

# Spetec® Clean room technology

- Clean room cell
- Clean room workbench
- Laminar flow box
- CleanBoy®
- Service, certification



**SPETEC**®

# Product overview

The device family of the PBS, FMS and FBS series features a modular design, meaning that the individual components are compatible with one another. So the laminar flow box FBS results from a protection box PBS plus the filter module FMS.

This means for the user of a protection box PBS, that he can retrofit it to be a full laminar flow box by purchasing a filter module FMS. The FMS series laminar flow modules can be found on both the clean room cell and the clean room workbench.

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# Portable clean room technology

Increasing requirements for product quality and process reliability require a clean environment during manufacturing, treating and processing, and for storage. Clean room technology plays an increasingly important role in nearly all high-tech sectors.

## Examples:

- Laser technology
- Optics and optoelectronics
- Microelectronics
- Manufacturing, processing and packaging of food
- Manufacture of pharmaceutical products
- Chemical analysis
- Assembly technology

## Reduce the microbial count using clean room technology!

Due to the corona crisis in spring 2020, the topics of hygiene and microbial contamination became even more relevant, so that practically all areas of economic life were affected.

Spetec cleanroom products have a proven effect to reduce the number of microbials. Offices or laboratories become considerably low in microbials or nearly microbe-free by air filtration, e.g. with a laminar flow system from Spetec.

In less than three minutes a Spetec FMS 75 Laminar Flow Module, for example, will clean the entire air in a 20m<sup>2</sup> room, filtering 99.995% of all particles – based on a particle size of 0.12 µm according to MPPS.

Bacteria, yeast and moulds do not float in the room air as individual clusters of molecules, but generally adhere to particles. Separating these particles from the air creates a practically microbe-free atmosphere.

Comparison of microbial counts in a production hall and in Spetec cleanroom systems:

Type	Laminar Flow Box (CFU/m <sup>3</sup> )	Production environment (CFU/m <sup>3</sup> )	Outdoor air (CFU/m <sup>3</sup> )
bacterial count	<1	230	60
yeast / moulds	<1	100	1190

## Laminar flow

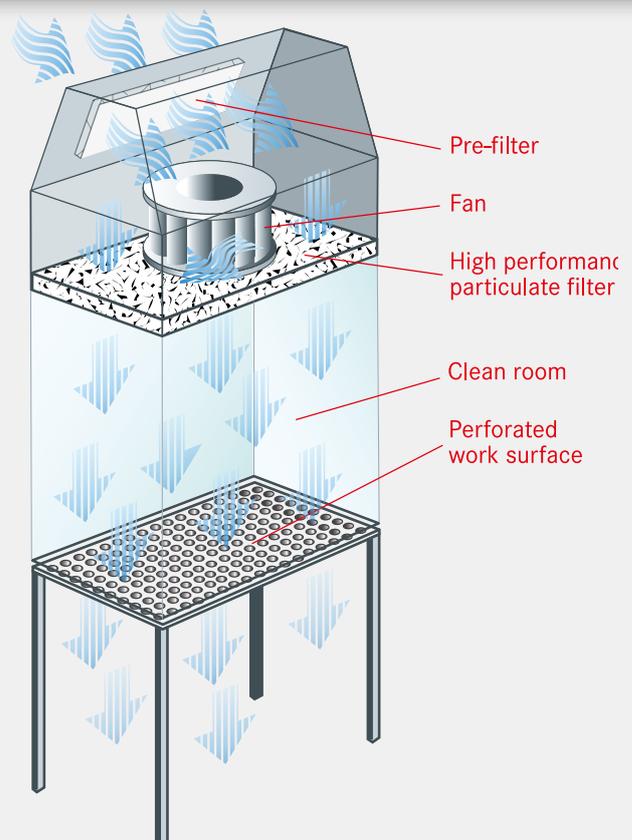
The basic principle for the development of clean room technology was established in the USA in the Sixties, when the principle of laminar flow was introduced.

The ambient air is drawn in using radial fans and pushed through the filter and flow straightener.

This generates a laminar flow, i.e. the air streams down in parallel flow lines. Particles are picked up by the parallel streams of air and transported out of the box. The air can escape through the perforated floor of the box.

## Application examples

Through the use of a Spetec laminar flow box, the particle concentration is reduced e.g. from approx. 15 Mio/m<sup>3</sup> (size of 0.12 µm, MPPS) to approx. 1500 particles within the box. This corresponds to a clean room category of DIN ISO 5 according to DIN EN ISO 14644-1.



# Laminar flow module

## FMS series SuSi®

The core element of Spetec's clean room technology is the Laminar Flow Module SuSi. When fitted with a ceiling suspension, the module can, for example, be used as a clean air shower or integrated directly into a machine housing. The master/slave function allows up to 100 slave modules to be controlled with just one control unit (optional).



Options: see page 25

Serie *SuSi*  
Super Silent



### Dimensions:

Name	Filter dim. in mm	Kg
*Laminar flow module FMS 24	610 x 400	20
Laminar flow module FMS 37	610 x 610	31
Laminar flow module FMS 56	915 x 610	37
Laminar flow module FMS 75	1220 x 610	52
Laminar flow module FMS 93	1525 x 610	58
Laminar flow module FMS 112	1830 x 610	64

\*Special version –  
See page 36 for device dimensions.

#### Control via PLC interface.

ON/OFF and increase/decrease flow velocity functions, filter replacement indicator and error indicator.

##### Control options

(control voltage 12V to 24V)

- Power on/off
- Light on/off
- Increase/decrease flow rate by one step
- PLC interface

##### Interface feedback

- Power has been turned on/off
- Light has been turned on/off
- Filter replacement required
- An error occurred (Fan is not turning)

### Control panel functions:

- 8 level adjustment of the flow velocity with night reduction and flushing function
- LCD display with selected flow velocity in m/second
- LED fault indicator
- Service and interval indicator, dependent on the usage period
- Automatic flow adjustment with filter replacement indicator (optional)
- Connection options for building control systems (remote monitoring) (optional)
- Interior light switch on the control panel (optional)

### Application examples

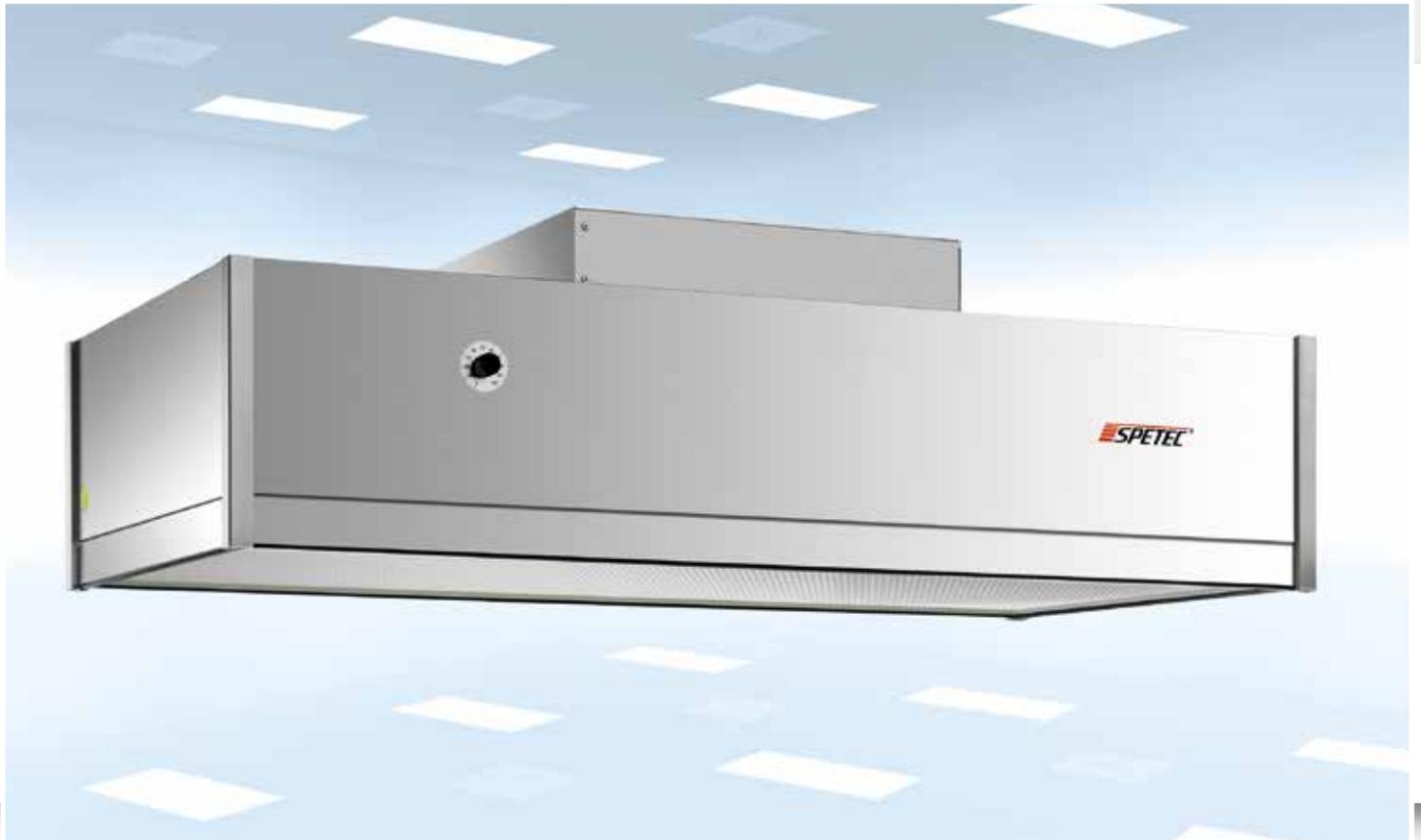
The laminar flow modules are also used on top of clean room cells. Please refer to the "Clean Room Cells" section for further information.

# Laminar flow module

## FMS Basic

The Basic module is a simpler, more affordable alternative to the laminar flow module of the SuSi series. The laminar flow module is offered in a simple, robust version. An EC motor with stepless speed control allows to adjust the flow

velocity according to requirements. The master/slave function allows up to 100 slave modules to be controlled with just one control unit (optional).



The laminar flow module can be used as a separate filter unit or in combination with a clean room cell. Retrofitting into a laminar flow box is not possible.

### Dimensions:

Name	Filter dim. in mm	Kg
Laminar flow module FMS 75 Basic	1220 x 610	30

See page 36 for device dimensions.

