ducting express
Ducting Express Services Ltd
Trade House, 7 Claymill Road, Thurmaston, Leicester, LE4 9JJ

Dry Spray booth Manual

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1 Type, Designation and Identification

Ducting Express Dry Filter Spraybooths are designated by an abbreviated prefix followed by the width of the Booth expressed in metres. The types of Booth available are as follows:

DF - The DF range of Booth are Dry Filter Spraybooths with an open-fronted configuration available in a range of widths from 2.2metres to 6.6metres e g. DF2.2 Dry Filter Spraybooth 2.2metres wide.

DFB - The DFB range of Booths are 1.1metre deep Dry Filter Spraybooths complete with an operators Bench. In these
Booths the filter medium is mounted above the operator's bench and angles forward at approximately 30°. They are supplied without a Canopy and can be operated as such. However, additional Canopies can be supplied and fitted if required e.g. DFB2.2 Dry Filter Benchbooth 2.2metres wide.

DEC - The DEC range of Booth are Dry Filter Extract Chambers. These Booths are similar in construction to the DF range but are intended to ventilate a spray space and are supplied without a Canopy but include a galvanised steel floor. They are available in widths ranging from 2.2metres to 6.6metres e.g. DEC2.2 Dry Filter Extract Chamber 2.2metres wide.

DHC - The DHC range of Booth is similar to the DEC range in that they are supplied without a Canopy to form an Extract Chamber. However, these Extract Chambers are suitable for low level extract applications as they are half the height of the standard DEC range i.e. 1.1metre high. The DHC range are available in widths ranging from 2.2metres to 6.6metres e.g. DHC2.2 Dry Filter Half Height Extract Chamber 2.2metres wide.

Each Spraybooth has affixed an identification plate. From this plate the following information can be obtained:

- The name and address of the manufacturer.
- The year of construction.
- The designation of model number.
- The serial number.
- The identity of the quality control inspector.

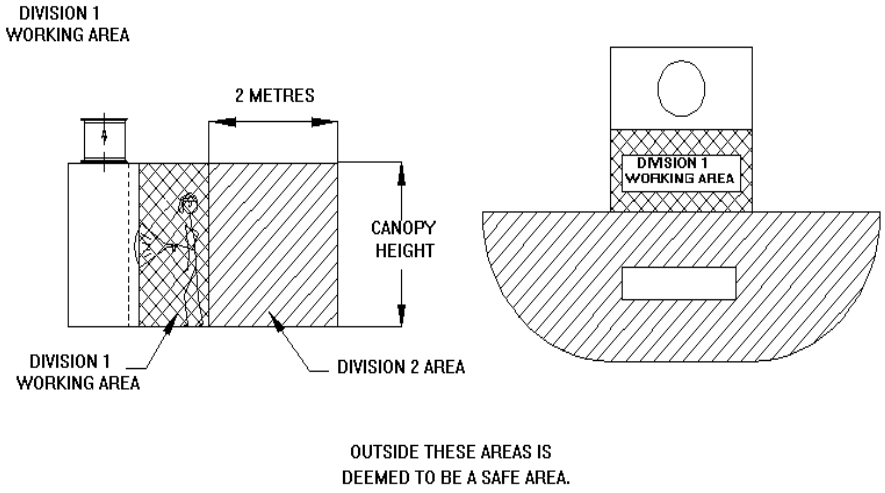
In addition to the above information, products manufactured for supply within the EEC will have a CE Mark affixed, which indicates compliance with the directives listed on the declaration of conformity contained within this document.
To enable the identification of spare parts, please refer to the tabulated information contained within section 18 of these instructions.

2 Uses Of the Machine

Normal use of an *Ducting Express* Spraybooth would be as an extractor of industrial airborne contaminants. The installation would be in an indoors industrial environment with ambient temperatures in the range +5°C to +30°C, and relative humidity of 65% or lower. Typical operations to be conducted within a Spraybooth include spray painting, fettling of wood metals or plastics, mixing of powders or decanting liquids containing evaporating solvents. It is assumed by the manufacturer that such activities would be conducted for a period of 8hours per day, 5days per week. It is also assumed that operations such as spraying of paints or adhesives would have a transfer efficiency of at least 50% in order to protect the Spraybooth from being forced to handle inordinately high volumes of waste material. If any doubt about the suitability of the *Ducting Express* Spraybooth purchased for a particular operation exists, specific advise must be sought from the manufacturer. Your attention is drawn to Section 6 (warranty) with regards to operating periods and conditions.

