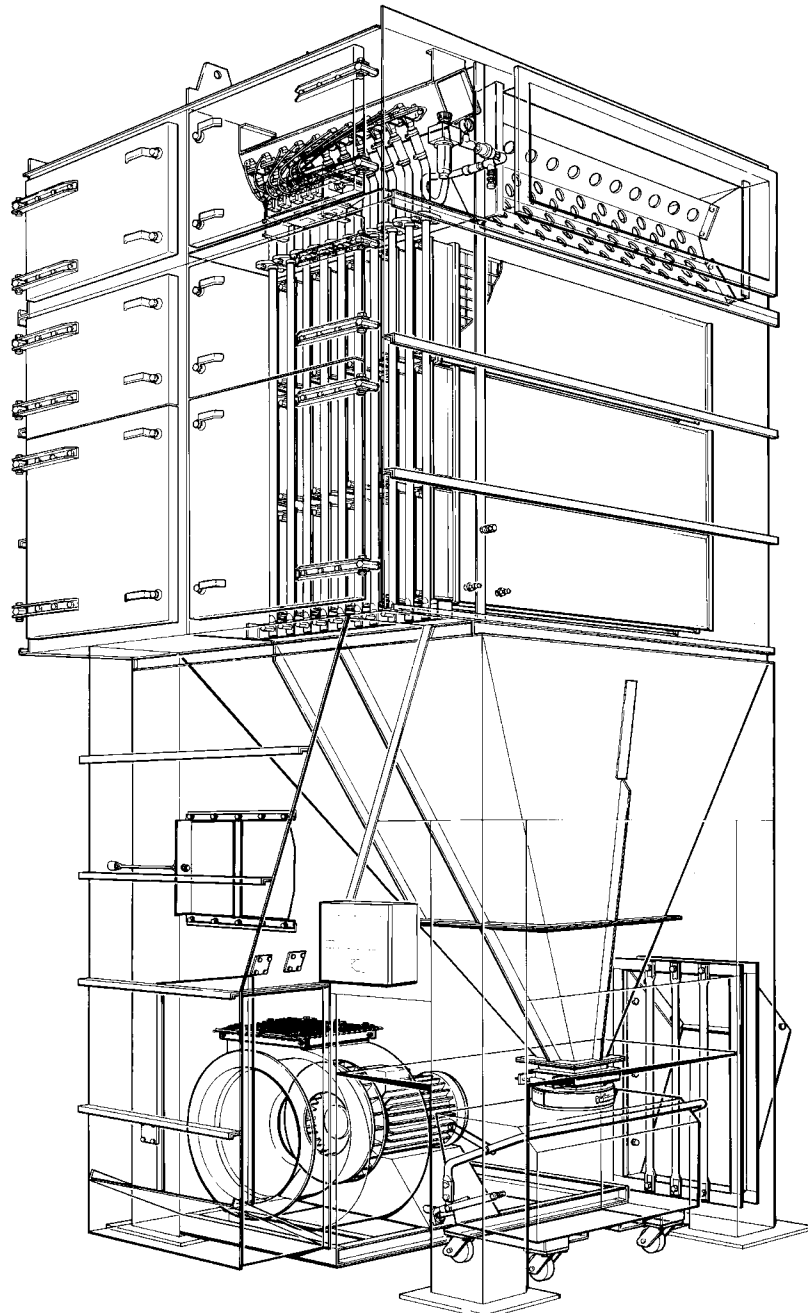


Dalamatic Concept Dust Collectors

Series D60-225



IMPORTANT

**PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLATION.
REFERENCE SHOULD ALSO BE MADE TO THE
SUPPLEMENTARY INFORMATION, PUBLICATION 2875,
SUPPLIED WITH THE DUST COLLECTOR.**

**THIS MANUAL SHOULD BE READ IN CONJUNCTION WITH THE RESPECTIVE
CONTROLLER MANUAL SUPPLIED WITH THE DUST COLLECTOR:**

TOTAL CONTROL BOARD (TCB) – PUBLICATION 262-3143

PT CONTROLLER – PUBLICATION 2697

EXPLANATION OF SYMBOLS USED



Indicates information on the efficient operation of the collector.



Indicates important information directed towards preventing damage.






Indicates an important warning, designed to prevent injury or extensive damage.

IMPORTANT

These details correspond to the serial nameplate located on the left-hand side panel of the equipment

This marking is used only on equipment suitable for use in Potentially Explosive Atmospheres

Donaldson®		 Donaldson.	
Torit® DCE®			
DONALDSON FILTRATION (GB) LIMITED Humberstone Lane, Thurmaston, Leicester, LE4 8HP, England TEL: +44 (0)116 269 6161 • FAX: +44 (0)116 269 3028 EMAIL: IFS-uk@emea.donaldson.com • www.donaldson.com		CE  II 3 D T 135°C	
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CONTENTS

Installation

General guidance to lifting	9
Installing base section	10
Flat bar stiffening and stiffener bridge pieces	11
Erecting explosion dome upstand	12
Positioning the filter and inlet sections	12
Fitting a screw conveyor	15
Compressed air requirements	16
Controller	17
Control of ancillary equipment and interlocks	18
Overload protection	18
Integral fan	18
EEx controls	19
Antistatic earthing	19
Explosion relief	20
Installation check list	20

Commissioning

Commissioning check list	21
Start-up sequence	22
Shut-down sequence	23

Operation

Principle of operation	24
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Maintenance

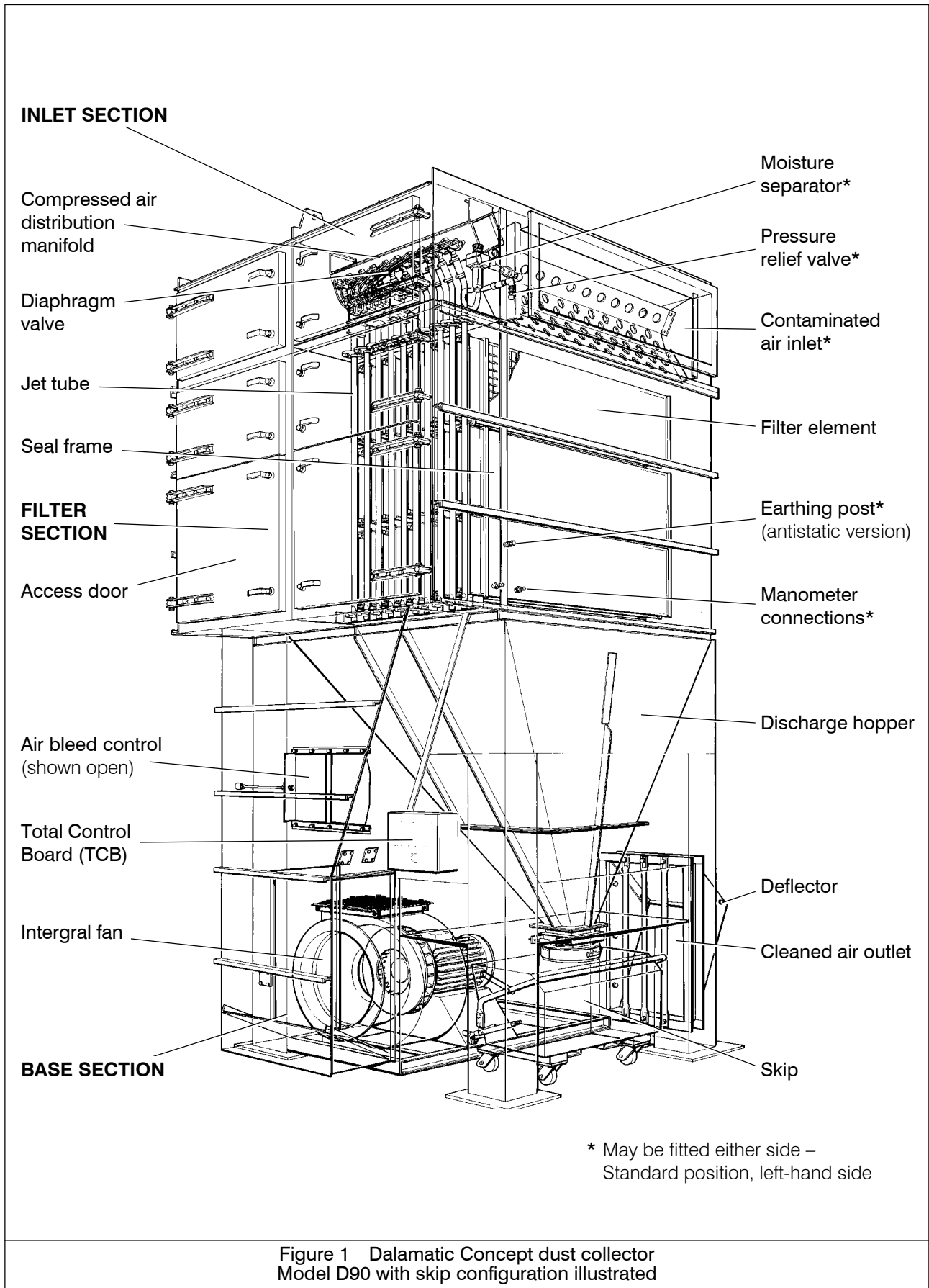
Routine inspection	25
Servicing schedule	26

Specification

Description and Range	30
Construction	30
Declaration of conformity	35

CONTENTS

Table 1	Dalamatic Concept dust collector delivery information	7
Table 2	Predicted flame lengths	20
Table 3	Fault location	29
Table 4	Dalamatic Concept dust collector range	31
Table 5	Weighted sound pressure levels	31
Table 6	Design limits	31
Table 7	Compressed air manifold design details	34
Table 8	Compressed air requirements	34
Figure 1	Dalamatic Concept dust collector	6
Figure 2	Section lifting arrangements	8
Figure 3	Two-point lifting arrangement	9
Figure 4	Four-point lifting arrangement	9
Figure 5	Installing base section	10
Figure 6	Flat bar stiffening and stiffener bridge pieces	11
Figure 7	Erecting explosion dome	13
Figure 8	Positioning the filter section	13
Figure 9	Connections	14
Figure 10	Earthing connection between base and filter sections	15
Figure 11	Earthing connection between filter and inlet sections	15
Figure 12	Fitting a screw conveyor	15
Figure 13	ΔP connections	17
Figure 14	Air bleed adjustment	22
Figure 15	Section through seal frame and two filter elements showing principle of operation	24
Figure 16	Valve diaphragm replacement	27
Figure 17	Filter element details	32
Figure 18	The valve system	33



INSTALLATION



If the equipment is not installed within 1 month of receipt, rotate the fan and motor slowly to prevent 'brinelling' of the bearing races. This procedure should be repeated each month until the collector is in service.