# FMS-Basic

## Clean room cell

# “Hard wall” clean room system

Spetec’s clean room cell can be equipped with two different kinds of walls. This will be determined primarily by the precise requirements and the field of application.

### Hard wall

Clean room cells with hard wall panels are mainly used in areas that demand an extremely high level of process reliability. Overpressure prevents particles from entering the clean room. The flexible wall system makes it possible to extend the clean room cell at any time.

Laminar flow module FMS series



### Optional features for hard wall systems:

- Aluminum or steel section support frame (dimensions to order)
- Airlock for materials and personnel
- Double doors with mutual locking system
- Electric sliding door with airlock functionality
- Side panels made from acrylic or laminated glass or aluminium sandwich panels (free choice of color)
- Transparent or tinted window elements

### High-performance filter

A type H 14 filter is used for the Spetec Laminar Flow Module FMS. This has a filtration efficiency of 99.995 %. This means that the filter captures at least 99.995 % of all particles of a size of 0.12  $\mu\text{m}$  (as per MPPS). The filtration efficiency is approx. 99.9995 % for particles with a size of 0.3  $\mu\text{m}$ .

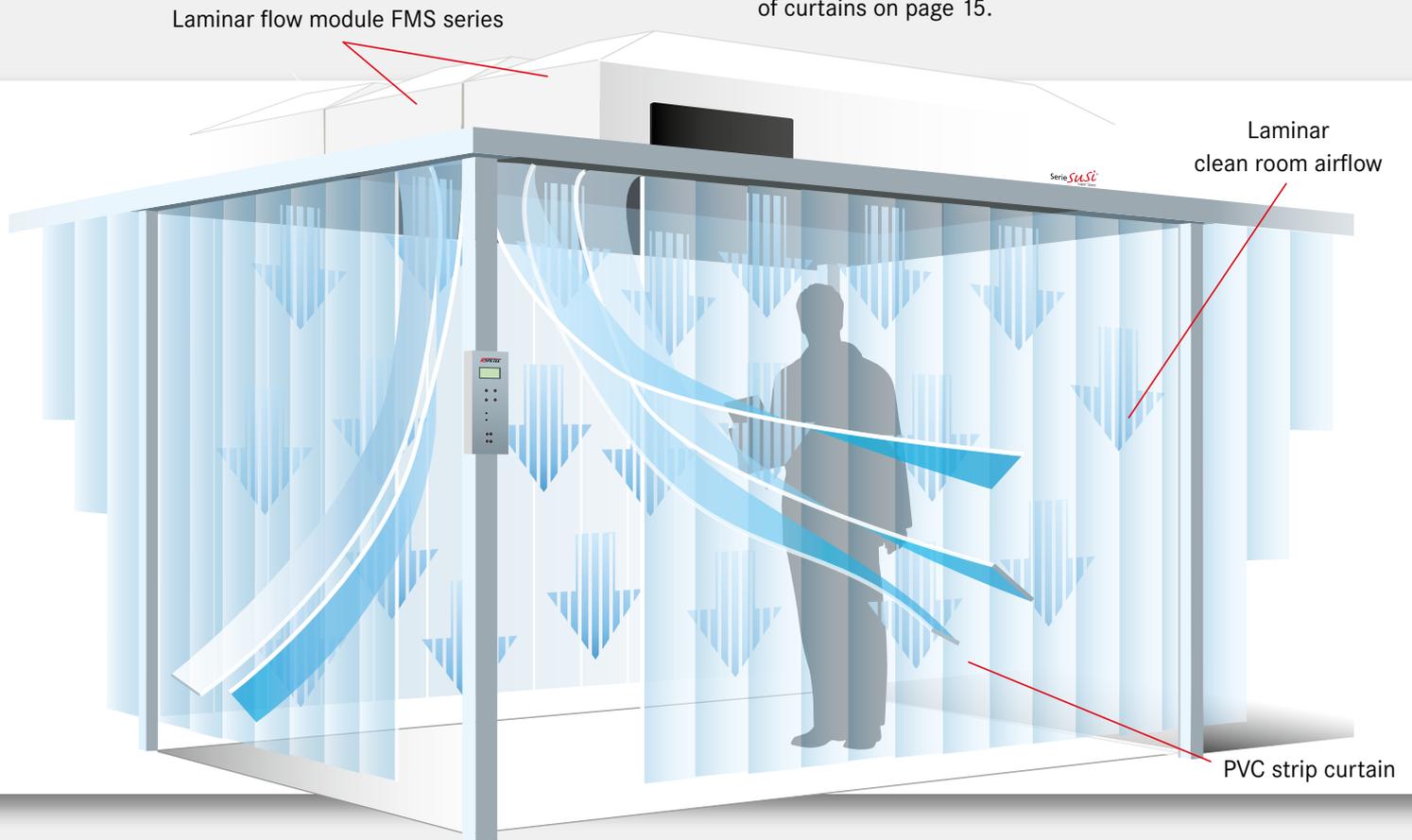
Thanks to the use of the H 14 filter, the Spetec Laminar Flow Module has an isolation factor of 10,000. This means that the air quality in the laminar flow is improved by a factor of at least 10,000 compared with the ambient air. The filter can be changed from the cleanroom side.

# Clean room cell

## “Soft wall” clean room system

### Soft wall

The strip curtain in the „soft wall“ version makes it possible to implement a simple, flexible clean room. Recesses and walls which follow the contours of machines can be achieved without difficulty. You can find details on the different designs of curtains on page 15.



### Optional features for soft wall systems:

- Aluminum or steel section support frame (dimensions to order)
- Airlock for materials and personnel
- Completely odor-free or antistatic strip curtain
- Strip width from 200 to 1,500 mm
- Roller-mounted design

### Control technology

The settings for the clean room cell and other environmental parameters (e.g. lighting) are made by remote control. A programmable controller interface is also optionally available.

### Application examples:

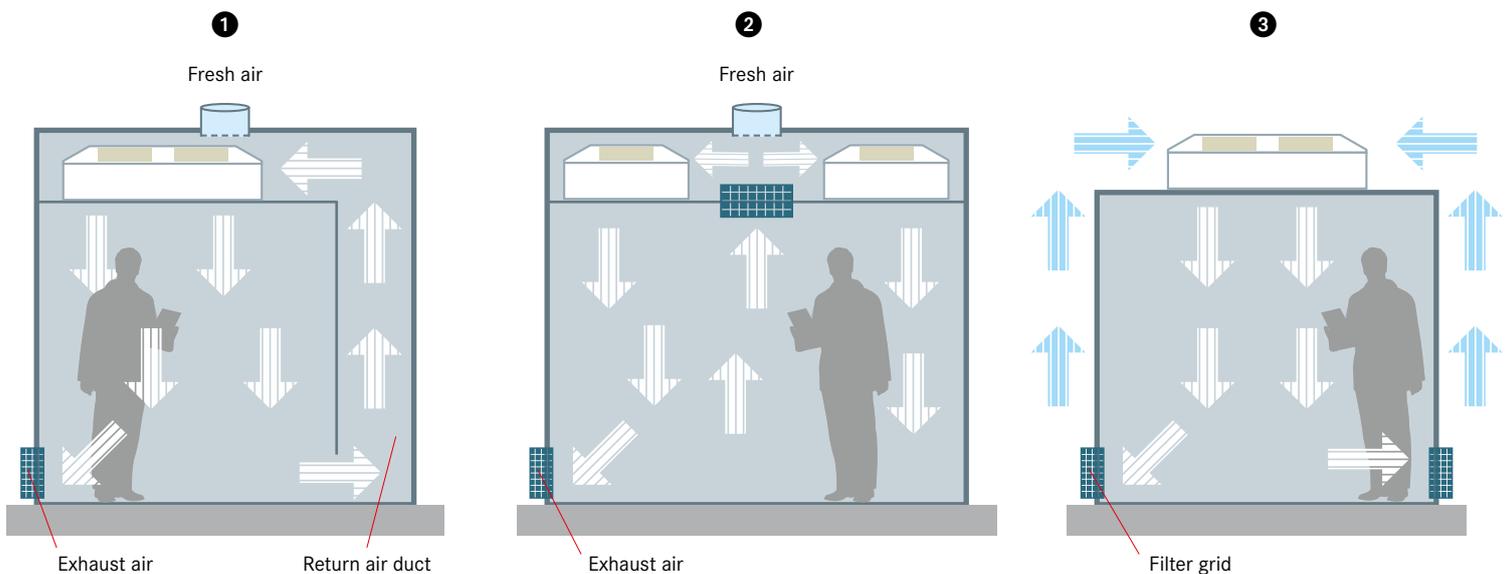
Using a Spetec clean room cell reduces the particle concentration from, for example, approx. 15 million/m<sup>3</sup> (at a size of 0.12 µm, MPPS) to approx. 1,500 particles within the cell. This corresponds to the clean room class ISO 5 according to DIN EN ISO 14644-1.

# Clean room cell

## Airflow principles

The Spetec clean room cell is a clean room system which can be designed in a flexible manner as a cost effective alternative to a complete clean room. One or more laminar flow modules are placed on a support frame and can be assembled according to specific requirements and with freely selectable measurements up to about 400 m<sup>2</sup>.

The Laminar Flow Modules act as a clean air shower under which a clean room workstation is located or where workpieces, instruments or equipment are stored. Thus, the cleanroom cells can be individually designed according to the following flow principles:



### 1 Clean room cell with return air duct

#### Characteristics:

- Optimal air flow
- Air conditioning of the cell is possible
- Directional air flow even with an important interior height
- Clean room cell may be operated with low air flow speeds.

