ESCO PHARMA
PLATFORM SPECIALIST.

Esco Pharmaceutical Products

Combined Brochure

Pharmacon

Downflow Booth

Esco Pharmacon Downflow Booth
Model DFB-G2

Introduction

Downflow booths provide operator, process and / or product protection by utilizing HEPA filtered unidirectional laminar downflow to maintain an ISO 5 environment at rest within the work zone and capture particulates during open handling processes.

The standard Esco DFBG2 has over 420 possible dimensional models and approximately 3.5 million possible system configurations ensuring that Esco can provide a standard solution to fit your specific process and facility requirements. Should a standard option not fit your requirements Esco can offer a customized solution.

The DFBG2 is designed such that through the different configurations it can be applied; but not limited to, the following markets:

- Pharmaceutical
- Cosmetic
- Nutraceutical
- Food
- Biological
- Animal
- Robotic
- Electronic

Basic Principles

- Laminar airflow velocity of 0.45m/s ± 20% (89 ft/min) measured 150mm (6") from terminal HEPA filter or diffuser face
- Containment Performance Target (CPT's) ≤ 100 µg/m^3 over an 8 hour Time Weighted Average (TWA) when used with proper operator techniques. CPT's of
- ≤ 10 µg/m^3 over an 8 hour TWA are achievable with the use of a high containment screen
- ISO 5 work space environment at rest conditions
- Enhanced cGMP practices
- Cross contamination control through negative and positive pressure environment option

Standard Features

- cGMP modular design with minimized joints and seams
- 6 different filter configurations available utilizing combinations of G4, F8, Carbon, H13, H14 and PLF screens
- Gel Seal HEPA Filters
- Integrated Filter challenge ports

Features

- Safe Change filter configurations are available for potent products, selectable to change either internally or externally to the booth
- Open loop or Closed Loop fan control configurations
- Recirculating or Single Pass airflow configurations allowing use for powder or solvent applications
- Optional cooling coil systems to provide operator comfort
- PVC strip curtains available
- Energy efficient EC fan units available to minimize operating costs
- Optional hazardous area configurations to meet ATEX and NEC 505 requirements.
- Multiple control system options (HMI, Push Button or Sentinel Gold Microprocessor interfaces)
- Modular design allows future system adjustment without full booth replacement

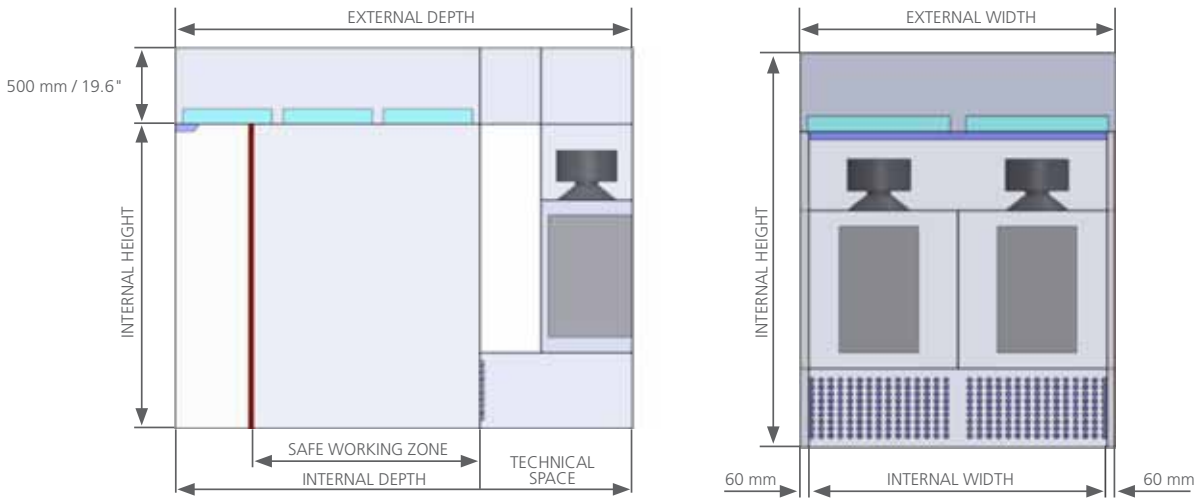
Model	Series	Explosive Rating	Inside Height	Outside Width	Inside Depth	Back Stack Depth	Filter Group	Fan/Filter Access	Recirculating or Single Pass Airflow	LOP Location	Bleed Position	Powder Coated Components	Stainless Steel Components	PVC Group	Supply Voltage	MCP Location	Control Type	Cooling Type	Other Options
DFBG2																			

Note: Refer to the configuration table below for parameter selection options and input them into the cells above. For example: DFBG2-SC-SA-21-24-20-B-A-R-F-PQ-RS-NILL-D-RM-3-CC-02-03-05 would be a safe change, safe area booth that has an internal height of 2.1 m, an external width of 2.4 m and an internal depth of 2.0 m and so on. For any option that you may not desire (PVC curtains, cooling options or other options) insert NILL into the cell.

		0.3 m Back Stock	0.6 m Back Stock	1.0 m Back Stock
Series	Option SC: Safe Change			√
	Option SCNB: Safe Change No-Bag			√
	Option ST: Standard	√	√	
Explosive Rating	Option SA : Safe Area		√	√
	Option ED: Explosive Dust		√	√
	Option EG: Explosive Gas		√	√
Dimensional Option	Internal Height Options (m)	2.1, 2.5	2.1, 2.5	2.1, 2.5
	External Width Options (m)	1.6, 1.8, 2.0, 2.4, 2.6, 2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.0, 4.2, 4.4, 4.6, 4.8, 5.0	1.6, 1.8, 2.0, 2.4, 2.6, 2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.0, 4.2, 4.4, 4.6, 4.8, 5.0	1.6, 1.8, 2.0, 2.4, 2.6, 2.8, 3.0, 3.2,3.4, 3.6, 3.8, 4.0, 4.2, 4.4, 4.6, 4.8,5.0
	Internal Depth Options (m)	0.8, 1.2, 1.6	0.8, 1.2, 1.6, 2.0, 2.4	0.8, 1.2, 1.6, 2.0, 2.4
Filter Arrangement Options	Option A - G4,F8,H13,H14,PLF			√
	Option B - G4,F8,H13,H14			√
	Option C - G4,F8,H13,PLF			√
	Option D - G4,F8,H14		√	√
	Option E - Carbon,H14	√		√
	Option F - Front	√		√
Fan / Filter Access	Option A - Internal to Booth	√	√	√
	Option B - External Area			√
Airflow Arrangement	Option R - Recirculating	√	√	√
	Option S - Single Pass			√
Bleed Position	Option T - Top			√
	Option F - Front	√	√	√
M.O.C. Options	Option P: Ceiling Plenum	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel
	Option Q: Side Panels, Rear Wall	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel
	Option R: Filter Housings, Fan Boxes, Spacer (if present) & Transition	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel
	Option S: Plinth	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel
	Option T: Exhaust Grills	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel
	Option U: Exterior Side Panels	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel	A: 316SS, B: 304 SS, C: White P.C. EG Steel
PVC Curtains	Option T - Top			√
	Option F - Front	√	√	√

Notes:

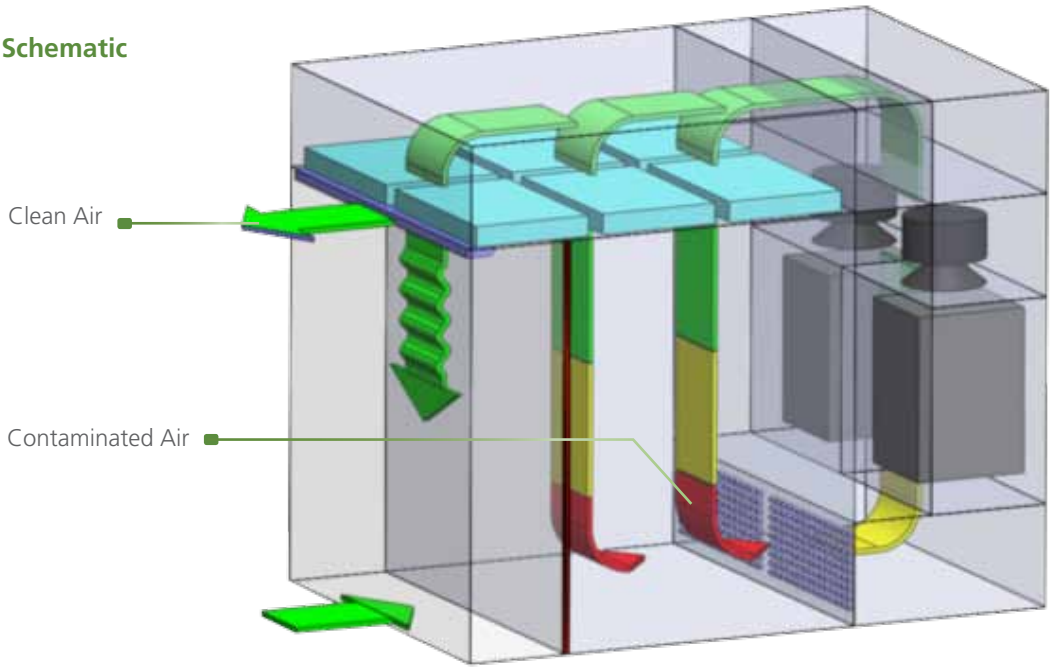
** Explosive Rating requires full definition at the time of enquiry*

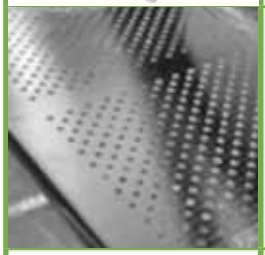


		0.3 m Back Stack	0.6 m Back Stack	1.0 m Back Stack
Voltage Supply	Option A: 230 V, 50 Hz, 1 Ph	√		
	Option B: 400 V, 50 Hz, 3 Ph		√	√
	Option C: 208 V, 60 Hz, 3Ph		√	
	Option D: 480 V, 60 Hz, 3 Ph		√	√
	Option E: 120 V, 60 Hz, 1 Ph	√		
MCP Location	OR: Onboard Right Access	√	√	√
	OL: Onboard Left Access	√	√	
	OF: Onboard Front Access	√		
	RM: Remote Mounted	√	√	
Control Type	Option 1: PLC/PB's/PDI/PDT - Allen Bradley Components - Closed Loop		√	√
	Option 2: PLC/PB's/PDI/PDT - Siemens Components - Closed Loop		√	√
	Option 3: PLC/HMI/PDT - Allen Bradley Components - Closed Loop		√	√
	Option 4: PLC/HMI/PDT - Siemens Components - Closed Loop			√
	Option 5: Sentinel Gold/PDI/PDT- Open Loop	√		
Cooling Type	Option CC: Chilled Water		√	√
	Option DX: Direct Expansion		√	√
	Option GL: Glycol		√	√

Mechanical	Many standard offerings to fit our client's needs result in reduced project start-up and fabrication times resulting in quicker equipment deliveries
	Modular design provides the option of increasing / decreasing booth size on-site without purchasing a new piece of equipment
Controls	DFB control system is pre-programmed for all possible options so existing DFBs can be easily adapted to suit changing customer needs
	Control system offerings (Siemens, AB, Sentinel Controller) provide options for international compliance and true closed loop control
Sales	Automated DFBG2 sales tool allows for instant quoting and drawing generation to greatly reduce the time between RFQ and quote submittal

Airflow Schematic



Options			
	High Containment Screen (1 or 5D)		Material Handling
	Bench; SST or Granite Tables, W x D, Fixed to Booth or Stand Alone		Bench; SST or Granite Tables, W x D, Fixed to Booth or Stand Alone
	Computer Monitor Mounting Screen		Bench; SST or Granite Tables, W x D, Fixed to Booth or Stand Alone
	Airlock		Bench; SST or Granite Tables, W x D, Fixed to Booth or Stand Alone
	UV Light Guards		Bench; SST or Granite Tables, W x D, Fixed to Booth or Stand Alone
	Two Additional Electrical Outlets		Bench; SST or Granite Tables, W x D, Fixed to Booth or Stand Alone
	Pass Through		Bench; SST or Granite Tables, W x D, Fixed to Booth or Stand Alone
	Side Wall Fire Sprinkler Penetration		

Weighing and Dispensing Containment Isolators (WDCI)

Weighing and Dispensing Containment Isolators (WDCI)

Intoduction

Weighing and Dispensing Containment Isolators (WDCI) are advanced containment systems providing controlled negative pressure environments to maximize personnel protection during weighing and dispensing of potent compounds.

Esco WDCIs provide standard configurable designs able to adapt to various weighing and dispensing quantities and accuracies.

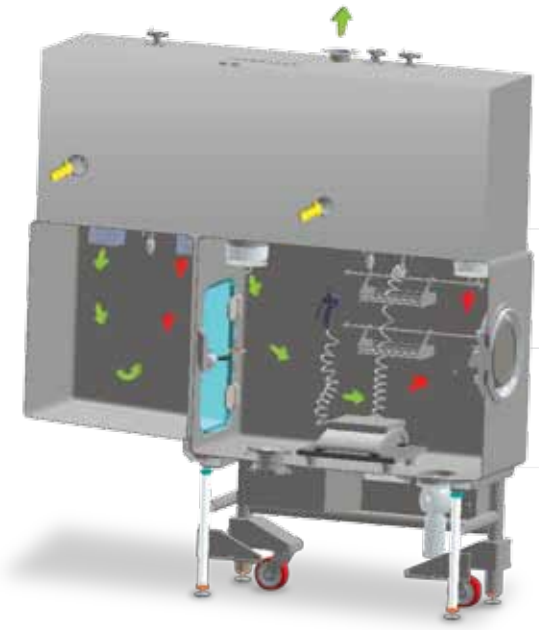
Basic principles

- Turbulent airflow allowing maximum containment with low airflow and therefore improved energy efficiency.
- Low negative pressure to reduce operator fatigue whilst providing maximum containment.
- Stable weighing accuracy as a result of low chamber pressure and flow in conjunction with Anti-Vibration platform.
- Contained Pass In / Pass Out systems to allow safe material transfer

Standard Features

- Fully welded single piece SS316L internal chambers with rounded coved corners.
- Pressure tested to ISO 14644-7.
- Inflatable Anti-Bacterial, USP Class VI Compliant and Food grade FDA approved gaskets provides both proactive and reactive sealing.
- Safe change glove system allowing change of gloves whilst maintaining a contained system.
- Integrated Anti-Vibration granite platform for weigh scale placement.
- Integrated automated pressure decay testing.
- Clean interior and exterior finishing.
- Safe change filters to allow in-process filter replacement.
- Lighting external to isolator chamber for ease of servicing and process chamber cleanliness.
- Integrated automated height adjustment providing 280mm of motion for ergonomic comfort.

Airflow Regimes



Room air Filtered air Contaminated air

		WDCI-2G_	WDCI-3G_	WDCI-4G_	WDCI-5G_
Nominal Size Process Chamber		1.2m	1.6m	2.0m	2.4m
External Dimensions (W x D x H)	Without Base Stand	1.2m x 0.65m x 1.73m	1.6m x 0.65m x 1.73m	2.0m x 0.65m x 1.73m	2.4m x 0.65m x 1.73m
	With Adjustable Base Stand (Min)	1.2m x 0.65m x 2.08m	1.6m x 0.65m x 2.08m	2.0m x 0.65m x 2.08m	2.4m x 0.65m x 2.08m
	With Adjustable Base Stand (Max)	1.2m x 0.65m x 2.36m	1.6m x 0.65m x 2.36m	2.0m x 0.65m x 2.36m	2.4m x 0.65m x 2.36m
Glove Port Height Min		1015	950	950	950
Glove Port Height Max		1300	1300	1300	1300
Chamber Pressure		Negative Pressure	Negative Pressure	Negative Pressure	Negative Pressure
Airflow Type		Turbulent Flow	Turbulent Flow	Turbulent Flow	Turbulent Flow
Airflow Volume - Maximum (Intake & Exhaust) - Normal operation		$21m^3/hr$	$21m^3/hr$	$21m^3/hr$	$21m^3/hr$
Airflow Volume - Maximum (Intake & Exhaust) - Glove Breach Protection		$75m^3/hr$	$75m^3/hr$	$75m^3/hr$	$75m^3/hr$
Filter Type - Inlet		H14 Cartridge Filter with PVC Shroud	H14 Cartridge Filter with PVC Shroud	H14 Cartridge Filter with PVC Shroud	H14 Cartridge Filter with PVC Shroud
Filter Efficiency - Inlet - Safe Change		99.999%	99.999%	99.999%	99.999%
Filter Type - Exhaust - Safe Change		H14 Push Push Filter with 316L St. St. Housing	H14 Push Push Filter with 316L St. St. Housing	H14 Push Push Filter with 316L St. St. Housing	H14 Push Push Filter with 316L St. St. Housing
Filter Efficiency - Exhaust		99.999%	99.999%	99.999%	99.999%
Lighting Level		≥650Lux	≥650Lux	≥650Lux	≥650Lux
Sound Level		≤68dBA	≤68dBA	≤68dBA	≤68dBA
Isolator Construction	Chamber	316L	316L	316L	316L
	Service Housing	316L	316L	316L	316L
	Support Frame	316L	316L	316L	316L
Anti-Vibration Weighing Mount	Black Granite for Analytical Weigh Scale	✓	✓	✓	✓
Isolator Finish	Chamber Internal	≤0.4Ra	≤0.4Ra	≤0.4Ra	≤0.4Ra
	Chamber External	≤0.6Ra	≤0.6Ra	≤0.6Ra	≤0.6Ra
	Service Housing External	0.6Ra	0.6Ra	0.6Ra	0.6Ra
	Support Frame	1.0Ra	1.0Ra	1.0Ra	1.0Ra
Controls	Color 6" HMI - Siemens - CE Marked	✓	✓	✓	✓
	Operator Specific Login sets Isolator Working Height for Ergonomic Comfort (Selectable)	✓	✓	✓	✓
Electrical Requirements (By Client)	110-120V, AC, 50Hz/60Hz, 1Ø	✓	✓	✓	✓
	220-240V, AC, 50Hz/60Hz, 1Ø	✓	✓	✓	✓
	480V, AC, 50Hz/60Hz, 3Ø	✓	✓	✓	✓
Compressed Air requirements (By Client)	6 Barg Pressure at 5ltr/sec	✓	✓	✓	✓
Exhaust Duct requirements (By Client) - Thimble Connection Required		(101.6mm) 4"	(101.6mm) 4"	(101.6mm) 4"	(101.6mm) 4"
Options	Pass Chamber	✓	✓	✓	✓
	Temperature & Humidity Monitoring	✓	✓	✓	✓
	Process Chamber Drain	✓	✓	✓	✓
	WIP - Spray Gun - Process Chamber	✓	✓	✓	✓
	CIP - Spray Balls - Process Chamber	✓	✓	✓	✓
	CIP - Spray Balls - Pass Chamber	✓	✓	✓	✓
	Split Butterfly Valve - 4"	✓	✓	✓	✓
	RTP Alpha - Ø190, Ø270, Ø350, Ø460	✓	✓	✓	✓
	RTP Beta Canister - Ø190, Ø270, Ø350, Ø460	✓	✓	✓	✓
	RTP Beta Liner - Ø190, Ø270, Ø350, Ø460	✓	✓	✓	✓

Aseptic Containment Isolator (ACTI)

Aseptic Containment Isolator (ACTI)

Intoduction

- Esco Aseptic Containment Isolator (ACTIs) work in conjunction with advanced material transfer techniques and bio decontamination agents providing a 6 log reduction inviable contaminants.
- Esco ACTIs provide standard configurable designs able to adapt to various batch sizes and process flows. Through a fully user selectable operating system, the same Isolator can be setup to operate under recirculation or full exhaust airflow and operate in positive or negative pressure modes, allowing the system to be multifunctional and cater for all requirements of toxic or non-toxic aseptic materials. For toxic materials, the system incorporates safe change filters.

