AZIENDA CERTIFICATA UNI EN ISO 9001: 2015

FUNCTIONAL AND TECHNICAL SPECIFICATIONS OF THE ELECTRONIC BOARD FOR RETARDER PROVER p/n. FE1030 or FE1036
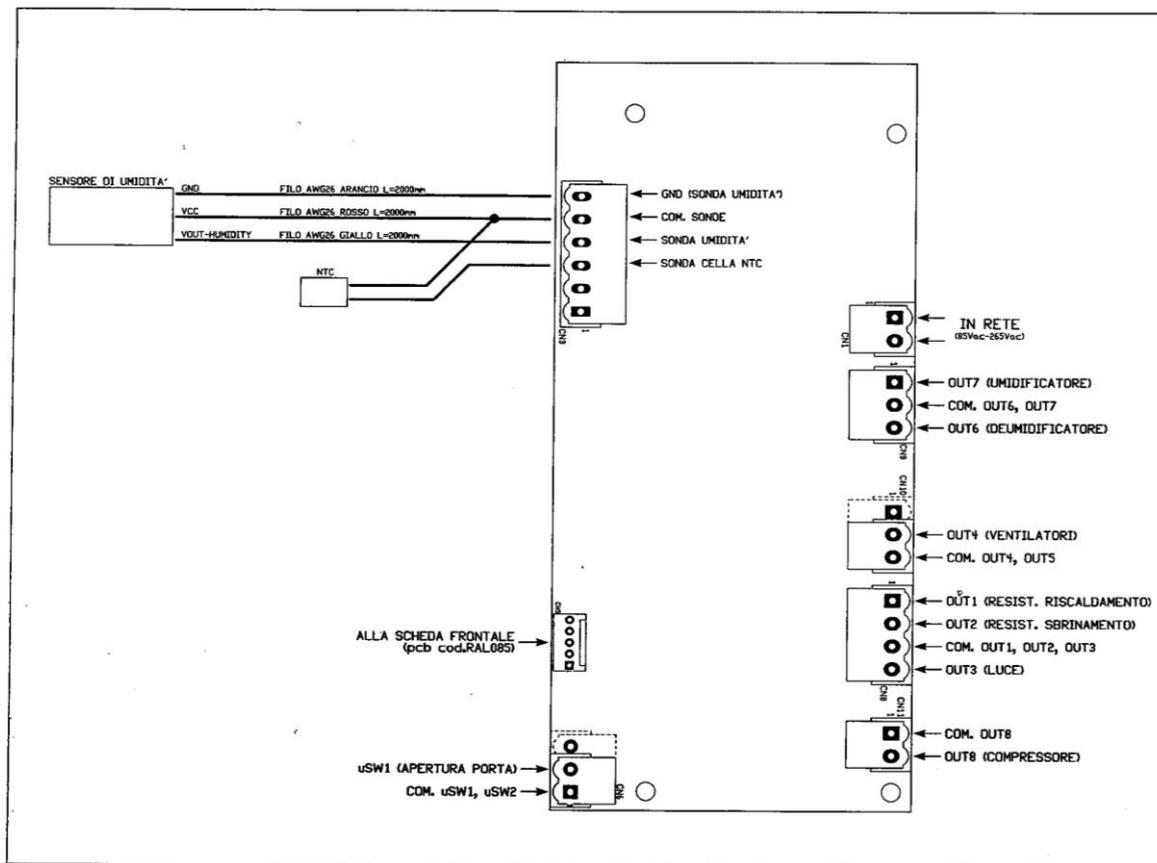
HARDWARE SPECIFICATIONS electronic board

The kit proposed for the retarder retarder control application consists of:

- a basic board, which integrates the relays for the actuations and manages the digital and analog inputs;
- a front board, which includes 4 mechanical keys, 6 digits divided into two pairs of 3 digits each, an 2x24 alphanumeric LCD display; (**Please note: in the FE1036 version the front board is provided in a sealed box**)
- an NTC temperature probe complete with wiring;
- a humidity probe complete with wiring.
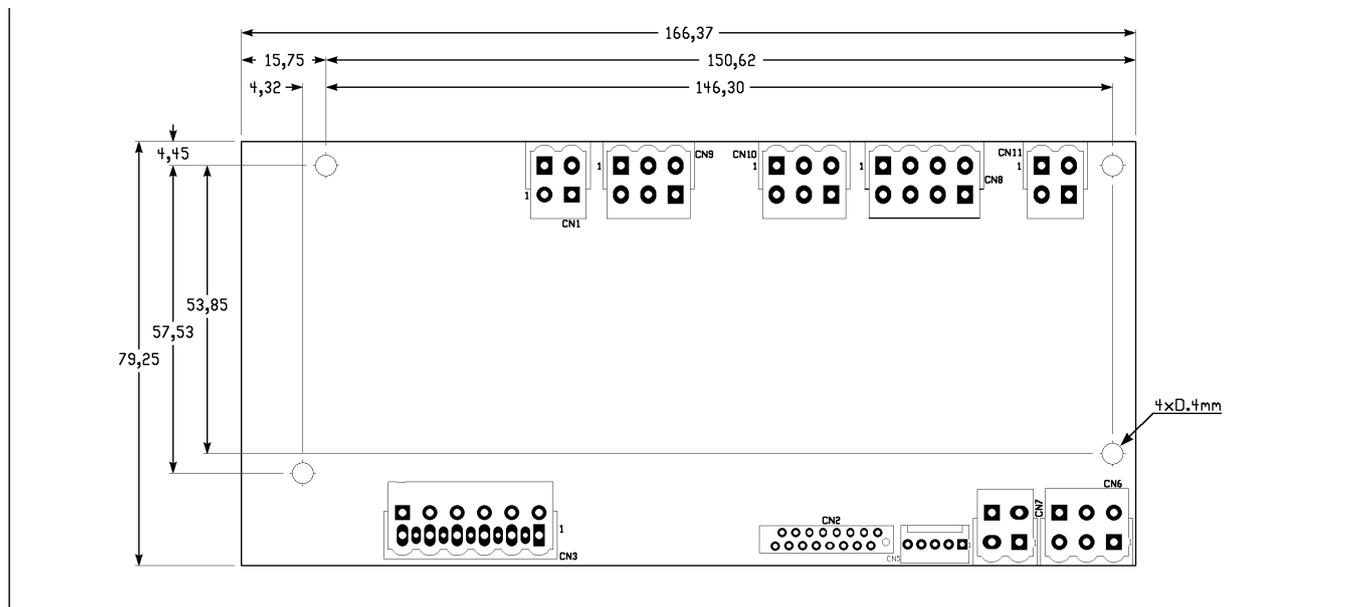- wiring for connection between base board and front board.

The wiring for the power supply is not provided: supply power (85Vac-265Vac / 50Hz-60Hz) to the base board using the appropriate screw terminal (2-pole connector CN1). No external mask is provided.

PLEASE NOTE: Read the following instruction manual carefully. The working parameters currently set by default are a standard configuration, check and possibly configure the parameters appropriately for your application.

