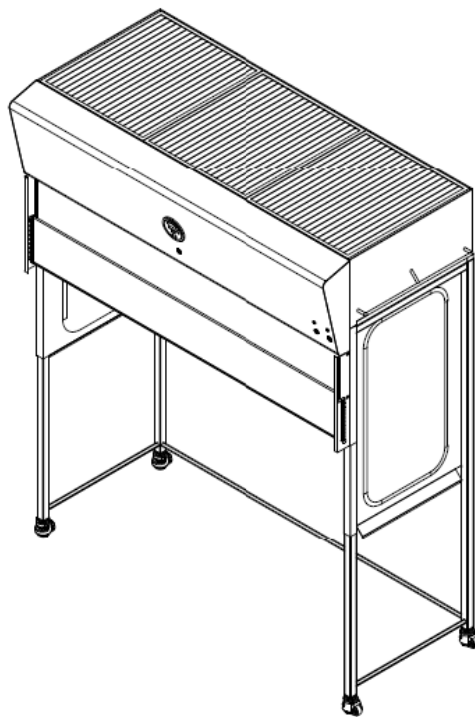


# LAF

## Vertical Laminar Flow Hood



### User Manual

### Models LAF-6 / LAF-8



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*Creating Environments that Serve Life Science Innovation and Advance Global Health*



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## Equipment Warranty

All Germfree Laboratories equipment is constructed with quality materials to meet the highest standards of workmanship. Our warranty covers equipment of our manufacture, which shows defects in workmanship or materials, for a period of 24 months from date of final customer acceptance. We will send prepaid replacements for any defective pieces. Labor incurred for repairs or defective pieces is covered until acceptance of third party certification documents by the owner. Upon certification acceptance, labor expenses are not covered as part of the warranty. An optional preventative maintenance contract and service agreement is available for purchase.

THIS LIMITED GUARANTEE WILL BE HONORED ONLY IN THE LIMITS OF LOCATION/SERVICE IN WHICH GERMFREE PLACED THE EQUIPMENT.

Germfree has the sole discretion in determining if repairs or replacement of workmanship or materials will be provided in accordance with the warranty which is subject to all conditions or limitations included herein. The guarantee does not cover circumstances beyond our control, or problems caused by an inability to follow the described methods of use in the equipment manuals.

Germfree does not offer any other explicit or implicit guarantee for this product. In the case where the exclusion of all implicit guarantees is contradicted by the law, the duration of the implicit guarantee will be for one year from the date of purchase.

Excluded from the coverage are the routine replacement and or maintenance of consumable pieces. This guarantee is void in the case of modification done without direct authorization by Germfree, negligence or abuse on the part of the user.

Germfree offers optional "Total Customer Care" (TCC) plans for our equipment. The TCC programs provide extended service and maintenance periods, by Germfree Factory Authorized Representatives (FAR), to ensure that the product(s) provided continue to meet or exceed expected levels of performance beyond the initial warranty period. Please contact a Germfree Salesperson for details.



## Introduction

The LAF Series Hood is designed for the unencumbered and fluid handling of non-hazardous materials in a sterile working environment. The work area is bathed by constant positive pressure vertical airflow that has passed through a High Efficiency Particulate Air (HEPA) filter. This filter removes organisms and particulates 0.3 micron in size with an efficiency of 99.99%. It is even more efficient for both larger and smaller particles due to the tendency for larger particles to get inertially trapped by the filter, while smaller particles exhibit particle diffusion in the direction of the fiber. The HEPA filter is positioned above the work area and is protected by a removable, perforated metal diffuser located immediately below it. The airflow utilized by the LAF Series Hood consists of moving individual streams of unidirectional, ultra-clean air along parallel lines with minimal turbulence. This airflow pattern is known as laminar.

Your LAF Series Hood is intended to be used as a work area that maximizes product quality control and minimizes risk of product exposure to contaminants. It should only be used with non-hazardous materials since the air being bathed over the product is reintroduced into the laboratory environment without being filtered again. The LAF hood does not provide any protection to the user.

Your LAF Series Hood has been thoroughly tested. The HEPA filter was integrity tested by the filter manufacturer and again at our factory during the assembly process. Refer to Certification/Testing section for more information regarding the testing process. All testing was performed in accordance with established standards and procedures, including ISO 14644.

## Installation

The **LAF Series Hood** should be transported and moved in an upright position. Your unit will arrive in two pieces (filter housing and stand) and needs to be carefully uncrated. It is very unlikely that your hood will arrive with damage, but if you have any concerns about the quality of the unit, contact Germfree immediately.

In order to get the hood inside the room, the filter housing needs to be removed from the unit (the hood is too tall for standard doorways) and assembled once the unit is inside. See Appendix A: Filter Housing Disassembly and Assembly for detailed instructions.

Once the **LAF Series Hood** is inside the laboratory, it should be positioned so that it is out of traffic patterns and away from room air currents that could disrupt its airflow. At least a foot of free space should be left on both sides of the unit for maintenance purposes. Air intake for the hood is located above the unit so you should take care that no neighboring equipment or storage blocks the airflow. If there is a window in the room it should remain closed at all times. The hood should not be placed in a location where air conditioning vents might disturb the air flow. A simple smoke test will help determine a proper location for the unit. An optimal location will have no turbulent airflow in front of, next to, or above the hood.

## Features

Before shipping, the **LAF Series Hood** is wiped completely with an industrial cleaner/polisher. This reduces fingerprints on the hood without leaving an oily residue. The polish is non-carcinogenic and non-toxic to the touch. The polish will be removed from the surface of the hood during your first cleaning and poses no threat to the cleaner.

All **LAF Series Hoods** are shipped complete and include the following accessories:

- Variable speed blower motor control
- Metal diffuser in front of supply filter
- One (1) prefilter set
- One (1) clear acrylic adjustable sash

All electrical components are in the control panel located above the work area on the front of the unit. The pressure gauge is also located here. The LED light and power switch are housed in the control panel. The motor blower, speed control and circuit breaker are mounted in the filter housing, above the work deck.

There are two operator controls on the hood: a power switch and light switch. There is only a single operating mode and the operator should not change any motor blower set points.

The unit's speed control has been calculated and set at the factory. Adjustments may occasionally have to be made during certification. The speed control setting should only be changed if air velocity falls below the specified range, which usually takes several years. This should only be done by your certifier.

***You should not adjust the speed control unless it is an emergency.***

The **LAF Series Hood** does not require any specific accessories for safety reasons.

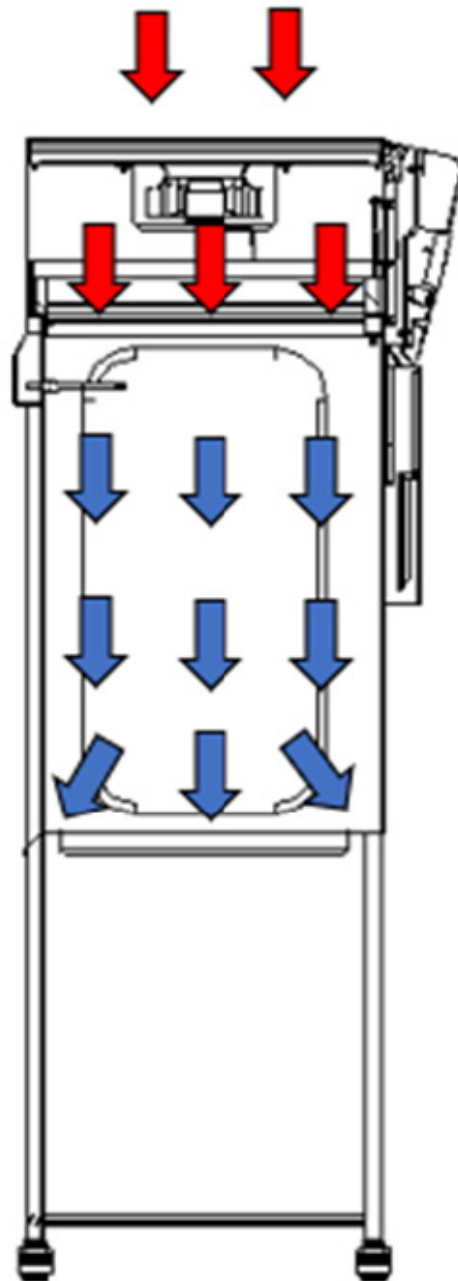
## Airflow

The LAF Series Hood intakes air through a prefilter placed on the top of the hood. Five motor blowers push air through a HEPA filter and diffuser, causing uniform, laminar air to bath over the entire work surface.

The blower motors are extremely efficient throughout a wide pressure range; they will overcome the resistance of both a clean and moderately "loaded" HEPA filter. Loaded refers to the number of particles trapped in the filter. The variable motor blower speed control is set at the factory to give a laminar airflow velocity of 80-100 linear feet per minute as measured by a thermoanemometer or velometer.

As the HEPA filter becomes "loaded" with particulate matter, the blower will overcome a considerable increase in resistance without having to be reset. Over time filter loading will necessitate an adjustment of the speed control. To best determine when the filters should be changed, direct readings of airflow in feet per minute should be taken. This is usually done with a velometer or thermoanemometer.

***These adjustments and measurements should only be performed by a certifier.***



## Use of the LAF Series Hood

The successful use of the LAF Series Hood depends upon two factors: advance planning and good technique. Even the most sophisticated and elaborate system would be useless if proper technique were not employed. The head of the involved department should make sure that personnel who use the unit are trained and exercise good technique.

### Advance Planning

To achieve maximum sterility from your unit, you must take into account the equipment and materials necessary for the proposed project and outline the procedural details for your particular operation.

The best way to accomplish this is to use a checklist and/or protocol for both materials and procedures. Materials should include equipment, apparatus, media, supplies, diluents, drugs and all other items that will be used. The procedural checklist should include the order of events in sequence and other details that are necessary for the successful completion of the proposed operation or experiment.

Your advance planning should include a layout for the arrangement of items in the work area. This should be planned so that, if there are dirty items, they are segregated from clean ones. The movement of the dirty items above clean items should be minimized. Base your layout on a logical progression for each specific operation. In a complex situation, an ideal arrangement of equipment may not be achievable, so it may be necessary to compromise.

### Good Technique

The operator is the critical factor in the successful performance of any LAF Series Hood. It is dangerous to rely on the unit to do all of the work. When properly maintained and operated, the LAF Series Hood will do an excellent job of controlling airborne contamination.

Using your checklist, collect all items that will be placed inside the hood for the procedure. Clean all of these items thoroughly before placing them into the work area. Keep the items at a comfortable distance away from the open front of the unit. All items used during operation should be placed behind this line. Because the airflow is downward, the movement of an item should not pass over or under another item. The items should be brought around the sides of other items to maintain cleanliness.

After all of the items on the checklist have been arranged in the work area, the unit should have been in operation for at least 10 minutes. Wait an additional 5 minutes before beginning the procedure. This will allow sufficient time for the ultra-clean air passing over the work area to remove airborne contamination, especially particulate matter from the newly introduced items.

Prior to beginning work inside the hood, the operator should wash their hands and arms with germicidal soap. It is recommended that technicians working in the LAF Series Hood wear PPE as per regulations. This will minimize the shedding of skin flora into the work area. Conventional laboratory coats with open cuffs allow the entrapment of contaminated air between the technician's wrist and forearms and the inside sleeves. This contaminated air can thus be introduced into the work area.

