LAB SETUP AMERICA

PRODUCT BROCHURE | LABORATORY & CLEANROOM EQUIPMENT

Cleanroom Air Showers

Self-contained air showers that remove particulate contamination from personnel and materials entering cleanrooms and controlled environments



- ULPA-filtered jets
- Cleanroom entry
- Pharma & research
- www.lsamerica.com

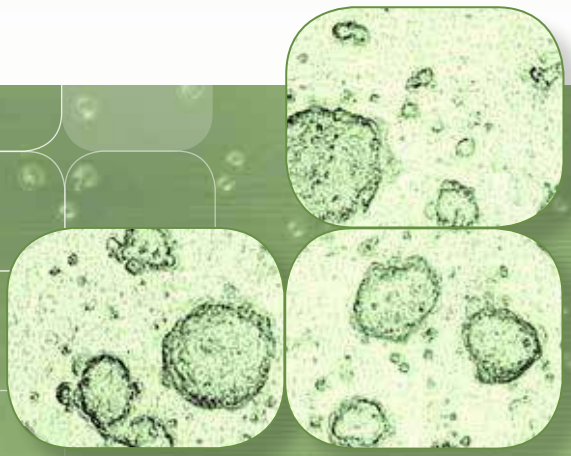


Esco Cleanroom Air Shower, Model EAS-2B_-SS

Esco Cleanroom Air Shower, Model EAS-2C_.

Esco Cleanroom Air Shower, Model EAS_B_ with Shutter Doors and Top Blowing

Cleanroom Air Showers



ESCO® PHARMA

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 ULPA-filtered air jets with velocities of 18-30 m/s (3,543 - 5,906 fpm) Contaminated air is then drawn through the base within the unit, filtered and recirculated.

Esco is the pioneering company for the construction of air showers with different applications on areas in the micro-electronics, semiconductors, pharmaceutical, spray painting, laboratory animal research and food markets.

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 augments the cleanroom operating protocol by reminding the operators that they are entering a controlled environment.

Pharmaceutical and Lab Animal Research Applications: Air showers maintain the cleanliness of the pharmaceutical production and laboratory animal breeding areas. It can also minimize egress of hazardous substances and allergens exiting the controlled environment.

Main Features

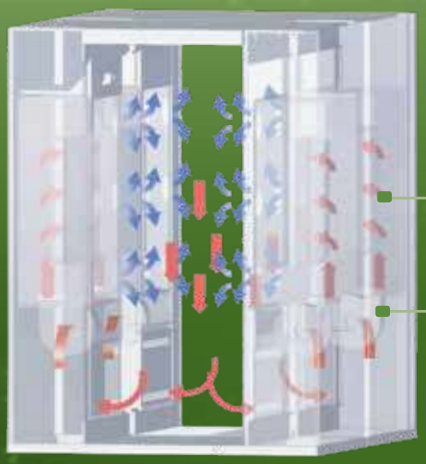
- High velocity shower jets running at 18-30 m/s to ensure efficient scrubbing action to remove particulate matter.
- Operating modes can be programmed in the field.
- Microprocessor controller supervises all functions.
- Mini-pleated ULPA filtration achieves > 99.9999% typical efficiency at 0.3 micron 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 exterior of the air shower to regulate traffic flow, in and out of the cleanroom.
- Permanently lubricated direct drive centrifugal blowers 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)	Double Sided	Single leaf
EAS (C-Series)	Double Sided	Double leaf

See the Specification Chart for more details.

Air Shower Filtration System



- ULPA-filtered air
- Unfiltered/potentially contaminated air

- Air is forced by the blower(s) through ULPA filter(s) which are 99.9999% 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.
- 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.

