

Spetec

Laminar Flow Box

Portable

Clean Room Technology



PORTABLE CLEAN ROOM TECHNOLOGY

Laminar Flow

The basis for the development of the clean room technology was first established in the USA during the mid sixties by applying the principle of low turbulence displacement (Laminar Flow).

The surrounding air is being withdrawn by a radial ventilator and pressed through an air filter and laminizer. The result of it is a laminar air stream which moves from top to bottom in a parallel flow. Particles within the path of the parallel air stream are being pulled along and thereby removed. By placing this technology into a box with a perforated bottom plate the air can move right through it.

Increasingly strict standards in terms of product quality and process safety require a clean environment for production, processing and storage. Clean room technology plays an increasingly important role in nearly all high-tech sectors.

Examples include:

- **Laser technology**
- **Optics and optoelectronics**
- **Microelectronics**
- **Production, processing and packaging of foodstuffs**
- **Packaging pharmaceutical products**
- **Chemical analysis**
- **Assembly technology**



High Performance Filter

The SPETEC® Laminar Flow Box FBS applies an airfilter with laminizer of the type H14. This filter provides a particle extraction capacity of 99.995% which means that the filter will remove particles of the size 0.12 µm (according to MPPS) with a 99.9995% certainty. Separation of approximately 99.9995% is achieved at a particle size of 0.3 µm. By applying the filter type H 14 the SPETEC® Laminar Flow Box obtains an isolation factor of 10⁴. This means that the quality of air in the Laminar Flow Box is improved versus the surrounding air by a factor of 10,000. (Please note example of application)

Operator panel

The flow rate can be regulated in 8 levels. A “night mode” to reduce energy costs as well as a “MAX” function to clean the workstation, parts or equipment are also provided.



Thanks to the use of the latest, highly efficient EC fan technology, power consumption is reduced to a minimum. Operating noise is in the range of approximately 52 to 53 dB; the models are correspondingly quieter at lower flow rates.

Operator panel functions:

- 8-level flow rate adjustment with “night mode” and purging function
- LCD screen displays the selected flow rate in m/sec
- Automatic flow rate adjustment with LED filter replacement indicator (optional)
- LED error indicator
- Building service management system interface (remote monitoring)
- Interior lighting controlled via operator panel (optional)
- Service indicator

Example of Application

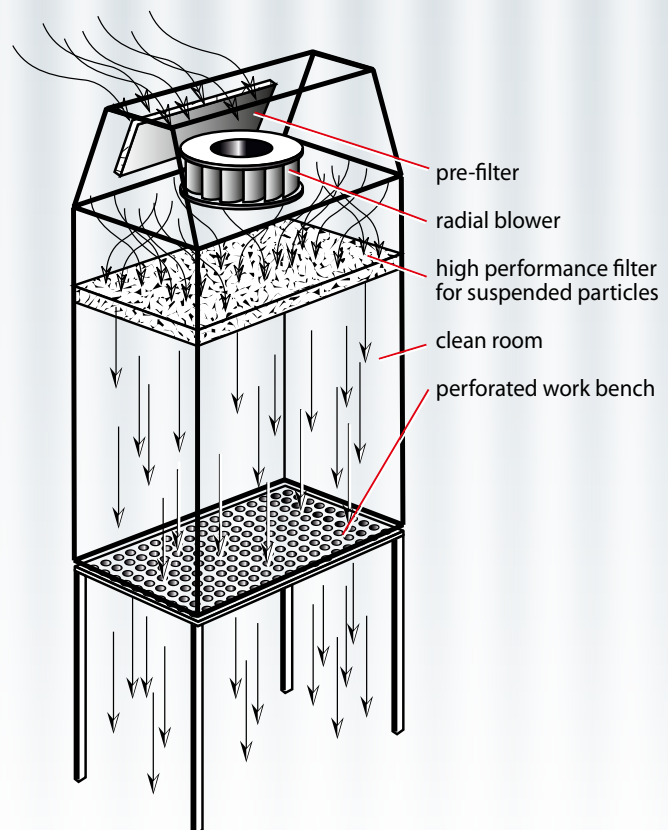
When operating the SPETEC® Laminar Flow Box in a room having a particle concentration of 1,000,000 at a size 0.12 µm then only a maximum of 100 particles will be present within the Laminar Flow Box. At a particle size of 0.3 µm only 10 particles/cft will be left in the box.

