



MT-519E Ver.02

DIGITAL TEMPERATURE CONTROLLER WITH TWO INDEPENDENT STAGES



Alarm

Buzzer

Cyclic timer

Functions block

Control functions shutdown

Serial programming

Protection level



MT519E02-03T-16560

Have this manual in the palm of your hand through the FG Finder app.

1. DESCRIPTION

Temperature controller for cooling or heating applications with two independent thermostats, allowing operations in two different environments. In addition, the outputs of the thermostats can be configured as cyclic timers and the alarm output can be linked to any of the thermostats. It also includes an audible alarm (buzzer), configurable digital filter, and an intelligent function lock system to prevent unauthorized people from changing the control parameters.

2. SAFETY RECOMMENDATIONS

- Check the controller for correct fastening;
- Make sure that the power supply is off and that it is not turned on during the controller installation;
- Read the present manual before installing and using the controller;
- Use adequate Personal Protective Equipment (PPE);
- For application at sites subject to water spills, such as refrigerated counters, install the protecting vinyl supplied with the controller;
- For protection under more critical conditions, we recommend the Ecase cover, which we make available as an optional item (sold separately);
- The installation procedures should be performed by a qualified technician.

3. APPLICATIONS

- Boilers
- Heaters
- Freezers
- Refrigerated counters
- Hot/cold counters

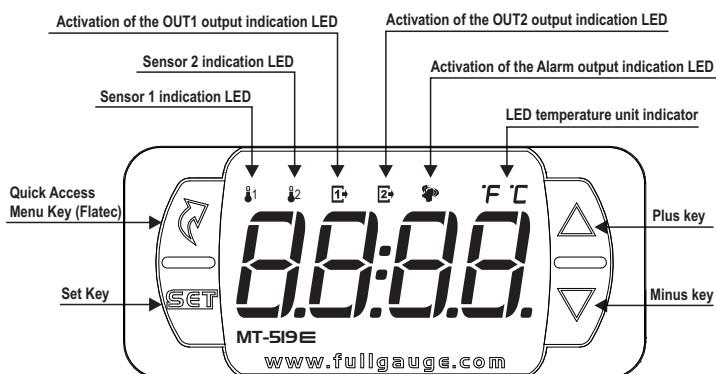
4. TECHNICAL SPECIFICATIONS

Power supply	MT-519E: 100~240 Vac (50/60 Hz) MT-519EL: 12 or 24 Vac/dc + 10%
Maximum approximate consumption	5,7 VA
Control temperature	-50 to 200°C (-58 to 392°F)(*)
Operating temperature	0 to 50 °C / 32 to 122°F
Maximum current/power per output	OUT1: 16(8)A / 250Vac 1HP OUT2: 16(8)A / 250Vac 1HP Alarm (NC) 1A / 250 Vac
Operating Humidity	10 to 90% UR (without condensation)
Dimensions (mm)	76 x 34 x 77 mm (WxHxD)
Dimensions of the clip for fixing the instrument	71 ± 0.5 x 29 ± 0.5 mm (see image V)

(*This device can measure and control temperatures of up to 200 °C when used in conjunction with a model SB59 silicon sensor cable (sold separately).

Note: Sensor cable length can be increased to up to 200 meters by using a PP 2 x 24 AWG cable.

5. INDICATIONS AND KEYS



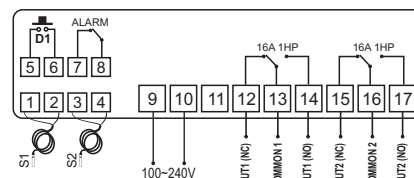
6. CONNECTION DIAGRAM

IMPORTANT

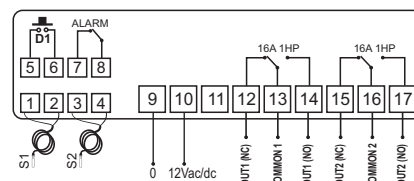
IT IS ESSENTIAL TO USE THE CORRECT TOOLS IN ORDER TO AVOID DAMAGE TO THE INSTRUMENT'S CONNECTION TERMINALS:

- ⊖ 3/32"(2.4mm) SLOTTED SCREWDRIVER FOR ADJUSTMENTS IN THE SIGNAL TERMINALS;
- ⊕ PHILLIPS SCREWDRIVER #1 FOR ADJUSTMENTS AT THE POWER TERMINLS;