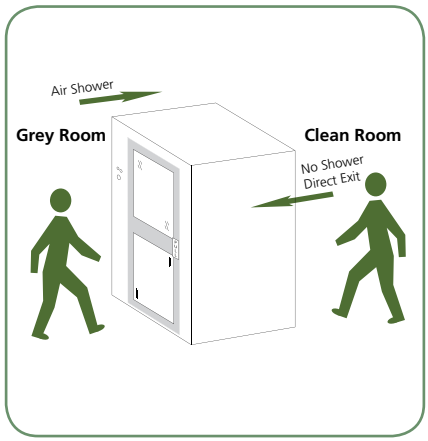
Air Shower Operating Sequences

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 sequences:



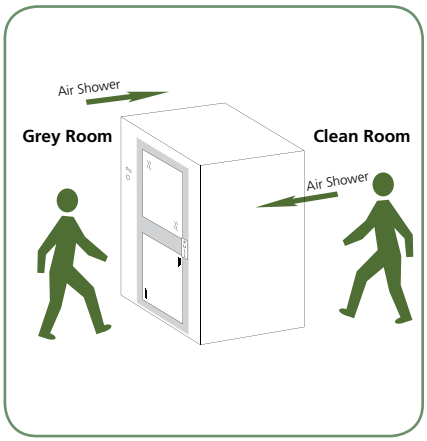
One-Way

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 traffic patterns in and out of the controlled environment.



Two-Way One-Way

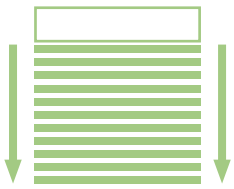
Personnel may enter or exit the controlled environment through the air shower. The air shower program is able to detect if the person is entering or exiting the controlled environment via door sensors and a time-sequenced control.



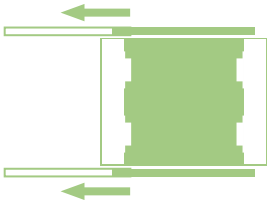
Two-Way

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.

Optional EAS Shutter Doors



Vertical Shutter Door

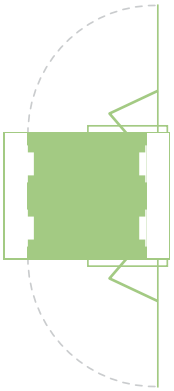


Single



Auto Sliding Door

Double

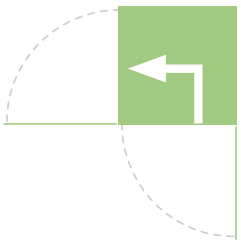


Auto-swing Door

Optional EAS Exit Directions



Straight-through



L-Shaped

**Turn Left or Turn Right as per client's specifications*

EAS Blowing Type



Single Side Blowing (EAS-A series)



Optional Three Side Blowing

**With Top Blowing*



Double Side Blowing (EAS-B and C series)

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, quiet, vibration-free operation.





ULPA Filtration System

ULPA filter(s) provide 99.9999% 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.



Esco Cleanroom Air Shower Model EAS-2C_.

Door

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



Sentinel Microprocessor Control System, Programmable

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





Light Diffuser

Diffusers ensure and unifrom lighting throughout the chamber.



Stainless Steel Nozzles

An array of 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 H14 performance (EU).
- The automatic reset feature unlocks the doors preventing accidental lock-outs in cases when an operator opens the air shower without actually entering.
- In case of a power failure, all doors are unlocked automatically, and the settings are retained.
- 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 qualifies the air shower for the most demanding applications. The air shower is carefully assembled and readily installed and operated when shipped.
- Each unit is shipped with a documentation outlining the tests undertaken and its individual results.
- All electrical components are UL listed / recognised.
- The Air Shower is warranted for one 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.

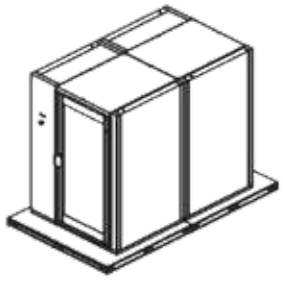
General Specifications, Cleanroom Air Shower, Model EAS (A-Series)

