TO-75IB Ver.02

TEMPERATURE AND HUMIDITY CONTROLLER FOR RISING OVENS

Therm-on

⚠ Access this manual in the palm of your hand with the **FG Finder** app.

Heating	Refrigeration	Ventilation	Humidity	Buzzer	Solenoid	RTC	Functions lock	Serial programming	IP 65 FRONT Protection level

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⚠ **BEFORE INSTALLING THE CONTROLLER, WE RECOMMEND READING THE INSTRUCTION MANUAL IN FULL TO PREVENT POSSIBLE DAMAGE TO THE PRODUCT.**

⚠ **THROUGH CONTINUOUS DEVELOPMENT, FULL GAUGE CONTROLS RESERVES THE RIGHT TO CHANGE THIS MANUAL INFORMATION AT ANY TIME, WITHOUT PRIOR NOTICE.**

1. DESCRIPTION

The **TO-75IB** controller has been developed for automation of baking processes by controlling the temperature and the process of dough proofers. The instrument allows the configuration of the type of process and the start and end times for the fermentation cycle using an internal RTC (real time clock), providing temperature control for both heating and refrigeration in dough proofers.

 The **TO-75IB** offers the possibility of controlling the humidity by using a temperature and humidity sensor (SB56, sold separately), or using only a temperature sensor and setting a cyclic timer to activate the humidity output, by adjusting the on and off times. It has a digital input used as a door opening sensor and another dedicated digital input for the level sensor input (float ball), which monitors the oven's water tank, while also allowing the activation of a solenoid valve when the water level detected in the tank is below the indicated level. It offers an output to activate the ventilation, internal audible alarm (buzzer) or an output that can be used as external audible alarm, selection the language of the main messages, and easy interface. It offers a function access lock feature to prevent third parties from changing the parameters, airtight front panel that provides high protection against the entry of dirt and moisture, and much more.

2. PRINCIPALES APLICACIONES

Rising and conservation ovens for doughs (night baker).

3. TECHNICAL SPECIFICATIONS

Power supply	85~265Vac (50-60Hz)
Approximate consumption	10VA
Operating temperature	0 to 60ºC / 32 to 140ºF
Control temperature	-9.9 to 70ºC ±1.5ºC (0.1ºC resolution) 14 to 158ºF ±3ºF (1ºF resolution)
Operating humidity	10 to 90% UR (without condensation)
Control humidity	-10 to 0°C (14 to 32°F) = 0 to 90% 0 to 50°C (32 to 122°F) = 0 to 100% 50 to 70°C (122 to 158°F) = 0 to 80% ±UR 5% UR (0.1% UR resolution)
Temperature sensor	SB 56 (not supplied with the product)
Temperature and humidity sensor (Optional)*	SB 56 (no incluido)
Digital inputs	E1: Door opening sensor input E2: Level sensor input (float ball)
Relay outputs	5 relay outputs: REFR / HEAT: 10 (8)A / 250Vac FAN / HUMI / VALV: 5 (3)A / 250Vac
External audible alarm (buzzer) output	12Vcc/30mA (max)
Product / Opening dimensions (mm)	75 x 75 x 100 (WxHxD) / 67,2 x 67,2

* You can use the temperature and humidity sensor SB 56 (sold separately) to control the humidity by adjusting the parameter `i01` - Enable Humidity Sensor as `YES`.

4. INTRODUCTION

Refrigeration mode activated (LED flashing) or REFR output activated (LED on) indication led;

❄

Heating mode activated (LED flashing) or HEAT output activated (LED on) indication led;

Automatic mode activated indication led;

HUMI output activated indication led;

Lower display: Indicates the time in real time, the day of the week, or configuration of parameters;

Upper display: Indicates the values measured by the temperature and humidity sensor, or configuration of parameters;

Temperature units indicator led;

Function lock mode activated indication led;

VALV output activated indication led;

Quick touch: Adjustment of the refrigeration setpoint, heating, type of cycle, and process start and end times;

SET Long touch: Access to the advanced configuration;

Quick touch: Enables or disables the automatic process mode;

AUT

Quick touch: Enables or disables the manual refrigeration mode;

❄

Quick touch: Decreases parameter value when in programming mode;

Long touch: Access to the setpoint adjustment menu or humidity cyclic timer;

Quick touch: Increases parameter value when in programming mode;

Long touch: Access to the adjustment of the real-time clock (RTC);

Quick touch: Enables or disables the manual heating mode;

KEY FUNCTIONS

LED / TECLA — Each key has a led to indicate its function. When the led is on, it indicates that the key is active and can be pressed.

5. INSTALLATION CONFIGURATION

`Fnc EdIt`

Access the installation configuration menu by pressing the **SET** key for 4 seconds until `Func`. is displayed. After that the message `Cod`, will be displayed and then the key **SET** must be pressed again (quick touch). Use the ↑ or ↓ keys to enter the access code 231 and press **SET** (quick touch) again when ready.

