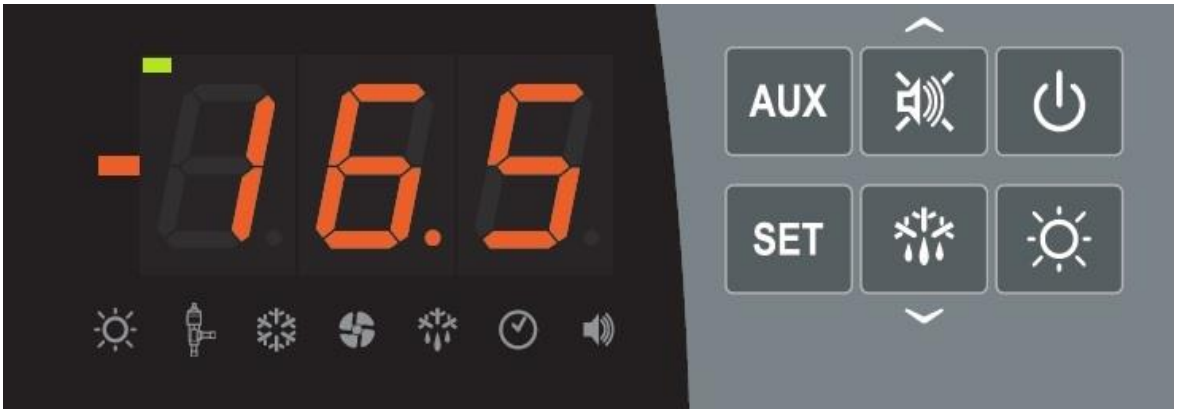
200SCH200STP

ELECTRONIC BOARD FOR PANELS WITH INTEGRATED STEPPER VALVE CONTROL



User manual

ENGLISH

READ AND KEEP

Software Rel.: 6

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION

GENERAL INFORMATION 1.1

DESCRIPTION:

The **200SCH200STP** board is an electronic cold room control board for the management of the refrigeration system with integrated control of the motorized electronic expansion valve and consent for condensing unit.
It allows the complete management of all the components present in a refrigeration system, such as the compressor, EEV Stepper, evaporator fans, defrosting resistors, cold room light and thermostat-controlled door anti-fog resistance.

APPLICATIONS:

- Management of the evaporation unit with electrical defrosting.
- Management of the bipolar motorised expansion valve.

KEY FEATURES:

- Compatible with 26 types of refrigerant gas: R404A, R134a, R22, R407A, R407F, R407H, R410A, R450A, R507, R513A, R744 (CO_2), R449A, R290, R32, R448A, R452A, R600, R600a, R1270, R1234ze(E), R23, R717 (NH_3), R454C, R515B, R471A, R455A.
- Easy valve parameter programming with 21 pre-set values for the most popular valves on the market. Ability for manually defining valve parameters.
- Easy parameter programming with 4 pre-set values for the several applications of the electronic expansion valve.
- Safety solenoid valve management with the system stopped.
- Possible connection to the backup battery module, allowing the stepper valve to close in the absence of network power.
- Display and adjustment of the cold room temperature, with decimal point.
- Evaporator temperature display from parameter.
- Configurable digital inputs.
- Activation/deactivation of system control.
- System alarm signal (probe error, minimum and maximum temperature alarm, compressor protection).
- LED signalling of the system status and large displays.
- Easy to use keyboard.
- Evaporator fan management.
- Air-recirculation management in the anti-stratification function.
- Emergency operation in case of ambient probe breakage.
- Automatic and manual defrost management (static, resistor, cycle reversal, thermostat resistors).
- Energy saving: day/night mode and intelligent defrosting.
- Consent for motorised condensing unit.
- Cell light activation with key on the panel or via Door switch.
- Integrated differential magnetic-thermal switch for protection and disconnection of the refrigeration unit.
- Case in self-extinguishing ABS, with transparent access door to the differential magnetic-thermal protective switch, with IP65 protection level, allowing its use as a panel external to the cell.
- Two alarm/auxiliary relays with activation configurable by parameter.

- RS485 for connection to the TeleNET supervision network or to a network with Modbus-RTU protocol.
- Parameter import / export via USB.
- Software upgradeable via USB.
- Cell light activation with key on the panel or via Door switch.
- Integrated differential magnetic-thermal switch for protection and disconnection of the refrigeration unit.
- Two alarm/auxiliary relays with activation configurable by parameter.
- RS485 for connection to the TeleNET supervision network or to a network with MODBUS-RTU protocol.
- Parameter import / export via USB.
- Software upgradeable via USB.

1.2 PRODUCT IDENTIFICATION CODE

200SCH200STP	Control and management board for motorised electronic expansion valve, consent for motorised condensing unit, defrosting resistors, evaporator fans, solenoid valve, cold room light, door resistance and presence of all the electrical protections required by regulations. Can be connected to any type of stepper valve in the market.

CHAPTER 2: TECHNICAL SPECIFICATIONS

2.1 TECHNICAL SPECIFICATIONS

Electronic board power supply	
Voltage	12-24 Vac ± 10% 50-60Hz 12-24 Vdc
Maximum power consumption	15W
Maximum absorption allowed (with all loads connected)	1,5W
General Features	
Types of compatible temperature probes	Temperature probes: NTC 10K 1%, PTC, PT1000
Resolution	0.1 °C
Probe reading accuracy	± 0.5 °C
Reading range	-45 ÷ +99 °C
Types of compatible pressure probes	Pressure probe: 4/20 mA
Output characteristics (voltage-free contacts)	
Description	**Relay installed**
Compressor	(Relay 5A AC1)
Resistors	(Relay 5A AC1)
Fans	(Relay 5A AC1)
Cold room light	(Relay 16A AC1)
Alarm / Aux1	(Relay 5A AC1)
Aux2	(Relay 5A AC1)
STEPPER valve piloting	
Nominal power	Bipolar valve (4 wires): max 0.8A **See valve compatibility table**

WARRANTY CONDITIONS 2.2

The **200SCH200STP** board is covered by warranty against all manufacturing defects for 24 months from the date of production.

In the event of a defect, the equipment must be shipped with appropriate packaging to our Authorized Facility or Service Centre upon request of the return authorization number.

The Customer is entitled to the repair the defective equipment including labour and spare parts. Transport costs and risks are borne entirely by the Customer.
Any intervention under warranty does not extend or renew the expiry of the same.

The warranty is voided in case of:

- Damage due to tampering, carelessness, inexperience or improper installation of the equipment.
- Installation, use or maintenance not in accordance with the requirements and instructions provided with the equipment.
- Repair operations carried out by unauthorised personnel.
- Damage due to natural phenomena such as lightning, natural disasters, etc.

In all these cases the costs for the repair will be borne by the customer.

Warranty service may be refused when the equipment is modified or transformed.

Under no circumstances will **Pego S.r.l.** be liable for any loss of data and information, costs of substitute goods or services, damage to property, persons or animals, loss of sales or income, interruptions of activities, any direct, indirect, incidental, property, coverage, punitive, special or consequential damages caused in any way, whether contractual, extra-contractual or due to negligence or other liability arising from the use of the product or its installation.

Malfunction caused by tampering, impact, improper installation automatically voids the warranty. It is mandatory to comply with all the instructions in the following manual and the operating conditions of the equipment.

Pego S.r.l. declines all responsibility for possible inaccuracies contained in this manual, if due to printing or transcription errors.

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

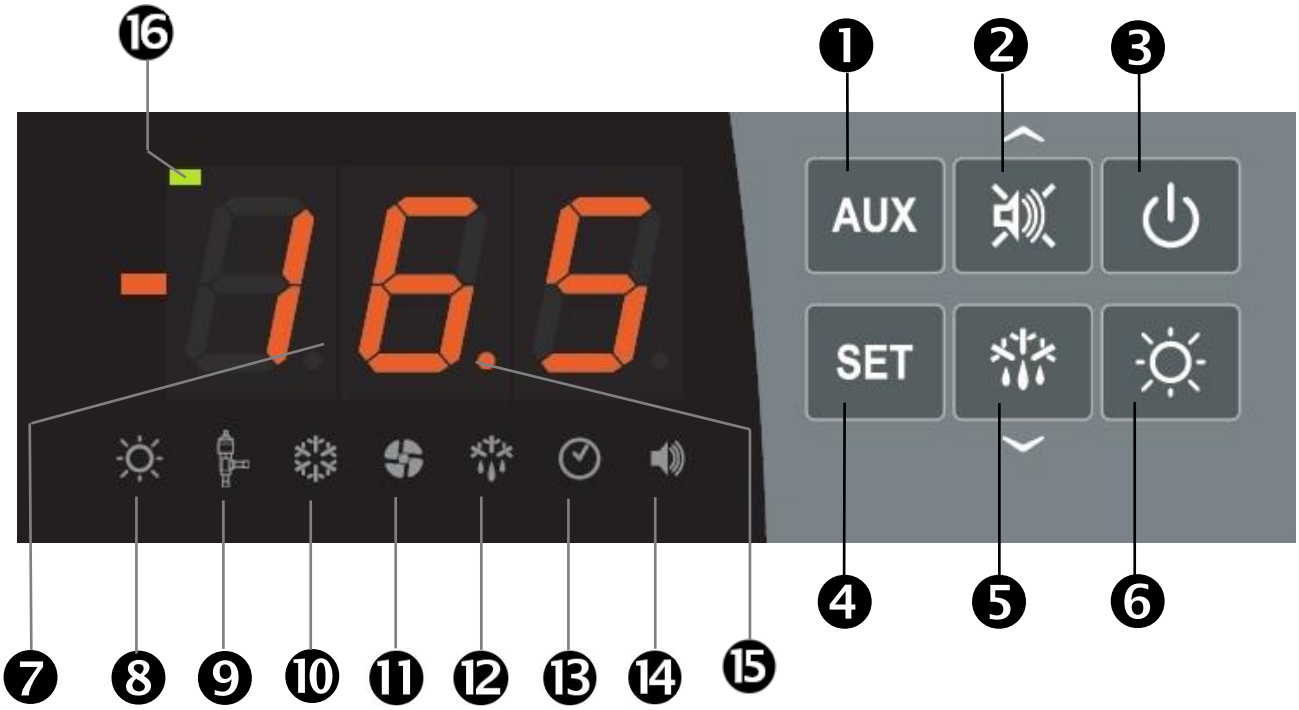
Each new release of Pego product manuals replaces all previous releases.

