# 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 ÷ +999 °C
- Display resolution: 0.1 °C (-9.9 ÷ +99.9 °C) and 1 °C (< -9.9 °C and > +99.9 °C)
- Precision: ± 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 relays models) or to manage the activation of the evaporator (4 relays model)
- Temperature probes: NTC (10 kΩ at 25 °C)
- Output: 1, 2 or 4 relays with change-over contact 8 A / 250 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



## 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 | 230 | 12 ÷ 24 | 24 / 230 |
| Power supply voltage in DC | | V | - | 12 ÷ 24 | - |
| Power supply voltage tolerance | | % | ± 15 | ± 10 | ± 10 |
| Absorption | | VA | 3 | 3 | 4.5 |
| Relay outputs | | | | | |
| capacity with change-over contact | 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 °C | | ± 0.5% of the full scale value ± 1 digit | ± 0.5% of the full scale value ± 1 digit | ± 0.5% of the full scale value ± 1 digit |
| Display range | | °C | -40 ÷ +110 °C | -40 ÷ +110 °C | -40 ÷ +110 °C |
| Display resolution | | | 0.1 °C (-9.9 ÷ +99.9 °C) 1 °C (<-9.9 °C and > +99.9 °C) | 0.1 °C (-9.9 ÷ +99.9 °C) 1 °C (<-9.9 °C and > +99.9 °C) | 0.1 °C (-9.9 ÷ +99.9 °C) 1 °C (<-9.9 °C and > +99.9 °C) |

Digital regulators for refrigeration

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

**FR NTC-1 / FR NTC-2**


**FR NTC-4**




## 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 |
| Probes 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

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.


# FR NTC-4

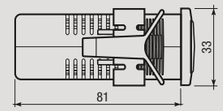
- The regulator, in addition to the thermometer and thermostat function, by activating a compressor or a solenoid valve to maintain the requested temperature, manages the defrosting actuator. The defrosting frequency and duration can be set. The end of the defrosting may occur when reaching the temperature (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.

## DIMENSIONS (mm)

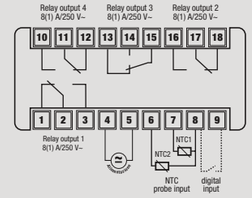
### Front view


### Side view




## CONNECTION DIAGRAM

### Diagram







## 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 |