Construction

The standard parts are corrosion-resistant and coated with plastic. An uncoated stainless steel version is also available upon request. The air intake is positioned on the slanted section of the filter module so that the laminar flow box can be positioned flush against a wall.



A sophisticated door mechanism makes opening and closing the sliding doors straightforward and functional. This mechanism is found on all PBS and FBS-series box versions. The door clearance is 450 mm (approx. 18”) in height.



Family of Devices

OVERVIEW

The family of devices of the series PBS, FMS, and FBS are of modular design. All components are interchangeable. The Laminar Flow Box FBS is a combination of the Protective Box PBS plus the Laminar Flow Module FMS. In practise this means that a user of a Protective Box PBS can create a complete Laminar Flow Box by simply adding the Laminar Flow Module FMS.

Protective Box PBS-Series

simple Protective Box without filter

Laminar Flow Module FMS-Series

Filter Module without Box incl. all parts for suspended ceiling installation

Laminar Flow Box FBS-Series

complete Laminar Flow Box incl. filter module

Laminar Flow Box FBS-V-Series

Filter Module with segmented clean room curtain

Laminar Flow Box EFBS-Series

complete Laminar Flow Box with integrated acid resistant telescopic exhaust ventilation

Laminar Flow Box EFBS-V-Series

Filter Module with segmented clean room curtain plus integrated telescopic extraction ventilation

Portable Exhaust Ventilation EBS

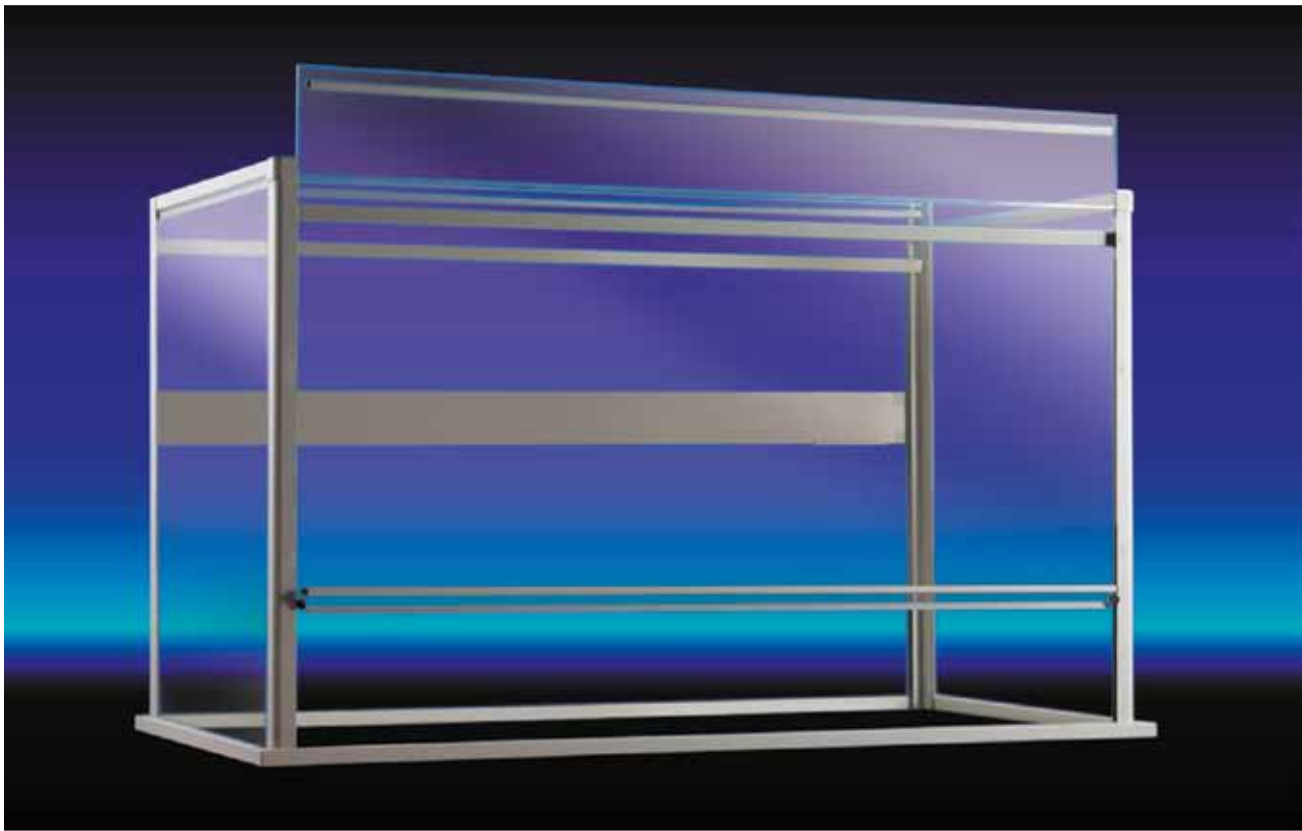
Exhaust Ventilation Box without filter module