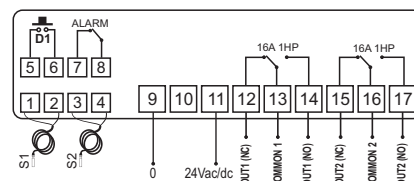
100~240Vac connection



12Vac/dc connection

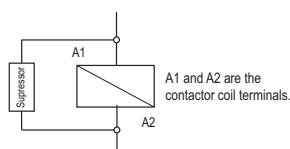


24Vac/dc connection

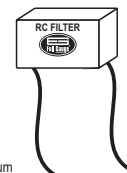
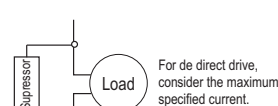


Electrical noise suppression filter

Wiring diagram of suppressors in contactors



Wiring diagram of suppressors in direct drive loads



6.1. Recommendations of standards NBR5410 and IEC60364

- Install overload protectors in the controller supply.
- Install transient suppressors – suppressor filter (RC type) – in the circuit to increase the service life of the controller relay.
- The sensor cables may be together, but not in the same conduit where the power supply of the controller and/or of the loads passes through.

7. FASTENING PROCEDURE

- Cut out the panel plate (Image V - item 12) where the controller shall be fastened, with sizes X = 71±0.5 mm and Y = 29±0.5 mm;
- Remove side locks (Image VI - item 12): to do that, compress the central elliptical part (with the Full Gauge Controls logo) and move the locks backwards;
- Introduce the controller in the notch made on the panel, inwards;
- Place the locks again and then displace them until they compress into the panel, fastening the controller to the housing (see arrow indication in Image VI - item 12);
- Perform the electric installation as described in item 6;
- Adjust the parameters as described in item 8.

WARNING: for installations requiring liquid tight sealing, the notch sizes for the controller installation should be no more than 70.5x29mm. The side locks should be fastened so that they press the sealing rubber avoiding infiltration between the notch and the controller.

Protector vinyl - Image VII (item 12).

This adhesive vinyl is supplied with the instrument in the package



IMPORTANT: Make the application only after completing the electrical connections.

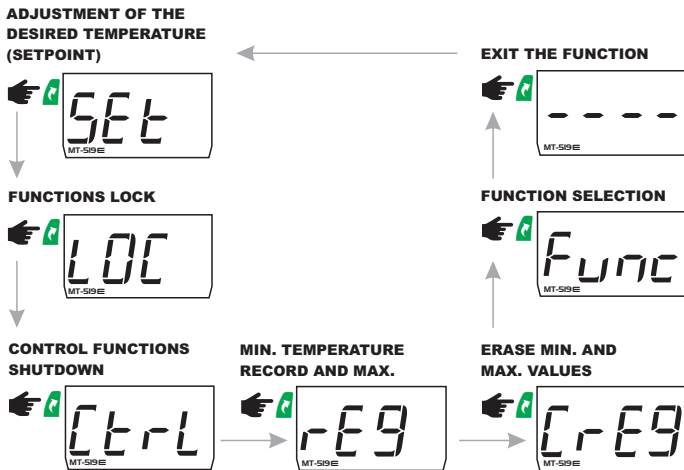
- Retreat the side locks (Image VI - item 12);
- Remove the protective film from the adhesive vinyl face;
- Apply the vinyl over the entire upper part, bending the flaps, as indicated by the arrows - Image VII (item 12);
- Reinstall the locks.

Note: The vinyl is transparent, allowing you to see the electrical circuitry of the instrument.

8. OPERATIONS











8.1. Quick Access Menu Map

To access the quick access menu, use the  key (quick touch) while the temperature is being displayed by the controller. Each touch displays the next function in the list; to confirm, use the  key (quick touch). For further details, refer to chapter 8.3. The functions map is shown below:






8.2. Quick Access Keys Map


When controller is on temperature display mode, the following keys can be used as a shortcut for the following functions:

	Hold down for 2 seconds: Setpoint adjustment.
	Quick touch: switches the temperature display.
	Hold down for 2 seconds: disable ALARM output.
	Hold down for 4 seconds: reverses cyclic 2 timer status.
	Quick touch: minimum and maximum temperature display.
	Hold down for 2 seconds: clear history when records are being displayed.
	Hold down for 4 seconds: reverses cyclic 1 timer status.
	Enters quick access menu.
	Hold down for 5 seconds: control functions shutdown.
	Enters function menu.

