MT-512G

DIGITAL CONTROLLER FOR COOLING WITH NATURAL DEFROST AND FOR HEATING

Ver.02

MT512GV02-06T-12775-2606

1. DESCRIPTION

The **MT-512G** is a temperature controller and indicator.
Controls cooling and defrosts through compressor shutdowns.

2. APPLICATIONS

· Counters
· Cooled chambers
· Greenhouses

3. TECHNICAL SPECIFICATION

- **Power supply:** 115 or 230Vac (50/60Hz)
- **Control temperature:** -50 to 99°C (-58 to 99°F)
- **Resolution:** 0,1°C (between -10 and 10 °C) and 1°C in the rest of the range
- **Maximum current:** 16(8)A / 250Vac 1HP
- **Operating temperature:** 0 to 50 °C
- **Operating humidity:** 10 to 90% RH (without condensation)

4. CONFIGURATIONS

4.1 - Control temperature adjust (SETPOINT)

- Press the frontal key for 12 seconds until appears SP ;
- Releasing th key, the set control temperature will appear.;
- Use the key to change the value. This operation must be done in 4 seconds, otherwise the indication of ambient temperature returns automatically.
- Wait 4 seconds to record and return to the normal operation.

4.2 - Parameters alteration

Configuration parameters protected by access code (except setpoint).

1. Press the frontal key of the panel for 8 seconds until Cd appears;
2. Releasing the button it will appears 00 ;
3. Use the key to insert the code 23 (twenty-three). This operation must be done in 4 seconds, otherwise the indication of ambient temperature returns automatically;
4. Wait 4 seconds to the instrument record the access code. At this time -- appears in the display and then the temperature.

After entering the access code:
If the access code is correct, the controller allows the user to view and change the parameters.
5. Press the key as many times as necessary until you reach the desired parameter.
6. Wait 2 seconds and then appears the adjusted value.
7. Use the key to modify the value;
8.Wait 4 seconds until the new value is recorded and the instrument returns to show the room temperature;
9. To change another parameter, repeat steps 5, 6, 7 and 8.

Note: After entering the access code, be careful not to leave the key idle (without being pressed) between parameter changes for more than 15 seconds.
If this happens, the message Cd will be displayed and the access to the adjust mode is automatically blocked, requiring entering the code again to make any changes.

4.3 - Parameters table

		CELSIUS				FAHRENHEIT			
Fun	Description	Min	Max	Unit	Standard	Min	Max	Unit	Standard
Cd	Access code: 23 (twenty three)	-	-	-	-	-	-	-	-
F1	Control differential (hysteresis)	0.1	20	°C	3	1	40	°F	37
F2	Minimum setpoint allowed for the end user	-50	99	°C	-1	-58	99	°F	30
F3	Maximum setpoint allowed for the end user	-50	99	°C	5	-58	99	°F	41
F4	Additional time at the end of the first cycle	0	99	min.	0	0	99	min.	0
r1	Cooling time	1	99	x10min.	30	1	99	x10min.	30
r2	Defrosting time	0	99	min.	25	0	99	min.	25
r3	Initial state up on energizing the instrument	0-refrig.	1-defrost	-	0-refrig.	0-refrig.	1-defrost	-	0-refrig.
r4	Temperature indication locked during defrost (*)	0-no	1-yes	-	1-yes	0-no	1-yes	-	1-yes
t1	Delay on the activation of the instrument	0	99	min.	0	0	99	min.	0
t2	Delay to turn the cooling output on (heating)	0	99	x10sec.	18	0	99	x10sec.	18
t3	Situation of the compressor with the damaged sensor	0-off	1-on	-	0-off	0-off	1-on	-	0-off
t4	Indication offset	-5	5	°C	0	-9	9	°F	0
t5	Intensity of the digital filter (**)	0	9	-	5	0	9	-	5
t6	Operation mode	0-refrig.	1-heat.	-	0-refrig.	0-refrig.	1-heat.	-	0-heat.

** Frozen display indication - If r4 s active, the indication is only released in the following refrigeration cycle and when the temperature reaches the "locked" value again, or after 15 minutes in refrigeration (as a safety measure).*
*** This filter aims at simulating an increase of environment sensor mass, thus increasing its response time (thermal inertia). The larger the value adjusted in this function, the longest the response time of the sensor.*
A typical application requiring this filter is the freezer for ice cream or frozen goods, because when the door is opened a hot air mass reaches the sensor directly, causing a quick rise in the indication of the measured temperature, thus causing the compressor to be activated unnecessarily many times.

5. FUNCTIONS WITH FACILITATED ACCESS

5.1- Show current status

Press the key and then release it (short touch). Soon the display will show the process that is running and the elapsed time.
Example:
Fr 01 92 --
The controller is in refrigeration mode for 192 minutes.
dF 25 --
The controller is in defrost mode for 25 minutes.
dL 02 --
The controller is executing the delay time to power the instrument on for 2 minutes.
Ht --
The controller is in heating mode.

5.2 - Manual defrost

MT-512G allows changing from refrigeration to defrost or vice-versa, regardless of what is programmed:
1. Press the key for 4 seconds until dF is displayed;
2. If the controller is in the refrigeration cycle, when the key is released the display will show On and the defrost cycle will start;
3. If the controller is in the defrost cycle, when the key is released the display will show OF and the refrigeration cycle will start.

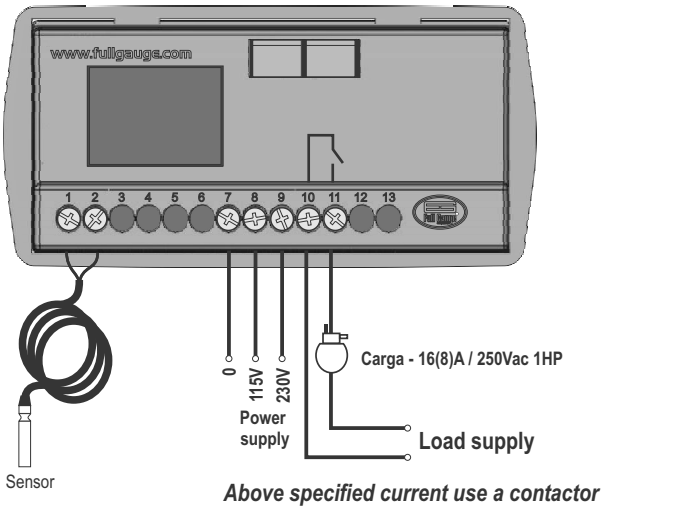
6. SIGNALLING

Er – Sensor disconnected or temperature out-of-range;
dF – Indicates the defrost cycle;
On – Indicates that the defrost cycle is turned on;
OF – Indicates that the defrost cycle is turned off (starts the refrigeration cycle);
Fr – Indicates the refrigeration cycle;
Ht – Indicates that the controller is operating in heating mode;
dL – Indicates the initial delay;
PP – Invalid configuration parameters;
In this situation the outputs are automatically turned off.
Check which parameters have invalid data and correct them to return to normal operation.
LED flashing – The controller is in cooling mode / heating and with the output on;
LED off – The controller is in cooling mode / heating and with the output on off;
LED on – The controller is in defrost mode.

7. UNIT SELECTION (°C / °F)

- Press the frontal key of the panel for 8 seconds until Cd appears;
- Releasing the button it will appears 00;
- Use the keys to enter code 31 (thirty-one). This option must be executed within four seconds, otherwise the display will automatically return to showing the room temperature;
- Wait 4 seconds to save the access code;
- Then the display will show the measurement unit in use (°C or °F);
- Press the keys to change the value between °C and °F and vice-versa;
- After 4 seconds without pressing any other keys the controller will save the selected unit;
- If the measurement unit is changed, FC will be displayed and the parameters will assume their default values.

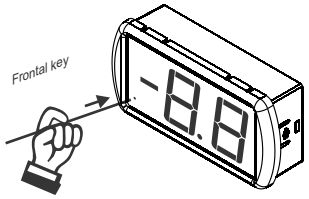
8. WIRING DIAGRAM



Above specified current use a contactor

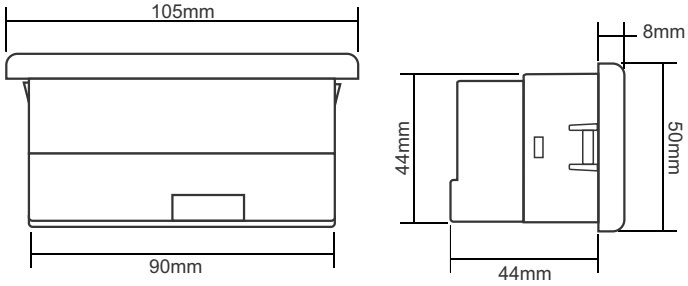
Note: The length of the sensor cable may be increased by the user up to 200 meters, using a PP 2 x 24 AWG cable. For immersion in water, use thermometric we

9. KEYS



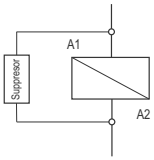
Accessible in the front side of the instrument.

10. DIMENSIONS



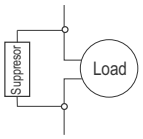
IMPORTANT
According to the chapters of norm IEC 60364:
1: Install protector against overvoltage on the power supply.
2: Sensor cables and signal cables of the computer may be joined, but not in the same electric conduit through which the electric input and the activation of the loads run.
3: Install 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.

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