

Refrigeration Temperature Controllers



TF3 Series CATALOG

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

The specifications, dimensions, etc are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- Standard installation size for refrigeration panels (W70.3×H28.2mm)
- Various compressor load current capacity : 5A, 16A, 20A
- Various user-friendly functions
 - Defrost sync function : simultaneous defrost operation of multiple controllers (up to 6 units)
 - RTC (Real Time Clock) function : night mode operation and real-time defrost control
 - Built-in alarm function
- Remote monitoring of real-time temperature and output control (using TFD series remote display unit, sold separately)
- Communication output models available : RS485 (Modbus RTU)
- Parameter configuration via PC (RS485 communication) : DAQMaster software included (comprehensive device management software)
- IP65 protection structure (IEC standard) : front panel only

Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website .

T F 3 ① - ② ③ ④ - ⑤

① Input No. of channels

- 1: 1 channel (NTC or RTD)
[Temperature + digital input (DI)]
- 3: 3 channel (NTC)
[Inlet + Defrost + Outlet temperature or digital input (DI)]

② Output

- 1: Compressor
- 2: Compressor + Defrost or Auxiliary (alarm, evaporator-fan)
- 3: Compressor + Defrost + Auxiliary (alarm, evaporator-fan) + buzzer support

③ Power supply

- 1: 24 VAC~ 50/60 Hz, 12-24 VDC=
- 4: 100-240 VAC~ 50/60 Hz

④ Compressor load capacity

- G: 20 A 1a (TF31 model)
- A: 5 A 1a
- H: 16 A 1a

⑤ Option per compressor load capacity (3 channel)

Product number	Option	Compressor load capacity	
		5 A 1a	16 A 1c
No mark	No	-	○
S	Synchronize defrost	○	-
T	RS485 Comm.	○	-
R	RTC Function (Real Time Clock)	-	○
A	RS485 Comm. + RTC	○	

Product Components

- Product
- Bracket × 2
- Instruction manual
- NTC sensor (5 kΩ) × 1

Software

Download the installation file and the manuals from the Autonics website.

■ DAQMaster

DAQMaster is comprehensive device management program. It is available for parameter setting, monitoring.

Specifications

Series		TF3 Series
Power supply	AC	100 - 240 VAC~ 50/60 Hz ±10%
	AC/DC	24 VAC~ 50/60 Hz ±10%, 12-24 VDC= ±10%
Power consumption	AC	≤ 8 VA
	AC/DC	AC: ≤ 5 VA, DC: ≤ 3 W
Sampling period	500 ms	
Input specification	Refer to 'Input Type and Using Range'.	
Option input	Digital input	<ul style="list-style-type: none"> • Contact - ON: ≤ 1 kΩ, OFF: ≥ 100 kΩ • Non contact - residual voltage ≤ 1 V, leakage current ≤ 1 mA • Outflow current: ≈ 4 uA
	Compressor (COMP)	250 VAC~ 5 A / 30 VDC= 5 A / 1a 250 VAC~ 16 A / 24 VDC= 16 A / 1c 250 VAC~ 20 A 1a
Control output	Defrost (DEF)	250 VAC~ 10 A / 24 VDC= 10 A / 1a
	Auxiliary (AUX)	250 VAC~ 5 A / 30 VDC= 5 A / 1a
RS485 communication	Modbus RTU	
Display type	7 segment (red), LED type	
Control type	ON/OFF Control	
Hysteresis	0.5 to 5.0 °C, 2 to 10 °F	
Relay life cycle	Mechanical	<ul style="list-style-type: none"> • COMP (5 A 1a), AUX: ≥ 5,000,000 operations • COMP (16 A 1c), DEF: ≥ 20,000,000 operations • COMP (20 A 1a): ≥ 10,000,000 operations
	Electrical	<ul style="list-style-type: none"> • COMP (5 A 1a), AUX: ≥ 50,000 operations (load resistance: 250 VAC~ 5 A) • COMP (16 A 1c): ≥ 30,000 operations (load resistance: 250 VAC~ 16 A) • COMP (20 A 1a): ≥ 100,000 operations (load resistance: 250 VAC~ 20 A) • DEF: ≥ 100,000 operations (load resistance: 250 VAC~ 10 A)
Dielectric strength	AC	Between all terminals and case, power and input circuit: 3,000 VAC~ 50 / 60 Hz for 1 min
	AC/DC	Between all terminals and case, power and input circuit: 1,000 VAC~ 50 / 60 Hz for 1 min
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours	
Insulation resistance	≥ 100 M.Ω (500 VDC= megger)	
Noise immunity	Square shaped noise by noise simulator (pulse width 1 μs) ± 2 kV R-phase, S-phase	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Protection structure	IP65 (front panel, IEC standards)	
Approval	CE, RoHS, ENEC, ENEC	
Unit weight (packaged)	≈ 105 g (≈ 207 g)	

Communication Interface

■ RS485	
Comm. protocol	Modbus RTU
Application standard	EIA RS485 compliance with
Maximum connection	31 units (address: 01 to 99)
Synchronous method	Asynchronous
Comm. method	Two-wire half duplex
Comm. effective range	≤ 800 m
Comm. speed	2,400 / 4,800 / 9,600 (default) / 19,200 / 38,400 bps (parameter)
Response time	5 to 99 ms (default: 20 ms)
Start bit	1 bit (fixed)
Data bit	8 bit (fixed)
Parity bit	None (default), Odd, Even
Stop bit	1 bit, 2 bit (default)

Input Type and Using Range

The setting range of some parameters is limited when using the decimal point display.

Input type	Decimal point	Display	Using range (°C)	Using range (°F)
Thermistor (NTC)	NTC 5 kΩ	1	-40 to 99	-40 to 212
		0.1	-40 to -20	-40 to -20
		0.1	-19.9 to 99.9	-19.9 to 99.9
	NTC 10 kΩ	1	-40 to 99	-40 to 212
		0.1	-40 to -20	-40 to -20
		0.1	-19.9 to 99.9	-19.9 to 99.9
RTD ⁰¹⁾	DPT100 Ω	1	-99 to 99	-148 to 212
	0.1	dP E.L	-19.9 to 99.9	

01) Only for 1 channel Input model.

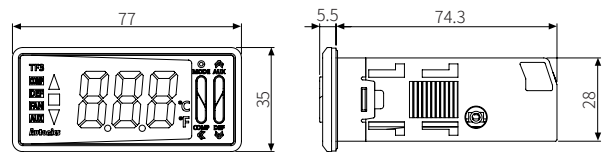
• TF3 Series displays only 3 digits. If PV decimal number of shaded temperature range is out of 3 digit, TF3 does not display the numbers below decimal point. You can check it at the comprehensive device management program (DAQMaster) by communicating via PC.

■ Display accuracy

Using temperature	Display accuracy
At room temperature (23°C ±5 °C)	±1 °C ±1 digit
Out of room temperature range	±2 °C ±1 digit

Dimensions

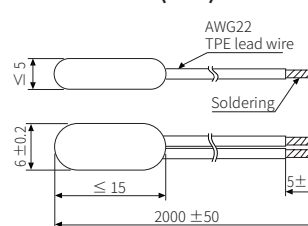
• Unit: mm, For the detailed drawings, follow the Autonics website.



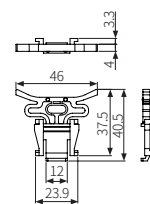
■ Panel cut-out



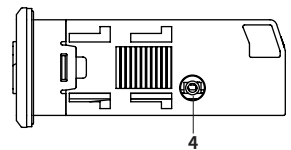
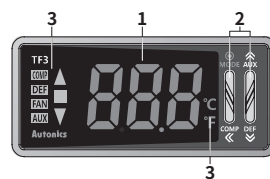
■ NTC sensor (5kΩ)



■ Bracket



Unit Descriptions



1. PV Display part (Red)

- Run mode: Displays PV (present value)
- Setting mode: Displays parameter name

2. Input key

Display	Name
[MODE]	Mode key
[◀], [▼], [▶]	Setting value control key

3. Indicator

Display	Name	Color	Description
▲	Deviation	Red	Displays deviation of PV (present value) based on SV (setting value).
		Green	
		Red	
COMP	Compressor output	Green	Turns ON when compressor output is ON. Flashes when output is OFF or protection operation. When operating compressor continuously, it turns ON for 2 sec, and turns OFF for 1 sec.
DEF	Defrost output	Green	Turns ON when defrost output is ON. Flashes when defrost delay operation. Turns ON for 2 sec and OFF for 1 sec for manual defrost or Power ON defrost.
FAN	evaporator-fan output	Green	Turns ON when evaporator-fan output is ON. Flashes when evaporator-fan output delay operation.
AUX	Auxiliary output	Green	Turns ON when alarm output is ON. Flashes when alarm output delay operation.
°C, °F	Temperature unit	Red	Displays selected unit (parameter).

4. PC loader port: For connecting Remote Display Unit (TFD series) or communication converter (SCM series).

Sold Separately

- Dedicated remote display unit for TF3: TFD Series
- Communication converter: SCM Series