For anything not expressly indicated, the legal provisions in force and in particular art. 1512 of the Italian Civil Code apply to the warranty.

For any dispute, the jurisdiction of the Court of Rovigo shall be deemed elected and recognised by the parties.

CHAPTER 3: DATA PROGRAMMING

3.1 CONTROL PANEL



3.2 FRONT KEYBOARD

1 

AUXILIARY RELAY COMMAND/SAVE PARAMETERS to USB
Manually controls the relay if parameter AU1/AU2=2.
If pressed for 3 seconds it accesses the parameter export/import menu via USB.

2 

UP KEY / MUTE BUZZER ALARM
Increases values / Scrolls up parameters.
Mutes the audible alarm if present / Acquires an alarm (if the alarm has returned and the bell is lighted, pressing this key turns off the bell as the alarm is acquired. If pressed for 3 seconds together with the standby button, it allows access to the valve adjustment menu (EEV parameters, level 3).

3 

STAND-BY
Pressed for more than 1 second toggles the standby state to the normal operating state and vice-versa. Upon switching, a confirmation BEEP is generated.
In the standby state, the system stops and the display alternates the OFF word with the temperature (if programmed, the alternate OFF word is not displayed)

4 

AMBIENT TEMPERATURE SETTING
Displays the set-point. Allows you to set the set-point if pressed in combination with the Down key or the UP key. Resets the audible alarm if present. If pressed for 3 seconds together with the standby button, allows access to the valve configuration menu (STEPPER parameters, level 4).

❺ 

DOWN / DEFROST
Pressed for more than 3 seconds activates manual defrosting (if the activation conditions are met).
Pressed for more than 3 seconds during defrosting, it ends the present defrosting.

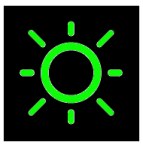
❻ 

COLD ROOM LIGHT

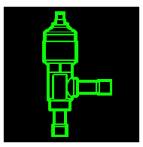
LED DISPLAY 3.3

❼ 

VALUES OF AMBIENT TEMPERATURE / PARAMETERS

❽ 

DOOR SWITCH/COLD ROOM LIGHT ICON
Led OFF = Door switch not active or not used and cold room light OFF
Led ON = Cold room light ON
Flashing LED = Active Door switch and cold room light ON

❾ 

EEV STEPPER OUTPUT STATUS ICON EEV Stepper output status (if enabled)
Led OFF = Motorised valve closed
Led ON = Motorised valve open

❿ 

COLD CALL/COMPRESSOR RUNNING ICON
Led OFF = Cold call OFF
Led ON = Cold call ON
Flashing LED = Cold call ON but waiting for waiting time C1

⓫ 

FANS CALL ICON
Led OFF = Fans call OFF
Led ON = Fans call ON

⓬ 

DEFROST CALL ICON
Led OFF = Defrost call OFF
Led ON = Defrost call ON
Flashing LED = Dripping in progress after defrosting (see parameter d7)

⓭ 

REAL-TIME CLOCK ICON
Led OFF = Real-time defrosting clock disabled
Led ON = Real-time defrosting clock enabled

⓮ 

ALARM PRESENCE ICON
Led OFF = No alarm present
Led ON = Alarm activated and then returned
Flashing LED = Alarm present

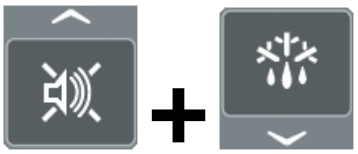
⓯ 

DECIMAL POINT (flashing in night mode)

⓰ 

AUXILIARY (AUX relay call signal if AU1/AU2=+/-2 or +/-3)

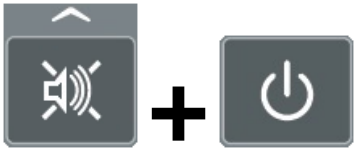
3.4 KEY COMBINATIONS



1ST-LEVEL PROGRAMMING
If pressed simultaneously for more than 3 seconds, they allow access to the first level programming menu.

LEAVING THE PROGRAMMING
If pressed simultaneously for more than 3 seconds within any programming menu.

2ND-LEVEL PROGRAMMING
If pressed simultaneously for more than 3 seconds, they allow access to the second level programming menu.
The entry in this menu activates the stand-by.



3RD-LEVEL PROGRAMMING
(EEV parameters)
If pressed simultaneously for more than 3 seconds, they allow access to the third level programming menu.
The entry in this menu activates the stand-by.

4TH LEVEL PROGRAMMING
(stepper valve parameters)
If pressed simultaneously for more than 3 seconds, they allow access to the fourth level programming menu. The entry in this menu activates the stand-by.

QUICK VIEW MENU
(READ-ONLY)
If pressed simultaneously for more than 3 seconds, they allow access to the quick display menu.

Within this menu, the up and down arrows allow you to scroll through the various parameters.
Pressing the Set key alternates the display of the parameter with its value.
With the parameter value displayed, pressing the up or down arrow exits the value display and returns to viewing the parameter.
This menu is exited automatically after 2 minutes of keyboard inactivity or by pressing.

3.5 SETTING AND SET-POINT DISPLAY

1. Press the "**Set**" key to display the current **SET-POINT** value (temperature).
2. Holding down the "**Set**" key and pressing one of the (▲) or (▼) keys changes the **SET-POINT** value.
3. Release the "**Set**" key to return to the cold room temperature display, the changes made will be automatically saved.

FIRST LEVEL PROGRAMMING (User level) 3.6

To access the first level configuration menu it's necessary to:

1. Press the **(▲)** and **(▼)** keys simultaneously and keep pressed for more than 3 seconds until the first programming parameter appears on the display.
2. Release the **(▲)** and **(▼)** keys.
3. Use the **(▲)** key or the **(▼)** key to select the parameter to be modified.
4. After selecting the desired parameter, it will be possible:
   - Display its setting by pressing the SET button.
   - Change its setting by holding down the SET button and pressing one of the **(▲)** or **(▼)** key.

Once the configuration values have been set, to exit the menu press the (▲) and (▼) keys simultaneously and hold them down for a few seconds until the cold room temperature value reappears.
The memorization of the changes made to the parameters will occur automatically when exiting the configuration menu.

FIRST LEVEL PARAMETER LIST (User Level) 3.7

PAR.	MEANING	VALUES	DEFAULT
r0	**Temperature difference** referred to the main SET-POINT. Defines the hysteresis of the temperature referred to the SET-POINT.	0.2 ÷ 10.0 °C	2.0 °C
d0	**Defrost interval** (hours). With d0=0 and dFr=0 defrosts are excluded.	0 ÷ 24 hours	4 hours
d2	**Defrosting end point:** defrosting is not performed if the temperature read by the defrosting probe is greater than the value d2 (in case of a faulty probe defrosting is performed on time).	-35 ÷ 45 °C	15°C
d3	**Maximum defrost duration** (minutes)	1 ÷ 240 min	25 min
d7	**Dripping duration** (minutes): at the end of defrosting, the compressor and fans remain stationary for the set time d7, the defrosting led on the front of the panel flashes.	0 ÷ 10 min	0 min
F5	**Fan pause** after defrosting (minutes). Allows the fans to remain stationary for a time F5 after dripping. This time is counted from the end of the dripping. If the dripping is not set, at the end of defrosting the fans pause immediately.	0 ÷ 10 min	0 min
A1	**Minimum temperature alarm:** absolute temperature referring to the ambient probe under which, once the delay time Ald has elapsed, the LOW temperature alarm is activated, which consists of activating the Buzzer (if present), of the **EL** word that alternates with the temperature on the display, and the flashing of the alarm presence icon. When the alarm has returned, the "alarm presence" icon remains steady on to indicate the intervention until the UP key is pressed.	-45.0 ÷ (A2-1) °C	-45.0°C
A2	**Maximum temperature alarm:** absolute temperature referring to the ambient probe above which, once the delay time Ald has elapsed, the HIGH temperature alarm is activated, which consists of activating the Buzzer (if present), of the **EH** word that alternates with the temperature on the display, and the flashing of the alarm presence icon. When the alarm has returned, the "alarm presence" icon remains steady on to indicate the intervention until the UP key is pressed.	(A1+1) ÷ +99.0 °C	+99.0°C
dFr	**Enabling of real-time defrosting of evaporators** With d0=0 and dFr=1 it is possible to set up to 6 real-time defrosts over a day through the dF1…dF6 parameters.	0 = disabled 1 = enabled	0
dF1… dF6	**Evaporator defrosting time programming:** you can set up to 6 defrosting times. The time is in the form **HH.M** where HH represents the hour and M the tens of minutes (e.g. 0=0 min; 1=10 min, etc). The flashing dot (.) indicates that a time is displayed and not a temperature.	00.0 ÷ 23.5	--
tdS	**Start of day phase**	00.0 ÷ 23.5	6.0
tdE	**End of day phase**	00.0 ÷ 23.5	22.0

3.8 SECOND LEVEL PROGRAMMING (Installer level)

To access the second programming level you must:

1. Press and hold the UP (▲), DOWN (▼), and cold room light keys for more than 3 seconds. When the first programming parameter appears, the system automatically switches to standby.
2. Select with the (▲) key or the (▼) key the parameter to be modified. After selecting the desired parameter, you will be able to:
   - Display the setting by pressing the SET key.
   - Change the setting by holding down the SET key and pressing one of the (▲) or (▼) keys.
3. Once the configuration values have been set, to leave the menu, press and hold the (▲) and (▼) keys simultaneously for a few seconds until the cold room temperature value reappears. When leaving the menu an audible signal will be emitted if the BUZZER is present.