Basic principles

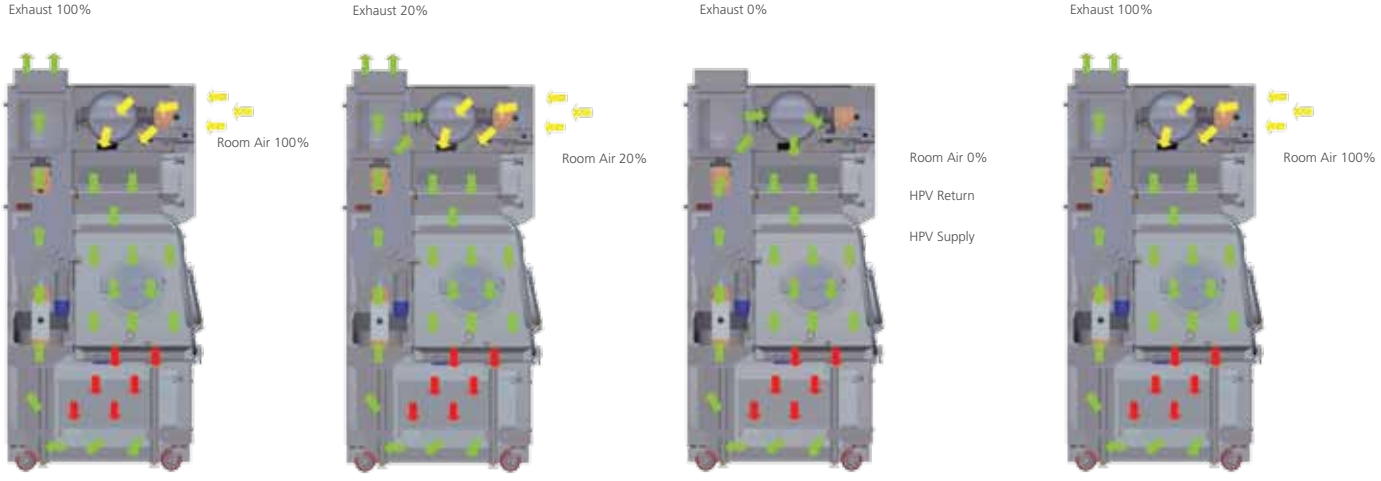
- Full unidirectional airflow provides superior aseptic work zones.
- Safety toughened laminated glass hinges upwards assisted with gas springs for batch loading.
- Airflow regime runs either in re-circulatory or full exhaust airflow. full exhaust airflow for fast purging of bio decontamination agent during aeration period and recirculation option for reduced airflow taken from the room and exhausted during normal operation and during conditioning and decontamination phases
- U15 supply and exhaust filters suitable for either toxic or non-toxic aseptic materials. Exhaust Filter directly below the isolator can be removed & a bypass tube fitted for non-potent material applications

Standard Features

- Full unidirectional airflow provides superior aseptic work zones.
- Safety toughened laminated glass hinges upwards assisted with gas springs for batch loading

Airflow Regimes

Room air Filtered air Contaminated air



Normal Running
- Full Exhaust Airflow

Normal Running
- Recirculating Airflow

Decontamination
- Recirculating Airflow

Aeration
- Full Exhaust Airflow

		ACTI-2G_	ACTI-3G_	ACTI-4G_
Nominal Size Main		1.2m	1.6m	2.0m
Working Chamber Dimensions		1.2m x 0.75m x 0.85	1.6m x 0.75m x 0.85	2.0m x 0.75m x 0.85
External Dimensions (W x D x H)	With Adjustable Base Stand (Min)	1.2m x 1.1m x 2.2m	1.6m x 1.1m x 2.2m	2.0m x 1.1m x 2.2m
	With Adjustable Base Stand (Max)	1.2m x 0.75m x 2.68m	1.6m x 0.75m x 2.68m	2.0m x 0.75m x 2.68m
Glove Port Height Min		1080	1080	1080
Glove Port Height Max		1360	1360	1360
Chamber Environment		ISO Class 5 all Chambers (Grade A)		
Filter Type – Isolator Inlet		ULPA U15 with Integral mesh guard and knife edge gel seal		
Filter Efficiency - Inlet		99.9998%	99.9998%	99.9998%
Filter Type – Isolator Exhaust		HEPA H14 with knife edge gel seal		
Filter Efficiency - Exhaust		99.997%	99.997%	99.997%
Lighting Level		≥600Lux	≥600Lux	≥600Lux
Sound Level		≤68dBA	≤68dBA	≤68dBA
Isolator Construction	Chamber	316L	316L	316L
	Service Housing	316L	316L	316L
	Support Frame	316L	316L	316L
Isolator Finish	Chamber Internal	≤0.4Ra	≤0.4Ra	≤0.4Ra
	Chamber External	≤0.6Ra	≤0.6Ra	≤0.6Ra
	Service Housing External	0.6Ra	0.6Ra	0.6Ra
	Support Frame	1.0Ra	1.0Ra	1.0Ra
Electrical Requirements (By Client)	220-240V, AC, 50Hz, 1Ø	✓	✓	✓
	110-120V, AC, 60Hz, 1Ø	✓	✓	✓
	220-240V, AC, 60Hz, 1Ø	✓	✓	✓
Compressed Air requirements (By Client)	6 Barg Pressure at 5ltr/sec	✓	✓	✓
Exhaust Duct requirements (By Client)		10" Duct from Isolator to Outside		
Options	Pass Chamber	✓	✓	✓
	Bio-Decontamination Steris	✓	✓	✓
	Bio-Decontamination Bioquell	✓	✓	✓
	Non-Viable Air Sampler	✓	✓	✓
	Viable Air Sampler	✓	✓	✓
	Sterility Test Pump	✓	✓	✓
	Glove Tester	✓	✓	✓
	Waste Bag Grommet	✓	✓	✓
	Sterile Continuous Liner	✓	✓	✓
	Bag-Welder with Table	✓	✓	✓
	RTP Ø270 - Alpha	✓	✓	✓
	RTP Ø270 - Beta Canister	✓	✓	✓
	RTP Ø270 - Beta Liner	✓	✓	✓

General Processing Platform Isolator (GPPI)

General Processing Platform Isolator (GPPI)

Intoduction

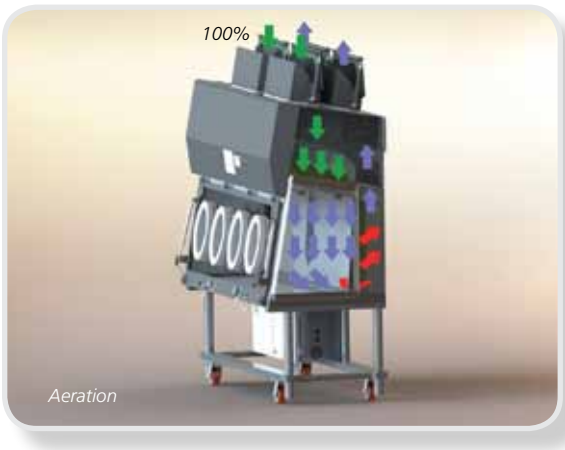
The Esco General Processing Platform Isolator (GPPI) is a highly adaptable, unidirectional laminar airflow isolator that can be used for sterility testing or other processes that require an ISO Class 5 (Grade A) aseptic environment. The GPPI's advanced control system allows the operator to select either positive or negative chamber pressure as well as single pass or recirculating airflow patterns. These features, along with the ability to perform safe change procedures on the supply and return ULPA filters, make the GPPI a highly versatile isolator that can be used for potent or non-potent aseptic materials.

In addition, the Esco GPPI's design offers over 20 standard options and configurations ensuring that Esco can provide a standard solution to fit your specific process and facility requirements. Should a standard option not fit your requirements Esco can offer customized solutions as well.

Basic Features

- Unidirectional laminar airflow
- User selectable positive or negative chamber pressures and single pass or recirculating airflow regimes
- Multiple standard VHP bio-decontamination options providing 6 log reduction in viable contaminants
- Low Contamination Filter Change design allows for the handling of potent and non-potent aseptic products

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



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

Standard Features

- Fully welded SS316L internal chambers with rounded coved corners
- Optional on-board exhaust catalytic convertor allows exhaust into the surrounding room without modifications to the facility and fitted with an interlocked external H_2O_2 sensor for safety
- Optional on-board air compressor eliminates the requirement for a site supplied compressed air connection, which allows for the installation of a simple plug-in of electrical power.
- Product is designed with FDA-approved hydraulic liquid that not only allows the user to raise and lower for optimal ergonomics but also enables ease of transport through a variety of doorway and ceiling heights.
- Self-contained design of control system & electrics allow for simple, plug-in installation
- Integrated particle monitoring connections and optional inclusion of the viable and non-viable monitoring equipment
- Automated pressure hold test
- Pre-Programmed system to function with multiple H_2O_2 system options
- Standard design incorporates cGMP compliant features; with the inclusion of an optional chart recorder or printer the GPPI will meet the data handling requirements for 21 CFR Part 11 requirements.
- Safe change glove system allows the changing of gloves while maintaining aseptic conditions inside of the chambers

Customized interchangeable racking for sterility test batches

Containment Barrier Isolator (CBI)

Containment Barrier Isolator (CBI)

Indroduction

Esco Containment Barrier Isolator (CBI) facilitates the isolation of a product or process while providing the required conditions for a sterile/aseptic environment. It is configured to operate at positive or negative pressure. This equipment provides a comprehensive range of personnel and product protection in addition to protection for the surrounding work areas and the environment.

CBI's design has complete compliance to PIC/s and EU cGMP standards with its 19 mm radius coved internal corners in a single piece chamber (no perforations or grilles for contaminants to be trapped on all 4 corners). Its Rear Return Filter ensures that ducts are not contaminated. The system comes in either recirculatory or single pass airflow.

Applications

- Pharmacy Compounding (Chemotherapy/TPN)
- As a Class III Cabinet for Biosafety Levels (BSL) 3 and 4
- Small Batch Sterility Testing
- Small-scale Potent Material Handling
- Cell Processing
- Aseptic Processing
- Research and Development

Key Features

- Controls exposure/cross-contamination risk to hazardous/aseptic materials for a wide variety of equipment and processes
- Controls false-positive risk for sterility testing
- Provides Operator Exposure Levels (OEL's) ≤1.0 µg/m^3 during controlled operations
- Levels of ≤0.1 µg/m^3 can be achieved via closed-transfer processes or based on client SOPs
- Enhances cGMP practices
- Quiet, energy-efficient ECM fans auto adjust to compensate for filter blockage
- Standard dimensions available are easily customized to suit process requirements
- Safe glove change and low contamination filter change
- FDA-approved static seals
- Pressure tested class 1 ISO 10648-2 standards
- System comes with a Semi-automated or Automated Pressure Hold Testing
- Pass Chamber comes in 2 sizes:
  - Small, non-gloved
  - Large, non-gloved/gloved

Filtration Package

Process Chamber

- Room Inlet Filter – F6 filtration. Panel filter, glass fiber media.
- Chamber Inlet Filter – Single U15 ULPA filtration. Panel filter, gel seal, glass fiber media.
- Chamber Return Filter – Single H14 HEPA filtration. Panel filter, gasket seal, glass fiber media.
- Chamber Outlet Filter – Standard F6 filtration, optional H14 HEPA filtration. Panel filter, gasket seal, glass fiber media.

Note: Hydrogen Peroxide Vapor (HPV) will pass through the filters during the HPV cycle to allow decontamination of the filters and air path.

Pass Chamber

- Room Inlet Filter – G4 filtration. Panel filter, polyester media.
- Chamber Inlet Filter – Single U15 ULPA filtration. Panel filter, gasket seal, glass fiber media.
- Chamber Exhaust Filter – F6 filtration. Panel filter, gel seal, glass fiber media.

Note: HPV will pass through the HEPA filters during the HPV cycle to allow decontamination of the filters and air path.

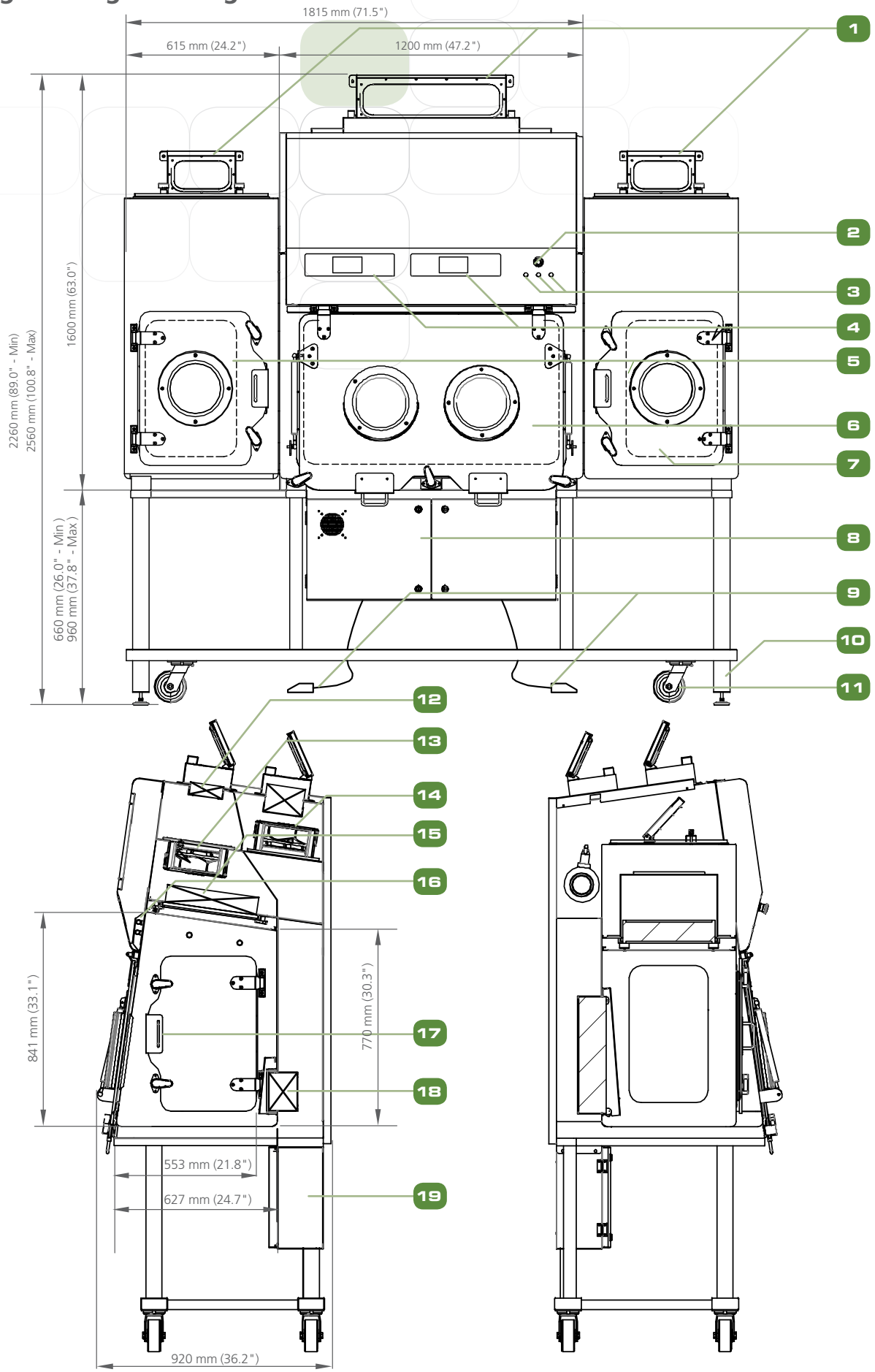
Control System

- Equipped with dual Sentinel™ Platinum Microprocessor Control System
- Standard Controls suitable for safe area applications
- Includes two IP66 electrical sockets as standard

Warranty

One year warranty (excluding consumables). Consumables are ballast, fluorescent, and filters. The warranty will cover all other parts including the blower, fan switch, and electrical main board. During the period of warranty, any repair, modification, testing and commissioning performed by any unauthorized party other than Esco Service Team will void the warranty of the unit.

Engineering Drawing



1. *Dampers*
2. *Emergency Stop or E-Stop*
3. *Pressure Injection Buttons*
4. *Sentinel™ Platinum Microprocessor Control System*
5. *Pass Chambers*
6. *Process Chamber*
7. *Sliding Tray*
8. *Main Control Panel*
9. *Foot Switch*
10. *Leveling Feet*
11. *Caster Wheel*
12. *F6 Pre-filter*
13. *Inlet EC Centrifugal Fan*
14. *Exhaust EC Centrifugal Fan*
15. *Gel-Sealed U15 Inlet Filter*
16. *T5 Fluorescent Lamp*
17. *Electromagnetic Interlock*
18. *Gasket-Sealed H14 Return Filter*
19. *Hydraulic Adjustable Support Stand (Optional)*

GENERAL SPECIFICATIONS				
Model		CBI-2G	CBI-3G	CBI-4G
Main Chamber Nominal Size (Width)		1.2 m	1.6 m	2.0 m
Working Chamber Dimensions - Min (L x W x H)		1.2 x 0.55 x 0.77 m	1.6 x 0.55 x 0.77 m	2.0 x 0.55 x 0.77 m
Working Chamber Dimensions - Max (L x W x H)		1.2 x 0.63 x 0.84 m	1.6 x 0.63 x 0.84 m	2.0 x 0.63 x 0.84 m
External Dimension (with one Pass Chamber) (L x W x H)	With Adjustable Base Stand (Min)	1.82 x 0.92 x 2.26 m	2.22 x 0.92 x 2.26 m	2.62 x 0.92 x 2.26 m
	With Adjustable Base Stand (Max)	1.82 x 0.92 x 2.56 m	2.22 x 0.92 x 2.56 m	2.62 x 0.92 x 2.56 m
Glove Port Height (Min)		1000 mm	1000 mm	1000 mm
Glove Port Height (Max)		1300 mm	1300 mm	1300 mm
Chamber Environment		ISO Class 5 all Chambers (Grade A)		
Filter Type - Chamber Inlet		ULPA U15 with Integral Mesh Guard and Knife Edge Gel Seal		
Filter Efficiency - Chamber Inlet		99.9998%		
Filter Type - Chamber Exhaust		HEPA H14 with Integral Mesh Guard and Gasket Seal		
Filter Efficiency - Chamber Exhaust		99.995%		
Lighting Level		≥ 700 Lux		
Sound Level		<63 dBA	TBA	TBA
Isolator Construction	Chamber	SS316L		
	Service Housing	SS304L		
	Support Frame	SS304L		
Isolator Finish	Chamber Internal	≤ 0.4 Ra		
	Chamber External	≤ 0.6 Ra		
	Service Housing External	≤ 0.6 Ra		
	Support Frame	≤ 1.0 Ra		
Electrical Requirements (by Client)	220-240 VAC, 50/60 Hz, 1Ø	✓	✓	✓
	110-120 VAC, 50/60 Hz, 1Ø	✓	✓	✓
Compressed Air Requirement (by Client) if no on-board compressor	2 Bar-g Pressure at 5 L/sec	✓	✓	✓
Exhaust Duct Requirements (by Client) unless Integral Catalytic Converter is Included		10" Duct from Isolator to Outside		
Options	Pass Chamber (Small, nongloved or Large, nongloved/gloved)	✓	✓	✓
	Bio-Decontamination BIOVAP	✓	✓	✓
	Non-Viable Air Sampler	✓	✓	✓
	Viable Air Sampler	✓	✓	✓
	Sterility Test Pump	✓	✓	✓
	Glove Tester	✓	✓	✓
	Waste Bag Grommet	✓	✓	✓
	Sterile Continuous Liner	✓	✓	✓
	Bag Welder with Table	✓	✓	✓
	RTPØ105, 190, 270, 350, 460 - Alpha	✓	✓	✓
	RTPØ105, 190, 270, 350, 460 - Beta Canister	✓	✓	✓
	RTPØ105, 190, 270, 350, 460 - Beta Liner	✓	✓	✓
	Analytical Balance	✓	✓	✓
	Spray Gun	✓	✓	✓
	Temperature and Humidity Monitor	✓	✓	✓
	H_2O_2 Monitoring	✓	✓	✓
	Product Waste Entry / Exit Ports	✓	✓	✓
	Liquid Waste Entry / Exit Ports	✓	✓	✓
	4" Butterfly Valve	✓	✓	✓
	Drain	✓	✓	✓
	Liner System	✓	✓	✓
	On-board Air Compressor	✓	✓	✓
	UV Lamp	✓	✓	✓
	Carbon Filter	✓	✓	✓
	Adjustable Hydraulic Stand	✓	✓	✓
	CCTV Camera	✓	✓	✓
	TV Monitor	✓	✓	✓

Technetium Dispensing Isolator

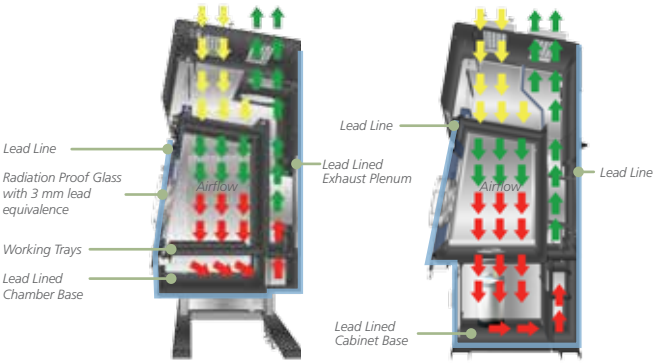
Technetium Dispensing Isolator (3 Module Isolator)

Indroduction

Esco Technetium Dispensing Isolator is designed to provide safe, controlled, and sterile environment for elution and dispensing of Technetium. It is configured to operate at negative pressure in a single pass airflow. It provides a comprehensive personnel and product protection.

Personnel protection is achieved by adequate shielding of the generator as well as the whole workstation. Air of each enclosure is provided with HEPA filters with MPPS of 99.997% to ensure product protection.

Constructed with 316L stainless steel, the Technetium Dispensing Isolator has complete compliance to PIC/s and EU cGMP standards with its 19 mm radius coved internal corners. It consists of 3 parts: the Elution Chamber, Process Chamber and Pass-through Chamber.



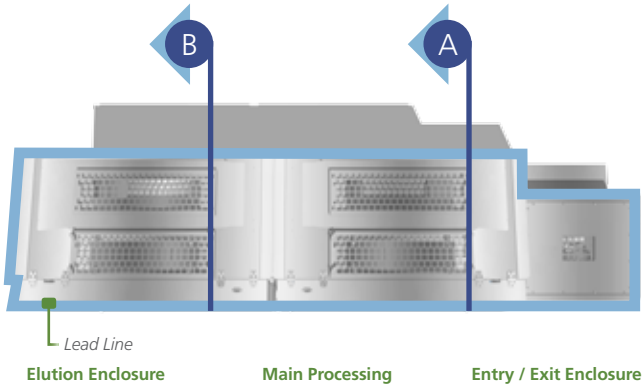
SECTION A SECTION B

Application

Technetium Dispensing Isolator is exclusively used for the preparation of radiopharmaceuticals.

