AIR BLUE "MICROCHILLER" MICROPROCESSOR FOR GAMMA AND LAMBDA

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User manual

CE
1370

AIR BLUE
air conditioning

Index

AIRBLUE MICROPROCESSOR

1. GENERAL DESCRIPTION

The **AIRBLUE MICROPROCESSOR** is a controller designed for the operation of AIR-TO-AIR air conditioning units.
The controller manages all the functions of the air conditioner or heat pump, such as the operation and control of the fans (based on condensation temperature), system timing and alarms.
For customers requiring total security, the **AIRBLUE MICROPROCESSOR** can also operate without a user interface. This means that the person in charge of the system can programme it, remove the user interface (because the controller is made up of two distinct parts) and leave the power card to manage the unit, secure in the knowledge that no-one can change the data that has been entered.
Thanks to an optional electronic card, the **AIRBLUE MICROPROCESSOR** can be connected to a computer, thus giving access to supervision and teleassistance services for the purpose of complete remote management, supervision and maintenance of the units.
The **AIRBLUE MICROPROCESSOR** is equipped with a memory for the SUMMER-WINTER and ON-OFF functions and all the saved parameters that are maintained even when the power supply is OFF, so that when it is switched back on, the unit resumes the state that it was in before switch-off.

2. PRELIMINARY NOTES

The **AIRBLUE MICROPROCESSOR** controller takes the form of two integrated systems:
- base: containing the controller, inputs and outputs
- terminal: which acts as a user interface.

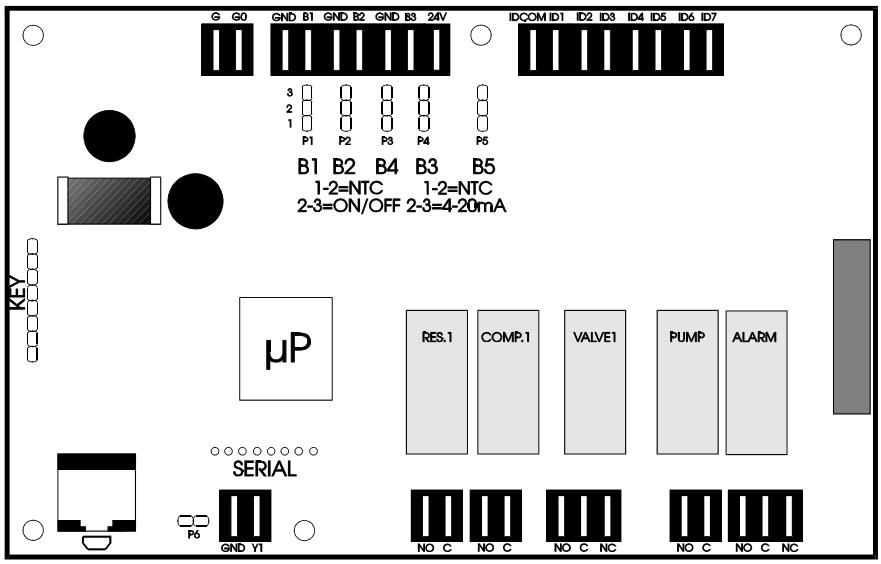
Optional cards for the auxiliary functions can be connected to these two main parts.

2.1. Single-compressor main card (Gamma unit)

The main card is the heart of the system, and processes the signals it receives from the probes. The card for managing a single compressor (Gamma unit) can be connected to the module for managing a second compressor (Lambda unit).

The card is divided into the following connection "areas", viewed clockwise:

- terminals **G** and **G0** for connecting the power supply (24VAC)
- the analogue inputs (from **B1** to **B3**) for connecting the probes
- the **24V** terminal (DC) for powering any pressure probes
- the digital inputs (from **ID1** to **ID7**) for connecting the alarms
- the relay-type digital outputs for controlling the various controlled devices
- the analogue output **Y1**, **GND** for connecting the optional cards for managing the condensation fans (ON/OFF or continuously variable speed)
- the telephone connector for connecting the user terminal



There are a further three important areas in the card:

- the **SERIAL** jumper for connecting an optional serial card for interfacing with a centralised supervision and/or teleassistance system
- the **KEY** jumper for connecting to an optional card (removable hardware key) for immediate programming of all the data
- the jumpers for selecting the operating mode of the analogue inputs
- jumper P1 associated with analogue output Y1 (see 4.7)

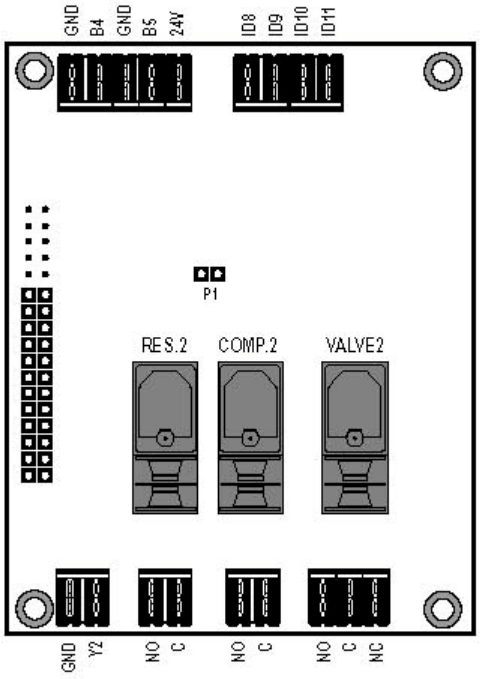
The card is designed to support two connected terminals, thus offering access from two separate points. By contrast, it is also possible to operate without connected terminals, thus guaranteeing total data security.

2.2. Second compressor card (Lambda unit)

The second compressor card is an expansion of the main card. In this case, only the "COMP.2" terminal needs to be connected.

The connection areas, viewed clockwise, are as follows:

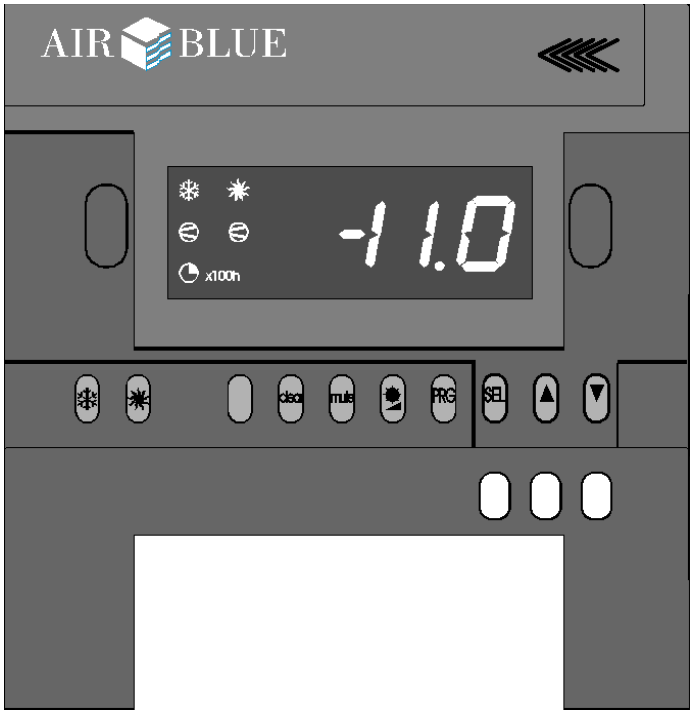
- the analogue inputs (B4 and B5) for connecting the probes (for the second circuit);
- the 24VDC terminal for powering any pressure probes;
- the digital inputs (from ID8 to ID11) for connecting the safety devices (for the second circuit);
- the relay-type digital outputs for controlling the various controlled devices;
- the analogue output Y2 GND for connecting the optional cards for managing the condensation fans (ON/OFF or continuously variable speed);
- the connector with flat cable for connecting to the single-compressor card;
- the jumper P1 for analogue output Y2 (to be left normally open, except in the cases defined for parameters F3 and F4).



3. User interface (terminal)

The terminal gives the user access to the machine data. It normally displays the temperature measured by the coil regulator probe (i.e. the evaporator air input temperature). Amongst other features, the terminal can be fitted with an optional card to enable remote use from a location up to 150 m from the main card.

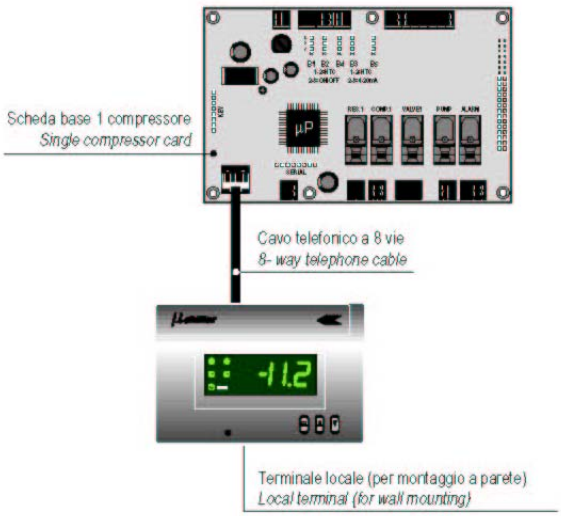
The terminal supports the use of a remote control, if desired, for quicker programming of the conditioning unit. There are 5 LEDs to indicate the operating state of the system (summer/winter), the state of the compressor (ON/OFF) and the number of compressor operating hours after the first 100 hours.
The version of the remote terminal for wall-mounting can be fitted with an optional card next to the single-compressor card, so as to enable remote use from a location up to 150 m away.
An internal buzzer (which can be disabled by means of a microswitch or when setting the relevant parameter) indicates any system operating anomalies.



