



**AIRPLAN**  
Cleanroom & Process Solutions

# **STERILE AIR**

## SOLUTIONS



**AIRSPECIALIST**  
CLEANROOM SOLUTIONS



## THE **AIRFFU**

FAN FILTER UNIT WITH PVC SLATS AND SUPPORT BARS



# SOLUTIONS CREATED BY **EXPERTS**



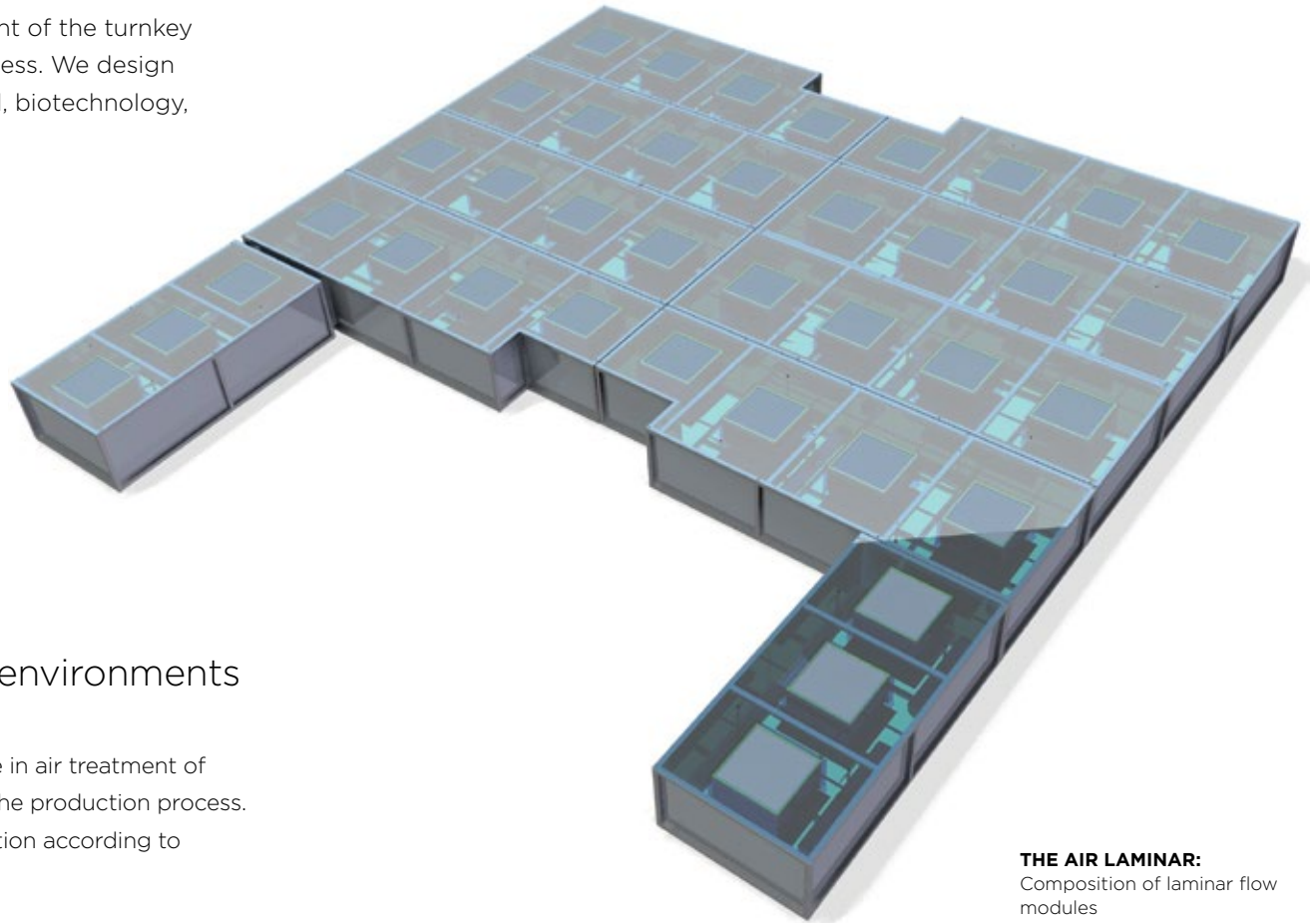
For more than 50 years we've been specialists in custom-made industrial air treatment. Today, we offer a wide-range of solutions dedicated to providing sterile areas in industrial environments, like the Fan Filter Units (THE AIR FFU), Laminar Flow Modules (THE AIR LAMINAR), dust and fume management (THE AIR DUST & FUMES) systems, along with products like the dispensing and weighing booth (THE AIR BOOTH).

Our cleanroom solutions using laminar air flow are a critical element of the turnkey projects that we carry out, integrating design, consulting and process. We design cleanroom equipment with unique features for the pharmaceutical, biotechnology, cosmetic, hospital, chemical and food industries.

## **AIR**SPECIALIST

Solutions and products for laminar air flow environments

**THEAIRFFU** and **THEAIRLAMINAR** draw from our extensive experience in air treatment of controlled environments for product contamination prevention during the production process. We provide sterile or aseptic areas or entire rooms with ISO 5 classification according to applicable standards.



**THE AIR LAMINAR:**  
Composition of laminar flow  
modules





# UNIQUE CONCEPTS FOR SPECIFIC NEEDS

## Integrated solutions

From a detailed study of your cleanroom to the integration and installation of the air solution that best suits your needs, AIRPLAN is there for every stage of your project.

## In compliance with international standards

We understand and are governed by the legal framework of each country in which we conduct our projects, as well as the applicable international standards. All of our products and solutions for laminar air flow environments are designed and manufactured to meet the requirements set by the European Machinery Directive (2006/42/CE), cGMP / EU GMP (Vol 4) regulations, ISO 14644, 21 CFR Part 11 (FDA) and ASHRAE.



EUROPEAN MEDICINES AGENCY  
SCIENCE. MEDICINES. HEALTH.