Abrupt movements of forearms and hands should be avoided. Excessive activity in the room also creates disruptive air currents. Therefore, such activity should be held to a minimum or eliminated when work is being performed.

While working in the hood, the operator should use slow and purposeful movements, and movements should be limited in number. Fast and erratic movements in the hood can have adverse effects on the airflow.

Since the hood does not provide any protection to the user from the activities performed, it is equally important

for the operator to wear PPE to protect themselves as much as the product.

## Operation

1. To start-up the hood, the power cord first needs to be plugged into a dedicated 10A, 235V power source.
2. The power button can now be pushed on, which is located on the control panel. The power button will illuminate green while running, and the running motor blower will be audible.
3. The Sensocon® pressure gauge mounted on the front of the control panel will begin showing readings. No work should be done in the hood until the pressure reading stabilizes in the acceptable range.
4. The light button needs to be pushed on before work can be done in the hood. The light button will illuminate blue while "on".
5. Clean the interior surfaces of the work area. Detailed cleaning instructions can be found in the next section.
6. If the hood has been on and the air has been flowing for at least 15 minutes, work can commence in the clean hood.

## Cleaning

First and most importantly, you should use and follow your facility's Standard Operating Procedure for primary cleaning instructions. Our cleaning instructions should be supplemental and do not take preference.

Do not use steel wool or steel pads while cleaning stainless steel or acrylic. We highly recommend not using bleach as it can ruin the finish on the stainless steel if not done properly. Periodic cleaning of the plastic surfaces with an acrylic cleaner, available at all home supply or hardware stores, will minimize particle accumulation on these surfaces.

The transparent acrylic sides of the work area are designed to provide optimal light in the work area. Many chemicals have an adverse effect on acrylic plastics. Never use household glass cleaners. Never use gritty soaps or household cleansers such as Comet® or Ajax®. Acrylics are attacked by concentrated alcohols, strong solvents, chlorinated hydrocarbons and many aromatic hydrocarbons. They are also adversely affected by ultraviolet light.

Acrylic is unaffected by most inorganic solvents, mineral and animal oils, low concentrations of alcohols, paraffinic and olefinic hydrocarbons, amines, alkyl monohalides, esters containing more than ten carbon atoms, alkalines, non-oxidizing acids, salt water, photographic solutions and chemicals, petroleum oils and greases, household cleaning products and chemicals used in treating water. For cleaning: 50% Ethyl Alcohol, 70% Isopropyl Alcohol, or a 5% bleach solution can be used. Do not use 95% or 70% Ethyl Alcohol, 99% Methyl Alcohol or Windex®.

To clean the outside of the hood, we recommend using low linting wipes saturated with a sporicidal disinfectant, such as PeridoxRTU®, using unidirectional, overlapping strokes. Ensure that the prefilter located above the unit does not become saturated with cleaner. We recommend not using any abrasive cleaners such as Comet or Ajax as they can scratch the stainless steel and acrylic windows.

Since this LAF unit should only be used to work with non-hazardous materials, a "decontamination" procedure does not need to be completed before cleaning the inside of the hood. A "disinfectant" procedure should be completed to ensure the hood is sanitized before more compounding occurs. The hood should be on during the cleaning procedure, which means the blower and pressure gauge will be operational. The alarm may need to be silenced during cleaning, which can be done by pushing the red Alarm Silence button located on the control panel.

Germfree recommends using a cleaning pad saturated with sporicidal disinfectant, such as PeridoxRTU®, to clean the inside of the hood with unidirectional, overlapping strokes. The inside of the hood should be mopped twice, and the surface should be left wet after the second pass for at least 3 minutes. Any equipment that stays in the hood should be cleaned with low linting wipes saturated with a sporicidal disinfectant.



Any spills that occur inside the hood should be cleaned immediately and the work surface should be disinfected before any more work occurs in the hood. Your facility should have a written plan available in case of a spill. Any wipes or mop pads used to clean the hood should be disposed in the same way as all other waste from the hood.

## Cautionary Notes

- Ensure the air intake area above the hood is never blocked with boxes, equipment, etc. Movement of air into the hood must not be impeded.
- The air flow should not be “turned up” under the impression that faster air flow will improve the unit’s performance. The laminar air flow is set to 80-100 linear feet per minute which has been determined to be the optimal velocity. It is fast enough to keep contaminants off of your product, but not fast enough to break up the laminar flow into turbulent patterns.
- Do not block the air from escaping the hood. It can create turbulent patterns in front of your product.
- Keep minimal material in the work area.
- All work in the hood should be done entirely under the hood. Laminar flow with optimal air velocity is not guaranteed beyond the edge of the hood.
- Any spill in the hood should be cleaned immediately. Do not perform any work with a spill in the hood.
- Contaminated or non-sterile items should not be moved above sterile items. Move them in front of, behind or below the sterile items.
- Don’t work with open cuffs or other loose garments that might trap air coming from the hood.

## Maintenance

### Prefilters

The prefilter is located horizontally on the top of the unit and should be kept in place at all times. The prefilter supplied with the unit is a fiberglass type similar to an air-conditioning filter. Once the unit has been placed into service, the prefilter should be inspected monthly. After it has been determined how long it takes for the prefilter to "load", it should be routinely inspected at this interval to determine if it should be replaced. After some experience is gained, you may prefer to select an arbitrary time to replace the prefilter. However, the prefilter should be changed at least once every 90 days. Replacement prefilters are available from Germfree and are usually a stock item. Call Germfree Customer Service to order.



### HEPA Filters

The average life of a HEPA filter is 3 to 5 years or longer, depending on the cleanliness of the ambient air. A loaded HEPA filter cannot be cleaned or recycled. New filters are available from the factory and we recommend that they be changed by qualified personnel. The filters are accessed from the top front of the unit.

Your certifier, using R.T.V. silicone sealant, can repair small holes or tears in the filter medium. The filter must be retested for leaks after any repair is made.

### Motor Blower

The motor blowers were selected because they have the following characteristics: low noise level, low vibration level, compatibility with the variable speed control, and most importantly, the efficiency in delivering air through clean HEPA filters as well as those loaded with a moderate amount of particulate matter.

The motor is located above the center of the blowers. Before servicing the motors, the power cord must be disconnected or, if this is difficult to reach, the fuses should be removed.

It should rarely be necessary to work on the motor blower assembly.

## Filter Diffuser

The HEPA filter is located behind the removable, perforated metal diffuser. Do not push items such as needles through the diffuser holes and do not hang items from any part of the diffuser. The diffuser should only be removed by your certifier and at that time it can be cleaned.

During routine cleaning, do not spray the diffuser with an aerosol or pump dispenser as it may saturate the filter. If an occasional spray mist reaches the filter it should dry and not cause a problem.



## Sensocon® Pressure Gauge

There is a Sensoccon® pressure gauge mounted on the front of the control panel. It is equipped with a digital pressure readout, set point and alarm indicators, and a process arch. There are four directional buttons, a "cancel" button and an "accept" button on the gauge for menu navigation. If the air pressure drops below the lower set point or rises above the upper set point, a visual and audible alarm will be triggered. The alarm can be reset by compressing the left and right arrows simultaneously until the alarm is silenced. If the air pressure does not return to acceptable levels, the alarm will continue to sound.



## Acrylic Sides

Please refer to "Cleaning" section of the manual for maintenance recommendations.

## Lighting

There are four LED strips located under the control panel. These bulbs have several thousand hours of life and should not need to be replaced. However, if the bulbs do need to be replaced, this can be done by lifting the control panel and removing the nuts holding the strips in place. Make sure the power switch is off before replacing the strips. Two nuts need to be unscrewed to remove each strip. The strip can now be pulled out until it drops out of place. Carefully remove the strip from the housing. Since LEDs contain trace amounts of gases that can harm an individual, replaced strips should be disposed of with hazardous waste. If the strip breaks, carefully clean the broken pieces as they can be sharp.

## Errors and Troubleshooting

The LAF Series Hood is a user-friendly machine. Pressure error messages are both visual and audible. Visual alarms are clear and concise, and they will remain on until the issue is resolved. When an alarm is activated, verify the error by resetting the alarm (hold left and right arrows on the Sensocon® pressure gauge simultaneously until the alarm resets). If the alarm persists, use the table below to fix the issue.

Trouble	Possible Causes	Remedy
Air Supply Inoperative	Main switch is off	Check main switch
		Verify plug is in outlet
		Blue light switch should be on
No Air Circulation	Blower off	Check motor blower control
	Blown circuit breaker	Check circuit breaker on speed control.
	Break in electrical wiring	Use wiring diagram and check wiring connections
Excessive Blower Vibration	Foreign matter in blower squirrel cage	Remove foreign matter
Exhaust Air Imbalance	Improper adjustment of blower motor control	Adjust to proper reading on pressure gauge – contact certifier
	Obstruction of plenum	Remove obstruction
	Leak between blower and plenum	Repair leak – contact certifier
	Filter loaded	Replace filter – contact certifier
Low Velocity Air	Low voltage on house current	Measure voltage – contact certifier
	Filter loaded	Replace filter – contact certifier
	Improper adjustment of blower motor	Adjust to proper reading on pressure gauge – contact certifier
	Obstruction in plenum	Remove obstruction
	Leak between blower and plenum	Repair leak – contact certifier
High Velocity Air	Filter rupture	Repair or replace filter – contact certifier
	Supply filter gasket leak	Find and repair leak – contact certifier
	Exhaust air outlet obstruction	Remove obstruction
	Improper adjustment of blower motor speed control	Adjust to proper reading on pressure gauge – contact certifier
Non-laminar Airflow	Large object obstructing airflow	Remove item
	Large leak in filter	Replace filter – contact certifier

## Certification / Testing Expectations

Your unit will need to be certified by an independent testing organization when the unit is installed and at least once annually for the duration of the hood's operation. When your unit is first installed, a smoke test should be performed.

The certifier can use a smoke tube in the operating room to find the optimal placement locations for the hood.

Any turbulent air pockets or inconsistent airflow patterns can be detected by this test. The hood should be placed in a location with a constant rate and pattern of smoke dissipation. This test will not be performed after the initial certification unless the airflow in the building has changed or you plan on moving the machine.

During the initial certification, and every year after, two other tests will be performed. The first will be a filter integrity test: the certifier will pump a non-volatile solvent (such as dioctyl phthalate (DOP), polyalphaolefin (PAO) or equivalent) over time into the assembled unit on the upstream side of the HEPA filter. An aerosol photometer will be used to scan the downstream side for any aerosol droplets that might pass through or around the HEPA filter. The second examination is an airflow test. Using a thermoanemometer or velometer, the certifier will verify that the airflow in the hood is uniform and unidirectional. A thermoanemometer uses a heated probe set in an airstream to determine air speed. The probe determines the heating power required to maintain the high probe temperature. This power is proportional to air speed. Alternatively, the velometer uses a probe that intakes air, and the force against the meter causes a deflection in the needle.

If your facility does not have a certifier, Germfree can assist in finding one in your area.

## Filter Housing Disassembly and Assembly

Your hood is transported in two pieces and operational. Once the filter housing is placed on the frame, it can be plugged into an outlet and will be ready to be certified. Placing the filter housing on the stand requires at least four people to ensure the hood is not damaged during the process.

