

**ESCO**  
HEALTHCARE



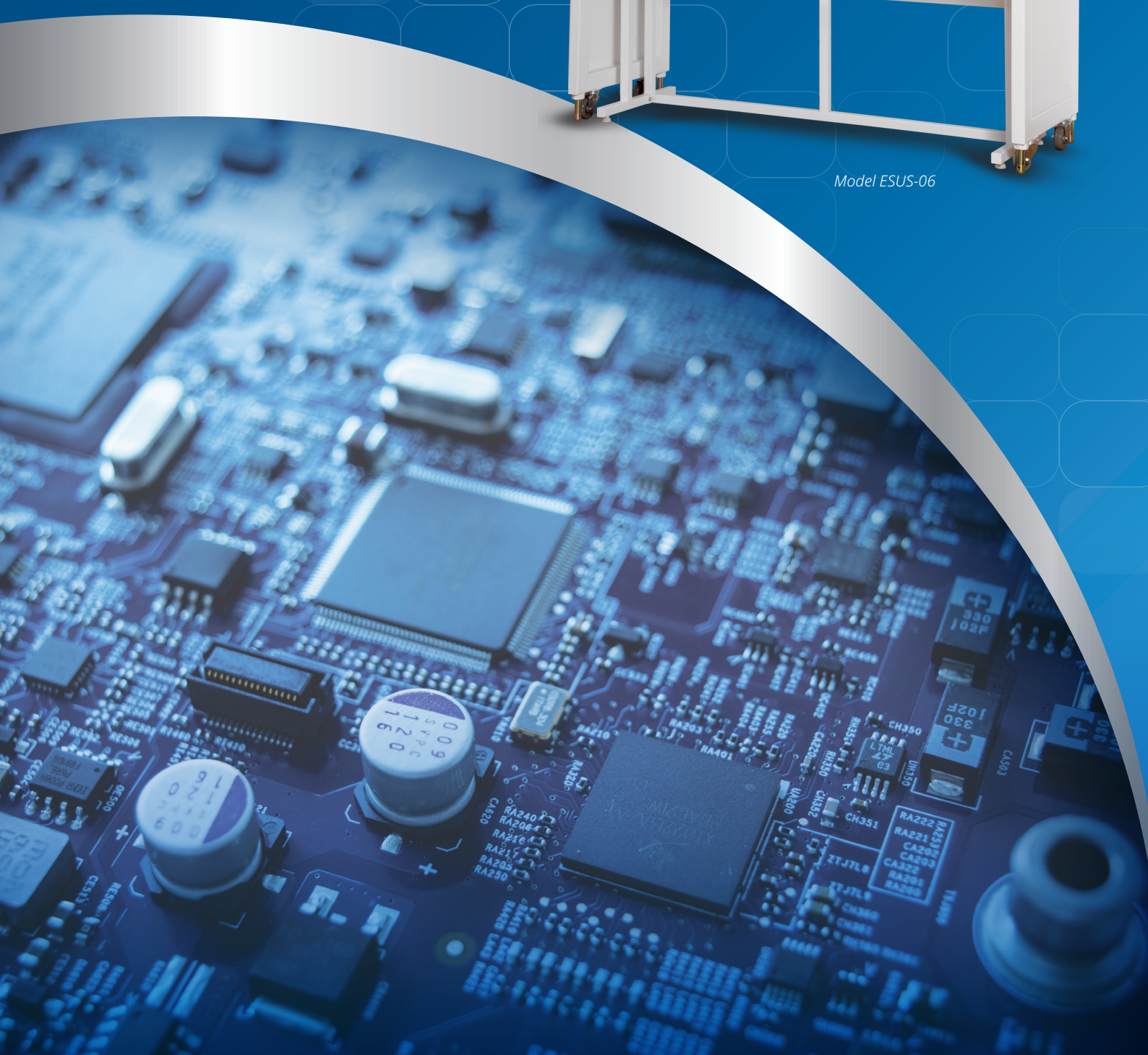
"Discovery to Delivery"

# Enterprise<sup>®</sup> Laminar Flow Straddle Unit, Single/Double

*The Leading Solution for  
Industrial Process Protection*



Model ESUS-06



## Provides Clean Air and Product Protection

Esco Enterprise Laminar Flow Straddle Units accommodate the stream of vertical air from the filter face flows to the work zone. It highly protects the product handling under the cabinet by the provision of Clean Air. The air from filter face also gives the Air Curtain effect to prevent the unintended aerosols and/or particles to the work zone, thus products are shielded in an expected way.