3 Identification of Working Areas

In the case of open-faced Spraybooths, please refer to the diagram below for guidance on approved operating areas. Broadly speaking, all activities that produce an airborne contaminant must be conducted within the canopy area (see diagram). In the case of fully enclosed Sprayrooms, all activities creating an airborne contaminant must be conducted within the confines of the Sprayroom. Warning, production of airborne contaminants outside the Spraybooth canopy or Sprayroom will be in contravention of the relevant HSE Directives. You may also run the risk of explosion, fire, and injury to the operators' respiratory system and pollution to the working environment of other employees.



4 Delivery and Handling of Data

Please refer to the following table for information on shipping weights of complete Spraybooths and individual Spraybooth components.

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Model	Shipping Weight	Fan Weight	Individual Panel Weight	Pack of Filter Paper
DF2.2	310	88	25	10
DF3.3	375	90	25	10
DF4.0	430	104	25	10
DF4.4	510	2 x 88	25	10
DF5.5	570	2 x 90	25	10
DF6.6	630	2 x 90	25	10
DFB1.1	175	72	25	10
DFB2.2	240	88	25	10
DEC2.2	260	88	25	10
DEC3.3	325	90	25	10
DEC4.0	380	104	25	10
DEC4.4	460	2 x 88	25	10
DEC5.5	520	2 x 90	25	10
DEC6.6	580	2 x 90	25	10
DHC2.2	190	88	25	10
DHC3.3	225	88	25	10
DHC4.0	245	88	25	10
DHC4.4	260	88	25	10
DHC5.5	320	90	25	10
DHC6.6	370	104	25	10

All Weights in kg

Ducting Express Spraybooths are usually delivered to site in component form. Components are either banded to pallets or manufactured in such a way so as to enable transportation by forklift truck. Fan units are equipped with holes for the connection of suitable shackles, and should be lifted into position by use of suitable proprietary lifting equipment (as diagram below).

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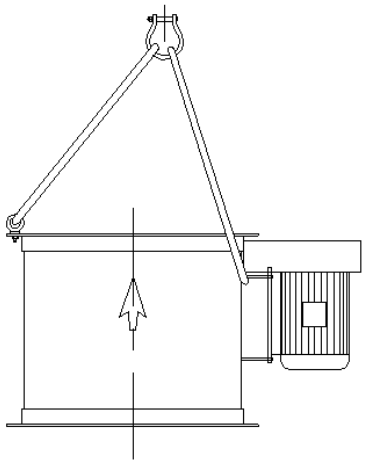

5 Inspection

Each Spraybooth should be unpacked and inspected on delivery. Any damage must be reported to the supplier in writing within 7 days.

It is important that these Installation and Operating Instructions are studied carefully before any installation takes place. Installation and operation should also be in accordance with local regulations and accepted codes of practice.

Under no circumstances should Fans or any other item relating to the Spraybooth be operated until correctly installed as detailed within these instructions. All terminal box covers, fan motor covers, guards, etc. should be secured in their appropriate positions.

6 Warranty

Warranty covers the replacement of any parts and associated carriage costs. It does not cover the labour to fit parts or the cost of removing, refitting or any secondary losses.

Any warranty claim must be immediately notified to *Ducting Express*. No repair work is to be conducted without prior agreement.
Any claim or defect arising from incorrect installation, inadequate maintenance or abuse of the equipment however caused is not covered by this warranty. Any modifications or alterations made to the equipment by a third party subsequent to the issue of CE certification renders certification and warranty void.

Your warranty is 12 Months on Parts, assuming max. 8hr. operation per working day and a 6 month (chargeable) *Ducting Express* service visit.