3.1. Connections

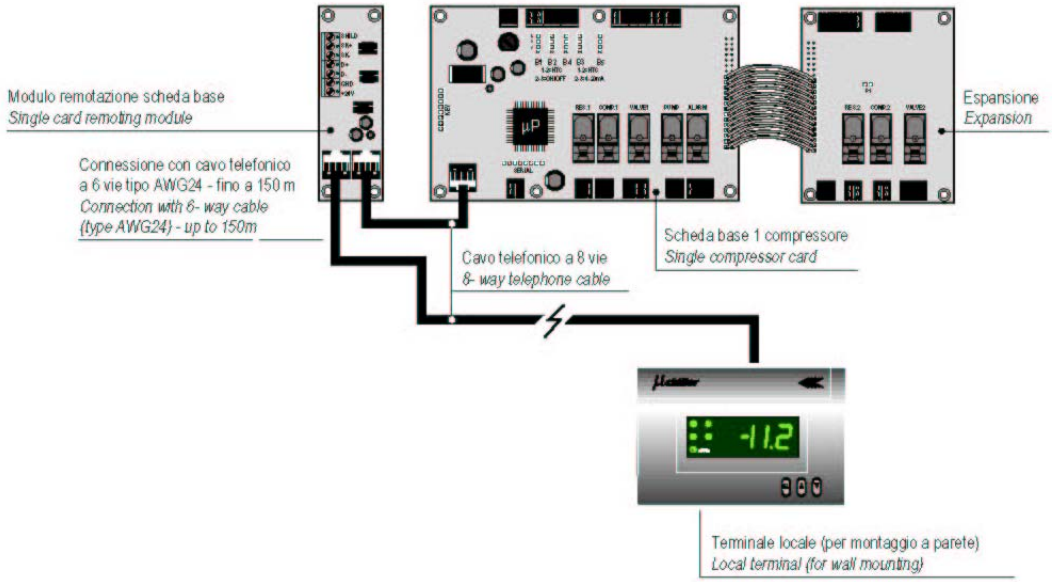
3.1.1. *Gamma unit local terminal*

The local terminal, installed on a panel on the Gamma unit, is connected to the main card by means of an 8-way telephone cable of not more than 3 m in length.



3.1.2. *Lambda unit local terminal*

The local terminal, installed on a panel on the Gamma unit, is connected to the main card by means of an 8-way telephone cable of not more than 3 m in length and the main card remoting module.



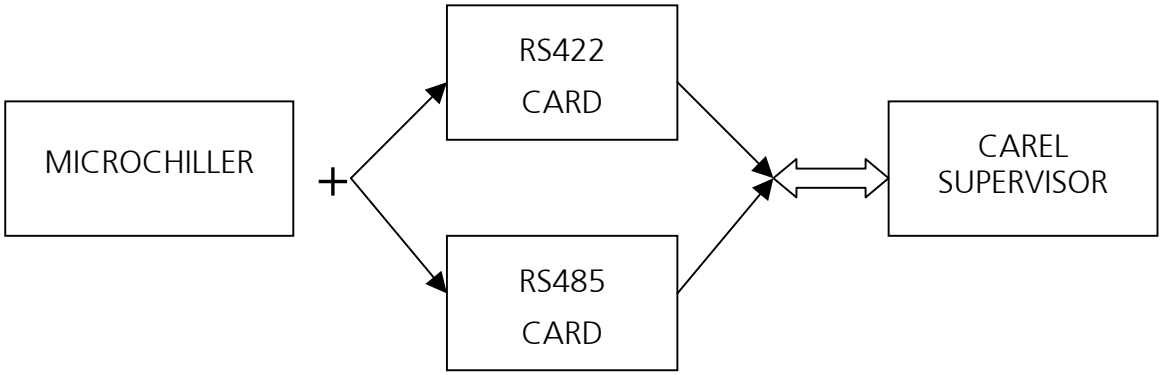
3.1.3. *Remote terminal*

In addition to the permanently present remote terminal, it is possible to connect a further remote terminal. To connect a remote terminal it is necessary to install a further card (main card remoting module). The connection between the main card remoting module and the remote terminal must be executed with an AWG24 6-way telephone cable at a maximum distance of 150 m.

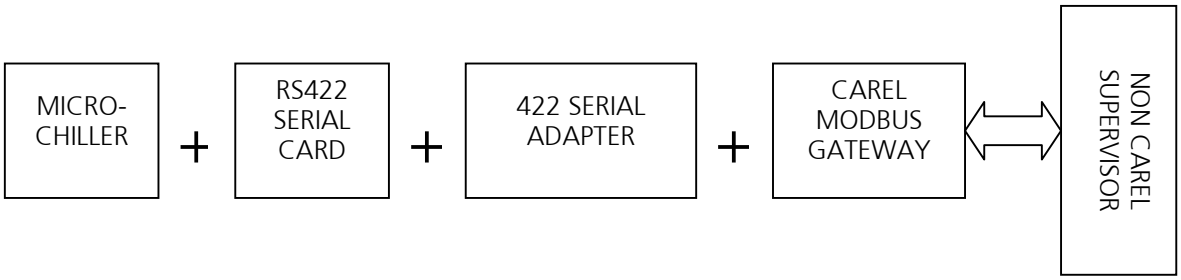
3.1.4. *Serial connection*

The serial connection to the supervision systems can be of two main types:

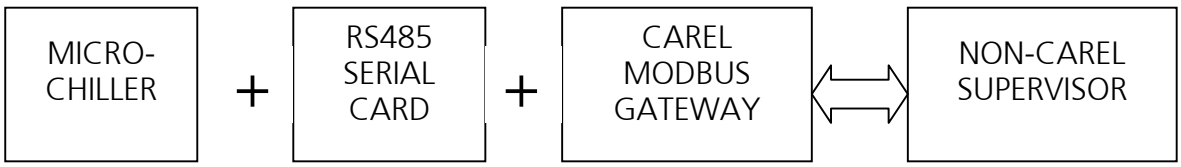
- to Carel supervisor system:



- to a non-Carel supervisor system:
  e.g. RS422 with MODBUS



  e.g. RS485 with MODBUS



3.2. *Inputs and outputs.*

Below is a list of inputs and outputs, with corresponding connector.

CONNECTOR	*MEANING*
B1-GND	*Ambient air probe*
B2- GND	*---*
B3- GND	*Circuit 1 condensation control probe (or defrost control in heat pump mode)*
B4- GND	*---*
B5- GND	*Circuit 2 condensation control probe (or defrost control in heat pump mode)*
ID1-IDCOM	*Circuit 1 high pressure switch*
ID2-IDCOM	*Circuit 1 low pressure switch*
ID3-IDCOM	*Circuit 1 compressor thermal cut-out*
ID4-IDCOM	*End defrosting contact circuit 1 (HP vers. only)*
ID5-IDCOM	*Air flow switch + fan overload cut-out*
ID6-IDCOM	*ON/OFF from external contact*
ID7-IDCOM	*Summer cooling/winter (heating) selection from external contact*
ID8-IDCOM	*Circuit 2 high pressure switch*
ID9-IDCOM	*Circuit 2 low pressure switch*
ID10-IDCOM	*Circuit 2 compressor thermal cut-out*
ID11-IDCOM	*Circuit 2 end defrosting contact (HP vers. only)*
Y1-GND	*PWM analogue output for circuit 1 condensation fan (speed regulator ON/OFF)*
Y2-GND	*PWM analogue output for circuit 2 condensation fan (speed regulator ON/OFF)*
RES.1	*---*
RES.2	*---*
COMP.1	*Circuit 1 compressor*
COMP.2	*Circuit 2 compressor*
VALVE 1	*Circuit 1 cycle inversion valve*
VALVE 2	*Circuit 2 cycle inversion valve*
PUMP	*Fans*
ALARM	*Remote indication of generic alarm*

4. USER INTERFACE

4.1. Display

The display consists of 3 digits with automatic display of the decimal point between -19.9 and +19.9°C. Outside this range, the temperature is automatically displayed without the decimal point (although internally, the unit continues to take account of the decimal). In normal operation, the figure displayed is the temperature read by the coil probe, i.e. the ambient air temperature.

4.2. Information on the state of the machine

The information on the state of the machine is displayed by means of 5 LEDs on the terminal display and two LEDs (yellow and green) on the main card.

4.2.1. *Meaning of display LEDs on single-compressor machine.*

LED	Flashing	Continuously lit
Comp. (LH)	not used	not used
Comp. (RH)	Compressor required	Compressor activated
Summer	-	Cooling mode
Winter	-	Heat pump mode
x100	-	Value *100

4.2.2. *Meaning of display LEDs with twin-compressor machine.*

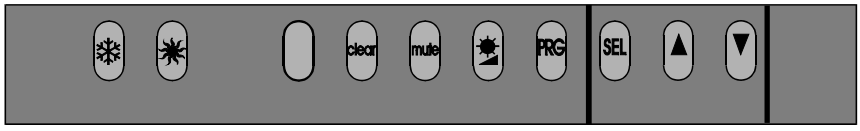
LED	Flashing	Continuously lit
Comp. (LH)	Comp. 1 required	Comp. 1 activated
Comp. (RH)	Comp. 2 required	Comp. 2 activated
Summer	-	Cooling mode
Winter	-	Heat pump mode
x100	-	Value *100

4.2.3. *Yellow and green LEDs on main card*

The yellow LED provides information about the correct operation of the machine. During normal operation, it flashes approximately once per second; if an alarm state is present (see table below) the speed of flashing doubles (twice per second). If the LED is OFF, the unit is not powered up.
The green LED provides information about communication with the connected terminal. It is switched off in the event of a communication error with the terminal (normally due to a problem with a cable or a poor contact between the cable and corresponding female telephone connectors on the main card or terminal).

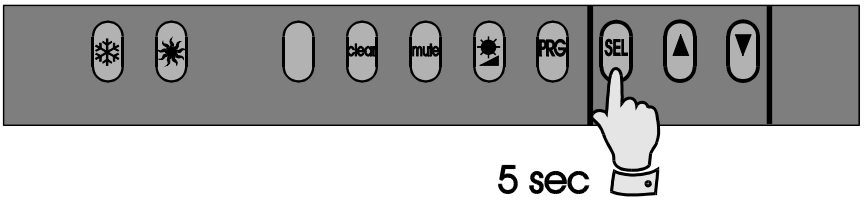
4.3. Keypad

The keypad is used for setting the operating parameters of the machine. It consists of a number of different keys so as to facilitate use.
The function of each key is set out below.