## Vibration Proof

- Isolated stainless steel work top minimizes the vibration on top of work zone.
- it matches for highly detail work and analytical balance applications.
- Shielded Work Zone
- Prefilter & HEPA main filter utilization, longer main filter lifetime
- Filter pressure monitoring indicates the filter is clogged or remained function.



## Safety and Certification

	Cabinet Performance	Air Quality	Filtration	Electrical Safety
Standard Compliance	IEST-RP-CC002.2, Worldwide	ISO 14644.1, Class 4, Worldwide IEST-G-CC1001, Worldwide IEST-G-CC1002, Worldwide	EN-1822 (H14), Europe IEST-RP-CC001.3, Worldwide IEST-RP-CC007.1, Worldwide IEST-RP-CC034.1, Worldwide	EN-1822 (H14), Europe IEST-RP-CC001.3, Worldwide IEST-RP-CC007.1, Worldwide IEST-RP-CC034.1, Worldwide



### Simple Controller

Rocker switches for blower and lamp as well as the monitoring of differential pressure of H14 filter



### Sash Optimum Opening

At the same time, to increase the air stream to the work zone yet wide opening to maximize the comfort of working or to accommodate huge equipment inside the cabinet



### Isolated Stainless Steel Work Top

Prevent the high vibration which caused by the blower rotor movement by separating the table-top integration from the cabinet

### Highly Customized Work Top

Worktop is feasible to be configured into specific needs; motorized up/down worktop, additional shelves, etc.





## Main Features

- Quiet, reliable, permanently lubricated direct drive centrifugal blowers.
- Long-life HEPA filter for supply airflow.
- Filtered clean air work zone environment created for optimum product protection.
- Esco antimicrobial coating on all painted surfaces minimizes contamination.
- Available in single, double, 1.2 and 1.8 meter (4' and 6') models.
- Multiple units may be connected for production line applications.

## Esco Experience

Esco is a leader in premium laminar flow clean benches for the global industrial and 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 purchaser, 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.

Esco Enterprise Laminar Flow Straddle Units are designed for larger-scale process protection in industrial applications typically requiring multiple units connected in an assembly line configuration. They may be placed within an ISO Class 8 cleanroom to provide an ultra-clean environment directly at the process level, without the initial and operating costs associated with a full-sized ISO Class 3 or 4 cleanroom.

## Air Cleanliness Standards

(ISO 14644-1, Air Cleanliness Particle Limits (No. of Particles / m<sup>3</sup>))

Particle Size (µm)	Cleanliness Class					
	Class 1	Class 2	Class 3	Class 4	Class 1	Class 1
0.1	10	100	1000	10000	100000	1000000
0.2	2	24	237	2370	23700	237000
0.3	-	10	102	1020	10200	102000
0.5	-	4	35	352	35200	35200
1.0	-	-	8	83	835	8320
5.0	-	-	-	-	29	293

## Vertical Laminar Flow Straddle Units

Esco Enterprise Laminar Flow Straddle Units feature vertical laminar flow and are available in single and double sided models. Vertical laminar flow generates less turbulence around large pieces of equipment as compared to horizontal laminar flow designs.

- 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.
- Double sided units are suitable for larger-scale industrial applications. Roller or belt conveyors can be configured with the units to facilitate assembly operations.

## Applications

Uses include applications where there is no generation of biohazardous materials and operator protection is not required.

- Cleanrooms, electronics assembly, semiconductors, pharmaceutical, aerospace, and medical devices industries.
- Mycology and food microbiology.
- Plant and mammalian cell culture.
- Clinical pharmacy and hospital use.
- Applications benefiting from the isolated work surface frame design which virtually eliminates vibration.

## The Highest Quality Construction

All Esco products are manufactured for the most demanding cleanroom applications.

