



Digital regulators for refrigeration

FR NTC-1 / FR NTC-2 / FR NTC-4

- Regulators with LED display, 3 digits, 7 segments and decimal point with relay intervention and operating mode signalling LED
- Display range: $-99 \div +999\text{ }^{\circ}\text{C}$
- Display resolution: $0.1\text{ }^{\circ}\text{C}$ ($-9.9 \div +99.9\text{ }^{\circ}\text{C}$) and $1\text{ }^{\circ}\text{C}$ ($< -9.9\text{ }^{\circ}\text{C}$ and $> +99.9\text{ }^{\circ}\text{C}$)
- Precision: $\pm 0.5\%$ of the full scale value ± 1 digit
- Parameter setting with digital mode:
 - Set-point
 - Differential
 - Output triggering timing
 - Digital input delay time and function
 - Alarm delay time / Buzzer enabling
 - Probe gauging OFFSET
 - Resolution displayed
 - Temperature unit of measurement
 - Measurement display filter (updating speed)
 - Probe input type
 - Password
 - Interval between defrostings
 - Defrosting duration
 - Continuous cycle duration
 - Duty cycle setting
 - Defrosting parameters
- 1 SET-POINT
- Control action of the Direct ON/OFF type
- Operating modes: Defrost, Duty cycle, Continuous cycle and Digital input
- 2 probe inputs to measure the temperature: the first probe may be used for the regulation and the second to display the temperature of preservation of the product (1 or 2 relay models) or to manage the activation of the evaporator (4 relay model)
- Temperature probes: NTC ($10\text{ k}\Omega$ at $25\text{ }^{\circ}\text{C}$)
- Output: 1, 2 or 4 relays with change-over contact $8\text{ A} / 250\text{ V AC1}$
- In the model with 2 relays the second output is dedicated to managing the minimum/maximum alarms
- Digital input: 1 with configurable function
 - External alarm
 - Probe selection
 - ON/OFF Regulation
 - Defrost management
 - Night time operation (with the contact closed the SET is modified by an OFFSET in degrees)
- Visual and acoustic alarm signalling for: external alarm (from digital input), probe alarm (fault), minimum or maximum alarm

TECHNICAL INFORMATION

GENERAL CHARACTERISTICS

Model			FR NTC - P3A	FR NTC - P3D	FR NTC - DA
Dimensions			Rear-panel 33x75 mm	Rear-panel 33x75 mm	4 DIN Modular
Power supply voltage in AC	A 50/60 Hz	V	$100 \div 230$	$12 \div 24$	$24 / 230$
Power supply voltage in DC		V	$140 \div 300$	$12 \div 24$	-
Power supply voltage tolerance		%	± 15	± 10	± 10
Power consumption		VA	3	3	4.5
Relay outputs (change-over contact) capacity	at 250 V AC1	A	8	8	8
maximum breakaway starting current		A	10	10	10
maximum switchable power in AC		VA	2000	2000	2000
maximum switchable resistive load	at 230 V	W	1760	1760	1760
single-phase motor capacity		HP	1/4	1/4	1/4
maximum switchable voltage		V	250	250	250
Precision	at ambient temperature = $23\text{ }^{\circ}\text{C}$		$\pm 0.5\%$ of the full scale value ± 1 digit	$\pm 0.5\%$ of the full scale value ± 1 digit	$\pm 0.5\%$ of the full scale value ± 1 digit
Display range		$^{\circ}\text{C}$	$-40 \div +110\text{ }^{\circ}\text{C}$	$-40 \div +110\text{ }^{\circ}\text{C}$	$-40 \div +110\text{ }^{\circ}\text{C}$
Display resolution			$0.1\text{ }^{\circ}\text{C}$ ($-9.9 \div +99.9\text{ }^{\circ}\text{C}$) $1\text{ }^{\circ}\text{C}$ ($< -9.9\text{ }^{\circ}\text{C}$ and $> +99.9\text{ }^{\circ}\text{C}$)	$0.1\text{ }^{\circ}\text{C}$ ($-9.9 \div +99.9\text{ }^{\circ}\text{C}$) $1\text{ }^{\circ}\text{C}$ ($< -9.9\text{ }^{\circ}\text{C}$ and $> +99.9\text{ }^{\circ}\text{C}$)	$0.1\text{ }^{\circ}\text{C}$ ($-9.9 \div +99.9\text{ }^{\circ}\text{C}$) $1\text{ }^{\circ}\text{C}$ ($< -9.9\text{ }^{\circ}\text{C}$ and $> +99.9\text{ }^{\circ}\text{C}$)

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HEAT REGULATION

TECHNICAL INFORMATION

GENERAL CHARACTERISTICS

Model		FR NTC - P3A	FR NTC - P3D	FR NTC - DA
Sampling time	s	0.5	0.5	0.5
Front protection degree		IP54	IP54	IP40
Terminal protection degree		IP20	IP20	IP20
Display		3 digits LED 7 segments and dec. point	3 digits LED 7 segments and dec. point	3 digits LED 7 segments and dec. point
Probe alarm signalling buzzer		■	■	■
Infrared receiver for remote control unit				
Digital input		■	■	■
Operating temperature	°C	0 ÷ +50	0 ÷ +50	0 ÷ +50
Operating humidity	RH	< 80%	< 80%	< 80%
Storage temperature	°C	-10 ÷ +70	-10 ÷ +70	-10 ÷ +70
Storage humidity	RH	< 80%	< 80%	< 80%

REFERENCE STANDARDS

Compliance with Community Directives: 73/23/EEC mod. from 93/68/EEC (Low Voltage) 89/336/EEC mod. from 92/31/EEC and 93/68/EEC (E.M.C.) is declared with reference to the following standards: • For safety: EN 60730-2-9 • For E.M. compatibility: EN 55014-1 / EN 55014-2 / EN 61000-6-2 / EN 61000-6-4

Digital regulators for refrigeration

FR NTC-1 / FR NTC-2

Digital regulators for the management of STATIC refrigerating units (i.e. without fans on the evaporator) operating at a temperature exceeding 0 °C.

- The regulator performs the functions of a thermometer, by displaying the temperature of an electronic thermostat, by activating a compressor and a solenoid valve to maintain the temperature requested. In addition it provides automatic Defrost by forced deactivation of the compressor. The defrosting frequency and duration can be set.



To complement the product the suitable probes must be ordered separately.



DIGITAL REGULATORS FOR REFRIGERATION

Code	Model	Version	Power supply	no. of relays
VM650900	FR NTC-1P3D	Rear-panel 33x75	12 ÷ 24 V AC/DC	1
VM651700	FR NTC-1P3A	Rear-panel 33x75	100 ÷ 230 V AC 140 ÷ 300 V DC	1
VM659000	FR NTC-1DA	4 DIN Modular	24/230 V AC	1
VM660800	FR NTC-2DA	4 DIN Modular	24/230 V AC	2

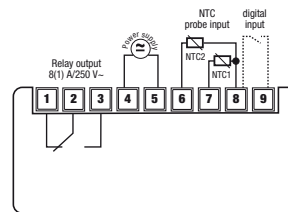
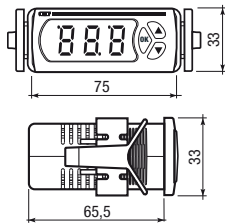
DIMENSIONS (mm)

CONNECTION DIAGRAM

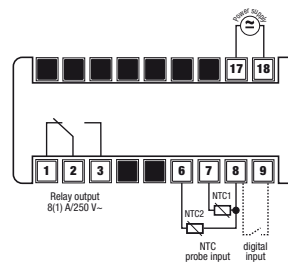
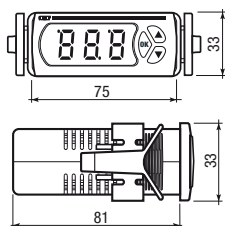
Front view / Side view

Diagram

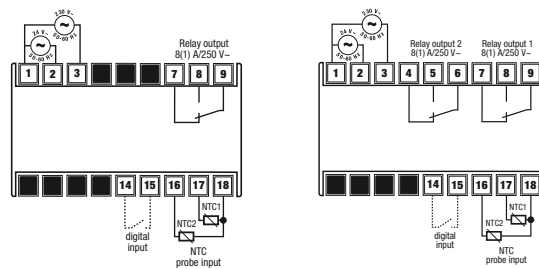
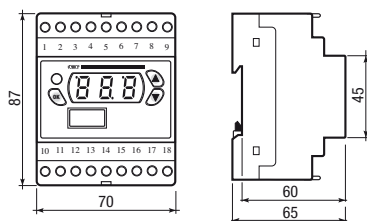
FR NTC-1P3D



FR NTC-1P3A



FR NTC-1DA FR NTC-2DA



Digital regulators for refrigeration

FR NTC-4

Digital regulators suitable for the management of FANNED refrigerating units, i.e. with a fan on the evaporator, operating at a temperature lower than 0 °C, which require an "active" defrosting using electrical resistance or hot gas injection.

- The regulator, in addition to the thermometer and thermostat function, by activating a compressor or a solenoid valve to maintain the requested temperature, manages the defrosting actuator. The defrosting frequency and duration can be set. The end of the defrosting may occur when reaching the temperature (by connecting a probe on the evaporator) or the time
- The functions of the relays are:
 - Relay 1: compressor management
 - Relay 2: defrost management
 - Relay 3: evaporator fan management
 - Relay 4: auxiliary or alarm channel



To complement the product the suitable probes must be ordered separately.

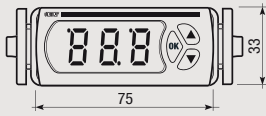


DIGITAL REGULATORS FOR REFRIGERATION

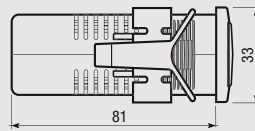
Code	Model	Version	Power supply	no. of relays
VM652500	FR NTC-4P3D	Rear-panel 33x75	12 ÷ 24 V AC/DC	4

DIMENSIONS (mm)

Front view

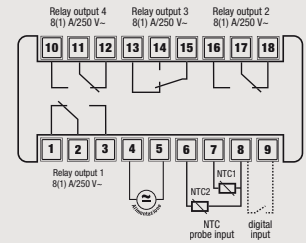


Side view



CONNECTION DIAGRAM

Diagram



HEAT REGULATION