4.3.1. *Controls and displays.*

- **<u>Access mode to Set Point and main control parameters for machine operation (DIRECT parameters).</u>**

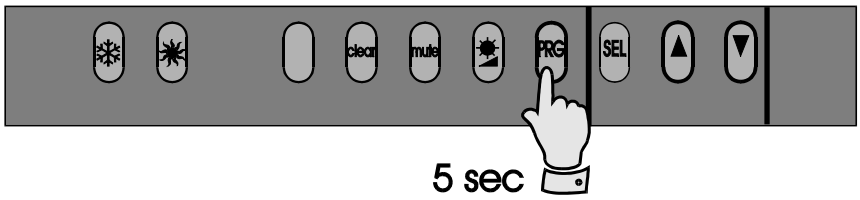


To display the summer and winter set points and the main control parameters for the machine (which we will refer to as DIRECT parameters), press SEL for at least 5 seconds; the display will show the code of the first available DIRECT parameter, i.e. the summer set point.
To scroll through all the DIRECT parameters, press the UP and DOWN keys.
To display the value of the desired DIRECT parameter, press SEL again, and change the value if you wish, by pressing the UP and DOWN keys.
To save the changes and exit the procedure, press PRG; or press SEL to go back to the DIRECT parameter menu.

In parameter setting mode, if you do not touch the keypad for a few seconds, the display starts flashing.

If no key is pressed within 60 seconds of entering parameter setting mode, the system returns to normal operating mode without saving any changes that may have been made.

- **Access mode to USER parameters.**



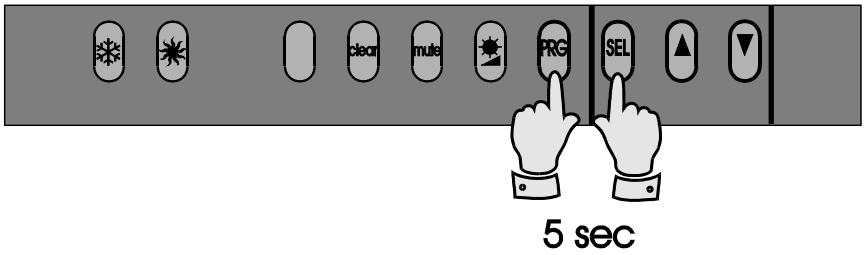
To access the USER parameter (i.e. the machine's working parameters) set-up menu, press PRG for at least 5 seconds (only when the buzzer is OFF). This level is password-protected to prevent access to data by unauthorised persons.

Setting the password: When the figure "00" flashes on the display, set a password by pressing the UP and DOWN keys, and then press SEL to go to the User level.
During the password setting procedure, if no key is pressed for a few seconds, the display starts flashing.

Selecting USER parameters: the display shows the code of the first available User parameter.
To scroll through all the User parameters, press UP or DOWN.
To display the value of the desired User parameter, press SEL and change the value if you wish by means of the UP and DOWN keys.
To save the changes and exit the procedure, press PRG; or press SEL to return to the User parameter selection menu.
In parameter setting mode, if no key is pressed for a few seconds, the display starts flashing.

If no key is pressed within 60 seconds of entering parameter setting mode, the system returns to normal operating mode without saving any changes that may have been made.

- **Access mode to FACTORY parameters.**



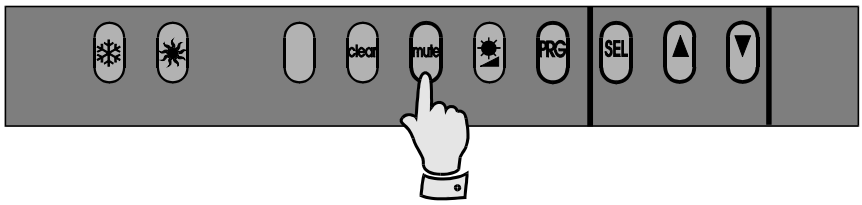
To access the FACTORY parameter (i.e. the machine configuration parameters) set-up menu, press PRG and SEL down for at least 5 seconds. This level is protected by a different password from the USER password so as to allow only authorised persons to access the data.

Setting the password: When the figure "00" flashes on the display, set a password by pressing the UP and DOWN keys, and then press SEL to go to the Factory level.
During the password setting procedure, if no key is pressed for a few seconds, the display starts flashing.

Selecting FACTORY parameters: the display shows the code of the first parameter. To scroll through all the parameters, press UP or DOWN.
To display the value of the desired Factory parameter, press SEL and change the value if you wish, by means of the UP and DOWN keys.
To save the changes and exit the procedure, press PRG; or press SEL to return to the Factory parameter selection menu.
In parameter setting mode, if no key is pressed for a few seconds, the display starts flashing.

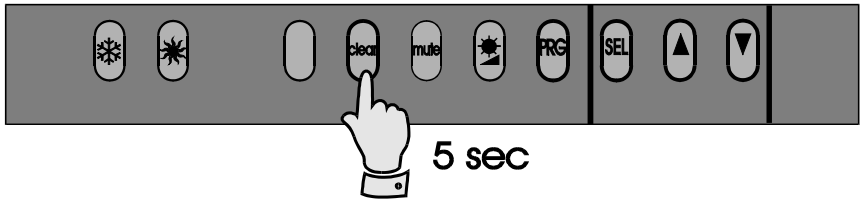
If no key is pressed within 60 seconds of entering parameter setting mode, the system returns to normal operating mode without saving any changes that may have been made.

- **Switching off the BUZZER**



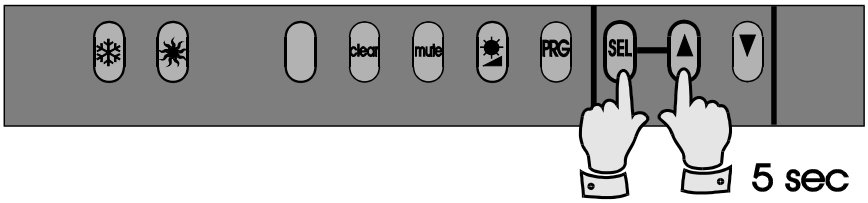
If the buzzer is ON you can switch it off by pressing MUTE.

- **Resetting ALARMS**



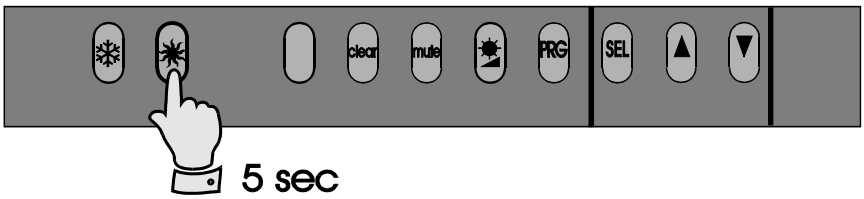
To clear any alarms from the memory (manual reset) and switch off the display message and alarm relay, press CLEAR for 5 seconds.

- **Running a forced defrosting CYCLE**



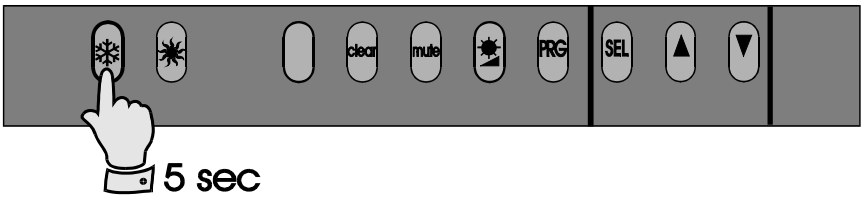
To run a forced defrosting cycle (if the temperature/pressure of the outdoor exchanger allows it, i.e. they are below the end of defrosting threshold), press SEL and UP for at least 5 seconds.

- **Switching COOLING (summer mode) ON and OFF**



To switch summer mode ON or OFF, press UP for at least 5 seconds. It is not possible to switch directly from winter mode to summer mode: if the machine was in winter mode, pressing UP has no effect.

- **Switching HEATING (winter mode) ON and OFF**

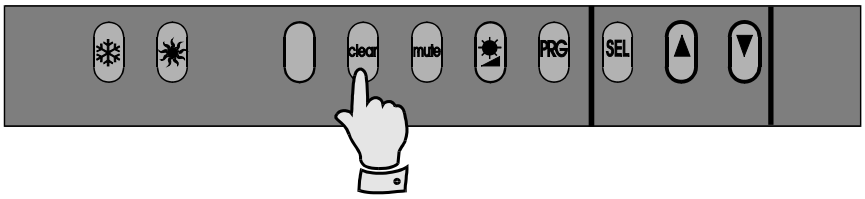


To switch winter mode ON or OFF, press DOWN for at least 5 seconds. It is not possible to switch directly from summer mode to winter mode: if the machine was in summer mode, pressing DOWN has no effect; summer mode must be switched off first.

- **Switching the machine off (stand-by).**

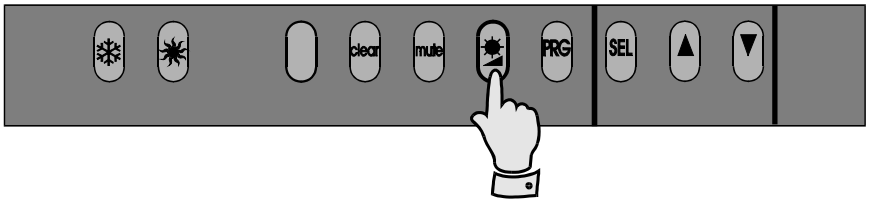
To switch the machine off, switch off both summer and winter modes.

- **Resetting the hourmeters**



When the display shows the compressor hourmeter reading (parameter c9), you can reset the hourmeter immediately by pressing UP and DOWN. This switches off the compressor maintenance message. To reset the hourmeters, press CLEAR.

- **Adjusting display contrast**



By pressing the key shown in the figure above, you can adjust the contrast of the display to one of three different levels (cyclically).

4.4. Summary of keypad functions

The table below shows the function of each key in the various modes.

Key	Machine state	Effect of pressing the key
SEL	1 Normal (i.e. when the display shows the coil probe temperature)	after 5'' DIRECT parameters
	2 Code list	shows the code list
	3 Display values	shows the value
PRG	1 Normal	after 5'' password for USER parameters
	2 Code list	saves parameters in EEPROM and goes back to displaying coil probe temperature
	3 Display values	saves parameters in EEPROM and goes back to displaying coil probe temperature
UP	1 Code list	scans the parameter codes
	2 Display values	increases the value
DOWN	1 Code list	scans the parameter codes
	2 Display values	decreases the value
PRG+SEL	1 Normal	after 5'' FACTORY parameter password
SEL+UP	1 Normal	after 5'' forces a manual defrosting cycle
CLEAR	1 Display hourmeter	immediate reset of hourmeter
❄	1 Normal	selects heating mode (winter)
☀	1 Normal	selects cooling mode (summer)
☀	1 Always	adjusts display contrast
CLEAR	1 Normal	clears any alarms
MUTE	1 Always	Mutes buzzer if ON

5. PARAMETERS

There are 3 types of chiller parameter:

- **DIRECT** (D): (shown in bold)

directly accessible without a password

- **USER** (U):

accessible with a password

- **FACTORY** (F):

accessible with a password at factory level

IMPORTANT: to change the user and factory parameters, the respective passwords must be obtained from AIRBLUE. Only qualified personnel can make these changes without causing malfunctions or damage.
The warranty is automatically invalidated if these parameters are changed arbitrarily without the manufacturer's permission.

