



Donaldson
FILTRATION SOLUTIONS

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

DFPRE™ Dust Collectors

Series DFPRE Large

4L- 6L- 9L- 12L

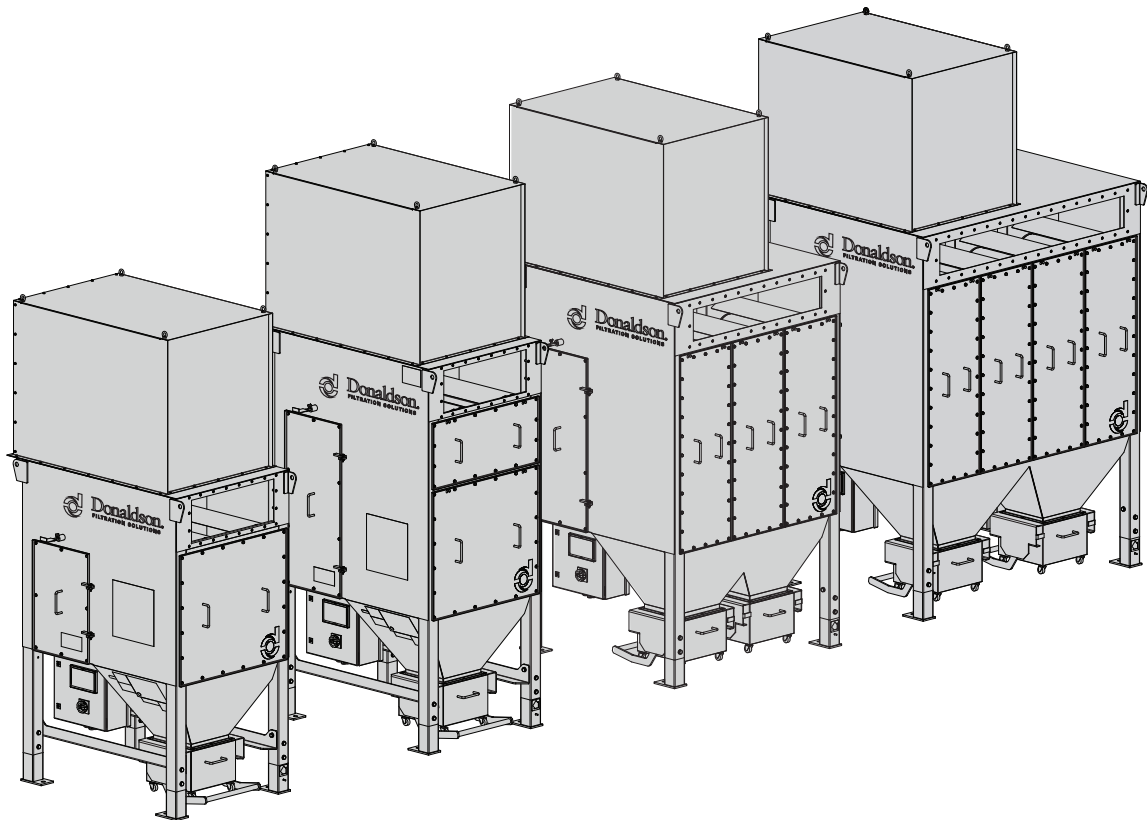


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IMPORTANT

Please read this manual carefully before installation.

This manual should be read in conjunction with the respective controller manual supplied with the dust collector.

Product reliability, warranty and safe operation may be compromised by not following the guidance given in these documents.

Applications having a risk of sparks and fires

1. Use

The DFPRE dust collector is designed for indoor/outdoor use and for handling non-explosive dusts.

2. EU Directive 99/92/EC

A reinforced and/or vented dust collector must be used when handling dusts that have the potential to form an explosive atmosphere. If a non-reinforced and/or non vented dust collector is used on these applications then the end user must ensure an equivalent, secure, and fool proof basis of safety, which must be clearly documented in the end users Explosion Protection Document in line with Article 8 of EU Directive 99/92/EC.

3. Self Heating Materials

Please note that some materials have the potential to self generate heat and hence to become an ignition source, that could result in a fire and / or an explosion (exothermic reactions). For this reason, ferrous and non-ferrous materials should not be extracted in to the same dust collector, as when combined they can create a violent thermite reaction that would ignite a fire and/or explosion.

4. Applications having a risk of sparks and fires

Where sparks are generated by the process, this must be considered as a potential ignition source which increases the risk of a fire or explosion. The filter can be supplied with an optional spark trap to help reduce the frequency of spark ignition and should be regarded as part of a risk reducing strategy.

The spark trap is not an extinguishment system and should never be relied upon to achieve spark eradication in processes where suppression requirements are absolute. The spark trap does not guarantee complete elimination of sparks and does not preclude the possibility of fire or explosion. Therefore, system redundancy and complementary measures should be taken in conjunction with the spark trap to further reduce the risk of fire and explosion from sparks in applications where there is potential for catastrophic combustion. Flame retardant media is recommended for these type of applications.

On these types of applications the enduser should carry out regular good housekeeping, such as:

- Periodically check for dust fall out in ducting and remove.
- Pulse down off line regularly to minimise retention of dust cake on filter cartridges.
- Empty dust bins frequently.

Other risk reducing strategies could include:

- Inject with an inert material.
- Consider additional spark detection and fire suppression equipment.

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 has been built in accordance with state-of-the-art standards and recognised safety rules. Nevertheless if not handled carefully it may put people at risk and also cause damage.



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:

- Regular maintenance of the unit
- 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.
- Dismantling and disassembling unit (Decommissioning).

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 safety 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.



The access door requires tools to open. To avoid danger from rotating fan impellor, ensure fan is isolated and allow sufficient time for fan to become stationary.



Do not put lit cigarettes or any burning object into the hood or ducting of any dust collection system.



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.



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.



All electrical equipment should comply with a category according to EN 60079-0.



The DFPRE dust collector is designed for handling non-explosive dusts.



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.



None of the fan assemblies can be considered to be a fully sealed design, indeed most are arranged with either an open inlet or an open outlet. For this reason, the internal and external atmospheres can be considered the same in terms of any potentially hazardous classification.



Standard fan assemblies should not exceed 3000 rpm (50 Hz supply) on systems fitted with an inverter drive.



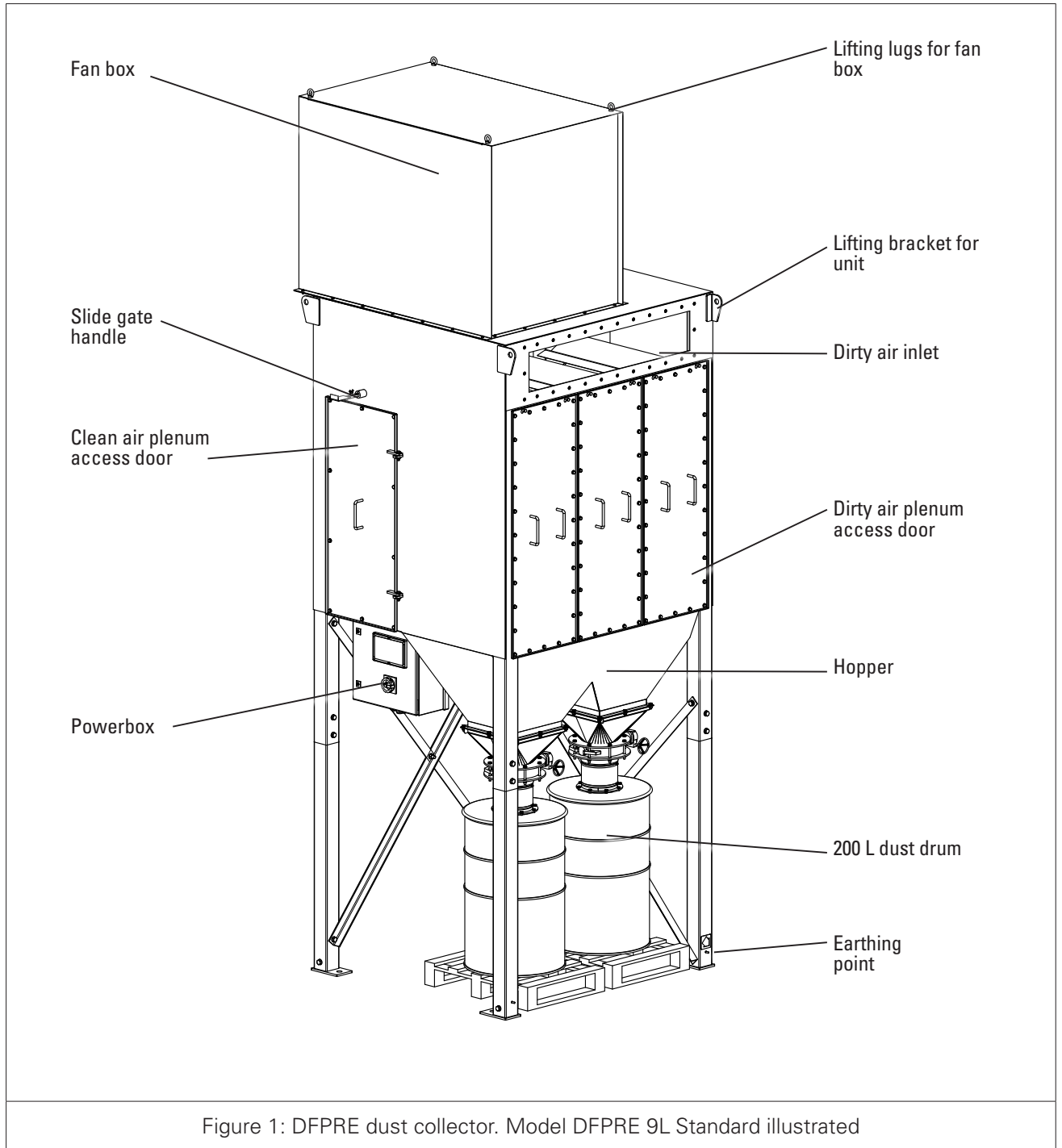
The filtration media is suitable for filtering particulate only (and not gas).