Use the ↑ or ↓ keys to select the desired function. The value can be edited with a quick touch on the **SET** key. Use the ↑ or ↓ keys to change the value and press the **SET** key with a quick touch when ready to save the configured value and return to the functions menu. To leave the configuration menu and return to the normal operating mode (temperature indication), press **SET** (long touch) until `- - - -` is displayed.

5.1 Installation setup table

FUN	FUNCTION	DESCRIPTION	MIN	MAX	UNIT	DEF.
`Cod`	Access code (231)	Required when you want to change installation setup parameters	0	9999	-	0
`i01`	Enables humidity sensor	Allows enabling the use of the humidity sensor.	`YES`	`no`	-	`no`
`i02`	Temperature units selection	Selects the temperature units the controller will use for its operation.	°C	°F	-	°C
`i03`	Language selection	Selects the language the controller will use to display messages: `Port` - Portuguese `En9` - English `ESP` - Spanish	`Port`	`ESP`	-	`Port`
`i04`	Enable external audible alarm (buzzer)	Enables or disables the external audible alarm (buzzer). If enabled, the internal audible alarm (buzzer) will be disabled.	`OFF`	`On`	-	`OFF`
`i05`	Internal audible alarm (buzzer) volume	Selects the sound intensity of the internal audible alarm (buzzer). `Min` = low volume `MEd` = medium volume `HiGH` = high volume	`Min`	`HIGH`	-	`MEd`
`i06`	Type of water level sensor (float ball) digital input signal	`no` = normally open contact (NO) `nC` = normally closed contact (NC)	`no`	`nC`	-	`nC`
`i07`	Door digital input signal type	`no` = normally open contact (NO) `nC` = normally closed contact (NC)	`no`	`nC`	-	`nC`

6. OPERATION

6.1 Operating modes

The **TO75IB** controller can operate in two basic operating modes: Automatic mode (observing the configuration of times and type of cycle) and manual mode of refrigeration or heating (configured by the user). You can also turn off the control modes and keep the controller only indicating the temperature and time, i.e. the outputs will not be activated according to the times or setpoints. The keys **AUT**, ❄, and ♨ are used to select these operating modes.

When these keys are pressed, a message will be displayed to inform the selected operating mode, according to the example:

Assuming that the current mode is auto mode and the user presses ❄ intending to switch to manual refrigeration mode, the message `Mod   OFF`, will be displayed, indicating that the previous mode has been disabled. Pressing ❄ again will cause the message `Mod   rEFr`, to be displayed, indicating that the manual refrigeration mode has been activated, i.e. when a mode is already active and you want to change to another mode, press the corresponding key once to switch off the current mode and a second time to activate the desired mode.

6.2 Indications of the operating modes

- When the controller is in automatic mode, led **AUT** will remain active, indicating the selected mode

- When the controller is in refrigeration mode, the indication will be as follows:
The led ❄ will remain on while the refrigeration output is active;
The led ❄ will remain flashing when the refrigeration output is off but the refrigeration mode is selected, regardless of whether the process is automatic or manual;

- When the controller is in heating mode, the indication will be as follows:
The led ♨ will remain on while the heating output is active;
The led ♨ will remain flashing when the heating output is off but the heating mode is selected, regardless of whether the process is automatic or manual.

6.2.1 Automatic mode

When the automatic operating mode is activated, the message `Mod   Aut`. will be displayed. In this mode the controller will act in accordance with the times configured by the user for starting and ending the fermentation cycle, observing the adjustment configured via function `F 13` – Process Mode, where you can configure which action will be taken by the controller after the fermentation cycle ends. Function `F 13` – Process Mode has three possible configurations:

- `Cont` Continuous mode: It allows keeping the controller controlling the fermentation cycle in continuous mode in accordance with the configured times for starting and ending the fermentation cycles and with the days selected to perform the fermentation cycles, which are configured in the function `CYC` in the user's menu. After the fermentation cycle ends, the automatic mode will be maintained, keeping the refrigeration of the oven until reaching the time to start a new fermentation cycle;

- `SnGl` Single mode without refrigeration at the end of the cycle: The controller will control the refrigeration of the oven until reaching the time to start the fermentation cycle and the temperature control and the automatic mode will be switched off after the end of the fermentation cycle;

- $\boxed{5nC2}$ Single mode with refrigeration at the end of the cycle: The controller will control the refrigeration of the oven before the time to start the fermentation cycle and after the end of the cycle. After the end time of the fermentation cycle, however, the automatic control will be switched off and the controller will be in manual refrigeration mode, i.e. if required, the user must activate the automatic mode again to perform a new fermentation cycle, observing the days selected in function $\boxed{CYC}$ in the user's manu.