The filter housing needs to be lifted by the lift bars located on the left and right sides of the housing. It will be have to be lifted completely over the stand and lowered into place on the gasket. There is a rim that goes around the stand that fits the filter housing exactly so it won't shift. The filter housing sits on a gasket, which will create the seal necessary for the hood to operate. The HEPA filter is exposed on the bottom of the housing so use slow, careful and deliberate movements so the filter is not accidentally damaged.

The control panel is connected to the filter housing by a few pins, a camlock for power supply, and a clear plastic tube for pressure connection to the Sensocon pressure gauge. These are attached before shipping so you should not have to connect them.

To remove the filter housing from the stand, complete the steps explained above in reverse order. Four individuals will need to lift the filter housing from the stand by the lift bars on the right and left side of the housing. If you are placing the filter housing on the ground, rotate the unit so it sits on the back side of the housing. The HEPA filter is exposed on the underside of the housing so refrain from placing that side directly on the ground.



Fig. 1 - Camlock for Power Supply



Fig. 2 - Port for Pressure Tube

## Parts List

Any consumable materials listed below can be replaced by contacting Germfree at +1 386.265.4300 or cs@germfree.com.

FILTERS	<ul style="list-style-type: none"> <li>• HEPA (High Efficiency Particulate Air)                             <ul style="list-style-type: none"> <li>• HEPA Air Filter – 73” x 29” x 3”</li> <li>• Germfree Part Number – 375-1068-00</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Prefilters                             <ul style="list-style-type: none"> <li>• LAF Prefilter – Qty. 3 @ 25 ½ x 29 ¾ x 1</li> <li>• Germfree Part Number – 375-2062-00</li> </ul> </li> </ul>
MOTOR/BLOWER	<ul style="list-style-type: none"> <li>• Qty. 5 – Fan Blower Variable Speed 9.8” diameter, 230V, 60Hz                             <ul style="list-style-type: none"> <li>• Rosenberg Motors Part Number – Z27-03</li> <li>• Germfree Part Number – 183-0072-00</li> </ul> </li> </ul>
PRESSURE GAUGE	<ul style="list-style-type: none"> <li>• Sensocon Pressure Gauge, 0-2”, with low flow alarm                             <ul style="list-style-type: none"> <li>• Sensocon Part Number – A4-1000-03</li> <li>• Germfree Part Number – 002-1200-00</li> </ul> </li> </ul>
VELOCITY PROBE	<ul style="list-style-type: none"> <li>• Degree Controls Velocity Sensor, 0-200 CFM, 11.2”                             <ul style="list-style-type: none"> <li>• Degree Controls Part Number – Fs26701</li> <li>• Germfree Part Number – 157-2023-03</li> </ul> </li> </ul>
POWER BUTTON	<ul style="list-style-type: none"> <li>• Push Button, Green Illuminated 24V LED                             <ul style="list-style-type: none"> <li>• EAO Part Number: 82-6153.2134</li> <li>• Germfree Part Number: 170-0107-00</li> </ul> </li> </ul>
LIGHT BUTTON	<ul style="list-style-type: none"> <li>• Push Button, Blue Illuminated 24V LED                             <ul style="list-style-type: none"> <li>• EAO Part Number: 82-6151.2124</li> <li>• Germfree Part Number: 170-0108-00</li> </ul> </li> </ul>
ALARM SILENCE BUTTON	<ul style="list-style-type: none"> <li>• Push Button, Red Illuminated 24V LED                             <ul style="list-style-type: none"> <li>• RS Pro Part Number – 8118553</li> <li>• Germfree Part Number – 170-0104-00</li> </ul> </li> </ul>
CIRCUIT BREAKER	<ul style="list-style-type: none"> <li>• 10 Amp, 1 pole, Push to Reset                             <ul style="list-style-type: none"> <li>• Potter &amp; Brumfield Part Number: W58-XB-1A4A-10</li> <li>• Germfree Part Number: 163-0062-00</li> </ul> </li> </ul>
SWITCH	<ul style="list-style-type: none"> <li>• Push Button, Blue Illuminated 24V LED                             <ul style="list-style-type: none"> <li>• EAO Part Number: 82-6151.2124</li> <li>• Germfree Part Number: 170-0108-00</li> </ul> </li> </ul>
CIRCUIT BREAKER	<ul style="list-style-type: none"> <li>• 20 Amp, 1 pole, Push to Reset                             <ul style="list-style-type: none"> <li>• Potter &amp; Brumfield Part Number: W58-XB-1A4A-5</li> <li>• Germfree Part Number: 163-0050-00</li> </ul> </li> </ul>
SPEED CONTROL	<ul style="list-style-type: none"> <li>• Qty. 2 – 24V, 20A. Motor Speed Control with Mounting Plate                             <ul style="list-style-type: none"> <li>• Evolution Controls Inc. Part Number – EVO/ECM-VCU-MP</li> <li>• Germfree Part Number – 332-0043-00</li> </ul> </li> </ul>
LIGHTING	<ul style="list-style-type: none"> <li>• Qty. 2 – LED, 4’, T5, 3400 Lumens, 25W Light Fixture                             <ul style="list-style-type: none"> <li>• V-TAC USA Part Number: VT-T5DW25/840/4</li> <li>• Germfree Part Number: 147-1069-00</li> </ul> </li> </ul>
POWER CORD	<ul style="list-style-type: none"> <li>• Twist-Lock, 20A, 125V, 2 Pole, 3 Wire                             <ul style="list-style-type: none"> <li>• Hubbell Part Number: HBL2311</li> <li>• Germfree Part Number: 583-0018-01</li> </ul> </li> </ul>





## Quality Statement

### **Accountability**

We will deliver our products on time, as promised, and free from defects.

### **Ownership**

We will strive to exceed expectations at every level and we will work to make sure that each customer is satisfied with the service that they receive.

### **Longevity**

All of our products are constructed from the highest quality materials and are designed to operate reliably for decades. We stand behind our work and take pride in our superior craftsmanship.

## Our Company

**Germfree has been a leading innovator in aseptic control and isolation systems since 1962.**

**We design and manufacture a diverse range of equipment and facilities for life science applications.**

Our systems are integral to critical processes across many sectors. We specialize in complex projects and custom applications that serve the rigorous demands of our clients. Our high-specification bioGO Modular Facilities operate across the world, and are sustainable as permanent facilities in remote regions with harsh conditions.

## Germfree's Mission

Creating Environments that Serve Life Science Innovation and Advance Global Health

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# Appendix A: LAF-6 Drawing Package

**NOTES:**

**CONSTRUCTION:**

- TYPE 304SS, #4 POLISHED
- VIEW SCREEN: 3/8" POLYCARBONATE
- SIDE SCREEN: 1/4" POLYCARBONATE
- GASKET MATERIAL: EPDM AND SILICONE

**CONTROL PANEL:**

- 1x SENSOCON
- 1x MAIN POWER PUSH BUTTON
- 1x LIGHT PUSH BUTTON
- 1x AIR PRESSURE ALARM
- 1x LED LIGHT

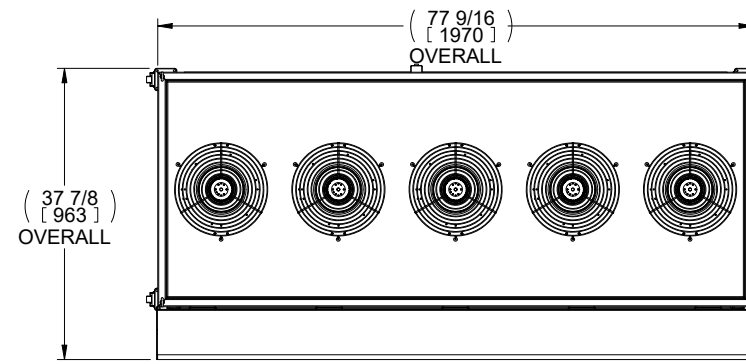
**POWER REQUIREMENTS:**

- UNIT REQUIRES 1 DEDICATED 120V, 60 HZ SINGLE PHASE, 15 AMP CIRCUIT

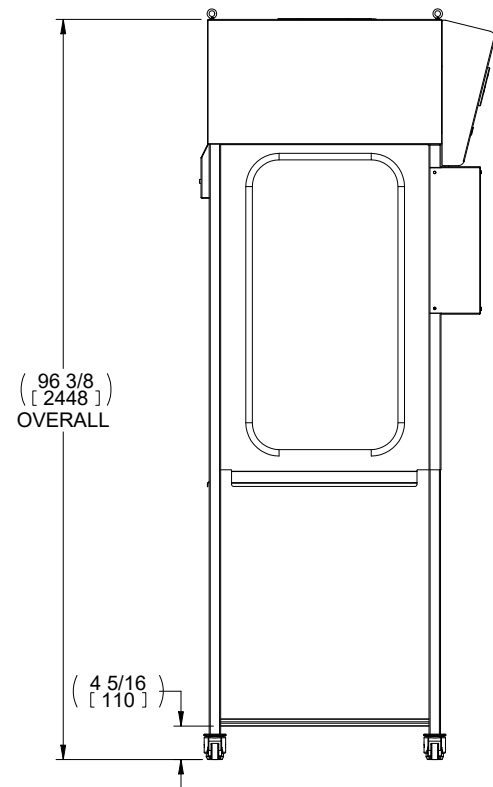
**FILTER SIZES:**

- HEPA FILTER (QTY:3): 36.5X29X3 (LXWXH)

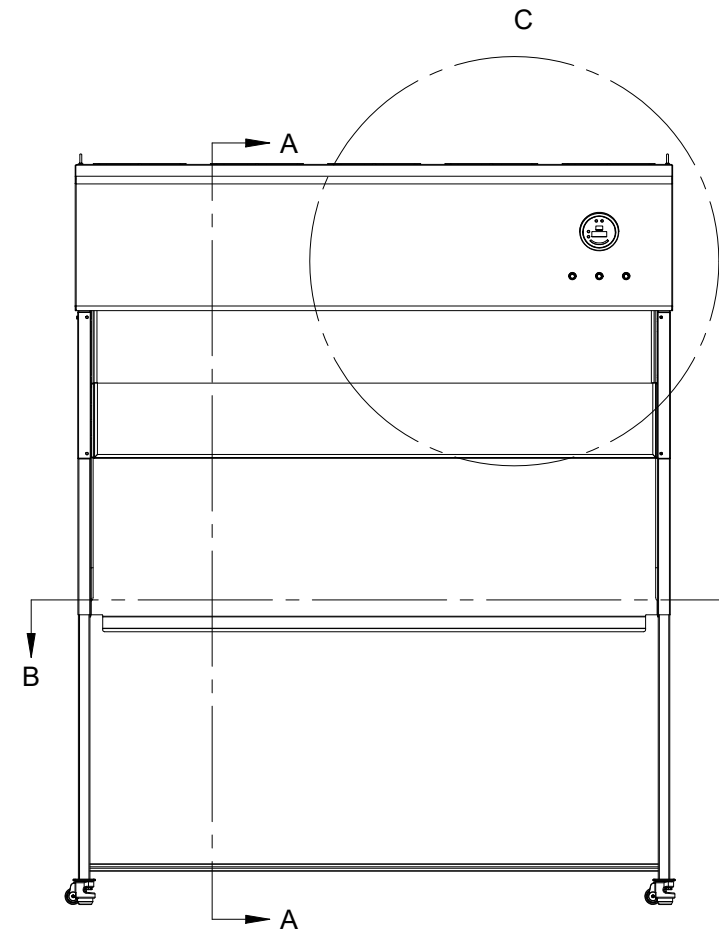
REVISIONS				
REV	DESCRIPTION	DATE	DRAWN BY	APPROVED
A	INITIAL RELEASE	10/01/19	MSP	RGL
B	DETAILS FOR NEW SASH DESIGN	11/18/19	PAR	BAS
C	SS CASTERS, RELOCATION OF SENSOCON	12/11/19	MSP	BAS