### 2 Clean room cell with return air duct via plenum

#### Characteristics:

- Small footprint
- Air conditioning of the cell is possible

### 3 Clean room cell with return air duct via filter grid or clean room curtain

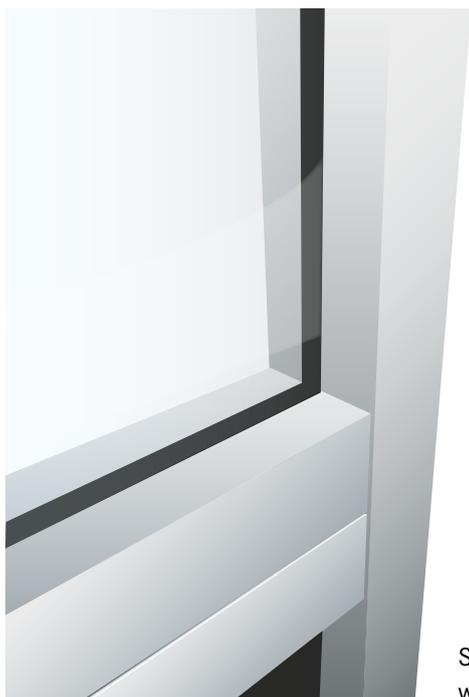
#### Characteristics:

- Cleaning effect for the environment
- Cost effective solution
- Clean room cell can also be realized with strip curtain

## Clean room cell

# Wall elements standard, flush-mounted

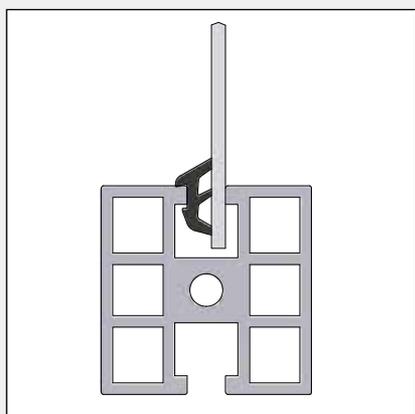
The hard-wall clean room cells are offered in two different variants. The **standard wall element** is intended for clean rooms of ISO classes 7 and 8, and the **flush-mounted system** is intended for applications corresponding to ISO classes 5 and 6 and GMP A through D.



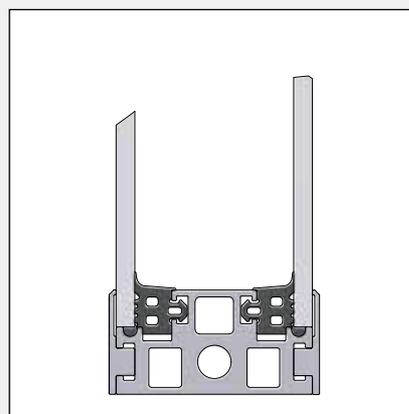
Standard wall system



Flush-mounted wall system



**Standard wall system** with fixed glazing. The panes of glass or the wall filling elements are installed centrally in the groove of the metal section.



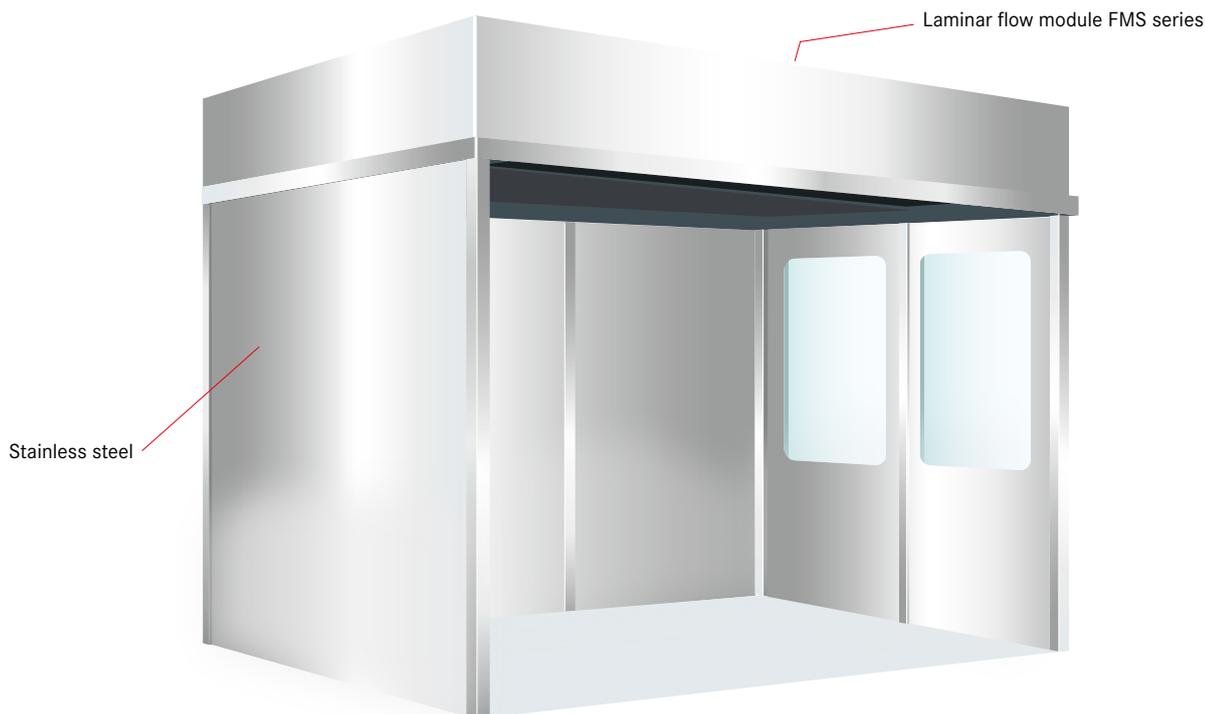
**Flush-mounted wall system** with fixed glazing. Double-glazing or wall filling elements are flush-mounted. This avoids dust deposits and ensures easy cleaning and disinfection.

# Clean room cell

## Stainless steel

Increasing requirements in the pharmaceuticals industry and in food engineering demand a clean environment during manufacturing, processing and storage.

Clean room cells are used in pharmacies, hospitals, in the foodstuffs and cosmetics industries and wherever a particle-free working environment is needed.



The stainless steel clean room cell is based on a similar concept to the aluminum profile clean room cell, but the supporting frame and any side walls are entirely manufactured from stainless steel. A flush-fitting ceiling and side walls ensure easy cleaning and disinfection of the cell.

The modular construction of the cell makes it a simple matter to extend the area of the clean room. So the cell can simply grow to meet future requirements.

Depending on the precise requirements, Spetec clean room cells are custom-built and adapted to the customer's exact needs. The cells can be built to meet the requirements of ISO classes 5 through 9 (DIN EN ISO 14644-1) and classes A through D of the GMP standard.

Generally, clean room conditions as laid down in the GMP (Good Manufacturing Practice) standard are required for such areas. The stainless steel clean room cell covers precisely these requirements.

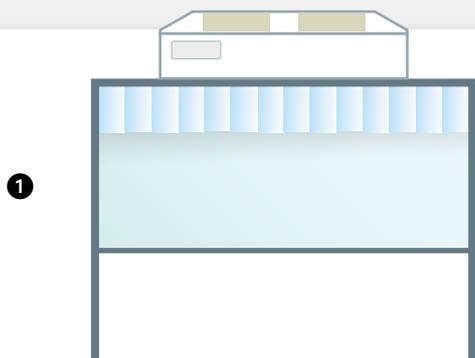
### Optional features:

- Flush-surface internal and/or external wall system (modular)
- Access via double hinged door, sliding door or PVC strip-curtain with stainless steel mounting
- Windows glazed with acrylic or safety glass
- Integrated lighting (yellow or white light)
- Operating hours meter
- Filter change indicator and error LED
- Programmable controller interface
- IP 65 construction
- Airlock for materials and personnel

# Clean room workbench

## Optional features

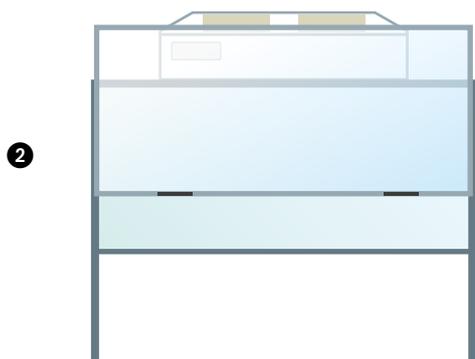
The clean room workbenches are always made to customer specifications. The measurements can be adjusted to the local requirements.



### 1 Clean room workbench with curtain-scoop

#### Characteristics

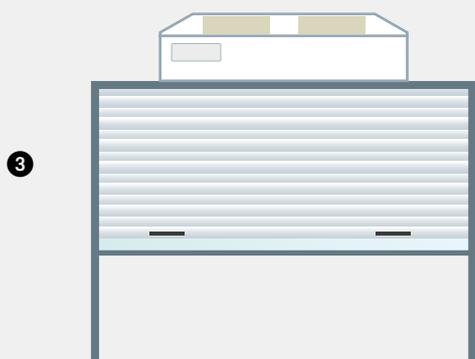
- Easy access to the workspace
- cost-effective



### 2 Clean room workbench with sliding door

#### Characteristics

- Continuous sliding mechanism, the opening height can be adjusted individually
- Workbench can be locked during breaks or for storage of materials. The clean room class remains intact.
- Transparent front-side



### 3 Cleanroom workbench with roller blind

#### Characteristics

- Simple locking of the workbench
- Opaque



### 4 Clean room workbench with canopy

#### Characteristics

- No draughts from outside disturbing the cleanroom conditions
- User is in the clean room
- Very high degree of process security

## Clean room workbench

# Mini environment

The Spetec clean room workbench or mini environment is primarily used in the optics, electronics, and mechanical industries, e. g. for display manufacturing or finishing of touch panels and for cleaning optical components. The key difference in comparison to the laminar flow box (FBS series, tabletop unit) is the **integrated work surface** which can be

Class  
100



fabricated from perforated stainless steel, “solid” stainless steel, or hard laminate.

The clean room workbench (Mini Environment) can also be **equipped with a “canopy”** to reduce the influence of dust or drafts from the environment. This housing provides additional protection of the work area and the employee from the ambient atmosphere.

The clean room workbench can be fabricated according to the individual customer requirements and the required clean room category. This means that the size, equipment, and de-

sign are **adapted to the respective requirements**. The clean room workbench is generally made with clean room compatible aluminium profiles. The side walls are made from glass, acrylic glass or a PVC strip curtain. A laminar flow module is installed on top, so that an ISO 5 or category 100 (according to US FED. 209E) clean room is created inside of the mini environment. That equates to only approx. 100 particles with a size of 0.5µm per cubic foot. Compared to a particle count of approx. 1 million per cubic foot in a typical office or laboratory, this corresponds to improving the air quality by a factor of 10,000.

ISO 5



**Clean room workbench with sliding door**

**Clean room work bench with PVC strip curtain incl. "canopy"**

0,5 $\mu$ m

### **Clean room workbench with ionizer**

Clean room workbench with extraction system and ionizer to neutralize static charges.

This special version of the clean room workbench is equipped with an ionizer and extraction system. Due to the vacuum generated in the extraction unit, cleaning takes place in a single operation. Subsequently, the static charge of the part is neutralized by the ionizer so that dust adhesion is avoided. This ensures clean further processing of the components.