The category to which the various parameters belong depends on the type of controller (air conditioner, heat pump or other) and the value of certain parameters:

controller for two compressors	(B=only on unit with two compressors)
condensation probe fitted	(S=parameter present only if a condensation probe is fitted; /3<>0)
current input	(C=parameter present only if the machine has current input; /3=2)
fan fitted	(V=parameter present only if the fan(s) are fitted; F1<>0)
run defrost	(D=parameter present only if defrosting is enabled; d1=0)

For the sake of completeness, all the parameters involved in programming the microprocessor are listed, even though some are not used in the GAMMA or LAMBDA series configuration.
The list includes the AIRBLUE default parameters which are common to the various models of AIRBLUE units.
Those which are not present are marked "/"; those which differ from model to model are marked "*"; in the latter case, to obtain the correct value, contact the AIRBLUE technical department, quoting the serial number of the unit.

	PROBE	Type	Min.	Max.	Unit of measurement	Variation	Airblue Default	DVCS present
/1	Type of coil ambient air probe 0=On/Off 1=NTC	F	0	1	flag	1	1	-----
/2	Type of B2 probe 0=On/Off 1=NTC	F	0	1	flag	1	/	-----
/3	Type of condensation probe 1=NTC 2=pressure 4_20mA	F	0	2	flags	1	2	-----
/4	Minimum value current input	F	0	/5	bar	1	0	--CS-
/5	Maximum value current input	F	/4	35	bar	1	25	--CS-
/6	Coil ambient air probe calibration	U	-6.0 -10.8	6.0 10.8	°C F	0.1	0.0	-----
/7	B2 probe calibration	U	-6.0 -10.8	6.0 10.8	°C F	0.1	/	-----
/8	Circuit 1 condensation probe calibration	U	-6.0 -10,8	6.0 10,8	°C F	0.1	0.0	---S-
/9	Circuit 2 B4 probe calibration	U	-6.0 -10.8	6.0 10.8	°C F	0.1	/	----B
/A	Circuit 2 condensation probe calibration	U	-6.0 -10.8	6.0 10.8	°C/bar F	0.1	0.0	---SB
/b	Digital filter	U	1	15	-	1	4	-----
/C	Input limitation	U	1	15	-	1	8	-----
/d	Unit of measurement 0=°C 1=F	U	0	1	flag	1	0	-----

	CONTROLLER	Type	Min.	Max.	Unit of measurement	Variation	Airblue default	DVCS present
r1	Summer set point	D	rA	rb	°C/F	0.1	24.0	-----
r2	Summer differential	D	0.1 0.1	11.0 19.8	°C F	0.1	2.0	-----
r3	Winter set point	D	rC	rd	°C/F	0.1	20.0	-----
r4	Winter differential	D	0.1 0.1	11.0 19.8	°C F	0.1	2.0	-----
r5	Compressor rotation 0=enabled 1=disabled	F	0	1	flag	1	1	----B
r6	B2 temperature	D	-	-	°C/F	-	-	-----
r7	Circuit 2 B4 temperature	D	-	-	°C/F	-	-	----B
r8	Condensation temperature/pressure	D	-	-	°C/F bar	-	-	---S-
r9	Circuit 2 condensation temperature/pressure	D	-	-	°C/F bar	-	-	---SB
rA	Summer minimum set point	U	-40	rb	°C/F	1	20	-----
rb	Summer maximum set point	U	rA rA	90 194	°C F	1	28	-----
rC	Winter minimum set point	U	-40	rd	°C/F	1	16	-----
rd	Winter maximum set point	U	rC rC	90 194	°C F	1	24	-----

	COMPRESSOR	Type	Min.	Max.	Unit of measurement	Variation	Airblue default	DVCS present
c1	Minimum switch-on time	U	0	150	sec	1	0	-----
c2	Minimum switch-off time	U	0	90	10sec	1	6	-----
c3	Delay between 2 switch-ons	U	0	90	10sec	1	36	-----
c4	Switch-on delay between the 2 compressors	U	0	150	sec	10	10	----B
c5	Switch-off delay between the 2 compressors	U	0	15	sec	1	0	----B
c6	Delay at switch-on	U	0	150	sec	10	0	-----
c7	Compressor switch-on delay after fan start-up	U	0	150	sec	1	10	-----
c8	Fan switch-off delay after compressor switch-off	U	0	150	min	1	2	-----
c9	Compressor hourmeter	D	0	19900	hours	-	0	-----
cA	Compressor 2 hourmeter	D	0	19900	hours	-	0	----B
cb	Operation hourmeter threshold	U	0	100	hours x100	1	0	-----
cC	Fan hourmeter	D	0	19900	hours	-	0	-----

	FANS	Type	Min.	Max.	Unit of measurement	Variation.	Airblue default	DVCS present
F1	Fan output 0=absent 1=present	F	0	1	flag	1	*	-----
F2	Fan operating mode 0=always ON 1=linked with compressor (parallel operation) 2=linked with compressor with On_Off control 3=linked with compressor with speed control	U	0	3	flags	1	*	-V---
F3	Minimum voltage threshold for Triac	F	0	F4	step 50Hz 60Hz	1	*	-V-S-
F4	Maximum voltage threshold for Triac	F	F3	 166 138	step 50Hz 60Hz		*	-V-S-
F5	Minimum speed temperature in summer mode Minimum speed pressure in summer mode	U	0 32 /4	F6 F6 F6	°C F bar	0.1 0.1	/ *	-V-S-
F6	Maximum speed temperature in summer mode Maximum speed pressure in summer mode	U	F5 F5 F5	50 122 /5	°C F bar	0.1 0.1	/ *	-V-S-
F7	Minimum speed temperature in winter mode Minimum speed pressure in winter mode	U	F8 F8 F8	50 122 /5	°C F bar	0.1 0.1	/ *	-V-S-
F8	Maximum speed temperature in winter mode Maximum speed pressure in winter mode	U	0 32 /4	F7 F7 F7	°C F bar	0.1 0.1	/ *	-V-S-
F9	Fan switch-off temperature in summer mode Fan switch-off pressure in summer mode	U	0 32 /4	F5 F5 F5	°C F bar	0.1 0.1	/ *	-V-S-
FA	Fan switch-off temperature in winter mode Fan switch-off pressure in winter mode	U	F7 F7 F7	50 122 /5	°C F bar	0.1 0.1	/ *	-V-S-
Fb	Fan pickup time	U	0	15	4 sec	1	*	-V-S-

* = Parameters to be obtained from after-sales assistance service.

	DEFROSTING	Type	Min.	Max.	Unit of measurement	Variation	Airblue default	DVCS present
d1	Run defrosting 0=no 1=yes	U	0	1	flag	1	1	---S-
d2	Defrosting by time or temperature 0=time 1=temperature	U	0	1	flag	1	1	D--S-
d3	Defrosting start temperature Defrosting start pressure	U	-30 -22 /4	d4 d4 d4	°C F bar	0.1 0.1	-5 3.2	D--S-
d4	Defrosting end temperature Defrosting end pressure	U	d3 d3 d3	50 122 /5	°C F bar	0.1 0.1	/ 19	D--S-
d5	Minimum time for start of defrosting	U	10	150	sec	10	10	D--S-
d6	Minimum duration of defrosting	U	0	150	sec	10	0	D--S-
d7	Maximum duration of defrosting	U	1	15	min	1	3	D--S-
d8	Delay between two defrosting requests	U	10	150	min	10	30	D--S-
d9	Defrosting delay between the two circuits	U	0	150	min	10	10	D--SB
dA	Defrosting from external contact	F	0	1	flag	1	*	D--S-
db	Anti-freeze electric heater defrosting	U	0	1	flag	1	0	D--S-
dc	Waiting time after defrosting	F	0	3	min	1	0	D--S-
dd	Waiting time after defrosting	F	0	3	min	1	0	D--S-
dE	End of defrosting with 2 refrigerant circuits and 1 fan circuit	F	0	1	flag	1	0	D--SB

	BACK-UP ELECTRIC HEATER	Type	Min.	Max.	Unit of measurement	Variation	Airblue default	DVCS present
A1	Low ambient temperature alarm set point	U	-30 -22	A4 A4	°C F	0.1	N/A	-----
A2	Low ambient temperature alarm differential	U	0.1 0.1	11.0 19.8	°C F	0.1	N/A	-----
A3	Low ambient temperature alarm bypass time at unit switch-on in winter	U	0	150	sec	10	N/A	-----
A4	Back-up electric heater set point	U	A1	rd	°C/F	0.1	N/A	-----
A5	Back-up electric heater differential	U	0.1 0.1	11.0 19.8	°C F	0.1	N/A	-----
A6	Back-up electric heater probes	F	0	1	flag	1	N/A	-----

	ALARM	Type	Min.	Max.	Unit of measurement	Variation	Airblue default	DVCS present
P1	Flow switch alarm delay at fan start-up	U	0	150	sec	10	30	-----
P2	Flow switch alarm delay in normal operation	U	0	90	sec	1	5	-----
P3	Low pressure alarm delay at compressor start-up	U	0	150	sec	1	60	-----
P4	Buzzer switch-on	U	0	15	min	1	1	-----
P5	Alarms reset	F	0	1	flag	1	0	-----
P6	2nd set of parameters	F	0	1	flag	1	0	-----
P7	Low pressure alarm with pressure probes	F	0	1	flag	1	0	--CS-

* = Parameters to be obtained from after-sales assistance service.

