Standard
Air-Conditioning units

Manual version: 1.5 - 30/05/96

Program code: **EPSTDECZ00**

CAREL

Technology & Evolution

INDEX

1 - INSTALLATION GUIDE

1.1. DESCRIPTION OF THE CONTROLLER AND COMPONENTS

- CONTROL BOARD

The main board is the core of the controller.
It is made of:
a section which includes the microprocessor and the memory for the machine control algorithm;
an I/O section which allows interfacing with controlled devices by means of a plug-in terminal.
a section devised for interfacing with supervisory network and terminal which can be installed in a remote position.
The control board represents the core of the system as it contains the microprocessor which performs the control algorithm and the user interface management. This board is connected to a pCO terminal and to any options.
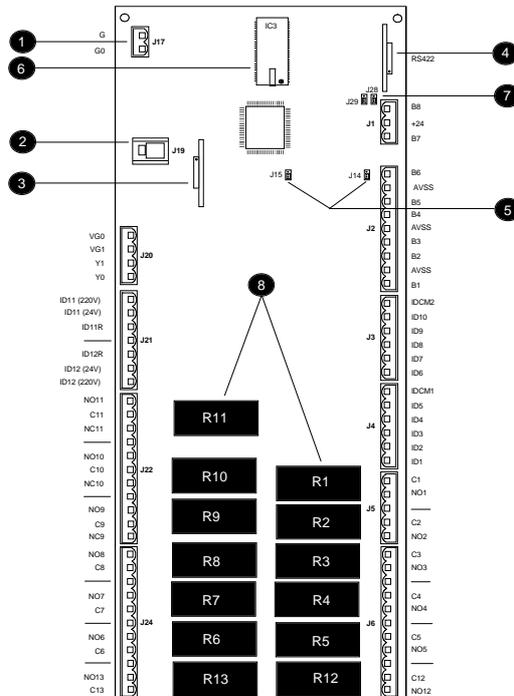
- List of components:

(1)   24 Vac supply cable
(2)   Telephone cable connector for terminal connection (RS485) or for local network connection
(3)   Optional Clock board
(4)   Optoisolated RS422 board for serial line connection for supervision and telemaintenance
(5)   Pin strip to select B5 and B6 voltage or current inputs
(6)   Eprom with the programme
(7)   Pin strip to select B28 and B29 voltage or current inputs
(8)   Relay outputs
Rxx: Connectors for digital relay outputs

No: Normally open contact
Nc: Normally close contact
C :   Common reference for contacts
ID :   Digital inputs
IDCM: Common reference for digital inputs
Bx :   Analogue input
AVSS: Reference for analogue outputs
Yx: Analogue outputs
VG1/0:   24V A.C. Analogue outputs power supply

- USER INTERFACE

Here below are listed all components of pCO control kit.
The terminal allows exchange of information by means of a LCD which displays the values of all controlled parameters, selected set-points, alarm thresholds and in general all data concerning the controlled variables in the specified formats. Moreover, the display will show particular messages any time an alarm condition occurs. A keypad allows the setting of configuration LCD parameters such as set-points, alarm thresholds, alarm activation delays, etc. ...
The visible rubber buttons, which can be seen and pressed even when the front door is closed, are the most important and the most used ones, above all when the machine is ON.
The above quoted buttons are the following: *-1-* ON/OFF button; *-2-* Buzzer silencing and alarm deactivating button; *-3-* ▲ button; *-4-* ▼ button; *-5-* ENTER button.
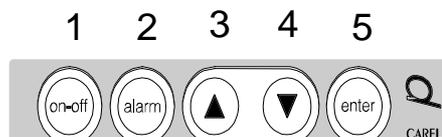

- FRONT PANEL
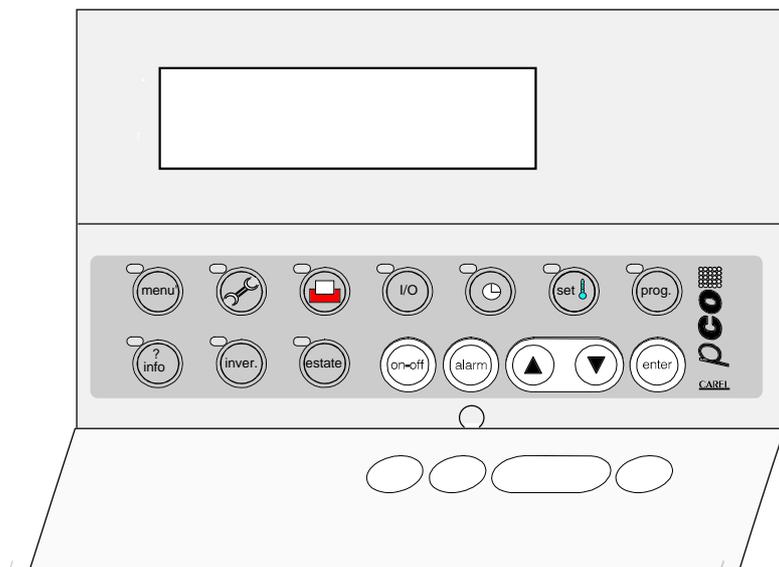
This is the control board front panel. The 4X20 LCD on the panel displays the values measured by the probes, working parameters and all necessary information for a

complete and precise regulation. The keypad allows access to the masks of the programme and any modification required.
The display normally shows ambient temperature and humidity together with time and date if clock option is present.
The pCO keypad is equipped with 15 buttons which, together with 4X20 LCD, represent the interface between user and controller.
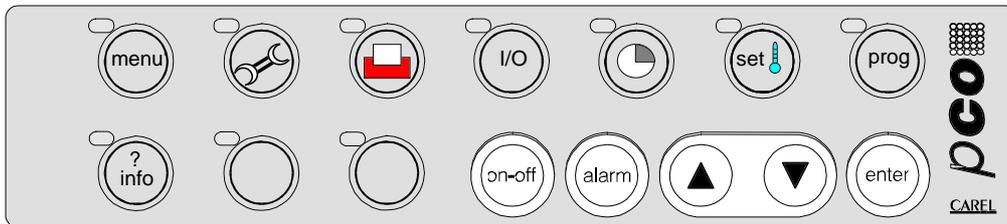
Directly from the keypad it is possible to gain access to the main parameters or to some parameters loops.

The " AL " message, on the upper right corner of the display, indicates an alarm condition and allows the access to the masks where the exact type of alarm is identified (for further information see below - ALARM button*)*
All reading and setting values are displayed according to a "tree" structure the user can enter by means of the controller keypad.

- pCO KEYPAD

GENERAL FUNCTIONING:

The first 10 buttons, the ones which disappear when closing the front door, are meant to allow the user to perform any kind of procedures from programming to parameters simple display. The blue and red buttons have not been used.
Their function is **to select** the required loop (or chain of masks). The 5 rubber buttons are used for programming and for parameters display. Once completed the procedures in a loop, which has been selected by pressing a button, the user only has to press another button to go at once to another loop.
The buttons share the following peculiar features :

-1- A green **LED** next to each button indicates which button has been selected. The LED remains ON as long as that loop of masks is being used. The LED is important in case the user does not remember which loop has been selected. It is important to point out that only one out of the 8 grey buttons can be ON, therefore activation of one automatically deactivates the others. Moreover, the user must remember that the LEDs will never be all OFF, because the mask menu is always on display; therefore, the LED next to the menu is ON even if no procedure is being performed or after a RESET due to a blackout:

-2- In the programme itself there is an automatic function which brings back on display the menu mask and, as a consequence, the LED next to the menu button will be turned ON again.

If, for example, the last procedure has been the setting of the printer parameters, for some seconds the last selected mask will remain on display and the LED next to the printer button will remain ON:

Once the selected time has elapsed, the LED next to the printer button will be turned OFF, the one next to the menu button will be turned ON and the temperature and humidity values will be displayed.

-3- Each loop of masks follows an order. This means that by pressing a button the *first* mask of the corresponding loop will be displayed. If the user then moves to other masks of the loop and by chance presses again the same button, the first mask will be displayed again.

MENU BUTTON

Gives information on the temperature and humidity values measured by the selected probes (the temperature probe is the only one to be always present and not selectable).

The procedure to be followed is:
- press the MENU button once

Result of procedure:
- the display will show the mask which indicates ambient temperature, ambient humidity, time, date and condition of the machine.

Procedure to be followed:
- press the ▲ and ▼ buttons

Result of procedure:
- cyclic visualisation of the loop of probe reading masks.

MAINTENANCE BUTTON

Allows visualisation and clearing of the total functioning hours of the main devices.

Procedure to be followed:
- press the **Maintenance** button once

Result of procedure:
- the display will show the working hours of the first three selected devices.

Procedure to be followed:
- press the ▲ and ▼ buttons

Result of procedure:
- cyclic visualisation of the masks which indicate for each device (heaters excluded) the activity hours and the setting of threshold hours and hour clearing .

N.B.   ***Reset of functioning hours: it is necessary to press ENTER to move the cursor to the "NO" sign. To reset the machine it is necessary to keep the ▲ or the ▼ button pressed for a couple of seconds until the "YES" sign appears. At this point wait for the "NO" sign to be displayed again.***

PRINTER BUTTON

Allows the user to manage the printer and to select its required parameters.
Procedure to be followed:
- press the **Printer** button once.
Result of procedure:
- the display will show a mask for the immediate setting of printing by simply pressing Enter.
Procedure to be followed:
- press the ▲ and ▼ buttons.
Result of procedure:
- activates the cyclic repetition of masks for immediate printing setting, for cyclic printing and, if the latter has been activated, of masks for the setting of cyclic printing interval.

INPUT/OUTPUT BUTTON

Allows visualisation of the status of interface board inputs/outputs.
Procedure to be followed:
- press the **Input/Output** button once.
Result of procedure:
- the display will show the status of all digital inputs.
Procedure to be followed:
- press the ▲ and ▼ buttons.
Result of procedure:
- activates the repetition of masks which indicate the status of digital outputs, analogue outputs and of digital inputs. Analogue inputs are already read in the Menu branch, therefore they are not visualised here.

N.B. Since digital inputs 7- 8- 9- 10 can manage different devices according to the settings effected in the manufacturer branch, I/O masks will indicate the selected device next to the output number in question.

CLOCK/TIME ZONES BUTTON

Allows the setting of time and date as well as the management of time zones.
Procedure to be followed:
- press the **Clock** button once.
Result of procedure:
- the display will show a mask for the setting of the date (day, month, year).

Procedure to be followed:
- press the ⏶ and ⏷ buttons.
Result of procedure:
- repetition of the masks for the management of time, for the setting of the password to gain access to the time zones branch, and again for the setting of the date.
Procedure to be followed:
- press the **Enter** button when the display shows the Password selecting mask.
Result of procedure:
- access to the field where the correct password (which is the same as the user password, that is 1234) is to be selected. If the password has been correctly selected, by pressing Enter you will move to the time zones branch, otherwise you will return to the clock loop.

Only for Time Zones setting

Once the above quoted procedures have been followed, you reach a mask asking if you want to select the time zones: if so, the following masks will be used to select times and set-points for temperature and humidity, otherwise you will go back to the first mask of the clock branch.

SET BUTTON

Allows the setting of set-points for ambient temperature and humidity regulation.
Procedure to be followed:

- press the **Set** button once.
Result of procedure:
- the display will show the mask for temperature set-point setting.

Procedure to be followed:
- press the ⏶ and ⏷ buttons.
Result of procedure:
- visualisation of the mask for humidity set-point setting.

PROGRAMMING BUTTON

Allows access to system parameters programming masks in all those functions the user need to personalise regulation.
Procedure to be followed:
- press the **Prog** button once.
Result of procedure:
- the display will show the user password (1234) selecting mask. If the password has been correctly selected, by pressing Enter you will reach the user branch; otherwise, you will remain in this mask.
Procedure to be followed:
- press the ⏶ and ⏷ button more than once.

