Airstream ®

Airstream Class lll, Biological Safety Cabinet, Model AC3-4B_.

Class III, Biological Safety Cabinets
The Premier Solution for High Containment Laboratories

ESCO
WORLD CLASS. WORLDWIDE.

Main Features

- Exhaust air is double-filtered through high-quality ULPA filters (per IEST-RP-CC-001.3) with typical efficiency of >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 materials transfer without risk of environmental contamination.

- Esco ISOCIDE™ antimicrobial surface on all painted surfaces minimizes contamination.

- An angled cabinet front ensures an ergonomic working posture.

- 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.

Airstream Class III Biological Safety Cabinet.
Model AC3-4B_.

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Biological Safety Cabinets • **Class III Biological Safety Cabinets**

Neoprene™ synthetic arm-length gauntlets are flame and abrasion resistant. Single piece, leak-tested assembly guarantees maximum protection. Black color allows the detection of leaks by visual means.

Containment and Protection

The Esco Airstream Class III Biological Safety Cabinet provides the industry's best protection for high-hazard applications.

- Complete welded construction ensures an air-tight carcass for absolute containment, operator and environmental safety.

- Dual exhaust ULPA filters deliver superior protection - the combined typical efficiency of the two exhaust filters in series allows only 1 particle out of 10 billion (of 0.1 - 0.3 microns size) to penetrate. Filtration efficiency is even higher for particles larger than 0.3 microns or smaller than 0.1 microns.

- Inflow room air is ULPA filtered to establish product protection; unfiltered room air does not enter the work zone, preventing product contamination.

- Integrated pass-through with interlocking doors allows materials and equipment to be easily passed into the main chamber without the risk of environmental contamination.

- Magnehelic* pressure gauge mounted in the rear wall of the work zone enables continuous monitoring of work zone negative pressure.

  *Registered trademark of Dwyer Instruments, Inc

Integrated Filtration System

A combination of a supply ULPA filter and dual exhaust ULPA filters give the AC3 cabinet a fully integrated performance envelope for product, operator and environmental protection.

- ULPA filters (per IEST-RP-CC001.3), are tested to a typical efficiency of >99.999% for 0.1 to 0.3 micron particles; these provide better filtration

capability than conventional HEPA filters that have a typical efficiency of >99.99% for 0.3 micron particles.

- Modern separator-less mini-pleat filter construction maximizes the filter surface area to extend filter life and eliminates possible filter media damage by thin and sharp aluminum separators used in conventional HEPA filter construction.

- The filter frame and media is constructed in accordance with EN1822 requirements for fire retardant properties

- The supply ULPA filter provides ISO Class 3 (per ISO14644.1) clean air to the work surface in a gentle vertical flow for product protection.

- The dual exhaust ULPA filters trap aerosols generated in the work area before air is exhausted to the room providing personnel and environmental protection.

- The exhaust filter media is protected from mechanical damage by an integrated metal screen guard, which is absent from conventional HEPA filters.

Mini-pleat Separatorless Filter (left) vs. Conventional Aluminum Separator Filter (right)

Esco cabinets use Swedish Camfil Farr® mini-pleat filters without aluminum separators to increase filter efficiency, minimize the chance of leakage, and to prolong filter life. Filters include a lightweight aluminum frame for structural stability and elimination of swelling common to conventional wood frames.

Blower System

The Airstream blower system is designed for high performance operation, maximum energy efficiency and minimal maintenance.

**Operator, Product and Environmental Protection**

The Esco Airstream Class III Biological Safety Cabinet (AC3) 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 Biosafety Levels 1, 2, 3 and 4. The AC3 is frequently used for work involving the deadliest biohazards, bacteria, viruses and microorganisms.

- Dual fan design ensures cabinet containment and operator safety in the event of a single fan failure.

- The permanently lubricated direct-drive external rotor motor / blower reduces operating costs.

- The external rotor motor design allows for optimum cooling of the motor during extended operations and extends the motor bearing life.

- An integral blower hour meter tracks operating life and aids in predictive maintenance planning.

Sentinel™ Microprocessor Control, Alarm, Monitoring System

The Esco Sentinel™ microprocessor-based control system supervises operation of all cabinet functions.