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

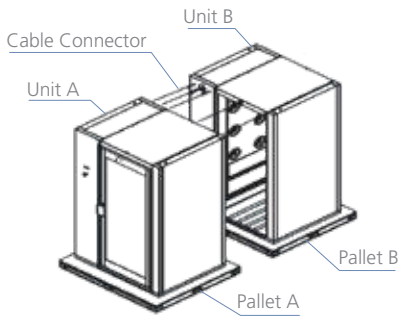
Model			EAS-1A_	EAS-2A_	EAS-3A_
External Dimensions (W x D x H)			1260 x 1000 x 2050 mm 49.7" x 39.4" x 80.7"	1260 x 2000 x 2050 mm 49.7" x 78.7" x 80.7"	1260 x 3000 x 2050 mm 49.7" x 118.1" x 80.7"
Internal Work Area, Dimensions (W x D x H)			790 x 920 x 1930 mm 31.1" x 36.2" x 76.0"	790 x 1920 x 1930 mm 31.1" x 75.6" x 76.0"	790 x 2920 x 1930 mm 31.1" x 115" x 76.0"
Clear Door Opening (WxH)			715 x 1835 mm		
Air Change (18-30 m/s)			137-227/Hr	131-218/Hr	129-215/Hr
Initial Airflow Velocity			18-30 m/s (3,543 - 5,906 fpm)		
Number of Nozzles			6	12	18
Air Shower Duration			Factory set at 12 seconds (adjustable)		
Persons Per Cycle			1	2-3	
Personnel Flow (Persons / Min.)			4	8-12	
			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: >99.9999% at 0.3 µm Pre-Filter: Arrestance 85%, efficiency 20%		
Filtration Elements			Main Filter: ULPA 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
	Note: Customer must provide isolator switch on site.				
Gross Weight			390 kg (858 lbs)	660 kg (1,452 lbs)	980 kg (2,156 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"
	Unassembled (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_