Where equipment is installed in a Potentially Explosive Atmosphere, care should be taken not to locate the collector where external ignition sources can be introduced, for example stray electric currents, lightning, electromagnetic waves, ionising radiation, ultrasonic waves.



You should ensure any persons carrying out work on the supplied equipment follow any relevant recognised standards/codes and are competent to do so. Areas requiring a competent person include:

- Maintenance on any component identified as a potential ignition source.
- Lifting and erection.
- Electrical installation, inspection and maintenance work.
- Pneumatic installation, inspection and maintenance work.
- Any access to internal classified potentially explosive atmospheres where the risks due to explosion and dust contact are reduced to a safe level.

Dalamatic Concept dust collectors are supplied in a number of factory assembled sections, as outlined in Table 1.

TABLE 1 — DALAMATIC CONCEPT DUST COLLECTOR DELIVERY INFORMATION

D90 and D135 dust collectors:	Supplied in two sections: – Base section – Combined filter and inlet section
D60, D120 and D180 dust collectors:	Supplied in three sections: – Base section – Filter section – Inlet section
D150 and D225 dust collectors:	Supplied in three sections: – Base section – Lower filter section – Combined upper filter and inlet section

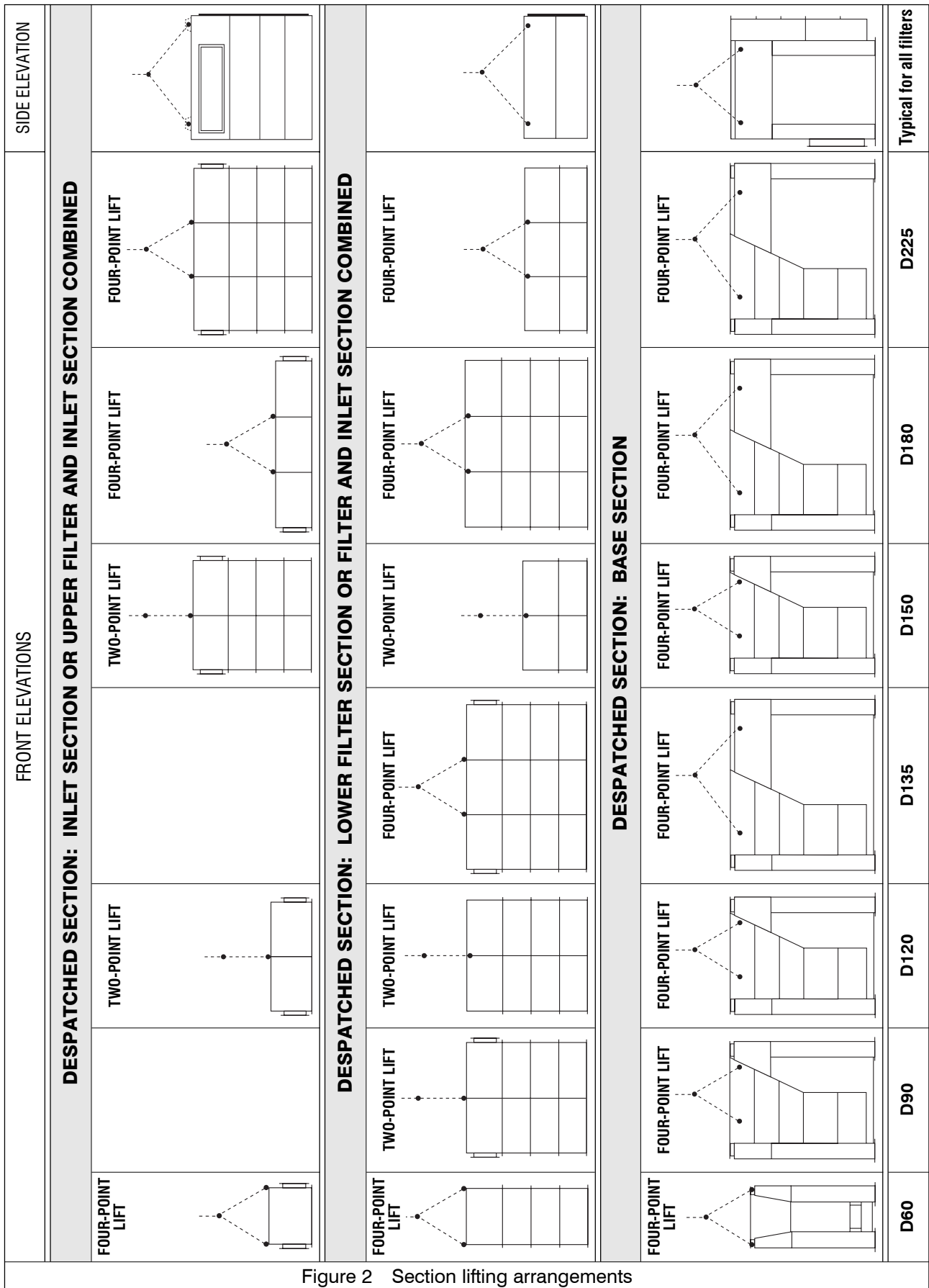


Figure 2 Section lifting arrangements

INSTALLATION

General guidance to lifting



Each section should be lifted by using either a two-point or four-point lift depending on the individual section type involved (see Figs. 2, 3 and 4).

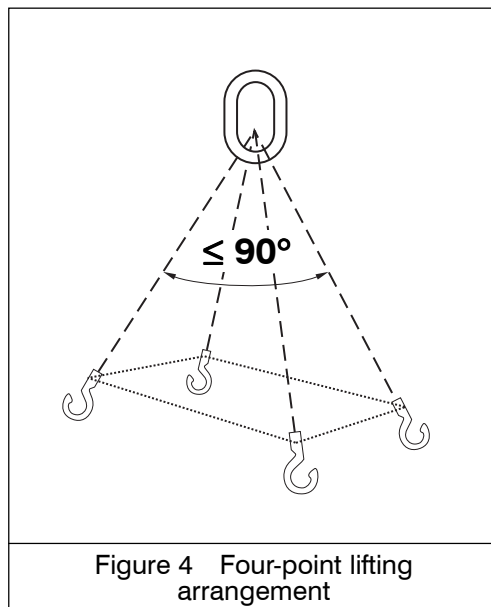
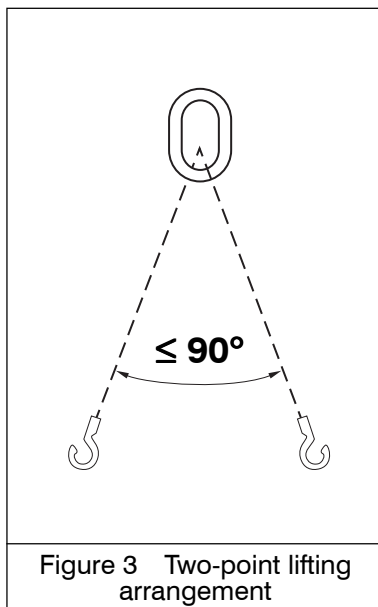


Chains or slings must be used with an adequate SWL (safe working load). (Refer to lifting label located adjacent to lifting bracket for weight of equipment supplied by Donaldson). Chains must be long enough to ensure that the included angle between diagonal chains is not greater than 90°.

Ideally the chains should be adjusted to give a horizontal lift. If the chain lengths are not adjusted the equipment will hang at an angle but can still be lifted safely.



The lifting brackets should only be used to lift the equipment as supplied, i.e. not with any ancillary equipment fitted.



INSTALLATION

Installing base section



The recommended method of securing base assemblies to foundations is by using expandible bolts.

(Refer also to Figure 5)

Attach deflector (A) to outlet at rear of base assembly.

If the optional extended leg clearance is required on collectors with rotary valve, then fit the base extension legs (B) to the base assembly.

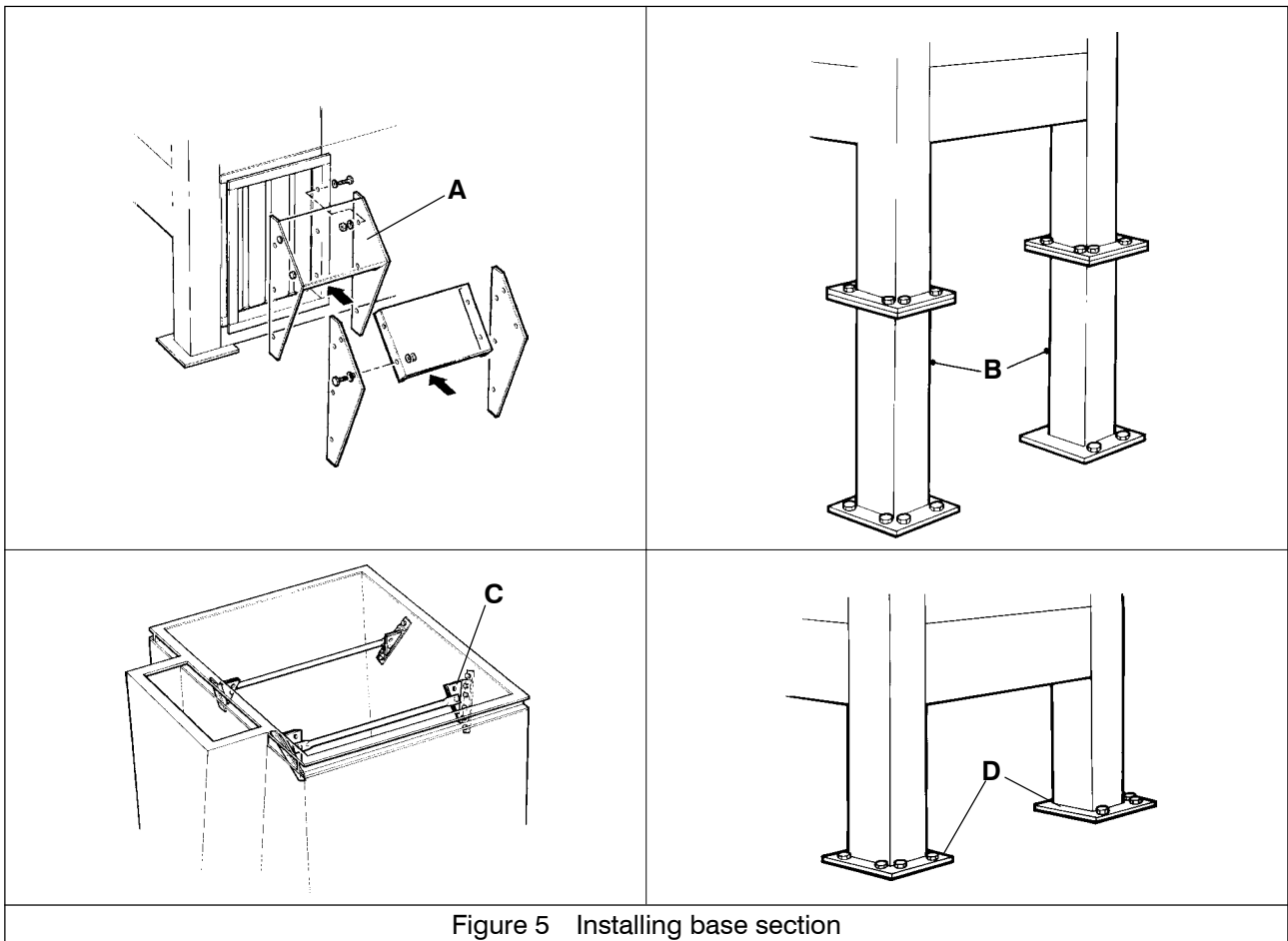
Lift the base section into position using the four lifting lugs (C) provided inside the hopper. (On D60 collectors, four lifting brackets are provided on the top flange).

