

# Vcolor 358

**Controllers for electric or gas rotary ovens  
for bread and pastry-making**



ENGLISH

**INSTALLER MANUAL ver. 1.1**

**CODE 144VC358E114**

**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.

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## **1 INTRODUCTION**

### **1.1 Introduction**

The Vcolor 358 controller is designed for electric or gas rotary ovens for bread and pastry-making and manages rack rotation both automatically and manually. With a stylish design and a remote touch-screen user interface in 5- or 7-inch glass, it can be installed semi-recessed into the front or flush with the panel using threaded studs.

The controller provides complete steam management (generation, injection and venting) in both automatic and manual mode and also using an external steam generator. The fan can be controlled in "on/off" mode at single or double speed or in modulating mode using analogue output 0... 10 Vdc or an EVCO inverter connected to the serial port.

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 be altered, overwritten and saved as favourites directly from the display. The controller also has a deferred start function so, for every day of the week, users can programme the switching on and off of two different recipes.

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 main features

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

MAIN FEATURES	KITS	
	Vcolor 358 M & L for J/K thermocouples	Vcolor 358 M & L for Pt 100 probes
<b>Power supply</b>		
Control module	12 Vac (20 VA)	12 Vac (20 VA)
User interface	Powered by the control module	Powered by the control module
<b>Analogue inputs</b>		
Chamber probe	J/K thermocouples	Pt 100 probe with 2 wires
Boiler steam probe	J/K thermocouples	Pt 100 probe with 2 wires
<b>Digital inputs (for NO/NC contact)</b>		
Power consumption (115... 230 Vac)	•	•
Thermal switch (115... 230 Vac)	•	•
Type 1/2 burner fault (115... 230 Vac)	•	•
Door switch	•	•
Rack limit switch	•	•
Enable steam injection	•	•
Chamber fan thermal switch	•	•
<b>Analogue output for chamber fan</b>		
0... 10 Vdc	•	•
<b>Digital outputs (electro-mechanical relays; A res. @ 250 Vac)</b>		
Configurable K1 (default chamber heating)	5 A	5 A
Configurable K2 (default steam injection)	5 A	5 A
Configurable K3 (default venting)	5 A	5 A
Configurable K4 (default chamber light)	5 A	5 A
Configurable K5 (default steam generator)	5 A	5 A
Configurable K6 (default Sound)	5 A	5 A
Configurable K7 (default chamber fan speed 1)	5 A	5 A
Configurable K8 (default)	8 A	8 A
Configurable K9 (default)	5 A	5 A
Configurable K10 (default suction hood)	5 A	5 A
Configurable K11 (default electronics compartment fan)	5 A	5 A
Configurable K12 (default rack rotation)	5 A	5 A
Configurable K13 (default Stand-by/On)	8 A	8 A

<b>Communications ports</b>		
RS-485 MODBUS (available on the display)	•	•
USB (available on the display)	•	•
<b>Connectivity</b>		
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)	•	•
<b>Other features</b>		
Clock	•	•
Alarm buzzer on the display + "Sound" relay to repeat all the buzzer events	•	•
"Cooking timer" function	•	•
"Weekly programmed switch-on" function	•	•
"Recipe book" function with up to 8 phases per cycle	•	•
Chamber fan management in on-off (1 or 2 speed) or modulating mode through 0-10 Vdc or via the serial port with an EVCO inverter (COMPACT series)	•	•

For more information see section "TECHNICAL SPECIFICATIONS".

The table below shows the purchasing codes.

Purchasing codes	<b><u>Models for J/K thermocouples</u></b>
	<b>Vcolor 358M (control module + 5-inch user interface kit)</b>
	EVCMC35DJ2E (flush fit installation)
	EVCMC35DJ2EF (semi-recessed installation)
	<b>Vcolor 358L (control module + 7-inch user interface kit)</b>
	EVCLC35DJ2E (flush fit installation)
	EVCLC35DJ2EF (semi-recessed installation)
	<b><u>Models for Pt 100 probes</u></b>
	<b>Vcolor 358M (control module + 5-inch user interface kit)</b>
	EVCMC35DC2E (flush fit installation)
	EVCMC35DC2EF (semi-recessed installation)
	<b>Vcolor 358L (control module + 7-inch user interface kit)</b>
	EVCLC35DC2E (flush fit installation)
	EVCLC35DC2EF (semi-recessed installation)

For more models, contact the EVCO sales network.

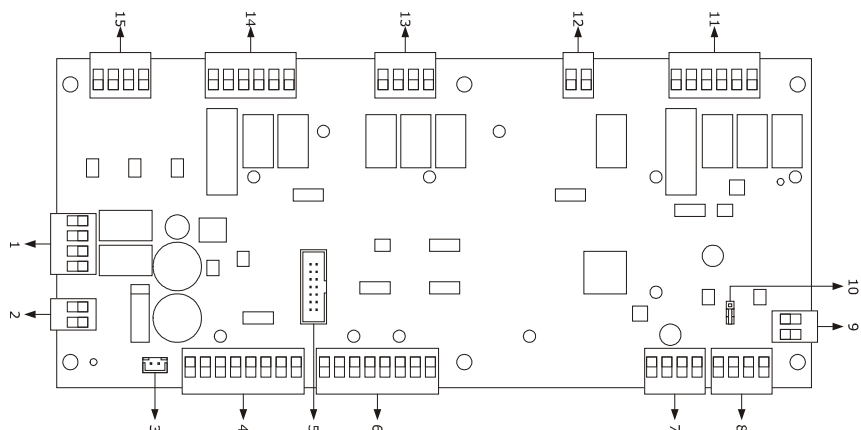
## 2 DESCRIPTION, MEASUREMENTS AND INSTALLATION OF THE CONTROLLER

### 2.1 Format features

The control module is available with an open frame board. The remote user interface is either 5 or 7 inch for vertical operation and has a capacitive colour TFT touch-screen graphic display.

### 2.2 Control module description

Below is a diagram of the control module and key:

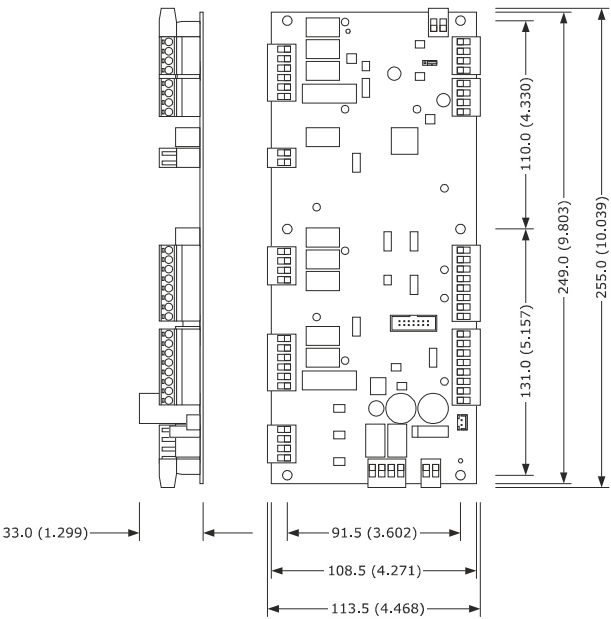


PART	DESCRIPTION
1	K1 and K3 digital outputs (configurable)
2	12 Vac power supply
3	external buzzer output (the external buzzer is optional)
4	voltage-free digital inputs
5	reserved
6	analogue inputs
7	communications port with EVCO inverter
8	communications port with user interface
9	analogue output 0... 10 Vdc
10	dip switch for the termination resistor
11	K10...K13 digital outputs (configurable)
12	K4 digital output (configurable)
13	K2, K5, K6 digital outputs (configurable)
14	K7, K8, K9 digital outputs (configurable)
15	high voltage digital inputs (115- 230 Vac)



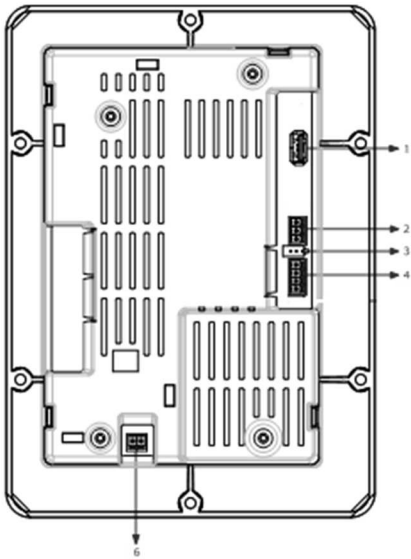
2.3 Control module measurements and installation

Measurements are expressed in mm (inches). Installation is on a flat surface with spacers.



2.4 User interface description

Below is a diagram of the back of the user interface and key:



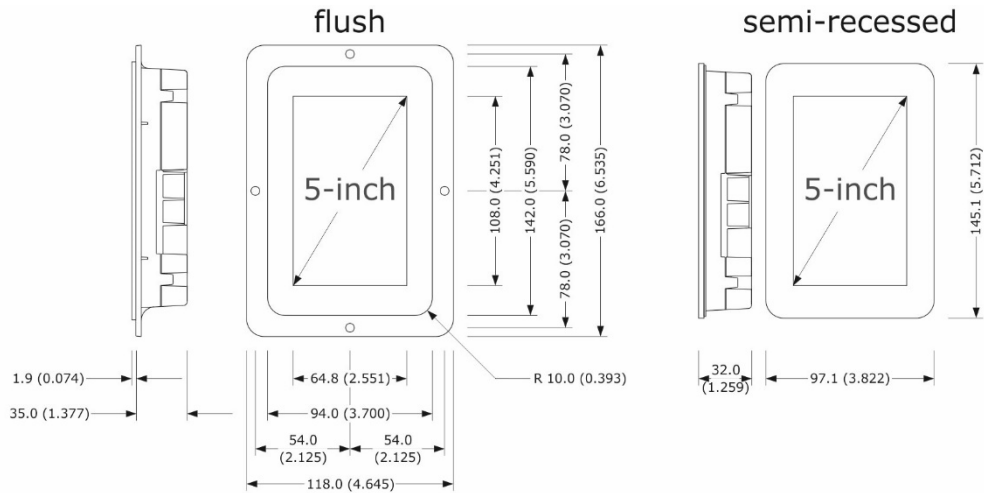
The table below describes the parts on the back of the controller user interface.

PART	DESCRIPTION
1	USB port
2	MODBUS communications port
3	dip switch for the termination resistor for the RS-485 MODBUS port
4	communications port and power supply with control model
6	earthing

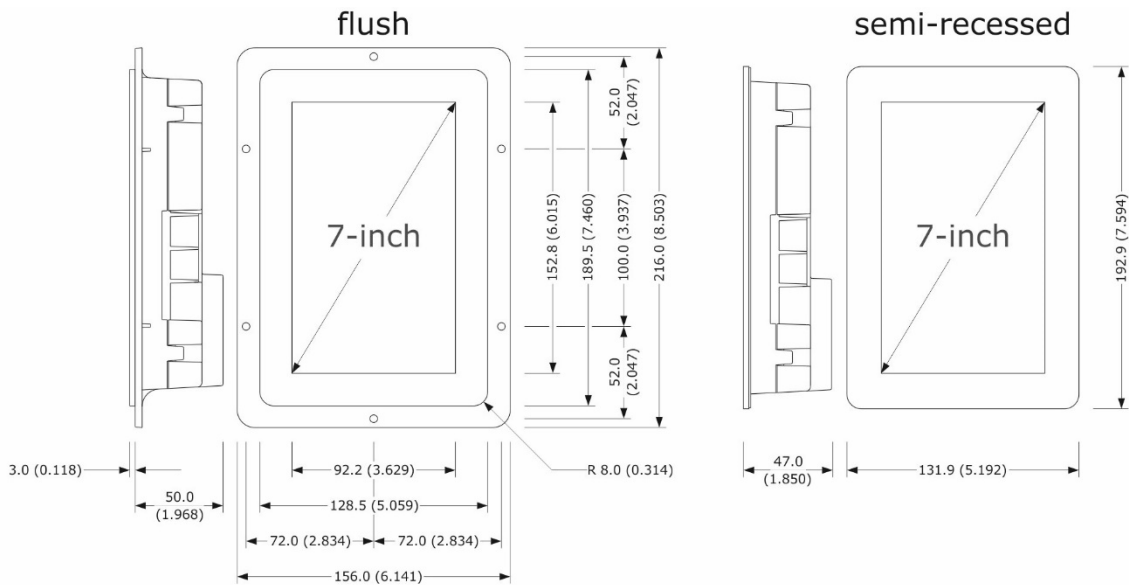
2.5 User interface measurements

The user interface is available in the model which is installed flush and the model which is semi-recessed into the front. The measurements vary according to the model, as illustrated below in mm (in).

Vcolor 358 M



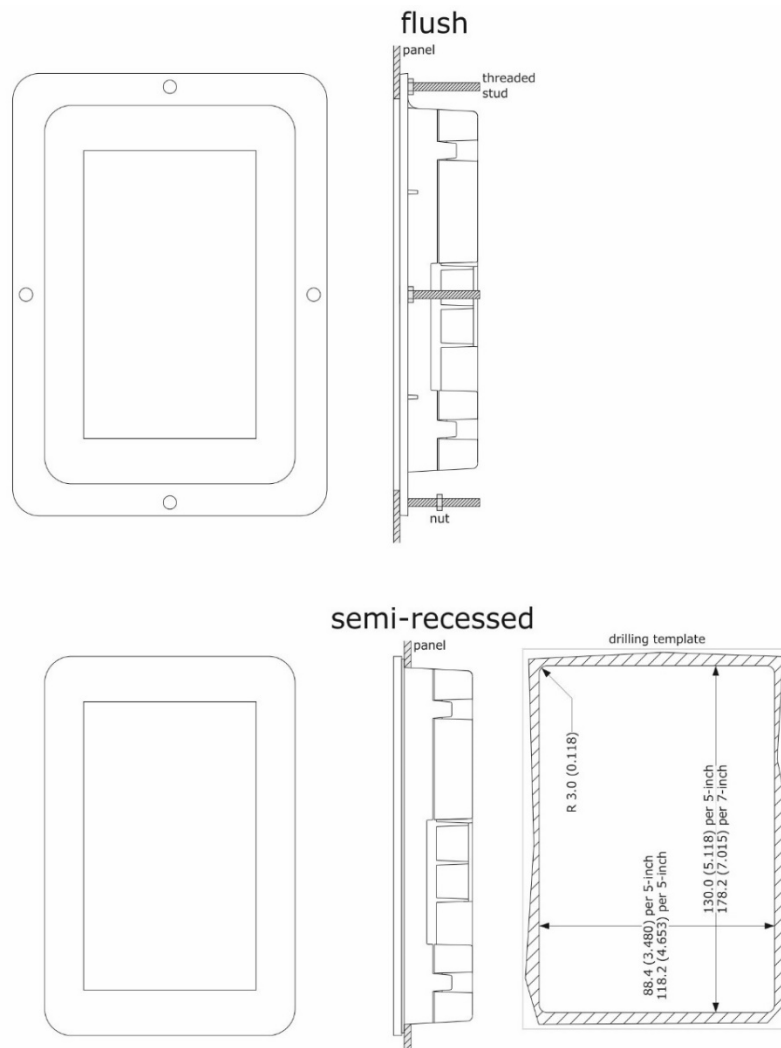
Vcolor 358 L



## 2.6 User interface installation

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.



## 2.7 Installation precautions

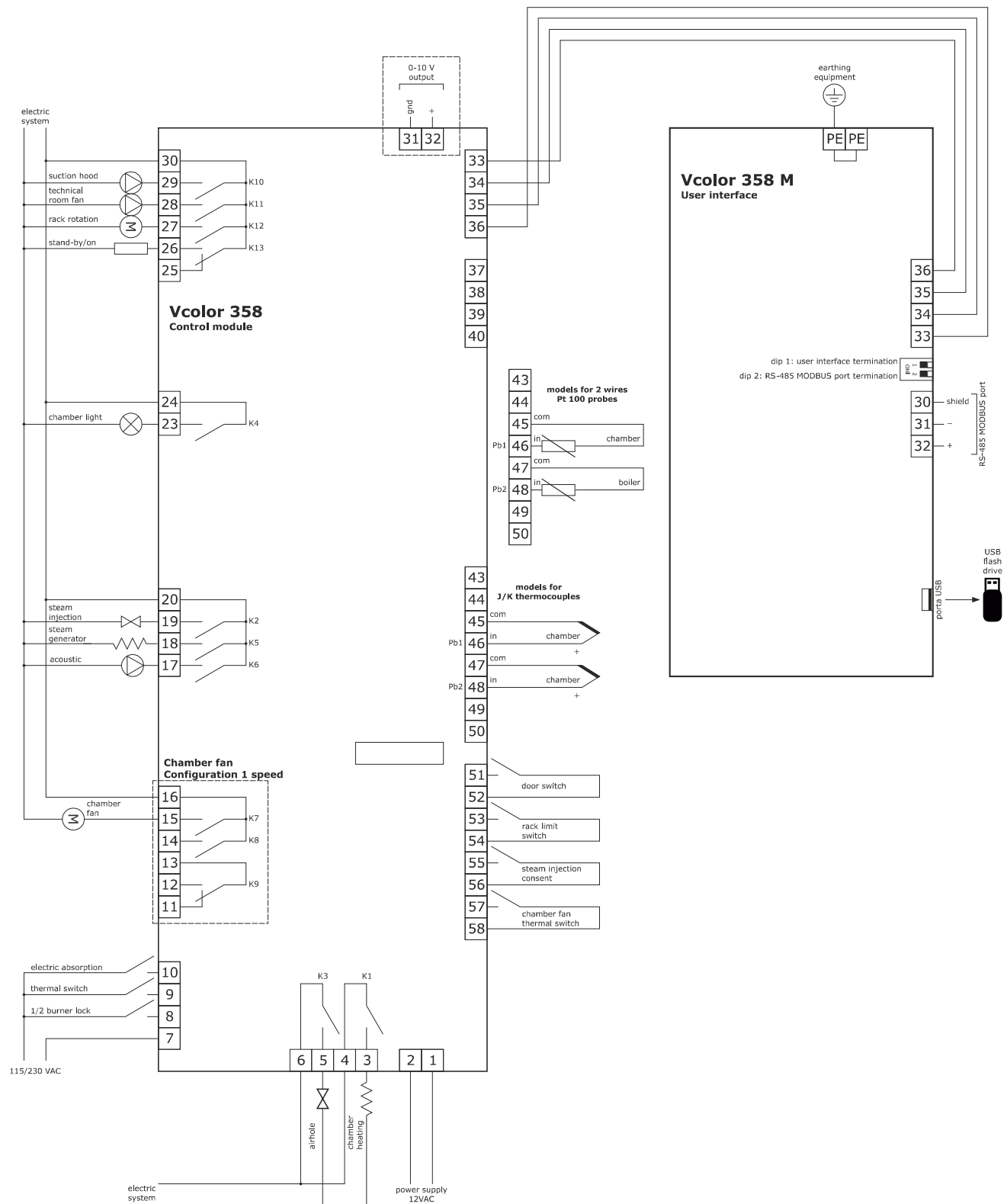
- Ensure that the working conditions for the device (operating temperature, humidity, etc.) are within the set limits. See section "TECHNICAL SPECIFICATIONS".
- Do not install the device close to heat sources (heaters, hot air ducts, etc.), equipment with a strong magnetic field (large diffusers, etc.), 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 358M electrical connection

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

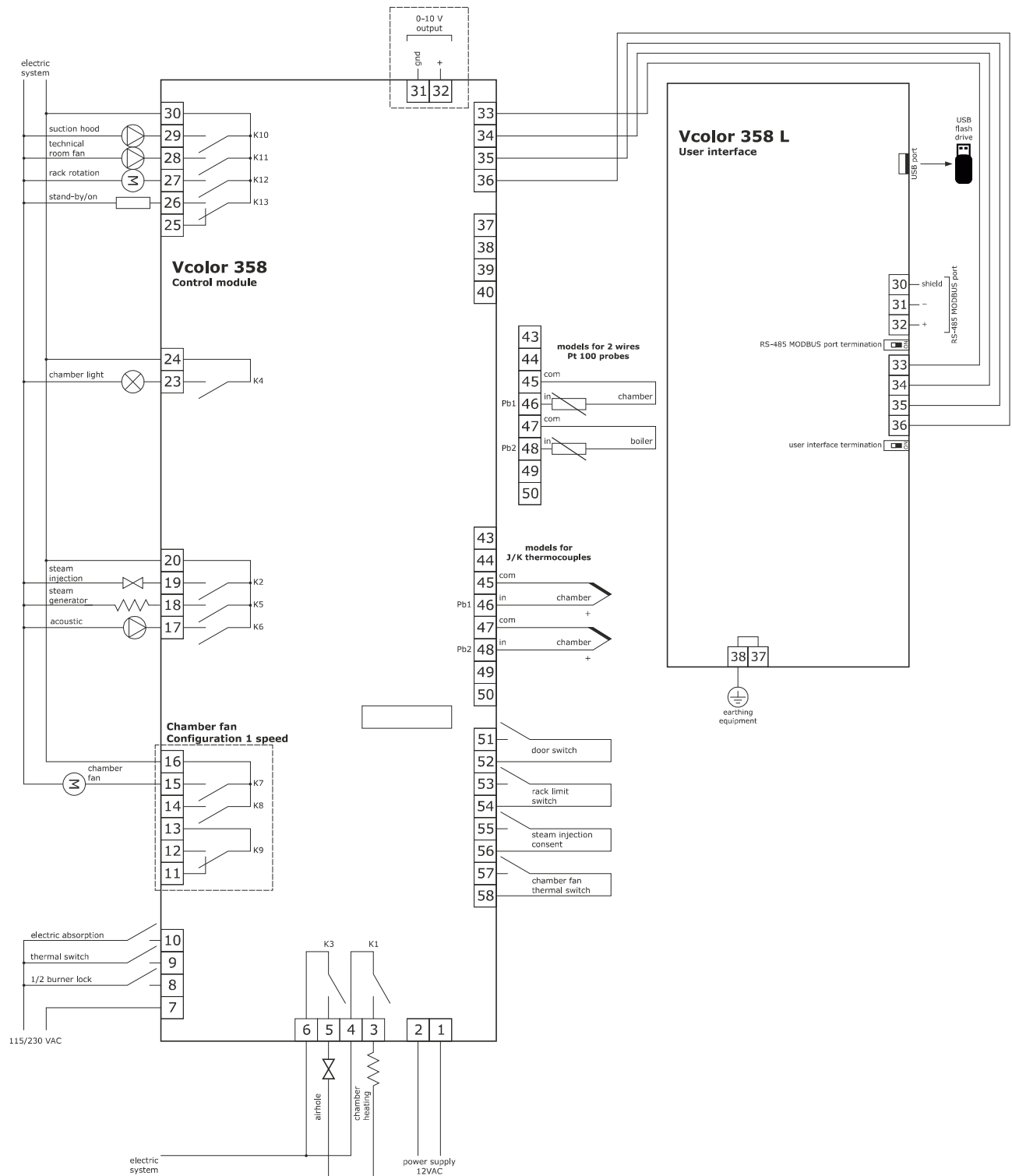
For more information on how to manage ventilation, see subsequent diagrams.



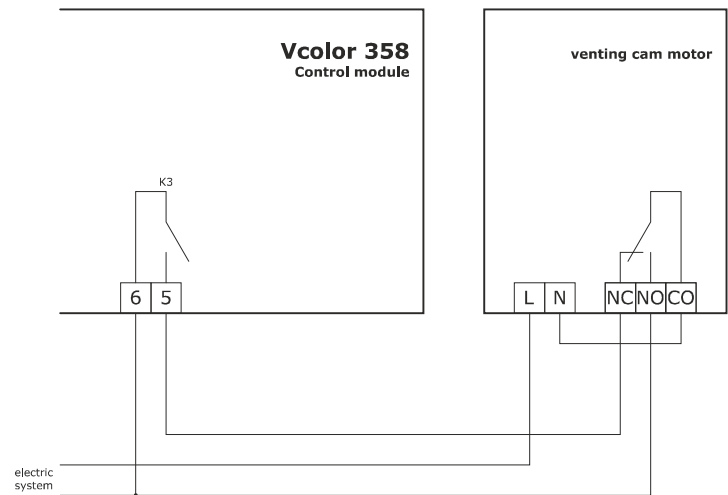
### 3.2 Vcolor 358L electrical connection

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

For more information on how to manage ventilation, see subsequent diagrams.

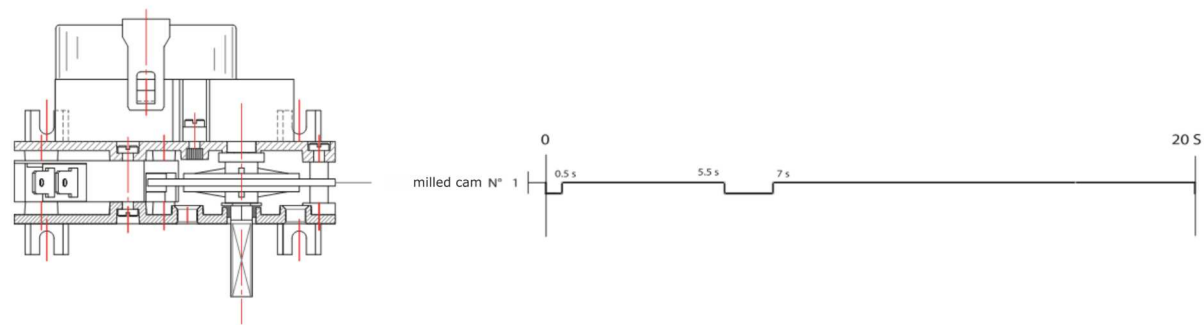


3.3 Example of connection of a motorised venting solenoid valve



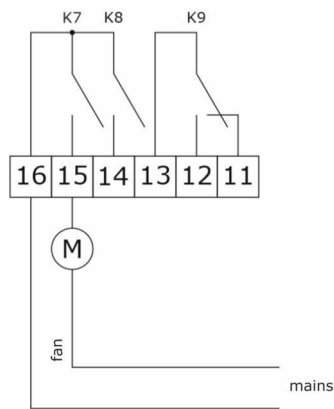
The diagram below shows operation with the parameters set as follows:

- 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

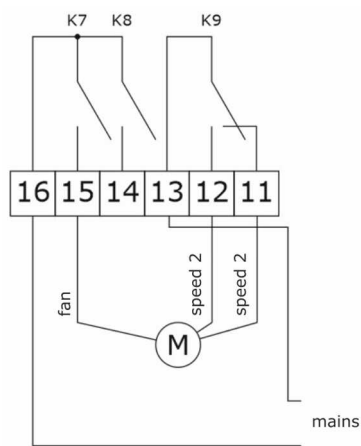


3.4 Example of chamber fan connection

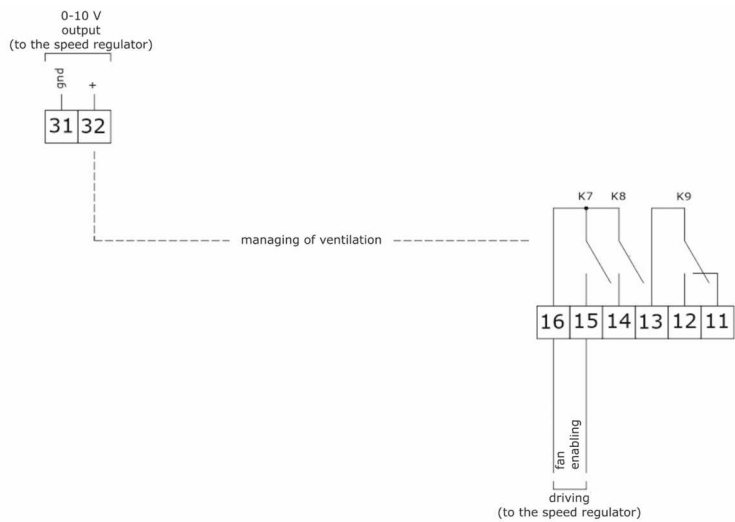
3.4.1 Chamber fan speed management in on/off and single speed mode (parameter F0=0)



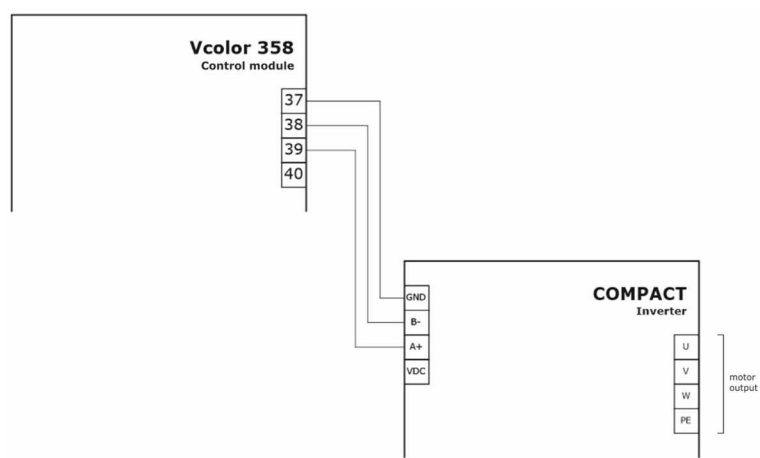
3.4.2 Chamber fan speed management in on/off and two-speed mode (parameter F0=1)



3.4.3 Chamber fan speed management in modulating mode on 0-10 Vdc output (parameter F0=2)



3.4.4 Chamber fan speed management with EVCO inverter (parameter F0=3)



### 3.5 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 15 "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 "DESCRIPTION, MEASUREMENTS AND INSTALLATION OF THE DEVICE", taking all the precautions mentioned in the paragraph "Installation precautions".
2. Make the electrical connection as shown in section "ELECTRICAL CONNECTION"
3. Connect the power supply to the device: the device will show a splash screen for a few seconds.
4. Set the time, date and day of the week; see paragraph "CONFIGURATION".
5. Configure the device as shown in paragraph "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 0 = J thermocouple 1 = K thermocouple <b>N.B.: the parameter is relevant only in the models for thermocouples; this parameter is not used in the models for Pt 100 probes</b>	0
P1	temperature measurement unit (1) 0 = °C 1 = °F <b>N.B.: moving from °C to °F and vice versa does not automatically adapt the parameter values; check they are set correctly</b>	0
P3	mode to enable steam injection activation 0 = MANUAL – steam injection will be enabled when the steam generator is switched on 1 = REMOTE – steam injection will be enabled when the steam generator is switched on and the multi-purpose input activated (until the input is deactivated; only if i5 = 5) 2 = THERMOSTATIC – steam injection will be enabled if steam temperature regulation is active and the steam temperature is above t1 - t3 3 = DISABLED – steam injection and generation are disabled and the appropriate menu is NOT visible	0
F0	fan management type 0 = in "on/off" and single speed mode 1 = in "on/off" and two-speed mode 2 = in modulating mode 0-10 V (5 speeds) 3 = with EVCO inverter on the serial line (5 speeds)	0
t0	MANUAL steam injection activation mode 0 = <u>for Ton + PERSISTENCE</u> – 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 1 = <u>PERSISTENCE</u> – pressing and releasing the "MANUAL STEAM INJECTION" key will cause steam injection for the length of time the key is pressed	1
u0	venting output contact type 0 = normally open (venting open with contact closed) 1 = normally closed (venting open with contact open)	0
u1	load managed by venting output 0 = <u>ON/OFF SOLENOID VALVE</u> 1 = <u>MOTORISED SOLENOID VALVE</u> - with this setting parameters u2, u3 and u4 are relevant	0

Next check the remaining parameters are appropriately set; see section "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.

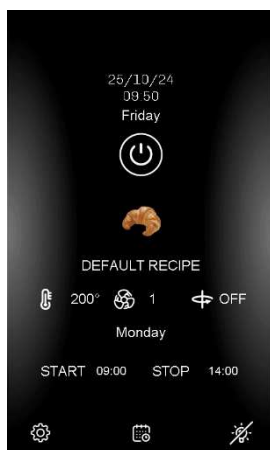
### 5.2 Splash screen

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 (with information about the next switch-on if the weekly programming function is enabled).



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

N.B.: OFF status can be forced by activating the multi-purpose input configured as "switches device on/off" and can be linked to a relay output configured as "Stand-by/On" (uxc=13).

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 8).

The "Configuration" key



gives access to set the date and time, configure parameters, see the list of alarms (see section "CONFIGURATION" 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.



If the chamber fan icon is still displayed on the stand-by screen, the temperature of the chamber has not gone below the value of parameter F10.

### 5.4 ON screen

#### 5.4.1 Pre-heating screen

When the oven is switched on and it goes from stand-by to ON, the screen below will be displayed:



and the oven goes into pre-heating.

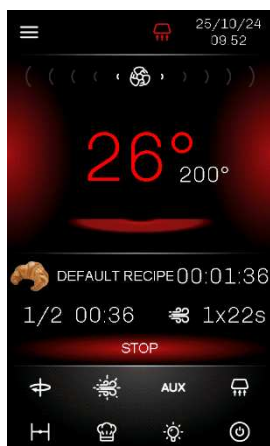
If the user wants to go immediately to the cooking cycle, press the pre-heating key; the oven will go to cooking status without waiting for the setpoint temperature to be reached.


The settings on this screen are:

- chamber setpoint
- cooking timer
- recipe selection
- venting
- hood
- chamber light
- rotor
- steam injection
- auxiliary output
- stand-by

### 5.4.2 Cooking screen

When the oven reaches the setpoint temperature, press the start key to start up the cooking cycle.

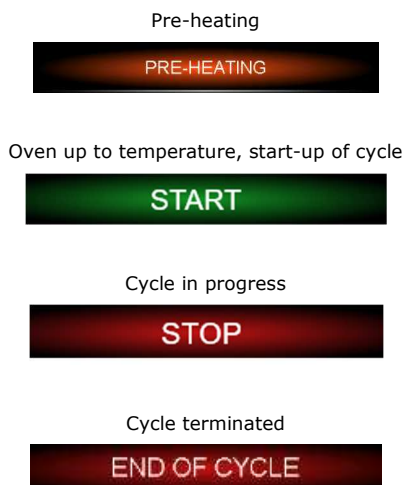


At the end of the cooking cycle, "EXTRA TIME" may be added by pressing the  icon.



### 5.4.3 Status bar

When the device is 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:



### 5.4.4 Steamer management and steam injection

If P3≠3, two icons will appear on the display to indicate steamer management and manual steam injection; the icons have the following meaning:



Steamer on



Steamer off



Manual injection enabled



Manual injection disabled

When the steamer icon is pressed, the following menu will open:



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

When the steamer is not up to temperature (parameter t1) or enabled by a digital input (i5, i7 or i9=5 with P3=1), 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 according to the configuration of parameter t0.



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



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



Here it is possible to:



set injector-on duration (Ton)



set injector-off duration (Toff)



set the number of injector repetitions (Ton+Toff)



save the settings

### 5.4.5 Venting key

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 vent 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.

The type of venting used (on/off or motorised) can be set by parameter u1.

### 5.4.6 Light key

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.

When the cooking cycle starts up, the light is managed according to parameter c17 whereas, at the end of the cooking cycle, the light works according to parameter u8.

### 5.4.7 Rotor management

The rotor is operated by:

- the rack rotation motor operating relay;
- the digital input for the rack limit switch which sets the STOP position;
- automatic activation/deactivation according to the configuration of the phase or manually by a key.

The motor rotor output is activated when the oven is switched on (pre-heating) according to the configuration of parameter K0.

At the end of the cooking cycle, the rotor operates according to the value assigned to parameter K6: when K6 = 0, the rotor will keep rotating; when K6 = 1, the rotor will not rotate until it is manually reactivated or until a new cooking cycle starts up.

It is possible to stop or restart rotation at any time using the motor rotate/stop key on the user interface. The motor will stop once the limit switch input is activated, indicating the rack is in the correct position and can be removed safely when the door is opened.

If the limit switch input is out of order, incorrectly cabled or not installed (for example for rotary ovens with a non-removable rack), the rack will stop after a maximum time set by parameter K2.

If the door is opened with the rack rotating, the output follows the setting of parameter K4:

K4 = 0 the motor will stop immediately;

K4 = 1 the motor will stop at the next activation of the limit switch input.

When the door is closed, parameter K1 controls whether the rack starts rotating again automatically or is halted in the position it was locked in when the door was opened.

Parameter K5 controls whether it is possible to operate the motor manually with the door open, as follows:

K5 = 0 The motor cannot be operated with the door open

K5 = 1 It is possible to turn the motor manually with the door open by pressing down on the rotor key.

### 5.4.8 AUX key

The AUX function is available if one of the relays is configured as "auxiliary output ON/OFF" (uxc=15). The output is activated or deactivated according to the configuration of the phase or can be manually forced using a key (the key has priority over the configuration of the phase in progress). If the output is modified using the key, when the programme passes to the next phase, the status of the output reverts to the configured status.

### 5.4.9 Hood key

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 (if i16=1). When configuring a phase, a suction hood pre-start time can be manually set.



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;
- if the door switch is activated, when the time set by parameter i8 has elapsed (if i8≠0).

### 5.4.10 Door switch management

Door switch input activation is always displayed on the screen with the following icon:



If the door open alarm is activated, the following icon is also displayed after the time of parameter i14 (with i14≠0) has elapsed.



The effect of the door switch input on regulation depends on parameters i0 and i4.

The chamber light remains on when the door is opened.

## 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.

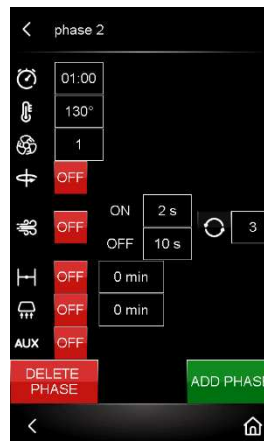
The "OEM RECIPES" recipe book contains recipes uploaded by the manufacturer or previously created recipes, or default recipes which can be used to create personalised recipes.



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
-  recipe not in favourites
-  recipe in 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:

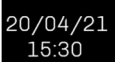
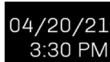


-  delete the phase (if there is more than one)
-  add a new phase

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.

## 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. Only when the display is touched, the message "PRESS TO UNLOCK" appears: press down on the message for at least four seconds to unlock the display.

This function can be deactivated by setting parameter e3=0.

## 6 COOKING CYCLE

### 6.1 Initial information

Each cooking cycle is preceded by a pre-heating stage. The working setpoint relates to the working setpoint during the first phase of the cooking cycle, the "working setpoint during the first

cooking cycle phase + working setpoint during pre-heating (r18)".

During pre-heating, the fan speed is always set to the maximum; it may be modified using the key (if several speeds are set).

When the temperature detected by the chamber probe reaches the working setpoint during pre-heating, the buzzer sounds for 3 seconds to indicate the cooking cycle may begin.

Parameters c15 and c16 control the opening and closing of the door at the beginning and end of the cooking cycle.

Each cooking cycle consists of a minimum of one up to a maximum of eight phases. At the end of each phase the device automatically moves on to the next one.

The device is capable of managing the following settings in each phase:

- duration of the phase
- chamber temperature
- fan speed, if fan management has been set to "on/off" two-speed mode (F0=1), modulating mode through the analogue output 0... 10 V (F0=2) or with the inverter (F0=3)
- suction hood status and pre-start time
- activation of the auxiliary output AUX
- rotor status
- configuration of steam injection cycles
- vent pre-opening time
- humidification

## 7 "WEEKLY PROGRAMMED SWITCH-ON" FUNCTION

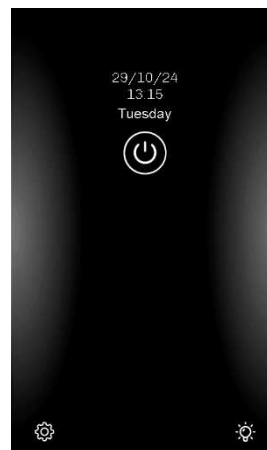
### 7.1 Initial information

If enabled by parameter C5, the "Weekly programmed switch-on" function allows users to programme up to two recipes, each with two 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.

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

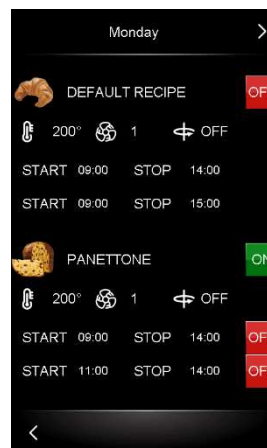


To access this procedure, proceed as follows:

1. Make sure at least one recipe has been saved and that the device is in Stand-by; 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):

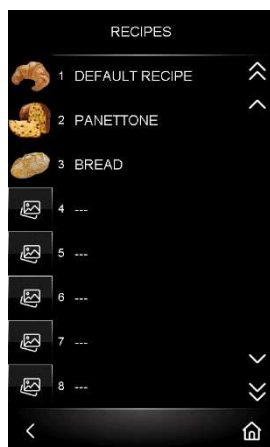


To programme a switch-on, proceed as follows:

1. Select the day of the week.
2. Select one of the two recipes; a screen will open to 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 as follows:



ON will start up pre-heating of the set recipe, according to machine configuration.

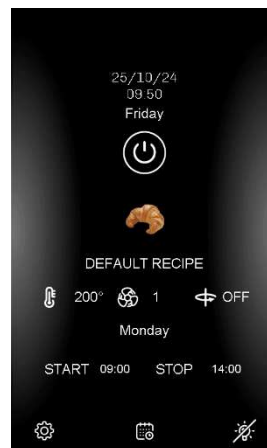
4. Set the START and STOP times.
5. Once the programming for that day of the week is complete, it is possible to:



delete the changes just made;




save the changes and exit; the controller will display the STAND-BY page with the details of the first programme closest in time;



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.

## 8 MANAGING LOADS

### 8.1 Initial information

This paragraph describes the loads during normal operation.

To learn the main consequences of an alarm signal, see the section "ALARM MANAGEMENT".

### 8.2 Temperature regulation

The output for temperature regulation stays on until the chamber temperature reaches the working setpoint and it switches on again whenever the temperature falls below the value set by parameter r0 ("working setpoint - r0").

#### 8.2.1 Type of regulation

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

##### ON-OFF regulation

The output stays on until the probe temperature reaches the working setpoint and it switches on again whenever the temperature falls below the value set by parameter r0 ("working setpoint - r0").

If a relay has been configured as "Auxiliary chamber heating", this output will be activated in parallel with the "Chamber heating" output according to the configuration of parameters r19 and r21.

##### PI regulation

Parameters r0, r9, r8, r10 and r11 are used for PI regulation (see the "List of configuration parameters").

If a relay has been configured as "Auxiliary chamber heating", this output will be activated in parallel with the "Chamber heating" output according to the configuration of parameters r19 and r21. In this case, make sure



parameters r0, r9, r19 and r21 are configured correctly to avoid overlapping of the differential or band.

### 8.3 Chamber fan

The type of fan management depends on parameter F0, as follows:

- if parameter F0=0, the fan will operate in "on/off" single speed mode (uxc=7)
- if parameter F0=1, the fan will operate in "on/off" two-speed mode (uxc=7, uxc=14)
- if parameter F0=2, the fan will operate in modulating mode 0-10 V (with 5 steps for the speed F11-F15)
- if parameter F0=3, the fan will operate with an EVCO inverter on the serial line (with 5 steps for the speed F11-F15)

If parameter F0=2 or 3, parameters F4 and F5 will set the minimum and maximum fan speed.

If the controller is placed in stand-by, the chamber fan will continue to operate until it goes below the temperature set by parameter F10.

During pre-heating, the fan speed is always set to the maximum; it may be modified using the key (if several speeds are set).

### 8.4 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

Steam injection automatically deactivates the fan and heater for the duration of injection (parameter F2=0) and for the post-injection pause time set by parameter F9.

It is possible to maintain ventilation for a few seconds at the beginning of the steam injection cycle by setting parameter F2.

#### 8.4.1 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.

#### 8.4.2 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 or i7 or i9=5).

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).

#### 8.4.3 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).

#### 8.4.4 Steam injection mode

The following parameters make it possible to personalise steam injection management (see section "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.

### 8.5 Buzzer management

The buzzer is activated in the following situations:

- for 3 seconds when the chamber pre-heating temperature has been reached to indicate the cooking cycle can begin
- 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=6).

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.

### 8.6 Sound relay management

Management of the acoustic signal depends on the buzzer status.

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



- if the buzzer is switched off, the relay will switch off
- The relay associated with this function (ucx=6) will repeat all the buzzer activations (alarms and events).

## 8.7 Electronics compartment fan

Management of the electronics compartment fan is independent of controller status and is activated or deactivated (if a relay is configured as ucx=11) according to the temperature set by parameter u6 and the relative differential u7.

## 8.8 Stand-by/On

Management of the load connected depends on the status of the device:

- if the device is switched on, the load will be on
- if the device is switched off, the load will be off

## 8.9 Type 1 or 2 burner fault reset

Burner fault reset management is only active if one of the relays is configured as "Burner fault reset" (uxc=8); the type of burner (1 or 2 according to parameter i13) depends on the high voltage input (230 Vac) which the burner is connected to.


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

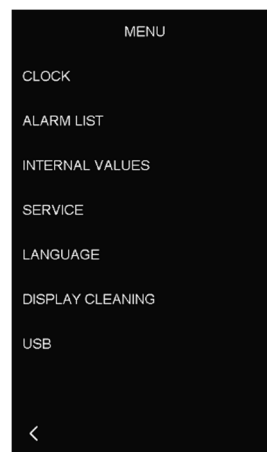
**TYPE 1 BURNER FAULT INPUT** – steam injection is disabled, the steam generator and the heating and fan outputs are switched off, the device displays the words "BURNER FAULT" and the buzzer is activated (until the input is deactivated). It is possible to reset the alarm by pressing the alarm key which will activate the relative relay output for five seconds, resetting the gas control unit and restoring normal operation.


**TYPE 2 BURNER FAULT INPUT** – steam injection is disabled, the steam generator and the heating and fan outputs are not switched off, the device displays the words "BURNER FAULT" 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 five seconds, resetting the gas control unit and restoring normal operation.

# 9 CONFIGURATION

## 9.1 Initial information

Touch the  key on the Stand-by screen to access the menu with the following options:



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.

## 9.2 Date-Time

By selecting this option, the date and time can be changed and either the "EU" or "US" format chosen.

## 9.3 List of alarms

This option displays the page with the active alarms.

## 9.4 Internal values

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

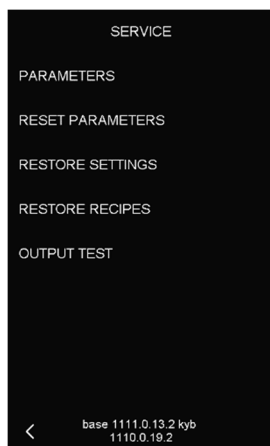
## 9.5 Service

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 and test the relays.

The password to reset the parameters or recipes is 149, while the password to restore all the settings is -119.

Testing the outputs (digital and analogue) allows the user to manually activate/deactivate all the outputs in the controller (both digital and analogue) independently of the regulation in progress. Every output can be activated/deactivated individually.

**N.B.:** for safety reasons, restoring all the settings configures all outputs to “unused” so they will therefore need to be reconfigured manually (unless the “restore.csv” file has been uploaded by the oven manufacturer).



## 9.6 Language

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

## 9.7 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.

## 9.8 USB

If this option is selected, the map of parameters or the recipe book can be imported or exported using a USB flash drive. See the section “USING THE USB PORT”.

## 9.9 Maximum power

If the controller is ON, the oven’s instant consumption can be viewed in the device’s menu; these values have no repercussions on oven operation.

PRC = max. power of chamber heater

PRA = max. power of auxiliary chamber heater (if configured)

PR = max. power of rotor

PF = max. power of chamber fan

PH = max. power of suction hood

PB = max. power of steam generator

PBL = max. power of chamber light

PST = max. power of stand-by/On

PAX = max. AUX power

## 10 LIST OF CONFIGURATION PARAMETERS

PARAM.	MIN.	MAX.	M.U.	DEF.	ANALOGUE INPUTS
P0	0	1	- - -	0	type of probe 0 = J thermocouple 1 = K thermocouple <b>N.B.: the parameter is relevant only in the models for thermocouples; this parameter is not used in the models for Pt 100 probes</b>
P1	0	1	- - -	0	temperature measurement unit (1) 0 = °C 1 = °F <b>N.B.: moving from °C to °F and vice versa does not automatically adapt the parameter values; check they are set correctly</b>
P3	0	3	- - -	0	mode to enable steam injection activation 0 = MANUAL – steam injection will be enabled when the steam generator is switched on 1 = REMOTE – steam injection will be enabled when the steam generator is switched on and the multi-purpose input activated (until the input is deactivated; only if i5 = 5) 2 = THERMOSTATIC – steam injection will be enabled if steam temperature regulation is active and the steam temperature is above t1 - t3 3 = DISABLED – steam injection and generation are disabled and the appropriate menu is NOT visible
CA1	-25/-50	25/50	°C/°F (2)	0	chamber probe offset
CA3	-25/-50	25/50	°C/°F (2)	0	steam probe offset
PARAM.	MIN.	MAX.	M.U.	DEF.	MAIN REGULATOR
r0	1	99	°C/°F (2)	5	differential or band according to the configuration of r9 if r9=0 chamber working setpoint differential if r9=1 proportional band for PI regulation
r1	0	r2	°C/°F (2)	0	minimum chamber working setpoint
r2	r1	999	°C/°F (2)	300	maximum chamber working setpoint
r3	r1	r2	°C/°F (2)	130	chamber working setpoint default value
r8	1	650	s	180	minimum time between two consecutive output switch-ons for temperature regulation
r9	0	1	---	0	type of temperature regulation 0 = ON-OFF regulation 1 = PI regulation (Proportional-Integral)
r10	1	240	sec	10	minimum on/off duration of the output for temperature regulation (only if r9=1)
r11	0	240	min	30	integral time (only if r9=1) <b>N.B.: with r10=0, only proportional regulation with band r0</b>
r18	-99	999	°C/°F (2)	0	working setpoint during pre-heating (referring to the working setpoint during the first cooking cycle phase, i.e. "working setpoint during the first cooking cycle phase + r18"; referring to the temperature detected by the chamber probe). See also parameter r0.

r19	0	100	°C/°F (2)	0	threshold above which the "auxiliary chamber heating" output is deactivated (only the "chamber heating" output is managed). See parameter r21. N.B.: the "auxiliary chamber heating" output is reactivated considering the differential of parameter r0.
r20	0	999	°C/°F (2)	0	differential above which the "auxiliary chamber heating" output is deactivated (only the "chamber heating" output is managed). See parameter r21. N.B.: the "auxiliary chamber heating" output is reactivated considering the differential of parameter r0.
r21	0	1	---	0	management of parameter r19 or r20 0 = threshold (absolute value set by parameter r19) 1 = differential (relative value, compared to the chamber setpoint, set by parameter r20).
PARAM.	MIN.	MAX.	M.U.	DEF.	MISCELLANEOUS
c0	-1	120	sec	15	duration of buzzer activation on completion of the cooking cycle -1 = until silenced manually
c1	0	1	- - -	0	buzzer activation (for 1 second) at the end of a cooking cycle phase
c3	0	99	°C/°F (2)	10	delta temperature above which the temperature detected by the chamber probe cannot be displayed (referring to the working setpoint, i.e. "working setpoint + c3") 0 = function absent
c4	0	99	°C/°F (2)	10	delta temperature below which the temperature detected by the chamber probe cannot be displayed (referring to the working setpoint, i.e. "working setpoint - c4") 0 = function absent
c5	0	1	- - -	0	enable the "weekly programmed switch-on" function 0 = NO 1 = YES
c14	0	1	- - -	0	regulation status at end of cooking cycle (until the STOP key is pressed or an extra cooking cycle is requested) 0 = temperature regulation switched off 1 = temperature regulation maintained
c15	0	2	- - -	0	cooking timer start-up with door opening/closing 0 = no action 1 = if device status is PRE-HEATING or READY 2 = only if device status is READY
c16	0	2	- - -	0	action at end of cooking cycle with door opening/closing 0 = no action (action in progress continues) 1 = goes to the Pre-heating/Ready status of the same cycle 2 = repeats the cycle, automatically starting the timer
c17	0	1	---	0	Behaviour of light at start-up of cooking cycle (see also u8) 0 = stays in the status it is in 1 = automatically comes on
PARAM.	MIN.	MAX.	M.U.	DEF.	CHAMBER FAN
F0	0	3	- - -	0	Fan management type 0 = in "on/off" and single speed mode 1 = in "on/off" and two-speed mode 2 = in modulating mode 0-10 V (5 speeds)

					3 = with EVCO inverter on the serial line (5 speeds)
F2	0	60	s	0	fan (and heater) ON time at the beginning of the steam injection cycle 0 = off for the entire duration of injection
F4	0	F5	%	0	minimum fan speed (meaning the percentage of the maximum speed; only if F0 = 2)
F5	F4	100	%	100	maximum fan speed (meaning the percentage of the maximum speed; only if F0 = 2)
F9	0	120	s	10	fan off time from end of steam injection 0 = no switch off
F10	0	999	°C/°F (2)	150	temperature below which the chamber fan is switched off when the controller is placed in stand-by
F11	0	100	%	20	speed 1 chamber fan with F0 = 2 or 3
F12	0	100	%	40	speed 2 chamber fan with F0 = 2 or 3
F13	0	100	%	60	speed 3 chamber fan with F0 = 2 or 3
F14	0	100	%	80	speed 4 chamber fan with F0 = 2 or 3
F15	0	100	%	100	speed 5 chamber fan with F0 = 2 or 3
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 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/°F	100	steam setpoint; see also t2 (only if P3 = 2)
t2	0	99	°C/°F	5	t1 differential (only if P3 = 2)
t3	0	99	°C/°F	50	steam temperature below which steam injection is disabled (relative to t1, i.e. "t1 - t3"; only if P3 = 2); 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 0 = NO 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 0 = NO 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	- - -	1	automatic steamer switch-on when the oven is switched on 0 = NO – manual switch-on using key 1 = YES – the steamer starts up automatically when going from STAND-BY to ON and switches off automatically when going from ON to STAND-BY.
t7	0	3	- - -	2	time available with quick setting of automatic steam injection cycles 0 = injection time ON 1 = injection time ON and OFF

					2 = injection time ON and OFF + number of automatic cycles 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 default t10 = -1, the on-off cycles continue until the steam generator switches off or is switched off using the key t10 = 0, no cycle, only if pressed down
t12	0	1	- - -	0	enable manual steam injection with steamer on 0 = only if conditions allow it (P3=1,2) 1 = always, even if conditions do not allow it (P3=1,2)
t13	0	999	sec	0	delay steam injection from start-up of cooking cycle or at each phase (see t14)
t14	0	1	- - -	0	management steam injection delay t13 0 = only at the first phase 1 = repeated for all phases in the cycle
t15	0	1	- - -	0	enable injection during pre-heating 0 = NO 1 = YES
PARAM.	MIN.	MAX.	M.U.	DEF.	TEMPERATURE ALARMS
A0	1	99	°C/°F (2)	10	A1 differential
A1	0	500	°C/°F (2)	0	absolute temperature above which the maximum temperature alarm is raised (referring to the temperature detected by the chamber probe) if A3=1. See also A0
A2	0	240	min	0	maximum temperature alarm delay A1
A3	0	2	- - -	0	type of maximum temperature alarm 0 = alarm absent 1 = absolute (or A1) 2 = relative to the working setpoint (i.e. "working setpoint+A8")
A4	0	80	°C/°F (2)	70	temperature above which the control module high temperature alarm is activated 0 = alarm absent
A5	-1	240	min	240	duration of a power outage during the cooking cycle sufficient to interrupt it -1 = returns to previous status without activating the PF alarm 0 = the controller is forced into stand-by without activating the PF alarm 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 <b>N.B.: if the PF alarm is still activated when going from one day to the next, the controller is forced into stand-by.</b>
A8	0	500	°C/°F (2)	0	differential above which the maximum temperature alarm is activated (referring to the working setpoint) if A3=2. See also A0
PARAM.	MIN.	MAX.	M.U.	DEF.	DIGITAL INPUTS
i0	0	1	- - -	0	door switch input contact type 0 = door open with contact open 1 = door open with contact closed

i1	0	1	- - -	0	multi-purpose input 1 contact type 0 = input active with contact closed 1 = input active with contact open
i2	0	1	- - -	0	multi-purpose input 2 contact type 0 = input active with contact closed 1 = input active with contact open
i3	0	1	- - -	0	multi-purpose input 3 contact type 0 = input active with contact closed 1 = input active with contact open
i4	0	1	- - -	1	effect of door switch input (see also parameter i16 for suction hood and K parameters for rotor) 0 = no effect on steam injection, chamber heater and fan 1 = steam injection off, chamber heaters off, fan off
i5	0	5	- - -	2	effect of multi-purpose input 1 0 = disabled 1 = fan off (fan thermal switch alarm, heaters are switched off) 2 = rack limit switch 3 = switches device on/off (same functions as Stand-by/On key) 4 = manual steam injection (same functions as key on display) 5 = steam injection enabled (if P3=1)
i6	0	120	sec	5	general thermal switch alarm signal delay (230 Vac)
i7	0	5	- - -	5	effect of multi-purpose input 2 see i5
i8	0	240	sec	10	automatic suction hood switch-off if automatically activated by the door switch (see also parameter i16): 0 = always on until the door switch input is deactivated 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	5	- - -	1	effect of multi-purpose input 3 see i5
i10	0	1	- - -	0	power consumption input contact type (230 Vac) 0 = normally open (input active with contact closed) 1 = normally closed (input active with contact open)
i11	0	1	- - -	0	thermal switch input contact type (230 Vac) 0 = normally open (input active with contact closed) 1 = normally closed (input active with contact open)
i12	0	1	- - -	0	1-2 burner fault input contact type (230 Vac) 0 = normally open (input active with contact closed) 1 = normally closed (input active with contact open)
i13	0	1	- - -	0	type of burner connected 0 = type 1 1 = type 2
i14	0	120	sec	0	door open alarm signal delay If i14=0 door alarm deactivated.
i15	0	120	sec	5	thermal switch alarm signal delay for chamber fan
i16	0	1	- - -	0	door open effect on suction hood 0 = none (only manual activation) 1 = YES (see also parameter i8)

PARAM.	MIN.	MAX.	M.U.	DEF.	ROTOR MANAGEMENT
K0	0	3	- - -	0	rotor operation during pre-heating (Pre) and cooking end after pressing the stop key (End) 0 = off in Pre and in End 1 = on in Pre, unchanged in End (with respect to cooking) 2 = on in Pre, off in End 3 = off in Pre, unchanged in End (with respect to cooking)
K1	0	1	- - -	1	rotor action after the door closes: 0 = the rotor remains off 1 = the rotor returns to its state before the door was opened
K2	0	100	s	10	maximum duration of rotor rotation from switch-off request with no activation of rack limit switch input
K4	0	1	- - -	0	effect on rotor by door opening 0 = the rotor stops immediately 1 = the rotor stops at the next activation of the limit switch input.
K5	0	1	- - -	0	Manual rotor activation when the door is opened 0 = with the door open it will not be possible to act on the rotor 1 = with the door open it will be possible to operate the rotor manually by pressing down on the rotor key.
K6	0	1	- - -	0	Rotor behaviour at end of cooking cycle 0 = the rotor continues to rotate 1 = the rotor stops until automatically activated at the beginning of a new cooking cycle
PARAM.	MIN.	MAX.	M.U.	DEF.	DIGITAL OUTPUTS
u0	0	1	- - -	0	venting output contact type 0 = normally open (venting open with contact closed) 1 = normally closed (venting open with contact open)
u1	0	1	- - -	0	load managed by venting output 0 = ON/OFF SOLENOID VALVE 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	-1	600	sec	0	time of forced opening of vent from end of cooking cycle -1 = open until closed by pressing key 0 = as set by cycle in progress
u6	20	65	°C/°F (2)	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/°F (2)	10	u6 differential
u8	0	2	- - -	0	chamber light mode to indicate end of cooking cycle 0 = the light goes off; by pressing the STOP key, the light returns to its status before the end of cooking



					1 = the chamber light flashes for 10 sec then returns to its status before the end of the cooking cycle 2 = remains in its current status
u1c	0	15	- - -	1	K1 relay 0 = Unused 1 = Chamber heating 2 = Steam injection 3 = Venting 4 = Chamber light 5 = Steam generator 6 = Sound (repeats all buzzer events) 7 = Chamber fan speed 1 8 = Type 1/2 burner fault reset 9 = Auxiliary chamber heating 10 = Suction hood 11 = Electronics compartment fan 12 = Rack rotation 13 = Stand-by/On 14 = Chamber fan speed 2 (only if F0=1) 15 = ON/OFF auxiliary output (managed during cycle phases + AUX key)
u2c	0	15	- - -	2	K2 relay same configurations as u1c
u3c	0	15	- - -	3	K3 relay same configurations as u1c
u4c	0	15	- - -	4	K4 relay same configurations as u1c
u5c	0	15	- - -	5	K5 relay same configurations as u1c
u6c	0	15	- - -	6	K6 relay same configurations as u1c
u7c	0	15	- - -	7	K7 relay same configurations as u1c
u8c	0	15	- - -	0	K8 relay same configurations as u1c
u9c	0	15	- - -	0	K9 relay same configurations as u1c
u10c	0	15	- - -	10	K10 relay same configurations as u1c
u11c	0	15	- - -	11	K11 relay same configurations as u1c
u12c	0	15	- - -	12	K12 relay same configurations as u1c
u13c	0	15	- - -	13	K13 relay same configurations as u1c
PARAM.	MIN.	MAX.	M.U.	DEF.	EVCO INVERTER <sup>(3)</sup>
S202	2	2000	ds (s/10)	30	duration acceleration ramp
S203	2	2000	ds (s/10)	50	duration deceleration ramp

S204	S205 <sup>(6)</sup>	6000	RPM	1500	maximum motor speed
S205	150	S204 <sup>(6)</sup>	RPM	300	minimum motor speed
S206	0	1	---	0	motor rotation direction 0= clockwise 1= anti-clockwise
S403	0	600	ds (s/10)	20	time-out inverter communication alarm
S501 <sup>(4)</sup>	1	94	dA (A/10)	55 <sup>(5)</sup>	nominal current
S502 <sup>(4)</sup>	50	400	V	230	nominal voltage
S503 <sup>(4)</sup>	0	100	Hz	50	nominal frequency
S504 <sup>(4)</sup>	1	8	---	2	number of pole pairs
S506 <sup>(4)</sup>	1	3000	RPM	1410 (5)	nominal motor revolutions
S511	0	50	%	50	motor overload
S512	0	60	ds (s/10)	30 <sup>(5)</sup>	maximum time motor overload
S513	1	3	---	1	stop type: 1 = stop with ramp 2 = stop with DC voltage injection 3 = stop with ramp + DC voltage injection
S515	0	200	ds (s/10)	0	duration of breaking in DC voltage (only if S513=2 or 3)
S516	0	50	%	0	DC bus voltage percentage applied to the motor during braking with DC voltage (only if S513=2 or 3)
S529	5	16	KHz	5	PWM carrier frequency
S534	0	100	%	0	motor phase loss alarm sensitivity percentage
S602	120	S603	V	200	undervoltage level
S603	S602	450	V	420	overvoltage level
PARAM.	MIN.	MAX.	M.U.	DEF.	DATA-LOGGING
rE0	1	240	min	5	internal data sampling time via external connectivity modules
PARAM.	MIN.	MAX.	M.U.	DEF.	SERIAL NETWORK
bLE	0	99	----	1	serial port configuration for connectivity 0 = free for MODBUS RTU 1-99 = EPoCA local network address (in this case the baud rate is automatically configured to 19,200 baud irrespective of the Lb value) 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	---	2	baud rate (the parameter is relevant only if bLE = 0) 0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud
LP	0	2	---	2	parity 0 = none 1 = odd 2 = even

PA1	-999	999	- - - -	426	EPoCA level 1 password (User)
PA2	-999	999	- - - -	824	EPoCA level 2 password (Administrator)
PARAM.	MIN.	MAX.	M.U.	DEF.	INSTANT CONSUMPTION DISPLAYED
PRC	0	9999	Wx10	0	chamber heater power consumption
PRA	0	9999	Wx10	0	auxiliary chamber heater power consumption
PR	0	9999	Wx10	0	rotor power consumption
PF	0	9999	Wx10	0	chamber fan power consumption
PH	0	9999	Wx10	0	suction hood power consumption
PB	0	9999	Wx10	0	steam generator power consumption
PBL	0	9999	Wx10	0	chamber light power consumption
PST	0	9999	Wx10	0	Stand-by/On output power consumption
PAX	0	9999	Wx10	0	AUX output power consumption
PARAM.	MIN.	MAX.	M.U.	DEF.	OTHERS
e0	0	1	---	0	behaviour of light when going from STD-BY to ON 0 = light on 1 = maintains the status it had in STD-BY
e1	0	1	---	0	behaviour of light when going from ON to STD-BY 0 = light off 1 = maintains the status it had in ON
e3	0	240	sec	0	locked display 0 = not locked 1÷240 = locked display activation delay
e4	0	1	---	0	save recipes 0 = always 1 = only upon entry of the password 19 (fixed, unchangeable value)

**Notes:**

- (1) Moving from °C to °F and vice versa automatically adapts the values of the parameters. Check they are correctly set all the same.
- (2) The unit of measurement depends on parameter P1.
- (3) The visibility of the inverter parameters depends on parameter F0. For a complete list of inverter parameters, see the dedicated documentation supplied with the inverter used. Except for S403, all parameters with their relative interval and default values are acquired when the inverter is switched on.
- (4) The parameter depends on the motor rating label data.
- (5) Values may differ depending on the inverter installed: the values indicated refer to the Compact inverter with power 1.5 KW and are given purely for reference purposes.
- (6) The upper limit of the minimum motor speed depends on the value set for S204; similarly, the lower limit of the maximum motor speed depends on the value set for S205. It is not possible, for instance, to set the minimum motor speed (parameter S205) at a value which is higher than the value of the maximum motor speed (parameter S204).

## 11 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 the alarm icon 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.

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

ALARM CODE		DESCRIPTION
RTC ALARM		to correct: - set the date and time
CHAMBER ALARM	PROBE	to correct: - check the type of probe; see parameter P0 - check the device-probe connection - check the chamber temperature main results: - the temperature regulation output will be switched off
STEAM ALARM	PROBE	to correct: - as in the previous case, but relating to the steam probe main results: - the steamer management output will be switched off
POWER ALARM	OUTAGE	to correct: - check the device-power supply connection main results: - 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" - 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).
CONTROL COMMUNICATION ALARM	MODULE	to correct: - check the user interface-control module connection main results: - the loads will be deactivated
CONTROL COMPATABILITY ALARM	MODULE	to correct: - check the user interface-control module FIRMWARE versions main results: - the loads will be deactivated
CHAMBER TEMPERATURE ALARM	HIGH	to correct: - check the temperature detected by the chamber probe. See parameters A0, A1 and A3 main results:

	- no effect
CONTROL MODULE HIGH TEMPERATURE ALARM	<p>to correct:</p> <ul style="list-style-type: none"> <li>- check the operating temperature of the control module. See parameter A4</li> </ul> <p>main results:</p> <ul style="list-style-type: none"> <li>- the vent will open, the electronics compartment fan will switch on, the chamber heater output, steam generator, rotor and fan will be switched off</li> </ul>
DOOR OPEN ALARM	<p>to correct:</p> <ul style="list-style-type: none"> <li>- check the cause of the input activation; see parameters i0 and i14</li> </ul> <p>main results:</p> <ul style="list-style-type: none"> <li>- see parameter i4</li> </ul>
FAN THERMAL SWITCH ALARM	<p>to correct:</p> <ul style="list-style-type: none"> <li>- check the causes of the input activation</li> </ul> <p>main results:</p> <ul style="list-style-type: none"> <li>- the chamber heater output, steam generator, rotor and fan will be switched off</li> </ul>
THERMAL SWITCH ALARM	<p>to correct:</p> <ul style="list-style-type: none"> <li>- check the causes of the input activation</li> </ul> <p>main results:</p> <ul style="list-style-type: none"> <li>- the chamber heater output, steam generator, rotor and fan will be switched off</li> </ul>
POWER CONSUMPTION ALARM	<p>to correct:</p> <ul style="list-style-type: none"> <li>- check the causes of the input activation</li> </ul> <p>main results:</p> <ul style="list-style-type: none"> <li>- the chamber heater output, steam generator, rotor and fan will be switched off</li> </ul>
CHAMBER BURNER ALARM	<p>to correct:</p> <ul style="list-style-type: none"> <li>- check the burner is working properly</li> </ul> <p>main results:</p> <ul style="list-style-type: none"> <li>- see relevant paragraph</li> </ul>
INVERTER COMMUNICATION ALARM	<p>inverter communication alarm</p> <p>to correct:</p> <ul style="list-style-type: none"> <li>- make sure the wiring is correct and intact</li> <li>- check the inverter is powered correctly</li> </ul>
INVERTER UNDERVOLTAGE ALARM	<p>inverter undervoltage alarm</p> <p>to correct:</p> <ul style="list-style-type: none"> <li>- check the characteristics of the motor</li> <li>- check the inverter is powered correctly</li> </ul>
INVERTER OVERVOLTAGE ALARM	<p>inverter overvoltage alarm</p> <p>to correct:</p> <ul style="list-style-type: none"> <li>- check the characteristics of the motor</li> <li>- check the inverter is powered correctly</li> </ul>
INVERTER OVERLOAD ALARM	<p>inverter overload alarm</p> <p>to correct:</p> <ul style="list-style-type: none"> <li>- check the characteristics of the motor</li> <li>- check the wiring</li> </ul>
INVERTER OVERCURRENT ALARM	<p>inverter overcurrent alarm</p> <p>to correct:</p> <ul style="list-style-type: none"> <li>- check the characteristics of the motor</li> <li>- check the wiring</li> </ul>
INVERTER HEAT SINK OVERHEAT ALARM	<p>inverter heat sink overheat alarm</p> <p>to correct:</p> <ul style="list-style-type: none"> <li>- check the inverter is powered correctly</li> <li>- check the inverter is aired correctly</li> </ul>

## 12 USING THE USB PORT

### 12.1 Initial information

Operations can be carried out using the EVUSB4096M USB flash drive in the USB port of Vcolor controllers. Below is a list of possible operations:

- upload and download recipe settings
- upload and download configuration parameter settings

The uploading operations described above are only possible if the firmware of the device from which it originates and the firmware of the destination device are the same.

- upload CSV files to the controller to personalise the graphics, recipes and languages (for the procedure to compile the ODS file, convert it to CSV, transfer to a USB flash drive and upload it to the controller, please refer to "Personalisation of the Vcolor platform").

### 12.2 Uploading the recipe settings

The recipe settings can be uploaded as follows:

1. Ensure the controller 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.

### 12.3 Downloading the recipe settings

The programme settings can be downloaded as follows:

1. Ensure the controller 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.

### 12.4 Uploading the settings in the configuration parameters

The programme settings can be uploaded as follows:

1. Ensure the controller 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.

### 12.5 Downloading the settings in the configuration parameters

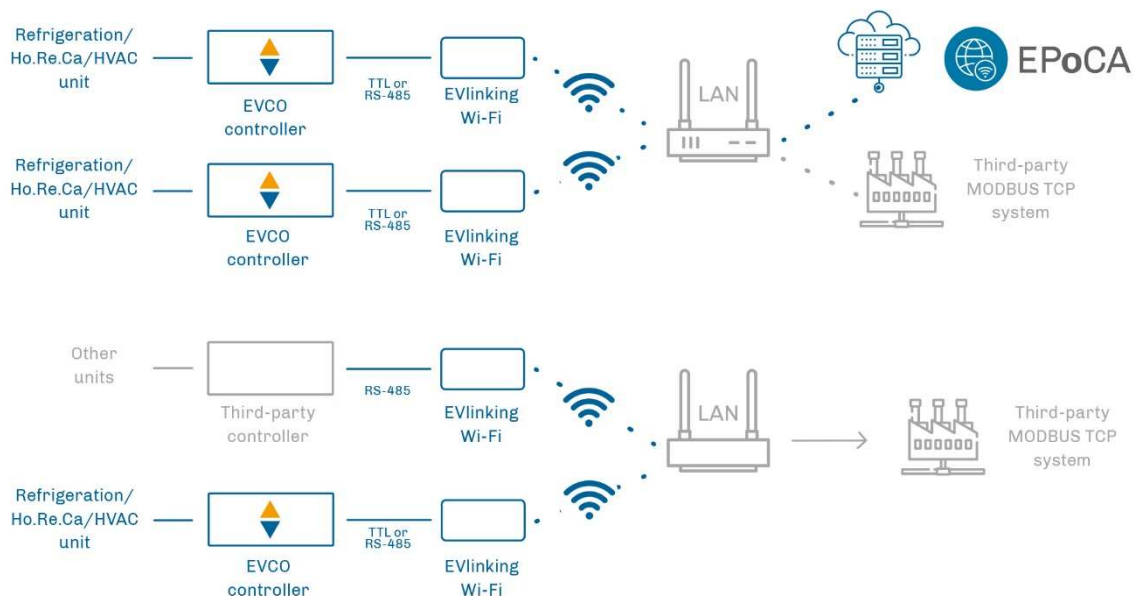
The programme settings can be downloaded as follows:

1. Ensure the controller 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 operation is complete, a "param.bin" file will be generated which can be used to upload the contents to other controllers.

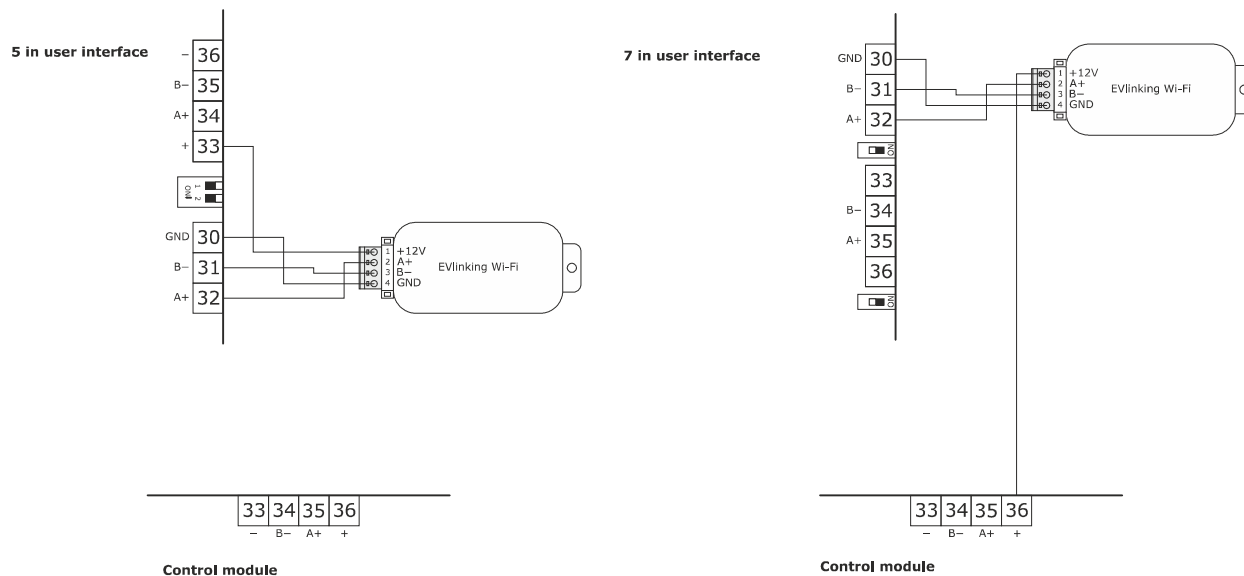
### 13 CONNECTIVITY

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](http://www.evco.it).

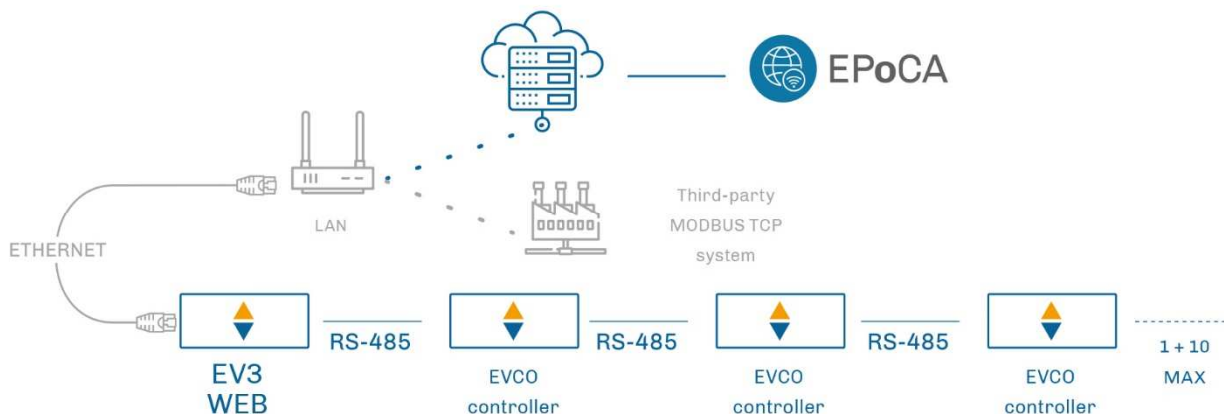
Schematic diagram for operation with EVlinking Wi-Fi (Wi-Fi connectivity)



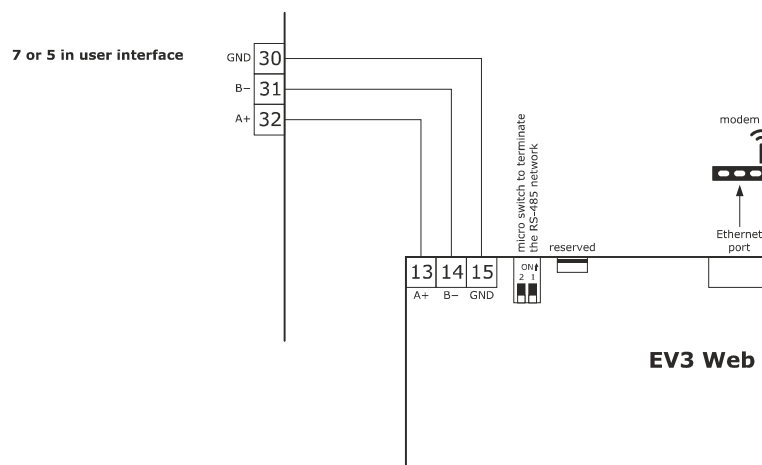
Detail of electrical connection of EVlinking Wi-Fi to Vcolor 358



Schematic diagram for operation with EV3 Web (Ethernet connectivity)



Detail of electrical connection of EV3 Web to Vcolor 358



### 13.1 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.



## 14 ACCESSORIES

### 14.1 Compact series inverter

EI750M2C04O0VXX/EI1K5M2C04O0VXX/EI2K2M2C04O0VXX/EI2K3M2C04O0VXX

Single-phase inverter 0.75/1.5/2.2/2.3 KW @ 230 VAC. Enables modulating management of asynchronous motors.



### 14.2 Safety transformer

ECTSFD004

The transformer can power the user interface.



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

EVIF20SUXI

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



### 14.4 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).



### 14.5 Connecting cables

0810500018/0810500020

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

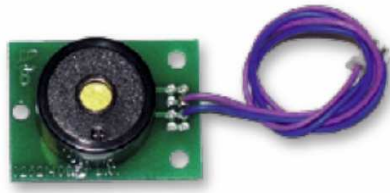
Cable 0810500018 is 2 m long; cable 0810500020 is 0.5 m long.



## 14.6 Buzzer expansion

CT1ES0070000

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



## 14.7 4GB USB flash drive

EVUSB4096M

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



## 14.8 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.



## 14.9 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.



## 15 TECHNICAL SPECIFICATIONS

### 15.1 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	control module
	Flush fit installation: 118.0 x 166.0 x 35.0 mm (6.535 x 4.645 x 1.377 in; L x H x D). Semi-recessed installation: 97.1 x 145.1 x 32.0 mm (5,712 x 3,822 x 1,259 in; L x H x D).	Flush fit installation: 156.0 x 216.0 x 50.0 mm (8.503 x 6.141 x 1.968 in; L x H x D). Semi-recessed installation: 131.9 x 192.9 x 47.0 mm (7,594 x 5,192 x 1,850 in; L x H x D).	166.0 x 116.0 x 44.0 mm (6.535 x 4.566 x 1.732 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:		
	<ul style="list-style-type: none"><li>- user interface-control module connection: 10 m (32.8 ft)</li><li>- power supply: 10 m (32.8 ft)</li><li>- analogue inputs: 10 m (32.8 ft)</li><li>- digital inputs: 10 m (32.8 ft)</li><li>- digital outputs: 100 m (329 ft)</li><li>- RS-485 MODBUS port: 1,000 m (3,280 ft)</li><li>- USB port: 1 m (3.28 ft)</li></ul>		

<b>Operating temperature:</b>	from 0 to 55 °C (from 32 to 131 °F)	
<b>Storage temperature:</b>	from -10 to 70 °C (from 14 to 158 °F)	
<b>Operating humidity:</b>	relative humidity without condensate from 10 to 90%	
<b>Pollution status of the control device:</b>	2	
<b>Environmental standards:</b>	<ul style="list-style-type: none"> <li>- RoHS 2011/65/EC</li> <li>- WEEE 2012/19/EU</li> <li>- REACH (EC) Regulation no. 1907/2006</li> </ul>	
<b>EMC standards:</b>	<ul style="list-style-type: none"> <li>- EN 60730-1</li> <li>- IEC 60730-1</li> </ul>	
<b>Power supply:</b>	user interface	control module
	powered by the control module	12 Vac (±15%), 50/60 Hz (±3 Hz), 20 VA max.
<b>Rated impulse withstand voltage:</b>	4 KV	
<b>Overvoltage category:</b>	III	
<b>Software class and structure:</b>	A	
<b>Clock:</b>	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)	
<b>Analogue inputs:</b>	2 inputs (chamber probe and boiler steam probe) for J/K thermocouples or Pt 100 according to the power board used.	
	thermocouple J type analogue inputs	
	Sensor type: iron/constantan	
	Measurement field: from -50 to 700 °C (from -58 to 1,292 °F)	
	Resolution: 1 °C (1 °F)	
	Protection: none	
<b>Analogue inputs:</b>	thermocouple K type analogue inputs	
	Sensor type: chromel/alumel	
	Measurement field: from -50 to 1,100 °C (from -58 to 2,012 °F)	
	Resolution: 1 °C (1 °F)	
	Protection: none	
	Pt 100 type analogue inputs	
<b>Analogue inputs:</b>	Type of sensor: Pt 100 class A	

	<p>Measurement field: from -50 to 550 °C (from -58 to 1,022 °F)</p> <p>Resolution: 1 °C (1 °F)</p> <p>Protection: none</p>
<b>Digital inputs:</b>	<p>7 inputs for normally open / normally closed (NO/NC) contact:</p> <ul style="list-style-type: none"> <li>- 3 for high voltage contact, 230 Vac (power consumption, thermal switch, type 1/2 burner fault)</li> <li>- 4 for voltage-free contact, 5 Vdc, 0.5 mA which are set by the configuration parameter</li> </ul>
	<p>voltage-free digital inputs</p> <p>Power supply: none</p> <p>Protection: none</p>
	<p>digital inputs for high voltage contact</p> <p>Power supply: 230 Vac</p> <p>Protection: none</p>
<b>Digital outputs:</b>	<p>13 outputs (electro-mechanical relays):</p> <ul style="list-style-type: none"> <li>- 1 5 A res. @ 250 Vac type SPST (K1) output</li> <li>- 1 5 A res. @ 250 Vac type SPST (K2) output</li> <li>- 1 5 A res. @ 250 Vac type SPST (K3) output</li> <li>- 1 5 A res. @ 250 Vac type SPST (K4) output</li> <li>- 1 5 A res. @ 250 Vac type SPST (K5) output</li> <li>- 1 5 A res. @ 250 Vac type SPST (K6) output</li> <li>- 1 5 A res. @ 250 Vac type SPST (K7) output</li> <li>- 1 5 A res. @ 250 Vac type SPDT (K8) output</li> <li>- 1 8 A res. @ 250 Vac type SPST (K9) output</li> <li>- 1 5 A res. @ 250 Vac type SPST (K10) output</li> <li>- 1 5 A res. @ 250 Vac type SPST (K11) output</li> <li>- 1 5 A res. @ 250 Vac type SPST (K12) output</li> <li>- 1 8 A res. @ 250 Vac type SPDT (K13) output</li> </ul> <p>* The relays do not control LED or fluorescent lights</p>
<b>Displays:</b>	<p>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.</p>
<b>Type 1 or Type 2 actions:</b>	Type 1
<b>Additional features of Type 1 or Type 2 actions:</b>	C
<b>Communications ports:</b>	<p>2 ports:</p> <ul style="list-style-type: none"> <li>- 1 RS-485 MODBUS port</li> <li>- 1 USB port</li> </ul>
<b>Warning and alarm buzzer:</b>	built-in



**Vcolor 358**

Controllers for electric or gas rotary ovens for bread and pastry-making

Installer manual ver. 1.1

PB - 43/24

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