Laminar flow systems

Translation of the original operating instructions

SPETEC®

6.0 2020

Legal notice

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Foreword

Thank you for choosing to purchase a clean room system from Spetec. The clean room system is ideal for use in industry and research.

The following pages provide instructions on proper and careful use of your clean room system as well as information for servicing and maintenance.

Table of contents

1 EC Declaration of Conformity

In accordance with the **Low Voltage Directive 2014/35/EU**
and the **Machinery Directive 2006/42/EC**
and the **Electromagnetic Compatibility Directive 2014/30/EU**

We hereby declare that the following product, on the basis of its design and construction, in the configuration placed on the market by us, satisfies the fundamental requirements of the aforementioned EU/EC directives.

Product **Product description**	**FMS 24 –112/2017** **Laminar flow module**

Standards applied:

Safety	EN 292 EN 294 EN 60024-1 EN 954-1 EN 61310-1
Electromagnetic Compatibility (EMC)	EN 55011:2009, Group 1, Class B EN 61000-3-2:2006+A1:2009+A2:2009, Class A EN 61000-6-2:2005

This Declaration of Conformity shall cease to be valid if the machine is converted or modified without our consent.

This declaration is made for and on behalf of the manufacturer.

Spetec GmbH
Am Kletthamer Feld 15
85435 Erding, Germany

Issued by: Karl Mairoth
Position in company: Product Manager

Erding, Germany — Place
26 March 2018 — Date
 — Signature

2 General information

2.1 General information concerning these instructions

Please read these instructions in full before commissioning the clean room system. They outline the way in which it should be used and point out potential hazards.

2.2 Explanation of symbols

The clean room cell is not designed for accessing the ceiling area.

When installing a clean room system or carrying out a filter change, do no step under suspended loads or parts.

2.3 Structure of safety information

The safety information in these instructions is presented in a standardised format with standardised symbols. Observe the information provided. The hazard classes outlined are used according to the likelihood of occurrence and the severity of the consequence.

Safety information

⚠ DANGER!

Imminent hazard with high risk
This could result in death or serious injury if the risk is not avoided.

⚠ WARNING!

Potential hazard with moderate risk
This could result in death or serious injury if the risk is not avoided.

⚠ CAUTION!

Hazard with low risk
This could result in minor or moderate injury or material damage if the risk is not avoided.

Information

NOTICE

Mandatory instructions.
User tips and other especially useful information.

2.4 On these operation instructions

Instructions

Steps that need to be carried out are presented as numbered lists. The sequence of the steps must be followed.

Example:

1. Step
2. Step

The results of an instruction are presented as follows:

- ▶ Result 1
- ▶ Result 2

Lists

Lists without a strict sequence are presented as bullet-point lists.

Example:

- Point 1
- Point 2

2.5 Intended target groups

The target groups for these operating instructions are operating and maintenance personnel, i.e. trained and instructed technicians or trained production workers. These persons carry out work in accordance with the authorisation granted by the operating company. These persons must have the expertise required to carry out the work based on their professional training or comparable on-the-job training and be able to carry out the work properly and with skill that takes into account safety and potential hazards. Their work shall be briefed, checked and overseen by trained supervisory personnel/specialist personnel appointed by the operating company. Only trained specialist personnel with appropriate personal protective equipment may enter the clean room cell to carry out a filter change.

2.6 Type plate

Each product group has a type plate bearing the key data in accordance with the Machinery Directive 2006/42/EC.

In the event that a clean room system comprises multiple parts, a part number (Pn) and type plate must be affixed for each clean room system.

In the event of individual solutions, the type plate is attached to the cable remote control.

3 Technical data

3.1 Clean room systems

Clean room systems

- FMS series SuSi
- FMS basic
- FBS series SuSi
- FBS-V series SuSi
- FMS series standard
- EBS series SuSi
- EFBS series SuSi
- EFBS-V series SuSi

Power supply	230 V AC
Frequency	50/60 Hz
Fuse	Si: M 3.15 A
Temperature range	+10°C to +50°C
Humidity	20% to 80% non-condensing

Clean room systems with acid-resistant fume cupboard

- EFBS series SuSi
- EFBS-V series SuSi
- EBS series SuSi

Power data for acid-resistant extraction	
Brushless EC motor power supply	230 V AC
Frequency	50/60 Hz
Power consumption	20 W
Fuse	Si: M 1.60 A
Extraction power	max. 60 m^3/h
Air vents, diameter	100 mm
Temperature range	+10°C to +50°C
Humidity	20% to 80% non-condensing

Clean room workstations

- CleanBoy maxi
- CleanBoy mini
- CleanBoy basic

Power supply	230 V AC
Frequency	50/60 Hz
Fuse	Si: M 3.15 A
Temperature range	+10°C to +50°C
Humidity	20% to 80% non-condensing

3.2 Power consumption

3.2.1 Laminar flow module

FMS series SuSi

Size	Average power consumption at 0.4 m/s in W	Maximum power consumption in W
37	60	265
56	85	265
75	125	510
93	155	510
112	140	510

FMS series basic

Size	Average power consumption at 0.4 m/s in W	Maximum power consumption in W
75	115	285

3.2.2 Clean room stations and workstations

CleanBoy basic

Size	Average power consumption at 0.4 m/s in W	Maximum power consumption in W
75	115	285

3.3 Filter sizes

3.3.1 Laminar flow module

FMS series SuSi

Designation	Filter dimensions in mm	Weight in 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

FMS series basic

Designation	Filter dimensions in mm	Weight in kg
Laminar flow module FMS 75	1220 x 610	30

3.3.2 Laminar flow boxes

FBS series SuSi

Designation	Filter dimensions in mm	Weight in 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

FMS series standard

Designation	Filter dimensions in mm	Weight in 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

EFBS series SuSi

Designation	Filter dimensions in mm	Weight in kg
Laminar flow box EFBS 37	610 x 610	84
Laminar flow box EFBS 56	915 x 610	99
Laminar flow box EFBS 75	1220 x 610	121
Laminar flow box EFBS 93	1525 x 610	136
Laminar flow box EFBS 112	1830 x 610	152