8.3. Basic Operations








8.3.1. Adjustment of desired temperature (setpoint) and cyclic timer times

Hold down the  key for 2 seconds to enter the setpoint adjustment menu. The message  will be shown in the display and then the value to adjust the 1st stage setpoint. Adjust the setpoint  of thermostat 2 using the same procedure.




NOTE: The setpoint adjustment will be available only when the thermostat is active (F02 or F16 other than .

8.3.2. Functions lock






The use of the functions lockdown brings greater security to the operation of the instrument. When it is active, the setpoint and other parameters can be visible to the user, but are protected against undue changes (F39=2) or you can block changes of control functions and leave the adjustment of the setpoint enabled (F39=1).

Using the  key (quick touch), access the  function in the quick access menu, confirm by pressing  (quick touch), then the message  will be displayed. After that, hold down the  key for the time configured for the functions lock (F40), until  is displayed. Upon releasing the key, the message  will be displayed indicating that the block function has been activated.



To unlock, turn off the controller then turn it back on whilst holding down the  key. Keep holding down the key until the message  appears. Keep the key held down for ten seconds and the message  will be shown on the display, indicating the deactivation of the block function once the key is released.

8.3.3. Control Functions Shutdown

Turning the control functions off allows the controller to operate just as a temperature indicator, keeping the control outputs and the alarms disconnected. Use of this feature is enabled and disabled by the control functions shutdown options . When enabled, the control functions are turned off ( or on () through the quick access menu in the option . When the control functions are off, the message  will be displayed alternately with the temperature and the other messages.


NOTE: It is also possible to switch the control functions on / off by pressing the  key for 5 seconds.





NOTE: When turning the control functions on again, the MT-519E will continue to respect the delay time of the thermostat.

8.3.4. Other measurement view


By pressing the  key (short touch) you can temporarily switch the preferred view between the temperature of sensor 1 and sensor 2.


The temporary indication lasts 15 seconds. Once this time has elapsed, the preferred view returns to the option chosen in  - Preferred Indication.


Icons T1 and T2 indicate which temperature is being displayed.


NOTE: If the thermostat is disabled, the message related to the cyclic timer  is displayed. If the cyclic timer is also disabled, the message  is displayed.

8.3.5. Manually changing the cyclic timer status



When the cyclic timer is active (F08 or F22 different from ), it is possible to manually change the cyclic timer output status from "on" to "off" and vice-versa, irrespective of the time elapsed.

Hold the  key down for 4 seconds to change the thermostat 1 cyclic timer.




Hold the  key down for 4 seconds to change the thermostat 1 cyclic timer.



Changing the cyclic timer status will display the message .


8.3.6. Minimum and Maximum Temperature Record

By pressing down the  key or via the quick access menu, the message  appears, after which the minimum and maximum temperatures recorded of each thermostat will be displayed.









Icons T1 and T2 indicate which temperature is being displayed.

To erase the current minimum and maximum values, press the  key (quick touch) until the message  is displayed. Press  to confirm.


Note: If the  key is pressed while the records are being displayed the values will be reset and the message  will be displayed.

Note: The minimum and maximum temperatures recorded of each thermostat only will be displayed if the respective thermostat is active. If sensor 2 is disabled (F25 - Sensor 2 indication displacement (Offset) = ), the records related to this sensor will not be displayed.

8.3.7. Temperature units selection













To select the unit in which the device will operate, enter the function  using the access code . Then, press the  key. Then select the desired unit  or  using the  or  keys, and press  to confirm. Whenever the units are changed, the functions' configuration assumes the factory default, so they need to be configured again.




8.3.8. Silencing the alarm

Hold the  key down for 2 seconds to silence the audible alarm. Only the alarm output will be inhibited. The message will still be displayed. When disabled, the alarm will happen again after exiting the current alarm condition and return to a new condition.

If the buzzer is active, it will also be inhibited.

8.4. Advanced operations

The functions menu can be accessed through the quick access menu, using the  option or by simultaneously pressing the  and  keys whilst the temperature is being displayed. To allow the parameters to be changed, enter  by pressing  (quick touch) and using the  or  keys enter code 123 (one hundred and twenty-three), and then confirm with . To change the other functions, browse the menu using the  or  keys and proceed the same way to adjust them. To exit the menu and return to the normal operation display, press  (long touch) until  is displayed.

NOTE: If the functions lock is enabled, when pressing the  or  keys, the controller will display the message  and will not allow parameter adjustment.

8.5. Parameters table

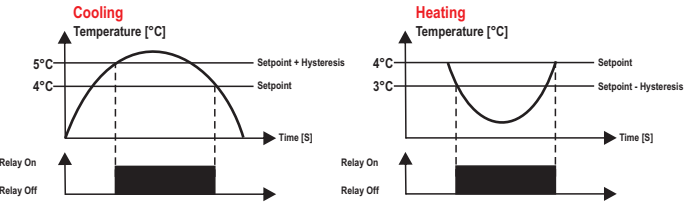
Fun	Description	CELSIUS				FAHRENHEIT			
		Min	Max	Unit	Default	Min	Max	Unit	Default
F01	Access code 123 (one hundred and twenty three)	0	999	-	0	0	999	-	0
F02	Thermostat 1 operation mode	0-Off	2-Aquec.	-	1-Refrig.	0-Off	2-aquec.	-	1-Refrig.
F03	Thermostat 1 differential control (hysteresis)	0.1	20.0	°C	1.0	1	36	°F	1
F04	Min. setpoint allowed to the end user (thermost. 1)	-50	200	°C	-50.0	-58	392	°F	-58
F05	Max. setpoint allowed to the end user (thermost. 1)	-50	200	°C	105	-58	392	°F	221
F06	Thermostat 1 output minimum time off	0(no)	9999	s	0	0(no)	9999	s	0
F07	Delay of therm. 1 when the instrument is powered on (initial delay)	0(no)	9999	s	0	0(no)	9999	s	0
F08	Thermostat 1 cyclic timer operation mode	0-Off	4	-	0-Off	0-Off	4	-	0-Off
F09	Thermostat 1 cyclic timer off time	1	9999	seg./min.	1	1	9999	seg./min.	1
F10	Thermostat 1 cyclic timer on time	1	9999	seg./min.	1	1	9999	seg./min.	1
F11	Indication offset for sensor 1	-5.0	5.0	°C	0	-9	9	°F	0
F12	Thermostat 1 alarm indication mode	0-Off	4	-	0-(Off)	0-Off	4	-	0-(Off)
F13	Thermostat 1 alarm minimum value	-50.0	200	°C	-50.0	-58	392	°F	-58
F14	Thermostat 1 alarm maximum value	-50.0	200	°C	105	-58	392	°F	221
F15	Thermostat 1 alarm delay on power on	0(no)	9999	s	0	0(no)	9999	s	0
F16	Thermostat 2 operation mode	0-Off	2-Aquec.	-	1-Aquec	0-Off	2-Aquec.	-	1-Aquec.
F17	Thermostat 2 differential control (hysteresis)	0.1	20.0	°C	1.0	1	36	°F	1
F18	Min. setpoint allowed to the end user (thermost. 2)	-50.0	200	°C	-50.0	-58	392	°F	-58
F19	Max. setpoint allowed to the end user (thermost. 2)	-50.0	200	°C	105	-58	392	°F	221
F20	Thermostat 2 output minimum time off	0(no)	9999	s	0(no)	0(no)	9999	s	0(no)
F21	Delay of therm. 2 when the instrument is powered on (initial delay)	0(no)	9999	s	0(no)	0(no)	9999	s	0(no)
F22	Thermostat 2 cyclic timer operation mode	0-Off	4	-	0-Off	0-Off	4	-	0-Off
F23	Thermostat 2 cyclic timer off time	1	9999	seg./min.	1	1	9999	seg./min.	1
F24	Thermostat 2 cyclic timer on time	1	9999	seg./min.	1	1	9999	seg./min.	1
F25	Indication offset for sensor 2	-5.0	5.1(Off)	°C	0	-9	9(Off)	°F	0
F26	Thermostat 2 alarm indication mode	0-Off	4	-	0-Off	0-Off	4	-	0-Off
F27	Thermostat 2 alarm minimum value	-50.0	200	°C	-50.0	-58	392	°F	-58
F28	Thermostat 2 alarm maximum value	-50.0	200	°C	105	-58	392	°F	221
F29	Thermostat 2 alarm delay on power on	0(no)	9999	s	0	0(no)	9999	s	0
F30	Alarm output operation mode	0-Off	4	-	0-Off	0-Off	4	-	0-Off
F31	Alarm output cyclic timer off time	0	9999	s	0	0	9999	s	0
F32	Alarm output cyclic timer on time	0	9999	s	0	0	9999	s	0
F33	Preferred indication	t-1	ALL	-	t-1	t-1	ALL	-	t-1
F34	Sensor error alarm	Off	On	-	On	Off	On	-	On
F35	Enable buzzer	Off	On	-	Off	Off	On	-	Off
F36	Digital input operation mode	0	6	-	0	0	6	-	0
F37	Digital filter intensity applied to the sensor 1	0(no)	9	-	0(no)	0(no)	9	-	0(no)
F38	Digital filter intensity applied to the sensor 2	0(no)	9	-	0(no)	0(no)	9	-	0(no)
F39	Functions lock mode	0	2	-	0	0	2	-	0
F40	Time for functions lock	15	60	s	15	15	60	s	15
F41	Control functions shutdown	0(no)	2	-	0(no)	0(no)	2	-	0(no)

8.5.1. Description of the parameters

F01 - Access code: 123 (one hundred and twenty-three):
It is required when you want to change setup parameters. This code is not required for viewing the parameters.
It allows entering the access codes provided:
[123](#) - Allows you access for changing the table parameters
[231](#) - Allows configuring the units of measurement [°F](#) or [°C](#)

F02 - Thermostat 1 operation mode:
Selects the 1st thermostat operation mode (**OUT1**):
[0FF](#) - Off: In this mode, temperature sensor 1 can be disconnected. If function F08 is other than [0FF](#), output **OUT1** will work only as cyclic timer
[1](#) - Cooling
[2](#) - Heating

F03 - Thermostat 1 control differential (Hysteresis):
This is the temperature difference (hysteresis) between turning the cooling (or heating) ON and OFF of the thermostat.
Example: You want to control the temperature at 4.0 °C with a differential of 1.0 °C. Therefore, the cooling is switched off at 4.0 °C and switched back on at 5.0 °C (4.0 + 1.0), in the heating mode the output is switched off at 4 °C and is switched on again at 3 °C (4.0 - 1.0), as per the charts below:



F04 - Minimum setpoint allowed to user (thermostat 1):
Prevents accidental setting of extremely low setpoint temperatures.

F05 - Maximum setpoint allowed to user (thermostat 1):
Prevents accidental setting of extremely high setpoint temperatures.

F06 - Thermostat 1 output minimum time off:
This is the minimum time during which the **OUT1** output remains off, i.e., the time interval between the last stop and next start. It helps to relieve the discharge pressure and increase the lifespan of the compressor. This delay also occurs when starting up the device. In facilities with several instruments, assigning different values to the delay time at the start up of each device will allow for demand peaks to be avoided when the devices are activated at different times.
If the cyclic timer of thermostat 1 is enabled, this time will not be observed.
This function can be switched off by setting it at the minimum value 0 [na](#).

F07 - Delay of thermostat 1 when the instrument is powered on (initial delay):
Time thermostat 1 will wait before activating its control functions. During this time only the temperature is measured.
This function can be switched off by setting it at the minimum value 0 [na](#).

F08 - Thermostat 1 cyclic mode operation mode:
Allows configuring the cyclic timer associated to output **OUT1**:
[0FF](#) - Disabled: Output **OUT1** will be constantly on or off depending only on the temperature. The possible settings for output time on and output time off are, respectively:
[1](#) - Seconds/Seconds
[2](#) - Seconds/Minutes
[3](#) - Minutes/Seconds
[4](#) - Minutes/Minutes

For configurations 1, 2, 3, and 4, output **OUT1** will keep cycling while the temperature of thermostat 1 requires the output to be on. The initial state of **OUT1** is always on.

F09 - Thermostat 1 cyclic timer off time:
F10 - Thermostat 1 cyclic timer on time:
Functions [F09](#) and [F10](#) are used when the user configures **OUT1** as cyclic timer, observing the time base configured in [F08](#).

F11 - Sensor 1 indication displacement (Offset):
Enables compensation for any temperature deviations resulting from sensor replacement or change in the cable length.

F12 - Thermostat 1 alarm indication mode:
Selects how the thermostat 1 checks for the presence of an alarm. Enabling this function only enables the alarm indication on the display. If you need the alarm output to be activated, you must configure function [F30](#).
[0FF](#) - Alarm off.
[1](#) - In-range alarm ([F13](#) and [F14](#)).
[2](#) - Out-of-range alarm ([F13](#) and [F14](#)).
[3](#) - In-range alarm related to the setpoint ([SP1](#) - [F13](#) and [SP1](#) + [F14](#)).
[4](#) - Out-of-range alarm related to the setpoint ([SP1](#) - [F13](#) and [SP1](#) + [F14](#)).

F13 - Thermostat 1 alarm minimum value:
F14 - Thermostat 1 alarm maximum value:
These are the minimum and maximum values for the alarm to actuate if configured in [F12](#).

F15 - Thermostat 1 alarm delay when powering on:
The time that the alarm of thermostat 1 will remain off even in alarm conditions. This time is counted after the time configured in [F07](#) has elapsed.
This function can be disabled by adjusting it to the minimum value [na](#).

F16 - Thermostat 2 operation mode:
Selects the 2nd thermostat operation mode (**OUT2**):
[0FF](#) - Off: In this mode, temperature sensor 2 can be disconnected. If function F22 is other than [0FF](#), output **OUT2** will work only as cyclic timer
[1](#) - Cooling
[2](#) - Heating

F17 - Thermostat 2 control differential (Hysteresis):
This is the temperature difference (hysteresis) between turning the cooling (or heating) ON and OFF of the thermostat.

F18 - Minimum setpoint allowed to user (thermostat 2):
Prevents accidental setting of extremely low setpoint temperatures.

F19 - Maximum setpoint allowed to user (thermostat 2):
Prevents accidental setting of extremely high setpoint temperatures.

F20 - Thermostat 2 output minimum time off:
This is the minimum time during which the **OUT2** output remains off, i.e., the time interval between the last stop and next start.
If the cyclic timer of thermostat 2 is enabled, this time will not be observed.
This function can be switched off by setting it at the minimum value 0 [na](#).

F21 - Delay of thermostat 2 when the instrument is powered on (initial delay):
Time thermostat 2 will wait before activating its control functions. During this time only the temperature is measured.
This function can be switched off by setting it at the minimum value 0 [na](#).

F22 - Thermostat 2 cyclic mode operation mode:
Allows configuring the cyclic timer associated to output **OUT2**:
[0FF](#) - Disabled: Output **OUT2** will be constantly on or off depending only on the temperature. The possible settings for output time on and output time off are, respectively:
[1](#) - Seconds/Seconds
[2](#) - Seconds/Minutes
[3](#) - Minutes/Seconds
[4](#) - Minutes/Minutes

For configurations 1, 2, 3, and 4, output **OUT2** will keep cycling while the temperature of thermostat 2 requires the output to be on. The initial state of **OUT2** is always on.

F23 - Thermostat 2 cyclic timer off time:
F24 - Thermostat 2 cyclic timer on time:
Functions [F23](#) and [F24](#) are used when the user configures **OUT2** as cyclic timer, observing the time base configured in [F22](#).

F25 - Sensor 2 indication displacement (Offset):
Enables compensation for any temperature deviations resulting from sensor replacement or change in the cable length.
Sensor 2 may be disabled by adjusting this function to the maximum value [0FF](#). When sensor 2 is disabled, thermostat 2 is controlled by sensor 1.

F26 - Thermostat 2 alarm indication mode:

Selects how the thermostat 2 checks for the presence of an alarm. Enabling this function only enables the alarm indication on the display. If you need the alarm output to be activated, you must configure function .

- Alarm off.

- In-range alarm (and .

- Out-of-range alarm (and .

- In-range alarm related to the setpoint (- and + .

- Out-of-range alarm related to the setpoint (- and + .

F27 - Thermostat 2 alarm minimum value:

F28 - Thermostat 2 alarm maximum value:

These are the minimum and maximum values for the alarm to actuate if configured in .

F29 - Thermostat 2 alarm delay when powering on:

The time that the alarm of thermostat 2 will remain off even in alarm conditions.

This time is counted after the time configured in has elapsed.

This function can be disabled by adjusting it to the minimum value .

F30 - Alarm output operation mode:

Selects how the alarm output is activated:

- Alarm output off

- The alarm output is activated when there is an alarm for thermostat 1

- The alarm output is activated when there is an alarm for thermostat 2

- The alarm output is activated when there is an alarm for thermostat 1 or 2

- The alarm output is activated when there is an alarm for thermostat 1 and 2 simultaneously.

NOTE: The contacts of the alarm output relay are NC. When the controller is powered off the contacts of this relay remain closed. If the controller is powered on, the contacts remain open, and close only if is other than and the alarm associated with this function occurs.

F31 - Alarm output cyclic timer off time:

F32 - Alarm output cyclic timer on time:

Functions and select the time the alarm output will cycle. If one of these functions is set to , the output will be always on.

F33 - Preferred indication:

Selects how the temperatures are shown in the display:

- Thermostat 1

- Thermostat 2

- Thermostat 1 and thermostat 2 alternately

Icons T1 and T2 indicate which temperature is being displayed.

F34 - Sensor error alarm (0 - Disabled / 1 - Enabled):

Allows enabling and disabling the activation of the alarm output when a sensor error is detected. The alarm output will be activated in accordance with the options chosen in .

F35 - Enable buzzer (0 - Disabled / 1 - Enabled):

Allows enabling and disabling of the internal buzzer for temperature alarm signaling. With this function enabled the buzzer will be activated whenever a temperature alarm associated with function occurs. If the alarm is inhibited, the buzzer will switched off.

F36 - Digital input operation mode:

Allows choosing which outputs the digital input will operate:

- Disabled

- Acts only on thermostat 1 (NO contact)

- Acts only on thermostat 2 (NO contact)

- Acts on thermostat 1 and 2 (NO contact)

- Acts only on thermostat 1 (NC contact)

- Acts only on thermostat 2 (NC contact)

- Acts on thermostat 1 and 2 (NC contact)

The digital input allows using an external device for protection of the control outputs (door switch or safety pressure switch, for instance). In case of external alarm, the corresponding output is switched off and the message is displayed. The digital input alarm is independent of the thermostat configuration mode and independent of the temperature alarms. The buzzer is **NOT** activated in case of digital input alarm.

F37 - Intensity of the digital filter applied to sensor 1:

This filter has the purpose of simulating increase in thermal mass at the sensor 1 thereby increasing its response time (thermal inertia). The larger the value adjusted in this function, the greater the response time of sensor 1.

This function can be switched off by setting it at the minimum value 0 .

F38 - Intensity of the digital filter applied to sensor 2:

This filter has the purpose of simulating increase in thermal mass at the sensor 2 thereby increasing its response time (thermal inertia). The larger the value adjusted in this function, the greater the response time of sensor 2.

This function can be switched off by setting it at the minimum value 0 .

F39 - Function lock mode:

This allows and configures the functions lockdown:

- Do not allow the function lock.

- It allows a partial lock where the control functions will be locked but the adjustment of the setpoint and maximum and minimum record views are allowed.

- It allows the full lock, enabling only the date views and maximum and minimum record views.

F40 - Time for Functions Block:

Allows locking of control functions (see item 8.3.2).

- - Defines the time in seconds for the controller to activate lockdown functions.

F41 - Control Functions Shutdown:

Allows the turning off of the control functions (see item 8.3.3).

- Disables control functions shutdown.

- Enables activation/deactivation of the control functions only if the functions are unlocked.

- Enables activation/deactivation of the control functions even if the functions are locked.

9. SIGNALING

<input type="text" value="Err1"/>	Error on sensor 1: Sensor disconnected or damaged.
<input type="text" value="Err2"/>	Error on sensor 2: Sensor disconnected or damaged.
<input type="text" value="AlH1"/>	Upper out-of-range alarm of thermostat 1.
<input type="text" value="AlLo"/>	Lower out-of-range alarm of thermostat 1.
<input type="text" value="AlIn"/>	In-range alarm of thermostat 1.
<input type="text" value="AlH2"/>	Upper out-of-range alarm of thermostat 2.
<input type="text" value="AlLo2"/>	Lower out-of-range alarm of thermostat 2.
<input type="text" value="AlIn2"/>	In-range alarm of thermostat 2.
<input type="text" value="ALd1"/>	Digital input alarm.
<input type="text" value="inib"/>	Alarm/Buzzer inhibited.
<input type="text" value="CYCL"/>	Output configured only as cyclic timer.
<input type="text" value="LOC"/> <input type="text" value="On"/>	Functions lock.
<input type="text" value="LOC"/> <input type="text" value="OFF"/>	Unlocking of functions.
<input type="text" value="OFF"/>	Control functions off.
<input type="text" value="ECAL"/>	Contact Full Gauge Controls.
<input type="text" value="PPPP"/>	Reconfigure the function values.

10. GLOSSARY OF ABBREVIATIONS

- °C: Temperature in degrees Celsius.

- °F: Temperature in degrees Fahrenheit.

- Heat.: Heating.

- LOC: Lock.

- OFF: Off/disabled.

- ON: On/activated.

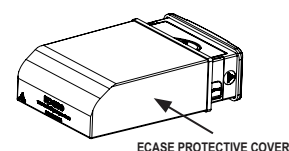
- Refr: Cooling.

- SET (Setting) (adjustment or configuration).

11. OPTIONAL ITEMS - Sold Separately

Ecase protective cover

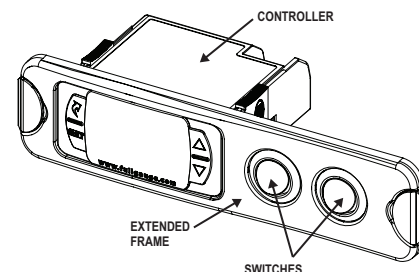
Recommended for the Evolution line, it prevents water from entering the rear part of the instrument. It protects the product when the site of installation is washed.



Extended frame

It allows the installation of Evolution line controllers with sizes 76 x 34 x 77 mm in various situations, since it does not require precision in the notch of the instrument fitting panel.

The frame integrates two switches of 10 Amperes that may be used to actuate interior light, air curtain, fan, and others.



EasyProg - version 2 or later

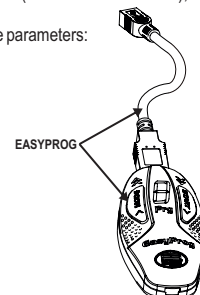
It is an accessory with a main function of storing the parameters of controllers. At any time you can load new parameters of a controller and unload them on a production line (of the same controller), for example.

It is provided with three types of connections for loading or unloading the parameters:

- **Serial RS-485:** It is connected via RS-485 network to the controller (only for those controllers provided with RS-485).

- **USB:** It is connected to the computer's USB port using Sitrad's Preset Editor.

- **Serial TTL:** The controller may be connected directly to **EasyProg** via Serial TTL connection.



12. ANNEXES - Reference Images

Image V

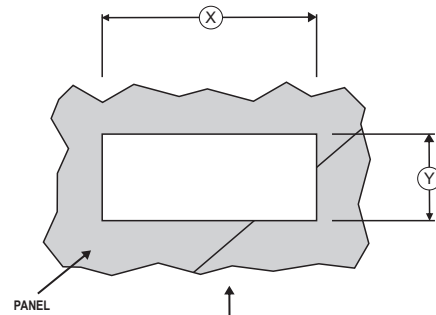


Image VI

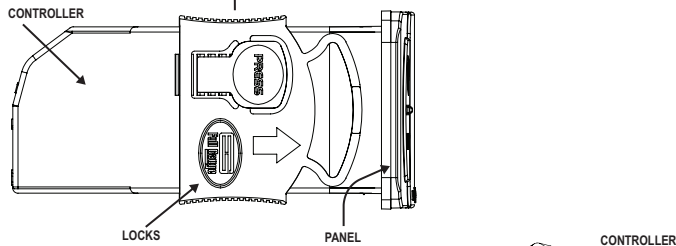
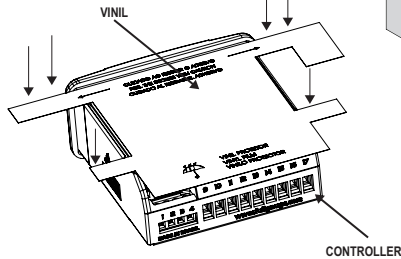


Image VII



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