CONOTEC

CONOTEC CO., LTD.
DIGITAL TEMPERATURE CONTROLLER

ISO 9001:2008   ISO 14001

| FOX-1004N | 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
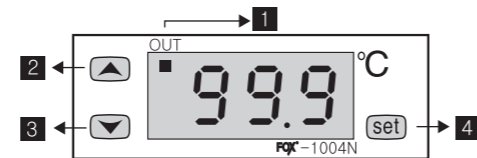
⚠ Danger
Caution: Risk of electric shock
- Electric shock – Do not touch the AC terminal while the current is flowing. It may cause an electric shock.
- You must disconnect the input power when servicing it.

02 Model Types

| Model	Sensor	Control method	Temp. range	Function
FOX-1004N	NTC(2m)	relay contact	−40.0℃ ~ +80.0℃	Temperature control

03 Components

| 1 | Temperature output display | 2 | Increasing switch |
| 3 | Function change switch | 4 | Reduced switch |

[Functionality of Operation Key]
1. set : Key for temperature setting and program change
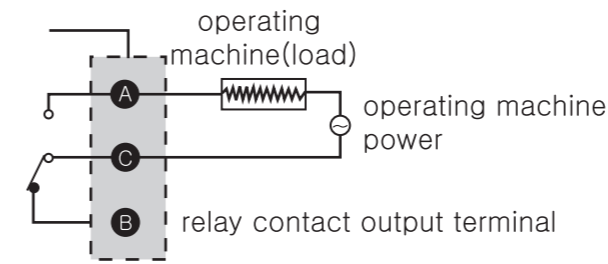2. ▲ ▼ : Key to change temperature and program settings
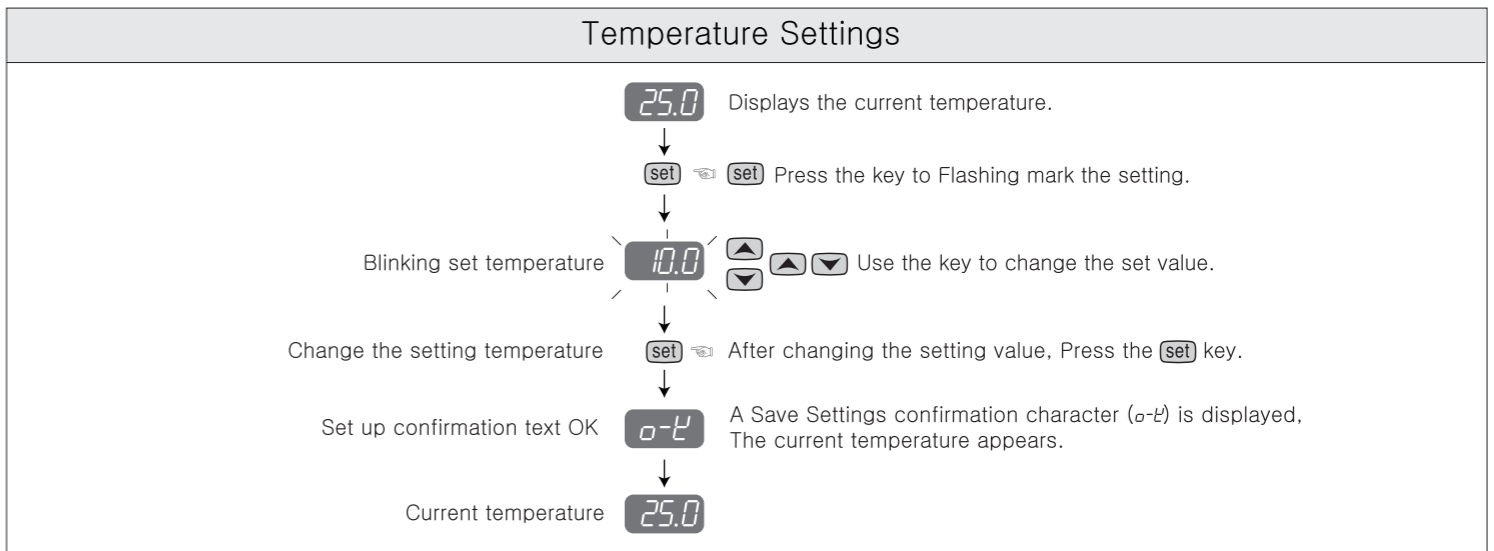
04 Terminal wiring diagram

[FOX – 1004N]
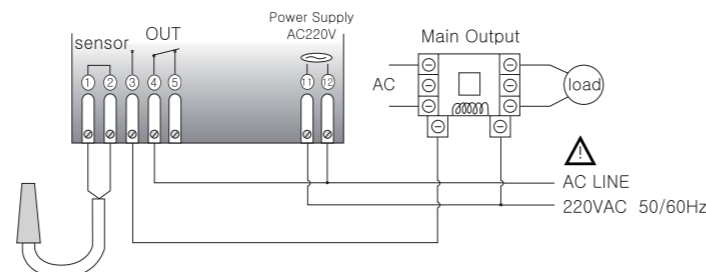
※ Output: Make sure to use a power relay or magnet when using 250VAC 2A or more.

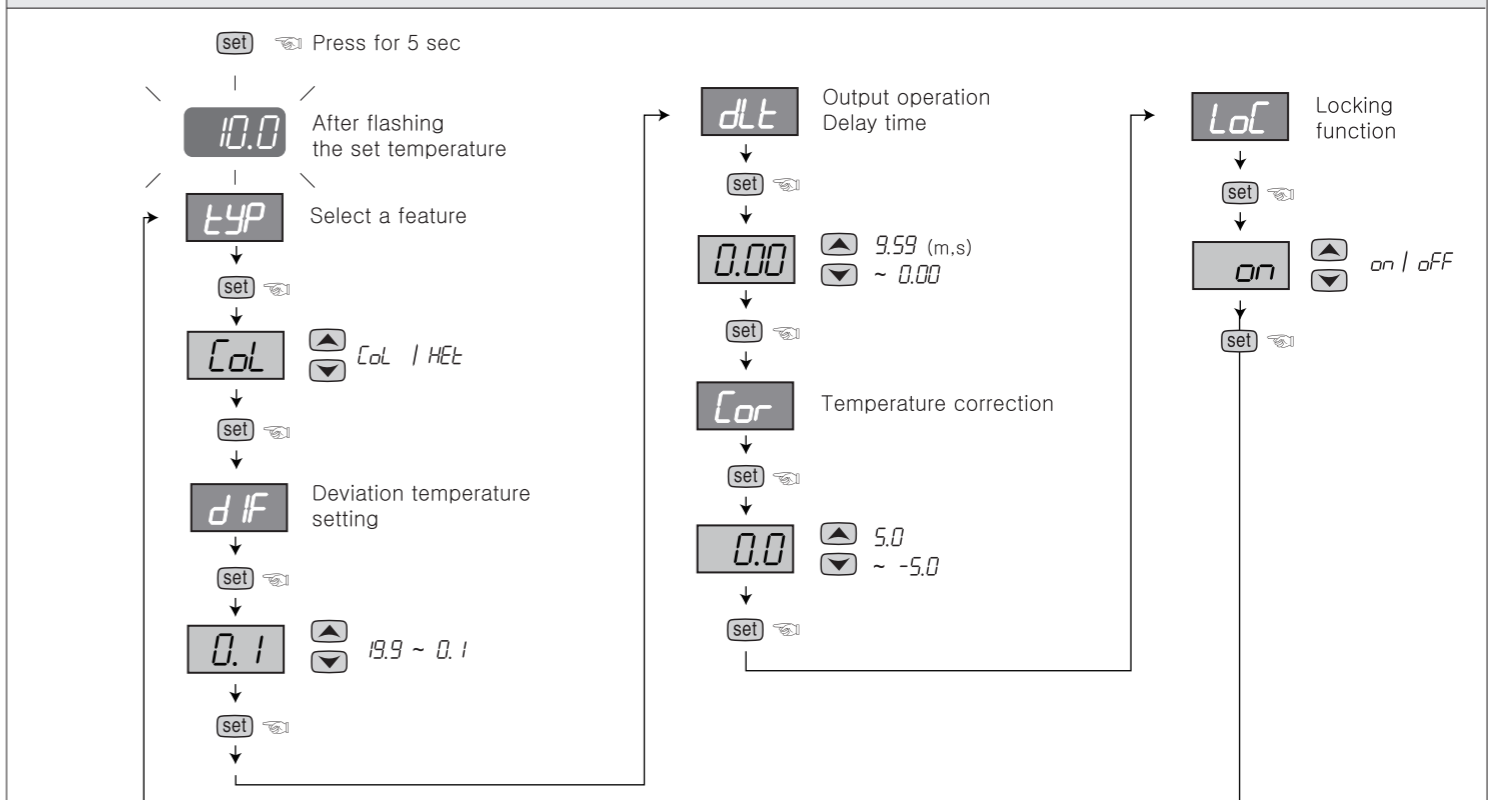※ Use a load that exceeds the contact's capacity can cause contact fusion, poor contact, and damage to the relay.

■ Example of a Relay Access

operating machine(load)
operating machine power
relay contact output terminal

05 Setting process

Temperature Settings

| 25.0 | Displays the current temperature. |

set / set Press the key to Flashing mark the setting.

Blinking set temperature | 10.0 | ▲ ▲ ▼ Use the key to change the set value.

Change the setting temperature | set | After changing the setting value, Press the set key.

Set up confirmation text OK | o-ヒ | A Save Settings confirmation character (o-ヒ) is displayed. The current temperature appears.

Current temperature | 25.0 |

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

set / Press for 5 sec

10.0 After flashing the set temperature

tYP Select a feature

set

CoL ▲ CoL / HEE

set

d IF Deviation temperature setting

set

0.1 ▲ ▼ 19.9 ~ 0.1

set

dLt Output operation Delay time

set

0.00 ▲ 9.59 (m.s) ▼ ~ 0.00

set

Cor Temperature correction

set

0.0 ▲ 5.0 ▼ ~ -5.0

set

LoC Locking function

set

on ▲ on / oFF ▼

set

※ In the current temperature display state, press the set key for 5 seconds to change to program setting mode.
※ All programs are terminated after checking the OK text by continuously pressing the set key for 2 seconds after setting up, or automatically return to the current temperature 30 seconds later.
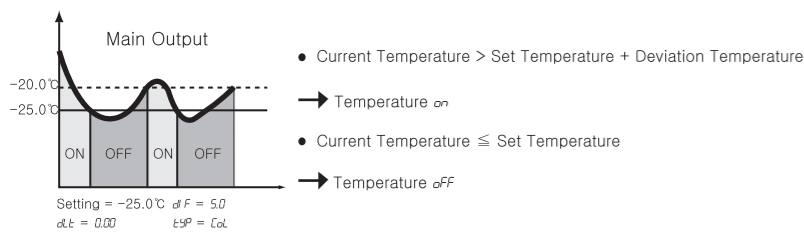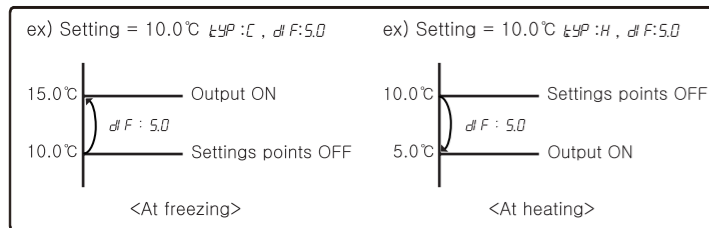
06 Setting process

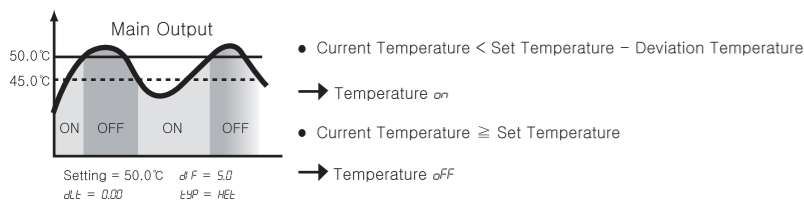`typ` : Cooling (`CoL`) and heating (`HEt`) selection functions

`dIF` : 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.

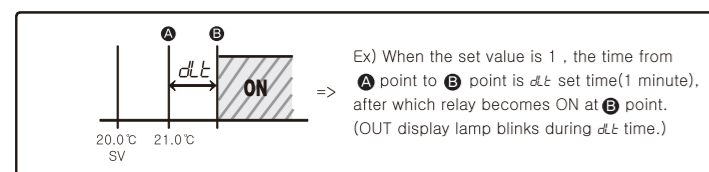• Output operation: Set deviation to + operation (off at set point)

ex) Setting = 10.0℃ `typ`:`C` , `dIF`:5.0

15.0℃ ——— Output ON
`dIF` : 5.0
10.0℃ ——— Settings points OFF

<At freezing>

ex) Setting = 10.0℃ `typ`:`H` , `dIF`:5.0

10.0℃ ——— Settings points OFF
`dIF` : 5.0
5.0℃ ——— Output ON

<At heating>

Main Output

-20.0℃
-25.0℃
ON OFF ON OFF

• Current Temperature > Set Temperature + Deviation Temperature
→ Temperature on

• Current Temperature ≦ Set Temperature
→ Temperature off

Setting = -25.0℃ `dIF` = 5.0
`dLt` = 0.00   `typ` = `CoL`

<When used for freezing>

Main Output

50.0℃
45.0℃
ON OFF ON OFF

• Current Temperature < Set Temperature - Deviation Temperature
→ Temperature on

• Current Temperature ≧ Set Temperature
→ Temperature off

Setting = 50.0℃ `dIF` = 5.0
`dLt` = 0.00   `typ` = `HEt`

<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.

A B
`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.)
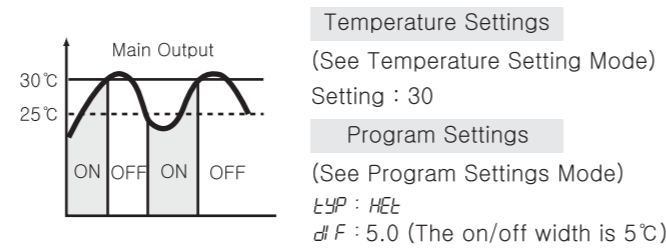
`Cor` : Current temperature calibration function
- While there is no problem in the product, a function to calibrate when temperature is different error and reference standard that occur in the input sensor (e.g. Mercury thermometer or thermomete currently use, a temperature controller)

- Ex) Actual temperature : 10.0℃
  Display window : 12.0℃
  → `Cor` Modification of 0.0 to -2.0
  → Displayed as 10.0 (corrected current temperature)

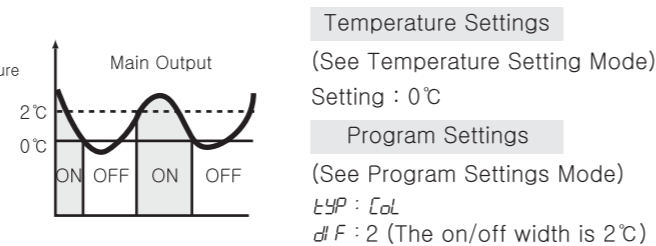`LoC` : The lock function of setting data.
- A safety device that prevents various setting values from being changed except for the main user.
- Setting `on` : Lock all settings except set temperature value LOCK.
- Setting `oFF` : Unlock all setting values except for setting temperature values.

■ 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℃?
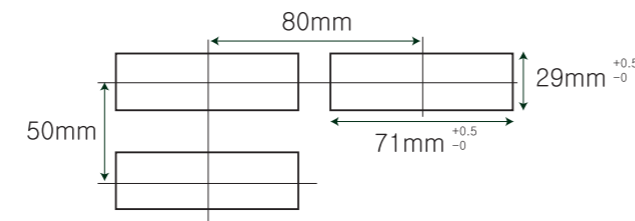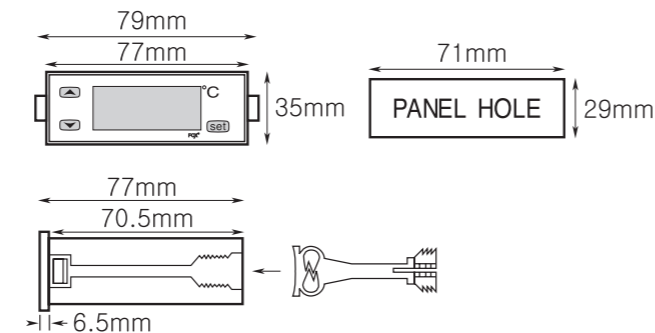
Main Output

30℃
25℃
ON OFF ON OFF

Temperature Settings
(See Temperature Setting Mode)
Setting : 30

Program Settings
(See Program Settings Mode)
`typ` : `HEt`
`dIF` : 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`
`dIF` : 2 (The on/off width is 2℃)

07 Diemension and panel hole sizes

(Unit : mm / error : ±0.5)

79mm
77mm
35mm
℃
set

71mm
PANEL HOLE
29mm

77mm
70.5mm
6.5mm

80mm
50mm
29mm +0.5 -0
71mm +0.5 -0

08 Easy error diagnosis instructions

※ If an error is displayed while the product is running

• `Er1` : 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 :
■ 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
• Counter and timer controller
• Current and voltage panel meter
• Temperature/humidity indicator
• Oven controller
• CO2 controller
• PID controller
• Unit cooler controller
• Heat pump controller
• Chiller controller
• Thermo-hygrostat controller
• Short message alarm
• Temperature/ humidity transmitter
• Smartphone app and monitoring system