ECP300 EXPERT

Use and maintenance manual

READ AND KEEP

REV. 01-18
ENG

ELECTRICAL BOARDS FOR REFRIGERATING INSTALLATIONS

Refrigeration Pego

Thanks for choosing this PEGO electrical panel.

This manual gives detailed information on installation, use and maintenance of ECP300 EXPERT series electrical panels and special version. Our products are designed and built in compliance with current standards, on the specific field of refrigeration and conditioning systems. A different use is allowed respecting the working conditions for which the panel is designed and made.
Before using the panel it's suggested to fully read this manual paying special attention to the highlighted parts with the simbology descripted below:

This symbol is used to focus on notes concerning installation, use and maintenance operations

This symbol is used to focus on important notes

This symbol is used to indicate the prohibition to do the shown operation

Instructions for disposal:

The electric board is made up of metal parts and plastic parts. In reference to European Union directive 2012/19/EC issued on 4 July 2012 and the related national legislation, please note that:

A. WEEE cannot be disposed of as municipal waste and such waste must be collected and disposed of separately.
B. The public or private waste collection systems defined by local legislation must be used. In addition, the equipment can be returned to the distributor at the end of its working life when buying new equipment.
C. The equipment may contain hazardous substances: the improper use or incorrect disposal of such may have negative effects on human health and on the environment.
D. The symbol  (crossed-out wheeled bin) shown on the product and on the user manual indicates that the equipment has been introduced onto the market after 13 August 2005 and that it must be disposed of separately.
E. In the event of illegal disposal of electrical and electronic waste, the penalties are specified by local waste disposal legislation.

CONTENTS

CHAPTER 1: INTRODUCTION

1.1 GENERAL

DESCRIPTION:

A line of power and control panels for refrigeration systems with three-phase compressor or to control only the three-phase evaporating unit, for the complete management of the room.

Magnetothermic protection and motor circuit breaker for the compressor accessible from the front panel linked to an innovative form makes it a perfect and functional choice.

ECP300 Expert VD

A line of power and control panels for refrigeration plants with three-phase compressor up to 7.5 HP, for the complete management of the room.

Different range of power combined with the various options allow the choice of an “AD HOC” panel for the system.

APPLICATIONS:

- Complete management of three-phase refrigerating systems up to 7,5 HP static or ventilated, with off-cycle or electrical defrosting.

ECP300 Expert U VD

A line of power and control panels for refrigeration systems to control only the three-phase evaporating unit where units are served by a central refrigerator or remote condenser unit.

Different range of power combined with the various options allow the choice of an “AD HOC” panel for the system.

APPLICATIONS:

- Control of evaporating unit with electrical defrost up to 12 kW.
- Remote control for compressor enable to be linked with a power panel.

CHAPTER 2: TECHNICAL CHARACTERISTICS

PRODUCT ID CODES 2.1

(*) Code available on request

Panels line ***ECP300 Expert VD 4*** series

SIEMENS COMPONENTS	
PEGO identification codes	***Compressor motor circuit breaker range***
110300EVD401 (*)	1,1-1,6A
110300EVD402	1,4-2A
110300EVD403	1,8-2,5A
110300EVD404	2,2-3,2A
110300EVD405	2,8-4A
110300EVD406	3,5-5A
110300EVD407	4,5-6,3A
110300EVD408	5,5-8A
110300EVD409	7-10A
110300EVD410 (*)	9-12A

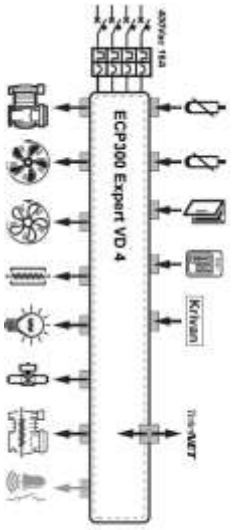
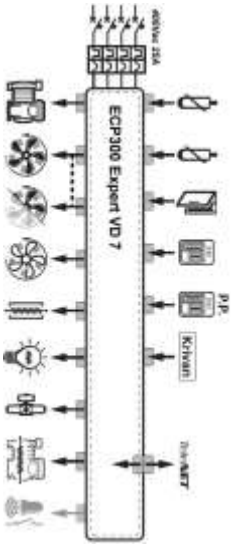
Panels line ***ECP300 Expert VD 7*** series

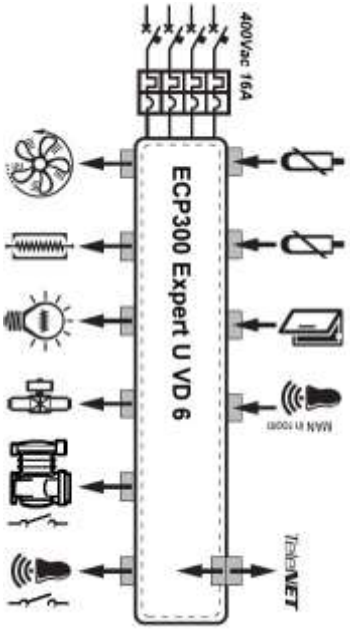
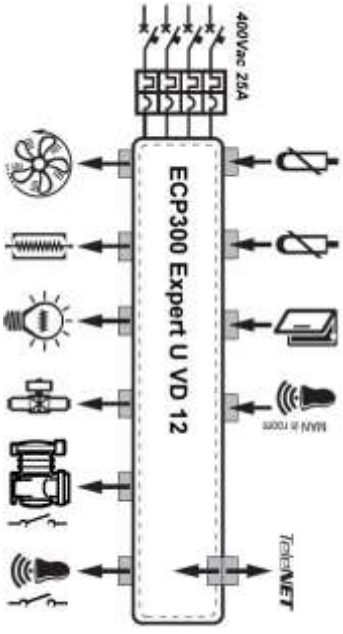
SIEMENS COMPONENTS	
PEGO identification codes	***Compressor motor circuit breaker range***
110300EVD701 (*)	5,5-8A
110300EVD702 (*)	7-10A
110300EVD703	9-12,5A
110300EVD704	11-16A
110300EVD705	14-20A

Panels line ***ECP300 Expert U VD*** series

SIEMENS COMPONENTS	
PEGO identification codes	***Heaters electrical defrost***
110300EUVD01	6kW
110300EUVD02	12kW

2.2 PRODUCT SERIES – TECHNICAL CHARACTERISTICS

TECHNICAL CHARACTERISTICS	*ECP300 Expert VD 4*	*ECP300 Expert VD 7*
Box dimensions	400x300x135 mm	400x300x135 mm
Weight	9 Kg	10 Kg
Protection rating	IP65	IP65
Power supply (3F+N+T)	400Vac ±10% 50/60Hz	400Vac ±10% 50/60Hz
Load type	3-phase	3-phase
Working temperature	- 5 ÷ + 40 °C	- 5 ÷ + 40 °C
Storage temperature	-25 ÷ +55 °C	-25 ÷ +55 °C
Relative ambient humidity	From 30% to 95% RH w/out condensate	From 30% to 95% RH w/out condensate
Altitude	< 1.000 m	< 1.000 m
Main switch / general protection **Interruption power**	4 poles magnetothermic **16A** "D" Icn=6kA / Ics=8kA / Icu=15kA	4 poles magnetothermic **25A** "D" Icn=6kA / Ics=8kA / Icu=15kA
Compressor protection	Adjustable motor circuit breaker	Adjustable motor circuit breaker
Control	***PEGO***	***PEGO***
Defrosting	Electrical	Electrical
Status indicators	LED + display	LED + display
Alarm signals	LED + Buzzer	LED + Buzzer
INPUTS		
Ambient probe	NTC 10K 1%	NTC 10K 1%
Evaporator probe	NTC 10K 1%	NTC 10K 1%
Door switch	Present	Present
High/low pressure switch	Present	Present
Kriwan ® connection	Present	Present
Compressor functioning mode selection	Pump-down / Thermostat	Pump-down / Thermostat
OUTPUTS		
Compressor	See motor circuit breaker thermal range relative to PEGO panel ID code	See motor circuit breaker thermal range relative to PEGO panel ID code
Condenser fans output 1 **Condenser fans output 2** (separated)	800W (1ph)	800W total (1ph)
Evaporator fans	500W (1ph)	2000W (1ph / 3ph)
Defrosting heaters	6000W (AC1) eq. resistive load	9000W (AC1) eq. resistive load
Room light	800W (AC1) resistive load	800W (AC1) resistive load
Solenoid valve	Present	Present
Compressor oil heater	Present	Present
Alarm relay	100W	100W
Supervision system	*TeleNET*	*TeleNET*
Connection diagrams :		