The memorization of the changes made to the parameters will occur automatically when exiting the configuration menu.
Press the STAND-BY button to enable electronic control.

3.9 SECOND LEVEL PARAMETER LIST (Installer level)

PAR.	MEANING	VALUES	DEFAULT
F3	**Evaporator fans operation**	0 = Fans running continuously 1 = Fans operating only during cold call 2 = Fans DISABLED	1
F4	**Fans pause during defrosting**	0 = Fans operating during defrosting 1 = Fans not working during defrosting	1
F6	**Evaporator fans activation for air recirculation.** The fans are activated for a time defined by F7 if they have not started for the F6 time. If the activation time coincides with the defrosting phase, the defrosting end is still awaited.	0 ÷ 240 min 0 = function not activated	0 min
F7	**Duration of the evaporator fans activation for air circulation.** Fan operating time for F6.	0 ÷ 240 sec	10 sec
dE	**Evaporator probe present.** Excluding the evaporator probe, defrosting occurs cyclically with period d0 and ends with the end of the active defrost input or due to expiration of time d3.	0 = evaporator probe present 1 = evaporator probe absent	0
d1	**Defrosting type**: resistance or with thermostat resistance.	2 = resistance, thermostat 1 = (do not use. See Chap. 3.24) 0 = resistance	0
dPo	**Defrost at start-up**	0 = disabled 1 = defrost at start-up (if possible)	0
dSE	**Intelligent defrosting**	0 = disabled 1 = enabled	0
dSt	**Intelligent defrost set point (if dSE=1):** the time count between defrosts is increased only if the cold call is active and the evaporator temperature is less than dSt.	-30 ÷ 30 °C	1 °C

PAR.	MEANING	VALUES	DEFAULT
dFd	**Display view when defrosting**	0 = current ambient temperature 1 = ambient temperature at the beginning of defrosting 2 = "DEF"	1
Ad	**Network address** for connection to the TeleNET or Modbus supervisory system.	0 ÷ 31 (with SEr=0) 1 ÷ 247 (with SEr=1)	0
SEr	**Communication protocol to RS-485**	0 = TeleNET Protocol 1 = Modbus-RTU protocol	0
Bdr	**Modbus baud rate**	2 = 1200 baud 4 = 4800 baud 6 = 14400 baud 3 = 2400 baud 5 = 9600 baud 7 = 19200 baud 8 = 38400 baud	5
Prt	**Parity bit Modbus**	0 = no parity 1 = even parity (even) 2 = odd parity (odd)	0
Ald	**Signal delay time and display of minimum or maximum temperature alarm.**	0 ÷ 240 min	120 min
AtE	**Temperature alarm enabling**	0 = always enabled 1 = disabled in case of standby 2 = disabled if Door switch active 3 = disabled if standby or Door switch active	0
C1	Minimum time between shut down and subsequent **cold call activation**. Set C1 >= 1 to allow the stepper valve to reset properly on startup.	0 ÷ 15 min	1 min
CAL	**Ambient probe value correction**	-10.0 ÷ +10.0 °C	0.0 °C
CE1	**Operating time ON cold call, in case of faulty ambient probe** (emergency operation). With CE1=0 the emergency operation in the presence of error E0 remains disabled, the cold call remains off and defrosting is inhibited to preserve the residual cold.	0 ÷ 240 minutes 0 = disabled	0 min
CE2	**Operating time OFF cold call, in case of faulty ambient probe.**	5 ÷ 240 minutes	5 min
doC	**Cold call warning time for Door switch:** when opening the Door switch the evaporator fans turn off and the cold call will remain active for the **doC** time and then turn off.	0 ÷ 5 minutes	0 min
tdo	**Cold call reactivation time after opening the door:** when the door switch is opened and after the time tdo has elapsed, the normal operation of the control is restored by signalling an "open door" alarm (**Ed**). If the door switch is closed and the light remains on for a time longer than tdo, the cold room light alarm (**E9**) is signalled. With tdo=0 the parameter is disabled.	0 ÷ 240 minutes 0 = disabled	0 min
Fst	**FAN blocking TEMPERATURE.** The fans will remain stationary if the temperature value read by the **evaporator** probe is higher than the value of this parameter. The blocking is deactivated with the evaporator probe disabled or in error.	-45 ÷ +99°C	+99°C
Fd	**Differential for Fst**	1 ÷ +10°C	2°C
LSE	**Minimum allowable set-point value**	-45 ÷ HSE-1°C	-45°C
HSE	**Maximum setting value of the set-point**	LSE+1 ÷ +99°C	+99°C

PAR.	MEANING	VALUES	DEFAULT
dnE	**Day/night enabling (energy saving)** During night operation the decimal point flashes.	0 = disabled 1 = enabled	0
nSC	**SET correction factor during night operation** (energy saving, with In1 or In2 = 8 or -8)**.** During night operation the adjustment Set is: Adjustment Set = Set + nSc In night mode the decimal point flashes.	-20.0 ÷ +20.0 °C	0.0 °C
StA	**Auxiliary relay temperature setting**	-45 ÷ +99°C	0
in1	**INP-1 digital input setting**	17 = tPF % fixed opening (N.O.) 16 = Compressor protection, display only (N.O., EcA) 15 = Condenser fan protection, display only (N.O., EFc) 14 = Evaporator fan protection, display only (N.O., EFE) 13 = Oil pressure switch protection (N.O., EcO) 12 = Minimum pressure switch protection (N.O., EcL) 11 = Maximum pressure switch protection (N.O., EcH) 10 = Pressure switch protection (N.O., EcP) 9 = Compressor thermal protection (N.O., Ect) 8 = Night entry (energy saving) (N.O.) 7 = Remote defrost stop (N.O., active on the ascent front) 6 = Start defrosting remotely (N.O., active on the ascent front) 5 = Remote stand-by (N.O.) To indicate the remote standby it is displayed on the OFF display 4 = Pump-down pressure switch (N.O.) 3 = Man in cold room alarm (N.O.) 2 = Compressor protection (N.O.) 1 = Door switch (N.O.) 0 = disabled -1 = Door switch (N.C.) -2 = Compressor protection (N.C.) -3 = Man in cold room alarm (N.C.) -4 = Pump-down pressure switch (N.C.) -5 = Remote stand-by (N.C.) To indicate the remote standby it is displayed on the OFF display -6 = Start defrosting remotely (N.C., active on the descent front) -7 = Stop defrosting remotely (N.C., active on the descent front) -8 = Night entry (energy saving) (N.C.) -9 = Compressor thermal protection (N.C., Ect) -10 = Pressure switch protection (N.C., EcP) -11 = Maximum pressure switch protection (N.C., EcH) -12 = Minimum pressure switch protection (N.C., EcL) -13 = Oil pressure switch protection (N.C., EcO) -14 = Evaporator fan protection, display only (N.C., EFE) -15 = Condenser fan protection, display only (N.C., EFc) -16 = Compressor protection, display only (N.C., EcA) -17 = tPF % fixed opening (N.C.)	1
In2	**INP-2 digital input setting**	- Same value legend as In1 -	2
In3	**INP-3 digital input setting**	- Same value legend as In1 -	3
In4	**INP-4 digital input setting**	- Same value legend as In1 -	4
bEE	**Buzzer enabling**	0 = disabled 1 = enabled	1

PAR.	MEANING	VALUES	DEFAULT
P1	**Password: type of protection** (active when PA is other than 0)	0 = displays only the set-point and allows tacit alarms. 1 = displays the set-point, allows tacit alarms, + defrost + light + aux key + access to the variable display only menu. 2 = blocks access to 1, 2, 3 and 4 level programming (all other functions are allowed). 3 = blocks access to 2, 3 and 4 level programming (all other functions are allowed).	5
PA	**Password** (see P1 for type of protection)	0...999 0 = function disabled	0
AU1	**Setting of Auxiliary Relay 1 /Alarm** (output with voltage-free contacts)	-7 (NO) = DO5 relay energised by the solenoid valve control. -6 (NC) = Relay de-energised in standby. -5 (NC) = Contact for sump resistance command (AUX relay closed if compressor output not active). This output remains active even when QE is in STANDBY mode. -4 (NC) = Pump down function (see chap. 3.26). -3 (NC) = Automatic auxiliary relay managed by temperature set StA with 2°C difference. -2 (NC) = Manual auxiliary relay commanded by the AUX key. -1 (NC) = Alarm relay. 0 = Relay off. 1 (NO) = Alarm relay. 2 (NO) = Manual auxiliary relay commanded by the AUX key. 3 (NO) = Automatic auxiliary relay managed by temperature set StA with 2°C difference. 4 (NO) = Pump down function (see chap. 3.26). 5 (NO) = Voltage-free contacts motorised condensing unit call (AUX relay in parallel with compressor). 6 (NO) = Relay energised in standby. 7 (NO) = DO5 relay energised by the solenoid valve control.	-1
AU2	**Setting of Auxiliary Relay 2** (output with voltage-free contacts)	- Same value legend as AU1 -	7
Yr	**Year setting**	0...99	20
Mo	**Month setting**	1...12	1
dy	**Day setting**	1...31	1
Hr	**Time setting**	0...23	12
min	**Minutes setting**	0...59	0
dEF	**Default reset** Press all keys simultaneously for 30 seconds to reset to factory settings.	---	---
reL	**Software release**	read-only	read-only

3.10 THIRD LEVEL PROGRAMMING (EEV PARAMETERS)

To access third level programming, you must:

1. Simultaneously keep keys UP (▲) and STAND.BY pressed for more than 3 seconds. When the first programming parameter appears, the system automatically switches to stand-by.
2. Select the parameter to be modified with the (▲) or (▼) button. After selecting the desired parameter, it will be possible:
   - To display its setting by pressing the SET key.
   - To amend the setting by keeping the SET key pressed down and press one of the (▲) or (▼) keys.
3. Once the configuration values have been set, to exit the menu press the (▲) and (▼) keys simultaneously and hold them down for a few seconds until the cold room temperature value reappears.

