MT-622R*i*

DIGITAL TWO STAGES CONTROLLER WITH ALARM, CYCLIC TIMER AND PROCESS TIMER

Ver.01

MT622V01-01T-12231

1. DESCRIPTION

The **MT-622R*i*** uses a type J thermocouple and has two outputs for temperature control and an internal buzzer. The second stage can be configured to also operate as an alarm or cyclic timer. It also has a timer that indicates the end of the process time, which can be triggered by the panel buttons or the digital inputs.

2. APPLICATIONS

- Fryers
- Ovens

3. TECHNICAL SPECIFICATIONS

- **Power Supply:** MT-622Ri - 115/230 Vac ±10% (50/60 Hz)
  MT-622RiL - 12/24 Vac/dc
- **Control Temperature:** -50 to 600°C / -58 to 999°F
- **Resolution:** 1ºC / 1ºF
- **Dimensions:** 71 x 28 x 71 mm
- **Operating temperature:** 0 to 50 ºC / 32 to 122ºF
- **Operating humidity:** 10 to 90% RH(without condensation)
- **Load Current:** OUT 1 - 16(8)A / 250 Vac 1HP - 4000W
  OUT 2 - 5(3)A / 250 Vac 1/8HP
- **Sensor:** Thermocouple Type J (sold separately)

4. CONFIGURATIONS

4.1. Control temperature adjust (SETPOINT)

- Press SET for 2 seconds until SEt appears ,then release it.
SP1 will appear and the temperature will be adjusted for the first stage.
- Use ▼ and ▲ to change the value and, when ready, press SET .
- Adjust in the same way SP2 (2nd estage) and tMr (process time).

4.2. Parameters alteration

- Access function F01 by simultaneously pressing keys ▼ and ▲ for 2 seconds until the message Fun appears. Then release the keys and wait for the F01 indication. When the indication appears on the display press the SET key and use ▼ and ▲ to enter the access code (123) When ready press the SET button to confirm.
- Use keys ▼ and ▲ to access the desired function.
- After selecting the function, press SET (press once quickly) to view the value configured for that function.
- Use the ▼ and ▲ keys to change the value and, when ready, press SET to memorize the configured value and return to the function menu.
- To exit the menu and return to the normal operation (temperature indication), press SET (hold it in) until - - - appears.

4.3. Parameters table

		CELSIUS				FAHRENHEIT			
Fun	**Description**	**Min**	**Max**	**Unit**	**Standard**	**Min**	**Max**	**Unit**	**Standard**
F01	Access code (123)	-	-	-	-	-	-	-	-
F02	Offset indication	-10	10	ºC	0	-18	18	ºF	0
F03	Operation mode of first stage	0	1	-	1	0	1	-	1
F04	Minimum setpoint allowed to the end user (first stage)	-50	600	ºC	-50	-58	999	ºF	-58
F05	Maximum setpoint allowed to the end user (first stage)	-50	600	ºC	600	-58	999	ºF	999
F06	Control differential (hysteresis) of first stage	1	20	ºC	1	1	32	ºF	2
F07	Minimum delay to turn on the first stage output	0	999	sec	0	0	999	sec	0
F08	Operation mode of second stage	0	9	-	1	0	9	-	1
F09	Minimum setpoint allowed to the end user (second stage)	-50	600	ºC	-50	-58	999	ºF	-58
F10	Maximum setpoint allowed to the end user (second stage)	-50	600	ºC	600	-58	999	ºF	999
F11	Control differential(hysteresis) of second stage	1	40	ºC	1	1	72	ºF	2
F12	Minimum delay to turn on the second stage output	0	999	sec	0	0	999	sec	0
F13	Delay to enable the alarm when the instrument is powered on	0	999	min	0	0	999	min	0
F14	Time of ALARM/TIMER (on cycle)	0	999	sec/min	1	0	999	sec/min	1
F15	Time of ALARM/TIMER (off cycle)	0	999	sec/min	1	0	999	sec/min	1
F16	Reactivation time of alarm when inhibited manually	Aut	999	-	Aut	Aut	999	-	Aut
F17	Time base of cyclic timer	0	3	-	0	0	3	-	0
F18	Activation time for second stage cyclic timer	0	999	sec	5	0	999	sec	5
F19	Buzzer operation mode	0	2	-	1	0	2	-	1
F20	Acting point of Buzzer (inferior limit)	-50	600	ºC	-50	-58	999	ºF	-58
F21	Acting point of Buzzer (superior limit)	-50	600	ºC	600	-58	999	ºF	999
F22	Buzzer time on	0	999	sec	1	0	999	sec	1
F23	Buzzer time off	0	999	sec	1	0	999	sec	1
F24	Inhibition time of Buzzer during electrical supply	0	999	min	0	0	999	min	0
F25	Reactivation time of Buzzer when inhibited manually	Aut	999	min	Aut	Aut	999	min	Aut
F26	Process time	1	999	sec/min	1	1	999	sec/min	1
F27	Enabling and the process display mode	0	2	-	2	0	2	-	2
F28	Audible alert at the end of the process (Buzzer)	0	1	-	1	0	1	-	1
F29	Timer time base	0	1	-	0	0	1	-	0
F30	Intensity of the digital filter	0	9	-	0	0	9	-	0