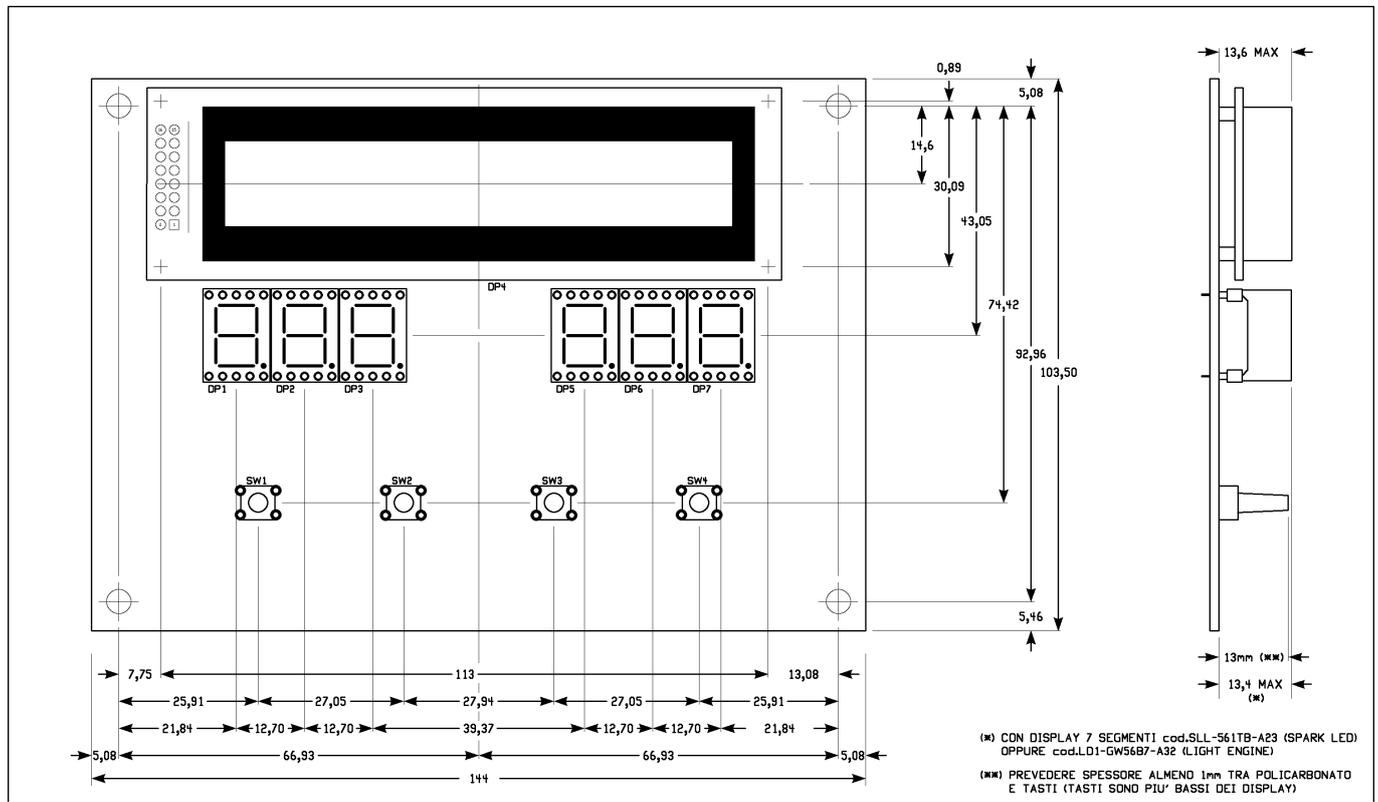FASAR ELETTRONICA S.r.L.
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Connection scheme of the base board:

Base board dimensions (in mm)

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<u>Front board dimensions (in mm)</u>

In this document, the four keys on the front board will be identified, starting from the left, as follows:

- SW1: "back"   main functions: return to stand-by condition, exit the menus
- SW2: "+"   main functions: increase values / scroll up menu items
- SW3: "-"   main functions: decreasing values / scrolling down the menu items
- SW4: "select"   main functions: access to the menu, confirmation of operations.

Each time a button is pressed, the buzzer emits a short acoustic signal (beep).

The three digits positioned on the left side of the front board display the temperature (in ° C) detected by the NTC probe, while the three digits positioned on the right side display the percentage of humidity detected by the humidity probe.

When the cards are turned on, the buzzer emits a triple acoustic signal, the LCD display shows for 5 seconds a welcome screen with the words "RETARDER PROVER CONTROL" and at the same time the 6 digits show the flashing "-" symbol. After 5 seconds, the machine enters the stand-by state and:

• the LCD display shows the word "STAND-BY" in the first line and the current time in the second line;
- the 3 left digits display the temperature (in ° C) measured by the NTC probe;
- the 3 digits on the right show the percentage of humidity measured by the humidity probe.

When the machine is in stand-by, two operations are allowed:

- access to the TIME / DATE SETTING mode to set the current time and date;

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- access to the MAIN MENU to select one of the machine operating modes (manual and automatic programs) or the settings of the installer parameters protected by password.

