

Regolatori per Refrigerazione Digitali

FR NTC-4

Manuale d'Uso



User Manual 4-Channel Refrigeration Regulators

 **Vemer** SPA

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Series of digital thermoregulator for regulating the temperature that execute 1B type actions (EN 60730-1).

SAFETY WARNINGS

■ During the installation and operation of the instrument, the following safety instructions should be followed:

- 1) The instrument should be installed by qualified personnel
- 2) Read the instructions in this manual carefully
- 3) Carefully follow the instruction diagrams to install the device
- 4) Before gaining access to the connector terminals, make sure the conductors to be connected to the instrument or already connected are not powered
- 5) Make sure the electric panel in which the device is inserted will prevent access to the terminals after installation
- 6) Do not supply power to the device if any part of it is damaged
- 7) The instrument must be installed and activated in compliance with current electric systems standards.
- 8) The connection cables should be able to resist the maximum operating temperature in the form of the maximum ambient temperature + 20 °C
- 9) The instruments guarantee main insulation between the low voltage parts (250 V) and the extremely low voltage parts
- 10) Any outside switches connected to the control panel should guarantee a minimum insulation of 250 V AC at operating temperature, or should be protected by equivalent insulation

TECHNICAL SPECIFICATIONS

- Series of digital temperature regulators used to satisfy the simplest requirements in the field of refrigeration. Can be used as regulators for the control of:
 - ventilated units (with fan on the evaporator) operating at low temperature (below 0°C)
- The temperature probe to be used is of the NTC type. It is also possible to connect a second probe for the display of the product conservation temperature
 - **FR NTC-4** with 4 relay outputs in exchange for the control of ventilated refrigeration units. The four relays controls the compressor, defrosting, evaporator fans and minimum and maximum alarms.Suitable for the control of VENTILATED refrigeration units with fan on the evaporator, operating at temperatures below 0 °C and requiring active defrosting by means of an electrical resistance or hot gas injection. As well as operating as a thermometer and thermostat, the regulator also controls the defrosting driver by activating a compressor or solenoid valve to keep the unit at the temperature required.

The frequency and duration of the defrosting process can be set.

The end of the defrosting cycle may take place when the temperature is reached (by connecting a probe to the evaporator) or on a timed basis.

- The predefined control action is of the ON/OFF DIRECT type (cannot be modified)
- Regulators with 3 digit, 7 segment and decimal point led display
- COMPRESSOR on warning lamp
- DEFROSTING warning lamp
- CONTINUOUS CYCLE on warning lamp
- EVAPORATOR FAN on warning lamp
- AUXILIARY output warning lamp
- Display range: $-99 \div +999$ °C
- Display resolution: 0.1 °C ($-9.9 \div +99.9$ °C) and 1 °C (< -9.9 °C and $> +99.9$ °C)
- Precision: ± 0.5 % of the end of scale value ± 1 digit
- Parameter setting in digital mode:
 - Set point
 - Differential
 - Output driver times
 - Digital input delay function and time
 - Alarm delay / buzzer enable time
 - Probe calibration offset
 - Resolution displayed
 - Temperature measurement unit
 - Measurement display filter (update speed)
 - Probe input type
 - Password
 - Interval between defrosting cycles
 - Duration of defrosting
 - Duration of continuous cycle
 - Duty setting
 - Defrost parameters
- 1 SET POINT
- Operating mode: defrost, duty cycle, continuous cycle and digital input
- 2 temperature measurement probe inputs: the first probe may be used for regulation and the second to the display of the product conservation temperature (1 or 2 relay models) or for the evaporator drive handling (4 relay model)
- Relay output with contact in 8 A / 250 V AC1 exchange
- Rated power output: 4.5VA
- Max absorption: 100mA at 12V, 50mA at 24V
- In the 2 relay models, the second output is dedicated to the handling of the minimum and maximum alarms
- Digital input: 1 for outside consensus for a configurable function – outside alarm, probe selection, regulation ON/OFF, defrost control, night operation (with the contact closed, the SET is modified by one offset in degrees)
- Acoustic and visual alarm signalling for: outside alarm (from digital input), probe alarm (malfunction), minimum or maximum alarm

Rear panel 33x75 mm

Code	Model	Power supply (*)	Power supply tolerance	n° of relays
VM652500	FR NTC-4P3D	from 12 to 24 V AC/DC	± 10	4





(*) Power supply in AC - Frequency 50/60 Hz

DESCRIPTION OF INSTRUMENT

Display

- 3-digit led display with decimal point.
For all the models, the display range is:
 - minimum display: -99 °C or -9.9 °C
 - maximum display: 999 °C or 999 °C

Relay intervention warning lamp:

-  / **COMP**: LED off if the compressor is off and on if the compressor is on, flashing if the compressor is off and waiting to become on due to active timing
-  / **DEF**: LED off if defrost is off, on if defrost is taking place, flashing if awaiting defrost execution
-  : LED off if continuous cycle inactive, on if continuous cycle is taking place, flashing if awaiting execution of the continuous cycle
- **AUX**: LED off if auxiliary output is OFF, on if auxiliary output is ON
-  : LED off if evaporator fan is off OFF, on if evaporator fan is ON

Keys

- Three keys are present for the parameter setting operations:



Confirm and parameter programming/display key



Parameter increase or go to next parameter



Parameter decrease or exit menu

ELECTRICAL CONNECTIONS

- Carefully follow the instructions in the safety warnings and the “**connection diagram**” section.

GLOSSARY

Set point (set or operating point)

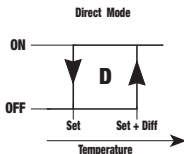
- The set point is the value at which the device has to intervene to maintain the measurement controlled at the required level.

Differential (or hysteresis)

- The differential is the maximum variation from the operating point of the measurement controlled before the intervention of the device. This is normally set in such a way as to prevent rapid swings in the measurement around the operating point from causing frequent starts and stoppages of the device or the driver connected to it.

Direct action

- A regulator acts in **direct** mode when it carries out a containment action on a measurement that is increasing. A typical example is a refrigeration system. As the temperature increases, the refrigeration power produced increases correspondingly, with a view to reducing the temperature.



Defrost

- This is a timed defrosting action that takes place by switching off the compressor. It may be timed (by setting the relevant parameter) or forced manually by holding down the “**up**” (▲) key for at least 3 seconds.

The **defrost** procedure terminates if:

- the defrost time expires;
- the “**up**” (▲) is held down again for at least 3 seconds;
- the unit goes into “duty cycle” operation due to a probe error.

During the **defrost** operation, both the maximum and minimum alarms are bypassed.

Duty Cycle

- This is the operating mode of the instrument in the event of probe failure. The **duty cycle** parameter may take on a whole number value from 0 to 100:
 - 0 compressor constantly off

- 100 compressor constantly on
- 1-99 the minutes of continuous operation of the compressor, with intermittent fixed stoppage time intervals of 15 minutes

This type of operation takes place when sensor alarms are detected.

If the instrument is defrosting or in a continuous cycle procedure, these are interrupted, but their timings remain active. If the probe alarm stops, the instrument resumes normal operation. If it was carrying out a continuous or duty cycle procedure and the cycle time has not terminated in the meantime, this will resume at the end of the operation. If the cycle time has terminated, the instrument will return to normal operation.

Continuous cycle

- The continuous cycle runs the compressor constantly for a programmed period (if the temperature of a refrigeration cell has to be reduced rapidly following a loading operation, for example).

To carry out the **continuous cycle** procedure, hold down the **“down” (▼)** key for at least 3 seconds. The procedure terminates it:

- the continuous cycle time terminates;
- the **“down” (▼)** key is held down again for at least 3 seconds;
- **“duty cycle”** operation is started up due to a probe error;
- the temperature reaches the minimum alarm threshold.

During the **continuous cycle**, both the maximum and minimum alarms are bypassed. These alarms will remain bypassed for a set period of time after the cycle has terminated.

OPERATION

Normal operation

- This is the type of operation that takes place when the parameters are not in advanced programming.

The instrument carries out the regulation on the basis of the value measured and the parameters set.

The information displayed is as follows:

- The temperature measured by the sensor
- Compressor status indication
- Defrost taking place indication
- Continuous cycle taking place indication
- Evaporator fan status indication

SETTING THE REGULATION PARAMETERS

- To set the regulation parameters, two types of programming are available:
 - Simplified programming
 - Advance programming

Note: to restore the default values set in the factory, switch on the instrument while holding down the “OK” key.

Simplified programming

- This is used to modify only the parameters of the **regulation menu [REG]**. In this regulator, the predefined control action is of the ON/OFF DIRECT type (cannot be modified), which means that the only parameters that can be modified are the set point and differential.

Access to this type of programming is gained by pressing “OK”.

Use the “up” (▲) key to scroll through the parameter labels in a circular movement.

Press “down” (▼) at any time to leave the menu and return to normal operation (this also occurs if no key is pressed for at least 40 seconds).

Press “OK” to switch between the display of the parameter label and its numerical value.

To modify a parameter:

- from the display of its label or value, hold down “OK” for at least three seconds
- the display will start to flash and show the parameter value
- use the p and q keys to increase or decrease the value respectively
- press “OK” to confirm the parameter and leave the modification (the display will stop flashing)

Note: if no key is pressed for at least 40 seconds, the instrument will exit the parameter modification without memorising the changes made. During the display and modification of the parameters, the instrument will go on working with the parameters set previously.

If “password 1” is enabled (access password for the protection of the settings entered – **see system menu**), and the “OK” key is pressed from normal status, the message “- - -” will appear. To proceed with the setting of the parameters, enter the password previously set (a numerical value from 0 to 255) with the “up” (▲) keys “down” (▼) and press “OK” to confirm.

If the password has been entered correctly, the label of the first menu will appear. Otherwise the system will return to normal status.

Advanced programming

- Access is gained to advanced programming from normal status by holding down the “up” (▲) and “down” (▼) keys together for at least 3 seconds.

Note: to restore the default values set in the factory, switch on the instrument while holding down the “OK” key.

The parameters are grouped into eight menus by type:

- 1) **Regulation** (marked [REG]): set point, differential
- 2) **Output** (marked [OUT]): output drive times
- 3) **Digital input** (marked [ING]): function, delay time
- 4) **Alarm** (marked [ALR]): output status in probe alarm, minimum/maximum shift, differential, delay time, buzzer enable
- 5) **Display** (marked [DSP]): set point limits, probe offset, resolution, measurement unit, measurement filter
- 6) **Sensor** (marked [SNS]): sensor type, sensor parameters
- 7) **System** (marked [SYS]): password, modification enable, operating mode
- 8) **Refrigeration** (marked [REF]): defrost interval, defrost time, defrost parameters
- 9) **Evaporator fan** (marked [FAN]): fan operating parameters

All the parameters in the eight menus and their values are listed in the section that follows.

- Use the key “up” (▲) to scroll through the eight menus in sequence
 - Press “OK” to enter the menu required
 - It is possible to scroll through the list of parameters inside each menu can be modified by pressing the “up” (▲).
To display the parameter value, press “OK” (if “OK” is pressed a second time, the parameter label is displayed again)
 - To change the parameter value, hold down “OK” for at least 3 seconds
 - The parameter value will start to flash and it can be increased or decreased by pressing the “up” (▲) and “down” (▼) keys
 - Press “OK” to confirm the value set
- The parameter will stop flashing and the new value will be displayed
- It is possible to return to normal operation at any time by pressing the “down” (▼) key (or if no key is pressed for at least 40 seconds)

Note: if no key is pressed for at least 40 seconds during the modification process, the system will return to the display of the parameter without saving the changes made.

Note: during the display and modification of the parameters, the instrument will continue to work with the previously set parameters.

If “password 2” is enabled (access password for the protection of the settings entered – see system menu), if the “up” (▲) and “down” (▼) keys are

held down for at least 3 seconds from normal status, the message “- - -” will appear. To set the parameters, enter the previously set password (a numerical value from 0 to 255) with the “up” (▲) and “down” (▼) keys and press “OK” to confirm.

If the password has been entered correctly, the label of the first menu will appear. Otherwise, the system will return to normal status.

PARAMETER MENU

- To simplify the advanced programming of the instrument, the parameters have been grouped into various menus, in the following order:
 - **[REG]** regulation menu
 - **[OUT]** output menu
 - **[ING]** outside input menu
 - **[ALR]** alarm menu
 - **[DSP]** display menu
 - **[SNS]** sensor menu
 - **[SYS]** system menu
 - **[REF]** refrigeration menu
 - **[FAN]** evaporator fan menu

Description of parameters

- Inside the tables, the labels are presented in the same order as they appear in the various menus of the instrument.

[REG] regulation menu

Labels of parameters that can be modified	Description	unit	Parameter values		default	notes
			min	max		
ST1	set point 1	degrees	LO1	HI1	00.0	(1)
DF1	Differential for set point 1	degrees	0.1	100	02.0	(1)
I-O	on/off regulation	-			on	(2)
AUS	on/off auxiliary relay (relay 4)	-			off	(3)
HIO	Max. measured by sensor 0	degrees			---	(4)
LOO	Min. measured by sensor 0	degrees			---	(4)
HI1	Max. measured by sensor 1	degrees			---	(4)
LO1	Min. measured by sensor 1	degrees			---	(4)

Notes:

(1) See Display Menu [DSP] for LO1 and HI1 values.

(2) With this parameter, it is possible to enable/disable the regulation from the keyboard.

When the parameter is ON, normal operation takes place

When the parameter is OFF:

- the display shows "OFF"

- relays 1 and 2 take on the status laid down by parameter [SUI] of menu [ING] in line with the timings (parameters [DON], [TOF], [TON] of the [OUT] menu

- the status of relays 3 and 4 is not modified

(3) With this parameter, it is possible to switch the status of relay 4 from the keyboard if parameter [FAR] of the [OUT] menu is set to 0 and parameter [TID] of the [ING] menu is different from 8

Notes: if the above conditions do not exist, this menu item is not visible

(4) These parameters are used to memorise the maximum/minimum value read by sensors 0 and 1. If sensor 1 is not present, the value displayed is "---"

The value of the parameter may be initialised (to start up a new check for the update of the parameter) by holding down the OK key for approximately 3 seconds

[OUT] output menu

Relay functions:

- **relay 1**: compressor handling
- **relay 3**: evaporator fan handling

- **relay 2**: defrost handling
- **relay 4**: auxiliary or alarm channel

Labels of parameters that can be modified	Description	unit	Parameter values		default	notes
			min	max		
ETR	Compressor time handling enable	-	0	1	1	(5)
DON	Minimum time between the start-ups of the same relay	min	0	200	0	(6)
TOF	Minimum OFF time for the same relay	min	0	200	0	(7)
TON	Minimum ON time for the same relay	min	0	200	0	(8)
INI	Initial instrument start-up delay	min	0	200	0	(9)
FAR	Auxiliary relay operating mode	-	0	2	0	(10)

Notes:

- (5) *this parameter enables the handling of the timings defined by DON, TOF, TON for the compressor in the following way:*
0 timings not enabled for compressor
1 timings enabled for compressor
- (6) *this parameter limits the number of start-ups per hour for the same relay*
- (7) *the minimum time for which the output has to remain in OFF status*
- (8) *the minimum time for which the output has to remain in ON status*
- (9) *this time delays the driving of all the outputs (1, 2, 3, 4) from the instant of instrument reset*
- (10) *this parameter determines the operating mode of auxiliary relay 4:*
0 auxiliary channel (switching from keyboard or digital input if the parameter [TID] within the [ING] menu = 8)
1 maximum/minimum alarm output in passive safety (ON if alarm active)
2 maximum/minimum alarm output in active safety (OFF if alarm active)

[ING] outside input menu

Labels of parameters that can be modified	Description	unit	Parameter values		default	notes
			min	max		
TID	Digital input function	-	0	8	7	(11)
DID	Digital input delay	min	0	200	0	(12)
SUI	Output status with active digital input (open)	-	0	3	0	(13)
DEL	Night-time variation delta	degrees	-50	+50.0	5.0	(14)

Notes:

(11) The following values can be set:

0 not active

1 outside alarm (with contact open) with delay time "DID" and automatic reset at end of alarm. The status of the outputs becomes "SUI"

2 outside alarm (with contact open) with manual reset

3 the input operates as a switch: instrument on with contact closed and off with contact open

4 the input operates as a switch for the display of the two probes S0 and S1

5 enables defrost with contact closed.

If a defrost is requested and the input is open, the request remains pending until the contact is closed. If a defrost cycle is taking place and the contact is opened, the instrument suspends the cycle, but without stopping the timing (the cycle may be stopped for the remaining time by reclosing the contact)

6 start defrost (from digital input with delay set in the [DDT] parameter of the refrigeration menu [REF]). If the [DDT] parameter in the [REF] menu is different from 0, the start of the defrost is delayed by time [DDT]

7 night-time operation. With the contact closed, the "Set" is varied by a quantity in degrees equivalent to "DEL"

8 door switch operation:

when the contact is open in this mode (door open), the regulation is inhibited (the status of relays 1 and 2 depends on the [SUI] parameter), relay 3, which commands the evaporator fan, is OFF, and relay 4 (auxiliary output), which commands the switching of the cell light, is ON. In addition, the maximum and minimum alarms are disabled for the time [TED] of the [REF] menu, even if the contact is closed in the meantime (door closed)

Note: the alarm bypass timing starts from the instant when the contact is OPENED (door open)

- (12) *this is the delay following which the instrument responds to a signal received at the digital input*
- (13) *when the digital input is active and a time "DID" has lapsed, the outputs may take on the following states:*
- 0** *both channels OFF*
 - 1** *channel 1 ON and channel 2 OFF*
 - 2** *channel 1 OFF and channel 2 ON*
 - 3** *both channels ON*
- (14) *the variation of the "Set" in degrees when the instrument switches to night-time operation*

[ALR] alarm menu

Labels of parameters that can be modified	Description	unit	Parameter values		default	notes
			min	max		
SUA	Output status in probe alarm condition	-	0	3	0	(15)
LOA	Minimum alarm shift	degrees	0.1	100	50	(16)
HIA	Maximum alarm shift	degrees	0.1	100	50	(16)
DFA	Alarm differential	degrees	0.1	100	2	
TRA	Alarm activation delay time	min	0	200	0	
SOU	Buzzer enable	-	no	yes	yes	(17)
EAC	Alarm messages enabled in timing	-	no	yes	no	(18)
RAR	Automatic relay and min/max alarm message reset at end of alarm	-	no	yes	yes	(19)
RAA	Automatic min/max alarm message reset at end of alarm	-	no	yes	yes	(20)
TRP	Min/max alarm generation delay from power-on	hours	0	15	0	(21)

Notes:

- (15) *this is the status taken on by the outputs in probe alarm condition (see note 13)*
- (16) *this value is added to or subtracted from the set point defined from the maximum or minimum alarm respectively*
- (17) *if "yes", the acoustic signal of the key and the buzzer are enabled in alarm condition. If no, both are disabled*
- (18) *if "yes", the display of the type of alarm is enabled even during the timing of this (if "no", the display of the type of alarm takes place only at the end of the timing)*
- (19) *if this parameter is "no", a manual intervention will be necessary at the end of a maximum/minimum alarm by pressing a key to cancel the display of the type of alarm and reset the alarm relay*

- (20) if this parameter is “no”, a manual intervention will be necessary at the end of a maximum/minimum alarm by pressing a key to cancel the display of the type of alarm. The relay will be reset automatically
- (21) this parameter can be used to inhibit the generation of the maximum/minimum alarms for a specific period (to enable a cell to reach the correct temperature, for example)

[DSP] display menu

Labels of parameters that can be modified	Description	unit	Parameter values		default	notes
			min	max		
LO1	Lower limit of set point 1	degrees	-99	HI1	-99	
HI1	Upper limit of set point 1	degrees	LO1	999	999	
SOF	Probe 0 calibration offset	degrees	-50	+50	0.0	(22)
S1F	Probe 1 calibration offset (evaporator)	degrees	-50	+50	0.0	(22)
RIS	Resolution displayed 0.1 or 1	-	HI	LO	HI	(23)
UNI	Temperature measurement unit	-	C	F	C	(24)
FIL	Measurement filter	-	no	yes	YES	(25)

Notes:

- (22) this value is added to the measurement to compensate for imprecision
- (23) the resolution with which the measurement is displayed: 0.1 if “HI” or 1.0 if “LO”
- (24) **Important:** when a measurement unit is modified, the parameters set are not converted automatically but recalibrated
- (25) If the parameter is set to “yes”, a mobile mean is taken of 8 values of the measurement (over a period of 4 seconds approx).
If “no”, this mean is not calculated

[SNS] sensor menu

Labels of parameters that can be modified	Description	unit	Parameter values		default	notes
			min	max		
TY0	Sensor type 0		0	16	nt2	(26)
TY1	Sensor type 1		12	16	no	
S01	Display of sensor 0 or 1	flag	S0	S1	S0	

Notes:

- (26) The range of sensors and default sensor depend on the instrument model.
All the sensors available are listed below:

NTC thermal resistances

Sensor type	Display format
(**)	nt0
(**)	nt1
type 4	nt2 (*)
(**)	CSt

* The instrument is set to this parameter by default. It corresponds to the use of the NTC temperature sensor code VN870200

** For the use of sensors other than "type 4" mentioned above (see note *), it is possible to select one of the three items "nt0, nt1, CSt", corresponding to probes with different temperature / resistance ratios. In such cases, we recommend contacting the Technical Assistance Service directly to identify the type of sensor to be selected

[SYS] system menu

Labels of parameters that can be modified	Description	unit	Parameter values		default	notes
			min	max		
PS1	Password 1	-	0	255	0	(27)
PS2	Password 2	-	0	255	0	(27)
NEN	Parameter modification enable	-	yes	no	yes	(28)

Notes:

(27) the password is enabled if the parameter is different from 000

(28) if set to no, it is not possible to modify any of the other parameters, but merely to display these

[REF] refrigeration menu

Labels of parameters that can be modified	Description	unit	Parameter values		default	notes
			min	max		
DDF	Interval between defrost cycles	h/min	0	200	8h	(29)
TDF	Defrost cycle duration	min/s	1	200	30'	(30)
TCC	Continuous cycle duration	hours	0	15	4h	(31)
TEC	Alarm bypass time after continuous cycle	hours	0	15	2h	(32)
TED	Alarm bypass time after defrost	hours	0	15	1h	(33)
DUT	Duty setting	%	0	100	100	(34)
BLD	Display block during defrost	-	no	yes	no	(35)
PRI	Defrost and continuous cycle priority over compressor protection systems	-	no	yes	no	(36)
BTE	Base times in hh/mm or mm/ss	-	h	s	h	
DAC	Defrost on start-up	-	no	yes	no	(37)
EED	Defrost interrupt error display enable	-	no	yes	no	(38)
DEF	Type of defrost operation	-	0	3	0	(39)
END	Temperature on completion of defrost cycle	degrees	-50	+50	+4.0	(40)
TGO	Drip time	min/s	0	15	2	(41)
DDT	Defrost start delay on reset or from digital input	min/s	0	200	0	(42)

Notes:

- (29) defines the defrost intervals; in hours (h) if the BTE parameter is set to "h-min" and in minutes (min) if set to "min-s"
- (30) defines the duration of the defrost cycle - in minutes (min) if the BTE parameter is set to "h-min" and in seconds if set to "min-s"
- (31) defines the duration of the continuous cycle (to reduce the temperature rapidly after the cell has been loaded)
- (32) defines the time following the continuous cycle during which the maximum and minimum alarms will be disabled
- (33) defines the time following a defrost cycle during which the maximum and minimum alarms will be disabled
- (34) compressor ON time in the event of a probe fault:
 0 always off
 100 always on
 1-99 ON time in minutes followed by a fixed pause of 15min
- (35) if set to yes, the temperature displayed is not updated during the defrost cycle
- (36) if set to yes, all the [OUT] menu timings (output menu) are bypassed during the defrost cycle

- (37) if set to yes, the instrument starts up with a defrost cycle even with the DDF parameter different from 0. If set to no, the first defrost will take place after a time DDF
- (38) if a type of defrost [DEF] is selected with the probe on the evaporator and the temperature does not reach the value [END] during the time [TDF], a defrost interrupt error will be generated which will be displayed with the message "EDI" alternating with the measurement only if parameter [EED] is YES.
This error will be reset at the start of the next defrost cycle.
- (39) defines the type of defrost [DEF] used
0 resistance
1 hot gas (cycle inversion)
2 time resistance
3 timed hot gas (cycle inversion)
 if types 0 or 1 are selected, the probe S1 has to be connected to the evaporator
- (40) the temperature detected by the evaporator probe to terminate a defrost cycle. If the temperature detected by the evaporator probe at the start of the defrost cycle is greater than temperature [END], the defrost cycle will not take place
- (41) this parameter is used to force the stoppage of the compressor and evaporator fans after a defrost, to encourage dripping from the evaporator.
In minutes (min) if parameter BTE is set to "h-min", and in seconds (s) if parameter BTE is set to "min-s"
- (42) used to delay the start of a defrost cycle from the reset of the instrument or the closure of the outside input contact (if [TID] in the [ING] menu is 6).
In minutes (min) if parameter BTE is set to "h-min", and in seconds (s) if parameter BTE is set to "min-s"

[FAN] evaporator fan menu

Labels of parameters that can be modified	Description	unit	Parameter values		default	notes
			min	max		
STF	Fan shutdown temperature	degrees	-99	999	5.0	(43)
DFF	Fan differential	degrees	0.1	100	2.0	(44)
FON	Fan always on	-	no	yes	no	(45)
SFC	Fan stop with compressor stopped	-	no	yes	no	(46)
SFD	Fan stop during defrost	-	no	yes	no	(47)
TFF	Fan stop after dripping	min/s	0	15	1	(48)

Notes:

- (43) this is an absolute temperature. If the temperature detected by the evaporator probe is less than [STF], the fans are switched on
- (44) the fan is switched on when the temperature value is less than [STF]-[DFF]
- (45) if yes, the evaporator fans do not depend on the fan regulator (and therefore the parameters [STF] and [DFF]), but are always on

- (46) *irrespective of the parameter [FON], this parameter can be used to force the fan shutdown when the compressor is OFF*
- (47) *irrespective of the parameter [FON], this parameter can be used to force the fan shutdown during a defrost cycle*
- (48) *this parameter delays the start-up of the fans after a defrost cycle, when the compressor is on.*

This time is useful to enable the evaporator to return to temperature after a defrost, preventing the forcing of hot air into the cell.

If the evaporator fans are run with a dedicated temperature probe, it is not necessary to select a time, as the regulator will restart the fans when the evaporator has reached the correct temperature.

If the handling of the evaporator fans by means of a dedicated temperature probe is active and a drip time value other than zero is allocated, the fans will remain off for the time selected, irrespective of the evaporator temperature.

Note: the fan warning lamp will flash during the post-drip phase

ERROR MESSAGES

- Due to alarms or malfunctions, the measurement display may alternate with messages describing the type of alarm. The table below describes the alarm/error messages that may be displayed during operation.

Message	Type of error	Output status
ERO	Sensor 1 disconnected or in short circuit	As parameter [SUA]
ER1	Sensor 2 disconnected or in short circuit	As parameter [SUA]
ALL	Minimum alarm	Relay auxiliary activation
ALH	Maximum alarm	Relay auxiliary activation
ALE	Alarm from outside input	As parameter [SUA]
OFF	Regulation inhibited from outside input	As parameter [SUA]
EDI	Error defrost interrupted	

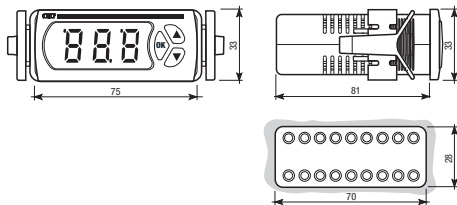
Notes: the "OFF" message does not alternate with the measurement, but remains fixed on the display.

REFERENCE STANDARDS

- Compliance to the Community Directives:
2006/95/EC (Low Voltage - LVD)
2004/108/EC (Electromagnetic compatibility- EMC)
is declared with reference to the follow Harmonised Standard:
EN 60730-2-9

33x75 mm REAR PANEL DIMENSIONS

FR NTC-4P3D

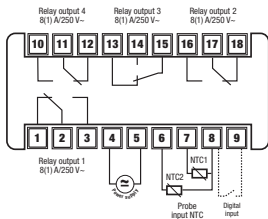


33x75 mm REAR PANEL DIAGRAMS

Model

Connection diagram

FR NTC-4P3D





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