# Vcolor 378

## Controllers for bread and pizza deck ovens


**ENGLISH**

# INSTALLER MANUAL ver. 2.1

## CODE 144VC378E214

**Important**

Read this document carefully before installation and before using the device and take all the prescribed precautions. Keep this document with the device for future consultation.

Only use the device in the ways described in this document. Do not use the device as a safety device.

**Disposal**

The device must be disposed of according to local regulations governing the collection of electrical and electronic equipment.

Contents

# 1 INTRODUCTION

## 1.1 Product description

Vcolor 378 is a controller for electric bread and pizza deck ovens with a remote touch-screen user interface in 5- or 7-inch glass which fits in perfectly with the design of the unit. It can control up to 5 decks through an RS-485 network of power boards connected to a single user interface, which also allows centralised management with power shared between the decks. Centralised management can also be enabled by connecting control kits (interface + power board), one for each deck and up to a maximum of 5, via the RS-485 serial port.

It manages steam (generation, injection and venting) in both automatic and manual mode and independently regulates the power and temperature of the top, floor and front heaters. Being able to control the temperature of the front heater is particularly important for certain baked goods.

The controller has an oven cleaning function which uses pyrolysis, a self-cleaning mechanism that does not require chemical detergents as food residue is oxidised at high temperature.

The controller can save up to 99 recipes; each recipe can have up to 8 phases, each with independent settings for duration, temperature, steam injection cycles, venting and suction. Recipes can be compiled in an ODS file (complete with pictures in BMP or GIF format) and uploaded to the controller using a USB flash drive, thanks to the innovative programmable platform which allows users to customise their recipes and add new languages. Recipes can also be altered, overwritten and saved directly from the display and two different recipes can be switched on and off for every day of the week.

Users can interact remotely with their equipment and start up/stop working cycles using the EPoCA® cloud platform with Wi-Fi or Ethernet connectivity (which also enables alternative or parallel control through MODBUS TCP). For more details, compare all the connectivity options in the Technical Data table and consult the Management and Monitoring Products/Systems and the Connectivity Products/Devices sections of our website.

## 1.2 Models available and technical features

The table below shows the technical features of the models available.

| | **Vcolor 378 M & L with J/K thermocouples** | **Vcolor 378 M & L with Pt 100 2 wires** |
|---|---|---|
| **Power supply** | | |
| Control module | 12 Vac | 12 Vac |
| User interface | Powered by the control module | Powered by the control module |
| **Analogue inputs (J/K or Pt100)** | | |
| Top probe (activated as chamber probe if regulation is by single analogue input with power distributed between the top and floor) | J/K thermocouples | Pt 100 2 wires |
| Floor probe (deactivated if regulation is by single analogue input) | J/K thermocouples | Pt 100 2 wires |
| Steam probe | J/K thermocouples | Pt 100 2 wires |
| Front probe | J/K thermocouples | Pt 100 2 wires |
| **Digital inputs (for NO/NC contact)** | | |
| Power consumption (230 Vac) | • | • |
| Thermal switch (230 Vac) | • | • |
| Type 1/2 burner block (230 Vac) | • | • |
| Door switch | • | • |
| Enable steam injection | • | • |
| Switch off device | • | • |
| Energy saving | • | • |
| **Digital outputs (electro-mechanical relays; A res. @ 250 Vac)** | | |
| Configurable k1 (default top heaters) | 5 A | 5 A |
| Configurable k2 (default stand-by/on) | 5 A | 5 A |
| Configurable k3 (default floor heater) | 5 A | 5 A |
| Configurable k4 (default floor front heater) | 5 A | 5 A |
| Configurable k5 (default chamber light) | 5 A | 5 A |
| Configurable k6 (default venting) | 5 A | 5 A |

| | | |
|---|---|---|
| Configurable k7 (default steam generation) | 5 A | 5 A |
| Configurable k8 (default steam injection) | 5 A | 5 A |
| Configurable k9 (default suction hood) | 8 A | 8 A |
| Configurable k10 (default electronics compartment fan) | 5 A | 5 A |
| Configurable k11 (default sound) | 5 A | 5 A |
| Configurable k12 (default reset of burner block 1/2) | 5 A | 5 A |
| Configurable k13 (default top front heater) | 8 A | 8 A |
| **Communications ports** | | |
| RS-485 MODBUS | • | • |
| USB | • | • |
| **Connectivity** | | |
| RS-485 MODBUS RTU (built-in) | • | • |
| Wi-Fi EPoCA/MODBUS TCP (optional through the EVlinking Wi-Fi module powered by controller) | • | • |
| Ethernet EPoCA/MODBUS TCP (optional through EV3 Web gateway) | • | • |
| **Other features** | | |
| "Cooking timer" function | • | • |
| "Rapid heating" function | • | • |
| Clock | • | • |
| Alarm buzzer | • | • |
| Independent management of the power delivered to top and floor | • | • |
| Independent management of the top and floor temperatures | • | • |
| "Weekly programmed switch-on" function | • | • |
| "Programmes" function | • | • |
| "Energy-saving" function | • | • |

For more information, see section 1517 "TECHNICAL SPECIFICATIONS".
The table below lists the purchasing codes of the available models:

| | |
|---|---|
| **Purchasing codes** | **With J/K thermocouples**<br>**Vcolor 378 M (control module + 5" user interface kit):**<br>**EVCMC37DJ2E** (flush fit installation)<br>**EVCMC37DJ2EF** (semi-recessed installation)<br><br>**Vcolor 378 L (control module + 7" user interface kit):**<br>**EVCLC37DJ2E** (flush fit installation)<br>**EVCLC37DJ2EF** (semi-recessed installation)<br><br>**Vcolor 378 M&L (additional control modules)**<br>**EVCLP37DJ2E**<br>**EVCLP37DJ2E01** (with 3 digital outputs for solid-state relay command; 12 Vdc, 15 mA max)<br><br>**With Pt 100 2 wires**<br>**Vcolor 378 M (control module + 5" user interface kit):**<br>**EVCMC37DC2E** (flush fit installation)<br>**EVCMC37DC2EF** (semi-recessed installation)<br><br>**Vcolor 378 L (control module + 7" user interface kit):**<br>**EVCLC37DC2E** (flush fit installation)<br>**EVCLC37DC2EF** (semi-recessed installation)<br><br>**Vcolor 378 M&L (additional control modules)**<br>**EVCLP37DC2E** |

For more models, contact the EVCO sales network.

# 2 MEASUREMENTS AND INSTALLATION

## 2.1 Format features

The control module is available in a split version with an open frame board. User interfaces are available in 5 or 7-inch versions for vertical operation and have capacitive colour TFT touch-screen graphic displays.

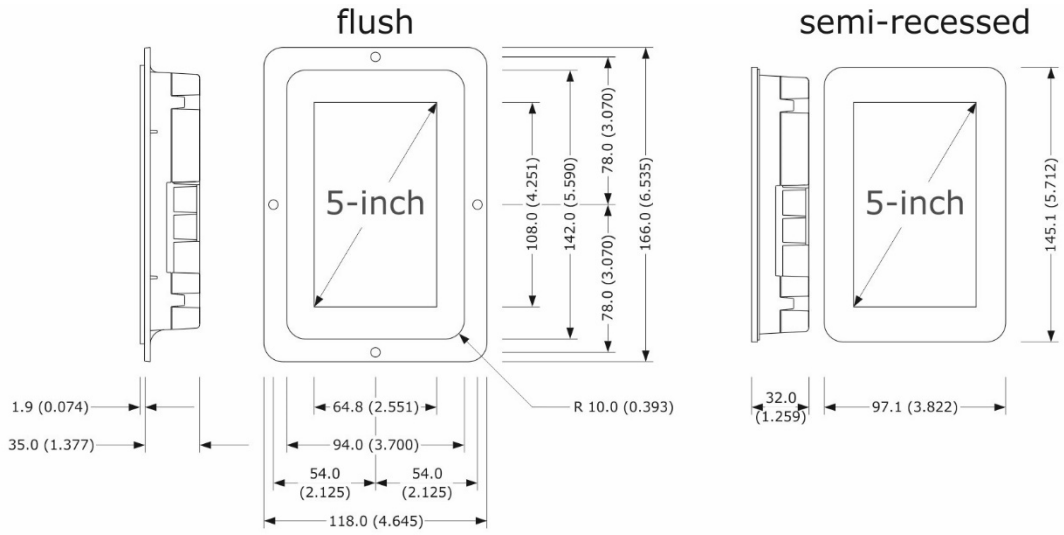
## 2.2 Measurements and installation of the control module

Measurements are indicated in mm (in). Installation of the control module is on a flat surface with spacers.

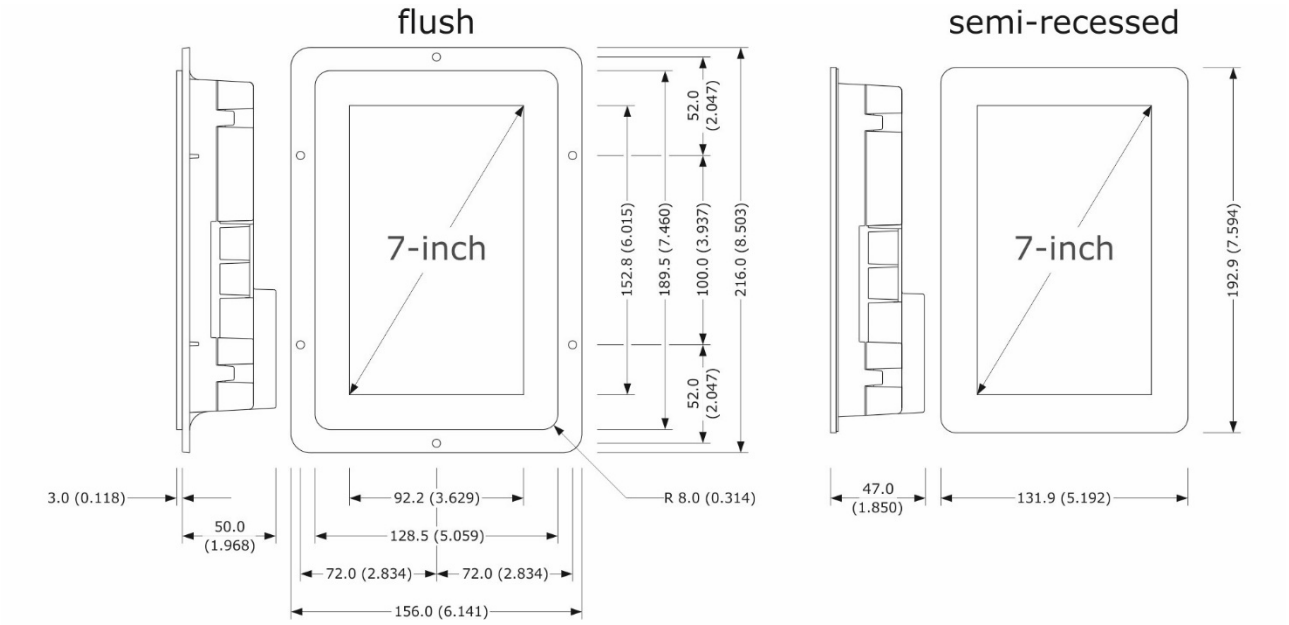

## 2.3 Measurements of the user interface

The user interface is available in the model for flush installation and in the model for semi-recessed frontal installation. Measurements vary based on the model as shown below in mm (in).

**Vcolor 378 M**



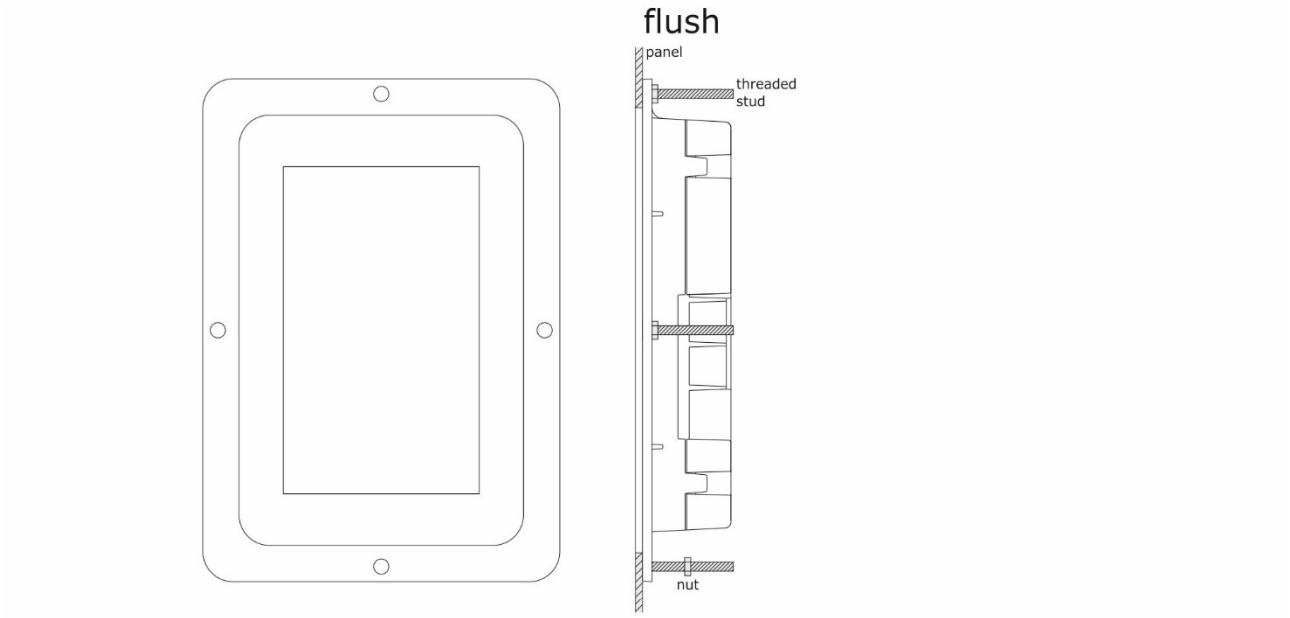
**Vcolor 378 L**


flush
semi-recessed
7-inch
7-inch
52.0 (2.047)
152.8 (6.015)
189.5 (7.460)
100.0 (3.937)
216.0 (8.503)
52.0 (2.047)
192.9 (7.594)
3.0 (0.118)
50.0 (1.968)
92.2 (3.629)
128.5 (5.059)
72.0 (2.834)
72.0 (2.834)
156.0 (6.141)
R 8.0 (0.314)
47.0 (1.850)
131.9 (5.192)

## 2.4 Installation of the user interface

Depending on the model, installation can be:

- flush, from behind the panel with threaded studs (not provided) welded to hold it in place;
- semi-recessed, from the front of the panel with spring clips to hold it in place.