ACCESS TO TIME / DATE SETTING MODE

With the machine in stand-by, press and hold the "select" button for 3 seconds: the second line of the display shows the time, with the digits representing the hours flashing; press or hold (for faster variation) the "+" and / or "-" keys to set the hours; press the "select" button to confirm the setting of the hours: the LCD display shows the time in the second row, with the digits representing the minutes flashing; press or hold (to have a faster variation) the keys "+" and / or "-" to set the minutes; press the "select" button to confirm the minute setting and move on to setting the date.

The second line of the display shows the date in the format dd.mm.yyyy: the representative digits of the day flash and can therefore be changed as previously described for the time; after setting the day, it is possible to set the month and then the year, moving on to the next field by pressing the "select" button; pressing the "select" button after having also set the year, the buzzer emits a double confirmation beep: time and date are saved and the LCD display returns to the stand-by screen.

If you press the "back" button while setting the time or date, the LCD display returns to the stand-by screen without saving the time and date. While setting the time and date, the left 3 digits continue to display the temperature and the right 3 digits continue to display the percentage of humidity.

ACCESS TO THE MAIN MENU

With the machine in stand-by, press the "select" button: the LCD display shows the various selectable menu items: scroll with the "+" and "-" keys the aforementioned items and press "select" to select one (NOTE: the indicator on the left of the display indicates the selected item, the arrows on the right of the display indicate the presence of further menu items in the directions indicated by the arrows themselves); using the "select" key, you can select manual programs, automatic programs or the settings menu (password protected) to access, and possibly modify, the installer parameters.

MANUAL PROGRAMS

It is possible to choose between two distinct programs: Refrigeration and Leavening.

By choosing the "Refrigeration" program using the "select" key, you can access the temperature setpoint setting screen: select the setpoint with the "+" and "-" keys and confirm with "select". Start the refrigeration process by pressing "select" again.

It is possible to interrupt the cycle at any time by pressing the "back" button; the display will ask whether or not to confirm the exit from the cycle: press "back" to not confirm the exit, press "select" to confirm the exit.

Even before starting the program, you can exit the menu by pressing "back": in this case, however, no confirmation will be required. In any case, exiting the Refrigeration menu leads to the list of manual programs.

By choosing the leavening program using the "select" key, you access the screen for setting the temperature and humidity setpoints: change the temperature setpoint with the "+" and "-" keys and confirm with "select", then select in the same way the humidity setpoint and confirm with the "select" key. Start the leavening process by pressing "select" again.

It is possible to interrupt the cycle at any time by pressing the "back" button; the display will ask whether or not to confirm the exit from the program: press "back" to not confirm the exit, press "select" to confirm the exit.

If you press "back" before starting the program, the following occurs:

- if temperature modification is enabled, then you return to the manual programs menu;
- if humidity modification is enabled, then humidity modification is disabled and temperature modification is enabled;
- if the humidity setpoint value has already been confirmed (therefore both temperature modification and humidity modification is disabled), then the modification of the humidity setpoint is enabled.

When a manual program is started (Refrigeration or Leavening), the values entered for the characteristic parameters are saved (temperature setpoint and / or humidity setpoint): in this way, the next time a program is selected, the user is offered the setpoint values used the previous time: these values, of course, can still be modified according to the procedure already described.

AUTOMATIC PROGRAMS

It is possible to choose from four distinct programs: "Today", "Tomorrow", "The day after tomorrow", "In 3 days".

When you select one of the aforementioned automatic programs for the first time, you access the first of 9 different screens that guide you to setting the characteristic parameters of the different phases of the program (Blocking phase, Rest phase, Fermentation phase, Sleepyhead phase) ; the first parameter to be set is the cycle end time which takes on different meanings according to the type of program chosen, and in particular:

- the "Today" program ends the current day, therefore imposing, for example, 22.30 as the end of the cycle time means ending the program at 22.30 today;
- the "Tomorrow" program ends after one day, therefore imposing, for example, 22.30 as the end of the cycle time means ending the program at 22.30 tomorrow;
- the "Day after tomorrow" program ends after two days, therefore imposing, for example, 10.30 pm as the end of the cycle time means ending the program at 10.30 pm the day after tomorrow;
- The "In 3 days" program ends after three days, therefore imposing, for example, 10.30 pm as the end of the cycle time means ending the program at 10.30 pm the day after the day after tomorrow.

