Enviraclean Systems

Hodge Clemco Ltd

MJC Mini Cartridge Filters

Owners Manual

TSOM 556 **Date of Issue: 13.07.04**

Hodge Clemco Ltd
Orgreave Drive, Sheffield
South Yorkshire. S13 9NR
Tel:0114 254 0600
Fax: 0114 2540250
Email:sales@hodgeclemco.co.uk
www.hodgeclemco.co.uk

MJC Mini Cartridge Filters

Installation, Operation and Maintenance Manual.

Unit designation:

MJC Mini 4/22/21, 8/40/21;
MJC Mini 9/22/22, 16/40/22, 26/66/22;
MJC Mini 13/22/32, 24/40/32, 40/66/32..

.

Description of units and intended use.

The MJC Mini is a range of compact cartridge filters with reverse jet cleaning designed particularly for smaller ventilation and dust collection, where the duty is continuous and / or arduous.

The open based filter versions will normally be bolted to a prepared flange on the vessel or container to be ventilated.
Units fitted with a base unit and quick release bin may be free standing or secured to the floor.
All units may be specified with a built-in ventilating fan for dust extraction purposes or to maintain a small negative pressure in the system. Standard fan sizes are 0.75, 1.1 2.2 and 3.0kW. A 4.0kW fan may be a special option.

Typical airflow volume capabilities range from 500 to 3000m³/h.

Handling.

The filter units are supplied with two slinging points incorporated into the lid construction.

- **Safety note:** ensure that the lid is securely bolted in the closed position before lifting using the slinging points.

The units may also be handled by forklift truck when mounted on a suitable pallet.

MJC Mini Unit typical weights: all weights kg.

	MJC Mini 13/22/32 no fan	MJC Mini 24/40/32 no fan	MJC Mini 40/66/32 no fan
Insertable	102	108	114
Cased vent	146	178	215
Cased with low tray-style, QR bin	184	216	253
Cased with hopper, QR bin	196	228	265

	MJC Mini 9/22/22 no fan	MJC Mini 16/40/22 no fan	MJC Mini 26/66/22 no fan
Insertable	83	87	91
Cased vent	120	145	175
Cased with low tray-style, QR bin	151	176	206

	MJC Mini 4/22/21 no fan	Mini 8/40/21 no fan
Insertable	37	39
Cased vent	58	74
Cased with inlet	90	111
Cased with inlet and tray-style QR bin	121	142

Add weight in kg. for optional items: -

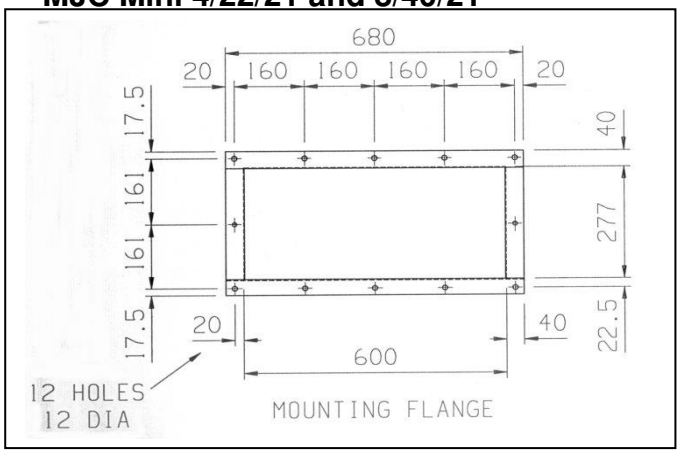
Silencer	12
Silencer W/cwl	1.5
0.75 kw fan	38
1.1 kw fan	40
2.2 kw fan	46
3 kw fan	53
Bin Balance	2
Vent W/cowl	2

INSTALLATION.

