



CNT-1SH(R)-1(T/H sensor) CNT-1H(H. sensor)

※ Thank you for selecting our products.

Please read carefully this instruction to reduce any damages or operation mistakes.

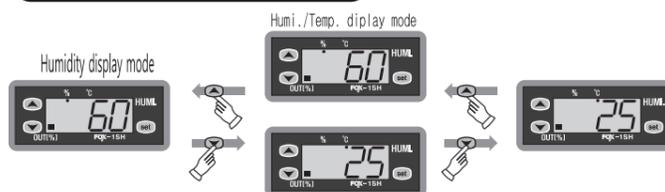
Regarding the English - language manual, please download it at our homepage.

5 Setting for programs (CNT - SH(R)-1)

User setting humidity



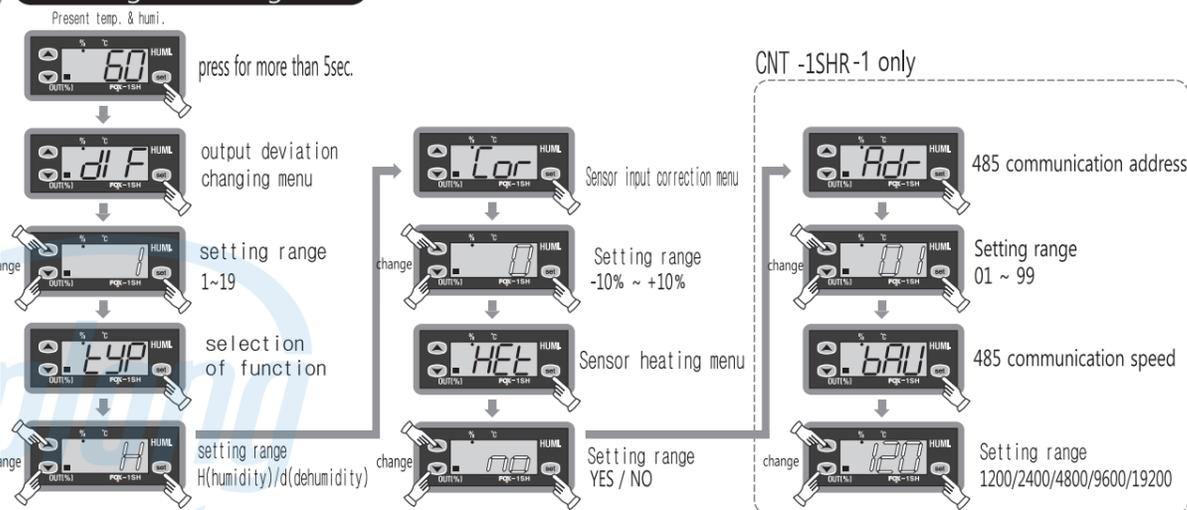
Humidity/Temperature mode changing



Caution1.

This product is a humidity controller, temperature is displayed in addition. The temperature is display only, please note that control is not.

Program setting



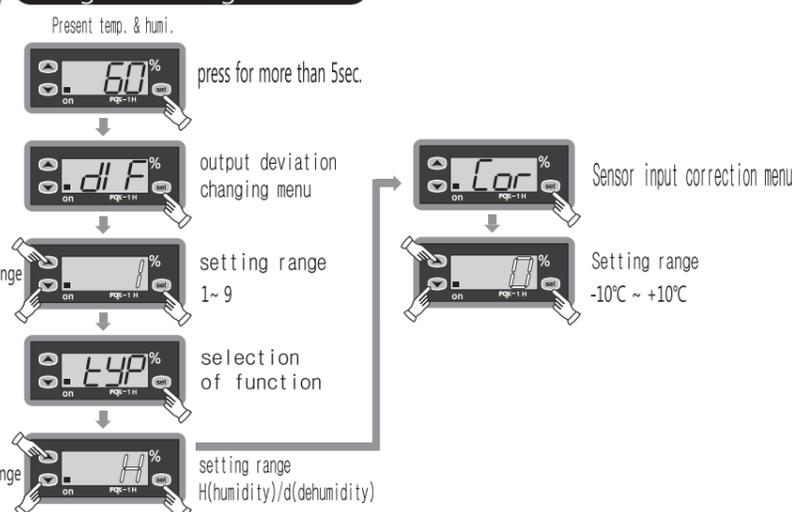
Ref 1. If press for more than 5 sec in the current state, the program setting mode to enter.
Ref 2. All the program after setting, if press for more than 3 sec or after 60 sec, automatically return to the current current of humidity display after displayed 0-K.

6 Setting for programs (CNT - 1H)

User setting humidity



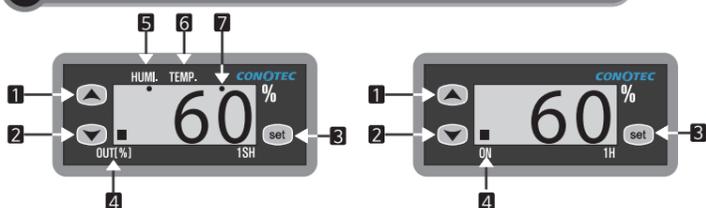
Program setting



Ref 1. If press for more than 5 sec in the current state, the program setting mode to enter.

Ref 2. All the program after setting, if press for more than 3 sec or after 60 sec, automatically return to the current current of humidity display after displayed 0-K.

3 Part name

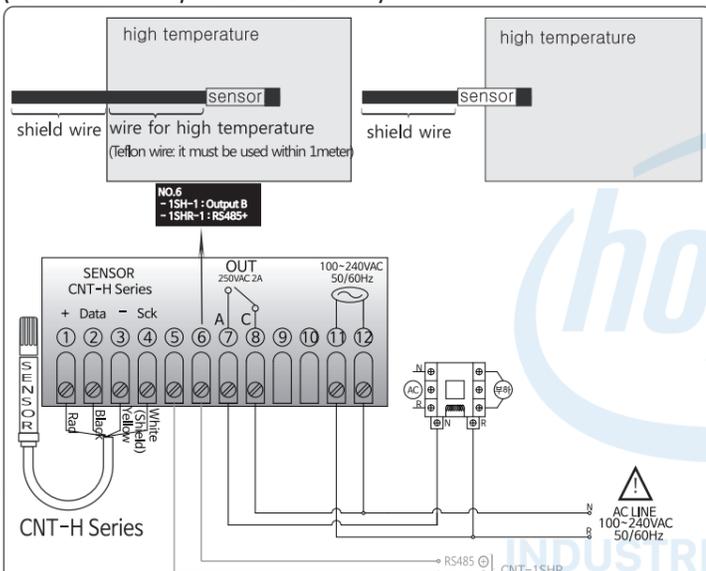


- 1 Setting(UP) 4 Output 7 Sensor communication status
- 2 Setting(DOWN) 5 Humidity display(CNT-1SH(R)model)
- 3 Setting key(SET) 6 Temperature display(CNT-1SH(R)model)

CNT-1SH(R)-1:humidity display and cotrol + temperature display for the currency status display, there're 2 kinds of mode, as a switch of <UP(increase), DN(decrease)>, you can change the display like "Humi./Temp".
CNT-1H : humidity display and control

4 Connection

<CNT-1SH-1 / CNT-1SHR-1>

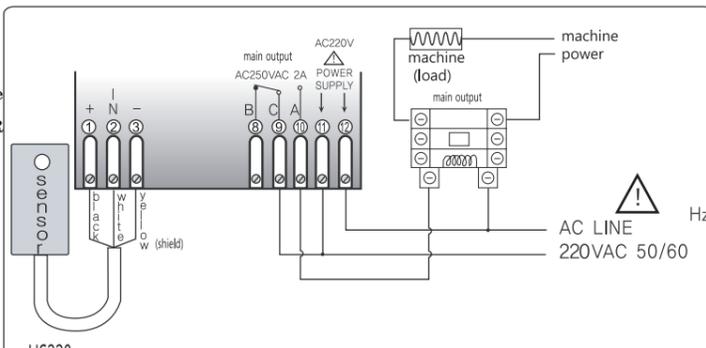


Ref1. Detailed specifications for the applicable sensor specifications, see the back of the '9. sensor's specifications'.

Caution1. Please make use of the shield wire when lengthening of the sensor wire, and in case of using in the high temperature range of 65°C~80°C, surely use the high temperature using wire(Teflon wiring).

Caution2. Please make the operating machine(load) be driven with using the power relay or magnet outside surely because its output specification of inside relay is less than 250VAC 2A

< CNT -1H >



Ref1. Detailed specifications for the applicable sensor specifications, see the back of the '10. sensor's specifications'.

Caution2. Please make the operating machine(load) be driven with using the power relay or magnet outside surely because its output specification of inside relay is less than 250VAC 2A

1 Model Composition

Model	Output	Sensor	Range	RS485 communi.
CNT-1H	1c 250Vac2A	HS220	10%~95 %Rh	-
CNT-1SH-1	1a 250Vac2A	CNT-Hseries	0%~100%Rh	-
CNT-1SHR-1	1a 250Vac2A	CNT-Hseries	0%~100%Rh	Available

2 Cautions for your safety

Please read the operating manual throughly before putting the device into operation
※ Product specifications and accessories may be changed at any time based on improvements and other reasons.

CAUTION

1. Pls use this item after installing the duplex safety device in which is applied at dangerous factors such as serious human injury or serious damages of property & important machine because this item is not designed as safety device
2. Do not checking or repairing when it is power on
3. Please check the terminal number before connecting power supply
4. Do not disassembling or opening, remodeling, repairing without any permission

SAFETY

- Please read the operating manual through completely before putting the device into operation.
- We will not assume any responsibility for damage to assets or persons caused by improper handling or failure to observe the safety instructions or hazard warnings.
- For safety and licensing reasons, unauthorized conversion and/or modification of the device is not permitted.
- Do not exceed the maximum permissible current - in case of higher loads, use a contactor of adequate power. Make sure that the supplied voltage matches the values specified for the instrument.
- The device must be adequately protected from water and dust as per the application and must be accessible via the use of appropriate tools
- The device must not be exposed to extreme temperature, sunlight, strong vibrations or high levels of humidity.
- Operation or installation is not permitted under unfavorable ambient conditions such as wetness or excessive induction loads or solenoid and dust, combustible gases, vapors or solvents, especially high-frequency noise
- Avoid operation or installation close to high-frequency fields such as welding devices, sewing machines, wireless transmitter, radio systems, SCR controller, etc
- Do not install the sensor cable nearby signal cable, power cable, load cable
- Please use the shield cable when the sensor cable's lengthen, however do not make it too much longer
- Please use the sensor cable without any cutting or flaw, blemish.
- The device is not a toy and should be kept away from children
- Installation work must only be carried out by suitably qualified personnel who are familiar with the hazards involved and with the relevant regulations.
- You shouldn't tinker with anything or the product may not be opened or disassembled unless you know what you're doing. Please ask us about this questioning

Danger

Caution, Danger of electric shock

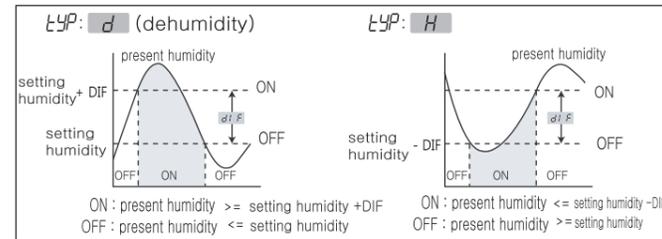
- Electric shock - Do not touch AC board during on power because of electric shock.
- Please intercept the input power surely when turn on power because of electric shock.

7 Detailed explanation

1 *dIF* Setting for temperature deviation **CNT-1H CNT-1SH-1 CNT-1SHR-1**

In the ON/OFF control, it needs at regular interval between ON and OFF. By operating the ON/OFF control frequently, the relay 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 relay or contact and so on.

2 *LYP* Selection for function **CNT-1H CNT-1SH-1 CNT-1SHR-1**



3 *Cor* Correction of the present humidity **CNT-1H CNT-1SH-1 CNT-1SHR-1**

Correction function for an discrepancy between the present's display value and the actual value(accurate value)
ex) An actual humidity value is 55.5%RH only, but the present humidity's display value was 57.5%RH
=> You may use this function and can correct the display's humidity value by -2.0%RH

Caution. Actual humidity is validated the performance and accurately calibrated by using the equipment to produce. If an inaccurate equipment calculated on the basis of the actual humidity calibration, it can be caused problems with product operation.

4 *HEE* Heating element for humidity sensor **CNT-1SH-1 CNT-1SHR-1**

It is possible to be covered with dew when the humidity is high, If the present humidity is 95%RH, it is generated heat inner its sensor in order to prevention of dew.

YES It is operated the heating function automatically if the humidity is more than 95%RH. It is removed it if the humidity is less than 95%RH

no The heating function will be prohibited.

Caution—It must be set up "NO" because the heating function can not be used for more than 95%RH

* R.F) The present temperature's display can be increased a little while operating of the humidity sensor's heating function

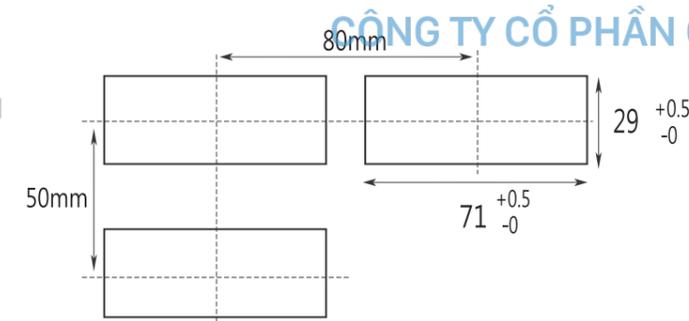
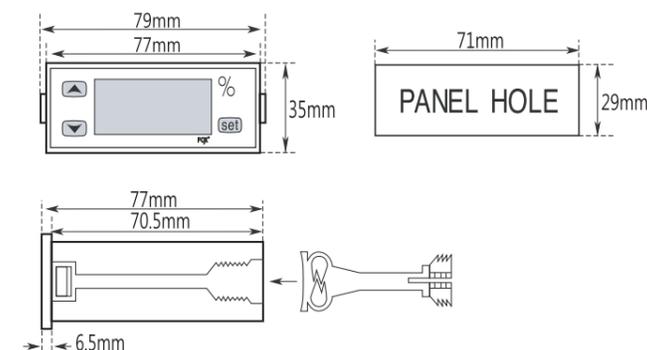
5 *Adr* RS485-communication address setting **CNT-1SHR-1**

The product CNT-1SH-1 supports RS485 communications. when communicating with the master device for mutual recognition is the ability to set the communication address.

6 *bAU* RS485-communication speed setting **CNT-1SHR-1**

when communicating with the master device to the exchange of accurate data must match the communication speed.

8 Size & dimension

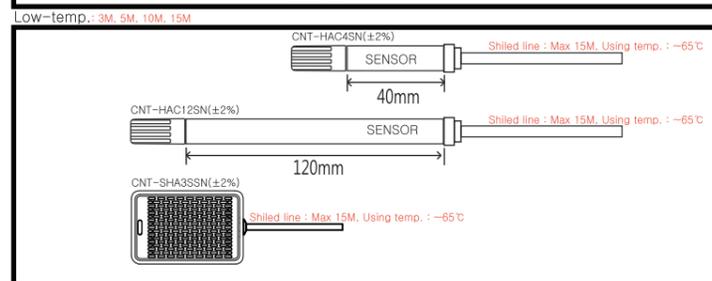
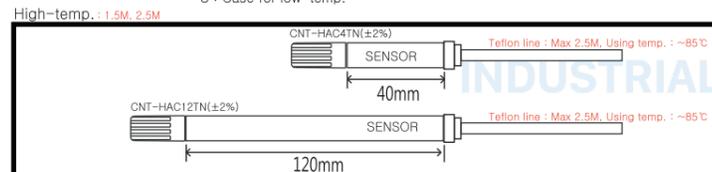
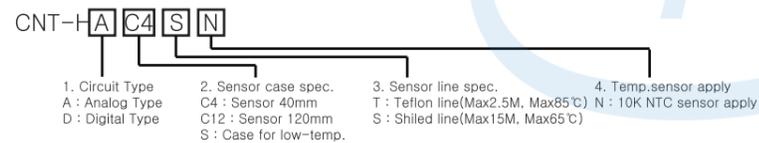


9 Setting range & Set value when deliver

Model	Function	Range	set value when deliver
CNT-1H CNT-1SH-1 CNT-1SHR-1	<i>dIF</i>	1H(1~9), 1SHR(1~19)	1
	<i>LYP</i>	H / d	H (humidity)
	<i>Cor</i>	-10 ~ +10	0
CNT-1SH-1 CNT-1SHR-1	<i>HEE</i>	YES / no	no
	<i>Adr</i>	01~99	01
CNT-1SH-1 CNT-1SHR-1	<i>bAU</i>	120 : 1200BPS	960(9600BPS)
		240 : 2400BPS	
		480 : 4800BPS	
		960 : 9600BPS	
		1920 : 1920BPS	

10 Sensor's specifications

< CNT-H Series > CNT-1SH(R)-1



* Standard length : 3M(CNT-HAC4N).

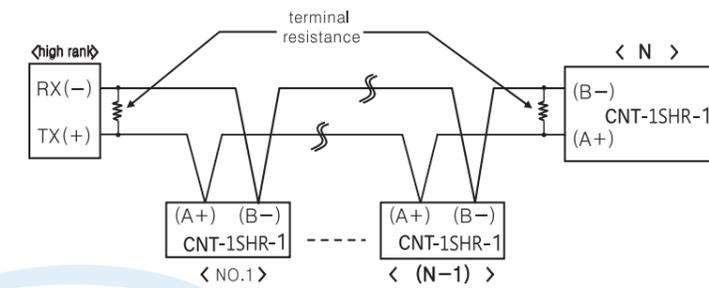
< HS220 > CNT-1H



11 Communication interface (CNT-1SHR-1)

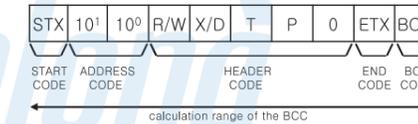
specification	in conformity EIA RS485
The method of communication	two wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1.2Km
communication speed	1200/2400/4800/9600/19200Bps
StartBit	fixed 1bit
StopBit	fixed 1bit
ParityBit	none
DataBit	fixed 8bit
Protocol	BCC

1 System

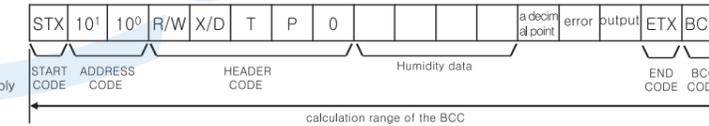


2 Definition between communication command and block

< Show the format of the command >



< Show the format of the response >



① START CODE

Show the lead(head) of the block
STX -> [02H]

② ADDRESS CODE

A high rank system can discriminates the channel code number among CNT-1SHR-1. 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], O[30H]

④ Composition of data : Data is displayed as "Hexa decimal"

⑤ **Decimal point** - 0[30H] there is no "decimal point"

1[31H] there is "decimal point"

⑥ **Error**- 0[30H]: there is no "error"
1[31H]: interrupted of the sensor's cable
2[32H]: low error
3[33H]: high error

⑦ **Output**- 0[30H] :output OFF // 1[31H] :output ON

⑧ **END CODE** : show the end(close) of the block ETX -> [03H]

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

• the others : As of no response of the ACK

- in case of not equivalent to the channel after receiving STX
- in case of generating the receive buffer overflow
- in case of not equivalent to the communication's set values or baud rate

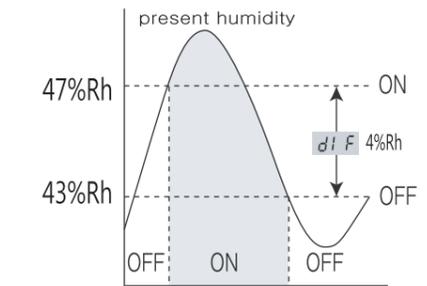
• treatment : in case of no response of the ACK

- check the cable
- check the communication's condition(set values)
- if the main cause of the status is the noise, try to do communication practicing 3times until recovering normally
- change the communication speed in case of bring about the communication's error frequently

12 Application for humidity controller

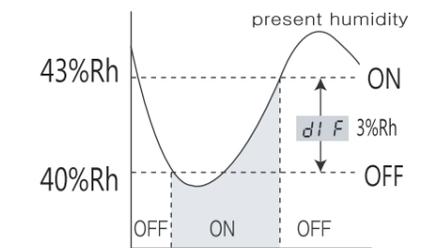
1 ex) a dehumidifier -> turn off at 43%RH, turn on at 47%RH
How to operate (setting for the humidity & programs) ?

User's setting humidity changing : 43%Rh Program setting *LYP*: d *dIF*: 4%Rh



2 ex) a humidifier -> turn off at 43%RH, turn on at 40%RH
How to operate (setting for the humidity & programs) ?

User's setting humidity changing : 43%Rh Program setting *LYP*: H *dIF*: 3%Rh



13 Error message

■ *E-1* - Memory error. Turn the power off and turn it on again.
If the error message persists, please request us A/S by return.

■ *E-2* - Sensor error. The sensor is interrupted. Check the cable.

■ *E-3* - Sensor error. The sensor is short-circuited. Check the cable.

* The product's specification can be changed without any notification to improve its quality.

* This device works proper operation with;

Surrounding Temp. : 0 C ~60 C

Surrounding Humi. : below 80 RH%

Regular power : 220VAC

■ Address : CONOTEC Co.,Ltd
56, Ballyongsandan 1-ro, Jangan-eup,
Gijang-gun, Busan, 46034 Rep. of KOREA

• C/S : 82-51-819-8277
• Website : www.conotec.co.kr
• Email : conotec@conotec.co.kr

Operating manual



FOX-2SHT(R)-1

- Digital temp./humi. controller
- temp. output : 1Relay(1a)
- humidity output : 1Relay(1a)
- Digital temp./humi. sensor application
- Applicable in the high temperature upto 80°C

* Thank you for selecting our products. please read carefully this instruction to reduce any damages or operation mistakes.

Regarding the English - language manual, please download it at our homepage.

1 Model composition

Model	Output	Sensor	RS485
CNT-2SHT-1	TEMP : 1a 250Vac2A	DS-SH Series	0.0%~100.0%Rh
CNT-2SHT-R	HUMI : 1a 250Vac2A		-39.9°C~80.0°C
			support

2 Safety and Hazard instructions

Read carefully this instruction manual before use and use the product properly.

* The specifications, appearance and dimension may be changed for improvement of performance without a prior notice

WARNING

1. This product is not made as a safety device, so when it is used for a control of devices feared to cause casualties, damages to the peripheral devices or huge property loss, the double safety devices should be arranged before use.
2. Avoid connecting lines, checking and repairing the products while power is supplied.
3. Connect power after making sure the terminal number.
4. Never disassemble modify, improve or repair the product.

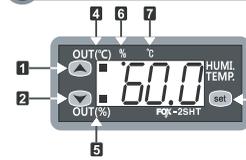
Safety

- Be well-informed of how to use, safety regulations, warnings, etc before installation of this device and apply it to the extent of the defined specifications and relevant capacity without fail.
- Avoid wiring or installation to a motor or solenoid with a large inductive load.
- Use a shielded cable for extension of the sensor and ensure not to make it longer than the necessary.
- Ensure not to use the parts generating arc when switching at the same power source or near to it.
- Keep the power cable away from a high-tension power line and ensure not to install it at a place with serious oil and dirt.
- Avoid strong magnetic field or serious noise, vibration or impact.
- Keep away from the place where strong alkaline or acid material is directly released and use an independent pipe line.
- When it is installed at kitchen, ensure not to pour water directly over the product for cleaning.
- Keep the sensor cable away from signal line, power source, power line or loaded line and use an independent pipe line.
- Note that the mark of Δ in terminal connection diagram is the safety expression for warnings or cautions.
- Avoid using the product close to the device generating noises(high frequency welder, high frequency sewing machine, high frequency radio, large capacity SCR Controller, etc).
- The use in any way other than what is instructed by the manufacturer may cause injury or property loss.
- It is not a toy and keep it out of reach of children's hand.
- The installation of the device should be performed by an expert or a qualified personnel without fail.
- We shall not take any responsibility for the damage caused by non-compliance with the above-mentioned warnings or cautions or by any consumer's mistake.

DANGER

- Attention, Danger related to electric shock
- Electric shock -Do not touch AC terminal during application of electric current. It may cause electric shock.
- Cut the power supply without fail during checking the input power.

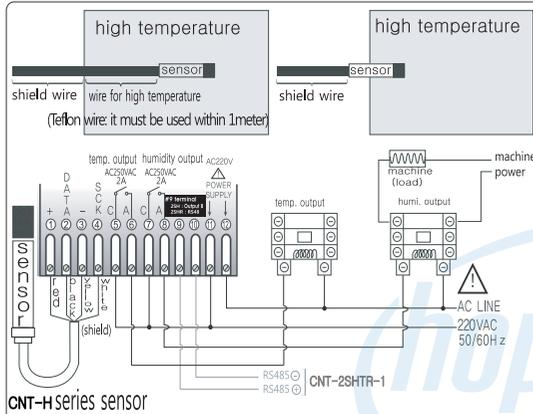
3 Part name



- 1 Setting up(UP)
- 2 Setting down(DN)
- 3 Setting switch(SET)
- 4 Temperature output
- 5 Humidity output
- 6 Humidity display
- 7 Temperature display

Humidity display and control + temperature display for the currency status display, there're 3 kinds of mode, as a switch of <UP(increase), DN(decrease)>, you can change the display like "Humidity/Humi&Temp/Temp".

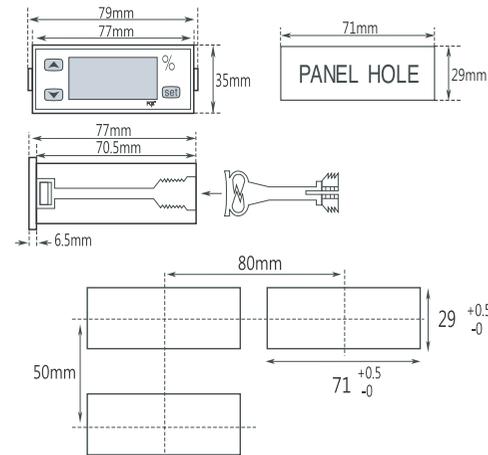
4 Connection



Ref1. Detailed specifications for the applicable sensor specifications, see the back of the '9 . sensor's specifications'.

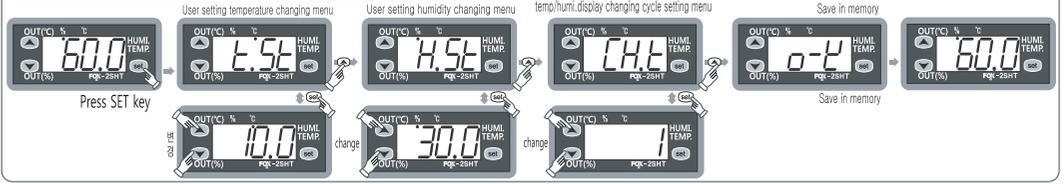
- Caution1.** Please make use of the shield wire when lengthening of the sensor wire, and in case of using in the high temperature range of 65°C~80°C, surely use the high temperature using wire(Teflon wiring).
- Caution2.** Please make the operating machine(load) be driven with using the power relay or magnet outside surely because its output specification of inside relay is less than 250VAC 2A

5 External size & panel size

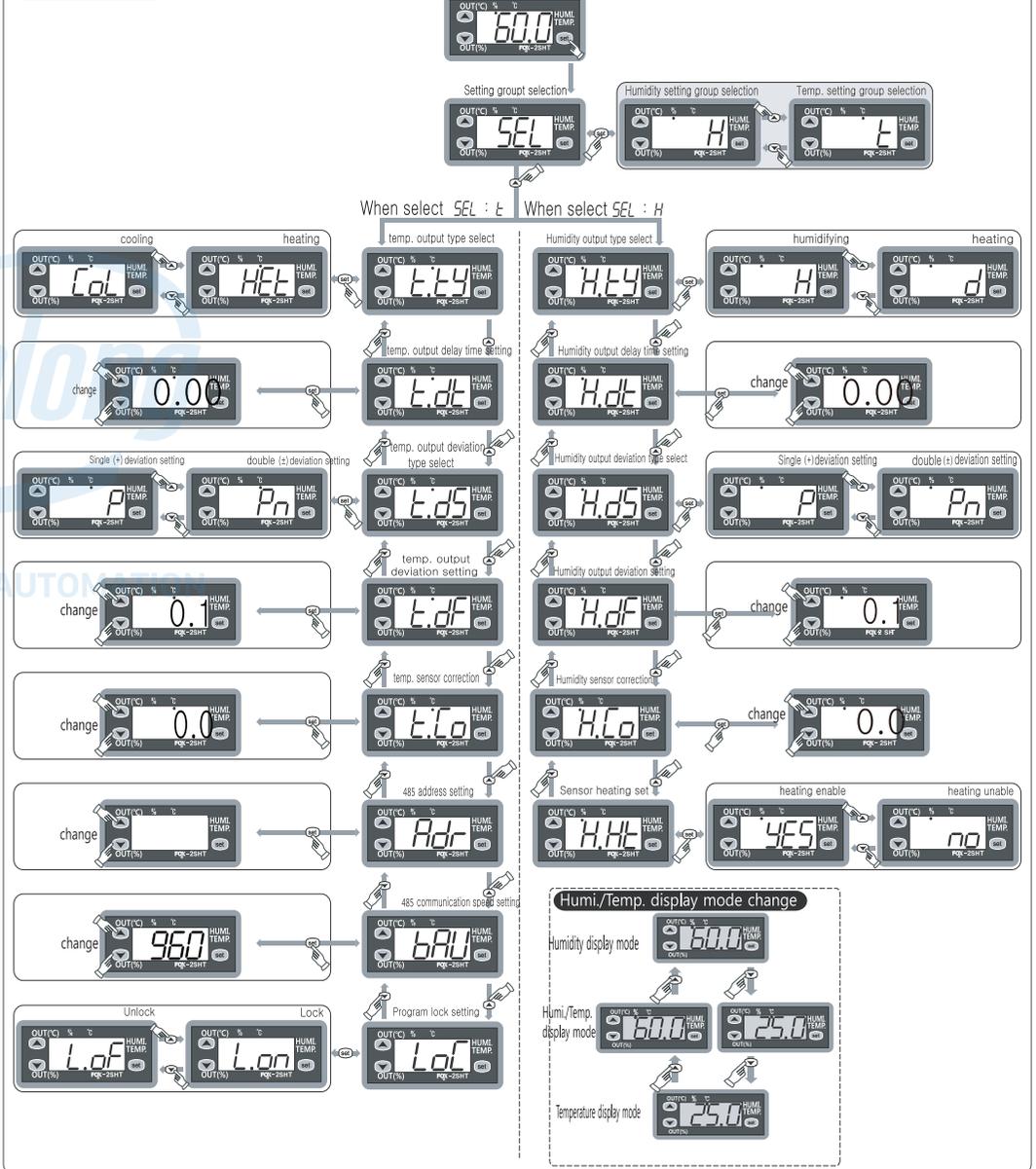


6 Setting for programs

User setting humidity/ User setting temperature changing



Program setting

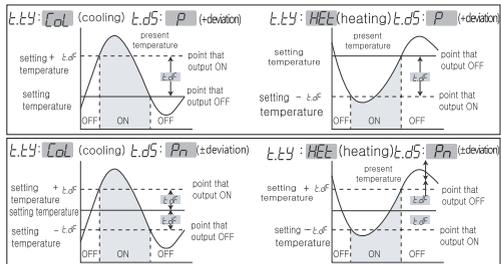


7 Detailed explanation

- 1. E.SE** Setting menu for user's temperature
 - Set the temperature point for the relay output
- 2. H.SE** Setting menu for user's humidity
 - Set the humidity point for the relay output
- 3. CHE** Setting time for the display changing temp. & humi. display.
 - Available to change the display in the state of present with the switch UP/DOWN.
 - "Humi. display mode" ↔ "Temp.&Humi. display mode" ↔ "Temp. display mode"
 - Please refer to that due to light the LED on the top of display to fit each of display mode.

- 4. SEL** Setting group selection menu
 - H : Humidity setting group selection E : Temp. setting group selection
- 5. E.EY** Setting the output type for temperature.
 - Col : cooling HEt : heating
- 6. E.dE** Setting the output delay time for the temperature.
 - It is widely used as the followings
 - in case of operating the ON/OFF control very often (cooler, compressor, etc)
 - to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply

- 7. E.dS** Setting the type of temperature deviation(Hysteresis)
 - P : + deviation Pn : ± deviation
- 8. E.dF** Setting for temperature deviation
 - In the ON/OFF control, it needs at regular interval between ON and OFF.
 - By operating the ON/OFF control frequently, the relay 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 relay or contact and so on.

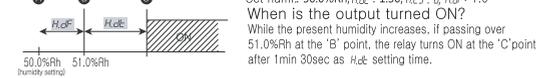


- 9. E.Lo** Correction of the present temperature.
 - Correction function for an discrepancy between the present's display value and the actual value(accurate value)
 - ex) An actual temperature : 55.0°C, the present temperature : 57.0°C if set the E.Lo value as -2.0, the present temperature will be displayed 55.0°C
 - Caution.** Actual temperature is validated the performance and accurately calibrated by using the equipment to produce. If an inaccurate equipment calculated on the basis of the actual temperature calibration, it can be caused problems with product operation.

- 10. bAU** RS485Communication address setting
 - The product FOX-2SHTR supports RS485 communications. When communicating with the master device for mutual recognition is the ability to set the communication address.
- 11. bPU** RS485Communication speed setting
 - The product FOX-2SHTR supports RS485 communications. When communicating with the master device to the exchange of accurate data must match the communication speed.

- 12. LoL** Setting data lock function
 - As a safety device, it is used in order not to change the set value except for a main user
 - Loon Lock on LoLf Lock off

- 13. H.EY** Setting the output type for humidity
 - H : humidity d : dehumidity
- 14. H.dE** Delay time of the output
 - It is widely used as the followings
 - in case of operating the ON/OFF control very often
 - to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply



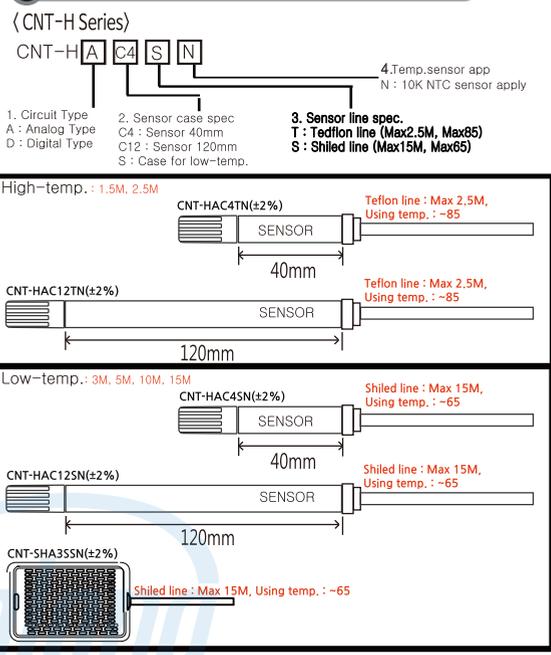
- 15. H.dS** Setting the type of humidity deviation(Hysteresis)
 - P : + deviation Pn : ± deviation
- 16. H.dF** Setting the deviation for humidity
 - By operating the ON/OFF control frequently, the relay or its output contact can be damaged quickly and it also occurs the hunting(oscillating, chattering) by virtue of external noise. You can make use of the temperature deviation in order to protect its relay or contact and so on.

- 17. H.Co** Correction of the present humidity
 - Correction function for a discrepancy between the present's display value and the actual value(accurate value)
 - ex) An actual humidity value : 55.0%RH, the present humidity : 57.0%RH if set the H.Co value by -2.0%RH, the present humidity will be displayed 55.0%RH
 - Caution.** Actual humidity is validated the performance and accurately calibrated by using the equipment to produce. If an inaccurate equipment calculated on the basis of the actual humidity calibration, it can be caused problems with product operation.
- 18. H.EL** Heating element for humidity sensor
 - It is possible to be covered with dew when the humidity is high.
 - If the present humidity is 95%RH, it is generated heat inner its sensor in order to prevention of dewy.
 - YES** It is operated the heating function automatically if the humidity is more than 95%RH. It is removed it if the humidity is less than 95%RH
 - no** The heating function will be prohibited.
 - Caution-** It must be set up "NO" because the heating function can not be used for more than 95%RH
 - * R.F) The present temperature's display can be increased a little while operating of the humidity sensor's heating function

- 8. Setting range & Set value when deliver**

Model	Division	Function	Range	set value when deliver	
CNT-2SHTR-1	Temp. setting	E.SE	Temp. setting	-39.9~119.9°C	10.0°C
		E.EY	Type setting for output	Col / HEt	Col
		E.dE	Output delay time setting	0.0~19min 59sec	0min 0sec
		E.dS	Type setting for output deviation	P / Pn	P
		E.dF	Setting for output deviation	0.1 ~ 19.9	0.1
		E.Lo	Temp. correction	-10.0 ~ +10.0	0.0
	Humi. setting	H.SE	Humidity setting	0.0~100.0%Rh	30.0%Rh
		H.EY	Type setting for output	d / H	H
		H.dE	Output delay time setting	0.0~19min 59sec	0min 0sec
		H.dS	Type setting for output deviation	P / Pn	P
		H.dF	Setting for output deviation	0.1 ~ 19.9	0.1
		H.Co	Humidity correction	-10.0 ~ +10.0	0.0
Common	H.Ht	Sensor's heating setting	YES / no	no	
	LoL	lock function	Loon / LoF	LoF	
	CHE	Temp.&Humi. changing display time	1 ~ 30sec	2sec	
communication	bAU	485 communication address	01 ~ 99	01	
	bPU	485 communication speed	120 (1200Bps) 240 (2400Bps) 480 (4800Bps) 960 (9600Bps) 1920 (19200Bps)	960 (9600Bps)	

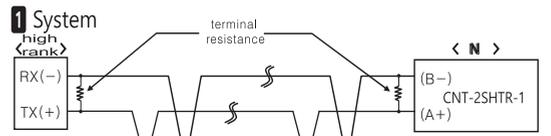
9 Sensor's specifications



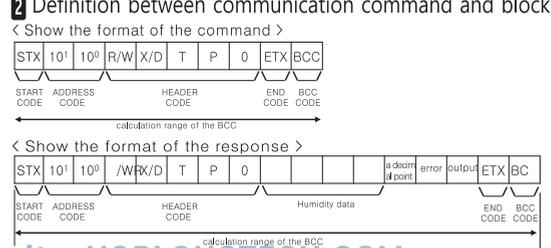
* Standard length : 3M(CNT-HAC4N).

10 Communication interface (CNT-2SHTR-1)

specification	in conformity EIA RS485
The method of communication	two wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1.2Km
communication speed	1200/2400/4800/9600/19200Bps
StartBit	fixed 1bit
StopBit	fixed 1bit
ParityBit	none
DataBit	fixed 8bit
Protocol	BCC



- 1 System**
- 2 Definition between communication command and block**



- ① START CODE** Show the lead(head) of the block STX → [02H]
- ② ADDRESS CODE** A high rank system can discriminate the channel code number among CNT-2SHTR-1. 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], O[30H]
- ④ Composition of data** Data is displayed as "Hexa decimal" (negative number : 2's complement)
- ⑤ Decimal point** - 0[30H] there is no "decimal point" 1[31H] there is "decimal point"
- ⑥ Error-** 0[30H]: there is no "error" 1[31H]: interrupted of the sensor's cable 2[32H]: low error 3[33H]: high error
- ⑦ Output-** 0[30H]: Output OFF // 1[31H]: Output ON
- ⑧ END CODE** show the end(close) of the block ETX → [03H]
- ⑨ BCC**(Black Check Character) Show the XOR arithmetic and logic values from the start(STX) to the ETX
 - the others : As of no response of the ACK
 - ① in case of not equivalent to the channel after receiving 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 31mes until recovering normally
 - ④ change the communication speed in case of bring about the communication's error frequently

11 How to diagnose a breakdown

- Indicating ERROR on using items
- This E is the damage of memory data for various of inner-DATA due to be got nosied strongly from outside while using this items. Please request us A/S by return. Although our controller is designed as the complementary measures regarding these noise from outside, it is not endurable against these noise with endlessly.
- If noise(2KV) disordering become an inflow, the inner-part will be damaged.
- E - Sensor error. The sensor is interrupted. Check the cable. If the error message persists, please request us A/S by return.
- L-E or H-E displayed when exceeding the range of humidity. Even if the ambient humidity of environment remaining in the normal state, these characters to be displayed, please request us A/S by return
- * WARRANTY PERIOD : 1 YEAR FROM THE DATE OF PURCHASE
- * The product's specification can be changed without any notification to improve its quality.
- When using this product, please observe the information of caution & warning due to give rise to disordering.
- Regarding the English-language manual, please download it at our homepage.

This device works proper operation with;

- surrounding Temp. : 0°C ~ 60°C
- surrounding Humi. : below 80%Rh
- Regular : 220Vac ±10% 50/60Hz

Main products & Development

- Digital temperature/humidity controller
- Digital timer, Current/voltage meter
- The other development products

• Address : CONOTEC Co.,Ltd
56, Ballyongsandan 1-ro, Jangnan-eup, Gijang-gun, Busan, 46034 Rep. of KOREA

• C/S : 82-51-819-8277
• Website : www.conotec.co.kr
• Email : conotec@conotec.co.kr

Operating manual



- Digital temp./humi. controller
- temp. output : 1Relay(1a)
- humidity output : 1Relay(1a)
- Digital temp./humi. sensor application
- Applicable in the high temperature upto 80°C

FOX-2SHT(R)-1

* Thank you for selecting our products. please read carefully this instruction to reduce any damages or operation mistakes.

Regarding the English - language manual, please download it at our homepage.

1 Model composition

Model	Output	Sensor	RS485
CNT-2SHT-1	TEMP : 1a 250Vac2A	DS-SH Series	0.0%~100.0%Rh
CNT-2SHT-R	HUMI : 1a 250Vac2A		-39.9°C~80.0°C
			support

2 Safety and Hazard instructions

Read carefully this instruction manual before use and use the product properly.

* The specifications, appearance and dimension may be changed for improvement of performance without a prior notice

WARNING

1. This product is not made as a safety device, so when it is used for a control of devices feared to cause casualties, damages to the peripheral devices or huge property loss, the double safety devices should be arranged before use.
2. Avoid connecting lines, checking and repairing the products while power is supplied.
3. Connect power after making sure the terminal number.
4. Never disassemble modify, improve or repair the product.

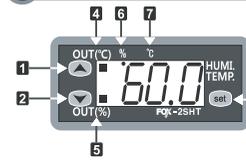
Safety

- Be well-informed of how to use, safety regulations, warnings, etc before installation of this device and apply it to the extent of the defined specifications and relevant capacity without fail.
- Avoid wiring or installation to a motor or solenoid with a large inductive load.
- Use a shielded cable for extension of the sensor and ensure not to make it longer than the necessary.
- Ensure not to use the parts generating arc when switching at the same power source or near to it.
- Keep the power cable away from a high-tension power line and ensure not to install it at a place with serious oil and dirt.
- Avoid strong magnetic field or serious noise, vibration or impact.
- Keep away from the place where strong alkaline or acid material is directly released and use an independent pipe line.
- When it is installed at kitchen, ensure not to pour water directly over the product for cleaning.
- Keep the sensor cable away from signal line, power source, power line or loaded line and use an independent pipe line.
- Note that the mark of ⚠ in terminal connection diagram is the safety expression for warnings or cautions.
- Avoid using the product close to the device generating noises(high frequency welder, high frequency sewing machine, high frequency radio, large capacity SCR Controller, etc).
- The use in any way other than what is instructed by the manufacturer may cause injury or property loss.
- It is not a toy and keep it out of reach of children's hand.
- The installation of the device should be performed by an expert or a qualified personnel without fail.
- We shall not take any responsibility for the damage caused by non-compliance with the above-mentioned warnings or cautions or by any consumer's mistake.

DANGER

- Attention, Danger related to electric shock
- Electric shock -Do not touch AC terminal during application of electric current. It may cause electric shock.
- Cut the power supply without fail during checking the input power.

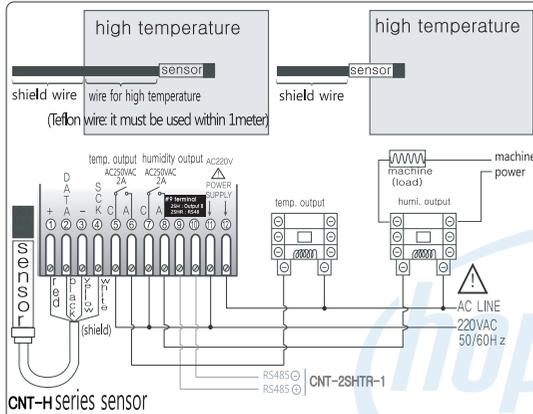
3 Part name



- 1 Setting up(UP)
- 2 Setting down(DN)
- 3 Setting switch(SET)
- 4 Temperature output
- 5 Humidity output
- 6 Humidity display
- 7 Temperature display

Humidity display and control + temperature display for the currency status display, there're 3 kinds of mode, as a switch of <UP(increase), DN(decrease)>, you can change the display like "Humidity/Humi&Temp/Temp".

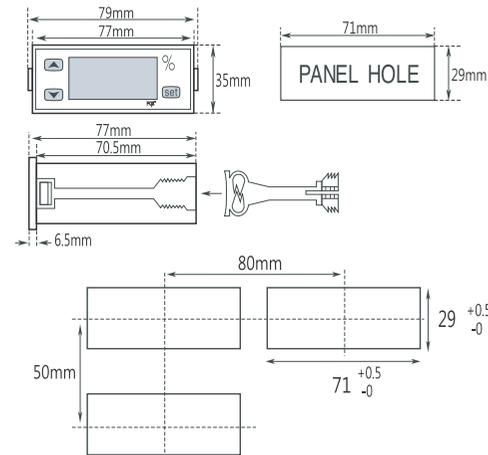
4 Connection



Ref1. Detailed specifications for the applicable sensor specifications, see the back of the '9 . sensor's specifications'.