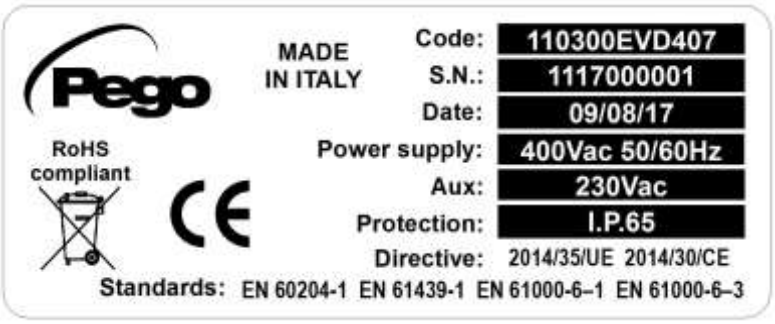
TECHNICAL CHARACTERISTICS	ECP300 Expert U VD 6	ECP300 Expert U VD 12
Box dimensions	400x300x135 mm	400x300x135 mm
Weight	9 Kg	10 Kg
Protection rating	IP65	IP65
Power supply (3F+N+T)	400Vac ±10% 50/60Hz	400Vac ±10% 50/60Hz
Load type	3-phase	3-phase
Working temperature	- 5 ÷ + 40 °C	- 5 ÷ + 40 °C
Storage temperature	-25 ÷ +55 °C	-25 ÷ +55 °C
Relative ambient humidity	From 30% to 95% RH w/out condensate	From 30% to 95% RH w/out condensate
Main switch / general protection Interruption power	4 poles magnetothermic **16A** "D" Icn=6kA / Ics=8kA / Icu=15kA	4 poles magnetothermic **25A** "D" Icn=6kA / Ics=8kA / Icu=15kA
Room light protection	Differential magnetothermic circuit breaker Id=30mA	Differential magnetothermic circuit breaker Id=30mA
Control	***PEGO***	***PEGO***
Defrosting	Electrical	Electrical
Status indicators	LED + display	LED + display
Alarm signals	LED + Buzzer	LED + Buzzer
INPUTS		
Ambient probe	NTC 10K 1%	NTC 10K 1%
Evaporator probe	NTC 10K 1%	NTC 10K 1%
Door switch	Present	Present
Man in cold-room alarm	Available	Available
OUTPUTS		
Evaporator fans	500W (1ph)	2000W (1ph / 3ph)
Defrosting heaters	6000W (AC1) eq. resistive load	12000W (AC1) eq. resistive load
Room light	800W (AC1) resistive load	1200W (AC1) resistive load
Solenoid valve	Present	Present
Enable condensing unit	Present	Present
Configurable alarm relay (AUX / alarm)	100W	100W
Door heater	Present	Present
Supervision system	*TeleNET*	*TeleNET*
Connection diagrams :		

2.3 OVERALL DIMENSIONS

IDENTIFICATION DATA 2.4

The product descripted in this manual is provided on the side with a label where its identification data are written:

- Name of Manufacturer
- Code of electrical board
- Serial number (S/N)
- Power supply
- Auxiliary circuits power supply
- IP protection rating



2.5 TRANSPORT AND STORAGE

Every panel is packed to be delivered without damages in normal transport conditions. In case of following transport it must be verified that:

- No objects or free parts could be inside the panel.
- The door is correctly closed and locked.
- In case of not using the original package, protect the product to allow transport without any damages.

Storage room must have an adeguate temperature and low humidity value; then avoid contact between the electrical panel and aggressive contaminating substances that could prejudice functionality and electrical security.

WARRANTY 2.6

ECP300 EXPERT series products are covered by a 24-months warranty against all manufacturing defects as from the date indicated on the product ID code.

In case of defect the product must be appropriately packaged and sent to our production plant or to any authorized Service Center with the prior request of the Return Authorization Number.

Customers are entitled to have defective products repaired, spare parts and labour included. The costs and the risks of transport are at the total charge of the Customer.
Any warranty action does not extend or renew its expiration.

The Warranty does not cover:

- Damages resulting from tampering, impact or improper installation of the product and its accessories.
- Installation, use or maintenance that does not comply with the instructions provided with the product.
- Repair work carried out by unauthorized personnel.
- Damage due to natural phenomena such as lightning, natural disasters, etc…

In all these cases the costs for repair will be charged to the customer.

The intervention service in warranty can be refused when the equipment is modified or transformed.

Under no circumstances **Pego S.r.l.** will be liable for any loss of data and information, costs of goods or substitute services, damage to property, people or animals, loss of sales or earnings, business interruption, any direct, indirect, incidental, consequential, damaging, punitive, special or consequential damages, in any way whatsoever caused, whether they are contractual, extra contractual or due to negligence or other liability arising from the use of the product or its installation.

Malfunction caused by tampering, bumps, inadequate installation automatically declines the warranty. It is compulsory to observe all the instructions in this manual and the operating conditions of the product.

Pego S.r.l. disclaims any liability for possible inaccuracies contained in this manual if due to errors in printing or transcription.

Pego S.r.l. reserves the right to make changes to its products which it deems necessary or useful without affecting its essential characteristics.

Each new release of the Pego product user manual replaces all the previous ones.

As far as not expressly indicated, is applicable the Law and in particular the art. 1512 C.C. (Italian Civil Code).

For any controversy is elected and recognized by the parties the jurisdiction of the Court of Rovigo.

CHAPTER 3: INSTALLATION

3.1 STANDARD ASSEMBLY KIT

For the purposes of assembly and use, the electronic ***ECP300 EXPERT*** control unit comes with:

- N° 4 seals, to be fitted between the fixing screws and the box back panel.
- N° 1 use and maintenance manual.
- N° 1 electrical drawing.
- N° 1 drilling layout.
- N° 2 probes NTC 10K 1%

3.2 MECHANICAL ASSEMBLY

- Each panel is conceived to be wall-mounted; please choose depending on the weight a correct fixing method.
- Install the device in places where the protection rating is observed.
- To effect correct electrical connection and maintain the protection rating, use appropriate cable glands and plugs to ensure a good seal.
- Install the device at height allowing the installer an easier use and maintenance. The installer must not be in danger when it's working on the panel. Height must be between 0,6 and 1,7 meters from the ground.
- Install the device away from fire and heat sources and possibly repaired from weather shelter.

Below we show step by step how to correctly install the panel.

Fig. 1: Pull up transparent cover protecting the general magnetothermic circuit breaker.

Fig. 2: Remove screw cover on the right-hand side.

Fig. 3: Undo the 4 fixing screws at the front of the box.

Fig. 4: Close the transparent protection cover.

Fig. 5: Open the front of the box, lift it and slide the two hinges out as far as they will go.

Fig. 6: Bend the hinges and rotate the front panel by 180° downward to get access inside the panel; then disconnect the connector to electronic card.

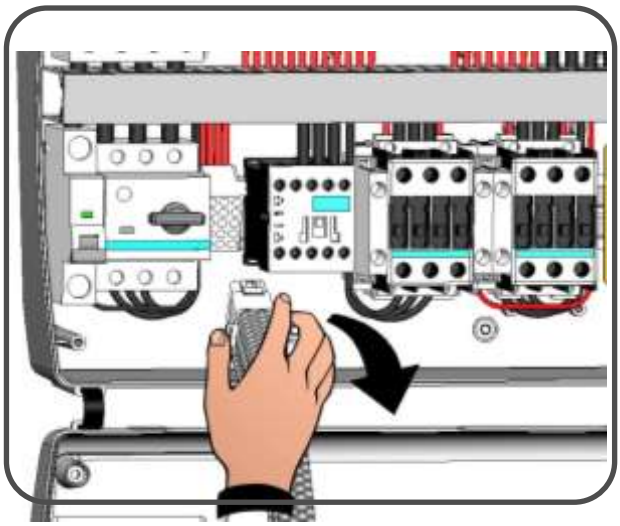


Fig. 7: Press on the sides of the hinges to remove them from their seats and so completely remove the front panel

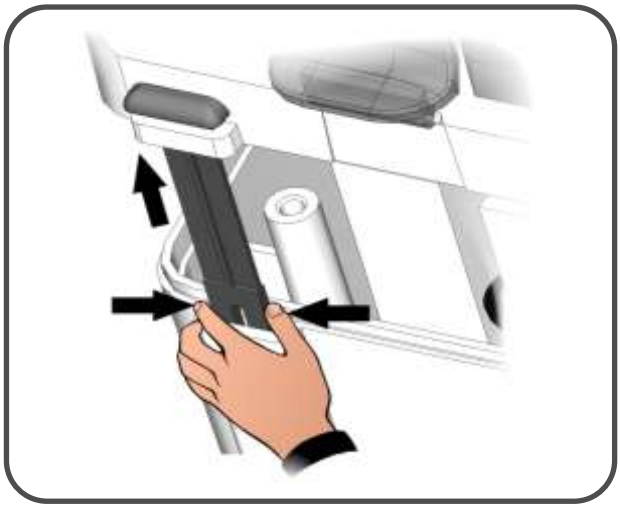


Fig. 8: Press with a screwdriver on the 4 preimpressed holes on the bottom to prepare fixing of the panel.