Result of procedure:
- visualisation of a series of masks for the setting of all values necessary to humidity and temperature control and for the setting of set-points and differentials of connected devices.

? INFO BUTTON

Allows visualisation of the software version.
Procedure to be followed:
- press the **Info** button once.
Result of procedure:
- the display will show the software version.

MANUFACTURER BUTTONS

Allow access to the manufacturer password selecting mask which, if correctly selected (0123), enables entering the branch for activation of probes, connected devices and their main functions, and for default configuration set-up (standard values).
Procedure to be followed :
- press at the same time the **Programming** and the **Menu** buttons for a couple of seconds.
Result of procedure:
- the display will show a mask for password setting. If the password has been correctly selected, by pressing the **Enter** button you will gain access to said branch, otherwise you will remain in the password selecting mask.

MANUAL BUTTONS

Allow access to the loop for the manual activation of devices if pressed together for a couple of seconds.
Procedure to be followed:
- press for a couple of seconds the **Menu** and **Set** buttons.

Result of procedure:
- access to a mask asking if you want to select manual functioning of devices. If you answer positively, you will gain access to a loop of masks which enables activation of all devices. These masks can be reached by pressing the ▲ and ▼ *buttons*.

ON/OFF BUTTON

Allows machine turning ON and OFF.
Procedure to be followed:
- press the **ON/OFF** button once.

Result of procedure:
-the LED indicator under the **ON/OFF** button turns ON   **:** Unit ON;
-the LED indicator under the **ON/OFF** button turns OFF   **:** Unit OFF.

 ALARM BUTTON

Allows **silencing** of the buzzer which has been activated in case of alarm and **resetting** of alarms as soon as the reasons that caused them disappeared.
Procedure to be followed:
- press the **Alarm** button once.
Result of procedure:
- if before following this procedure there are no active alarms (LED under **Alarm** button OFF, buzzer OFF, no alarm messages on display), the display will show a mask informing of the absence of any alarms.
The mask will disappear if another button is pressed.
- if before following this procedure there is at least one active alarm (LED under the **Alarm** button ON, buzzer ON, alarm message on display), the pressing of the **Alarm** button silences the buzzer and on display appears the exact message of the alarm which can be the only one or the first of a series. At this point, it is possible to check if there are more than one active alarms and in that case which kind of alarms have been activated. It is sufficient to press the or the buttons. In this case if there are more than one active alarms a list of alarm messages will be displayed.
- if before following this procedure the buzzer has been **silenced** and the display shows an alarm mask, two are the possibilities: if the reasons which caused the alarms have disappeared, the LED indicator under the Alarm button will turn OFF and the programme will automatically return to the menu mask (this function is called **Clear**); if the reasons which caused the alarms have not disappeared the buzzer will be reactivated.
- if before following this procedure the buzzer has been **silenced** and the display shows any masks except an alarm one, the programme will automatically enter the alarm branch where it is possible to select the **Clear** function.

 UP / DOWN BUTTONS

Allow to move upwards or downwards in the masks of the loop. If used after pressing the **Enter** button, they allow selection of the parameter values.
(1) If a loop is composed of masks 1, 2, 3, 4, and 5 and mask 1 is on display, by pressing the button more than once the masks will scroll following the order: 1, 2, 3, 4, 5, 1 etc... By pressing the button more than once the masks will scroll following the order: 1, 5, 4, 3, 2, 1 etc...
(2) If, with reference to the same example, mask 3 is on display and the Enter button is pressed, the cursor will jump from position 0,0 to the numeric field. By pressing the button the number will increase; by pressing the button the number will decrease.

(enter) **ENTER BUTTON**

Allows parameter setting (through the (▲) and (▼) buttons) and is used to confirm data after setting. (1) If, for example, the display shows a mask with the message: "Temperature Set-point Setting", by pressing Enter the cursor will go from 0,0 position to the numeric field where a digit like 020.0 (20 ºC) is displayed. By means of the (▲) and (▼) button it is possible to modify this value. (2) By pressing Enter again the cursor will go back to 0,0 and at the same time the modified value will be memorised.

- pCO TERMINAL BOARD REAR PART

The terminal board is composed of
a section including the microprocessor
a section which allows interfacing with pCO and a serial printer

CONNECTION TO pCO CONTROLLER

CONNECTION TO PRINTER

MICROPROCESSOR
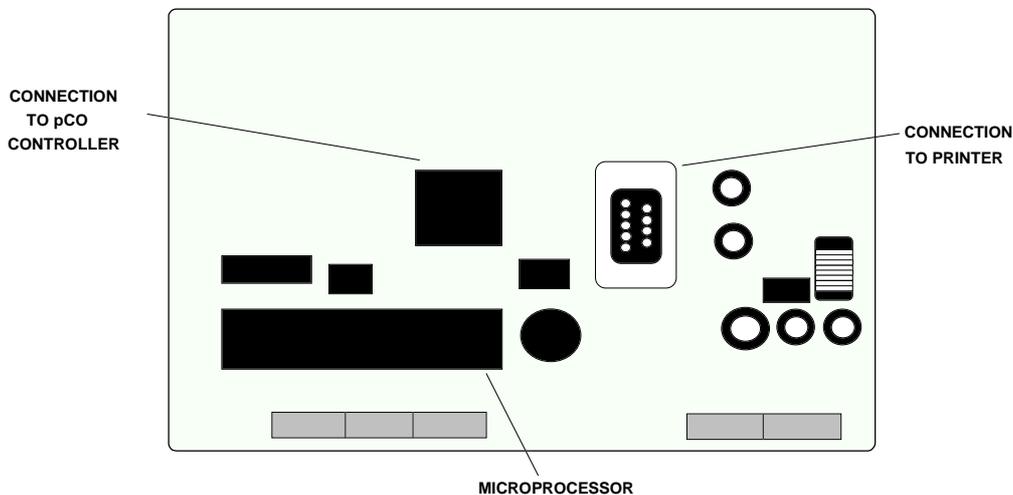
- EPROM

The Eprom socket is on the interface board.

The Eprom should be placed with the chip reference notches coinciding with the terminal board ones.
With reference to the picture :
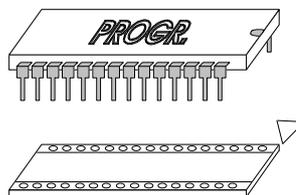
On inserting pay great   attention:
• an arrow on the label shows the exact Eprom inserting position.
• to the Eprom correct polarity, during the set-up the notch on the Eprom should coincide with the one on the socket.
  Particular attention should be paid also to the set-up itself so as to avoid bending or breaking the component pins.
- TROUBLESHOOTING

THE UNIT DOES NOT START

LED of the ON/OFF button is turned OFF, the display is OFF, other LEDs turned OFF.

Check :
a.   that power supply is present
b.   that there are 24 VAC   of power supply voltage at the secondary coil transformer (220 - 24 VAC)
c.   the correct insertion of 24 VAC power supply connector in the proper socket.

WHEN TURNING ON THE INSTRUMENT YOU FIND:

alarm LED indicator ON ,
display with no or random messages
buzzer ON.

Check :
a.   that the Eprom has been inserted with the correct polarity
b.   that the Eprom pins have not been bent on inserting the Eprom itself
c.   that the microprocessor chip has not been damaged: in that case contact the assistance.

WRONG INPUT SIGNALS READING

Check:
a.   that the connection of probes cables is in accordance with instructions
b.   that probe signals pass on cables installed at a sufficient distance from possible excessively disturbing sources (power cables, contactors, high-voltage cables and cables with high inrush ampere consumption connected devices)
c.   connections between interfaces and controller (flat cables)
d.   correct power supply of interfaces and probes

DAMAGED EPROM ALARM

a.   Contact the assistance

THE CONTROLLER ACTIVATES THE WATCH-DOG FUNCTION, THAT IS IT TURNS ON AND OFF AS FOR A POWER SUPPLY FAILURE OR ACTIVATES SOME OUTPUTS AT RANDOM (DIGITAL AND/OR ANALOGUE)

Check :
a.   the connections between controller and interfaces
b.   that power cables do not pass near interfaces and control board microprocessors.

- DIGITAL VOLTAGE INPUTS CONNECTION (220 Volt ac; 24 Volt ac)

The pCO controller allows voltage digital inputs to be connected with terminals ID11 - ID11R and ID12 - ID12R as shown in the picture below.
When the general alarm input is open, the high pressure alarm on pCO input will be detected.
Connections must be done as follows:
Digital Input 11: connection between **ID11R** (common) and **ID11 (24V)** if 24V are applied, or between **ID11R** (common) and **ID11 (220V)** if 220V are applied.
Digital Input 12: connection between **ID12R** (common) and **ID12 (24V)** if 24V are applied, or between **ID12R** (common) and **ID12 (220V)** if 220V are applied.
N.B. Do not apply 220V to the terminals ID11 (24V) and ID12 (24V).

220/24 Volt = normal situation
0 Volt = alarm situation

220 Volt
24 Volt

general alarm
compressor

| ID11R | inputs |
| ID11 (24/220V) | pCO voltage |
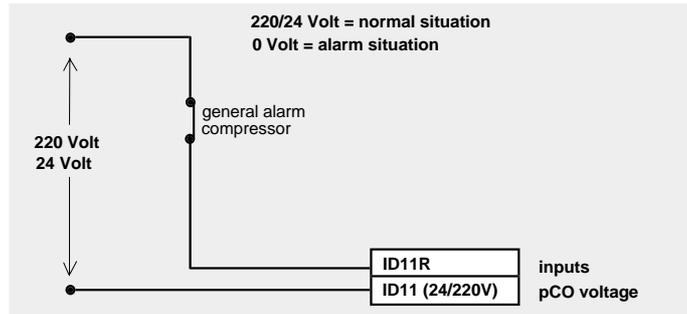
- DIGITAL OUTPUTS CONNECTION

Macroplus / pCO terminal connector

← 24/220 Volt →

1c / C
1o / NO

device (ex. motor pump)
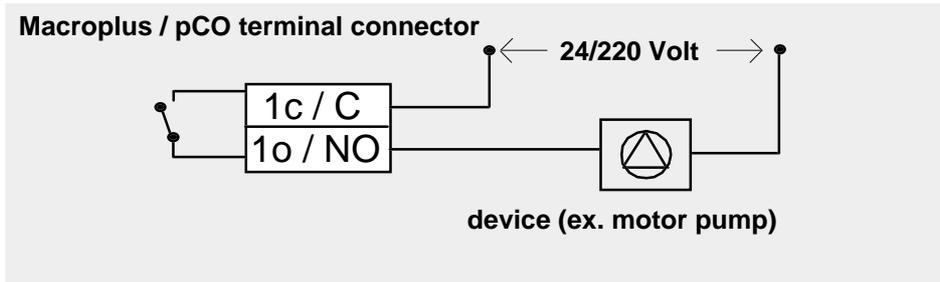
1.2- HARDWARE: USER INTERFACE

The user interface comprises all those components, such as keypad, display and LED indicators, which are necessary for the exchange of information between the user who needs air conditioning and the microprocessor devised by CAREL for the managing of this operation.

- POWER SUPPLY

Connect the 24 V secondary of the network transformer to inputs G0-G placed on the controller.

- INPUTS/OUTPUTS

The "Reference" column indicates the contacts on the board shown on page 3.

