Formula Air
Supporting your performance

CJF – Cartridge filter

Maintenance manual

Table of contents

1. EC- declaration of incorporation

EC-Declaration of Incorporation for Partly Completed Machinery

Machinery Directive 2006/421EC 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: Cyclone filter

Name: Gram

Type: CJF 13 (04 505 000)
CJF 26 (04 506 000)

Was manufactured in conformity with the following essential health and safety requirements in the Machinery Directive 2006/421EC Annex1:

The following harmonized standards were used:
ISO 14121
EN/I.S013857
EN60204
EN1127-1

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

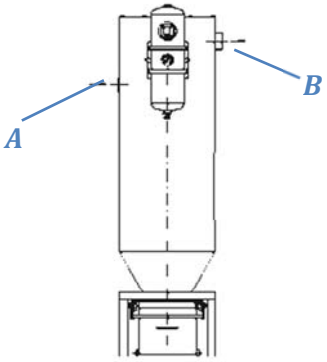
Date : XX.XX.XXXX

(Signature)

2. General description

The cyclo-filters type CJF are units used for the separation of dust from processed air.
Standard surface treatment in enameling and powder enameling for outdoor execution.
Only ATEX-Zone XX-marked unit may be used in explosion dangerous environments.

3. Functioning



Processed air is led in through the side in the lowest connection, where after the air passes in the pre-separator and filter elements. Air leaves unit on the other side in upper connection.

Filtered material is collected in an emptyable dust container.

3.1 Daily maintenance

Differential pressure (display) or watch is monitored daily. The pressure may not exceed 2,300 Pa. However, with filter elements G115A and G116A, this may be increased up to 3,000Pa.

Dust container is emptied according to need, but may never be filled more that 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. When the bag must be removed, it is straightened out in its full length and is closed with 1 pcs. strips, before it is taken out of the dust container to be destroyed according to governmental demands. Sack must always be mounted, when a relief hose is mounted.

Repairs may only be carried out by professional trained personnel. Jet valves must be kept clean of dust.

4. Unit condition during operation

All filter doors must be closed and secured.

The dust container must be mounted and locked correctly during all steps of filter operation.

5. Intentional / unintentional application

Cyclone filter type CJF may only be used for dry dust without sparks. Filter unit may not be used for larger chips and the like. For this Gram cyclone type CY is used as a coarse separator.

In ATEX-zones only units may be used that are marked for the same zone. Filter units can- not be converted to another zone.

Repairs may only be performed with original spare parts.

6. Mounting

The cyclo-filters type CJF 13 – CJF 52 are delivered completely mounted, laying down on pallets.

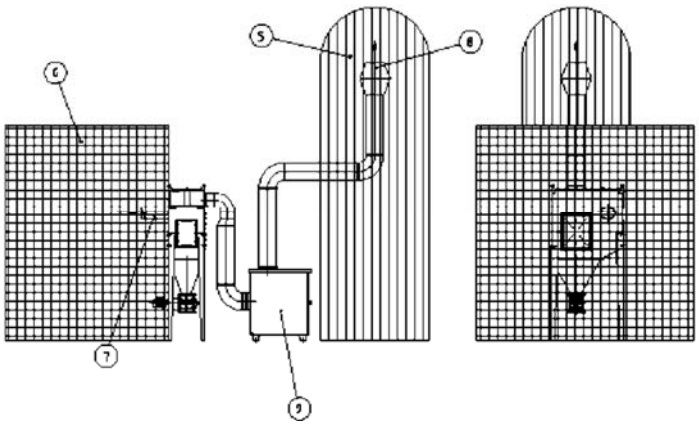
All the CJF filters are bolted to the pallet to ensure a safe transport. Check that all bolts are removed when removing from the pallet.

Lifting hooks are placed on the top of the unit for an easy handling during placement.

Note that these filters have to be bolted to the ground on an even surface before operation.

6.1 Filter placement

At cyclone filter placement the environment and fire demands must be considered. At EX- unit mounting the danger zones must be taken into consideration



Note : Zone range 5 is intended as a guide, normal radius of 1000mm around the outlet.

Zone range 6 depends on the dust type and the concentration of it.

6.2 Electrical connections

Electrical connection for TEC-33-N or differential pressure control type BA are made in the control box, which is connected to 230V, 50Hz and earth.