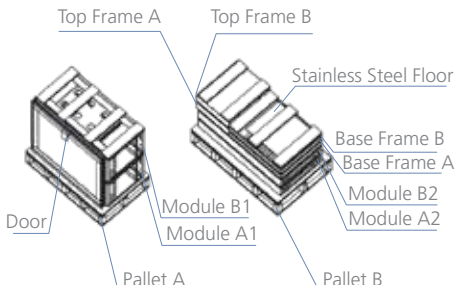
Assembled



Module Form

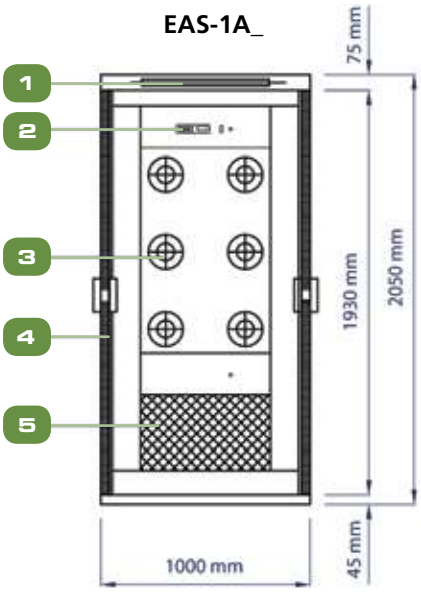


Unassembled

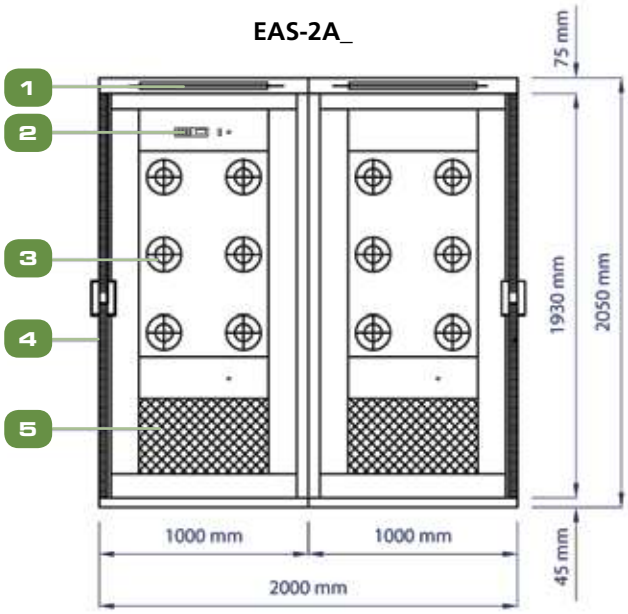


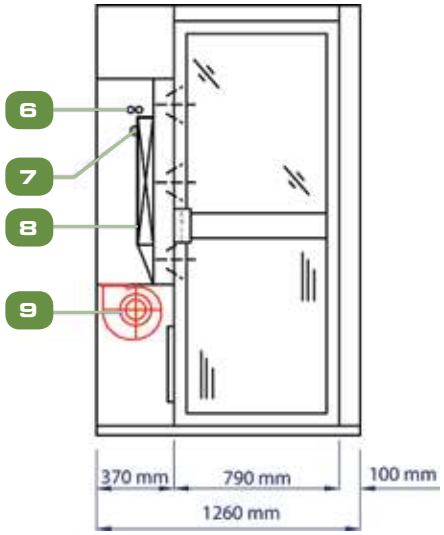
Model EAS (A-Series) Cleanroom Air Shower Technical Specifications

EAS-1A_

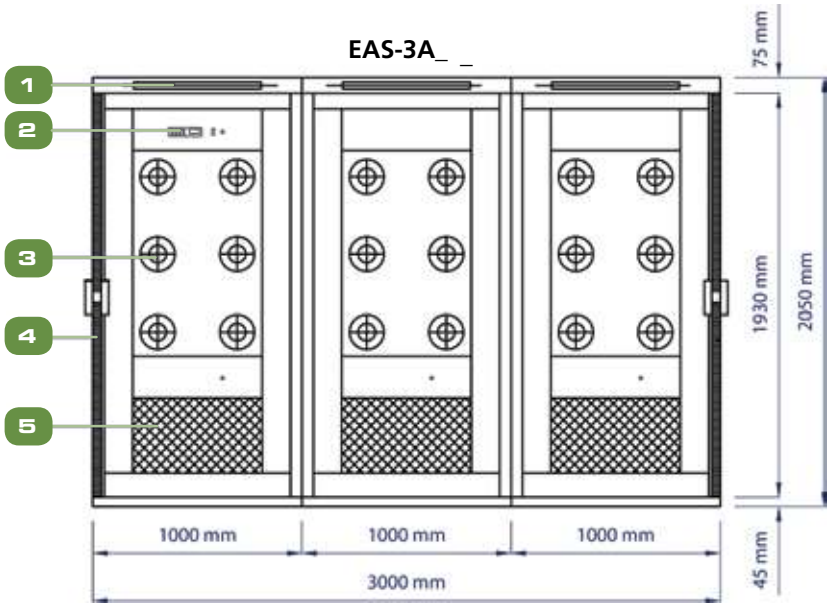


EAS-2A_





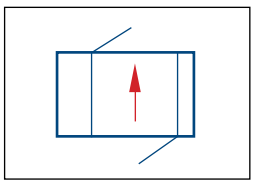
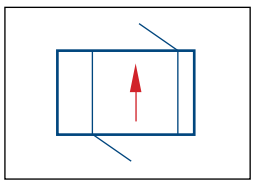
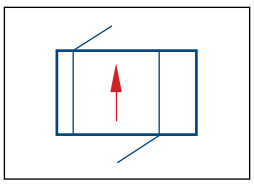
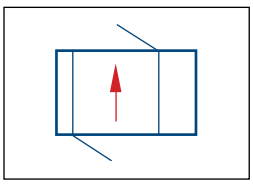
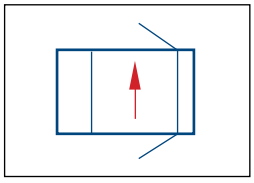
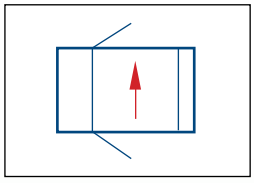
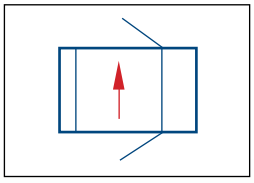
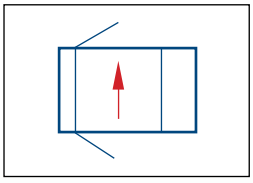
EAS-3A_ _



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

Model EAS (A-Series), Door Direction

(Factory Configured. Choose One When Ordering.)