7 Assembly & Installation

All *Ducting Express* Dry Filter Spraybooths are supplied in component form. Within the information pack you will find separate assembly instructions. Please hand these instructions to your Spraybooth installers and, refer to the weight table in Section 4 when selecting suitable mechanical handling equipment. Spraybooth Panels are punched with an oversize hole for M6 bolts as an intentional feature to ease assembly. We recommend assembling all Bolts finger tight, followed by precise alignment and tightening to 5Nm (1.7lb.ft.). If correctly installed, Spraybooths do not require seam sealing of panel joints. If the Booth canopy is to form part of a dust free environment the panel joints may be sealed with a proprietary high velocity duct sealant.

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8 Exhaust Ducting

Exhaust ducting venting an *Ducting Express* Spraybooth to atmosphere should be designed and installed by a competent ventilation engineer. In order to ensure the correct operation of the *Ducting Express* Spraybooth and also ensure that the correct volume of air is extracted at its face, the complete ducting system should be sized so as to achieve a maximum pressure drop of "80Pa".

Generally speaking, all ductwork should allow air an uninterrupted and smooth passage from the fan unit to the point of discharge. All bends or transition sections should be designed so as to maintain the cross-sectional area of the fan discharge diameter and performance checks should be carried out upon completion of the installation. Please Note: Customers whose solvents consumption requires them to comply with the Environmental Protection Act (E.P.A.) must pay particular attention to the design criteria of such ductwork as detailed by the Act.

Specialist information and advice can be sought from *Ducting Express* Product Finishing Limited on the suitability of intended ductwork systems. Please contact our Sales Department for further advice.

9 Noise

Please refer to the tables over to obtain information of test results obtained from typical *Ducting Express* Spraybooth installations. Please Note: Specific individual noise levels should be obtained following installation of your Spraybooth, as it is impossible for *Ducting Express* to predict the properties of the acoustic environment in which your Spraybooth is to be sited.

Please Note: *Ducting Express* will be pleased to advise on suitable in-duct silencers for use with their range of Spraybooths. Please contact our Sales Department for further information.

SOUND TABLES

ITEM	IMPELLER CODE	MOTOR kW	RPM	dB(A) @ 3Dia	dBW
A	630/150/10s/30 DEG	1.5	1440	71	91
B	630/150/10s/40 DEG	2.2	1440	73	93
C	630/150/10s/40 DEG	3.0	1620	77	97
D	630/150/10s/40 DEG	4.0	1710	78	98

ITEM	MID FREQUENCY Hz	63	125	250	500	1k	2k	4k	8k
A	In-Duct dBW	88	86	85	84	83	78	73	62
B	In-Duct dBW	90	88	87	86	85	80	75	64
C	In-Duct dBW	94	92	91	90	89	84	79	68
D	In-Duct dBW	95	93	92	91	90	85	80	69

10 Electrical Data

Before removing the terminal box cover from the electric motor of the fan unit, ensure that its electrical supply has been suitably isolated and cannot be switched on.

All electrical connections should be carried our by a qualified and authorised electrician in accordance with local site regulations and the latest issue of the IEE Regulations.

The metal body of the motor, the switchgear control panel and, the fan unit must all be earthed. It is strongly recommended that an earth leakage circuit breaker with a tipping current of 30mA or less is fitted on the incoming electrical supply.

Motors are designed to operate on voltages between +6% of the highest voltage and –6% of the lowest voltage shown on the rating plate, e.g. 380Volts–6% to 415V+6%. This statement is only applicable to range rated motors, which are evident from the hyphen separating the two values, e.g. 380-415V. On motors with a spot voltage, i.e. 415V, the operating voltage should be plus or minus 6% of that spot voltage. Please Note: If voltage deviates beyond these limits there is a danger that the motor protection will continually trip, and hence the fan will not meet the requirements of the Spraybooth.

11 Electrical Connections

All electrical connections should be carried our by a qualified and authorised electrician in accordance with local site regulations and the latest issue of the IEE Regulations.

In interests of electrical safety, a local means of isolating the electrical supply should be located as close as practically possible to the Spraybooth, and must be of a type capable of being fitted with a lock to prevent the supply being inadvertently turned on during maintenance operations.

In the case of larger Spraybooth installations, a local means of isolating the electrical supply should be located as close as practically possible to all fan units individually. This is of particular importance when contactor or starter panels are remotely mounted.