DO NOT FORGET to close the control box firmly after mounting. Humidity can destroy the print.

Connection must be in accordance with the Power Code and must be breakable from supply.

Electrical connection must be active for so long after operation with BA-control as the after- cleaning takes. The control box diagram is enclosed.

For ATEX-units the special rules in the Power Code must be followed. And for ATEX-units all parts must be securely earthed. Where there is a dust container, this must also be earthed.

6.3 Compressed air connection

The compressed air connection must give min. 5.5 - max. 6.0 bar dry compressed air. The connection is made at the end of the header tank. A reduction valve and water separator from Gram order no. 04 493 500 (½") can be advantageous.

6.4 Ducting connection

The ducting connection must be made with approved ventilation pipes.

For ATEX-units, it must be secured that piping cannot be blown away at a possible explosion.

6.5 Rotary valve (optional)

The rotary valve must be securely mounted on the unit and it must be airtight. It must be in operation at the start and during the running of the filter unit.

6.6 Adjustments

Every filter unit is dimensioned for a certain workload which may not be exceeded as it would result in an improper function of the unit or a premature lifespan.

The unit is dimensioned following the following criteria's :

_____ Maximum air volume

_____ Type of dusts

Type of fan :

Type of cartridges : cartridges G1xx / ø225x1000 mm Polyester

Total surface area: xx m²

6.7 Controller

Cleaning cycles are done with the controller typeTEC33-N, preprogrammed at production. The parameters of opening time of the valve and the time between two cleaning cycles can be adapted according to the needs of the unit, de type of dust and the frequency of use.

1. Connection:

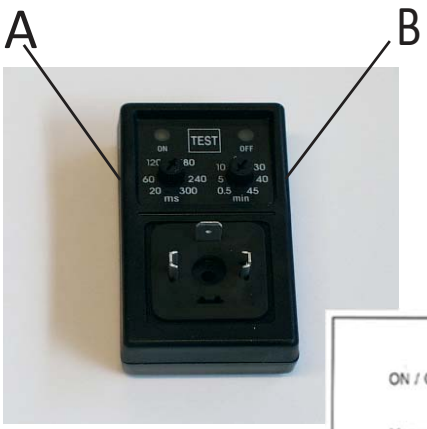
- The controller TEC3–N is directly mounted on the electro-valve.

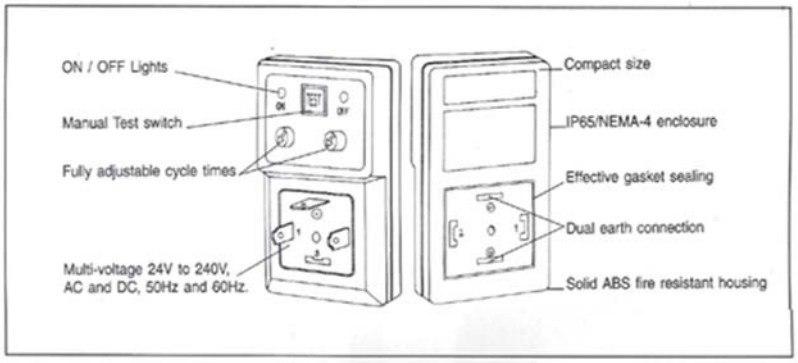
- The electrical tension is 24 - 240VAC/DC.

2. Regulating : (see picture)

- Control « A » changes the signal length on the output. Possible from 20 and 300 ms. The basic set value is 170 ms.

- Control « B » controls the time interval between the cleaning (0.5-45min.)





6.8 Differential pressure control

The cleaning of the cartridges can be done with a differential pressure control type BA programmed by V.Aa.gram A/S.
The unit is operational on delivery of the filter. The unit will indicate the first differential pressure control when it is at minimum 200 Pa.
See point 10 for the modifications to the basic settings.

7. Noise damping

Average noise level excluding cleaning shot cycles : more or less 75 dB (A)

Average noise level including cleaning shot cycles : more or less 85 dB (A), this can be brought down to 75 dB (A) if an acoustic booth is placed on the header tank.

8. Maintenance

Filter unit must be maintained 1 time a year to work optimally.

Differential pressure settings are checked (see instructions for differential pressure control type BA/filter control type TEC33-N in the back of these instructions). Differential pressure may not exceed 2,300Pa (3,000Pa with filter material G115A and G116A) at max. set operation point for air volume.