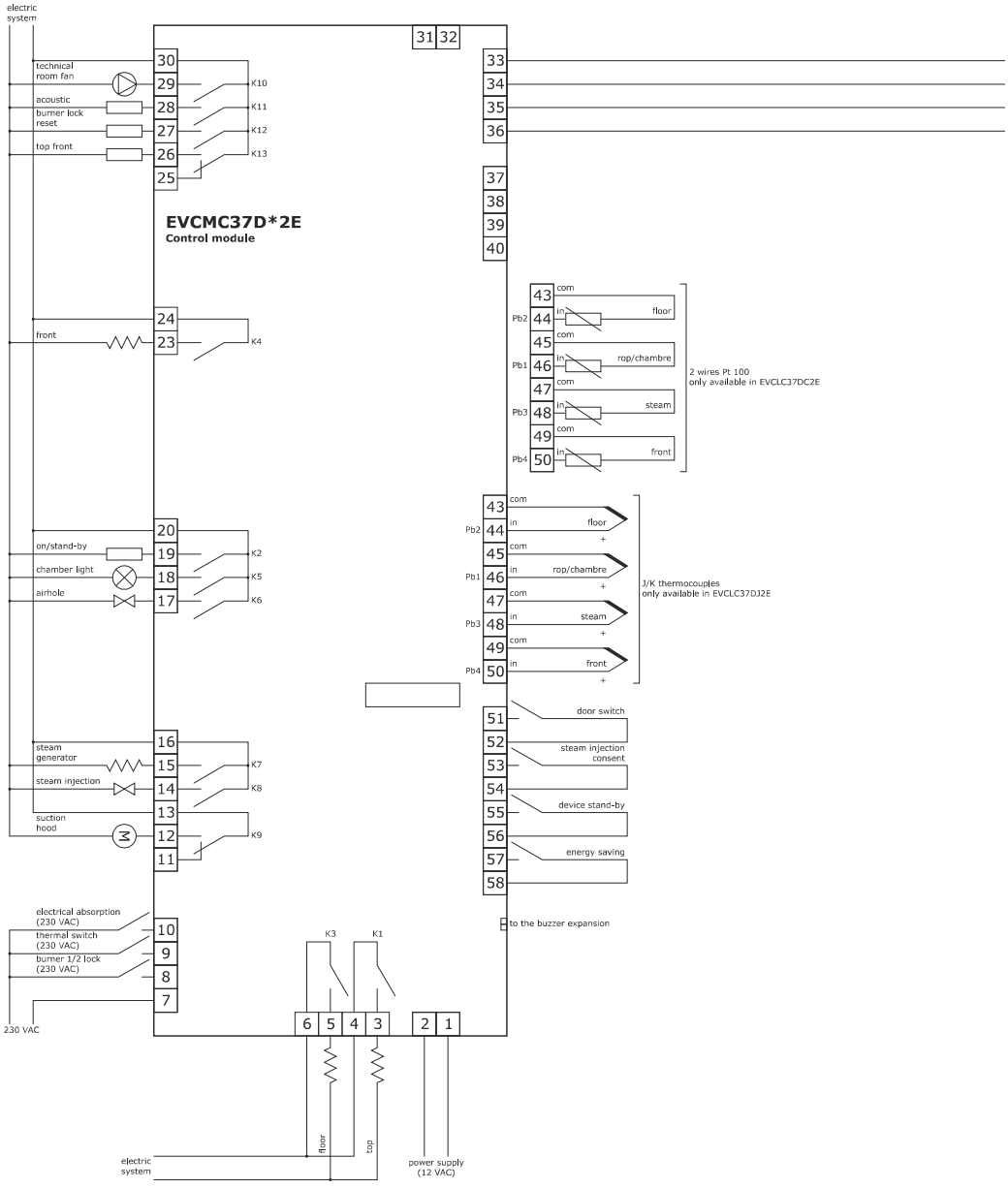

## 2.5 Installation precautions

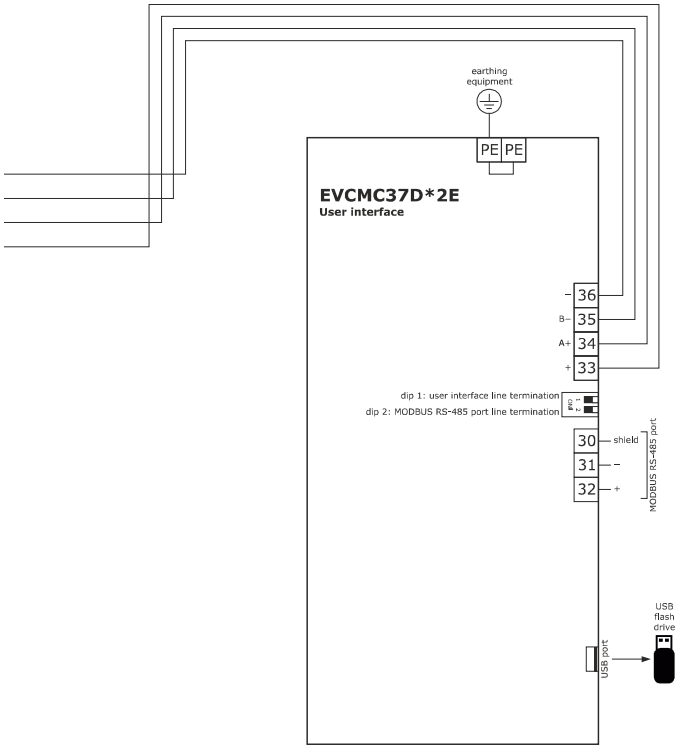
- Ensure that the working conditions for the device (operating temperature, humidity, etc.) are within the set limits. See section 17 "TECHNICAL SPECIFICATIONS"
- Do not install the device close to heat sources (heaters, hot air ducts, etc.), equipment with a strong magnetic field (large diffusers, etc.), in places subject to direct sunlight, rain, damp, excessive dust, mechanical vibrations or shocks
- Any metal parts close to the control module must be far enough away so as not to compromise the safety distance
- In compliance with safety regulations, the device must be installed properly to ensure adequate protection from contact with electrical parts. All protective parts must be fixed in such a way as to need the aid of a tool to remove them
- Ensure that the thermocouple is properly insulated from contact with metal parts or use already insulated thermocouples.

# 3 ELECTRICAL CONNECTION

## 3.1 Vcolor 378M electrical connection

The diagram below shows the electrical connection of the control device with a 5-inch user interface.



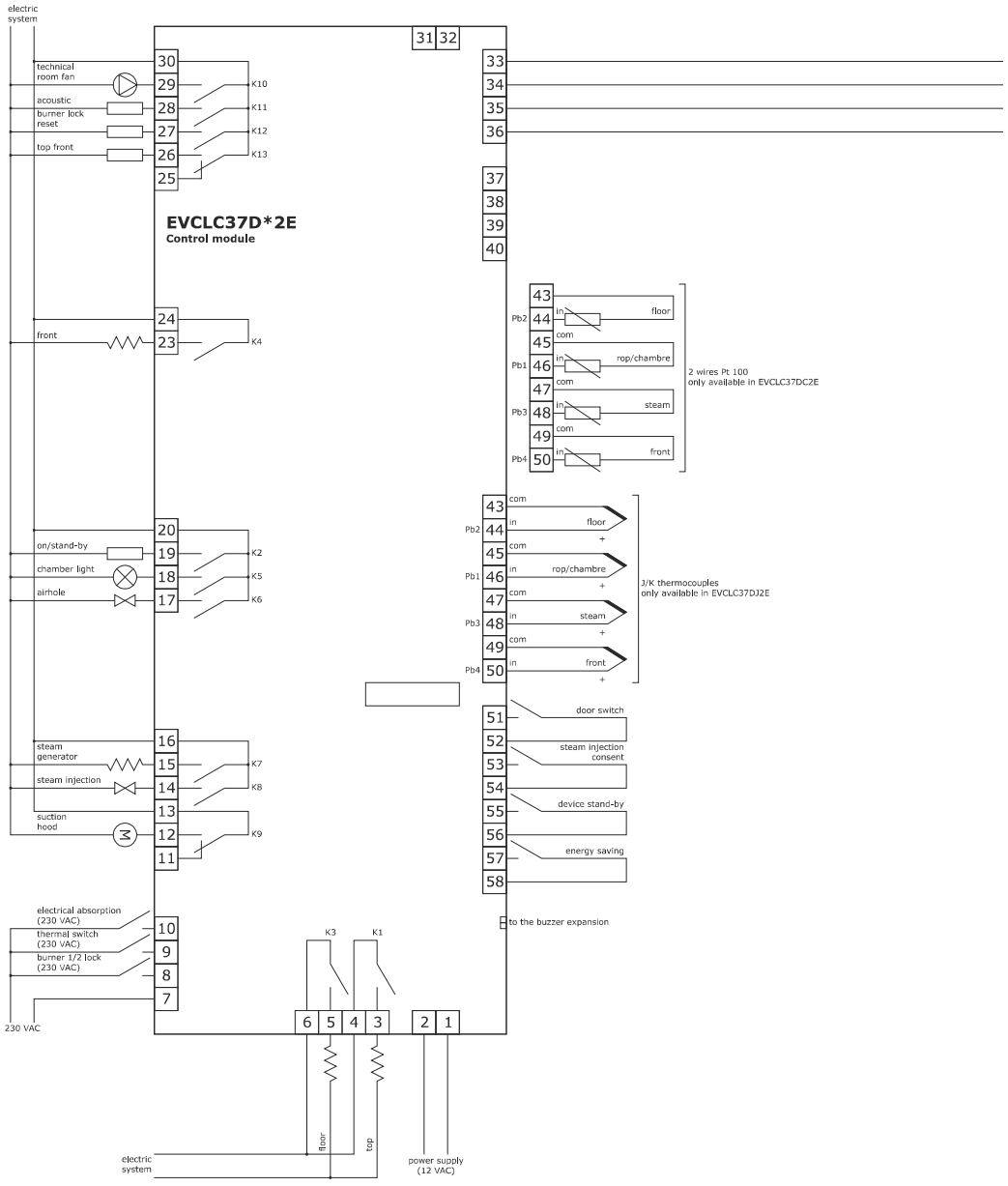


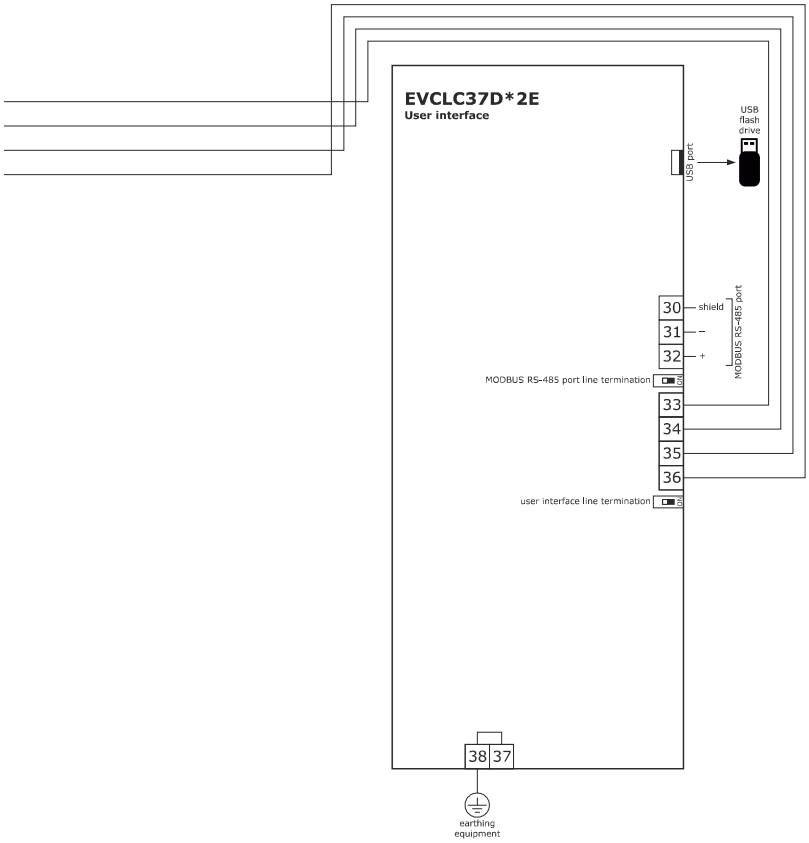

N.B.:

- The USB communications port makes it possible to upload and download the device settings and personalise the graphics, recipes and languages using an ordinary USB flash drive (see section 14. USING THE USB PORT).
- The RS-485 MODBUS communications port enables connection to the Parameters Manager set-up software or to the modules for Wi-Fi or Ethernet connectivity to manage the unit using the EPoCA cloud platform or MODBUS TCP systems (see section 13. CONNECTIVITY).

## 3.2 Vcolor 378L electrical connection

The diagram below shows the electrical connection of the control device with a 7-inch user interface.



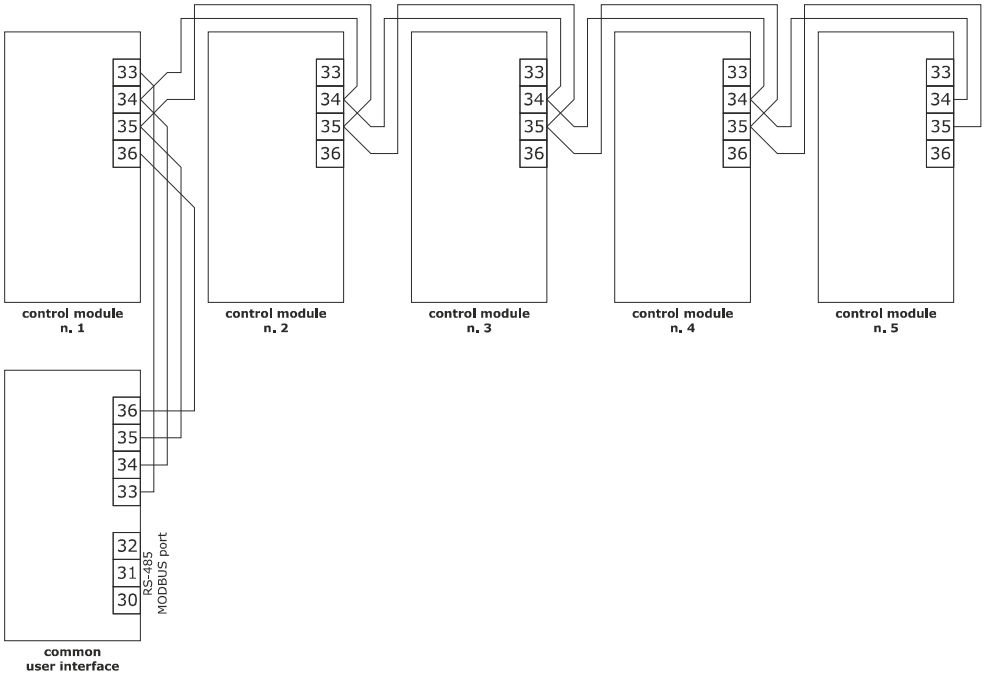



N.B.:

- The USB communications port makes it possible to upload and download the device settings and personalise the graphics, recipes and languages using an ordinary USB flash drive (see section 14. USING THE USB PORT).
- The RS-485 MODBUS communications port enables connection to the Parameters Manager set-up software or to the modules for Wi-Fi or Ethernet connectivity to manage the unit using the EPoCA cloud platform or MODBUS TCP systems (see section 13. CONNECTIVITY).

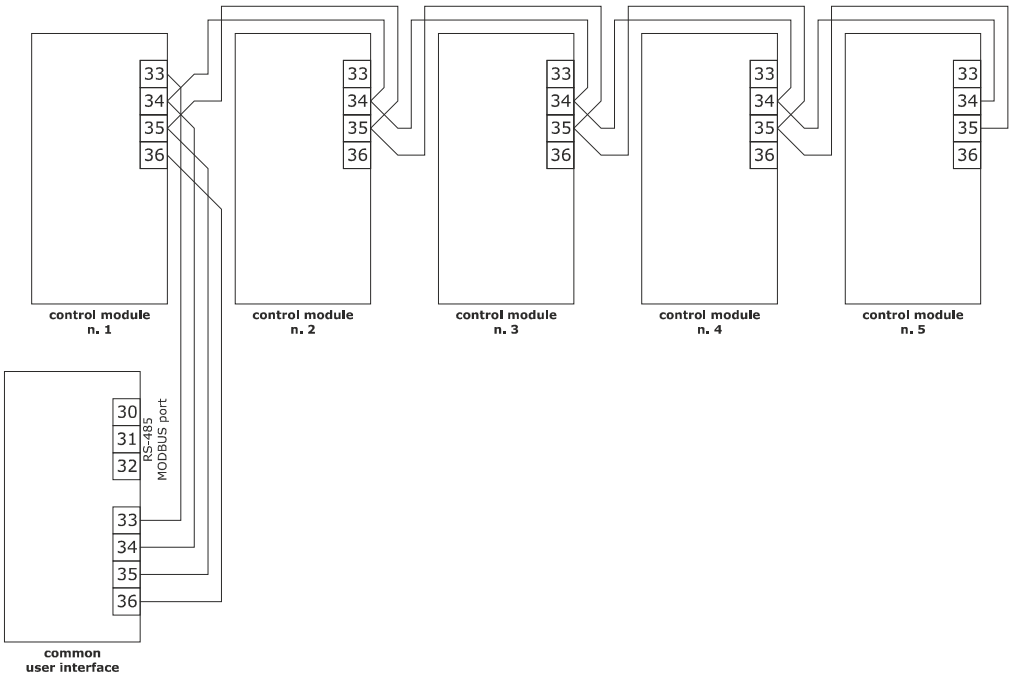
## 3.3 Vcolor 378M electrical connection in multi-base mode

The diagram below shows the electrical connection of an RS-485 network with up to 5 control devices with a single 5- or 7-inch user interface.