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.



INSTALLATION



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 dust collector (e.g. ducting) 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.



Strength of ducting should match with capability of the fans ducting. 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.



Consider placing a back draft damper on outlet in order to prevent dust migration during offline cleaning.

Required tools and equipment

- Crane/fork lift
- Slings/clevis pins and adequate lifting equipment
- Standard tools (e.g. screwdrivers, wrenches etc.)
- Drill
- Sealant

Delivery and inspection

The collector is normally supplied in one piece. Depending on your order, the following parts are shipped loose:

- Dust disposal system
- Support structure
- Transition pieces
- Fan set (if not pre-mounted)
- Silencer
- Spare parts
- Anchor bolts
- Hardware and sealant
- Paint can and brush
- Compressed air filter regulator (if selected as option)

Compare the parts received against the packing list. If there is any damage or parts missing, notify the delivery company and your local Donaldson representative.

Location considerations



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, lightning, electromagnetic waves, ionising radiation, ultrasonic waves.

The collector should be located with consideration for:

- Emptying the dust container.
- Shortest runs of inlet and outlet ductwork with radius bends on elbows as large as possible.
- Easy access to electrical and compressed air connections.
- Convenience of maintenance.

When calculating for foundations or support structure consider the following:

- The weight of the dust collector.
- The material being collected.
- All auxiliary equipment.
- Live loads.
- Snow and wind loads on outside installations.



For collector weights and dimensions refer to the datasheet, publication number DOCAM1382701 (DFPRE 4L and 6L) or DOCAM1449401 (DFPRE 9L and 12L).

General guidance to lifting



The collector should be lifted using either the four-point lifting arrangement or the fork-lifting arrangement by a qualified competent person (refer to figures 2 and 3).



During all lifting operations a crane or fork lift with an adequate SWL (safe working load) must be used. (Refer to lifting label located adjacent to lifting points for weight of equipment supplied by Donaldson).



When using the four-point lifting method, chains or slings with an adequate SWL (safe working load) must be used. (Refer to lifting label located adjacent to lifting points 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° (refer to figure 2, 3 and 4).



Care should be taken as the unit might have a high center of gravity.



Do not use the lifting lugs of the spark trap / cyclopeel.



Before unloading, remove all packing and strapping.

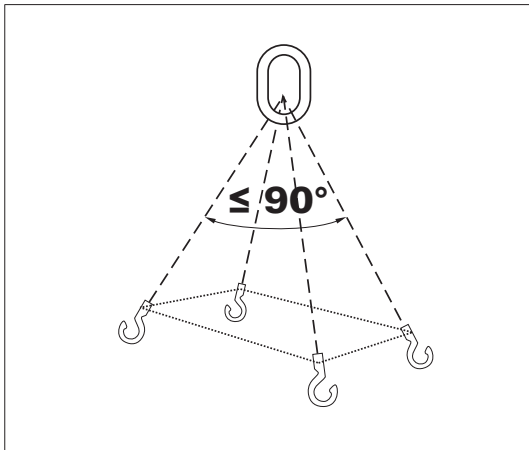


Figure 2: Four-point lifting arrangement

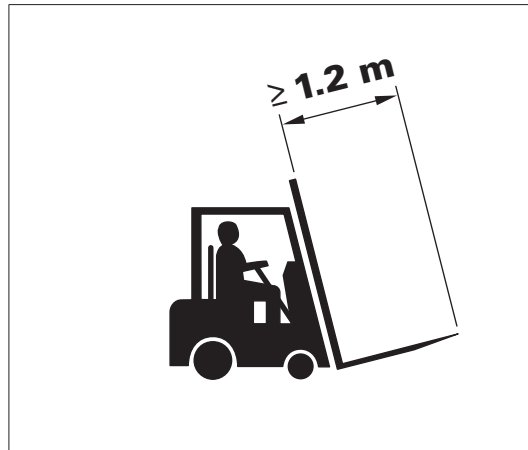


Figure 3: Fork lifting arrangement

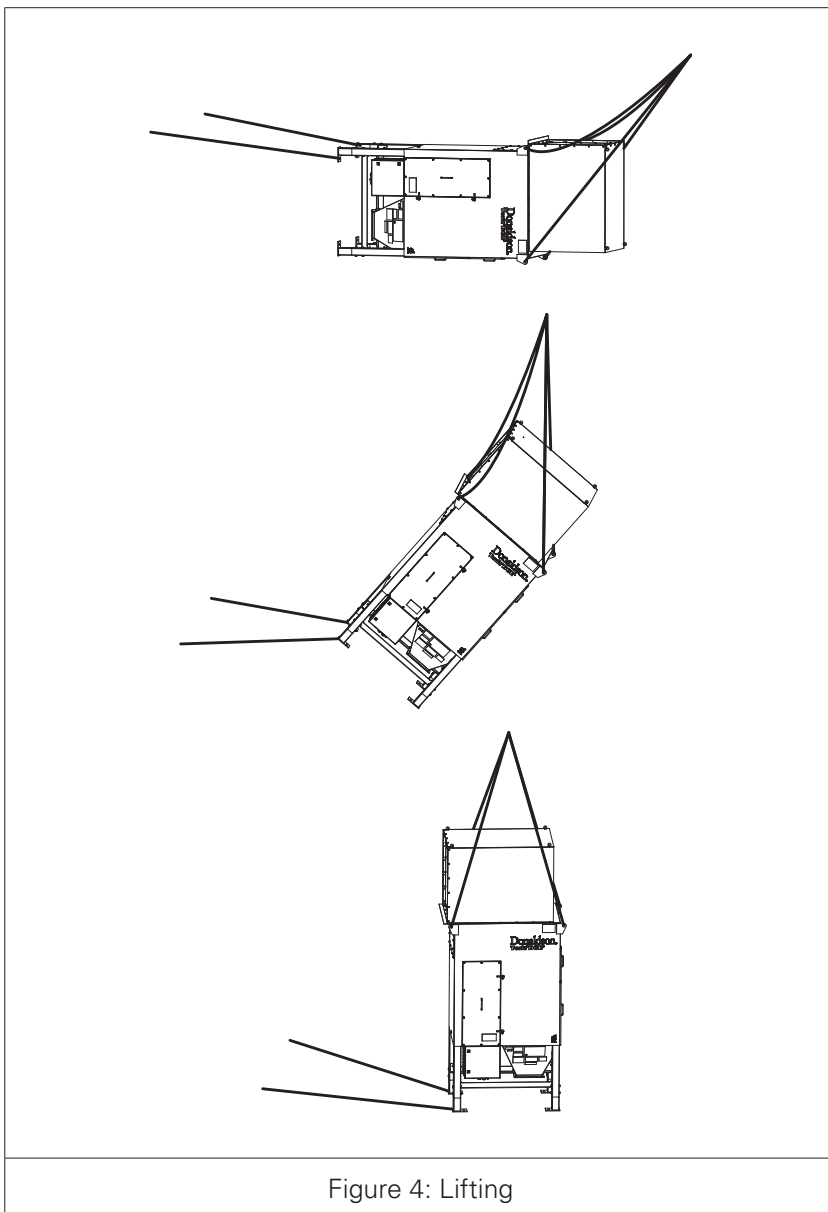


Figure 4: Lifting

Positioning the collector

1. Lift the collector into position following the general guidance to lifting.



Take care not to damage dust container and cables when using fork lifting method.

2. Using spirit levels, line up both horizontally and vertically, using shims where required.
3. Where applicable, secure the collector to the foundation anchor bolts.



Do not use the lifting lugs of the fan box when the unit is equipped with a fan box. consider



Anchor the dust collector to the foundations.

Provisional anchor bolt recommendations

4. Consider Hilti HIT-HY 200 Anchor System or equivalent. Quantity of anchor bolts should match the number of holes provided in the base plates
5. Anchor diameter is typically 3 mm less than baseplate hole diameter.
6. Corrosive environment or outdoor installation may require stainless steel anchors.

Anchor should project a minimum of 45 mm and account for nut, washer, base plate and shims/ grout.

Embedment depth

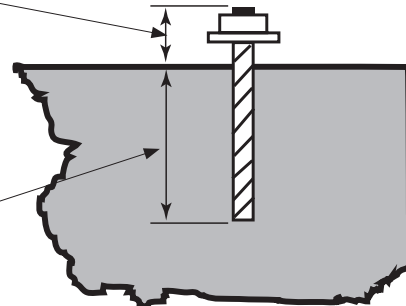


Figure 5: Typical foundation anchor



The lifting profile can be removed after securing the collector, see figure 6. Store the profiles for eventual future use.

