



Cartridge filter
CFR & CFR-V

Maintenance manual (EN)

Up to 2018 - V1.0-2021

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1. Introduction

This manual cannot be reproduced, even partially, without prior written consent by Formula Air Group. Every step of the filter range has been deeply analyzed by Formula Air Group in the expected area during the design, construction, and user manual creation. However, it is understood that nothing can replace the experience, training and good sense of those professionals who work with the device.

Ignoring the cautions and warning from the present user manual, using improperly parts or the whole device supplied, using unauthorized spare parts, manipulating the device by non-qualified personnel, violation of any safety norm regarding design, construction and use expected by the supplier, exempt Formula Air Group from all responsibility in case of damages to people or properties.

Formula Air Group does not take any responsibility for the non-observance of the user about the preventive safety measures presented in this user manual.

Failure to comply with the requirements of the user manual or incorrect use of the filter during operation can lead to the damage of the filter and improper functioning of the filter itself. This will result in termination of the warranty on the item and will release the manufacturer from any liability.

Warranty

Regarding to the device's warranty, see the sales general condition.

Attention !

All drawings and references contained within this user manual are non-contractual and are subject to change without prior notice at the discretion of the Formula Air Group and its partners.

1.1. EC- declaration of incorporation

EC-Declaration of Incorporation for Partly Completed Machinery

Machinery Directive 2006/42/EC Annex IIB

The undersigned manufacturer and authorized for the elaboration of technical documentation for partly completed machinery and by due request hand over the technical dossier to the national authorities :

Manufacturer: v.Aa.Gram A/S
Klintevej4,6100Haderslev,Denmark
Tel.:+457452 30 75,Fax:+45745301 64

The undersigned hereby declare that:

Partly completed machinery: filter
Name: Gram
Type: CFR-3 CFR-3-V CFR-3-VT500
CFR-5 CFR-5-V CFR-5-VL750

Was manufactured in conformity with the following essential health and safety requirements in the Machinery Directive 2006/42/EC Annex1. The following harmonized standards were used:

EMC-Directive 2014/30/EU
Directive 2014/68/EU for pressure equipment
Low Voltage Directive 2014/35/EU
EN 12100
EN ISO 12499
EN ISO 13857
EN 4414
ISO 5801
EN 60204-1
IEC 60034-(1)-(2-1)-(5)-(9)-(14)-(30-1)

The partly completed machinery may not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with all relevant health and safety requirements in the Machinery Directive 2006/42/EC and other relevant Directives

Position : XX
Name : XX
Company : V.Aa.Gram A/S

Date : XX.XX.XXXX

XXX

(Signature)

2. General description

The filter unit type CFR & CFR-V is a partly completed machine used for separation of dust from process air at smaller tasks.

The filter unit type CFR & CFR-V may not be used in connection with ATEX-zones.

The filter unit is powder enamelled for indoor mounting.

3. Functioning

Processed air is led in over dust container in the left side and out of top. (and through the fan for fan equipped models)

3.1. Daily maintenance

The filter cartridge must be cleaned with 5 - 10 turns of Roto-cleaning after end use or at dropping extraction capacity (see system guard).

Filter unit may only be cleaned without vacuum (and with the fan stopped for models equipped with fan). Dust on filter cartridge should not stay overnight due to condensation.

Dust container is emptied according to need, but may never be filled more than max. 75% of its volume.

At work with dangerous dust a plastic bag is placed in the dust container. The surplus plastic bag is turned over the dust container (point A, page 3). When the bag must be removed, it is straightened out in its full length and is closed with 1 plastic strip, before it is taken out of the dust container to be destroyed according to governmental demands (point B, page 3). Sack must always be mounted, when a relief hose is mounted.

ATTENTION:
Make sure the perforations are not obstructed!



If sound level changes, the unit must be checked for possible defects.

Repairs may only be carried out by professional trained personnel.

4. Unit condition during operation

All doors must be closed, and dust container must be mounted correctly and locked during operation.

For Denmark (DK): Outlet must be led outside.

5. Intentional / unintentional application

The filter unit may not be used for the extraction of burning or glowing substances, like e.g. cigarettes, matches. metallic dust or chips, paper, cleaning wipes etc. Unit may not be used for larger chips and the like. For this a cyclone can be used as a coarse separator.

