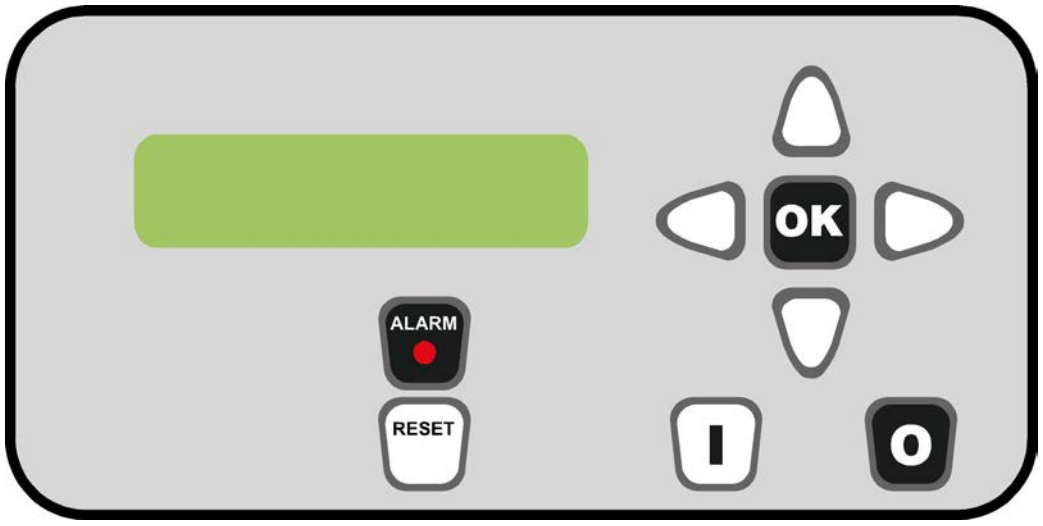
Manuale centralina per compressori
Control unit manual for compressors

SERIE / SERIES

- ETII



Research and Development

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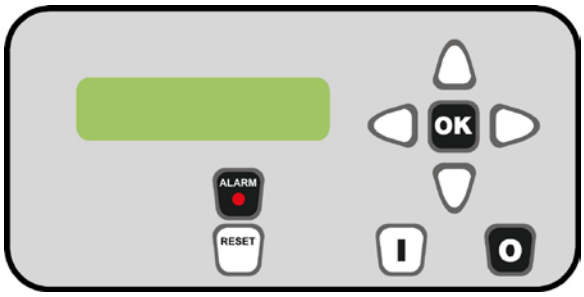
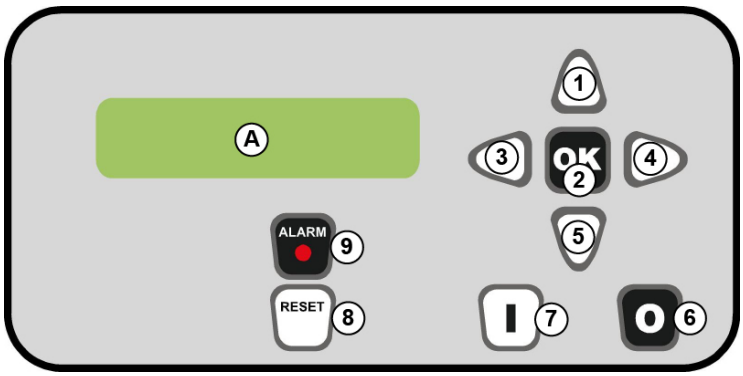
File: **Manuale Centralina ETII_ENG_R0 code 9041868**



General features:	
Power supply	24Vac ±15%
Max consumption at 24Vac	200mA
Relay outputs	4
Relay maximum current	8 A resis. Max 230Vac
Serial standar RS232*	1
Serial standar RS485*	1
Digital inputs	6
input at 24/230Vac	1
Input for phase sequence	1 to 5 Vac
Temp. analog input	1 (10 bit)
LCD contrast adjustment	60 levels
Maximum lifespan	50.000 hours
Analog input 4-20mA	1 (12 bit)
Analog output 4-20mA	1 (10 bit)
Ability to communicate via RS485 with I/O module (COMP09). Boot loader you can update the Firmware via RS232.	

* = simultaneous use, which can be set by setting the enabling parameter RS485, is not possible.



Picture 1

1.	Tasto su	*Up button*
2.	Tasto ok	ok button
3.	Tasto Sinistra	*left button*
4.	Tasto destra	*Right button*
5.	Tasto giù	*Down button*
6.	Tasto STOP	*Stop button*
7.	Tasto START	*Start button*
8.	Tasto RESET	*Reset button*
9.	Led allarme	light alarm
10.	Display LCD	Display Lcd

HOME PAGE: remains displayed for 5 seconds after turning on the control unit.

```
Easy Tronic II
V.0.0.0 00/00/00
```

NORMAL OPERATION SCREEN (with electronic pressure transducer):

example:

```
100°C 9.5Bar
Stato=stand-by
```

OPERATION SCREEN (with mechanical pressure switch):

example b:

```
100°C h00001 m00
Stato=stand-by
```

OPERATION SCREEN (with electronic pressure transducer and inverter):

example c:

```
100°C 9.5Bar 85%
Stato=stand-by
```

When the compressor is in Start mode, it is possible to display some information:

- ✓ **Total time** press the button **1 up** ,
- ✓ **Vacuum time** press the button **5 down**,
- ✓ **Set no-load** or **Operating delta,** press key **4 right**,
- ✓ **Set loading** or **operating pressure,** press key **3 right**,

The information will be displayed for 15 seconds.

