Unicell Concept Dust Filters
Series C 120 – 320

Manual P/N 447 683 A
– English –

Keep for Future Reference

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CE

Order number
P/N = Order number for Nordson products

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Congratulations on the Purchase of Your Nordson Product

Nordson equipment is engineered and manufactured in accordance with strict specifications, using high quality components and state–of–the–art technologies that assure reliable, long–term performance. Your product was thoroughly tested for proper operation prior to shipment.

Before unpacking and installing your new equipment, please read this manual. It is your guide to safe installation, productive operation and effective maintenance. We recommend that you keep the manual available for future reference.

Your Safety is Important to Nordson

Carefully read the *Safety* section. Your product is designed for safe operation when used according to the published instructions. Potential hazards exist when operating instructions are not followed.

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Nordson International

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Belgium		31-13-511 8700	31-13-511 3995
Czech Republic		4205-4159 2411	4205-4124 4971
Denmark	*Hot Melt*	45-43-66 0123	45-43-64 1101
	Finishing	45-43-66 1133	45-43-66 1123
Finland		358-9-530 8080	358-9-530 80850
France		33-1-6412 1400	33-1-6412 1401
Germany	*Erkrath*	49-211-92050	49-211-254 658
	Lüneburg	49-4131-8940	49-4131-894 149
	Düsseldorf - Nordson UV	49-211-3613 169	49-211-3613 527
Italy		39-02-904 691	39-02-9078 2485
Netherlands		31-13-511 8700	31-13-511 3995
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Spain		34-96-313 2090	34-96-313 2244
Sweden	*Hot Melt*	46-40-680 1700	46-40-932 882
	Finishing	46 (0) 303 66950	46 (0) 303 66959
Switzerland		41-61-411 3838	41-61-411 3818
United Kingdom	*Hot Melt*	44-1844-26 4500	44-1844-21 5358
	Finishing	44-161-495 4200	44-161-428 6716
	Nordson UV	44-1753-558 000	44-1753-558 100

Distributors in Eastern & Southern Europe

DED, Germany	49-211-92050	49-211-254 658

Outside Europe / Hors d'Europe / Fuera de Europa

- For your nearest Nordson office outside Europe, contact the Nordson offices below for detailed information.
- Pour toutes informations sur représentations de Nordson dans votre pays, veuillez contacter l'un de bureaux ci-dessous.
- Para obtener la dirección de la oficina correspondiente, por favor diríjase a unas de las oficinas principales que siguen abajo.

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	Nordson UV	1-440-985 4592	1-440-985 4593

Section 1

Safety

Section 1
Safety

1. Introduction

Read and follow these safety instructions. Task and equipment specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to all persons operating or servicing equipment.

2. Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

3. Intended Use

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

4. Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

5. Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing any moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- While operating manual electrostatic spray guns, make sure you are grounded. Wear electrically conductive gloves or a grounding strap connected to the gun handle or other true earth ground. Do not wear or carry metallic objects such as jewelry or tools.
- If you receive even a slight electrical shock, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

6. Fire Safety

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment in the spray area. Check equipment and workpiece grounding devices regularly. Resistance to ground must not exceed one mega–ohm.
- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Provide adequate ventilation to prevent dangerous concentrations of volatile materials or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits while working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Shut off electrostatic power and ground the charging system before adjusting, cleaning, or repairing electrostatic equipment.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

7. Action in the Event of a Malfunction

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out electrical power. Close pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the equipment.

8. Disposal

Dispose of equipment and materials used in operation and servicing according to local codes.

Section 2

Description

Section 2
Description

1. Description and Range

THE UNICELL CONCEPT is an automatic reverse–jet cleaned dust control filter, designed to handle known quantities of dust–laden air, and is capable of continuous operation over extended periods. The 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 filter to operate at a constant rating – in that it maintains a uniform pressure drop across the filter.

The Unicell Concept filter range has been designed to minimise on–site installation and maintenance times.

The basis of the Unicell Concept is a filter section comprising a group of filter modules mounted in a sealed frame. The filter modules are slotted side by side into the frame and the individual module sealing arrangement effectively separates the dirty (inlet) side of the filter from the clean (outlet) side, as shown in Fig. 2-4. Removal of filter modules is always carried out from the clean side of the filter.

Machinery noise levels are an important consideration in the design and selection of new equipment. EC Directives and National Laws/ Regulations adopting these directives, make reference to airborne noise emissions. Actions that employers are required to comply with if employees are subjected to a daily personal noise exposure Lep,d of 85 dB(A) or more are also specified. All Unicell Concept filters operating an 8 hour shift are below this action limit (see Table 2-1).

The Unicell Concept can be supplied, if required, suitably equipped for installation in hazardous areas where there is risk of fire or explosion.

The Unicell Concept filter range consists of five sizes (see Table 2-1). A number of identical sized filter modules are fitted to all filters (as indicated in Table 2-1). Each module gives an effective filtration area of $5m^2$. The filter assembly is contained in a steel housing complete with its own integral fan mounted in the base section, which also serves as an acoustic enclosure (see Fig. 2-1). Provision is made for inlet and outlet ducts. Discharge arrangement can be either by skip, dust container, screw conveyor or rotary valve as shown in Table 2-1. For further details refer to Publication 2296 and Data Sheet 2297.

1. Description and Range
(contd.)

Table 2-1 Unicell concept filter range

Filter type	Filtration area	Number of filter modules	**Filter configuration**			
			Skip [A]	Dust container [B]	Screw conveyor	Rotary valve [C]
C 120	120 m^2	24	✓	✓	**X**	✓
C 160H	160 m^2	32	✓	✓	**X**	✓
C 160L	160 m^2	32	✓ (2)	✓ (2)	✓	✓ (2)
C 240	240 m^2	48	✓ (2)	✓ (2)	✓	✓ (2)
C 320	320 m^2	64	✓ (2)	✓ (2)	✓	✓ (2)

A Size: 233 litre (8 cu.ft:)
B Size: 80 litre (3 cu.ft.) or 110 litre (4 cu.ft.)
C Hopper outlet size: 252 x 252 mm l/S

Weighted sound pressure levels* :									
Low pressure fans					High pressure fans				
CD15	**K21**	**CD22**	**CD30**	**CD45**	**CS15**	**CS22**	**CS30**	**CS37**	**CS45**
75dB(A)**	76dB(A)**	77dB(A)**	78dB(A)	79dB(A)**	74dB(A)**	75dB(A)**	75dB(A)**	78dB(A)**	80dB(A)**

* All readings were taken in normal industrial areas, i.e. semi-reverberant surroundings, with local equipment silent. Measurements were taken at maximum air flow conditions at 1.0 metre radius from the equipment housing and 1.6 metres above base level, using a precision sound level meter and octave filter. Noise data based on single bank tests, however, CD45 and CS45 assumed to be installed in two bank filter. Noise measurements of installed equipment may also vary due to site conditions.
** Estimated values.

Temperature range:

– 10˚ to + 60˚ C

Pressure range:

as fan performance curves from shut–off to ambient pressure (refer to Data Sheet 2297)

Dimension tolerances:

±5 mm on main dimensions; ±2 mm on detail dimensions

Maximum fan impeller speed:

