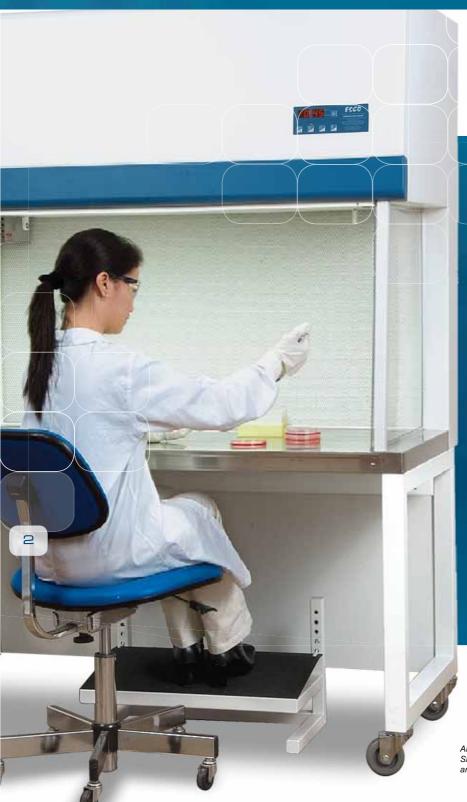


Laminar Flow Clean Benches, Horizontal and Vertical



WORLD CLASS. WORLDWIDE.





Esco is the world leader in premium laminar flow clean benches for the global life sciences market. Since 1978, Esco has installed tens of thousands of laminar flow clean benches providing reliable protection for samples and work processes for a multitude of applications.

Esco laminar flow clean benches are the premium selection for the discerning researcher, offering a combination of value, high quality construction, low operating noise levels, and a wide product range to suit all budgets, from the industry leader.

Airstream Horizontal Laminar Flow Clean Bench. Shown with optional caster wheels stand, ergonomic lab chair and footrest.

Standards Compliance	Cabinet Performance	Air Quality	Filtration	Electrical Safety	
	EN 12469* IEST-RP-CC002.2, Worldwide	ISO 14644.1 Class 3, Worldwide AS 1386 Class 1.5, Australia JIS B9920 Class 3, Japan	EN-1822 (H14), Europe IEST-RP-CC001.3, Worldwide IEST-RP-CC007.1, Worldwide IEST-RP-CC034.1, Worldwide	IEC 61010-1, Worldwide EN 61010-1, Europe UL 61010-1, USA CAN/CSA-22.2, No.61010-1	

<sup>\*</sup> Type-tested for cross-contamination and product protection using the microbiological testing methods adapted from this biological safety cabinet standard.

# Save Time and Money, Sentinel<sup>™</sup> Delta Microprocessor Monitors Airflow in Real Time to Prevent Sample Contamination

Touchpad data entry buttons permit control settings and access to default settings.

Color coded indicator lamps display green for fan operation, fluorescent lights and electrical outlet; and red for caution (UV lamp ON). 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.



Esco Sentinel Delta Microprocessor Control System, Programmable

 When programmed ON, an airflow alarm warns of deviations from normal velocities.

# Horizontal and Vertical Laminar Flow Clean Benches

Esco Airstream Laminar Flow Clean Benches are available in both horizontal and vertical flow models. In both models, air is taken in from above the cabinet and passed through a ULPA filter.