	GENERAL	Type	Min.	Max.	Unit of measurement	Variation	Airblue default	DVCS present
H1	Machine model 0=air_air unit 1=air_air heat pump 2=air_water chiller 3=air_water heat pump 4=water_water chiller 5=water_water heat pump with gas reversibility 6=water_water heat pump with water reversibility	F	0	6	flags	1	**	-----
H2	Number of ventilation circuits present 0=1 circuit 1=2 circuits	F	0	1	flag	1	1	-V-SB
H3	Number of evaporators present 0=1 evaporator 1=2 evaporators	F	0	1	flag	1	0	----B
H4	Tandem compressors 0=no 1= yes	F	0	1	flag	1	0	----
H5	Delivery fan mode 0=disabled 1=always ON 2=ON at request of controller	F	0	2	flags	1	1	-----
H6	Summer/winter digital input 0=Absent 1=Present	U	0	1	flag	1	***	-----
H7	ON_OFF digital input 0=Absent 1=Present	U	0	1	flag	1	***	-----
H8	Number of terminals 0=1 1=2	F	0	1	flag	1	0	-----
H9	Keypad lock	U	0	3	flags	1	1	-----
HA	Serial address	U	1	16	-	1	1	-----
Hb	Remote control password	U	0	15	-	1	0	-----

** =Depends on type of machine to be controlled
*** =To be enabled if requested

5.1. DESCRIPTION OF PARAMETERS

5.1.1. *Password*

USER :
To access the User parameters, press PRG for 5 seconds, enter the User password and press SEL.

FACTORY:
to access the Factory parameters, press PRG and SEL simultaneously for 5 seconds, enter the Factory password and press SEL.

5.1.2. *Probe set-up ("/" parameters)*

/1: Type of coil ambient air probe
Indicates the type of probe used for the ambient air temperature.
There is an NTC probe with corresponding hardware set-up: pin strip P1 with connection between 1 and 2.

/2: Type of B2 and B4 probe
Not available.

/3: Type of BP1 and BP2 circuit 1 and 2 condensation probe
Indicates the operating mode of the analogue inputs for the probe on the condenser for controlling defrosting and the fans. There may be no probes, NTC probes or pressurised probes (4÷20mA current inputs).

The software set-up must be associated with an appropriate hardware set-up.
For the NTC probes, pin strips P4 and P5 must have the connection between 1 and 2.
For the 4÷20 mA probes, pin strips P4 and P5 must have the connection between 2 and 3.
The absence of condensation probes disables defrosting and the use of the condensation fans.

/4: Current input minimum value
Sets the pressure reading that corresponds to a current of 4mA on the pressure probe.

/5: Current input maximum value
Sets the pressure reading that corresponds to a current of 20mA on the pressure probe.

/6: Coil ambient air probe calibration
Serves to correct the coil reading

/7: B2 probe calibration
Serves to correct the B2 reading

/8: Circuit 1 condensation probe calibration
Serves to correct the BP1 reading

/9: B4 probe calibration
Serves to correct the B4 reading

/A: Circuit 2 condensation probe calibration
Serves to correct the BP2 reading

/b: Digital filter
Serves to determine the coefficient used in digital filtering of the reading.
High values for this parameter make it possible to eliminate any continuous disturbances at the analogue inputs (but reduce the promptness of measurement). The recommended value is 4.

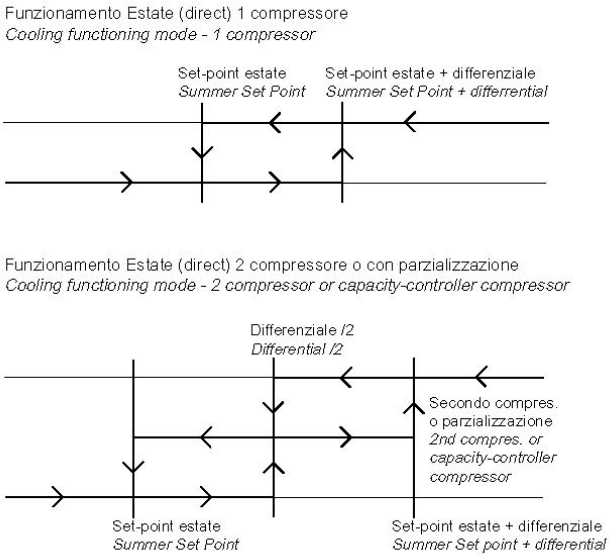
/C: Input limitation.
Serves to determine the maximum variation that can be detected by the probes in a machine programme cycle. In practice, the maximum variations permitted in measuring are between 0.1 and 1.5 units (bar, °C or F depending on the probe and unit of measurement). Low values for this parameter make it possible to limit the effect of impulse-type disturbances. The recommended value is 8.

/d: Unit of measurement
Serves to select the operating mode with degrees Centigrade or Fahrenheit. When the parameter is changed, the microprocessor automatically converts the values of the new unit of measurement.

5.1.3. *Controller set-up ("r" parameters)*

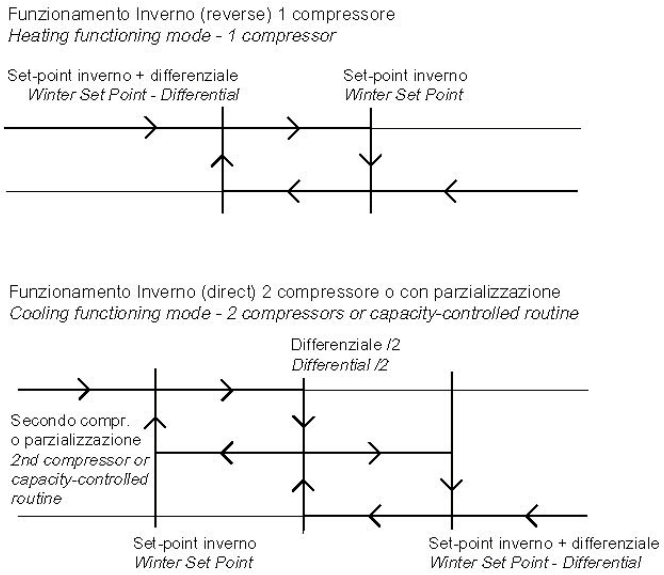
r1: Summer set point
Serves to set the set point for summer control - Cooling (direct).

r2: Summer differential
Serves to set the differential for summer control.



r3: Winter set point
Serves to set the Set Point for winter control - Heating (reverse).

r4: Winter differential
Serves to set the differential for winter control



r5: Compressor rotation
Rotating the compressors shares the operating time equally between them. They are switched on and off according to the FIFO principle (the first to be switched on is the first to be switched off, and the first to be switched off is the first to be switched on).

r6: B2 temperature
Displays the B2 temperature.

r7: B4 temperature
Displays the B4 temperature.

r8: BP1 condensation temperature/pressure
Displays the temperature or pressure of the BP1 condenser.

r9: BP2 condensation temperature/pressure
Displays the temperature or pressure of the BP2 condenser.

rA: Summer minimum set point
Establishes the minimum limit that can be used for setting the summer Set Point

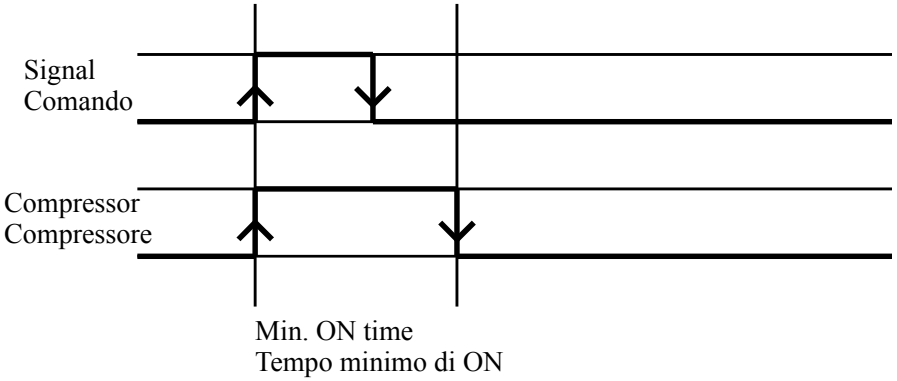
rb: Summer maximum set point
Establishes the maximum limit that can be used for setting the summer Set Point

rC: Winter minimum set point
Establishes the minimum limit that can be used for setting the winter Set Point

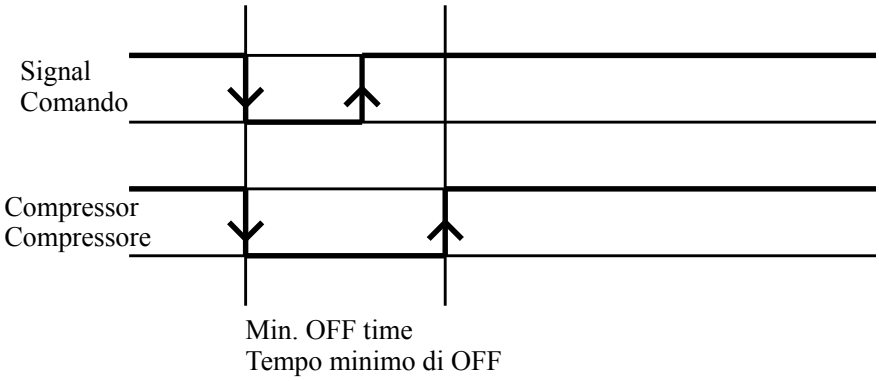
rd: Winter maximum set point
Establishes the maximum limit that can be used for setting the winter Set Point

5.1.4. *Operation of the compressor*

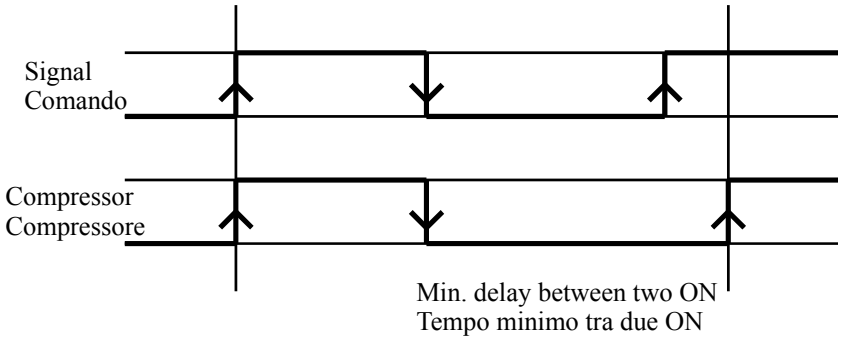
c1: Minimum switch-on time
Determines the time for which the compressor must remain ON after being switched on, even if demand for it ceases.



