

Hard Capsule® Hard Wall Cleanroom

The Flexible Solution for
Cleanroom Applications



Hard Capsule® Hard Wall Cleanroom

Ceiling Grid ■

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

Construction ■

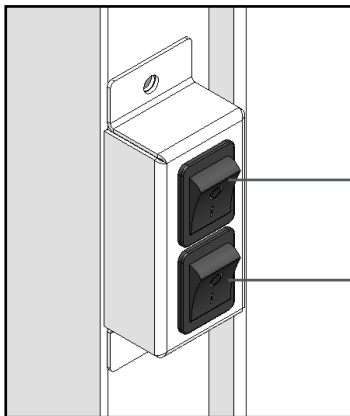
- Cleanroom-grade construction utilizing full welded, reinforced, mild steel tubular sections. Structure is finished with an abrasion-resistant oven-baked powder coat. Esco Isocide antimicrobial coating on all painted surfaces minimizes contamination. Entire structure is free-standing and does not require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

Control Panel ■

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



FFU Switch

LED & UV Switch

Exhaust Grill ■

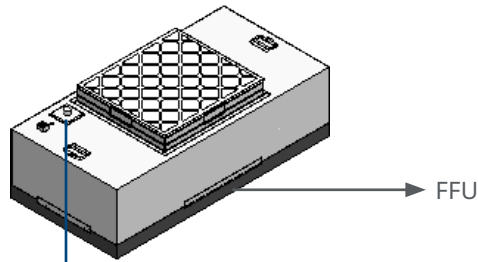
Our standard unit features an exhaust channel that removes contaminated air from the cleanroom at the perimeter close to floor level.



Hard Capsule Hard Wall Cleanroom,
Model HC-667

Fan Filter Units

- See page 4 for more details information.



FFU



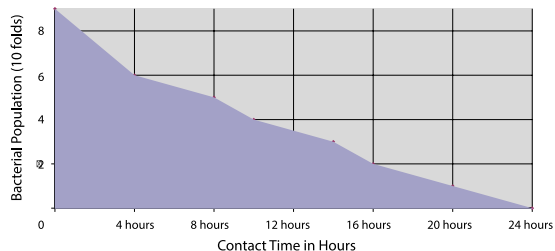
FFU Speed Controller

- The airflow/speed of the FFU can be adjusted by rotating the knob.

Side Hard Wall

- EG steel side wall with polycarbonate viewing window isolates the cleanroom from the ambient environment.

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

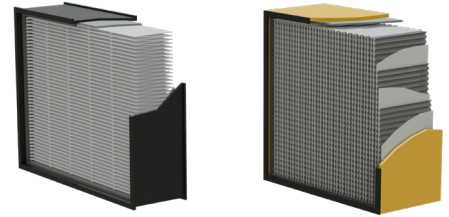
- The Hard Capsule Cleanroom is shipped unassembled with tools and parts for on-site assembly, turning an existing air-conditioned space into a cleanroom in a matter of hours.

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 maximize surface area improves efficiency and extends the filter life. Filters operate at a typical efficiency of >99.995% 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 are superior to conventional "step" controllers and offer infinite adjustment from zero to maximum setting.

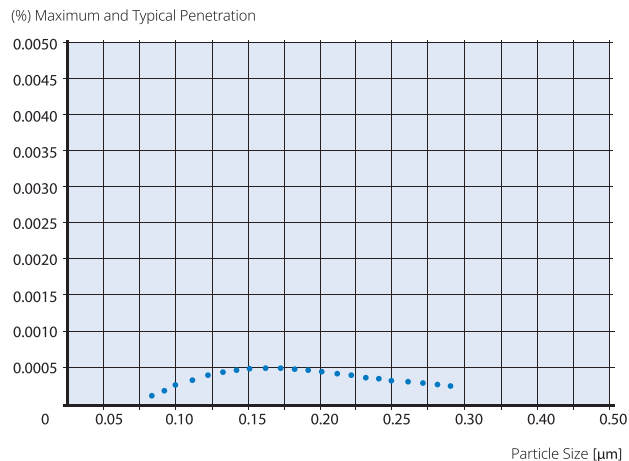
Mini-pleat Separatorless Filter (left) vs. Conventional Aluminium Separator Filter (right)