When accessing any of the aforementioned screens, the modification of any parameter is not enabled (ie there are no field items flashing on the display): it is therefore possible to move to the following screens without changing the value of the parameters by pressing the "-" key (similarly, unless you are in the first setting screen, you can move to the previous screen by pressing the "+" key). At the last of the 9 screens, pressing the "-" key selects the start screen of the selected program: at this point, pressing "select" starts the program, while pressing "back" returns to the automatic programs menu.

If you want to change one or more parameters of one of the automatic program parameters setting screens, press the "select" button: the first modifiable parameter on the display will start to flash and you can change its value with the "+" and "-". To confirm and select the next parameter, press "select". When the value of the last parameter on the screen has also been confirmed, you can move to the next screen by pressing the "-" button (similarly you can move to the previous screen by pressing the "+" button).

In the new screen, no parameter will be ready for modification until the "select" key is pressed: if you do not want to make changes (or if the screen does not have modifiable values) and you want to proceed to the next screen, press the key "-".

When navigating through the 9 screens for setting the parameters of an automatic program, pressing the "back" key does not allow you to return to the menu for choosing automatic programs: to return to the menu for choosing automatic programs, you

must first go back (using the "+" key, to be pressed when the modification of any parameter is not enabled) to the first setting screen (the one in which the cycle end time is defined) and then press "back".

When the last screen for setting the parameters is filled, the start of a program is controlled with the "select" key, the system calculates the duration of the Rest Phase (parameter that cannot be set) according to the time current, of the chosen program ("Today", "Tomorrow", "The day after tomorrow", "In 3 days") and of the durations set for the Blocking Phase and for the Fermentation Phase: if the data entered are not consistent, the calculation of the duration of the Rest Phase returns a negative value, and therefore not admissible. In this case, the display shows for a few seconds a message asking to re-enter the program parameters, after which the first setting screen is displayed to allow the user to correct the data entered.

When an automatic program is started ("Today", "Tomorrow", "The day after tomorrow", "In 3 days"), the values entered for the characteristic parameters of the program itself are saved by the system and remain stored even following a blackout or machine shutdown. For this reason, every time an automatic program already executed in the past is selected, the system allows the user to start the program without going through the setting screens, therefore using the parameters already previously saved for the program in question; in particular, when an automatic program previously used is selected, the display shows the message "START THE PROGRAM: NO / YES": if you press the "select" button, you are not given the option to re-set the parameters and the program starts immediately; if you press the "back" button, you access the various parameter setting screens and only after viewing the last screen will it be possible to start the program.

During the execution of an automatic program, the first line of the display shows which phase is in progress, while the second line shows the time and day of the end of the cycle. It should be noted that the cycle end time coincides with the end of the Fermentation Phase, after which the system enters the Sleepy Phase of indefinite duration.

It is possible to interrupt an automatic program at any time by pressing the "back" button; the display will ask whether or not to confirm the exit from the program: press "back" to not confirm the exit, press "select" to confirm the exit and return to the stand-by condition.

The different phases of an automatic program are briefly described below.

Phase 1: Block

Dead zone thermostatic control with only the compressor: the duration of the phase is set by the user. In this phase, humidity is not controlled and defrosting is not performed.

Phase 2: Rest

Dead zone thermostatic control with only the compressor; humidity is controlled in a dead zone by means of a dehumidifier and humidifier. The duration of the phase is not set by the user but is calculated by the system based on: current time, time and end date of the cycle (the end date of the cycle, as specified above, is a function of the chosen automatic program), duration of the Block Phase and duration of the Fermentation Phase.

The humidity control is not performed in the "Today" and "Tomorrow" program cycles, while for the "The day after tomorrow" and "In 3 days" programs it depends on the value set for the "Humidity In Phase 2" parameter. Humidity is not controlled when the compressor is running.