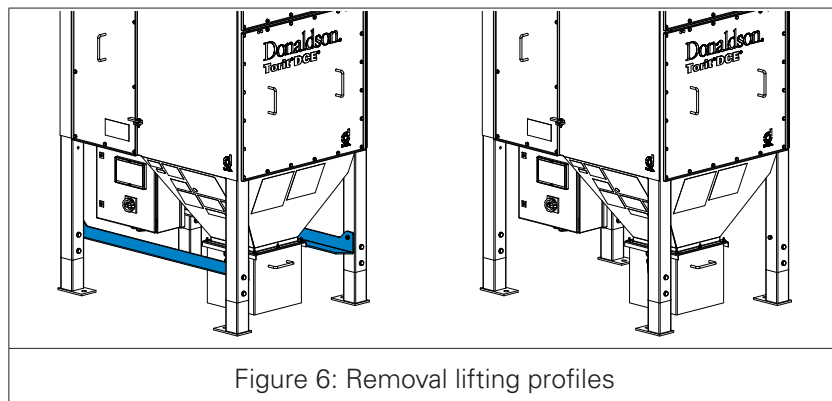


Figure 6: Removal lifting profiles

Cyclopeel / spark trap assembly

For collectors supplied with a cyclopeel pre-separator or a spark trap:

Refer also to figure 7.

1. Remove one column of filter cartridges from right-hand side of collector.
2. Using a two-point lifting arrangement lift cyclopeel / spark trap section.
3. Apply a continuous 5 mm bead of sealing compound to mounting surface of cyclopeel / spark trap section, along each side of hole pattern.
4. Lift cyclopeel / spark trap section into position and align bolt holes.
5. Bolt cyclopeel / spark trap section to side of collector.



The bolts in area 1 are fastened from inside the clean air chamber.

The bolts in area 2 are fastened from inside the contaminated air chamber.

The bolts in area 3 are fastened from inside the contaminated air chamber, through the contaminated air inlet.

6. Mount leg underneath cyclopeel / spark trap section.
7. Anchor leg underneath cyclopeel / sparktrap section.

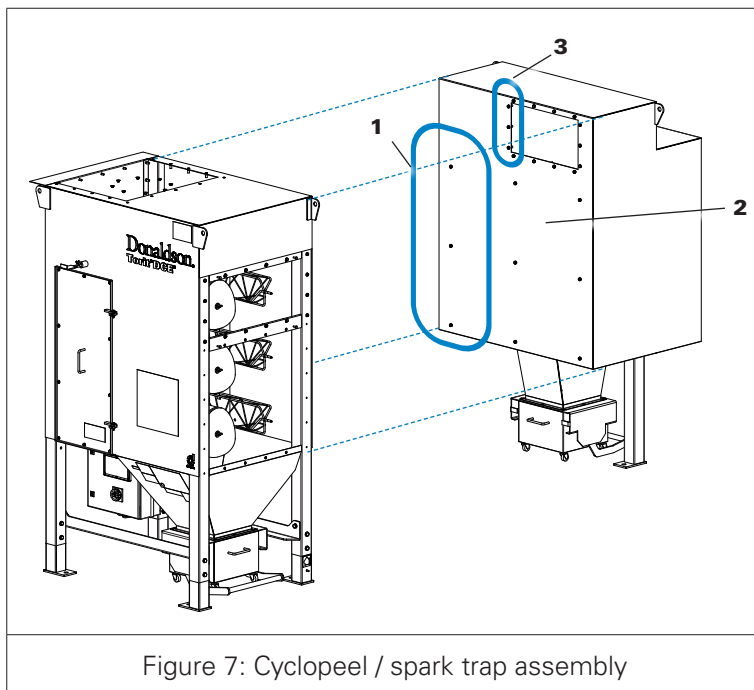


Figure 7: Cyclopeel / spark trap assembly

Optional fan box assembly

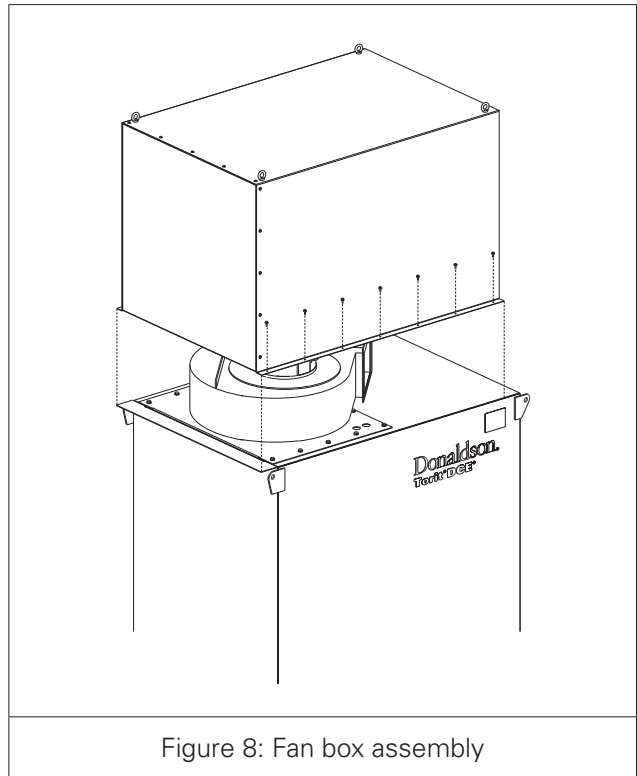
For collectors supplied with a fan box:

Refer also to figure 4.



The outlet position can be changed from the side to other rear by swapping the grill and cover before mounting the fan box.

1. Apply a continuous 5 mm bead of sealing compound to mounting surface of collector, along each side of hole pattern.
2. Using a four-point lifting arrangement, lift fan box into position and align bolt holes.
3. Bolt fan to the collector



Dust container assemblies

1. Apply a continuous 5 mm bead of sealing compound to mounting surface of dust container, along each side of the bolt pattern.
2. Bolt dust container to the hopper flange.



Keep your toes, and feet away from pinch points giving your full attention while assembling dust disposal system.



The dust container can be mounted to operate from the front, rear or either side.

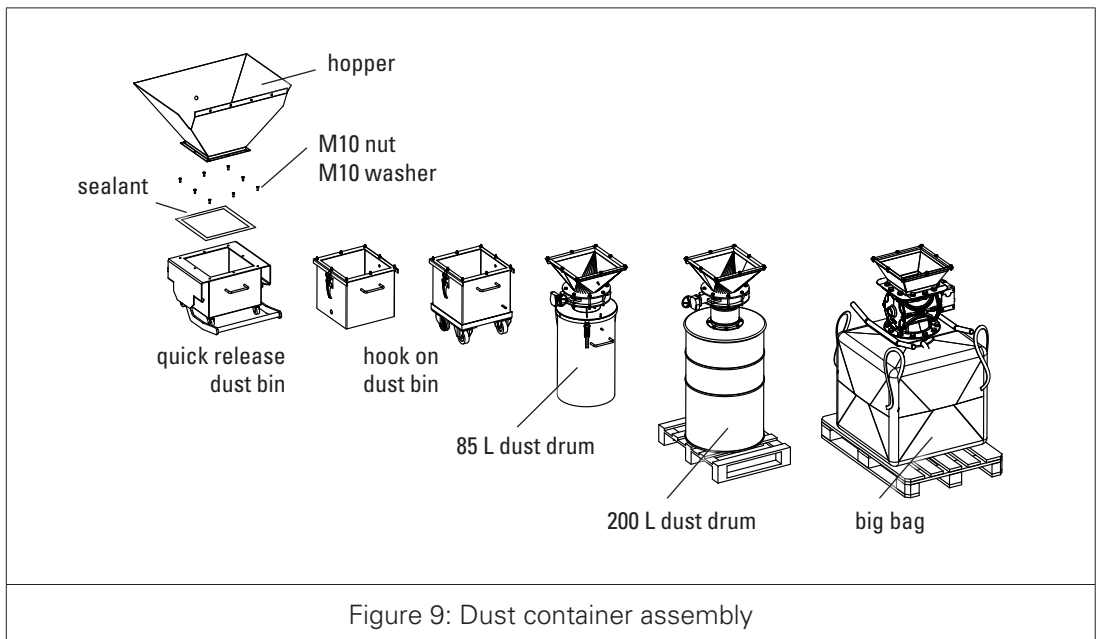
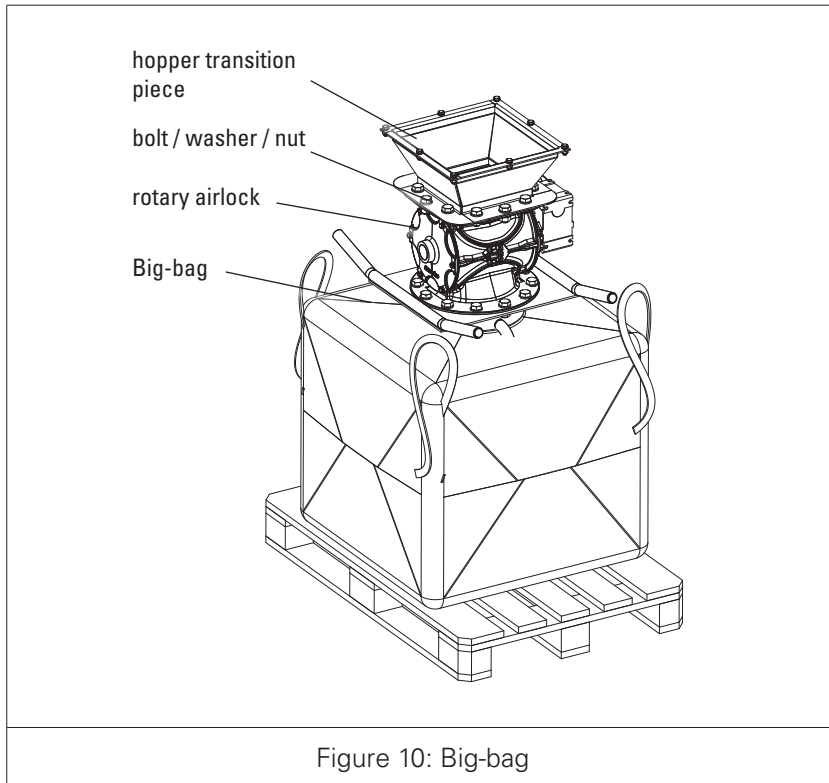