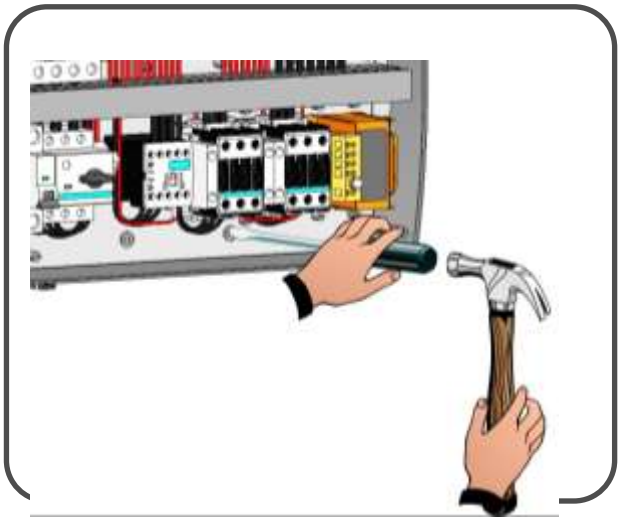


Fig. 9: Using the furnished drilling layout make four fixing holes on the wall.

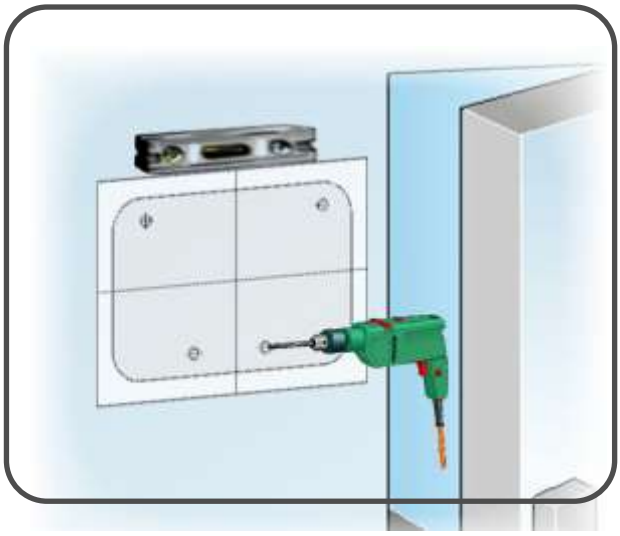


Fig.10: Using holes made on previous point fix the bottom with 4 screws of a length suitable for the thickness of the wall to which the panel will be attached. Fit a o-ring (supplied) between each screw and the box backing.

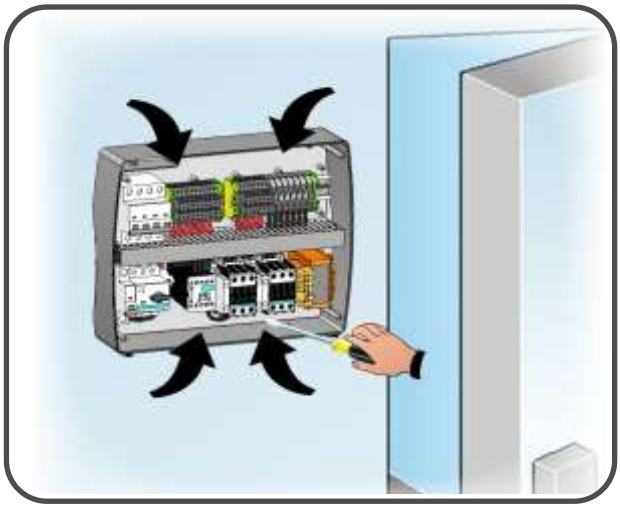
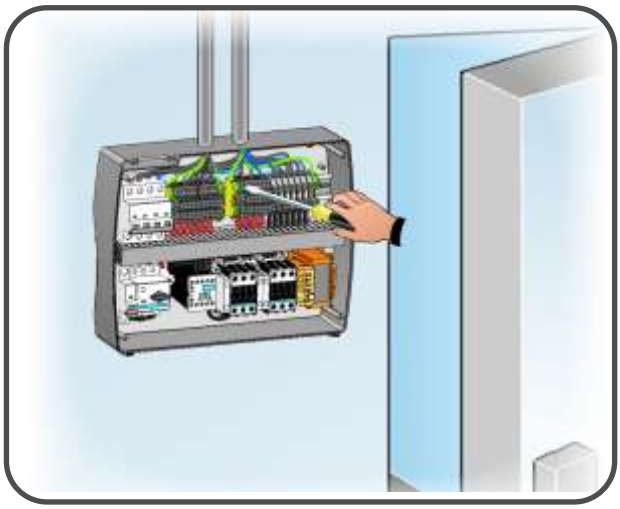


Fig.11: Now make the electrical wirings as indicated in the next chapter.



ELECTRICAL WIRINGS 3.3

- For the electrical wirings please refer to the wiring diagram and technical characteristics of the panel model to be installed.
- Panel power supply must be on a dedicated line, and must be placed a device suitable for protection against indirect contacts upstream the line (differential interruptor).
- Do not fit power supply wiring and signal wiring (probes/sensors and digital inputs) in the same raceways or ducts.

- Do not use multi-polar cables in which there are wires connected to inductive/power loads or signalling wires (e.g. probes/sensors and digital inputs).
- Minimise the length of connector wires so that wiring does not twist into a spiral shape as this could have negative effects on the electronics.
- When it is necessary to make a probe/sensor extension, the wires must have a cross-section of at least 1mm^2.
- All wiring must be of a cross-section suitable for relevant power levels. Insulation degree must be compatible with the applied voltages. Preferably use cables with insulator not propagating the flame and a low toxic smoke emission if interested by fire.

- It's **obligatory** to connect the clamp marked with **PE** abbreviation to the ground of the supply system. If necessary, please verify ground system efficiency.

- Do not connect to the **PE** clamp conductors different from the external protection one.

3.4 FRONT PANEL CONNECTION

Hook front panel and reconnect the electronic card connector as indicated below.

Fig.12: Hook the frontal panel back up to the lower part of the box by inserting the two hinges in their seats.

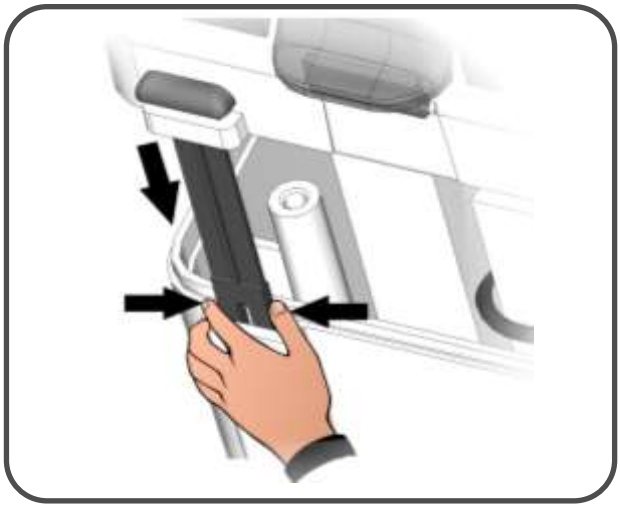


Fig.13: Bend the hinges and rotate the front panel downwards 180° to gain access inside the panel and then reconnect the electronic card connector.

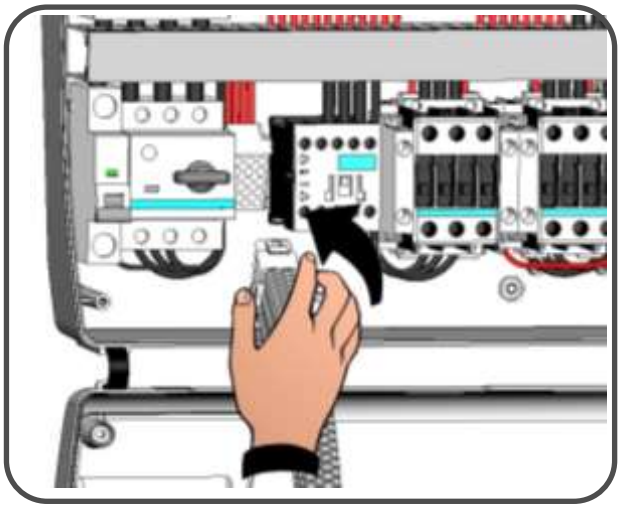
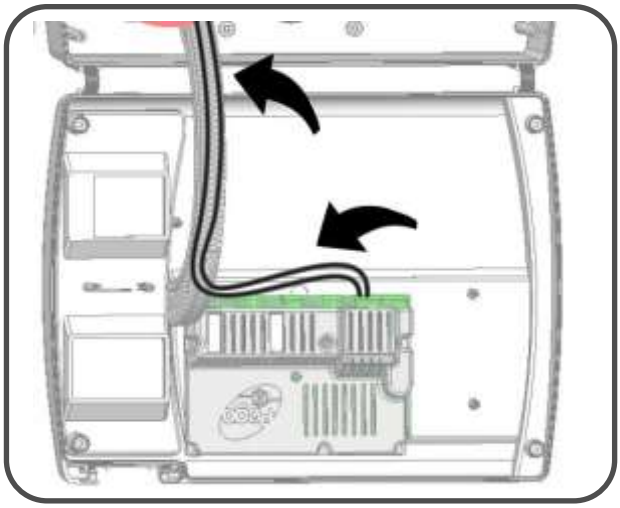


Fig.14: In case panel is connected with *TeleNET* or Alarm/Aux relay is used wirings must be done directly on the electronic card clamps.
It's suggested to put that wirings beside the connection cables from electronic card and bottom of the box.
For further clarification on the clamps please refer to the chapter "*TeleNET* SUPERVISING AND MONITORING SYSTEM".



