



# Esco Biological Safety Cabinets

## Your protection from biohazards.

**ESCO**

WORLD CLASS. WORLDWIDE.

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## Welcome to Esco

*Esco's Vision is to provide enabling technologies for scientific discoveries to make human lives healthier and safer.*



The Esco Group of Companies is committed to deliver innovative solutions for the clinical, life sciences, research, industrial, laboratory, pharmaceutical, and IVF community. With the most extensive product line in the industry, Esco have passed a number of international standards and certifications, and is operating under ISO 90001, ISO 14001, and ISO 13485. Esco represents innovation and forward-thinking designs, that are of the highest standard quality since 1978.

**Availability and Accessibility.** Esco has headquarters in Singapore, Indonesia, and Philippines, with manufacturing facilities are located in Asia and Europe. Research and Development (R&D) is conducted worldwide spanning the US, Europe and Asia. Sales, services and marketing subsidiaries are located in 42 major markets including US, UK, Japan, China and India. Esco regional distribution centers are located in Singapore, Malaysia, Thailand, Vietnam, Myanmar, Indonesia, Philippines, Bangladesh, Hong Kong, Taiwan, South Korea, China, Japan, India, UAE, Central and South Africa, Denmark, Germany, Italy, Lithuania, Russia, United Kingdom, and USA. Because of our worldwide presence, you can be sure that Esco is within your reach.

**High Quality, Reliable, and Dependable.** Esco products are of high quality, reliable, and dependable; assuring customers of research accuracy. Cross functional teams from Esco Production, R&D, Quality Assurance, and Senior Management, are regularly assembled to review and implement areas for improvement.

**Esco Cares for Your Safety.** Esco focuses on providing safety not just for your samples but also for you and the environment.

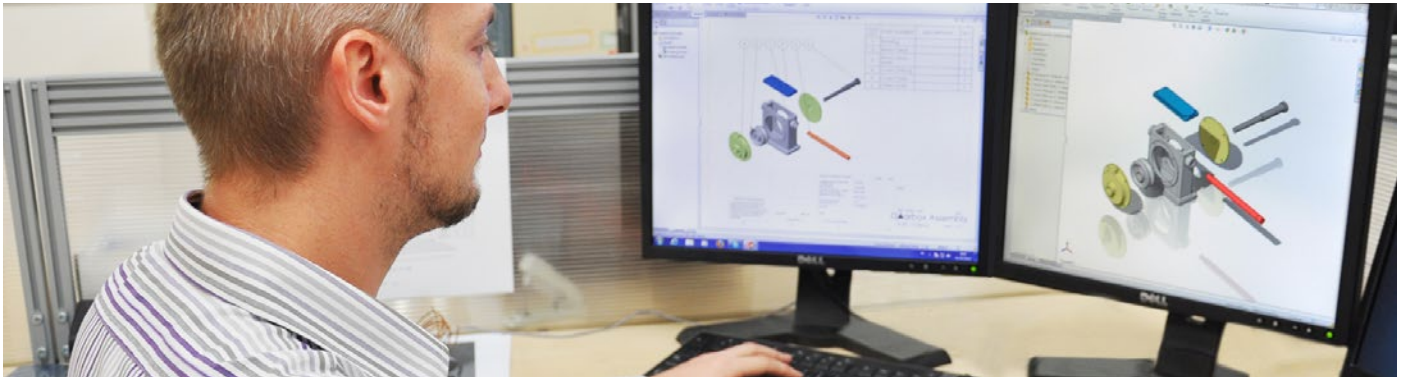
**Esco Cares for Your Comfort.** Building ergonomic designs and reducing noise levels of the units ensures comfort for our users.

**Esco Cares for the Environment.** One in every four of Esco's employees is involved in R&D and a number of them evaluate new components and/or designs to produce energy efficient equipment. Being GREEN is more than just modifying parts used to produce a new energy efficient technology, it is also embodied in the every aspect of the company.

**Customer Service and Support.** Our service does not stop once purchase has been done. Esco gives on-time customer service and offers end-user seminars, service training, preventive maintenance, and provides educational materials and informative videos.

As Esco takes the opportunity to respond to the world's needs, we aim not only to contribute in the advancement of scientific discoveries but also in making the world a safer, healthier, and better place to live in.

## Research and Development



An integral part of our business planning effort is based on managing a robust research and development program in Singapore, China, Europe and the USA, balanced against an investment in service support, training and customer education. Compared to industry averages, Esco invests a significant percentage of annual revenues in research and development. As a result of our investment, and with continuous feedback and idea evaluation among our research, global sales, marketing, purchasing and manufacturing teams; Esco products reflect the best contemporary designs in performance, ergonomics and customer satisfaction.

- Engineers located in technology centers in Singapore, China, Europe and the USA
- Growing patent portfolio
- Core competencies:
  - Embedded system, sensor and software development and integration
  - Containment engineering for biohazards, chemical vapors and hazardous powders
  - Decontamination cycle development
  - Computational fluid dynamics
  - Temperature, humidity, gas and environmental control
  - Imaging systems
  - Wireless and remote monitoring

## Production and Quality



Esco's manufacturing advantage stems from our extensive degree of vertical integration, enabled by our world leading high throughput. All processes, with a few exceptions, are performed in-house. This allows us to achieve quality and reliability that is truly world class.

- Incoming materials inspection and warehousing
- CNC-controlled sheet metal fabrication and welding
- Environmentally-friendly powder coating lines
- Electromechanical final product assembly
- Electrical / electronics sub-assembly
- Multi-step electrical and physical performance testing
- Independent quality control at each step in the production cycle
- Microbiology, chemistry, containment test labs

Esco's focus on quality and timeliness is relentless. Continuous improvement is a mantra. Cross functional teams from Esco Production, R&D, Quality Assurance, Senior Management, are regularly assembled to review and implement areas for improvement.

## Life Sciences Laboratory Equipment

### Sample Preparation

- Class I Biological Safety Cabinets
- Class II Microbiological Safety Cabinets
- Class II Type A2 Biological Safety Cabinets
- Class II Type B1 Biological Safety Cabinets
- Class II Type B2 Biological Safety Cabinets
- Class III Biological Safety Cabinets
- Horizontal Laminar Flow Clean Benches
- Vertical Laminar Flow Clean Benches
- Laboratory Animal Research Workstations
- Laboratory Centrifuges

### Sample Cultivation

- CO<sub>2</sub> Incubators, Direct Heat Air-Jacketed
- CO<sub>2</sub> Incubators with Cooling System
- CO<sub>2</sub> Incubators with Stainless Steel Exterior
- Laboratory Shakers

### Sample Handling and Analysis

- PCR Thermal Cyclers
- Conventional Thermal Cyclers

### PCR Sample Handling

- Microplate Shakers
- PCR Cabinets

### Sample Storage & Sample Protection Solutions

- Ultra-low Temperature Freezers
- Lab Refrigerators and Freezers
- Sample Database Management Software
- Intelligent Remote Monitoring Application Protocol
- Remote Monitoring, Datalogging, Programming Software
- Wireless Monitoring System

### Chemical Research

- Ductless Fume Hoods
- Laboratory Fume Hoods
- Fume Hood Airflow Monitors
- Exhaust Blowers
- Powder Weighing Balance Enclosures
- Filtered Storage Cabinet

### General Equipment

#### Laboratory Thermostatic Products

- Laboratory Oven
- Laboratory Incubator
- Refrigerated Incubator
- Natural Convection Incubator

### Forensic Sciences

- Evidence Drying Cabinet

## Medical / IVF Equipment

### Controlled Embryo Handling

- Fertilisafe™ ART Workstation
- AVT-I Anti Vibration Table
- Semi Closed Environment IVF

### Safe Embryo Culture

- MIRI® Multi room Benchtop Incubator
- CelCulture® CO<sub>2</sub> Incubator
- Mini MIRI® Humidified Benchtop Incubator

### Innovative Time Lapse Imaging

- MIRI® Time-lapse Incubator

### Accurate Quality Control

- MIRI® GA Gas and Temperature Validation Unit
- MIRI® GA Mini Gas Validation Unit

### Unique Consumables

- CultureCoin

## Healthcare

### Esco Pharma Products

#### Airflow Containment Products

- Pharmacon® Downflow Booths
- Ceiling Laminar Airflow Units
- Laminar Flow Horizontal/Vertical Trolley
- Enterprise™ Laminar Flow Straddle Unites
- Cytoculture™ Cytotoxic Safety Cabinets

#### Isolation Containment

- Aseptic Containment Isolator (ACTI)
- Weighing and Dispensing Containment Isolator (WDCI)
- General Processing Platform Isolator (GPPI)
- Containment Barrier Isolator (CBI)
- Turbulent Flow Aseptic (Grade A) Isolator (TFAI)
- Isoclean® Healthcare Platform Isolator (HPI)
- Streamline® Compounding Isolators (SCI)
- Technetium Dispensing Isolators
- Blood Cell Labeling Isolators
- Open and Closed Restricted Barrier Access Systems (RABS)

#### Cross Contamination Facility Integrated Barrier

- BioPass™ Pass Through
- Infinity® Air Shower Pass Box
- Cleanroom Air Shower
- Infinity® Cleanroom Transfer Hatch
- Infinity® Pass Box
- Soft capsule® Soft Wall Cleanroom
- Dynamic Passboxes and Dynamic Floor Laminar Hatches
- Laminar Flow Storage Cabinet

#### Ventilation Containment

- Ventilated Balance Enclosure

### VacciXcell Products

#### Bioreactors and Fermenters

- CelCradle™
- TideXcell™
- VacciXcell™ Hybrid Bioreactor

#### Cell Culture Monitoring, Media and Consumables

- Super Plus™
- Plus™ Vero
- Plus™ MDCK
- Plus™ MDCK II
- BioNOC™ II macrocarriers
- GlucCell™ Glucose Monitoring System
- CVD Kit

#### Filling Line Equipment

- Filling Line Isolators
- cRabs (close restricted access barriers)
- oRabs (open restricted access barriers)

#### Integrated Solutions

- Cell Processing Isolator
- Cell Processing Center

### TaPestle Rx Products and Services

#### PRODUCTS

- Pharmacy Automation and Compounding Supply**
- Compounding Pharmacy Isolators (SCI, HPI, CBI, GPPI)
- Safety Cabinets and Enclosures (Class II BSC, VBE, LFC)
- Radiopharmacy Hoods and Isolators
- Aseptic Filling Systems

#### Healthcare and Laboratory Construction Components

- Prefabricated Walls (Airecell®)
- Prefabricated Containerized Facility (Prefab™)
- Series Ceiling Systems
- Hygienic/Hermetic Door Systems
- Surgical Scrub Sinks
- Vinyl Tiles and Epoxy
- Laboratory Fit-outs
  - Worktops
  - Frames
  - Specialty Storage cabinets
  - Service Spines & Reagent Shelving

#### SERVICES

- Conceptualization
- Planning
- Procurement
- Installation

#### FACILITY DESIGNS

- Process Architecture
- Biocontainment/Biosafety
- Pharmacy Compounding/Nuclear Medicine
- Cleanroom, Vaccine and Cell Processing
- Laboratory
- Containerized Facility
- ART/IVF
- Cold Chain

## We adapt to your needs!

Esco offers a wide range of models in biosafety cabinetry. From classifications of BSC to certifications to different international standards, Esco offers it all. Esco has the broadest selection of biosafety cabinets in the market. Esco manufactures a wide array of sizes and configuration to guarantee that there is always an Esco biosafety cabinet that suits your need.

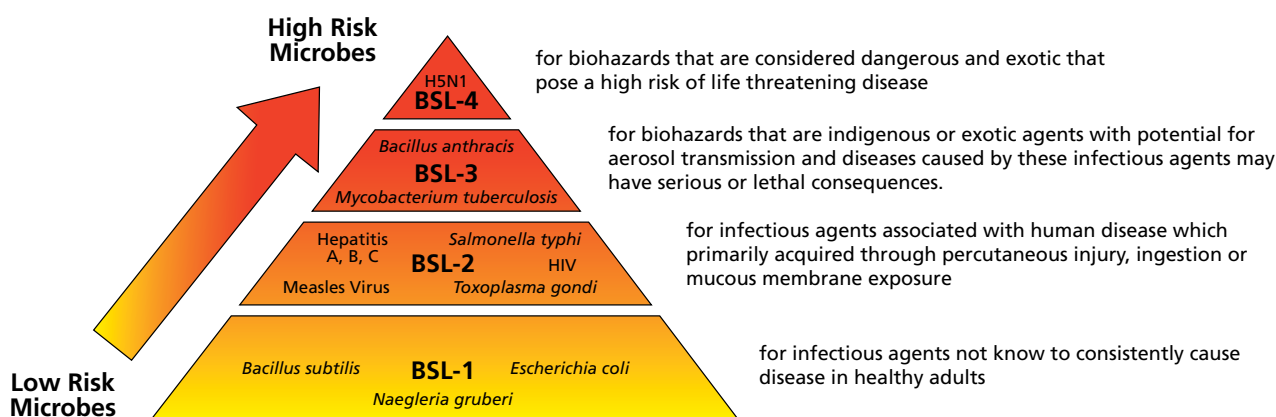
## Comprehensive Performance Testing at Esco

Every biosafety cabinet manufactured by Esco is individually tested, documented by serial number and validated with the following test methods:

- Inflow and downflow velocity
- PAO aerosol challenge for filter integrity
- Airflow pattern visualization
- Electrical safety to IEC61010-1
- Additional KI-Discus containment and microbiological testing are performed on statistical sampling basis

## Know your Biosafety Levels.

Biosafety Levels 1 through 4 were established by the Centers for Disease Control (CDC) and the National Institutes of Health (NIH) and are combinations of laboratory practices and techniques, safety equipment and facilities. All of these levels are appropriate for the biohazard posed by the agents used and for the laboratory activity.



Source: Biosafety in Microbiology and Biomedical Laboratories, U.S. Department of Health and Human Services, HHS publication (CDC) 21-1112, 5th Edition (revised). December 2009. p 24-26.

## Selection of a Biological Safety Cabinet

A BSC should be selected primarily in accordance with the type of protection needed: product protection; personnel protection against Risk Group 1 ~ 4 microorganisms; personnel protection against exposure to radionuclides and volatile toxic chemicals; or a combination of these. The table below shows which BSCs are recommended for each type of protection.

Type of Protection	BSC Selection
Personnel Protection, microorganisms in Risk Group 1-3	Class I, Class II, Class III
Personnel Protection, microorganisms in Risk Group 4, glove box laboratory	Class III
Personnel Protection, microorganisms in Risk Group 4, suit laboratory	Class I, Class II
Product Protection	Class II, Class III
Volatile radionuclide/ chemical protection, re-circulated back to work zone	Class II Type B1, Class II Type A2 vented to outside
Volatile radionuclide/ chemical protection, no re-circulated back to work zone	Class I, Class II Type B2, Class III vented to outside

Source: Laboratory Biosafety Manual. 3rd ed (revised). Interim guidelines. World Health Organization. p52.

## Is your Biological Safety Cabinet truly safe?

Many cabinets meet the minimum safety requirements of international standards like NSF/ANSI 49 and EN 12469, but does your biosafety cabinet have these extended safety features to further protect you from the cabinet's wear and tear and unexpected situations?



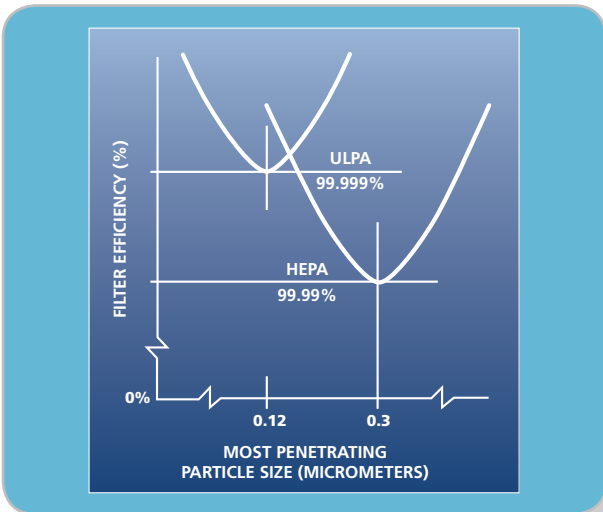
### Negative-pressured side walls

Negative-pressured side walls help prevent contaminants from escaping out.



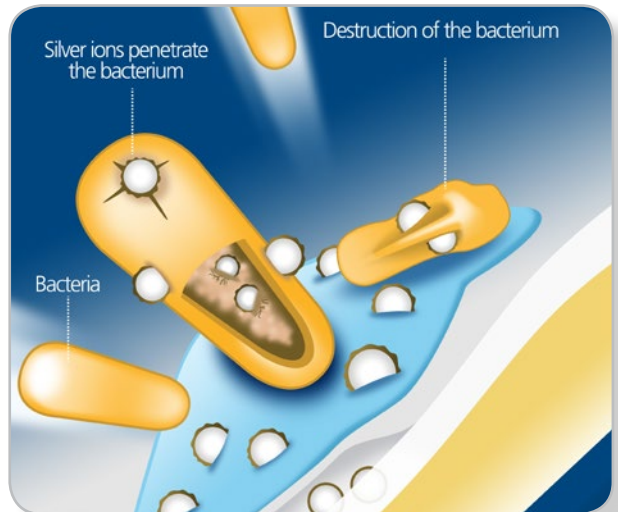
### Puncture-resistant metal plenum

Metal plenum resists tear and leak, unlike plastic bag / HPX plenum



### ULPA Filter

ULPA filter has 10x filtration efficiency of HEPA filter ~ 10x more protection against biohazards.



### Antimicrobial powder coating

Antimicrobial coating impregnated with silver ions can inhibit microbial growth to improve safety.

**Think safety.** Choose a biosafety cabinet with enhanced safety features beyond international standard requirements.

## Esco biosafety cabinets save energy, money and environment!

Esco provides biological safety cabinets that are energy-efficient. With its dedication to protect the environment, we employ EC or DC fans in a move to reduce energy costs. With EC technology, 90% efficiency can be reached across a very wide speed and load range by converting AC mains to DC via proprietary electronics. This not only saves up to 66% of the energy demand of conventional AC fans, but also produces less heat output for cooler working conditions and significantly lowers noise levels.

Moreover, higher torque can be delivered and constant airflow is maintained since the fans can run at higher speeds than conventional systems. HEPA filter life is extended and general maintenance costs are reduced.