## Viability guarantee

The manufacturing process at our production facility ensures precise and faithful design execution. Without intermediaries, we can respond with greater diligence to the needs of our customers, and offer solutions that are viable from the start, while maintaining cost and ensuring delivery time.



**Pictured above:** Assembly stage of laminar flow modules at our manufacturing plant.



**Left photo:** Installation in progress of a custom-made laminar flow for a dispensing area.

Regardless of the geometry or construction of your cleanroom, AIRPLAN can equip it with a customized solution.

## THE **AIRFFU**

### Standard models

THE AIR FFU is a filtration and ventilation unit (Fan Filter Unit), ready-to use that provides an environment with ISO 5 classification specified for your cleanroom, such as laminar air flow for packing areas, thanks to its rectangular or square shape, which can be combined to cover areas of different measurements and geometry.

Current models are the result of intensive conceptualization and design which have involved the Engineering, Business and Facilities Divisions and, of course, our Manufacturing Division. Our range for THE AIR FFU has been developed based on the most frequent needs of our customers.

## THE **AIRLAMINAR**

### Customized solutions

We develop customized solutions for every customer that are perfectly integrated, regardless of the available space, the geometry of the room, technical area accessibility and/or relative flow rate, temperature and humidity requirements. We rely on the necessary know-how for the technical conceptualization of each project and unique 3D design construction solutions.

Our own production plant, integrated with our headquarters, allows us to offer laminar modules specifically manufactured for our customers, whose quality we can guarantee while maintaining competitive prices.



# THE **AIRFFU** / THE **AIRLAMINAR** COMMON TECHNICAL CHARACTERISTICS

## A careful manufacturing process

The Laminar Flows (THE AIR LAMINAR) along with Fan Filter Units (THE AIR FFU) are functionally designed and constructed with stainless steel 304, 316 or 316L, according to requirements, with a satin polish finish. Critical parts are joined by TIG (Tungsten Inert Gas) welding and the remaining joints are sealed with polyurethane polymer to ensure airtightness.

Both the width of the frame and the filter-frame space of our FFUs have been reduced to guarantee a laminar air flow with minimal dead spots. Likewise, the location of the slats has been designed to optimize the laminar flow area.

## High-tech components

Centrifugal fans using EC technology for THE AIR FFU and for the THE AIR LAMINAR models comply with the ErP standards that regulate energy efficiency and noise pollution.

By integrating an electronically-controlled motor, constant air flow can be automatically regulated, saving energy.

## Quality-tested according to ISO 14644

Our fan filter units and laminar flows are issued after meeting internal quality controls as defined by our Quality Control division to verify flow, HEPA filter air-tightness and speed uniformity in the terminal air flow.

A customer request can be made for the preparation and performance of a FAT (Factory Acceptance Test) or SAT (Site Acceptance Test) according to testing guidelines for international ISO standard 14644, to obtain a qualification in situ.

## Delivery with qualification

THE AIR FFU / THE AIR LAMINAR come with a *Documentation Dossier* which includes the instruction and/or assembly manual, the technical construction details, as well as a specific maintenance manual with a list of spare parts, individual certificates for the filters and, when applicable, the CE certificate and the electrical diagrams of the equipment.



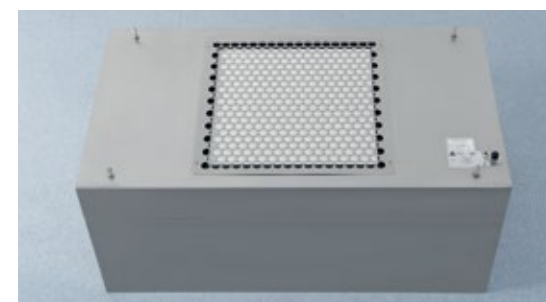
# THE AIR FFU

## TECHNICAL INFORMATION

<b>Material</b>	Stainless Steel 304, 316 or 316L, according to requirements, with a satin polish finish.
<b>Assembly options</b>	1) Overhead support. 2) Adaptation to the existing structure to protect the equipment. 3) Supporting feet, with or without wheels with breaks for mobility requirements. Supplied with PVC slats or, optionally, with stainless steel and methacrylate structures.
<b>Control</b>	Manual control of air flow in the upper part of the FFU, for adjustments during commissioning and for subsequent qualifications. <b>Optional (THE AIR FFU Extended):</b> <ul style="list-style-type: none"> <li>▶ Monitoring and independent activation of the alarms for filter clogging.</li> <li>▶ Automatic control of the air flow to compensate for filter clogging.</li> <li>▶ DOP ports for easy equipment validation.</li> </ul>
<b>Air intake</b>	Air suction is freely carried out from the room where the equipment is located. A minimum space is required between the false ceiling of the room and equipment. Air can also be returned via other solutions. <b>Optional solution with lateral air intake (THE AIR FFU Extended):</b> Customized design with prefilters and access door on the Fan Filter Unit's side. Recommended for FFUs mounted on top of filling or dosage lines, allowing to unite the production unit with the false ceiling in order to eliminate any risk of dust and particle accumulation on top.
<b>Filtration</b>	The standard model of THE AIR FFU is designed for applications in rooms with a particle level associated with ISO classification 5/7 and is supplied with a terminal H14 filter. To avoid rapid clogging of the HEPA filter in an environment without this filtration level, we offer the option to include an additional M6 pre-filtration module. <b>Filtration stages:</b> <ol style="list-style-type: none"> <li>1) <b>Terminal HEPA filtration for air sterilization:</b> H14 classification according to EN standard 1882:2009 (HEPA). MPPS efficacy (most penetrating particle size) H14&gt;99.995%. H14 Filter replacement from within the work area / cleanroom. Optionally, access doors for lateral filter replacement (THE AIR FFU Extended).</li> <li>2) <b>Optional pre-filtration:</b> M6 classification according to EN standard 779. The pre-filter can be incorporated without modifications to current models. M6 pre-filter (superior filter replacement access).</li> </ol>
<b>Fan</b>	Type EC centrifugal fan, electronically controlled. <b>Motor:</b> Voltage of 115 / 240 V, frequency de 50-60 Hz + N + T. <b>Operating Temperature:</b> between -20° C and +50° C (-4° F to +122° F)
<b>Electricity</b>	<b>The FFUs are adaptable to any electrical supply voltage:</b> Standard models with 115 / 240 V monophase, 50 - 60 Hz.
<b>Air flow</b>	<b>Number of air changes in the work area:</b> approx. 800 Vol./h for an average height of 2 meters (6' 7" ft-in). <b>Output speed in the HEPA filters:</b> 0,45 m/s (nominal) or 1.48 ft/s.