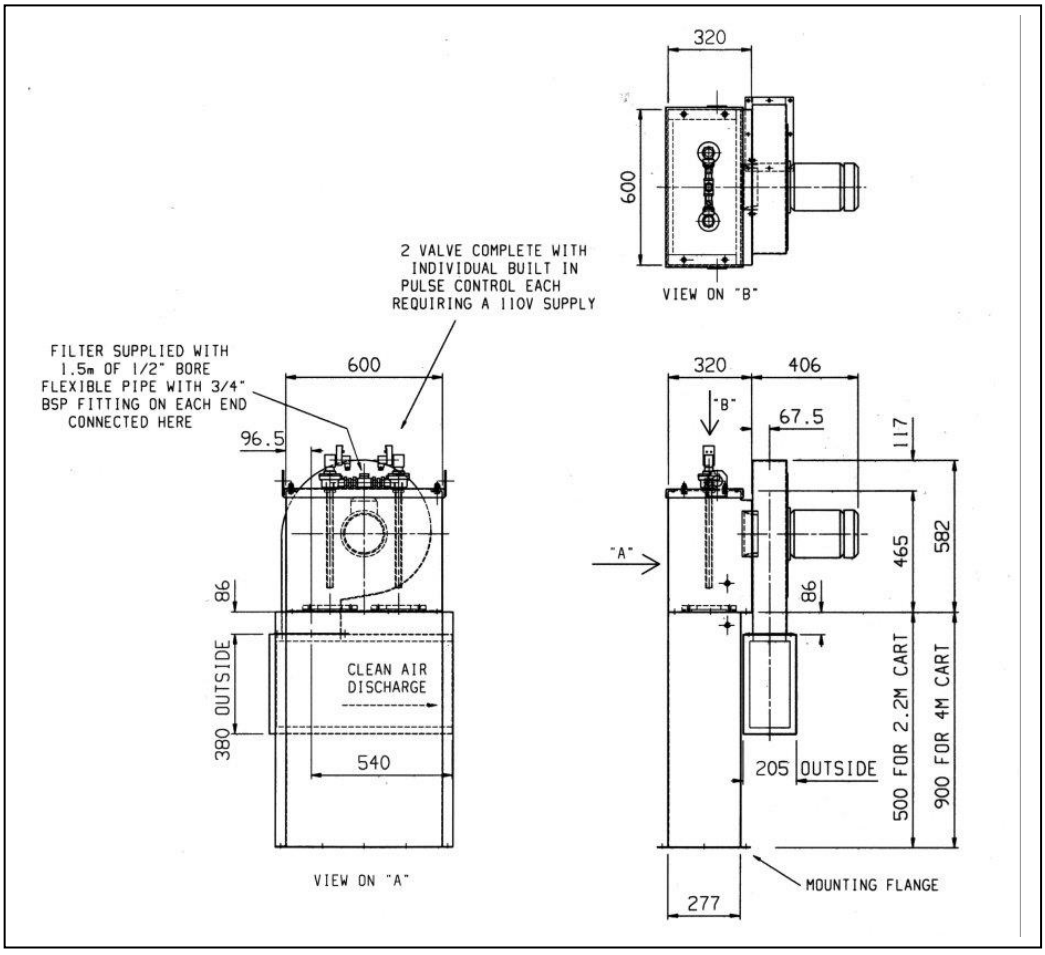
- **Safety note:** mechanical and electrical installation should be performed by suitably qualified and experienced personnel.

Open based units should be sealed and securely bolted to a prepared flange on top of the vessel or housing to be ventilated. The units are supplied fully assembled. The required unit and flange dimensions are given in the information below. Units with the standard base units and quick release bin may be free standing or secured as appropriate.