EFBS-V series SuSi

Designation	Filter dimensions in mm	Weight in kg
Laminar flow box EFBS-V 37	610 x 610	71
Laminar flow box EFBS-V 56	915 x 610	81
Laminar flow box EFBS-V 75	1220 x 610	101
Laminar flow box EFBS-V 93	1525 x 610	115
Laminar flow box EFBS-V 112	1830 x 610	126

FBS-V series SuSi

Designation	Filter dimensions in mm	Weight in kg
Laminar flow box FBS-V 37	610 x 610	64
Laminar flow box FBS-V 56	915 x 610	74
Laminar flow box FBS-V 75	1220 x 610	94
Laminar flow box FBS-V 93	1525 x 610	108
Laminar flow box FBS-V 112	1830 x 610	119

3.3.3 Clean room stations and workstations

CleanBoy mini/maxi

Designation	Filter dimensions in mm
CleanBoy 37	610 x 610
CleanBoy 56	915 x 610
CleanBoy 75	1220 x 610
CleanBoy 93	1525 x 610
CleanBoy 112	1830 x 610

CleanBoy mini/maxi basic

Designation	Filter dimensions in mm
CleanBoy basic 75	1220 x 610

3.4 Dimensions

The dimensions apply for the following clean room systems:

- FBS series
- EFBS series
- PBS series
- EBS series

Size	Dimensions in mm
37	645 x 735
56	950 x 1040
75	1255 x 1345
93	1560 x 1650
112	1865 x 1955

The dimensions apply for the following clean room systems:

- CleanBoy mini
- CleanBoy maxi

Size	Width in mm
37	735
56	1040
75	1345
93	1650
112	1955

3.5 Internal dimensions of the frame of the laminar flow module

Internal dimensions of the frame from above

Designation	Width in mm	Length in mm
Laminar flow module FMS 37	645	645
Laminar flow module FMS 56	645	950
Laminar flow module FMS 75	645	1255
Laminar flow module FMS 93	645	1560
Laminar flow module FMS 112	645	1865

Internal dimensions of the frame from below

Designation	Width in mm	Length in mm
Laminar flow module FMS 37	680	685
Laminar flow module FMS 56	680	990
Laminar flow module FMS 75	680	1295
Laminar flow module FMS 93	680	1600
Laminar flow module FMS 112	680	1905

4 Safety

4.1 General safety information

⚠ DANGER!

Danger of death due to electrical voltage to 230 V/50 Hz

This could result in death or serious injury.

- Do not touch live parts.
- Do not attach earths to mechanical connecting elements.

⚠ DANGER!

Danger of death due to residual voltages in capacitors on fan motors.

Contact with fan motors could result in death or serious injury.

- Do not touch metallic parts.
- Conversion work and maintenance may only be carried out with the clean room system switched off and secured against reactivation.

⚠ WARNING!

Risk of injury due to voltages on the clean room system

This could result in serious injury or death.

- Remove the mains plug of the clean room system before opening the clean room system.

⚠ WARNING!

Risk of injury due to rotating parts

This could result in serious injury or death.

- Do not reach into mechanical moving parts.
- Conversion work and maintenance may only be carried out with the clean room system switched off and secured against reactivation.

⚠ WARNING!

Risk of injury due to falling parts

This could result in serious injury or death.

- Do not stand under the main filter when carrying out a main filter change.
- A filter change must be carried out by two people.
- Do not stand under suspended loads when installing the clean room system.

⚠ WARNING!

Risk of injury due to restoration of energy supply after an interruption

This could result in serious injury or death.

- Troubleshooting and maintenance may only be carried out with the clean room system switched off and secured against reactivation.

4.2 Safety equipment

The clean room system does not have a mechanical emergency stop.

Safety equipment	Function
Contact protection	The pre-filter is protected by a grille to prevent objects from falling into the air inlet.

4.3 Personal protective equipment

To prevent accidents, operating and maintenance personnel must wear personal protective equipment.

	**Protective work clothes** Protective work clothes are close-fitting clothes with low tear resistance, narrow sleeves and no protruding parts. They are primarily designed to prevent the user from becoming caught on moving machine parts. Do not wear rings, chains and other jewellery.
	**Safety goggles** Wear non-breakable safety goggles with side protection as compressed-air, splashed water and flying chips can cause serious eye damage, including loss of sight.
	**Ear protection** Ear protection must be worn to prevent hearing damage. Ear protection must be worn if exceptional operations cause noise emissions to exceed the legal limit of 70 dB(A).
	**Safety shoes** Safety shoes are designed to protect against heavy falling parts and slipping on slippery ground.

4.4 Foreseeable misuse

Disregard of the information provided or of the intended use can lead to (permanent) damage to the clean room system. It can also lead to impaired operational safety.

The clean room system must not be operated under the following conditions:

- Outside of the national stipulations and rules.
- Outside of the values defined in the technical data.
- Where there is a risk of direct lightning strike or impact in the vicinity.

4.5 Before use

- Check that the supply voltage matches that on the type plate.
- Observe the legal stipulations for electrical commissioning.
- The clean room system may only be connected to a socket fitted with a protective conductor terminal.
- Do not reach into mechanical moving parts.
- Remove the mains plug before opening the casing.
- Remove the mains plug before changing the fuse. Use only the fuse types listed here.
- Conversions and attachments to the clean room system are permitted **only with the consent** of Spetec.

5 Description of the clean room system

Product series:

- Laminar flow module (FMS series)
- Laminar flow boxes (FBS, EFBS series)
- Protection box (PBS series)
- Exhaust (protection) box (EBS series)
- Clean room stations and workstations (CleanBoy)

The series of devices is modular in construction, which means that individual components are mutually compatible and expandable.

