

# 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 germ load using clean room technology!

Due to the corona crisis in spring 2020, the topics of hygiene and germ 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 germs. Offices or laboratories become considerably low in germs or nearly germ-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.

Viruses, bacteria, yeast and moulds do not float in the room air as individual clusters of molecules, but generally adhere to particles. If these particles are separated from the air, a practically germ-free atmosphere is created.

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

Test	Laminar Flow Box (germ load/m <sup>3</sup> )	Production environment (germ load/m <sup>3</sup> )	outside (germ load/m <sup>3</sup> )
bacterial count	<1	230	60
yeast / moulds	<1	100	1190

## Laminar flow

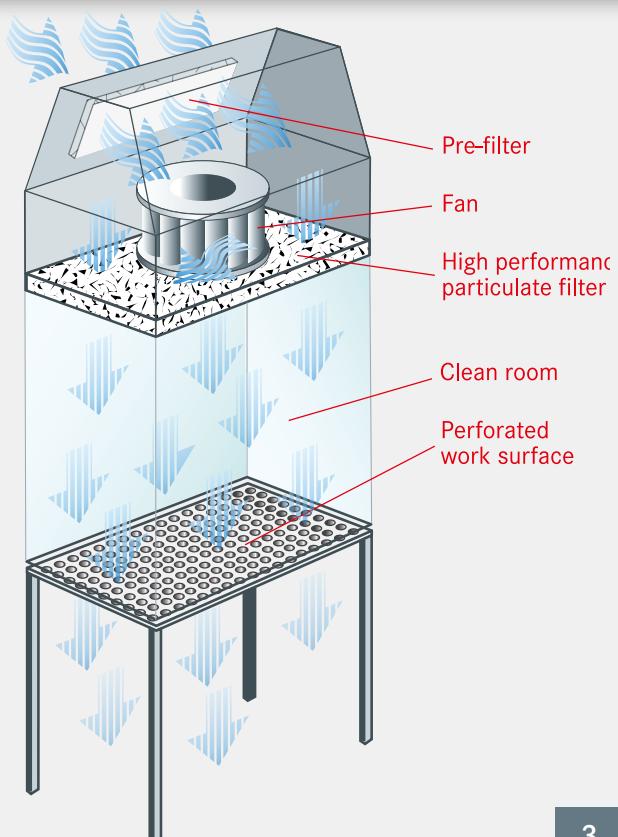
The basic principle for the development of clean room technology was established in the USA in the Sixties, when the principle of laminar flow was introduced.

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 concentrate 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.



# 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 30 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

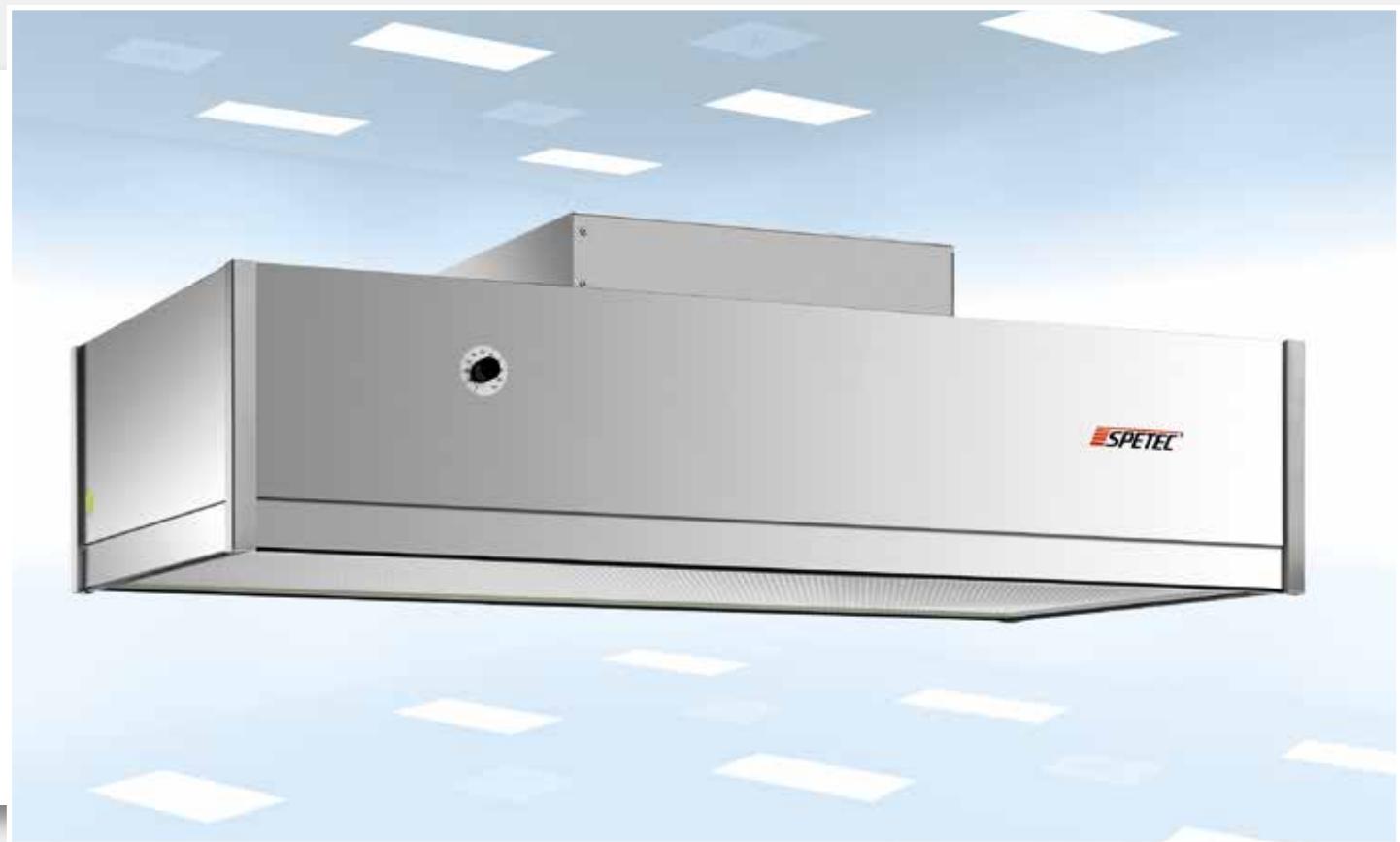
The laminar flow modules are also used on top of clean room cells.