Key Features

- Each module provides an EU GMP Grade A environment
- Radiation-proof acrylic glass and work zones with lead equivalence of 3 mm
- Quiet, energy-efficient ECM fans auto adjust to compensate for filter blockage
- Modular and easily customizable with desired equipment integration inside the workstation
- Capable of carrying out Pressure Decay Tes



TOP VIEW

Elution Chamber

- Generators are housed in a removable trolley to minimize handling and lifting.
- Can be combined with Process Chamber as 1 module or separate as 2 modules.
- 200 mm glove ports

Process Chamber

Option for 2-, 3-, or 4-gloved chamber, 200 mm in diameter.

Pass-Through Chamber

- Fully interlocked and gasket-sealed class E transfer chambers
- Optional 1- or 2-gloved chamber
- Lightweight, non-stick doors

Control Sytem

- Equipped with Sentinel™ Microprocessor Control System
- Audible and visual alarms
- UPS for emergency power back-up for not less than 15 minutes

Options

- Integrated dose calibrator with automatic dipper
- Glove leak tester
- Shielded viewing barrier, waste bins, etc
- Extract fan unit

Service Requirements

- 240 VAC 13A single phase electrical supply
- External air extraction system capable of extracting 106 m/hr per module (single pass units only)

GENERAL SPECIFICATIONS				
Model		2 - Module	3 - Module (Small Pass-through)	3 - Module (Large Pass-through)
External Dimension - Min (W x D x H)		2610 x 920 x 2500 mm (102.8 x 36.2 x 98.4")	2610 x 920 x 2500 mm (102.8 x 36.2 x 98.4")	3600 x 920 x 2500 mm (141.7 x 36.2 x 98.4")
External Dimension - Max (W x D x H)		2610 x 920 x 2500 mm (102.8 x 36.2 x 98.4")	3180 x 920 x 2500 mm (125.2 x 36.2 x 98.4")	4400 x 920 x 2500 mm (173.2 x 36.2 x 98.4")
Glove Port - Elution Chamber		4	2	2
Glove Port - Process Chamber		4	2, 3, 4	2, 3, 4
Glove Ports - Pass-through Chamaber		1	1	1
Glove Ports Diameter		200 mm	200 mm	200 mm
Chamber Environment		ISO Class 5 all Chambers (Grade A)		
Pre-filter	Process Chamber	F6 filter, glass fiber media		
	Pass-through Chamber	G4, polyester media		
Filter Type - Chamber Inlet		ULPA U15 with Integral Mesh Guard and Knife Edge Gel Seal		
Filter Efficiency - Chamber Inlet		99.9998%		
Filter Type - Chamber Return and Chamber Exhaust		HEPA H14 with Integral Mesh Guard and Gasket Seal		
Filter Efficiency - Chamber Return and Chamber Exhaust		99.995%		
Lighting Level		TBA		
Sound Level		TBA		
Isolator Construction	Chamber	Stainless Steel 316L		
	Service Housing	Stainless Steel 304L		
	Support Frame	Stainless Steel 304L		
Isolator Finish	Chamber - Internal	≤ 0.4 Ra		
	Chamber - External	≤ 0.6 Ra		
	Service Housing - External	≤ 0.6 Ra		
	Support Frame	≤ 1.0 Ra		
Electrical Requirements (by Client)	220-240 VAC, 50/60 Hz, 1Ø	✓	✓	✓
	110-120 VAC, 50/60 Hz, 1Ø	✓	✓	✓
Compressed Air Requirement (by Client) if no on-board compressor	2 Bar-g Pressure at 5 L/sec	✓	✓	✓
Exhaust Duct Requirements (by Client) unless Integral Catalytic Converter is Included		10" Duct from Isolator to Outside		
Options	Bio-Decontamination BIOVAP	✓	✓	✓
	Glove Tester	✓	✓	✓
	Waste Bag Grommet	✓	✓	✓
	Sterile Continuous Liner	✓	✓	✓
	Bag Welder with Table	✓	✓	✓
	Spray Gun	✓	✓	✓
	H_2O_2 Monitoring	✓	✓	✓
	Product Waste Entry / Exit Ports	✓	✓	✓
	Liquid Waste Entry / Exit Ports	✓	✓	✓
	4" Butterfly Valve	✓	✓	✓
	Drain	✓	✓	✓
	Liner System	✓	✓	✓
	On-board Air Compressor	✓	✓	✓

Containment Barrier Isolator Class III (CBI-III)

Containment Barrier Isolator (CBI) Class III

Introduction

Esco Containment Barrier Isolator Class III (CBI-III) is designed to offer highest level of product, operator, and environmental protection from infectious or biohazardous aerosols and materials. It is configured to operate at negative pressure in a single pass airflow.

The CBI-III has complete compliance to PIC/s and EU cGMP standards with its 19 mm radius coved internal corners in a single piece chamber (no perforations or grilles for contaminants to be trapped on all 4 corners). Its Rear Return Filter ensures that ducts are not contaminated.

Applications

The CBI-III can be utilized for work involving agents assigned to Biosafety Levels 3 and 4. It can serve as the primary containment of BSL-4 laboratories in manipulating dangerous pathogens. The CBI-III can also offer an elevated level of containment for work that involves higher risk agents. All in all, it is designed for the absolute level of containment with work frequently used for the deadliest biohazards, bacteria, viruses, and microorganisms.

Key Features

- Controls exposure/cross-contamination risk to hazardous/ aseptic materials for a wide variety of equipment and processes
- Provides Operator Exposure Levels (OEL's) ≤1.0 µg/m^3 during controlled operations
- Levels of ≤0.1 µg/m^3 can be achieved via closed-transfer processes or based on client SOPs
- Enhances cGMP practices
- Quiet, energy-efficient ECM fans auto adjust to compensate for filter blockage
- Standard dimensions available are easily customized to suit process requirements
- Safe glove change and low contamination filter change
- Pressure tested: Class 1 as per ISO 10648-2 standards
- System comes with a Semi-automated or Automated Pressure Hold Testing

Filtration Package

Process Chamber

- Room Inlet Filter – F6 filtration. Panel filter, glass fiber media.
- Chamber Inlet Filter – Single U15 ULPA filtration. Panel filter, gel seal, glass fiber media.
- Chamber Return Filter – Single H14 HEPA filtration. Panel filter, gasket seal, glass fiber media.
- Chamber Outlet Filter – Standard F6 filtration, optional H14 HEPA filtration. Panel filter, gasket seal, glass fiber media.

Note: Hydrogen Peroxide Vapor (HPV) will pass through the filters during the HPV cycle to allow decontamination of the filters and air path.

Pass Chamber

- Room Inlet Filter – G4 filtration. Panel filter, polyester media.
- Chamber Inlet Filter – Single U15 ULPA filtration. Panel filter, gasket seal, glass fiber media.
- Chamber Exhaust Filter – F6 filtration. Panel filter, gel seal, glass fiber media.

Note: HPV will pass through the HEPA filters during the HPV cycle to allow decontamination of the filters and air path.

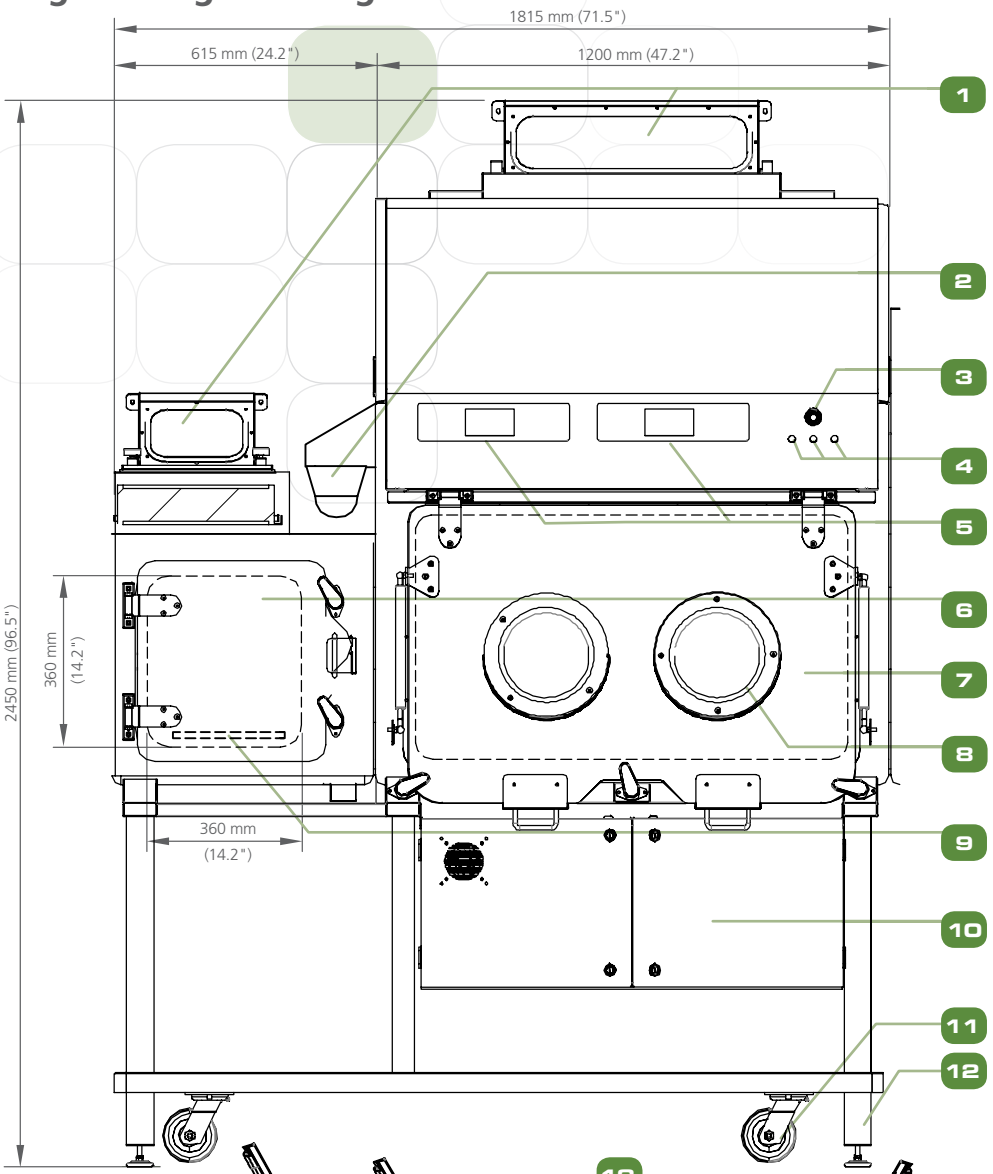
Control System

- Equipped with dual Sentinel™ Platinum Microprocessor Control System
- Standard controls suitable for safe area applications
- Includes two IP66 electrical sockets as standard

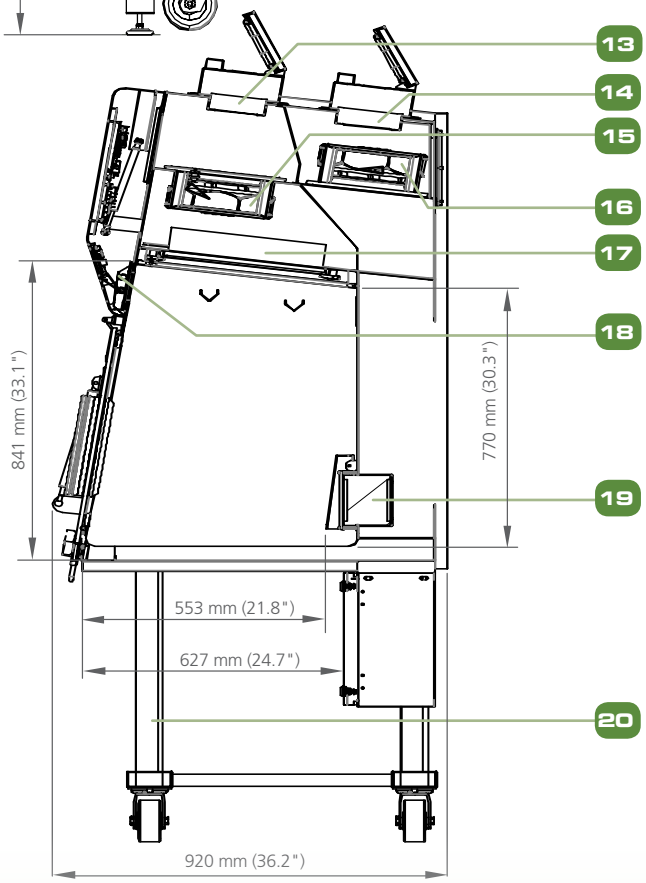
Warranty

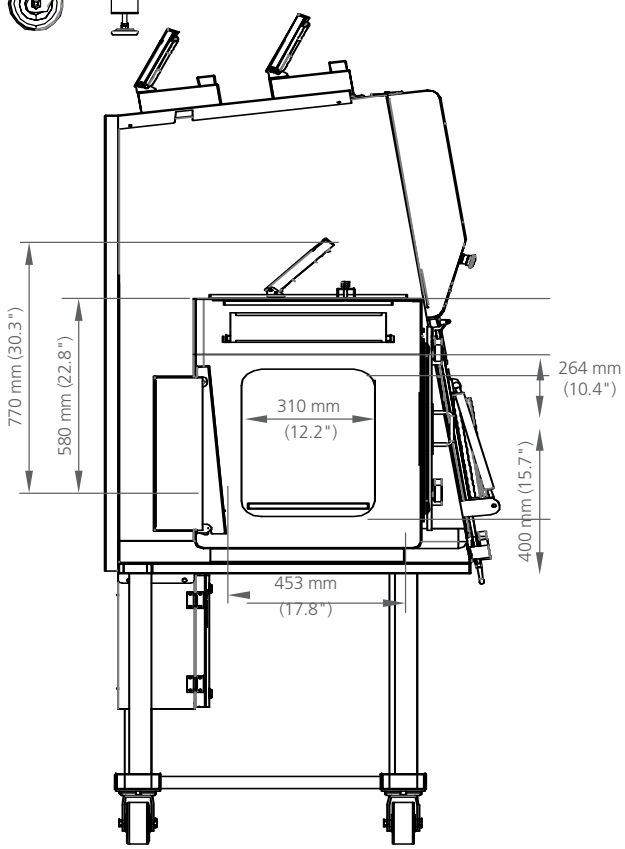
One year warranty (excluding consumables). Consumables are ballast, fluorescent, and filters. The warranty will cover all other parts including the blower, fan switch, and electrical main board. During the period of warranty, any repair, modification, testing and commissioning performed by any unauthorized party other than Esco Service Team will void the warranty of the unit.

Engineering Drawing



1. Dampers
2. CCTV Integration/Provision
3. Emergency Stop Button (E-Stop Button)
4. Pressure Injection Buttons
5. Dual Sentinel™ Microprocessor Control System
6. Small Pass-through Chamber, non-gloved
7. Process Chamber
8. Glove Ports
9. Sliding Tray
10. Main Control Panel
11. Caster Wheel
12. Leveling Feet
13. F6 Pre-filter
14. Gasket-sealed H14 Exhaust Filter
15. Inlet EC Centrifugal Fan
16. Exhaust EC Centrifugal Fan
17. Gel-sealed U15 Inlet Filter
18. T5 Fluorescent Lamp
19. Gasket-sealed H14 Return Filter
20. Hydraulic Adjustable Support Stand (optional)





GENERAL SPECIFICATIONS

		CBI-2G	CBI-3G	CBI-4G
Main Chamber Nominal Size (Width)		1.2 meter (4')	1.6 meter (5.2')	2.0 m (6.6')
Working Chamber Dimensions - Min (W x D x H)		1.2 x 0.55 x 0.77 m (4' x 1.8' x 2.5')	1.6 x 0.55 x 0.77 m (5.2' x 1.8' x 2.5')	2.0 x 0.55 m x 0.77 m (6.6' x 1.8' x 2.5')
Working Chamber Dimensions - Max (W x D x H)		1.2 x 0.63 x 0.84 m (4' x 2.1' x 2.8')	1.6 x 0.63 x 0.84 m (5.2' x 2.1' x 2.8')	2.0 x 0.63 x 0.84 m (6.6' x 2.1' x 2.8')
External Dimension (with one Pass Chamber) (W x D x H)	With Adjustable Base Stand (Min)	1.82 x 0.92 x 2.26 m (6' x 3' x 7.4')	2.22 x 0.92 x 2.26 m (7.3' x 3' x 7.4')	2.62 x 0.92 x 2.26 m (8.6' x 3' x 7.4')
	With Adjustable Base Stand (Max)	1.82 x 0.92 x 2.56 m (6' x 3' x 7.4')	2.22 x 0.92 x 2.56 m (7.3' x 3' x 7.4')	2.62 x 0.92 x 2.56 m (8.6' x 3' x 7.4')
External Dimension - Small Pass-through Chamber (W x D x H)		0.62 x 0.45 x 0.58 m (2' x 1.5' x 2')	0.62 x 0.45 x 0.58 m (2' x 1.5' x 2')	0.62 x 0.45 x 0.58 m (2' x 1.5' x 2')
Glove Port Height (Min)		1000 mm	1000 mm	1000 mm
Glove Port Height (Max)		1300 mm	1300 mm	1300 mm
Chamber Environment		ISO Class 5 all Chambers (Grade A)		
Pre-filter	Process Chamber	F6 filter, glass fiber media		
	Pass-through Chamber	G4, polyester media		
Filter Type - Chamber Inlet		ULPA U15 with Integral Mesh Guard and Knife Edge Gel Seal		
Filter Efficiency - Chamber Inlet		99.9998%		
Filter Type - Chamber Return and Chamber Exhaust		HEPA H14 with Integral Mesh Guard and Gasket Seal		
Filter Efficiency - Chamber Return and Chamber Exhaust		99.995%		
Lighting Level		TBA		
Sound Level		TBA		
Isolator Construction	Chamber	Stainless Steel 316L		
	Service Housing	Stainless Steel 304L		
	Support Frame	Stainless Steel 304L		
Isolator Finish	Chamber - Internal	≤ 0.4 Ra		
	Chamber - External	≤ 0.6 Ra		
	Service Housing - External	≤ 0.6 Ra		
	Support Frame	≤ 1.0 Ra		
Electrical Requirements (by Client)	220-240 VAC, 50/60 Hz, 1Ø	✓	✓	✓
	110-120 VAC, 50/60 Hz, 1Ø	✓	✓	✓
Compressed Air Requirement (by Client) if no on-board compressor	2 Bar-g Pressure at 5 L/sec	✓	✓	✓
Exhaust Duct Requirements (by Client) unless Integral Catalytic Converter is Included		10" Duct from Isolator to Outside		

OPTIONS

	CBI-2G	CBI-3G	CBI-4G		CBI-2G	CBI-3G	CBI-4G
Pass Chamber (Small, nongloved or Large, nongloved/gloved)	✓	✓	✓	Product Waste Entry / Exit Ports	✓	✓	✓
CCTV Integration	✓	✓	✓	Liquid Waste Entry / Exit Ports	✓	✓	✓
CCTV Integration + Provision	✓	✓	✓	4" Butterfly Valve	✓	✓	✓
Bio-Decontamination BIOVAP	✓	✓	✓	Drain	✓	✓	✓
Glove Tester	✓	✓	✓	Liner System	✓	✓	✓
Waste Bag Grommet	✓	✓	✓	On-board Air Compressor	✓	✓	✓
Sterile Continuous Liner	✓	✓	✓	UV Lamp	✓	✓	✓
Bag Welder with Table	✓	✓	✓	Adjustable Hydraulic Stand	✓	✓	✓
RTPØ105, 190, 270, 350, 460 - Alpha	✓	✓	✓	TV Monitor	✓	✓	✓
RTPØ105, 190, 270, 350, 460 - Beta Canister	✓	✓	✓	Bio Dunk Tank	✓	✓	✓
RTPØ105, 190, 270, 350, 460 - Beta Liner	✓	✓	✓	BSC Integration	✓	✓	✓
Analytical Balance	✓	✓	✓	Autoclave Integration	✓	✓	✓
H_2O_2 Monitoring	✓	✓	✓	CO_2 incubator Integration	✓	✓	✓

Ventilated Balance Enclosure (VBE)

Ventilated Balance Enclosure (VBE-4ft)

Introduction

Ventilated Balance Enclosure (VBE) is designed specifically for stability and accuracy while maintaining a high level of operator protection by containing hazardous airborne powder. Using our aerodynamic design on sash and arm rest plus a sectionalized baffle, the airborne powders are well contained inside the enclosure and exhausted through a HEPA filter or direct to the lab exhaust.

Construction

The enclosure is made from powder-coated electro-galvanized sheet with polycarbonate sash and side panels. Also equipped with aerodynamic sash handle and arm rest to provide optimized airflow inside the enclosure.

The design of VBE is modular in terms of exhaust and filtration system. There are three basic modules: the Base Module, the Filter Module, and the Blower Module.

Key Features

- Negative pressure application provides high level of operator's protection from hazardous airborne particles
- Disposal port is equipped with O-ring to provide a sealed trash bag for additional powder containment solution
- VBE is equipped with a filter and blower module for better airflow control

Control System Package

- RH/Temperature Sensor
- Fan speed control

Filtration Package

- Single Bag-In Bag-Out Filter
  - Efficiency: 99.995% at 0.3 micron
  - Classification: H14 filters
  - Media: Glass Fiber
  - Sealing Method: Gasket

Comfortable Ergonomic Design

- The 5° angled front frame improves viewing on the workspace
- Lightweight sash with position hinge to provide easy access on equipment inside
- Instant start-up fluorescent lamp
- The arm rest is raised above the work zone to improve comfort and to ensure the user's arm is not blocking the airflow
- Optimized side panels provide more light inside

Electrical Safety and Certification

- All components meet or exceed applicable safety requirements
- Each cabinet is individually tested at the factory for electrical safety
- Documentation specific to each cabinet serial number is maintained on file

Warranty

1 year warranty (excluding consumables). Consumables are ballast, fluorescent, and filters. The warranty will cover all other parts including the blower, fan switch, and electrical main board. During the period of warranty, any repair, modification, testing and commissioning performed by any unauthorized party other than the Esco Service Team, shall void the warranty of the unit.