ALARMS:

1) **Rotation direction**; in case of incorrect phase sequence, alarm signal is given. The alarm blocks the compressor, to restore operation, restore the phase sequence. When the internal phase sequence is enabled, the same is controlled only for the first 30 seconds after the ignition of the controller; the incorrect sequence must last at least 10 seconds.
   CAUTION: This alarm can only be reset by cutting off the power supply

```
110°C h00001 m00
err. Direct. of rot.
```

2) **Temperature probe**: is controlled by the temperature sensor (open or shorted probe) installed. The alarm signal is given. The alarm locks the compressor, to restore the operation check the probe and press the button **8**.

```
110°C h00001 m00
temp.sens.faulty
```

3) **Maximum oil temperature**: when maximum oil temperature is reached, the alarm is triggered. This alarm locks the compressor. To restart the compressor, you need to wait for the temperature to drop below the set value and press the button **8.**

```
110°C h00001 m00
Max oil temp.
```

4) **Minimum oil temperature**: when the minimum oil temperature is reached, the alarm is triggered. This alarm locks the compressor. To restart the compressor, you need to wait for the temperature to rise above the set value and press the button **8**.

```
 -7°C h00001 m00
 Min oil temp.
```

5) **Oil temperature pre-alarm**: when the oil pre-alarm temperature is reached, the alarm is triggered. The alarm does not lock the compressor. To reset the alarm, press the button **8**.

```
105°C h00001 m00
 Oil temp. pre.
```

6) **Motor thermal switches**: when the motor or fan thermal switch is triggered, the alarm is activated. This alarm locks the compressor. To reset the alarm press **key 8** after having checked the cause.

```
105°C h00001 m00
 Motor Thermal
```

7) **Emergency**: this alarm signals that the emergency button that locks the compressor has been pressed. To silence the alarm press **key 8** after having released the emergency button.

```
105°C h00001 m00
 Emergency button
```

8) **Machine maintenance pre-alarm**: this alarm warns the user that the machine requires a maintenance on the 4 meters:
-Oil Hours
-Oil Filter Hours
-Air Filter Hours
-Oil Separator Hours
This alarm should be reset by the service centre that carried out the maintenance, resetting the meter to the desired value.

```
105°C h00001 m00
Scheduled maintenance
```

9) **Separator pressure switch**: Alarm trips in the event of the separator pressure switch contact opening. This alarm locks the compressor. To silence the alarm press key 8, first reset the separator pressure switch and after having checked the cause.

```
105°C h00001 m00
Press. Separato.
```

10) **Air filter:** This alarm does not block the compressor. To silence the alarm, press key 8.
This alarm can also be triggered by the I/O (COMP09) circuit board.

```
105°C h00001 m00
Air filter
```

11) **Pressure sensor broken**: this alarm is activated when the pressure sensor connected to the input 4-20mA is not working properly. : this alarm locks the compressor. To reset the alarm press key **8 Reset**, after having restored the normal state of the pressure sensor.

```
105°C h00001 m00
Press.Sens.Broken
```

12) **Maximum pressure reached**: this alarm is activated when the maximum pressure set for the maximum pressure alarm parameter is exceeded; this alarm locks the compressor. To reset the alarm press key **8**, after having restored the correct value of the pressure.

```
105°C h00001 m00
Max. pressure
```

13) **Inverter Faulty:** the alarm is triggered when the external phase sequence inverter is active turning into inverter faulty signal; it is active only after 20 seconds after controller ignition. It can be deactivated via the internal phase control menu; the faulty inverter control is deactivated and the external phase sensor is restored.
This alarm can also be triggered by the I/O (COMP09) circuit board.

```
105°C h00001 m00
Inverter Fault
```

14) **Fan thermal breaker alarm**, this alarm can be triggered only by the I/O circuit board (COMP09). This alarm blocks the compressor. To reset the alarm press key **8**, after having restored the normal state of the fan thermal breaker.

```
105°C h00001 m00
Termico ventola
```

15) **I/O circuit board communication error alarm (COMP09)**, This occurs when one or more I/O circuit boards don't communicate anymore. This alarm blocks the compressor. To reset the alarm, press the key **8**, after restoring the connection to the I/O circuit board.

```
105°C h00001 m00
Errore I/O id:1
```

16) **Dryer alarm**: This alarm is triggered when the dryer parameter is active, the air filter input becomes dryer alarm ; the alarm does not block the compressor.

```
105°C h00001 m00
Dryer.alar
```

17) **Remote pressure alarm**: This alarm is triggered when the remote pressure is active and the pressure reaches the set vacuum value.

```
85°C h00001 m00
remote press.alarm
```

If there are multiple consecutive alarms, the same will be displayed in sequence and by pressing the **8** key you can reset all alarms for which the cause was restored. The alarms can also be reset via I/O circuit board input (COMP09).

ALARM HISTORY:

It is possible to view the history of the last 30 alarms, you can scroll through the alarms with the arrows; for each alarm is indicated the activation time and the temperature.

1st alarm

```
0)95°C h1 m0
 Motor Thermal
```

5° allarme

```
5)40°C h1864 m56
 Emergency button
```

To clear the alarm history, press **3 + 8 + 4** simultaneously and enter the factory password.