**Bottom View:** HEPA filter H14



**Top view with pre-filter:** Air intake area

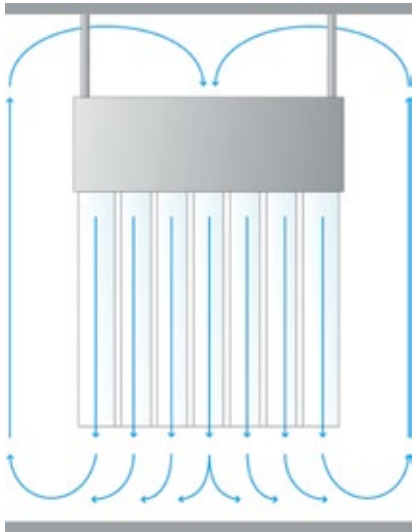


**THE AIR FFU Extended.** Includes a lateral access door for easy filter replacement, apt for Fan Filter Units mounted on top of filling or dosage lines.



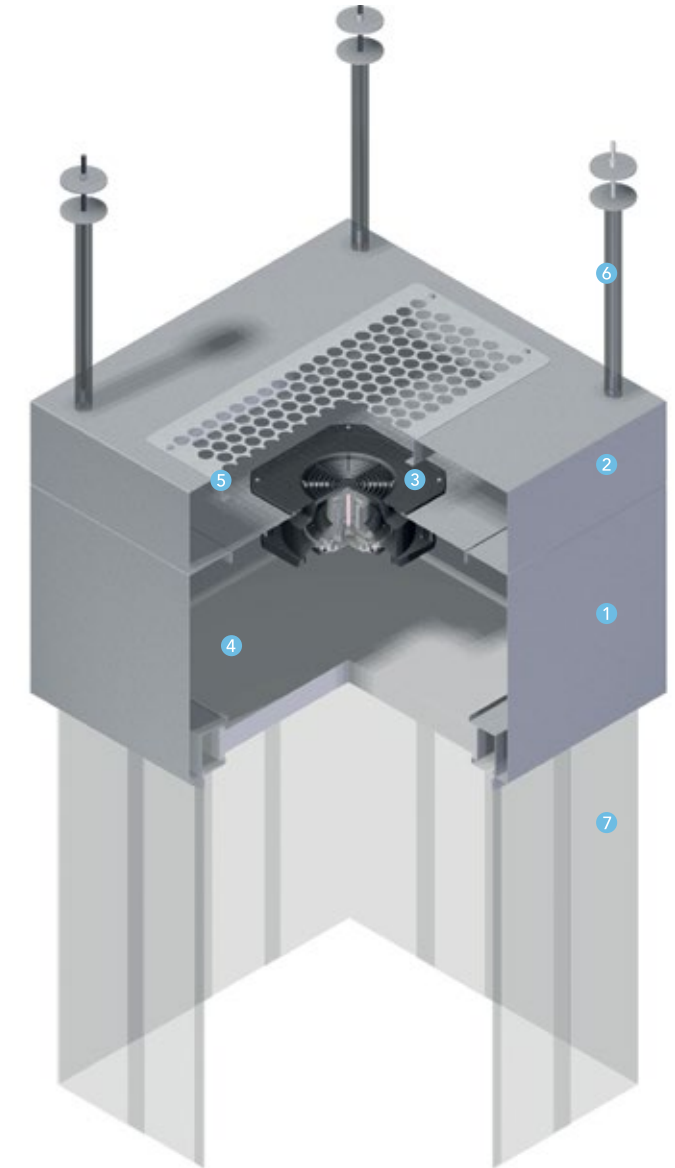
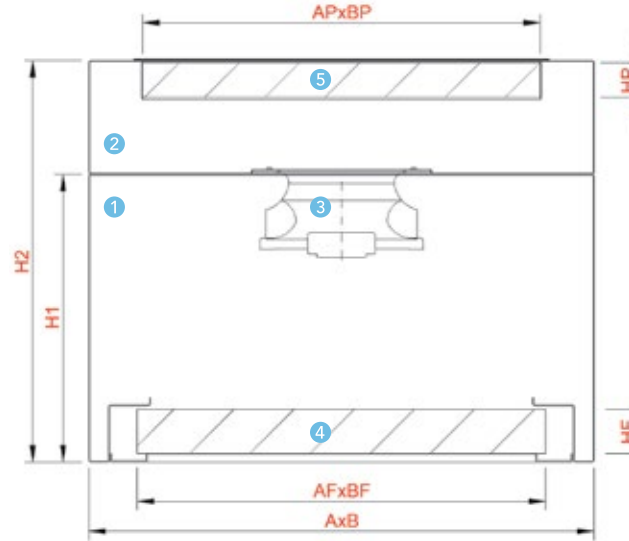
**THE AIR FFU Extended.** Design including integrated control panel.





#### Operating diagram of THE AIR FFU mounted with overhead support

Air pushes through the HEPA filter towards the work area creating a slight dynamic pressure and exits through the bottom part of the slats to be recirculated towards the upper suction area of the FFU.