Using plumb lines and spirit levels, line up base section both horizontally and vertically, using shims under leg baseplates (D) where required.

Drill through base holes and insert suitable expandible bolts.

Tighten holding down expandible bolts.

Remove lifting lugs and support bar, and replace M10 bolts to seal the hopper. (On D60 collectors remove lifting brackets from top flange).



INSTALLATION

Flat bar stiffening and stiffener bridge pieces

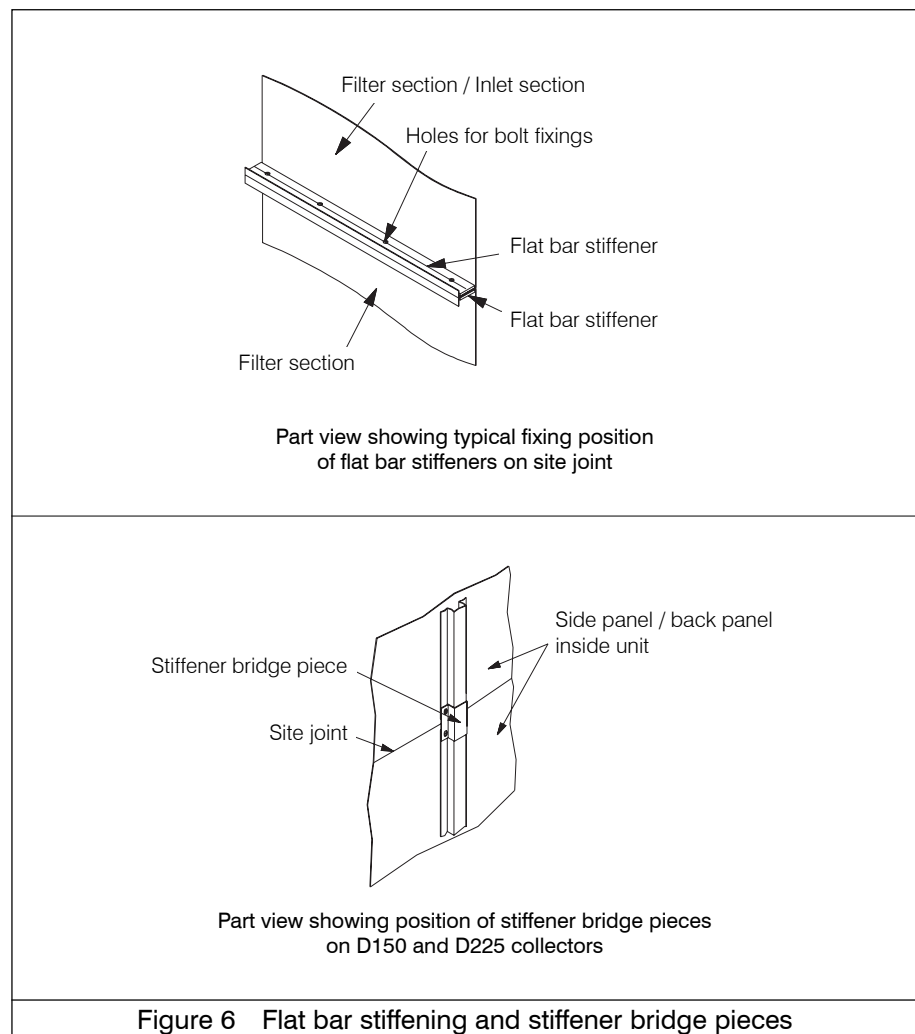
For the following options, a set of flat bars are supplied with the collectors:

- –1140 mm W.G. stiffened collectors.
- Top explosion collectors.
- –1140 mm W.G. stiffened with top explosion collectors.
- –1140 mm W.G. stiffened with rear explosion collectors.

(Refer also to Figure 6)

The flat bar stiffeners should be fitted at all the relevant site joints, when the collector is being installed i.e. filter section to inlet section and joint lines between filter sections on D150 and D225 collectors.

Additionally, on D150 and D225 collectors, stiffener bridge pieces are required at the site joint, where the stiffeners are split.



INSTALLATION

Erecting explosion dome upstand (if fitted)

(Refer also to Figure 7)

Tack bolt channels (E) together with left-hand side channel (F) and right-hand side channel (G).

For multi-bank collectors, fit make up plate(s) (H) between two channels (E) and tack bolt centre channel(s) (J) into position.

Secure the explosion dome upstand to the pressure relief vent flanges.

Tighten bolts.

Position dome (K) into place and drill Ø6 mm holes through dome and top flange. The holes should be drilled in the corners of the dome and at approx. 300 mm pitches.

Apply silicon sealant around dome mounting flange. Secure the explosion dome with the push button tacks provided (until the sealant has set).

If the dome is exposed to high winds before the silicon sealant has cured, then additional support may be required, by drilling and fixing M6 screws and nuts through the flanges.

Positioning the filter and inlet sections

(Refer also to Figures 8 and 9)

The filter and inlet sections must be raised into position in the pieces supplied, e.g. D150: lower filter section first, followed by the upper filter and inlet section combined.

With the exception of D90 and D135 collectors, jet tubes should be removed from filter section prior to lifting – this will ease location of upper filter or inlet section.

Apply a suitable sealing compound, to suit both temperature and application, around top of hopper flange (L) and (M) making a continuous 5 mm bead along each side of the flange fixing holes.

Sling the filter section only from the lifting lugs (N) provided. Use a four-point lift on D60, D135, D180 and D225 collectors and a two-point lift on D90, D120 and D150 collectors (see Figs 2, 3 and 4).

Raise the filter section vertically and carefully lower onto the hopper flanges.

Locate nuts and bolts on flange (M) first, do not tighten. Then locate holes on flanges (L) using podger (P). Fit remaining nuts and bolts and tighten all securely.

On D60 collectors remove lifting brackets from filter section before lifting inlet section.

With the exception of D90 and D135 collectors, apply a suitable sealing compound, to suit both temperature and application, along the seating flange for the upper filter or inlet section, making a continuous 5 mm bead along each side of the flange fixing holes. Locate the bolts on the flanges, fit nuts and bolts and tighten all securely.

INSTALLATION

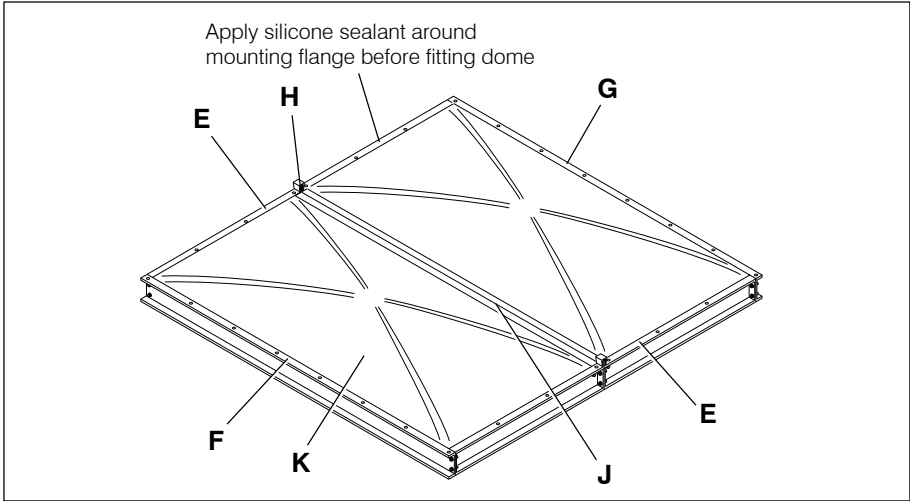


Figure 7 Erecting explosion dome (2-bank shown)

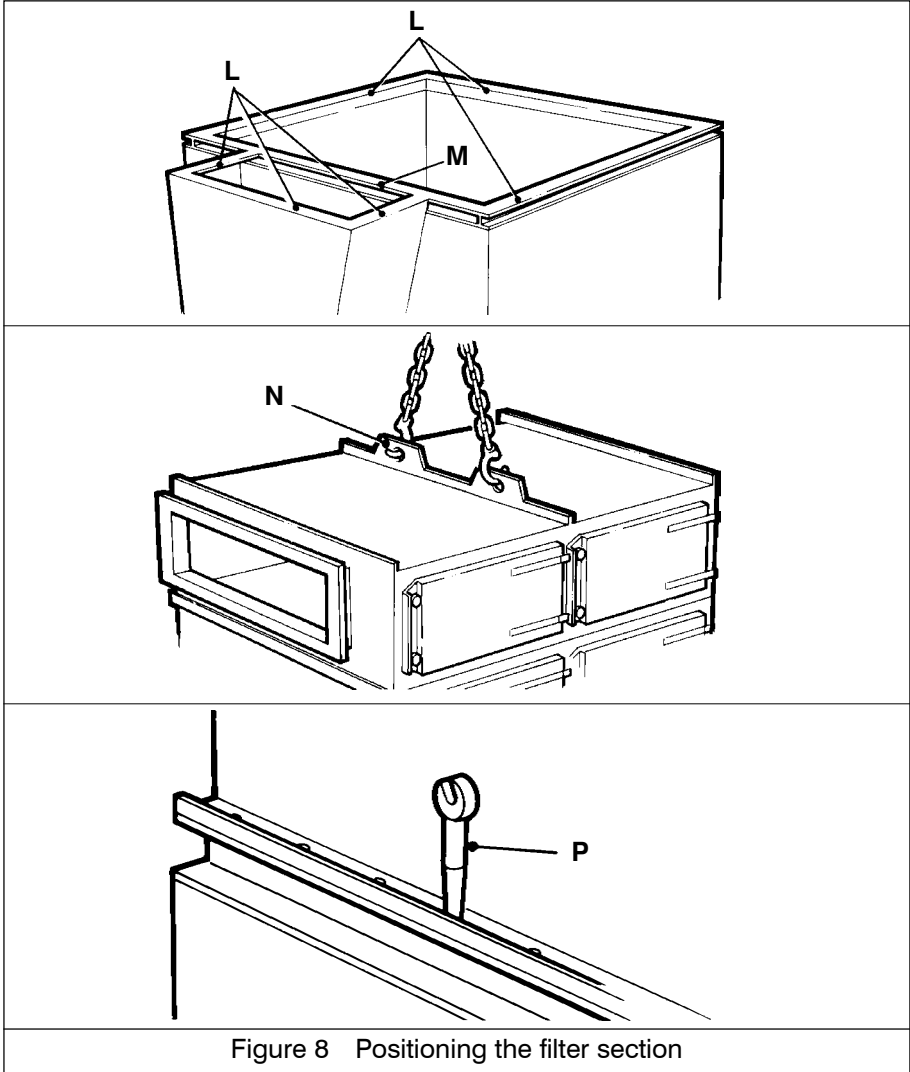


Figure 8 Positioning the filter section

INSTALLATION

Uncoil the conduit containing the cable between the solenoid valve enclosure and the Total Control Board. Pass the plug connectors through the M25 connection hole in the base of the TCB (Q) and secure conduit with nut. Plug the connectors into TCB circuit board (R).