Esco ULPA Filter Efficiency
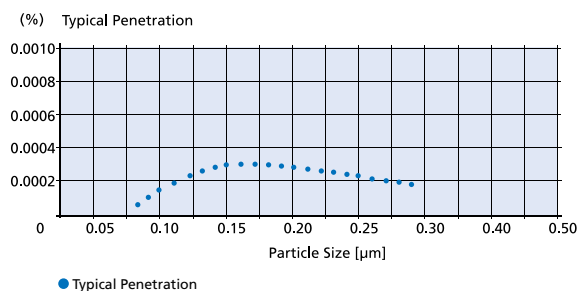
Independent supply and exhaust filters provide 99.999% typical efficiency for particle sizes of 0.1 to 0.3 microns. Airstream Series filters meet the IEST-RP-CC001.3 recommended practice for ULPA performance (USA), and EN 1822 for H14 performance (EU).

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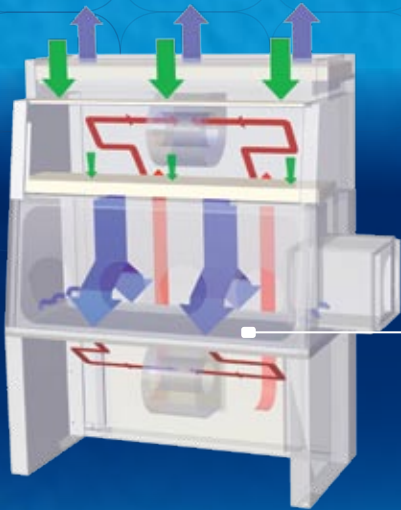
Cabinet Filtration System

Dynamic air barrier, inflow and forward-directed downflow air converge

- Ambient air is pulled into the cabinet through a disposable pre-filter, trapping larger particles and prolonging the life of main filter. Air is then passed through the downflow ULPA filter into the work zone as a vertical laminar flow air stream, bathing the work surface in clean air.

- The uniform non-turbulent air stream protects against cross contamination within and throughout the work area.

- Near the work surface, the downflow air stream splits and exits the chamber through perforations around the perimeter of the work zone.

Legend:
- ULPA-filtered air
- Unfiltered / potentially contaminated air
- Room air / Inflow air

- Air from work zone passes through the first ULPA exhaust filter below the work surface, before traveling through internal ducting and exhausting to the laboratory environment after passing through the second ULPA exhaust filter located above the cabinet's main chamber.

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-CC034.1, Worldwide IEST-RP-CC007.1, Worldwide IEST-RP-CC001.3, Worldwide EN 1822 (H14), Europe	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN/CSA-22.2, No. 61010-1

4

- The control panel is located in the center of the cabinet and angled down for easy access by the operator.
- Cabinet airflow is monitored continuously and displayed on a bright, easy-to-read LCD display.
- An integrated, temperature-compensated true airflow velocity sensor provides an accurate airflow reading despite room temperature fluctuation.
- All electronic parts are contained inside a plug-and-play module that permits easy exchange if required.
- Microprocessor software updates are available from Esco for download via the Internet.

Sentinel functions are factory set to default to ON or OFF, depending on worldwide destination and local preferences. Default settings can be user activated through the touchpad data entry access.

- Automatic start-up sequence will prepare the cabinet for normal operation and advise when safe conditions are established.
- An administrator controlled PIN (personal identification number) can be set to restrict access to main menu.

- The airflow alarm can be activated or deactivated depending on user preference and nature of the work.

Consult your Esco Operating Manual or contact your Sales Representative for information on user-preference programming capabilities built into the Sentinel™ microprocessor platform.

Cabinet Construction

Robust construction and enhanced safety features qualify the cabinet for the most demanding laboratory applications. The cabinet is fully assembled and ready to install and operate when shipped.

- All stainless steel work surface is easy to clean.
- Optional electrical service fittings are located for easier access.

- External surfaces are coated with Esco Isocide™ antimicrobial coating to protect against surface contamination and inhibit bacterial growth. Isocide™ eliminates 99.9% of surface bacteria within 24 hours of exposure.
- Industrial grade support frame constructed of electro-galvanized steel with an abrasion resistant finish.

Comfortable Ergonomic Design

The AC3 cabinet is engineered for comfort, utility value and safety.