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 30 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.



### 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

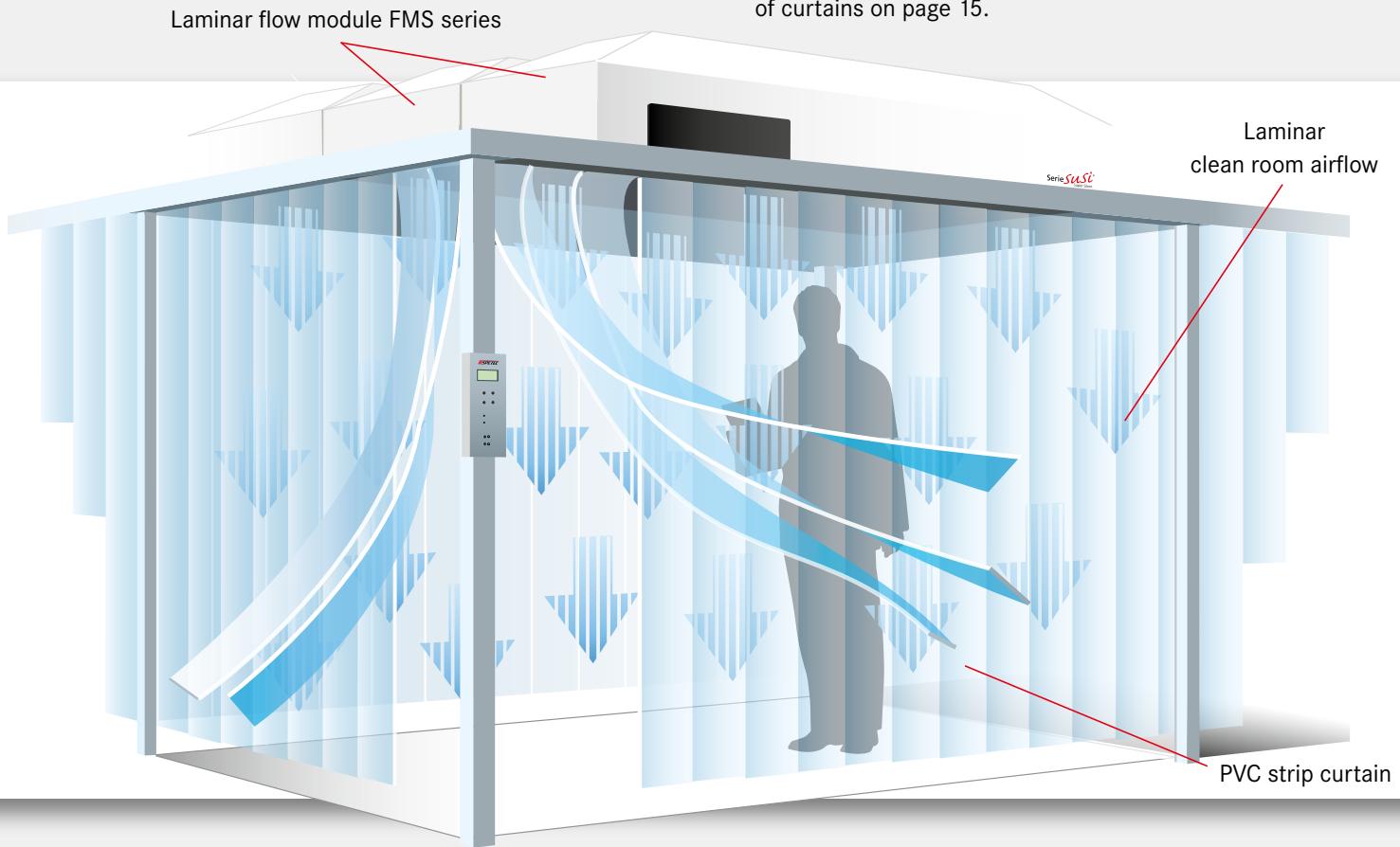
A type H 14 filter is used for the Spetec Laminar Flow Module FMS. This has a filtration efficiency of 99.995 %. This means that the filter captures at least 99.995 % of all particles of a size of 0.12 µm (as per MPPS). The filtration efficiency is approx. 99.9995 % for particles with a size of 0.3 µm.

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:

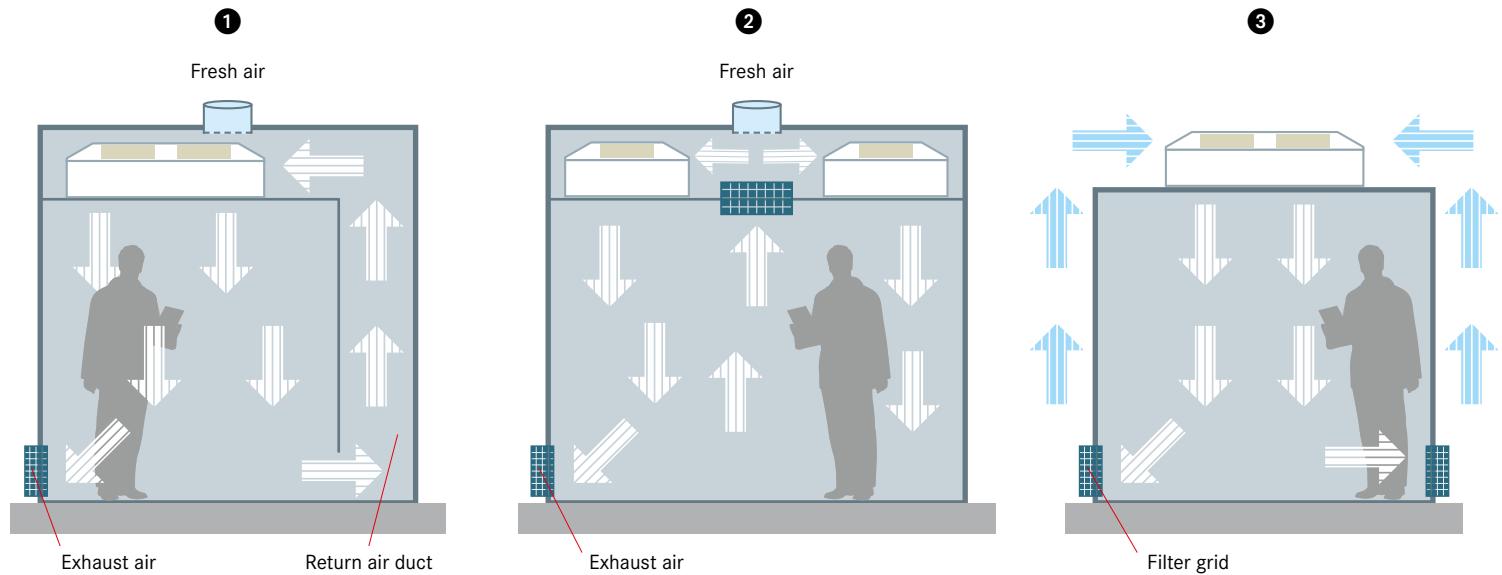
Using a Spetec clean room cell reduces the particle concentration from, for example, approx. 15 million/m<sup>3</sup> (at a size of 0.12 µm, MPPS) to approx. 1,500 particles within the cell. This corresponds to the clean room class DIN 14644-1.

