

Multi Digital Temp. Controller (FX3T SERIES)



PreCaution for Use

1. This product may cause an electric shock in handling. Please do not attempt to open it with power turned on.
 2. This product should be installed in a place fixed secured by a rack or panel.
 3. This product can be used under the following environmental condition
① Indoor ② Pollution Degree 2 ③ At an altitude of 2000m or below ④ Installation Category II
 4. To turn on or turn off power supply for this product, please the circuit breaker or switch of a standard product of IEC 60947-1 or IEC 60947-3 product and install it within a close distance allowing convenient operation by user.
 5. Please be understood that if this product is dismantled or modified discretionary, after sales service will not be able to be provided.
 6. An output wire to be used for this product should be inflammable grade FV1 (V-1 grade or above), the thickness of the wire should be AWG No. 20 or above. (0.50mm²)
 7. In order to prevent it from an inductive noise, please maintain the high-voltage wire and power wire separated.
 8. Please avoid installing the product in a place where a strong magnetism, noise, severe vibration and impact exist.
 9. When extending the sensor wire, use a shield wire and do not extend it unnecessary long.
 10. The sensor wire and signal wire should be away from the power and load wires using conduits separately installed.
 11. Please avoid using the product near a device generating strong high frequency noise
(high-frequency welding machine, high-frequency sewing machine, high-frequency radiotelegraph, high capacity SCR controller)
 12. PRODUCT'S DAMAGES OTHER THAN THOSE DESCRIBED IN THE GUARANTEE CONDITIONS PROVIDED BY THE MANUFACTURER SHALL NOT BE RESPONSIBLE BY US.
- ※ The Aforementioned precautions must be observed, and if you fail to do so, it may cause a product's breakdown.

Basic Specification

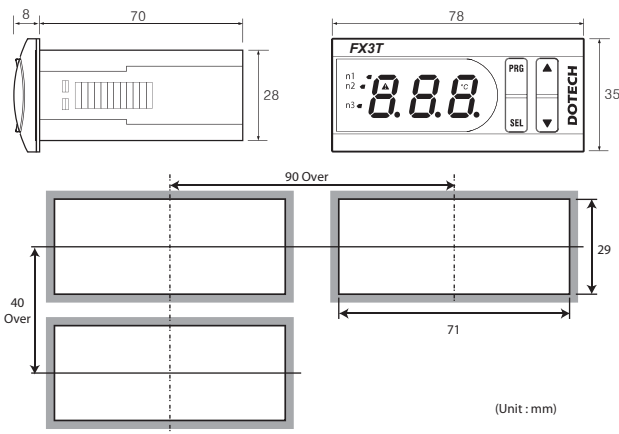
| Model | FX3T-TC |
|----------------|-------------------------------------------------------------------------------------------|
| Power | 100 - 240Vac , 50/60Hz |
| Current | MAX 4VA |
| Connector | Screw Bolt Connector (1.5mm ² Wire Use Possibility) |
| Input / Output | Relay output 3p (N1, 2, 3 : 250Vac/5A) Temp. sensor input 1p Thermo-couple C.A(K-Type) |
| Operation | Temp. -10~50°C (No condensation only) |
| Storage | Temp. -20~60°C, Humidity Under 90%RH |
| Sensor | Thermo-couple Measuring range : 0 ~ 1000°C |

Order Information

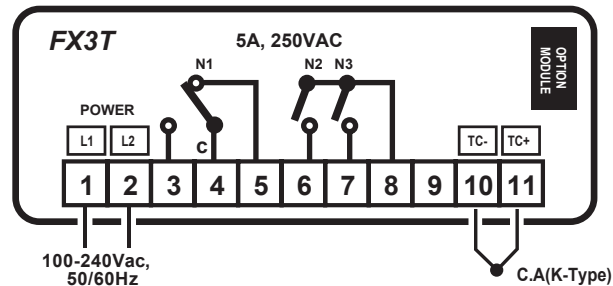
- FX3T - TC - 00 : Basic Model
- FX3T - TC - R4 : RS-485 Comm. model (Comm. function MODBUS RTU MODE) ※
- FX3T - TC - A1 : 4~20mA Trans output model (Connection cable is provided basically)
- FX3T - TC - R2 : RS-232 Comm. model (Comm. function MODBUS RTU MODE) ※

※ Comm. cable is provided basically

Dimensions and Panel Cut-Out Form



Connection Diagram

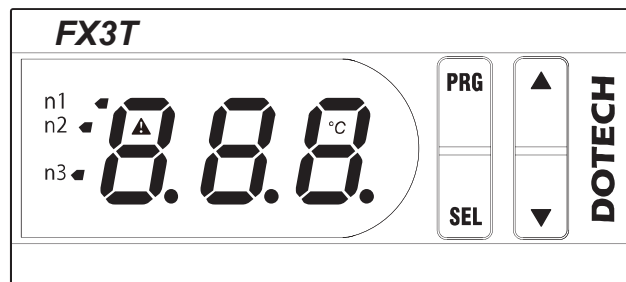


- OUT1 : HEAT/COOL#1 ON/OFF output, Alarm output
- OUT2 : HEAT/COOL#2 ON/OFF output, Alarm output
- OUT3 : HEAT/COOL#3 ON/OFF output, Alarm output

Option

| RS-485 COMM. OPTION MODULE | RS-232 COMM. OPTION MODULE | 4~20mA Output OPTION MODULE |
|----------------------------|----------------------------|-----------------------------|
| 1 ○ | 1 ○ | 1 ○ |
| 2 ○ TRX ⊕ | 2 ○ RXD | 2 ○ 4~20mA ⊕ |
| 3 ○ TRX ⊖ | 3 ○ TXD | 3 ○ 4~20mA ⊖ |
| 4 ○ SG | 4 ○ GND | 4 ○ SG |

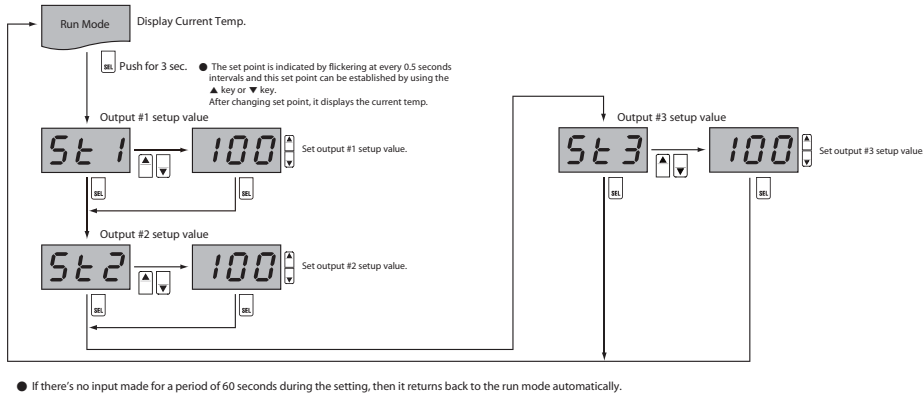
Constitution (Function of Display Lamp and Button)



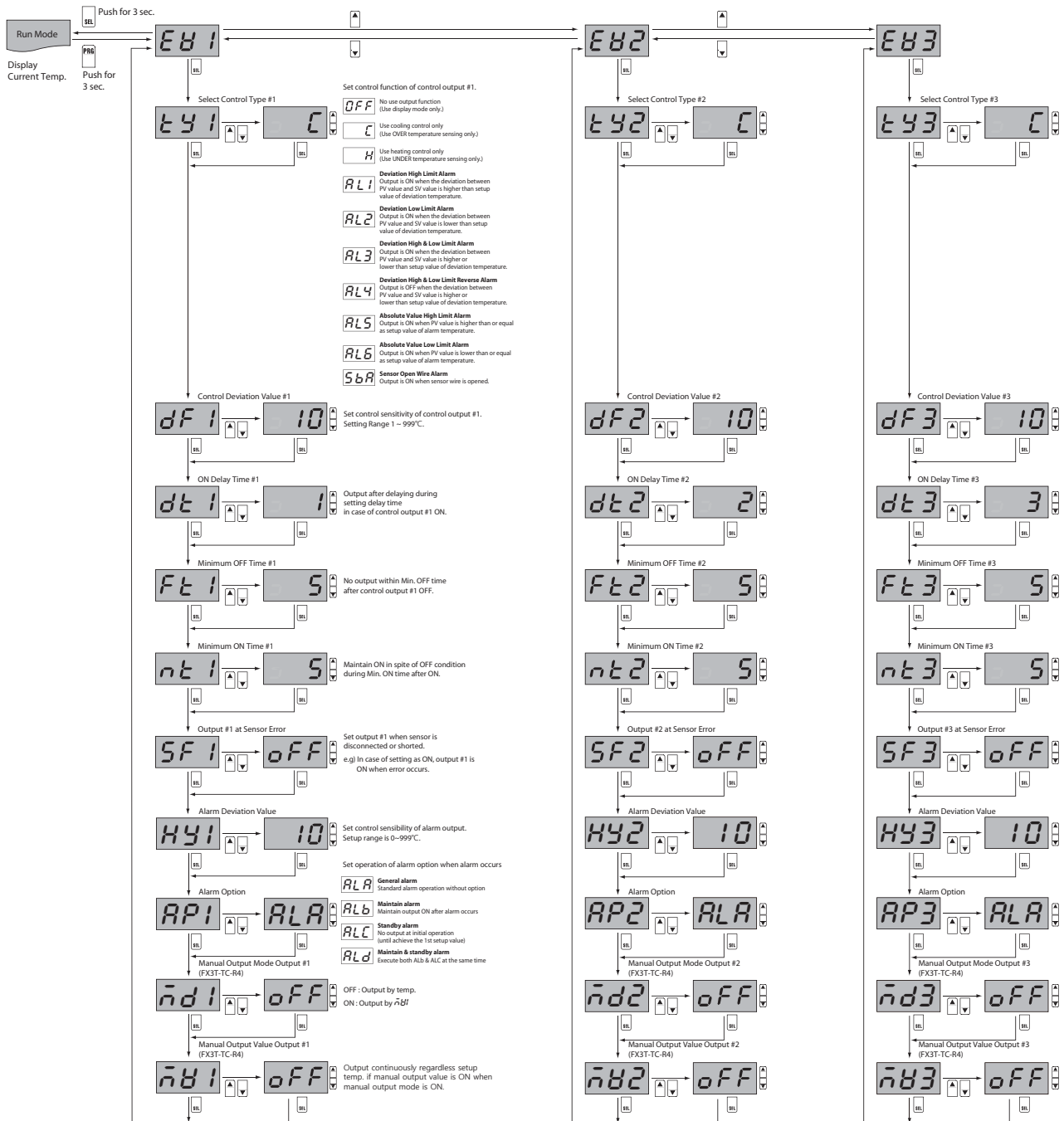
| | |
|----|------------------------------------------------------|
| n1 | Turn on when output #1 is ON (Flickering at standby) |
| n2 | Turn on when output #2 is ON (Flickering at standby) |
| n3 | Turn on when output #3 is ON (Flickering at standby) |
| °C | Display temp. value |
| ! | ON at trip, Flickering at alarm |

| | |
|-----|--------------------------------------------|
| PRG | Use at program setup |
| SEL | Execute selected menu or Input setup value |
| ▲ | Move between menus & Increase setup value |
| ▼ | Move between menus & Decrease setup value |

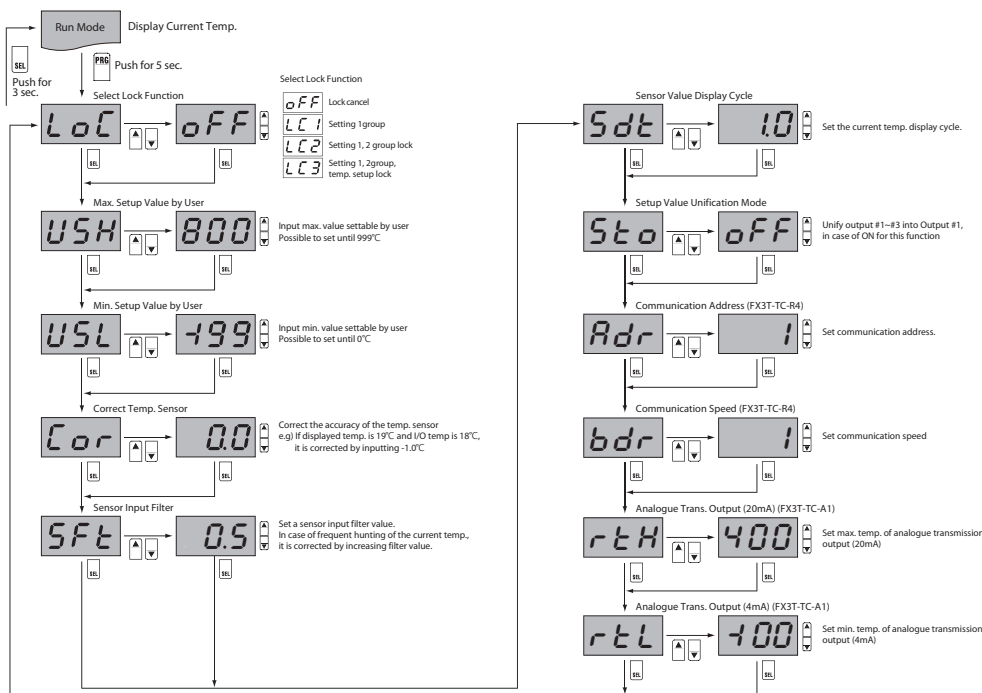
■ Temperature Setting Group



■ Setting 1 Group



■ Setting 2 Group



■ Setting 1 Group Table

| NO | DESCRIPTION | CODE | UNIT | STEP | MIN. | MAX. | DEFAULT | USER SETUP |
|-----|---------------------------------|---------------|------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------|------------|
| 100 | Select Control Type | <i>ty 1~3</i> | | | <i>oFF</i> : No use <i>C</i> : Cooling mode <i>H</i> : Heating mode <i>SbA</i> : Sensor open wire alarm <i>RL1</i> : Deviation high limit alarm <i>RL3</i> : Deviation high, low limit alarm <i>RL5</i> : Absolute value high limit alarm <i>RL2</i> : Deviation low limit alarm <i>RL4</i> : Deviation high, Low limit reverse alarm <i>RL6</i> : Absolute value low limit alarm | | <i>C</i> | |
| 101 | Control Deviation Value | <i>dF 1~3</i> | K | 1 | 1 | 999 | 10 | |
| 104 | ON Delay Time (※1) | <i>dE 1~3</i> | Sec. | 1 | 0 | 999 | 1 | |
| 105 | Minimum OFF Time (※2) | <i>Ft 1~3</i> | Sec. | 1 | 0 | 999 | 5 | |
| 106 | Minimum ON Time (※3) | <i>nE 1~3</i> | Sec. | 1 | 0 | 999 | 5 | |
| 107 | Output at Sensor Error (※4) | <i>SF 1~3</i> | | | <i>oFF</i> / <i>On</i> | | <i>oFF</i> | |
| 108 | Manual Output Mode Output (※5) | <i>nd 1~3</i> | | | <i>oFF</i> / <i>On</i> | | <i>oFF</i> | |
| 109 | Manual Output Value Output (※6) | <i>nB 1~3</i> | | | <i>oFF</i> / <i>On</i> | | <i>oFF</i> | |
| 110 | Alarm Deviation Value | <i>HY 1~3</i> | K | 1 | 0 | 999 | 2 | |
| 111 | Alarm Option | <i>AP 1~3</i> | | | <i>ALR</i> : General alarm <i>ALb</i> : Maintain alarm <i>ALC</i> : Standby alarm <i>ALd</i> : Maintain & standby alarm | | <i>ALR</i> | |

※1) ON delay time : It outputs after setting delay time in spite of output condition. During ON delay time, output lamp is turned on with output after flickering in fast cycle

※2) Min OFF Time : It lets output not occur within min. OFF time after it is turned off. During min. OFF time, output lamp is turned on with output after it flickers every 1 second intervals.

※3) Min ON Time : It is for avoiding frequent ON/OFF of control output and maintains ON condition in spite of OFF condition during Min ON Time after being turned on. (In case of sensor error, OFF at once)

※4) Output at Sensor Error : In case of sensor error such as open wire/short, it sets ON/OFF status of the related output.

※5) Manual Output Mode : *oFF* : Output by temperature / *On* : Output by *nB* (FX3T-TC-R4)

※6) Manual Output Value Setup : It outputs continuously regardless setup temp. if manual output value is ON when manual output mode is ON. (FX3T-TC-R4)

■ Setting 2 Group Table

| NO | DESCRIPTION | CODE | UNIT | STEP | MIN. | MAX. | DEFAULT | USER SETUP |
|-----|---------------------------------------------|------------|------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|
| 500 | Select Lock Function | <i>LoC</i> | | | <i>oFF</i> : Lock cancel <i>LoC 1</i> : Setting 1group <i>LoC 2</i> : Setting 1, 2 group lock <i>LoC 3</i> : Setting 1, 2group, temp. setup lock | | <i>oFF</i> | |
| 502 | Max. Setup Value by User (※7) | <i>USH</i> | - | 1 | <i>USL</i> | 999 | 999 | |
| 503 | Min. Setup Value by User (※7) | <i>USL</i> | - | 1 | 0 | <i>USH</i> | 0 | |
| 506 | Correct Temp. Sensor | <i>Cor</i> | K | 1 | 0 | +199 | 0 | |
| 507 | Sensor Input Filter (※8) | <i>Sft</i> | Sec. | 0.1 | 0.2 | 10.0 | 0.5 | |
| 508 | Sensor Value Display Cycle | <i>Sdt</i> | Sec. | 0.1 | 0.0 | 5.0 | 1.0 | |
| 509 | Setup Value Unification Mode (※9) | <i>Sto</i> | - | | <i>oFF</i> : Individual Temp. setup <i>On</i> : Unifying Temp. setup | | <i>oFF</i> | |
| 510 | Communication Address (FX3Q-RTD-R4) | <i>Adr</i> | - | 1 | 0 | 128 | 1 | |
| 511 | Communication Speed (FX3Q-RTD-R4) | <i>bdr</i> | - | 1 | 0 | 3 | 48 | |
| 512 | Analogue Trans. Output (20mA) (FX3Q-RTD-A1) | <i>rth</i> | °C | 1 | 0 | 999 | 400 | |
| 513 | Analogue Trans. Output (4mA) (FX3Q-RTD-A1) | <i>rtl</i> | °C | 1 | 0 | 999 | 0 | |

※7) User Setup Max./Min. : It inputs the range of temperature setup value.

※8) Sensor Input Filter Value : It avoids hunting by giving temperature measuring delay.

※9) Setup Value Unification Mode : In case of setting this function as ON, temperature setup value from output #1 to output #3 unifies as setup value of output #1.

Alarm Operation Group

| | | |
|-------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AL-1 | <p>※ In case of setting deviation temp. as 10°C for dF</p> | Deviation High Limit Alarm Output is ON when the deviation between PV value and SV value is higher than setup value of deviation temperature. Deviation temperature is set up at dF in setting 1 group. |
| AL-2 | <p>※ In case of setting deviation temp. as 10°C for dF</p> | Deviation Low Limit Alarm Output is ON when the deviation between PV value and SV value is lower than setup value of deviation temperature. Deviation temperature is set up at dF in setting 1 group. |
| AL-3 | <p>※ In case of setting deviation temp. as 10°C for dF</p> | Deviation High & Low Limit Alarm Output is ON when the deviation between PV value and SV value is higher or lower than setup value of deviation temperature. Deviation temperature is set up at dF in setting 1 group. |
| AL-4 | <p>※ In case of setting deviation temp. as 10°C for dF</p> | Deviation High & Low Limit Reverse Alarm Output is OFF when the deviation between PV value and SV value is higher or lower than setup value of deviation temperature. Deviation temperature is set up at dF in setting 1 group. |
| AL-5 | <p>※ In case of setting alarm temp. as 110°C for dF</p> | Absolute Value High Limit Alarm Output is ON when PV value is higher than or equal as setup value of alarm temperature. Alarm temperature is set up at dF in setting 1 group. |
| AL-6 | <p>※ In case of setting alarm temp. as 90°C for dF</p> | Absolute Value Low Limit Alarm Output is ON when PV value is lower than or equal as setup value of alarm temperature. Alarm temperature is set up at dF in setting 1 group. |
| SBa | | Sensor Open Wire Alarm Output is ON when sensor wire is opened. |

* SV : $Set1 \sim Set3$ * dF : $dF1 \sim dF3$ * HY : $HY1 \sim HY3$

Alarm Option Group

| CODE | OPERATION TITLE | DESCRIPTION FOR ALARM OPTION OPERATION |
|------------|--------------------------|--------------------------------------------------------------------|
| ALa | General alarm | Standard alarm operation without option |
| ALb | Maintain alarm | Maintain output ON after alarm occurs |
| ALc | Standby alarm | No output at initial operation (until achieve the 1st setup value) |
| ALd | Maintain & standby alarm | Execute both ALb & ALc at the same time |

Simple Trouble Check Point

In case of error occurring, the following messages are flickering at every 0.5 sec intervals.

| | |
|------------|------------------------------------------------------------------------------|
| Err | In Case of Input Sensor Open Wire (Normal operation after sensor connecting) |
|------------|------------------------------------------------------------------------------|

※ In case of the above-mentioned error, it will be normally operated with cancelling error status if the reason of error is solved.