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 

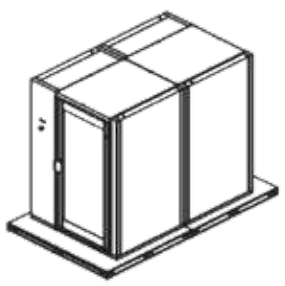
General Specifications, Cleanroom Air Shower, Model EAS (B-Series)*

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

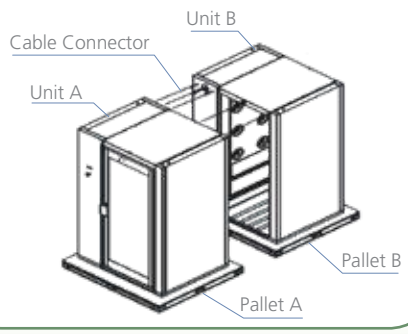
Model			EAS-1B_	EAS-2B_	EAS-3B_
External Dimensions (W x D x H)			1530 x 1000 x 2050 mm 60.2" x 39.4" x 80.7"	1530 x 2000 x 2050 mm 60.2" x 78.7" x 80.7"	1530 x 3000 x 2050 mm 60.2" x 118.1" x 80.7"
Internal Work Area, Dimensions (W x D x H)			790 x 920 x 1930 mm 31.1" x 36.2" x 76.0"	790 x 1920 x 1930 mm 31.1" x 75.6" x 76.0"	790 x 2920 x 1930 mm 31.1" x 115" x 76.0"
Clear Door Opening (WxH)			715 x 1835 mm		
Air Change (18-30 m/s)			273-454/Hr	261-435/Hr	258-429/Hr
Initial Airflow Velocity			18-30 m/s (3,543 - 5,906 fpm)		
Number of Nozzles			12	24	36
Air Shower Duration			Factory set at 12 seconds (adjustable)		
Persons Per Cycle			1	2-3	
Personnel Flow (Persons / Min.)			4	8-12	
			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: >99.9999% at 0.3 µm Pre-Filter: Arrestance 85%, efficiency 20%		
Filtration Elements			Main Filter: ULPA 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
	Note: Customer must provide isolator switch on site.				
Gross Weight			450 kg (990 lbs)	820 kg (1808 lbs)	1250 kg (2750 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"
	Unassembled (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_