# 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 work-pieces, 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

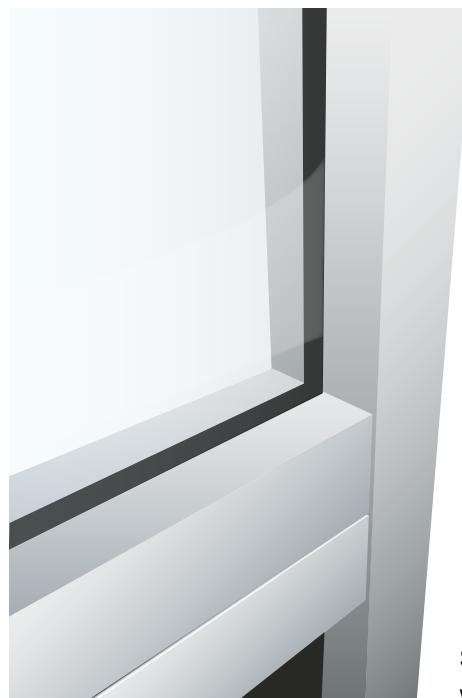
#### Characteristics:

- 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

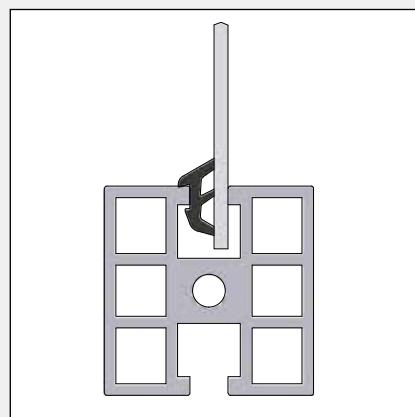
The hard-wall clean room cells are offered in two different variants. The **standard wall element** is intended for clean rooms of ISO classes 7 and 8, and the **flush-mounted system** is intended for applications corresponding to ISO classes 5 and 6 and GMP A through D.



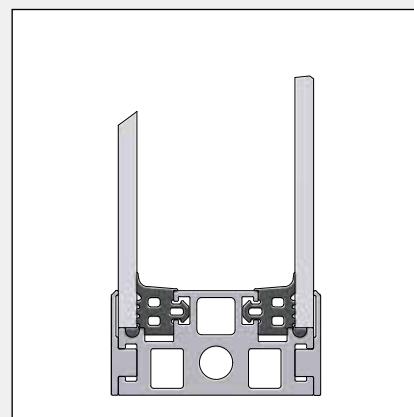
Standard  
wall system



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.



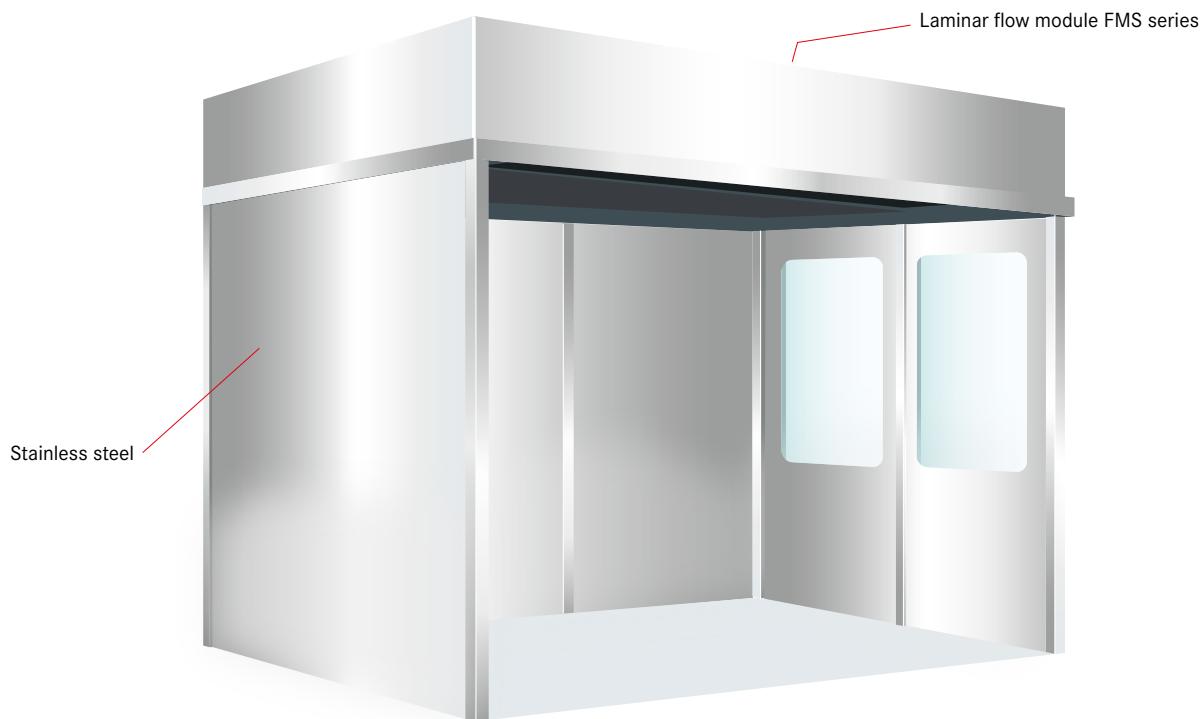
**Flush-mounted wall system** with fixed glazing. Double-glazing or wall filling elements are flush-mounted. This avoids dust deposits and ensures easy cleaning and disinfection.

