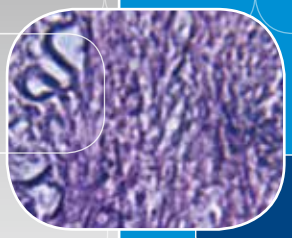


Airstream®

EN12469

Airstream Class II, Biological Safety Cabinet (E-series), Model AC2-4E_.

Class II, Biological Safety Cabinets

The Industry's Most Energy Efficient Class II Cabinet

ESCO

WORLD CLASS. WORLDWIDE.

Main Features

- NEW Esco Sentinel™ Gold microprocessor with integrated temperature-compensated airflow monitoring system.
- NEW Quickstart mode, to turn the blower on when the sash window is moved from fully closed pisition and lights on/off when the sash window reaches safe sash height.
- NEW RS 232 data output port enables remote monitoring of cabinet operating parameters.
- NEW Dual exhaust filtered models (AC2-D, AC2-G) provide >100,000x better protection than conventional single exhaust models.
- NEW Improved low noise design improves operator comfort.
- NEW Counterbalanced sliding sash is easier to operate.
- NEW Multi-language display and menu access in English, French, Italian and Spanish.
- Long life ULPA filtration technology, ≥99.999% efficient at 0.1 to 0.3 micron sizes, trusted by the world's leading pharmaceutical companies and research laboratories, delivers superior product, operator and cross-contamination protection.
- Unique Esco Dynamic Chamber™ plenum design delivers quiet, uniform airflow.
- INNOVA™ INNOVA energy saving fan technology reduces cabinet power consumption and heat output.
- ISOCIDE™ antimicrobial coating on all painted surfaces inside and out minimizes contamination.
- Ergonomically angled front, armrest, frameless sash for operator comfort. Actual work opening is 25.4mm (1") larger than tested sash opening to provide additional work space.
- Safe - 0.9m/3', 1.2m/4', 1.8m/6' models tested and certified to EN12469 at the Health Protection Agency, Porton Down, UK.
- Available in stainless steel-side models with one-piece internal work zone liners for superior cleanability, or glass-side models for customers who prefer a brighter work space with maximum visibility.
- 0.6m/2' AC2-E Series Glass Side models available for applications in which space is at a premium.
- Backed by our industry-leading warranty with trained sales and service partners worldwide.

EN12469

Airstream E-Series Class II Biological Safety Cabinet, model AC2-4E_ shown with optional support stand. Cabinet features glass sides to enhance visibility inside the work area and is available in 0.6, 0.9, 1.2, 1.5 and 1.8 meter (2', 3', 4', 5' and 6') models.

Putting Your Needs First Airstream® Offers the Most Complete Class II Cabinet Range				
Airstream Product	**E-Series**	**G-Series**	**S-Series**	**D-Series**
Side Walls	Tempered Glass Increases Visibility and Prevents the Operator from Experiencing a "Boxed-In" Sensation		Single-Piece Stainless Steel with Large Radius Corners for Cleanability. Side Capture Zones and Negative Pressure Side Walls Optimize Containment.	
Work Tray	Multi-Piece, Autoclavable		Single-Piece Stainless Steel, Spill Retaining	
Fan System	Combined Inflow/Downflow Fan(s), Energy Efficient	Independent Inflow/Downflow Fans, Redundant System Provides Protection in Case of Fan Failure	Combined Inflow/Downflow Fan(s), Energy Efficient	Independent Inflow/Downflow Fans, Redundant System Provides Protection in Case of Fan Failure
Exhaust Filter	Single ULPA Filter, ≥99.999% Efficient	Dual ULPA Filters, >100,000x Better Protection than Single Filter Systems	Single ULPA Filter, ≥99.999% Efficient	Dual ULPA Filters, >100,000x Better Protection than Single Filter Systems
Sizes Available	0.6m (2'), 0.9m (3'), 1.2m (4'), 1.5m (5'), 1.8m (6')	1.2m (4'), 1.8m (6')	0.9m (3'), 1.2m (4'), 1.5m (5'), 1.8m (6')	1.2m (4'), 1.8m (6')

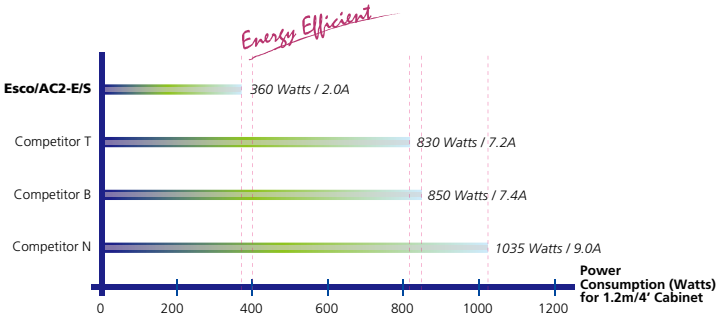
Thousands of Units Installed in Laboratories in More than 100 Countries

Esco Airstream Class II Biological Safety Cabinets offer premium operator, product and environmental protection with advanced technology.

Intelligent, ergonomic design enhances productivity, operator comfort, maintenance and utility value. With an extensive track record of safety, reliability and performance, Airstream cabinets make ideal investments for a wide range of general laboratory applications.

Airstream biological safety cabinets provide operator, product and environmental protection. This cabinet can be used for handling organisms in all Risk Groups. In the event of work with Risk Group 4 organisms, the operator needs to wear positive pressure suit when this Cabinet is used. User needs to carry out risk assessment to determine the suitable type of biological safety cabinet.

Save Energy, Money and the Planet!



INNOVA™ backward curved, motorized impeller fan technology replaces conventional fans. Improved energy efficiency dramatically lowers operating costs. Lower heat output further improves building energy efficiency.

Energy savings of up to US$500 per cabinet per year, based on average 500W savings on a 1.2m/4' cabinet, continuous operation, and electricity cost of US$0.10/kWH, plus additional savings from reduced building cooling load.

Airstream S-Series Class II Biological Safety Cabinet, Model AC2-4S_, shown with optional support stand.

Airstream® Class II Biological Safety Cabinets (E-Series)

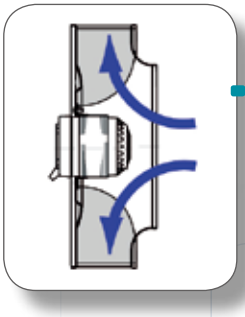
Provide Operator, Product and Environmental Protection

High Performance Fan System

German made ebm-papst® permanently lubricated, centrifugal motor/fans with external rotor designs.

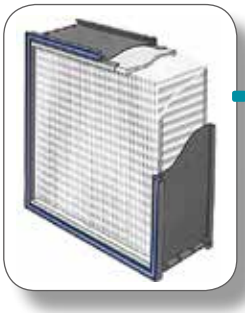
Motors selected for energy efficiency, compact design, and flat profile. Completely integrated assembly optimizes motor cooling.

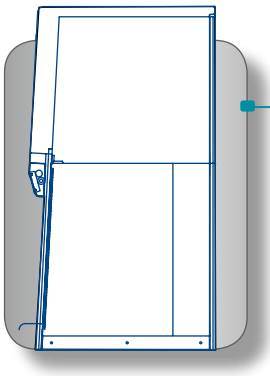
All rotating parts balanced for smooth, quiet, vibration-free operation.



ULPA Filtration System

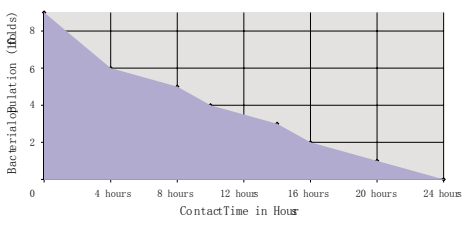
Swedish Camfil Farr® ULPA filters operate at a typical efficiency of ≥99.999% at 0.1 to 0.3 micron sizes, providing superior product protection over conventional HEPA filters. ULPA filters last as long as HEPA filters and have comparable replacement costs.





User Interface

Ergonomically angled front improves reach and comfort, reduces glare. Armrest with curved front edge provides excellent forearm support. Frameless, shatterproof sash is easier to clean, offers larger, unobstructed viewing area. Narrow profile inflow grille reduces strain while working.



Built-In Protection

External surfaces are powder-coated with Esco ISOCIDE™ to eliminate 99.9% of surface bacteria within 24 hours of exposure.

Airstream Class II Biological Safety Cabinet, Model AC2-4E_.

Sentinel™ Gold Microprocessor Control System

Advanced microprocessor control supervises operation of all cabinet functions. Temperature-compensated air velocity sensor monitors both exhaust and downflow. And large 4-lines LCD shows user crucial cabinet status in a single glance. 24-hour clock, UV timer, UV hour meter, filter life display, and blower run hour meter are standard. Programmable PIN restricts unauthorized certification reminder cabinet access.

Robust Cabinet Construction

Key components, including fluorescent lamps, motor capacitor, electrical harness, electronic ballast, exhaust damper, and switch control are mounted outside the airstream and away from contaminated air to permit service without decontamination.

Work Top

Multi-piece tray can be easily lifted and removed with the help of ergonomic tray handle to provide easy access and to encourage surface decontamination. Work trays are rounded at the rear for easy cleaning.

Dynamic Chamber™ Plenum Design

Negative pressure *Positive pressure*

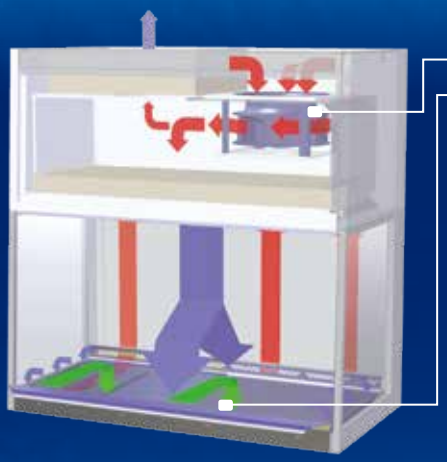
The Esco permanent metal Dynamic Chamber™ plenum surrounds contaminated areas with negative pressure, preventing the possibility of contamination from leaks in the filter seal, gasket or cabinet structure; no fabric bags are used.