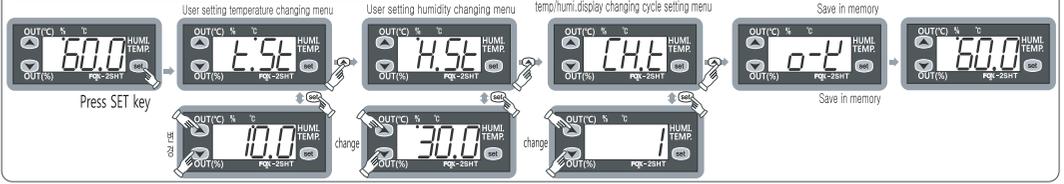
- Caution1.** Please make use of the shield wire when lengthening of the sensor wire, and in case of using in the high temperature range of 65°C~80°C, surely use the high temperature using wire(Teflon wiring).
- Caution2.** Please make the operating machine(load) be driven with using the power relay or magnet outside surely because its output specification of inside relay is less than 250VAC 2A

5 External size & panel size

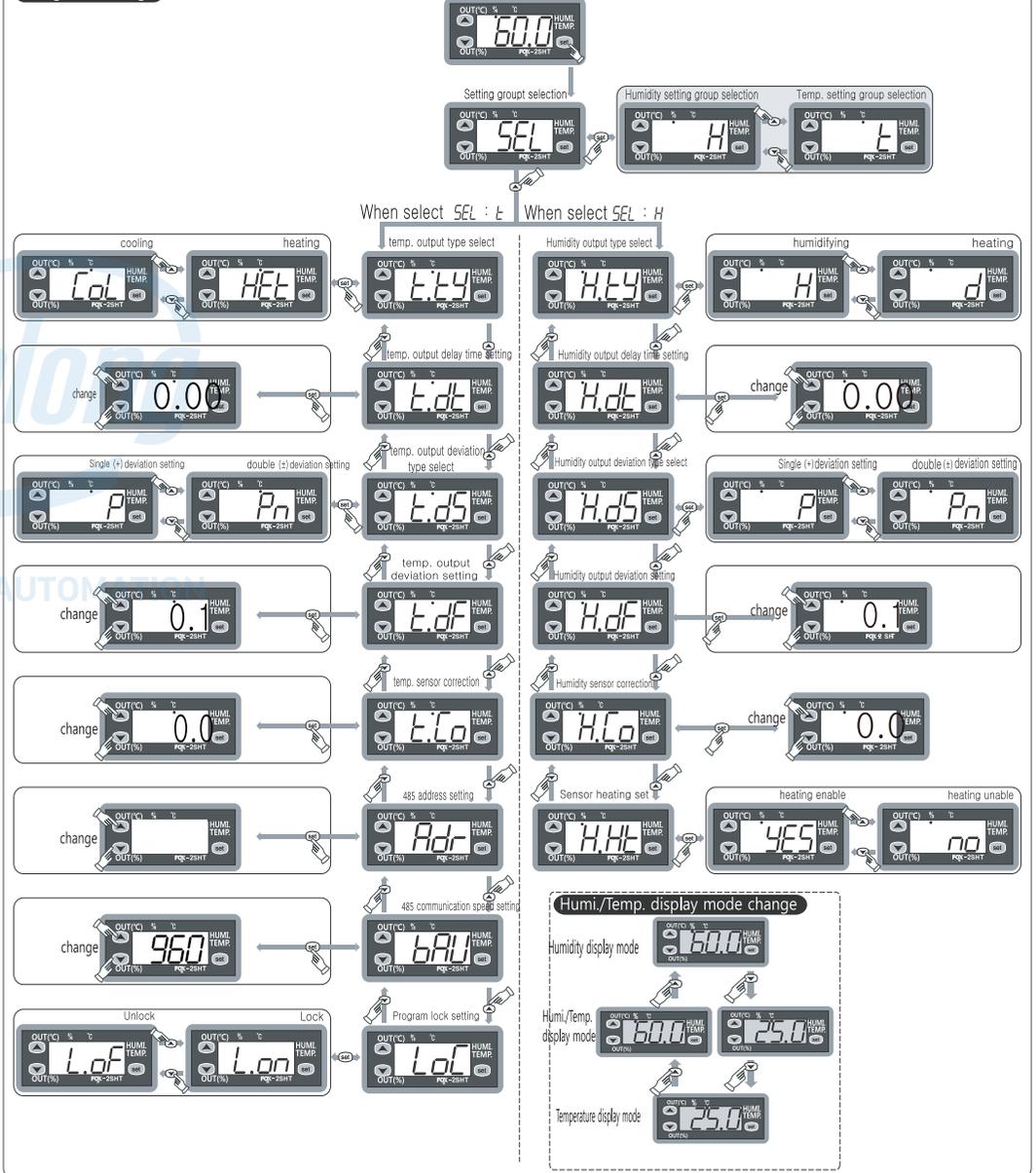


6 Setting for programs

User setting humidity/ User setting temperature changing



Program setting

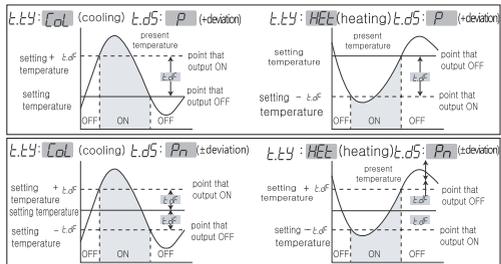


7 Detailed explanation

- 1. E.SE** Setting menu for user's temperature
 - Set the temperature point for the relay output
- 2. H.SE** Setting menu for user's humidity
 - Set the humidity point for the relay output
- 3. CHE** Setting time for the display changing temp. & humi. display.
 - Available to change the display in the state of present with the switch UP/DOWN.
 - "Humi. display mode" ↔ "Temp.&Humi. display mode" ↔ "Temp. display mode"
 - Please refer to that due to light the LED on the top of display to fit each of display mode.

- 4. SEL** Setting group selection menu
 - H : Humidity setting group selection E : Temp. setting group selection
- 5. E.EY** Setting the output type for temperature.
 - Col : cooling HEt : heating
- 6. E.dE** Setting the output delay time for the temperature.
 - It is widely used as the followings
 - in case of operating the ON/OFF control very often (cooler, compressor, etc)
 - to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply

- 7. E.dS** Setting the type of temperature deviation(Hysteresis)
 - P : + deviation Pn : ± deviation
- 8. E.dF** Setting for temperature deviation
 - In the ON/OFF control, it needs at regular interval between ON and OFF.
 - By operating the ON/OFF control frequently, the relay 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 relay or contact and so on.

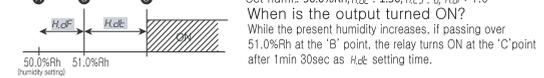


- 9. E.Lo** Correction of the present temperature.
 - Correction function for an discrepancy between the present's display value and the actual value(accurate value)
 - ex) An actual temperature : 55.0°C, the present temperature : 57.0°C if set the E.Lo value as -2.0, the present temperature will be displayed 55.0°C
 - Caution.** Actual temperature is validated the performance and accurately calibrated by using the equipment to produce. If an inaccurate equipment calculated on the basis of the actual temperature calibration, it can be caused problems with product operation.

- 10. bAU** RS485Communication address setting
 - The product FOX-2SHTR supports RS485 communications. When communicating with the master device for mutual recognition is the ability to set the communication address.
- 11. bPU** RS485Communication speed setting
 - The product FOX-2SHTR supports RS485 communications. When communicating with the master device to the exchange of accurate data must match the communication speed.

- 12. LoL** Setting data lock function
 - As a safety device, it is used in order not to change the set value except for a main user
 - Loon Lock on LoLf Lock off

- 13. H.EY** Setting the output type for humidity
 - H : humidity d : dehumidity
- 14. H.dE** Delay time of the output
 - It is widely used as the followings
 - in case of operating the ON/OFF control very often
 - to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply



- 15. H.dS** Setting the type of humidity deviation(Hysteresis)
 - P : + deviation Pn : ± deviation
- 16. H.dF** Setting the deviation for humidity
 - By operating the ON/OFF control frequently, the relay 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 relay or contact and so on.

- 17. H.Co** Correction of the present humidity
 - Correction function for a discrepancy between the present's display value and the actual value(accurate value)
 - ex) An actual humidity value : 55.0%RH, the present humidity : 57.0%RH If set the H.Co value by -2.0%RH, the present humidity will be displayed 55.0%RH
 - Caution.** Actual humidity is validated the performance and accurately calibrated by using the equipment to produce. If an inaccurate equipment calculated on the basis of the actual humidity calibration, it can be caused problems with product operation.
- 18. H.EL** Heating element for humidity sensor
 - It is possible to be covered with dew when the humidity is high.
 - If the present humidity is 95%RH, it is generated heat inner its sensor in order to prevention of dewy.
 - YES** It is operated the heating function automatically if the humidity is more than 95%RH. It is removed it if the humidity is less than 95%RH
 - no** The heating function will be prohibited.
 - Caution-** It must be set up "NO" because the heating function can not be used for more than 95%RH
 - * R.F) The present temperature's display can be increased a little while operating of the humidity sensor's heating function

8 Setting range & Set value when deliver

Model	Division	Function	Range	set value when deliver	
CNT-2SHTR-1	Temp. setting	E.SE	Temp. setting	-39.9~119.9°C	10.0°C
		E.EY	Type setting for output	Col / HEt	Col
		E.dE	Output delay time setting	0.0~19min 59sec	0min 0sec
		E.dS	Type setting for output deviation	P / Pn	P
		E.dF	Setting for output deviation	0.1 ~ 19.9	0.1
		E.Lo	Temp. correction	-10.0 ~ +10.0	0.0
	Humi. setting	H.SE	Humidity setting	0.0~100.0%Rh	30.0%Rh
		H.EY	Type setting for output	d / H	H
		H.dE	Output delay time setting	0.0~19min 59sec	0min 0sec
		H.dS	Type setting for output deviation	P / Pn	P
		H.dF	Setting for output deviation	0.1 ~ 19.9	0.1
		H.Co	Humidity correction	-10.0 ~ +10.0	0.0
Common	H.Ht	Sensor's heating setting	YES / no	no	
	LoL	lock function	Loon / LoLf	LoLf	
	CHE	Temp.&Humi. changing display time	1 ~ 30sec	2sec	
communication	bAU	485 communication address	01 ~ 99	01	
	bPU	485 communication speed	120 (1200Bps) 240 (2400Bps) 480 (4800Bps) 960 (9600Bps) 1920 (19200Bps)	960 (9600Bps)	

9 Sensor's specifications

(CNT-H Series)

1. Circuit Type
A : Analog Type
D : Digital Type

2. Sensor case spec
C4 : Sensor 40mm
C12 : Sensor 120mm
S : Case for low-temp.

3. Sensor line spec.
T : Teflon line (Max2.5M, Max85)
S : Shielded line (Max15M, Max65)

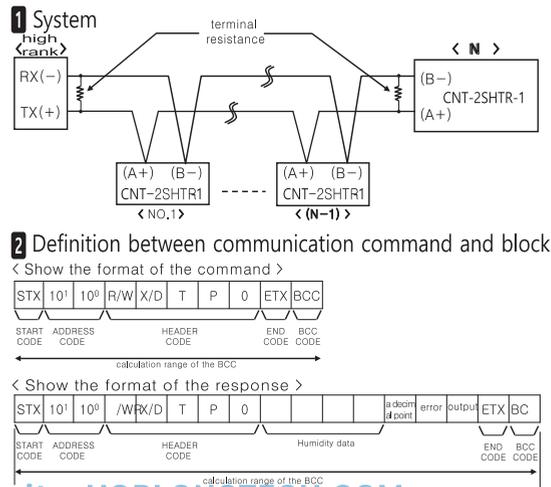
4. Temp. sensor app
N : 10K NTC sensor apply

High-temp. : 1.5M, 2.5M
Low-temp. : 3M, 5M, 10M, 15M

* Standard length : 3M(CNT-HAC4N)

10 Communication interface (CNT-2SHTR-1)

specification	in conformity EIA RS485
The method of communication	two wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1.2Km
communication speed	1200/2400/4800/9600/19200Bps
StartBit	fixed 1bit
StopBit	fixed 1bit
ParityBit	none
DataBit	fixed 8bit
Protocol	BCC



- ① START CODE** Show the lead(head) of the block
STX → [02H]
- ② ADDRESS CODE** A high rank system can discriminate the channel code number among CNT-2SHTR-1. 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], O[30H]
- ④ Composition of data** Data is displayed as "Hexa decimal" (negative number : 2's complement)
- ⑤ Decimal point** - 0[30H] there is no "decimal point"
1[31H] there is "decimal point"
- ⑥ Error-** 0[30H]: there is no "error"
1[31H]: interrupted of the sensor's cable
2[32H]: low error
3[33H]: high error
- ⑦ Output-** 0[30H]: Output OFF // 1[31H]: Output ON
- ⑧ END CODE** show the end(close) of the block ETX → [03H]
- ⑨ BCC**(Black Check Character)
Show the XOR arithmetic and logic values from the start(STX) to the ETX
• the others : As of no response of the ACK
① in case of not equivalent to the channel after receiving 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 normally
④ change the communication speed in case of bring about the communication's error frequently

11 How to diagnose a breakdown

- Indicating ERROR on using items
- This E is the damage of memory data for various of inner-DATA due to be got nosied strongly from outside while using this items. Please request us A/S by return. Although our controller is designed as the complementary measures regarding these noise from outside, it is not endurable against these noise with endlessly.
- If noise(2KV) disordering become an inflow, the inner-part will be damaged.
- E - Sensor error. The sensor is interrupted. Check the cable. If the error message persists, please request us A/S by return.
- L-E or H-E displayed when exceeding the range of humidity. Even if the ambient humidity of environment remaining in the normal state, these characters to be displayed, please request us A/S by return
- * WARRANTY PERIOD : 1 YEAR FROM THE DATE OF PURCHASE
- * The product's specification can be changed without any notification to improve its quality.
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- Regarding the English-language manual, please download it at our homepage.
- This device works proper operation with; surrounding Temp. : 0°C ~ 60°C surrounding Humi. : below 80%Rh
- Regular : 220Vac ±10% 50/60Hz
- Main products & Development
 - Digital temperature/humidity controller
 - Digital timer, Current/voltage meter
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- Address : CONOTEC Co.,Ltd
56, Ballyongsandan 1-ro, Jangang-eup, Gijang-gun, Busan, 46034 Rep. of KOREA
- C/S : 82-51-819-8277
- Website : www.conotec.co.kr
- Email : conotec@conotec.co.kr



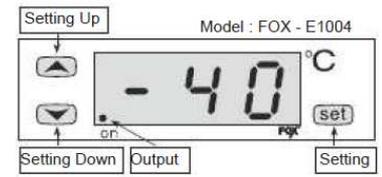
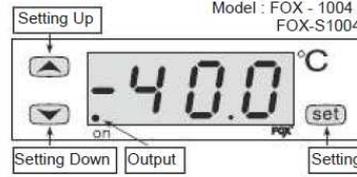
1. Tên gọi một số thành phần



DAE SUNG E.N.G

Tài liệu hướng dẫn bằng Tiếng Việt
Tài liệu này không có giá trị thay thế cho
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Thiết bị điều khiển nhiệt độ
www.foxeng.co.kr



FOX-1004, FOX-E1004 : dùng cho cả 2 chế độ làm nóng & làm lạnh
FOX-S1004 : chỉ dùng cho chế độ làm lạnh

2. Hướng dẫn cài đặt

● Cài đặt nhiệt độ

Nhiệt độ thực sẽ được hiển thị ngay sau khi cấp nguồn cho thiết bị. Nếu nhấn phím **(set)** sẽ nhấp nháy số hiển thị nhiệt độ. Nhấn các phím **↔** để thay đổi giá trị.
Nếu nhấn phím **(set)** lần nữa, **0.0** sẽ hiển thị, việc thiết lập nhiệt độ được lưu lại và màn hình sẽ hiển thị nhiệt độ hiện thời.

● Cài đặt chương trình

Nếu nhấn giữ phím **(set)** hơn 5 giây, chế độ chương trình sẽ được sắp xếp theo trình tự như sau:
TYP → DLT → DIF → COR (nhìn sang cạnh trái : cài đặt)
Giá trị thiết lập của mỗi chế độ có thể chuyển đổi bằng cách nhấn phím **↔** và sau đó nhấn **(set)** để chuyển tới chế độ kế tiếp.

Khi thiết lập kết thúc, nếu bạn nhấn phím **(set)** hơn 2 giây, các tham số mới thiết lập sẽ được lưu lại (các giá trị được trả về giá trị hiện hành sau 10 giây nếu không có bất kỳ tác động nào)

Model	FOX-1004	S	FOX-S1004	S	FOX-E1004	S
TYP	Làm nóng / lạnh	C / H	C	C / H	C	C / H
DLT	T.gian hoãn output	0 ~ 19phút, 59giây	O	0 ~ 19phút, 59giây	O	0 ~ 19phút, 59giây
DIF	Độ chính xác	±0.1°C ~ ±19.9°C	1.0°C	±0.1°C ~ ±19.9°C	1.0°C	±1°C ~ ±19.9°C
COR	Khoảng lệch	±5.0°C	0.0°C	±5.0°C	0.0°C	±5.0°C

* Ghi chú: Một số ký tự viết tắt

S : Setting value when deliver (Đặt giá trị khi chuyển)

C : Cooling (làm lạnh)

H : Heating (làm nóng)

C/H : Cooling / Heating (Làm lạnh / làm nóng)

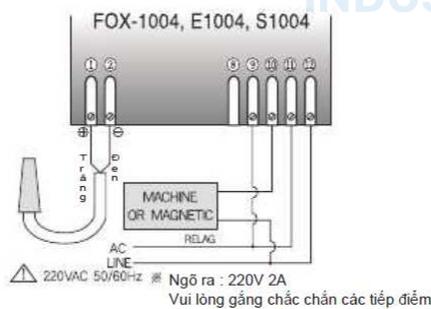
Hướng dẫn sử dụng

MODEL	TẦM ĐO	LOẠI CẢM BIẾN
FOX-1004	-40.0°C ~ +90.0°C	Diode
FOX-E1004	-40.0°C ~ +90.0°C	Diode
FOX-S1004	-40.0°C ~ +90.0°C	Diode

3. Kích thước



4. Đầu nối



5. Những điểm cần lưu ý khi sử dụng :

⚠ An toàn

Vui lòng sử dụng sản phẩm này sau khi thiết lập thiết bị để bảo vệ thật an toàn, trong đó quan tâm đến những yếu tố nguy hiểm như tổn thương con người hoặc thiết bị hại tài sản, bởi vì thiết bị này không được thiết kế như một thiết bị bảo vệ.

⚠ An toàn và những cảnh báo nguy hiểm

- Vui lòng đọc hết hướng dẫn sử dụng này trước khi vận hành thiết bị.
- Chúng tôi sẽ không chịu trách nhiệm bất kỳ thiệt hại nào về con người hoặc tài sản do việc không tuân thủ các hướng dẫn an toàn hay cảnh báo nguy hiểm.
- Để an toàn, không được quyền chuyển đổi hoặc sửa chữa thiết bị khi không được phép.
- Không được sử dụng vượt quá giới hạn cho phép - trong trường hợp tải trọng cao hơn, hãy sử dụng rời le trung gian hoặc khởi động từ phù hợp với dòng tải sử dụng. Hãy chắc chắn rằng điện áp đã phù hợp với chỉ dẫn của thiết bị.
- Phải bảo vệ thiết bị khỏi nước và bụi cũng như nó phải được sử dụng với những công cụ, thiết bị thích hợp.
- Không để thiết bị tiếp xúc trực tiếp với nhiệt độ cao, ánh sáng mặt trời, rung động mạnh hoặc độ ẩm cao.
- Không được phép vận hành hoặc cài đặt khi điều kiện xung quanh bất lợi như: ẩm ướt, những cuộn dây cảm ứng, bụi, khí đốt, hơi nước, dung môi, tiếng ồn có tần số cao, ...
- Tránh vận hành hoặc cài đặt gần khu vực có tần số cao như: thiết bị hàn, máy phát không dây, hệ thống phát thanh, điều khiển SCR, v.v
- Không đặt cáp cảm biến gần dây tín hiệu, cáp điện, cáp tải.
- Xin sử dụng cáp có vỏ bọc (chuyên dùng cho cáp cảm biến) khi cáp cảm biến cần dài hơn, tuy nhiên không được quá dài.
- Vui lòng sử dụng cáp cảm biến tránh những hư hỏng như: bị cắt hoặc rạn nứt.
- Thiết bị này nên để xa tầm tay trẻ em.
- Công việc cài đặt chỉ được thực hiện bởi người đã thành thạo các vấn đề liên quan đến nguy hiểm và các thao tác phù hợp.
- Bạn không nên sửa đổi bất kỳ thứ gì hoặc tháo rời sản phẩm nếu bạn chưa hiểu tường tận về nó. Mọi thắc mắc xin vui lòng gửi về chúng tôi.

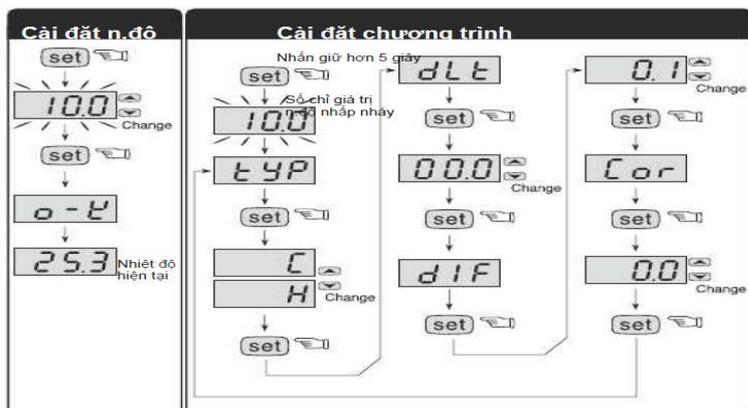
⚠ Nguy hiểm

Chú ý! Không bao giờ làm việc trên các nối điện khi máy móc ở chế độ mở (on)

⚠ Bảo lỗi

- ⚠ Lỗi bộ nhớ.
- ⚠ Lỗi cảm biến. Cảm biến bị ngắt, kiểm tra lại cáp cảm biến.
- ⚠ Lỗi cảm biến. Cảm biến bị chập. Kiểm tra lại cáp cảm biến.

* Đặc điểm kỹ thuật của thiết bị này có thể được thay đổi (mà không cần bất kỳ thông báo nào) để cải thiện chất lượng của nó





CONOTEC

Digital Humidity Controller

CONOTEC CO., LTD.

www.conotec.co.kr

Operating manual



CNT-2SHA(R)

- ◆ Digital humidity controller
- ◆ Temperature display
- ◆ Temp./humi sensor application
- ◆ Auxiliary output select - 2 outputs or Alarm output
- ◆ Applicable in the high temperature upto 80°C

※ Thank you for selecting our products. please read carefully this instruction to reduce any damages or operation mistakes.

Regarding the English - language manual, please download it at our homepage.

1 Model composition

Model	Output	Sensor	Range	RS485
CNT-2SHA	Main:1a 250Vac2A	DS-SH series	0.0%~100.0%Rh	-
CNT-2SHAR	Aux:1a 250Vac2A			support

2 Safety and Hazard instructions

Read carefully this instruction manual before use and use the product properly.

※ The specifications, appearance and dimension may be changed for improvement of performance without a prior notice

WARNING

1. This product is not made as a safety device, so when it is used for a control of devices feared to cause casualties, damages to the peripheral devices or huge property loss, the double safety devices should be arranged before use.
2. Avoid connecting lines, checking and repairing the products while power is supplied.
3. Connect power after making sure the terminal number.
4. Never disassemble modify, improve or repair the product.

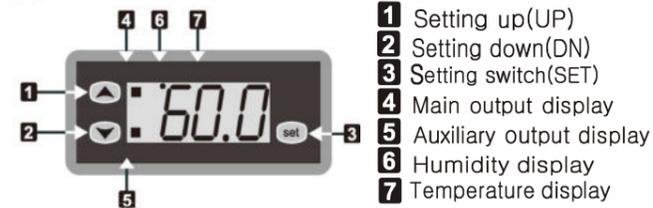
Safety

- Be well-informed of how to use, safety regulations, warnings, etc before installation of this device and apply it to the extent of the defined specifications and relevant capacity without fail.
- Avoid wiring or installation to a motor or solenoid with a large inductive load.
- Use a shielded cable for extension of the sensor and ensure not to make it longer than the necessity.
- Ensure not to use the parts generating arc when switching at the same power source or near to it.
- Keep the power cable away from a high-tension power line and ensure not to install it at a place with serious oil and dirt.
- Avoid strong magnetic field or serious noise, vibration or impact.
- Keep away from the place where strong alkaline or acid material is directly released and use an independent pipe line.
- When it is installed at kitchen, ensure not to pour water directly over the product for cleaning.
- Keep the sensor cable away from signal line, power source, power line or loaded line and use an independent pipe line.
- Note that the mark of Δ in terminal connection diagram is the safety expression for warnings or cautions.
- Avoid using the product close to the device generating noises(high frequency welder, high frequency sewing machine, high frequency radio, large capacity SCR Controller, etc).
- The use in any way other than what is instructed by the manufacturer may cause injury or property loss.
- It is not a toy and keep it out of reach of children's hand.
- The installation of the device should be performed by an expert or a qualified personnel without fail.
- We shall not take any responsibility for the damage caused by non-compliance with the above-mentioned warnings or cautions or by any consumer's mistake.

Danger

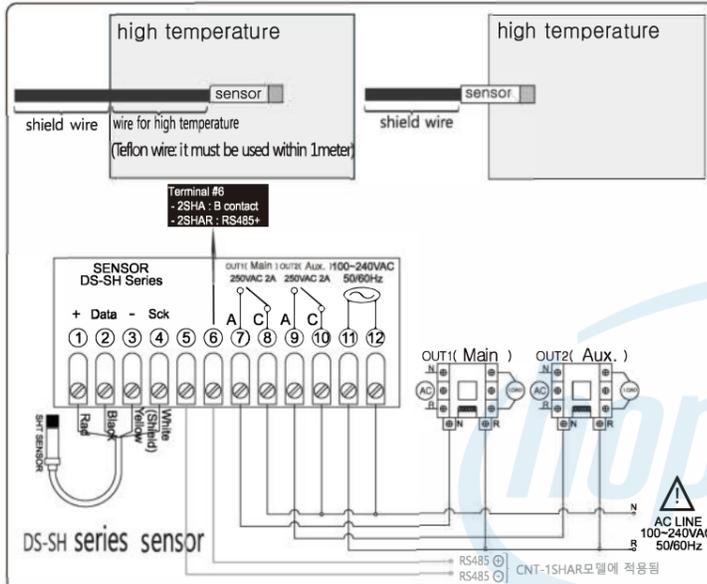
- Attention, Danger related to electric shock
- Electric shock -Do not touch AC terminal during application of electric current. It may cause electric shock.
- Cut the power supply without fail during checking the input power.

3 Part name



Current status display has 2 kinds of mode, can be change with the keys UP(increase)/DN(decrease) to " Humidity display /temperature display".

4 Connection

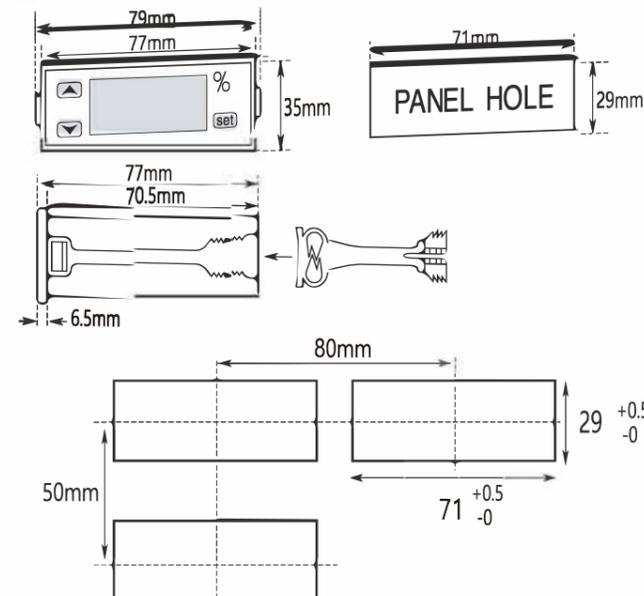


Ref1. Detailed specifications for the applicable sensor specifications, see the back of the '9. sensor's specifications'.

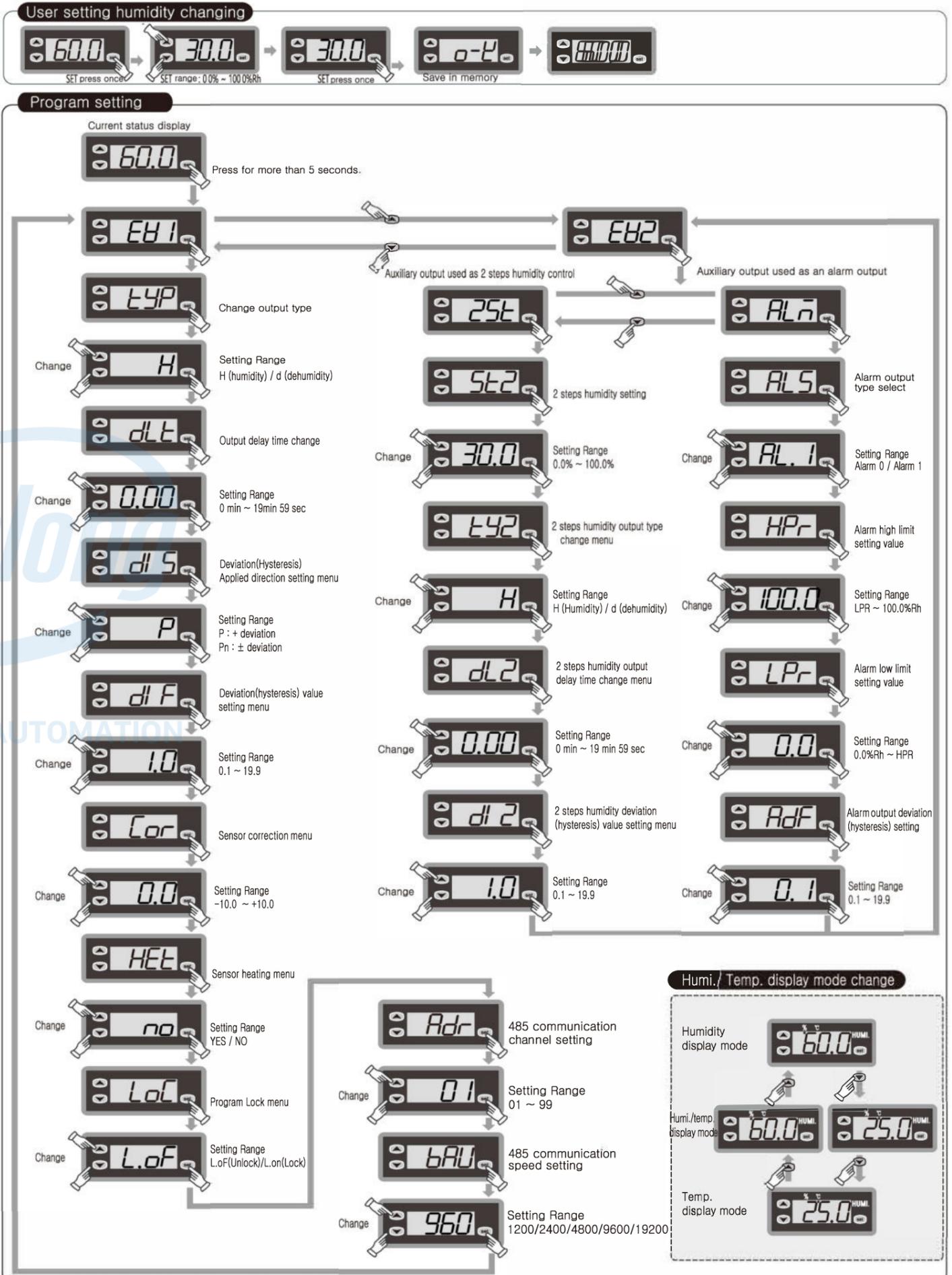
Caution1. Please make use of the shield wire when lengthening of the sensor wire, and in case of using in the high temperature range of 65°C~80°C, surely use the high temperature using wire(Teflon wiring).

Caution2. Please make the operating machine(load) be driven with using the power relay or magnet outside surely because its output specification of inside relay is less than 250VAC 2A

5 External size & panel size

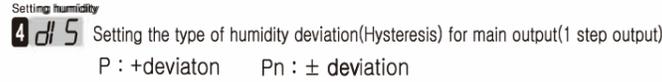


6 Setting for programs

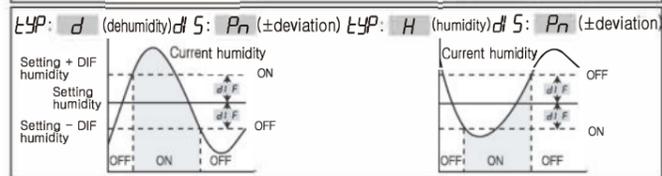
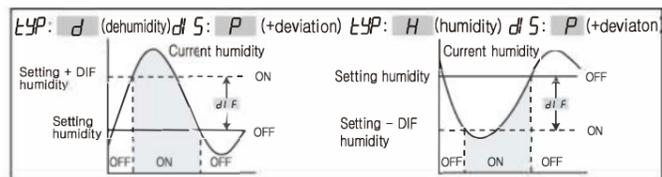


7 Detailed explanation

- 1 **EB1** Display the setting for Main output(1 step output)
- 2 **LYP** Setting the output type for main output(1 step output)
H : humidity operation d : dehumidity operation
- 3 **dLE** Output delay time setting for main output(1 step output)
-Used when the control object repeats the ON/OFF frequently creating troubles. (Freezer, Compressor & etc.)
-Function protecting product from instantaneous power outage, or when re-engaging the power supply.



- 4 **dLF** Setting the type of humidity deviation(Hysteresis) for main output(1 step output)
P : +deviation Pn : ± deviation
- 5 **dIF** Setting output deviation for main output(1 step output)
By operating the ON/OFF control frequently, the relay or its output contact can be damaged quickly and it also occurs the hunting(oscillating, chattering) by virtue of external noise.
To avoid such phenomenon, by setting between ON and OFF at regular intervals, this function is able to protect the contacts of devices, and so on.



- 6 **LoC** Correction of the present humidity
Correction function for a discrepancy between the present's display value and the actual value(accurate value)
ex) An actual humidity value is 55.5%RH only, but the present humidity's display value was 57.5%RH
=> You may use this function and can correct the display's humidity value by 2.0%RH

Caution. Actual humidity is validated the performance and accurately calibrated by using the equipment to produce. If an inaccurate equipment calculated on the basis of the actual humidity calibration, it can be caused problems with product operation

- 7 **HEE** Heating element for humidity sensor
It is possible to be covered with dew when the humidity is high, If the present humidity is 95%RH, it is generated heat inner its sensor in order to prevention of dewy
- YES** It is operated the heating function automatically if the humidity is more than 95.0 %RH. It is removed it if the humidity is less than 95.0 %RH
- no** The heating function will be prohibited.

Caution 1-It must be set up " NO " because the heating function can not be used for more than 95%RH
Caution 2-The present temperature's display can be increased a little while operating of the humidity sensor's heating function

- 8 **LoC** Setting data lock function
As a safety device, it is used in order not to change the set value except for a main user.
L.on Lock on **L.of** Lock off

- 9 **Rdr** RS485 Communication address setting
The product FOX-2SHAR supports RS485 communications. When communicating with the master device for mutual recognition is the ability to set the communication address.

- 10 **BAU** RS485 Communication speed setting
The product FOX-2SHAR supports RS485 communications. When communicating with the master device to the exchange of accurate data must match the communication speed.

- 11 **EB2** Display as shown of auxiliary output
- 12 **2SE** Use as 2 steps humidity output with an auxiliary output
- 13 **SE2** Change the set humidity of an auxiliary output (2 steps humidity output)
- 14 **LY2** Output type setting of an auxiliary output (2 steps humidity output)
h : humidity d : dehumidity
- 15 **dL2** Output delay time setting of an auxiliary output (2 steps humidity output) 3. dlt Refer to the menu
- 16 **dI2** Output deviation setting of an auxiliary output(2 steps humidity output) 5. dIF Refer to the menu
- 17 **ALn** Setting as an alarm output with an auxiliary output
- 18 **ALS** Auxiliary output(alarm output) type setting
al.0 : Alarm output type out of range
Alarm will be ON when humidity displays out of setting range.

8 Setting range & Set value when deliver

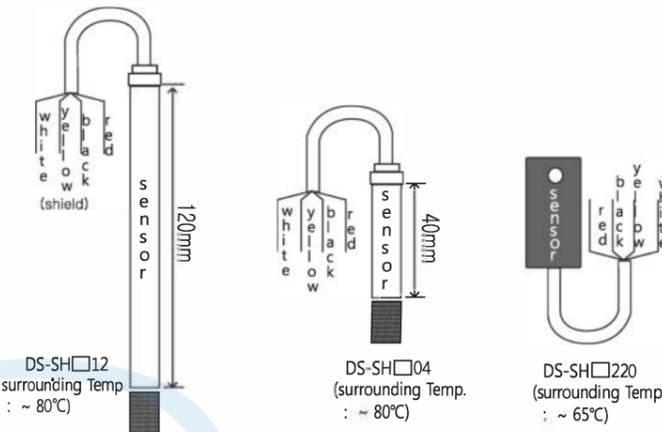
Model	Section	Setting menu	Range	Value when delivery
CNT-2SHAR	Main output	SEt	User's humidity setting	0.0~100.0%Rh 30.0%Rh
		LYP	Output type setting	H / d H (humidity)
		dLE	Output delay time setting	0.0~19min 59 sec 0 min 0 sec
		dIF	Output deviation setting	0.1 ~ 19.9 0.1
	Main/2steps	dLS	Deviation type select	P / Pn P (+deviation)
	Sensor	LoC	Humidity sensor correction value	-10.0 ~ +10.0°C 0.0°C
	Main/2steps	LoC	Program Lock function	L.on/L.of L.of
	Auxiliary output (2 steps output)	SE2	Auxiliary output humidity setting	0.0~100.0%Rh 30.0%Rh
		LY2	Output type setting	H / d H (humidity)
		dL2	Output delay time setting	0.0~19min 59sec 0 min 0 sec
		dI2	Output deviation setting	0.1 ~ 19.9 0.1
	Auxiliary output (alarm output)	ALS	Alarm type select	AL.0/AL.1 AL.0
		HPr	High limit alarm value setting	LPr ~ 100.0%Rh 100.0%Rh
		LPr	Low limit alarm value setting	0.0%Rh ~ HPr 0.0%Rh
		RdF	Alarm deviation setting	0.1 ~ 19.9%Rh 0.1%Rh
Sensor	HEE	Humidity sensor heating function	YES / no no	
Communication	Rdr	485 comm. address setting	01 ~ 99 01	
Communication	BAU	485 communication velocity setting	120 (1200Bps) 240 (2400Bps) 480 (4800Bps) 960 (9600Bps) 1920 (19200Bps)	960 (9600Bps)

9 Sensor's specifications

< DS-SH series >

Model : DS-SH[A][H]

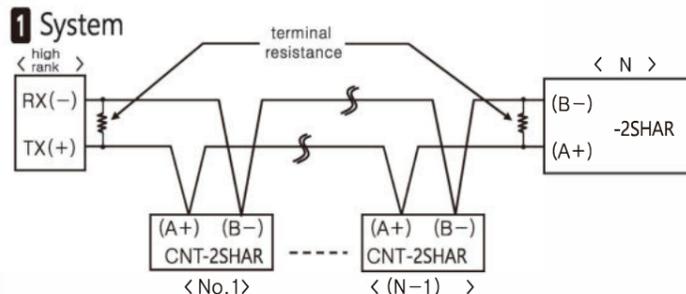
- A(Humidity Accuracy)
- 0 : ±4.5%
- 1 : ±3.0%
- 5 : ±2.0%
- H(Housing Type)
- 04 :Stainless Body Length 40mm(Ambient temp. : to 80°C)
- 12 :Stainless Body Length 120mm(Ambient temp. : 80°C)
- 220 : Plastic Case



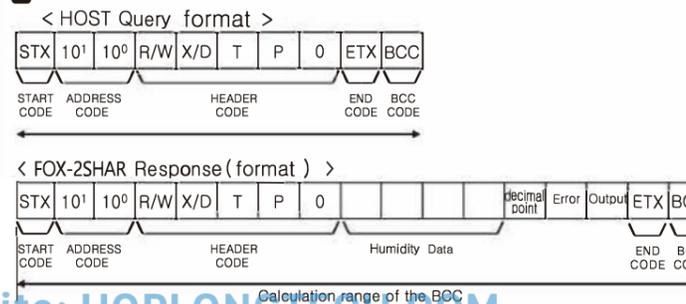
Caution1. When using a communication shield wire, the distance sensor installation is within 20m.
Caution2. In addition to using the shield, when using a wire, the distance sensor installation is within 3
Caution3. Installation direction refers to the shown.

10 Communication interface

specification	in conformity EIA RS485
The method of communication	two wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1.2Km
communication speed	1200/2400/4800/9600/19200Bps(select)
StartBit	fixed 1bit
StopBit	fixed 1bit
ParityBit	none
DataBit	fixed 8bit
Protocol	BCC



2 Communication Command and Block's definition



- 1 START CODE
Show the lead(head) of the block
STX -> [02H]
 - 2 ADDRESS CODE
A high rank system can discriminate the channel code number among. FOX-2SHAR. It is available to set between 01 and 99(BCD ASCII)
 - 3 HEADER CODE : Show the command name as an alphabetic letter.
TP0(Temp.value)->T[54H],P[50H],O[30H] RX(reading demand) -> R[52H], X[58H]
HP0(Humi.value)->H[48H],P[50H],O[30H] RD(reading response) -> R[52H], D[44H]
WX(writing demand) -> W[57H], X[58H]
WD(writing response) -> W[57H], D[44H]
 - 4 Composition of data Data is displayed as "Hexa decimal"
 - 5 Decimal point -0[30H]: there is no decimal point//1[31H]: there is "decimal point"
 - 6 Error- 0[30H]: there is no "error" //1[31H]: interrupted of the sensor's cable
2[32H]: low error //3[33H]: high error
 - 7 Output
- | Output | Auxiliary output Alarm output | 2 steps output | Main output | Output | Auxiliary output Alarm output | 2 steps output | Main output |
|--------|-------------------------------|----------------|-------------|--------|-------------------------------|----------------|-------------|
| 0x30 | OFF | OFF | OFF | 0x34 | ON | OFF | OFF |
| 0x31 | OFF | OFF | ON | 0x35 | ON | OFF | ON |
| 0x32 | OFF | ON | OFF | 0x36 | ON | ON | OFF |
| 0x33 | OFF | ON | ON | 0x37 | ON | ON | ON |
- 8 END CODE : show the end(close) of the block ETX -> [03H]
 - 9 BCC : (Block Check Character)
* Show the XOR arithmetic and logic values from the start(STX) to the ETX
- the others : As of no response of the ACK
1 in case of not equivalent to the channel after receiving 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 3 times until recovering normally
4 change the communication speed in case of bring about the communication's error frequently

11 How to diagnose a breakdown

- Indicating ERROR on using items
- This **Er 1** is the damage of memory data for various of inner-DATA due to be got noised strongly from outside while using this item. Please request us A/S by return in this case. Although our controller is designed as the complementary measures regarding these noise from outside, it is not endurable against these noise with endlessly.
- If noise(2KV) disordering become an inflow, the inner-part will be damaged.
- o-E** Sensor error. The sensor is interrupted. Check the cable.
f the error message persists, please request us A/S by return.
- L-E** or **H-E** displayed when exceeding the range of humidity. Even if the ambient humidity of environment remaining in the normal by return.
- WARRANTY PERIOD : 1 YEAR FROM THE DATE OF PURCHASE**
The products specification can be changed without any notification to improve its quality.
Be sure to familiarize yourself with the above handling instructions outlined in the product information.
Regarding the English-language manual, please download it at our web-site.

WARNING: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE CONNECT to the protective earth ground and the mains supply. Do not block the vents.

Handling Precautions
* This Product is suitable in the following environment:

- Ambient temperature: 0oC~ 60 oC
- Ambient humidity: 80%Rh max.
- Using for indoor only
- Pollution Degree 2
- Altitude 2000 or less
- Installation Category II

Avoid equipment placement that is difficult to operate power cord If using the equipment in a manner not specified by the equipment manufacturer may impair the protection provided by the equipment.

- Rated power: AC 100~240VAC 50/60Hz 3VA
- H. Office : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea
- Factory : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea

- TEL : +82-51-819-0426
- FAX : +82-51-819-4562
- e-mail : conotec@conotec.co.kr
- URL : www.conotec.co.kr

- Main products & Development
Digital temperature/humidity controller
Digital timer, Current/voltage meter
The other development products



CONOTEC

Digital Humidity Controller

CONOTEC CO., LTD.

www.conotec.co.kr

Operating manual



CNT-2SHA(R)

- ◆ Digital humidity controller
- ◆ Temperature display
- ◆ Temp./humi sensor application
- ◆ Auxiliary output select - 2 outputs or Alarm output
- ◆ Applicable in the high temperature upto 80°C

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1 Model composition

Model	Output	Sensor	Range	RS485
CNT-2SHA	Main:1a 250Vac2A	DS-SH series	0.0%~100.0%Rh	-
CNT-2SHAR	Aux:1a 250Vac2A			support

2 Safety and Hazard instructions

Read carefully this instruction manual before use and use the product properly.

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2. Avoid connecting lines, checking and repairing the products while power is supplied.
3. Connect power after making sure the terminal number.
4. Never disassemble modify, improve or repair the product.