5.1 Laminar flow module

The following versions of the laminar flow module are available:

- FMS series SuSi
- FMS series basic

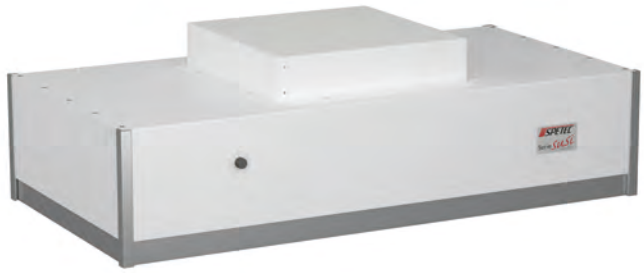
The FMS series is a filter module equipped with pre-filters and a main filter of type H 14.

FMS series SuSi

The FMS series SuSi is a filter module with a display and can be converted into a laminar flow box.

FMS series basic

The FMS series basic does not have a display and cannot be converted into a laminar flow box.



5.2 Laminar flow box

5.2.1 Laminar flow box

The following versions of the laminar flow box are available:

- FBS series
- FBS series standard
- FBS-V series

The laminar flow box is designed as a table-top device and is used as product protection when manufacturing products and for storing objects in clean room conditions.

FBS series

The FBS series is a table-top device with sliding door and perforated metal shelves.

FBS series standard

The FBS series standard is a table-top device without sliding door and perforated metal shelves.

FBS-V series

The FBS-V series is a laminar flow module with clean room strip curtain. The curtain is 2000 mm long, but can be made according to customer specifications.

5.2.2 Exhaust flow box

The following versions of the exhaust flow box are available:

- EFBS series
- EFBS-V series

The EFBS series is a laminar flow box that is additionally equipped with an acid-resistant extraction device. The extraction device is connected to a domestic extraction system by a pipe.

EFBS series

The EFBS series is a laminar flow box with integrated acid-resistant extraction device.

EFBS-V series

The EFBS-V series is a laminar flow box with integrated acid-resistant extraction device and a clean room strip curtain. The curtain is 2000 mm long, but can be made according to customer specifications.

5.3 Protection box

PBS series

The protection box is a table-top device. It does not have a filter attachment. It can be retrofitted with a filter attachment to convert it into a laminar flow box.

The PBS series is used as a clean room workstation and is designed for dust-proof storage of objects.

5.4 Exhaust (protection) box

EBS series

The EBS series is a table-stop fume cupboard with integrated acid-resistant extraction device.

5.5 Clean room stations and workstations

The following versions of the clean room station and workstation are available:

- CleanBoy mini
- CleanBoy maxi
- CleanBoy basic

The CleanBoy comprises a SuSi series laminar flow module and a mounting frame.

CleanBoy mini

The CleanBoy mini is a table-top device.

CleanBoy maxi

The CleanBoy maxi is a standalone device.

CleanBoy basic mini

The CleanBoy basic mini is a table-top device and is equipped with a basic series laminar flow module.

CleanBoy basic maxi

The CleanBoy basic maxi is a standalone device and is equipped with a basic series laminar flow module.

6 Installing the clean room system

⚠ DANGER!

Danger of death due to electrical voltage to 230 V/50 Hz
This could result in death or serious injury.

- Do not touch live parts.
- Do not attach earths to mechanical connecting elements.

⚠ WARNING!

Risk of injury due to rotating parts
This could result in serious injury or death.

- Do not reach into mechanical moving parts.
- Conversion work and maintenance may only be carried out with the clean room system switched off and secured against reactivation.

NOTICE

Note the weight and mounting points of your laminar flow module, see Chapter 3.3, "Filter sizes".

NOTICE

Handles may be obtained from Spetec for easier installation.
Use suitable lifting equipment for laminar flow modules.

The following clean room systems must undergo installation before commissioning:

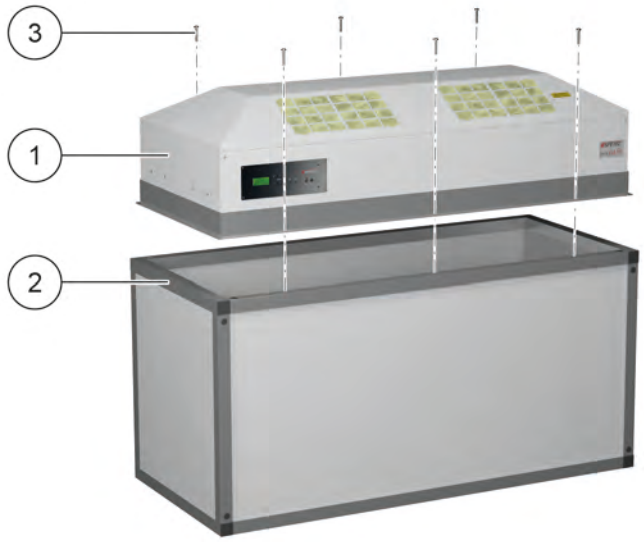
- FMS series SuSi
- FMS series basic
- FBS-V series SuSi
- EFBS-V series SuSi

6.1 Installing the FMS series SuSi

The FMS series SuSi can be installed in the following locations:

