



EN 12469
EN 12469, SANS 12469

Airstream® Class II, Biosafety Cabinet, Model AC2-4E_

Airstream®

Class II Biological Safety Cabinets

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



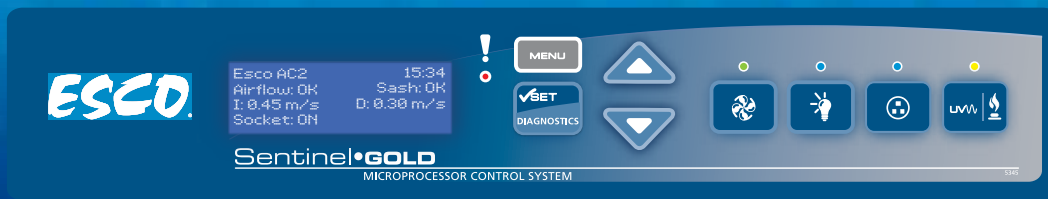
ESCO

WORLD CLASS. WORLDWIDE.



RS 232 Serial Interface Port

- Send 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

Airstream®

Class II Biological Safety Cabinets



EN 12469

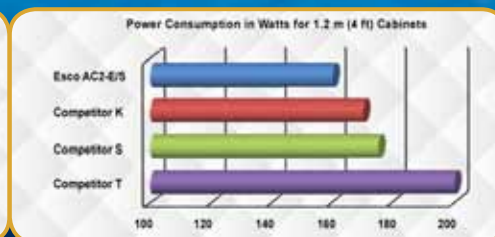
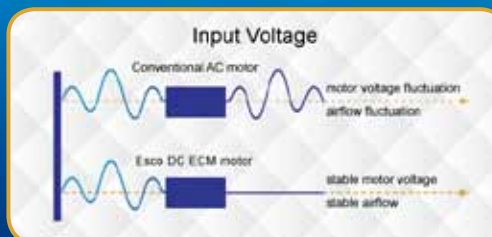
Esco Airstream® Class II has been certified by PHE / Public Health England (formerly HPA) for compliance to EN 12469

Airflow Sensor

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

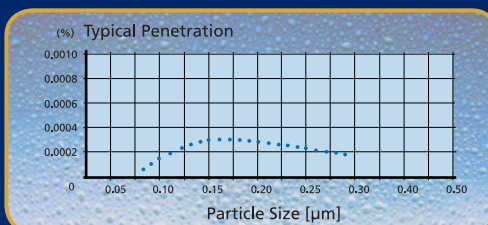
Energy-Efficient DC ECM Motor

- The most energy-efficient Class II biosafety cabinet in the world, provides 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



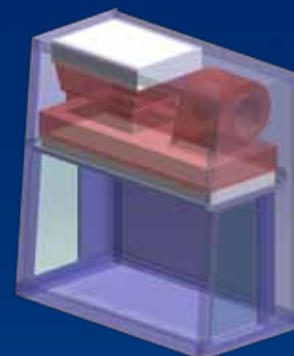
Esco cabinets use ULPA filters (per IEST-RP-CC001.3) / H14 per EN 1822 instead of H13 HEPA filters used on many BSCs in the market.

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

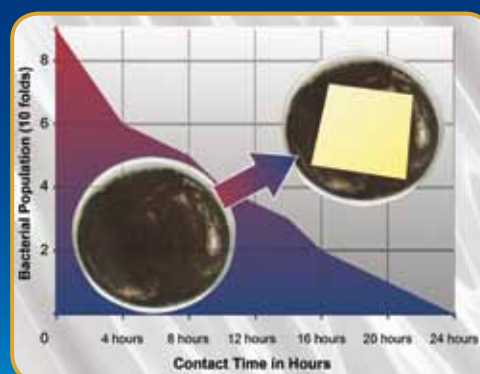
- Blower plenum and side walls (AC2-S and AC2-D variant)
- Prevent contaminants from escaping outside

■ Positive pressure
■ Negative pressure



ISOCIDE™ Powder Coat

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



| Standards Compliance | Biosafety Cabinet | Air Quality | Filtration | Electrical Safety |
|----------------------|--|--|---|---|
| | EN 12469, Europe SANS 12469, South Africa | ISO 14644.1 Class 3, Worldwide JIS B9920 Class 3, Japan JIS 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 |