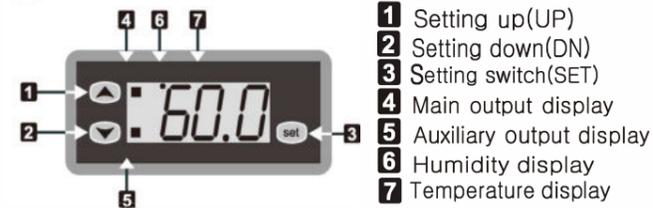
Safety

- Be well-informed of how to use, safety regulations, warnings, etc before installation of this device and apply it to the extent of the defined specifications and relevant capacity without fail.
- Avoid wiring or installation to a motor or solenoid with a large inductive load.
- Use a shielded cable for extension of the sensor and ensure not to make it longer than the necessity.
- Ensure not to use the parts generating arc when switching at the same power source or near to it.
- Keep the power cable away from a high-tension power line and ensure not to install it at a place with serious oil and dirt.
- Avoid strong magnetic field or serious noise, vibration or impact.
- Keep away from the place where strong alkaline or acid material is directly released and use an independent pipe line.
- When it is installed at kitchen, ensure not to pour water directly over the product for cleaning.
- Keep the sensor cable away from signal line, power source, power line or loaded line and use an independent pipe line.
- Note that the mark of Δ in terminal connection diagram is the safety expression for warnings or cautions.
- Avoid using the product close to the device generating noises(high frequency welder, high frequency sewing machine, high frequency radio, large capacity SCR Controller, etc).
- The use in any way other than what is instructed by the manufacturer may cause injury or property loss.
- It is not a toy and keep it out of reach of children's hand.
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Danger

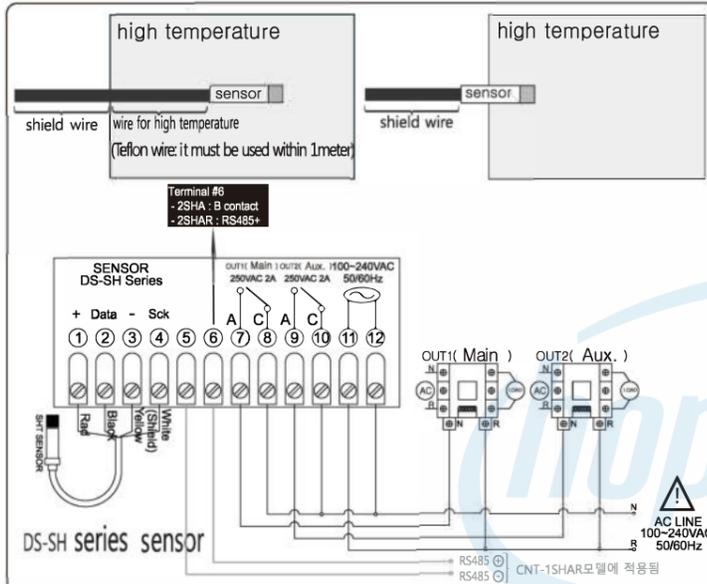
- Attention, Danger related to electric shock
- Electric shock -Do not touch AC terminal during application of electric current. It may cause electric shock.
- Cut the power supply without fail during checking the input power.

3 Part name



Current status display has 2 kinds of mode, can be change with the keys UP(increase)/DN(decrease) to " Humidity display /temperature display".

4 Connection

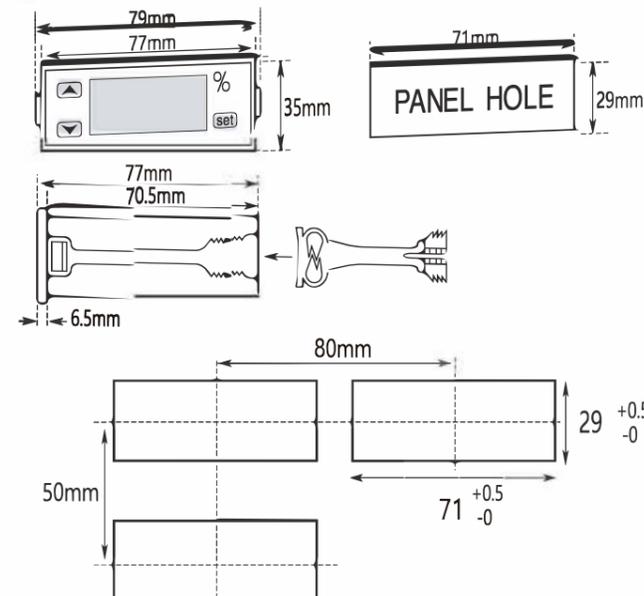


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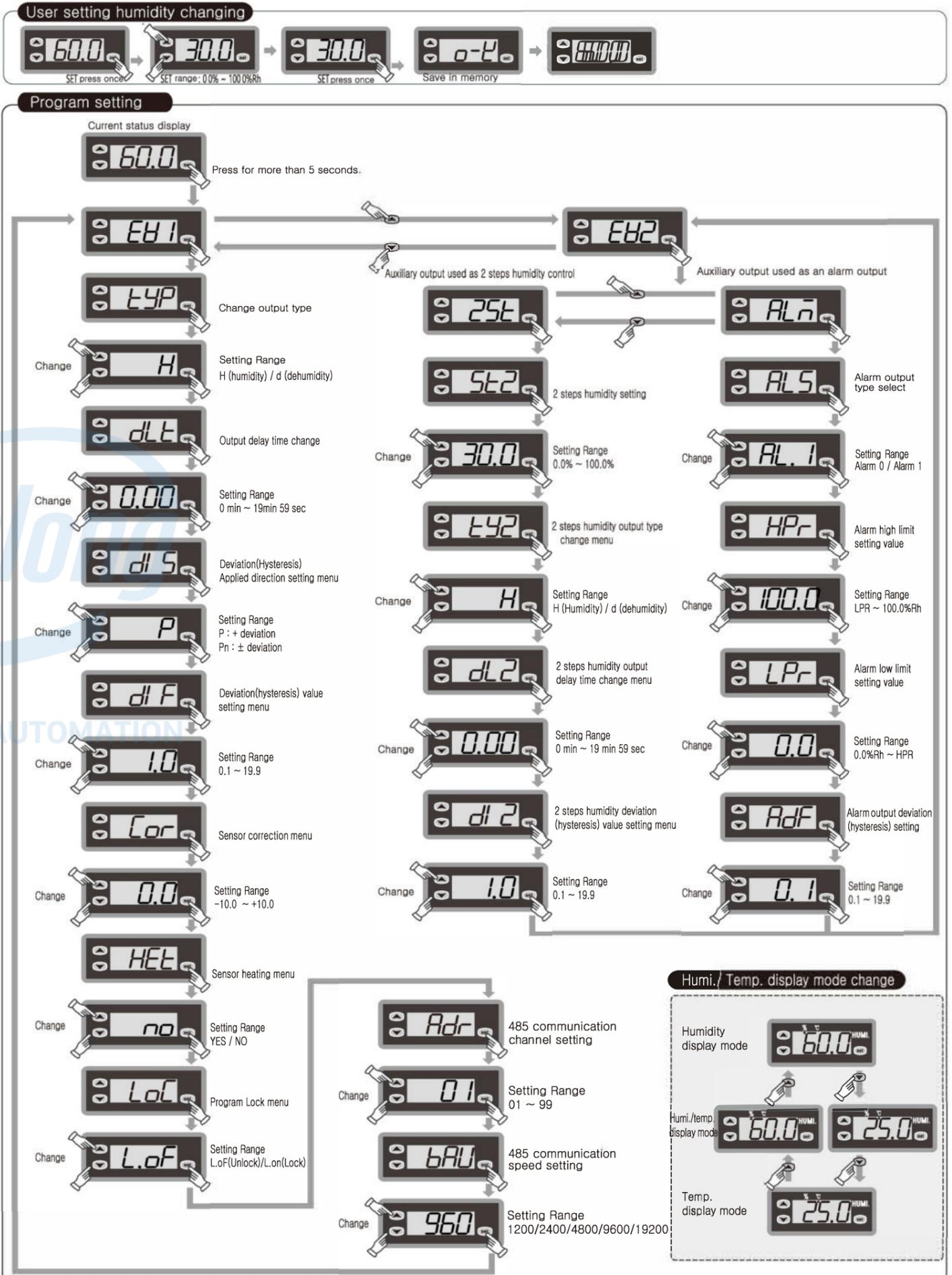
Caution1. Please make use of the shield wire when lengthening of the sensor wire, and in case of using in the high temperature range of 65°C~80°C, surely use the high temperature using wire(Teflon wiring).

Caution2. Please make the operating machine(load) be driven with using the power relay or magnet outside surely because its output specification of inside relay is less than 250VAC 2A

5 External size & panel size



6 Setting for programs

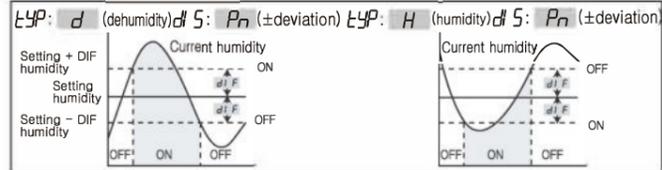
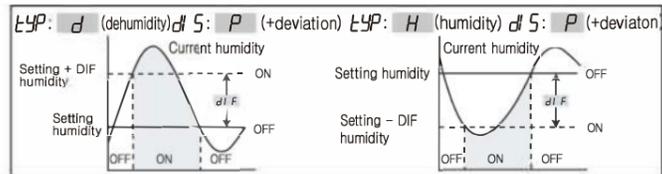


7 Detailed explanation

- 1 E81** Display the setting for Main output(1 step output)
- 2 EYP** Setting the output type for main output(1 step output)
H : humidity operation d : dehumidity operation
- 3 dLE** Output delay time setting for main output(1 step output)
-Used when the control object repeats the ON/OFF frequently creating troubles. (Freezer, Compressor & etc.)
-Function protecting product from instantaneous power outage, or when re-engaging the power supply.
-Set humi. : 50%Rh, dLE: 1.30, EYP: d, dF: 1.0
When is the output turned ON?
In increasing current humidity, if passes 51.0% at 'B', after 1 min 30sec as DLT setting time, Relay is to be ON at 'C'.

- 4 dLS** Setting the type of humidity deviation(Hysteresis) for main output(1 step output)
P : +deviation Pn : ± deviation

- 5 dLF** Setting output deviation for main output(1 step output)
By operating the ON/OFF control frequently, the relay or its output contact can be damaged quickly and it also occurs the hunting(oscillating, chattering) by virtue of external noise.
To avoid such phenomenon, by setting between ON and OFF at regular intervals, this function is able to protect the contacts of devices, and so on.



- 6 LoC** Correction of the present humidity
Correction function for a discrepancy between the present's display value and the actual value(accurate value)
ex) An actual humidity value is 55.5%RH only, but the present humidity's display value was 57.5%RH
=> You may use this function and can correct the display's humidity value by 2.0%RH

Caution Actual humidity is validated the performance and accurately calibrated by using the equipment to produce. If an inaccurate equipment calculated on the basis of the actual humidity calibration, it can be caused problems with product operation

- 7 HEE** Heating element for humidity sensor
It is possible to be covered with dew when the humidity is high, If the present humidity is 95%RH, it is generated heat inner its sensor in order to prevention of dewy

YES It is operated the heating function automatically if the humidity is more than 95.0 %RH. It is removed it if the humidity is less than 95.0 %RH

no The heating function will be prohibited.

Caution 1-It must be set up " NO " because the heating function can not be used for more than 95%RH

Caution 2-The present temperature's display can be increased a little while operating of the humidity sensor's heating function

- 8 LoC** Setting data lock function
As a safety device, it is used in order not to change the set value except for a main user.

L.on Lock on **L.of** Lock off

- 9 Rdr** RS485 Communication address setting
The product FOX-2SHAR supports RS485 communications. When communicating with the master device for mutual recognition is the ability to set the communication address.

- 10 bAU** RS485 Communication speed setting
The product FOX-2SHAR supports RS485 communications. When communicating with the master device to the exchange of accurate data must match the communication speed.

- 11 E82** Display as shown of auxiliary output
- 12 2SE** Use as 2 steps humidity output with an auxiliary output
- 13 SE2** Change the set humidity of an auxiliary output (2 steps humidity output)
- 14 EY2** Output type setting of an auxiliary output (2 steps humidity output)
h : humidity d : dehumidity
- 15 dL2** Output delay time setting of an auxiliary output (2 steps humidity output) 3. dlt Refer to the menu
- 16 dL2** Output deviation setting of an auxiliary output(2 steps humidity output) 5. dIF Refer to the menu
- 17 ALn** Setting as an alarm output with an auxiliary output
- 18 ALS** Auxiliary output(alarm output) type setting
al.0 : Alarm output type out of range
Alarm will be ON when humidity displays out of setting range.

8 Setting range & Set value when deliver

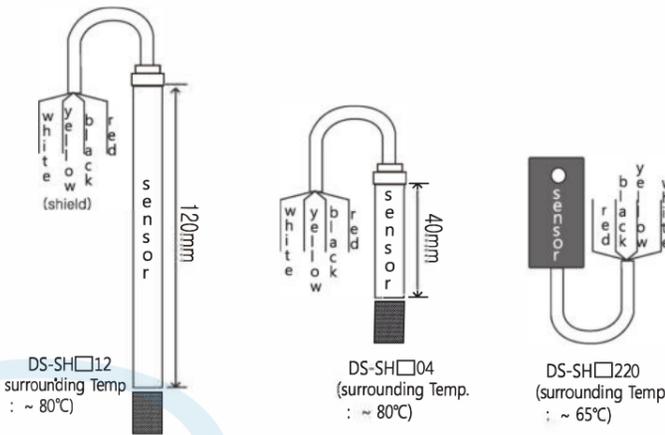
Model	Section	Setting menu	Range	Value when delivery
CNT-2SHAR	Main output	SEt	User's humidity setting	0.0~100.0%Rh 30.0%Rh
		EYP	Output type setting	H / d H (humidity)
		dLE	Output delay time setting	0.0~19min 59 sec 0 min 0 sec
		dLF	Output deviation setting	0.1 ~ 19.9 0.1
	Main/2steps	dLS	Deviation type select	P / Pn P (+deviation)
	Sensor	LoC	Humidity sensor correction value	-10.0 ~ +10.0°C 0.0°C
	Main/2steps	LoC	Program Lock function	L.on/L.of L.of
	Auxiliary output (2 steps output)	SE2	Auxiliary output humidity setting	0.0~100.0%Rh 30.0%Rh
		EY2	Output type setting	H / d H (humidity)
		dL2	Output delay time setting	0.0~19min 59sec 0 min 0 sec
		dL2	Output deviation setting	0.1 ~ 19.9 0.1
	Auxiliary output (alarm output)	ALS	Alarm type select	AL.0/AL.1 AL.0
		HPr	High limit alarm value setting	LPr ~ 100.0%Rh 100.0%Rh
		LPr	Low limit alarm value setting	0.0%Rh ~ HPr 0.0%Rh
	Sensor	RdF	Alarm deviation setting	0.1 ~ 19.9%Rh 0.1%Rh
HEE		Humidity sensor heating function	YES / no no	
Communication	Rdr	485 comm. address setting	01 ~ 99 01	
Communication	bAU	485 communication velocity setting	120 (1200Bps) 240 (2400Bps) 480 (4800Bps) 960 (9600Bps) 1920 (19200Bps) 960 (9600Bps)	

9 Sensor's specifications

< DS-SH series >

Model : DS-SH[A][H]

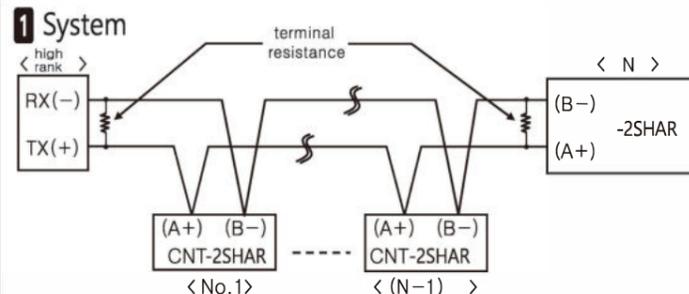
- A(Humidity Accuracy)
- 0 : ±4.5%
- 1 : ±3.0%
- 5 : ±2.0%
- H(Housing Type)
- 04 :Stainless Body Length 40mm(Ambient temp. : to 80°C)
- 12 :Stainless Body Length 120mm(Ambient temp. : 80°C)
- 220 : Plastic Case



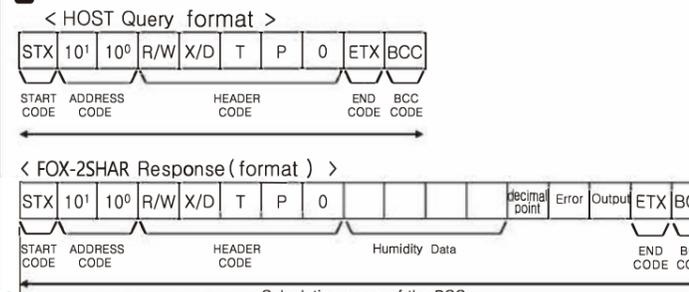
Caution1. When using a communication shield wire, the distance sensor installation is within 20m.
Caution2. In addition to using the shield, when using a wire, the distance sensor installation is within 3
Caution3. Installation direction refers to the shown.

10 Communication interface

specification	in conformity EIA RS485
The method of communication	two wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1.2Km
communication speed	1200/2400/4800/9600/19200Bps(select)
StartBit	fixed 1bit
StopBit	fixed 1bit
ParityBit	none
DataBit	fixed 8bit
Protocol	BCC



2 Communication Command and Block's definition



- 1 START CODE**
Show the lead(head) of the block
STX -> [02H]
- 2 ADDRESS CODE**
A high rank system can discriminate the channel code number among.
FOX-2SHAR, It is available to set between 01 and 99(BCD ASCII)
- 3 HEADER CODE** : Show the command name as an alphabetic letter.
TP0(Temp.value)->T[54H],P[50H],O[30H] RX(reading demand) -> R[52H], X[58H]
HP0(Humi.value)->H[48H],P[50H],O[30H] RD(reading response) -> R[52H], D[44H]
WX(writing demand) -> W[57H], X[58H]
WD(writing response) -> W[57H], D[44H]
- 4 Composition of data** Data is displayed as "Hexa decimal"
- 5 Decimal point** -0[30H]: there is no decimal point// 1[31H]: there is "decimal point"
- 6 Error** - 0[30H]: there is no "error" // 1[31H]: interrupted of the sensor's cable
2[32H]: low error // 3[33H]: high error

Output	Auxiliary output	Main output	Output	Auxiliary output	Main output
0x30	OFF	OFF	0x34	ON	OFF
0x31	OFF	OFF	0x35	OFF	ON
0x32	OFF	ON	0x36	ON	OFF
0x33	OFF	ON	0x37	ON	ON

- 7 Output**
- 8 END CODE** : show the end(close) of the block ETX -> [03H]
- 9 BCC** : (Block Check Character)
* Show the XOR arithmetic and logic values from the start(STX) to the ETX
- the others : As of no response of the ACK
1 in case of not equivalent to the channel after receiving 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 3 times until recovering normally
4 change the communication speed in case of bring about the communication's error frequently

11 How to diagnose a breakdown

- Indicating ERROR on using items
- This **E r 1** is the damage of memory data for various of inner-DATA due to be got noised strongly from outside while using this item. Please request us **A/S** by return in this case. Although our controller is designed as the complementary measures regarding these noise from outside, it is not endurable against these noise with endlessly.
- If noise(2KV) disordering become an inflow, the inner-part will be damaged.
- o-E** Sensor error. The sensor is interrupted. Check the cable.
f the error message persists, please request us **A/S** by return.
- L-E** or **H-E** displayed when exceeding the range of humidity. Even if the ambient humidity of environment remaining in the normal by return.
- WARRANTY PERIOD** : 1 YEAR FROM THE DATE OF PURCHASE
The products specification can be changed without any notification to improve its quality.
Be sure to familiarize yourself with the above handling instructions outlined in the product information.
Regarding the English-language manual, please download it at our web-site.

WARNING: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE CONNECT to the protective earth ground and the mains supply. Do not block the vents.

- Handling Precautions
- * This Product is suitable in the following environment:
 - Ambient temperature: 0oC~ 60 oC
 - Ambient humidity: 80%Rh max.
 - Using for indoor only
 - Pollution Degree 2
 - Altitude 2000 or less
 - Installation Category II
- Avoid equipment placement that is difficult to operate power cord
If using the equipment in a manner not specified by the equipment manufacturer may impair the protection provided by the equipment.
- Rated power: AC 100~240VAC 50/60Hz 3VA
- H. Office : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea
- Factory : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea
- TEL : +82-51-819-0426
- FAX : +82-51-819-4562
- e-mail : conotec@conotec.co.kr
- URL : www.conotec.co.kr

- Main products & Development
- Digital temperature/humidity controller
- Digital timer, Current/voltage meter
- The other development products

7 기능 상세 설명

1. **L.St** 사용자 온도 설정 메뉴

- 릴레이 출력을 위한 온도 지점을 설정합니다.

2. **H.St** 사용자 습도 설정 메뉴

- 릴레이 출력을 위한 습도 지점을 설정합니다.

3. **CH.E** 온도 / 습도 변경표시 주기 설정

- 현재상태 표시모드에서 UP(증가)/DN(감소)스위치로 표시모드를 바꿀수 있습니다.

- "습도표시모드" ↔ "온습도 표시모드" ↔ "온도표시모드"
- 각각의 표시모드에 맞게 표시창 위 부분에 LED 점등이 되므로 참고하시면 됩니다.

4. **SEL** 설정그룹 선택메뉴

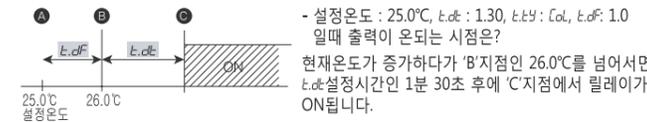
H : 습도설정그룹 선택 t : 온도설정그룹 선택

5. **L.t.Y** 온도출력에 대한 출력타입 설정

CoL : 쿨링동작 HEt : 히팅동작

6. **L.d.t** 온도출력에 대한 출력지연시간 설정

- 제어대상체가 ON/OFF 동작을 자주 반복하여 문제가 발생할 경우 사용 (냉동기, 콤프레사 등)
- 순간적인 정전이나 전원 재 투입시 작동기계 보호 기능



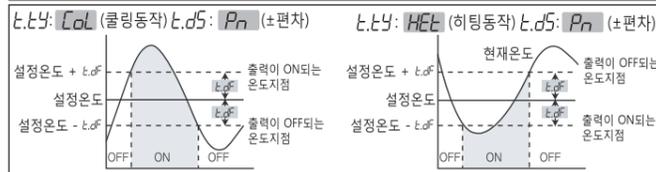
7. **L.d.S** 온도출력에 대한 편차(히스테리시스) 적용방식 설정

P : +편차적용 Pn : ± 편차적용

8. **L.d.F** 온도출력에 대한 출력편차 설정

릴레이 출력이 너무 잦은 ON/OFF를 반복하게 되면 출력접점이 빨리 손상되거나 외부의 노이즈 등에 의하여 현팅(발진현상, 채터링)이 발생하게 됩니다.

이러한 현상을 방지하기 위하여 ON과 OFF출력동작간에 일정한 간격을 설정함으로써 기기의 접점등을 보호할 수 있는 기능입니다.



9. **L.Co** 현재 온도 보정

제품 자체에는 문제가 없으나, 실제온도와 기기의 표시창에 표시되는 온도가 상이할 경우 현재온도를 보정하여 실제온도와 같게 해주는 기능입니다.

예) 실제온도 : 55.0°C, 현재온도 : 57.0°C일때
L.Co 값을 -2.0로 설정하면 현재온도가 55.0°C로 표시됩니다.

주의1. 실제온도는 성능이 검증되었고 교정이 정확하게 된 장비를 사용하시어 산출 하십시오. 부정확한 장비로 산출된 실제온도를 기준으로 하여 보정을 하시면 제품동작에 문제가 생길수 있습니다.

10. **Adr** RS485통신 주소 설정

FOX-2SHTR제품은 RS485통신을 지원합니다. RS485통신을 사용할 때 마스터 장비와의 상호인식을 위하여 통신 주소를 설정하는 기능입니다.

11. **bAU** RS485통신 속도 설정

FOX-2SHTR제품은 RS485통신을 지원합니다. RS485통신을 사용할 때 마스터 장비와의 정확한 데이터 교환을 위하여 통신속도를 일치시켜야 합니다.

12. **LoC** 설정데이터 잠금기능

사용자 온도설정, 사용자 습도설정, 온도습도 변경표시주기 외 각종 설정 값을 변경하지 못하도록 하는일종의 안전장치입니다.

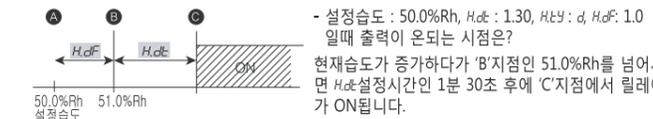
L.on 잠금 L.oF 잠금해제

13. **H.t.Y** 습도출력에 대한 출력타입 설정

H : 가습동작 d : 제습동작

14. **H.d.t** 습도출력에 대한 출력지연시간 설정

- 제어대상체가 ON/OFF 동작을 자주 반복하여 문제가 발생할 경우 사용 (냉동기, 콤프레사 등)
- 순간적인 정전이나 전원 재 투입시 작동기계 보호 기능



15. **H.d.S** 습도출력에 대한 편차(히스테리시스) 적용방식 설정

P : +편차적용 Pn : ± 편차적용

16. **H.d.F** 습도출력에 대한 출력편차 설정

릴레이 출력이 너무 잦은 ON/OFF를 반복하게 되면 출력접점이 빨리 손상되거나 외부의 노이즈 등에 의하여 현팅(발진현상, 채터링)이 발생하게 됩니다.

이러한 현상을 방지하기 위하여 ON과 OFF출력동작간에 일정한 간격을 설정함으로써 기기의 접점등을 보호할 수 있는 기능입니다.

17. **H.Co** 현재 습도 보정

제품 자체에는 문제가 없으나, 실제습도와 기기의 표시창에 표시되는 습도가 상이할 경우 현재습도를 보정하여 실제습도와 같게 해주는 기능입니다.

예) 실제습도 : 55.0%Rh, 현재습도 : 57.0%Rh일때
H.Co 값을 -2.0로 설정하면 현재습도가 55.0%Rh로 표시됩니다.

주의1. 실제습는 성능이 검증되었고 교정이 정확하게 된 장비를 사용하시어 산출 하십시오. 부정확한 장비로 산출된 실제습도를 기준으로 하여 보정을 하시면 제품동작에 문제가 생길수 있습니다.

18. **HEE** 습도센서 히팅기능

습도가 매우 높을때는 센서소자 주변에 이슬이 맺힐수 있으므로, 현재습도가 95.0%이상일때는 이슬맺힘 방지를 위하여 센서내부에서 열을 발생 해주는 기능입니다.

YES 95.0%이상의 습도에서 히팅기능이 자동으로 동작하고, 95.0%이하가 되면 해제됩니다.

no 자동 히팅기능을 사용하지 않습니다.

주의1. 설정습도를 95%이상으로 사용시에는 히팅기능을 사용할 수 없으므로, NO로 설정해야 합니다.

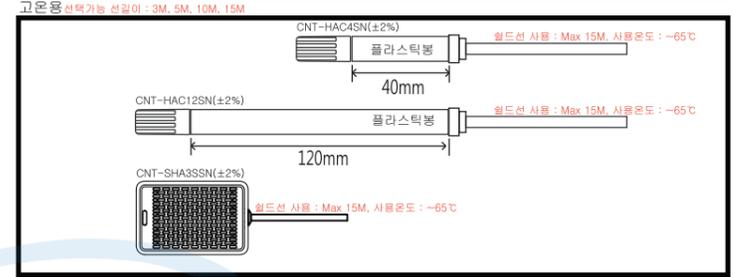
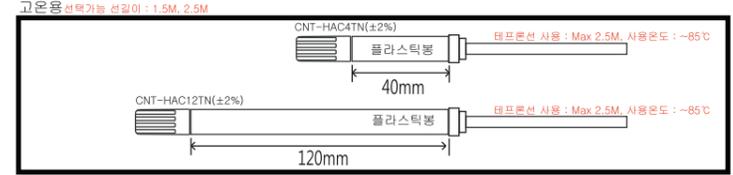
주의2. 습도센서 히팅기능이 동작중일때는 표시창의 현재온도가 소폭 상승할 수 있습니다.

8 설정범위 및 출고시 설정값

모델명	구분	설정 메뉴	설정범위	출고시 설정값
CNT-2SHTR-1	온도 설정	L.St 사용자온도설정	-39.9~119.9°C	10.0°C
		L.t.Y 출력타입설정	CoL / HEt	CoL
		L.d.t 출력지연시간설정	0.00~19분59초	0분 0초
		L.d.S 출력편차타입설정	P / Pn	P
		L.d.F 출력편차설정	0.1 ~ 19.9	0.1
		L.Co 온도보정	-10.0 ~ +10.0	0.0
	습도 설정	H.St 사용자습도설정	0.0~100.0%Rh	30.0%Rh
		H.t.Y 출력타입설정	d / H	H
		H.d.t 출력지연시간설정	0.00~19분59초	0분 0초
		H.d.S 출력편차타입설정	P / Pn	P
		H.d.F 출력편차설정	0.1 ~ 19.9	0.1
		H.Co 습도보정	-10.0 ~ +10.0	0.0
공통	H.Ht 센서히팅설정	YES / no	no	
	LoC 프로그램잠금기능	L.on / L.oF	L.oF	
	CH.E 온습도변경표시주기	1 ~ 30 초	2 초	
통신	Adr	485통신주소설정	01 ~ 99	01
	bAU	485통신속도설정	120 (1200Bps) 240 (2400Bps) 480 (4800Bps) 960 (9600Bps) 1920 (19200Bps)	960 (9600Bps)

9 적용 센서 사양

< CNT-H Series >

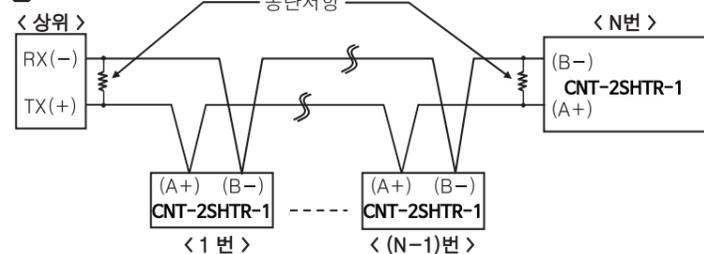


* 별도의 요청이 없을 시 기본형 선길이:3M(CNT-HAC4N)으로 출고됩니다.

10 통신 사양 (CNT - 2SHTR - 1 해당)

적용규격	EIA RS485준거
통신방법	2선식 반이중
동기방식	비동기방식
통신거리	1.2Km이내
통신속도	1200/2400/4800/9600/19200Bps(선택)
스타트비트(StartBit)	1bit로 고정
스톱비트(StopBit)	1bit로 고정
패리티비트(ParityBit)	없음
데이터비트(DataBit)	8bit로 고정
프로토콜(Protocol)	BCC

1 시스템 구성



2 통신 Command와 Block의 정의

< 상위(Host) Query(질문) 포맷 >



< FOX-2SHTR Response(응답) 포맷 >



1 START CODE

BLOCK의 선두를 나타냅니다. STX -> [02H]

2 ADDRESS CODE

상위 시스템이 FOX-2SHTR를 식별하는 국번 CODE이며, 01~99(BCD ASCII)범위에서 설정가능 합니다.

3 HEADER CODE : COMMAND의 명칭을 문자로 나타냅니다.

TP0(온도측정값) -> T[54H], P[50H], 0[30H] RX(읽기요구) -> R[52H], X[58H]
HP0(습도측정값) -> H[48H], P[50H], 0[30H] RD(읽기응답) -> R[52H], D[44H]
WX(쓰기요구) -> W[57H], X[58H]
WD(쓰기응답) -> W[57H], D[44H]

4 DATA의 구성 : DATA는 16진수(Hexadecimal)로 표현됩니다.(음수 : 2의 보수)

5 소수점 - 0[30H]:소수점 없음 // 1[31H]:소수점 있음

6 예러 - 0[30H]:에러 없음 // 1[31H]:센서 오픈 에러
2[32H]: 로우 에러 // 3[33H]: 하이에러

7 출력 - 0[30H]:출력오프 // 1[31H]:출력온

8 END CODE : BLOCK내용의 종료를 나타냅니다. ETX -> [03H]

9 BCC : Black Check Character의 약자로서 프로토콜 처음(STX)부터 ETX까지의 XOR 연산값을 나타냅니다.

※ 기타

- ACK 응답이 없는 경우
- 1 먼저 선로 상태를 확인
- 2 통신조건(설정치)을 확인
- 3 노이즈가 원인으로 생각되는 통신 이상일 경우에 이상회복이 될 때 까지 통신실행을 3회 정도 시도
- 4 빈번한 통신 이상이 발생할 경우는 통신속도 조절

ACK 응답이 없는 경우의 처리

- 1 먼저 선로 상태를 확인
- 2 통신조건(설정치)을 확인
- 3 노이즈가 원인으로 생각되는 통신 이상일 경우에 이상회복이 될 때 까지 통신실행을 3회 정도 시도
- 4 빈번한 통신 이상이 발생할 경우는 통신속도 조절

11 간단한 고장 진단 요령

■ 제품 사용 중 에러를 표시하는 경우

- Er 1의 경우는 제품이 사용 중 외부로부터 강한 노이즈를 받아서 내부에 있는 각종 DATA의 기억소자가 파손된 경우입니다. 이 경우에는 당사로 A/S를 의뢰하십시오.
- 본 조절기는 외부의 노이즈에 대하여 보완대책이 수립되어 있습니다만, 노이즈 2KV 정도가 유입되면 내부가 파손될 수 있습니다.
- o-E 문자가 표시될 경우에는 센서와의 데이터 통신에 불량이 발생한 경우입니다. 센서와의 결선상태, 배선의 단선확인, 결선순서 등을 확인 하십시오, 그래도 개선되지않을 경우 본사로 A/S 의뢰하십시오.
- L-E 또는 H-F 는 습도표시범위를 초과하였을때 표시됩니다. 주변의 습도 환경을 정상상태로 유지하였는데도 위와 같은 문자가 표시될 때는 본사로 A/S 의뢰하십시오.
- 품질보증기간 : 구입한 날로부터 1년

※ 상기제품사양은 제품의 성능향상을 위해 예고없이 변경될 수도있습니다. 상기취급시 주의사항에 명기된 내용을 잘 숙지하시고 반드시 지켜주십시오.

※ Regarding the English-language manual, please download it at our homepage. 영문 사용설명서는 홈페이지에서 다운받으시기 바랍니다.

■ 주소 : (도로명) 부산광역시 기장군 장안읍 반룡산단1로 56 (지번) 부산광역시 기장군 장안읍 반룡리 901-1 (우)46034

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■ 주요 생산 품목 및 개발

- 온/습도 조절기
- 카운터 & 타이머 컨트롤러
- 전류 & 전압 판별 메타
- 온도/습도 인디케이터
- 오븐 제어기
- CO2 제어기
- PID제어기
- 유니트클러 제어기
- 히트펌프 제어기
- 칠러 제어기
- 항온항습 제어기
- SMS 문자 경보기
- 온도/습도 트랜스미터
- 스마트폰 앱 & 모니터링 시스템

※ 본 설명서는 네이버 나눔글꼴을 이용하여 제작되었습니다.



CONOTEC®

Humidity & Temperature Transmitter Controller

CONOTEC CO., LTD.

www.conotec.co.kr

Instruction Manual

CNT-TMC100



1 Notes of attention for the safety

Make sure to read notes of attention carefully before operating and properly use.

※Specifications and sizes indicated on this instruction manual are subject to change without notification for the improvement of performance.

Warning

- This product has not been manufactured for the safe device. Therefore, if using for the purpose of the control including the devices with much concern on casualties, damage on important devices nearby, or significant property damage, please make sure to attach the dual safety device before using.
- Make sure not to disconnect, maintain, or repair when the power is connected.
- When connecting the power, make sure to check the circuit number beforehand.
- This device shall not be disassembled, processed, processed, or repaired.

Caution

- Make sure to be well-informed of warning or safety rules/instructions before installing this device and proceed within the regulated capacities or specifications.
- Motor or solenoid with much inductive load shall not be wired or installed.
- Make sure to use the shielding wire if extending the sensor and not to extend unnecessarily.
- Make sure not to use the product causing the arc when opening or closing the same power or near the power.
- Make sure to have the power cable stay away from the high pressure line and not to install them in the place with severe water, oil, or dust.
- Make sure not to install in the place with direct sun light or rainwater.
- Make sure not to install in the area with strong magnetic power, noise, vibration, and impact.
- Make sure to stay away from the place with strong alkali or acid substance come out and use the independent pipe.
- When installing in the kitchen, make sure not to spray water for the cleaning purposes.
- Make sure not to install in the place with temperature or humidity exceeding the standard values.
- Make sure not to have sensor cables disconnected or scratched.
- Make sure to have sensor cables stay away from signal wire, power, motor power, and load cables and use independent pipe.
- If randomly disassembling or remodeling this product, please be informed that the follow-up management is not provided.
- The indication on the terminal wiring diagram indicates warning or notes of caution.
- Make sure not to use near the devices with strong and high frequency (high frequency welding machine, high frequency sewing machine, high frequency radio, and large capacity SCR controller)
- If using with the methods other than what manufacturer designates, there might be damages or loss in the property.
- As it is not a toy, make sure to keep it away from children.
- Make sure to only have specialists or qualified parties install the product.
- If not following contents on the notes of caution or warning, or in case of faults of consumers, our company is not responsible for anything.

Danger

- Risk about caution or electronic shock
- Electronic shock – Make sure not to contact AC terminal during the applying electronic current
- When checking the input power source, make sure to disconnect the input power.

2 Product specifications

Input power	100~240VAC 50/60Hz	Degree of indication	±1% rdg ± 1 digit
Indication	7segment 0.51inch 4Digit		
Output specifications	250 VAC 2A relay 4EA		
Sensor specifications	Sensor name	Temperature range	Humidity range
	CNT-TM100	-20.0°C~80.0°C	0%~100%Rh
Communication specifications	RS485, MODBUS RTU, Data 8 bit , Parity None , Stop bit 1		
Notes of attention	0~55°C , 35~80%Rh(no freezing or dew condensation)		

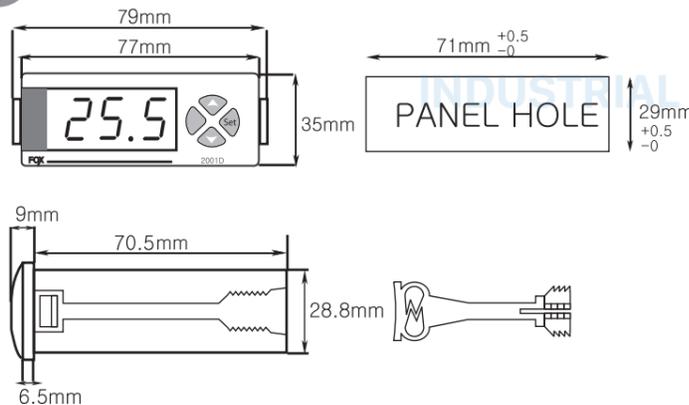
3 Names of each part

■ Appearance and names of each part



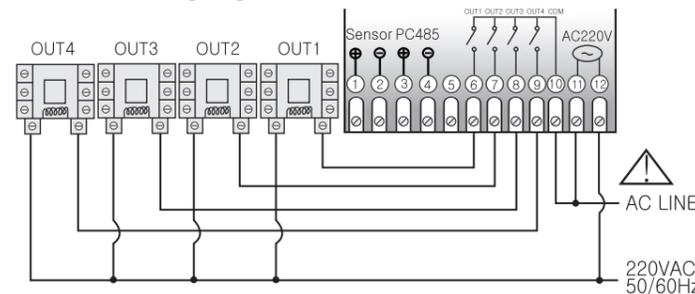
- OUT 1 output indication
- OUT 2 output indication
- OUT 3 output indication
- OUT 4 output indication
- Increasing switch
- Function changing switch
- Reduction switch

4 Exterior specifications and panel processing values



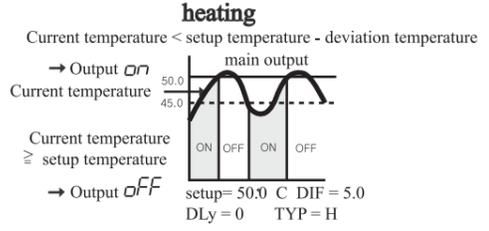
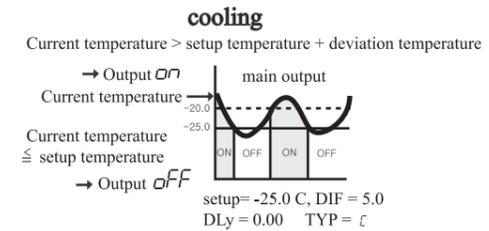
5 Terminal wiring diagram

■ Terminal wiring diagram

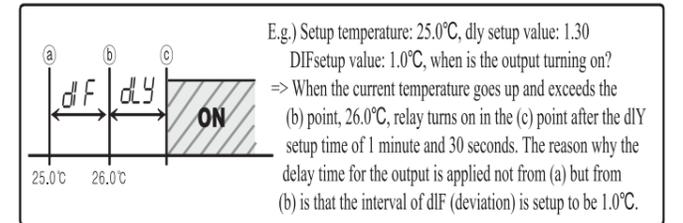


6 Order for changing the setup values

- ES1 ES2 ES3 ES4**
EV1, EV2, EV3, EV4 temperature setup, range : -20.0 ~ 80.0°C
- HS1 HS2 HS3 HS4**
EV1, EV2, EV3, EV4 humidity setup, range: -0.0 ~ 100.0%RH
- SrA** : Setup to be consistent with number of the sensor that is connected with the sensor. Available up to four.
- Adr** : Setup PC communication number, range: 1 – 256
- bPS** : Setup PC communication speed, range: 1200/2400/4800/9600/19200
- LoL** : Setup the data locking function
As a safety device for making not feasible to change setup values except for main users,
If setup as On: Lock all the setup values except for the setup temperature values
If setup as Off: Discharge lock on all the setup values except for the setup temperature values
- EB1 EB2 EB3 EB4** : Setup output 1, output 2, output 3, and output 4
- LYP** : Setup output type
LoU HoU tRo HRo Available to setup one of four types
- LoU** : Control temperature control
- HoU** : Control humidity control
- tRo** : Control temperature notification output
- HRo** : Control humidity notification output
- SSE** : Choose sensor to control
ADR Control average OR **I** control individual from 1 to 256
- FSE** : Choose cooling (C) or heating (H) if controlling temperature output
Choose dehumidification (D) or humidification (H) if controlling humidity output
- dIF** : Setup temperature and humidity deviation, range: 0.1 – 19.9
In the control for On/Off, consistent interval between on and off is required. (setup the on/off width) If on/off is too frequently operated, output point other than relay might be damaged too fast, or hunting (lifting off or chattering) might occur due to the noise from outside.
If on/off is too frequently operated, output point other than relay might be damaged too fast, or hunting (lifting off or chattering) might occur due to the noise from outside.

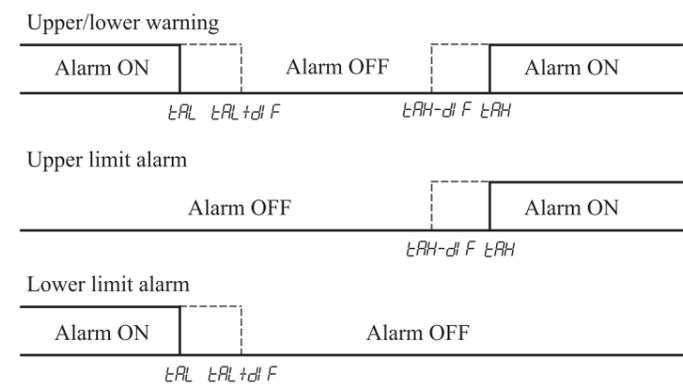


- dLY** : Delay time of temperature and humidity output, range: 0 second – 9 minutes and 59 seconds, Use if there is an issue for frequent operation of on/off on the controlled subjects. (freezer and compressor, etc.) Protecting function of the operating machines if re-applying power or instant blackout.



- tAS** : Setup the temperature alarm output
HL HI Lo Available to choose one of three types
- HL** : Select upper/lower alarm
- HI** : Select upper/lower alarm
- Lo** : Select lower alarm
- tAH** : Setup upper value of temperature
- tAL** : Setup lower value of temperature
- dIF** : Setup alarm deviation of temperature and humidity
- HAS** : Setup humidity alarm output type
HL HI Lo Available to choose one of the three types
- HrH** : Setup upper value of humidity
- HrL** : Setup upper value of humidity

* Example of using alarm setup



<Func 0x03 : Read Holding Registers>

Available to read the setup menu

Request

Sub-pro Address	com-mand	Starting number		Data number		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x03	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

Number of byte = number of data x 2
If the number of data is 23, total 23 data and 46 bytes are received.

Response

Sub-pro Address	com-mand	Byte number	Data1		Data n		CRC16	
			Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x03	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	

<Func 0x06 : Write Single Registers>

Available to change setup menu by one item

Request

Sub-pro Address	com-mand	Writing registry		Data		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

If Func 06 Write Single Register is normally registered, request and response contents are identical.

Response

Sub-pro Address	com-mand	Writing registry		Data		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

<Func 0x10 : Write Multiple Registers>

Available to change setup menu with many items.

Request When writing multiple registries, if there is an error on at least one of the data, they are not written at all.