DIGITAL INPUTS

REFERENCE	DIGITAL INPUT
ID1 - IDCM1	COMPRESSOR 1 GENERAL ALARM (HIGH PRESSURE OR OVERLOAD)
ID2 - IDCM1	COMPRESSOR 2 GENERAL ALARM (HIGH PRESSURE OR OVERLOAD)
ID3 - IDCM1	COMPRESSOR 1 LOW PRESSURE
ID4 - IDCM1	COMPRESSOR 2 LOW PRESSURE
ID5 - IDCM1	CLOGGED FILTER
ID6 - IDCM2	FAN OVERLOAD
ID7 - IDCM2	AIR FLOW DETECTOR
ID8 - IDCM2	REMOTE ON / OFF
ID9 - IDCM2	HEATER 1 OVERLOAD
ID10 - IDCM2	HEATER 2 OVERLOAD
ID11 - ID11R	NOT USED
ID12 - ID12R	FIRE

ANALOGUE INPUTS

REFERENCE	ANALOGUE INPUT
B1 - AVSS	AMBIENT TEMPERATURE PROBE
B2 - AVSS	OUTLET AIR TEMPERATURE PROBE
B3 - AVSS	OUTLET WATER TEMPERATURE PROBE
B4 - AVSS	OUTSIDE AIR/ INLET WATER TEMPERATURE PROBE
B5 - AVSS	AMBIENT HUMIDITY PROBE
B6 - AVSS	NOT USED

DIGITAL OUTPUTS

REFERENCE	DIGITAL OUTPUT
R1	PARTIALISATION /REDUCTION FAN SPEED VALVE
R2	MAIN FAN - (SYSTEM ON)
R3	ENERGY SAVING VALVE
R4	HUMIDIFICATION
R5	COMPRESSOR 1 PARTIALISATION - (FILL WATER VALVE)
R6	COMPRESSOR 2 PARTIALISATION - (DRAIN WATER VALVE)
R7	OPENING COLD WATER THREE-POINT VALVE/COMPRESSOR 1
R8	OPENING COLD WATER THREE-POINT VALVE/COMPRESSOR 2
R9	OPENING HOT WATER THREE-POINT VALVE/HEATER 1
R10	OPENING HOT WATER THREE-POINT VALVE/HEATER 2
R11	GENERAL ALARM SITUATION

ANALOGUE OUTPUTS

REFERENCE	ANALOGUE OUTPUT
VG0 - Y0	COLD WATER VALVE
VG0 - Y1	HOT WATER VALVE

- pCO OPTIONAL BOARDS INSTALLATION
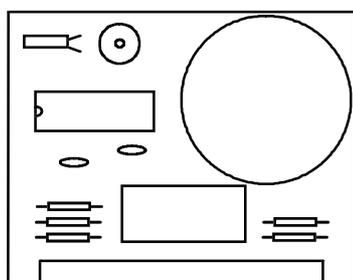
Clock board
This board allows to display date and time as well as the management of Time-bands. To use this board connect it to the connector (3) shown in the picture on page 3.

Cod. MNEWCLOCK0
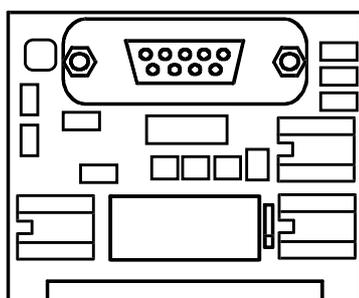
Serial optoisolated board RS422
This serial board RS422 allows pCO network connection. This enhances remote and local telemaintenance and supervisory systems.
To use this board connect it to the connector (4) shown in the picture on page 3.

Cod. PCOSER0000
.

- JUMPER SETTING FOR 4-20 mA PROBES
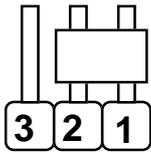
N.B.
Remember to place the jumper of J14 (analogue input n.5), J15 (analogue input n.6), J28 (analogue input n.7) and J29 (analogue input n.8) in the position shown in the picture in order to configure the pressure transducer reading into the 4-20 mA mode.

- FIRST INSTALLATION

There are two phases:
a) Hardware connection
AFTER HAVING CHECKED THAT THE MATERIAL RECEIVED IS EXACTLY THE ONE YOU REQUESTED, UNPACK IT AND CONNECT THE SINGLE PARTS TO ASSEMBLE THE CONTROLLER AS DESCRIBED BELOW:

- connect the telephone cable between the Interface and the pCO controller.
- insert the Eprom with the programme in the proper socket

*** WARNING: INSERT THE EPROM IN THE RIGHT WAY ***

- connect all probes and devices to the controller, following the indications of the
   inputs/outputs table
- connect power supply with interface

b) Software initialisation
Software initialization means to **correctly set-up all the parameters in order to allow the unit to work**.
The machine will thouroughly meet the costumer's requirements, only if all the selected parameters (contained in the following branches: Programming, Manufacturer, and Maintenance) take into account the type of plant, present devices, and control parameters (setpoints, threshold alarms, etc).
All the selected parameters are contained in the **buffer storage** (a memory that maintain the selected values also in the absence of voltage).

When the machine is first installed, the stored parameters are the parameters established by Carel (Default values) which ensure a standard working of the machine but not really meet the costumer's requirements.
To modify the parameters the operator must enter the branches of interest and change the incorrect parameters. All the modified parameters are stored again.
On page 20 a complete list of the default values is shown.

On certain circumstances the machine could present some parameters no more answering the needs of the user (following a test or change of the equipment to be controlled, etc), and their recovery would involve an excessive expenditure of time.
In this case it is advisable to recover the default values established by Carel and afterwards to change the ones tha are not in a accordance with the equipment.
To do this the following operations are needed:
Keep pressed for more than 2 seconds the **Menu + Prog** buttons;
- due to the previous action you are now in the Manufacturer Password. Now it is necessary to correctly select the Manufacturer Password.
Two different passwords are available:
- hardaware " 0123 " password that must be known only by the assistance technician or qualified personnel.

It is used during the preliminary operations, and whenever it is impossible to have access to the branch MASTER password (because the memory has been "spoiled").
- MASTER password: the value of this password is selected in the password set mask. It must be used during the normal working of the machine;
- having correctly selected the password, press **Enter**; you reach the mask indicating the branch "Special Procedures";
- you are now in the INSCONFIG mask which permit the erasure and the installation of the default values in the buffer storage; pressing once ⬆ or ⬇ allows to change the answer to the question from NOT to YES. **Do not do any operation and wait until the text becomes again No.**
Now the installation of the default values is completed.

2. - CONFIGURATION GUIDE

2.1 SET-POINT - DIFFERENTIAL - DEAD ZONE

Temperature control may be based on a proportional or proportional + integral regulation that can be selected by entering the GTEMP2 mask, the branch is named "Temperature Management" under password "service".
The proportional control works in a proportional way in function of the difference between the required temperature or humidity value (**SET-POINT**) and the actual value.
The P+I regulation is based on the error between the required temperature and the measured temperature in relation to the moment in which the difference between the two values persists (the integration constant can be selected in the GTEMP5 mask).

The humidity control is a proportional control; the humidifier is activated when the relative humidity value is lower than the "set-point-differential".

The **PROPORTIONAL BAND** defines the temperature/humidity control area. The more the value differs from the selected Set-point the greater is the control effect.

-The selected differential is half of the total differential: for temperature control, the 3 Centigrade Degrees selected as default values are to be intended above and below the set-point; in case there are 3 heaters and 2 compressors, the latter will turn ON when the set-point is 23 degrees (default) + differential (3 degrees), whereas all heaters will be active at 20 degrees.

- The selected **DEAD ZONE** corresponds to a half of the total dead zone; the dead zone prevents the control action when the temperature values are near the set-point.

REGOLAZIONE PROPORZIONALE
PROPORTIONAL REGULATION

RISCALDAMENTO
HEATING

RAFFREDDAMENTO
COOLING

-100%

0

+100%

SET POINT

ZONA MORTA
META' DELLA TOTALE
DEAD ZONE
HALF OF THE TOTAL

BANDA IMPOSTABILE
META' DELLA TOTALE
BAND
HALF OF THE TOTAL
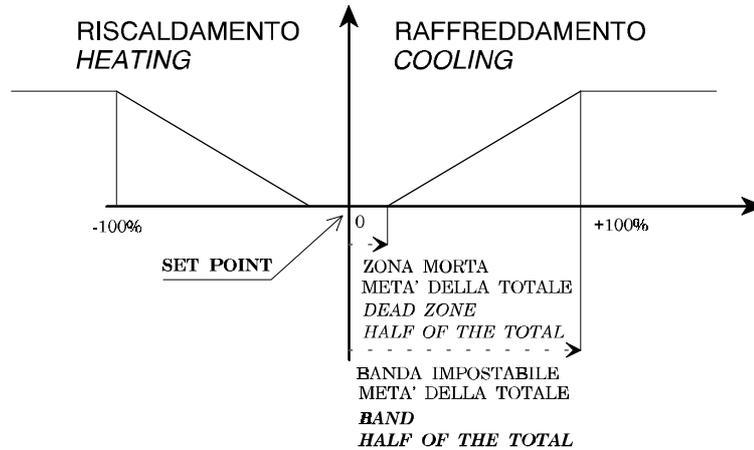
2.2 STEP

For each step it is possible to select the following:
- the set-point of the step itself (% value of the regulation differential)
- the hysteresis, that is half of the step dimension and a % value of the differential

SIGNIFICATO DI GRADINO
MEANING OF STEP

GRADINO DI CALDO
HEATING STEP

GRADINO DI FREDDO
COOLING STEP

ON

ON

SET POINT

OFF

OFF

SET POINT

ISTERESI
HYSTERESIS

ISTERESI
HYSTERESIS
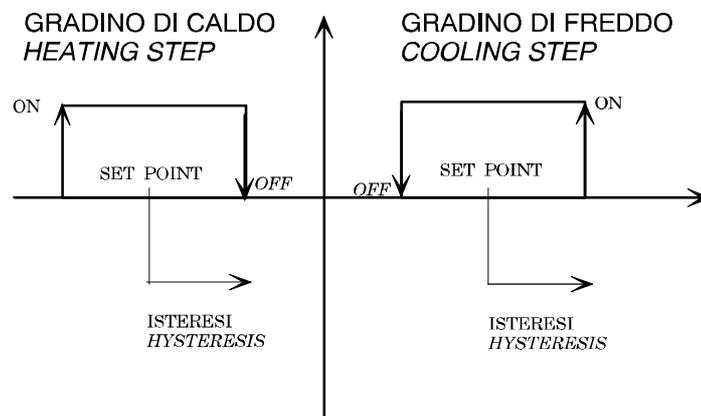
Each step is connected to a device:

        Cold step -------> Compressor

        Hot step   -------> Heater

16

2.3 DEFAULT VALUES

The factory-set configuration provides for the following devices:

- *ambient temperature probe*
- *ambient relative humidity probe*
- *outside air temperature probe*
- *water temperature probe*
- *cold water valve*
- *hot water valve*
- *all heaters enabled (n.2)*
- *both compressors enabled*
- *external humidifier*

Here is the list of the default values the controller accepts as machine parameters whenever the user answers affirmatively to the mask successive to that of back-up memory deletion in the "special procedures" branch.