Input Activation:

Motor thermal switch: Always active.

Air filter: Always active except for the case in which you turn on the dryer of the parameter 21, becomes dryer alarm.

Rotation direction: Always active except for the case in which you turn on the inverter of the parameter 22 and the internal phase sequence parameter 11 is ON, becomes inverter faulty input.

Press. Separatore: Always active.

Remote ON/OFF: Always active.

Emergency: Always active.

Work pressure switch: inputs 230Vac or 24Vac. Active only when the electronic pressure sensor parameter 14 is disabled, otherwise it becomes oil separator pressure input and prevents the compressor from starting if parameter 20 remote pressure function is enabled; this input becomes remote pressure, disabling the other functions.

4-20mA in: Input active only if the electronic pressure switch is enabled parameter 14.

Temperature probe: Always active.

+5V phase sequence transformer: Active only if the internal phase sequence is enabled parameter 11.

Output activation:

Line remote control switch: active during start-up.

Star remote control switch: active during start-up.

Triangle remote control switch: active after 5 seconds from start-up.

Load solenoid valve: active after 3 seconds after switching to triangle (with inverter the time is variable).

Fan: active only when the motor is running and after having exceeded the set temperature parameter 11.

4-20mA out: : active only with the inverter active parameter 22**.**

Fixed parameters:

PARAMETER		Unit of Measurement
Initial Stand-By Duration	15	Sec
Star Triangle time	3	Sec
Load delay time	3*	Sec
Delay time between restarts	15	Sec

*= with the enabled inverter, it is variable

Settable parameters:

N.	Parameter	MIN	MAX	TYP	Unit of Measurement	Pass.
0	I/O Menu	-	-	-	-	Fabbr.
1	Pre-alarm hours (oil, oil filter, air filter, oil separator*)	-32768	32768	-	ore	Assist.
2	Line hours	0	65535	1	ore	Fabbr.
3	Vacuum time	0	65535	0	ore	Fabbr.
4	Alarm history					-
5	Pre-alarm temperature (DELTA)	0	20	5	°C	Fabbr.
6	Maximum temperature	0	150	110		Fabbr.
7	Minimum Temperature	-13	-1	-7	°C	Fabbr.
8	Fan temperature	0	150	80	°C	Assist.
9	No-load time	30	250	75	Sec	Assist.
10	Automatic reset	SI	NO	NO		Assist.
11	Internal phase sequence	SI	NO	SI		Assist.
12	Language			ITA		-
13	Enable RS485	SI	NO	SI		-
14	Pressure sensor	SI	NO	SI		-
15	PSI/BAR	PSI	BAR	BAR		-
16	Operating pressure/vacuum setting	0	15.0**	10.0	bar	-
17	Operation delta/load setting	0	15.0***	8.5	bar	-
18	Maximum settable pressure	0	15.0	11.0	bar	-
19	Maximum alarm pressure	0	16.0	13.7	bar	Fabbr.
20	Remote pressure	NO	SI	NO		Assist.
21	Dryer	NO	SI	NO		Assist.
22	Inverter	SI	NO	NO		Assist.
23	% Minimum operating	0	100	50	%	Fabbr.
24	Load delay	0	250	10	Sec	Assist.
25	Supplementary inverter	0	250	0		-
26	Proportional inverter	0	250	30		
27	Derivative inverter	0	250	180		

NOTE:
*= Default parameters: Oil time = 2000, oil filter = 2000, air filter = 2000, oil separator = 4000
**= the maximum settable value is the value set in parameter n.18, , if the parameter 22 is set to ON, the parameter turns into operating pressure
***= = if the parameter 22 is set to ON, the parameter becomes the delta function, maximum settable is 2.

Menu

Contrast: When the machine is in standby (state=OFF) by pressing the key ← and →at the same time, you will access the configuration menu to adjust the contrast from 1 (darker) to 60 (brighter) with the keys ↑ and ↓, to exit press RESET, the contrast value is automatically stored in the memory.

Parameters Menu

Press the key OK with the machine at a standstill (Status = OFF) to access the parameters menu:

1) I/O Module:

- Set up I/O
  0. Out= Common alarm
  1. Out= **pre-alarm**
  2. Out= Drain condensate
  3. Out= Control on
  4. Out= Compressor on
  5. Out= Motor running
  6. Out= No-load/loading compressor
  7. Out= Emergency button pressed
  8. In= **Alarm reset**
  9. In= Fan thermal breaker
  10. In= **Inverter Faulty**
  11. In= **Air filter**

  This menu allows you to enter the ID and the Output or Input linked to the function selected, press the key **3 Left** to change the number of the input or output, press key **4 right**, in case you want to reverse the logic from NO to NC press key **4 right** until a full dot appears to the right of the Input/Output number. **Warning: never enter the same ID and IN or OUT on multiple functions, make sure that the set up ID is similar to that set on the I/O circuit board (COMP09).**

- Drain condensate
  a) Interval = interval in minutes between the opening of the drain solenoid valve, the minutes are calculated on line time (no load and load).
  b) Opening = seconds in which the solenoid valve remains open.

