Installation, Operation and Maintenance Manual

Donaldson
Torit® DCE®

Dalamatic Cased Dust Collectors

Series DLM 15

IOM AK0302901(0)

Donaldson®

IMPORTANT

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLATION

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

IPC OR IPC (ΔP) CONTROLLER – PUBLICATION 2699

PT CONTROLLER – PUBLICATION 2697

Delta P-C01 Controller-IOM AK0303001

PRODUCT RELIABILITY, WARRANTY AND SAFE OPERATION MAY BE COMPROMISED BY NOT FOLLOWING THE GUIDANCE GIVEN IN THESE DOCUMENTS.

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

Improper operation of a dust control system may contribute to conditions in the work area or facility that could result in severe personal injury and product or property damage. Check that all collection equipment is properly selected, sized and operated for the intended use.

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

The supplied weight refers only to equipment supplied by Donaldson, i.e. the main filter casing (containing the filter assembly) and the control equipment. It does not include the weights of hopper and support etc.

CONTENTS

GENERAL SAFETY REQUIREMENTS

The collector should be stored as supplied. Only remove packaging to install. For the purposes of storage:

- *Collector with specification for inside use = IP50.*
- *Collector with specification for outside use = IP54.*

The dust collector should be used only when it is in a technically acceptable condition. Regular maintenance, as set out in this manual, is required to minimise technical failure. Third party supplied components (for example motors) should be maintained according to the manufacturer's instructions.

You should ensure any persons carrying out work on the supplied equipment follow any relevant recognised standards/codes, have received adequate training 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 there may be a risk due to explosion.*

During assembly/installation or dismantling of equipment, potential ignition sources may occur that were not considered in the risk assessment of the unit in operation (for example, grinding, welding sparks, etc.)

You should use the dust collector in full accordance with the conditions set out in the Order Acknowledgment and relevant Scope of Delivery. Failure to do so may compromise product reliability, warranty and safety. The Scope of Delivery is an integral part of the manual.

Other items of equipment, not supplied under the Scope of Delivery from Donaldson, should be installed, operated and maintained according to the documentation supplied with the respective equipment.

Any modification carried out on the 'as supplied' equipment may reduce reliability and safety, and will nullify warranty; such actions fall outside the responsibility of the original supplier.

The hopper should not be used as a storage vessel. To prevent damage to the collector, care should be taken to avoid an excessive build up of heavy materials.

Where necessary for safety, the dust collector is fitted with fixed guards. Removal of these guards and any subsequent work should only be carried out after adequate precaution is taken to ensure it is safe to do so. All guards should be refitted before re-energising.

Compressed air is recommended for collectors that operate using reverse jet cleaning. Alternative gases should be assessed before use to ensure that explosive atmospheres are not introduced during media cleaning.

GENERAL SAFETY REQUIREMENTS

Where the equipment supplied is suitable for working within a potentially explosive atmosphere (as defined by Directive 94/9/EC) it will be according to the categories and conditions marked on the collector serial nameplate. You should ensure the equipment supplied by others is also suitable. If no marking is given on the serial nameplate then the supplied equipment is not suitable for use in potentially explosive atmospheres.

Care should be taken to ensure that any potentially 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.

To reduce the risk of ignition when handling explosive or flammable materials, it is important that the accumulation of flammable deposits are prevented/ removed, e.g. from within ducting etc.

If the collector is handling a potentially explosive dust or is placed in a potentially explosive atmosphere, then all motors should be connected to thermal protection devices to prevent them exceeding their maximum surface temperature. All electrical equipment should comply with a category according to all related National and Local Codes.

Where the dust being processed can ignite due to exothermic reaction, including self ignition, the collector MUST be fitted with a suitable explosion protection method (venting for example). The risk of ignition can be minimised by avoiding the accumulation of dust layers with regular cleaning.

The dust collector may be fitted with explosion protection in the form of a vent panel. Precautions, as set out in the Scope of Delivery, are used to minimise the risk of ignition of any dust clouds contained within the dust collector. The possibility of other ignition sources being introduced into the collector during periods where any dust cloud may be present should be minimised. Particular care should be taken to avoid introducing glowing particles via the collector inlet ducting.

The explosion relief assembly, where fitted, has been designed to provide adequate safety from an explosion initiated from within the collector, for the given dust explosion characteristics and collector arrangement as set out in the Scope of Delivery. You should ensure that explosions are not allowed to propagate into the dust collector (using suitable isolation devices) since pressures may be generated leading to unsafe equipment rupture.

Where applicable, equipment connected to the dust collector (for example, a cyclone) should be protected, using suitable isolation devices, against the transfer of flame and pressure if, in the event of an explosion initiating inside the dust collector, the connected equipment is not capable of safely withstanding these effects.

GENERAL SAFETY REQUIREMENTS

The explosion relief assembly, where fitted to the dust collector, is not suitable for use with dusts that are classified as poisonous, corrosive, irritant, carcinogenic, teratogenic or multigenic unless the dust released during the explosion venting process can be contained to a safe level.

In order to ensure the required venting efficiency is maintained, the explosion relief assembly, if fitted to the collector, should not be obstructed in any way.

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 bursting panel detection device.

Part of the risk assessment on possible ignition sources for dust and gas mixtures with very low MIE, has considered the electrostatic risk from cone discharges. Here the basis of safety is based on using a conductive bin, dusts with a median particle size of less than 400µm and advising frequent emptying.

You may wish to consider the use of a sprinkler system when handling explosive or flammable materials.

The filtration media is suitable for filtering particulate only (and not gas).

Some applications are prone to risk of fire. This risk can be reduced by pulse cleaning and emptying the dust container regularly.

- *Any extinguishing technique and material used must be suitable for the flammable nature of the dust.*
- *A water sprinkler system can be fitted as a special option.*

Materials handled by the dust collector may be hazardous (e.g. toxic). Conduct a Risk Assessment to ensure correct technique is employed.

The dust collector should be cleaned and put into a safe condition prior to decommissioning. All equipment decommissioning/removal is to be executed in a manner consistent with applicable codes, regulations and sound engineering practice.

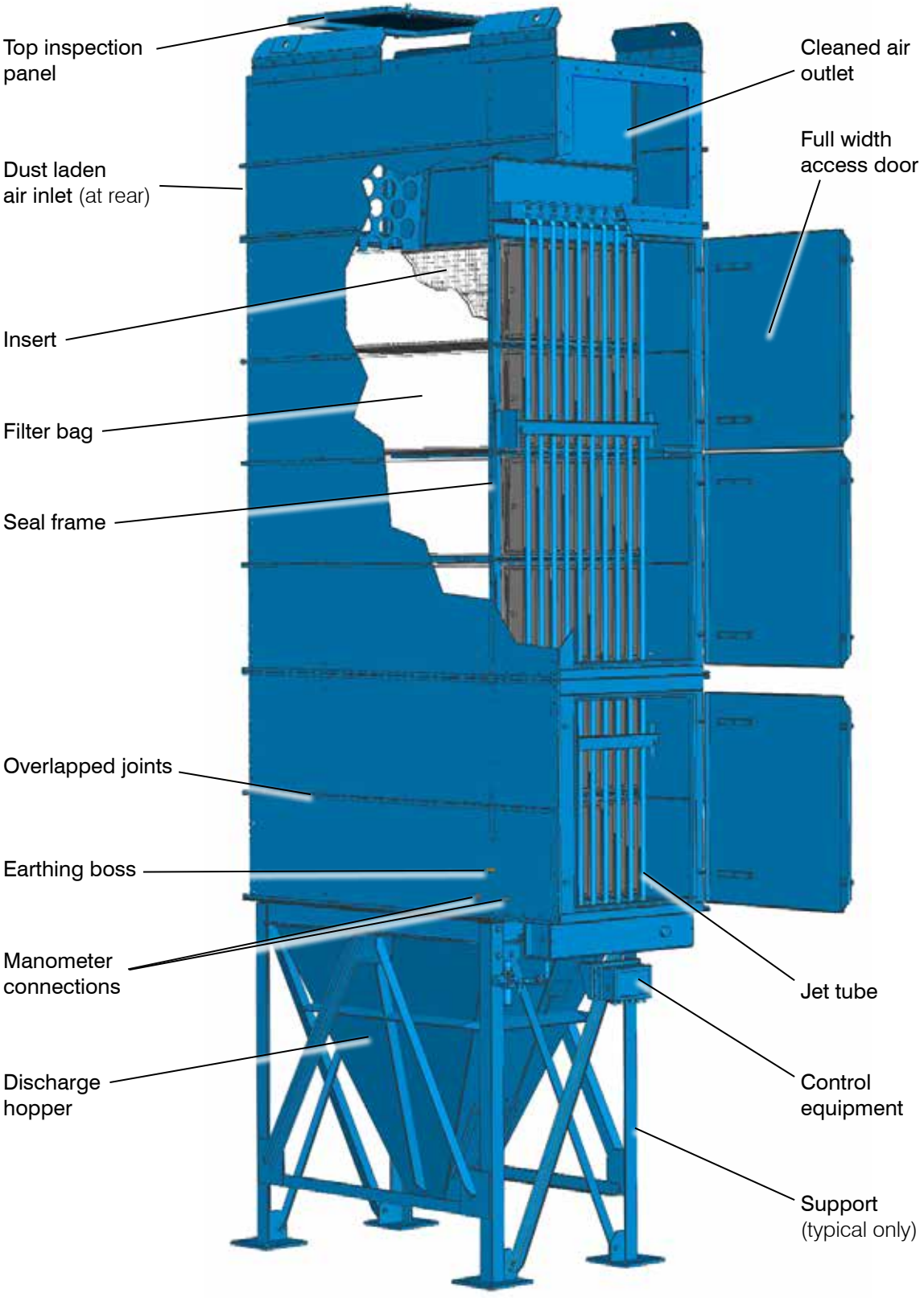


Figure 1 Dalamatic Cased dust collector
Model DLM 1/6/15 illustrated

INSTALLATION

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

When handling explosive or flammable materials and the risk of a fire is high, then precautions such as fitting a sprinkler system and not locating the collector in a zone 21/1 area should be considered.

When handling explosive or flammable materials the collector should be located so as to avoid external heat sources, e.g. from nearby processes or extreme direct sunlight.

Where applicable, care is required when siting the dust collector to ensure that the effects (flame, pressure, noise and fire) produced during and after the explosion venting process do not put at risk personnel and nearby plant.

The collector is not designed to support site-installed ducts, interconnecting piping or electrical services. All ducts, piping or electrical services must be adequately supported.

All external equipment connected to the inlet, outlet or discharge (e.g. ducting, rotary valve) should be correctly sealed. This can be achieved by applying a continuous 5 mm bead of sealing compound to the mounting surface, along each side of the hole pattern. For non-Donaldson equipment please also check supplier's IOM manual for any specific requirements.

Dalamatic Cased dust collectors are normally supplied as outlined below:

- The main case(s) containing the filter assembly (in fully-assembled sections – refer to note on Table 3 in 'Specifications' section).
- Discharge arrangement and supporting structure, which is supplied broken down.
- Control equipment.

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 should 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.

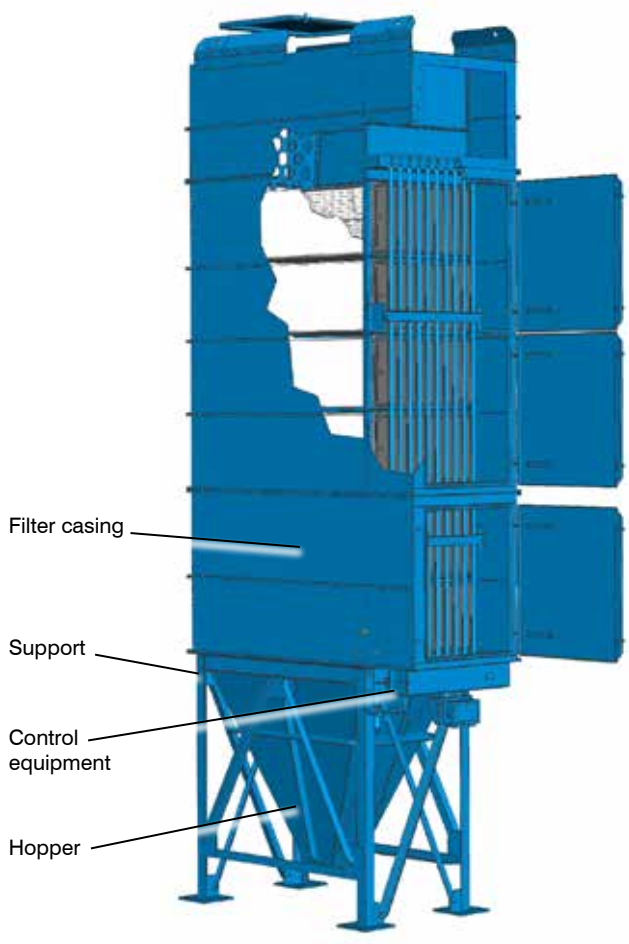


Figure 2 Identification of separate sections

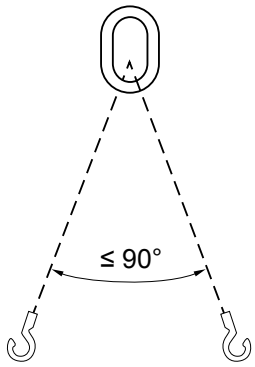


Figure 3 Two-point lifting arrangement

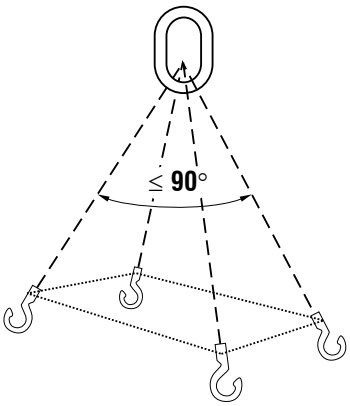


Figure 4 Four-point lifting arrangement

INSTALLATION

Each collector should be assembled as follows:

Erect Support

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

Fit support assembly bolts to suit size of holes (generally, larger diameter bolts fit at top of legs).

All bracing require fitting (see fig. 7).

Refer also to figure 7.

1 Tack-bolt end assemblies (A) together with top front and rear members (B) (see fig. 5).

Ensure bolt heads are on the inside to allow maximum clearance for hopper.

2 Tack-bolt together remaining support members.

3 Using plumb lines and spirit levels, line up support both horizontally and vertically, using shims (C) under legs where required (see fig. 6).

4 Drill through base holes and insert suitable expandible bolts.

Due to access restrictions some supports may require marking and drilling or temporary removal of bracing.

5 Tighten holding down expandible bolts (D) (see fig. 6).

6 Tighten support bolts.

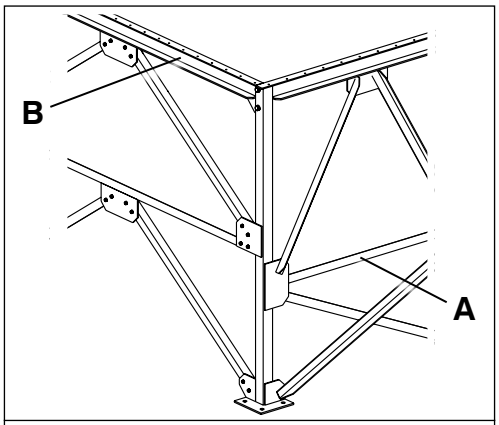


Figure 5 Assemble support structure

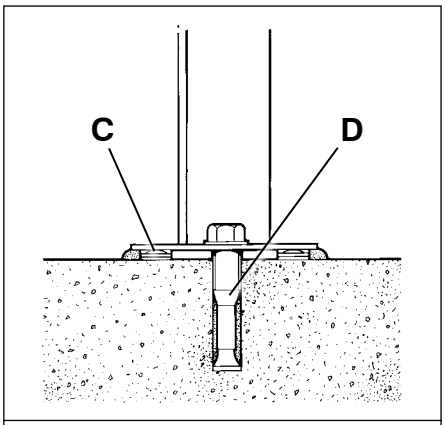
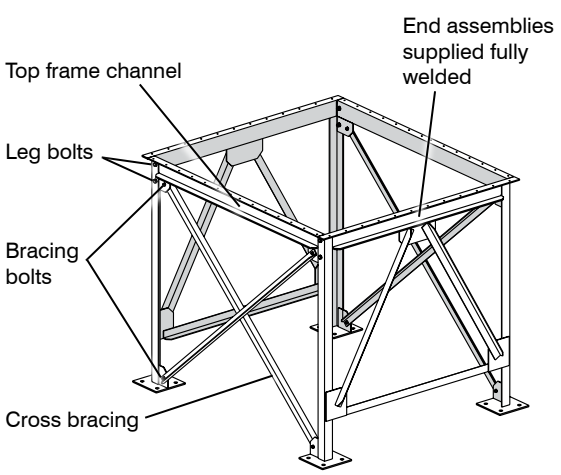
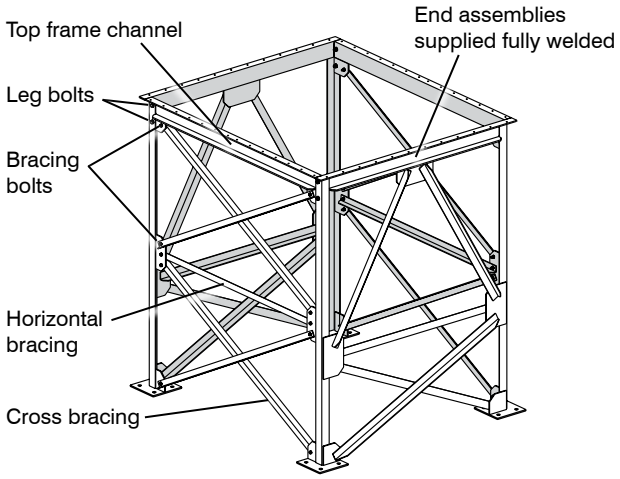


Figure 6 Secure support structure

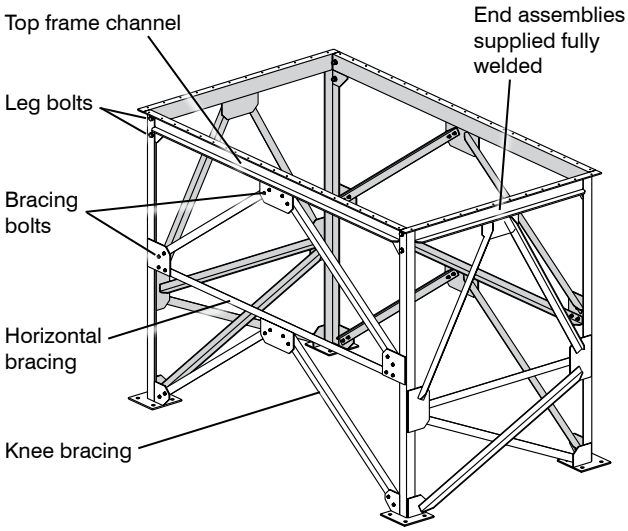
INSTALLATION



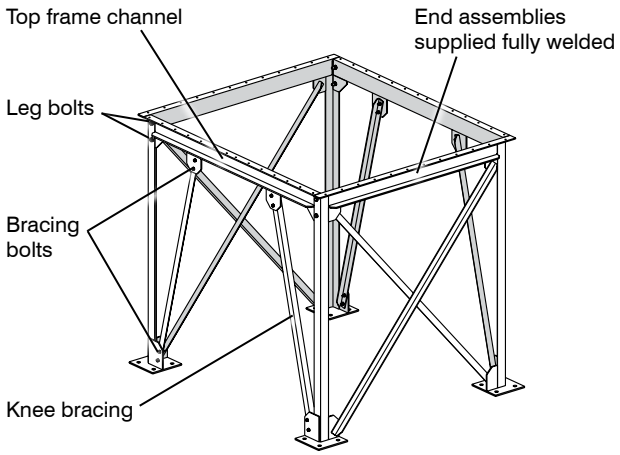
ASSEMBLY 1



ASSEMBLY 2



ASSEMBLY 3



ASSEMBLY 4

	Support height	1-bank	2-bank	3-bank
Collector with rotary valve hopper	1803 mm 2303 mm 3028 mm	Assembly 1 Assembly 2 Assembly 2	Assembly 1 Assembly 2 Assembly 2	Assembly 1 Assembly 3 Assembly 3
Collector with single outlet hopper	1803 mm 2303 mm 3028 mm	– – –	Assembly 1 Assembly 2 Assembly 2	– – –
Collector with screw conveyor hopper	1803 mm 2303 mm 3103 mm	– – –	Assembly 1 Assembly 2 Assembly 2	Assembly 1 Assembly 3 Assembly 3
Collector with dust containers	1979 mm	Assembly 4	Assembly 4	Assembly 4

Figure 7 Standard design support structures

INSTALLATION

Erect hopper

Refer to figures 8, 9 and 10.

1 Lift hopper into position inside top support frame using the lifting lugs provided and match holes.

2 On multi-hopper assembles only, seal between hopper sections (A). Apply a suitable sealing compound, to suit both temperature and application, making a continuous 5 mm bead along each side of the holes. Match up and bolt together.

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

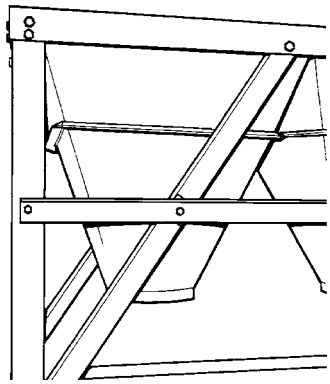


Figure 8 Position hopper inside support structure

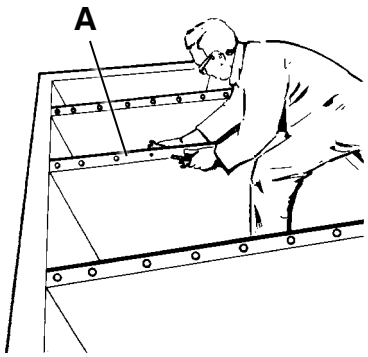
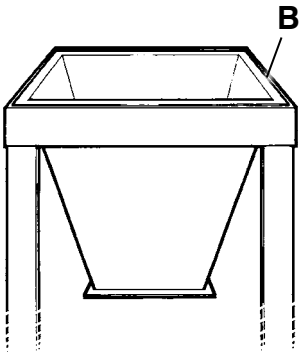


Figure 9 Fix together multi-hopper assemblies



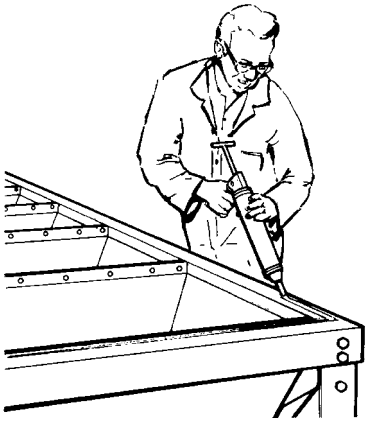


Figure 10 Apply sealant to hopper flange

INSTALLATION

Position the filter casing

Refer to figures 11 to 17.

1 Sling the Dalamatic filter case only from the lifting lugs provided. Use a four point lift for 1- and 3-bank cases and a two point lift for 2-bank cases to avoid twisting.

2 Lift the Dalamatic filter case vertically and place on to the hopper/support flanges.

3 Align seating level holes with suitable podger (A); starting at clean air chamber base to hopper joint (F), fit bolts and tighten, working from the centre of the filter to the outer edge.

(4-, 5-, 6-, 7- and 8-tier collectors)

4 These collectors have a horizontal joint/s. Lift and secure lower section as above.

On 1-bank 4-, 5-, 6-, 7- and 8-tier collectors the four lifting angles (B) on the lower section will have to be removed.

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

(Multi-bank collectors)

6 Depending on site conditions, it is preferable to erect an end bank first rather than a middle bank.

7 Each case site joint must be sealed at (D) and (E) where the cases are bolted together. Apply a suitable sealing compound, to suit both temperature and application, making a continuous 5 mm bead along each side of the holes. Extra care should be taken at (E) to avoid leaks.

8 As soon as the second bank of filters is lifted into position it must be bolted up tightly, otherwise creep can develop. Always locate bolts (F) first. Open the front access doors to fit the inner line of bolts (G).

Erect explosion dome upstand (if fitted)

Refer to figure 18.

1 Tack bolt channels (H) together with left-hand side channel (J) and right-hand side channel (K).

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

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

4 Tighten bolts.

5 Position dome (N) into place and drill ∅6 mm holes through dome and top flange. The holes are to be drilled in the corners of the dome and at approx. 300 mm pitches.

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

7 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.

INSTALLATION

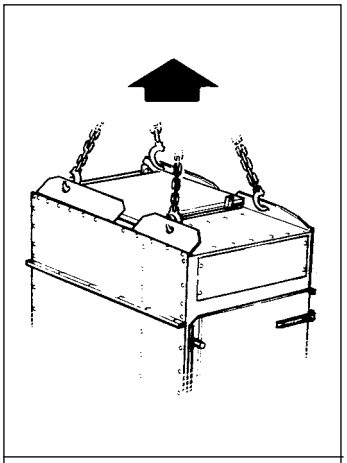


Figure 11 Use lifting brackets provided

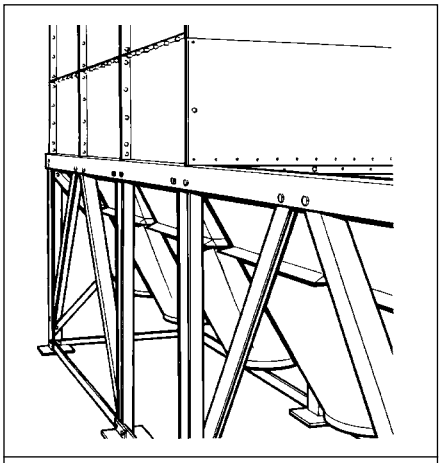


Figure 12 Place filter case on hopper/support flanges

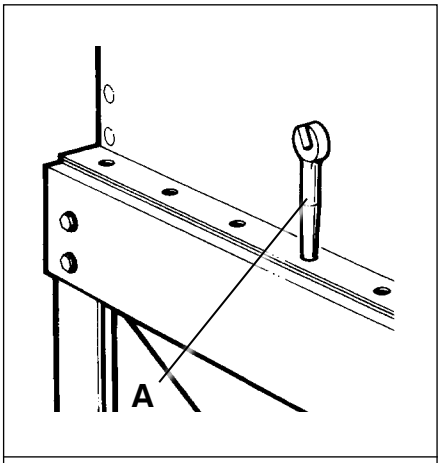


Figure 13 Align seating level holes

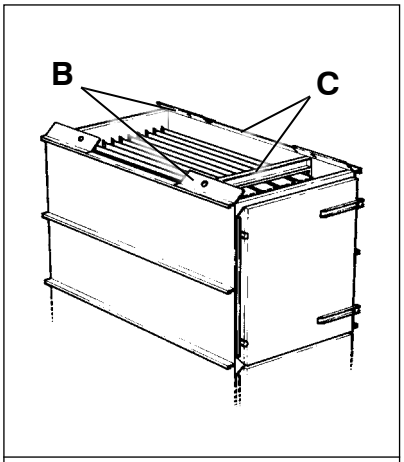


Figure 14 Remove lifting brackets on lower sections

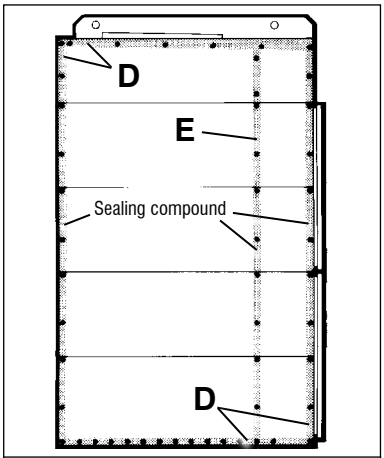


Figure 15 Apply sealant to site joints

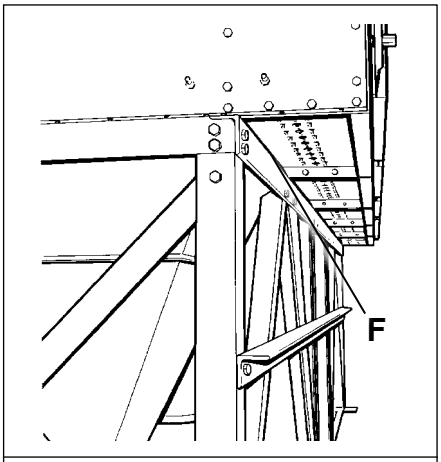


Figure 16 Clean air chamber base / hopper joint

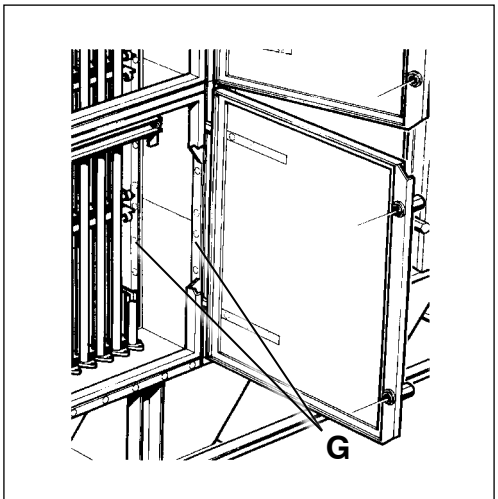


Figure 17 Fit inner bolts

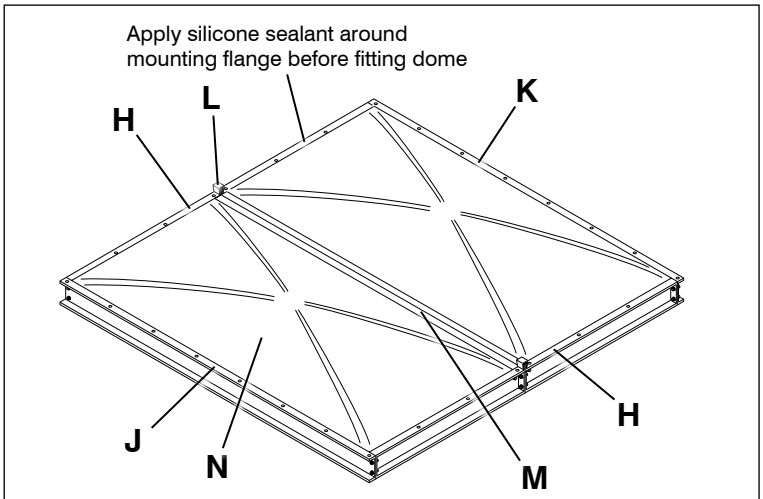


Figure 18 Erect explosion dome (2-bank shown)

INSTALLATION

Flat bar stiffening and stiffener bridge pieces

For the following options, a set of flat bar stiffeners and stiffener bridge pieces are supplied with 4-tier collectors and above:

- –1140 mm W.G. stiffened collectors.
- Top explosion collectors.
- Top explosion with –1140 mm W.G. stiffened collectors.
- Rear explosion collectors. (Flat bar stiffeners are only required on 5-tiers and above. Stiffener bridge pieces are not required).
- Rear explosion with –1140 mm W.G. stiffened collectors.

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 5-tier collectors and above (see fig. 19).

Stiffener bridge pieces are required at site joints where the stiffeners are split (see fig. 20).

Control equipment

Controls should be fitted to the collector in the sequence as shown in Table 1.

A maximum of 4-banks can be operated by one IPC (ΔP) Controller (see Table 1).

A maximum of 3-banks can be operated by one Delta P Controller (see Table 2).

One moisture separator is required every 4-banks up to 6-tier, and every 3-banks for 7- and 8-tier. When only one moisture separator is used it is fitted to the left hand end. Where two moisture separators are required they are fitted at each end (rearrange fittings to suit). Where three or more moisture separators are required they are fitted below the controls, fittings supplied to suit.

(2-, 3-, 4-, 5- and 6-tier collectors – standard temperature)

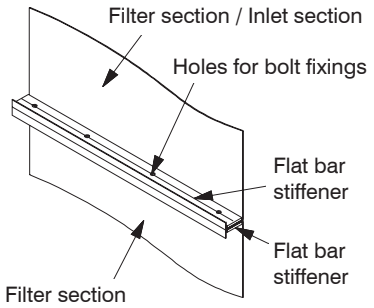


Figure 19 Part view showing typical fixing position of flat bar stiffeners on site joint

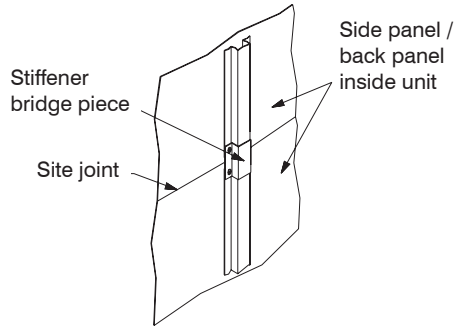


Figure 20 Part view showing typical position of stiffener bridge piece

INSTALLATION

Refer to figure 21.

1 Fit securing bolts (A) into threaded holes at top ends of manifold. Tighten bolts.

2 Lift controls assembly to underside of clean air chamber. Locate diaphragm valve outlets (B) and securing bolts (A) into holes provided and, from inside clean air chamber, secure with nuts (C).

3 Place valve seal (D) over diaphragm valve outlets (B) inside clean air chamber and secure in position with valve seal clamp (E).