c2: Minimum switch-off time
Determines the time for which the compressor must remain OFF after being switched off, even in the event of demand for it to be switched back on. During this phase, the compressor LED flashes.



c3: Delay between 2 switch-ons of the same compressor
Determines the minimum time that must elapse between one switch-on and the next of the same compressor (establishes the maximum number of switch-ons per hour of the compressor). During this phase, the compressor LED flashes.



c4: Switch-on delay between the 2 compressors
Determines the switch-on delay between the two compressors, so as to reduce current absorption during pickup. During this phase, the compressor LED flashes.

c5: Switch-off delay between the 2 compressors
Determines the switch-off delay between the two compressors.

c6: Delay at switch-on
At switch-on (i.e. powering the controller with 24 VAC) this parameter delays activation of all the outputs so as to distribute the mains current absorption and protect the compressor against repeated switch-on in the event of multiple mains power cut-off.

c7:Compressor switch-on delay after start-up of delivery fan.
In summer and winter operating modes, with the delivery fan at the command of the controller (parameter H5=2), if compressor switch-on is requested, the controller first switches on the delivery fan and then switches on the compressors . If the fan is set to always ON (H5=1), it is activated only at the moment at which the machine is switched on (i.e. summer or winter selection) and the delay is never enabled.

c8:Delivery fan switch-off delay after compressor switch-off.
In summer and winter operating modes, with the delivery fan at the command of the controller (parameter H5=2), if compressor switch-off is requested, the controller first switches off the compressor and then switches off the fan.
If the fan is set to always ON (H5=1), it is switched off only in standby mode.

c9: Compressor 1 hourmeter
Indicates the number of operating hours of the circuit 1 compressor.
If you press CLEAR while the hourmeter reading is being displayed, this resets the hourmeter and consequently deletes the request for maintenance.

cA: Compressor 2 hourmeter
Indicates the number of operating hours of the circuit 2 compressor.
If you press CLEAR while the hourmeter reading is being displayed, this resets the hourmeter and consequently deletes the request for maintenance.

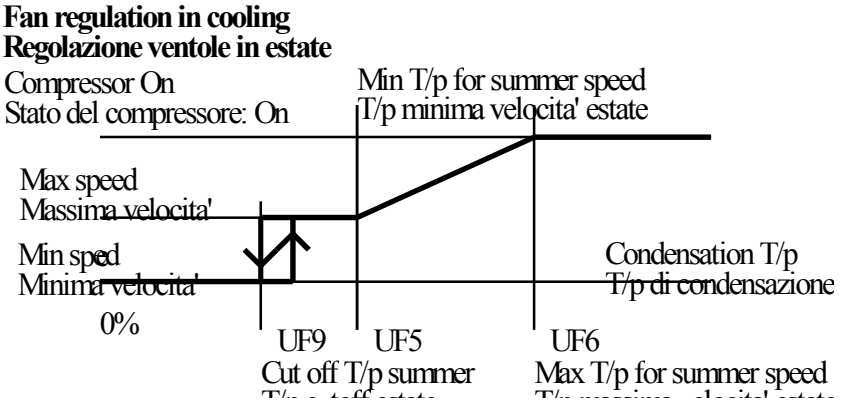
cb: Hourmeter threshold in operation
Determines the number of compressor operating hours beyond which to indicate a request for maintenance. Setting to 0 disables the function.

cC: Delivery fan hourmeter
Displays the number of operating hours of the delivery fans. If you press CLEAR while the hourmeter reading is being displayed, this resets the hourmeter.

5.1.5. *Operation of the condensation fans*

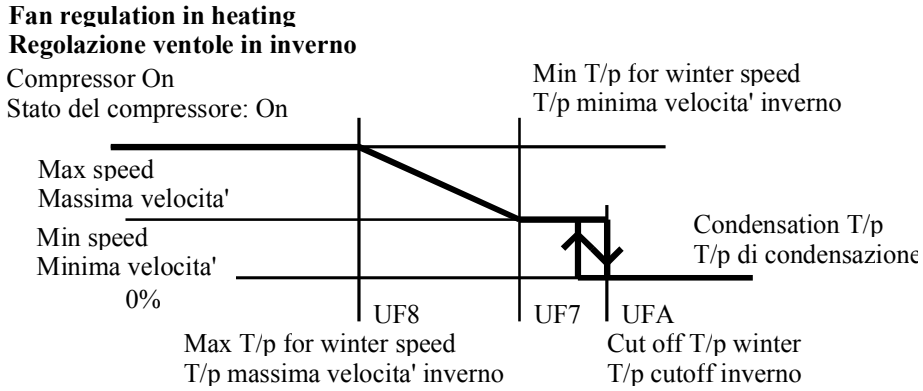
F1: condensation fan output
Determines the operating mode of the fans:
- =0 fans absent
- =1 fans present. This selection requires the presence of the optional fan management cards (ON/OFF or speed variation)

F2: Condensation fan operating mode
Determines the operating mode of the fans. The following modes are available:
- =0 always switched on independently of the compressor (unless the machine is in standby)
- =1 switched on when the compressor is ON (parallel operation)
- =2 switched on when the compressor is ON with ON/OFF control depending on the minimum and maximum speed temperatures (parameters F5, F6, F7 and F8). When the compressor switches off, the corresponding fans switch off regardless of the condensation temperature/pressure.
- =3 switched on when the compressor is ON with speed control. When the compressor switches off, the corresponding fans switch off regardless of the condensation temperature/pressure.



F3: Minimum voltage threshold for Triac

In the case of speed control of the condensation fans, the optional phase cut-out card (equipped with Triac) must be fitted. In this case, it is necessary to specify the voltage delivered by the Triac to the electric motor of the minimum speed fan. The set value is not the actual voltage applied, but a unit of calculation inside the microprocessor.



F4: Maximum voltage threshold for Triac

In the case of speed control of the condensation fans, the optional phase cut-out card (equipped with Triac) must be fitted. In this case, it is necessary to specify the voltage delivered by the Triac to the electric motor of the maximum speed fan.

The set value is not the actual voltage applied, but a unit of calculation inside the microprocessor.

F5: Minimum speed temperature/pressure in summer mode (cooling)

Determines the temperature or pressure below which the fans remain at minimum speed. In the case of ON/OFF control, this is the temperature or pressure below which the fans are switched off in summer.

F6: Maximum speed temperature/pressure in summer mode (cooling)

Determines the temperature or pressure above which the fans must be switched on at maximum speed. In the case of ON/OFF control, this is the temperature or pressure above which the fans are switched on.

F7: Minimum speed temperature/pressure in winter mode (heating)

Determines the temperature or pressure above which the fans remain at minimum speed. In the case of ON/OFF control, this is the temperature or pressure above which the fans are switched off.

F8: Maximum speed temperature/pressure in winter mode (heating)
Determines the temperature or pressure below which the fans must be switched on at maximum speed. In the case of ON/OFF control, this is the temperature or pressure below which the fans are switched on.

F9: Fan switch-off temperature/pressure in summer mode (cooling)
If using the speed controller, this is the temperature or pressure below which the fans are switched off.
Switch-on takes place at 1°C "above" the switch-off set point if using NTC temperature probes for condensation control or 0.5 Bar if using pressure probes (BP1 and BP2).

FA: Fan switch-off temperature/pressure in winter mode (heating)
If using the speed controller for the fans, this is the temperature or pressure above which the fans are switched off.
Switch-off takes place at 1°C "below" the switch-off set point if using NTC temperature probes for condensation control or 0.5 Bar if using pressure probes (BP1 and BP2).

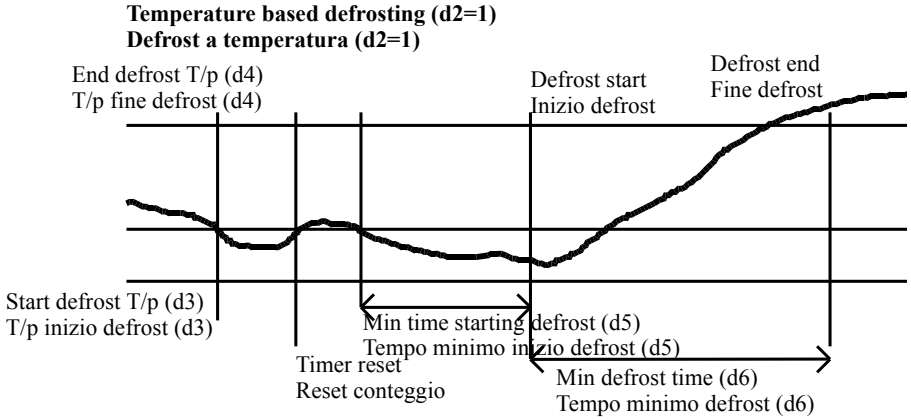
Fb: Fan pickup time
At switch-on of the fans, this parameter determines the operating time at maximum speed to overcome the mechanical inertia of the motor. If set to 0, the function is not executed, i.e. the fans are switched on at minimum speed and then controlled according to the condensation temperature/pressure.