2) Pre-alarm time: Menu of service hours, these meters are calibrated automatically after each hour of operation of the machine, when the meter reaches the value 0, the controller sends the maintenance alert, there are 4 meters

- Oil Hours
-Oil Filter Hours
-Air Filter Hours
-Oil Separator Hours

The meter with the sign – in front indicates the hours passed from the maintenance alert; use the keys **1** or **5** to set the new value desired; press the key **6** to set the meter to **2000,** press the key **7** to set the meter to **4000** (to restore the maintenance alarm set the greater value to 0).

3) **Line time:** number of hours of compressor operation with the motor switched on.
After you typed in the correct password you will enter in the line operating hours menu. This meter is incremented continuously every hour of machine operation.
This meter can be reset by pressing key **6** and can be automatically set to 4000 hours by pressing key **7** or use the arrow keys **1** and **5** to set the desired value; at the end of the operation press "OK" to save the values. To display the value while the compressor is running, press **1**.

4) **No-load time:** These are the hours during which the compressor works without load.
The setup procedure is the same as that in point 2 Line time. To display the value while the compressor is running, press **5**.

5) **Alarm history:** Access to scroll through the last 30 alarms and read the working time and the temperature of oil at which the alarm was triggered.

6) **Pre-alarm temperature**: this value, not changeable, defines the temperature delta, expressed in °C, from the maximum alarm temperature. This value can be set from 1 to 20. For instance, if maximum temperature is 120 °C and delta is 10°C, the maximum temperature pre-alarm will be displayed at 110 °C.

7) **Maximum temperature**: this value, not changeable, defines the Maximum Allowed Temperature. Regulation range goes from 0 to 150°C.

8) **Minimum temperature** this value, not changeable, defines the Minimum Allowed Temperature. Regulation range goes from 0 to –13 °C.

9) **Fan temperature**: this parameter is the fan enabling temperature; the adjustment range is from 0 to 150 °C, at a preset temperature the fan starts, the hysteresis is fixed at 10 °C.

10) **No load time**: in this parameter you can change the no load cycle time of the machine, the adjustment range is from 30 to 250 seconds.

11) **Automatic Start**: The parameter enables the automatic start, when this parameter is activated the compressor starts automatically, even after a power outage; the first start can be enabled by pressing the key **6** on the keyboard. **For safety reasons we strongly advise you NOT to use it.**

12) **Int. phase sequence**: The parameter enables the internal phase sequence control.

13) **Language**: This parameter is used to change the language

14) **Enable RS485**: This parameter enables transmission through RS485, and automatically disables transmission through RS232.

15) **Pressure sensor**: enables the “4-20 mA” input to which the pressure sensor is connected. With this parameter activated, the pressure measurement is displayed. Enabling this parameter, the external pressure switch contact changes function and becomes an input for the deoiler minimum pressure switch; in this situation, the compressor is prevented from restarting if pressure in the deoiler is high.

16) **PSI/BAR**: In this parameter the user can choose the unit of measurement for the pressure.

17) **Operating pressure/vacuum setting**: in this parameter you can enter the operating pressure at which the compressor stop; if the inverter is active, this parameter indicates the operating pressure at which the inverter must begin to modulate to keep it steady.

18) **Operation delta/load setting**: indicates the pressure at which the controller enables the compressor restart. If the inverter is active, this parameter becomes the delta of operation, i.e. , it indicates the range of pressure at which the compressor has to work for example, if set to 1.0 bar and the operating pressure is 9.0 bar, it means that the compressor will shut down to 9.5 bar and will restarts at 8.5 bar.

19) **Maximum alarm pressure** this value, not changeable, defines the maximum pressure value at which the 16 Set central goes in alarm and blocks the machine.

20) **Maximum alarm pressure** this value, not changeable, defines the maximum pressure value at which the central goes in alarm and blocks the machine.

21) **Remote pressure:** By enabling this parameter, you will maintain the pressure display and the associated alarms, but compressor restart is controlled via remote pressure switch contact, **the remote on/off input is disabled, as well as the separator input is disabled**. If the pressure measured by the internal electronic transducer exceeds the set pressure, the compressor stops, even if the external pressure switch prompts you to continue.

22) **Inverter**: Enables the inverter. By enabling the Inverter, the mechanical pressure switch input **becomes the pressure switch**, disables compressor restart in the presence of oil separator pressure.

23) **Minimum working %**: Indicates the minimum percentage at which the inverter must work. The maximum value is always 100%.

24) **Load delay**: this parameter is only active in the presence of the INVERTER; you can set the delay in seconds, from the moment in which the start-up cycle ends to the moment in which you activate the air load solenoid valve.

25) **Supplementary inverter**: Parameter that changes the complementary constant of inverter speed calculation.

26) **Proportional inverter**: Parameter that changes the proportional constant on the calculation of inverter speed; by raising this parameter you can track the speed more responsively.

27) **Derivative inverter**: Parameter that changes the derivative constant; by raising this parameter you will have an estimate and a correction of the anticipated speed.

OPERATING CYCLE

Start-up procedure with mechanical pressure transducer:

Press the key 7 START, If no alarms are on, the start-up cycle is enabled:

- **a)** **Wait for start-up:** on display appears ***"STATE= STAND-BY"*** and the controller waits for the following conditions to be met prior to activating the compressor:
  1) If the machine was switched off or a previous stoppage was executed, the control unit waits 15 seconds before starting the compressor. The machine state button flashes.
  2) The controller waits for the work Pressure switch contact to close.
- **b)** **Compressor start-up:** the line remote control switch and triangle output closes and the message ***"STATE=VACUUM"*** is displayed.
- **c)** **Operational start-up:** Switching from start to triangle after 5 sec. After 2 seconds, if requested by the work pressure switch, is energized the load solenoid valve and on display appears "***STATE=LOAD".***
- **d)** **Compressor shutdown:** When the compressor reaches the set pressure and the pressure switch cuts off the enabling signal, the controller disables the load solenoid valve and the vacuum cycle starts if the switch does not enable the operation again once the load is completed; after the vacuum time set elapses the controller stops the compressor and the latter remains in ***"STATE= STAND-BY".***
- **e)** **Compressor stop:** If you press the key 6 while the controller is in Stand-by, the controller stops instantly and on display appears ***"STATE=STOP",*** ; on the other hand, if the key is pressed during the load cycle, the controller goes in vacuum mode and on display appears ***"STATE=VACUUM"*** that flashes once the vacuum time elapses, and the controller goes in STOP mode, in case you press the key 6 STOP during the vacuum cycle, the controller waits until the remaining vacuum time elapses and then goes in STOP mode.

f) ***remote ON/OFF*****:** Via the ***remote on/off*** the user can shut down or start the compressor. (the ***remote on/off*** control is active only if the controller is in START mode).

Start-up procedure with electronic pressure transducer:
Press the key 7 START, . If no alarms are on, the start-up cycle is enabled:

a) **Wait for start-up:** on display appears **"*STATE= STAND-BY"*** and the controller waits for the following conditions to be met prior to activating the compressor:
1) If the machine was switched off or a previous stoppage was executed, the control unit waits 15 seconds before starting the compressor. The machine state button flashes.
2) The control unit waits for the pressure to go below the value set in the "Load pressure" set before starting the compressor.
3) The controller waits for the work pressure switch, which becomes the oil separator pressure switch, to close.

b) **Compressor start-up:** the line remote control switch and triangle output closes and the message ***"STATE=VACUUM"*** is displayed

c) **Operational start-up:** Switching from start to triangle after 5 sec. After 2 seconds, if requested by the work pressure switch, is energized the load solenoid valve and on display appears "***STATE=LOAD".***

d) **Compressor shutdown:** When the compressor reaches the set vacuum pressure the controller disables the load solenoid valve and the vacuum cycle starts if the pressure does not drop below the set value; after the vacuum time set elapses the controller stops the compressor and the latter remains in **"*STATE= STAND-BY".***

e) **Compressor stop:** If you press the key 6 while the controller is in Stand-by, the controller stops instantly and on display appears ***"STATE=STOP",*** ; on the other hand, if the key is pressed during the load cycle, the controller goes in vacuum mode and on display appears ***"STATE=VACUUM"*** that flashes once the vacuum time elapses, and the controller goes in STOP mode, in case you press the key 6 STOP during the vacuum cycle, the controller waits until the remaining vacuum time elapses and then goes in STOP mode.

f) ***remote ON/OFF*****:** Via the ***remote on/off*** the user can shut down or start the compressor. (the ***remote on/off*** control is active only if the controller is in START mode).

Start-up procedure with electronic pressure transducer and INVERTER:
Press the key 7 START If no alarms are on, the start-up cycle is enabled:

a) **Wait for start-up:** on display appears **"*STATE= STAND-BY"*** and the controller waits for the following conditions to be met prior to activating the compressor:
a. If the machine was switched off or a previous stoppage was executed, the control unit waits 15 seconds before starting the compressor. The machine state button flashes.
b. The control unit waits for the pressure to drop below the value set in the "Working Pressure-Working Delta" parameter before starting the compressor.
c. The controller waits for the work pressure switch, which becomes the oil separator pressure switch, to close.

b) **Compressor start-up:** the line remote control switch and star output closes and the message ***"STATE=VACUUM"*** is displayed; the motor starts at minimum speed % set..

c) **Operational start-up:** After the time set in the load delay parameter elapses, the load solenoid valve is enabled and on display appears "***STATE=LOAD",*** when the compressor reaches the operating pressure, the inverter output will begin to modulate the motor to keep the pressure steady. The pressure will be adjusted from minimum % set to 100% of speed.

d) **Compressor shutdown:** When the compressor reaches the set operating pressure + operating delta, the controller disables the load solenoid valve and the motor works at minimum operating speed % and the vacuum cycle starts if the pressure does not drop below the set value; after the vacuum time set elapses the controller stops the compressor and the latter remains in **"*STATE= STAND-BY".***