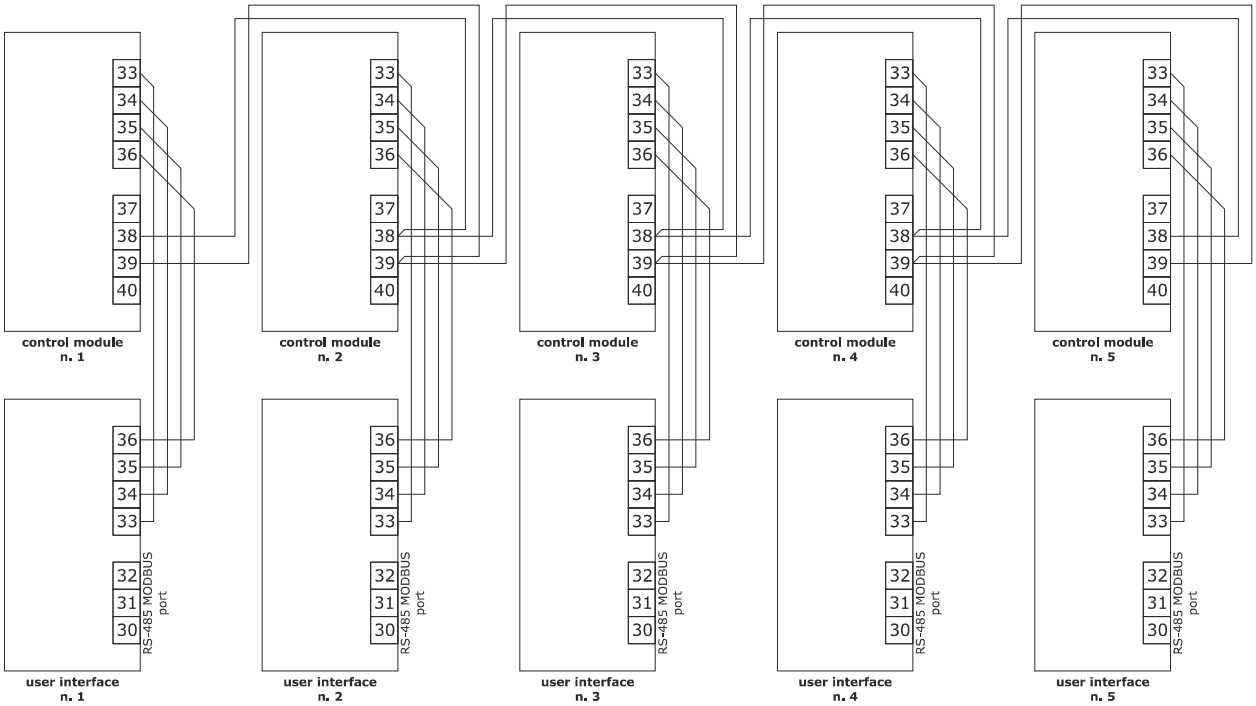



## 3.4 Vcolor 378L electrical connection in multi-base mode

The diagram below shows the electrical connection of an RS-485 network with up to 5 control devices with a single 5- or 7-inch user interface.

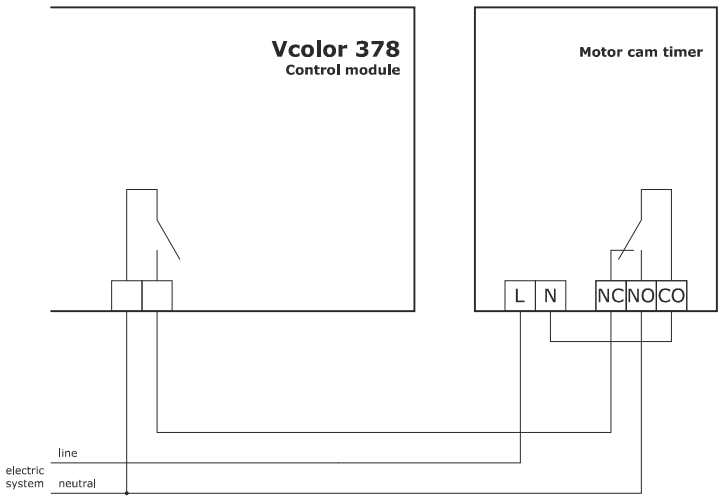


## 3.5 Vcolor 378 electrical connection in multi-kit mode




## 3.6 Electrical connection with a motorised venting solenoid valve

The diagram below shows an example of connection with a motorised venting solenoid valve.

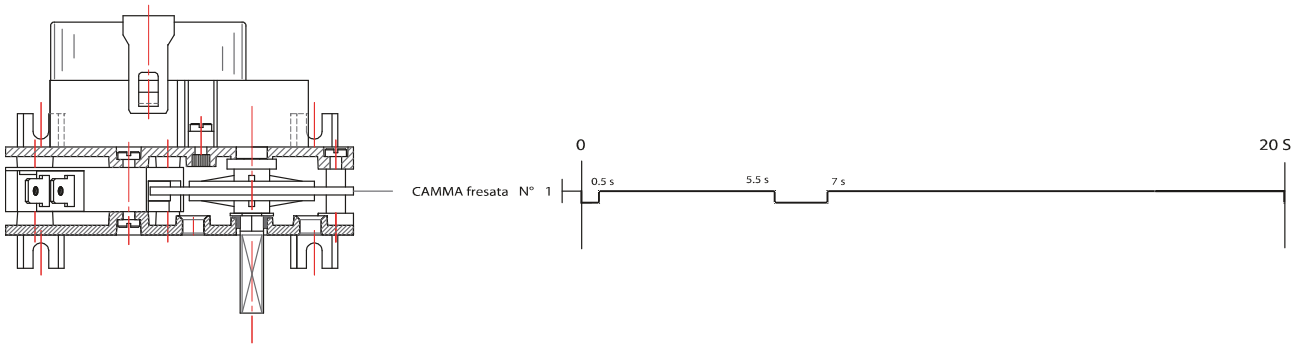



The diagram below shows operation with the parameters set as follows:

u2 = 140 (14 seconds) pause time for cam to run

u3 = 10 (1 second) motor activation time for short milling output

u4 = 30 (3 seconds) motor activation time for long milling output




## 3.7 Precautions for electrical connection

- Do not use electric or pneumatic screwdrivers on the terminal blocks of the device
- If the device is moved from a cold to a warm place, the humidity may cause condensation to form inside. Wait about an hour before switching on the power
- Make sure that the supply voltage, electrical frequency and power of the device correspond to the local power supply. See section 1517 “TECHNICAL SPECIFICATIONS”
- Disconnect the device from the power supply before doing any type of maintenance
- Locate the power cables as far away as possible from those for the signal
- To reduce reflections on the signal transmitted along the cables connecting the user interface to the control module, it is necessary to fit a termination resistor
- Ensure that the thermocouple is properly insulated from contact with metal parts or use already insulated thermocouples
- For repairs and for further information on the device, contact the EVCO sales network.

# 4 FIRST-TIME USE

## 4.1 First-time use

Proceed as follows:

1. Install the device as shown in section 2 "INSTALLATION", taking all the precautions mentioned in paragraph 2.3 "Installation precautions".
2. Make the electrical connection as shown in section 3 "ELECTRICAL CONNECTION".
3. Connect the power supply to the device: the device will show a splash screen for some seconds.
4. Set the time, date and day of the week. See section 8 "CONFIGURATION".
5. Configure the device as shown in section 10 "LIST OF CONFIGURATION PARAMETERS".

The following table describes the main configuration parameters. The parameters are listed in the recommended configuration order.

| PARAM. | DESCRIPTION | FACTORY SETTING |
|---|---|---|
| P0 | type of probe<br>0 = J thermocouple<br>1 = K thermocouple<br>2 = Pt 100 | 0 |
| P1 | unit of measurement<br>0 = °C<br>1 = °F<br>N.B.: passing from °C to °F automatically adapts the parameter values; please note that this parameter does not affect recipe configuration | 0 |
| P2 | type of operation<br>0 = WITH 1 ANALOGUE INPUT (chamber probe, with separate management of the top and floor heating by setting the percentage of power delivered to the top and floor heaters)<br>1 = WITH 2 ANALOGUE INPUTS (top and floor probes, with separate temperature management for the top and the floor by setting 2 different temperature setpoints: one for the top heaters and one for the floor heaters) | 0 |
| P3 | mode to enable steam injection activation<br>0 = MANUAL – steam injection will be enabled if the steam generator is switched on<br>1 = REMOTE – steam injection will be enabled if the steam generator is switched on and if the multi-purpose input is activated (until the input is deactivated; only if i5 = 1)<br>1 = THERMOSTATIC – steam injection will be enabled if steam temperature regulation is activated and the steam temperature is above t1 - t3<br>3 = DISABLED – steam injection and generation are disabled and the appropriate menu is NOT visible | 0 |
| P4 | front probe present<br>0 = no<br>1 = yes | 0 |
| u1 | load managed by venting output<br>0 = ON/OFF SOLENOID VALVE<br>1 = MOTORISED SOLENOID VALVE - with this setting parameters u2, u3 and u4 are relevant | 0 |
| e2 | oven configuration<br>0 = Single or multi-kit regulator (max. 5 connected to RS-485) for the shared power option<br>1 = Multi-base regulator (1 user interface with max. 5 power boards connected in a network) | 0 |

Next check the remaining parameters are appropriately set; see section 10 "LIST OF CONFIGURATION PARAMETERS".

# 5 USER INTERFACE

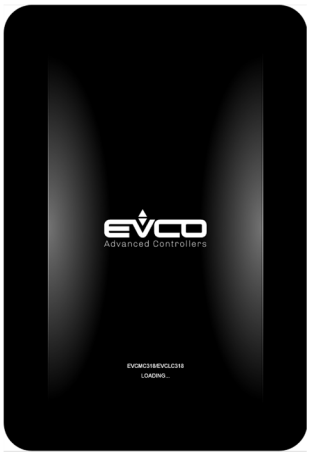
## 5.1 Initial information

The controller has the following operating modes:

- "OFF": no power to the device; the display and all the loads are switched off.
- "STAND-BY": the device is powered, the display is on and all the loads are switched off (except the chamber light if activated manually).
- "ON": the device is powered and the display is on; the loads may be switched on, depending on machine status.

## 5.2 Splash screen

When the control module is powered up, it defaults to the EVCO splash screen for a few seconds.




## 5.3 STAND-BY screen

After the splash screen, the user interface displays the stand-by screen according to the configuration of parameter e2.

e2 = 0 e2 = 1


Briefly press the ON/OFF key to switch the device on.

N.B.: OFF status can be forced by activating input id2 (see parameter i7) and can be linked to a relay output configured as "Stand-by/On" (uxc=10).

If the "weekly programming" function is enabled by the parameter (C5 = 1), the Planning key will also be displayed,

making it possible to set weekly programmed switch-ons (see section 6).

The "Configuration" key

gives access to set the date and time, configure parameters, see the list of alarms (see section 8 "CONFIGURATIONS" for a detailed description of all the possible options).

The "Chamber Light" key allows the user to switch the chamber light on and off manually, even when the controller is in stand-by.

## 5.4 ON screen

### 5.4.1 Initial information

Depending on the construction features of the oven, and according to whether it has 1 or 2 analogue inputs, the controller can be regulated in two different ways that have to be correctly set with parameter P2:

P2 = 0 1 analogue input (chamber probe)

P2 = 1 2 analogue inputs (top probe and floor probe)

Control of the front heater can also be added and is regulated in two different ways:

- 1 dedicated analogue input (P4=1 in configurations with r12=0, 1, 3, 4, 5)
- by setting a percentage relative to the working percentage of the top heater (P4=0 with configuration r12=2, 6, 7); the working percentage, set by parameters r16 and r17, will always be calculated considering the set working percentage of the top heater as the maximum value.

### 5.4.2 Oven regulated by one chamber probe

In this type of oven, separate temperature management for the top and the floor is obtained by setting the percentage of power delivered above (top) and below (floor). The percentages can be set individually and are not affected by each other. The following screen is displayed:


The settings for ovens with one chamber probe are as follows:

- chamber setpoint (shown in smaller type to the side of the chamber temperature)
- top power
- floor power
- cooking timer
- recipe selection
- mode (economy or rapid)
- venting
- hood
- chamber light
- steam generator
- steam injection
- stand-by

### 5.4.3 Oven regulated by one chamber probe + one probe for floor front

This configuration differs from the previous one as it includes a dedicated probe (P4=1) to manage the front heater. The following screen is displayed:


On the basis of parameter r12, the temperature of the front can be:

- absolute (r12=0): in this case parameters r13, r14 and r15 are relevant

- relative to the chamber setpoint (r12=1): in this case the front setpoint cannot be changed but is considered the same setpoint as the chamber; a relay must also be configured as the front floor heater (uxc=3).

### 5.4.4 Oven regulated by one chamber probe + floor front % adjutment

If the oven is regulated by a single probe and the front heater is not controlled by a temperature probe but a percentage relative to the top cycle time (P4=0, r12=2, in this case parameters r16 and r17 are relevant), the following screen is displayed:


### 5.4.5 Oven regulated by one chamber probe + independent regulation % of front floor

If the oven is regulated by a single probe (chamber) and the front heater is controlled with a percentage which is selected according to parameters r16 and r17 and is independent of that of the top and/or floor (configuration P2=0, P4=0, r12=6, with cycle time set by parameter r8), regulation of the front heater is only active if the chamber setpoint is not reached.

A relay must also be configured as front floor heater (uxc=3); the screen is the same as in the previous section.

### 5.4.6 Oven regulated by one chamber probe + one probe for top/floor front

This oven configuration is used when there is a chamber probe (P2=0) and a front probe (P4=1), with the chamber and front setpoints set individually but the percentages of the power delivered to the top/floor of the front the same as those delivered to the top/floor of the chamber (r12=5).

Four relay outputs must be configured in this setting: chamber top heater (uxc=1), chamber floor heater (uxc=2), front floor heater (uxc=3) and front top heater (uxc=13).


### 5.4.7 Oven regulated by two probes (top and floor)

In this type of oven there are two probes which are independent of the top temperature and the floor temperature. Separate temperature management for the top and floor is obtained by setting two different temperature setpoints: one for the top and one for the floor. The following screen is displayed:


The possible settings for ovens with 2 probes (top and bottom) are as follows:

- top setpoint (shown in smaller type to the side of the top temperature)
- floor setpoint (shown in smaller type to the side of the floor temperature)
- cooking timer
- recipe selection
- mode (economy or rapid)
- venting
- hood
- chamber light
- steam generator
- steam injection
- stand-by
- stand-by

### 5.4.8 Oven regulated by two probes (top and floor) + independent regulation % of front floor

If the oven is regulated by two probes (independent top and floor temperature probes) and the front heater is controlled with a percentage which is selected according to parameters r16 and r17 (configuration P2=1, P4=0, r12=7, with cycle time set by parameter r8), regulation of the front heater is only active if the chamber setpoint is not reached.

A relay must also be configured as front floor heater (uxc=3).


### 5.4.9 Oven regulated by two probes (top and floor) + one probe for floor front

This configuration differs from the previous one as it includes a dedicated probe (P4=1) to manage the floor front heater. The following screen is displayed:


On the basis of parameter r12, the temperature of the front can be:

- absolute (r12=0): in this case parameters r13, r14 and r15 are relevant;

- relative to the top setpoint (r12=3): in this case the setpoint of the front cannot be changed but is considered the same setpoint as the top;
- relative to the floor setpoint (r12=4): in this case the setpoint of the front cannot be changed but is considered the same setpoint as the floor; a relay must also be configured as the floor front heater (uxc=3).