6. Mounting

The filter unit type CFR & CFR-V is delivered mounted on a pallet.

The filter unit is lifted off the pallet and placed on an even surface. Feet adjusting screws are adjusted so they support all at the same time. Lock-nuts are tightened against unit.

6.1. Electrical connection (for fan equipped models)

At filter unit type CFR-V with fan, the electro-motor is connected to 3x400V and earthed through the motor protection, which is correctly adjusted, as well as supply breaker for use at repairs and maintenance.

Power Code must be followed.

Filter unit type CFR-V may not be used without this connection.

System guard type L may not be connected to the same power source.



The sense of rotation must be checked. Verify the motor cooling impeller sense of rotation which must be in accordance with the arrow on the cooling plate.

BEFORE start-up, the fan impeller must be rotated manually by hand to check, whether it runs freely and does not hit the cabinet. If fan impeller hits the cabinet, it can be due to fan damages or motor has moved during transport. If it is due to damages, please contact the supplier for rectification.

Fan type	Installed power (kW)	Working current consumption (A)	Start-up current consumption (A)
VT 500	0.37	0.91	5.46
VL 750	0.75	1.67	10.02

6.2. Ducting connection

Ducting connection is made with approved ventilation pipes and possibly hard-wearing hose on inlet side.

CFR : Max. 5,000 Pa

CFR-V : Max. 40,000 Pa

For Denmark (DK) : Outlet must be led outside and finished by turned up outlet in correct height.

6.3. Filter Adjustments

Every unit is dimensioned for a specific air volume, which may not be exceeded, since it would result in filter life reduction.

Unit is dimensioned for following air volume:

_____ m³/h (Must be filled out by ventilation contractor)

_____ dust sort (e.g. grinding dust, sandblasting)

Ventilation contractor name:

_____ (Must be filled out by ventilation contractor)

7. Automatic Roto-cleaning (option)

At operation with automatic Roto-cleaning the automatic control is delivered separately. It is connected to the power grid in accordance with enclosed diagram and Power Code.

Sensor hose is closed by enclosed sensor connection piece for outlet side in filter chamber.

8. Noise data

8.1. Noise damping (fanequipped models)

Outlet noise from fan can be damped with the use of silencers.

Valid for EU (not Denmark) : Outlet silencer for recirculation can be mounted.

8.2 Noise level

Filter type	dB(A)	Filter type	Fan	dB(A)
CFR 3	approx. 65	FR 3	VT 500	72
CFR 5	approx. 65	FR 5	VL 750	73

9. Maintenance

The filter unit must be maintained 1 to 2 times a year to work optimally.

For fan equipped models, check the fan for vibrations and unusual noise while there is current in the unit.

With disconnected extraction check filter for untightness. Sealing at top plate and dust container are checked and exchanged if necessary.

Defect filters are exchanged. Do not forget correct size and quality. Washable filters can possibly be washed.

Suitable protection mask, eye protectors and protection gloves must be used (depending on dust type).

9.1. Filter element replacement

Every electric supply must be disconnected.

For manual models, the filter elements are exchanged by dismounting connection plate.

For fan equipped models, the Filter elements are exchanged by dismounting fan.

DO NOT FORGET to move Roto-bar with plastic strips.

Dimension must be correct, and quality must be fitted according to task.

The used filter elements must be disposed of according to governmental demands.

9.2 Filter element cleaning

Filter elements G101, G113 & G116A can be washed are dismounted. Filter cartridges are washed with high pressure cleaner at max. 50°C hot water. Possible soap **WITHOUT** detergent.

Other Filter material **ARE NOT** washable.

Nozzle distance: 30 - 50cm (DO NOT FORGET: wide spread)

You wash the dirt from the dirty air side of the filter, so the net supports the filter cloth.

Filter elements must be completely dry before operation.

New filter elements must in dimension be equal to original cartridge. Filter cloth quality must be according to filter job. Original type of filter elements can be seen on machine marking.

9.3 For fan equipped models

9.3.1 Fan maintenance and repair

At service maintenance personnel must be aware of hot surfaces - especially the electro motor.

At service take care that fan impeller does not rotate (check motor cooling wing), even though power is cut off.

Fan maintenance personnel must be aware of the dangers with fan service and those substances that the fan possibly transports.

During service you must be aware of the fact that the fan impeller can be very sharp and can rotate in connection to motor.

9.3.2 Fan service check

Below you find those points that have to be checked at service.

At service please check the following:

- Whether fan impeller rotate correctly according to rotation arrow marking.
- Whether fan impeller is in balance during operation.
- Check whether fan impeller is dirty (this can cause unbalance), if yes:
Remove it through washing, brushing or scraping. Be careful: do not damage the impeller.
- Check whether no desired foreign matter is present in fan impeller or housing, if yes:
Remove it and find cause.
- Check whether electrical connection is intact.
- Clean on and around fan.

9.3.3 Minimizing environmental impact as well as ensure optimal life expectancy

To obtain optimal conditions for the fan the following is important:

Vibrations

- Ensure that no unusual vibrations occur
- Ensure that fan impeller is without dirt and in balance

Noise

Mechanical noise and channel noise should be reduced to a minimum in order not to have an impact on the surroundings.

To dimensioning the optimum noise reduction exact frequency band measurements can be stated regarding the mechanical noise and channel noise of the fan. This information can be requested to FORMULA AIR for the operational point in question.

Unwanted noise can easily occur in channel connections and flexible connections - especially at leakages. This should be reduced to a minimum.

Energy consumption

It is very important only to extract the necessary air volume at the necessary vacuum to reduce the energy consumption. This can be regulated with a regulating damper which moves with the use of frequency converters with PID-regulation.

Leakage in piping as well as pollution in piping will always cause increased energy consumption as well as possible noise.

Electro motor surface must all times be kept clean, and cooling air access may not be hindered, since this will increase the energy consumption.

Extracted air from a heated room may not exceed the necessary air flow, as well as the use of a heat exchanger can reduce the energy consumption of the complete unit.

9.3.4 Exchanging the fan impeller

At disassembling you must take care that fan impeller is not rotating (check motor cooling wing) and that current is disconnected and dismantled.

Personnel that disassembles fans must be aware of the dangers at fan disassembling, where dangerous substances or gases can be present in fan housing.

Motor flange, motor and impeller are taken off fan housing. impeller locking screw is loosened. Fan impeller can be pulled off and replaced by new original impeller.

If motor must be changed, it is loosened from motor flange. Electro-motor may only be exchanged with similar type. After ended service all bolts and washers must be mounted again and tightened up.

Always use suitable lifting gear, hand gloves and suitable personal protection.

9.3.5 Irregularities

In case of unbalanced fan impeller we recommend that you send the impeller (motor + motor flange and fan impeller as complete unit) to our factory for balancing. Do not forget to inform us that you request us to balance the fan impeller. Submitting requires a case number, before we can handle the case.

Irregularities can normally be found through changed noise picture and changed pressure.

Changed pressure can be seen directly as alarm on statutory control device (valid for Denmark) for process ventilation units.

10. After maintenance

After the maintenance operations are completed, make sure that all electrical and pneumatic connections are established.

Test and control the filter unit before operation.

11. Dismantling and recycling

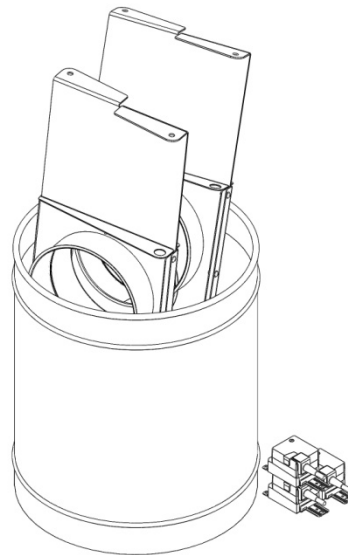
When dismantling a unit, be sure to keep in mind the following important information:

- As the unit is dismantled, set aside all still functioning parts to re-use them on another unit.
- You should always separate the different materials depending on their type: iron, rubber, oils, greases, etc...
- Recyclable parts must be disposed of in the appropriate containers or brought to a local recycling company.

The rubbish must be collected in special containers with appropriate labels and disposed of in compliance with the national laws and/or local legislations in force.

CAUTION !

It is strictly forbidden to dispose of toxic wastes in municipal sewerage and drain systems. This concerns all oils, greases, and other toxic materials in liquid or solid form.



12. Maintenance log

date	description



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