Ordering Information

Guide to Ventilated Balance Enclosure (VBE) Models

VBE-2 A 8-03 SA

MODEL	Internal Width (mm)	SIZE	CONFIGURATION	ELECTRICAL CODE	ENCLOSURE MODULE	FILTER MODULE	EXHAUST TYPE
VBE	610	**2**	**A** - Standard	**7** - 100V 50/60Hz	**03** - with filter and blower	**S** - Single Filtration	**A** - Ducted
	915	**3**		**8** - 230V 50/60Hz			
	1220	**4**		**9** - 115V 50/60Hz			
	1525	**5**					
	1830	**6**					
	2135	**7**					
	2440	**8**					

ITEM CODE	MODEL CODE	DESCRIPTION
2030049	VBE-2A7-03SA	Ventilated Balance Enclosure - Standard, 2ft/610 mm, single filtration, with blower, ducted, 100V 50/60 Hz
2030050	VBE-2A8-03SA	Ventilated Balance Enclosure - Standard, 2ft/610 mm, single filtration, with blower, ducted, 230V 50/60 Hz
2030051	VBE-2A9-03SA	Ventilated Balance Enclosure - Standard, 2ft/610 mm, single filtration, with blower, ducted, 115V 50/60 Hz
2030052	VBE-3A7-03SA	Ventilated Balance Enclosure - Standard, 3ft/915 mm, single filtration, with blower, ducted, 100V 50/60 Hz
2030053	VBE-3A8-03SA	Ventilated Balance Enclosure - Standard, 3ft/915 mm, single filtration, with blower, ducted, 230V 50/60 Hz
2030054	VBE-3A9-03SA	Ventilated Balance Enclosure - Standard, 3ft/915 mm, single filtration, with blower, ducted, 115V 50/60 Hz
2030055	VBE-4A7-03SA	Ventilated Balance Enclosure - Standard, 4ft/1220 mm, single filtration, with blower, ducted, 100V 50/60 Hz
2030056	VBE-4A8-03SA	Ventilated Balance Enclosure - Standard, 4ft/1220 mm, single filtration, with blower, ducted, 230V 50/60 Hz
2030057	VBE-4A9-03SA	Ventilated Balance Enclosure - Standard, 4ft/1220 mm, single filtration, with blower, ducted, 115V 50/60 Hz
2030058	VBE-5A7-03SA	Ventilated Balance Enclosure - Standard, 5ft/1525 mm, single filtration, with blower, ducted, 100V 50/60 Hz
2030059	VBE-5A8-03SA	Ventilated Balance Enclosure - Standard, 5ft/1525 mm, single filtration, with blower, ducted, 230V 50/60 Hz
2030060	VBE-5A9-03SA	Ventilated Balance Enclosure - Standard, 5ft/1525 mm, single filtration, with blower, ducted, 115V 50/60 Hz
2030061	VBE-6A7-03SA	Ventilated Balance Enclosure - Standard, 6ft/1830 mm, single filtration, with blower, ducted, 100V 50/60 Hz
2030062	VBE-6A8-03SA	Ventilated Balance Enclosure - Standard, 6ft/1830 mm, single filtration, with blower, ducted, 230V 50/60 Hz
2030063	VBE-6A9-03SA	Ventilated Balance Enclosure - Standard, 6ft/1830 mm, single filtration, with blower, ducted, 115V 50/60 Hz
2030064	VBE-7A7-03SA	Ventilated Balance Enclosure - Standard, 7ft/2135 mm, single filtration, with blower, ducted, 100V 50/60 Hz
2030065	VBE-7A8-03SA	Ventilated Balance Enclosure - Standard, 7ft/2135 mm, single filtration, with blower, ducted, 230V 50/60 Hz
2030066	VBE-7A9-03SA	Ventilated Balance Enclosure - Standard, 7ft/2135 mm, single filtration, with blower, ducted, 115V 50/60 Hz
2030067	VBE-8A7-03SA	Ventilated Balance Enclosure - Standard, 8ft/2440 mm, single filtration, with blower, ducted, 100V 50/60 Hz
2030068	VBE-8A8-03SA	Ventilated Balance Enclosure - Standard, 8ft/2440 mm, single filtration, with blower, ducted, 230V 50/60 Hz
2030069	VBE-8A9-03SA	Ventilated Balance Enclosure - Standard, 8ft/2440 mm, single filtration, with blower, ducted, 115V 50/60 Hz

Accessories and Options

Filter Module

- Filter module can be configured as Single or Dual filtration, additional H14 filters may be ordered
- Additional carbon filter may be supplied for odor control

CARBON FILTER	CARBON TYPE	SIZE	DIMENSIONS
CF	**A** - Organic	**2V**	457 x 457 x 90 mm (2 for 5ft cabinets)
	B - Acid	**3V**	457 x 762 x 90 mm (2 for 6ft and 7ft cabinets)
	C - Mercury	**3V**	457 x 914 x 90 mm (2 for 8ft cabintes)
	D - Sulphur		
	E - Halogen		
	F - Aldehyde		
	G - Ammonia/Amine		
	H - Chloroform /Ethers		

Exhaust Module

- Standard unit comes in ducted exhaust. Optional **DUCTLESS** or **PORTABLE** exhaust is available

Worktop

- Three types of worktop material available are: **Solid Epoxy**, **316L Stainless Steel**, and **Granite**

Base Option

- Base comes in three different options: **Base Cabinet, Support Stand with Casters, and Support Stand with Leveling Feet**
- **Support Stand with Drum Lift Access** is available as option for 5ft, 6ft, 7ft and 8ft cabinets. Choice of Epoxy or 316L Stainless steel material.

Containment System

TOP COVER is designed to be ducted or ductless

BIBO RING WITH BIBO BAG to provide hazard-free Filter Change Procedure

SENTINEL MICROPROCESSOR to provide control, visual monitoring and alarm system

SASH SWEEP - Incoming air from this area sweep airborne particle away from sash

SIDE AIRFOILS - is designed to maximize the airflow to the enclosure
by pulling air from sides

MAIN STREAM - The sash opening provides an airflow velocity of 0.3 m/s

BLOWER with low level noise

HEPA FILTER to provide high level of filtration

BAFFLE Is tested to provide optimized airflow inside the enclosure

SASH HANDLE to provide air form the top of the sash to the enclosure if the user is blocking a section of the sash during operation.

ARM REST to provides air from bottom of the sash to the enclosures. Provides base sweep.

LFHT / LFVT

Laminar Flow Horizontal Trolley / Laminar Flow Vertical Trolley

Laminar Flow Horizontal or Vertical Trolleys provide enhanced aseptic work zones by utilizing uni-directional airflow to purge the working environment from contaminants allowing aseptic transfer of materials throughout the Pharmaceutical plant.

Laminar Trolleys are customizable units that can provide:

- Product aseptic zones with single pass or re-circulatory airflow.
- Operator or environment protection (only available in re-circulatory airflow) and in negative pressure with respect to ambient.
- Stand alone units mounted over mobile stands for mobile aseptic zones.

Applications

- Transfer of lyophilized vials to and from freeze driers.
- Transfer of process skids or feed hoppers.
- Aseptic workzones.

Basic Principles

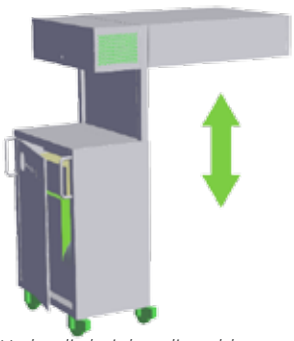
- Room air is drawn via an EU6 prefilter before entering perforated diffuser into the supply plenum.
- Airflow passes through a baffle system prior to Gel Seal HEPA Filtration, creating a low decibel aseptic work zone for operator comfort.

Standard Features

- Easy to clean design with single welded construction
- Tempered glass doors
- Stainless steel hinges
- HEPA/ULPA knife edge gel seal design is better than conventional gasket sealed.
- Sentinel Silver micrprocessor control with audio/visual alarms for downflow velocity
- Zoned Magnehelic gauges for filter loading
- PU Wheels
- Special Food grade FDA approved air tight seal
- 10 mm glass windows with plastic latches
- Magnehelic Differential Pressure Gauges for monitoring filter lifespan.
- Battery for onboard power when not connected to main building supply.
- E-Stop

Optional Configurations

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



Hydraulic height adjustable

Options

- Hydraulic adjustable stands
- Electromagnetic interlocking doors
- Splashproof electrical outlets
- PVC Curtains
- Main body is electrogalvanized steel with ISOCIDE™ antimicrobial coating

Airflow Patterns

- Single Pass
- Re-circulatory

Guide to Models

LF_T - A-EG - _ - S-P-2

Product Code	-	MOC-	IW (cm)	ID (cm)	IH (cm)	Airflow Pattern	Airflow Pressure	-	Battery Life (Hrs)
V- Vertical airflow		A-EG Steel Exterior/ Interior with SS304 base.	1			S-Single Pass	P-Positive	-	2 (standard 2 hours)
H-Horizontal airlow		B-SS Full SS304 right angle corners.	2			R-Recirculatory	N-Negative		2 (standard 2 hours)

Ceiling Laminar Airflow (CLAF)

Ceiling Laminar Airflows are customizable units that are:

- Utilized as open restricted access barriers over filling and capping machines.
- Stand alone units mounted via eye bolts and drop rods over specific applications.
- Stand alone units mounted over mobile stands for mobile aseptic zones.

Basic Principles

- Room air is drawn pre-filtered via an EU6 prefilter before entering via the perforated diffuser into supply plenum.
- A special baffle system channels airflow via the knife edge gel seal Hepa filters as downflow supply creating an aseptic workzone with low noise.

Features

- Modular easy to clean design
- HEPA/ULPA knife edge gel seal design is better than conventional gasket sealed.
- Sentinel Silver micrprocessor control with audio/visual alarms for downflow velocity.
- Zoned Magnehelic gauges for filter loading.
- Energy efficient teardrop lightings away from downflow.
- Emergency stop

Options

- Remote mounted Main Control Panel.
- Splashproof electrical outlets
- PVC Curtains
- Splashproof electrical outlets

Guide to Models

CLAF-PC 1 -AC-H13

Product Code	-	MOC-	Electrical Code	EW (cm)	ED (cm)	EH (cm)	-	Fan	-	Filter Type
CLAF		PC(Powder Coated EG Steel)	1					AC	-	H13
		S1 (SS304)	2					EC		H14 U15 Others
		S2 (SS316)	3							

Electrical Supply Options

1 = 220-240 VAC 50 / 60 Hz

2 = 110-130 VAC 50 / 60 Hz

3 = 100-110 VAC 50 / 60 Hz

DPB/DFLH

Introduction

Dynamic Passboxes and Dynamic Floor Label Hatches are aseptic architectural systems utilized to prevent contaminants from leaking into aseptic suits. They are utilized for aseptic transfer of materials into and out from the critical process environments.

Basic Principles

- Dynamic airflow provides an air barrier to prevent contaminant from entering into critical controlled environments during material transfers.
- Vertical purge, purges any trace contaminants that could have entered post material transfer.
- Airflow set at dual re-circulatory on both sides

The Highest Quality Cabinet Construction

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

- Modular easy to clean design
- HEPA/ULPA knife edge gel seal main filter design
- Sentinel microprocessor control with audio/visual alarms for downflow velocity and filter loading.
- Red/Green indicators for all operational parameters.
- Emergency stop
- Food grade FDA approved, USP class 6 Compliant air tight seals.
- Toughened safety glass
- Air tight Pharma grade latches with electromagnetic interlocks
- Stainless steel hinges
- Fully rounded interior corners with enhanced perforated grille system for full downflow in critical corners.
- Port for particle counter probe.
- Port for upstream PAO concentration
- Pressure tested as per ISO standards

Basic Principles

- UV Lighting
- Onboard lighting
- Splashproof electrical outlets
- Internal Shelves
- Flanges
- Support stands
- Lead shielding
- Atex rated
- Fire rated
- Roller Conveyors (only for DFLH)
- Auto sliding PVC doors (only for DFLH)

Product Code	-	MOC-	-	IW (cm)	ID (cm)	IH (cm)	Door Opening	-	Base	-	Onboard Lighting	-	UV Light	-	Electrical Code
DPB/ DFLH		A-EG Steel Exterior/Interior with SS304 base.					1- Straight Through		1 - With		1 - With		1 - With		1 220-240 VAC 50/60 Hz
		S1-Full SS304 with interior rounded corners					2 - L shape		2 - Without		2 - Without		2 - Without		2 110-130 VAC 50/60 Hz
		S2-Full SS316L with interior rounded corners					3 - 3 way								3 100-110 VAC 50/60Hz
		CMB-Other Combinations													

Standard sizes now available from Esco at standard factory leadtimes!

Standard Sizes	Internal WxDxH (mm)
DFLH-S909090-112X1	900x900x900
DFLH-9090120-112X1	900x900x1200
DFLH-150150150-112X1	1500x1500x1500
DPB-606060-112X1	600x600x600
DPB-616161-312X1	610x610x610
DPB-454545-112X1	450x450x450

Standard Sizes	Internal WxDxH (mm)
DPB-606060-212X1	600x600x600
DPB-616176-31211	610x610x760
DPB-919191-11211	915x915x915
DPB-606060-112X1	610x610x760
DPB-616161-312X1	610x610x915

Soft Capsule

Soft Wall Cleanroom

Esco Soft Capsule Soft Wall Cleanrooms are an ideal solution when clean air areas need to be created on a small to mid scale. Flexible and economical, they may be easily relocated when application requirements change. Esco offers a complete range of soft wall cleanrooms to meet various construction, dimensional and cleanliness class requirements.

Air Cleanliness Standards

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

Particle Size (µm)	Cleanliness Class								
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9
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	3520	35200	352000	3520000	35200000
1.0	-	-	8	83	832	8320	83200	832000	8320000
5.0	-	-	-	-	29	293	2930	29300	293000

Soft Capsule Soft Wall Cleanroom

Ceiling Grid

- Standard 2' x 4' (1.2 x 0.6m) cleanroom ceiling grid enables flexible placement of fan filter units. Non particulate shedding powder coated steel panels are provided to cover empty bays.

Construction

- Cleanroom-grade construction utilizing full welded, reinforced, steel tubular sections. Structure is finished with an abrasion-resistant oven-baked powder coat. Esco Isocide antimicrobial coating on all painted surfaces minimizes contamination. Entire structure is free-standing and does not require any suspending ceiling supports.

Lighting

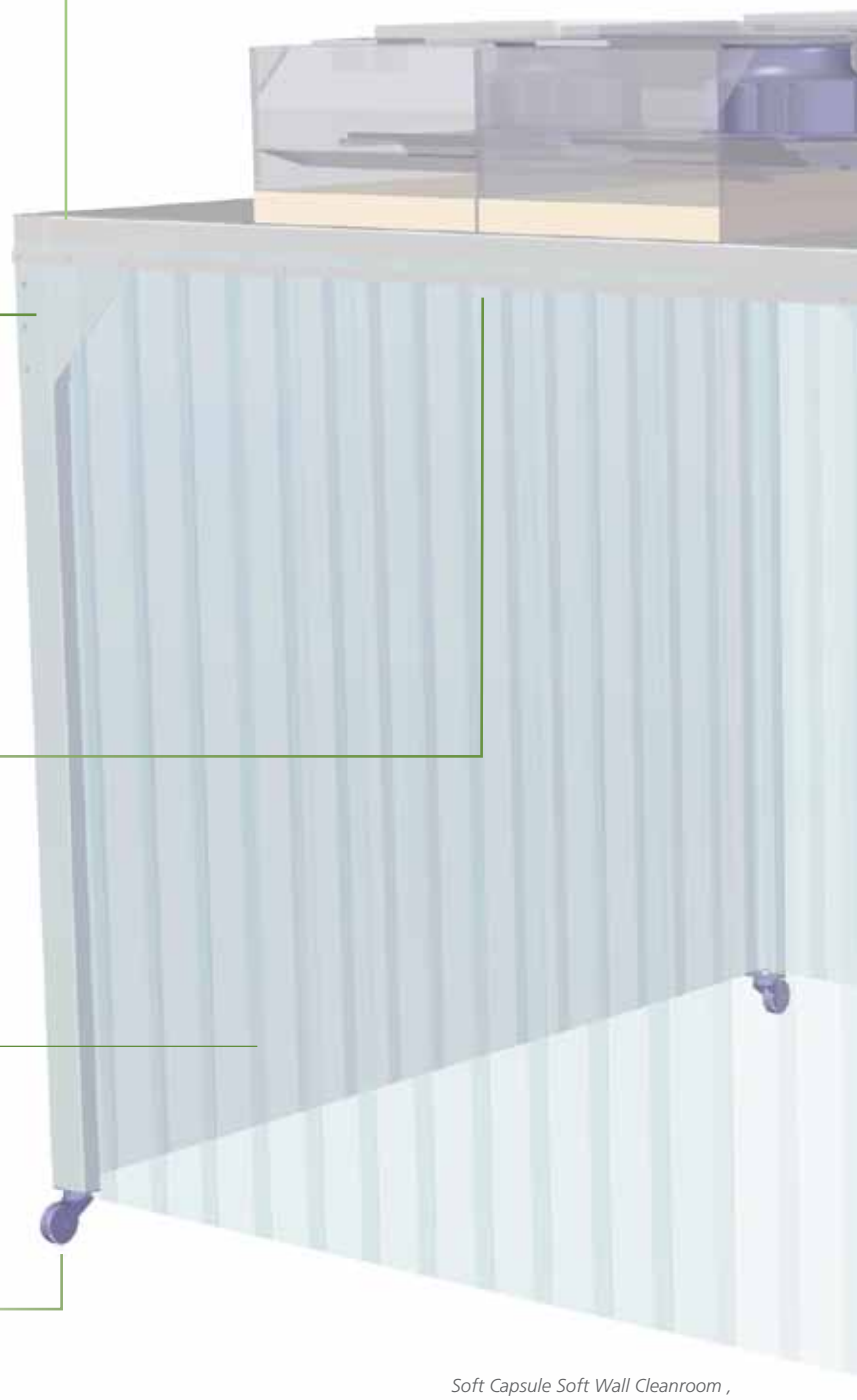
- Built-in warm white, 5000k lighting provides excellent illumination of the cleanroom and reduces operator fatigue. The reliable lighting system is zero-flicker and instant start. Tear-drop design does not interfere with the laminar flow in the cleanroom.

Side Curtains

- Isostat™ vinyl curtains isolate the cleanroom from the ambient environment, while allowing for easy passage of materials and personnel in and out of the clean area. Vinyl curtains terminate at a specific distance above the floor to allow for exhaust of clean air out of the cleanroom.

Casters

Stainless steel swivel casters feature nonshedding polyurethane wheels. Capacity: 300 lbs. each.



Soft Capsule Soft Wall Cleanroom , Model SC-887.

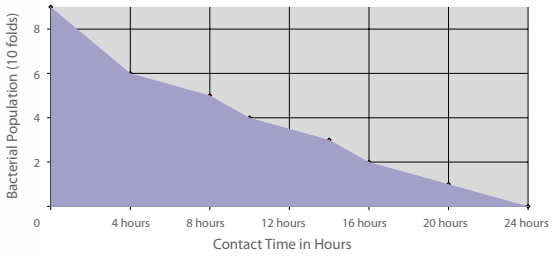
Control Panel

- Centrally mounted control panel enables rapid startup of fan filter units and lighting.

Fan Filter Units

- See page 6 for more details information.

ISOCIDE™ Antimicrobial Powder-Coating



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

Installation

- The Soft Capsule Cleanroom is shipped unassembled with tools and parts for on-site assembly, turning an existing air-conditioned space into a cleanroom in a matter of hours.

Fan Filter Units

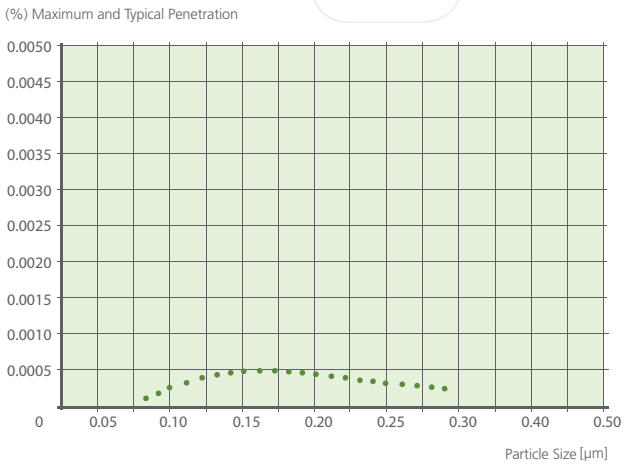
- Esco Airstream Fan Filter Units incorporate German made ebm-papst permanently lubricated, direct drive centrifugal blowers with external rotor designs, and Swedish Camfil-Farr HEPA/ULPA filters.
- The energy efficient external rotor motor design reduces operating costs and has extremely low noise and vibration levels, improving the working conditions in the cleanroom.
- Internal baffles maximize airflow uniformity.
- High quality HEPA filters utilizing an improved mini-pleated separation technique to maximizes surface area improves efficiency and extends the filter life. Filters operate at a typical efficiency of >99.99% at 0.1 to 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 against damage and prolonging life.
- Built-in solid-state variable speed controllers is superior to conventional "step" controllers and offer infinite adjustment from zero to maximum setting.