### 5.4.10 Status bar

When the device is switched on, the oven is already operating and the outputs are active according to the required settings.
The status bar shows the function being performed by the oven:

Pre-heating


Oven up to temperature, start-up of cycle


Cycle in progress


Cycle terminated


### 5.4.11 Steamer

If enabled by parameter P3 (except with P3=3, in which case the two icons will not be visible), two icons will appear on the display to indicate steamer management and manual steam injection. The icons have the following meanings:


Steamer on


Steamer off


Manual injection enabled


Manual injection disabled

The following menu opens when the steamer key is pressed:


- OFF: key to switch the steamer off
- ON: key to switch the steamer on
- AUTO: activate automatic cycle
- SET: set automatic cycle

When the steamer is not up to temperature or enabled by a digital input (P3 = 1 or 2), the steamer and manual injection keys will flash. When this happens, manual steam injection is dependent on the configuration of parameter t12.
If the steamer is up to temperature or enabled by a digital input, the steamer and manual injection keys stay on.
The MANUAL key, if enabled, enables persistent steam injection (see parameter t0).

The AUTO key activates/deactivates cyclical steam injection during any phase, depending on the recipe setting. If an automatic cycle has already been performed in a phase, the cycle can be repeated by repressing the AUTO key (if conditions permit, otherwise it will be pre-set).


The SET key gives access to the automatic steam injection setting bar.


The following actions can be taken:

- set injector-on duration
- set injector-off duration
- set number of On/Off injector repeats
- save settings


### 5.4.12 Venting

A short press of the venting key

changes vent status (open/closed) regardless of whether a cooking cycle is or is not in progress.
If a cycle is not in progress, it is possible to programme each phase of the recipe to establish whether the vent must be open or closed or set a time for the vent to open in advance before the end of the cooking cycle.
If a cycle is in progress, it is possible to manually change venting status during the phase in progress. When the programme passes to the next phase, the vent is positioned according to the current configuration of the recipe.
When the controller is in PREHEAT or READY status, the vent is always automatically closed.
The vent always opens automatically at the end of the cooking cycle.

### 5.4.13 Light

The On/Off light key

manually switches the light on and off when the device is in stand-by or ON. The light can be switched on and off automatically using parameters "e0" and "e1".

### 5.4.14 "Mode"

The following functions can be controlled by the "mode" key, found in the configuration with one analogue input:

- **Energy Saving**


deactivated

 activated

This activates the energy-saving function, except when rapid heating is in operation. For more details, see paragraph 7.2.5.

- **Rapid heating**

This key is only visible in the configuration with an analogue input.

 deactivated

 activated

The rapid heating key enables the oven to reach its regulation setpoint more quickly by activating the top and floor heaters at full power. This function cannot be activated when energy-saving is in progress. For more details, see paragraph 7.2.2.

## 5.5 Recipe book

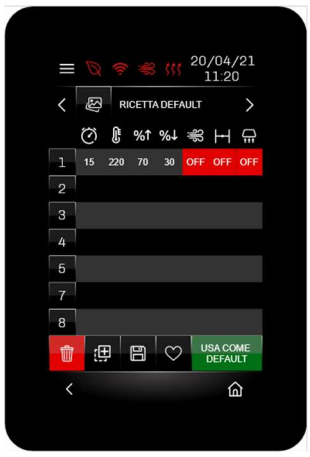
The recipe book key

gives access to the recipe management screen.


The recipe book contains a main section "OEM RECIPES", where up to 99 recipes can be saved, and a second section, "MY RECIPES", where the user's favourite recipes in the main section can be displayed. This function gives quick access to the most frequently used recipes.

The "OEM RECIPES" recipe book contains recipes uploaded by the manufacturer or previously created recipes, or default recipes which can be used to create personalised recipes.

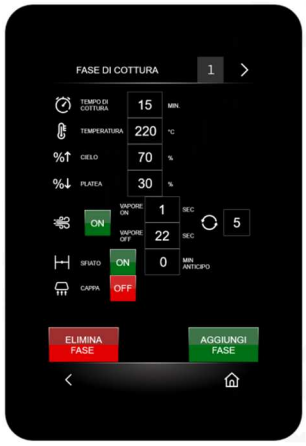
If a stored recipe is selected, a screen opens where it is possible to:




-  use the recipe for a cooking cycle
-  delete the recipe (it will be overwritten by the default recipe)
-  copy the recipe
-  save the recipe
-  include or exclude the recipe from the favourites

To configure a recipe (with one or more phases), press one of the available phases; this will open the following screen where it is possible to

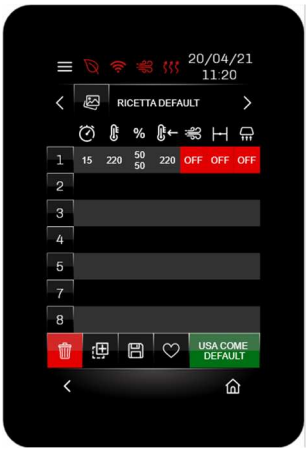
version with one analogue input




-  delete the phase (if there is more than one)
-  add a new phase

N.B.: the recipe and phase configuration fields depend on the type of oven configuration.

version with 1 analogue input + front heater




version with 2 analogue inputs

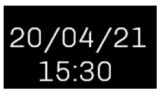

version with 2 analogue inputs + front heater


To go back to the ON screen, press the key if shown or press the key to go back to the previous page.

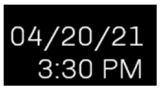
#### 5.5.1 Clock and alarms

The clock field shows the current date and time, which can be configured in either EUROPEAN or US format:

EUROPEAN:




US:




If an alarm is active, the following icon will appear in place of the clock field.

By pressing the icon, the page with the active alarms will be displayed.

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## 5.6 Locked display

Following a period of inactivity of the keypad, which can be set using parameter e3, the display goes into locked display mode but the information on the display remains the same. When the display is touched, the message "PRESS TO UNLOCK" appears: press down on the message for at least 4 seconds to unlock the display.

The locked display function can be deactivated using parameter e3=0.

# 6 "WEEKLY PROGRAMMED SWITCH-ON" FUNCTION

## 6.1 Initial information

If enabled by parameter C5, the "Weekly programmed switch-on" function allows the user to programme up to two recipes, each with 2 switch-ons, for every day of the week.

The recipe is loaded and the oven heats up to the pre-set temperature for the recipe.

To set it off, it must be started up manually using the appropriate key.

## 6.2 Setting and activating the "Weekly programmed switch-on" function

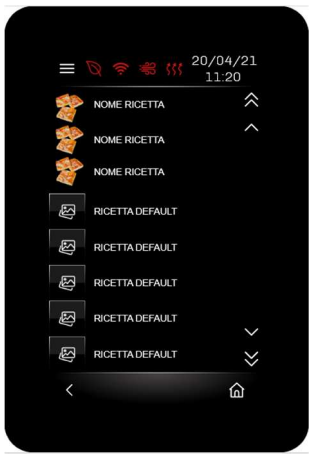
To access this procedure, proceed as follows:

1. Make sure at least one recipe has been saved and that the device is in stand-by mode (see paragraph 6.3); if no recipes have been saved, the default recipe will be used.
2. Touch the key in the middle of the screen at the bottom.
   The following screen with the default recipe will appear (if it is the first time it is programmed):


To programme a switch-on, proceed as follows:

1. Select the day of the week.
2. Select one of the two recipes; choose which section to upload the recipe from ("OEM RECIPES" or "MY RECIPES"):


   Select the recipe:




3. Activate the recipe using the OFF/ON key.


   As soon as ON is pressed, two more keys will appear to set the times.


   They will be set to OFF by default but can be changed by pressing the key:


   ON will start up pre-heating of the set recipe, according to machine configuration.
   The HARE will start up pre-heating in rapid heating mode if an analogue input has been configured.
4. Set the START and STOP times.
5. Once the programming for that day of the week is complete, it is possible to:

   ANNULLA delete the changes just made

   SALVA ED ESCI save the changes and exit; the controller will display the stand-by page with the details of the first programme closest in time


SALVA E PROSSIMO save the changes and go to the next day.

The weekly programme can be changed at any time by touching the key and repeating the steps described above.

# 7 MANAGING LOADS

## 7.1 Initial information

This paragraph describes the loads during normal operation.
To learn the main consequences of an alarm signal, see section 13 Alarm Management.

## 7.2 Temperature regulation

The temperature is regulated by activating the related relays. When the relay activation is cyclical, switch-ons will be separated in time as much as possible to minimise the top and floor relays overlapping when they switch-on. The minimum relay switch-on is also controlled by parameter r10 (minimum duration of the temperature regulation output switch-on/off) which cannot be set below 10 seconds when the regulation relays are electro-mechanical.

### 7.2.1 Devices with one analogue input (chamber probe)

The oven temperature in this type of device is regulated by the chamber probe and there are two relay outputs for the top and floor.

PI regulation is not available with this configuration, regulation is always ON-OFF: the outputs are switched on together or in sequence, according to the power set, until the temperature detected by the chamber probe reaches the working setpoint. They are switched on again when the temperature falls below that set by parameter r0 ("working setpoint - r0").

The switch-on cycle period is set in seconds by parameter r8. The switch-on time for each load is calculated as follows

Ton = r8 * power/100
Toff = Ton - r8

The powers of the top and floor can be linked by setting parameter r7 to 1 or 2 (enabling the link between the power delivered to the top and to the floor)
If r7 = 1, the setting of the power delivered to the top causes the power delivered to the floor to be adapted automatically, and vice versa. This guarantees that the sum of the two power values is always 100.

If, on the other hand, r7 = 2, the power selected for the top (within the range 0-100%) has priority, so the maximum power that can be set for the floor must not exceed the remaining power calculated using the formula "max. power range - top power set".
Examples:
- if the top power is set to 80%, the power of the floor can be set from 0% to 20% max.
- if the top power is set to 50% and the floor power to 50%, if the power of the top is increased, from 50% to 70% for instance, the power of the floor is automatically decreased (from 50% to 30%).

### 7.2.2 Rapid heating

In devices with one analogue input, the rapid heating function can be activated using the key; this function will force activation of the heaters, regardless of their regulation percentage, to reach the chamber temperature as rapidly as possible during the pre-heating phase.
The parameters are set as follows:

- c6: this activates the "rapid heating" function when the device is switched from stand-by to ON.
- c7: chamber temperature above which the "rapid heating" function is interrupted. If c7 is set to 0, the function stops when the working setpoint is reached.

N.B: this function cannot be activated in energy-saving mode.

To access this function, press the MODE key.

### 7.2.3 Devices with 2 analogue inputs (top and floor probes)

This type of device has two different independent oven temperature regulation systems: one operates the top probe, the other the floor probe, each linked to a top and a floor relay.

According to parameter r9, the temperature regulation can be ON-OFF or PI (Proportional-Integral).

- **ON-OFF regulation**
  The output is on until the probe temperature reaches the working setpoint and it switches on again whenever the temperature falls below parameter r0 setting (“working setpoint - r0”).
- **PI regulation**
  Parameters r0, r8, r10 and r11 are used for PI regulation (see section 10 “LIST OF CONFIGURATION PARAMETERS”).

#### 7.2.4 Front heater

As well as the top and floor heaters, the front heater can also be configured (P4=1); this heating element can be controlled in different ways according to parameter r12.

#### 7.2.5 Energy-saving function

The energy-saving function enables consumption to be reduced and it is activated using the key or by multi-purpose digital input 2, if parameter i7 is set at 2, and it will remain active until the input is deactivated. The maximum duration of the energy-saving function is given by parameter c8.

- **Devices with one analogue input**

  The function cannot be activated in these devices if the "rapid heating" function is in progress.
  The reduction in consumption is achieved by lowering the percentage of power delivered to the top and floor by setting parameter c9. This percentage can also be set by applying prolonged pressure to the key. The ratio is as follows:
  power in ES= power set * c9/100

To access this function, press the MODE key.

- **Devices with 2 analogue inputs**

  The reduction in consumption is achieved in these devices by inhibiting the activations of the relay outputs at the same time.
  For ON-OFF regulation, the switch-on cycle periods are set in seconds by parameter r8. The switch-on time for each load will be half that period, r8/2 seconds, and switch-ons will be separated in time so as to avoid overlapping.
  With PI regulation, overlapping activation of the relays will automatically be inhibited.

In this configuration, the key is always present on the main screen.

## 7.3 Steamer management

Steam generator operation depends mainly on parameter P3 (enable steam injection) and can be:

- 0 = Manual
- 1 = Remote
- 2 = Thermostatic
- 3 = Disabled

Switching on the steamer can also be managed automatically using parameter t6 (automatic steamer switch-on when the oven is switched on) or using the On/Off steam key.

 steamer on

 steamer off

#### 7.3.1 Manual steam regulation (P3 = 0)

Once steamer management is enabled, the steam generator relay output is always active and steam injection is always enabled.
Manual injection using the steam key is always enabled.

#### 7.3.2 Remote steam regulation (P3 = 1)

Once steamer management is enabled, the steam generator relay output is always active.
Steam injection is enabled if the multi-purpose input has been activated, setting i5 to 1.
Manual injection using the steam key depends on the configuration of parameter t12.
When the steamer is activated and the digital input not yet activated, the steamer and manual steam injection keys flash (if t12=1 only the steamer key flashes).

#### 7.3.3 Thermostatic steam regulation (P3 = 2)

Once steamer management is enabled, the steam probe activates thermostatic steam regulation.
The ON-OFF regulator parameters are as follows

- t1 = steam setpoint
- t2 = t1 differential

Steam injection (automatic and manual with t12=0) is enabled as soon as the steam setpoint is reached (steamer up to temperature). Injection (automatic and manual with t12=0) is disabled if the temperature detected by the steam probe falls t3 degrees below the setpoint.
If t12=1, only manual steam injection is allowed, regardless of steam temperature.
When the steamer is activated and the steam temperature setpoint not yet reached, the steamer and manual steam injection keys flash (if t12=1 only the steamer key flashes).

#### 7.3.4 Steam injection mode

The following parameters make it possible to personalise steam injection management (see section 10 LIST OF CONFIGURATION PARAMETERS):

- t0 = steam injection activation mode: acts on the manual steam injection key function
- t4 = enables constraint between cyclical steam injection and cooking timer start-up
- t5 = enables constraint between cyclical steam injection and the cooking timer stop.

## 7.4 Suction hood management

The suction hood can be activated manually using the key below, according to the configuration of the phase of the recipe, or automatically on activation of the door switch input.
The hood is always off when the controller is in stand-by.

#### 7.4.1 Suction hood management with door switch input

Door switch input activation is always shown on the display.

The effect of the door switch input on regulation depends on parameter i4:

0 = no effect

1 = SWITCH ON THE SUCTION HOOD - the suction hood is switched on

2 = SWITCH ON THE SUCTION HOOD, SWITCH OFF THE TOP AND FLOOR OUTPUTS AND DISABLE STEAM INJECTION – the suction hood is switched on, the top and floor outputs switched off and steam injection disabled (until the input is deactivated).

N.B.:

If the suction hood is activated automatically upon activation of the switch input, it will be switched off as follows:

- when the door switch input is deactivated;
- when the door switch is activated and only when the time set by parameter "i8" elapses (if i8≠0).

## 7.5 Buzzer management

The buzzer is activated in the following situations:

- at the end of the cooking cycle (see parameter c0)
- for one second at the end of a cooking cycle phase (see parameter c1)
- on activation of an alarm

N.B.: buzzer activation can be linked to a relay if configured as "Sound" (uxc=11).

The buzzer can also be placed outside the electronics compartment using an expansion device, supplied as an accessory (CT1ES0070000), which must be connected to the relevant connector on the power board (see section 3 "ELECTRICAL CONNECTION").

## 7.6 Electronics compartment fan

Management of the electronics compartment fan depends mainly on the status of the device:

- if the device is switched on, the fan will switch on
- if the device is switched off, the fan will switch off

N.B.: the fan may remain on when the device is switched off if the operating temperature of the control module is above the u6 threshold.

## 7.7 Stand-by/on relay management

When an output is configured as a stand-by/on relay, management of the connected load depends on the status of the device:

- if the device is switched on, the relay will switch on
- if the device is switched off, the relay will switch off

## 7.8 Sound relay management

When an output is configured as a sound relay, the relay will behave as follows every time the buzzer is activated:

- if the buzzer is switched on, the relay will switch on
- if the buzzer is switched off, the relay will switch off

## 7.9 Reset of type 1/2 burner block

Burner block reset management is only active if one of the relays is configured as "Burner block reset" (uxc=12); the type of burner block (1 or 2) depends on the high voltage input (230 Vac) which the burner is connected to.

