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CONOTEC

CONOTEC CO., LTD.

DIGITAL TEMPERATURE CONTROLLER

ISO 9001:2008

FOX-302SERIES 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

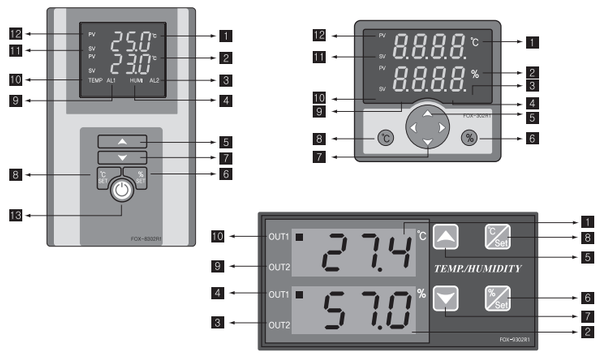
Caution: Risk of electric shock

- Electric shock – Do not touch the AC terminal while the current is flowing. It may cause an electric shock.

02 Model Types

Model	Sensor	Temperature/Humidity Range	External Size	Function
FOX-302R1	FS-200N HCPV-220H	- 55.0 ~ 99.9 ℃ 10 ~ 95%	W72 x H72 mm	Temperature / Humidity Control
FOX-9302R1			W96 x H48 mm	
FOX-8302R1			W94 x H150 mm	RS485 Communications

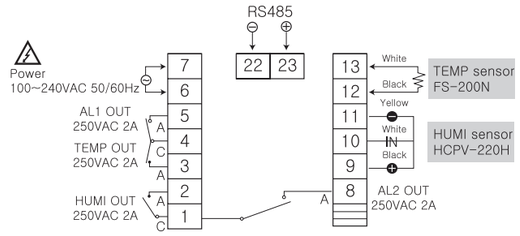
03 Components



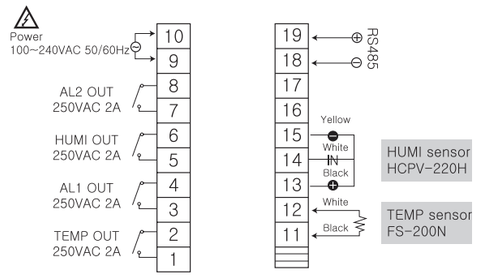
1 : Temperature Measurement Value Display (Red)
2 : Humidity measurement value display (green)
3 : Humidity alarm output operation indication lamp
4 : Humidity output motion display lamp
5 : Setting value (up) manipulation key
6 : Change humidity mode key
7 : Setting value (down) operation key
8 : Temperature Mode Change Key
9 : Temperature alarm output operation indication lamp
10 : Temperature output motion indication lamp
11 : Set value display lamp
12 : Measurement display lamp
13 : Power Key

04 Terminal Wiring Diagram

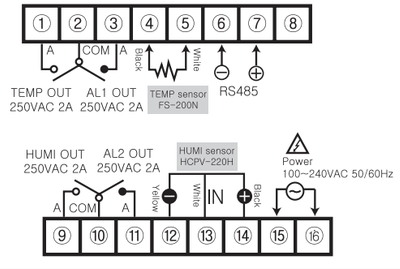
[FOX - 302R1] ※ Output: 250VAC 2A Be sure to use a power relay or magnet.



[FOX - 9302R1]



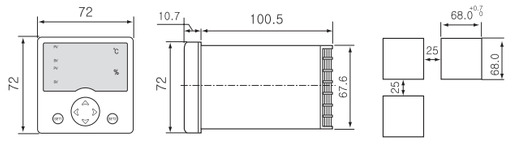
[FOX - 8302R1]



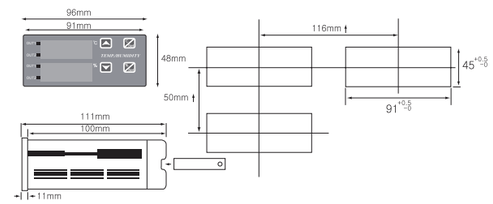
05 Diemension and panel hole sizes

(Unit : mm / error : ±0.5)

