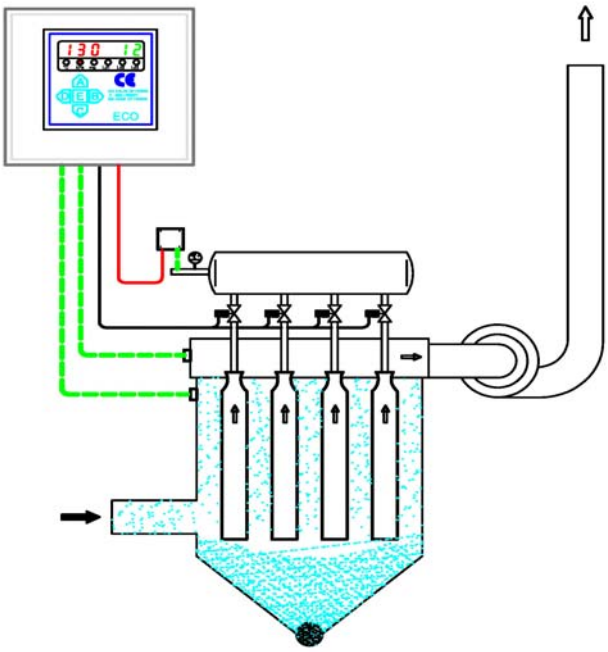
ECONOMIZER FOR DEDUSTING SYSTEM

PLEASE READ THE ENTIRE INSTRUCTION MANUAL CAREFULLY BEFORE INSTALLING THE TIMER

DOCUMENTATION CONTENTS

Economizer for dedusting plant cleaning, cycle control with digital differential pressure checks. Device with microprocessor management and zero-crossing detection for the output activation to give high immunity from external interference and low field emission.



DOCUMENTATION INDEX

STANDARD CHARACTERISTICS DETAIL

A2a	O	Relay Supply ON (K1)
B1b		Number of outputs selection
B10		Manual activation of each output
C1		Digital differential pressure control (end cycle STOP)
C8		Zero dP reading adjust
C10		ON/OFF cleaning cycle by keyboard.
C13_5		dP range up to 5 kPa
C3		Differential pressure reading by internal transducer (max 10 kPa)
C4		Cleaning cycle
C7d1	O	Maximum dP alarm. Relay contact open with alarm. Automatic Reset.
D14a		Hours counter
D1b1		Additional cleaning cycles by dP reading. Activation on STOP.
D5a	I	Air pressure external consent
D6a	I	ON/OFF cleaning cycle from external contact
DPa		6x4 RILSAN pipe dP connection
G1		Driving 1 valve on each output (max power 25W)
HV		Supply and output voltage selection by jumper on the board.
L10		Single terminal on the board

0 = Output signal. Relay contact
I = Input Signal. Voltfree contact

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S/N: Y18
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INSTALLATION RULES

Fix the device at minimum 60 cm from the floor at least.

Put the device far from heat and electromagnetic fields source. Avoid putting the device in direct contact with heat and electromegnetic fields source. Connect the device on supply line different that the one used for other devices that can create high noise on the net.

Protect the Timer against the direct exposure to the sun.

For the electrical connection of supply voltage and cleaning electrovalves use anti-flame wires with minimum section of 0,75 mm² for voltage 115VAC or 230VAC, use anti-flame wires with minimum section of 1,5 mm2 for voltage 24VAC and 24VDC. For output relay contacts use anti-flame wires with minimum section of 1,5 mm2.

For input control signals to the Timer (D5, D6,...) use anti-flame wires with minimum section of 0,25 mm²

For the output signal 4÷20 mA of differential pressure reading use anti-flame shielded wire with minimum section of 0,25 mm².

For the connection of the Tribo Check probe (option on request) use 3x0,75 mm² anti-flame shielded cable.

Before opening the device for any operation that is different by keyboard adjustment, switch always off the supply voltage, wait 30 seconds for the internal capacitor discharge and verify to be under conditions of sure atmosphere. At the end of the operations close the device to restore the degree protection before switch it on.