The memorization of the changes made to the parameters will occur automatically when exiting the configuration menu.
Press the STAND-BY button to enable electronic control.

3.11 THIRD LEVEL PARAMETERS LIST (EEV PARAMETERS)

PAR.	MEANING	VALUES	DEFAULT
ESH	**Overheating set-point.**	0.1 ÷ +25.0 °C	6.0°C
EEV	**EEV electronic valve management** **Settings 1 through 5 load the default values into the ESH, ECt, EPb, EtI, Etd, ELS, MOP, EMO, LOP, ELO parameters.** **When leaving the programming:** if the selected EEV value is different from the one previously saved, the default values related to the selection are loaded. Pressing the Set key alone to see the current EEV value does not load the default values.	1 = EEV control (default 1) 2 = EEV control (default 2) 3 = EEV control (default 3) 4 = EEV control (default 4) 5 = EEV control (default 5) 6 = EEV control via Modbus (register 1536) (see table in Chap. 3.12)	1
ErE	**Type of refrigeration GAS used.** Setting this parameter is of fundamental importance for proper operation.	0 = R404A 1 = R134a 2 = R22 3 = R407A 4 = R407F 5 = R407H 6 = R410A 7 = R450A 8 = R507 9 = R513A 10=R744 (CO_2) 11 = R449A 12 = R290 ***** present from reL 5 13 = R32 14 = R448A 15 = R452A 16 = R600 17 = R600a 18 = R1270 19 = R1234ze(E) 20 = R23 21 = R717 (NH_3) 22 = R454C 23 = R515B ***** 24 = R471A ***** 25 = R455A ****** ****** present from reL 6	0
EPb	**Proportional band (gain) PID for overheating adjustment.**	1 ÷ 100%	15%
EtI	**Full time PID algorithm for overheating adjustment.**	0 ÷ 500 sec	100
Etd	**Derivative time PID algorithm for overheating adjustment.**	0.0 ÷ 10.0 sec	2.0 sec
EOE	**Percentage of EEV valve opening in case of probes S4 or S5 error.** This function allows you to continue the adjustment although not optimally in case of failure of adjustment probes.	0 ÷ 100%	50%
ESO	During the Start phase the EEV valve opens at the ESO percentage for the ESt time	0 ÷ 100%	85%
ESt	Duration of the Start phase. **At this stage the MOP, LOP, LSH alarms are disabled.**	0 ÷ Edt tens of seconds	6 tens of seconds
EdO	After Defrost the EEV valve opens at the EdO percentage for the Edt time	0 ÷ 100%	100%
Edt	Duration of EdO valve opening phase after Defrost. **At this stage the MOP, LOP, LSH alarms are disabled.**	Est ÷ 250 tens of seconds	24 tens of seconds

PAR.	MEANING	VALUES	DEFAULT
EHO	**Maximum opening percentage of the EEV valve:** in the case of an oversized valve, this variable allows limiting its maximum opening to the set percentage.	0 ÷ 100%	100%
EPt	**Type of temperature transducer (S4):** sets the type of transducer used to detect the temperature (S4)	0 = NTC 1 = PT1000 2 = PTC (-45/80 °C)	0
EP4	**Pressure (bar) corresponding to 4mA or 0V referred to the evaporation pressure probe (S5).**	-1.0 ÷ EP2 bar	0.0
EP2	**Pressure (bar) corresponding to 20mA or 5V referred to the evaporation pressure probe (S5).**	EP4 ÷ 90.0 bar	12.0
CA4	**Calibration of the Suction temperature transducer (S4)**	-10.0 ÷ +10.0 °C	0.0
CA5	**Calibration of the Evaporation pressure transducer (S5)**	-10.0 ÷ +10.0 Bar	0.0
LSH	**LSH threshold (Low overheating temperature)** Too low overheating values can cause liquid to return to the compressor or strong oscillations. Below the LSH value, the ELS protection intervenes, which increases the speed of the PID when closing the valve, to move to the setting of the set overheating.	0.0 ÷ Set SH °C	2.0 °C
ELS	**LSH protection** If enabled, when **tSH < LSH** the PID integration time is set based on the ELS selection from 1 to 7. Setting 1 generates the fastest shut down. Upon insertion of this protection, the SHd count for activating the LSH alarm begins. THE LSH PROTECTION TAKES PRECEDENCE OVER THE LOP PROTECTION. THE LSH PROTECTION IS NOT ACTIVATED DURING THE START PHASE (ESt TIME), AND DURING THE DEFROST OR POST-DEFROST PHASE (Edt TIME)	0 = LSH protection and related LSH alarm signal disabled 1 = 5% EtI 2 = 10% EtI 3 = 15% EtI 4 = 20% EtI 5 = 25% EtI 6 = 30% EtI 7 = 35% EtI 8 = 50% EtI 9 = 100% EtI (no correction and only the LSH alarm is activated)	2
SHd	**LSH alarm activation delay:** the LSH overheating alarm is signalled only after it has remained active for the time SHd. In case of LSH alarm, the valve closing is still instantaneous. The alarm is self-resetting and is cancelled when **tSH ≥ LSH** With an active alarm you have: - Flashing LSH word on the display - Buzzer	0 ÷ 240 tens of seconds	30
MOP	MOP threshold (Maximum saturated evaporation temperature referred to sensor **S5**). **Represents the maximum evaporation pressure, expressed in saturated degrees, above which the MOP (EMO Parameter) protection is activated. In case of MOP the control closes the valve gradually to limit the evaporation temperature and prevent the compressor from stopping due to thermal protection.**	(LOP+1) ÷ +99°C	+45°C
EMO	**MOP protection (active with tS5>MOP).** When the evaporation temperature (tS5) is above the MOP threshold, the control interrupts the overheating adjustment and the valve closes trying to limit the evaporation temperature (and therefore the pressure). The closing speed of the valve depends, in addition to the difference between the evaporation temperature and the MOP threshold, also on the EMO integral time parameter: the lower it is the lower will be the valve closing time. When this protection is inserted, the MOd count for activating the MOP alarm begins. THE MOP PROTECTION IS NOT ACTIVATED DURING THE START PHASE (ESt TIME), AND DURING THE DEFROST OR POST-DEFROST PHASE (Edt TIME)	0 = MOP protection disabled and also the related MOP alarm signal 0 ÷ 500 seconds In steps of 2 seconds	0

PAR.	MEANING	VALUES	DEFAULT
MOd	**MOP alarm activation delay:** the MOP alarm is signalled only after the MOP protection has remained active for the MOd time**.** The alarm is self-resetting when **"S5 Temp"≤MOP** With an active alarm you have: - Flashing MOP word on the display - Buzzer	0 ÷ 240 tens of seconds	60
LOP	**LOP threshold (minimum saturated evaporation temperature referred to sensor S5).** Represents the minimum evaporation pressure, expressed in saturated degrees, below which the LOP protection is activated. In case of LPO the control opens the valve to prevent the compressor from stopping due to low pressure (mechanical pressure switch).	-45°C ÷ (MOP-1)	-45°C
ELO	**LOP protection (active with tS5 < LOP)** When the evaporation temperature (tS5) is below the LOP threshold, the control stops the overheating adjustment and the valve opens. The opening speed of the valve depends, in addition to the difference between the evaporation temperature and the LOP threshold, also on the integral time parameter ELO: the lower it is the higher the valve opening speed will be. When this protection is activated, the LOd count starts to activate the LOP alarm. THE LSH PROTECTION TAKES PRECEDENCE OVER THE LOP PROTECTION. THE MOP PROTECTION IS NOT ACTIVATED DURING THE START PHASE (ESt TIME), AND DURING THE DEFROST OR POST-DEFROST PHASE (Edt TIME)	0 = LOP protection disabled and also the related LOP alarm signal 0 ÷ 500 seconds 2 second steps	0
LOd	**LOP alarm activation delay:** the LOP alarm is signalled only after it has remained active for the LOd time. The alarm is self-resetting when **"S5 Temp"**≥ LOP With an active alarm you have: - Flashing LOP word on the display - Buzzer	0 ÷ 240 tens of seconds	30
tPF	**Valve forced positioning.** At any time via digital input (if the control is not in standby mode) it is possible to force the valve to open at a predetermined value.	0 ÷ 100 %	50%

Note: All LSH, MOP, LOP alarm calculation times are reset when the adjustment is stopped OR DURING THE START PHASE (ESt TIME), AND DURING THE DEFROST OR POST-DEFROST PHASE (Edt TIME).

LOADING DEFAULT SETTINGS BASED ON THE EEV PARAMETER 3.12

	EEV = 1 PEGO DEFAULT	EEV = 2 (CELL control or TN REFRIGERATION BENCH with compressor on board)	EEV = 3 (CELL control or BT REFRIGERATION BENCH with compressor on board)	EEV = 4 (CELL control or TN CHANNELED REFRIGERATION BENCH)	EEV = 5 (CELL control or BT CHANNELED REFRIGERATION BENCH)
ESH	6 °C	6 °C	6 °C	11 °C	11 °C
EPb	15 %	15 %	15 %	15 %	15 %
EtI	100 sec	100 sec	100 sec	150 sec	150 sec
Etd	2 sec	2 sec	2 sec	5 sec	5 sec
LSH	2 °C	2 °C	2 °C	5 °C	5 °C
ELS	2	2	2	2	2
MOP	+45 °C	5 °C	-15 °C	+5 °C	-15 °C
EMO	0	5	5	5	5
LOP	-45 °C	-25 °C	-45 °C	0	0
ELO	0	15	15	0	0

3.13 FOURTH LEVEL PROGRAMMING (STEPPER VALVE PARAMETERS)

To access the fourth programming level press and hold the SET and STANDBY keys for more than 3 seconds. When the first programming variable appears, the system automatically switches to standby.