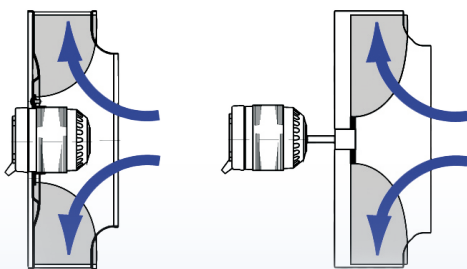
Esco cabinets use Swedish Camfil Farr® mini-pleat filters without aluminum separators to increase filter efficiency, minimize the chance of leakage, and to prolong filter life. Filters include a lightweight aluminum frame for structural stability and elimination of swelling common to conventional wood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



Esco HEPA Filter Efficiency

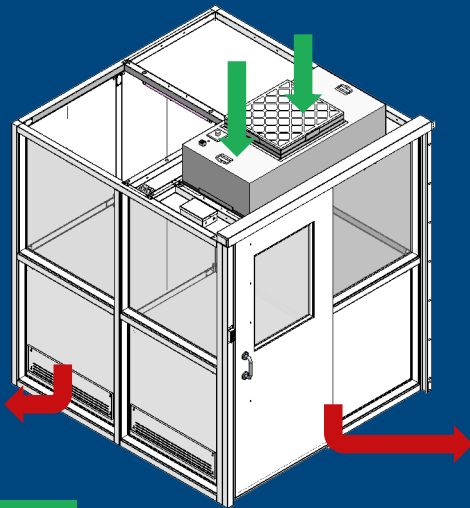


Airstream Cleanroom Fan Filter Units
Model FFU-32A-AH-2



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.