THE AIR FFU	600		900		1200		1350		1500		1800	
<b>Air flow</b>	m <sup>3</sup> /h	cfm	m <sup>3</sup> /h	cfm	m <sup>3</sup> /h	cfm	m <sup>3</sup> /h	cfm	m <sup>3</sup> /h	cfm	m <sup>3</sup> /h	cfm
Total	600	353	900	530	1200	706	1350	795	1500	883	1800	1060
<b>No. of fans</b>	1		1		2		2		2		2	
Power	170 W		170 W		340 W		340 W		340 W		340 W	
Electricity consumption	1,45 A		1,45 A		2,9 A		2,9 A		2,9 A		2,9 A	
<b>HEPA filter H14</b>	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in
Width (AF)	610	2'	915	3'	1220	4'	915	3'	1220	4'	1220	4'
Depth (BF)	610	2'	610	2'	610	2'	915	3'	762	2' 6"	915	3'
Height (HF)	66	0' 2.6"	66	0' 2.6"	66	0' 2.6"	66	0' 2.6"	66	0' 2.6"	66	0' 2.6"
<b>External dimensions</b>	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in
Width (A)	770	2' 6.3"	1075	3' 6.32"	1380	4' 6.33"	1075	3' 6.32"	1380	4' 6.33"	1380	4' 6.33"
Depth (B)	770	2' 6.3"	770	2' 6.3"	770	2' 6.3"	1075	3' 6.32"	922	3' 0.3"	1075	3' 6.32"
H1 Height w/o pre-filter	430	1' 4.9"	430	1' 4.9"	430	1' 4.9"	430	1' 4.9"	430	1' 4.9"	430	1' 4.9"
H2 Height with pre-filter	600	1' 11.6"	600	1' 11.6"	600	1' 11.6"	600	1' 11.6"	600	1' 11.6"	600	1' 11.6"
<b>Optional M6 pre-filter</b>	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in
Width (AP)	287	0' 11.3"	592	1' 11.3"	592	1' 11.3"	592	1' 11.3"	592	1' 11.3"	592	1' 11.3"
Depth (BP)	592	1' 11.3"	592	1' 11.3"	592	1' 11.3"	592	1' 11.3"	592	1' 11.3"	592	1' 11.3"
Height (HP)	48	0' 1.89"	48	0' 1.89"	48	0' 1.89"	48	0' 1.89"	48	0' 1.89"	48	0' 1.89"

#### Complete THE AIR FFU

- (1) Filtration and ventilation unit
- (2) Optional pre-filter unit
- (3) EC fan
- (4) H14 HEPA filter
- (5) M6 pre-filter
- (6) Support system
- (7) PVC slats

# THE **AIRLAMINAR** COMPLETELY CUSTOMIZED

## Laminar flow concepts

Each laminar flow has various functional levels, itemized as A through F, which are comprised of variable and combination elements.

On pages 12 and 13, we show some of the most common solutions for laminar flow, represented by model and type, that we have designed based on our experience and the frequent requirements of our customers.

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### LEVEL A - MAKEUP AIR

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#### \*A1 AMU

The Makeup Air Unit (AMU) filters the external air, generating the required overpressure, contributing to the temperature control (T) and humidity (HR) for the system, and provides the minimum ventilation for staff. It can be shared by several laminar flows / rooms in the same productivity area.

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### LEVEL B - AIR HANDLING

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#### \*B1 AHU

The Air Handling Unit (AHU) controls temperature (T) and humidity (HR) for the air flow and, as an option, the acoustic level in the work area.

#### \*B2 AHU-AVU

If by a lack of space it is not feasible to install the AHU, you may resort to the AHU combination for partial air management and control of T/HR and AVU (Air Ventilation Unit) and for the remaining air management.

#### \*B3 Cooling Coil

For technical areas with limited space, the AHU is replaced by a heat exchanger for control of T/HR integrated in the laminar flow module.

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**Upper image:** Complete installation of air makeup and handling units for a laminar flow of 26.600 m<sup>3</sup>/h.

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## LEVEL C - ADDITIONAL FILTRATION

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### \*C1 Optional additional H14

To increase the level of containment, a HEPA filtration module can be included in the supply air coming from the AHU or AMU, as well as in the return air from the cleanroom to the AHU.

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## LEVEL D - VENTILATION

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### \*D1 External AVUs

If by lack of space it is not feasible to install the fans within the laminar flow unit, one or more AVUs can be used.

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### \*D2 WALL FAN

The Air Ventilation Unit (AVU) is integrated vertically or laterally on the filtration-diffusion module. Because of the strategic location and operational independence of each fan, they can work together or separately. In case one fails, the flow is maintained by the other unit, allowing for a quick fix by simply replacing the damaged fan, minimizing production downtime.

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### \*E2 FFU

The Fan Filter Unit combines fans and filter(s) in a compact unit (see LEVEL E).

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## LEVEL E - HEPA FILTRATION

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### \*E1 "TERMINAL 66"

Terminal filtration in a room with a HEPA filter of 66 mm (2.6 inches) thickness that does not require an end diffuser membrane. The filter is mounted on aluminum and airtight fixation is achieved with tightened bolts. Optionally, surface lights, located / anchored peripherally on the structure itself are added. This solution implies that the room must accommodate to the standard filter setting.

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### \*E2 "COMPACT 110"

Associated with FFUs (Fan Filter Units) with a HEPA filter of 110 mm (4.3 inches) thickness. Allows more surface air flow at the expense of the total surface area occupied by the FFUs.

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### \*E3 "ADAPT 292"

HEPA filter with 292 mm (11.5 inches) thickness, prior to the level of diffusion. It requires the minimum amount of filters and offers maximum surface air flow.

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## LEVEL F - DIFFUSION AND LIGHTING

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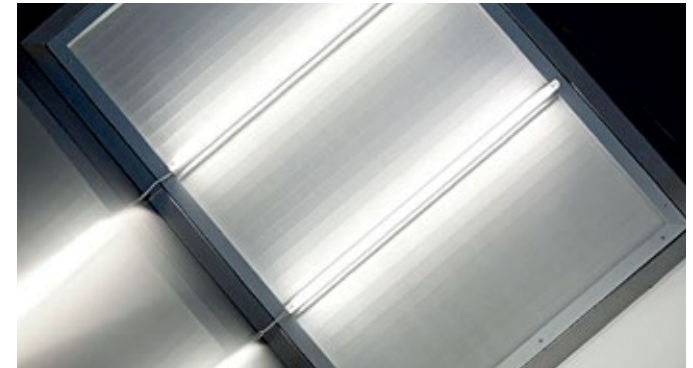
**\*F1** Diffuser membrane in aluminum frame with the possibility of including hidden lights (light level: ~70/90 W/m<sup>2</sup> according to single or double scrim). This solution allows perfect adaptation to the dimensions and shapes of the existing or required rooms.