# 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 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.

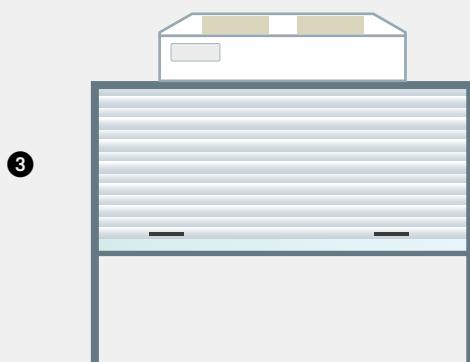
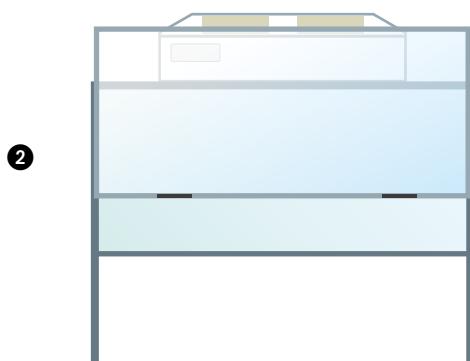
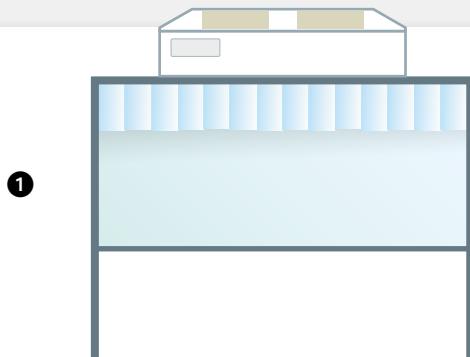
### Optional features:

- 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"**

0,5µm

### **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.

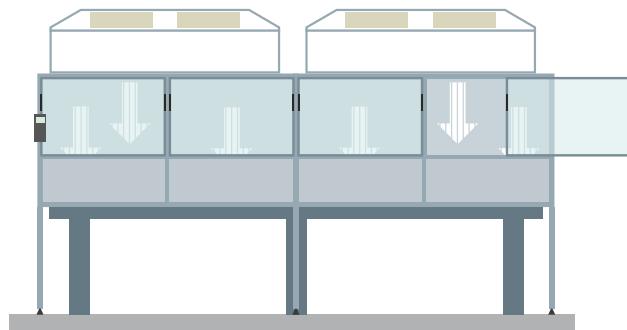
### Application examples:

#### Industry

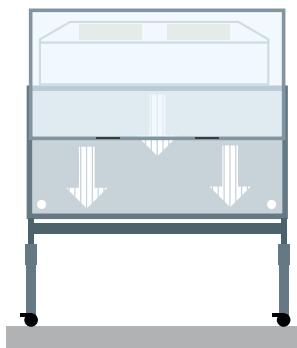
- Production machineries in plastics processing
- Filling systems for pharmaceutical products
- Packaging machines in the foodstuffs industry
- Assembly in the automotive industry – armatures, displays

#### Research and development

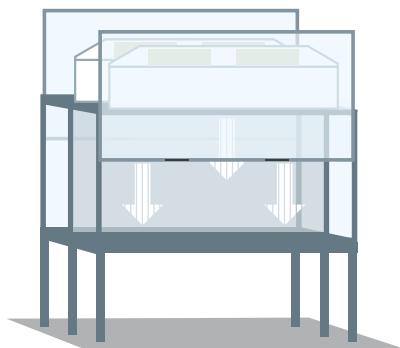
- Complete laser tables
- Laser systems
- Sample preparation in trace element analysis
- Optics and optoelectronics



Optical tables, straight and removable sliding door



Adjustable in height



Double sliding door

Housing of an optical table or a machine.