Sub-pro Address	com-mand	Starting address		data number		Data1		Data n		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	byte number	Sub byte	Main byte	Main byte	Sub byte	Main byte
1BYTE	0x10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

Response

Sub-pro Address	com-mand	Starting address		data number		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

Number of data = Number of byte x 2

MAP Func 0x03, 0x06, 0x10

NO	Address	Explanation	Range	unit	Released value
400001	0000	Temperature1 setup values	-20.0 ~ 80.0℃	℃	20.0℃
400002	0001	Temperature2 setup values	-20.0 ~ 80.0℃	℃	20.0℃
400003	0002	Temperature3 setup values	-20.0 ~ 80.0℃	℃	20.0℃
400004	0003	Temperature4 setup values	-20.0 ~ 80.0℃	℃	20.0℃
400005	0004	Humidity1 setup values	0.0 ~ 100.0%	%	20.0%
400006	0005	Humidity2 setup values	0.0 ~ 100.0%	%	20.0%
400007	0006	Humidity3 setup values	0.0 ~ 100.0%	%	20.0%
400008	0007	Humidity4 setup values	0.0 ~ 100.0%	%	20.0%
400009	0008	Sensor matching 1	0 = No, 1~256		1
400010	0009	Sensor matching 2	0 = No, 1~256		No
400011	0010	Sensor matching 3	0 = No, 1~256		No
400012	0011	Sensor matching 4	0 = No, 1~256		No
400013	0012	PC communication number	1~256		1
400014	0013	PC communication speed	1200/2400/4800/9600/19200		9600

NO	Address	Explanation	Range	unit	Released value
400015	0014	LOCK	OFF = 0 , ON = 1		ON
400016	0015	EV1 time setup value	0 = Temperature, 1 = humidity 2 = temp alarm, 3 = humi alarm		temperature
400017	0016	EV1 sensor choosing setup values	0 = average , 1~256		1
400018	0017	EV1 temperature function setup	0 = Heating , 1 = Cooling		Heating
400019	0018	EV1 humidity function setup	0 = Humidification 1 = dehumidification		humidification
400020	0019	EV1 deviation	1~19.9		5.0
400021	0020	EV1 delay time	0 ~ 599	sec	5 sec
400022	0021	EV1 temperature alarm selection	0 = upper / lower limit, 1 = upper limit 2 = lower limit		upper/ lower limit
400023	0022	EV1 temperature upper limit setup	-20.0 ~ 80.0℃	℃	40.0℃
400024	0023	EV1 temperature lower limit setup	-20.0 ~ 80.0℃	℃	0.0℃
400025	0024	EV1 humidity alarm selection	0 = upper / lower limit, 1 = upper limit 2 = lower limit		upper/ lower limit
400026	0025	EV1 4 humidity upper limit setup	0.0 ~ 100%	%	40.0%
400027	0026	EV1 humidity lower limit setup	0.0 ~ 100%	%	0.0%
400028	0027	EV1 alarm deviation	1 ~ 19.9	%/℃	5.0
400027	0026	EV1 humidity lower limit setup	0.0 ~ 100%	%	0.0%
400028	0027	EV1 alarm deviation	1 ~ 19.9		5.0
400029	0028	EV2 time setup value	0 = Temperature, 1 = humidity 2 = temp alarm, 3 = humi alarm	%/℃	temperature
400030	0029	EV2 sensor choosing setup values	-1 = No, 0 = average , 1~256		No
400031	0030	EV2 temperature function setup	0 = Heating , 1 = Cooling		Heating
400032	0031	EV2 humidity function setup	0 = Humidification , 1 = dehumidification		humidification
400033	0032	EV2 deviation	1~19.9		5.0
400034	0033	EV2 delay time	0 ~ 599	sec	5 sec
400035	0034	EV2 temperature alarm selection	0 = Temperature, 1 = humidity 2 = temp alarm, 3 = humi alarm		upper/ lower limit
400036	0035	EV2 temperature upper limit setup	-20.0 ~ 80.0℃	℃	40.0℃
400037	0036	EV2 temperature upper limit setup	-20.0 ~ 80.0℃	℃	0.0℃
400038	0037	EV2 humidity alarm selection	0 = Temperature, 1 = humidity 2 = temp alarm, 3 = humi alarm		upper/ lower limit
400039	0038	EV2 humidity upper limit setup	0.0 ~ 100%	%	40.0%
400040	0039	EV2 humidity lower limit setup	0.0 ~ 100%	%	0.0%
400041	0040	EV2 alarm deviation	1 ~ 199	%/℃	5.0
400042	0041	EV3 time setup value	0 = temperature, 1 = humidity, 2 = temp alarm, 3 = humi alarm		temperature
400043	0042	EV3 sensor choosing setup values	-1 = No, 0 = average , 1~256		No
400044	0043	EV3 temperature function setup	0 = Heating , 1 = Cooling		Heating
400045	0044	EV3 humidity function setup	0 = Humidification , 1 = dehumidification		humidification
400046	0045	EV3 deviation	1~19.9		5.0
400047	0046	EV3 delay time	0 ~ 599		5 sec
400048	0047	EV3 temperature alarm selection	0 = upper / lower limit, 1 = upper limit 2 = lower limit	sec	upper/ lower limit
400049	0048	EV3 temperature upper limit setup	-20.0 ~ 80.0℃	℃	40.0℃

NO	Address	Explanation	Range	unit	Released value
400051	0050	EV3 humidity alarm selection	0 = upper / lower limit, 1 = upper limit , 2 = lower limit		upper/ lower limit
400052	0051	EV3 humidity upper limit setup	0.0 ~ 100%	%	40.0%
400053	0052	EV3 humidity lower limit setup	0.0 ~ 100%	%	0.0%
400054	0053	EV3 alarm deviatoin	1 ~ 199	%/℃	5.0
400055	0054	EV4 time setup value	0 = Humidification , 1 = dehumidification		temperature
400056	0055	EV4 sensor choosing setup values	-1 = No, 0 = average , 1~256		No
400057	0056	EV4 temperature function setup	0 = Heating , 1 = Cooling		Heating
400058	0057	EV4 humidity function setup	0 = Humidification , 1 = dehumidification		humidification
400059	0058	EV4 deviation	1~19.9		5.0
400060	0059	EV4 delay time	0 ~ 599	sec	5 sec
400061	0060	EV4 temperature alarm selection	0 = upper / lower limit, 1 = upper limit , 2 = lower limit		upper/ lower limit
400062	0061	EV4 temperature upper limit setup	-20.0 ~ 80.0℃	℃	40.0℃
400063	0062	EV4 temperature lower limit setup	-20.0 ~ 80.0℃	℃	0.0℃
400064	0063	EV4 humidity alarm selection	0 = upper / lower limit, 1 = upper limit , 2 = lower limit		upper/ lower limit
400065	0064	EV4 humidity upper limit setup	0.0 ~ 100%	%	40.0%
400066	0065	EV4 humidity lower limit setup	0.0 ~ 100%	%	0.0%
400067	0066	EV4 alarm deviation	1 ~ 199	%/℃	5.0

9 Simple instructions for diagnosis on the breakdown

- If indicating error while using the product
 - In case of, *Eri* this is the case that product receives strong noise from outside during the usage, and many of the storage cells in data inside are damaged. In this case, make sure to request A/S to our company. This controller has established with supplementary measures on the noise from outside. However, it is not to keep resisting the noise. In case of noise that is higher than 2KV, inside might be destroyed. If O-E or N-R are indicated, there is an abnormal condition on the screen. Make sure to check the sensor.

※ Specifications of aforementioned product are subject to change without notification for improvement of performance of a product. Make sure to be well-informed of contents indicated on the notes when dealing with them and follow them as well.

※ Regarding the English-language manual, please download it at our homepage.

■ Address : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang-gun, Busan, 46034, Rep. of KOREA

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 Email : conotec@conotec.co.kr

■ Major products and development
 - Digital temperature/humidity controller
 - Digital timer, current/voltage meter
 - Development of other products

Manual DSFOX - X10, XR10



• A user manual for this product is posted on the company website.
 • Please download the technical document and communications manual on the company website
 www.conotec.co.kr

1 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 the manufacturer may lead an injury or a property damage
17. This product is not a toy. Keep it away from children

18. This 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

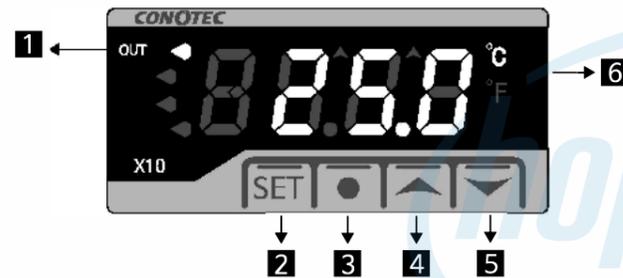
- Caution: Risk of electric shock
 - Electric shock - Do not touch the AC terminal while the current is flowing. It may cause an electric shock.
 - You must disconnect the input power when servicing it.

2 Model types

Model	Sensor	Control Type	Temperature Range	Power	Function
DSFOX-X10	NTC 10K	Relay contact (1EA)	Celsi - 55.0 °C us: ~ +99.9 °C	100~240 VAC 50/60Hz	Temperature control
DSFOX-XR10			Fahren - 60 °F heit: ~ +200 °F		Temperature control 485 communications

3 Components

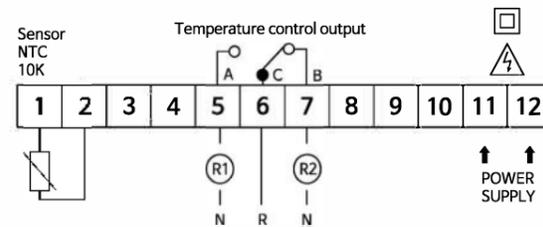
- Product appearance and components



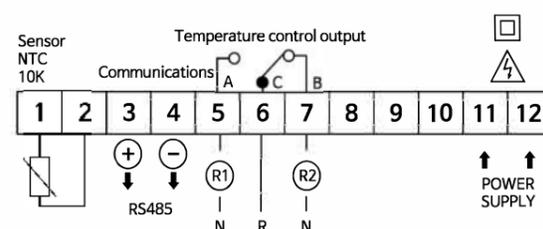
- 1 OUT output display
- 2 SET switch
- 3 Back switch
- 4 Up switch
- 5 Down switch
- 6 Temperature unit

4 Terminal wiring diagram

[DSFOX - X10]



[DSFOX - XR10]



※ Output: 250VAC 2A; A power relay or a magnet must be used.
 ※ Be careful that any load over the contact capacity may cause contact fusion, contact defect, relay damage or others

5 Setting process

Setting method

Name	Image	Description
SET key	SET	Entry into or return to the settings page Selection and saving of data values
Back switch	●	Go to the previous menu when setting up a program
Up/down key	▲ / ▼	Increment/decrement of the selected menu data

- Change of the temperature output's set temperature (temperature setting)
 - 1) If you press the SET key once, the setting will blink and be displayed
 - 2) Increase or decrease the setting with the ▲ or ▼ key.
- Installer mode settings (Program settings)
 - 1) Press the SET key for at least 5 seconds to enter into the installer mode.
 - 2) Configure the program based on the temperature program configuration diagram.
 - 3) Press ● key for Enter the previous setting menu (* Program setting mode only)

Temperature setting

The current temperature will be displayed.

If the press the SET key, the setting will blink.

Use the ▲ or ▼ key to change the setting.

Press the SET key after changing the setting.

OK, a setting confirmation text, will be displayed, and the current temperature will be shown.

Program setting

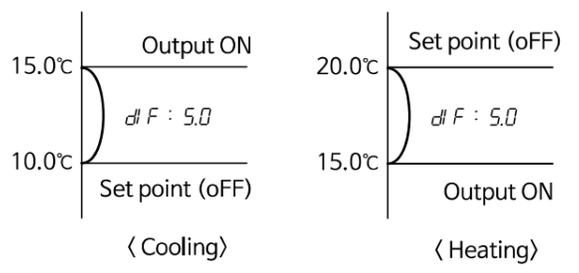
Press the key for at least 5 seconds.

- Unit: Temperature unit setting (C/F)
- Addr: Communications address setting (1~99)
- Typ: Output function option (Cool/Heat)
- Cool: Cool/Heat
- dIF: Deviation temperature setting (°C: 0.1~25.0, °F: 1~100)
- dLT: Output delay time setting (0.00~60.00 (00M 00S))
- Cor: Temperature correction setting (°C: -10.0~10.0, °F: -20~20)
- Baudrate setting: 1200 / 2400 / 4800 / 9600 / 19200
- Lock setting: OFF / ON

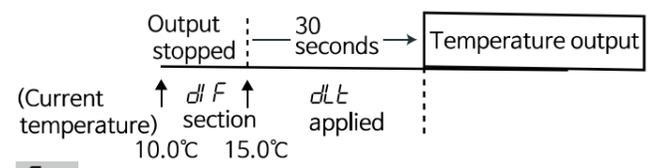
※ Those functions within a dotted rectangle will only be available on an XR 10 model.

6 Function details

- Unit** : Change of the temperature unit
 - C (temperature displayed in Celsius)
 - F (temperature displayed in Fahrenheit)
- ※ Note: If you change the **Unit** while the product is running, all the settings except for the unit will be initialized to factory settings. Please reset all the settings.
- LYP** : Output function option
 - Cooling (Cool) or heating (Heat)
- dIF** : Deviation temperature setting
 - For on/off control, there should be a certain interval between on and off.
 - A relay or other output contacts may be quickly damaged or experience hunting (electricity generation, chattering, etc.) due to an external noise if the on/off function is used too frequently.
 - Different temperature is set to prevent such phenomenon and protect relevant contacts.
- Example 1) Set temperature : 20.0°C, **LYP** : Cool, **dIF** : 5.0
 - Example 2) Set temperature : 20.0°C, **LYP** : Heat, **dIF** : 5.0



- dLT** : Output delay time setting
 - Used if the on/off function of a control target is used too frequently (freezer, compressor, etc.)
 - Protects running machine from momentary outage or power re-connection
 e.g.) When is the output on for the following conditions:
 set temperature (10.0°C); **dLT** (00.30); **dIF** (5.0°C)?



- Cor** : Correction of the current temperature
 - Used to correct the current temperature based on the reference temperature (e.g. mercury thermometer, existing thermometer, thermostat, etc.) when there is an input error by an external sensor even though the product itself does not have any problem
 e.g.) Actual temperature: 10.0°C
 Display window : 12.0°C → **Cor** Modification of 0.0 to -2.0
 → Displayed as 10.0 (current temperature modified)

- Addr** : Communications address setting
 - An address from 1 to 99 should be specified for RS485 communications
- bPS** : Baudrate setting
 - 1200BPS / 2400BPS / 4800BPS / 9600BPS / 19200BPS
- LoL** : 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 except for the set temperature will be locked.
 -If set at off: All the settings will be unlocked.

7 Setting range and factory settings

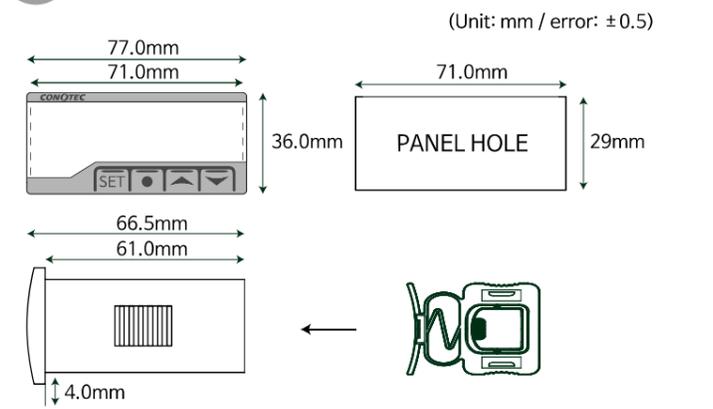
Display	Function	Applicable range in Celsius	Applicable range in Fahrenheit	Factory setting	Remarks
	Temperature setting	-55.0 ~ 99.9	-60 ~ 200	10.0	
Unit	Temperature unit	C / F		C	C : Celsius F : Fahrenheit
LYP	Output function option	Cool / Heat		Cool	
dIF	Deviation temperature setting	0.1 ~ 25.0	1 ~ 100	1.0	
dLT	Output delay time setting	0.00 ~ 60.00		0.00	minutes, seconds
Cor	Temperature correction setting	-10.0 ~ 10.0	-20 ~ 20	0.0	Correction of the difference between the displayed temperature & actual temperature
Addr	Communications address	1 ~ 99		1	
bPS	Baudrate setting	1200 / 2400 / 4800 / 9600 / 19200		9600	1200 : 1200bps 2400 : 2400bps 4800 : 4800bps 9600 : 9600bps 19200 : 19200bps
LoL	Lock option	on / off		off	

8 Communications specifications

Applicable standard	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 1.2 km
Communications protocol	Modbus
Start bit, Stop bit	1 bit (fixed)
Parity bit, Data bit	Parity bit: None, Data bit: 8 bit (fixed)

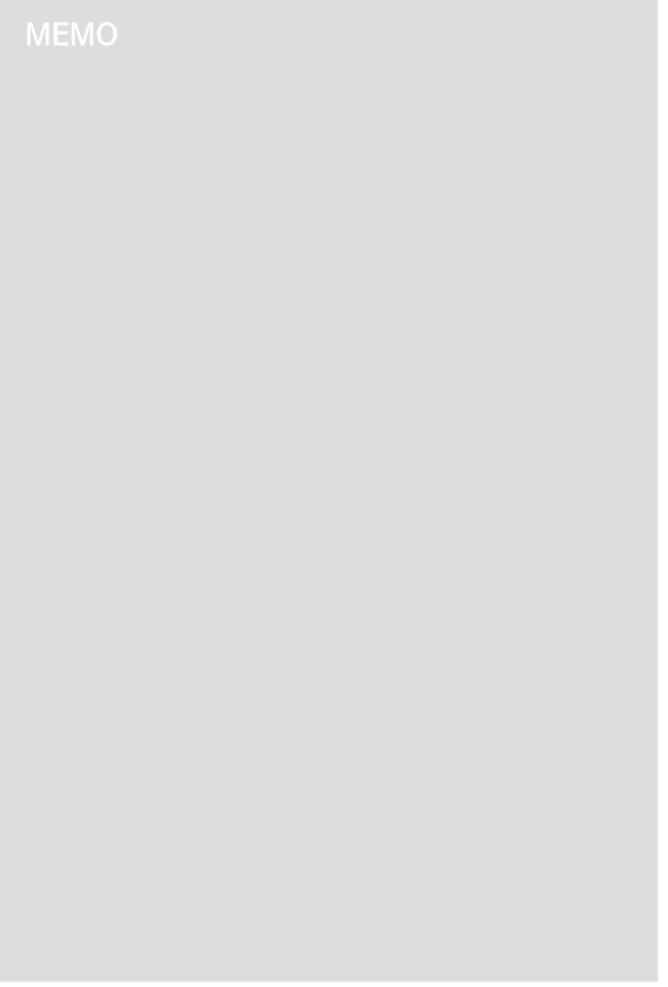
※ Please see the user manual on our website for more details about the communications specifications..

9 Product dimensions and panel processing dimensions



10 Easy error diagnosis instructions

- ※ If an error is displayed while the product is running
- **Err** : It is a 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
 - If **o-L** (OK) is displayed, settings have been saved.
 - A text such as **LoL** (lock) indicates that the product is in the lock mode
 - If **E 10** (product name) is displayed, it refers to a model name.
 - If **Er 10** (product name) is displayed, it refers to a model name.



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

- Address: (Street address) 56, Ballyongsandan 1-ro, Jangnan-eup, Gijang-gun, Busan, ROK
 (Land-lot address) 901-1, Ballyong-ri, Jangnan-eup, Gijang-gun, Busan, ROK (46034)
- Product service : 070-7815-8266
- Customer service: 051-819-0425 ~ 0427
- FAX : 051-819-4562 • Website : www.conotec.co.kr
- Email : conotec@conotec.co.kr
- SNS : Facebook, Instagram, Twitter, YouTube ☞ 'Search for 'Conotec'

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

※ This manual was prepared in the Naver Nanum fonts.

Operating manual



※ Thank you for selecting our products. please read carefully this instruction to reduce any damages or operation mistakes.

1 Model composition

Model	Output	Sensor	Humidity range	RS485
FOX-2H	Main:1c 250Vac2A	HM1500	0.0%~100.0%Rh	-
FOX-2H-2	Aux:1a 250Vac2A	HM1500	0.0%~100.0%Rh	-
FOX-2SH-1	Main:1a 250Vac2A	DS-SH series	0.0%~100.0%Rh	-
FOX-2SHR	Aux:1a 250Vac2A	DS-SH series	0.0%~100.0%Rh	support

2 Safety and Hazard instructions

Safety

Please use this item after installing the duplex safety device in which is applied at dangerous factors such as serious human injury or serious damages of property & important machine because this item is not designed as safety device.

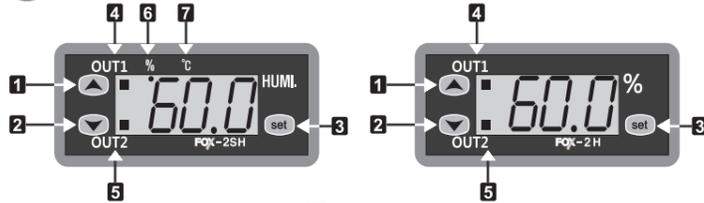
safety instruction and hazard warnings

- Please read the operating manual through completely before putting the device into operation.
- We will not assume any responsibility for damage to assets or persons caused by improper handling or failure to observe the safety instructions or hazard warnings.
- For safety and licensing reason, unauthorized conversion and/or modification of the device is not permitted.
- Do not exceed the maximum permissible current – in case of higher loads, use a contactor of adequate power. Make sure that the supplied voltage matches the values specified for the instrument.
- The device must be adequately protected from water and dust as per the application and must be accessible via the use of appropriate tools.
- The device must not be exposed to extreme temperature, sunlight, strong vibrations or high levels of humidity.
- Operation or installation in not permitted under unfavorable ambient conditions such as wetness or excessive induction loads or solenoid and dust, combustible gases, vapors or solvents, especially high-frequency noise.
- Avoid operation or installation close to high-frequency fields such as welding devices, sewing machines, wireless transmitter, radio systems, SCR controller, etc
- Do not install the sensor cable nearby signal cable, power cable, load cable.
- Please use the shield cable when the sensor cable's lengthen, however do not make it too much longer.
- Please use the sensor cable without any cutting or flaw, blemish.
- The device is not a toy and should be kept away from children.
- Installation work must only be carried out by suitably qualified personnel who are familiar with the hazards involved and with the relevant regulations.
- you shouldn't tinker with anything or the product may not be opened or disassembled unless you know what you're doing. Please ask us about this questioning.

Danger

Attention! Never work on electrical connections when the machine is switched on

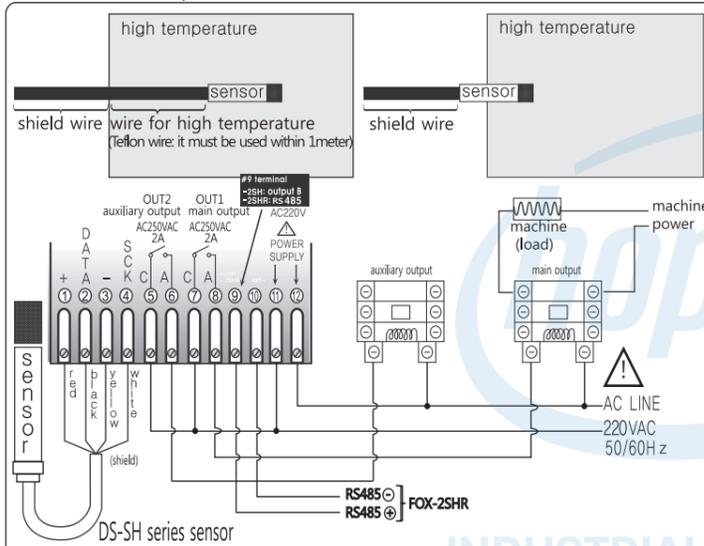
3 Part name



- 1 Setting up(UP)
 - 2 Setting down(DN)
 - 3 setting switch(SET)
 - 4 Main output
 - 5 Auxiliary output
 - 6 Humidity display(FOX-2SH(R))
 - 7 Temperature display(FOX-2SH(R))
- FOX-2SH(R) : humidity display and control + temperature display for the currency status display, there're 3 kinds of mode, as a switch of <UP(increase), DN(decrease)>, you can change the display like "Humidity/Humi&Temp/Temp".
 FOX-2H, FOX-2H-2 : humidity display and control

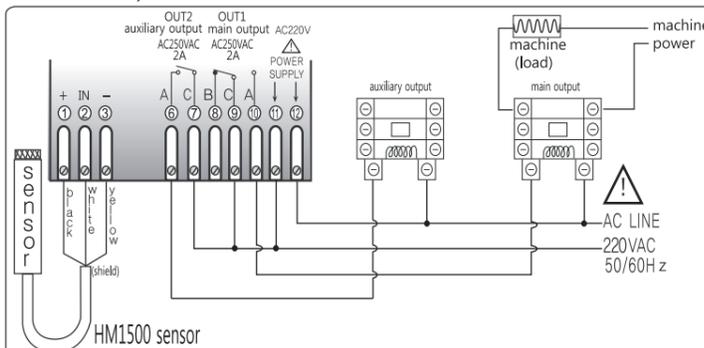
4 Connection

< FOX-2SH-1/ FOX-2SHR >



Ref1. Detailed specifications for the applicable sensor specifications, see the back of the '10. sensor's specifications'.
Caution1. Please make use of the shield wire when lengthening of the sensor wire, and in case of using in the high temperature range of 65℃~80℃, surely use the high temperature using wire(Teflon wiring).
Caution2. Please make the operating machine(load) be driven with using the power relay or magnet outside surely because its output specification of inside relay is less than 250VAC 2A.

< FOX-2H, FOX-2H-2 >



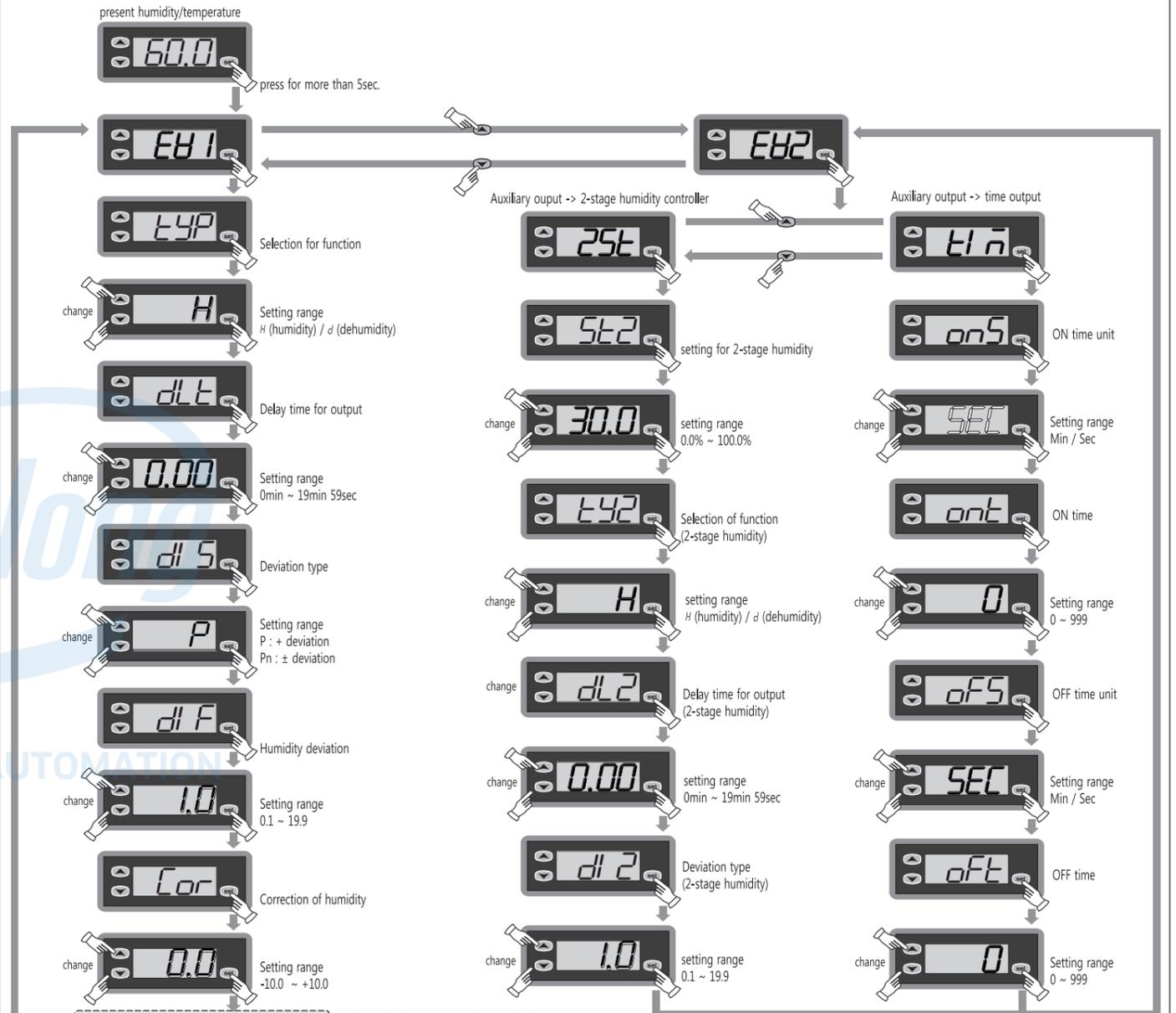
Ref1. Detailed specifications for the applicable sensor specifications, see the back of the '10. sensor's specifications'.
Caution2. Please make the operating machine(load) be driven with using the power relay or magnet outside surely because its output specification of inside relay is less than 250VAC 2A.

5 Setting for programs

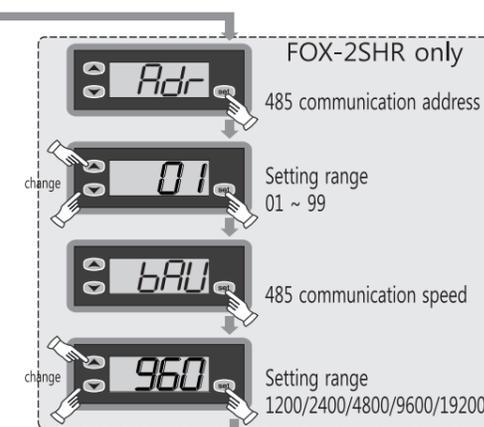
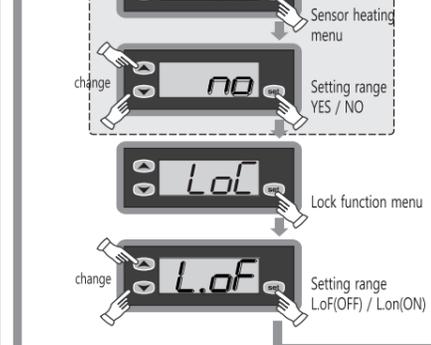
User setting humidity



Program setting



FOX-2SH-1/ FOX-2SHR only



Humi./Temp. display mode change



7 Detailed explanation

1 **EH1** Set value of the main output

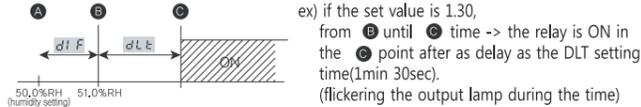
2 **LYP** Selection for function

H : humidity d : dehumidity

3 **dLE** Delay time of the output

- It is widely used as the followings

- in case of operating the ON/OFF control very often
- to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply

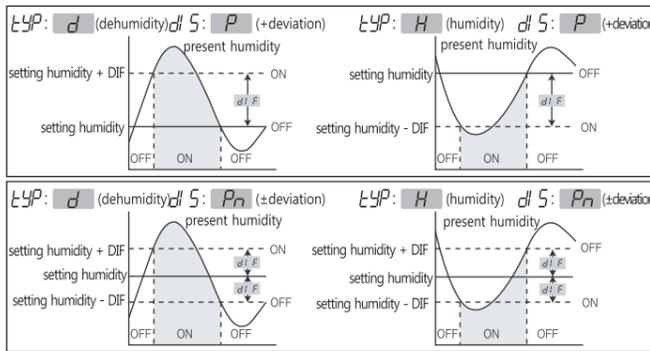


4 **dLS** Selection of the deviation for a main output

P : + deviation Pn : ± deviation

5 **dLF** Setting for temperature deviation

In the ON/OFF control, it needs at regular interval between ON and OFF. By operating the ON/OFF control frequently, the relay 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 relay or contact and so on.



6 **Cor** Correction of the present humidity

Correction function for an discrepancy between the present's display value and the actual value(accurate value)

ex) An actual humidity value is 55.5%RH only, but the present humidity's display value was 57.5%RH

=> You may use this function and can correct the display's humidity value by -2.0%RH

Caution. Actual humidity is validated the performance and accurately calibrated by using the equipment to produce. If an inaccurate equipment calculated on the basis of the actual humidity calibration, it can be caused problems with product operation.

7 **HEE** Heating element for humidity sensor (only FOX-2SH-1)

It is possible to be covered with dew when the humidity is high, If the present humidity is 95%RH, it is generated heat inner its sensor in order to prevention of dew.

YES It is operated the heating function automatically if the humidity is more than 95%RH. It is removed it if the humidity is less than 95%RH

no The heating function will be prohibited.

Caution-It must be set up "NO" because the heating function can not be used for more than 95%RH

R.F) The present temperature's display can be increased a little while operating of the humidity sensor's heating function

8 **LoL** Lock function of setting data

As a safety device, it is used in orser not to change the set value except for a main user

LoL Setting for lock function **LoF** removal for lock function

9 **Adr** RS485-communication address setting

The product FOX-2SHR supports RS485 communications. when communicating with the master device for mutual recognition is the ability to set the communication address.

10 **bPU** RS485-communication speed setting

when communicating with the master device to the exchange of accurate data must match the communication speed.

11 **EE2** Set values for an auxiliary

12 **2SE** auxiliary output -> 2-stage output

13 **SE2** change of the setting humidity for an auxiliary output

14 **LY2** Output type for an auxiliary output

H : humidity d : dehumidity

15 **dL2** Delay time of the auxiliary output

see the 3. dLE menu

16 **dL2** Humidity deviation of the auxiliary output

see the 5. dLF menu

17 **ELn** auxiliary output -> time output

18 **onS** auxiliary output on time

n : setting for a minute unit SEC : setting for a second unit

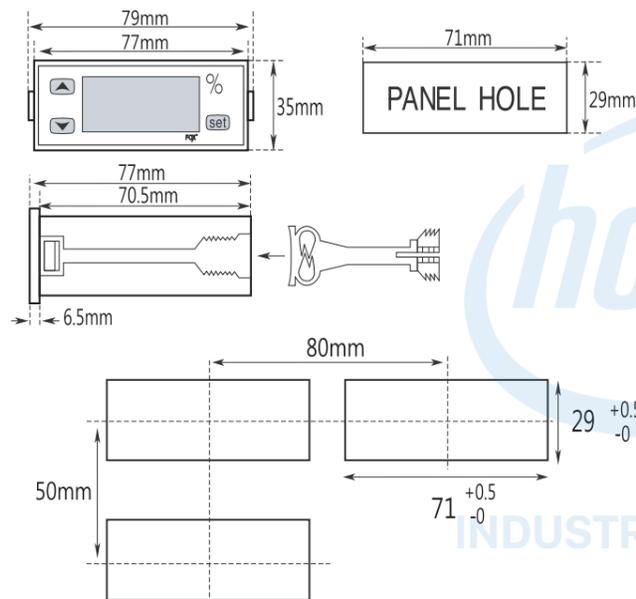
19 **ont** auxiliary output -> on time

20 **oFS** auxiliary output off time

n : setting for a minute unit SEC : setting for a second unit

21 **oFE** auxiliary output -> off time

8 Size & dimension



9 Setting range & Set value when deliver

Model	Division	Function	Range	set value when deliver
FOX-2SHR	Main output	SEt	setting for humidity	0.0~100.0%Rh 30.0%Rh
		LYP	selection for function	H / d H(humidity)
		dLE	delay time for output	0.0~19min 59sec 0min 0sec
	Sensor	dLF	humidity deviation	0.1 ~ 19.9 0.1
		dLS	deviation type	P / Pn P(+deviation)
		Cor	correction of humidity	-10.0 ~ +10.0°C 0.0°C
	auxiliary output (2-stage)	LoL	lock function	LoL/LoF LoF
		SE2	setting humidity	0.0~100.0%Rh 30.0%Rh
		LY2	selection for function	H / d H(humidity)
		dL2	delay time for output	0.0~19min 59sec 0min 0sec
dL2		humidity deviation	0.1 ~ 19.9 0.1	
auxiliary output (time)	onS	ON time unit	n / n/SEC SEC (sec)	
	ont	setting for ON time	0 ~ 999 0	
	oFS	setting for OFF time unit	n / n/SEC SEC (sec)	
Sensor	oFE	setting for OFF time	0 ~ 999 0	
	HEE	heating function for the humidity sensor	YES/no no	
communication	Adr	485 communication address	01 ~ 99 01	
	bPU	485 communication speed	120 (1200Bps) 240 (2400Bps) 480 (4800Bps) 960 (9600Bps) 1920 (19200Bps) 960 (9600Bps)	

10 Sensor's specifications

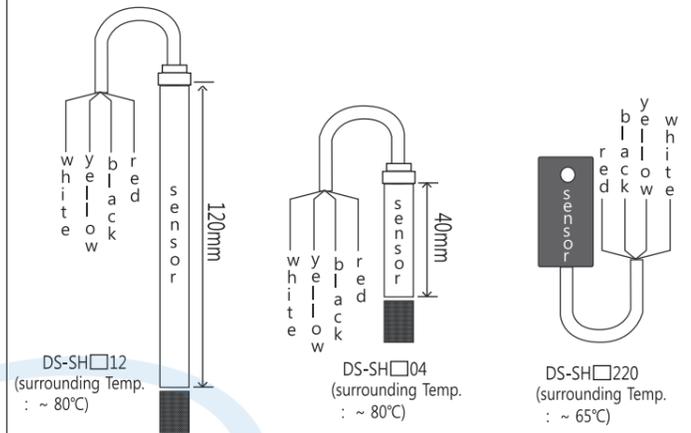
< DS-SH series > FOX-2SH-1 FOX-2SHR

Model : DS-SH[A][H]
 A(Humidity Accuracy) H(Housing Type)
 - 0 : ±4.5% - 04 : Stainless Body Length 40mm(To the ambient temperature is 80°C)
 - 1 : ±3.0% - 12 : Stainless Body Length 120mm(To the ambient temperature is 80°C)
 - 5 : ±2.0% - 220 : Plastic Case

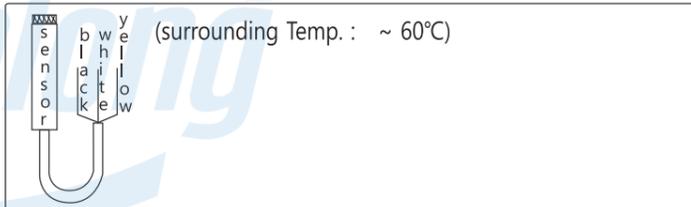
Caution1. When using a communication shield wire, the distance sensor installation is within 20m.

Caution2. In addition to using the shield, when using a wire, the distance sensor installation is within 3m.

Caution3. Installation direction refers to the shown below.



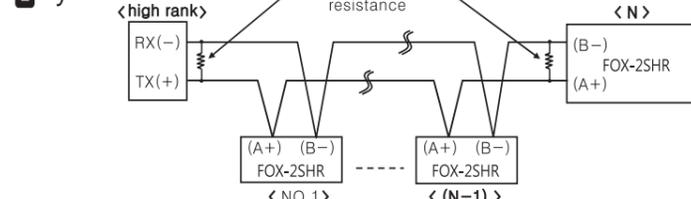
< HM1500 > FOX-2H, FOX-2H-2



11 Communication interface (FOX - 2SHR)

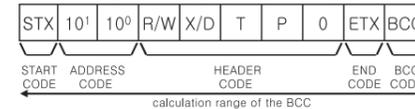
specification	in conformity EIA RS485
The method of communication	two wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1.2Km
communication speed	1200/2400/4800/9600/19200bps
StartBit	fixed 1bit
StopBit	fixed 1bit
ParityBit	none
DataBit	fixed 8bit
Protocol	BCC

1 System

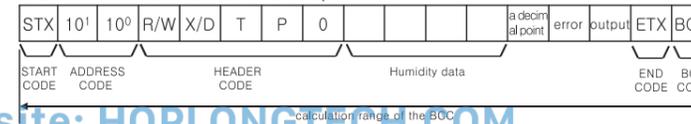


2 Definition between communication command and block

< Show the format of the command >



< Show the format of the response >



① START CODE

Show the lead(head) of the block
STX -> [02H]

② ADDRESS CODE

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

③ HEADER CODE : Show the command name as a 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], O[30H]

④ Composition of data : Data is displayed as "Hexa decimal"

⑤ Decimal point - 0[30H] there is no "decimal point"

1[31H] there is "decimal point"

⑥ Error- 0[30H] : there is no "error"

1[31H] : interrupted of the sensor' s cable
 2[32H] : low error
 3[33H] : high error

⑦ Output

output	time output	auxiliary 2-stage output	main output	output	time output	auxiliary 2-stage output	main output
0x30	OFF	OFF	OFF	0x34	ON	OFF	OFF
0x31	OFF	OFF	ON	0x35	ON	OFF	ON
0x32	OFF	ON	OFF	0x36	ON	ON	OFF
0x33	OFF	ON	ON	0x37	ON	ON	ON

⑧ END CODE : show the end(close) of the block ETX -> [03H]

⑨ BCC(Black Check Character)

Show the XOR arithmetic and logic values from the start(STX) to the ETX

• the others : As of no response of the ACK

- ① in case of not equivalent to the channel after receiving 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 normally
- ④ change the communication speed in case of bring about the communication' s error frequently

13 Error message

■ **Er I** - Memory error. Turn the power off and turn it on again. If the error message persists, please request us A/S by return.

■ **o-E** - Sensor error. The sensor is interrupted. Check the cable.

■ **S-E** - Sensor error. The sensor is short-circuited. Check the cable.

※ The product's specification can be changed without any notification to improve its quality.

■ **H. Office** : CONOTEC Co.,Ltd 56, Ballyongsandan 1-ro, Jangan-eup, Gijang-gun, Busan, 46034 Rep. of KOREA

■ **A/S** TEL : 051 - 819 - 0425 ~ 7

■ **e-mail** : conotec@conotec.co.kr

■ **URL** : www.conotec.co.kr

■ This device works proper operation with;
 surrounding Temp. : 0°C ~ 60°C
 surrounding Humi. : below 80%RH
 Regular : 220Vac ±10% 50/60Hz

■ **Main products & Development**

- Digital temperature/humidity controller
- Digital timer, Current/voltage meter
- The other development products

Operating Manual



Thank you very much for selecting our products.

1 Caution for your safety

Please read this instruction carefully before using this controller

※ The manual's information & specification can changeable to improve its quality without any notification.

⚠ Safety

1. Pls use this item after installing the duplex safety device in which is applied at dangerous factors such as serious human injury or serious damages of property & important machine because this item is not designed as safety device
2. Do not checking or repairing when it is power on
3. Please check the terminal number before connecting power supply
4. Do not disassembling or opening, remodeling, repairing without any permission

⚠ Safety Instruction and Hazard Warnings

- Please read the operating manual through completely before putting the device into operation.
- We will not assume any responsibility for damage to assets or persons caused by improper handling or failure to observe the safety instructions or hazard warnings.
- For safety and licensing reasons, unauthorized conversion and/or modification of the device is not permitted.
- Do not exceed the maximum permissible current - in case of higher loads, use a contactor of adequate power. Make sure that the supplied voltage matches the values specified for the instrument.
- The device must be adequately protected from water and dust as per the application and must be accessible via the use of appropriate tools
- The device must not be exposed to extreme temperature, sunlight, strong vibrations or high levels of humidity.
- Operation or installation is not permitted under unfavorable ambient conditions such as wetness or excessive induction loads or solenoid and dust, combustible gases, vapors or solvents, especially high-frequency noise
- Avoid operation or installation close to high-frequency fields such as welding devices, sewing machines, wireless transmitter, radio systems, SCR controller, etc
- Do not install the sensor cable nearby signal cable, power cable, load cable
- Please use the shield cable when the sensor cable's lengthen, however do not make it too much longer
- Please use the sensor cable without any cutting or flaw, blemish.
- The device is not a toy and should be kept away from children
- Installation work must only be carried out by suitably qualified personnel who are familiar with the hazards involved and with the relevant regulations.
- You shouldn't tinker with anything or the product may not be opened or disassembled unless you know what you're doing. Please ask us about this questioning

⚠ Danger

Attention ! Never work on electrical connections when the machine is switched on

2 Composition

Model	Sensor	Temp./Humi.range	External size	Function
FOX-300JSHR	SH-104	-29.9 ~ 99.9°C 0.0 ~ 99.9%	W194 X H241mm	temp,humi.control R485 communication
FOX-300-2S	SH-104	-29.9 ~ 99.9°C 0 ~ 100%	W72 X H72mm	temp.control humi.control
FOX-300A	DS-4000NH	-40.0 ~ 65.0°C 10 ~ 100%	W72 X H72mm	temp.control humi.control
FOX-300AR	DS-4000NH	-40.0 ~ 65.0°C 10 ~ 100%	W72 X H72mm	temp,humi.control R485 communication
FOX-300JR	DS-4000NH	-40.0 ~ 65.0°C 10 ~ 100%	W194 X H241mm	temp,humi.control R485 communication
FOX-8300R	DS-4000NH	-40.0 ~ 65.0°C 10 ~ 100%	W94 X H150mm	temp,humi.control R485 communication

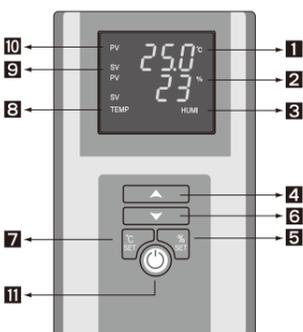
※300 series

Temp./humi. range can be changed to -55 C ~ 99.9 C (10~100%) if using

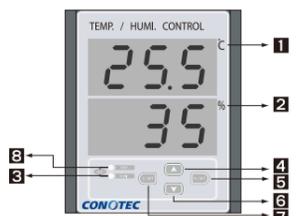
Temp. sensor : FS-200N(NTC 10K)
Humi. sensor : DS4000

instead of DS4000NH.