Description	AC2-4S -NS /AR2 with DC ECM blower	Typical BSC with AC Blower	Savings	Unit
Instantaneous Power	200	800	600	Watt
Hours of Operation in a year	2000			Hours
Energy	400	1600	1200	KWh
Energy cost USA at \$ 0.10 / KWh	40	160	<b>120</b>	<b>USD</b>
Energy cost EU at € 0.20 / KWh	80	320	<b>240</b>	<b>Euro</b>
CO <sub>2</sub> released in USA at 1 lbs / KWh	400	1600	<b>1200</b>	<b>lbs</b>
CO <sub>2</sub> emission in EU at 0.35 Kg / KWh	140	560	<b>420</b>	<b>Kg</b>

\*Values based on estimates only.

## Ensured containment of biohazards with Esco biological safety cabinets.

Containment refers to the ability of the cabinet/enclosure to contain all hazardous particles inside the working space without any escape through the front of the cabinet.

There is only one recognized way in the entire world to perform testing of containment on a safety cabinet in the field and after manufacture – the KI-DISCUS test as specified in EN12469:2000. It should be noted that a cabinet can pass all the airflow tests but still fail the containment test.



Esco is one of the few companies outside Europe with KI-DISCUS testing capabilities. We maintain a statistical testing program by which a cabinet from a statistical sample of units manufactured is individually-tested at the factory with the KI-DISCUS test. In addition, all our safety cabinets have been type-tested and approved for containment with this method. Finally, many Esco cabinets have also been independently type-tested – in the most recognized international laboratories – using the microbiological method for operator protection.

Aside from KI-DISCUS, microbiological tests such as product and cross-contamination protection tests are also employed. These tests determine whether aerosols formed during microbiological applications can be effectively contained within the biosafety cabinet, whether outside contaminants will not be able to enter the work zone, and whether aerosol contamination of other equipment can be effectively minimized.



## Biological Safety Cabinets Product Overview

Esco is a world leader in biological safety cabinets, offering the industry's widest product range, with thousands of installations in leading laboratories in more than 100 countries around the globe. Esco's biological safety cabinets have earned more independent certifications in more countries, in more languages, than any other product, demonstrating our commitment to the industry's best safety and quality.

### Class I Biological Safety Cabinets

The Class I cabinet has the most basic and rudimentary design of all biological safety cabinetry available today. It provides protection to the operator and the environment from exposure to biohazards and is suitable for work with microbiological agents assigned to biosafety levels 1, 2 and 3.

Brand available: Airstream®

### Class II Type A2 Biological Safety Cabinets

The Class II Type A2 biological safety cabinet is the most common Class II cabinet. It is also the most common safety cabinet of all the different types available. It has a common plenum from which 30% of air is exhausted, and 70% is re-circulated to the work area as the downflow. It provides protection to the operator and the environment from exposure to biohazards, and also protects products from contaminated room air and cross-contamination.

Note: If trace amount of toxic chemicals are employed as an adjunct to microbiological processes, Type A cabinets should be exhaust-ducted.

Brands available: Airstream®, Labculture®, NordicSafe®, Cytoculture®

### Class II Type B2 Biological Safety Cabinets

In a Class II Type B2 biological safety cabinet, all inflow and downflow air is exhausted after HEPA filtration to the external environment without recirculation within the cabinet. Type B2 cabinets are suitable for work with toxic chemicals employed as an adjunct to microbiological processes under all circumstances since no re-circulation occurs. In theory, Type B2 cabinets may be considered to be the safest of all Class II BSCs since the total exhaust feature acts as a fail-safe in the event that the downflow and/or exhaust HEPA filtration system cease to function normally.

Brands available: Airstream®, Labculture®

### Class III Biological Safety Cabinet

The Class III biological safety cabinet provides an absolute level of safety, which cannot be attained with Class I and Class II cabinets. It is suitable for work with microbiological agents assigned to biosafety levels 1, 2, 3 and 4. It is frequently specified for work involving the most lethal biological hazards.

## Esco's Superior Microprocessor Controllers

With Esco's dedication to make your lives in the laboratory easier and safer, we developed superior microprocessor controllers for you – ergonomically designed for easy reach, viewing and operation.



### Sentinel™ Gold Microprocessor Controller

- Displays all safety information on one screen
- Centered and angled down for easy reach and viewing
- Selectable Quickstart mode for fast operation
- Available for Airstream® Class I (AC1), Airstream® Class II Type A2 (AC2), Labculture® Class II Type A2 (LA2), Labculture® Class II Type B2 (LB2) and NordicSafe® Class II Type A2 (NC2) BSCs



### Sentinel™ Silver Microprocessor Controller

- Supervises all cabinet functions
- Centered and angled down for easy reach and viewing
- Large display monitors operational parameters
- Available for Airstream® Class II Type B2 (AB2), Airstream® Class III (AC3) BSCs

Esco also offers easy-to-use **Rocker Switches and Pressure Gauge** for Airstream® Reliant Class II Type A2 (AR2) and Labculture® Reliant Class II Type A2 (LR2) models.



## Esco brings ergonomics to a new level!

Must-haves of an Esco Biological Safety Cabinet:



*Airstream® Plus Class II, Biosafety Cabinet,  
Model AC2-4E8-TU*

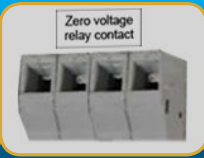
1. Low noise chamber design
2. Centered and angled down controller for easy reach and viewing
3. Easy-to-reach service fixtures and outlets
4. Curved corners for easy cleaning
5. Raised arm rest for comfortable working posture
6. UV light strategically placed inside the cabinet to avoid eye irritation
7. Sufficient and uniform lighting at more than 1200 lux
8. Angled front sash to prevent reflection and improve reach
9. Easy-to-lift and easy-to-clean work tray
10. Ergonomic lab chair for adequate back support
11. Ergonomic foot rest for individuals whose feet do not rest comfortably on the floor

# Class I Biological Safety Cabinet

## Airstream® Class I Biological Safety Cabinet

Provides protection for you and your environment.

The Airstream® Class I biological safety cabinet offers protection for you and your environment. It has been certified by PHE / Public Health England (formerly HPA) for compliance to EN 12469. AC1 is ergonomically designed without compromising your safety.

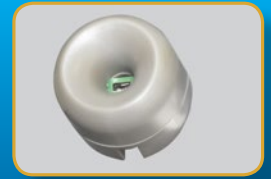


### RS 232 Port and Zero Volt Relay Contact

- RS 232 Port to send operational information to Building Management System (BMS)
- Zero Volt Relay Contact to turn ON/OFF exhaust blower and signal the building alarm

### Airflow Sensor

- Monitors real-time airflow for safety
- Alerts the user if airflow is insufficient



### Sentinel™ Gold Microprocessor Controller

- Displays all safety information on one screen
- Centered and angled down for easy reach & viewing

### Optional Secondary H14 or Carbon Filter

#### H14 Filter

- 10x filtration efficiency of HEPA filter



### Easy-to-clean Back Wall

- Large back wall radius for easy cleaning
- With UV Lamp Provision



### Hinged Window

- 90° opening for an easy workzone access
- 8 mm UV-resistant Polycarbonate Window
- Gasket-surrounded window to provide airtight seal for better safety.



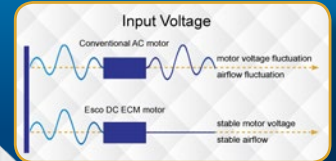
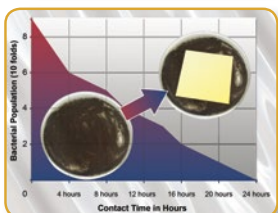
### UV Door

- Safety door against UV light
- Provides airtight seal during decontamination
- Integrated with VHP Injection Port for easy connection to VHP/HPV generator



### Work Top

- 1.2 mm (0.05") 18 gauge SS 304, 4B Finish
- Spill-retaining work top design with a recessed central area contains accidental liquid spills.



### Energy-efficient DC ECM Motor

- 70% energy savings from AC Motor
- Stable airflow, despite building voltage fluctuations
- Night Setback to further reduce power consumption by 60%



Available in 1.2 meter / 4 ft width

Airstream® Class I Biosafety Cabinet Model AC1-4E8



Esco Class I Microbiological Safety Cabinets has been certified by PHE / Public Health England (formerly HPA) for compliance to EN 12469

Standards Compliance	Biological Safety Cabinets	Filtration	Electrical Safety
	EN 12469, Europe SANS12469, South Africa	EN-1822 (H14), Europe IEST-RP-CC001.3, USA IEST-RP-CC007, USA IEST-RP-CC034.1, USA	IEC61010-1, Worldwide EN-61010-1, Europe

### Technical Specifications for Airstream® Class I Biological Safety Cabinet

Model		AC1-4E8
External Dimensions (W x D x H)		1340 x 731 x 1395 mm (52.8" x 28.8" x 55.0")
Gross Internal Dimensions (W x D x H)		1220 x 660 x 670 mm (48.0" x 26.0" x 26.4")
Usable Work Area		0.76 m <sup>2</sup>
Maximum Window Opening (at 90° opening)		565 mm (22.2")
Working Opening		203 mm (8")
Average Inflow Velocity		0.85 m/s (167 fpm)
Airflow Volume	Inflow	758 m <sup>3</sup> /h (446 cfm)
	Exhaust	758 m <sup>3</sup> /h (446 cfm)
	Required Exhaust with Optional Thimble Exhaust Collar	1219 m <sup>3</sup> /h (717 cfm)
	Static Pressure for Optional Thimble Exhaust Collar	85 Pa (0.34 in H <sub>2</sub> O)
HEPA Filter Typical Efficiency		>99.999% at 0.1 to 0.3 micron, ULPA as per IEST-RP-CC001.3 USA >99.999% at MPPS, H14 as per EN 1822 EU
Sound Emission in Typical Lab Room per EN 12469		48.4 dBA
Fluorescent Lamp Intensity (lux)		>1200 lux (>111 foot candles)
Cabinet Construction	Main body	1.2 mm (0.08") / 18 gauge EG Steel with Isocide™ oven-baked epoxy-polyester antimicrobial powder coating
	Work Zone	Table: 1.2 mm (0.08") / 18 gauge, SS 304, 4B Finish
	Side Walls	5 mm (0.2") UV-absorbing tempered glass
Electrical	Cabinet Full Load Amps (FLA)	8.1
	Heat Load (BTU / Hr)	628
Nominal Power Consumption		184 W
Net Weight *		230 Kg (507 lbs)
Shipping Weight *		285 Kg (628 lbs)
Shipping Dimensions, Maximum (W x D x H)*		1450 x 820 x 1760 mm (57.1" x 32.3" x 67.6")
Shipping Volume, Maximum *		2.09 m <sup>3</sup>

#### Guide to Models

### AC1-4E8

Nominal Width	Code	Side Walls	Code	Electrical Code	Code
4 ft (1220mm)	4	Glass side walls	E	230 V, 50/60 Hz	8

## Class II Type A2 Biological Safety Cabinets

Esco's Class II Type A2 cabinets provide protection to (a) the operator and laboratory environment from particulates generated within the work zone; (b) the product and process within the work zone from airborne contamination from ambient air; (c) and the product and process within the work zone from cross contamination.

*Note: Class II Type A2 biological safety cabinets can be used to handle minute quantities of volatile toxic chemicals and trace amounts of radionuclides when thimble-ducted. Use this option if chemical vapor re-circulation into the work zone is permitted.*

**Airstream® Series** - model variants  
AB2, AC2-E, AC2-S, AC2-G, AC2-D, AC2-NS, AC2-K,  
AC2-E-TU, AC2-S-TU, AR2



Model AC2-4E8-TU

**Labculture® Series** – model variants  
LA2-E, LA2-K, LA2-L, LB1-E, LB2-E, LR2-E



Model LA2-4A\_-E

**NordicSafe®**



Model NC2-4L8

## Class II Type A2 Biological Safety Cabinets

### Airstream® Class II Type A2 Biological Safety Cabinets

The World's Most Energy-Efficient, Quiet, and Compact Biosafety Cabinet

Aside from providing protection for you and your environment, Airstream® Class II biological safety cabinet provides protection for your microbiological samples.

#### We understand your BSC requirements.

Airstream® offers the most complete Class II cabinet range, with 9 models to choose from.



## Class II Type A2 Biological Safety Cabinets

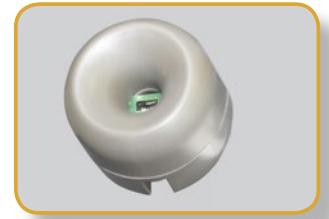
### Airstream® Class II Type A2 Biological Safety Cabinets, Gen 3

The World's Most Energy-Efficient, Quiet, and Compact Biosafety Cabinet



#### RS 232 Serial Interface Port

- Sends operational information to Building Management System (BMS)
- Optional zero volt exhaust and alarm contact



#### Sentinel™ Gold Microprocessor Controller

- Displays all safety information on one screen
- Centered and angled down for easy reach & viewing
- Selectable Quickstart mode for fast operation



#### Curved Corner & Glass Side

- Large corner radius for easy cleaning
- Easy-to-reach service fixture and outlets
- Stainless steel side wall is available (AC2-S and AC2-D variant)



#### Divided Work Tray

- Easy to lift and clean
- Single-piece recessed tray is available (AC2-S and AC2-D variant)



#### Raised Arm Rest

- Helps prevent grille blocking
- Comfortable working posture



#### Removable Paper Catch

- Easy to clean
- Optional pre-filter can be fitted

Available in 0.6, 0.9, 1.2, 1.5, and 1.8 meter width



**EN 12469**

Esco Airstream Class II has been certified by PHE / Public Health England (formerly HPA) for compliance to EN 12469



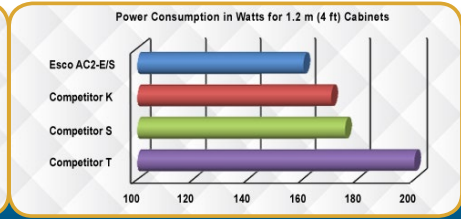
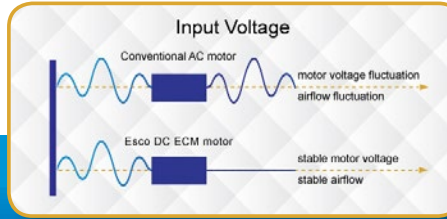
## Energy-Efficient DC ECM Motor

- The most energy-efficient Class II Biosafety Cabinet in the world with 70% Energy savings compared to AC motor
- Stable airflow, despite building voltage fluctuations & filter loading
- Night Setback mode to further reduce power consumption by 60%



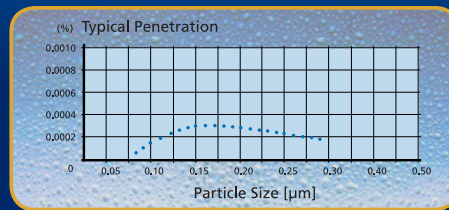
## Airflow Sensor

- Monitors real-time airflow for safety
- Alerts the user if airflow is insufficient



## ULPA Filter

- 10x Filtration efficiency of HEPA filter
- Creates ISO Class 3 work zone instead of industry-standard ISO Class 5



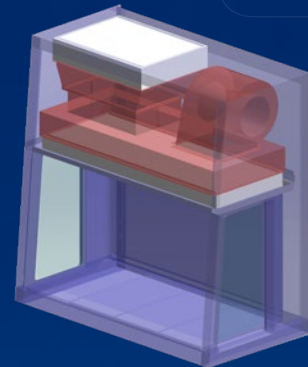
Esco cabinets use ULPA filters (per IEST-RP-CC001.3) / H14 per EN 1822 instead of H13 HEPA filters used on many BSCs in the market.

HEPA filters only offer 99.99% typical efficiency at 0.3 micron, while ULPA filters provide 99.999% typical efficiency for particle sizes of 0.1 to 0.3 micron.

## Dynamic Chamber™

- Blower plenum and side walls (AC2-S and AC2-D variant)
- Prevents contaminants from escaping outside

- Positive pressure
- Negative pressure



## ISOCIDE™ Powder Coat

- Silver ion-impregnated powder coat
- Inhibits microbial growth to improve safety



Airstream® Class II, Gen 3 Biosafety Cabinet, Model AC2-4E...

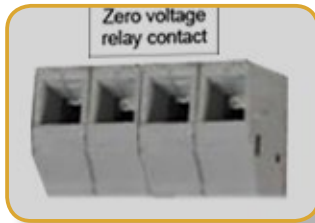
	Biosafety Cabinet	Air Quality	Filtration	Electrical Safety
Standards Compliance	EN 12469, Europe SANS 12469, South Africa	ISO 14644.1 Class 3, Worldwide JIS B9920 Class 3, Japan BS 5295 Class 3, UK	EN-1822 (H14), Europe IEST-RP-CC001.3, USA IEST-RP-CC007, USA IEST-RP-CC034.1, USA	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN / CSA-22.2, No.61010-1

## Class II Type A2 Biological Safety Cabinets

### Airstream® Class II Type A2 Biological Safety Cabinets (AC2-K)

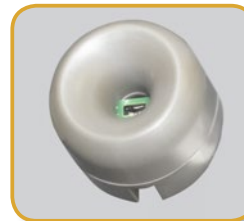
The World's Leading Energy-Efficient, Quiet and Compact Biosafety Cabinet

Note: Airstream® (AC2-K) model is only available for Australia.



#### Voltage Free Relay Contact

- Zero volt exhaust and alarm contact



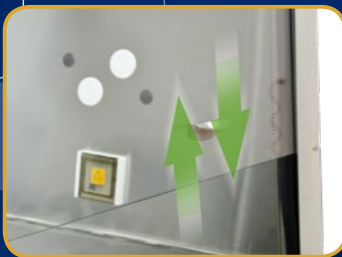
#### Airflow Sensor

- Monitors real-time airflow for safety
- Alerts the user if airflow is insufficient
- High-end Accusense sensor made by Degree C



#### Sentinel™ Gold Microprocessor Controller

- Displays all safety information on one screen
- Centered and angled down for easy reach & viewing
- Selectable Quickstart mode for fast operation



#### Counter-balance Sash Window

- Aerosol-tight window seal
- Manual window with counter-balance system



#### Single-Piece Work Tray

- Recessed to contain spillage
- Sloped perimeter that is easy to wipe



#### Raised Arm Rest

- Helps prevent grille blocking
- Comfortable working posture



#### Removable Paper Catch

- Easy to clean
- Optional pre-filter can be fitted



Available in 1.2 meter width (4').