Figure 9: Dust container assembly

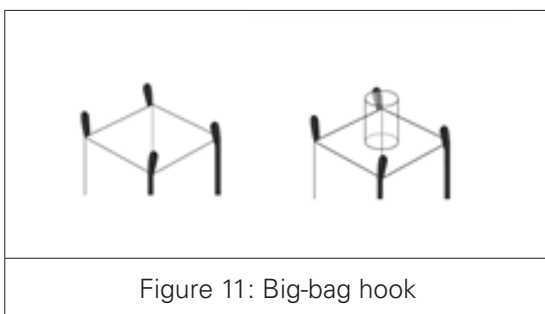
When using rotary airlock or screw conveyor:

- A sealant must be fitted between all connecting flanges.
- Check the rotation (direction of the arrow).
- Electrical connections shall be made by a qualified electrician.



When using big-bag hook:

- A sealant must be fitted between all connecting flanges.
- Circular or square shaped Big-bag should be sourced separately, and it is not part of the delivery. Both fully opened and filler neck type are acceptable solutions.



The access to the rotor/screw or butterfly valve must be made impossible during operation. See manual of your dust disposal system.

Compressed air requirements

DFPRE dust collectors require an independent supply of clean, dry, oil-free compressed air. Details of pressure and quantity requirements are given in Table 3 (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 collector, then the following conditions should be observed as far as possible:

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 12 mm (½" NB) piping. For further details see Table 3. 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 design pressure of 8 bar (see Table 2 in 'Specifications' section). It is a requirement that adequate protection is made not to exceed this pressure.



We advise to install a pressure regulator - oil/water separator to regulate the compressed air and to ensure the compressed air is free from oil and condensate.

Controller



It is a requirement of the Supply of Machinery (Safety) Regulations 2008 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 DFPRE dust collector is supplied with a factory fitted Powerbox to operate the fan and the compressed air cleaning system.



For controller connections and set-up, refer to the controller manual.



Details of standard fan motor supply voltage are given in Table 4 (refer to 'Specification' section).

Overload protection

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

Installation check list

- Where applicable, ensure that the collector is securely bolted to the floor.
- Ensure compressed air supply is free from leaks, installed correctly and according to the compressed air specifications, Table 2 and 3.
- Ensure electrical supply is installed correctly and complies to local legislation.
- Ensure all the electrical components are complying with the zone where they are installed.

COMMISSIONING



It is a requirement of the Supply of Machinery (Safety) Regulations 2008 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.

Before putting the dust collector into service the following items should be checked. Similar checks, as appropriate, should be made after any major overhaul.

Commissioning check list

- Where applicable, ensure that the collector is securely bolted to the floor.
- Ensure dust disposal system is correctly installed.
- Ensure all ducting is complete, all detachable panels are in position and fixed guards are secure.
- When new filter elements are installed it is necessary to reduce the airflow through the filter media by partially closing the slide gate. You can do this by fully closing the slide gate and secure position by tightening wingnut (STAGE 1).

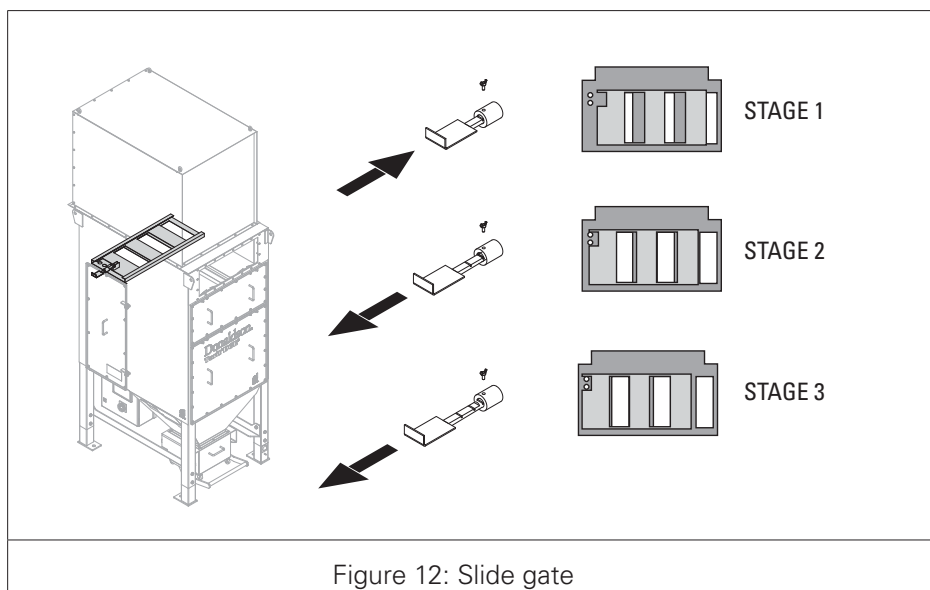


Figure 12: Slide gate

This way the dust will not penetrate the media and can be cleaned off as described above. After the elements are conditioned the slide gate can be placed back to its original position (STAGE 2 and 3).

- Ensure collectors are suitably earthed.
- Ensure electrical power is available.
- Check fan motor for correct rotation and that the full load current is not exceeded. (Refer to the fan rotation label located on the fan mounting plate inside the clean air chamber).



Keep clear of inlet opening/rotating impeller whilst performing rotation check.

To reverse rotation (single phase power supply):
Follow manufacturer's instructions on the motor nameplate.

To reverse rotation (three phase power supply):
Turn electrical power OFF at source and switch any two phase wires on either the motor junction box or the controller input terminals.

- Ensure access panel seals are intact, then close and secure the panels.
- Ensure the compressed air manifold has sufficient protection for overpressure.
- Start the compressor and check that the air supply is maintained at the recommended pressure.
- Switch on the controller.



When Delta P cleaning is selected, then the cleaning system will not operate until the differential pressure rises above a set value of 80 daPa.

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).

- Ensure unit properly connected to earth using the brass screw provided, to prevent any static build-up. (Located next to symbol shown).

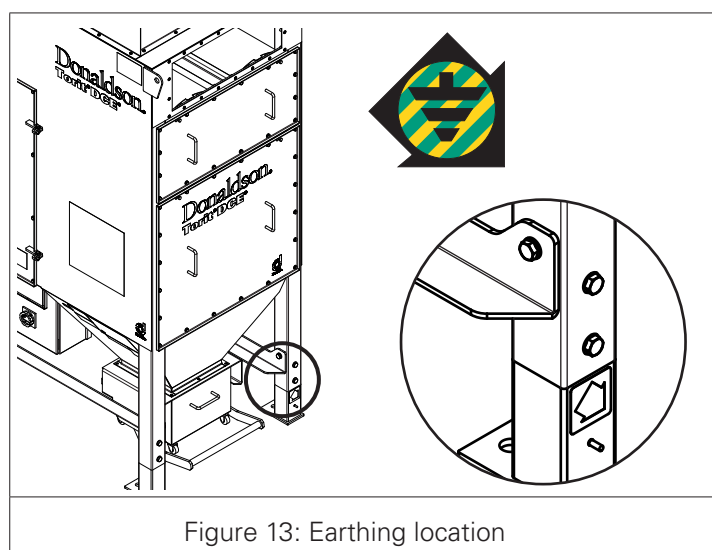


Figure 13: Earthing location

Start-up sequence

1. Turn on compressed air supply.
2. Check that the compressed air supply is maintained at the recommended pressure.
3. Adjust the slide gate as described in commissioning.
4. Switch on controller.

Shut-down sequence



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

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



To enable off-line cleaning, see controller manual.

2. After 10-15 minutes, switch off controller and the compressed air.



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 the dust collector installation is maintained at optimum efficiency.