The cleaning time is reduced by more than 50% in comparison to conventional cleaning methods. The canopy with PVC strip curtain prevents dirt from entering the workbench from the outside, making it easier to achieve the clean room category and allowing for even cleaner working.



# Clean room cell

## Special solutions

We are happy to advise you in the selection of a concept and the materials used.

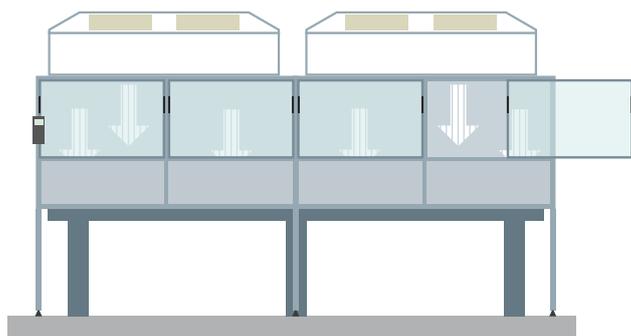
### Application examples:

#### Industry

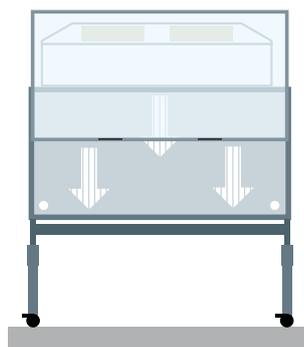
- Production machineries in plastics processing
- Filling systems for pharmaceutical products
- Packaging machines in the foodstuffs industry
- Assembly in the automotive industry – armatures, displays

#### Research and development

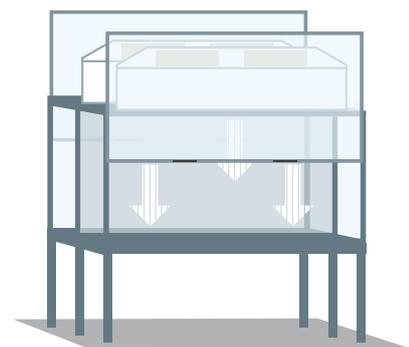
- Complete laser tables
- Laser systems
- Sample preparation in trace element analysis
- Optics and optoelectronics



Optical tables, straight and removable sliding door



Adjustable in height



Double sliding door

Housing of an optical table or a machine.



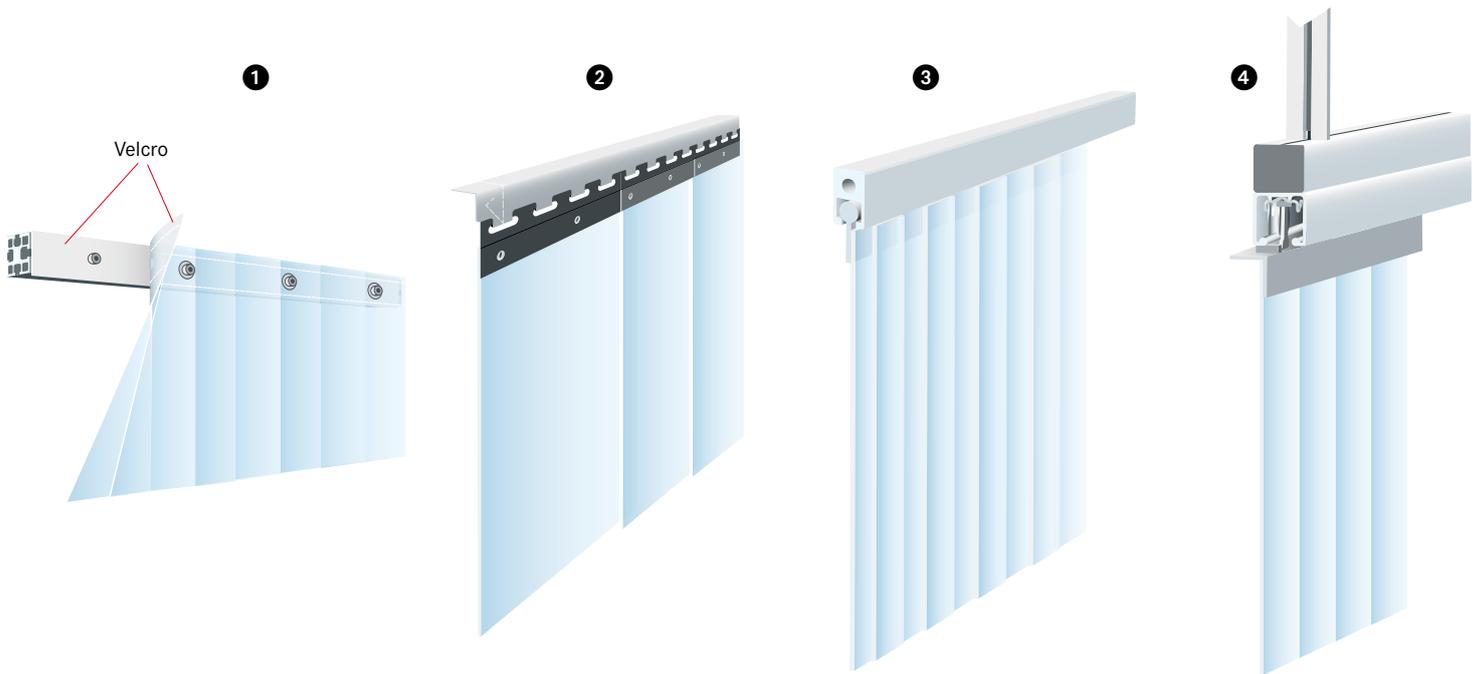
# Clean room technology

## Clean room curtains

The Spetec clean room curtains are made from strips of various thicknesses and heavy-duty materials. They are always produced according to customer requirements. This allows us to offer you a customized product tailored precisely to your requirements. The strip curtain is fitted to the respective given conditions using special hardware.

### Examples:

- Clean rooms
- Locks
- Room separation
- Thermal barriers



### Hanger systems

#### 1 Velcro system

The individual strips are sewn in on the top side and attached to the aluminium profile via Velcro and screws.

#### Characteristics:

- Easy to dismantle
- Cost-effective

#### 2 Hook system

(Stainless steel)

Each strip is attached to a separate retaining plate. As a result each strip can be replaced individually.

#### Characteristics:

- Stainless steel
- Overlap can be manually adjusted

#### 3 Bead system

This system allows a simple and quick installation and can be variably produced for all sizes. By integrating the curtain into the tent-rail a tight connection is created, which offers a high degree of process security.

#### Characteristics:

- Particle dense assembly
- Cannot be moved

#### 4 Sliding system

In the sliding system the curtain is guided using a holding system in the running rail. Sliding is possible in both directions. The opening range can be limited via a stopper or be set only on one side.

#### Characteristics:

- Flexible solution

Request our  
“**Laser safety**”  
brochure!

# Clean room cell

## Options



Option 1



Option 2



Option 3



Option 4



Option 5

Options	
1	<b>Material lock</b>
2	<b>Access systems</b> - Curtain - Sliding door - Hinged door
3	<b>Sliding door electrical/mechanical</b>
4	<b>Flush ceiling</b>
5	<b>Interlocking personnel lock</b>
6	<b>Flush wall system</b>
	<b>Side panels</b>
	- VSG – Laminated safety glass
	- Acrylic glass
7	- Aluminium sandwich panels
	- Stainless steel
	- MDF
	- Clean room curtain
8	<b>Fluorescent light</b>
9	<b>LED light</b>



Option 2

# Clean room cell

## Applications



Clean room cell "Soft wall" for injection moulding



Clean room cell „Hard wall“



Clean room enclosure of a machine in the pharmacy



Laminar Flow Boxes in the field: Optics and laser production



Clean room environment for packaging of pharmaceutical products

# Laminar flow box

## FBS series

Using the Laminar Flow Box, a portable cleanroom workstation is created, which can have a size from 0.37 to 1.12 m<sup>2</sup> depending on the model variant. It is used for manufacturing products and for storing objects under clean room conditions.



Options: see page 25

# FBS



Sliding door

Serie *susi*<sup>®</sup>  
Super Silent

Ambient air is drawn in using EC fans and pushed through the filter. This generates an ISO class 5 laminar flow, i.e. the air streams down in parallel flow lines. Particles are picked up the flow of air and transported out of the box through the perforated plate bottom.

### Technical Data

The technical data have been tested and certified by the Fraunhofer Institute for Manufacturing Engineering and Automation! The measurement systems used for the qualification are calibrated regularly and can be traced back to national and international standards. If no national standards exist, then the measurement process meets the current technical regulations and standards. The documentation prepared for this process can be reviewed upon request.

### Dimensions:

Name		Filter dim. in mm	Kg
Laminar flow box FBS	37	610 x 610	77
Laminar flow box FBS	56	915 x 610	92
Laminar flow box FBS	75	1220 x 610	114
Laminar flow box FBS	93	1525 x 610	129
Laminar flow box FBS	112	1830 x 610	145

See page 36 – 37 for special version device dimensions.  
Max. door clearance 480 mm

## High performance filter

The Spetec laminar flow box FBS uses a type H 14 filter. It features a retention rate of 99.995%. This means that at a particle size of 0.12  $\mu\text{m}$  (according to MPPS), the filter removes at least 99.995% of all particles. At a particle size of 0.3  $\mu\text{m}$ , the retention rate is approx. 99.9995%. By using the H 14 filter, the Spetec laminar flow box FBS has an isolation factor of  $10^4$ . This means that the air quality inside the laminar flow box is improved by a factor of at least 10,000 relative to the ambient air.

## Design

The box is primarily made from anodized aluminium profiles and acrylic glass. The air inlet is located at the slope of the filter module so that the laminar flow box can be placed flush against a wall.

A sophisticated door mechanism allows an easy and functional opening and closing of the sliding door. All box variants of the PBS and FBS series feature this mechanism. The maximum usable door clearance is 480 mm.



## Control panel

The flow velocity can be controlled in 8 steps. The controls include the “night reduction” (eco) mode to save energy costs, and the “MAX” function to clean the workstation, parts, or equipment if applicable.

Through the use of latest generation EC fans with a very high efficiency, the power draw is reduced to a minimum. The noise generation in the workspace is approx. 43 to 55 dB (depending on the size), and the models are correspondingly quieter at lower flow velocities.