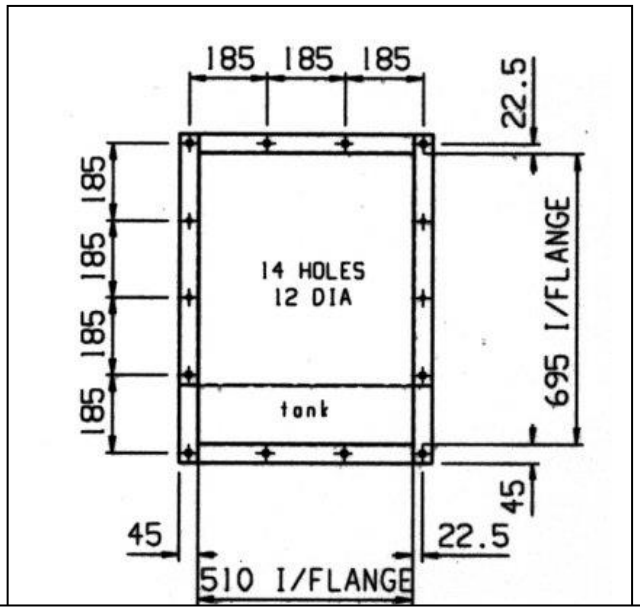
MJC Mini 4/22/21 and 8/40/21



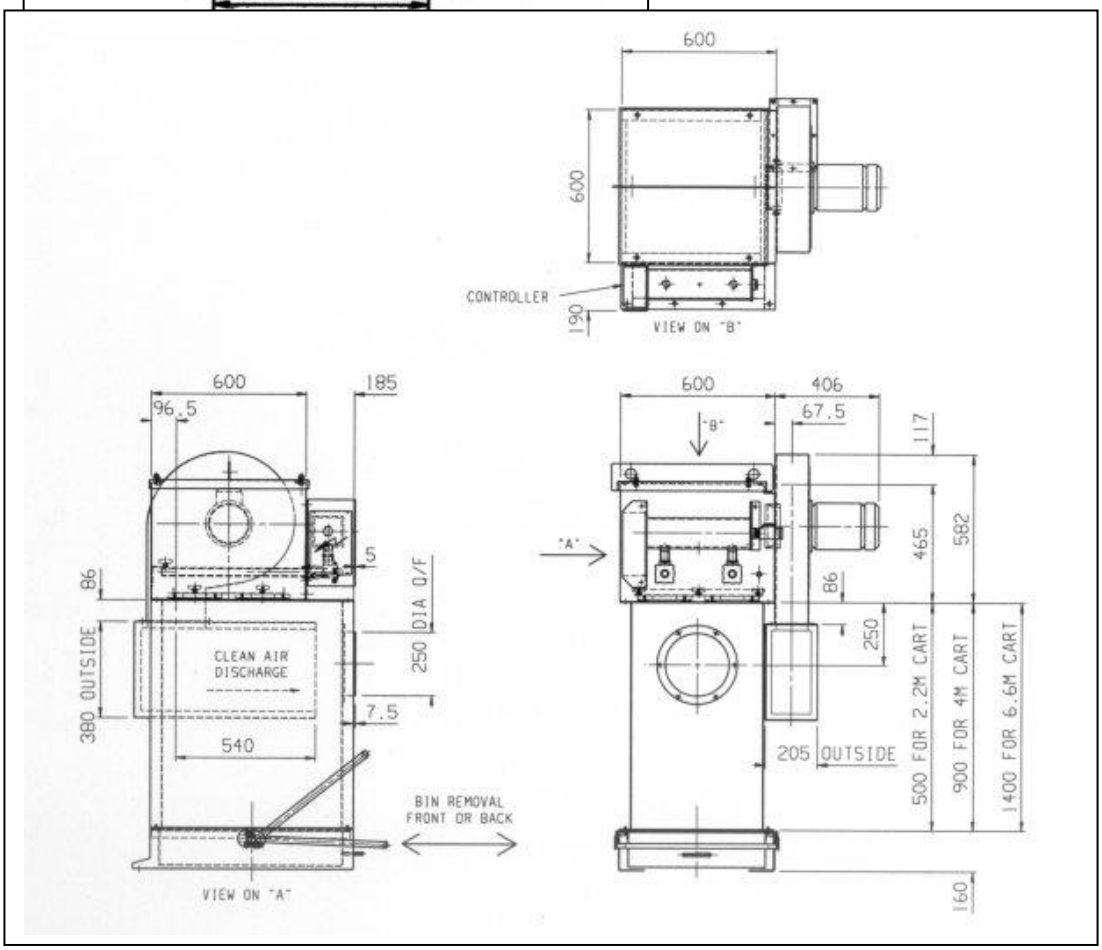
A suitable gasket or tube sealant material should be applied inboard of the base flange holes before bolting in place, to prevent leakage during normal use.



