CONOTEC

CONOTEC CO., LTD.
DIGITAL TEMP. & HUMI. CONTROLLER

CE ISO 9001:2008

INVENTION PATENT SYSTEM 0441398
UTILITY MODEL SYSTEM 0357664
DESIGN REGISTRATION SYSTEM 0364322

FOX-300 SERIES	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
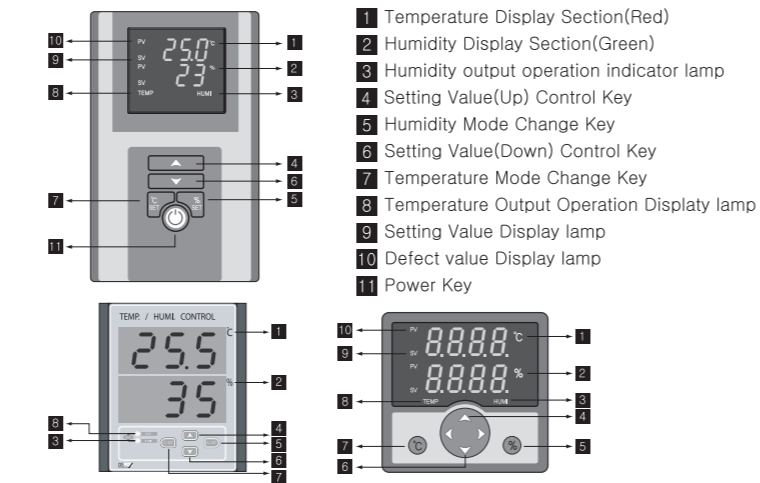
⚠ Danger

Caution: Risk of electric shock

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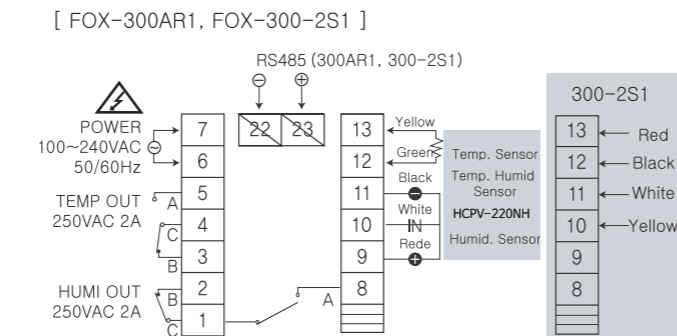- You must disconnect the input power when servicing it.

02 Model Types

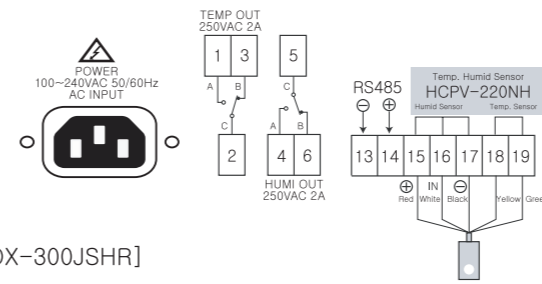| Model	Sensor	Temp/Humid Range	Outward Size	Function
FOX-300JSHR	CNT-H Series	−39.9℃ ~ 80.0℃ 0% ~ 100Rh%	W194 x H241mm	Temp. Control Humid. Control RS485 Communication
FOX-300-2S1			W72 x H72mm	
FOX-300A-1	HCPV-220NH	−40.0 ~ 65.0℃ 10 ~ 95%	W72 x H72mm	Temp. Humid Control
FOX-300AR1				Temp. Control Humid. Control RS485 Communication
FOX-300JR1			W194 x H241mm	
FOX-8300R1			W94 x H150mm	

03 Components

1. Temperature Display Section(Red)
2. Humidity Display Section(Green)
3. Humidity output operation indicator lamp
4. Setting Value(Up) Control Key
5. Humidity Mode Change Key
6. Setting Value(Down) Control Key
7. Temperature Mode Change Key
8. Temperature Output Operation Displaty lamp
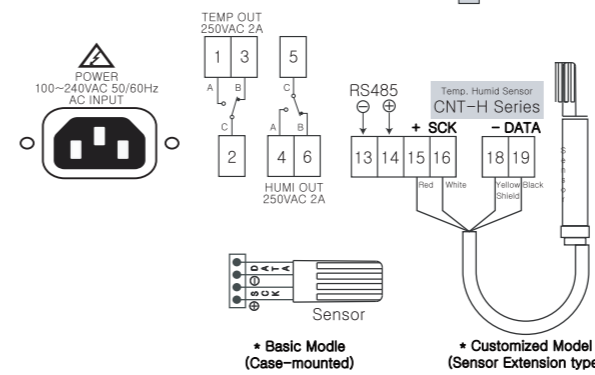9. Setting Value Display lamp
10. Defect value Display lamp
11. Power Key

04 Terminal wiring diagram

[FOX-300AR1, FOX-300-2S1]

[FOX-300JR1]

[FOX-300JSHR]

* Basic Modle (Case-mounted)
* Customized Model (Sensor Extension type)
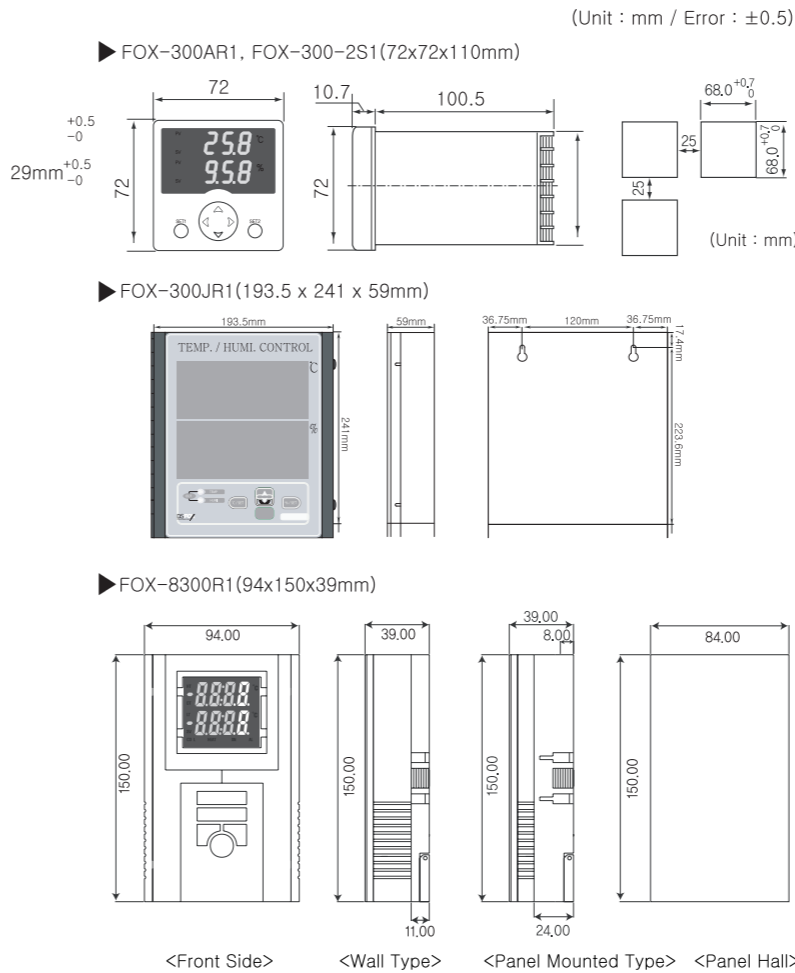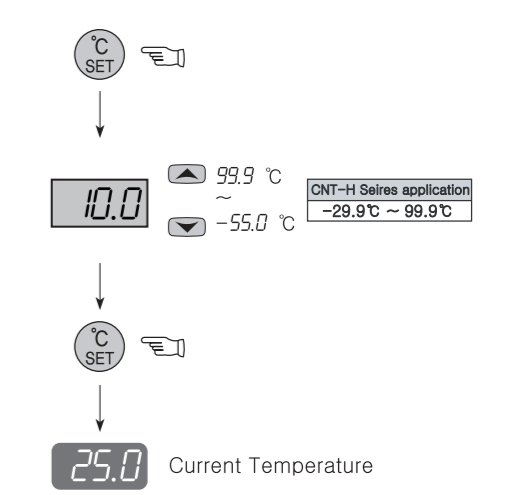
[FOX-8300R1]
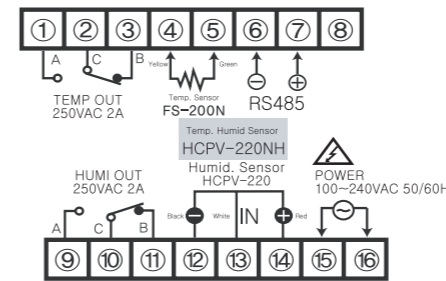
05 Product external & panel cutout dimensions

(Unit : mm / Error : ±0.5)

▶ FOX-300AR1, FOX-300-2S1(72x72x110mm)

(Unit : mm)

▶ FOX-300JR1(193.5 x 241 x 59mm)

▶ FOX-8300R1(94x150x39mm)

<Front Side> <Wall Type> <Panel Mounted Type> <Panel Hall>

Temperature Setting

CNT-H Seires application −29.9℃ ~ 99.9℃

99.9 ℃ ~ −55.0 ℃

Current Temperature

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

Press the key for at least 5 seconds.

typ	Type
C	Change
dLt	Delay Time
0	
diF	Deviation Temperature
Cor	Current Temp Correction
Adr	Communication address Setting
bPS	Communication Speed Setting

CNT-H Series application −9.9℃ ~ 9.9℃

+ 10.0 ℃ ~ − 10.0 ℃

10 min ~ 0

99 ~ 1

19.9 ℃ ~ 0.1 ℃

192- ~ 1200
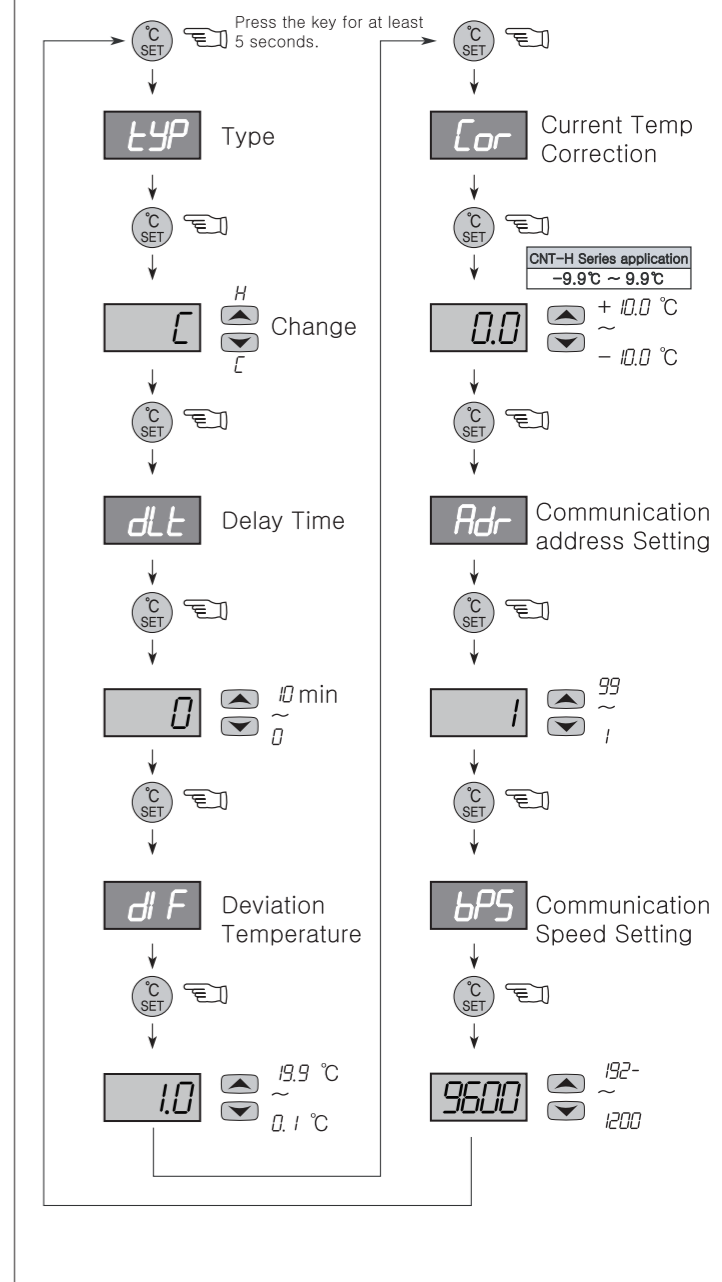
06 Humidity Setting Value Change in order

Humidity Setting


```
% SET
    ↓
 30.0    ▲ 100
         ▼ ~ 0    CNT-H Series application
                  0.0 ~ 99.9%
    ↓
% SET
    ↓
 50.0    Curretn Temperature
```

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

```
% SET  — Press the key for at least 5 seconds.        °C SET
   ↓                                                    ↓
 tYP   Type                                            dlF   Deviation Humidity
   ↓                                                    ↓
% SET                                                  % SET
   ↓                                                    ↓                CNT-H Series application
  d    ▲ Humidification( H )                            l     ▲ 29 %        0.1 ~ 29.9%
       ▼ Dehumidification( d )                                ▼ ~ 1%
       Change
   ↓                                                    ↓
% SET                                                  % SET
   ↓                                                    ↓
 dLt   Delay time                                     Cor   Current Humidity Correction
   ↓                                                    ↓
% SET                                                  % SET              CNT-H Series application
   ↓                                                    ↓                  -9.9 ~ 9.9%
  0    ▲ 10 분                                          0     ▲ + 10 %
       ▼ ~ 0                                                  ▼ - 10 %
```
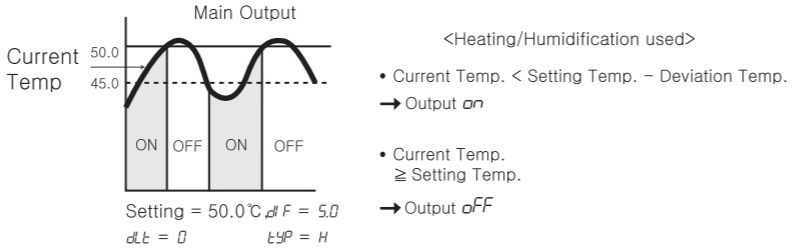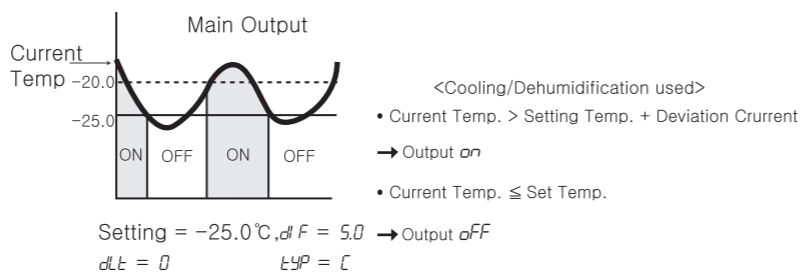
※ When the SET KEY is pressed and held for 5 seconds in the current temperature display mode, it will switch to the program setting mode

※ After completing all program settings, press the SET KEY once more, and after the *o-E* display, it will return to the current temperature or automatically revert to the current temperature after 30 seconds.
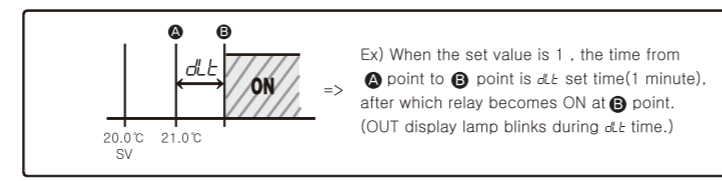
07 Function detailed Description

tYP : Temperature: Cooling(C) or Heating(H) Selectable
Humidity : Dehumidification(d) or Humidification(H) Selectable

dlF : Deviation Temperature Setting
– In ON/OFF control, a certain interval is required between ON and OFF. (ON/OFF width setting)

– If the ON and OFF cycles repeat too frequently, the relay or other output contacts may wear out quickly, or hunting (oscillation, chattering) may occur due to external noise. To prevent this phenomenon, the ON/OFF control includes a function that sets a certain interval between ON and OFF, protecting the device's contacts and extending its lifespan.

Main Output

```
Current
Temp -20.0
     -25.0
          ON  OFF  ON  OFF
```

<Cooling/Dehumidification used>
• Current Temp. > Setting Temp. + Deviation Crurrent
→ Output *on*

• Current Temp. ≦ Set Temp.

Setting = −25.0℃ , dlF = 5.0 → Output *oFF*
dLt = 0   tYP = C

Main Output

```
Current
Temp  50.0
      45.0
          ON  OFF  ON  OFF
```

<Heating/Humidification used>
• Current Temp. < Setting Temp. − Deviation Temp.
→ Output *on*

• Current Temp. ≧ Setting Temp.
→ Output *oFF*

Setting = 50.0℃ , dlF = 5.0
dLt = 0   tYP = H

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.

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)

Adr : Communication Address Setting
–When using RS485 communication, you must assign a station number between 1 and 99.

bPS : Communication Speed Setting
– 120 1200 : 1200BPS
– 240 2400 : 2400BPS
– 480 4800 : 4800BPS
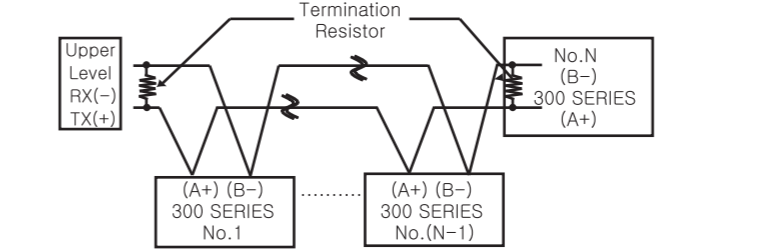– 960 9600 : 9600BPS
– 19- 192- : 19200BPS
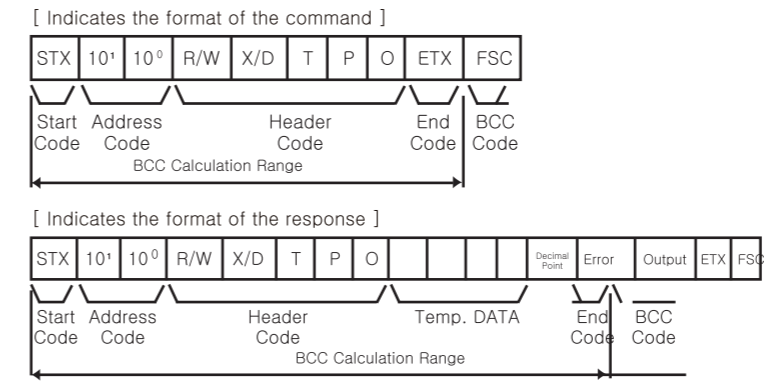(Start Bit1, Stop Bit1, Non parity)

08 Communication interface

Applicable specification	EIA RS485
Maximum units accessed	32 units (however, 1~99 available for address setting)
Communications method	2-line half-duplex:Asynchronous
Data speed	1200/2400/4800/9600/19200bps(5 options)
Communications range	Within 1.2Km
Communications protocol	Modbus
Start Bit, Stop Bit	1Bit (fixed)
Parity Bit, Data Bit	Parity Bit : None, Data Bit : 8Bit (fixed)

※ Please see the user manual on our website for more details about the communications specifications..

■ System Configuration

■ Communication Command and Block Definition

[Indicates the format of the command]

STX	10¹	10⁰	R/W	X/D	T	P	O	ETX	FSC

Start Code / Address Code / Header Code / End Code / BCC Code
BCC Calculation Range

[Indicates the format of the response]

| STX | 10¹ | 10⁰ | R/W | X/D | T | P | O | | | Decimal Point | Error | Output | ETX | FSC |

Start Code / Address Code / Header Code / Temp. DATA / End Code / BCC Code
BCC Calculation Range

① START CODE
epresents the leader of the blockSTX→[02H], If it's a response, ACK will be added.

② ADDRESS CODE
The prefix code that identifies the 300 Series in the upper system can be set within the range of 01 to 99 (BCD ASCII)

③ HEADER CODE: Represents the name of the COMMAND in characters
RX (Read Request) →R[52H], X[58H]
RD (Read Response) →R[52H], D[44H]
WX (Write Request) →W[57H], X[58H]
WD (Write Response) →W[57H], D[44H]
TP0(Temp Detect Value) →T[54H], P[50H], 0[30H]
HP0(Humid. Detect Value) →H[48H], P[50H], 0[30H]

④ Structure of DATA: DATA is represented in hexadecimal

⑤ Decimal point: 0 [30H]: No decimal point // 1 [31H]: Decimal point present

⑥ Error: 0 [30H]: No error // 1 [31H]: Sensor open error
2 [32H]: Sensor short error.

⑦ Output: 0[30H] T/H OUT ON
3[33H] T/H OUT OFF

⑧ END CODE: Indicates the end of the BLOCK content. ETX → [03H]

⑨ BCC: Abbreviation for Block Check Character, representing the XOR result from the start of the protocol (STX) to ETX

※ Other

• In the case of no ACK response
① In the case of no ACK response
② In the case where the STX reception does not match the prefix
③ In the case where the baud rate or other communication settings do not match

• Handling of the case when there is no ACK response
① First, check the line status
② Check the communication conditions (settings)
③ If the communication issue is believed to be caused by noise, attempt to execute communication about 3 times until the issue is recovered
④ If frequent communication issues occur, change the communication speed

---

09 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 should 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.