Option 1	Stainless steel base frame on caster wheels, plastic-coated H = 840 mm for all box versions PBS, FBS and EFBS
Option 2	Customised built-in laboratory cabinet, available with drawers or shelves for all box versions PBS and FBS
Option 3	Version made of UV-resistant polycarbonate
Option 4	Interior lighting
Option 5	Interior lighting with UV lamp
Option 6	230V connection inside the box, 3x outlet, supplied from the flow module or by a mains cable with PBS
Option 7	Automatic flow adjustment with filter replacement indicator
Option 8	Stainless steel ceiling mount
Option 9	Telescoping arm adjustable in three dimensions for the models EFBS, EFBS-V and EBS

Protective Box

PBS-SERIES

The Protective Box PBS is applied toward the storage of optic, electronic and analytic components. The Protective Box does not include a Filter Module. However, it may be extended to become a Laminar Flow Box at any time later on.



Dimensions:

Description	Measure
Protective Box PBS 24	610 x 400
Protective Box PBS 37	610 x 610
Protective Box PBS 56	915 x 610
Protective Box PBS 75	1220 x 610
Protective Box PBS 93	1525 x 610
Protective Box PBS 112	1830 x 610

The inside height of the box measures 700 mm (approx. 27.5")

The total height measures 800 mm (approx. 31.5")

The height with the sliding door open measures 1,150 mm (approx. 45.3")

The inside dimensions relate to: width x depth

Laminar Flow Module

FMS-SERIES



The Laminar Flow Module of the FMS series is equipped for suspended ceiling mounting. It is being applied as a clean room shower.

Together with the Protective Box PBS (please note page 5) the Laminar Flow Module may be expanded to turn into a Laminar Flow Box of any series.

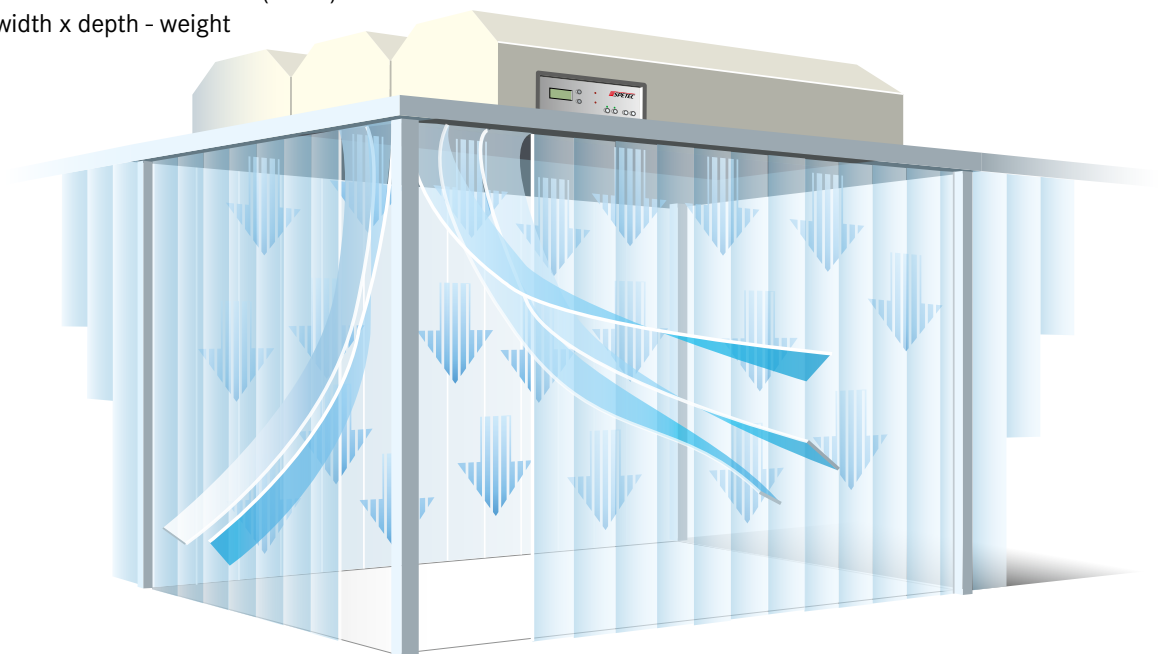
Dimensions:

Description	Measure	kg
Laminar Flow Module FMS 24	610 x 400	20
Laminar Flow Module FMS 37	610 x 610	23
Laminar Flow Module FMS 56	915 x 610	30
Laminar Flow Module FMS 75	1220 x 610	37
Laminar Flow Module FMS 93	1525 x 610	45
Laminar Flow Module FMS 112	1830 x 610	50

The height of the Laminar Flow Module is 420 mm (16.5")
 The dimensions relate to: width x depth - weight

Application example

The laminar flow modules are also used with the clean room cells. For more information, please consult our special "Clean Room Cell" brochure.



Laminar Flow Box

FBS-SERIES



The FBS series laminar flow box creates a portable clean room workstation with a size of 0.24 to 1.12 m² depending on the model. It is used in the production of goods and to store items under clean room conditions.

The ambient air is extracted by an EC fan and pushed through the filter. This creates a laminar air flow of ISO class 5, i.e. the downwards stream of air flows in parallel flow lines. Particles are picked up by the stream of air and transported out of the box through the stainless steel perforated plate floor.

The qualification for the construction is based on the US Federal Standard.

Technical specifications

The technical specification were tested and certified by the highly reputable Fraunhofer Institute for Production and Automation Technology in Stuttgart, Germany. The measuring devices for the determination of the qualification were consistently calibrated. They conform to national and international standards which may be reassessed at any time. Though, for as long as there is no other national standard, the measurement method applied must be considered within the present technical rules and norms. The documentation obtained within this process may be inspected on request.



Dimensions:

Description	Measure
Laminar Flow Box FBS 24	610 x 400
Laminar Flow Box FBS 37	610 x 610
Laminar Flow Box FBS 56	915 x 610
Laminar Flow Box FBS 75	1220 x 610
Laminar Flow Box FBS 93	1525 x 610
Laminar Flow Box FBS 112	1830 x 610

The inside height of the box measures 700 mm (approx. 27.5")

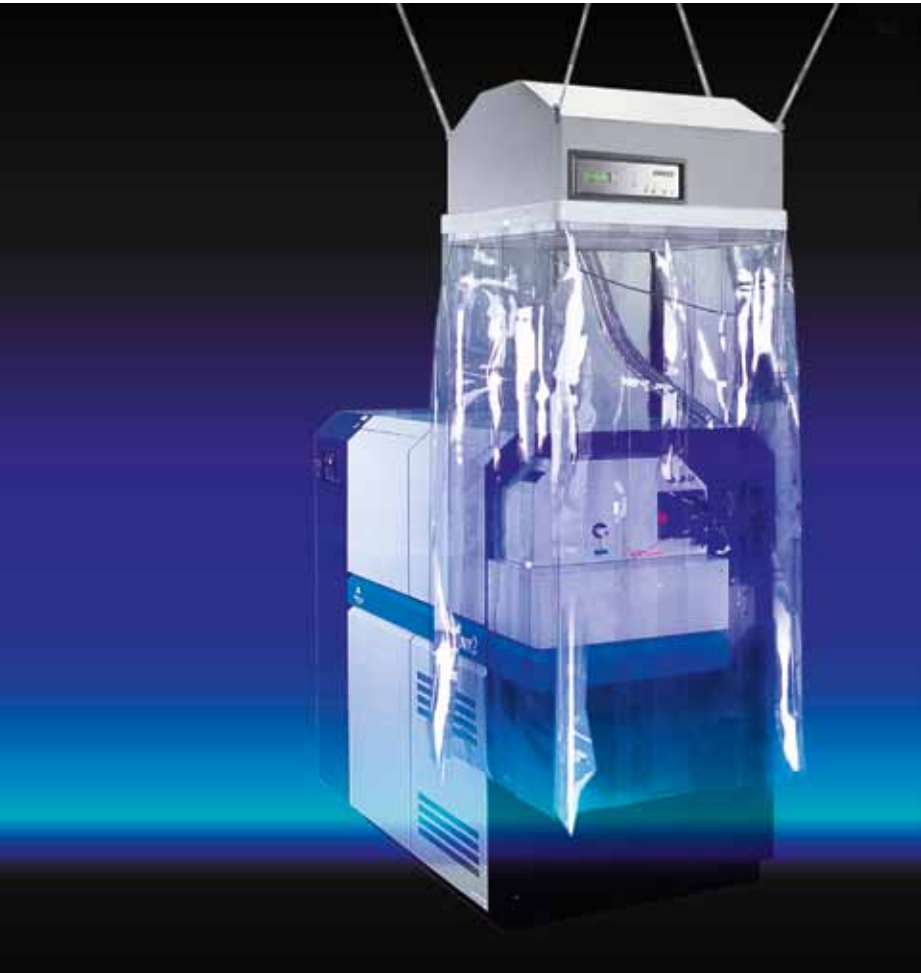
The total height measures 1,200 mm (approx. 47.2")