.....  
**OPTIONAL FUMIGATION**  
.....

We can study any fumigation solution for integration into the laminar flow.



**Detail of the interior part of a laminar flow module:**  
HEPA filters and lights before placing diffuser membrane.



**Detail of one of the "TERMINAL 66" HEPA filters.**



**Laminar flow installed with a dismantled diffuser membrane.**

## THE AIR LAMINAR TERMINAL 66

with terminal HEPA filters above cleanroom area

## THE AIR LAMINAR COMPACT 110

with ventilation and filtration unit

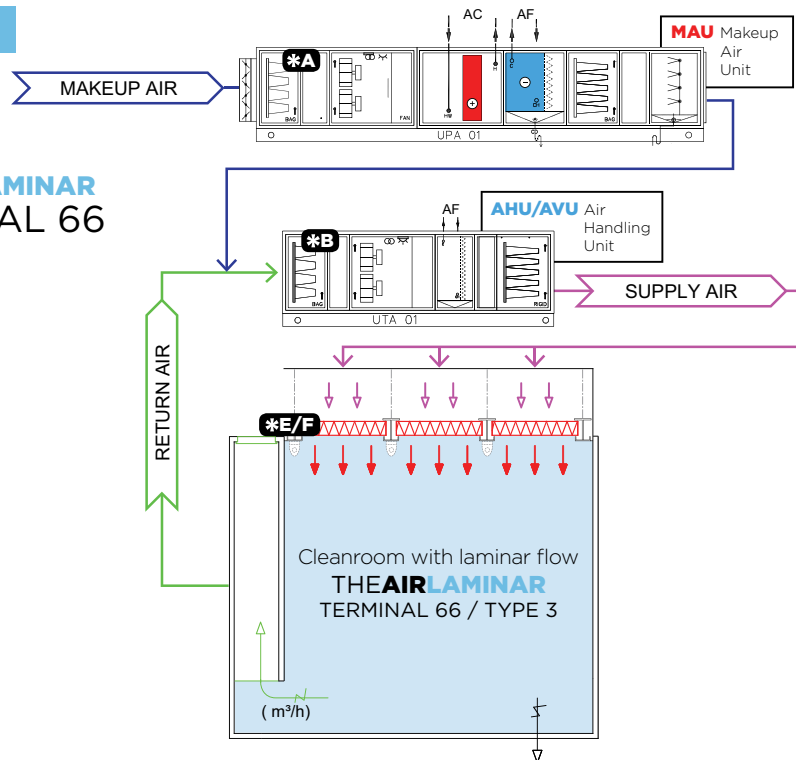
## THE AIR LAMINAR ADAPT 292

with high capacity HEPA filters

Level / Type	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6	TYPE 7	TYPE 8	TYPE 9	TYPE 10
*A - Makeup air	AMU				AMU		AMU			
*B - Air treatment	AHU	AHU	AHU-AVU	Cooling Coil	AHU	Cooling Coil	AHU	AHU	AHU-AVU	Cooling Coil
*C - Additional filtration	Optional H14	Optional H14	Optional H14	Optional H14	Optional H14	Optional H14	Optional H14	Optional H14	Optional H14	Optional H14
*D - Fan	AVU/AVUs	WALL FAN	-	WALL FAN	FFUs (Fan Filter Units) High capacity H14 filtration and ventilation units of 110 mm in height		AVU/AVUs	WALL FAN	-	WALL FAN
*E - Terminal filtration	H14 filters with standard dimensions. Height of filter: 66 mm Optional visible light fixture						High capacity H14 filter. Height of filter: 292 mm			
*F - Diffusion and lighting					Hidden light, cloth diffuser		Hidden light, cloth diffuser			

