



MT-512E Log^{Ver.09}

DIGITAL INDICATOR AND CONTROLLER FOR HEATING OR REFRIGERATION WITH NATURAL DEFROST THROUGH COMPRESSOR SHUTDOWN AND INTERNAL DATALOGGER



Have this manual in the palm of your hand by FG Finder application.



1. DESCRIPTION

Designed for cooling or heating application. **MT-512E Log** is equipped with 1 powerful 2HP relay, 1 temperature sensor, 1 digital input, data logger, cyclic time for natural defrost, IP65 frontal, min-max temperature record, sensor response time control, fast freezing mode, tamper-proof function, control functions shutdown and RS485 serial communication port for Sitrad real-time monitoring and management.

Product conforming to UL Inc. (United States and Canada) and NSF (United States).

2. SAFETY RECOMMENDATIONS

- Check the controller for correct assembling;
- 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 cabinets, install the protecting vinyl supplied with the controller;
- For protection under more critical conditions, we recommend the Ecace cover, which we make available as an optional item (sold separately);
- The installation procedures should be performed by a qualified technician.

3. APPLICATIONS

- Refrigerated displays
- Walk-in coolers
- Hot cabinets
- Greenhouses

4. TECHNICAL SPECIFICATIONS

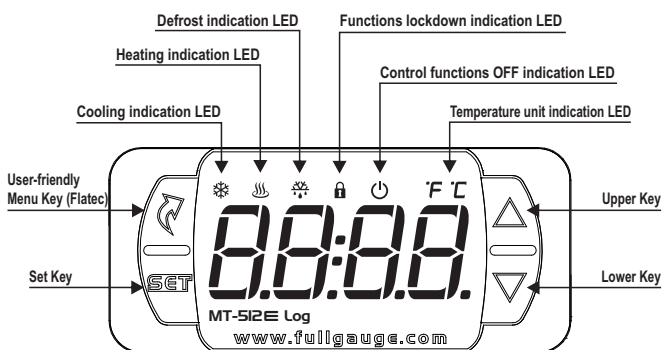
Power supply	MT-512E Log 115 or 230 Vac ±10% (*) (50/60 Hz) MT-512EL Log 12 or 24 Vac/dc +10% (*)
Control temperature	-50 to 105°C (-58 to 221°F) (**)
Operating temperature	0 to 50 °C / 32 to 122°F
Maximum output current	NO - 16A / 2HP NC - 500W / 1/10HP
Maximum consumption of device	1.5 VA
Operating humidity	10 to 90% RH (without condensation)
Dimensions (mm)	76 x 34 x 77 mm (WxHxD)
Cutout dimensions (mm)	71 ± 0,5 x 29 ± 0,5 mm (see image V)

(*) Admissible variation in relation to the voltage rating.

(**) 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 the user by using a PP 2 x 24AWG cable.

5. INDICATIONS AND KEYS



6. WIRING DIAGRAM

6.1. Identifications (see Images I to IV)

- Image I: MT-512E Log, supplied at 115 Vac.
- Image II: MT-512E Log, supplied at 230 Vac.
- Image III: MT-512EL Log, supplied at 12 Vac/dc.
- Image IV: MT-512EL Log, supplied at 24 Vac/dc.

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;

Image I: MT-512E Log - 115Vac

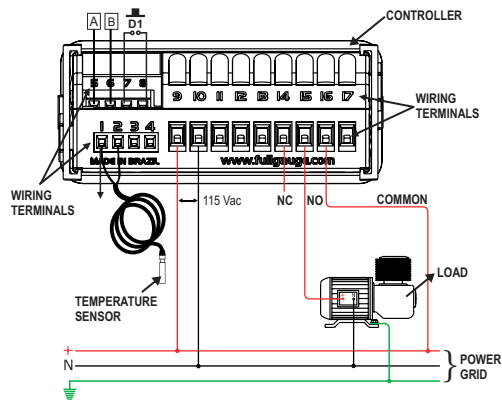


Image II: MT-512E Log - 230 Vac

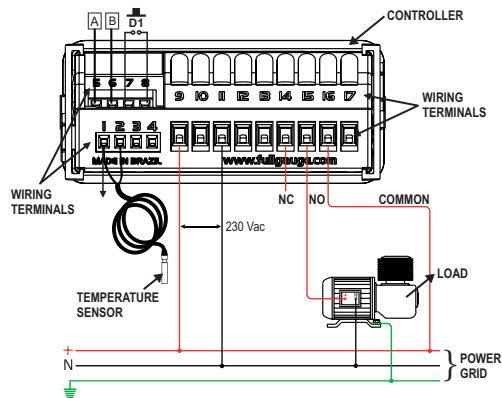
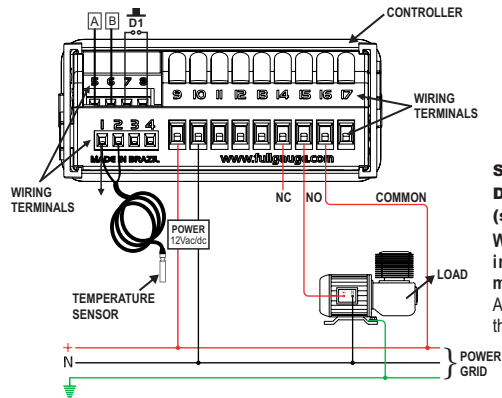


Image III: MT-512EL Log - 12Vac/dc



Surge Protective Device (SPD) (sold separately)

Wiring diagram for installation of SPD in magnetic contactor. A1 and A2 are the terminals of the contactor coil.

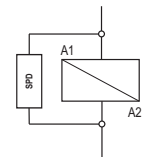
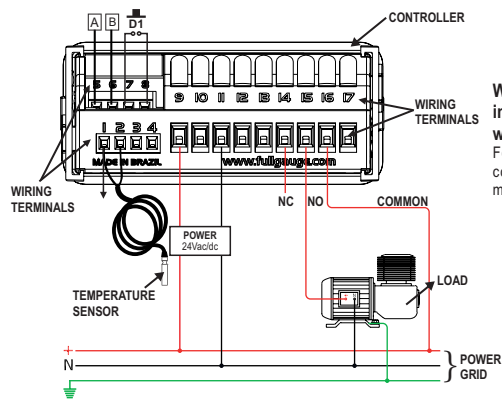
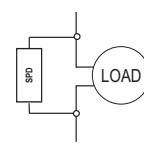


Image IV: MT-512EL Log - 24Vac/dc



Wiring diagram for installation of SPD in line with loads

For direct drive take in to consideration the specified maximum current.



6.2. Temperature sensor connection

- Connect the sensor wires to terminals '1 and 2': the polarity is not relevant.
- Length of the sensor cables can be increased by user himself to up to 200 meters, using a PP 2x24 AWG cable.
- For immersion in water, use a thermowell (Image VI - item 13), available in the Full Gauge Controls product line (sold separately).

6.3. Controller power supply

Use the pins according to table below, considering the set version:

Pins	MT-512E Log	MT-512EL Log
9 and 10	115 Vac	12 Vac/dc
9 and 11	230 Vac	24 Vac/dc

6.4. Recommendations of IEC60364 standard

- Install overload protectors in the controller supply.
- Install transient suppressors – suppressor filter RC – in the circuit to increase the service life of the controller relay. See connection instructions of the filter on the previous page.
- 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. ASSEMBLING PROCEDURE

- Cut out the panel plate (Image V - item 13) where the controller shall be fastened, with sizes $X = 71 \pm 0.5$ mm and $Y = 29 \pm 0.5$ mm;
- Remove side locks (Image VII - item 13): to do that, compress the central elliptical part (with the Full Gauge Controls logo) and displace 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 VII - item 13);
- Perform the electric installation as described in item 6;
- Adjust the parameters as described in item 8.

⚠ ATTENTION: 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 VIII (item 13)

It protects the controller when installed at a site subject to water spills, such as refrigerated counters. This adhesive vinyl is supplied with the instrument in the package.

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

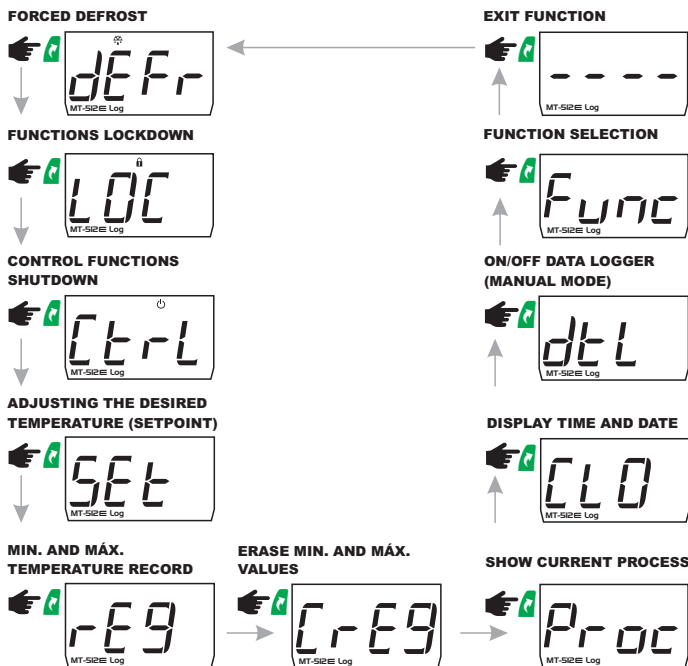
- Retreat the side locks (Image VII - item 13);
- Remove the protective film from the adhesive vinyl face;
- Apply the vinyl over the entire upper part, bending the flaps, as indicated by the arrows - Image VIII (item 13);
- Reinstall the locks.

NOTE: The vinyl is transparent, allowing visualization of the wiring system of the instrument.

8. SETTING THE SETPOINT AND PARAMETERS

8.1. Quick Access Menu Map

By pressing **F** (Fplate), it is possible to navigate through the function menus. For more details, see chapter 8.3. See the functions map below:



8.2. Quick access keys map

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

SET	Hold down for 2 seconds: Setpoint adjustment.
SET	Quick touch: The current day, month, year, hour and minute will be shown in sequence on the display.
✓	Quick touch: Displays the status of the process.
▲	Quick touch: Maximum and minimum temperature display.
▲	Hold down for 2 seconds: Clear history when records are being displayed.
▲	Hold down for 4 seconds: Carries out manual defrost.
▲	Enter the quick access menu.
▲ and ✓	Hold down for 10 seconds: Manually switches the datalogger on/off.
▲ and ✓	Enter the quick access menu.

8.3. Basic operations

8.3.1. Adjusting setpoint (desired temperature)

Hold the key **F** down for 2 seconds until the message **SEt** is displayed. The adjusted control temperature will be displayed when the key is released.

Use the keys **▲** or **▼** to change the value and then press **SET** to save.

The desired temperature can also be changed in the quick access menu, (see map on item 8.1) or by function **DEFr** item 8.5.

8.3.2. Manual defrost

The manual defrost is performed through the quick access menu (**▲**) or by holding the key **▲** for 4 down for 4 seconds. Press the key **▲** (quick touch) until the message **DEFr** (led **☼** flashing) is displayed, and then press the key **▲** (quick touch) to select. The message **DEFr** (led **☼** on) will then be displayed.

To manually stop the defrosting, press the key **▲** (quick touch) until the message **DEFr** (led **☼** flashing) is displayed. Press the key **▲** (quick touch) to select. The message **DEFr** (led **☼** off) will then be displayed.



8.3.3. Function lock

For safety reasons, the controller has a feature to allow functions to be locked. When this configuration is active, the setpoint and other parameters are protected from undue changes. However, the parameters can be viewed. Under this condition, the message **LOC** will be displayed when trying to change those values. To lock the functions you first need to adjust the parameter **Func** - Time for function lock* to a value greater than 14 (below 15, **no** is displayed and it means that function lock is not allowed). Select **▲** using the key **▲**, (quick touch), and then press **▲** (quick touch). Then keep **▲** held down until **LOC** is displayed. The message **no** will be displayed upon releasing the key.



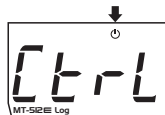
To unlock, turn the controller off and then turn it on again with the key **▲** held down. Keep the key held down until **LOC** is displayed. The message **no** will be displayed when the key is released.

8.3.4. Control functions shutdown

When the control functions are turned off, the controller starts to operate as a temperature indicator only and the output relay turns off.

The way to turn off the control functions depends on the configuration of the parameter **Ctrl** - Turn off of the control functions*:

- no** - Does not allow the turning off the control functions.
- 1** - Allows shutdown the control functions only if the functions are not locked.
- 2** - Allows shutdown the control functions even if the functions are locked. Using the key **▲** (quick touch), select **Ctrl**, and then press **▲** (quick touch) to confirm.



Then, the message **Ctrl** will be displayed. At this moment the temperature display will alternate with the message **no**.

To turn the control functions back on, follow the same procedure used to turn them off, selecting with the key **▲** (quick touch), **Ctrl**. The message **Ctrl** will be displayed as soon as the user presses the key **▲**.

NOTE: When the control functions are turned on again, the MT-512E Log will keep following the functions **Func** - Minimum output switched off time* and **Func** - Initial state when turning the device on*.

8.3.5. Visualization of Processes

Press **✓** (quick touch) to view the status and the time already elapsed. This way the controller will display the stage of the current process, and the following messages may be shown on the display:

- - control off
- dtL** - initial delay
- DEFr** - refrigeration
- Hdt** - heating
- DEFr** - defrost

8.3.6. Minimum and Maximum Temperature Record

Holding the **▲** key down or also via the quick access menu (see item 8) will cause the message **rEg** to be displayed and the minimum and maximum temperatures to be recorded.

For erasing the current minimum and maximum values, press the **▲** key (quick touch) until the message **CrEg** is displayed. Press **▲** to confirm.

NOTE: These records are not stored in the internal datalogger and in the case of a power cut, the data will be lost.

8.3.7. View current date and time

Quickly pressing the key **▲** makes it possible to view the current date and time set in the controller.

The current day (**---**), month (**---**), year (**---**), hour, and minute (**---**) will be shown in sequence on the display. It is also possible to view the date and time through the quick access menu in the option **CLD**.

8.3.8. Manual datalogger activation

The manual activation requires function F21 to be configured with the value 2. By holding down the keys **▲** and **▼** for 10 seconds, it is possible to activate or deactivate the operation of the internal record of temperature values and control outputs (datalogger). The message **[dEt]** will be shown followed by the message **[On]** when the datalogger is activated or **[OFF]** when it is deactivated. It is also possible to activate the datalogger manually through the quick access menu in option **[dEt]**.

8.3.9. Selection of temperature measurement units

To select the temperature measurement units the system will use to operate, press **▲** and **▼** simultaneously while the temperature is being displayed, enter the option **[EdE]** using the access code **[237]** and then press **↵**. Then select the desired unit **[°C]** or **[°F]** using the keys **▲** or **▼**, and press **↵** to confirm.

NOTE: Whenever the units are changed, the configuration of the functions assume the factory default, so they need to be configured again.

8.4. Advanced operations

8.4.1. Access to the main menu

The main menu can be accessed through the quick access menu (**▲**), option **[Func]** or pressing **▲** and **▼** simultaneously when the temperature is being displayed.

The following options will be displayed:

- [EdE]** - Entry to the access code
- [Func]** - Change the advanced parameters
- [EtE]** - Adjust or visualization of the date and time

8.4.2. Access code

To allow changing the parameters or adjusting the clock, select the option **[EdE]** by pressing **↵** (quick touch) and enter the access code 123 (one hundred and twenty-three) using the keys **▲** or **▼**, and confirm with **↵**.

8.4.3. Changing the controller parameters

In the main menu (after entering the code 123) select the option **[Func]** and then the desired function using the keys **▲** and **▼**. Press **↵** (quick touch) after selecting the function to view its value.

Use **▲** or **▼** to change the value and press **↵** when ready to save the configured value and return to the function menu. To leave the menu and return to the normal operating mode (temperature indication), hold down **↵** (long touch) until **[---** appears.

NOTE: If the function lock is active, the controller will show the message **[ELU]**, in the display upon pressing **▲** or **▼** and will not allow the adjustment of the parameters.

8.4.4 Date and time adjustment

When the **[EtE]** menu is selected, if the access code **[123]** has been entered, the controller will enter the date and time adjustment mode. Use **▲** or **▼** to change the value and press **↵** when ready to save the configured value. If the date entered is invalid, the message **[ELU]** will be shown on the display.

Example 1 (correct access code entered):



▲ IMPORTANT:

The controller has an auxiliary internal power supply to keep the clock running for at least 72 hours in case of a power failure. If the controller remains off for a long period of time, the message **[ELU]** 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.

8.4.5. Internal datalogger (internal memory)

When the datalogger is enabled (F21), it is possible to store records in the controller's internal memory. It can be configured to store records by time interval (F22), by temperature variation (F23), and/or by the variation of the state of the digital output or inputs (F24).

NOTE: The equipment records date, time, temperature, and events (sensor error, refrigeration/heating output state, defrost output state, and open door sensor).

8.5 Parameters table

Fun	Description	CELSIUS				FAHRENHEIT			
		Min	Max	Unit	Standard	Min	Max	Unit	Standard
[F01]	Desired temperature (Setpoint)*	-50	200	°C	4	-58	392	°F	39
[F02]	Sensor indication displacement (Offset)	-5.0	5.0	°C	0	-9	9	°F	0
[F03]	Minimum setpoint allowed to the end user	-50	200	°C	-50	-58	392	°F	-58
[F04]	Maximum setpoint allowed to the end user	-50	200	°C	75	-58	392	°F	167
[F05]	Control differential (hysteresis)	0.1	20.0	°C	1.0	1	36	°F	2
[F06]	Operating mode	0-cool.	1-heat.	-	0-cool.	0-cool.	1-heat.	-	0-cool.
[F07]	Minimum output-on time	no	999	sec	20	no	999	sec	20
[F08]	Minimum output-off time	no	999	sec	20	no	999	sec	20
[F09]	Refrigeration time (interval between defrosts)	1	999	min	240	1	999	min	240
[F10]	Defrosting time	no	999	min	30	no	999	min	30
[F11]	Initial status when turning on the device	0-cool.	1-defr.	-	0-cool.	0-cool.	1-defr.	-	0-cool.
[F12]	Temperature indication locked during defrosting	no	yes	-	no	no	yes	-	no
[F13]	Delay in turning on device	no	240	min	no	no	240	min	no
[F14]	Additional time to the end of the first cycle	no	240	min	no	no	240	min	no
[F15]	Compressor state with a disconnected or faulty sensor	0	2	-	0	0	2	-	0
[F16]	Compressor time on in case of error	1	999	min	15	1	999	min	15
[F17]	Compressor time off in case of error	1	999	min	15	1	999	min	15
[F18]	Digital filter intensity	no	9	-	no	no	9	-	no
[F19]	Time for function lock	no	60	sec	no	no	60	sec	no
[F20]	Control functions shutdown	no	2	-	no	no	2	-	no
[F21]	Datalogger operating mode	0	2	-	2	0	2	-	2
[F22]	Time between samples in the memory	1	999	sec	30	1	999	sec	30
[F23]	Minimum temperature change to force data writing	0	10.0	°C	0	0	18	°F	0
[F24]	Output change to force data writing	no	yes	-	no	no	yes	-	no
[F25]	Overwrite memory?	no	yes	-	yes	no	yes	-	yes
[F26]	Digital input operating mode	no	2	-	no	no	2	-	no
[F27]	Address of the instrument in the RS-485 network	1	247	-	1	1	247	-	1

*The minimum and maximum values depend on the values configured in **[F03]** and **[F04]**.

Legend: **[9E5]** = yes
[no] = no

8.5.1. Parameters description

F01 - Desired temperature (Setpoint):

The reference value for temperature control, that is, the temperature to be maintained in a controlled environment.

F02 - Sensor indication displacement (Offset):

Compensates for any deviations in temperature reading caused by sensor exchange or alterations in the cable length.

F03 - Minimum setpoint allowed to the end user:

A threshold aimed at preventing an exceedingly low temperature setpoint from being inadvertently adjusted.

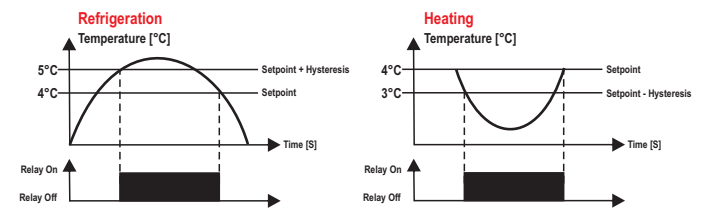
F04 - Maximum setpoint allowed to the end user:

A threshold aimed at preventing an exceedingly high temperature setpoint from being inadvertently adjusted.

F05 - Differential control (hysteresis):

The difference in temperature (hysteresis) between TURNING ON and OFF the refrigeration (or heating).

Example: One wants to control the temperature at 4.0 °C with a differential of 1.0 °C. Therefore, the refrigeration 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 is switched on again at 3° (4.0 - 1.0), as per the charts below:



F06 - Operating mode:

Allows selecting the controller operation mode.

- [0]** - Refrigeration
- [1]** - Heating

NOTE: In the heating mode functions F09, F10, F11 and F12 are disregarded.

F07 - Minimum output-on time:

The minimum time the output will remain on, i.e. the length of time between the last start up and the next stop. It is aimed at avoiding high voltage surges in the power lines.

F08 - Minimum output-off time:

The minimum time the output will remain off, i.e. the length of time between the last start up and the next stop. It relieves the discharge pressure and increases the service life of the compressor.

F09 - Refrigeration time (interval between defrosts):

Corresponds to the time in which the refrigeration function will operate via the controller. When this time is up the controller enters the defrost process.

F10 - Defrost time:

This is the defrost duration time. Within this period, the relay will remain off, and upon finishing, the controller will go back to the refrigeration state.

F11 - Initial status when turning on the device:

It allows defrosting when controller is turned on.

F12 - Temperature indication locked during defrost:

This function is aimed at avoiding viewing the room temperature rise due to the defrost cycle. The last temperature measured in the refrigeration cycle will be locked in the display during the defrost. The real time temperature indication will only be released at the next refrigeration cycle after it reaches the "locked" temperature value again, or after 15 minutes in refrigeration (as a safety measure).

F13 - Delay in turning on device:

When the device is switched on its control output will remain disabled, delaying the beginning of the process. During this time the controller only works as a temperature indicator. The purpose is to avoid peaks of electric power demand after a power cut when many devices are connected to the mains. To do this, simply set different times for each device. This delay may be either for the compressor or the defrost (when the defrost is configured during the startup).

NOTE: At its end, the count of minimum time of output off is started, if there is any.

F14 - Additional time to the end of the first cycle:

Aimed at increasing the refrigeration time only in the first refrigeration cycle, increasing the efficiency.

F15 - Compressor state with a disconnected or faulty sensor:

If the room sensor is shorted, disconnected or out of range, the compressor will assume the state configured in this function.

0 - Compressor off

1 - Compressor on

2 - Cycling according to times defined in and

NOTE: If the system is in both heating and error mode, the output will be switched off.

F16 - Compressor time on in case of error:

F17 - Compressor time off in case of error:

Sets the minimum time the compressor will remain on/off respectively when the sensor is disconnected or out of range.

F18 - Digital filter intensity:

This filter has the purpose of simulating thermal mass increase in the sensor, thus increasing its response time (thermal inertia). The greater the value set in this function, the greater the sensor response delay will be.

F19 - Time for function lock:

When this function is active, the setpoint and other parameters are protected from undue changes. When the controller is locked the user can only view the setpoint and parameters. To lock the functions, see item 8.3.3 - Basic Operations, item Function lock.

F20 - Control functions shutdown:

Allows the output to be switched off for maintenance purposes, see item 8.3.4 - Basic Operations, item Turning off the control functions.

F21 - Datalogger operating mode:

Indicates how to activate the device that records data in the internal memory:

0 - Always off

1 - Always on

2 - Manual operation

F22 - Time between each sample in the memory:

The time in seconds that the controller takes to record samples of the temperature information and refrigeration output state.

F23 - Minimum temperature change to force the writing of data:

The temperature difference in relation to the last piece of data written in the datalogger for the data to be recorded in the memory regardless of the sampling time set in . To deactivate this function, just decrement the value until the message is displayed.

F24 - Output change to force the writing of data:

Indicates whether the change in the control output will force the recording of data in the memory regardless of the sampling time set in .

F25 - Overwrite memory?:

This function indicates whether the controller should start writing new data at the beginning of the datalogger memory when the memory is full. This function prevents the last data calculated by the equipment from being lost.

F26 - Digital input operating mode:

Aims to program the controller with the type of door sensor used in the installation.

0 - Off

1 - NC door contact

2 - NO door contact

F27 - Address of the instrument in the RS-485 network:

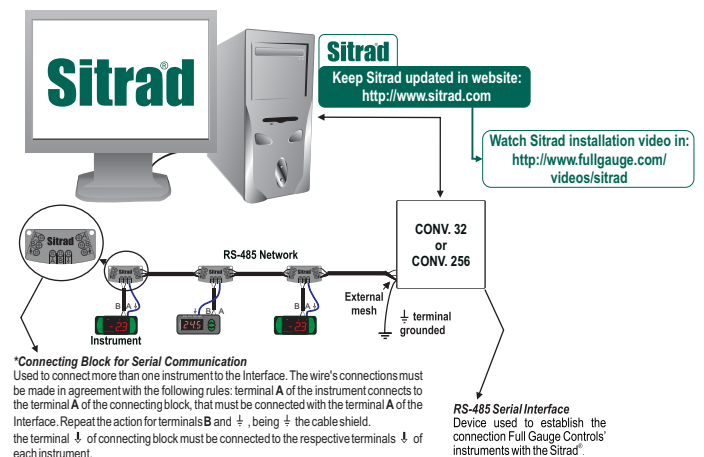
Equipment's network address for communicating with Sitrad software.

Note: Every single controller within the network must have different address.

9. SIGNALS

<input type="text" value="Err1"/>	Error in sensor: Sensor disconnected or damaged.
<input type="text" value="OFF"/>	Control functions turned off.
<input type="text" value="dEFr"/> <input type="text" value="On"/>	Manual activation of defrost process.
<input type="text" value="dEFr"/> <input type="text" value="OFF"/>	Manual activation of the refrigeration process.
<input type="text" value="LOC"/> <input type="text" value="On"/>	Function lock.
<input type="text" value="LOC"/> <input type="text" value="OFF"/>	Function unlock.
<input type="text" value="OPEN"/>	Open door indication.
<input type="text" value="AdFL"/>	Datalogger memory full.
<input type="text" value="ENEN"/>	Contact Full Gauge Controls.
<input type="text" value="CLD"/>	Adjustment or visualization of the date and time.
<input type="text" value="ECLD"/>	Invalid date and/or time (adjust the clock).
<input type="text" value="PPPP"/>	Reconfigure the values of the functions.
<input type="text" value="ECLAL"/>	Contact Full Gauge Controls.

10. INTEGRATING CONTROLLERS, RS-485 SERIAL INTERFACE AND COMPUTER



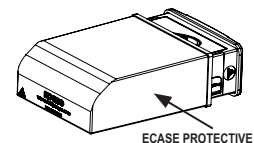
11. GLOSSARY OF ACRONYMS

- °C: Temperature in Celsius degrees.
- °F: Temperature in Fahrenheit degrees.
- Refr: Refrigeration.
- Defr: Defrost.
- Heat.: Heating.
- LOC: Blocked.
- No: No.
- OFF: Turned off/disabled.
- ON: Turned on, enabled.
- SET (as in "Setting") (setting or configuration).
- Vac: Electrical voltage (volts) of alternating current.
- Vdc: Electrical voltage (volts) of direct current.
- Yes: Yes.

12. OPTIONAL ITEMS - Sold Separately

Ecace protective cover

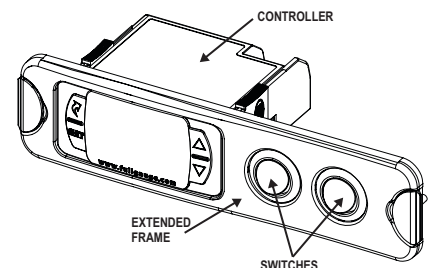
It is recommended for the Evolution line, keeps water from entering the back part of the instrument. It also protects the product when the installation site is washed.



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.

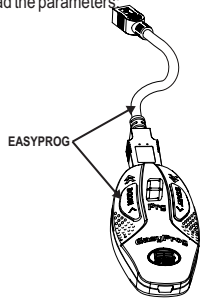
The frame integrates two switches of 10 Amperes that may be used to actuate interior light, air curtain, fan, and others.




EasyProg - version 2 or higher

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 download 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.
- **Serial TTL:** The controller can be connected directly to **EasyProg** by the TTL Serial connection.



IMPORTANT

 TO PERFORM THE COMMUNICATION WITH EASYPROG THIS EQUIPMENT MUST NOT BE COMMUNICATING WITH SITRAD SOFTWARE.

13. ANNEXES - Reference Images

Image V

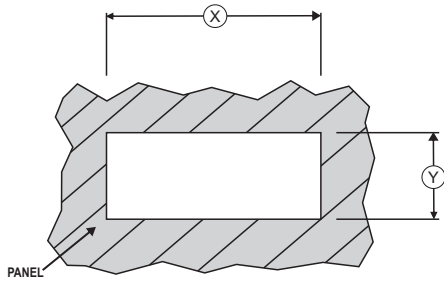


Image VI

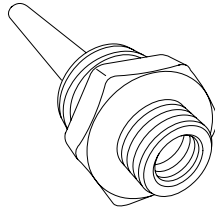


Image VII

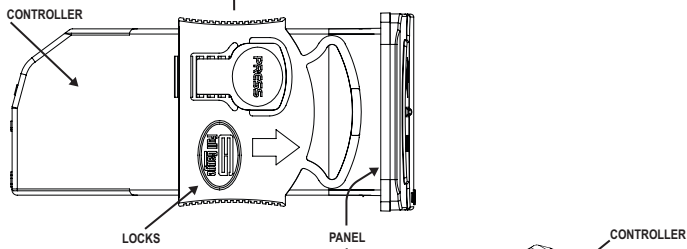
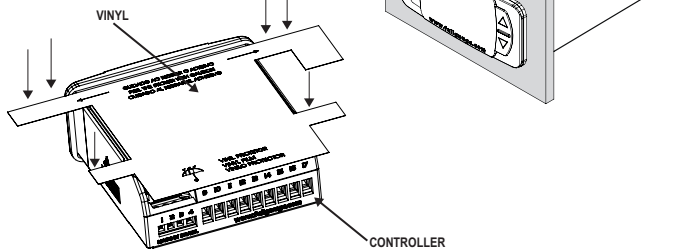



Image VIII



 **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

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