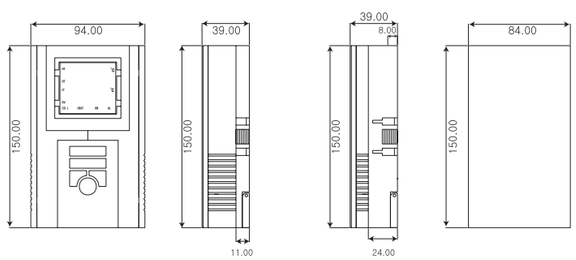
▶ FOX-302R1(72 x 72 x 110 mm)



▶ FOX-9302R1(96 x 48 x 110 mm)



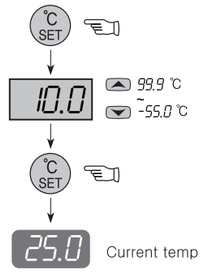
▶ FOX-8302R1(94 x 150 x 39 mm)



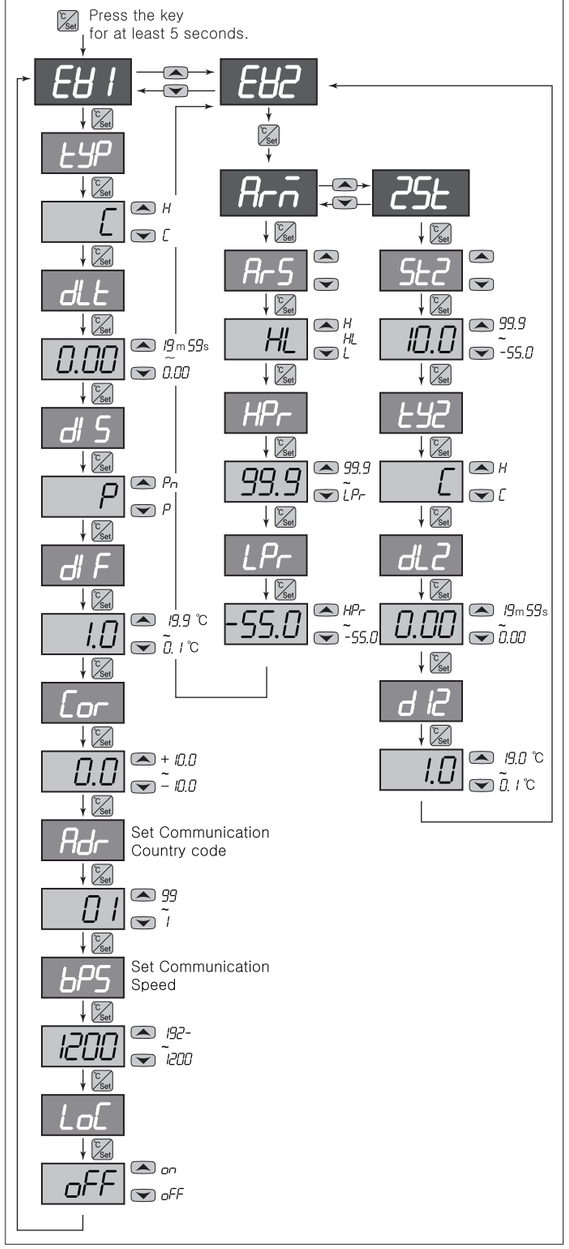
<The Front> <Wall-mounted Type><Panel indentation Type> <Panel hall>

06 Setting process

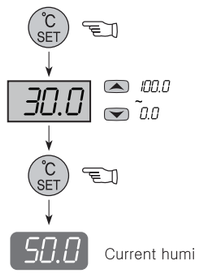
Temperature Setting



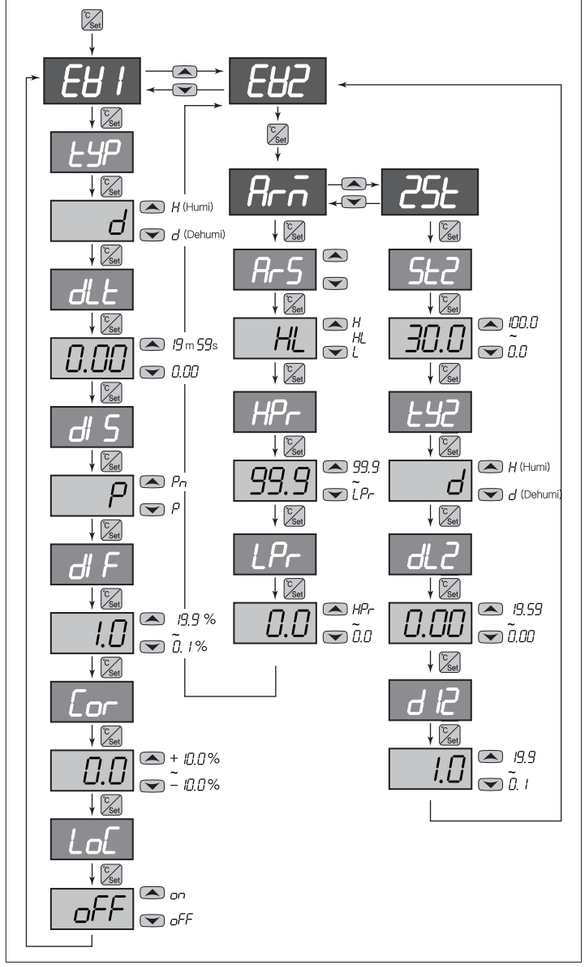
Temperature Program Setting



Humidity Setting



Humidity Program Setting



※ In the current temperature display state, pressing the SET key for 5 seconds changes the program setting mode.

※ After changing the settings, press the SET key again. After the End mark, it returns to the current temperature or automatically returns to the current temperature 30 seconds later.

07 Function details

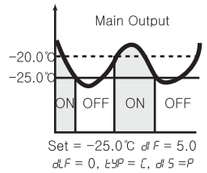
tYP : Temperature-Cooling and selection functions
Humidity-Dehumidification and humidification selection functions

Ar1 : Operate using auxiliary output as an alarm function
(When set to this action, the setting for **25t** cannot be done)

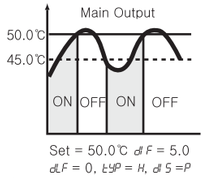
dIF : Setting fot temperature deviation

-ON/OFF control requires a certain interval between ON and OFF (ON/OFF width setting)
If ON and OFF are operated too often, relay or other
-The output contact point is quickly damaged or hunting (power generation phenomenon, chattering) occurs due to external noise.
-To prevent this phenomenon, setting and using the deviation Temp is a function to protect the contact point of the device.

■ How to apply deviation in ON/OFF control



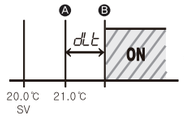
When used for freezing/dehumidifying purposes
• Current Temp > Set Temp + Deviation Temp
→ Output : on
• Current Temp ≤ Set Temp
→ Output : oFF



When used for heating/humidification
• Current Temp < Set Temp - Deviation Temp
→ Output : on
• Current Temp≥ Set Temp
→ Output : oFF

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 A point to B point is dLt set time(1 minute), after which relay becomes ON at B 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)

Adr : Set Communication Country code

- RS485 When using communication, a country number between 1 and 99 must be designated.

bPS : Set Communication Speed

- 1201 : 1200 bps
- 2401 : 2400 bps
- 4801 : 4800 bps
- 9601 : 9600 bps
- 1921 : 19200 bps

(Start bit 1, Stop bit 1, Non Parity)

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.

25t : Operates using auxiliary output as a two-stage setting function
(When set to this action, the setting for **Ar1** cannot be done)

HPr : Warning of the upper limit
When the input is at a temperature higher than the upper limit set, the auxiliary output is switched on

LPr : Low-limit warning
When the input is at a temperature lower than the lower limit set, the auxiliary output is switched on

Ar5 : Select the alarm output method

- H : Output ON only if HPr or higher
- HL : Output ON for both HPr or higher and LPr or lower
- L : Output ON only if it is below LPr

St2 : Auxiliary Output - Refer to No. 1

tY2 : Auxiliary Output - Refer to No. 2

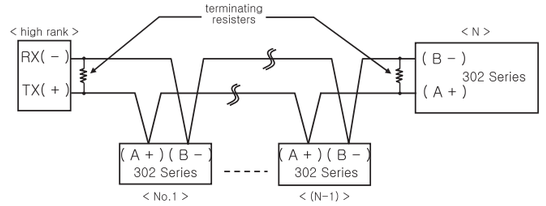
dL2 : Auxiliary Output - Refer to No. 3

08 Communication interface

Application Specifications	standard EIA RS485
Maximum number of connections	32 (but address settings can be set from 1 to 99)
The method of communication	Two-wire half-duplex, asynchronous
Communication speed	1200/2400/4800/9600/19200Bps(Selectable)
Communication distance	within 1.2Km
Protocol	BCC
StartBit, StopBit	fixed 1bit
ParityBit, DataBit	none, fixed 8bit

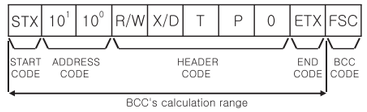
※ For communication manuals, please refer to the detailed manual on the website.

■ System Configuration

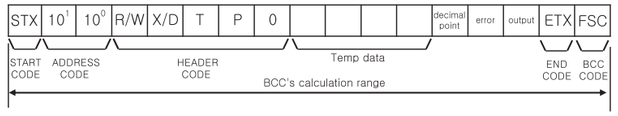


■ Definition between communication command and block

[Represents the format of the command]



[Indicates the format of the response]



① START CODE
It represents the lead of BLOCK
STX -> [02H] i If it is Response, ACK is added.

② ADDRESS CODE
A high rank system can discriminates the channel code number among FOX-302 series.
It is available to set between 01 and 99(BCD ASCII)

③ HEADER CODE: Show the command name as an alphabetic letter
RX (reading demand) -> R [52H], X[58H]
RD(reading response)-> R[52H], D[44H]
WX(writing demand) -> W[57H], X[58H]
WD(writing response) -> W[57H], D[44H]
TPO(temperature measuring value)-> T[54H], P[50H], 0[30H]
HPO(humidity measuring value)-> H[48H], P[50H], 0[30H]

④ Configuration of data: data is displayed as "hexadecimal"

⑤ Decimal point -0[0X30] There's No decimal point
1[0X31] There's a decimal point

⑥ Error : 0[0X30] : no error // 1[0X31] : sensor open error
2[0X32] : sensor short error

⑦ Output :

	TEMP	
	TEMP	AL1
0(0 X 30)	O	O
1(0 X 31)	O	X
2(0 X 32)	X	O
3(0 X 33)	X	X

	HUMI	
	HUMI	AL2
0(0 X 30)	O	O
1(0 X 31)	O	X
2(0 X 32)	X	O
3(0 X 33)	X	X

⑧ END CODE : show the end (close) of the block I ETX -> [0X03]

⑨ BCC : (Black Check Character)
Show the XOR arithmetic and logic values from the start(STX) to the ETX

※ Others

■ The others As of no response of the ACK
① in case of not equivalent to the channel after receving STX
② in case of generating the receive buffer overflow
③ in case of not equivalent to the communication' s set values or baud rate

■ Treatment in case of no response of the ACK
① check the cable
② check the communication's condition (set values)
③ if the main cause of the status is the noise, try to do communication practicing 3times until recovering nomally
④ change the communication speed in case of bring about the communication's error frequently

09 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.

※ The above specifications may be changed without any notice for performance enhancement. Please make yourself fully familiar with and follow the above precautions.

■ Warranty period: One year from the date of purchase

■ Address : (Street address) 56, Ballyongsandan 1-rp, Jangan-eup, Gijang-gun, Busan, ROK
(Land-lot address) 901-1, Ballyong-ri, Jangan-eup, Gijang-gun, Busan, ROK (46034)

- Product service : 070-7815-8289
- Customer service : 051-819-0425 ~ 0427
- FAX : 051-819-4562
- Email : conotec@conotec.co.kr
- SNS : Facebook, Instagram, Twitter, YouTube▶ 'Search for 'Conotec'
- Website : www.conotec.co.kr

◈ 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
- 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

※ This manual was prepared in the Naver Nanum fonts.