- On a machine
- Above a table or workstation
- On the ceiling of a building

FMS series SuSi installation from above



1 FMS series SuSi

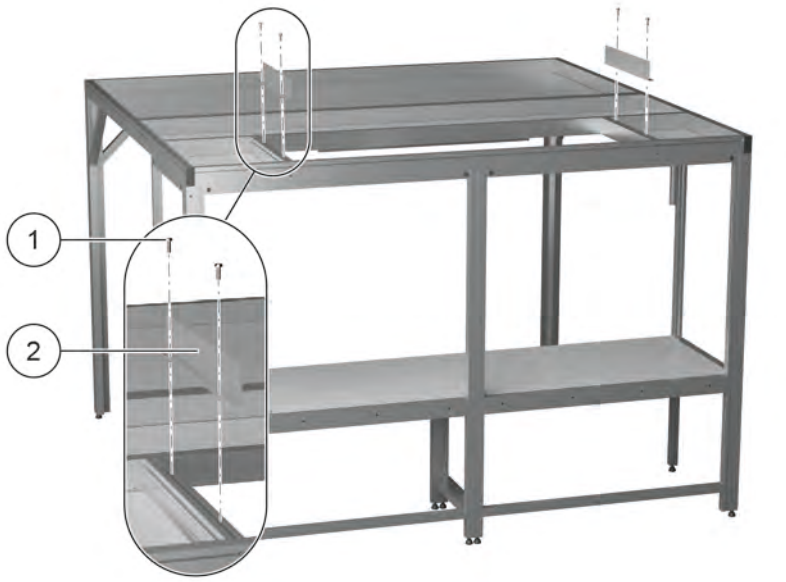
2 Profile frame

3 M6 fillister head screws

1. Position the FMS series SuSi (1) flush on the profile frame (2). The internal dimensions of the profile frame can be found in the technical data, see Chapter 3.5, "Internal dimensions of the frame of the laminar flow module".
2. Screw the FMS series SuSi firmly to the profile frame using M6 fillister head screws (3).
3. Check that the FMS series SuSi is firmly positioned.

FMS series SuSi installation from below

NOTICE
Installing the laminar flow module from below allows for a main filter change from below.



1 Screw

2 Mounting (not included)

3 FMS series SuSi

4 Screw

1. Slide the FMS series SuSi (3) through the profile frame from below. The internal dimensions of the profile frame can be found in the technical data, see Chapter 3.5, "Internal dimensions of the frame of the laminar flow module".
2. Secure the FMS series SuSi with a mounting (2).

3. Screw the FMS series SuSi to the profile frame.
4. Check that the profile frame is above the module frame and holds the ceiling bracket on which the ceiling panels are positioned.

Installing a laminar flow module on the ceiling of a building

1 Ceiling attachments

1. Fit the four ceiling mountings on the ceiling of the building.
2. Secure the four ceiling attachments to the FMS series SuSi.
3. Hook the FMS series SuSi into the ceiling mountings.
4. Check that the FMS series SuSi is firmly positioned.

6.2 Installing the FMS basic

⚠ WARNING!

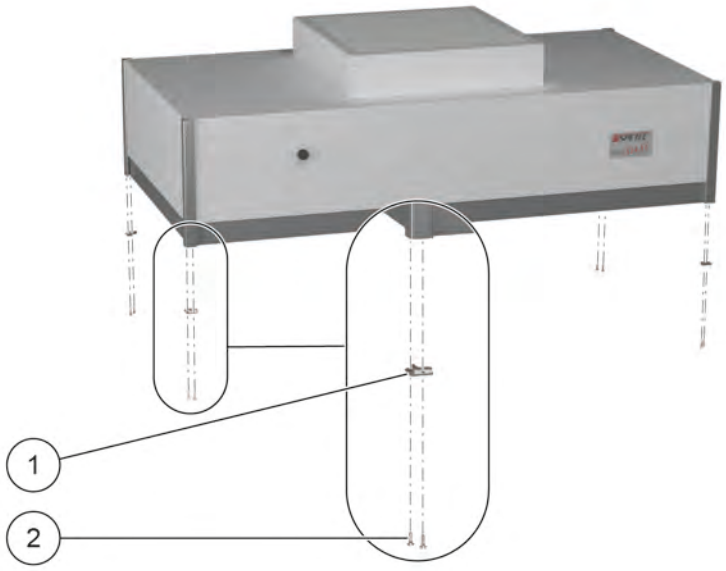
Risk of injury due to falling main filter
This could result in serious injury or death.

- Undo the lock plates only when carrying out installation and maintenance.
- Installation must be carried out by two people.

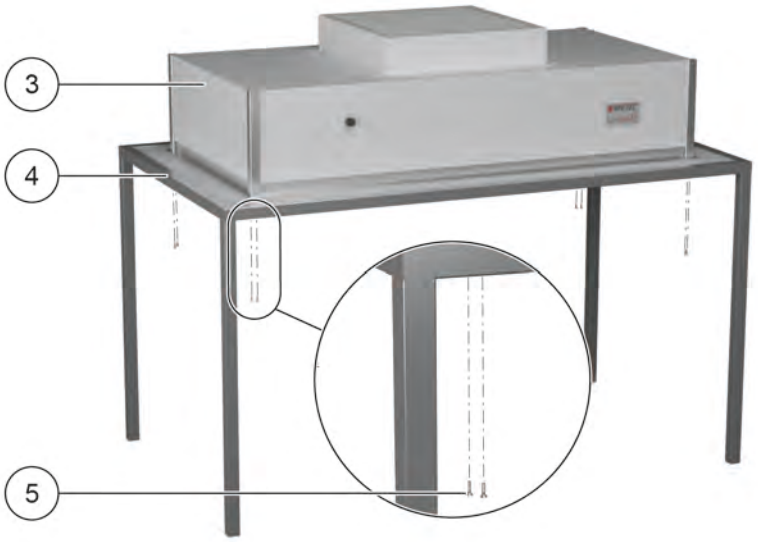
The FMS series basic can be used in the following locations:

- As a separate filter unit on a machine
- In combination with a clean room cell

Installation on a mounting frame



1 Lock plate
2 Countersunk screws



3 FMS series basic
4 Mounting frame
5 M6 screws

1. Undo the countersunk screws (2) using a hexagonal screwdriver 2.5 or Torx Tx20.
2. Remove the lock plate (1).
3. Position the FMS series basic (3) flush on the mounting frame (4).
4. Screw the FMS series basic to the mounting frame using M6 screws (5).
5. Check that the FMS series basic is firmly positioned.