NOTE: If mode $\boxed{Cont}$ is selected, the controller will control the refrigeration before and after the end of the fermentation cycle, observing the days selected for the fermentation cycles in accordance with the value of function $\boxed{CYC}$. Example:
Fermentation cycle start and end times - $\boxed{In i}$: 02:00 / Time to end the fermentation cycle - $\boxed{End}$: 06:00 / Cycle type - $\boxed{CYC}$: $\boxed{tEr}$ / Process mode - $\boxed{F12}$ = $\boxed{Cont}$.
Each fermentation cycle will start on Tuesday at 02:00 and end at 06:00, but since it is configured for one day only, however in continuous mode, the controller keep refrigerating in automatic mode until the following Tuesday, at 02:00 or until the user disables the automatic mode or changes the schedule.

6.3.2 Manual mode

You can switch between manual heating mode or manual refrigeration mode, thus the user is responsible for changing the operating mode when needed or activating the automatic mode. If the controller is in manual mode, the respective mode configurations, like setpoint and hysteresis, will be observed. The start and end times of the fermentation cycle, however, will not be observed when the manual mode is configured, but only in automatic mode. When heating mode is selected, the message $\boxed{Mod}$ $\boxed{HEAt}$ will be displayed and when refrigeration mode is selected, the message $\boxed{Mod}$ $\boxed{rEFr}$ will be displayed.

6.3.3 Control mode off

It is possible to switch off the control functions together with all the controller's outputs. When the control mode is switched off, the message $\boxed{Mod}$ $\boxed{OFF}$ will be displayed, indicating the controller will no longer activate the outputs, i.e. the environment control of the rising oven is disabled.

6.4 Magnitude views

6.4.1 Three-digit display

In the standard mode (with temperature sensor only), the upper display will show only the value measured by the temperature sensor.
If the humidity sensor is enabled, the upper, three-digit display will alternate between the display of the legend of the respective magnitude and the value measured by the sensors, as follows:
The display will show the legend $\boxed{tMP}$ and then, after a few moments, the temperature measured by the sensor, for instance $\boxed{25.0}$, along with the indication of the respective LED of the temperature units.
After that, the display will show the legend $\boxed{HuM}$ and then, after a few moments, the relative humidity measured by the sensor, for instance $\boxed{70.0}$.

6.4.2 Four-digit display

The lower, four-digit display will show the real time clock for about 10 seconds, switching to the day of week for about four seconds.

7. OPERATIONS - BASIC LEVEL

The controller offers easy access to the resources relevant to the user of the rising oven, allowing adjusting the refrigeration setpoint $\boxed{SPrE}$, heating setpoint $\boxed{SPHt}$, cycle type $\boxed{CYC}$, cycle start time $\boxed{In i}$ and cycle end time $\boxed{End}$. To access the user menu, press **SET** (quick touch) and adjust the parameters as follows:

7.1 Refrigeration setpoint adjustment

$\boxed{\begin{array}{c}5.0\\SPrE\end{array}}$ The display will keep flashing the refrigeration setpoint value while it is being adjusted, observing the limits set on $\boxed{F02}$ – Minimum value allowed to configure the refrigeration setpoint, and $\boxed{F03}$ – Maximum value allowed to configure the refrigeration setpoint. The value is adjusted using ⬆ or ⬇ and the desired value is confirmed with a quick touch on **SET**.

7.2 Heating setpoint adjustment

$\boxed{\begin{array}{c}30.0\\SPHt\end{array}}$ The display will keep flashing the heating setpoint value while it is being adjusted, observing the limits set on $\boxed{F05}$ – Minimum value allowed to configure the heating setpoint, and $\boxed{F06}$ – Maximum value allowed to configure the heating setpoint. The value is adjusted using ⬆ or ⬇ and the desired value is confirmed with a quick touch on **SET**.

7.3 Cycle type adjustment

$\boxed{\begin{array}{c}CYC\\7d\end{array}}$ After confirming the adjustment of the refrigeration and heating setpoints, the message $\boxed{CYC}$ will be displayed to allow adjusting the type of cycle in accordance with the following options:

$\boxed{7d}$ - All days of the week;
$\boxed{dOM}$ - Sunday only;
$\boxed{SEG}$ - Monday only;
$\boxed{tEr}$ - Tuesday only;
$\boxed{9uA}$ - Wednesday only;
$\boxed{9u i}$ - Thursday only;
$\boxed{SEH}$ - Friday only;
$\boxed{SAb}$ - Saturday only;
After selecting the type of processing cycle, you must confirm the selection with a quick touch on **SET** to save this value and proceed to the adjustment of the cycle start and end times;

7.4 Adjustment of the start time of the fermentation cycle

$\boxed{\begin{array}{c}In i\\02:00\end{array}}$ Here you must select the time of the day to start the fermentation process. First the two digits corresponding to the hours will flash indicating that you must adjust the hours using ⬆ or ⬇ and confirm the adjustment with a new touch on **SET**. After that the last two digits will start to flash indicating that you must now adjust the minutes using ⬆ or ⬇ and confirm the adjustment with a new touch on **SET** to save the time adjustment to the controller's memory.