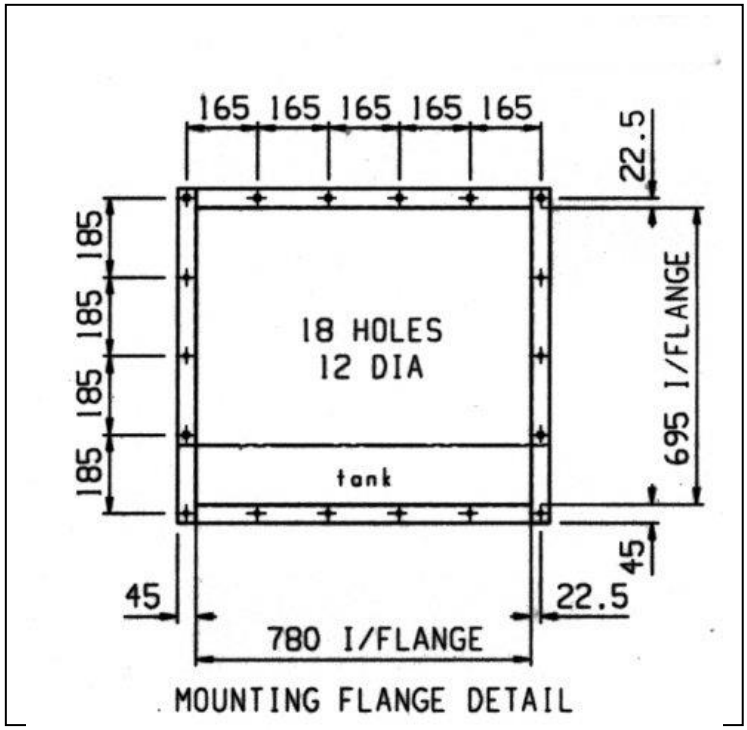
MJC Mini 9/22/22, 16/40/22 and 26/66/22



A suitable gasket or tube sealant material should be applied inboard of the base flange holes before bolting in place, to prevent leakage during normal use.