TECHNICAL DATA

Supply Voltage	230 VAC ± 5% 50/60 Hz
Output Voltage	24 VDC ± 5%
Fuse	250 V / 1 A F (5 x 20)
Max output power	5VA in Stand-by / 30 VA pulse
Temperature	- 10 ÷ + 50 °C
Visualization	5 Display LED h 13 mm
Degree Protection	See drawing
Control dP	By internal transducer (See C13)
Dimensions	See drawing
Clamping	2,5 mm² 250 VAC/12A

NOTE: With supply voltage 24 VDC, the output voltage avaliable is 2 V less for the drop voltage inside the device. Verify the compatibility with the electrovalves used.

We reserve the right make technical changes without obligation.

ENTER DATA IN SET MODE

By switching On the supply voltage the cleaning cycle starts if all the conditions for the start are present.
Press key B to enter in SET MODE Code 01.
DS2 (2 digit on the right) shows the code of the selected function,
DS1 (3 digit on the left) shows the set value for the selected function (see table SET DATA).
Press key B to increase the number of the selected function.
Press key D to decrease the number of the selected function.
Press key A to increase the set value.
Press key C to decrease the set value.
All the set value remain memorized without supply voltage too.
Press key E to store the SET UP data and to enter in RUNNING MODE.

A / C Increase - Decrease Value
E ESC / Reset
B / D Increase - Decrease Code

Default	DS1	DS2	U.M.	Data Setting	Rif.	kPa	mg	Ld1	Ld2	Ld3
1	0	01		Automatic running mode	C4a	☐				
1	1	01		Manual running mode	C4b	☐				
200	040-500	02	ms	Pulse time for each valve from 2 to 500 ms.	B2b	☐				
5	001-250	03	sec	Pause time between two activation from 1 to 250 sec.	B3b	☐				
1.00	0.02-5.00	04	kPa	1st dP threshold, end cycle STOP for low dP	C1a	☐				
2.00	0.02-5.00	05	kPa	2nd dP threshold, START cycle for high dP	C1b	☐				
3.00	0.02-5.00	06	kPa	3rd dP threshold, maximum dP alarm	C7d1	☐				
12	01-24	07		Number of outputs selection	B1b	☐				
5	00-99	08	cycles	Number of additional cleaning cycle	D1x	☐				
	01-24	09		Manual activation of each output	B10	☐				
0.00	0.00	10	kPa	Zero dP reading adjust	C8	☐				
0.10	0.01-0.99	11	kPa	dP threshold for additional cycle management	D1bx	☐				
0	0	12		30 seconds delay for max dP alarm activation	C7	☐				
0	1	12		Istantaneous activation of max dP alarm	C7	☐				
	000-999	13	hours	Hours counter	D14a	☐				
	000-065	14	hours	Running hours counter up to 065 thousand	D14a	☐				
5	001-250	15	sec	Pause time with additional cycle active	B3c	☐				

The default datas can be different from the value in the table on request.

☐ Green LED ON ○ Red LED ON ◯ Yellow LED ON ⊘ Red LED Blinking ⊘ Green LED Blinking

Default: Factory set values. These values can be changed in the range of DS1.
DS1: Red Display . It shows the current value of the function selected by DS2
DS2: Green Display. It shows the current value of the Setup function
U.M.: Measure Unit

RUNNING MODE

By switching On the supply voltage the cleaning cycle starts if all the conditions for the start are present.

In Manual running Mode, DS1 shows the dP reading, DS2 shows the number of the next output that must be energized.

In Automatic running Mode, DS1 shows the dP reading, DS2 shows different digit or letters depending on the run condition.

Press key E for 3 seconds to stop the device (see C10).

Press key E for a time less than 3 seconds to reset any alarm.

DS1	DS2	U.M.	Operation	Rif.	kPa	mg	Ld1	Ld2	Ld3
*	*		Automatic running mode	C4a				☐	
*	*		Manual running mode	C4b				⊘	
*			Cleaning cycle Off by keyboard	C10				○	
*	*		Output activation						☐
1.00	*	kPa	dP reading		☐				
E	*	kPa	dP reading over range		☐				
-.50	*	kPa	Negative dP reading		☐				
*	06		Next output activated		☐				
*	P		Cycle stops for low dP		☐				
*	--		Cycle stops for fan OFF		☐				
*	LP		Alarm compressed air fail. Cycle stops.	D5x	☐				
*	LO		Cleaning cycle stop. External conset Off.	D6x	☐				
*	. .		Additional cycles active	D1x	☐				
DS1	**DS2**	**U.M.**	**Alarms**	**Rif.**	**kPa**	**mg**	**Ld1**	**Ld2**	**Ld3**
2.00	*	kPa	Max dP Alarm (DS1 blinking)		⊠				