### RS 232 Serial Interface Port

- Sends operational information to Building Management System (BMS)

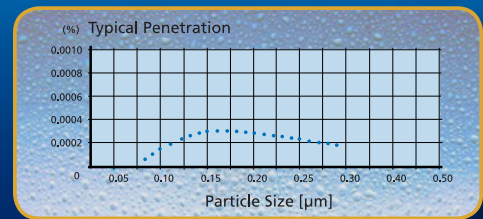
### DUAL Energy-Efficient DC ECM Motor

- The most energy-efficient Class II Biosafety Cabinet in the world
- 70% Energy savings compared to AC motor
- Stable airflow, despite building voltage fluctuations & filter loading
- Standby mode to further reduce power consumption by 60%



### H14 Filter

- H14 Filter with efficiency of 99.999%
- Creates ISO Class 3 work zone instead of industry-standard ISO Class 5



### ISOCIDE™ Powder Coat

- Silver ion-impregnated powder coat
- Inhibits microbial growth to improve safety



### Optional Hydrogen Peroxide Injection Port

- Easily connects to VHP/HPV Generator
- Combined with sealed front window for easy decontamination



### Angled Drain Pan

- Easy to clean
- Does not harbor contaminants



Airstream® Class II Type A2 Biosafety Cabinet  
Model AC2-4K8

Standards Compliance	Biosafety Cabinet	Air Quality	Filtration	Electrical Safety
	AS1807.22, Australia DIN EN 12469, Europe SANS 12469, South Africa	ISO 14644.1 Class 3, Worldwide JIS B9920 Class 3, Japan BS 5295 Class 3, UK	EN-1822 (H14), Europe IEST-RP-CC001.3, USA IEST-RP-CC007, USA IEST-RP-CC034.1, USA	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN / CSA-22.2, No.61010-1

## Class II Type A2 Biological Safety Cabinets

### Airstream® and Airstream® Reliant Class II Type A2 Biological Safety Cabinets

The World's Most Energy-Efficient, Quiet, and Compact Biosafety Cabinet

Note: Airstream® Reliant (AR2) model is only available for USA.



#### RS 232 Serial Interface Port and Voltage Free Relay Contact (Not Applicable for AR2)

- Sends operational information to Building Management System (BMS)
- Zero Volt Relay Contact to turn ON/OFF exhaust blower and signal the building alarm



#### Sentinel™ Gold Microprocessor Controller (for AC2)

- Displays all safety information on one screen
- Centered and angled down for easy reach & viewing
- Selectable Quickstart mode for fast operation



#### Rocker Switches and Pressure Gauge (for AR2)

- Easy-to-use switches
- Displays filter loading status
- Manually adjustable UV timer



#### Single-Piece Wall

- Easy-to-reach service fixture and outlets
- Large radius for easy cleaning



#### Single-Piece Work Tray

- Recessed to contain spillage
- Sloped perimeter that's easy to wipe



#### Raised Arm Rest

- Helps prevent grille blocking
- Comfortable working posture



Airstream® Class II, N

Available in 0.9, 1.2, 1.5 and 1.8 meter width (3', 4' 5" and 6')



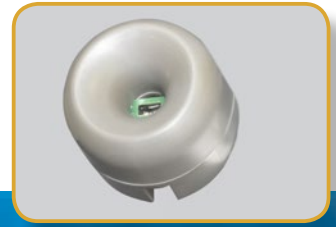
NSF 49



UL 61010

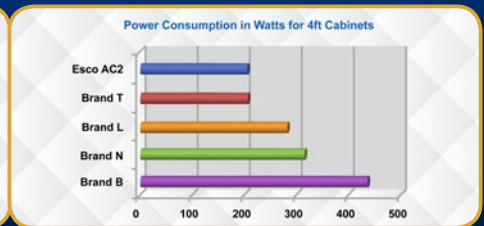
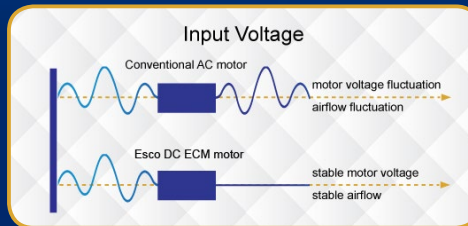
### Airflow Sensor (Not Applicable for AR2)

- Monitors real-time airflow for safety
- Alerts the user if airflow is insufficient



### Energy-Efficient DC ECM Motor

- The leading energy-efficient Class II Type A2 Biosafety Cabinet in the world with 70% Energy savings compared to AC motor
- Stable airflow, despite building voltage fluctuations & filter loading
- Standby mode to further reduce power consumption by 60%



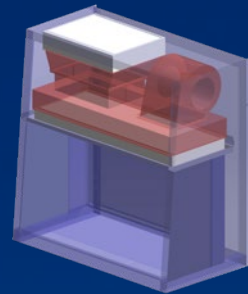
### ULPA Filter

- 10x Filtration efficiency of HEPA filter
- Creates ISO Class 3 work zone instead of industry-standard ISO Class 5

### Dynamic Chamber™

- Blower plenum and side walls are surrounded by negative pressure
- Prevents contaminants from escaping outside

■ Positive pressure  
■ Negative pressure



### Angled Sash

- 5° angled front to optimize user comfort, reduce glare and maximize reach into the work area

### ISOCIDE™ Powder Coat

- Silver ion-impregnated powder coat
- Inhibits microbial growth to improve safety



### Removable Paper Catch

- Easy to clean
- Optional pre-filter can be fitted



ISF-certified Biosafety Cabinet, Model AC2-4S9-NS

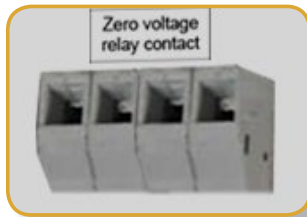
	Biosafety Cabinets	Air Quality	Filtration	Electrical Safety
Standards Compliance	NSF / ANSI 49 NSF*	ISO 14644.1, Class 3, Worldwide JIS B9920, Class 3, Japan BS 5295 Class 3, UK US Fed Std 209E, Class 1 USA	EN-1822 (H14), Europe IEST-RP-CC001.3, USA IEST-RP-CC007, USA IEST-RP-CC034.1, USA	UL-61010A-1, USA CSA22.2, No.1010-192, Canada EN-61010-1, Europe IEC61010-1, Worldwide

## Class II Type A2 Biological Safety Cabinets

### Airstream® Plus Class II Biological Safety Cabinets

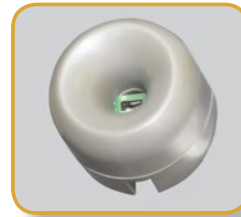
The World's Most Energy-Efficient, Quiet, and Compact Biosafety Cabinet

Aside from providing protection for you and your environment, Airstream® Plus Class II biological safety cabinet provides protection for your microbiological samples.



#### Voltage Free Relay Contact

- Zero volt exhaust and alarm contact



#### Airflow Sensor

- Monitors real-time airflow for safety
- Alerts the user if airflow is insufficient
- High-end Accusense sensor made by Degree C



#### Sentinel™ Gold Microprocessor Controller

- Displays all safety information on one screen
- Centered and angled down for easy reach & viewing
- Selectable Quickstart mode for fast operation



#### Motorized Window

- Aerosol-tight window seal
- Window automatically stops at safe operating height
- Conveniently move the window by fingertip

#### Unique Stainless Steel and Glass Hybrid Wall (E-Series)

- Large corner radius for easy cleaning
- Easy-to-reach service fixture and outlets
- Stainless steel side wall is available (S-Series)
- Hole-free side glass for increased safety



#### Divided Work Tray

- Easy to lift and clean
- Single-piece recessed tray is available (S-Series)



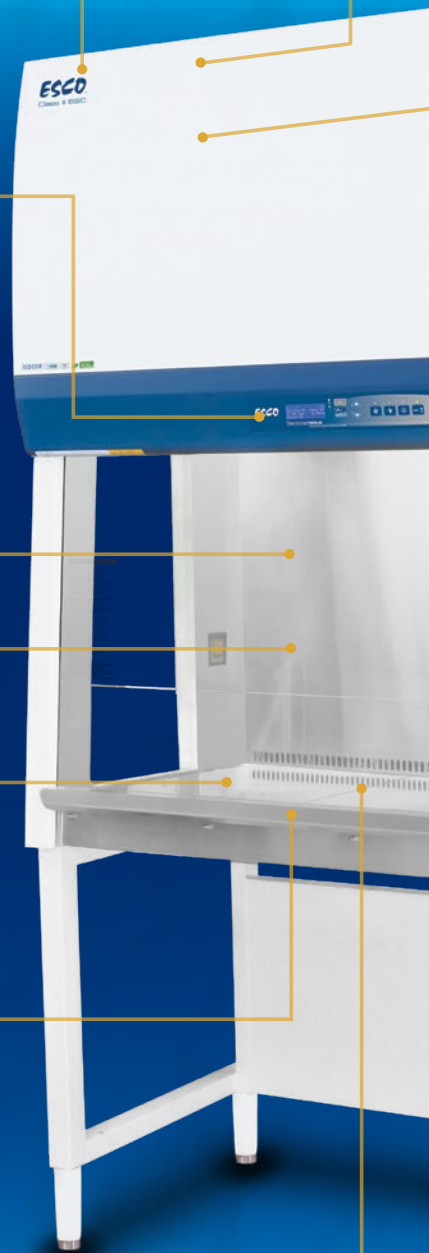
#### Raised Arm Rest

- Helps prevent grille blocking
- Comfortable working posture



#### Removable Paper Catch

- Easy to clean
- Optional pre-filter can be fitted



Available in 0.9, 1.2, 1.5 and 1.8 meter widths (3', 4', 5' and 6')


  
**EN12469**

  
 Certified by TÜV NORD, Germany  
 for compliance to DIN EN 12469



### RS 232 Serial Interface Port

- Sends operational information to Building Management System (BMS)

### Optional RS485 Port

- Sends operational information to Esco Voyager or Building Management System (BMS)

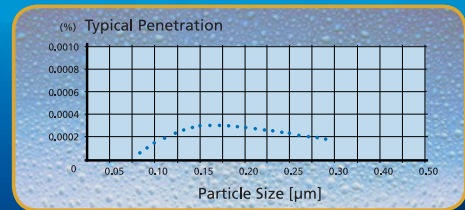
### DUAL Energy-Efficient DC ECM Motor

- The most energy-efficient Class II Biosafety Cabinet in the world with 70% energy savings compared to AC motor.
- Stable airflow, despite building voltage fluctuations & filter loading
- Standby mode to further reduce power consumption by 60%



### H14 / Optional U15 Filter

- H14 Filter with efficiency of 99.999%
- U 15 Filter with efficiency of 99.9999% (10x filtration efficiency of H14 filter)
- Creates ISO Class 3 work zone instead of industry-standard ISO Class 5
- Easy filter replacement procedure due to customized plenum design



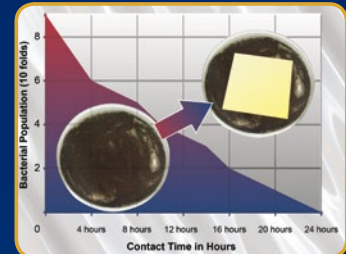
### LED Lamp

- Energy-efficient
- Last 4x longer than fluorescent lamp
- Brighter than fluorescent lamp



### ISOCIDE™ Powder Coat

- Silver ion-impregnated powder coat
- Inhibits microbial growth to improve safety



### Optional Hydrogen Peroxide Injection Port

- Easily connects to VHP/HPV Generator
- Combined with sealed front window for easy decontamination



### Angled Drain Pan

- Easy to clean
- Does not harbor contaminants



Airstream® Plus Class II, Biosafety Cabinet, Model AC2-4E8-TU

Standards Compliance	Biosafety Cabinet	Air Quality	Filtration	Electrical Safety
	DIN EN 12469, Europe SANS 12469, South Africa	ISO 14644.1 Class 3, Worldwide JIS B9920 Class 3, Japan JIS B9920 Class 3, Japan BS 5295 Class 3, UK	EN-1822 (H14), Europe IEST-RP-CC001.3, USA IEST-RP-CC007, USA IEST-RP-CC034.1, USA	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN / CSA-22.2, No.61010-1

## Putting your needs first.

Airstream® offers the most complete Class II cabinet range, with 9 models to choose from.

Airstream Product	AC2 Gen 3				AC2-K	AC2-NS	AR2	AC2-TU	
	E-Series	G-Series	S-Series	D-Series				S-Series	E-Series
Side Wall	Tempered glass increases visibility and prevents the operator from experiencing a “boxed-in” feeling		One-piece stainless steel with coved corners for cleanability. Side capture zones and negative pressure side walls optimize containment.				Unique stainless steel and glass hybrid wall increases visibility and prevents the operator from experiencing a “boxed-in” feeling, with coved corners for cleanability.		
Work Tray	Multi-piece, autoclavable		Single-piece, spill retaining				Single-piece, spill retaining	Multi-piece, autoclavable	
Fan System	Single blowers for inflow and downflow. Energy-efficient and cost-effective	Dual blower for inflow and downflow. Redundant system provides protection in case of fan failure	Single blower for inflow and downflow. Energy-efficient and cost-effective	Dual blowers for inflow and downflow. Redundant system provides protection in case of fan failure	Single blower for inflow and downflow. Energy-efficient and cost-effective		Double blowers for inflow and downflow. Redundant system provides protection in case of fan failure		
Exhaust Filter	Cost-effective ULPA filter with >99.999% efficiency	Dual ULPA filters that provide > 10x better protection than single filter system	Cost-effective ULPA filter with >99.999% efficiency	Dual ULPA filters that provide > 10x better protection than single filter system	H14 filters with efficiency of 99.999%	Cost-effective ULPA filter with > 99.999% efficiency			
Controller	Sentinel™ Gold Microprocessor Controller					Rocker Switches and Pressure Gauge	Sentinel™ Gold Microprocessor Controller		
Lamp	T5 Fluorescent Lamp					LED Lamp			
Optional H <sub>2</sub> O <sub>2</sub> port	None				Present	Present	None		Present
Window	Sliding				Counter-balance system	Sliding		Motorized	
Voltage Free Relay Contact	Optional				Present	Present	None		Present
Angled Drain Pan	None				Present	None		Present	
Dynamic Chamber™	Present								
Certifications	EN 12469, SANS 12469				AS 1807.22	NSF/ ANSI 49		EN 12469, SANS 12469	
Sizes Available	0.6 m (2'), 0.9 m (3'), 1.2 m (4'), 1.5 m (5'), 1.8 m (6')	1.2 m (4'), 1.8 m (6')	0.6 m (2'), 0.9 m (3'), 1.2 m (4'), 1.5 m (5'), 1.8 m (6')	1.2 m (4'), 1.8 m (6')	1.2 m (4')	0.9 m (3'), 1.2 m (4'), 1.5 m (5'), 1.8 m (6')			

### Guide to Models

Airstream Variant	Code	Nominal Width <sup>b</sup>	Code	Side Walls <sup>c</sup>	Code	Electrical Code <sup>d</sup>	Code	Suffix	Code
Sentinel™ Gold	C	2 ft (0.6 m)	2	Glass side walls	E	230 V, 50/60 Hz	8	Airstream®, NSF-certified	NS
Rocker Switches and Pressure Gauge	R	3 ft (0.9 m)	3	Stainless steel side walls	S	115 V, 50/60 Hz	9	Airstream® Plus	TU
		4 ft (1.2 m)	4	Stainless steel side walls (for AC2-K)	K				
		5 ft (1.5 m)	5						
		6 ft (1.8 m)	6						

Note: Airstream® Reliant is only available for USA.  
Airstream® (AC2-K) is only available for Australia.

**a** Applicable for Airstream® Reliant only (AR2)

**b** 2 ft (0.6 m) nominal width available for AC2 (E and S-series); AC2 (D and G-series) available in 4 ft and 6 ft nominal width. Airstream® (AC2-K) is available in 4 ft width only.

**c** Unique hybrid side walls for AC2-E-TU, Stainless steel side walls for AC2-K, AC2-NS and AR2. Code for AC2-K side walls is K.

**d** Airstream® (AC2-K) electrical code is 230 V, 50/60 Hz (code 8) only. Airstream® Reliant (AR2) electrical code is 115 V, 50/60 Hz (code 9).



## Technical Specifications for Airstream® Class II Biological Safety Cabinets, Gen 3 (E- and S-series)

Glass Side: 230 V, 50/60 Hz		AC2-2E8 2010718	AC2-3E8 2010658	AC2-4E8 2010621	AC2-5E8 2010656	AC2-6E8 2010657
Glass Side: 115 V, 50/60 Hz		AC2-2E9 2010777	AC2-3E9 2010779	AC2-4E9 2010697	AC2-5E9 2010784	AC2-6E9 2010787
Stainless Steel Side: 230 V, 50/60 Hz		AC2-2S8 2010767	AC2-3S8 2010721	AC2-4S8 2010711	AC2-5S8 2010725	AC2-6S8 2010722
Stainless Steel Side: 115 V, 50/60 Hz		AC2-2S9 2010790	AC2-3S9 2010792	AC2-4S9 2010744	AC2-5S9 2010797	AC2-6S9 2010800
Nominal Size		2 ft (0.6 meter)	3 ft (0.9 meter)	4 ft (1.2 meter)	5 ft (1.5 meter)	6 ft (1.8 meter)
External Dimensions (W x D x H)	Width	730 mm (28.8")	1035 mm (40.8")	1340 mm (52.8")	1645 mm (64.8")	1950 mm (76.8")
	Depth without Arm Rest	753 mm (29.5")				
	Depth with Arm Rest	810 mm (32.0")				
	Height	1400 mm (54.8")				
Gross Internal Dimensions (W x D x H)	Width	610 mm (24.0")	915 mm (36.0")	1220 mm (48.0")	1525 mm (60.0")	1830 mm (72.0")
	Depth	580 mm (22.8")				
	Height	660 mm (26")				
Usable Work Area		0.27 m <sup>2</sup> (2.9 sq.ft.)	0.42 m <sup>2</sup> (4.5 sq.ft.)	0.56 m <sup>2</sup> (6.1 sq.ft.)	0.71 m <sup>2</sup> (7.63 sq.ft.)	0.86 m <sup>2</sup> (9.2 sq.ft.)
Tested Opening		175 mm (7")				
Working Opening		190 mm (7.5")				
Average Airflow Velocity	Inflow	0.45 m/s (90 fpm)				
	Downflow	0.30 m/s (60 fpm)				
Airflow Volume	Inflow	173 cmh (102 cfm)	259 cmh (152 cfm)	346 cmh (204 cfm)	432 cmh (254 cfm)	519cmh (305 cfm)
	Downflow	369 cmh (217 cfm)	553 cmh (325 cfm)	738 cmh (434 cfm)	922 cmh (543 cfm)	1107 cmh (657 cfm)
	Exhaust	173 cmh (102 cfm)	259 cmh (152 cfm)	346 cmh (204 cfm)	432 cmh (254 cfm)	519cmh (305 cfm)
	Required Exhaust with Optional Thimble Exhaust Collar	260 m <sup>3</sup> /h (153 cfm)	320 m <sup>3</sup> /h (189 cfm)	538 m <sup>3</sup> /h (317 cfm)	615 m <sup>3</sup> /h (362 cfm)	823 m <sup>3</sup> /h (485 cfm)
	Static Pressure for Optional Thimble Exhaust Collar	28 Pa / 0.11 in H <sub>2</sub> O	29 Pa / 0.11 in H <sub>2</sub> O	31 Pa / 0.12 in H <sub>2</sub> O	35 Pa / 0.14 in H <sub>2</sub> O	47 Pa / 0.18 in H <sub>2</sub> O
ULPA Filter Typical Efficiency		>99.999% at 0.1 to 0.3 micron, ULPA as per IEST-RP-CC001.3 USA				
		>99.999% at MPPS, H14 as per EN 1822 EU				
Sound Emission*	NSF / ANSI 49	56.3	56.6	58.7	58.2	59.4
	EN 12469	51.0	52.0	53.5	53.6	55.7
Fluorescent Lamp Intensity (lux)		859	1279	1404	1227	1384
Fluorescent Lamp Intensity (ft-cd)		80	119	130	114	129
Cabinet Construction	Main body	1.2 mm (0.05") 18 gauge electro-galvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder-coated finish				
	Work Zone	1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish				
	Side Walls (E Series)	UV-absorbing tempered glass, 5 mm (0.2"), colorless and transparent				
	Side Walls (S Series)	1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish				
Electrical	Cabinet Full Load Amps (FLA)	1.8	3.5	3.7	4.3	5.5
	Heat Load (BTU / Hr)	324	447	580	717	966
Nominal Power Consumption (W)		95	131	160	210	283
Net Weight**		116 Kg (256 lbs)	173 Kg (381 lbs)	230 Kg (507 lbs)	288 Kg (635 lbs)	346 Kg (763 lbs)
Shipping Weight**		143 Kg (315 lbs)	214 Kg (472 lbs)	285 Kg (628 lbs)	356 Kg (785 lbs)	428 Kg (944 lbs)
Shipping Dimensions Maximum (W x D x H)**		850 x 820 x 1760 mm (33.5" x 32.3" x 69.3")	1120 x 820 x 1760 mm (44.1" x 32.3" x 69.3")	1450 x 820 x 1760 mm (57.1" x 32.3" x 69.3")	1720 x 820 x 1760 mm (67.7" x 32.3" x 69.3")	2050 x 820 x 1760 mm (80.7" x 32.3" x 69.3")
Shipping Volume, Maximum**		1.23 m <sup>3</sup> (43.2 ft <sup>3</sup> )	1.62 m <sup>3</sup> (57.2 ft <sup>3</sup> )	2.09 m <sup>3</sup> (73.8 ft <sup>3</sup> )	2.48 m <sup>3</sup> (87.6 ft <sup>3</sup> )	2.96 m <sup>3</sup> (104.5 ft <sup>3</sup> )