Key Features

- All contaminated plenums are surrounded by negative pressure, virtually eliminating filter perimeter leaks.
- The backward curved wheel with external rotor motor delivers class-leading energy efficiency for lower operating costs.
- Unique raised armrest design elevates the operator's arms to prevent inflow grille blockage which may compromise safety.
- The cabinet work zone has no welded joints to collect contaminants or rust.
- Multiple piece stainless steel work surface is easier to remove and put into autoclave / washer.
- Glass sides eliminate the feeling of "working in a box", enhance cabinet lighting, and permit observation of procedures.
- The angled viewing window and narrow profile front grille improves reach into the work area.
- Actual sash opening is larger than tested opening, and improves reach into the work zone without compromising safety.
- Programmable automatic UV light timer simplifies operation while extending UV lamp life and saving energy.
- Inherently safe counterbalance locking mechanism for the sash window operation to lock the counterbalance and sash window in place if any one the 2 cables is detached.
- Powder-coated work zone rear wall increases light intensity compared to stainless steel interiors.
- Cabinets are KI-Discus tested on a sampling basis for performance integrity.
- Additional IQ/OQ documentation is available upon request.

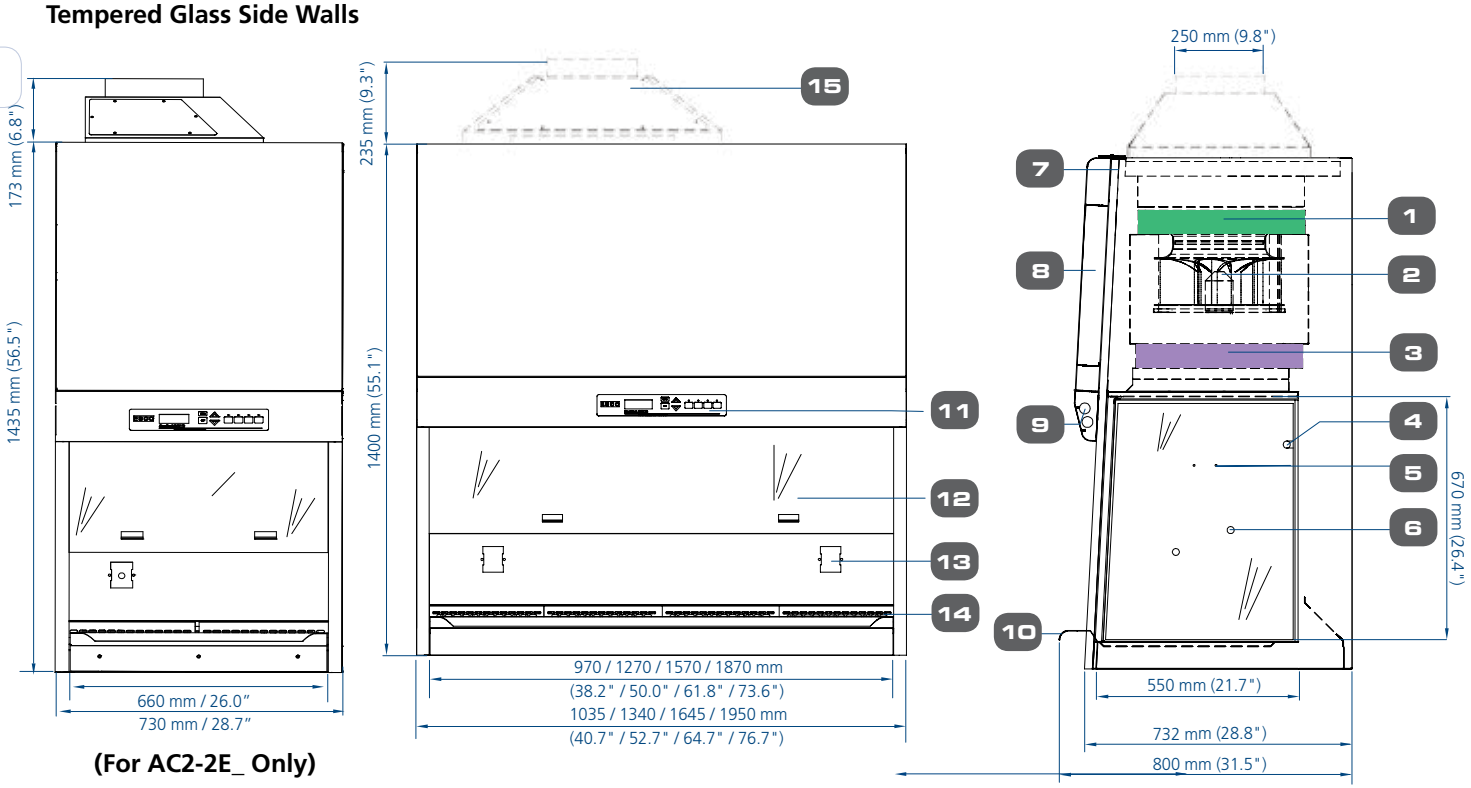
	Biological Safety Cabinets	Air Quality	Filtration	Electrical Safety
Standards Compliance	EN 12469, Europe	ISO 14644.1 Class 3, Worldwide AS 1386 Class 1.5, Australia JIS B9920 Class 3, Japan	IEST-RP-CC034, Worldwide IEST-RP-CC007, Worldwide IEST-RP-CC001, Worldwide EN 1822, Europe	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN/ CSA C22.2 No. 61010-1

Precision Tuned and Tested Airflow and Intake Geometry



- Ambient air is pulled through the perforations located towards the work zone front to prevent contamination of the work surface and work product. The inflow does not mix with the clean air within the cabinet work zone. Inflow air travels through a return path toward the common air plenum (fan plenum) at the top of the cabinet.
- 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 with a portion moving toward the front air grille, and the remainder moving to the rear air grille. A small portion of the ULPA filtered downflow enters the intake perforations at the side capture zones at a higher velocity (small purple arrows).
- A combination of inflow and downflow air streams forms an air barrier that prevents contaminated room air from entering the work zone, and prevents work surface emissions from escaping the work zone.
- Air returns to the common air plenum where the 32% exhaust and 68% recirculation process is continued.
- Optimized air curtain maintains personnel and product protection even in the unlikely event of inflow and downflow imbalance that would compromise protection on a conventional cabinet.

Airstream Model AC2 (E-Series) Biological Safety Cabinet Technical Specifications, Tempered Glass Side Walls



(For AC2-2E_ Only)

1. *Exhaust ULPA filter*
2. *Fan*
3. *Downflow ULPA filter*
4. *Standard UV light Retrofit Kit™ provision*
5. *Standard IV bar Retrofit Kit™ provision (Maximum load for IV bars is 1 kg)*
6. *Plugged service fixture provisions (2 on each side)*
7. *RS 232 port*
8. *Electrical and electronics panel*
9. *Fluorescent lamp*
10. *Stainless steel armrest*
11. *Esco Sentinel™ Gold microprocessor control system*
12. *Tempered glass sliding sash window*
13. *Standard electrical outlet Retrofit Kit™ provision*
14. *Stainless steel multi-piece work tray*
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.*

General Specifications, Airstream Class II, Biological Safety Cabinets (E-Series)

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

Model		AC2-2E_	AC2-3E_	AC2-4E_	AC2-5E_	AC2-6E_
Nominal Size		0.6 meters (2')	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	730 x 800 x 1400 mm 28.7" x 31.5" x 56.5"	1035 x 800 x 1400 mm 40.7" x 31.5" x 55.1"	1340 x 800 x 1400 mm 52.7" x 31.5" x 55.1"	1645 x 800 x 1400 mm 64.7" x 31.5" x 55.1"	1950 x 800 x 1400 mm 76.7" x 31.5" x 55.1"
	With Optional Base Stand, 711mm (28") type	730 x 800 x 2146 mm 28.7" x 31.5" x 84.5"	1035 x 800 x 2111 mm 40.7" x 31.5" x 83.1"	1340 x 800 x 2111 mm 52.7" x 31.5" x 83.1"	1645 x 800 x 2111 mm 64.7" x 31.5" x 83.1"	1950 x 800 x 2111 mm 76.7" x 31.5" x 83.1"
Internal Work Area, Dimensions (W x D x H)		670 x 550 x 670 mm 26.4" x 21.7" x 26.4"	970 x 550 x 670 mm 38.2" x 21.7" x 26.4"	1270 x 550 x 670 mm 50.0" x 21.7" x 26.4"	1570 x 550 x 670 mm 61.8" x 21.7" x 26.4"	1870 x 550 x 670 mm 73.6" x 21.7" x 26.4"
Internal Work Area, Space		0.29 m^2 (3.1 sq.ft)	0.42 m^2 (4.6 sq.ft)	0.56 m^2 (6.0 sq.ft)	0.71 m^2 (7.6 sq.ft)	0.85 m^2 (9.1 sq.ft)
Average Airflow Velocity	Inflow	0.45 m/s (90 fpm) at initial setpoint				
	Downflow	0.30 m/s (60 fpm) at initial setpoint with uniformity of better than ± 20%				
Airflow Volume	Inflow	185 m^3/h (111 cfm)	270 m^3/h (162 cfm)	356 m^3/h (213 cfm)	440 m^3/h (263 cfm)	524 m^3/h (313 cfm)
	Downflow	385 m^3/h (230 cfm)	563 m^3/h (337 cfm)	741 m^3/h (443 cfm)	916 m^3/h (548 cfm)	1091 m^3/h (652 cfm)
	Exhaust	185 m^3/h (111 cfm)	270 m^3/h (162 cfm)	356 m^3/h (213 cfm)	440 m^3/h (263 cfm)	524 m^3/h (313 cfm)
	Required Exhaust With Optional Thimble Exhaust	260 m^3/h (153 cfm)	320 m^3/h (189 cfm)	538 m^3/h (317 cfm)	615 m^3/h (362 cfm)	823 m^3/h (485 cfm)
	Static Pressure For Optional Thimble Exhaust Collar	28 Pa / 0.11 in H_2O	29 Pa / 0.11 in H_2O	31 Pa / 0.12 in H_2O	35 Pa / 0.14 in H_2O	47 Pa / 0.18 in H_2O
ULPA Filter Typical Efficiency	Downflow	≥99.999% at 0.1 to 0.3 micron as per IEST-RP-CC001 USA ≥99.999% at MPPS as per EN 1822 (H14) EU				
	Exhaust					
Maximum Sash Opening		440 mm (17.3")	430 mm (17")	430 mm (17")	430 mm (17")	430 mm (17")
Sound Emission (Typical)*	NSF / ANSI 49	<62 dBA	<61 dBA	<62 dBA	<62 dBA	<63 dBA
	EN 12469	<59 dBA	<58 dBA	<59 dBA	<59 dBA	<60 dBA
Fluorescent Light Intensity At Zero Ambient		>900 Lux (> 84 foot candles)	>1130 Lux (>105 foot candles)	>1280 Lux (>119 foot candles)	>1050 Lux (>97 foot candles)	>1220 Lux (>113 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 with No.4 finish				
	Side Walls	UV absorbing tempered glass, 5 mm (0.2"), colorless and transparent				
Electrical**	220-240V, AC, 50Hz, 1Φ	AC2-2E1	AC2-3E1	AC2-4E1	AC2-5E1	AC2-6E1
	Cabinet Full Load Amps (FLA)	2 A	2 A	2 A	2 A	4 A
	Cabinet Nominal Power	271 W	291 W	289 W	333 W	549 W
	Optional Outlets FLA	5 A	5 A	5 A	5 A	5 A
	Total Cabinet FLA	7 A	7 A	7 A	7 A	9 A
	Cabinet BTU****	925	993	986	1136	1873
	110-120V, AC, 60Hz, 1Φ	AC2-2E2	AC2-3E2	AC2-4E2	AC2-5E2	AC2-6E2
	Cabinet Full Load Amps (FLA)	3.5 A	3.5 A	3.5 A	5 A	6.5 A
	Optional Outlets FLA	5 A	5 A	5 A	5 A	5 A
	Cabinet Nominal Power	302 W	300 W	346 W	388 W	595 W
	Cabinet BTU****	1030	1024	1181	1324	2030
	220-240V, AC, 60Hz, 1Φ	AC2-2E3	AC2-3E3	AC2-4E3	AC2-5E3	AC2-6E3
	Cabinet Full Load Amps (FLA)	2 A	2 A	2 A	2 A	4 A
	Optional Outlets FLA	5 A	5 A	5 A	5 A	5 A
	Cabinet Nominal Power	326 W	338 W	400 W	442 W	647 W
	Cabinet BTU****	1112	1153	1365	1508	2208
Net Weight***		160 kg (353 lbs)	177 kg (390 lbs)	203 kg (447 lbs)	251 kg (552 lbs)	299 kg (658 lbs)
Shipping Weight***		187 kg (412 lbs)	230 kg (507 lbs)	265 kg (583 lbs)	294 kg (647 lbs)	385 kg (847 lbs)
Shipping Dimensions, Maximum (W x D x H)***		850 x 820 x 1760 mm 33.5" x 32.3" x 69.3"	1150 x 850 x 1760 mm 45.3" 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***		1.23 m^3 (43 cu.ft.)	1.72 m^3 (61 cu.ft.)	2.17 m^3 (77 cu.ft.)	2.62 m^3 (93 cu.ft.)	3.07 m^3 (108 cu.ft.)