Operating voltage and other electrical data are marked on the motor nameplate. Please make sure that the motor is suitable for the electrical supply on which it will be used. Conductors of the electrical supply cables should be connected securely to the appropriate electrical motor terminals in accordance with the diagrams in the motor terminal box and with the information given on the motor rating plate. All cables must be of adequate size to prevent any drop in supply voltage. The appropriate cable gland must be fitted to the terminal box and, tightened and secured against ingress of duct, dampness or, water. Terminal box covers must be fitted correctly, ensuring that the gasket seals the terminal box effectively.

Motors must be connected to a contactor starter, incorporating no voltage release, overload protection and, for three phase motors, phase failure protection (single phase prevention). On direct on-line starters the overload unit should be adjusted to trip out at the motors full load current as shown on the motor rating plate. In cases where the motor is only lightly loaded it is permissible to set the overload to a lower value, but under no circumstances should the overload be set to a higher value than the full load current shown on that motors rating plate. The direction of rotation of the fan unit is marked on the outside of the fan casing with a yellow label. To reverse the direction of rotation switch off and isolate the electrical supply and, on three phase motors interchange any two of the incoming supply wires. On single-phase motors, check details inside the motor terminal box cover.

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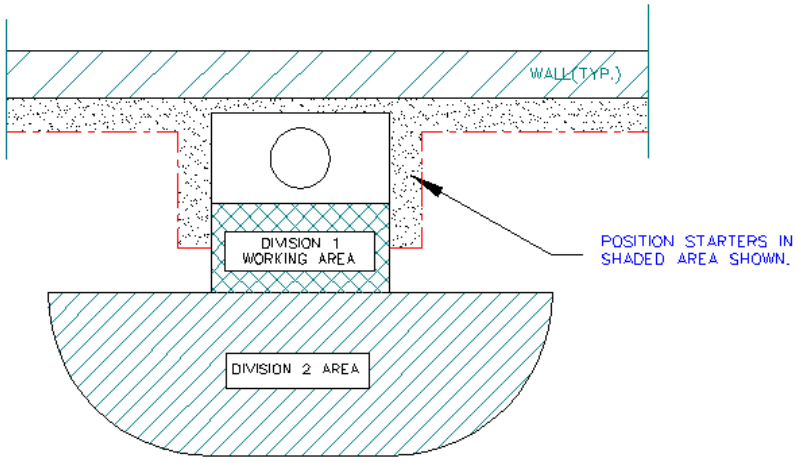
12 Siting of Electrical Controls

Please refer to the following diagram for the permitted position to site electrical controls. If the Spraybooth supplied is of the Extract Chamber type, i.e. to be located within a complete Sprayroom, all electrical equipment within this room (Zone One Area) must be of an EEXD flameproof configuration. All wiring must be completed in micee-type cable and any other sources of ignition must be excluded from this area.

If it is intended to use non-flameproof type starters for controlling a Sprayroom type environment, the starters must be located outside the Sprayroom area within an area designated as a safe area.



In order to comply with the requirements of CE marking, all Spraybooths must now be fitted with a facility for an emergency stop within easy reach of the operator. *Ducting Express* will be pleased to quote for the supply of a suitable emergency stop wire kit, now available to meet the requirements of this regulation. Please contact our Sales Department for further information.

13 Fitting of Filters

Ducting Express Dry Filter Spraybooths are fitted with either Paper-Type Filter Medium or Open-Weave Filter Medium. Please identify which type of Filter Medium has been supplied with your Spraybooth and follow the appropriate instruction paragraph below.

If you are unsure as to which type of filter has been supplied, please check one of the filter support frames. If the frame is fitted with a 50mm by 50mm weldmesh panel then your Spraybooth is to be used with Open-Weave Type Filter Medium. If the apertures are open, without the weldmesh panel, then this Spraybooth can only be used with the concertina Paper-Type Filter Medium.

FITTING PAPER-TYPE FILTER

Remove the filter paper from the box. First begin by stretching out the filter paper on the floor to the correct pleats per metre. Measure the width of filter paper appropriate to the width of your Spraybooth and add to this length an extra 250mm. Cut the paper this length. At the left and right hand side of each filter paper slot is an angled filter paper clip. Gather together the first three or four corrugations at the left-hand side of the filter paper and insert them into the filter paper clip. This will now hold the left-hand side of the filter paper. Stretch the filter paper carefully across the width of the Booth until you reach the right hand side. Now gather together the remaining corrugations and insert into the right hand paper clip. Repeat this operation for the lower filter paper slot and the installation of the filter medium is now complete.