VERIFICATIONS BEFORE USE 3.5

- After doing the wirings, please verify using the wiring diagram on the correct execution of the connections.
- Please check the correct screw clamping.
- Check, when possible, the correct functioning of the outside protection devices.
- Please correctly calibrate the motor circuit breaker (if present) dedicated to the compressor as indicated in the next chapter.

- After powering the electrical panel please check the correct current absorption on the loads, and after few hours of functioning check the good tightening of screws on terminal blocks (included power supply line connection). Warning: before doing that it's necessary to cut off power sectioning power supply upstream the line and block it with a padlock for max. safety. Before any operation verify with a tester the absence of voltage.

3.6 COMPRESSOR MOTOR CIRCUIT BREAKER CALIBRATION

Below we show step by step how to correctly calibrate motor circuit breaker dedicated to the compressor.

Fig.15: When the system is started for first time it's suggested to calibrate the motor circuit breaker on the compressor power circuits. Using an ammeter verify the effective absorption.

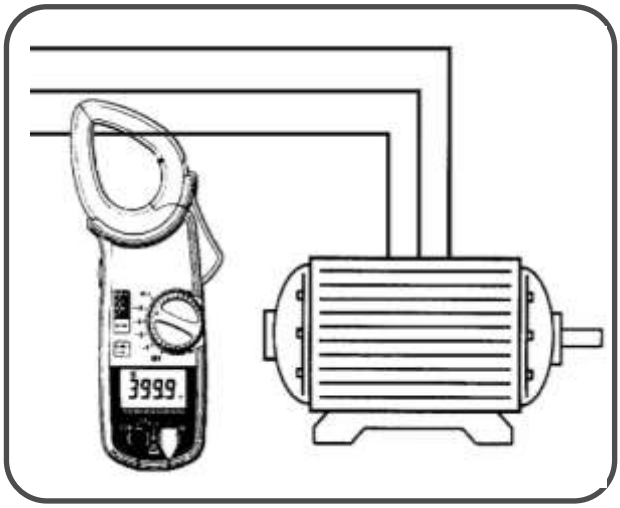


Fig.16: Make the motor circuit breaker calibration basing on the measured absorption. Any way the set up value must not be higher than the one expected by the compressor manufacturer. Warning: a wrong calibration may cause compressor breakdown or bad intervention of the motor circuit breaker.

Fig.17: To make the calibration use the regulation screw on the front side of motor circuit breaker.

ELECTRICAL PANEL CLOSING 3.7

When electrical wirings, verifications and calibrations are finished continue with the panel closing.

Fig.18: Close the front panel, making sure that all the wires are inside the box and that the box seal sits in its seat properly

Fig.19: Tighten the front panel using the 4 screws. Reposition screw cover on the right-hand side.

Fig.20: Power up the panel and carry out thorough reading/programming of all the parameters.

CHAPTER 4: FUNCTIONS

4.1 ECP300 EXPERT PANEL FUNCTIONS

- Signaling with LED icons of the plant status.
- Electronic control with wide LED display and easy to use buttons.
- Display and adjustment of cold room temperature accurate to 0.1 °C.
- Display of evaporator temperature from parameter.
- System control activation/deactivation.
- Alarm signaling: probe errors, minimum and maximum temperature alarm, compressor protection (man in cold room alarm in preset models).
- Evaporator fans control.
- Automatic and manual defrost control (static, heating element).
- Direct or pump-down control of motor compressor unit (selectable by terminal block connection in preset models).
- Room light activation, via panel key or door switch.
- Auxiliary relay with activation configurable by parameter.
- RS485 for connection to *TeleNET* industrial supervision network.
- Paramet access with Password (4 different selectable restriction levels).
- General magnetothermic circuit breaker accessible from the front panel, which cuts the general power supply.
- Adjustable motor circuit breaker for compressor protection accessible from the front panel (in preset models).
- Differential magnetothermic Id=30mA dedicated to room light accessible from the front panel (in preset models).

CHAPTER 5: DATA PROGRAMMING

CONTROL PANEL 5.1

FRONT KEYPAD 5.2

1 

AUXILIARY RELAY CONTROL
(it manually controls the auxiliary relay, if parameter AU=1)

2 
UP / MUTE BUZZER ALARM

3 
STAND BY (if the system shuts down the LED flashes)

4 
Room temperature **SETTING**

❺  **DOWN / MANUAL DEFROST**

❻  **ROOM LIGHT**

5.3 LED DISPLAY

❼ **AMBIENT TEMPERATURE VALUE / SETTINGS**

❽ 
STANDBY ICON
Led OFF = Board OFF
Led ON = Board ON and live
Led flashing = Board in stand-by (outputs are disabled)

❾ 
DOOR SWITCH / ROOM LIGHT ICON
Led OFF = Door switch disabled or not in use and room light OFF
Led ON = Room light ON
Led Flashing = Door switch enabled and room light ON

❿ 
COLD CALL ICON
Led OFF = Cold call OFF
Led ON = Cold call ON

⓫ 
FAN CALL ICON
Led OFF = Fan call OFF
Led ON = Fan call ON
Led Flashing = Fans paused after defrost (see parameter F5)

⓬ 
DEFROST CALL ICON
Led OFF = Defrost call OFF
Led ON = Defrost call ON
Led Flashing = Dripping phase in progress after defrost (see parameter D7)

⓭ 

AUXILIARY RELAY ICON (with parameter AU=1)
Led OFF = Aux relay call OFF
Led ON = Aux relay call ON

⓮ 
ALARM ICON
Led OFF = No alarm in progress
Led ON = Alarm activated then stopped
Led Flashing = Alarm in progress

GENERAL 5.4

To enhance safety and simplify the operator's work, the ***ECP300 EXPERT*** has two programming levels; the first level (Level 1) is used to configure the frequently-modified **SETPOINT** parameters. The second programming level (Level 2) is for general parameter programming of the various controller work.

It is not possible to access the Level 2 programming directly from Level 1: you must exit the programming mode first.

KEY TO SYMBOLS 5.5

For purposes of practicality the following symbols are used:

- **(▲)** the UP key is used to increase values and mute the alarm.
- **(▼)** the DOWN key is used to decrease values and force defrosting.

SETTING AND DISPLAYING THE SET POINTS 5.6

1. Press the **SET key** to display the current **SETPOINT** (temperature).
2. Hold down the **SET key** and press the **(▲)** or **(▼)** keys to modify the **SETPOINT**.

Release the **SET key** to return to cold room temperature display: the new setting will be saved automatically.

5.7 LEVEL 1 PROGRAMMING (User Level)

To gain access to the Level 1 configuration menu proceed as follows:

1. Press the **(▲)** and **(▼)** keys simultaneously and keep them pressed for a few seconds until the first programming variable appears on the display.

2. Release the **(▲)** and **(▼)** keys.

3. Select the variable to be modified using the **(▲)** or **(▼)** key.

4. When the variable has been selected it is possible:

• to display the setting by pressing SET key.

• to modify the setting by pressing the SET key together with the **(▲)** or **(▼)** key.

When configuration values have been set you can exit the menu by pressing the **(▲)** and **(▼)** keys simultaneously for a few seconds until the cold room temperature reappears.

5. The new settings are saved automatically when you exit the configuration menu.

LIST OF LEVEL 1 VARIABLES (User Level) 5.8

VARIABLES	MEANING	VALUE	DEFAULT
r0	**Temperature difference** compared to main SETPOINT	0.2 - 10 °C	2°C
d0	**Defrost interval** (hours)	0 - 24 hours	4 hours
d2	**End-of-defrost setpoint**. Defrost is not executed if the temperature read by the defrost sensor is greater than *d2* (If the sensor is faulty defrosting is timed)	-35 - 45 °C	15°C
d3	**Max defrost duration** (minutes)	1 - 60 min	25 min
d7	**Drip duration** (minutes) At the end of defrost the compressor and fans remain at standstill for time *d7*, the defrost LED on the front panel flashes.	0 - 10 min	0 min
F5	**Fan pause** after defrost (minutes) Allows fans to be kept at standstill for a time *F5* after dripping. This time begins at the end of dripping. If no dripping has been set the fan pause starts directly at the end of defrost.	0 - 10 min	0 min
A1	**Minimum temperature alarm** Allows user to define a minimum temperature for the room being refrigerated. Below value *A1* an alarm trips: the alarm LED flashes, displayed temperature flashes and the buzzer sounds to indicate the problem.	-	-45°C
A2	**Maximum temperature alarm** Allows user to define a maximum temperature for the room being refrigerated. Above value *A2* an alarm trips: the alarm LED flashes, displayed temperature flashes and the buzzer sounds to indicate the problem.	-	+45°C
tEu	**Evaporator sensor temperature display**	Displays evaporator temperature (displays nothing if dE =1)	read only

5.9 LEVEL 2 PROGRAMMING (Installer Level)

To access the second programming level press the UP **(▲)** and DOWN **(▼)** keys and the LIGHT key simultaneously for a few seconds.

When the first programming variable appears the system automatically goes to stand-by.