1. Select with the (▲) key or the (▼) key the variable to be modified. After selecting the desired variable, you can view its setting by pressing the SET key.
2. Change the setting by holding down the SET key and pressing one of the (▲) or (▼) keys.
3. Once the configuration values have been set, to leave the menu, press simultaneously and hold the (▲) and (▼) keys for a few seconds until the principal visualisation reappears.

Press the STAND-BY key to enable the electronic control.
Changes made to the variables will be automatically saved when leaving the configuration menu. By entering this menu the adjustment is interrupted and the valve is closed.
Possible electrical damage! => make changes in this programming level with the valve disconnected. When leaving the valve is completely closed. At the first start it is necessary to set the type of valve (parameter "tEU"). Parameters for coded valves cannot be changed (tEU >=1).

3.14 FOURTH LEVEL PARAMETER LIST (STEPPER VALVE PARAMETERS)

PAR.	MEANING	VALUES	DEFAULT
tEU	**Type of motorised valve connected** **With tEU = -2 all the relative controls and signals are disabled. The relative errors of probes S4 (Suction temperature) and S5 (Evaporation pressure) are also disabled and excluded.** Settings 1 through 21 load the default values into the LSP, HSP, CSP, SPD, ICF, ICM, SYN, TYP variables. However, it is possible to change the default values set automatically by selecting **tEU** other than zero. Pressing the Set key alone to see the current **tEU** value does not load the default values.	-2 = Disables valve control (keeps cold room control only) -1 = Valve not configured 0 = Custom (set EEV parameters) 1 = Carel ExV 2 = Danfoss ETS 25-50 3 = Danfoss ETS 100 4 = Danfoss ETS 250/400 5 = ETS 6 Danfoss 6 = Alco EX4 7 = Alco EX5 8 = Alco EX6 9 = Alco EX7 10 = Alco EX8 500 11 = Sporlan SEI 0.5-11 12 = Sporlan SER 1.5-20 13 = Sporlan SER(I) G, J, K 14 = Sporlan SEI 30 15 = Sporlan SEI 50 16 = Sporlan SEH 100 17 = Sporlan SEH 175 18 = Castel 261 / 271 Eliwell SXVB261 19 = Castel 262 / 263 Eliwell SXVB262 / SXVB263 20 = Castel 272 / 273 21 = Castel 264 / 274 Eliwell SXVB264	-1
LSP	**Minimum number of steps:** it allows you to select the minimum number of valve steps at which the valve is to be considered completely closed. You must read the valve manufacturer's manual to set this parameter correctly. It is the minimum number of steps to remain within the operating range recommended by the manufacturer.	0 ÷ HSP-1 (10*steps)	---
HSP	**Maximum number of steps:** it allows you to select the maximum number of steps that can be performed by the valve. At this number of steps, the valve should be fully open. You must read the valve manufacturer's manual to set this parameter correctly. It is the maximum number of steps to remain within the operating range recommended by the manufacturer.	LSP+1 ÷ CSP (10*steps)	---

PAR.	MEANING	VALUES	DEFAULT
CSP	**Closing steps.** Number of additional steps to achieve the complete closing of the valve, it is used to realign the valve to the physical position of fully closed. Driver and valve are then ready for adjustment and both aligned to 0 (zero). Then the forced closing is performed when the controller is switched on and also periodically, to realign the valve position to the position calculated by the driver.	HSP ÷ 999 (10*steps)	---
Spd	**Rated speed.** Maximum motor movement speed without loss of steps and therefore without loss of precision. It is necessary to remain below the maximum speed available for the valve.	0 ÷ 999 steps/sec	---
ICF	**Rated current per phase (bipolar valves)**: is the current per phase used by the valve during adjustment. **NB:** Consult the manufacturer's manual.	BWI+1 ÷ 800 mA	---
BWI	**Stopping current (bipolar valves)**: is the current per phase when the valve has been stopped for at least 5 minutes.	0 ÷ ICF-1 mA	---
dut	**Valve duty cycle.** Fraction of time during which the valve is checked.	10 ÷ 100 %	100
SYN	**Synchronization active** Every time the valve has to be fully opened or closed a number of extra steps are performed to arrive at the complete opening/closing of the valve	0 = deactivated 1 = activated in opening 2 = activated in closing 3 = activated in opening and closing	0
CTr	**Adjustment type:** sets the type of adjustment of the stepper motor current. A microstep or half-step control ensures a smoother movement (there is current modulation) but this causes torque reduction. With the full-step control the windings are always adjusted to the maximum current but the movement is quicker.	0 = Microstep 1 = Full – step 2 = Half - step	0

Loading default settings based on the tEU variable:

tEU	LSP (x10) step	HSP (x10) step	CSP (x10) step	Spd (step/s)	ICF (mA)	ICM (mA)	dut	SYN	Ctr
-1= Valve not configured	---	---	---	---	---	---	---	---	---
0 = Custom	5	48	50	50	450	100	100	2	0
1 = Carel ExV	5	48	50	50	450	100	100	2	0
2 = Danfoss ETS 25-50	7	262	262	300	100	100	100	2	0
3 = Danfoss ETS 100	10	353	353	300	100	100	100	2	0
4 = Danfoss ETS 250/400	11	381	381	300	100	100	100	2	0
5 = NOT USED	-	-	-	-	-	-	100	-	0
6 = Alco EX4	10	75	75	500	500	100	100	2	0
7 = Alco EX5	10	75	75	500	500	100	100	2	0
8 = Alco EX6	10	75	75	500	500	100	100	2	0
9 = Alco EX7	10	160	160	500	750	250	100	2	1
10 = Alco EX8 500	10	260	260	500	800	500	100	2	1
11 = Sporlan SEI 0.5-11	10	160	360	200	200	50	100	2	0
12 = Sporlan SER 1.5-20	10	160	360	200	200	50	100	2	0
13 = Sporlan SER(I) G, J, K	10	250	350	200	200	50	100	2	0
14 = Sporlan SEI 30	20	319	360	200	200	50	100	2	0
15 = Sporlan SEI 50	40	639	750	200	200	50	100	2	0
16 = Sporlan SEH 100	40	639	750	200	200	50	100	2	0
17 = Sporlan SEH 175	40	639	750	200	200	50	100	2	0
18 = Castel 261 / 271 Eliwell SXVB261	0	42	51	35	200	50	100	2	0
19 = Castel 262 / 263 Eliwell SXVB262 / SXVB263	0	20	25	20	200	50	100	2	0
20 = Castel 272 / 273	0	42	51	35	300	50	100	2	0
21 = Castel 264 / 274 Eliwell SXVB264	0	99	113	70	560	50	100	2	0

REFRIGERATION FLUID TEMPERATURE TABLE 3.15

The following table shows the evaporation temperature limits (tS5, see chap. 3.17) according to the type of refrigeration fluid set (ErE parameter).

Parameter ErE	Encoding	Temperature Range	ErE parameter	Encoding	Temperature Range
0	R404A	-50 ÷ 70 °C	13	R32	-50 ÷ 70 °C
1	R134a	-50 ÷ 70 °C	14	R448A	-50 ÷ 70 °C
2	R22	-50 ÷ 70 °C	15	R452A	-50 ÷ 70 °C
3	R407A	-50 ÷ 70 °C	16	R600	-20 ÷ 70 °C
4	R407F	-50 ÷ 70 °C	17	R600a	-30 ÷ 70 °C
5	R407H	-50 ÷ 70 °C	18	R1270	-50 ÷ 70 °C
6	R410A	-50 ÷ 70 °C	19	R1234ze(E)	-30 ÷ 70 °C
7	R450A	-40 ÷ 70 °C	20	R23	-50 ÷ 25 °C
8	R507	-50 ÷ 70 °C	21	R717 (NH_3)	-50 ÷ 70 °C
9	R513A	-45 ÷ 70 °C	22	R454C	-50 ÷ 70 °C
10	R744 (CO_2)	-50 ÷ 40 °C	23	R515B	-40 ÷ 70 °C
11	R449A	-50 ÷ 70 °C	24	R471A	-50 ÷ 60 °C
12	R290	-50 ÷ 70 °C	25	R455A	-50 ÷ 70 °C

3.16 QUICK VIEW MENU (READ-ONLY)

During the start-up of the system it may be useful to simply check the reading of the various probes or some values to verify or optimize the process.
To access the quick viewing menu, press and hold the DOWN (▼) and STAND-BY buttons for more than 3 seconds. Within this menu, the up or down arrows allow you to scroll through the different parameters.
Pressing the Set key alternates the display of the parameter with its value (to facilitate reading, pressing the SET key switches between parameter and value: it is not necessary to keep it pressed). With the parameter value displayed, pressing the up or down arrow keys still leads to the display of the parameter following or preceding the current one (it therefore automatically exits the value display). Exiting this menu occurs automatically after 2 minutes of console inactivity or by simultaneously pressing the up arrow (▲) + down arrow (▼) keys for a few seconds.