In the event of a burner block alarm, in both cases, a key is displayed to the side of the alarm signal which, when pressed, activates the relay output for 5 seconds, resetting the gas control unit and restoring normal operation.

TYPE 1 BURNER BLOCK INPUT – steam injection is disabled, the steam generator, the top, floor and front outputs (if fitted) are switched off, the device displays the message "BURNER BLOCK" and the buzzer is activated (until the input is deactivated). It is possible to reset the alarm by pressing the alarm key which will activate the relative relay output for 5 seconds, resetting the gas control unit and restoring normal operation.

TYPE 2 BURNER BLOCK INPUT – the steam generator, the top, floor and front outputs (if fitted) are not switched off, the device displays the message "BURNER BLOCK" and the buzzer is activated (until the input is deactivated). It is possible to reset the alarm by pressing the alarm key which will activate the relative relay output for 5 seconds, resetting the gas control unit and restoring normal operation.

## 7.10 Rotary plate relay management

When an output is configured as "rotary plate motor" (uxc = 14), the plate is activated when the cooking cycle starts up and automatically stops when cooking time ends, irrespective of its status.

It is always possible to manually activate/deactivate the plate (even during a cooking cycle), whatever status the controller may be in, with the exception of stand-by status.

The way in which the plate is manually activated/deactivated depends on the steam management settings (parameter P3): if steam management is disabled, the  key is displayed on the ON screen for this purpose; if steam management is enabled, the key is not visible on the ON screen but the activation/deactivation option is available in the menu.

Switching the rotary plate on/off using the key

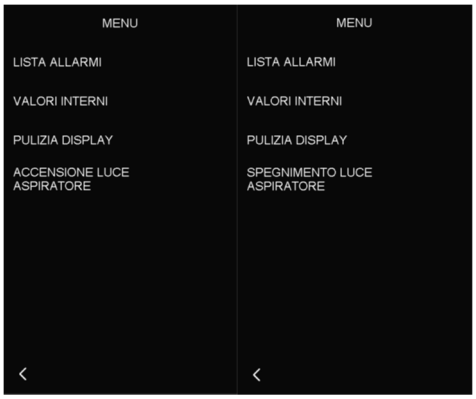
Switching the rotary plate on/off through the menu


## 7.11 Suction hood light management

If a relay output is configured as HOOD LIGHT (uxc=15), the light on the hood can be switched on/off manually. The way in which the light is switched on/off depends on the steam management settings (parameter P3): if steam management is disabled, the key is displayed on the STAND-BY and ON screens for this purpose; if steam management is enabled, the key is only visible on the STAND-BY screen but the function is available in the ON menu.

Switching the suction hood light on/off using the key


Switching the suction hood light on/off through the menu




## 7.12 Proofer management

If a proofer is installed (usually below the oven), it can be controlled by setting parameter EP1≠0. This configuration, which is separate from oven operation, manages a heater in on/off regulation mode controlled by a dedicated probe and a timer (countdown) which signals the end of proofing. When correctly configured using parameter EP1, the timer can signal the end of the countdown and block regulation (EP1=2) or that the time has expired without blocking regulation (EP1=1); in both cases, a buzzer sounds at the end of the countdown. The proofer is managed using an external expansion device (optional) with a probe and relay specifically for this purpose; the probe is either NTC or PTC (and is configured by parameter EP0). The proofer screen is accessed from the menu by pressing the key "PROOFER MANAGEMENT" when the controller is in either STAND-BY or ON.


After exiting this screen to go back to oven management, the icon will be displayed to indicate that the proofer is on, when the controller is in either STAND-BY or ON.

# 8 CONFIGURATION

## 8.1 Initial information

On the Stand-by screen, touch the key to access the menu with the following options:

Page 1 Page 2

If the controller is ON, press the key to access the menu which, in this case, will give only a few options:


To access the various procedures, touch the screen near the information/function required.

## 8.2 Setting the date and time

By selecting this option, the date and time can be changed and either the "EU" or "US" format chosen.
In the event of "multi-base" configuration, this function can only be accessed if all the decks are in stand-by (this menu has a key which automatically puts all the ovens in stand-by).

## 8.3 List of alarms

This option displays the page with the active alarms.

## 8.4 Internal values

This option displays the values and status of the controller's inputs and outputs.

## 8.5 Service

This option (accessed using the password -19) gives access to a sub-menu where it is possible to change the parameters, restore factory settings, factory recipes and all the settings or test the relays.
The password for "reset parameters" or "restore recipes" is "149", while it is "-119" for "restore settings" (restore parameters + recipe book). Please be aware that, for safety reasons, the "restore settings" function configures all outputs to "unused" and they will therefore need to be reconfigured manually (unless the "restore.csv" file has been uploaded by the oven manufacturer).
In the event of "multi-base" configuration, the service can only be accessed if all the decks are in stand-by (this menu has a key which automatically puts all the ovens in stand-by).

## 8.6 Languages

By selecting this option, the device can be configured with the required language. One of the following languages can be selected: Italian, English, German, French or Spanish.

## 8.7 Oven cleaning cycle

The oven cleaning cycle can be started up when the controller is in stand-by (irrespective of whether the deferred start function is activated or not). During this cycle, all the heaters operate at full power until they reach the setpoint. By entering the options menu and pressing "oven cleaning", the programme starts instantly and a new screen opens with the following information: chamber temperature + cleaning cycle setpoint (c11), cleaning cycle count-down (c12).
Once the oven has reached the setpoint temperature c11 (this value is the same for all configured temperature probes), countdown c12 will begin; during countdown, the temperature will be maintained considering the differential c13. Once the time has elapsed, the controller will automatically go back into stand-by. If the "stop" key is pressed, the cycle is interrupted, the stand-by page is displayed and the controller returns to its previous status.
If parameter C12=0, once setpoint c11 has been reached, the controller immediately goes back into stand-by. If there are several temperature probes (for example top, floor and front), the setpoint is reached when all the temperatures reach it.
During the oven cleaning cycle, the message "CLEANING CYCLE IN PROGRESS. KEEP THE DOOR CLOSED" will be displayed on the screen.

## 8.8 Display cleaning

If this option is selected, the display is deactivated for 15 seconds, during which time the glass may be cleaned without altering any of the settings on the screen.

## 8.9 USB

If this option is selected, the map of parameters or the recipe book can be imported or exported.
In the event of "multi-base" configuration, this function can only be accessed if all the decks are in stand-by (this menu has a key which automatically puts all the ovens in stand-by).

## 8.10 Shared power status (if applicable)

If this option is selected (available with multi-base or multi-kit configuration), the shared power status can be viewed; the loads which are activated, deactivated or awaiting activation are displayed for each deck.


Display example in ovens with 1 analogue input


Display example in ovens with 2 analogue inputs.

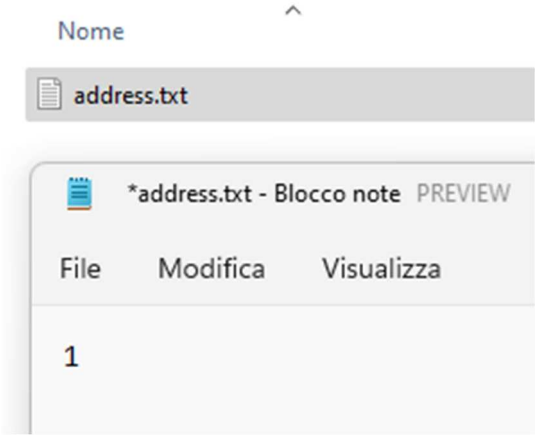

## 9 MULTI-BASE CONFIGURATION

In this configuration, several power boards (max. 5) can be connected to a single display. The electrical connection between the display and the power boards is through the RS485 network (pins 34-35 of the display and pins 34-35 of the power boards). See paragraphs 3.3 and 3.4 "Vcolor 378 M/L connection in multi-base mode".

The power boards must be assigned an address, from 1 to 5 (the addresses must always be consecutive).

The power board addresses must be configured when the device is in stand-by.

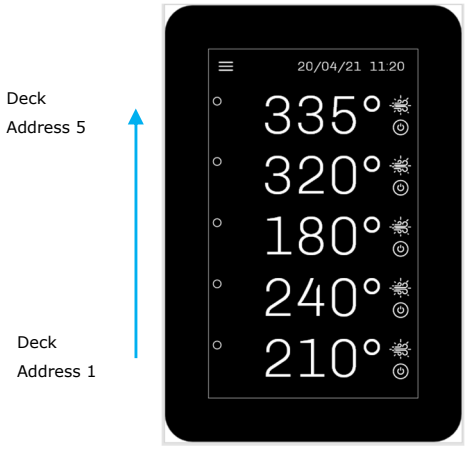
Below is the procedure to configure the address of the power boards (the boards must be powered during this procedure).
Using a computer, create a file with the name "address.txt" and the number of the address of the power board in it and upload it to a USB flash drive (formatted to FAT32).




Insert the USB flash drive into the USB port on the first power board and wait at least 30 seconds before removing it; to check the power board has been correctly programmed, open the "log.txt" file generated automatically by the USB flash drive.

Repeat this operation (using a different number for the address of the power board) for the other boards in the network.

Now switch the display on and enter the menu to programme the parameters. Configure parameter e2=1 (multi-base configuration). Parameter MS6 must be configured by inserting the number of connected power boards (e.g. MS6=5 if there are 5 power boards).
Switch the display and the power boards off and then on again to update system configuration; the following screen will be displayed:




The following information is given: on the right are the function keys to switch each deck on individually and, if enabled, the steam injection key. In the centre is the chamber temperature

(if the deck has one probe) or the top temperature (if the deck has several probes). On the left is the status of each individual floor, which can be:

a. if white, deck in stand-by
if yellow, deck heating up
if green, deck up to temperature
if red, alarm in progress

b. energy saving function is activated on the deck

c. rapid heating mode is activated on the deck

d. deferred start function is activated on the deck

To control each individual deck, just press on the temperature; a white ball on the left hand side indicates the deck being shown.


Multi-base configuration can also be used for centralised management with power shared among the decks. To do this, the parameters given in section 12 under CENTRALISED MANAGEMENT must be set.

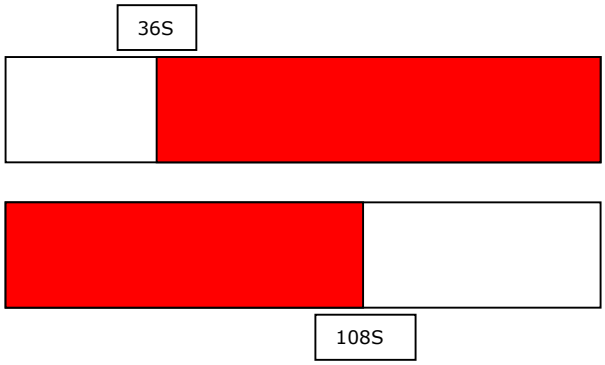
# 10 MULTI-KIT CONFIGURATION

In this configuration, a maximum of 5 control kits (each consisting of a power board + user interface) can be connected via the serial port in order to use centralised management with shared power. The electrical connection between the power boards is through the RS485 network (pins 38-39). See section 3.5 "Vcolor 378 connection in multi-kit mode".
Multi-kit configuration can only be used for centralised management with shared power between the decks. The parameters given in section 12 under CENTRALISED MANAGEMENT must be set to do this.

# 11 Centralised management with power shared between the decks

A problem businesses often encounter when using multi-deck ovens is that they have limited electric power. When there are four decks, one on top of the other, each with a power of 14 kW (e.g. 5 kW top heater, 5 kW floor heater, 2 kW front heater, 1.7 kW steamer, 0.3 kW lights) and there is maximum power of 36 kW, operating all four decks at full power at the same time would cause the power to shut off. On the other hand, an oven only really works at full power for a short amount of time, for example when it is first switched on. The aim of this function is to activate different loads on different decks in the oven to prevent costly power overloads or even power failures due to exceeding the rated load.

A) Configuration with one analogue input:
In order for this algorithm to work, the average power of each individual deck must be taken into consideration and not the instantaneous power. If, for example, we have 5 kW on the top and 5 kW on the floor and the user sets 80% on the top and 60% on the floor for a cycle time of 180 s, we have an instantaneous power of 10 kW for 72 s and an average power of 7 kW over the total time.




This is a realistic scenario as magnetothermal switches and counters calculate an average value of the current.
If the setpoint is reached, the power requested is zero.

B) Configuration with two analogue inputs:
In ovens which are configured with two probes, on the other hand, the individual request of the individual heating group must be taken into consideration and not the average power request for the time.

The controllers are connected to a master/slave serial bus. To keep it simple, the controller with address 1 is the master. At start-up, the master interrogates the slaves (addresses 2 - 5) and determines the number of ovens.

## 11.1 Parameters of reported consumption

The master (identified by parameter MS1=1) has the following shared parameters:
POW = max. power available for the oven.
PT = top power consumption (this is the same for all the decks in multi-base configuration)
PF = floor power consumption of the particular deck (this is the same for all the decks in multi-base configuration)
PMF = front floor power consumption (this is the same for all the decks in multi-base configuration)

PMT = front top power consumption (this is the same for all the decks in multi-base configuration)
PH = suction hood power consumption (one for all the decks)
PB = steam generator power consumption (the steamer, set by parameter PBT, can be used for an individual deck or for all the decks)
PBT = steam generator use (individual or shared)
PBL = chamber light power consumption (this is the same for all the decks in multi-base configuration)

Each slave must report the power of its own loads:
PT = top power consumption
PF = floor power consumption
PMF = front floor power consumption
PMT = front top power consumption
PB = steamer power of the particular deck (if the steam generators are independent for each deck)
PBL = chamber light power

## 11.2 Loads with immediate and non-immediate activation

The loads involved in the energy-saving strategy are divided into loads which must be activated the moment the system requests it and loads which can wait a few seconds to enter the shared distribution algorithm.

- The loads requiring immediate activation are:
a) shared suction hood
b) lights on each deck
To ensure these loads are immediately activated, the system must always have enough available power.
So the actual power available for loads "not requiring immediate activation" will be:
"P available" = POW – PH - PBL1 - PBL2 - ... – PBL5

- The loads not requiring immediate activation are:
PB = steam generator power consumption
PT = top power consumption
PF = floor power consumption
PMF = front floor power consumption
PMT = front top power consumption
These loads will be activated according to an algorithm which decides their priority, as explained in the next section.

## 11.3 Distribution strategy of the available power

Every "MS5" seconds, the master controller receives the following information from the network of devices:
a) activation requests for the independent boilers or the shared boiler;
b) decks in the oven manually excluded from the energy-saving strategy or which have the "rapid" function activated;
c) power requested calculated for the top, floor and front of the oven. This is expressed as the average of the top, floor and front powers when the oven is regulated by one probe (in the previous example 5*60%+5*80%+2*70% of the percentage of the top = 8.120 kW) or the power requested by each individual heating group (0 kW or 5 kW for the top and floor, 0 kW or 2 kW for the front) when it is regulated by two probes;
d) error calculated in relation to the working setpoint (one single error when regulated with one probe, separate for top and floor when regulated with two probes); "error" means the delta between the setpoint and temperature of the relative probe.

The master controller uses these four pieces of information to prioritise load activation, following this principle:
1. The boiler(s) will always be in first place
2. The decks in the oven which have been manually excluded from the energy-saving strategy will be in second place
3. The decks in "rapid heating" function will be in third place
4. The remaining heating groups will be ranked according to the error calculated in relation to the working setpoint: the higher the error, the higher their position.

Once the positions have been decided, the algorithm allows activation of the loads with the established priority for as long as there is "available P" (i.e. the rated power of the mains minus the loads requiring immediate activation). It will therefore exclude any loads whose ranking exceeds the available power.
Once "MS5" time has elapsed, a new order of priority will be drawn up and so on.

The error of ovens which received power will therefore decrease (they heat up), while the error of ovens with no power will increase and the order will be updated accordingly after "MS5" has elapsed. The system works and is updated practically in real time.

## 11.4 Managing networks with shared power

At least two controllers must be connected to manage the SHARED ECONOMY function.
The network is defined by parameter "e2" (type of oven) and parameter MS6 (number of devices connected, from 1 to 5); these parameters allow the MASTER to understand if a device is no longer connected to the network due to a fault or disconnected cables.
Every SLAVE recognises when it is no longer connected to the master, according to parameter MS4; this is signalled by the network icon .