SELECTABLE PARAMETERS	RANGE	PRE-SET
Temperature set-point	15÷30	23.0º
Temperature differential	1÷10	3º
High temperature threshold	10÷50	30º
Low temperature threshold	0÷30	10º
Integration constant	****	600 sec
Only 1 compressor enabled;		
Set-point compressor 1 in CW	0÷100%	50%
Hysteresis compressor 1 in CW	0÷100%	50%
or;		
Set-point compressor 1 in ES	0÷100%	66%
Hysteresis compressor 1 in ES	0÷100%	33%
Both compressors enabled;		
Set-point compressor 1 in CW	0÷100%	25%
Hysteresis compressor 1 in CW	0÷100%	25%
Set-point compressor 2 in CW	0÷100%	75%
Hysteresis compressor 2 in CW	0÷100%	25%
or;		
Set-point compressor 1 in ES	0÷100%	49%
Hysteresis compressor 1 in ES	0÷100%	16%
Set-point compressor 2 in ES	0÷100%	82%
Hysteresis compressor 2 in ES	0÷100%	16%
1 heater enabled;		
Set-point (not modifiable)	0÷100%	25%
Hysteresis (not modifiable)	0÷100%	25%
2 heaters enabled;		
Set-point heater 1 (not modifiable)	0÷100%	25%
Hysteresis heater 1 (not modifiable)	0÷100%	25%
Set-point heater 2 (not modifiable)	0÷100%	75%
Hysteresis heater 2 (not modifiable)	0÷100%	25%
Beginning cold water valve	0÷100%	0%
End cold water valve	0÷100%	100%
Beginning hot water valve	0÷100%	0%
End hot water valve	0÷100%	100%
Set-point relative humidity	0÷100UR%	50%
Humidity differential	5÷20%UR	10%
High humidity threshold	0÷100%	80%
Low humidity threshold	0÷100%	30%
Set-point dehumidification step	0÷100%	50%

Hysteresis dehumidification step	0÷100%	10%
Start-up delay	****	15 sec
Threshold working hours compressor 1	1÷4000h	4000h
Threshold working hours compressor 2	1÷4000h	4000h
Threshold working hours humidifier	1÷4000h	4000h
Threshold working hours fan	1÷4000h	4000h
Water high temperature threshold	****	20º
Water low temperature threshold	****	2º
Delay between compressors start-ups	****	360 sec
Min. time compressors ON	****	60 sec
Min. delay for compressors re-start	****	180 sec
Low pressure alarm delay	****	180 sec
Digital inputs detection delay	****	60 sec
High/low temperature alarm delay	****	30 min
Heaters insertion delay	****	3 sec
Time-band 1 (hs) for temperature	00:00/23:59	6:00
Time-band 2 (hs) for temperature	00:00/23:59	12:00
Time-band 3 (hs) for temperature	00:00/23:59	18:00
Time-band 1 (hours) for humidity	00:00/23:59	6:00
Time-band 2 (hours) for humidity	00:00/23:59	12:00
Time-band 3 (hours) for humidity	00:00/23:59	18:00
Temperature set-point 1st zone	****	21º
Temperature set-point 2nd zone	****	21º
Temperature set-point 3rd zone	****	21º
Temperature set-point 4th zone	****	21º
Humidity set-point 1st Time-band	****	50%
Humidity set-point 2nd Time-band	****	50%
Humidity set-point 3rd Time-band	****	50%
Humidity set-point 4th Time-band	****	50%

2.4 MANUAL CONTROL

This part of the programme allows the manual activation of the various DEVICES. In order to preserve the integrity of the devices and to ensure maximum safety, the interblock and its protections are always present.

In order to enable the manual functioning of the unit it is necessary to follow the procedures described in the paragraph dedicated to pCO keypad.
Manual functioning of the unit is identified by the "M" letter that appears in the last part of the display.

2.5 TEMPERATURE CONTROL DIAGRAMS

TWO-COMPRESSOR UNIT WITHOUT ENERGY SAVING OPTION
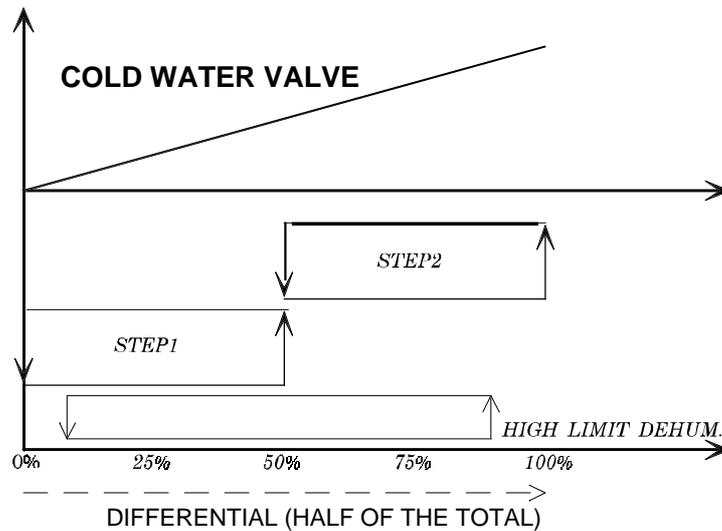
Default values:
- Set-point compressor 1: 25%   Hysteresis compressor 1: 25%
- Set-point compressor 2: 75%   Hysteresis compressor 2: 25%

In case of use of default partialised compressors, the compressor steps coincide with the relative partialisations.

TWO-COMPRESSOR UNIT WITH ENERGY SAVING OPTION
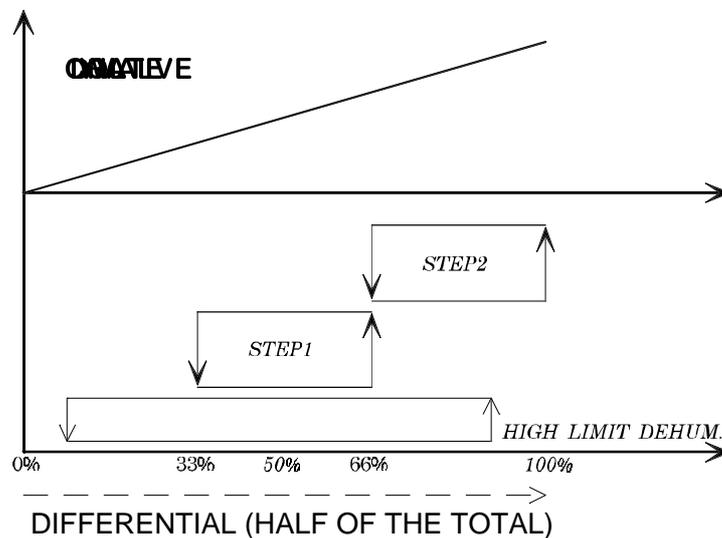
Default values:

- Set-point compressor 1: 49%   Hysteresis compressor 1: 16%
- Set-point compressor 2: 82%   Hysteresis compressor 2: 16%

In case of use of default partialised compressors, the compressor steps coincide with the relative partialisations.

-MANAGEMENT OF COMPRESSORS

After the compressor has been turned ON, it must go on working for at least 1 min (default) (VALUE SELECTABLE THROUGH DEDICATED MASK).

After the compressor has been turned OFF, it is necessary to wait for at least 6 min (default) before restarting it (VALUE SELECTABLE THROUGH DEDICATED MASK).

The second compressor can not be turned ON before 3 min. have elapsed from the starting up of the first one (default) (VALUE SELECTABLE THROUGH DEDICATED MASK).

In the 2-compressor configuration it is possible to select the compressor ROTATION option.

The HIGH-LIMIT step activates during dehumidification as follows:

- if within one minute from the indication of higher limit of the cooling differential (85%) the temperature value is not comprised within the regulation differential (85% -15%), the HIGH-LIMIT step is activated and dehumidification stopped.
- the step remains active until 15% of the heating differential is reached, then dehumidification will restart only if required.

-ENERGY SAVING

In order to adopt the Energy Saving option check that:

Ambient Temperature - Water Temperature > (SET energy saving + HYST energy saving)

The value of SET ENERGY SAVING can be selected through a dedicated mask (mask GTEMPES in the "Temperature Management" branch).
If this condition occurs:

- by answering affirmatively to the COM-ES mask ("Compressors compatible with the valve in the Energy Saving option"), the compressors steps within the differential will be postponed with respect to the cold water valve, but only when the conditions necessary to the energy saving activation occur. Otherwise, with activated energy saving option but functioning conditions, the compressors will be normally functioning.
- by answering negatively to the COM-ES mask, the compressors steps will be eliminated and only the valve will remain active in case the conditions necessary to the energy saving activation occur. Otherwise, the compressors will be normally functioning.

1 COMPRESSOR UNIT WITHOUT ENERGY SAVING OPTION

COLD WATER VALVE

STEP1

HIGH LIMIT DEHUM.

0%   50%   100%

DIFFERENTIAL (HALF OF THE TOTAL)
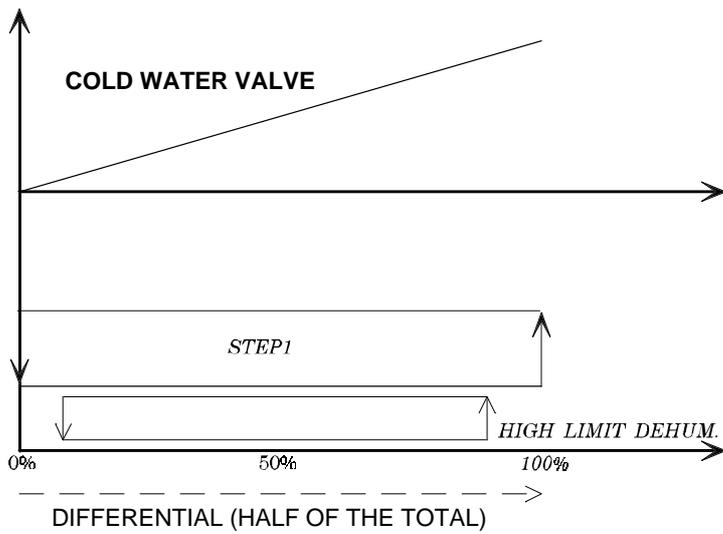
Default values:
- Set-point compressor: 50%   Hysteresis compressor: 50%
In case of use of default partialised compressors, the compressor step coincides with the relative partialisation.

1 COMPRESSOR UNIT WITH ENERGY SAVING OPTION

COLD WATER VALVE

STEP1

HIGH LIMIT DEHUM.

0%   33%   66%   100%

DIFFERENTIAL (HALF OF THE TOTAL)
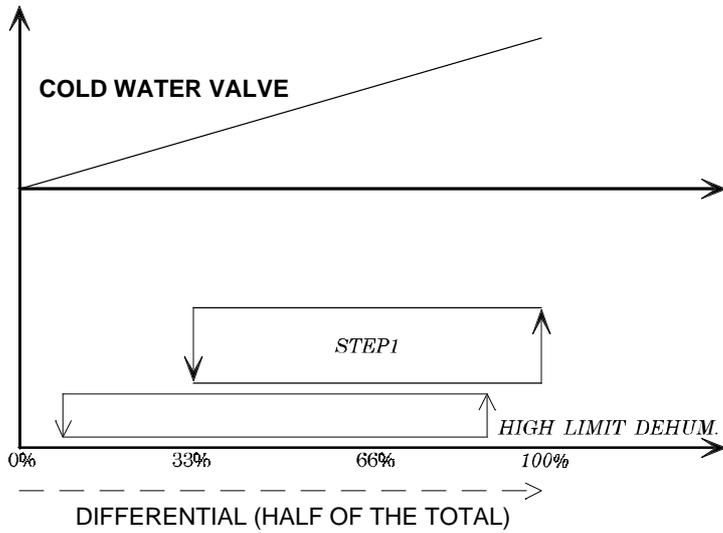
Default values:
- Set-point compressor 1: 66%   Hysteresis compressor 1: 33%
In case of use of default partialised compressors, the compressor step coincides with the relative partialisation.

21

TWO-HEATER UNIT

HOT WATER VALVE

LOW LIMIT DEUMID.

STEP2

STEP1

-100%   -66%   -33%   0%

DIFFERENTIAL (HALF OF THE TOTAL)
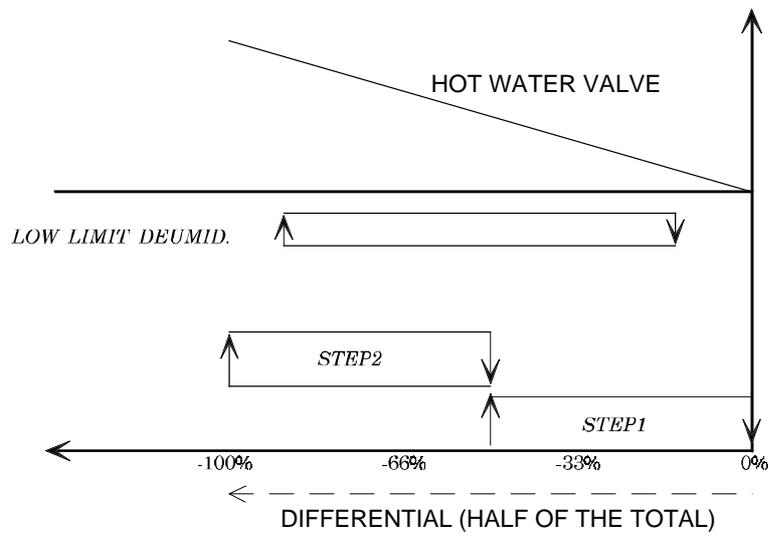
Default values:
- Set-point heater 1: 25%   Hysteresis heater 1: 25%
- Set-point heater 2: 75%   Hysteresis heater 2: 25%

ONE-HEATER UNIT

HOT WATER VALVE

LOW LIMIT DEUMID.