6.3 Installing the FBS-V series SuSi and EFBS-V series SuSi

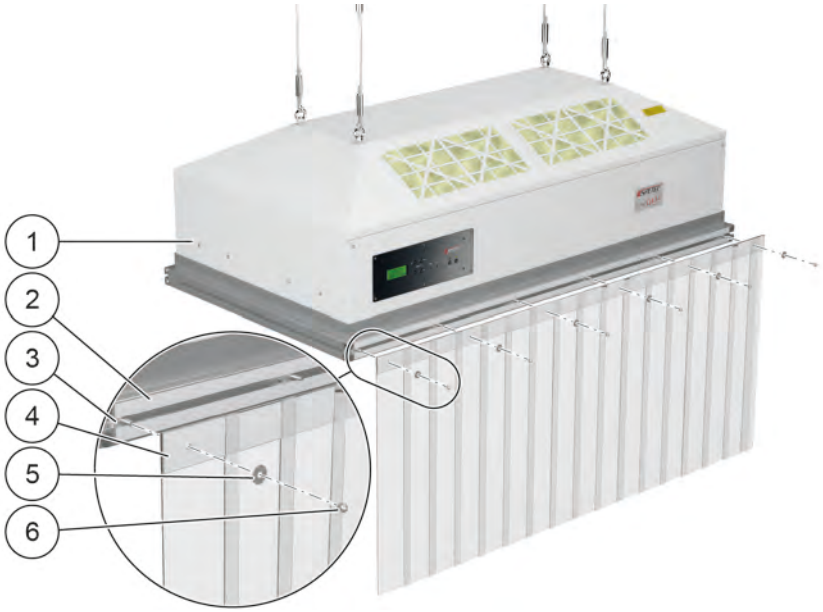
NOTICE

Note the weight and mounting points of your laminar flow module, see Chapter 3.3, "Filter sizes".

NOTICE

Handles may be obtained from Spetec for easier installation.
Use suitable lifting equipment for laminar flow modules.

Instead of a box made from acrylic glass panes, the FBS-V series SuSi and EFBS-V series SuSi have a clean room strip curtain. Consequently, the four mounting points on the FMS series SuSi must be attached to a ceiling mounting.



1 FMS series SuSi
2 Profile
3 Slot nut
4 Clean room strip curtain
5 Washer
5 Cap nut

1. Install the FMS series SuSi (1) on the ceiling of the building, see Chapter 6.1, "Installing the FMS series SuSi".
2. Attach the clean room strip curtain (2) according to the mark by sliding the holes of the clean room strip curtain onto the threaded rods.
3. Adjust the clean room strip curtain so that its ends seal flush with the device casing.
4. Secure the clean room strip curtain using washers (5) and cap nuts (6).

7 Commissioning

⚠ DANGER!

Danger of death due to residual voltages in capacitors on fan motors.
Contact with fan motors could result in death or serious injury.

- Do not touch metallic parts.
- Conversion work and maintenance may only be carried out with the clean room system switched off and secured against reactivation.

Commissioning is carried out in stages:

1. Setup/installation of the clean room system, see Chapter 6, "Installing the clean room system".
2. Connection of the clean room system, see Chapter 7.2, "Connectors".
3. Switch-on and setting of the clean room system, see Chapter 8, "Operation".

7.1 Connecting the cables

NOTICE

There is no fixed sequence for connecting the cables. Nevertheless, Spetec recommends connecting the control cables first and then the cold-device plug for the 230 V power supply.

NOTICE

The maximum power consumption of the light output and mains output is 200 W. This value must not be exceeded.

Cold-device plug

The cold-device plug (supplied) is used to establish the power supply and inserted into the **power** socket.

Control cables

The 7-pin control cable (remote) is used to connect multiple modules (master/slave) and to connect the cable remote control. This connection is wired internally only, no signals can be processed.

Cold-device sockets

Additional equipment such as lights or signal lamps can be connected to cold-device sockets. A maximum load of 200 W must not be exceeded at either connection.

7.2 Connectors

SuSi clean room system connectors

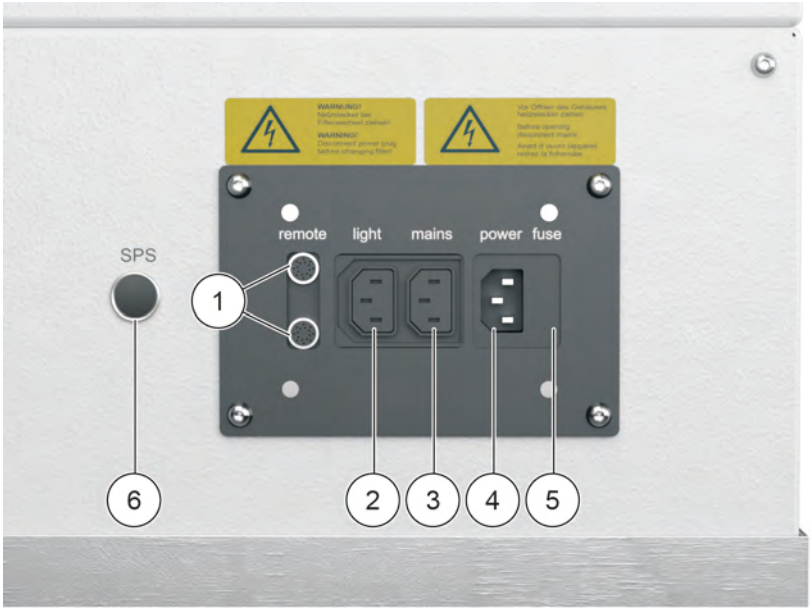


Fig. 1: Cable connections

1 Control (7-pin)
2 Light output
3 Mains output
4 Power supply
5 Device fuse
6 PLC connection (10-pin)*

*PLC connection can be optionally installed at the time of purchase. Please observe the supplementary instructions.

1. If necessary, connect multiple modules using the control (7-pin).
2. If necessary, connect a cold-device plug to the light output.
3. If necessary, connect a cold-device plug to the mains output.
4. Connect the supplied cold-device cable to the power supply.
5. Connect the power supply cable to a free socket.

▶ The clean room system is ready for operation.