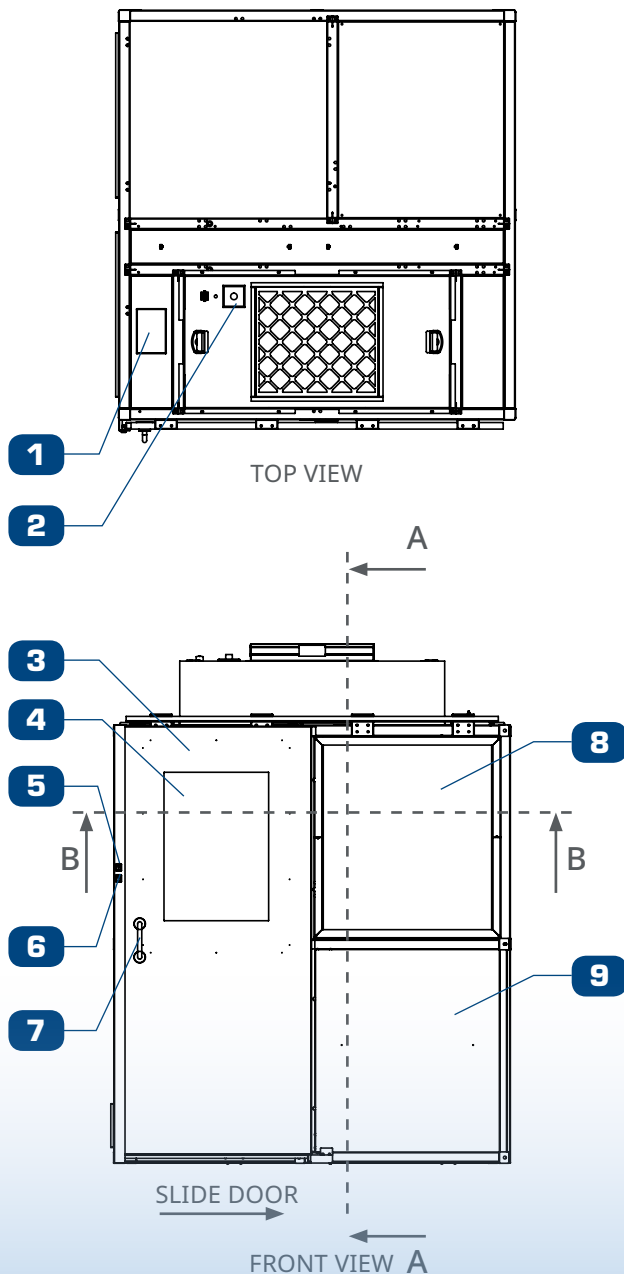


■ Room Air
■ Purified Air

Hard Wall Cleanroom Filtration System

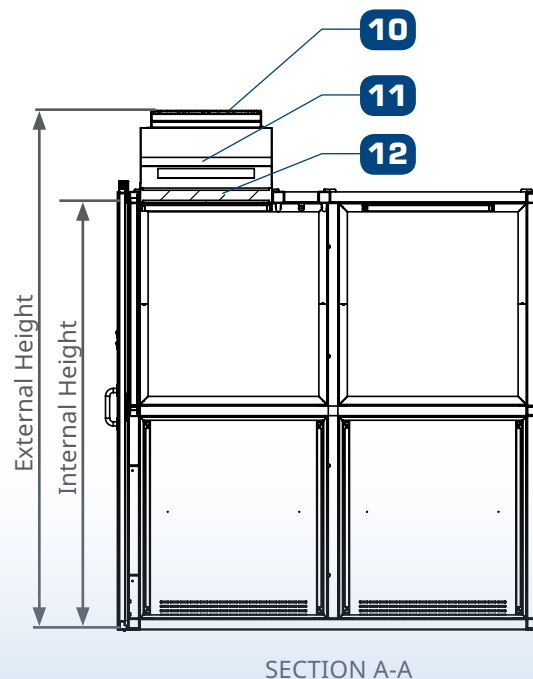
- Room air is taken in from the top of the cleanroom through a disposable pre-filter with 90% efficiency; this serves to trap larger particles and increase the life of the main filter.
- Air is forced evenly across the HEPA filter(s); the result is a stream of clean laminar air within the work zone; 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 HC, Hard Capsule Hard Wall Cleanroom Technical Specifications



Remarks

1. Junction Box
2. Speed Control (FFU)
3. Manual Sliding Door
4. Polycarbonate Viewing Window Door
5. FFU Switch On/Off
6. LED & UV Switch On/Off
7. Door Handle
8. Polycarbonate Viewing Window Unit
9. EG Steel Cover
10. Pre-Filter (FFU)
11. Fan Filter Unit (FFU)
12. H14 HEPA Filter (FFU)



General Specifications, Hard Capsule Hard Wall Cleanroom, Model HC

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)	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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)	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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 2.95' x 2.3'	2.52 m³
ISO Class 7* (US Federal Standard Class 10,000)	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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' x 2.43'	1.84 m³
	HC-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
	HC-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
	HC-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
	HC-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
	HC-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

*Cleanroom Classification Reference:

Code 3.5 = ISO Class 5 (FS 209E Class 100)

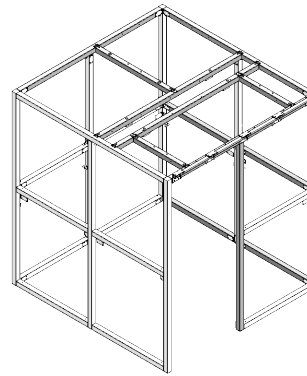
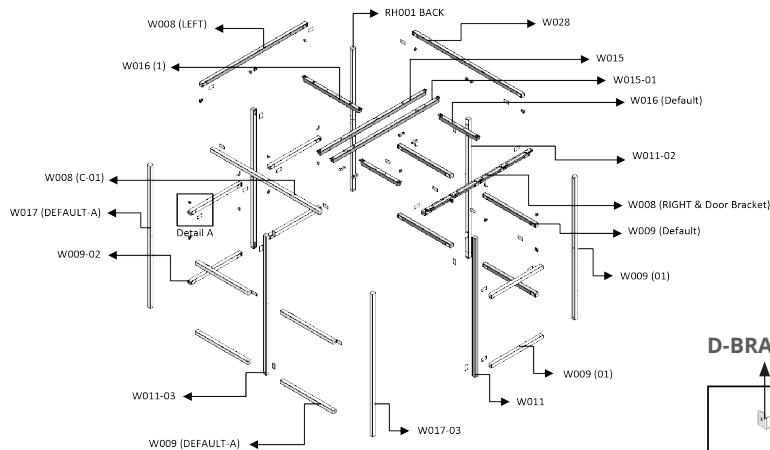
Code 4.5 = ISO Class 6 (FS 209E Class 1000)