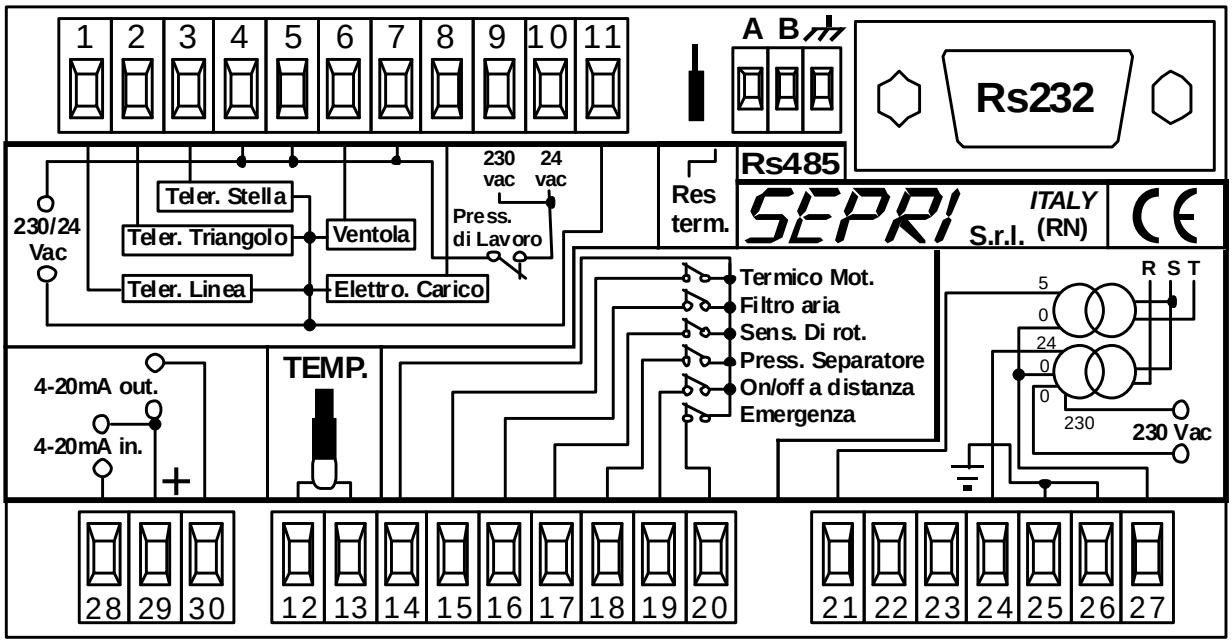
e) **Compressor stop:** If you press the key 6 STOP while the controller is in Stand-by, the controller stops instantly and on display appears ***"STATE=STOP",*** on the other hand, if the key is pressed during the load cycle, the controller goes in vacuum mode and on display appears ***"STATE=VACUUM"*** that flashes once the vacuum time elapses, and the controller goes in STOP mode, in case you press the key 6 STOP during the vacuum cycle, the controller waits until the remaining vacuum time elapses and then goes in STOP mode.

f) ***remote ON/OFF*:** Via the ***remote on/off*** the user can shut down or start the compressor. (the ***remote on/off*** control is active only if the controller is in START mode).

Password:

Password Assistenza/Service Password = **2954**

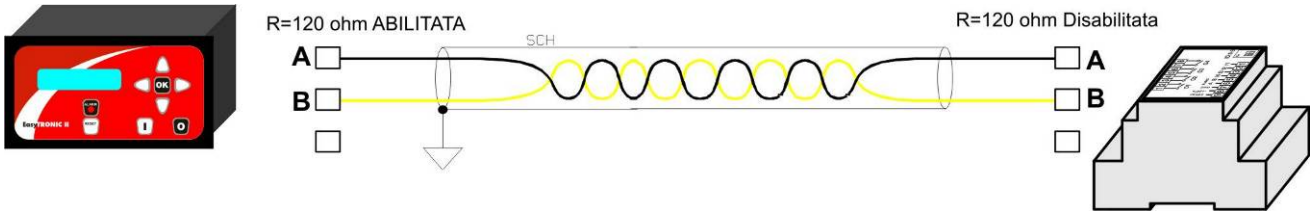
Wiring diagram



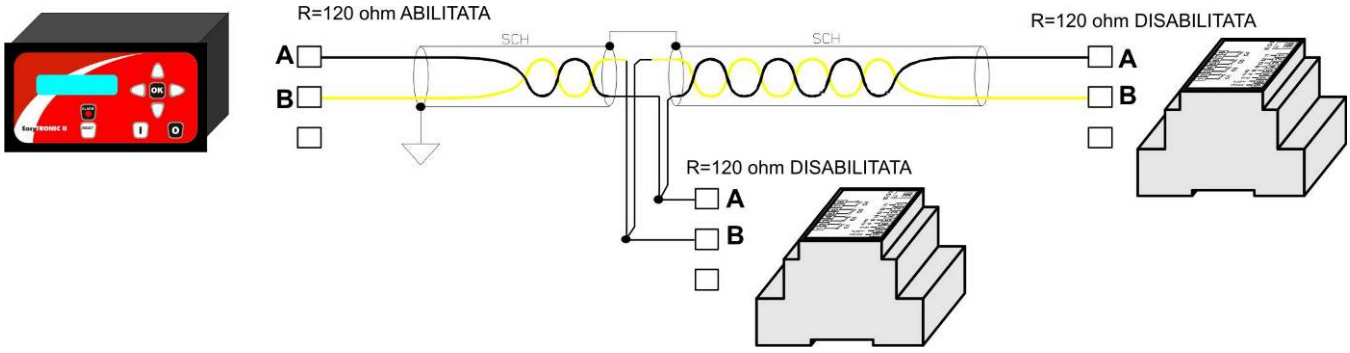
RS485 connection

- The communication distance between the first and last of the connected devices must be no more than 1200 metres.
- Up to 4 control units can be connected in parallel to he RS485 port I/O comp09.
- The use of twisted or screened cable is recommended. To avoid closed loops, the screen must be connected to just one point on the entire network, as illustrated.