# 12 LIST OF CONFIGURATION PARAMETERS

| PARAM. | MIN. | MAX. | M.U. | DEF. | ANALOGUE INPUTS |
|---|---|---|---|---|---|
| P0 | 0 | 1 | - - - | 0 | type of probe<br>0 = J thermocouple (only for J/K power board)<br>1 = K thermocouple (only for J/K power board)<br>2 = Pt 100 (on for Pt 100 power board) |
| P1 | 0 | 1 | - - - | 0 | temperature measurement unit<br>0 = °C<br>1 = °F<br>N.B.: moving from °C to °F automatically adapts the parameter values; please note that this parameter does not affect recipe configuration |
| P2 | 0 | 1 | - - - | 0 | type of operation<br>0 = WITH 1 ANALOGUE INPUT (chamber probe, with separate management of the top and floor heating by setting the percentage of power delivered to the top and floor heaters)<br>1 = WITH 2 ANALOGUE INPUTS (top and floor probes, with separate temperature management for the top and the floor by setting 2 different temperature setpoints: one for the top heaters and one for the floor heaters) |
| P3 | 0 | 3 | - - - | 0 | mode to enable steam injection activation<br>0 = MANUAL – steam injection will be enabled if the steam generator is switched on<br>1 = REMOTE – steam injection will be enabled if the steam generator is switched on and if the multi-purpose input is activated (until the input is deactivated; only if i5 = 1)<br>2 = THERMOSTATIC – steam injection will be enabled if steam temperature regulation is activated and the steam temperature is above t1 - t3<br>3 = DISABLED – steam injection and generation are disabled and the appropriate menu is NOT visible |
| P4 | 0 | 1 | - - - | 0 | front probe present<br>0 = no<br>1 = yes |
| CA1 | -25 | 25 | °C (1) | 0 | top probe offset |
| CA2 | -25 | 25 | °C (1) | 0 | floor probe offset |
| CA3 | -25 | 25 | °C (1) | 0 | steam probe offset |
| CA4 | -25 | 25 | °C (1) | 0 | front probe offset |
| PARAM. | MIN. | MAX. | M.U. | DEF. | MAIN REGULATOR |
| r0 | 1 | 99 | °C (1) | 5 | with ON-OFF regulation (r9=0):<br>if P2 = 0: working and front setpoint differential<br>if P2 = 1: top, floor and front setpoint differential<br>with regulation PI (r9=1 and P2=1): top and floor setpoint proportional band |
| r1 | 0 | r2 | °C (1) | 0 | if P2 = 0: minimum working setpoint<br>if P2 = 1: minimum top setpoint |
| r2 | r1 | 999 | °C (1) | 300 | if P2 = 0: maximum working setpoint<br>if P2 = 1: maximum top setpoint |

| | | | | | |
|---|---|---|---|---|---|
| r3 | r1 | r2 | °C (1) | 130 | working/top setpoint |
| r4 | 0 | r5 | °C (1) | 0 | only if P2 = 1: minimum floor setpoint |
| r5 | r4 | 999 | °C (1) | 300 | only if P2 = 1: maximum floor setpoint |
| r6 | r4 | r5 | °C (1) | 130 | floor setpoint |
| r7 | 0 | 2 | - - - | 0 | enables constraint between power delivered to the top and power delivered to the floor (only P2 = 0)<br>0 = no<br>1 = yes – the setting for the power delivered to the top causes automatic adaptation of the power delivered to the floor, and vice-versa, so as to guarantee that the sum of the two power values is always 100<br>2 = yes – the setting for the power delivered to the top (priority) causes automatic adaptation of the power delivered to the floor, so as to guarantee that the sum of the two power values is always 100 (the floor power will always be the remaining percentage, considering "100 % - % top"). |
| r8 | 1 | 650 | sec | 80 | if P2 = 0: cycle time for switch-on of the top and floor outputs<br>if P2 = 1: cycle time for switch-on of the top and floor outputs during the energy-saving function (or PI cycle time only if r9 = 1) |
| r9 | 0 | 1 | --- | 0 | type of temperature regulation<br>0 = ON-OFF<br>1 = PI (Proportional-Integral), ONLY FOR 2-PROBE REGULATION |
| r10 | 1 | 240 | sec | 10 | minimum on/off duration of the output for temperature regulation (values under 10 seconds are not recommended where there are outputs with electro-mechanical relays) |
| r11 | 0 | 240 | min | 30 | integral time (only valid if r9 = 1)<br>N.B.: with r11=0: only proportional regulation |
| r12 | 0 | 7 | --- | 0 | type of management of front heater<br>0 = absolute (P4=1, see also r13, r14, r15)<br>1 = relative to the chamber setpoint (P2=0, P4=1)<br>2 = relative to the top cycle time with values to be selected from r16 and r17 (P2=0, P4=0)<br>3 = relative to the top setpoint (P2=1, P4=1)<br>4 = relative to the floor setpoint (P2=1, P4=1)<br>5 = chamber and front with different setpoints, same working percentage (P2=0, P4=1)<br>6 = absolute with independent percentage (with the chamber probe)<br>7 = absolute with independent percentage (with top probe and floor probe) |
| r13 | r14 | r15 | °C (1) | 130 | front setpoint |
| r14 | -99 | r15 | °C (1) | 0 | only if P4 = 1, minimum front setpoint |
| r15 | r14 | 999 | °C (1) | 300 | only if P4 = 1, maximum front setpoint |
| r16 | 0 | r17 | % | 20 | minimum settable percentage for the front heater, relative to the working percentage of the top heater (P4=0, r12=2) |
| r17 | r16 | 100 | % | 100 | maximum settable percentage for the front heater, relative to the working percentage of the top heater (P4=0, r12=2) |
| PARAM. | MIN. | MAX. | M.U. | DEF. | MISCELLANEOUS |

| | | | | | |
|---|---|---|---|---|---|
| c0 | -1 | 120 | sec | 15 | duration of buzzer activation on completion of the cooking cycle<br>-1 = until silenced manually |
| c1 | 0 | 1 | - - - | 0 | buzzer status at the end of a cooking cycle phase<br>0 = deactivated<br>1 = activated for 1 s |
| c2 | 0 | 240 | min | 60 | time that has to pass if the device is not operated (from activation of the "weekly programmed switch-on" function) in order for it to switch off |
| c3 | 0 | 99 | °C (1) | 10 | temperature above which the temperature detected by the chamber probe cannot be displayed (referring to the working setpoint, i.e. "working setpoint + c3")<br>0 = function absent<br>value considered for top, floor and front |
| c4 | 0 | 99 | °C (1) | 10 | temperature below which the temperature detected by the chamber probe cannot be displayed (referring to the working setpoint, i.e. "working setpoint - c4")<br>0 = function absent<br>value considered for top, floor and front |
| c5 | 0 | 1 | - - - | 0 | enable the "weekly programmed switch-on" function<br>0 = no<br>1 = yes |
| c6 | 0 | 1 | - - - | 0 | activation of the "rapid heating" function when the device is switched on (only for 1-probe operation)<br>0 = no<br>1 = yes |
| c7 | 0 | 999 | °C (1) | 150 | chamber temperature above which the "rapid heating" function is interrupted (only for 1-probe operation)<br>0 = THE FUNCTION IS INTERRUPTED WHEN THE WORKING SETPOINT IS REACHED |
| c8 | 0 | 240 | min | 60 | maximum duration of the energy-saving function<br>0 = infinite duration (until manual deactivation)<br>N.B.: only applies if the energy-saving function has not been activated or kept active by the digital input (see i7) |
| c9 | 0 | 100 | % | 50 | percentage reduction in the duration of the top and floor output switch-ons during the energy-saving function<br>ONLY APPLIES FOR 1-PROBE OPERATION. IT CAN ALSO BE SET USING THE QUICK PROCEDURE |
| c10 | 0 | 1 | - - - | 0 | maintain energy-saving function when moving from STD-BY to ON<br>0 = no<br>1 = yes |
| c11 | 0 | 999 | °C (1) | 450 | setpoint for oven cleaning cycle start-up |
| c12 | 0 | 240 | min | 45 | oven cleaning cycle duration (after setpoint c11 has been reached)<br>if c12=0, when the setpoint is reached, the controller goes immediately into stand-by. |
| c13 | 0 | 99 | °C (1) | 5 | oven cleaning cycle differential |
| PARAM. | MIN. | MAX. | M.U. | DEF. | STEAM INJECTION |
| t0 | 0 | 1 | - - - | 1 | MANUAL steam injection activation mode |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | 0 = For Ton + PERSISTENCE – pressing and releasing the "MANUAL STEAM INJECTION" key will cause steam injection for the Ton time or for the length of time the key is pressed<br>1 = PERSISTENCE – pressing and releasing the "MANUAL STEAM INJECTION" key will cause steam injection for the length of time the key is pressed |
| t1 | 0 | 500 | °C (1) | 100 | steam setpoint; see also t2 (only if P3 = 2) |
| t2 | 0 | 99 | °C (1) | 5 | t1 differential (only if P3 = 2) |
| t3 | 0 | 999 | °C (1) | 50 | steam temperature below which steam injection is disabled (relative to t1, i.e. "t1 - t3"; only if P3 = 2)<br>steam injection is enabled once steam temperature has reached the temperature set by parameter t1 |
| t4 | 0 | 1 | - - - | 1 | enable cyclical steam injection when the cooking timer starts up<br>0 = no<br>1 = yes - cyclical steam injection will be activated when the cooking timer starts up |
| t5 | 0 | 1 | - - - | 1 | enable constraint between cyclical steam injection and the cooking timer stop<br>0 = no<br>1 = yes – when the cooking timer stops, cyclical steam injection will be deactivated; press and release the "AUTO" key to reactivate it |
| t6 | 0 | 1 | - - - | 0 | automatic steamer switch-on when the oven is switched on<br>0 = no<br>1 = yes – the steamer starts up automatically when going from STAND-BY to ON |
| t7 | 0 | 3 | - - - | 2 | time available with quick setting of automatic steam injection cycles<br>0 = injection time ON<br>1 = injection time ON and OFF<br>2 = injection time ON and OFF + number of automatic cycles<br>3 = injection time ON + number of automatic cycles |
| t8 | 1 | 99 | sec | 2 | steam injection default time ON with quick setting |
| t9 | 1 | 550 | sec | 10 | steam injection default time OFF with quick setting |
| t10 | -1 | 20 | - - - | 3 | number of automatic steam injection cycles<br>-1 = the on-off cycles continue until the steam generator is switched off or switched off using the key<br>0 = no cycle, only if pressed down |
| t11 | - - - | - - - | - - - | - - - | RESERVED |
| t12 | 0 | 1 | - - - | 0 | enable manual steam injection with steamer on<br>0 = only if conditions allow it (P3=1,2)<br>1 = always, even if conditions do not allow it (P3=1,2) |
| PARAM. | MIN. | MAX. | M.U. | DEF. | TEMPERATURE ALARMS |
| A0 | 1 | 99 | °C (1) | 10 | A1 and A6 differential |
| A1 | 0 | 500 | °C (1) | 0 | temperature above which the maximum temperature alarm is raised (referring to the temperature detected by the chamber probe or the top and floor temperature). See also A0 and A3<br>N.B.: check the temperature value is appropriately set if A3 = 1 or 2 |
| A2 | 0 | 240 | min | 0 | maximum temperature alarm delay A1 and A6 |

| | | | | | |
|---|---|---|---|---|---|
| A3 | 0 | 2 | - - - | 0 | type of maximum temperature alarm<br>0 = alarm absent<br>1 = absolute (A1)<br>2 = relative to the working setpoint (i.e. "working setpoint + A1") |
| A4 | 0 | 80 | °C (1) | 70 | temperature above which the working temperature alarm is raised (referring to the working temperature of the control module)<br>0 = alarm absent |
| A5 | -1 | 240 | min | 240 | duration of a power outage during the cooking cycle sufficient to interrupt it<br>-1 = returns to previous status without activating the PF alarm<br>0 = the controller is forced into stand-by without activating the PF alarm<br>1÷240 = the PF alarm is activated - If the interruption is less than A5, the cycle resumes from the beginning of the current phase; if it is more than A5, the cycle is interrupted<br>N.B.: if the PF alarm is still activated when going from one day to the next, the controller is forced into stand-by |
| A6 | 0 | 500 | °C (1) | 0 | temperature above which the maximum temperature alarm for the front heater is activated; see also A0 and A7<br>N.B.: check the temperature value is appropriately set if A7 = 1 or 2 |
| A7 | 0 | 2 | - - - | 0 | type of maximum temperature alarm<br>0 = alarm absent<br>1 = absolute (A6)<br>2 = relative to the working setpoint (i.e. "working setpoint + A6") |
| PARAM. | MIN. | MAX. | M.U. | DEF. | DIGITAL INPUTS |
| i0 | 0 | 1 | - - - | 0 | door switch input contact type<br>0 = door open with contact open<br>1 = door open with contact closed |
| i1 | 0 | 1 | - - - | 0 | enable steam injection input contact type<br>0 = input active with contact closed<br>1 = input active with contact open |
| i2 | 0 | 1 | - - - | 0 | device switch-off input contact type<br>0 = input active with contact closed<br>1 = input active with contact open |
| i3 | 0 | 1 | - - - | 0 | energy-saving input contact type<br>0 = input active with contact closed<br>1 = input active with contact open |
| i4 | 0 | 2 | - - - | 2 | effect caused by activation of the door switch input<br>0 = no effect<br>1 = SUCTION HOOD SWITCHED ON - the suction hood is switched on<br>2 = SUCTION HOOD SWITCHED ON, TOP AND FLOOR OUTPUTS SWTICHED OFF AND STEAM INJECTION DISABLED – the suction hood will be switched on, the top and floor outputs switched off and steam injection disabled (until the input is deactivated) |
| i5 | 0 | 1 | - - - | 0 | effect caused by activation of the enable steam injection input<br>0 = no effect<br>1 = STEAM INJECTION ENABLED – steam injection is enabled (until the input is deactivated, only if P3 = 1) |

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|---|---|---|---|---|---|
| i6 | 0 | 120 | sec | 5 | thermal switch alarm signal delay (230 Vac) |
| i7 | 0 | 2 | - - - | 0 | effect caused by activation of multifunction 2 input<br>0 = no effect<br>1 = DEVICE SWITCHED OFF – the device is placed in stand-by and, when the input is active, the on-off key is disabled; deactivating the input will not automatically start the controller back up again but will enable the on-off key so the controller can be switched on manually<br>2 = START-UP OF COOKING CYCLE |
| i8 | 0 | 240 | sec | 10 | automatic suction hood switch-off if automatically activated by the door switch:<br>0 = always on until the door switch input is deactivated<br>1÷240 = if the door switch is activated, it is forcibly switched off when the time set has elapsed, irrespective of door switch status |
| i9 | 0 | 1 | - - - | 0 | effect caused by activation of energy-saving input<br>0 = no effect<br>1 = ENERGY-SAVING FUNCTION ACTIVATED – the energy-saving function is activated (until the input is deactivated) |
| i10 | 0 | 1 | - - - | 0 | power input contact type<br>0 = normally open (input active with contact closed)<br>1 = normally closed (input active with contact open) |
| i11 | 0 | 1 | - - - | 0 | thermal switch input contact type<br>0 = normally open (input active with contact closed)<br>1 = normally closed (input active with contact open) |
| i12 | 0 | 1 | - - - | 0 | 1/2 burner block input contact type<br>0 = normally open (input active with contact closed)<br>1 = normally closed (input active with contact open) |
| i13 | 0 | 1 | - - - | 0 | type of fault of the burner connected<br>0 = type 1<br>1 = type 2 |
| PARAM. | MIN. | MAX. | M.U. | DEF. | DIGITAL OUTPUTS |
| u0 | 0 | 1 | - - - | 0 | venting output contact type<br>0 = normally open (venting open with contact closed)<br>1 = normally closed (venting open with contact open) |
| u1 | 0 | 1 | - - - | 0 | load managed by venting output<br>0 = ON/OFF SOLENOID VALVE<br>1 = MOTORISED SOLENOID VALVE - with this setting parameters u2, u3 and u4 are relevant |
| u2 | 0 | 600 | ds (s/10) | 120 | duration of the venting output stoppage from the end of the short pulse for opening the vent and from the end of the long pulse for closing it (only if u1 = 1). See also u3 and u4 |
| u3 | 0 | 600 | ds (s/10) | 10 | duration of the short pulse for opening the vent (only if u1 = 1). See also u2 and u4 |
| u4 | 0 | 600 | ds (s/10) | 30 | duration of the long pulse for closing the vent (only if u1 = 1). See also u2 and u3 |
| u5 | - - - | - - - | - - - | - - - | RESERVED |

