

# **Instruction Manual and Installation**

# **Electric regenerators**

Models:

RG 311 / RG 611 / RG 1011 / RG1021



ATTENTION: Please, read these instructions before using the unit.

# INDEX

1.	CE CERTIFICATION				
2.	WARRANTY				
3.	GENERAL AND SAFETY STANDARDS				
4.	SAFETY INSTRUCTIONS, TRANSPORT AND MAINTENANCE	7			
4.1	Unpacking				
4.2	Tranport	7			
4.3	Preliminary operations				
4.4	Placing the unit				
4.5	Electric installation				
4.6	Water supply installation				
4.7	Vapours exhaust	10			
4.8	Ventilation	10			
4.9	Drain connection				
5.	INSTRUCTIONS FOR USE OF THE DISPLAY	12			
5.1	Key Function				
5.2	Display Icons				
5.3	Display Visualization				
5.4	Operation in manual cooking mode				
5.5	Temperature adjustment				
5.6	Cooking time adjustment				
5.7	Humidity adjustment				
5.8	Automatic preheating				
5.9	Running a cooking cycle in manual mode				
5.10 Program operation					
5.11	5.11 Various functions				

6. REPORTS AND ALARMS

18

# 1. Ce Certification

# DECLARACIÓN UE DE CONFORMIDAD DECLARATION EU OF CONFORMITY

Directiva(s) del Consejo con la(s) que se declara conformidad: Council Directive(s) to which conformity is declared:

DC 2014/35/EU + DC 2014/30/EU + DC 2011/65/EU

Aplicación de las Normas:

Application of the Standards: UNE-EN 60335-1:2012 + AC:2014 + A11:2014 + A13:2017 + A14:2014 +A2:2020 + A1:2020; UNE-EN 60335-2-42:2004 + Corr:2007 + A1:2008 + A11:2012; UNE-EN 55014-1:2017 + A11:2021; UNE-EN 55014-2:2015; UNE-EN 61000-3-2:2014; UNE-EN 61000-3-3:2013 +A1:2020

Fabricante / Manufacturer's name:	FM CALEFACCIÓN S.L. CIF: B-14343594
Dirección / Manufacturer's address:	CTRA. de Rute km.2.700, C.P.:14900, Lucena, Cordoba, Spain
Tipo de aparato / Type of device:	REGENERADOR / REGENERATOR
Marca / Trade.:	FM CALEFACCIÓN
Modelo / Model no.:	RG 311 / RG 611 / RG 1011 / RG1021

Nosotros, los abajo firmantes, declaramos bajo nuestra exclusiva responsabilidad que el equipo especificado cumple con la(s) Directiva(s) y Norma(s) mencionadas

We, the undersigned, hereby declare under our sole responsibility that the specified equipment is in conformity with the above Directive(s) and Standard(s)



Lugar / Place: Lucena

Fecha / Date: 01/01/21

(Firma / Signature) **B-14343594** (Nombre / Full name)

# 2. Warranty

The warranty period is **12 months** from the date of the purchase of the unit.

The warranty does not cover damages to the glass, lamps, door seals, insulating materials or damages caused by improper installation, maintenance, or lack of maintenance, repair and misuse.

To process the repair of a unit under warranty or for any other query, please contact your distributor and reference to the following description table:

Distributor:			
Unit model:	Serial number:		
Name:	Date of the request:		
Fault description:			
Address:			
Contact telephone number:	Time frame:		

Warning: improper adjustment, installation, service or maintenance of the unit may lead to damages to

the goods or persons. For this reason, read this manual thoroughly before starting the unit.

# 3. General and safety standards



# Safety standards and responsability for installing and maintaining

- Read this manual thoroughly before starting the unit and keep it for further consultation. If you need technical support, contact an authorised technical service.
- Installation, starting and maintenance of the oven shall be carried out by qualified technicians in accordance with the scale and technical characteristics specified by the manufacturer. Likewise, observe the current legislation on safety and with regard to installations and occupational safety in force in the country of use.
- Check that the unit is unplugged from the power supply before installing or maintaining.
- Before installing the unit, check that installations are in accordance with the current legislation in the country of use and refer to the indications on the data plate.
- Do not manipulate or disconnect the unit safety devices. This will invalidate the warranty.
- Damages, injuries or fatal accidents could be produced due to the non-observance of the manufacturer's indications.
- If the oven is installed on supports or overlaying parts, use the ones supplied by FM only and follow the assembly instructions inside the packaging.
- Non-original spare parts do not ensure that the correct operation of the unit and will imply the loss of the warranty.
- The oven must be only used by duly-trained technicians.
- The oven data plate provicdes necessary technical information for repair or maintenance. Therefore, avoid removing, damaging or modifying it.
- Failure to comply with these safety standards will release FM from any responsibility and the warranty will become null and void.



# Safety standards for use

- Read this manual thoroughly before starting the unit and keep it for further consultation. If you need technical support, contact an authorised technical service.
- If the unit is not used for a long time, all connections must be interrupted (power supply and water).
- The oven must only and exclusively be used for the purpose it was designed, it is to say, for baking products such as fresh or frozen bread or pastries. Any use other than that mentioned may damage the unit.
- Do not put products into the oven with a high alcohol concentration.
- The outside and inside of the oven should be cleaned frequently to ensure hygiene and proper performance. Do not use abrasive or flammable products, which may damage the unit, to clean those surfaces.
- Usage and cleaning different from what is recommended by the manufacturer and with non-authorised products may damage the unit and the user.

- Do not use direct water jet on the unit in order to avoid damaging its components.
- If the unit has a humidifier, the use of an anti-lime filter at the water supply inlet is recommended. Otherwise, some oven components may be damaged. Faults caused by lime or water sediment are not included on the warranty.
- Failure to comply with these safety standards will release FM from any responsibility and the warranty will become null and void.



- Read these warnings carefully and follow its indications when the oven is working or not completely cooled down.
- Only touch the unit control elements and the door handle. Avoid touching any other external element of the oven as it may reach temperatures over 60<sup>a</sup>C.
- Wear thermal mittens or similar to move or handle containers or trays inside the baking chamber.
- Open the oven door slowly and be careful with high temperature steam coming out from the baking chamber.



- If you do not clean the unit properly or as ofter as needed, greases and food leftovers will be accumulated in the baking chamber and then, become inflamed.
- Only use the products recommended by the manufacturer. Using the products may damage the unit and invalidate the warranty.
- Only use home-use cleaning products and a soft damp cloth to clean the outside coating. Do not use corrosive or irritating substances.

# 4. SAFETY INSTRUCTIONS, TRANSPORT AND MAINTENANCE

# 4.1 Unpacking

**Visible damages:** when receiving the material, enter a detailed description of the break in the PDA or in the delivery note.

General comments such as "damaged packaging" or "damage can be seen", etc. will not be accepted. Clear photographs showing the damaged good and packaging must be provided.

**Hidden damages:** when receiving the material and within 24 hours after reception, once the hidden damage has been checked, photographs showing the damaged good and its corresponding packaging must be provided. The transport agency label must be clearly visible. Photographs showing the contect only and exclusively will not be accepted.

In either case, transport incidences should be reported to FM Industrial to manage the replacement of the machine.

If visible damages are detected when receiving the packaged machine, indicate "hits to the oven" at the time of the delivery, take photos of the damages and transport agency label of the packaging. Please, contact FM Industrial immediately.

If package is apparently in good conditions, and damages are detected when unpacking, place the original packaging again on the machine, take pictures of the packaging and transport Agency label on the packaging. Next, unpack again and take photos of damages to the machine. Please, contact FM Industrial immediately.

# 4.2 Transport

Before transporting the unit to its installation site, make sure that:

- Fits through the door
- The floor withstands its weight

Transport should only and exclusively be carried out by mechanical means, such as pallet Jack, and always on a pallet.



## 4.3 Preliminary operations

Remove the protection film from the unit. Clean the adhesive residues with an appropriate solvent. Never use abrasive or acid products or tools that may damage the surface.

# 4.4 Placing the unit

Place the oven in the selected work place and keep a safe distance as indicated below. Check that the unit has sufficient cold air inlets through the ventilation registers ensuring correct operation. Otherwise, the unit may overheat, and some components may be destroyed.

- If the oven is installed on an auxiliary support, it must be fixed to it.
- The facilities must be conditioned and meet the regulations in force with regard to safety in installations.
- In addition, the unit must be protected from atmospheric agents.
- The ambient temperature may range between 5° and 35°C maximum for correct operation of the unit.
- Humidity should not exceed 70%.



We recommend leaving a 120 mm gap for repair and if there are heat sources or combustible elements, that safety distance must be 700 mm mínimum. We also recommend ensuring good ventilation of the unit to prevents overheating its components.



We recommended leaving a free working space of around 500 mm for maintenance operations.

### 4.5 Electrical connection

Before connecting the unit to the power supply, check that the electrical grid characteristics match those described in the technical characteristics of each unit. The electrical installation must be performed by authorised technicians and meet the regulations in force.

Preferably, the electrical connection should be performed by mounting an electrical outlet of appropriate type and capacity for the maximum current absorbed by the oven phases. If not possible, it could be directly connected to the circuit breaker on the electrical control board.

In order to prevent damages from unintentional reset of the power failure thermal device, this unit should not be fed by an external control device, such as timer, or be connected to a circuit whose supply is regularly interrupted.

An own power supply line protected by an adequately sized magneto-thermic switch and a fixed supply connection is recommended.

Observe the colour code of cables. Innapropriate connection may damage the unit.

	Grey (R)	Black (S)	Brown (T)
PHASES			
		Blue (N)	
NEUTRAL			
		Yellow / Green 🖶	
GROUNDING			

### **COLOUR CODE:**

### 4.6 Water supply installation

If the unit is fitted with a humidifier, the use of an anti-lime filter at the water supply inlet and a check valve is recommended. The oven has a  $\frac{3}{4}$  connection for water inlet.

Besides, installing a "digimeter" or digital instrument for measuring the litres of water consumed by the oven is recommended. In this way, you will know when the filter should be replaced.

**Important:** before connecting the water supply, check that there are no residues in the pipe. The pressure of the incoming water should range between 2 and 3 bar, with temperature not highter than 30°C. If pressure is higher than these values, a pressure reducer at the inlet should be installed.

The inlet water must have a pressure between 1 and 3 bar, with a temperature not exceeding 30 °C. If the pressure is higher than these values, a pressure reducer should be installed at the inlet.

The inlet water must have a pressure between 1 and 3 bar, with a temperature not exceeding 30°C. If the pressure is higher than these values, a pressure reducer should be installed at the inlet.

### 4.7 Salida de Gases

Los gases de salida pueden ser húmedos y llegar a una temperatura elevada, por lo que para canalizarlos no utilicen tubos de materiales que no garanticen una absoluta estabilidad térmica de hasta 200ºC.

Para el tratado de los vapores de la cocción es posible adpatar un condensador que permitirá condensar los vapores y expulsarlos a un desagüe. El horno esta dotado de una conexión en la parte posterior para dicha función.

#### 4.8 Vapour exhaust

The appliance does not necessarily require the use of an extractor hood, but if installed, the following should be considered: Install a grease filter in the area protruding from the hood.

- Make sure that the hood complies with current regulations.
- The hood should protrude about 300-500 mm from the front of the unit.
- Install a grease filter in the area protruding from the hood.

### 4.9 Drain connection

- The oven drain connection must be made with discharge pipes that guarantee thermal stability, as the furnace gases can reach high temperatures (85-95°C).
- It is advisable to connect the oven drain pipe throught a corresponding siphon to contain the oven vapors. This pipe must maintain a minimum slope of 4% at all times to ensure correct operation.
- The drain pipe must have a diameter NOT smaller tan the drain connection.
- Be specific on each device. Otherwise, make sure that the main pipe is dimensioned to secure the proper flow abd without obstacles.
- Be free of bottlenecks.

# 5. Instructions for the use of the display

Attention! Read carefully these instructions before starting up the device.

# 5.1 Key function





,

,

Pressing this key, you could turn on and off the device.



When the oven is turned on, press this key to start the cooking process.



When the oven is turne don, press this key to allow a cooking time.



Decrease the value that appears on the screen.



Increase the value that appears on the screen.



Used to program the humidity or to perform manual humidity injections during firing.



In the cooking it is possible to set up to 3 different cooking phases.



With the oven turned ON you would be able to store or check the ones already stored, with a total amount of 99.

#### TIME/HUMIDITY Display

It allows you to visualize the humidity and time programmed.

#### TEMPERATURE/PROGRAMS Display

It allows you to visualize the real temperature and programmed ones by the user, alongside with the programs.



## 5.2 Display icons

#### TEMPERATURE Icon

When it is flashing, it means that we are programming the temperature.

When it is constantly illuminated, it indicates the actual temperature inside the oven.

#### PREHEATING Icon

When the symbol is enlighted that means that the oven will create a previous preheating to the cooking process. During this process, the oven will reach 30°C above the established temperature. Once the preheating is finished, the device will perform an acoustic signal notifying that you can already place your product in the oven.

#### CLOCK Icon

When the icon is enlightened in red, it shows the time visualization on the display.

#### HUMIDITY Icon

The humidity key is enlightened in green while we keep the button pressed, to notify that we are injecting humidity.

#### RESISTORS Icon

When we have a cooking cycle iniciated, this icon will turn on in green colour if the resistors are activated. When it will turn on in red colour, that means that the resistors are off.

#### PROGRAMS Icon

It lights red to indicate that you have entered programming mode.

#### OPEN DOOR Icon

It lights red to indicate that the door is open. It lights red to indicate that the door is closed.

#### PHASES Icon

Only visible with cooking programs. F1,F2 and F3 lights red one by one to indicate in which phase of the program are working.

### 5.3 Display visualization



#### TIME/HUMIDITY Display

When time icon on steady, it shows the remaining time value.

When time icon flashing, it shows the programmed time value.

When humidity icon flashing, it shows the humidity value programmed for cooking.

When the time and humidity icons are off, it displays an alarm code. See point 6.6.1 "Alarms".

#### TEMPERATURE/PROGRAMSDisplay

With the temperature icon flashing, it shows the programmed cooking temperature.

With the temperature icon on steady, it shows the actual temperature of the cooking chamber (value measured by the probe).

With all icons off, it displays an alarm code.

#### 5.4 Operation in manual cooking mode

When the oven is off it shows "off" on the top display, everything else will be off. Pressing on the ON/OFF button turns the oven on. When the oven is on, the display shows the current temperature value inside the firing chamber (value measured by the probe, "fixed temperature icon") and the TIME/HUMIDITY display shows END (clock icon on). Pressing the increase or decrease button allows you to set a temperature value (see point 6.2.2 "temperature setting").

By pressing on the time button, it allows you the setting of the cooking time (see point 6.2.3)

By pressing the start/stop button, you can start or stop a cooking cycle.

#### 5.5 Temperature adjustment

At the first start-up, the current oven temperature will be shown on the display. By default, it will have a set point temperature of 30°C. At the end of the cycle, the previously set value will be displayed flashing.

When the furnace is switched on, pressing the increase or decrease buttons immediately allows you to set a temperature value (adjustable temperature range from  $30 - 170^{\circ}$ C).

When editing the values, they will be show non the display flashing. To confirm the value, wait 8 seconds or press button 3 "time". Once the value has been confirmed, the flashing will stop. Pressing ON/OFF will delete the set values.

#### 5.6 Cooking time adjustment

When the furnace is switched on, END appears in the lower display (display time). The time range can be set between 00 hours 01 minutes – 15 hours 59 minutes.

Pressing the "increase or decrease" buttons will allow us to set a time value. If we want to set a "continuous mode" of cooking we have to press the decrease button until "INF" appears on the display. If we have chosen the INF time it means that you have set an infinite time and the oven will be running until we press the Start/Stop button. When editing the values, they are always shown flashing on the display. To confirm the values, either wait 8 seconds until they stop flashing or press button 3 "time".

If we are in programming mode, and we need to dispense with one of the three phases, we simply set the END time value for the phase we want to eliminate.

#### 5.7 Humidity adjustment

Ed.:21 - Ver.:01 - 01/01/2021

During firing, the continuous pressure on the humidity button allows the activation of the solenoid valve for a punctual steam injection.

To set the humidity by percentage, when setting the firing parameters, either in a manual program or in programming, press the humidity button. At this point, "OFF" will flash on the lower display. Pressing the increase or decrease button allows you to enter the desired humidity value. Humidity range: 0%-100%. To confirm, press the humidity button again. After confirming, the humidity value dissapears from the display and the cooking time is displayed. When pressing the Start/Stop button to start a firing cycle, if the cycle has a programmed humidity percentage e.g. from 10% to 100%, it will not start injecting water until the actual temperature of the firing chamber has exceeded 85°C. When humidification is active, the humidity icon will be permanently illuminated green when performing each injection.

During steam injection the steam icon will illuminate green. In case of coinciding with a fan rotation change the injection will stop until the fan rotation change is finished.

### 5.8 Automatic preheating

Automatic preheating allows us to preheat the oven before starting the cooking cycle to ensure that the oven is always the desired temperature to start cooking. In this way we will compensate the lemperature loss that exists from the moment we open the door and load the food. To start the cycle it will only be necessary to open the door, introduce the food and close the door and immediately after that time will start to count down.

When the symbol "PRE" is illuminated, it means that the oven will preheat before cooking. During preheating, the oven will rise 30°C above the set temperature. Once the preheating is finished, the equipment will emit an acoustic signal indicating that the product can now be placed in the oven.

To activate preheating, press the time key for three seconds before starting cooking.

To deactivate the preheating, it can be done by pressing the time button for three seconds while setting the cooking parameters, or by opening and closing the door once the cycle has started.

### 5.9 Running a cooking cycle in manual mode

With the oven on and after having set the time and temperature values, pressing and holding the time button for 3 seconds will activate preheating. Then press START/STOP to start the cycle. This will activate the heating element, fan and humidification is programmed. Pressing start /stop stops the cooking cycle at any time and the countdown is locked and the remaining time is shown on the display. If the set value was INF, the value displayed will remain INF. Pressing the Start/Stop button again will restart the cooking cycle with the programmed time.

During the cooking time:

- The upper display (temperature display) will show the actual value of the temperature inside the oven measured by the probe (fixed temperature icon). The lower display (time display) will show the remaining time in hours and minutes (when the set value is greater than 1 hour) and in minutes and seconds (when the set

value is less than 60 minutes) If the INF value is replaced by a certain time, the countdown will start from the time the value is set.

 At the end of a cooking cycle (the time icon is illuminated) the time display shows END flashing, the fans and heating elements are switched off and a buzzer will sound for 1 min. If during this minute, a new time is set, the oven will resume operation for the extra time added with the same temperature settings as before. Otherwise by pressing the Start/Stop button the buzzer is silenced and the display returns to the normal display.

Note: To extend the cooking cycle, simply press the time button and increase the value, then press the time button again to confirm and the oven will resume cooking.

5 minutes after the cooking ending if there is no operation made over the oven, it will authomatically turn off. To reactivate it you only have to press on the ON/OFF key.

### 5.10 Program operation

The memory card can store up to 99 programs.

### Store of a new program

To store a new cooking program, you shall perform the following procedure:

- Press button 8 "Recipe" which will allow you to enter the progamming mode. The upper display will flash "Menu" indicating that you are in Manual mode. Press the decrease or increase buttons to select the program that you want to set and save (e.g. P25). To confirm you can either wait 10 seconds until it stops flashing or press the recipes button. The display will show the values associated with the recipe, if you have never used it, the values that appear are the default values (30°C temperature and END in time, off in humidity and phase 1).
- Modify the values of time, temperature, humidity...
- If you wish to add more phases to the firing program, press button 7 "phases" and the icon of the next phase to be programmed (F1, F2 or F3) will light up. Then modify the time, temperature and humidity values for this new phase.
- Finally, press and hold the recipes button for 4 seconds to store it. The memorization will be effective with a sound and the display will show the program number that we have previously selected to store it.

For the programmed settings to be executed correctly, it is necessary to memorize the recipe, otherwise the program will not start correctly.

If we want to know which recipe are we working on, we simply have to click on the recipe button and the recipe number will appear.

To edit a program, you must follow the next procedure:

- Click once on the recipes below.
- Choose the program you want to edit.
- Modify the values of time, temperature, humidity...
- Press and hold the recipes button for 4 seonds until a beep sounds to indicate that the data has been stored correctly.

### Cooking phases of a program

When you select the "PROGRAM" mode, the phase button allows you to see the steps that make up the program (each program can have up to 3 phases). By pressing the button, we can switch from one phase to another (the F1, F2 and F3 lights when illuminated will indicate which phase of the program we are in). The parameters time, temperature and humidity can be changed at any time.

### Using a stored program

To use a cooking program that has already been stored, follow the procedure below:

- Press the "recipes" button and you will enter the programming mode. In the upper display, "Menu" will appear flashing.
- Use the increase or decrease buttons to select the desired recipe (e.g. P25) and when confirming, the values associated with this recipe will be displayed.
- Press the Start/Stop button to start or stop the selected program.

### 5.11 Various functions

#### Opening the door of the oven

When the oven door is opened and cooking is interrupted, icon #7 will illuminate green and the timer will freeze and the oven will pause until the door is closed again. Once the door is closed the cycle will resume where it left off.

#### Reversing the fan rotation

The oven motor stops to allow for a change in the direction of rotation. The oven changes the direction of rotation of the motors every 120 seconds and leaving a pause of 16 seconds to stop the motors. While this operation is being performer, himidification is stopped.

# 6. <u>Reports and alarms</u>

When a malfunction occurs in the oven, an alarm code will appear on the lower display (time/humidity display) and the oven will beep to alert of the malfunction that has occurred.

To silence the alarm, simply press the START/STOP button.

Alarm Code	Description
	Alarm description:
	Core Probe
	Solution:
	- Check the chamber probe
Alarm Fr01	- Check that the chamber probe is correctly connected to the power board
	- If the problem continues, replace the probe
	- In the problem continues, replace the proble.
	Main consequences:
	If the alarm is activated when the device is ON no cooking cycle can be
	started
	- If the alarm is activated during a cooking cycle, this cycle will stop
	Alarm description:
	Safetythermostat
	Salety memostat
	Solutioner
	Solutions.
	- Reset the safety thermostat.
Alarma Er03	- Check that the safety thermostat is dully connected.
	- Check that the safety thermostat of the power pale is appropriately
	connected.
	If the elermic activated when the device is ON as eaching evels can be
	- If the alarm is activated when the device is ON, no cooking cycle can be
	staned.
	- in the alarm is activated during a cooking cycle, this cycle will stop.
	Description of the alarm:
	Overneating of the oven power board.
Alarma Er04	Solutions:
	- Check that the plate cooling fan works appropriately.
	- Check that the oven is installed according to the safety distances shown in
	this manual and that there is no element obstructing the outlet of hot aire
	through the ventilation holes.
	- If the alarm does not stop, contact the Technical Support Service.

	Main consequences:		
	- If the alarm is activated when the device is on, no cooking cycle can be		
	started.		
	- If the alarm is activated during a cooking cycle, this cycle will stop.		
	Alarm description:		
	No communication between the control module and the display		
	Solutions		
Alarma Er05	- Check the wiring between the control module and the display.		
	- If the alarm persists, notify the Technical Assistance Service.		
	Main consequences:		
	- If this alarm occurs when the device i son, a firing cycle cannot be started.		
	- If the alarm occurs during a firing cycle, the firing cycle will be interrupted.		
	Alarm description:		
	Chamber overtemperature. Occurs when the chamber temperature exceeds		
	310°C.		
	Solutions:		
Alarma Er06	- Wait for the oven to cool down.		
	- If the alarm persists, contact the Technical Assistance Service.		
	Main consequences:		
	- If this alarm occurs when the device is on, it will not be possible to start a		
	firing cycle.		
	- If the alarm occurs during a firing cycle, the firing cycle will be interrupted.		
	Alarm description:		
	Firmware error.		
	Solutions:		
Alarma Fr09	- Notify the Technical Assistance service.		
	Main Consequences.		
	- If this alarm occurs when the device i son, it will not be possible to start a		
	cooking cycle.		
	- If the alarm occurs during a cooking cycle, the cooking cycle will be		
	interrupted.		



FM CALEFACCIÓN S.L. B-14343594 Carretera de Rute, km. 2'700 14900 Lucena (Córdoba) www.fmindustrial.es