Ducting Express Services Ltd
Unit 3 Claymill Road, Thurmaston, Leicester, Le4 9JJ

Maintenance
And
Installation Manual
For
Ducting Express ‘M’ Series Modular Filter Units

25M Auto shaker Fine dust extraction filter

ATEX 22 Compliant:

Tel: 01455 616 444
Fax: 01455 616 442
E-mail: info@ducting-express.co.uk
www.ducting-express.co.uk

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Type 25M 11kw Mec/Shake unit (2.9 CF bin size) Bin Balance to allow the use of plastic collection bags Volume 8000 M3h @ 200mm SWG

- Internal Silencer
- 25 sq.mt of Shell anti-static filter media
- Primary NF304 polyester filter elements
- High capacity waste collection bin
- Single inlet flange
- Top mounted motor 11kw direct driven fan set (IP55 2EFF)
- 0.25kw shaker motor
- Internal or external application
- Hinged access doors
- Powder coated to a RAL colour of your choice
- Atex explosion panel fitted with ATEX panel and Atex fittings)
- 11 Kw Fully Auto Starter panel

Allow 3 to 4 weeks delivery

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Your DES M Type Filter Unit has been designed for use in industry, but it is essential that the application to which the Dust Extraction Unit is required to operate is within its capabilities, as, whilst we do acknowledge that careful maintenance pays dividends, it will not correct filter units which have been undersized at the outset.

The DES M range of package filter units. These units have been designed with filter areas of 8, 15, 25, 32, 40, 50, 64, 75, 80, 96, 120, 128, 150, 196 and 256sq.m of filter fabric area respectively. All units are of the same basic design and consequently their operation is similar.

The direct driven fan is mounted on the clean air side of the filter fabric and requires little maintenance, apart from the greasing point (if fitted on the motor bearing). Periodically the electrical terminations to all motors and starters should be checked. We would recommend on at least an annual basis.

The filter fabric usually supplied within the filter unit would be a cotton material if supplied as a standard machine; however, Terylene needle felt is the more common filter supplied as standard. Other types of filter medium can be supplied to deal with arduous conditions or special dust applications. The cleaning of the accumulated deposit on the filter bag is achieved by shaking the filter bag to dislodge the deposits of accumulated material. An electric geared shaker motor is used for shaking the filter element.

The electric shaker which is supplied as standard with all 'M' filter units is a fractional 0.375kW geared motor. The motor is mounted internally on the filter unit and connects via a linkage to the filter shaking frame. The length of the shaking stroke is approximately 70mm and oscillations of 230 shakes per minute are achieved.

In operation the dust ladened air is drawn onto the filter element, however because the approach speed to the element is lower that the inlet velocity this change in speed causes the larger dust particles (which cannot be transported by this lower carrying velocity) to drop out of the air stream and back into the collection bin. The contaminated air is then drawn onto the filter element where separation of the dust from the air takes place, the cleaned air passing through the filter element to atmosphere through the fan set.

The filter/fan configuration on the DES ‘M’ filter unit is the most ideal situation as the filter body is (other than in the cleaning cycle) kept under a negative pressure thus ensuring that dust can’t escape from the filter when the fan is in operation. All maintenance work is also carried out on the clean side of the filter element.

Removal of the collection bin is as detailed below.

Upon pressing the stop/clean button on the shaker starter the fan/s will be de energised and a pre-set rundown of the fan/s will occur, after this period the filter element shaker will energised cleaning of the filter element will take place. The displaced dust from the element falling back into the collection bin.

Access to the filer element and gearbox shaker is gained through the front access door/s which is detailed below.

The makeup of the body is of an all panel construction welded together and sealed prior to painting the final specification will be as the order acknowledgement.
The fully automatic control panel which is supplied as standard with all DES 'M' filter units is a combined fan/shaker controller and its operation is as follows.

SINGLE FAN CONTROLLERS

On pressing the start button the fan is energised and runs until the filter stop/clean button is pressed. On pressing the stop/clean button the fan contactors are de-energised, a timer is brought into operation which allows the fan to run down and come to rest (normally 90 sec is adequate). When the run down cycle has finished the shaker is brought in to operation and shaking occurs cleaning the filter element (normally 15 sec is adequate). Upon completion of the filter cleaning a further 15 sec is allowed for the dust to settle into the collection receptacle before the filter unit can be re-started. During the two minute shaking cycle the filter cannot be overridden and started until the cycle has ended.

MULTI-FAN CONTROLLERS

On pressing the start button the first fan is energised and runs until speed is achieved when the next fan or fans are brought in a cascade start and the fans run until the filter stop/clean button is pressed. On pressing the stop/clean button the fan contactors are de-energised a timer is brought into operation which allows the fan to run down and come to rest (normally 90 sec is adequate) when the run down cycle has finished the shaker is brought in to operation and shaking occurs cleaning the filter element (normally 15 sec is adequate). Upon completion of the filter cleaning a further 15 sec is allowed for the dust to settle into the collection receptacle before the filter unit can be re-started. During the two minute shaking cycle the filter cannot be overridden and started until the cycle has ended.
A drawing of the control panel will be found in the panel, from which it should be removed for safe keeping.

3 MONTHLY INSPECTION

With the fan stopped and the electrical power to the controller isolated in the off position, open the inspection panel on the main filter body, this will be either:

A. A standard lift off door having 2 retaining catches and 2 hinges per door. Turn the retainingcatches1/4 of a turn and pull the door outwards. If access to the filter is limited then the hinge bolts may be removed and the door lifted out of the frame. However if this is done the adequate care should be taken to ensure that the door is sufficiently supported to prevent door movement or slippage particularly in confined, windy or difficult locations.

B. A standard lift off door having 2 retaining catches and 2 hinges per door with also 2 door retaining bars each retained by 2*M10 holding down nuts. Remove the 4 retaining nuts per door. Turn the retaining catches 1/4 of a turn and pull the Door outwards. If access to the filter is limited then the hinge bolts may be removed and the door lifted out of the frame. However if this is done the adequate care should be taken to ensure that the door is sufficiently supported to prevent door movement or slippage particularly in confined, windy or difficult locations.

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IT IS IMPORTANT WHEN GAINING ACCESS TO THE FILTER UNIT THAT THE DOOR SEALS ARE CHECKED AND IF FOUND NOT TO RE-GENERATE SHOULD BE REPLACED PRIOR TO REFITTING THE INSPECTION DOOR.

Check the filter element for obvious signs of wear and penetration of dust through the element and if necessary remove and clean or replace as required. A check should be made with a differential pressure gauge to log the pressure loss across the filter when the filter is in operation this reading should be no higher than 75mm WG in operation and should be checked again immediately on start up of the filter unit to ensure that regeneration of the filter has taken place. If the pressure drop across the element does not indicate that regeneration has occurred then the filter element should be replaced. The regenerated pressure drop should be 15 to 50mm WG. This will depend on the condition of the filter element.

Check for the free rotation of the fan motor and impeller and should a situation arise that the fan impeller or motor is to be removed from the filter body the following procedure should be adopted.

With the electrical controller isolated in the off position.

Remove the air silencer if one has been fitted.

Disconnect the motor wiring at the motor terminal box.

Unscrew the retaining studs holding the motor plate to the filter section.

Lift the complete fan assembly up and away from the filer top.(additional lifting equipment may be required deponent upon site conditions and fan size etc.).

Unscrew the retaining screw from the end of the motor shaft.

Unscrew the 2 retaining shaft grub screws in the impeller hub.

The impeller may now be withdrawn from the impeller shaft.

Unbolt the motor from the motor plate.

The reverse procedure is to be adopted upon re assembly. Note upon completion check that the fan rotation is correct.

Removal of the filter element is accomplished as follows:-

A. Remove the suspension grips from the front of the shaker frame allowing the hooked end to pass along the filter top cuff over the middle shaker bar and through the back top cuff this is done for every element pocket until all the elements are laying on top of the filter frame in the base of the filter unit.

B. Unscrew the 4 or 6 filter retaining studs around the base of the filter frame. The frame along with the attached element can now be removed from the filter body (on applications where toxic dusts are encountered breathing apparatus and/or other methods of personal protection must be used in line with the H.S.E. requirements along with safe disposal of the contaminated element).

C. The new element which is factory fitted to the filter frame along with the new frame seal can now be positioned in the filter body and bolted into position with the previously mentioned filter retaining studs. The filter grips should be located to the rear of the shaker frame and threaded

through the rear top cuff, over the middle shaker bar and through the top front cuff finally locating the hook into the hole on the shaker frame.

THE ELECTRIC SHAKER MOTOR. Check the eccentric nylotron bushes for obvious signs of wear and replace as required. Check the electrical termination's on the shaker motor. Check the holding down of bolts on the shaker motor. Check the lubrication to the shaker motor gear box if not sealed for life.

GENERAL MAINTENANCE

Check the start up and run down timing of the starter panel.

Check the filter frame main support bearings for signs of wear.

Check the filter door seals and replace if not regenerating.

Check the free running of the impeller and condition of the inlet cone.

6 MONTHLY CHECK
Carry out three monthly check.

9 MONTHLY CHECK
Carry out three monthly check.

12 MONTHLY CHECK
Carry out three monthly check plus

A. Grease main motor bearings if applicable.

B. Carry out COSHH survey to dust extraction equipment and associated plant. Ducting Express Services Limited will undertake a full service contract including all survey and report work in relation to COSHH.

There are several styles of dust disposal methods for the DES 'M' type filter unit and these are.

The 'Standard Quick Release Bin' in various capacity sizes. Also including bins with internal disposal bags for safe collection of dusts so as not to cause a secondary dust problem. Removal of the bin is as follows.

Lift the retaining handle cross bar into its highest position and pull forward to lock the bin handle in the high position. Pull the bin forward and out of the bin mouth piece. To replace the bin, push the bin back into the hopper mouth piece and when located push the retaining handle cross bar back towards the filter unit body. With the handle in this position press down to lift the bin and lock the bin in position.

For bins with a Bin Balance System
Lift the retaining handle cross bar into its highest position and pull forward to lock the bin handle in the high position. Pull the bin forward and out of the bin mouth piece. Remove the bag insert and dispose of as required. Fit a new liner bag into the bin. To replace the bin, push the bin back into the hopper mouth piece and when located push the retaining handle cross bar back towards the filter unit body. With the handle in this position press down to lift the bin and lock the bin in position. **Note:- do not use the bin unless a liner has been fitted to the bin.** If a liner is not to be fitted to the bin then the bin balance system should be disconnected.

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The 'High Capacity Collection Hopper' which will discharge the collected material via a valve arrangement into a skip or other collection receptacle, or through the valve into a pneumatic conveying system.

Or flanged directly onto the client's collection receptacle i.e. a silo or other closed and airtight container.

ELECTRICAL INSTALLATION

The fan and shaker motors supplied with the DES 'M' dust extraction unit are normally supplied for 415/3/50 plus or minus 6% electric supply. The main wiring to the fan motor should be suitable for the rating of the actual motor installed.

Shaker motors are of the geared reduction type. Input speed is 1400 r.p.m. and the output speed is 230 r.p.m.

One 0.75kW 1.5kW 2.2kW and 4kW fan units these will normally be 220/415/3/50 dual voltage motors and unless specified will be connected to the 415/3/50 supply for direct on line starting.

On motors of 5.5kW and above single voltage motors suitable for direct on line or star delta starting are supplied.

LINE FUSE REQUIREMENTS

The characteristics of the line driven centrifugal fans, as fitted within the DES 'M' range of filter units will apply moderate starting torque's to the motors, therefore, the electrical current absorbed is in production to these figures. We therefore recommend that the following fuses are incorporated in circuits to DES 'M' extraction units for DOL. starting.

Motor size	0.75kW	5 amp
Motor size	1.5kW	10 amp
Motor size	2.2kW	15 amp
Motor size	4kW	20 amp
Motor size	5.5kW	30 amp
Motor size	7.5kW	40 amp
Motor size	11kW	50 amp
Star -delta Motor size	15kW	64 amp

RECOMMENDED SPARES LIST

All models:

One set of filter elements
One set of filter grips
One set of Filter and Doors seals
One Shaker motor
One set of Shaker Linkage
One Main Fan Motor
One Impeller
One Inlet cone (if fitted)