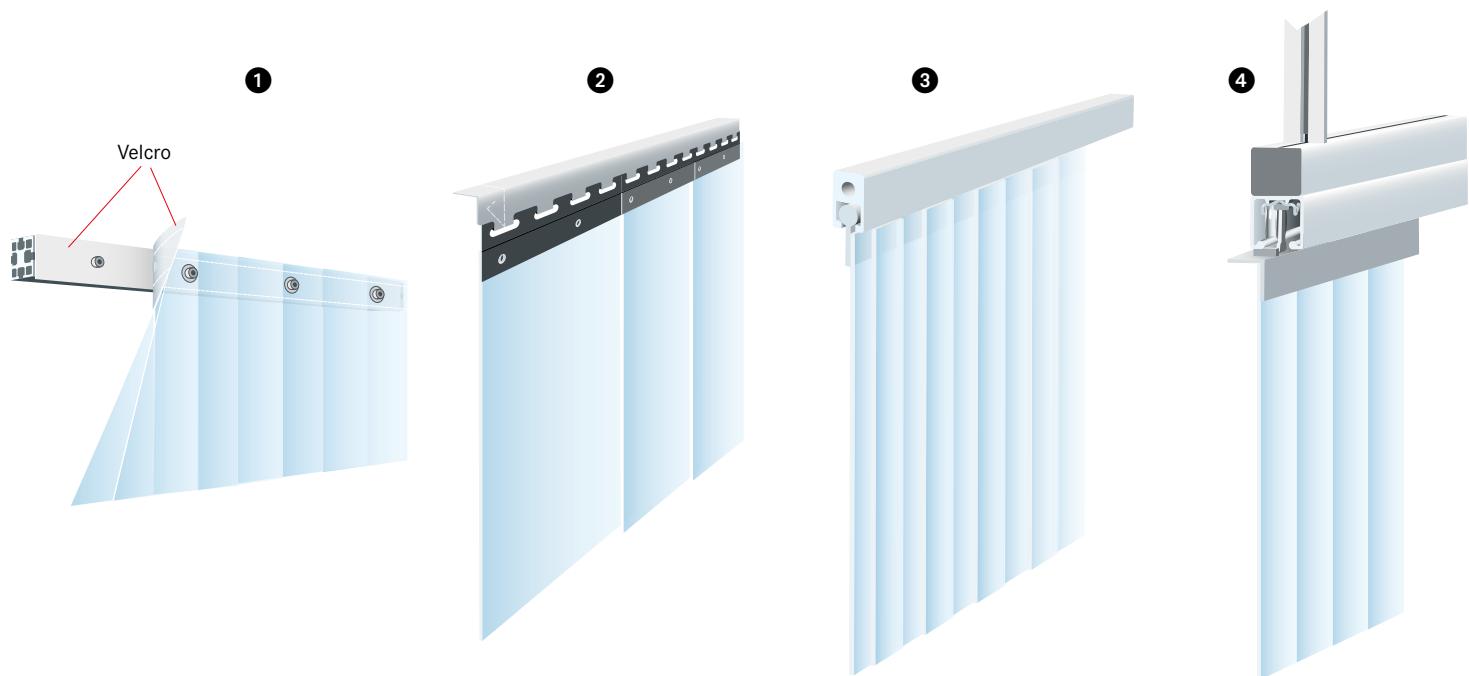
# Clean room technology

## 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> <ul style="list-style-type: none"> <li>- Curtain</li> <li>- Sliding door</li> <li>- Hinged door</li> </ul>
3	<b>Sliding door electrical/mechanical</b>
4	<b>Flush ceiling</b>
5	<b>Interlocking personnel lock</b>
6	<b>Flush wall system</b>
7	<b>Side panels</b> <ul style="list-style-type: none"> <li>- VSG – Laminated safety glass</li> <li>- Acrylic glass</li> <li>- Aluminium sandwich panels</li> <li>- Stainless steel</li> <li>- MDF</li> <li>- Clean room curtain</li> </ul>
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

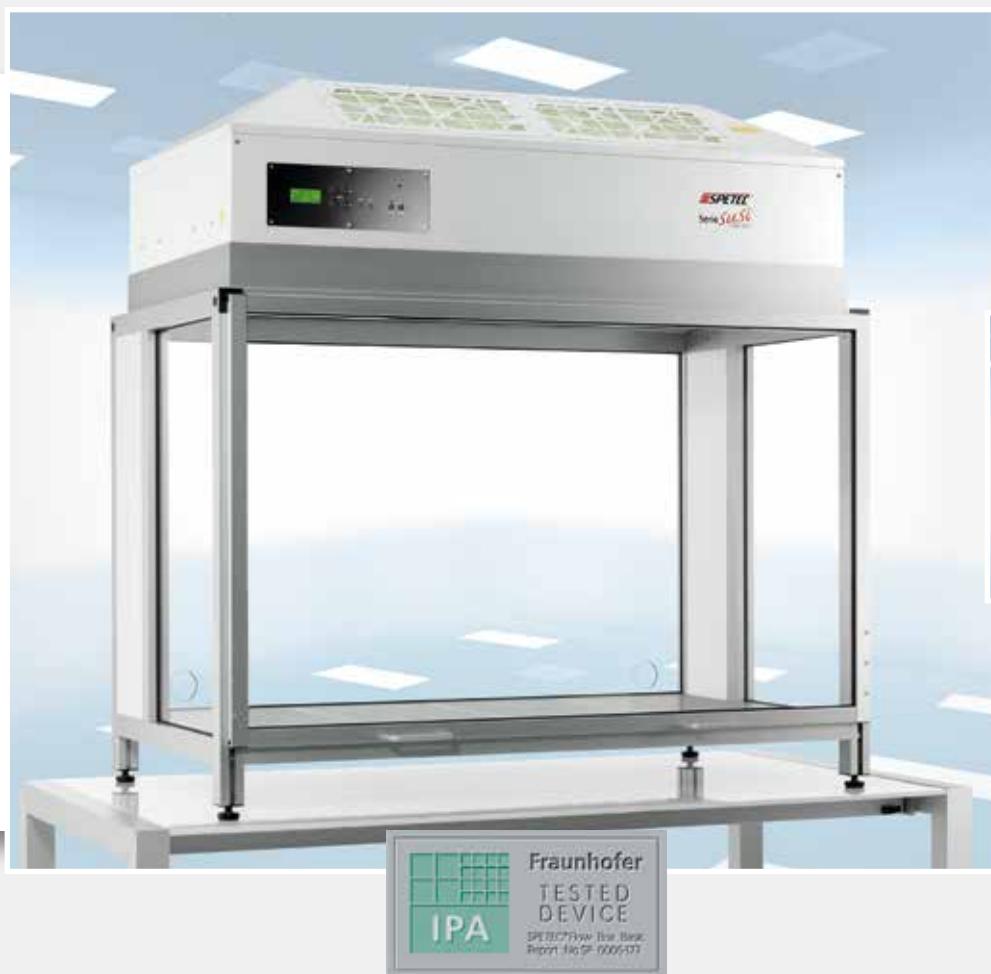


Clean room environment for packaging of pharmaceutical products

# 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	106

See page 30 – 31 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 µm (according to MPPS), the filter removes at least 99.995% of all particles. At a particle size of 0.3 µm, 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.

FMS 75  
flow rate 6  
0,45 m/sec.  
SPETEC h:000000



## 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.

## 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 31 for device dimensions.

FBS-Standard

# 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 30 – 31 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**  
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 31 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 30 – 31 for device dimensions.

Option
<b>Telescoping arm for extraction.</b> 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



## Dimensions:

Name	Device dimensions
Protection box PBS 37	
Protection box PBS 56	
Protection box PBS 75	see page 31
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 1,441 mm

# 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
Exhaust hood EBS 37	
Exhaust hood EBS 56	
Exhaust hood EBS 75	see page 31
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 1,441 mm