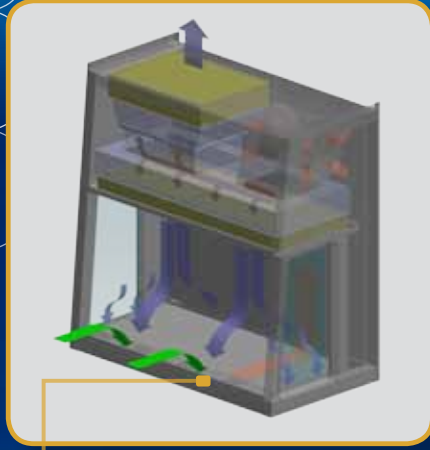
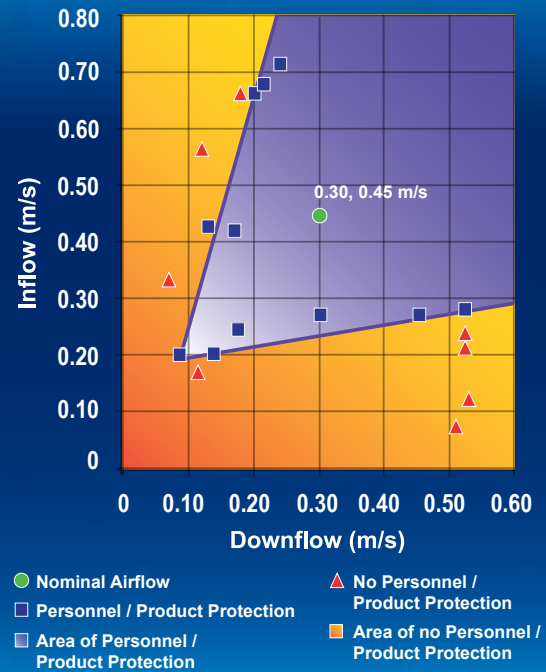
ESCO

WORLD CLASS. WORLDWIDE.

Cabinet Filtration System

- Ambient air is pulled through front grille to create inflow, without going through the work surface. Inflow is joined by half of the downflow, to create front air curtain that is fine-tuned to create a large performance envelope. The combined air stream travels through the back air column towards the blower.
- Approximately 1/3 of the air in the common plenum is exhausted through the ULPA filter to the room. The remaining 2/3 of the air is passed through the downflow ULPA filter and into the work area as a vertical laminar flow air to create ISO Class 3 work surface and prevents cross contamination.
- Near the work surface, the downflow splits. About Half goes to the front grille, and half goes to the rear grille. A small portion enters the side capture zones to prevent dead air corners (small blue arrows).
- The design was optimized to give large performance envelope, that provides operator and product protection at wide Inflow and Downflow variation from the Nominal point.

Performance Envelope of AC2 G3



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

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

LCD simultaneously displays time, airflow & sash status, inflow and downflow velocities, and status remarks.

Multi Language: English, French, German, Spanish, Italian.

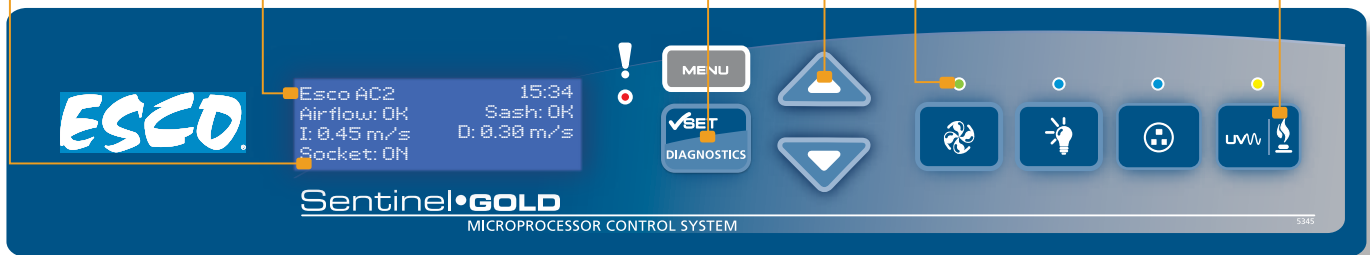
Diagnostics button, to easily check the cabinet operating parameters and assist servicing.