STEP1

-100%   -50%   0%

DIFFERENTIAL (HALF OF THE TOTAL)
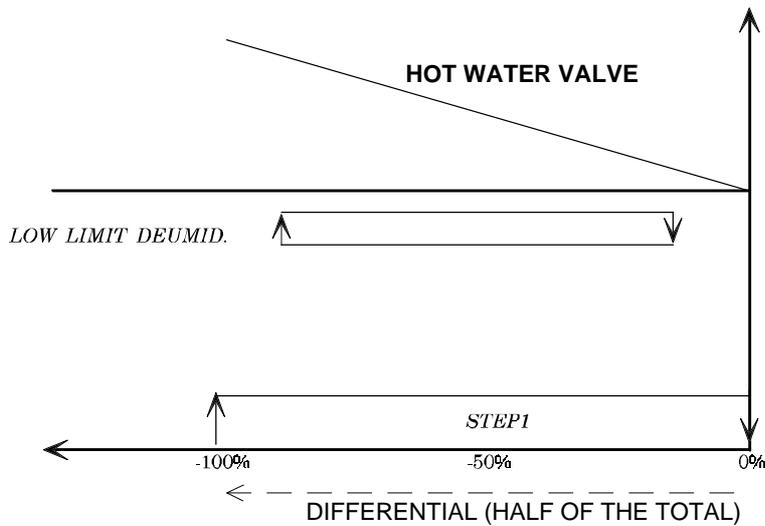
Default values:
- Set-point heater: 50%   Hysteresis heater: 50%

NOTES

The 2-step heating configuration allows setting of the following two alternatives:

- STANDARD

during insertion:
        HEATER 1
        HEATER 1 + HEATER 2

during disinsertion:
        HEATER 1 + HEATER 2
        HEATER 1

- BINARY

during insertion:
        HEATER 1
        HEATER 2
        HEATER 2 + HEATER 1

during disinsertion:
        HEATER 2 + HEATER 1
        HEATER 2
        HEATER 1

The LOW-LIMIT step intervenes during dehumidification as follows:

- if within one minute from the indication of lower limit of the heating differential (-85%) the temperature values are not comprised within the regulation differential (-85% _-15%) the LOW-LIMIT step is activated and dehumidification stopped.
- the step remains active up to -15% of the heating differential, then dehumidification will restart only if required.

2.6 HUMIDITY CONTROL DIAGRAMS

FEATURES:

The type of control can be selected through the dedicated mask (mask SR1U within the "PROBE MANAGEMENT" branch)

DEHUMIDIFICATION can be achieved:
- by starting one compressor (chosen in the DEU mask within the "Compressors Management" branch);
- through partialisation of cold water valve (chosen in the GUMI1DEU mask within the "Compressors Management" branch);
- through fan reduction speed (chosen in the GUMI2DEU mask within the "Compressors Management" branch);

- Dehumidification is enabled only if ambient temperature is within the alarm limits.
IN CASE OF OUT-OF-RANGE TEMPERATURE VALUES DEHUMIDIFICATION IS PREVENTED (see diagrams of temperature control).

HUMIDITY REGOLATION

humidification

dehumidification

set point

differential (half of the total)
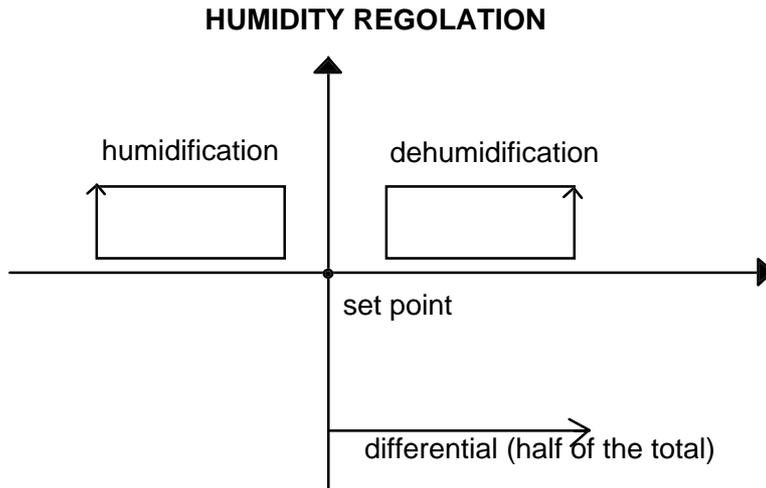
3. USER GUIDE

The Liquid Crystal Display is the main communicative channel between pCO and user. All information that can be read on display is stored in a series of masks. All masks will be listed below.

3.1 MASK

The typical mask structure is the following (the display has 4 rows x 20 columns):

Nome maschera
Mask name

Nome identificativo ramo
Branch name

Visualizzaizione orologio/datario
Clock/Date visualization

Freccia indicante possibili MP3
rami affiancati
Arrow to indicate a branch on the right

0>

1^ RIGA
1^ ROW

Posizione iniziale
Cursore (0,0)
Initial cursor position (0,0)

Gestione

Temperatura

2^ RIGA
2^ ROW

3^ RIGA
3^ ROW

4^ RIGA
4^ ROW

Indicazione profondita'
mascherina
Branch position

In case of numeric setting fields, press *ENTER* to move the cursor from the current position (for example 0,0) to the first figure of the first numeric field available; if the current position corresponds to the last possible setting field, by pressing *ENTER* the cursor will return on "home" position - 0,0.

3.2 ALARM MASKS

Each alarm condition is signalled ;

- by the incorporated buzzer;
- by the red LED indicator on the front panel of user interface and by the "AL" message which appears on the higher right corner of display.

It is possible to display an alarm message indicating the type of problem occurred by pressing the *ALARM* button. All alarms are subjected to 1 minute delay at the unit start-up, with the exception of high/low temperature & humidity alarms and of damaged probe alarm which are subjected to a delay selectable in the Manufacturer branch.

The buttons that can be used within the alarm branch are:

- ▲ *BUTTON*
- ▼ *BUTTON*
- *MENU BUTTON*

3.3 LIST OF MASKS

```
VERS
+--------------------+              Software version.
¦STANDARD C.AR.EL AL¦              This mask is visualised only by pressing
¦AIR CONDITIONING    ¦              the "?info" button.
¦Ver 1.312  16/04/96 ¦
¦Brugine (PD)        ¦
+--------------------+


Letter "M" indicates that manual procedures are active.
        ¦
        ¦
        ¦
SINOT1  ↓                          (MENU BRANCH)
+--------------------+              First mask of synoptic tree.
¦ 00:00 M 00/00/0000 ¦              This is the menu mask. Access is gained by pressing
¦Temperature:00.0 _C ¦              the "menu" button.

¦Humidity   :00.0 RH%¦              From here by pressing the ▲ and ▼ buttons you
¦ >ABNORMAL WORKING< ¦              can move within the Menu branch.
+--------------------+

SINOT3                             (MENU BRANCH)
+--------------------+
¦    ACTUAL VALUES   M¦←── ───      Unlike the Menu mask, in all the other masks the
¦Inlet Air Temper.:  ¦              "M" of manual procedures changes position.
¦      00.0 _C       ¦              Visualisation of value measured by inlet air
¦ >ABNORMAL WORKING< ¦              temperature probe.
+--------------------+

SINOT2                             (MENU BRANCH)
+--------------------+              Visualisation of value measured by outlet water
¦    ACTUAL VALUES   M¦              temperature probe.
¦Outlet Water Temp.: ¦
¦      00.0 _C       ¦
¦ >ABNORMAL WORKING< ¦
+--------------------+

SINOT3A                            (MENU BRANCH)
+--------------------+              Visualisation of value measured by outside air
¦    ACTUAL VALUES   M¦              temperature probe. This mask can also visualise
¦External Air Temp.: ¦              inlet water temperature according to setting
¦      00.0 _C       ¦              effected in the manufacturer branch.
¦ >ABNORMAL WORKING< ¦
+--------------------+
SINOT5                             (MENU BRANCH)
+--------------------+              Visualisation of temperature set-point selected
¦    ACTUAL VALUES   M¦              in the "SET" branch. If Time-bands have been
¦SetPoint Temperature¦              enhanced this set-point will no more correspond
¦      00.0 _C       ¦              to reality.
```

```
¦ >ABNORMAL WORKING< ¦
+--------------------+
```

```
CONTA1
+--------------------+
¦Time Counter     AL¦
¦                    ¦
¦Fan         00000  ¦
¦                    ¦
¦Compressor 1 00000  ¦
¦Compressor 2 00000  ¦
+--------------------+
```

(MAINTENANCE BRANCH)
First mask of the maintenance branch you reach by pressing the "**Maintenance**" button. This is the mask for the visualisation of fan/2 compressors working hours. By pressing the ▲ and the ▼ buttons you can move upwards and downwards the loop.

```
CONTA2
+--------------------+
¦Time Counter     AL¦
¦                    ¦
¦Humidifier    00000 ¦
¦                    ¦
+--------------------+
```

(MAINTENANCE BRANCH)
Visualisation of humidifier working hours.

```
OREVEN
+--------------------+
¦-- Fan           AL¦
¦Working Hours: 00000¦
¦                    ¦
¦Hours Thr.  : 00000¦
¦Reset          No  ¦
+--------------------+
```

(MAINTENANCE BRANCH)
Mask for Fan Hours Threshold programming and for already calculated hours clearing. For the clearing function it is necessary to keep pressed for a couple of seconds the ▲ or the ▼ button on the **No** word. The same is for the following masks.

```
ORECOMP1
+--------------------+
¦-- Compressor 1   AL¦
¦Working Hours: 00000¦
¦Hours Thr.  : 00000¦
¦Reset          No  ¦
+--------------------+
```

(MAINTENANCE BRANCH)
Mask for Compressor 1 Hours Threshold programming and for already calculated hours clearing.

```
ORECOMP2
+--------------------+
¦-- Compressor 2   AL¦
¦Working Hours: 00000¦
¦Hours Thr.  : 00000¦
¦Reset          No  ¦
+--------------------+
```

(MAINTENANCE BRANCH)
Mask for Compressor 2 Hours Threshold programming and for already calculated hours clearing.

```
OREUMID
+--------------------+
¦-- Humidifier    AL¦
¦Working Hours: 00000¦
¦Hours Thr.  : 00000¦
¦Reset          No  ¦
+--------------------+
```

(MAINTENANCE BRANCH)
Mask for Humidifier Hours Threshold programming and for already calculated hours clearing.

```
PRINT1
+--------------------+
¦                    ¦
¦     PRINTER     AL¦
¦                    ¦
¦                    ¦
¦Immediate Print     ¦
¦Enabled?         No¦
+--------------------+
```