- The straddle unit work surface is constructed of stainless steel, making the work zone easy to clean. The interior surface will not chip, rust or generate particles.
- Reliable rocker switches operate the fan and lights and a Minihelic™ pressure gauge monitors straddle unit operation.
- Built-in warm white, electronically ballasted, 5000k lighting provides excellent illumination of the work zone and reduces operator fatigue. The reliable lighting system is zeroflicker and instant start.
- All components are designed for maximum chemical resistance and enhanced durability for a long service life.
- The main body of the straddle unit is constructed of industrial-grade electrogalvanized steel.

- The straddle unit is mobile on casters and may be fixed in place via the built-in leveling feet.
- All straddle unit components are clean room compatible.
- Isocide eliminates 99.9% of surface bacteria within 24 hours of exposure.
- Transparent Polycarbonate side panels enhance visibility and create a more comfortable work environment for the operator as opposed to conventional stainless steel or painted steel sides.
- Polycarbonate side panels are removable when multiple units are connected.
- Polycarbonate is scratch and abrasion resistant, does not particulate, and decontaminates easily.

## Enhanced Filtration System

The enhanced filtration system on the straddle unit is designed to provide the highest level of air quality within the work zone, meeting all relevant standards (see technical specifications for details).

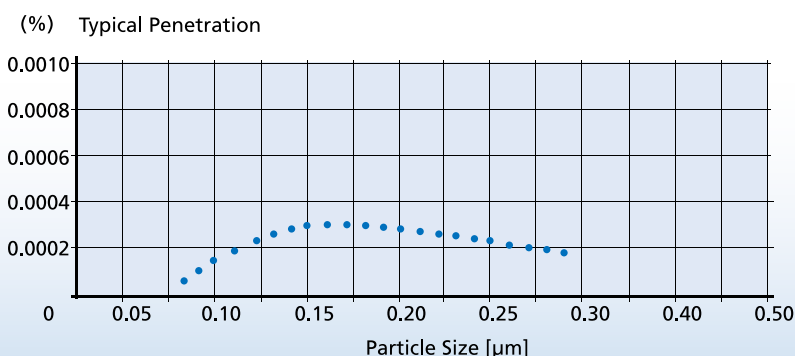
- CEsco straddle units provide ISO Class 5 air cleanliness within the work zone as per ISO 14644.1.
- High quality HEPA filters utilize an improved mini-pleated separation technique to maximize surface area, improve efficiency and extend the filter life. Filters operate at a typical efficiency of >99.995% at 0.3 micron sizes.
- An additional disposable pre-filter on all models traps large particles in the inflow air prior to reaching the main filter, protecting it against damage and prolonging its life.

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



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

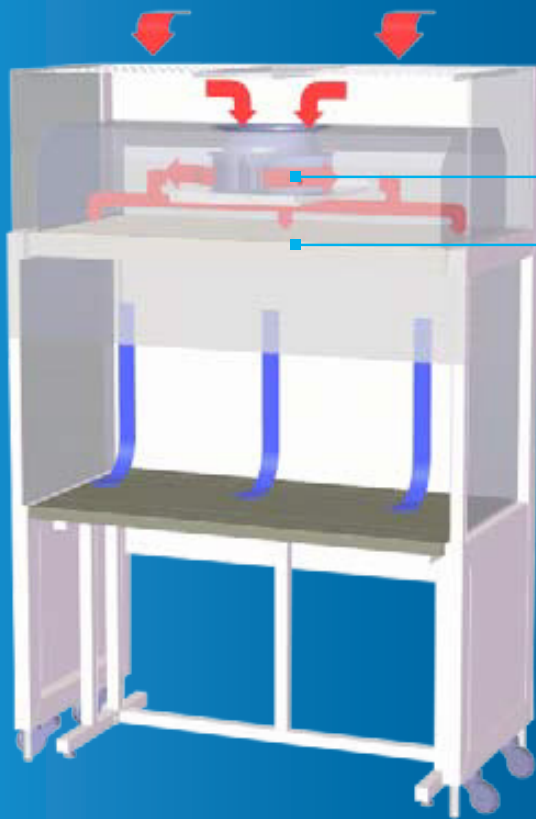
## Esco ULPA Filter Efficiency



### ● Typical Penetration

Esco straddle units use ULPA filters (per IEST-RP-CC001.3) provide >99.999% typical efficiency for particle sizes of 0.1 to 0.3 micron level.

