Jet filter unit type AJ

AJ 6	**(04 520 000)**	☐
AJ 12	**(04 521 000)**	☐
AJ 18	**(04 523 000)**	☐
AJ 24	**(04 518 000)**	☐
AJ 30	**(04 519 000)**	☐

Please, note:
At any jet filter unit modifications the EC-declaration of incorporation will be annulled.

Table of contents:

Manufacturer:
V. Aa. Gram A/S
Klintevej 4
DK-6100 Haderslev

Rev. 09.12

1. EC-declaration of incorporation

EC-Declaration of Incorporation for Partly Completed Machinery

Machinery Directive 2006/42/EC Annex II B

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

Manufacturer: V. Aa. Gram A/S
Klintevej 4, 6100 Haderslev, Denmark
Tel.: +45 74 52 30 75, Fax: +45 74 53 01 64

The undersigned hereby declare that:

Partly completed machinery: Jet filter unit

Name: Gram

Type:

AJ 6	(04 520 000)	☐
AJ 12	(04 521 000)	☐
AJ 18	(04 523 000)	☐
AJ 24	(04 518 000)	☐
AJ 30	(04 519 000)	☐

was manufactured in conformity with the following essential health and safety requirements in the Machinery Directive 2006/42/EC Annex I:

The following harmonized standards were used:

ISO 14121
EN/ISO 13857
EN 60204
EN 1127-1

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: X

Name: X X

Company: V. Aa. Gram A/S

DK-Haderslev, date: XX.XX.20XX

XXXXXXXXXXX
(Signature)

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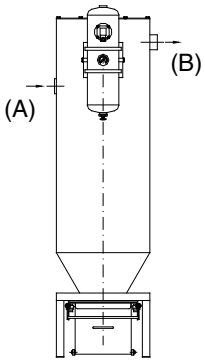
2. General description
Jet filter unit type AJ is a partly completed machine used for separation of dust from process air.

Standard emamelling: Powder enamelling for indoor mounting.

Only ATEX-Zone XX-marked unit may only be used in explosion dangerous environments.



3. Function
Process air is led in by (A), whereafter the air passes preseparator and filter elements. Air leaves unit at (B).

Filtered material is collected in an emptiable dust container.

3.1. Daily maintenance
Differential pressure (display) or watch is monitored daily. May not exceed 2,300Pa. However filter materials G115 and G116 may increase to 3,000Pa.

Dust container is emptied according to need, but may never be filled more that max. 75%.

At work with dangerous dust a plastic bag is placed in the dust container. The surplus plastic bag is turned over the square insert in 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.

Repairs may only be carried out by professional trained personnel.

At ATEX-unit the jet valves must be kept clean of dust.

4. Unit condition during operation
All doors must be closed and dust container must be mounted correctly and locked during operation.

5. Intentional/Unintentional application
Jet filter unit type AJ 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 cannot be converted to another zone.

Repairs may only be performed with original spare parts.

6. Mounting
AJ 6 - AJ 18:
Unit is received standing on a pallet.

Shipment consists of following parts: Unit
Possible pressure reducing valve

Jet filter unit type AJ is bolted on pallet.

Jet filter unit type AJ is lifted from pallet by lifting eyes after removal of transport bolts.

Please, note: Filter unit must be bolted to surface.

AJ 24 - AJ 30:
Unit is delivered lying on pallet with loose legs.

Shipment consists of following parts: Unit
Loose legs

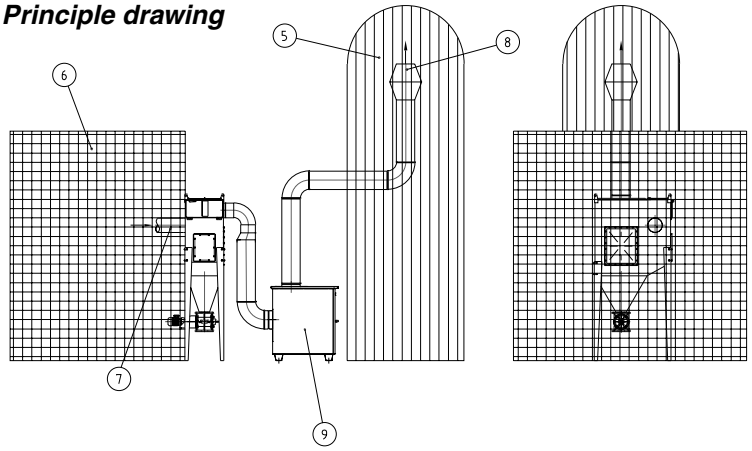
Transport bolts are removed. Jet filter units is risen and lifted up by the help of crane lifting points. The legs are placed in leg bushes and are fastened.

Please, note: Filter unit must be bolted to surface.

6.1 Jet filter unit placement

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

Principle drawing



Note:
Zone range point 5 is intended as a guide, normal radius 1000mm around output.

Zone range point 6 depend on dust sort and concentration.

6.2 Electrical connection

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

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

Connection must be 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 after-cleaning takes. Control box diagram is enclosed.

At EX-units the special rules in the Power Code must be followedd. At EX-units all parts must be securely earthed. Where there is a dust container, this must also be earthed.

6.3 Compressed air connection

Compressed air connection must give min. 4.5 - max. 5.0 bar dry compressed air. Connection is made in pressure tank end. As reduction valve and water separator Gram order no. 04 493 500 (½") can advantagerous be used.

DO NOT FORGET compressed air at possible after-cleaning.

6.4 Channel connection

Channel connection is made with approved ventilation pipes.

At EX-unit it must be secured that piping cannot be blown away at a possible explosion.

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6.5 Possible rotary valve chamber
Rotary valve chamber must be mounted airtight to filter unit and must be in operation during fan operation as well as during after-cleaning.

Gram can deliver adapters for rotary valve chamber as well as ATEX-rotary valve chambers.

6.6 Adjustment
Every unit is dimensioned for at particular air volumen, which may not be exceeded, since it would result in filter life reduction.

Unit is dimensioned for following air volume:

_____ m^3/h ***(Must be filled out by ventilation contractor)***

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

Ventilation contractor name:

_____ ***(Must be filled out by ventilation contractor)***
_____
_____
_____

Filter material is harmonized to process.

6.7 TEC33-N control
There is no after-cleaning on TEC33-N-control. Instructions for TEC33-N - see in back of these instructions.

6.8 Differential pressure control
Filter element cleaning takes place by differential pressure control type BA, which is programmed by V. Aa. Gram A/S.

Control will stand in automatic operation at receipt. Display shows first differential pressure, when it is at minimum 200Pa.

Instructions for differential pressure control type BA - see in the back of these instructions.

7 Noise damping
Shot noise can be damped by tank sound enclosure with following Gram order numbers:

AJ 6 - 18: 04 515 000
AJ 24 - 30: 04 515 100

7.1 Noise data
Noise level excl. shot level approx. 75 dB(A)

Noise level in shot moment approx. 85 dB(A)

8. Maintenance
Filter unit must be maintained 1 to 2 times 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 at max. set operation point for air volume.

At filter control type TEC33-N it is read on differentil 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), e.g. Peltor Optime III from 3M.

With electrical supply removed check the tightness of pipe connections, tank and valves. Tank is emptied for water by ventilating valve beneath tank.

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

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

At filter defects, tight filters that cannot be washes (G105 and G104A), or worn-out filters these are replaced. Use protection clothing, gloves, full face mask 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 owing to very fine particles that attach themselves to the fibres.

Also be aware whether compressed air operates with defect pressure reducing valve. 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.

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

8.1. Filter element replacement from clean air side
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. Shot nozzle swivel nut is loosened and shot pipe bracket is dismounted. Hereafter the shot pipe can be pulled through bulkhead duct half and thus be dismounted. The 3 bolts in bayonet grib on filter cartridge is loosend 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.

At mounting of new filter cartridges ensure that the included rubber packing is correctly placed in the herefore designed groove on filter cartridge flange so that packing is between filter cartridge flange and filter mounting plate.

Hereafter filter is bolted, the shot pipe is correctly placed with guide pin in bracket bowl. Swivel nut is tightened and shot pipe bracket is mounted. Top lid on filter units is remounted.

8.2 Filter element replacement from raw air side
Every electric supply must be disconnected as well as pressure tank emptied for air before filter replacement.

Side doors to clean air and row air chambers are dismounted. All filter bolts in clean air chamber are screwed completely down. Now the filter cartridges can be removed.

This is done by guiding a plastic bag up around the filter cartridge from beneath, gripping the cartridge and turning it clockwise until it is released from the bolts.

Filter cartridges are removed from the filter units, and plastic bag is closed with 1 plastic strip.

The new filter cartridges (check sealing) are hung on the filter bolts. They are fastened hereafter. Doors are mounted.

Used filter elements must disposed of according to governmental demands.

8.3 Filter element cleaning
Filter elements that can be washed are dismounted as deschribed in point 8.1 or 8.2. Filter cartridges are washed with high pressure cleaner at max. 50°C hot water. Possible soap **without** detergent.

Filter material G104 and G105 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.