Basic clean room system connector

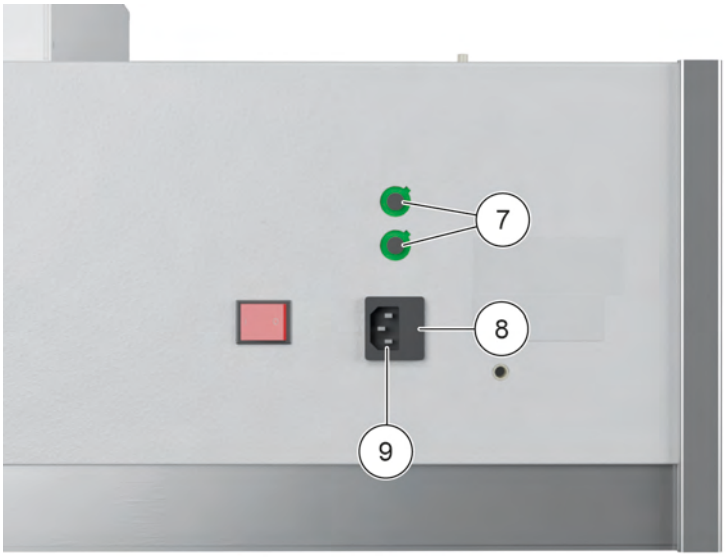


Fig. 2: Cable connections

7 Remote connection

8 Device fuse

9 Power supply

1. Connect the supplied cold-device cable to the power supply.
2. Connect the power supply cable to a free socket.

▶ The clean room system is ready for operation.

8 Operation

⚠ DANGER!

Danger of death due to electrical voltage to 230 V/50 Hz
This could result in death or serious injury.

- Do not touch live parts.
- Do not attach earths to mechanical connecting elements.

8.1 SuSi clean room systems

NOTICE

If **call service** appears on the display, please contact customer services.

Display

Fig. 3: 4-row LC display

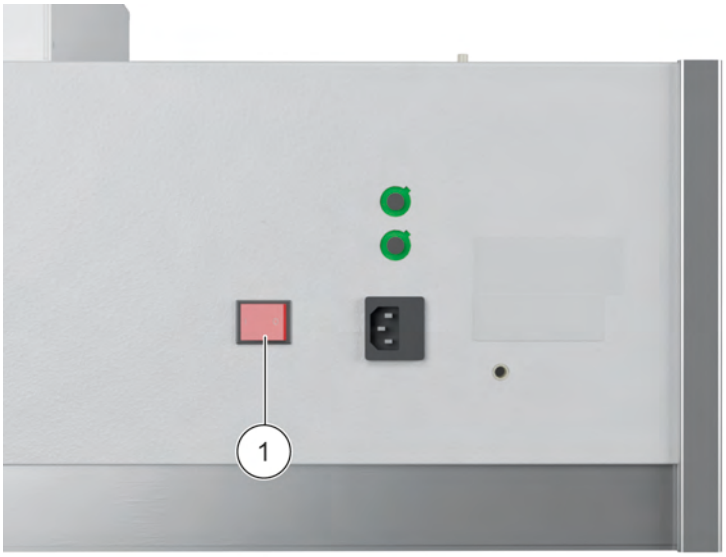
1 Type designation
2 Speed level
3 Flow speed indication in m/sec
4 Operating hours indication/call service

Settings

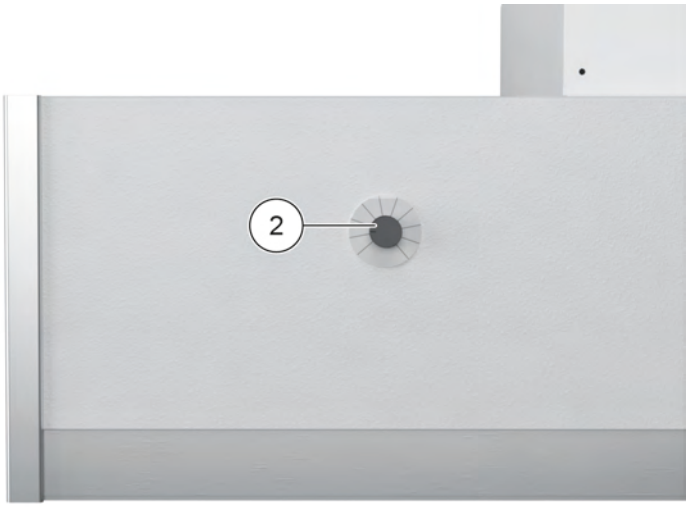
Button	Function	Explanation
+	Increase flow speed	Flow speed can be adjusted in increments. ▶ The following appear on the display: eco, 0.25m/s, 0.30m/s, 0.35m/s, 0.40m/s; 0.45m/s, 0.50 m/s, max.
-	Reduce flow speed	Flow speed can be adjusted in increments. ▶ The following appear on the display: eco, 0.25m/s, 0.30m/s, 0.35m/s, 0.40m/s; 0.45m/s, 0.50 m/s, max.
max	Flow speed max.	Fan runs at maximum speed. ▶ The clean room system is flushed.
eco	Flow speed min.	The clean room system is put into night economy. ▶ Fan runs on low to continuously flush the clean room system with air.
filter	LED main filter change	The main filter must be changed. ▶ See Chapter 10.2, "Filter change".
error	LED error	There is an error in the clean room system. ▶ See Chapter 9, "Troubleshooting".
light	Light on/off button	Switch the output light on/off. ▶ LED lights up, output light is on.
power	Mains on/off button	Switch the fan on/off. ▶ LED lights up, clean room system is supplied with power.