Code 5.5 = ISO Class 7 (FS 209E Class 10000)

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

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

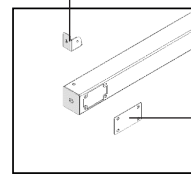
Installation Procedure



STEP 1

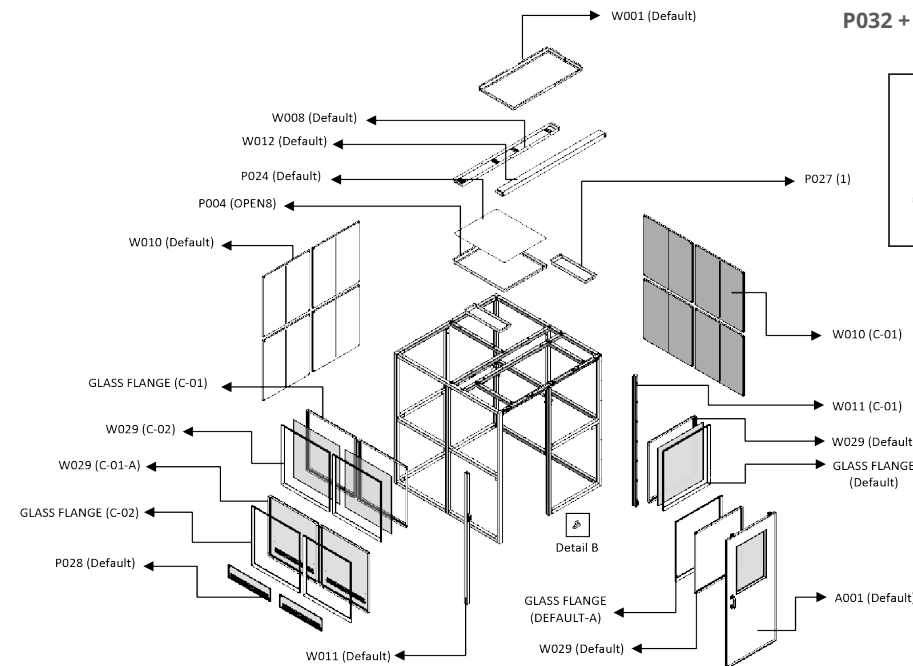
Assemble all the main frames using allenkey bolt M8.

D-BRACKET SIDE PANEL

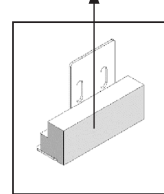


Detail A

D-BRACKET SIDE PANEL



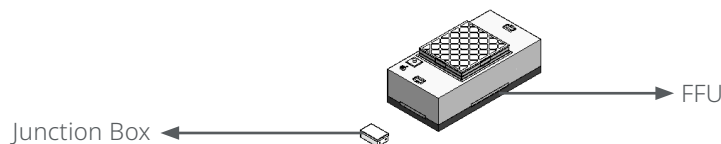
P032 + BRACKET ROLLER



Detail B

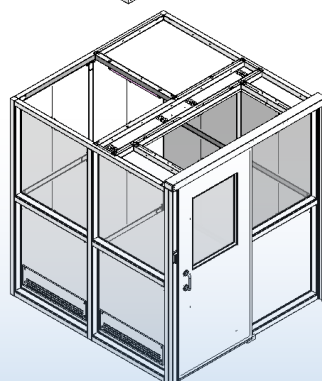
STEP 2

Install the EG part using screw M4 and M5.



STEP 3

Install the Electrical Component, Junction Box, and FFU.



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

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

ESCO

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