(PRINTER BRANCH)
First mask of the printer branch you reach by pressing the "**Printer**" button. By pressing the ▲ and the ▼ buttons you can move within the loop. In this mask the immediate print of probes and alarms reading can be selected.

```
PRINT2                              (PRINTER BRANCH)
+--------------------+              Mask for the cyclic print setting.
¦       PRINTER    AL¦              If the cyclic print has been selected, within the
¦                    ¦              loop the following mask will be selected too.
¦Cyclic Print        ¦
¦Enabled?          No¦
+--------------------+


PRINT3                              (PRINTER BRANCH)
+--------------------+              Mask for cyclic print interval setting
¦       PRINTER    AL¦              calculated in minutes.
¦Print Cycle         ¦
¦Time                ¦
¦         000 min.   ¦
+--------------------+


DIN                                 (INPUTS/OUTPUTS BRANCH)
+--------------------+              This is the first mask of the Inputs/Outputs
¦Digital Inputs:   AL¦              branch you can reach by pressing the "I/O" button.
¦                    ¦
¦C=Close  O=Open     ¦              By pressing the ⊙ and the ▼ buttons you can
¦1:CCC    4 :CCC     ¦              move within the loop.
¦7:CCC    10:CCC     ¦              Visualisation of the digital inputs condition.
+--------------------+


DOUT                                (INPUTS/OUTPUTS BRANCH)
+--------------------+              Visualisation of digital outputs condition from n.1
¦Digital Outputs : AL¦              to n.3.
¦1 Part. Valve   : No¦
¦2 Fan           : No¦
¦3 Energy Saving:  No¦
+--------------------+


DOUT1                               (INPUTS/OUTPUTS BRANCH)
+--------------------+              Visualisation of digital outputs condition from n.4
¦Digital Outputs : AL¦              to n.6.
¦4 Humidification: No¦
¦5 Part.Compr.1  : No¦
¦6 Part.Compr.2  : No¦
+--------------------+


DOUT2                               (INPUTS/OUTPUTS BRANCH)
+--------------------+              Visualisation of digital outputs condition from n.7
¦Digital Outputs : AL¦              to n.8. Instead of compressors there may be: "Open
¦                    ¦              Cooling Valve" or "Close Cooling Valve" according
¦7 Compressor 1  : No¦              to the settings effected.
¦8 Compressor 2  : No¦
+--------------------+


DOUT3                               (INPUTS/OUTPUTS BRANCH)
+--------------------+              Visualisation of digital outputs condition from n.9
¦Digital Outputs : AL¦              to n.11. Instead of heaters there may be: "Open
¦9  Heater 1     : No¦              Heating Valve" or "Close Heating Valve" according
¦10 Heater 2     : No¦              to the settings effected.
¦11 General Al.  : No¦
+--------------------+


AOUT                                (INPUTS/OUTPUTS BRANCH)
+--------------------+              Visualisation of analogue outputs condition:
¦Analogue Outputs: AL¦              Cooling Valve and Heating valve.
¦                    ¦
¦Cooling Valve:000.0V¦
¦Heating Valve:000.0V¦
+--------------------+


DATA                                (CLOCK/TIME BANDS)
+--------------------+              This is the first mask of the "Time /Time-bands"
¦    Clock & Date  AL¦              branch you can reach by pressing the "Clock"
button.
¦                    ¦
¦                    ¦              By pressing the ⊙ and the ▼ buttons you can
¦Date  Setting   :   ¦              move within the loop.
¦dd/mm/yy  00/00/0000¦              This mask allows date setting.
+--------------------+
ORA                                 (CLOCK/TIME BANDS)
+--------------------+              Mask for the setting of the present time.
¦     Clock & Date  AL¦
¦                    ¦
¦Time Setting:       ¦
¦hh:mm        00:00  ¦
+--------------------+
```

```
PASSFAS                                (CLOCK/TIME BANDS BRANCH)
+-------------------+                  Mask for the setting of the user password that
¦ DAILY TIME ZONE AL¦                  allows access also to time zones masks if the
¦Insert the Password¦                  password has been correctly selected. Otherwise,
¦for Daily Time Zone:¦                 the time zones masks will not be enabled.
¦           0000    ¦
+-------------------+

ATTIVFAS                               (CLOCK/TIME BANDS BRANCH)
+-------------------+                  First mask of Time Zones which is meant to select
¦ DAILY TIME ZONE  AL¦                 activation/deactivation of Time Zones.
¦                   ¦
¦Daily Time Zone    ¦
¦Enabled?        No ¦
+-------------------+

FAS                                    (CLOCK/TIME BANDS BRANCH)
+-------------------+                  This mask indicates that in the following masks
¦                AL¦                   it is possible to modify times and set-points of
¦Daily Time Zone    ¦                  the temperature regulation.
¦    Temperature    ¦
¦                   ¦
¦                   ¦
+-------------------+

FAS1                                   (CLOCK/TIME BANDS BRANCH)
+-------------------+                  Mask for the setting of time and set-point of the
¦-- Temperature  AL¦                   first temperature Time Zone.
¦Daily Time Zone 1  ¦
¦End Time  : 00:00  ¦
¦Set-point : 00.0 _C¦
+-------------------+

FAS2                                   (CLOCK/TIME BANDS BRANCH)
+-------------------+                  Mask for the setting of time and set-point of the
¦-- Temperature  AL¦                   second temperature Time Zone.
¦Daily Time Zone 2  ¦
¦End Time  : 00:00  ¦
¦Set-point : 00.0 _C¦
+-------------------+

FAS3                                   (CLOCK/TIME BANDS BRANCH)
+-------------------+                  Mask for the setting of time and set-point of the
¦-- Temperature  AL¦                   third temperature Time Zone.
¦Daily Time Zone 3  ¦
¦End Time  : 00:00  ¦
¦Set-point : 00.0 _C¦
+-------------------+

FAS4                                   (CLOCK/TIME BANDS BRANCH)
+-------------------+                  Mask for the setting of time and set-point of the
¦-- Temperature  AL¦                   fourth temperature Time Zone.
¦Daily Time Zone 4  ¦
¦End Time  : 24:00  ¦
¦Set-point : 00.0 _C¦
+-------------------+

UMIDFAS                                (CLOCK/TIME BANDS BRANCH)
+-------------------+                  This mask indicates that in the following masks
¦                AL¦                   it is possible to modify times and set-points of
¦ Daily Time Zone   ¦                  humidity regulation.
¦ Humidity          ¦
¦                   ¦
¦                   ¦
+-------------------+

UMIDFAS1                               (CLOCK/TIME BANDS BRANCH)
+-------------------+                  Mask for the setting of time and set-point of the
¦--   Humidity   AL¦                   first humidity Time Zone.
¦Daily Time Zone 1  ¦
¦End Time  : 00:00  ¦
¦Set-point : 000.0 U%¦
+-------------------+

UMIDFAS2                               (CLOCK/TIME BANDS BRANCH)
+-------------------+                  Mask for the setting of time and set-point of the
¦--   Humidity   AL¦                   second humidity Time Zone.
¦Daily Time Zone 2  ¦
¦End Time  : 00:00  ¦
¦Set-point : 000.0 U%¦
+-------------------+

UMIDFAS3                               (CLOCK/TIME BANDS BRANCH)
+-------------------+                  Mask for the setting of time and set-point of the
```

```
|--    Humidity    AL|
|Daily Time Zone 3   |
|End Time  :  00:00  |
|Set-point : 000.0 U%|
+--------------------+
```

third humidity Time Zone.

UMIDFAS4
```
+--------------------+
|--    Humidity    AL|
|Daily Time Zone 4   |
|End Time  :  24:00  |
|Set-point : 000.0 U%|
+--------------------+
```

(CLOCK/TIME BANDS BRANCH)
Mask for the setting of time and set-point of the
fourth humidity Time Zone.

SETTEMP
```
+--------------------+
|--   Set  Point   AL|
|                    |
|                    |
|Temperature Set     |
|Point Value   00.0 _C|
+--------------------+
```

(SET-POINT BRANCH)
This is the first mask of the set-point branch you
can reach by pressing the "**Setpoint**" button. By

pressing the ⊕ and the ⊕ buttons you can move
within the loop which is composed of only another
mask. This mask allows temperature set-point
setting.

SETUMI
```
+--------------------+
|--   Set  Point   AL|
|                    |
|Humidity Set        |
|Point Value 000.0 U%|
+--------------------+
```

(SET-POINT BRANCH)
Mask for the setting of humidity set-point.

SERVPASS
```
+--------------------+
|    USER BRANCH   AL|
it
|Insert the          |
|Password Service    |
|            0000    |
+--------------------+
```

(USER BRANCH)
This is the first mask of the user branch you can
reach by pressing the "**Prog.**" button. In this mask

is necessary to set the user password correctly to
be able to move to the other masks of the branch.

GTEMP1
```
+--------------------+
|--   Temperature  AL|
|                    |
|Setting  Value of   |
|Proport.Differential|
|      00.0 _C       |
+--------------------+
```

(USER BRANCH)
First mask you can reach after the correct password
has been correctly set.

By pressing the ⊕ and the ⊕ buttons you can
move within the loop, but the Servpass mask will
come back no more. This mask allows the setting of
the Temperature Proportional band.

GTEMP11
```
+--------------------+
|--   Temperature  AL|
|Setting Value of    |
|Dead Zone :         |
|      00.0 _C       |
+--------------------+
```

(USER BRANCH)
Setting of temperature Dead Zone.

GTEMP2
```
+--------------------+
|--   Temperature  AL|
|Type of Regulation: |
|                    |
|    PROPORTIONAL    |
+--------------------+
```

(USER BRANCH)
Setting of the type of temperature regulation
whether Proportional or Proportional + Integral.

GTEMP3
```
+--------------------+
|--   Temperature  AL|
|Alarm Threshold     |
|High Temp.:  00.0 _C|
|Low Temp. :  00.0 _C|
+--------------------+
```

(USER BRANCH)
Setting of High/Low air temperature alarm
thresholds.

GTEMP5
```
+--------------------+
|--   Temperature  AL|
|Integration Time    |
|Regulation:         |
|    0000  seconds   |
+--------------------+
```

(USER BRANCH)
Integration time setting.

GTEMPES

(USER BRANCH)

```
+--------------------+                    Setting of Energy Saving set-point/differential.
¦-- Temperature   AL¦
¦Energy Saving      ¦
¦Set-point   :00.0 _C¦
¦Differential:00.0 _C¦
+--------------------+

SA                                        (USER BRANCH)
+--------------------+                    Setting of High/Low water temperature alarm
¦Water Temperature AL¦                    thresholds.
¦Alarm Threshold    ¦
¦High Temp.:  00.0 _C¦
¦Low Temp. :  00.0 _C¦
+--------------------+

COMPENS1                                  (USER BRANCH)
+--------------------+                    Setting of external air set-point for Energy
¦- Compensation   AL¦                     Saving.
¦Set Point External ¦
¦Air Temperature:   ¦
¦      00.0 _C:     ¦
+--------------------+

COMPENS2                                  (USER BRANCH)
+--------------------+                    Setting of compensation percentage.
¦-- Compensation  AL¦
¦Compensation       ¦
¦Percent. Regulation ¦
¦    000   U%:      ¦
+--------------------+

COMPENS3                                  (USER BRANCH)
+--------------------+                    Setting of the type of compensation whether Direct
¦-- Compensation  AL¦                     or Reverse.
¦Type of Compens.   ¦
¦                   ¦
¦       DIRECT      ¦
+--------------------+

UMID12                                    (USER BRANCH)
+--------------------+                    Setting of the humidity proportional band.
¦--    Humidity   AL¦
¦Setting of         ¦
¦Prop. Differential ¦
¦     000.0 U%      ¦
+--------------------+

UMID40                                    (USER BRANCH)
+--------------------+                    Setting of High/Low humidity thresholds.
¦--    Humidity   AL¦
¦Alarm Threshold    ¦
¦High  :   000.0 U%¦
¦Low   :   000.0 U%¦
+--------------------+

RIT_RES                                   (USER BRANCH)
+--------------------+                    Setting of delay between the activation of one
¦--   Heaters     AL¦                     heater and the activation of the next one if two
¦Delay between      ¦                     heaters have been selected.
¦Heaters Activation ¦
¦   0000   seconds  ¦
+--------------------+

RAMPE2                                    (USER BRANCH)
+--------------------+                    Setting of the values of activation/deactivation of
¦-Modulable Valves AL¦                    the cooling valve, if it has been selected.
¦Cooling Valve      ¦
¦Start :    000  U%¦
¦End   :    000  U%¦
+--------------------+

RAMPE6                                    (USER BRANCH)
+--------------------+                    Setting of the values of activation/deactivation of
¦-Modulable Valves AL¦                    the heating valve, if it has been selected.
¦Heating Valve      ¦
¦Start :    000  U%¦
¦End   :    000  U%¦
+--------------------+

RAMPE23                                   (USER BRANCH)
+--------------------+                    Setting of the values of activation/deactivation of
```

```
|- 3-Point Valves  AL|
|Cooling 3-P Valve   |
|Start  :     000 U%|
|End    :     000 U%|
+--------------------+
```
cooling 3-point valve, if it has been selected.