4.4. Parameters description

F01 - Access code (123)
It is necessary when you wish to change the set up parameters. To only view the adjusted parameters it is not necessary to insert this code.

F02 - Offset indication
It allows to compensate eventual shunting lines in the reading of ambient temperature proceeding from the exchange of the sensor or cable lenght alteration.

F03 - Operation mode of first stage
- 0 - Refrigeration
- 1 - Heating

F04 - Minimum setpoint allowed to the end user (first stage)

F05 - Máximum setpoint allowed to the end user (first stage)
Electronic limits whose purpose is prevent that too high or too low setpoint temperatures are regulated.

F06 - Control differential (hysteresis) of first stage
It is the difference of temperature(hysteresis) between turn ON and turn OFF the fisrt stage output.

F07 - Minimum delay to turn on the first stage output
It is the minimum time that the first stage output will keep turned off, it means, space of time between the last stop and the next start.

F08 - Operation mode of second stage
- 0 - Refrigeration
- 1 - Heating
- 2 - Intra-range alarm
- 3 - Extra-range alarm
- 4 - Relative extra-range to first stage (SP1 - F09 and SP1 + F10), It is considered the absolute values of F09 and F10.
- 5 - Independent cyclic Timer
- 6 - Timer triggered by the cyclic set point of the 1st stage
- 7 - The 1st stage is linked to the cyclic timer (timer starts on)
- 8 - The 1st stage is linked to the cyclic timer (timer starts off)
- 9 - The output of the cyclic timer is on whenever the output of the 1st stage is connected

F09 - Minimum setpoint allowed to the end user (second stage)

F10 - Maximum setpoint allowed to the end user (second stage)
Electronic limits whose purpose is prevent that too high or too low setpoint temperatures are regulated. When the second stage is defined as alarm, the acting points are defined in F09 and F10.

F11 - Control differential (hysteresis) of second stage
It is the difference of temperature(hysteresis) between turn ON and turn OFF the second stage output.

F12 - Minimum delay to turn on the second stage output
It is the minimum time that the second stage output will keep turned off, it means, the space of time between the last stop ant the next start (only if F08 = 0 or 1).

F13 - Delay to enable the alarm when the instrument is powered on
During this time the alarm is kept turned off waiting that the system reaches the working control temperature.

F14 - Time of ALARM/TIMER (on cycle)
It allows to adust the time that the second stage output will keep turned on if it is set as alarm or timer.

F15 - Time of ALARM/TIMER (off cycle)
It allows to adust the time that the second stage output will keep turned off if it is set as alarm or timer.To keep the alarm always activated, just set "0" to this function.

F16 - Reactivation time of the alarm when inhibited manually
This function configures the manual inhibition of the alarm. If an alarm condition is found, this can be inhibited manually by pressing the ▲ and SET keys simultaneously.
If you set a value between 1 and 999 minutes, when it reaches an alarm condition which is manually inhibited, it will only be activated again after the expiration of that time. If the automatic mode (Aut) is selected, the alarm will only be triggered if the normal condition returns and it is returned to the alarm condition, without the time limit.
Set to 0, the manual inhibition is disabled.
- Aut - Alarm returns to sound when you exit and return to the alarm condition
- 0 - Manual inhibition disabled
- 1 ~ 999 - Time in which the alarm output will remain inhibited (in minutes)

F17 - Time base of cyclic timer (F08=5, 6, 7, 8 or 9)
If the output OUT2 is configured as a cyclic timer, the base time in which the output will remain activated and deactivated can be set in seconds or minutes. The setting of the base time is activated and deactivated respectively:
- 0 - seconds / seconds
- 1 - seconds / minutes
- 2 - minutes / seconds
- 3 - minutes / minutes

F18 - Activation time for second stage cyclic timer
This is the delay time to activate the cyclic timer if it is set to be triggered by the set point of the 1st stage (F08 = 6).

F19 - Buzzer operation mode
- 0 - Intra-range alarm
- 1 - Extra-range alarm
- 2 - Relative extra-range to first stage (SP1 - F20 and SP1 +F21), it is considered the absolute values of F20 and F21.

F20 - Acting point of Buzzer (inferior limit)
It is the inferior value of temperature to the buzzer alarm act as the configured buzzer operation mode .

F21 - Acting point of Buzzer (superior limit)
It is the superior value of temperature to the buzzer alarm act as the configured buzzer operation mode .

F22 -Buzzer time on
It is the time that the Buzzer will be turned on (cycle on). To turn it off the sonore alarm (Buzzer) adjust the value "0" to this function.

F23 - Buzzer time off
It is the time that the buzzer will be turned off (cycle off). To turn it off the sonore alarm (Buzzer) adjust the value "0" to this function.

F24 - Inhibition time of Buzzer during electrical supply
It is the time were the alarm will kept turned off even if in alarm contitions. It serves to inhibit the buzzer during the time while the system do not reaches the working control temperature.

F25 - Reactivation time of Buzzer when inhibited manually
This function configures the manual inhibition of the buzzer. If you enter into an alarm condition, the buzzer may be inhibited by manually pressing the ▼ and SET keys simultaneously.
If you set a value between 1 and 999 minutes when the buzzer reaches an alarm condition and is manually inhibited, it will only be activated again after the expiration of that time. If you selected the automatic mode (Aut), after the buzzer is inhibited it will only be triggered if it returns to the normal condition and return to the alarm condition without a time limit.
When set to 0, the manual inhibition is disabled.
- Aut - Buzzer back to work when leaves and returns to the alarm condition
- 0 - Disable
- 1 ~ 999 - Time that the buzzer will remain inhibited (in minutes)

F26 - Process time
This is the duration of the process. It can be configured between 1 and 999 seconds (F29 = 0) or minutes (F29 = 1).

F27 - Enabling and the process display mode
This function is used to enable or disable the process timer. If enabled, it can be set to, during the process, display the temperature or remaining time. The choice of information to be displayed when the timer is triggered depends on the user's needs.
- 0 - Disabled
- 1 - During the process shows the temperature
- 2 - During the process shows the remaining time

F28 - Audible alert at the end of the process (Buzzer)
- 0 - Disable buzzer to indicate the end of the process
- 1 - Enable buzzer to indicate the end of the process

F29 - Timer time base
- 0 - Seconds
- 1 - Minutes

F30 - Intensity of the digital filter
This filter aims at simulating an increase of the mass of environment sensor, thus increasing its response time (thermal inertia). The larger the value adjusted in this function, the longest the response time of sensor .

5. FUNCTIONS WITH FACILITATED ACCESS

5.1. Process Timer

5.1.1. Description
The process timer is a time counter. It is started manually and after the time set in F26 displays the message End in the display. This can be configured to emit an audible alarm at the end of the process (F28). The process time can be counted in seconds (F29 = 0) or minutes (F29 = 1). It is noteworthy that the end of the process time is indicated only by the display and/or buzzer, and does not affect the outputs OUT1 and OUT2.

5.1.2. Operation
Press the ▼ or **START** keys to begin the process. The timer starts counting the time indicated by a flashing LED on the bottom right of the display , at the end of the programmed time, the buzzer is activated and the message End will be intermittently shown on the display for 10 seconds, then the temperature will be shown.

5.1.3. Pause
If it is necessary to stop the count during the process, press ▼ or **START**.
To continue, press ▼ or **START** again to continue. You can tell whether the process is in progress or paused by the LED indicator on the bottom right of the display , which keeps flashing during the counting and lit (not flashing) during the pause.

5.1.4. View details
By pressing SET during the process, additional information is displayed for 5 seconds, then the display returns to show the information configured in function F27.

5.1. 5. Manual Termination of the timer
If it is necessary to manually terminate the process, press ▲ or **STOP**. The buzzer is activated and the message End will be shown on the display intermittently for 2 seconds, then the temperature indication will be shown.

5.2. Register of minimum and maximum temperatures
On temperature display mode press ▲ , it will appear the minimum registered temperature. Soon will apears the the maximum registered temperature.
Note: To reset the registers, keep the key ▲ pressed during the visualization of minimum and maximum registers until rSt to be showed.
Note 2: If there is an ongoing process, when pressing ▲ it is manually ended (item 5.1.5).

5.3. Alarm Inhibit
The OUT2 output can be configured to act as an alarm. Once the alarm is triggered, it can be inhibited by pressing ▲ and SET simultaneously. This inhibition can be set at F16. With F16 = 0, this function is disabled. If a value between 1 and 999 is set, the alarm is inhibited by the number of minutes selected. In the automatic mode (Aut) the alarm is inhibited and will only be triggered if it is triggered again and returns to the alarm condition.

5.4. Buzzer Inhibit
This is analogous to the inhibition of the alarm, the buzzer can be inhibited. If it is activated, simultaneously press ▼ and SET to inhibit the buzzer. The buzzer can be set with F25. Using F25 = 0, this function is disabled. When the value is between 1 and 999 the buzzer is inhibited by the number of minutes selected. In the automatic mode (Aut) the buzzer is inhibited and will only be triggered if it is activated again and returned to the alarm condition.

5.5. Summary
SET for 2 seconds - Adjust the set point and process time
▼ and ▲ for 2 seconds - Access to the parameters menu
▲ and SET - Inhibits alarm (if activated)
▼ and SET - Inhibits buzzer (if activated)

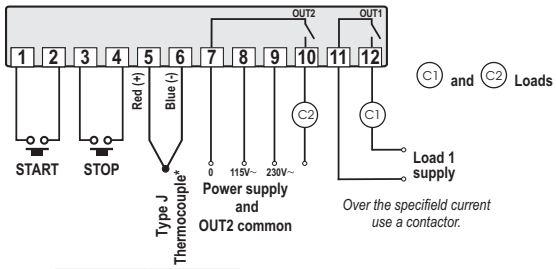
Process timer not activated:
▲ - Record of maximum and minimum temperatures (hold down to clear the record)
▼ - Start the process timer

Process timer activated:
▲ - Terminate process time
SET - Display information (time or temperature)
▼ - Pause the process

6. SIGNALING
OUT 1 - Fisrt stage output on;
OUT 2 - Second stage output on;
BUZZ - Buzzer activated;
Err - Detached temperature sensor or outside the specified range;
- Flashing: Counting the time/ Always on: Time counting paused.

7. SELECTION OF THE UNIT (ºC / ºF)
In order to define the unit that the instrument will operate in, enter function "F01" with the access code 231 and confirm with the SET key. Press the ▲ key and the indication Uni will appear.
Press SET to choose between ºC or ºF and confirm. After selecting the unit the FAC message will appear, and the instrument will return to the function "F01". Every time that the unit is changed, the parameters should be reconfigured, since they assume the "standard" values.

8. WIRING DIAGRAM

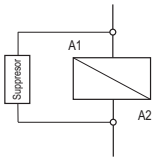


	MT-622Ri	MT-622RiL
7 - 8	115V~	12V≂
7 - 9	230V~	24V≂

*Sensor sold separately

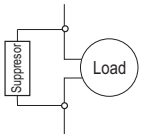
IMPORTANT
According to the chapters of norm IEC 60364:
1: Install protector against overvoltage on the power supply
2: Sensor cables and signal cables of the computer may be joined, but not in the same electric conduit through which the electric input and the activation of the loads run
3: Install transient suppresors (RC filters) parallel to the loads as to increase the product life of the relays.

Schematic for the connection of supresors to contactors



A1 and A2 are the contactor coil terminals.

Schematic for the connection of supresors to direct activation loads



For direct activation the maximum specified current should be taken into consideration.

PROTECTIVE VINYL:
This adhesive vinyl (included inside the packing) protects the instruments against water drippings, as in commercial refrigerators, for example. Do the application after finishing the electrical connections.

Remove the protective paper and apply the vinyl on the entire superior part of the device, folding the flaps as indicated by the arrows.