3000 RPM (50 Hz) or 3600 RPM (60 Hz)

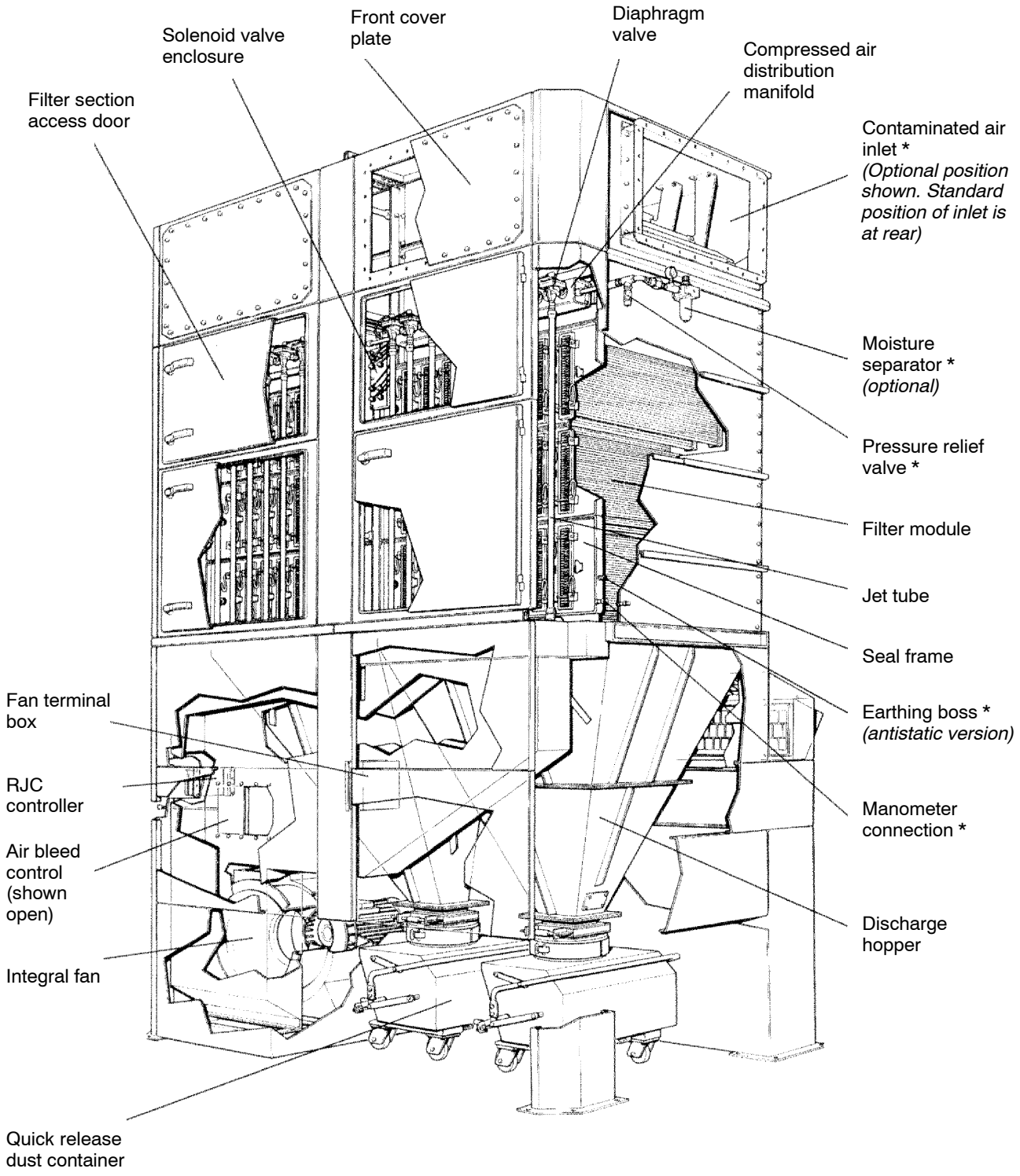


Fig. 2-1 Unicell concept filter, model C240 illustrated

2. Components

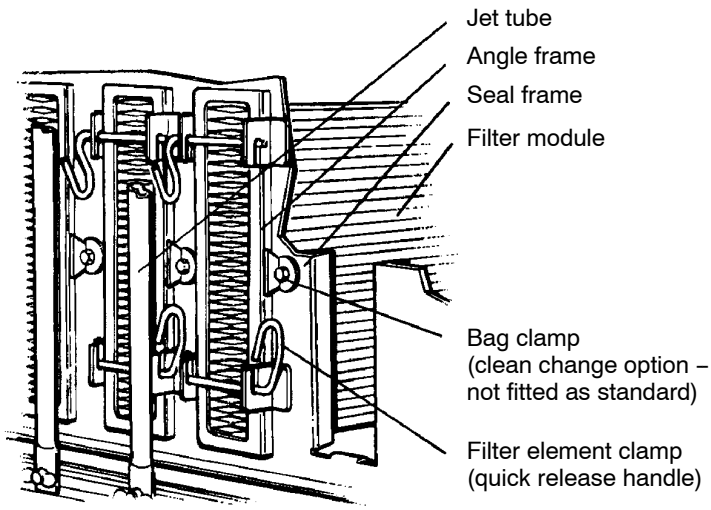


Fig. 2-2 Filter module details

Filter modules (Figs. 2-1, 2-2 and 2-4)

Each removable filter module is manufactured from a spun–bonded polyester filter media with polyurethane end mouldings. The header moulding contains an integral seal.

Antistatic filter modules are available, secured with stainless steel quick release handles to a stainless steel seal frame, this option is for installations where the dust is potentially explosive or to improve the flow of dusts that are susceptible to retaining a static charge. (See *Antistatic Earthing* in section *Installation*).

Seal frame (Figs. 2-1, 2-2 and 2-4)

The seal frame is a rigid, rectangular structure of sheet steel, slotted to accept the filter modules. The filter modules are inserted from the clean side of the filter and each one is individually clamped by means of a steel angle frame and secured by two filter element clamps (quick release handles), thus eliminating the requirement of any tools for this operation.

An earthing boss is fitted to all antistatic versions of filters for antistatic earthing (see Fig. 2-1).

Clean change option

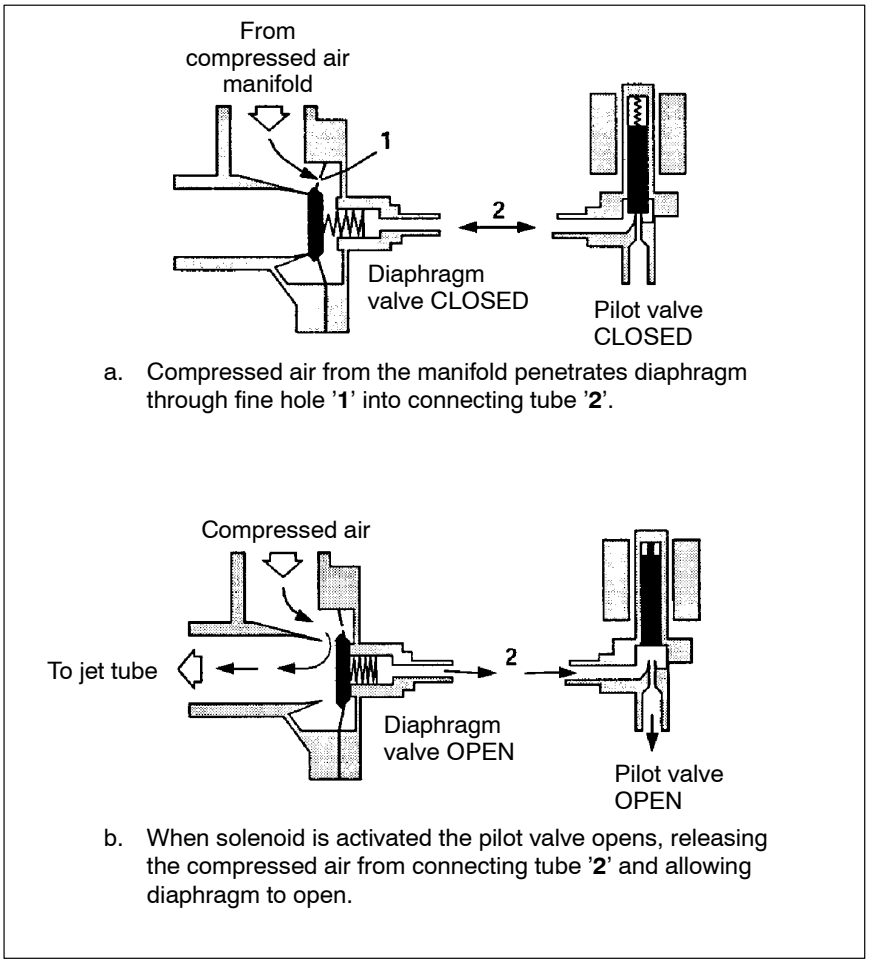
An optional 'clean change' facility is available which allows filter modules to be withdrawn from the seal frame into a polythene bag with minimal contamination of the clean side of the unit.

Jet tubes (Figs. 2-1, 2-2 and 2-4)

Positioned in the 'clean side' of the filter is a series of full–length vertical 'jet tubes' having jet orifices at regular intervals to serve the filter modules. The 'open' end of each tube is swaged to fit over the diaphragm valve, while the other, closed end, is secured at the filter section base by a captive wing nut.

Valves (Figs. 2-1 and 2-3)

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.



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.

Fig. 2-3 The valve system

2. Components *(contd.)*

Compressed air distribution manifold (Fig. 2-1)

The manifold is fabricated from either 150 sq x 6 mm thick or 180 sq x 8 mm thick steel tube, with welded ends. Holes are provided for diaphragm valves, drain plug, inspection ports, pressure relief valve and air inlet moisture separator connections. (Moisture separator is not supplied as standard with the filter). The manifold supplied with the Unicell Concept filter has been independently approved to operate under the conditions as specified in Table 2-2.

Table 2-2 Compressed air manifold design details

Design pressure	6.85 bar (99 psig)
Maximum operating pressure	6.2 bar (90 psig)
Test pressure	10.35 bar (150 psig)
Design temperature	–30˚ C to +60˚ C
Maximum rating of pressure relief device	25 dm^3/s at 6.9 bar (preset at 6.9 bar)
Manifold volume	25.6 litres (C 120, C 160L and C 240 filters) 36.4 litres (C 160H, C 320 filters)
Product of pressure and capacity	175.2 bar litres (C 120, C 160L and C 240 filters) 249.7 bar litres (C 160H, C 320 filters)
Material used for manifold construction	Structural hollow section
To improve corrosion resistance the manifold is painted externally and internally using cathodic electrocoat – minimum metal thickness, before the manifold requires special inspection	5.5 mm on 150 mm sq manifold (C 120, C 160L and C 240 filters) 7.0 mm on 180 mm sq manifold (C 160H, C 320 filters)

1 bar = 10^5 Pa

RJC controller (Fig. 2-1)

The RJC controller is fully automatic and ensures that the diaphragm valves of the Unicell Concept filter it serves are operated in sequence, at regular intervals, to facilitate the efficient cleaning of the filter modules. The pulse duration must be set at 200 ms with 12 sec. intervals between pulses and these should not be altered without prior consultation with Nordson Corporation.

The controller is mounted on the base assembly at the side of the filter and consists of an IP65 weatherproof ABS enclosure with either AC or DC input voltage options. Mounted within the box are two printed circuit boards which control the solenoid valve timing functions and the front plate display. See *Electrical Requirements* in section *Installation* for further details.

Located in the clean side of the filter section is a separate enclosure (or enclosures, depending on filter type), housing the appropriate number of solenoid valves (one per 'way'). The enclosure is connected to the RJC controller by an umbilical multiwire lead.

NOTE: For Unicell Concept filters installed in areas subject to risk of fire or explosion refer to *EEx Controls* in section *Installation.*