## Vertical Laminar Flow Straddle Unit Airflow Diagram



- Blower
- HEPA Filter
- HEPA-filtered air
- Unfiltered/potentially contaminated air
- Room air / inflow air

- During operation, room air is drawn through the top of the straddle unit via a washable polyurethane pre-filter with 20% arrestance, trapping larger particles and increasing the life of the main filter.
- The air is then forced evenly through the ULPA filter with >99.999% efficiency, resulting in a unidirectional stream of clean air projected vertically over the internal work zone. All airborne contaminants are flushed and diluted, resulting in a particulate-free work environment.
- The purified air then leaves the storage area across the entire open front of the straddle unit.
- A nominal filter face velocity of 0.45 m/s (90 fpm) ensures that there is a sufficient number of air changes within the enclosed area of the straddle unit in order to maintain cleanliness.

## Blower Efficiency

- Esco straddle units incorporate permanently lubricated direct drive centrifugal blowers.
- The energy efficient external rotor motor design reduces operating costs and has extremely low noise and vibration levels.
- Built-in solid state variable speed controllers, with integral RFI and noise filters, are superior to conventional "step" controllers and offer infinite adjustment from zero to maximum setting.

## Designed and Built to Exceed Safety Criteria

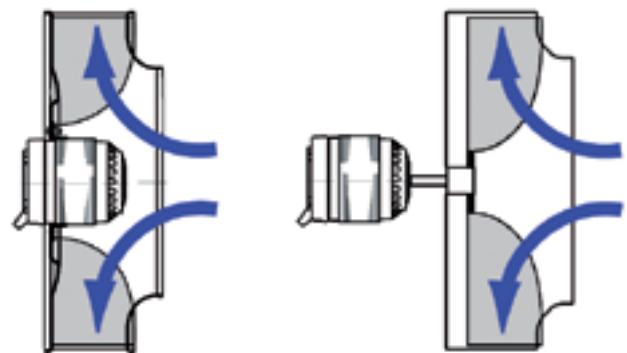
All components used in Esco products meet or exceed all applicable safety requirements.

- Each straddle unit 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.
- All Esco straddle units meet general safety requirements set by independent testing laboratories (see technical specifications for details).

## Warranty

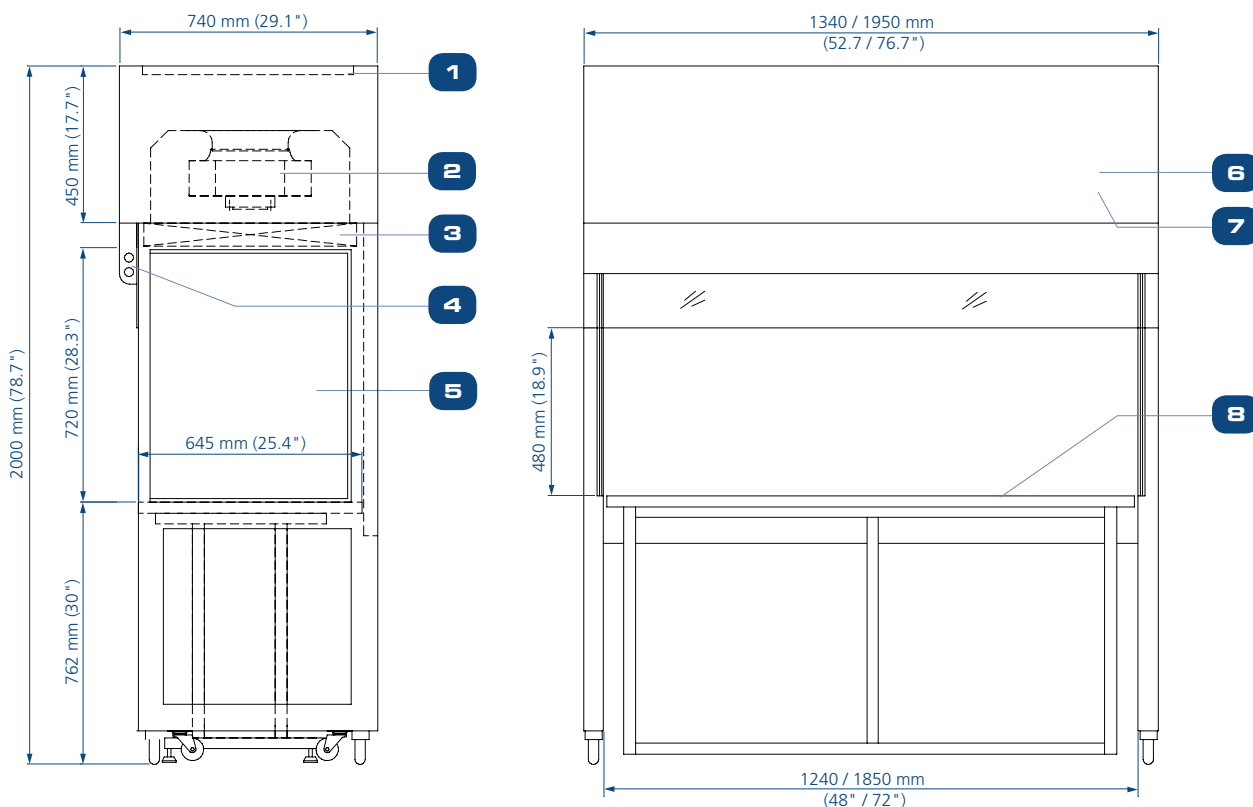
Esco Enterprise Straddle Units come with a 12 months warranty, excluding consumable parts and accessories. Contact your local representative for specific warranty details.