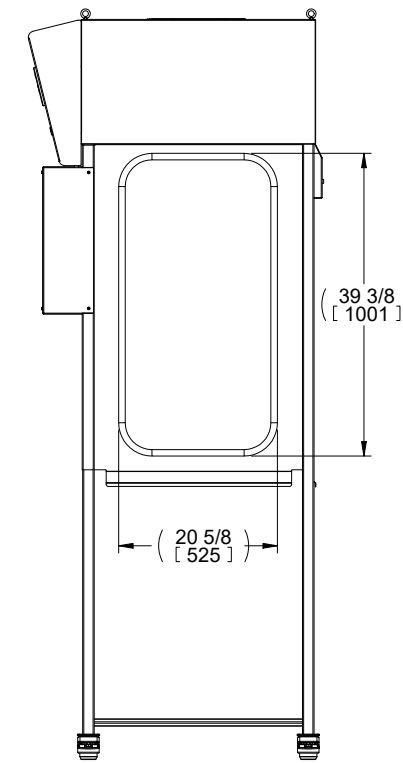
**TOP VIEW**



**LEFT VIEW**



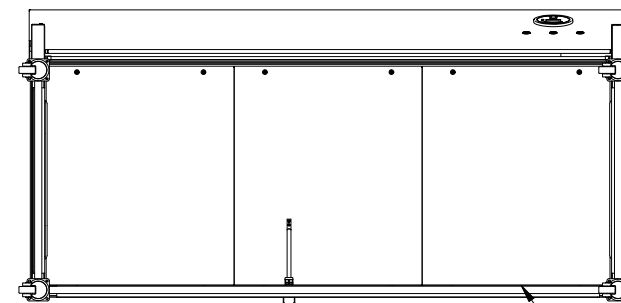
**FRONT VIEW**



**RIGHT VIEW**

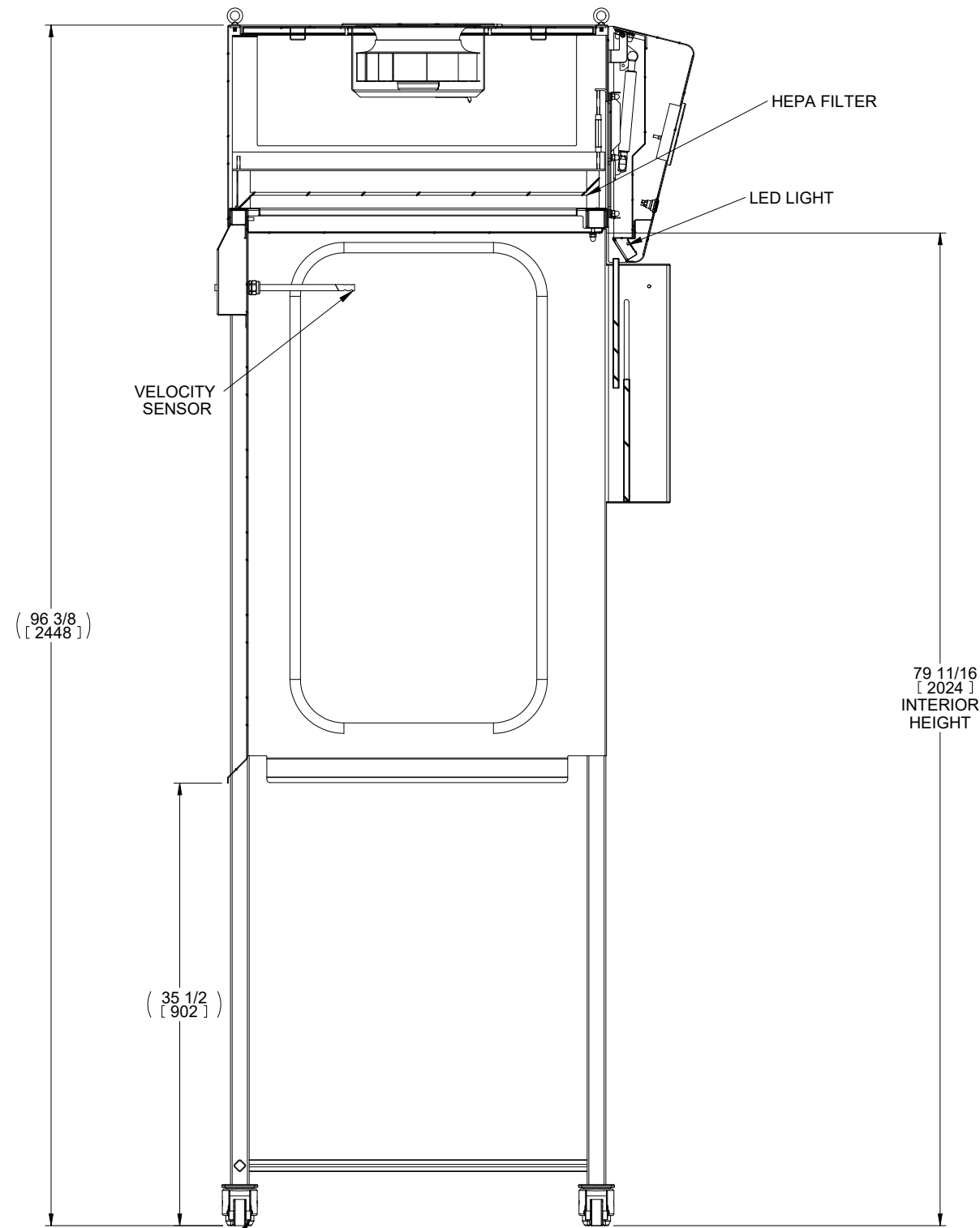


**ISO VIEW**

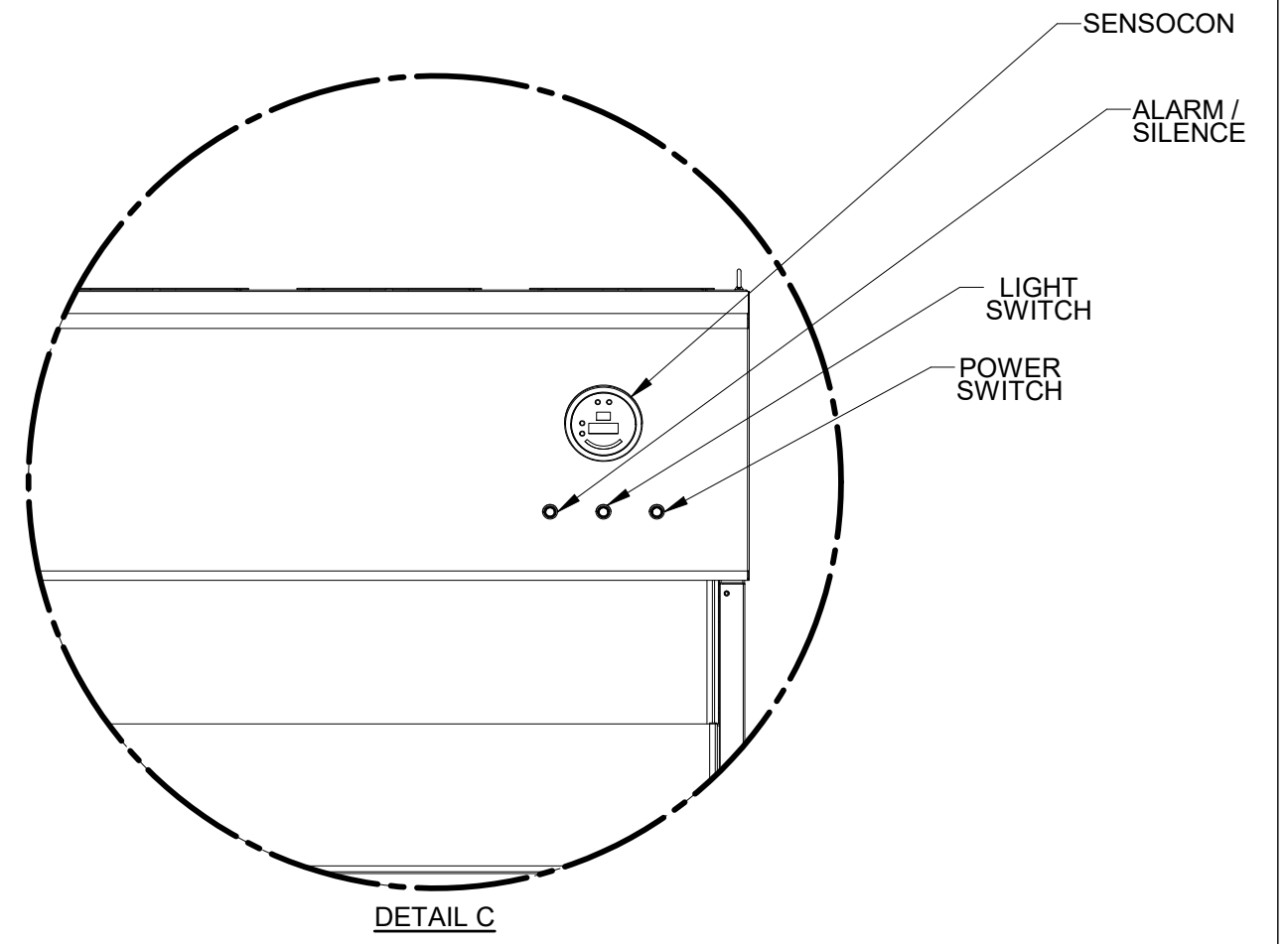
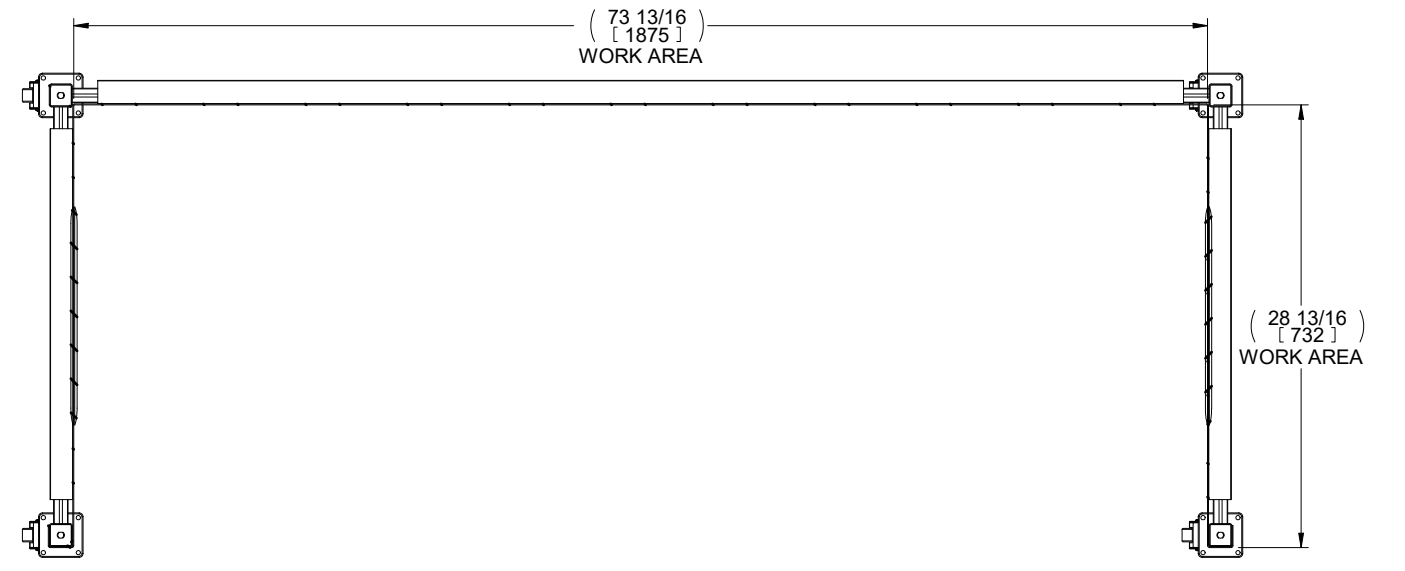