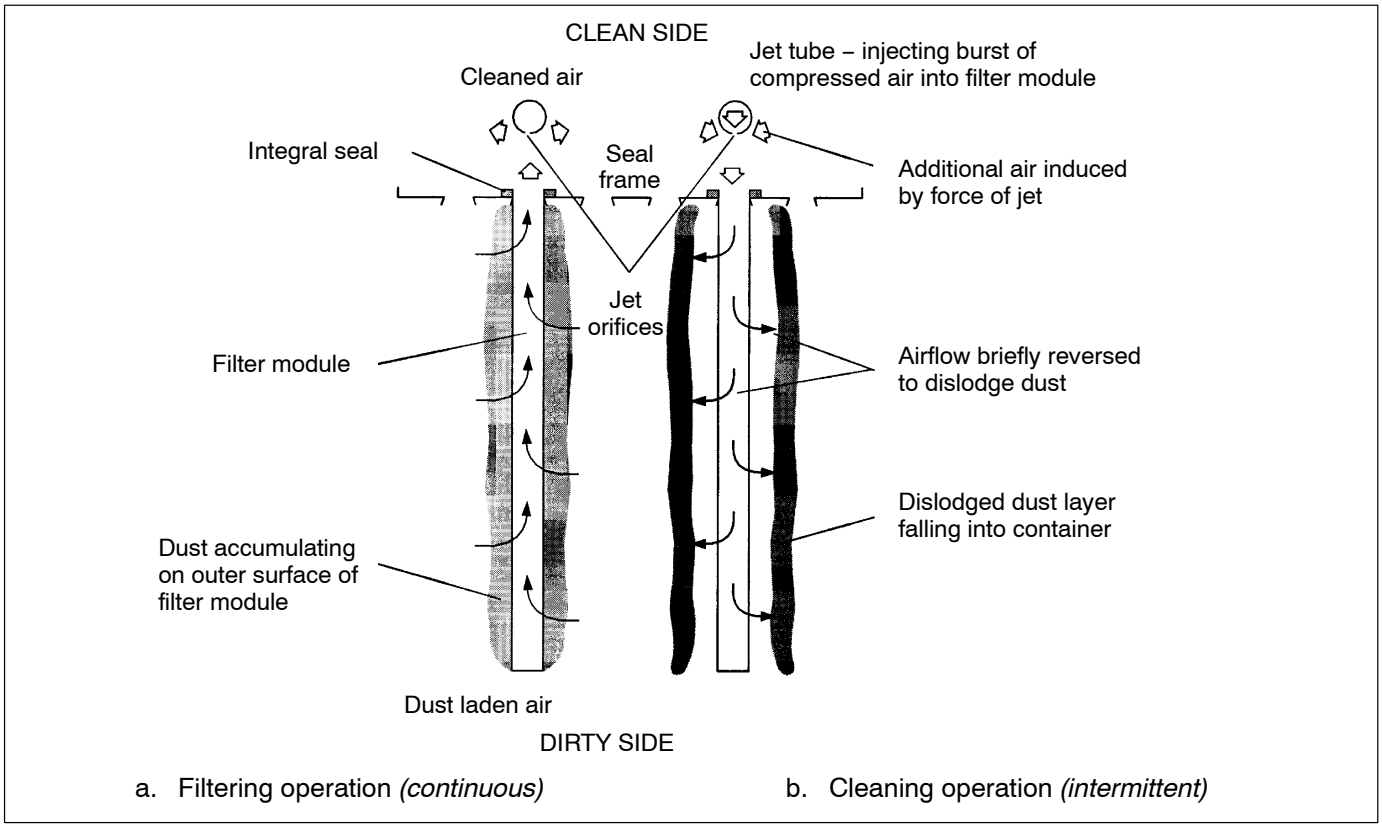


Fig. 2-4 Section through seal frame and two filter modules, showing principle of operating

3. 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 negative values.

The hinged filter section door gives access to the clean air chamber for removal of the jet tubes and filter modules when servicing and also access to the control equipment, consisting of the air distribution manifold, diaphragm valves and solenoid valve enclosure. For access to the acoustic base, a large inspection door is provided on the left–hand side of the filter when viewed from the front. Inspection doors are also provided in rotary valve and screw conveyor type hoppers.

Section 3

Operation

Section 3
Operation

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. Operating Principle

Dust–laden air is ducted into the chamber containing the filter modules, where it impinges on all their outer surfaces. A layer of dust builds up on the outside of the filter module as the air itself passes through the media (see Fig. 3-1a). The clean air emerges from the outlet header of each filter module into the cleaned air chamber and from there it is discharged, normally via the fan and acoustic base section, to atmosphere.

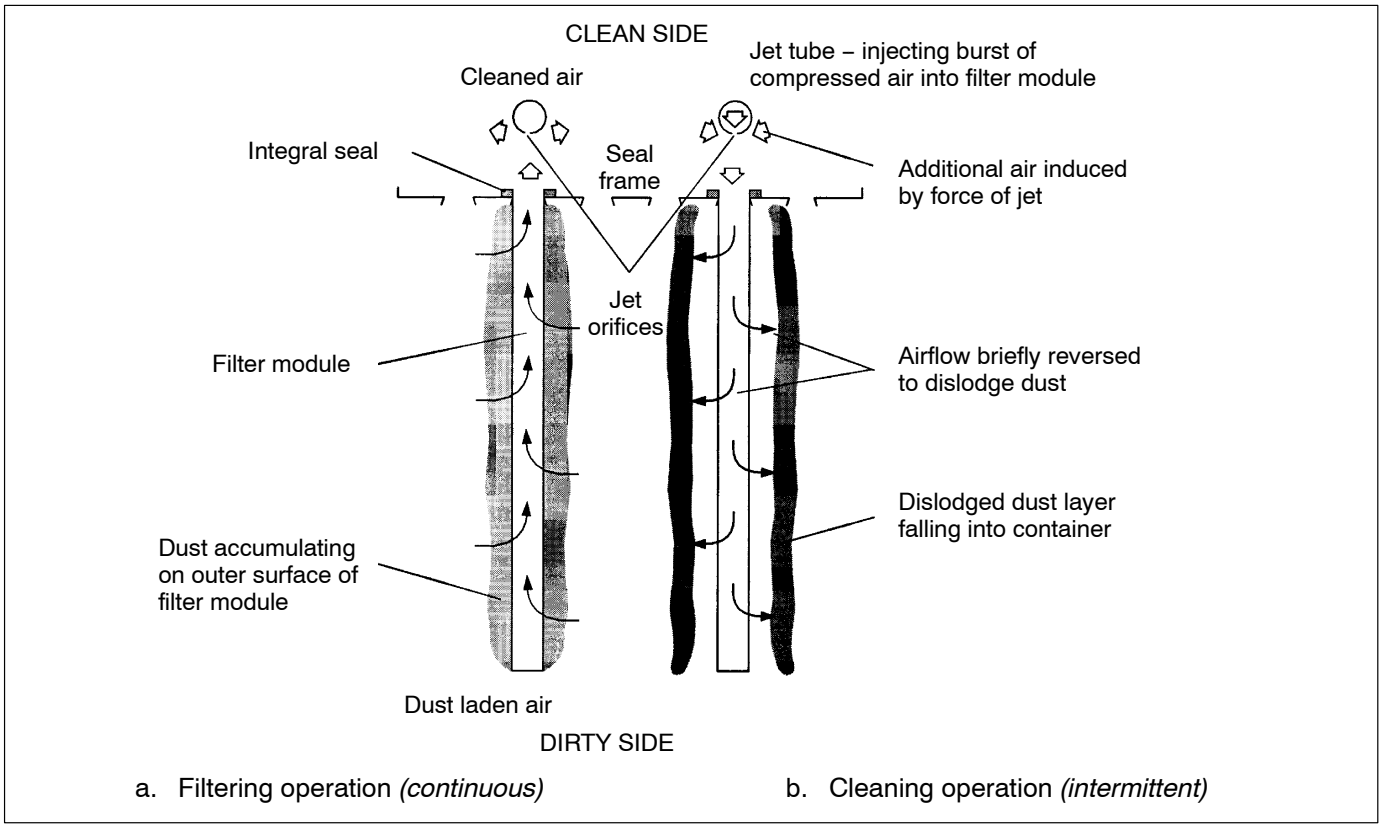


Fig. 3-1 Section through seal frame and two filter modules, showing principle of operating

1. Operating Principle
(contd.)

At regular intervals, governed by the controller, each filter module in turn receives a short burst of compressed air from its respective jet tube (see Fig. 3-1b). As previously mentioned, the jet tube has a series of small–diameter jet orifices positioned adjacent to the outlet header of each filter module (see Figs. 2-2 and 3-1). These orifices are of an optimum size and distance from the filter module, 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 module, effectively dislodging the dust layer which then falls into the discharge hopper.

In this way the pressure drop across the whole filter is kept at a virtually constant level, enabling the Unicell Concept filter to operate continuously, twenty–four hours a day.

Section 4

Installation

Section 4
Installation

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. Installation

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

NOTE: All electrical installation should be carried out by competent personnel.

Unicell Concept filters are normally supplied in two or three separate sections as outlined below. Each section is fully factory assembled, including all controls and associated equipment.

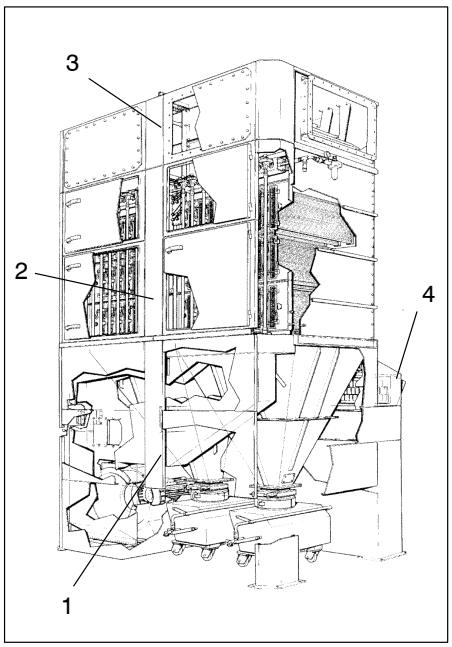


Fig. 4-1 Identification of separate sections

1. *Base section (skip type illustrated)*
2. *Filter section*
3. *Inlet section*
4. *Outlet weather cowl*

C 160L filter – 2 sections
i.e. (1) Base section
(2) Filter and inlet section combined

NOTE: The base section is lifted using the four–point lifting arrangement. The filter/inlet section is lifted using the two–point lifting arrangement.

C 120, 160H, 240 and 320 filters – 3 sections
i.e. (1) Base section
(2) Filter section
(3) Inlet section

NOTE: On C 120 and 160H filters the base, filter and inlet sections are each lifted using the four–point lifting arrangement. On C 240 and 320 filters the base section is lifted using the four–point lifting arrangement, the filter and inlet sections are each lifted using the 2–point lifting arrangement.

General Guidance to Lifting

Each section should be lifted by using either two–point or four–point lifts depending on the individual section type involved (see Figs. 4-1, 4-2 and 4-3).

Chains or slings must be used with an adequate SWL (Safe Working Load). (Refer to lifting label located adjacent to lifting bracket for weight of equipment supplied by Nordson Corporation).

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.

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

NOTE: If a rotary valve option is selected refer to *Fitting a Rotary Valve* before proceeding.

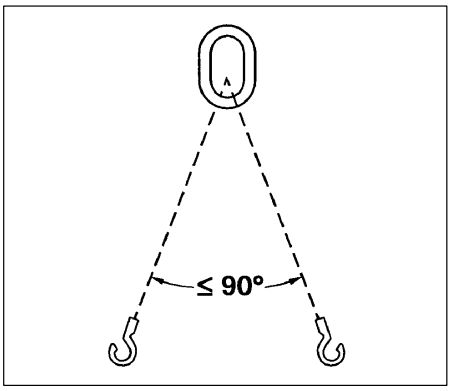


Fig. 4-2 Two-point lifting arrangement

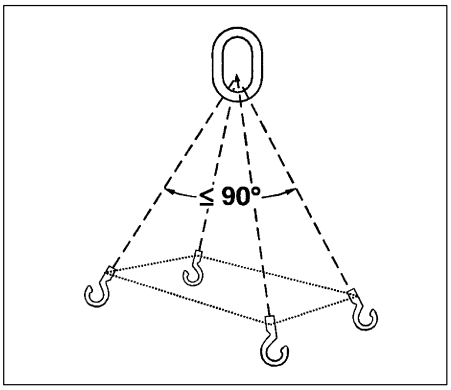


Fig. 4-3 Four-point lifting arrangement

Installing Base Section

NOTE: The recommended method of securing the base section to foundations is by using expandable bolts.

