

Autonics Refrigeration Temperature Controller TF3 SERIES INSTRUCTION MAUAL



Thank you for choosing our Autonics product. Please read the following safety considerations before use.

Safety Considerations

Please observe all safety considerations for safe and proper product operation to avoid hazards.

Safety considerations are categorized as follows.

Warning Failure to follow these instructions may result in serious injury or death.

Caution Failure to follow these instructions may result in personal injury or product damage.

The symbols used on the product and instruction manual represent the following:

A symbol represents caution due to special circumstances in which hazards may occur.

Warning

- 1. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)

2. Install on a device panel to use. Failure to follow this instruction may result in electric shock or fire.

3. Do not connect, repair, or inspect the unit while connected to a power source. Failure to follow this instruction may result in electric shock or fire.

4. Check 'Connections' before wiring. Failure to follow this instruction may result in fire.

5. Do not disassemble or modify the unit. Failure to follow this instruction may result in electric shock or fire.

Caution 1. When connecting the power, communication input and relay output, use AWG 28-12 cable and tighten the terminal screw with a tightening torque of 0.4N·m for the power, communication input terminal, and use AWG 28-12 cable and tighten the terminal screw with a tightening torque of 0.5N·m for the relay output.

2. Use the unit within the rated specifications. Failure to follow this instruction may result in fire or product damage.

3. Use dry cloth to clean the unit, and do not use water or organic solvent. Failure to follow this instruction may result in electric shock or fire.

4. Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present. Failure to follow this instruction may result in fire or explosion.

5. Keep metal chip, dust, and wire residue from flowing into the unit. Failure to follow this instruction may result in fire or product damage.

Ordering Information: A flowchart showing the construction of the model number from options like input channels, power supply, and output.

Table listing various options for the controller, categorized by function (Compressor load capacity, Power supply, Output, Digits, Item).

Ordering Information

Table listing option functions such as Synchronize defrost, RS485 communication, RTC, and RS485 communication+RTC.

Table listing compressor load capacity options (5A 1a, 16A 1c, 20A 1a).

Table listing power supply options (24VAC 50/60Hz, 12-24VDC).

Table listing output options (1CH, 1CH, 3CH) and their corresponding internal connections.

Table listing the number of input channels (1, 3) and the corresponding input types.

Table listing the digit count (3) and the corresponding display type.

Table listing the item name (TF) as Refrigeration Temperature Controller.

Notes explaining specific options and configurations for different models.

Specifications

Main specifications table for TF3 Series, including model, power, voltage, display, input type, control, and communication output details.

Remote display unit (TFD) specifications table, detailing model, power, display, and communication options.

Notes regarding remote display unit specifications and environmental resistance.

Part Description

1. Present value (PV) display component (red): RUN mode: Displays present value (PV). Setting mode: Displays parameter and setting value.

2. Deviation indicator (a: green, v/a: red): Displays deviation of present value (PV) based on setting value (SV).

Table detailing deviation indicator logic: More than 1.8°C (green indicator ON), Within ±1.8°C (red indicator ON), Less than -1.8°C (red indicator ON).

3. Compressor (COMP) output indicator (green): Turns ON for compressor output. In case of compressor protection operation and output does not turn ON, it flashes.

4. Defrost (DEF) output indicator (green): Turns ON for defrost output. Flashes for defrost delay operation.

5. Evaporator-fan (FAN) output indicator (green): Turns ON for evaporator-fan output. Flashes for delay operation of evaporator-fan output.

6. Auxiliary (AUX) output indicator (green): Turns ON for alarm output. Flashes for delay operation of alarm output.

7. Unit indicator (red): Displays temperature unit set at parameter 1 group.

8. (MODE) key: Used for entering parameter setting group, returning RUN mode, moving parameter or saving SV.

9. (AUX) key: Used for entering SV setting group or changing setting value.

10. (DEF) key: Used for entering SV setting group or changing setting value.

11. (COMP) key: Used for entering SV setting group, changing setting value, moving digits.

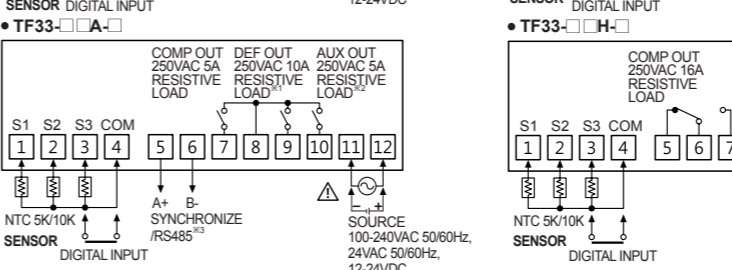
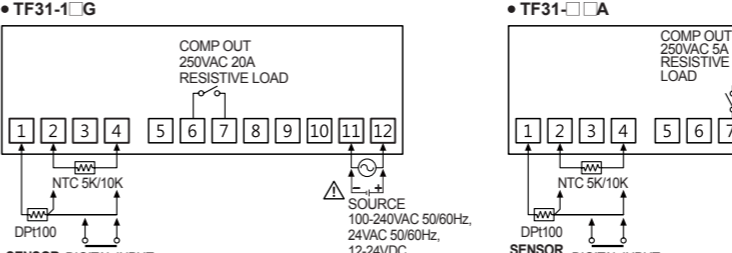
12. Data loader port: It is for displaying TF3 data at remote display unit (TFD) by connecting phone-jack.

Input Type and Temperature Range

Table mapping input types (NTC 5kΩ, NTC 10kΩ, RTD 100Ω) to decimal points, display methods, and temperature ranges in both Celsius and Fahrenheit.

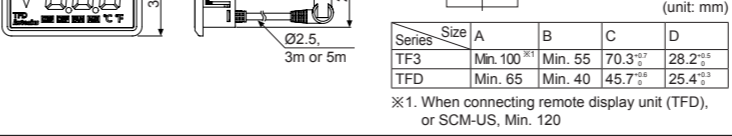
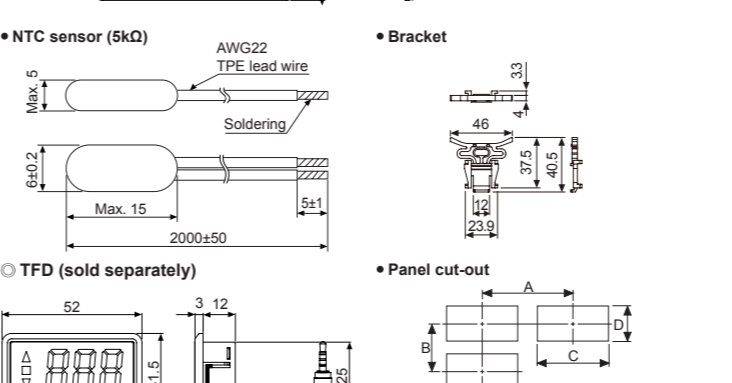
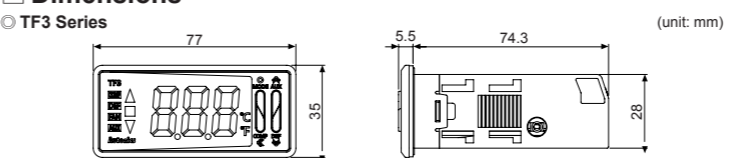
Notes regarding input type and temperature range specifications, including notes about display resolution and communication methods.

Connections



Notes regarding connection requirements for different output models and communication protocols.

Dimensions

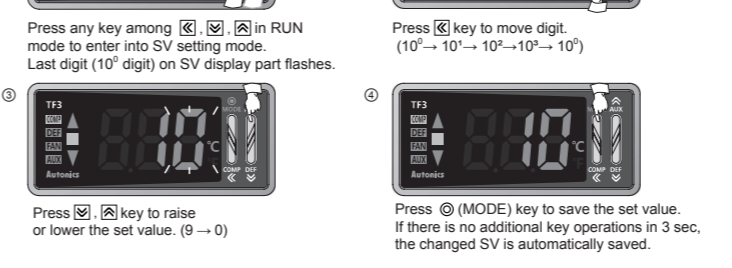


Remote Display Unit (TFD) [sold separately]

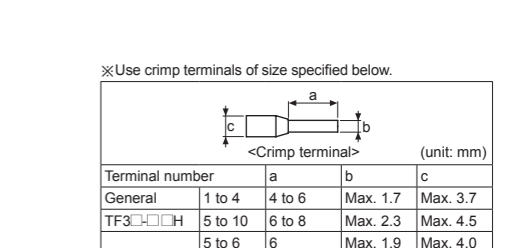
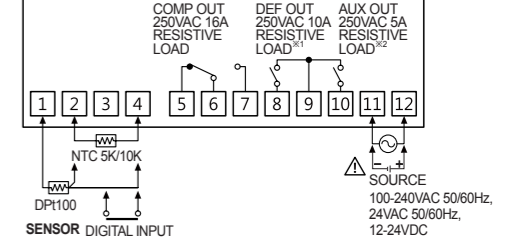
Remote display unit (TFD) displays current temperature or output status of TF3 at remote place. TFD cable is TFD-3: 3m, TFD-5: 5m.

SV Settings

You can set the temperature to control with (MODE) key.

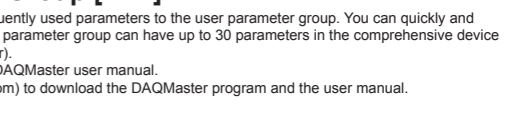
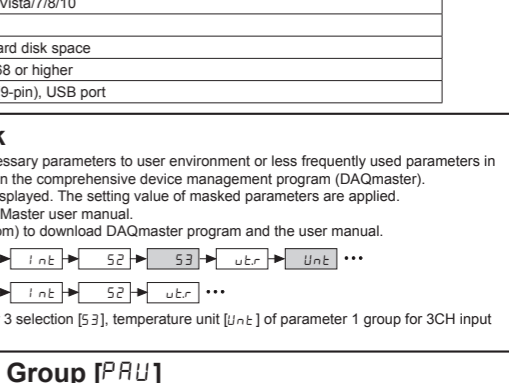
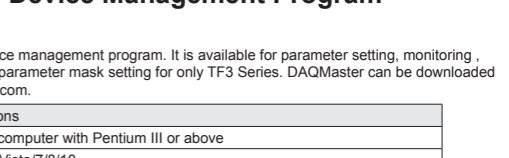


Connections



Notes regarding connection requirements for different output models and communication protocols.

Dimensions

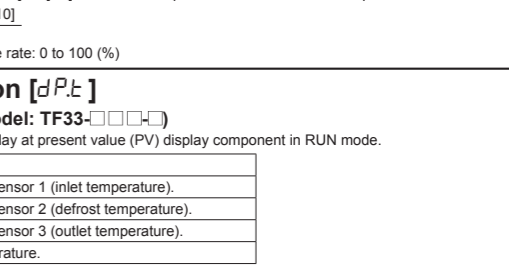
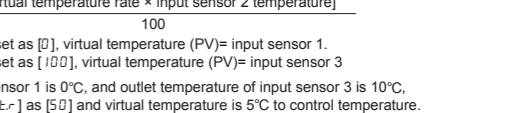


Remote Display Unit (TFD) [sold separately]

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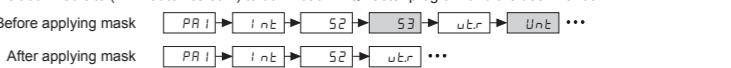
Comprehensive Device Management Program [DAQMaster]

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

Table listing minimum specifications for the DAQMaster program, including system requirements, operating system, memory, and disk space.

Parameter Mask

This function is able to hide unnecessary parameters to user environment or less frequently used parameters in parameter group.



The above is masking input sensor 3 selection [53], temperature unit [unit] of parameter 1 group for 3CH input model (TF33-1 to TF33-4).

Parameter User Group [PAU]

This function is able to set the frequently used parameters to the user parameter group. You can quickly and easily set parameter settings.



The above is setting user parameter group in the DAQMaster with delay display period [d5] of parameter 1 group, hysteresis [h5], night mode hysteresis [nhy] of parameter 2 group, defrost method [def], defrost time [dt] of parameter 3 group, alarm output hysteresis [rh5] of parameter 4 group.

Virtual Temperature Rate [u.r.]

Virtual temperature rate [u.r.] (only for 3CH input model: TF33-1 to TF33-4). In case of 3CH input model, input sensor 3 selection [53] of parameter 1 group is set as outlet temperature [t5].

Virtual temperature (PV) = [(100 - virtual temperature rate) × input sensor 1 temperature] + [virtual temperature rate × input sensor 2 temperature]

If virtual temperature rate [u.r.] is set as [0], virtual temperature (PV) = input sensor 1. If virtual temperature rate [u.r.] is set as [100], virtual temperature (PV) = input sensor 3.

Setting range of virtual temperature rate: 0 to 100 (%)

Display Selection [d.p.t.]

(only for 3CH input model: TF33-1 to TF33-4). You can select input sensor to display at present value (PV) display component in RUN mode.

Table mapping parameter selection keys (51, 52, 53, u5) to their respective display functions (input sensor 1, 2, 3, and virtual temperature).