** 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.*

Airstream® Class II Biological Safety Cabinets (S-Series)

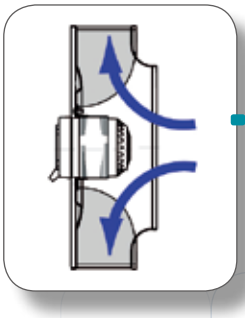
Provide Operator, Product and Environmental Protection

High Performance Fan System

German made ebm-papst® permanently lubricated, centrifugal motor/fans with external rotor designs.

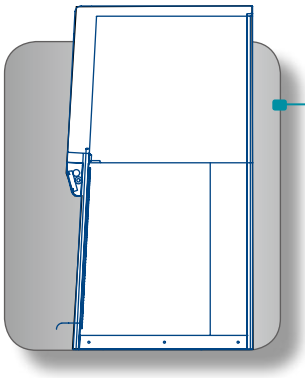
Motors selected for energy efficiency, compact design, and flat profile. Completely integrated assembly optimizes motor cooling.

All rotating parts balanced for smooth, quiet, vibration-free operation.



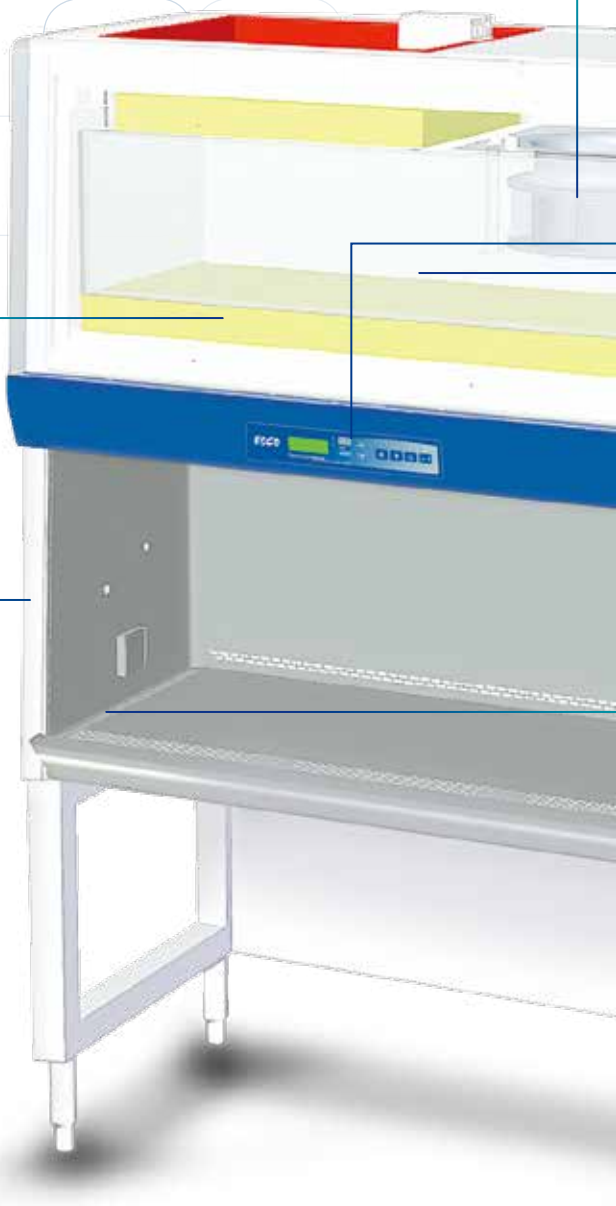
ULPA Filtration System

Swedish Camfil Farr® ULPA filters operate at a typical efficiency of ≥99.999% at 0.1 to 0.3 micron sizes, providing superior product protection over conventional HEPA filters. ULPA filters last as long as HEPA filters and have comparable replacement costs.

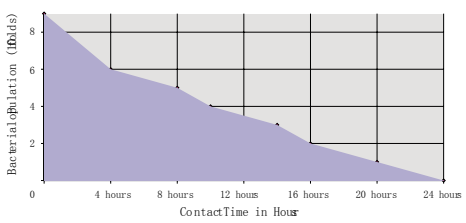


User Interface

Ergonomically angled front improves reach and comfort, reduces glare. Armrest with curved front edge provides excellent forearm support. Frameless, shatterproof sash is easier to clean, offers larger, unobstructed viewing area. Narrow profile inflow grille reduces strain while working.

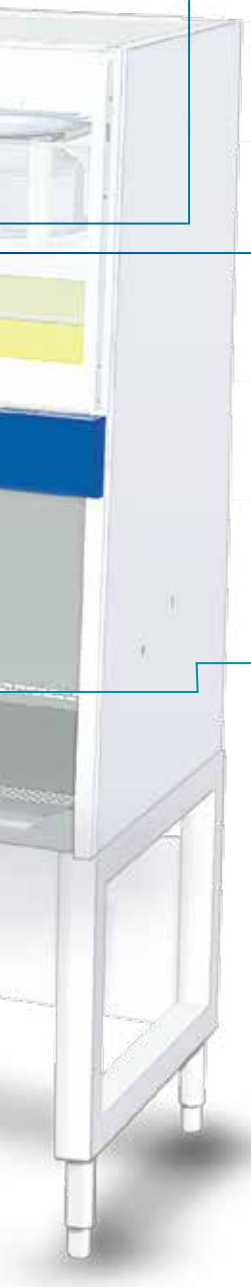


Airstream Class II Biological Safety Cabinet, Model AC2-4S_.



Built-In Protection

External surfaces are powder-coated with Esco ISOCIDE™ to eliminate 99.9% of surface bacteria within 24 hours of exposure.



Sentinel™ Gold Microprocessor Control System

Advanced microprocessor control supervises operation of all cabinet functions. Temperature-compensated air velocity sensor monitors both exhaust and downflow. And large 4-lines LCD shows user crucial cabinet status in a single glance. 24-hour clock, UV timer, UV hour meter, filter life display, and blower run hour meter are standard. Programmable PIN restricts unauthorized certification reminder cabinet access.

Robust Cabinet Construction

Key components, including fluorescent lamps, motor capacitor, electrical harness, electronic ballast, exhaust damper, and switch control are mounted outside the airstream and away from contaminated air to permit service without decontamination.

Work Top

The spill-retaining work top design with a recessed central area contains accidental liquid spills. Ergonomic tray handle to provide easy access and to encourage surface decontamination.

Dynamic Chamber™ Plenum Design

Negative pressure *Positive pressure*

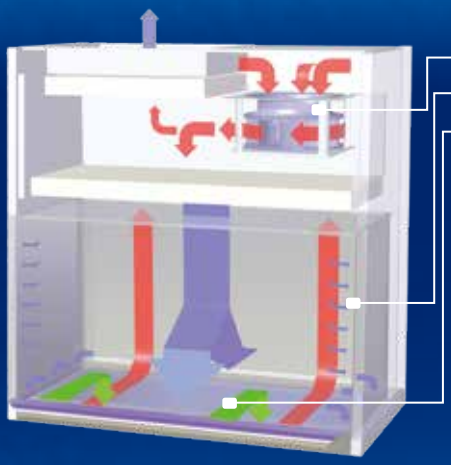
The Esco permanent metal Dynamic Chamber™ plenum surrounds contaminated areas with negative pressure, preventing the possibility of contamination from leaks in the filter seal, gasket or cabinet structure; no fabric bags are used.

Key Features

- All contaminated plenums are surrounded by negative pressure, virtually eliminating filter perimeter leaks.
- The backward curved wheel with external rotor motor delivers class-leading energy efficiency for lower operating costs.
- Unique raised armrest design elevates the operator's arms to prevent inflow grille blockage which may compromise safety.
- The cabinet work zone has no welded joints to collect contaminants or rust.
- Removable stainless-steel single-piece work surface with large radius corners simplifies cleaning.
- One-piece formed stainless steel work surface with a curved front edge is designed for maximum operator comfort.
- Auto-purge™ holes located at the front side walls eliminate eddy currents and dead air pockets in the critical area behind the sash window.
- The angled viewing window and narrow profile front grille improves reach into the work area.
- Actual sash opening is larger than tested opening, and improves reach into the work zone without compromising safety.
- Programmable automatic UV light timer simplifies operation while extending UV lamp life and saving energy.
- Cabinets are KI-Discus tested on a sampling basis for performance integrity.
- Additional IQ/OQ documentation is available upon request.

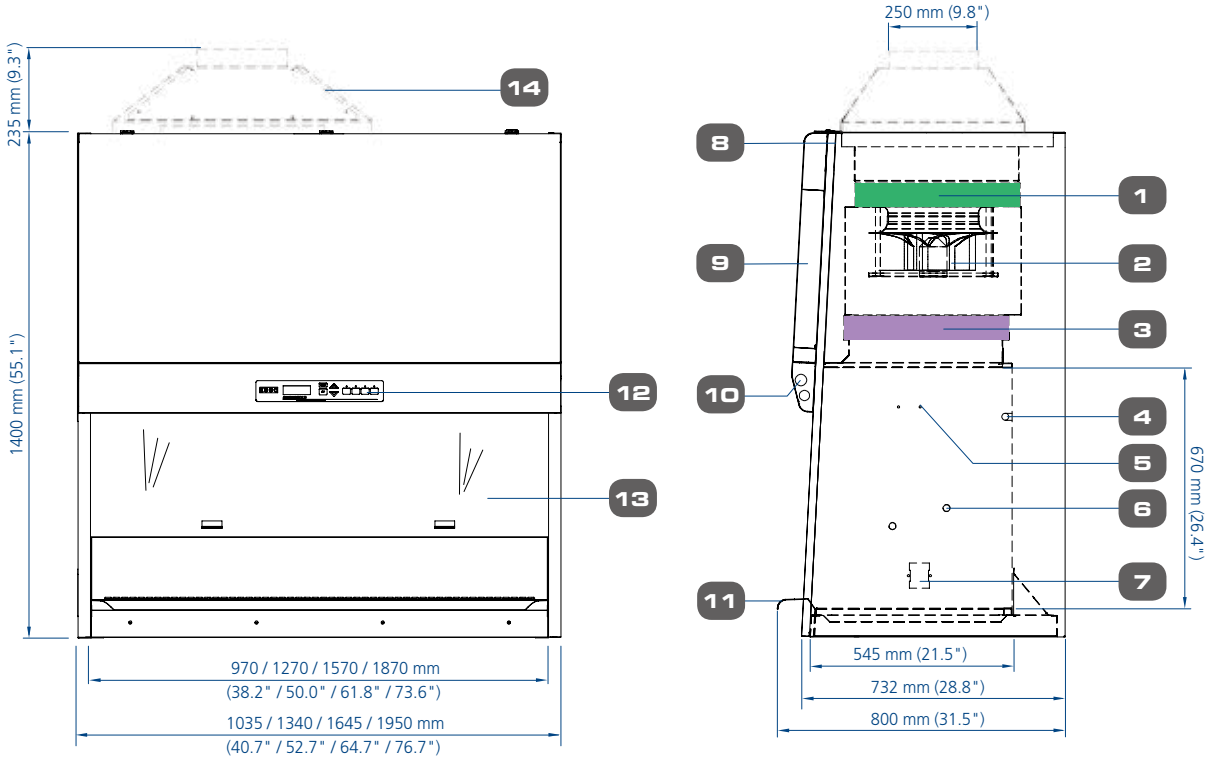
	Biological Safety Cabinets	Air Quality	Filtration	Electrical Safety
Standards Compliance	EN 12469, Europe	ISO 14644.1 Class 3, Worldwide AS 1386 Class 1.5, Australia JIS B9920 Class 3, Japan	IEST-RP-CC034, Worldwide IEST-RP-CC007, Worldwide IEST-RP-CC001, Worldwide EN 1822, Europe	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN/ CSA C22.2 No. 61010-1

Precision Tuned and Tested Airflow and Intake Geometry



- Ambient air is pulled through the perforations located towards the work zone front to prevent contamination of the work surface and work product. The inflow does not mix with the clean air within the cabinet work zone. Inflow air travels through a return path toward the common air plenum (fan plenum) at the top of the cabinet.
- 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 with a portion moving toward the front air grille, and the remainder moving to the rear air grille. A small portion of the ULPA filtered downflow enters the intake perforations at the side capture zones at a higher velocity (small purple arrows).
- A combination of inflow and downflow air streams forms an air barrier that prevents contaminated room air from entering the work zone, and prevents work surface emissions from escaping the work zone.
- Air returns to the common air plenum where the 32% exhaust and 68% recirculation process is continued.
- Optimized air curtain maintains personnel and product protection even in the unlikely event of inflow and downflow imbalance that would compromise protection on a conventional cabinet.

Airstream Model AC2 (S-Series) Biological Safety Cabinet Technical Specifications, Stainless Steel Side Walls



1. *Exhaust ULPA filter*
2. *Fan*
3. *Downflow ULPA filter*
4. *Standard UV light Retrofit Kit™ provision*
5. *Standard IV bar Retrofit Kit™ provision (Maximum load for IV bars is 1 kg)*
6. *Plugged service fixture provisions (2 on each side)*
7. *Standard electrical outlet Retrofit Kit™ provision*
8. *RS 232 port*
9. *Electrical and electronics panel*
10. *Fluorescent lamp*
11. *Stainless steel armrest*
12. *Esco Sentinel™ Gold microprocessor control system*
13. *Tempered glass sliding sash window*
14. *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.*

General Specifications, Airstream Class II, Biological Safety Cabinets (S-Series)

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

Model		AC2-3S_	AC2-4S_	AC2-5S_	AC2-6S_
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	1035 x 800 x 1400 mm 40.7" x 31.5" x 55.1"	1340 x 800 x 1400 mm 52.7" x 31.5" x 55.1"	1645 x 800 x 1400 mm 64.7" x 31.5" x 55.1"	1950 x 800 x 1400 mm 76.7" x 31.5" x 55.1"
	With Optional Base Stand, 711mm (28") type	1035 x 800 x 2111 mm 40.7" x 31.5" x 83.1"	1340 x 800 x 2111 mm 52.7" x 31.5" x 83.1"	1645 x 800 x 2111 mm 64.7" x 31.5" x 83.1"	1950 x 800 x 2111 mm 76.7" x 31.5" x 83.1"
Internal Work Area, Dimensions (W x D x H)		970 x 545 x 670 mm 38.2" x 21.5" x 26.4"	1270 x 545 x 670 mm 50.0" x 21.5" x 26.4"	1570 x 545 x 670 mm 61.8" x 21.5" x 26.4"	1870 x 545 x 670 mm 73.6" x 21.5" x 26.4"
Internal Work Area, Space		0.42 m^2 (4.6 sq.ft)	0.56 m^2 (6.0 sq.ft)	0.71 m^2 (7.6 sq.ft)	0.85 m^2 (9.1 sq.ft)
Average Airflow Velocity	Inflow	0.45 m/s (90 fpm) at initial setpoint			
	Downflow	0.30 m/s (60 fpm) at initial setpoint with uniformity of better than ± 20%			
Airflow Volume	Inflow	270 m^3/h (162 cfm)	356 m^3/h (213 cfm)	440 m^3/h (263 cfm)	524 m^3/h (313 cfm)
	Downflow	563 m^3/h (337 cfm)	741 m^3/h (443 cfm)	916 m^3/h (548 cfm)	1091 m^3/h (652 cfm)
	Exhaust	270 m^3/h (162 cfm)	356 m^3/h (213 cfm)	440 m^3/h (263 cfm)	524 m^3/h (313 cfm)
	Required Exhaust With Optional Thimble Exhaust	320 m^3/h (189 cfm)	538 m^3/h (317 cfm)	615 m^3/h (362 cfm)	823 m^3/h (485 cfm)
	Static Pressure For Optional Thimble Exhaust	29 Pa / 0.11 in H_2O	31 Pa / 0.12 in H_2O	35 Pa / 0.14 in H_2O	47 Pa / 0.18 in H_2O
ULPA Filter Typical Efficiency	Downflow	≥99.999% at 0.1 to 0.3 micron as per IEST-RP-CC001 USA ≥99.999% at MPPS as per EN 1822 (H14) EU			
	Exhaust				
Maximum Sash Opening		430 mm (17")	430 mm (17")	430 mm (17")	430 mm (17")
Sound Emission (Typical)*	NSF / ANSI 49	<61 dBA	<62 dBA	<62 dBA	<63 dBA
	EN 12469	<58 dBA	<59 dBA	<59 dBA	<60 dBA
Fluorescent Light Intensity At Zero Ambient		>1040 Lux (>97 foot candles)	>1190 Lux (>111 foot candles)	>920 Lux (>85 foot candles)	>1020 Lux (>95 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 No.4 finish			
	Side Walls	0.9 mm (0.035") 20 gauge stainless steel type 304			
Electrical**	220-240V, AC, 50Hz, 1Φ	AC2-3S1	AC2-4S1	AC2-5S1	AC2-6S1
	Cabinet Full Load Amps (FLA)	2 A	2 A	2 A	4 A
	Cabinet Nominal Power	286 W	306 W	321 W	558 W
	Optional Outlets FLA	5 A	5 A	5 A	5 A
	Total Cabinet FLA	7 A	7 A	7 A	9 A
	Cabinet BTU****	976	1044	1095	1904
	110-120V, AC, 60Hz, 1Φ	AC2-3S2	AC2-4S2	AC2-5S2	AC2-6S2
	Cabinet Full Load Amps (FLA)	3.5 A	3.5 A	5 A	6.5 A
	Optional Outlets FLA	5 A	5 A	5 A	5 A
	Cabinet Nominal Power	246 W	342 W	379 W	572 W
	Cabinet BTU****	839	1167	1293	1952
	220-240V, AC, 60Hz, 1Φ	AC2-3S3	AC2-4S3	AC2-5S3	AC2-6S3
	Cabinet Full Load Amps (FLA)	2 A	2 A	2 A	4 A
	Optional Outlets FLA	5 A	5 A	5 A	5 A
	Cabinet Nominal Power	348 W	391 W	409 W	678 W
	Cabinet BTU****	1187	1334	1396	2313
Net Weight***		180 kg (397 lbs)	218 kg (481 lbs)	256 kg (563 lbs)	305 kg (672 lbs)
Shipping Weight***		230 kg (507 lbs)	272 kg (599 lbs)	320 kg (704 lbs)	361 kg (795 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^3 (61 cu.ft.)	2.17 m^3 (77 cu.ft.)	2.62 m^3 (93 cu.ft.)	3.07 m^3 (108 cu.ft.)

** 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.*

Airstream® Class II Biological Safety Cabinets (D-Series)

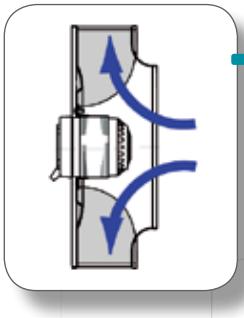
Provide Operator, Product and Environmental Protection

High Performance Fan System

German made ebm-papst® permanently lubricated, centrifugal motor/fans with external rotor designs.

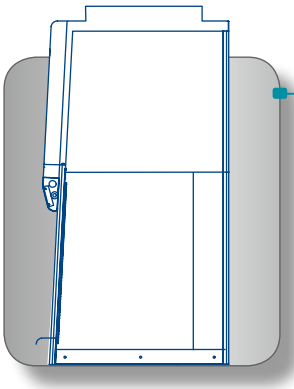
Motors selected for energy efficiency, compact design, and flat profile. Completely integrated assembly optimizes motor cooling.

All rotating parts balanced for smooth, quiet, vibration-free operation.



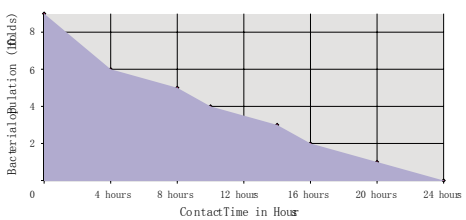
ULPA Filtration System

Swedish Camfil Farr® ULPA filters operate at a typical efficiency of ≥99.999% at 0.1 to 0.3 micron sizes, providing superior product protection over conventional HEPA filters. ULPA filters last as long as HEPA filters and have comparable replacement costs.



User Interface

Ergonomically angled front improves reach and comfort, reduces glare. Armrest with curved front edge provides excellent forearm support. Frameless, shatterproof sash is easier to clean, offers larger, unobstructed viewing area. Narrow profile inflow grille reduces strain while working.



Built-In Protection

External surfaces are powder-coated with Esco ISOCIDE™ to eliminate 99.9% of surface bacteria within 24 hours of exposure.

Airstream Class II Biological Safety Cabinet, Model AC2-4D_.

Sentinel™ Gold Microprocessor Control System

Advanced microprocessor control supervises operation of all cabinet functions. Temperature-compensated air velocity sensor monitors both exhaust and downflow. And large 4-lines LCD shows user crucial cabinet status in a single glance. 24-hour clock, UV timer, UV hour meter, filter life display, and blower run hour meter are standard. Programmable PIN restricts unauthorized certification reminder cabinet access.

Robust Cabinet Construction

Key components, including fluorescent lamps, motor capacitor, electrical harness, electronic ballast, exhaust damper, and switch control are mounted outside the airstream and away from contaminated air to permit service without decontamination.

Work Top

Multi-piece tray can be easily lifted and removed with the help of ergonomic tray handle to provide easy access and to encourage surface decontamination. Work trays are rounded at the rear for easy cleaning.

Dynamic Chamber™ Plenum Design

Negative pressure *Positive pressure*

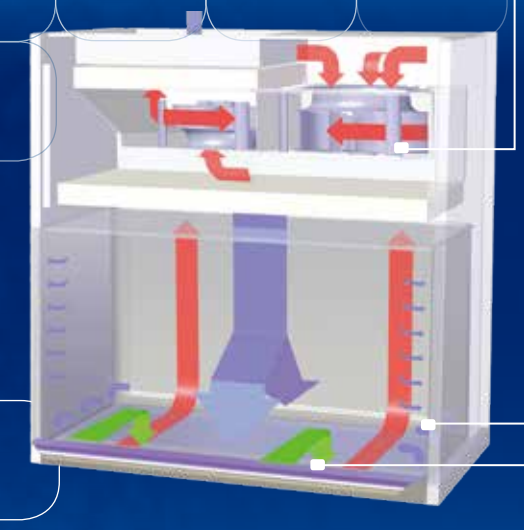
The Esco permanent metal Dynamic Chamber™ plenum surrounds contaminated areas with negative pressure, preventing the possibility of contamination from leaks in the filter seal, gasket or cabinet structure; no fabric bags are used.

Key Features

- Dual ULPA Filters, >100,000 x Better Protection than Single Filter Systems.
- Independent Inflow/Downflow Fans, Redundant System Provides Protection in Case of Fan Failure.
- All contaminated plenums are surrounded by negative pressure, virtually eliminating filter perimeter leaks.
- The backward curved wheel with external rotor motor delivers class-leading energy efficiency for lower operating costs.
- Unique raised armrest design elevates the operator's arms to prevent inflow grille blockage which may compromise safety.
- The cabinet work zone has no welded joints to collect contaminants or rust.
- Removable stainless-steel single-piece work surface with large radius corners simplifies cleaning.
- One-piece formed stainless steel work surface with a curved front edge is designed for maximum operator comfort.
- Auto-purge™ holes located at the front side walls eliminate eddy currents and dead air pockets in the critical area behind the sash window.
- The angled viewing window and narrow profile front grille improves reach into the work area.
- Actual sash opening is larger than tested opening, and improves reach into the work zone without compromising safety.
- Programmable automatic UV light timer simplifies operation while extending UV lamp life and saving energy.
- Cabinets are KI-Discus tested on a sampling basis for performance integrity.
- Additional IQ/OQ documentation is available upon request.

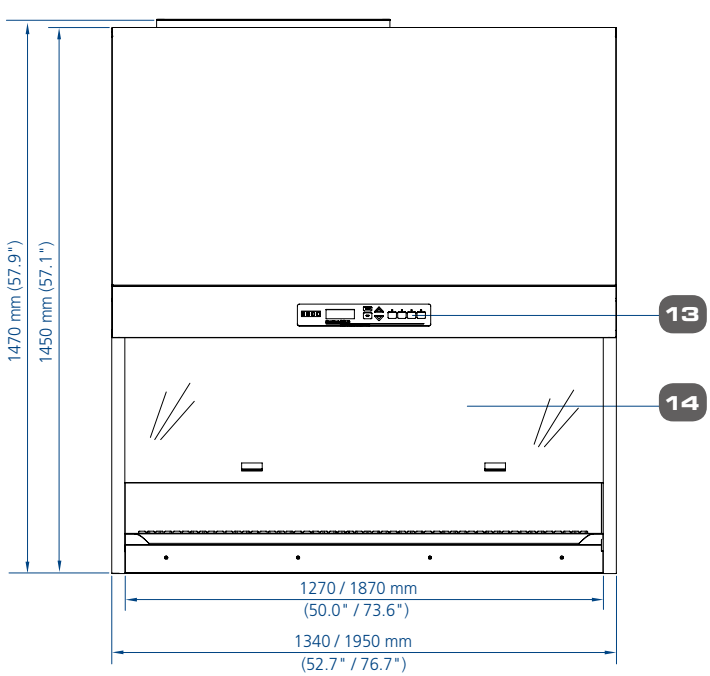
	Biological Safety Cabinets	Air Quality	Filtration	Electrical Safety
Standards Compliance	EN 12469, Europe	ISO 14644.1 Class 3, Worldwide AS 1386 Class 1.5, Australia JIS B9920 Class 3, Japan	IEST-RP-CC034, Worldwide IEST-RP-CC007, Worldwide IEST-RP-CC001, Worldwide EN 1822, Europe	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN/ CSA C22.2 No. 61010-1

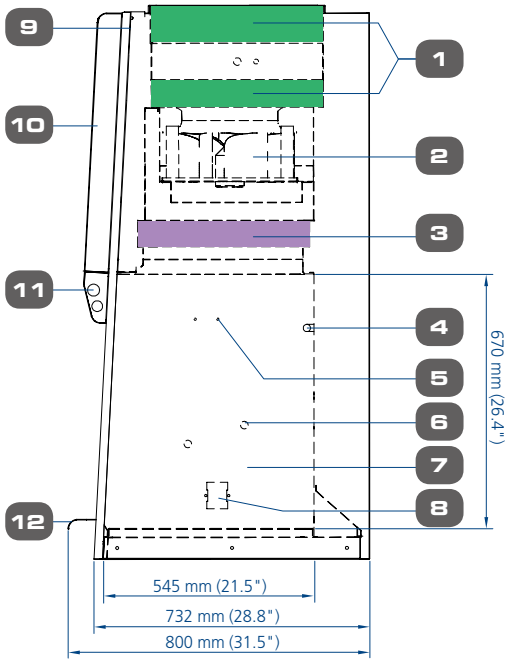
Precision Tuned and Tested Airflow and Intake Geometry



- Ambient air is pulled through the perforations located towards the work zone front to prevent contamination of the work surface and work product. The inflow does not mix with the clean air within the cabinet work zone. Inflow air travels through a return path toward the common air plenum (fan plenum) at the top of the cabinet.
- Dual fans and dual exhaust filters provide an added measure of protection. If the primary fan fails, the secondary fan still pushes the air across the exhaust filters to maintain inflow and containment.
- Approximately 32% of the air in the common plenum is exhausted through the ULPA filter to the room. The remaining 68% of the air is passed through the downflow ULPA filter and into the work area 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 with a portion moving toward the front air grille, and the remainder moving to the rear air grille. A small portion of the ULPA filtered downflow enters the intake perforations at the side capture zones at a higher velocity (small blue arrows).
- A combination of inflow and downflow air streams forms an air barrier that prevents contaminated room air from entering the work zone, and prevents work surface emissions from escaping the work zone.
- Air returns to the common air plenum where the 32% exhaust and 68% recirculation process is continued.
- Optimized air curtain maintains personnel and product protection even in the unlikely event of inflow and downflow imbalance that would compromise protection on a conventional cabinet.