Example Connection between a control unit and I/O circuit board comp09



Example Connection between a control unit with 2 or more I/O circuit boards comp09



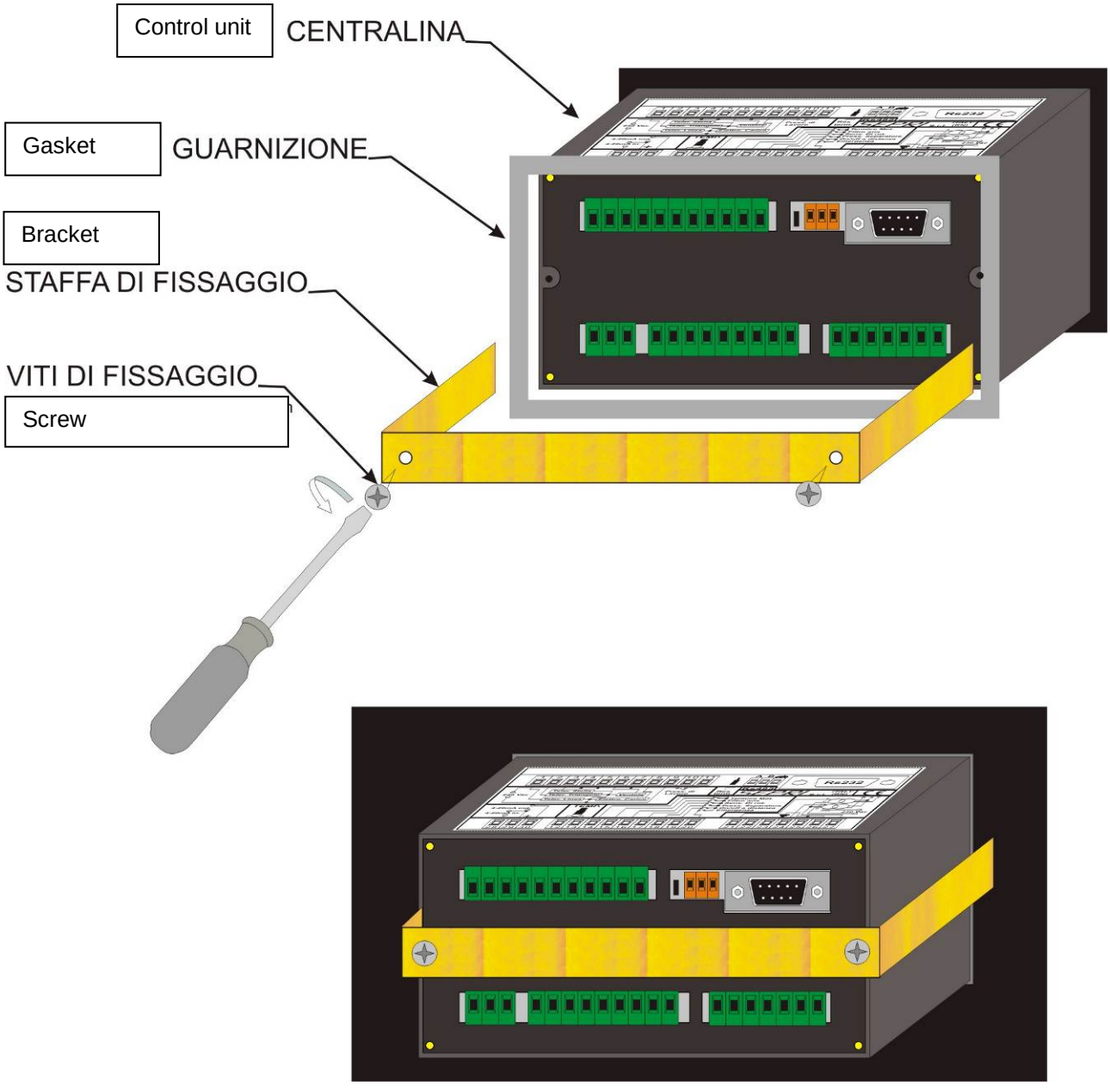
RS232 connection - update

To allow connection of the control unit to a computer by way of the RS232 interface, a null-modem type cable must be connected. 3 signals are necessary (Gnd, RX and TX); if use is made of a standard cable with all contacts connected,operation will be guaranteed. Whilst the standard maximum distances for this interface are around 15 m.

Null-Modem

Name og Signal	DB-25 PC	DB-9 PC		DB-9 Cent.	
TX (Transmit Data)	2	3	-	2	RX
RX (Receive Data)	3	2	-	3	TX
Gnd (Signal Ground)	7	5	-	5	Gnd