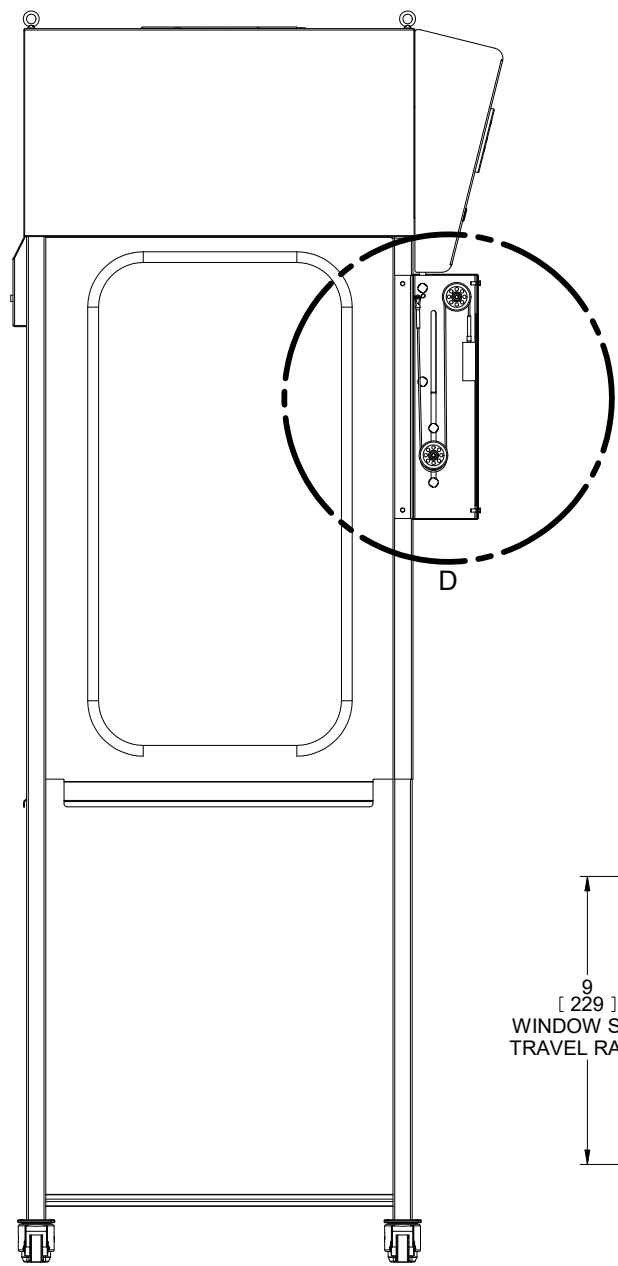
DIFFUSOR PANELS (3)

**BOTTOM VIEW**

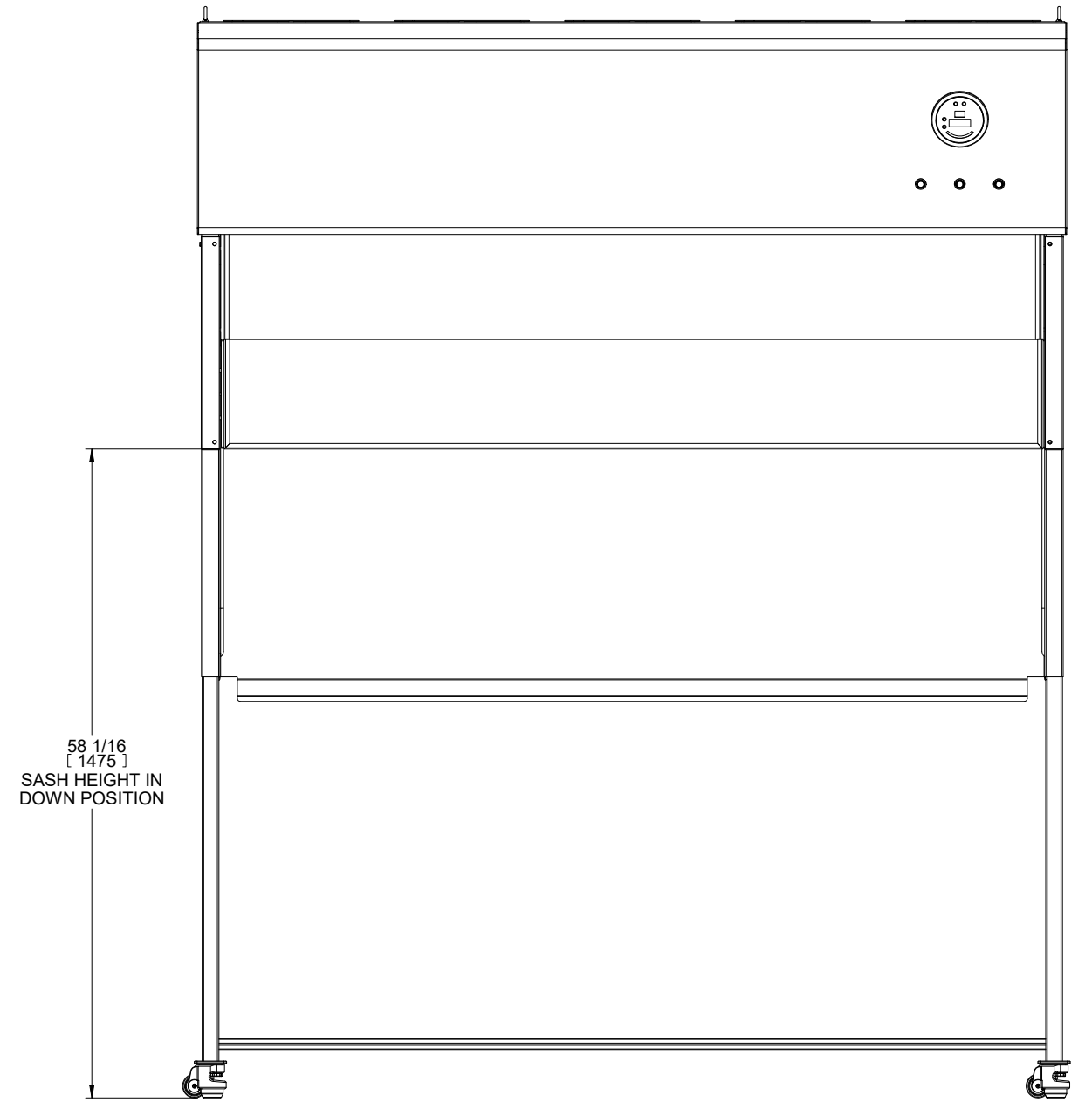
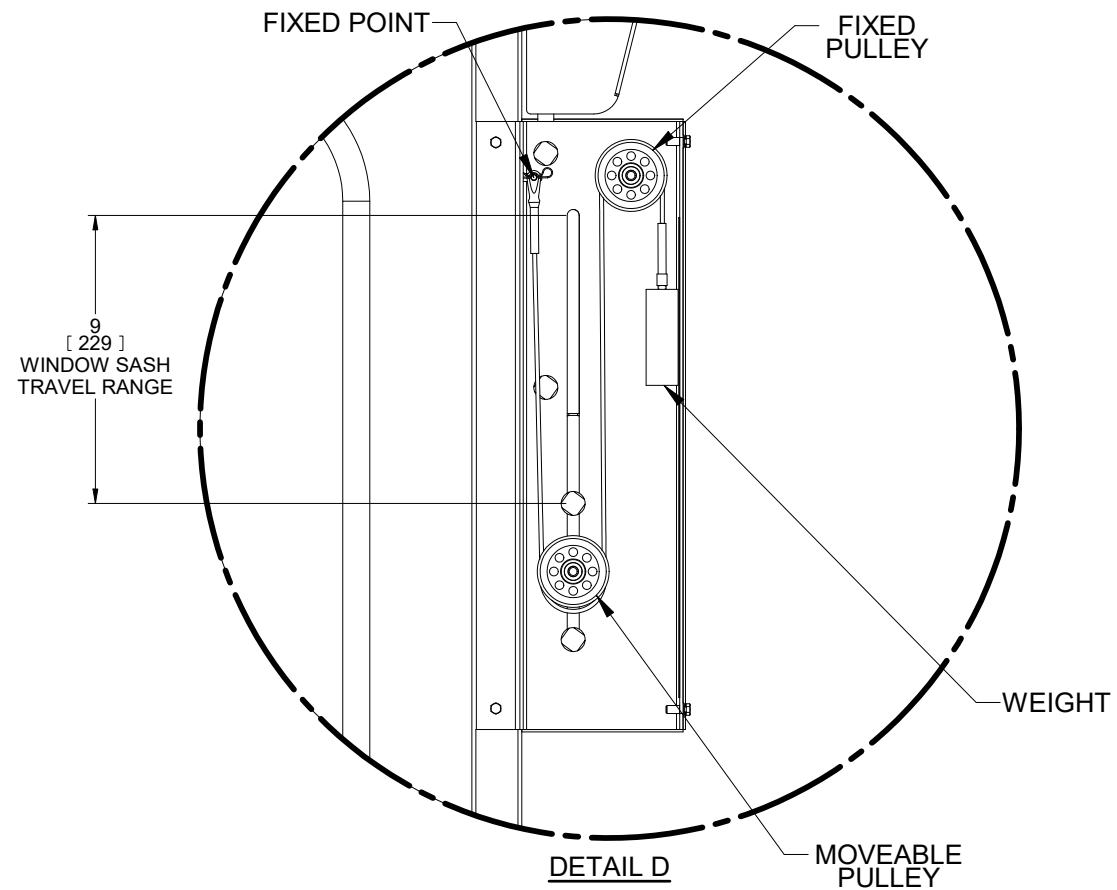