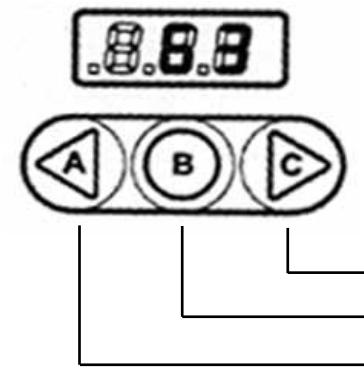
8.4 Jet valve exchange/repair
Exhange may only take place, when supply and compressed air are not connected to unit, and compressed air tank is ventilated by compressed air ventilating valve.

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

9. After maintenance
After maintenance electricity and compressed air are connected. Unit is tested and checked before operation.

INSTRUCTIONS FOR
TURBO-DIFFERENTIAL PRESSURE CONTROL TYPE BA

In operation mode:
Press key “C” to scroll and select functions.



Mount differential pressure control in a suitable place, drill a hole for cable gland ensuring that it is positioned to prevent entrance of water (avoid top surface).

Electrical connections

See enclosed diagram. When main supply is connected, display will be alight.
DO NOT FORGET: Clamp 14 and 15 must be short-circuited (jumper) for activation of dP-program.

Setting operation data:

1. Press C to go into set-up. Function “F01” can now be seen in display.

2. Press A to go into the function.

3. Press A or C to increase or decrease value in function.

4. Press B to go back to function menu.

5. Press C to go one step forward in function menu. (Note: You can only go forward in menu).

6. Repeat point 2 - 5, until function “F13” is set.

7. Press B to leave set-up.

Please, note:
Display will show “-0-” after completed dP-programming (only for units with switched-off fan).
During operation display will alternately show dP-reading and “P”.
Control will automatically switch from Set mode to Run Mode, if no key is pressed for 5 minutes.

At possible problems with unintentional “after-cleaning” during operation with differential pressure below 200Pa 0-calibration can be raised by 100Pa by which starting point for “after-cleaning” is moved.

NB!!! If the 0-calbration has been changed you also have to increase all other settings with 100Pa to obtain the desired levels.
By changing the 0-calibration we recommend to mark the control with this changes with a label

Function	Description	Recommend value
F01	Extern 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	Set number of valves (0 - 16)	According to unit
F05	Further cycles after fan stop (0 - 99)	15
F06	Manual activation of each valve. Press C requested valve; Press A to activate	-
F07	Activation of dP-programming	1
F08	Output voltage	24V
F09	Zero adjustment “0.00” 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 delay K1	2.3
F13	Fan control - “0” by switch / “1” by dP-reading	1

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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 disactivated, they are considered as alway closed and no jumper is required on the terminal board. Use a jumper for unused inputs, if you activated them.
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 threshold 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 keyboard from 0 to 99. The timer will automatically recognise 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 electrovalve. 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 electrovalves (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 threshold. Otherwise, this might cause any malfunction or damage to the sequencer.

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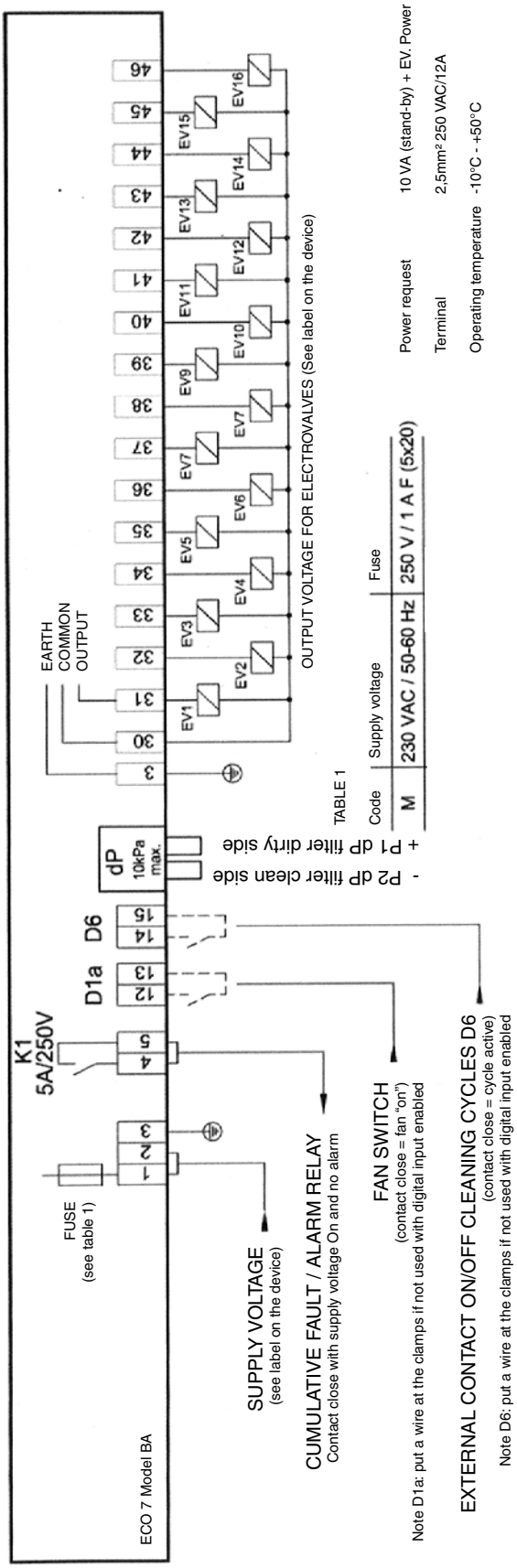

PLEASE NOTE!

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

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1. Connection:

- Filter control type TEC33-N is mounted directly on solenoid valve.

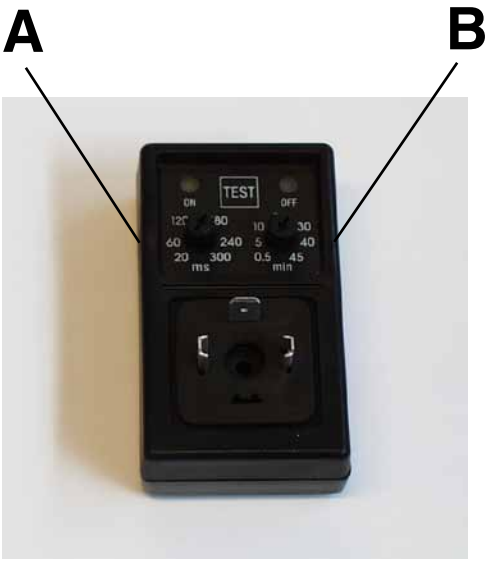
- Voltage is 24-240V AC/DC, but must be connected according to solenoid valve.

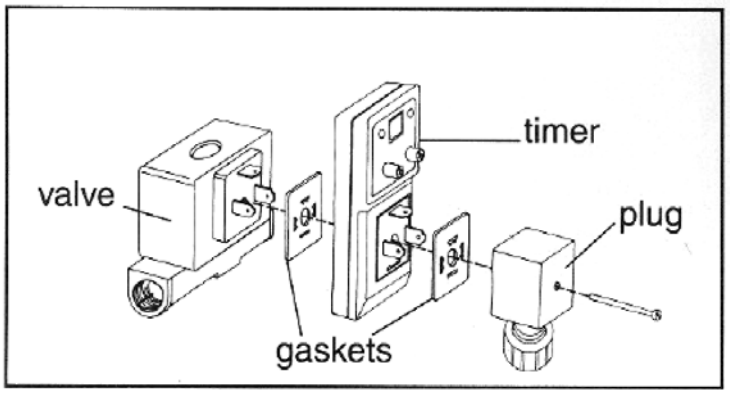
2. Operation: (See photo)

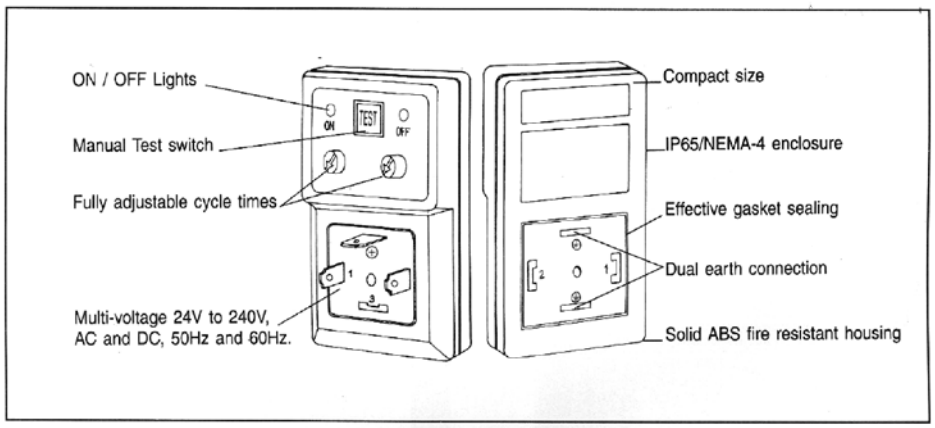
- Control pos. A changes signal length on output (20 - 300 ms).
  Basic setting: 170ms. (This setting is not to be changed.)

- Control pos. B changes interval from one operation to the next operation
  (0.5 -45 min.)

  Basic setting: 0.5 min.







TEC33-N can advantageously be mounted with after-running so control can break later than fan to ensure a better filter after-cleaning.

TEC33-N can advantageously be replaced with BA4 (09 550 000) that with constantly supplied current ensures correct after-cleaning and at the same time monitors the differential pressure above filter.

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