4 Fit moisture separator (J).

(2-, 3-, 4-, 5- and 6-tier collectors – high temperature and 7- and 8-tier collectors)

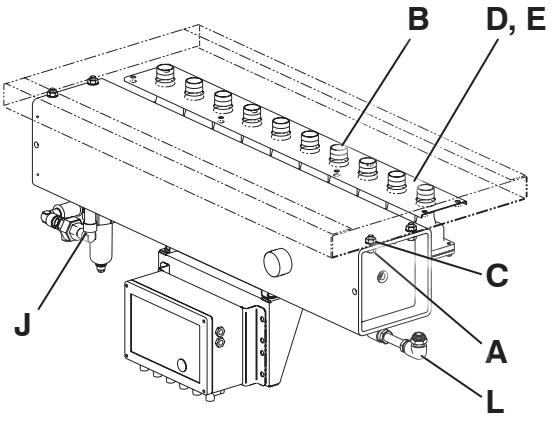
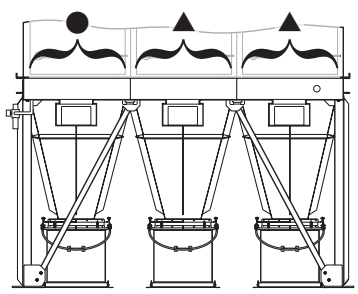


Figure 21 Controls assembly
(2- to 6-tier, standard temperature shown)

TABLE 1 – CONTROLS ASSEMBLY SEQUENCE IPC(ΔP)

1-bank	●
2-bank	● ▲
3-bank	● ▲ ▲
4-bank	● ▲ ▲ ▲
5-bank	● ▲ ▲ ■ ▲
6-bank	● ▲ ▲ ■ ▲ ▲
7-bank	● ▲ ▲ ▲ ■ ▲ ▲
8-bank	● ▲ ▲ ▲ ■ ▲ ▲ ▲
9-bank	● ▲ ▲ ■ ▲ ▲ ■ ▲ ▲
10-bank	● ▲ ▲ ▲ ■ ▲ ▲ ■ ▲ ▲



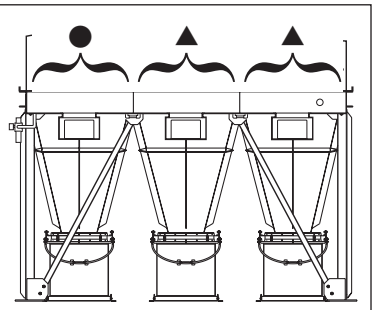
(3-bank shown)

● = Controls assy with IPC (ΔP) Controller ▲ = Controls assy with Solenoid Valve Terminal Box
■ = Controls assy with IPC Controller

INSTALLATION

TABLE 2 - CONTROLS ASSEMBLY SEQUENCE (Delta P-C01)

1-bank	●
2-bank	● ▲
3-bank	● ▲ ▲
4-bank	● ▲ ■ ▲
5-bank	● ▲ ▲ ■ ▲
6-bank	● ▲ ▲ ■ ▲ ▲
7-bank	● ▲ ▲ ■ ▲ ■ ▲
8-bank	● ▲ ▲ ■ ▲ ▲ ■ ▲
9-bank	● ▲ ▲ ■ ▲ ▲ ■ ▲ ▲
10-bank	● ▲ ▲ ■ ▲ ▲ ■ ▲ ■ ▲



(3-bank shown)

● = Control ASSY with Delta P-C01 and valves ▲ = Terminal Box with valves

■ =Control ASSY with Timer Board and valves

INSTALLATION

Refer to figures 22 and 23.

1 Apply a suitable sealant, to suit both temperature and application, to each hose stem adaptor (F).

2 Lift controls assembly below clean air chamber and bolt into position.

3 Tighten clip (G) on rubber hose (H).

4 Fit moisture separator (J).

(Multi-bank collectors)

Refer to figure 24.

5 Link manifolds (K) together with nylon tubing and fittings supplied (L).

6 Fit pressure gauge (M) to controls furthest from moisture separator.

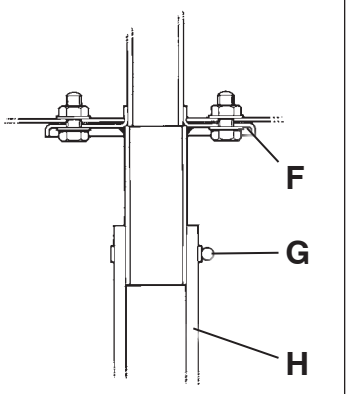


Figure 22 Hose stem adaptor fixing (2- to 6-tier, high temperature and 7- and 8-tier)

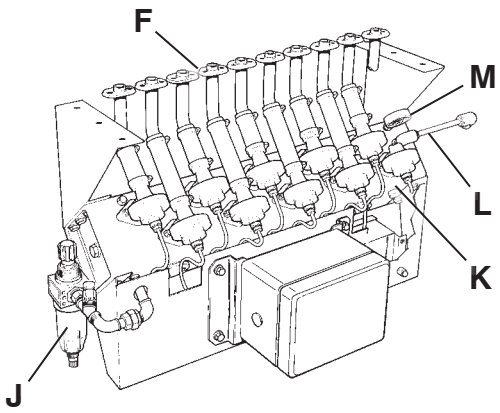


Figure 23 Controls assembly (7- and 8-tier shown)

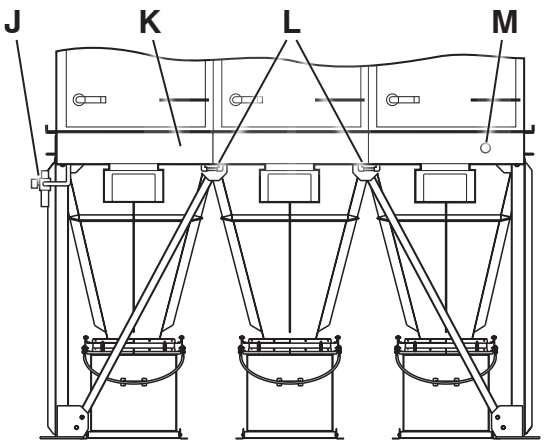


Figure 24 Multi-bank assembly (3-bank shown)

INSTALLATION

Compressed air requirements

Dalamatic Cased dust collectors require an independent supply of clean, dry, oil-free compressed air. Details of atmospheric pressure and quantity are given in Table 4 (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:

Type of compressor

Use a compressor of ample capacity – an overloaded compressor tends to 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 25 mm (1" NB) piping. For further details see Table 4. 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 5 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 dm^3/s at 7.1 bar. Extra system relief will be required if the connected supply can exceed this.

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.

Always isolate power before opening the controller.

Each Dalamatic Cased dust collector is supplied with either an IPC controller or an IPC (ΔP) controller or a Delta P-C01 controller with valves to operate the reverse jet cleaning system.

For IPC or IPC (ΔP) controller connections and set-up, refer to publication 2699.

for Delta P-C01 controller connections and set-up, refer to the drawings and Delta P-C01 IOM.

INSTALLATION

(Multi-bank collectors)-IPC(ΔP) Controller)

One IPC (ΔP) controller can operate up to 3 additional solenoid valve terminal boxes (i.e. up to 4-banks). Connect together with 11 core cable as shown in figure 25.

For collectors larger than 4-banks, additional IPC controllers are used (refer to Table 1). Connection is made using terminals 18 and 20 on the underside of the top PCB on the IPC (ΔP) controller, to terminals 7 and 8 on the additional IPC controller as shown in figure 25. If applicable, any subsequent IPC controllers are connected in turn, using terminals 7 and 8.

(Multi-bank collectors-Delta P-C01 Controller)

One Delta P-C01 controller can operate up to 2 additional solenoid valve terminal boxes (i.e.up to 3-banks). Connect together with 12 core cable (provided by user).Connection please refer to wiring diagram provided by Donaldson.

For collectors larger than 3-banks, additional Timer Board with valves controllers are used (refer to Table 2). Connection please refer to wiring diagram provided by Donaldson.

Fan motor

The fan motor used in conjunction with the Dalamatic Cased dust collector will need to be wired to a suitable control panel for the type of Fan Motor installed. This control panel should be designed in such a way to comply with local legislation for electrical installations. Refer also to 'Overload protection' and 'Interlocks'.

Overload protection

All feeder circuits should be adequately protected with suitably-rated fuses and contactors with integral overload protection.

Interlocks

Discharge equipment such as belt feeders, rotary valve or screw conveyor should be separately controlled but interlocked with the filter controller (see fig. 26).

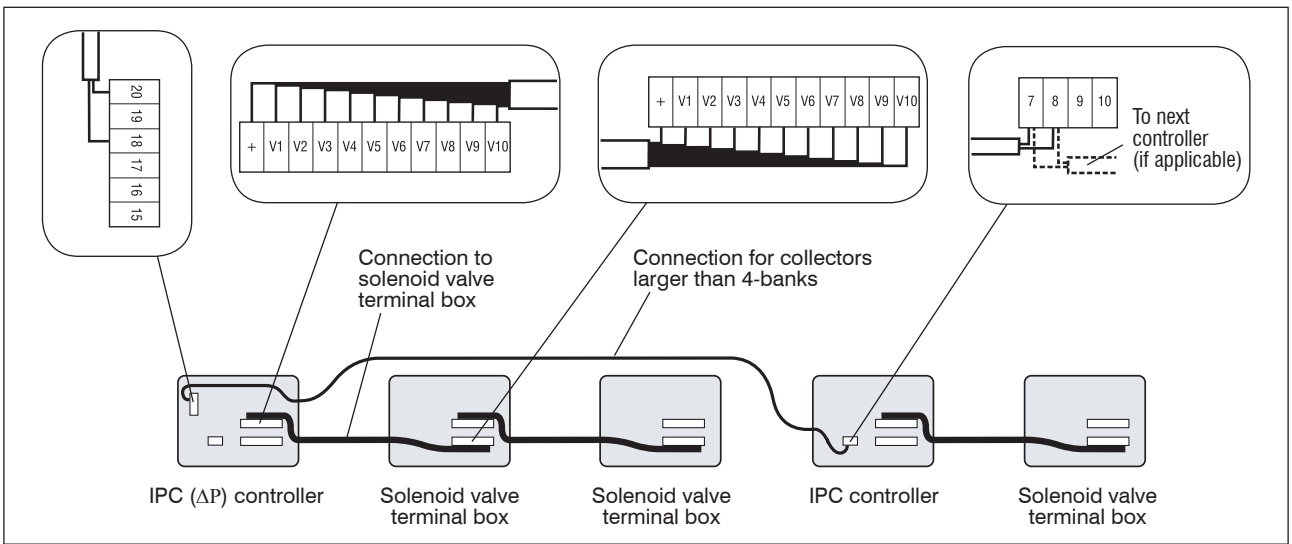


Figure 25 Multi-bank connection details (5-bank shown)

INSTALLATION

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.

Such interlocks are illustrated in figure 26 which also allows for the compressor etc. to operate without airflow through the collector, to facilitate clearance of the collector in the event of blockage due to failure of non-electrical equipment.

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.

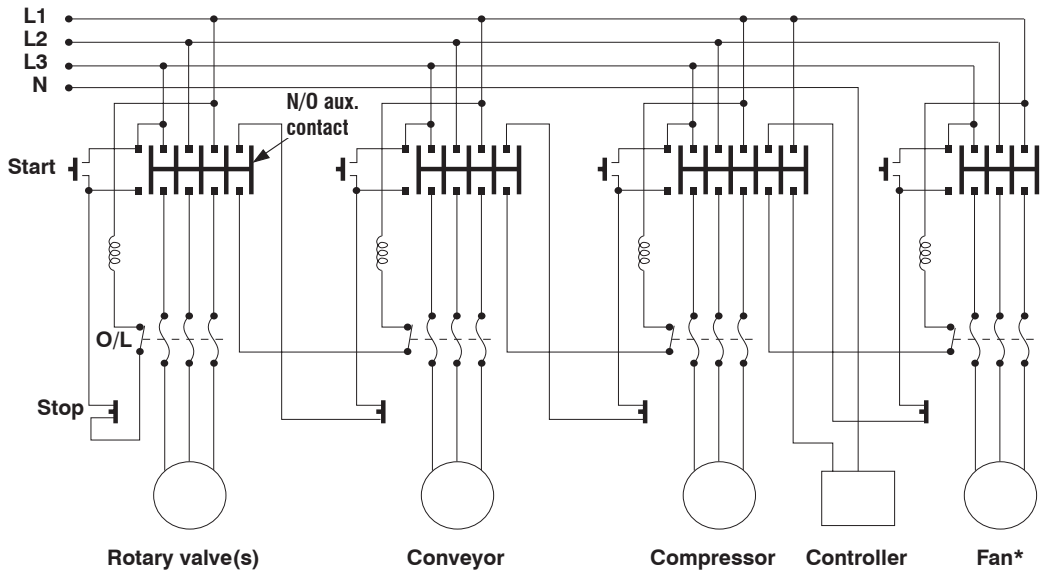


Figure 26 Schematic diagram showing typical interlock system for a Dalamatic collector installation
* For fans powered by 11kW motors or above collectors are connected for star delta starting as standard

INSTALLATION

Ex controls

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

- *Exd solenoids and remote controller*

  When this option is fitted, the dust collector has its solenoid valves in an Exd IIb T6 enclosure mounted directly to the compressed air manifold. A controller,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).

  It is recommended that cable with a core size of 2.5mm^2 is used.

  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 the need for an electrical supply is eliminated.

  The controller is supplied complete with air regulator and is normally bracket-mounted directly to the compressed air manifold.

  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 to the middle manifold.

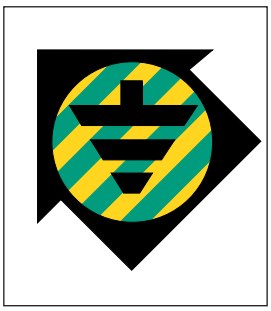
Explosion relief

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 Publication 2713 for explosion relief assembly installation.

INSTALLATION

Antistatic earthing



It It is particularly important on collectors having antistatic features and/or explosion stiffening, 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).

On collectors of 5-banks, 5-tiers and above, a static earthing connection must be made at the site joint where the collector is banked (see fig. 27) and the site joint between tiers (see fig. 28).

Access for maintenance

It is recommended that suitable walkways and ladders etc. are installed for safe access to maintenance areas etc. on Dalamatic collectors.

Repositioning the collector

If the Dalamatic collector is to be repositioned, the reversal of the installation procedure should be followed.

Installation check list ✔

- ☐ Ensure the Dalamatic filter casing is securely bolted to the support structure.
- ☐ Ensure the support structure 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.

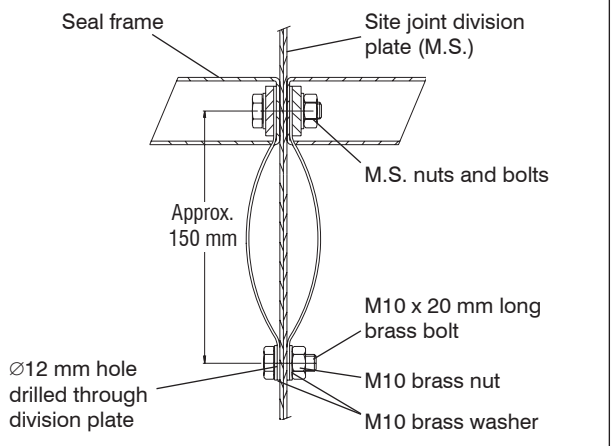


Figure 27 Plan view showing antistatic earthing arrangement between banked collectors

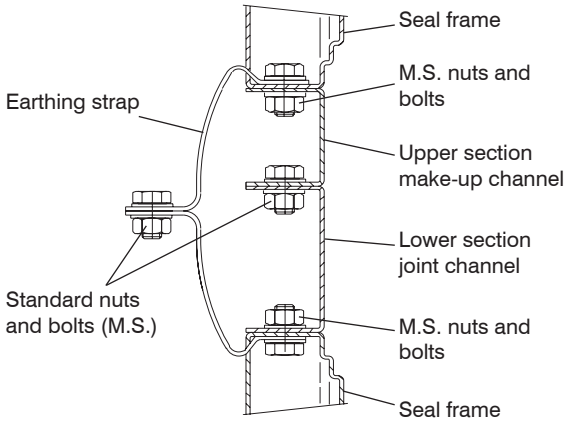


Figure 28 Typical upper and lower section joint showing earthing arrangement

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.

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 filter casing is securely bolted to the support structure.
- ☐ Ensure the support structure is securely bolted to the floor.
- ☐ Ensure that all ducting is complete and all detachable panels are in position.
- ☐ Ensure collectors fitted with antistatic filter elements 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 in the collector, then close and secure the doors.
- ☐ Ensure controller is connected to the correct voltage and that the pulse interval and duration settings are correct. For 24V DC ensure polarity is correct. It is essential that the controller is earthed for both AC and DC connections.
- ☐ Ensure electric power is available.
- ☐ Ensure the compressed air manifold has sufficient protection for over-pressure.
- ☐ 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 that all valves operate in sequence (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.
- ☐ Start up the main fan and check for correct rotation and that the full load current is not exceeded.
- ☐ 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).

COMMISSIONING

Start-up sequence

Having completed all the necessary checks, the equipment may be put into operation. A typical installation, as shown in figure 26, 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 controller.

4 Start main fan.

Shut-down sequence

At the end of any period of operation it is most important that all residual deposits are cleared from the filter elements, casing, discharge hopper(s) and equipment being served. To achieve this, equipment should be shut down in the following order:

1 Stop main fan only, leaving controller and compressed air supply switched on to allow filter to be cleaned 'off-line'.

To enable off-line cleaning, refer to respective controller 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.

2 After 10-15 minutes, switch off controller and compressor but leave discharge equipment running to ensure that it is emptied.

3 After a further 5 minutes, switch off the discharge equipment if applicable.

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

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

On installations where the inlet duct is relatively short, this procedure may result in a dust emission occurring at the inlet and therefore may not be an appropriate procedure if the dust being handled is dangerous. Therefore a Risk Assessment must be carried out to ensure the final procedure is safe.

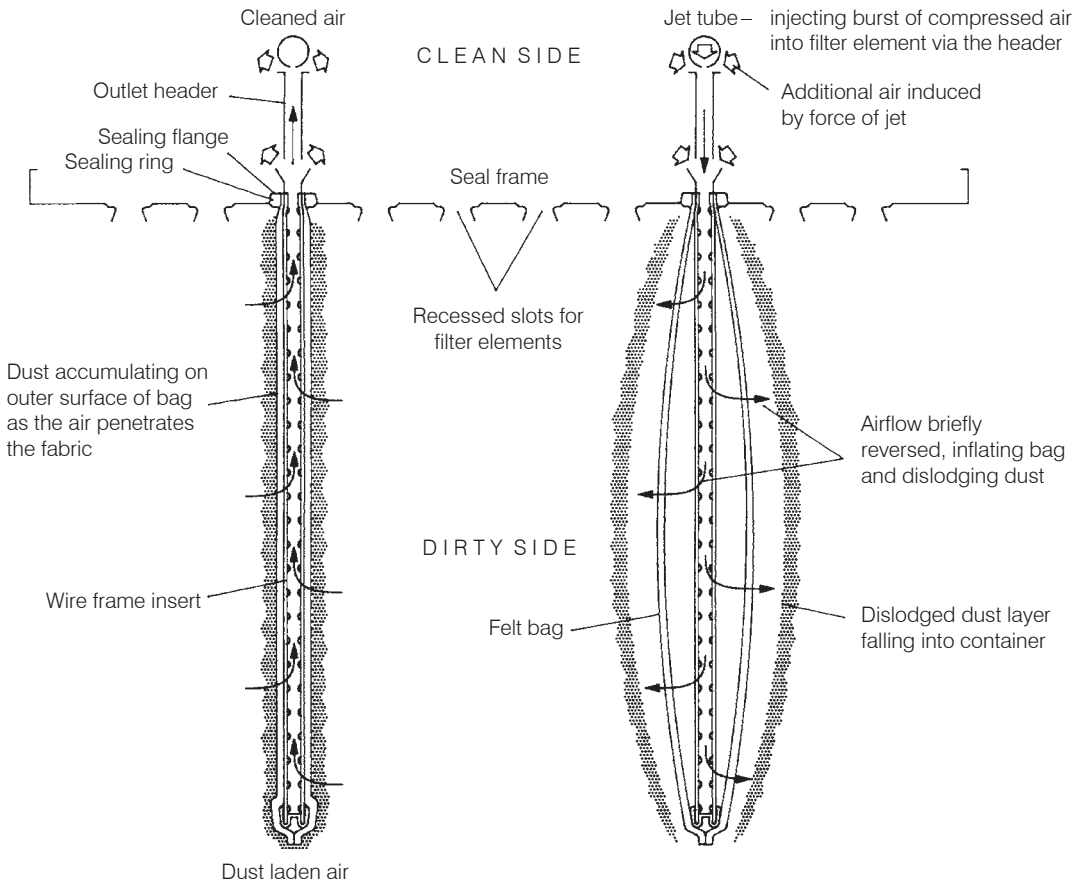
OPERATION

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. 29a). 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. 29b). The jet tube has a series of small-diameter jet orifices positioned adjacent to the outlet header of each filter element (see figs. 29 and 32). 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.



a Filtering operation (continuous) **b** Cleaning operation (intermittent)

Figure 29 Section through seal frame and two filter elements, showing principle of operation

OPERATION

Dust disposal

For safe handling of the dust container an assessment must be made to satisfy the requirements of the European Directive 90/269/EEC or all related National and Local Codes on manual handling.

Dust containers may require regular emptying. If the dust being handled is explosive, then care should be taken to ensure that dust spillage is kept to a minimum to avoid the creation of potentially explosive atmospheres and secondary hazards.

Dust containers should be securely replaced and resealed prior to collector restart. This is a good time to check the dust container for damage, which may lead to a dust leak or flame emission in the rare instance of an internal explosion.

Standard dust container:

1 Release the container by raising the sealer gear handle.

2 Remove and empty the container.

3 Replace container by sliding it back into position.

4 Reseal the container by lowering the sealer gear handle.

Dust container with pressure balance:

1 Release the container by raising the sealer gear handle.

2 Slide the container out.

3 The polythene bag liner can be sealed in a manner to suit the toxicity of the dust and then removed.

4 Fit a new polythene bag into the dust container and slide the container back into position.

5 Reseal the container by lowering the sealer gear handle.

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. Appropriate personal protection equipment (PPE) should be used, e.g. dust mask, safety hat, gloves etc.

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 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).

Care should be taken during cleaning and maintenance to avoid creating static discharges that have the potential to ignite a flammable atmosphere.

When carrying out maintenance always follow typical best practice to local regulations (e.g. TRGS 560).

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.

MAINTENANCE

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

Filter resistance can be checked by connecting a U-tube manometer or differential-type pressure gauge to tapping points on the filter casing (see fig. 1). This will give a continuous indication of the state of the filter. 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 Connect a manometer to tapping points (refer to Routine inspection) and measure the pressure drop across the filter.

Monthly

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 one of the appropriate following procedures:

- *2-, 3-, 4-, 5- and 6-tier collectors (fig. 30)*

  Use service kit available from Donaldson.

1 Switch off fan and compressed air supply.

2 Remove 6 mm diameter nylon tube (A) by pulling out from valve.

MAINTENANCE

3 Remove the hexagon head set screws and shakeproof washers securing the valve bonnet (B).

4 The diaphragm and spring (if fitted) can now be replaced, first ensuring the 'bleed' hole pin is not blocked.

5 Ensure that diaphragm fits over 'bleed' hole pin and that the nylon sealing washer is inside throat of valve.

6 Position spring (if fitted) inside bonnet recess.

7 Refit bonnet ensuring spring (if fitted) locates over diaphragm disc shoulder and bonnet locates over 'bleed' hole pin.

8 Refit and tighten the hexagonal head set screws and shakeproof washers.

9 Push-fit 6 mm diameter nylon tube back into valve.

10 The collector is now ready to restart.

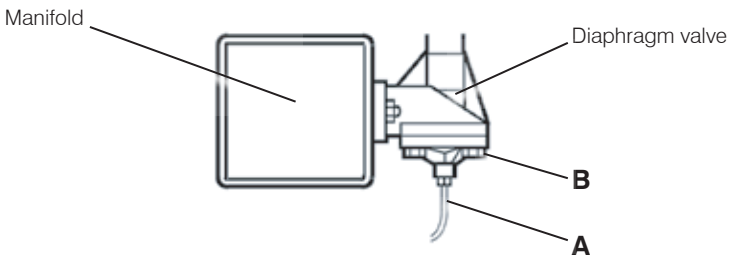


Figure 30 Valve diaphragm replacement
(2-, 3-, 4-, 5- and 6-tier, standard temperature shown)

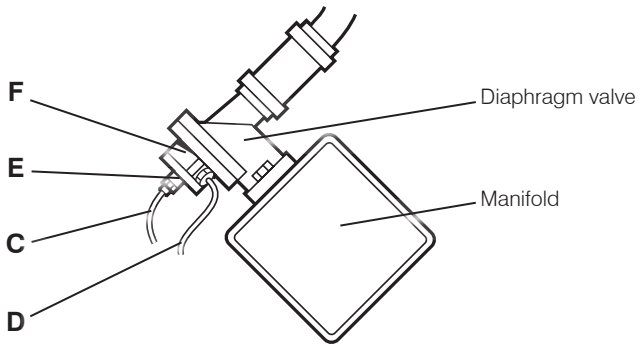


Figure 31 Valve diaphragm replacement
(7- and 8-tier shown)

MAINTENANCE

- *7- and 8-tier collectors (fig. 31)*

  Use service kit available from Donaldson.

1 Switch off fan and compressed air supply.

2 Remove 6 mm diameter nylon tube (C) by pulling out from valve.

3 Remove 10 mm diameter nylon tube (D) by unscrewing the tubing nut in the side of the valve bonnets.

4 With the valve in place on the manifold, remove the four cap screws securing the small bonnet (E).

5 The small diaphragm and spring can now be replaced, first ensuring the 'bleed' hole pin is not blocked.

6 Ensure that the diaphragm fits over 'bleed' hole pin, and metal disc on diaphragm should be uppermost.

7 Position the 16 mm long spring over the disc shoulder.

8 Refit bonnet ensuring the spring locates inside the bonnet recess and bonnet locates over 'bleed' hole pin.

9 Tighten up the cap screws.

10 Remove the six hexagon screws securing the large bonnet (F).

11 The large diaphragm and spring can now be replaced, first ensuring that the 'bleed' hole pin is not blocked.

12 Ensure that the diaphragm fits over the 'bleed' hole pin, and the nylon diaphragm seat is positioned over the main outlet and metal disc on the diaphragm is uppermost.

13 Position the 25 mm long spring over the disc shoulder.

14 Refit the bonnet ensuring that the spring locates inside the bonnet recess and the bonnet locates over the 'bleed' hole pin.

15 Tighten up the hexagon screws.

16 Push-fit 6 mm diameter nylon tube back into valve.

17 Refit 10 mm diameter nylon tube and tubing nuts.

18 The filter is now ready to restart.

Annually

1 Moisture separator – Isolate the compressed air supply; remove and clean the filter element.

2 Air manifold – Having isolated the compressed air supply, 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.

MAINTENANCE

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.

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. Place used filter bag into a sealable bag and dispose properly.

If in doubt regarding the safe disposal of the used filter bag, consult your local regulations.

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.

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 2 – FAULT LOCATION

Symptom	Possible cause	Action
1 Part loss of suction (excessive pressure differential).	1.1 Compressed air malfunction.	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.	a Refer to 'Fault location' table in controller manual supplied with dust collector.
	1.3 Filter blocked.	a Check that emptying device or equipment being served is working. Check starter overloads, fuses and interlocks. b Run collector clear*, then remove each element in turn and vacuum-clean all its outer surfaces. Renew any filter bags that are damaged.
	1.4 Main fan belt slipping.	a Adjust the fan belts or renew if worn.
	1.5 Motor speed low.	a Check line voltage, phases, fan motor connections. For Star/Delta applications, check motor is in Delta.
	1.6 Incorrect fan motor rotation.	a Check electrical connections and transpose if necessary.
2 Total loss of suction.	2.1 Fan motor stopped.	a Check motor supply overloads, fuses and interlocks (if fitted). b Check motor connections and windings.
	2.2 Filter blocked.	a Check that emptying device or discharge equipment is working. Check starter overloads, fuses and interlocks. b Run collector clear*, then remove each element in turn and vacuum-clean all its outer surfaces. Renew any filter bags that are damaged.
	2.3 Ducting blocked.	a Check throughout and clear.
3 Visible effluent in clean air outlet.	3.1 Filter elements not properly sealed.	a Tighten element retaining bolts to ensure compression of sealing rings.
	3.2 Damaged filter bag.	a Damaged filter bag can be identified by the dust present in clean air chamber. Withdraw element and renew bag.

*To run collector 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 Cased 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 29. Removal of filter elements is always carried out from the clean side of the collector.

The Dalamatic Cased dust collector range is based on modules each containing ten filter elements, with each filter element having an effective filtration area of 1.5 m^2. The number of modules, hence the effective filtration area, is indicated in the model number, e.g. a DLM 2/4/15 contains two banks of four tiered modules and consequently eighty filter elements having a total effective filtration area of 120 m^2.

The filter assembly is contained in a steel housing, with provision made for inlet and outlet ducts, and the whole is mounted on a support structure, allowing adequate space below the hopper for the discharge of dust (see fig. 1). Larger collectors are assembled on site from suitable combinations of sizes (see Table 3). For further details refer to Publication 372.

Equipment is available suitable 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.

TABLE 3 – DALAMATIC CASED DUST COLLECTOR RANGE

1-bank collectors			2-bank collectors			3-bank collectors		
DLM model	Filtration area	Number of elements	**DLM model**	Filtration area	Number of elements	**DLM model**	Filtration area	Number of elements
1/2/15*	30 m^2	20	**2/2/15***	60 m^2	40	**3/2/15***	90 m^2	60
1/3/15*	45 m^2	30	**2/3/15***	90 m^2	60	**3/3/15***	135 m^2	90
1/4/15	60 m^2	40	**2/4/15**	120 m^2	80	**3/4/15**	180 m^2	120
1/5/15	75 m^2	50	**2/5/15**	150 m^2	100	**3/5/15**	225 m^2	150
1/6/15	90 m^2	60	**2/6/15**	180 m^2	120	**3/6/15**	270 m^2	180
1/7/15	105 m^2	70	**2/7/15**	210 m^2	140	**3/7/15**	315 m^2	210
1/8/15	120 m^2	80	**2/8/15**	240 m^2	160	**3/8/15**	360 m^2	240

Larger collectors are assembled on site from suitable combinations of the above sizes.
*Supplied pre-assembled. All other models are supplied in two or more sections.

Temperature range: –10° to +60°C (Std.) or –10° to +200°C

Pressure range: –500 mm W.G. or –1140 mm W.G. (For positive pressures refer to Donaldson)

Dimension tolerances: ±5 mm on main dimensions; ±2 mm on detail dimensions

SPECIFICATION

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 consists of the air distribution manifold, diaphragm valves, solenoid valves and controller (see figs. 33 and 34). These items form a sub-assembly which is mounted immediately below the clean air chamber.

Large hinged inspection doors give access to the clean air chamber for removal of the jet tubes and filter elements when servicing. A lift-off door is also provided on the top or rear of the collector for access, if necessary, to the dirty air chamber. Inspection doors are also provided in rotary valve and screw conveyor type hoppers.

Filter elements (figs. 1, 29 and 32)

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).

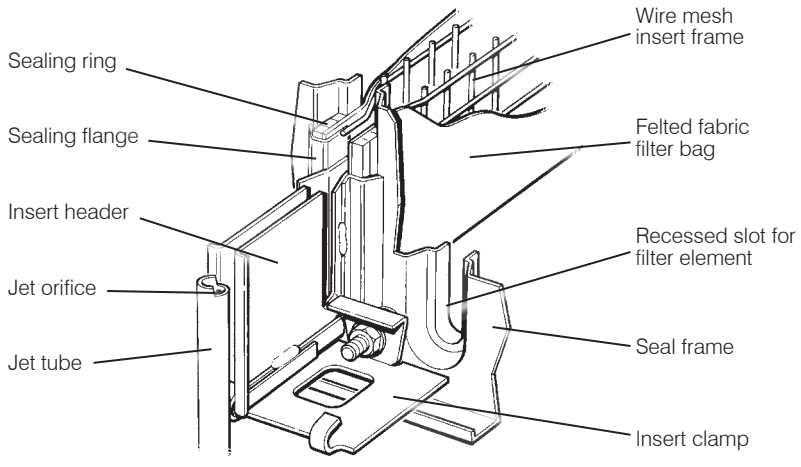


Figure 32 Filter element details

SPECIFICATION

Compressed air distribution manifold (figs. 33 and 34)

The manifold is fabricated from either 180sq x 8 mm thick (2- to 6-tier) or 200sq x 10 mm thick (7- and 8-tier) 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.

The manifold supplied with the Dalamatic Cased dust collector has been independently approved to operate under the conditions as specified in Table 5.

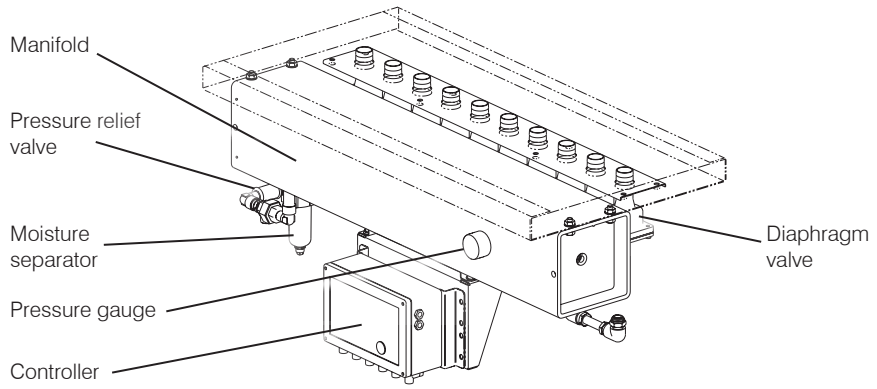


Figure 33 Control equipment
(2- to 6-tier, standard temperature shown)

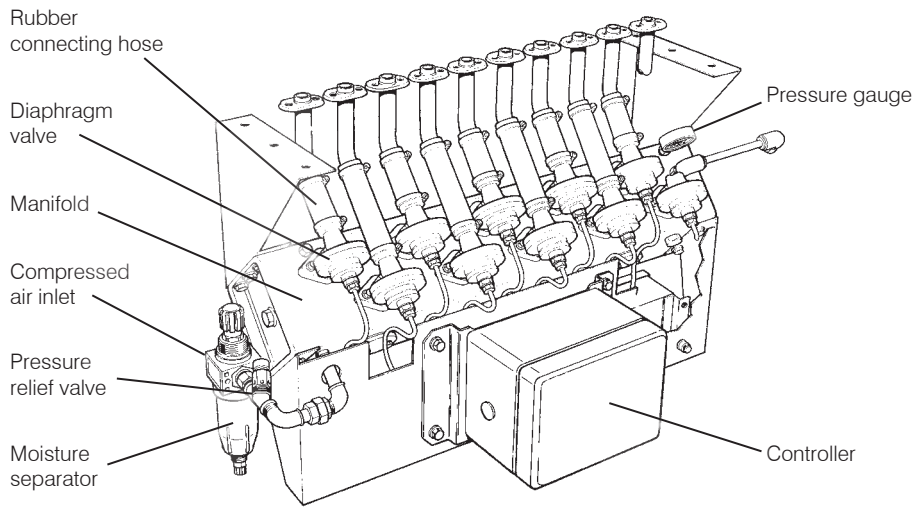


Figure 34 Control equipment
(7- and 8-tier shown)

SPECIFICATION

Seal frame (figs. 29 and 32)

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).

Jet tubes (figs. 1, 29 and 32)

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 either connected directly, or connected by a rubber hose, to a compressed air valve; the closed end is flattened and crimped, and is secured by a bolt and nut.

Valves (figs. 1, 33, 34 and 35)

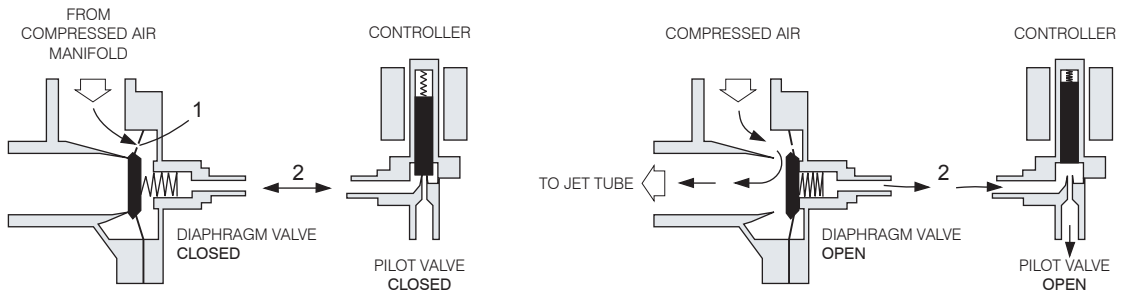
The compressed air is supplied to each jet tube via a diaphragm valve, the opening and closing of which is controlled by a solenoid-operated pilot valve connected to the diaphragm vent by a flexible nylon tube. The solenoid valves are energised sequentially by electrical pulses generated by the controller.

Controller

For IPC or IPC (ΔP) controller specifications, refer to publication 2699.

For PT controller specifications, refer to publication 2697.

For Delta P-C01 controller specifications, refer to IOM of Delta P-C01 AK0303001



a Compressed air from the manifold penetrates diaphragm through fine hole '**1**' into connecting tube '**2**'.

b When solenoid is activated the pilot valve opens, releasing the compressed air from connecting tube '**2**' and allowing diaphragm to open.

Figure 35 The valve system

SPECIFICATION

TABLE 4 – COMPRESSED AIR REQUIREMENTS

Model	Working compressed air pressure [a]	Atmospheric air volume – F.A.D. at 12 sec. intervals [b]	Pulse duration	Minimum pipe diameter [c]
1-bank:				
DLM 1/2/15	3.4 bar 50 psig	7.4 m³/h 4.3 cfm	60 ms	½" NB (12)
DLM 1/3/15	3.8 bar 55 psig	9.5 m³/h 5.6 cfm	60 ms	½" NB (12)
DLM 1/4/15	5.2 bar 75 psig	13.7 m³/h 8.1 cfm	60 ms	¾" NB (20)
DLM 1/5/15	5.2 bar 75 psig	13.7 m³/h 8.1 cfm	60 ms	¾" NB (20)
DLM 1/6/15	6.2 bar 90 psig	24.9 m³/h 14.6 cfm	100 ms	¾" NB (20)
DLM 1/7/15	6.2 bar 90 psig	28.9 m³/h 17.0 cfm	100 ms	¾" NB (20)
DLM 1/8/15	6.2 bar 90 psig	28.9 m³/h 17.0 cfm	100 ms	¾" NB (20)
2-bank:				
DLM 2/2/15	3.4 bar 50 psig	14.7 m³/h 8.7 cfm	60 ms	¾" NB (20)
DLM 2/3/15	3.8 bar 55 psig	19.0 m³/h 11.2 cfm	60 ms	¾" NB (20)
DLM 2/4/15	5.2 bar 75 psig	27.5 m³/h 16.2 cfm	60 ms	1" NB (25)
DLM 2/5/15	5.2 bar 75 psig	27.5 m³/h 16.2 cfm	60 ms	1" NB (25)
DLM 2/6/15	6.2 bar 90 psig	49.8 m³/h 29.3 cfm	100 ms	1¼" NB (32)
DLM 2/7/15	6.2 bar 90 psig	57.7 m³/h 34.0 cfm	100 ms	1¼" NB (32)
DLM 2/8/15	6.2 bar 90 psig	57.7 m³/h 34.0 cfm	100 ms	1¼" NB (32)
3-bank:				
DLM 3/2/15	3.4 bar 50 psig	22.1 m³/h 13.0 cfm	60 ms	¾" NB (20)
DLM 3/3/15	3.8 bar 55 psig	28.6 m³/h 16.8 cfm	60 ms	1" NB (25)
DLM 3/4/15	5.2 bar 75 psig	41.1 m³/h 24.2 cfm	60 ms	1" NB (25)
DLM 3/5/15	5.2 bar 75 psig	41.1 m³/h 24.2 cfm	60 ms	1" NB (25)
DLM 3/6/15	6.2 bar 90 psig	74.7 m³/h 43.9 cfm	100 ms	1½" NB (38)
DLM 3/7/15	6.2 bar 90 psig	86.6 m³/h 51.0 cfm	100 ms	1½" NB (38)
DLM 3/8/15	6.2 bar 90 psig	86.6 m³/h 51.0 cfm	100 ms	1½" NB (38)
4-bank:				
DLM 4/2/15	3.4 bar 50 psig	29.4 m³/h 17.3 cfm	60 ms	1" NB (25)
DLM 4/3/15	3.8 bar 55 psig	38.1 m³/h 22.4 cfm	60 ms	1" NB (25)
DLM 4/4/15	5.2 bar 75 psig	54.8 m³/h 32.3 cfm	60 ms	1¼" NB (32)
DLM 4/5/15	5.2 bar 75 psig	54.8 m³/h 32.3 cfm	60 ms	1¼" NB (32)
DLM 4/6/15	6.2 bar 90 psig	99.6 m³/h 58.6 cfm	100 ms	1¾" NB (45)
DLM 4/7/15	6.2 bar 90 psig	115.5 m³/h 68.0 cfm	100 ms	1¾" NB (45)
DLM 4/8/15	6.2 bar 90 psig	115.5 m³/h 68.0 cfm	100 ms	1¾" NB (45)
5-bank:				
DLM 5/2/15	3.4 bar 50 psig	36.2 m³/h 21.3 cfm	60 ms	1" NB (25)
DLM 5/3/15	3.8 bar 55 psig	47.6 m³/h 28.1 cfm	60 ms	1¼" NB (32)
DLM 5/4/15	5.2 bar 75 psig	68.5 m³/h 40.4 cfm	60 ms	1½" NB (38)
DLM 5/5/15	5.2 bar 75 psig	68.5 m³/h 40.4 cfm	60 ms	1½" NB (38)
DLM 5/6/15	6.2 bar 90 psig	124.5 m³/h 73.3 cfm	100 ms	2" NB (51)
DLM 5/7/15	6.2 bar 90 psig	144.3 m³/h 85.0 cfm	100 ms	2" NB (51)
DLM 5/8/15	6.2 bar 90 psig	144.3 m³/h 85.0 cfm	100 ms	2" NB (51)