Lift the base section into position using the four lifting lugs provided inside the hopper(s) (see Fig. 4-4).

Using plumb lines and spirit levels, line up both horizontally and vertically using shims under base section where required. Drill through base section holes and insert and tighten expandable bolts.

Remove the lifting lugs and support bars and replace M10 nuts, bolts and washers to seal the hopper.

Apply sealing compound, to suit both temperature and application, around the flange making a continuous 5mm bead along each side of the holes (see Fig. 4-5). Attach weather cowl to outlet at rear of base assembly (optional) (see Fig. 4-1).

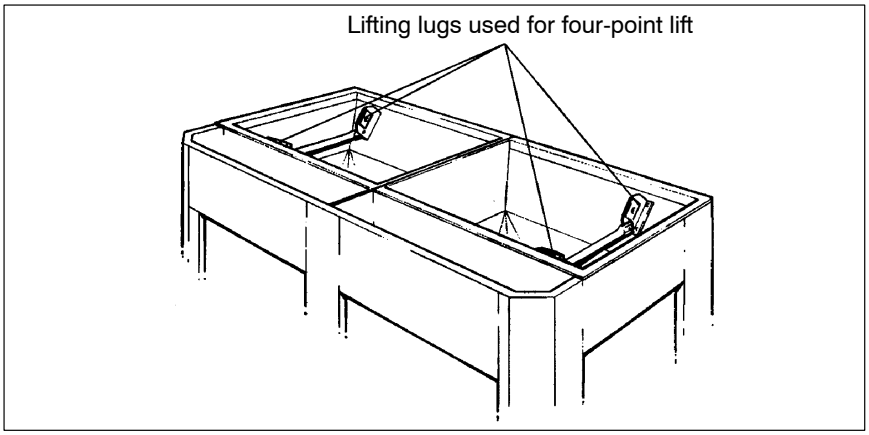


Fig. 4-4 Base section lifting lugs

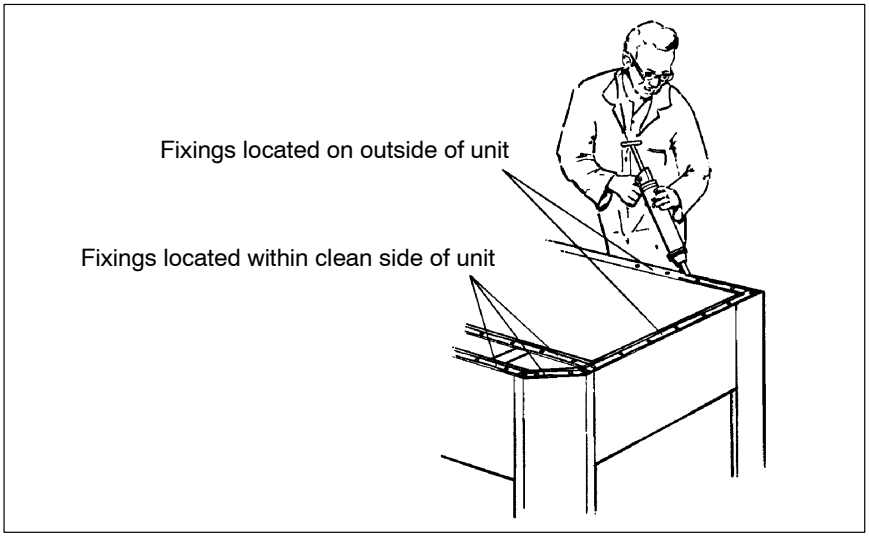


Fig. 4-5 Applying aperture sealant to base section joint flange/outlet weather cowl option

Positioning the Filter and Inlet Sections

C 160L filter/inlet section combined

Carefully lift the combined filter/inlet section into position and secure using nuts, bolts and washers to form an airtight seal.

C 120 and 160H filters

Carefully lift the filter section into position and secure using nuts, bolts and washers to form an airtight seal. Remove lifting brackets and apply sealant as before. Carefully lift the inlet section into position and secure. Apply sealant to front mounting frames and secure front cover plates using nuts, bolts and washers.

C 240 and 320 filters

Carefully lift the filter section into position and secure using nuts, bolts and washers to form an airtight seal. Apply sealant as before. Carefully lift the inlet section into position and secure. Fit front cover plates by applying sealant to front mounting frames and securing front cover plates using nuts, bolts and washers.

NOTE: On each joint line a number of fixings are positioned within the clean side of the filter section, some of which are only accessible from within the base section (Fan access door to be removed to gain internal access – see Fig. 4-6). Additional access may be gained by removing access plates located in the clean air chamber base. Ensure these plates are replaced on completion of joint (apply sealant as required).

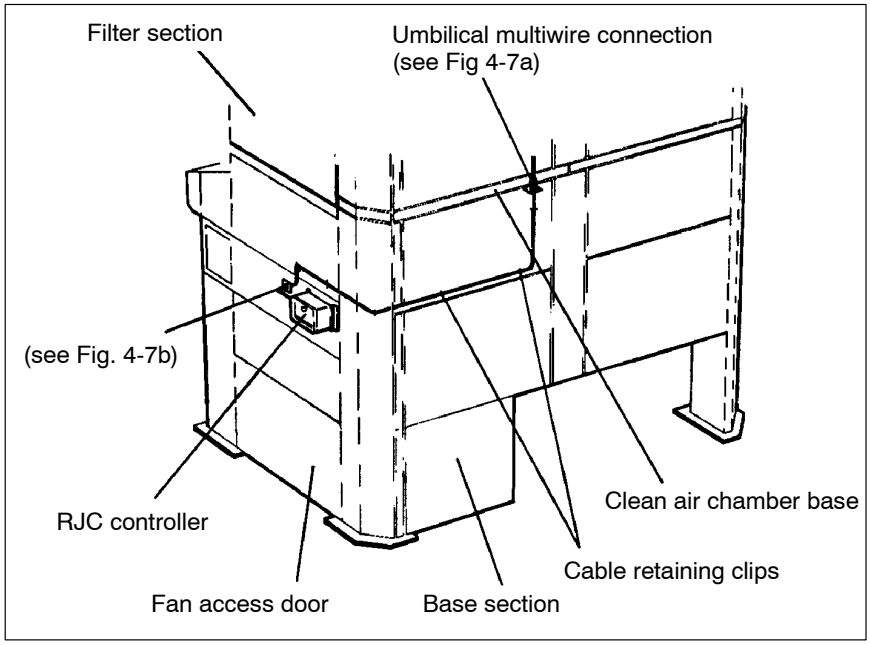


Fig. 4-6 RJC controller lead connection between base and filter sections

Connections

Once the base, filter and inlet sections have been correctly assembled, the control equipment and the compressed air assembly should be connected as follows:

Remove the protective cap from the umbilical multiwire lead (originating from the solenoid enclosure located in the filter section). Connect the plug/adaptor plate and gasket to the clean air chamber base (see Figs. 4-6 and 4-7).

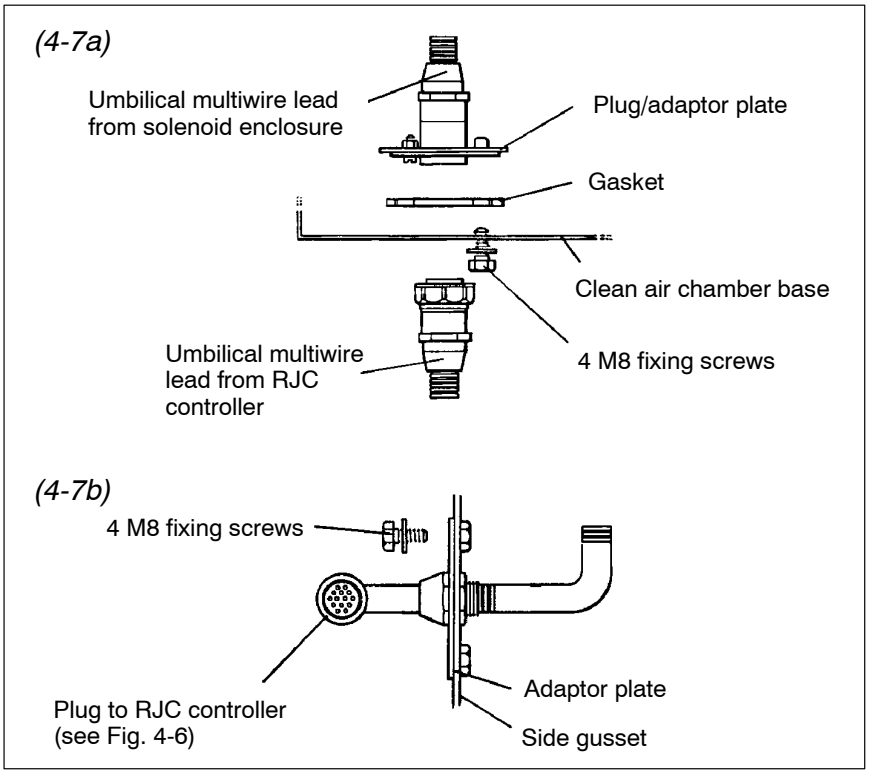


Fig. 4-7 RJC controller to solenoid enclosure connection

Connect the socket end of the umbilical multiwire lead from the RJC controller in base section, to the plug now protruding below the clean air chamber base. Ensure that the pins are correctly aligned.

Connections *(contd.)*

For connection of electrical supply to RJC controller refer to *Electrical Requirements.*

Connect the compressed air assembly, comprising relief valve, gauge and moisture separator (optional) as shown in Fig. 4-8.