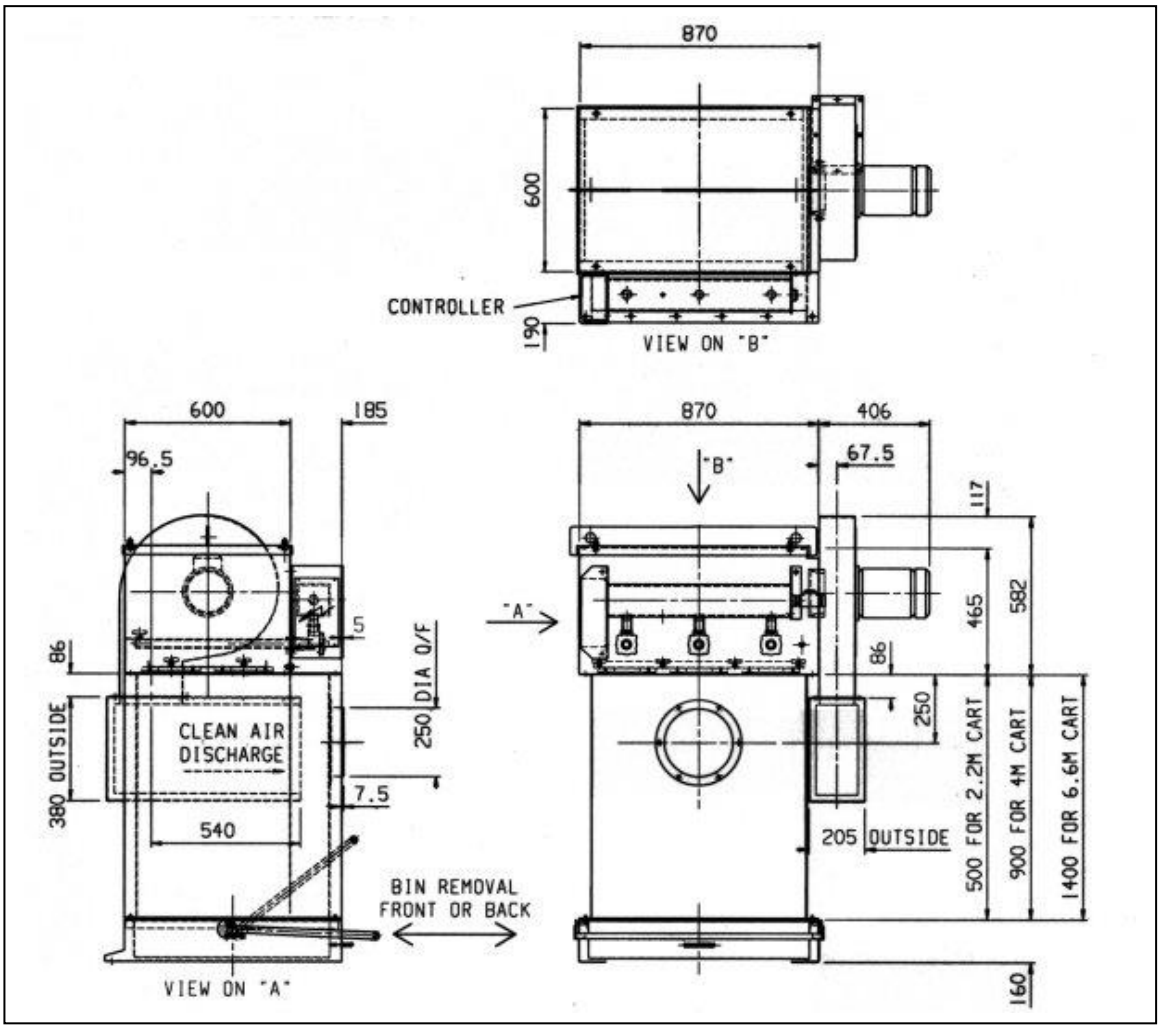


MJC Mini 13/22/32, 24/40/32 and 40/66/32



A suitable gasket or tube sealant material should be applied inboard of the base flange holes before bolting in place, to prevent leakage during normal use.

MJC Mini 13/22/32, 24/40/32 and 40/66/32 - continued



Connections – mechanical.
When the unit has been securely bolted into position, the compressed air supply for the reverse jet cleaning may be connected directly to the compressed air tank, which has a ¾" BSP female fitting.
Note that the MJC Mini 4/22/21 and 8/40/21 units have no tank, simply a pipe connection. These units are supplied with a flexible pipe with a ¾"BSP connection to facilitate access for maintenance. The compressed air system should have the capacity to operate the filter reverse jet cleaning system. Details are given below: -

Reverse jet cleaning: single 4.7 or 7.7 litre steel compressed air reservoir.
Max. working pressure: 7.0 bar.
Test pressure: 13.0 bar.

Normal cleaning pressure for cartridges: **5.5 bar g.** The compressed air should be dry and free from oil. A pressure regulator should be fitted to ensure that the pressure in the filter receiver is limited to 5.5barg. The normal working range is from 5.0 to 5.5barg. Lower pressures may result in less effective filter cartridge cleaning.

Compressed air consumption (typical): 50 Normal litres per pulse (Mini 4/22/21, 8/40/21).
60 Normal litres per pulse (all other units)
For a typical two minute cleaning cycle operating continuously, this would be equivalent to: -
3.0 Nm^3/h for the MJC Mini 4/22/21 and 8/40/21 models,
3.6 Nm^3/h for the MJC Mini 9/22/22, 16/40/22 and 26/66/22 models,
5.4 Nm^3/h for the MJC Mini 13/22/32, 24/40/32 and 40/66/32 models.

Cleaning valves:
MJC Mini 4/22/21 and 8/40/21: - combined 3/4" diaphragm / solenoid valve, 110 or 127V AC, 50 / 60Hz. 24V DC available upon request.
Number of cleaning valves: 2 Each valve services 1 cartridge.

MJC Mini 9/22/22, 16/40/22, 26/66/22: - combined 1" diaphragm / solenoid valves, 110, 127, 220 or 240V AC, 50 / 60Hz. Other voltages upon request.
Number of cleaning valves: 2 Each valve services 2 cartridges.

MJC Mini 13/22/32, 24/40/32, 40/66/32: - combined 1" diaphragm / sol. valves, 110, 127, 220 or 240V AC, 50 / 60Hz. Other voltages upon request.
Number of cleaning valves: 3 Each valve services 2 cartridges.

Reverse jet timer controls:
MJC Mini 4/22/21 and 8/40/21: - direct mounted individual timer, one per valve.
All other MJC Mini units: - 3-way printed circuit board housed in IP65 enclosure protected by a 1amp circuit board fuse.

Connections – electrical.