☐ Green LED ON ○ Red LED ON ◯ Yellow LED ON ⊘ Red LED Blinking ⊠ Green LED Blinking

DS1: Red Display. It shows the current value of the Differential Pressure reading

* : Any value

U.M.: Measure Unit

STANDARD CHARACTERISTICS DETAIL

A2a - RELAY SUPPLY VOLTAGE PRESENT/FAULT

With timer supplied the relay K1 is activated and the contact at the clamp is closed. In case of supply voltage Off this contact is open

B1b OUTPUT NUMBER SELECTION

The selection of the number of outputs connected to the device by keyboard in set mode

B10 MANUAL ACTIVATION OF EACH OUTPUT

By keyboard it is possible to activate each output, once a time, for checking. Using key A to select the number of output to check. Press key C to activate the selected output

C1 - DIFFERENTIAL PRESSURE CONTROL

In automatic running mode (C4a) the cleaning cycle starts and stops according to the dP reading.
C1a Set dP threshold for stop cleaning cycle: with dP reading under this threshold the cleaning cycle stops, DS2 shows 'P'. The cleaning cycle stops at the end (Set 04).
C1b Set dP threshold for start cleaning cycle: with dP reading over this threshold the cleaning cycle is able to start (Set 05)

C8 - ZERO dP READING ADJUSTMENT

In this set up code it is possible to adjust the zero reading of differential pressure. In this function DS1 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 adjust it by key A and C

C10 - ON/OFF CLEANING CYCLE BY KEYBOARD

This function allow to stops the running mode of the device in every time without switch Off the supply voltage. By pressing key 'E' for 3 seconds the Timer switch from START to STOP and viceversa.
The Ld2 led become red fixed in STOP, relay K1 switch Off (if used as A2a or A3a), up to changing in START by pressing key 'E' for 3 seconds again.

C13_5 - dP READING FULL RANGE 5 kPa

Maximun differential pressure measurable by the economizer 5.00 kPa = 50.0 mbar = 506 mmH2O. With dP reading over 5 kPa DS2 shows 'E'.

C3 - DIFFERENTIAL PRESSURE READING BY INTERNAL TRANSDUCER (max 10 kPa)

The economizer got an internal differential pressure transducer. The maximun input differential pressure is 10 kPa

C4 - CLEANING CYCLE

When supply volatge switch On if all the conditions necessary for the start of cleaning cycle are present (e.g. fan On, external conset C6 or D5 present, dP reading over start threshold), automatically the device activate the output in sequencial way with the timing set by keyboard
C4a AUTOMATIC RUNNING MODE
By keyboard and in SET MODE it is possible to select the running mode.
In automatic all the controls are active (fan, dP, C6, D5) and the start of the cleaning cycle depend on them. The Ld2 led in On green.
C4b MANUAL RUNNING MODE
By keyboard and in SET MODE it is possible to select the running mode.
In manual mode the controls active in automatic mode are Off. The Ld2 led blink red.

C7d1 - MAXIMUM dP ALARM WITH RELAY CONTACT OPEN WITH ALARM AND AUTOMATIC RESET

With dP reading over the threshold in Set Up the maximum dP alarm switch On, DS1 blinking showing dp reading (and 'H' if the device got the alarm of minimum dP option, too) and the corrispondent relay indicate the alarm condition. The alarm switch off automatically when dP reading decrease under the threshold
In set up it is possible to include or exclude a fixed dalay of 30 seconds on the activation of this alarm

D14a HOURS COUNTER

In SET MODE it is possible to visualize an hours counter. This counter is active when the cleaning cycle in On. In case of fan stop, consent D6 not present or with the device in SET MODE the counter stops.

D1b1 - ADDITIONAL CLEANING CYCLES AFTER THE STOP OF THE FAN BY dP READING (STOP)

In automatic run mode it is possible to add some additional cleaning cycles efter the stop of the fan. Its numbers is set from keyboard from 0 to 99. The device automatically checks the status of the fan by comparing the dP reading with a threshold set in code 11: dP > set 11 = fan on, dP < set 11 = fan off.
The cleaning cycles start even if dP reading is 0
With fan off the display DS2 shows'- -'. With additional cycles on the decimal points on DS2 blink
The cleaning cycles are enabled only if dP reading reach the set value in code 04 when the fan is on.