## Esco Centrifugal Fan with External Rotor Motor (left) vs. Conventional Fan with Standard Motor (right)



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

## ESUS-0\_Enterprise Laminar Flow Single Straddle Unit Technical Specifications

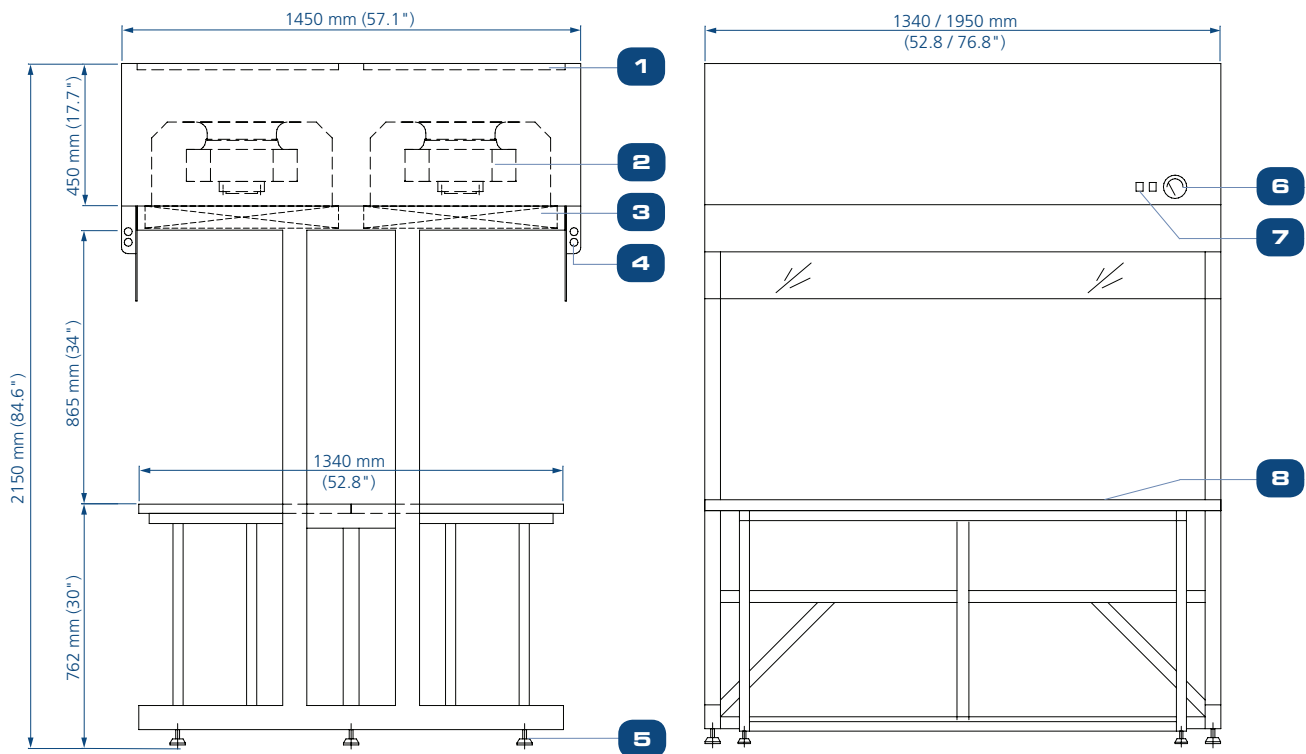


- |                |                                   |
|----------------|-----------------------------------|
| 1. Pre-filter  | 5. Polycarbonate sides            |
| 2. Blower      | 6. Pressure gauge                 |
| 3. HEPA Filter | 7. Operating Switches             |
| 4. LED lamp    | 8. Isolated stainless steel table |

### General Specifications, Enterprise Laminar Flow Single Straddle Unit

Model	ESUS-04	ESUS-06	
Normal Size	1.2 meters (4')	1.8 meters (6')	
External Dimensions (W x D x H)	1340 x 740 x 2000 mm (52.7" x 29.1" x 78.7")	1950 x 740 x 2000 mm (76.7" x 29.1" x 78.7")	
Internal Work Area, Dimensions (W x D x H)	1240 x 645 x 720 mm (48" x 25.4" x 28.3")	1850 x 645 x 720 mm (72" x 25.4" x 28.3")	
Usable Work Zone	1220 x 645	1850 x 645	
Initial Airflow Velocity	Average of 0.45 m/s or 90 fpm (+/- 20%)		
Air Volume	1205 m <sup>3</sup> /h	1858 m <sup>3</sup> /h	
Pre-Filter	Washable non-woven polyester fibers with 90% arrestance and 20% efficiency		
HEPA Filter Typical Efficiency	99.99% at partial size 0.3 μm		
Sound Emission Per IEST-RP-CC002.2	< 67 dBA	<67 dBA	
LED Lamp Intensity At Zero Ambient	≥ 800		
Cabinet Construction	Main Body	1.5 mm (0.06") electro-galvanised steel with white oven-baked epoxy powder-coated finish.	
	Work Zone	1.2mm (0.05") 18 gauge stainless steel grade 304	
Net Weight	220 kg (484 lbs)	300 kg (660 lbs)	
Shipping Weight	270 kg (594 lbs)	360 kg (792 lbs)	
Shipping Dimensions, Maximum (W x D x H)	2200 x 960 x 2200 mm (59" x 35.4" x 86.6")	2200 x 900 x 2200 mm (82.6" x 35.4" x 86.6")	
Electrical	220-240V, AC, 50Hz, 1ø	ESUS-04	ESUS-06
	Cabinet Power/ Amp	380 W/ 2 A	680 W/ 4 A
	BTU/ Hr	775	1387

## ESUD-0\_Enterprise Laminar Flow Double Straddle Unit Technical Specifications



- |                |                                   |
|----------------|-----------------------------------|
| 1. Pre-filter  | 5. Polycarbonate sides            |
| 2. Blower      | 6. Pressure gauge                 |
| 3. HEPA Filter | 7. Operating switches             |
| 4. LED lamp    | 8. Isolated stainless steel table |

### General Specifications, Enterprise Laminar Flow Double Straddle Unit

Model	ESUD-04	ESUD-06	
ESUD	1.2 meters (4')	1.8 meters (6')	
External Dimensions (W x D x H)	1340 x 1450 x 2150 mm (52.7" x 57.1" x 84.6")	1950 x 1450 x 2150 mm (76.7" x 57.1" x 84.6")	
Internal Work Area, Dimensions (W x D x H)	1340 x 1340 x 865 mm (52.8" x 52.8" x 34")	1950 x 1340 x 865 mm (76.8" x 52.8" x 34")	
Usable Work Zone	1340 x 1340	1950 x 1340	
Initial Airflow Velocity	Average of 0.45 m/s or 90 fpm (+/- 20%)		
Air Volume	2410 m³/h	3716 m³/h	
Pre-Filter	Washable non-woven polyester fibers with 90% arrestance and 20% efficiency		
HEPA Filter Typical Efficiency	99.99% at partial size 0.3 µm		
Sound Emission Per IEST-RP-CC002.2	< 67 dBA	< 67 dBA	
LED Lamp Intensity At Zero Ambient	≥ 800		
Cabinet Construction	Main Body	1.5 mm (0.06") electro-galvanised steel with white oven-baked epoxy powder-coated finish.	
	Work Zone	1.2mm (0.05") 18 gauge stainless steel grade 304	
Net Weight	420 kg (924 lbs)	300 kg (660 lbs)	
Shipping Weight	500 kg (1100 lbs)	360 kg (792 lbs)	
Shipping Dimensions, Maximum (W x D x H)	1950 x 950 x 2200 mm (59" x 63" x 86.6")	2200 x 900 x 2200 mm (82.6" x 35.4" x 86.6")	
Electrical	220-240V, AC, 50Hz, 1ø	ESUD-04	ESUD-06
	Cabinet Power/ Amp	380 W/ 2 A	680 W/ 4 A
	BTU/ Hr	775	1387





