CONOTEC

CONOTEC CO., LTD.
DIGITAL TEMPERATURE CONTROLLER

CE
ISO 9001:2008　ISO 14001

FOX-2001　　　　Instruction Manual

- A user manual for this product is posted on the company website.
- Please download the technical document and communications manual on the company website.

01　Safety precautions

Please read the safety precautions carefully for correct operation of the product.

※ The specifications and dimensions specified in this instruction manual may be changed without any notice for performance enhancement.

⚠ Warning

1. This product was not made as a safe device. Therefore, this product should be attached with dual safety devices if it is used for the control purposes (e.g. a device vulnerable to accident and property damage, etc.).
2. Do not wire, inspect or service this product while the power is being supplied.
3. You must attach this product to a panel. Otherwise, it may cause an electric shock.
4. When connecting the power, you must check the terminal number.
5. Do not ever disassemble, process, modify or repair this product.

⚠ Caution

1. Please make yourself familiar with all the operation instructions, safety precautions and warnings before using this product. Comply with related specifications and capacity requirements
2. Do not wire or install this product to any unit with high inductive load (e.g. motor, solenoid, etc.).
3. Use a shielded cable with a proper length when extending a sensor.
4. Do not use any part that generates an arc when used in the same power or directly switched in close proximity.
5. Keep the power cable away from a high-voltage cable and do not install this product in any place that is full of water, oil and dust.
6. Do not install this product in any place that is exposed to direct sunlight or rain.
7. Do not install this product in any place that is subject to strong magnetic power, noise, vibration or shock.

8. Keep this product away from any place that generates strong alkaline or acid substances. Use a separate pipe.
9. Do not sprinkle water onto this product for cleaning when installing it in the kitchen.
10. Do not install this product in any place where the temperature/ humidity ratings are exceeded
11. The sensor cable should not be cut or cracked..
12. Keep the sensor cable away from a signal cable, a power cable or a load cable. Use a separate pipe.
13. Keep in mind that the follow-up service will not be available if this product has been arbitrarily disassembled and modified
14. ⚠ symbol on the terminal wiring diagram indicates a safety statement that alerts a warning or caution.
15. Do not use this product near any device generating strong high-frequency noise (e.g. high-frequency welding machine high-frequency sewing machine, high-frequency radio, large-capacity SCR controller, etc.).
16. Using this product in any method other than those specified by by the manufacturer may lead an injury or a property damage
17. The product is not a toy. Keep it away from children.
18. The product should be installed only by an expert or a qualified person.
19. The company will not be liable for any damage caused by the violation of the above warnings and cautions or by a consumer's fault

⚠ Danger

Caution: Risk of electric shock

- Electric shock – Do not touch the AC terminal while the current is flowing. It may cause an electric shock.
- You must disconnect the input power when servicing it.

02　Model Types

| Model	Sensor	Output	Temp.Range	Function
FOX-2001	NTC	Relay	-55.0℃ ~ +99.9℃	TEMP. Control
FOX-2001S	NTC	SSR (12VPC 30mA Max)	-55.0℃ ~ +99.9℃	TEMP. Control

03　Components

1 Temp Output Lamp　**2** Up Switch　**3** Function Change Switch
4 Down Switch

[The Function of each key.]

1. set : A key to change of the programs & setting temperature
2. ▲▼ : A key to change of the program's set values & temperature

04 Terminal Wiring diagram

[FOX – 2001]

SSR
4 −
3 +
12VDC ±3V
30mA Max.