5.1.6. *Defrosting*

d1: Execute defrosting
With (H1=3), this parameter determines whether a defrosting check of the outdoor exchanger must be carried out (evaporator in winter mode).

d2: Time-based or temperature-based defrosting
Determines whether defrosting is executed by time (fixed duration of defrosting) or by temperature (defrosting stops as soon as the condensation probe reaches the end threshold or with external contact dA=1).

d3: Defrosting start temperature/pressure



With (H1=3)

determines the temperature or pressure blow which to start a defrosting cycle. To start the defrosting cycle, the condition must persist for the time d5.

d4: End defrosting temperature/pressure
Determines the temperature or pressure above which the defrosting cycle ends.

d5: Minimum time for start defrosting
Determines the time for which the temperature/pressure must remain below the start defrosting cycle threshold d3, and the compressor must remain ON, for a defrosting cycle to be started.

d6: Minimum defrosting duration
This is the minimum duration of the defrosting cycle (defrosting continues even if the condensation probe exceeds the end temperature/pressure). If set to 0, the minimum defrosting time function is disabled.

d7: Maximum defrosting duration
If time-based defrosting is enabled (d2=0), this parameter determines the duration of defrosting. If defrosting is to be ended on the basis of temperature/pressure or external contact (dA=1), it is the maximum duration (as it is a safety device, an alarm signal is triggered).

d8: Delay between two requests for defrosting
This is the minimum delay between two successive defrosting cycles.

d9: Defrosting delay between the 2 circuits
Determines the defrosting start delay between the two circuits of the unit. If set to 0, the two circuits can be defrosted simultaneously.

dA: End defrosting with external contact
Enables the mode in which the defrosting cycle is ended by a digital contact (originating from a pressure switch). The contacts must be connected in place of the condensation fan thermal cut-outs (ID4 for circuit 1 and ID11 for circuit 2). When defrosting is set to be ended by a digital input (dA=1), defrosting is activated according to the normal procedures, as well as by closure of the end defrosting input. The end of defrosting is detected when the contact is OPEN.

dA	Selection
0	end of defrosting from external contact NOT enabled
1	end of defrosting from external contact

db: Back-up electric heaters defrosting
This parameter determines whether the back-up electric heaters must be switched on during defrosting in order to limit the flow of cold air into the room. The meaning of the parameter is as follows:

db	Selection
0	back-up electric heaters NOT switched on during defrosting
1	back-up electric heaters switched on during defrosting

dc: Waiting time before defrosting
When the defrosting condition has arisen, but before activation of the cycle, the controller stops the compressor for a time dc (programmable from 0 to 3 min). If dc=0, the compressor is not stopped and the cycle reverse valve is turned immediately.

dd: Waiting time after defrosting
At the end of the defrosting cycle, the controller stops the compressor for a time dd (programmable from 0 to 3 min). If dd=0, the compressor is not stopped and the cycle reverse valve is turned immediately.

5.1.7. *Alarms*

P1: Air flow alarm delay at fan switch-on
Determines a delay in recognising the air flow alarm at fan switch-on (in order to wait for the flow to reach full rate).

P2: Air flow alarm delay at full rate
Determines a delay in recognising the air flow alarm in order to filter any flow rate fluctuations.

P3: Low pressure alarm delay at compressor start-up
Determines a delay in recognising the low pressure alarm at compressor start-up in order to wait for the full operating value to be reached. This delay is also observed upon reversal of the 4-way valve in the gas circuit.

P4: Buzzer switch-on.
Indicates the duration for which the buzzer sounds in the event of an alarm:
- if set to 0 the buzzer is disabled at all times.
- if set to a value of 1 to 14, the buzzer is automatically muted after this time in minutes.
- if set to 15, the buzzer continues to sound until the alarm that triggered it is cleared.

P5: Alarm reset
Serves to enable automatic resetting of all alarms which are normally reset manually (high pressure, low pressure, air flow and low temperature), as per the table below:

P5	Selection
0 (default)	High pressure, low pressure, air flow and low temperature reset manually
1	All alarms reset automatically

P7: Low pressure alarm with pressure probes
With P7=1, heat pump mode, if the pressure of the outdoor exchanger is less than 1 bar (parameter /3, i.e. the presence of condensation pressure probes must obviously be enabled) the low pressure alarm is triggered. With P7=0, this function is disabled.

5.1.8. *General parameters*

H1: Machine model
Serves to select the type of machine to control: the units in the GAMMA and LAMBDA series must be set to H1=2 for the cold only version, and to H1=3 for the HP version. The other parameters are described here for the sake of completeness.

H2: Number of ventilation circuits present
Determines the number of ventilation circuits present in the two-compressor configuration.

H3: Number of evaporators
Determines the number of evaporators present in the two-compressor version. In the AIRBLUE units, the evaporator is always single.

H4: Tandem compressors
The parameter serves to enable the control of compressors in tandem. This parameter is not enabled for AIRBLUE units.

H5: Delivery fan mode
Determines the delivery fan operating mode. The fan can be always ON or switched on at the request of the controller (in response to demand for hot or cold, the fan starts first and then the compressor). If disabled, the air flow alarm is not supported.

H6: Summer/winter digital input
Determines whether summer/winter selection from a digital input is enabled or not. If it is enabled, it takes priority over the keypad setting (in the sense that the summer/winter command from the keypad is disabled).
If the selection is enabled (H6=1), the "open" state forces the machine to operate in summer mode.

H7: ON_OFF digital input

Determines whether the ON/OFF selection from a digital input is enabled or not. If it is enabled, it takes priority over the keypad setting.
If the selection is enabled (H7=1) the "open" state forces the machine to switch off.

H8: Number of terminals
Determines the number of terminals connected to the machine (maximum 2)

H9: Block changes to direct parameters
Serves to disable the changing of DIRECT and USER parameters from the keypad and remote control, while still allowing the parameter value to be displayed. This also disables the following functions: summer enable/disable, winter enable/disable, forced defrosting and reset hourmeters.
The enable/disable settings are as shown in the table below:

Value	Remote control	Keypad
0	enabled	disabled
1 (default)	enabled	enabled
2	disabled	disabled
3	disabled	enabled

HA: Serial address
Determines the address of the instrument for serial connection, by means of the optional serial card and card ISA72 (which can support up to 16 inputs from the same number of serial cards), to a supervision and/or teleassistance computer connected to the Carel network. If you connect to a generic serial network, it is also necessary to obtain a GATEWAY 999 card and the access protocol.

Hb: Remote control password
Determines the address of the instrument for the transmission of data from the remote control. If several instruments are located within the range of action of the remote control, it is possible to send the parameter changes to all the instruments simultaneously or to a specific instrument only.

If the value of the password is 00, connection is immediate. If it is any number other than zero, clients must key that number into the remote control keypad as a password, each time they want to use the remote control.

6. ALARMS AND INDICATIONS

The occurrence of an alarm state triggers the following events:

- buzzer switches on (if enabled, see parameter P4 and microswitch No.3 on the card, and if the machine is not in standby)
- alarm relay is activated
- temperature starts flashing
- yellow LED on the single-compressor card lights more frequently
- alarm code appears on display, alternating with temperature

When the manually resettable alarms disappear or the CLEAR key is pressed for 5 seconds with manually resettable alarms, the following events are triggered:

- buzzer switches off
- alarm relay is de-activated
- temperature stops flashing
- yellow LED lights with normal frequency
- alarm code is cleared from display

If the alarm state continues, the events described above are repeated.

6.1. Alarms from digital inputs.

The machine receives alarms from external digital contacts (24VAC). These alarms are not detected when the machine is in standby, and if parameter P5 is set to 1, they are all automatically reset.

Type	Digital input	Alarm state	Delay (if applicable)	Reset	Indication on display
High pressure or cond. fan thermal cut-out circuit 1	1	open	--	manual (automatic if P5=1)	H1
Low pressure circuit 1	2	open	P3	manual (automatic if P5=1)	L1
Compressor 1 thermal cut-out	3	open	--	automatic	C1
Air flow or delivery fan thermal cut-out	5	open	P1 e P2/--	manual (automatic if P5=1)/automatic	FL
High pressure or cond. fan thermal cut-out circuit 2	8	open	--	manual (automatic if P5=1)	H2
Low pressure circuit 2	9	open	P3	manual (automatic if P5=1)	L2
Compressor 2 thermal cut-out	10	open	--	automatic	C2

6.1.1. *High pressure*

The alarm is generated regardless of the state of the fans and compressor. The compressor is switched off immediately (without observing the protection times).

6.1.2. *Low pressure*

The alarm is generated only if the relevant compressor is ON, regardless of the state of the fans. The compressor is switched off immediately (without observing the protection times).

6.1.3. *Compressor thermal cut-out*

The alarm is generated regardless of the state of the fans and compressor, and switches off the compressor (without observing the protection times).

6.1.4. *Air flow*

The alarm is generated only if the delivery fan is ON, regardless of the state of the compressor. All the outputs are disabled: delivery fan, compressor (without observing the switch-off times) and condensation fan.

6.1.5. *Low ambient temperature*

The alarm is detected by the coil probe and causes the compressor and condensation fan to be switched off immediately.
If the temperature exceeds the switch-off threshold, the electric heater is switched off, while all the other controlled devices remain OFF until the clear alarms procedure is implemented (press CLEAR for 5 seconds).
The anti-freeze alarm is present when the machine is in either summer or winter mode (in the latter case, after setting the timing for machine switch-on).
If the microprocessor is in standby, the alarm state is not detected and only the electric heaters are managed.

6.2. Other alarms

6.2.1. *Probe alarms*

The probe alarms are detected even when the machine is in stand-by.

Type	Reset	Indication
Probe B1 - Ambient air temperature	automatic	E1
Probe B3 – Condensation pressure circuit 1	automatic	E3
Probe B5 - Condensation pressure circuit 2	automatic	E5

The presence of a probe alarm causes the compressors, condensation fans and delivery fans to switch off.

6.2.2. *EEPROM error alarm*

Type	**Reset**	**Indication**
EEPROM error	automatic	**EE**

An EEPROM error alarm is a problem with saving parameters in the machine's non-volatile memory (EEPROM). The microprocessor continues to control the system with the data in the volatile memory (RAM), which holds a physical copy of all the data. As soon as power to the instrument is cut off, the configuration is lost. To try to eliminate the problem, use the relevant password to enter level "F" and exit by pressing the PRG key, so as to force all the parameters to be written in EEPROM. The buzzer and alarm relay are not activated.

Indication of defrosting state, defrosting error, communication error and compressor maintenance

Type	Reset	Indication
Defrosting state of circuit 1	automatic	d1
Defrosting state of circuit 2	automatic	d2
Defrosting error on circuit1	automatic/manual	r1
Defrosting error on circuit 2	automatic/manual	r2
Communication error with terminal	automatic	Cn
Maintenance compressor 1	manual	n1
Maintenance compressor 2	manual	n2

6.2.3. *Defrosting state*

During the defrosting procedure, the machine displays the message d1 or d2. As this is an indication of operating state, the standard anomaly error procedures are not activated (buzzer, alarm relay and increase in illumination frequency of yellow LED on the single-compressor card).
The temperature on the display, however, starts flashing (alternating with the indication message).

6.2.4. *Defrosting error*

If defrosting is terminated due to timeout when it has actually been set to terminate when the temperature threshold is reached or from an external contact, the machine displays the code r1 or r2. To clear the message, implement the clear alarms procedure or run another defrosting cycle correctly.
The buzzer and alarm relay are not activated. The yellow LED on the card continues to flash approximately once a second. The temperature flashes (alternating with the indication message).