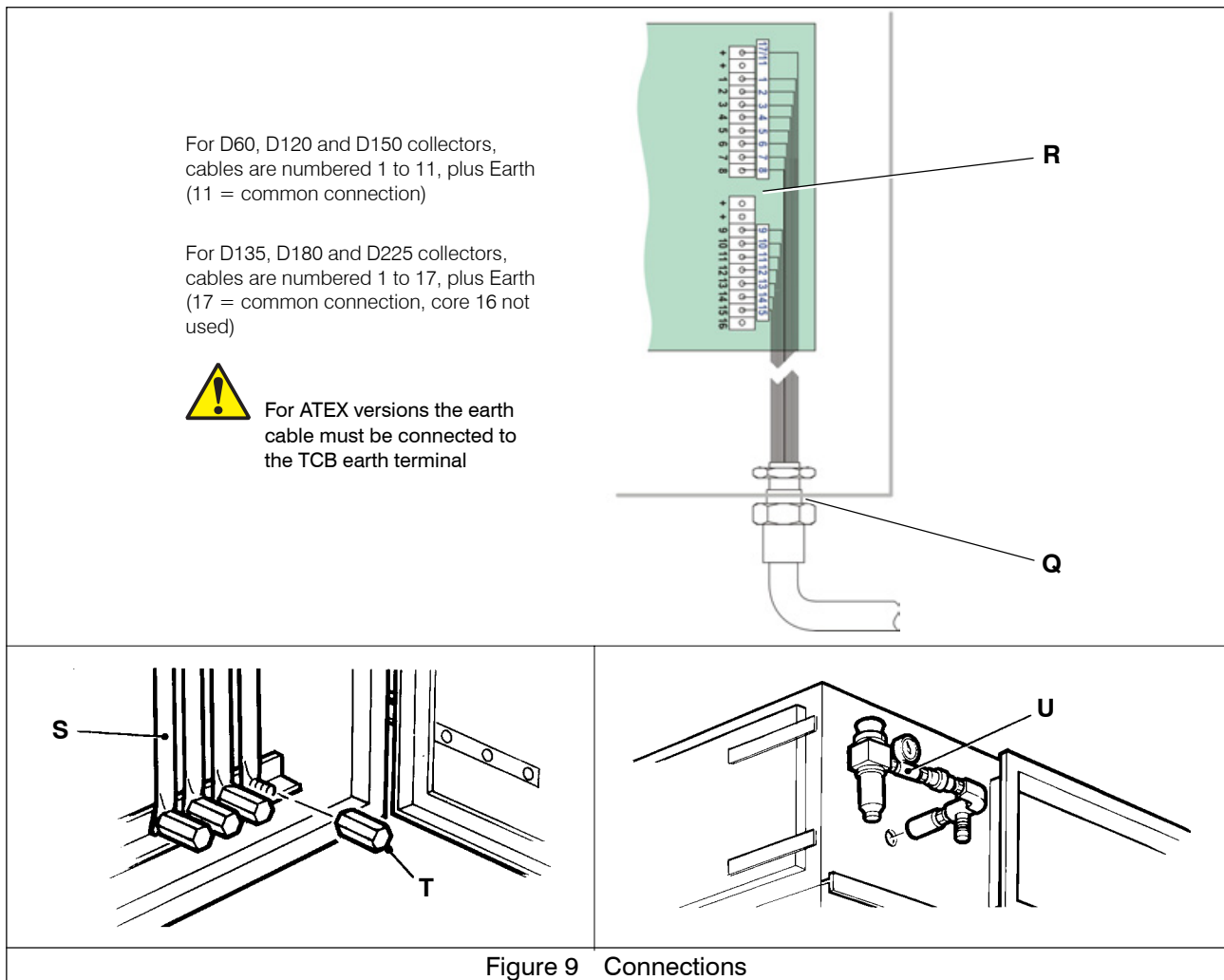
For ATEX versions, connect the earth cable to the earth terminal on the TCB DIN rail.

With the exception of D90 and D135 collectors, fit the jet tubes (S) into position and tighten retaining bolts (T). Where two-piece jet tubes are used ensure gaskets supplied are fitted between jet tube flanges.

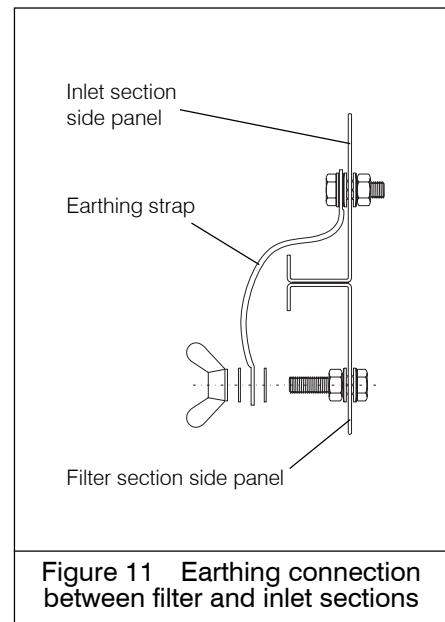
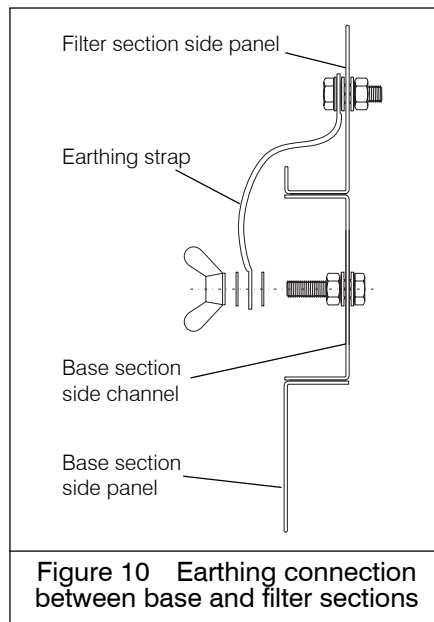
Insert and fit the moisture separator (U).



On all collectors fitted with antistatic filter elements, an earthing connection must be made between the base and filter sections (see Fig. 10), and also, with the exception of D90 and D135 collectors, between the filter and inlet sections (see Fig. 11), using the earthing straps provided.



INSTALLATION



Fitting a screw conveyor

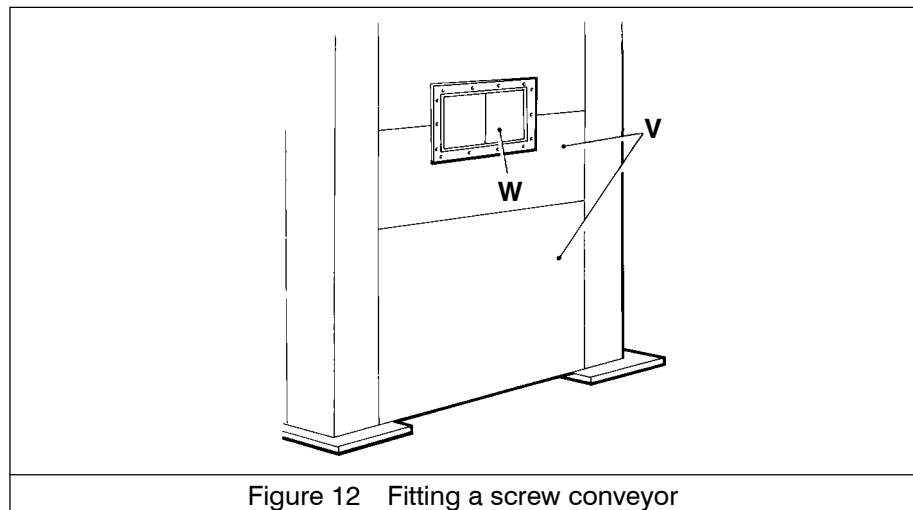
(Refer also to Figure 12)

On collectors with screw conveyor, some acoustic panels (V) will require removal.

After removing the panels fit the screw conveyor, as detailed in your supplier's instructions. Ensure there is a good seal between the hopper and the conveyor by using a suitable sealing compound, to suit both temperature and application.

Refit the acoustic panels.

To ensure a good seal to the acoustic compartment, it will be necessary to cut the supplied blanking sheets (W) to the profile of the conveyor. Once shaped these should be fixed in position using the retaining frame. Complete the sealing process by applying a suitable sealing compound, to suit both temperature and application.



INSTALLATION

Compressed air requirements

Dalamatic Concept dust collectors require an independent supply of clean, dry, oil-free compressed air. Details of atmospheric pressure and quantity are given in Table 8 (refer to 'Specification' section). A design label is also attached to each manifold. Where an existing factory mains system is to be used it may be necessary to install an additional moisture separator in the supply line to the collector. If a compressor is being installed to supply the Dalamatic, then the following conditions should be observed as far as possible:



Alternative cleaning gases should be assessed before use to ensure explosive atmospheres are not introduced.

Type of compressor

Use a compressor of ample capacity – an overloaded compressor may produce excessively contaminated, moisture-laden air.

Location of air intake

Avoid locating the air intake in an excessively polluted area and install an adequate air intake filter. The compressor air intake should be sited, if possible, on the north side of the building – fresh air drawn from the north side is usually cooler and denser, and therefore has a lower moisture content. (South of the equator the reverse will apply).

Layout and installation of air lines

The pipework between compressor and dust collector should be long enough to act as a cooling device for the compressed air. A typical requirement for the smaller installation would be 10 m (30ft) of 20 mm ($\frac{3}{4}$ " NB) piping. For further details see Table 8. The piping should be installed to provide a fall in the direction of air flow to assist in the drainage of accumulated moisture. A moisture separator should be provided at the lowest point of the installation.