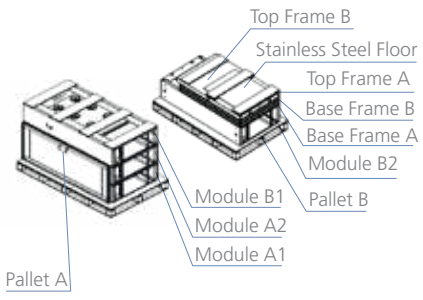
Assembled



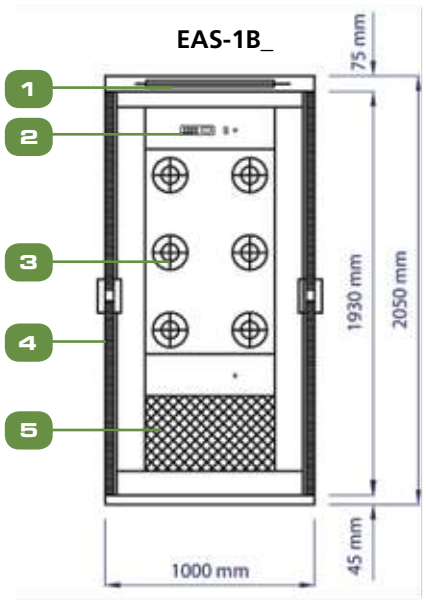
Module Form

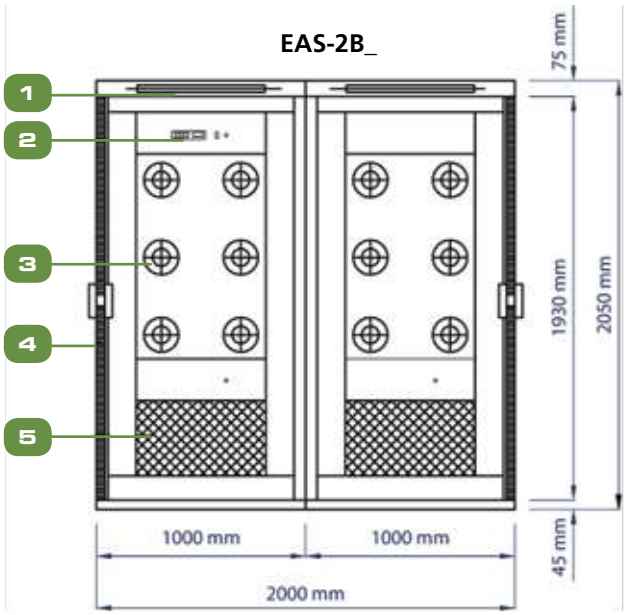


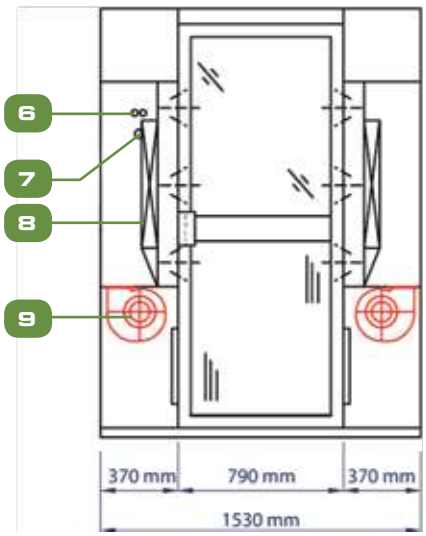
Unassembled

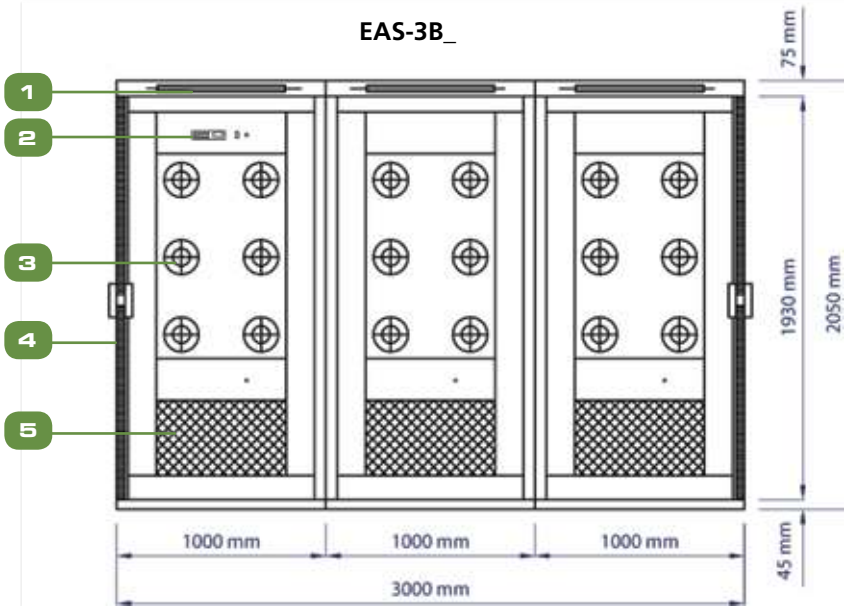


Model EAS (B-Series) Cleanroom Air Shower Technical Specifications





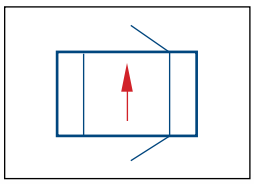
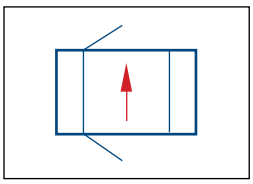
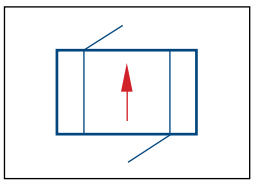
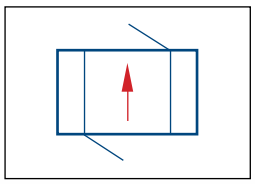