- The angled front improves reach into the work area and reduces glare from the glass surface.
- The instant-start 5000k fluorescent lamp operates on an electronic ballast to reduce heat, improve comfort and conserve energy.
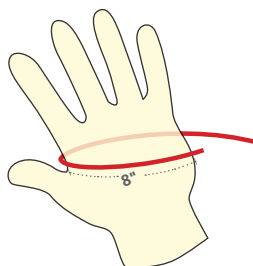
Glove Sizes

- To find out your glove size, measure (in inches) around your hand with a tape measure at the place indicated on the diagram. This measurement, in inches, is the closest to your glove size, i.e. 8" is equal to a glove size of 8.

- You should use your dominant hand, the right if you are right-handed, and the left if you are left-handed.

- Standard glove sizes available are 7, 8 (standard size) and 9. Specify when ordering.

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Touchpad data entry buttons permit control settings and access to diagnostics, default settings and hierarchical menus.

Color coded indicator lamps display green for primary function (fan operation); blue for secondary function (fluorescent lights and electrical outlet); and orange for caution (UV lamp ON).

Programmable automatic UV light timer simplifies operation, enhances contamination control, extends UV lamp life and saves energy.

Digital read-out with alpha-numeric display indicates all input, status and alarm functions.

All functions can be user activated through touch-pad programming access; see Operations Manual.

MENU   SET   ▲   ▼

AIR SAFE   16:20

Read all safety-related instructions before use
Test / certify this cabinet at least annually

🛩   💡   ✱   UV

Designed to Meet IEC 61010-1
Safety / Protection Standards
ISO 9001 Quality Certified
Manufacturing Environment

ESCO ®

Sentinel Microprocessor Control System, Programmable

■ *When programmed ON* • *the start-up sequence confirms status with Air Safe and local time display.*
• *the Personal Identification Number (PIN) access restricts unauthorized adjustments.*
• *an airflow alarm warns of deviations from normal velocities.*

- The lamp delivers uniform lighting to the work surface for greater comfort, reduced glare and improved productivity (see Technical Specifications).
- Neoprene™ synthetic arm-length gauntlets are flame and abrasion resistant. Single piece, leak-tested assembly guarantees maximum protection. Black color allows the detection of leaks by visual means.
- Glove ports are designed for easy and safe glove changing.

Electrical Safety and Certification

All components meet or exceed applicable safety requirements.

- Each cabinet is individually factory tested for electrical safety.

- Documentation specific to each cabinet serial number is maintained on file.
- All electrical components are UL-listed or recognized.

Contact Esco or your Sales Representative for site preparation information (see Electrical Specifications).

Warranty

The AC3 is warranted for 3 years excluding consumable parts and accessories.

- Each cabinet is shipped with a comprehensive User's Manual complete with a report documenting all test procedures.
- Additional IQ/OQ documentation is available upon request.

Contact your local Sales Representative for specific warranty details or documentation requests.

Accessories and Options

Esco offers a variety of options and accessories to meet local applications. Contact Esco or your local Sales Representative for ordering information.
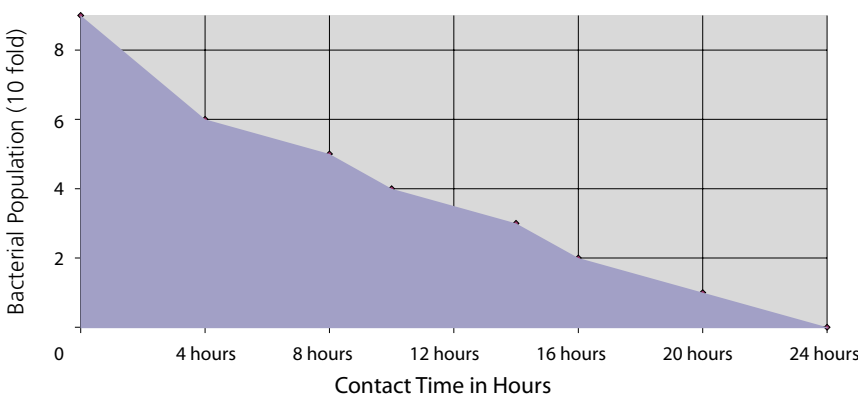
Electrical Outlets and Utility Fixtures
- Electrical outlet, ground fault, North America
- Electrical outlet, Europe / Worldwide

Cabinet Accessories
- Germicidal UV lamp
  - Controlled by automatic UV lamp timer through Sentinel™ microprocessor control panel

ISOCIDE™ Antimicrobial Powder-Coating

All exterior painted surfaces are powder-coated with Esco Isocide, an antimicrobial inhibitor to minimize contamination. Isocide is integrated into the coating substrate and cannot wash out or diminish by repeated cleaning. Performance results are available upon request. Contact Esco or your Esco Sales Representative for details.

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General Specifications, Airstream Class lll, 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 m² (8.1 sq.ft)	0.92 m² (9.9 sq.ft)	1.09 m² (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 m³/h (355 cfm)	756 m³/h (445 cfm)	902 m³/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)		Typical: 99.999% at 0.1 to 0.3 μm and MPPS		
Sound Emission (Typical)*	NSF 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 Zone	1.2 mm (0.05") 18 gauge stainless steel, type 304, with 4B 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 m³ (236 cu.ft.)	7.38 m³ (261 cu.ft.)	7.38 m³ (261 cu.ft.)

* Noise reading in open field condition/ anechoic chamber.
** Additional voltages may be available; contact Esco for ordering information.

(Cont.)

- Emission of 253.7 nanometers for most efficient decontamination
- Ergonomic lab chair
  - Laboratory grade construction, meets Class 100 cleanliness; alcohol resistant PVC materials
  - Adjustable height 395-490 mm (15.6"-19.3")
- Ergonomic foot rest
  - Angled, helps maintain proper posture

- Adjustable height
- Anti-skid coating, chemical resistant finish
- Formalin vaporizer

The Airstream Class lll Biological Safety Cabinet is available in all stainless steel construction for pharmaceutical grade applications, contact Esco or your Sales Representative for more details.
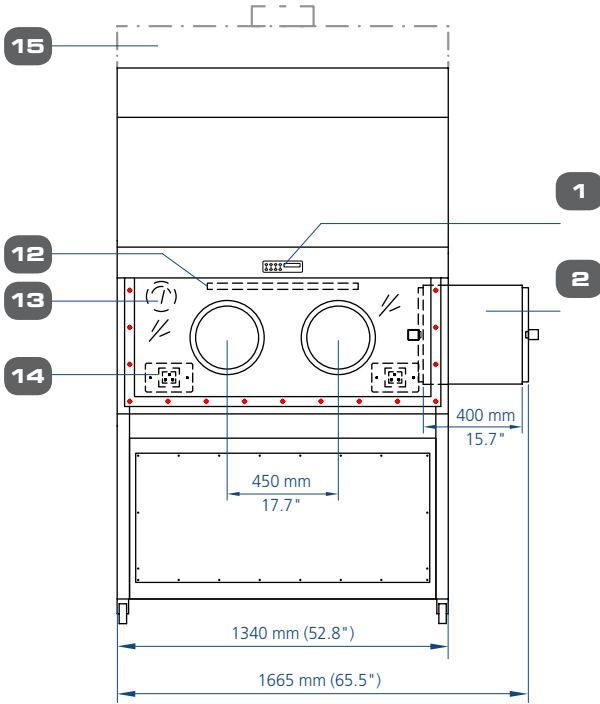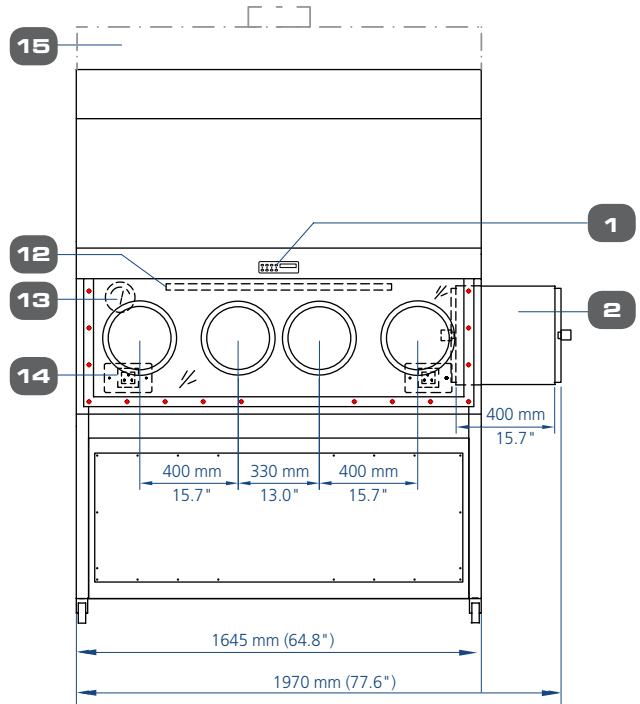
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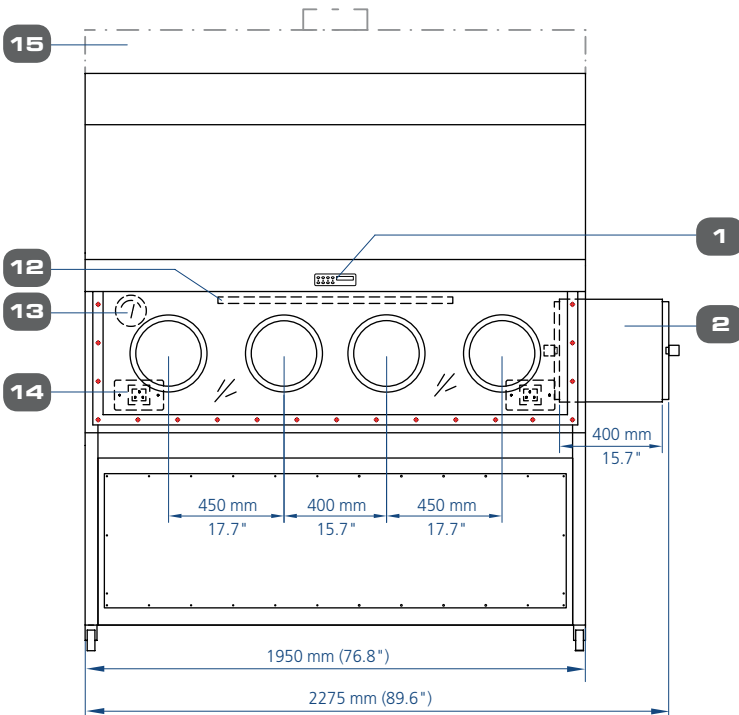## Airstream Model AC3 Class lll Biological Safety Cabinet Technical Specifications
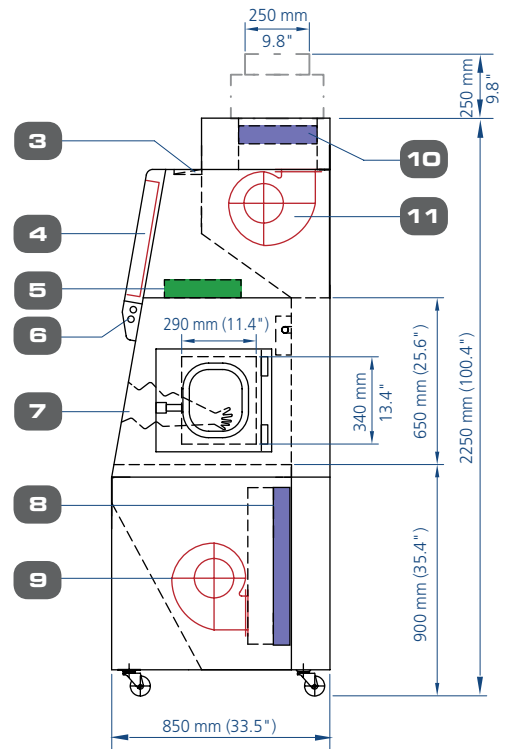
Model AC3-4B_

400 mm
15.7"

450 mm
17.7"

1340 mm (52.8")

1665 mm (65.5")

Model AC3-5B_

400 mm
15.7"

400 mm
15.7"

330 mm
13.0"

400 mm
15.7"

1645 mm (64.8")

1970 mm (77.6")

Model AC3-6B_

400 mm
15.7"

450 mm
17.7"

400 mm
15.7"

450 mm
17.7"

1950 mm (76.8")

2275 mm (89.6")

Common Side View

250 mm
9.8"

250 mm
9.8"

290 mm (11.4")

340 mm
13.4"

650 mm (25.6")

2250 mm (100.4")

900 mm (35.4")

850 mm (33.5")

1. Esco Sentinel microprocessor control system
2. Pass box
3. Pre- filter
4. Electrical & electronics panel
5. ULPA filter (downflow)
6. Fluorescent light
7. Glove ports
8. First exhaust ULPA filter
9. First exhaust blower
10. Second exhaust ULPA filter
11. Second exhaust blower
12. UV lamps (optional)
13. Pressure gauge
14. Work zone back wall: optional electrical outlet Retrofit Kit™ provisions (2 outlets in work zone one on each side)
15. Exhaust collar (optional)*

*NIOSH Alert: If biosafety cabinets are used for minute quantities of volatile toxic chemicals and trace amounts of radionucleotides, they must be exhausted through properly functioning exhaust canopies.