3 Part name



- 1: Display of the present temperature (red color)
- 2: Display of the present humidity (green color)
- 3: output display of the humidity's working
- 4: Up
- 5: Humidity mode
- 6: Down
- 7: Temperature mode
- 8: output display of the temperature' working
- 9: Display of the set value
- 10: Display of the measuring value
- 11: Power supply

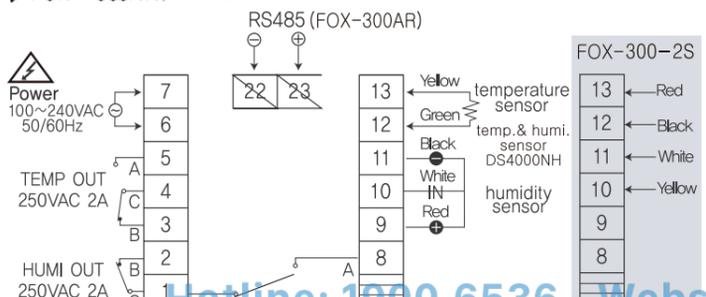


- 1: Temperature sensor
- 2: temp. & humi. sensor DS4000NH
- 3: humidity sensor
- 4: Humidity mode
- 5: Temperature mode
- 6: Down
- 7: Temperature mode
- 8: output display of the temperature' working
- 9: Display of the set value
- 10: Display of the measuring value
- 11: Power supply

4 Connection

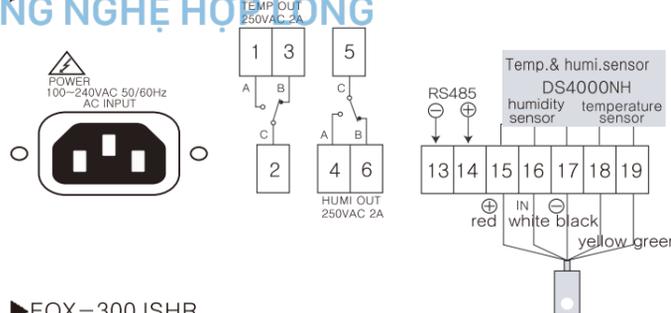
output : 250VAC 2A
Please make use of the power relay or a suitable magnet surely.

▶ FOX - 300AR, 300-2S

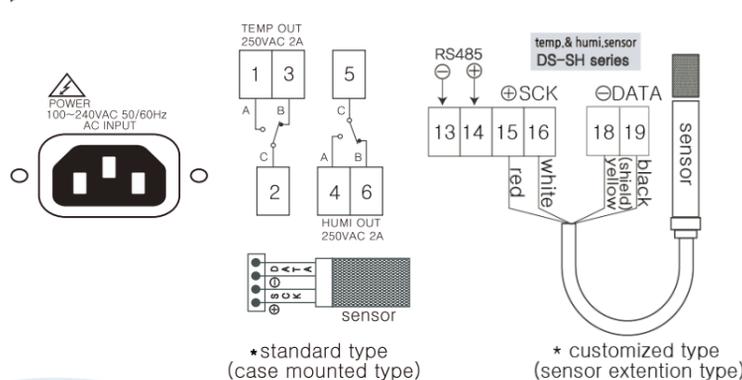


CÔNG TY CỔ PHẦN CÔNG NGHỆ HỢP LONG

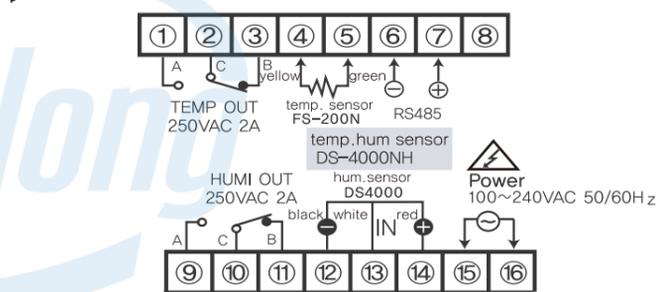
▶ FOX-300JR



▶ FOX-300JSHR

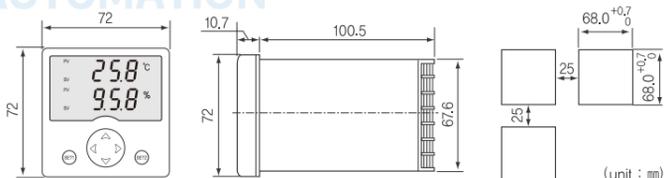


▶ FOX-8300R

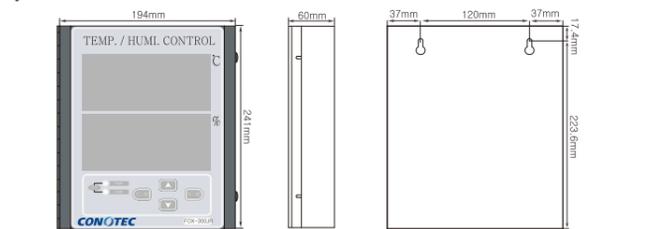


5 Size & Dimension

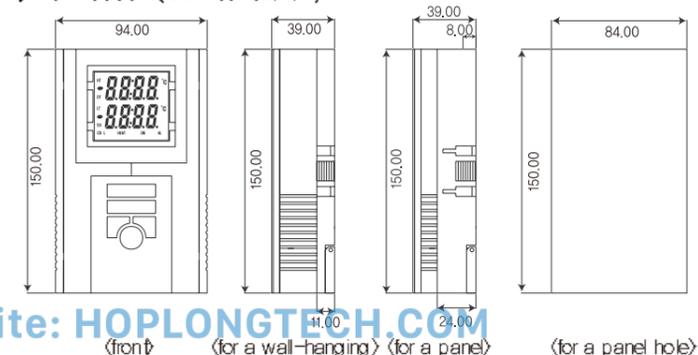
▶ FOX -300AR, 300-2S(72x72x110mm)



▶ FOX-300JR(194x241x60mm)

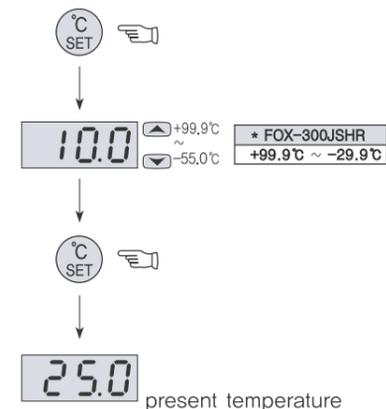


▶ FOX-8300R(94x150x39mm)

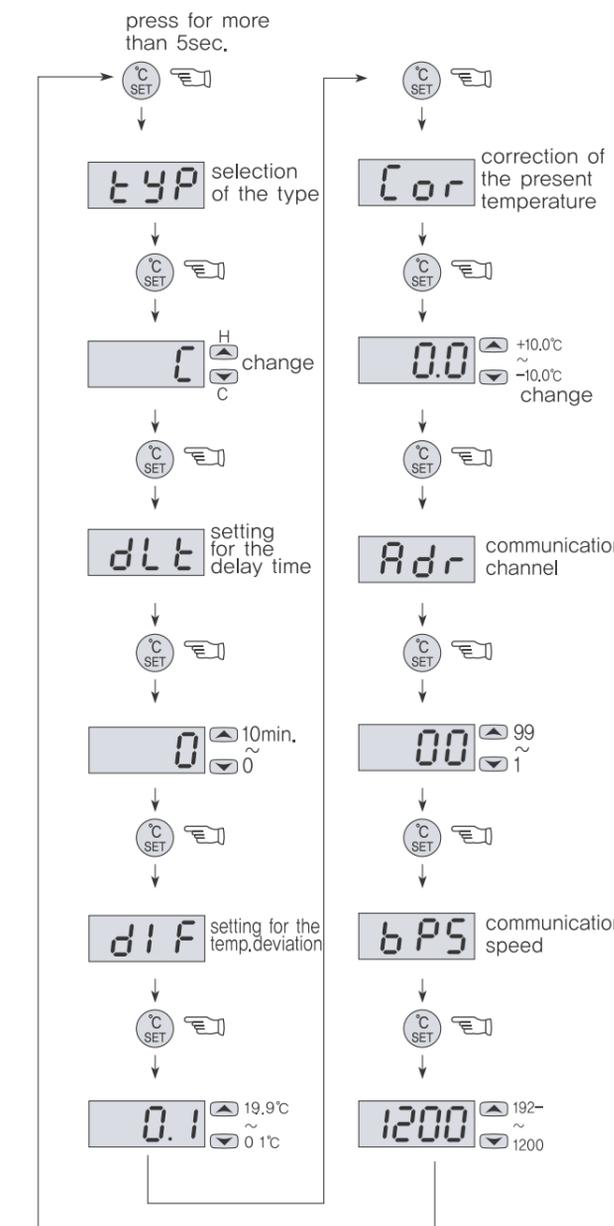


6 Temperature

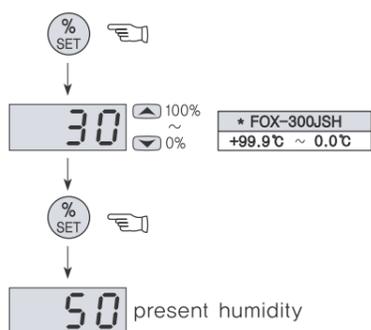
Setting for temperature



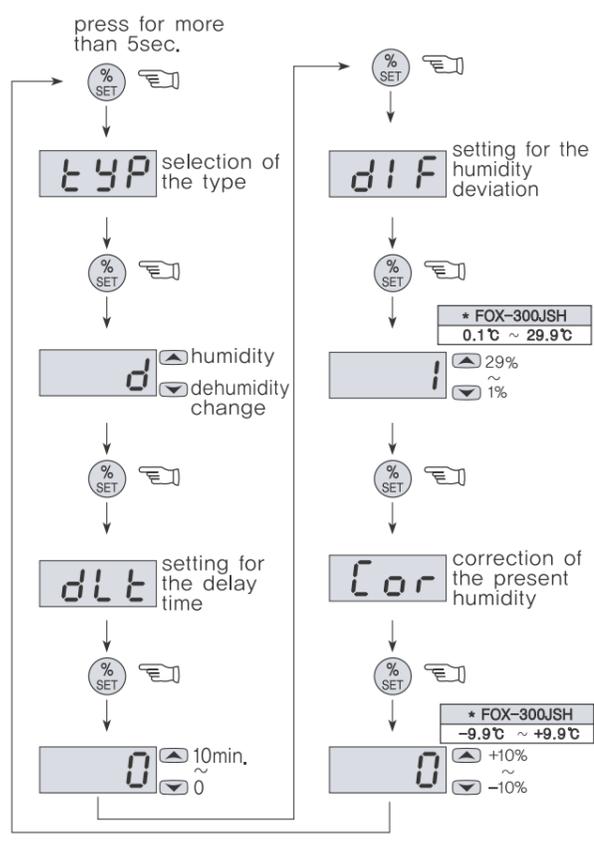
Setting for temperature programs



Setting for the humidity



Setting for humidity programs



※To change it with program mode, press the SET key for more than 5 second in the present temperature display mode.

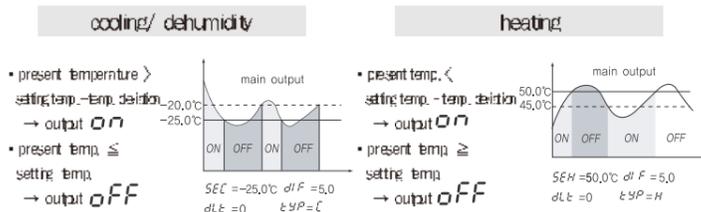
※The set or programming mode is terminated, if you press the **o-k** key, parameters(set values) are saved after the display shows OK letter or return to present temperature automatically after 30 second.

8 Detailed manual

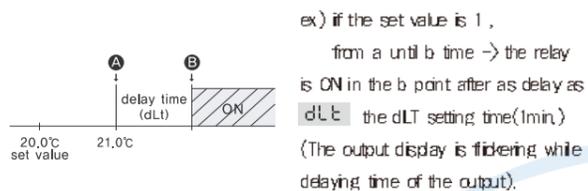
- typ** : temperature : possible to select the coding or heating, humidity : possible to select the humidity or dehumidity.
- dif** : Setting for temperature deviation
 - In the ON/OFF control, it needs at regular interval between ON and OFF.
 - By operating the ON/OFF control frequently, the relay or 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 relay or contact and so on.

Temp. range & set value when deliver

ex=> The method of the temp. deviation when ON/OFF control



- dlt** : Delay time of the output
 - It is widely used as followings ;
 - in case of operating the ON/OFF control very often,
 - to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply



- cor** : Correction of the present temperature,
 - It is used for the correction of an discrepancy between the display temperature and an actual temperature
- ex) real temp. : 10.0°C
display : 12.0°C → **cor** : 0.0 ⇒ -2.0 correction
→ 10.0°C display

- Adr** : Communication channel
 - To designate the channel while RS485 communication working
- bps** : Communication speed(velocity)
 - 120, 1200 : 1200bps
 - 240, 2400 : 2400bps
 - 480, 4800 : 4800bps
 - 960, 9600 : 9600bps
 - 192, 1920 : 19200bps

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

9 Temp. range & set value when deliver

	function	display	range	set value	remarks
setting temp.	setting temp.(DS4000NH)		-40.0~65.0	10.0	
	setting temp.(SH-104)		-29.9~99.9	10.0	
setting programs	selection of the type	typ	C/H	C	H : heating C : cooling
	temp deviation	dif	0.1~19.9	1.0	
	delay time	dlt	0~10	0	minute
	correction of the temp	cor	-10.0~10.0	0.0	correc: bran discrepancy between the display temp. and an actual temperature.
	communication name	Adr	01~99	0	RS485 communication
communication speed	bps	1200/2400/4800/9600/19200	1200	RS485 communication	

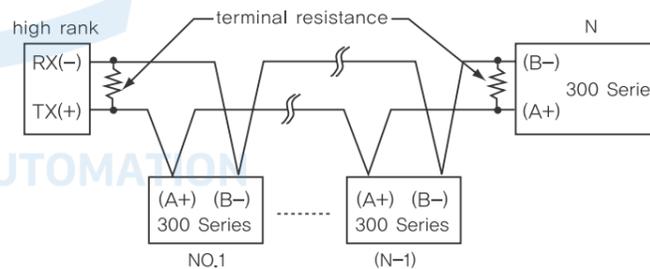
	function	display	range	set value	remarks
setting humi.	setting humidity	DS4000NH SH-104	0~100% 0.0~99.9%	30%	
	selection of the type	typ	d/H	d	H : humidity d : dehumidity
setting programs	humidity deviation	DS4000NH SH-104	1~29 0.1~29.9	1 0.1	
	delay time	dlt	0~10	0	minute
	correction	DS4000NH SH-104	cor	-10~10 -9.9~9.9	0

11 Communication output

Interface

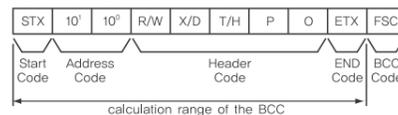
specification	in conformity EIA RS485
maximum connection	32(However, available to set the Address from 01 until 99)
the method of communication	two-wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1,2km
communication speed	1200/2400/4800/9600/19200bps(ass: to be section)
Start bit	fixed 1bit
Stop bit	fixed 1bit
Parity bit	none
Data bit	fixed 8bit
Protocol	BCC

System

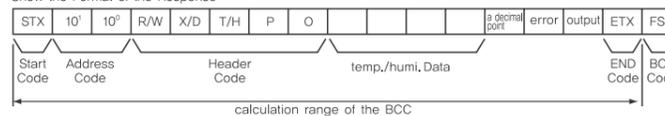


Definition between communication command and Block

Show the Format of the Command



Show the Format of the Response



- Start Code**
 - show the lead(head) of the Block
 - ACK will be added in case of STX->[02H], Response
- Address Code**
 - A high rank system can discriminates the channel code number among FOX-300series
 - It is available to set between 01 and 99(BCD ASC II)
- Header Code**
 - show the command name as a 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) → W[54H], P[50], O[30H]
 - HPO(temperature measuring value) → H[48H], P[50], O[30H]
- Composition of Data**
 - Data is displayed as "Hexadecimal"
 - Decimal point** → O[30H] there is no "decimal point" 1[31H] there is "decimal point"
 - Error** → O[30H] there is no "error" 1[31] interrupted of the sensor's cable 2[32] short-circuited error of the sensor
 - Output** → 1[31H] T/H OUT ON 3[33H] T/H OUT OFF
 - END Code**
 - show the end(close) of the Block ETX → [03H]
 - BCC(Black Check Character)**
 - show the XOR arithmetic and logic values from the start(STX) to the ETX
 - the others : As of no response of the ACK
 - in case of not equivalent to the channel after receiving STX
 - in case of generating the Receive Buffer Overflow
 - in case of not equivalent to the communication's set values or baud rate
 - treatment- in case of no response of the ACK
 - check the cable
 - check the communication's condition (set values)
 - if the main cause of the status is the noise, try to do communication practicing 3times until recovering normally.
 - change the communication speed in case of bring about the communication's error frequently.

12 Error message

- E-r** Memory error. Turn the power off and turn it on again
 - If the error message persists, please request us A/S by return
- o-e** Sensor error. The sensor is interrupted. Check the cable.
- s-e** Sensor error. The sensor is short-circuited. Check the cable

※The product's specification can be changed without any notification to improve its quality.

■ H. Office : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea
 ■ Factory : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea

■ TEL : +82-51-819-0426
 ■ FAX : +82-51-819-4562
 ■ e-mail : conotec@conotec.co.kr
 ■ URL : www.conotec.co.kr

■ Main products & Development
 - Digital temperature controller
 - Digital humidity controller
 - Digital timer

※ This device works proper operation with:
 Surrounding Temp. : 0°C ~ 60°C
 Surrounding Humi. : below 80%RH
 Regular power : 220VAC ±10% 50/60Hz



2 Models

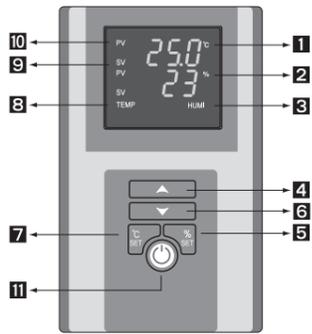
Model	Sensor	Range	Dimension	Function
FOX-300JSHR	DS-SH series	-39.9°C ~ 80.0°C 0% ~ 100Rh%	W194 x H241mm	Temp./Humi. control RS485
FOX-300-2S1			W72 x H72mm	
FOX-300A-1	HCPV-220NH	-40.0 ~ 65.0°C 10 ~ 95%	W72 x H72mm	Temp./Humi. control
FOX-300AR1			W194 x H241mm	
FOX-300JR1			W194 x H241mm	Temp./Humi. control RS485
FOX-8300R1			W94 x H150mm	

※ FOX-300 series model

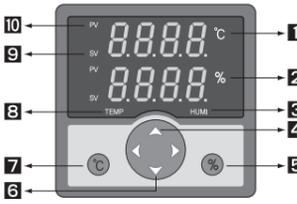
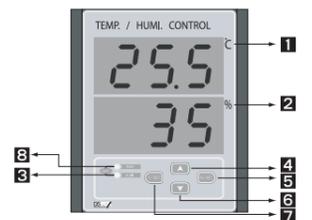
The sensor HCPV-220NH (Temp./Humi) is replaceable with Temp. : FS-200N(NTC10K)
Humi. : HCPV-220

Temp. & Humi. ranges are also available upto -55.0°C ~ 99.9°C
10 ~ 95%

3 Name of each parts

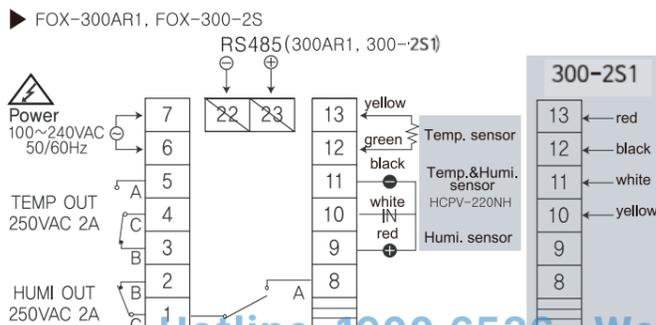


- 1 : Temp. measured value display(red)
- 2 : Humi. measured value display(green)
- 3 : Humi. output display
- 4 : Set value(UP) key
- 5 : Humi. mode changing key
- 6 : Set value(DOWN) key
- 7 : Temp. mode changing key
- 8 : Temp. output display
- 9 : Set value display
- 10 : Measured value display
- 11 : Power

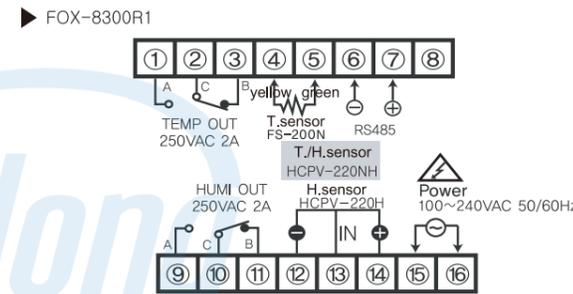
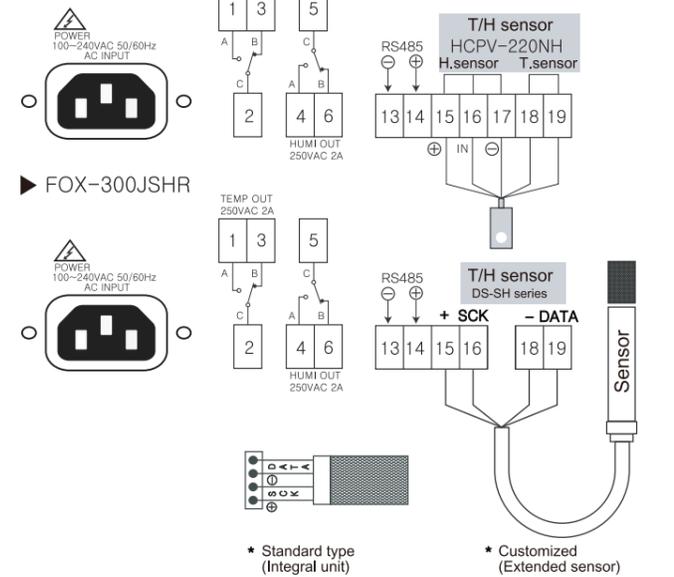


4 Wiring terminal

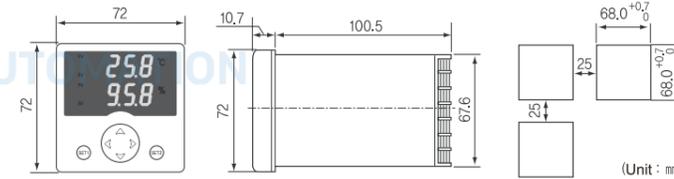
Output : 250VAC 2A
Please make sure to use the power relay or a suitable magnet .



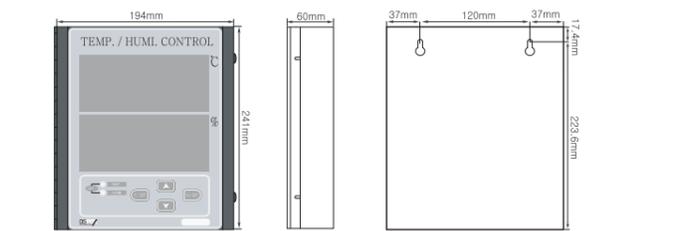
5 Product exterior dimension



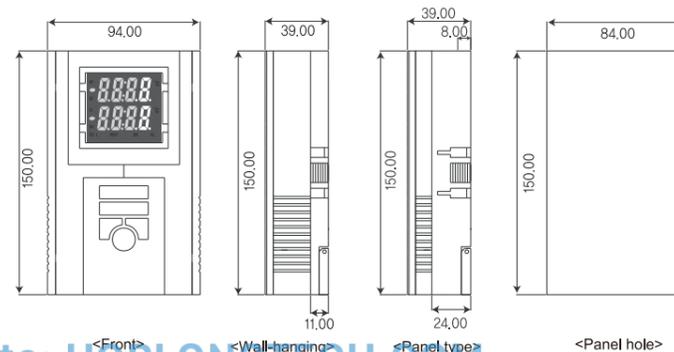
▶ FOX-300AR1, FOX-300-2S1 (72x72x110mm)



▶ FOX-300JR1 (194x241x60mm)

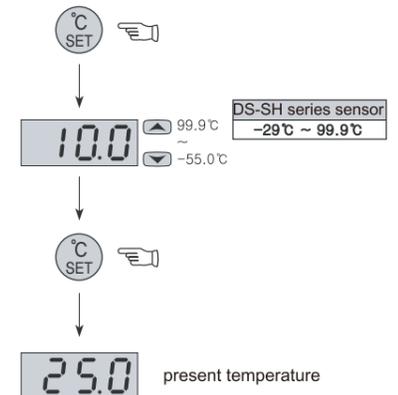


▶ FOX-8300R1 (94x150x39mm)

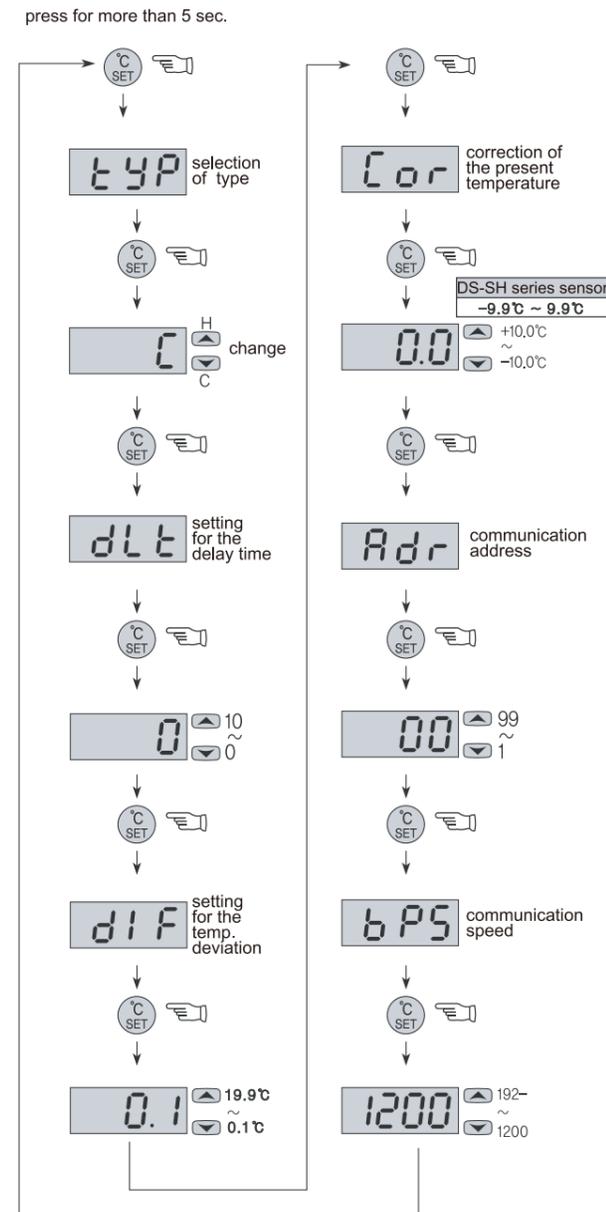


6 Temperature

Setting for temperature



Setting for temperature programs



1 Safety Precautions

Be sure to read cautions before use for correct use.

※ The specifications and exterior sizes described in this manual may be subject to change for improving product capacity.

⚠ Safety Precautions

- This product was not manufactured as a safety device. Therefore, in case of using it as a controller such as for a device that may cause casualty, serious damage to peripheral devices, and tremendous loss of property, be sure to attach double safety devices.
- Do not wire or inspect or repair while power is on.
- In case of supplying power, be sure to check a terminal number for connection.
- This device should not be disassembled, processed, improved, or repaired.

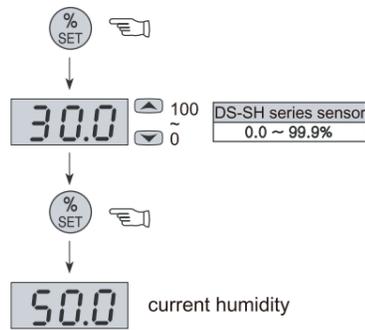
⚠ Caution

- Before the installation of this device, understand fully how to use, safety regulations or warnings, and be sure to use within specified related specifications or related capacities.
- Do not wire or install it for a motor or solenoid with great inductive load.
- During the extension of a sensor, use a shielding wire, and do not make it unnecessarily longer.
- Do not use the same power supply or any part that generates arc during closing or opening directly near the power supply.
- A power line should be far apart from a high-tension wire, and the device should not be installed in a place containing much water, oil, or dust.
- Do not install it in a place under direct light or exposed to rain.
- Do not install it in a place with strong magnetism or noise or vibration or impact.
- Put it far apart from a place that may release strongly alkaline or strongly acidic substance, and use an independent pipe.
- Do not spray water directly on it for cleaning in case of installing it in the kitchen.
- Do not install it in a place where temperature/humidity exceeds rating.
- Take caution not to break a sensor wire or make any scratch.
- A sensor wire should be away from a signal line, power, and load line, and use an independent pipe.
- In case of disassembling or modifying this product voluntarily, it may not be applied with warranty service.
- A ⚠ mark on the terminal circuit diagram is a safety mark as warning or caution.
- Do not use it near any device (harmonics welder, harmonics, harmonics radio, and large capacity SCR controller) that generates strong harmonics noise.
- In case of using it with any other method than one designated by a manufacturer, injury or loss of properties may occur.
- As it is not a toy, keep out of the reach of children.
- Installation must be done by a relevant professional or a qualified person.
- Our company shall not be responsible for any damage caused by failing to observe the contents specified in the above warnings or cautions or by the fault of a consumer.

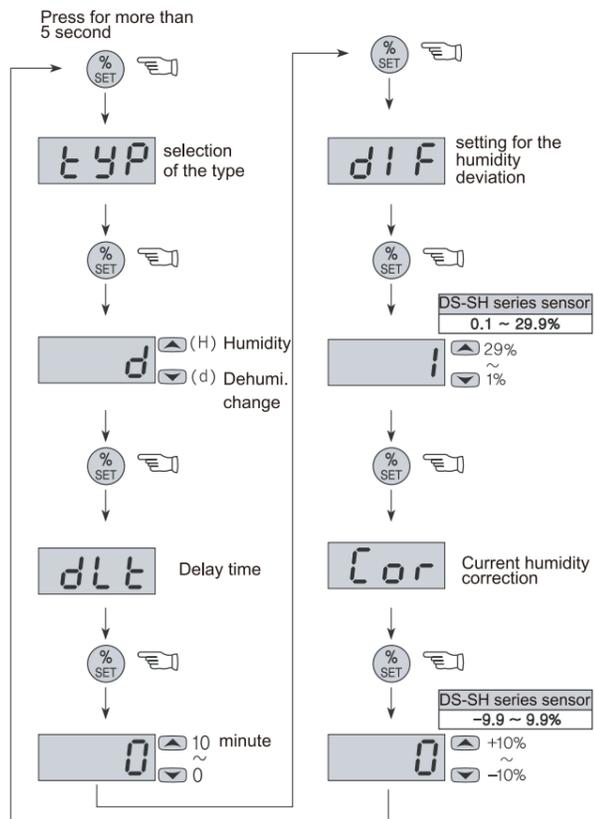
⚠ Danger

- Caution, risk of electric shock
- Electric Shock - Do not contact with AC terminal during current carrying. This may cause electric shock.
- Input power must be blocked when checking input power.

Setting for the humidity



Setting for the humidity program

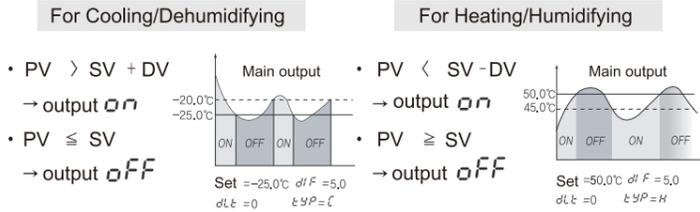


※ Pressing SET key for 5 sec. in the state of current temperature display, can be entered the program setting mode.
 ※ All programs are returned automatically in 30 sec. to the present temperature after displaying [o-H] by pressing SET key once after set value changing.

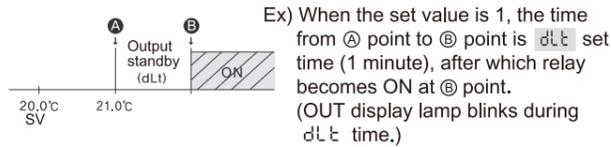
8 About Detailed Function

- tYP** : Temperature : Select Cooling(C) or Heating(H)
 Humidity : Select Dehumidity(d) or Humidity(H)
- dIF** : Deviation temperature setting
 - A regular interval is required between ON and OFF in the ON/OFF control (set up ON/OFF width)
 - Frequent ON and OFF will shorten the lifespan of the relay or the output contact or cause hunting (generation, chattering) by noise from outside. The temperature deviation function is used to setup temperature deviation to protect the equipment contact, etc.

Method of temperature deviation when ON/OFF control



- dLT** : Output Delay Time
 - This function should be used when an object subject to control repeats ON/OFF actions and cause problems (chillers, compressors).
 - A function to protect the working machine upon momentary power failure or power is reapplied.



- 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 a thermometer currently use, a temperature controller)

e.g.) Actual temperature : 10.0°C → CoR : 0.0 ⇒ -2.0
 Display Window : 12.0°C
 Display in → 10.0°C (corrected current temperature)

- Adr** : Communication station settings
 - When using the RS485 communication, specify a station number between 1-99.
- bPS** : Communication speed settings
 - 120, 1200 : 1200bps
 - 240, 2400 : 2400bps
 - 480, 4800 : 4800bps
 - 960, 9600 : 9600bps
 - 192, 1920 : 19200bps
 (Start bit 1, Stop bit 1, Non parity)

9 Temperature setting range and default set

	Function	Display	Range	Default	Remarks
Setting temperature	Temperature setting (HCPV-220NH, DS-SH series)		-55.0 ~ 99.9	10.0	DS-SH series : -29.9~99.9
Settings	Function selection	tYP	C / H	C	H : For Heating C : For Cooling
	Deviation temperature	dIF	0.1 ~ 19.9	1.0	
	Output delay time	dLT	0 ~ 10	0	Minute
	Temperature correction (HCPV-220NH, DS-SH series)	CoR	-10.0 ~ 10.0	0.0	Differs from displayed and actual value SHT11 : -9.9 ~ 9.9
	Address	Adr	01 ~ 99	0	RS485 communication
	Speed	bPS	1200/2400/4800 / 9600/19200	9600	

10 Setting range and default set

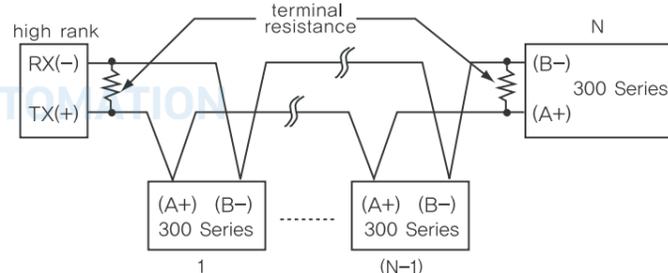
	Function	Display	Range	Default	Remarks
Set humidity	Humidity setting (HCPV-220NH, DS-SH series)		0 ~ 100%	30	0.0 ~ 99.9
Program Settings	Selection of function	tYP	d / H	d	d : For dehumidifying H : For humidifying
	Humidity deviation (HCPV-220NH, DS-SH series)	dIF	1 ~ 29	1	0.1 ~ 29.9
	Output delay time	dLT	0 ~ 10	0	Minute
	Correction of the humidity (HCPV-220NH, DS-SH series)	CoR	-10 ~ 10	0	correct discrepancy between the value in displayed and actual value -9.9 ~ 9.9

11 Communication

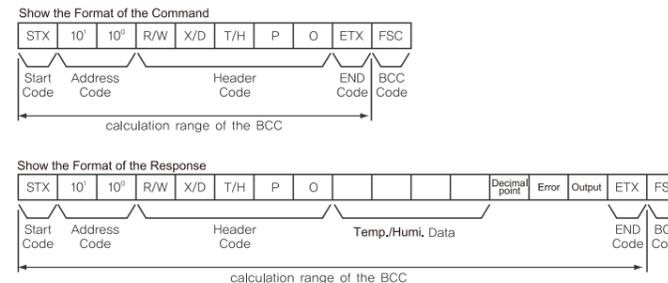
Interface

Specification	In conformity EIA RS485
Maximum connection lines	32 units (However, Address setting is available from 01 to 99)
Method	2-wire half-duplex
Synchronous system	Asynchronous
Distance	Within 1.2Km
Speed	1200/2400/4800/9600/19200bps (selectable)
Start bit	1 Bit fixed
Stop bit	1 Bit fixed
Parity bit	None
Data bit	8 Bit Fixed
Protocol	BCC

System Configuration



Definition of Communication Command and Block



- Start Code**
 Displays the head of BLOCK.
 STX → [02H], ACK will be added in case of RESPONSE
- Address Code**
 A code of which the host system identifies FOX-300 series, and can be set from 01 to 99 (BCD ASCII).
- Header Code**
 The name of command is shown in text.
 RX(Read demand) → R[52H], X[58H]
 RD(Read response) → R[52H], D[44H]
 WX(Write demand) → W[57H], X[58H]

- WD(Write response) → W[57H], D[44H]
 TPO(Temp.measured value) → W[54H], P[50H], O[30H]
 HPO(Humi.measured value) → H[48H], P[50H], O[30H]
- Data Configuration
 Data is expressed in Hexadecimal
 - Decimal point → 0[30H] No decimal point
 1[31H] There is a decimal point
 - Error → 0[30H] No error,
 1[31H] Sensor open error
 2[32] Sensor short error
 - Output → 1[31H] T/H OUT ON
 3[33H] T/H OUT OFF
 - END Code
 Displays termination of Block. ETX → [03H]
 - BCC
 Block Check Character. It shows the XOR operation value from the beginning (STX) protocol to ETX
 - Others : If there is no ACK response
 ① If code numbers are inconsistent after receiving STX
 ② If Receive Buffer Overflow occurred
 ③ If borate or other communication SV is inconsistent
 - Handling when there is no ACK response
 ① Check the status of line.
 ② Check communication condition (SV).
 ③ In the case of communication abnormality caused by noise, perform communication for 3 times for recovery.
 ④ Change the communication speed if communication abnormality is too frequent.

12 Simple troubleshooting tip

- If error is displayed while using the product:
 - E r 1** is displayed when the DATA memory element is damaged inside the product as it is affected by powerful noise from outside while in use. In this case, contact our company for customer service.
 While the controller is equipped with supplementary measures for outside noise, it cannot endure infinite noise.
 The interior of the product may be damaged if noise (2KV) is introduced.
 - The sensor has defect when **o - E** (Open Error) or **S - E** (Short Error) is displayed. Please check the sensor.

※ The above specification may be changed without prior notice for further improvement in performance.
 Please read and observe precautionary instructions during handling of the Product.

※ Regarding the English-language manual, please download it at our web-site.

Address : CONOTEC CO., LTD
 56 Ballyongsandan 1-ro, Jangan-eup, Gijang-gun, Busan, 46034 Rep. of Korea.
Warranty service : 070-7815-8266
Customer center : 051-819-0425 ~ 0427
Website : www.conotec.co.kr
E-mail : conotec@conotec.co.kr

- Installation Precautions**
 - WARNING: To avoid the risk of electric shock, this equipment must be connected to protective grounding and to a supply voltage.
 - Do not block the vents.
- Handling Precautions**
 - This instrument is suitable for the following environments.
 - Ambient temp. : 0°C~60°C
 - Ambient humi. : Less than 80% RH
 - Used indoors only
 - Pollution Degree 2
 - Altitude : less than 2000m
 - Installation Category II
 - Avoid placing equipment that is difficult to operate power coding.
 - Use of the equipment in a manner not specified by the equipment manufacturer may impair the protection provided by the equipment.
 - Rated power : 100~240Vac 50/60Hz 9VA

- Major products and development**
 - Digital temperature, humidity controller
 - Digital timer, current/voltage meter
 - Other product development

User's Manual



1 Safety Precautions

Be sure to read cautions before use for correct use.

- ※ The specifications and exterior sizes described in this manual may be subject to change for improving product capacity.

⚠ Safety Precautions

- 1.This product was not manufactured as a safety device. Therefore, in case of using it as a controller such as for a device that may cause casualty, serious damage to peripheral devices, and tremendous loss of property, be sure to attach double safety devices.
- 2.Do not wire or inspect or repair while power is on.
- 3.In case of supplying power, be sure to check a terminal number for connection.
- 4.This device should not be disassembled, processed, improved, or repaired.

⚠ Caution

- Before the installation of this device, understand fully how to use, safety regulations or warnings, and be sure to use within specified related specifications or related capacities.
- Do not wire or install it for a motor or solenoid with great inductive load.
- During the extension of a sensor, use a shielding wire, and do not make it unnecessarily longer.
- Do not use the same power supply or any part that generates arc during closing or opening directly near the power supply.
- A power line should be far apart from a high-tension wire, and the device should not be installed in a place containing much water, oil, or dust.
- Do not install it in a place under direct light or exposed to rain.
- Do not install it in a place with strong magnetism or noise or vibration or impact.
- Put it far apart from a place that may release strongly alkaline or strongly acidic substance, and use an independent pipe.
- Do not spray water directly on it for cleaning in case of installing it in the kitchen.
- Do not install it in a place where temperature/humidity exceeds rating.
- Take caution not to break a sensor wire or make any scratch.
- A sensor wire should be away from a signal line, power, and load line, and use an independent pipe.
- In case of disassembling or modifying this product voluntarily, it may not be applied with warranty service.
- A ⚠ mark on the terminal circuit diagram is a safety mark as warning or caution.
- Do not use it near any device (harmonics welder, harmonics, harmonics radio, and large capacity SCR controller) that generates strong harmonics noise.
- In case of using it with any other method than one designated by a manufacturer, injury or loss of properties may occur.
- As it is not a toy, keep out of the reach of children.
- Installation must be done by a relevant professional or a qualified person.
- Our company shall not be responsible for any damage caused by failing to observe the contents specified in the above warnings or cautions or by the fault of a consumer.

⚠ Danger

- Caution, risk of electric shock
 - Electric Shock - Do not contact with AC terminal during current carrying. This may cause electric shock.
 - Input power must be blocked when checking input power.

2 Models

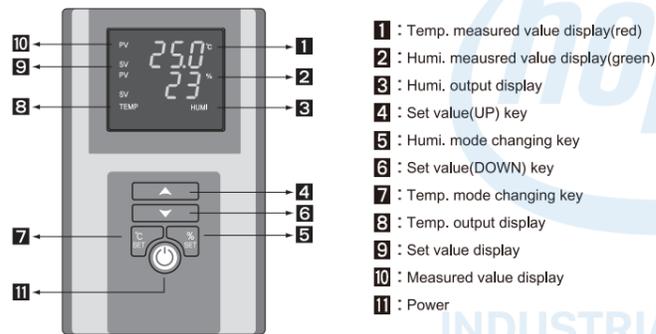
Model	Sensor	Range	Dimension	Function
FOX-300JSHR	SHT11	-29 ~ 99.9°C 0.0 ~ 99.9%	W194 x H241mm	Temp./Humi. control RS485
FOX-300-2S	SH-104	-29.9 ~ 99.9°C 0 ~ 100%	W72 x H72mm	Temp./Humi. control
FOX-300A-1	HCPV-220NH	-40.0 ~ 65.0°C 10 ~ 95%	W72 x H72mm	Temp./Humi. control
FOX-300AR1			W194 x H241mm	Temp./Humi. control RS485
FOX-300JR1			W194 x H241mm	
FOX-8300R1			W94 x H150mm	

※ FOX-300 series model

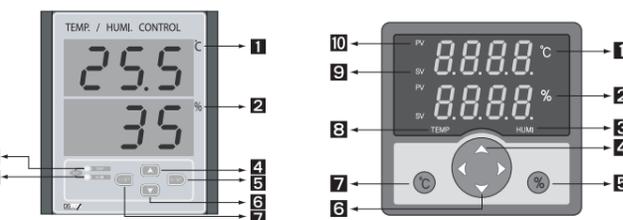
The sensor HCPV-220NH (Temp./Humi) is replaceable with Temp. : FS-200N(NTC10K)
Humi. : HCPV-220

Temp. & Humi. ranges are also available upto -55.0°C ~ 99.9°C
10 ~ 95%

3 Name of each parts

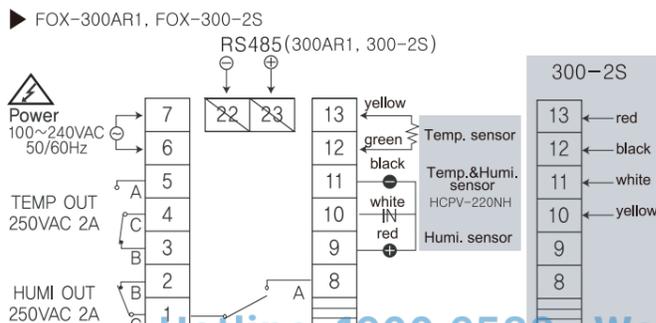


- 1 : Temp. measured value display(red)
- 2 : Humi. measured value display(green)
- 3 : Humi. output display
- 4 : Set value(UP) key
- 5 : Humi. mode changing key
- 6 : Set value(DOWN) key
- 7 : Temp. mode changing key
- 8 : Temp. output display
- 9 : Set value display
- 10 : Measured value display
- 11 : Power



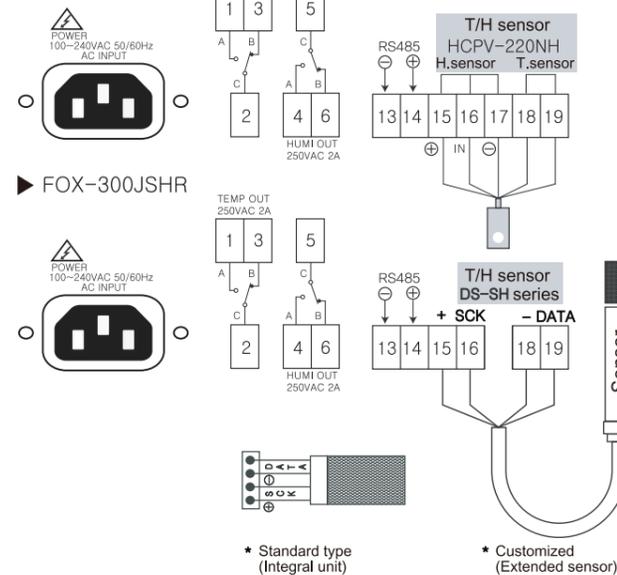
4 Wiring terminal

Output : 250VAC 2A
Please make sure to use the power relay or a suitable magnet .