# Laminar flow box

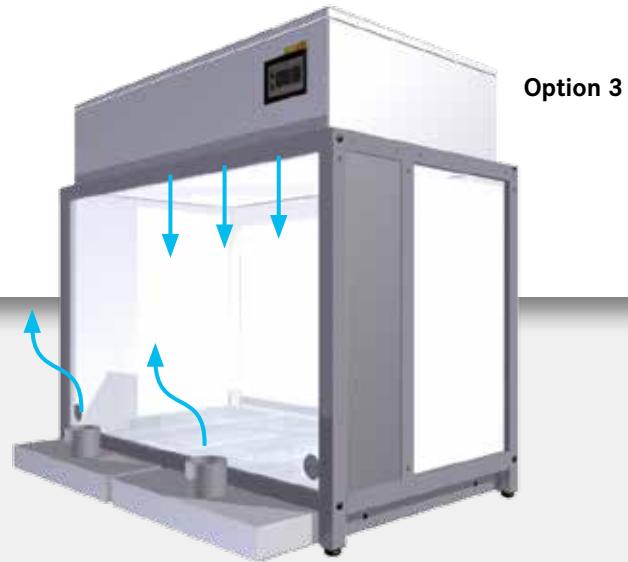
## Options



Option 1



Option 2



Option 3

Options	
1	<b>Base frame on casters.</b> As a table replacement for FBS series, providing you with a mobile cleanroom workplace.
2	<b>Laboratory cabinet with drawers.</b> Provides storage space to keep laboratory materials and other tools, only available in combination with option 1.
3	<b>Extraction well underneath the perforated worktop</b> 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.
4	<b>Interior light, FBS series fluorescent lamp.</b>
5	<b>230 V connection inside box.</b> Installation of a cleanroom-compatible triple outlet inside the box.
6	<b>Control via PLC interface.</b>
7	<b>Automatic flow adjustment</b> for FBS series and cleanroom workbench
8	<b>Automatic flow adjustment</b> for FMS series and cleanroom cell
9	<b>Automatic flow adjustment</b> for FBS-V series and EFBS-V series
10	<b>Ceiling mount</b>
11	<b>Stainless steel pre-filter cartridge</b> (size 37-56 per 2 units, size 75-112 per 4 units)

Options	
12	<b>Replacement H14 filter</b>
13	<b>H14 PTFE main filter</b>
14	<b>Pre-filter</b> (size 24-56 per 2 units, size 75-112 per 4 units)
15	<b>Worktop</b> made of solid stainless steel, not perforated
16	<b>Worktop</b> made of sealed hard laminate, not perforated
17	<b>ESD-compatible version</b> for FBS series
18	<b>ESD-gerechte Ausführung</b> für FBS-Serie „Standard“
19	<b>Plastic coating</b> , acid-resistant for FBS series
20	<b>Plastic coating</b> , acid-resistant for base frame on casters
21	<b>FMS series with master function</b> and wired remote control
22	<b>Telescoping arm</b> for exhaust hood

# Clean room work place

## CleanBoy® Mini

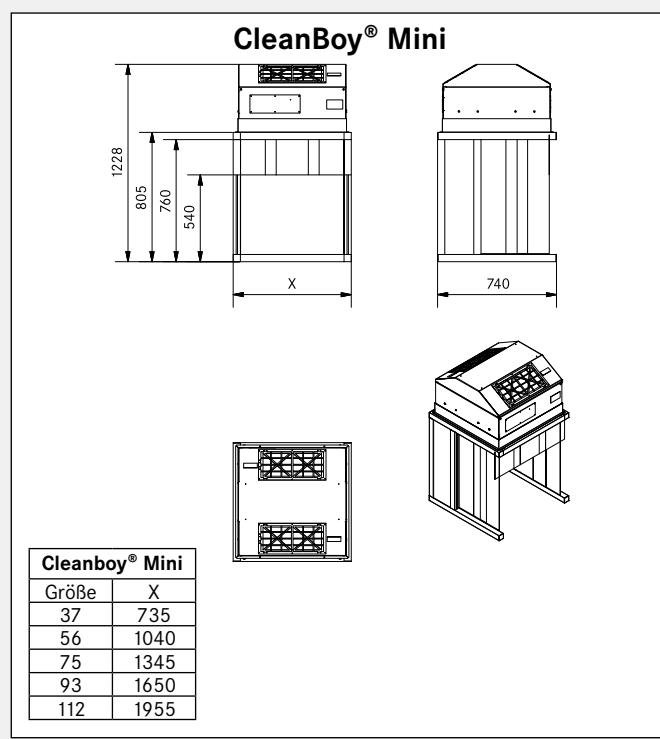
The Spetec clean room work place CleanBoy brings cleanliness to the exact work place where you need it.

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

*CleanBoy®*



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



**Application example** CleanBoy® work place

# Clean room work place

## CleanBoy® Maxi

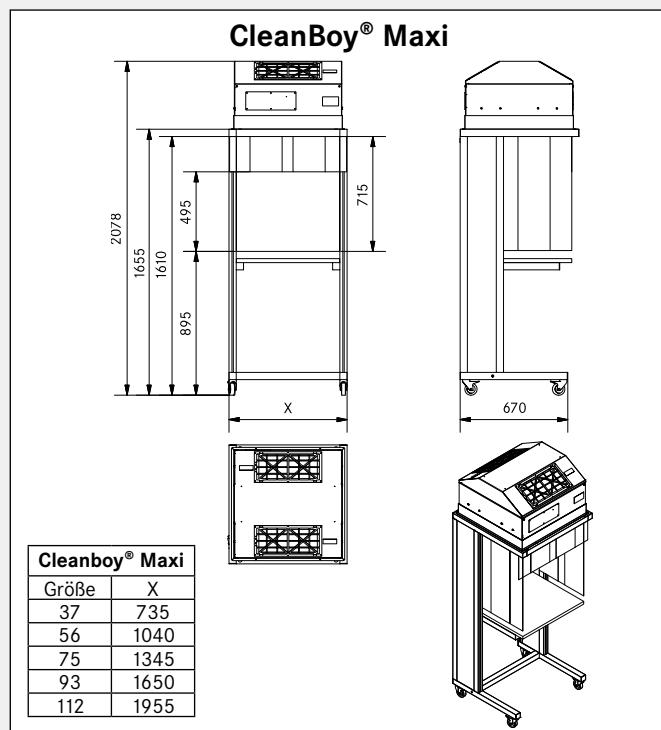


The CleanBoy® Mini or Maxi consists of a laminar flow module series SuSi and a supporting frame made from anodized aluminium. Work can be performed on the table top under ISO 5 clean room conditions.