1. Select the variable to be modified by pressing the UP **(▲)** and DOWN **(▼)** keys.

When the parameter has been selected it is possible to:

2. View the setting by pressing the SET key.

3. Modify the setting by holding the SET key down and pressing the **(▲)** or **(▼)** key.

4. When configuration settings have been completed you can exit the menu by pressing the **(▲)** and **(▼)** keys simultaneously and keeping them pressed until the room temperature reappears.

5. Changes are saved automatically when you exit the configuration menu.

6. Press the STAND-BY key to enable electronic control.

5.10 LIST OF LEVEL 2 VARIABLES (Installer Level)

VARIABLES	*MEANING*	*VALUES*	*DEFAULT*
AC	**Door switch status**	0 = normally open 1 = normally closed	0
F3	**Fan status with compressor off**	0 = Fans run continuously 1 = Fans only run when compressor is working	1
F4	**Fan pause during defrost**	0 = Fans run during defrost 1 = Fans do not run during defrost	1
dE	**Sensor presence** If the evaporator sensor is disabled defrosts are carried out cyclically with period *d0:* defrosting ends when an external device trips and closes the remote defrost contact or when time *d3* expires.	0 = evaporator sensor present 1 = no evaporator sensor	0
d1	**Defrost type**, cycle inversion (hot gas) or with heater elements	1 = hot gas 0 = element	0
Ad	**Net address** for connection to TeleNET supervision system or Modbus	0 ÷ 31 (with AU=3) 1 ÷ 247 (with AU=7)	0
AId	**Minimum and maximum temperature** signalling and alarm display delay	1…240 min	120 min
C1	Minimum time between shutdown and **subsequent switching on of the compressor**.	0…15 min	0 min
CAL	**Cold room sensor value correction**	-10…+10	0
Pc	**Compressor protection contact status**	0 = NO 1 = NC	0 = NO

doC	**Compressor safety time for door switch**: when the door is opened the evaporator fans shut down and the compressor will continue working for time **doC**, after which it will shut down.	0…5 minutes	0
tdo	**Compressor restart time after door opening.** when the door is opened and after tdo time, it's setted back the normal functioning giving door open alarm (Ed) With tdo=0 the parameter is disabled.	0…240 min 0 = disabled	0
Fst	**FAN shutdown TEMPERATURE** The fans will stop if the temperature value read by the **evaporator** sensor is higher than this value.	-45…+45°C	+45°C
Fd	**Fst differential**	0…+10°C	2°C
LSE	**Minimum value attributable to setpoint.**	-45... HSE °C	-45°C
HSE	**Maximum value attributable to setpoint.**	+45... LSE °C	+45°C
tA	**NO – NC** alarm relay switching	0 = activates when alarm is on 1 = deactivates when alarm is on	1
AU	**Auxiliary/alarm relay control** (only on version with relay fitted)	0 = alarm relay 1 = manual auxiliary relay controlled via AUX key 2 = automatic auxiliary relay managed by StA temp. setting with 2°C differential 3 = relay disabled / TeleNET function 4 = pump down function (see CHAP 5.15) 5 = free voltage contact for condensing unit (AUX relay and compressor relay in parallel) 6 = Contact for casing element control (AUX relay closed with compressor output inactive). 7 = relay disabled / Modbus-RTU function	0
StA	**Temperature setting for aux. relay**	-45…+45°C	0
In1	**Man in cold room alarm** Select input INP1 on the board as *compressor protection alarm* or as *man in cold room alarm* (contact NC).	0 = compressor protection 1 = man in room alarm	0
P1	**Password type of protection** (active when PA is not equal 0)	0 = only display set point 1 = display set point, AUX, light access 2 = access in programming not permitted 3 = access in second level programming not permitted	3
PA	**Password** (see P1 for the type of protection)	0...999 0 = not active	0
reL	**Software release**	indicates software version	Read only (7)

5.11 SWITCHING ON ECP300 EXPERT PANEL

After wiring the electronic controller correctly, power up at 400 VAC; the display panel will immediately emit a beep and all the LEDs will come on simultaneously for a few seconds.

5.12 COMPRESSOR ACTIVATION/DEACTIVATION CONDITIONS

The ***ECP300 EXPERT*** controller activates the compressor when cold room temperature exceeds setting+differential (r0); it deactivates the compressor when cold room temperature is lower than the setting.
If the Pump-down function is selected refer to chapter 5.14 for the compressor activation / deactivation conditions.

5.13 MANUAL DEFROSTING

To defrost just press the dedicated key (see section 5.2) to activate the elements relay. Defrosting will not take place if the end-of-defrost temperature setting (d2) is lower than the temperature detected by the evaporator sensor. Defrosting ends when the end-of-defrost temperature (d2) or maximum defrost time (d3) is reached.

PUMP DOWN FUNCTION 5.14

Selection of PUMP DOWN functioning mode for the compressor working on X1 terminal block, changing the selection connection as indicated in the wiring diagram.
AU parameter must never be set up on 4, because PUMP DOWN function is made electromechanically inside the panel.

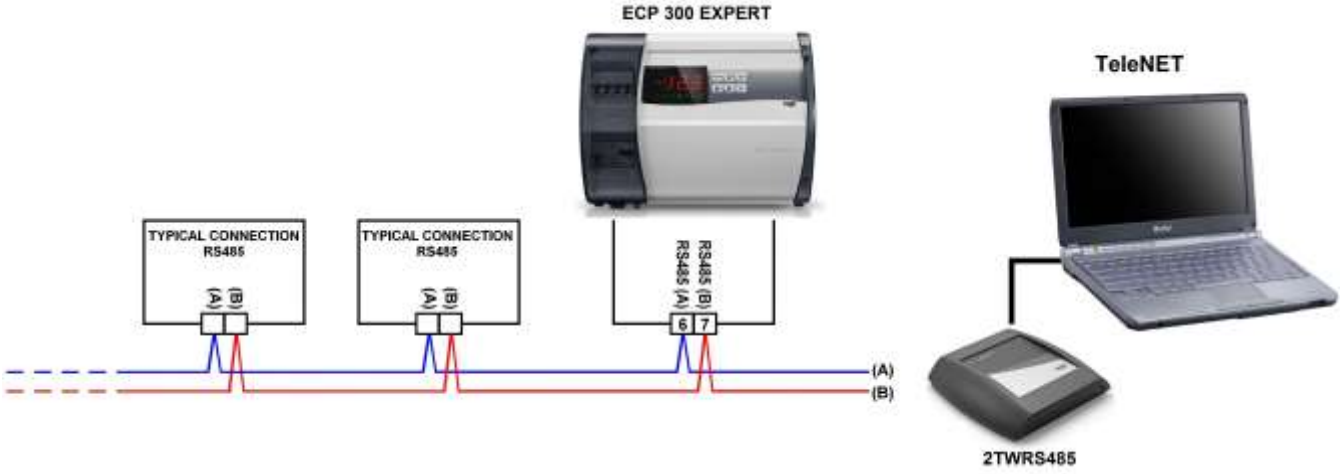
PASSWORD FUNCTION 5.15

When parameter PA is setting with value different to 0 the protection function is activated.
See parameter P1 for the different protection.
When PA is setting the protection start after two minutes of inactivity. On display appear 000. With up/down modify the number, with set key confirm it.
Use universal number 100 if you don't remember the password.

CHAPTER 6: OPTIONS

6.1 TELENET MONITORING AND SUPERVISION SYSTEM

For ***TeleNET*** connections to enable RS485 as indicated at chapter 6.3 and follow the scheme below. Refer to ***TeleNET*** user manual for instrument configuration.
WARNING: During configuration, at entry “Module” to select the entry " *Instrument ECP Base Series / ECP Expert Series* ".



6.2 NET CONFIGURATION WITH MODBUS-RTU PROTOCOL

For ***RS485*** connections with ***Modbus-RTU*** protocol, to enable RS485 output as indicated at chapter 6.3 and follow the scheme below.
Refer to MODBUS-RTU_ECP200T1 user manual (available on Pego Internet web site) for MODBUS-RTU communication protocol specification.

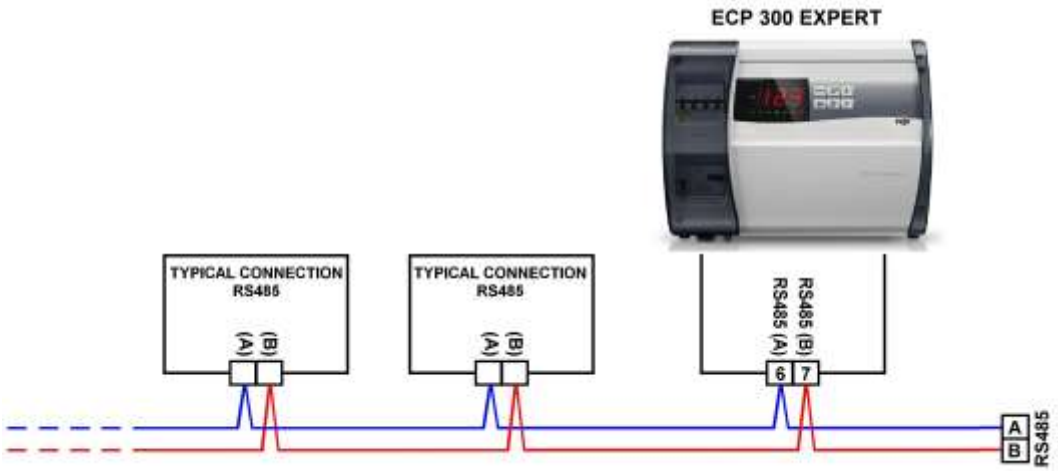


Fig.21: Open the front panel as described in Chap. 3.2 (page 13)

Fig.22: Bend the hinges and rotate front panel downwards 180° to gain access to the electronic card.