\* Noise reading in open field condition / **anechoic** chamber. Noise reading in **normal room varies** by room size, layout, and background noise, but may reach roughly 3-4 dBA above these values.  
 \*\* Cabinet only, excludes optional stand.

## Technical Specifications for Airstream® Class II Biological Safety Cabinets, Gen 3 (D- and G-series)

Glass Side: 230 V, 50/60 Hz		AC2-4G8 2010734	AC2-6G8 2010743
Stainless Steel Side: 230 V, 50/60 Hz		AC2-4D8 2010733	AC2-6D8 2010742
Nominal Size		4ft / 1.2 m	6ft / 1.8 m
External Dimensions (W x D x H)	Width	1340 mm (52 ¾")	1950 mm (76 ¾")
	Depth without arm rest	753 mm (29 ½")	
	Depth with arm rest	810 mm (32")	
	Height	1400 mm (54 ¾")	
Gross Internal Dimensions (W x D x H)	Width	1220 mm (48")	1830 mm (72")
	Depth	580 mm (22 ¾")	
	Height	660 mm (26")	
Usable Work Area		0.56 m <sup>2</sup> (6.1 sq.ft.)	0.86 m <sup>2</sup> (9.0 sq.ft.)
Tested Opening		175mm (7")	
Working Opening		190 mm (7 ½")	
Average Airflow Velocity	Inflow	0.45 m/s (90 fpm)	
	Downflow	0.30 m/s (60 fpm)	
Airflow Volume	Inflow	346 cmh (588 cfm)	519 cmh (881 cfm)
	Downflow	738 cmh (1254 cfm)	1107 cmh (1880 cfm)
	Exhaust	346 cmh (588 cfm)	519 cmh (881 cfm)
	Required Exhaust With Optional Thimble Exhaust Collar	538 m <sup>3</sup> / h (317 cfm)	823 m <sup>3</sup> / h (485 cfm)
	Static Pressure For Optional Thimble Exhaust Collar	31 Pa / 0.12 in H <sub>2</sub> O	47 Pa / 0.18 in H <sub>2</sub> O
ULPA Filter Typical Efficiency		>99.999% at 0.1 to 0.3 micron, ULPA as per IEST-RP-CC001.3 USA	
		>99.999% at MPPS, H14 as per EN 1822 EU	
Sound Emission*	NSF / ANSI 49	61.3 dBA	62.5 dBA
	EN 12469	58.3 dBA	59.5 dBA
Fluorescent Lamp Intensity (lux)		1400	
Fluorescent Lamp Intensity (ft-cd)		130	
Cabinet Construction	Main body	1.2 mm (0.05") 18 gauge electro-galvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder-coated finish	
	Work Zone	1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish	
	Side Walls (G-Series)	UV absorbing tempered glass, 5 mm (0.2"), colorless and transparent	
	Side Walls (D-Series)	1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish	
Electrical	Cabinet Full Load Amps (FLA)	9.6 A	11.0 A
	Heat Load (BTU / Hr)	905	1230
Nominal Power Consumption		265 W	360 W
Net Weight **		240 Kg (529 lbs)	366 Kg (807 lbs)
Shipping Weight **		295 Kg (650 lbs)	448 Kg (988 lbs)
Shipping Dimensions, Maximum (W x D x H) mm**		1450 x 820 x 1760	2050 x 820 x 1760
Shipping Volume, Maximum **		2.09 m <sup>3</sup>	2.96 m <sup>3</sup>

\* Noise reading in open field condition / **anechoic** chamber. Noise reading in **normal room varies** by room size, layout, and background noise, but may reach roughly 3-4 dBA above these values.

\*\* Cabinet only, excludes optional stand.

## Technical Specifications for Airstream® Class II Type A2 Biological Safety Cabinets (AC2-4K8)

Stainless Steel Side: 220-240 VAC, 50/60 Hz		AC2-4K8 2011038
Nominal Size		4 ft (1.2 m)
External Dimensions (W x D x H)	Width	1340 mm (52.8")
	Depth without arm rest	767 mm (30.2")
	Depth with arm rest	823 mm (32.4")
	Height	1400 mm (55.1")
Gross Internal Dimensions (W x D x H)	Width	1220 mm (48.0")
	Depth	580 mm (22.8")
	Height	654 mm (25.7")
Usable Work Area		0.56 m <sup>2</sup> (6.1 sq.ft.)
Tested Opening		175 mm (6.9")
Average Airflow Velocity	Inflow	0.65 m/s (128 fpm)
	Downflow	0.41 m/s (81 fpm)
Airflow Volume	Inflow	500 cmh (294 cfm)
	Downflow	1026 cmh (604 cfm)
	Exhaust	500 cmh (294 cfm)
	Required Exhaust with Optional Thimble Exhaust Collar	554 cmh (326 cfm)
	Static Pressure for Optional Thimble Exhaust Collar	38 Pa / 0.12 in H <sub>2</sub> O
ULPA Filter Typical Efficiency		>99.999% at 0.1 to 0.3 micron, ULPA as per IEST-RP-CC001.3 USA >99.999% at MPPS, H14 as per EN 1822 EU
Sound Emission per AS 1807.20		61 dBA
Fluorescent Lamp Intensity		866 lux (80 foot candles)
Cabinet Construction	Main body	1.2 mm (0.05") 18 gauge electro-galvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder-coated finish
	Work Zone	1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish
	Side Walls	1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish
Electrical	Cabinet Full Load Amps (FLA)	10
	Heat Load (BTU/Hr)	682
Nominal Power Consumption (W)		223
Net Weight **		236 Kg (520 lbs)
Shipping Weight **		260 Kg (573 lbs)
Shipping Dimensions, Maximum (W x D x H)**		1450 x 880 x 1760 mm (57.1" x 34.6" x 69.3")
Shipping Volume, Maximum **		2.25 m <sup>3</sup> (79.5 ft <sup>3</sup> )

\*Noise reading in open field condition / **anechoic** chamber. Noise reading in **normal room varies** by room size, layout, and background noise, but may reach roughly 3-4 dBA above these values.

\*\*Cabinet only, excludes optional stand.

## Technical Specifications for Airstream®, NSF-certified and Airstream® Reliant Class II Type A2 Biological Safety Cabinets

Model	110-130 VAC, 50/60 Hz	AC2-3S9-NS 2010945	AC2-4S9-NS 2010752	AC2-5S9-NS 2010977	AC2-6S9-NS 2010925
	220-240 VAC, 50/60 Hz	AR2-3S9 2010982	AR2-4S9 2010753	AR2-5S9 2010984	AR2-6S9 2010986
External Dimensions (W x D x H) mm		1035 x 753 x 1400 mm (40.7" x 29.6" x 55.1")	1340 x 753 x 1400 mm (52.8" x 29.6" x 55.1")	1645 x 753 x 1400 mm (64.8" x 29.6" x 55.1")	1950 x 753 x 1400 mm (76.8" x 29.6" x 55.1")
Gross Internal Dimensions (W x D x H) mm		915 x 580 x 660 mm (36" x 22.8" x 26")	1220 x 580 x 660 mm (48" x 22.8" x 26")	1525 x 580 x 660 mm (60" x 22.8" x 26")	1830 x 580 x 660 mm (72" x 22.8" x 26")
Usable Work Area		0.42 m <sup>2</sup> (4.5 ft <sup>2</sup> )	0.56 m <sup>2</sup> (6.0 ft <sup>2</sup> )	0.70 m <sup>2</sup> (7.5 ft <sup>2</sup> )	0.86 m <sup>2</sup> (9.3 ft <sup>2</sup> )
Tested Opening	203 mm (8")				
Average Inflow Velocity	0.53 m/s (105 fpm)				
Average Downflow Velocity	0.30 m/s (60 fpm)				
Airflow Volume	Inflow	354 cmh (208 cfm)	473 cmh (278 cfm)	591 cmh (348 cfm)	709 cmh (417 cfm)
	Downflow	553 cmh (325 cfm)	738 cmh (434 cfm)	922 cmh (543 cfm)	1107 cmh (652 cfm)
	Exhaust	354 cmh (208 cfm)	473 cmh (278 cfm)	591 cmh (348 cfm)	709 cmh (417 cfm)
	Required Exhaust With Optional Thimble Exhaust Collar	531 cmh (313 cfm)	710 cmh (418 cfm)	887 cmh (522 cfm)	1064 cmh (626 cfm)
	Static Pressure For Optional Thimble Exhaust Collar	32 Pa / 0.12 in H <sub>2</sub> O	45 Pa / 0.18 in H <sub>2</sub> O	57 Pa / 0.23 in H <sub>2</sub> O	68 Pa / 0.27 in H <sub>2</sub> O
ULPA Filter Typical Efficiency	>99.999% at 0.1 to 0.3 micron, ULPA as per IEST-RP-CC001.3 USA >99.999% at MPPS, H14 as per EN 1822 EU				
Sound Emission per NSF / ANSI 49*	57.5 dBA		58.5 dBA		60.5 dBA
Fluorescent Lamp Intensity (lux)	≥ 1200 lux (111 foot candles)				
Cabinet Construction	Main body	1.2 mm (0.05") / 18 gauge EG Steel With Isocide™ Oven-Baked Epoxy-Polyester Powder Coating			
	Work Zone	1.5 mm (0.06") / 16 gauge, SS 304, 4B finish			
	Side Walls	1.5 mm (0.06") / 16 gauge, SS 304, 4B finish			
Electrical 110-130VAC 50/60Hz	Cabinet Full Load Amps (FLA)	11	11.5	12.5	15
	Heat Load (BTU / Hr)	503	628	698	999
	Nominal Power Consumption (W)	160	200	222	318
Net Weight**	188 Kg (414 lbs)	230 Kg (507 lbs)	288 Kg (634 lbs)	346 Kg (763 lbs)	
Shipping Weight**	216 Kg (476 lbs)	285 Kg (628 lbs)	356 Kg (785 lbs)	428 Kg (944 lbs)	
Shipping Dimensions, Maximum (W x D x H)**	1120 x 820 x 1760 mm (44" x 32" x 69")	1450 x 820 x 1760 mm (57" x 32" x 69")	1720 x 820 x 1760 mm (68" x 32" x 69")	2050 x 820 x 1760 mm (80" x 32" x 69")	
Shipping Volume, Maximum**	2.09 m <sup>3</sup> (74 ft <sup>3</sup> )	2.09 m <sup>3</sup> (74 ft <sup>3</sup> )	2.48 m <sup>3</sup> (88 ft <sup>3</sup> )	2.96 m <sup>3</sup> (105 ft <sup>3</sup> )	

Specifications are subject to change without notice.

Note: Airstream® Reliant Biological Safety Cabinet is only available for USA.

\*Noise reading in open field condition / anechoic chamber. Noise reading in normal room varies by room size, layout, and background noise,  
but may reach roughly 3-4 dBA above these values.

\*\*Cabinet only, excludes optional stand.

## Technical Specifications for Airstream® Plus Class II Biological Safety Cabinets

Glass Side: 220-240 VAC, 50/60 Hz		AC2-3E8-TU 2011036	AC2-4E8-TU 2011005	AC2-5E8-TU 2010981	AC2-6E8-TU 2011007
Stainless Steel Side: 220-240 VAC, 50/60 Hz		AC2-3S8-TU 2011037	AC2-4S8-TU 2010749	AC2-5S8-TU 2010980	AC2-6S8-TU 2010943
Nominal Size		3 ft (0.9 meter)	4 ft (1.2 meter)	5 ft (1.5 meter)	6 ft (1.8 meter)
External Dimensions (W x D x H)	Width	1035 (40.7")	1340 mm (52.8")	1645 mm (64.8")	1950 mm (76.8")
	Depth without arm rest	767 mm (30.2")			
	Depth with arm rest	823 mm (32.4")			
	Height	1400 mm (55.1")			
Gross Internal Dimensions (W x D x H)	Width	915 (36.0)	1220 mm (48.0")	1525 mm (60.0")	1830 mm (72.0")
	Depth	580 mm (22.8")			
	Height	654 mm (25.7")			
Usable Work Area		0.42 m <sup>2</sup> (4.5 sq.ft.)	0.56 m <sup>2</sup> (6.1 sq.ft.)	0.71 m <sup>2</sup> (7.6 sq.ft.)	0.86 m <sup>2</sup> (9.2 sq.ft.)
Tested Opening		175 mm (7")			
Average Airflow Velocity	Inflow	0.48 m/s (95 fpm)			
	Downflow	0.35 m/s (69 fpm)			
Airflow Volume	Inflow	278 cmh (164 cfm)	369 cmh (217 cfm)	463 cmh (273 cfm)	553 cmh (325 cfm)
	Downflow	661 cmh (389 cfm)	876 cmh (516 cfm)	1099 cmh (647 cfm)	1314 cmh (773 cfm)
	Exhaust	278 cmh (164 cfm)	369 cmh (217 cfm)	463 cmh (273 cfm)	553 cmh (325 cfm)
	Required Exhaust with Optional Thimble Exhaust Collar	320 m <sup>3</sup> /h (189 cfm)	554 cmh (326 cfm)	692 cmh (407 cfm)	830 cmh (488 cfm)
	Static Pressure for Optional Thimble Exhaust Collar	29 Pa / 0.11 in H <sub>2</sub> O	38 Pa / 0.12 in H <sub>2</sub> O	44 Pa / 0.14 in H <sub>2</sub> O	50 Pa / 0.18 in H <sub>2</sub> O
ULPA Filter Typical Efficiency		>99.999% at 0.1 to 0.3 micron, ULPA as per IEST-RP-CC001.3 USA			
		>99.999% at MPPS, H14 as per EN 1822 EU			
Sound Emission per EN 12469*		49.6 dBA	51.7 dBA	53.4 dBA	54.8 dBA
Fluorescent Lamp Intensity		1008 lux (93 foot-candles)	1562 lux (145 foot-candles)	1510 lux (140 foot-candles)	1450 lux (134 foot-candles)
Cabinet Construction	Main body	1.2 mm (0.05") 18 gauge electro-galvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder-coated finish			
	Work Zone	1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish			
	Side Walls (E Series)	UV absorbing tempered glass, 6 mm (0.2"), colorless and transparent 1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish			
	Side Walls (S Series)	1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish			
Electrical	Cabinet Full Load Amps (FLA)	10			
	Heat Load (BTU/Hr)	597	682	785	938
Maximum Power Consumption (5A EOs included) (W)		1880			
Nominal Power Consumption (W)		175	200	245	287
Net Weight**		191 Kg (421 lbs)	236 Kg (520 lbs)	293 Kg (645 lbs)	351 Kg (773 lbs)
Shipping Weight**		220 Kg (485)	260 Kg (573 lbs)	331 Kg (729 lbs)	403 Kg (888 lbs)
Shipping Dimensions, Maximum (W x D x H)**		1100 x 880 x 1760 mm (43.3" x 34.6" x 69.3")	1450 x 880 x 1760 mm (57.1" x 34.6" x 69.3")	1720 x 880 x 1760 mm (67.7" x 34.6" x 69.3")	2050 x 880 x 1760 mm (80.7" x 34.6" x 69.3")
Shipping Volume, Maximum**		1.7 m <sup>3</sup> (60.0 ft <sup>3</sup> )	2.25 m <sup>3</sup> (79.5 ft <sup>3</sup> )	2.66 m <sup>3</sup> (93.9 ft <sup>3</sup> )	3.17 m <sup>3</sup> (111.9 ft <sup>3</sup> )

\*Noise reading in open field condition / anechoic chamber. Noise reading in normal room varies by room size, layout, and background noise, but may reach roughly 3-4 dBA above these values.

\*\*Cabinet only, excludes optional stand.

# Class II Type A2 Biological Safety Cabinets

## Labculture® Class II Type A2 Biological Safety Cabinets

The Most Certified Energy-efficient, Safe, and Ergonomic Biosafety Cabinet in the World

Note: Labculture® Reliant (LR2) model is only available for USA. | Labculture® (LA2-K) model is only available for Australia.

Aside from providing protection for you and your environment, Labculture® Class II biological safety cabinet provides protection for your microbiological samples.