### Control panel functions:

- 8 level adjustment of the flow velocity with night reduction and flushing function
- LCD display with selected flow velocity in m/second
- LED fault indicator
- Service and interval indicator, dependent on the usage period
- Automatic flow adjustment with filter replacement indicator (optional)
- Connection options for building control systems (remote monitoring) (optional)
- Interior light switch on the control panel (optional)

## Laminar flow box

# FBS series standard

As an alternative to the laminar flow box of the FBS series SuSi, this version is offered without a sliding door and perforated metal floor. As a result, work can be performed directly on the existing table.



# FBS

Serie *SuSi*<sup>®</sup>  
Super Silent

A well thought-out air duct ensures that the air flow passes from the inside to the outside and that there is no contamination with the outside air inside the box.



**Application example**  
FBS standard work place

### Dimensions:

Name	Filter dim. in mm	Kg
Laminar flow box FBS 37 standard	610 x 610	57
Laminar flow box FBS 56 standard	915 x 610	67
Laminar flow box FBS 75 standard	1220 x 610	86
Laminar flow box FBS 93 standard	1525 x 610	96
Laminar flow box FBS 112 standard	1830 x 610	106

See page 37 for device dimensions.

# Laminar flow box

## FBS-V series

### PVC clean room strip curtain

FBS-V series models consist of a laminar flow module FMS and a PVC clean room strip curtain.

The PVC strip curtain which hangs down from the laminar flow module is adjusted so that its ends are flush with the device housing. Thanks to the laminar flow of air, there is no mixing of dirty ambient air.



Options: see page 25

# FBS-V

Serie *susi*<sup>®</sup>  
Super Silent

The laminar flow module is attached to the building's ceiling with ceiling hangers. The curtain prevents the entry of dirty air when people walk by or transport vehicles drive by. In general, this system is used to create localized clean room conditions at machines or instruments which are too big to place them inside a box. In addition, assembly workstations can also be enclosed.

### Dimensions:

Name	Filter dim. in mm	Kg
Laminar flow box FBS-V 37	610 x 610	42
Laminar flow box FBS-V 56	915 x 610	47
Laminar flow box FBS-V 75	1220 x 610	65
Laminar flow box FBS-V 93	1525 x 610	73
Laminar flow box FBS-V 112	1830 x 610	81

The curtain has a length of 2,000 mm, but can also be produced according to customer requirements. See page 36 for device dimensions.

# Laminar flow box

## EFBS series

The EFBS series laminar flow box also features an additional acid-resistant extraction system. The telescoping extraction arm, which can be positioned in three dimensions, can be adjusted precisely so that gases and vapours are extracted exactly where they are generated.

There is practically no mixing of the vapours being extracted with the clean air flowing down from above, since the flow velocity at the tip of the extraction tube is higher than that of the clean air flow. The exhaust system has a maximum capacity of 1 cubic meter per minute and is continuously adjustable.



Options: see page 25

# EFBS

Serie *susi*<sup>®</sup>  
Super Silent

### Dimensions:

Name		Filter dim. in mm	Kg
Laminar flow box EFBS	37	610 x 610	85
Laminar flow box EFBS	56	915 x 610	96
Laminar flow box EFBS	75	1220 x 610	100
Laminar flow box EFBS	93	1525 x 610	137
Laminar flow box EFBS	112	1830 x 610	152

See page 37 for device dimensions.

The EFBS series devices are used where clean room conditions are required, but where these conditions are at the same time impaired by vapours, combustion gases, etc., e.g. AAS graphite tubes, ICP/MS, and laboratory benches used for chemical analysis.

### Option

#### Telescoping arm for the extraction system.

Arm with three-dimensional position adjustment for connection to the acid-resistant extraction system. Only available in combination with the EFBS, EFBS-V and EBS series.

# Laminar flow box

## EFBS-V series

The EFBS-V Series combines the benefits of an FBS-V and an acid-resistant extractor in situations where clean room conditions are required, but where such conditions would be impacted by vapor, gas, etc.

The strip curtain of the clean room is adjusted so that it is flush with the equipment or workspace that is to be enclosed.



Options: see page 25

# EFBS-V

Serie *susi*<sup>®</sup>  
Super Silent

### Dimensions:

Name	Filter dim. in mm	Kg
Laminar flow box EFBS-V 37	610 x 610	49
Laminar flow box EFBS-V 56	915 x 610	54
Laminar flow box EFBS-V 75	1220 x 610	72
Laminar flow box EFBS-V 93	1525 x 610	80
Laminar flow box EFBS-V 112	1830 x 610	88

The curtain has a length of 2,000 mm, but can also be produced according to customer requirements. See page 36 for device dimensions.

### Option

#### Telescoping arm for extraction.

Arm with three-dimensional position adjustment for connection to the acid-resistant extraction system. Only in combination with the EFBS, EFBS-V and EBS series.

## Protection box

# PBS series

The protection box PBS is used in the optics, analysis, and electronics industries to protect items against dust. However, it does not have a filter attachment, but can be retrofitted with it at any time and thereby serves as a laminar flow box.



# PBS

## Portable tabletop exhaust hood

# EBS series

The portable tabletop exhaust hood EBS is universally usable. It is corrosion and acid resistant. The maximum extraction capacity is 1 cubic meter per minute.



# EBS

### Dimensions:

Name	Device dimensions
Protection box PBS 37	see page 37
Protection box PBS 56	
Protection box PBS 75	
Protection box PBS 93	
Protection box PBS 112	

The interior height is 805 mm  
 The total height is 940 mm  
 Height with the door open is 1,421 mm

### Dimensions:

Name	Device dimensions
Exhaust hood EBS 37	see page 37
Exhaust hood EBS 56	
Exhaust hood EBS 75	
Exhaust hood EBS 93	
Exhaust hood EBS 112	

The interior height is 805 mm  
 The total height is 940 mm  
 Height with the door open is 1,421 mm

# Laminar flow box

## Options



Option 1



Option 2



Option 3

### Options

**Base frame on casters.** As a table replacement for FBS series, providing you with a mobile cleanroom workplace.

**Laboratory cabinet with drawers.** Provides storage space to keep laboratory materials and other tools, only available in combination with option 1.

**Extraction well underneath the perforated worktop** for connection to an extraction unit or to a central house exhaust air system. For the discharge of the “contaminated” air flowing through the box.

**Interior light LED**

**230 V connection inside box.** Installation of a cleanroom-compatible triple outlet inside the box.

**Control via PLC interface.**

**Automatic flow adjustment** for FBS series and cleanroom workbench

**Automatic flow adjustment** for FMS series and cleanroom cell

**Automatic flow adjustment** for FBS-V series and EFBS-V series

**Ceiling mount with chain link**

**Stainless steel pre-filter cartridge**  
(size 37–56 per 2 units, size 75–112 per 4 units)

### Options

**Replacement H 14 filter**

**H 14 PTFE main filter**

**Pre-filter** (size 24–56 per 2 units, size 75–112 per 4 units)

**Worktop** made of solid stainless steel, not perforated

**Worktop** made of sealed hard laminate, not perforated

**ESD-compatible version** for FBS series

**ESD-gerechte Ausführung** für FBS-Serie „Standard“

**Plastic coating**, acid-resistant for FBS series

**Plastic coating**, acid-resistant for base frame on casters

**FMS series with master function** and wired remote control

**Telescoping arm** for exhaust hood

# Clean room workspace

## CleanBoy®

The units in the CleanBoy® range boast the following features:

- Clean room conditions anywhere in laboratories, production facilities and offices
- Storage of objects under clean room conditions
- Air purification at the place of work
- Simple to use
- No installation required
- ISO 5 clean room class
- Air flow: Laminar at 0.45 m/s



### The CleanBoy® variants:

Size	37	56	75	93	112
Filter area in mm (W x D)	610 x 610	915 x 610	1220 x 610	1525 x 610	1830 x 610
CleanBoy Basic Mini, aluminium			X		
CleanBoy Basic Maxi, aluminium			X		
CleanBoy Mini Series SuSi aluminium	X	X	X	X	X
CleanBoy Maxi Series SuSi, aluminium	X	X	X	X	X
CleanBoy Plus table-top unit, stainless steel		X			
CleanBoy Plus free-standing unit, stainless steel		X			
CleanBoy Office	X		X		
Laminar Flow Module FMS Office	X	X	X	X	X

## Clean room workspace

# CleanBoy® Basic 75

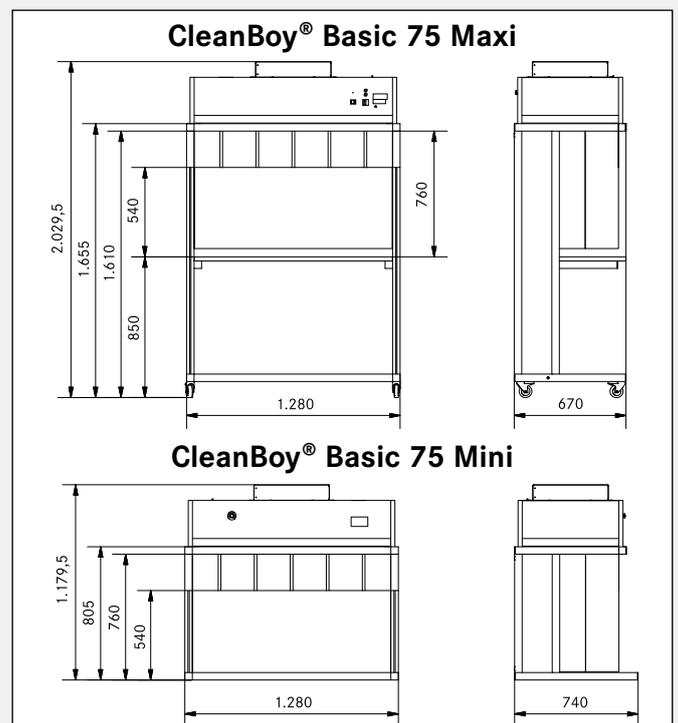


**CleanBoy® Basic,**  
Floor-standing device with work surface

*CleanBoy®*

The CleanBoy® Basic consists of a simpler, more affordable laminar flow module Basic. This laminar flow module is offered in a plastic coated, robust version. An EC motor with stepless speed control allows to adjust the flow velocity according to requirements.