FITTING OPEN-WEAVE FILTER MEDIUM

Open-Weave Filter Medium is supplied on a roll and must be fitted into the Spraybooth with the green surface facing towards the operator. Unroll a suitable length of filter medium on the floor and cut to width of the Spraybooth. At the left and right hand side of the Spraybooth filter slot is a filter medium clamp plate secured to the Spraybooth with self-tapping screws. Remove both filter clips and stretch the filter medium across the face of the Spraybooth slot. Once in position, replace the two filter medium clips by screwing the self-tapping screws through the Filter Medium. Repeat this operation for the lower filter medium slot and the installation of the Spraybooth filter is now complete.

14 Commissioning

Commissioning of *Ducting Express* Dry Filter Spraybooths is a simple operation.

1. Ensure the Spraybooth and its Canopy has been assembled in accordance with the manufacturer's instructions. Check that the Canopy is square and that its front edges are secured to the factory floor.

2. Turn on the electrical isolator and check the direction of the fan/s. The correct direction of rotation is marked on the outside of the fan housing with a yellow sticker.

3. Check that the filter medium is correctly fitted as described in Section 13 and that there are no gaps through which unfiltered air could pass to the exhaust ductwork.

4. It may be prudent at this stage to take *Ducting Express* readings at the face of the Spraybooth canopy using a digital anemometer. Readings can be used as a comparison with readings taken at a later date to establish the efficiency of the Booth and the general condition of the filter medium. If a filter loss gauge has been specified as an optional extra, the reading on the gauge should now be marked to enable monitoring of the filter efficiency over forthcoming periods of operation. The Spraybooth is now ready for use.

15 Operation

TO START	Switch electrical isolator on. Press the green Start button on the electrical contactor (on Booths with multiple fans, repeat this operation for each fan in sequence).
TO STOP	Press the red Stop button on each contactor to stop the extraction fans. Turn off the electrical isolator.

16 Maintenance

To maintain an efficient cleansing action to provide the operator with the optimum working environment, your *Ducting Express* Dry Filter Spraybooth should be checked and

maintained at regular intervals. Failure to maintain your Spraybooth in good working condition will result in the invalidation of your 12 month Parts Warranty.

DAILY

Check the condition of the Filter Medium. If a Filter Loss Gauge is fitted, ensure that once the Booth is running the pressure drop across the filter medium is within recommended limits. Ensure that all fans are operating correctly and listen for any unusual noises or vibration, which may indicate a deteriorating condition of the drive belts and/or an accumulation of paint build-up on the impeller blades.

WEEKLY

Check the operation of the Fans by running individually and noting that the correct extract is present at the Spraybooth face. Isolate the supply to the Spraybooth and lock the isolator in the "Off" position, slide back the filter paper, and visually inspect the interior of the Spraybooth. If the filter has been working correctly there should not be an excessive amount of build-up on the internal surfaces of the Chamber. Visually inspect the fan units from within the Extract Chamber. Ensure that the finger guard/s are correctly secured and that there is no paint residue adhering to the mesh of the finger guard/s. Visually inspect the impeller blades within Fan housing are not coated with excessive build-up of paint residue.

EVERY THREE MONTHS OR AS REQUIRED FOLLOWING WEEKLY INSPECTION

Using suitable personal protective equipment, remove the contaminated filter medium and dispose of it in a safe manner. Replace the filter medium as described in Section 13. Completely clean the internal surfaces of the Spraybooth. Isolate the supply to the Fans and fit a suitable lock, remove the finger guards to the fan unit and clean the internal surfaces of the Fan if required, paying particular attention to the impeller blades.

Whilst still ensuring the power is isolated and locked in the "Off" position, remove the fan belt guard over and check the condition and tension of the drive-belt. The belts should be tensioned as described in Section 17. After replacing the filter medium and with the Fan running coat the internal surfaces of the Booth canopy with Peelable Booth Coating. This will ensure that the following clean down is a quick and efficient operation.