Airstream Duo Model AC2 (D-Series) Biological Safety Cabinet Technical Specifications, Stainless Steel Side Walls, Dual Fan - Dual Exhaust Filter System





1. *Dual exhaust ULPA filters*
2. *Fan*
3. *Downflow ULPA filter*
4. *Standard UV light Retrofit Kit™ provision*
5. *Standard IV bar Retrofit Kit™ provision (Maximum load for IV bars is 1 kg)*
6. *Plugged service fixture provisions (2 on each side)*
7. *Stainless steel work zone*
8. *Electrical outlet Retrofit Kit™ provision*
9. *RS 232 port*
10. *Electrical panel*
11. *Fluorescent lamp*
12. *Stainless steel armrest*
13. *Esco Sentinel™ Gold microprocessor control system*
14. *Tempered glass sliding sash window*

General Specifications, Airstream Class II, Biological Safety Cabinets (D-Series)

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

Model		AC2-4D_	AC2-6D_
Nominal Size		1.2 meters (4')	1.8 meters (6')
External Dimensions (W x D x H)	Without Base Stand	1340 x 800 x 1470 mm 52.7" x 31.5" x 57.9"	1950 x 800 x 1470 mm 76.7" x 31.5" x 57.9"
	With Optional Base Stand, 711mm (28") type	1340 x 800 x 2181 mm 52.8" x 31.5" x 85.9"	1950 x 800 x 2181 mm 76.7" x 31.5" x 85.9"
Internal Work Area, Dimensions (W x D x H)		1270 x 545 x 670 mm 50.0" x 21.5" x 26.4"	1870 x 545 x 670 mm 73.6" x 21.5" x 26.4"
Internal Work Area, Space		0.56 m^2 (6.0 sq.ft)	0.85 m^2 (9.1 sq.ft)
Average Airflow Velocity	Inflow	0.45 m/s (90 fpm) at initial setpoint	
	Downflow	0.30 m/s (60 fpm) at initial setpoint with uniformity of better than ± 20%	
Airflow Volume	Inflow	356 m^3/h (213 cfm)	524 m^3/h (313 cfm)
	Downflow	741 m^3/h (443 cfm)	1091 m^3/h (652 cfm)
	Exhaust	356 m^3/h (213 cfm)	524 m^3/h (313 cfm)
	Required Exhaust With Optional Thimble Exhaust	538 m^3/h (317 cfm)	823 m^3/h (485 cfm)
	Static Pressure For Optional Thimble Exhaust	31 Pa / 0.12 in H_2O	47 Pa / 0.18 in H_2O
ULPA Filter Typical Efficiency	Downflow	≥99.999% at 0.1 to 0.3 micron as per IEST-RP-CC001 USA ≥99.999% at MPPS as per EN 1822 (H14) EU	
	Exhaust		
Maximun Sash Opening		430 mm (17")	430 mm (17")
Sound Emission (Typical)*	NSF / ANSI 49	<62.5 dBA	<63 dBA
	EN 12469	<59.5 dBA	<60 dBA
Fluorescent Light Intensity At Zero Ambient		>1200 Lux (>111.5 foot candles)	>1020 Lux (>95 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 No.4 finish	
	Side Walls	0.9 mm (0.035") 20 gauge stainless steel type 304	
Electrical**	220-240V, AC, 50Hz, 1Φ	AC2-4D1	AC2-6D1
	Cabinet Full Load Amps (FLA)	3 A	4.5 A
	Optional Outlets FLA	5 A	5 A
	Cabinet Nominal Power	394 W	660 W
	Cabinet BTU****	1344	2252
	220-240V, AC, 60Hz, 1Φ	AC2-4D3	AC2-6D3
	Cabinet Full Load Amps (FLA)	3 A	4.5 A
	Optional Outlets FLA	5 A	5 A
	Cabinet Nominal Power	502 W	792 W
	Cabinet BTU****	1713	2702
Net Weight***		223.5 kg (492.7 lbs)	315 kg (694 lbs)
Shipping Weight***		245.5 kg (541.2 lbs)	370 kg (815 lbs)
Shipping Dimensions, Maximum (W x D x H)***		1450 x 850 x 1760 mm 57.1" x 33.5" x 69.3"	2050 x 850 x 1760 mm 80.7" x 33.5" x 69.3"
Shipping Volume, Maximum***		2.17 m^3 (77 cu.ft.)	3.07 m^3 (108 cu.ft.)

** 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.*

Airstream® Class II Biological Safety Cabinets (G-Series)

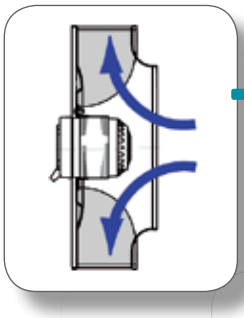
Provide Operator, Product and Environmental Protection

High Performance Fan System

German made ebm-papst® permanently lubricated, centrifugal motor/fans with external rotor designs.

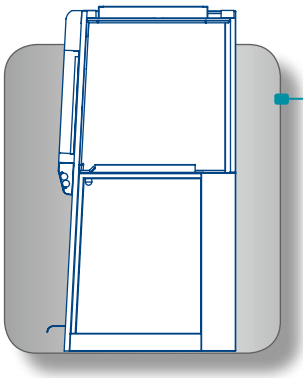
Motors selected for energy efficiency, compact design, and flat profile. Completely integrated assembly optimizes motor cooling.

All rotating parts balanced for smooth, quiet, vibration-free operation.



ULPA Filtration System

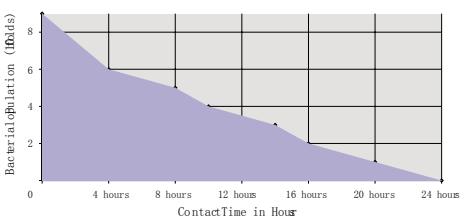
Swedish Camfil Farr® ULPA filters operate at a typical efficiency of ≥99.999% at 0.1 to 0.3 micron sizes, providing superior product protection over conventional HEPA filters. ULPA filters last as long as HEPA filters and have comparable replacement costs.



User Interface

Ergonomically angled front improves reach and comfort, reduces glare. Armrest with curved front edge provides excellent forearm support. Frameless, shatterproof sash is easier to clean, offers larger, unobstructed viewing area. Narrow profile inflow grille reduces strain while working.

Airstream Class II Biological Safety Cabinet, Model AC2-4G_.



Built-In Protection

External surfaces are powder-coated with Esco ISOCIDE™ to eliminate 99.9% of surface bacteria within 24 hours of exposure.

Sentinel™ Gold Microprocessor Control System

Advanced microprocessor control supervises operation of all cabinet functions. Temperature-compensated air velocity sensor monitors both exhaust and downflow. And large 4-lines LCD shows user crucial cabinet status in a single glance. 24-hour clock, UV timer, UV hour meter, filter life display, and blower run hour meter are standard. Programmable PIN restricts unauthorized certification reminder cabinet access.

Robust Cabinet Construction

Key components, including fluorescent lamps, motor capacitor, electrical harness, electronic ballast, exhaust damper, and switch control are mounted outside the airstream and away from contaminated air to permit service without decontamination.

Work Top

Multi-piece tray can be easily lifted and removed with the help of ergonomic tray handle to provide easy access and to encourage surface decontamination. Work trays are rounded at the rear for easy cleaning.

Dynamic Chamber™ Plenum Design

Negative pressure *Positive pressure*

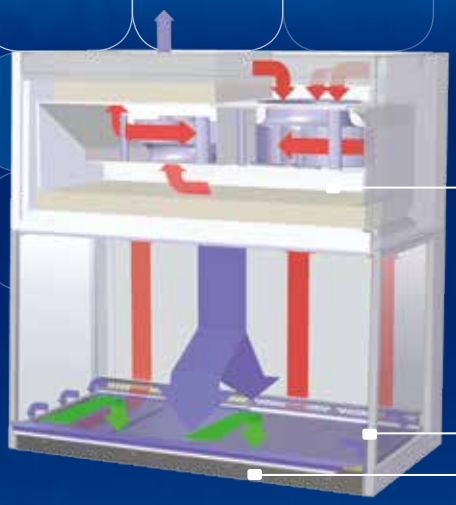
The Esco permanent metal Dynamic Chamber™ plenum surrounds contaminated areas with negative pressure, preventing the possibility of contamination from leaks in the filter seal, gasket or cabinet structure; no fabric bags are used.

Key Features

- Dual ULPA Filters, >100,000 x Better Protection than Single Filter Systems.
- Independent Inflow/Downflow Fans, Redundant System Provides Protection in Case of Fan Failure.
- All contaminated plenums are surrounded by negative pressure, virtually eliminating filter perimeter leaks.
- The backward curved wheel with external rotor motor delivers class-leading energy efficiency for lower operating costs.
- Unique raised armrest design elevates the operator's arms to prevent inflow grille blockage which may compromise safety.
- The cabinet work zone has no welded joints to collect contaminants or rust.
- Multiple piece stainless steel work surface is easier to remove and put into autoclave / washer.
- Glass sides eliminate the feeling of "working in a box", enhance cabinet lighting, and permit observation of procedures.
- The angled viewing window and narrow profile front grille improves reach into the work area.
- Actual sash opening is larger than tested opening, and improves reach into the work zone without compromising safety.
- Programmable automatic UV light timer simplifies operation while extending UV lamp life and saving energy.
- Powder-coated work zone rear wall increases light intensity compared to stainless steel interiors.
- Cabinets are KI-Discus tested on a sampling basis for performance integrity.
- Additional IQ/OQ documentation is available upon request.

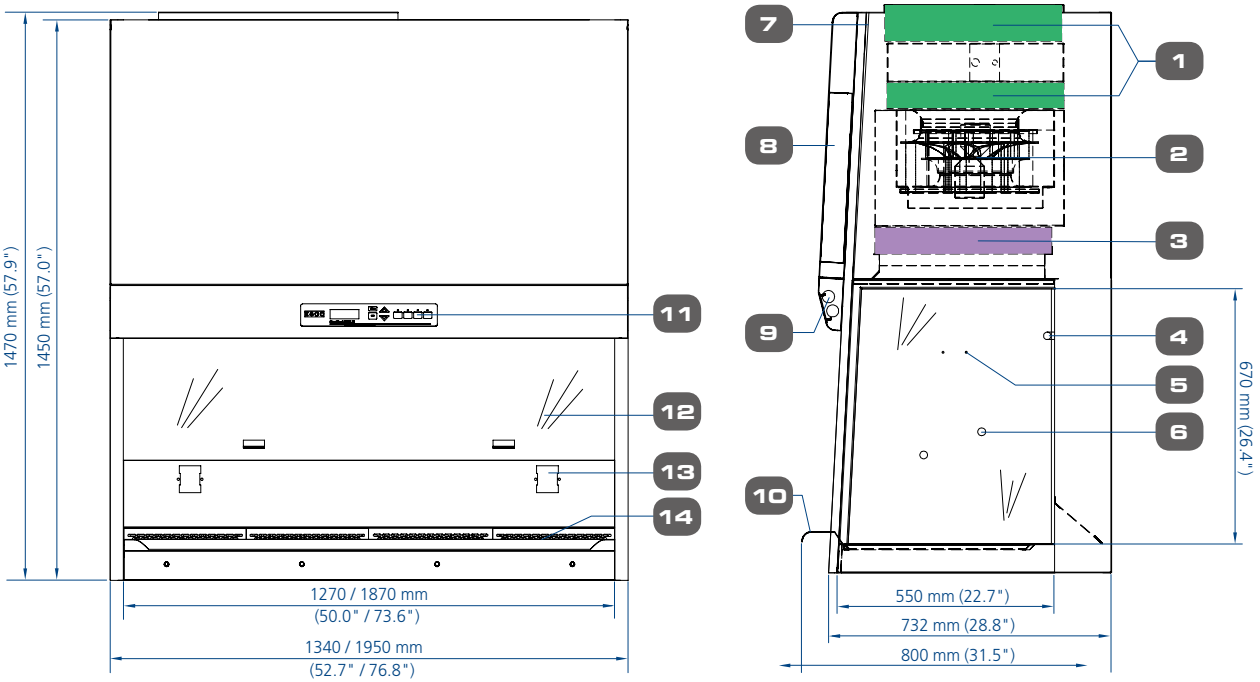
	Microbiological Safety Cabinets	Air Quality	Filtration	Electrical Safety
Standards Compliance	EN 12469, Europe	ISO 14644.1 Class 3, Worldwide AS 1386 Class 1.5, Australia JIS B9920 Class 3, Japan	IEST-RP-CC034, Worldwide IEST-RP-CC007, Worldwide IEST-RP-CC001, Worldwide EN 1822, Europe	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN/ CSA C22.2 No. 61010-1

Precision Tuned and Tested Airflow and Intake Geometry



- Ambient air is pulled through the perforations located towards the work zone front to prevent contamination of the work surface and work product. The inflow does not mix with the clean air within the cabinet work zone. Inflow air travels through a return path toward the common air plenum (fan plenum) at the top of the cabinet.
- Dual fans and dual exhaust filters provide an added measure of protection. If the primary fan fails, the secondary fan still pushes the air across the exhaust filters to maintain inflow and containment.
- Approximately 32% of the air in the common plenum is exhausted through the ULPA filter to the room. The remaining 68% of the air is passed through the downflow ULPA filter and into the work area 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 with a portion moving toward the front air grille, and the remainder moving to the rear air grille. A small portion of the ULPA filtered downflow enters the intake perforations at the side capture zones at a higher velocity (small blue arrows).
- A combination of inflow and downflow air streams forms an air barrier that prevents contaminated room air from entering the work zone, and prevents work surface emissions from escaping the work zone.
- Air returns to the common air plenum where the 32% exhaust and 68% recirculation process is continued.

Airstream Duo Model AC2 (G-Series) Biological Safety Cabinet Technical Specifications, Tempered Glass Side Walls, Dual Fan - Dual Exhaust Filter System



1. *Dual exhaust ULPA filters*
2. *Fan*
3. *Downflow ULPA filter*
4. *Standard UV light Retrofit Kit™ provision*
5. *Standard IV bar Retrofit Kit™ provision (Maximum load for IV bars is 1 kg)*
6. *Plugged services fixtures provisions (2 on each side)*
7. *RS 232 port*
8. *Electrical panel*
9. *Fluorescent lamp*
10. *Stainless steel armrest*
11. *Esco Sentinel™ Gold microprocessor control system*
12. *Tempered glass sliding sash window*
13. *Electrical outlet Retrofit Kit provision*
14. *Stainless steel multi-piece work tray*

General Specifications, Airstream Class II, Biological Safety Cabinets (G-Series)

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

Model		AC2-4G_	AC2-6G_
Nominal Size		1.2 meters (4')	1.8 meters (6')
External Dimensions (W x D x H)	Without Base Stand	1340 x 800 x 1470 mm 52.7" x 31.5" x 57.9"	1950 x 800 x 1470 mm 76.7" x 31.5" x 57.9"
	With Optional Base Stand, 711mm (28") type	1340 x 800 x 2181 mm 52.7" x 31.5" x 85.9"	1950 x 800 x 2181 mm 76.7" x 31.5" x 85.9"
Internal Work Area, Dimensions (W x D x H)		1270 x 550 x 670 mm 50.0" x 22.7" x 26.4"	1870 x 550 x 670 mm 73.6" x 22.7" x 26.4"
Internal Work Area, Space		0.56 m^2 (6.0 sq.ft)	0.85 m^2 (9.1 sq.ft)
Average Airflow Velocity	Inflow	0.45 m/s (90 fpm) at initial setpoint	
	Downflow	0.30 m/s (60 fpm) at initial setpoint with uniformity of better than ± 20%	
Airflow Volume	Inflow	356 m^3 /h (213 cfm)	524 m^3 /h (313 cfm)
	Downflow	741 m^3 /h (443 cfm)	1091 m^3 /h (652 cfm)
	Exhaust	356 m^3/h (213 cfm)	524 m^3 /h (313 cfm)
	Required Exhaust With Optional Thimble Exhaust	538 m^3/h (317 cfm)	823 m^3/h (485 cfm)
	Static Pressure For Optional Thimble Exhaust	31 Pa / 0.12 in H_2O	47 Pa / 0.18 in H_2O
ULPA Filter Typical Efficiency	Downflow	≥99.999% at 0.1 to 0.3 micron as per IEST-RP-CC001 USA ≥99.999% at MPPS as per EN 1822 (H14) EU	
	Exhaust		
Maximun Sash Opening		430 mm (17")	430 mm (17")
Sound Emission (Typical)*	NSF / ANSI 49	<62 dBA	<63 dBA
	EN 12469	<59 dBA	<60 dBA
Fluorescent Light Intensity At Zero Ambient		>1280 Lux (>119 foot candles)	>1220 Lux (>113 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 No.4 finish	
	Side Walls	UV absorbing tempered glass, 5 mm (0.2"), colorless and transparent	
Electrical**	220-240V, AC, 50Hz, 1Φ	AC2-4G1	AC2-6G1
	Cabinet Full Load Amps (FLA)	3 A	4.5 A
	Optional Outlets FLA	5 A	5 A
	Cabinet Nominal Power	403 W	660 W
	Cabinet BTU****	1375	2252
	220-240V, AC, 60Hz, 1Φ	AC2-4 G3	AC2-6G3
	Cabinet Full Load Amps (FLA)	3 A	4.5 A
	Optional Outlets FLA	5 A	5 A
	Cabinet Nominal Power	483.6 W	792 W
	Cabinet BTU****	1650	2702
Net Weight***		213 kg (470 lbs)	310 kg (683 lbs)
Shipping Weight***		292 kg (644 lbs)	323 kg (712 lbs)
Shipping Dimensions, Maximum (W x D x H)***		1450 x 850 x 1760 mm 57.1" x 33.5" x 69.3"	2050 x 850 x 1760 mm 80.7" x 33.5" x 69.3"
Shipping Volume, Maximum***		2.17 m^3 (77 cu.ft.)	3.07 m^3 (108 cu.ft.)

** 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.*

Options and Accessories

Support Stands

Support Stand with Caster Wheels (SPC)

- Available in two standard heights: 711mm (28.0") or 860mm (34.0")
- Durable polyurethane caster wheels with 360 degree horizontal rotation
- Total brake system on front wheels
- Maximum weight supported: 600 kg (1323 lbs)

Support Stand with Leveling Feet (SAL)

- Available in two standard heights: 737 mm (29.0") or 864 mm (34.0"), ±38.1 mm (1.5")
- Maximum weight supported: 500 kg (1,100 lbs)

Telescoping Support Stands with Caster Wheels (STC)

- Allow manual adjustment of the product height. The cabinet must be removed from a Telescoping Support Stand prior to adjustments.
- Adjustable height range: 660-880 mm (26.0"-34.6")
- Adjustable in 25.4 mm (1.0") increments
- White oven-baked epoxy powder-coated finish, better adjustment interval than other brands.
- Total brake system on front wheels
- Maximum weight supported: 600 kg (1323 lbs)

Telescoping Support Stands with Leveling Feet (STL)

- Allow manual adjustment of the product height. The cabinet must be removed from a Telescoping Support Stand prior to adjustments.
- Adjustable height range: 660-960 mm (26.0"-37.8")
- White oven-baked epoxy powder-coated finish
- Leveling feet models are NSF tested
- Maximum weight supported: 600 kg (1323 lbs)

Hydraulic Motorized Adjustable Support Stand with Casters (SPM)

- Adjustable height range : 711-863 mm / (28.0"-34.0")
- Infinitely adjustable to accommodate user preference for sitting or standing work surface height.
- Standard with caster wheels
- Motorized electrically-adjustable
- White oven-baked epoxy powder-coated finish
- Maximum weight supported: 500 kg (1100 lbs)

Electrical Outlets and Utility Fixtures

- Electrical outlet, Ground Fault Circuit Interrupter, North America

Note: 2ft, 3ft cabinets - 1 Retrofit Kit;
4ft, 5ft, 6ft cabinets - 2 Retrofit Kits.

- Electrical outlet, Europe / Worldwide

Note: 2ft, 3ft cabinets - 1 Retrofit Kit;
4ft, 5ft, 6ft cabinets - 2 Retrofit Kits.

- Petcock (air, gas, vacuum)
  -North America (American) style
  -Europe / Worldwide style
  DIN 12898, DIN 12919,
  DIN 3537

Cabinet Accessories

IV Bar with Hooks

For pharmacy applications, a built-in intravenous bar provides a convenient means to hang and store intravenous bags during work. Apart from convenience, the IV bar increases the effective cabinet working zone.

- Stainless steel IV bar with 6 hooks.

Germicidal UV Lamps

- Controlled by automatic UV lamp timer through Sentinel™ microprocessor control panel
- Emission of 253.7 nanometers for most efficient decontamination
- Lamp is positioned away from operator line of sight for safety and proper exposure to interior surfaces.

Note: Observe personnel safety precautions when using UV lamps.
UV lamp is not a substitute for good cleaning and decontamination practices. Its effective lifespan is limited to approx.12 months depending upon the total number of hours in use. Replace UV lamp every 12 months.

Ergonomic Foot Rest

- Angled, helps maintain proper posture
- Adjustable height
- Anti-skid coating, chemical resistant finish

PVC Armrest

- Chemically treated, improves operator comfort, easy to clean.

Ergonomic Lab Chair

- Laboratory grade construction, meets Class 100 cleanliness; alcohol resistant PVC materials
- Adjustable height 395-490 mm (15.6"-19.3")

Microscope Viewing Device

- Mounting and viewing pouch integrated into sash.
- Factory installed; specify when ordering.