1. *Fluorescent lamp*
2. *Esco microprocessor system*
3. *Nozzles*
4. *Door*
5. *Pre-filters*
6. *Indicator light*
7. *Emergency switch*
8. *ULPA filter*
9. *Blower*

Model EAS (B-Series), Door Direction

(Factory Configured. Choose One When Ordering.)

1. 
2. 
3. 
4. 

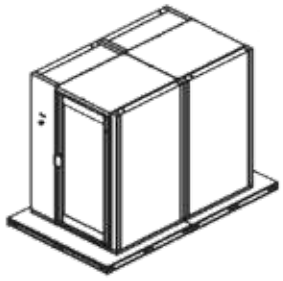
General Specifications, Cleanroom Air Shower, Model EAS (C-Series)*

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

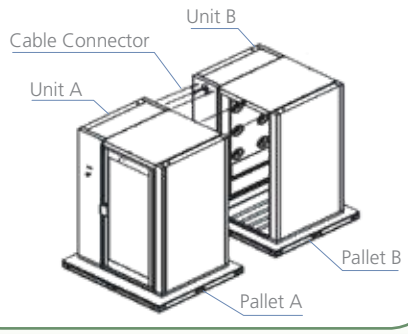
Model			EAS-2C_	EAS-3C_
External Dimensions (W x D x H)			2330 x 2000 x 2050 mm 91.7" x 78.7" x 80.7"	2330 x 3000 x 2050 mm 91.7" x 118.1" x 80.7"
Internal Work Area, Dimensions (W x D x H)			1590 x 1920 x 1930 mm 62.6" x 75.6" x 76.0"	1590 x 2920 x 1930 mm 62.6" x 115" x 76.0"
Clear Door Opening (WxH)			1515 x 1835 mm	
Air Change (18-30 m/s)			130-216/Hr	128-214/Hr
Initial Airflow Velocity			18-30 m/s (3,543 - 5,906 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: >99.9999% at 0.3 µm Pre-Filter: Arrestance 85%, efficiency 20%	
Filtration Elements			Main Filter: ULPA 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
	Note: Customer must provide isolator switch on site.			
Gross Weight			910 kg (2006 lbs)	1660 kg (3660 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"
	Unassembled (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 m^3 (493 cu.ft.)	N/A
	Module Form		13.94 m^3 (493 cu.ft.)	20.91 m^3 (740 cu.ft.)
	Unassembled		5.71 m^3 (202 cu.ft.)	7.87 m^3 (279 cu.ft.)