**Magnehelic gauge**

Filter drop will be indicated here once the pressure is two times the daily normal pressure

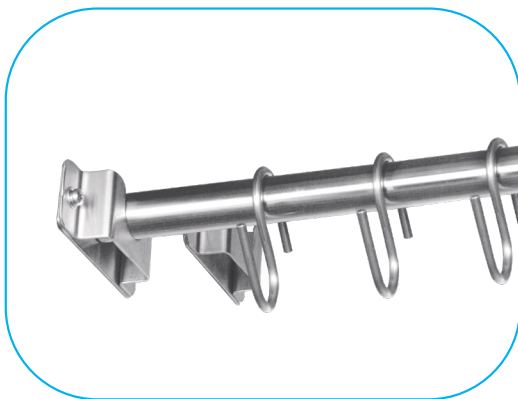
**Blower switch**

The simple ON and OFF button for blower upon cabinet use to provide the 0.45 m/s at 150 mm below the diffuser.

**Lamp switch**

The lighting with standardized acceptance intensity criteria will give a proper space work.

**Accessories**



**IV Bar**



**Electrical Outlet**



**Service Fixture**



**Leveling Feet / Caster Wheel**

Customizations/Add-ons



ESUS with additional of cabinet underneath the tabletop



ESUS with customized isolated tabletop with motorized system



ESUD with customized wider and longer tabletop



**Upgrade to Sentinel  
Microprocessor controller**



**UP/DOWN Motorized system**



**ESUS with customized material with Full  
Stainless-Steel 304/316**

**ESCO LIFESCIENCES GROUP NETWORK**  
*42 Locations in 21 Countries All Over the World*



- Global Offices
- Distributors
- Factories
- R&D Centers
- Regional Distribution Centers



- Air Shower
- Aseptic Containment Isolator (ACTI)
- Ceiling Laminar Airflow Units
- Cleanroom Transfer Hatch
- Containment Barrier Isolator (CBI)
- Downflow Booth (DFB)
- Dynamic Floor Laminar Hatch
- Dynamic Pass Box
- Evidence Drying Cabinet
- Garment Storage Cabinet
- General Processing Platform Isolator (GPPI)
- Laminar Flow Horizontal Trolley
- Laminar Flow Straddle Units, Single and Double
- Laminar Flow Vertical Trolley
- Pass Box
- Soft Wall Cleanroom
- Sputum Booth
- Ventilated Balance Enclosure (VBE)
- Weighing and Dispensing Containment Isolator (WDCI)

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



**Esco Healthcare**  
 19 Changi South Street 1,  
 Singapore 486779  
 Tel: +65 65420833  
 Email: mail@vaccixcell.com

**Esco Technologies, Inc.**  
 2512 Metropolitan Drive, Suite 120 B  
 Feasterville- Trevose, PA 19053-6738  
 Tel: +1 215 322 2155  
 Email: eti.pharma@escolifesciences.com

**Esco GB Ltd**  
 Unit 2 R-evolution @ Gateway 36, Kestrel  
 Way, Barnsley, S70 5SZ  
 Tel: +44 (0) 1226 360 799  
 Email: egb.info@escolifesciences.co

**Esco Lifesciences Offices:** Bangladesh | China | Denmark | Germany | Hong Kong | Indonesia | Italy | Lithuania | Malaysia | Myanmar | Philippines | Russia | Singapore | South Africa | South Korea | Taiwan | Thailand | UAE | UK | USA | Vietnam