MJC Mini 4/22/21 and 8/40/21, no fan: -110V single phase 50 or 60Hz
MJC Mini, all other models, no fan: - 110 or 220V single phase 50 or 60Hz.

Fan, if fitted: - typically 380/415V 3-phase for any fan up to 3.0kW or optional 220/240V single phase supply for 0.75, 1.1kW fan only, as required.

If a fan is fitted, connections should be made directly to the motor terminal box. The fan motor may be up to 3.0kW (4.0kW special option). The fan case is fixed rigidly to the filter body. The fan motor should be supplied via a suitable starter/controller, such as M1 to M4 for European applications, M5 to M8 for US applications.

Method of Control.

Fan assisted units: -The filter reverse jet controller and fan should be controlled in such a way that the reverse jet cleaning and fan are energised together. At end of the duty the fan should be de-energised but reverse jet cleaning should if practicable remain run on for a few minutes. This after-clean period will be particularly useful if the dust is slightly moist or sticky.

Vent. units: - energise cleaning during duty cycle, plus after-clean as above.

OPERATION

When the filter is used for the first time, check that the reverse jet cleaning is operating correctly. Each valve should pulse in turn strongly and with similar intensity. There should be no leakage of compressed air between pulses. Initially the time interval between pulses should be set to give a complete cleaning cycle every two minutes.

If a fan is fitted, check that its direction of rotation is correct. If rotation is incorrect, the fan will provide reduced extraction but the motor is likely to run under overload conditions.

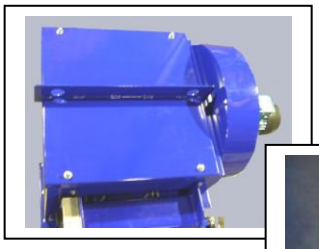
MAINTENANCE

- **Safety note:** Before commencing maintenance work, ensure that it is safe to do so. Isolate the electrical and compressed air supplies. All work should comply with national health and safety regulations.
- Wear suitable protective clothing. Refer to health and safety data for the dust materials to be filtered.

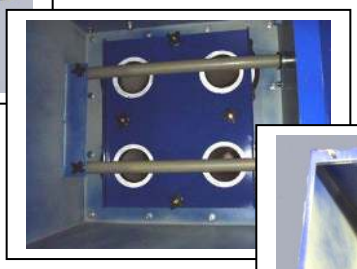
Items that may require attention during the life of the unit are the filter cartridges, the cleaning valves, the electronic controller and fan (if fitted).

Cartridge removal and replacement –

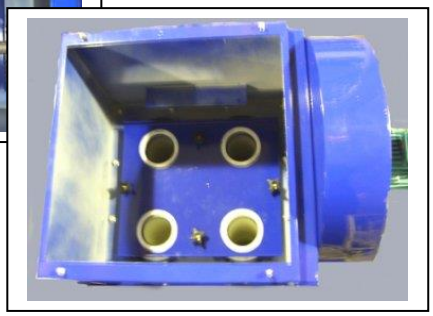
All units except MJC Mini 4/22/21 and MJC Mini 8/40/21



Remove the nuts securing the lid and lift off the lid, putting it in a safe position.



Unscrew knobs securing jet tubes and withdraw jet tubes from socket.

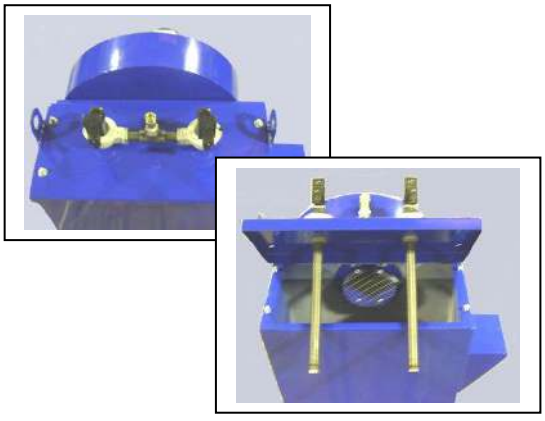


Unscrew and remove the knobs and washers from the cartridge clamping plates. Remove the clamping plates.