The inside dimensions relate to: width x depth

DIN ISO 14644-1

Laminar Flow Box

FBS-V-SERIES



PVC clean room strip curtain

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

The laminar flow module is mounted to the ceiling. The curtain prevents the entry of contaminated air due to people walking or vehicles driving by. These systems are generally used to create localised clean room conditions on machines or instruments that are too large to fit it into a box. Assembly workstations can also be encased.

The PVC clean room strip curtain hanging down from the laminar flow module is adjusted so that the ends are flush with the equipment housing.

There is practically no exchange of contaminated ambient air due to the laminar air flow.

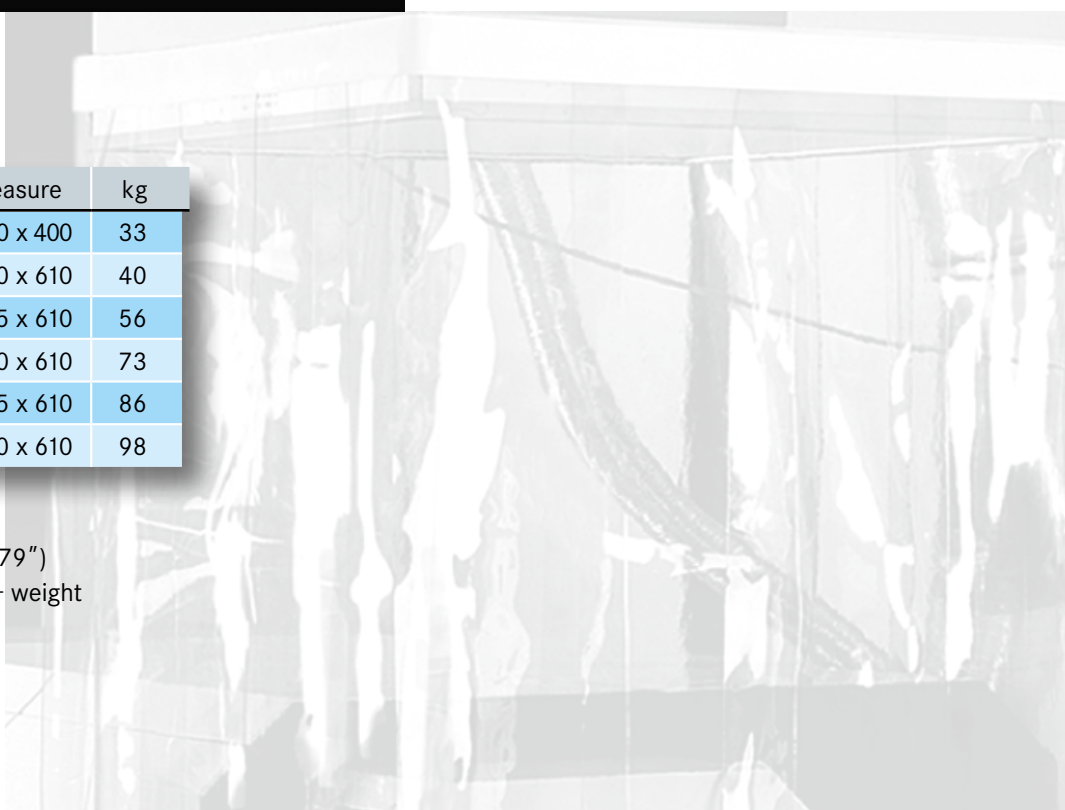
Dimensions:

Description	Measure	kg
Laminar Flow Box FBS-V 24	610 x 400	33
Laminar Flow Box FBS-V 37	610 x 610	40
Laminar Flow Box FBS-V 56	915 x 610	56
Laminar Flow Box FBS-V 75	1220 x 610	73
Laminar Flow Box FBS-V 93	1525 x 610	86
Laminar Flow Box FBS-V 112	1830 x 610	98

The module size is 420 mm (16.5")

The curtain length is 2,000 mm (approx. 79")

The dimensions relate to: width x depth – weight



Laminar Flow Box

EFBS-SERIES

The Laminar Flow Box of the series EFBS is equipped additionally with an acid resistant extraction ventilation. The telescopic extraction arm is adjustable in three dimensions. It can be positioned very precisely to the target and thus remove gases and vapor exactly where they occur.

Because of the constant clean air stream moving downward in the Laminar Flow Box there is no exchange taking place with the gases or vapour being extracted. The reason for it is that the extraction speed at the tip of the telescope opening is greater than the clean air stream.

The instruments of the EFBS-series are being installed where clean room conditions are required but vapour, combustion gases, etc. may interfere. For example Graphite Furnace AAS, ICP, ICP/ MS, and most work areas in the chemical-analytical laboratory.

The extraction volume is continuously variable up to a maximum of 1 cubic metre per minute.



Dimensions:

Description	Measure
Laminar Flow Box EFBS 24	610 x 400
Laminar Flow Box EFBS 37	610 x 610
Laminar Flow Box EFBS 56	915 x 610
Laminar Flow Box EFBS 75	1220 x 610
Laminar Flow Box EFBS 93	1525 x 610
Laminar Flow Box EFBS 112	1830 x 610

The inside height of the box measures 700 mm (approx. 27.5")

The total height measures 1,200 mm (approx. 47.2")

The inside dimensions relate to: width x depth

Laminar Flow Box

EFBS-V-SERIES



The instruments of the EFBS-V-series are being installed where clean room conditions are required but vapor, combustion gases, etc. may interfere. For example Graphite Furnace AAS, ICP, ICP/ MS, and most work areas in the chemical-analytical laboratory.

The extraction volume is continuously variable up to a maximum of 1 cubic metre per minute.

The segmented PVC curtain fits in front of the instrument or machine to ensure clean room conditions.

Dimensions:

Description	Measure	kg
Laminar Flow Box EFBS-V 24	610 x 400	42
Laminar Flow Box EFBS-V 37	610 x 610	49
Laminar Flow Box EFBS-V 56	915 x 610	56
Laminar Flow Box EFBS-V 75	1220 x 610	82
Laminar Flow Box EFBS-V 93	1525 x 610	95
Laminar Flow Box EFBS-V 112	1830 x 610	107

The height of the module is 420 mm (16.5")

The length of the curtain is 2,000 mm (approx. 79")

The dimensions relate to: width x depth - weight



Portable Exhaustion Hood

EBS-SERIES

The portable hood is universally applicable for different work benches regardless of the task. The portable hood is corrosion resistant. The extraction volume is continuously variable up to a maximum of 1 cubic metre per minute.

Dimensions:

Description	Measure
Exhaustion Hood EBS 24	610 x 400
Exhaustion Hood EBS 37	610 x 610
Exhaustion Hood EBS 56	915 x 610
Exhaustion Hood EBS 75	1220 x 610
Exhaustion Hood EBS 93	1525 x 610
Exhaustion Hood EBS 112	1830 x 610



The inside height of the box measures 700 mm (approx. 27.5")
 The total height measures 800 mm (approx. 31.5")
 The height with the sliding door open measures 1150 mm (approx. 45.3")
 The inside dimensions relate to: width x depth

Additional Options



Option 1

Stainless steel frame on casters

- Sturdy stainless square bar frame with a bar dimension of 25 x 25 mm (1" square). Frame base according to box sizes (please note paragraph dimension) with a working height of 840 mm (approx. 33"). Other heights are available on request.
- Powder coated and acid resistant.

Option 2

Stainless steel cabinet base on casters

- Built to customer specification to fit the available space (niche).
- Drawers or shelves with fold out front covers.
- Recessed front to allow seating in front of the flow box. It includes drawers and shelves in the base unit.

Option 4 and 5

Inside Lighting

UV or fluorescent lamp, selection from the control panel. UV lamp only in conjunction with option 3 (please note page 4). Covers of boxes made of polycarbonat.



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