Pressure relief

The manifold has a maximum operating pressure of 6.2 bar (see Table 7 in 'Specifications' section). It is a requirement that adequate precaution is taken to avoid exceeding this pressure. Where a relief valve is supplied by Donaldson this device has a relief rating of 25 dm³/s at 7.1 bar. Extra system relief will be required if the connected supply can exceed this.

INSTALLATION

Controller



It is a requirement of the Supply of Machinery (Safety) Regulations 1992 to provide adequate isolation and emergency stop facilities. Due to the varied nature of site installations this cannot be provided by Donaldson but instead is the responsibility of the customer. Refer to TCB manual (Publication 262-3143) for details of connecting to emergency stop.



Ensure all personnel carrying out electrical installation work on the equipment follow any relevant recognised standards/codes and are competent to do so.



Always isolate power before opening the controller.



Care should be taken to ensure that any explosive atmosphere is not present when performing operations that increase the risk of ignition (opening of controller for adjustment or electrical repair for example). Ensure the installation is always returned to its original state.

Each Dalamatic Concept dust collector is supplied with a Total Control Board (TCB) to operate the reverse jet cleaning system.



If the dust collector is not fitted with a TCB please refer to supplied documentation.



For TCB connections and set-up, refer to Publication 262-3143.

The cleanside and dirtyside tapping points, as shown in Figure 13, require connecting to the cleanside (coloured blue and labelled P1) and dirtyside (labelled P2) tapping points on the controller, using the ΔP connection kit supplied.

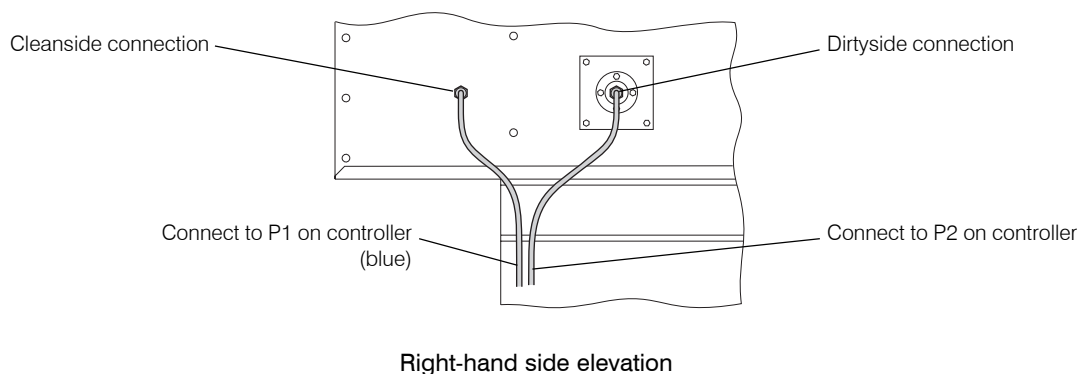


Figure 13 ΔP connections

INSTALLATION

Control of ancillary equipment and interlocks

The Total Control Board can be configured to operate a complete dust collector system (e.g. fan motor, screw conveyor, rotary valve etc.) and accept inputs from other devices (e.g. PLCs, level probes, explosion panel rupture detectors etc.). See Publication 262-3143 and drawings supplied with the TCB for full details of supplied control system.

Where the TCB is used for the complete system all necessary interlocks will be built into the system. If the ancillary equipment is controlled by a separate system it is important to provide appropriate interlocks to ensure trouble-free operation of the dust collector.

The design of the electrical circuitry controlling equipment associated with the Dalamatic collector should be such that breakdown of any one of the associated pieces of equipment does not cause a complete blockage of the collector. For example, should the motor of a rotary valve fitted to the collector cease to function, the collector housing will gradually fill with dust until completely choked. Failure of the compressor could also cause a similar blockage.

It is therefore important that the starters of all ancillary equipment be interlocked to ensure:

- 1 Correct starting sequence;
- 2 Operation of a warning system, or alternatively stoppage of the entire installation in the event of a failure of any of the auxiliary motors;
- 3 Correct stopping sequence.

Refer to Donaldson for further information on interlocks / system configuration if required.



It may be necessary to provide a facility to shut down the equipment in the event of an explosion (where collectors are fitted with explosion relief panels). The signal should be taken from the explosion relief detection device and may be connected to the input circuits of the TCB (refer to Publication 262-3143).

Overload protection

All feeder circuits should be adequately protected with suitably-rated fuses.

Integral fan

The fan is pre-wired to the TCB. Connect the incoming three phase supply to the isolator of the TCB (refer to Publication 262-3143).

INSTALLATION

EEx controls

When the dust collector is to be installed in a hazardous area, where there is a risk of fire or explosion, it will be marked for the area(s) it can be safely used within (refer to serial nameplate). In some instances the collector may be fitted with either of the following control systems:

● EExd solenoids and remote controller

When this option is fitted, the dust collector has its solenoid valves in an EExd IIb T6 enclosure mounted directly to the collector. A Total Control Board, housed in an IP65 box, is supplied loose. This must be installed in a safe area and connected to the solenoid valves on the dust collector using suitable cabling (not supplied).



The maximum length of cabling that can be used is 100m.

Instructions for setting up the controller are the same as those for the standard controller.

● PT controller

The PT controller is a pneumatically operated device which operates the diaphragm valves in sequence, therefore an electrical supply is not required.

The controller is supplied complete with air regulator and is mounted on a bracket within the cleanside of the inlet section.



For PT controller connections and set-up, refer to Publication 2697.

(Multi-bank collectors)

One PT controller can operate up to 3-banks, by means of 'stacked' collet-type connection fittings.



The length of tubing connected to any one diaphragm valve should not exceed 2 metres. For this reason, a controller serving three banks should be mounted in the middle.

Antistatic earthing

It is particularly important on collectors having antistatic filter elements that the earthing post (located adjacent to the symbol, shown opposite) is properly connected to earth, using the brass screw provided, to prevent any static build-up (refer also to Fig. 1).



INSTALLATION

**TABLE 2 — PREDICTED FLAME LENGTHS
(calculation based on VDI 3673)**

Unit type:	D60	D90	D120	D135	D150	D180	D225
Flame length:							
Top explosion relief	14.3 m	17.3 m	18.1 m	19.9 m	19.8 m	20.1 m	22.6 m
Rear explosion relief	17.8 m	21.6 m	22.6 m	24.8 m	24.6 m	25.9 m	28.2 m

Explosion relief



Explosion panels, if fitted, must be relieved to a safe area in accordance with Factory Inspectorate recommendations. The explosion relief area is suitable for the collector volume only. Fitment of the collector to larger vessels will require additional explosion protection to be fitted to the vessel. This protection should ensure that pressures developed during an explosion are lower than the collector strength. Consult Donaldson for specific collector design pressures. Refer to Table 2 for predicted flame lengths during an explosion.

Installation check list ✓

- Ensure the Dalamatic Concept filter section is securely bolted to the base section and the inlet section is securely bolted to the filter section.
- Ensure the base section is securely bolted to the floor.
- Ensure compressed air supply is installed correctly and free from leaks.
- Ensure electrical supply is installed correctly and complies to local legislation.
- Ensure earthing straps are fitted on collectors supplied with antistatic filter elements.

COMMISSIONING



It is a requirement of the Supply of Machinery (Safety) Regulations 1992 to provide adequate isolation and emergency stop facilities. Due to the varied nature of site installations this cannot be provided by Donaldson but instead is the responsibility of the customer. Refer to TCB manual (Publication 262-3143) for details of connecting to emergency stop.



Ensure all personnel carrying out electrical or pneumatic inspection work on the equipment follow any relevant recognised standards/codes and are competent to do so.



When making your preliminary checks, or during the start-up sequence, particularly note that on collectors fitted with an explosion panel the cleaning system should not be operated on its own for longer than necessary as the positive pressure produced could weaken the Membrex membrane.

Commissioning check list ✓

- Ensure the Dalamatic Concept filter section is securely bolted to the base section and the inlet section is securely bolted to the filter section.
- Ensure the base section is securely bolted to the floor.
- Ensure all ducting is complete and all detachable panels are in position.
- Ensure collectors fitted with antistatic filter modules and/or explosion relief are suitably earthed.
- Where fitted, ensure explosion relief panels are venting to a safe area.
- Ensure all door seals are intact on the collector, then close and secure the doors.
- Ensure electric power is available and connected to the TCB isolator.
- Start the compressor and check that the air supply is maintained at the recommended pressure.
- If applicable, start up the discharge equipment (e.g. screw conveyor, rotary valve, belt feeders etc.).
- Switch on the controller and check the TCB initialises correctly (refer to TCB manual). Set the TCB for continuous cleaning (refer to TCB manual) and check all valves operate in sequence by 'feeling' pulses in rubber hoses (look and listen for exhaust pulses). As each valve operates, the air pressure reading should drop to approximately 50% of the initial setting and then return to the initial value. Reset the TCB for ΔP cleaning.

COMMISSIONING

- Start up the main fan and check for correct rotation and that the full load current is not exceeded (refer to fan rotation label located on the back of the fan).
- Verify operation of the interlocks and audible warning system if fitted.

If any of the above check boxes are not ticked, then the reasons why should be investigated. (Refer to fault location table in 'Maintenance' section).

Start-up sequence

Having completed all the necessary checks, the equipment may be put into operation. A typical installation should be started up as follows:

- 1 Start up compressed air supply.
- 2 Set the equipment being served, if applicable, in motion.
- 3 Switch on discharge equipment (if applicable).
- 4 Switch on controller.
- 5 Start main fan.
- 6 Adjustment of air volume may be achieved by opening/closing the air bleed control situated in the fan inlet duct. Adjustment is made via a handle on the left-hand side of the fan inlet duct (see Figs. 1 and 14). Initially the valve should be set in a closed position and adjusted to aid system balancing if required.