RAMPE43   **(USER BRANCH)**
```
+--------------------+
|- 3-Point Valves  AL|
|Heating 3-P Valve   |
|Start  :     000 U%|
|End    :     000 U%|
+--------------------+
```
Setting of the values of activation/deactivation of heating 3-point valve, if it has been selected.

RAMPE53   **(USER BRANCH)**
```
+--------------------+
|- 3-Point Valves  AL|
|Running Time of     |
|3-Point Valve :     |
|     000 seconds    |
+--------------------+
```
Setting of Running time or opening time of 3-point valves.

COMP1ED   **(USER BRANCH)**
```
+--------------------+
|--    Compressors AL|
|Compressor 1 (DE)   |
|Position   : 000 U% |
|Hysteresis : 000 U% |
+--------------------+
```
Setting of the values of activation/deactivation of the first compressor if only one compressor has been selected and the Energy Saving option has not been adopted.

COMP1ES   **(USER BRANCH)**
```
+--------------------+
|--    Compressors AL|
|Compressor 1  (ES)  |
|Position   : 000 U% |
|Hysteresis : 000 U% |
+--------------------+
```
Setting of the values of activation/deactivation of the first compressor if only one compressor has been selected and the Energy Saving option has not been adopted.

COMP1ED_2   **(USER BRANCH)**
```
+--------------------+
|--    Compressors AL|
|Compressor 1 (DE)   |
|Position   : 000 U% |
|Hysteresis : 000 U% |
+--------------------+
```
Setting of the values of activation/deactivation of the first compressor if two compressors have been selected and the Energy Saving option has not been adopted.

COMP2ED_2   **(USER BRANCH)**
```
+--------------------+
|--    Compressors AL|
|Compressor 2 (DE)   |
|Position   : 000 U% |
|Hysteresis : 000 U% |
+--------------------+
```
Setting of the values of activation/deactivation of

litati due compressors e Energy Saving non abilitato.

COMP1ES_2   **(USER BRANCH)**
```
+--------------------+
|--    Compressors AL|
|Compressor 1 (ES)   |
|Position   : 000 U% |
|Hysteresis : 000 U% |
+--------------------+
```
Setting dei valori di accensione e di spegnimento del primo compressor se abili- tati due compressors e Energy Saving abili- tato.

COMP2ES_2   **(USER BRANCH)**
```
+--------------------+
|--    Compressors AL|
|Compressor 2 (ES)   |
|Position   : 000 U% |
|Hysteresis : 000 U% |
+--------------------+
```
Setting of the values of activation/deactivation of the second compressor if two compressors have been selected and the Energy Saving option has been adopted.

PARZ1ED   **(USER BRANCH)**
```
+--------------------+
|- Partialisations AL|
|Partialis. 1 (DE)   |
|Position   : 000 U% |
|Hysteresis : 000 U% |
+--------------------+
```
Setting of the values of activation/deactivation of the first compressor partialisation if only one compressor has been selected and the Energy Saving option has not been adopted.

PARZ1ES   **(USER BRANCH)**
```
+--------------------+
|- Partialisations AL|
```
Setting of the values of activation/deactivation of the first compressor partialisation if only one

31

```
¦Partialis. 1  (ES)  ¦        compressor has been selected and the Energy Saving
¦Position   : 000 U% ¦        option has been adopted.
¦Hysteresis : 000 U% ¦
+--------------------+


PARZ1ED_2                     (USER BRANCH)
+--------------------+        Setting of the values of activation/deactivation of
¦- Partialisations AL¦        the first compressor partialisation if two
¦Partialis. 1  (DE)  ¦        compressors have been selected and the Energy
¦Position   : 000 U% ¦        Saving option has not been adopted.
¦Hysteresis : 000 U% ¦
+--------------------+


PARZ2ED_2                     (USER BRANCH)
+--------------------+        Setting of the values of activation/deactivation of
¦- Partialisations AL¦        the second compressor partialisation if only one
¦Partialis. 2  (DE)  ¦        compressor has been selected and the Energy Saving
¦Position   : 000 U% ¦        option has not been adopted.
¦Hysteresis : 000 U% ¦
+--------------------+


PARZ1ES_2                     (USER BRANCH)
+--------------------+        Setting of the values of activation/deactivation of
¦- Partialisations AL¦        the first compressor partialisation if two
¦Partialis. 1  (ES)  ¦        compressors have been selected and the Energy
¦Position   : 000 U% ¦        Saving option has been adopted.
¦Hysteresis : 000 U% ¦
+--------------------+


PARZ2ES_2                     (USER BRANCH)
+--------------------+        Setting of the values of activation/deactivation of
¦- Partialisations AL¦        the second compressor partialisation if two
¦Partialis. 2  (ES)  ¦        compressors have been selected and the Energy
¦Position   : 000 U% ¦        Saving option has been adopted.
¦Hysteresis : 000 U% ¦
+--------------------+


RIT_COMP1                     (USER BRANCH)
+--------------------+        Setting of the minimum time lapse between the
¦--   Compressors  AL¦        deactivation and the activation of the same
¦Minimum Run-Time    ¦        compressor.
¦Before Comp. Stop : ¦
¦    0000   seconds  ¦
+--------------------+


RIT_COMP2                     (USER BRANCH)
+--------------------+        Setting  of the minimum working time of the single
¦--   Compressors  AL¦        compressor .
¦Compressor Working  ¦
¦Minimum Time:       ¦
¦    0000   seconds  ¦
+--------------------+


RIT_COMP3BIS                  (USER BRANCH)
+--------------------+        Setting of the minimum time lapse between a start
¦--   Compressors  AL¦        and the following one of the same compressor.
¦Time Between Starts ¦
¦of Same Compressor: ¦
¦    0000   seconds  ¦
+--------------------+


RIT_COMP3                     (USER BRANCH)
+--------------------+        Setting of the necessary time to detect the low
¦--   Compressors  AL¦        pressure alarm.
¦Low Pressure Alarm  ¦
¦Delayed for:        ¦
¦    0000   seconds  ¦
+--------------------+


RIT_COMP4                     (USER BRANCH)
+--------------------+        Setting of the minimum time lapse between the start
¦--   Compressors  AL¦        of one compressor and the start of the following
¦Time Between Starts ¦        one if two compressors have been selected.
¦of 2 Different Comp.¦
¦    0000   seconds  ¦
+--------------------+


COMPROT                       (USER BRANCH)
+--------------------+        Setting of compressors rotation.
¦--   Compressors  AL¦
¦Automatic Rotation  ¦
```

32

```
|of Compressors       |
|Enabled?          No|
+--------------------+
```

DEU
```
+--------------------+
|--    Compressors AL|
|For Dehumidification|
|Compressor 1   N.E. |
|Compressor 2   N.E. |
+--------------------+
```
(USER BRANCH)
Mask for the setting of any use of one or two
compressors (if selected) for dehumidification.

DEUMID
```
+--------------------+
|-- Humidification AL|
|Dehumidification by |
|Partialising Valve  |
|Enabled?          No|
+--------------------+
```
(USER BRANCH)
This mask will be displayed only if you have
answered "Yes" in almost one of the compressors.
In this mask the use of the partialising valve for
dehumidification is adopted.

DEUMID1
```
+--------------------+
|-- Humidification AL|
|Dehumidification    |
|Through Fan Speed   |
|Reduction?        No|
+--------------------+
```
(USER BRANCH)
This mask too will be displayed only if you have
answered "Yes" in almost one of the compressors.
It allows dehumidification through fan speed
reduction and automatic deletion of the preceding
mask selection.

NEWSERVP
```
+--------------------+
|-Password Setting AL|
|Change Service      |
|Password            |
|            0000    |
+--------------------+
```
(USER BRANCH)
Setting of a new user Password which becomes an
alternative to the already existing one, but does
not substitute it.

GESTMAN
```
+--------------------+
|--   Manual      AL|
|                    |
|Manual Management   |
|                    |
|Enabled?            |
|            No      |
+--------------------+
```
(MANUAL MANAGEMENT BRANCH)
This is the first mask of the manual management
branch you can reach by pressing the "**Menu**" button
and the "**Set**" button together. By pressing the ▲
and the ▼ buttons you can move within the loop.
This mask allows the setting of the manual
management and of all the masks in the loop.

MANRES
```
+--------------------+
|--    Manual     AL|
|Heater 1     N.E.   |
|Heater 2     N.E.   |
|                    |
+--------------------+
```
(MANUAL MANAGEMENT BRANCH)
Mask for the manual activation of the heaters if
they have been selected.

MANCOMPR
```
+--------------------+
|--    Manual     AL|
|Compressor 1   N.E. |
|Compressor 2   N.E. |
|                    |
+--------------------+
```
(MANUAL MANAGEMENT BRANCH)
Mask for the manual activation of the compressors
if they have been selected.

MANRAMPE
```
+--------------------+
|--    Manual     AL|
|Cooling Valve N.E. 0|
|Heating Valve N.E. 0|
|                    |
+--------------------+
```
(MANUAL MANAGEMENT BRANCH)
Mask for the manual activation of the heating and
the cooling valve..

MANVAL3F
```
+--------------------+
|--    Manual     AL|
|Cooling 3-P Valve:  |
|Open            No  |
|Close           No  |
+--------------------+
```
(MANUAL MANAGEMENT BRANCH)
Mask for the manual activation of the cooling 3-
point valve.

MANUAL3C
```
+--------------------+
|--    Manual     AL|
|Heating 3-p Valve:  |
```
(MANUAL MANAGEMENT BRANCH)
Mask for the manual activation of the heating 3-
point valve.

```
¦Open           No ¦
¦Close          No ¦
+------------------+
```

COSTPASS
```
+--------------------+
¦-MANUFACT. BRANCH AL¦
¦Insert the          ¦
¦Manufacturer        ¦
¦                    ¦
¦Password:     0000  ¦
¦                    ¦
+--------------------+
```
(MANUFACTURER BRANCH)
This is the first mask of the manufacturer branch
you reach by pressing the "**Menu**" button and the
"**Prog.**" button together. If the password has been
correctly set, you will reach the manufacturer

branch where you can move by pressing the ▲ and

the ▼ buttons.

GESTSON
```
+--------------------+
¦                  AL¦
¦      Probes        ¦
¦    Management      ¦
¦                    ¦
+--------------------+
```
(MANUFACTURER BRANCH)
This mask informs you that the following masks are
used to activate/deactivate the probes with the
exception of the temperature probe which is always
activated.

SONDUIN
```
+--------------------+
¦--       Probes   AL¦
¦                    ¦
¦Is Humidity Probe   ¦
¦Present?          No¦
+--------------------+
```
(MANUFACTURER BRANCH)
Activation of the Humidity probe.

SONDARIA
```
+--------------------+
¦--     Probes     AL¦
¦Is Outlet Air       ¦
¦Temperature Probe   ¦
¦Present?          No¦
+--------------------+
```
(MANUFACTURER BRANCH)
Activation of outlet air temperature probe.

SONDH2O
```
+--------------------+
¦--     Probes     AL¦
¦Is Outlet Water     ¦
¦Temperature Probe   ¦
¦Present?          No¦
+--------------------+
```
(MANUFACTURER BRANCH)
Activation of outlet water temperature probe.

SONDH2OIN
```
+--------------------+
¦--     Probes     AL¦
¦Is Inlet Water      ¦
¦Temperature Probe   ¦
¦Present?          No¦
+--------------------+
```
(MANUFACTURER BRANCH)
Activation of inlet water temperature probe.