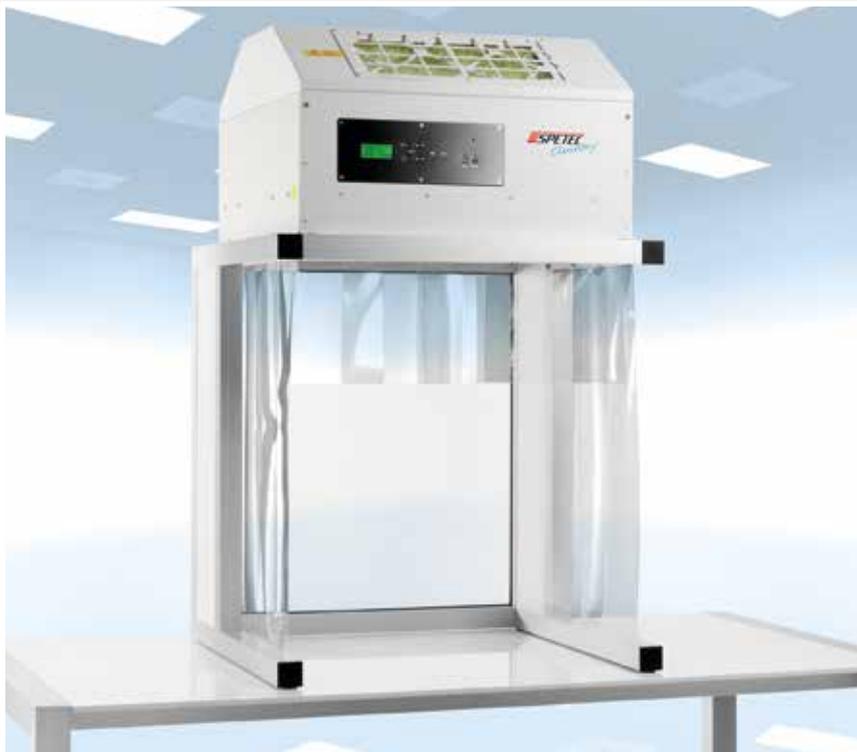
The CleanBoy® Basic is available as a free-standing unit with a work surface and a base frame on castors, or as a tabletop unit so that the existing work surface can be used.



# Clean room workspace

## CleanBoy®

The Spetec clean room work place CleanBoy brings cleanliness to the exact work place where you need it. Cleanliness in technical terms means classified clean room conditions. The CleanBoy clean room work place is available as a full height or tabletop device. It is simply set up and is operational immediately without any further installation.



### CleanBoy® Mini

Table-top device without additional work surface

CleanBoy®

**CleanBoy® Mini**

Cleanboy® Mini	
Dimension	X
37	735
56	1040
75	1345
93	1650
112	1955



Application example CleanBoy® workspace

# Clean room workspace

## CleanBoy® Maxi

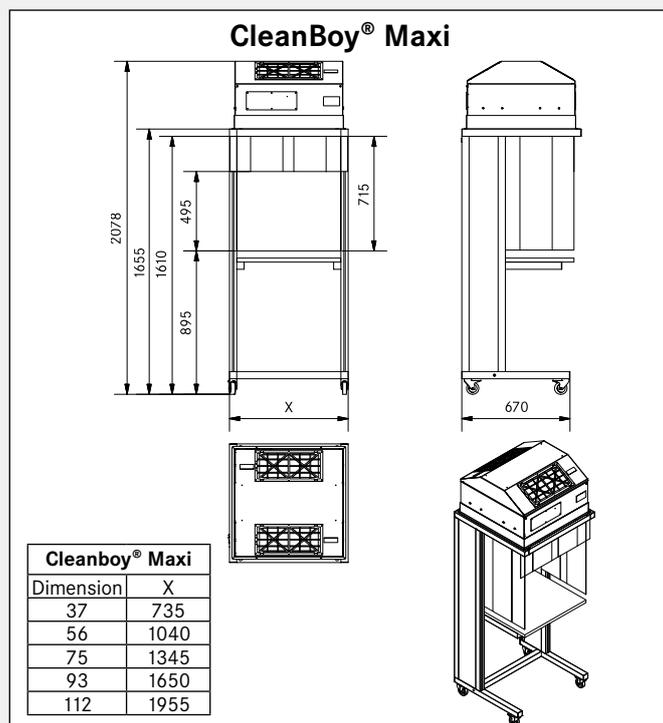


The CleanBoy® Mini or Maxi consists of a laminar flow module series SuSi and a supporting frame made from anodized aluminium. Work can be performed on the table top under ISO 5 clean room conditions.

**CleanBoy® Maxi,**  
Floor-standing device with work surface



**Application example**  
CleanBoy application example in analysis: Storage of analysis samples under clean room conditions



One of the most noteworthy features of the modules is the extremely low level of noise produced by the fans. The modules include an operating hours meter, a filter change and error indicator and a display for setting reproducible flow rates.

The height of the work surface can be set to 750 mm or 850 mm

## Clean room workspace

# CleanBoy® Plus 56

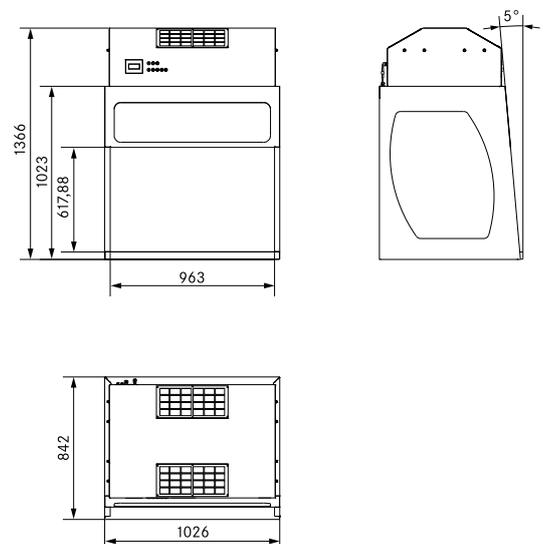
The CleanBoy® Plus cleanroom station was specially developed for use in workplaces where hygiene plays a significant role (GMP – food, medicine, pharmaceuticals). This means that no more than 1 CFU (colony forming units) can be detected on sedimentation plates at any point within the cleanroom station. The unit allows to create cleanroom conditions wherever they are needed with little capital outlay.



The CleanBoy® Plus has been tested by the Fraunhofer Institute for Manufacturing Engineering and Automation (IPA). Assuming complete adherence to the relevant standards, the unit is deemed to be fundamentally suitable for use in Grade B hygiene-critical production environments as per GMP.

The laminar airflow creates a virtual wall that separates the clean interior from the particle-laden external environment. The unit is fitted with a Type H14 high-performance filter, which has a filtration efficiency of 99.995 %. This means that the filter captures at least 99.995 % of all particles of a size of 0.12 µm (MPPS). Thanks to the use of the H14 filter, the Spetec CleanBoy® Plus has an isolation factor of 104. This means that the air quality below the Laminar Flow Module is improved by a factor of at least 10,000 compared with the ambient air.

**CleanBoy® Plus 56 table-top unit**



## Clean room workspace

# CleanBoy® Plus 56

On the inside, the CleanBoy® Plus is the same as the standard CleanBoy® range. The main feature is that all components of the housing are made from stainless steel. All corners and edges have been rounded to facilitate cleaning and disinfection of the surfaces of the unit. The unit thus complies with the Guide to Good Manufacturing Practice for the pharmaceuticals industry (GMP)

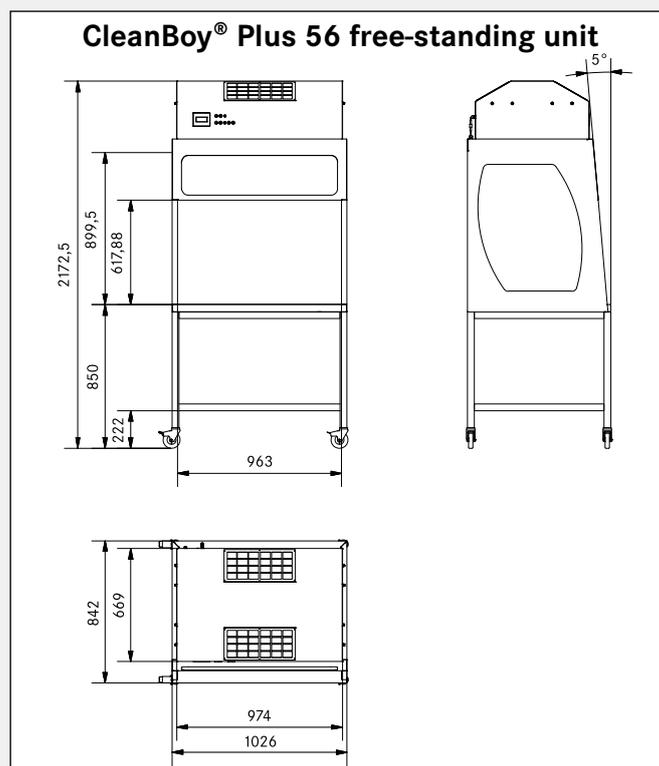


**CleanBoy®**  
Plus  
Serie **SuSi®**  
Super Silent

Furthermore, a clean room atmosphere means that it is possible to reduce the microbial count within the workspace. The conditions are effectively sterile. For more information, refer to the table showing the microbial counts on page 32.

Viruses, bacteria, yeasts and fungi are not simply suspended in the air as individual clumps of molecules. As a rule, they instead adhere to particles. If these particles are filtered out from the air, this creates an effectively sterile environment.

Type	Purified airflow	Ambient air	Outdoor air
Microbial count (bacteria)	<1 CFU/m <sup>3</sup>	230 CFU/m <sup>3</sup>	60 CFU/m <sup>3</sup>
Yeasts/fungi	<1 CFU/m <sup>3</sup>	100 CFU/m <sup>3</sup>	1.190 CFU/m <sup>3</sup>



## Air purification systems

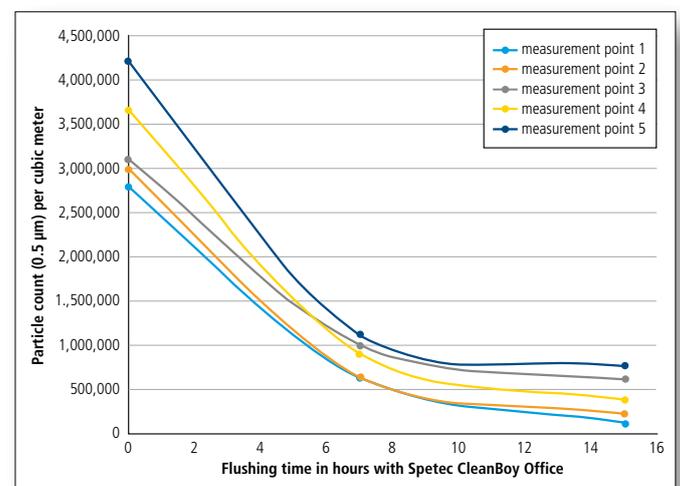
# CleanBoy® Office, FMS Office

The Spetec air purification systems are ideally suited for filtering aerosol particles such as viruses, bacteria, spores and even pollen from the air. Pathogens are not simply suspended in the air in the form of clumps of molecules. Rather, they tend to adhere to particles or are transported in aerosol droplets. The benefit is obvious: The risk of infection is minimized as the quantity of airborne pathogens decreases.