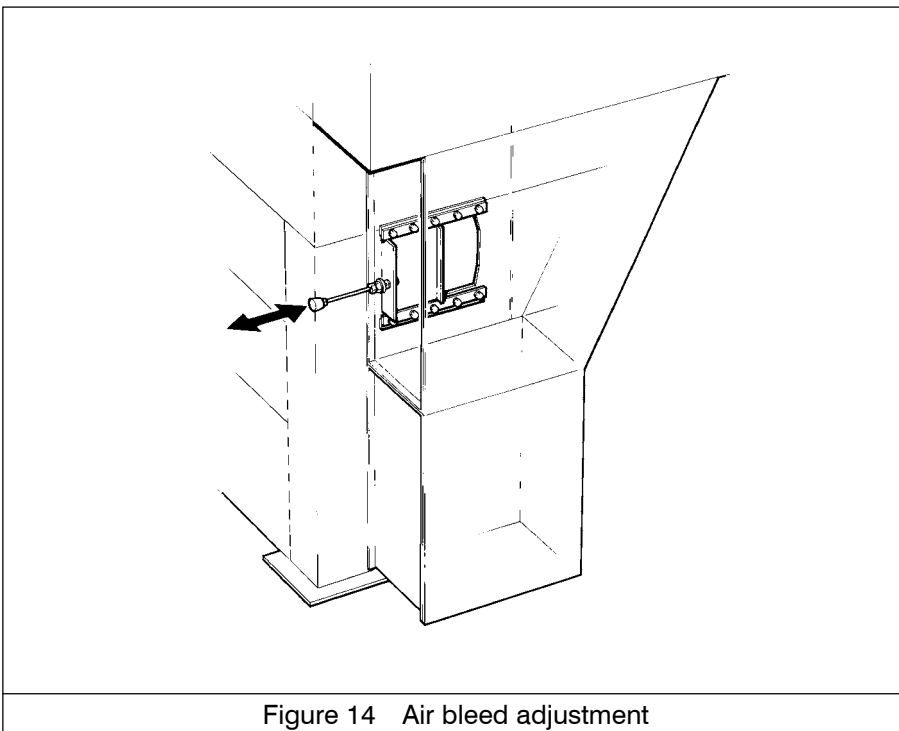


Figure 14 Air bleed adjustment

COMMISSIONING

Shut-down sequence



At the end of any period of operation it is important that all residual deposits are cleared from the filter elements, casing, discharge hopper and equipment being served. To achieve this, the TCB should be set for off-line cleaning. This will automatically perform an off-line cleaning sequence and maintain operation of any discharge equipment also connected to the TCB.



To enable off-line cleaning, refer to TCB manual.



This procedure is not recommended where explosion panels are fitted, as damage could result to the Membrex membrane. In such cases consult with Donaldson.

After the off-line cleaning sequence is complete the compressor and any separately controlled discharge equipment may be switched off.



Where the dust being handled has self-heating properties, it is important to remove any deposits in the dust container(s) or skip(s) to reduce the risk of an explosion.

Adherence to the above procedure will ensure that a Dalamatic Concept collector installation is maintained at optimum efficiency.

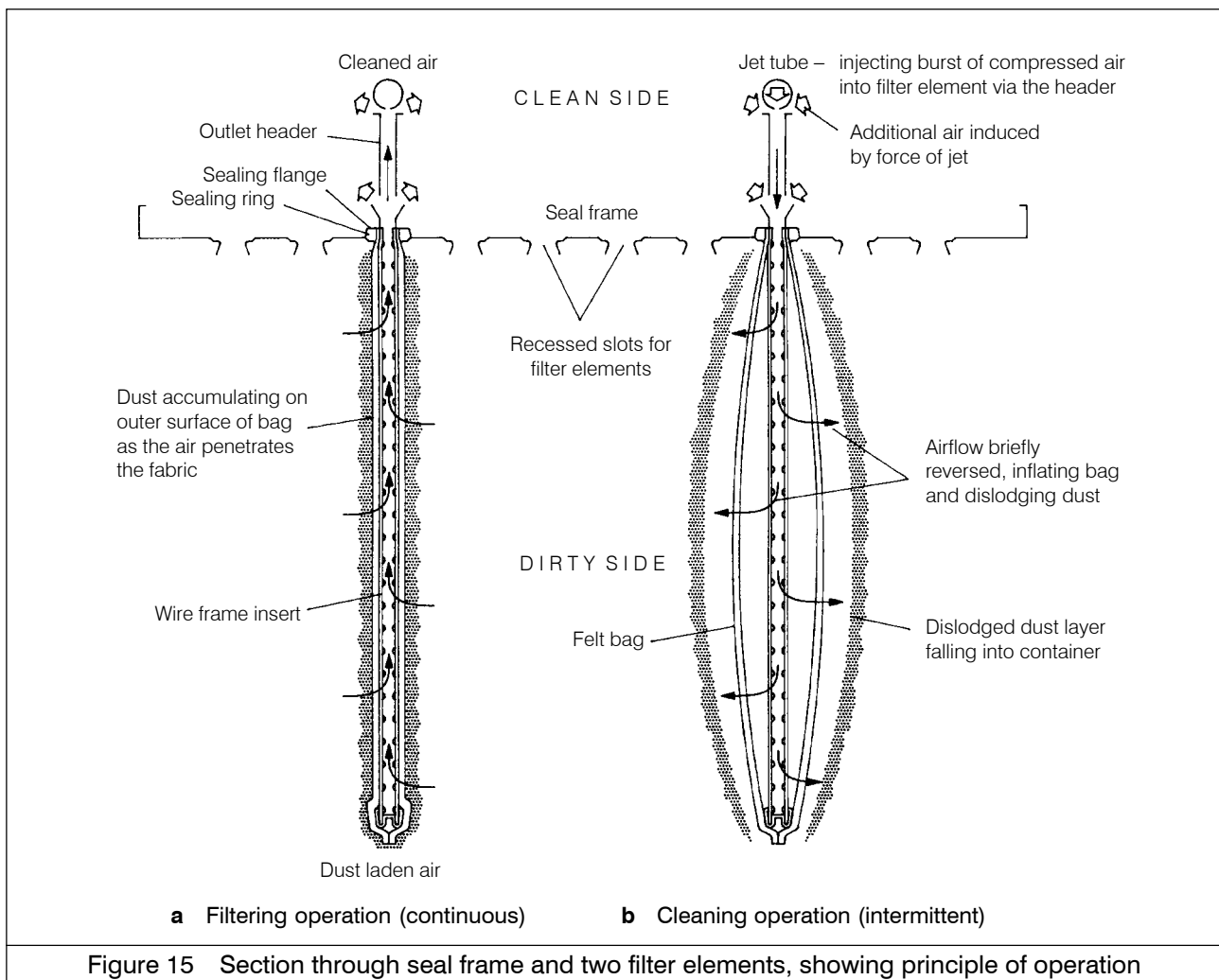
OPERATION

Principle of operation

Dust-laden air is ducted into the chamber containing the filter elements, where it impinges on all their outer surfaces. A layer of dust builds up on the outside of the elements as the air itself penetrates the fabric (see Fig. 15a). The clean air emerges from the outlet header of each filter element into the cleaned air chamber and from there it is discharged, normally via the fan, to atmosphere.

At regular intervals, governed by the controller, each element in turn receives a short burst of compressed air from its respective jet tube (see Fig. 15b). The jet tube has a series of small-diameter jet orifices positioned adjacent to the outlet header of each filter element (see Figs. 15 and 17). These orifices are of an optimum size and distance from the filter element, ensuring that a large volume of air is induced by each injection of compressed air. This causes a brief, powerful reversal of airflow through the filter element, flexing the fabric outwards and effectively dislodging the dust layer which then falls into the discharge hopper.

In this way the pressure drop across the whole collector is kept at a virtually constant level, enabling the Dalamatic to operate continuously, twenty-four hours a day.



MAINTENANCE



A platform should be used when carrying out maintenance where the position of the technician's feet is greater or equal to 2 metres above ground level.



Before any work is carried out, ensure the equipment is adequately isolated.



Ensure the pneumatic system is fully isolated and depressurised before any work is carried out.



For ancillary equipment not manufactured by Donaldson, refer to manufacturer's instructions.



If it is unavoidable to work on the equipment while an explosive atmosphere is present, care should be taken to avoid introducing ignition sources not present during expected operation. Non-sparking tools should be used.



Access to the dirty air chamber of the equipment may create risks and hazards that under normal circumstances are not present and as such this work must be carried out by competent personnel. These risks include inhalation of dust and potential explosion hazards.



In order to maintain the original collector specification and to ensure the same level of safety, only genuine spare parts should be fitted.



Every care has been taken to avoid the risk of ignition of a potentially flammable atmosphere. The measures taken to avoid ignition should not be altered since this may result in unsafe operation. Particular care should be taken during maintenance and component replacement to ensure the same level of safety is maintained. When replacing fan impellers, avoid any rubbing of components (to prevent mechanical sparks).

Routine inspection

To maintain the optimum performance of any Dalamatic collector, a routine inspection should be made to minimise down-time in the event of equipment malfunction, particularly on continuous performance applications and to ensure the equipment is maintained to its original supply condition.

Any abnormal change in pressure differential across the filter elements indicates a change in operating conditions and a fault to be rectified. For example, a prolonged stoppage of compressed air will cause an excessive build-up of dust on the elements, resulting in a greatly increased pressure drop.

After the fault has been rectified, resumption of compressed air cleaning will usually return the collector to normal efficiency. However, it is advisable to operate

MAINTENANCE

the controller in still-air conditions for a short period to dislodge any accumulated dust before putting the Dalamatic collector into operation.

A continuous indication of the filter resistance is shown by the LCD on the TCB. Once running, the operating resistance will be relatively stable, the actual value depending on the air volume and the characteristics of the dust being handled.

It is recommended to periodically inspect the general casing integrity and support structures.

It is recommended that door fastener threads are lubricated at regular intervals (applicable to units fitted with explosion relief).



Do not operate above recommended compressed air pressure. Excessive pressure will reduce the working life of components.



Dalamatic collectors fitted with explosion relief should be inspected weekly to ensure that the bursting panels are intact and clear of obstruction. During winter, particular care must be taken to prevent build-up of snow or ice on explosion panels.

Servicing schedule

A record of all pressure checks should be kept in a log book to aid the speedy diagnosis of faulty operation.

Weekly

- 1 Open the valve at the bottom of the moisture separator bowl and allow the collected water to drain off, then close the valve.
- 2 Make a note of the pressure drop across the filter, indicated on the TCB.

Monthly

If the equipment is out of service for more than 1 month, rotate the fan and motor slowly to prevent 'brinelling' of the bearing races. This procedure should be repeated each month until the collector is back in service.

Check operation of solenoid and diaphragm valves.



It may be necessary to check the operation of the valves while the system is pressurised. Care should be taken to avoid injury.

If it is found necessary to replace a diaphragm, use the following procedure (refer also to Fig. 16):

Use service kit available from Donaldson.

- 1 Switch off the TCB and lock-off.
- 2 Isolate compressed air supply.
- 3 Remove nylon tube (A) by pulling out from valve – this will release the manifold pressure.