At filter control type TEC33-N it is read on differential pressure manometer.

Check that all valves shoot correctly. If the valves are checked with open clean air chamber, you must use ear defenders for 95-110 dB(A) (SNR=35).

With electrical supply removed check the tightness of pipe connections, tank and valves. Tank is emptied for water through connection.

When compressed air is disconnected, check clean air chamber for possible dust.

If dust occurs, check filter sealing and filter elements for tightness between elements. Sealing at doors and dust container are checked for damages - possible defects are corrected, of if necessary seals are replaced.

At filter defects, tight filters that cannot be washed (G105 and G104A), or worn-out filters must be replaced. Use protective clothing, gloves, and respirator with filter adjusted according to work place dust type.

Filter cartridge durability is variable, depending on circumstances like filter stress, dust type and volume. Filter cartridges get blocked with time due to very fine particles that attach themselves to the fibers.

Also be aware whether compressed air operates with defect pressure reducing valve with water separator. This means an internal dirtying of filter cartridges. Under normal circumstances there will be a certain dust layer on the outside of cartridge,

even after compressed air cleaning. This layer increases the filtration capacity and the differential pressure.

If noticeable capacity reduction occurs, we recommend cartridge cleaning with high pressure cleaner (see point 8.2).

Every filter cartridge is mounted with bayonet grip attached with 3 bolts in filter mounting plate.

8.1. Cartridge replacement

Every electric supply must be disconnected as well as pressure tank emptied for air before filter replacement from clean air side. Top lid of filter units is dismounted. Pressure tank is dismounted. The 3 bolts in bayonet grip on filter cartridge is loosened and filter cartridge can carefully be pulled up.

At filter cartridge handling containing dangerous/health-hazardous dust you must be aware of personal precautions that protect the operator in the time of dismounting. The used filter cartridges must be securely packed and disposed of according to governmental demands.

When mounting new filter cartridges, ensure that the included rubber seal is correctly placed in the therefore designed groove on filter cartridge flange so that seal is between filter cartridge flange and filter mounting plate. Mount cone from the old filter cartridge.

8.2 Cartridge cleaning

The filter cartridge type G103 can be cleaned, after having been dismounted from the filter as described in the procedure point 8.1. These can be cleaned with a high pressure cleaner with a maximum temperature of 50°C. Soap without detergent can be used if needed. Place the cleaner nozzle at a distance of 30 to 50 cm from the cartridge (on WIDE spread). Only clean the outside of the cartridge.

The fitter cartridges G104 and G105 cannot be cleaned.

The cartridges must be completely dry before reinserting them in the filter unit.

8.3 Jet valve exchange / repair

Exchange may only take place, when supply and compressed air are not connected to unit, and compressed air tank is emptied by compressed air connection.

Coil, membrane and valve top are exchangeable by disconnecting electric plug, where after 4 pcs. M6-bolts are loosened and new coil and membrane are mounted.

9. After maintenance

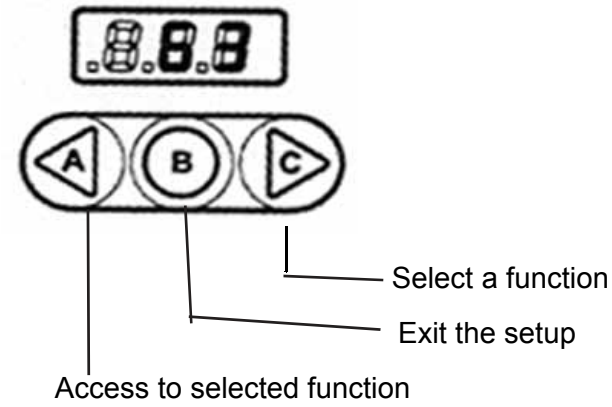
After the maintenance operations are completed, make sure that all electrical and pneumatic connections are established.

Test and control the filter unit before operation.

10. Differential pressure control - type BA

In operation mode :

Press «C » to Scroll through the functions.



Mount the differential pressure control in a suitable location.

Electrical connections :

See diagram furnished with the controller. Display will light up once connected.

DO NOT FORGET : clamp 14 & 15 must be short-circuited (jumper) for the activation of the dP program.

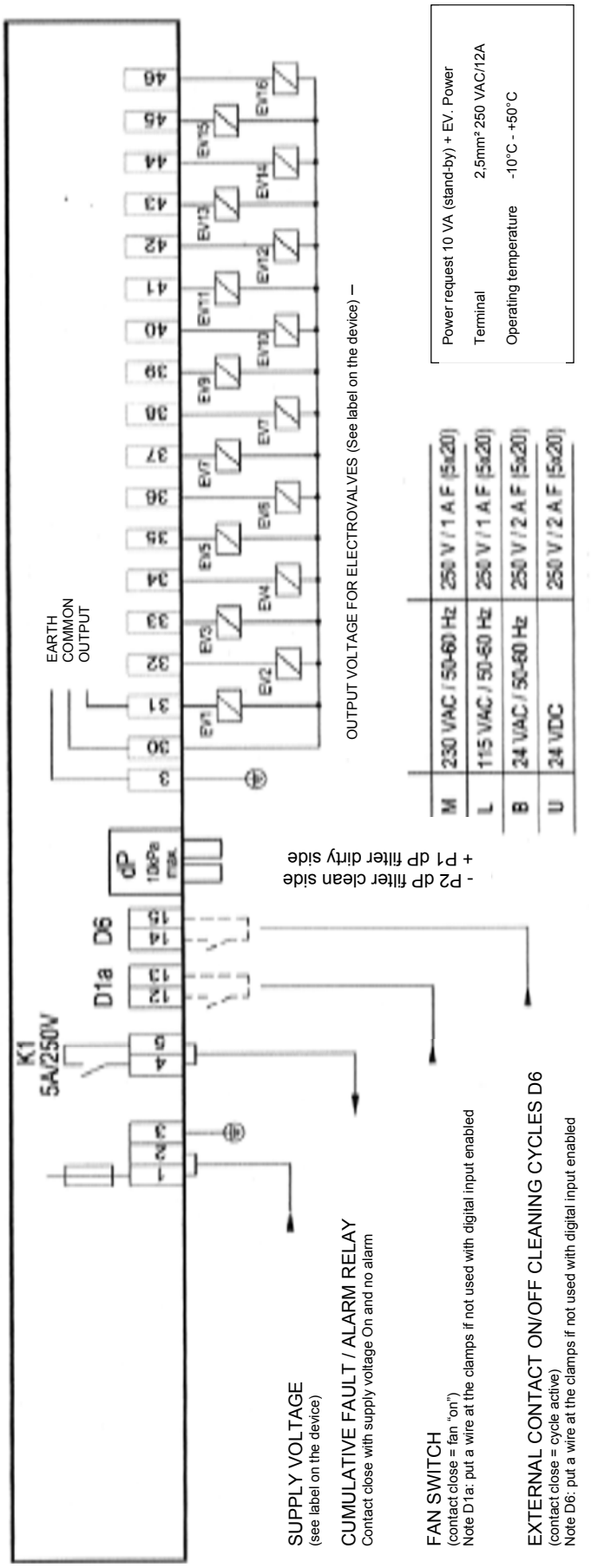
Setting operation data :

1. Press C to enter the menu. Function « F01 » is displayed on the screen.
2. Press A to enter in the function.
3. Press A or C to increase or decrease the value of the function.
4. Press B to go back to the functions menu.
5. Press C to move forward in the functions menu.
6. Repeat points 2 to 5 until function 13 is established.
7. Press B to leave the set-up menu.

Function	Description	Recommended value
F01	External start/stop - signal “0” / differential pressure control “1”	1
F02	Pulse time 0.05 - 5.00 seconds	0.24
F03	Pulse time 1 - 999 seconds	20 - 40
F04	Define number of valves (0 - 16)	See model
F05	Other cycles after fan stops (0 - 99)	15
F06	Manual activation of each valve. Press C selection; press A to activate	-
F07	Activation of dP program	1
F08	Output voltage	24V
F09	Zero adjustment“0.00”of the dP value at first unit start	0
F10	Set stop cycle cleaning in min. dP	0.60
F11	Set start cycle cleaning in max. dP	0.90
F12	3rd threshold – alarm max. dP used with relay K1	2.3
F13	Fan control - “0” by switch / “1” by pD reading	1

Standard description

Code	Description
B1a	**MANUAL SELECTION OF NUMBER OF OUTPUTS / ELECTRO-VALVES BY KEYBOARD** Every EDABUS line can drive up to 32 RED modules. If over 32, the activation of the RED modules will automatically switch from one line to the next one.
B2x	**SET ACTIVATION TIME FOR EACH OUTPUT FROM 0.05 TO 5.00 SEC.**
B3x	**SET INTERVAL TIME BETWEEN TWO ACTIVATIONS FROM 1 TO 999 SEC.** If the pulse time is lower than 1 sec. it is possible to set any interval time value in the range indicated. If the activation time is higher than 1 sec. the minimum settable interval time is: Minimum interval time = 5 times pulse time (B2x)
B8a	**SHORT CIRCUIT OUTPUT PROTECTION** In case of short circuit, the output is automatically shipped, relay K1 - normally active - is deactivated and the terminal board contact opens. The display alternatively shows code E1 and the number of the faulty output. Press key B to reset the alarm.
B10	**MANUAL ACTIVATION OF EVERY SINGLE OUTPUT** From the keyboard you can manually and individually activate every single output for a operation test. Press key A to select the output you wish to activate. Press key C to activate the output.
C0	**INPUTS ACTIVATION FROM KEYBOARD** In Set up you can activate or deactivated the control of all the inputs of the device. If inputs are deactivated, they are considered as always closed and no jumper is required on the terminal board. Use a jumper for unused
C1d	**DIFFERENTIAL PRESSURE DIGITAL CONTROL** With dP control active (set F07), the cleaning cycle starts and stops according to the dP reading. With dP reading under the STOP threshold the cleaning cycle stops and the display shows dP reading and letter P alternatively. The cleaning cycle stop is at the end of the cycle. With dP reading over the START threshold the cleaning cycle is able to start.
C3	**DIFFERENTIAL PRESSURE READING BY INTERNAL TRANSDUCER (max. 10 kPa)**
C7d1	**MAXIMUM dP ALARM WITH ALARMED OPEN CONTACT AND AUTOMATIC RESET** If the dP readout is above the threshold in Set up, the maximum dP alarm is activated. The display shows the alarm condition code E7 (see the alarm description) or the dP readout and the letter H alternatively, according to model. The corresponding alarm relay will signal its condition. The alarm is automatically reset when the dP readout is below the alarm thresh- old again. The activation of this alarm is delayed by 20 seconds by default.
C8	**ZERO dP READING AJDUSTMENT** In this Set up code it is possible to adjust the zero reading of differential pressure. In this function the display shows the dP reading and, with plant stop or air pipes not connected if the dP reading is not 0.00 kPa it is possible to adjust it by key A or C.
C13_10	**dP READING FULL RANGE 10 kPa** Maximum differential pressure measurable by the sequencer 10.00 kPa = 100.0 mbar = 1012 mmH2O With dP reading over 10 kPa the display shows “E” instead of the numeric value of dP.
D1ab1	**ADDITIONAL POST-CLEANING CYCLES AFTER THE STOP OF THE FAN** In Set up you can select the mode intended to manage the fan and the post-washing cycles: SET = 0 If you connect a voltage-free auxiliary contact of the circuit intended to drive the fan with the timer, you can add a pre-set number of washing cycles after the fan stop. Their number can be set from the keyboard from 0 to 99. Post-cleaning cycles can be also activated when the C6 contact is open. If the D1a contact is open, the display will show “-0-” and signal that the cycle is not working because the fan is off. The decimal points on the display will flash on and off during the cycles after the fan stop. NOTE D1a: Connect D1a by means of a jumper, if it is not used with active inputs (see F01). SET = 1 If the dP control is activated, you can add a pre-set number of washing cycles after the fan stop. Their number can be set from the key- board from 0 to 99. The timer will automatically recognize the fan state by comparing the dP readout with a 0.20 kPa fixed threshold: dP > 0.20 kPa = fan on, dP < 0.20 kPa = fan off. Post-cleaning cycles will be activated even if the dP readout = 0. If the fan is off, the display will show “-0-”. The decimal points on the display will flash on and off during the additional cycles. Post-cleaning cycles will be activated only if the dP readout should reach the cycle STOP threshold value during the normal operation
D6	**ON/OFF CLEANING CYCLE BY EXTERNAL VOLT FREE CONTACT** If contact D6 is open, the cleaning cycle is not enabled and the display shows “OFF”. By closing D6, the cleaning cycle can start from the first electro valve. NOTE D6: Use a jumper for D6 if it is not used with active inputs (see F01).
G1	**MAXIMUM LOAD POWER FOR 25W OUTPUT FOR MAX. 5 SEC.**
HV	**INPUT AND OUTPUT VOLTAGE SELECTION BY JUMPER JP1, JP2, JP3 ON THE BOARD** Use the jumpers on the board to select the supply voltage and the output voltage for the electro valves (see the plates on the sequencers). JP1: Supply voltage selection between 115VAC and 230VAC. JP2: Output voltage selection between 24, 115, 230V (Only with 115 VAC or 230 VAC power supply). JP3: Output voltage selection between AC and DC only with JP2 set to 24V. ATTENTION: Set F08 to the same output voltage that has been selected by means of the jumpers to adjust the short circuit trip thresh- old. Otherwise, this might cause any malfunction or damage to the sequencer.