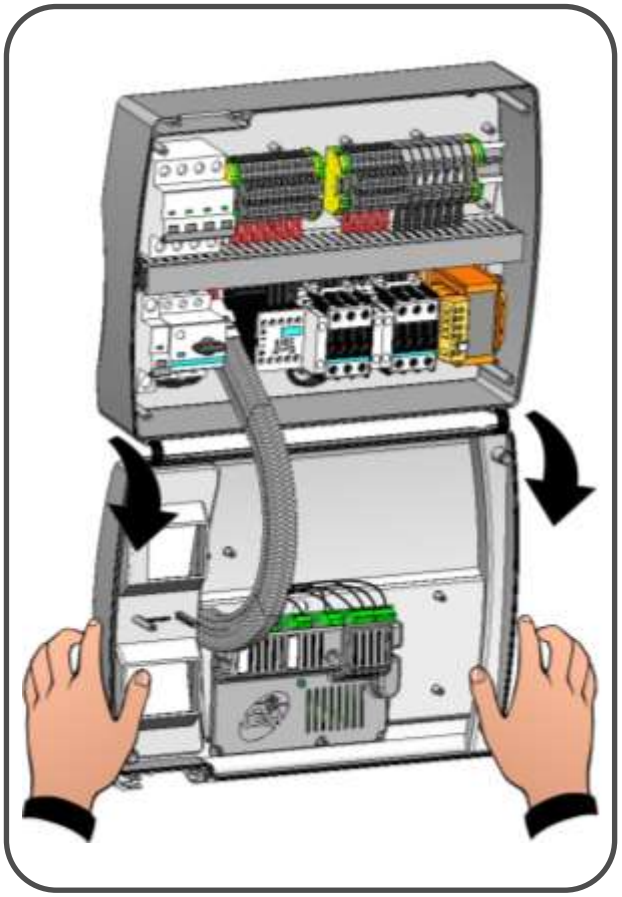


Fig.23: Undo the 6 CPU board cover fixing screws: remove the board from the frontal part of the box in ABS.

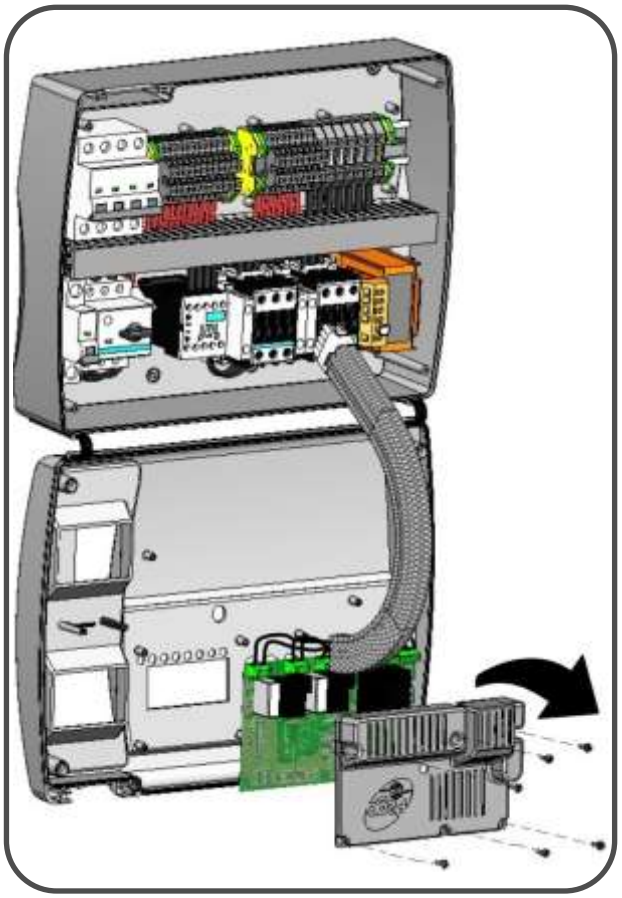


Fig.24: Remove the jumper from JUMPER JP2.

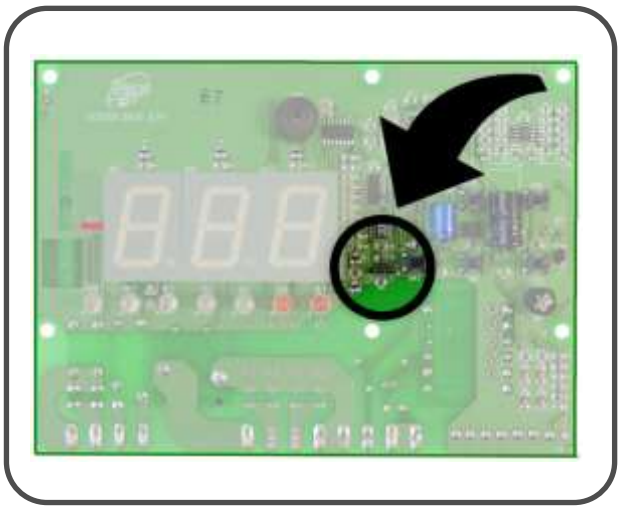


Fig.25: ***TeleNET*** **Selection**: Insert the jumper in JUMPER **JP2** in position **3-2** and set level 2 variable **AU=3**. Terminal blocks for *TeleNET* connection are **7=RS485_(A)** and **8=RS485_(B)** on the electronic card. Remember then to assign a LAN address compatible with existing *TeleNET* network, if present (Level 2 parameter Ad).
Warning! With this configuration auxiliary relay is disabled.

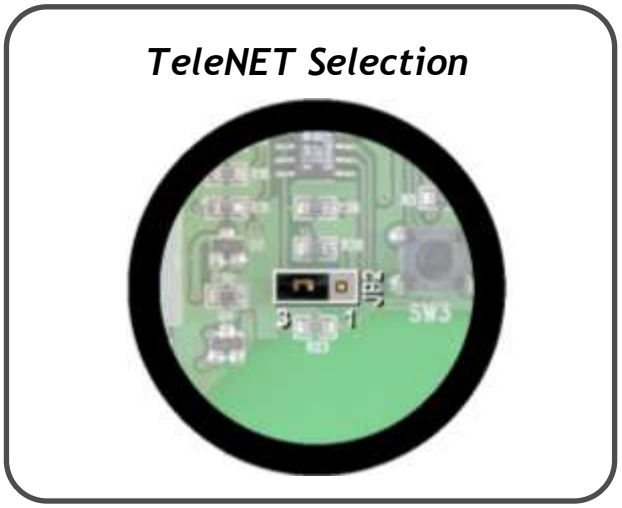


Fig.26: **Alarm/AUX relay Selection**: Insert the jumper in JUMPER **JP2** in position **2-1** and set level 2 variable **AU** with one of the values 1, 2, 5 according with the desired function. Terminal blocks for free-voltage contact on configurable relya are 16 and 17 on the electronic card.
Warning! With this configuration *TeleNET* connection is disabled.

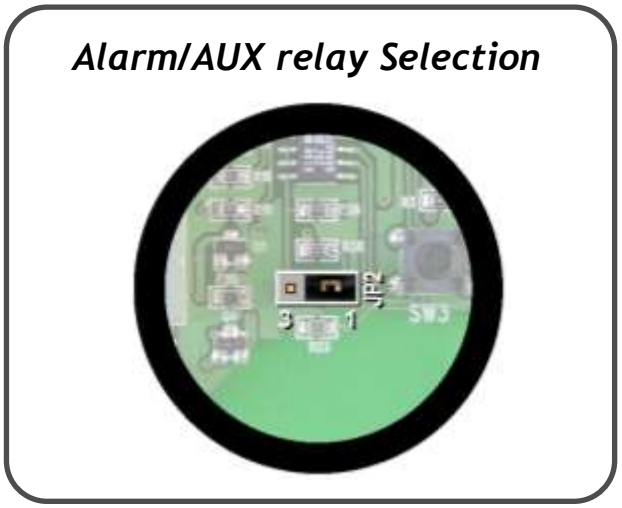
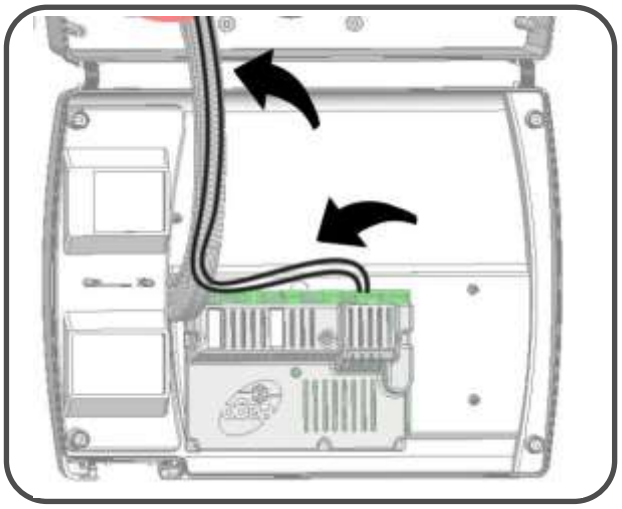


Fig.27: In case panel is connected with *TeleNET* or Alarm/Aux relay is used wirings must be done directly on the electronic card clamps.
It's suggested to put that wirings beside the connection cables from electronic card and bottom of the box.