### Sentinel™ Gold Microprocessor Controller

- Displays all safety information on one screen
- Centered and angled down for easy reach & viewing
- Selectable Quickstart mode for fast operation
- Not applicable to LR2



### Rocker Switches and Pressure Gauge (for LR2)

- Easy-to-use switches
- Displays filter loading status
- Manually adjustable UV timer



### Sash Glass

- Aerosol-tight window seal
- 10° angled front to optimize user comfort, reduce glare and maximize reach into the work area

### Adjustable UV Timer (for LR2)

- Easily adjustable to desired minutes to hours
- Prolongs UV lamp, for not turning it ON overnight



### Single-Piece Wall

- Large radius for easy cleaning
- Side-mounted electrical outlets and staggered service fixtures, for easy reach



### Single-Piece Work Tray

- Recessed to contain spillage
- Curved grill to prevent blockage



### Raised Arm Rest

- Helps prevent grille blocking
- Comfortable working posture



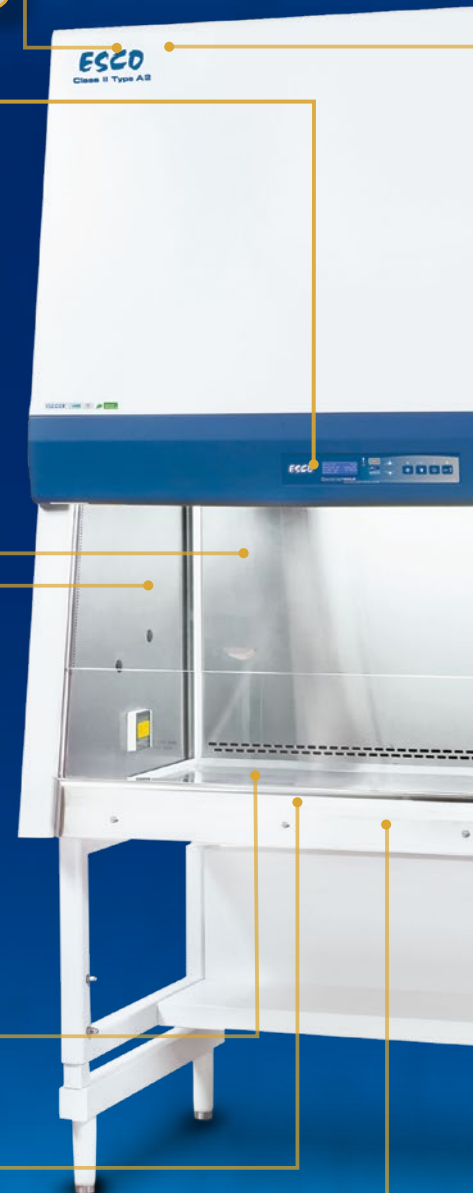
### Angled Drain Pan

- Easy to clean
- Does not harbor contaminants



### RS 232 Port and Zero Volt Relay Contact

- RS 232 Port to send operational information to Building Management System (BMS)
- Zero Volt Relay Contact to turn ON/OFF exhaust blower and signal the building alarm
- Not applicable for LA2-L



Available in 0.9, 1.2, 1.5, 1.8 and 2.4 meter models (3', 4', 5', 6' and 8'). Shown with optional telescoping stand.

Biosafe



NSF 49



UL 61010,



JIS K3800



CFDA YY-0569

Esco Labculture Class II Type A2 (LA2- A-E) has passed more performance certifications throughout more countries than any other biological safety cabinet.

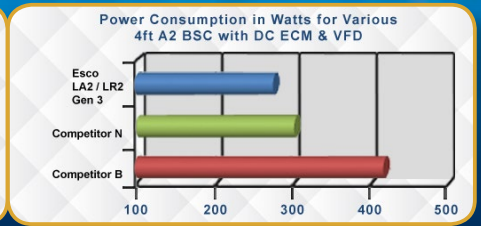
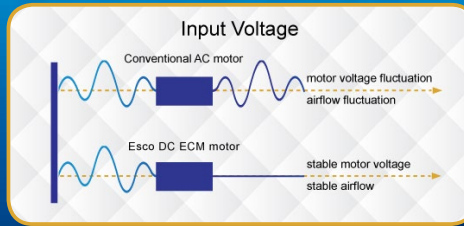


### Airflow Sensor

- Monitors real-time airflow for safety
- Alerts the user if airflow is insufficient

### Energy-Efficient DC ECM Motor

- Powered by latest generation DC ECM motor, that is more efficient than legacy ECM and VFD motors
- 70% Energy savings compared to AC motor
- Stable airflow, despite building voltage fluctuations & filter loading
- Night Setback mode to further reduce power consumption by 60%



### ebm-papst Motor (for LA2-L)

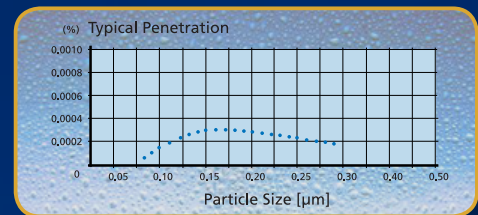
- German-made, permanently lubricated, centrifugal motor/ blowers with external rotor designs
- Integrated blades narrow the profile and eliminate need for a motor shaft
- Motors are selected for energy-efficiency, compact design, and flat profile. The completely integrated assembly optimizes motor cooling.
- All rotating parts are unitized and balanced for smooth, quiet, vibration-free operation.

### ULPA Filter

- 10x Filtration efficiency of HEPA filter
- Creates ISO Class 3 work zone instead of industry-standard ISO Class 5

Esco cabinets use ULPA filters (per IEST-RP-CC001.3) / H14 per EN 1822 instead of H13 HEPA filters used on many BSCs in the market.

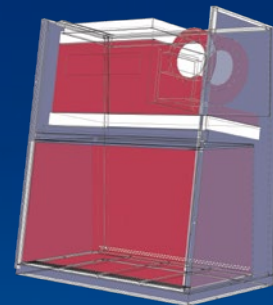
HEPA filters only offer 99.99% typical efficiency at 0.3 micron, while ULPA filters provide 99.999% typical efficiency for particle sizes of 0.1 to 0.3 micron.



### Dynamic Chamber™

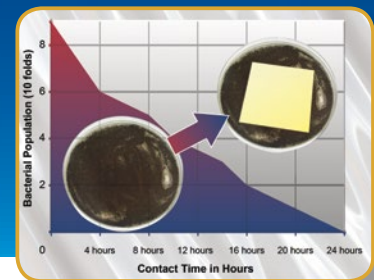
- Blower plenum and side walls are surrounded by negative pressure
- Prevents contaminants from escaping outside

- Positive pressure
- Negative pressure



### ISOCIDE™ Powder Coat

- Silver ion-impregnated powder coat
- Inhibits microbial growth to improve safety



Labculture® Class II, Type A2 Safety Cabinet, Model LA2-4A\_-E



EN 12469

EN 12469 SANS 12469

...nce tests in more languages, for ...al safety cabinet in the world.

### Greater Access Opening

- With greater tested and working opening for comfort and convenience

## Guide to Models

L 2 - -

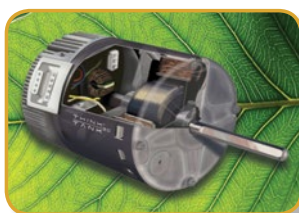
Labculture® Variant	Code	Nominal Width <sup>b</sup>	Code	Side Walls <sup>c</sup>	Code	Electrical Code <sup>d</sup>	Code	Suffix	Code
Sentinel™ Gold	A	3 ft (0.9 m)	3	Labculture® (certified to NSF, EN, JIS and CFDA)	A	230 V, 50 Hz	1	Suffix for LA2-E, LA2-K and LR2 only	E
Rocker Switches and Pressure Gauge <sup>a</sup>	R	4 ft (1.2 m)	4	Labculture® Reliant	S	115 V, 60 Hz <sup>c</sup>	2		
		5 ft (1.5 m)	5	Labculture® (certified to AS 2252)	K	230 V, 60 Hz	3		
		6 ft (1.8 m)	6	Labculture® Low Noise	L				
		8 ft (2.4 m) <sup>b</sup>	8						

Note: Labculture® Reliant (LR2) model is only available for USA.  
Labculture® (LA2-K) model is only available for Australia.

a Applicable for Labculture® Reliant only (LR2)  
b 8 ft (2.4 m) nominal width available for LA2-E and LR2 only  
c 115 V, 60 Hz (code 2) is applicable for LA2-E and LR2 only

### The 5 Stars of Labculture® Class II Type A2 Biological Safety Cabinet

Have you heard? Esco's Labculture® Class II Type A2 Biological Safety Cabinet is definitely a must-have for a microbiological laboratory. Here are its exciting features.



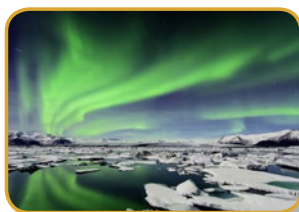
**Energy-efficient.** Labculture® is powered by the latest generation DC ECM motor that is more efficient than ECM and VFD motors. Aside from it renders up to 70% energy savings, it provides stable airflow, despite building voltage fluctuations and filter loading.



**Ergonomic.** Labculture® is designed to provide you maximum comfort when working in your laboratory. With its centered and angled down microprocessor controller, you can easily reach and view all of the cabinet's safety information in one screen. Cleaning will never be difficult anymore because of its easy-to-clean drain pan, walls and work tray. With its ergonomic arm rest and chair, you will definitely achieve comfortable working posture.



**Safe.** Equipped with efficient ULPA filter and Dynamic Chamber™, you are assured that you and your environment is safe from biohazards. Isocide™ powder coat inhibits microbial growth in its exterior surface for improved safety. Other safety features of Labculture® include zero volt relay contact and airflow sensor.



**Quiet.** You can work at ease with its less than 67dBA (NSF/ANSI 49) or 65dBA (EN 12469) sound emission. Truly, you can achieve a peaceful working environment.



**Most certified.** Labculture® Class II Type A2 biological safety cabinet is definitely superior among biological safety cabinets. It is currently certified to NSF/ANSI 49, EN 12469, JIS K 3800 and CFDA YY 0569.



Standard Compliance	Biosafety Cabinets	Air Quality	Filtration	Electrical Safety
	NSF / ANSI 49, USA*	ISO 14644.1, Class 3, Worldwide	EN-1822 (H14), Europe	IEC61010-1, Worldwide
	EN 12469, Europe**	JIS B9920, Class 3, Japan	IEST-RP-CC001.3, USA	EN 61010-1, Europe
	JIS K 3800, Japan**	BS 5295, Class 3, UK	IEST-RP-CC007, USA	UL-C-61010-1, USA
	CFDA YY-0569, China	US Fed Std 209E, Class 1, USA	IEST-RP-CC0034.1, USA	CSA22.2, No. 1010-192, Canada
	AS 2242, Australia***			

\*NSF/ ANSI 49 certified models are LA2-E and LR2.

\*\*EN 12469 certified models are LA2-E, LA2-L, and LA2-K

\*\*\*JIS K 3800 and CFDA YY-0569 certified model is LA2-E only.

\*\*\*\*AS 2252 certified model is LA2-K only.

Technical Specifications for Labculture® and Labculture® Reliant Class II Type A2 Biological Safety Cabinets						
Labculture® Class II A2	LA2-3A_-E	LA2-4A_-E	LA2-5A_-E	LA2-6A_-E	LA2-8A_-E	
Labculture® Reliant Class II A2	LR2-3S_-E	LR2-4S_-E	LR2-5S_-E	LR2-6S_-E	LR2-8S_-E	
Nominal Size	0.9 meter (3')	1.2 meter (4')	1.5 meter (5')	1.8 meter (6')	2.4 meters (8')	
External Dimensions * (W x D x H)	1115 x 852 x 1540 mm (44.0" x 33.5" x 60.6")	1420 x 852 x 1540 mm (56.0" x 33.5" x 60.6")	1725 x 852 x 1540 mm (68.0" x 33.5" x 60.6")	2030 x 852 x 1540 mm (80.0" x 33.5" x 60.6")	2600 x 852 x 1540 mm (102.4" x 33.5" x 60.6")	
Internal Dimensions (W x D x H)	970 x 623 x 670 mm (38.2" x 24.5" x 26.4")	1270 x 623 x 670 mm (50.0" x 24.5" x 26.4")	1570 x 623 x 670 mm (61.8" x 24.5" x 26.4")	1870 x 623 x 670 mm (73.6" x 24.5" x 26.4")	2440 x 623 x 670 mm (96.0" x 24.5" x 26.4")	
Usable Work Area	0.45 m <sup>2</sup> (4.8 sq.ft.)	0.6 m <sup>2</sup> (6.5 sq.ft.)	0.75 m <sup>2</sup> (8.1 sq.ft.)	0.9 m <sup>2</sup> (9.7 sq.ft.)	1.2 m <sup>2</sup> (13 sq.ft.)	
Tested Opening	229 mm (9")	229 mm (9")	229 mm (9")	203 mm (8")	203 mm (8")	
Working Opening	274 mm (10.8")	274 mm (10.8")	274 mm (10.8")	248 mm (9.8")	248 mm (9.8")	
Average Airflow Velocity	Inflow	0.53 m/s (105 fpm)				
	Downflow	0.35 m/s (70 fpm)	0.35 m/s (70 fpm)	0.35 m/s (70 fpm)	0.33 m/s (65 fpm)	
Airflow Volume	Inflow	424 m <sup>3</sup> /h (251 cfm)	555 m <sup>3</sup> /h (328 cfm)	686 m <sup>3</sup> /h (406 cfm)	724 m <sup>3</sup> /h (426 cfm)	945 m <sup>3</sup> /h (560 cfm)
	Downflow	628 m <sup>3</sup> /h (363 cfm)	822 m <sup>3</sup> /h (476 cfm)	1016 m <sup>3</sup> /h (588 cfm)	1210 m <sup>3</sup> /h (700 cfm)	1579 m <sup>3</sup> /h (914 cfm)
	Exhaust	424 m <sup>3</sup> /h (251 cfm)	555 m <sup>3</sup> /h (328 cfm)	686 m <sup>3</sup> /h (406 cfm)	724 m <sup>3</sup> /h (426 cfm)	945 m <sup>3</sup> /h (560 cfm)
	Required Exhaust with Optional Thimble Exhaust Collar	529 m <sup>3</sup> /h (311 cfm)	764 m <sup>3</sup> /h (450 cfm)	1116 m <sup>3</sup> /h (657 cfm)	1164 m <sup>3</sup> /h (685 cfm)	1540 m <sup>3</sup> /h (913 cfm)
	Static Pressure for Optional Thimble Exhaust Collar	32 Pa / 0.12 in H <sub>2</sub> O	49 Pa / 0.19 in H <sub>2</sub> O	62 Pa / 0.24 in H <sub>2</sub> O	79 Pa / 0.31 in H <sub>2</sub> O	100 Pa / 0.40 in H <sub>2</sub> O
ULPA Filter Typical Efficiency	>99.999% for particle size between 0.1 to 0.3 microns per IEST-RP-CC001.3 / H14 per EN 1822					
Sound Emission**	NSF / ANSI 49	62.5 dBA	63 dBA	63.5 dBA	64 dBA	64.5 dBA
	EN 12469	59.5 dBA	60 dBA	60.5 dBA	61 dBA	61.5 dBA
Fluorescent Lamp Intensity	>1000 lux (> 93 foot-candles)					
Cabinet Construction	Main Body	Electro-galvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder-coated finish, 1.5 mm (0.06") / 16 gauge thick				
	Work Zone	Stainless steel Type 304 with No.4 finish, 1.5 mm (0.06") / 16 gauge thick				
Electrical	Full Load Amps 230 V	10 A			10 A and 5 A	
	Full Load Amps 115 V	13 A			13 A and 8 A	
	Heat Load	853 BTU/Hr	972 BTU/Hr	1177 BTU/Hr	1297 BTU/Hr	1774 BTU/Hr
Nominal Power Consumption	250 W	285 W	345 W	380 W	520 W	
Net Weight***	243 Kg (536 lbs)	283 Kg (624 lbs)	350 Kg (772 lbs)	426 Kg (939 lbs)	580 Kg (1279 lbs)	
Shipping Weight***	292 Kg (644 lbs)	345 Kg (761 lbs)	410 Kg (904 lbs)	486 Kg (1072 lbs)	640 Kg (1411 lbs)	
Shipping Dimensions, Maximum (W x D x H)***	1200 x 950 x 1900 mm (47.2" x 37.4" x 74.8")	1550 x 950 x 1900 mm (61.0" x 37.4" x 74.8")	1950 x 950 x 1900 mm (76.8" x 37.4" x 74.8")	2150 x 950 x 1900 mm (84.6" x 37.4" x 74.8")	2720 x 950 x 1900mm (84.6" x 37.4" x 74.8")	
Shipping Volume, Maximum***	2.17 m <sup>3</sup> (77 cu.ft.)	2.80 m <sup>3</sup> (99 cu.ft.)	3.52 m <sup>3</sup> (124 cu.ft.)	3.88 m <sup>3</sup> (137 cu.ft.)	4.91 m <sup>3</sup> (173 cu.ft.)	

\*Depth includes the remove-able arm rest and front cover. When they are removed, depth is 790 mm (31.1").

\*\*Noise reading in open field condition / anechoic chamber. Noise reading in normal room varies by room size, layout, and background noise, but may reach roughly 3-4 dBA above these values

\*\*\*Cabinet only, excludes optional stand.