**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.

Cleanboy® Maxi	
Größe	X
37	735
56	1040
75	1345
93	1650
112	1955

# Clean room work place

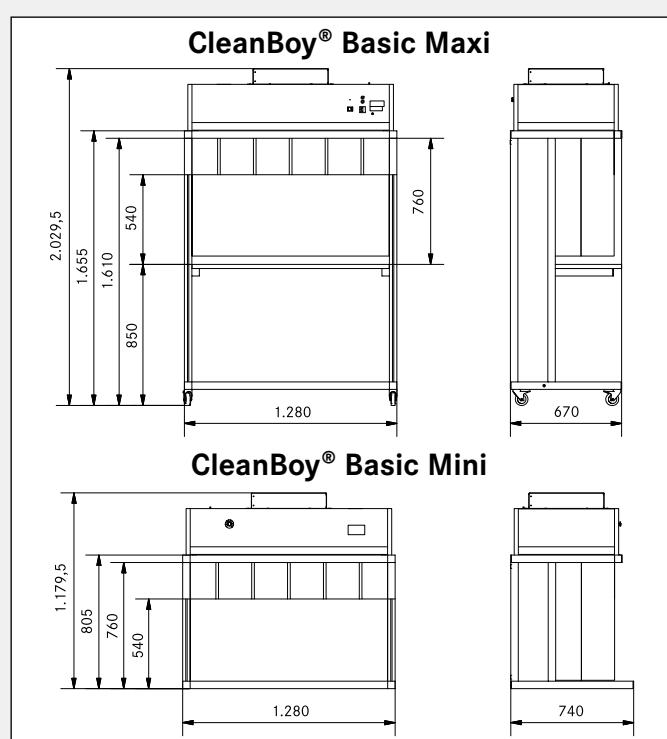
## CleanBoy® Basic



**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.



# 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

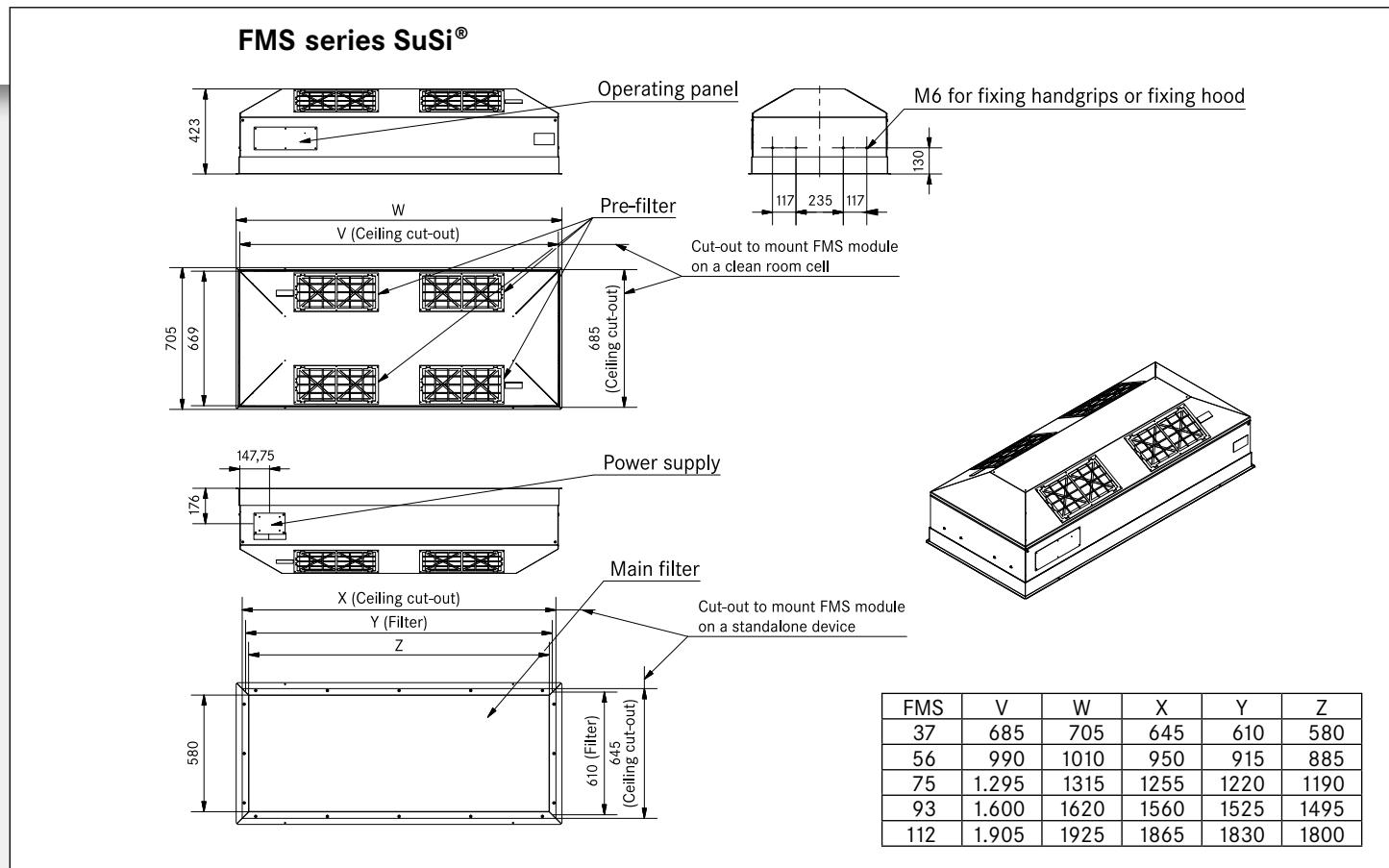
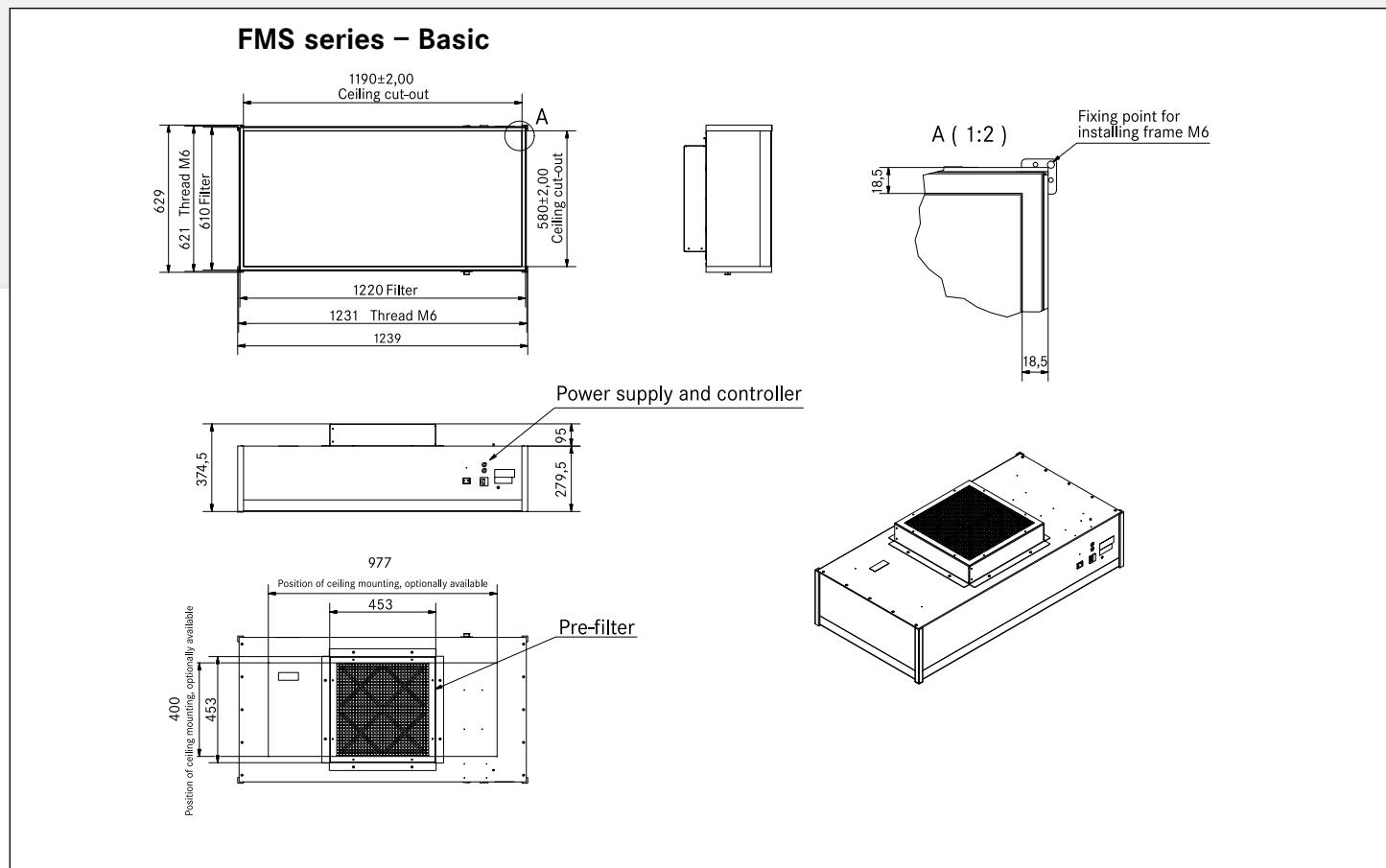
The main filter can be changed from the top or bottom of the unit. This reduces the contamination of the clean room - depending on the local conditions - to a minimum.