NOTE: The following two sections are for optional discharge arrangements:

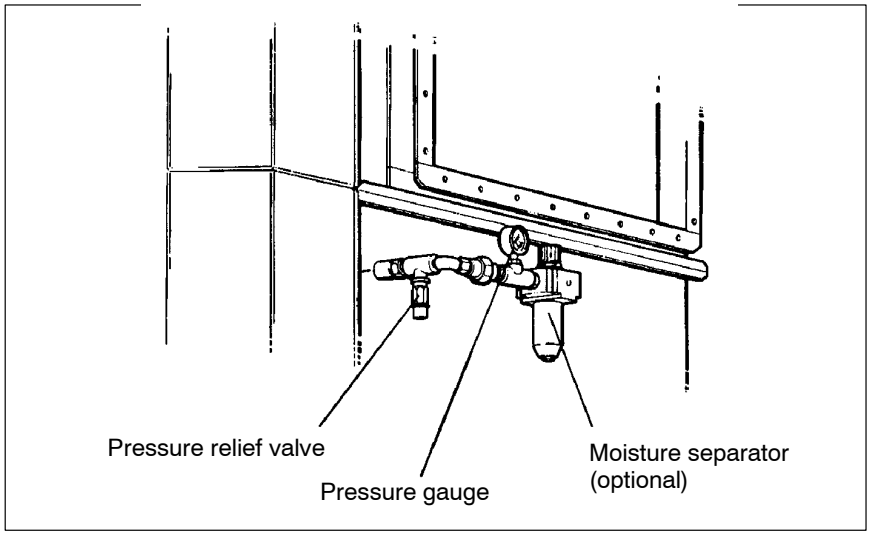


Fig. 4-8 Compressed air assembly connection

Fitting a Screw Conveyor

In order to fit your screw conveyor some acoustic panels (**N**) will require removal.

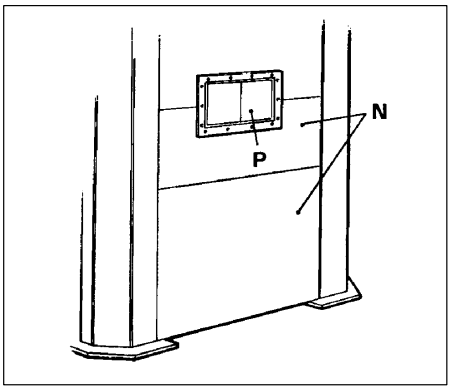


Fig. 4-9

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

Refit the acoustic panels.

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

Fitting a Rotary Valve

If the extended clearance is required then the base extension legs (**Q**) must be fitted to the base assembly first.

The base, with the extended legs already fitted, and the filter section can be installed as detailed in *Installing Base Section* and *Positioning the Filter and Inlet Sections.*

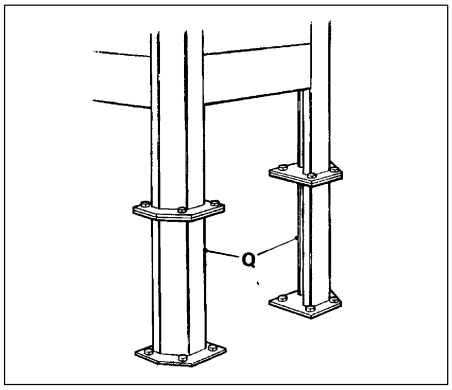


Fig. 4-10

Compressed Air Requirements

Unicell Concept filters require an independent supply of clean, dry, oil–free compressed air. Details of pressure and quantity are given in Table 4-1. 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 filter. If a compressor is being installed to supply the Unicell Concept filter then the following conditions should be observed as far as possible:

Table 4-1 Compressed air requirements

Filter type	**Working compressed air pressure (see note A)**		**Atmospheric air volume – F.A.D. at 12 sec. intervals (see note B)**		**Pulse duration**	**Minimum pipe diameter (see note C)**
C 120	6.2 bar	90 psig	22.35 m^3/h	13.26 cfm	200 ms	3/4” NB (20)
C 160H	5.2 bar	75 psig	31.70 m^3/h	18.81 cfm	200 ms	1 ” NB (25)
C 160L	5.2 bar	75 psig	38.24 m^3/h	22.69 cfm	200 ms	1 ” NB (25)
C 240	6.2 bar	90 psig	44.69 m^3/h	26.52 cfm	200 ms	1 ” NB (25)
C 320	5.2 bar	75 psig	63.40 m^3/h	37.62 cfm	200 ms	1 1/4” NB (30)

NOTE 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 (100 ft) in length. For longer runs consult with Nordson Corporation.

1 bar = 10^5 Pa

Compressed Air Requirements
(contd.)

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.

Layout and installation of air lines

A suitable dryer should be installed in the compressed air line to remove excess moisture. However, in smaller installations a long run (min. 10 m) of piping can be used, to act as a cooler, with a moisture separator. For further details see Table 4-1. The piping should be installed to provide a fall in the direction of air flow to assist in the drainage of accumulated moisture. A blow–down cock should be provided at the lowest point of the installation.

Pressure relief

The manifold is fitted with a relief valve and gauge. The relief valve is preset at 6.9 bar (100 psig). Extra system relief will be required if a volume of air greater than the relief device rating can be supplied (i.e. 25 dm^3/s at 6.9 bar).

Explosion Relief

Explosion panels, if fitted, must be relieved to a safe area in accordance with Factory Inspectorate recommendations.

Access for Maintenance

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

2. Electrical Requirements

NOTE: 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 Nordson but instead is the responsibility of the installer.

NOTE: All electrical work should be carried out by competent personnel.

Each dust control filter is supplied with an integral fan and either an RJC or an RJC+ controller which is used to operate the reverse jet cleaning function.

The Integral Fan

The integral fan is wired to the Fan Terminal box located on the side of the unit, see Fig. 2-1. These terminals will need to be wired to a suitable control panel for the type of Fan Motor supplied. This control panel should be designed in such a way to comply with local legislation for electrical installations. See also chapters on *Interlocks* and *Overload Protection* in this section.

RJC Controller

The controller consists of control electronics housed in an IP65 enclosure, linked to a separate solenoid valve enclosure(s). For details on the pneumatic function of the controller, refer to *Valves* in section *Description*. The electrical functions are described below.

The operating temperature range for RJC controllers is –10˚ C to +60˚ C. (For temperatures outside these limits refer to Nordson).

Electrical requirements

Voltage Inputs

(AC version): 105–120V or 200–240V, 1 phase, 50/60 Hz
(DC version): 24V

Power requirements

(AC version): 36VA (incoming supply fuse 1A)
(DC version): 80W (incoming supply fuse 3A)

NOTE: AC and DC versions of the RJC controller are not interchangeable.

RJC Controller *(contd.)*

Connection to supply and setup

Open the lid of the controller and unscrew the 4 top plate retaining screws. Remove the top plate assembly, ensuring that the ribbon cable is disconnected from the lower PCB assembly. Connect the incoming supply to the terminal block J5 (see Fig. 4-11). Ensure that the terminal block is pushed in fully to engage retaining clips. On the AC version ensure that the voltage setting links are set for the incoming supply voltage (for 105–120 V use 2 links in the positions marked 110; for 200–240 V use 1 link in the position marked 240. When the 200–240 V range is selected the second link is not used – this is attached to the 200–240 V link by a cable tie when despatched from Nordson).

NOTE: The mains cables should not exert any undue stress on the terminal block J5. The use of multistrand conductors is advised.

Ensure that the pulse duration is set at 200 ms with 12 sec. intervals between pulses. The setting links for these are denoted by the ⎍ and ⎏ symbols, respectively, on the PCB (see Fig. 4-11).

Reconnect the ribbon cable on the top plate assembly to the lower PCB and affix the top plate to the controller housing using the four M5 screws. Switch on the mains supply. The green power on LED will illuminate and the cleaning sequence will commence. When the solenoid valves operate the corresponding LED will flash on the display panel.

Interrupt options

The RJC controller offers the facility to interrupt and restart cleaning cycle at any point. This is particularly useful on venting applications where the actual filter operates over a short period of time (e.g. pneumatic conveying of small quantities of product) where a complete cleaning cycle may not take place. Under normal circumstances if the power to the controller is switched off the cleaning cycle is reset to the first element position when the power is reapplied. The interrupt option can be used to start and stop the cleaning without the controller resetting, provided that the power is left on, ensuring that all filter elements are cleaned.

In order to utilise this function a volt free contact (typically from a PLC system) should be connected across the terminals marked 'INT' on the lower PCB (see Fig. 4-11). Closing the contact stops the cleaning cycle opening the contact restarts the cycle.

RJC+ Controller

The RJC+ controller is a higher specification version of the RJC controller and contains the additional features described below:

ΔP control

The principle feature of the RJC+ controller is the ΔP control system, which ensures effective and economical use of the dust control filter's reverse–jet cleaning system. Under normal operation a dust coating on the filtration medium can enhance the filter's overall efficiency but this 'dust cake' will become detrimental if allowed to build up to such an extent that it becomes a barrier to the air flow.

The ΔP control system monitors this build–up of dust by measuring the Differential Pressure (known as the 'ΔP') across the filtration medium and dust cake. The RJC+ will activate the cleaning system when an adjustable preset high level limit is reached and maintain cleaning until the differential pressure has returned to a second adjustable preset low limit, when the cleaning system will be switched off. This process is repeated every time the pressure rises to the high level limit.

NOTE: When the reverse–jet cleaning is activated a ⇅ symbol is shown on the display next to the ΔP symbol.

This system ensures that a combination of both efficient filter performance and minimum compressed air consumption is maintained.

In order for this function to operate, the RJC+ controller must be pneumatically connected, to the pressure tappings on the right hand side of the controller enclosure. The clean and dirty side connections are denoted by the ◌ and ● symbols respectively.

Once connected the RJC+ will operate under ΔP control.

The ΔP control facility can be overridden using the manual override option (for details refer to RJC+ setup).

Further facilities are offered on the RJC+ as follows:

1 Off–line cleaning facility

2 4–20 mA output

3 Alarm relay

4 In use relay

RJC+ Controller *(contd.)*

Off–line cleaning facility

This function (when enabled) allows the cleaning cycle to continue for a period of time after the fan has been switched off. In order for this function to operate, a normally open contact, on the fan starter system, must be connected to the lower PCB terminals, marked with the ✳ symbol (see Fig. 4-11). This will then signal the controller that the fan is either off or on. The off–line cleaning will then operate according to the parameters entered via the membrane keypad (refer to RJC+ setup).

NOTE: If the fan starter is not linked to the terminals on the RJC+ and this feature is enabled cleaning cycles will not occur.

4–20 mA output

A 4–20 mA linear output is available for connection to a remote system. The signal represents the value of the filter pressure drop reading in the range 0–300 mm W.G. This can, typically be used to drive a remote display or provide information to a PLC/Scada system.

Alarm relay

The alarm relay provides a volt free changeover contact to indicate an alarm condition. The alarm condition is either a power fail or high filter pressure drop. The pressure drop level at which the alarm is triggered is entered via the keypad on the front of the controller (refer to RJC+ setup). When the alarm is active due to high filter pressure drop a 🔔 symbol is shown on the display.