## Technical Specifications for Labculture® Low Noise Class II Type A2 Biological Safety Cabinets (LA2-\_L\_)

General Specifications International Models <i>(Europe, Asia-Pacific, Africa, Latin America / 230 V, 50 &amp; 60 Hz)</i>		LA2-3L1 LA2-3L3	LA2-4L1 LA2-4L3	LA2-5L1 LA2-5L3	LA2-6L1 LA2-6L3
Nominal Size		0.9 meters ( 3')	1.2 meters ( 4')	1.5 meters ( 5')	1.8 meters ( 6')
External Dimensions (W x D x H)	Without Base Stand	1115 x 810 x 1540 mm 43.9" x 31.9" x 60.6"	1420 x 815 x 1540 mm 55.9" x 32.1" x 60.6"	1725 x 815 x 1540 mm 67.9" x 32.1" x 60.6"	2030 x 815 x 1540 mm 79.9" x 32.1" x 60.6"
	With Base Stand (Min)	1115 x 810 x 2251 mm 43.9" x 31.9" x 88.6"	1420 x 815 x 2251 mm 55.9" x 32.1" x 88.6"	1725 x 815 x 2251 mm 67.9" x 32.1" x 88.6"	2030 x 815 x 2251 mm 79.9" x 32.1" x 88.6"
	With Base Stand (Max)	1115 x 810 x 2404 mm 43.9" x 31.9" x 94.6"	1420 x 815 x 2404 mm 55.9" x 32.1" x 96.6"	1725 x 815 x 2404 mm 67.9" x 32.1" x 96.6"	2030 x 815 x 2404 mm 79.9" x 32.1" x 96.6"
Gross Internal Dimensions (W x D x H)		970 x 623 x 670 mm 38.2" x 24.5" x 26.4"	1270 x 623 x 670 mm 50.0" x 24.5" x 26.4"	1570 x 623 x 670 mm 61.8" x 24.5" x 26.4"	1870 x 623 x 670 mm 73.6" x 24.5" x 26.4"
Usable Work Area		0.45 m <sup>2</sup> (4.8 sq.ft.)	0.6 m <sup>2</sup> (6.5 sq.ft.)	0.75 m <sup>2</sup> (8.1 sq.ft.)	0.9 m <sup>2</sup> (9.7 sq.ft.)
Tested Opening		173 mm (6.8")	173 mm (6.8")	173 mm (6.8")	173 mm (6.8")
Working Opening		218 mm (8.6")	218 mm (8.6")	218 mm (8.6")	218 mm (8.6")
Average Airflow Velocity	Inflow	0.45 m/s (90 fpm)			
	Downflow	0.30 m/s (60 fpm)	0.30 m/s (60 fpm)	0.30 m/s (60 fpm)	0.30 m/s (60 fpm)
Airflow Volume	Inflow	272 m <sup>3</sup> /h (163 cfm)	356 m <sup>3</sup> /h (213 cfm)	440 m <sup>3</sup> /h (263 cfm)	524 m <sup>3</sup> /h (313 cfm)
	Downflow, 70%	653 m <sup>3</sup> /h (390 cfm)	855 m <sup>3</sup> /h (511 cfm)	1056 m <sup>3</sup> /h (631 cfm)	1258 m <sup>3</sup> /h (752 cfm)
	Exhaust, 30%	272 m <sup>3</sup> /h (163 cfm)	356 m <sup>3</sup> /h (213 cfm)	440 m <sup>3</sup> /h (263 cfm)	524 m <sup>3</sup> /h (313 cfm)
	Required Exhaust With Optional Thimble Exhaust Collar	405 m <sup>3</sup> /h (242 cfm)	530 m <sup>3</sup> /h (317 cfm)	655 m <sup>3</sup> /h (392 cfm)	781 m <sup>3</sup> /h (467 cfm)
	Static Pressure For Optional Thimble Exhaust Collar	32 Pa / 0.26 in H <sub>2</sub> O	38 Pa / 0.30 in H <sub>2</sub> O	42 Pa / 0.34 in H <sub>2</sub> O	47 Pa / 0.38 in H <sub>2</sub> O
ULPA Filter Typical Efficiency		≥99.999% at particle size between 0.1 to 0.3 microns			
Sound Emission*	NSF / ANSI 49	<57.5 dBA	<58.5 dBA	<59.5 dBA	<61 dBA
	EN 12469	<52.5 dBA	<53.5 dBA	<54.5 dBA	<56 dBA
Fluorescent Lamp Intensity		> 1150 Lux (> 107 foot-candles)	> 1150 Lux (> 107 foot-candles)	> 1000 Lux (> 93 foot-candles)	> 1150 Lux (> 107 foot-candles)
Cabinet Construction		Electrogalvanized steel with Isocide oven-baked epoxy-polyester powder coating			
		1.2 mm (0.05") / 18 gauge			
Electrical **	220-240V, AC, 50Hz, 1Ø	LA2-3L1	LA2-4L1	LA2-5L1	LA2-6L1
	220-240V, AC, 60Hz, 1Ø	LA2-3L3	LA2-4L3	LA2-5L3	LA2-6L3
Net Weight ***		243 kg / 536 lbs	283 kg / 624 lbs	317 kg / 698 lbs	350 kg / 772 lbs
Shipping Weight ***		292 kg / 644 lbs	345 kg / 761 lbs	402 kg / 886 lbs	486 kg / 1071 lbs
Shipping Dimensions, Maximum (W x D x H) ***		1200 x 940 x 1940 mm 47.2" x 37" x 76.4"	1530 x 940 x 1940 mm 60.2" x 37" x 76.4"	1950 x 940 x 1940 mm 76.8" x 37" x 76.4"	2200 x 940 x 1940 mm 86.6" x 37" x 76.4"
Shipping Volume, Maximum ***		2.14 m <sup>3</sup> (76 cu.ft.)	2.79 m <sup>3</sup> (99 cu.ft.)	3.56 m <sup>3</sup> (126 cu.ft.)	4.01 m <sup>3</sup> (142 cu.ft.)

\* Noise reading at open field condition / anechoic chamber.

\*\* Additional voltages may be available; contact Esco for ordering information.

\*\*\* Cabinet only, excludes optional stand.

## Technical Specifications for Labculture® Class II Type A2 Biological Safety Cabinets (LA2-\_K\_)

General Specifications		LA2-3K1	LA2-4K1	LA2-6K1
Nominal Size		0.9 meter (3')	1.2 meter (4')	1.8 meter (6')
External Dimensions (W x D x H)		1115 x 852 x 1540 mm 44" x 33.5" x 60.6"	1420 x 852 x 1540 mm 55.9" x 33.5" x 60.6"	2030 x 852 x 1540 mm 80.0" x 33.5" x 60.6"
Gross Internal Dimensions (W x D x H)		960 x 623 x 670 mm 37.8" x 24.5" x 26.4"	1270 x 623 x 670 mm 50.0" x 24.5" x 26.4"	1870 x 623 x 670 mm 73.6" x 24.5" x 26.4"
Usable Work Area		0.4 m <sup>2</sup> (4.8 sq.ft.)	0.6 m <sup>2</sup> (6.5 sq.ft.)	0.9 m <sup>2</sup> (9.7 sq.ft.)
Tested Opening		175 mm (6.9")		
Working Opening		274 mm (10.8")		
Average Airflow Velocity	Inflow	0.62 m/s (122 fpm)		
	Downflow	0.41 m/s (80.7 fpm)		
Airflow Volume	Inflow	375 m <sup>3</sup> / h (221 cfm)	496 m <sup>3</sup> / h (292 cfm)	926 m <sup>3</sup> / h (545 cfm)
	Downflow	808 m <sup>3</sup> / h (476 cfm)	1068 m <sup>3</sup> / h (629 cfm)	1573 m <sup>3</sup> / h (926 cfm)
	Exhaust	375 m <sup>3</sup> / h (221 cfm)	496 m <sup>3</sup> / h (292 cfm)	926 m <sup>3</sup> / h (545 cfm)
	Required Exhaust With Optional Thimble Exhaust Collar	529 m <sup>3</sup> / h (311 cfm)	764 m <sup>3</sup> / h (450 cfm)	1417 m <sup>3</sup> / h (834 cfm)
	Static Pressure For Optional Thimble Exhaust Collar	32 Pa / 0.12 in H <sub>2</sub> O	49 Pa / 0.19 in H <sub>2</sub> O	80 Pa / 0.32 in H <sub>2</sub> O
ULPA Filter Typical Efficiency with eco phone		>99.999% for particle size between 0.1 to 0.3 microns per IEST-RP-CC001.3 / H14 per EN 1822		
Sound Emission with Ecophon**	NSF / ANSI 49	59.9 dBA	55.6 dBA	61.6 dBA
	Australia	59.4 dBA	55.1 dBA	61.2 dBA
Fluorescent Lamp Intensity		> 1230 Lux (> 114 foot-candles)	> 1400 Lux (> 130 foot-candles)	
Cabinet Construction		Electrogalvanized steel with Isocide™ oven-baked epoxy-polyester powder coating 1.2 mm (0.05") / 18 gauge		
		1.5 mm (0.06") / 16 gauge thick		
Electrical	Full Load Amps 230 V	4.5 A	5.5 A	6.5 A
	Electrical Outlet 5 A	5 A		
	Heat Load	853 BTU / Hr	972 BTU / Hr	1297 BTU / Hr
Nominal Power Consumption		233 W	245 W	350 W
Net Weight ***		237 Kg (522 lbs)	283 Kg (624 lbs)	426 Kg (939 lbs)
Shipping Weight ***		287 Kg (633 lbs)	345 Kg (761 lbs)	486 Kg (1071 lbs)
Shipping Dimensions, Maximum (W x D x H) ***		1200 x 950 x 1900 mm 47.2" x 37.4" x 74.8"	1550 x 950 x 1900 mm 61.0" x 37.4" x 74.8"	2150 x 950 x 1900 mm 84.6" x 37.4" x 74.8"
Shipping Volume, Maximum ***		2.17 m <sup>3</sup> (77 cu.ft.)	2.80 m <sup>3</sup> (99 cu.ft.)	3.88 m <sup>3</sup> (137 cu.ft.)

\* Depth includes the remove-able arm rest and front cover. When they are removed, depth is 790 mm (31.1").

\*\* Noise reading in open field condition / anechoic chamber. Noise reading in normal room varies by room size, layout, and background noise, but may reach roughly 3-4 dBA above these values

\*\*\* Cabinet only, excludes optional stand.

## Learn About International Standards

Esco Biological Safety Cabinets are one of the most-certified cabinets in the world. Esco performs testing in accordance with more than 20 of the world's most recognized standards, of local, regional and international scopes. In particular, testing in our laboratory is most frequently conducted based on: EN 12469, NSF 49, IEST RP. An NSF-Accredited Biological Cabinet Field Certifier is available in-house full-time to supervise all testing work.



### About ANSI / NSF 49

The NSF International (formerly The National Sanitation Foundation) Biological Safety Cabinetry Program was initiated during the 1970s at the request of the regulatory community, including the Centers for Disease Control (CDC), National Institutes of Health (NIH), and the National Cancer Institute (NCI).

The first phase of the program was the development of NSF/ANSI Standard 49 for the evaluation of Class II laminar flow biological safety cabinets. The standard was completed in 1976, followed by the implementation of a testing and certification program to that standard, titled the Biological Safety Cabinetry Certification Program.

The third and final stage was completed in 1993, titled the Biological Safety Cabinet Field Certifier Accreditation Program.

NSF Certification program is accredited by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC), and is recognized as the leader in the certification of Class II Biological Safety Cabinets throughout the USA and Canada.



### About UL

Underwriters Laboratories Inc. (UL) is an independent, not-for-profit product-safety testing and certification organization. Founded in 1894, UL is now one of the most recognized conformity assessment providers in the world. Conformity to UL Standard 61010A-1 (Electrical Equipment For Laboratory Use; Part 1: General Requirements) is a pre-requisite to NSF certification.



### About EN 12469

EN 12469: 2000 Biotechnology - Performance criteria for microbiological safety cabinets is the new harmonized European standard for microbiological safety cabinets, published by CEN, the European Committee for Standardization. This standard replaces the following standards for Biological Safety Cabinets: British Standard BS5726, German Standard DIN12950 Teil 10 and French Standard NF X44-201:1984. The European Committee for Standardization (CEN) was founded in 1961 by the national standards bodies in the European Economic Community and EFTA countries.



### About JIS K3800

The Japan Industrial Standard (JIS) K3800 covers performance and safety requirements for Class II biological safety cabinets. Certification to JIS K3800 is performed by Japan Air Cleaning Association (JACA). Similar to NSF International, JACA also performs field certifier training and accreditation in Japan.



### About AS 2252

AS 2252 is also known as the Australian standard, was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee ME-060. It supersedes AS/NZS 2647:2000. This standard specifies requirements for biological safety cabinets including installation and use. For Class I biological safety cabinet, emphasis is given to personnel and environment protection. For Class II biological safety cabinet, its design should provide personnel, environment and product protection.



### About CFDA YY 0569

CFDA YY 0569, formerly known as State Food and Drug Administration YY 0569 (SFDA YY 0569) is the Chinese Standard for biological safety cabinets. It is modeled on both the EN 12469:2000 and NSF49:2002. This standard adopted the KI-DISCUS test from the European standard. Even though YY 0569 is based from the two major international standards, there are some notable improvements, i.e. instant display for air exchange rate and air intake, audio and visual warning system, to alert workers to performance malfunctions of biological safety cabinets. It is similar to NSF such that it recognizes four types of Class II BSCs. In summary, there are aspects unique to NSF and EN standards that are used as basis for YY 0569.

## Class II Type A2 Biological Safety Cabinets

### NordicSafe® Class II Type A2 Biological Safety Cabinets

The Industry's Most Comfortable, Energy-Efficient Cabinet

Esco NordicSafe® Class II Microbiological Safety Cabinets offer a premium level of operator, product and environmental protection with advanced technology.



NordicSafe® Class II Microbiological Safety Cabinet features glass sides to enhance visibility inside the work area. Model NC2-4L8, with optional support stand.

\* Ultra low noise level achieved on 1.2 meter (4') model per EN12469 at open field condition.

### Main Features

- Extremely low energy consumption (190 Watts) for environment-friendly operation.
- Latest generation, energy-efficient ECM blower from ebmpapst Germany maintains constant airflow, despite building voltage fluctuations.
- Quietest cabinet in the industry (51 dBA), emulates soft noise of distant waterfalls, for a serene working environment that helps reduce fatigue and improve concentration. Half Speed Mode reduces energy consumption to 80 watts while still maintaining personnel and product protection when the cabinet is not being used.
- Zero Volt Relay Contact, to synchronize turning ON/OFF internal blower fan with remote exhaust fan.
- Esco Sentinel™ Gold microprocessor with integrated temperature-compensated airflow monitoring system.
- Quickstart mode, to turn the blower and lights on/off, by moving the sash window to correct position.
- RS 232 data output port enables remote monitoring of cabinet operating parameters.
- Unique Esco Dynamic Chamber™ plenum design delivers quiet, uniform airflow.
- Negative pressure plenum surrounds contaminated positive pressure plenum; no fabric bags are used.
- Dual, long-life ULPA filters (per IEST-RP-CC001.3), for supply and exhaust airflow.
- Ergonomically-angled front improves reach and comfort.
- Frameless, shatterproof motorized sash is easier to clean, offers larger, unobstructed viewing area.
- Multi-piece tray components are autoclavable. They are easy to lift and remove, to provide easy access during surface decontamination.
- The front sash is motorized for convenient one-touch operation.
- Raised airflow grille maintains safety by preventing blockage.
- Transparent side windows, angled front, and reduced noise levels combine to create the most comfortable, well-lit cabinet in Esco's range.
- Esco **ISOCIDE™** antimicrobial coating on all painted surfaces minimizes contamination.

### Guide to Models

NC2- L

Nominal Width	Code	Electrical Code	Code
4 ft (1.2 m)	4	220-240 V, 50 Hz	8
6 ft (1.8 m)	6		



EN 12469

## Technical Specifications for NordicSafe® Class II Type A2 Biological Safety Cabinets

Model		NC2-4L8	NC2-6L8
Nominal Size		1.2 meters (4')	1.8 meters (6')
External Dimensions (W x D x H)	Without Base Stand	1200 x 812 x 1410 mm 47.2" x 32.0" x 55.5"	1800 x 812 x 1410 mm 70.9" x 32.0" x 55.5"
	With Optional Base Stand, 711 mm (28") type	1200 x 812 x 2121 mm 47.2" x 32.0" x 83.5"	1800 x 812 x 2121 mm 70.9" x 32.0" x 83.5"
Internal Work Area, Dimensions (W x D x H)		1130 x 584 x 670 mm 44.5" x 23.0" x 26.4"	1720 x 584 x 670 mm 67.7" x 23.0" x 26.4"
Internal Work Area		0.44 m <sup>2</sup> (4.7 sq.ft)	0.81 m <sup>2</sup> (8.7 sq.ft)
Tested Opening		173 mm (6.8")	173 mm (6.8")
Working Opening		200 mm (7.9")	200 mm (7.9")
Average Airflow Velocity	Inflow	0.45 m/s (90 fpm) at initial setpoint	
	Downflow	0.32 m/s (65 fpm) at initial setpoint with uniformity of better than +/- 20%	
Airflow Volume	Inflow	317 m <sup>3</sup> /h (187 cfm)	485 m <sup>3</sup> /h (286 cfm)
	Downflow	703 m <sup>3</sup> /h (414 cfm)	1165 m <sup>3</sup> /h (686 cfm)
	Exhaust	317 m <sup>3</sup> /h (187 cfm)	485 m <sup>3</sup> /h (286 cfm)
	Required Exhaust With Optional Thimble Exhaust Collar	479 m <sup>3</sup> /h (282 cfm)	757 m <sup>3</sup> /h (446 cfm)
	Static Pressure For Optional Thimble Exhaust Collar	28 Pa / 0.11 in H <sub>2</sub> O	43 Pa / 0.17 in H <sub>2</sub> O
ULPA Filter Typical Efficiency	Downflow	>99.999% at 0.1 to 0.3 microns and MPPS as per IEST-RP-CC001.3 USA with H14 rating as per EN 1822, Europe	
	Exhaust		
Typical Sound Emission per EN 12469**		52 dBA	54 dBA
Fluorescent Light Intensity At Zero Ambient		1200 Lux (111 foot candles)	1600 Lux (149 foot candles)
Cabinet Construction	Main Body	1.2 mm (0.05") 18 gauge electrogalvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder coated finish	
	Work Surface	1.5 mm (0.06") 16 gauge stainless steel, type 304, with BA finish	
	Side Walls	UV absorbing tempered glass, 5 mm (0.2"), colorless and transparent	
Electrical 220-240V, AC, 50Hz, 1Ø	Cabinet Full Load Amps (FLA)	3 A	3.5 A
	Optional Outlets FLA	5 A	5 A
	Cabinet Nominal Power	187 W	272 W
	Cabinet BTU	638	928
Net Weight***		208 kg (459 lbs)	287 kg (633 lbs)
Shipping Weight***		247 kg (545 lbs)	339 kg (747 lbs)
Shipping Dimensions, Maximum (W x D x H)***		1350 x 850 x 1760 mm 53.1" x 33.5" x 69.3"	2050 x 850 x 1760 mm 80.7" x 33.5" x 69.3"
Shipping Volume, Maximum***		2.02 m <sup>3</sup> (71 cu.ft.)	3.07 m <sup>3</sup> (108 cu.ft.)

\* Excluding hump. Please refer to engineering drawing on page 6 for details.

\*\* Noise reading in open field condition / anechoic chamber.