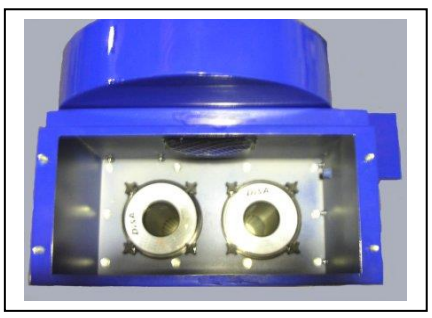
Withdraw the cartridges, shaking them first before extracting to remove excess loose material. **You are strongly advised to replace the black cartridge sealing ring before re-fitting a cartridge.**

Before replacing the cartridges, clean the area around the cartridge sealing ring location. Insert the cartridges carefully. Locate the cartridge clamping plates and screw down the clamping plate knobs firmly but evenly by hand. Do not overtighten by using a tool. Then replace jet tubes and lid. **Cartridge removal and replacement –**

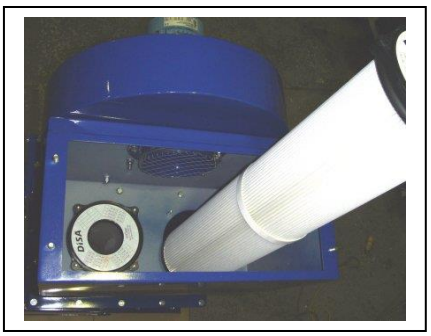
MJC Mini 4/22/21 and MJC Mini 8/40/21 only



Remove the nuts securing the lid and lift off the lid, putting it in a safe position, so that the wiring and compressed air hose are not stressed.



Unscrew and remove the knobs and washers securing the cartridges.



Withdraw the cartridges, shaking them first before extracting to remove excess loose material.
You are strongly advised to replace the black cartridge sealing ring before re-fitting a cartridge.

Before replacing the cartridges, clean the area around the cartridge sealing ring location. Insert the cartridges carefully. Screw down the four cartridge clamping knobs firmly but evenly by hand. Do not overtighten by using a tool.

Cleaning valves.
MJC Mini 4/22/21 and 8/40/21. There are two diaphragm type cleaning valves fitted directly onto the filter lid. Each diaphragm valve incorporates a solenoid pilot valve and a single reverse jet timer (see reverse jet controller below).

All other MJC Mini models. These have two or three diaphragm type cleaning valves connected to a small compressed air manifold tank secured to the side of the filter body. The solenoid valves are connected to a separate controller (see Reverse jet controller be

It is possible that a diaphragm may require replacing. To do this, isolate the compressed air supply and disconnect from the valve. Remove the diaphragm valve lid slowly after removing its securing screws. Note whether any oil or water is present. If there is, check the condition of the supply filter / separator or the compressor itself.

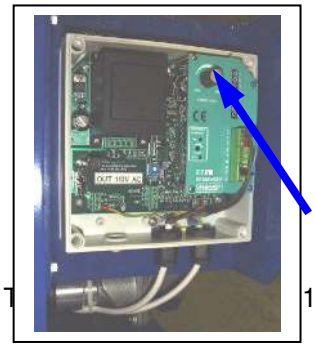
There may be a loose coil spring located on the diaphragm. Be careful not to lose this item as the unit is taken apart. When replacing a diaphragm, ensure that all surfaces are clean, to prevent subsequent leaks. Do not forget the spring, if fitted.

To remove a solenoid coil, first check that the electrical supply is safely isolated. Then remove the clip on its retaining post and slide the unit off. Remove the electrical connector after unscrewing its retaining screw.

Check wiring for mechanical damage. If any external wiring is replaced, ensure that suitable weatherproof sealing glands are used.

Reverse jet controller. (except Mini 4/22/21 and 8/40/21)

This is housed in an IP65 enclosure on the filter unit. Apart from a circuit board fuse plus adjusters for the cleaning pulse duration and interval, the timer contains no serviceable parts. If a fault occurs with the controller the complete timer board should be replaced. This is fixed in the enclosure by four screws.



When replacing this item, note carefully the positions of the electrical connections so that they may be replaced in identical positions.

It is possible that the time interval between pulses may require adjustment, if more or maybe less cartridge cleaning is required. To do this, open the controller lid and locate the circular slotted potentiometer marked “Interval”. Clockwise rotation increases the time interval. Do not adjust more than a quarter turn at a time. To check

the new setting, energise the cleaning and measure the new time interval. The maximum interval available is approximately 70 seconds.