NOTE: This relay is energised in the non alarm state.

In use relay

This provides a volt free changeover contact which indicates whether the cleaning system is active or inactive. This can typically, be used to provide information to a PLC/Scada system.

Electrical requirements

Voltage Inputs

(AC version): 105–120V or 200–240V, 1 phase, 50/60 Hz
(DC version): 24V

Power requirements

(AC version): 36VA (incoming supply fuse 1A)
(DC version): 80W (incoming supply fuse 3A)

Note: AC and DC versions of the RJC+ Controller are not compatible and therefore AC and DC supply voltages cannot be interchanged on the same controller.

Connection to supply and setup

Open the lid of the controller and unscrew the 4 top plate retaining screws. Remove the top plate assembly, ensuring that the ribbon cable is disconnected from the lower PCB assembly and that the clear PVC tubes are disconnected from the bulkhead fittings. Connect the incoming supply to the terminal block J5 (see Fig. 4-11). On the AC version ensure that the voltage setting links are set for the incoming supply voltage (for 105–120 V use 2 links in the positions marked 110; for 200–240V use 1 link in the position marked 240. When the 200–240V range is selected the second link is not used – this is attached to the 200–240V link by a cable tie when despatched from Nordson Corporation).

Reconnect the ribbon cable on the top plate assembly to the lower PCB, reconnect the tubes from the pressure transducer to the bulkhead fittings (the tube from the pressure transducer tapping 'B' connects to the bulkhead tapping marked with a symbol) and affix the top plate to the controller. Switch on the mains supply.

RJC+ Controller (contd.)

RJC+ setup

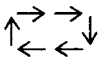
The power on LED and the LCD display will illuminate. After a period of 5 seconds the controller will be ready to set up; i.e. when the ΔP symbol is displayed with the pressure drop reading (in mm W.G.). To set up the RJC+ controller use the green select button to scroll through the set–up options available and the arrow keys to adjust the settings (see Fig. 4-13).

The options available are as follows:

This is the high ΔP alarm set point (initial factory setting 200mm W.G.)

This is the set point (high limit) at which cleaning will commence when ΔP cleaning is used (initial factory setting 100mm W.G.).

This is the set point (low limit) at which cleaning will cease when ΔP cleaning is used (initial factory setting 74mm W.G.).



This selects the cleaning mode. Either ΔP cleaning [0] or continuous cleaning [1]. (Factory setting [0]: ΔP cleaning ON).

Off–line cleaning time. Two options available 15 or 25 minutes (factory set 25 minutes).

Off–line cleaning select. Either on [1] or off [0] (factory set off [0]).

Interval and pulse duration settings. Refer to the compressed air requirements in the User Manual for the recommended settings for the dust control filter.

NOTE: These settings override those made with the links on the base PCB.

Once the settings have been entered the display will revert to reading the actual pressure drop (ΔP) across the filter media. To change one setting only scroll through to the appropriate option, change the value and then allow the display to revert back to the ΔP reading. The controller settings are retained in memory even if the power is switched off.

RJC and RJC+ Spares

The fitment of replacement PCBs is relatively simple. However, it must be noted that the lower PCB assembly is a universal spare and must be configured to the number of solenoid valves fitted in the solenoid valve enclosure. In order to do this the jumper links, denoted by the  symbol (see Fig. 4-11) must be in the correct position (either 2, 3, 4, 5, 6, 8 or 10). Failure to carry out this procedure will result in poor filter performance.

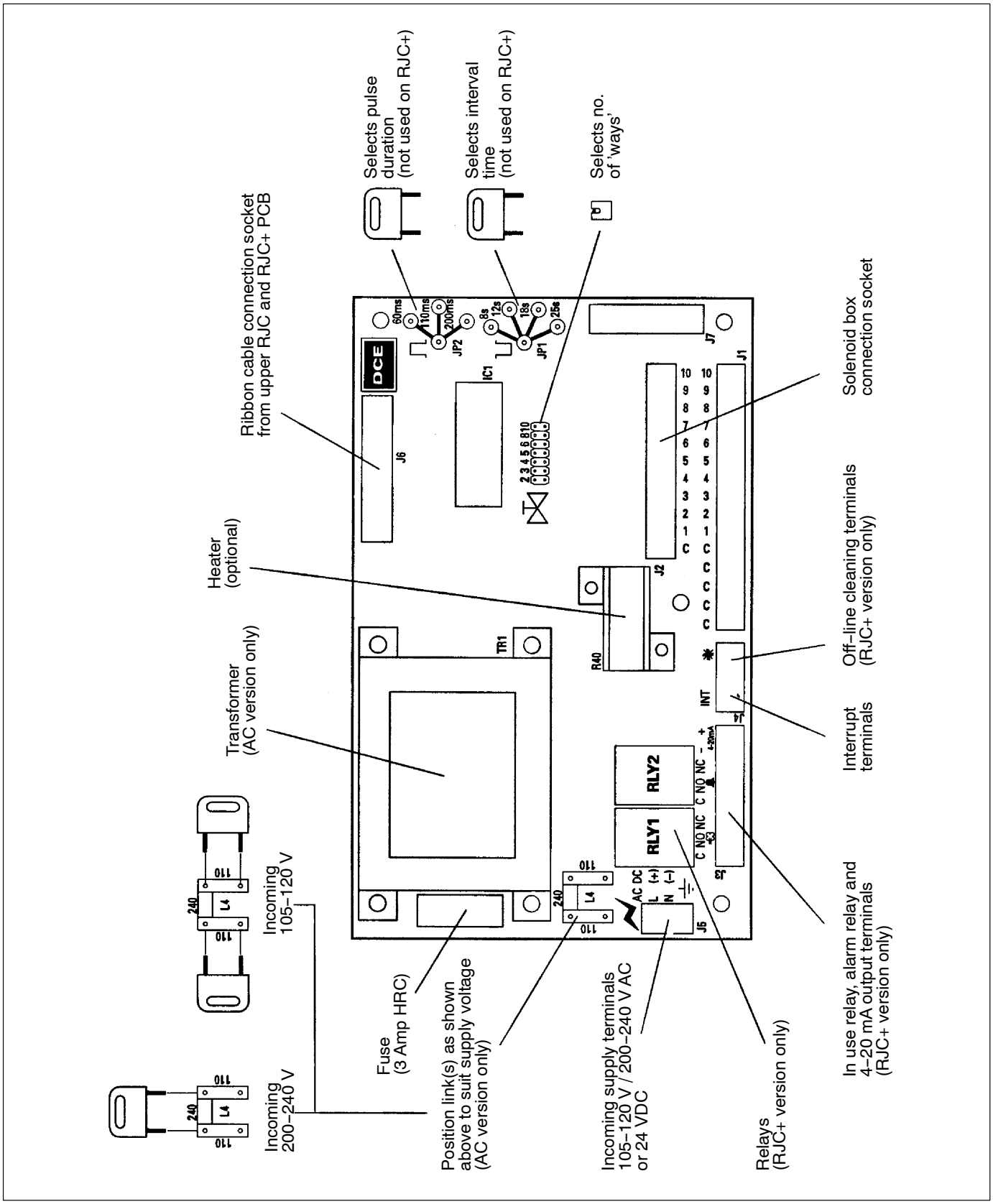


Fig. 4-11 Lower PCB layout for RJC and RJC + controllers

RJC+ Upgrade

A standard RJC controller can be upgraded to an RJC+, on site, relatively easily. In order to perform an upgrade an RJC+ upgrade kit pack is available. This contains the following:

1. Top plate assembly, including PCB and membrane keypad.
2. 2 x relays
3. 1 x 8–way terminal socket
4. 1 x length 6 mm o/d tubing (small)
5. 2 x bulkhead fittings
6. 2 x tailpiece adapters
7. 1 x clean/dirty side label
8. 2 x bonded seals

NOTE: External fitting kit pack(s) is supplied to suit.

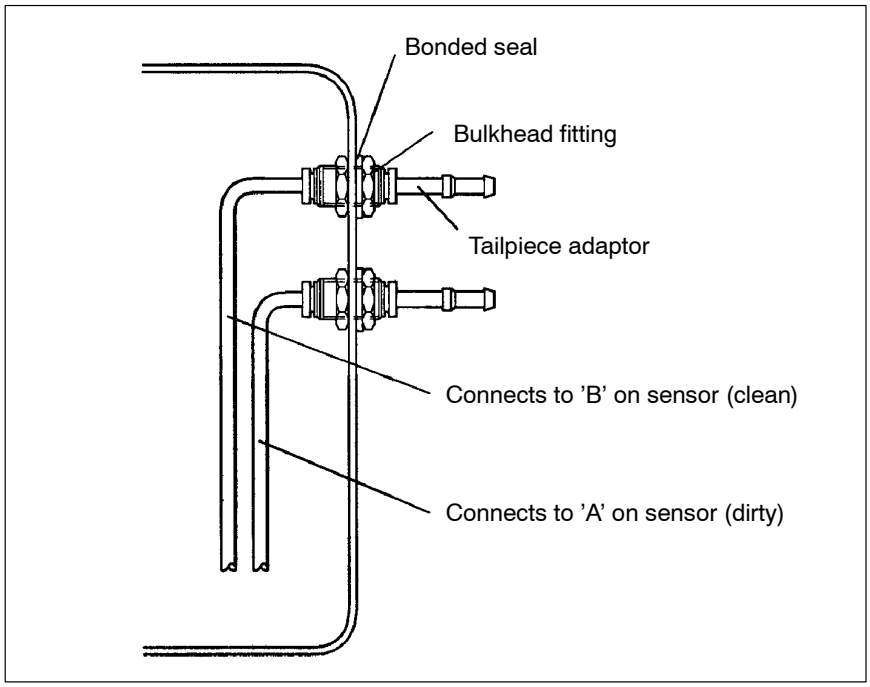


Fig. 4-12 Assembly of fittings

To perform the upgrade the following steps are to be carried out:

1. Switch off supply to RJC Controller.
2. Remove existing top plate assembly and disconnect from lower PCB.
3. Remove the two small bungs on the right–hand side of the controller box.
4. Fit the two bulkhead fittings, tailpiece adapters and bonded seals as shown in Fig. 4-12.
5. Plug the two relays in to the lower PCB in the areas labelled RLY1 and RLY2 (see Fig. 4-11).
6. Fit the 8–way terminal socket to the vacant 8–way PCB mounted plug (see Fig. 4-11).
7. Connect the pressure transducer to the bulkhead fittings as shown in Fig. 4-12, using the small diameter tubing.
8. Connect the top PCB to the lower PCB using the ribbon cable (into the socket marked DB).
9. Fit top plate assembly into box.
10. Fit clean and dirty side label to outside of the box in the position as shown in Fig 4-13.
11. Connect clean and dirty side tappings on the filter to the clean and dirty side tappings on the controller, using the large diameter tubing in separate kit pack.
12. Switch on power.