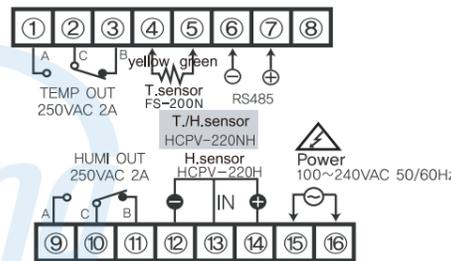


CÔNG TY CỔ PHẦN CÔNG NGHỆ HOPLONG

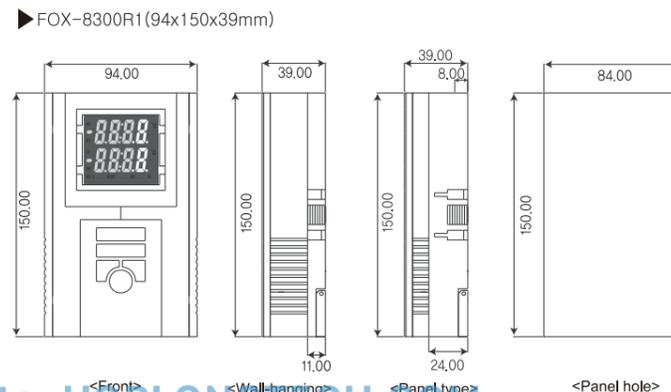
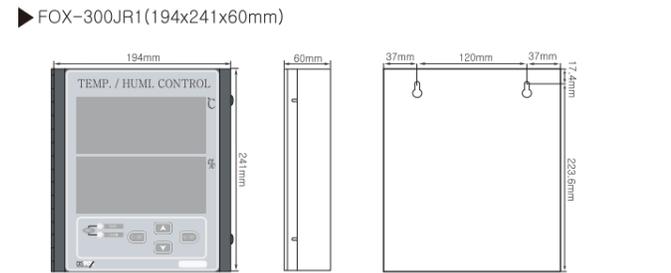
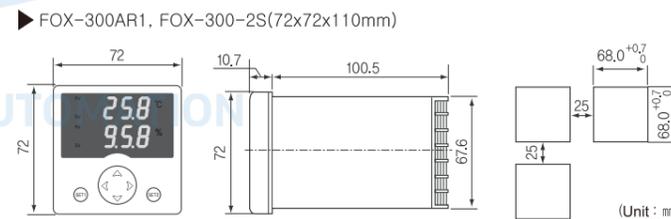
FOX-800JR1



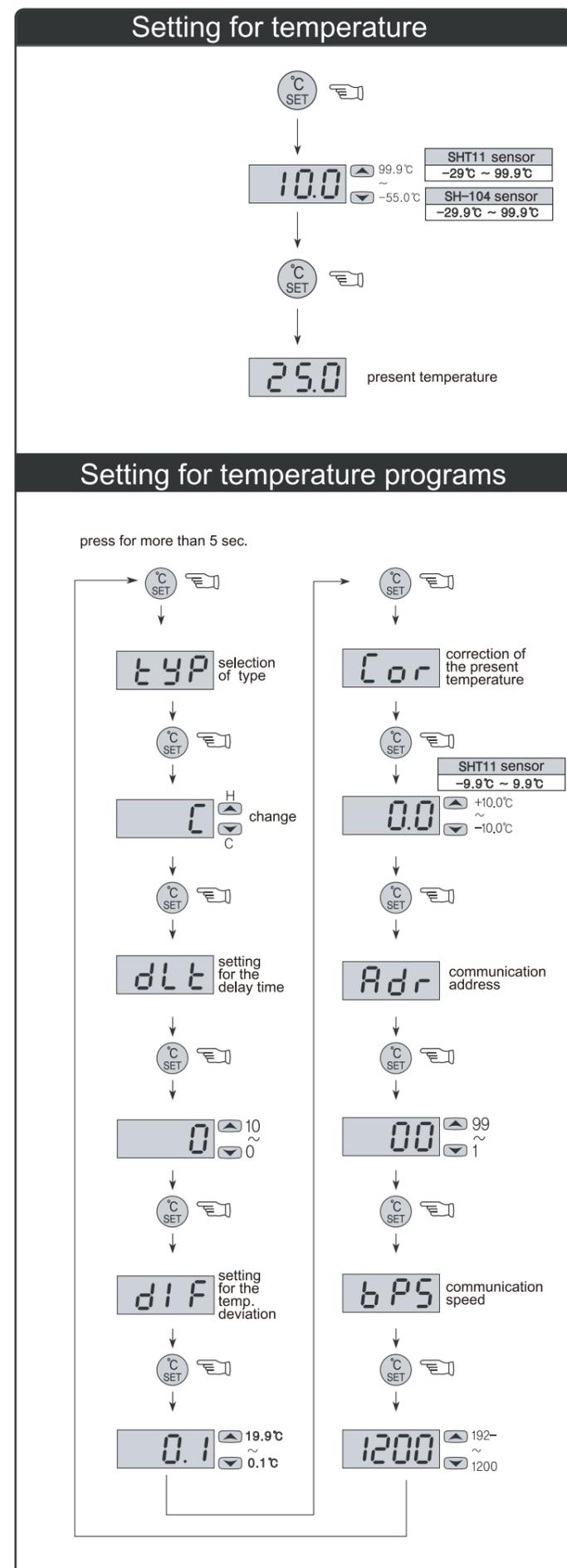
FOX-8300R1



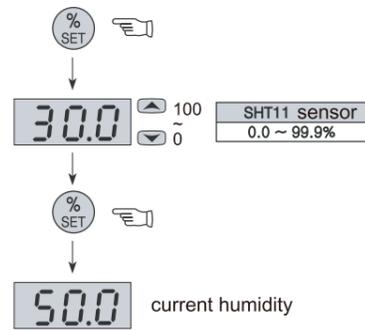
5 Product exterior dimension



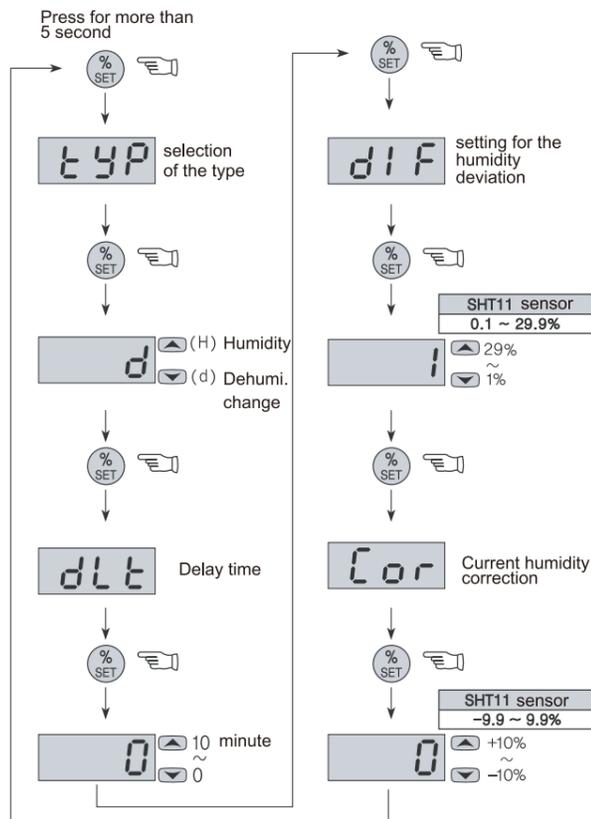
6 Temperature



Setting for the humidity



Setting for the humidity program

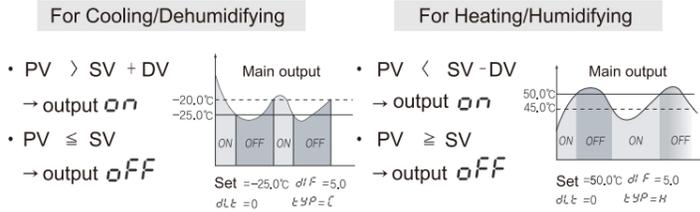


※ Pressing SET key for 5 sec. in the state of current temperature display, can be entered the program setting mode.
 ※ All programs are returned automatically in 30 sec. to the present temperature after displaying **o-h** by pressing SET key once after set value changing.

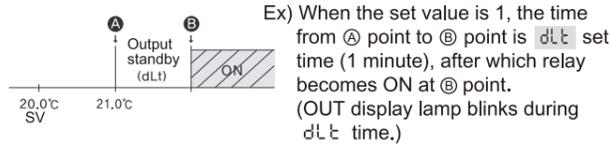
8 About Detailed Function

- typ** : Temperature : Select Cooling(C) or Heating(H)
 Humidity : Select Dehumidity(d) or Humidity(H)
- dif** : Deviation temperature setting
 - A regular interval is required between ON and OFF in the ON/OFF control (set up ON/OFF width)
 - Frequent ON and OFF will shorten the lifespan of the relay or the output contact or cause hunting (generation, chattering) by noise from outside. The temperature deviation function is used to setup temperature deviation to protect the equipment contact, etc.

「Method of temperature deviation when ON/OFF control」



- dlt** : Output Delay Time
 - This function should be used when an object subject to control repeats ON/OFF actions and cause problems (chillers, compressors).
 - A function to protect the working machine upon momentary power failure or power is reapplied.



- 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 a thermometer currently use, a temperature controller)

e.g.) Actual temperature : 10.0°C → **cor** : 0.0 ⇒ -2.0
 Display Window : 12.0°C
 Display in → 10.0°C (corrected current temperature)

- Adr** : Communication station settings
 - When using the RS485 communication, specify a station number between 1-99.
- bps** : Communication speed settings
 - 120, 1200 : 1200bps
 - 240, 2400 : 2400bps
 - 480, 4800 : 4800bps
 - 960, 9600 : 9600bps
 - 192, 1920 : 1920bps
 (Start bit 1, Stop bit 1, Non parity)

9 Temperature setting range and default set

	Function	Display	Range	Default	Remarks
Setting temperature	Temperature setting (HCPV-220NH)		-55.0 ~ 99.9	10.0	SH-104 : -29.9 ~ 99.9 SHT11 : -29 ~ 99.9
Settings	Function selection	typ	C / H	C	H : For Heating C : For Cooling
	Deviation temperature	dif	0.1 ~ 19.9	1.0	
	Output delay time	dlt	0 ~ 10	0	Minute
	Temperature correction (HCPV-220NH, SH-104)	cor	-10.0 ~ 10.0	0.0	Differs from displayed and actual value SHT11 : -9.9 ~ 9.9
	Address	Adr	01 ~ 99	0	RS485 communication
Speed	bps	1200/2400/4800/9600/19200	9600		

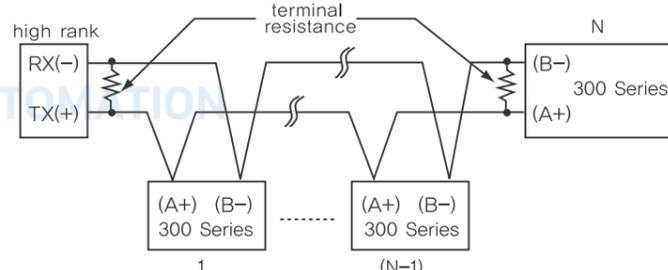
	Function	Display	Range	Default	Remarks
Set humidity	Humidity setting (HCPV-220H)		0 ~ 100%	30	SHT11 : 0.0 ~ 99.9
Program Settings	Selection of function	typ	d / H	d	d : For dehumidifying H : For humidifying
	Humidity deviation (HCPV-220H, SH-104)	dif	1 ~ 29	1	SHT11 : 0.1 ~ 29.9
	Output delay time	dlt	0 ~ 10	0	Minute
	Correction of the humidity (HCPV-220H, SH-104)	cor	-10 ~ 10	0	correct discrepancy between the value in displayed and actual value SHT11 : -9.9 ~ 9.9

11 Communication

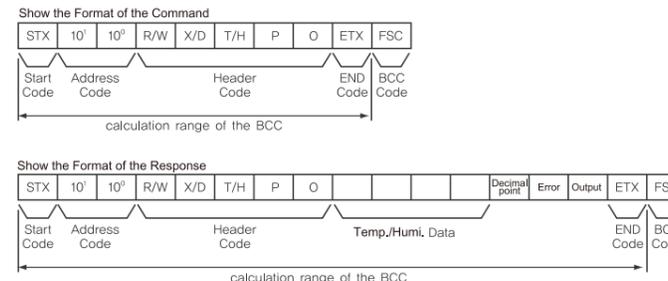
Interface

Specification	In conformity EIA RS485
Maximum connection lines	32 units (However, Address setting is available from 01 to 99)
Method	2-wire half-duplex
Synchronous system	Asynchronous
Distance	Within 1.2Km
Speed	1200/2400/4800/9600/19200bps (selectable)
Start bit	1 Bit fixed
Stop bit	1 Bit fixed
Parity bit	None
Data bit	8 Bit Fixed
Protocol	BCC

System Configuration



Definition of Communication Command and Block



- Start Code**
 Displays the head of BLOCK.
 STX → [02H], ACK will be added in case of RESPONSE
- Address Code**
 A code of which the host system identifies FOX-300 series, and can be set from 01 to 99 (BCD ASCII).
- Header Code**
 The name of command is shown in text.
 RX(Read demand) → R[52H], X[58H]
 RD(Read response) → R[52H], D[44H]
 WX(Write demand) → W[57H], X[58H]

- WD(Write response) → W[57H], D[44H]
- TPO(Temp.measured value) → W[54H], P[50H], O[30H]
- HPO(Humi.measured value) → H[48H], P[50H], O[30H]
- ④ Data Configuration
 Data is expressed in Hexadecimal
- ⑤ Decimal point → 0[30H] No decimal point
 1[31H] There is a decimal point
- ⑥ Error → 0[30H] No error,
 1[31H] Sensor open error
 2[32] Sensor short error
- ⑦ Output → 1[31H] T/H OUT ON
 3[33H] T/H OUT OFF
- ⑧ END Code
 Displays termination of Block. ETX → [03H]
- ⑨ BCC
 Block Check Character. It shows the XOR operation value from the beginning (STX) protocol to ETX
- Others : If there is no ACK response
 - If code numbers are inconsistent after receiving STX
 - If Receive Buffer Overflow occurred
 - If borate or other communication SV is inconsistent
- Handling when there is no ACK response
 - Check the status of line.
 - Check communication condition (SV).
 - In the case of communication abnormality caused by noise, perform communication for 3 times for recovery.
 - Change the communication speed if communication abnormality is too frequent.

12 Simple troubleshooting tip

- If error is displayed while using the product:
 - E r** is displayed when the DATA memory element is damaged inside the product as it is affected by powerful noise from outside while in use. In this case, contact our company for customer service.
 While the controller is equipped with supplementary measures for outside noise, it cannot endure infinite noise.
 The interior of the product may be damaged if noise (2KV) is introduced.
 - The sensor has defect when **o-E** (Open Error) or **5-E** (Short Error) is displayed. Please check the sensor.

※ The above specification may be changed without prior notice for further improvement in performance.
 Please read and observe precautionary instructions during handling of the Product.

※ Regarding the English-language manual, please download it at our web-site.

Installation Precautions

- WARNING: To avoid the risk of electric shock, this equipment must be connected to protective grounding and to a supply voltage.
- Do not block the vents.
- Handling Precautions
 - This instrument is suitable for the following environments.
 - Ambient temp.: 0°C~60°C
 - Ambient humi. : Less than 80% RH
 - Used indoors only
 - Pollution Degree 2
 - Altitude : less than 2000m
 - Installation Category II
 - Avoid placing equipment that is difficult to operate power coding.
 - Use of the equipment in a manner not specified by the equipment manufacturer may impair the protection provided by the equipment.
 - Rated power : 100~240Vac 50/60Hz 9VA

H. Office : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea
 Factory : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea

TEL : +82-51-819-0426
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e-mail : conotec@conotec.co.kr
 URL : www.conotec.co.kr

Major products and development
 - Digital temperature, humidity controller
 - Digital timer, current/voltage meter
 - Other product development

Operating Manual



Thank you very much for selecting our products.

1 Caution for your safety

Please read this instruction carefully before using this controller

※ The manual's information & specification can changeable to improve its quality without any notification.

⚠ Safety

1. Pls use this item after installing the duplex safety device in which is applied at dangerous factors such as serious human injury or serious damages of property & important machine because this item is not designed as a safety device.
2. Do not checking or repairing when it is power on.
3. Please check the terminal number before connecting power supply.
4. Do not disassemble or open, remodel, repair without any permission.

⚠ Safety Instruction and Hazard Warnings

- Please read the operating manual through completely before putting the device into operation.
- We will not assume any responsibility for damage to assets or persons caused by improper handling or failure to observe the safety instructions or hazard warnings.
- For safety and licensing reasons, unauthorized conversion and/or modification of the device is not permitted.
- Do not exceed the maximum permissible current - in case of higher loads, use a contactor of adequate power. Make sure that the supplied voltage matches the values specified for the instrument.
- The device must be adequately protected from water and dust as per the application and must be accessible via the use of appropriate tools
- The device must not be exposed to extreme temperature, sunlight, strong vibrations or high levels of humidity.
- Operation or installation is not permitted under unfavorable ambient conditions such as wetness or excessive induction loads or solenoid and dust, combustible gases, vapors or solvents, especially high-frequency noise
- Avoid operation or installation close to high-frequency fields such as welding devices, sewing machines, wireless transmitter, radio systems, SCR controller, etc
- Do not install the sensor cable nearby signal cable, power cable, load cable
- Please use the shield cable when the sensor cable's lengthen, however do not make it too much longer.
- Please use the sensor cable without any cutting or flaw, blemish.
- The device is not a toy and should be kept away from children.
- Installation work must only be carried out by suitably qualified personnel who are familiar with the hazards involved and with the relevant regulations.
- You shouldn't tinker with anything or the product may not be opened or disassembled unless you know what you're doing. Please ask us about this questioning.

⚠ Danger

- Caution, Danger of Electric Shock
- 1. Electric shock - Do not contact AC terminal during the current carrying. Electric shock can occur.
- 2. In case of checking the input power, it should be disconnected without fail.

2 Composition **CÔNG TY CỔ PHẦN CÔNG NGHỆ HỢP LONG**

Model	Sensor	Range	Size	Function
FOX-300-2S	SH-104	-29.0 ~ 99.9°C 0.0 ~ 99.9%	W72 X H72mm	temp.,humi.control
FOX-300A-1	HCPV-220NH	-40.0 ~ 65.0°C 10 ~ 95%	W72 X H72mm	temp.control
FOX-300AR1				humi.control
FOX-300JB-1			temp.,humi.control	
FOX-300JR1	temp.,humi.control	W194X H241mm	RS485 communication	
FOX-8300R1	temp.,humi.control	W94 X H150mm	RS485 communication	

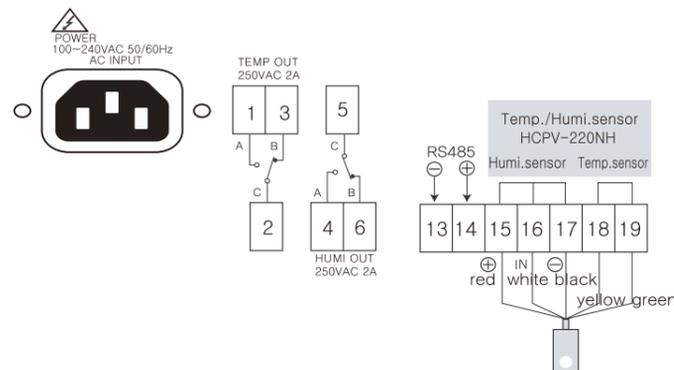
※ 300 series

Temp./humi. range can be changed to -55.0°C ~ 99.9°C / 10~95% if using

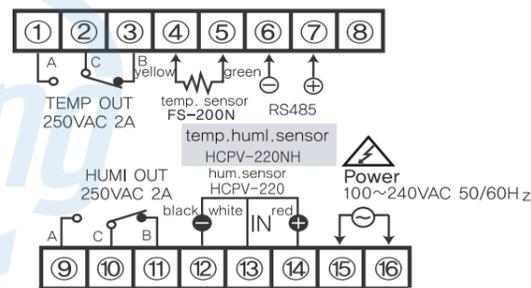
Temp. sensor : FS-200N(NTC 10K)
Humi. sensor : HCPV-220

instead of HCPV-220NH(Temp.&humi.)

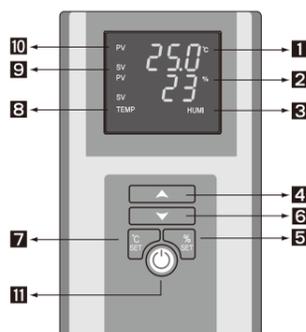
▶ FOX-300JB-1/JR1



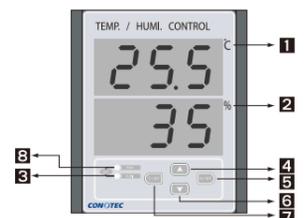
▶ FOX-8300-1/R1



3 Part name



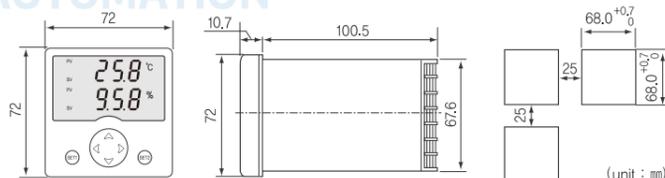
- 1: Display of the present temperature (red color)
- 2: Display of the present humidity (green color)
- 3: output display of the humidity's working
- 4: Up
- 5: Humidity mode
- 6: Down
- 7: Temperature mode
- 8: output display of the temperature' working
- 9: Display of the set value
- 10: Display of the measuring value
- 11: Power supply



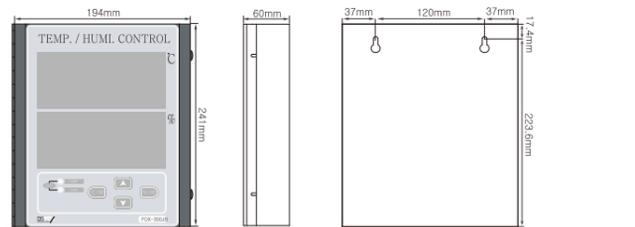
- 1: Display of the present temperature (red color)
- 2: Display of the present humidity (green color)
- 3: output display of the humidity's working
- 4: Up
- 5: Humidity mode
- 6: Down
- 7: Temperature mode
- 8: output display of the temperature' working
- 9: Display of the set value
- 10: Display of the measuring value
- 11: Power supply

5 Size & Dimension

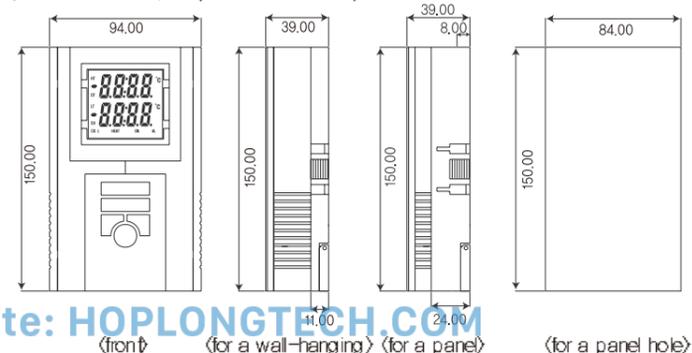
▶ FOX-300A-1/AR1,300-2S (72x72x110mm)



▶ FOX-300JB-1/JR1 (194x241x60mm)



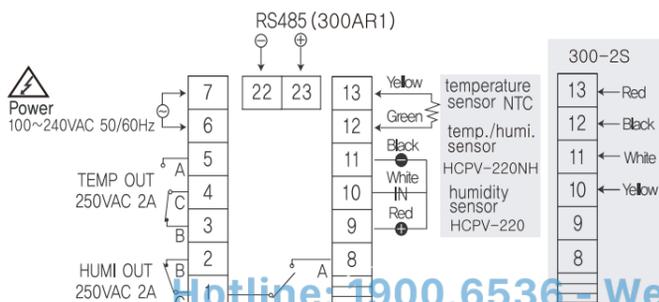
▶ FOX-8300-1/R1 (94x150x39mm)



4 Connection

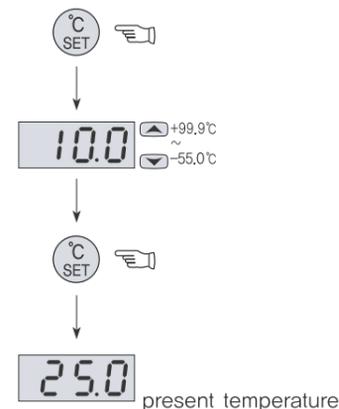
output : 250VAC 2A
Please make use of the power relay or a suitable magnet surely.

▶ FOX-300A-1/AR1, 300-2S

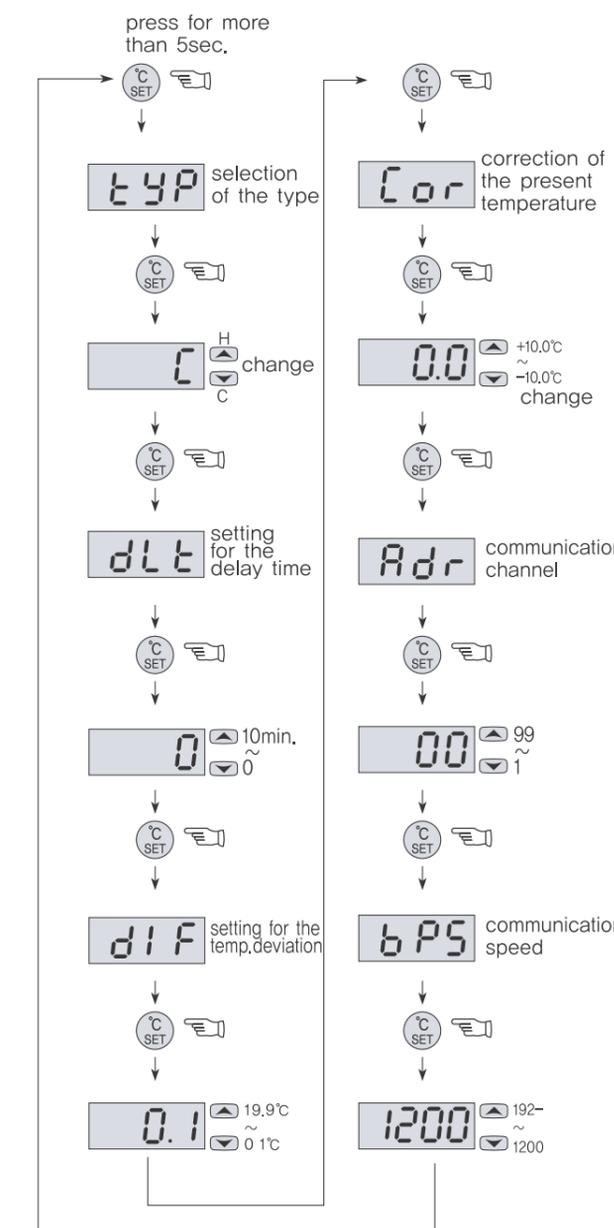


6 Temperature

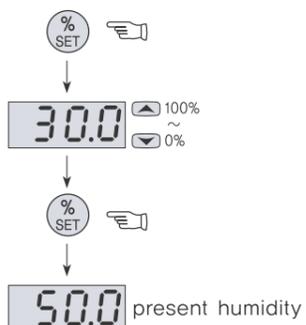
Setting for temperature



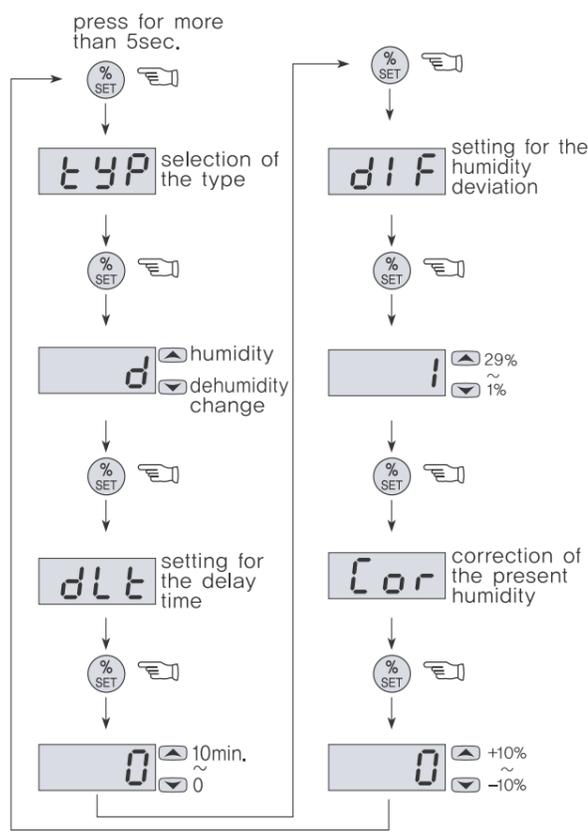
Setting for temperature programs



Setting for the humidity



Setting for humidity programs



※To change it with program mode, press the --key for more than 5 second in the present temperature display mode.

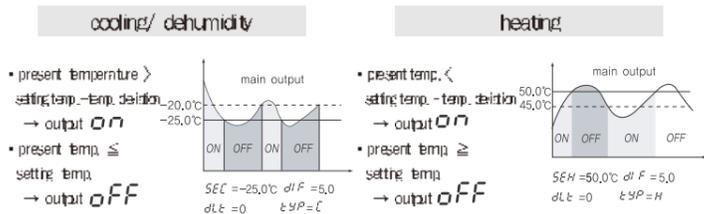
※The set or programming mode is terminated, if you press the o-k key, parameters(set values) are saved after the display shows OK letter or return to present temperature automatically after 30 second.

8 Detailed manual

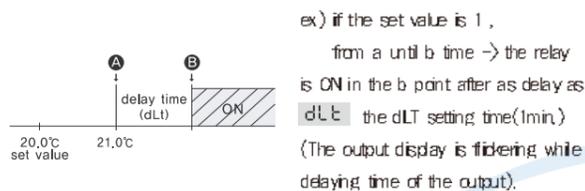
- typ** : temperature : possible to select the coding or heating, humidity : possible to select the humidity or dehumidity.
- dif** : Setting for temperature deviation
 - In the ON/OFF control, it needs at regular interval between ON and OFF.
 - By operating the ON/OFF control frequently, the relay or 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 relay or contact and so on.

9 Temp. range & set value when deliver

ex=> The method of the temp. deviation when ON/OFF control



- dlt** : Delay time of the output
 - It is widely used as followings ;
 - in case of operating the ON/OFF control very often,
 - to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply



- cor** : Correction of the present temperature,
 - It is used for the correction of a discrepancy between the display temperature and an actual temperature
 - ex) real temp. : 10.0°C
display : 12.0°C → **cor** : 0.0 ⇒ -2.0 correction
→ 10.0°C display

- Adr** : Communication channel
 - To designate the channel while RS485 communication working
- bps** : Communication speed(velocity)
 - 120, 1200 : 1200bps
 - 240, 2400 : 2400bps
 - 480, 4800 : 4800bps
 - 960, 9600 : 9600bps
 - 192, 1920 : 1920bps
 - (Start bit 1, Stop bit 1, Non parity)

9 Temp. range & set value when deliver

	function	display	range	factory default	remarks
setting temp.	setting temp. (HCPV-220NH)		-40.0~65.0	10.0	FOX-300-2S
	setting temp. (SH-104)		-29~99.9		Other 300 series
setting programs	selection of the type	typ	C/H	C	H : heating C : cooling
	temp deviation	dif	0.1~19.9	1.0	
	delay time	dlt	0~10	0	minute
	correction of the temp. (HCPV-220NH)	cor	-10.0~10.0	0.0	correct for a discrepancy between the display temp. and an actual temperature.
	correction of the temp. (SH-104)		-9.9~9.9		
	communication name	Adr	1~99	0	RS485 communication
communication speed	bps	1200/2400/4800/9600/1920	9600	RS485 communication	

11 Communication output

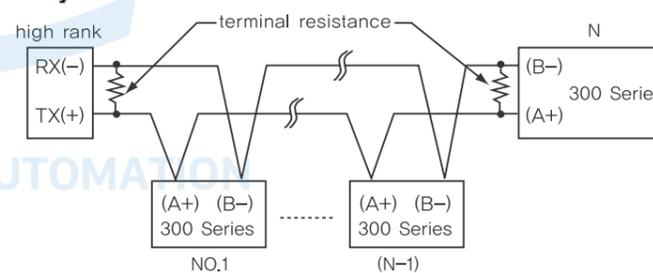
	function	display	range	factory default	remarks
setting humi.	setting humidity (HCPV-220NH)		0~100%	30	HCPV-220NH
	setting humidity (SH-104)		0.0~99.9%	30.0	SH-104
setting programs	selection of the type	typ	d/H	d	H : humidity d : dehumidity
	humidity deviation (HCPV-220NH)	dif	1~29	1	
	humidity deviation (SH-104)		0.1~29.9	0.1	
	delay time (HCPV-220NH)	dlt	0~10	0	minute
	correction of the humidity (HCPV-220NH)	cor	-10~10	0	correct for a discrepancy between the display humi. and an actual humidity.
correction of the humidity (SH-104)	-9.9~9.9				

11 Communication output

Interface

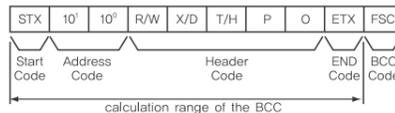
specification	in conformity EIA RS485
maximum connector	32(However, available to set the Address from 01 until 99)
the method of communication	two-wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1.2km
communication speed	*200/2400/4800/9600/19200bps(available to select)
Start bit	fixed 1bit
Stop bit	fixed 1bit
Parity bit	none
Data bit	fixed 8bit
Protocol	BCC

System

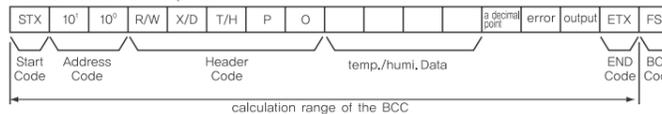


Definition between communication command and Block

Show the Format of the Command



Show the Format of the Response



- Start Code**
 - show the lead(head) of the Block
 - ACK will be added in case of STX->[02H], Response
- Address Code**
 - A high rank system can discriminate the channel code number among FOX-300series
 - It is available to set between 01 and 99(BCD ASC II)
- Header Code**
 - show the command name as a 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) → W[54H], P[50], O[30H]
 - HPO(humidity measuring value) → H[48H], P[50], O[30H]
- Composition of Data**
 - Data is displayed as "Hexadecimal"
 - Decimal point** → O[30H] there is no "decimal point" 1[31H] there is "decimal point"
 - Error** → O[30H] there is no "error" 1[31] interrupted of the sensor's cable 2[32] short-circuited error of the sensor
 - Output** → O[30H] T/H OUT ON 3[33H] T/H OUT OFF
 - END Code**
 - show the end(close) of the Block ETX → [03H]
 - BCC(Block Check Character)**
 - show the XOR arithmetic and logic values from the start(STX) to the ETX
 - the others : As of no response of the ACK
 - in case of not equivalent to the channel after receiving STX
 - in case of generating the Receive Buffer Overflow
 - in case of not equivalent to the communication's set values or baud rate
 - treatment- in case of no response of the ACK
 - check the cable
 - check the communication's condition (set values)
 - if the main cause of the status is the noise, try to do communication practicing 3times until recovering normally.
 - change the communication speed in case of bring about the communication's error frequently.

12 Error message

- Indicating ERROR on using items
 - This **Err!** is the damage of memory data for various of inner-DATA due to be got nosied strongly from outside while using this items. Please request us A/S by return.
- Although our controller is designed as the complementary measures regarding the noise from outside, it is not enduring against the noise with endlessly.
- If noise(2KV) disordering become an inflow, the inner-part will be damaged.
- When shows these letters **o-E** (open error) **s-E** (short error) it is the case of the error of the sensor. Please check the sensor.

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 ■ FAX : +82-51-819-4562

■ e-mail : conotec@conotec.co.kr
 ■ URL : www.conotec.co.kr

■ Main products & Development
 - Digital temperature controller
 - Digital humidity controller
 - Digital timer



1 Cautions for safety

Be sure to read cautions before use for correct use.

※ The specifications and exterior sizes described in this manual may be subject to change for improving product capacity.

⚠ Safety Precautions

1. This product was not manufactured as a safety device. Therefore, in case of using it as a controller such as for a device that may cause casualty, serious damage to peripheral devices, and tremendous loss of property, be sure to attach double safety devices.
2. Do not wire or inspect or repair while power is on.
3. In case of supplying power, be sure to check a terminal number for connection.
4. This device should not be disassembled, processed, improved, or repaired.

⚠ Caution

- Before the installation of this device, understand fully how to use, safety regulations or warnings, and be sure to use within specified related specifications or related capacities.
- Do not wire or install it for a motor or solenoid with great inductive load.
- During the extension of a sensor, use a shielding wire, and do not make it unnecessarily longer.
- Do not use the same power supply or any part that generates arc during closing or opening directly near the power supply.
- A power line should be far apart from a high-tension wire, and the device should not be installed in a place containing much water, oil, or dust.
- Do not install it in a place under direct light or exposed to rain.
- Do not install it in a place with strong magnetism or noise or vibration or impact.
- Put it far apart from a place that may release strongly alkaline or strongly acidic substance, and use an independent pipe.
- Do not spray water directly on it for cleaning in case of installing it in the kitchen.
- Do not install it in a place where temperature/humidity exceeds rating.
- Take caution not to break a sensor wire or make any scratch.
- A sensor wire should be away from a signal line, power, and load line, and use an independent pipe.
- In case of disassembling or modifying this product voluntarily, it may not be applied with warranty service.
- A ⚠ mark on the terminal circuit diagram is a safety mark as warning or caution.
- Do not use it near any device (harmonics welder, harmonics, harmonics radio, and large capacity SCR controller) that generates strong harmonics noise.
- In case of using it with any other method than one designated by a manufacturer, injury or loss of properties may occur.
- As it is not a toy, keep out of the reach of children.
- Installation must be done by a relevant professional or a qualified person.
- Our company shall not be responsible for any damage caused by failing to observe the contents specified in the above warnings or cautions or by the fault of a consumer.

⚠ Danger

- **Caution, risk of electric shock**
- Electric Shock - Do not contact with AC terminal during current carrying. This may cause electric shock.
- Input power must be blocked when checking input power.

2 Models

Model	Sensor	Range	Dimension	Function
FOX-301AR1			W72 x H72mm	Temp./Humi. control RS485
FOX-301JR1	HCPV-220NH	-40.0 ~ 65.0°C 10 ~ 95%	W193.5 x H241mm	
FOX-8301R1			W94 x H150mm	
FOX-301JSH	SHT11	0.0%~100.0%Rh	W194 x H241mm	Temp./Humi. control

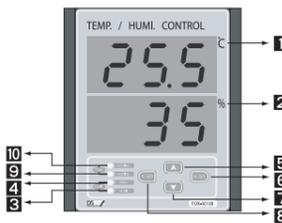
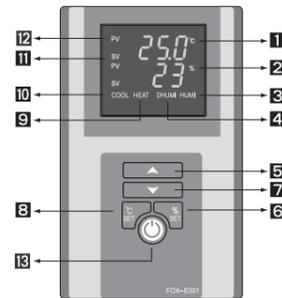
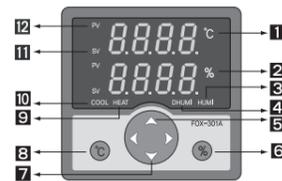
※ FOX-301 series can be changed as follows :

Sensor HCPV-220NH is convertible

⇒ Sensor for temperature : FS-200N(NTC 10K)
Sensor for humidity : HCPV-220NH

Converted temperature range : Upto -55.0°C ~ 99.9°C
humidity range : Upto 10~95%

3 Name of each parts

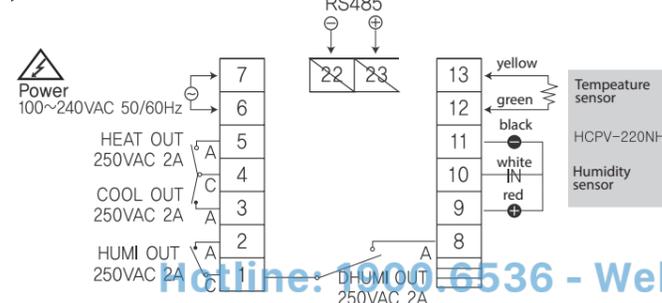


- 1 Temp. measured value display (red)
- 2 Humi. measured value display (green)
- 3 Humi. output display
- 4 Dehumi. output display
- 5 Set value (UP) key
- 6 Humi. mode changing key
- 7 Set value (DOWN) key
- 8 Temp. mode changing key
- 9 Heating output display
- 10 Cooling output display
- 11 Set value display
- 12 Measured value display
- 13 Power

4 Wiring terminal

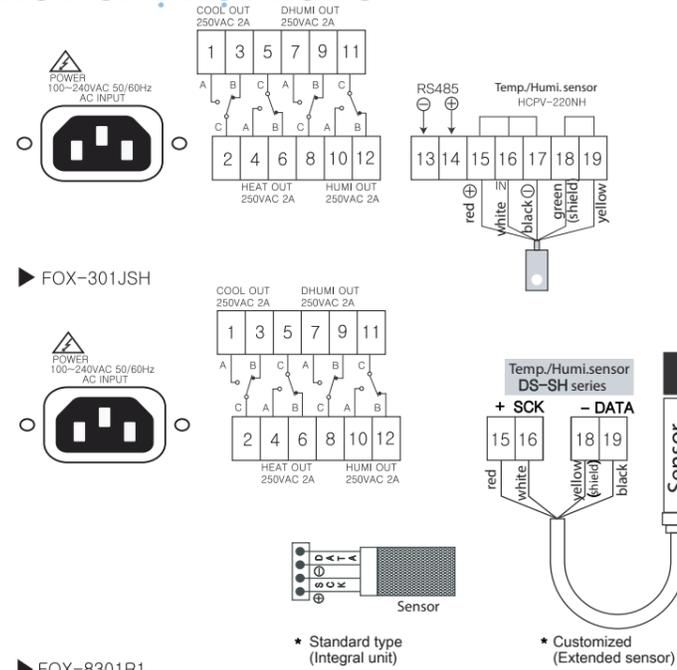
Output : 250VAC 2A
Please make sure to use the power relay or a suitable magnet.

▶ FOX-301AR1

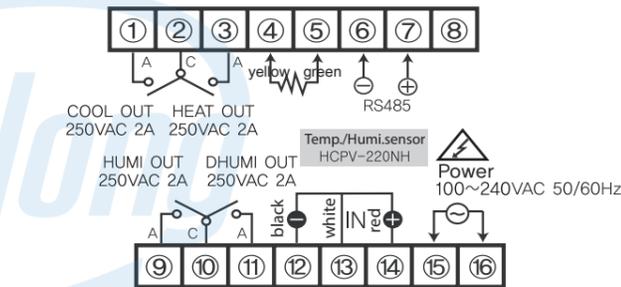


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▶ FOX-801JR1

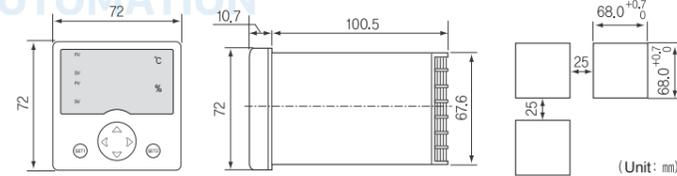


▶ FOX-8301R1

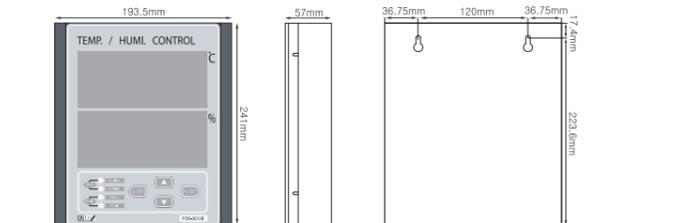


5 Product exterior dimension

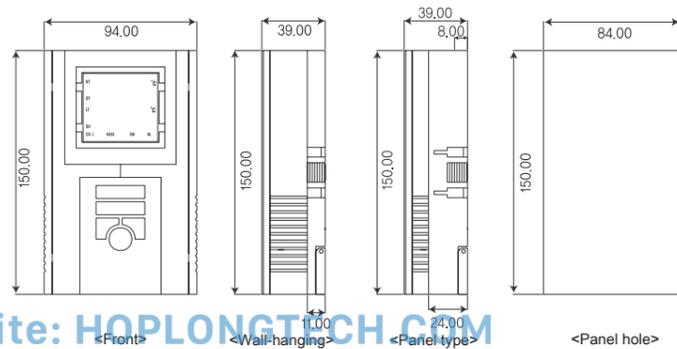
▶ FOX-301AR1 (72 x 72 x 110 mm)



▶ FOX-301JSH (193.5 x 241 x 57 mm)

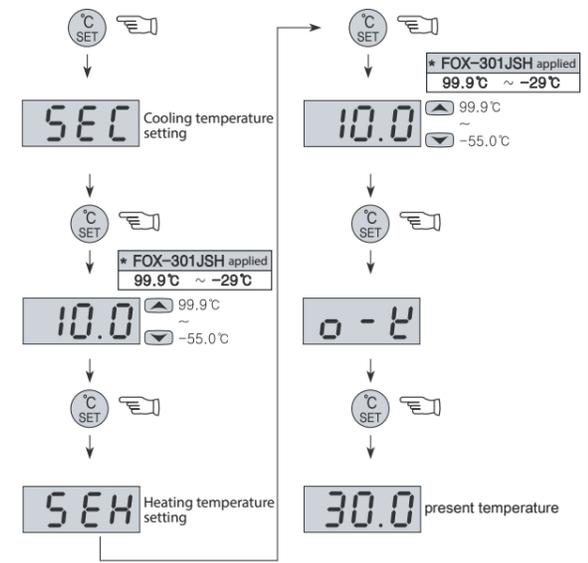


▶ FOX-8301R1 (94 x 150 x 39 mm)

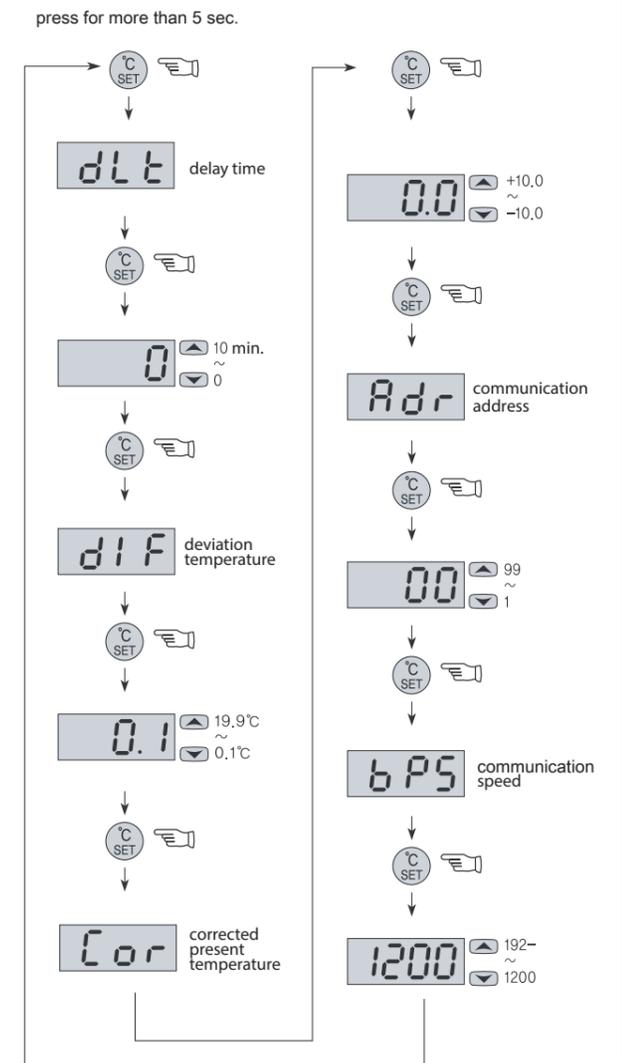


6 Temperature

Setting for temperature



Setting for temperature programs



- ④ Data Configuration
Data is expressed in Hexadecimal
- ⑤ Decimal point → 0[30H] No decimal point
1[31H] There is a decimal point
- ⑥ Error → 0[30H] No error,
1[31H] Sensor open error
2[32] Sensor short error
- ⑦ Output

	TEMP		HUMI	
	COOL	HEAT	HUMI	DHUMI
0(30H)	O	O	0(30H)	O
1(31H)	O	X	1(31H)	X
2(32H)	X	O	2(32H)	O
3(33H)	X	X	3(33H)	X

- ⑧ END Code
Displays termination of Block. ETX → [03H]
- ⑨ BCC
Block Check Character. It shows the XOR operation value from the beginning (STX) protocol to ETX.
- Others : If there is no ACK response
 - ① If code numbers are inconsistent after receiving STX
 - ② If Receive Buffer Overflow occur
 - ③ If borate or other communication SV is inconsistent
- Handling when there is no ACK response
 - ① Check the status of line.
 - ② Check communication condition (SV).
 - ③ In the case of communication abnormality caused by noise, perform communication for 3 times for recovery.
 - ④ Change the communication speed if communication abnormality is too frequent.

12 Simple troubleshooting tip

■ If error is displayed while using the product:

- **E r 1** is displayed when the DATA memory element is damaged inside the product as it is affected by powerful noise from outside while in use. In this case, contact our company for customer service. While the controller is equipped with supplementary measures for outside noise, it cannot endure infinite noise. In case of the nose of 2KV or more flows in, inside of the product may be damaged.
- The sensor has defect when **o -E** (Open Error) or **S -E** (Short Error) is displayed. Please check the sensor.

※ The above specification may be changed without prior notice for further improvement in performance. Please read and observe precautionary instructions during handling of the product.

※ Regarding the English language manual, please download it at our web-site.

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Website : www.conotec.co.kr
E-mail : conotec@conotec.co.kr

- ◆ Installation Precautions
 - WARNING: To avoid the risk of electric shock, this equipment must be connected to protective grounding and to a supply voltage.
 - Do not block the vents.
- ◆ Handling Precautions
 - ※ This instrument is suitable for the following environments.
 - Ambient temp. : 0℃~60℃
 - Ambient humi. : Less than 80% RH
 - Using indoors only
 - 2(Pollution Degree 2)
 - Altitude : less than 2000m
 - Installation Category II
 - Avoid equipment arrangements that are difficult to handle.
 - Unless use of the equipment in a manner specified by the equipment manufacturer, may impair the protection provided by the equipment.
- Rated power : 100~240Vac 50/60Hz 9VA

■ Major products and development
- Digital temperature, humidity controller
- Digital timer, current/voltage meter
- Other product development

「 Method of deviation application when ON/OFF control 」

For Cooling/Dehumidifying

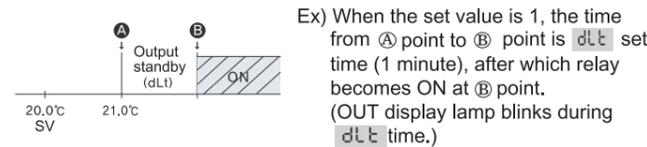
- PV > SV + DV → output ON
- PV ≤ SV → output OFF

For Heating/Humidifying

- PV < SV → output ON
- PV ≥ SV → output OFF

* PV : present temperature value SV : set temperature value DV : deviation temperature value

2. **dL t** : Output Delay Time
 - This function should be used when an object subject to control repeats ON/OFF actions and cause problems (chillers, compressors).
 - A function to protect the working machine upon momentary power failure or power is reapplied.



3. **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 a thermometer currently use, a temperature controller)

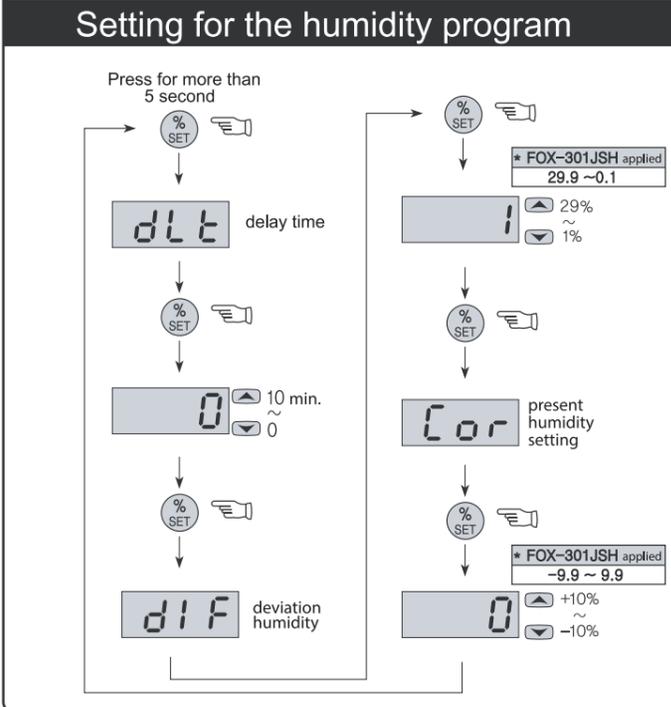
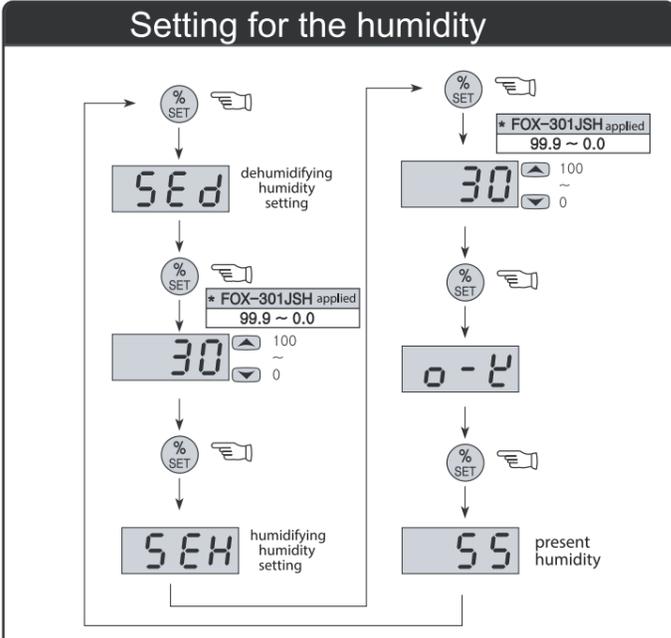
e.g.) Actual temperature : 10.0℃ → **Cor** : 0.0 ⇒ -2.0 corrected
 Display Window : 12.0℃
 Display in → 10.0℃ (corrected current temperature)

4. **R d r** : Communication station settings
 - When using the RS485 communication, specify a station number between 1-99.
5. **b P S** : Communication speed settings
 - **120** , **1200** : 1200bps
 - **240** , **2400** : 2400bps
 - **480** , **4800** : 4800bps
 - **960** , **9600** : 9600bps
 - **192** , **1920** : 19200bps

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

9 Temperature range and default values

	Function	Display	Range	Default	Remarks
Setting temperature	For Cooling	SEC	-55.0 ~ 99.9	10.0	
	For Heating	SEH	-55.0 ~ 99.9	10.0	
Settings	Deviation temperature	dI F	0.1 ~ 19.9	1.0	
	Output delay time	dL t	0 ~ 10	0	Minute
	Temperature correction	Cor	-10.0~10.0	0.0	Differs from displayed and actual value
	Address	R d r	01~99	0	RS485 communication
	Speed	b P S	1200/2400/4800/9600/19200	1200	RS485 communication



※ Pressing SET key for 5 sec. in the state of current temperature display, can be entered the program setting mode.

※ All programs are returned automatically in 30 sec. to the present temperature after displaying **o -E** by pressing SET key once after set value changing.

8 About Detailed Function

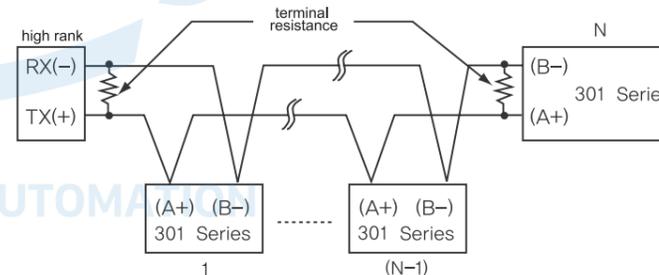
1. **dI F** : Deviation temperature setting
 - A regular interval is required between ON and OFF in the ON/OFF control (set up ON/OFF width)
 - Frequent ON and OFF will shorten the lifespan of the relay or the output contact or cause hunting (generation, chattering) by noise from outside. The temperature deviation function is used to setup temperature deviation to protect the equipment contact, etc.

11 Communication

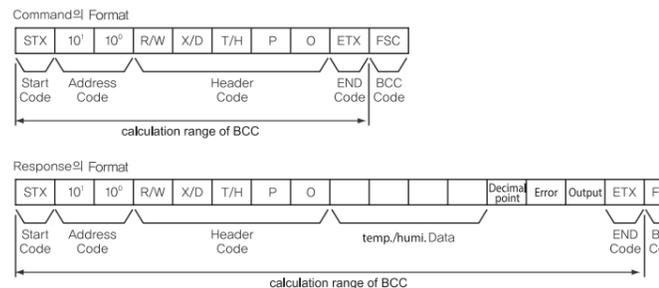
■ Interface

Specification	In conformity EIA RS485
Maximum connection lines	32 units (However, Address setting is available from 01 to 99)
Method	2-wire half-duplex
Synchronous system	Asynchronous
Distance	Within 1.2Km
Speed	1200/2400/4800/9600/19200bps (selectable)
Start bit	1 Bit fixed
Stop bit	1 Bit fixed
Parity bit	None
Data bit	8 Bit Fixed
Protocol	BCC

■ System Configuration



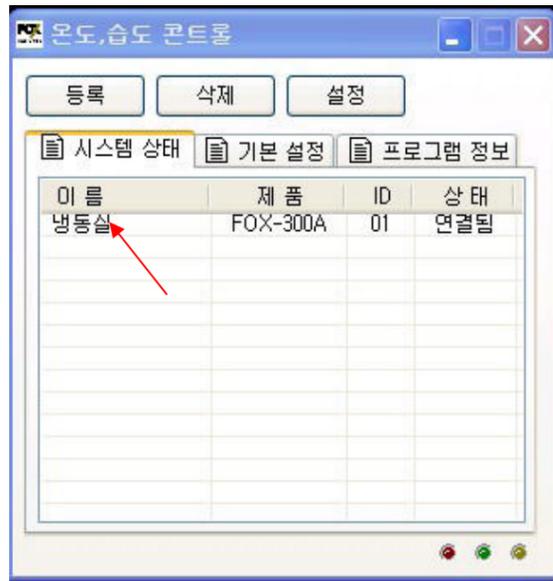
■ Definition of Communication Command and Block



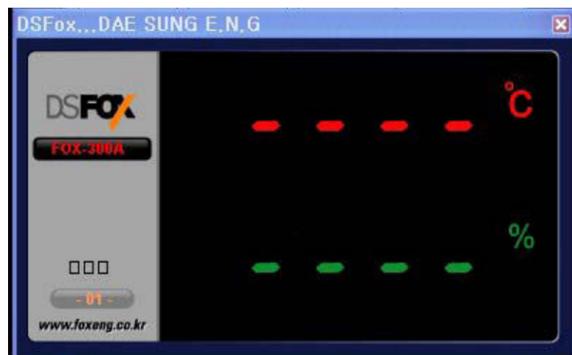
- ① Start Code
Displays the head of BLOCK.
STX → [02H], ACK will be added in case of RESPONSE
- ② Address Code
A code of which the host system identifies FOX-301 series, and can be set from 01 to 99 (BCD ASCII).
- ③ Header Code
The name of command is shown in text.
RX(Read demand) → R[52H], X[58H]
RD(Read response) → R[52H], D[44H]
WX(Write demand) → W[57H], X[58H]
WD(Write response) → W[57H], D[44H]
TPO(Temp.measured value) → W[54H], F[50H], O[30H]
HPO(Humi.measured value) → H[48H], P[50H], O[30H]

< 3. Temperature/Humidity Data >

Press the directory of the registered product twice using the mouse to see temperature/humidity data.



If communication is not done normally, following picture does not appear.

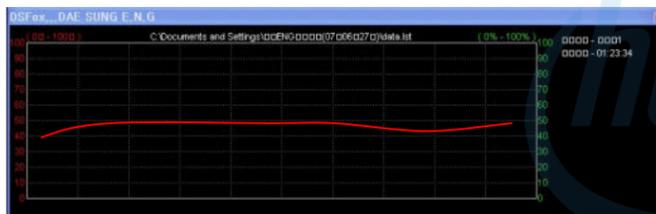


In case there is any problem in communication,

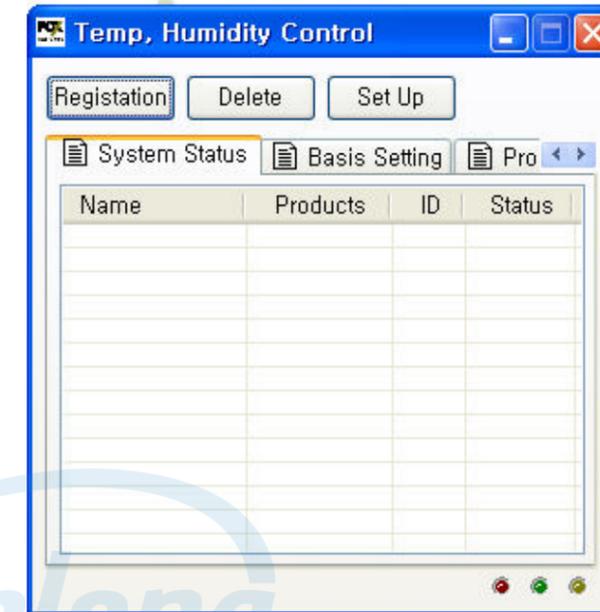
- 1) Make sure that communication port and speed correspond with those of the product in Default Setting.
- 2) If there is no mistake in Default Setting, press "Delete" button to delete registration data, and try to register the product again.

< 4. Temperature/Humidity Graph >

Press the indicated part of the following picture twice using the mouse to see temperature/humidity graph.



The following window should appear when you run the program.



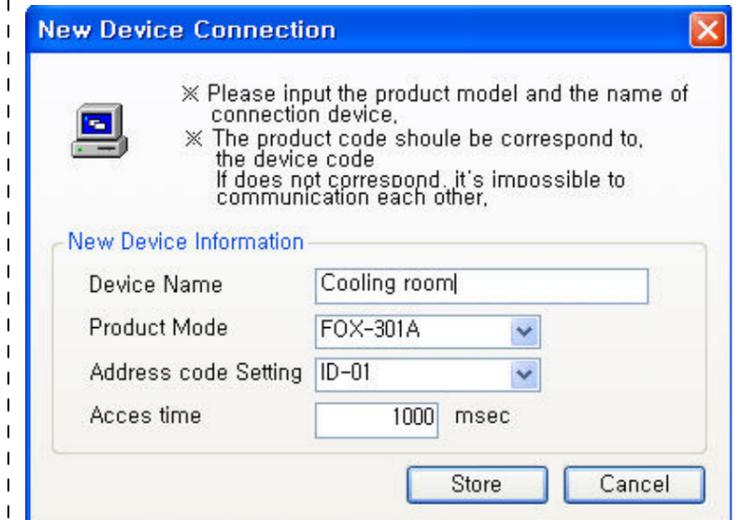
< 1. Default Setting >

Set the communication connection port and communication speed(bits/sec) by clicking on the Default Setting tap. These two parameters must be also set in the save products to be connected with PC.

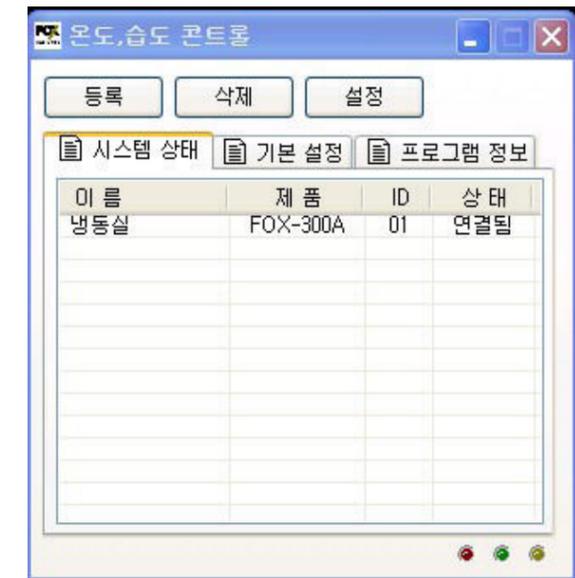


< 2. Product Registration >

Press "Register" button to register the product
 Facility Name : enter the name of the facility
 Product Model : select the model of the product
 ID Number Setting : select the number marked "not in use", which must be the same as ID number of the product.
 Frequency : set the frequency of reading temperature/humidity data of the product.
 Press "Save" button



By pressing "Save" button, the product is registered, and if there is no problem in communication "Connected" is displayed in Status



Operating Manual



Thank you very much for selecting our products.

1 Caution for your safety

Please read this instruction carefully before using this controller
 ※ The manual's information & specification can changeable to improve its quality without any notification.

Safety

1. As use this item after installing the duplex safety device in which is applied at dangerous factors such as serious human injury or serious damages of property & important machine because this item is not designed as safety device
2. Do not checking or repairing when it is power on
3. Please check the terminal number before connecting power supply
4. Do not disassembling or opening, remodeling, repairing without any permission

Safety Instruction and Hazard Warnings

- Please read the operating manual through completely before putting the device into operation.
- We will not assume any responsibility for damage to assets or persons caused by improper handling or failure to observe the safety instructions or hazard warnings.
- For safety and licensing reasons, unauthorized conversion and/or modification of the device is not permitted.
- Do not exceed the maximum permissible current - in case of higher loads, use a contactor of adequate power. Make sure that the supplied voltage matches the values specified for the instrument.
- The device must be adequately protected from water and dust as per the application and must be accessible via the use of appropriate tools
- The device must not be exposed to extreme temperature, sunlight, strong vibrations or high levels of humidity.
- Operation or installation is not permitted under unfavorable ambient conditions such as wetness or excessive induction loads or solenoid and dust, combustible gases, vapors or solvents, especially high-frequency noise
- Avoid operation or installation close to high-frequency fields such as welding devices, sewing machines, wireless transmitter, radio systems, SCR controller, etc
- Do not install the sensor cable nearby signal cable, power cable, load cable
- Please use the shield cable when the sensor cable's lengthen, however do not make it too much longer
- Please use the sensor cable without any cutting or flaw, blemish.
- The device is not a toy and should be kept away from children
- Installation work must only be carried out by suitably qualified personnel who are familiar with the hazards involved and with the relevant regulations.
- You shouldn't tinker with anything or the product may not be opened or disassembled unless you know what you're doing. Please ask us about this questioning

Danger

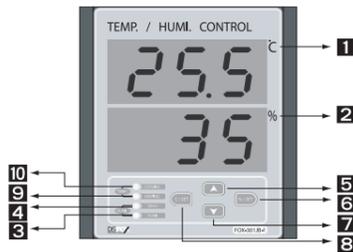
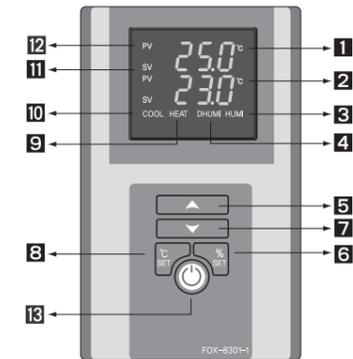
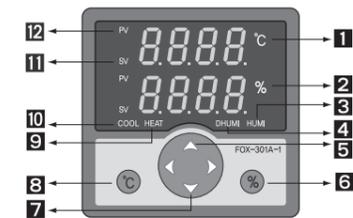
Attention ! Never work on electrical connections when the machine is switched on

2 Composition

model	sensor	temp./humi.range	external size	function
FOX-301A-1	HCPV-220NH	-40.0 ~ 65.0°C 10 ~ 95%	W72 X H72mm	temp. control
FOX-301AR1				humi. control
FOX-301JB-1			W193.5 X H241mm	temp. control
FOX-301JR1				humi. control
FOX-301JSH	SH-104	0.0%~100.0%Rh	W94 X H150mm	temp. control
FOX-8301-1	HCPV-220NH	-40.0 ~ 65.0°C 10 ~ 95%		temp. control
FOX-8301R1			humi. control	

*HCPV-220NH can be replaced with FS-200N(-55.0°C~99.9°C) and HCPV-220(10~95%).

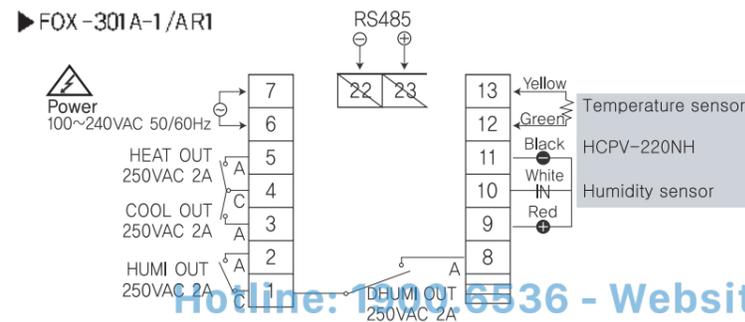
3 Part name



- 1: Display of the present temperature (red color)
- 2: Display of the present humidity (green color)
- 3: Output display of the humidity's working
- 4: Output display of the dehumidity's working
- 5: Up
- 6: Humidity mode
- 7: Down
- 8: Temperature mode
- 9: Display of the heating output
- 10: Display of the cooling output
- 11: Display of the measuring value
- 12: Display of the set value
- 13: Power supply

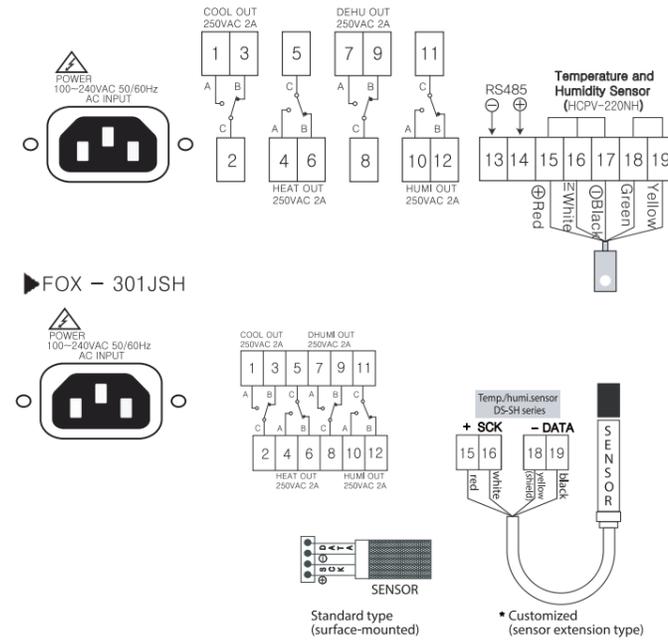
4 Connection

output : 250VAC 2A
 Please make use of the power relay or a suitable magnet surely.

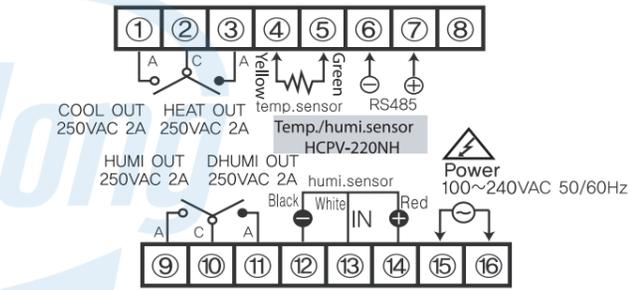


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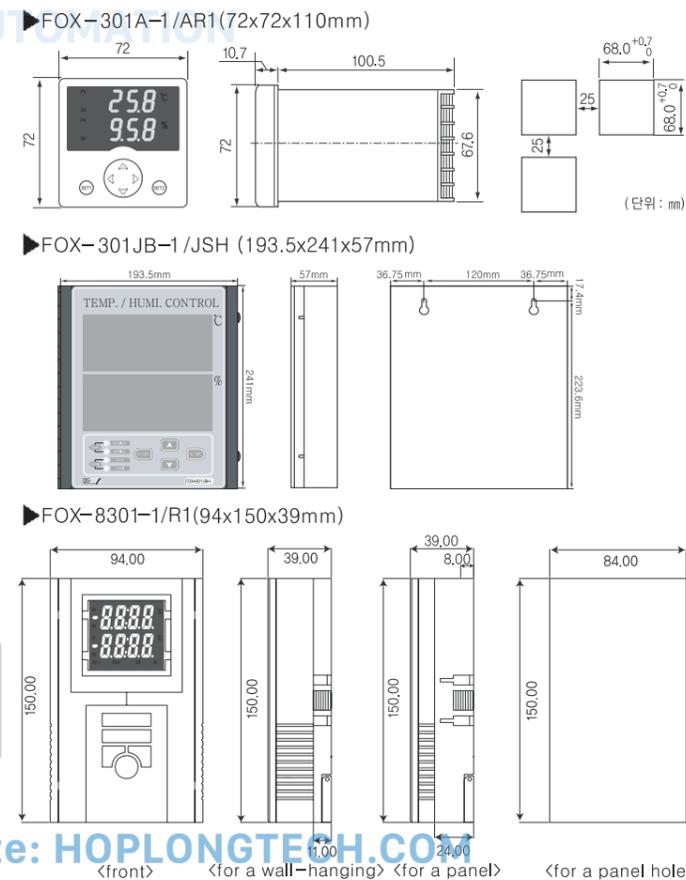
FOX-301JB-1/JR1



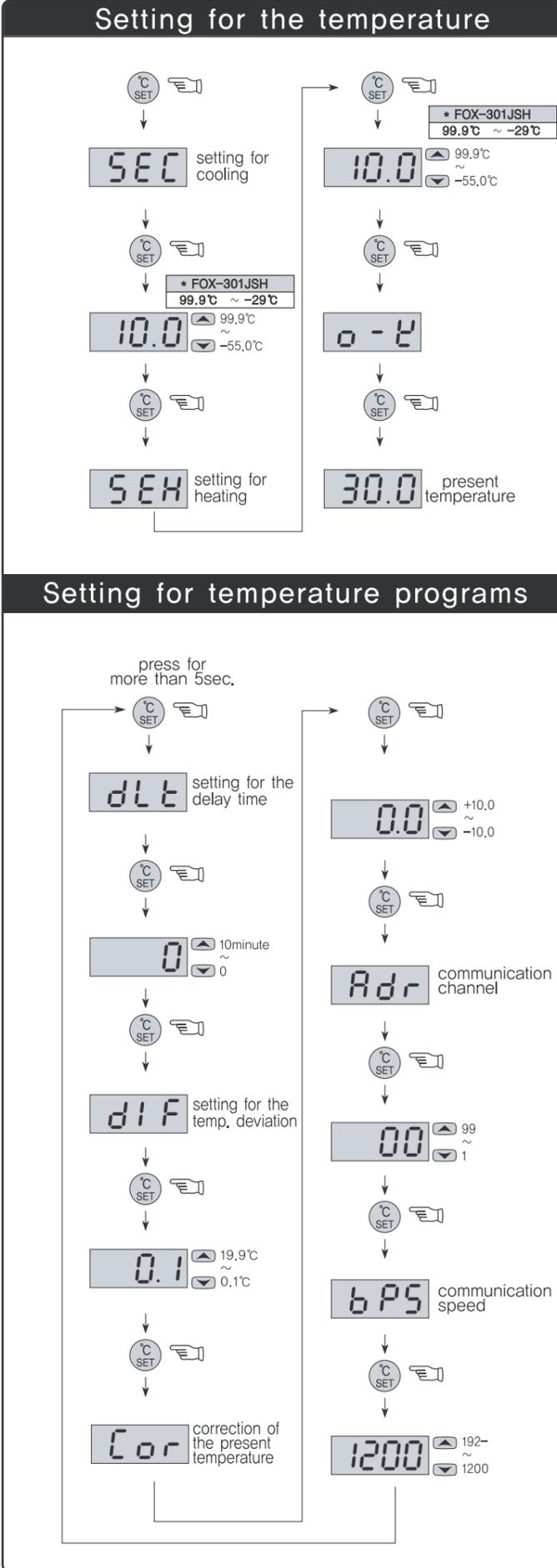
FOX-8301-1/R1



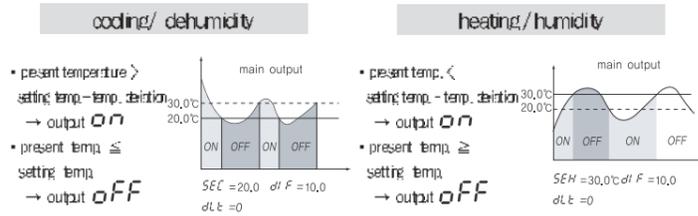
5 Size & Dimension



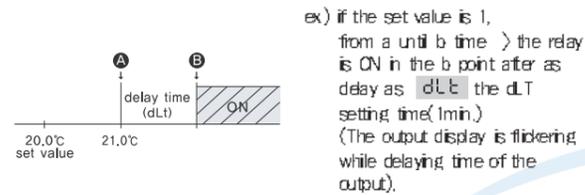
6 Temperature



「ex=> The method of the temp. deviation when ON/OFF control」



2. **dL t** : Delay time of the output
It is widely used as the followings
- in case of operating the ON/OFF control very often,
- to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply



3. **Cor** : Correction of the present temperature.
- It is used for the correction of a discrepancy between the display temperature and real temperature
ex) real temp. : 10.0°C
display : 12.0°C → **Cor** : 0.0 ⇒ -2.0 correction
→ 10.0°C display (corrected present temperature)

4. **Adr** : Communication channel
- To designate the channel 1~99 while RS485 communication working

5. **bPS** : Communication speed(velocity)
- 120, 1200 : 1200bps
- 240, 2400 : 2400bps
- 480, 4800 : 4800bps
- 960, 9600 : 9600bps
- 192, 1920 : 1920bps
(Start bit 1, Stop bit 1, Non parity)

9 Temp.range & set value when deliver

	function	display	range	set value	remarks
setting Temp.	setting for cooling	SEd	-55.0~99.9	10.0	
	setting for heating	SEH	-55.0~99.9	10.0	
setting programs	temperature deviation	dIF	0.1~19.9	1.0	
	delay time	dL t	0~10	0	minute
	correction of the temperature	Cor	-10.0~10.0	0.0	correct for a discrepancy between the display temp. and an actual temperature.
	Communication channel	Adr	01~99	0	RS485 communication
	Communication speed	bPS	1200/2400/4800/9600/1920	1200	RS485 communication

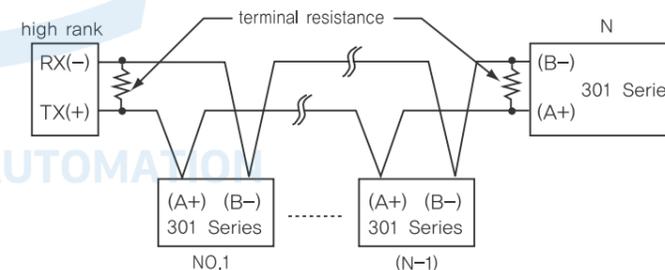
	function	display	range	set value	remarks
setting humi.	setting for dehumidify	SEd	0~100%	30%	
	setting for humidity	SEH	0~100%	30%	
setting programs	humidity deviation	dIF	1~29	1	
	delay time	dL t	0~10	0	minute
	correction of the humidity.	Cor	-10~10	0	correct for a discrepancy between the display humi. and an actual humidity.

11 Communication output

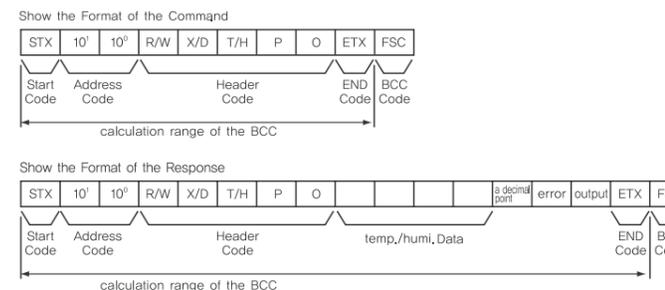
Interface

specification	in conformity EIA RS485
maximum connection	32(However, available to set the Address from 01 until 99)
the method of communication	two-wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1,2km
communication speed	1200/2400/4800/9600/19200bps (assess to section)
Start bit	fixed 1bit
Stop bit	fixed 1bit
Parity bit	none
Data bit	fixed 8bit
Protocol	BCC

System



Definition between communication command and Block



- ① Start Code
show the lead(head) of the Block
STX->[02H], ACK will be added in case of Response.
- ② Address Code
A high rank system can discriminate the channel code number among FOX-301series
It is available to set between 01 and 99(BCD ASC II)
- 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) → W[54H], P[50], O[30H]
- HPO(temperature measuring value) → H[48H], P[50], O[30H]
- ④ Composition of Data
Data is displayed as "Hexadecimal"
- ⑤ Decimal point → O[30H] there is no "decimal point"
1[31H] there is "decimal point"
- ⑥ Error → O[30H] there is no "error"
1[31] interrupted of the sensor's cable
2[32] short-circuited error of the sensor

	TEMP		HUMI	
	COOL	HEAT	HUMI	DHUMI
0(30H)	O	O	0(30H)	O
1(31H)	O	X	1(31H)	O
2(32H)	X	O	2(32H)	X
3(33H)	X	X	3(33H)	X

- ⑧ END Code
show the end(close) of the Block ETX → [03H]
- ⑨ BCC
show the XOR arithmetic and logic values from the start(STX) to the ETX
- the others : As of no response of the ACK
 - ① in case of not equivalent to the channel after receiving 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 normally.
 - ④ change the communication speed in case of bring about the communication's error frequently.

12 Error message

- **E r I** Memory error. Turn the power off and turn it on again
If the error message persists, please request us A/S by return
- **O - E** Sensor error. The sensor is interrupted. Check the cable.
- **S - E** Sensor error. The sensor is short-circuited. Check the cable

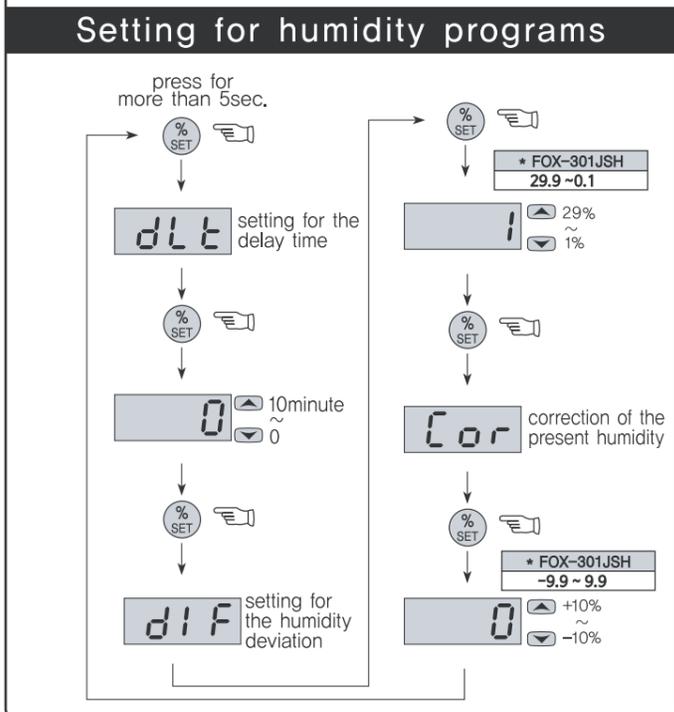
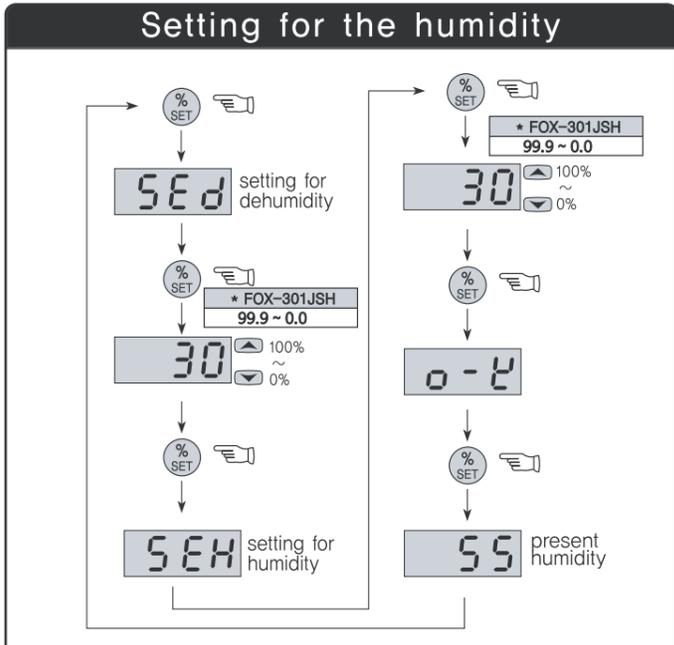
* The product's specification can be changed without any notification to improve its quality.

■ H.Office : Ballyonsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea
■ Factory : Ballyonsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea

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■ FAX : 82-51-819-4562

■ E-mail : conotec@conotec.co.kr
■ Homepage : www.conotec.co.kr

- Main Products & Development
 - Digital Temperature /Humidity Controller
 - Digital Timer, Current/Voltage Meter
 - Other Products Development



※To change it with program mode, press the --key for more than 5 second in the present temperature display mode.
※The set or programming mode is terminated, if you press the --key, parameters(set values) are saved after the display shows OK letter or return to present temperature automatically after 30 second.

8 Detailed manual

- 1. **dIF** : Setting for temperature deviation
- In the ON/OFF control, it needs at regular interval between ON and OFF.
- By operating the ON/OFF control frequently, the relay 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 relay or contact and so on.

Operating Manual



Thank you very much for selecting our products.

1 Caution for your safety

Please read this instruction carefully before using this controller
 ※ The manual's information & specification can be changed to improve its quality without any notification.

⚠ Safety

1. Pls use this item after installing the duplex safety device in which is applied at dangerous factors such as serious human injury or serious damages of property & important machine because this item is not designed as a safety device.
2. Do not check or repair when it is power on.
3. Please check the terminal number before connecting power supply.
4. Do not disassemble or open, remodel, repair without any permission.

⚠ Safety Instruction and Hazard Warnings

- Please read the operating manual through completely before putting the device into operation.
- We will not assume any responsibility for damage to assets or persons caused by improper handling or failure to observe the safety instructions or hazard warnings.
- For safety and licensing reasons, unauthorized conversion and/or modification of the device is not permitted.
- Do not exceed the maximum permissible current - in case of higher loads, use a contactor of adequate power. Make sure that the supplied voltage matches the values specified for the instrument.
- The device must be adequately protected from water and dust as per the application and must be accessible via the use of appropriate tools
- The device must not be exposed to extreme temperature, sunlight, strong vibrations or high levels of humidity.
- Operation or installation is not permitted under unfavorable ambient conditions such as wetness or excessive induction loads or solenoid and dust, combustible gases, vapors or solvents, especially high-frequency noise
- Avoid operation or installation close to high-frequency fields such as welding devices, sewing machines, wireless transmitter, radio systems, SCR controller, etc
- Do not install the sensor cable nearby signal cable, power cable, load cable
- Please use the shield cable when the sensor cable's lengthen, however do not make it too much longer
- Please use the sensor cable without any cutting or flaw, blemish.
- The device is not a toy and should be kept away from children
- Installation work must only be carried out by suitably qualified personnel who are familiar with the hazards involved and with the relevant regulations.
- You shouldn't tinker with anything or the product may not be opened or disassembled unless you know what you're doing. Please ask us about this questioning

⚠ Danger

Attention ! Never work on electrical connections when the machine is switched on

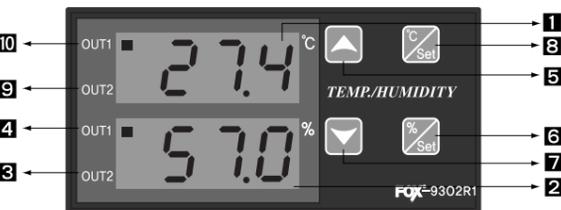
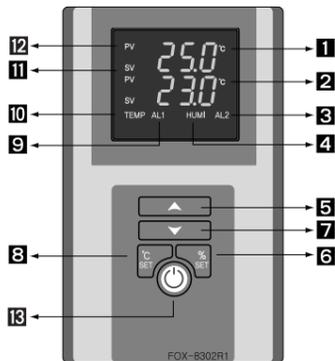
2 Composition

model	sensor	temp./humi.range	external size	function
FOX-302R1			W72 X H72mm	
FOX-9302R1	FS-200N HCPV-220H	-50.0~99.9°C 10 ~ 95%	W96 X H48mm	temp.control humi.control RS485 com.
FOX-8302R1			W94 X H150mm	

3 Part name



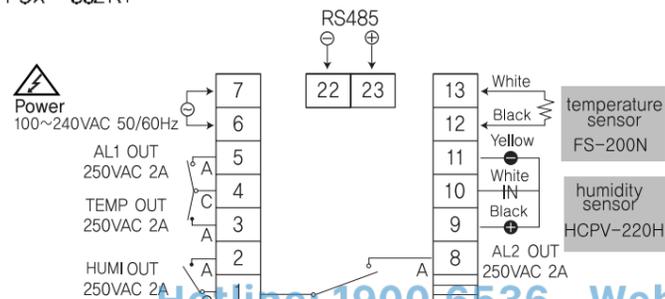
- 1: Display of the present temperature (red color)
- 2: Display of the present humidity (green color)
- 3: Alarm output display of the humidity
- 4: output display of the humidity's working
- 5: Up
- 6: Humidity mode
- 7: Down
- 8: Temperature mode
- 9: Alarm output display of the temperature
- 10: Output display of the temperature' working
- 11: Display of the set value
- 12: Display of the set value
- 13: Power supply



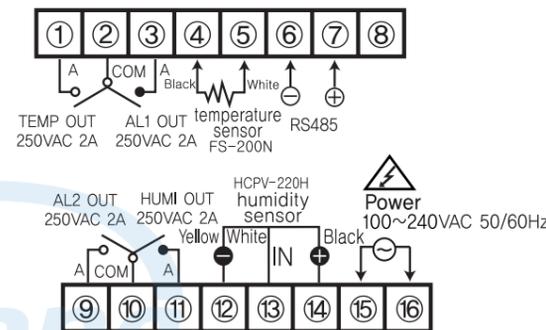
4 Connection

output : 250VAC 2A
 Please make use of the power relay or a suitable magnet surely.

