
User and Operation instructions

for

CIPRES filters type GH and V

DCP

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1. General

The CIPRES envelop filter CARM GH / V is developed for the extraction and filtration of dust. The amount of air, dust load and physical and chemical properties are important for the choice of the filter.

This technical documentation should help you to get known with the filter CARM GH / V in a better way and to help you to make the best use of it. Beside that it gives important instruction for a safe use of the filter.

Therefore it is of importance that these instructions are read by any person working with the filter.

The handed over instructions are only given to buyers of our filters. It is not allowed to duplicate them or to give them to third parties.

Claims in relation with the scope of supply can not be inverted from this documentation.

2. Warranty conditions

For every filter a warranty of one year is applicable. As supplier we guarantee the working if used in a proper way.

The warranty will be void if during the warranty period:

- modifications are made to the filter
- the filter is used for other purpose
- the instructions are not followed
- damage on the filter is repaired without informing us first.

For warranty questions and for spare parts you can apply to Dust Control Partners B.V., Almere.

3. Transport instructions

The filter will be shipped in one or more parts. For transport the parts are placed on pallets or wooden blocks. The filter has to be transported by qualified personnel with the proper skills and experience.

4. Technical description

For the technical description we refer to the order acknowledgement.

Depending on this document the following configurations are possible:

- standalone or insertable
- fan mounted on the air outlet side, supported by means of dampers.
- optional an additional acoustic diffuser can be supplied with the fan.
- de filter envelops are fitted rectangular to the seal plate and, if applicable, can be accessed through an inspection door.
- filter housing can be supplied with a hopper and supports.
- hopper can be fitted with a rotary valve, conveying screw or one or more dustbins.

5. Operation description

5.1. Description filtering principle

Contaminated air flows from the dirty air chamber, through the filter envelopes, into the clean air chamber of the filter. The filtration direction on the envelopes goes from the outside to the inside. In this way the contamination or dust will stay on the outside of the filter envelop and will build up a dust cake.

The filter envelopes will be cleaned by the reverse jet pulse cleaning system. The membrane valves, which supply the reverse jet pulses, are actuated by an electronic controller. Interval time and pulse duration are adjustable for sequential cleaning. Alternatively, in case the Δp -control option is supplied, values can be set to create a band wide in which the cleaning system will operate.

A slide pulsation of the filter housing can be noticed during the cleaning sequence. The extent of the pulsation depends on the interval time and pulse duration.

The filter must be supplied with compressed air. The compressed air must be free from oil and moisture. The preferred pressure for the cleaning system depends on the filter type and is given in the enclosed order acknowledgement. If the pressure of the supplied compressed air is higher than the preferred pressure, a reducing valve has to be used between the air tank of the filter and the compressed air supply.

5.2. Description controller

The basic function of the controller is to actuate the solenoid valves. On their turn the solenoids will open the membrane valves, which will guide the compressed air to the jet tubes in the filter. To establish a continues filtration process, the filter envelopes are cleaned one at the time. If the process conditions are not changed, the pressure drop over the filter will nearly stay constant.

Pressure drop over the filter envelopes can be visually monitored with a manometer. If the contamination grows the pressure drop will increase. It is necessary to record the pressure drop value at startup and after a reasonable period of operational time.

The controllers mains are 230V AC or optional 24VDC. The operation voltage is 24VDC as well as the outgoing signals to the solenoid valves. Depending on the filter type, the controller is able to actuate 5 to 20 solenoid valves. To set the interval time and pulse duration, two adjustable voltages dividers can be found on the circuit board.

The controller comes in a solid plastic housing IP65 with a transparent front.

If the Δp function on the controller is utilized, the controller will switch between two interval times, which can be set manually. For the Δp function a separate Δp - switch has to be connected tot the controller.

6. Mains

With regards to safety rules all other electrical equipment, e.g. like electric motors for rotary valves and conveying screws, have to be connected according to the local standards.

Common mains for the controller on behalf of the cleaning system are normally 230V AC, 50 Hz.