CHAPTER 7: TROUBLESHOOTING

7.1 ALARM CODES

In the event of any anomalies the ***ECP300 EXPERT*** warns the operator by displaying alarm codes and sounding the warning buzzer inside the control panel. If an alarm is tripped the display will show one of the following messages:

ALARM CODE	POSSIBLE CAUSE	SOLUTION
E0	*Cold room temperature sensor not working properly*	• Check that cold room temperature sensor is working properly • If the problem persists replace the sensor
E1	*Defrost sensor not working properly* (In this case defrosts will last time *d3*)	• Check that defrost sensor is working properly • If the problems persists replace the sensor
E2	*Eeprom alarm* An EEPROM memory alarm has been detected (All outputs except the alarm one are deactivated)	• Switch unit off and back on
E8	*Man in cold room alarm*	• Reset the alarm input inside the cold room
Ec	*Compressor protection tripped* (e.g. thermal protection) (All outputs except the alarm one – where applicable – are deactivated)	• Check that compressor is working properly • Check compressor absorption • If the problem persists contact the technical assistance service
Ed	*Open door Alarm.* When the door is opened and after tdo time, it's setted back the normal functioning giving door open alarm (Ed)	• Check door switch status • Check door switch connections • If the problem persists contact the technical assistance service
Temperature shown on display is flashing	*Minimum or maximum temperature alarm.* The temperature inside the cold room has exceeded the min. or max. temperature alarm setting (see variables *A1 and A2, user programming level*)	• Check that the compressor is working properly. • Sensor not reading temperature properly or compressor start/stop control not working.

TROUBLESHOOTING 7.2

In case no alarm code is present below are indicated some of the most common causes that can result in anomalies. These causes may be referable to internal or external problems of the panel.

EVENTS	POSSIBLE CAUSE	SOLUTION
Compressor not starting **Display is OFF**	*Power supply absent*	• Check if display is ON and system functioning green lamp is working. • Check the ambient probe connections • If the problem persists replace the probe
	General magnetothermic circuit breaker intervention.	• Before reinserting the magnetothermic circuit breaker please check that no short-circuits are present. Reinsert then magnetothermic circuit breaker verifying all the absorptions to identify any anomalies.
	Auxiliary circuits magnetothermic circuit breaker intervention.	• Before reinserting the magnetothermic circuit breaker please check that no short-circuits are present. Reinsert then magnetothermic circuit breaker verifying all the absorptions to identify any anomalies.
	Circuit protection fuse (on the transformer) intervention.	• Restore the fuse (Fusibile vetro 10X20 F250mA 250V) . • Check that transformer output absorption not exceeding 0.25A. • Check that on clamps for Kriwan supply no other users are connected. • Check that no short-circuits are present on transformer output.
Compressor not starting	*The panel is in stand-by mode*	• Check that panel is not in stand by mode (blinking green lamp). In that case press the key to start the panel (fixed green lamp)
	Pressure switches or Kriwan malfunctioning or their intervention.	• Check wirings, calibration and correct working of compressor and sensors. • In case system is starting for the very first time please check the presence of bridge for Pump-Donw/Thermostat functioning selection on X1 terminal block. Make bridges on terminal block for the enabling of devices not present in the system (Kriwan, pressure switches)
Defrosting cycle doesn't start	*Wrong setting of defrosting cycle parameters*	• Check the correct setting of parameters.

CHAPTER 8: MAINTENANCE

8.1 GENERAL SECURITY RULES

For any type of maintenance, it must be exclusively executed by skilled technical staff.

In case of break down or maintenance to the electrical system, before proceeding please cut off voltage to the panel placing general power supply switch on open position (O). Check the absence of voltage with a tester before doing any operation.
Each element of the panel, if defective, must be replaced only with original spare parts.

If the intervention is on external parts of panel follow the next steps:

- Switch off safely the panel power supply in one of the following ways:

1) Put 300 Expert main switch on OFF position and block it with a mechanical block (Pego accessories ***ACC5ST3801***) and then using a padlock.

2) Cut off power supply upstream the panel permanently, using a padlock (on OFF position).

- Place signals indicating maintenaince in progress.

Before proceeding with maintenance operations please follow these security prescriptions:

- The electrical panel must be without voltage.
- Prevent the presence of unauthorized staff around the intervention area.
- Positioning of suitable notices to signal "Device under maintenance".
- Wear suitable and without free appendixes work cloths (overalls, gloves, shoes, headgears).
- Remove if worn, every object which can get entangled in any part of the panel.
- Suitable tools for the maintenance operations must be at disposal.
- Tools must be correctly cleaned and greased.
- Necessary technical documentation to execute maintenance intervention must be at disposal (wiring diagrams, tables, drawings, etcc.…)
- At the end of the maintenance operations please remove all the residual materials and make a careful cleaning inside the panel.

It’s absolutely forbidden to accomodate additional parts inside the panel.

The manufacturer declines every responsibility in case all the points descripted in this chapter are not observed.

MAINTENANCE 8.2

The maintenance is necessary to ensure the electrical panel functionalities during the time and to avoid that damaging of a few elements can put people in danger.
It must be done by skilled and authorized technical staff respecting the general security rules.

DEVICE	TYPE OF INTERVENTION	FREQUENCY
Terminal block	*Wires tightening*	After first 20 days of functioning
Terminal block	*Wires tightening*	Annual

SPARE PARTS 8.3

ECP300 Expert panels spare parts

PEGO Identification Codes	DESCRIPTION
200SCHBASE4	SPARE PART ELECTRONIC CARD
ACC5ST3801	MECHANICAL BLOCK FOR GENERAL MAIN SWITCH (SIEMENS)
……	……

Spare parts must be requested to your distributor.

APPENDICES

A.1 DICHIARAZIONE DI CONFORMITA' UE / EU CONFORMITY

LA PRESENTE DICHIARAZIONE DI CONFORMITA' E' RILASCIATA SOTTO LA RESPONSABILITA' ESCLUSIVA DEL FABBRICANTE:
THIS DECLARATION OF CONFORMITY IS ISSUED UNDER THE EXCLUSIVE RESPONSIBILITY OF THE MANUFACTURER:

PEGO S.r.l. Unipersonale Via Piacentina 6/b, 45030 Occhiobello (RO) – Italy –

DENOMINAZIONE DEL PRODOTTO IN OGGETTO / DENOMINATION OF THE PRODUCT IN OBJECT

☑ ECP300 EXPERT VD4	☑ ECP300 EXPERT VD7	☐ ……
☑ ECP300 EXPERT U VD6	☑ ECP300 EXPERT U VD 12	☐ ……

IL PRODOTTO DI CUI SOPRA E' CONFORME ALLA PERTINENTE NORMATIVA DI ARMONIZZAZIONE DELL'UNIONE EUROPEA:
THE PRODUCT IS IN CONFORMITY WITH THE RELEVANT EUROPEAN HARMONIZATION LEGISLATION:

Direttiva Bassa Tensione (LVD):	**2014/35/UE**
Low voltage directive (LVD):	***2014/35/EU***
Direttiva EMC:	**2014/30/CE**
Electromagnetic compatibility (EMC):	***2014/30/EU***

LA CONFORMITA' PRESCRITTA DALLA DIRETTIVA E' GARANTITA DALL'ADEMPIMENTO A TUTTI GLI EFFETTI DELLE SEGUENTI NORME (comprese tutte le modifiche):
THE CONFORMITY WITH THE REQUIREMENTS OF THIS DIRECTIVE IS TESTIFIED BY COMPLETE ADHERENCE TO THE FOLLOWING STANDARDS (including all amendments):

Norme armonizzate:	**EN 60204-1:2006, EN 61439-1:2011, EN 61000-6–1:2007, EN 61000-6–3:2007**
European standards:	***EN 60204-1:2006, EN 61439-1:2011, EN 61000-6–1:2007, EN 61000-6–3:2007***

IL PRODOTTO E' COSTITUITO PER ESSERE INCORPORATO IN UNA MACCHINA O PER ESSERE ASSEMBLATO CON ALTRI MACCHINARI PER COSTITUIRE UNA MACCHINA CONSIDERATE DALLA DIRETTIVA: 2006/42/CE "Direttiva Macchine".
THE PRODUCT HAS BEEN MANUFACTURED TO BE INCLUDED IN A MACHINE OR TO BE ASSEMBLED TOGHETER WITH OTHER MACHINERY TO COMPLETE A MACHINE ACCORDING TO DIRECTIVE: EC/2006/42 "Machinery Directive".