Large touchpad control buttons provide good tactile feedback.

Color coded LED: green for fan; blue for FL lights and outlets; and orange for UV lamp.

Programmable UV light timer extends UV lamp life.

4



Accessories for AC2-G3 Biological Safety Cabinets

| Cabinet | Glass Side Wall | | AC2-2E8 2010718 | AC2-3E8 2010658 | AC2-4E8 2010621 | AC2-5E8 2010656 | AC2-6E8 2010657 |
|-------------------|--|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 230 VAC, 50/60 Hz | | | | AC2-4G8 2010734 | | AC2-6G8 2010743 |
| | | | AC2-2S8 2010767 | AC2-3S8 2010721 | AC2-4S8 2010711 | AC2-5S8 2010725 | AC2-6S8 2010722 |
| | Stainless Steel Side Wall | | | | AC2-4D8 2010733 | | AC2-6D8 2010742 |
| Exhaust Ducting | Glass Side Wall | | AC2-2E9 2010777 | AC2-3E9 2010779 | AC2-4E9 2010697 | AC2-5E9 2010784 | AC2-6E9 2010787 |
| | 115 VAC, 50/60 Hz | | AC2-2S9 2010790 | AC2-3S9 2010792 | AC2-4S9 2010744 | AC2-5S9 2010797 | AC2-6S9 2010800 |
| | | | ABBV-10P 5170352 | | | | |
| | Tri-safe Exhaust Collar with Alarm | | TEM-4 2010606 | | | | |
| Work Zone | Thimble Exhaust Collar | | ECO-AC22 5170520 | ECO-AC23 5170521 | ECO-AC24 5170623 | ECO-AC25 5170624 | ECO-AC26 5170625 |
| | UV Lamp | | UV-15A-L 5170251 | | | UV-30A-L 5170255 | |
| | IV Bar | | IV-910 5170499 | IV-910 5170499 | IV-1215 5170231 | IV-1520 5170500 | IV-1825 5170501 |
| | Multiple Piece Tray Option (AC2-S / AC2-D) | | SDT-AC2-2E 5020643 | SDT-AC2-3E 5020635 | SDT-AC2-4E 5020606 | SDT-AC2-5E 5020640 | SDT-AC2-6E 5020592 |
| | Single Piece Tray Option (AC2-E / AC2-G) | | SGT-AC2-2S 5020696 | SGT-AC2-3S 5020648 | SGT-AC2-4S 5020627 | SGT-AC2-5S 5020651 | SGT-AC2-6S 5020645 |
| Electrical Outlet | Pre-filter | | PF-40 5090060 | PF-41 5090061 | PF-42 5090062 | PF-43 5090063 | PF-44 5090064 |
| | Direct Mounted / GFCI | | EO-__ | | | | |



ABBV-10P



TEM-4



ECO-AC2-G3



IV-__

| | | | | | | |
|----------------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Service Fixtures | EU SF-Gas-20 mm | SF-1G20 5170410 | | | | |
| | EU SF-Vacuum-20 mm | SF-1V20 5170457 | | | | |
| | EU SF-Air-20 mm | SF-1A20 5170502 | | | | |
| | EU SF-Nitrogen-20 mm | SF-1N20 5170503 | | | | |
| | EU SF-Water-20 mm | SF-1W20 5170458 | | | | |
| | EU SF-Universal-22 mm | SF-2U22 5170504 | | | | |
| Support Stands, Ships Flat | Fixed Stand with Leveling Feet, 28" height | SAL-2A0 Gen 2 5130169 | SAL-3A0 Gen 2 5130170 | SAL-4A0 Gen 2 5130134 | SAL-5A0 Gen 2 5130171 | SAL-6A0 Gen 2 5130172 |
| | Fixed Stand with Leveling Feet, 34" height | SAL-2B0 Gen 2 5130173 | SAL-3B0 Gen 2 5130174 | SAL-4B0 Gen 2 5130175 | SAL-5B0 Gen 2 5130176 | SAL-6B0 Gen 2 5130177 |
| | Fixed Stand with Caster Wheels, 28" height | SPC-2A0 Gen 2 5130161 | SPC-3A0 Gen 2 5130155 | SPC-4A0 Gen 2 5130152 | SPC-5A0 Gen 2 5130162 | SPC-6A0 Gen 2 5130154 |
| | Fixed Stand with Caster Wheels, 34" height | SPC-2B0 Gen 2 5130164 | SPC-3B0 Gen 2 5130165 | SPC-4B0 Gen 2 5130166 | SPC-5B0 Gen 2 5130167 | SPC-6B0 Gen 2 5130168 |
| | Telescopic Stand with Leveling Feet, 1" adjustment | STL-2A0 5130092 | STL-3A0 5130050 | STL-4A0 5130051 | STL-5A0 5130052 | STL-6A0 5130053 |
| | Telescopic Stand with Caster Wheels, 1" adjustment | STC-2A0 5130135 | STC-3A0 5130055 | STC-4A0 5130056 | STC-5A0 5130057 | STC-6A0 5130058 |
| | Motorized Height Stand with Caster Wheels | | SPM-3A2 5130093 | SPM-4A2 5130047 | SPM-5A2 5130100 | SPM-6A2 5131141 |
| Misc | IQ OQ Protocol | 9010179 | | | | |