For those who suffer with allergies (such as hayfever), this means that irritation of the respiratory tract drops considerably after the air purification system has been in operation for a few minutes. The chart below shows the fall in particle concentration in the ambient air over time with the CleanBoy® Office in operation.

The table shows the microbial count directly in the flow of purified air.

**CleanBoy®**  
Office  
Serie **SuSi®**  
Super Silent



The integrated two-phase filtration system with the particularly large surface area of the H14 class HEPA filter allows 99.995 % of these particles to be filtered out – at a particle size of 0.12 µm (MPPS). HEPA filters are high-efficiency air filters that are also used for purifying the air inside the cabins of aircraft. So, if you filter particles from the ambient air, the amount of bacteria, viruses, yeasts and fungi as well as pollen is also reduced considerably.

Other studies (see box) show that there need to be at least 6 changes of air per hour to provide effective protection. Based on these findings, the Spetec air purification systems are dimensioned for rooms of a size of up to 100 m<sup>2</sup> (see the technical data sheet). Multiple air purification systems can be used in parallel in larger rooms.

*In an independent study, Professor Kähler of the Institute of fluid dynamics and aerodynamics at the Bundeswehr University, Munich has investigated the speed and efficiency with which aerosols and particles are removed from the air in a room when air filtering systems are used.*

*His conclusion is that the investigations show “..., that mobile air purifiers are well suited for filtering aerosol particles and hence also viruses from the air. The devices ensure that the viral load is kept at a very low level, with the result that one need have no concerns about indirect infection. Such devices must, however, meet certain requirements.”*

*This study allows the following conclusions to be drawn:*

- 1. At least 6 changes of air per hour are required*
- 2. The filter is crucial: only class H14 HEPA filters (high efficiency particulate air) are also able to filter out the smallest particles of submillimeter dimensions, such as viruses.*
- 3. The devices must be as quiet as possible to make them suitable for operation over extended periods in classrooms or offices.*

*Source: Spiegel interview from 30 October, 2020 – “Mobile Raumluftfilter – die Winter-Wunderwaffe” (Mobile air purifiers – Winter’s wonder weapon”)*

# Air purification systems

## CleanBoy® Office

The unit is supplied fitted with rollers and is manufactured from wood-effect hard laminate. This means that it is not just suitable for use in production facilities, but is an inconspicuous part of the office or classroom: Even when running at full power, noise levels remain below those usually found in an office.

Operation of the unit has deliberately been kept very simple and intuitive. No installation is necessary. Simply turn the unit on and clean air is guaranteed after a matter of a few minutes. Users can simply remove and replace the filters as needed.



CleanBoy® Office 37



CleanBoy® Office 75

### Technical data

	CleanBoy® Office 37	CleanBoy® Office 75
External dimensions (LxBxH):	780 x 790 x 860 mm	1,390 x 790 x 860 mm
Weight:	60 kg	95 kg
Voltage:	230 V/50 Hz	230 V/50 Hz
Filter:	Two-phase filtration <ul style="list-style-type: none"> <li>• Pre-filter</li> <li>• Main filter H 14 (as per DIN EN 1822) with 0.37 m<sup>2</sup> filter area</li> </ul>	Two-phase filtration <ul style="list-style-type: none"> <li>• Pre-filter</li> <li>• Main filter H 14 (as per DIN EN 1822) with 0.75 m<sup>2</sup> filter area</li> </ul>
Volumetric flow rate of filtered air: (infinitely variable)	<ul style="list-style-type: none"> <li>• 330 m<sup>3</sup>/h (≅ 20 m<sup>2</sup>*)</li> <li>• 650 m<sup>3</sup>/h (≅ 40 m<sup>2</sup>*)</li> <li>• 1000 m<sup>3</sup>/h (≅ 60 m<sup>2</sup>*)</li> <li>• Flushing function</li> </ul>	<ul style="list-style-type: none"> <li>• 330 m<sup>3</sup>/h (≅ 20 m<sup>2</sup>*)</li> <li>• 650 m<sup>3</sup>/h (≅ 40 m<sup>2</sup>*)</li> <li>• 1000 m<sup>3</sup>/h (≅ 60 m<sup>2</sup>*)</li> <li>• 1300 m<sup>3</sup>/h (≅ 80 m<sup>2</sup>*)</li> <li>• 1600 m<sup>3</sup>/h (≅ 100 m<sup>2</sup>*)</li> <li>• Flushing function</li> </ul>
Noise level**:	<ul style="list-style-type: none"> <li>• 33 dB(A) (≅ 20 m<sup>2</sup>*)</li> <li>• 42 dB(A) (≅ 40 m<sup>2</sup>*)</li> <li>• 54 dB(A) (≅ 60 m<sup>2</sup>*)</li> </ul>	<ul style="list-style-type: none"> <li>• 33 dB(A) (≅ 20 m<sup>2</sup>*)</li> <li>• 35 dB(A) (≅ 40 m<sup>2</sup>*)</li> <li>• 36 dB(A) (≅ 60 m<sup>2</sup>*)</li> <li>• 42 dB(A) (≅ 80 m<sup>2</sup>*)</li> <li>• 45 dB(A) (≅ 100 m<sup>2</sup>*)</li> </ul>

\* This specification refers to the room size at which 6 air changes can be achieved. Rooms are assumed to be 2.7 m high.

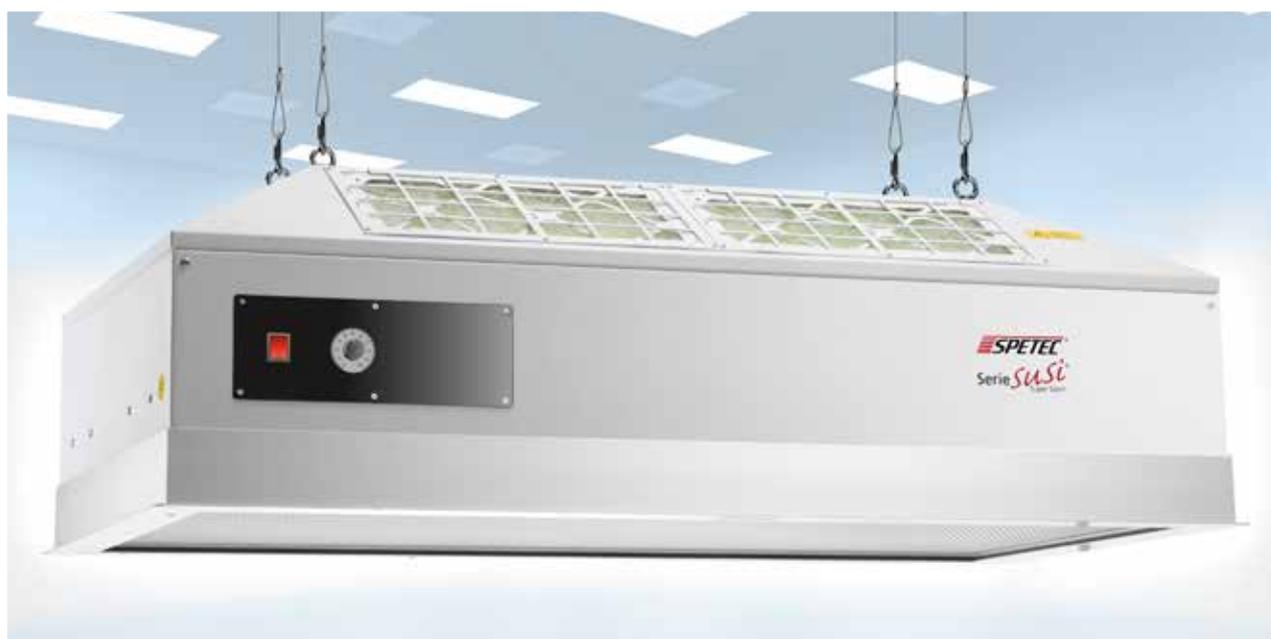
\*\* Measuring distance 1.00 m in front of the device.

# SuSi® Series air purification system

## FMS Office

The FMS Office Series units are clean air modules that can be set up anywhere. If there is no suitable location for a free-standing unit, or if space is limited, these modules can be fixed to the ceiling of the room. The room is then flooded with pure air from above. Ideally, the unit should be mounted by a local fitter.

Serie *SuSi*<sup>®</sup>  
Super Silent



The units of the FMS Office and SuSi Series ranges are available in the following sizes. The size should be selected to match the size of the room in which the clean air module is to be installed.

Installation requirements:  
A 230 volt power socket is sufficient.

Designation	External dimensions in mm (LxBxH)	Weight in kg	Volumetric flow rate per hour in m <sup>3</sup>	Recommended for rooms up to	Noise level
FMS - Office 37	705 x 705 x 423	31	400	24 m <sup>2</sup>	40.7 dB(A)
FMS - Office 56	1010 x 705 x 423	37	600	37 m <sup>2</sup>	50.3 dB(A)
FMS - Office 75	1315 x 705 x 423	52	800	50 m <sup>2</sup>	50.0 dB(A)
FMS - Office 93	1620 x 705 x 423	58	1000	60 m <sup>2</sup>	48.2 dB(A)
FMS - Office 112	1620 x 705 x 423	64	1200	74 m <sup>2</sup>	52.0 dB(A)

# Clean room technology

## Service

As a manufacturer and service provider in clean room technology, we offer you a wide range of equipment options as well as fast and universal assistance in service matters. We have now incorporated our many years of experience as a manufacturer into a range of services that enable us to check, inspect and maintain your cleanroom systems using state-of-the-art measuring equipment.

### We offer the following services:

- Particle counts
- Replacing filters in various brands of laminar flow boxes (LF units)
- Finding and fixing leaks
- Determining volume flow rates or flow velocities
- Temperature and relative humidity measurements
- HEPA filter / filter system installation monitoring
- DEHS leak test
- Clean room validation and certification in accordance with EN ISO 14644 and GMP guidelines

We also perform certification within the framework of EN ISO 14644, i.e. we record the measurement parameters defined in DIN EN ISO 14644 such as particle counts, flow velocities, etc. All of these parameters are confirmed with a corresponding certificate. All of the particle measurement devices, air speed, temperature, and humidity sensors we use are tested and calibrated every 12 months. You receive comprehensive documentation about the measurements and a risk assessment.