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

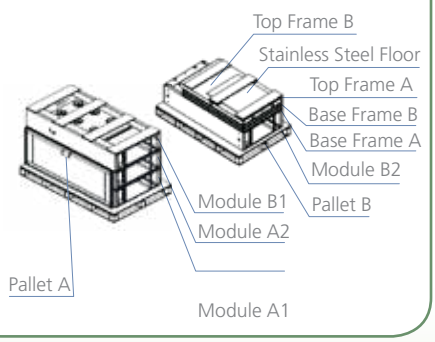
Assembled



Module Form

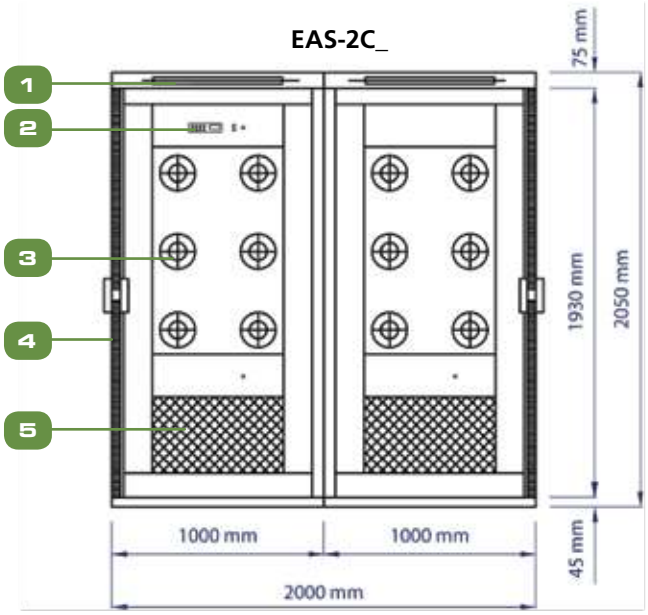


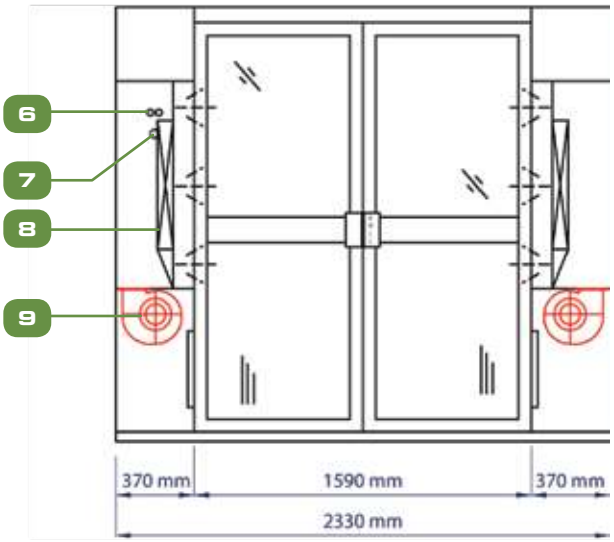
Unassembled



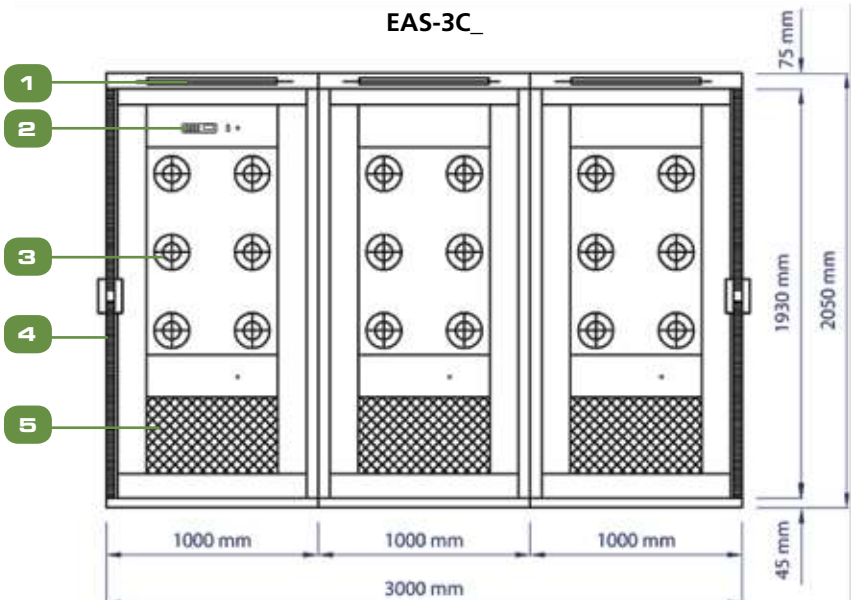
Model EAS (C-Series) Cleanroom Air Shower Technical Specifications

EAS-2C_





EAS-3C_

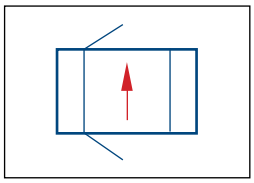


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8. *ULPA filter*
9. *Blower*

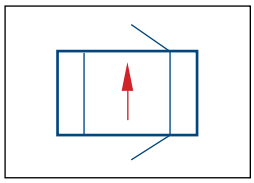
Model EAS (C-Series), Door Direction

(Factory Configured. Choose One When Ordering.)

1.



2.



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