Sensor　OUT　Power Supply AC220V　Main Output
AC
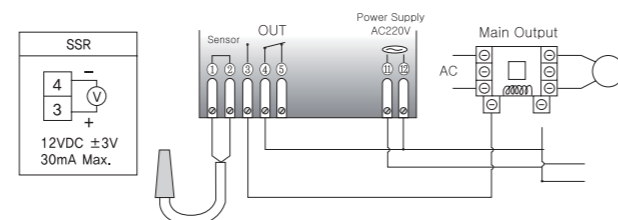
※Output : When using over 250VAC 2A, be sure to use a power relay or magnetic contactor.
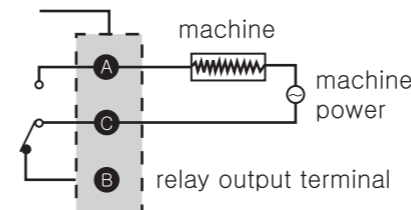
※ Exceeding the contact capacity may cause contact welding, poor contact. or relay damage, so please exercise caution
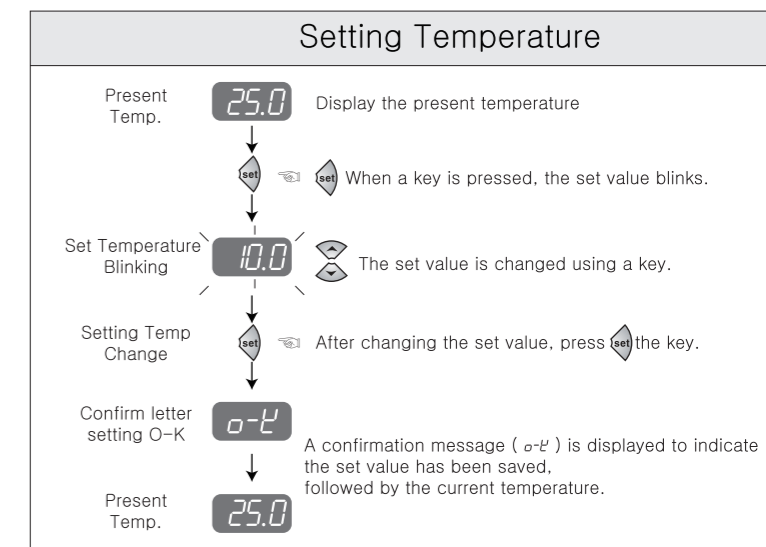
■ EX) SSR junction

non-contact(static) relay(SSR)

voltage output
INPUT
LOAD
load
load power
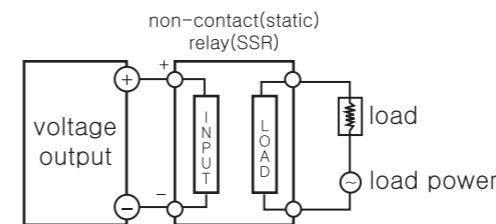
※ Please make sure that the SSR's capacity should be used more than load capacity.

■ EX) Relay junction

machine
machine power
relay output terminal

05　Setting process

Setting Temperature

Present Temp.	25.0	Display the present temperature
Set Temperature Blinking	10.0	When a key is pressed, the set value blinks.
Setting Temp Change		The set value is changed using a key.
Confirm letter setting O-K	o-t	After changing the set value, press set the key.
Present Temp.	25.0	A confirmation message (o-t) is displayed to indicate the set value has been saved, followed by the current temperature.

Program Setting　(The value of each item is the factory setting.)

set 🖙 Press for more than 5 sec.

10.0	Set Temperature After Blinking	
HSP	User Temperature Upper Limit Point Setting	
99.9	99.9 ~ LSP	
LSP	User Temperature Lower Limit Point Setting	
-55.0	HSP ~ -55.0	
tYP	Function Selection	
CoL	CoL / HEt	
dIS	Deviation Method Selection	

Pn	P / Pn	
dIF	Deviation Temperature Setting	
0.1	19.9 ~ 0.1	
dLt	Output Operation Delay Time	
0.00	9.59 (Min, Sec) ~ 0.00	
Cor	Temperature Calibration	
0.0	5.0 ~ -5.0	

LoC	Lock Function	
on	on /oFF	

※ To change it with program mode, press the set key for more than present temprature display mode.
※ The set or programming mode is terminated if you press the set key for 2 second. parameters (set values) sre saved after the display shows OK letter or return to present tempera ture automatically after 30 secomd.

HSP : User Set Temperature Upper Limit (Maximum Setpoint Allowed for the End User)
The set temperature value cannot exceed the **HSP** set value

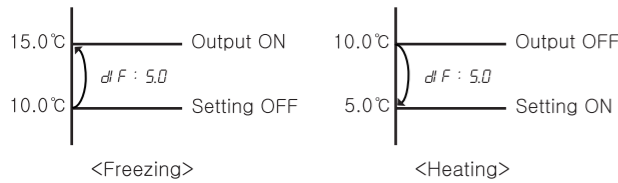Example) **HSP** = 25.0℃ Setting => The set temperature can be adjusted up to 25.0℃

LSP : User Set Temperature Lower Limit (Minimum Setpoint Allowed for the End User)
The set temperature value cannot be set below the **LSP** set value

Example) **LSP** = 10.0℃ Setting => The set temperature can be adjusted up to 10.0℃

tYP : Cooling (**CoL**) and heating (**HEt**) selection functions

dI5 : Deviation Selection Method

P Output operation: Set deviation to + operation (off at the set point)

Example) Setting = 10.0℃, tYP :C , dI F:5.0   Example) Setting = 10.0℃, tYP :H , dI F:5.0

```
15.0℃ ─── Output ON         10.0℃ ─── Output OFF
      dI F : 5.0                   dI F : 5.0
10.0℃ ─── Setting OFF        5.0℃ ─── Setting ON
    <Freezing>                   <Heating>
```

Pn Output operation: Set deviation to ± operation (based on the set point)

Example) Setting = 10.0℃, tYP :C , dI F:5.0   Example) Setting = 10.0℃, tYP :H , dI F:5.0

```
15.0℃ ─── ON          15.0℃ ─── OFF
      dI F : 5.0            dI F : 5.0
10.0℃ ─── Set Point   10.0℃ ─── Set Point
      dI F : 5.0            dI F : 5.0
5.0℃ ─── OFF          5.0℃ ─── ON
   <Freezing>            <Heating>
```
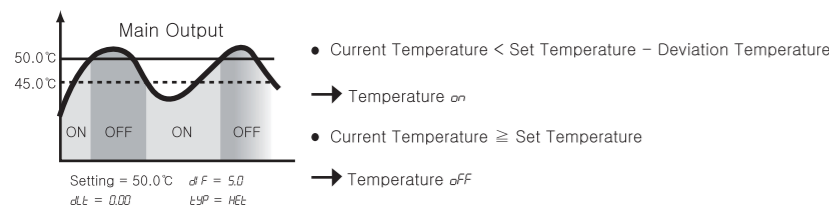
dI F : Setting fot temperature deviation
– In the ON/OFF control, it needs at regular interval between ON and OFF.
– By operating the ON/OFF control frequently, the realy or its output contact can be damaged quickly and it also occurs the hunting (oscillating,chattering) by virtue of external noise.
– You can make use of the temperature deviation in order to protect its realy or contact and so on.

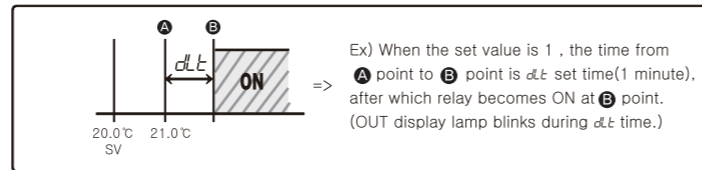• Output operation: Set deviation to + operation (off at set point)

```
Main Output
-20.0℃
-25.0℃
        ON  OFF  ON  OFF
Setting = -25.0℃ dI F = 5.0
dLt = 0.00   tYP = CoL
```
● Current Temperature > Set Temperature + Deviation Temperature
→ Temperature on
● Current Temperature ≦ Set Temperature
→ Temperature off

<When used for freezing>

```
Main Output
50.0℃
45.0℃
        ON  OFF  ON  OFF
Setting = 50.0℃  dI F = 5.0
dLt = 0.00   tYP = HEt
```
● Current Temperature < Set Temperature − Deviation Temperature
→ Temperature on
● Current Temperature ≧ Set Temperature
→ Temperature off

<When used for heating>

dLt : Output Delay Time
– It is widely used as the followings in case of operating the ON/OFF control very often, (Cooler,Compressor and so on)
– To protect the operation machinery when re-input of the power supply or momentary stoppage of power supply.

```
        Ⓐ  Ⓑ
        ←dLt→
             ON
20.0℃  21.0℃
  SV
```
=> Ex) When the set value is 1 , the time from Ⓐ point to Ⓑ point is dLt set time(1 minute), after which relay becomes ON at Ⓑ point. (OUT display lamp blinks during dLt time.)

Cor : Current temperature calibration function
– While there is no problem in the product, a function to calibrate when temperature is different error and reference standard that occur in the input sensor (e.g. Mercury thermometer or thermomete currently use, a temperature controller)
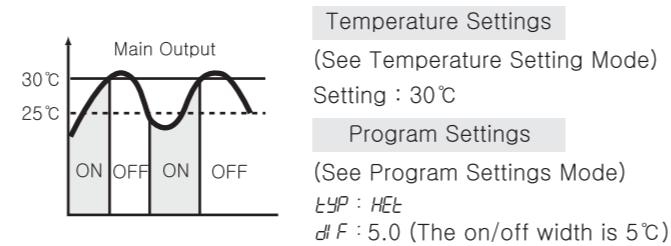
– Ex) Actual temperature : 10.0℃   **Cor** Modification of 0.0 to −2.0
Display window : 12.0℃   → Displayed as 10.0
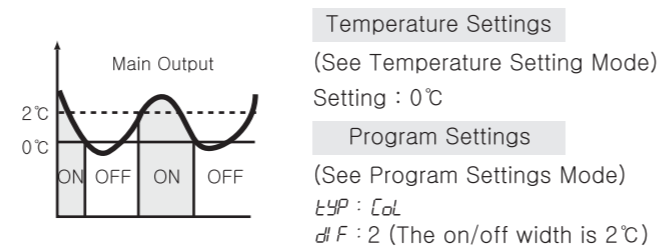(corrected current temperature)

LoC : Locking of the setting
– Safety function intended to prevent anyone other than the main user from changing the settings
– If set at **on** : All the settings expect for the set temperature will be locked.
– If set at **oFF** : All the settings will be unlocked.

■ Example of thermostat usage

Example 1) What is the temperature and program setting when the heater is turned off at 30℃ and tried to operate at 25℃?
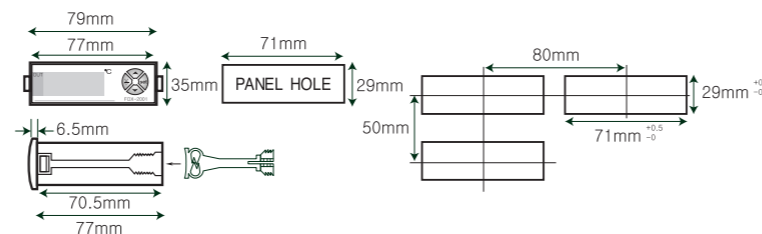
```
Main Output
30℃
25℃
   ON OFF ON OFF
```

Temperature Settings
(See Temperature Setting Mode)
Setting : 30℃

Program Settings
(See Program Settings Mode)
tYP : HEt
dI F : 5.0 (The on/off width is 5℃)

Example 2) What are the temperature and program settings when the cooler is turned off at 0℃ and restarted at 2℃?

```
Main Output
2℃
0℃
   ON OFF ON OFF
```

Temperature Settings
(See Temperature Setting Mode)
Setting : 0℃

Program Settings
(See Program Settings Mode)
tYP : CoL
dI F : 2 (The on/off width is 2℃)

07 Diemension and panel hole sizes

(Unit : mm / error : ±0.5)

```
79mm
77mm          71mm              80mm
         35mm  PANEL HOLE  29mm          29mm +0.5/-0
←6.5mm                      50mm    71mm +0.5/-0
70.5mm
77mm
```

08 Easy Error diagnosis Instructions

※ If an error is displayed while the product is running

• **Er 1** : It is case where the product was subject to a strong external noise and internal data memories have been damaged In this case, contact us for product service.
• Although this controller was designed to withstand a certain level of external noise, it is not supposed to withstand all levels of noise.
• If the product is subject to a noise greater than 2KV, it could be internally damaged.
• If **o-E** (open error) or **S-E** (short error) is displayed, there is something wrong with a sensor. Please check the sensor.

◈ Installation precautions
■ This device sholuld be connected to a protective earth terminal and a power supply in order to prevent an electric shock.
■ Do not block the air outlet.

◈ Operation precautions
※ An operating environment of this device is as follows.
■ Ambient temperature : 0 ~ 60℃ ■ Ambient humidity : 80%RH or less
■ Indoor uses only ■ Pollution class 2
■ Altitude under 2000m ■ Installation category : II
■ This device should be laid out in a way that its power cord is easy to handle.
■ Using this product in any method other than those specified by the manufacturer may damage its protection function

■ Major products and development
• Temperature/humidity controller   • Heat pump controller
• Counter and timer controller   • Chiller controller
• Current and voltage panel meter   • Thermo-hygrostat controller
• Temperature/humidity indicator   • Short message alarm
• Oven controller   • Temperature/ humidity transmitter
• CO2 controller
• PID controller   • Smartphone app and monitoring system
• Unit cooler controller

※ This manual was prepared in the Naver Nanum fonts.