

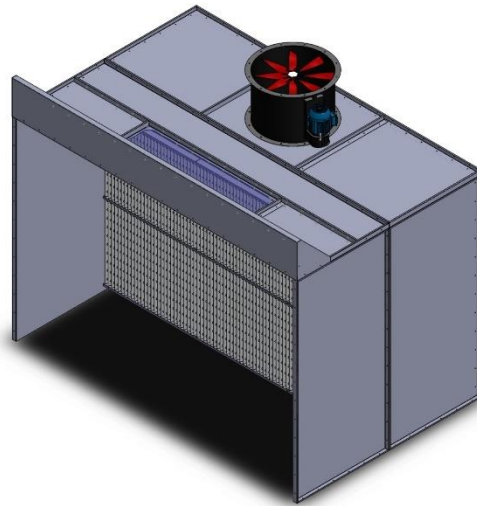


Volume

1

BOSTEC LIMITED

Dry Filter Spray Booth Manual



Dry Filter Spray Booth Manual



BOOTH OVEN & STOVING TECHNOLOGIES

Operating, Servicing & Fault Finding

***Sample Copy Ltd.
Model No. 2F33B 1D 1L
3rd January 2020***

© BOSTEC Limited
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Important Information

To ensure the safety of all personnel the booth must be operated in accordance with this manual.

The equipment has been designed to offer simple, safe and reliable service to you for many years. However it should be properly commissioned and serviced regularly to ensure the equipment performs correctly over its lifetime.

ICON KEY

	Valuable information
	Contact Information
	Technical Information
	Commissioning Report*

We have tried to create a simple to follow manual. Please use the icons for a quick guide to the most important information.

If you have any questions please contact us at info@bostec.co.uk.

WARNING

If incorrectly used or maintained Spray Booths can be hazardous. It is vital that this manual is followed, the spray booth is only operated by trained personnel and only serviced by Qualified Engineers.

Commissioning Report* - only available when commissioned by BOSTEC at time of installation.

SAFETY INFORMATION

You should:



Always ensure the equipment is electrically isolated and 'locked off' prior to commencing any maintenance or work on the equipment controls.

Never tamper with any electrical device or air proving device.

Ensure the equipment is regularly serviced (by Qualified Persons). The law requires you to service any Spray Booth (LEV) every 14 months. Contact us to find out how we can help with this.

Never consume food or drink in the Spray Booth area.

Ensure the area around the Spray Booth is kept clean and tidy.

Always check the operation of any safety equipment prior to use of the Spray Booth.

Appropriate PPE we would recommend:



Safety Glasses or Goggles.

Protective safety shoes with a suitable non-slip sole.

Suitable breathing apparatus such as a filtered or Air-fed Mask.

Disposable gloves.

Spray Booth Operation

Start up Procedure

Check all safety devices are in good condition and operating correctly.

Check filters are installed correctly as follows:

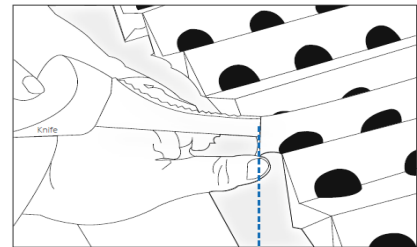
Channel Frame Installation



① Cut filter length to fit frame opening:

Count marks to length the frame opening and cut.
(i.e. 10 ft wide frame opening, count 10 marks and cut on the 10th mark; i.e. 3m wide frame opening, count 9 marks and 6 pleats, then cut).

To cut, slide knife under pleat (and polyester if cutting the HE). After knife is in position, firmly grasp the filter and lift knife.



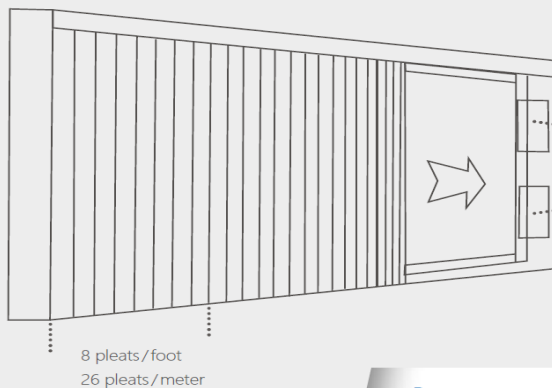
You will cut through two paper layers (plus synthetic material in the High range). Pinch the pleats on either side beneath the knife for additional control while cutting.

② Gather filter:

Gather filter into a tight accordian for easy transport. Slide filter into frame, white side facing toward spray gun. Release.