INSTALLATION

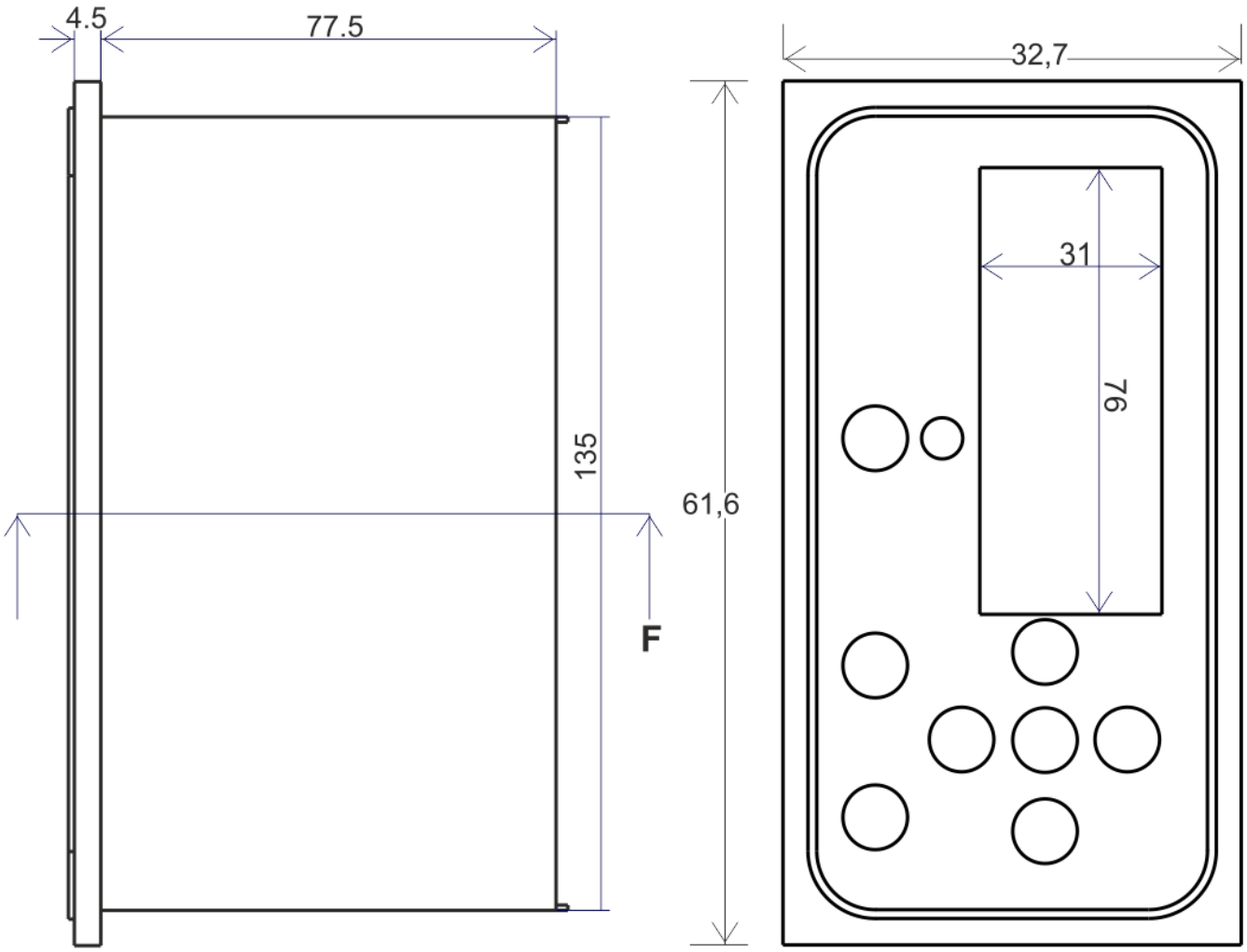


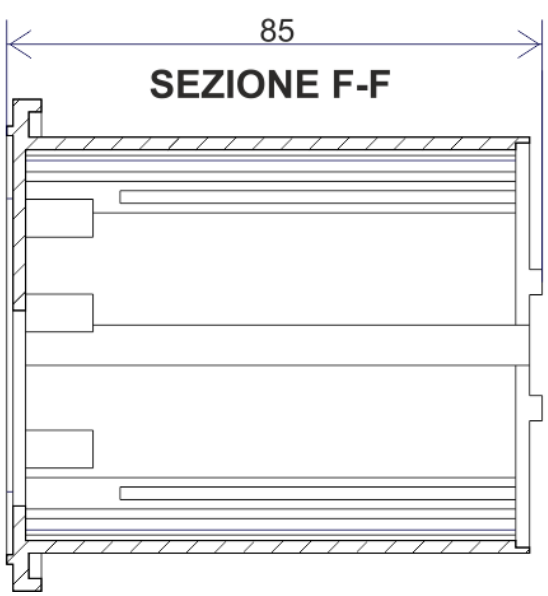
1) Position the seal on the control unit.
2) Insert the unit into the slot
3) Attach the fixing bracket
4) Tighten the 2 screws to tighten the control unit

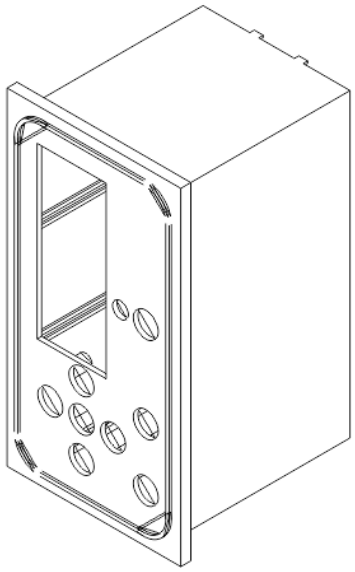
CAUTION!!!!

Before connecting the terminals, **isolate the unit from the a.c. supply.**

Dimensions







(in mm)

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R 0

N	DESCRIZIONE MODIFICA	*MODIFY DESCRIPTION*	Data/Date
0	Creazione (tutte le pagine)	*Creation (all pages)*	27/08/2015