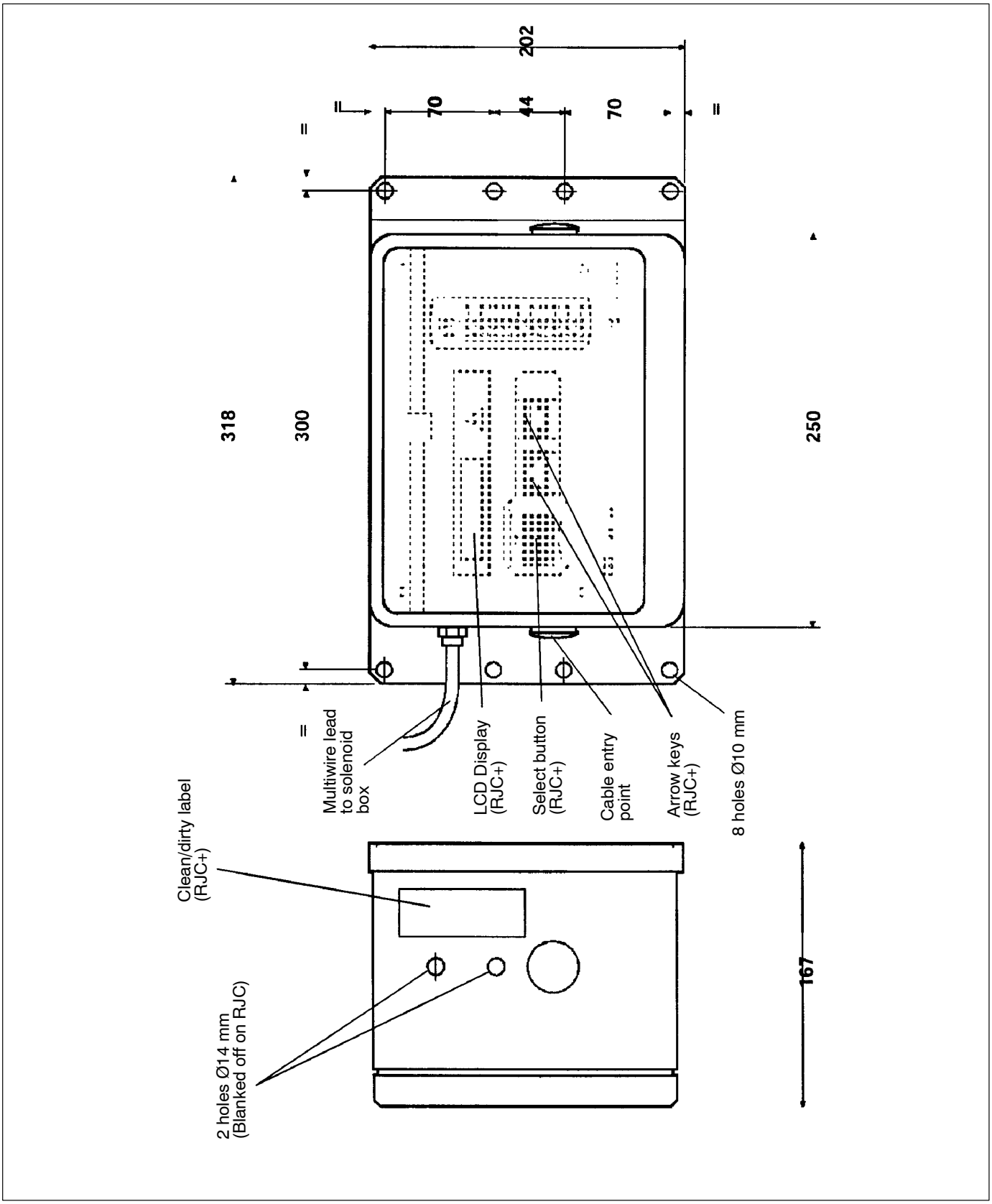


Fig. 4-13 RJC and RJC + controller – Dimensions common to all controllers

EEx Controls

When the dust control filter is to be installed in a hazardous area where there is any risk of fire or explosion, it will be equipped to suit the area classification, with either of the following control systems:

EExd Solenoids and Remote Controller

When this option is fitted the dust control filter has its solenoid valves in an EExd IIb T6 enclosure mounted on the filter. The RJC controller, housed in an IP65 box, is supplied loose. This must be installed in a safe area and connected to the solenoid valves on the dust control filter using suitable cabling (not supplied).

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

NOTE: 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 RJC controller.

Interlocks

Discharge equipment such as belt feeders, rotary valve or screw conveyor should be separately controlled but interlocked with the unit controller (see Fig. 4-15).

The design of the electrical circuitry controlling equipment associated with the Unicell Concept filter should be such that breakdown of any one of the associated pieces of equipment does not cause a complete blockage of the filter. For example, should the motor of the rotary valve fitted to the filter cease to function, the filter 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 Fig. 4-15 which also allows for the compressor etc. to operate without airflow through the filter, to facilitate clearance of the filter in the event of blockage due to failure of non−electrical equipment.

Overload Protection

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

A fused isolator, fitted with a 3 amp fuse at the correct input voltage rating, should be fitted between the controller and incoming supply. A high rupturing capacity (HRC) cartridge–type fuse must be used.

Protection of the RJC controller against an output current overload is achieved by a small HRC cartridge fuse mounted on the PCB (see Fig. 4-11). In an emergency a quick–acting fuse could be used as a temporary alternative but a time delay fuse must not be used under any circumstances.

Antistatic Earthing

It is particularly important on filters having antistatic filter modules that the earthing boss (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.2-1).

3. Commissioning

When making your preliminary checks, or during the start–up sequence, particularly note that on filters 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.

Preliminary Checks

Before putting the Unicell Concept filter into service the following items should be checked. Similar checks, as appropriate, should be made after any major overhaul:

1. Ensure base section is securely bolted to the floor.
2. Ensure inlet, filter and base sections are securely bolted to each other.
3. Ensure all ducting is complete and all detachable panels are in position.
4. Ensure all door seals are intact on the filter, then close and secure the doors.
5. Ensure transformer in RJC controller is set to the correct voltage and that the pulse interval and duration settings are correct. For 24V DC versions ensure polarity is correct. It is essential that the RJC controller is earthed for both AC and DC versions.

6. Ensure umbilical multiwire lead between RJC controller and solenoid valve enclosure(s) is correctly joined between base and filter sections.

7. Ensure electric power is available.

8. Start compressor and check air supply is maintained at the recommended pressure.

9. Start up, if applicable, the discharge equipment (e.g. rotary valve, screw conveyor, belt feeders etc.).

10. Switch on RJC controller and check all valves operate in sequence by monitoring the LEDs on the front panel. As each valve operates, the air pressure reading should drop to approximately 50% of the initial setting and then return to the initial value.

11. Start/stop the fan and check for correct rotation during fan run–down (Refer to the fan rotation label located on the back of the fan).

12. Refit fan access door (fan not running) and ensure it is securely bolted in position.

13. Start up fan and check that the full load current is not exceeded.

14. Verify operation of interlocks and audible warning system if fitted.

Start–up Sequence

Having completed all the necessary checks, the equipment may be put into operation. A typical installation, as shown in Fig. 4-15, should be started up as follows:

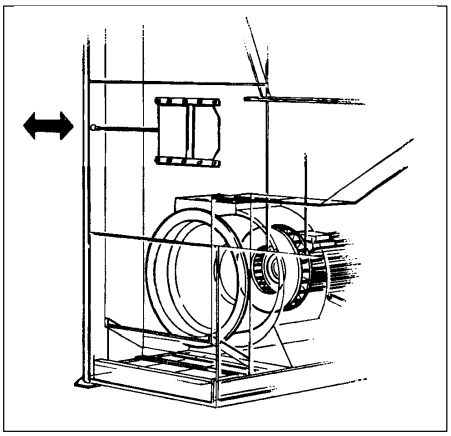


Fig. 4-14 Air bleed adjustment

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

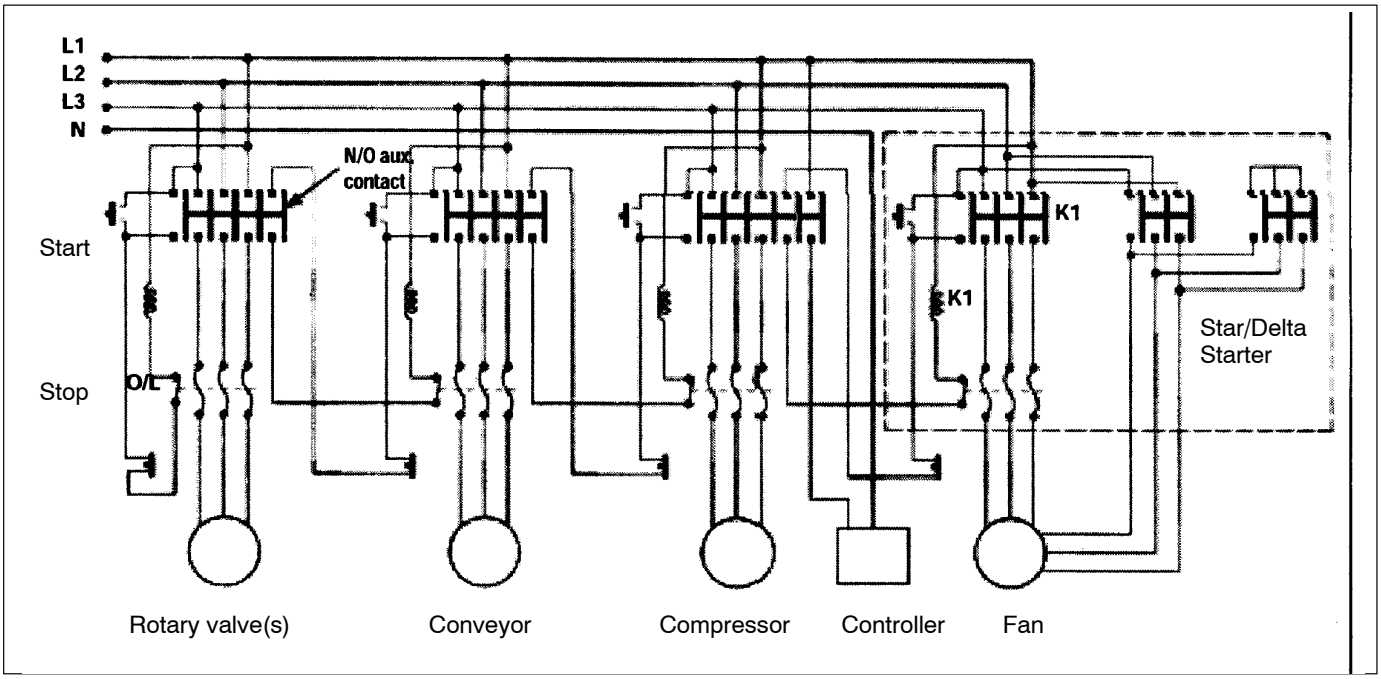


Fig. 4-15 Schematic diagram showing typical interlock system for a Unicell Concept filter installation

Shut–down Sequence

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

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

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

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

   NOTE: If an RJC+ controller is fitted then the off–line cleaning facility can be used. (See *Electrical Requirements*).