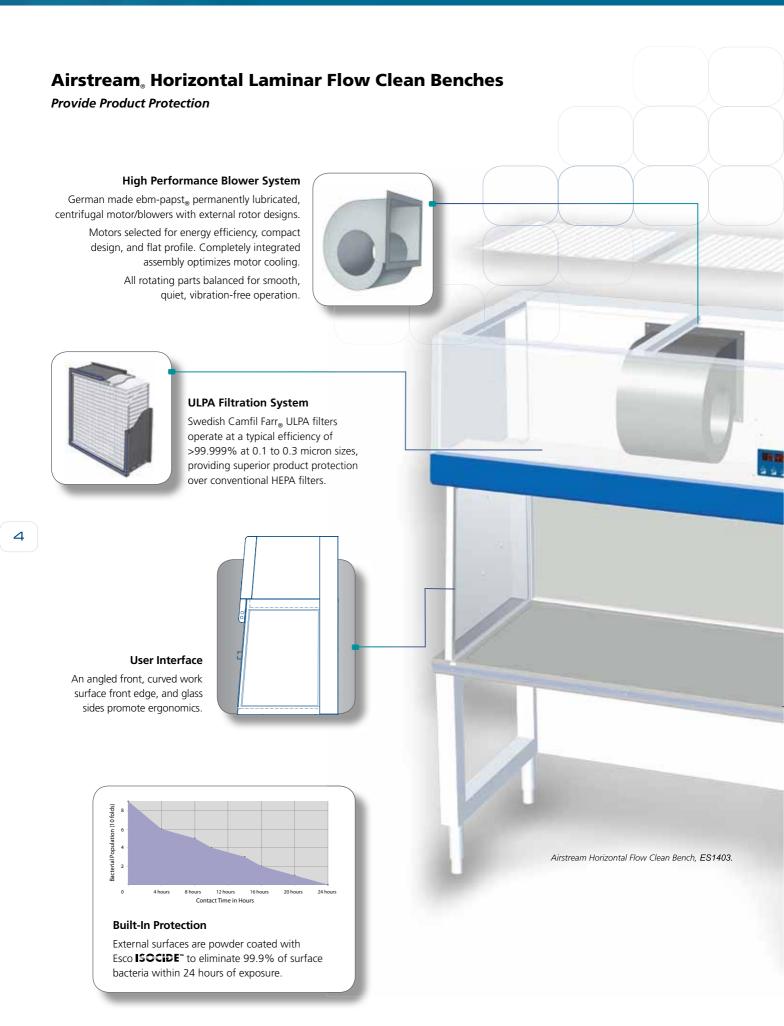
- In horizontal flow models filtered air is then passed through the main chamber of the clean bench in a horizontal laminar (unidirectional) air stream and is exhausted through the front opening of the cabinet.
- In vertical flow models, filtered air is passed through the main chamber of the clean bench in a vertical laminar (unidirectional) air stream before being exhausted through the front opening of the clean bench.

In horizontal laminar flow clean benches (ES14) there is a slightly reduced level of turbulence compared to vertical flow clean benches (ES15) due to the airflow not striking the work surface. However vertical laminar flow clean benches generate less turbulence around large pieces of equipment as compared to horizontal laminar flow clean benches.



Airstream Horizontal Laminar Flow Clean Bench, Model ES1403. Shown with optional caster wheels stand. Available in 0.6, 0.9, 1.2, 1.5 and 1.8m widths (2', 3', 4', 5' and 6').







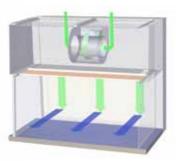
#### Sentinel™ Delta Microprocessor Control System

Soft touch controls for blower, light, outlet and UV are easy to clean. A temperature-compensated air velocity sensor and real-time display allows airflow to be monitored more accurately compared with conventional pressure gauges.



#### **Work Top**

The spill-retaining work top design with a recessed central area contains accidental liquid spills.



#### **Proven Product Protection**

Horizontal laminar air flow with ULPA filtration, >99.999% at 0.1 to 0.3 microns, provides superior product protection.

# Esco Filter Efficiency (%) Typical Penetration 0 0010 0 0008 0 0006 0 0004 0 0002 0 005 0 10 0 15 0 20 0 25 0 30 0 40 0 50 Particle Size [µm]

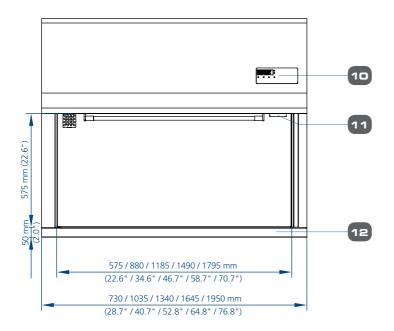
Esco clean benches use ULPA filters (per IEST-RP-CC001.3) instead of conventional HEPA filters commonly found in laminar flow clean benches. While HEPA filters offer 99.99% typical efficiency at 0.3 micron level, ULPA filters provide 99.999% typical efficiency for particle sizes of 0.1 to 0.3 micron level.