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

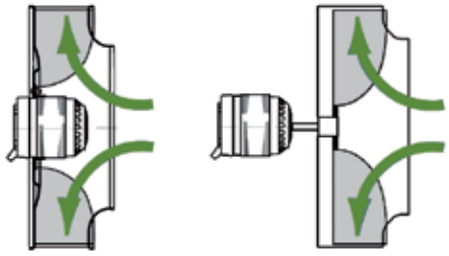
Esco cabinets use Swedish Camfil Farr® mini-pleat filters without aluminum separators to increase filter efficiency, minimize the chance of leakage, and to prolong filter life. Filters include a lightweight aluminum frame for structural stability and elimination of swelling common to conventional wood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

Airstream Cleanroom Fan Filter Units Model FFU-33A-AH-1 for 230V , 50Hz and FFU-33A-AH-3 for 230V, 60 Hz.

Esco HEPA Filter Efficiency



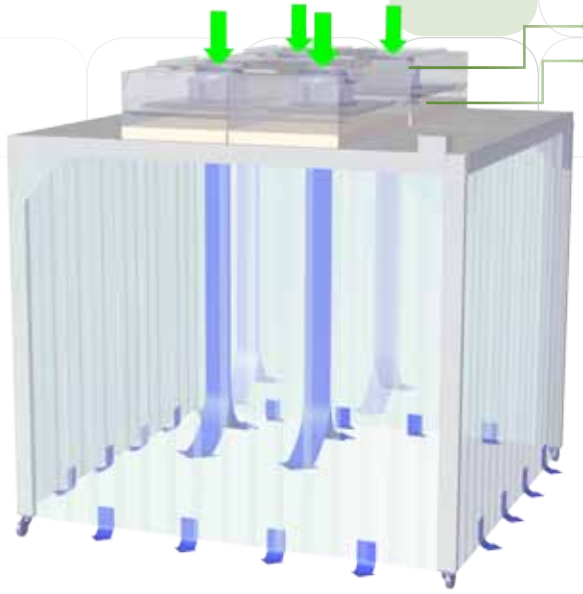
This filter efficiency graphs reflect filter efficiencies for HEPA filters with 66mm / 2.6" height for the nominal airflow velocity of 0.45 m/s or 90fpm. Filter efficiency figures change with different airflow settings and filter heights, e.g. filter efficiency will be higher for lower airflow velocities and vice versa.



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.*

Soft Wall Cleanroom Filtration System



Room air is taken in from the top of the cleanroom through a disposable pre-filter with 85% arrestance; this serves to trap larger particles and increase the life of the main filter.

Air is forced evenly across the HEPA filter(s); the result is a stream of clean laminar air within the work zone; this dilutes and flushes all airborne contaminants from the interior.

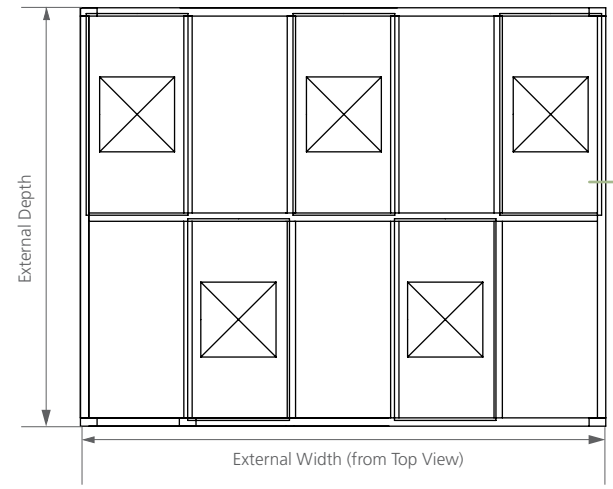
A nominal filter face velocity of 0.45 m/s or 90 fpm ensures that there is a sufficient number of air changes within the cleanroom in order to maintain cleanliness.

The purified air travels downward within the interior in a vertical, unidirectional stream, and leaves the cleanroom close to floor level at the perimeter.

The cleanroom is positively pressurized to prevent ingress of airborne contaminants from the external environment.

Model SC, Soft Capsule Soft Wall Cleanroom Technical Specifications

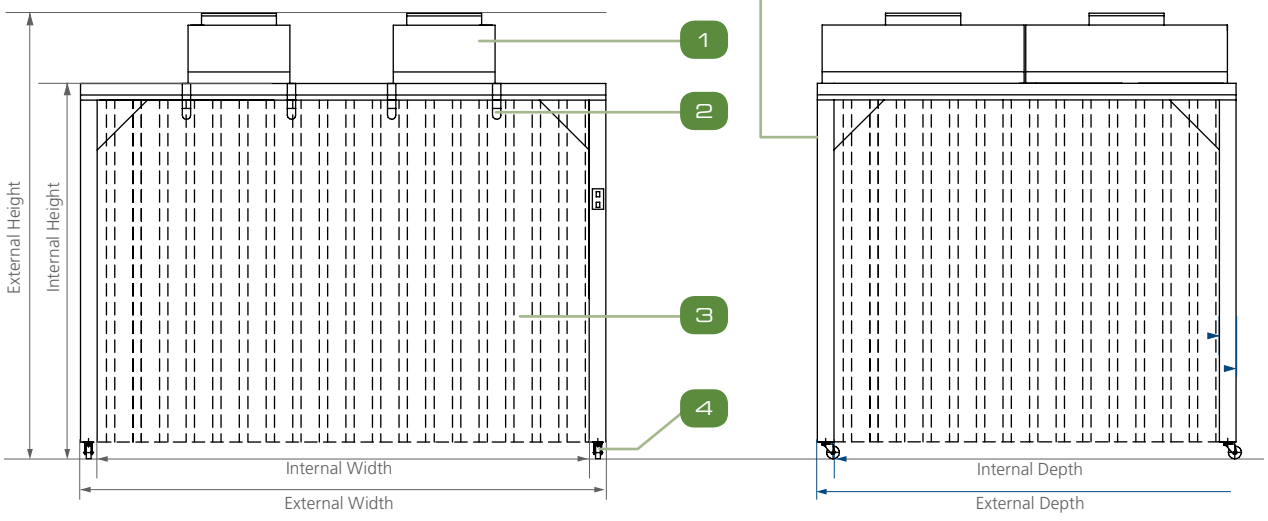
Top View



1. *Airstream fan filter unit*
2. *Fluorescent lamp*
3. *IsoStat™ vinyl curtain*
4. *Caster wheel*

Note: Numbers of Fan Filter Unit (FFU) depends on size and cleanliness class of the clean-room. Refer to General Specifications, page 8 for details.

Note: Cleanroom wider than 12ft and above, require additional support beams.



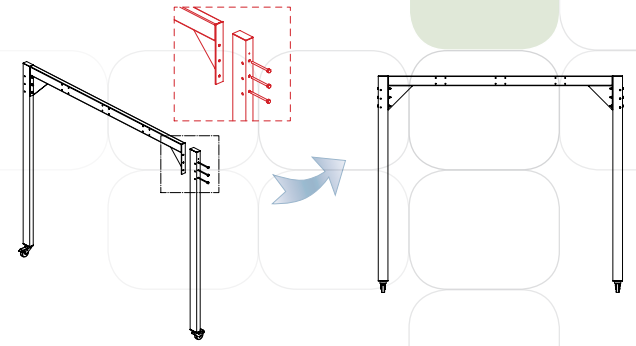
Front View **Side View**

General Specifications, Soft Capsule Soft Wall Cleanroom, Model SC

Cleanroom Class	Model	Internal Dimension (W x D x H)	External Dimension (W x D x H)	Power ** Consumption	No. of FFUs	Air Volume	Shipping Dimension (W x D x H) (Unassembled)	Shipping Volume
ISO Class 5* (US Federal Standard Class 100)	SC-447-M3.5	4' x 4' x 7'	4.23' x 4.23' x 8.60'	460 W	2	2300 m³/h (1360 cfm)	8.2' x 2.46'x 1.44'	0.825 m³
	SC-487-M3.5	4' x 8' x 7'	4.23' x 8.23' x 8.60'	500 W	2	2300 m³/h (1360 cfm)	8.2' x 4.1' x 1.31'	1.25 m³
	SC-687-M3.5	6' x 8' x 7'	6.30' x 8.23' x 8.60'	790 W	3	3450 m³/h (2040 cfm)	8.2' x 4.1' x 1.97'	1.87 m³
	SC-6127-M3.5	6' x 12' x 7'	6.26' x 12.26' x 8.60'	1210 W	5	5750 m³/h (3400 cfm)	12.8' x 5.51' x 1.48'	2.94 m³
	SC-6167-M3.5	6' x 16' x 7'	6.26' x 16.29' x 8.60'	1420 W	6	6900 m³/h (4080 cfm)	8.2' x 4.1' x 2.46'	2.34 m³
	SC-6207-M3.5	6' x 20' x 7'	6.26' x 20.32' x 8.60'	2000 W	8	9200 m³/h (5440 cfm)	10.5' x 3.12' x 2.46'	2.28 m³
	SC-887-M3.5	8' x 8' x 7'	8.29' x 8.29' x 8.60'	1080 W	4	4600 m³/h (2720 cfm)	8.2' x 3.12' x 1.8'	1.31 m³
	SC-8107-M3.5	8' x 10' x 7'	8.23' x 10.32' x 8.60'	1370 W	5	5750 m³/h (3400 cfm)	10.5' x 3.12' x 1.97'	1.82 m³
	SC-8127-M3.5	8' x 12' x 7'	8.29' x 12.26' x 8.60'	1500 W	6	6900 m³/h (4080 cfm)	12.47' x 3.02' x 1.64'	1.75 m³
	SC-8167-M3.5	8' x 16' x 7'	8.29' x 16.29' x 8.60'	1920 W	8	9200 m³/h (5440 cfm)	8.53' x 3.12' x 2.43'	1.84 m³
	SC-8207-M3.5	8' x 20' x 7'	8.29'' x 20.32' x 8.60'	2580 W	10	11500 m³/h (6800 cfm)	10.5' x 3.12' x 2.3'	2.91 m³
	SC-10127-M3.5	10' x 12' x 7'	10.32' x 12.26' x 8.60'	2210 W	9	10350 m³/h (6120 cfm)	11.02' x 4.27' x 1.8'	2.4 m³
	SC-12127-M3.5	12' x 12' x 7'	12.36' x 12.36' x 8.60'	2290 W	9	10350 m³/h (6120 cfm)	13.06' x 3.12' x 2.3'	2.65 m³
ISO Class 6* (US Federal Standard Class 1000)	SC-6127-M4.5	6' x 12' x 7'	6.26' x 12.26' x 8.60'	790 W	3	3450 m³/h (2040 cfm)	12.8' x 5.51' x 1.48'	2.94 m³
	SC-6167-M4.5	6' x 16' x 7'	6.26' x 16.29' x 8.60'	1000 W	4	4600 m³/h (2720 cfm)	8.2' x 4.1' x 2.46'	2.34 m³
	SC-6207-M4.5	6' x 20' x 7'	6.26' x 20.32' x 8.60'	1080 W	4	4600 m³/h (2720 cfm)	10.5' x 3.12' x 2.46'	2.28 m³
	SC-887-M4.5	8' x 8' x 7'	8.29' x 8.29' x 8.60'	660 W	2	2300 m³/h (1360 cfm)	8.2' x 3.12' x 1.8'	1.31 m³
	SC-8107-M4.5	8' x 10' x 7'	8.23' x 10.34' x 8.60'	950 W	3	3450 m³/h (2040 cfm)	10.5' x 3.12' x 1.97'	1.82 m³
	SC-8127-M4.5	8' x 12' x 7'	8.29' x 12.26' x 8.60'	870 W	3	3450 m³/h (2040 cfm)	12.47' x 3.02' x 1.64'	1.75 m³
	SC-8167-M4.5	8' x 16' x 7'	8.29' x 16.29' x 8.60'	1080 W	4	4600 m³/h (2720 cfm)	8.53' x 3.12' x 2.43'	1.84 m³
	SC-8207-M4.5	8' x 20' x 7'	8.29' x 20.32' x 8.60'	1620 W	6	6900 m³/h (4080 cfm)	10.5' x 3.12' x 2.3'	2.91 m³
	SC-10127-M4.5	10' x 12' x 7'	10.32' x 12.26' x 8.60'	1580 W	6	6900 m³/h (4080 cfm)	11.02' x 4.27' x 1.8'	2.4 m³
	SC-12127-M4.5	12' x 12' x 7'	12.36' x 12.36' x 8.60'	1450 W	5	5750 m³/h (3400 cfm)	13.06' x 3.12' x 2.3'	2.65 m³
	SC-12167-M4.5	12' x 16' x 7'	12.36' x 16.29' x 8.60'	2080 W	8	9200 m³/h (5440 cfm)	12.8' x 3.12' x 2.3'	2.59 m³
	SC-12207-M4.5	12' x 20' x 7'	12.36' x 20.32' x 8.60'	2080 W	8	9200 m³/h (5440 cfm)	13.12' x 900 x 2.3'	2.52 m³
ISO Class 7* (US Federal Standard Class 10,000)	SC-6127-M5.5	6' x 12' x 7'	6.26' x 12.26' x 8.60'	370 W	1	1150 m³/h (680 cfm)	12.8' x 5.51' x 1.48'	2.94 m³
	SC-6167-M5.5	6' x 16' x 7'	6.26' x 16.29' x 8.60'	500 W	2	2300 m³/h (1360 cfm)	8.2' x 4.1' x 2.46'	2.34 m³
	SC-6207-M5.5	6' x 20' x 7'	6.26' x 20.32' x 8.60'	660 W	2	2300 m³/h (1360 cfm)	10.5' x 3.12' x 2.46'	2.28 m³
	SC-887-M5.5	8' x 8' x 7'	8.29' x 8.29' x 8.60'	660 W	2	2300 m³/h (1360 cfm)	8.2' x 3.12' x 1.8'	1.31 m³
	SC-8107-M5.5	8' x 10' x 7'	8.23' x 10.34' x 8.60'	740 W	2	2300 m³/h (1360 cfm)	10.5' x 3.12' x 1.97'	1.82 m³
	SC-8127-M5.5	8' x 12' x 7'	8.29' x 12.26' x 8.60'	780 W	2	2300 m³/h (1360 cfm)	12.47' x 3.02' x 1.64'	1.75 m³
	SC-8167-M5.5	8' x 16' x 7'	8.29' x 16.29' x 8.60'	660 W	2	2300 m³/h (1360 cfm)	8.53' x 3.12' x2.43'	1.84 m³
	SC-8207-M5.5	8' x 20' x 7'	8.29' x 20.32' x 8.60'	780 W	2	2300 m³/h (1360 cfm)	10.5' x 3.12' x 2.3'	2.91 m³
	SC-10127-M5.5	10' x 12' x 7'	10.32' x 12.26' x 8.60'	740 W	2	2300 m³/h (1360 cfm)	11.02' x 4.27' x 1.8'	2.4 m³
	SC-12127-M5.5	12' x 12' x 7'	12.36' x 12.36' x 8.60'	820 W	2	2300 m³/h (1360 cfm)	13.06' x 3.12' x 2.3'	2.65 m³
	SC-12167-M5.5	12' x 16' x 7'	12.36' x 16.29' x 8.60'	1240 W	4	4600 m³/h (2720 cfm)	12.8' x 3.12' x 2.3'	2.59 m³
	SC-12207-M5.5	12' x 20' x 7'	12.36' x 20.32' x 8.60'	1440 W	4	4600 m³/h (2720 cfm)	13.12' x 2.95' x 2.3'	2.52 m³

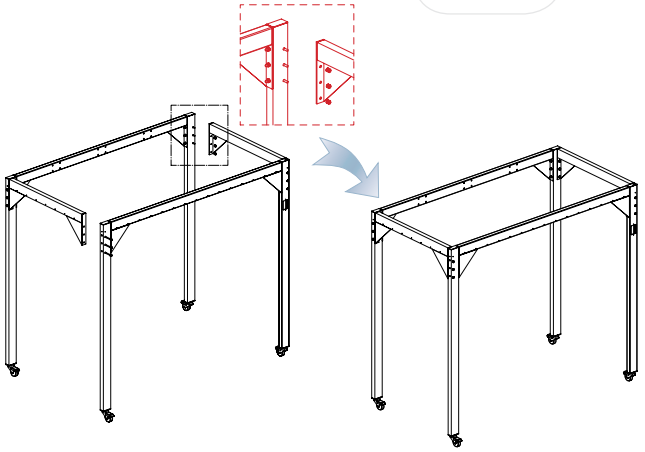
**Other ISO cleanliness classes available. Contact Esco for information.*

***Based on 230V/single phase/50Hz (International electrical configurations available)*



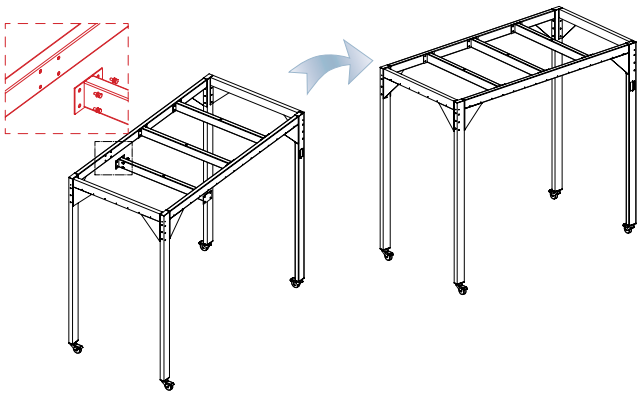
STEP 1

- Assemble the horizontal to vertical bar to form a side frame.



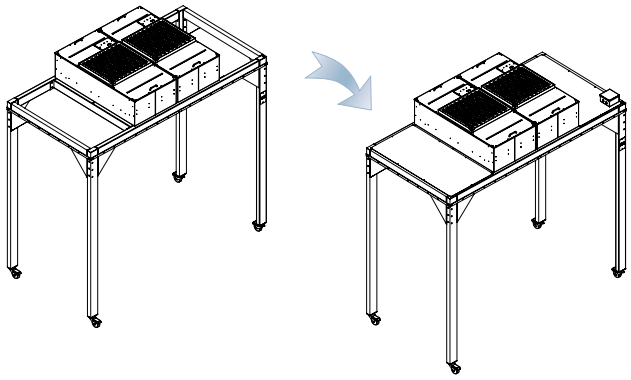
STEP 2

- Assemble side frame with additional vertical beams to form framework.



STEP 3

- Add ceiling bars to form a complete ceiling grid.
- Install tear-drop lighting below the ceiling grid.



STEP 4

- Install fan filter units and cover panels for empty bays.
- Install curtains around the general framework to complete the assembly.

Options

- All stainless steel construction.
- Leveling feet.
- Complete factory test and certification, including airflow, filter integrity, particle counting, light and noise tests.
- Extensions for existing Soft Capsule cleanrooms.

Warranty

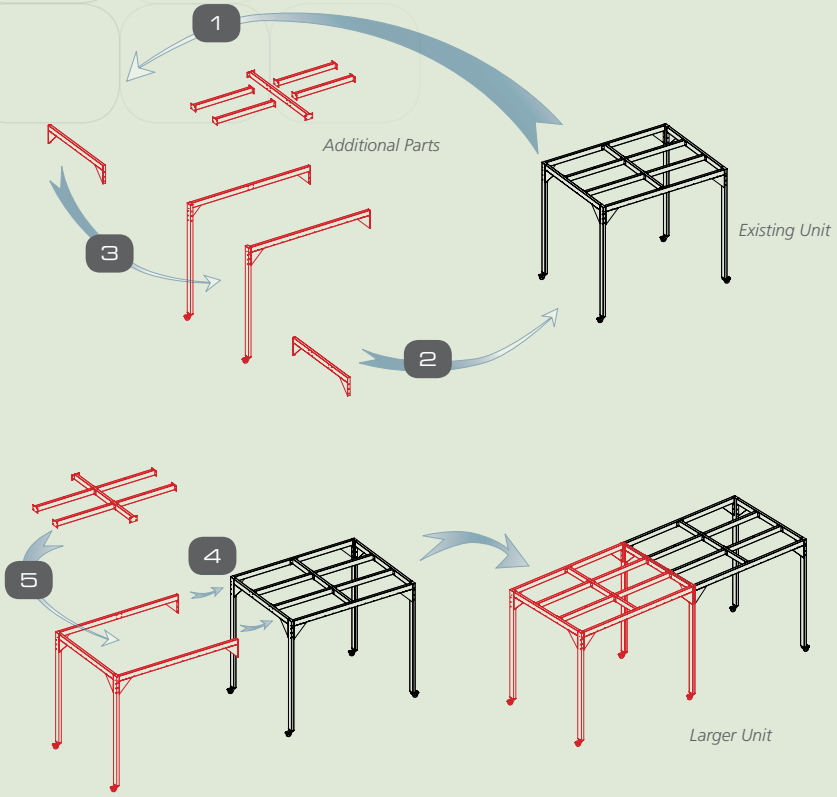
- All Esco Soft Capsule Cleanrooms are covered by a 1 year warranty, excluding consumable parts and accessories. Contact your local Sales Representative for warranty details.

Custom Modular Cleanroom Systems

- Esco custom designs, fabricates and validates modular cleanroom systems to suit application specific requirements. These are examples of some of the custom system we have delivered.