3.17 QUICK VIEW MENU PARAMETER LIST (READ ONLY)

VARIABLES	MEANING	VALUES
tS0	**Probe display (S0) Ambient temperature**	(read-only) °C
tE	**Probe display (S1) Defrost temperature**	(read-only) °C
tS4	**Probe display (S4) Suction temperature**	(read-only) °C
tS5	**Probe display (S5) Evaporation temperature**	(read-only) °C
PS5	**Probe display (S5) Evaporation pressure**	(read-only) Bar
tSH	**Overheating temperature display tSH = tS4 – tS5**	(read-only) °C
oEV	**EEV Valve opening percentage**	(read-only) %
PAS	**EEV valve opening position**	(read-only) steps/10

PARAMETER DOWNLOAD/UPLOAD 3.18

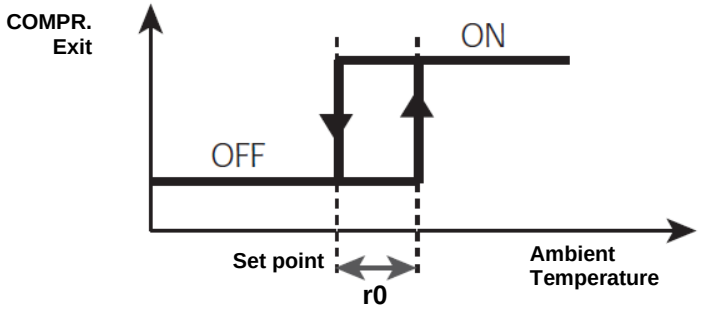
It's possible to download/upload the parameters set in the EXPERT STEPPER control via the USB port on the electronic board. To carry out this operation you need:

1. Open the electrical panel and insert the USB memory into the slot on the electronic board.
2. Press the **AUX** key for 5 seconds and select the item "**PrE**" to download the parameters, "**Pri**" to upload the parameters from the USB (in this case there must be a file previously downloaded on the USB memory).
3. Press the **SET** key to confirm. The controller automatically download/upload the set parameters and device status.

Note: the generated file (name: **STEPP200.PAR**) can be uploaded onto other EXPERT STEPPER panels to obtain an identically configured instrument.

THERMOSTAT OPERATING MODE 3.19

COLD CALL MODE
The COMPR. output is activated when the temperature measured by the Ambient probe reaches or exceeds the SET-POINT value +r0 and remains active until the temperature drops below the SET-POINT.
The COMPR. output is combined with the lighting of the cold call icon.



PASSWORD FUNCTION 3.20

The password function is activated by setting a value other than 0 for the PA parameter. See parameter P1 for different security levels.
Protection is automatically enabled after about 2 minutes of inactivity on the keyboard.
The figure 000 appears on the display. Use the up/down keys to change the number and the SET key to confirm it.
The password entry mask 000 disappears if you do not act on the keyboard within 2 minutes.
If you forget your password, use the universal number 100.

EMERGENCY OPERATION IN CASE OF ERROR E0 (AMBIENT PROBE FAULT) 3.21

This safety mode ensures the operation of the compressor even in the event of a faulty environment probe (error E0).
With probe error E0 and CE1 other than 0, the compressor operates in work pause mode, with compressor ON for time CE1 and OFF for time CE2.
With CE1>0, in case of error E0, defrosts are managed as in the normal operating mode.
With CE1=0, the emergency operation remains disabled in the presence of error E0: the compressor remains off and defrosting is inhibited to preserve the residual cold,
Eliminate the cause of error E0 as soon as possible and reactivate the normal function of the control for a correct temperature adjustment.

3.22 MANUAL DEFROST ACTIVATION

To activate defrosting, simply press the DOWN button for more than 3 seconds; in this way the resistance relay is activated. Defrost is not activated if the activation conditions are not met (defrost end temperature (d2) set lower than the temperature detected by the evaporator probe).
Defrost will end when the defrost end temperature (d2) is reached or due to maximum defrost duration (d3), or due to manual forced defrost stop (defrost end key or digital input).

3.23 MANUALLY FORCED DEFROST STOP IN PROGRESS

During a defrosting in progress, pressing the DOWN button for 3 seconds forces the end of defrosting.
The manual defrost end also cancels the dripping.

3.24 DEFROST WITH THERMOSTAT RESISTORS

Set parameter d1=2 to manage the defrost with resistors within a time limit. During defrosting the defrost relay is activated if the temperature read by the defrost probe is less than d2. The defrost phase lasts d3 minutes, regardless of the relay status. This allows a better defrosting of the evaporator with consequent energy savings.

3.25 HOT GAS DEFROSTING

WARNING: this function **is not available** in this type of electrical panel.

Do not set parameter d1=1.

3.26 AMBIENT TEMPERATURE DISPLAY AFTER DEFROSTING

After defrosting, the display continues to display for 1 minute the last ambient temperature value detected before defrosting begins.

3.27 PUMP DOWN FUNCTION

Setting parameter AU1 = 4 or -4 activates the compressor stop operation in pump down. The digital input configured as a pump-down input (In1 or In2 = 4 or -4) constitutes the working pressure switch input and directly manages the compressor output. The AUX relay becomes the evaporator solenoid call and is managed by the cold call of the thermostat which also turns on the EEV solenoid output.

INITIAL START-UP PROCEDURE 3.28

The fourth level valve parameters must be configured at the first start-up. The first start-up procedure is as follows:

1) **With the valve disconnected** (terminals 1A-1B-2A-2B free) turn on the 200SCH200STP board. The "CFG" alarm appears to indicate that the valve must be configured.
2) Press the SET and STANDBY keys for more than 3 seconds to enter the fourth programming level. Set the "tEU" parameter according to the type of valve connected, or configure the necessary parameters (see Chap. 3.13).
3) When the configuration values have been set, leave the menu by pressing the (▲) and (▼) keys simultaneously for a few seconds until the value of the main display reappears.
4) Turn off the 200SCH200STP board by turning off the power.
5) **Appropriately connect the electronic valve (see Appendix A2 and A4) with the control off**.
6) Turn on the 200SCH200STP board. When switched on, after an initialization phase ("ini" is displayed and the valve is completely closed) the control starts adjusting the cold room and the overheating temperature. Then set all the necessary parameters according to the type of application (ambient set-point, overheating set-point, etc.).

SOFTWARE UPDATE 3.29

It's possible to update the control software of the 200SCH200STP automatically, using the USB port on the electronic control board.
To update the software you need:

1. Download the latest version available from the website **www.pego.it**, check that the release is higher than the one already present in the controller (rEL parameter).
2. Open the electrical panel and insert the USB memory into the slot on the electronic board.
3. Press the key AUX for 5 seconds and select the "**Upd**" item.
4. Press the SET key SET to confirm. The electrical panel automatically downloads the set parameters and automatically proceeds with the software update.

The parameters are automatically restored to their values prior to the software update.

Note: never disconnect the USB memory and do not turn off the power to the panel until the software update is complete.

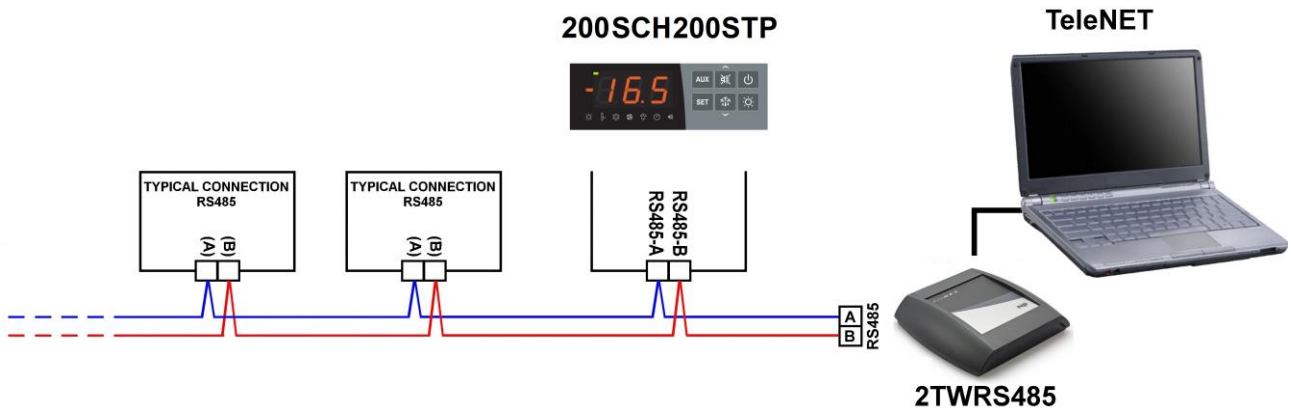
NEW SOFTWARE FEATURES 3.30

Rel. 5: Added refrigerants R515B and R471A.
Rel. 6: Added refrigerant R455A.

CHAPTER 4: OPTIONS

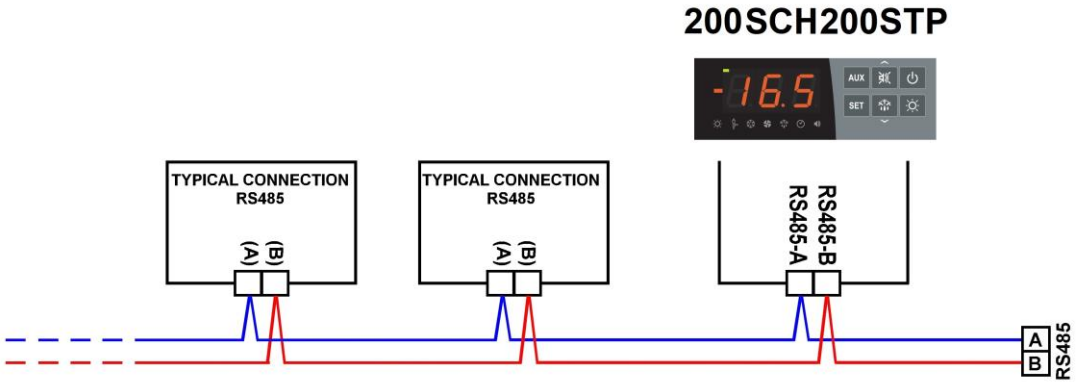
TELENET MONITORING/SUPERVISION SYSTEM 4.1

For **TeleNET** connections follow the scheme below. Refer to **TeleNET** user manual for instrument configuration.
IMPORTANT: During configuration, at entry “Module” to select the entry "ECP200EEV instrument“.