8.2 Basic clean room systems

Controls



1 Mains on/off switch

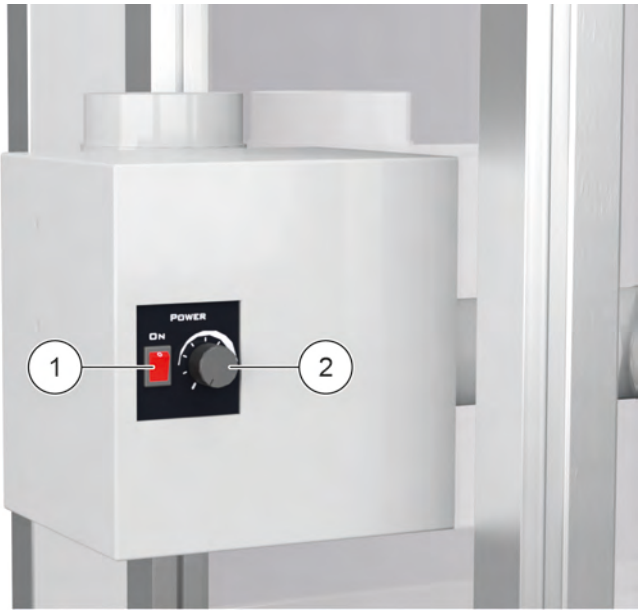


2 Flow speed setting

Function	Explanation
Mains on/off switch	Switch the fan on/off
Flow speed setting	Continuous adjustment of flow speed

8.3 EFBS, EFBS-V and EBS series clean room systems

Controls



1 Mains on/off switch

2 Extraction power setting

Function	Explanation
Mains on/off switch	Switch the fan on/off
Extraction power setting	Continuous adjustment of extraction power

9 Troubleshooting

⚠ WARNING!

Risk of injury due to restoration of energy supply after an interruption
This could result in serious injury or death.

- Troubleshooting and maintenance may only be carried out with the clean room system switched off and secured against reactivation.

NOTICE

In the event of errors in the control or electronics, please contact Spetec.

10 Maintenance

⚠ DANGER!

Danger of death due to residual voltages in capacitors on fan motors.
Contact with fan motors could result in death or serious injury.

- Do not touch metallic parts.
- Conversion work and maintenance may only be carried out with the clean room system switched off and secured against reactivation.

10.1 Care and service

NOTICE

If **call service** appears on the display, please contact customer services.

Pre-filter

1. Replace the pre-filter at least once annually according to the degree of soiling.
2. Visually check the degree of soiling in the pre-filter at regular intervals.

Service intervals

To ensure consistency of function and quality from the clean room system, regular maintenance is essential.
An annual service of the clean room system by a service technician is recommended.
In the event that ‘call service’ appears on the display, maintenance by a service technician is required.
This will include the following:

- Particle count in accordance with DIN ISO 14644-1
- Replacement of the pre-filter
- Replacement of the main filter, if necessary
- Mechanical inspection and, if necessary, repair
- Certification with confirmation of clean room class
- Specification of the measured particle count inside and outside of the Spetec clean room system

Spetec customer services contact information

Telephone: +49(0) 8122 95909-0
E-mail: spetec@spetec.de

10.2 Filter change

⚠ WARNING!

Risk of injury due to voltages on the clean room system

This could result in serious injury or death.

- Remove the mains plug of the clean room system before opening the clean room system.

⚠ WARNING!

Risk of injury due to falling parts

This could result in serious injury or death.

- Do not stand under the main filter when carrying out a main filter change.
- A filter change must be carried out by two people.
- Do not stand under suspended loads when installing the clean room system.

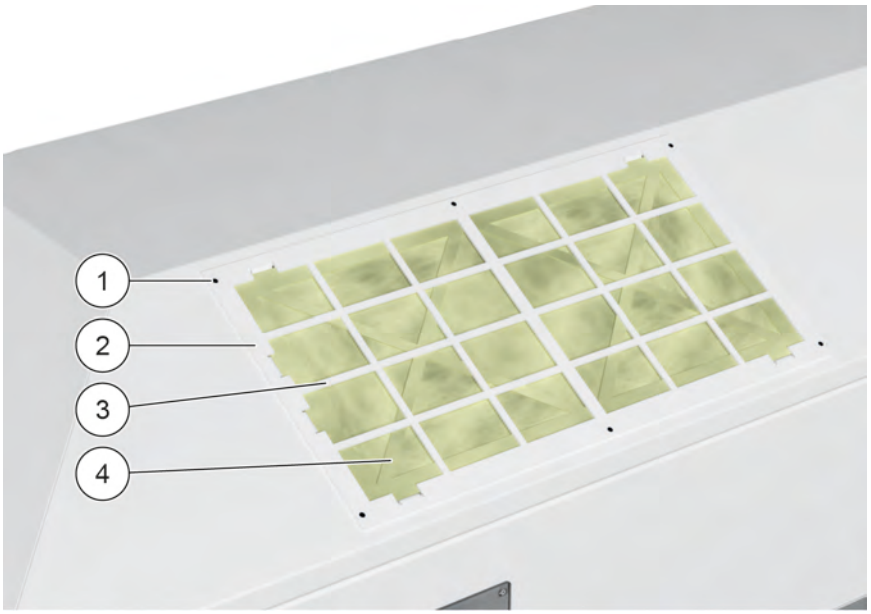
⚠ WARNING!

Risk of injury due to rotating parts

This could result in serious injury or death.

- Do not reach into mechanical moving parts.
- Conversion work and maintenance may only be carried out with the clean room system switched off and secured against reactivation.

10.2.1 Changing the pre-filter



1 Screws (6x)
2 Pre-filter with filter grille
3 Filter grille
4 Pre-filter

1. Remove the screws (1).
2. Remove the pre-filter and filter grille (2).
3. Slide the pre-filter (4) out of the filter grille (3).
4. Insert the new pre-filter (4) into the filter grille (3).
5. Fit the pre-filter and filter grille (2).

10.2.2 Changing the main filter on standalone devices

NOTICE

On standalone devices, do not change the filter from below.
Lift the laminar flow module upwards.

NOTICE

To prevent damage to the main filter, the inside of the main filter must not be subjected to point loads.

1 Filter module
2 Main filter
3 Screws (12x)

1. Undo the screws (3) inside.
2. Lift the filter module (1) upwards.
3. Remove the main filter (2).
4. Insert the new main filter (2).
5. Reposition the filter module (1).
6. Screw on the filter module (1) from inside.
   - ▶ The laminar flow module can be put back into operation.

A filter leak test in accordance with DIN 14644 is recommended after putting the module back into operation.

