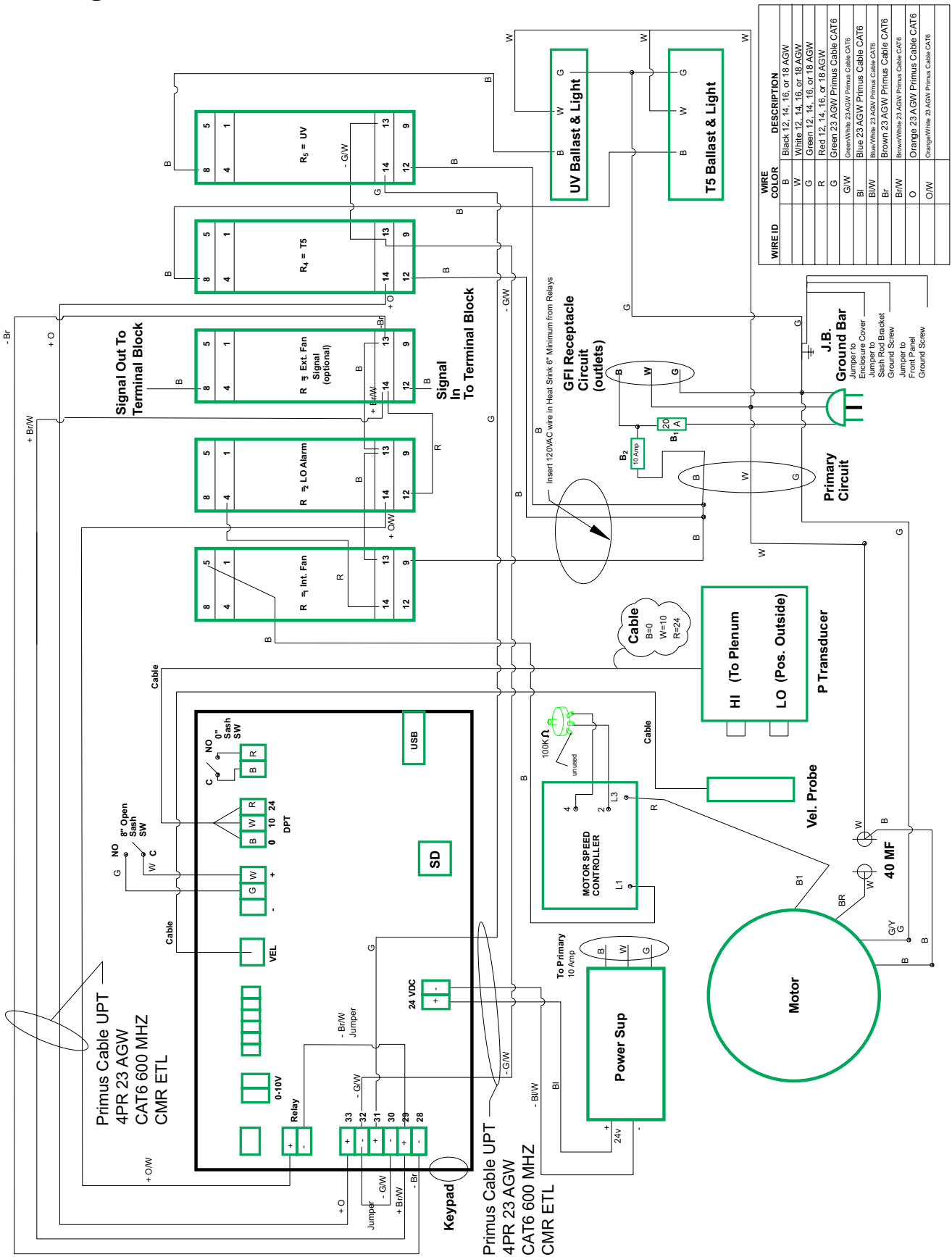
Wiring Schematic

CLASS II B2 WIRING DIAGRAM - 1400B



Wiring Schematic

CLASS II B2 WIRING DIAGRAM - 2000B



Fan Voltage and Speed Adjustment

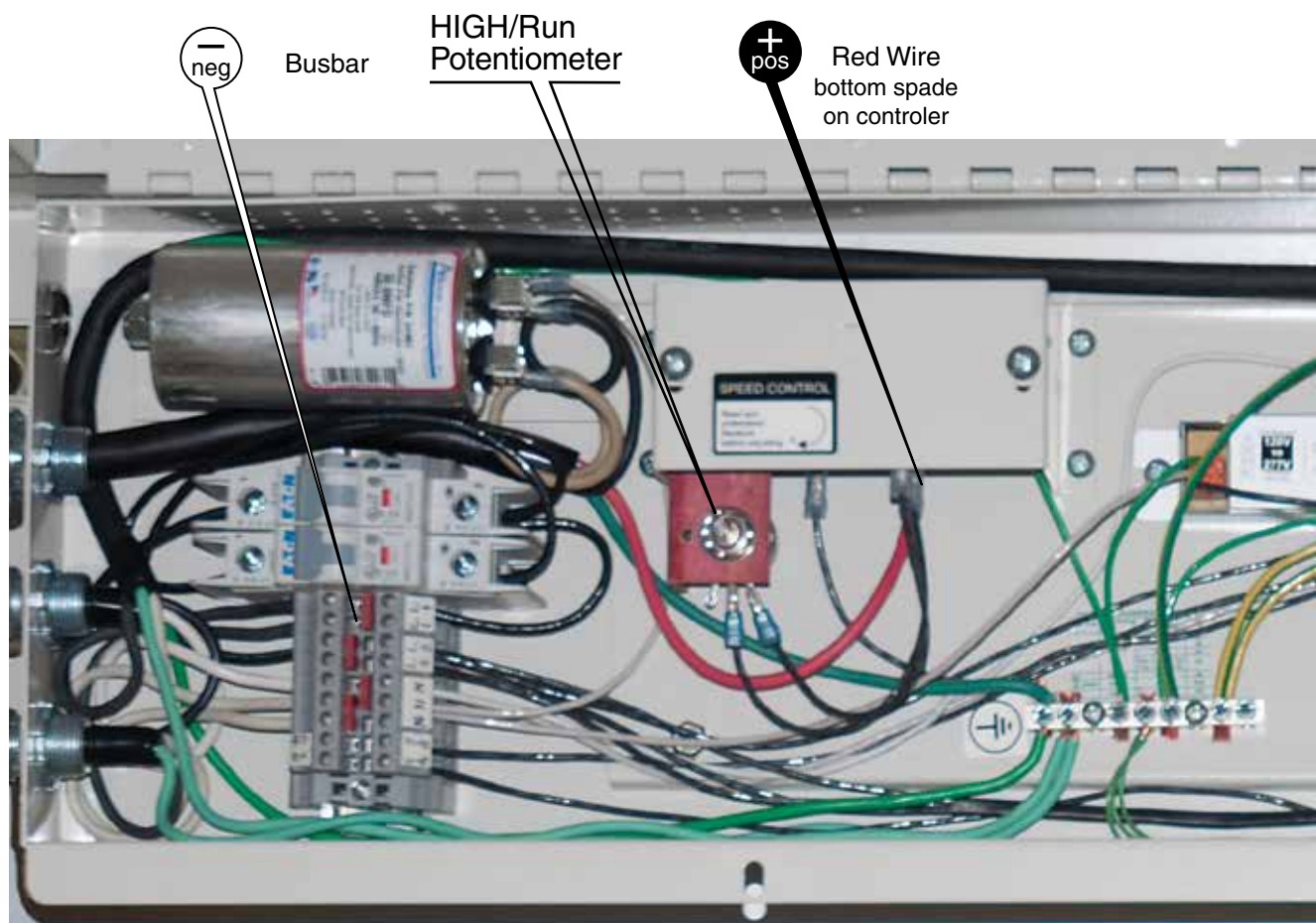


Figure 5.1 Electrical Junction Box – Fan Voltage Display and Speed Adjustment Potentiometers

Sash Face Opening Chart

Model	Height	Width	Area
INT-1400B	8"	49.1"	3.41 sq ft
INT-2000 B	8"	72.7"	5.47 sq ft

Table 5.2



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