MT-512Ri plus

DIGITAL CONTROLLER FOR COOLING WITH NATURAL DEFROST THROUGH COMPRESSOR SHUTDOWN

Ver. 09

Full Gauge CONTROLS®

Sitrad

CE · NSF · c UL us E251415

1. DESCRIPTION

The **MT-512Ri plus** is a temperature controller and indicator, with a joined cyclical timer. Controls cooling and defrost through compressor shutdowns. It also has a serial output for communication with the SITRAD®.
Product complies with CE (European Union), NSF (United States) and UL Inc. (United States and Canada).

2. APPLICATIONS

• Counters
• Cooled chambers

3. TECHNICAL SPECIFICATION

- **Power supply:** MT-512Ri plus → 115 or 230 Vac ±10%(50/60 Hz)
  MT-512RiL plus   12 or 24 Vac/dc
- **Control temperature:** -50 to 75.0ºC / -58 to 167°F
- **Load current:** NO → 16(8)A/250Vac 1HP
  NC   8A/250Vac
- **Dimensions:** 71 x 28 x 71mm
- **Operating temperature:** 0 to 50 ºC / 32 to 122°F
- **Operating humidity:** 10 to 90% RH (without condensation)

CLASSIFICATION ACCORDING TO IEC60730-2-9 STANDARD:
- **Temperature limit of the installation surface:** 50°C / 122°F
- **Type of construction:** Built-in electronic controller
- **Automatic action:** Type 1
- **Control of pollution:** Level 2
- **Impulse voltage:** 1,5kV
- **Temperature for the test of sphere pressure:** 75°C and 125°C / 167°F and 257°F
- **Insulation:** Class II

4. CONFIGURATIONS

4.1 - control temperature adjust (SETPOINT)

- Press **SET** for 2 seconds until appears `SEt` and then release the key.
  The set control temperature will appear.
- Use the ▼ and ▲ keys in order to change the value and, when ready, press **SET** to record.

4.2 - Parameters table

Fun	Descripion	CELSIUS				FAHRENHEIT			
		Min	Max	Unid	Standard	Min	Max	Unid	Standard
F01	Access code: 123 (one hundred and twenty three)	-	-	-	-	-	-	-	-
F02	Indication offset	-5.0	5.0	°C	00.0	-9	9	°F	000
F03	Minimum setpoint allowed for the end user	-50	75.0	°C	-50	-58	167	°F	-58
F04	Maximum setpoint allowed for the end user	-50	75.0	°C	75.0	-58	167	°F	167
F05	Control differential (hysteresis)	0.1	20.0	°C	01.0	1	40	°F	002
F06	Delay to turn the cooling output on	0	999	sec.	020	0	999	sec.	020
F07	Cooling time	1	999	min.	240	1	999	min.	240
F08	Defrosting time	0	999	min.	030	0	999	min.	030
F09	Initial state up on energizing the instrument	0 - cooling.	1 - defrost	-	0	0 - cooling.	1 - defrost	-	0
F10	Indication of the temperature locked during defrost	0 - no	1 - yes	-	0	0 - no	1 - yes	-	0
F11	Delay on the activation of the instrument	0	240	min.	000	0	240	min.	000
F12	Additional time at the end of the first cycle	0	240	min.	000	0	240	min.	000
F13	Address of the instrument on the network RS-485	001	247	-	001	001	247	-	001

4.3 - Parameters Alteration

- Access function "F01" by simultaneously pressing keys ▼ and ▲ for 2 seconds.
When the message `Fun` appears release the keys and wait for the `F01` indication. When the indication appears on the display press the **SET** key and use ▼ or ▲ to enter the access code (123) When ready press the **SET** button to confirm.
- Use keys ▼ or ▲ to access the desired function.
- After selecting the function, press **SET** (press once quickly) to view the value configured for that function.
- Use the ▼ or ▲ 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.

5. FUNCTIONS WITH FACILITATED ACCESS

5.1 - Maximum and minimum temperature logs

Press the ▲ key. The minimum and maximum temperatures registered will appear.
Note: To restart the logs you just have to keep the ▲ key pressed during the viewing of the minimum and maximum temperatures until `rSE` to be displayed.

Manual defrost:
- To change from "cooling" to "defrost" or vice-versa, irrespective of the programming, hold ▲ key in for four seconds, until `dEF` ou `rEF` appears in the display.
To visualize the status and the elapsed time, press ▼.
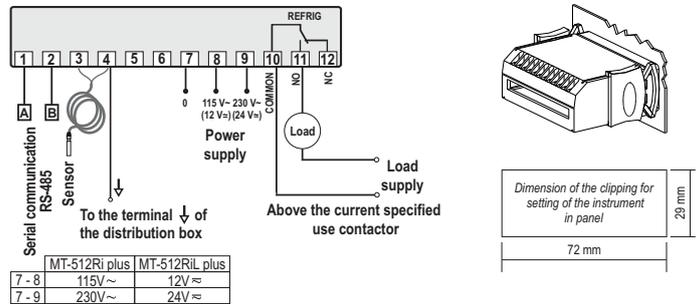`dEL` → Initial delay   `rEF` → Refrigeration   `dEF` Defrosting

6. SIGNALLING

REFRIG - Cooling output on
DEFROST - Performing natural defrost
`Err` - Sensor disconnected or temperature out of the specified range.

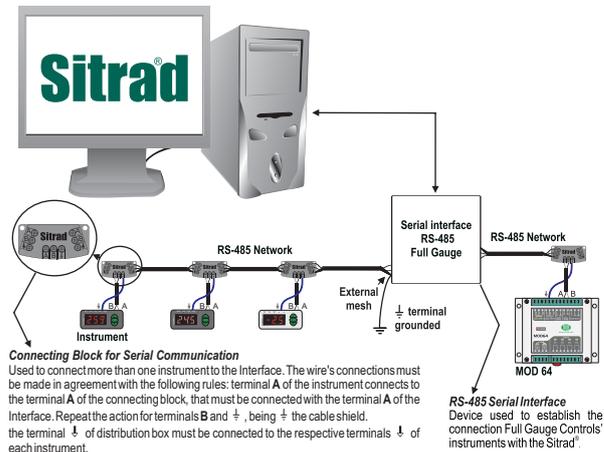## 7. SELECTION OF THE UNIT (C° / F°)

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 `°C` or `°F` 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 DIAGRAN

| | REFRIG |
| A | B | | | | | | | | 0 | 115 V~ 230 V~ (12 V≈) (24 V≈) | COMMON | NO | NC |

Serial communication RS-485
Sensor
Power supply
Load
Load supply
To the terminal of the distribution box
Above the current specified use contactor

Dimension of the clipping for setting of the instrument in panel
29 mm
72 mm

	MT-512Ri plus	MT-512RiL plus
7 - 8	115V~	12V≈
7 - 9	230V~	24V≈

Note: The length of the sensor cable may be increased by the user up to 200 meters, using a 2 x 24 AWG cable. For immersion in water, use thermometric well.
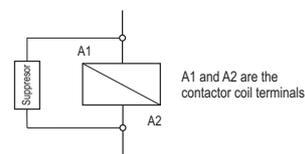
9-INTEGRATING CONTROLLERS, RS-485 SERIAL INTERFACE AND COMPUTER

Sitrad®

Instrument
RS-485 Network
Serial interface RS-485 Full Gauge
RS-485 Network
External mesh
terminal grounded
MOD 64

Connecting Block for Serial Communication
Used to connect more than one instrument to the Interface. The wire's connections must be made in agreement with the following rules: terminal **A** of the instrument connects to the terminal **A** of the connecting block, that must be connected with the terminal **A** of the Interface. Repeat the action for terminals **B** and , being the cable shield. the terminal of distribution box must be connected to the respective terminals of each instrument.

RS-485 Serial Interface
Device used to establish the connection Full Gauge Controls' instruments with the Sitrad®.

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

Load

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

ENVIRONMENTAL INFORMATION
Package:
The packages material are 100% recyclable. Just dispose it through specialized recyclers.

Products:
The electro components of Full Gauge controllers can be recycled or reused if it is disassembled for specialized companies.

Disposal:
Do not burn or throw in domestic garbage the controllers which have reached the end-of-life. Observe the respectively law in your region concerning the environmental responsible manner of dispose its devices. In case of any doubts, contact Full Gauge controls for assistance.

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.