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|---|---|---|---|---|---|
| u6 | 20 | 65 | °C (1) | 60 | temperature above which the electronics compartment fan is switched on with the oven in stand-by mode (referring to the operating temperature of the control module). See also F7 |
| u7 | 1 | 99 | °C (1) | 10 | u6 differential |
| u1c | 0 | 15 | - - - | 1 | K1 relay<br>0 = unused<br>1 = top heater (or chamber heater if P2=0)<br>2 = chamber floor heater<br>3 = front floor heater<br>4 = steam generator<br>5 = steam injection<br>6 = venting<br>7 = chamber light<br>8 = suction hood<br>9 = electronics compartment fan (see also parameters u6 and u7)<br>10 = stand-by/on<br>11 = sound<br>12 = burner block reset<br>13 = front top heater (can only be used if r12=5)<br>14 = rotary plate motor<br>15 = hood light |
| u2c | 0 | 15 | - - - | 10 | K2 relay<br>same configurations as u1c |
| u3c | 0 | 15 | - - - | 2 | K3 relay<br>same configurations as u1c |
| u4c | 0 | 15 | - - - | 3 | K4 relay<br>same configurations as u1c |
| u5c | 0 | 15 | - - - | 7 | K5 relay<br>same configurations as u1c |
| u6c | 0 | 15 | - - - | 6 | K6 relay<br>same configurations as u1c |
| u7c | 0 | 15 | - - - | 4 | K7 relay<br>same configurations as u1c |
| u8c | 0 | 15 | - - - | 5 | K8 relay<br>same configurations as u1c |
| u9c | 0 | 15 | - - - | 8 | K9 relay<br>same configurations as u1c |
| u10c | 0 | 15 | - - - | 9 | K10 relay<br>same configurations as u1c |
| u11c | 0 | 15 | - - - | 11 | K11 relay<br>same configurations as u1c |
| u12c | 0 | 15 | - - - | 12 | K12 relay<br>same configurations as u1c |
| u13c | 0 | 15 | - - - | 13 | K13 relay<br>same configurations as u1c |
| u14c | 0 | 15 | - - - | 0 | relay K14<br>reserved |
| u15c | 0 | 15 | - - - | 0 | relay K15 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | reserved |
| u16c | 0 | 15 | - - - | 0 | relay K16<br>reserved |
| u17c | 0 | 15 | - - - | 0 | relay K17<br>reserved |
| u18c | 0 | 15 | - - - | 0 | relay K18<br>reserved |
| u19c | 0 | 15 | - - - | 0 | relay K19<br>reserved |
| PARAM. | MIN. | MAX. | M.U. | DEF. | DATA-LOGGING |
| rE0 | 1 | 240 | min | 5 | internal data sampling time |
| PARAM. | MIN. | MAX. | M.U. | DEF. | SERIAL NETWORK |
| bLE | 0 | 99 | - - - - | 1 | serial port configuration for connectivity<br>0 = free for MODBUS RTU<br>1-99 = EPoCA local network address (in this case the baud rate is automatically configured to 19,200 baud irrespective of the Lb value)<br>N.B.: if connectivity comes from EVlinking Wi-Fi, the only value that can be set is 1 |
| LA | 1 | 247 | - - - | 247 | device address |
| Lb | 0 | 3 | - - - | 3 | baud rate (the parameter is relevant only if bLE = 0)<br>0 = 2,400 baud<br>1 = 4,800 baud<br>2 = 9,600 baud<br>3 = 19,200 baud |
| LP | 0 | 2 | - - - | 2 | parity<br>0 = none<br>1 = odd<br>2 = even |
| PA1 | -999 | 999 | - - - - | 426 | EPoCA level 1 password (User) |
| PA2 | -999 | 999 | - - - - | 824 | EPoCA level 2 password (Administrator) |
| PARAM. | MIN. | MAX. | U.M. | DEF. | CENTRALISED MANAGEMENT |
| MS1 | 1 | 5 | - - - - | 1 | device address<br>(address 1 identifies the Master) |
| MS2 | 0 | 1 | - - - - | 0 | enable centralised management<br>0 = no<br>1 = yes |
| MS3 | 0 | 1 | - - - - | 0 | enable centralised management from power-on<br>0 = no<br>1 = yes |
| MS4 | 10 | 240 | sec | 30 | lack of communication with master device consecutive time for independent regulation |
| MS5 | 5 | 999 | sec | 30 | interval to recalculate power distribution |
| MS6 | 2 | 5 | - - - - | 2 | number of devices in network<br>(max. 5 power boards if e2=1 or max. 5 kits if e2=0) |

| | | | | | |
|---|---|---|---|---|---|
| MS7 | 1 | 4 | - - - - | 1 | difference between number of slaves in network and number of communicating slaves to protect Master (Master loads forced to OFF) |
| POW | 0 | 999 | KW | 999 | max. power available for oven |
| PT | 0 | 9999 | Wx10 | 0 | top power consumption (same for all decks in multi-base configuration) |
| PF | 0 | 9999 | Wx10 | 0 | floor power consumption (same for all decks in multi-base configuration) |
| PMF | 0 | 9999 | Wx10 | 0 | front floor power consumption (same for all decks in multi-base configuration) |
| PMT | 0 | 9999 | Wx10 | 0 | front top power consumption (same for all decks in multi-base configuration) |
| PH | 0 | 9999 | Wx10 | 0 | suction hood power consumption for all decks |
| PB | 0 | 9999 | Wx10 | 0 | steam generator power consumption (see PBT) |
| PBT | 0 | 1 | - - - - | 0 | steam generator use<br>0 = one for each deck<br>1 = one for all decks |
| PBL | 0 | 9999 | Wx10 | 0 | chamber light power consumption (same for all decks in multi-base configuration) |
| PARAM. | MIN. | MAX. | M.U. | DEF. | OTHERS |
| e0 | 0 | 1 | --- | 0 | behaviour of the light when going from STD-BY to ON<br>0 = light on<br>1 = maintains the status it had in STD-BY |
| e1 | 0 | 1 | --- | 0 | behaviour of the light when going from ON to STD-BY<br>0 = light off<br>1 = maintains the status it had in ON |
| e2 | 0 | 1 | --- | 0 | oven configuration<br>0 = Single or multi-kit regulator (max. 5 connected to RS-485) for the shared power option<br>1 = multi-base regulator (1 display with max. 5 power boards in a network) |
| e3 | 0 | 240 | sec | 0 | locked display<br>0 = not locked<br>1÷240 = locked display activation delay |
| 2CA1 | -50 | 50 | °C (1) | 0 | Deck 2 chamber/top probe calibration (if e2=1) |
| 2CA2 | -50 | 50 | °C (1) | 0 | Deck 2 floor probe calibration (if e2=1) |
| 2CA3 | -50 | 50 | °C (1) | 0 | Deck 2 steam probe calibration (if e2=1) |
| 2CA4 | -50 | 50 | °C (1) | 0 | Deck 2 front probe calibration (if e2=1) |
| 3CA1 | -50 | 50 | °C (1) | 0 | Deck 3 chamber/top probe calibration (if e2=1) |
| 3CA2 | -50 | 50 | °C (1) | 0 | Deck 3 floor probe calibration (if e2=1) |
| 3CA3 | -50 | 50 | °C (1) | 0 | Deck 3 steam probe calibration (if e2=1) |
| 3CA4 | -50 | 50 | °C (1) | 0 | Deck 3 front probe calibration (if e2=1) |
| 4CA1 | -50 | 50 | °C (1) | 0 | Deck 4 chamber/top probe calibration (if e2=1) |
| 4CA2 | -50 | 50 | °C (1) | 0 | Deck 4 floor probe calibration (if e2=1) |
| 4CA3 | -50 | 50 | °C (1) | 0 | Deck 4 steam probe calibration (if e2=1) |

| | | | | | |
|---|---|---|---|---|---|
| 4CA4 | -50 | 50 | °C (1) | 0 | Deck 4 front probe calibration (if e2=1) |
| 5CA1 | -50 | 50 | °C (1) | 0 | Deck 5 chamber/top probe calibration (if e2=1) |
| 5CA2 | -50 | 50 | °C (1) | 0 | Deck 5 floor probe calibration (if e2=1) |
| 5CA3 | -50 | 50 | °C (1) | 0 | Deck 5 steam probe calibration (if e2=1) |
| 5CA4 | -50 | 50 | °C (1) | 0 | Deck 5 front probe calibration (if e2=1) |
| ECA1 | -50 | 50 | °C (1) | 0 | Proofer probe calibration (if EP1≠0 expansion device fitted) |
| Er0 | 1 | 99 | °C (1) | 3 | Proofer probe hysteresis (if EP1≠0 expansion device fitted) |
| EP0 | 0 | 1 | --- | 1 | Type of proofer probe (if EP1≠0 expansion device fitted)<br>0 = PTC<br>1 = NTC |
| EP1 | 0 | 2 | --- | 0 | Enable proofer<br>0 = not present<br>1 = present<br>2 = present with timer |
| S1 | 0 | 1 | --- | 1 | End of cooking cycle management<br>0 = at the end of the cycle, the controller automatically goes into pre-heating/ready status<br>1 = at the end of the cycle, extra time is requested |

(1) Temperatures are given in °C; refer to the conversion table for minimum and maximum settable values in °F. If the unit of measurement is set in °F (see parameter P1), temperatures are automatically converted on the device.

# 13 ALARM MANAGEMENT

If an alarm situation occurs, the buzzer is activated and the alarm icon below will appear on the ON screen in place of the clock field.

Pressing this key will silence the buzzer and the page with the active alarms will automatically be displayed.

If the alarm is automatically reset, once the alarm situation has been resolved, the signal will no longer be displayed on this page; if, on the other hand, the alarm must be manually reset, another icon will appear to manually reset it. An example of an active alarm display is given below:


If an alarm can be reset manually, a key appears on the right of the active alarm. Press it to activate the reset alarm procedure.

The table below shows the meaning of the device's various alarm codes.

| ALARM CODE | DESCRIPTION |
|---|---|
| RTC ALARM | to correct:<br>- set the date and time |
| Top/chamber probe ALARM | to correct:<br>- check the type of probe; see parameter P0<br>- check the device-probe connection<br>- check the temperature of the top/chamber<br>main results:<br>- the temperature regulation output will be switched off |
| Floor probe ALARM | to correct:<br>- as in the previous case, but relating to the floor<br>main results:<br>- the temperature regulation output will be switched off |
| Front probe ALARM | to correct:<br>- as in the previous case, but relating to the front<br>main results:<br>- the temperature regulation output will be switched off |
| Steam probe ALARM | to correct:<br>- as in the previous case, but relating to the steam probe<br>main results:<br>- the steamer management output will be switched off |
| Power outage ALARM | to correct:<br>- check the device-power supply connection<br>main results:<br>- if the alarm occurs when the device is in stand-by, it is not signalled |

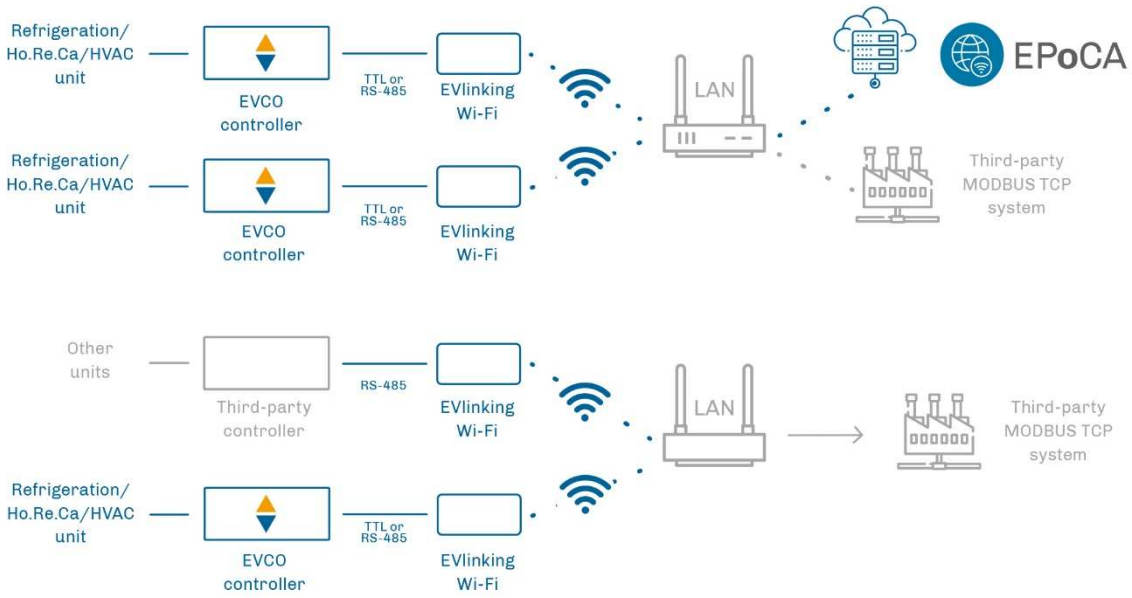
| | |
|---|---|
| | - if the alarm occurs when the device is on, see parameter A5 in cases "-1" and "0"<br>- if the alarm occurs during a cooking cycle with A5>0 and the interruption lasts for a shorter time than that set by parameter A5, when power is restored the cycle will be resumed from the start of the phase in which the power failed (if the interruption lasts longer than the time set by parameter A5, the cycle will be interrupted when power is restored) |
| No connection ALARM | to correct:<br>- check the user interface-control module connection<br>main results:<br>- the loads will be deactivated |
| Power board incompatibility ALARM | to correct:<br>- check the user interface-control module FIRMWARE versions<br>main results:<br>- the loads will be deactivated |
| Top/floor temperature ALARM | to correct:<br>- check the temperature detected by the top/floor probe. See parameters A0, A1 and A3<br>main results:<br>- no effect |
| Front temperature ALARM | to correct:<br>- check the temperature detected by the chamber probe. See parameters A0, A6 and A7<br>main results:<br>- no effect |
| High board temperature ALARM | to correct:<br>- check the operating temperature of the control module. See parameter A4<br>main results:<br>- the vent will open, the electronics compartment fan will switch on, the top and floor outputs and the steam generator will be switched off |
| Door switch ALARM | to correct:<br>- check the cause of the input activation. See parameter i0<br>main results:<br>- see parameter i4 |
| Safety thermostat ALARM | to correct:<br>- check the cause of the input activation. See parameters i6, i7<br>main results:<br>- the top and floor outputs and the steam generator will be switched off |
| Peak consumption ALARM | to correct:<br>- check the causes of the input activation<br>main results:<br>- the top and floor outputs and the steam generator will be switched off |
| Type 1 or type 2 burner block ALARM | to correct:<br>- check the burner is working properly<br>main results:<br>- see relevant paragraph |

# 14 CONNECTIVITY

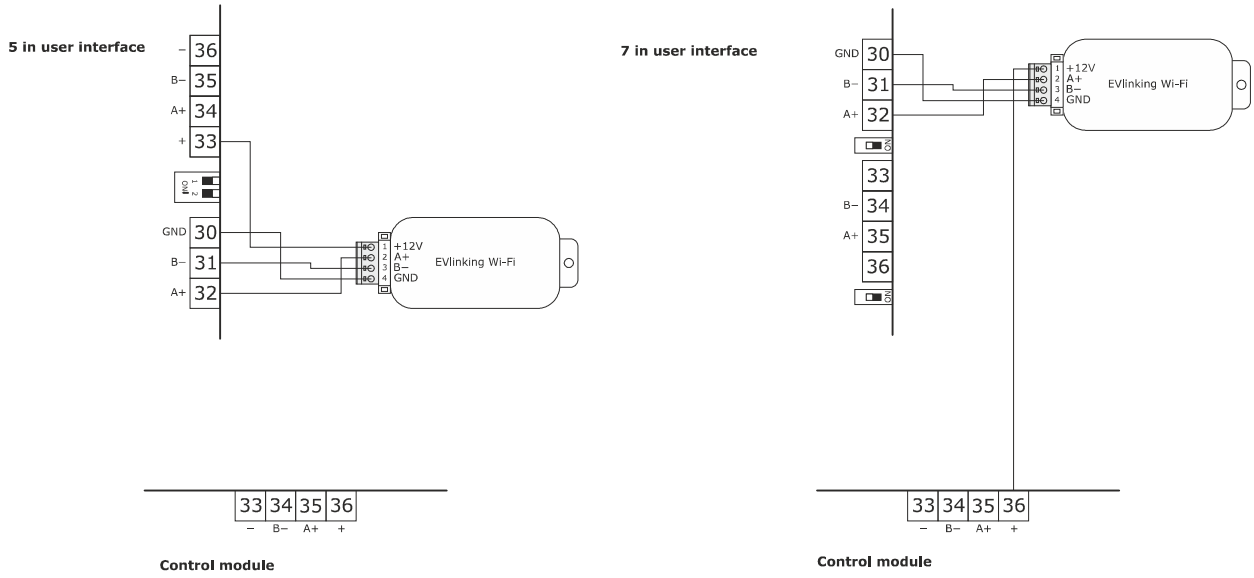
## 14.1 Initial information

Users can interact remotely with their equipment and start up/stop working cycles using the EPoCA cloud platform with Wi-Fi or Ethernet connectivity (which also enable alternative or parallel control through MODBUS TCP). For more details, compare the connectivity options in the "Models available and technical features" table and consult the Management and Monitoring Products/Systems and the Connectivity/Devices sections of our website www.evco.it.