\*\*\* Cabinet only; excludes optional stand

Standards Compliance	For Microbiological Safety Cabinets	For Air Quality	For Filtration	For Electrical Safety
	EN 12469, Europe	ISO 14644.1 Class 3, Worldwide AS 1386 Class 1.5, Australia JIS B9920 Class 3, Japan	EN-1822 (H14), Europe IEST-RP-CC001.3, Worldwide IEST-RP-CC007.1, Worldwide IEST-RP-CC034.1, Worldwide	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN/CSA-22.2, No.61010-1

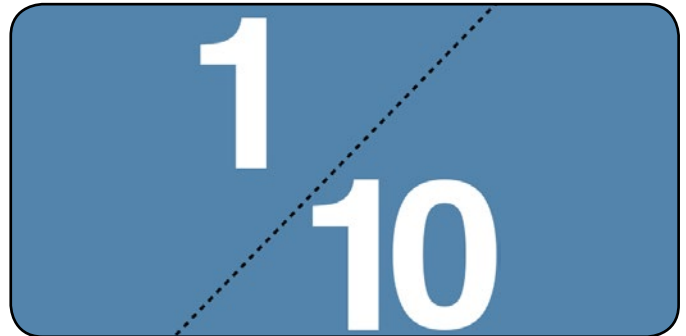
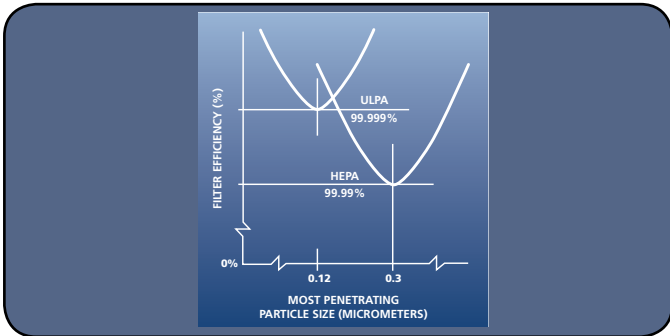
# ULPA vs HEPA



## What is an ULPA Filter?

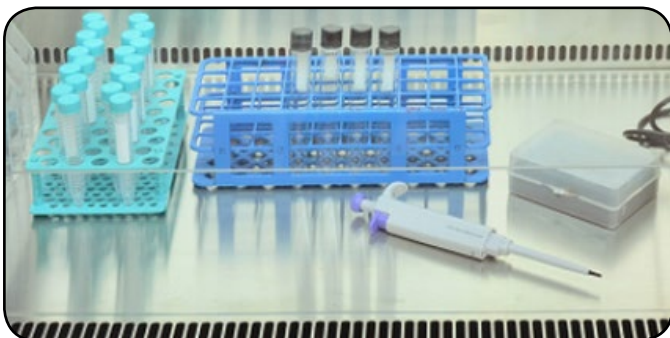
**ULPA (Ultra-Low Penetration Air) Filter** is a dry extended media filter in a rigid frame, with a minimum particle-collection efficiency of **99.999%**. Depending on the filter, the particle-collection efficiency can be measured at 0.3  $\mu\text{m}$  or at MPPS.

Source: White, E. 2009. HEPA and ULPA Filters. *Journal of Validation Technology*. [Online] p.54



**ULPA filters have an efficiency of 99.999%** vs 99.99% of HEPA filters, therefore ULPA filters meet HEPA filter efficiency requirement, but at higher efficiency, giving you better operator and product protection.

If 1 million spores are released on the work zone, **only 1 spore will escape from ULPA filter while 10 spores will escape from HEPA filter.** This can mean the difference between healthy operators or not.



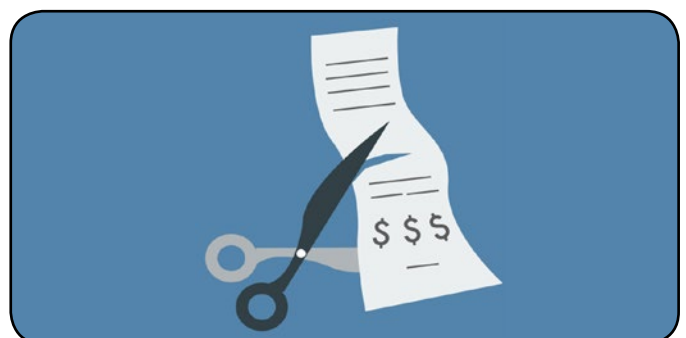
**ULPA filters provide an ISO Class 3 work zone vs ISO Class 5 of HEPA filters,** thus offering substantially better product protection for your precious work.



Despite ULPA filter media has 5% higher pressure drop, Esco uses **larger filter media to have same filter life (typically 8-10 years) as HEPA used by competitors.**



**Esco ULPA filter replacement cost is about the same, than competitor HEPA filter,** which on average is about **\$300-400**. Please feel free to ask for our formal replacement filter quotation and compare with competitor HEPA filters.



At same filter life and replacement cost, Esco ULPA filters reduce the chance of operator infection and product contamination, which potentially **reduces liability & product failure cost,** yielding huge savings for you.

**There is an absolute gain when you use ULPA filters - and at no extra cost for you.**



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## Class II Type B2 Biological Safety Cabinets

### Labculture® Class II Type B2 Biological Safety Cabinet

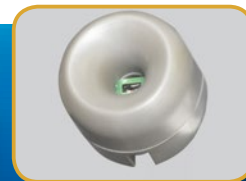
Probably the Most Advanced, Energy-efficient, Safe and Ergonomic Biosafety Cabinet in the World

Esco Labculture® Class II, Type B2 Biological Safety Cabinet provides operator, product and environmental protection against biohazards assigned in Biosafety Levels 1, 2, and 3. This cabinet can be used for handling biohazards assigned to Biosafety Level 4, provided that the operator wears positive pressure suit.



#### RS 232 Port and Zero Volt Relay Contact

- RS 232 Port to send operational information to Building Management System (BMS)
- Zero Volt Relay Contact to turn ON/OFF exhaust blower and signal the building alarm



#### Airflow Sensor

- Monitors real-time airflow for safe operation
- Alerts the user if airflow is insufficient



#### Sentinel™ Gold Microprocessor Controller

- Displays all safety information on one screen
- Centered and angled down for easy reach & viewing
- Selectable Quickstart mode for fast operation



#### Single-Piece Wall

- Large radius for easy cleaning
- Side-mounted electrical outlets and staggered service fixtures, for easy reach



#### Single-Piece Work Tray

- Recessed to contain spillage
- Curved grill to prevent blockage



#### Raised Arm Rest

- Helps prevent grille blocking
- Comfortable working posture



#### Angled Drain Pan

- Easy-to-clean
- Does not harbor contaminants



Available in 0.9, 1.2, 1.5, 1.8 and 2.4 meter models (3', 4', 5', 6' and 8'). Shown with optional telescoping stand.



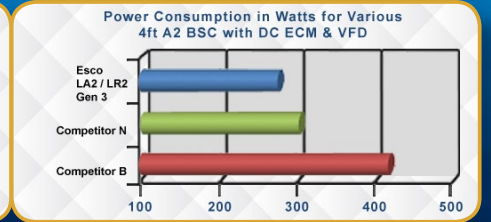
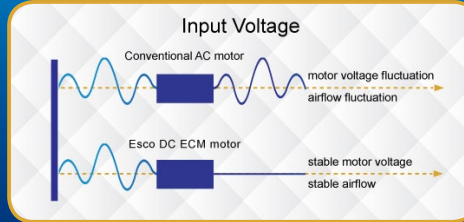


### Pressure Switch

- Temperature-independent
- Fast response

### Energy-Efficient DC ECM Motor

- Powered by latest generation DC ECM motor, that is more efficient than legacy ECM and VFD motors
- 70% Energy savings compared to AC motor
- Stable airflow, despite building voltage fluctuations & filter loading
- Night Setback mode to further reduce power consumption by 60%

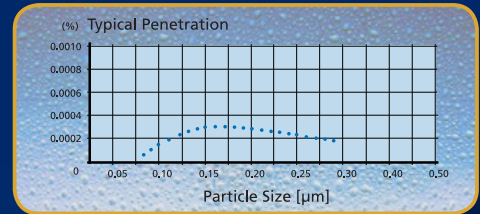


### ULPA Filter

- 10x Filtration efficiency of HEPA filter
- Creates ISO Class 3 work zone instead of industry-standard ISO Class 5

Esco cabinets use ULPA filters (per IEST-RP-CC001.3) / H14 per EN 1822 instead of H13 HEPA filters used on many BSCs in the market.

HEPA filters only offer 99.99% typical efficiency at 0.3 micron, while ULPA filters provide 99.999% typical efficiency for particle sizes of 0.1 to 0.3 micron.



### Dynamic Chamber™

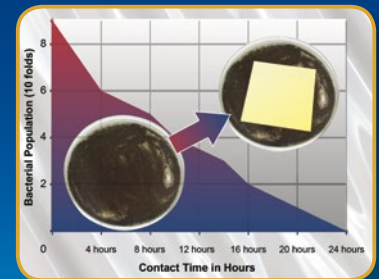
- Blower plenum and side walls are surrounded by negative pressure
- Prevents contaminants from escaping outside

- Positive pressure
- Negative pressure



### ISOCIDE™ Powder Coat

- Silver ion-impregnated powder coat
- Inhibits microbial growth to improve safety



afety  
efficient

Labculture®



NSF 49

### Certification

	Biosafety Cabinets	Air Quality	Filtration	Electrical Safety
Standards Compliance	NSF / ANSI 49 NSF	ISO 14644.1, Class 3, Worldwide JIS B9920, Class 3, Japan JIS B55295, Class 3, Japan US Fed Std 209E, Class 1 USA	EN-1822 (H14), Europe IEST-RP-CC001.3, USA IEST-RP-CC007, USA IEST-RP-CC034.1, USA	UL-C-61010A-1, USA CSA22.2, No.1010-192, Canada EN-61010-1, Europe IEC61010-1, Worldwide

Guide to Models

LB2 - B - E

Nominal Width	Code	Electrical Code	Code
3 ft (0.9 m)	3	220-240 V, 50 Hz	1
4 ft (1.2 m)	4	110-120 V, 60 Hz	2
5 ft (1.5 m)	5	220-240 V, 60 Hz	3
6 ft (1.8 m)	6		
8 ft (2.4 m)	8		

Technical Specifications for Labculture® Class II Type B2 Biological Safety Cabinets

Labculture® Class II B2		LB2-3B -E	LB2-4B -E	LB2-5B -E	LB2-6B -E	LB2-8B -E
Nominal Size		0.9 meter (3')	1.2 meter (4')	1.5 meter (5')	1.8 meter (6')	2.4 meters (8')
External Dimension* (W x D x H)	Without Base Stand	1115 x 852 x 1610 mm (44.0" x 33.5" x 63.3")	1420 x 852 x 1610 mm (56.0" x 33.5" x 63.3")	1725 x 852 x 1610 mm (68.0" x 33.5" x 63.3")	2030 x 852 x 1610 mm (80.0" x 33.5" x 63.3")	2600 x 852 x 1610 mm (102.4" x 33.5" x 63.3")
	With Optional Base Stand, 711 mm (28") type	1115 x 852 x 2321 mm (44.0" x 33.5" x 91.4")	1420 x 852 x 2321 mm (56.0" x 33.5" x 91.4")	1725 x 852 x 2321 mm (68.0" x 33.5" x 91.4")	2030 x 852 x 2321 mm (80.0" x 33.5" x 91.4")	2600 x 852 x 2321 mm (102.4" x 33.5" x 91.4")
Internal Dimensions (W x D x H)		970 x 623 x 715 mm (38.2" x 24.5" x 28.1")	1270 x 623 x 715 mm (50.0" x 24.5" x 28.1")	1570 x 623 x 715 mm (61.8" x 24.5" x 28.1")	1870 x 623 x 715 mm (73.6" x 24.5" x 28.1")	2440 x 623 x 715 mm (96.0" x 24.5" x 28.1")
Usable Work Area		0.45 m <sup>2</sup> (4.8 sq.ft.)	0.6 m <sup>2</sup> (6.5 sq.ft.)	0.75 m <sup>2</sup> (8.1 sq.ft.)	0.9 m <sup>2</sup> (9.7 sq.ft.)	1.2 m <sup>2</sup> (13 sq.ft.)
Tested Opening		203 mm (8.0")	203 mm (8.0")	203 mm (8.0")	203 mm (8.0")	203 mm (8.0")
Working Opening		274 mm (10.8")	274 mm (10.8")	274 mm (10.8")	248 mm (9.8")	248 mm (9.8")
Average Airflow Velocity	Inflow	0.53 m/s (105 fpm)				
	Downflow	0.31 m/s (60 fpm)				
Airflow Volume	Inflow	376 m <sup>3</sup> /h (223 cfm)	492 m <sup>3</sup> /h (292 cfm)	608 m <sup>3</sup> /h (361 cfm)	724 m <sup>3</sup> /h (429 cfm)	945 m <sup>3</sup> /h (560 cfm)
	Downflow	628 m <sup>3</sup> /h (363 cfm)	822 m <sup>3</sup> /h (476 cfm)	1016 m <sup>3</sup> /h (588 cfm)	1210 m <sup>3</sup> /h (700 cfm)	1580 m <sup>3</sup> /h (914 cfm)
	CBV Exhaust Air Volume**	1127 m <sup>3</sup> /h (658 cfm)	1476 m <sup>3</sup> /h (862 cfm)	1824 m <sup>3</sup> /h (1065 cfm)	2173 m <sup>3</sup> /h (1269 cfm)	2835 m <sup>3</sup> /h (1656 cfm)
	Min Exhaust Static Pressure	400 Pa / 1.6 in H <sub>2</sub> O	375 Pa / 1.5 in H <sub>2</sub> O	375 Pa / 1.5 in H <sub>2</sub> O	400 Pa / 1.6 in H <sub>2</sub> O	475 Pa / 1.9 in H <sub>2</sub> O
	CBV Exhaust Static Pressure**	575 Pa / 2.3 in H <sub>2</sub> O	550 Pa / 2.2 in H <sub>2</sub> O	550 Pa / 2.2 in H <sub>2</sub> O	575 Pa / 2.3 in H <sub>2</sub> O	650 Pa / 2.6 in H <sub>2</sub> O
Supply ULPA Filter Typical Efficiency		≥99.999% for particle size between 0.1 to 0.3 microns				
Exhaust HEPA Filter Typical Efficiency		≥99.99% at 0.3 microns				
Maximum Sash Opening		508 mm (20")				
Sound Emission***	NSF / ANSI 49	57 dBA	58 dBA	59 dBA	60 dBA	61 dBA
	EN 12469	54 dBA	55 dBA	56 dBA	57 dBA	58 dBA
Fluorescent Lamp Intensity At Zero Ambient		> 1000 lux (> 93 foot-candles)				
Cabinet Construction	Main Body	Electro-galvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder-coated finish, 1.5 mm (0.06") / 16 gauge thick				
	Work Zone	Stainless steel Type 304 with No.4 finish, 1.5 mm (0.06") / 16 gauge thick				
Electrical	Full Load Amps 230 V	8 A				11 A
	Full Load Amps 115 V	10 A				15 A
	Heat Load	566 BTU/Hr	645 BTU/Hr	781 BTU/Hr	860 BTU/Hr	1177 BTU/Hr
Nominal Power Consumption		166 W	189 W	229 W	252 W	345 W
Net Weight****		279 Kg (615 lbs)	317 Kg (699 lbs)	359 Kg (791 lbs)	438 Kg (966 lbs)	591 Kg (1304 lbs)
Shipping Weight****		318 Kg (703 lbs)	370 Kg (814 lbs)	402 Kg (886 lbs)	491 Kg (1083 lbs)	651 Kg (1435 lbs)
Shipping Dimensions, Maximum (W x D x H)****		1210 x 950 x 1950 mm (47.6" x 37.4" x 76.8")	1520 x 950 x 1950 mm (59.8" x 37.4" x 76.8")	1900 x 950 x 1950 mm (74.8" x 37.4" x 76.8")	2150 x 950 x 1950 mm (84.7" x 37.4" x 76.8")	2720 x 950 x 1950 mm (107.0" x 37.4" x 76.8")
Shipping Volume, Maximum****		2.24 m <sup>3</sup> (79.1 cu.ft.)	2.82 m <sup>3</sup> (99.6 cu.ft.)	3.52 m <sup>3</sup> (124.3 cu.ft.)	3.98 m <sup>3</sup> (140.6 cu.ft.)	5.04 m <sup>3</sup> (178.0 cu.ft.)

\*Height includes exhaust collar, and depth includes the remove-able arm rest and front cover. When they are removed, depth is 790 mm (31.1").

\*\*This Concurrent Balance Value (CBV) Exhaust Volume (per Pitot Duct Traverse) and Static Pressure at cabinet exhaust connection should be used when sizing the HVAC exhaust and supply.

\*\*\*Noise reading in open field condition / anechoic chamber. Noise reading in normal room varies by room size, layout, and background noise, but may reach roughly 3-4 dBA above these values

\*\*\*\*Cabinet only, excludes optional stand.

# Class II Type B2 Biological Safety Cabinets

## Airstream® Class II Type B2 Biological Safety Cabinets

The Industry's Best Value of any Type B2 (Total Exhaust) Biological Safety Cabinet

Esco Airstream® Class II, Type B2 Biological Safety Cabinet provides operator, product and environmental protection against biohazards assigned in Biosafety Levels 1, 2, and 3. This cabinet can be used for handling biohazards assigned to Biosafety Level 4, provided that the operator wears positive pressure suit.



Airstream Class II, Type B2 (Total Exhaust) Biological Safety Cabinet (AB2), Model AB2-4S. Shown with optional support stand.



### Main Features

- The best value of any Type B2 (Total Exhaust) Biological Safety Cabinet in the industry.
- Less energy consumption and heat output than competing products delivers lower total cost of ownership.
- The angled front, narrow profile front grille, raised armrest and frameless sash create an ergonomic work environment.
- Single piece stainless steel internal work zone eliminates welded joints where contaminants may accumulate.
- Dual-wall construction surrounds the work zone with negative pressure plenums for maximum safety.
- Fail-safe system ensures that in case of exhaust failure, the cabinet's main fan automatically shuts down to ensure safety to the user.
- Unique Esco Dynamic Chamber™ plenum design delivers quiet, uniform airflow.
- Long life ULPA (per IEST-RP-CC001.3) supply filter and HEPA exhaust filter for airflow.
- Esco Sentinel™ microprocessor supervises all cabinet functions.
- Esco **ISOCIDE™** antimicrobial coating on all painted surfaces minimizes contamination.

### Guide to Models

#### AB2 - S

Nominal Width	Code	Electrical Code	Code
3 ft (0.9 m)	3	220-240 V, 50 Hz	1
4 ft (1.2 m)	4	110 V-120 V, 60 Hz	2
5 ft (1.5 m)	5	230 V, 60 Hz	3
6 ft (1.8 m)	6		

	Biological Safety Cabinets	For Air Quality	For Filtration	For Electrical Safety
Standards Compliance	NSF/ ANSI 49, USA EN 12469, Europe CFDA YY-0569, China*	ISO 14644.1 Class 3, Worldwide JIS B9920, Class 3, Japan BS 5295, Class 3, UK US Fed Std 209E, Class 1, USA	EN-1822 (H14), Europe IEST-RP-CC001.3, USA IEST-RP-CC007, USA IEST-RP-CC034.1, USA	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN/CSA-22.2, No. 61010-1

\*CFDA certification is exclusive to AB2 models sold in China.