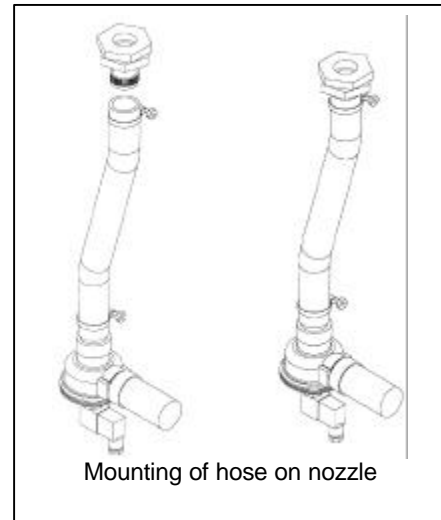
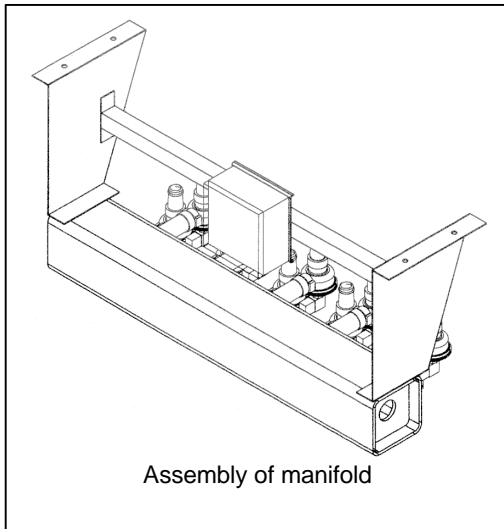
It is recommended to have the cleaning system, rotary valves and screw conveyers running for 2 to 5 minutes after the fan has been powered down.

7. Erection instructions

- Erection and commissioning of the filter equipment must be performed by well instructed personal.
- Sealant has to be used between flanges of separate parts.

Remark: In case the filter is supplied in separate module, sealant also has to be supplied between the flanges of the seal frames.

- When placing the connection hoses between pulse valve and CARM GH filter we recommend to shift the hose and clamp simultaneous over the nozzle under need the GH-filter section.



- All electrical connections have to be performed by a recognized electrician.
- The filter equipment may only be placed on a suitable floor, which is able carry the weight of the equipment. The filter must be placed level and, in case of an outside erection, a solid foundation must be applied.

Remark: access doors, inspection doors and the manometer must stay clear at all times for inspection and maintenance purposes.

8. Commissioning

Before commissioning the following matter must be checked:

- Is all concerning equipment installed in the correct manner.
- Is compressed air supply operational and installed properly

Remark: If the filter is connected to a new installed connection, make sure the connection is clean and free from dirt on the inside.

- Are all electrical connections made properly

Remark: Check if thermal fuses are installed for the correct capacities of the concerning electric motors.

- If the filter equipment is supplied in separate parts, all parts have to be checked on correct mounting.
- Close doors and hatches
- Does the sealer gear fit well on the dustbin (air tight)
- Are the conditions of the compressed air conform the demands as described in the order acknowledgement
- If possible check pressure safety valve
- Record pressure drop over filter
- In case of Äp cleaning, check values for maximum and minimum pressure drop.

9. Operation and service

During operation it is very important to check the operation conditions from time to time. It is also important to check the pressure drop over the filter to see if the filter is working properly. If the pressure drop is too low, there is a strong possibility that one or more of the envelopes is defective. If this is the case, the envelopes are to be replaced immediately.

If the pressure drop over the filter settles on a high value, the interval time, pulse duration and the pressure of the compressed air needs to be checked and or adjusted. If these values are not set properly, there is a change that the filter cake on the envelopes will be too thick.