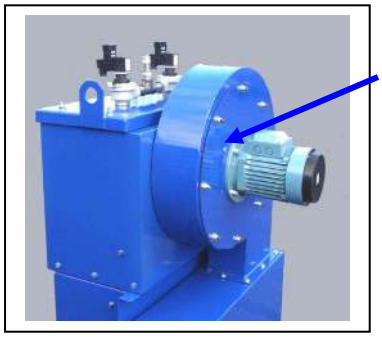
The control marked **"Duration"** should **NOT be adjusted**, as this would alter the factory setting of 100 milliseconds. This could adversely affect the cleaning performance.

Reverse jet controller - Mini 4/22/21 and 8/40/21 only.

Each valve is fitted with an individual timer. The timer has two adjustable controls. The duration control marked "ms" should always be set to 100. The other marked "min" is the time between pulses and may be set to suit conditions, but not less than 0.5 minutes.

Fan.

If a fan is fitted, it will be mounted on the side of the filter clean air chamber. Normally no maintenance will be required for the fan, but if removal is necessary, proceed as follows: -



Remove the nuts securing the motor mounting plate to the fan case.

Carefully withdraw the motor and impeller assembly from the fan case.

To remove the fan impeller from the shaft, release the nut from the shaft end and remove it and the metal washer.
Slide the impeller from the shaft. Retain the shaft key.

When re-assembling, ensure that the shaft, key, keyway and impeller bore are clean and free from debris and dust.

The inlet side of the fan is protected by a metal mesh guard. When maintaining the fan inspect the security of this item.

After re-assembly check that the fan operates freely without catching on the inlet components.

Fault location.

Fault	Possible cause	Suggested remedy
Filter becomes blocked unexpectedly	Vessel being ventilated too full, if directly mounted onto vessel	Check level probe
	Reverse jet cleaning not operating	Controller switched off or disconnected
	No compressed air pressure	Check and reinstate compressed air supply
	Timer board faulty	Replace timer board
	One or more solenoid valves not operating	Check output from timer board. If output ok, replace suspect solenoid pilot valve coil
Dust escapes from filter	Damaged cartridge or seal	Replace cartridge and seal ring
	Loose clamping plate	Remove clamping plate and its cartridges. Clean mating surfaces. Replace cartridge sealing rings and replace clamping plate according to maintenance instructions
Filter gradually blocks over a period of time	Insufficient cleaning	Reduce time between cleaning pulses
		Increase after-clean time
		Replace cartridges if they are getting old
Cleaning pulse weak	Low compressed air pressure	Restore pressure
	Diaphragm leaking	Check and replace diaphragm
	Solenoid faulty	Replace solenoid coil
For fan-assisted units, the following may apply		
Unexpectedly low fan performance	Fan rotating in wrong direction	Reverse two phases of the electrical supply at the motor terminal box.
Excessive vibration	Dust on fan impeller	Remove and clean fan – check filter for dust leaks
Excessive vibration persists	Fan impeller out of balance	Remove impeller and inspect for damage. Re-balance impeller if there is no obvious damage.

Dismantling.

At the end of its working life, the filter may be removed and dismantled. Disposal of unserviceable items may then be carried out.

To remove the unit, first isolate and then disconnect compressed air and electrical supplies. The compressed air tank (if fitted) should be discharged by carefully opening the drain tap. A flange mounted filter can then be unbolted from the vessel upstand.

- **Safety note:** The filter lid should be secured in the closed position before lifting the unit from its position.
- When the filter is lifted from its upstand, the aperture in the vessel to which it had been fixed should immediately be covered to prevent the possibility of personnel falling into the vessel.

For disposal purposes, please note the following components and their principal materials.

Filter body and lid:	Mild steel painted
Compressed air tank:	Mild steel, painted
Diaphragm valves:	Aluminium alloy, steel, rubber
Controller:	Plastics, copper, electrical circuit board

Filter cartridges: These are composed of various non-chlorinated polymer plastics and contain no metal parts. Safe disposal method will depend upon the nature of the material filtered by the cartridges as traces may remain even after thorough manual cleaning.

Technical assistance and further information.

If you require further information, clarification or technical assistance, please contact the Technical Department. On 0114 254 8811