Extendable Modular Cleanroom

- Your cleanroom can be expanded as your manufacturing needs increase.



Example 1

Soft wall stainless steel frame modular cleanroom enclosure

Example 2

Hard wall double wall stainless steel modular cleanroom enclosure

Cleanroom Air Shower

Esco Cleanroom Airshower
*Model: EAS-2C_*

Introduction

Air Showers are self contained chambers installed at entrances to cleanrooms and other controlled environments. They minimize particulate matter entering or exiting the clean space. Personnel and materials entering or exiting the controlled environment are "scrubbed" by high velocity HEPA-filtered air jets with velocities of 20-22m/s (4000-4300fpm). Contaminated air is then drawn through the base within the unit, filtered and recirculated.

Esco is a leader in air showers for demanding applications in the micro-electronics, semiconductors, pharmaceutical, spraypainting, lab animal research and food markets. Esco filed its first Air Shower patent in the 1980's and since then has installed thousands of units in diverse markets worldwide. The present Esco Air Shower is a third-generation product and features a field-programmable microprocessor control that offers the maximum application flexibility of any unit on the market.

Cleanroom Applications: The greatest source of particulate contamination in a cleanroom is the operator. Air showers are installed between change areas and the cleanroom. The air shower enhances cleanroom operating protocol by serving as a reminder to all operators that they are entering a controlled environment. Personnel therefore develop the habit of gowning up properly before entering the air shower.

Pharmaceutical and Lab Animal Research Applications: Air showers keep pharmaceutical production and lab animal breeding areas clean and also minimize egress of hazardous substances and allergens

	Filtration	Electrical Safety
Standards Compliance	EN-1822 (H13), Europe IEST-RP-CC001.3, USA IEST-RP-CC007, USA IEST-RP-CC034.1, USA	UL-61010-1, USA CAN/CSA-22.2, No.61010-1 EN-61010-1, Europe IEC-61010-1, Worldwide

**Please refer to the specifications tabel on page 4, 6 & 8 for the modeling listing.*

Main Features

- High velocity shower jets in excess of 20 m/s ensure efficient scrubbing action to
- remove particulate matter.
- Operating modes can be programmed in the field.
- Microprocessor controller supervises all functions.
- Mini-pleated HEPA filtration achieves > 99.99% typical efficiency at 0.3 micron particles.
- A disposable pre-filter with 85% arrestance extends the life of the main filter.
- An emergency stop button is mounted on both sides of the shower.
- Indicator lights mounted on both sides of the air shower exterior regulate traffic
- flow in and out of the cleanroom.
- Permanently lubricated direct drive centrifugal blowers are used in conjunction
- with stainless steel air nozzles.

EAS, Cleanroom Air Shower Series Comparison Chart		
Model	**Airflow**	**Door**
EAS (A-Series)	Single Sided	Single leaf
EAS (B-Series)	Single Sided	Single leaf
EAS (C-Series)	Single Sided	Single leaf

See the Specification Chart for more details.

Air Shower Efficacy Testing

Esco is the only company in the industry to validate the efficacy of our air showers using the body box test, a method pioneered
by Esco.

1. New cleanroom garments without laundry processing, which have residual particulate contamination from manufacturing in a non cleanroom environment, are used.

2. The operator gowns up (in a jumpsuit, booties, gloves, mask and hood), and enters a specially sealed enclosure (the body box). This enclosure is equipped with vertical laminar flow.

3. The operator performs a series of standardized physical movements in order to induce the generation of particles in the body box, for a specific duration.

4. A particle counter connected to the base of the body box measures particle count levels. This count is the baseline level.

5. The operator gowns up using another garment from the same batch.

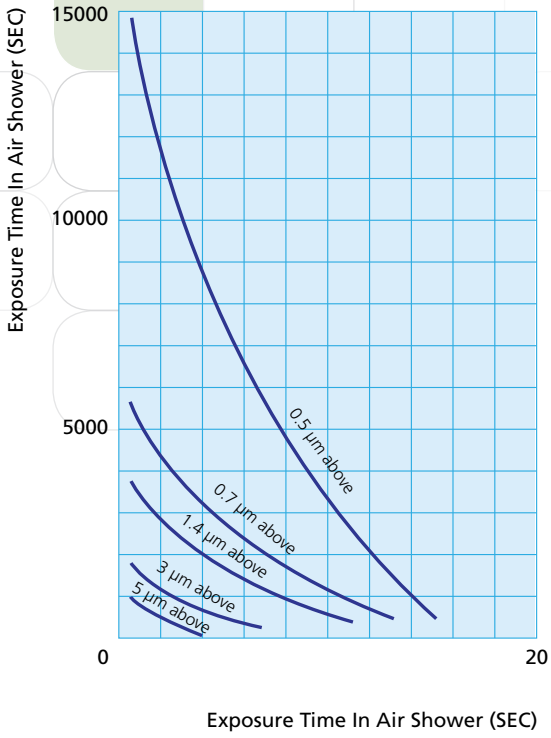
6. The operator proceeds into the air shower (device under test), for a shower cycle.

7. The operator exits the air shower and proceeds into the body box. In the body box the operator performs the same series of standardized physical movements in order to induce the generation of particles in the body box, for a specific duration.

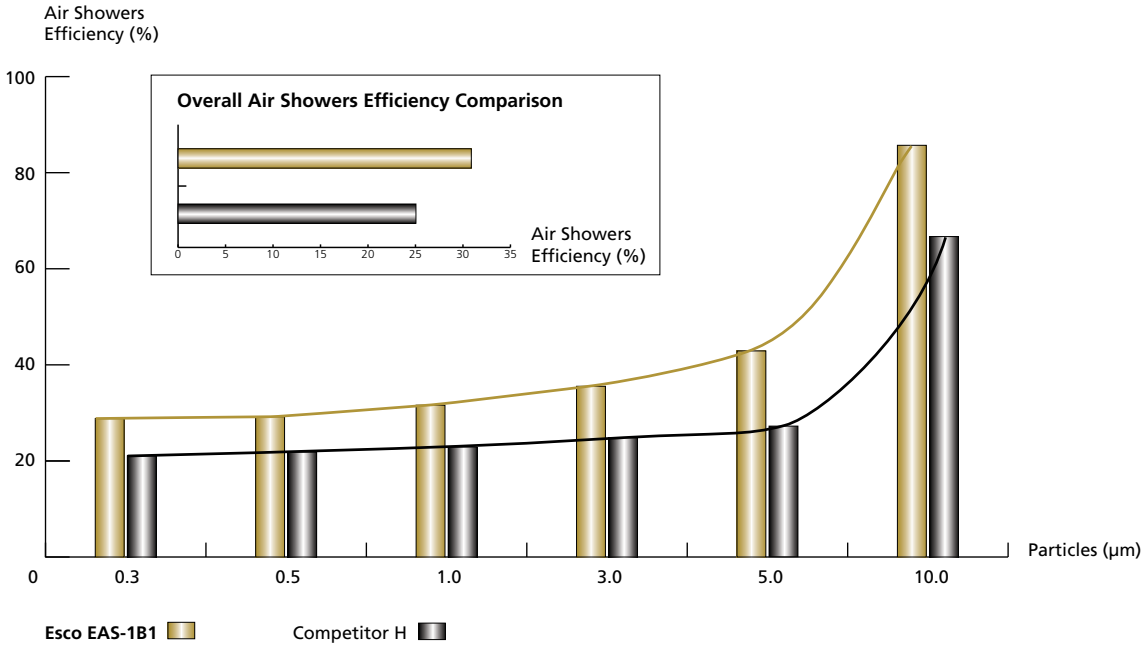
8. Particle count levels are measured, and compared against the baseline. The overall efficacy of the air shower under test and shower cycle is calculated. Shower cleaning efficiency at various particle sizes is also characterized.

9. The test is repeated multiple times, to gather sufficient data and eliminate any bias.

Particles Removal in EAS



Air Showers Efficiency Comparison



Cleanroom Air Showers

High Performance Blower System

German made ebm-papst® permanently lubrocated centrifugal motor/blowers 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, quite, vibration-free operation.

HEPA Filtration System

HEPA filter(s) provide 99.99% typical efficiency for particle sizes of 0.1 to 0.3 microns.

Light Indicator and Emergency Switch

Indicator lamps indicate if doors are locked or unlocked, thereby regulating the flow of personnel in and out of the air shower.

Emergency buttons mounted on both external faces of the shower unlock all doors instantly.

Door

Heavy-duty, durable aluminum framed door assemblies are constructed with glass windows permitting visibility.

Esco Cleanroom Air Shower Model EAS-2C_.

Sentinel Microprocessor Control System, Programmable

The microprocessor control detects improper operation and displats corresopinding error messages should the integrity of the cleaneroom be violated.
The LCD displays shower duration and countdown, and reports cycle progress and operational status.
A 24 hout clock displays local time.

Light Diffuser

Diffusers ensure and unifrom lighting throughout the chamber.

Stainless Steel Nozzles

An array if stainless steel nozzles direct high-velocity jets within the chamber.

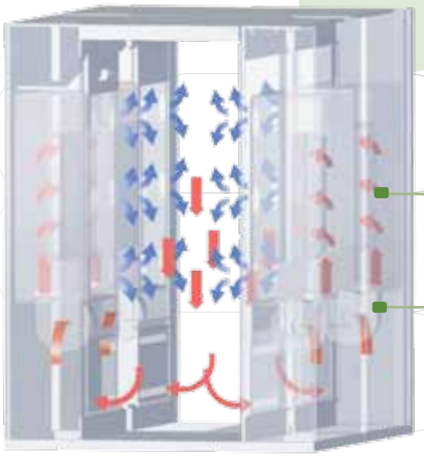
Key Features

- Esco Air Shower filters meet the IEST-RP-CC001.3 recommended practice for HEPA performance (USA), and EN 1822 for H13 performance (EU).
- The auto reset feature unlock doors in case personnel open the air shower door but do not actually enter, thus preventing accidental lock-outs.
- In case of a power failure, all doors are unlocked automatically, and controller settings saved.
- A disposable pre-filter with 85% arrestance extends the life of the main filter.
- The air shower is constructed of electro-galvanised steel sheets with an abrasion-resistant oven-baked powder coated finish.
- Each air shower is individually factory tested for safety and performance in accordance with international standards.
- Robust construction qualify the air shower for the most demanding applications. The air shower is fully assembled and ready to install and operate when shipped.
- Each unit is shipped with a documentation outlining the tests undertaken and the units individual results for each unit.
- All electrical components are UL listed / recognised.
- The Air Shower is warranted for 1 year excluding consumable parts and accessories.

FAST TRACK

FastTrack models are available for shipment within 1 week from order placement, from Esco Singapore, to destinations around the world. The following models are available under this program: EAS-1A1 & EAS-1B1.

Air Shower Filtration System



Blower

HEPA Filter

- Air is forced by the blower(s) through HEPA filter(s) which are 99.99% efficient against particles of 0.3 microns.
- Filtered air is ejected through nozzles at high velocities into the chamber. These turbulent air streams disperse particulate matter on all surfaces.
- Dispersed particulate matter migrate with the air stream towards the lower areas in the air shower chamber. Air enters the blower supply plenum through pre-filter(s) installed at the base of the chamber.

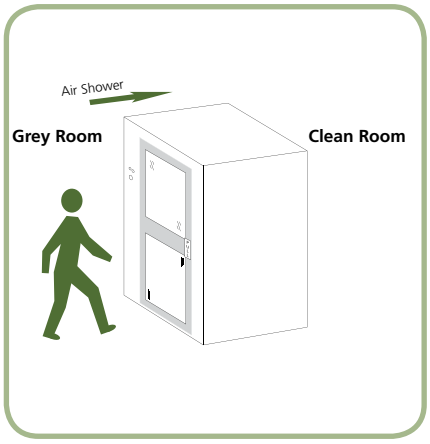
ULPA-filtered air

Unfiltered/potentially contaminated air

- The air is continuously filtered and recirculated. The air shower is a selfcontained device and does not exchange air with the environment it is placed in.

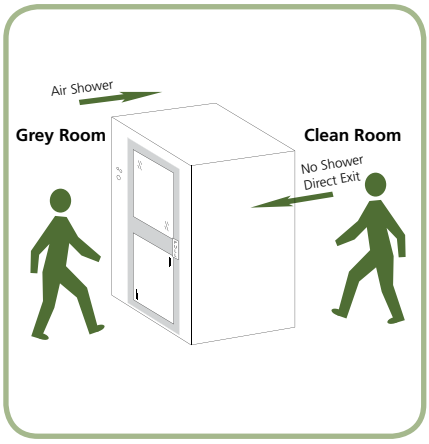
Air Shower Operating Sequences

Unlike conventional air showers which are delivered with a fixed operating sequence, the Esco Air Shower's operating sequence may be selected from three pre-programmed sequnces:



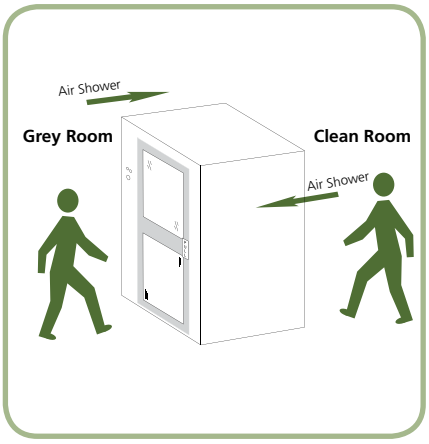
One-Way

Personnel may enter the controlled environment but not exit through the air shower. At the idle state, the clean side door is locked while the grey side is unlocked. This mode of operation is useful for controlling traffice patterns into and out of the controlled environment.



Two-Way One-Way

Personnel may enter or exit the controlled environment through the air shower. When entering the controlled environment the shower is activated. When exiting the shower is disabled to reduce throughput time. The air shower program is able to detect if the person is entering or exiting the controlled environment via door sensors and a time-sequenced control.



Two-Way

Personnel may enter or exit the controlled environment through the air shower. In both directions the air shower is activated. This mode of operation is useful in pharmaceutical and lab animal research applications to prevent the egress of hazardous substances and allergens from the controlled environment.

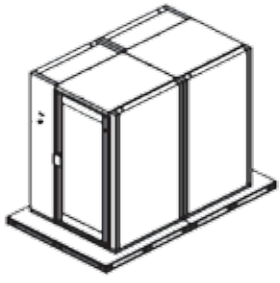
General Specifications, Cleanroom Air Shower, Model EAS (A-Series)

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

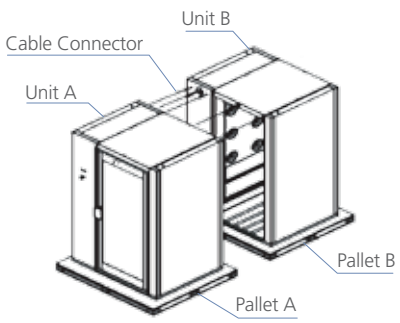
Model			EAS-1A_	EAS-2A_	EAS-2A_
External Dimensions (W x D x H)			1260 x 1000 x 2050 mm 49.7" x 39.4" x 80.7"	1260 x 2000 x 2050 mm 49.7" x 78.7" x 80.7"	1260 x 3000 x 2050 mm 49.7" x 118.1" x 80.7"
Internal Work Area, Dimensions (W x D x H)			790 x 920 x 1930 mm 31.1" x 36.2" x 76.0"	790 x 1920 x 1930 mm 31.1" x 75.6" x 76.0"	790 x 2920 x 1930 mm 31.1" x 115" x 76.0"
Air Change			371/ Hr	356/ Hr	351/ Hr
Initial Airflow Velocity			20-22 m/s (3,937-4,330 fpm)		
Number of Nozzles			6	12	18
Air Shower Duration			Factory set at 12 seconds (adjustable)		
Persons Per Cycle			1	2-3	4-6
Personnel Flow (Persons / Min.)			4	8-12	15-23
			Above figures based on: Total Cycle Time of 16 seconds (12 seconds of Air Shower + 4 seconds for buffer time / personnel entrance and exit)		
Filtration Efficiency			Main Filter: >99.99% at 0.3 µm Pre-Filter: Arrestance 85%, efficiency 20%		
Filtration Elements			Main Filter: HEPA filter Pre-Filter: Disposable and non-washable polyester fibers		
Fluorescent Lamp			17 W x 2	17 W x 4	17 W x 6
Air Shower Construction			1.5 mm/ 0.06"/18 electro-galvanised steel / White oven-baked epoxy powder-coated finish		
Max. Power Consumption Current, BTY/Hr	During Operation		245 W, 1.2 A, 500 BTU/ Hr	490 W, 2.4 A, 1000 BTU/ Hr	735 W, 3.5 A, 1499 BTU/ Hr
	During Standby		113 W, 0.5 A, 231 BTU/ Hr	226 W, 1 A, 461 BTU/ Hr	339 W, 1.5 A, 692 BTU/ Hr
Electrical	220-240V, AC, 50Hz, 1Ø		EAS-1A1	EAS-2A1	EAS-3A1
	110-130V, AC, 60Hz, 1Ø		EAS-1A2	EAS-2A2	EAS-3A2
	220-240V, AC, 60Hz, 1Ø		EAS-1A3	EAS-2A3	EAS-3A3
Gross Weight			410 kg (904 lbs)	820 kg (1808 lbs)	1230 kg (2712 lbs)
Net Weight			250 kg (551 lbs)	500 kg (1102 lbs)	750 kg (1653 lbs)
Shipping Dimensions, Maximum (W x D x H)*	Assembled (W x D x H)		1450 x 1250 x 2152 mm 57.1" x 49.2" x 84.7"	1450 x 1250 x 2152 mm 57.1" x 49.2" x 84.7"	N/A
	Module Form (W x D x H)	Pallet A	N/A	1450 x 1250 x 2152 mm 57.1" x 49.2" x 84.7"	1450 x 1250 x 2152 mm 57.1" x 49.2" x 84.7"
		Pallet B	N/A	1450 x 1250 x 2152 mm 57.1" x 49.2" x 84.7"	1450 x 1250 x 2152 mm 57.1" x 49.2" x 84.7"
		Pallet C	N/A	N/A	1450 x 1250 x 2152 mm 57.1" x 49.2" x 84.7"
	Unassebled (W x D x H)	Pallet A	2100 x 1300 x 778 mm 82.7" x 51.2" x 30.6"	2100 x 1300 x 924 mm 82.7" x 51.2" x 36.4"	2100 x 1300 x 1296 mm 82.7" x 51.2" x 51.0"
		Pallet B	N/A	2100 x 1300 x 632 mm 82.7" x 51.2" x 24.9"	2100 x 1300 x 781 mm 82.7" x 51.2" x 30.7"
Shipping Volume, Maximum	Assembled		3.90 m3 (138 cu.ft.)	7.80 m3 (276 cu.ft.)	N/A
	Module Form		N/A	7.80 m3 (276 cu.ft.)	11.70 m3 (414 cu.ft.)
	Unassembled		2.12 m3 (75 cu.ft.)	4.24 m3 (150 cu.ft.)	5.66 m3 (200 cu.ft.)