③ Tuck first and last pleats:

Behind clips on each end of exhaust frame.



L-shape clip

The filter is
This exam



Option B
S-shape clip

Do not over-extend the filter.
Over-extension reduces arrestance efficiency and filter life.

Start up Procedure cont...



Note

We only recommend the use of *Andrea Filters* – other inferior filters do not offer the same performance. Contact us for further details on this.

Switch on the Mains Isolator.

Press the START button – in a few moments the LED Lights (if fitted) will turn on and the extraction system will be ready.

Check the Manometer (if fitted) as this tells you if the filters require changing.



If the **RED** Liquid moves into the **RED** Zone you must change the filters immediately (see previous page on how to change filters).

If the **RED** Liquid is in the **Green** or **Amber** Zones you are ready to spray.

Shutdown Procedure

Press the STOP button – the booth will turn off the fans and the lights.

Note



We recommend leaving the Spray Booth switched on and extracting air after the spraying has finished as many of the VOC Gases will still be airborne for a significant period after the spraying has ceased.

Optional – On Spray Booths fitted with the optional Automatic Run-Down Clearance Timer the booth will operate as follows:

Press the Stop button – the lights will switch off – the fan/s will continue to run for a preset time to ensure the minimum clearance time as set out in the commissioning report has been met.

When you want to start spraying again simply press the START button again – this will override the timer system and turn the lights back on.



When the booth is not in use isolate the power at the main electrical isolator.

Maintenance Procedures

Daily:

Check Filter condition using Manometer located on side of booth (see page 4).
Thoroughly clean down the Spray Booth area.



Weekly:

In addition to Daily checks:
Thoroughly clean glazing panels use for lighting (use thinners or other suitable solvent if necessary).

Monthly:

In addition to Daily & Weekly checks:
Check belt tension on extraction fansets – replace if required.
If belts are adjusted run for 15-20 minutes and then re-check and re-adjust as required (as the belts may stretch as they become warm).
From inside the extraction chamber (where possible) inspect and clean the fan impellor if any paint buildup is apparent. Following cleaning lightly grease each impellor to aid easy cleaning next time.
Check and clean the internal finger guard if any paint buildup is apparent.



Annually (14 months maximum):

A full 'Thorough Inspection and Test' of all LEV equipment is required in accordance with HSG258 every 14 months.
This check and certification should be carried out by a competent person and can be carried out by BOSTEC for you.
Contact us for a quotation for this Inspection, Service and Certification.

Fanset Information:

FAN ENGINEERING (MIDLANDS) LIMITED

19 SANDY WAY, AMINGTON IND. EST., TAMWORTH, B77 4EX
PHONE: 01827 57000 FAX: 01827 64641

MANUFACTURERS OF CENTRIFUGAL AND AXIAL INDUSTRIAL FANS

General Safety Instructions for Fans

To be read in conjunction with:

"General Installation, Operation and Maintenance Instructions for Axial Flow Fans"
and
"General Installation, Operation and Maintenance Instructions for Centrifugal Fans"

Fan equipment may present mechanical, electrical, noise or vibration hazards. In order to minimise the risks associated with these hazards it is essential that safety instructions and Installation, operation and maintenance instructions, are implemented by technically competent personnel so that a safe and reliable equipment installation is achieved.

Mechanical hazards must be minimised by preventing access to the rotating parts whilst the fan is operating. Wire mesh guards can be provided by fan engineering for this purpose.

All installation work must be completed in accordance with the installation, operation and maintenance instructions, before any attempt is made to run the fan. The fan must be correctly earthed and no maintenance work carried out without first switching off and isolating the fan and its controls from the electrical supply and ensuring that the rotating parts are at rest.

Fan equipment when operating at high pressures and/or rotational speed may generate unacceptable noise levels. By reference to fan engineering, the sound levels can be obtained and the necessary action must then be taken to reduce these appropriately. Sound and vibration attenuators can be provided by fan engineering for this purpose.

Fans require routine maintenance, and facilities for this to be carried out safely, must be incorporated in to design of the fan installation.

If there is any difficulty in correctly interpreting these safety instructions or the installation, operation and maintenance instructions, then it is essential that fan engineering is consulted for help and advice.

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MANUFACTURERS OF CENTRIFUGAL AND AXIAL INDUSTRIAL FANS

General Installation, Operation and Maintenance Instructions for Axial Flow Fans

To be read in conjunction with "General Safety Instructions for Fans".

Site Storage

The fan must be stored in clean, dry conditions in a vibration free area. Before installation the resistance to earth of the motor should be measured. If this is less than 1 Megaohm the motor should be dried out before applying the main voltage. The impeller should be rotated periodically to prevent the hardening of the grease and corrosion of the bearings.