NETWORK CONFIGURATION WITH MODBUS-RTU PROTOCOL 4.2

For **RS485** connections with **Modbus-RTU** protocol follow the scheme below.
Refer to MODBUS-RTU_ECP200EEV user manual (available on our website) for MODBUS-RTU communication protocol specification.



CHAPTER 5: DIAGNOSTICS

5.1 DIAGNOSTICS

In the event of any anomalies, the **200SCH200STP** board alerts the operator through the alarm codes shown on the display and an acoustic signal emitted by a buzzer (if present).
The audible alarm can be silenced by pressing the UP button (the error code remains) and is reactivated by pressing the SET button.
If an alarm condition occurs, one of the following messages will appear on the display:

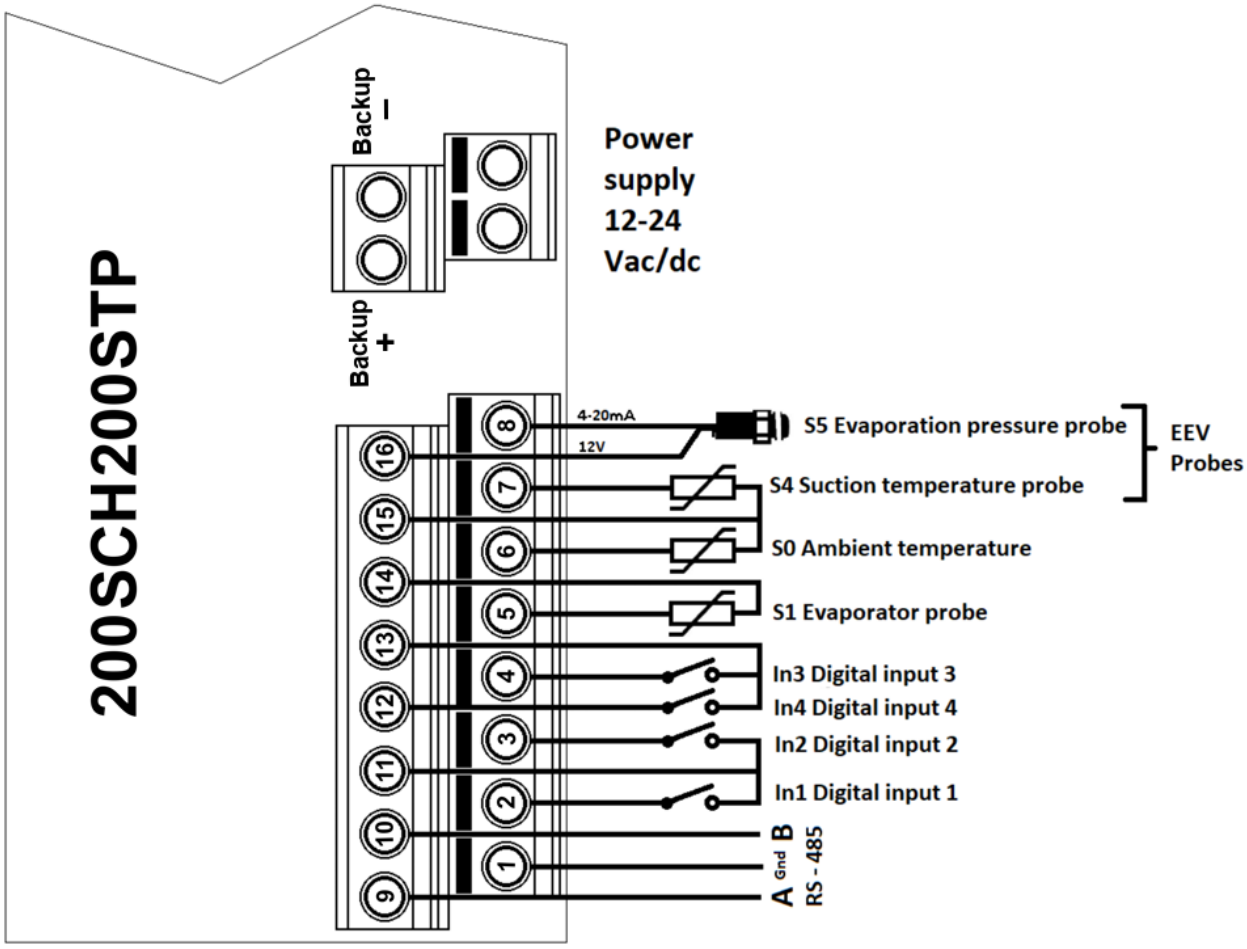
ALARM CODE	POSSIBLE CAUSE	OPERATION TO BE PERFORMED
E0i **E0E**	**EEPROM Alarm:** An error was detected in the EEPROM memory. The outputs are all deactivated except the alarm ones.	• Switch the equipment off and on again. • Reset to the default values.
E0	**Functional fault of the ambient probe (S0)**	• Check the ambient probe status. • If the problem persists, replace the probe.
E1	**Functional fault of the defrost probe (S1).** In this case, any defrost will have a duration equal to time d3.	• Check the status of the defrost probe. • If the problem persists, replace the probe.
E4	**Functional fault of the Suction temperature probe (S4)**	• Check the suction probe status.
E5	**Evaporation Pressure probe functional fault (S5)**	• Check the evaporation pressure probe status.
E6	**Low battery alarm**: the control will work for at least another 20 days, after which the clock setting will be lost if the power supply to the panel fails.	• Replace the clock battery (**CR2032**), located on the board on the front of the panel.
E8	**Person in cold room alarm**: the person in cold room alarm button has been pressed to signal a dangerous situation.	• Reset the person in cold room alarm button.
E9	**Cell light alarm**: when the light comes on with the key, the alarm E9 is activated after the time tdo. If it is silenced and the light is not switched off, when the time tdo expires again, the alarm will reappear.	• Turn off the light.
Ect	**Compressor thermal protection insertion** The outputs are all deactivated except the alarm one, if present.	• Check the compressor status. • Check the compressor absorption. • If the problem persists, contact technical support.
EcP	**Compressor pressure switch protection insertion:** the outputs are all deactivated except for the alarm one, if present.	• Check the compressor status. • Check the compressor protection pressure switch. • If the problem persists, contact technical support.
EcL	**Compressor low pressure protection insertion:** the outputs are all deactivated except the alarm one, if present.	• Check the compressor status. • Check the compressor protection pressure switch. • If the problem persists, contact technical support.
EcH	**Compressor high pressure protection insertion:** the outputs are all deactivated except the alarm one, if present.	• Check the compressor status. • Check the compressor protection pressure switch. • If the problem persists, contact technical support.

ALARM CODE	POSSIBLE CAUSE	OPERATION TO BE PERFORMED
EcO	**Compressor oil pressure switch protection insertion:** the outputs are all deactivated except for the alarm one, if present.	• Check the compressor status. • Check the compressor protection oil pressure switch. • If the problem persists, contact technical support.
Ec	**Compressor protection insertion** (e.g. thermal protection or max. pressure switch). The outputs are all deactivated except the alarm one, if present.	• Check the compressor status. • Check the compressor absorption. • If the problem persists, contact technical support.
Ed	**Door open alarm**: when the Door switch is opened and the time tdo has elapsed, the normal operation of the control is restored by signalling the door open alarm (Ed).	• Check that the door is closed. • Check the electrical connections of the Door switch. • If the problem persists, contact technical support.
EH	**Maximum ambient temperature alarm.** An ambient temperature higher than that set for the maximum temperature alarm has been reached (see variable A2).	• Check the compressor status. • The probe does not detect the temperature correctly or the compressor stop /run command does not work. • If the problem persists, contact technical support.
EL	**Minimum ambient temperature alarm.** The ambient probe has reached a temperature lower than that set for the minimum temperature alarm (see variable A1).	• Check the compressor status. • The probe does not detect the temperature correctly or the compressor stop /run command does not work. • If the problem persists, contact technical support.
EcA	**Compressor alarm** (display only)	• Check the compressor status.
EFc	**Condenser fan alarm** (display only)	• Check the status of the condenser fans.
EFE	**Evaporator fan alarm** (display only)	• Check the status of the evaporator fans.
LSH	**Low overheating temperature alarm**	• Check the status of the refrigeration system. • Change PID parameters. • If the problem persists, contact technical support.
MOP	**Maximum saturated evaporation temperature alarm referring to sensor S4**	• Check the status of the refrigeration system. • Change PID parameters. • If the problem persists, contact technical support.
LOP	**Minimum saturated evaporation temperature alarm referring to sensor S4**	• Check the status of the refrigeration system. • Change PID parameters. • If the problem persists, contact technical support.
VAL	**Valve Alarm** An overcurrent or valve overheating alarm has been detected. The valve management is disabled. When the alarm returns, the valve is re-initialized to the total closing position.	• Check valve configuration and connections. • Switch the equipment off and on again. • If the problem persists, contact technical support.
CFG	**Valve not configured.** At first start-up you are prompted to configure the type of valve connected.	• Configure the type of connected valve by setting the fourth level parameter "tEU".
Ini	**Initializing in progress (complete closing)**	• Wait for the initialization procedure to complete.