## Technical Specifications for Airstream® Class II Type B2 Biological Safety Cabinets

*Note to customer: Insert electrical voltage number into last model number digits \_ when ordering*

Model		AB2-3S_	AB2-4S_	AB2-5S_	AB2-6S_
Nominal Size		0.9 meters (3')	1.2 meters (4')	1.5 meters (5')	1.8 meters (6')
External Dimension (W x D x H)	Without Base Stand	1035 x 811 x 1460 mm 40.7" x 39.1" x 57.5"	1340 x 811 x 1460 mm 52.8" x 39.1" x 57.5"	1645 x 811 x 1460 mm 64.8" x 39.1" x 57.5"	1950 x 811 x 1460 mm 76.8" x 39.1" x 57.5"
	With Optional Base Stand, 711mm (28") type	1035 x 811 x 2171 mm 40.7" x 39.1" x 85.5"	1340 x 811 x 2171 mm 52.8" x 39.1" x 85.5"	1645 x 811 x 2171 mm 64.8" x 39.1" x 85.5"	1870 x 811 x 2171 mm 76.8" x 39.1" x 85.5"
Internal Work Area, Dimensions (W x D x H)		970 x 585 x 670 mm 38.2" x 23.0" x 26.4"	1270 x 585 x 670 mm 50.0" x 23.0" x 26.4"	1570 x 585 x 670 mm 61.8" x 23.0" x 26.4"	1870 x 585 x 670 mm 73.6" x 23.0" x 26.4"
Internal Work Area, Space		0.43 m <sup>2</sup> (4.67 sq.ft)	0.58 m <sup>2</sup> (6.2 sq.ft)	0.73 m <sup>2</sup> (7.8 sq.ft)	0.87 m <sup>2</sup> (9.3 sq.ft)
Tested and Working Opening		173 mm (6.8") and 198 mm (7.8")			
Average Airflow Velocity	Inflow	0.53 m/s (105 fpm) at initial setpoint			
	Downflow	0.33 m/s (65 fpm) at initial setpoint with uniformity of better than ± 20%			
Airflow Volume	Inflow	320 m <sup>3</sup> /h (190 cfm)	419 m <sup>3</sup> /h (248 cfm)	518 m <sup>3</sup> /h (307 cfm)	617 m <sup>3</sup> /h (366 cfm)
	Downflow	622 m <sup>3</sup> /h (366 cfm)	815 m <sup>3</sup> /h (480 cfm)	1007 m <sup>3</sup> /h (593 cfm)	1200 m <sup>3</sup> /h (707 cfm)
	Certification Exhaust (Inflow + Downflow)	942 m <sup>3</sup> /h (556 cfm)	1234 m <sup>3</sup> /h (728 cfm)	1525 m <sup>3</sup> /h (900 cfm)	1817 m <sup>3</sup> /h (1072 cfm)
	Concurrent Balance Value Exhaust Volume at corresponding Static Pressure <b>Note:</b> Use this for HVAC sizing*	1056 m <sup>3</sup> /h (623 cfm)	1382 m <sup>3</sup> /h (816 cfm)	1708 m <sup>3</sup> /h (1008 cfm)	2035 m <sup>3</sup> /h (1201 cfm)
	Minimum exhaust static pressure for clean exhaust filter**	465 Pa / 1.9 in H <sub>2</sub> O	364 Pa / 1.5 in H <sub>2</sub> O	330 Pa / 1.3 in H <sub>2</sub> O	417 Pa / 1.7 in H <sub>2</sub> O
	Static Pressure with additional 174 Pa (0.7 in H <sub>2</sub> O) required by NSF/ANSI 49:2008 <b>Note:</b> Use this for HVAC sizing*	639 Pa / 2.6 in H <sub>2</sub> O	538 Pa / 2.2 in H <sub>2</sub> O	504 Pa / 2.0 in H <sub>2</sub> O	591 Pa / 2.4 in H <sub>2</sub> O
Downflow ULPA Filter Typical Efficiency		≥99.999% for particle size between 0.1 to 0.3 microns			
Exhaust HEPA Filter Typical Efficiency		≥99.99% at 0.3 microns			
Maximum sash opening		440 mm (17.3")			
Sound Emission***	NSF/ANSI 49	<59 dBA	<59 dBA	<60 dBA	<60 dBA
	EN 12469	<56 dBA	<56 dBA	<57 dBA	<57 dBA
Fluorescent Light Intensity At Zero Ambient		>1000 Lux (>93 foot candles)	>1000 Lux (>93 foot candles)	>900 Lux (>84 foot candles)	>1000 Lux (>93 foot candles)
Cabinet Construction	Main Body	1.5 mm (0.06") 16 gauge electro-galvanized steel with Isocide™ white oven-baked epoxy-polyester powder-coating			
	Work Zone	Stainless steel Type 304 with No.4 finish			
Electrical****	220-240V, AC, 50Hz, 1ø	AB2-3S1	AB2-4S1	AB2-5S1	AB2-6S1
	Cabinet Full Load Amps (FLA)	2 A	2 A	2 A	2 A
	Optional Outlets FLA	5 A	5 A	5 A	5 A
	Cabinet Nominal Power	277 W	292 W	330 W	340 W
	Cabinet BTU *****	945	996	1126	1160
	110-120V, AC, 60Hz, 1ø	AB2-3S2	AB2-4S2	AB2-5S2	AB2-6S2
	Cabinet Full Load Amps (FLA)	3.5 A	3.5 A	3.5 A	3.5 A
	Optional Outlets FLA	5 A	5 A	5 A	5 A
	Cabinet Nominal Power	293 W	309 W	334 W	360 W
	Cabinet BTU *****	1000	1054	1140	1228
	220-240V, AC, 60Hz, 1ø	AB2-3S3	AB2-4S3	AB2-5S3	AB2-6S3
	Cabinet Full Load Amps (FLA)	2 A	2 A	2 A	2 A
	Optional Outlets FLA	5 A	5 A	5 A	5 A
	Cabinet Nominal Power	293 W	308 W	345.8 W	356 W
	Cabinet BTU *****	1000	1051	1180	1215
	Net Weight*****		175 kg (386 lbs)	229 kg (505 lbs)	238 kg (525 lbs)
Shipping Weight, Maximum*****		232 kg (511 lbs)	273 kg (602 lbs)	295 kg (650 lbs)	350 kg (772 lbs)
Shipping Dimensions, Maximum (W x D x H)*****		1150 x 850 x 1760 mm 45.2" x 33.5" x 69.3"	1450 x 850 x 1760 mm 57.1" x 33.5" x 69.3"	1750 x 850 x 1760 mm 68.9" x 33.5" x 69.3"	2050 x 850 x 1760 mm 80.7" x 33.5" x 69.3"
Shipping Volume, Maximum*****		1.72 m <sup>3</sup> (61 cu.ft.)	2.17 m <sup>3</sup> (77 cu.ft.)	2.62 m <sup>3</sup> (93 cu.ft.)	3.07 m <sup>3</sup> (108 cu.ft.)

\* This Concurrent Balance Value (CBV) Exhaust (per Pitot Duct Traverse) and Static Pressure must be used when sizing the HVAC exhaust & supply.

\*\* This minimum exhaust static pressure for clean exhaust filter should not be used for exhaust fan sizing, and it is listed here for comparative purpose only.

\*\*\* Noise reading in open field condition / anechoic chamber.

\*\*\*\* Additional voltages may be available; contact Esco for ordering information.

\*\*\*\*\* Cabinet only, excludes optional stand.

\*\*\*\*\* Cabinet BTU = Cabinet nominal power x 3.41214.

## Class III Biological Safety Cabinet

### Airstream® Class III Biological Safety Cabinets

The Premier Solution for High Containment Laboratories

The Airstream® Class III biological safety cabinet provides you the industry's best protection for high-hazard applications, which cannot be attained with Class I and Class II cabinets. It offers the highest possible level of containment and protection. The cabinet's airtight seal and advanced ULPA filtered laminar airflow provides product, operator and environmental protection and is suitable for use with agents assigned to all risk groups, although more commonly used for handling Risk Group 3 and 4 organisms. AC3 cabinet is engineered for comfort, utility value, and safety.



Airstream Class III Biological Safety Cabinet.  
Model AC3-4B\_



### Main Features

- Exhaust air is double-filtered through high-quality ULPA filters (per IEST-RP-CC001) with typical efficiency of  $\geq 99.999\%$  for 0.1 to 0.3 micron particles, better than HEPA filters.
- Exclusive dual exhaust filters provide  $>100,000$  times better protection than single-stage designs.
- Microprocessor-based Esco Sentinel™ Silver control system provides visual / audible alarms for airflow.
- Magnehelic\* pressure gauge is mounted in the rear of the work zone for at-a-glance monitoring of work zone negative pressure.
- Neoprene™ gauntlets are single-piece leak-tested glove assemblies which guarantee maximum protection.
- An integrated pass-through with interlocking doors permits material transfer without risk of environmental contamination.
- Esco **ISOCIDE™** antimicrobial surface on all painted surfaces minimizes contamination.
- Ergonomically angled front improves reach and comfort.
- Cabinet operates at negative pressure relative to the laboratory in order to prevent migration of pathogenic materials out of the work area.

\*Registered trademark of Dwyer Instruments, Inc.

### Guide to Models

#### AC3- B

Nominal Width	Code	Electrical Code	Code
4 ft (1.2 m)	4	220-240 V, 50 Hz	1
5 ft (1.5 m)	5	110 V-120 V, 60 Hz	2
6 ft (1.8 m)	6	230 V, 60 Hz	3

Standards Compliance	Biosafety Cabinets	For Air Quality	For Filtration	For Electrical Safety
	EN 12469, Europe	ISO 14644.1 Class 3, Worldwide IEST-G-CC1001, USA IEST-G-CC1002, USA	IEST-RP-CC034, Worldwide IEST-RP-CC007, Worldwide IEST-RP-CC001, Worldwide EN 1822 (H14), Europe	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN/CSA-22.2, No. 61010-1

### Technical Specifications for Airstream® Class III Biological Safety Cabinets

Note to customer: Insert electrical voltage number into last model number digits \_ when ordering

Model		AC3-4B__	AC3-5B__	AC3-6B__
Nominal Size		1.2 meters (4')	1.5 meters (5')	1.8 meters (6')
External Dimensions (W x D x H)		1665 x 850 x 2250 mm 65.6" x 33.5" x 88.6"	1970 x 850 x 2250 mm 77.6" x 33.5" x 88.6"	2275 x 850 x 2250 mm 89.6" x 33.5" x 88.6"
Internal Work Area, Dimensions (W x D x H)		1340 x 560 x 650 mm 52.8" x 22.0" x 25.6"	1645 x 560 x 650 mm 64.8" x 22.0" x 25.6"	1950 x 560 x 650 mm 76.8" x 22.0" x 25.6"
Internal Work Area, Space		0.75 m <sup>2</sup> (8.1 sq.ft)	0.92 m <sup>2</sup> (9.9 sq.ft)	1.09 m <sup>2</sup> (11.7 sq.ft)
Number of Gloves Ports		2 ports	4 ports	4 ports
Glove Type & Sizes Available		Neoprene™ polychloroprene synthetic rubber gauntlets. Available in sizes 7, 8 (standard size) and 9		
Initial Airflow Volume		603 m <sup>3</sup> /h (355 cfm)	756 m <sup>3</sup> /h (445 cfm)	902 m <sup>3</sup> /h (531 cfm)
Negative Work Zone Pressure		-275 Pa (-1.1" Wg)		
Pre-Filter		Disposable and non-washable polyester fibers with 85% arrestance / EU3 rated		
ULPA Filter Typical Efficiency (Downflow, 1st Exhaust, 2nd Exhaust)		≥99.999% at 0.1 to 0.3 μm and MPPS		
Sound Emission (Typical)*	NSF / ANSI 49	<54 dBA	<55 dBA	<56 dBA
	EN 12469	<51 dBA	<52 dBA	<53 dBA
Fluorescent Light Intensity At Zero Ambient		>2000 Lux (>186 foot candles)	>1800 Lux (>167 foot candles)	>2000 Lux (>186 foot candles)
Cabinet Construction	Main Body	1.5 mm (0.06") 16 gauge electro-galvanized steel with white oven-baked epoxy-polyester Isocide antimicrobial powder coated finish		
	Work Tray	1.5 mm (0.06") 16 gauge stainless steel Type 304 with No.4 finish		
	Work Zone	1.2 mm (0.05") 18 gauge electro-galvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder coated finish		
Electrical**	220-240V, AC, 50Hz, 1Ø	AC3-4B1	AC3-5B1	AC3-6B1
	Cabinet Full Load Amps (FLA)	3 A	3 A	3 A
	Optional Outlets FLA	5 A	5 A	5 A
	Cabinet Nominal Power	361 W	430 W	455 W
	Cabinet BTU ***	1232	1467	1553
	110-120V, AC, 60Hz, 1Ø	AC3-4B2	AC3-5B2	AC3-6B2
	Cabinet Full Load Amps (FLA)	10 A	11.5 A	11.5 A
	Optional Outlets FLA	5 A	5 A	5 A
	Cabinet Nominal Power	536 W	586 W	620.5 W
	Cabinet BTU ***	1829	2000	2117
Net Weight		498 kg (1096 lbs)	598 kg (1316 lbs)	676 kg (1487 lbs)
Shipping Weight		606.5 kg / 1337 lbs	615 kg / 1356 lbs	720 kg / 1587 lbs
Shipping Dimensions, Maximum (W x D x H)		2600 x 1950 x 1320 mm 102.4" x 76.8" x 52.0"	2600 x 2150 x 1320 mm 102.4" x 84.6" x 52.0"	2600 x 2150 x 1320 mm 102.4" x 84.6" x 52.0"
Shipping Volume, Maximum		6.69 m <sup>3</sup> (236 cu.ft.)	7.38 m <sup>3</sup> (261 cu.ft.)	7.38 m <sup>3</sup> (261 cu.ft.)

\* Noise reading in open field condition/ anechoic chamber.

\*\* Additional voltages may be available; contact Esco for ordering information.

\*\*\* Cabinet BTU = Cabinet nominal power x 3.41214.

## Options and Accessories:

Esco offers a variety of options and accessories to meet local applications. Contact Esco or your local Sales Representative for ordering information.

Options and accessories may not be applicable for your desired model. For detailed information on options and accessories, please see brochure of your desired BSC model.

Accessories	Description
Support Stands	<ul style="list-style-type: none"> <li>Fixed height, with levelling feet or casters</li> <li>Telescoping height, with levelling feet or casters</li> <li>Electronic adjustable height, with levelling feet or casters</li> </ul>
Electrical Outlets	<ul style="list-style-type: none"> <li>European/ Worldwide Style, available in Type C, D, E, F, G, H, I</li> <li>North American style</li> </ul>
Germicidal UV Lamp	<ul style="list-style-type: none"> <li>Emission of 253.7 nanometers for most efficient decontamination</li> <li>Lamp is positioned away from operator's line-of-sight for safety and proper exposure to interior surfaces</li> </ul>
Service Fixtures	<ul style="list-style-type: none"> <li>European/ Worldwide style</li> <li>North American style</li> <li>Electronic adjustable height, with levelling feet or casters</li> </ul>
IV Bars, with hooks	<ul style="list-style-type: none"> <li>Stainless steel construction, Max Load 6 Kg (13 lbs)</li> <li>Available for all standard Esco cabinets</li> </ul>
Exhaust Accessories	<ul style="list-style-type: none"> <li>Air-tight damper</li> <li>Thimble exhaust collar</li> <li>SEAS (Sentinel Exhaust Alarm System)*</li> <li>Anti-blow back valve</li> <li>Tri-safe exhaust collar with alarm</li> </ul>
Decontamination bag	<ul style="list-style-type: none"> <li>Plastic decontamination bag for formalin decontamination on all BSC</li> </ul>
Port	<ul style="list-style-type: none"> <li>Airtight cable port, installed on right side wall</li> <li>Holds 1 to 4 cables</li> </ul>
Ergonomic Foot Rest	<ul style="list-style-type: none"> <li>Angled, helps maintain proper posture</li> <li>Easily adjustable from 3" to 11" in 1" increment, 20" wide</li> <li>Anti-skid coating, chemical-resistant finish</li> </ul>
Ergonomic Lab Chair	<ul style="list-style-type: none"> <li>Laboratory-grade construction, meets Class 100 cleanliness;</li> <li>Alcohol-resistant PVC materials</li> <li>Adjustable height 395-490 mm (15.6"-19.3")</li> </ul>
PVC Arm Rest	<ul style="list-style-type: none"> <li>Chemically treated, improves operator comfort, easy to clean</li> </ul>
Microscope Viewing Pouch	<ul style="list-style-type: none"> <li>Factory-installed</li> <li>Mounting and viewing pouch integrated into sash</li> </ul>
VHP Port	<ul style="list-style-type: none"> <li>VHP Out Top Box for Cabinet with or without exhaust collar installed</li> </ul>
Pre-filter	<ul style="list-style-type: none"> <li>Pre-filter on paper catch</li> </ul>
IQ/OQ	<ul style="list-style-type: none"> <li>Installation Qualification and Operational Qualification Protocol</li> </ul>
Formalin vaporizer	<ul style="list-style-type: none"> <li>Dependable construction and innovative design</li> <li>Specifically designed for safety cabinet decontamination with automatic control</li> </ul>



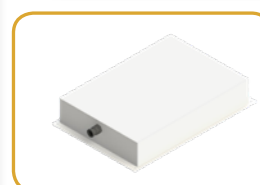
Support Stands



Electrical Outlet



Germicidal UC Lamp



VHP Port



Service Fixtures



PVC Arm Rest

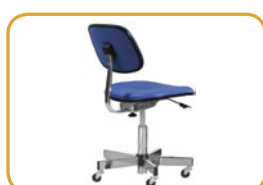


IV Bars, with hooks

\* Type A Biological Safety Cabinets with thimble exhaust collar NOT equipped with alarm system can no longer be certified by an NSF-Accredited certifier.



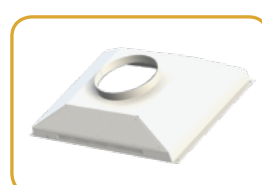
Ergonomic Foot Rest



Ergonomic Lab Chair



Formalin Vaporizer



Exhaust Accessories



Pre-filters

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