Installation

For long trouble free operation of the fan it will require periodic routine maintenance, therefore the fan must be mounted so that it is easily accessible, and that all inlet and discharge ducting is self-supporting.

The axial fan is supplied fully assembled and is run tested in the factory. In dry conditions (unless otherwise stated) the fan may be mounted in any position horizontally, vertically or inclined.

Bifurcated fans when mounted horizontally, should have the motor tunnel in a vertical position.

Inlet and Outlet Connections

When installing the fan, sharp bends in the ductwork should be avoided in the vicinity of the fan. For optimum performance the connection to the ductwork should be by means of a smooth transformation duct with a 60° maximum effective included angle when the diameter decreases in the direction of airflow, or 15° maximum effective angle when it increases in the direction of airflow. The height of the fan supports should be adjusted so that no undue distortion of the fan casing or mounting occurs. When anti vibration mounts are used, flexible connections should also be used. The flexible connections should be fitted so that they are almost taut. The fan should be aligned closely with the inlet and outlet ductwork and must be fitted in accordance with the airflow direction and rotation arrows shown on the nameplate.

Electric Motors

Supply. The details of the site supply must be checked to ensure that the voltage, frequency, power rating and number of phases comply with the details given on the motor nameplate.

Connection. The wiring must be connected in accordance with the instructions on the motor name plate. The direction of rotation of the fan is marked on the fan case.

Earthing. The fan must be earthed in accordance with the requirements of the local supply authority or code of practice. A separate earth continuity conductor should be connected to the earthing screw in the terminal box.

Starting. Starting of the fan may be carried out manually or automatically. The number of starts in a given time should be limited as follows:

3 direct on line starts / hour
2 starts in succession followed by 30 min. Cooling.

Protection. Any fuses in the circuit should be regarded as protecting the wiring against the effects of short circuits or wiring faults. They are not suitable for overload protection. Fuse ratings must be sufficient to carry the starting current, which, if no specific information is available, may be taken as six times the nameplate current for 5 seconds (direct on line starting) or 3 times the name plate current for 20 seconds (star delta starting).

Single Phasing. To provide protection against a blown fuse or a bad contact, a starter with single phase protection must be used.

Overload Protection. The overload current setting must not exceed 1.1 times the nameplate current. Motors fitted with thermistor overheat protection should be wired in accordance with the instructions given.

Weather Proof Motors. Weather proof motors are provided with drain holes and in wet conditions must be mounted with the drain holes at the lowest point. If the drain holes are plugged the plugs must be removed before commissioning.

Operating Conditions

Standard fans are suitable for use in an ambient temperature of -40°C to $+40^{\circ}\text{C}$, except for belt driven fans which may be used from 0°C to 60°C , provided the motor is in an ambient from -20°C to $+40^{\circ}\text{C}$.

When fans are operating in ambient temperatures below 0°C icing up must be avoided.

Direct driven fans are not suitable for handling air containing free moisture or corrosive fumes.

Routine Maintenance

After a short period of running, and thereafter as experience dictates, the fan should be inspected to ensure that there is no build up of dirt or other matter that would cause overheating of the motor or obstruct the impeller track.

The belt tension of belt driven axial fans should be checked after the first few hours running and thereafter at three monthly intervals or as experience dictates. The belt tension should be set as stated in the fenner wedge belt tensioning instructions (see *next page*). After tensioning the belts the alignment of the pulleys should be checked by holding a straight edge across their faces.

Lubrication

Direct driven axials are fitted with sealed bearings and do not require greasing.

Belt driven axials require lubricating with SHELL ALVANIA R3 grease after one month operation and thereafter as conditions dictate. When carrying out relubrication it is essential that every trace dirt and water is removed from around the grease nipple and that a clean grease gun is used. Only a low pressure should be required to inject the grease. If a high pressure is required the cause should be investigated.

Fenner Wedge Belt Tensioning Instructions

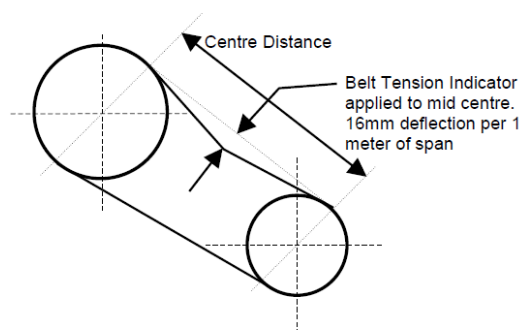
One Shot Tensioning

Fenner wedge belts are built right from the start to ensure totally precise inherent length, to stay matched during storage and in the new drive. Now, after extensive field tests, our claim of genuine "one shot" tensioning has been endorsed by satisfied customers all over the world on all belt sections.