# **Key Features**

- ULPA filters (per IEST-RP-CC-001.3) tested to a typical efficiency of >99.999% for 0.1 to 0.3 micron particles are superior to HEPA filters. ULPA filters last as long as conventional HEPA filters and have similar replacement costs.
- All Esco laminar flow clean benches provide ISO Class 3 air cleanliness within the work zone as per ISO 14644.1, significantly cleaner than the usual Class 5 classification on clean benches offered by the competition.
- The intelligent blower system maintains airflow as the filter becomes loaded, ensuring optimum efficiency and product protection.
- An additional disposable pre-filter traps large particles in the inflow air prior to reaching the main filter, protecting against damage and prolonging filter life.
- All Esco products are manufactured for the most demanding laboratory applications. All components are designed for maximum chemical resistance and enhanced durability for a long service life. The main body of the clean bench is constructed of industrialgrade electro-galvanized steel.
- One piece formed stainless steel work surface with a curved front edge is designed for maximum operator comfort.
- Built-in warm white, electronically ballasted, 5000k lighting provides excellent illumination of the work zone and reduces operator fatigue. The reliable lighting system is zero-flicker and instant start.
- Esco Laminar Flow Clean Benches have been tested for cross-contamination and product protection using microbiological test methods specified in EN12469.
- Each clean bench is individually factory tested for safety and performance in accordance with international standards.
- All electrical components are UL listed or UL recognized, ensuring superior electrical safety for the operator.
- Esco ISOCIDE™ antimicrobial coating on all painted surfaces.



# D-Series, Airstream Horizontal Laminar Flow Clean Bench Technical Specifications



102 mm (3.2°)
Note for ES1405 is 632 mm (24.9°)

797 mm (31.4°)
Note for ES1405 is 804 mm (31.6°)

- 1. Pre-filter
- 2. Blower
- 3. Fluorescent lamp
- 4. UV light Retrofit Kit provision
- 5. IV bar Retrofit Kit provision
- 6. Optional front cover
- 7. Service fixture Retrofit Kit provision (2 penetrations on each side)
- 8. ULPA filter
- 9. Tempered glass side panels
- 10. Esco Sentinel™ Delta microprocessor control system
- 11. Standard electrical outlet Retrofit Kit provision
- 12. Stainless steel work top

# Warranty

All Esco Airstream, vertical and horizontal flow clean benches are covered by an extended 3 year warranty, excluding consumable parts and accessories. Contact your local Sales Representative for warranty details.

# **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.

### **Support Stands**

- Fixed height, available 711 mm (28") or 860 mm (34")
  - With leveling feet (SPL)
  - With casters (SPC)
- Adjustable height, hydraulic range 711 mm (28") to 860 mm (34")
  - Manual or electrical lift (SPM)
  - With casters

# Electrical Outlets and Utility Fixtures

- Electrical outlet, ground fault, North America
- Electrical outlet, Euro/ Worldwide
- Petcock (air, gas, vacuum)
  - North America (American) style
  - Euro/Worldwide style DIN 12898, DIN 12919, DIN 3537

# **Cabinet Accessories**

- Germicidal UV lamp
- Transparent front cover (recommended when UV lamp is used)
- PVC armrest
- Height-adjustable lab chair
- Ergonomic foot rest
- IV bar, with hooks



# **General Specifications, Airstream Horizontal Laminar Flow Clean Benches**

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

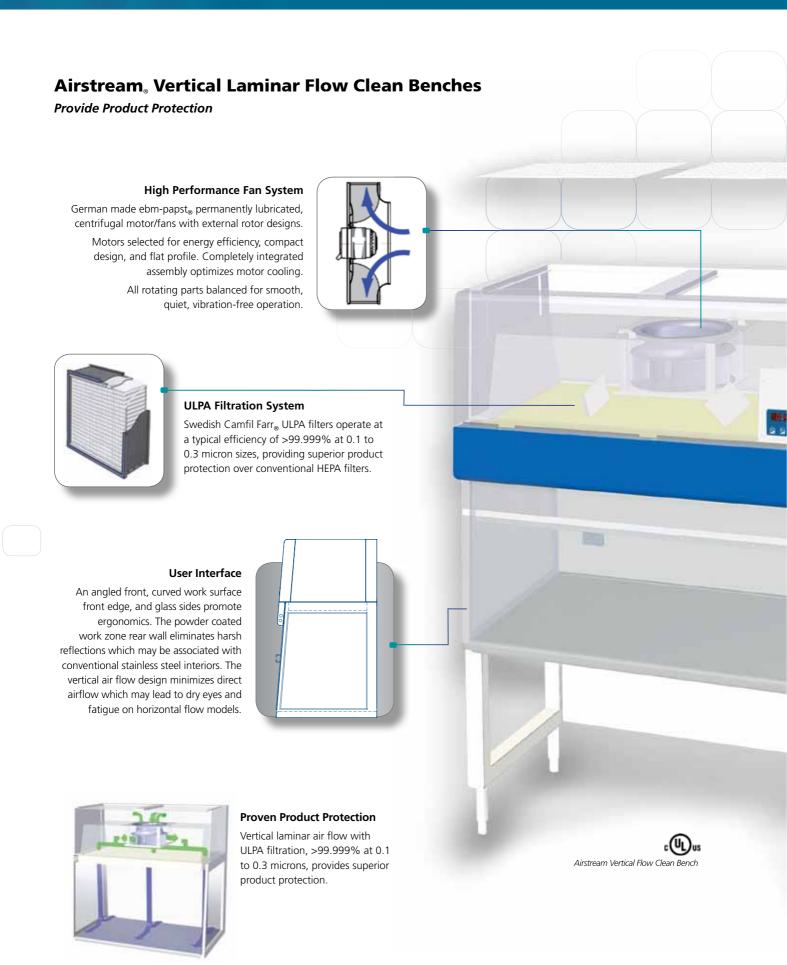
710		te to customen msert ex	etireai Voitage mamber int	o last model number digit	_ mien erdening.			
Model		ES1401	ES1402	ES1403	ES1404	ES1405		
Nominal Size		0.6 meters (2')	0.9 meters (3')	1.2 meters (4')	1.5 meters (5')	1.8 meters (6')		
External Dimensions (W x D x H)	Without Base Stand	730 x 797 x 1105 mm 28.7" x 31.4" x 43.5"	1035 x 797 x 1105 mm 40.7" x 31.4" x 43.5"	1340 x 797 x 1105 mm 52.8" x 31.4" x 43.5 "	1645 x 797 x 1105 mm 64.8" x 31.4" x 43.5"	1950 x 804 x 1175 mm 76.8" x 31.6" x 46.3"		
	With Optional Base Stand, 711 mm (28") type	730 x 797 x 1816 mm 28.7" x 31.4" x 71.5"	1035 x 797 x1816 mm 40.7" x 31.4" x 71.5"	1340 x 797 x 1816 mm 52.8" x 31.4" x 71.5"	1645 x 797 x 1816 mm 64.8" x 31.4" x 71.5"	1950 x 804 x 1886 mm 76.8" x 31.6" x 74.2"		
Internal Work Area, Dimensions (W x D x H)*		575 x 625 x 575 mm 22.6" x 24.6" x 22.6"	880 x 625 x 575 mm 34.6" x 24.6" x 22.6"	1185 x 625 x 575 mm 46.7" x 24.6" x 22.6"	1490 x 625 x 575 mm 58.7" x 24.6" x 22.6"	1795 x 632 x 575 mm 70.7" x 24.9" x 22.6"		
Internal Work Area, Space		0.36 m <sup>2</sup> (3.87 sq.ft)	0.55 m² (5.92 sq.ft)	0.74 m² (7.96 sq.ft)	0.94 m <sup>2</sup> (10.11 sq.ft)	1.13 m <sup>2</sup> (12.16 sq.ft)		
Average Airflow Velocity		0.45 m/s (90 fpm) at initial setpoint						
Air Volume		531 m³/h (313 cfm)	815 m³/h (480 cfm)	1099 m³/h (647 cfm)	1383 m³/h (814 cfm)	1667 m³/h (981 cfm)		
ULPA Filter Typical Efficiency		>99.999% at particle size between 0.1 to 0.3µm						
Sound Emission Per IEST-RP-CC002.2*		54 dBA	55 dBA	57 dBA	59 dBA	60 dBA		
Fluorescent Lamp Intensity At Zero Ambient		1530 Lux (142 foot candles)	1490 Lux (138 foot candles)	1680 Lux (156 foot candles)	1390 Lux (129 foot candles)	1510 Lux (140 foot candles)		
	Main Body	1.2 mm (0.05") 18 gauge electro-galvanized steel with white oven-baked epoxy-polyester powder-coated finish.						
Cabinet Construction	Work Zone	1.2 mm (0.05") 18 gauge stainless steel, grade 304, with 48 finish						
	Side Walls	UV absorbing tempered glass, 5 mm (0.2"), colorless and transparent						
	220-240V, AC, 50Hz, 1Ø							
	Cabinet Full Load Amps (FLA)	2A	2A	2A	2A	5A		
	Optional Outlets FLA	5A	5A	5A	5A	5A		
	Cabinet Nominal Power	203	228	390	515	636		
	Cabinet BTU	693	778	1331	1757	2170		
Fl lan	110-120V, AC, 60Hz, 1Ø							
	Cabinet Full Load Amps (FLA)	6.5A	6.5A	6.5A	6.5A	10.5A		
Electrical**	Optional Outlets FLA	5A	5A	5A	5A	5A		
	Cabinet Nominal Power	550	600	650	750	868		
	Cabinet BTU	1877	2047	2218	2559	2962		
	220-240V, AC, 60Hz, 1Ø							
	Cabinet Full Load Amps (FLA)	2A	2A	2A	2A	5A		
	Optional Outlets FLA	5A	5A	5A	5A	5A		
	Cabinet Nominal Power	203	228	390	515	636		
	Cabinet BTU	693	778	1331	1757	2170		
Net Weight***		101 kg (223 lbs)	124 kg (273 lbs)	150 kg (331 lbs)	157 kg (346 lbs)	198 kg (436 lbs)		
Shipping Weight***		136.5 kg (301 lbs)	163.6 kg (361 lbs)	190.1 kg (419 lbs)	201.0 kg (443 lbs)	267.3 kg (589 lbs)		
Shipping Dimensions, Maximum (W x D x H)***		860 x 820 x 1610 mm 33.8" x 32.3" x 63.4"	1120 x 820 x 1610 mm 44" x 32.3" x 63.4"	1430 x 820 x 1610 mm 56.3" x 32.3" x 63.4"	1720 x 820 x 1610 mm 67.7" x 32.3" x 63.4"	2040 x 820 x 1610 mm 80.3" x 32.3" x 63.4"		
Shipping Volume, Maximum***		1.14 m³ (40.3 cu.ft)	1.48 m³ (52.3 cu.ft)	1.89 m³ (66.7 cu.ft)	2.27 m <sup>3</sup> (80.2 cu.ft)	2.69 m³ (95.0 cu.ft)		

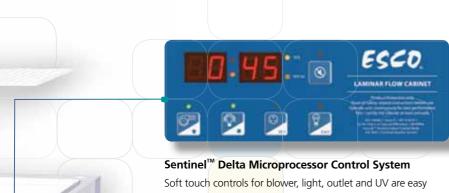


<sup>\*</sup> Noise reading in open field condition/ anechoic chamber.

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

\*\*\* Clean bench only; excludes optional stand.





Soft touch controls for blower, light, outlet and UV are easy to clean. A temperature-compensated air velocity sensor and real-time display allows airflow to be monitored more accurately compared with conventional pressure gauges.



#### **Vertical Laminar Flow**

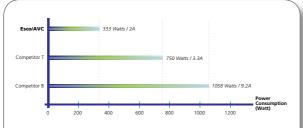
Compared with horizontal flow models, vertical flow clean benches generate less turbulence when large instruments or items are placed in the work zone.

Auto-Purge™ slots minimize airflow turbulence in the rear of the work space.



# **Work Top**

The spill-retaining work top design with a recessed central area contains accidental liquid spills. (Not applicable for Model ES1505.)



# **Energy Efficiency Chart**

Esco vertical laminar flow clean benches utilize extremely efficient backward curve fans, allowing for exceedingly low levels of cabinet power consumption that is unparalled in the industry.

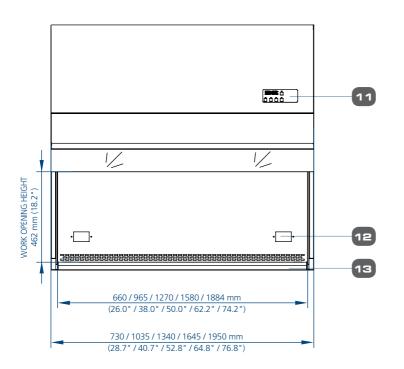
The result is greater cost-savings for the user with no compromise in cabinet performance.

# **Key Features**

- ULPA filters (per IEST-RP-CC-001.3) tested to a typical efficiency of >99.999% for 0.1 to 0.3 micron particles are superior to HEPA filters. ULPA filters last as long as conventional HEPA filters and have similar replacement costs.
- All Esco laminar flow clean benches provide ISO Class 3 air cleanliness within the work zone as per ISO 14644.1, significantly cleaner than the usual Class 5 classification on clean benches offered by the competition.
- The backward curved wheel with external rotor motor delivers classleading energy efficiency for lower operating costs.
- An additional disposable pre-filter traps large particles in the inflow air prior to reaching the main filter, protecting against damage and prolonging filter life.
- All Esco products are manufactured for the most demanding laboratory applications. All components are designed for maximum chemical resistance and enhanced durability for a long service life. The main body of the clean bench is constructed of industrialgrade electrogalvanized steel.
- One piece formed stainless steel work surface with a curved front edge is designed for maximum operator comfort.
- Built-in warm white, electronically ballasted, 5000k lighting provides excellent illumination of the work zone and reduces operator fatigue. The reliable lighting system is zero-flicker and instant start.
- Esco Laminar Flow Clean Benches have been tested for cross-contamination and product protection using microbiological test methods specified in EN12469.
- Each clean bench is individually factory tested for safety and performance in accordance with international standards.
- All electrical components are UL listed or UL recognized, ensuring superior electrical safety for the operator.
- Esco **ISOCIDE**<sup>™</sup> antimicrobial coating on all painted surfaces.



# D-Series, Airstream Vertical Laminar Flow Clean Bench Technical Specifications



2 mm (49.2 " 4 0 5 250 mm (27.4") 6 695 r 8 9 10 40 mn (1.6") 712 mm (28.0") Note for ES1501 is 700 mm (27.6") 770 mm (30.3")

- 1. Pre-filter
- 2. Fan
- 3. ULPA filter
- 4. Fluorescent lamp
- 5. IV bar Retrofit Kit provision
- 6. Airflow & temperature sensor
- 7. UV light Retrofit Kit provision
- 8. Tempered glass side panels
- 9. Service fixture Retrofit Kit provision (2 penetrations on each side)
- 10. Optional front cover
- 11. Esco Sentinel™ Delta microprocessor control system
- 12. Electrical outlet Retrofit Kit provision (1 for 2ft and 3ft models, 2 for 4ft and above)
- 13. Stainless steel work top with front curved edge

# Warranty

All Esco Airstream, vertical and horizontal flow clean benches are covered by an extended 3 year warranty, excluding consumable parts and accessories. Contact your local Sales Representative for warranty details.

# **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.

#### Support Stands

- Fixed height, available 711 mm (28") or 860 mm (34")
  - With leveling feet (SPL)
  - With casters (SPC)
- Adjustable height, hydraulic range
   711 mm (28") to 860 mm (34")
  - Manual or electrical lift (SPM)
  - With casters

#### **Electrical Outlets and Utility Fixtures**

- Electrical outlet, ground fault, North America
- Electrical outlet, Euro/ Worldwide
- Petcock (air, gas, vacuum)
  - North America (American) style
  - Euro/Worldwide style DIN 12898, DIN 12919, DIN 3537

# **Cabinet Accessories**

- Germicidal UV lamp
- Transparent front cover (recommended when UV lamp is used)
- PVC armrest
- Height-adjustable lab chair
- Ergonomic foot rest
- IV bar, with hooks



# **General Specifications, Airstream Vertical Laminar Flow Clean Benches**

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

	Note to	o customer: Insert electric	cal voltage number into la	ist model number digit _	when ordering.		
Model		ES1501	ES1502	ES1503	ES1504	ES1505	
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 770 x 1250 mm 28.7" x 30.3" x 49.2"	1035 x 770 x 1250 mm 40.7" x 30.3" x 49.2"	1340 x 770 x 1250 mm 52.8" x 30.3" x 49.2"	1645 x 770 x 1250 mm 64.8" x 30.3" x 49.2"	1950 x 770 x 1250 mm 76.8" x 30.3" x 49.2"	
	With Optional Base Stand, 711 mm (28") type	730 x 770 x 1961 mm 28.7" x 30.3" x 77.2"	1035 x 770 x 1961 mm 40.7" x 30.3" x 77.2"	1340 x 770 x 1961 mm 52.8" x 30.3" x 77.2"	1645 x 770 x 1961 mm 64.8" x 30.3" x 77.2"	1950 x 770 x 1961 mm 76.8" x 30.3" x 77.2"	
Internal Work Area, Dimensions (W x D x H)		660 x 700 x 695 mm 26.0" x 27.6" x 27.4"	965 x 712 x 695 mm 38.0" x 28.0" x 28.3"	1270 x 712 x 695 mm 50.0" x 28.0" x 28.3"	1580 x 712 x 695 mm 62.2" x 28.0" x 28.3"	1884 x 712 x 695 mm 74.2" x 28.0" x 28.3"	
Internal Work Area, Space		0.39 m <sup>2</sup> ( 4.2 sq.ft)	0.59 m <sup>2</sup> (6.3 sq.ft)	0.79 m <sup>2</sup> (8.5 sq.ft)	0.98 m <sup>2</sup> (10.54 sq.ft)	1.18m <sup>2</sup> (12.7 sq.ft)	
Average Airflow Velocity		0.45 m/s (90 fpm) at initial setpoint					
Air Volume		603 m³/h (355 cfm)	903 m³/h (531 cfm)	1204 m³/h (709 cfm)	1506 m³/h (886 cfm)	1806 m³/h (1063 cfm)	
ULPA Filter Typical Efficiency		>99.999% at particle size between 0.1 to 0.3μm					
Sound Emission Per IEST- RP-CC002.2*		55.5 dBA	55.5 dBA	56.5 dBA	57 dBA	57 dBA	
Fluorescent Lamp Intensity At Zero Ambient		1590 Lux (148 foot candles)	970 Lux (90 foot candles)	1110 Lux (103 foot candles)	890 Lux (83 foot candles)	980 Lux (91 foot candles)	
Claan banch	Main Body	1.2 mm (0.05") 18 gauge electro-galvanized steel with white oven-baked epoxy-polyester powder-coated finish					
Clean bench Construction	Work Zone	1.2 mm (0.05") 18 gauge stainless steel, grade 304, with 4B finish					
	Side Walls		UV absorbing tempere	ed glass, 5 mm (0.2"), col	orless and transparent		
	220-240V, AC, 50Hz, 1Ø						
	Cabinet Full Load Amps (FLA)	2A	2A	2A	2A	4A	
	Optional Outlets FLA	5A	5A	5A	5A	5A	
	Cabinet Nominal Power	280	294	333	340	544	
	Cabinet BTU	955	1003	1136	1160	1856	
	110-120V, AC, 60Hz, 1Ø						
Electrical**	Cabinet Full Load Amps (FLA)	3.5A	3.5A	3.5A	3.5A	6.7A	
Electrical	Optional Outlets FLA	5A	5A	5A	5A	5A	
	Cabinet Nominal Power	330	350	370	535	591	
	Cabinet BTU	1126	1194	1262	1825	2017	
	220-240V, AC, 60Hz, 1Ø						
	Cabinet Full Load Amps (FLA)	2A	2A	2A	2A	4A	
	Optional Outlets FLA	5 A	5 A	5 A	5A	5 A	
	Cabinet Nominal Power	280	294	333	340	544	
	Cabinet BTU	955	1003	1136	1160	1856	
Net Weight***		106 kg (234 lbs)	127 kg (280 lbs)	152 kg (335 lbs)	171 kg (414 lbs)	201 kg (443 lbs)	
Shipping Weight***		162 kg (357 lbs)	171 kg (377 lbs)	234 kg (516 lbs)	245 kg (540 lbs)	270 kg (595 lbs)	
Shipping Dimensions, Maximum (W x D x H)***		860 x 820 x 1610 mm 33.8" X 32.3" X 63.4"	1130 x 820 x 1610 mm 44.5 "x 32.3" X 63.4"	1430 x 820 x 1610 mm 56.3" x 32.3" X 63.4"	1720 x 820 x 1610 mm 67.7" x 32.3" X 63.4"	2050 x 820 x 1610 mm 80.7" x 32.3" X 63.4"	
Shipping Volume, Maximum***		1.14 m³ (40.3 cu.ft)	1.49 m³ (52.6 cu.ft)	1.89 m³ ( 66.7 cu.ft)	2.27 m <sup>3</sup> (80.2 cu.ft)	2.71 m³ (95.7 cu.ft)	



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

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

\*\*\* Clean bench only; excludes optional stand.



Since 1978, Esco has emerged as a leader in the development of controlled environment, laboratory and cleanroom 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



WORLD CLASS, WORLDWIDE,