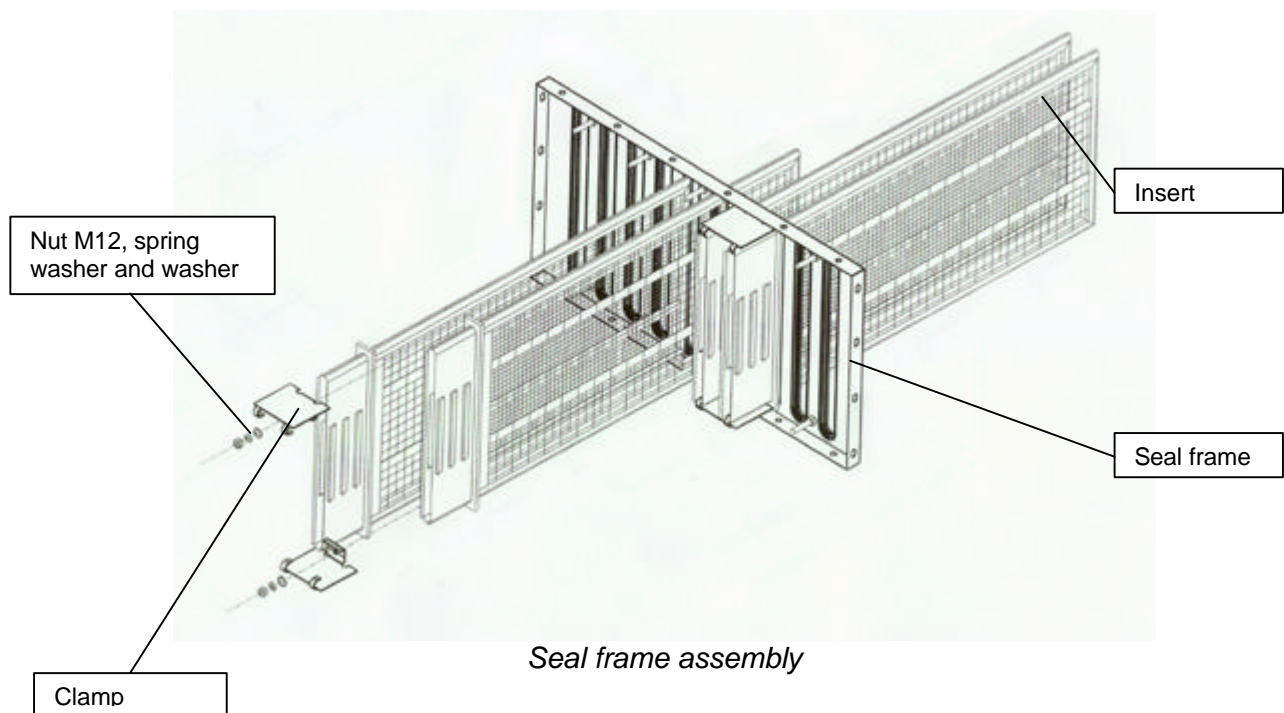
If the above mentioned parameters are set correctly and the pressure drop over the filter will not go down, even after a couple of cleaning cycles, the envelopes need to be replaced.

9.1. Changing the filter envelopes

- open access door or access hatch
- take away the jet tubes
- take away the insert clamps
- take out the inserts with envelopes
- exchange the envelopes in the inserts

- place the inserts with envelopes
- place and tighten the clamps
- put the jet tubes in place and check if they are tightened properly
- close all access doors and hatches

Remark: make sure the hard smooth side of the filter envelopes is on the outside when placed on the inserts.



9.2. Maintenance of the filter

The filter equipment does not need extra maintenance precautions. The maintenance only exists of checking the pressure drop over the filter and checking the dustbins, which have to be emptied.

Filter envelopes from CIPRES are made of the best quality needle felt fabric.

Although the reversed jet cleaning system is sufficient, it might be necessary to initiate an extra cleaning cycle now and then under certain conditions. The following influences can affect the operation conditions:

- type of dust
- atmospheric humidity
- dust load
- filtration velocity

If the pressure drop over the filter stays on a high level, there are two ways of cleaning the envelopes:

1. vacuum cleaning
2. washing

Cleaning of the envelopes may only be performed by skilled people who are able to make a judgment for the risks for people and environment.

1. Vacuum cleaning:

The envelopes can be cleaned by means of an industrial vacuum cleaner. It is not necessary to remove the envelopes from the inserts.

2. Washing:

Depending on the degree of contamination, there are the following possibilities to wash the envelopes:

- use lukewarm water for contamination which can be dissolved in water
- soak the envelopes in water of 45°C and add some washing powder for fine tissues. Wash the envelopes by hand. Make sure the envelopes are rinsed properly before reinstalling.
- In case the envelopes are washed in an industrial washing machine the temperature may not exceed 60°C. The same temperature counts for industrial drying.

Remark: It is not advisable to wash filter envelopes. Washing must be seen as a solution under special circumstances. After washing the quality of the needle felt will degrade. In comparison with buying new filter envelopes the cost will be equal.

Attention: It is very important to check the envelopes on wear spots and sturdiness after washing.

10. Security


10.1. Important Instructions

The following directions must be respected when using CIPRES CARM GH/V filter equipment to guaranty a good operation of the filter equipment and your own safety.

- Although the CIPRES equipment is designed and build according to the latest technologies, dangerous situations might occur in case of improper use or when the equipment is operated by unauthorized personnel.

Every person who is involved in operating the CIPRES equipment, must have taken notice and must have understood the full contents of the User and Operation instructions.

- The purpose of the filter equipment is exclusively to be use with non-explosive dust types and in non-hazardous environments. Every other form of usage is improper use of the filter equipment. The supplier of the filter equipment cannot be held responsible for any damage cause by improper use.

Only if the filter is marked with a category marking () the filter may be utilized in a zone of the corresponding category.

One must prevent potential ignition sources like sparks and glowing particles to reach the filter. In case the filter is not equipped with an explosion relief device one must absolutely be sure no potential ignition sources like sparks and glowing particles can reach the filter.