Firmato per nome e per conto di:
Signed for and on behalf of:

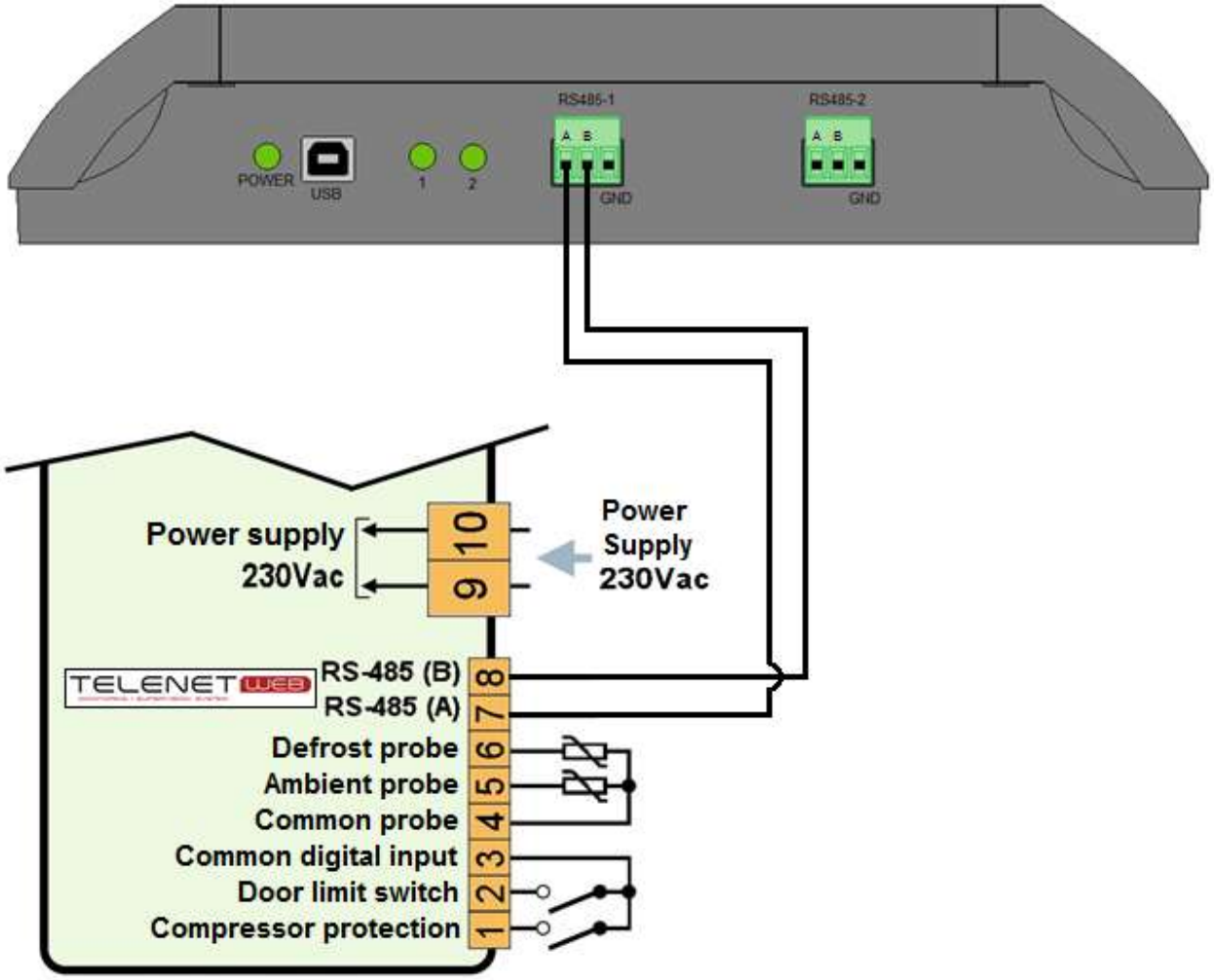
Pego S.r.l.
Lisa Zampini
Procuratore Generale

Luogo e Data del rilascio:
Place and Date of Release:

Occhiobello (RO), 08/01/2018

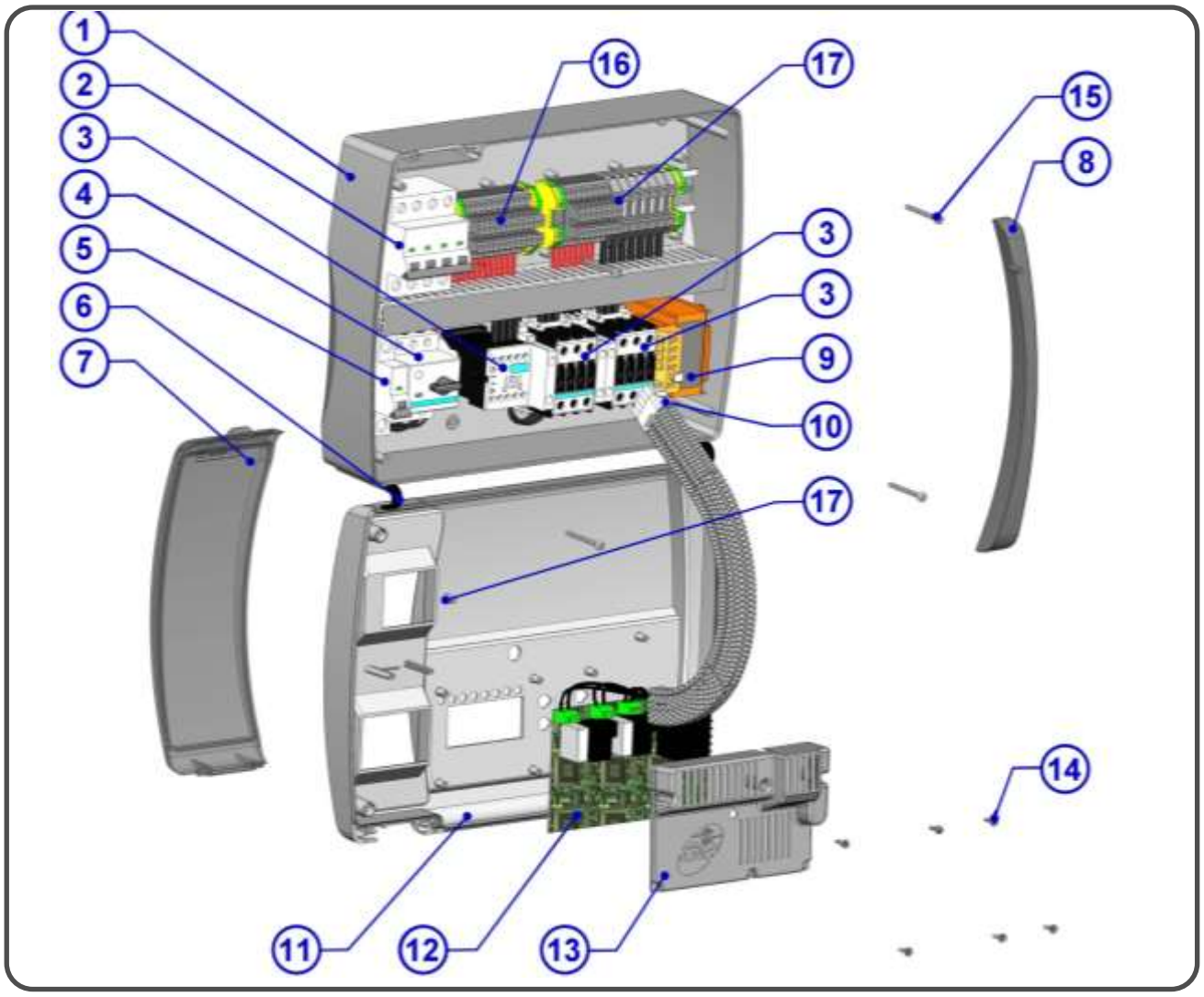
A.2 *TeleNET* CONNECTION DIAGRAM

Before proceeding with the wiring please select AUX/Alarm relay function by JP2 jumper and level 2 parameter AU as indicated on chapter 6.
Remember then to assign a LAN address compatible with existing *TeleNET* network, if present. (Level 2 parameter Ad)



PART LIST

6.2



LEGEND	
RIF.	**DESCRIPTION**
1	Box rear in ABS
2	4 poles magnetothermic circuit breaker with general switch / general protection function
3	Contactors for units control
4	Compressor protection motor circuit breaker
5	Auxiliary protection 1-pole magnetothermic circuit breaker
6	Box front opening hinges
7	Front cover in transparent polycarbonate
8	Transparent polycarbonate screw cover
9	Auxiliary circuits transformer (N.B. with inside a glass fuse 10X20 F250mA 250V)
10	Connector for linking panel and the electronic card
11	Front panel
12	Electronic card
13	Electronic card cover
14	Electronic card fixing screws
15	Box closure screws
16	Auxiliary terminal block X1
17	Power terminal block X2

Attention: This part list is purely indicative and refers to the ECP300VD7 model. Components on the various panels may be different.

NOTES

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