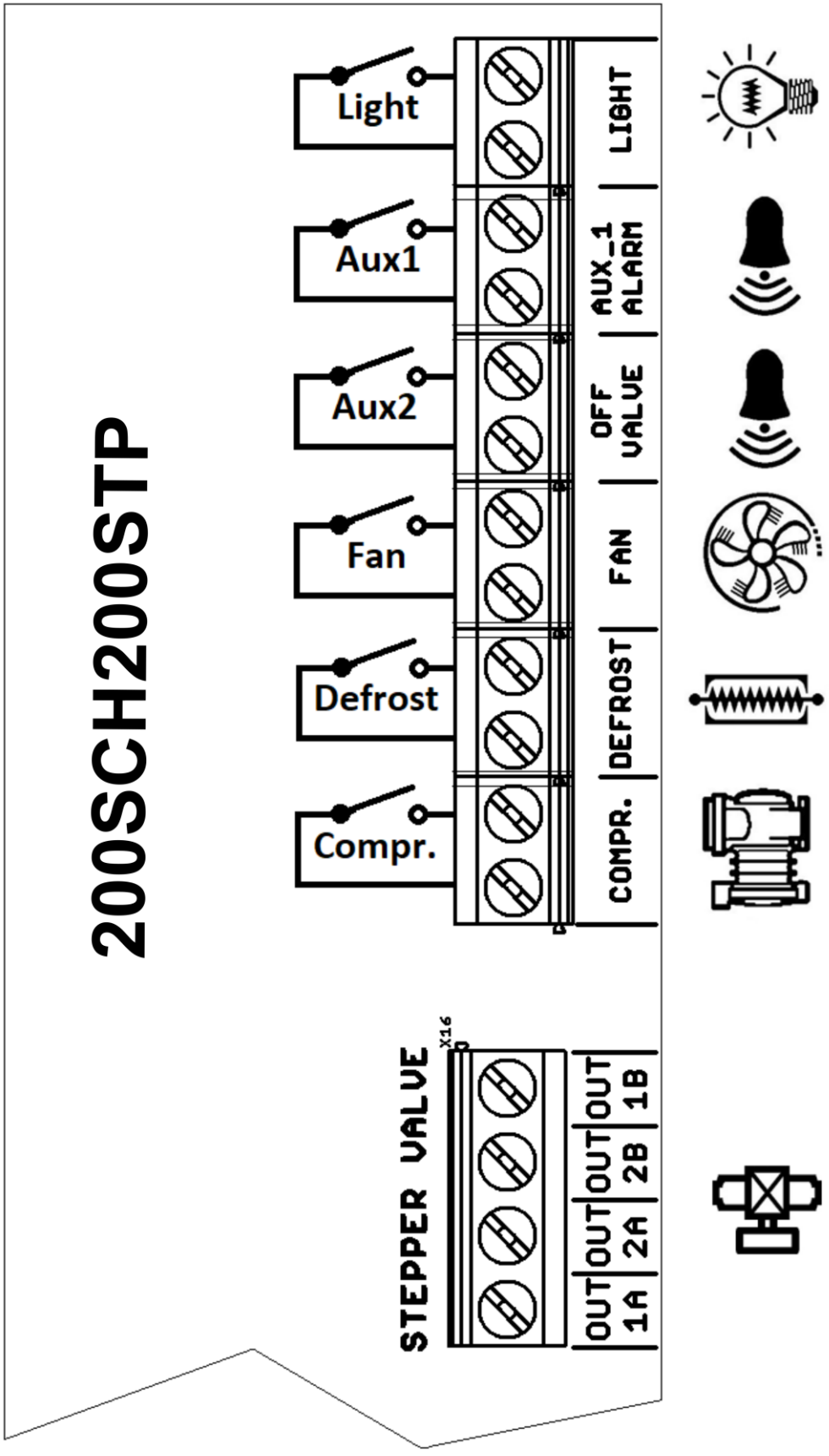
ATTACHMENTS

CONNECTION DIAGRAM A.1

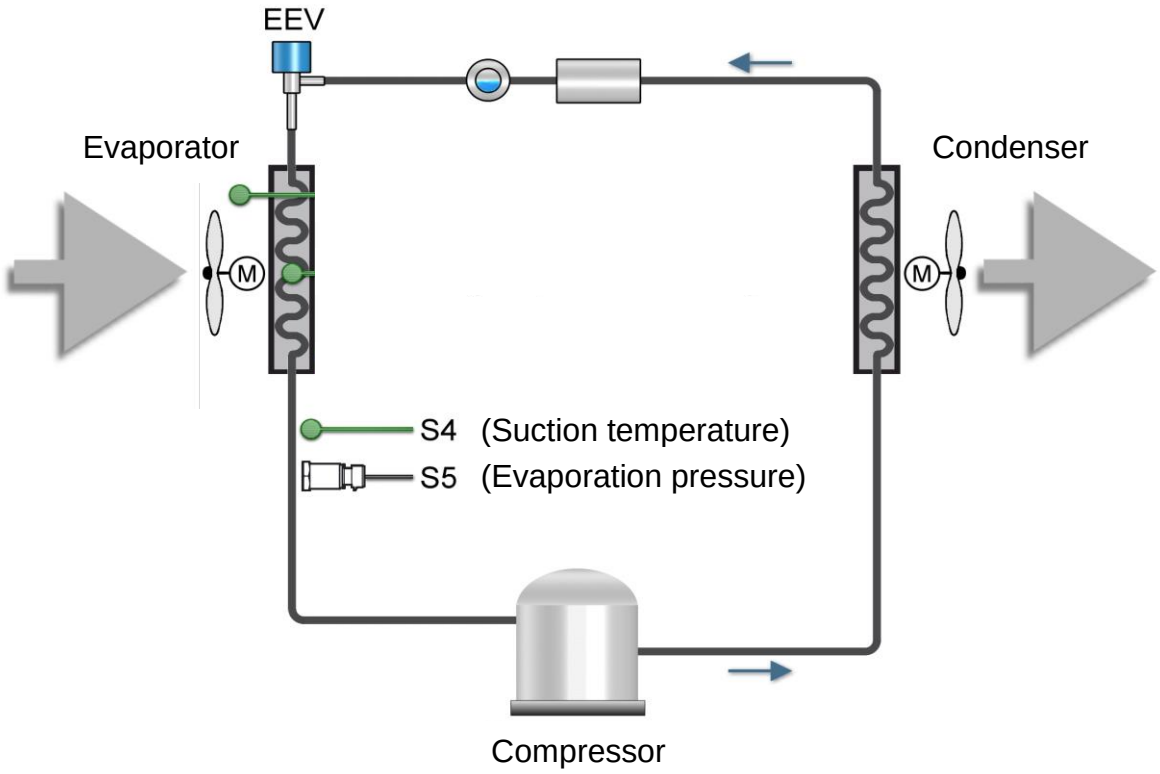
DIGITAL INPUTS	
2) Digital input 1 (Door switch)	4) Digital input 3 (Man in cold room alarm)
3) Digital input 2 (Compressor protection)	12) Digital input 4
11) GND (common digital inputs 1 and 2)	13) GND (common digital inputs 3 and 4)
ANALOGICAL INPUTS	
7) Analogical Input 1 (Overheating probe)	5) Analogical Input 3 (Defrost probe)
6) Analogical Input 2 (Ambient probe)	14) GND (common analogical input 3)
15) GND (common analogical inputs 1 and 2)	
PRESSURE PROBE INPUT	
8) Input 4-20mA (Pressure probe)	16) Power supply for probe 4-20 mA
RS-485	
9) RS-485 channel A	1) GND input RS-485
10) RS-485 channel B	



Output diagram:



A.2 POSITIONING AND DESCRIPTION OF PROBES



A.3 VALVE CONNECTION

Valve (par. tEU)	PIN 1A	PIN 2A	PIN 2B	PIN 1B
1 = Carel ExV	GREEN	BROWN	YELLOW	WHITE
2 = Danfoss ETS 25-50	GREEN	RED	WHITE	BLACK
3 = Danfoss ETS 100	GREEN	RED	WHITE	BLACK
4 = Danfoss ETS 250/400	GREEN	RED	WHITE	BLACK
5 = NOT USED	YELLOW	ORANGE	BLACK	RED
6 = Alco EX4	BLUE	BROWN	WHITE	BLACK
7 = Alco EX5	BLUE	BROWN	WHITE	BLACK
8 = Alco EX6	BLUE	BROWN	WHITE	BLACK
9 = Alco EX7	BLUE	BROWN	WHITE	BLACK
10 = Alco EX8 500	BLUE	BROWN	WHITE	BLACK
11 = Sporlan SEI 0.5-11	GREEN	RED	BLACK	WHITE
12 = Sporlan SER 1.5-20	GREEN	RED	BLACK	WHITE
13 = Sporlan SER(I) G,J,K	GREEN	RED	BLACK	WHITE
14 = Sporlan SEI 30	GREEN	RED	BLACK	WHITE
15 = Sporlan SEI 50	GREEN	RED	BLACK	WHITE
16 = Sporlan SEH 100	GREEN	RED	BLACK	WHITE
17 = Sporlan SEH 175	GREEN	RED	BLACK	WHITE
18 = Castel 261-271 / Eliwell SXVB261	WHITE(2)	BROWN(1)	BLUE(3)	BLACK(4)
19 = Castel 262-263/Eli. SXVB262-263	WHITE(2)	BROWN(1)	BLUE(3)	BLACK(4)
20 = Castel 272-273	WHITE(2)	BROWN(1)	BLUE(3)	BLACK(4)
21 = Castel 264 -274 / Eliwell SXVB264	WHITE(2)	BROWN(1)	BLUE(3)	BLACK(4)

PEGO s.r.l.
Via Piacentina, 6/b 45030 Occhiobello (RO) - ITALY
Tel. +39 0425 762906
e-mail: info@pego.it – www.pego.it

TECHNICAL ASSISTANCE
Tel. +39 0425 762906 e-mail: tecnico@pego.it

Distributor: