


MT-622E Ver.06

**TWO STAGE DIGITAL CONTROLLER
WITH ALARM AND CYCLIC TIMER
AND PROCESS TIMER**


Buzzer

Functions
lockdownControl functions
shutdownSerial
programmingIP 65
FRONT
Protection
level
CAL US
E251415


MT622EV06-02T-13636

1. DESCRIPTION

The **MT-622E** is a temperature controller that uses a thermocouple type J as sensor, has two outputs for temperature control and internal buzzer. It also has a timer that can operate in different modes, triggered by digital inputs, which indicates the end time of one or two processes.

The first stage can use a cyclic preheating mode, and the second stage can function as an alarm, a cyclic timer or end of process indication. It is also possible to use 5 configurable recipes, which allows to quickly change the values for the temperature setpoint and the hysteresis of the first stage and the processing time.

Product complies with UL Inc. (United States and Canada).

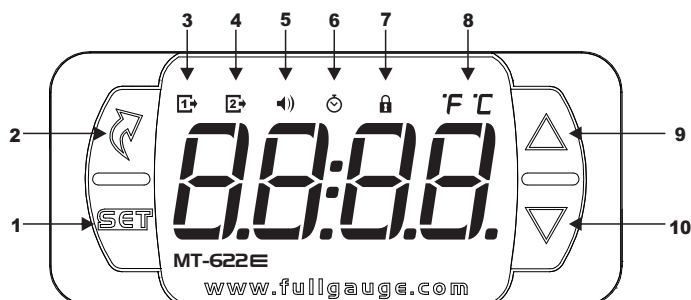
2. APPLICATIONS

- Fryers
- Ovens

3. TECHNICAL SPECIFICATIONS

- Power supply: MT-622 E → 115/230 Vac ±10% (50/60 Hz)
- Control temperature: 0 to 600°C / 32 to 1112°F
- Operating temperature: 0 to 50 °C / 32 to 122°F
- Resolution: 1°C / 1°F
- Operating humidity: 10 to 90% UR (non-condensing)
- Current output: OUT 1 - 16(8)A / 250 Vac 1HP - 4000W
OUT 2 - 5(3)A / 250 Vac 1/8HP
- Sensor: J type Thermocouple (sold separately)
- Dimensions: 76 x 34 x 77 mm (WxHxD)
- Dimensions of the clipping for fixing of the instrument: 71 ± 0,5 x 29 ± 0,5 mm (see item 5)

4. INDICATIONS AND KEYS



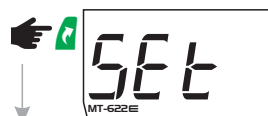
1	Set key
2	Quick access menu
3	Output OUT1 drive indicator LED
4	Output OUT2 drive indicator LED
5	Internal buzzer drive indicator LED
6	Process timer indicator LED
7	Function locks indicator LED
8	Temperature unit indicator LED
9	Increase key
10	Decrease key

6. OPERATIONS

6.1 Facilitated menu map

By pressing **2** it is possible to navigate through the function menus. For more details, see chapter 6.3. See the functions map below:

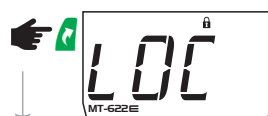
ADJUSTING THE DESIRED TEMPERATURE (SETPOINT)



EXIT THE MENU



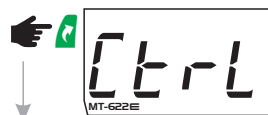
LOCK FUNCTION



FUNCTION SELECTION



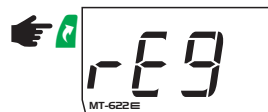
CONTROL FUNCTIONS SHUTDOWN



CLEAR VALUES MAX. AND MIN.



REGISTRATION OF TEMPERATURE MIN. AND MÁX.

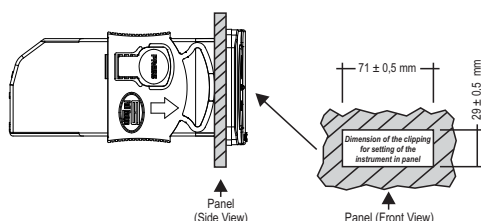


6.2 FACILITATED KEY MAP

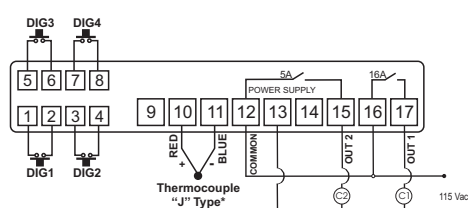
When the controller is on display temperature, the following shortcut keys are used for the following functions:

SET	Pressed 2 seconds: Adjusts the setpoint or change of recipe.
SET	Short press: Inhibits alarm and buzzer (if activated).
▲	Short press: Maximum and minimum temperatures display.
SET	Short press: With process timer driven - Switches display between temperature and remaining time.
▶	Short press: Starts process.
▲	Short press: Ends process.
▲	Enter the function selection.

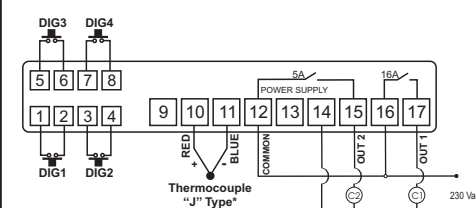
5. INSTALLATION - ELECTRICAL CONNECTIONS AND PANEL



Connection 115 Vac



Connection 230 Vac



ATTENTION

FOR INSTALLATIONS WHERE A SEALING IS REQUIRED TO AVOID LIQUID CONTACT, THE CUT FOR THE CONTROLLER MUST BE OF 70,5X29mm MAXIMUM. THE SIDE LOCKS MUST BE FIXED SO IT PASSES THE RUBBER SEALING AVOIDING INFILTRATION BETWEEN THE CUT AND THE CONTROLLER.

IMPORTANT

THE USE OF APPROPRIATE TOOLS IS ESSENTIAL TO AVOID DAMAGE IN THE CONNECTION AT INSTRUMENT TERMINALS:
⊖ SCREWDRIVER SLOT 3/32" (2.4mm) FOR ADJUSTMENTS IN THE SIGNAL TERMINALS;
⊕ SCREWDRIVER PHILLIPS #1 FOR ADJUSTMENTS IN THE POWER TERMINALS;

Ⓢ1 and Ⓢ2 loads
*Sensor sold separately

6.3 BASIC OPERATIONS

6.3.1 Adjusting the desired temperature (setpoint) and time process

If it is configured not to use formulas (F03=):

- Press and hold the key for two seconds, until the message appears;
- Then the message will appear and it will be possible to adjust the stage 1 setpoint;
- Use the keys or to change the value, and press to confirm.

It will then be possible to adjust the setpoint of stage 2 and the process time ().

Note 1: The adjustment of the stage 2 setpoint can only be configured if the unit is set to operate as a thermostat (F28=0 or 1).

Note 2: When F49=4, it is possible to set a time lapse for each timer, identified by the message , , and .

If it is set to use formulas (F03=):

Each formula can be configured to use different values for the setpoint, hysteresis of stage 1 and the time of the process. To select the formula:

- Press and hold the key for two seconds, until the message and appears;
- You will then see the currently selected formula.

- Use the or keys to select which of the 5 formulas will be used:

- Formula 1;

- Formula 2;

- Formula 3;

- Formula 4;

- Formula 5.

To confirm the selection, press .

Then setpoint of stage 2 can be adjusted, if configured to operate as a thermostat (F28=0 or 1).

Note 1: The values of the functions of each formula are configured in the parameter menu.

Note 2: The formulas are linked only to the first timer. In case of F49=4, only the value of , and can be configured manually.

6.3.2 Process Timer

The process timer is a time counter. It is manually started after the end of the programmed time displays the message on the controller's display, if F49=0. If F49=1, 2, 3 or 4, the controller will be operating 4 timers, each operated by a digital input. Thus, the message displayed at the end of the time count for each timer will be , , and .

Through function F48, the instrument can be configured to sound an alarm at the end of processing time.

Note that the end of processing time does not affect the **OUT1** output.

6.3.3 Function Lock

For safety reasons, this controller provides the ability to lock functions. With this setting enabled, the setpoint and the other parameters are protected against unauthorized changes. However, they can be visualized. In this condition, when trying to change these values, the message appears on display. To perform the functions lockdown it is necessary, first, that parameter " - Time for functions lockdown" parameter is set to a value higher than 14 (if lower than 15, the message is shown, which means not allowing the lockdown of functions). With key (quick touch), select , then press (quick touch), then keep the key pressed until appears. When releasing the key, the message will appear.



To unlock, turn off the controller and reconnect it with the key pressed. Keep the key pressed until the message appears. When performing it, the message will appear on the display.

6.3.4 Control Functions Shutdown

With the shutdown of the control functions the controller will operate only as a temperature indicator and output relay stays off.

The way to operate the control functions shutdown depends on the parameter setting " - Control functions shutdown":

Does not allow the shutdown of the control functions.

Allows to turn on and off the control functions only if the functions are unlocked.

Allows to turn on and off the control functions even when the functions are locked. With key (quick touch), select , then press (quick touch) to confirm.

6.3.5 Changing display during process

With the process timer is in progress, press the key (short press) to switch the information on the screen between temperature and remaining time of each process.

- Temperature

- Remaining time of process 1

- Remaining time of process 2

- Remaining time of process 3

- Remaining time of process 4

Note: In operating modes 1 and 4 of the F49, you can also observe the remaining time of process through the push buttons.

6.3.6 Registers of minimum and maximum temperature

Pressing key or also through the quick access menu (see chapter 6), the message will appear, followed by the minimum and maximum recorded temperatures.

To turn the current minimum and maximum values off, press key (short press), until the message is displayed. Press key to confirm.

6.3.7 Unit Selection (°C / °F)

To determine the unit in which the instrument will operate, enter function " " with access code press key now the user can select the unit by pressing keys or where the messages or will alternate. Press key to confirm the desired unit. Then, the indication that corresponds to the unit or will come on.

Every time the unit is changed, the parameters must be reconfigured, since they are assumed the "standard" values.

6.4 ADVANCED OPERATIONS

6.4.1 Changing the parameters of the controller

Access function by pressing keys and simultaneously or through the quick access menu. After that, will appear, then, press the key (short press). Use keys or to enter with access code and, when ready, press . Use keys or to access the desired function.

After selecting the function, press the key (short press), to visualize the set value for that function. Use keys or to change the value, and when ready, press to memorize the set value and return to the functions menu. To exit the menu and return to normal operation (temperature indication) press and hold until .

OBS: If the lock function is active, by pressing the or to change the value of the function, the controller will displays the message and will not allow to set the of parameter.

6.5 PARAMETER TABLE

Fun	Description	CELSIUS				FAHRENHEIT			
		Min	Max	Unit	Standard	Min	Max	Unit	Standard
	Access Code (123)	-	-	-	-	-	-	-	-
	Indicator Offset (offset)	-10	10	-	0	-18	18	-	0
	Using formulas in the 1st stage			-				-	
	Operation Setpoint of the 1st stage (rc1)	0	600	°C	20	32	1112	°F	68
	Operation Setpoint of the 1st stage (rc2)	0	600	°C	20	32	1112	°F	68
	Operation Setpoint of the 1st stage (rc3)	0	600	°C	20	32	1112	°F	68
	Operation Setpoint of the 1st stage (rc4)	0	600	°C	20	32	1112	°F	68
	Operation Setpoint of the 1st stage (rc5)	0	600	°C	20	32	1112	°F	68
	Differential control of the 1st stage (rc1) (°)	1	40	°C	2	1	72	°F	3
	Differential control of the 1st stage (rc2)	1	40	°C	2	1	72	°F	3
	Differential control of the 1st stage (rc3)	1	40	°C	2	1	72	°F	3
	Differential control of the 1st stage (rc4)	1	40	°C	2	1	72	°F	3
	Differential control of the 1st stage (rc5)	1	40	°C	2	1	72	°F	3
	Process time (rc1)	1	999	sec./min.	5	1	999	sec./min.	5
	Process time (rc2)	1	999	sec./min.	5	1	999	sec./min.	5
	Process time (rc3)	1	999	sec./min.	5	1	999	sec./min.	5
	Process time (rc4)	1	999	sec./min.	5	1	999	sec./min.	5
	Process time (rc5)	1	999	sec./min.	5	1	999	sec./min.	5
	Operational Mode of the 1st stage	0	2	-	1	0	2	-	1
	Minimum setpoint allowed to the end user (1st stage)	0	600	°C	0	32	1112	°F	32
	Maximum setpoint allowed to the end user (1st stage)	0	600	°C	600	32	1112	°F	1112
	Minimum delay to re-connect the output of the 1st stage	0	999	sec.	0	0	999	sec.	0
	Temperature to terminate preheating	1	600	°C	60	33	1112	°F	140
	Time base used to preheat	0	3	-	0	0	3	-	0
	Time that preheating is connected	1	999	sec./min.	1	1	999	sec./min.	1
	Time that preheating is disconnected	1	999	sec./min.	1	1	999	sec./min.	1
	Maximum time to preheat	1	999	min.	5	1	999	min.	5
	Operational Mode of the 2nd stage	0	10	-	3	0	10	-	3
	Minimum setpoint allowed to the end user (2nd stage)	0	600	°C	0	32	1112	°F	32
	Maximum setpoint allowed to the end user (2nd stage)	0	600	°C	600	32	1112	°F	1112
	Control differential (hysteresis) of the 2nd stage	1	40	°C	2	33	72	°F	3
	Minimum delay to re-connect the output of the 2nd stage	0	999	sec.	0	0	999	sec.	0
	Delay to enable the alarm when the instrument is powered on	0	999	min.	0	0	999	min.	0
	Time the ALARM/TIMER is on	1	999	sec./min.	1	1	999	sec./min.	1
	Time ALARM/TIMER is off	0	999	sec./min.	1	0	999	sec./min.	1
	Time to reactivate the alarm when manually disabled		999	min.			999	min.	
	Time base of cyclical timer	0	3	-	0	0	3	-	0
	Time for activation of 2nd stage cyclic timer	0	999	sec.	5	0	999	sec.	5
	Operation Mode of audible alarm	0	2	-	1	0	2	-	1
	Activation point of audible alarm (lower limit)	0	600	°C	0	32	1112	°F	32
	Activation point of audible alarm (upper limit)	0	600	°C	600	32	1112	°F	1112
	Time audible alarm is connected	1	999	sec.	1	1	999	sec.	1
	Time audible alarm is disconnected	0	999	sec.	1	0	999	sec.	1
	Audible alarm deactivation time when turning the controller on	0	999	min.	0	0	999	min.	0
	Time to reactivate the audible alarm when manually disabled		999	min.			999	min.	
	Enabling and viewing mode of the process timer	0	2	-	2	0	2	-	2
	Time base of the timer	0	1	-	1	0	1	-	1
	Audible alert at the end of the process (Buzzer)			-				-	
	Operational mode of digital inputs	0	4	-	0	0	4	-	0
	Intensity of the digital filter	0	9	-	0	0	9	-	0
	Time for functions lockdown		60	sec.			60	sec.	
	Control functions shutdown		2	-			2	-	

Legend: = yes
 = no

6.5.1 Parameters description

F01 - Access Code:

This is necessary when you want to change the configuration parameters. It is not necessary to insert this code to see the set parameters.

F02 - Indicator Offset (offset):

Allows the compensation of eventual deviations in temperature reading, caused by the change of the sensor or changing the length of the cable.

F03 - Using formulas in the 1st stage:

Allows to configure the controller in order to use the formulas or not:

☐ **No:** If setup this way, the instrument will not use the receipt values in the control routines. For this, setpoint 1 will be used and process time , which are adjusted through the easy access menu. The differential control to be used will be the same as formula 1, F09 "Differential control of the 1st stage (rc1)."

The value set in can be set between F20 "Minimum setpoint allowed to the end user (1st stage)" and F21 "Maximum setpoint allowed to the end user (1st stage)."

☐ **Yes:** If configured this way, the instrument uses the control routines of the setpoint values, differential control and process time of the formula that is active.

The formula selection will be made through the easy access menu, in the same way as adjusting the setpoint. However, the value shown on the display will be the name of the formula that is active.

Example:

F04 - Operation setpoint for the 1st stage (rc1):

F05 - Operation setpoint for the 1st stage (rc2):

F06 - Operation setpoint for the 1st stage (rc3):

F07 - Operation setpoint for the 1st stage (rc4):

F08 - Operation setpoint for the 1st stage (rc5):

These parameters specify the desired temperature for each formula in the 1st stage.

F09 - Differential control of the 1st stage (rc1) (*):

F10 - Differential control of the 1st stage (rc2):

F11 - Differential control of the 1st stage (rc3):

F12 - Differential control of the 1st stage (rc4):

F13 - Differential control of the 1st stage (rc5):

These parameters specify the desired temperature for each formula in the 1st stage.

(*) The function F09 is used when F03=0 together with or when F03=1 in combination with setpoint .

F14 - Process Time (rc1):

F15 - Process Time (rc2):

F16 - Process Time (rc3):

F17 - Process Time (rc4):

F18 - Process Time (rc5):

These parameters specify the duration of the process for each formula.

F19 - Operational mode of the 1st stage:

Allows to configure the operating mode of the 1st stage.

- Cooling: The 1st stage operates in cooling mode. For temperature control, the instrument uses one of selected recipe or setpoint. In this control mode the instrument is permanently operating the OUT 1 output to maintain the desired temperature. The end of process time does not imply shutdown of OUT 1 output. It is only indicated by the message in the display and drive the internal buzzer.

- Heating: The 1st stage operates in heating mode. For temperature control, the instrument uses one of selected recipe or setpoint. In this control mode the instrument is permanently operating the OUT 1 output to maintain the desired temperature. The end of process time does not imply shutdown of OUT 1 output. It is only indicated by the message in the display and drive the internal buzzer.

- Preheating/Heating: This operation mode is similar to heating mode, however, when to connect the controller is done the preheating. This preheating is accomplished by switching the state of the OUT 1 output. The amount of time per cycle that the output remains switched on and off is set in the F25 and F26 functions. The controller remains in the preheating mode until it reaches the temperature configured in F23, or until the time configured in F27. When it reaches the temperature or preheating timeout, the controller will operate in heating mode.

F20 - Minimum setpoint allowed to the end user (1st stage):

F21 - Maximum setpoint allowed to the end user (1st stage):

The electronics limits have the purpose of preventing, by mistake, the use of very high or low set temperature setpoints.

F22 - Minimum delay to re-connect the output of the 1st stage:

It is the minimum time that the output of the 1st stage is off, i.e. the time between the last stop and the next start.

Note: This time will only be taken into consideration after the preheating end, if F19=2.

F23 - Temperature to terminate preheating:

Temperature that the output stops OUT 1 preheating and starts to operate in the heating mode. To carry out the preheating F19 must be set to (F19=2) when connecting the controller.

F24 - Time base used to preheat:

Allow the setting of the time bases in order to turn on and off the output OUT 1 when operating in the preheating mode. The possible settings for time on and time off are respectively:

- Seconds/Seconds;

- Seconds/Minutes;

- Minutes/Seconds;

- Minutes/Minutes.

F25 - Time that preheating is connected:

This function is to adjust the time that the controller stays connected with output OUT 1 connected when the 1st stage is in the preheat mode.

F26 - Time that preheating is disconnected:

This function is to adjust the time that the controller stays connected with output OUT 1 disconnected when the 1st stage is in the preheat mode.

F27 - Maximum time to preheat:

This function serves as security for finalizing the preheating mode. It limits the maximum operating time of the cyclic mode, if the temperature read by the controller does not reach the value configured in F23. After this time, the controller will operate in heating mode, as a simple thermostat, even without reaching the temperature configured in F23.

F28 - Operational mode of the 2nd stage:

- Refrigeration

- Heating

- Alarm intra-range

- Alarm extra-range

- The extra-range alarm related to the first stage (- F29 and + F30)

- Independent Cyclic timer

- Cyclic timer triggered by the setpoint of the 1st stage

- 1st stage coupled to the cyclic timer (timer starts on)

- 1st stage coupled to the cyclic timer (timer starts off)

- Output of the cyclic timer is always connected when the output of the 1st stage is connected.

- End of process alarm

Note: When F28=10, the output OUT 2 is triggered at the end of the process according to the times set in functions F34 and F35 (time base only in seconds).

F29 - Minimum setpoint allowed to the end user (2nd stage):

F30 - Maximum setpoint allowed to the end user (2nd stage):

The electronic limits have the purpose of preventing the use, by mistake, of very high or low temperature setpoints. When the 2nd stage is defined as an alarm, the setpoints are defined in F29 and F30.

F31 - Control differential (hysteresis) of the 2nd stage:

This is the temperature difference (hysteresis) between turning on and off the 2nd stage output.

F32 - Minimum delay to re-connect the output of the 2nd stage:

This is the minimum time in which the output of the 2nd stage is off, i.e. the time between the last stop, and the next start up (only if F28=0 or 1).

F33 - Delay to enable the alarm when the instrument is powered on (F28=2,3 or 4):

This function is to disable the alarm for a period of time because the system has not yet reached the working temperature.

F34 - Time the ALARM/TIMER is on:

This function is to adjust the time that the output of the 2nd stage will remain activated if it is set as an alarm or timer.

F35 - Time the ALARM/TIMER is off:

This function is to adjust the time that the output of the 2nd stage remains switched off if it is configured as an alarm or timer. To always keep the alarm triggered, just set "0" in this function.

F36 - Time to reactivate the alarm when manually disabled:

This function configures the alarm manual inhibition. If it enters into alarm condition, it can be inhibited manually by pressing key.

If a value between 1 and 999 minutes is set when it reaches an alarm condition and is disabled manually, it can only be activated again after that time elapses.

If the automatic mode is selected () , the alarm, after being disabled, will only be triggered if the normal condition returns and alarm condition returns, with no time limit. Set to 0, the manual deactivation is itself disabled.

- Alarm will sound again when you leave and return to the alarm condition

- Manual deactivation disabled

~ - Time that the output of alarm remains disabled (in minutes)

F37 - Time base of Cyclic timer (F28=5, 6, 7, 8 or 9):

If the output OUT 2 is configured as a cyclic timer, the time base in which the output remains switched on and switched off can be set to seconds or minutes. The setting of the switched on and switched off the time base is, respectively:

- Seconds/Seconds;

- Seconds/Minutes;

- Minutes/Seconds;

- Minutes/Minutes.

F38 - Time for activation of 2nd stage cyclic timer:

This is the delay time to activate the cyclic timer if it is set to be triggered by the setpoint of the 1st stage (F28=6).

F39 - Operational Mode of the audible alarm:

- Intra-range alarm

- Extra-range alarm

- Alarm relating to the first stage (- F40 and + F41)

F40 - Activation point of the audible alarm (lower limit):

This is the lowest temperature to activate the audible alarm according to the operating mode selected.

F41 - Activation point of audible alarm (upper limit):

This is the upper temperature to activate the audible alarm according to the operating mode selected.

F42 - Time audible alarm is connected:

Time that the audible alarm will remain powered (active cycle).

F43 - Time audible alarm is disconnected:

Time that the audible alarm will remain off (inactive cycle). To disable the audible alarm, adjust the value "0" for this function

F44 - Audible alarm deactivation time when turning the controller on:

This is the time that the buzzer will remain off, even in an alarm condition. This time is to disable the audible alarm while the system has not yet reached working conditions.

F45 - Time to reactivate the audible alarm when manually disabled:

This function configures the buzzer manual inhibition. If it enters into alarm condition, the buzzer can be inhibited manually by pressing key.

If a value between 1 and 999 minutes is set, when the audible alarm reaches an alarm condition and is disabled manually, it can only be activated again after that time elapses.

If the automatic mode is selected () , the audible alarm, after being disabled, will only be triggered if the normal condition and the alarm condition returns, with no time limit. Set to 0, the manual disability is disabled.

- The audible alarm sounds again when leaving and there is a new alarm situation

- Disabled

~ - Time in which the audible alarm remain disabled (in minutes)

F46 - Enabling and viewing mode of the process timer:

This function is used to enable or disable the process timer. If it is enabled, it may be configured to, during the process, show the temperature or remaining time. The choice of the information to be displayed when the timer is triggered depends on the user's needs.

- ☐ 0 - Disabled
- ☐ 1 - During the process it shows temperature
- ☐ 2 - During the process it shows the remaining time

F47 - Time base of the timer:

Allows to select which time base will be used to count the processing time

- ☐ 0 - Seconds
- ☐ 1 - Minutes

F48 - Audible alert at the end of the process (Buzzer):

- ☐ 0 - Disables the audible alarm to indicate the end of the process
- ☐ 1 - Enables the audible alarm to indicate the end of the process

F49 - Operational mode of digital inputs:

This function allows to set the operating mode of the digital inputs:

☐ 0 - 1 Timer - DIG1 (START) and DIG2 (STOP):

Digital input 1 (DIG1) or ☐ operates as **START** or **PAUSE** command and digital input 2 (DIG2) or ☐ operates as **STOP** command.

The controller applies the configured value in process time on a single internal timer. When activating the digital input 1 (DIG1) or ☐ , the controller starts the process time counting.

PAUSE: If the process timing is in progress and is triggered digital input 1 (DIG1) or ☐ , the count will paralyze and press again to continue the digital input 1 (DIG1) or ☐ .

When activating the digital input 2 (Dig2) or ☐ , the process timing is closed.

If the process is closed and the digital input 1 (DIG1) or ☐ is triggered, the controller opens a new count for the process time.

☐ 1 - 4 timers (Closed contact = START/REMAINING TIME/STOP):

In this operation mode, the controller will operate with 4 timers using the same process time. Each digital input starts working as **START**, **REMAINING TIME** and **STOP** for each timer. In this operation mode are provided keys **PUSH BUTTON** type (without mechanical retention of the contact). When turn on the key the electrical contact changes state, and to release it, back to idle status (NO).

Example: If timer 1 is stopped and digital input 1 (DIG1) is triggered, appears in display Start 1 message, and started timing. At the end of configured time, appears End 1 message on the display, indicating the end of the process time. The message will be displayed until DIG1 is pressed again. If during the counting of time input is triggered again, a message process time (End 1 + time) appears. If the DIG1 input is pressed for 1s before finishing the timing, the process is closed and displays the End 1 message. Similarly is the operation of DIG2, DIG3 and DIG4 digital inputs.

☐ 2 - 4 timers (Closed contact = START, open contact = STOP):

In this operation mode, the controller will operate with 4 timers using the same process time. Each digital input starts working as **START** and **STOP** for each timer. In this operation mode are provided keys **ON/OFF** type (NO with mechanical retention of the contact). By closing the contact, the timing is initiated, and by opening, is closed.

Example: If timer 1 is stopped and digital input 1 (DIG1) contact is closed, appears in display Start 1 message, and started timing. At the end of configured time, appears End 1 message on the display, indicating the end of the process time. The message will be displayed until the DIG1 input contact is opened. If the DIG1 input contact is open before finishing the timing, the process is closed and displays the End 1 message. Similarly is the operation of DIG2, DIG3 and DIG4 digital inputs.

☐ 3 - 4 timers (open contact = START, closed contact = STOP):

In this operation mode, the controller will operate with 4 timers using the same process time. Each digital input starts working as **START** and **STOP** for each timer. In this operation mode are provided keys **ON/OFF** type (NC with mechanical retention of the contact). By opening the contact, the timing is initiated, and by closing, is closed.

Example: If timer 1 is stopped and digital input 1 (DIG1) contact is open, appears in display Start 1 message, and started timing. At the end of configured time, appears End 1 message on the display, indicating the end of the process time. The message will be displayed until the DIG1 input contact is closed. If the DIG1 input contact is closed before finishing the timing, the process is closed and displays the End 1 message. Similarly is the operation of DIG2, DIG3 and DIG4 digital inputs.

☐ 4 - 4 Independent timers (Closed contact = START /STOP):

In this mode the operation is identical to the F49 = 1, with the difference that each of the 4 timers has a different time. The process times are set in End 1 , End 2 , End 3 and End 4 , as described in 6.3.1.

Note: The keys ☐ and ☐ function as **START** and **STOP** only with F49=0.

F50 - Intensity of the digital filter:

This filter is intended to simulate the increase of the sensor mass, thereby increasing its response time (thermal inertia). The higher the value set in this function the higher the response time of the sensor will be.

F51 - Time for functions lockdown:

With this setting enabled, the setpoint and the other parameters are protected against unauthorized changes. With the lockdown of the controller the user will only be able to visualize the setpoint and the parameters. To lock the functions, see chapter 6.3.3 - Basic Operations, Functions lockdown item.

F52 - Control functions shutdown:

It allows to switch off the output to perform maintenance, see chapter 6.3.4 - Basic Operations, Control functions shutdown item.

7. SIGNALS

<u>Err</u>	Sensor damaged, disconnected or out of temperature range.
<u>Ctrl On</u>	Control functions on.
<u>Ctrl Off</u>	Control functions off.
<u>Loc On</u>	Lock functions.
<u>Loc Off</u>	Unlocking functions.
<u>Start 1</u> <u>Start 2</u> <u>Start 3</u> <u>Start 4</u>	Start of the process time.
<u>End 1</u> <u>End 2</u> <u>End 3</u> <u>End 4</u>	End of the process time.
<u>End 1</u> <u>End 2</u> <u>End 3</u> <u>End 4</u>	Remaining time of process.

8. OPTIONAL ITEMS - Sold Separately

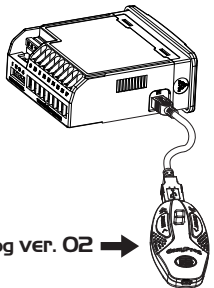
8.1 EasyProg ver. 02

It is an accessory that has as its main function to store the parameters of the 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 has three types of connections to load or unload the parameters:

- **Serial RS-485:** It connects via RS-485 network to the controller (only for controllers that have RS-485).

- **USB:** it can be connected to the computer via the USB port, using Sitrad's Recipe Editor. The parameters can be copied, edited and saved in **EasyProg ver. 02**. The USB port can also have the function of electrically feeding the **EasyProg ver. 02** and the controller (when the USB and Serial TTL are used together).

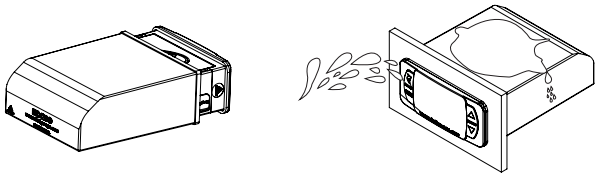
- **Serial TTL:** The controller can be connected directly to **EasyProg ver. 02** by the TTL Serial connection. Thus the **EasyProg ver. 02** may be fed by **MT-622E**, or vice versa.



EasyProg ver. 02 →

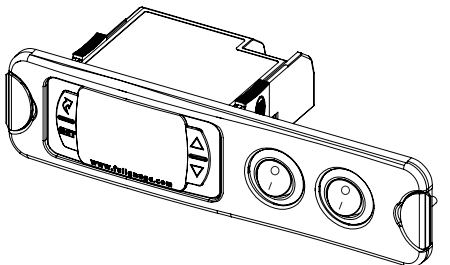
8.2 Ecase

Protective cover for controllers (Evolution line), which prevents the entrance of water and inner moisture. It protects the product when washing is carried out in the location where the controller is installed.



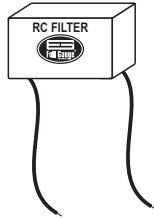
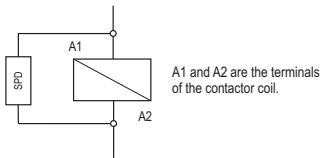
8.3 Extension Frame

The Full Gauge Controls extension frame allows the installation of Evolution / Ri line with measures 76x34x77 mm (dimensions of the clipping for fixing in the extension frame is 71x29mm) in varied situations, since it eliminates precision cut to embed the instrument. Allows customization via a sticker with the brand and the company contact, and accompany two 10A (250 Vac) switches that can trigger internal light, air curtain, on / off system or fan.

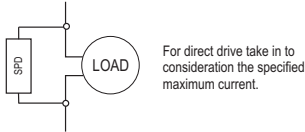


8.4 Surge Protective Device (SPD)

Wiring diagram for instalation of SPD in magnectic contactor



Wiring diagram for instalation of SPD in line with loads



ENVIRONMENTAL INFORMATION

Packaging:

The materials used in the packaging of Full Gauge products are 100% recyclable. Try to perform disposal through specialized recyclers.

Product:

The components used in Full Gauge controllers can be recycled and reused if disassembled by specialized companies.

Disposal:

Do not incinerate or dispose the controllers that have reached the end of their service as household garbage. Observe the laws in your area regarding disposal of electronic waste. If in doubt, please contact Full Gauge Controls.

WARRANTY - FULL GAUGE CONTROLS

Products manufactured by Full Gauge Controls, as of May 2005, have a two (02) year warranty, as of the date of the consigned sale, as stated on the invoice. They are guaranteed against manufacturing defects that make them unsuitable or inadequate for their intended use.

EXCEPTIONS TO WARRANTY

The Warranty does not cover expenses incurred for freight and/or insurance when sending products with signs of defect or faulty functioning to an authorized provider of technical support services. The following events are not covered either: natural wear and tear of parts; external damage caused by falls or inadequate packaging of products.

LOSS OF WARRANTY

Products will automatically lose its warranty in the following cases:

- The instructions for assembly and use found in the technical description and installation procedures in Standard IEC60364 are not obeyed;
- The product is submitted to conditions beyond the limits specified in its technical description;
- The product is violated or repaired by any person not a member of the technical team of Full Gauge Controls;
- Damage has been caused by a fall, blow and/or impact, infiltration of water, overload and/or atmospheric discharge.

USE OF WARRANTY

To make use of the warranty, customers must send the properly packaged product to Full Gauge Controls together with the invoice or receipt for the corresponding purchase. As much information as possible in relation to the issue detected must be sent to facilitate analysis, testing and execution of the service.

These procedures and any maintenance of the product may only be provided by Full Gauge Controls Technical Support services in the company's headquarters at Rua Júlio de Castilhos, 250 - CEP 92120-030 - Canoas - Rio Grande do Sul - Brasil

Rev. 03

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