At the beginning of the Rest Phase, a defrost is performed after a time given by the parameter "Postpone 1st Defrost.": The subsequent defrosts take place at regular intervals as established by the parameter "Interval. Defrosts" settable by user. All defrosts have a duration defined by the "Defrost Duration" parameter that can be set by the user.

Phase 3: Fermentation

Dead zone thermostatic control with compressor and resistance, and dead zone humidity control by means of humidifier and dehumidifier; defrosting is not performed. The duration of phase 3 is set by the user.

Humidity is not controlled when the compressor is running.

At the beginning of the Fermentation Phase, thermal control is activated by means of a step-by-step temperature growth ramp (the number of which is the parameter "Nr.Gradini F2-F3" that can be set by the user) from the setpoint of phase 2 up to the setpoint of the phase. 3. The ramp ends when the last temperature step is reached or when 70% of the phase duration is reached.

The end of phase 3 is signaled by a prolonged beep and coincides with the end of the cycle.

Phase 4: Sleepyhead

Dead zone thermostatic control with compressor and resistance, and dead zone humidity control by means of humidifier and dehumidifier; defrosting is not performed. The duration of phase 4 is indefinite: the user can stop it at any time by pressing the "back" button and confirming the stop with the "select" button.

DEFROST

Defrosting is activated if the "Defrosting" parameter is set to "YES".

In this case, defrosting is performed at regular intervals established by the parameter "Interv. Defrosts" expressed in hours.

During the defrost, only the Defrost output is active while all the others are off.

The defrost ends in time according to the "Defrost duration" parameter expressed in minutes.

At the end of defrosting, a dripping phase of a fixed duration of 2 minutes (not modifiable by the user) is carried out and subsequently a phase of stopping the fans for a further 2 minutes (not modifiable by the user). In this last phase, the thermostatic control via the compressor starts working again.

Defrosting is performed only in the manual refrigeration cycle and in phase 2 of the automatic cycle.

FANS

The evaporator fans are activated when at least one of the following loads is active: compressor, heating element and humidifier. They are not controlled with an active dehumidifier. For each phase of an automatic cycle and for a manual cycle it is possible to set the operating mode of the fans using the relative parameters ("Ventilation Phase1", "Ventilation Phase2", "Ventilation Phase3", "Ventilation Phase4", "Ventilation Man") choosing from the following options:

NO = off; IM = pulse; CO = on.

The pulsed mode IM turns the fans on and off by means of the parameters "Vent duration. On "and" Vent. Duration OFF "which respectively set the ON time and the OFF time of the fans.

If all loads are off, the fans are off.

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When you open the door the fans turn off.

In defrost, dripping and fan stop, the fans are off.

CELL LIGHT

The cell light output is automatically activated when the door is opened.

PASSWORD PROTECTED INSTALLER PARAMETERS SETTING

From the main menu choose the SETTINGS item; when prompted for the password, enter pin 4791: to do this, use the "+" and "-" keys to change the value of the flashing digit, then press "select" to confirm the changed digit and move on to setting the next. After setting the last digit and confirming with the "select" key, you access the list of parameters (in case of incorrect password you will be asked to enter it again).

Use the "+" and "-" keys to move between the different items, then press "select" to enable the modification of the parameter of interest (the corresponding value will start to flash): modify the value with the "+" and "keys - "and then press" select "to confirm.

The changes made are saved only by pressing the "back" button and confirming the desire to save the modified data by pressing the "select" button.

When you are in the parameter list (therefore after entering the correct password) you can restore the default value of the installer parameters; for this purpose, keep the "back" and "-" keys pressed simultaneously for about 5 seconds (when no parameter modification is in progress): the display returns the message that the parameters have been re-initialised and returns to the stand-by.