7.5 Adjustment of the end time of the fermentation cycle

$\boxed{\begin{array}{c}End\\06:00\end{array}}$ Now you must adjust the time to end the fermentation process. First the two digits corresponding to the hours will flash indicating that you must adjust the hours using ⬆ or ⬇ and confirm the adjustment with a new touch on **SET**. After that the last two digits will start to flash indicating that you must now adjust the minutes using ⬆ or ⬇ and confirm the adjustment with a new touch on **SET** to save the adjustment to the controller's memory.

7.6 Functions lock

$\boxed{\begin{array}{c}LOC\\On\end{array}}$ To enable / disable the function lock, press ⬆ and ⬇ and hold for the time configured in parameter $\boxed{F18}$ - Time for function lock.
When this configuration is active, the parameters cannot be changed, but they can be viewed. When the lock is active, the parameters available for adjustment are defined in parameter $\boxed{F17}$ – Functions Lock.
Icon 🔒 indicates the status of the lock. Icon lit indicates the functions lock is active.

7.7 Enable the Default operation mode of the level sensor input

If an error occurs in the tank level sensor, you can ignore the error message $\boxed{ErS}$, but then the controller will no longer monitor the water level, resulting in an operation with reduced safety. To ignore the error $\boxed{ErS}$ and operate without level sensor measurement, the controller must be powered on with ❄ and ♨ pressed until the message $\boxed{SnS}$ $\boxed{OFF}$ appears on the display. In this way, the tank level control will be disabled until the controller is restarted.

8. CLOCK AND DAY OF THE WEEK ADJUSTMENT

To access the clock adjustment menu, press ⬆ for four seconds while the temperature and clock are being displayed until the message $\boxed{CLO}$ $\boxed{00:00}$ appears on the display, where the first two digits will flash, indicating you can adjust the hours using ⬆ or ⬇, then press **SET** (quick touch) to save. After that, the time setting is saved and the last two digits will flash, indicating you can adjust the minutes using ⬆ or ⬇ then save the clock setting by pressing **SET** (quick touch). Now the display will show $\boxed{dAY}$ $\boxed{dOM}$ indicating you can adjust the day of the week using ⬆ or ⬇ and confirm the adjustment by pressing **SET** (quick touch). In this way the time has been adjusted and saved to the controller's internal RTC. The messages with the day of the week will be displayed according to the language selected in $\boxed{i03}$.

NOTE: The controller has an auxiliary internal power supply to keep the clock running for at least 72 hours in case of power fault. If the controller remains off for a long period of time, the message $\boxed{ECLO}$, may be displayed to indicate that the clock is not programmed. In this case, the date and time must be adjusted and the controller must be kept on for 10 hours to fully recharge the auxiliary power supply.

9. HUMIDITY CONTROL ADJUSTMENT

9.1 Operating modes of humidity control

The **TO75IB** allows control of humidity inside the dough proofer in two different ways: One is reading the indoor environment using a temperature and humidity sensor (SB56) or by using only a dedicated cyclic timer that allows on-and-off time adjustments of humidity output control without use a humidity sensor. In this way, it is possible to maintain a higher humidity level during any process step through function $\boxed{F08}$ - **Humidity control operating mode**, it allows the humidity control only operates in the heating mode (manual or automatic), only in the cooling process (manual or automatic) or in both heating and cooling processes (manual or automatic). Function $\boxed{i01}$ - **Enables the humidity** sensor to enable or not to activate the humidity sensor, and with this the respective humidity control mode.

9.2 Adjustment of the cyclic timer of the humidity output (with SB56 temperature sensor)

The standard sensor used in the controller is the SB41 model, which performs only temperature measurements. However, an exclusive cyclic timer can be used to control the moisture inside the chamber for the fermentation process. By adjusting the on and off time values it is possible to toggle the status of the humidity output. To set the cyclic timer values, press the ⬇ key for 4 seconds while the main display of the controller is displayed, until the message $\boxed{5}$ $\boxed{ton}$ (time on) is displayed, indicating that the time can be set the humidity output will remain activated using the ⬆ or ⬇ keys and after the setting, press the key (short touch) to confirm the desired value. In the sequence, the message $\boxed{60}$ $\boxed{tOFF}$ (time off) will be displayed, indicating that the time that the humidity output will be deactivated can be adjusted using the ⬆ or ⬇ keys and after setting, press the key (short press) to confirm the value. In this way the humidity output will be activated respecting the times set in $\boxed{ton}$ and $\boxed{tOFF}$ during the respective processing mode according to the setting made in function $\boxed{F08}$.
If it is not necessary to use the humidity output, the output can be deactivated by moving the parameter setting $\boxed{ton}$ to the minimum until the display shows $\boxed{no}$.

9.3 Humidity setpoint adjustment (with SB56 humidity sensor)

If you want to perform temperature and humidity measurement, use the SB56 sensor (sold separately) and enter the function $\boxed{i01}$ - Enable the humidity sensor in the installation menu and select $\boxed{YES}$. In this way, it will be possible to control the humidity of the fermentation chamber during its process, as adjusted in function $\boxed{F08}$. To set the humidity setpoint value, press the ⬇ key for 4 seconds during the main controller display until $\boxed{\begin{array}{c}50.0\\SPHu\end{array}}$ is displayed, indicating that the desired value can be set within the limits defined in $\boxed{F10}$ - Minimum value allowed to set the humidity setpoint and $\boxed{F11}$ - Maximum value allowed to set the humidity setpoint, using the ⬆ or ⬇ keys. After setting, press the key (short key) to confirm the saved value.

10. OPERATIONS - ADVANCED LEVEL

10.1 Changing the controller parameters

$\boxed{\begin{array}{c}Fnc\\EdIt\end{array}}$ Access the advanced configuration menu by pressing the **SET** key for 4 seconds until $\boxed{Fnc}$ is displayed. When $\boxed{Cod}$, is displayed, press **SET** again (quick touch). Use the ⬆ or ⬇ to enter the access code 123 and then press **SET** (quick touch) again.

Use the ⬆ or ⬇ keys to select the desired function. The value can be edited with a quick touch on the **SET** key.
Use the ⬆ or ⬇ keys to change the value and press the **SET** key with a quick touch when ready to save the configured value and return to the functions menu.
To leave the configuration menu and return to the normal operating mode (temperature and time indication), press **SET** (long touch) until $\boxed{----}$ is displayed.

10.2 Parameters table

FUN	FUNCTION	DESCRIPTION	MIN	MAX	UNIT	DEF.
$\boxed{Cod}$	**Access code (123)**	Required when you want to change the advanced configuration parameters.	0	9999	-	0
$\boxed{F01}$	**Temperature sensor indication offset**	Allows compensating for deviations in the sensor temperature reading.	-5.0 (-9)	5.0 (9)	°C (°F)	0.0 (0)
$\boxed{F02}$	**Minimum value allowed to configure the refrigeration setpoint**	These parameters serve as the lower and upper threshold for the adjustment of parameter $\boxed{SPrE}$ - refrigeration setpoint. They are used to block temperature adjustment and avoid an improper configuration for the operation.	-9.9 (14)	F03	°C (°F)	4.0 (39)
$\boxed{F03}$	**Maximum value allowed to configure the refrigeration setpoint**		F02	70.0 (158)	°C (°F)	15.0 (59)

FUN	FUNCTION	DESCRIPTION	MIN	MAX	UNIT	DEF.
F04	Refrigeration control differential (Hysteresis)	Temperature difference (hysteresis) between switching the refrigeration output on and off.	0.1 (1)	20.0 (36)	°C (°F)	2.0 (3)
F05	Minimum value allowed to configure the heating setpoint	These parameters serve as the lower and upper threshold for the adjustment of parameter SPHt - heating setpoint. They are used to block temperature adjustment and avoid unsuitable configuration for the operation.	-9.9 (14)	F06	°C (°F)	15.0 (59)
F06	Maximum value allowed to configure the heating setpoint		F05	70.0 (158)	°C (°F)	45.0 (113)
F07	Heating control differential (Hysteresis)	Temperature difference (hysteresis) between switching the heating output on and off.	0.1 (1)	20.0 (36)	°C (°F)	2.0 (3)
F08	Humidity control operation mode	ALL : The humidity control will operate in the cooling and heating modes, both in the automatic mode and in the manual mode; rEFr : The humidity control will only operate in the cooling mode, both in the automatic mode and in the manual mode; HEAt : The humidity control will only operate in the heating mode, both in the automatic mode and in the manual mode.	ALL HEAt	-		ALL
F09	Sensor indication displacement (offset)	Allows compensating deviations in the humidity sensor reading.	-20.0	20.0	% UR	0.0
F10	Minimum value allowed to configure the humidity setpoint	These parameters serve as the lower and upper threshold for the adjustment of parameter SPHu - humidity setpoint. They are used to block humidity adjustment and avoid unsuitable configuration for the operation.	0.0	F11	% UR	20.0
F11	Maximum value allowed to configure the humidity setpoint		F10	99.9	% UR	90.0
F12	Humidity control differential (Hysteresis)	Relative humidity difference (hysteresis) between switching the humidity output on and off when the controller is in heating mode.	0.1	20.0	% UR	5.0
F13	Process mode	Cont Continuous: In this mode the controller remains in automatic mode and will refrigerate again after the fermentation cycle ends, waiting for the start of the next cycle. SnG1 Single mode without refrigeration at the end of the cycle: In this mode the controller will not refrigerate again after the cycle ends, keeping the outputs switched off. SnG2 Single mode with refrigeration: In this mode the controller will keep the refrigeration output in manual mode after the cycle ends, remaining in manual refrigeration mode until the mode is switched off or the automatic mode is activated by the user.	Cont SnG2	-		SnG1
F14	Time to confirm low water level in the tank	Sets the delay to indicate error (critical water level in the tank) and enter safety mode after the level sensor's detection in the tank.	1	60	s	30
F15	Fermentation process end alarm time	Sets the time to reset the message and audible warning after the fermentation cycle ends. If you want to keep this warning until a key is pressed or the door is opened, displace the adjustment to the minimum until MAn - Manual shutdown is displayed.	MAn	60	s	5
F16	Delay to display door open messages	Sets the delay time to activate the buzzer and display a message requesting to close the door. To disable this function displace the adjustment to the minimum until no is displayed. In this case, the message requesting to close the door will be displayed immediately after the door is opened.	no	180	s	90
F17	Functions lock	Defines the functions lock mode: OFF = functions lock disabled; LOC1 = partial functions lock 1 – prevents advanced configuration Fxx and installation configuration Ixx parameters from being changed; FULL = full functions lock, does not allow any parameter adjustment, only change operating modes.	OFF FULL	-		LOC1
F18	Time for functions lock	Defines the time to lock / unlock the functions. For more information see item 7.6 – Functions Lock	1	30	s	10

11. MANAGEMENT OF THE OUTPUTS

- **Refrigeration output:** When in refrigeration mode (manual or automatic), the refrigeration output will be activated until the temperature reaches the value configured in SPrE - Refrigeration setpoint. The output will be activated again when the temperature measured by the sensor is equal to or higher than the desired setpoint value plus the value adjusted in function F04 - Refrigeration control differential (hysteresis).
- **Heating output:** When in heating mode (manual or automatic), the heating output will be activated until the temperature reaches the value configured in SPHt - Heating setpoint. The output will be activated again when the temperature measured by the sensor is equal to or lower than the desired setpoint value minus the value adjusted in function F07 - Heating control differential (hysteresis).

- **Ventilation output:** The ventilation output will be activated whenever one of the heating or refrigeration modes is active, either automatic or manual. The ventilation output will be switched off when the control mode is off or every time the oven door is opened when the door open sensor is used.

- **Humidity output:** The humidity control mode will be activated according to the setting selected in function F08 - Moisture control mode and parameter I01 - Enables the humidity sensor, ie if the SB56 sensor is used (sold separately) the moisture output will be activated until the measured humidity reaches the value set in SPHu - Moisture setpoint. The output will be activated again when the humidity is equal to or below the desired setpoint minus the value set in function F12 - Moisture control differential (Hysteresis).
If the SB56 sensor is not used, it is possible to operate the humidity output via a cyclic timer according to the values set in tOn and tOFF. In this way, the humidity output will remain activated for the time set in tOn and off depending on the time set in tOFF.

- **Solenoid valve output:** The solenoid valve will be activated whenever the level sensor (float ball) detects a water level below the permitted limit. The solenoid valve will be deactivated when the level sensor returns to the full tank position or after the time configured in function F14 - Minimum time to report error in the water level sensor, indicating a sensor error or lack of water in the pipes.

12. SIGNALING

12.1 Programming signaling
Mod HEAt - Manual heating mode activated
Mod rEFr - Manual refrigeration mode activated
Mod OFF - Control mode deactivated
Mod Aut - Automatic mode activated

12.2 Programming signaling

LOC On — **Functions lock active**
Does not allow adjusting the parameter.
To deactivate functions lock see item 7.6 - Functions lock.

no Cod — **Parameter adjustment denied**
Enter access code in parameter Cod , to adjust the parameter value.

EAS ProG — **Receiving parameters via EasyProg* (programming key)**
Updating the parameter table via EasyProg*.
*sold separately

12.3 Alarm signaling

Er1 ECAL — **Measure:** Contact Full Gauge Controls.

Er2 PPPP — **Measure:** Contact Full Gauge Controls.

Er3 tEMP — **Reason:** Temperature sensor disconnected or out of range. **Measure:** Check sensor connections and operation.

Er4 HuMi — **Reason:** Temperature sensor disconnected or out of range. **Measure:** Check sensor connections and operation. *Note: Error Er4 will always be associated with error Er3 .*

Err — **Reason:** Temperature sensor disconnected or out of range. **Providence:** Check connections and humidity sensor operation. *Note: In the event of a moisture sensor failure, its control output is turned off. The other characteristics of the controller are maintained.*

ErS SOLE — **Reason:** Water level sensor (float ball) error. **Providence:** Check level sensor connections and operation.

If the controller detects an error that interferes in the operation of the system, the controller switches off the outputs, switches on the audible alarm intermittently, and indicates the detected failure on the display. To exit the error modes Er3 , Er4 or Er5 just correct the problem, without the need to restart the controller. For errors Er1 and Er2 , contact Full Gauge Controls.

12.4 Clock signaling

ECLO — **Reason:** Invalid time and/or day of the week. **Measure:** Adjust the time and day of the week.

CLO FAIL — **Reason:** Error when trying to activate automatic mode while the clock is deprogrammed. **Measure:** Set the time and day of the week.

12.5 End of process signaling

FIM FErM — **Reason:** The fermentation process was completed. **Measure:** Press any key on the controller or wait for the time configured in F15 to display the message.

12.6 Open door signaling

OPEn door — Indicates that the oven door is open. Whenever the oven door is opened, the ventilation output will be switched off. *Note: The message keeps cycling on the lower display.*

CLOSE tHE door — Requests the operator to close the oven door. Indicates that the door remained open for the time configured in parameter F16 . In this mode, the controller keeps the ventilation output off and activates the audible alarm. *Note: The message keeps cycling on the lower display.*
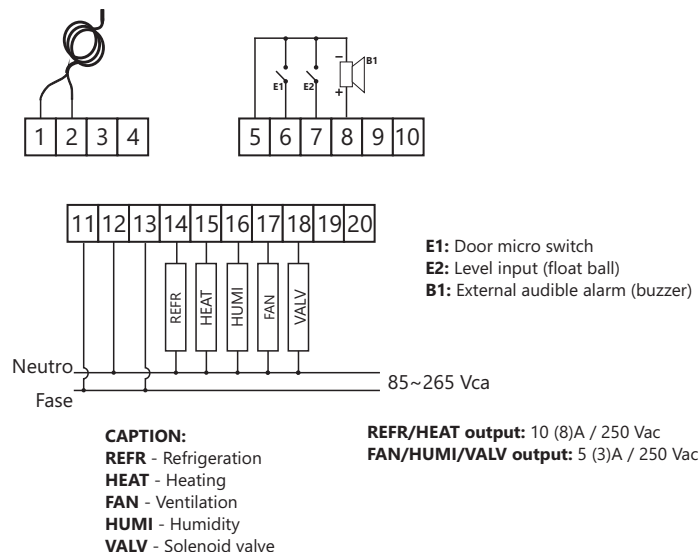
13. INSTALLATION

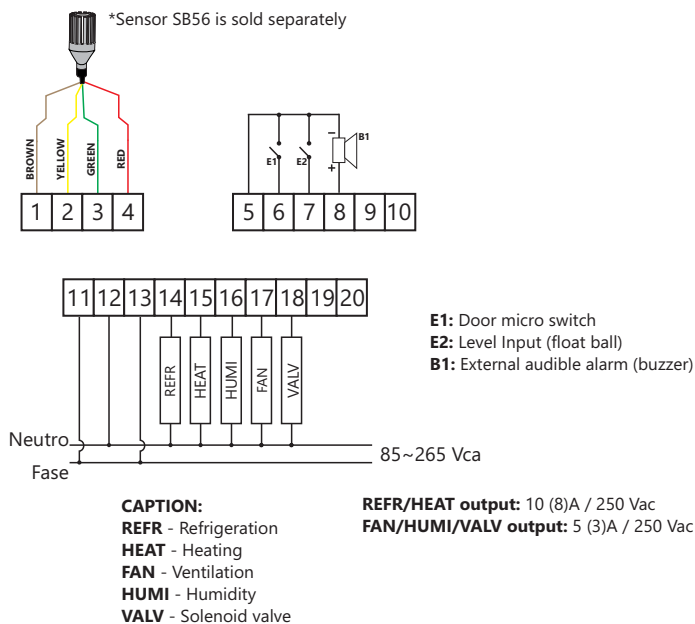## 13.1 Electrical connections

⚠️ **PRODUCT INSTALLATION PRECAUTIONS:**

➡️ Before performing any procedure on this instrument, disconnect it from the power grid;

➡️ Ensure that it has adequate ventilation, avoid installation on control panels containing devices that could cause it to operate outside its specified temperature range;

➡️ Install the product away from sources that may generate electromagnetic disturbances, such as: motors, contactors, relays, electrovalves, etc;
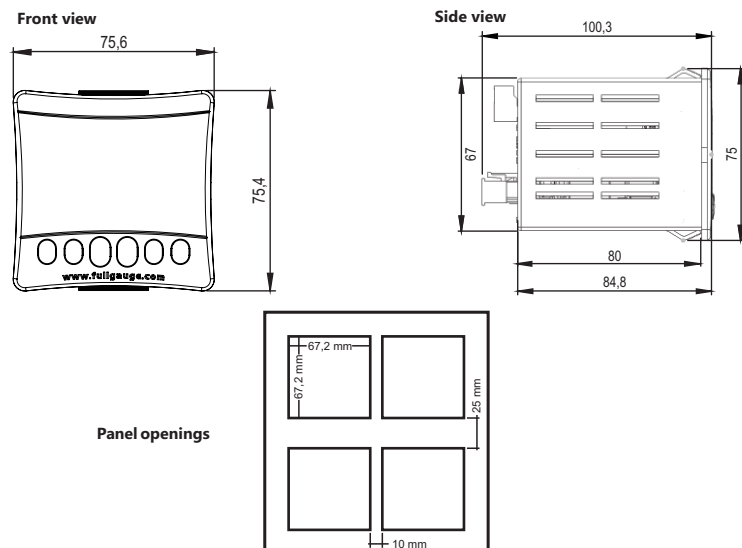
13.1.1 Electrical connection using SB41 temperature sensor

E1: Door micro switch
E2: Level input (float ball)
B1: External audible alarm (buzzer)

Neutro
Fase
85~265 Vca

CAPTION:
REFR - Refrigeration
HEAT - Heating
FAN - Ventilation
HUMI - Humidity
VALV - Solenoid valve

REFR/HEAT output: 10 (8)A / 250 Vac
FAN/HUMI/VALV output: 5 (3)A / 250 Vac

13.1.2 Electrical connection using SB56 temperature and humidity sensor

*Sensor SB56 is sold separately

BROWN YELLOW GREEN RED

E1: Door micro switch
E2: Level Input (float ball)
B1: External audible alarm (buzzer)

Neutro
Fase
85~265 Vca

CAPTION:
REFR - Refrigeration
HEAT - Heating
FAN - Ventilation
HUMI - Humidity
VALV - Solenoid valve

REFR/HEAT output: 10 (8)A / 250 Vac
FAN/HUMI/VALV output: 5 (3)A / 250 Vac

14. DIMENSIONS

Front view

75,6
75,4

www.fullgauge.com

Side view

100,3
67
75
80
84,8

Panel openings

67,2 mm
67,2 mm
25 mm
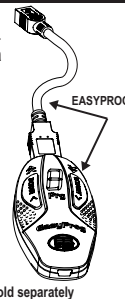10 mm

15. EasyProg* - version 02 or later

It is an accessory the main function of which is to store the parameters of controllers. At any time you can load new parameters of a controller and unload them on a production line (of the same controller), for example.
It is provided with three types of connections for loading or unloading the parameters:

EASYPROG

- **Serial RS-485:** It is connected by RS-485 network to the controller (only for those controllers provided with RS-485).
- **USB:** It is connected to the computer by USB port, using the Sitrad Preset Editor.
- **Serial TTL:** The controller may be connected directly to EasyProg by Serial TTL connection.

*sold separately

ENVIRONMENTAL INFORMATION

PACKAGING:
Materials used in the packaging of the Full Gauge Controls products are 100% recyclable. Be sure to dispose of using specialized recycling facilities.
PRODUCT:
The components used in the Full Gauge Controls controllers may be recycled and reused if disassembled by specialized companies.
DISPOSAL:
Do not incinerate or dispose of the controllers that reached the end of their service life in household waste. Be sure to comply with the existing legislation in your area relating to disposal of electronic waste. In the event of doubt, please contact Full Gauge Controls.

WARRANTY - FULL GAUGE CONTROLS

Products manufactured by Full Gauge Controls, as of May 2005, have a ten (10)-year warranty directly with the factory and one (1) year before the reseller network, counted as of the date of consigned sale as stated on the invoice. After this said year before the reseller network, the warranty shall continue to be executed if the instrument is sent directly to Full Gauge Controls. The products are warranted in case of defects in workmanship making them unsuitable or inadequate to the intended applications. The warranty is limited to maintenance of instruments manufactured by Full Gauge Controls, disregarding other kinds of expenses, such as indemnity for damages caused to other equipment.
EXCEPTIONS TO WARRANTY
The Warranty does not cover expenses incurred for freight and/or insurance for sending the products with signs of defect or malfunctioning to the provider of technical support services. The following events are also excluded from warranty: natural wear and tear of parts, external damages caused by falls or inadequate packaging of products.
INVALIDATION OF WARRANTY
The product warranty shall lose validity, automatically, if:
- The instructions for use and assembly contained in the technical description and the installation procedures described in Standard NBR5410 are not followed;
- The product is submitted to conditions beyond the limits specified in its technical description;
- The product is violated or repaired by a person not integrating the technical team of Full Gauge Controls;
- The damages are due to a fall, blow and/or impact, water damage, overload and/or atmospheric discharge.
USE OF WARRANTY
For using the warranty, the customer should send the adequately packaged product, along with the respective Invoice to Full Gauge Controls. The customer will bear the freight cost for sending of the products. Also, as much information as possible with regard to the defect verified should be sent, in order to facilitate the analysis, the testing and the performance of the service.
Those processes and any product maintenance shall only be performed by the Technical Support Services of Full Gauge Controls, at the Company headquarters - Rua Júlio de Castilhos, 250 - CEP 92120-030 - Canoas - Rio Grande do Sul – Brazil.

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