17 Servicing

The only moving parts that require servicing on the *Ducting Express* range of Dry Filter Spraybooths is the Extraction Fan. The type of Fan used on these Booths is the patented *Ducting Express* Cartridge Fan, the features of which are a long working life and ease of maintenance. Servicing of the Cartridge Fan should only be conducted by a competent mechanical engineer and limited to the two operations detailed below.

DRIVE BELT REPLACEMENT AND TENSIONING

1. Ensure the power is isolated from the Spraybooth and that a lock is fitted to keep the isolator in the "Off" position.

2. Unbolt the belt guard from the end of the motor shaft and remove the guard.

3. Visually check the condition of the drive belts, if they are still in a serviceable condition, go straight to Section 6.

4. Loosen the M16 nuts, which are used to tension the motor and its mounting plate until the belts are slack enough to remove.

5. Fit the new belts onto the pulleys ensuring there are no twists.

6. Re-tension the motor mounting plate using the M16 nuts until it is possible to deflect the belt by 10-15mm as it enters the fan housing with moderate finger pressure. Caution: Do not cover tighten drive belts as premature wear of motor bearings, shaft bearings and other drive components will result.

7. Replace belt guard.

8. Test run the Fan.

REMOVAL AND REPLACEMENT OF COMPLETE CARTRIDGE ASSEMBLY

1. Isolate the supply to the Spraybooth and ensure a lock is fitted to maintain the isolator in the "Off" position.

2. Remove the filter medium to gain access to the inside of the Spraybooth.

3. Remove the finger guard.

4. Remove the bolt and washer from the centre of the fan shaft and by means of a suitable extraction puller remover the fan impeller.

5 Prize away the flinger seal from the fan shaft.

6. From the roof of the Spraybooth, remover the four bolts securing the cartridge arm to the two rolled steel angle supports of the fan casing. Please Note: Be careful not to lose the shim washers which are trapped between the cartridge arm and the fan causing as these must be replaced in exactly the same position when re-installing the cartridge arm.

7. Lift the cartridge vertically upwards approximately 50mm and then withdraw the complete cartridge assembly from the side of the fan casing.

8. It is now possible to work on the complete cartridge assembly. However, you may now wish to remove the motor connection wires and take the cartridge to your workshop for overhaul.

TO REPLACE THE CARTRIDGE ASSEMBLY

1. Slide the cartridge arm into the fan casing until the shaft locates in the fan casing hole. Lower the cartridge by approximately 50mm into position.

2. Replace the four mounting bolts, ensuring that that the identical shims are placed in identical respective positions.

3. Tighten these bolts to 30Nm (22lbs/ft.).

4. It is now necessary to visually check from inside the Spraybooth that the fan impeller shaft is perfectly central within the fan casing aperture. If the shaft is not exactly in the centre of the hole, adjust the shims under the bolts until it is exactly central with an even gap all the way around.

5. Fit a new flinger seal onto the Fan shaft.

6. Replace the impeller and tighten the impeller securing belt to a torque of 30Nm.

7. Replace the fan finger guard.

8. Replace the filter medium.

9. Test run the fan, check its direction of rotation and check that it operates smoothly without noise or vibration.

Ducting Express provides a national network of trained service engineers. Each service vehicle is equipped with a considerable
range of genuine spares. We would strongly recommend that to maximise the performance and longevity of your
Our own service personnel carry out Ducting Express Spraybooth that service work.
Please Note: It is a condition of your 12-month Warranty that your Spraybooth is serviced every 6 months. Please contact *Ducting Express* Sales Department to arrange for your service visits.

In addition to standard servicing *Ducting Express* are also able to provide a complete performance, environmental and COSHH
assessment service. Please contact our Sales Department to discuss your requirements.

18 Spare Parts

Please quote the following information when ordering spare parts.

Your Company Name	e.g.	A. Smith Limited
Model Number	e.g.	DF3.3
Serial Number	e.g.	14459
Inspection / Despatch Date	e.g.	11/10/95

Ducting Express carry large stocks of all spare parts and can arrange same day despatch for orders received before 3pm Monday to Friday. Please Note: The performance of your ***Ducting Express*** spare parts. Please do not fit locally produced substitutes.