PF-



ABBV-10P

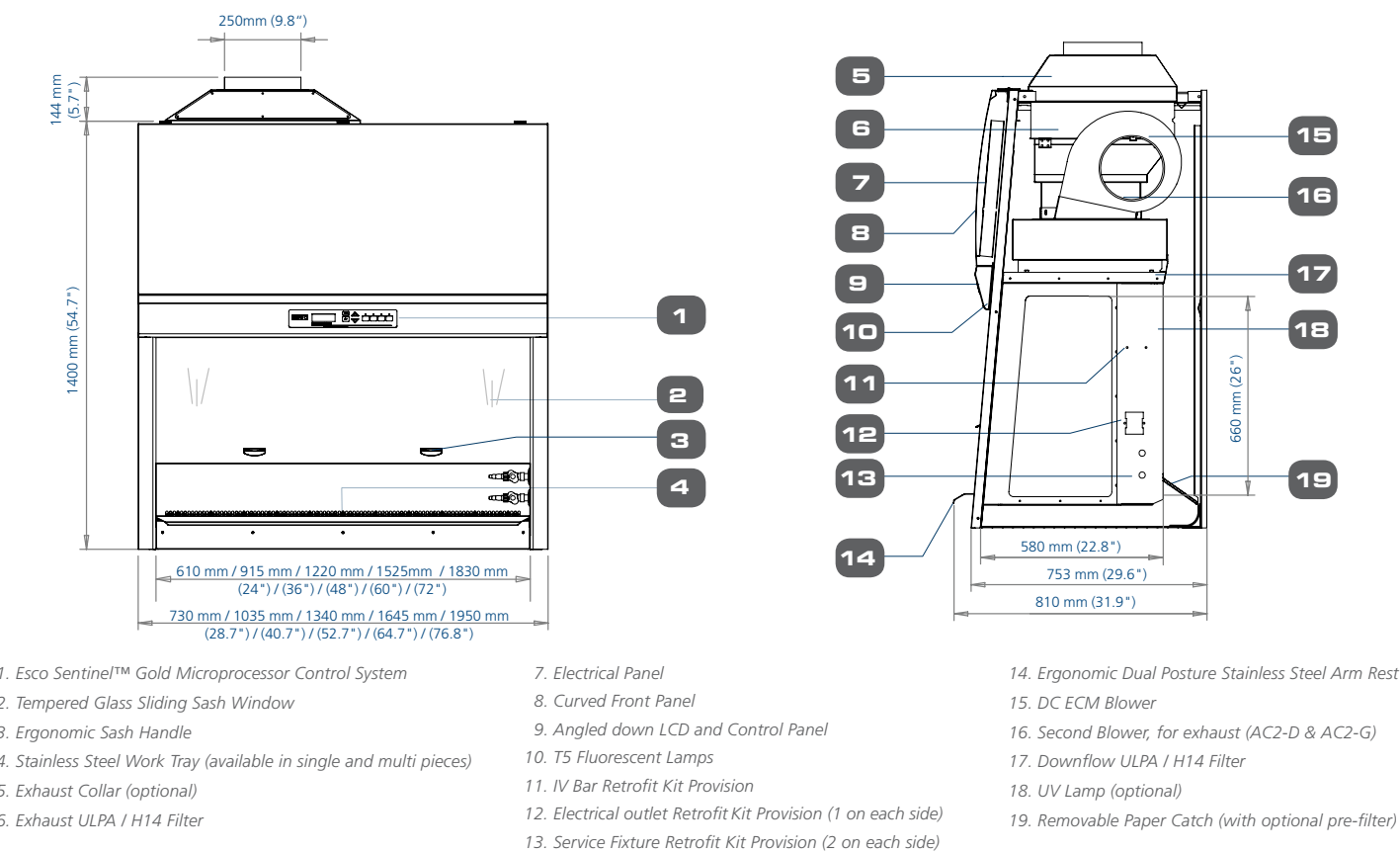


SF-

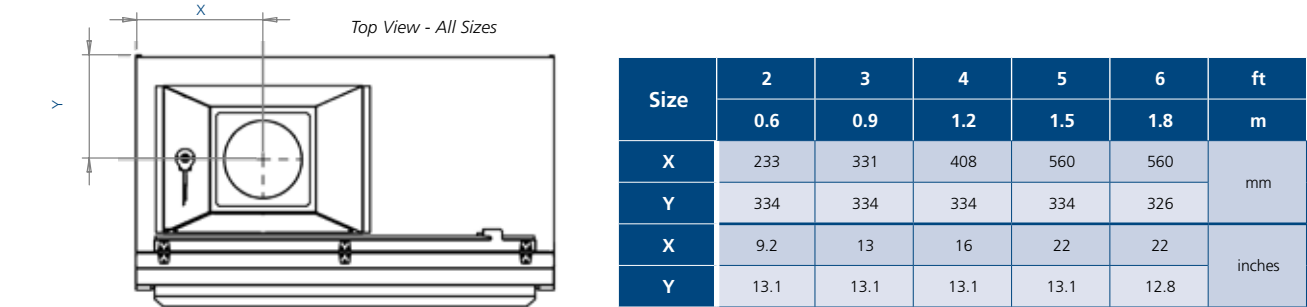


SPC-_A0 Gen2

AC2 Biological Safety Cabinet Engineering Drawing



Optional Exhaust Collar Positions for Thimble-Ducting for AC2 Models



| Technical Specifications | | | | | | |
|--|--|--|---|---|---|---|
| Glass Side: 230 VAC, 50/60 Hz | | AC2-2E8 2010718 | AC2-3E8 2010658 | AC2-4E8 2010621 | AC2-5E8 2010656 | AC2-6E8 2010657 |
| Glass Side: 115 VAC, 50/60 Hz | | AC2-2E9 2010777 | AC2-3E9 2010779 | AC2-4E9 2010697 | AC2-5E9 2010784 | AC2-6E9 2010787 |
| Stainless Steel Side: 230 VAC, 50/60 Hz | | AC2-2S8 2010767 | AC2-3S8 2010721 | AC2-4S8 2010711 | AC2-5S8 2010725 | AC2-6S8 2010722 |
| Stainless Steel Side: 115 VAC, 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 (26.0") | | | | |
| Usable Work Area | | 0.27 m² (2.9 sq.ft.) | 0.42 m² (4.5 sq.ft.) | 0.56 m² (6.1 sq.ft.) | 0.71 m² (7.63 sq.ft.) | 0.86 m² (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 m³/h (153 cfm) | 320 m³/h (189 cfm) | 538 m³/h (317 cfm) | 615 m³/h (362 cfm) | 823 m³/h (485 cfm) |
| | Static Pressure for Optional Thimble Exhaust Collar | 28 Pa / 0.11 in H ₂ O | 29 Pa / 0.11 in H ₂ O | 31 Pa / 0.12 in H ₂ O | 35 Pa / 0.14 in H ₂ O | 47 Pa / 0.18 in H ₂ 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 (foot-candles) | | 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 m³ (43.2 ft³) | 1.62 m³ (57.2 ft³) | 2.09 m³ (73.8 ft³) | 2.48 m³ (87.6 ft³) | 2.96 m³ (104.5 ft³) |

*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

| | | | |
|--|---|--|--|
| Glass Side: 230 VAC, 50/60 Hz | | AC2-4G8 2010734 | AC2-6G8 2010743 |
| Stainless Steel Side: 230 VAC, 50/60 Hz | | AC2-4D8 2010733 | AC2-6D8 2010742 |
| Nominal Size | | 4 ft (1.2 meter) | 6 ft (1.8 meter) |
| External Dimensions (W x D x H) | Width | 1340 mm (52.8") | 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 | 1220 mm (48") | 1830 mm (72") |
| | Depth | 580 mm (22.8") | |
| | Height | 660 mm (26") | |
| Usable Work Area | | 0.56 m ² (6.1 sq.ft.) | 0.86 m ² (9.0 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 | 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 ³ /h (317 cfm) | 823 m ³ /h (485 cfm) |
| | Static Pressure for Optional Thimble Exhaust Collar | 31 Pa / 0.12 in H ₂ O | 47 Pa / 0.18 in H ₂ 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 (foot-candles) | | 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)** | | 1450 x 820 x 1760 mm (57.1" x 32.3" x 69.3") | 2050 x 820 x 1760 mm (80.7" x 32.3" x 69.3") |
| Shipping Volume, Maximum** | | 2.09 m ³ (73.8 ft ³) | 2.96 m ³ (104.5 ft ³) |

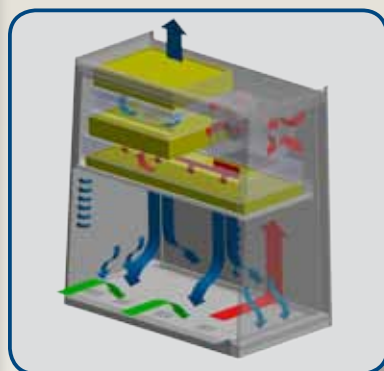
*Noise reading in open field condition / **anechoic** chamber. Noise reading in **normal room varies** by room size, layout, and background noise, but may reach roughly 3-4 dBA above these values.

**Cabinet only, excludes optional stand.

First Airstream® Offers the Most Complete Class II Cabinet Range

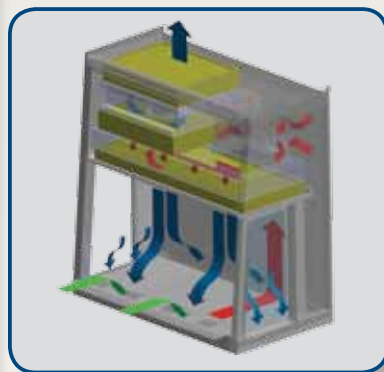
| Airstream Product | E-Series | G-Series | S-Series | D-Series |
|-------------------|--|--|--|--|
| Side Wall | Tempered glass increases visibility and prevents the operator from experiencing a "boxed-in" feeling | | One-piece stainless steel with coved corners for cleanability. Side capture zones and negative pressure side walls optimize containment. | |
| Work Tray | Multi-piece, Autoclavable | | Single-piece stainless steel, spill retaining | |
| Fan System | 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. | Dual 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 > 100x better protection than single filter system | Single ULPA Filter >99.999% Efficient, Cost Effective | Dual ULPA Filters, >100.000x Better Protection than Single Filter System |
| Size 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') |

AC2-D Airflow Diagram



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

AC2-G Airflow Diagram



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

7

Comprehensive Performance Testing At Esco

Every Airstream® AC2 model manufactured by Esco is individually tested, documented by serial number and validated with the following test methods:

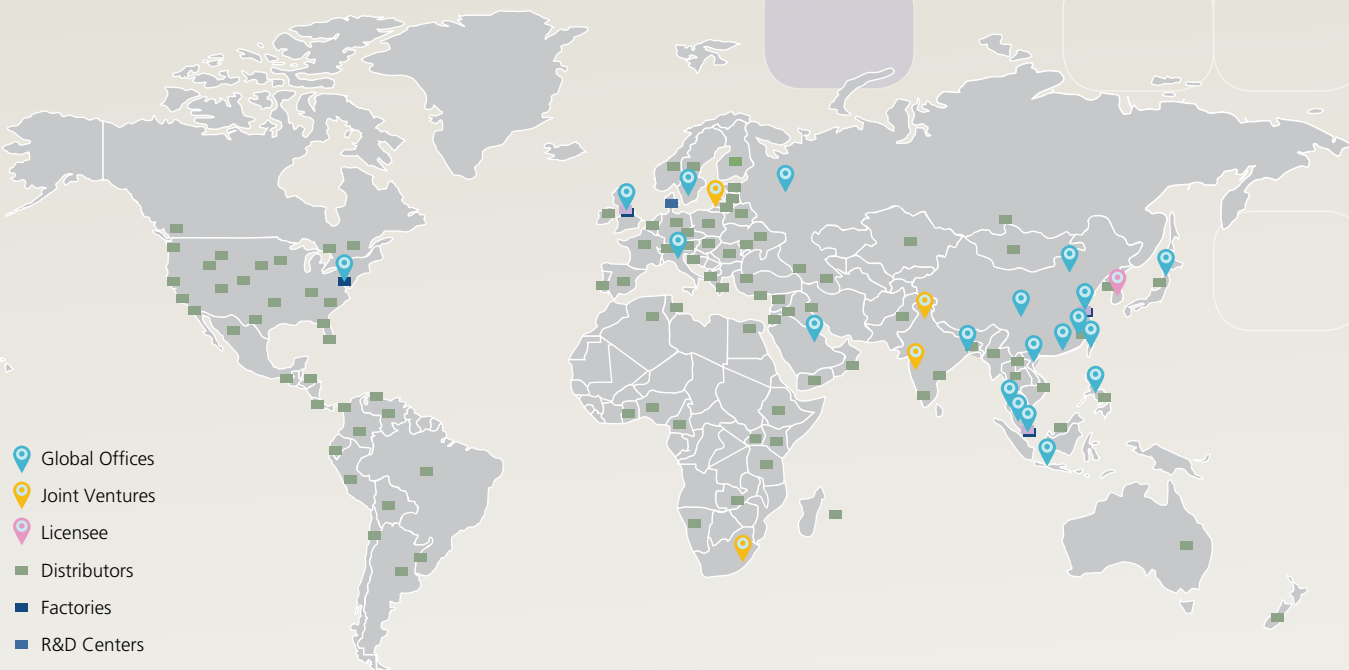
- Inflow and downflow velocity
- PAO aerosol challenge for filter integrity
- Airflow pattern visualization
- Electrical safety to IEC61010-1
- Additional KI-Discus containment and microbiological testing are performed on statistical sampling basis.










ESCO

WORLD CLASS. WORLDWIDE.

ESCO GLOBAL NETWORK



-  Global Offices
-  Joint Ventures
-  Licensee
-  Distributors
-  Factories
-  R&D Centers
-  Regional Distribution Centers



ART Equipment
Biological Safety Cabinets
CO₂ Incubators
Compounding Pharmacy Equipment
Containment / Pharma Products
Ductless Fume Hoods
Freeze Dryers
Lab Animal Research Products
Laboratory Centrifuges
Laboratory Fume Hoods
Laboratory Ovens and Incubators
Laboratory Shakers
Laminar Flow Clean Benches
PCR Cabinets
PCR Thermal Cyclers
Powder Weighing Balance Enclosures
Ultra-low Temperature Freezers

The Esco Group of Companies is a global life sciences tools provider with sales in over 100 countries. The group is active in lab equipment, pharma equipment and medical devices. Manufacturing facilities are located in Asia and Europe. R&D is conducted worldwide spanning the US, Europe and Asia. Sales, service and marketing subsidiaries are located in 12 major markets including the US, UK, Singapore, Japan, China and India. Regional distribution centers are located in the US, UK, and Singapore.

Life Science • Chemical Research • Assisted Reproductive Technology (ART) • Pharmaceutical Equipment • General Equipment

ESCO

WORLD CLASS. WORLDWIDE.

Esco Micro Pte. Ltd. • 21 Changi South Street 1 • Singapore 486 777
Tel +65 6542 0833 • Fax +65 6542 6920 • mail@escoglobal.com
www.escoglobal.com

Esco Technologies, Inc. • 903 Sheehy Drive, Suite F, Horsham, PA 19044, USA
Toll-Free USA and Canada 1-877-479-3726 • Tel 215-441-9661 • Fax 484-698-7757
eti.sales@escoglobal.com • www.escolifesciences.us

Esco Global Offices: Bangladesh | China | Denmark | Germany | Hong Kong | India | Indonesia | Italy | Japan | Lithuania | Malaysia | Philippines | Russia | Singapore | South Africa | South Korea | Russia | Taiwan | Thailand | UAE | United Kingdom | USA | Vietnam