OPERATION



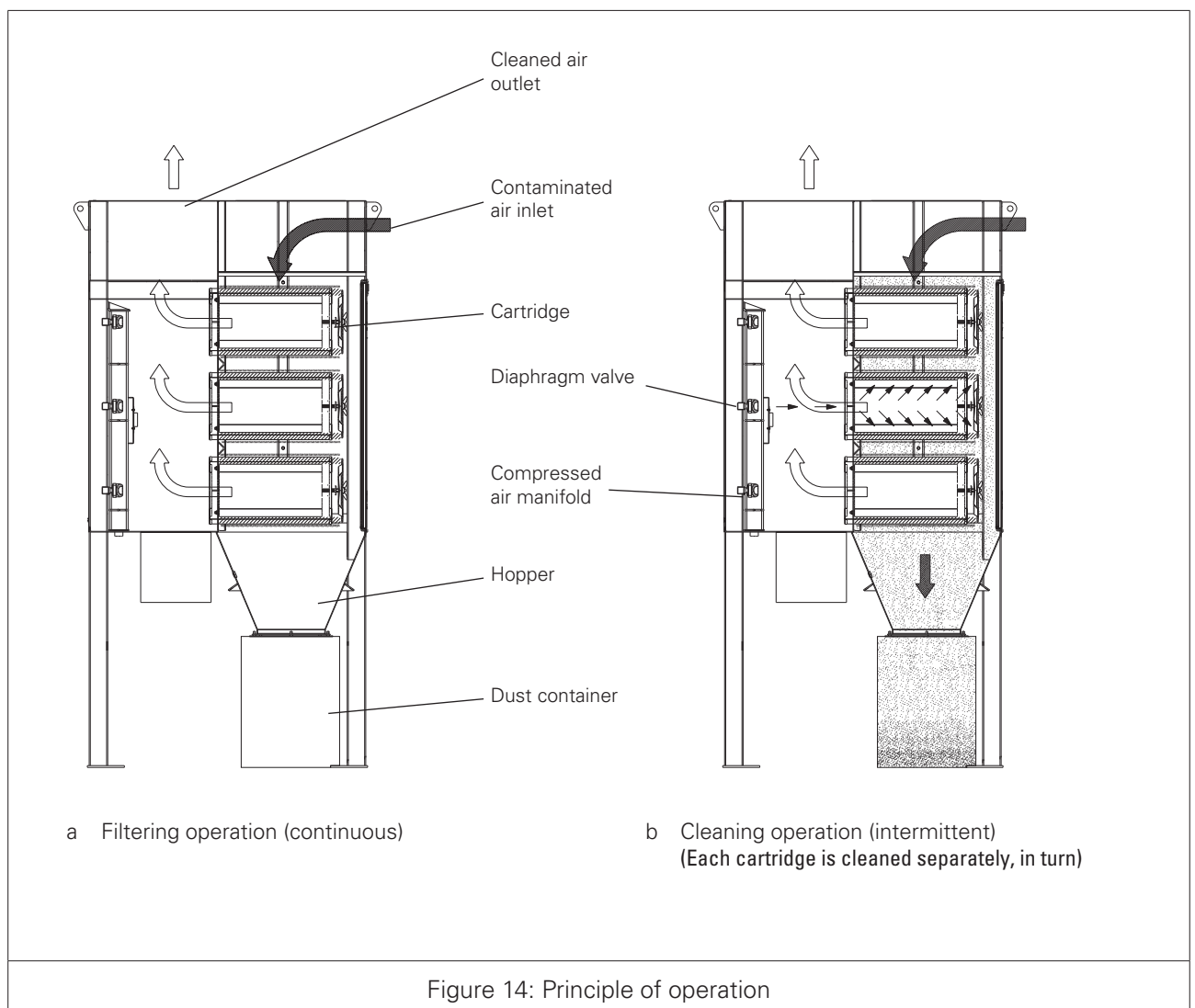
On installations where the inlet duct is relatively short, this procedure may result in a dust emission occurring at the inlet and therefore may not be an appropriate procedure if the dust being handled is dangerous. Therefore a Risk Assessment must be carried out to ensure the final procedure is safe.

Principle of operation

(Refer also to figure 4).

Contaminated air from the dust generation source is drawn through the inlet to the collector by the fan. Airflow is directed through the collector and heavier particulate falls directly into the hopper. The cartridges remove the fine particulate and clean, filtered air passes through the cartridge to the clean air chamber and discharges through the clean air outlet.

At regular intervals, governed by the controller, each cartridge in turn receives a short burst of compressed air from an adjacent air diaphragm valve. These valves are at an optimum distance from the cartridge, ensuring that a large volume of air is induced by each injection of compressed air, causing a brief, powerful reversal of airflow through the cartridge, effectively dislodging the dust layer which then falls into the discharge hopper.



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 on manual handling of loads.



Dust containers may require regular emptying.

Dust containers should 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.



Make sure to wear proper PPE during dust container service process.

Turn off the dust collector and empty the dust container on a regular basis using one of the following procedures:



When using forklifts, ensure to secure large bins to forklifts during transport.



Empty the dust container when $\frac{3}{4}$ full.

Quick release dust bin (collector hopper and cyclopeel)

1. Release the container by lowering the handle
2. Remove and empty the container
3. Replace container by sliding it back into position
4. Reseal the container by raising the handle.

Hook on dust bin (collector hopper and cyclopeel)

1. Release the container by unclamping both latches
2. Remove and empty the container
3. Replace container by sliding it back into position
4. Reseal the container by clamping down both latches.

85 L drum (collector hopper only)

1. Close the butterfly valve
2. Open clamp and lift dust bin cover
3. Replace dust bin, position cover and tighten clamp
4. Open butterfly valve



Ensure the butterfly valve is opened before restating the collector.

200 L drum (collector hopper only)

1. Close the butterfly valve
2. Open clamp and lift dust bin cover
3. Replace dust bin, position cover and tighten clamp
4. Open butterfly valve



Ensure the butterfly valve is opened before restating the collector.

Big-bag (collector hopper only)

1. Close the butterfly valve
2. Replace the bag by putting bag straps on hanging hooks
3. Open butterfly valve



Ensure the butterfly valve is opened before restating the collector.

MAINTENANCE



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



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



Ensure the pneumatic system is fully isolated and depressurized 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 a potentially 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 Plenum 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).



Make sure to wear proper PPE during dust container service process.



Use torque limiter when fitting fasteners to reduce the risk of seizure.

Routine inspection

To maintain the optimum performance of the dust 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 differential pressure across the filter cartridges 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 cartridges, resulting in a greatly increased pressure drop.

After the fault has been rectified, resumption of compressed air cleaning will usually return the filter to normal efficiency. However, it is advisable to operate the in still-air conditions for a short period to dislodge any accumulated dust before putting the collector into operation.

Filter resistance can be checked by viewing the display on the front panel of the controller. 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.



If the differential pressure exceeds 120 mm WG, check the following:

- *The compressed air supply is installed correctly, is free of water or oil and is maintained at the recommended pressure (refer to Table 3).*
- *The differential pressure connections are not blocked.*
- *The solenoid and diaphragm valves are functioning correctly.*
- *The controller is operational.*
- *The dust container is properly sealed.*

If the differential pressure still exceeds 120 mm WG after checking the above, then reduce the pulse cleaning interval time to see if this will improve the cleaning of the filter cartridges and, in turn, lower the differential pressure (details of pulse interval settings are provided in the controller manual).

If the differential pressure exceeds 150 mm WG, then the cartridges have reached the end of their lifetime and need replacing.



Ignition minimising fans are fitted with a lining inside the casing. As this may only offer protection for a limited period, if there is any upset condition leading to rubbing, then the fan must be switched off immediately and the condition corrected.



It is recommended to periodically inspect the general casing integrity.



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

Servicing schedule

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

Daily

1. Check level of contents in dust container and cyclopeel if applicable, and empty if $\frac{3}{4}$ full.

Weekly

1. Open valve at the bottom of moisture separator bowl and allow collected water to drain off, then close valve.
2. Check the pressure drop across the filter by viewing the display on the front panel of the controller. If excessive, refer to Table 1.

Every 2 weeks

1. Check for visible dust emissions in cleaned air plenum. If evident, refer to Table 1.
2. Check controller settings (refer to controller manual).
3. For units fitted with a sparktrap, open sparktrap inspection cover and check for dust deposit. Clean dust to avoid fire ignition. Close inspection cover.

Monthly

1. Check dust seals on all access panels for damage or ageing and ensure 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.

2. Check operation of solenoid and diaphragm valves. If it is found necessary to replace a diaphragm, refer to Valve disassembly/reassembly.



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

Every 2 months

1. Check connected ducting. Repair any leaks as necessary.

Every 6 months

1. Check general casing integrity and support structure. Repair or replace as necessary.
2. The fan impellor has been dynamically balanced and the fan assembly vibration level should be in line with category BV-3, ISO 14694. An assessment of vibration should be made every six months, or after a significant emission, or after any misuse and a record kept of measured values. Excessive vibration levels should be investigated and corrected immediately.



Vibration monitoring is mandatory on category 2G, 3G and 2D fan assemblies.

Annually

1. Remove and replace compressed air filter regulator element.
2. Remove drain plug and air inlet connections from compressed air manifold. 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. If applicable, check all flameproof enclosures, motors and cable glands for corrosion and tightness.



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

4. If applicable, check collector earthing continuity.
5. If applicable, check measures taken to avoid ignition sources are still in place.
6. Open the clean air chamber access cover and, by looking through fan inlet eye, inspect fan thoroughly. If necessary, remove all residual dust accumulation. (Although the fan is located on the clean side of the collector, it is possible for low quantities of dust to migrate through the filter media).



The fan should be inspected immediately after any period of significant dust emission, i.e. due to damaged filter media or seal etc.



The fan should be inspected immediately if there is any unexpected noise, temperature or vibration.



The fan should be inspected every twelve months or immediately following any misuse.



If inspection reveals any damage then the fan must not be put back into service until properly repaired or replaced.

Every 2 years

Replace filter cartridges (unless specified otherwise in Scope of Delivery). Refer to Filter cartridge replacement.

Replace Dirty air plenum (DAP) access cover gaskets by applying two rows of neoprene (07011636) nearby the holes.

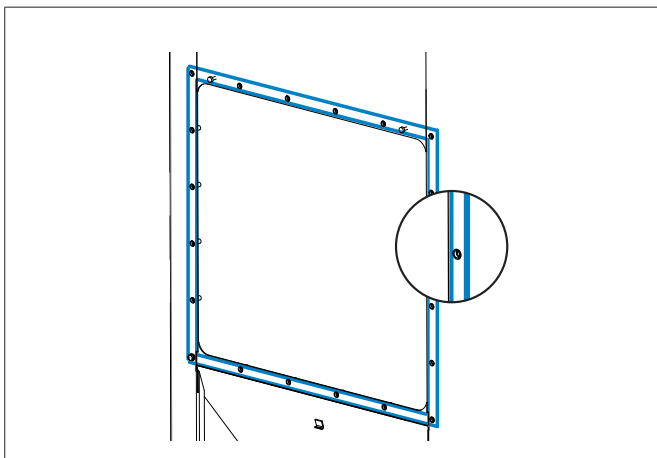


Figure 15: Dirty Air Plenum access cover gasket

Replace Clean Air Plenum (CAP) access cover gasket by putting bulb trim gasket (2622569X-000-440) over the edges.

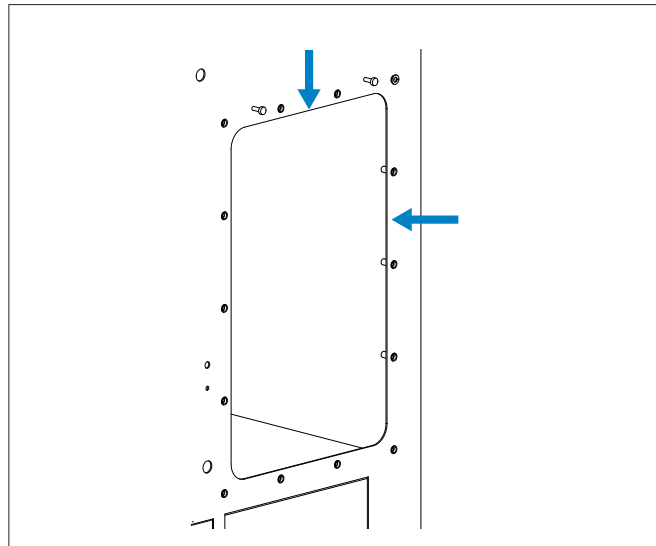


Figure 16: Clean Air Plenum access cover gasket

Valve disassembly / reassembly



Do not overtighten pipe connections.

Refer also to figure 9.

1. Switch off the compressed air.



Make sure manifolds are depressurized before any work is carried out.

2. Open the clean air access door.
3. Using screwdriver unscrew 4 screws to remove bonnet from valve.
4. Diaphragm assembly is now accessible for cleaning or replacement.



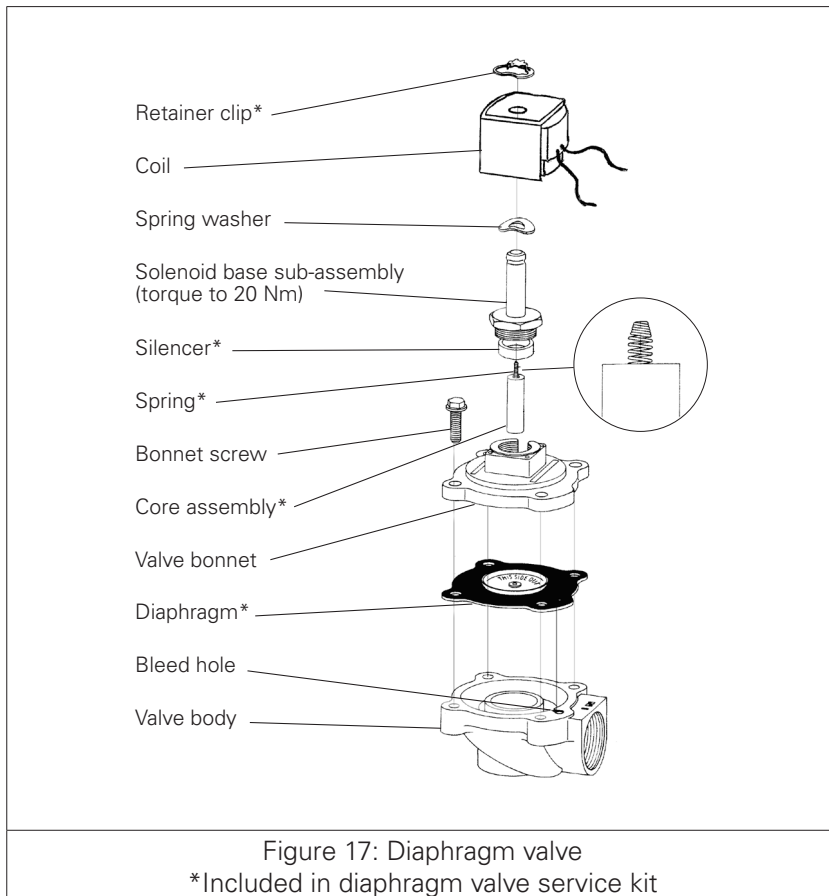
When replacing diaphragm assembly ensure the marking "THIS SIDE OUT" faces valve bonnet and bleed hole is in alignment with cavity in valve body and bonnet. The external contours of diaphragm, body and bonnet must all be in alignment.

5. Replace bonnet and tighten screws according to torque chart (16 Nm \pm 2Nm).



Torque 7 Nm (\pm 1). Torque should be applied crosswise.

6. After maintenance, operate valve a few times to ensure proper operation.



Filter cartridge replacement



All filter cartridges should be changed at the same time.



Removing cartridges requires the use of safety and protective equipment.



Filter cartridges cannot be washed and re-used.



Do not drop cartridges.

Refer also to figure 10.

1. Turn off power to the collector and compressed air.
2. Open Dirty Air Plenum access doors by removing the bolts. Set the doors aside.
3. Begin filter cartridge replacement at one of the top filter access ports.
4. Remove filter cartridge cover by unscrewing wing nut anticlockwise. Set cover aside.
5. Slide cartridge out of collector along suspension yoke.



Dirty cartridges may be heavier than they appear.



For safe handling of the access doors and cartridges an assessment must be made to satisfy the requirements of the European Directive 90/269/EEC on manual handling of loads.

6. Place cartridge into a sealable bag and dispose of the cartridge properly.



If in doubt regarding safe disposal of used cartridges, consult your local regulations.

7. Clean sealing surfaces with a damp cloth.



Surface around opening on seal frame must be clean to ensure an airtight cartridge seal.

8. Slide new cartridge onto suspension yoke.



Insert seal-end first.

9. Wipe clean cartridge cover seal and replace cover. Tighten wing nut securely, by hand.



Do not use tools to tighten wing nut.



When refitting filter elements, make sure they are not over-tightened.



Check cover is seated and sealed properly. Seal must be compressed to ensure it is airtight.

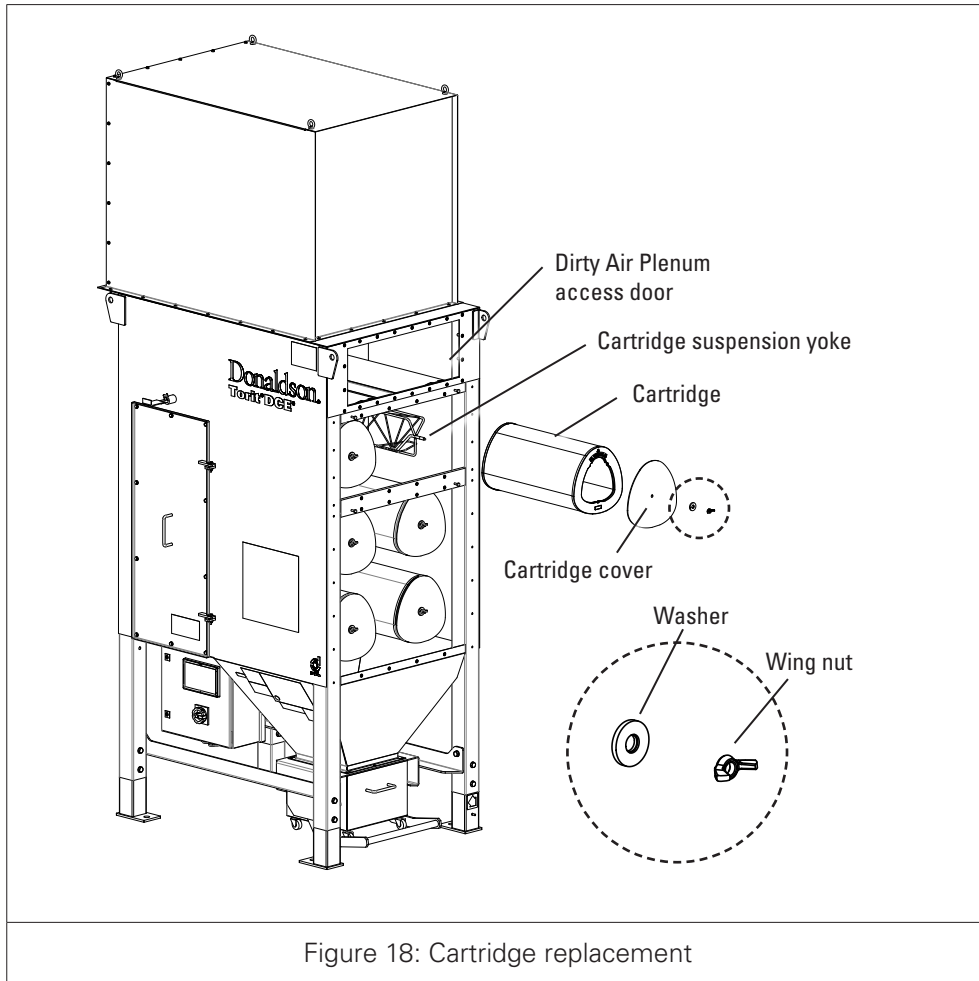


Damaged seals must be replaced.

10. Continue by replacing the remaining filter cartridges in the top row. Proceed to replace filter cartridges in the next rows. Replacing filter cartridges row by row starting at the top will help limit dusting during replacement.
11. Wipe clean contaminated air chamber access door seal.
12. Reinstall access doors. Do not exceed 8 N*m tightening torque to secure access panel as over tightening may cause damage to the filter and/or equipment.

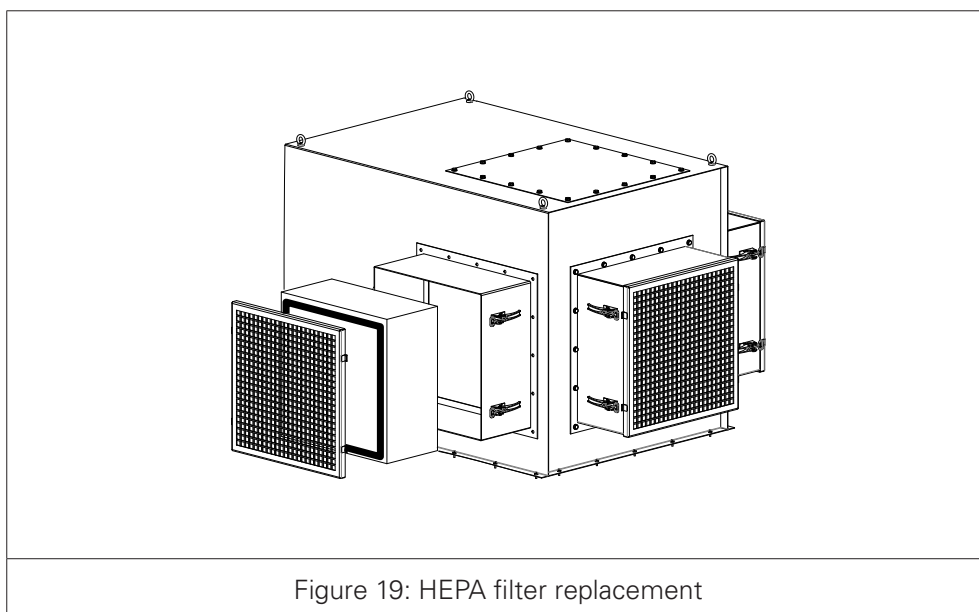
When new filter elements are installed it is necessary to reduce the airflow through the filter media.

This way the dust will not penetrate the media and can be cleaned off as described above. After the elements are conditioned the slide gate can be placed back to its original position.



HEPA filter replacement

1. Remove the HEPA filter by unclamping the outlet grid panel at the side/top.
2. Install the new HEPA filter in reverse order. Make sure the HEPA filter gasket is facing the outlet access panel.



Fan assembly removal



Isolate electrical power supply.

1. Open clean air chamber access door.
2. Disconnect electrical cables from terminal box.
3. Remove fan securing bolts.
4. Remove airflow damper panel or fan box from top of collector, if applicable.
5. The fan assembly can now be removed using a suitable lifting arrangement.

Dismantle / decommission dust collector



Make sure to empty dust container and cover all the open areas to prevent possible dust spillage/exposure during transportation.



Refer to general guidance lifting on page 10.



Check structural integrity of unit before dismantling any component

If it is intended, for any reason, to put the machine out of service and demolish it, some basic rules must be observed to safeguard health and the environment in which we live:

- Sheaths, flexible ducts and components made of plastic or non-metal must be removed and disposed of separately.
- Electrical components switches, power supplies, boards, etc., must be removed in order to be reused if they are still in good condition, or if possible, reconditioned and recycled.
- However, the structure and all metal parts of the machine must be removed and grouped by type of material. The various parts obtained in this way can then be scrapped and melted down to allow the material that makes up the original machinery to be recycled.

The responsibility to reuse some machine parts, such as engines, lies solely with the User.

The manufacturer will not be held responsible for damage caused by the machine when it is used without certain components or by using it for purposes not expressly specified in this manual.

For the demolition of any machines connected to this machine, it is necessary to follow the instructions contained in the relevant user manuals.

IT IS NECESSARY TO RESPECT REGULATIONS IN FORCE IN THE COUNTRY OF THE USER REGARDING DISPOSAL OF THE MATERIALS PROVIDED WITH THE MACHINE.

TABLE 1 – FAULT LOCATION

Symptom	Possible cause	Action
Part loss of suction (excessive pressure differential).	Compressed air malfunction.	If compressor stopped, rectify compressor fault; check interlocks; check motor and supply; check drive.
		If compressor OK, check pulses at manifold pressure gauge.
		Clean filters, dismantle and clean moisture separator.
		Check for excessive water or oil in compressed air supply, and possible accumulation in manifold.
	No pulses of air to valves.	Refer to 'Fault location' table in controller manual supplied with dust collector.
	Unit blocked.	Check dust container is not overfull. Check starter overloads, fuses and interlocks.
		Run unit clear*, then remove each cartridge in turn and renew any that are damaged.
	Motor speed low.	Check line voltage, phases, fan motor connections.
	Incorrect fan motor rotation.	Check electrical connections and transpose if necessary.
	Airflow damper incorrectly adjusted	Check airflow in duct. Adjust damper control until correct airflow is achieved.
Access panels open or incorrectly secured	Check all access panels are in place and correctly secured. Ensure dust container is properly sealed.	
Fan exhaust area restricted	Check fan exhaust area for obstructions.	
Total loss of suction.	Fan motor stopped.	Check motor supply overloads, fuses and interlocks (if fitted).
		Check motor connections and windings.
	Unit blocked.	Check that dust container is not overfull. Check starter overloads, fuses and interlocks.
		Run unit clear*, then remove each cartridge in turn and renew any that are damaged.
Ducting blocked.	Check throughout and clear.	
Visible effluent in clean air outlet.	Filter cartridges not properly sealed.	Check cartridge access covers are seated and seal properly.
	Damaged filter cartridge.	Damaged cartridges can be identified by the dust present in clean air chamber. Withdraw cartridge and renew.

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

TABLE 1 – FAULT LOCATION (CONTINUED)

Symptom	Possible cause	Action
Total loss of suction.	Fan motor stopped.	Check motor supply overloads, fuses and interlocks (if fitted).
		Check motor connections and windings.
	Unit blocked.	Check that dust container is not overfull. Check starter overloads, fuses and interlocks.
		Run unit clear*, then remove each cartridge in turn and renew any that are damaged.
Ducting blocked.	Check throughout and clear.	
Visible effluent in clean air outlet.	Filter cartridges not properly sealed.	Check cartridge access covers are seated and seal properly.
	Damaged filter cartridge.	Damaged cartridges can be identified by the dust present in clean air chamber. Withdraw cartridge and renew.
Dust container pressure balance (if fitted) not working.	Leaking balance pipe connection.	Check connections and rectify.
Excessive noise from diaphragm valve.	Diaphragm valve failure.	Check for debris, obstruction, valve wear or diaphragm failure. Replace damaged valve or parts.

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

SPECIFICATION



For other specifications on this product refer to the datasheet, publication number DOCAM1382701 (DFPRE 4L and 6L) or DOCAM1449401 (DFPRE 9L and 12L).



For controller specifications refer to controller manual, publication number DOCAM0097301.

TABLE 2 – COMPRESSED AIR MANIFOLD DESIGN DETAILS

Design pressure:	8 bar	
Maximum operating pressure, PS:	7 bar (101.5 psig)	
Test pressure:	11.5 bar	
Design temperature:	-20° to +70°C	
Manifold volume:	DFPRE 4L:	7 liters
	DFPRE 6L:	9 liters
	DFPRE 9L:	13 liters
	DFPRE 12L:	13 liters
Product of pressure and capacity:	DFPRE 4L:	49 bar liters
	DFPRE 6L:	63 bar liters
	DFPRE 9L:	91 bar liters
	DFPRE 12L:	91 bar liters
Material used for manifold construction:	Structural hollow section according to EN13445	

1 bar = 10⁵ Pa

TABLE 3 – COMPRESSED AIR REQUIREMENTS

Collector type	Working compressed air pressure ^a	Atmospheric air volume- F.A.D. ^b	Pulse duration	Approximate compressed air usage
DFPRE 4L	6-7 bar	at 12 sec. intervals ^b 13.5 m ³ /h	100 ms	45 liters per pulse
DFPRE 6L	6-7 bar	at 12 sec. intervals ^b 13.5 m ³ /h	100 ms	45 liters per pulse
DFPRE 9L	6-7 bar	at 12 sec. intervals ^b 15.3 m ³ /h	100 ms	51 liters per pulse
DFPRE 12L	6-7 bar	at 12 sec. intervals ^b 15.3 m ³ /h	100 ms	51 liters per pulse

^a Normal operating pressure. ^b Recommended initial settings; these may be varied with experience.

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

1 bar = 10⁵ Pa

TABLE 4 – STANDARD FAN MOTOR SUPPLY VOLTAGE DETAILS

To comply with European standards the motor nameplate will display the following:

3 Phase / 50 Hz (IEC 60034-30)

kW	Nameplate details	Range
0.75 – 3.0	230/3/50 D	220-240 D
	400/3/50 Y	380-420 Y
4.0 and above	400/3/50 D	380-420 D
	690/3/50 Y	660-690 Y

3 Phase / 60 Hz*

kW	Nameplate details	Range
0.75 – 3.0	250-280/3/60 D	250-280 D
	440-480/3/60 Y	440-480 Y
4.0 and above	440-480/3/60 D	440-480 D

*Some motors will be fitted with a second nameplate displaying 60 Hz details



The details above may not apply to non-standard motors.

SPARE PARTS LIST

Description	Part number	
Filter cartridge assembly		
Ultra-Web®	CARTRIDGE DFE ULTRA-WEB OD (349 X 349) MM X L 660 MM TRIANGONAL	2626827-000-440 ✓
Ultra-Web® Earthed	CARTRIDGE DFE ULTRA-WEB OD (349 X 349) MM X L 660 MM TRIANGONAL EARTHED	2626827E-000-440 ✓
Ultra-Web® Flame Retardant	CARTRIDGE DFE ULTRA-WEB FR OD (349 X 349) MM X L 660 MM TRIANGONAL	2626913-000-440 ✓
Ultra-Web® Flame Retardant Earthed	CARTRIDGE DFE ULTRA-WEB FR OD (349 X 349) MM X L 660 MM TRIANGONAL EARTHED	2626913E-000-440 ✓
Ultra-Web® on SpunBond	CARTRIDGE DFE ULTRA-WEB SB OD (349 X 349) MM X L 660 MM TRIANGONAL	2626915-000-440 ✓
Ultra-Web® on SpunBond Earthed	CARTRIDGE DFE ULTRA-WEB SB OD (349 X 349) MM X L 660 MM TRIANGONAL EARTHED	2626915E-000-440 ✓
Ultra-Web® on SpunBond Anti-Static	CARTRIDGE DFE ULTRA-WEB SB ANTI-STATIC OD (349 X 349) MM X L 660 MM TRIANGONAL	2627283-000-440 ✓
Ultra-Web® Anti-Static	CARTRIDGE DFE ULTRA-WEB ANTI-STATIC FR OD (349 X 349) MM X L 660 MM TRIANGONAL	2627284-000-440 ✓
Torit-TEX®	CARTRIDGE DFE TORIT-TEX OD (349 X 349) MM X L 660 MM TRIANGONAL	2627286-000-440 ✓
Torit-TEX® Earthed	CARTRIDGE DFE TORIT-TEX OD (349 X 349) MM X L 660 MM TRIANGONAL EARTHED	2627286E-000-440 ✓
Torit-TEX® Anti-Static	CARTRIDGE DFE TORIT-TEX ANTI-STATIC OD (349 X 349) MM X L 660 MM TRIANGONAL	2627287-000-440 ✓
Ultra-Web® No Liner	DFE ULTRA-WEB NL CARTRIDGE (349 MM X 349 MM) OD X 660 MM L (13.74" X 13.74") OD X 26" L	P034302-016-436 ✓
Ultra-Web® Flame Retardant No Liner	DFE ULTRA-WEB FR NL CARTRIDGE (349 MM X 349 MM) OD X 660 MM L (13.74" X 13.74") OD X 26" L	P034304-016-436 ✓
Ultra-Web® Stainless Steel	DFE ULTRA-WEB SS CARTRIDGE (349 MM X 349 MM) OD X 660 MM L (13.74" X 13.74") OD X 26" L	P034305-016-436 ✓
Fibra-Web®	DFE FIBRA-WEB CARTRIDGE (349 MM X 349 MM) OD X 660 MM L (13.74" X 13.74") OD X 26" L	P034306-016-431 ✓
Fibra-Web® Earthed	DFE FIBRA-WEB EARTHED CARTRIDGE (349 MM X 349 MM) OD X 660 MM L (13.74" X 13.74") OD X 26" L	P034306E-016-431 ✓
Fibra-Web® Flame Retardant	DFE FIBRA-WEB FR CARTRIDGE (349 MM X 349 MM) OD X 660 MM L (13.74" X 13.74") OD X 26" L	P034307-016-431 ✓
Thermo-Web®	DFE THERMO-WEB CARTRIDGE (349 MM X 349 MM) OD X 660 MM L (13.74" X 13.74") OD X 26" L	P034308-016-429 ✓
Thermo-Web® Earthed	DFE THERMO-WEB EARTHED CARTRIDGE (349 MM X 349 MM) OD X 660 MM L (13.74" X 13.74") OD X 26" L	P034308E-016-429 ✓
Kevlar Nomex (high temp)	DFE HIGH TEMP CARTRIDGE (349 MM X 349 MM) OD X 660 MM L (13.74" X 13.74") OD X 26" L	P034311-016-340 ✓
Sealable bag (for dirty cartridge) – item not illustrated		2622217-000-440 ✓
Cartridge cover		AM1099901
Fan assembly		
VCM 403S fan assembly (including motor†), 2.2 kW, 230V/400V, 50Hz		AM0569800
VCM 451S fan assembly (including motor†), 3.0 kW, 230V/400V, 50Hz		AM0569900
ART 452 fan assembly (including motor†), 4.0 kW, 400V/690V, 50Hz		AM0573400
ART 451 fan assembly (including motor†), 5.5 kW, 400V/690V, 50Hz		AM0570100
MEC 451 fan assembly (including motor†), 7.5 kW, 400V/690V, 50Hz		8PPAM0257700
ART 502 fan assembly (including motor†), 7.5 kW, 400V/690V, 50Hz		8PPAM0257800
ART 501 fan assembly (including motor†), 11.0 kW, 400V/690V, 50Hz		8PPAM0257900
MEC 502 fan assembly (including motor†), 11.0 kW, 400V/690V, 50Hz		8PPAM0258000
ART 562 fan assembly (including motor†), 11.0 kW, 400V/690V, 50Hz		8PPAM0258100
✓ Recommended spares for up to two years' operation Damaged safety related parts and safety components should be replaced only with genuine original spare parts otherwise CE mark will become invalid		

Description		Part number	
FP 501 fan assembly (including motor†), 11.0 kW, 400V/690V, 50Hz		8PPAM0258800	
ART 561 fan assembly (including motor†), 15.0 kW, 400V/690V, 50Hz		8PPAM0258300	
FQ 562 fan assembly (including motor†), 15.0 kW, 400V/690V, 50Hz		8PPAM0258400	
FQ 561 fan assembly (including motor†), 18.5 kW, 400V/690V, 50Hz		8PPAM0258500	
FR 501 fan assembly (including motor†), 18.5 kW, 400V/690V, 50Hz		8PPAM0258600	
ART 632 fan assembly (including motor†), 22.0 kW, 400V/690V, 50Hz		8PPAM0258700	
† For other types/specifications/motors for hazardous areas consult Donaldson			
Access door assembly			
Gasket Prik 5004	GASKET PRIK 5004 EPDM SHEET THICKNESS 1 MM TO 3.5 MM 10 M-PACK	2622569X-000-440	✓
Gasket 10 x 5 mm Neoprene		07011636	✓
Dust container assembly			
Polythene bag liner (for dust container with pressure balance)		AD1000279-000-440	
Controller			
For controller spares information refer to Publication DOCAM0097301			
Compressed air assembly			
Diaphragm valve – item not illustrated	DIAPHRAGM VALVE 25 MM (1") THREADED CONNECTION INTEGRATED SOLENOID REMOTE PILOT	2620139	
Diaphragm valve service kit – item not illustrated	REPAIR KIT FOR 25 MM (1") DIAPHRAGM VALVE	2620087	✓
<p>✓ Recommended spares for up to two years' operation Damaged safety related parts and safety components should be replaced only with genuine original spare parts otherwise CE mark will become invalid</p>			