Simply put the belts around the pulleys, set them to the appropriate tension value stated in the "tensioning forces" table opposite (using a belt tension indicator), run the drive under load for 30 minutes, stop the drive, check the tension, re-setting to the catalogue if necessary. On a properly designed drive for the application there will be no need for any attention during the life of the drive.

Method of Belt Tensioning using Belt Tension Indicator

1. Calculate the deflection distance in mm on a basis of 16mm per metre of centre distance.
Centre Distance (m) x 16 = Deflection (mm).
2. Set the lower marker ring at the deflection distance required, mm on the lower scale.
3. Set the upper marker ring against the bottom edge of the top tube.
4. Place the belt tension indicator on top of the belt at the centre of the span, and apply a force at right angles to the belt deflecting it to point where the lower marker ring is level with the top of the adjacent belt.
5. Read off the force value indicated by the top edge of the upper marker ring.
6. Compare this force to the kgf value shown in the table below.



If the measured force falls within the values given. The drive should be satisfactory. A measured force below the lower value indicates under-tensioning. A new drive should be tensioned to the higher value to allow for the normal drop in tension during the running in period.

Note after the drive has been running for 30 minutes, the tension should be checked and re-adjusted to the higher value, if necessary.

Belt Section	Force required to deflect belt 16mm per meter span		
	Small Pulley Dia (mm)	Newton (N)	Kilogram force (kgf)
SPZ	56 - 95	13 - 20	1.3 - 2.0
	100 - 140	20 - 25	2.0 - 2.5
SPA	80 - 132	25 - 35	2.5 - 3.6
	140 - 200	35 - 45	3.6 - 4.6
SP	112 - 224	45 - 65	4.6 - 6.6
	236 - 315	65 - 85	6.6 - 8.7
SPC	224 - 355	85 - 115	8.7 - 11.7
	375 - 560	115 - 150	11.7 - 15.3

The high performance and efficiency of Fenner precision built belts requires correct tension

Basic Fault Finding

The extraction works but there are no lights:



1. Check switch/starter for lights
2. Check tubes
3. Check fitting

There is no lighting and the fans are not working:



1. Check the power is switched on
2. Check the starter is operating correctly

The lights are on but there appears to be no extraction:



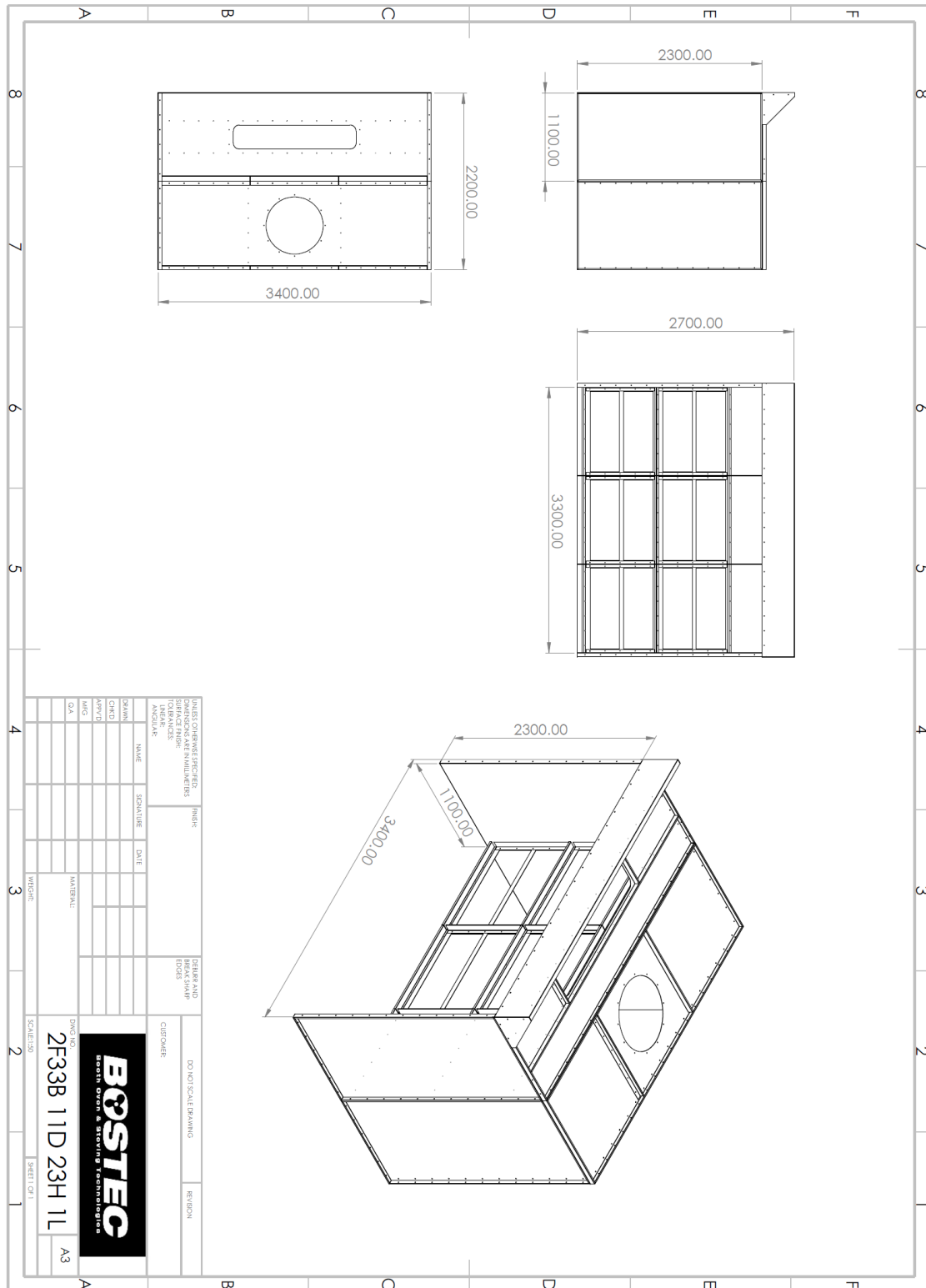
1. Check the starter for the fans is working
2. Check the belts on the fans are not slipping or broken
3. Check the fanset is free to rotate