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

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

Section 5

Maintenance

Section 5
Maintenance

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

NOTE: Always isolate the electrical supply before servicing.

1. Routine Inspection

To maintain the optimum performance of any Unicell Concept filter 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 absorbed across the filter modules 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 modules, 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 RJC controller in still–air conditions for a short period to dislodge any accumulated dust before putting the Unicell Concept filter into operation.

Filter resistance can be checked by connecting a U–tube manometer or differential–type pressure gauge to the tapping points on the filter casing (Fig. 2-1). This will give a continuous indication of the state of the filter. Once run–in, 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.

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

Unicell Concept filters 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.

2. 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 the tapping points and measure the pressure drop across the unit. Record the figure in the log book. If the pressure drop increases significantly over two or three successive checks, e.g. 50%, check the unit as described in the *Fault Location* in section *Troubleshooting.*

Monthly

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

Check operation of solenoid and diaphragm valves. If it is found necessary to replace a diaphragm, use the following procedure:

C 120, 160L and 240 Filters

See Fig. 5-1.

Use service kit available from Nordson Corporation.

a. Switch off fan and compressed air supply.

b. Remove 5 mm diameter nylon tube (1) by unscrewing tubing nut from 90° elbow fitted to valve bonnet – this will release the manifold pressure.

c. With the valve in place on the manifold (2), remove the four hexagonal–head screws (3) securing the valve bonnet.

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

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

f. Position spring over disc shoulder.

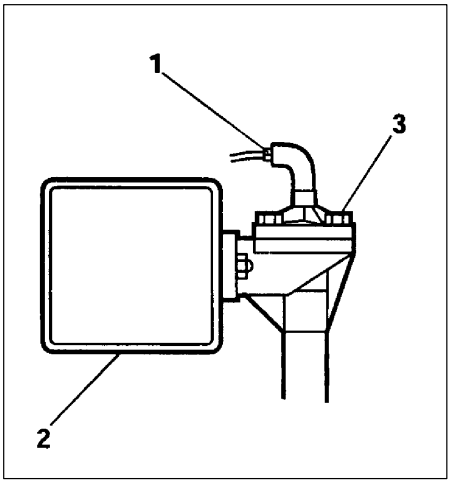


Fig. 5-1 Valve diaphragm replacement (C 120, 160L and 240 filters)

g. Refit bonnet ensuring spring locates inside of bonnet recess and bonnet locates over ’bleed’ hole pin.

h. Refit and tighten the four M10 hexagonal–head screws and shakeproof washers.

i. Reconnect the tubing to the valve bonnet.

j. The filter is now ready to restart.

C 160H and 320 Filters

See Fig. 5-2.

Use service kit available from Nordson Corporation.

a. Switch off fan and compressed air supply.

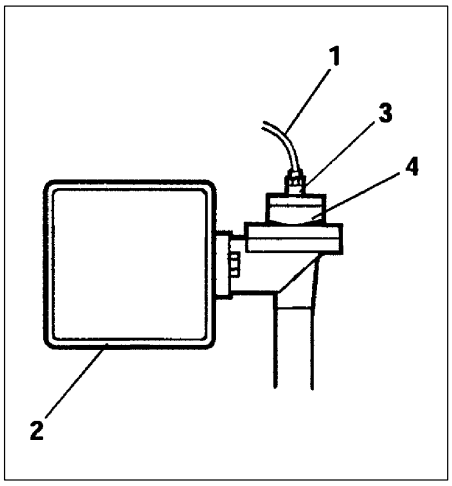


Fig. 5-2 Valve diaphragm replacement (C 120, 160L and 240 filters)

b. Remove the 5 mm diameter nylon tube (1) by unscrewing tubing nut in end of valve bonnet – this will release the manifold pressure.

c. With the valve in place on the manifold (2), remove the four cap screws securing the small bonnet (3).

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

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

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

g. Refit bonnet ensuring the spring locates inside the bonnet recess and bonnet locates over ’bleed’ hole pin.

h. Tighten up the cap screws.

i. Remove the six hexagon screws securing the large bonnet (4).

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

k. 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.

C 160H and 320 Filters *(contd.)*

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

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

n. Tighten up the hexagon screws.

o. Refit the 5 mm and 10 mm nylon tube and tubing nuts.

p. The filter is now ready to start.

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.

3. *Non–standard fan motor (Consult motor plate) (CD45 fan only)*
   Lubricate motor bearings according to the instructions on the lubrication plate which is mounted on the cowl at the rear of the motor.

4. *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 filter is located outside or in a wet atmosphere. *Faulty seals must be replaced.*

5. *Filter modules*
   Remove the jet tubes then remove each filter module and check the general condition of the media and integral header seal. Clean the outside of each filter module using a vacuum cleaner. If the dust is of an abrasive nature it is advisable to examine the filter modules more frequently. *Filter modules showing excessive wear must be replaced.*

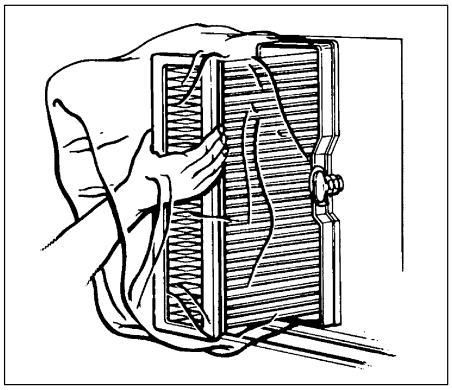


Fig. 5-3 'Clean change' option

Seal frame with clean change option

The clean change facility allows filter modules to be withdrawn from the seal frame into a polythene bag with minimal contamination of the clean side of the unit.

The system is 'clean change' and not safe change as it is not possible to avoid contamination of the seal frame area immediately around the filter module slot.

To remove the filter modules follow this procedure:

Items marked '*' are re–usable.

a. With the unit offline, open the filter section access door.

b. Remove each jet tube* by releasing the captive wingnut sited at the filter section base and slide the tube off the diaphragm valve.

c. Pass the open end of the bag through the bag frame and fold outwards over the rubber seal.

d. Clamp the polythene bag over the filter module as shown in Fig. 5-3.

e. Release the filter element clamps (quick release handles) (two per filter module) by pulling the handle towards you, this releases the clamping force on the filter module, slide each filter element clamp (quick release handle) out of the brackets and allow to fall into the polythene bag.

f. Draw the filter module and filter module angle frame from the seal frame into the polythene bag.

g. Release the clamps securing the polythene bag and bag frame* and seal the filter module inside the polythene bag.

h. Fit replacement filter module, filter module angle frame, quick release handles and jet tubes.

NOTE: The filter module angle frame and quick release handles are not re–usable, ensure adequate spares before commencing work.

C 160H and 320 Filters *(contd.)*

Seal frame with clean change option *(contd.)*

6. *Jet Tubes*
   Check that the jet tubes are clean and that the jet orifices are clear.

7. *Flameproof maintenance*
   It is important that all flameproof enclosures, motors and cable glands are inspected for corrosion and tightness on an annual basis.

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

Section 6

Troubleshooting

Section 6
Troubleshooting

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. Fault Location

There are three basic indications of loss of Unicell Concept filter performance:

1 Part loss of suction (excessive pressure differential)

2 Total loss of suction

3 Effluent in the clean air outlet

Some of the reasons for the faults may be common to all three.

Service engineers should rectify any incipient faults they may find during their investigations. For example, loose terminals should be tightened, perished hoses replaced etc.

Problem	Possible Cause	Corrective 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 O.K., 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.	Check valves (look and listen for exhaust pulses).
		If all valves affected, check 'Power on' LED is lit on RJC controller. If not lit, check incoming supply and lower PCB fuse. If lit, check INT function is not enabled. If INT function disabled, replace lower PCB.
		If isolated solenoid or diaphragm valve is affected, check corresponding solenoid valve indicator LED on RJC controller. If no response on LED, replace solenoid valve. If LED responds, replace lower PCB.
		Check ΔP function on RJC+ controller (if fitted).
	Filter blocked.	Check that emptying device or discharge equipment is working. Check starter overloads, fuses and interlocks.
		Run filter clear,* then remove each filter module in turn and vacuum–clean all its outer surfaces. Renew any filter modules that are damaged.
	Motor speed low.	Check line voltage, phases, motor connections. For Star/Delta applications, check motor is in Delta.
	Incorrect fan motor rotation.	Check electrical connections and transpose if necessary.
	Air bleed control incorrectly adjusted.	Adjust via handle on left–hand side of base section (see figs. 2-1 and 4-15).

Problem	Possible Cause	Corrective Action
Total loss of suction.	Fan motor stopped.	Check motor supply overloads, fuses and interlocks. Check motor connections and windings.
	Filter blocked.	Check that emptying device or discharge equipment is working. Check starter overloads, fuses and interlocks. Run filter clear,* then remove each filter module in turn and vacuum–clean all its outer surfaces. Renew any filter modules that are damaged.
	Ducting blocked.	Check throughout and clear.
Visible effluent in the clean air outlet.	Damaged filter module material causing dust leak into clean side of filter.	Damaged filter modules can be identified by the dust present in clean air chamber. Withdraw filter module and renew. There may be a build up of dust in the fan inlet duct, and the acoustically lined base; this should be removed prior to restarting the filter. A check for excessive vibration should also be made on the fan assembly before and after restarting to ensure no damage to the impeller has occurred.

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