Model	Working compressed air pressure [a]	Atmospheric air volume – F.A.D. at 12 sec. intervals [b]	Pulse duration	Minimum pipe diameter [c]
6-bank:				
DLM 6/2/15	3.4 bar 50 psig	44.1 m³/h 26.0 cfm	60 ms	1¼" NB (32)
DLM 6/3/15	3.8 bar 55 psig	57.1 m³/h 33.7 cfm	60 ms	1½" NB (38)
DLM 6/4/15	5.2 bar 75 psig	82.3 m³/h 48.5 cfm	60 ms	1½" NB (38)
DLM 6/5/15	5.2 bar 75 psig	82.3 m³/h 48.5 cfm	60 ms	1½" NB (38)
DLM 6/6/15	6.2 bar 90 psig	149.4 m³/h 87.9 cfm	100 ms	2½" NB (64)
DLM 6/7/15	6.2 bar 90 psig	173.2 m³/h 102.0 cfm	100 ms	2½" NB (64)
DLM 6/8/15	6.2 bar 90 psig	173.2 m³/h 102.0 cfm	100 ms	2½" NB (64)
7-bank:				
DLM 7/2/15	3.4 bar 50 psig	51.5 m³/h 30.3 cfm	60 ms	1¼" NB (32)
DLM 7/3/15	3.8 bar 55 psig	66.6 m³/h 39.3 cfm	60 ms	1½" NB (38)
DLM 7/4/15	5.2 bar 75 psig	96.0 m³/h 56.5 cfm	60 ms	1¾" NB (45)
DLM 7/5/15	5.2 bar 75 psig	96.0 m³/h 56.5 cfm	60 ms	1¾" NB (45)
DLM 7/6/15	6.2 bar 90 psig	174.3 m³/h 102.6 cfm	100 ms	2½" NB (64)
DLM 7/7/15	6.2 bar 90 psig	202.1 m³/h 119.0 cfm	100 ms	2½" NB (64)
DLM 7/8/15	6.2 bar 90 psig	202.1 m³/h 119.0 cfm	100 ms	2½" NB (64)
8-bank:				
DLM 8/2/15	3.4 bar 50 psig	58.9 m³/h 34.7 cfm	60 ms	1½" NB (38)
DLM 8/3/15	3.8 bar 55 psig	76.2 m³/h 44.9 cfm	60 ms	1½" NB (38)
DLM 8/4/15	5.2 bar 75 psig	109.7 m³/h 64.6 cfm	60 ms	2" NB (51)
DLM 8/5/15	5.2 bar 75 psig	109.7 m³/h 64.6 cfm	60 ms	2" NB (51)
DLM 8/6/15	6.2 bar 90 psig	199.2 m³/h 117.2 cfm	100 ms	2½" NB (64)
DLM 8/7/15	6.2 bar 90 psig	230.9 m³/h 136.0 cfm	100 ms	3" NB (76)
DLM 8/8/15	6.2 bar 90 psig	230.9 m³/h 136.0 cfm	100 ms	3" NB (76)
9-bank:				
DLM 9/2/15	3.4 bar 50 psig	66.2 m³/h 39.0 cfm	60 ms	1½" NB (38)
DLM 9/3/15	3.8 bar 55 psig	85.8 m³/h 50.5 cfm	60 ms	1¾" NB (45)
DLM 9/4/15	5.2 bar 75 psig	123.4 m³/h 72.7 cfm	60 ms	2" NB (51)
DLM 9/5/15	5.2 bar 75 psig	123.4 m³/h 72.7 cfm	60 ms	2" NB (51)
DLM 9/6/15	6.2 bar 90 psig	224.1 m³/h 131.9 cfm	100 ms	3" NB (76)
DLM 9/7/15	6.2 bar 90 psig	259.8 m³/h 153.0 cfm	100 ms	3" NB (76)
DLM 9/8/15	6.2 bar 90 psig	259.8 m³/h 153.0 cfm	100 ms	3" NB (76)
10-bank:				
DLM 10/2/15	3.4 bar 50 psig	73.6 m³/h 43.4 cfm	60 ms	1½" NB (38)
DLM 10/3/15	3.8 bar 55 psig	95.2 m³/h 56.1 cfm	60 ms	1¾" NB (45)
DLM 10/4/15	5.2 bar 75 psig	137.1 m³/h 80.8 cfm	60 ms	2½" NB (64)
DLM 10/5/15	5.2 bar 75 psig	137.1 m³/h 80.8 cfm	60 ms	2½" NB (64)
DLM 10/6/15	6.2 bar 90 psig	249.0 m³/h 146.5 cfm	100 ms	3" NB (76)
DLM 10/7/15	6.2 bar 90 psig	288.7 m³/h 170.0 cfm	100 ms	3" NB (76)
DLM 10/8/15	6.2 bar 90 psig	288.7 m³/h 170.0 cfm	100 ms	3" NB (76)

[a] Normal operating pressure. [b] Recommended initial setting; this may be varied with experience.

[c] Sizes suitable for runs of pipe up to 30m (100ft) in length. For longer runs of pipe or larger multi-bank collectors consult with Donaldson.

1 bar = 10^5 Pa

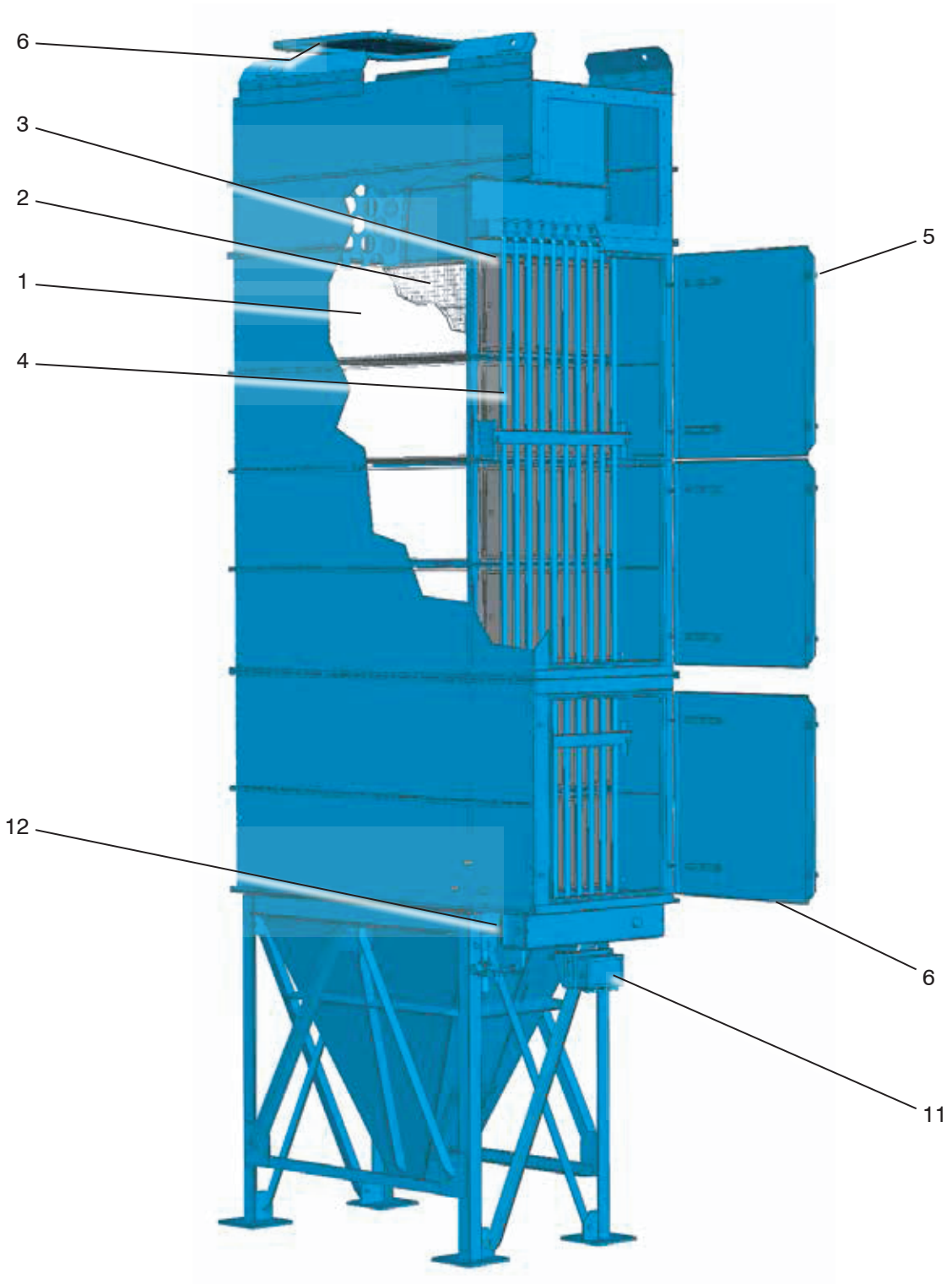
SPECIFICATION

TABLE 5 – 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 +150°C
Maximum rating of pressure relief device:	25 dm^3/s at 7.1 bar (factory set at 7.1 bar)
Manifold volume:	24.21 litres (2- to 6-tier) 29.74 litres (7- and 8-tier)
Product of pressure and capacity:	150.10 bar litres (2- to 6-tier) 184.39 bar litres (7- and 8-tier)
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 (180 sq) 9.0 mm (200 sq)

1 bar = 10^5 Pa

SPARE PARTS



DLM 1/4/15 illustrated

Figure 36 Spare parts identification

Item	Description		Part number	✳
	Filter element assembly			
1	Fabric filter bag	Dura-Life	1A 3139 2319	✔
		Dura-Life oleophobic	1A 3139 2331	✔
		Dura-Life epitropic	1A 3139 2325	✔
		Dura-Life oleophobic and epitropic	1A 3139 2337	✔
		Polypropylene	1A 3139 2042	✔
		Polypropylene antistatic¶	1A 3139 2050	✔
		Tetratex	1A 3139 2281	✔
		Tetratex antistatic¶	1A 3139 2293	✔
		Dralon (homopolymer acrylic)	1A 3139 2038	✔
		Aramid	1A 3139 2046	✔
	¶ Fitting antistatic bags will not provide a full earthing arrangement without fitting an additional earthing bar and straps, and making an earthing connection using the earthing post			
2	Insert		1A 3131 9000	
3	Insert clamp		1A 3131 0007	
4	Jet tube	2-tier (standard temperature) 2-tier (high temperature)	1A 3581 1003 1A 3181 1023	
		3-tier (standard temperature) 3-tier (high temperature)	1A 3581 1000 1A 3181 1020	
		4-tier (standard temperature) 4-tier (high temperature)	1A 3181 1063 1A 3181 1009	
		5-tier (upper, standard temperature) 5-tier (lower, standard temperature)	1A 3181 1025 1A 3181 1064	
		5-tier (upper, high temperature) 5-tier (lower, high temperature)	1A 3181 1025 1A 3181 1038	
		6-tier (upper, standard temperature) 6-tier (lower, standard temperature)	1A 3181 1066 1A 3181 1064	
		6-tier (upper, high temperature) 6-tier (lower, high temperature)	1A 3181 1066 1A 3181 1038	
		7-tier (upper) 7-tier (lower)	1A 3181 1030 1A 3181 1036	
		8-tier (upper) 8-tier (lower)	1A 3181 1037 1A 3181 1036	
	Door assemblies			
5	Door handle, filter section door		1A 6319 3000	
6	Door seal (filter section, top and rear inspection doors)	Neoprene Silicone	1A 1816 5223 1A 1816 6684	✔ ✔
	Dust container assembly			
7	Dust container – item not illustrated		1A 2141 1040	
8	Dust container sealer gear assembly – item not illustrated (includes items 9 and 10)	with neoprene seal with silicone seal	1A 2141 2046 1A 2141 2042	

Item	Description		Part number	✳
9	Canvas sleeve, dust container sealer gear – item not illustrated		1A 2149 2025	✔
10	Seal, dust container sealer gear – item not illustrated	Neoprene Silicone	1A 2149 2047 1A 2149 2050	✔ ✔
	Controller			
11	For controller spares information refer to Publication 2699 for IPC or IPC (ΔP) Controller or AK0303001 for Delta P-C01 Controller			
	Compressed air assembly			
12	Diaphragm valve	2- to 6-tier 7- and 8-tier	1A 3189 9011 1A 2565 3103	
13	Seal, diaphragm valve outlets – item not illustrated (2- to 6-tier, standard temperature only)	Neoprene Silicone	1A 3119 0380 1A 3119 0379	
14	Diaphragm valve service kit – item not illustrated	2- to 6-tier 7- and 8-tier	1A 2565 3204 1A 2565 3203	✔ ✔
15	Gasket, diaphragm valve – item not illustrated	2- to 6-tier 7- and 8-tier	1A 3189 0066 1A 2512 2168	✔ ✔
16	Differential pressure gauge assembly – item not illustrated		1A 2151 9155	
	Explosion relief assembly			
17	For explosion relief spares information refer to Publication 2713			
	Stainless Steel Explosion Vent			