There is only partial or reduced extraction:



1. Check the condition of the filters
2. Check the fan is rotating in the correct direction
3. Check all fans are working at the same time (only on multi-fan booths)
4. Check ducting for damage or blockage

Drawings



Commissioning Form



LEV - Thorough Inspection & Test

Test Record & Certificate

Company Name

SampleCopyLtd

Test Date:

03/01/2020

Test Date

Plant Ser No. or Manufacturer

30000

Time

18:03

LEV Type

DryFilter Booth

Full visual check?

Yes

Are all joints sealed?

Yes

Are all guards in place?

Yes

Is ducting in good condition?

Yes

Is the inside of the ducting okay?

Yes

Some paint build up is expected - heavy deposits are not acceptable.

Any visual signs of leakage from ducting?

No

Is the electrical equipment okay?

Yes

Is general LEV construction in good condition?

Yes

Grease bearings/shafts/hinges/pumps/fans.

N/A

Is there a Manometer?

Yes

Is Manometer working correctly?

Yes

Is there a conveyor?

No

Are there any motorised dampers?

No

How many extract fans are there?

1

Fan 1

Motor kW	O/L Amps Setting	Clipped Amps
3.0	7.0	5.8

Is a full Air Speed Check being carried out?

Yes

Are the extract filters new?

Yes

Filters must be new before test takes place - inform customer and replace (**chargeable**) if requested.

Air Speed Readings & Calculation

Filter Area Width

3.30

in Metres

Filter Area Height

2.00

in Metres

High Level 1

0.70

M/Sec

High Level 2

0.75

M/Sec

High Level 3

0.68

M/Sec

High Level 4

0.49

M/Sec

Mid Level 1

0.77

M/Sec

Mid Level 2

0.68

M/Sec

Mid Level 3

0.60

M/Sec

Mid Level 4

0.59

M/Sec

Low Level 1

0.68

M/Sec

Low Level 2

0.71

M/Sec

Low Level 3

0.70

M/Sec

Low Level 4

0.70

M/Sec

Avg Air Velocity - M/Second

0.67

Measured Air Volume - M3/Hour

15,938.99

Smoke Test been carried out?

Yes

Clearance Time

16

Time in Seconds

Time in Seconds

Fit 'Clearance Time' Label?

Yes

Has equipment passed LEV
Test?

Yes

Has the PASS Label been fitted?

Yes

Have any parts been used
during the test?

No

Parts other than those required on every
test

*Parts other than those used on
every test are charged as follows:*

Engineers Name

Stephen

First

Tracey

Last

Customers Name

John

First

Hancock

Last

Engineers Signature



Customers Signature



Congratulations you're all set. Your next test is due:

04/03/2021