10.2.3 Changing the main filter on clean room cells and suspended laminar flow modules

⚠ WARNING!

Risk of injury due to falling main filter

This could result in serious injury or death.

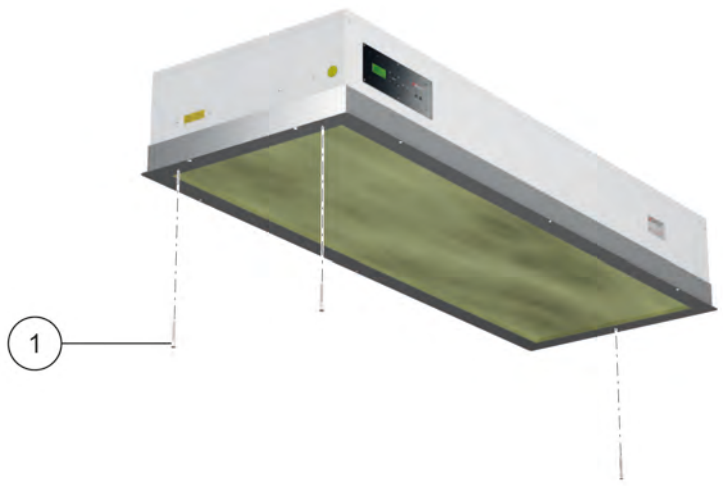
- Undo the lock plates only when carrying out installation and maintenance.
- A filter change must be carried out by two people.

NOTICE

The threaded rods must not turn when the wing nuts are turned.
A star grip may be used to hold the threaded rods in position.

On clean room cells and suspended laminar flow modules, the main filter is changed from below. To do this, the profile frame can be lowered with the aid of a changing unit and the main filter replaced.

1. Undo the countersunk screws (1).
2. Remove the four lock plates.

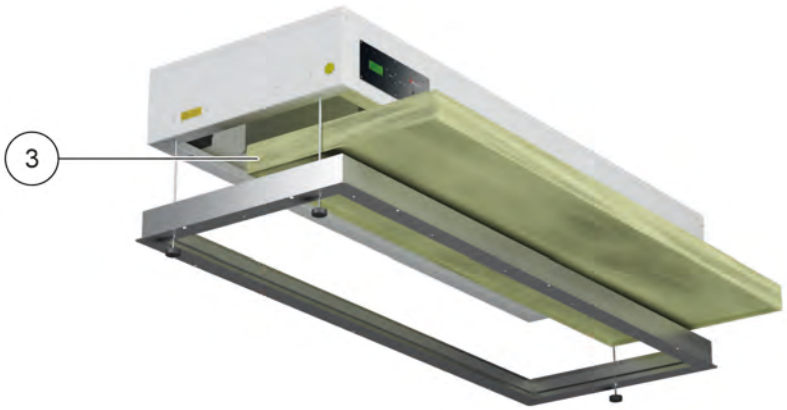


1 Countersunk screws (3x)

3. Screw in the changing unit (2) until the red mark is no longer visible.
4. Check that the changing unit is firmly seated.
5. Undo the remaining countersunk screws (1).

2 Changing unit

6. Screw down the wing screws alternatively in increments of 50 to 80 mm until the main filter (3) can be removed.
7. Insert the new main filter.



3 Main filter

8. Fit the main filter in reverse order.
9. Check that the main filter is firmly seated.
   - ▶ The laminar flow module can be put back into operation.

A filter leak test in accordance with DIN 14644 is recommended after putting the module back into operation.

11 Cleaning

NOTICE

The acrylic glass panes and strip curtains must not be cleaned with household wipes as they can scratch the surface.

Cleaning information

Regular care and observance of some basic requirements help to ensure fault-free operation and a lengthy service life.

1. Cleaning the casing of the device from the outside with a dampened cloth only. Do not use water jets.
2. Do not use sharp, scraping, solvent-based cleaners.
3. Ensure that moisture does not penetrate the device.
4. To clean the inside, use cleaning cloths designed specifically for clean rooms so as to prevent contamination with particles.

12 Disassembly and disposal

12.1 Disassembly

1. Switch the power supply to the clean room system off at the power switch.
2. Physically disconnect the power supply from the clean room system. Ensure that any stored energy has discharged.
3. Remove operating and auxiliary materials and processed materials and dispose of them properly, see Chapter 12.2, "Disposal".

12.2 Disposal

Spetec clean room systems are constructed in accordance with applicable directives on the avoidance of hazardous substances (RoHS).

The pre-filter and main filter must be disposed of by the operating company.

The clean room system without the pre-filter and main filter can be disposed of by a recycling specialist.

The disposal number (EAR number) is
DE 66147005

13 Spare parts list

Designation	Item no.
Microfuse M 1.60 A	40 - 0040 acid fume cupboard
Microfuse M 3.15 A	40 - 0070 (size 24 to 112)
Device supply line	42 - 0025
Radial fan	22 - 0203
Front assembly	06 - 0053
Rear assembly	06 - 0050
H14 filter FMS 24	11 - 0302
H14 filter FMS 37	11 - 0303
H14 filter FMS 56	11 - 0304
H14 filter FMS 75	11 - 0305
H14 filter FMS 93	11 - 0306
H14 filter FMS 112	11 - 0307
Replacement pre-filter incl. filter grille	11 - 0622
Replacement pre-filter without filter grille	11 - 0623
Pre-filter fleece for stainless steel pre-filter grille	11 - 0635
Device for main filter change	11 - 0106

14 Warranty conditions

14.1 Warranty and liability

The statutory warranty for all modules is 24 months. Filters and wear parts are excluded from the warranty.
The warranty period commences on the day of delivery to the end customer.
No warranty claims shall be accepted for damage resulting from a failure to observe these operating instructions.

Table of abbreviations

EBS	Spetec exhaust (protection) box
EFBS	Spetec exhaust flow box
FBS	Spetec flow box
FBS-V	Spetec flow box curtain
FMS	Spetec flow module
PBS	Spetec protection box
SuSi	Super silent

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