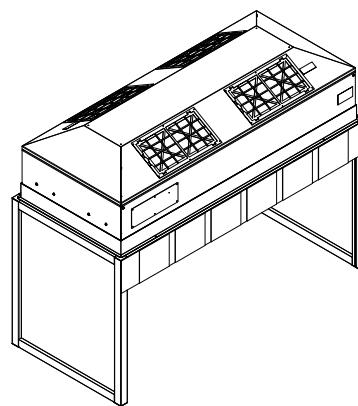
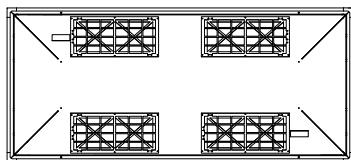
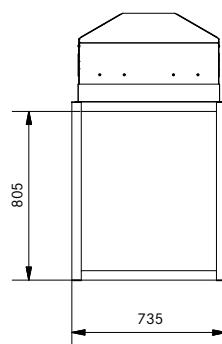
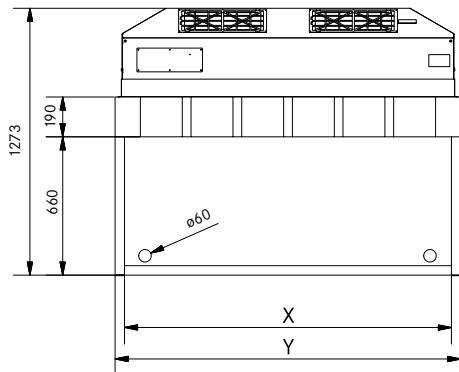
It is easy to remove the main filter by simply releasing the filter replacement cassette.

# Clean room technology

## Technical drawings

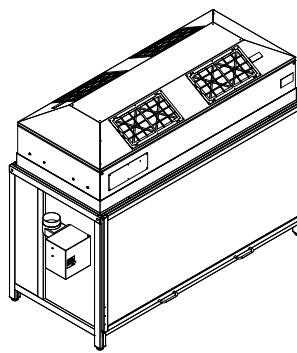
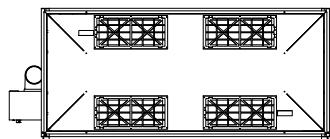
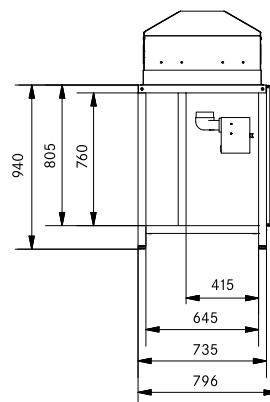
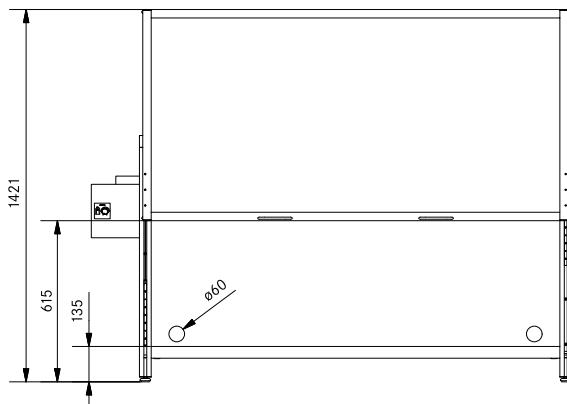
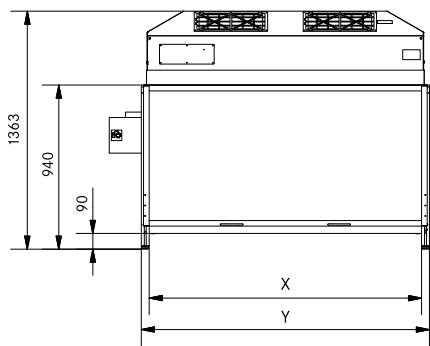


### FBS series – standard



FBS	X	Y
37	645	735
56	950	1040
75	1255	1345
93	1560	1650
112	1865	1955

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



FBS	X	Y
37	645	735
56	950	1040
75	1255	1345
93	1560	1650
112	1865	1955

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