Ex22BB

SEQUENCER FOR DEDUSTING PLANTS

DOCUMENTATION INDEX

1.1 Description
2.1 Standard features (List)
2.2 Standard features (Details)
3.1 Installation rules and security
4.1 Technical features
5.1 Enter data in set mode
6.1 Display indications in operation
7.1 Display indications with alarm
8.1 Information and guide on the display
9.1 Wiring Diagram
10.1 Electronic board size and voltage settings
11.1 Enclosure dimensions
12.1 Problems solutions
13.1 Warranty
14.1 Certificates

1.1 DESCRIPTION

Sequencer for dedusting plant cleaning cycle control with digital dP control by internal transducer.

2.1 STANDARD FEATURES

AL1	Alarm relay contacts open
B10b	Manual activation of every single output from keyboard
B1b	Select Number of outputs
B2x	Activation time from 0.05 to 5.00 sec.
B3x	Interval time from 1 to 999 sec.
B8a	Short-circuit protection of every single output
C0	Input activation from external contacts
C13_10	dP full range 10.00 kPa = 100.0 mbar = 1012 mmH2O.
C1d	Differential pressure digital control
C3	Differential pressure readout from internal transducer (max 10 kPa)
C7d1	Maximum dP alarm. Contact open with alarm. Automatic reset.
C8	dP zero readout regulation
D1ab1	Additional cycles after fan stop with fan mode selection.
D6	ON/OFF Cleaning cycle from external contact.
DPa	Air connections 6x4 RILSAN pipe
G1	Maximum load power 25W per output
HV	Input / Output voltage selection.

II 3D Ex tc IIIC IP65 T100°C

Code: Ex22BB : ATEX - Zone 22
Max Nr. Output: 16
Voltage IN / OUT: 115 VAC - 230 VAC (24 VAC - 24 VDC On Request)

ESA Electronic Engineering s.r.l.
Electronic Control System for dust collectors
esa@esaelectronic.it www.esaelectronic.it
Phone ++39 02 972 89 899 Fax ++39 02 972 89 270

GENERIC DOCUMENTATION. THE SPECIFIC DOCUMENTATION IS ATTACHED TO THE SEQUENCER

2.2 STANDARD FEATURES

The presence of options on request could nullify or modify the operating of standard features.

Code	Description
AL1	**Alarm relay contacts open** The relay contacts signaling the presence of alarm are open if there is no supply or in presence of alarm condition. With power supply on and in the absence of an alarm, the contact is closed. Relay contacts: 42 VAC - 5 A Max / 42VDC - 3A Max
B10b	**Manual activation of every single output from keyboard** By keyboard, it is possible to activate manually and individually every single output for an operation test. Press key C to select the desired output to be activated. Press key A to activate the output. The output is holded active for all the time that key A is pressed. It allows to measure the output voltage by using a tester. In case of anomalous operating, do this test with electrovalves disconnected.
B1b	**Select Number of outputs** The selection of the number of outputs to be control led is connected by keyboard in SET MODE. If you set 0 or AUTO in this function the sequencer will automatically select the connected loads by skipping the non connected ones. Minimum load 5W ÷ 12 W depending on the output voltage. If the load is below of the minimum, the autoselection does not work correctly, set the number of outputs in set up.
B2x	**Activation time from 0.05 to 5.00 sec.**
B3x	**Interval time 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: Minumum interval time = 5 times pulse time (B2x)
B8a	**Short-circuit protection of every single output** In case of short circuit, the output is automatically skipped, the 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.
C0	**Input activation from external contacts** In Set up you can activate or deactivate 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 inputs if you activate them. NOTE: all inputs of the device have to be connected to external contact without voltage.
C13_10	**dP full range 10.00 kPa = 100.0 mbar = 1012 mmH2O.** Maximum differential pressure value measurable by the device 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. Reading error ± 10 points
C1d	**Differential pressure digital control** If dP control is active (Set F07 = 1), 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 readout from internal transducer (max 10 kPa)**
C7d1	**Maximum dP alarm. Contact open with alarm. 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 letter H alternatively, according to the 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	**dP zero readout regulation** 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 stops or air pipes not connected if the dP reading is not 0.00 kPa it is possible to adjust it by key A and C.
D1ab1	**Additional cycles after fan stop with fan mode selection.** In set up it is possible to select the mode to manage the fan and the post-cleaning cycles: SET F13 = 0 (not avaliable with C11a option) If you connect a voltage-free auxiliary contact of the circuit intended to drive the fan with the sequencer, it is possible to add a pre-set number of cleaning 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 dP = 0. If the D1a contact is open, the display will show both '-0-' and the dP reading alternated, to indicate 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 stops. NOTE D1a: Connect D1a by means of a jump if it is not used with active inputs (see F01). SET F13 = 1 If the dP control is activated, you can add a pre-set number of cleaning cycles after the fan stop. Their number can be set from the keyboard from 0 to 99. The Timer compare the dP readout with a 0.30 kPa fixed threshold.

2.2 STANDARD FEATURES

Code	Description
D6	**ON/OFF Cleaning cycle from external contact.** If contact D6 is open, the cleaning cycle is not enabled and the display shows 'OFF'. With sequencer with digital dP control the display shows 'OFF' and the dP reading alternatively. By closing D6, the cleaning cycle can start from the first electrovalve NOTE D6: Link D6 clamps if it is not used with inputs from external contact active. (see 5.1 : SETUP F01).
DPa	**Air connections 6x4 RILSAN pipe**
G1	**Maximum load power 25W per output**
HV	**Input / Output voltage selection.** Use the jumpers on the board to select the supply voltage and the output voltage on the electrovalves. (See the board layout). JP1: Supply voltage selection between 115VAC and 230VAC. JP2: Output voltage selection between 24, 115, 230 V (Only with 115VAC or 230VAC power supply). JP3: Output voltage selection between AC and DC only with JP2 set to 24V. WARNING: set F08 (PB/BB) or F16 (PC/BC) to the same output voltage that has been selected by means of the jumpers to adjust the shortcircuit threshold. Otherwise, this might cause any malfunction or damage to the sequencer.

3.1 INSTALLATION RULES AND SECURITY

3.2 Protect the device against the direct exposure to the sun.

3.3 Avoid arranging the device in the proximity of or in direct contact with any source of heat and electromagnetic field and inverter. Connect the device on supply lines different from those used for motor drives or other devices that may cause some noise on the net.

Not security equipment.

3.4 Fix the device on the wall at minimum 60 cm from the floor.

3.5 The access to the device to adjust operating parameters have to be done by person with appropriate skills.

3.6 Before acting on the device for any operation, check for safe conditions. For electrical operations never forget to disconnect the power supply, wait for 30 seconds for the internal capacitors discharge before opening. At the end of the operations close the device to restore the protection degree before powering again.

3.7 In case of faulty that does not depend only the fuse, switch off immediately the supply voltage and contact the supplier.

3.8 One time in a month or more frequently if necessary verify if there is dust on the enclosure of the device and remove it if it is present by using wet cloth.

3.9 For supply voltages, cabling and voltages applicable to the relay contacts, follow the current rules

3.10 For all input control signals to the Timer (D1a, D5, D6,...) use anti-flame wires with a minimum section of 0.5 mm².

3.11 For the electrical connection of the supply voltage and filter cleaning electrovalves use anti-flame wires with a minimum section of 0.75 mm². For output relay contacts use anti-flame wires with a minimum section of 1.5 mm2.

3.12 The lack of application of existing rules and standards of installation and safety exonerate the manufacturer of responsibility.

3.13 For the output signal 4÷20 mA related to dP use anti-flame shielded wire with minimum section of 0,5 mm². (Option on request. Code: C11a)

3.14 Do not connect to earth the common of the electrovalves (see electrical wiring diagram).

4.1 TECHNICAL FEATURES

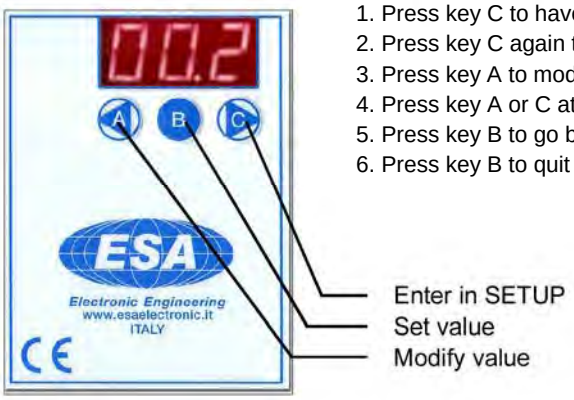
Power requirement	10 W (Stand-by) - 30 W Max ev ON
Operating temperature	- 10 °C ÷ + 50 °C
dP Control	With internal trasducer
Pneumatic connection	Rilsan 6 x 4
Dimensions / Protection degree	140x230x95 mm. / IP65
Terminals	2,5 mm² - 250 VAC / 12 A
Voltage applicable to the relay contacts	42 VAC - 5 A Max / 42VDC - 3A Max

A wrong supply voltage connection might cause irreparable damages to the device.

The fuse wire protect only from any short circuit and not necessarily from wrong supply voltage.

5.1 ENTER DATA IN SET MODE (SETUP)

If no button is pressed for 5 minutees, the device leaves the setup mode, restarting normal operation.

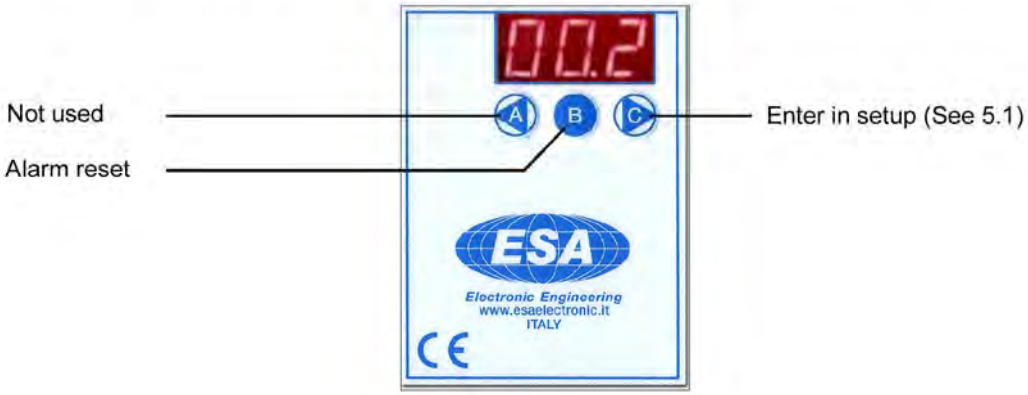


1. Press key C to have access to the SETUP menu F01
2. Press key C again to select the desired function F01, F02, F03 ...
3. Press key A to modify data.
4. Press key A or C at the same time to change the data item.
5. Press key B to go back to the function menu SETUP Fxx.
6. Press key B to quit SETUP and go back to the operating mode.

SETUP	DESCRIPTION	DATO	Range	Code	Default
F01	Inputs from external contacts	0 = Enabled 1 = Disable	0÷1	C0	1
F02	Pulse time from 0.05 to 5.00 sec.		0.05÷5.00	B2x	0.50
F03	Interval time between ev. from 1 to 999 sec.		1÷999	B3x	005
F04	Selection Number of electrovalves	0 = Automatic selection of the load 1÷xx = Set number of solenoid valves	0 ÷ 16	B1b	000
F05	Number additional cycles after fan stop		0÷99	D1ab1	002
F06	TEST Manual activation of every single ev. from keyboard	Key A = Activate solenoid Key C = Select solenoid These keys work only after entering the SETUP	0 ÷ 16	B10b	
F07	Operation selection AUTOMATIC / MANUAL	0 = Manual 1 = Automatic (Cleaning by dP values)	0÷1	C1d	1
F08	Threshold adjustment for option B8x correct operating. See jumper JP2 position.			HV	Vout
F09	dP zero readout regulation			C8	0.00
F10	1st dP threshold, STOP cleaning since dP low		0.01÷9.99	C1d	1.00
F11	2nd dP threshold, START cleaning since dP high		0.01÷9.99	C1d	2.00
F12	Maximum dP alarm threshold.		0.01÷9.99	C7d1	3.00
F13	Additional cycles mode selection	0 = By contact 1 = By dP reading	0÷1	D1ab1	0

6.1 DISPLAY INDICATIONS IN OPERATION

When supply voltage switch on the cleaning cycle starts if all the necessary conditions for running are present.



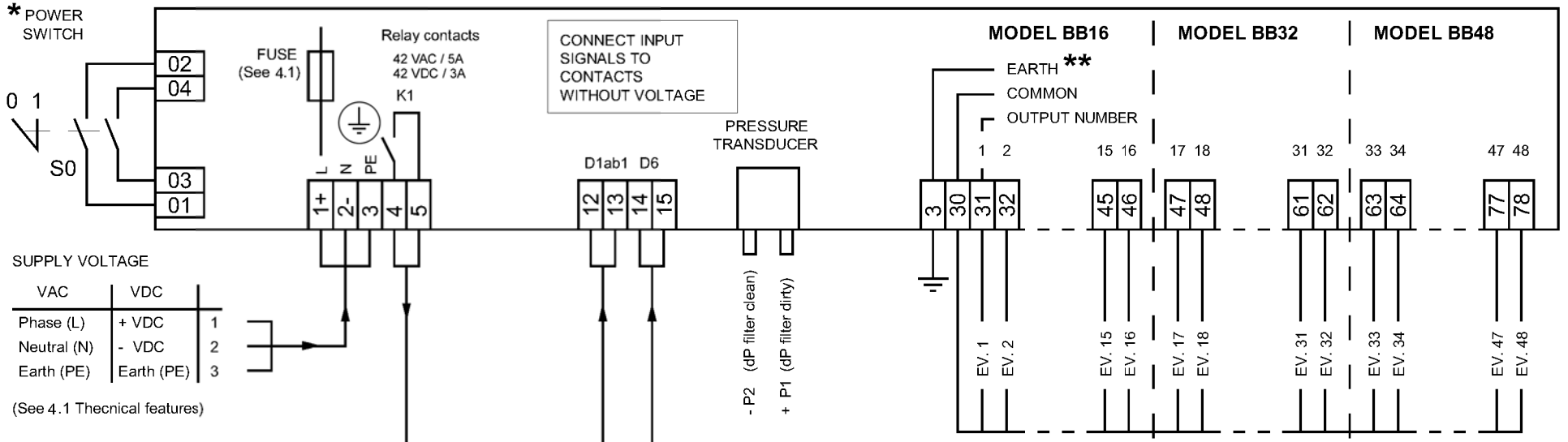
DISPLAY	DESCRIPTION	Code
1.23 / OFF	Cycle stops for cleaning consent missing (D6 open)	D6
0.00 / -0-	Cycle stops for ventilator OFF. dP reading < 0.20 kPa.(See 5.1 Code D1ab1)	D1ab1
A01	Number of activated electrovalve	
0.50 / P	Cycle stops for low dP.	C1d
...	Additional cycles after ventilator stop active (Blinking points)	D1ab1
1.23	Differential pressure reading (Standard in kPa)	C13_10
E	dP reading over range	C13_x

7.1 DISPLAY INDICATIONS WITH ALARM

DISPLAY	DESCRIPTION
1.50 / H	Maximum dP alarm (display blinking). Filter congested. Check the solenoid valves activation and cleaning frequency.
E1/05	Overload output 05 (Example, Display blinking). Check the ev. connection; state of the coil of the ev. indicated on display and possible presence of water inside the electric connector of the ev.

8.1 INFORMATION AND GUIDE ON THE DISPLAY

Not available for this model



SUPPLY VOLTAGE

VAC	VDC	
Phase (L)	+ VDC	1
Neutral (N)	- VDC	2
Earth (PE)	Earth (PE)	3

(See 4.1 Thecnical features)

OUTPUT VOLTAGE FOR ELECTRO-VALVES

(For output voltages see 4.1 Technical features)

WITH OUTPUT VDC THE COMMON IS CONNECTED TO + VDC

WITH SUPPLY VOLTAGE VDC THE MINUS IS CONNECTED TO EARTH

** **DO NOT CONNECT TO EARTH (3) THE COMMON OF THE EV. (30)**

OUTPUT SIGNALS

CUMULATIVE ALARM RELAY (K1)

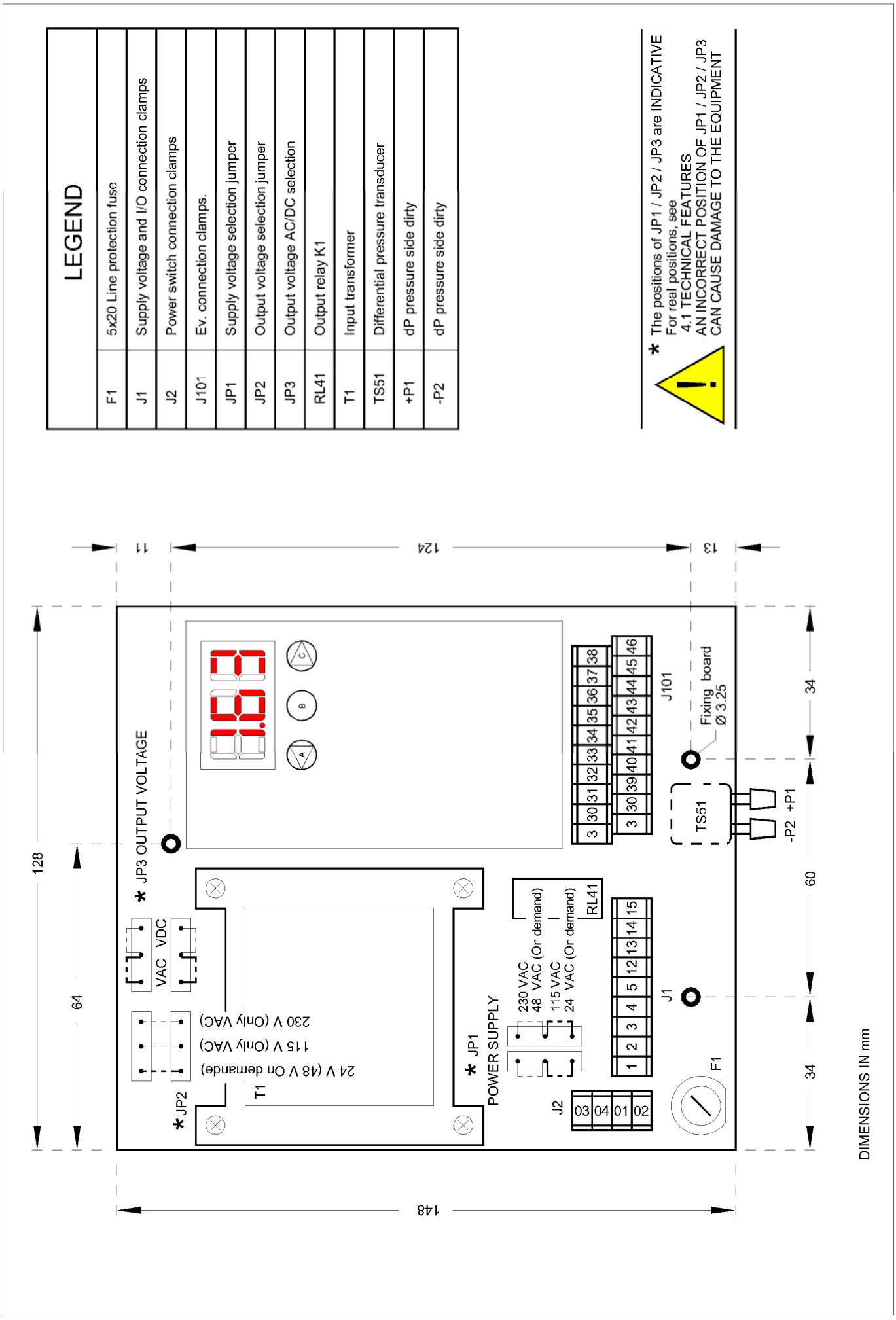
INPUT SIGNALS

ADDITIONAL CYCLES FROM FAN CONTACT
Contact close = FAN on
LINK CLAMPS IF NOT USED WITH INPUTS
FROM EXTERNAL CONTACT ENABLED
(See 2.2 Code D1ab1)

ON / OFF CLEANING FROM EXTERNAL CONTACT
Contact close = cycle enabled
LINK CLAMPS IF NOT USED WITH INPUTS
FROM EXTERNAL CONTACT ENABLED
(See 2.2 Code D6)

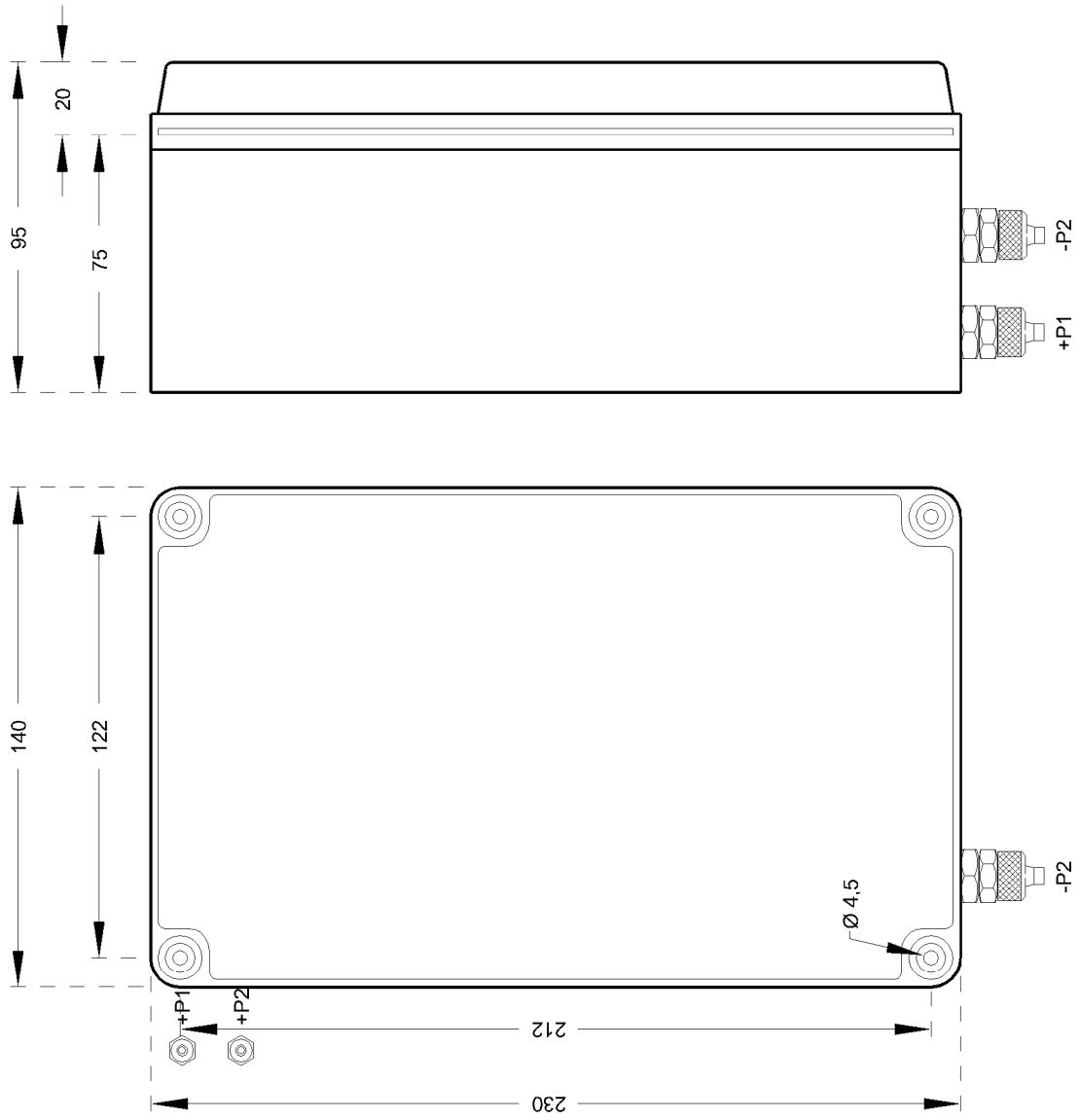
* ON REQUEST

10.1 ELECTRONIC BOARD SIZE AND VOLTAGE SETTINGS



11.1 ENCLOSURE DIMENSIONS

TECHNICAL FEATURES	
Code	1.30
Protection degree	IP65
Material	ABS
Temperature	- 20 °C ÷ 60 °C
Colour	RAL 7035
+P1	dP input side dirty
-P2	dP input side clean



DIMENSIONS IN mm.

12.1 PROBLEMS SOLUTIONS

DEFECT	POSSIBLE CAUSE	SOLUTION
Display OFF	Fuse burnt. Supply voltage. Jumper for input voltage selection	Check the protection fuse on supply line. Check if supply voltage is present and if it agrees with supply voltage needed by the device (clamps 1 and 2). Check jumper JP1.
No output activation	Output voltage. Connection to the electrovalves. Jumper for output voltage selection	Check that sequencer output voltage and electrovalve coils have the same voltage. Check the connection between sequencer and electrovalves and do manual test of the outputs (See B10 / B10b). Check jumper JP2 and JP3.
Wrong differential pressure reading.	Pneumatic connection not free. Pipe damaged	Disconnect the 2 pipe to the device and verify that dP reading is 0.00 kPa. If it is OK check the pipe for air connection from the device to the filter.
The cleaning cycle do not run in according to the set value.	The memory of the microprocessor could be modified by external factor.	Switch Off the supply voltage of the sequencer. Hold down key B and switch on the supply voltage. By means of this operation the default data are loaded in set up. Adjust the zero dP reading and the other parameters according to the filter's needs.

13.1 WARRANTY

The warranty lasts 2 years. The company will replace any defective electronic component, exclusively at our laboratory, unless otherwise agreed, upon the Company's prior consent.

WARRANTY EXCLUSION

The warranty is not valid in case of:
1) Tampering or unauthorized repairs.
2) Wrong use of the device, not in compliance with technical data.
3) Wrong electrical wiring.
4) Inobservance of the installation rules.
5) Use of the device, not in compliance with CE rules.
6) Atmospheric events (Lightning, electrostatic discharge), Overvoltage.

We reserve the right to make any change without notice.