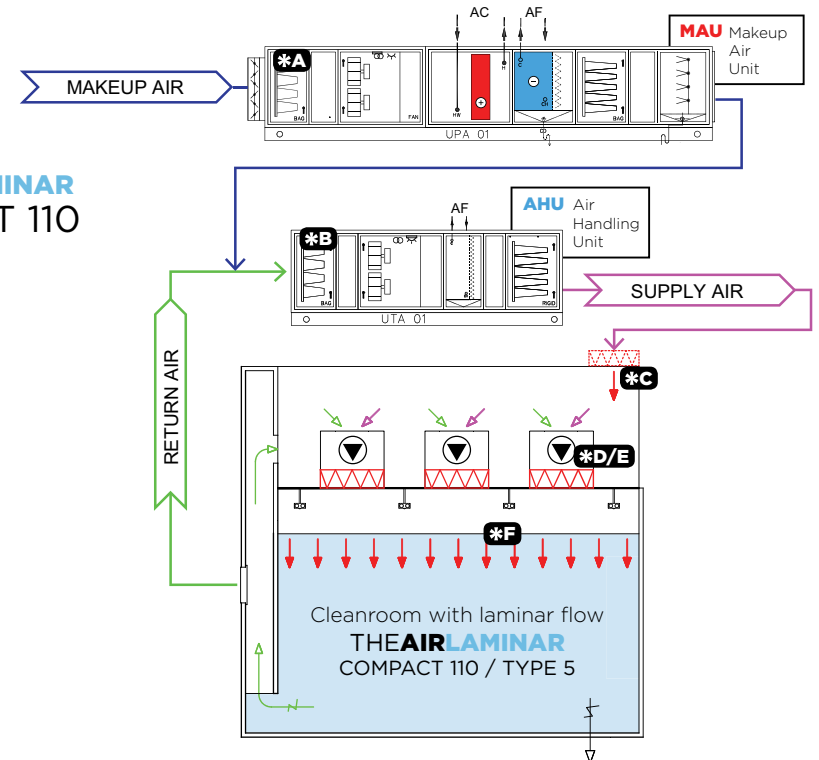
### TYPE 3

## THE AIR LAMINAR TERMINAL 66

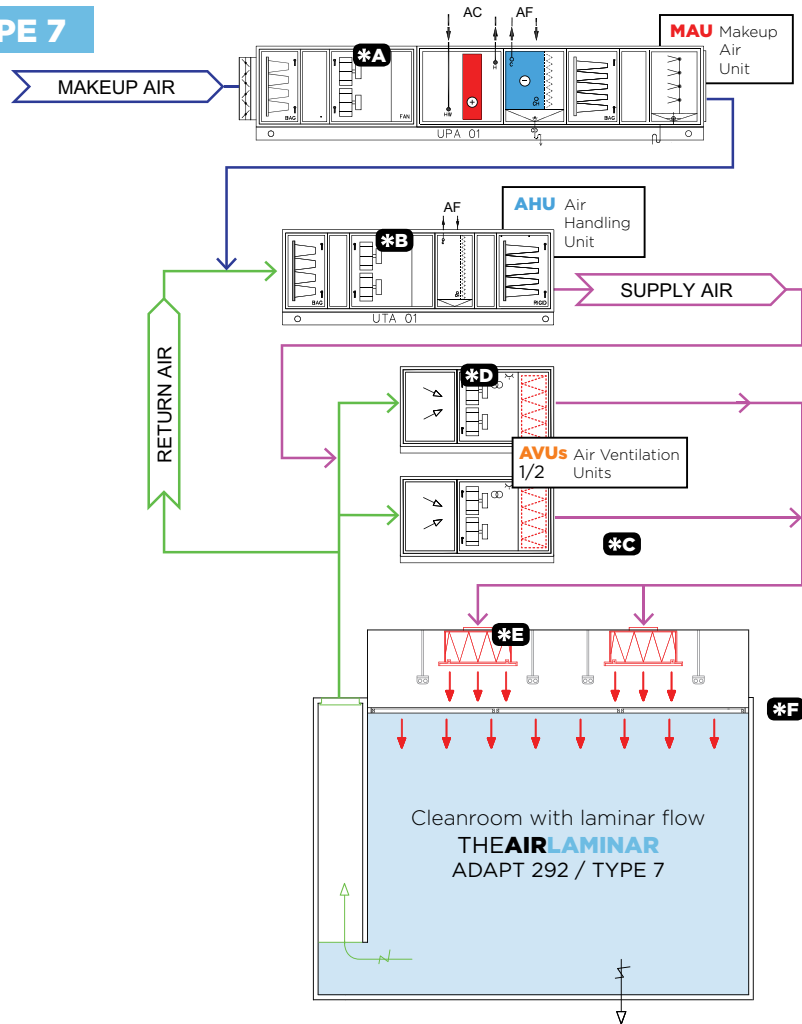


### TYPE 5

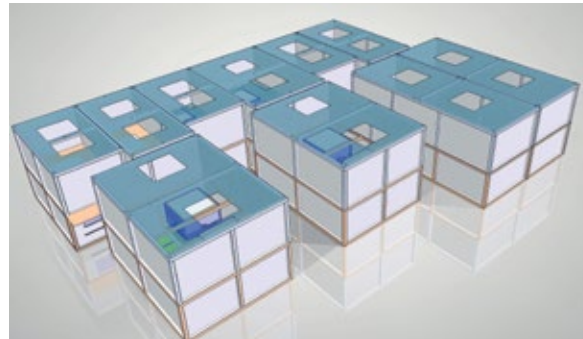
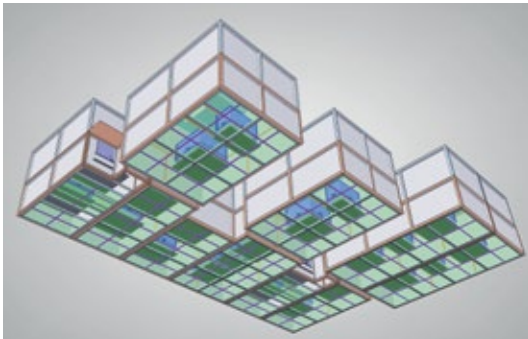
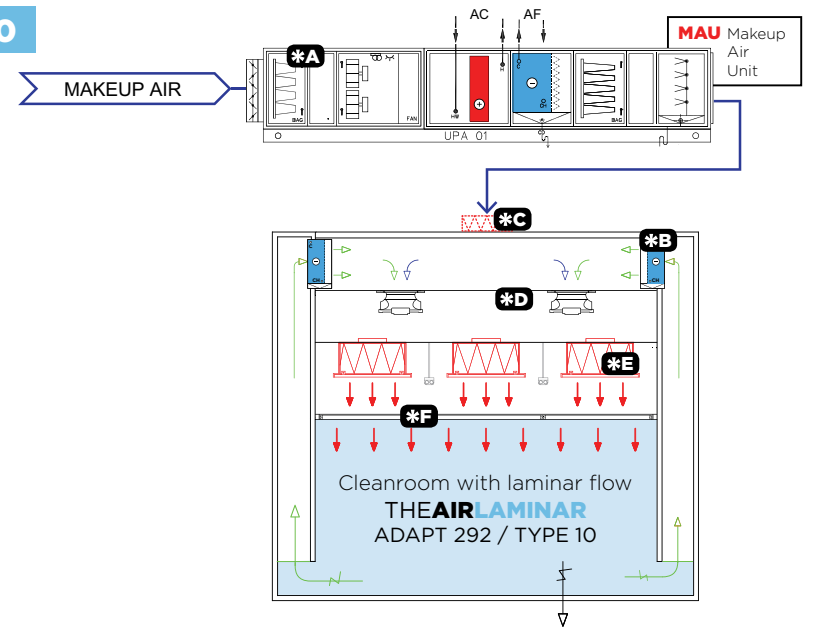
## THE AIR LAMINAR COMPACT 110



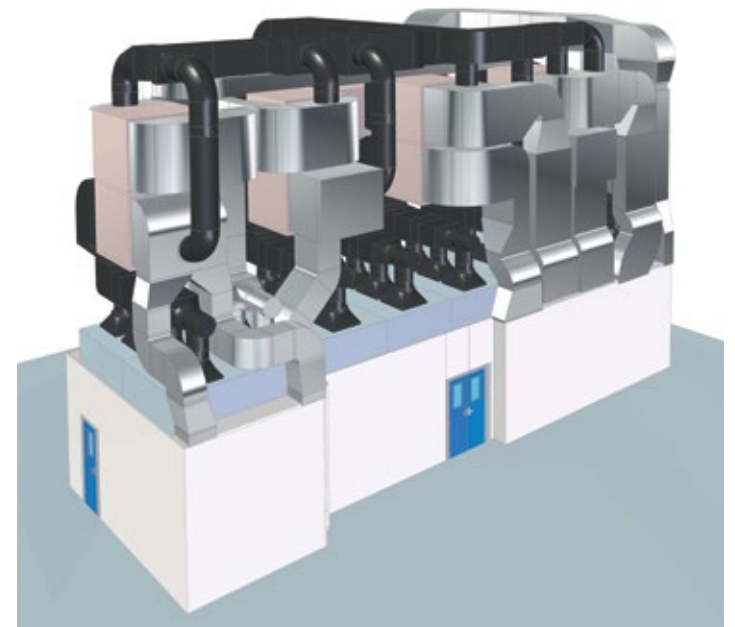
## TYPE 7



## TYPE 10



Examples of 3D laminar flow modules.



Laminar flow for aseptic zone. HVAC in limited space.



## THEAIRFFU

FAN FILTER UNIT ADAPTED FOR A PACKING LINE



# THE **AIRBOX**

**OUR PASS-THROUGH SOLUTION**



# SEVERAL SOLUTIONS, **VARIOUS TYPES**

## General Concepts

The AIR BOX is a compact material pass-through unit for cleanrooms, designed to conveniently transfer materials between classified and/or unclassified areas. The electronic interlocking door system prevents the doors from opening simultaneously and thus altering the pressurization between the areas to which it connects. We have created two types:

### THE **AIRBOX**

The basic solution without filtration



### THE **AIRBOX DYNAMIC**

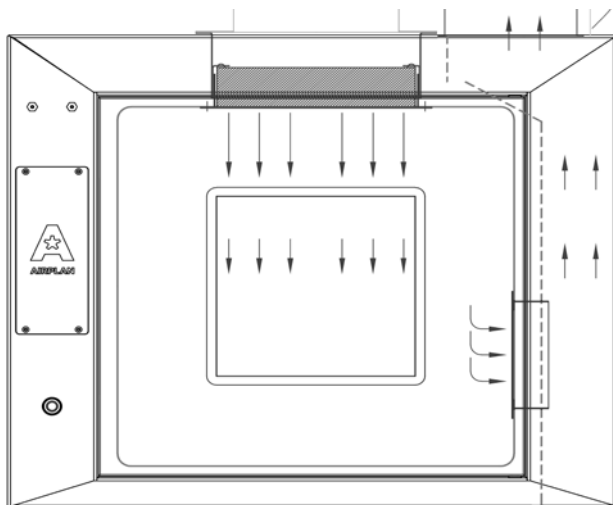
The solution with HEPA filtration



# THE **AIRBOX**

## TECHNICAL DATA

<b>Material</b>	Stainless steel AISI 304 or AISI 316L, satin polished
<b>Doors</b>	Laminated glass windows Automatic interlocking activated by touch buttons
<b>Power</b>	Adaptable to any tension Standard models of 115 / 240V, single phase, 50-60Hz
<b>Air filtration</b>	Only applicable to THE AIRBOX DYNAMIC model H14 HEPA level filter Unit operation and filter clogging visual warning Optionally, DOP socket for equipment validation



### THE AIR BOX DYNAMIC operation diagram

The air is driven through the HEPA filter located at the top, flows into the chamber, and exits on the side for recirculation



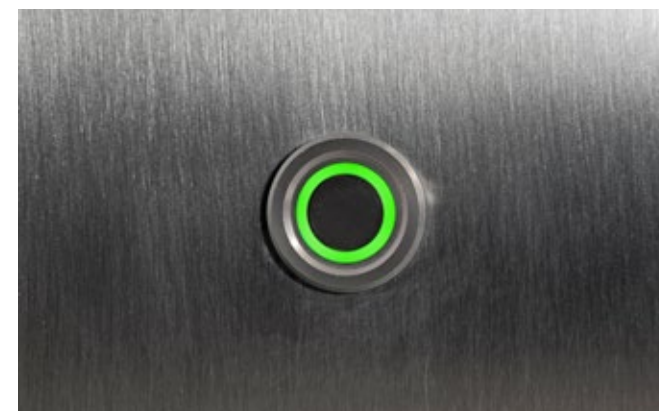
Direct access to the control panel



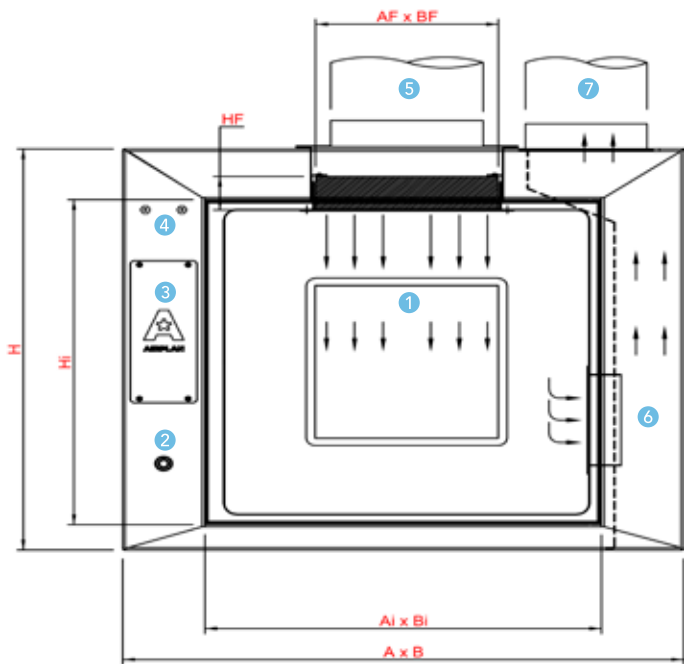
**Interlocked doors** to prevent simultaneous opening



**cGMP design:** flat surfaces, rounded corners; easy cleaning

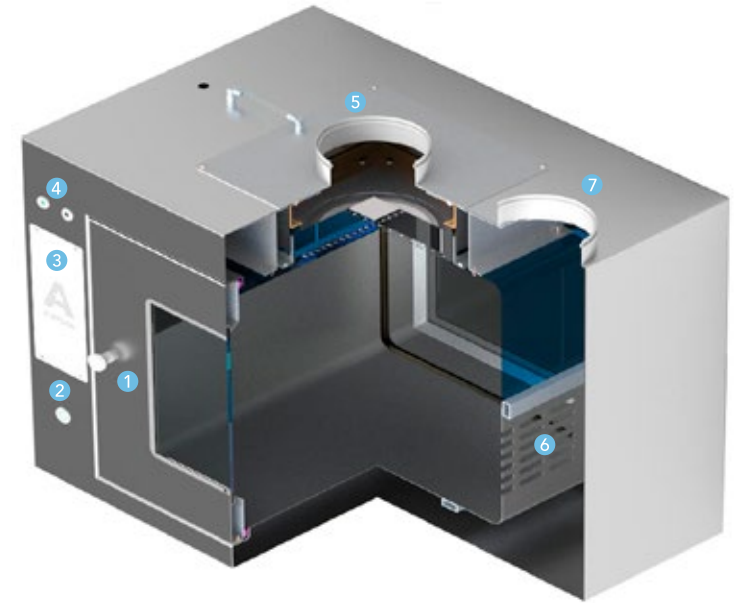


**Tactile push buttons** for door control



## THE AIR BOX

- (1) Door with laminated glass
- (2) Touch push button
- (3) Control panel
- (4) System status LEDs
- (5) Supply air
- (6) Air return grille
- (7) Return air



THE AIR BOX	BASIC										DYNAMIC							
	444		555		666		888		1111		555		666		888		1111	
<b>Airflow</b>	-	-	-	-	-	-	-	-	-	-	m³/h	cfm	m³/h	cfm	m³/h	cfm	m³/h	cfm
Total	-	-	-	-	-	-	-	-	-	-	150	88	150	88	300	177	600	353
<b>Electric Req.</b>																		
Power	500W																	
Electric Consump.	2,5A																	
<b>Internal measur.</b>	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in
Width (A <sub>i</sub> )	400	1' 3.7"	500	1' 7.7"	600	1' 11.6"	800	2' 7.5"	1000	3' 3.4"	500	1' 7.7"	600	1' 11.6"	800	2' 7.5"	1000	3' 3.4"
Depth (B <sub>i</sub> )																		
Height (H <sub>i</sub> )																		
<b>External measur.</b>	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in
Width (A)	646	2' 1.4"	746	2' 5.4"	846	2' 9.3"	1046	3' 5.2"	1246	4' 1.1"	830	2' 8.7"	930	3' 0.6"	1130	3' 8.5"	1330	4' 4.4"
Depth (B)	470	1' 6.5"	570	1' 10.4"	670	2' 2.4"	870	2' 10.3"	1070	3' 6.1"	570	1' 10.4"	670	2' 2.4"	870	2' 10.3"	1070	3' 6.1"
Height (H)	540	1' 9.3"	640	2' 1.2"	740	2' 5.1"	940	3' 1.0"	1140	3' 8.9"	690	2' 3.2"	790	2' 7.1"	990	3' 3.0"	1190	3' 10.9"
<b>H14 absolute filter</b>	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in
Width (AF)	-	-	-	-	-	-	-	-	-	-	305	1' 0.0"	305	1' 0.0"	305	1' 0.0"	610	2' 0.0"
Depth (BF)	-	-	-	-	-	-	-	-	-	-								
Height (HF)	-	-	-	-	-	-	-	-	-	-								
<b>Others</b>	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
Weight	50	110	70	154	100	220	140	309	170	375	100	220	140	309	170	375	200	441



## WE SUPPORT EVERY SOLUTION WITH CUSTOMIZED SERVICE

We offer a range of complimentary and after-sales services, to help you get the most out of THE AIR FFU or THE AIR LAMINAR and care for your long-term investment.

### Free service

#### AIRPLAN HELPDESK

Questions? Comments? Contact us with any problems at our AIRPLAN CARE number and our team will offer a solution whether remotely or in person.



**+34 938 788 384**



**wecare@airplan-sa.com**

### Complimentary service

#### Start-up & SAT

We offer a customized start-up service for every client, for implementation of both THE AIR FFU and THE AIR LAMINAR requiring special construction integration. AIRPLAN will install any laminar flow solution / fan filter unit, guaranteeing correct operation and optimum performance with the appropriate settings.

Every start-up concludes with the delivery of the relevant report. By customer request, we can complete the SAT (Site Acceptance Test) protocols. THE AIR FFU is also delivered with the FAT (Factory Acceptance Test) protocols and certificates, carried out by AIRPLAN.

### Re-qualification

#### VALUE CARE

We diagnose the state of THE AIR FFU or THE AIR LAMINAR and prepare it for its re-qualification, completing the necessary adjustments. Corrective measures that require skilled labor or spare parts are available at a preferential rate.

We prepare the re-qualification SAT protocols to be completed by an external entity.

### Spare parts

#### RENEW CARE

We recommend purchasing a pack of spare parts when THE AIR FFU or THE AIR LAMINAR's warranty period begins. Our spare parts packs include matching filters and may be supplemented by additional components of your choice.

You will find a detailed list of recommended spare parts and the necessary replacement instructions within the *Documentation Dossier*.



# More?

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