## Filter replacement

The main filter can be changed from the top or bottom of the unit. This reduces the contamination of the clean room - depending on the local conditions - to a minimum.

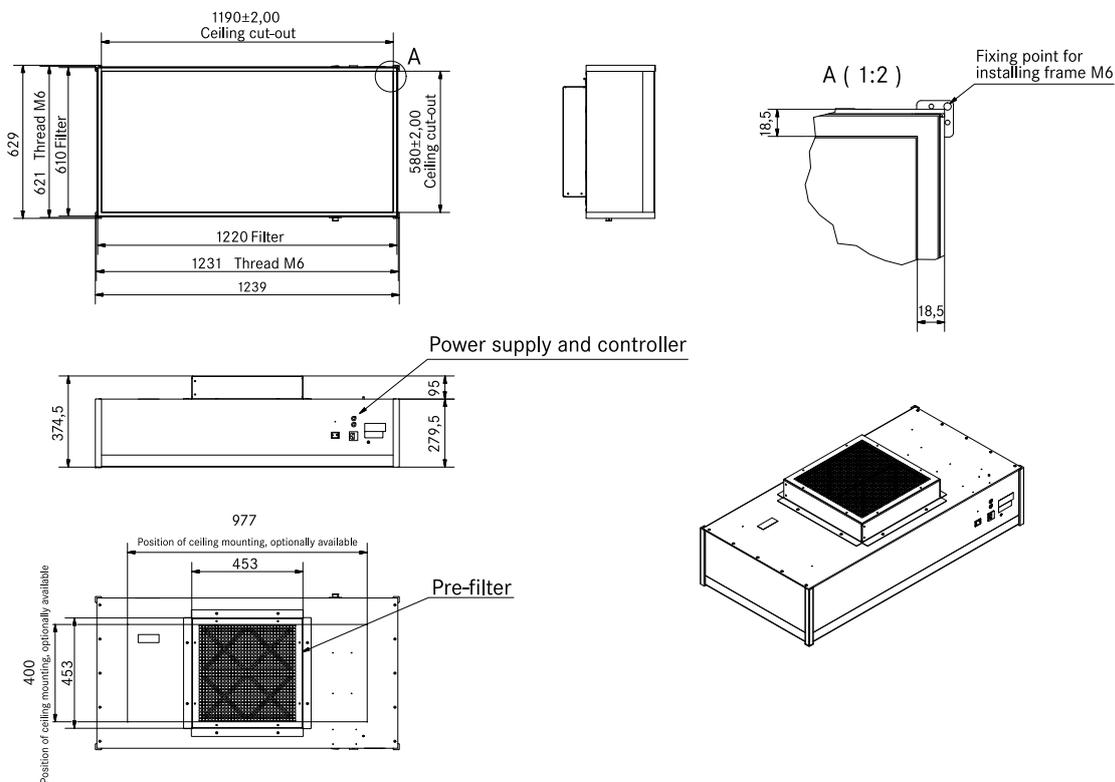


It is easy to remove the main filter by simply releasing the filter replacement cassette.

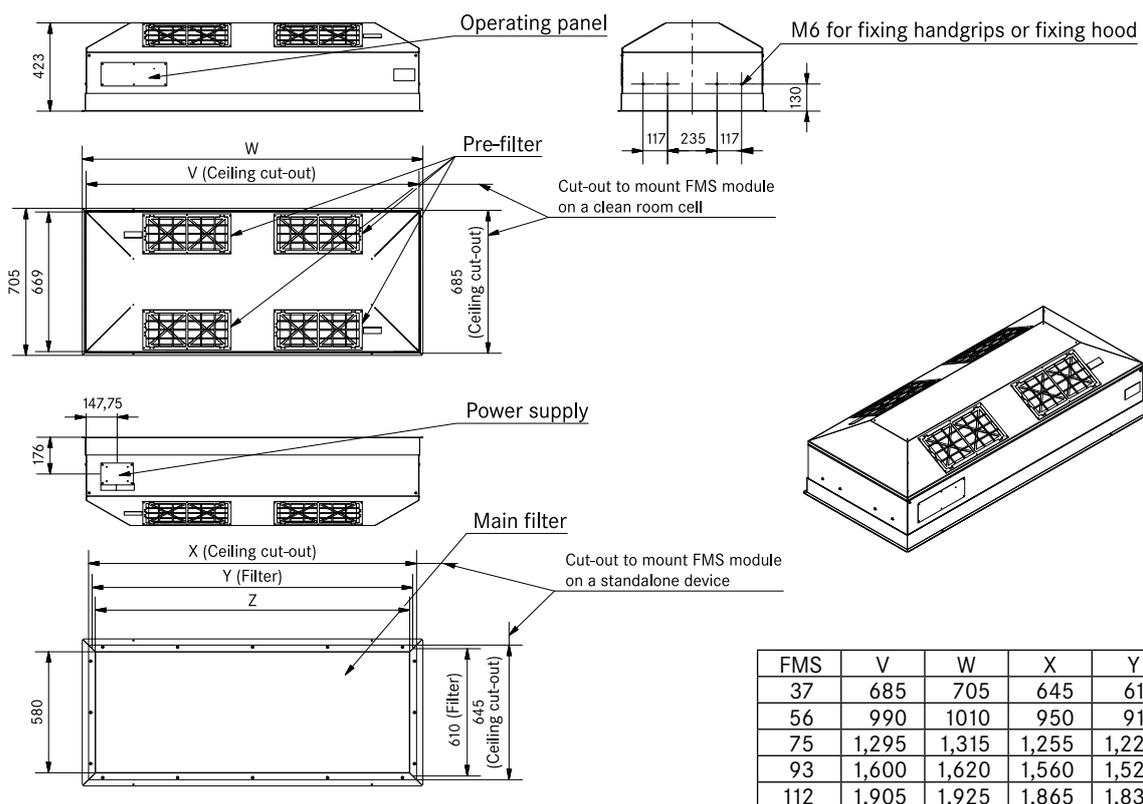
# Clean room technology

## Technical drawings

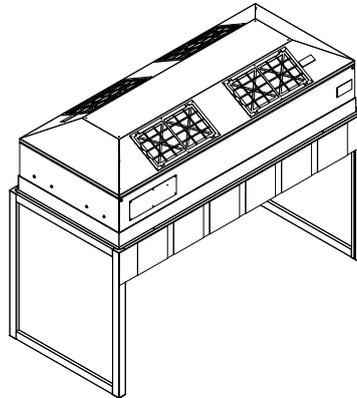
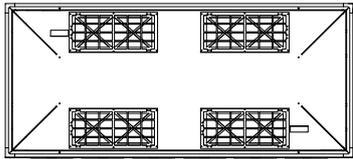
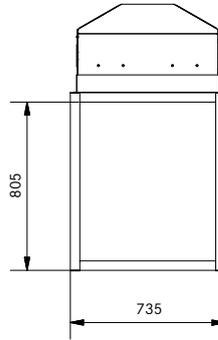
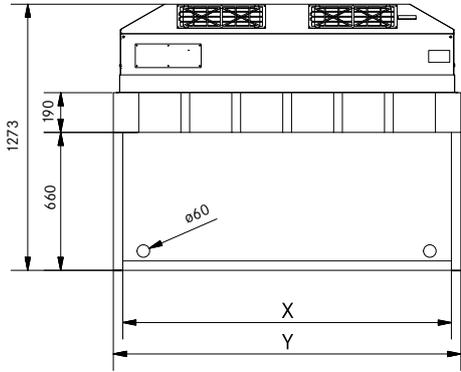
### FMS series – Basic



### FMS series SuSi®

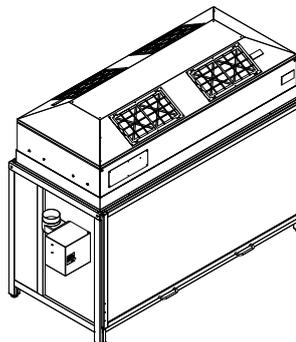
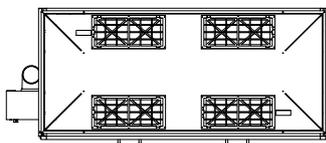
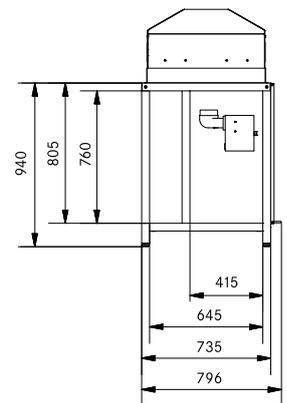
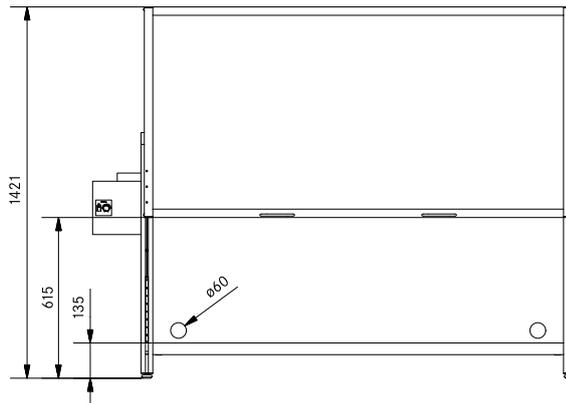
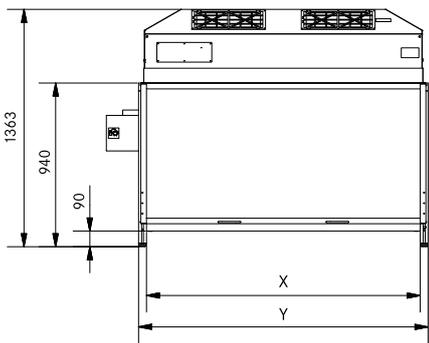


### FBS series – standard



FBS	X	Y
37	645	735
56	950	1,040
75	1,255	1,345
93	1,560	1,650
112	1,865	1,955

### FBS-, EFBS-, PBS-, EBS series



FBS	X	Y
37	645	735
56	950	1,040
75	1,255	1,345
93	1,560	1,650
112	1,865	1,955

# Notes



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