Microbiological Testing

Esco performs testing in accordance with more than 10 of the world's most recognized standards for local, regional and international criteria.

Testing in our microbiology laboratory is conducted according to NSF / ANSI 49, EN12469, and JIS K3800. An NSF-accredited biosafety cabinet field certifier is available in-house full-time to supervise all testing work, using harmless Bacillus Subtilis bacteria that is used to challenge the cabinet, then incubated for 48 hours and the Colony Forming Units (CFU) are counted to determine the testing results. Increased microbiological challenge tests with objects inside the cabinet work zone, Bunsen burner, external airflow disturbance, and Human-As-Mannequin test adapted from Fume Hood development were performed to simulate real-world conditions.

Personnel Protection Test

The test objective is to evaluate the safety of the cabinet for the personnel operating on potentially hazardous samples in the cabinet work zone.

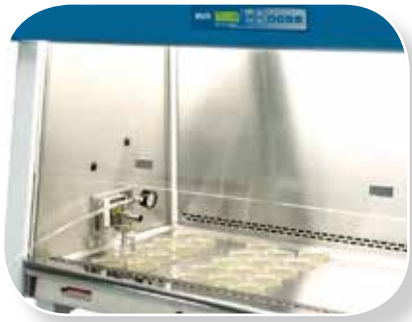
- A nebulizer containing 55 mL of 5 to 8 x 10^8 spores/mL B.Subtilis spores is placed inside the work zone, 10 cm (4") behind the front opening sash.
- Target slit air samplers and impingers are placed outside the work zone to capture possibly escaping B.Subtilis spores, then the sample is incubated.
- Acceptance: The number of Bacillus Subtilis CFU recovered from the agar plates shall not exceed 10 CFU per test.

Product Protection Test

The test objective is to determine cabinet protection to the product/samples inside the cabinet work zone from environmental contaminants.

- A nebulizer containing 55 mL of 5 to 8 x 10^6 spores/mL B.Subtilis is placed at 10 cm (4") in front of sash window.
- Target agar plates are placed throughout the entire work surface.
- Acceptance: The number of Bacillus Subtilis CFU recovered from the agar plates shall not exceed 5 CFU per test.

Cross-Contamination Test



The test objective is to evaluate cabinet protection from cross-contamination of samples placed simultaneously inside the work zone.

- A nebulizer containing 55 mL of spores (5 to 8 x 10^4/mL) is placed against one of the work zone sidewalls.
- Target agar plates are placed 360 mm (14") away from the same side wall.
- Acceptance: The number of Bacillus Subtilis CFU recovered on agar plates shall not exceed 2 CFU per test.

KI Discus Containment Test According to EN 12469 (Potassium Iodide)

Esco is currently one of the few companies in the world equipped to perform the KI Discus test for our customers. The KI Discus test is defined in the European Standard for microbiological safety cabinets, EN12469, as a test method for validating the operator/personnel protection capabilities of the cabinet.

- The KI Discus test shows excellent correlation with the microbiological test method for operator protection, and is useful for validating the actual containment performance of the cabinet on-site.
- The KI-Discus takes only 45 minutes as opposed to 2 days for microbiological testing.
- Thus, Esco Airstream AC2 model is factory tested on a sampling basis using the KI-Discus method for operator safety.

Comprehensive Performance Testing At Esco

Every Airstream model manufactured by Esco is individually tested, documented by serial number and validated with the following test methods.

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

Purchase Specifications

AC2 Series Class II Biological Safety Cabinet

General Performance and Certifications

1. The biological safety cabinet shall comply with one or more of the following international standards, and the manufacturer shall provide a certified copy of containment and performance tests equivalent to or greater than specified in the following independent international standards for biological safety, electrical and other functional characteristics: Class II per EN 12469, SFDA YY-0569, SANS12469.
2. The cabinet shall protect (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.
3. Cabinets shall be factory tested on a sampling basis by the KI-Discus test (European Standard EN12469:2000) to validate operator/personnel protection. The retention efficiency for the front aperture shall be not less than 99.999%. Microbiological testing for cabinet performance shall be performed on a statistical sampling basis.
4. Cabinets rated for operation at 230VAC 50HZ shall be CE-marked and meet corresponding requirements for electrical safety.
5. Original documentation specific to each cabinet serial number shall be provided with the cabinet and maintained in the manufacturer's records. Test data verifying all performance criteria shall be available upon request to include: (a) inflow velocity through direct inflow measurement method; (b) downflow velocity and uniformity; (c) filter leak scan with aerosol challenge for both filters; (d) and electrical safety.

Filtration System

6. The cabinet shall have one supply downflow filter and separate exhaust filter(s) (AC2-D, AC2-G). All filters shall be ULPA type per IEST-RP-CC001 and meet EN1822 (H14) requirements. Dual exhaust filtered cabinets shall have twin exhaust filters providing >100,000x better protection than single exhaust filtered models.
7. The filters shall be within an aluminum frame with mini-pleat design without aluminum separators; no wood or fiberboard shall be used in the filter assembly.
8. Typical filter efficiency shall be 99.999% at MPPS and for particle size between 0.1 to 0.3 micron.
9. An integral filter guard shall be affixed to prevent damage to the filter media.
10. The filters shall be (a) individually scan tested by the manufacturer, (b) individually scan tested after assembly, and (b) easily accessible for scan testing in situ by means of a dedicated upstream sampling port accessible from within the cabinet.
11. A removable, perforated metal diffuser shall be installed below the supply filter to optimize airflow uniformity and to protect from damage.

Fan System

12. The cabinet shall have direct drive, permanently lubricated centrifugal fan(s)/motor(s) dynamically balanced in two planes compliant to ISO2710 for low noise, low vibration and long filter life.
13. The fan/motor shall have an external rotor design and include an automatic thermal cut-out to disable the motor in case of overheating.
14. The fan/motor shall have sufficient reserve capacity to compensate for filter loading.
15. The fan/motor system shall be enclosed within a dynamic chamber shaped steel plenum and integrated with the removable supply filter assembly to simplify filter changing.
16. Cabinet shall be equipped with separate main/exhaust fan or exhaust damper to facilitate airflow balancing.
17. The fan system shall be of an energy-efficient backward-curved design and power consumption data shall be provided by the manufacturer.

Cabinet Design, Construction, Cleaning

18. The cabinet shall be of a design whereby all positive pressure plenums capable of handling contaminated air shall be surrounded by negative pressure. No positive pressure areas shall be accessible external to the cabinet.
19. The cabinet shall maintain containment performance even when removable work area components are removed for cleaning.
20. The cabinet shall have a one-piece fabricated trough to contain spills.
21. The cabinet shall be free of sharp edges, nonfunctional protrusions, bolts, screws or hardware, and all metal edges shall be deburred.

Ergonomics and Convenience

22. The front sash shall be frameless to maximize visibility, and accessible for cleaning front and back. Sash glass shall be safety glass.
23. The sash counterbalance shall be suspended on two high-strength cables, and the sash shall lock into position in the event one cable becomes detached.
24. Magnetic, not mechanical, proximity sensors shall work in conjunction with the control system to indicate proper sash position for containment.
25. Fluorescent lamps shall be mounted behind the control panel module out of the work zone. Electronic ballasts shall be used to eliminate flicker, extend lamp life and reduce heat output.
26. The UV lamp shall operate via an automatic timer with automatic shut-off managed by the microprocessor controller and shall be interlocked with the fan/motor and fluorescent lights for safety.
27. The cabinet shall be equipped with UV hour meter to monitor the remaining UV lamp life.
28. The cabinet shall be designed with angled front to optimize user comfort, reduce glare and maximize reach into the work area.
29. The armrest shall have a curved front edge for comfort, and be of a raised design to prevent the operator's arms from blocking the inflow grilles.
30. Penetrations for petcocks and service fittings shall be provided; penetrations shall be offset to improve user access.
31. The cabinet shall accommodate an optional mounting stand for fixed-height or adjustable height configurations.

Control and Alarm System

32. All cabinet functions shall be managed by a programmable microprocessor control system capable of software updates via Internet downloads.
33. The microprocessor controller shall be mounted on the main control panel facing down toward the user.
34. The controller shall include soft-touch keypad controls and backlit LCD displays to permit operation of the fan/motor, light, UV lamp, electrical outlet(s) and menu.
35. The controller shall be user programmable in situ to enable or disable functions such as PIN (personal identification number) access restriction, cabinet start-up protocol, airflow alarm and other microprocessor controlled operations outlined in the user manual.
36. When programmed ON, the start-up protocol shall perform an automatic pre-purge and postpurge cycle to ensure proper cabinet operation.
37. The controller shall include a fan/motor hours meter to display aggregate motor running time to assist in predictive maintenance.
38. Audible and visual alarms shall be provided for unsafe conditions such as improper airflow or sash position.
39. Airflow shall be monitored by a temperature compensating, thermistor-based, true air velocity sensor mounted in the cabinet. Pressure gauges or sensors shall not be used to monitor airflow.
40. The airflow display and alarm system shall be individually calibrated before shipment.
41. The main control panel shall exhibit continuous display of air velocity and a 24-hour clock display.
42. The controller shall include a filter life display and UV hour meter to display aggregate filter use and UV use respectively to assist in predictive maintenance.
43. Diagnostics button should be available on the control panel, to easily check the cabinet operating parameters and assist servicing.
44. The cabinet shall have field calibration mode that simplifies on-site calibration mode.
45. A selectable Quickstart mode should be available to turn the blower on when the sash window is moved from fully closed pistion and lights on/off when the sash window reach safe sash height.
46. The BSC shall have RS 232 data output port for remote monitoring of cabinet operating parameters.
47. TCP/IP converter shall be available as an option, to connect RS 232 to network for remote monitoring.

Service and Decontamination

48. The cabinet shall be approved for both hydrogen peroxide vapor (HPV) and formaldehyde decontamination protocol.
49. All panels leading to potentially contaminated and/or hazardous areas shall be color coded red.
50. All components including exhaust damper (if any) with the exception of fan/motor and ULPA filters shall be located outside of contaminated air spaces to facilitate servicing without the need to decontaminate the cabinet.
51. All exterior surfaces shall be painted with a permanent antimicrobial inhibitor coating to minimize contamination.
52. There shall be a reminder for re-certification controlled by the microprocessor system.

ART Equipment
Biological Safety Cabinets
CO_2 Incubators
Compounding Pharmacy Equipment
Containment / Pharma Products
Ductless Fume Hoods
Freeze Dryer
Lab Animal Research Products
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