--WARNING--
**By answering YES to one of the masks SONDH-
2OIN or SONDARIAIN you obtain the automatic
disappearance of the other, because only one
of the two probes can be activated.**

SONDARIAIN
```
+--------------------+
¦--     Probes     AL¦
¦Is External Air     ¦
¦Temperature Probe   ¦
¦Present?          No¦
+--------------------+
```
(MANUFACTURER BRANCH)
Activation of external air temperature probe.

GESTRES
```
+--------------------+
¦0~                AL¦
¦      Heaters       ¦
¦    Management      ¦
¦                    ¦
¦                    ¦
+--------------------+
```
(MANUFACTURER BRANCH)
This mask informs you that the following masks
allow or not the activation of heaters.

RESINS
```
+--------------------+
¦--   Heaters      AL¦
¦ Type of Insertion? ¦
¦                    ¦
¦       STANDARD     ¦
+--------------------+
```
(MANUFACTURER BRANCH)
Selection of the binary heaters insertion.

NUMRES
```
+--------------------+
¦--   Heaters      AL¦
¦Number of Heaters   ¦
```
(MANUFACTURER BRANCH)
This mask is selected if you have not answered
affirmatively to the preceding mask.
In this mask you can activate only one heater, two

```
¦To Be Inserted:    ¦          heaters or no heaters.
¦          0        ¦
+-------------------+


RAMPAFRE                      (MANUFACTURER BRANCH)
+-------------------+         Activation of the cooling valve.
¦-Modulable Valves AL¦
¦                   ¦
¦Cooling Valve      ¦
¦Enabled?        No¦
+-------------------+


RAMPAFES                      (MANUFACTURER BRANCH)
+-------------------+         This mask is selected if the cooling valve in the
¦--  Cooling Valve AL¦        preceding mask has been activated.
¦Energy-Saving      ¦         It allows activation of the valve in case the
¦Enabled:           ¦         Energy Saving option has been adopted.
¦(Yes/No)?       No¦
+-------------------+


COM_ES                        (MANUFACTURER BRANCH)
+-------------------+         This mask too is selected if the cooling valve in
¦-Modulable Valves AL¦        the RAMPAFRE mask has been activated.
¦Are Compressors    ¦         It allows activation of the compressors even
¦Enabled also with  ¦         together with the cooling valve.
¦Valve on ES ?    No¦
+-------------------+


RAMPACAL                      (MANUFACTURER BRANCH)
+-------------------+         Activation of the heating valve.
¦-Modulable Valves AL¦
¦                   ¦
¦Heating Valve      ¦
¦Enabled?        No¦
+-------------------+


GESTCOMP                      (MANUFACTURER BRANCH)
+-------------------+         This mask informs that the following masks are used
¦                AL¦          to activate compressors and their main functions.
¦     Compressors   ¦
¦     Management    ¦
¦                   ¦
¦                   ¦
+-------------------+


NUMCOMPR                      (MANUFACTURER BRANCH)
+-------------------+          In this mask you can select the number of
¦--  Compressors  -AL¦        compressors to be inserted.
¦Compressors Number ¦
¦to be Inserted:(0-2)¦
¦          0        ¦
+-------------------+


PARZCOMP                      (MANUFACTURER BRANCH)
+-------------------+         This mask is always activated except when no
¦--   Compressors  AL¦        compressors have been activated.
¦                   ¦         It is used to activate partialisations.
¦Compressors Are    ¦
¦Partialised?     No¦
+-------------------+


RAMPAFIN                      (MANUFACTURER BRANCH)
+-------------------+         This mask is selected only if no compressors have
¦- 3-Point Valves  AL¦        been activated.
¦Cooling 3-P Valve  ¦         It is used to activate or not the cooling 3-point
¦Enabled?           ¦         valve.
¦          No       ¦
+-------------------+


RAMPACIN                      (MANUFACTURER BRANCH)
+-------------------+         This mask is selected only if no heaters have been
¦- 3-Point Valves  AL¦        activated.
¦Heating 3-P Valve  ¦         It is used to activate or not the heating 3-point
¦Enabled?           ¦         valve.
¦          No       ¦
+-------------------+


PROSPE                        (MANUFACTURER BRANCH)
+-------------------+         This mask informs you that the following masks are
¦                AL¦          used for Back-up memory clearing, default values
¦     Special       ¦         setting, run-time values etc. ...
¦     Procedures    ¦
```

```
¦                        ¦
+--------------------+
```

INSCONF
```
+--------------------+
¦- Special Proced. AL¦
¦                    ¦
¦Configuration       ¦
¦Installing?       No¦
+--------------------+
```
(MANUFACTURER BRANCH)
Mask for clearing and for Default values setting in
Back-up memory.

RITACCEN
```
+--------------------+
¦- Special Proced. AL¦
¦Delay for the First ¦
¦Start:              ¦
¦     0000  seconds  ¦
+--------------------+
```
(MANUFACTURER BRANCH)
In this mask you can select the delay for the first
start-up.

RITALL
```
+--------------------+
¦- Special Proced. AL¦
¦Delay of Overshot   ¦
¦Threshold Alarm:    ¦
¦     0000  seconds  ¦
+--------------------+
```
(MANUFACTURER BRANCH)
In this mask you can select a delay in the
detection of all overshot threshold alarms.

IDENTNUM
```
+--------------------+
¦- Special Proced. AL¦
¦   Identification   ¦
¦      Number :      ¦
¦          000       ¦
+--------------------+
```
(MANUFACTURER BRANCH)
In this mask you can select the identification
number for supervisory network connection.

REMOTO
```
+--------------------+
¦- Special Proced. AL¦
¦                    ¦
¦Remote ON/OFF       ¦
¦Enabled?          No¦
+--------------------+
```
(MANUFACTURER BRANCH)
In this mask you can activate the remote ON-OFF
(DIN8).

RITORNO
```
+--------------------+
¦Automatic Return  AL¦
¦to Menu Delayed for ¦
¦                    ¦
¦   000 seconds      ¦
+--------------------+
```
(MANUFACTURER BRANCH)
Setting of the delay in the automatic return to the
menu mask. If you leave it in 0 position, there
will not be the automatic return to the menu mask.

NEWCOST
```
+--------------------+
¦- New Password    AL¦
¦Change Manufacturer ¦
¦Password            ¦
¦            0000    ¦
+--------------------+
```
(MANUFACTURER BRANCH)
Setting of a personal manufacturer password, which
is an alternative to the already existing one, but
which does not substitute it.

```
AL1                            AL2                            AL3
+-------------------+          +-------------------+          +-------------------+
|                   |          |                   |          |                   |
|   General  Alarm  |          |   General  Alarm  |          |  Pressostat       |
|   Compressor  1   |          |   Compressor  2   |          |  Low Pressure 1   |
|                   |          |                   |          |                   |
+-------------------+          +-------------------+          +-------------------+
High pressure/Overload         High pressure/Overload
alarm compressor 1.            alarm compressor 2.

AL4                            AL5                            AL7
+-------------------+          +-------------------+          +-------------------+
|                   |          |    SERIOUS ALARM  |          |    SERIOUS ALARM  |
|  Pressostat       |          |      Air Flow     |          |     Fan Overload  |
|  Low Pressure 2   |          |                   |          |                   |
|                   |          |**    UNIT OFF  **|          |**   UNIT OFF   **|
+-------------------+          +-------------------+          +-------------------+
                                Owing to these two alarms the controller is deactivated
                                and, when the alarm stops, the controller must be
                                activated with manual procedures.

AL10                           AL10_11
+-------------------+          +-------------------+
|                   |          |                   |
|      -Alarm-      |          |      -Alarm-      |
|  Heater 1 Overload|          |  Heater 2 Overload|
|                   |          |                   |
+-------------------+          +-------------------+

AL12                           AL14
+-------------------+          +-------------------+
|                   |          |                   |
|   SERIOUS ALARM   |          |      -Alarm-      |
|                   |          |   Clogged Filter  |
|**    UNIT OFF  **|          |                   |
+-------------------+          +-------------------+

AL20                           AL21                           AL22
+-------------------+          +-------------------+          +-------------------+
|                   |          |                   |          |                   |
|      -Alarm-      |          |      -Alarm-      |          |      -Alarm-      |
|  High Temperature |          |  Low Temperature  |          |   High Humidity   |
|                   |          |                   |          |                   |
+-------------------+          +-------------------+          +-------------------+

AL23
+-------------------+
|                   |
|      -Alarm-      |
|    Low Humidity   |
|                   |
+-------------------+

AL28                           AL29
+-------------------+          +-------------------+
|                   |          |                   |
|      -Alarm-      |          |      -Alarm-      |
|   Working  Hours  |          |   Working  Hours  |
|   Compressor 1    |          |   Compressor 2    |
+-------------------+          +-------------------+
The working hours threshold set in the  maintenance branch has been overshot and the
device/s need maintenance.

AL30_1
+-------------------+
|                   |
|      -Alarm-      |
|   Working  Hours  |
|       Fan         |
+-------------------+
AL35                           AL36                           AL38
+-------------------+          +-------------------+          +-------------------+
|                   |          |                   |          |                   |
|      -Alarm-      |          |      -Alarm-      |          |   -Probe Alarm-   |
|  High Temperature |          |  Low Temperature  |          |  Temperature Probe|
|    Outlet Water   |          |    Outlet Water   |          |  Faulty/Disconnected|
|-------------------+          +-------------------+          +-------------------+

AL39                           AL41
```

```
+-------------------+        +-------------------+
¦    -Probe Alarm-  ¦        ¦    -Probe Alarm-  ¦
¦ Outlet Air        ¦        ¦ Outlet Water      ¦
¦ Temperature Probe ¦        ¦ Temperature Probe ¦
¦ Faulty/Disconnected¦       ¦ Faulty/Disconnected¦
+-------------------+        +-------------------+
```

AL43   **WARNING**   AL43A
```
+-------------------+                                   +-------------------+
¦    -Probe Alarm-  ¦                                   ¦    -Probe Alarm-  ¦
¦External Air       ¦                                   ¦ Ambient Humidity  ¦
¦Temperature Probe  ¦                                   ¦ Probe             ¦
¦Faulty/Disconnected¦                                   ¦ Faulty/Disconnected¦
+-------------------+                                   +-------------------+
```

In the AL43 mask you can see the message indicated or the message of Faulty Inlet Water Probe according to the selection effected.

AL44
```
+-------------------+
¦                   ¦
¦  Wrong Checksum   ¦
¦  Call Assistance  ¦
¦                   ¦
+-------------------+
```

AL45   M_ALL_IO   AL47
```
+-------------------+        +-------------------+      +-------------------+
¦   SERIOUS ALARM   ¦        ¦                   ¦      ¦                   ¦
¦   Damaged Eeprom  ¦        ¦     Error  In     ¦      ¦     No Alarm      ¦
¦   Call Assistance ¦        ¦     Interface     ¦      ¦                   ¦
¦**   UNIT OFF   **¦         ¦     Management     ¦      ¦                   ¦
+-------------------+        +-------------------+      +-------------------+
```
Alarm of damaged Back-up   Alarm of error in the
memory   management of I/O

4. COMPONENTS AND CODES

4.1 LIST OF COMPONENTS

In the STANDARD A/C UNITS the following devices are available:

- user interface: cod. **PCOT000CB0**   LCD "4X20"
                               cod. **PCOT00SCB0**   LCD "4X20" with printer connection set up

- *eprom*:   cod. **EPSTDECZOO**

- *pCO control board*:   cod. **PCOB000A00**   plug-in connectors
                               cod. **PCOB000B00**   fixed screw connectors

- *connetting cable interface/main board*:
                               cod. **S90CONN002**   0,8m
                               cod. **S90CONN000**   1,5m
                               cod. **S90CONN001**   3m

- *probes*:   of different type and code according to requirements.

Carel reserves the right to modify its products without prior notice.

Note: _____

CAREL
Technology & Evolution

Agency: