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ECONOMIZER

E6T

UP TO 184 OUTPUT CHANNELS IP65 IK09

User Manual

23/05/2016
Manual Release 1.00
Hardware Release 1.01

General Description

Economizer for controlling the pneumatic cleaning function of industrial dust collection systems.

The pressure differential is digitally controlled by an internal transducer allowing to determine filter obstruction with accuracy.

The device has three output relays contacts and two digital input contacts.

A large, bright display is provided for reading the filter obstruction level, the active solenoid valves and any alarms in any moment.

Technical Specifications

Casing

- 15/10 thick sheet steel, painted textured RAL 7035.
- Protection degree to water and dust: IP65 (EN60529) complies with NEMA 4.
- Impact resistance degree as per IEC EN 62208: IK09 10 joule.
- Door: reversible, with one box locking element painted textured RAL 7035, provided with a seal applied by continuous molding.

Output Channels

The basic version with a minimum number of output channels is up to 24.

With the use of expansion cards are obtained versions up to:

Number Of Output Channels	Casing Dimensions		
	H *L*	L *W*	P *H*
24 ÷ 56	400 mm	400 mm	200 mm
64 ÷ 120	600 mm	400 mm	200 mm
124 ÷ 184	800 mm	600 mm	250 mm

Performance Of The Device

- Power voltage 115-230 Vac ± 10% 50-60 Hz selectable by means of jumpers, optional 24Vac, 24Vdc.
- Output voltage 24Vdc, 24-115-230Vac selectable by means of jumper must also set with Out Voltage in Calibration / Tests.
- Lcd display viewing area 72.0 x 40.0 mm.
- Three active configurable alarm relays normally closed.
- Micro SD memory card for data storage, extractable for consultation. Sampling is performed every 10 seconds, the time interval is editable.
- Four operation modes: manual; automatic, automatic with forced cycle; proportional.
- Operating times expressed in seconds with selectable ranges for any application (option pause time in minutes).
- Pressure measurements expressed in kPa or inch Wc or mm H_2O.
- Washing function with the fan off (post-cleaning) through the dP fan threshold in the automatic/automatic with forced cycle/proportional modes and through contact in the manual mode with up to 99 cycles that can be selected.
- Total and partial hour counter for maintenance.
- Maximum dP (filter obstructed) alarm.
- Minimum dP alarm (broken sleeve/cartridge), with possibility of inclusion/exclusion.
- Solenoid valve not working alarm.
- Filtering element maintenance deadline alarm, with on/off selection.
- External contact cleaning activation.
- Compressed air presence enable input.
- Pre-Coating function, with possibility of inclusion/exclusion.
- 4-20mA active output proportional to dP reading for remote pressure reading.
- Manual solenoid valve activation.
- Setting the current date and time associated with the archiving historical data on the SD card, where are stored the detected values.

Electric Specifications

Electric Power

- 115 VAC ± 10% 50-60 Hz – 25W
- 230 VAC ± 10% 50-60 Hz – 25W
- 24 VAC ± 10% 50-60 Hz – 25W optional
- 24 VDC ± 10% – 25W optional

Warning! Read the section on installation before connecting the device.

Selectable Output Voltage

- 24 Vdc Maximum Load 25 W.
- 24 Vac Maximum Load 25 W.
- 115 Vac Maximum Load 25 W.
- 230 Vac Maximum Load 25 W.

Inputs And Outputs Galvanically Insulated

- Enable contact (remote cleaning enable).
- Fan contact (post-cleaning).
- 4 – 20mA (dP remote reading).

The solenoid valves connected to the unit are normally closed.
The activation of a solenoid valves causes them to open and let out a jet of air.

Alarm Relays

The three alarm relays contain 2 clean contacts on terminals 4 ÷ 9 di J4.
Maximum permitted load: 3A @ 250Vac, 2A @ 24Vac, 2A @ 24Vdc.
The relays are normally closed, opens in case of alarm, and opens to the control unit off in the absence of power.

Fuse

1 x 1 A @ 115Vac. 1 x 1 A @ 230Vac.
1 x 3 A @ 24Vac. 1 x 3 A @ 24Vdc.

Working Temperature

from -10°C to 55°C

Storage Temperature

-20°C to 60°C

Timer Specifications:

Pulse Time (Valve Opening)

from 50 ms to 5 sec

Pause Time (Interval Between Valve Openings)

1 sec - 999 sec

Differential Pressure Gauge

Measurable pressure range: from 0 to 4 kPa
Maximum applicable pressure: 16 kPa - 0.16 bar
(optional sensor 10kPa)

Warning! Higher pressures will damage the device.
Do not connect clogging measuring tubes to the compressed air circuit.

Warning Symbols Used In This Manual

The information regarding safety are highlighted using the symbols:

	Warning-Danger	Generic - Warning-
	Risk – Danger	Electric Current
	Dispose according to the standards for electrical and electronic equipment RAAE	

Installation Rules Notes and Warnings

- Protect the device from direct exposure to sunlight.
- Do not position the device near or directly in contact with sources of heat or electromagnetic fields.

- Fix the device of a height of at least 60 cm from the ground.

  In a clearly visible place easily accessible.
- Connect the device to power lines other than those for operating motors or other large power devices which could generate network interference.
- The electrical supply of the unit must be protected by a differential switch 230Vac~ 30mA and a bipolar magneto thermic 230Vac~ 10A, positioned in a place easily accessible.
- Before working on the equipment to perform any operation switch off the magneto thermic differential switch.

- For electric operations, always remove voltage, wait 30 seconds for the inside capacitors to discharge before opening. At the end of the operations, close the device to restore the correct degree of protection before powering up.
- For the connection of the supply voltage, use anti-flame wires with a minimum section of 0.75mm² certified and conform to the standard IEC60227 or IEC60245.
- Use flame-retardant cables with a minimum cross-section area of 0.75 mm² for all control signals.
- Use flame-retardant cables with a minimum cross-section area of 0.75 mm² to connect to the indicating relays.
- Use flame-retardant cables with a minimum cross-section area of 0.75 mm² for electro valves control signals.
- Use flame-retardant cables with a minimum cross-section area of 0.5 mm² for electro valves control signals.
- The wire ground conductor of protection must be yellow/green.
- The wire ground conductor of protection must be connected first.
- The wire which is colored yellow/green must only be used for the ground conductor.

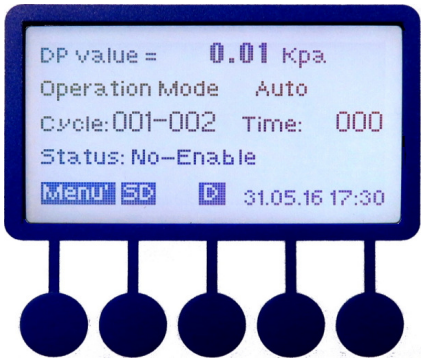
- The cable glands must be chosen according to the diameter of the cable to be used.
- The sealing of the press cable is guaranteed by the compression of the rubber gasket that tightens on the outer diameter of the cable.
- The tightness of the cable gland is guaranteed by the compression of the rubber seal that tightens on the outer diameter of the cable.
- The size of cable and cable gland must ensure that a power cord traction is not acting on the terminals.
- The terminal block must not be the point of mechanical anchoring of the conductors.
- The cable gland PG9 supplied on request, has cable diameter minimum of 4mm and a maximum of 8mm, with clamping nut by 19mm.
- Any use not described in this user instruction manual or incorrect use of the device may cause damage to the device or to the devices connected to it.
- Furthermore, incorrect use or tampering with the device may cause injury.
- Waterproofness of the casing is guaranteed when the flap is closed.
- Make sure that rigid or flexible ducts used for wiring, if any, do not fill up with water or other liquids.
- To preserve the IP degree of protection of the box must be used cable glands of the same class of the enclosure or higher.
- Cut off power supply immediately if water is found in the casing.
- If the control unit is used in ways not specified by the manufacturer, the protection provided by the device may be impaired.
- The Control Unit does not release potentially toxic or harmful substances to the health and the environment.
- No part with dangerous voltage is normally accessible.

Do not use the economizer if you have not read or do not understand this manual.

Display And Keypad

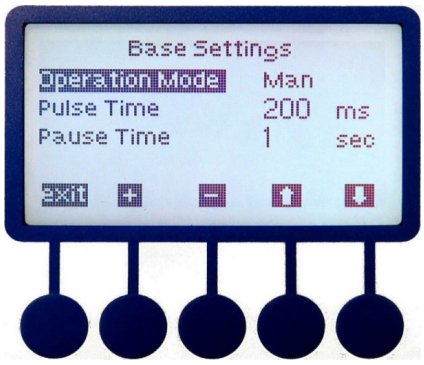
There are five round buttons on the front panel for controlling the device and turning on the display as shown in the following figure.

- Press the first button to the left to access the configuration menu
- By pressing the button corresponding to the letter D is accessing the menu Video Setting



- Use the arrows to scroll through the items of the menu.
- After entering one of the functions use the OK.
- The OK button is used to confirm data and reset alarms.

- Buttons + and - increase or decrease the values.
- Holding down the + and - buttons to scroll through all the values or functions until the end of the left or right.
- Press the Exit button to quit and save.



Menu Diagram

The menu and the contents of each entry are organized as shown below.

Base Settings	
Operation Mode	Manual dP excluded Automatic dP included, › default setting Automatic with forced cycle dP included Proportional dP included
Pulse Time	Solenoid activation time Possible values: 0.05 seconds – 5.00 seconds step 0.01 seconds › default setting 0.20 seconds
Pause Time	Washing pause time between solenoid valves Possible values: 001 seconds – 999 seconds step 1 seconds › default setting 20 seconds
Number Of Outputs	Number of connected outputs. Possible values: 001 – 099 step 1 › default setting 001
Start Threshold	Cleaning cycle start threshold Possible values: 0.00 kPa – 3.99 kPa step 0.01 › default setting 0.80 kPa
Stop Threshold	Cleaning cycle stop threshold Possible values: 0.00 kPa – 3.99 kPa step 0.01 › default setting 0.40 kPa

Advanced Settings	
Fan Mode	Fan on recognition mode Possible values: from contact – from dP › default setting from dP
Fan Threshold	dP threshold for fan on recognition if Fan Mode = from dP Possible values: 0.00 kPa – 3.99 kPa step 0.01 › default setting 0.10 kPa
PCC Cycles	Number of post cleaning cycles after stopping the fan. Possible values: 01 – 99 step 1 › default setting 01
Pause PCC	Post cleaning mode pause time between solenoid valves (fan off) Possible values: 001 seconds – 999 seconds step 1 seconds › default setting 10 seconds
Precoating	Precoating function enabling. Possible values: 0 (disabled) – 1 (enabled) › default setting 0
Precoating Threshold	dP threshold for precoating function Possible values: 0.00 kPa – 3.99 kPa step 0.01 › default setting 2.00 kPa
Enforced Cycle In	Selection of minutes or hours for Enforced Cleaning Cycle. Only if the Operation Mode Automatic with forced cycle dP included Minutes 0 =minutes, 1 =hours › default setting 0 minutes
Time Enforced Cycle	Setting time interval for Enforced Cleaning Cycle in relation to the choice of Enforced Cycle In Possible values: 1 - 999 step 1 › default setting 240 minutes

Alarms	
Alarm Maintenance	Maintenance deadline alarm enable. Possible values: disabled – enabled › default setting disabled
Maintenance Interval	Maintenance frequency expressed in tens of hours Possible values: 001 – 999 step 1. (e.g.: 1=10h, 10=100h) › default setting 100 › 100 hours
Minimun dP Alarm	Enabling Minimum dP Alarm function. Possible values: disabled – enabled › default setting disabled
Minimum dP Alarm Threshold	Min dP Alarm Threshold, Broken Sleeve or Cartridge Possible values: 0.00 kPa – 3.99 kPa step 0.01 › default setting 0.20 kPa
Maximum dP	Max dP Alarm Threshold, Filter Clogging For Over 20 Seconds Possible values: 0.00 kPa – 3.99 kPa step 0.01 › default setting 3.00 kPa
Exclude E.V. In Short Circuit	Exclusion of the valve in short circuit, if set to the valve shorted is excluded from the cycle. Possible values: enabled - disabled › default setting not excluded

Calibration / Tests	
Voltage Output	Output voltage setting Possible values: 24 Vdc, 24 Vac, 115 Vac, 230 Vac › default setting 24 Vac
Manual Activation	Manual output activation Possible values: 1 – number of outputs set in › Base Settings › Outputs Number
Zero dP	Zero dP threshold Possible values: 0.00 kPa – 3.99 kPa step 0.01 › default setting 0.00 kPa
Set Date & Time	Setting the date on the internal clock Settable values Day 1 – 31, Month 1 – 12, Year 00 – 99 Setting of the time for the internal clock Settable values: Hours 0 – 23, Minutes 0 – 59
4 mA Calibration	The signal of 4 milliamps corresponding to a pressure of 0 inch kPa, measured with a digital ammeter to terminals 10 negative and positive 11 connector J6, is adjusted by acting on the + and - keys.
20 mA Calibration	The signal of 20 milliamps corresponding to a pressure of 3.99 kPa, measured with a digital ammeter to terminals 10 negative and positive 11 connector J6, is adjusted by acting on the + and - keys.

Counters	
Total Hour Counter	Total counter of the hours of activity of the device
Maintenance Hour Counter	Counter for maintenance
Zero Maintenance Counter	Maintenance hour counter reset. Possible values: disabled – reset › default setting disabled

Display Settings	
Language	To select one of the 6 available languages: Italian, English, French, German, Spanish, Portuguese.
Bright	To adjust the brightness of the Lcd video
Backlight	To adjust the back lighting of the Lcd video

It is possible to access at that menu Display Setting even from the main menu by pressing the button corresponding to the letter D.

System Info	
SW GUI Version	Software Release Graphical User Interface
SW E6T Version	Software Release Control Unit Main Board

Alarms

The unit runs a number of checks during the start-up cycle and during normal operation. The possible alarms and respective solutions are shown in the following table.

A. Nr.	Description	Action
E01	Voltage Output Setting set to 24Vdc – AC jumper detected	- For 24Vdc, switch the device off and move the AC/DC jumpers to DC. - For 24Vac, set the function Voltage Output Setting select A24 and press OK to confirm.
E02	Voltage Output Setting set to 24Vac – DC jumper detected	- For 24Vac, switch the device off and move the AC/DC jumpers to AC. - For 24Vdc, set the function Voltage Output Setting select A24 and press OK to confirm.
E03	Voltage Output Setting set to 24Vac or dc. Voltage out of range detected	- To use 24V valves, switch the device off and move the output voltage selection jumper to 24V. - If the jumper is in the correct position, set the function Voltage Output Setting select 115 or 230 and confirm.
E04	Voltage Output Setting set to 115V. Voltage out of range detected	- To use 115V valves, switch the device off and move the output voltage selection jumper to 115V. - If the jumper is in the correct position, set the function Voltage Output Setting select 115 or 230 and confirm.
E05	Output Voltage Setting set to 230V. Voltage out of range detected	- To use 230V valves, switch the device off and move the output voltage selection jumper to 230V. See jumper table next. - If the jumper is in the correct position, set the function Voltage Output Setting select a24, d24 or 115 and confirm.
E06	Solenoid valve current lower than minimum threshold or disconnected solenoid valve	Check correct connection of the solenoid valve and respective data. The alarm is self-reset.
E07	Solenoid valve current higher than maximum threshold	Check correct connection of the solenoid valve and respective data. The alarm is self-reset.
E08	Output short circuit The signaling of the code E08 alternates with the indication of the interested output is shown as Uxx where xx is the number of the output and the value of dP.	Turn off the device and then turn it back on, after having verified the plant of the solenoid valves.

E09	Max dP Alarm Threshold, Filter Clogging Detected for longer than 20 seconds.	Check state of filtering elements.
E10	dP sensor hardware offset out of range.	The self-calibration of the dP sensor has determined that a value is out of range. Disconnect the air tubes and repeat the function. Take the device to be serviced if the alarm occurs again.
E11	Maintenance deadline reached	Carry out maintenance.
E12	dP sensor full-scale value reached Immediate reporting without any delay.	Check state of filtering elements. IMPORTANT: Running in this condition may damage the device.
E13	Minimum dP alarm value ranging from dP Threshold For Fan On Recognition to Min dP Alarm Threshold, Broken Sleeve/Cartridge warning: the alarm is generated with a fixed delay of 60 seconds.	Check the status of the filtering elements.
E14	Indicates that a valve in short circuit has been excluded from the cycle. The signaling of the code E14 alternates with the indication of the interested output is shown as Uxx where xx is the number of the output and the value of dP. An output is considered a short circuit if not responding for 3 following activations. An activation without error resets the counting.	Turn off the device and then turn it back on, after having verified the plant of the solenoid valves.
E20	Internal clock error.	Replace buffer battery CR1632 3V 130mAh and set current time and date.

Description Of Operation

The installed SW version will appear on the display when the economizer is powered up. Meaning that coherence between settings stored in E2Prom and the set jumpers is being checked, will appear on the display when the economizer is powered up. A corresponding error will appear in case of discrepancies between settings. Only editing functions will be allowed on the unit. The operator may switch off the unit and configure the jumpers correctly.

Manual Operating Mode dP Excluded

The economizer will work as a programmable cycle sequencer in manual mode. The connected outputs will be activated at the programmable frequencies. Manual mode can be activated by accessing the configuration menu and setting to Manual dP Excluded.

Pulse Time and Pause Time will set the activation time and the pause time, respectively.

Automatic Operating Mode dP Included

By selecting automatic mode Automatic dP Included, the economizer will work autonomously can carry out the pneumatic washing cycle only when needed. The device will start the washing cycle if the obstruction is higher than Threshold Dp Start. Washing is suspended when obstruction drops under Threshold dP Stop level until it reaches a value higher than the Threshold dP Start threshold once again. When washing is active, the economizer respects the times set in Pulse Time operating and Pause Time.

Automatic Mode With Forced dP Included

Identical to the automatic mode, except for the fact that it is possible to obtain a cleaning cycle with the activation of the solenoid valves connected without reaching the Start Threshold. The forced cleaning interval may range from 1 to 999 h and can be selected through function Forced Cycle In and Time Forced Cycle.

Proportional Mode dP Included

With the proportional mode, the economizer will work in full autonomy, initially setting the dP Start Threshold, activation time Solenoid Activation Time and pause time Washing Pause Time Between Solenoid Valves.

When the Start Cleaning threshold is exceeded, the solenoid valves are automatically activated in sequence. If the dP threshold drops below 15% at the end of an entire cycle of pulses of the connected solenoid valves, the washing is suspended until pressure returns to a value above the Start Cleaning dP value. If the dP value does not drop below 15% of the Start Cleaning threshold, the frequency of the cycle time is automatically reduced in proportion with each entire cycle of pulses of the connected solenoid valves, until a minimum cycle time between solenoid valves reaches 10 seconds. The minimum threshold of 10 seconds has been chosen so as not to hamper the dispensing of air by the compressor connected to the filter.

Cleaning Function With Fan Off PCC

This function allows to carry out one or more cleaning cycles, the number of cycles is defined by the Number Of Post Cleaning Cycles After Stopping The Fan when the fan is off. The on or off state of the fan may be determined by the state of the contacts 12-13 (contacts open = fan off) if Fan On Recognition Mode =0, or may be determined automatically (with Fan On Recognition Mode =1) when the dP pressure drops under the threshold defined in dP Threshold For Fan On Recognition. The pulse time of the valves will always be that defined in Solenoid Activation Time, while the pause time in this case is defined in Post Cleaning Mode Pause Time Between Solenoid Valves (Fan Off).

The display alternately shows the number of the valve activated and the word PCC.

Number Of Output Selection

The number of outputs (solenoid valves) on which the economizer will run the cleaning cycle can be selected. Cleaning will be carried out in order from the first to the last solenoid valve. The valves can be adjusted by the Number Of Connected Outputs function.

Precoating Function Enabling

This function is used to carry out precoating. Precoating is a filtering element treatment carried out with precoating powder. Washing and manual output activation is suspended during precoating until the precoating thresholds defined in dP Threshold For Precoating Function is reached.

The dP value and the message Precoating will appear alternatively on the display.

dP Zero Calibration Threshold

This function is used to reset dP reading with the fan off.

Increase or decrease the value shown by pressing + and - as required. This value will be subtracted from the value read by the dP sensor.

dP Sensor Self-Calibration

This function allows to reset dP reading with the fan off automatically.

The message Self-calibration dP On will appear after the start-up test. The unit will go back to normal state after a few instants. Automatic calibration is complete.

Fuse

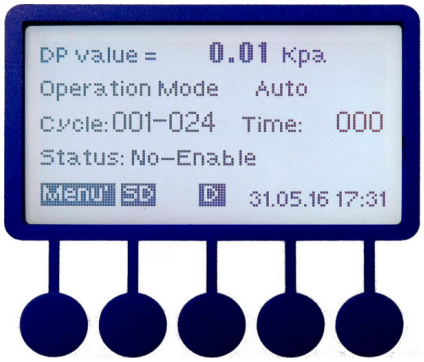
A fuse which can be reset in case of need is located near the power terminal board. Use a delayed fuse 5x20mm as shown in the table on next pages.

SD Memory Card

The Micro SD memory card slot is located on the bottom right angle of the control unit.

The card is not supplied with the control unit. A card with a maximum of 32GB can be used.

The card must be formatted FAT32, which is the format recognized by all devices and operating systems.

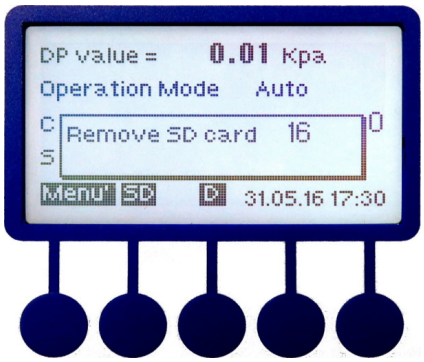


When the SD card is inserted into its place, SD indication on the screen is displayed.

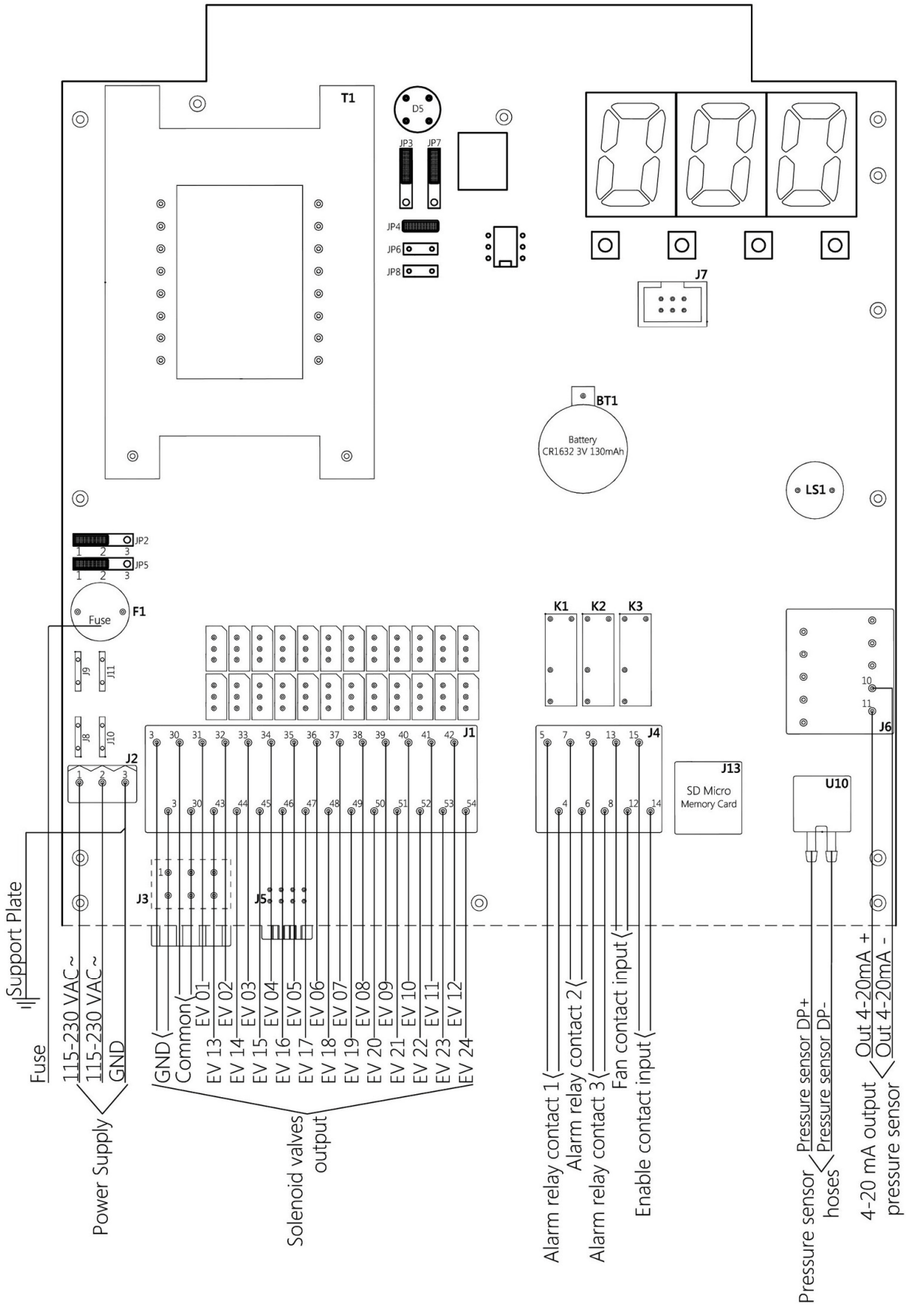
Before removing the memory card, press the second button in correspondence of the written SD, during the countdown of the duration of 20 seconds the card can be safely removed.

The Micro SD Card connector is push-pull.

Press upwards and extract the card to remove it.



Connection Diagram Main Board



Pressure Sensor	dP + Pressure inlet dirty section
	dP - Depression inlet clean section

Contacts And Relay Terminal Block J4

Enable contact input consensus 14.15 terminals.

Is used to activate the control unit remotely, it can be turned on and off remotely.

The unit is supplied with a jumper on the two terminals 14:15, without it will not turn on.

Fan contact 12.13 input terminals.

Indicated by the control unit that the plant has been started and is in operation.

The unit is supplied with a jumper on two 12:13 terminals to simulate the state of the plant, as if the fan was turned on.

Alarm Relay K1 4.5 terminals.

The relay is normally closed, opens in case of alarms, and opens to the control unit off in the absence of power.

The alarms that open the relays are:

Problem with solenoid valves E06-E08.

Maintenance interval has been reached.

If one of these occurs, the relay is activated.

Alarm Relay K2 6.7 terminals.

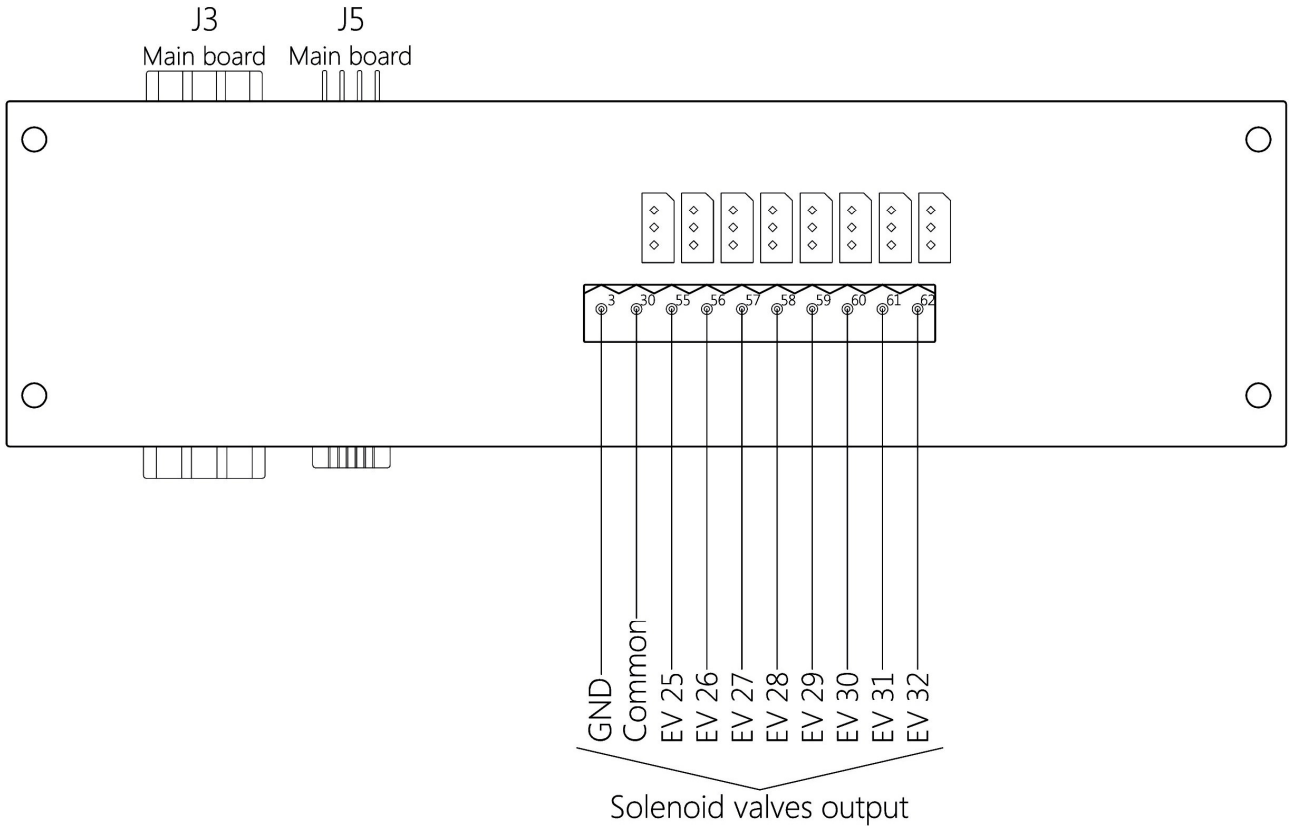
The relay is normally closed, opens in case of alarm, and opens to the control unit off in the absence of power.

The alarm that open the relays is:

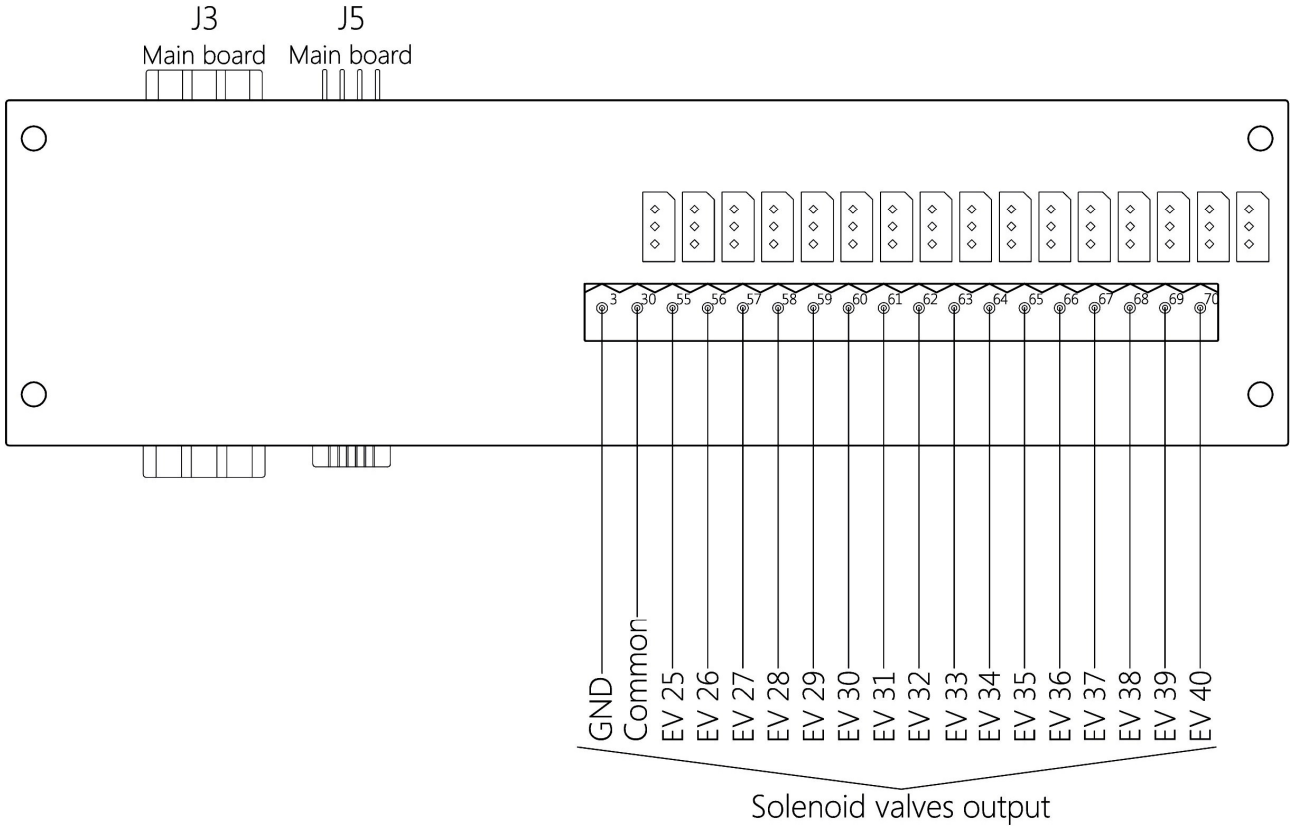
Max dP has been reached.

Connection Diagram Expansions

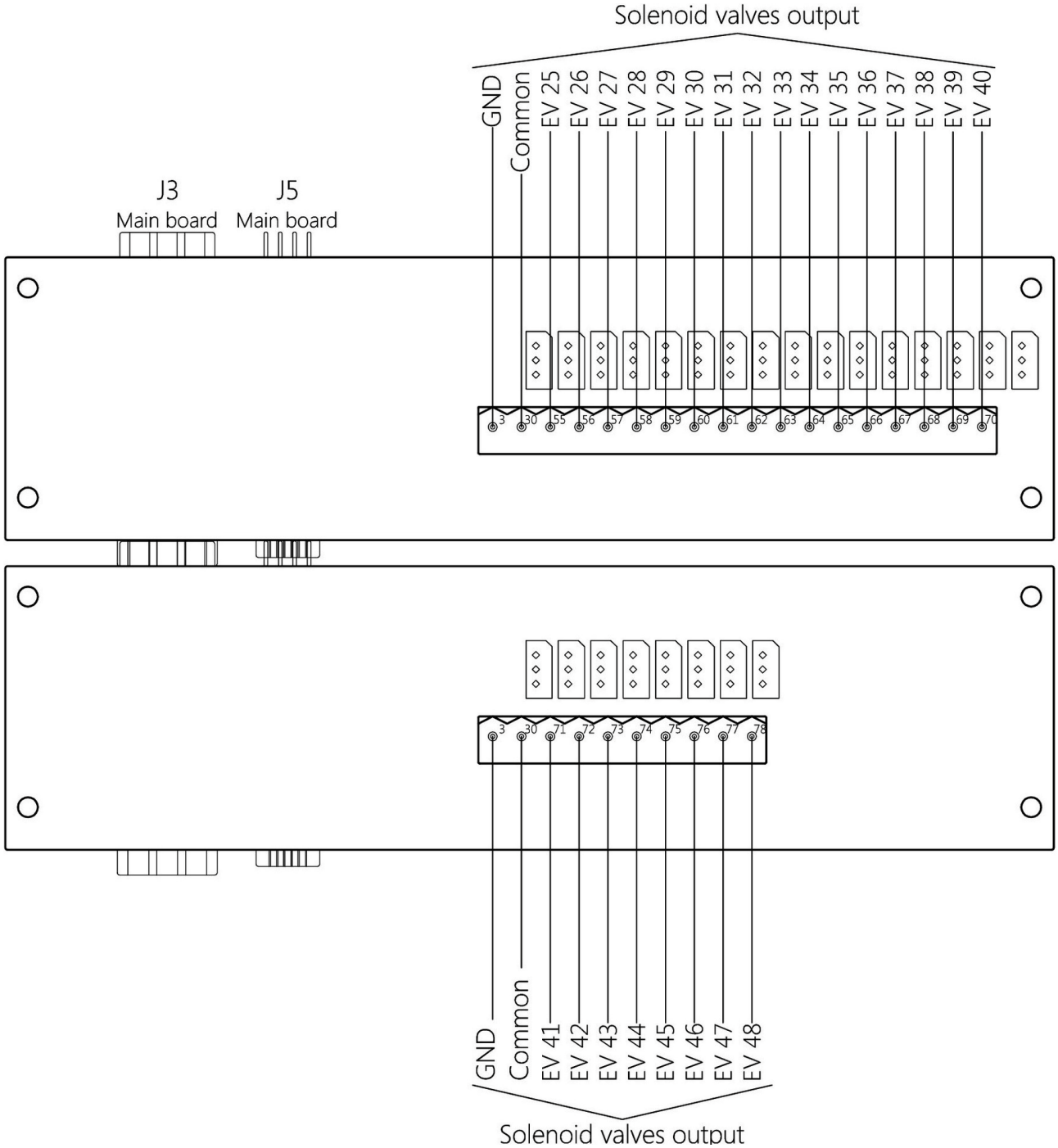
Expansion Up To 32 Channels



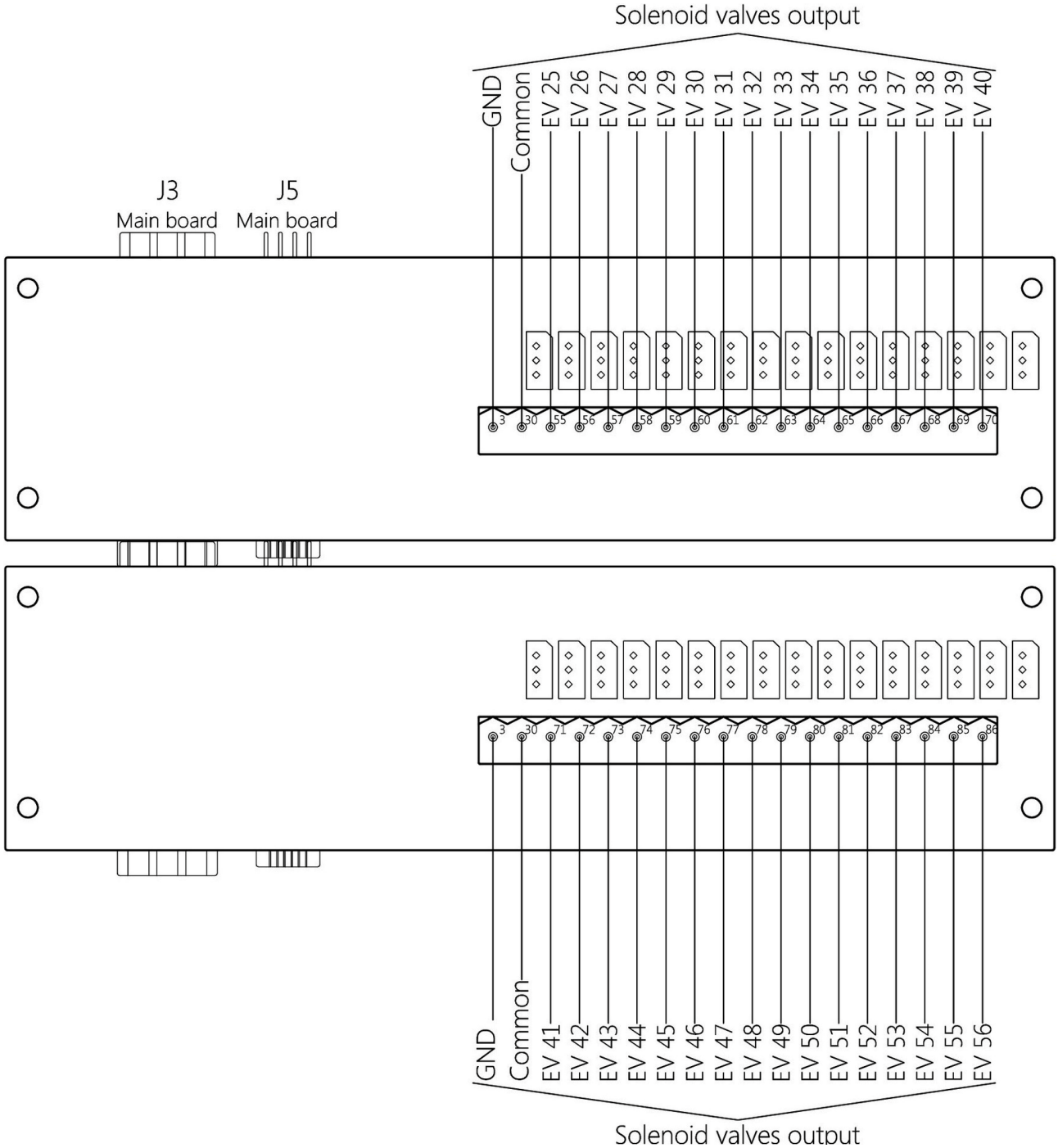
Expansion Up To 40 Channels



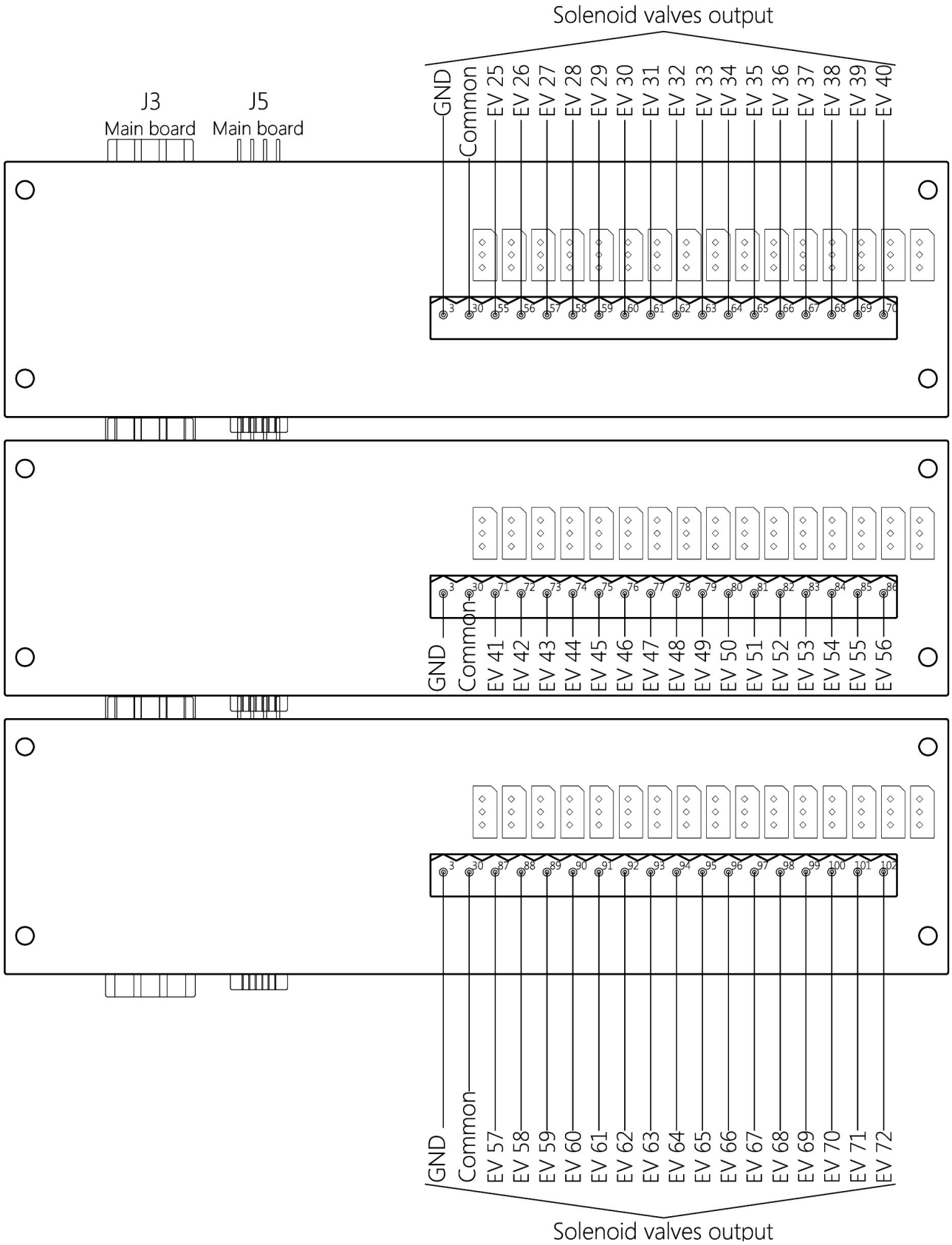
Expansion Up To 48 Channels



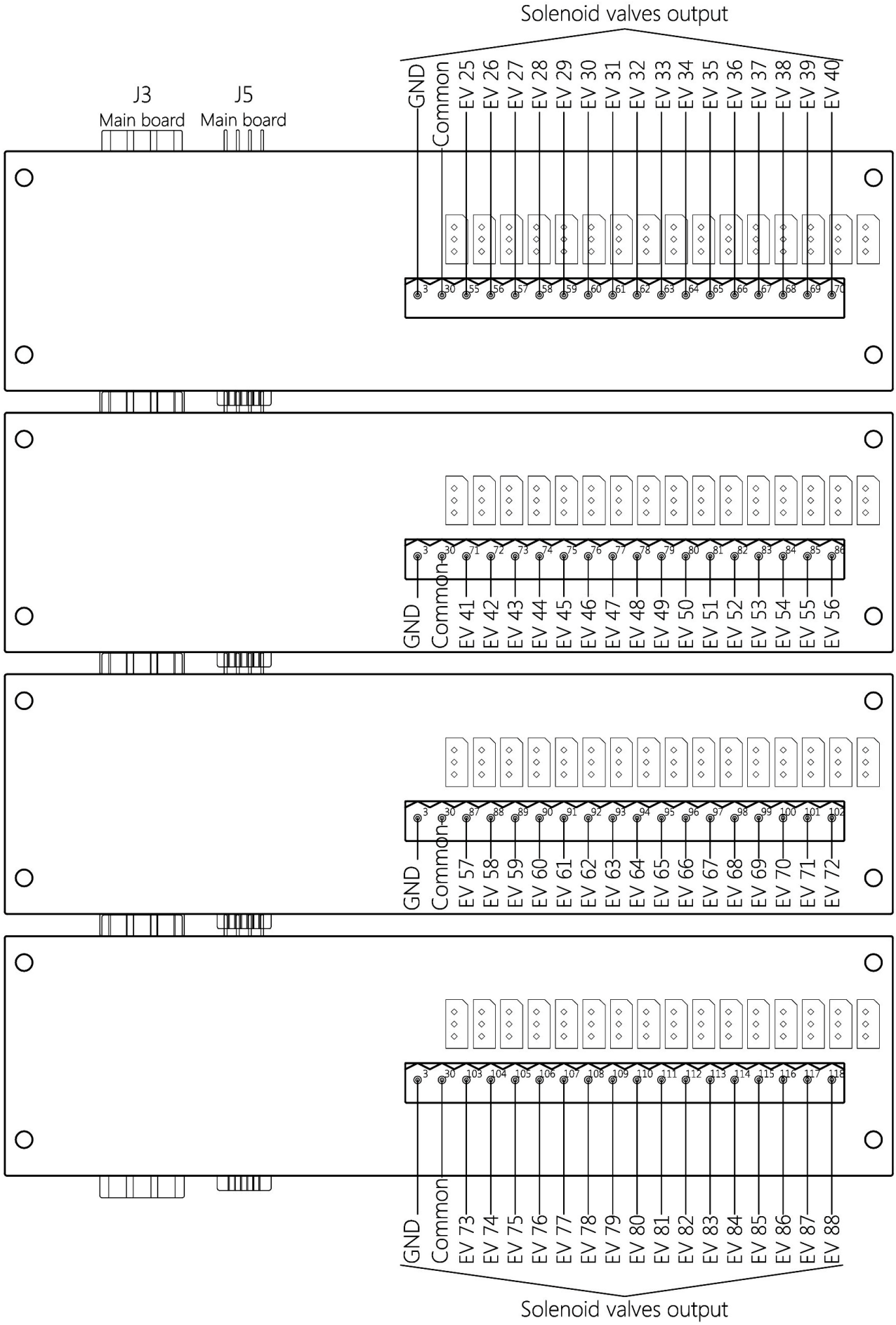
Expansion Up To 56 Channels



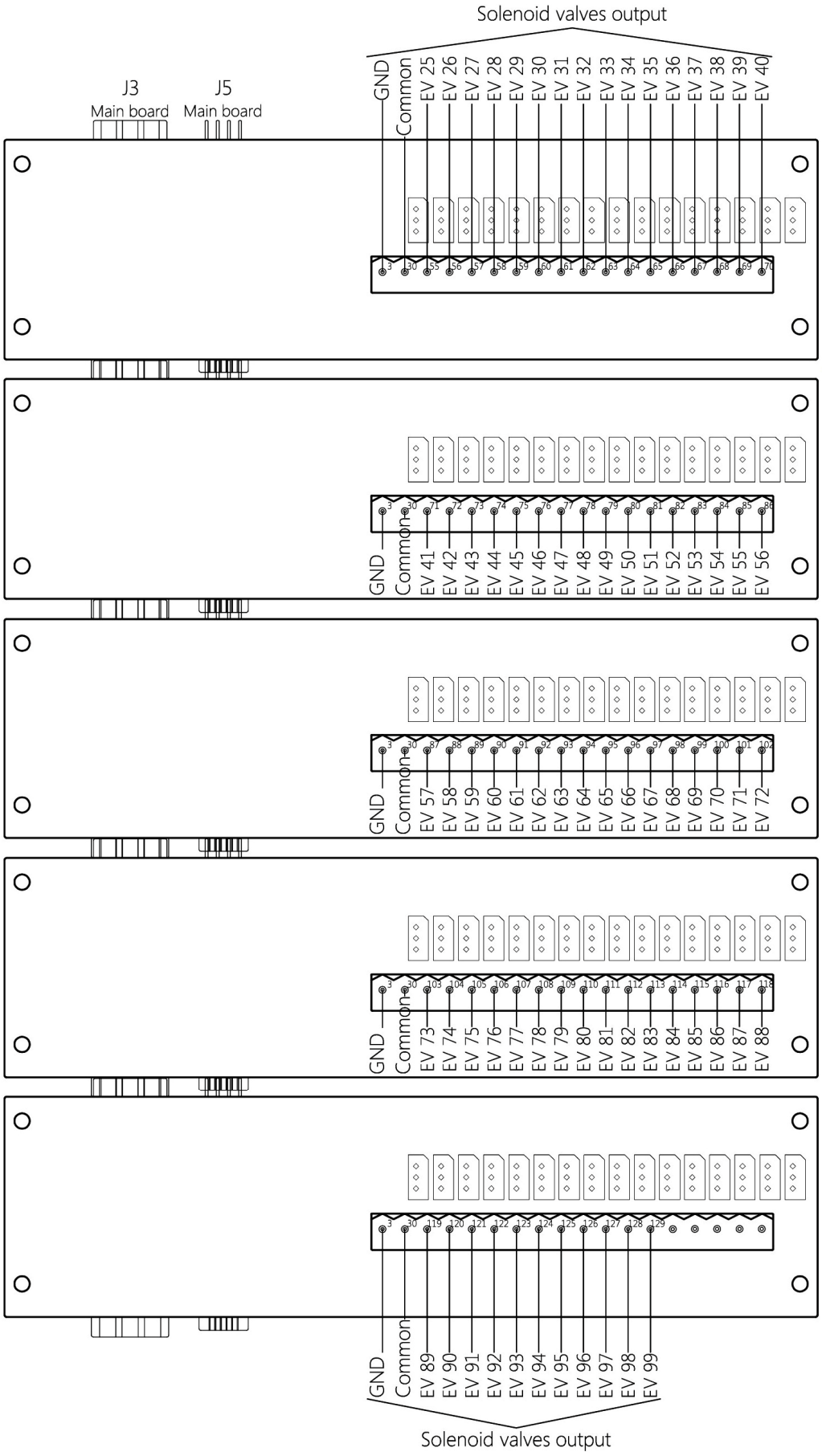
Expansion Up To 72 Channels



Expansion Up To 88 Channels



Expansion Up To 99 Channels



For subsequent valves connections up to 184 channels, refer to the indications of the connection tables.

Terminal Table

To access the terminal block of the control board, open the door locks, using the supplied wrench.

Main Board			
Terminal	Description	Terminal	Description
01	Power Supply 115 230 Vac	47	Solenoid Output 17
02	Power Supply 115 230 Vac	48	Solenoid Output 18
03	Earth Gnd	49	Solenoid Output 19
		50	Solenoid Output 20
03	Solenoid Valve Earth Gnd	51	Solenoid Output 21
30	Solenoid Valve Common	52	Solenoid Output 22
31	Solenoid Output 01	53	Solenoid Output 23
32	Solenoid Output 02	54	Solenoid Output 24
33	Solenoid Output 03		
34	Solenoid Output 04	04	Alarm Relay Contact 01
35	Solenoid Output 05	05	Alarm Relay Contact 01
36	Solenoid Output 06	06	Alarm Relay Contact 02
37	Solenoid Output 07	07	Alarm Relay Contact 02
38	Solenoid Output 08	08	Alarm Relay Contact 03
39	Solenoid Output 09	09	Alarm Relay Contact 03
40	Solenoid Output 10	12	Fan Input
41	Solenoid Output 11	13	Fan Input
42	Solenoid Output 12	14	Enable Input
43	Solenoid Output 13	15	Enable Input
44	Solenoid Output 14		
45	Solenoid Output 15	10	4-20ma Dp Output -
46	Solenoid Output 16	11	4-20ma Dp Output +

If the economizer is in G2 version with reinforced transformer, connect two solenoid valves in parallel to each terminal.

Expansion Boards			
Expansion Up To 32 Channels		Expansion Up To 40 Channels	
Terminal	Description	Terminal	Description
03	Solenoid Valve Earth Gnd	03	Solenoid Valve Earth Gnd
30	Solenoid Valve Common	30	Solenoid Valve Common
55	Solenoid Output 25	63	Solenoid Output 33
⇩	⇩	⇩	⇩
62	Solenoid Output 32	70	Solenoid Output 40

Expansion Up To 48 Channels		Expansion Up To 56 Channels	
Terminal	Description	Terminal	Description
03	Solenoid Valve Earth Gnd	03	Solenoid Valve Earth Gnd
30	Solenoid Valve Common	30	Solenoid Valve Common
71	Solenoid Output 41	79	Solenoid Output 49
⇩	⇩	⇩	⇩
78	Solenoid Output 48	86	Solenoid Output 56

Expansion Up To 64 Channels		Expansion Up To 72 Channels	
Terminal	Description	Terminal	Description
03	Solenoid Valve Earth Gnd	03	Solenoid Valve Earth Gnd
30	Solenoid Valve Common	30	Solenoid Valve Common
87	Solenoid Output 57	95	Solenoid Output 65
⇩	⇩	⇩	⇩
94	Solenoid Output 64	102	Solenoid Output 72

Expansion Up To 80 Channels		Expansion Up To 88 Channels	
Terminal	Description	Terminal	Description
03	Solenoid Valve Earth Gnd	03	Solenoid Valve Earth Gnd
30	Solenoid Valve Common	30	Solenoid Valve Common
103	Solenoid Output 73	111	Solenoid Output 81
⇩	⇩	⇩	⇩
110	Solenoid Output 80	118	Solenoid Output 88

Expansion Up To 96 Channels		Expansion Up To 104 Channels	
Terminal	Description	Terminal	Description
03	Solenoid Valve Earth Gnd	03	Solenoid Valve Earth Gnd
30	Solenoid Valve Common	30	Solenoid Valve Common
119	Solenoid Output 89	127	Solenoid Output 97
⇩	⇩	⇩	⇩
126	Solenoid Output 96	134	Solenoid Output 104

Expansion Up To 112 Channels		Expansion Up To 120 Channels	
Terminal	Description	Terminal	Description
03	Solenoid Valve Earth Gnd	03	Solenoid Valve Earth Gnd
30	Solenoid Valve Common	30	Solenoid Valve Common
135	Solenoid Output 105	143	Solenoid Output 113
⇩	⇩	⇩	⇩
142	Solenoid Output 112	150	Solenoid Output 120

Expansion Up To 128 Channels		Expansion Up To 136 Channels	
Terminal	Description	Terminal	Description
03	Solenoid Valve Earth Gnd	03	Solenoid Valve Earth Gnd
30	Solenoid Valve Common	30	Solenoid Valve Common
151	Solenoid Output 121	159	Solenoid Output 129
⇩	⇩	⇩	⇩
158	Solenoid Output 128	166	Solenoid Output 136

Expansion Up To 144 Channels		Expansion Up To 152 Channels	
Terminal	Description	Terminal	Description
03	Solenoid Valve Earth Gnd	03	Solenoid Valve Earth Gnd
30	Solenoid Valve Common	30	Solenoid Valve Common
167	Solenoid Output 137	175	Solenoid Output 145
⇩	⇩	⇩	⇩
174	Solenoid Output 144	182	Solenoid Output 152

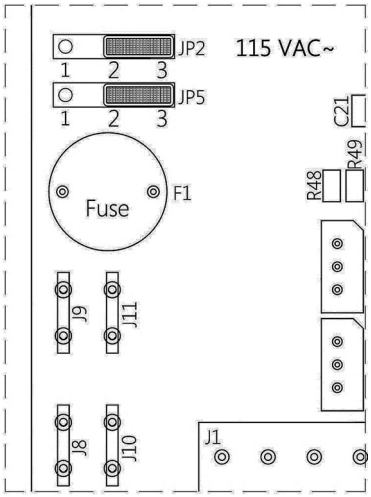
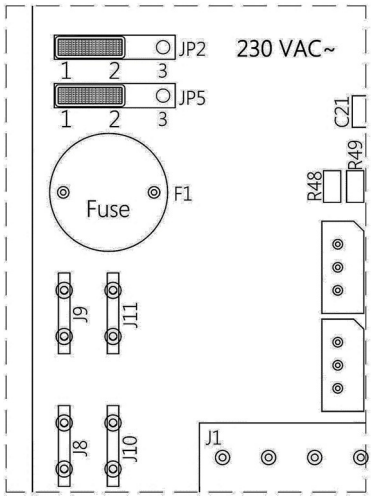
Expansion Up To 160 Channels		Expansion Up To 168 Channels	
Terminal	Description	Terminal	Description
03	Solenoid Valve Earth Gnd	03	Solenoid Valve Earth Gnd
30	Solenoid Valve Common	30	Solenoid Valve Common
183	Solenoid Output 153	191	Solenoid Output 161
⇩	⇩	⇩	⇩
190	Solenoid Output 160	198	Solenoid Output 168

Expansion Up To 176 Channels		Expansion Up To 184 Channels	
Terminal	Description	Terminal	Description
03	Solenoid Valve Earth Gnd	03	Solenoid Valve Earth Gnd
30	Solenoid Valve Common	30	Solenoid Valve Common
199	Solenoid Output 169	207	Solenoid Output 177
⇩	⇩	⇩	⇩
206	Solenoid Output 176	214	Solenoid Output 184

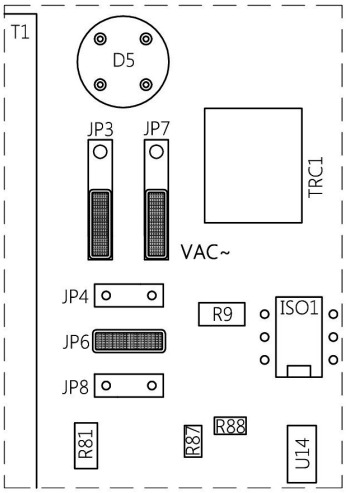
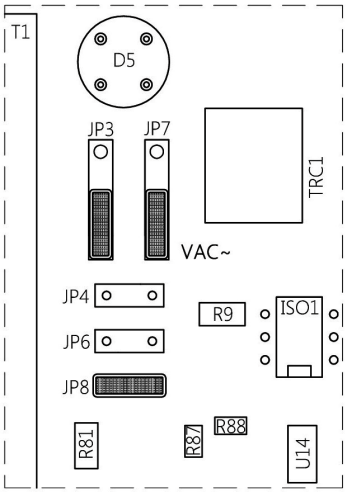
Fuse Table

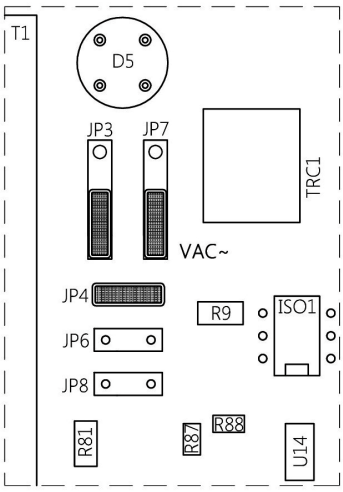
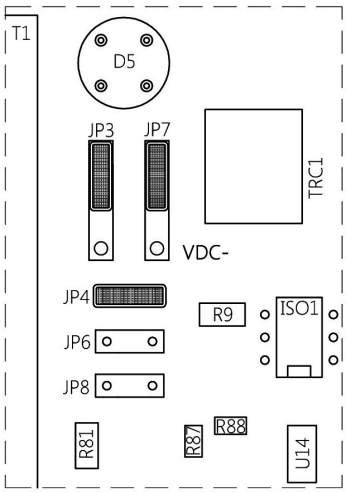
Voltage	Value
230 V	1 A
115 V	1 A
24 Vdc / Vac	3 A

Jumper Configuration Power Supply

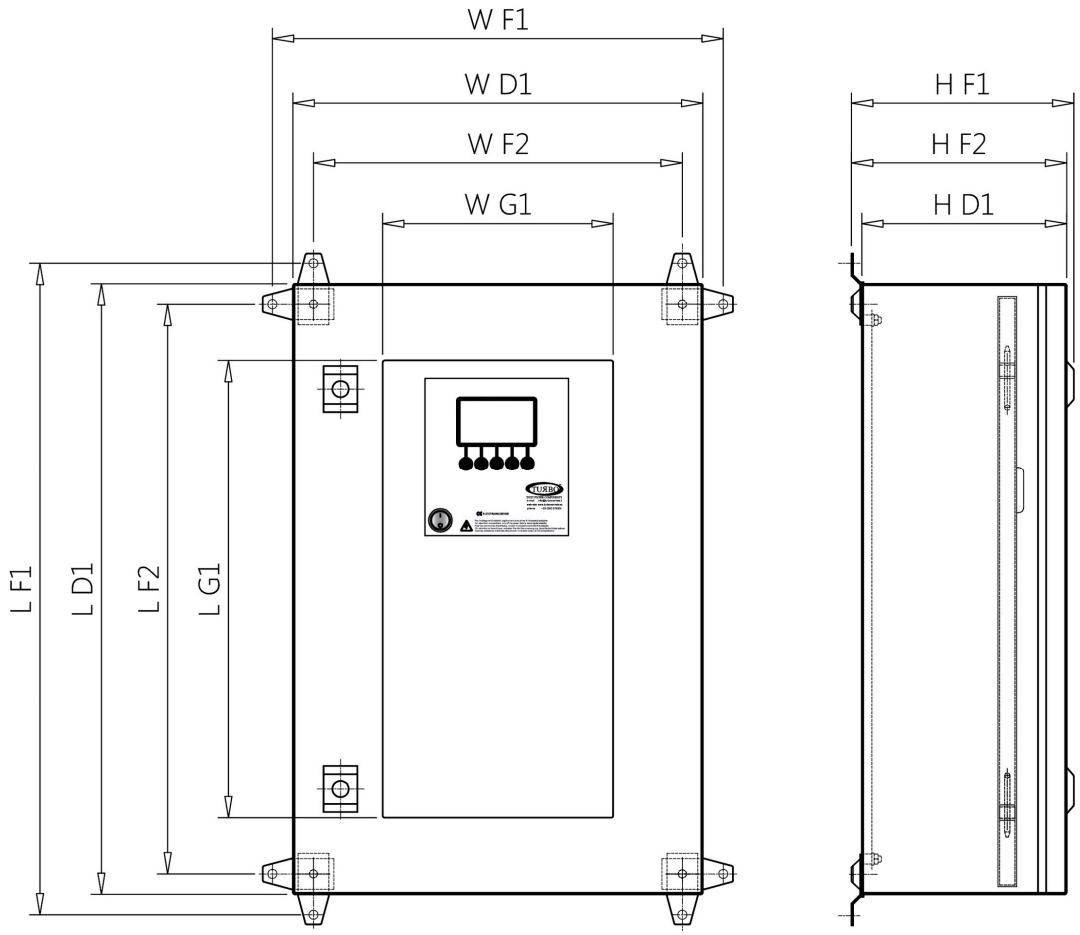
115VAC	230VAC
	

Jumper Configuration Output

115VAC	230VAC
	

24VAC	24VDC
	

Installation And Casing Dimensions



Outputs	Casing Dimensions											Weight
Number	L D1	W D1	H D1	L F1	W F1	H F1	L F2	W F2	H F2	L G1	W G1	kg
24÷56	400	400	200	440	440	218	360	360	210	250	225	14.6
64÷120	600	400	200	640	440	218	560	360	210	450	225	21.9
124÷184	800	600	250	840	640	268	760	560	260	650	425	44

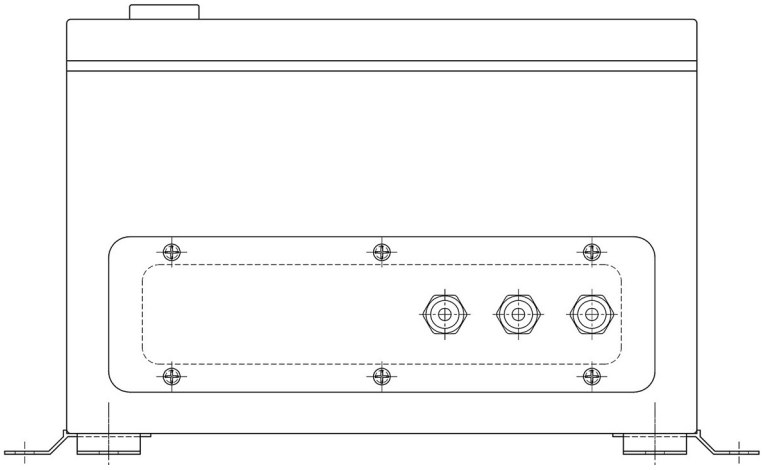
Cable Entry For The Electrical Connections

For power supply of parts, use of cable glands which must only be installed on the removable cover plate located at the bottom of the enclosure.

To preserve the IP degree of protection of the box must be used cable glands of the same class of the enclosure or higher.

The holes should be done with precision as specified by the manufacturer of the cable glands.

The example shows a cable entry made with 3 cable glands.



Maintenance

Only the fuses, batteries and SD card can be replaced.

All other repairs must be done by the manufacturer.

To clean dust or dirt off the surfaces, wipe gently with cotton, or other soft material soaked with isopropyl alcohol, ethyl alcohol; for the Lcd display do not use water, ketone or aromatics and never scrub hard, do not rub with abrasive sponges.

Default Settings

Description	Set Value
Operation Mode Automatic Setting Using dP or manual	Automatic
Solenoid Valve Activation Time	0.20 Seconds
Washing Pause Time Between Solenoid Valves	20 Seconds
Number Of Connected Outputs	1
Output Voltage Setting: 24Vdc, 24Vac, 115Vac, 230Vac.	24 Vac
Manual Solenoid Valve Activation	1
Zero dP Threshold	0 kPa
Cleaning cycle start dP threshold	0.80 kPa
Cleaning cycle stop dP threshold	0.40 kPa
Max. dP alarm level threshold	3.00 kPa
Fan On Recognition Mode 0 from contact , 1 from dP	dP
Fan On Recognition Mode if dP Threshold is on	0.10 kPa
Number Of Cycles Of Post Cleaning After Stopping The Fan	1
Post Cleaning Pause Time Between Solenoid Valves With Fan Off	10 Seconds
Maintenance Frequency Expressed In 10h (1=10h, 100=1000h)	100
Maintenance Deadline Alarm enable on (1) or off (0)	0
Maintenance Hour Counter Reset: set Yes and confirm to reset the maintenance hour counter	No
Precoating Function Enabling on (1) or off (0)	0
Precoating dP Threshold	2.00 kPa
Enabling Minimum dP Alarm function	0
Min dP Alarm Threshold (Broken Sleeve/Cartridge)	0.20 kPa
Cleaning Cycle Forced only available in Operating Mode Automatic, set if it handled in minutes or if in hours	Minutes
Setting The Interval Time in relation to the choice of Cleaning Cycle Forced	240
Exclusion of valve in short circuit.	Disable

Disposal

Do not disperse in the environment after use. Dispose of the product according to current regulations for the disposal of electronic equipment.

This device is used in a dust collector system and, therefore, it is part of a fixed installation.

Warranty

The warranty has a duration of 2 years. The company will replace any electronic component deemed defective exclusively at our workshop, except in the presence of contrary agreements to be authorized by the company.

Exclusions From Warranty

The warranty is void in the case of:

- Signs of tampering and unauthorized repairs.
- Incorrect use of the equipment that does not comply with the technical data.
- Incorrect electrical connections.
- Failure to comply with the installation standards.
- Use beyond EC standards.
- Atmospheric events (lightning, electrostatic discharge), over voltages.
- Clogged air connections. Damaged tubes.

Problem Solution *FAQ*

Fault	Possible Cause	Solution
The display does not light up.	Burnt fuse.	Check the protection fuse on the power voltage. Check that the power voltage is present and compliant with that required for the device terminals 01, 02 and 03.
The outputs are not activated.	Incorrect output voltage. Wiring to solenoid valves.	Check that the unit and solenoid vale output voltage agree. Check wiring between economizer and solenoid valves.
The differential pressure reading is not correct.	Obstructed pneumatic connections. Damaged pipes.	Check that the differential pressure is 0.00 inch WC with the pipes disconnected. In this case, check that the connection pipes between device and filter are not obstructed or damaged.
The cleaning cycle is not carried out.	The Cleaning Cycle Start Threshold is too high and therefore the cycle is not activated.	Adjust the start-up pressure threshold or set the economizer to Manual mode Configuring The Operation Mode = Manual.
Do alarm messages appear?		Check the alarm code with the table.
Do the alarms fail to activate signalling devices?	System wiring errors. No power to alarm devices.	The alarm devices must be powered by voltage external to the economizer. Activating to open the respective relay.
Does post-cleaning start during normal cleaning?	Fan On Recognition Mode dP Threshold set too high.	Change the post-cleaning start-up threshold Fan On Recognition Mode dP Threshold by lowering it.
Does post-cleaning fail to start when the normal cleaning cycle ends?	Fan On Recognition Mode dP Threshold set too low.	Check that the measured pressure is lower than the post-cleaning activation pressure when the fan is off.
Does the economizer occasionally reset?	Check the there is no filtered pulse load on the power line (spot welding machines, welding machines, plasma cutters etc.).	Install a filter on the power line of the economizer, if needed.
The value of 0.0 inch WC does not appear on the display when the fan is off.	dP zero calibration Zero dP Threshold is not correct.	Calibrate the dP zero by appropriately setting the parameter Zero dP Threshold or running the self-calibration function explained on the Operation pages.

Declaration Of Conformity Of The Manufacturer

The Manufacturer:
TURBO SRL

The Manufacturer's Address:
Via Po 33/35 20811 Cesano Maderno (MB), Italy

Declares that:

Product Name:
Economizer E6T

Product Options:
All

Complies with the following directives:
Directive 2014/30/EU Electromagnetic Compatibility compliant with Harmonised European standards EN61000-6-2:2005 class B of EN61000-6-4:2001
Directive 2014/35/EU Low Voltage compliant with Harmonised European Standards EN 60947-1:2004

A typical configuration of the product was tested.

Cesano Maderno, 23/05/2016

F. MESSINA (C.E.O.)

TURBO s.r.l.

Code And Serial Number