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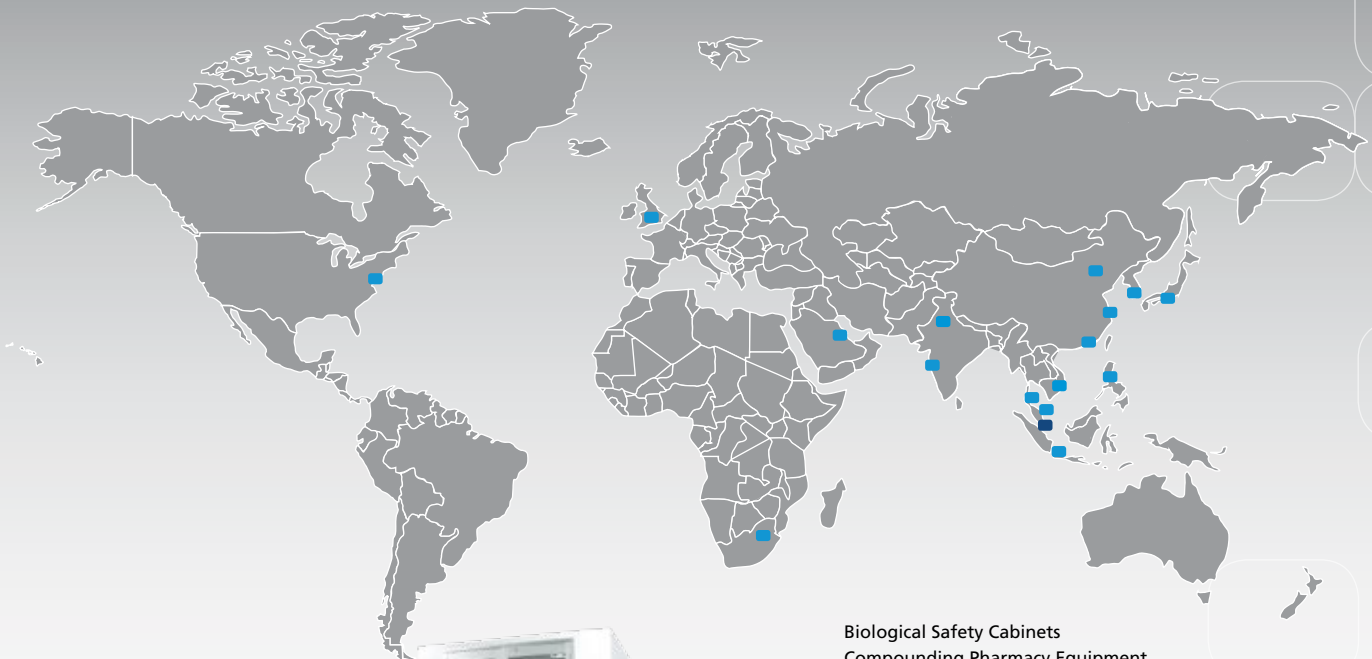
Biological Safety Cabinets
Compounding Pharmacy Equipment
Containment / Pharma Products
CO_2 Incubators
Ductless Fume Hoods
In-Vitro Fertilization Workstations
Lab Animal Research Products
Laboratory Fume Hoods
Laboratory Ovens and Incubators
Laminar Flow Clean Benches
PCR Products
Ultralow Freezer

Since 1978, Esco has emerged as a leader in the development of controlled environment, laboratory and pharmaceutical equipment solutions. Products sold in more than 100 countries include biological safety cabinets, fume hoods, ductless fume hoods, laminar flow clean benches, animal containment workstations, cytotoxic cabinets, hospital pharmacy isolators, and PCR cabinets and instrumentation. With the most extensive product line in the industry, Esco has passed more tests, in more languages, for more certifications, throughout more countries than any biosafety cabinet manufacturer in the world. Esco remains dedicated to delivering innovative solutions for the clinical, life science, research and industrial laboratory community. www.escoglobal.com.

Biological Safety Cabinets and Laminar Flow • Laboratory Fume Hoods • Laboratory Ovens
Laboratory Incubators • PCR Thermal Cyclers • Microplate Shaker/Incubators • Ultralow Freezers

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