PLEASE NOTE!

Turbo differential pressure control type BA is connected to constant current and is not cut off with fan or the like.

Operation

When power is on, cleaning cycle will start, if all necessary conditions for operation are present.
OFF Cycle stops for cleaning, consent is missing (D6 open).
-0- Cycle stops for fan OFF (D1a open).
1.00/P Cycle stops for low dP (display blinks).
A01 Number of activated electro valves.
... Cycles after fan stop active (blinking points).
1.23 Differential pressure reading (kPa).

E dP reading above 9.99 kPa.
Key B = Alarm reset
Key C = Access to set-up.

11. Dismantling and recycling

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

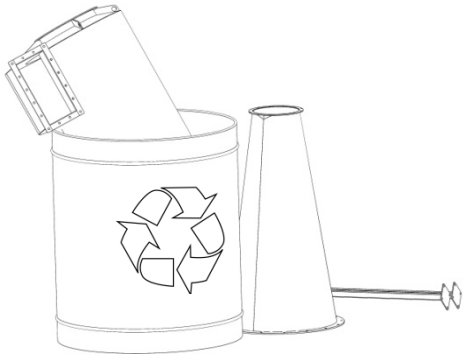
As the unit is dismantled, set aside all still functioning parts in order to re-use them on another unit.

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. Spare parts

For spare parts please contact Formula Air Group.

Formula Air
The Netherlands
Bosscheweg 36
SX 5741 Beek en Donk
The Netherlands
Tel: +31 (0) 492 45 15 45
Fax: +31 (0) 492 45 15 99

info-nl@formula-air.com
view Google Map

Formula Air
Belgium
Rue des Dizeaux 4
1360 Perwez
Belgium
Tel: +32 (0) 81 23 45 71
Fax: +32 (0) 81 23 45 79

info-be@formula-air.com
view Google Map

Formula Air
Baltic
Televizoriu G.20
LT-78137 Šiauliai
Lithuania
Tel: +370 41 54 04 82
Fax: +370 41 54 05 50

info-lt@formula-air.com
view Google Map

Formula Air
France
Zac de la Carrière Doree
BP 105, 59310 Orchies
France
Tel: +33 (0) 320 61 20 40
Fax: +33 (0) 320 61 20 45

info-fr-nord@formula-air.com
view Google Map

Formula Air
Est Agence France
2, rue Armand Bloch
25200 Montbeliard
France
Tel. +33 (0) 381 91 70 71
Fax +33 (0) 381 31 08 76

info-fr-est@formula-air.com
view Google Map

Formula Air
France Agence Ouest
19a rue Deshoulières
44000 Nantes
France
Tel. +33 (0) 251 89 90 75
Fax +33 (0) 251 89 94 06

info-fr-ouest@formula-air.com
view Google Map

Formula Air
France Agence Sud
Chemin de Peyrecave
09600 Regat
France
Tel: +33 561 66 79 70
Fax: +33 567 07 01 09

info-fr-sud@formula-air.com
view Google Map

Air Formula
Russia
Нижний Новгород
Россия
Tel: +7 (499) 609 23 45
Fax: +7 (831) 277 85 38

info-ru@formula-air.com
View Google Map

Formula Air
Vietnam
33, Lot 2, Den Lu 1
Hoang Mai District, Hanoi,
Vietnam
Tel: +84 (4) 38 62 68 01
Fax: +84 (4) 38 62 96 63

info@vinaduct.com
www.vinaduct.com
View Google Map

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