6.2.5. *Communication error with terminal*

In the event of a communication error between the card and the terminal (whether local or remote) the message Cn is displayed. Check the state of the cable and that it is properly connected with the female connectors on the cards.
The buzzer and alarm relay are not activated. The yellow LED on the card continues to flash approximately once a second. The display shows the message Cn constantly.

6.2.6. *Compressor maintenance.*

When the number of operating hours of a compressor exceeds the maintenance threshold (factory set to zero, hence control is disabled) the maintenance request indication is displayed.
The buzzer and alarm relay are not activated. The yellow LED on the card continues to flash approximately once a second. The temperature flashes (alternating with the indication message).

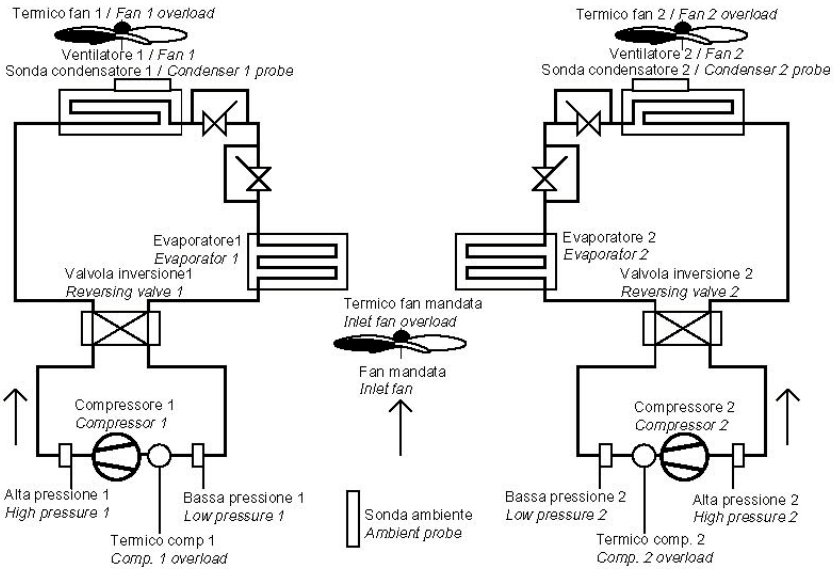
6.2.7. *Sequence of machine indications.*

If the microprocessor is switched to standby, with at least one alarm present, all the indications remain active except for the buzzer, which switches off. If the machine is already in standby, no alarms except system alarms are detected (i.e. only the probe and EEPROM alarms are supported, and not the digital input alarms).

N°	*Message*	*Yellow LED on main card*	*Display*	*Buzzer*	*Alarm relay*
1 2 3 4 5	E1 E2 E3 E4 E5	*flashes quickly (1)*	*Flashes*	On (2)	*Energised*
6	EE	*flashes normally*			
7 8 9 10 11 12	FL H1 L1 C1 F1 A1	*flashes quickly (1)*			
13 14 15	d1 r1 n1	*flashes normally*		Off	*De-energised*
16 17 18 19 20	H2 L2 C2 F2 A2	*flashes quickly (1)*		On (2)	*Energised*
21 22 23	d2 r2 n2	*flashes normally*		Off	*De-energised*
24	Cn		*cn flashes.*		
25	LO	*flashes quickly (1)*	*Flashes*	On (2)	*Energised*

(1) about twice a second
(2) if enabled

7. INPUT/OUTPUT DIAGRAM

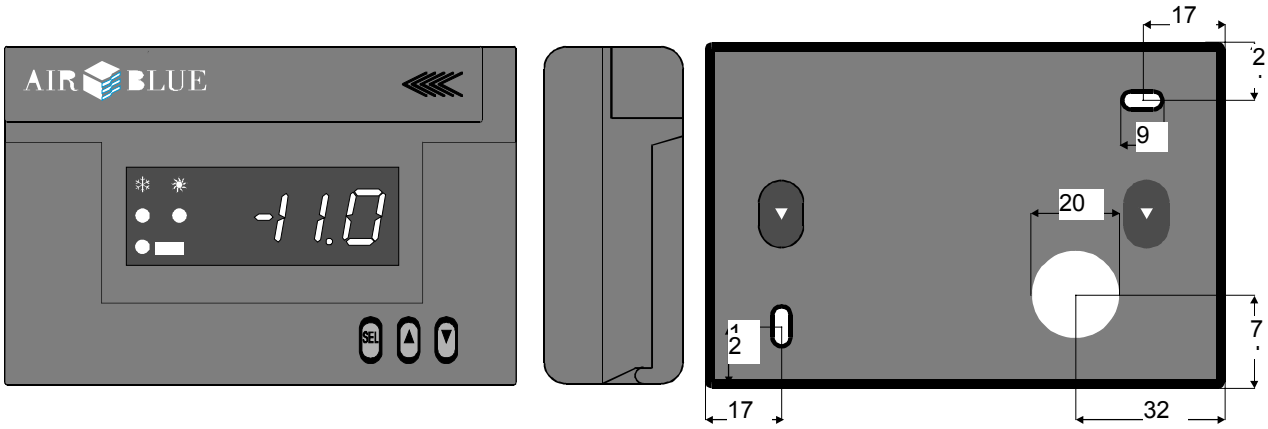


Connector	Meaning	Connector	Meaning
B1-GND	Ambient air probe		
B2-GND	N/A	B4-GND	N/A
B3-GND	Condensation control probe circuit 1	B5-GND	Condensation control probe circuit 2
ID1-IDCOM	High pressure switch circ.1 and cond. fan thermal cut-out circ.1	ID8-IDCOM	High pressure switch circ.2 and cond. fan thermal cut-out circ.2
ID2-IDCOM	Low pressure switch circ.1	ID9-IDCOM	Low pressure switch circ.2
ID3-IDCOM	Thermal cut-out comp.1	ID10-IDCOM	Thermal cut-out comp.2
ID4-IDCOM	End defrosting pressure switch circ.1	ID11-IDCOM	End defrosting pressure switch circ. 2
ID5-IDCOM	Delivery fan thermal cut-out and no air flow		
ID6-IDCOM	ON/OFF from external contact		
ID7-IDCOM	Summer/winter from external contact		

Connector	Meaning	Connector	Meaning
Y1-GND	Analogue output for cond. fan circuit 1	Y2-GND	Analogue output for cond. fan circuit 2
RES.1	N/A	RES.2	N/A
COMP.1	Compressor circuit 1	COMP.2	Compressor circuit 2
VALV.1	Reverse cycle valve circuit 1	VALV.2	Reverse cycle valve circuit 2
VENT.MAND.	Delivery fan		
ALARM	Remote indication of general alarm		

8. CONNECTING A REMOTE TERMINAL

The remote terminal serves to control the conditioning unit from a remote location. Thanks to its modular structure, the **AIRBLUE MICROPROCESSOR** supports up to 2 active terminals simultaneously.



For wall-mounting of the terminal, use the fixing slots in the rear cover of the terminal. During installation, take care to pass the cables through the appropriate hole; then fit the top cover using the screws supplied.
The remote card must be fixed to the panel with the screws supplied, while the card on board the terminal is inserted in the appropriate connector equipped with guide slots.
When connecting the cables, follow the wiring diagram and refer to the label affixed to the rear cover of the terminal (see figure below).
Power is supplied to the remote terminal and cards directly by the main card, so no further connections are necessary.

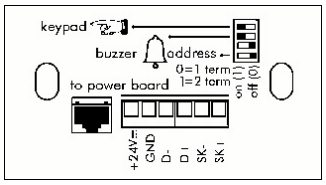
8.1. Function of the microswitches on the back of the terminal

On the back of the terminal, there are 4 microswitches for controlling specific functions.
Address=00: 1 terminal connected to power card - default
Address=01: 2 terminals connected to power card - set the switch to ON in one of the two terminals.

🔔 =0: buzzer always OFF

🔔 =1: buzzer enabled (see parameter P4) - default
Keypad=0: terminal disabled
Keypad=1: terminal enabled - default

To activate the signal to the second remote terminal, during programming set parameter H8=1 and set the 1st microswitch from the bottom (see figure) to 1 (ON). The microswitch in the terminal on board the machine remains in position 0 (OFF).
One terminal will perform the function of parameter reading and programming, and the other will perform the function of parameter reading only; to invert the two functions between the terminals (remote and on board machine) simply press any button for 15 seconds on the parameter reading only terminal.



8.2. *Keypad functions*

The keypad provides access to the machine's control parameters. Below is a summary of the functions of the keys and indicator LEDs referred to previously:

Indicator LED

❄ indicates that the machine is operating in heat pump mode (heating)

✷ indicates that the machine is operating in conditioner mode (cooling)

If neither of the above LEDs is lit, the machine is in stand-by.

⊖ OFF: the compressor is not demanded by the controller
flashing: the compressor is demanded by the controller, but is not running because one or more cut-outs have tripped (time-outs or safety devices)
ON: the compressor is running

◔ x100h can be activated only in operating hourmeter display mode: indicates that the figure shown on the display must be multiplied by 100 to obtain the real value

❄ if pressed for 5 seconds while the machine is in stand-by, enables or disables heat pump operating mode (heating). Pressing this key has no effect if the machine is running in conditioner mode (cooling)

✷ if pressed for 5 seconds while the machine is in stand-by, enables or disables conditioner operating mode (cooling). Pressing this key has no effect if the machine is operating in heat pump mode (heating)

clear if pressed for 5 seconds, manually resets any alarms present, de-activating the indication and alarm relay

mute pressing this key mutes the alarm buzzer, if ON

☼ selects one of three different levels of display brightness

PRG provides access to the machine service parameters (password-protected) and saves any changes made to the parameters

SEL if pressed for 5 seconds, provides access to the machine control parameters (set point and differential). Once you have made the changes, press PRG to save

▲ ▼ scans the parameters during display of the corresponding codes, or any change if the parameter value is displayed.

Technical data

Dimensions:	115x76x33mm
Storage temperature/humidity	-10T70°C/90%RH non-condensing
Front panel protection class	IP20
Environmental pollution	normal

Remote terminal cable/remote card: 6-pole with braid, max. length 150 m, with twisted pair conductors (braid to earth, resistance <80mohm/m)

The very low voltage parts of the terminal are functionally insulated from all parts that are accessible to the user. Switch off the power supply before fitting and replacing the card and before carrying out maintenance work on it.

BLUE BOX Condizionamento
AIR BLUE Air Conditioning
BLUE FROST Refrigeration

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Technical data may change without notice
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