- Proper use of the filter equipment also involves respecting the directions mentioned in the User and Operation instructions.
- The CIPRES equipment may only be maintained and operated by authorized and recognized employees.
- It is the users own responsibility to keep the filter equipment in good condition. It is not allowed to modify or change the equipment.
- All necessary electrical work has to be performed by an recognized electrician.
- Maintenance on the filter equipment may only be performed when the complete equipment has been powered down, the compressed air has been shutoff and all electric mains are switched off and have been secured.

Remark: After maintenance check if the dustbin has been sealed of properly or, if applicable, the dust conveying system is working properly before powering up the filter equipment.

10.2. Risk Assessment:

Operation	Hazard	Risk	Measurement	Safety-norm
Transportation and hoisting	Dragging over floor	Components may trip and can be damaged or drop on personnel.	Use proper transportation material for transport over floor. E.g. Forklift or manual load mover.	EN 292/1
	Hoisting with improper hoisting materials.	Components may fall and can be damaged or drop on personnel.	Use hoisting materials suitable for dimensions and weight of the components.	EN 292/2
	Hoisting with non-fixed singles	Components may slip out of the singles, fall and can be damaged or drop on personnel.	Use lifting lugs.	EN 292/2
Erection	Improper fastening of components.	Components may trip and can be damaged or drop on personnel.	Use supplied bolts, nuts and washers. Provide every flange hole with a bolt and nut..	EN 292/2
	No sealant between flanges (e.g. KIT or Cell rubber).	Dust may emit from flanges. High dust emission.	All flange connections must be provide with proper sealant.	EN 292/1

Erection	Improper connection of electric parts.	Filter may get blocked because of mal functioning of cleaning system.	Electric connections may only be carried out by qualified personal.	EN 292/2
	Improper connection of compressed air.	Filter may get blocked because of mal functioning of cleaning system.	Be sure of good quality of compressed air and the correct pressure.	EN 292/2
	Improper rotation direction of fan. (If applicable).	Excessive noise production and insufficient air flow.	Check for correct rotation direction.	EN 292/1
Maintenance	Controller for reverse jet cleaning is active during opening of hatches and/or removing of dust disposal devices.	Dust emits to surroundings and personal can be exposed to the dust.	Turn of controller and/or compressed air supply. In case only air supply is switch of it is necessary to wait for at least 2 cleaning pulses before the manifold is depressurized.	EN 292/2
	Start up of fan (if applicable) with opened access doors (Both clean and dirty air side).	Personal may be trapped between slamming door. Doors might get damaged.	Fix doors in desired position. Secure local main switches on fan or control panel in safe position. If no main switches are present the fuses have to be removed.	EN 292/2
	Incorrect closing of inspection openings.	Dust emits to surroundings and personal can be exposed to the dust.	One has to be assured the inspection openings are closed properly before start-up of fan.	
	Insufficient use of personal safety means.	Personal can be exposed to the dust.	Use sufficient and correct personal safety means. Especially when replacing filter elements.	EN 292/2

10.3. Explosive dust

For filter equipment which is used on types of dust which might cause explosions one have to determine the necessary safety precautions based on a risk assessment.

10.3.1. Explosion relief device

In case the filter is equipped with an explosion relief device. The venting area of the bursting disks may not be blocked by any means.

Do not place any objects in front of the facing of the bursting disks. Being in range of the bursting disks during operation of the filter equipment can be live threatening!!

In case the filter equipment is placed inside, an explosion relief channel has to be placed to guide the explosion to a safe outside area. The channel may not be longer than 3 m.

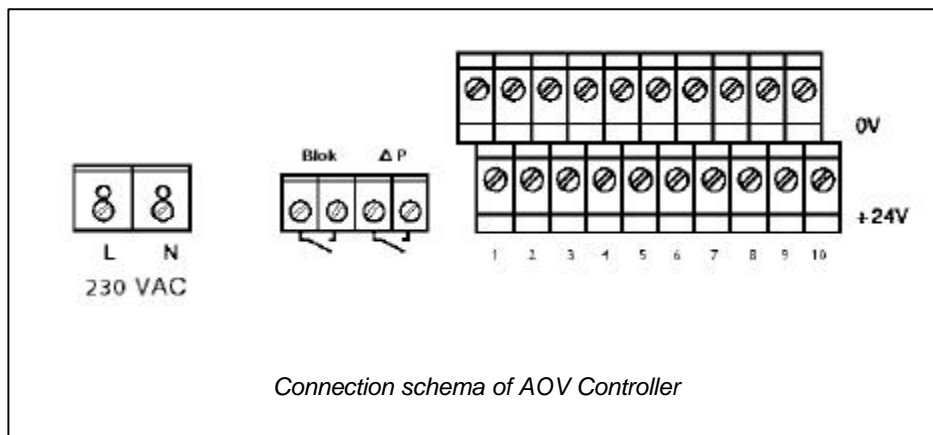
10.3.2. Anti-static features

In case the filter is order inclusive anti-static features, the filter has to be properly connected to a ground-facility for static drain.