SS CASTERS  
4X





LEFT VIEW  
WITHOUT SASH  
BRACKET COVER



FRONT VIEW

# Appendix B: LAF-8 Drawing Package

**NOTES:**

**CONSTRUCTION:**

- TYPE 304SS, #4 POLISHED
- FRONT VIEW SCREEN: 3/8" POLYCARBONATE
- SIDE SCREEN: 1/4" POLYCARBONATE
- GASKET MATERIAL: EPDM AND SILICONE

**CONTROL PANEL:**

- 1x SENSOCON
- 1x MAIN POWER PUSH BUTTON
- 1x LIGHT PUSH BUTTON
- 1x AIR PRESSURE ALARM
- 1x LED LIGHT
- 1x ALARM SILENCE BUTTON

**POWER REQUIREMENTS:**

- UNIT REQUIRES 115 VAC, 60 HZ SINGLE PHASE, 15 AMP CIRCUIT

**FILTER SIZES:**

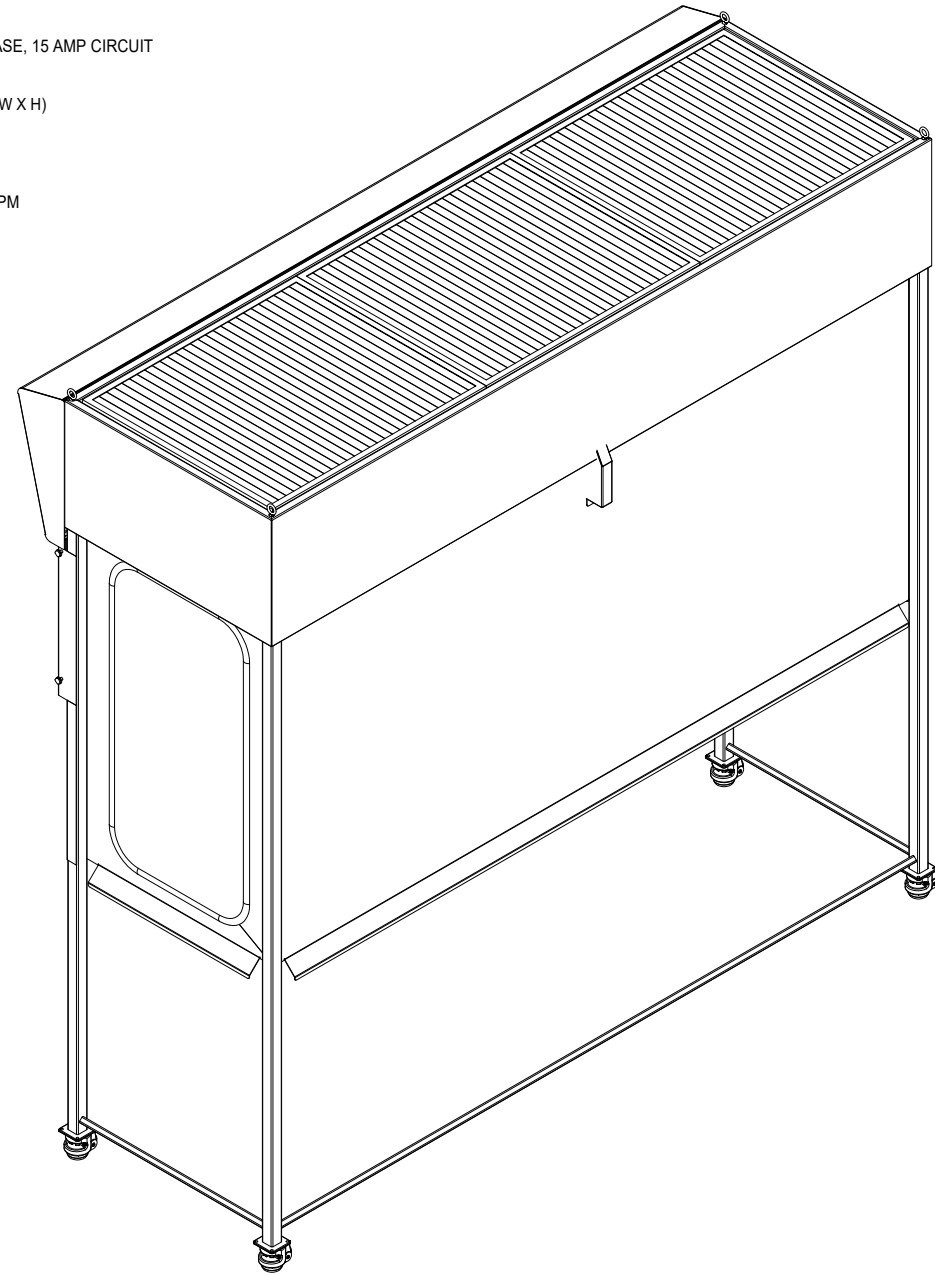
- HEPA FILTER (QTY 2): 47.6875 X 27.25 X 3 (L X W X H)
- PRE FILTER (QTY 3): 31.5 X 28 X (L X W X H)

**MSC:**

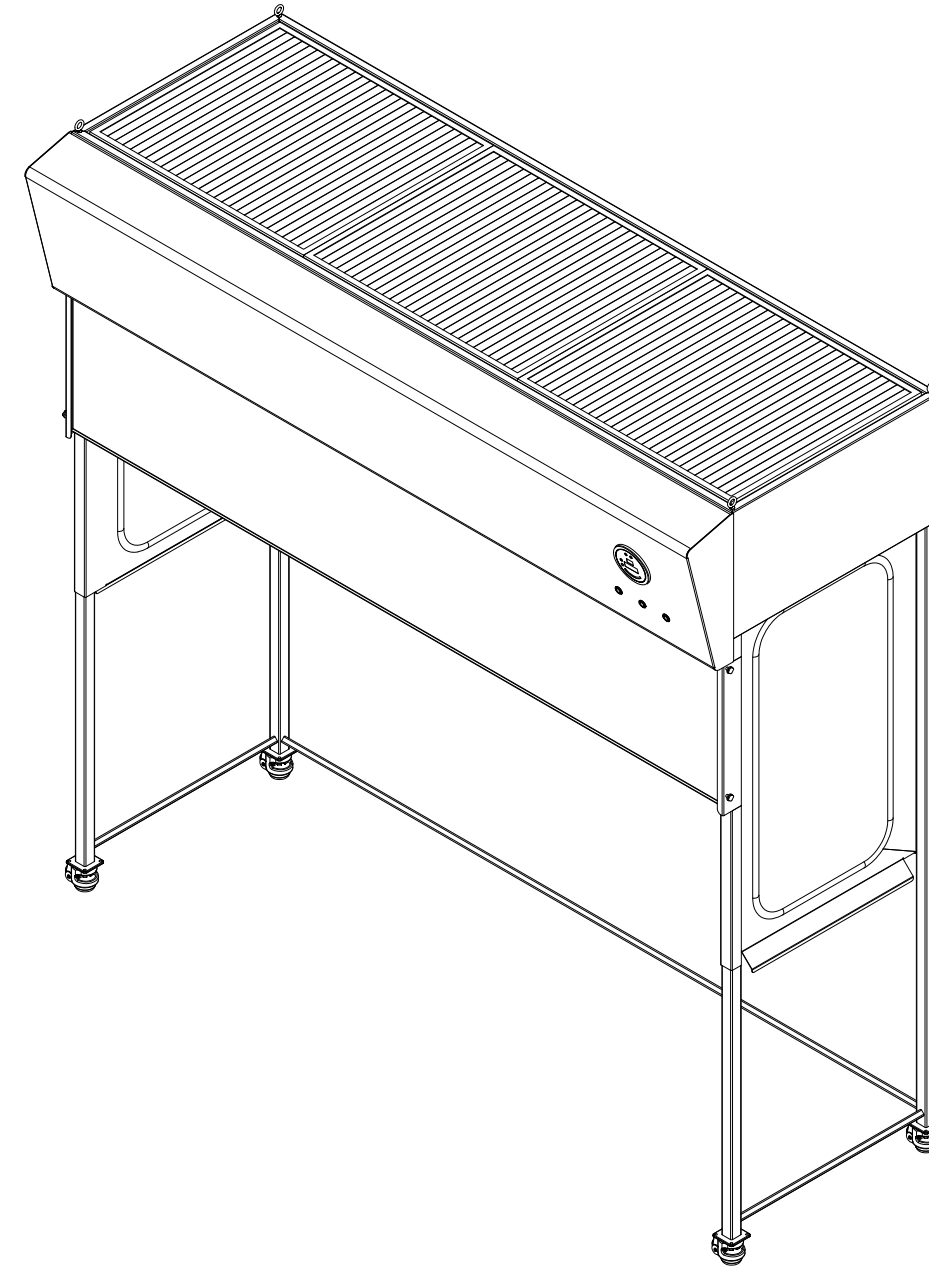
- HEPA FILTER EFF: 99.99% @ 3 MICRONS
- DOWNFLOW AIR VELOCITY RANGE: 72-108FPM

**REVISIONS**

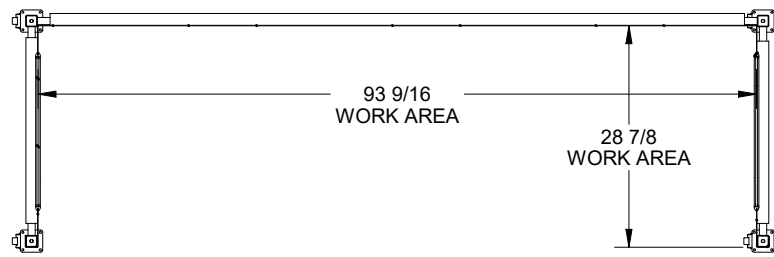
REV	DESCRIPTION	DATE	DGNR	DRFTR	CHKR	APRV
-	INITIAL RELEASE	07JAN21	MSP	MSP	BAS	JQS