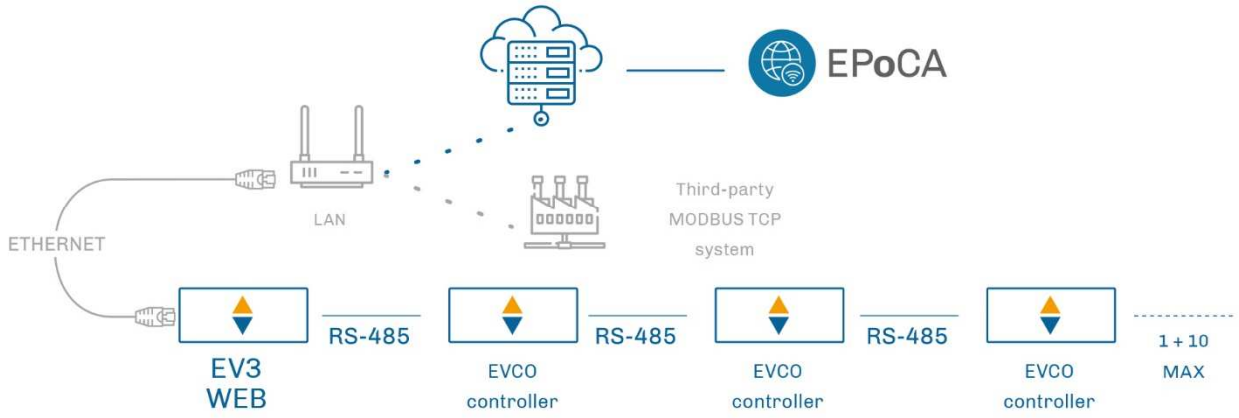
Schematic diagram for operation with EVlinking Wi-Fi (Wi-Fi connectivity)



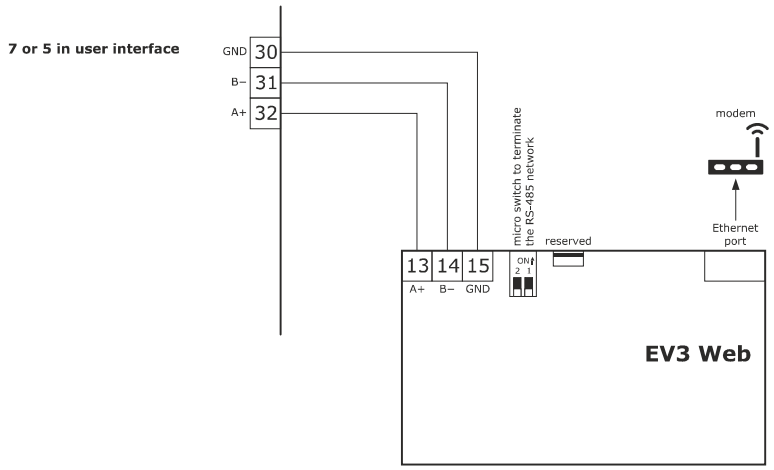

Detail of electrical connection of EVlinking Wi-Fi to Vcolor 378



Schematic diagram for operation with EV3 Web (Ethernet connectivity)




Detail of electrical connection of EV3 Web to Vcolor 378




## 14.2 EPoCA cloud platform

EPoCA® is a remote management and monitoring system based on a cloud platform. Originally developed to meet the management needs of the food preservation and cooking sector, it has been expanded to HVAC units in response to market demand.

To connect to the cloud system and remotely control machinery from a PC, tablet or smartphone, all users need is an EVCO controller with native EPoCA® technology and connectivity which is either built-in or provided by external hardware modules. All devices are configured using the dedicated "EPoCA Start" mobile app.

The responsive design and the graphic interface conceived to provide a pleasant user experience make EPoCA® a "ready-to-use" solution for easily accessible management and monitoring operations, even for entry-level users, while offering all the typical functions of professional platforms.

With the appropriate protection measures for access and data, the system makes it possible for one or more enabled users to operate remotely on the unit to configure its parameters, activate cycles, receive automatic alerts, view data (also as a graph) and download records in the most popular formats, such as XLSX, CSV and PDF.

# 15 USING THE USB PORT

## 15.1 Initial information

The following actions are possible through the USB port:

- upload and download recipe settings
- upload and download configuration parameter settings
- upload CSV files to personalise the graphics, recipes and languages.

These operations are guaranteed by using the EVUSB4096M USB key.

Uploading operations are only possible if the firmware of the device from which it originates and the firmware of the destination device are the same.

## 15.2 Uploading the recipe settings

The recipe settings can be uploaded as follows:

1. Ensure that the device is in stand-by and that no procedures are in progress.
2. Insert the USB flash drive containing the recipe file with the name "prog.bin" (previously downloaded from another device) in the USB port of the device and wait a few seconds.
3. Press the "UPLOAD RECIPES" key.
4. When the upload is complete, remove the USB flash drive from the port of the device.

## 15.3 Downloading the recipe settings

The recipe settings can be downloaded as follows:

1. Ensure that the device is in stand-by and that no procedures are in progress.
2. Insert a USB flash drive in the USB port of the device and wait for a few seconds.
3. Press the "DOWNLOAD RECIPES" key.
4. When the operation is complete, a "prog.bin" file will be generated which can be used to upload the contents to other controllers.

## 15.4 Uploading the settings in the configuration parameters

The programme settings can be uploaded as follows:

1. Ensure that the device is in stand-by and that no procedures are in progress.
2. Insert the USB flash drive containing the recipe file with the name "param.bin" (previously downloaded from another device) in the USB port of the device and wait a few seconds.
3. Press the "UPLOAD PARAMETERS" key.
4. When the upload is complete, remove the USB flash drive from the port of the device.

## 15.5 Downloading the settings in the configuration parameters

The programme settings can be downloaded as follows:

1. Ensure that the device is in stand-by and that no procedures are in progress.
2. Insert a USB flash drive in the USB port of the device and wait for a few seconds.
3. Press the "DOWNLOAD PARAMETERS" key.
4. When the upload is complete, remove the USB flash drive from the port of the device.

## 15.6 Uploading CSV files to personalise the graphics, recipes and languages

For the procedure to compile the ODS file, convert it to CSV and transfer to a USB flash drive and upload it to the controller, please refer to the file "How to personalise the Vcolor platform".

# 16 ACCESSORIES

## 16.1 Expansion device for proofer

EVPB03A3S4N9XN2

Expansion device with the possibility of using an electro-mechanical relay for an electrical resistance and an analogue PTC/NTC temperature input.

## 16.2 Safety transformer

ECTSFD004

The transformer can power the user interface.

## 16.3 Non-optoisolated RS-485/USB serial interface

EVIF20SUXI

The interface enables the device to be connected to the Parameters Manager set-up software system.

## 16.4 USB plug for panel installation

0812000002

The plug makes the USB communications port of the device more accessible.

To connect the device to the plug, connecting cable 0810500018 or 0810500020 must be used (to be ordered separately).

## 16.5 Connecting cables

0810500018/0810500020

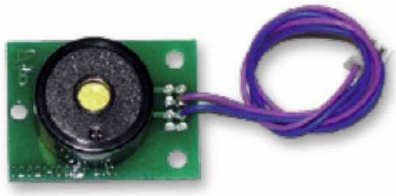
These cables are used to connect the USB plug for panel installation 0812000002 to the device.

Cable 0810500018 is 2 m long; cable 0810500020 is 0.5 m long.

## 16.6 Buzzer expansion

CT1ES0070000

The buzzer can be placed outside the electronics compartment using an expansion device which can be connected to the control module.



## 16.7 4GB USB flash drive

EVUSB4096M

The flash drive makes it possible to upload and download the settings and the data recorded by the device.

## 16.8 EVlinking Wi-Fi RS-485 module

EVIF25SWX

Through the RS-485 communications port, the module provides the controller with Wi-Fi connectivity which enables remote management and monitoring from the Internet using the EPoCA® cloud system.


## 16.9 EV3 Web gateway

EV3W01

IoT gateway with Ethernet connectivity and data logging functions to remotely monitor and control an RS-485 MODBUS RTU network with up to 10 EVCO controllers with EPoCA® technology using the EPoCA® cloud platform.

# 17 TECHNICAL SPECIFICATIONS

## 17.1 Technical data

| | | |
|---|---|---|
| **Purpose of the control device:** | function controller | |
| **Construction of the control device:** | built-in electronic device | |
| **Housing:** | user interface | control module |
| | plastic housing | open frame board |
| **Category of heat and fire resistance:** | D | |
| **Measurements:** | user interface M | user interface L |
| | Flush fit installation:<br>118.0 x 166.0 x 35.0 mm (4.645 x 6.535 x 1.377 in; L x H x D)<br>Semi-recessed installation:<br>97.1 x 145.1 x 32.0 mm (3,822 x 5,712 x 1,259 in; L x H x D) | Flush fit installation:<br>156.0 x 216.0 x 50.0 mm (6.141 x 8.503 x 1.968 in; L x H x D)<br>Semi-recessed installation:<br>131.9 x 192.9 x 47.0 mm (5,192 x 7,594 x 1,850 in; L x H x D) |
| **Mounting methods for the control device:** | user interface | control module |
| | flush with the panel from behind with threaded studs (not provided) to hold it in place or semi-recessed from the front of the panel using the spring clips | on a flat surface with spacers |
| **Degree of protection:** | user interface | control module |
| | IP65 (front) | IP00. |
| **Connection method:** | user interface | control module |
| | plug-in screw terminal blocks for wires up to 1.5 mm², type A female USB connector (USB port) | plug-in screw terminal blocks for wires up to 2.5 mm² |
| | Maximum permitted length for connection cables:<br>- user interface-control module connection: 10 m (32.8 ft)<br>- power supply: 10 m (32.8 ft)<br>- analogue inputs: 10 m (32.8 ft)<br>- digital inputs: 10 m (32.8 ft)<br>- digital outputs: 100 m (329 ft)<br>- RS-485 MODBUS port: 1,000 m (3,280 ft)<br>- USB port: 1 m (3.28 ft) | |
| **Operating temperature:** | from 0 to 55 °C (from 32 to 131 °F) | |
| **Storage temperature:** | from -10 to 70 °C (from 14 to 158 °F) | |
| **Operating humidity:** | relative humidity without condensate from 10 to 90% | |
| **Pollution status of the control device:** | 2 | |
| **Environmental standards:** | - RoHS 2011/65/EC<br>- WEEE 2012/19/EU<br>- REACH (EC) Regulation no. 1907/2006 | |
| **EMC standards:** | - EN 60730-1<br>- IEC 60730-1 | |

| | | |
|---|---|---|
| **Power supply:** | user interface | control module |
| | powered by the control module | 12 VAC (±15%), 50/60 Hz (±3 Hz), 20 VA max. |
| **Rated impulse withstand voltage:** | 4 KV | |
| **Overvoltage category:** | III | |
| **Software class and structure:** | A | |
| **Clock:** | built-in (with secondary lithium battery) | |
| | clock drift: ≤ 60 s/month at 25 °C (77 °F) | |
| | clock battery autonomy in the absence of a power supply: > 6 months at 25 °C (77 °F) | |
| | clock battery charging time: 24 h (the battery is charged by the power supply of the device) | |
| **Analogue inputs:** | 4 inputs (top probe, floor probe, front probe and steam probe) for J/K thermocouples or PT 100 according to the power board used | |
| | thermocouple J type analogue inputs<br>Sensor type: iron/constantan<br>Measurement field: from -50 to 700 °C (from -58 to 1,292 °F)<br>Resolution: 1 °C (1 °F)<br>Protection: none | |
| | thermocouple K type analogue inputs<br>Sensor type: chromel/alumel<br>Measurement field: from -50 to 1,100 °C (from -58 to 2,012 °F)<br>Resolution: 1 °C (1 °F)<br>Protection: none | |
| | Pt 100 type analogue inputs<br>Type of sensor: Pt 100 class A<br>Measurement field: from -50 to 550 °C (from -58 to 1,022 °F)<br>Resolution: 1 °C (1 °F)<br>Protection: none | |
| **Digital inputs:** | 7 inputs:<br>- 4 can be set using the configuration parameter for a normally open/normally closed contact (voltage-free, 5 Vdc, 0.5 mA)<br>- 3 (power consumption, thermal switch, type 1/2 burner block) for a normally open/normally closed contact (high voltage contact, 230 Vac) | |
| | voltage-free digital inputs<br>Power supply: none<br>Protection: none | |
| | digital inputs for high voltage contact<br>Power supply: 230 Vac<br>Protection: none | |

| | |
|---|---|
| **Digital outputs:** | 13 outputs (electro-mechanical relays):<br>- 1 5 A res. @ 250 VAC type SPST (K1) output for top heater<br>- 1 5 A res. @ 250 VAC type SPST (K2) output for managing stand-by/on<br>- 1 5 A res. @ 250 VAC type SPDT (K8) output for managing steam injection<br>- 1 8 A res. @ 250 VAC type SPST (K9) output for managing the suction hood<br>- 1 5 A res. @ 250 VAC type SPST (K7) output for managing the steam generator<br>- 1 5 A res. @ 250 VAC type SPST (K5) output for managing the chamber light<br>- 1 5 A res. @ 250 VAC type SPST (K4) output for front floor heater<br>- 1 5 A res. @ 250 VAC type SPST (K3) output for floor heater<br>- 1 5 A res. @ 250 VAC type SPST (K6) output for managing venting<br>- 1 5 A res. @ 250 VAC type SPST (K10) output for managing the electronics compartment fan<br>- 1 5 A res. @ 250 VAC type SPST (K11) output for managing the sound<br>- 1 5 A res. @ 250 VAC type SPST (K12) output for managing the reset of type 1/2 burner block<br>- 1 8 A res. @ 250 VAC type SPDT (K13) output for front top heater<br><br>* The relays do not control LED or fluorescent lights |
| **Displays:** | 5 or 7-inch TFT touch-screen graphic display, 16K colours, 800 x 480 pixel resolution The presence of imperfection points on the display is within the tolerance limits as established by the reference standards |
| **Type 1 or Type 2 actions:** | type 1 |
| **Additional features of Type 1 or Type 2 actions:** | C |
| **Communications ports:** | 2 ports:<br>- 1 RS-485 MODBUS port<br>- 1 USB port |
| **Warning and alarm buzzer:** | built-in |

# Notes

***Vcolor 378***

Controller for bread and pizza deck ovens

Installer manual ver. 2.1

PB - 24/23

Code 144VC378E214

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