MAINTENANCE

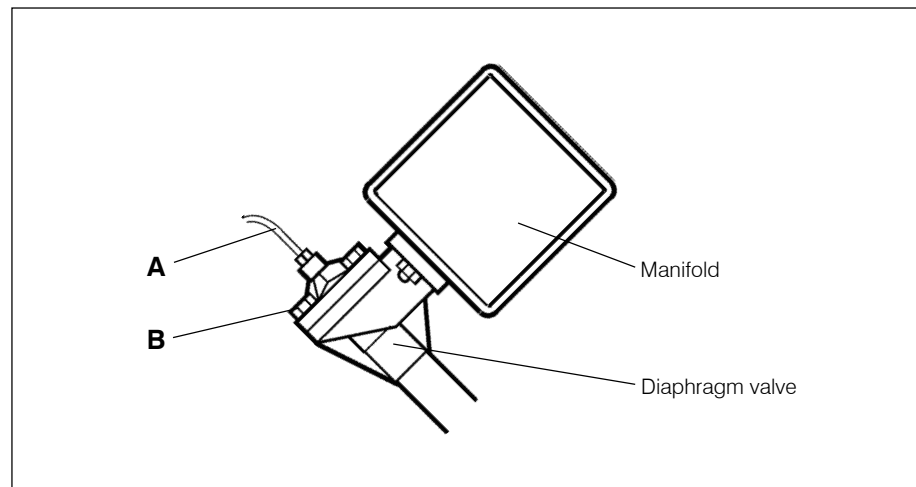


Figure 16 Valve diaphragm replacement

- 4 Remove the hexagon head set screws and shakeproof washers securing the valve bonnet (B).
- 5 The diaphragm and spring (if fitted) can now be replaced, first ensuring the 'bleed' hole pin is not blocked.
- 6 Ensure that diaphragm fits over 'bleed' hole pin and that the nylon sealing washer is inside throat of valve.
- 7 Position spring (if fitted) inside bonnet recess.
- 8 Refit bonnet ensuring spring (if fitted) locates over diaphragm disc shoulder and bonnet locates over 'bleed' hole pin.
- 9 Refit and tighten the hexagonal head set screws and shakeproof washers.
- 10 Push-fit nylon tube back into valve.
- 11 The collector is now ready to restart.

Annually

- 1 Moisture separator – Isolate the compressed air supply and release the manifold pressure via the moisture separator or as described in the previous section. Then remove and clean or replace the filter element.
- 2 Air manifold – Having isolated the compressed air supply and released the manifold pressure, remove the drain plug and air inlet connections and clean out any accumulated sludge and inspect to any current local legislation.



It may be necessary to remove a diaphragm valve for internal inspection purposes.

- 3 Doors – Check the dust seals on all access doors for damage or ageing and ensure that they are properly seated to prevent entry of water. This is particularly important where the collector is located outside or in a wet atmosphere.



Faulty seals must be replaced.

MAINTENANCE

- 4 Filter elements (inserts and bags) – Before removing the filter elements, cover the base with some suitable material to avoid the dust falling into the valve exhaust port. Remove the jet tubes, then remove each filter element and check the general condition of the bag. Clean each bag using a vacuum cleaner. If the dust is of an abrasive nature it is advisable to examine the elements more frequently.



Bags showing holes must be replaced.



Any dust falling into the valve exhaust port should be removed before restarting the collector.



When refitting filter elements, tighten bottom clamp first. Do not over-tighten. (Recommended maximum torque 20 ft-lbs f or 27 Nm.)

- 5 Jet Tubes – Check that the jet tubes are clean and that the jet orifices are clear.
- 6 Flameproof maintenance – It is important that all flameproof enclosures, motors and cable glands are inspected for corrosion and tightness on an annual basis.



This task should be carried out by a suitably trained and qualified technician.



In particularly aggressive environments, this period should be more frequent.

- 7 Antistatic earthing (if fitted) – Check collector earthing continuity.
- 8 Explosion risks – Check measures taken to avoid ignition sources are still in place.

MAINTENANCE

TABLE 3 — FAULT LOCATION

Symptom	Possible cause	Action
1 Part loss of suction (excessive pressure differential).	1.1 Compressed air malfunction.	<ul style="list-style-type: none"> a If compressor stopped, rectify compressor fault; check interlocks; check motor and supply; check drive. b If compressor OK, check pulses at manifold pressure gauge. c Clean filters, dismantle and clean moisture separator. d Check for excessive water or oil in compressed air supply, and possible accumulation in manifold.
	1.2 No pulses of air to valves.	<ul style="list-style-type: none"> a Refer to 'Fault location' table in TCB manual supplied with dust collector.
	1.3 Filter blocked.	<ul style="list-style-type: none"> a Check that emptying device or equipment being served is working. Check starter overloads, fuses and interlocks. b Run unit clear*, then remove each element in turn and vacuum-clean all its outer surfaces. Renew any filter elements that are damaged.
	1.4 Motor speed low.	<ul style="list-style-type: none"> a Check line voltage, phases, fan motor connections. For Star/Delta applications, check motor is in Delta.
	1.5 Incorrect fan motor rotation.	<ul style="list-style-type: none"> a Check electrical connections and transpose if necessary.
	1.6 Air bleed control incorrectly adjusted.	<ul style="list-style-type: none"> a Adjust via handle on left-hand side of the fan inlet duct (see Figs 1 and 14).
2 Total loss of suction.	2.1 Fan motor stopped.	<ul style="list-style-type: none"> a Check motor supply overloads, fuses and interlocks (if fitted). b Check motor connections and windings.
	2.2 Filter blocked.	<ul style="list-style-type: none"> a Check that emptying device or discharge equipment is working. Check starter overloads, fuses and interlocks. b Run unit clear*, then remove each element in turn and vacuum-clean all its outer surfaces. Renew any filter elements that are damaged.
	2.3 Ducting blocked.	<ul style="list-style-type: none"> a Check throughout and clear.
3 Visible effluent in clean air outlet.	3.1 Filter elements not properly sealed.	<ul style="list-style-type: none"> a Tighten element retaining bolts to ensure compression of sealing rings.
	3.2 Damaged filter bag.	<ul style="list-style-type: none"> a Damaged filter bag can be identified by the dust present in clean air chamber. Withdraw element and renew bag. There may be a build up of dust in the fan inlet duct and the acoustically lined base – this should be removed prior to restarting the collector. A check for excessive vibration should also be made on the fan assembly before and after restarting, to ensure no damage has occurred to the impeller.

*To run unit clear, switch off main fan only and allow the controller to perform several complete cleaning cycles before switching off compressor etc.



This procedure is not recommended where explosion panels are fitted, as damage could result to the Membrex membrane. In such cases consult with Donaldson.

SPECIFICATION

Description and Range

The Dalamatic Concept is an automatic reverse-jet cleaned, type of dust collector, designed to handle large quantities of dust-laden air, and is capable of continuous operation over extended periods. This reverse-jet cleaning system, which functions during the normal course of operation, not only serves to maintain optimum filtering efficiency at all times, but enables the collector to operate at a constant rating – in that it maintains a uniform pressure drop across the collector.

The basis of the Dalamatic is a module comprising a group of filter elements mounted on a sealed frame. The elements are fitted side by side and the individual sealing arrangement effectively separates the dirty (inlet) side of the collector from the clean (outlet) side, as shown in Figure 15. Removal of filter elements is always carried out from the clean side of the collector.

The Dalamatic Concept dust collector range is based on modules each containing ten filter elements, with each filter element having an effective filtration area of 1.5 m². The filter assembly is contained in a steel housing complete with its own integral fan mounted in the base section, which also serves as an acoustic enclosure (see Fig.1). Provision is made for inlet and outlet ducts. Discharge arrangement can be either by skip, dust container, screw conveyor or rotary valve as shown in Table 4. For further details refer to Publications 1572 and 1574.

The Dalamatic can be supplied, if required, suitably equipped for use in a potentially explosive atmosphere (Directive 94/9/EC) satisfying the requirements for group II category 2G or 2D and 3G or 3D T135°C.

Construction

The filter casing is constructed of mild steel panels which permit operation at partial vacuums down to –500 mm water gauge and may be fitted with additional reinforcement for greater suction values.

The control equipment, consisting of the air distribution manifold, diaphragm valves and solenoid valve enclosure, is located in a separate chamber at the top of the collector and accessed via a hinged inspection door. The controller is mounted separately on the base section of the collector and is connected to the solenoid valve enclosure by a flexible multicore cable inside a conduit.

Seal frame (Figs. 1, 15 and 17)

The seal frame assembly is a rectangular structure of sheet steel which is flanged for rigidity and incorporates a slotted steel pressing into which the filter elements are inserted and secured by clamps.

An earthing boss is fitted to all antistatic versions of collectors for antistatic earthing (see Fig. 1).

SPECIFICATION

TABLE 4 — DALAMATIC CONCEPT DUST COLLECTOR RANGE

Collector type	Filtration area	Number of elements	Collector configuration			
			Skip ^a	Dust container ^b	Screw conveyor	Rotary valve
D60	60 m ²	40	X	✓	X	✓
D90	90 m ²	60	✓	✓	✓	✓
D120	120 m ²	80	✓	✓	✓	✓
D135	135 m ²	90	✓ (2)	✓ (2)	✓	X
D150	150 m ²	100	✓	✓	✓	✓
D180	180 m ²	120	✓ (2)	✓ (2)	✓	X
D225	225 m ²	150	✓ (2)	✓ (2)	✓	X

^a Size: 233 litre (8 cu.ft.)

^b Size: 80 litre (3cu.ft) or 110 litre (4 cu.ft.)

TABLE 5 — WEIGHTED SOUND PRESSURE LEVELS

D60			D90-225 Low pressure fans				D90-225 High pressure fans				
K11 (7.5 kW)	K15 (11.0 kW)	CSR15 (15.0 kW)	K18 (15.0 kW)	K21 (18.5 kW)	CDR22 (22.0 kW)	CDR30 (30.0 kW)	CSR15 (15.0 kW)	CSR18 (18.5 kW)	CSR22 (22.0 kW)	CSR30 (30.0 kW)	CSR37 (37.0 kW)
78 dB(A)	79 dB(A) [†]	75 dB(A)	73 dB(A)	74 dB(A)	75 dB(A)	76 dB(A)	72 dB(A)	72 dB(A)	73 dB(A)	75 dB(A)	76 dB(A) [†]

* All readings were taken in normal industrial areas, i.e. semi-reverberant surroundings, with local equipment silent.

Measurements were taken at maximum air flow conditions at 1.0 metre radius from the equipment housing and 1.6 metres above base level, using a precision sound level meter and octave filter. Measurements are based on D90 collectors – noise levels for other sizes of collector may differ slightly. Noise levels of installed equipment may vary due to site conditions.

[†] Measured data.

TABLE 6 — DESIGN LIMITS

Temperature range:	–10° to +60°C (std.) or –10° to +100°C** (For applications outside this range refer to Donaldson) **For temperatures above 60°C the enclosed base cannot be used – an in-line attenuator may be required
Pressure range:	–500 mm W.G. or –1140 mm W.G. (For positive pressures refer to Donaldson) Collectors with fan: as fan performance curves from shut-off to ambient pressure (refer to Publications 1572 and 1574)
Maximum fan impeller speed:	3000 RPM (50Hz) or 3600 RPM (60Hz)

SPECIFICATION

Compressed air distribution manifold (Fig. 1)

The manifold is fabricated from 180sq x 8 mm thick steel tube, with welded ends. Holes are provided for diaphragm valves, drain plug, pressure relief valve and air inlet moisture separator connections.



It may be necessary to remove a diaphragm valve for internal inspection purposes.



Ensure the pneumatic system is fully isolated and depressurised before any work is carried out.

The manifold supplied with the Dalamatic Concept dust collector has been independently approved to operate under the conditions as specified in Table 7.

Filter elements (Figs. 1, 15 and 17)

Each removable filter element is rectangular in shape and comprises a slim wire mesh frame or 'insert' for the filter bag, to which is welded a shaped steel outlet header with sealing flange. The filter bag itself consist of a rectangular pocket incorporating a resilient sealing ring at the open end. The bag is pulled over the wire portion of the insert until the sealing ring meets the sealing flange. The ring is compressed when the element is clamped into the seal frame, effectively isolating the dirty side from the clean side of the collector.

The size of element is 1.5 m. Alternatively, in applications where pre-separation is required, 1.0 m elements may be fitted. The filtering medium is felted polyester or other fibre suitable for the dust or product being handled.

Antistatic filter elements are available, together with stainless steel and brass securing bolts and washers, as an option for installations where the dust is potentially explosive. (See 'Installation' section.)

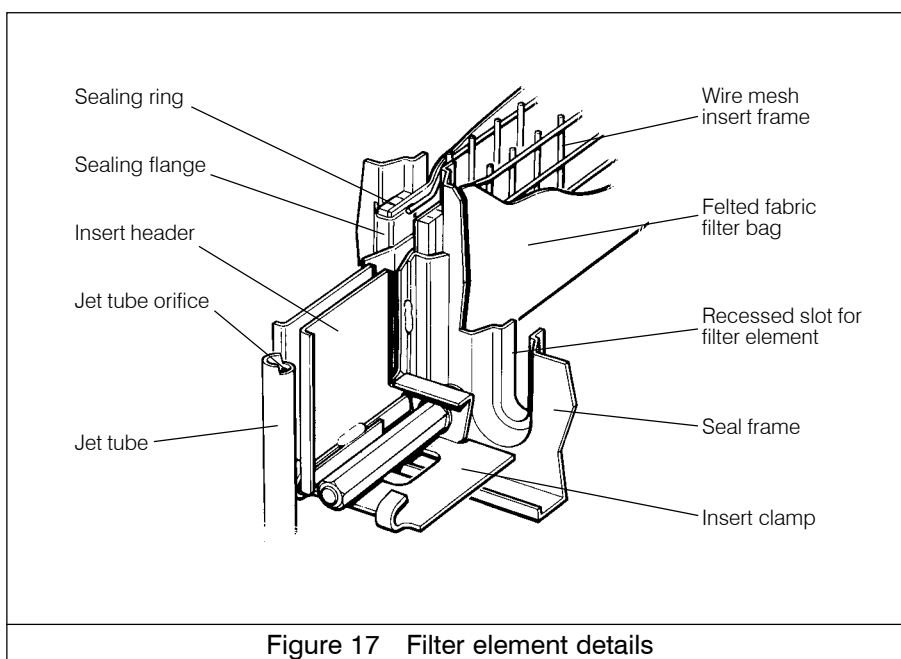


Figure 17 Filter element details

SPECIFICATION

Jet tubes (Figs. 1, 15 and 17)

Positioned in the 'clean side' of the collector is a series of full-length 'jet tubes' having small-diameter jet orifices located adjacent to the outlet header of each filter element. The 'open' end of each tube is connected by a rubber hose to a compressed air valve; the closed end is flattened and crimped, and is secured by a bolt and extended nut.

Valves (Figs. 1 and 18)

The compressed air is supplied to each jet tube via a diaphragm valve, the opening and closing of which is controlled by a solenoid-operated pilot valve connected to the diaphragm vent by a flexible nylon tube. The solenoid valves are energised sequentially by electrical pulses generated by the controller.

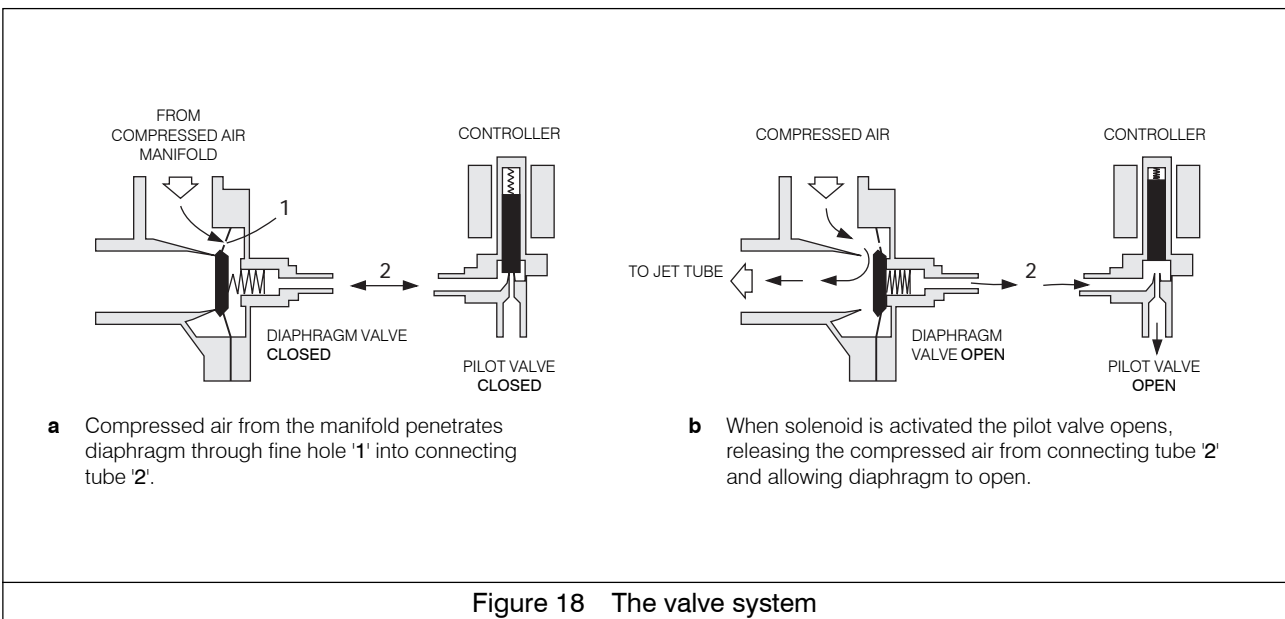
Controller



For TCB specifications, refer to Publication 262-3143.



For PT controller specifications, refer to Publication 2697.



SPECIFICATION

TABLE 7 — COMPRESSED AIR MANIFOLD DESIGN DETAILS

Design pressure:	6.9 bar (100 psig)
Maximum operating pressure, PS:	6.2 bar (90 psig)
Test pressure:	10.35 bar (150 psig)
Design temperature:	-30° to +60°C
Maximum rating of pressure relief device:	25 dm ³ /s at 7.1 bar (factory set at 7.1 bar) (not supplied as standard)
Manifold volume:	24.3 litres
Product of pressure and capacity:	167.7 bar litres
Material used for manifold construction:	Structural hollow section
Minimum metal thickness before manifold requires special inspection:	To improve corrosion resistance the manifold is painted externally and internally using cathodic electrocoat. 7.0 mm

1 bar = 10⁵ Pa

TABLE 8 — COMPRESSED AIR REQUIREMENTS

Collector type	Working compressed air pressure ^a		Atmospheric air volume — F.A.D. ^b		Pulse interval ^c	Pulse duration	Minimum pipe diameter ^d
D60	5.2 bar	75 psig	13.7 m ³ /h	8.1 cfm	12 sec.	60 ms	¾" NB (20)
D90	3.7 bar	55 psig	19.0 m ³ /h	11.2 cfm	12 sec.	60 ms	¾" NB (20)
D120	5.2 bar	75 psig	27.5 m ³ /h	16.2 cfm	12 sec.	60 ms	1" NB (25)
D135	3.7 bar	55 psig	28.6 m ³ /h	16.8 cfm	8 sec.	60 ms	1" NB (25)
D150	5.2 bar	75 psig	27.5 m ³ /h	16.2 cfm	12 sec.	60 ms	1" NB (25)
D180	5.2 bar	75 psig	41.1 m ³ /h	24.2 cfm	8 sec.	60 ms	1" NB (25)
D225	5.2 bar	75 psig	41.1 m ³ /h	24.2 cfm	8 sec.	60 ms	1" NB (25)

^aNormal operating pressure. ^bRecommended atmospheric air volume of clean, dry compressed air.

^cRecommended initial settings; these may be varied with experience.

^dSizes suitable for runs of pipe up to 30 m (100ft) in length; for longer runs consult with Donaldson.

1 bar = 10⁵ Pa

DECLARATION OF CONFORMITY

UK

EC DECLARATION OF CONFORMITY (Machinery directives 98/37/EEC)

Head Office: **Donaldson Europe B.V.B.A.**
Interleuvenlaan 1, B-3001 Leuven (Heverlee), Belgium

Manufacturing Centres: **Donaldson Filtration (GB) Ltd.**
Humberstone Lane, Thurmaston, Leicester LE4 8HP, England
Donaldson Industrial CR – koncern s.r.o.
Kralovsky vrch 1986, 432 01 Kadan, Czech Republic

Customer Service Centre: **Donaldson Europe B.V.B.A.**
Pathoekeweg 166, B-8000 Brugge, Belgium

Description of the machinery: **Dust Collector**

Brand: **Donaldson Torit DCE**

Description: **See attached Scope of Delivery**

The undersigned, authorized by Donaldson, certifies that the machine described above, provided that it is installed, maintained and used in accordance with the instructions for use and the codes of practice, meets the essential safety and health requirements of the following Directives:

- Machinery directives 98/37/EEC
- Low voltage directive 73/23/EEC
- Pressure equipment directive 97/23/EC
- Electromagnetic compatibility directive 89/336/EEC
- Equipment and protective systems intended for use in Potentially Explosive Atmospheres 94/9/EC

IMPORTANT! Read the Installation, Operation and Maintenance Manual before using this machine. If you require additional copies contact your local Donaldson representative.

The machinery must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the above mentioned directives.

Signature:



Name: **Heiner Carstensen**

Position: **Product Development Director**

Date: **September 2006**



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