11. Standard CIPRES AOV controller:

11.2. Technical data:

- Controller –type : AOV 5ND
AOV 10ND
AOV 20ND
- Application : Fully automatic control of pilot valves on membrane valves for filter series CARM GH en CARM V.
- Number of pilot valves : max. 5, 10 or 20 depending on controller type. The number of pilot valves to can easily be set by means of the control buttons behind the front display.
- Impulse timing : 200 till 650 msec. Adjustable
- Interval timing : 5 till 180 sec. Adjustable
- Mains : 230 V, 50 Hz, 50 W
- Operation voltage : 24 V DC, max 22 W
- Operating temperature : -20 till +60⁰ C
- Protection class : IP 65, (IP20 in case the controller is opened during programming)



11.2. LCD- display

The LCD- information display show the actual operating information or the operating data, depending on the active operation mode at that time.

11.2.1.Operation-mode

On power up of the controller, the controller performs a self check. During and after the self check the following data will be shown on the LCD- information display with an interval of 5 seconds:

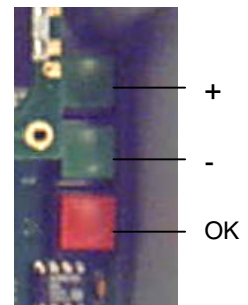
- Manufacturer : Cipres Filtr Brno – Tsjechië
- Representative and service : Dust Control Partners B.V.
Tel.:+31(0)36 5219282
Fax.: +31(0)36 5219280
- Controller type : AOV xx ND 24 V (xx stands for maximum of pilot valves which can be actuated by the controller.)
- Indication of valve number which is going to be actuated next.

11.2.2. Service-mode

When the front cover and display are removed, the 3 control buttons will be visible. 2 Green buttons, for which the circuit board states ‘+’ and ‘-’, and a red colored ‘OK’ button.

By holding down both green buttons at the same time for approximately 3 seconds, the controller will switch to Service mode.

The red ‘OK’ button is used for shifting between the different menu’s. The values in the LCD-information display can be increased and decreased by pressing the green buttons.



Menu list:

- Number of valves : Number of present valves which have to be actuated. Number of valves to be actuated depends on the type of filter.
- Impulse timing : Duration of cleaning impulse. Value can be set between 200 msec. and 650 msec in steps of 25 msec.
- Pause 1 : Interval time between each cleaning impulse. Value can be set between 5 and 180 sec. in steps of 5 sec.
- Pause 2 : Interval time between each cleaning impulse during Dp- operation is active. Value can be set between 5 and 180 sec. in steps of 5 sec.
- Test : Test mode is meant for checking the valve settings. To shift between real time testing and fast testing press the green buttons.
In Fast testing mode the interval time is 5 seconds.

By holding down both green buttons at the same time for approximately 3 seconds, the controller will switch back to Operation mode.

11.3. Operation of Cipres AOV Controller:

The Cipres AOV controller can be operated in 3 ways.

11.3.1. Normal operation:

The 'BLOK' connector is standard supplied with a so called bridge. The controller operates continuous and the active interval time is **Pause 1**.



11.3.2. Discontinuous operation:

By replacing the bridge on the 'BLOK'-contact with a switch (e.g. a relay contact or a \ddot{A} p-switch). The AOV controller will start its cleaning sequence at the moment the switch on the 'BLOK'-contact is closed.

Attention: The switch on the 'BLOK'-contact must be potential free. Switching capacity 24 VDC 1A.

11.3.3. Delta-P Operation:

By connecting a \ddot{A} p-switch to the ' \ddot{A} p'-contact on the AOV circuit board, the interval timing 2 will be activated as soon as the switch is closed.

This way of operation is suitable in case the load on the filter fluctuates. When the load on the filter increases, the pressure drop over the filter will also increase. This will then be detected by the pressure switch. As soon as the pressure switch closes Interval timing 2 will be activated and the cleaning sequence will increase.

When the load on the filter decreases and the pressure drop over the filter will also decrease. The pressure switch will open and the AOV controller shifts back to interval timing 1.

Attention: The switch on the ' \ddot{A} p'-contact must be potential free. Switching capacity 24 VDC 1A.

The new microprocessor controlled CF-valve controller series AOV xx ND actuates 5, 10 or 20 valves, depending on what type of controller is used, fully automatic.

12. Compressed Air settings and consumption:

Filter type	Air pressure	Interval time	Pulse duration	Air volume
	Bar(o)	sec.	msec.	Nm ³ /h
CARM-V06/1/1/07 (4,2 m ²), V06/1/1/10 (6 m ²) V06/1/1/07 (7,5 m ²) en V06/1/1/15 (9 m ²)	4,5	25	200	5,0
CARM-V10/1/1/07 (7 m ²), V10/1/1/10 (10 m ²) V10/1/1/12 (12,5 m ²) en V10/1/1/15 (15 m ²)	4,5	25	200	5,0
CARM-V06/1/2/07 (8,4 m ²), V06/1/2/10 (12 m ²) (3 valves) V06/1/2/12 (15 m ²) en V06/1/2/15 (18 m ²)	6,0	25	200	7,5
CARM-V10/1/2/07 (14 m ²) en V10/1/2/10 (20 m ²)	6,0	25	200	7,5
CARM-V10/1/3/07 (21 m ²) en V10/1/3/10 (30 m ²)	5,2	25	200	7,0
CARM-V10/1/2/12 (25 m ²) en V10/1/2/15 (30 m ²)	4,5	25	200	5,0
CARM-V10/1/3/12 (37,5 m ²) en V10/1/3/15 (45 m ²)	5,2	25	200	7,0
CARM-V10/1/4/12 (50 m ²) en V10/1/4/15 (60 m ²)	6,2	25	200	8,5

Filter type	Air pressure	Interval time	Pulse duration	Air volume
	Bar(o)	sec.	msec.	Nm ³ /h
CARM-GH10/1/1/07 en GH 10/1/1/10	4,5	25	200	5,0
CARM-GH10/1/2/07, GH 10/1/2/10 en GH 10/1/2/15 (5 valves)	6,0	25	200	7,5
CARM-GH10/1/3/10 en GH 10/1/3/15	5,2	25	200	7,0
CARM-GH10/1/4/10 en GH 10/1/4/15	6,2	25	200	8,5
CARM-GH12/1/1/07 en GH 12/1/1/10	4,5	20	200	6,5
CARM-GH12/1/2/07, GH 12/1/2/10 en GH 12/1/2/15 (6 valves)	6,0	20	200	9,5
CARM-GH12/1/3/10 en GH 12/1/3/15	5,2	20	200	9,0
CARM-GH12/1/4/10 en GH 12/1/4/15	6,2	20	200	10,5
CARM-GH15/1/1/07 en GH 15/1/1/10	4,5	15	200	8,5
CARM-GH15/1/2/07, GH 15/1/2/10 en GH 15/1/2/15	4,5	15	200	8,5
CARM-GH15/1/3/10 en GH 15/1/3/15	5,2	15	200	11,5
CARM-GH15/1/4/10 en GH 15/1/4/15	6,2	15	200	14,0
For 10 slot width GH filters higher than 4 rows use following per column	6,2	25	200	8,5
For 12 slot width GH filters higher than 4 rows use following per column	6,2	20	200	10,5
For 15 slot width GH filters higher than 4 rows use following per column	6,2	15	200	14,0

13. Cipres engines:

Standard fan motors use by Cipres are Siemens. The motors can be used without special measurements in area's with a temperature from -20°C to $+40^{\circ}\text{C}$.