D5a - CLEANING START CONSENT BY COMPRESSED AIR VOLT FREE SWITCH

In automatic running mode and with contact D5a open the cleaning cycles stops, relay K2 indicate the alarm situation. Closing D5a to restart cycle from the point it stops.
With D5a open the display DS2 shows 'LP'.
NOTE. Bridge D5a if not used

D6a - ON / OFF CLEANING CYCLE FROM EXTERNAL CONTACT

With contact D6a open the cleaning cycle is not able to start and the display DS2 shows 'LO'.
Closing D6a the cleaning cycle start from the first electerovalve.
NOTE: bridge D6a if not used

STANDARD CHARACTERISTICS DETAIL

DPa - DIFFERENTIAL PRESSURE AIR CONNECTION

Air connection 6x4 RILSAN pipe. Pressure P1 > Pressure P2

G1 - ACTIVATION OF ONE VALVE MAX 25W

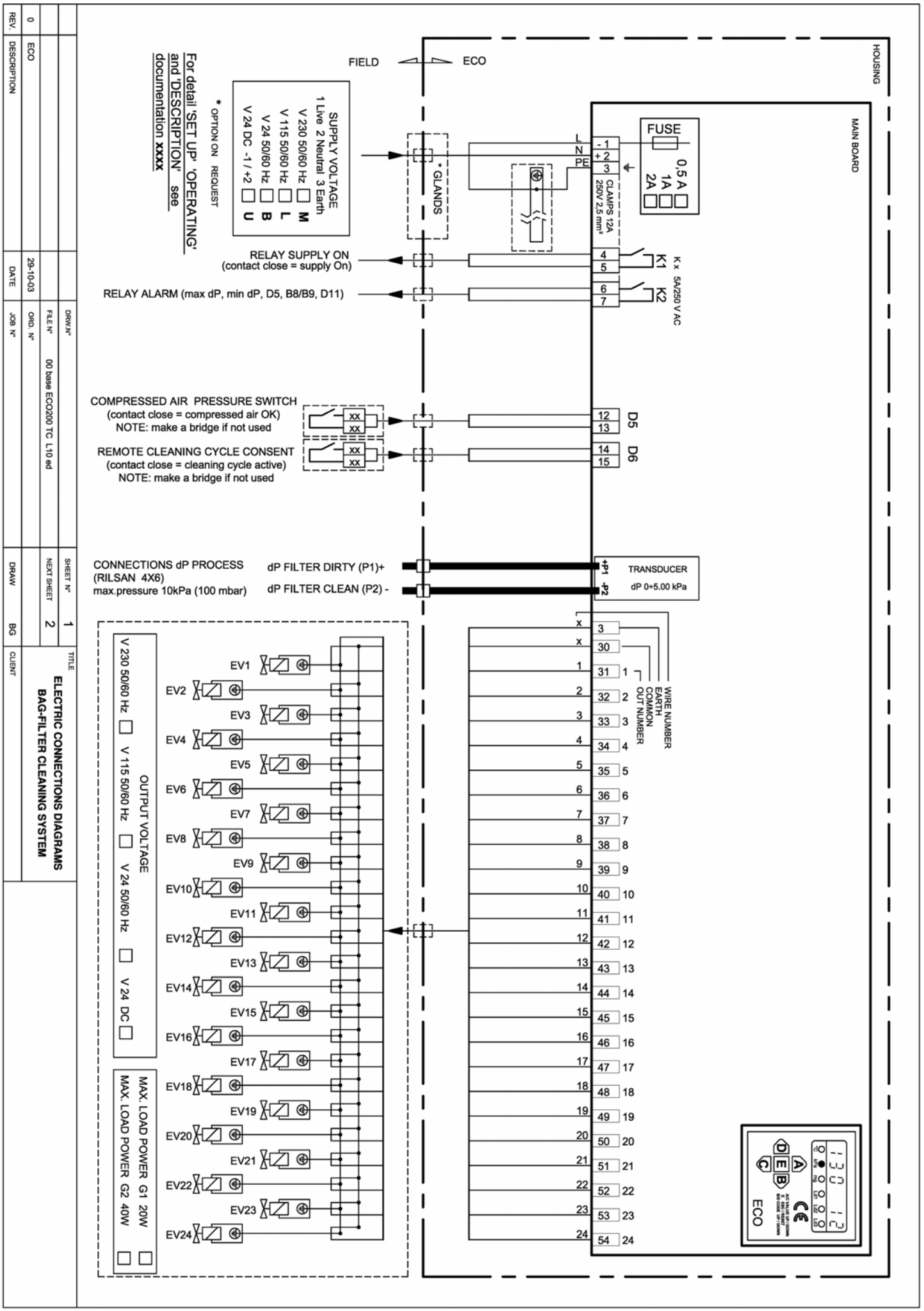
Connection of one electrovalve for each output

HV - SUPPLY AND OUTPUT VOLTAGE SELECTION BY JUMPER ON THE BOARD

By some jumpers on the board it is possible to change the supply voltage and the output voltage for the electrovalves.
(NOT AVALIABLE ON TIMER UU)

L10 - SINGLE CLAMP ON THE BOARD

Single clamp on the board for the connection of the load (1 wire for common + 1 wire for each output) and various input and output signals.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00 base ECO200 TC L10 ed
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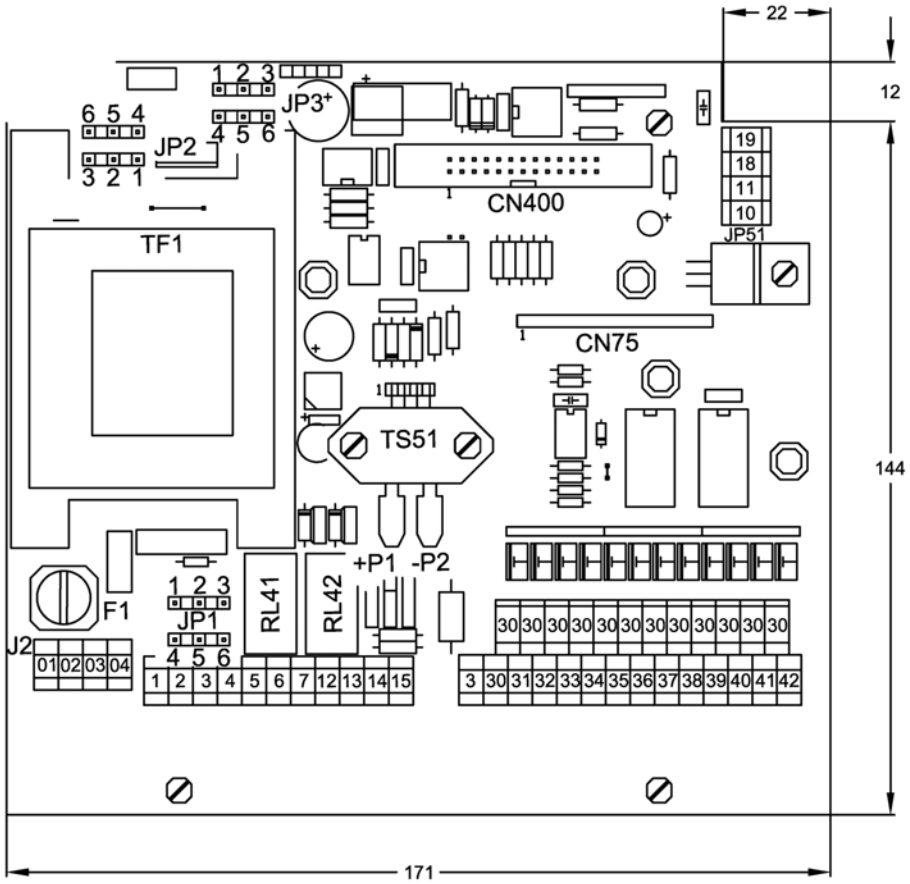
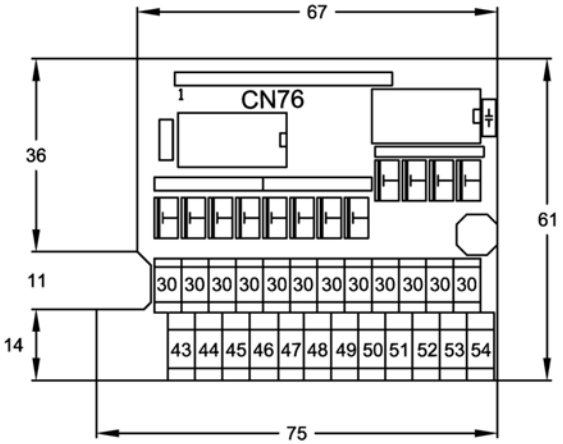
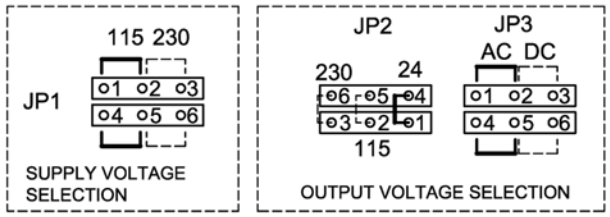
2
1
ELECTRIC CONNECTIONS DIAGRAMS
BAG-FILTER CLEANING SYSTEM
FIELD
ECO
HOUSING
MAIN BOARD
SUPPLY VOLTAGE
1 Live 2 Neutral 3 Earth
V 230 50/60 Hz ☐ M
V 115 50/60 Hz ☐ L
V 24 50/60 Hz ☐ B
V 24 DC -1 / +2 ☐ U
* OPTION ON REQUEST
For detail 'SET UP' 'OPERATING' and 'DESCRIPTION' see documentation xxxx
* GLANDS
FUSE
0,5 A
1A
2A
CLAMPS 12A
250V 2,5 mm²
RELAY SUPPLY ON
(contact close = supply On)
RELAY ALARM (max dP, min dP, D5, B8/B9, D11)
K1
K2
K x 5A/250 V AC
COMPRESSED AIR PRESSURE SWITCH
(contact close = compressed air OK)
NOTE: make a bridge if not used
REMOTE CLEANING CYCLE CONSENT
(contact close = cleaning cycle active)
NOTE: make a bridge if not used
D5
D6
CONNECTIONS dP PROCESS
(RILSAN 4X6)
max.pressure 10kPa (100 mbar)
dP FILTER DIRTY (P1)+
dP FILTER CLEAN (P2) -
TRANSDUCER
dP 0÷5.00 kPa
WIRE NUMBER
EARTH
COMMON
OUT NUMBER
OUTPUT VOLTAGE
V 230 50/60 Hz ☐ V 115 50/60 Hz ☐ V 24 50/60 Hz ☐ V 24 DC ☐
MAX. LOAD POWER G1 20W ☐
MAX. LOAD POWER G2 40W ☐
EV1
EV2
EV3
EV4
EV5
EV6
EV7
EV8
EV9
EV10
EV11
EV12
EV13
EV14
EV15
EV16
EV17
EV18
EV19
EV20
EV21
EV22
EV23
EV24
ECO





VOLTAGE SELECTION



NOTE: DC OUPUT VOLTAGE IS AVALIABLE ONLY FOR 24V

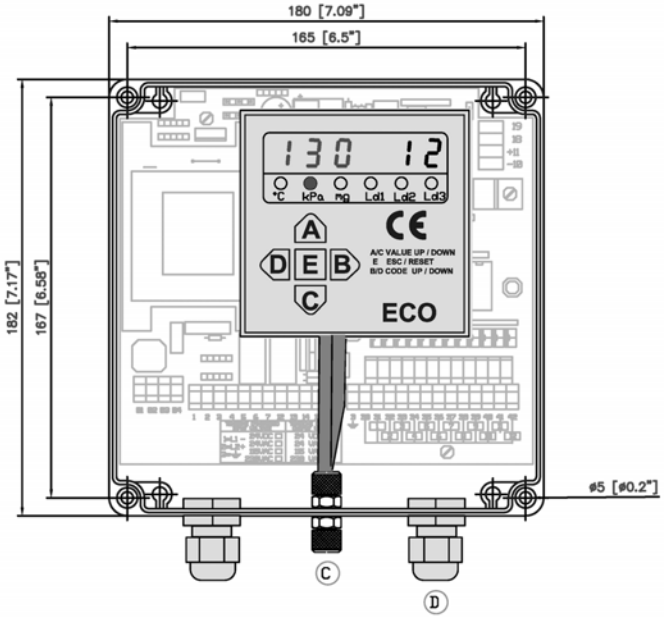
LEGEND

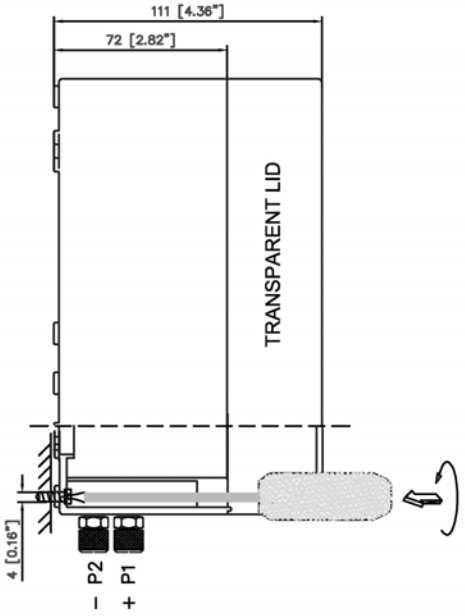
CN 400	Front panel flat cable connector
CN 75	Strip connector for output 13÷24 board
CN 76	Strip connector for main board connection
F1	Line protection fuse
J2	Main switch clamps (option)
J51	4÷20 mA ouput signal and external dp transducer clamps (option)
JP1	Supply voltage selection jumper
JP2	Ouput voltage selection jumper
JP3	Output voltage AC/DC selection
+P1	Higher pressure dP input
-P2	Lower pressure dP input
RL41	Output relay K1
RL42	Output relay K2
TF1	Input transformer
TS51	Differential pressure transducer

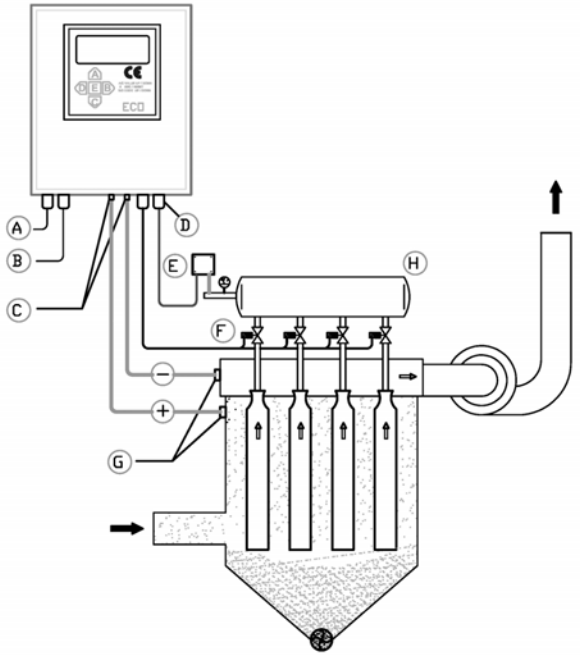
SIZE IN mm.

			DRW.N° -	SHEET N° -	TITLE	**ECONOMIZER B12÷24 LAYOUT DESCRIPTION**	**FOR ELECTRICAL CONNECTIONS SEE ELECTRICAL WIRING DIAGRAM ENCLOSED TO THIS DOCUMENTATION**
			FILE N° B12M5-200	NEXT SHEET -			
0	B12÷24 LAYOUT	14/10/2003	ORD. N° -				
REV.	DESCRIPTION	DATE	JOB N° -	DRAW M.P.	CLIENT -		

ECONOMIZER Bxx-1.4 MAX. 12 output







Technical data enclosure

Degree protection	IP 65
Impact resistence	> 7 joule ,EN 50014
Insulation	Fully insulated to VDE 0100
Temperature range	-10°C to +70°C
Flammability	V 2 to UL 94
Toxicity	low-halogen
Colour	grey RAL 7035

Legend

A - Power supply see electrical wiring
B - Interface signal see electrical wiring
C - Bulckead dP signal tube RILSAN 4x6 +P1 DURTY - P2 CLEAN
D - Glands option on request
E - Air compressed switch
F - Electrovalves cleaning cycle
G - Connection port signal dP (filter bulckead on request)
H - Air compressed tank

			DRW.N° B12-1.4	SHEET N° 2	TITLE
			FILE N° B12-1.2-201	NEXT SHEET –	LAYOUT B12-1.4
0	ECO B12	24-10-03	ORD. N° –		
REV.	DESCRIPTION	DATE	JOB N° –	DRAW BG	CLIENT –

PROBLEMS SOLUTION

FAILURE	POSSIBLE CAUSE	SOLUTION
Display OFF	Protection fuse broken. Supply voltage. Selection supply voltage Jumper. (If Present)	Check the protection fuse on supply line. Verify that supply voltage is present and it is correct (clamps 1 and 2). Verify that the supply voltage selection JP1 are in right position and not broken.
No output activation	Output voltage. Connection to the electrovalves. Output voltage selection Jumper	Verify that the output voltage of the Timer and the voltage of the electrovalves are the same. Verify that the selection Jumper JP2 and JP3 are in right position and not broken. Check the connection between Timer and electrovalves.
The intensity of the display decrease or the fuse broke when an output is activated.	Connection to the electrovalves. Shortcircuit on an electrovalves. Wrong output voltage selection.	Verify the connection between Timer and electrovalves. Check the coil of the electrovalves and cables connection to them. Verify that the output voltage selection of the Timer and the voltage of the electrovalves are the same. (Jumper JP2 e JP3)
Wrong differential pressure reading.	Pneumatic connection not free. Pipe damaged	Disconnect the 2 pipe to the Timer and verify that dP reading is 0.00 kPa. If it is OK check the pipe for air connection from the Timer 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 to the Timer. With key A hold down switch on supply voltage. With this operation the default data are loaded in set up. Adjust the zero dP reading and the other parameters as request.
The display shows LO	Miss a bridge at clamps 14, 15 (If contact not used). Wrong connection between Timer and remote system.	If the contact is not used, verify if there is a bridge at the clamps 14, 15. If the contact is used, verify that the remote system give a volt free contact close when the cleaning cycle must start.
The display shows LP	The bridge at clamps 12, 13 miss (If contact not used). The connection of the compressed air switch the clamps 12, 13 is not right.	If the contact is not used, verify if there is a bridge at the clamps 12, 13. If the contact is used, verify that the air cmpressed switch give a volt free contact close when the compressed air is Ok.

WARRANTY

The warranty is 4 years. The company will provide to replace any electronic component held defective, exclusively in our laboratory, different accords excepted that they must be authorizes from the company.

WARRANTY EXCLUSION

The warranty is not valid in case of:
1) Tampering or reparations made by no authorizated persons.
2) Wrong use of the device without technical data respect.
3) Wrong electrical wiring.
4) No respect of the installation rules.
5) Use of the device out of CE rules.
6) Atmospheric events (Lightning, electrostatic discharge), Overvoltages.

DICHIARAZIONE DI CONFORMITA' DEL COSTRUTTORE

CONFORMITY DECLARATION OF THE CONSTRUCTOR

Nome del costruttore:
ESA Electronic Engineering
Indirizzo del costruttore:
via J.Kennedy 28 I 20010 Mesero (Mi) Italia

Constructor name:
ESA Electronic Engineering
Constructor address
via J.Kennedy 28 I 20010 Mesero (Mi) Italia

Dichiara che il prodotto:
Nome del Prodotto(i): Economizzatore
Modello: B
Opzioni del prodotto: Tutte

Declare that the device:
Device(s) name: Economiser
Model: B
Device options: All

E' conforme alle seguenti direttive:

Direttiva Macchine 89/336/EC 'compatibilità elettromagnetica' e alle successive modifiche 91/236/EC, 92/31/EC, 93/68/EC e 93/97/EC rispondenti alle norme Europee armonizzate EN61000-6-2 (classe B della norma) e EN61000-6-4

Meets the following directive:

Machine Directive 89/336/EC 'electromagnetic compatibility',amended by 91/236/EC, 92/31/EC, 93/68/EC e 93/97/EC related to the European Standard EN61000-6-2 (class B of the rule) and EN61000-6-4

Direttiva Bassa Tensione (DBT) 73/23/EC rispondente alle norme Europee armonizzate EN 60947-1/A1 e EN 60947-1/A2

Low Voltage Directive 73/23/EC related to the European Standard EN 60947-1/A1 and EN 60947-1/A2

Informazioni supplementari:
I prodotti sono stati sottoposti a test in configurazione tipica e con potenza di carico 40 watt

Additional informations
the devices were tested in typical configuration with load power of 40 watt

Mesero, 02 gennaio, 2003

G. BELLINELLI
Amministratore delegato / Managing director

ESA ELECTRONIC ENGINEERING s.r.l.