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LIST OF OPERATING PARAMETERS

Parameter	Description	Range	Default
Lingua	Screens language	[ITA;ENG;FRA;ESP]	FRA
Unita Temperatura	Temperature measurement unit	[°C; °F]	°C
Temp. Massima	Maximum settable temperature	[0; 50] °C	45°C
Temp. Minima	Minimum settable temperature	[-20; -1] °C	-10°C
Zona Morta Temp.	Temperature control dead zone	[0; 20] °C	10°C
Isteresi Caldo	Heating hysteresis	[1; 5] °C	2°C
Isteresi Freddo	Cooling hysteresis	[1; 5] °C	2°C
Rit. Off-On Comp.	Compressor OFF-ON delay	[0; 5] min	2min
Nr.Gradini F2-F3	Number of ramp steps between Phase2 and Phase3	[1;10]	5
Massima Umidita	Maximum relative humidity settable	[0; 100] %	95%
Zona Morta Um.	Humidification dead zone	[0; 20] %	10%
Zona Morta Deum.	Dehumidification dead zone	[0; 20] %	10%
Tempo Ugello On	Nozzle time ON	[0; 20] s	5s
Tempo Ugello Off	Nozzle time OFF	[0; 99] s	20s
Isteresi Um.	Humidification hysteresis	[2; 10] %	5%
Isteresi Deum.	Dehumidification hysteresis	[2; 10]%	5%
Umidita in Fase 2	Humidity control in Phase2 (programs "The day after tomorrow", "In 3 days")	[NO; SI]	SI
Sbrinamento	Enable defrost function	[NO; SI]	SI
Posticipo 1° Sbrin.	Postponement of first defrost	[1; 4] h	1h
Durata Sbrinamento	Defrosting duration	[5; 30] min	15min
Interv. Sbrinamenti	Interval between two successive defrosts	[2; 9] h	4h
Ventilazione Fase1	Func. fans with active loads in Phase1	[NO; IM; CO]	CO
Ventilazione Fase2	Func. fans with active loads in Phase2	[NO; IM; CO]	IM
Ventilazione Fase3	Func. fans with active loads in Phase3	[NO; IM; CO]	NO
Ventilazione Fase4	Func. fans with active loads in Phase4	[NO; IM; CO]	IM
Ventilazione Man.	Func. fans with active loads in Manual Phase	[NO; IM; CO]	CO
Durata Vent. On	ON time for fans	[1; 60] min	1min
Durata Vent. Off	OFF time for fans	[1; 60] min	7min
Switch Porta	Door switch polarity	[NO; NC]	NC
Massimo Power Down	Max duration Power Down	[1; 60] min	30min

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FAULTY TEMPERATURE PROBE

If an alarm occurs due to a faulty temperature probe, the system stops the program in progress and goes back to stand-by, a continuous acoustic signal is emitted for a minute that can be silenced by pressing any key. During the alarm sound, the display shows the alert message for a faulty temperature probe: once the buzzer has stopped (because it has been silenced by pressing a button or because a minute has passed since the alarm occurred alarm event), the display shows, for 10 seconds every minute, the alert screen for a faulty temperature probe.

In the event of a faulty temperature probe, the start of any program (manual or automatic) is not allowed, but it is still possible to access the list of installer parameters protected by password and possibly modify them.

FAULT HUMIDITY PROBE

If an alarm for a faulty humidity probe occurs (or if the humidity probe is not connected), the system signals the event with an appropriate message on the display, however it is possible to continue selecting / starting manual and / or automatic programs. In the same way, access to the list of password-protected parameters is still allowed.

When the humidity probe is faulty or not connected, the humidity is controlled by time with ON and OFF cycles of the humidifier according to the "Nozzle On Time" and "Nozzle Off Time" parameters.

SERIAL COMMUNICATION ALARM MANAGEMENT

If there is a problem with the serial communication between the main board and the front board, the warning message COMMUNICATION ERROR - REQUEST ASSISTANCE is displayed.

POWER-DOWN

If a power outage occurs (Power-Down), the functionality of the machine will be restored in the following ways:

- manual programs will resume regularly,

- the automatic programs will resume from where they left off. If the duration of the power-down is less than the value of the "Maximum Power Down" parameter, the cycle end time will be postponed by the duration of the power-down. If the duration of the power-down is greater than the "Maximum Power Down" value, the appliance interrupts the cycle in progress and a blackout message appears on the display.