

ESCO
Healthcare



DPB/ DFLH

Dynamic Pass Boxes and
Dynamic Floor Laminar Hatches



Dynamic Pass Boxes/Dynamic Floor Laminar Hatches (DPB/DFLH)

Esco DPB/DFLH is an aseptic architectural system used to prevent contaminants interfering the clean suites. It is utilized for transfer of materials into and out of the critical process environments by supplying a zone with the controlled particle counts. Esco DPB/DFLH acts as a Material Airlock (MAL) to ensure protection of higher-grade environment by effective flushing with an active filtered air supply as per Revised Annex 1 EU GMP.

Esco DPB/DFLH is the best choice for ensuring your dynamic activities of delivering goods between 2 contrast cleanliness grade areas.



Applications

- Manufacturing Facilities
- Pharmaceutical Industry
- Cleanroom and Controlled Environments
- cGMP facilities
- Nanotechnology
- Semiconductors Industry
- Space Industry
- Automotive Industry

Features

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



Easy-to-clean construction

Esco DPB/DFLH is constructed from full stainless steel. DPB features cGMP-compliant rounded/coved corners at the base for easy cleaning. While DFLH supplies a floor mounted design for the wheeled cart application.

Cleanliness is assured during the transfer of materials

Equipped with a HEPA (H14) knife-edge gel-sealed main filter and a G4 pre-filter to extend the lifespan of the main filter, providing superior ISO Class 5/Grade A environment within the chamber.

Intuitive user-adaptable controller system

Selection from simple rocker switch or Sentinel™ Gold microprocessor controller with audio/visual alarms for downflow velocity and filter loading.



Comprehensible signal to indicate the quality of filter

Selection between Magnehelic gauge or digital display of differential pressure value across filters (via Sentinel™ Gold microprocessor controller with filter load alarm).

Convenient operation by an identifiable indicator lights

Red/green indicators lights to signal door and operation status.



Safety-oriented application

The emergency stop button is conveniently positioned on both sides of the unit, ensuring easy accessibility in the event of an unforeseen emergency.

Clear view to the Internal chamber

Esco DPB/DFLH viewing window is constructed with durable tempered glass.

Validated electromagnetic interlocking doors with time-delayed purge

Enhancing safety and Contamination Control Strategy with time-delay air purge and interlocking system that prevent both doors from being opened at the same time.

Optimal air change guarantee to chamber

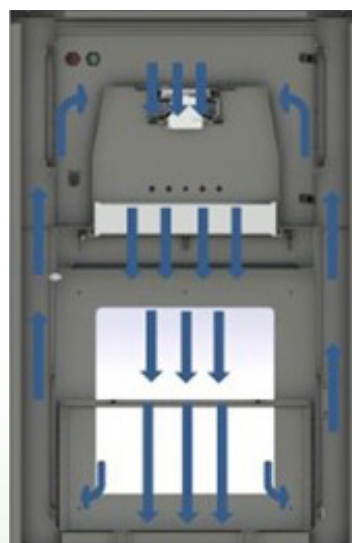
Safe containment construction allows the optimal air change inside the chamber recirculates via perforated grill system at the side walls

Adaptable installation with no edge of gap on the wall cut-out

Designed with flanges ensuring smooth and impervious wall-to-pass box finish.

Basic Principles

- Dynamic airflow provides an air barrier to prevent contaminants from entering into critical controlled environments during material transfers.
- Vertical purging removes any trace contaminants that could possibly enter into the cleanroom environment.
- Unit operates with a recirculating airflow and on-board fans, hence external ducting is not required.



Guide to DPB/DFLH Model Code							
Models	DPB-S454545-C						
Product Code	-	MOC-	Internal Dimensions			-	Customization
			Width (cm)	Depth (cm)	Height (cm)		
DPB/DFLH		A - EG Steel Exterior/Interior with SS304 base (no coved corner)	45	45	45		C - Customization
		S1 - Full SS304	*	*	*		No customization

Note: *the minimum feasible customized chamber size is WxDxH 450x450x450 mm

Standard Sizes	External & Internal Dimensions (W x D x H)
DPB-S454545	Ext. Dimension (WxDxH): 700 x 530 x 1200 mm (27.6" x 20.9" x 47.2") Int. Dimension (WxDxH): 450 x 450 x 450 mm (17.7" x 17.7" x 17.7")
DPB-S606060	Ext. Dimension (WxDxH): 850 x 680 x 1350 mm (33.5" x 26.8" x 53.2") Int. Dimension (WxDxH): 600 x 600 x 600 mm (23.6" x 23.6" x 23.6")
DPB-S909090	Ext. Dimension (WxDxH): 1150 x 980 x 1650 mm (45.3" x 38.6" x 65.0") Int. Dimension (WxDxH): 900 x 900 x 900 mm (35.4" x 35.4" x 35.4")
DFLH-S909090	Ext. Dimension (WxDxH): 1150 x 980 x 1600 mm (45.3" x 38.6" x 62.9") Int. Dimension (WxDxH): 900 x 900 x 900 mm (35.4" x 35.4" x 35.4")

Frequently Asked Questions (FAQs)

How do dynamic pass boxes (DPB) differ from dynamic floor laminar hatches (DFLH)?

- Our DPB is a wall-mounted unit, featuring coved corners and a 50 mm height base, can be customized with support stands for ergonomic, easy cleaning, and space-saving convenience. In contrast, the DFLH is a floor-mounted unit with a 1.5 mm stainless steel base plate or a floor-finished level (without a base) option, ensuring optimal accessibility for trolley pass-by scenarios.

What is the recommendation of pass box type whether Dynamic Pass Box (DPB) or Static Pass Box (SPB) to transfer material between the same cleanliness grade areas?

- For the same cleanliness grade rooms, the most suitable and affordable option is SPB. Moreover, DPB is not limited to the application for material transfer of 2 contrast cleanliness grade areas only. Using DPB for the same cleanliness grade areas will enhance the aseptic transfer environment.
- Dynamic pass boxes or dynamic floor laminar hatches (DPB/DFLH) have built in blower and filter and can provide ISO Class 5/ Grade A clean air within the unit.

What airflow pattern does DPB/DFLH operate in?

- Standard design of DPB/DFLH runs at a recirculating mode. During operation, room air is drawn to the DPB/DFLH unit and passed through a G4 prefilter, trapping larger particles and increasing the life of the main filter.
- Downflow air is then forced evenly through the H14 knife edge gel sealed filter resulting in a unidirectional stream of clean air projected vertically over the internal chamber.
- The purified air then recirculates via a G4 prefilter before passing through the H14 filter for downflow supply of air.
- Depending on the requirement, it is also possible to design DPB/DFLH to be single pass with air intake and exhaust. This may incur customization costs.

What is the typical efficiency of the filters used for DPB/DFLH?

- G4 prefilter with 85% arrestance, and HEPA H14 filter with typical efficiency of >99.995% for particle sizes of 0.3 microns.

How does DPB/DFLH differ from other pass-through cabinets offered by Esco?

- Esco Pharma has 4 types of pass-through cabinets with varying features and capabilities, these include:

Static pass boxes

- Esco static pass boxes (EPB-A, EPB-B, SPB) and cleanroom transfer hatches (EPB-S) are situated in between cleanroom or controlled environment to facilitate in the aseptic transfer of material/s in order to mitigate cross-contamination risks.

Dynamic pass boxes and Dynamic Floor Laminar Hatches (DPB/DFLH)

- Unlike static ones, DPB/DFLH are aseptic architectural systems that can provide ISO Class 5 as per ISO 14644-1 (Grade A as per EU GMP) environment within the chamber. DPB/DFLH are stand-alone units which have built-in pre-filters, HEPA filter and blower integrated within.

Esco air shower pass boxes (EAS-PB)

- EAS-PB works similarly to DPB/DFLH where air is being provided to the internal chamber of the unit except that for EAS-PB, air is only supplied for a limited duration.
- EAS-PB utilizes high velocity air jets which run at 18-30 m/s to provide a "scrubbing" effect to particulate matter or surface contaminants which may potentially be present on the material/s being transferred between rooms.

BioPass™ Pass Through

- The design of BioPass™ Pass Through is similar to a dynamic floor laminar hatch (DFLH) wherein both are floor standing units with built in blowers, and is maintained with an ISO Class 5 as per ISO 14644-1 (Grade A as per EU GMP) clean air supply within.
- In contrast to the other pass throughs, Biopass™ is integrated with a hydrogen peroxide (H2O2) based bio-decontamination system within and it is designed for r passing through of relatively larger equipment/ materials into the chamber.

What is the standard operating sequence of DPB/DFLH?

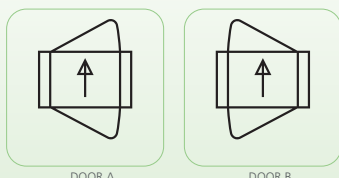
- When one door is opened, the opposite door will be locked (indicator light is red)
- Once the door is closed, both doors will be locked in a specified amount of time to purge potential contaminants that may have leaked into the chamber. (indicator light is red)
- Once the purging time & purging process is done, both doors will remain closed but will be unlocked. Hence, either door is ready to be pulled open. (indicator light is green)
- In case the unit is customized to have an add-on optional door release button, the doors will always be locked. The only time a door can be pulled open is by pressing the door release button first to unlock a door. Once unlocked, only then can the door be pulled open.

GENERAL SPECIFICATIONS

DYNAMIC PASS BOX/DYNAMIC FLOOR LAMINAR HATCH

		DPB-S454545	DPB-S606060	DPB-S909090	
Door Opening	Straight Through*	✓	✓	✓	
	L-shape	✓	✓	✓	
	3 way	✓	✓	✓	
Base	With Base	✓	✓	✓	
	Without Base**	✓	✓	✓	
Onboard Lighting (LED)	With Onboard Lighting	✓	✓	✓	
	Without Onboard Lighting	✓	✓	✓	
UV Light	With UV light	✓	✓	✓	
	Without UV light	✓	✓	✓	
Electrical Code	220-240 VAC 50/60 Hz	✓	✓	✓	
	110-130 VAC 50/60 Hz	✓	✓	✓	
	100-110 VAC, 60 Hz	✓	✓	✓	
External Dimensions (W x D x H)		700 x 530 x 1200 mm (27.6" x 20.9" x 47.2")	850 x 680 x 1350 mm (33.5" x 26.8" x 53.2")	1150 x 980 x 1650 mm (45.3" x 38.6" x 65.0")	
Internal Dimensions (W x D x H)		450 x 450 x 450 mm (17.7" x 17.7" x 17.7")	600 x 600 x 600 mm (23.6" x 23.6" x 23.6")	900 x 900 x 900 mm (35.4" x 35.4" x 35.4")	
Material of Construction (MOC)	Interior	A-EG Steel Exterior/Interior with SS304 base (no covered corner)	Customization		
		S-SS304, 1.5 mm thickness	✓	✓	✓
		S2-SS316L, 1.5 mm thickness	Customization		
	Exterior	A-EG Steel Exterior/Interior with SS304 base (no covered corner)	Customization		
		S-SS304, 1.5 mm thickness	✓	✓	✓
		S2-SS316L, 1.5 mm thickness	Customization		
	Handle	D-shape handle			
	Chamber Door	Double layer Tempered Glass, 4 mm per layer			
	Chamber Base	50 mm height with covered corner only at the base (only for DPB)			
	Flanges (if required)	A set (2 pcs) of removable flanges			
Operating Controller	Simple rocker switch with Magnehelic gauge	✓	✓	✓	
	Sentinel Gold microprocessor controller with Differential Pressure and Airflow monitoring on display	✓	✓	✓	
Filter Package	Prefilter Filter	G4 Pre-filter, Washable non-woven polyester fibers with an arrestance ≥90% as per EN779:2012			
	Main Filter	H14 HEPA Filter, Efficiency 99.995% at Most Penetrating Particle Size (MPPS) as per EN1822:2009			
Chamber Environment		ISO Class 5 (Grade A) during operation (when blower is ON)			
Door Lock System		Electromagnetic Interlocking Doors with round magnets for double lock			
Surface Roughness	Interior	≤ 1.2 Ra			
	Exterior				
Lighting Level (if with LED lighting)		≥ 500 lux			
Sound Level		≤ 75 dBA			

Door Direction Options



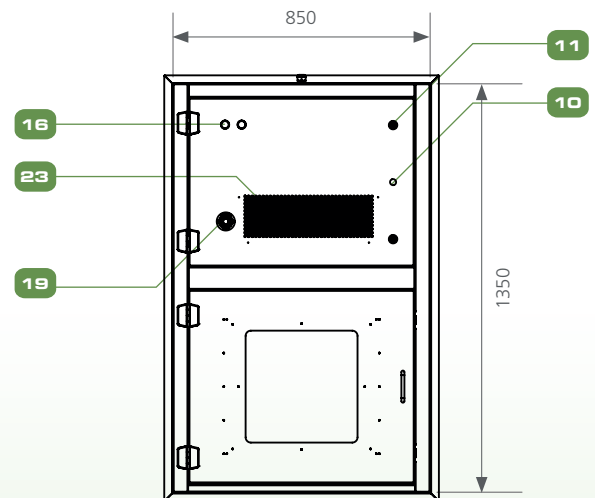
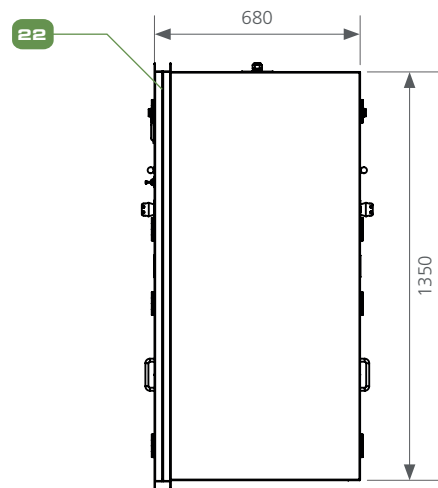
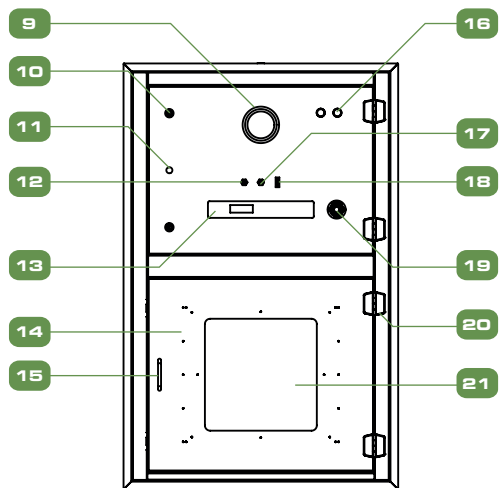
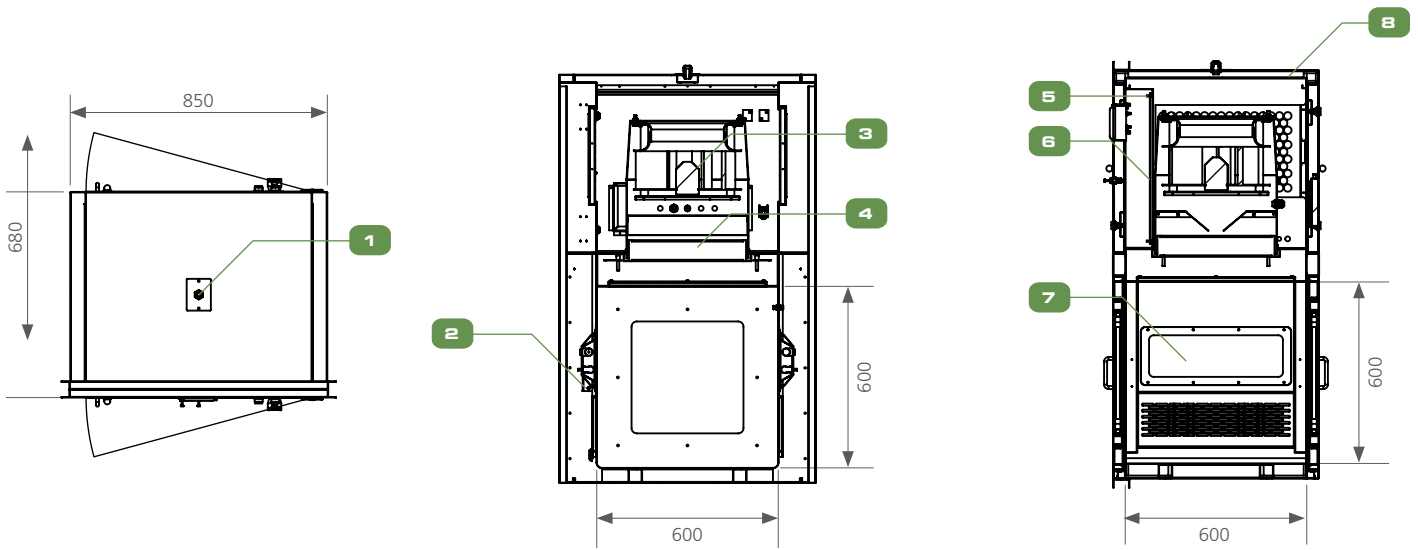
Notes:

*Straight-through door opening direction should be determined according to the door direction code by Esco. Other straight-through door directions, L-shaped and 3-way door opening dimensions are to be advised upon ordering.

**Without base is applied for DFLH only. DFLH is equipped with thin plate for the base replacement and door drops seal.

***Open Loop is a manual system to control blower speed; Closed Loop is an auto-compensate blower speed to reach the 0.45 m/s air velocity.

ENGINEERING DRAWING (MODEL: DPB-S606060-C)



- | | |
|------------------------------|------------------------------------|
| 1. Pre-Wired Cable | 13. Sentinel Microprocessor System |
| 2. Electromagnetic Interlock | 14. Door |
| 3. Blower | 15. D-Shape Handle |
| 4. H14 HEPA Filter | 16. Green & Red Light Indicator |
| 5. Pao Injection Port | 17. Pao Sampling Port |
| 6. Electrical Panel | 18. Power On/Off Switch |
| 7. UV / LED Housing | 19. Emergency Stop |
| 8. G3 Pre-Filter | 20. Hinge |
| 9. Magnehelic Gauge | 21. Tempered Glass Viewing Window |
| 10. Cam Latch | 22. Removable Flange |
| 11. Access Knob | 23. G4 Pre-Filter (Make-Up Air) |
| 12. Spare Port | |

ESCO LIFESCIENCES GROUP NETWORK

42 Locations in 21 Countries All Over the World



- 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. www.lifesciences.com.

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