Esco Cleanroom Air Showers, Modes of Shipment, Model EAS-2A_

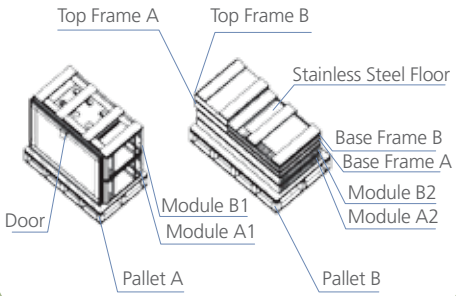
Assembled



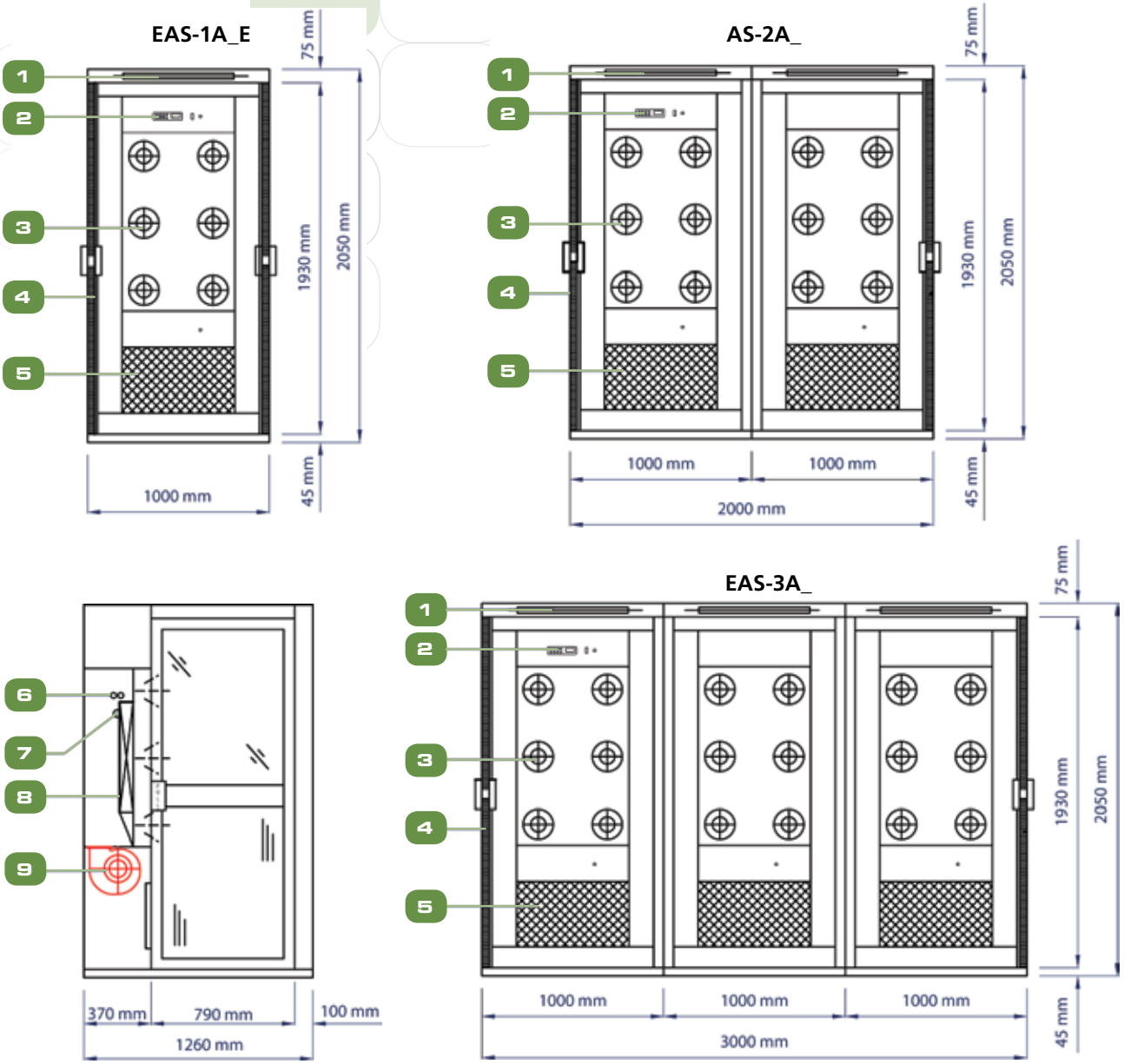
Module Form



Unassembled



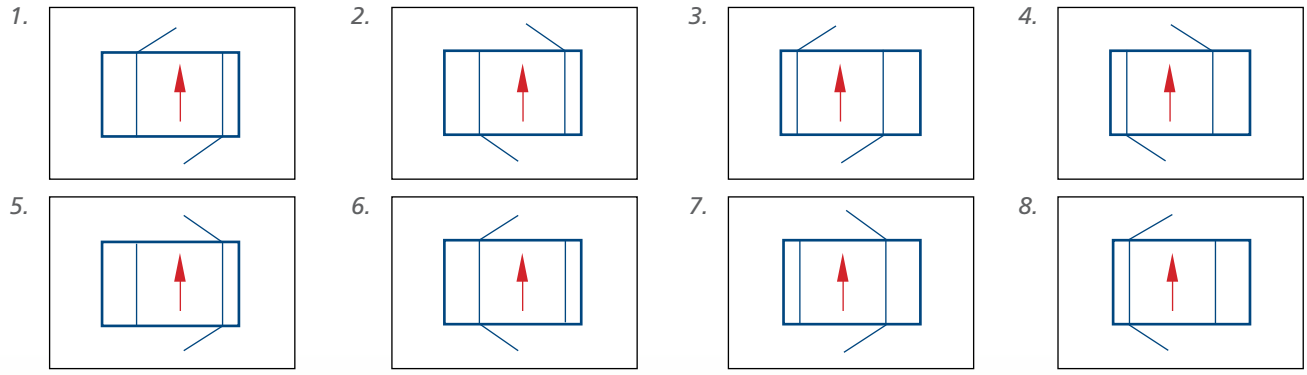
Model EAS (A-Series) Cleanroom Air Shower Technical Specifications



1. *Fluorescent lamp*
2. *Esco microprocessor system*
3. *Nozzles*
4. *Door*
5. *Pre-filters*
6. *Indicator light*
7. *Emergency switch*
8. *HEPA filter*
9. *Blower*

Model EAS (A-Series), Door Direction

(Factiry Configured. Choose One When Ordering.)



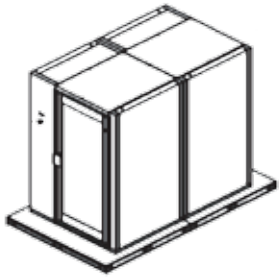
General Specifications, Cleanroom Air Shower, Model EAS (B-Series)*

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

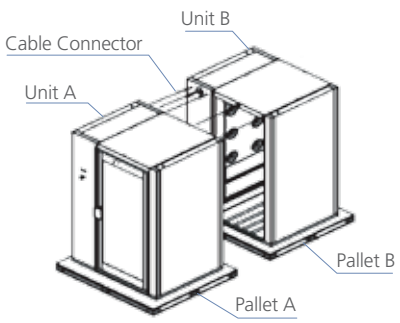
Model			EAS-1B_	EAS-2B_	EAS-3B_
External Dimensions (W x D x H)			1530 x 1000 x 2050 mm 60.2" x 39.4" x 80.7"	1530 x 2000 x 2050 mm 60.2" x 78.7" x 80.7"	1530 x 3000 x 2050 mm 60.2" x 118.1" x 80.7"
Internal Work Area, Dimensions (W x D x H)			790 x 920 x 1930 mm 31.1" x 36.2" x 76.0"	790 x 1920 x 1930 mm 31.1" x 75.6" x 76.0"	790 x 2920 x 1930 mm 31.1" x 115" x 76.0"
Air Change			743/ Hr	712/ Hr	702/ Hr
Initial Airflow Velocity			20-22 m/s (3,937-4,330 fpm)		
Number of Nozzles			12	24	36
Air Shower Duration			Factory set at 12 seconds (adjustable)		
Persons Per Cycle			1	2-3	4-6
Personnel Flow (Persons / Min.)			4	8-12	15-23
			Above figures based on: Total Cycle Time of 16 seconds (12 seconds of Air Shower + 4 seconds for buffer time / personnel entrance and exit)		
Filtration Efficiency			Main Filter: >99.99% at 0.3 µm Pre-Filter: Arrestance 85%, efficiency 20%		
Filtration Elements			Main Filter: HEPA filter Pre-Filter: Disposable and non-washable polyester fibers		
Fluorescent Lamp			17 W x 2	17 W x 4	17 W x 6
Air Shower Construction			1.5 mm/ 0.06"/18 electro-galvanised steel / White oven-baked epoxy powder-coated finish		
Max. Power Consumption Current, BTY/Hr	During Operation		500 W, 2.3 A, 1020 BTU/ Hr	1000 W, 4.6 A, 2040 BTU/ Hr	1500 W, 7 A, 3060 BTU/ Hr
	During Standby		162 W, 0.7 A, 330 BTU/ Hr	200 W, 1 A, 408 BTU/ Hr	250 W, 1.1 A, 510 BTU/ Hr
Electrical	220-240V, AC, 50Hz, 1Ø		EAS-1B1	EAS-2B1	EAS-3B1
	110-130V, AC, 60Hz, 1Ø		EAS-1B2	EAS-2B2	EAS-3B2
	220-240V, AC, 60Hz, 1Ø		EAS-1B3	EAS-2B3	EAS-3B3
Gross Weight			410 kg (904 lbs)	820 kg (1808 lbs)	1230 kg (2712 lbs)
Net Weight			250 kg (551 lbs)	500 kg (1102 lbs)	750 kg (1653 lbs)
Shipping Dimensions, Maximum (W x D x H)*	Assembled (W x D x H)		1750 x 1250 x 2152 mm 68.9" x 49.2" x 84.7"	1750 x 2500 x 2152 mm 68.9" x 98.4" x 84.7"	N/A
	Module Form (W x D x H)	Pallet A	N/A	1750 x 1250 x 2152 mm 68.9" x 49.2" x 84.7"	1750 x 1250 x 2152 mm 68.9" x 49.2" x 84.7"
		Pallet B	N/A	1750 x 1250 x 2152 mm 68.9" x 49.2" x 84.7"	1750 x 1250 x 2152 mm 68.9" x 49.2" x 84.7"
		Pallet C	N/A	N/A	1750 x 1250 x 2152 mm 68.9" x 49.2" x 84.7"
	Unassebled (W x D x H)	Pallet A	2100 x 1300 x 1048 mm 82.7" x 51.2" x 41.3"	2100 x 1300 x 1296 mm 82.7" x 51.2" x 51.0"	2100 x 1300 x 1668 mm 82.7" x 51.2" x 65.7"
		Pallet B	N/A	2100 x 1300 x 800 mm 82.7" x 51.2" x 31.5"	2100 x 1300 x 1219 mm 82.7" x 51.2" x 48.0"
Shipping Volume, Maximum	Assembled		4.70 m³ (166 cu.ft.)	9.40 m³ (333 cu.ft.)	N/A
	Module Form		N/A	9.40 m³ (333 cu.ft.)	14.10 m³ (499 cu.ft.)
	Unassembled		2.83 m³ (100 cu.ft.)	5.71 m³ (202 cu.ft.)	7.87 m³ (279 cu.ft.)

Esco Cleanroom Air Showers, Modes of Shipment, Model EAS-2B_

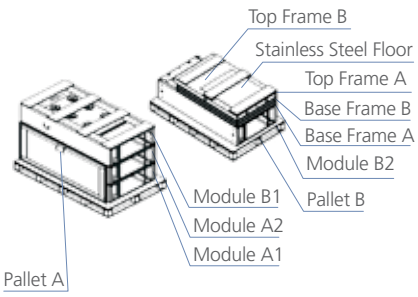
Assembled



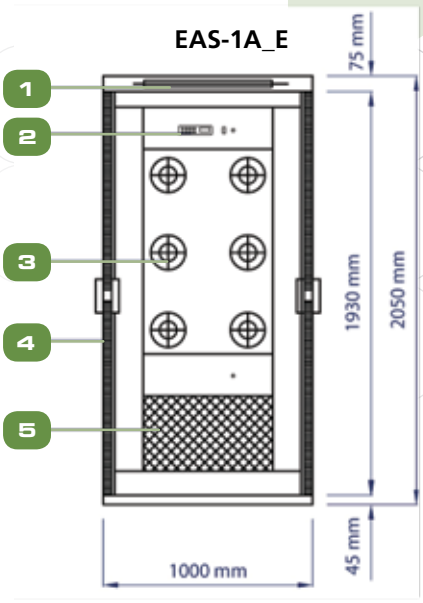
Module Form

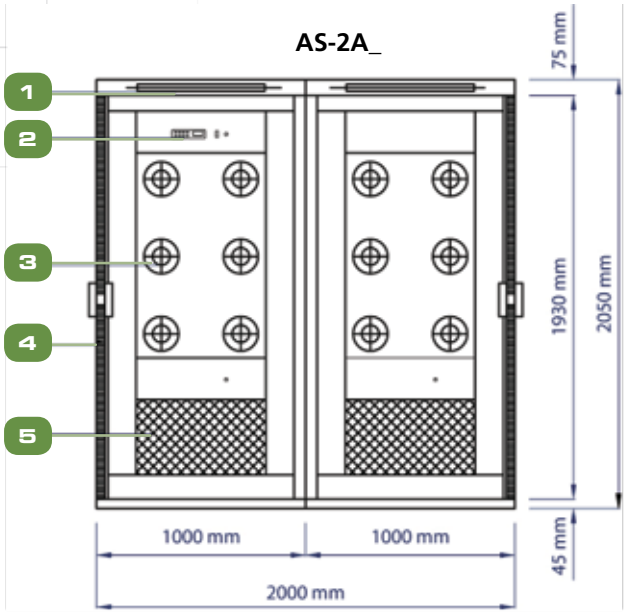


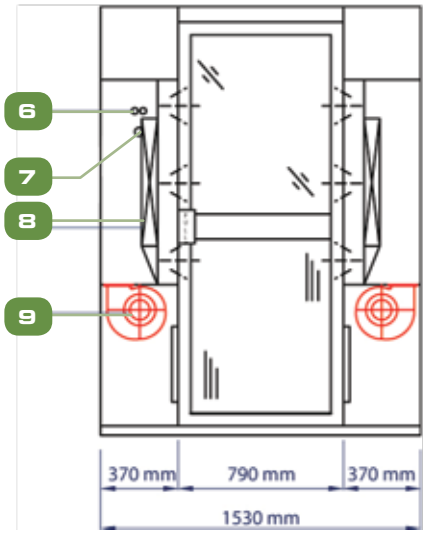
Unassembled

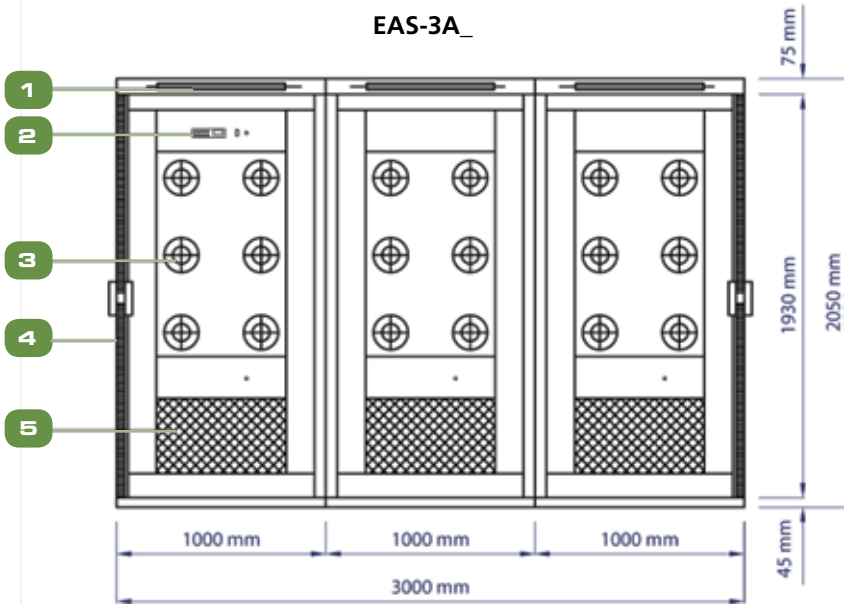


Model EAS (B-Series) Cleanroom Air Shower Technical Specifications





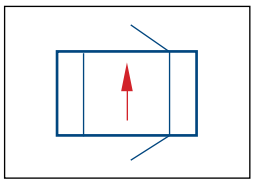
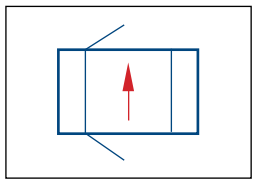
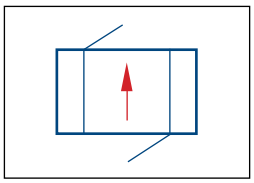
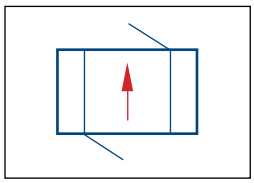




1. *Fluorescent lamp*
2. *Esco microprocessor system*
3. *Nozzles*
4. *Door*
5. *Pre-filters*
6. *Indicator light*
7. *Emergency switch*
8. *HEPA filter*
9. *Blower*

Model EAS (A-Series), Door Direction

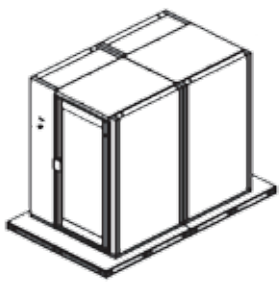
(Factiry Configured. Choose One When Ordering.)

1. 
2. 
3. 
4. 

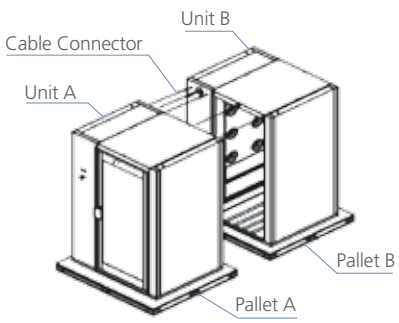
General Specifications, Cleanroom Air Shower, Model EAS (C-Series)*				
Note to customer: Insert electrical voltage number into last model number digit _ when ordering.				
Model			**EAS-2C_**	**EAS-3C_**
External Dimensions (W x D x H)			2330 x 2000 x 2050 mm 91.7" x 78.7" x 80.7"	2330 x 3000 x 2050 mm 91.7" x 118.1" x 80.7"
Internal Work Area, Dimensions (W x D x H)			1590 x 1920 x 1930 mm 62.6" x 75.6" x 76.0"	1590 x 2920 x 1930 mm 62.6" x 115" x 76.0"
Air Change			354/ Hr	349/ Hr
Initial Airflow Velocity			20-22 m/s (3,937-4,330 fpm)	
Number of Nozzles			24	36
Air Shower Duration			Factory set at 12 seconds (adjustable)	
Persons Per Cycle			2-3	4-6
Personnel Flow (Persons / Min.)			8-12	15-23
			Above figures based on: Total Cycle Time of 16 seconds (12 seconds of Air Shower + 4 seconds for buffer time / personnel entrance and exit)	
Filtration Efficiency			Main Filter: >99.99% at 0.3 µm Pre-Filter: Arrestance 85%, efficiency 20%	
Filtration Elements			Main Filter: HEPA filter Pre-Filter: Disposable and non-washable polyester fibers	
Fluorescent Lamp			17 W x 8	17 W x 12
Air Shower Construction			1.5 mm/ 0.06"/18 electro-galvanised steel / White oven-baked epoxy powder-coated finish	
Max. Power Consumption Current, BTY/Hr	During Operation		1000 W, 2.3 A, 1020 BTU/ Hr	1500 W, 7 A, 3060 BTU/ Hr
	During Standby		162 W, 0.7 A, 330 BTU/ Hr	250 W, 1.1 A, 510 BTU/ Hr
Electrical	220-240V, AC, 50Hz, 1Ø		EAS-2C1	EAS-3C1
	110-130V, AC, 60Hz, 1Ø		EAS-2C2	EAS-3C2
	220-240V, AC, 60Hz, 1Ø		EAS-2C3	EAS-3C3
Gross Weight			910 kg (2006 lbs)	1660 kg (3660 lbs)
Net Weight			750 kg (1653 lbs)	1500 kg (3307 lbs)
Shipping Dimensions, Maximum (W x D x H)*	Assembled (W x D x H)		2500 x 2500 x 2232 mm 98.4" x 98.4" x 87.9"	N/A
	Module Form (W x D x H)	Pallet A	2500 x 1250 x 2232 mm 98.4" x 49.2" x 87.9"	2500 x 1250 x 2232 mm 98.4" x 49.2" x 87.9"
		Pallet B	2500 x 1250 x 2232 mm 98.4" x 49.2" x 87.9"	2500 x 1250 x 2232 mm 98.4" x 49.2" x 87.9"
		Pallet C	N/A	2500 x 1250 x 2232 mm 98.4" x 49.2" x 87.9"
	Unassebled (W x D x H)	Pallet A	2100 x 1300 x 1296 mm 82.7" x 51.2" x 51.0"	2100 x 1300 x 1668 mm 82.7" x 51.2" x 65.7"
		Pallet B	2100 x 1300 x 800 mm 82.7" x 51.2" x 31.5"	2100 x 1300 x 1219 mm 82.7" x 51.2" x 48.0"
Shipping Volume, Maximum	Assembled		13.94 m³ (493 cu.ft.)	N/A
	Module Form		13.94 m³ (493 cu.ft.)	20.91 m³ (740 cu.ft.)
	Unassembled		5.71 m³ (202 cu.ft.)	7.87 m³ (279 cu.ft.)

Esco Cleanroom Air Showers, Modes of Shipment, Model EAS-2C_

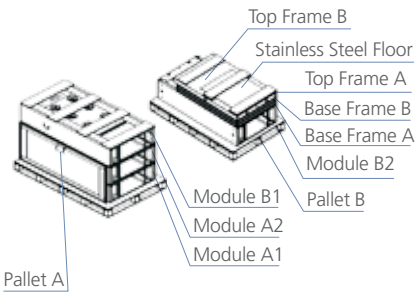
Assembled



Module Form

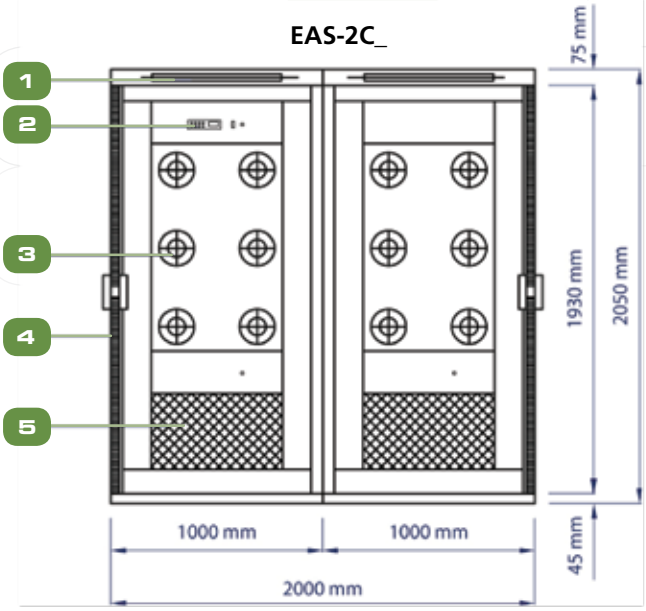


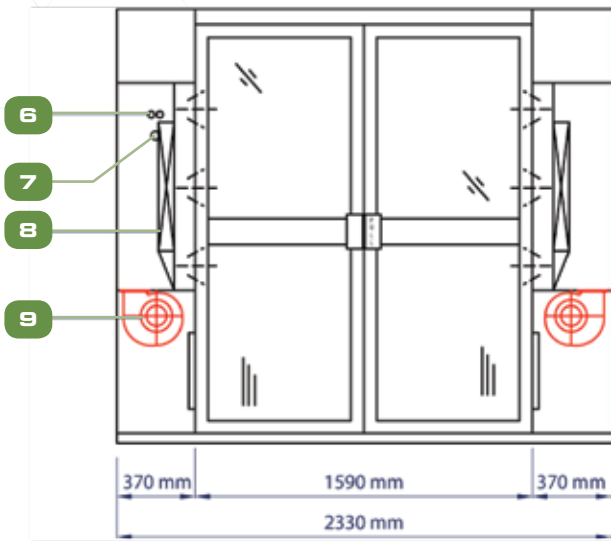
Unassembled



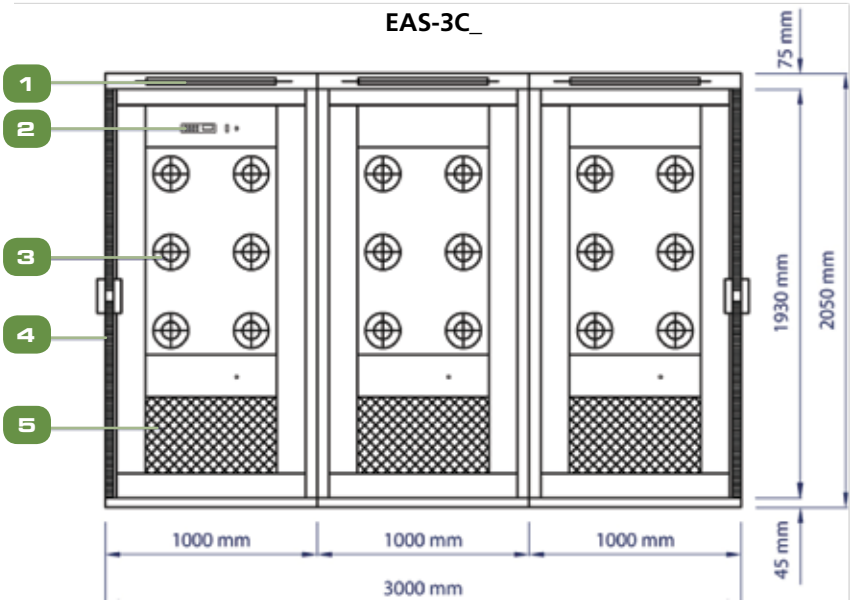
Model EAS (C-Series) Cleanroom Air Shower Technical Specifications

EAS-2C_





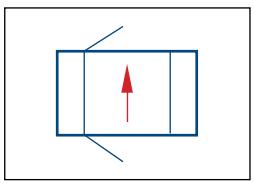
EAS-3C_

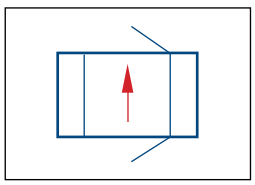


1. *Fluorescent lamp*
2. *Esco microprocessor system*
3. *Nozzles*
4. *Door*
5. *Pre-filters*
6. *Indicator light*
7. *Emergency switch*
8. *HEPA filter*
9. *Blower*

Model EAS (C-Series), Door Direction

(Factiry Configured. Choose One When Ordering.)

1. 

2. 

Laminar Flow Straddle Units, Single and Double

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.

Main Features

- Quiet, reliable, permanently lubricated direct drive centrifugal blowers.
- Long-life ULPA filter for supply airflow.
- Sterile 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.
- Units are floor mounted with stainless steel work surfaces isolated from the main frame to reduce vibration.

	Cabinet Performance	Air Quality	Filtration	Electrical Safety
Standards 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	UL 61010-1, USA CAN/CSA-22.2, No.61010-1 EN 61010-1, Europe IEC 61010-1, Worldwide

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

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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.

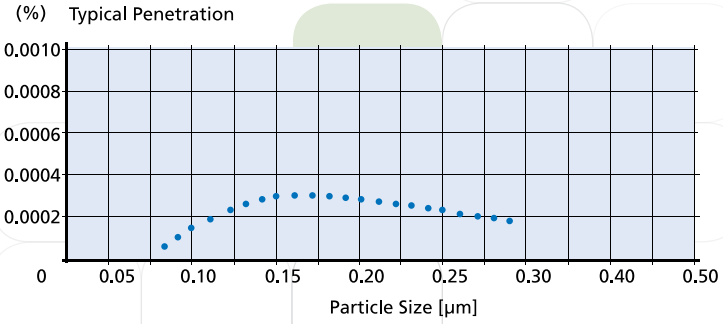
- In vertical flow models, filtered air is passed through the main chamber of the clean bench in a vertical laminar (unidirectional) air stream before being exhausted through the front opening of the clean bench.
- Double sided units are suitable for larger-scale industrial applications. Roller or belt conveyors can be configured with the units to faciliate assembly operations.

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.

Esco ULPA Filter Efficiency



Typical Penetration

Esco straddle units use ULPA filters (per IEST-RP-CC001.3) instead of conventional HEPA filters commonly found in laminar flow cabinets. 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.

- 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.
- 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 acrylic side panels enhance visibility and create a more comfortable work environment for the operator as opposed to conventional stainless steel or painted steel sides.
- Acrylic side panels are removable when multiple units are connected.
- Acrylic 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

- Esco straddle units provide ISO Class 4 air cleanliness within the work zone as per ISO 14644.1, 10 times cleaner than the usual Class 5 classification on laminar flow cabinets offered by the competition.
- High quality ULPA filters utilizing an improved mini-pleated separation technique to maximizes surface area improves efficiency and extends the filter life. 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.
- 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.

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

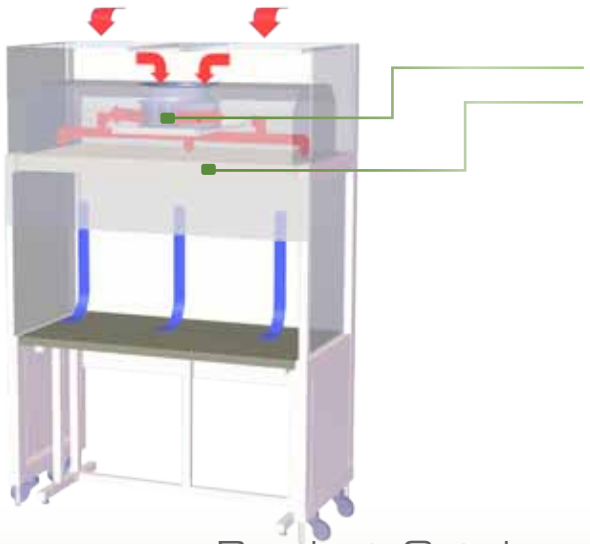
All components used in Esco products meet or exceed all applicable safety requirements.

- 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

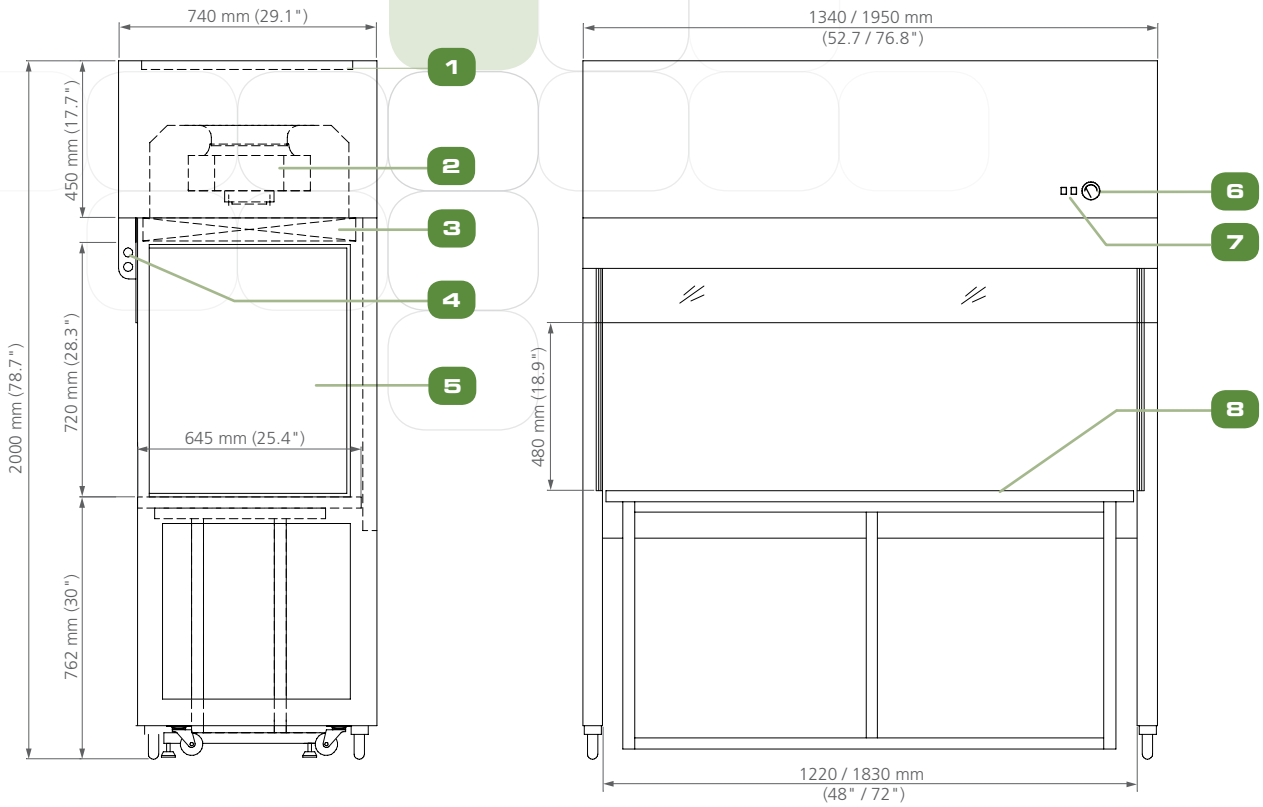
Esco Enterprise Straddle Units come with a 12 months warranty, excluding consumable parts and accessories. Contact your local representative for specific warranty details.

Vertical Laminar Flow Straddle Unit Airflow Diagram



- *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.*

Model EQU/0_-ESUS Enterprise Laminar Flow Single Straddle Unit
Technical Specifications



1. *Pre-filter*
2. *Blower*
3. *ULPA filter*
4. *Fluorescent lamp*
5. *Acrylic sides*
6. *Pressure gauge*
7. *Operating switches*
8. *Isolated stainless steel table*

General Specifications, Enterprise Laminar Flow Single Straddle Unit			
Model		EQU/04-ESUS	EQU/06-ESUS
Nominal 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 (76.8" x 29.1" x 78.7")
Internal Work Area, Dimensions (W x D x H)		1220 x 645 x 720 mm (48" x 25.4" x 28.3")	1830 x 645 x 720 mm (72" x 25.4" x 28.3")
Usable Work Zone		1220 x 645 mm	1830 x 645 mm
Initial Airflow Velocity		Average of 0.45 m/s or 90 fpm (+/- 20%)	
Air Volume		1205 m^3/h	1810 m^3/h
Pre-Filter		Washable non-woven polyester fibers with 90% arrestance and 20% efficiency	
HEPA Filter Typical Efficiency		99.99% at partical size 0.3 µm	
Sound Emission Per IEST-RP-CC002.2		62 dBA	63.5 dBA
Fluorescent Lamp Intensity At Zero Ambient		1000 Lux	
Cabinet Construction	Main Body	1.5 mm (0.06") electro-galvanised steel with white oven-baked epoxy powder-coated finish.	
	Work Zone	1.2 mm (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)		2150 x 950 x 1610 mm 84.6" x 37.4" x 63.4"	2150 x 950 x 1610 mm 84.6" x 37.4" x 63.4"
Electrical	220-240V, AC, 50Hz, 1ø	EQU/04-ESUS	EQU/06-ESUS
	Cabinet Full Load Amps (FLA)	1.8 A	4 A
	Cabinet Nominal Power	378 W	628 W
	Cabinet BTU	1290	2143

Garment Storage Cabinet

Esco Garment Storage Cabinet, Model EQUI04-EGSC.

Introduction

Esco is a leader in laminar flow cabinets. Since 1978, Esco has installed tens of thousands of laminar flow cabinets providing reliable protection for samples and work processes for a multitude of applications.

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

Designed and Built for Enhanced Usability

Cleanroom garments can accumulate contamination during storage and between laundry washes, which in turn may lead to lower product yields and increased product quality issues. Esco garment storage cabinets make a positive contribution to maintaining the cleanliness of a cleanroom environment.

- ULPA-filtered airflow keeps garments clean in storage and when being handled.
- Enables garments to be stored in a visible and organized manner.
- This small investment emphasizes to both employees and visitors that the garment they are about to don will be used to enter a controlled environment, which leads to a better awareness of cleanroom standards and operating procedures.

The Highest Quality Cabinet Construction

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

- Reliable rocker switches operate the fan and lights and a Minihelic™ pressure gauge monitors cabinet 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 zero-flicker and instant start.
- All components are designed for maximum chemical resistance and enhanced durability for a long service life.
- The main body of the cabinet is constructed of industrial-grade electrogalvanized steel.
- The cabinet is mobile on casters and may be fixed in place via the built-in leveling feet.
- All cabinet components are clean room compatible. Isocide eliminates 99.9% of surface bacteria within 24 hours of exposure.

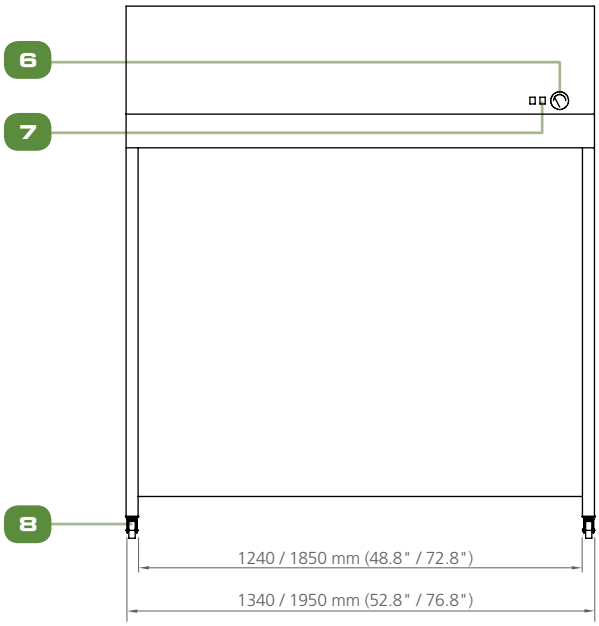
Enhanced Filtration System

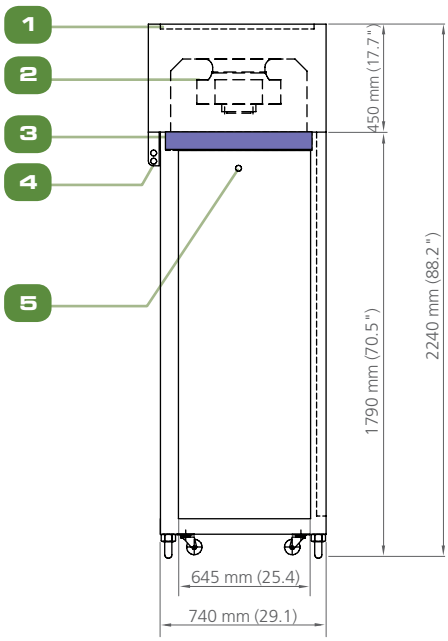
The enhanced filtration system on the garment storage cabinet is designed to provide the highest level of air quality within the work zone, meeting all relevant standards (see Technical Specifications for details).

- Esco laminar flow cabinets provide ISO Class 3 air cleanliness within the work zone as per ISO 14644.1, 100 times cleaner than the usual Class 5 classification on cabinets offered by the competition.
- High quality ULPA filters utilizing an improved mini-pleated separation technique to maximizes surface area improves efficiency and extends the filter life. 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.

General Specifications, Garment Storage Cabinet			
Model		**EQU/04-EGSC**	**EQU/06-EGSC**
Nominal Size		1.2 meters (4')	1.8 meters (6')
External Dimensions (W x D x H)		1340 x 740 x 2240 mm 52.8" x 29.1" x 88.2"	1950 X 740 X 2240 mm 76.8" x 29.1" x 88.2"
Internal Storage Area, Dimensions (W x D x H)		1240 x 645 x 1790 mm 48.8" x 25.4" x 70.5"	1850 x 645 x 1790 mm 72.8" x 25.4" x 70.5"
Storage Capacity		16 garments on hangers (4' model)	24 garments on hangers (6' model)
Average Airflow Velocity		0.45 m/s (90 fpm)	
Pre-Filter		Disposable and non-washable polyester fibers with 85% arrestance / EU3 rated	
ULPA Filter Typical Efficiency		99.999% for particles size at 0.3 microns	
Sound Emission Per IEST-RP-CC002.2		61 dBA	63 dBA
Fluorescent Lamp Intensity At Zero Ambient		>800 Lux (74 foot candles)	
Cabinet Construction	Main Body	1.2 mm (0.05") 18 gauge electro-galvanised steel with white oven-baked epoxy powder-coated finish	
Electrical	220-240V, AC, 50Hz, 1Ø	EQU/04-EGSC	EQU/06-EGSC
	Cabinet Nominal Power	378 W	628 W
	Cabinet Full Load Amps (FLA)	1.8 A	4 A
	Cabinet BTU	1290	2143
Net Weight		150 kg (331 lbs)	220 kg (484 lbs)
Gross Weight		229.5 kg (506 lbs)	311.6 kg (687 lbs)
Shipping Dimensions, Maximum (W x D x H)		2150 x 950 x 1610 mm 84.6" x 37.4" x 63.4"	2150 x 950 x 1610 mm 84.6" x 37.4" x 63.4"
Shipping Volume, Maximum		3.29 m³ (116 cu.ft.)	3.29 m³ (116 cu.ft.)

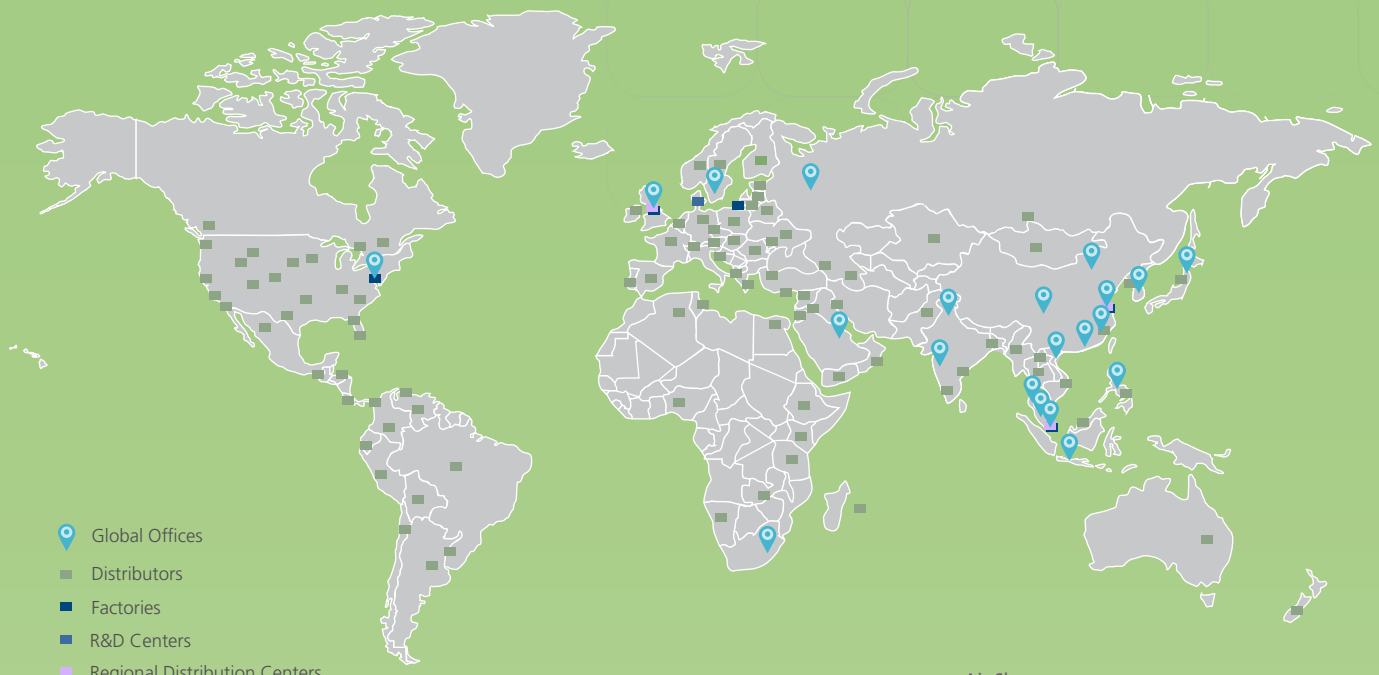
Model EGSC Esco Garment Storage Cabinet





1. *Pre-filter*
2. *Blower*
3. *ULPA filter*
4. *Fluorescent lamps*
5. *Stainless steel rod*
6. *Pressure gauge*
7. *Operating switches*
8. *Castors*

ESCO GLOBAL NETWORK



Air Shower
Aseptic Containment Isolator (ACTI)
Ceiling Laminar Airflow Units
Cleanroom Transfer Hatch
Containment Barrier Isolator (CBI)
Downflow Booth (DFB)
Dynamic Floor Label 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. www.escoglobal.com.

ESCO® PHARMA PLATFORM SPECIALIST.

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