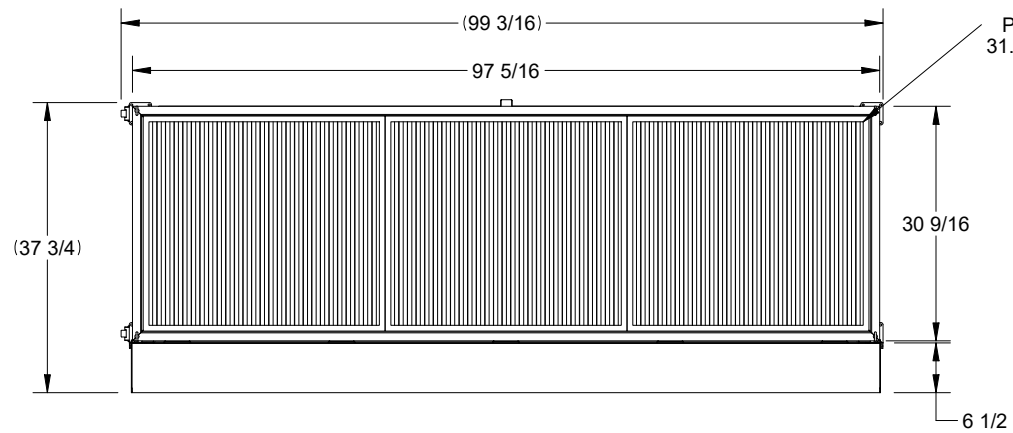
REAR ISO VIEW



FRONT ISO VIEW

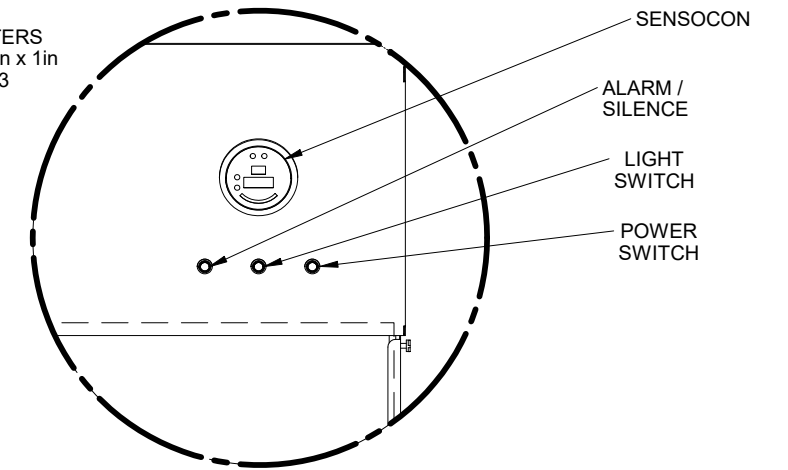


**SECTION C-C**

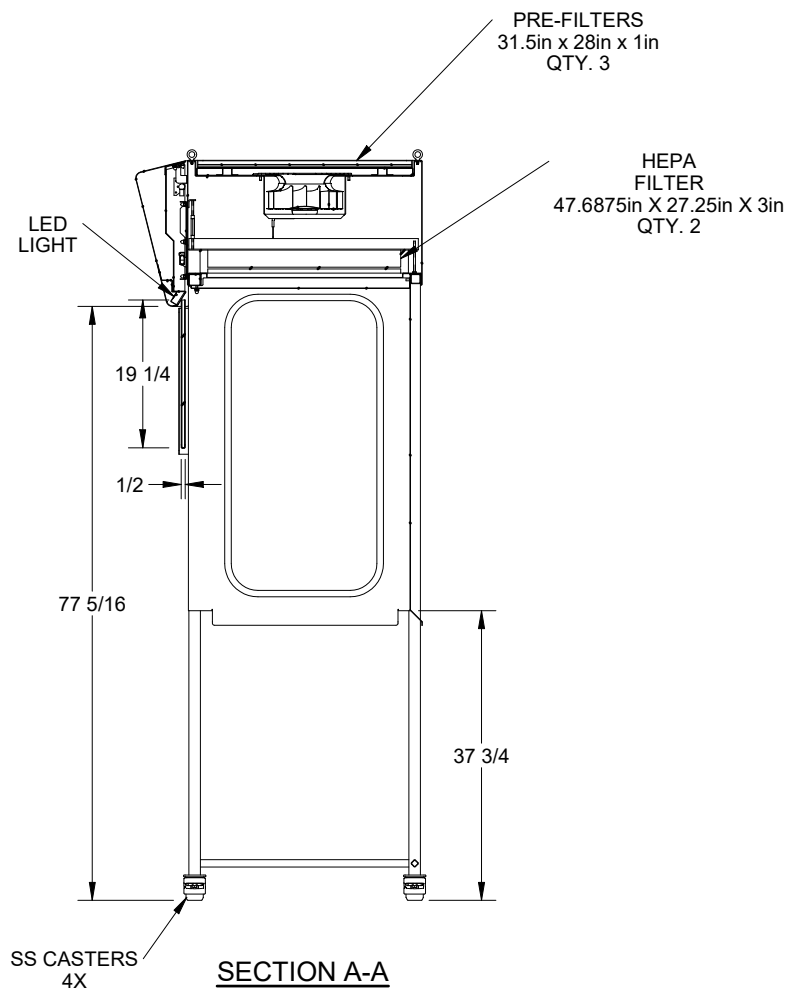


**TOP VIEW**

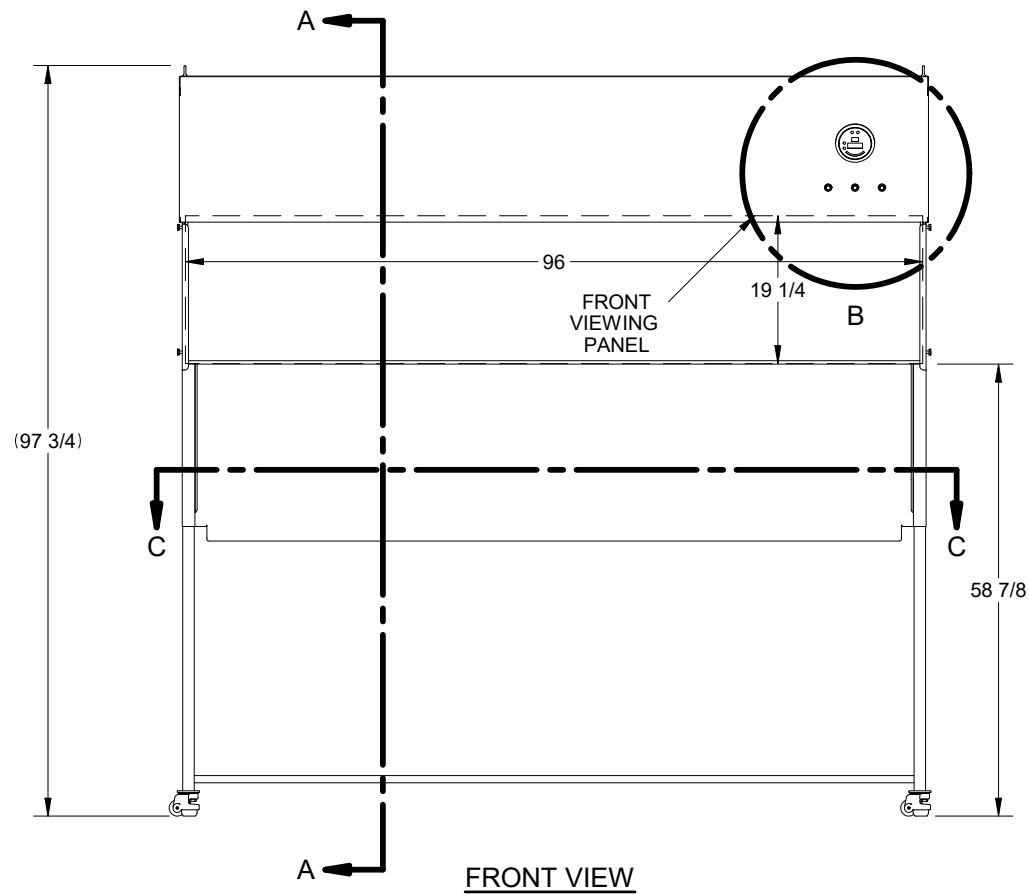
PRE-FILTERS  
31.5in x 28in x 1in  
QTY. 3



