EVCO
Advanced Controllers

EVOLVE COMBI

Next-generation controllers for combi ovens used in the catering and patisserie/bakery sectors

WARNING

Make sure you read and fully understand the manual before using this device.

Non-observance of these instructions may result in death or serious injury.

Operating manual

114EVO3E4.00 - 05/2025

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INFORMATION SECTION

Chapter content

This chapter contains the following information:

IMPORTANT LEGAL INFORMATION

LIABILITY AND RESIDUAL RISKS

EVCO assumes no liability for any damage caused by the following (by way of example; this is not an exhaustive list):

- Installation/use for purposes other than those specified and, in particular, not adhering to the safety provisions set out by current regulations in the country in which the product is installed and/or contained in this manual;
- Use in appliances that do not guarantee sufficient protection against electric shocks, water and dust within the installation conditions created;
- Use in appliances that allow access to hazardous parts without the use of a keyed or tooled locking mechanism when accessing the instrument;
- Tampering and/or modifying the product;
- Installation/use in appliances which do not comply with current regulations in the country in which the product is installed.

The customer/manufacturer is responsible for ensuring their machine complies with these regulations.
EVCO's responsibility is limited to the correct and professional use of the product in accordance with regulations and the instructions contained in this manual and other product support documents.

To comply with EMC standards, observe all the electrical connection instructions. As it depends on the wiring configuration as well as the load and the installation type, compliance must be verified for the final machine as specified by the relevant product standard.

DISCLAIMER

This document is the exclusive property of EVCO. It contains a general description and/or a description of the technical specifications for the services offered by the products listed herein. This document should not be used to determine the suitability or reliability of these products in relation to specific user applications. Each user or integration specialist should conduct their own complete and appropriate risk analysis, in addition to carrying out a product evaluation and test in relation to its specific application or use. Users can send us comments and suggestions on how to improve or correct this publication.

Neither EVCO nor any of its associates or subsidiaries shall be held responsible or liable for improper use of the information contained herein.

EVCO has a policy of continuous development; therefore, EVCO reserves the right to make changes and improvements to any product described in this document without prior notice.

The images in this document and other documentation supplied with the product are provided for illustrative purposes only and may differ from the product itself.

The technical data in this manual is subject to change without prior notice.

TERMS AND CONDITIONS OF USE

Permitted use

The device must be installed and used in accordance with the instructions provided and, in particular, hazardous live parts must not be accessible under normal conditions.

The device must be suitably protected from water and dust with regard to its application and must also only be accessible with the aid of a tool (with the exception of the front panel).
Only qualified personnel may install the product or perform technical support procedures on it.

The customer must only use the product as described in the documentation relating to that product.

Prohibited use

Any use other than those described in the "**Permitted use**" section and in the product support documentation is prohibited.

ACCEPTANCE OF THE TERMS

By using the Manual, the user accepts the terms of this Disclaimer. If the user does not accept the terms of this Disclaimer, they must not use the Manual.

DISPOSAL

The device must be disposed of in accordance with local regulations regarding the collection of electrical and electronic appliances.

CONTACTS

For any questions or doubts about this Disclaimer, please contact the Company: see the last page.

CONSIDER THE ENVIRONMENT

The company works towards protecting the environment, while taking account of customer requirements, technological innovations in materials, and the expectations of the community to which we belong. EVCO places great importance on respecting the environment, encouraging all associates to become involved with company values and guaranteeing safe, healthy and functional working conditions and workplaces.
Please consider the environment before printing this document.

IMPORTANT SAFETY INFORMATION

Please read this document carefully before installation; study all the warnings before using the device. Only use the device in accordance with the methods described in this document. The following safety messages may be repeated several times in the document, to provide information regarding potential hazards or to attract attention to information which may be useful in explaining or clarifying a procedure.

SYMBOLS USED IN THIS MANUAL

This symbol is used to indicate a risk of electric shock.
It is a safety indication and as such, should be observed to avoid potential accidents or fatalities.

This symbol is used to indicate a risk of serious personal injury.
It is a safety indication and as such, should be observed to avoid potential accidents or fatalities.

SAFETY MESSAGES

⚠ ⚠ DANGER

DANGER indicates a situation of imminent danger which, if not avoided, **will lead to death or serious injury**.

⚠ WARNING

WARNING indicates a situation of imminent danger which, if not avoided, **may lead to death or serious injury**.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **could cause minor or moderate injury.**

NOTICE

NOTICE indicates a situation not related to physical injuries but which, if not avoided, could damage the equipment**.**

NOTE: the maintenance, repair, installation and use of the equipment must only be entrusted to qualified personnel.

QUALIFIED PERSONNEL

Only suitably trained and experienced personnel capable of understanding the content of this manual and all documentation regarding the product are authorised to work on and with this equipment. Furthermore, the personnel must have completed courses in safety and must be able to recognise and prevent the implied dangers. The personnel must have suitable training, knowledge and experience at a technical level, and be capable of anticipating and detecting potential risks caused by using the product, as well as changing the settings and modifying the mechanical, electric and electronic equipment for the entire system in which the product is used. All personnel working on and with the product must be entirely familiar with the relevant standards and directives, as well as safety regulations.

UNAUTHORISED PERSONNEL

The equipment must **not** be used by persons (including children) with reduced physical, sensory or mental capabilities, or persons with no experience or knowledge.

SAFETY PRECAUTIONS REGARDING THE PRODUCT AND ITS USE

Before carrying out any work on the equipment, read these instructions carefully, making sure you understand everything.

DANGER

RISK OF ELECTRIC SHOCK, EXPLOSION OR ELECTRIC ARC

- Only use electrically insulated measuring devices and equipment.
- Do not install the equipment while the power supply is connected.
- Cut off the power supply to all equipment, including any connected devices, before installing/uninstalling the device.
- Always use a properly calibrated Voltmeter to make sure the system is powered off.
- Do not touch the unshielded components or the terminals while they are live.
- Do not open, disassemble, repair or modify the product.
- Do not expose the equipment to liquids or chemicals.
- All 12 Vac models must be powered individually.
- Before applying voltage to the equipment:
  - Make sure all protective elements, such as covers, hatches and grilles, are fitted and/or closed.
  - Check all wiring connections.

DANGER

RISK OF ELECTRIC SHOCK AND FIRE

- Do not use the device with loads greater than those indicated in the technical data section.
- Do not exceed the temperature and humidity ranges indicated in the technical data section.
- Use the required safety interlocks (fuses and/or magnetothermal switches) of a suitable size.

DANGER

RISK OF ELECTRIC SHOCK OR MALFUNCTIONING OF THE EQUIPMENT

Do not use damaged products or accessories.

WARNING

MALFUNCTIONING OF THE EQUIPMENT

- Perform the wiring carefully, in compliance with electromagnetic compatibility requirements.
- Make sure the wiring is correct for its application.
- Use shielded cables for all I/O signal and communication cables.
- Minimise the length of the connections as much as possible, to avoid winding the cables around electrically connected parts.
- The signal (digital and analogue inputs, communication and corresponding power supplies) and power cables for the device must be routed separately.
- Before applying the power supply, check all the wiring connections.
- Use the necessary safety interlocks wherever the risk of injury to personnel and/or equipment damage exists.
- Install and use this device in a cabinet of a suitable class for the intended environment, protected by a keyed locking mechanism or other suitable instruments.
- In terms of connection and the fuses used in the circuits for the power supply and output lines, observe local and national regulatory requirements relating to the nominal current and voltage for the equipment in use.
- Do not use this equipment for machine functions that are critical to safety.
- Do not disassemble, repair or modify the equipment.
- Do not connect wires to unused terminals and/or terminals marked with the text “No connection” (“N.C.”).

INFORMATION ABOUT THE DOCUMENT

⚠ WARNING

MALFUNCTIONING OF THE EQUIPMENT

Make sure you read and fully understand the manual before using this device.

Non-observance of these instructions may result in death or serious injury.

PURPOSE OF THE DOCUMENT

This document describes the **EVOLVE COMBI** series - understood to mean a base board and user interface - dedicated to combi ovens used in the catering and patisserie/bakery sectors and the corresponding accessories. The information provided includes:

- Safety;
- Installation;
- Wiring;
- Commissioning;
- Configuration.
- Usage;
- Diagnostics.

NOTE: read this document - and all related documents - carefully before installing, operating or servicing the controller.

INTENDED READERS

This manual is intended for readers in different countries. Both metric and imperial units of measurement are used in the manual.

APPLICATION AND VALIDITY

This manual is only valid for the **EVOLVE COMBI** series.

RELATED TECHNICAL DOCUMENTS

Document	Code (p/n)	Language
EVOLVE COMBI operating manual, EN	**114EVO3E4**	ENGLISH
EVOLVE COMBI series instruction sheet, EN-IT	**104EVO3A4**	MULTILINGUAL (EN-IT)

1. INTRODUCTION

Chapter content

This chapter contains the following information:

1.1 DESCRIPTION

Controllers in the **EVOLVE COMBI** series by EVCO feature the most advanced functions and are dedicated to the management of combi ovens used in the catering and patisserie/bakery sectors.

A number of combi ovens can be managed, including:

- Electric combi ovens;
- Gas combi ovens;
- Combi ovens with direct steam injection;
- Combi ovens with external boilers.

It is also possible to integrate an EVCO inverter into the application, so as to modulate the fan speed and achieve greater oven efficiency.

The **EVOLVE COMBI** series consists of:

- Base board;
- Remote user display interface.

The remote user interface display consists of a colour TFT graphic display featuring capacitive touchscreen technology, available in two sizes with vertical alignment:

- **7”** touchscreen TFT display;
- **9”** touchscreen TFT display.

Plus, the EVCO range of displays offers the user two different types of interface installation, for optimum flexibility:

- User interface with front mounting (see ***"3.4.1 Models with front mounting” on page 23***);
- User interface with flush mounting from the rear of the panel (see ***"3.4.2 Models with mounting from the rear of the panel” on page 24***)

EVOLVE COMBI offers full management of steam with:

- direct generation;
- injection and venting;

in both automatic and manual mode.

If the steam is generated by means of an external boiler module, you will be able to manage the boiler functions, such as:

- Water fill and drain;
- Boiler rinsing;
- Boiler cleaning with:
  - liquid detergent;
  - detergent tablet.

1.2 PRODUCT OVERVIEW

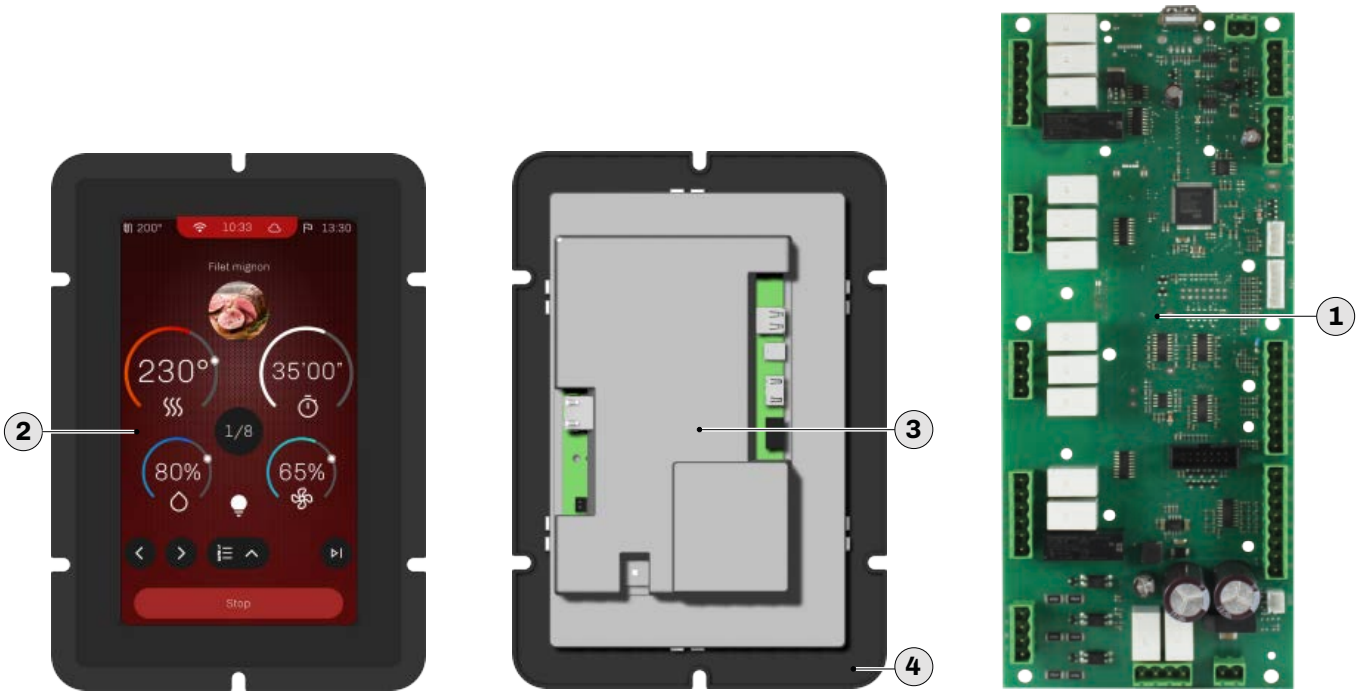


Fig. 1. *Product overview*

Reference	Description	Reference	Description
1	Base board	3	Remote user interface - Back
2	Remote user interface - Front	4	Flush plate for mounting through the back of the panel

1.3 AVAILABLE MODELS

The EVCO **EVOLVE COMBI** solution for combi ovens consists of various models:

1.3.1 BASE BOARD

P/n	Description
EVCLP36FJ2E	**EVOLVE COMBI** base board with J/K thermocouples
EVCLP36FC2E	**EVOLVE COMBI** base board with Pt100

1.3.2 7” USER INTERFACE

P/n	Mount type	Description
EVO300LV2	Flush, from the rear of the panel	**EVOLVE COMBI** 7" user interface with Ethernet+audio
EVO310LV2	Flush, from the rear of the panel	**EVOLVE COMBI** 7" user interface with WiFi+audio
EVO320LV2	Flush, from the rear of the panel	**EVOLVE COMBI** 7” user interface with WiFi+Ethernet+audio

1.3.3 9” USER INTERFACE

P/n	Mount type	Description
EVO300XV2	Flush, from the rear of the panel	**EVOLVE COMBI** 9" user interface with Ethernet+audio
EVO310XV2	Flush, from the rear of the panel	**EVOLVE COMBI** 9” user interface with WiFi+audio
EVO320XV2	Flush, from the rear of the panel	**EVOLVE COMBI** 9” user interface with WiFi+Ethernet+audio

1.4 MAIN FEATURES

1.4.1 HARDWARE SPECIFICATIONS

BASE BOARD

The main hardware features of the **EVOLVE COMBI** series are as follows:

- 4 analogue inputs, which depending on the model may be:
  - 4 analogue inputs for J/K thermocouples;
  - 4 analogue inputs for Pt1000 probes;
- Up to 6 digital inputs, including:
  - 2 voltage-free digital inputs;
  - 3 hazardous voltage digital inputs;
- 15 unsealed relay outputs;
- 1 analogue output 0...10 V for chamber fan;
- 1 master RS-485 serial port;
  - Dedicated to connection with boiler expansion and inverter;
- 1 slave RS-485 serial port;
  - Dedicated to connection with display user interface;
- 1 USB port;
  - Dedicated to firmware updates.

USER INTERFACE

- 1 slave RS-485 serial port;
  - Dedicated to connection with base board;
- 1 USB port;
  - Dedicated to firmware updates;
- 1 WiFi antenna (see ***"1.3 Available models” on page 12***);
- 1 Ethernet port (see ***"1.3 Available models” on page 12***);
- 1 HDMI port (see ***"1.3 Available models” on page 12***);
- Built-in display;
- External buzzer (optional, see section ***"1.5 Accessories” on page 13***);
- External speaker (optional, see section ***"1.5 Accessories” on page 13***).

NOTE: for further information regarding input/output specifications, please refer to paragraph ***"2.2 Technical specifications” on page 15***.

1.4.2 OPERATIONAL FEATURES

The main operational features of the **EVOLVE COMBI** series are as follows:

- Customising the homepage;
- User management;
- Ventilation management in both ON/OFF and modulating modes, with fan operating direction reversal;
- Ventilation management via serial connection to EVCO inverter;
- Cleaning management with both liquid detergent and detergent tablets;
- Weekly programmed startup for recipes and cleaning cycles;
- Cookbook function;
- End-of-cycle consumption report;
- Connectivity with the cloud.

1.5 ACCESSORIES

The following accessories are available for the EVCO **EVOLVE COMBI** range:

P/n	Description
ECTSFD004	230/12 Vac 20 VA transformer (for power base)
CJAV73	Connectors kit for base board
CT1ES0070000	External buzzer with cable, length = 200 mm
EVSPK01	Speaker, 3 W 86 dBA
EVCLE315XXE	Boiler module
EVCLE302XXE	Gas burner module with ventilation, 12 V
EVCLE312XXE	Gas burner module with ventilation, 24 V
EI750M2C04O0VXX	**Compact series** inverter for speed adjustment, for three-phase motors up to 0.75 kW
EI1K5M2C04O0VXX	**Compact series** inverter for speed adjustment, for three-phase motors up to 1.5 kW
EI2K2M2C04O0VXX	**Compact series** inverter for speed adjustment, for three-phase motors up to 2.2 kW
EI2K3M2C04O0VXX	**Compact series** inverter for speed adjustment, for three-phase motors up to 2.3 kW

2. TECHNICAL SPECIFICATIONS

Chapter content

This chapter contains the following information:

2.1 BEFORE YOU START

All the system components in the **EVOLVE COMBI** series satisfy European Community (EC) requirements for open systems. They must be installed in casing or another location designated on the basis of specific environmental conditions and in order to minimise the risk of involuntary contact with hazardous voltage. Use metal casing to improve **EVOLVE COMBI** system immunity to electromagnetic fields. This equipment satisfies the EC requirements as indicated in the tables below.

⚠ WARNING

MALFUNCTIONING OF THE EQUIPMENT

Do not exceed any of the nominal values specified in this section.

2.2 TECHNICAL SPECIFICATIONS

Type	Description
The product complies with the following harmonised standards:	EN60730-1 and EN60730-2-9
Device construction:	Incorporated electronic device
Device purpose:	Operating control device
Type of action:	1.C
Pollution category:	2
Overvoltage category:	III
Nominal pulse voltage:	4000 V
Power supply:	**Base board**: 12 Vac, ±15%, 50/60 Hz, non-isolated **User interface**: supplied from base board
Consumption:	**Base board**: 20 VA maximum
Ambient operating conditions:	0 ... 55 °C (32 ... 131 °F) 10 ... 90 % RH non-condensing
Transportation and storage conditions:	-10 ... 70 °C (14 ... 158 °F) 10 ... 90 % RH non-condensing
Software class:	A
Protection degree provided by the casing:	**Base board**: IP00 **User interface**: IP65
RTC:	Built-in 24-hour autonomy (with full charge) in the event of power supply failure Charge time: 2 minutes (via device)

2.3 I/O SPECIFICATIONS

Type	Description
Digital inputs	2 voltage-free digital inputs (3.3 Vdc, 1 mA) 3 hazardous voltage digital inputs (230 Vac)
Analogue inputs	4 analogue inputs (*)
Low voltage (SELV) digital output	15 digital outputs
Serial port	2 RS-485 serial ports 1 USB port

(*) If the multi-sensor needle is configured (max. 4 sensor/points), the needle must be connected to the AUX connector

ANALOGUE INPUT SPECIFICATIONS

MODELS WITH J/K THERMOCOUPLES

	K thermocouple	J thermocouple	Current 4...20 mA	Voltage 0...5 V	Voltage 0...10 V	Digital input
AI1	•	•	---	---	---	---
AI2	•	•	---	---	---	---
AI3	•	•	---	---	---	---
AI4	•	•	---	---	---	---

Range	-50...1100 °C (-58...2012 °F)	-50...700 °C (-58...1292 °F)	---	---	---	---
Solution	1 °C (1 °F)		---	---	---	---

MODELS WITH PT100 PROBES

	Pt100 1 kΩ at 0 °C	Current 4...20 mA	Voltage 0...5 V	Voltage 0...10 V	Digital input
AI1	•	---	---	---	---
AI2	•	---	---	---	---
AI3	•	---	---	---	---
AI4	•	---	---	---	---

Range	-50...550 °C (-58...1022 °F)	---	---	---	---
Solution	1 °C (1 °F)	---	---	---	---

DIGITAL INPUT SPECIFICATIONS

	Default	Input type	Voltage	Current
DI1	Door switch	Voltage-free contact	3.3 Vdc	1 mA
DI2	Oven rack	Voltage-free contact	3.3 Vdc	1 mA
DI3	Safety thermostat	At hazardous voltage	230 Vac	---
DI4	General thermal protection	At hazardous voltage	230 Vac	---
DI5	Electrical absorption	At hazardous voltage	230 Vac	---

DIGITAL OUTPUT SPECIFICATIONS

	Default	Description	Load (at 250 Vac)	Load type
Out1	Heating	SPST	5 A	Resistive
Out2	Venting	SPST	5 A	Resistive
Out3	Steam reduction	SPDT	8 A	Resistive
Out4	Not configured	SPST	5 A	Resistive
Out5	Single speed chamber fan	SPST	5 A	Resistive
Out6	Extractor hood	SPST	5 A	Resistive
Out7	Technical compartment fan	SPST	5 A	Resistive
Out8	Direct steam injection	SPST	5 A	Resistive
Out9	Booster heating	SPST	5 A	Resistive
Out10	Smoking	SPST	5 A	Resistive
Out11	Chamber light	SPST	5 A	Resistive
Out12	Liquid rinse aid injection, cleaning cycle	SPDT	8 A	Resistive
Out13	Water drainage, cleaning cycle	SPST	5 A	Resistive
Out14	Liquid detergent injection, cleaning cycle	SPST	5 A	Resistive
Out15	Water injection valve, cleaning cycle	SPST	5 A	Resistive

3. MECHANICAL ASSEMBLY

Chapter content

This chapter contains the following information:

3.1 BEFORE YOU START

Read this manual carefully before installing the system.
In particular, the safety instructions, electrical requirements and current regulations for the machine or the process in which this device is involved must be observed. The use and application of the information contained herein requires experience in the design and programming of automated control systems. Only the user, integrator or manufacturer of the machine can be familiar with all the conditions and factors which arise during installation and configuration, operation and maintenance of the machine or the process, and as such can identify the relevant automation equipment and the corresponding interlocks and safety systems which can be used effectively and appropriately. When selecting automation and control equipment and other connected equipment and software, for a particular application, you must consider all applicable local, regional and national standards and/or regulations.

3.2 INFORMATION CONCERNING INSTALLATION AND THE SURROUNDING ENVIRONMENT

Before carrying out any work on the equipment, read these instructions carefully, making sure you understand everything.

⚠ DANGER

RISK OF ELECTRIC SHOCK, EXPLOSION OR ELECTRIC ARC

- Only use electrically insulated measuring devices and equipment.
- Do not install the equipment while the power supply is connected.
- Cut off the power supply to all equipment, including any connected devices, before installing/uninstalling the device.
- Always use a properly calibrated Voltmeter to make sure the system is powered off.
- Do not touch the unshielded components or the terminals while they are live.
- Do not open, disassemble, repair or modify the product.
- Do not expose the equipment to liquids or chemicals.
- Before applying voltage to the equipment:
  - Make sure all protective elements, such as covers, hatches and grilles, are fitted and/or closed.
  - Check all wiring connections.

⚠ WARNING

MALFUNCTIONING OF THE EQUIPMENT

- Perform the wiring carefully, in compliance with electromagnetic compatibility and safety requirements.
- Make sure the wiring is correct for its application.
- Use shielded cables for all I/O signal and communication cables.
- Minimise the length of the connections as much as possible, to avoid winding the cables around electrically connected parts.
- The signal (digital and analogue inputs, communication and corresponding power supplies) and power cables for the device must be routed separately.
- Before applying the power supply, check all the wiring connections.
- Use the necessary safety interlocks wherever the risk of injury to personnel and/or equipment damage exists.
- Install and use this device in a cabinet of a suitable class for the intended environment, protected by a keyed locking mechanism or other suitable instruments.
- In terms of connection and the fuses used in the circuits for the power supply and output lines, observe local and national regulatory requirements relating to the nominal current and voltage for the equipment in use.
- Do not use this equipment for machine functions that are critical to safety.
- Do not disassemble, repair or modify the equipment.
- Do not connect wires to unused terminals and/or terminals marked with the text “No connection” (“N.C.”).

3.3 DIMENSIONS

3.3.1 BASE BOARD

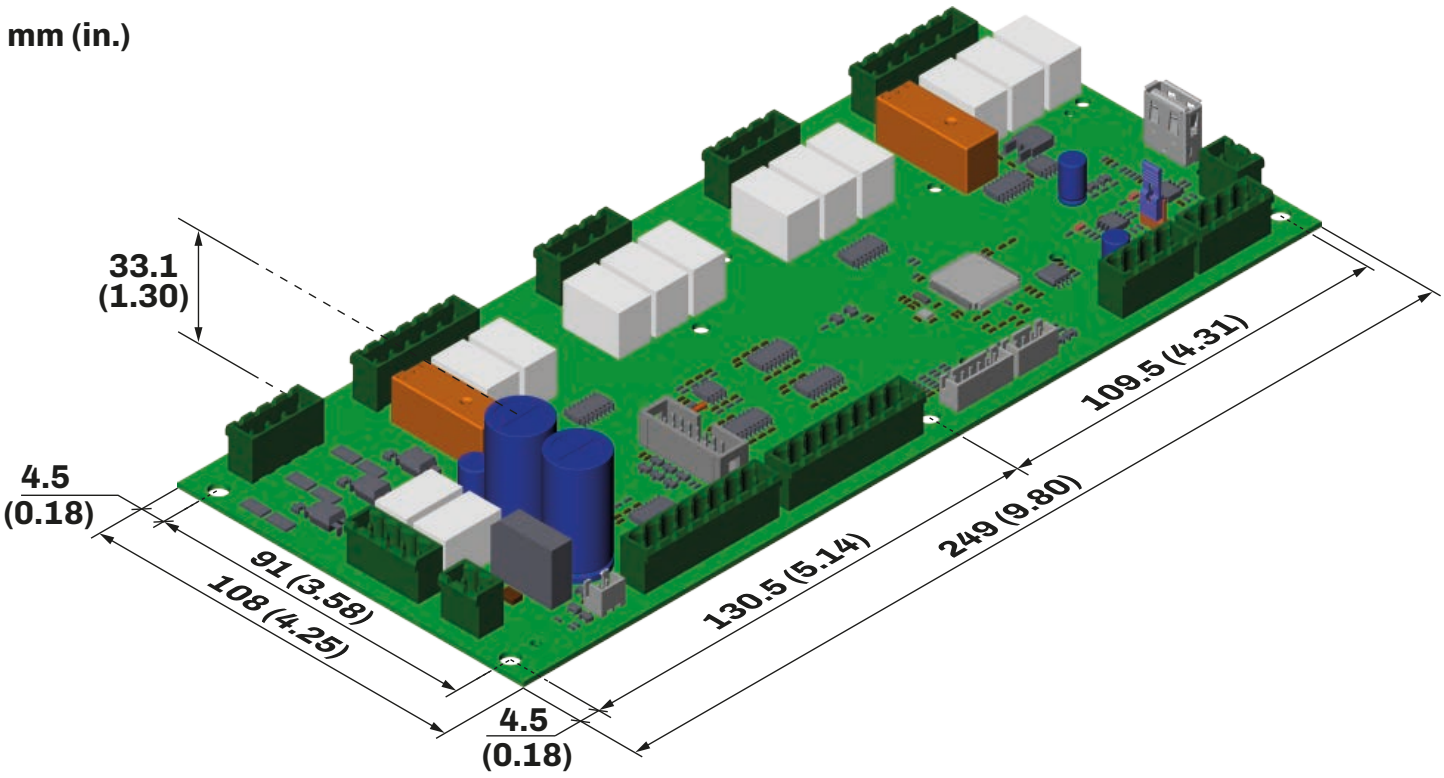


Fig. 2. ***Base board*** *dimensions*

3.3.2 USER INTERFACE | MODELS WITH FRONT MOUNTING

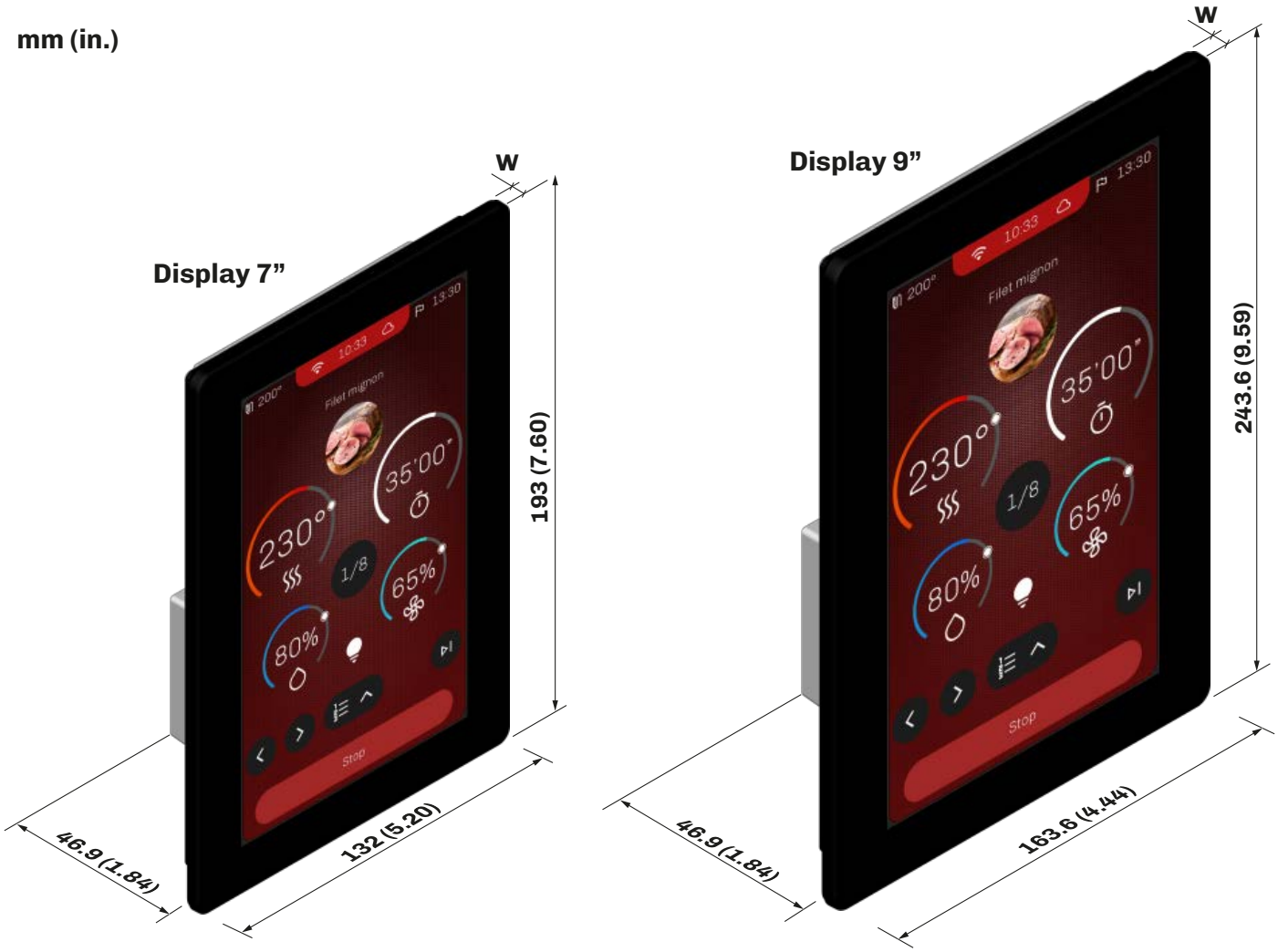


Fig. 3. *Dimensions* ***User interface | Models with front mounting***

3.3.3 USER INTERFACE | MODELS WITH FLUSH MOUNTING FROM THE REAR OF THE PANEL

7” DISPLAY

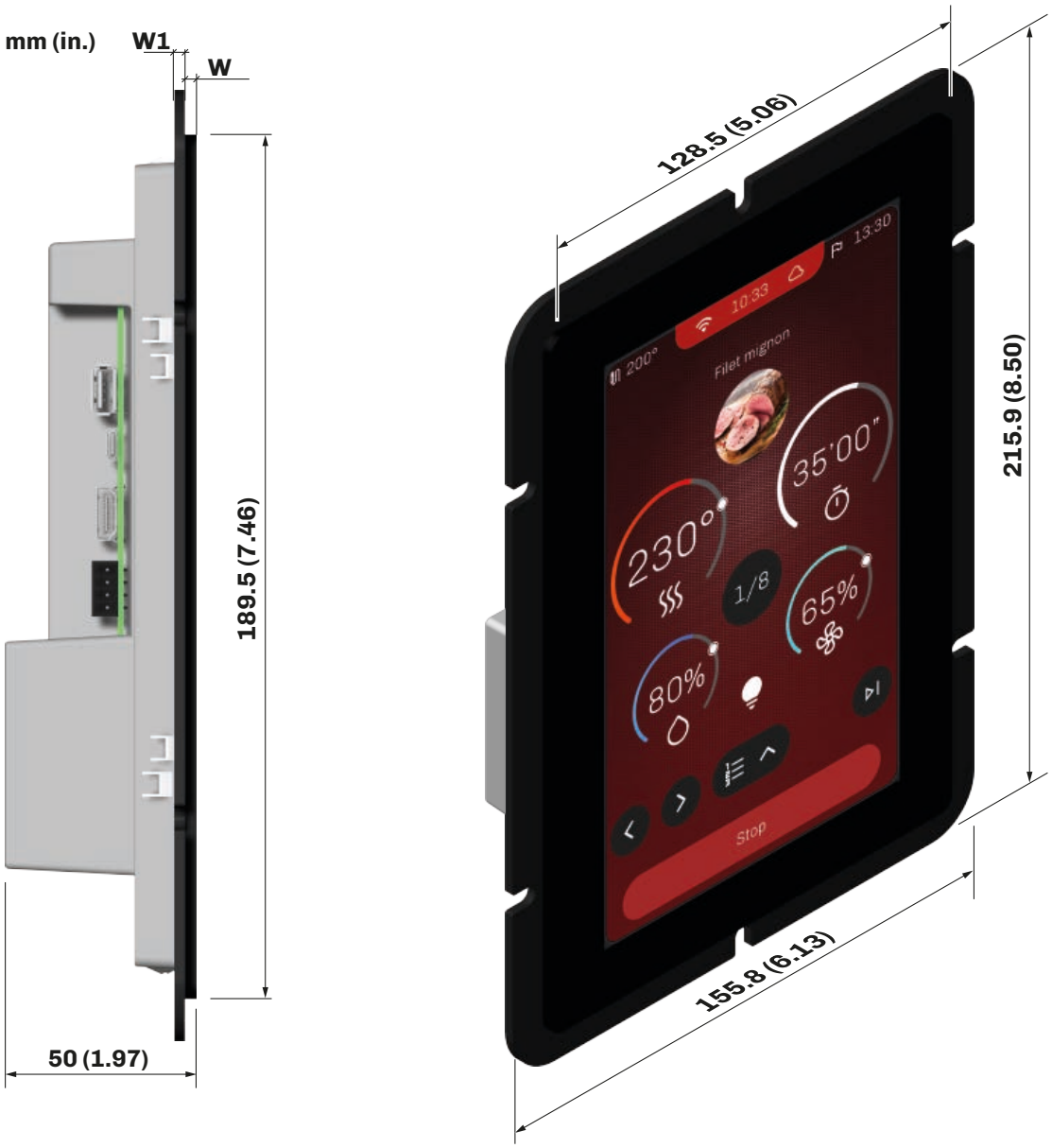


Fig. 4. *Dimensions* ***Models with flush mounting from the rear of the panel | 7” display***

9” DISPLAY

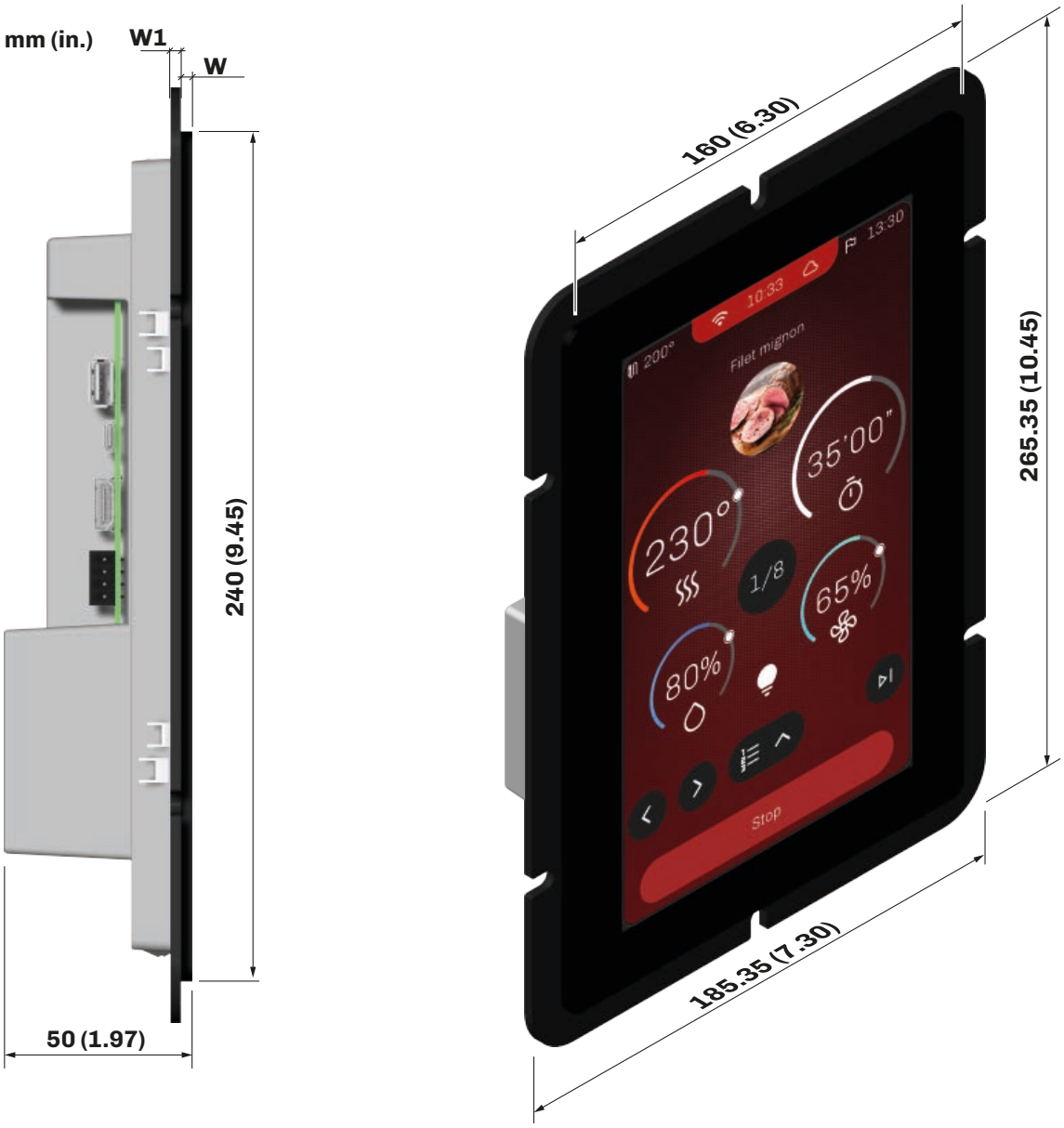


Fig. 5. *Dimensions* ***Models with flush mounting from the rear of the panel | 9” display***

3.4 INSTALLATION

3.4.1 MODELS WITH FRONT MOUNTING

7” display	9” display

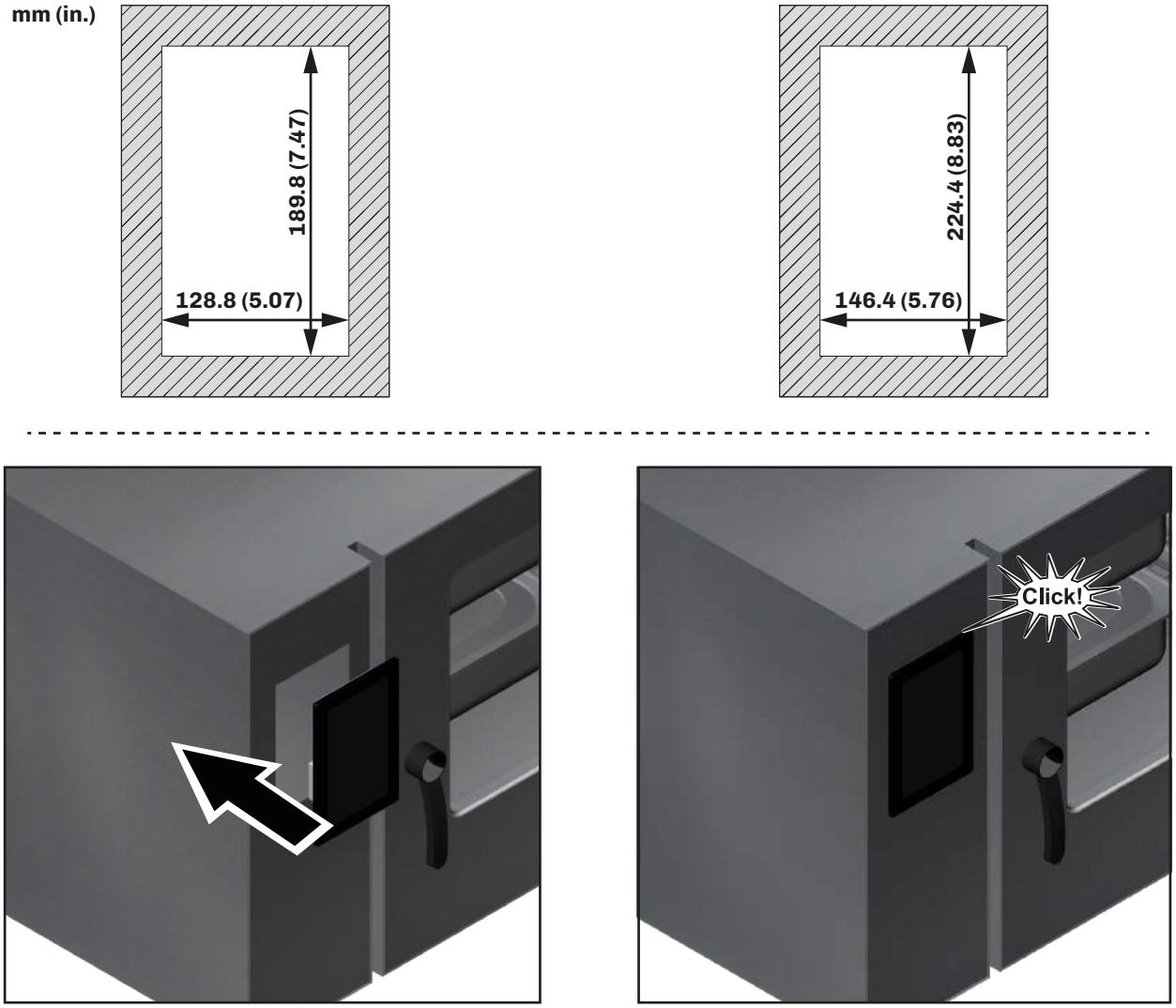


Fig. 6. *Installation* ***Models with front mounting***

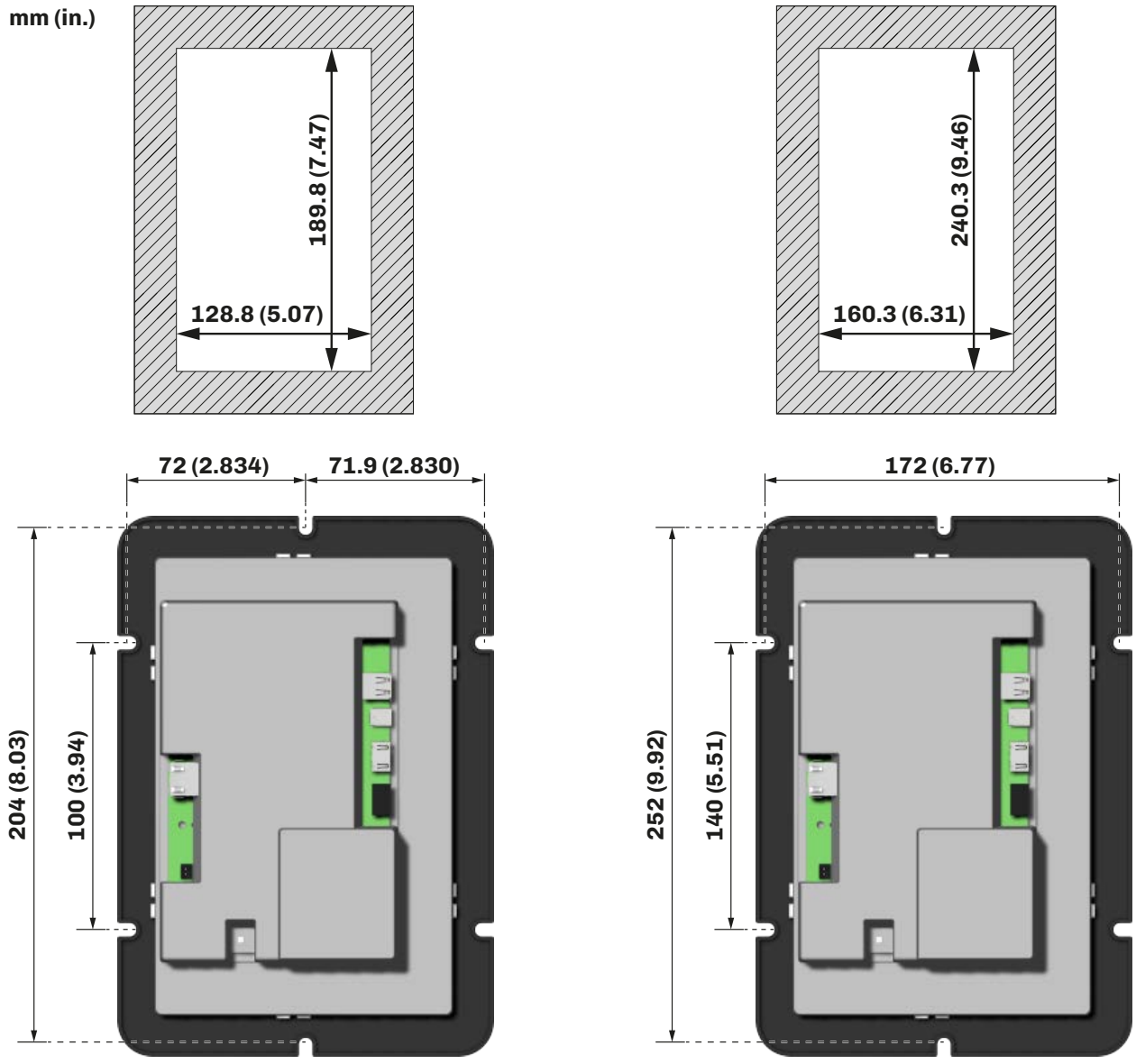
PANEL THICKNESS

Panel thickness varies, depending on the material used in its construction:

Material	Thickness (X) [mm (in.)]
Metal	0.8...1.5 (0.03...0.06)
Plastic	0.8...3.4 (0.03...0.13)

3.4.2 MODELS WITH MOUNTING FROM THE REAR OF THE PANEL

7” display	9” display



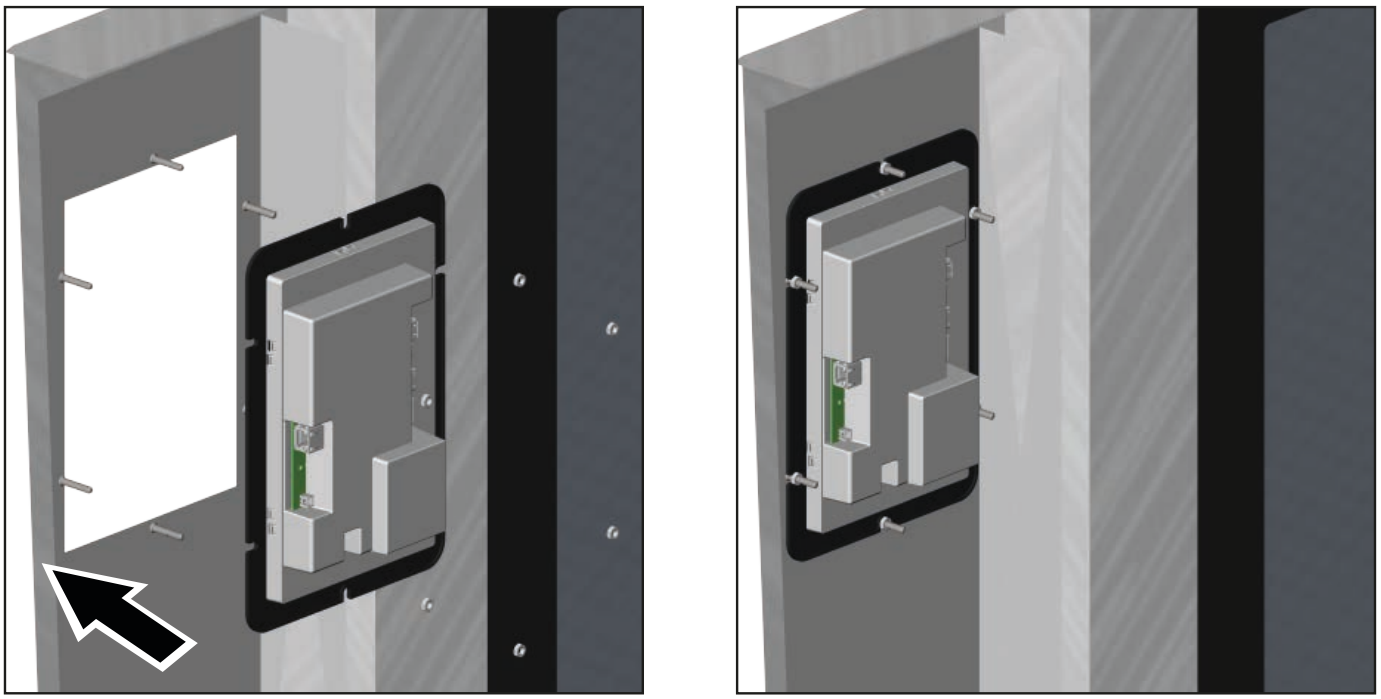


Fig. 7. *Installation* ***Models with mounting from the rear of the panel***

4. ELECTRICAL CONNECTIONS

Chapter content

This chapter contains the following information:

4.1 WIRING BEST PRACTICES

The following information describes the wiring guidelines and best practices which should be observed when using the equipment described in this user manual.

⚠ ⚠ DANGER

RISK OF ELECTRIC SHOCK, EXPLOSION OR ELECTRIC ARC

- Only use electrically insulated measuring devices and equipment.
- Do not install the equipment while the power supply is connected.
- Cut off the power supply to all equipment, including any connected devices, before installing/uninstalling the device.
- Always use a properly calibrated Voltmeter to make sure the system is powered off.
- Do not touch the unshielded components or the terminals while they are live.
- Do not open, disassemble, repair or modify the product.
- Do not expose the equipment to liquids or chemicals.
- All 12 Vac models must be powered individually.
- Before applying voltage to the equipment:
  - Make sure all protective elements, such as covers, hatches and grilles, are fitted and/or closed.
  - Check all wiring connections.

4.1.1 WIRING GUIDELINES

When wiring the controllers, observe the following standards:

- The I/O and communication wiring must be kept separate from the power supply wiring. These two types of wiring must be routed in separate ducts.
- Make sure the operating environment and conditions fall within the specified values.
- Use wires with the correct diameter, suited to the voltage and current requirements.
- Use copper conductors (compulsory).
- Use shielded twisted pair cables for analogue/digital I/O connections.

Use correctly earthed shielded cables for all inputs or analogue outputs and for communication connections. If shielded cables are not used for these connections, electromagnetic interference may cause signal degradation. Degraded signals can result in unpredictable operation of the controller or the modules and connected equipment.

⚠ WARNING

MALFUNCTIONING OF THE EQUIPMENT

- Perform the wiring carefully, in compliance with electromagnetic compatibility and safety requirements.
- Make sure the wiring is correct for its application.
- Use shielded cables for all I/O signal and communication cables.
- Minimise the length of the connections as much as possible, to avoid winding the cables around electrically connected parts.
- The signal (digital and analogue inputs, communication and corresponding power supplies) and power cables for the device must be routed separately.
- Before applying the power supply, check all the wiring connections.
- Use the necessary safety interlocks wherever the risk of injury to personnel and/or equipment damage exists.
- Install and use this device in a cabinet of a suitable class for the intended environment, protected by a keyed locking mechanism or other suitable instruments.
- In terms of connection and the fuses used in the circuits for the power supply and output lines, observe local and national regulatory requirements relating to the nominal current and voltage for the equipment in use.
- Do not use this equipment for machine functions that are critical to safety.
- Do not disassemble, repair or modify the equipment.
- Do not connect wires to unused terminals and/or terminals marked with the text “No connection” (“N.C.”).

4.1.2 GUIDELINES FOR SCREW TERMINALS

SUITABLE WIRING FOR THE POWER SUPPLY

Step 5.08 mm (0,199 in.)

mm / in. 7 / 0.28								
mm^2	1.5...2.5	1.5...2.5	1.5...2.5	1.5...2.5	2x0.75...1	2x0.75...1.5	2x0.75...1	2x0.75...1.5
AWG	16...14	16...14	16...14	16...14	2x18...17	2x18...16	2x18...17	2x18...16

Ø 3.5 mm (0.14 in.)	C	Nm	0.5...0.6
		lb-in.	4.42...5.31

Fig. 8. *Suitable wiring for the power supply*

Suitable wiring for I/O SELV

Step 3.5 mm (0,137 in.)

mm / in. 7 / 0.28								
mm^2	0.14...1.5	0.14...1.5	0.25...1.5	0.25...0.5	2x0.08...0.5	2x0.08...0.5	2x0.25...0.34	2x0.5
AWG	25...15	25...15	22...15	22...20	2x28...20	2x28...20	2x18...17	2x20

Ø 3.5 mm (0.14 in.)	C	Nm	0.5...0.6
		lb-in.	4.42...5.31

Fig. 9. *Suitable wiring for I/O SELV*

4.1.3 PERMITTED CABLE LENGTHS

NOTICE

INOPERABLE EQUIPMENT

- When connecting the power supply, use cables that are no longer than 10 m (32.80 ft.).
- When connecting the probes, digital inputs and the Intrabus serial line, use cables that are no longer than 10 m (32.80 ft.).
- When connecting the RS-485 serial line, use cables that are no longer than 1000 m (3280 ft).
- When connecting the digital outputs, use cables that are no longer than 10 m (32.80 ft).

4.2 WIRING DIAGRAMS

4.2.1 BASE BOARD

MODELS WITH J/K THERMOCOUPLES

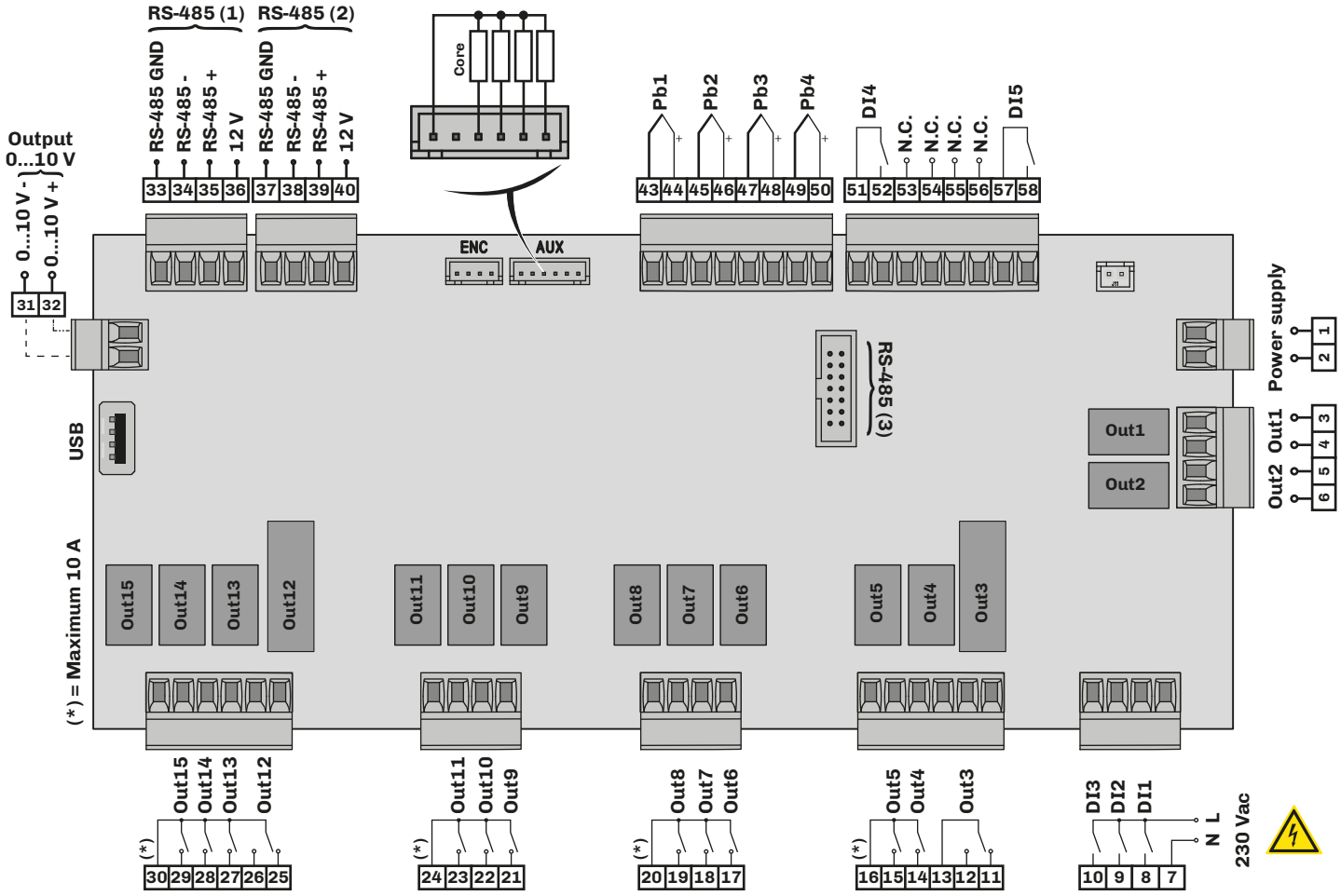


***Fig. 10. Base board** wiring diagram for models with J/K thermocouple*

TERMINALS			
1-2	12 Vac power supply input	**30-26-25**	**30-26:** Normally closed contact **Out12** **30-25:** Digital output **Out12** (Liquid rinse aid injection, cleaning cycle)
3-4	Digital output **Out1** (Heating)	**30-27**	Digital output **Out13** (Water drainage, cleaning cycle)
5-6	Digital output **Out2** (Venting)	**30-28**	Digital output **Out14** (Liquid detergent injection, cleaning cycle)
7-8	Hazardous voltage digital input **DI1** (Fan safety thermostat)	**30-29**	Digital output **Out15** (Water injection valve, cleaning cycle)
7-9	Hazardous voltage digital input **DI2** (General thermal protection)	**33...36**	**RS-485** communication serial port for connection to user interface
7-10	Hazardous voltage digital input **DI3** (Maximum electrical absorption)	**37...40**	**RS-485** communication serial port for connection of: • Inverter; • Boiler expansion module
13-12-11	**13-11:** Normally closed contact **Out3** **13-12:** Digital output **Out3** (Steam reduction)	**43-44**	Analogue input **Pb1** (Needle probe)
16-14	Digital output **Out4** (Not configured)	**45-46**	Analogue input **Pb2** (Chamber probe)
16-15	Digital output **Out5** (Single speed chamber fan)	**47-48**	Analogue input **Pb3** (Steam reduction probe)
20-17	Digital output **Out6** (Extractor hood)	**49-50**	Analogue input **Pb4** (Boiler probe)
20-18	Digital output **Out7** (Technical compartment fans)	**51-52**	Digital output **DI4** (Door switch)
20-19	Digital output **Out8** (Direct steam injection)	**53...56**	No connection N.C.
21-24	Digital output **Out9** (Booster heating)	**57-58**	Digital output **DI5** (Oven rack present)
22-24	Digital output **Out10** (Smoking)	**USB**	USB drive connection (for programming)
23-24	Digital output **Out11** (Chamber light)	**AUX**	Multi-sensor needle probe connection

MODELS WITH PT100 PROBES

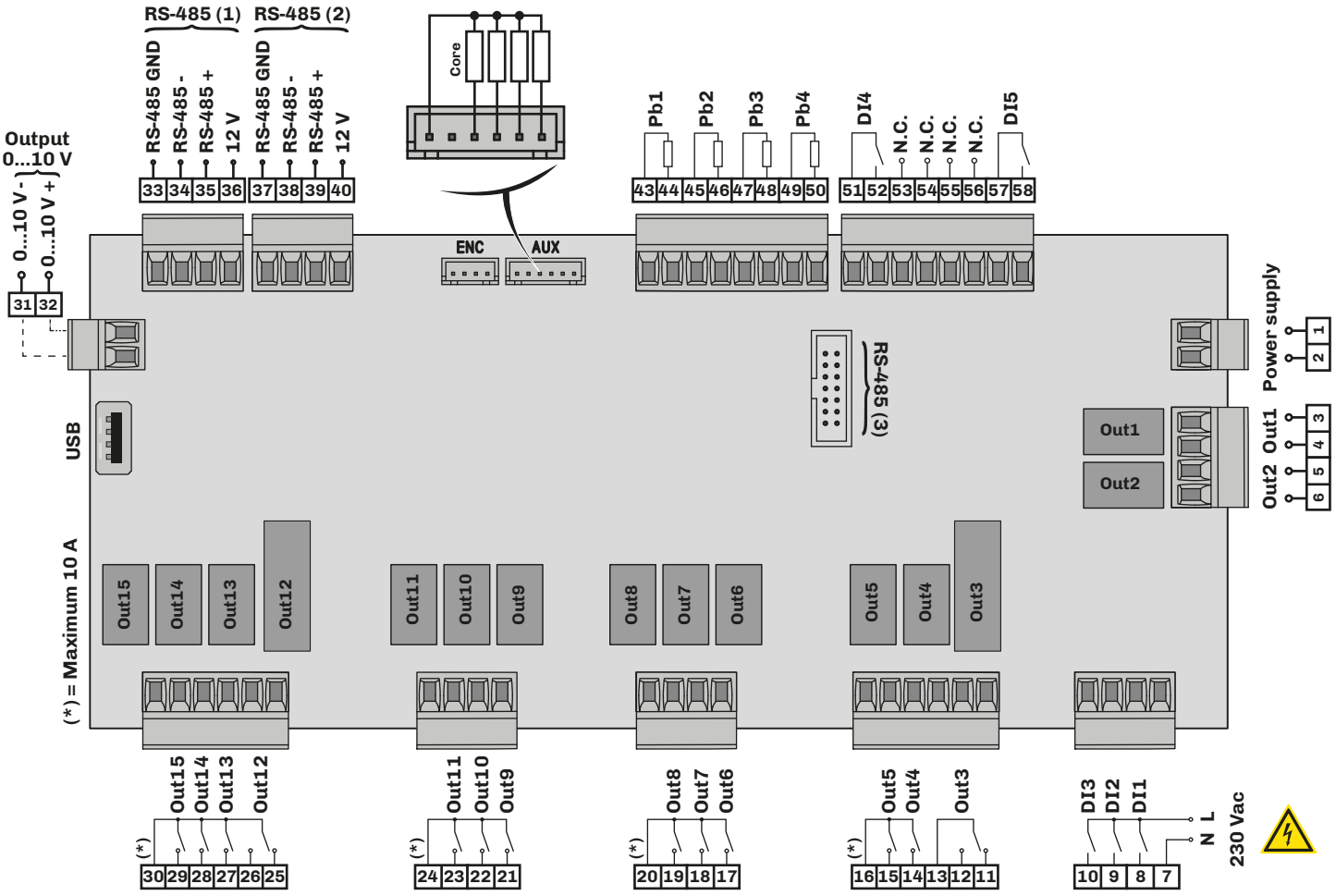


Fig. 11. ***Base board*** *wiring diagram for models with Pt100 probe*

TERMINALS			
1-2	12 Vac power supply input	**30-26-25**	**30-26:** Normally closed contact **Out12** **30-25:** Digital output **Out12** (Liquid rinse aid injection, cleaning cycle)
3-4	Digital output **Out1** (Heating)	**30-27**	Digital output **Out13** (Water drainage, cleaning cycle)
5-6	Digital output **Out2** (Venting)	**30-28**	Digital output **Out14** (Liquid detergent injection, cleaning cycle)
7-8	Hazardous voltage digital input **DI1** (Fan safety thermostat)	**30-29**	Digital output **Out15** (Water injection valve, cleaning cycle)
7-9	Hazardous voltage digital input **DI2** (General thermal protection)	**33...36**	**RS-485** communication serial port for connection to user interface
7-10	Hazardous voltage digital input **DI3** (Maximum electrical absorption)	**37...40**	**RS-485** communication serial port for connection of: • Inverter; • Boiler expansion module.
13-12-11	**13-11:** Normally closed contact **Out3** **13-12:** Digital output **Out3** (Steam reduction)	**43-44**	Analogue input **Pb1** (Needle probe)
16-14	Digital output **Out4** (Not configured)	**45-46**	Analogue input **Pb2** (Chamber probe)
16-15	Digital output **Out5** (Single speed chamber fan)	**47-48**	Analogue input **Pb3** (Steam reduction probe)
20-17	Digital output **Out6** (Extractor hood)	**49-50**	Analogue input **Pb4** (Boiler probe)
20-18	Digital output **Out7** (Technical compartment fans)	**51-52**	Digital output **DI4** (Door switch)
20-19	Digital output **Out8** (Direct steam injection)	**53...56**	No connection N.C.
21-24	Digital output **Out9** (Booster heating)	**57-58**	Digital output **DI5** ( )
22-24	Digital output **Out10** (Smoking)	**USB**	USB drive connection (for programming)
23-24	Digital output **Out11** (Chamber light)	**AUX**	Multi-sensor needle probe connection

4.2.2 USER INTERFACE

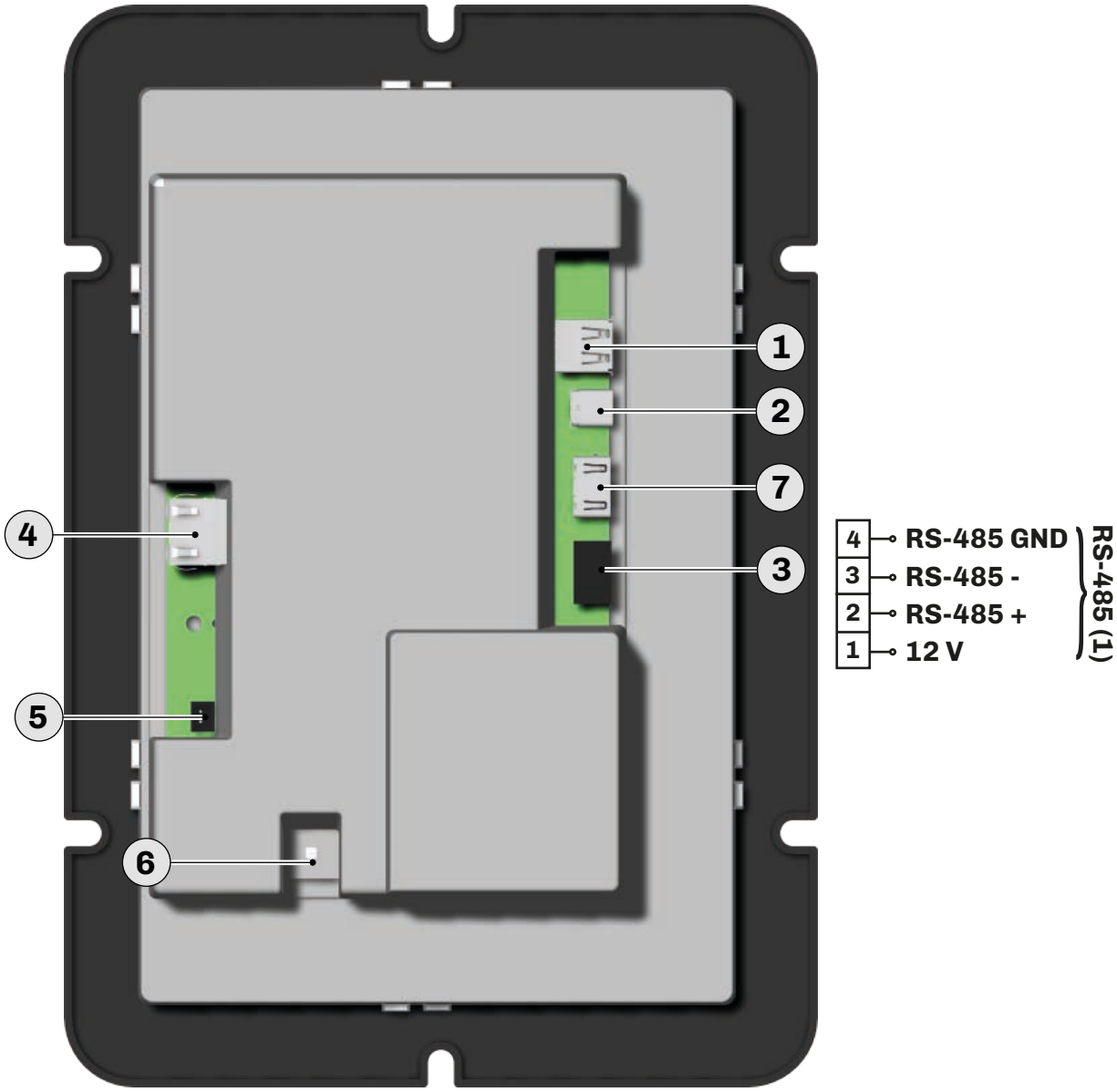


***Fig. 12. User interface** wiring diagram*

Reference	Description
1	USB port
2	Connection exclusively reserved for EVCO use
3	Serial communication connection **RS-485 (1)**
4	Ethernet port

Reference	Description
5	Connection for external speaker
6	Connection for Wi-Fi antenna
7	HDMI port

(1) RS-485 for connection to base board.

4.2.3 BOILER MODULE

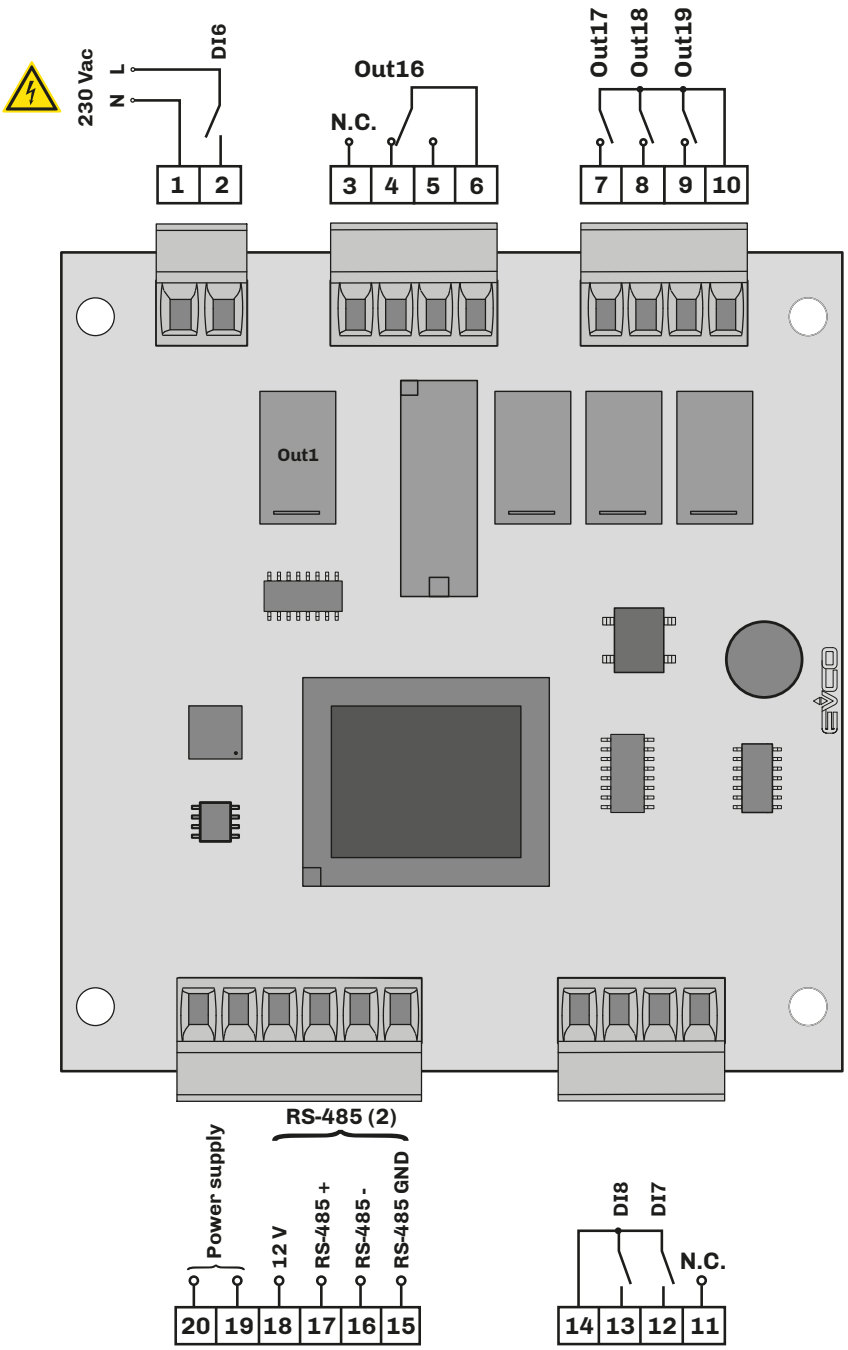


***Fig. 13. Boiler module** wiring diagram*

TERMINALS			
1-2	Hazardous voltage digital input **DI6** (Boiler thermal protection)	**11**	No connection N.C.
3	No connection N.C.	**12-14**	Digital input **DI7** (Boiler maximum water level)
6-5-4	**6-4:** Normally closed contact **Out16** **6-5:** Digital output **Out16** (Boiler temperature regulation)	**13-14**	Digital input **DI8** (Boiler minimum water level)
7-10	Digital output **Out17** (Boiler steam injection)	**15...18**	Serial communication connection **RS-485 (2)**
8-10	Digital output **Out18** (Boiler water drainage)	**19-20**	12 Vac power supply input
9-10	Digital output **Out19** (Boiler water filling)		

(2) RS-485 for connection to base board.

4.2.4 BURNER MODULE

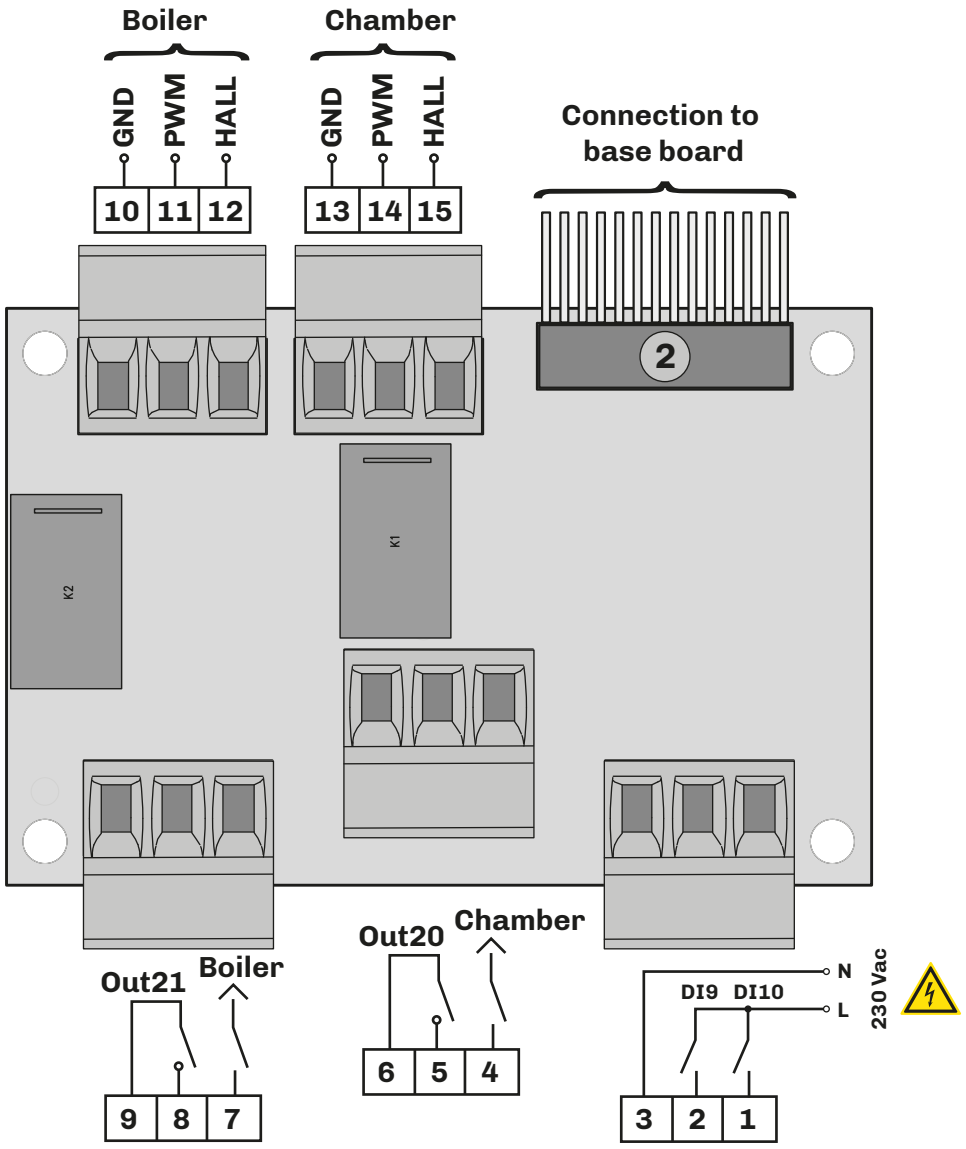


***Fig. 14. Burner module** wiring diagram*

TERMINALS			
1-3	Hazardous voltage digital input **DI10** (Flame present, chamber)		
2-3	Hazardous voltage digital input **DI9** (Flame present, boiler)		
4	Hazardous voltage digital input for inhibiting the chamber burner (**directly connected to the burner control unit**)		
5-6	Hazardous voltage digital output Out20 (Chamber burner)	**5**	Neutral
		6	Reset
②	Connection to base board		

7	Hazardous voltage digital input for inhibiting the boiler burner (**directly connected to the burner control unit**)		
8-9	Hazardous voltage digital output **Out21** (Boiler burner)	**8**	Neutral
		9	Reset
10...12	Connection to fan for boiler natural draught burner		
13...15	Connection to fan for chamber natural draught burner		

5. USER INTERFACE AND NAVIGATING

Chapter content

This chapter contains the following information:

5.1 BEFORE YOU START

This section is dedicated to the **EVOLVE COMBI** user interface. In it, we will explore in detail the various elements of the interface and how to interact with them in order to fully utilise the functions of the combi oven.

The user interface is designed to be intuitive and easy to use, allowing you to quickly access all available options and tools. In this section, we will discuss:

- **Interface overview**: a general description of the main visual components.
- **Navigation**: how to navigate within the interface and access the various areas.
- **Interactive elements**: an explanation of the buttons, menus and other interactive components.
- **Customisation**: options for adapting the interface to suit your preferences.
- **User protection**: tips and advice to ensure safe usage of the interface and to protect your data.

5.1.1 GUIDELINES FOR PROTECTING THE USER AND THEIR DATA

It is essential to operate the user interface securely, to protect your data and to ensure your experience is free from problems. Here are a few tips:

- **Protecting your credentials**: do not share your passwords and use complex combinations for greater security.
- **Regular updates**: keep the firmware up to date to benefit from the latest resources available.
- **Secure access**: make sure you only access the product via secure devices and trusted networks.
- **Data backup**: back up your data regularly to avoid losing it in the event of technical problems.

Our aim is to provide you with a clear and full understanding of the user interface, so that you can use the **EVOLVE COMBI**, and the combi oven in which it is installed, efficiently and safely.

5.2 SWITCHING THE OVEN ON

Once the **EVOLVE COMBI** and oven are powered on, the display lights up and shows the system loading screen for a few moments, after which the **EVOLVE COMBI** shows the standby screen.

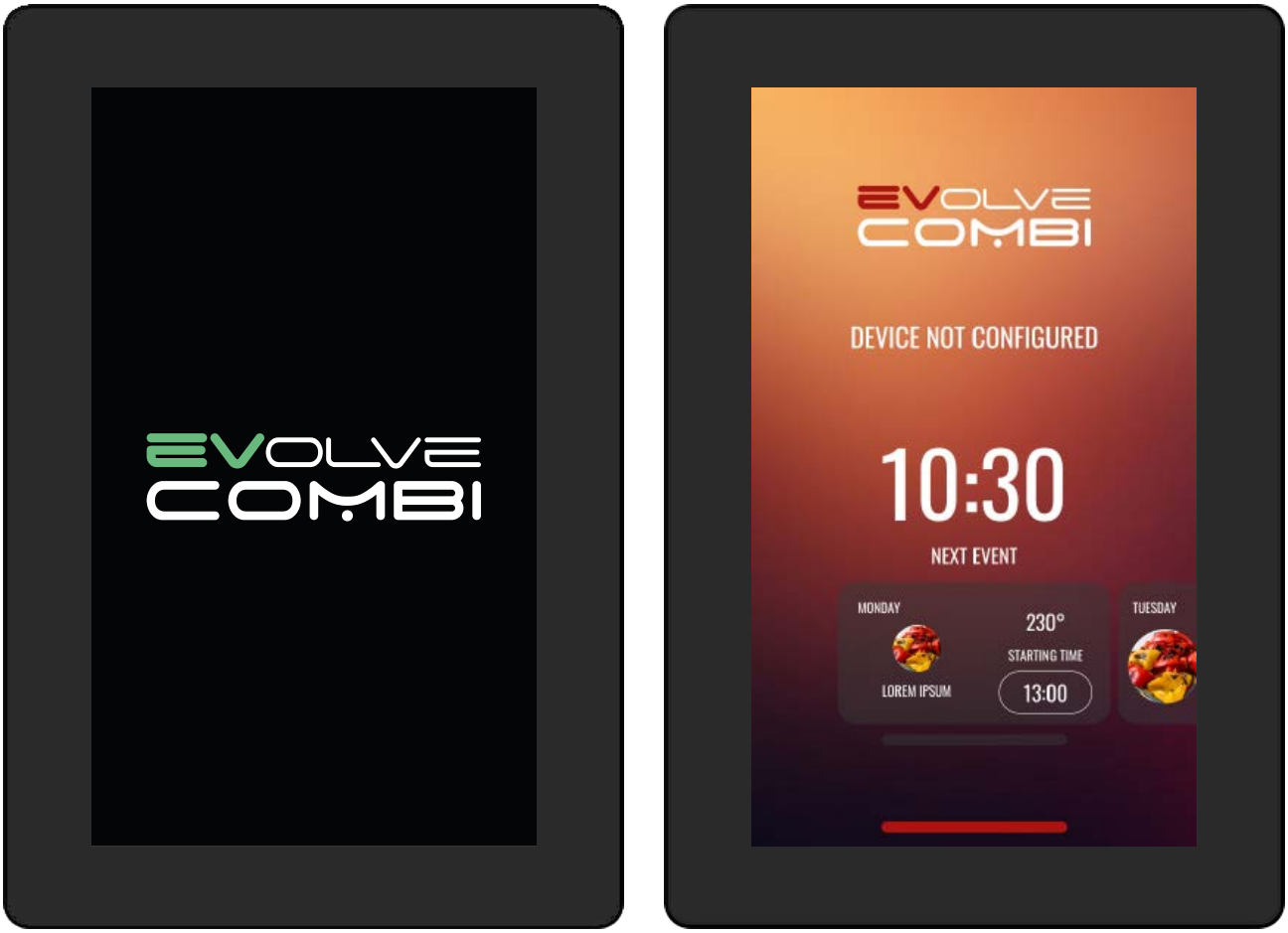


Fig. 15. *First power-on - Loading and standby screen*

5.3 HOMEPAGE

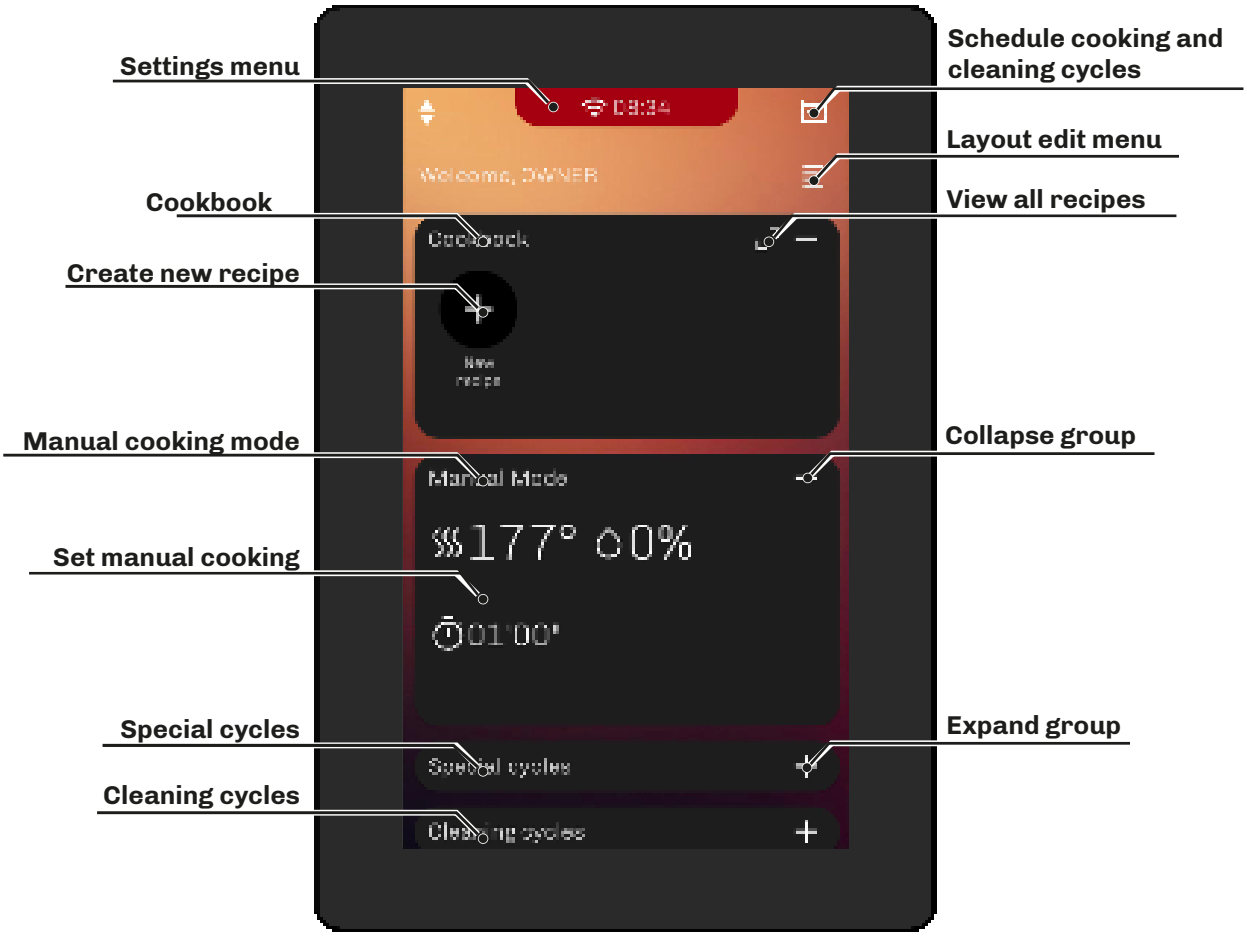


Fig. 16. *Homepage*

The HOMEPAGE can be used to view and access functions such as:

- Cookbook;
  - View all recipes;
  - Create new recipes;
- Manual cooking;
  - View and select all manual cooking settings;
- Special cycles;
- Cleaning cycles;
- Settings menu;
- Layout edit menu (customisation).

5.4 SETTINGS MENU

Swipe downwards, as shown below, to access the **EVOLVE COMBI** settings.

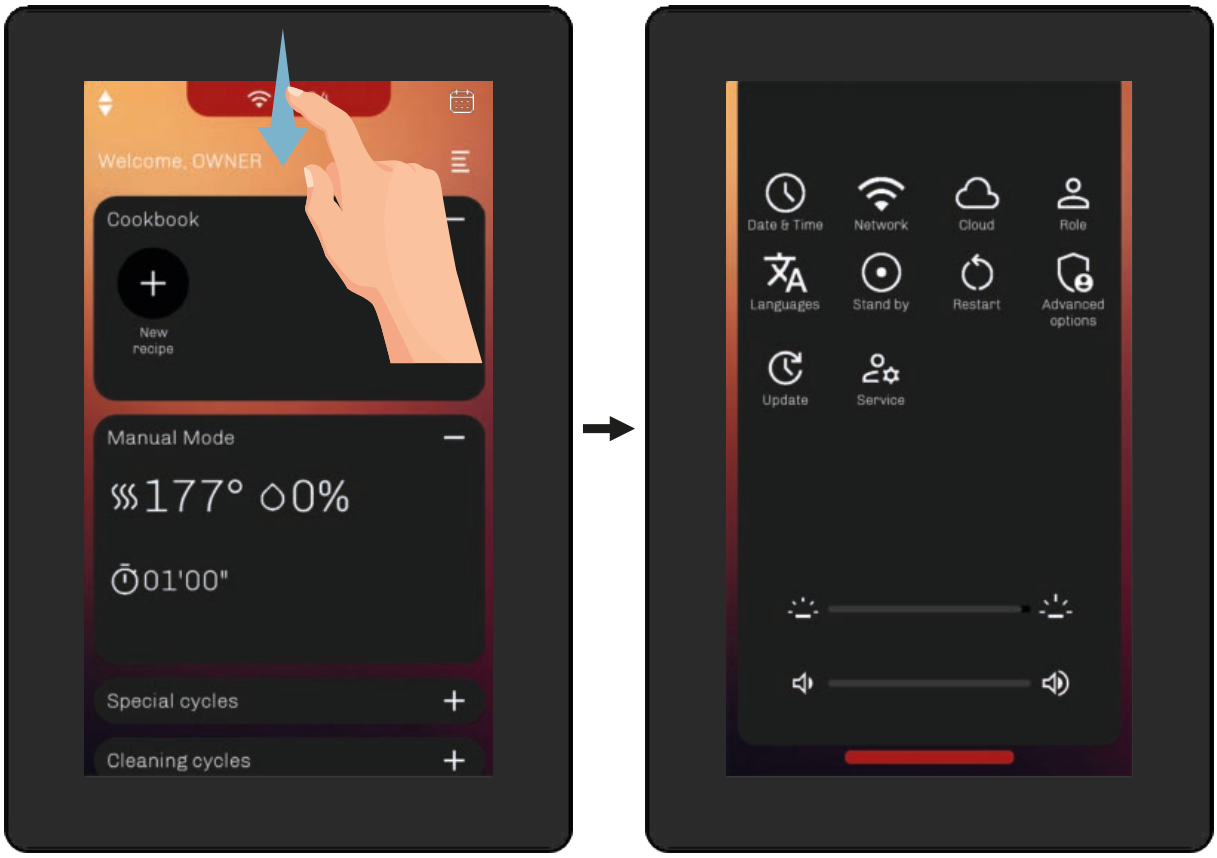


Fig. 17. *EVOLVE COMBI settings*

The settings can be used to access the following options:

Message	Description
DATE AND TIME	Set the date and time
NETWORK	Configure Wi-Fi and Ethernet
CLOUD	Register on the cloud portal (QR CODE)
ROLE	Log-in area for various roles
LANGUAGES	Select the display language
STAND BY	The controller is set to STANDBY status
RESTART	Restart the device
ADVANCED OPTIONS	Access Advanced options
UPDATE	Update the application remotely or via USB drive
SERVICE	Access: • Parameters; • Alarms; • Test.
BRIGHTNESS	Access to adjust the screen brightness level
AUDIO VOLUME	Access to increase/decrease the volume (speaker only)

NOTE: some options are visible or hidden, depending on the logged-in user (role).

5.4.1 CHANGE DATE/TIME

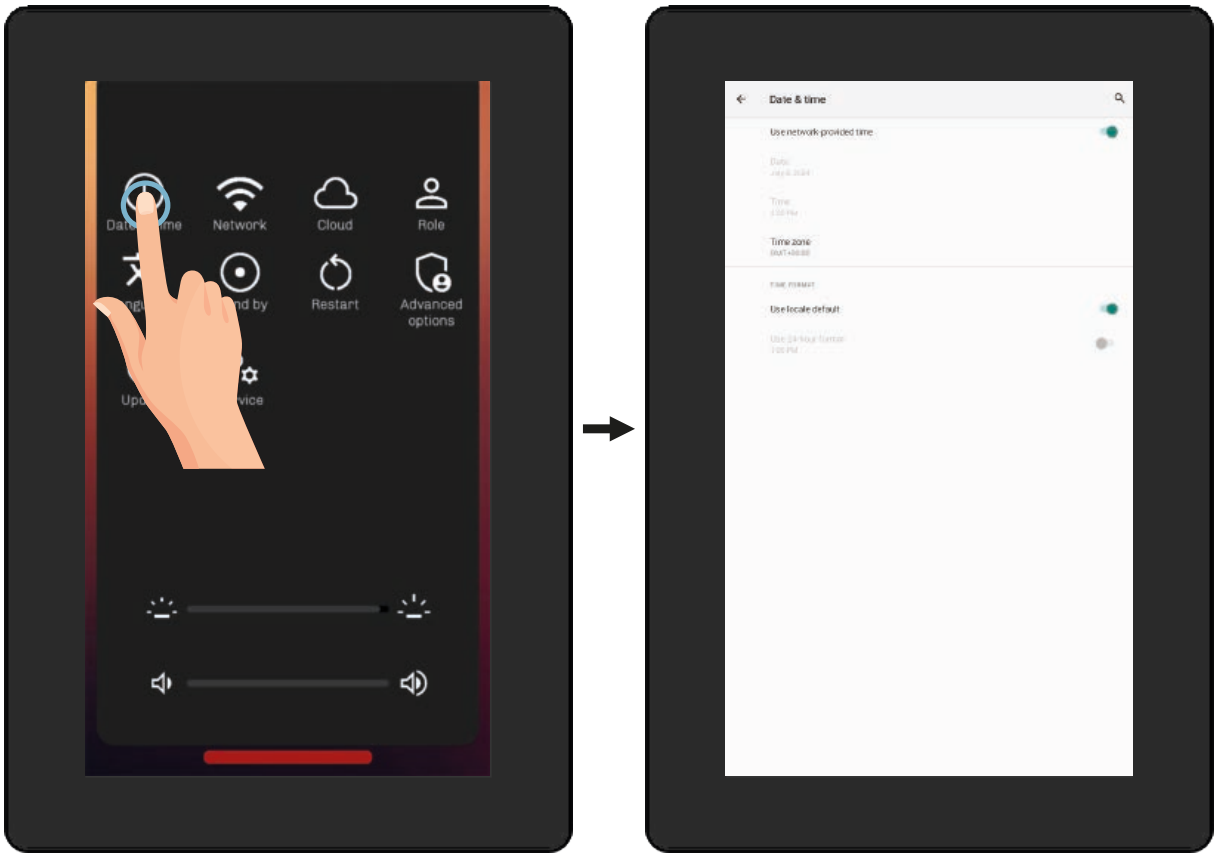


Fig. 18. *Change date/time*

In the date/time menu, you can:

- Set the date and time manually;
- If connected to the internet, set the date/time automatically with updates via the internet;
- Set the time zone.

5.4.2 CHANGE NETWORK

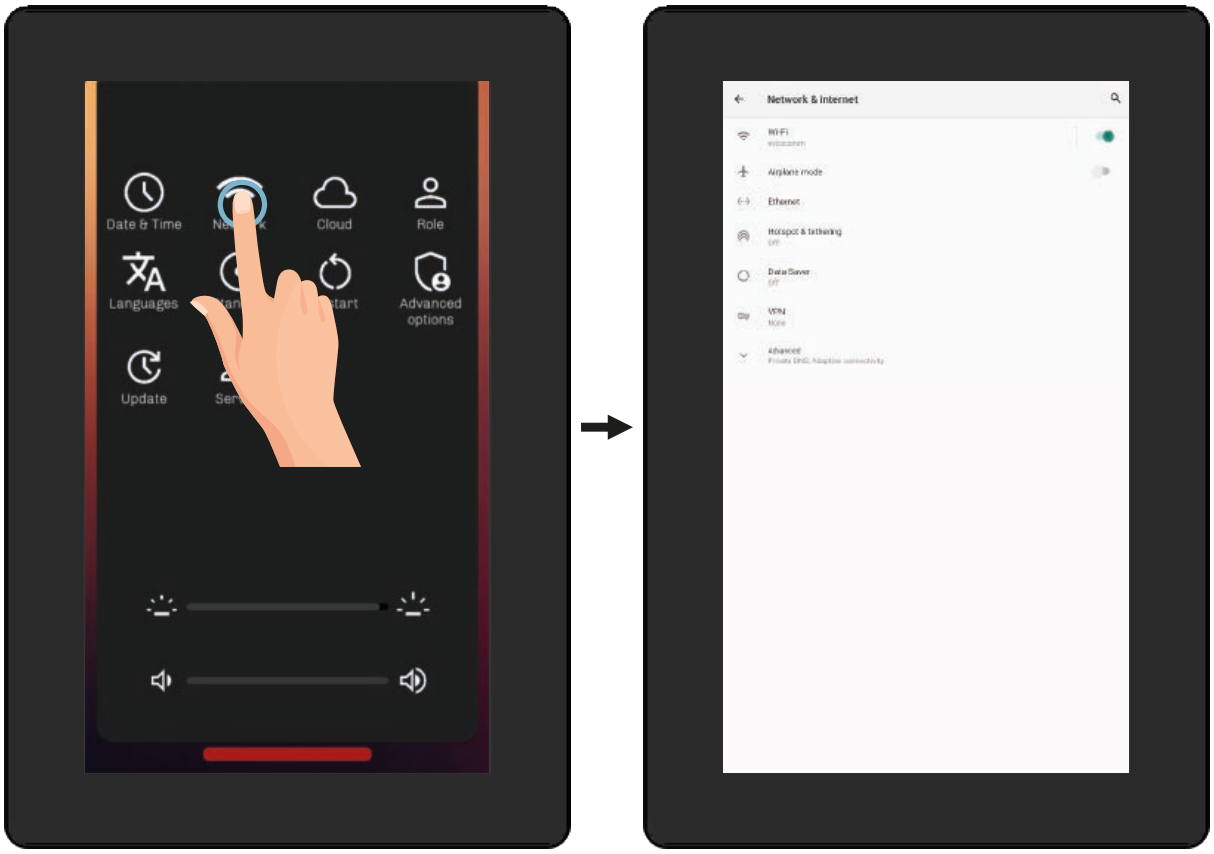


Fig. 19. *Change network*

In the network menu, you can:

- Configure the internet connection via Wi-Fi;
- Configure the internet connection via Ethernet;
- Set Airplane mode;
- Set up Hotspot & Tethering;
- Configure the VPN.

5.4.3 CLOUD MENU

Fig. 20. *Cloud menu*

If the controller has not yet been configured, an identification code for registering with cloud services will be shown (the code shown in the above image is for illustrative purposes only); when the controller is registered on the cloud portal, the screen shows the various updating options between the display and the cloud.

5.4.4 ROLE

EVOLVE COMBI offers 3 pre-set roles:

- ADMIN;
- SERVICE;
- OWNER.

The ***ADMIN*** and ***SERVICE*** roles have access privileges for performing oven maintenance and reset procedures.

The ***OWNER*** role is intended for the end user (Cooks, Chefs, Bakers, etc.).

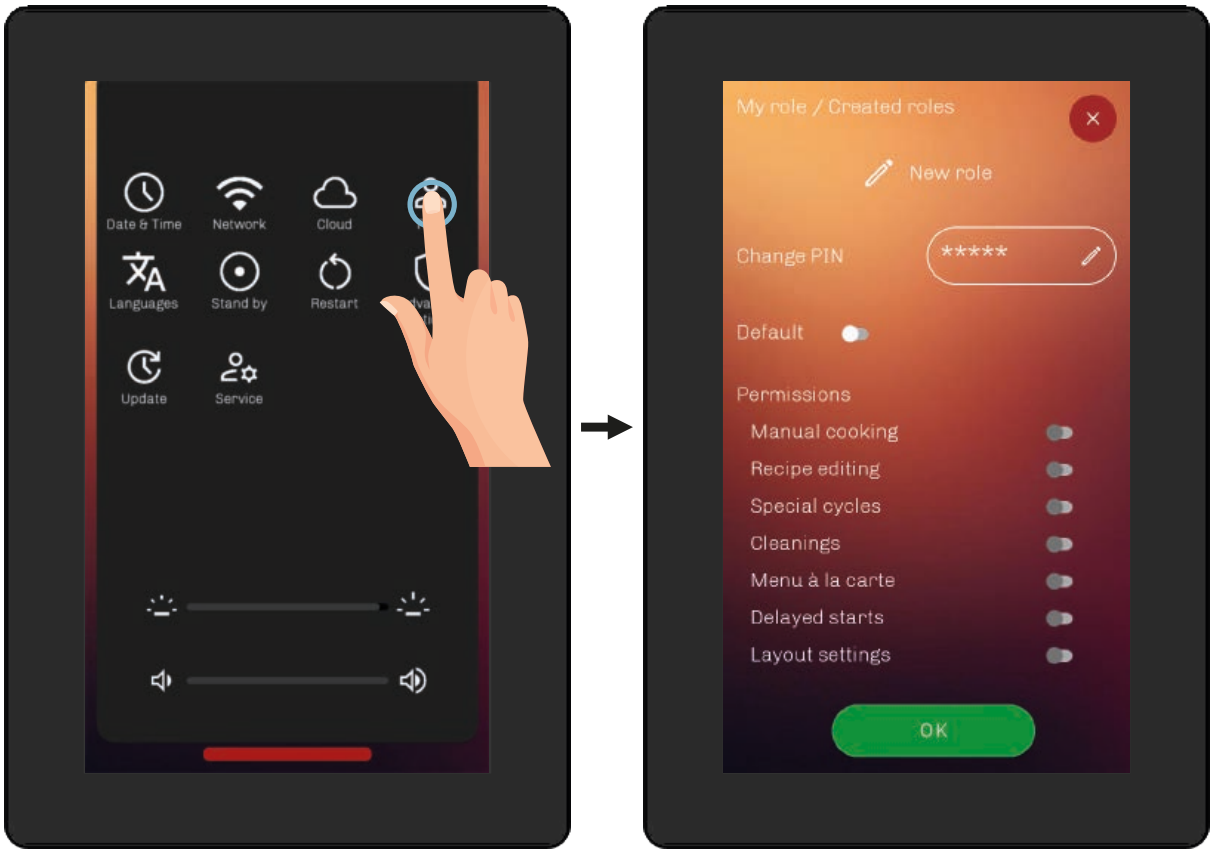


Fig. 21. *Role menu*

Each role can in turn create other users and assign them a specific set of permissions, including:

- Carrying out manual cooking;
- Recipe editing;
- Carrying out special cycles;
- Carrying out cleaning;
- Viewing and using *à la carte* menus;
- Scheduling and using delayed starts;
- Managing the layout settings;
- Managing roles.

You can change user by selecting the desired name and entering a 5-digit PIN; default PINs are as follows:

ROLE	PIN
ADMIN	33333
SERVICE	22222
OWNER	11111

Upon access, the various interfaces adapt to the new permissions for the selected user.

5.4.5 LANGUAGES

This menu can be used to select the display language.

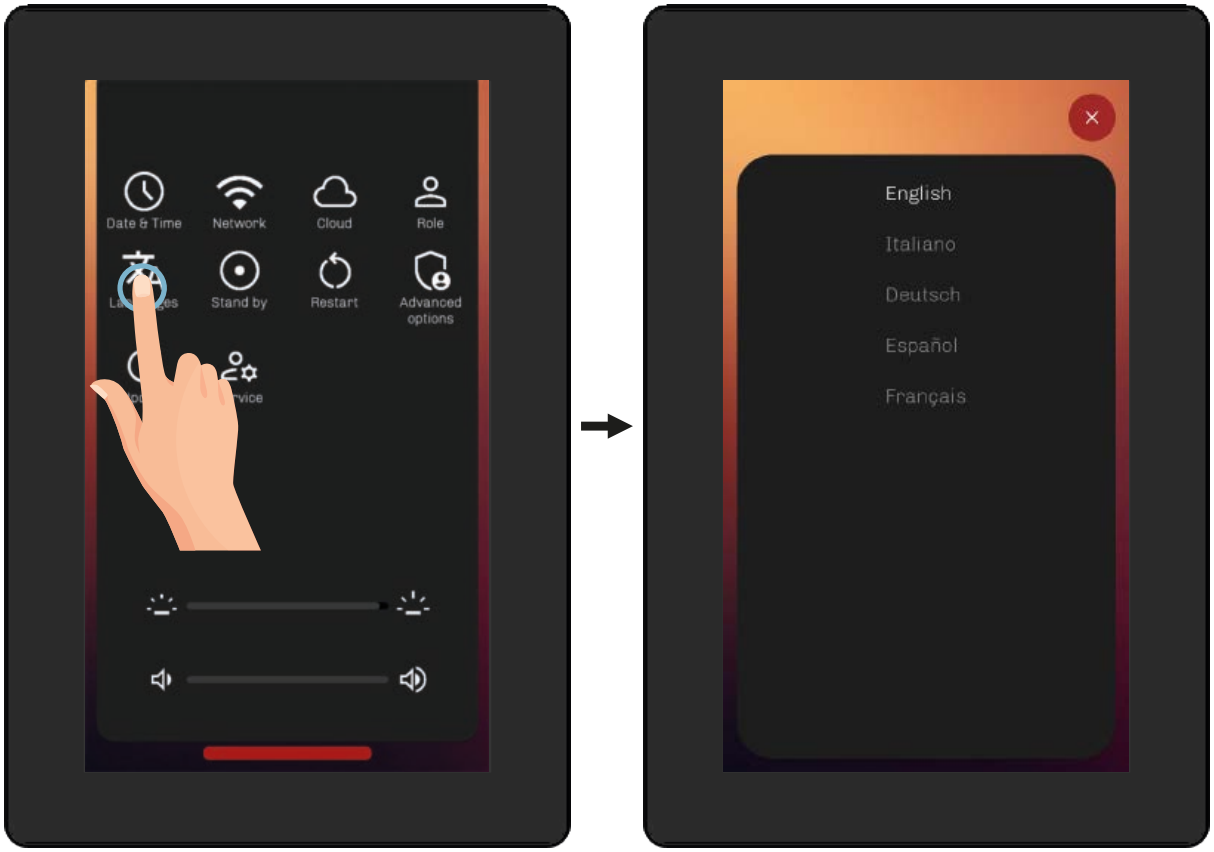


Fig. 22. *Display language*

Available languages are:

- English;
- Italian;
- German;
- Spanish;
- French.

5.4.6 STAND BY

Tap STAND BY to exit controller ON status and set it to standby mode.

In this status the controller is powered but all regulations are deactivated.

If a schedule is enabled, on exiting ON status the controller will ask whether to activate the enabled schedule or not.

5.4.7 RESTART

Tap RESTART to restart the display application.

5.4.8 ADVANCED OPTIONS

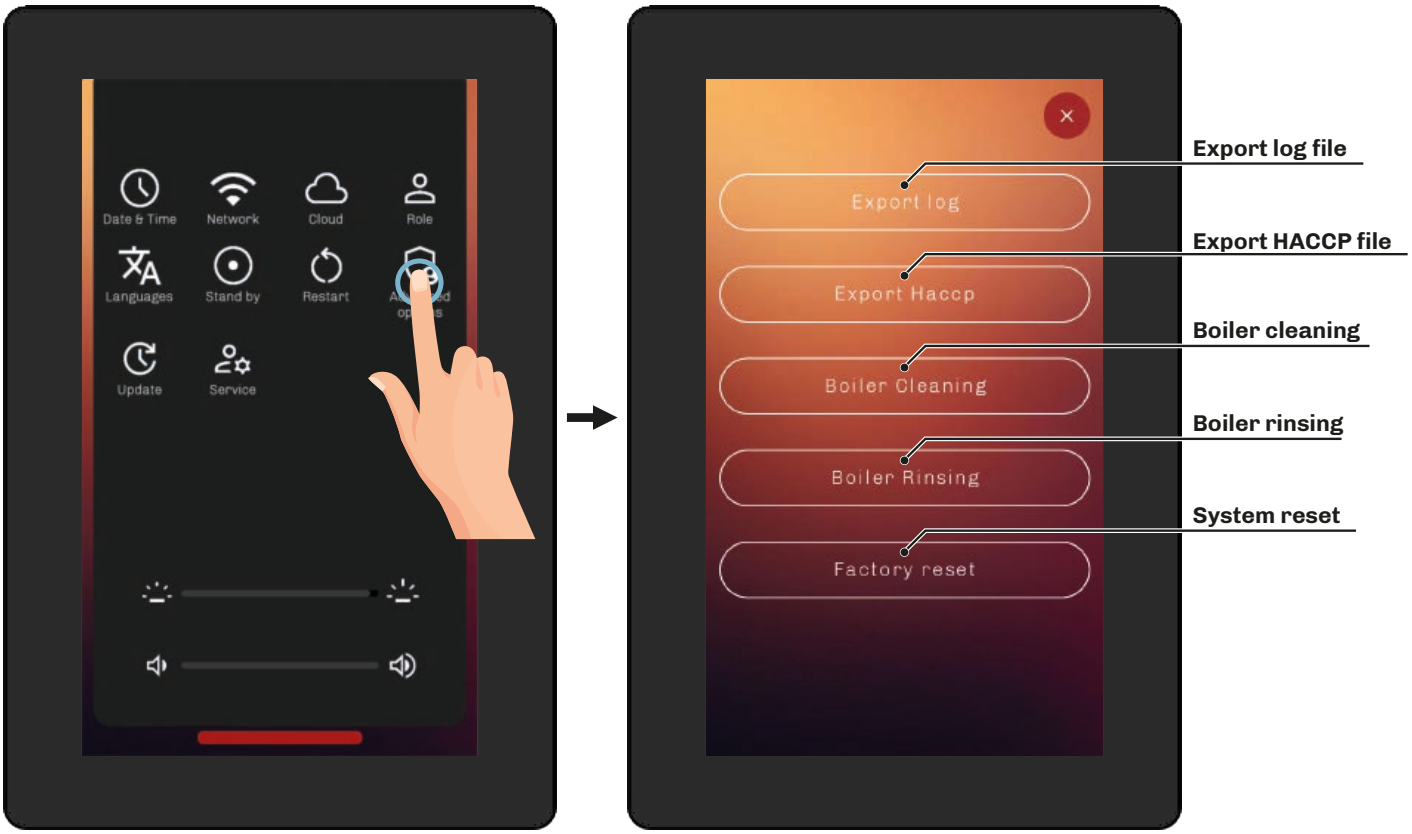


Fig. 23. *Advanced Options*

From the Advanced Options menu, you can:

- Export a log file: this file contains information which is useful to Evco in identifying any controller malfunctions; (the file export_log_yyyymmdd_x will be exported to the USB drive);
- Export the HACCP file (the file export_haccp_yyyymmdd_x.Csv will be exported to the USB drive);
- Carry out the boiler cleaning cycle (if the boiler module is present);
- Carry out the boiler rinsing cycle (if the boiler module is present);
- Perform a factory reset for the system: this option is only available for the “admin” role and, if selected, restores the controller to its factory settings (if registered on the cloud, the device will also be deleted). After this procedure has been carried out, the controller will need to be reconfigured in order to connect to the cloud.

5.4.9 UPDATE

This menu can be used to update the **EVOLVE COMBI** via:

- Cloud portal;
- USB drive.

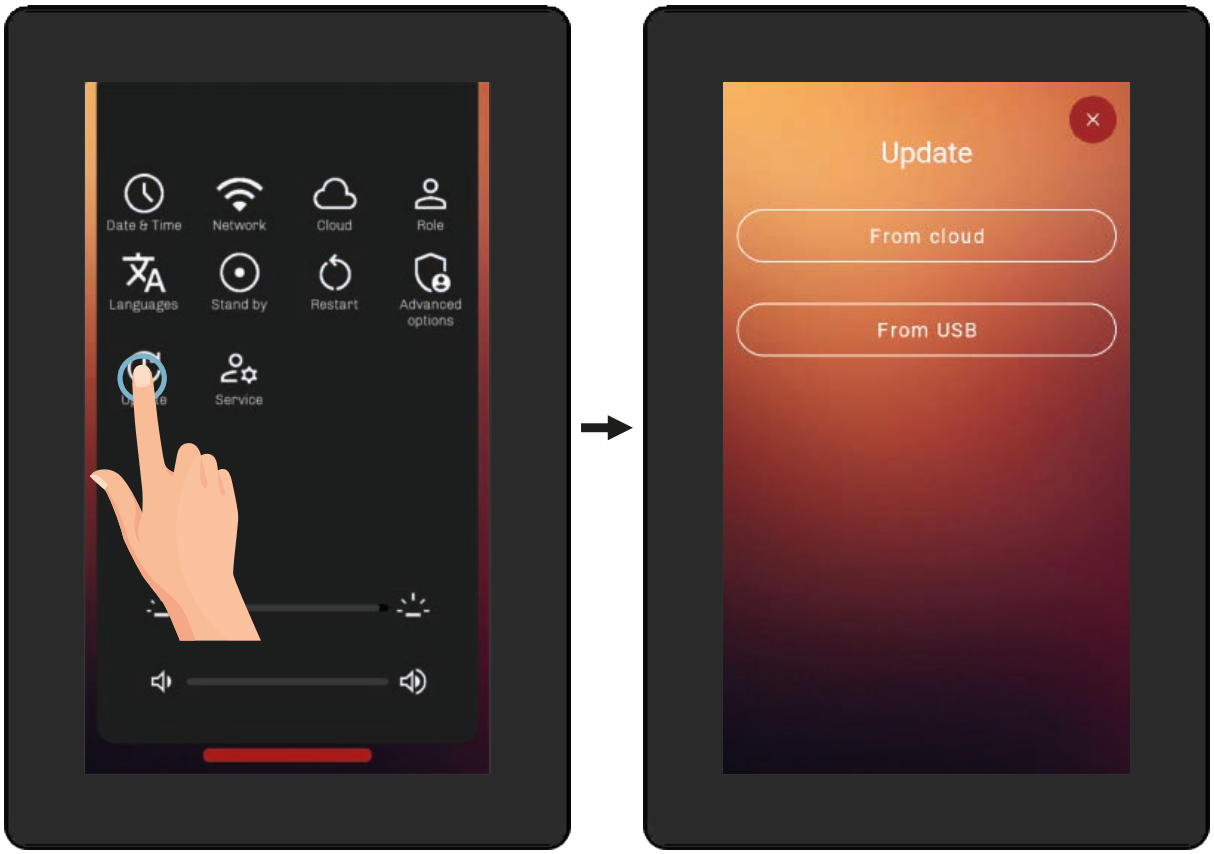


Fig. 24. *Updating the* ***EVOLVE COMBI***

5.4.10 SERVICE

Only ***ADMIN*** and ***SERVICE*** roles can access the **SERVICE** menu.
In this menu, you can:

- Access and:
  - View/edit parameters;
  - View alarms;
- Carry out a TEST (if the user has the relevant permissions) and:
  - View the values for configured probes;
  - View the status of the digital inputs;
  - Force the digital outputs on/off;
  - Check whether the load connected to the digital outputs is working properly.

Fig. 25. *Service*

5.4.11 ADJUST DISPLAY BRIGHTNESS

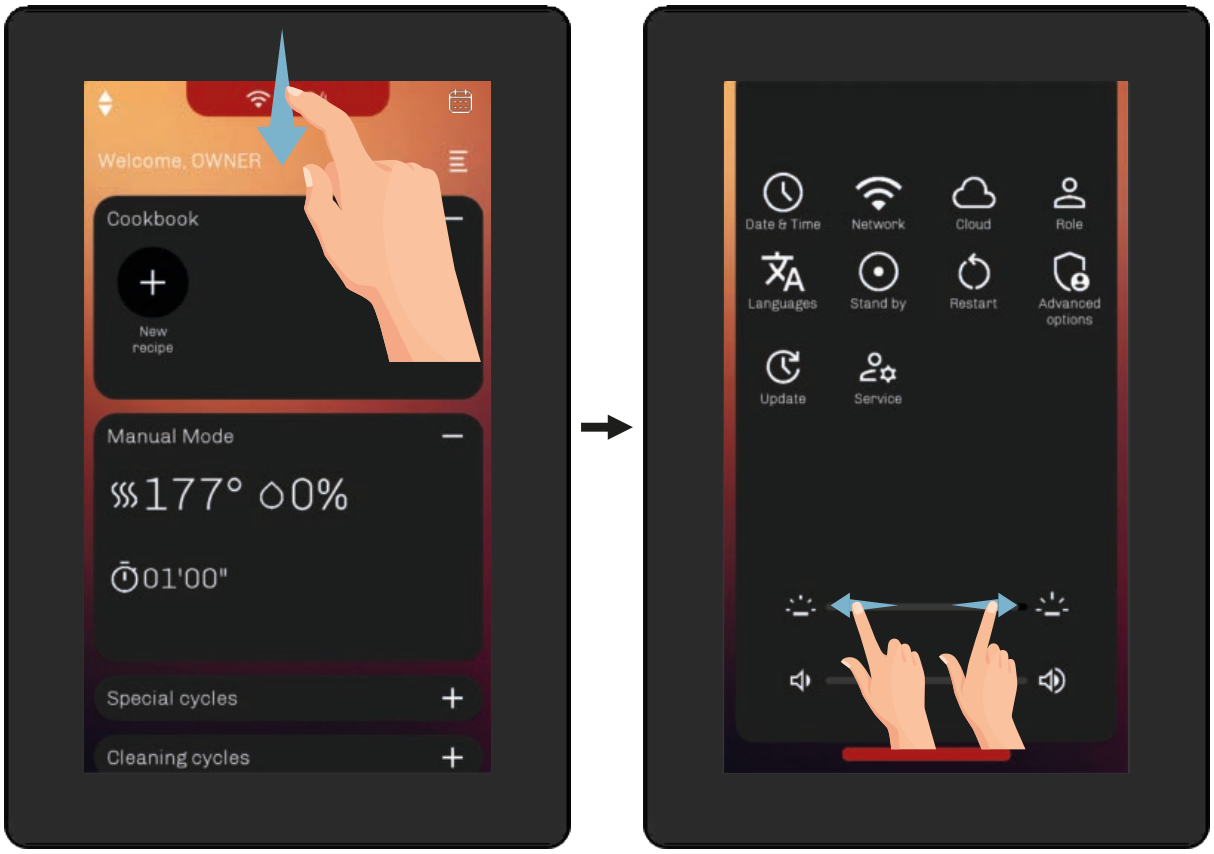


Fig. 26. *Increasing/decreasing the display brightness level*

5.4.12 ADJUST THE VOLUME

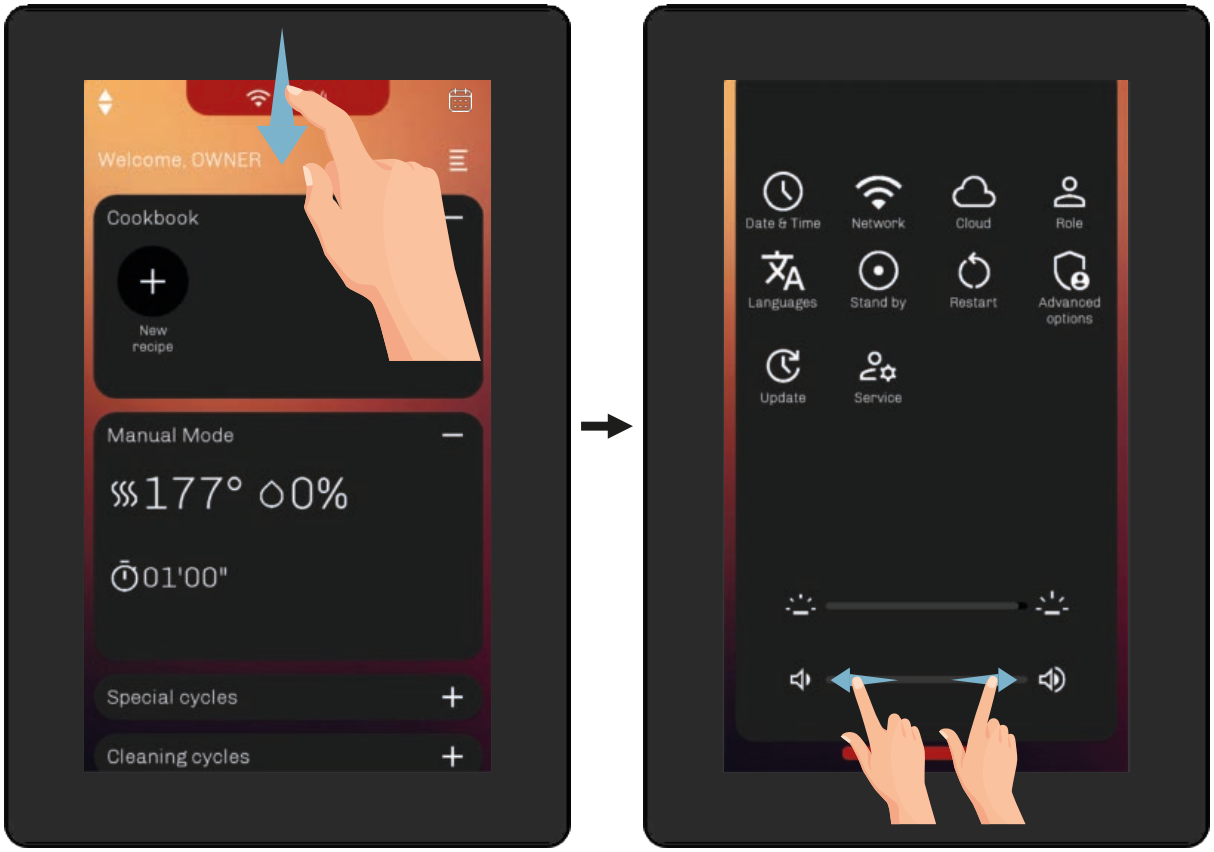


Fig. 27. *Increasing/decreasing the volume*

5.5 MANUAL COOKING

Manual cooking has a single step; for cooking with several steps you will need to start with a new recipe in the cookbook tab.

Fig. 28. *Manual cooking*

If you tap ⚙ you can:

- Select the preheating type:
  - Off;
  - Low (**r51**);
  - Medium (**r52**);
  - High (**r53**).
  - Manually enter the desired temperature value.

NOTE: preheating is not available if Delta T cooking is selected.

NOTE: preheating settings may exceed the maximum limits that can be set for the chamber temperature.

If you tap the temperature **Setpoint key** for the chamber you can:

- Change the Setpoint value;
- Select the cooking type:
  - Convection cooking;
  - Steam cooking;
  - Mixed cooking.

If you tap the cooking **duration key** you can:

- Change the cooking duration value;
- Select the cooking control type:
  - Timed control;
  - Core control;
  - Delta-T control.

If you tap the **humidity key** you can:

- Change the humidity value;
- Set the vent status.

If you tap the **fan key** you can change the fan speed; if **F0** = 0 or **F0** = 1, speed is not an option. During manual cooking, you can change the cooking type from timed to needle probe or Delta T.

5.6 COOKBOOK AND COOKING A RECIPE

If you tap COOKBOOK on the HOMEPAGE, you can:

- Create up to 300 recipes;
- Recall pre-set recipes or recipes created by the user during cooking.

Fig. 29. *Service*

To create e new recipe, the information shown in the following image is required:

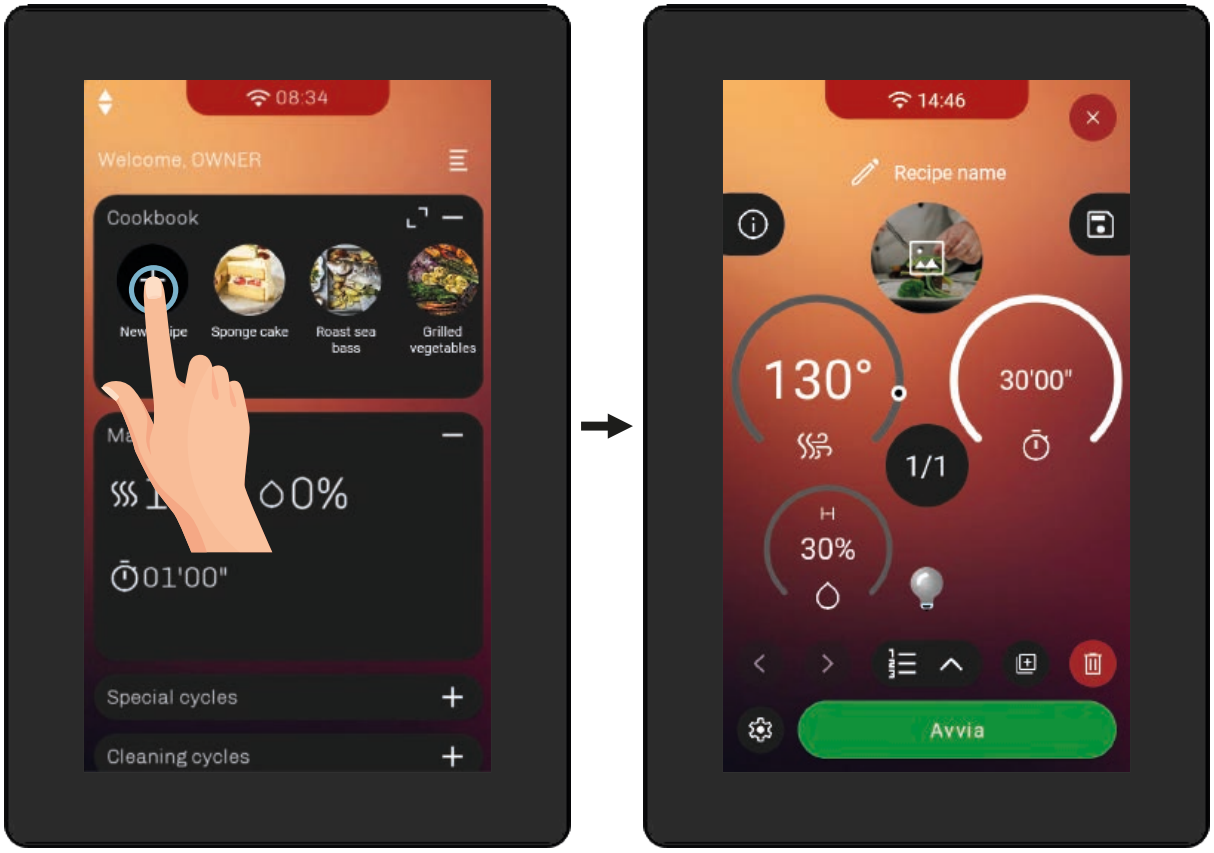


Fig. 30. *Service*

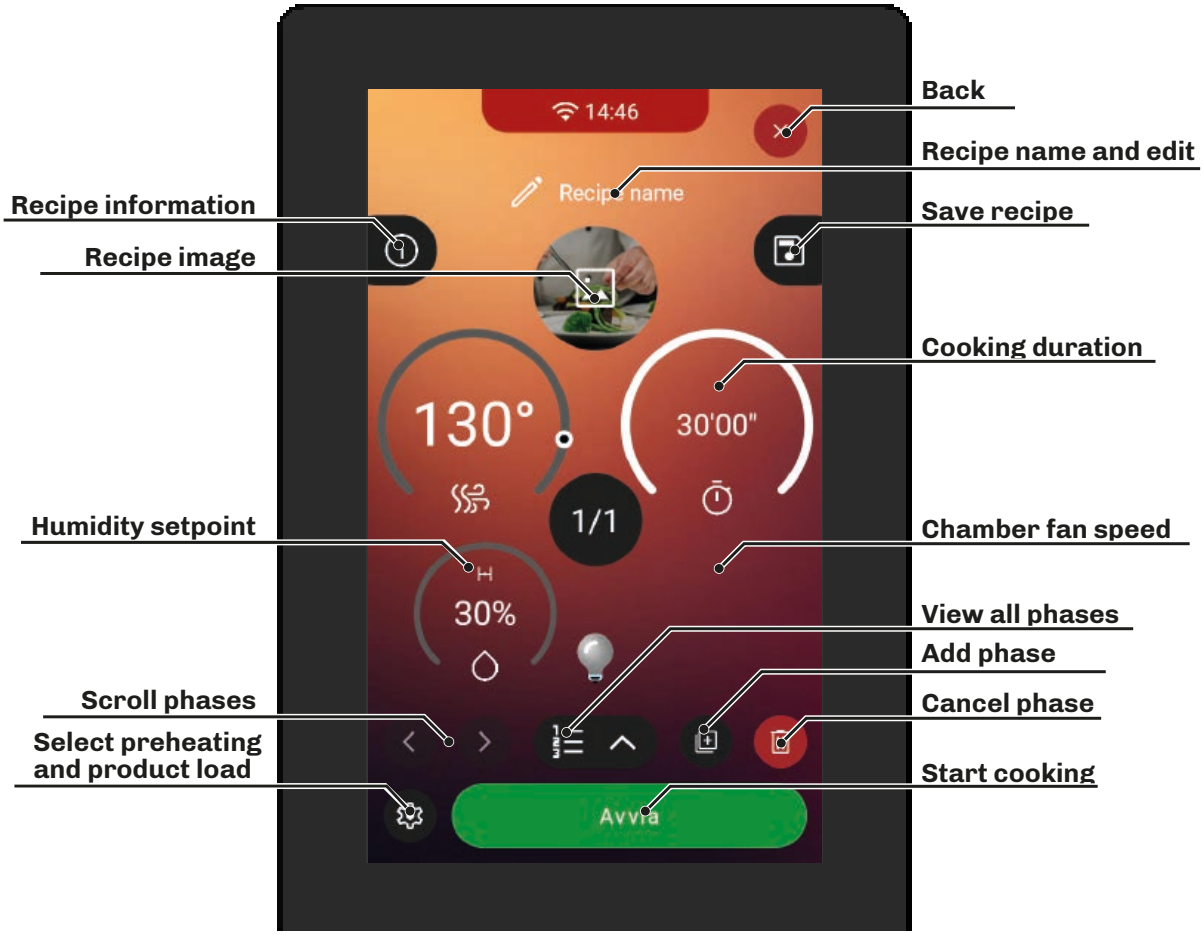


Fig. 31. *New recipe and cooking a recipe from the cookbook*

In a new recipe the following configuration options are available:

- Recipe name;
- Picture of the food/Recipe;
- Recipe information;
- Save Recipe;
- Selected step and Total Number of steps (each recipe can include up to 10 steps);
- Add or delete a step and scrolling through steps;
- Summary view of all steps;
- Set Preheating:
  - Off;
  - Low (**r51**);
  - Medium (**r52**);
  - High (**r53**);
  - Manually enter the desired temperature value.

NOTE: preheating is not available if Delta T cooking is selected.

NOTE: preheating settings may exceed the maximum limits that can be set for the chamber temperature.

- Enable/disable the product load type:
  - Light (**r26**);
  - Normal (as defined by the cycle);
  - Heavy (**r27**).

NOTE: if enabled, tap Start (to start the cooking cycle) and you will be asked to set the product load type.

5.6.1 DELETE / DUPLICATE RECIPE

Press and hold a recipe for a few seconds; a window will appear allowing you to delete or duplicate the recipe.

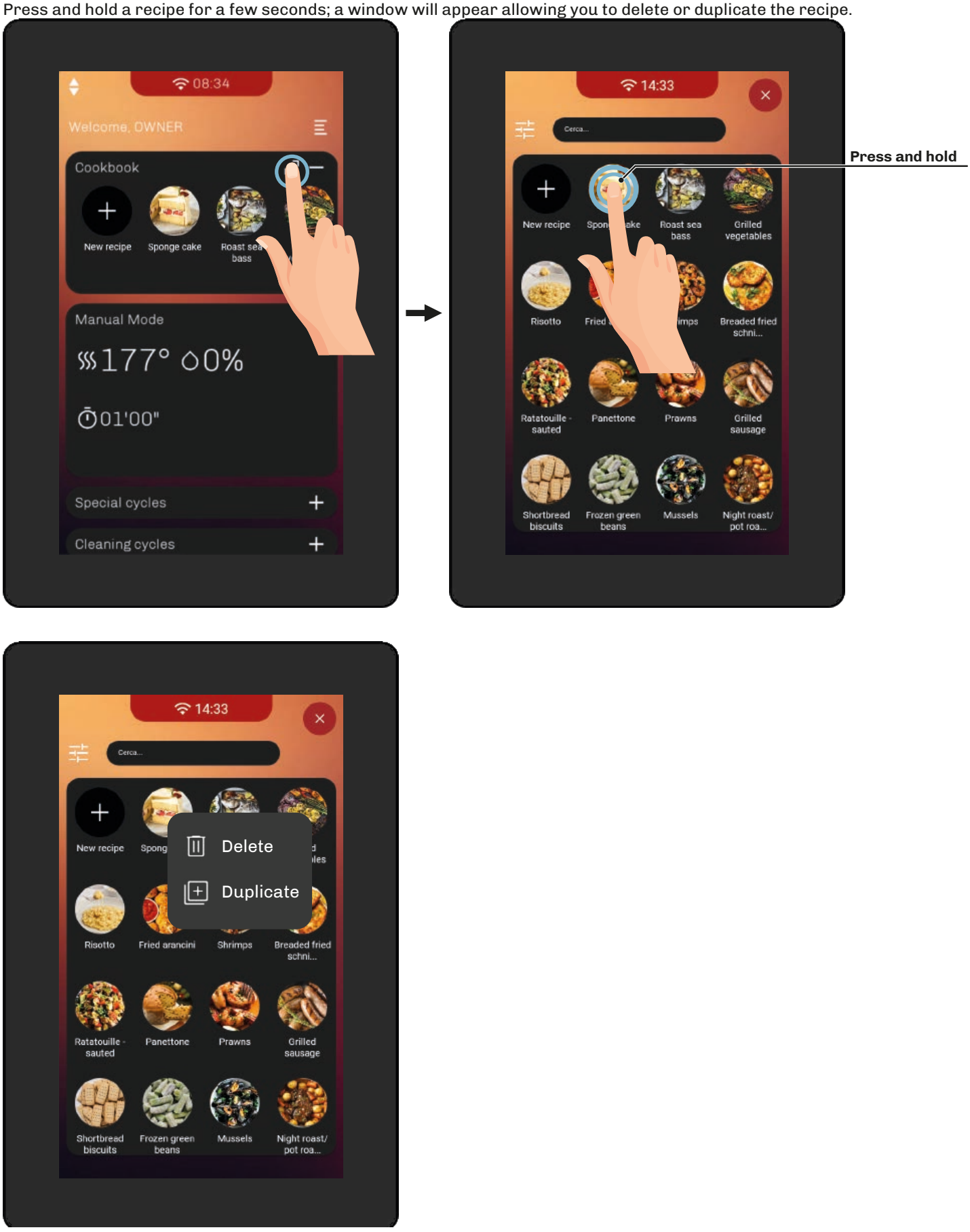


Fig. 32. *New recipe and cooking a recipe from the cookbook*

5.7 SPECIAL CYCLES

If you tap SPECIAL CYCLES on the HOMEPAGE, you can access the cycles linked to cooking, such as:

- Regeneration;
- Tempering dishes;

and the chamber cooling cycle.

Even though the special cycles have been pre-configured with default values, a new set of parameters can be used to select minimum, maximum and default values for each interval used in the creation of the cycle.

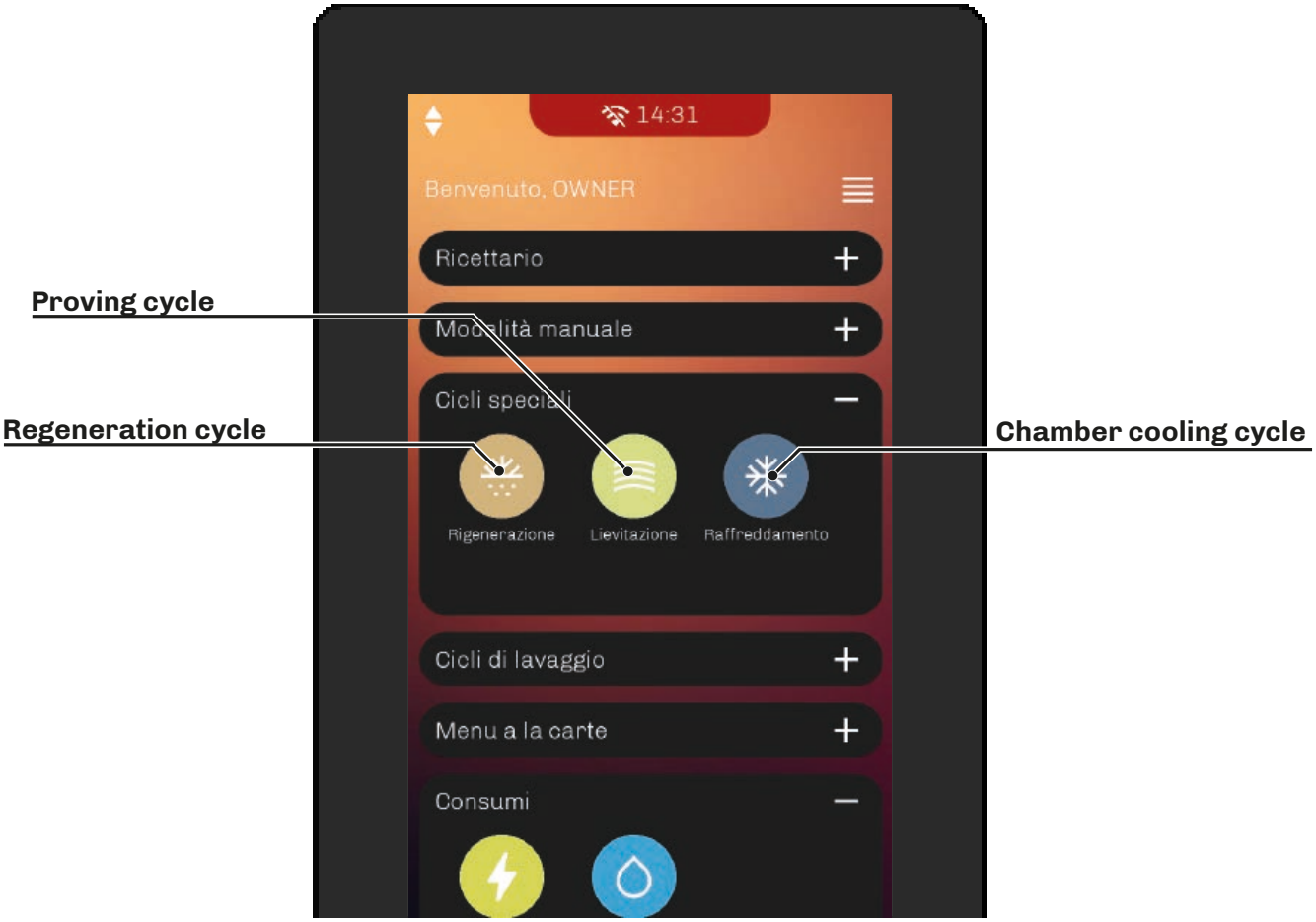


Fig. 33. *Special cycles*

5.8 SCHEDULING COOKING AND CLEANING CYCLES

In order to add events, you must have already developed some recipes. The images below describe the procedure for adding a scheduled event.

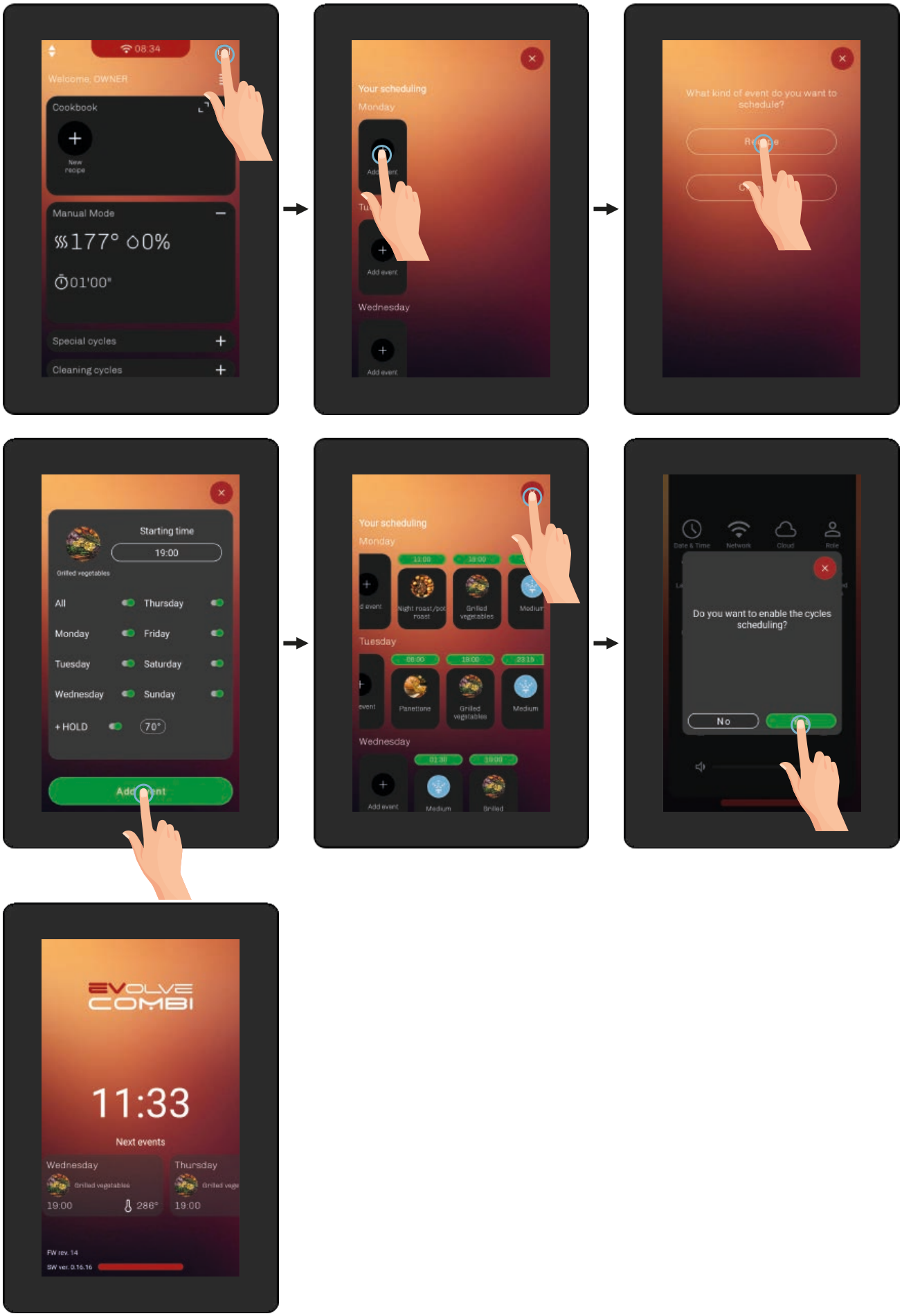
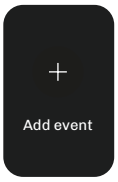


Fig. 34. *Scheduling cooking and cleaning cycles*

Tap 

on the day for which you want to add the new schedule and then select whether the event concerns a recipe or a cleaning cycle.

If you tap Recipe the menu of recipes available for the oven will open; select the desired recipe.

On the next screen, select:

- The event start time;
- The day (or days) on which it should be repeated;
- Whether the oven should maintain (HOLD) its temperature at the end of the cooking cycle;
- When maintaining, if enabled, the default temperature will be shown (this can also be changed later on).

This means when you tap Add event, the display will return to the main scheduling screen where the event you have just created can be seen.

To enable scheduling, set the controller to standby; before the standby screen appears, a window will be shown asking whether you want to enable scheduling or not.

If you confirm scheduling, the STANDBY screen will show the events in chronological order of execution; to view the next events, scroll using the bar.

6. COOKING FOOD

Chapter content

This chapter contains the following information:

6.1 INTRODUCTION

EVOLVE 360 COMBI can manage different types of cooking, including:

- Convection cooking;
- Steam cooking;
- Mixed cooking.

Each cycle consists of 1...10 steps. Once each step has finished, the cycle automatically passes to the next step.

The following settings can be configured for each individual step:

- Preheating the food;
- Product load (prepared size);
- Timed cooking;
- Delta T cooking;
- Working setpoint;
- Delta T setpoint;
- Humidification;
- Step duration;
- Setpoint at core;
- Fan speed;
- Automatic opening duration for the vent.

PREHEATING FOOD

Each cooking cycle can be preceded by a preheating step (unless Delta T cooking has been selected, which does not include preheating).

Preheating is managed in levels:

Level	Description
OFF	Preheating is not carried out (when cooking starts you will be prompted to put the food in and once this has been confirmed, the cooking cycle begins immediately).
LOW	The preheating Setpoint is relative to the working Setpoint value in the first step of the cooking cycle + **r51**.
MEDIUM	The preheating Setpoint is relative to the working Setpoint value in the first step of the cooking cycle + **r52**.
HIGH	The preheating Setpoint is relative to the working Setpoint value in the first step of the cooking cycle + **r53**.
MANUAL	The preheating Setpoint can be set manually.

During preheating:

- The fan comes on at maximum speed;
- Humidification takes place at the same value as the first step of the cooking cycle.

NOTE: preheating is not available if Delta T cooking is selected.

NOTE: preheating settings may exceed the maximum limits that can be set for the chamber temperature.

PRODUCT LOAD (PREPARED SIZE)

When configuring a recipe, you can enable or disable the request for the type of product load (prepared size).

Available options are:

Options	Description
LIGHT	Cooking time is reduced by a percentage set by **r26**.
NORMAL	The cooking time specified in the recipe is unchanged.
HEAVY	Cooking time is increased by a percentage set by **r27**.

Increases/reductions should be taken into account for *time* steps. If the step is in *temperature* mode, these options do not apply.

If enabled, tap Start (to start the cooking cycle) and you will be asked to set the product load type.

TIMED COOKING
The working Setpoint is an absolute value and the step can last for the set time (max. 10:00 hours) or an infinite period of time (∞).

DELTA T COOKING
Delta T can only be set if the needle probe is connected and enabled (**P2** = 1).

The step lasts until the temperature detected by the probe reaches the core Setpoint; the working Setpoint refers to the temperature detected by the needle probe + Delta T Setpoint.

With **Delta T cooking**, you can activate **HOLD** mode by setting the Delta T value = 0 °C, which ensures the unit will keep the chamber at the same temperature as the needle probe until the cycle is ended manually.

Plus, every time a cooking cycle is launched, the temperature of the needle probe is read at the end of the time period defined by **r24**.

You can select whether the vent is open or closed during the cooking cycle.

CORE COOKING
Core cooking can only be set if the needle probe is connected and enabled (**P2** = 1).

The step lasts until the temperature detected by the probe reaches the core Setpoint; the working Setpoint is an absolute value.

Every time a cooking cycle is launched, the temperature of the needle probe is read at the end of the time period **r24**.

WORKING SETPOINT
The working Setpoint can only be set if timed cooking or core cooking has been selected.

DELTA T SETPOINT
The Delta T Setpoint can only be set if Delta T cooking has been selected.

HUMIDIFICATION
Humidification can only be set if steam cooking or mixed cooking has been selected.

The configuration parameters are:

Par.	Description	MU	Range
t0	Steam generation mode	---	0...2
t1	Cycle time for injection of the steam generated in direct mode (Mixed cooking only). If **t1** = 1000, a single injection takes place at the start of the cycle.	s	**t2**...999
t2	Duration of the injection of steam generated in direct mode corresponding to maximum humidification (Mixed cooking only).	s	0...**t1**
t3	Delay in the injection of steam generated in direct mode from the start of the cooking cycle.	s	0...999
t4	Enable link between injection of steam generated in direct mode and the fan.	---	0/1
t5	Enable link between injection of steam generated in direct mode and the temperature regulation output.	---	0/1
t6	Cycle time for injection of the steam generated with an external humidifier (for Mixed cooking).	s	**t7**...999
t7	Duration of the injection of steam generated with an external humidifier corresponding to maximum humidification (for Mixed cooking).	s	0...**t6**
t8	Delay in the injection of steam generated with an external humidifier from the start of the cooking cycle.	s	0...999
t9	Enable link between injection of steam generated with an external humidifier and the fan.	---	0/1
t10	Enable link between injection of steam generated with an external humidifier and the temperature regulation output.	---	0/1
t11	Delay in the injection of steam from temperature regulation output activation or fan activation.	s	0...240
t12	Temperature above which the injection of steam generated in direct mode is activated and below which the injection of steam generated with an external humidifier is activated (refers to the temperature detected by the chamber probe; only if **t0** = 2).	°C/°F	0.0...500.0
t13	Temperature above which steam reduction is activated (refers to the temperature detected by the steam reduction probe; only if **F0** ≠ 2) (see **t14**).	°C/°F	0.0...500.0
t14	Differential to apply to **t13**.	°C/°F	1.0...99.0
t15	Enable Boiler expansion.	---	0/1
t16	Boiler temperature above which boiler steam injection is enabled.	°C/°F	1.0...500.0
t17	Boiler steam working temperature.	°C/°F	1.0...500.0
t18	Boiler steam hold temperature.	°C/°F	1.0...500.0
t19	Differential to apply to **t17** and **t18**.	°C/°F	1.0...99.0
t20	Delay in boiler water filling stop.	s	0...240
t21	Delay in boiler water drain stop.	min	0...240
t22	Anti-limescale step 1 action time for Cleaning.	min	0...240

Par.	Description	MU	Range
t23	Anti-limescale step 1 temperature for Cleaning.	°C/°F	1.0...500.0
t24	Step 2 Cleaning action time.	min	0...240
t25	Step 2 Cleaning action temperature.	°C/°F	1.0...500.0
t26	Step 2 number of Cleaning cycles.	---	1...10
t27	Minimum water level alarm activation delay.	s	0...240
t28	Maximum water level alarm activation delay.	min	0...240
t30	Enable link between injection of steam generated and the vent.	---	0/1
t31	Link between steam injection and fans (heating) only if bread type single oven injection (**t1** = 1000). • If **t31** = 0, injection and fans remain independent. • If **t31** ≠ 0, the fans switch off on activation of steam injection and remain off for a time period **t31** after steam injection has ended.	s	0...240
t32	Minimum humidity setpoint for Mixed cooking.	%	0...**t33**
t33	Maximum humidity setpoint for Mixed cooking.	%	**t32**...100
t34	Minimum humidity setpoint for Steam cooking.	%	0...**t35**
t35	Maximum humidity setpoint for Steam cooking.	%	**t34**...100
t36	Cycle time for injection of the steam generated in direct mode (for Steam cooking).	s	**t37**...999
t37	Duration of the injection of steam generated in direct mode corresponding to maximum humidification (for Steam cooking).	s	0...**t36**
t38	Cycle time for injection of the steam generated with an external humidifier (for Steam cooking).	s	**t39**...999
t39	Duration of the injection of steam generated with an external humidifier corresponding to maximum humidification (for Steam cooking).	s	0...**t38**
t40	Boiler water level inputs.	---	0...3
t41	Temperature below which the boiler water fill valve is closed.	°C/°F	0.0...100.0
t42	Duration of manual steam injection (Convection cycle only).	s	0...99
t43	Minimum humidity setpoint for Convection cooking.	%	-100...**t44**
t44	Maximum humidity setpoint for Convection cooking.	%	**t43**...100
t45	Minimum humidity setpoint for Core regeneration.	%	0...**t46**
t46	Maximum humidity setpoint for Core regeneration.	%	**t45**...100
t47	Humidity setpoint for Core regeneration cycle factory setting.	%	**t45**...**t46**
t48	Minimum humidity setpoint for Timed regeneration.	%	0...**t49**
t49	Maximum humidity setpoint for Timed regeneration.	%	t48...100
t50	Humidity setpoint for Timed regeneration cycle factory setting.	%	**t48**...**t49**
t51	Minimum humidity setpoint for Timed proving.	%	0...**t52**
t52	Maximum humidity setpoint for Timed proving.	%	**t51**...100
t53	Humidity setpoint for Timed proving cycle factory setting.	%	**t1**...**t52**

STEP DURATION
The step duration can only be set if Timed cooking has been selected.

SETPOINT AT CORE
The Core setpoint can only be set if Delta T cooking or Core cooking has been selected.

FAN SPEED
The fan speed can only be set if **F0** = 2 or **F0** = 3 or **F0** = 4.

AUTOMATIC OPENING DURATION FOR THE VENT
Automatic opening duration for the vent should be understood as advancing the end of the step. It can only be set if Timed cooking has been selected.

In relation to Core and Delta T cooking, you can select whether the vent is open or closed during the cooking cycle.

6.2 OPERATING MODES FOR BREAD AND PATISSERIE FAN OVENS

If the oven is used for baking bread and patisserie products, the oven manufacturer can apply a special parameter configuration in order to adapt the EVOLVE setup and allow management of bread and patisserie fan ovens.

In particular, this means setting:

Configuration	Description
t1 = 1000	To obtain a single steam injection at the start of the cooking cycle (with a delay time defined by **t3** and/or **t8**).
t31 > 0	To switch off the fan during steam injection and after the steam injection has ended for the time period **t31**.

6.3 STARTING AND STOPPING THE COOKING CYCLE

If configured, as mentioned previously, once a cooking cycle has been launched, preheating will begin.

Opening and closing the door, or touching the status bar, causes the oven to move on to the first step in the cooking cycle.

During preheating and the cooking cycle, the display shows the value of the variables involved in the process, as well as their settings.

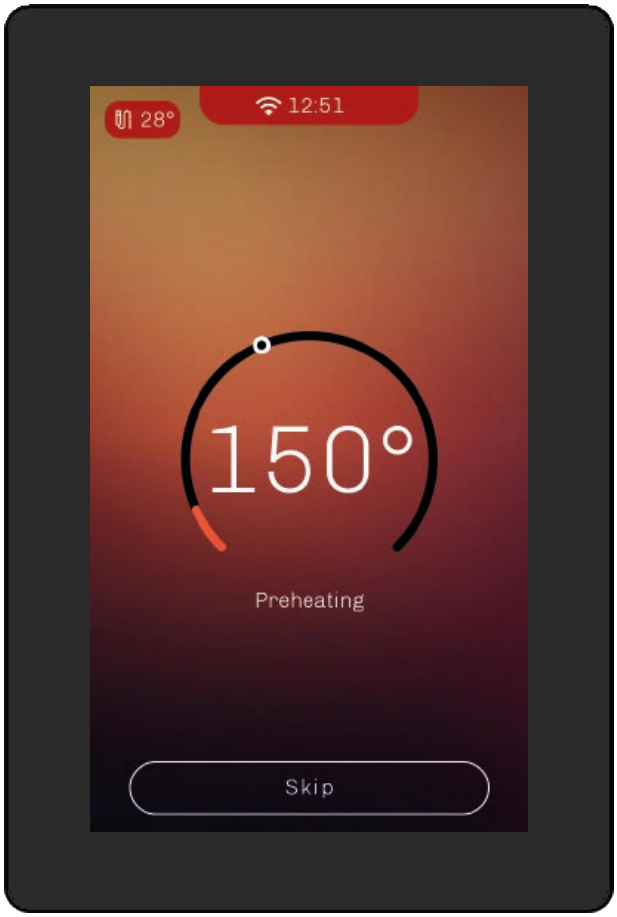


Fig. 35. *View of variable values during the process*

You can adjust the following at any time:

- All working setpoints:
  - Temperature widget;
  - Time widget;
  - Humidity widget;
  - Ventilation widget;
- Open/close the vent manually:
  - Humidity widget;
- Turn the light on/off manually.

During the cooking cycle you can start the *Smoking* function if:

- A relay has been configured as Smoking (**u1c**...**u15c** = 16);
- The maximum duration of the Smoking cycle has been set (**r50** > 0).

When the cooking cycle ends, the buzzer/speaker is activated for a time period **c0** and the chamber light flashes for 100 seconds; a window also appears that can be used to extend the cooking cycle by a time period that you select.

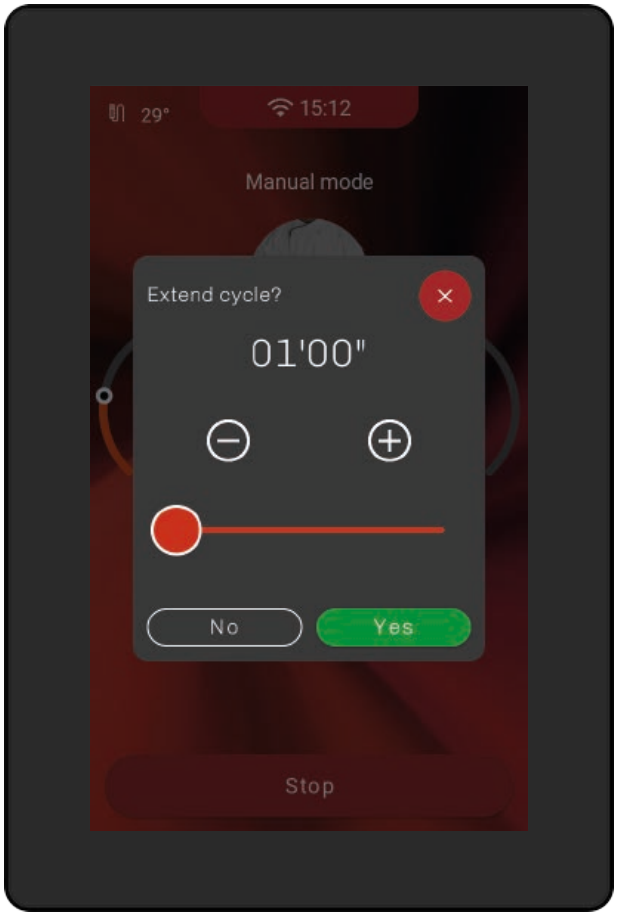


Fig. 36. *Cooking cycle extension request*

Tap the STOP key at any time to manually stop the cooking cycle.

7. SPECIAL CYCLES

Chapter content

This chapter contains the following information:

7.1 INTRODUCTION

The “Special cycles” function can be applied to make use of ready-to-use operating cycles.

The following cycles can be started via the special cycles menu:

- Core regeneration cycle;
- Timed regeneration cycle;
- Timed proving cycle;
- Chamber cooling cycle.

The cycle parameters mentioned previously are illustrated below; these values can be changed before starting each cycle.

Setting	Core regeneration		Timed regeneration		Timed proving		Chamber cooling	
	Default	Range	Default	Range	Default	Range	Default	Range
Working setpoint	**r31**	**r29...r30**	**r37**	**r35...r36**	**r43**	**r41...r42**	**r49**	**r47...r48**
Humidification	**t47**	**t45...t456**	**t50**	**t48...t49**	**t53**	**t51...t52**	---	---
Setpoint at core	**r34**	**r32...r33**	---	---	---	---	---	---
Step duration	---	---	**r40**	**r38...r39**	**r46**	**r44...r45**	---	---
Fan speed	Minimum		Minimum		Minimum		Minimum (without operation reversal)	
Vent opening	At the end of the cycle		At the end of the cycle		At the end of the cycle		At the start of the cycle and for the entire duration	

7.2 À LA CARTE COOKING CYCLE

The *à la carte* cooking cycles can be used to cook trays with different dishes inside the oven, each with different cooking times but similar cooking types (in terms of temperature and humidity settings).

There are two types of *à la carte* cooking cycles:

- Free cooking;
- Synchronised cooking end.

NOTE: preheating settings may exceed the maximum limits that can be set for the chamber temperature.

7.2.1 À LA CARTE COOKING CYCLE | FREE COOKING

This type of cycle is mainly used during preparation of the cooking line for restaurant service. Essentially, it is continuous cooking.

Trays with different products are placed inside the oven at the same time or at different times, and each tray has its own cooking completion time.

Other trays with other types of product, with different cooking times, can be added later.

EVOLVE COMBI indicates, visually with a pop-up and audibly via buzzer/speaker, which tray has finished cooking.

When all trays in the oven have finished cooking, **EVOLVE COMBI** keeps the oven warm.

7.2.2 À LA CARTE COOKING CYCLE | SYNCHRONISED COOKING END

This type of cycle is mainly used during restaurant service.
Trays with different cooking/tempering times all end at the same time, so that the dishes can be served to the table at the same time.

EVOLVE COMBI guides the user through insertion of the trays, indicating - visually with a pop-up and audibly via buzzer/speaker - the right moment to insert trays with faster cooking times.

This means all tray cooking processes anticipated by the cooking cycle will end at the same time, when the oven will indicate the end of cooking and keep the dishes warm until the oven receives a manual STOP command.

When setting up an *à la carte* cycle, the temperature and humidification level of the oven are established either manually by the user (manual menu) or by selecting a reference recipe (new menu) which should have a single step.

The cooking time for other trays can be configured manually or by recalling other recipes from the cookbook. Only recipes that are compatible in terms of temperature and humidity can be used (with an error percentage established by parameters **e3** and **e4**) with the reference recipe; incompatible recipes will automatically be hidden.

Taking a tray out or putting it in as indicated by the controller is confirmed automatically when the door is opened and closed.

Depending on the oven type, **EVOLVE COMBI** can be used to set the maximum number of trays by configuring **e5**.

7.3 *À LA CARTE* MENU CREATION EXAMPLE

Fig. 37. *À la carte menu creation procedure example*

8. BOILER MANAGEMENT

Chapter content

This chapter contains the following information:

8.1 INTRODUCTION

If the application anticipates **EVOLVE COMBI** usage via the boiler module (see ***"1.5 Accessories" on page 13***) it can be used to manage some of the functions, such as:

- Boiler water filling;
- Boiler water drainage;
- Boiler rinsing;
- Boiler cleaning;
  - Cleaning with liquid detergent;
  - Cleaning with detergent tablet.

8.2 ENABLING THE BOILER MODULE

In order to enable the boiler module, the following conditions must be satisfied:

- Enable the boiler module by setting **T15** = 1;
- Set steam generation mode with external or mixed humidification **T0** = 1 or **T0** = 2.

There are a few types of boiler in which the temperature of the water inside can be monitored, while other boilers have integrated control via pressure switch.

Enable/disable temperature checking via probe; does not affect boiler module operation.

If the boiler probe is disabled (**P4** = 0), **EVOLVE COMBI** does not check the temperature of the boiler before allowing steam injection during cooking.

The water level in the boiler can be checked:

- Setting **t40** = 0 enables checking the minimum and maximum water levels in the boiler;
- Setting **t40** = 1 enables checking the minimum water level in the boiler;
- Setting **t40** = 2 disables checking the water level in the boiler.

8.3 OPERATION

8.3.1 WATER FILLING MANAGEMENT

If the boiler module is enabled and ON, and if the maximum level digital input is enabled (**DI7** = Closed), water fills the boiler and the maximum level maintained.

If the minimum level is not reached during water filling within a time period **t27**, **EVOLVE COMBI** shows the alarm BOILER MIN. WATER LEV. (**Minimum water level alarm**).

If the maximum level is not reached during water filling within a time period **t28**, **EVOLVE COMBI** shows the alarm BOILER MAX. WATER LEV. (**Maximum water level alarm**).

8.3.2 WATER DRAINAGE MANAGEMENT

When **EVOLVE COMBI** switches off, the boiler drains the water on the basis of **e13**.

Par.	Description	MU	Range
e13	Boiler drain type with machine OFF. **0** = Drain only; the output remains active for time period **t21**; **1** = Drain after reaching the maximum water level (see **t41**).	---	0/1

When **e13** = 1, both level digital inputs must be enabled and the boiler probe must be enabled and running (not in alarm status).

As soon as the maximum level is reached, the drainage relay is activated (and the filling relay remains active). When the temperature of the boiler probe < **t41**, the filling relay is deactivated, while the drainage relay remains active for a time period **e10**.

8.3.3 WATER HEATING MANAGEMENT

If the boiler module is enabled and ON, the water is kept at temperature **t18**, while during:

- cooking;
- boiler cleaning;
- chamber cleaning

the water is heated and kept at temperature **t17**.

Water heating regulation is deactivated in the event of:

- No water (Minimum water level alarm);
- Boiler probe disabled.

When the boiler probe is disabled, the boiler heating element remains active even when steam injection is required.

8.3.4 BOILER RINSING

You can access the Boiler menu from the settings menu and start the Boiler rinsing function.

The Rinsing function has 4 phases:

1. Filling the water to the maximum level;
2. Draining the water;
3. Filling the water to the maximum level;
4. Draining the water.

If the boiler does not empty, the **Boiler drain alarm** is shown; this can be reset via a button.

If, during filling, the water does not reach the maximum level within the time period **t28**, **EVOLVE COMBI** shows the BOILER MAX. WATER LEV. alarm (**Maximum water level alarm**) with manual reset.

In the case of:

- Boiler drain alarm
- Maximum water level alarm

Rinsing is inhibited until the cause that triggered the alarm or alarms has been resolved.

Rinsing can be stopped manually by touching the **STOP** key for 4 seconds.

8.3.5 BOILER CLEANING

The user can carry out boiler cleaning via the Boiler menu if the following conditions are met:

- Access via Login
- **t0** ≠ 0

The Cleaning function has 3 phases:

1. Preparation phase
    1. Filling the water to the maximum level;
    2. Draining the water;
2. Boiler cleaning phase
    1. Limescale remover fill request; filling is manual. Once this step is complete, confirm by tapping  (**N.B**.: from this point onwards, it will not be possible to stop the cleaning cycle).
    2. Filling the water to the maximum level;
    3. Activation of anti-limescale action: this phase has a duration of **t22**, and the water is heated to a temperature set by **t23**;
3. Rinsing phase
    1. Draining the water;
    2. Filling the water to the maximum level;
    3. Activation of cleaning action: this phase has a duration of **t24**, and the water is heated to a temperature set by **t25**;
    4. Steps **1**, **2**, **3** of the rinsing phase are repeated a number of times, as set by **t26**.
    Cleaning ends with the water being emptied from the boiler.

If emptying does not occur, the **Boiler drain alarm** is shown; this can be reset via a button.

If, during filling, the water does not reach the maximum level within the time period **t28**, **EVOLVE COMBI** shows the ***BOILER MAX. WATER LEV.*** alarm (**Maximum water level alarm**) with manual reset.

In the case of:

- Boiler drain alarm
- Maximum water level alarm

Cleaning is inhibited until the cause that triggered the alarm or alarms has been resolved.

Cleaning can be stopped manually by touching the **STOP** key for 4 seconds.

9. BURNER MODULE

Chapter content

This chapter contains the following information:

9.1 INTRODUCTION

Through the burner module (***"1.5 Accessories" on page 13***), **EVOLVE COMBI** can be used to manage:

- Gas ovens with modulated forced draught burners;
- Gas ovens with ON/OFF natural draught burners.

The burner module is available with two power supply voltage values:

- 12 V burner module;
- 24 V burner module.

9.2 ENABLING THE BURNER MODULE

To enable the burner module functions, you first need to set the type of burner module to be controlled:

- Set **b14** = 2 for Gas ovens with modulated forced draught burners;
- Set **b14** = 3 for Gas ovens with ON/OFF natural draught burners.

9.3 MANAGING MODULATED FORCED DRAUGHT BURNERS

If you set **b14** = 2, **EVOLVE COMBI** will manage modulated forced draught burners. When the oven requests heat, the corresponding burner is activated instead of the chamber heating element or boiler.

Modulated forced draught burners are managed in 3 phases:

1. Pre-ventilation phase:
   The burner fan speed is set by **b2** for the chamber or **b9** for the boiler and is kept constant for 10 s.
2. Ignition phase:
   After 10 seconds:
   - The stability of the burner fan speed is checked by means of the Hall sensor;
   - The burner module is activated via the corresponding relay (chamber heating or boiler heating);
   - The presence of a flame is verified (via digital input) and the heating phase begins.
3. Heating phase:
   The burner reaches the speed requested by the controller to heat the oven.
   This speed is calculated proportionally within temperature band **b3** (chamber) or **b10** (boiler). The speed may vary by a minimum **b1** (chamber) or **b8** (boiler), to maximum **b0** (chamber) or **b7** (boiler).

9.3.1 HALL SENSOR

The burner speed is always measured via the Hall sensor and is used as feedback.

9.3.2 FLAME PRESENCE

To detect the burner flame, set **b17**.

Par.	Description	MU	Range
b17	Flame detection. **0** = None; **1** = Present.	---	0/1

Flame presence is verified via a digital input. This check can be disabled by setting **b17** = 0. Regulation takes place as if the flame was always present.

9.3.3 BURNER INHIBITING

If the burner inhibit signal is activated, parameter **b15** sets the status which should be assumed by the heating output corresponding to the chamber or boiler.

Par.	Description	MU	Range
b15	Burner status while inhibited. **0** = OFF; **1** = ON.	---	0/1

- If **b15** = 0, the heating output is deactivated and the control unit switches off.
- If **b15** = 1, the heating output remains active and the burner module performs its reset procedures.

9.3.4 ERROR MANAGEMENT

During the ignition phase, if no flame is detected (if **b17** = 1):

- the burner remains at the ignition speed.

During the heating phase, if no flame is detected (if **b17** = 1):

- the activation relay is switched off;
- the burner returns to the ignition speed for 10 seconds;
- after 20 seconds switch-on is attempted again.

When the burner module activates the **Burner inhibiting** digital input, a reset procedure is carried out in which the reset relay is activated to give the burner a reset pulse.

EVOLVE COMBI makes 3 attempts to reset the burner; if they are not successful, the **Chamber/boiler burner inhibited alarm** is shown.

Heating stops until the alarm is reset.

The burner speed is verified via the Hall input; if the speed set for the chamber burner differs from the read value, for a value > **b5** and a time period > **b6**, the **Chamber burner alarm** is triggered.

If the speed read by the HALL sensor > than the speed set for the boiler burner for a value > **b12** and a time period > **b13**, the **Boiler burner alarm** is shown.

Heating stops until the alarm is reset.

If the Hall sensor does not detect any feedback speed for > 5 seconds, the **Chamber burner** and **Boiler burner** alarms are shown.

The configuration parameters are:

Par.	Description	MU	Range
b5	Number of chamber burner alarm revolutions.	rpm	200...1000
b6	Chamber burner revolutions alarm delay.	s	10...120
b12	Number of boiler burner alarm revolutions.	rpm	200...1000
b13	Boiler burner revolutions alarm delay.	s	10...120
b17	Flame detection. **0** = None; **1** = Present.	---	0/1

The **Chamber/boiler burner inhibited alarm** is reset via the display.

9.4 MANAGING ON/OFF NATURAL DRAUGHT BURNERS

If you set **b14** = 3, **EVOLVE COMBI** will manage ON/OFF natural draught burners.

When the oven is required to heat, the heating output (chamber or boiler) is activated and controls the burner module. There are no controls in the natural draught burner relating to the centrifugal fan; this means the PWM output and the Hall input are not managed.

9.4.1 FLAME PRESENCE

To detect the burner flame, set **b17**.

Par.	Description	MU	Range
b17	Flame detection. **0** = None; **1** = Present.	---	0/1

Flame presence is verified via a digital input. This check can be disabled by setting **b17** = 0. Regulation takes place as if the flame was always present.

9.4.2 BURNER INHIBITING

If the burner inhibit signal is activated, parameter **b15** sets the status which should be assumed by the heating output corresponding to the chamber or boiler.

Par.	Description	MU	Range
b15	Burner status while inhibited. **0** = OFF; **1** = ON.	---	0/1

- If **b15** = 0, the heating output is deactivated and the control unit switches off.
- If **b15** = 1, the heating output remains active and the burner module performs its reset procedures.

9.4.3 ERROR MANAGEMENT

During the heating phase, if no flame is detected (if **b17** = 1):

- the activation relay is switched off;
- after 30 seconds switch-on is attempted again.

The burner module independently starts the reset procedure. When the **Burner inhibiting** digital input is activated, the **Chamber/boiler burner inhibited alarm** is shown.

Heating stops until the alarm is reset. The output assumes the status set by **b15**.

Burner speed is not managed.

The **Chamber/boiler burner inhibited alarm** is reset via the display.

10. UTILITY MANAGEMENT

Chapter content

This chapter contains the following information:

10.1 INTRODUCTION

EVOLVE COMBI allows the user to manage utilities such as:

- Oven temperature regulation;
- Steam injection;
- Venting;
- The chamber light;
- The technical compartment fan;
- The chamber fan;
- Steam reduction;
- Management of outputs for cleaning cycles.

Various utility applications are described below.

10.2 OVEN TEMPERATURE REGULATION

Temperature regulation can be ON-OFF or PI (proportional-integral) based on **r13**.

Par.	Description	MU	Range
r13	Temperature regulation type. **0** = ON/OFF regulation; **1** = PI (Proportional-Integral) regulation (electric oven only).	---	0/1

NOTE: PI regulation is only available for electric ovens.

In the case of ON-OFF regulation, the output is switched on until the chamber temperature reaches the working Setpoint and comes on again when the temperature < **r0** (i.e. working Setpoint – **r0**).

In the case of PI regulation, the configuration parameters are:

Par.	Description	MU	Range
r0	If **r13** = 1 proportional band for PI regulation.	°C/°F	1...99
r14	Minimum time between two consecutive switch-ons of the temperature regulation output (applies if **r13** = 1).	s	60...999
r15	Minimum on/off duration for the temperature regulation output (only applies if **r13** = 1).	s	10...240
r16	Integral time (applies if **r13** = 1). **0** = Integral contribution to PI regulation is disabled.	min	0...240

By setting **e11** = 0, the chamber temperature regulation heating output remains inactive during steam cooking.

10.3 STEAM INJECTION

The configuration parameters are:

Par.	Description	MU	Range
t0	Steam generation mode. **0** = Direct; **1** = With an external humidifier; **2** = Combined (i.e. both direct and with an external humidifier).	---	0...2
t12	Temperature Setpoint for injection type.	°C/°F	0.0...500.0
t42	Duration of manual steam injection (Convection cycle only). **0** = Continuous only.	s	0...99

By setting **t0** = 2:

- If the chamber probe temperature > **t12**, steam injection is activated in direct mode;
- If the chamber probe temperature < **t12**, injection of steam generated by an external humidifier is activated.

Tap to manually inject steam into the oven. Parameter **t42** sets the manual injection duration.

If **e11** = 0, steam cannot be injected manually in convection cooking.

10.4 VENTING

The venting configuration parameters are:

Par.	Description	MU	Range
u0	Vent output contact type. **0** = Normally open (vent open with contact closed); **1** = Normally closed (vent open with contact open).	---	0/1
u1	Utility managed by the vent output. **0** = Vent ON/OFF; **1** = Vent motorised in open/closed mode; **2** = Vent motorised in open/45°/closed mode.	---	0...2
u2	Duration of vent output inhibiting from the end of the short vent opening pulse and from the end of the long vent closing pulse (only if **u1** = 1).	dS	0...600
u3	Duration of the short vent opening pulse (only if **u1** = 1).	dS	0...600
u4	Duration of the long vent closing pulse (only if **u1** = 1).	dS	0...600
u5	Vent power supply output off delay for partial closure to 45° (only if **u1** = 2).	dS	0...600

You can use **u1** to set vent behaviour during cooking cycles.

The vent is automatically opened at the end of a cooking cycle, but you can activate it manually at any time during the cooking cycle by tapping the steam element and selecting the vent status.

10.5 CHAMBER LIGHT

Tap to switch the chamber light on or off. The icon changes status depending on whether the light is ON or OFF.

Icon	Description	Icon	Description
	Chamber light OFF		Chamber light ON

10.6 TECHNICAL COMPARTMENT FAN

The technical compartment fan is always on and remains on even when the **EVOLVE COMBI** is in Standby, if the board temperature is > **F6**. The technical compartment fan switches off when the board temperature is < **F6**-**F7**.

The configuration parameters are:

Par.	Description	MU	Range
F6	Temperature above which the technical compartment fan remains on when switching to Standby (refers to the base board usage temperature) (see **F7**).	°C/°F	20.0...65.0
F7	Differential of **F6**.	°C/°F	1.0...99.0

10.7 OVEN FAN

The configuration parameters are:

Par.	Description	MU	Range
F0	Ventilation management type **0** = In ON/OFF mode and at a single speed; **1** = In ON/OFF mode, at a single speed and with fan operating direction reversal; **2** = In ON/OFF mode, at dual speed and with fan operating direction reversal; **3** = In modulating mode and with fan operating direction reversal; **4** = In modulating mode and with fan operating direction reversal via Evco Inverter (also configure **F9**).	---	0...4
F1	Fan switch-off duration due to its operating direction reversal (only if **F0** = 1, 2, 3 or 4).	s	5...120
F2	Fan on duration for each operating direction (only if **F0** = 1, 2, 3 or 4).	s	5...600
F3	Output switch-off for temperature regulation during fan switch-off due to its operating direction reversal (only if **F0** = 1, 2, 3 or 4). **0** = Yes; **1** = No. **NOTA BENE**: only if PI regulation is not enabled for the chamber.	---	0/1
F4	Minimum fan speed (percentage of the maximum speed; only if **F0** = 3 or 4).	%	0...**F5**
F5	Maximum fan speed (percentage of the maximum speed; only if **F0** = 3 or 4).	%	**F4**...100
F8	Minimum fan speed that can be set by the user (percentage of the maximum speed; only if **F0** = 3 or 4).	%	0...100
F9	Number of inverters used (if **F0** = 4).	---	0...2

If **F0** = 0 or **F0** = 1 or **F0** = 2, then:

- **F1** sets the fan switch-off duration due to its operating direction reversal;
- **F2** sets the fan on duration for each operating direction.

- If **F0** = 3, then:
  - **F4** and **F5** set the minimum and maximum fan speed;
  - **F8** establishes the minimum fan speed (understood to mean a percentage of the maximum speed) which can be set in the cooking cycles.
- If **F0** = 4, then:
  - **S05** and **S04** set the minimum and maximum fan speed;
  - **F8** establishes the minimum fan speed (understood to mean a percentage of the maximum speed) which can be set in the cooking cycles.

10.8 STEAM REDUCTION

To enable the steam reduction function, set:

- **P3** = 1;
- At least one digital output **u1c**...**u15c** = 19.

Steam reduction is activated until the temperature detected by the steam reduction probe = **t13** and it is deactivated when the temperature < **t13** - **t14**, only if the steam reduction probe is enabled (**P3** = 1).

10.9 MANAGEMENT OF OUTPUTS FOR CLEANING CYCLES

EVOLVE COMBI has 4 digital outputs intended to manage two cleaning types:

- Cleaning with liquid detergent, without water recirculation;
- Cleaning with detergent tablet, with water recirculation.

Every time a cleaning cycle begins, the chamber light comes on automatically; it can be switched off an on again by tapping the corresponding icon.

The washing cycle type can be selected by setting **w17**. The configuration parameters are:

Par.	Description	MU	Range
w0	Pre-cleaning phase working Setpoint.	°C/°F	0.0...500.0
w1	Pre-cleaning activation enable differential.	°C/°F	1.0...99.0
w2	Pre-cleaning time.	min	0...240
w3	Cleaning phase working Setpoint.	°C/°F	0.0...500.0
w4	Liquid detergent feed time.	s	0...240
w5	• Liquid detergent action time. • Cleaning time (in cleaning with tablet).	min	0...240
w6	• Steam feed time for liquid detergent action. • Detergent action time (in cleaning with tablet).	min	0...240
w7	Short rinse time.	s	0...240
w8	• Rinse aid phase working Setpoint. • Cleaning preparation working Setpoint (in cleaning with tablet).	°C/°F	0.0...500.0
w9	• Rinse aid feed time. • Water outlet pump activation time after the end of the cycle (in cleaning with tablet).	s	0...240
w10	• Rinse aid action time. • RINSEN phase time (in cleaning with tablet).	min	0...240
w11	• Steam feed time for rinse aid action. • Cleaning preparation time (in cleaning with tablet).	min	0...240
w12	Rinsing phase working Setpoint.	°C/°F	0.0...500.0
w13	Rinsing phase duration.	min	0...240
w14	Drying phase working Setpoint.	°C/°F	0.0...500.0
w15	Drying phase duration.	min	0...240
w16	Water outlet pump deactivation delay.	s	0...240
w17	Cleaning type. **0** = Disabled; **1** = With liquid detergent, without recirculation; **2** = With detergent tablet and recirculation; **3** = Reserved.	---	0...3
w18	Load activation enable band during phase 2B - Cleaning Preparation (in cleaning with tablet).	°C/°F	**r0**...99
w19	Cleaning drainage probe Setpoint (in cleaning with tablet).	°C/°F	0...500
w20	Detergent/rinse aid output action (only if **w17** = 1). **0** = Single relay activation; **1** = Combined with water solenoid valve relay.	---	0/1
t11	Delay in the injection of steam from temperature regulation output activation or fan activation.	s	0...240

10.9.1 CLEANING WITH LIQUID DETERGENT, WITHOUT WATER RECIRCULATION (W17 = 1)

There are 4 management relays with different functions:

- **Out15**: Mains supply water solenoid valve
- **Out14**: Liquid detergent feed pump
- **Out13**: Water outlet pump
- **Out12**: Liquid rinse aid feed pump

The cleaning cycle with liquid detergent and without water recirculation takes place over 5 consecutive phases:

1. Pre-cleaning phase;
2. Cleaning phase;
3. Rinse aid phase;
4. Rinsing phase;
5. Drying phase.

PHASE 1 - PRE-CLEANING

The oven temperature is set to the pre-cleaning temperature **w0**.

- If the chamber temperature < **w0**-**w1**, the following occurs:
  - Heating is activated;
  - Ventilation is activated;
  - The vent is closed.
- If the chamber temperature > **w0**, the following occurs:
  - Heating remains off;
  - Ventilation is activated;
  - The vent is opened;
  - A pop-up will appear, asking you to open the door in order to cool the chamber more quickly.
- If the chamber temperature is > **w0** but < **w1**, the following occurs:
  - The vent is closed;
  - If the door had been open previously, a pop-up will appear asking you to close it;
  - The water mains solenoid valve output will be activated for a time period **w2**;
  - The water outlet pump output will be activated for a time period **w2**;
  - Ventilation will be kept constant for the entire phase;
  - The heating output will be kept active to maintain the set temperature at a constant value.
- At the end of the time period **w2** the following occurs:
  - All heating elements are deactivated;
  - Ventilation is turned off;
  - The water solenoid valve output is deactivated;
  - After a delay period **w16**, the water outlet pump output is deactivated.

PHASE 2 - CLEANING

Once the pre-cleaning phase has ended, the cleaning phase begins and the liquid detergent feed pump relay is activated for a time period **w4**.

If **w20** = 1, the following occurs:

- The injection relay is activated;
- The water solenoid valve output is activated.

After time period **w4**, a time period **w5** is left to allow the detergent to act fully on the dirt.

At the end of time period **w5**, the oven resumes heating with ventilation active until the chamber reaches the cleaning temperature **w3**.

Once a time period **t11** has elapsed, **EVOLVE COMBI** activates steam injection inside the chamber (with regulation at 100%) for a time period **w6**.

Once time period **w6** has elapsed, **EVOLVE COMBI** carries out a short chamber rinse, by activating:

- The water mains solenoid valve output for a time period **w7**;
- The water outlet output for a time period **w7**.

Once time period **w7** has elapsed:

- The water mains solenoid valve output is deactivated;
- After a time period **w16**, the water outlet output is deactivated.

The cleaning phase can be carried out 3 times depending on the cleaning intensity set by the end user during the cycle selection/setting phase:

- The cleaning phase is repeated once (**SOFT cleaning**);
- The cleaning phase is repeated twice (**MEDIUM cleaning**);
- The cleaning phase is repeated three times (**HARD cleaning**).

PHASE 3 - RINSE AID

Once cleaning is complete, the Rinse aid phase begins.

In this phase:

- The liquid rinse aid feed pump relay is activated for w9 seconds.

If **w20** = 1, the following occurs:

- The injection relay is activated;
- The water solenoid valve output is activated.

After time period **w9**, a time period **w10** is left to allow the detergent to act fully on the dirt.

At the end of time period **w10**, the oven resumes heating with ventilation active until the chamber reaches the cleaning temperature **w8**.

Once a time period **t11** has elapsed, **EVOLVE COMBI** activates steam injection inside the chamber (with regulation at 100%) for a time period **w11**.

NOTE: if **w9** = 0, the rinse aid phase is skipped.

PHASE 4 - RINSING

Once the rinse aid phase has finished, the rinsing phase begins:

- The oven, with ventilation active, is brought to the rinsing temperature **w12**;
- **EVOLVE COMBI** activates:
  - The water mains solenoid valve output for **w13** minutes;
  - The water outlet pump output for **w13** minutes.

Ventilation remains active for the entire phase and the heating output keeps the temperature at a constant set value.

Once time period **w13** has elapsed:

- The water mains solenoid valve output is deactivated;
- After a time period **w16**, the water outlet output is deactivated.

PHASE 4 - DRYING

Once the rinsing phase has finished, the drying phase begins:

- The oven, with ventilation active, is brought to the drying temperature w14;
- The vent is opened;
- The temperature is kept constant for a time period **w15**;
- Once time period **w15** has elapsed the cleaning cycle ends;
- All outputs are switched off;
- The chamber light is switched off;
- The oven is set to the Homepage screen.

INHIBITING CLEANING

If the cycle is stopped manually during the pre-cleaning, rinsing or drying phase, the cleaning cycle is stopped immediately.

If the cycle is stopped manually during the cleaning or rinse aid phase, the cycle ends that phase and moves on to the rinsing phase.

The **power failure alarm** during any phase will cause that phase to be restarted from the beginning.

If the door is opened during any phase, the cycle is paused and will be resumed once the door has been closed.

10.9.2 CLEANING WITH DETERGENT TABLET, WITH WATER RECIRCULATION (W17 = 2)

There are 3 management relays with different functions:

- **Out15**: Condenser mains supply water feed solenoid valve;
- **Out14**: Water recirculation pump;
- **Out13**: Water outlet pump.

The cleaning cycle with liquid detergent and without water recirculation takes place over 5 consecutive phases:

1. Pre-cleaning phase;
2. Rinsen phase;
   1. Cleaning preparation phase;
3. Cleaning phase;
4. Rinse aid phase;
5. Rinsing phase;
6. Drying phase.

This type of cleaning can also use a probe dedicated to the outlet temperature of the water used for cleaning, given that according to regulations, the temperature of the water should not exceed 60-75 °C in order to be channelled into sewage pipes (government-imposed rules).

⚠ WARNING

REGULATORY INCOMPATIBILITY

Make sure all the equipment used and the systems conform to all applicable local, regional and national regulations and standards.

To enable outlet water temperature reading:

- Enable the probe (as an alternative to the steam reduction probe) by setting **P3** = 2.

Cleaning with a tablet requires the selection of 4 different cycle types:

- Rinsing
- **SOFT** cleaning
- **MEDIUM** cleaning
- **HARD** cleaning

RINSEN cleaning is a cycle with a special sequence, in which the difference is the number of times the cleaning phases are repeated.

SELECTING AND STARTING THE CYCLE

If a RINSEN cycle is selected and started, the cycle immediately begins with the pre-cleaning phase.

If, on the other hand, one of the other 3 cleaning types available is selected, the controller will ask you to provide the number of detergent doses fed into the chamber:

- 2 doses = **SOFT** cleaning
- 4 doses = **MEDIUM** cleaning
- 6 doses = **HARD** cleaning

After adding the detergent (the machine does not check that the detergent has been added), when you press START again the machine will begin the pre-cleaning phase.

PHASE 1 - PRE-CLEANING

The oven temperature is set to the pre-cleaning temperature **w0**.

- If the chamber temperature < **w0** - **w1**, the following occurs:
  - Heating is activated;
  - Ventilation is activated;
  - The vent is closed.
- If the chamber temperature > **w0**, the following occurs:
  - Heating remains off;
  - Ventilation is activated;
  - The vent is kept open;
  - A pop-up will appear, asking you to open the door in order to cool the chamber more quickly.
- If the chamber temperature is > **w0** but < **w1**, the following occurs:
  - The vent is closed;
  - If the door had been open previously, a pop-up will appear asking you to close it;
  - The water mains solenoid valve output will be activated for a time period **w2**, so that the condenser fills with water and the recirculation pump can draw water for the various cleaning phases;
  - Ventilation will be kept constant for the entire phase;
  - The heating output will be kept active to maintain the set temperature at a constant value.
- At the end of the time period **w2**, machine operation varies depending on type of cycle set:
  - RINSEN cycle;
  - Cleaning cycle.

PHASE 2A - RINSEN

Once the pre-cleaning phase (RINSEN) has ended, the selected cycle is carried out.

The cycle begins with a countdown **w10** during which the following outputs are activated:

- Condenser mains supply water feed solenoid valve;
- Direct steam injection;
- Water recirculation pump with ventilation activated at maximum speed.

Once countdown **w10** has elapsed:

- **EVOLVE COMBI** returns to the HOME screen;
- The Condenser water outlet pump digital output remains active for a time period **w9**, to empty the condenser.

If the oven door is opened, or STOP is pressed, the cycle stops and **EVOLVE COMBI** returns to the HOME screen.

PHASE 2B - CLEANING PREPARATION

The oven is brought to the Cleaning preparation temperature **w8** with humidification at 100% for **w11** minutes, during which the condenser mains supply water feed solenoid valve relay is activated.

Once the temperature has been reached:

- The ventilation digital output remains active;
- All other digital outputs are deactivated until:
  - Oven temperature < **w8 - w18**;
  - Regulation is resumed;
  - Steam injection is resumed;
  - Mains supply water injection is resumed.

Once time period **w11** has elapsed, the cycle moves on to the next phase.

PHASE 3 - CLEANING

Once the Cleaning Preparation phase has ended, the cycle begins the Cleaning phase.

This phase begins by bringing the oven to the cleaning temperature **w3** for a time period **w5** and:

- Ventilation is active at maximum speed;
- The recirculation pump that feeds the hot water from the condenser into the chamber is activated, passing it over the detergent tablet;
- Steam injection is OFF;
- Next, **w5** is reloaded for a further time period **w6**, to allow the detergent time to work, and:
  - The chamber light remains on;
  - All other utilities are switched off.

The cleaning phase is repeated:

- 3 times for **SOFT** cleaning;
- 6 times for **MEDIUM** cleaning;
- 9 times for **HARD** cleaning.

During cleaning, if:

- The water outlet probe is enabled **P3** = 2
- The water outlet temperature > **w19**

then **EVOLVE COMBI** activates the *Mains supply water feed* to lower the temperature of the condenser.

The differential of this regulation is -10 °C, therefore the *Mains supply water feed* is deactivated when:

- The water outlet temperature < **w19 - 10 °C.**

When the number of cycles included for the phase have been completed, the next phase begins.

PHASE 4 - RINSING

This phase has a duration of **w13**, during which the following outputs are active:

- Condenser mains supply water feed;
- Direct steam injection;
- Ventilation at maximum speed.

The rinsing phase does not include:

- Heating;
- Recirculation.

Once time period **w13** has elapsed, the cycle moves on to the next phase.

PHASE 5 - DRYING

Once the rinsing phase has finished, the drying phase begins.

The oven is brought to the drying temperature **w14**, with:

- Ventilation active at maximum speed for a time period **w15**;
- Once time period **w15** has elapsed, the water outlet pump is activated for a time period **w9**.

Once time period **w9** has elapsed, the cycle is complete and **EVOLVE COMBI** returns to the HOME screen.

INHIBITING CLEANING

If the cycle is stopped manually during:

- Phase 2a - Rinsen;
- Phase 2b - Cleaning Preparation;
- Phase 5 - Drying;

the cycle is stopped immediately.

If the cycle is stopped manually during Phase 4 - Rinsing, the cycle stops the phase in progress and then ends.

If the door is opened during any phase, the cycle does not stop but all outputs involved in regulation are deactivated.

The **power failure alarm** during any phase will cause that phase to be restarted from the beginning.

11. PARAMETERS

Chapter content

This chapter contains the following information:

11.1 DESCRIPTION OF COLUMNS IN THE TABLE OF PARAMETERS

- **Par**.: list of configurable device parameters;
- **Description**: indicates parameter operation and any possible selections;
- **MU**: measurement unit relating to the parameter;
- **Range**: describes the interval of values that the parameter can assume. This can be correlated with other instrument parameters (indicated with the parameter code).
  NOTE: *if the actual value is outside the permitted limits for that parameter (for example, because other parameters defining the aforementioned limits have been altered), the value of the violated limit is displayed instead of the actual value;*
- **Default**: indicates the pre-set factory configuration;
- **PW**: indicates the access level for the parameter:
  - **U** = User parameters;
  - **I** = Installer parameters;
  - **M** = Maintenance parameters;
  - **C** = Construction parameters.

11.2 TABLE OF CONFIGURATION PARAMETERS

Par.	Description	MU	Range	Default
	ANALOGUE INPUT group			
P0	Probe type. **0** = Thermocouple J (models with J/K thermocouples only); **1** = Thermocouple K (models with J/K thermocouples only); **2** = Pt100 (models with Pt100 only).	---	0...2	0
P1	Temperature unit of measure. **0** = °C; **1** = °F.	---	0/1	0
P2	Enable needle probe. **0** = Disabled; **1** = Enabled; **2** = Multi-sensor (1 needle with up to 4 sensors).	---	0...2	0
P3	Enable steam reduction/water outlet probe. **0** = Probe disabled; **1** = Steam reduction probe; **2** = Water outlet probe.	---	0...2	0
P4	Enable boiler probe. **0** = No; **1** = Yes.	---	0/1	0
CA1	Chamber probe offset.	°C/°F	-25.0...25.0	0
CA2	Needle probe offset.	°C/°F	-25.0...25.0	0
CA3	Steam reduction probe offset.	°C/°F	-25.0...25.0	0
	REGULATION group			
r0	• If **r13** = 0 working Setpoint differential (refers to the temperature detected by the chamber probe). • If **r13** = 1 proportional band for PI regulation.	°C/°F	1...99	5
r1	Minimum working Setpoint (refers to the temperature detected by the chamber probe) for Mixed cooking.	°C/°F	0...r2	40
r2	Maximum working Setpoint (refers to the temperature detected by the chamber probe) for Mixed cooking.	°C/°F	**r1**...500	150
r3	Working Setpoint for factory settings (refers to the temperature detected by the chamber probe) (see **r0**).	°C/°F	**r1**...**r2**	130
r4	Minimum Setpoint at core (refers to the temperature detected by the needle probe).	°C/°F	0...**r5**	0
r5	Maximum Setpoint at core (refers to the temperature detected by the needle probe).	°C/°F	**r4**...500	100
r6	Working Setpoint at core for factory settings (refers to the temperature detected by the needle probe).	°C/°F	**r4**...**r5**	30
r7	Minimum Delta T Setpoint (refers to the temperature detected by the needle probe).	°C/°F	0...r8	0
r8	Maximum Delta T Setpoint (refers to the temperature detected by the needle probe).	°C/°F	r7...150	30
r9	Delta T Setpoint for factory settings (refers to the temperature detected by the needle probe).	°C/°F	**r7**...**r8**	5

Par.	Description	MU	Range	Default
r12	Duration of a power supply failure occurring during the cooking cycle that causes stoppage (2). **0** = Always stops cooking; **-1** = Disabled (cooking is not stopped).	min	0...240	-1
r13	Temperature regulation type. **0** = ON/OFF regulation; **1** = PI (Proportional-Integral) regulation (electric oven only).	---	0/1	0
r14	Minimum time between two consecutive switch-ons of the temperature regulation output (only applies if **r13** = 1).	s	60...999	180
r15	Minimum on/off duration for the temperature regulation output (only applies if **r13** = 1).	s	10...240	10
r16	Integral time (only applies if **r13** = 1). **0** = Integral contribution to PI regulation is disabled.	min	0...240	30
r17	Minimum working Setpoint (refers to the temperature detected by the chamber probe) for Convection cooking.	°C/°F	0.0...**r2**	50
r18	Maximum working Setpoint (refers to the temperature detected by the chamber probe) for Convection cooking.	°C/°F	**r1**...500.0	300
r19	Minimum working Setpoint (refers to the temperature detected by the chamber probe) for Steam cooking.	°C/°F	0.0...**r2**	30
r20	Maximum working Setpoint (refers to the temperature detected by the chamber probe) for Steam cooking.	°C/°F	**r1**...500.0	90
r23	Working Setpoint differential (refers to the temperature of the chamber probe) for activation of the support heater.	°C/°F	1.0...99.0	10
r24	Delay for reading the needle probe (from when the cycle begins).	s	0...240	7
r25	Working Setpoint during maintenance after a programmed cooking cycle.	°C/°F	0.0...500.0	70
r26	Reduction of the cooking time in % for LOW load.	%	0...100	20
r27	Increase of the cooking time in % for HIGH load.	%	0...100	20
r29	Minimum working Setpoint for core regeneration cycle.	°C/°F	0.0...**r30**	20
r30	Maximum working Setpoint for core regeneration cycle.	°C/°F	**r29**...500.0	180
r31	Working setpoint for core regeneration cycle factory setting.	°C/°F	**r29**...**r30**	110
r32	Minimum core Setpoint for core regeneration cycle.	°C/°F	0.0...**r33**	20
r33	Maximum core Setpoint for core regeneration cycle.	°C/°F	**r32**...500.0	100
r34	Core Setpoint for core regeneration cycle factory setting.	°C/°F	**r32**...**r33**	70
r35	Minimum core Setpoint for timed regeneration cycle.	°C/°F	0.0...**r36**	20
r36	Maximum core Setpoint for timed regeneration cycle.	°C/°F	**r35**...500	180
r37	Core Setpoint for timed regeneration cycle factory setting.	°C/°F	**r35**...**r36**	110
r38	Minimum duration for timed regeneration cycle.	min	0...**r39**	5
r39	Maximum duration for timed regeneration cycle.	min	**r38**...999	90
r40	Duration for timed regeneration cycle factory setting.	min	**r38**...**r39**	25
r41	Minimum working Setpoint for timed proving cycle.	°C/°F	0.0...**r42**	20
r42	Maximum working Setpoint for timed proving cycle.	°C/°F	**r41**...500.0	50
r43	Working Setpoint for timed proving cycle factory setting.	°C/°F	**r41**...**r42**	30
r44	Minimum duration for timed proving cycle.	min	0...**r45**	1
r45	Maximum duration for timed proving cycle.	min	**r44**...999	300
r46	Duration for timed proving cycle factory setting.	min	**r44**...**r45**	120
r47	Minimum working Setpoint for cooling cycle.	°C/°F	0.0...**r48**	0
r48	Maximum working Setpoint for cooling cycle.	°C/°F	**r47**...500.0	300
r49	Working Setpoint for cooling cycle (refers to the temperature detected by the chamber probe).	°C/°F	**r47**...**r48**	50
r50	Smoking duration. **0** = Smoking disabled.	min	0...999	0
r51	Working Setpoint during LOW preheating (refers to the working Setpoint during the first phase of the cooking cycle, i.e. the working Setpoint during the first phase of the cooking cycle + **r51**; refers to the temperature detected by the chamber probe) (see **r0**).	°C/°F	-199.0...199.0	10

Par.	Description	MU	Range	Default
r52	Working Setpoint during MEDIUM preheating (refers to the working Setpoint during the first phase of the cooking cycle, i.e. the working Setpoint during the first phase of the cooking cycle + **r52**; refers to the temperature detected by the chamber probe) (see **r0**).	°C/°F	-199.0...199.0	20
r53	Working Setpoint during HIGH preheating (refers to the working Setpoint during the first phase of the cooking cycle, i.e. the working Setpoint during the first phase of the cooking cycle + **r53**; refers to the temperature detected by the chamber probe) (see **r0**).	°C/°F	-199.0...199.0	30
	THERMOSTAT REGULATION group			
c0	Duration of buzzer activation at the end of the cooking cycle. **0** = No buzzer or pop-up indication; **-1** = Until it is manually silenced.	s	-1...120	10
c1	Buzzer activation (for 1 s) at the end of a phase in the cooking cycle. **0** = No; **1** = Yes.	---	0/1	0
c2	Time which must elapse with no procedures on the device (from activation of the weekly programmed startup function) in order for it to switch off, only after reaching the preheating Setpoint.	min	0...240	60
c3	Temperature above which displaying of the temperature detected by the chamber probe is inhibited (relating to the working Setpoint, i.e. working Setpoint + **c3**). **0** = Function not present.	°C/°F	0.0...99.0	10
c4	Temperature below which displaying of the temperature detected by the chamber probe is inhibited (relating to the working Setpoint, i.e. working Setpoint - **c4**). **0** = Function not present.	°C/°F	0.0...99.0	10
	FAN group			
F0	Ventilation management type **0** = In ON/OFF mode and at a single speed; **1** = In ON/OFF mode, at a single speed and with fan operating direction reversal; **2** = In ON/OFF mode, at dual speed and with fan operating direction reversal; **3** = In modulating mode and with fan operating direction reversal; **4** = In modulating mode and with fan operating direction reversal via Evco Inverter (also configure **F9**) (3).	---	0...4	0
F1	Fan switch-off duration due to its operating direction reversal (only if **F0** = 1, 2, 3 or 4) (see **F2**).	s	5...120	15
F2	Fan on duration for each operating direction. (Only if **F0** = 1, 2, 3 or 4) (see **F1**).	s	5...600	120
F3	Output switch-off for temperature regulation during fan switch-off due to its operating direction reversal (only if **F0** = 1, 2, 3 or 4). **0** = Yes; **1** = No. **NOTA BENE**: only if PI regulation is not enabled for the chamber.	---	0/1	0
F4	Minimum fan speed (understood as a percentage of the maximum speed; only if **F0** = 3 or 4).	%	0...**F5**	0
F5	Maximum fan speed (understood as a percentage of the maximum speed; only if **F0** = 3 or 4).	%	**F4**...100	100
F6	Temperature above which the technical compartment fan remains on when switching to Standby (refers to the base board usage temperature) (see **F7**).	°C/°F	20.0...65.0	60
F7	Differential of **F6**.	°C/°F	1.0...99.0	10
F8	Minimum fan speed that can be set by the user (understood as a percentage of the maximum speed; only if **F0** = 3 or 4).	%	0...100	10
F9	Number of inverters used (if **F0** = 4).	---	0...2	1
	HUMIDIFICATION group			
t0	Steam generation mode **0** = Direct; **1** = With an external humidifier; **2** = Combined (i.e. both direct and with an external humidifier).	---	0...2	0
t1	Cycle time for injection of the steam generated in direct mode (Mixed cooking only). .	s	**t2**...999	60
t2	Duration of the injection of steam generated in direct mode corresponding to maximum humidification (Mixed cooking only).	s	0...**t1**	30

Par.	Description	MU	Range	Default
t3	Delay in the injection of steam generated in direct mode from the start of the cooking cycle. **0** = the controller manages humidification in the chamber at the humidity value set for the first phase of the cooking cycle, even during preheating.	s	0...999	60
t4	Enable link between injection of steam generated in direct mode and the fan. **0** = No; **1** = Yes. Injection is inhibited when the fan switches off. If the fan is off when steam is due to be injected, the injection takes place when the fan is next activated and if the fan needs to switch off during steam injection, it does so once injection has ended.	---	0/1	0
t5	Enable link between injection of steam generated in direct mode and the temperature regulation output. **0** = No; **1** = Yes. If the output is off when steam is due to be injected, the injection takes place when the output is next activated and if the output needs to switch off during steam injection, it does so once injection has ended.	---	0/1	0
t6	Cycle time for injection of the steam generated with an external humidifier (for Mixed cooking).	s	**t7**...999	60
t7	Duration of the injection of steam generated with an external humidifier corresponding to maximum humidification (for Mixed cooking).	s	0...**t6**	30
t8	Delay in the injection of steam generated with an external humidifier from the start of the cooking cycle. **0** = the controller manages humidification in the chamber at the humidity value set for the first phase of the cooking cycle, even during preheating.	s	0...999	60
t9	Enable link between injection of steam generated with an external humidifier and the fan. **0** = No; **1** = Yes. If the fan is off when steam is due to be injected, the injection takes place when the fan is next activated and if the fan needs to switch off during steam injection, it does so once injection has ended.	---	0/1	0
t10	Enable link between injection of steam generated with an external humidifier and the temperature regulation output. **0** = No; **1** = Yes. If the output is off when steam is due to be injected, the injection takes place when the output is next activated and if the output needs to switch off during steam injection, it does so once injection has ended.	---	0/1	0
t11	Delay in the injection of steam from temperature regulation output activation or fan activation.	s	0...240	5
t12	Temperature above which the injection of steam generated in direct mode is activated and below which the injection of steam generated with an external humidifier is activated (refers to the temperature detected by the chamber probe; only if **t0** = 2).	°C/°F	0.0...500.0	120
t13	Temperature above which steam reduction is activated (refers to the temperature detected by the steam reduction probe (see **t14**).	°C/°F	0.0...500.0	90
t14	Differential to apply to **t13**.	°C/°F	1.0...99.0	5
t15	Enable Boiler expansion. **0** = Disabled; **1** = Enabled.	---	0/1	0
t16	Boiler temperature above which boiler steam injection is enabled.	°C/°F	1.0...500.0	80
t17	Boiler steam working temperature.	°C/°F	1.0...500.0	95
t18	Boiler steam hold temperature.	°C/°F	1.0...500.0	70
t19	Differential to apply to **t17** and **t18**.	°C/°F	1.0...99.0	2
t20	Delay in boiler water filling stop.	s	0...240	2
t21	Delay in boiler water drain stop.	min	0...240	2
t22	Anti-limescale step 1 action time for Cleaning.	min	0...240	25
t23	Anti-limescale step 1 temperature for Cleaning.	°C/°F	1.0...500.0	60
t24	Step 2 Cleaning action time.	min	0...240	20
t25	Step 2 Cleaning action temperature.	°C/°F	1.0...500.0	60
t26	Step 2 number of Cleaning cycles.	---	1...10	3
t27	Minimum water level alarm activation delay.	s	0...240	5

Par.	Description	MU	Range	Default
t28	Maximum water level alarm activation delay.	min	0...240	3
t30	Enable link between injection of steam generated and the vent. **0** = Disabled; **1** = Enabled, valve open, no steam.	---	0/1	0
t31	Link between steam injection and fans (heating). • If **t31** = 0, injection and fans remain independent. • If **t31** ≠ 0, the fans switch off on activation of steam injection and remain off for a time period **t31** after steam injection has ended.	s	0...240	10
t32	Minimum humidity setpoint for Mixed cooking.	%	0...**t33**	20
t33	Maximum humidity setpoint for Mixed cooking.	%	**t32**...100	80
t34	Minimum humidity setpoint for Steam cooking.	%	0...**t35**	50
t35	Maximum humidity setpoint for Steam cooking.	%	**t34**...100	100
t36	Cycle time for injection of the steam generated in direct mode (for Steam cooking).	s	**t37**...999	60
t37	Duration of the injection of steam generated in direct mode corresponding to maximum humidification (for Steam cooking).	s	0...**t36**	30
t38	Cycle time for injection of the steam generated with an external humidifier (for Steam cooking).	s	**t39**...999	60
t39	Duration of the injection of steam generated with an external humidifier corresponding to maximum humidification (for Steam cooking).	s	0...**t38**	30
t40	Boiler water level inputs. **0** = Minimum level and maximum level; **1** = Minimum level only; **2** = Level check disabled (**N.B.**: no boiler cleaning/rinsing).	---	0...3	0
t41	Temperature below which the boiler water fill valve is closed.	°C/°F	0.0...100.0	50
t42	Duration of manual steam injection (Convection cycle only). **0** = Continuous only.	s	0...99	0
t43	Minimum humidity setpoint for Convection cooking.	%	-100...**t44**	0
t44	Maximum humidity setpoint for Convection cooking.	%	**t43**...100	0
t45	Minimum humidity setpoint for Core regeneration.	%	0...**t46**	40
t46	Maximum humidity setpoint for Core regeneration.	%	**t45**...100	100
t47	Humidity setpoint for Core regeneration cycle factory setting.	%	**t45**...**t46**	70
t48	Minimum humidity setpoint for Timed regeneration.	%	0...**t49**	40
t49	Maximum humidity setpoint for Timed regeneration.	%	t48...100	100
t50	Humidity setpoint for Timed regeneration cycle factory setting.	%	**t48**...**t49**	70
t51	Minimum humidity setpoint for Timed proving.	%	0...**t52**	40
t52	Maximum humidity setpoint for Timed proving.	%	**t51**...100	100
t53	Humidity setpoint for Timed proving cycle factory setting.	%	**t51**...**t52**	80
	ALARM group			
A0	Differential to apply to **A1**.	°C/°F	1.0...99.0	10
A1	Temperature above which the chamber high temperature alarm is activated (refers to the temperature detected by the chamber probe (see **A0** and **A3**).	°C/°F	0.0...500.0	500
A2	Chamber high temperature alarm delay.	min	0...240	0
A3	High temperature alarm type. **0** = Alarm not present; **1** = Absolute (i.e. **A1**); **2** = Relative to the working Setpoint (i.e. working Setpoint + **A1**).	---	0...2	1
A4	Temperature above which the base board high temperature alarm is activated (refers to the base board usage temperature). **0** = Alarm not present.	°C/°F	0.0...80.0	70
	CUSTOM INPUT CONFIGURATION group			
i0	Door switch input contact type (clean contact). **0** = Normally open (input active with contact closed); **1** = Normally closed (input active with contact open).	---	0/1	0
i1	Fan thermal protection input type (230 Vac). Same as **i0**.	---	0/1	0
i3	Safety thermal protection input type (230 Vac). Same as **i0**.	---	0/1	0
i4	Electrical absorption input contact type (230 Vac). Same as **i0**.	---	0/1	0
i6	Oven rack input contact type (clean contact). Same as **i0**.	---	0/1	0

Par.	Description	MU	Range	Default
	VENT OUTPUT group			
u0	Vent output contact type. **0** = Normally open (vent open with contact closed); **1** = Normally closed (vent open with contact open).	---	0/1	0
u1	Utility managed by the vent output. **0** = Vent ON/OFF; **1** = Vent motorised in open/closed mode (see **u2**, **u3** and **u4**); **2** = Vent motorised in open/45°/closed mode (see **u2**, **u3, u4** and **u5**).	---	0...2	0
u2	Duration of vent output inhibiting from the end of the short vent opening pulse and from the end of the long vent closing pulse (only if **u1** = 1) (see **u3** and **u4**).	dS	0...600	120
u3	Duration of the short vent opening pulse (only if **u1** = 1), see **u2** and **u4**.	dS	0...600	10
u4	Duration of the long vent closing pulse (only if u1 = 1) (see **u2** and **u3**).	dS	0...600	30
u5	Vent power supply output off delay for partial closure to 45° (only if **u1** = 2) (see **u2**, **u3** and **u4**).	dS	0...600	75
	EXTRACTOR HOOD group			
k2	Maximum hood activation duration. **k2** = 0 the hood is off.	s	0...100	10
	CLEANING group			
w0	Pre-cleaning phase working Setpoint.	°C/°F	0.0...500.0	60
w1	Pre-cleaning activation enable differential.	°C/°F	1.0...99.0	10
w2	Pre-cleaning time.	min	0...240	10
w3	Cleaning phase working Setpoint.	°C/°F	0.0...500.0	70
w4	Liquid detergent feed time.	s	0...240	5
w5	• Liquid detergent action time. • Cleaning time (in cleaning with tablet).	min	0...240	10
w6	• Steam feed time for liquid detergent action. • Detergent action time (in cleaning with tablet).	min	0...240	10
w7	Short rinse time.	s	0...240	10
w8	• Rinse aid phase working Setpoint. • Cleaning preparation working Setpoint (in cleaning with tablet).	°C/°F	0.0...500.0	70
w9	• Rinse aid feed time. • Water outlet pump activation time after the end of the cycle (in cleaning with tablet).	s	0...240	5
w10	• Rinse aid action time. • RINSEN phase time (in cleaning with tablet).	min	0...240	10
w11	• Steam feed time for rinse aid action. • Cleaning preparation time (in cleaning with tablet).	min	0...240	10
w12	Rinsing phase working Setpoint.	°C/°F	0.0...500.0	60
w13	Rinsing phase duration.	min	0...240	5
w14	Drying phase working Setpoint.	°C/°F	0.0...500.0	100
w15	Drying phase duration.	min	0...240	10
w16	Water outlet pump deactivation delay.	s	0...240	15
w17	Cleaning type. **0** = Disabled; **1** = With liquid detergent, without recirculation; **2** = With detergent tablet and recirculation; **3** = Reserved.	---	0...3	1
w18	Load activation enable band during phase 2B - Cleaning Preparation (in cleaning with tablet).	°C/°F	**r0**...99	7
w19	Cleaning drainage probe Setpoint (in cleaning with tablet).	°C/°F	0...500	70
w20	Detergent/rinse aid output action (only if **w17** = 1). **0** = Single relay activation; **1** = Combined with water solenoid valve relay.	---	0/1	1
	CHAMBER BURNER group			
b0	Maximum number of chamber burner revolutions.	rpm	2500...6000	5000
b1	Minimum number of chamber burner revolutions.	rpm	1500...4000	2500
b2	Number of chamber burner ignition revolutions.	rpm	1000...3000	1000
b3	Chamber temperature proportional regulation band.	°C/°F	1.0...99.0	10

Par.	Description	MU	Range	Default
b5	Number of chamber burner alarm revolutions.	rpm	200...1000	200
b6	Chamber burner revolutions alarm delay.	s	10...120	10
b7	Maximum number of boiler burner revolutions.	rpm	2500...6000	5000
b8	Minimum number of boiler burner revolutions.	rpm	1500...4000	2500
b9	Number of boiler burner ignition revolutions.	rpm	1000...3000	1000
b10	Boiler temperature proportional regulation band.	°C/°F	1.0...99.0	10
b12	Number of boiler burner alarm revolutions.	rpm	200...1000	200
b13	Boiler burner revolutions alarm delay.	s	10...120	10
b14	Oven type. **0** = Electric oven; **1** = Gas oven with modulated forced draught burner; **2** = Gas oven with ON/OFF natural draught burner.	---	0...3	0
b15	Burner status while inhibited (for version with natural draught burner only). **0** = OFF; **1** = ON.	---	0/1	0
b16	HALL sensor. **0** = None; **1** = Present.	---	0/1	1
b17	Flame detection. **0** = None; **1** = Present.	---	0/1	1
b18	Number of MODBUS burners.	---	0...3	1
b19	Chamber burner consumption.	m^3/h	0...1000	0
b20	Boiler burner consumption.	m^3/h	0...1000	0
b21	Number of pulses/revolution for calibration of forced draught burner fans.	---	1...6	1
b22	Proportional band for controlling calibration of forced draught burner fans.	---	1...64000	34000
b23	Integral time for controlling calibration of forced draught burner fans.	---	1...64000	30
b24	Minimum offset for fan speed controlling calibration of forced draught burner fans.	%	0...1000	100
	COOKING group			
e3	Temperature compatibility percentage for inserting recipes in Multicook cooking mode.	%	0...100	10
e4	Humidity compatibility percentage for inserting recipes in Multicook cooking mode.	%	0...100	20
e5	Number of trays for inserting recipes in Multicook cooking mode.	---	4...20	10
e7	Chamber temperature recording (with sampling of 1 minute). **0** = Chamber probe temperature HACCP; **1** = Probe temperature HACCP on display.	---	0/1	1
e8	Chamber temperature cooling while cooking alert band.	°C/°F	0.0...240.0	20
e10	Enable steam injection during convection cycle. **0** = No; **1** = Yes.	s	0...240	5
e11	Enable heater during steam cycle. **0** = Disabled; **1** = Enabled.	---	0/1	1
e13	Boiler drain type with machine OFF. **0** = Drain only; the output remains active for time period **t21**; **1** = Drain after reaching the maximum water level (see **t41** and **e13**).	---	0/1	0
e16	Values loaded in manual cooking. **0** = Values from the last setting; **1** = Default values.	---	0/1	0
e17	Light on when door opened. **0** = Light OFF; **1** = Light ON.	---	0/1	0
e18	Chamber temperature cooling while cooking alert band.	°C/°F	0.0...100.0	10
e19	Type of sound used. **0** = External buzzer (optional); **1** = External speaker (optional).	---	0/1	0
e20	Heater consumption.	Wx10	0...5000	1000

Par.	Description	MU	Range	Default
e21	Additional heater consumption.	Wx10	0...5000	1000
e22	Chamber fan consumption at maximum speed (if **F0** = 0,1,3,4).	W	0...32000	600
e23	Chamber fan consumption at minimum speed only if **F0** = 2 (if **F0** = 2 **e22** is considered as maximum speed).	W	0...32000	400
e24	Steam generator water consumption.	cl/min	0...32000	1
e25	Cleaning cycle water consumption.	l/min	0...32000	6
e26	Detergent consumption.	ml/s	0...32000	15
e27	Rinse aid consumption.	ml/s	0...32000	15
e28	Boiler heater consumption.	Wx10	0...5000	1000
	INVERTER group			
S202	Acceleration ramp duration.	dS	2...2000	30
S203	Deceleration ramp duration.	dS	2...2000	50
S204 (5)	Maximum motor speed.	rpm	**S205**...6000	1500
S205 (5)	Minimum motor speed.	rpm	150...**S204**	300
S206	Motor rotation direction. **0** = Clockwise; **1** = Anticlockwise.	---	0/1	0
S403	Inverter communication alarm timeout. **0** = Disabled.	dS	0...600	20
S501 (4)	Nominal current.	dA	1...94	55 (5)
S502 (4)	Nominal voltage.	V	50...400	230
S503 (4)	Nominal frequency.	Hz	0...100	50
S504 (4)	Number of pole pairs.	---	1...8	2
S506 (4)	Nominal motor revolutions.	rpm	1...3000	1410 (5)
S511	Motor overload.	%	0...50	50
S512	Maximum motor overload time.	dS	0...60	30 (5)
S513	Stop type. **1** = Stop with ramp; **2** = Stop with DC voltage injection; **3** = Stop with ramp + DC voltage injection.	---	1...3	1
S515	Braking time in DC voltage (only if **S513** = 2, 3).	dS	0...200	0
S516	DC bus voltage percentage applied to the motor during braking with DC voltage (only if **S513** = 2, 3).	%	0...50	0
S529	PWM carrier frequency.	kHz	5...16	5
S534	Motor phase loss alarm sensitivity percentage.	%	0...100	0
S602	Undervoltage level.	V	120...**S603**	200
S603	Overvoltage level.	V	**S602**...450	420

Par.	Description	MU	Range	Default
	DIGITAL OUTPUT CONFIGURATION group			
u1c	**out1** relay configuration. **0** = Reserved; **1** = Heating; **2** = Vent (open / closed); **3** = Fan mode 1; **4** = Fan mode 2; **5** = Fan mode 3; **6** = Extraction; **7** = Technical compartment fan; **8** = Direct chamber injection; **9** = Chamber heating booster; **10** = Chamber light; **11** = Liquid detergent injection; **12** = Water drainage; **13** = Water recirculation; **14** = Water filling; **15** = Rinse aid injection; **16** = Smoking; **17** = Vent (45°); **18** = Reserved; **19** = Steam reduction.	---	0...19	1
u2c	**out2** relay configuration. Same as **u1c**.	---	0...19	2
u3c	**out3** relay configuration. Same as **u1c**.	---	0...19	19
u4c	**out4** relay configuration. Same as **u1c**.	---	0...19	0
u5c	**out5** relay configuration. Same as **u1c**.	---	0...19	3
u6c	**out6** relay configuration. Same as **u1c**.	---	0...19	6
u7c	**out7** relay configuration. Same as **u1c**.	---	0...19	7
u8c	**out8** relay configuration. Same as **u1c**.	---	0...19	8
u9c	**out9** relay configuration. Same as **u1c**.	---	0...19	9
u10c	**out10** relay configuration. Same as **u1c**.	---	0...19	16
u11c	**out11** relay configuration. Same as **u1c**.	---	0...19	10
u12c	**out12** relay configuration. Same as **u1c**.	---	0...19	15
u13c	**out13** relay configuration. Same as **u1c**.	---	0...19	12
u14c	**out14** relay configuration. Same as **u1c**.	---	0...19	11
u15c	**out15** relay configuration. Same as **u1c**.	---	0...19	14

12. DIAGNOSTICS

Chapter content

This chapter contains the following information:

The table below lists alarms with corresponding solutions. The warning is given by the alarm icon ⚠ and notice pop-up. Each alarm is recorded in the Alarms menu.

12.1 TABLE OF ALARMS

Alarm code	Cause	Effects	Solution
Chamber probe alarm	• Probe not working • Probe not connected properly • Incorrect probe type	• Alarm code displayed • Cooking cycles OFF • Cleaning cycles OFF • If alarm ON during cooking cycle, cooking is stopped • Temperature regulation OFF	• Check the probe type (**PO**) • Check the probe wiring • Change the probe type • Automatic reset
Needle probe alarm	• If **P2**≠0 and steam cooking: • Probe not working • Probe not connected properly • Incorrect probe type	• Alarm code displayed • Delta T cooking cycle OFF • Core cooking cycle OFF • If alarm ON during Delta T or Core cooking cycle, cooking is stopped	
Steam reduction probe alarm	• Probe not working • Probe not connected properly • Incorrect probe type	• Alarm code displayed • Steam reduction management OFF	
Boiler probe alarm		• Alarm code displayed • Temperature regulation OFF	
Power supply failure alarm	Power supply cut off	• Alarm code displayed • If alarm ON and device ON or OFF, when the power supply is restored the device will switch off • If alarm ON during cooking cycle: • If power failure lasts < **R12**, when the power supply is restored it will resume from the start of the phase in which it was stopped • If power failure lasts > **R12**, when the power supply is restored the cycle will be stopped	• Check the power supply source • Automatic reset
Base board communication alarm	No communication with the base board	• Alarm code displayed • If alarm ON and device ON or OFF, cooking cycles cannot be started • If alarm ON during a cooking cycle, does not affect cooking	• Restore communication with the base board • Automatic reset
Chamber high temperature alarm	Temperature **Pb1** > **A1**+**A0** for time period ≥ **A2**	• Alarm code displayed • No effect	• Check chamber probe operation • Check system operation • Wait for the temperature < **A1-A0** for time period > **A2** • Automatic reset
Base board high temperature alarm	Board temperature > **A4**	• Alarm code displayed • If alarm ON and device ON, cooking cycles cannot be started • If alarm ON during cooking cycle, cooking is stopped • Vent ON • Technical compartment fans ON • Other digital outputs OFF • If the board switches off with the alarm ON, the buzzer/speaker is activated	• Wait for the temperature < **A4** • Automatic reset
 **Door open input alarm**	Door switch input activated	• Alarm code displayed • If alarm ON during cooking cycle: • Temperature regulation OFF • Fans OFF • Steam injection OFF	• Check for and remove the cause of the alarm on the door switch input • See **i0** • Automatic reset

Alarm code	Cause	Effects	Solution

Fan thermal protection alarm	Fan thermal protection digital input activated	• Alarm code displayed
		• If alarm ON during cooking cycle:
		  • Temperature regulation OFF
		  • Fans OFF
			• Check for and remove the cause of the alarm on the thermal protection input
			• See **i1**
			• Automatic reset

Electrical absorption alarm	Electrical absorption digital input activated	• Alarm code displayed • If alarm ON during cooking cycle: • All digital outputs OFF	• Check for and remove the cause of the alarm on the thermal protection input • See **i4** • Automatic reset
Minimum water level alarm	Water does not reach the minimum level for time period > **t27** and the corresponding digital input is activated	• Alarm code displayed • Boiler temperature regulation OFF	• Check for and remove the cause of the alarm on the minimum level digital input • See **t27** • Automatic reset
Maximum water level alarm	Water exceeds the maximum level for time period > **t28** and the corresponding digital input is activated	• Alarm code displayed • Boiler temperature regulation OFF	• Check for and remove the cause of the alarm on the maximum level digital input • See **t28** • Automatic reset
Water drain alarm	No water drainage	• Alarm code displayed • Boiler temperature regulation OFF	• Check the boiler water minimum level and maximum level digital inputs • See **t21** • Automatic reset
Boiler module communication alarm	No communication with boiler module	• Alarm code displayed • Boiler module regulation OFF	• Restore communication with base board and boiler module • Automatic reset
Boiler safety alarm	Thermal protection digital input activated	• Alarm code displayed • Boiler module regulation OFF	• Check for and remove the cause of the alarm on the thermal protection input • Manual reset
Chamber/boiler burner inhibited alarm	Burner inhibiting digital input activated and 3 reset attempts unsuccessful	• Alarm code displayed • Chamber burner output OFF • Boiler burner output OFF	• Check for and remove the cause of the burner inhibiting • Automatic reset
Chamber/boiler burner alarm	Speed read by the HALL sensor > than the speed set for the boiler burner for a value > **b12** and a time period > **b13**	• Alarm code displayed • Chamber burner output OFF • Boiler burner output OFF	• Check centrifugal fan operation • Check Hall sensor operation • See parameters **b5** and **b6** (chamber burner) • See parameters **b12** and **b13** (boiler burner)
Control module compatibility alarm	User interface not compatible with the control module	• Alarm code displayed • Cycle in progress stopped	Make sure the user interface and the control module are compatible
Thermal protection alarm	Safety thermostat digital input activated	• Alarm code displayed • If alarm ON during cooking cycle: • Cycle OFF	• Check for and remove the cause of the alarm on the safety thermostat input • See **i3** • Automatic reset
Control module probe alarm	• Probe built into the control module not working • High technical compartment temperature	• Alarm code displayed • Technical compartment fans ON	• Switch the device off and on again • Check technical compartment temperature and if necessary, lower it
RTC (clock) alarm	Clock (RTC) not working alarm	Functions connected to the RTC not present or not synchronised with the actual time	• Set the correct time/date • If the error persists, replace the device (RTC battery exhausted)

Alarm code	Cause	Effects	Solution
Inverter communication alarm	No communication with inverter	• Alarm code displayed • Functions connected to the inverter OFF	• Restore communication with the inverter • Make sure the inverter is powered correctly • Automatic reset
Inverter undervoltage alarm	Inverter voltage < **S602**	• Alarm code displayed • ?????	• Alarm reset from specified inverter input • Check motor specifications • Check wiring • Manual reset
Inverter overvoltage alarm	Inverter voltage > **S603**	• Alarm code displayed • ?????	
Inverter overcurrent alarm	Inverter current absorption > **S601**	• Alarm code displayed • ?????	
Inverter overload alarm	When the amount of energy according to logic **I x t** > **S511** and **S512**	• Alarm code displayed • ?????	
Inverter cooler overheating alarm	Motor temperature > **S606**	• Alarm code displayed • ?????	Automatic reset when the cooler temperature < **S606** - 10 °C (50 °F)
Phase Loss alarm	• Motor not connected correctly • Incorrect **S534** sensitivity	• Alarm code displayed • ?????	

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