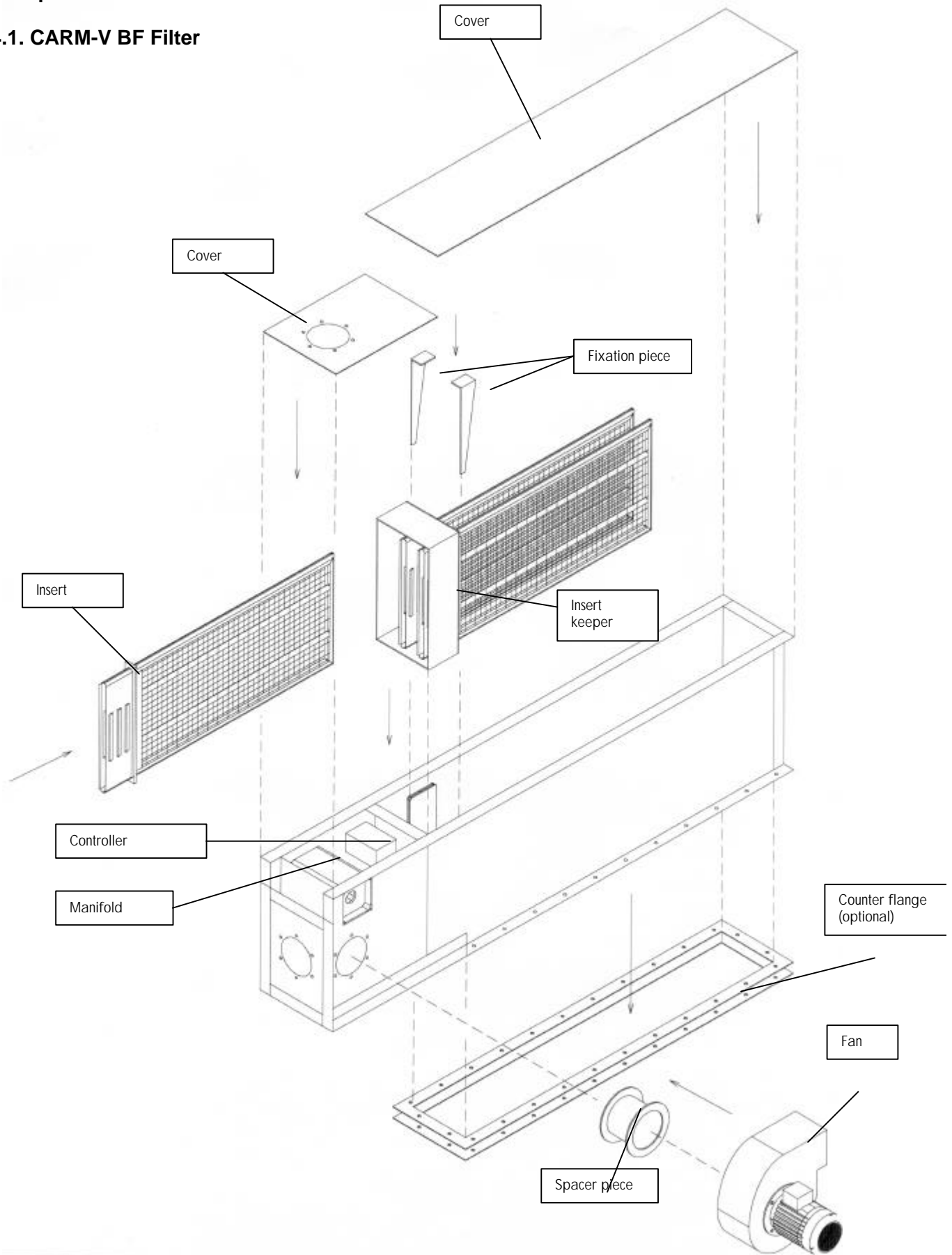
Frame type : IM B3
 Dimensions : according to IEC 60 072
 Temperature class : F
 Protection : IP 55
 Operation : 3.000 rpm, 2-poles, 50 Hz

Fan type	Installed power	Frame size	Mains 50 Hz	I-nominal at 400 V 50Hz	Nominal speed	cos φ	Weight
R1	0,37 kW	71 M	230/400 V	1,00 A	2.740 rpm	0,82	5 kg
R2, G01, F01	0,75 kW	80 M	230/400 V	1,73 A	2.855 rpm	0,86	9 kg
-	1,10 kW	80 M	230/400 V	2,40 A	2.845 rpm	0,87	11 kg
G03,	1,50 kW	90 S	230/400 V	3,25 A	2.860 rpm	0,85	13 kg
F02, F04	2,20 kW	90 L	230/400 V	4,55 A	2.880 rpm	0,85	16 kg
G05, F05, F15/3, F37	3,00 kW	100 L	230/400 V	6,10 A	2.890 rpm	0,85	22 kg
F03, F06, F07, F8-2, F9+7	4,00 kW	112 M	400/690 V	7,80 A	2.905 rpm	0,86	29 kg
F8/2-1, F8/2-3, F09, F10, F11+3	5,50 kW	132 S	400/690 V	10,30 A	2.925 rpm	0,89	39 kg
F08, F10-1, F11	7,50 kW	132 S	400/690 V	13,80 A	2.930 rpm	0,89	48 kg
F8-3, F12, F15, F17, F18	11,00 kW	160 M	400/690 V	20,00 A	2.940 rpm	0,88	68 kg
F13, F14, F16, F19, F21, F23	15,00 kW	160 M	400/690 V	26,50 A	2.940 rpm	0,90	77 kg
F20, F22, F25, F38, F60	18,50 kW	160 L	400/690 V	32,50 A	2.940 rpm	0,91	86 kg
F24, F34, F36, F50	22,00 kW	180 M	400/690 V	39,00 A	2.940 rpm	0,88	113 kg
F26, F27, F40	30,00 kW	200 L	400/690 V	53,00 A	2.945 rpm	0,89	162 kg
F42, F45, F72	37,00 kW	200 L	400/690 V	65,00 A	2.945 rpm	0,89	182 kg
-	45,00 kW	225 M	400/690 V	78,00 A	2.960 rpm	0,89	212 kg

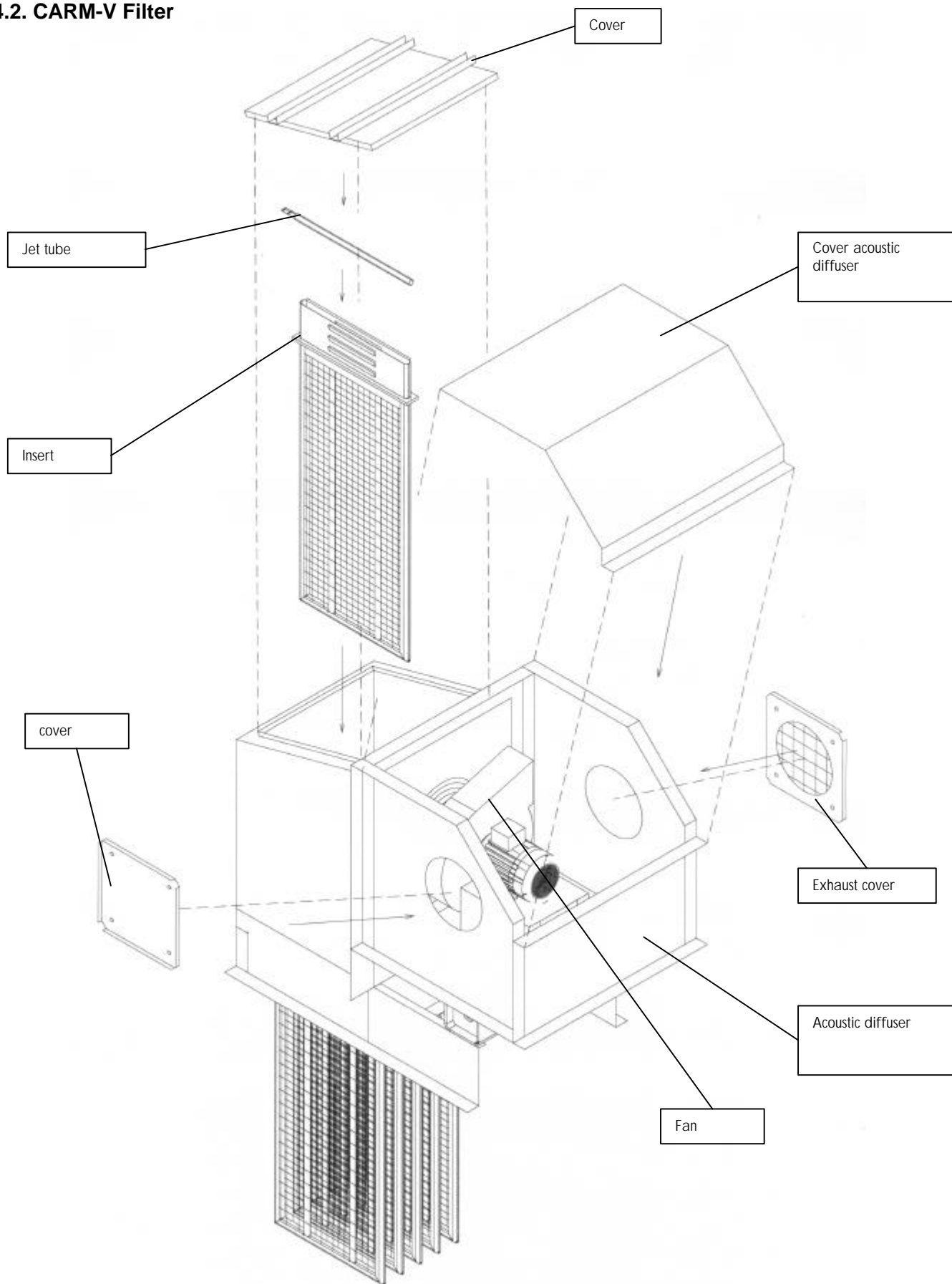
Specifications may differ from the above list depending on supplementary wished or demands of customer.

14. Exploded views:

14.1. CARM-V BF Filter



14.2. CARM-V Filter



14.3. CARM-GH Filter