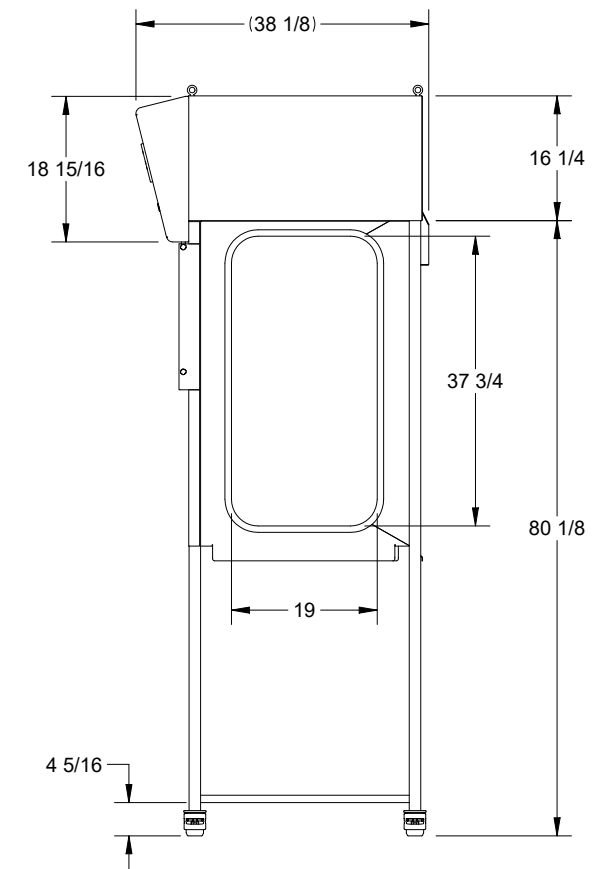
**DETAIL B**



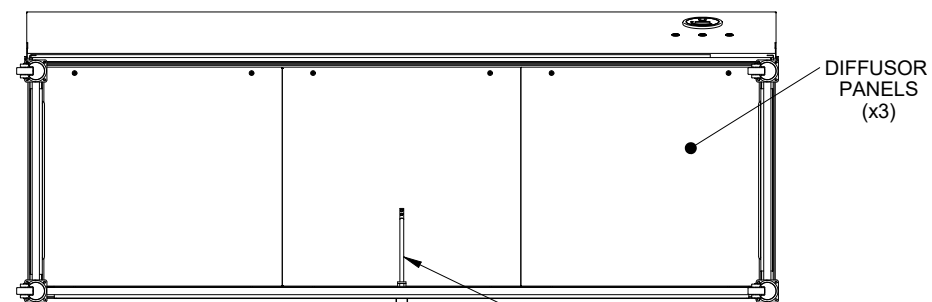
**SECTION A-A**



**FRONT VIEW**



**RIGHT VIEW**



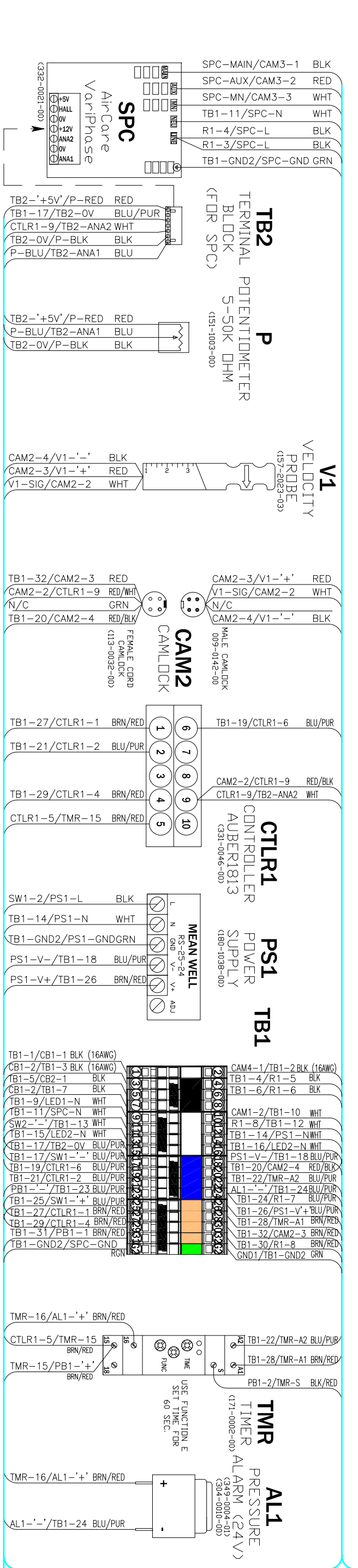
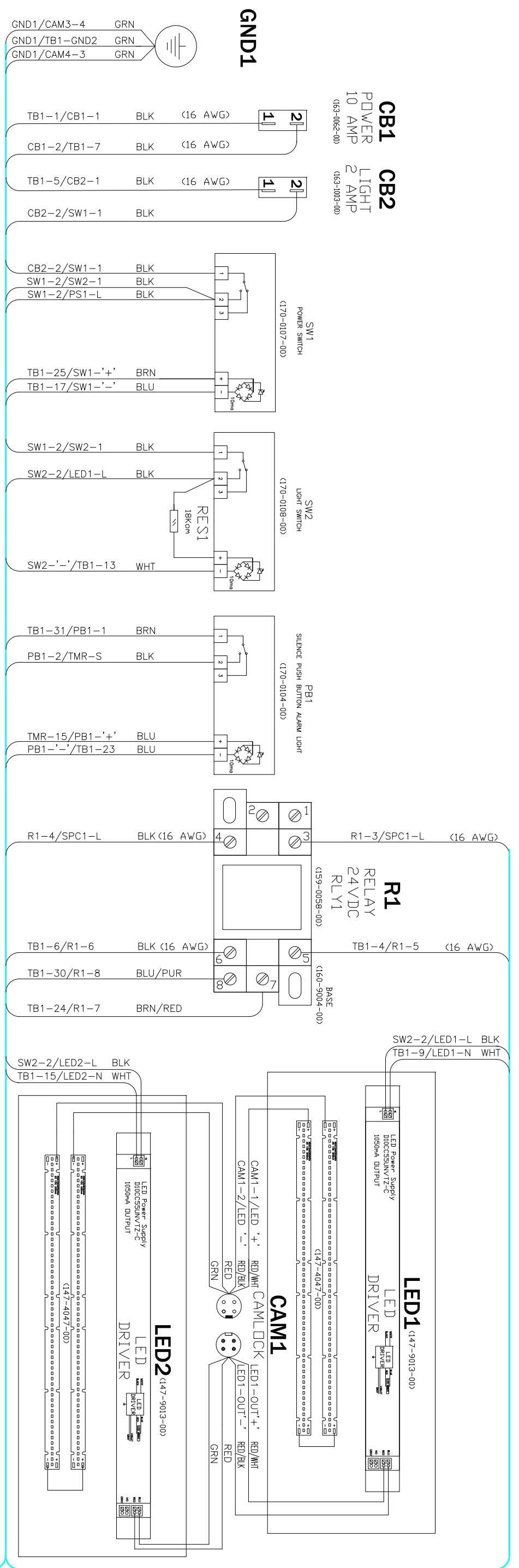
**BOTTOM VIEW**

VELOCITY  
SENSOR

DIFFUSOR  
PANELS  
(x3)

# Appendix C: Electrical Diagrams

REVISIONS HISTORY				
REV	DESCRIPTION	DATE	DRAWN	CHECKED
A	AS-BUILT	07/10/18	DT	JLC
				RL



**NOTES**  
 1. DESIGNATIONS ARE READ "THRU/TO"  
 EXAMPLE: TB1-17/SW1-1 IS READ "THRU TB1 POSITION 1 TO SW1 POSITION 1"  
 2. ALL WIRES 18 AWG UNLESS NOTED OTHERWISE. EX. (16 AWG)  
 3. BOM: 232-0023-00

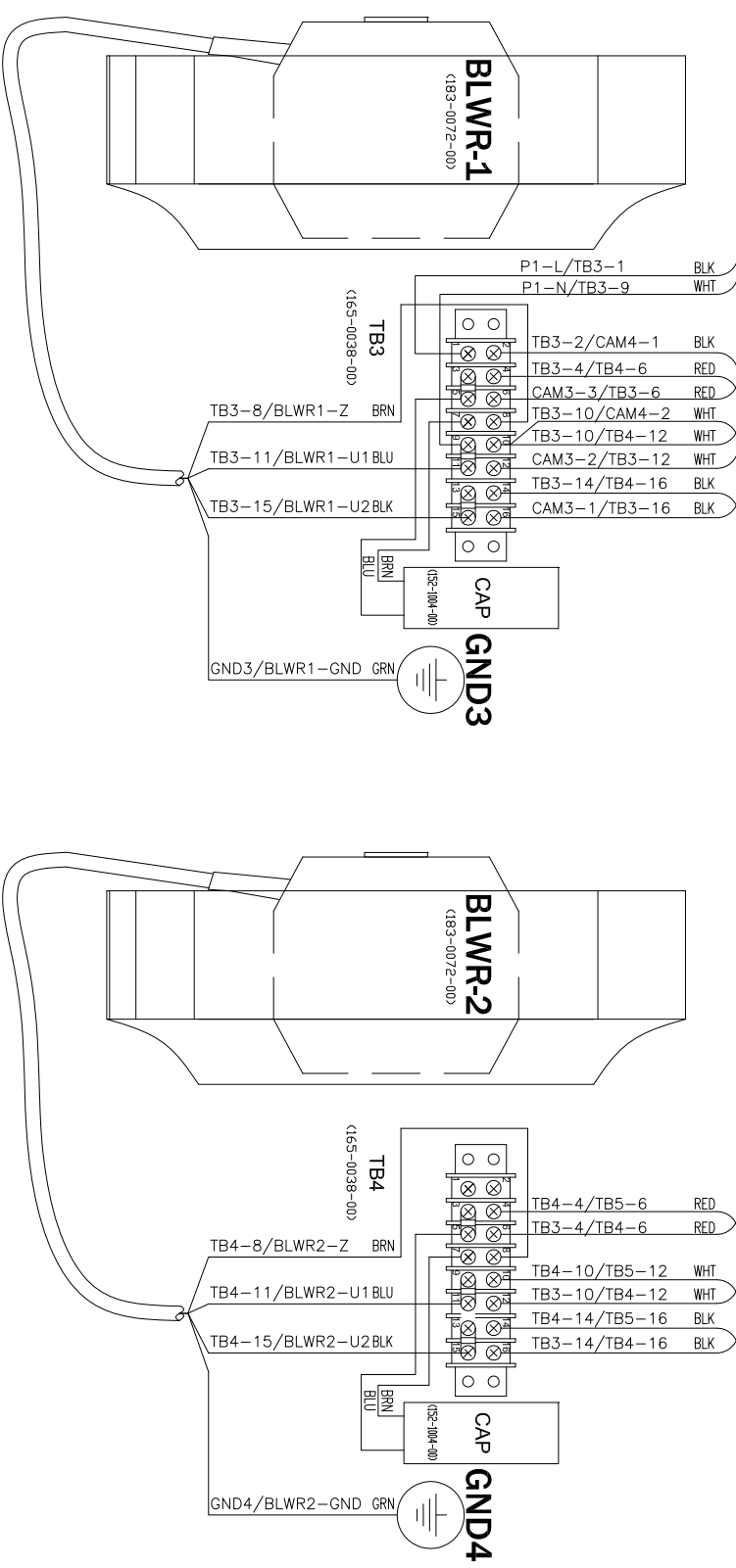
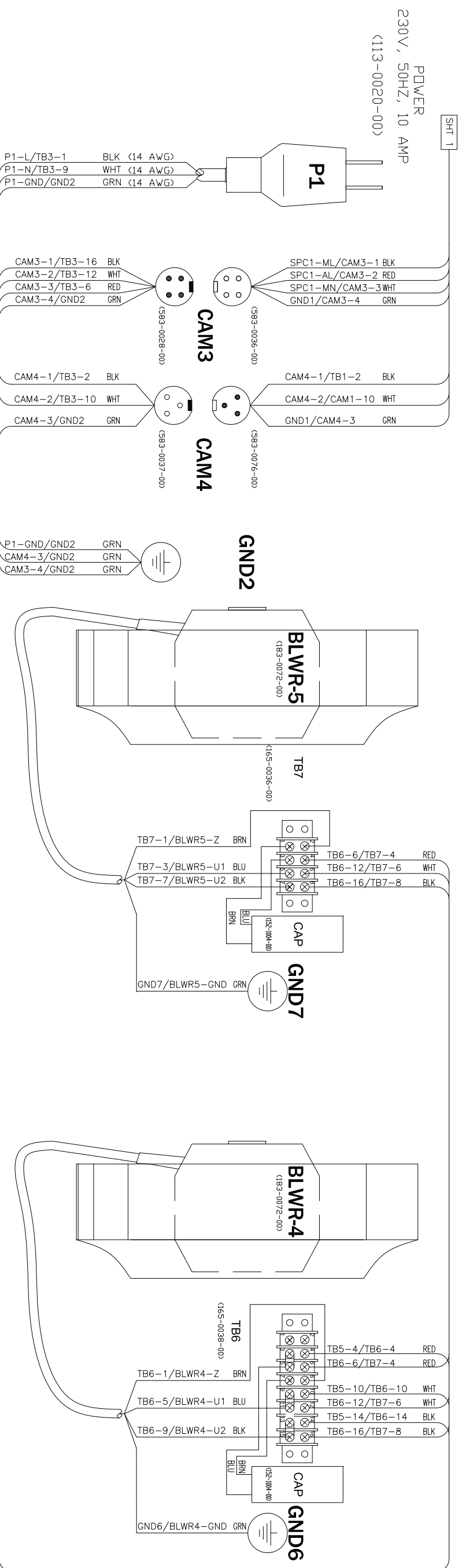
THIS PRINT IS PROVIDED ON A RESTRICTED BASIS AND IS NOT TO BE USED IN ANY WAY DETRIMENTAL TO THE INTERESTS OF GERMFREE LABORATORIES.

SIGNATURE		DATE
D. TAUBIN		07/01/18
CHECKED: J. CARLISLE		07/10/18
APPROVAL: R. LAVICOTT		07/10/18
MATERIAL		FINISH
DRAWING NUMBER		REVISION:
906-1578-01		A
SCALE	FILE TYPE	DWG
N/A		

GERMFREE LABORATORIES  
 WIRING DIAGRAM, CUSTOM LAF  
 PE17083-AST

SHEET 2

REVISIONS HISTORY				
REV	DESCRIPTION	DATE	DRAWN	CHECKED
A	AS-BUILT	07/10/18	DT	JLC
				RL



- NOTES:**
- DESIGNATIONS ARE READ "FROM/TO"  
EXAMPLE: TB1-1/SW1-1 IS READ "FROM TB1 POSITION 1 TO SW1 POSITION 1"
  - ALL WIRES 18 AWG UNLESS NOTED OTHERWISE EX. (16 AWG)
  - BOM: 232-0023-00

THIS PRINT IS PROVIDED ON A RESTRICTED BASIS AND IS NOT TO BE USED IN ANY WAY DETRIMENTAL TO THE INTERESTS OF GERMFREE LABORATORIES.

SIGNATURE		DATE	
DRAWN: D. TAUBIN		07/10/18	
CHECKED: J. CARLISLE		07/10/18	
APPROVAL: R. LAVICOTT		07/10/18	
MATERIAL		FINISH	
SCALE		FILE TYPE	
N/A		DWG	

WIRING DIAGRAM, CUSTOM LAF  
PE17083-AST  
DRAWING NUMBER  
906-1578-01  
REVISION:  
A

GERMFREE LABORATORIES

SCALE: N/A FILE TYPE: DWG SHEET: 2 OF 2