▶ FOX - 302 R1

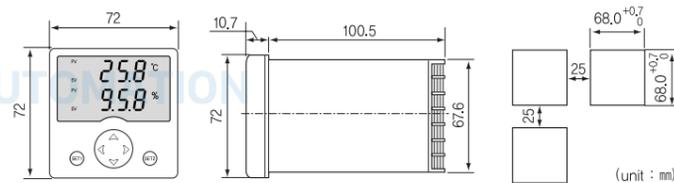


▶ FOX -8302R1

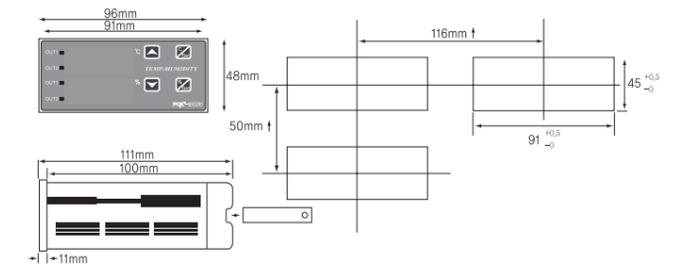


5 Size & Dimension

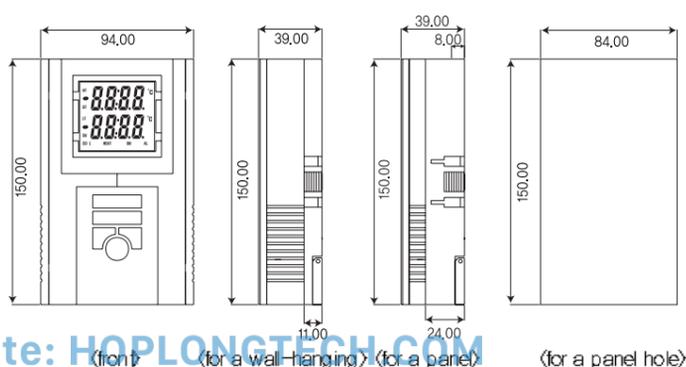
▶ FOX -302R1 (72x72x110mm)



▶ FOX -9302R1 (96x48x110mm)

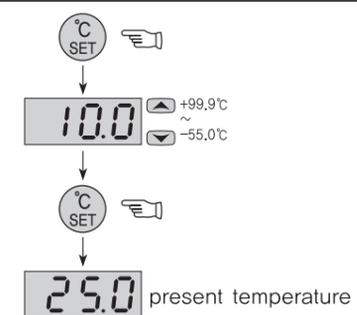


▶ FOX -8302R1 (94x150x39mm)

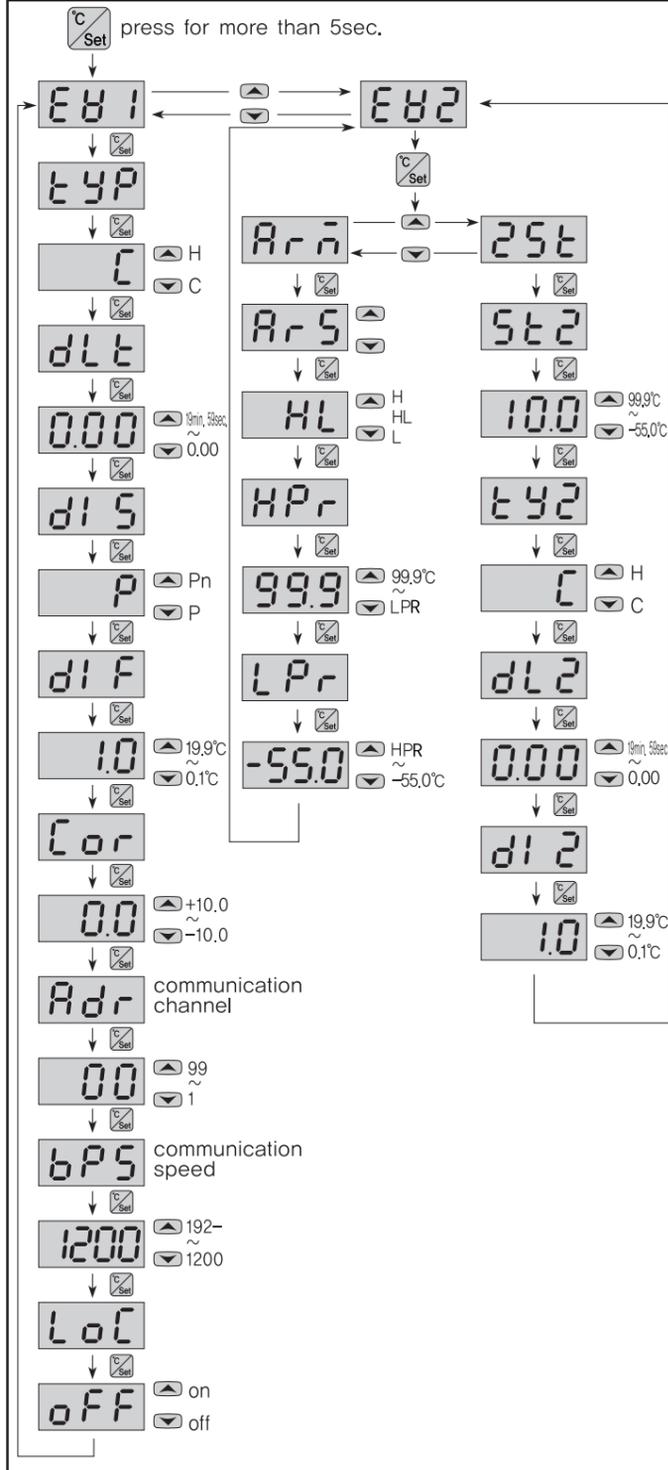


6 Temperature

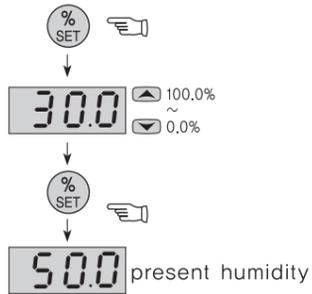
Setting for the temperature



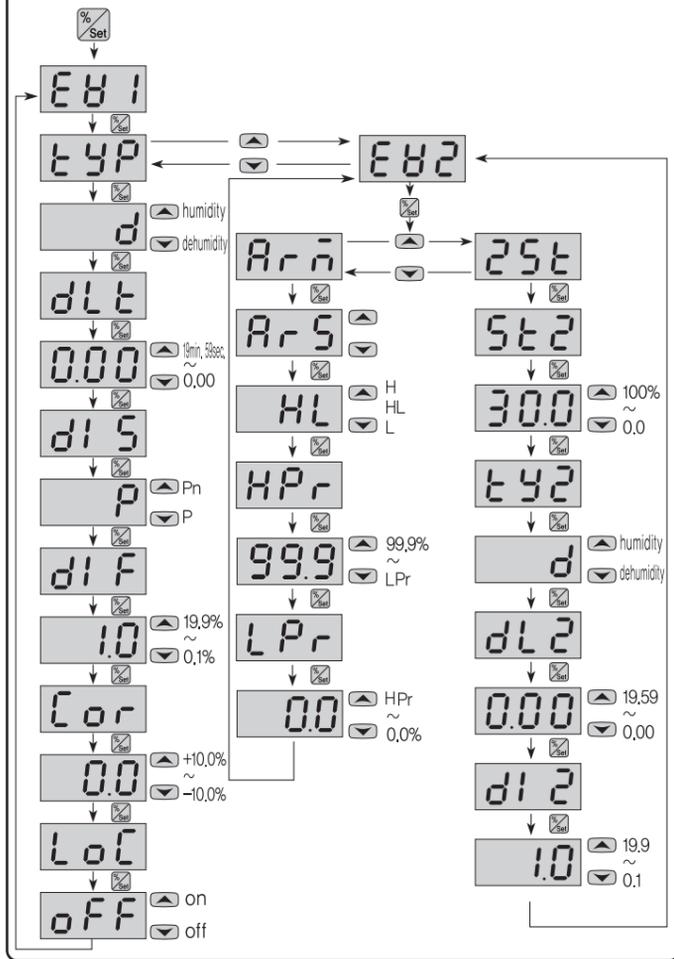
Setting for temperature programs



Setting for the humidity



Setting for humidity programs



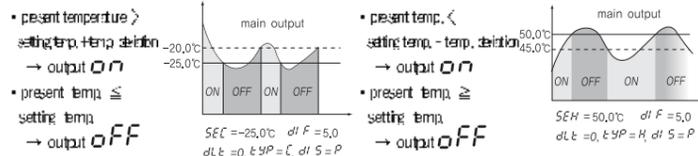
※To change it with program mode, press the --key for more than 5 second in the present temperature display mode.

※The set or programming mode is terminated, if you press the **o-E** key, parameters(set values) are saved after the display shows OK letter or return to present temperature automatically after 30 second.

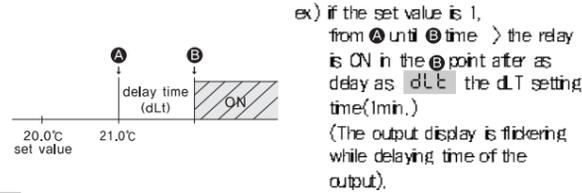
8 Detailed manual

- tYP** : temperature : possible to select the coding or heating, humidity : possible to select the humidity or dehumidity.
- dIF** : Setting for temperature deviation
 - In the ON/OFF control, it needs at regular interval between ON and OFF.
 - By operating the ON/OFF control frequently, the relay 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 relay or contact and so on.

ex=> The method of the temp. deviation when ON/OFF control
cooling / dehumidity heating / humidity



- dLT** : Delay time of the output
It is widely used as the followings
 - in case of operating the ON/OFF control very often,
 - to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply



- Cor** : Correction of the present temperature,
 - It is used for the correction of a discrepancy between the display temperature and real temperature
- ex) real temp. : 10.0°C → **Cor** : 0.0 ⇒ -20 correction
→ 10.0°C display(corrected present value)

- RdR** : Communication channel
 - To designate the channel while RS485 communication working
- SPS** : Communication speed(velocity)
 - 120, 1200 : 1200bps
 - 240, 2400 : 2400bps
 - 480, 4800 : 4800bps
 - 960, 9600 : 9600bps
 - 192, 1920 : 19200bps

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

- LoC** : The lock function : As a safety device, it is used in order not to change the set values except for the main user, ON- setting for the lock function, OFF- removal for the lock function
- Rrā** : 25t auxiliary output → alarm function(impossible to set the 25t while this function working)
- 25t** : Rrā auxiliary output → 2-stage function(impossible to set the Rrā while this function working)
- HPr** : Setting function of the alarm temperature for the highest limit
 - It will be operated higher than HPr set value
- LPr** : Setting function of the alarm temperature for the lowest limit,
 - It will be operated lower than LPr set value
- RrS** : Selection of the alarm output style
 - H** : output is turn on - when a high or a low temperature is more than HPr set value
 - HL** : outputs are on - both more than HPr and less than LPr
 - L** : output is turn on -when a high or a low temperature is less than LPr set value.
- St2** : auxiliary output- refer to no.1
- tY2** : auxiliary output - refer to no.2
- dL2** : auxiliary output - refer to no.3

Temp./humidity range when deliver

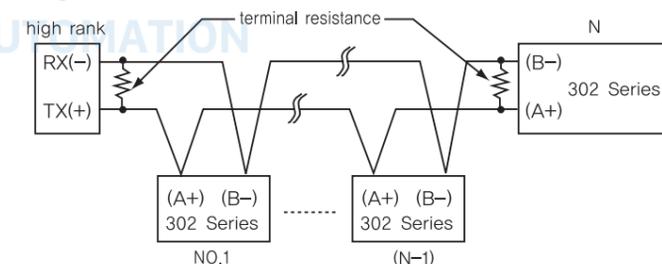
Display	Range	set values when deliver
°C/SET	temperature : -55.0~99.9°C	temperature : 10.0
%/SET	humidity : 0.0~100.0%	humidity : 30.0
tYP	temperature : C / H humidity : d / H	temperature : C humidity : d
dLT	0.00 ~ 19minute 59second	0.00
dIF	P / Pn 0.1 ~ 19.9	P
Cor	temperature : -15.0 ~ 15.0°C humidity : -10.0 ~ 10.0%	
LoC	on / off	off
Rrā	selection of the alarm function	
25t	2-stage setting function	
RrS	H / HL / L	HL
HPr	temperature : LPr ~ 99.9°C humidity : LPr ~ 100.0%	temperature : 65.0°C humidity : 95%
LPr	temperature : -55.0°C ~ HPr humidity : 0.0% ~ HPr	temperature : -55.0°C humidity : 0.0%
St2	temperature : -55.0 ~ 99.9°C humidity : 0.0 ~ 100.0%	temperature : 10.0°C humidity : 30.0%
tY2	temperature : C / H humidity : d / H	temperature : C humidity : d
dL2	0.00 ~ 19minute 59second	0.00
dl2	0.1 ~ 19.9	1.0

10 Communication output

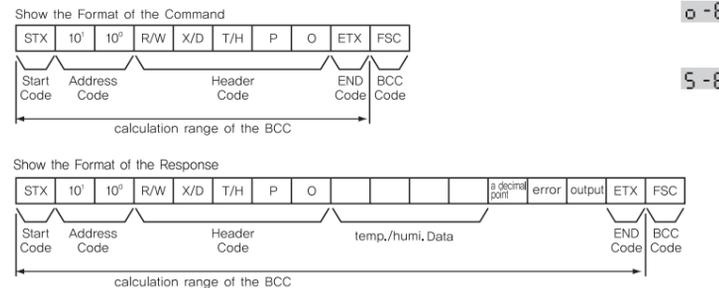
Interface

specification	in conformity IEC RS485
maximum connection	32 (however, available to set the Address from 01 unit 99)
the method of communication	two-wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1.2km
communication speed	1200/2400/4800/9600/19200bps(adjustable to selection)
Start bit	fixed 1bit
Stop bit	fixed 1bit
Parity bit	none
Data bit	fixed 8bit
Protocol	BCC

System



Definition between communication command and Block



- Start Code**
show the lead(head) of the Block
ACK will be added in case of Response, STX→[02H]
- Address Code**
A high rank system can discriminate the channel code number among FOX-302series
It is available to set between 01 and 99(BCD ASC II)
- Header Code**

- show the command name as 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) → W[54H], P[50], O[30H]
- HPO(humidity measuring value) → H[48H], P[50], O[30H]

- Composition of Data
Data is displayed as "Hexadecimal"
- Decimal point → O[30H] there is no "decimal point"
1[31H] there is "decimal point"
- Error → O[30H] there is no "error"
1[31] open error of the sensor's cable
2[32] short-circuited error of the sensor
- Output → O[30H] TEMP/AL1 OUT ON
HUMI/AL2 OUT ON
1[31H] TEMP/AL1 OUT ON
HUMI/AL2 OUT OFF
2[32H] TEMP/AL1 OUT OFF
HUMI/AL2 OUT ON
3[33H] TEMP/AL1 OUT OFF
HUMI/AL2 OUT OFF
- END Code
show the end(close) of the Block. ETX→[03H]
- BCC (Block Check Character)
show the XOR arithmetic and logic values from the start(STX) to the ETX
- the others : As of no response of the ACK
 - in case of not equivalent to the channel after receiving STX
 - in case of generating the Receive Buffer Overflow
 - in case of not equivalent to the communication's set values or baud rate
- treatment- in case of not response of the ACK
 - check the cable
 - check the communication's condition (set values)
 - if the main cause of the status is the noise, try to do communication practicing 3 times until recovering normally.
 - change the communication speed in case of bring about the communication's error frequently.

11 Error message

- If error is displayed while using the product:
 - E r 1** is displayed when the DATA memory element is damaged inside the product as it is affected by powerful noise from outside while in use. In this case, contact our company for customer service. While the controller is equipped with supplementary measures for outside noise, it cannot endure infinite noise. In case of the nose of 2KV or more flows in, inside of the product may be damaged.
 - The sensor has defect when **o -E** (Open Error) or **S -E** (Short Error) is displayed. Please check the sensor.

※The product's specification can be changed without any notification to improve its quality. Please read and observe precautionary instructions during handling of the product.

※ Regarding the English language manual, please download it at our web-site.

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■ TEL : +82-51-819-0426
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■ e-mail : conotec@conotec.co.kr
■ URL : www.conotec.co.kr

■ Main products & Development
- Digital temperature controller
- Digital humidity controller
- Digital timer

※ This device works proper operation with:
Surrounding Temp. : 0°C ~ 60°C
Surrounding Humi. : below 80%RH
Regular power : 220VAC ± 10% 50/60Hz

User's Manual



1 Safety Precautions

Be sure to read cautions before use for correct use.

- ※ The specifications and exterior sizes described in this manual may be subject to change for improving product capacity.

⚠ Safety Precautions

- 1.This product was not manufactured as a safety device. Therefore, in case of using it as a controller such as for a device that may cause casualty, serious damage to peripheral devices, and tremendous loss of property, be sure to attach double safety devices.
- 2.Do not wire or inspect or repair while power is on.
- 3.In case of supplying power, be sure to check a terminal number for connection.
- 4.This device should not be disassembled, processed, improved, or repaired.

⚠ Caution

- Before the installation of this device, understand fully how to use, safety regulations or warnings, and be sure to use within specified related specifications or related capacities.
- Do not wire or install it for a motor or solenoid with great inductive load.
- During the extension of a sensor, use a shielding wire, and do not make it unnecessarily longer.
- Do not use the same power supply or any part that generates arc during closing or opening directly near the power supply.
- A power line should be far apart from a high-tension wire, and the device should not be installed in a place containing much water, oil, or dust.
- Do not install it in a place under direct light or exposed to rain.
- Do not install it in a place with strong magnetism or noise or vibration or impact.
- Put it far apart from a place that may release strongly alkaline or strongly acidic substance, and use an independent pipe.
- Do not spray water directly on it for cleaning in case of installing it in the kitchen.
- Do not install it in a place where temperature/humidity exceeds rating.
- Take caution not to break a sensor wire or make any scratch.
- A sensor wire should be away from a signal line, power, and load line, and use an independent pipe.
- In case of disassembling or modifying this product voluntarily, it may not be applied with warranty service.
- A ⚠ mark on the terminal circuit diagram is a safety mark as warning or caution.
- Do not use it near any device (harmonics welder, harmonics, harmonics radio, and large capacity SCR controller) that generates strong harmonics noise.
- In case of using it with any other method than one designated by a manufacturer, injury or loss of properties may occur.
- As it is not a toy, keep out of the reach of children.
- Installation must be done by a relevant professional or a qualified person.
- Our company shall not be responsible for any damage caused by failing to observe the contents specified in the above warnings or cautions or by the fault of a consumer.

⚠ Danger

- Caution, risk of electric shock
 - Electric Shock - Do not contact with AC terminal during current carrying. This may cause electric shock.
 - Input power must be blocked when checking input power.

2 Models

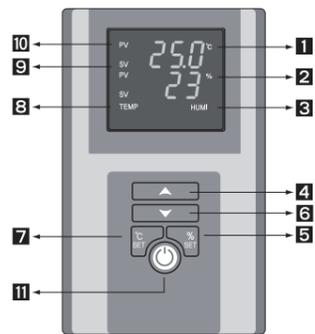
Model	Sensor	Range	Dimension	Function
FOX-300JSHR	SHT11	-29 ~ 99.9°C 0.0 ~ 99.9%	W194 x H241mm	Temp./Humi. control RS485
FOX-300-2S	SH-104	-29.9 ~ 99.9°C 0 ~ 100%	W72 x H72mm	Temp./Humi. control
FOX-300A-1	HCPV-220NH	-40.0 ~ 65.0°C 10 ~ 95%	W72 x H72mm	Temp./Humi. control
FOX-300AR1			W194 x H241mm	Temp./Humi. control RS485
FOX-300JR1			W94 x H150mm	
FOX-8300R1				

※ FOX-300 series model

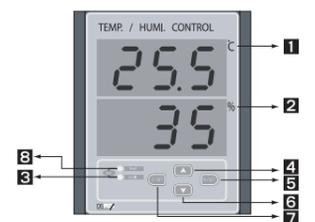
The sensor HCPV-220NH (Temp./Humi) is replaceable with Temp. : FS-200N(NTC10K)
Humi. : HCPV-220

Temp. & Humi. ranges are also available upto -55.0°C ~ 99.9°C
10 ~ 95%

3 Name of each parts



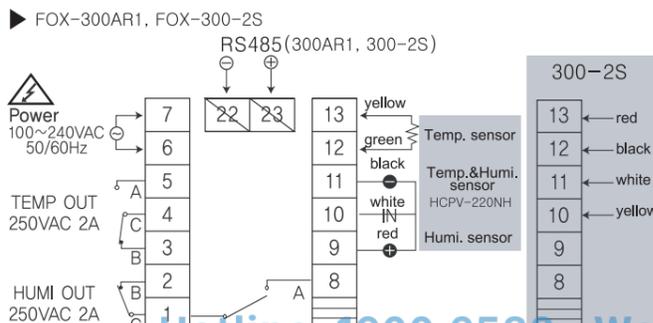
- 1 : Temp. measured value display(red)
- 2 : Humi. measured value display(green)
- 3 : Humi. output display
- 4 : Set value(UP) key
- 5 : Humi. mode changing key
- 6 : Set value(DOWN) key
- 7 : Temp. mode changing key
- 8 : Temp. output display
- 9 : Set value display
- 10 : Measured value display
- 11 : Power



- 1 : Temp. measured value display
- 2 : Humi. measured value display
- 3 : Humi. output display
- 4 : Set value(UP) key
- 5 : Humi. mode changing key
- 6 : Set value(DOWN) key
- 7 : Temp. mode changing key
- 8 : Temp. output display
- 9 : Set value display
- 10 : Measured value display
- 11 : Power

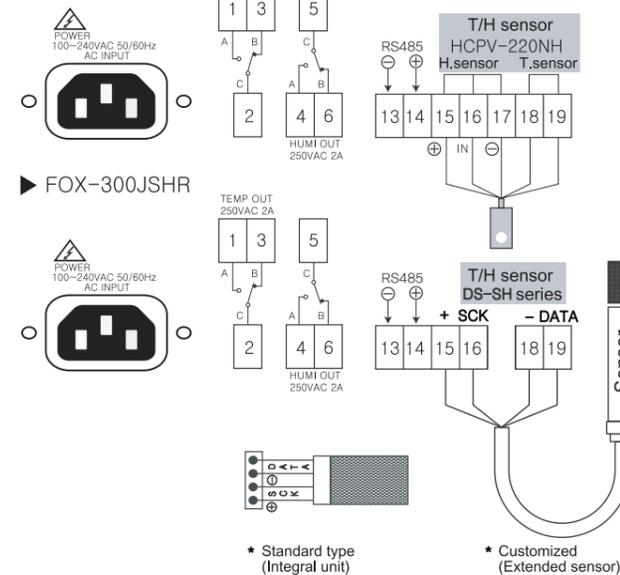
4 Wiring terminal

Output : 250VAC 2A
Please make sure to use the power relay or a suitable magnet .

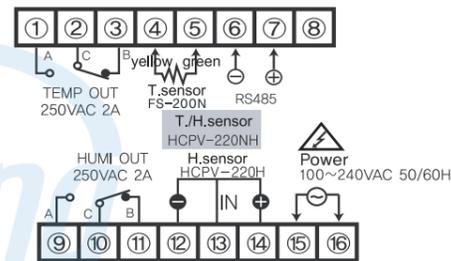


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FOX-800JR1

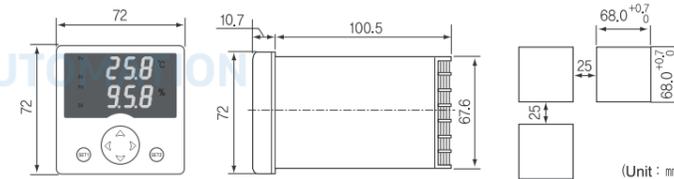


FOX-8300R1

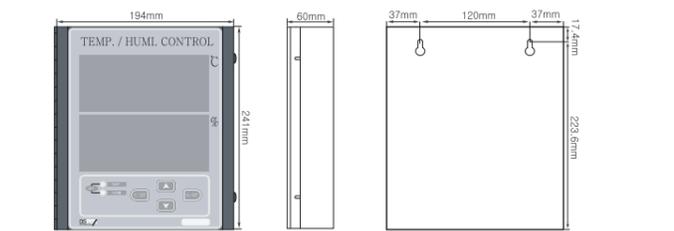


5 Product exterior dimension

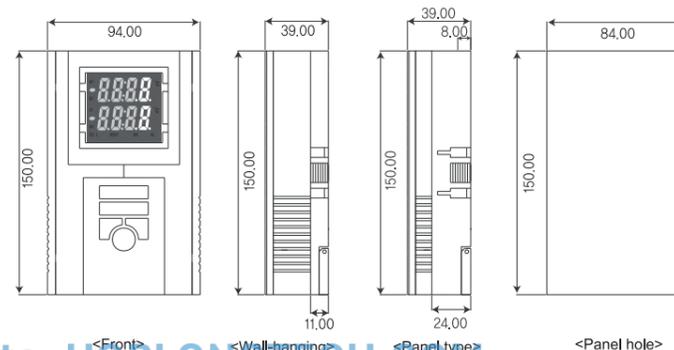
FOX-300AR1, FOX-300-2S(72x72x110mm)



FOX-300JR1 (194x241x60mm)

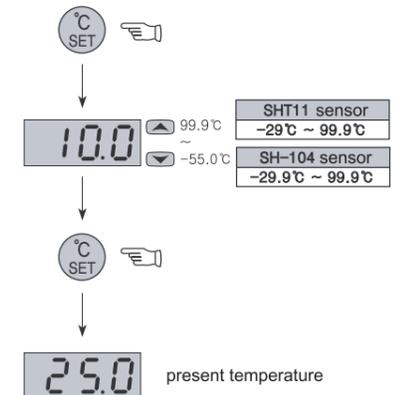


FOX-8300R1 (94x150x39mm)

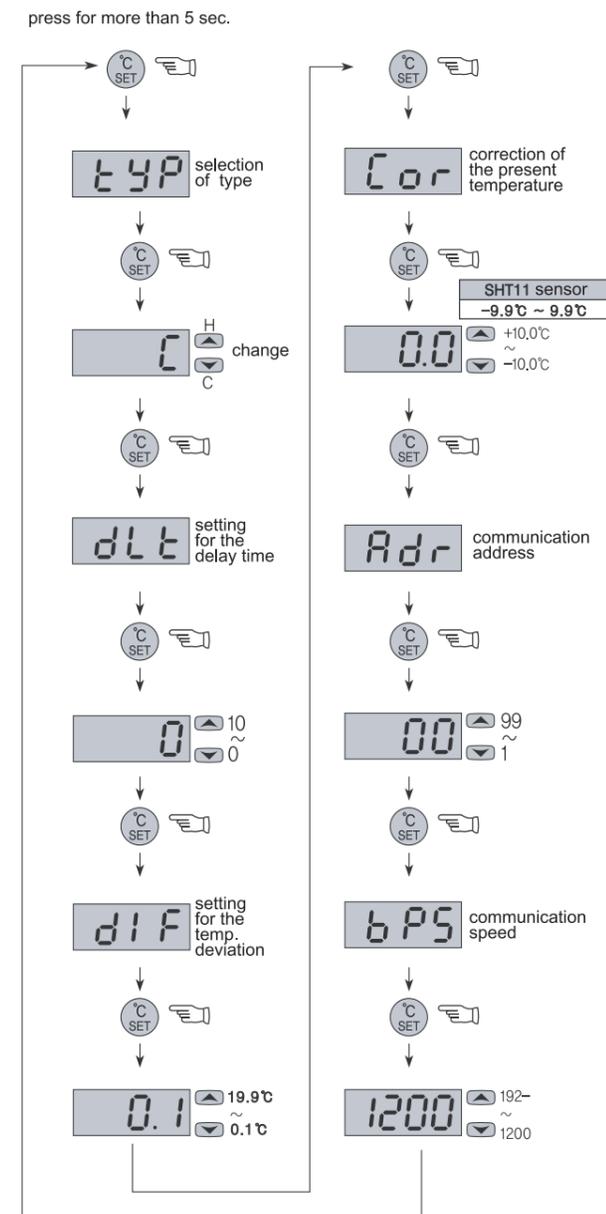


6 Temperature

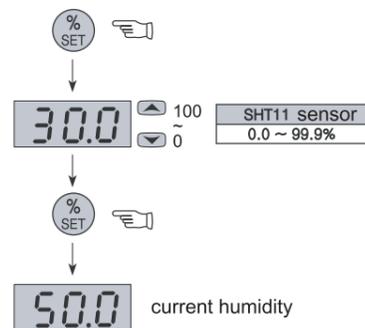
Setting for temperature



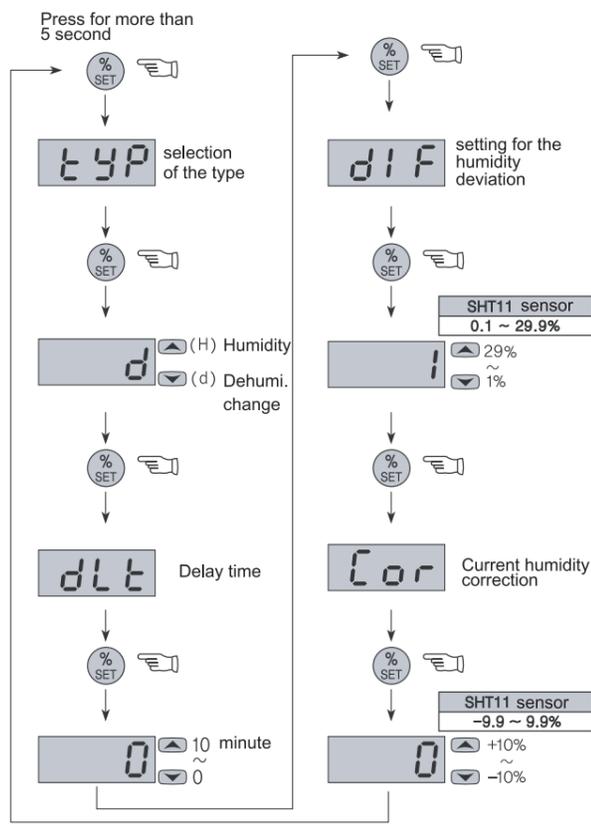
Setting for temperature programs



Setting for the humidity



Setting for the humidity program



※ Pressing SET key for 5 sec. in the state of current temperature display, can be entered the program setting mode.
 ※ All programs are returned automatically in 30 sec. to the present temperature after displaying **o-E** by pressing SET key once after set value changing.

8 About Detailed Function

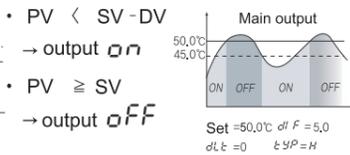
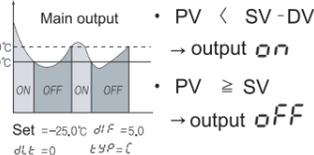
- tYP** : Temperature : Select Cooling(C) or Heating(H)
 Humidity : Select Dehumidity(d) or Humidity(H)
- dIF** : Deviation temperature setting
 - A regular interval is required between ON and OFF in the ON/OFF control (set up ON/OFF width)
 - Frequent ON and OFF will shorten the lifespan of the relay or the output contact or cause hunting (generation, chattering) by noise from outside. The temperature deviation function is used to setup temperature deviation to protect the equipment contact, etc.

Method of temperature deviation when ON/OFF control

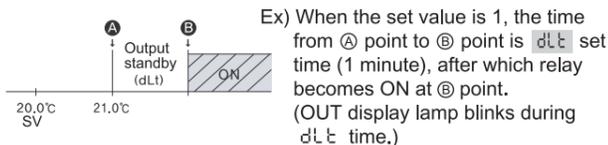
For Cooling/Dehumidifying

For Heating/Humidifying

- PV > SV + DV
→ output ON
- PV ≤ SV
→ output OFF



- dLT** : Output Delay Time
 - This function should be used when an object subject to control repeats ON/OFF actions and cause problems (chillers, compressors).
 - A function to protect the working machine upon momentary power failure or power is reapplied.



- 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 a thermometer currently use, a temperature controller)

e.g.) Actual temperature : 10.0°C
 Display Window : 12.0°C → **Cor** : 0.0 ⇒ -2.0
 Display in → 10.0°C (corrected current temperature)

- Adr** : Communication station settings
 - When using the RS485 communication, specify a station number between 1-99.
- bPS** : Communication speed settings
 - 120, 1200 : 1200bps
 - 240, 2400 : 2400bps
 - 480, 4800 : 4800bps
 - 960, 9600 : 9600bps
 - 192, 1920 : 19200bps
 (Start bit 1, Stop bit 1, Non parity)

9 Temperature setting range and default set

	Function	Display	Range	Default	Remarks
Setting temperature	Temperature setting (HCPV-220NH)		-55.0 ~ 99.9	10.0	SH-104 : -29.9 ~ 99.9 SHT11 : -29 ~ 99.9
Settings	Function selection	tYP	C / H	C	H : For Heating C : For Cooling
	Deviation temperature	dIF	0.1 ~ 19.9	1.0	
	Output delay time	dLT	0 ~ 10	0	Minute
	Temperature correction (HCPV-220NH, SH-104)	Cor	-10.0 ~ 10.0	0.0	Differs from displayed and actual value SHT11 : -9.9 ~ 9.9
	Address	Adr	01 ~ 99	0	RS485 communication
Speed	bPS	1200/2400/4800/9600/19200	9600		

10 Setting range and default set

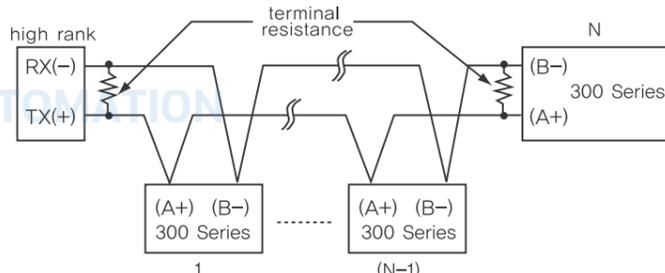
	Function	Display	Range	Default	Remarks
Set humidity	Humidity setting (HCPV-220H)		0 ~ 100%	30	SHT11 : 0.0 ~ 99.9
Program Settings	Selection of function	tYP	d / H	d	d : For dehumidifying H : For humidifying
	Humidity deviation (HCPV-220H, SH-104)	dIF	1 ~ 29	1	SHT11 : 0.1 ~ 29.9
	Output delay time	dLT	0 ~ 10	0	Minute
	Correction of the humidity (HCPV-220H, SH-104)	Cor	-10 ~ 10	0	correct discrepancy between the value in displayed and actual value SHT11 : -9.9 ~ 9.9

11 Communication

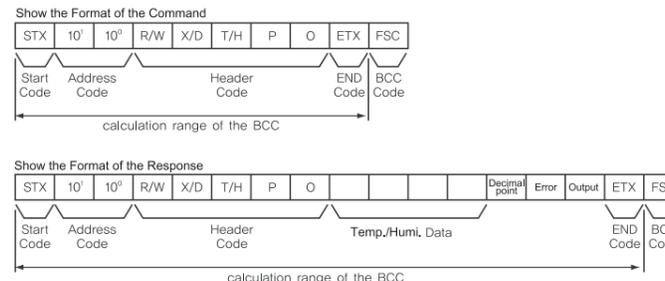
Interface

Specification	In conformity EIA RS485
Maximum connection lines	32 units (However, Address setting is available from 01 to 99)
Method	2-wire half-duplex
Synchronous system	Asynchronous
Distance	Within 1.2Km
Speed	1200/2400/4800/9600/19200bps (selectable)
Start bit	1 Bit fixed
Stop bit	1 Bit fixed
Parity bit	None
Data bit	8 Bit Fixed
Protocol	BCC

System Configuration



Definition of Communication Command and Block



- Start Code**
 Displays the head of BLOCK.
 STX → [02H], ACK will be added in case of RESPONSE
- Address Code**
 A code of which the host system identifies FOX-300 series, and can be set from 01 to 99 (BCD ASCII).
- Header Code**
 The name of command is shown in text.
 RX(Read demand) → R[52H], X[58H]
 RD(Read response) → R[52H], D[44H]
 WX(Write demand) → W[57H], X[58H]

WD(Write response) → W[57H], D[44H]

TPO(Temp.measured value) → W[54H], F[50H], O[30H]

HPO(Humi.measured value) → H[48H], P[50H], O[30H]

- Data Configuration
 Data is expressed in Hexadecimal
- Decimal point → 0[30H] No decimal point
 1[31H] There is a decimal point
- Error → 0[30H] No error,
 1[31H] Sensor open error
 2[32] Sensor short error
- Output → 1[31H] T/H OUT ON
 3[33H] T/H OUT OFF
- END Code
 Displays termination of Block. ETX → [03H]
- BCC
 Block Check Character. It shows the XOR operation value from the beginning (STX) protocol to ETX
- Others : If there is no ACK response
 ① If code numbers are inconsistent after receiving STX
 ② If Receive Buffer Overflow occurred
 ③ If borate or other communication SV is inconsistent
- Handling when there is no ACK response
 ① Check the status of line.
 ② Check communication condition (SV).
 ③ In the case of communication abnormality caused by noise, perform communication for 3 times for recovery.
 ④ Change the communication speed if communication abnormality is too frequent.

12 Simple troubleshooting tip

■ If error is displayed while using the product:

- E r** is displayed when the DATA memory element is damaged inside the product as it is affected by powerful noise from outside while in use. In this case, contact our company for customer service.
 - While the controller is equipped with supplementary measures for outside noise, it cannot endure infinite noise.
 - The interior of the product may be damaged if noise (2KV) is introduced.
- The sensor has defect when **o-E** (Open Error) or **S-E** (Short Error) is displayed. Please check the sensor.

※ The above specification may be changed without prior notice for further improvement in performance.
 Please read and observe precautionary instructions during handling of the Product.

※ Regarding the English-language manual, please download it at our web-site.

Installation Precautions

- WARNING: To avoid the risk of electric shock, this equipment must be connected to protective grounding and to a supply voltage.
- Do not block the vents.

Handling Precautions

- This instrument is suitable for the following environments.
 ■ Ambient temp. : 0°C~60°C ■ Ambient humi. : Less than 80% RH
 ■ Used indoors only ■ Pollution Degree 2
 ■ Altitude : less than 2000m ■ Installation Category II
- Avoid placing equipment that is difficult to operate power coding.
- Use of the equipment in a manner not specified by the equipment manufacturer may impair the protection provided by the equipment.
- Rated power : 100~240Vac 50/60Hz 9VA

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 ■ Factory : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea

■ TEL : +82-51-819-0426
 ■ FAX : +82-51-819-4562

■ e-mail : conotec@conotec.co.kr
 ■ URL : www.conotec.co.kr

■ Major products and development
 - Digital temperature, humidity controller
 - Digital timer, current/voltage meter
 - Other product development

User's Manual



1 Cautions for safety

Be sure to read cautions before use for correct use.

※ The specifications and exterior sizes described in this manual may be subject to change for improving product capacity.

⚠ Safety Precautions

- 1.This product was not manufactured as a safety device. Therefore, in case of using it as a controller such as for a device that may cause casualty, serious damage to peripheral devices, and tremendous loss of property, be sure to attach double safety devices.
- 2.Do not wire or inspect or repair while power is on.
- 3.In case of supplying power, be sure to check a terminal number for connection.
- 4.This device should not be disassembled, processed, improved, or repaired.

⚠ Caution

- Before the installation of this device, understand fully how to use, safety regulations or warnings, and be sure to use within specified related specifications or related capacities.
- Do not wire or install it for a motor or solenoid with great inductive load.
- During the extension of a sensor, use a shielding wire, and do not make it unnecessarily longer.
- Do not use the same power supply or any part that generates arc during closing or opening directly near the power supply.
- A power line should be far apart from a high-tension wire, and the device should not be installed in a place containing much water, oil, or dust.
- Do not install it in a place under direct light or exposed to rain.
- Do not install it in a place with strong magnetism or noise or vibration or impact.
- Put it far apart from a place that may release strongly alkaline or strongly acidic substance, and use an independent pipe.
- Do not spray water directly on it for cleaning in case of installing it in the kitchen.
- Do not install it in a place where temperature/humidity exceeds rating.
- Take caution not to break a sensor wire or make any scratch.
- A sensor wire should be away from a signal line, power, and load line, and use an independent pipe.
- In case of disassembling or modifying this product voluntarily, it may not be applied with warranty service.
- A ⚠ mark on the terminal circuit diagram is a safety mark as warning or caution.
- Do not use it near any device (harmonics welder, harmonics, harmonics radio, and large capacity SCR controller) that generates strong harmonics noise.
- In case of using it with any other method than one designated by a manufacturer, injury or loss of properties may occur.
- As it is not a toy, keep out of the reach of children.
- Installation must be done by a relevant professional or a qualified person.
- Our company shall not be responsible for any damage caused by failing to observe the contents specified in the above warnings or cautions or by the fault of a consumer.

⚠ Danger

- Caution, risk of electric shock
- Electric Shock - Do not contact with AC terminal during current carrying. This may cause electric shock.
- Input power must be blocked when checking input power.

2 Models

Model	Sensor	Range	Dimension	Function
FOX-301AR1			W72 x H72mm	Temp./Humi. control RS485
FOX-301JR1	HCPV-220NH	-40.0 ~ 65.0°C 10 ~ 95%	W193.5 x H241mm	
FOX-8301R1			W94 x H150mm	
FOX-301JSH	SHT11	0.0%~100.0%Rh	W194 x H241mm	Temp./Humi.control

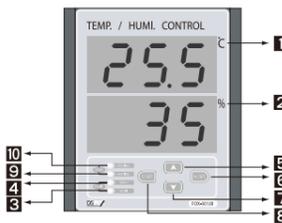
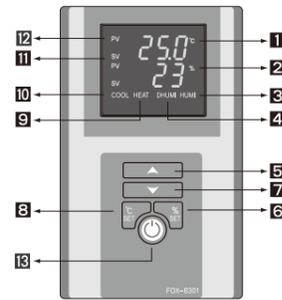
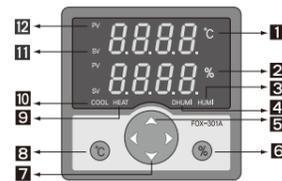
※ FOX-301 series can be changed as followings :

Sensor HCPV-220NH is convertible

⇒ Sensor for temperature : FS-200N(NTC 10K)
Sensor for humidity : HCPV-220H

Converted temperature range : Upto -55.0°C ~ 99.9°C
humidity range : Upto 10~95%

3 Name of each parts

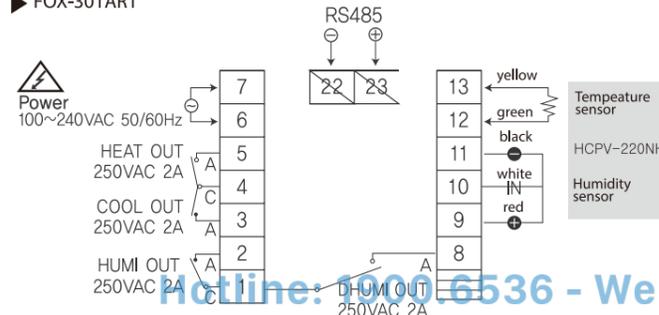


- 1 Temp. measured value display(red)
- 2 Humi. measured value display(green)
- 3 Humi. output display
- 4 Dehumi. output display
- 5 Set value(UP) key
- 6 Humi. mode changing key
- 7 Set value(DOWN) key
- 8 Temp. mode changing key
- 9 Heating output display
- 10 Cooling output display
- 11 Set value display
- 12 Measured value display
- 13 Power

4 Wiring terminal

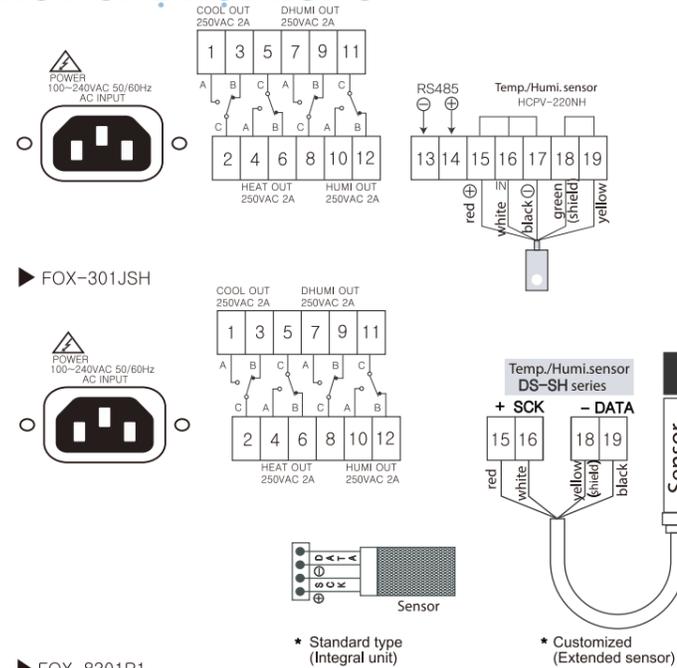
Output : 250VAC 2A
Please make sure to use the power relay or a suitable magnet .

▶ FOX-301AR1

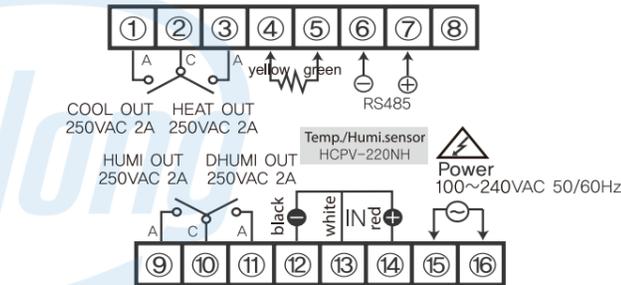


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▶ FOX-801JR1

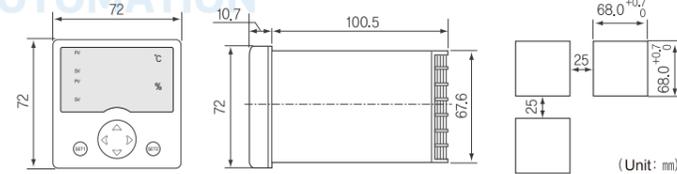


▶ FOX-8301R1

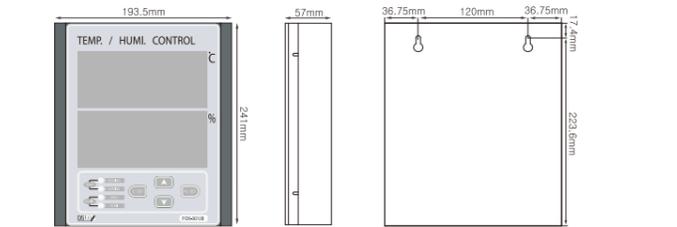


5 Product exterior dimension

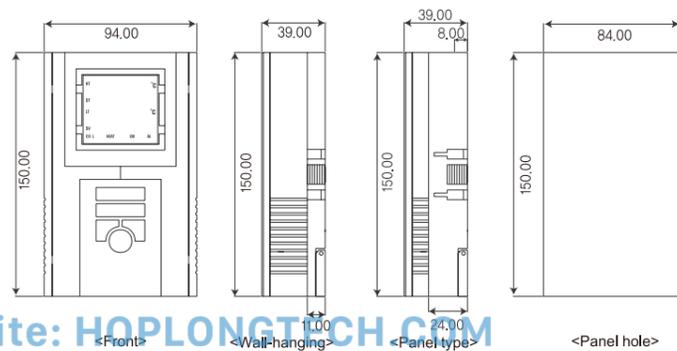
▶ FOX-301AR1(72 x 72 x 110 mm)



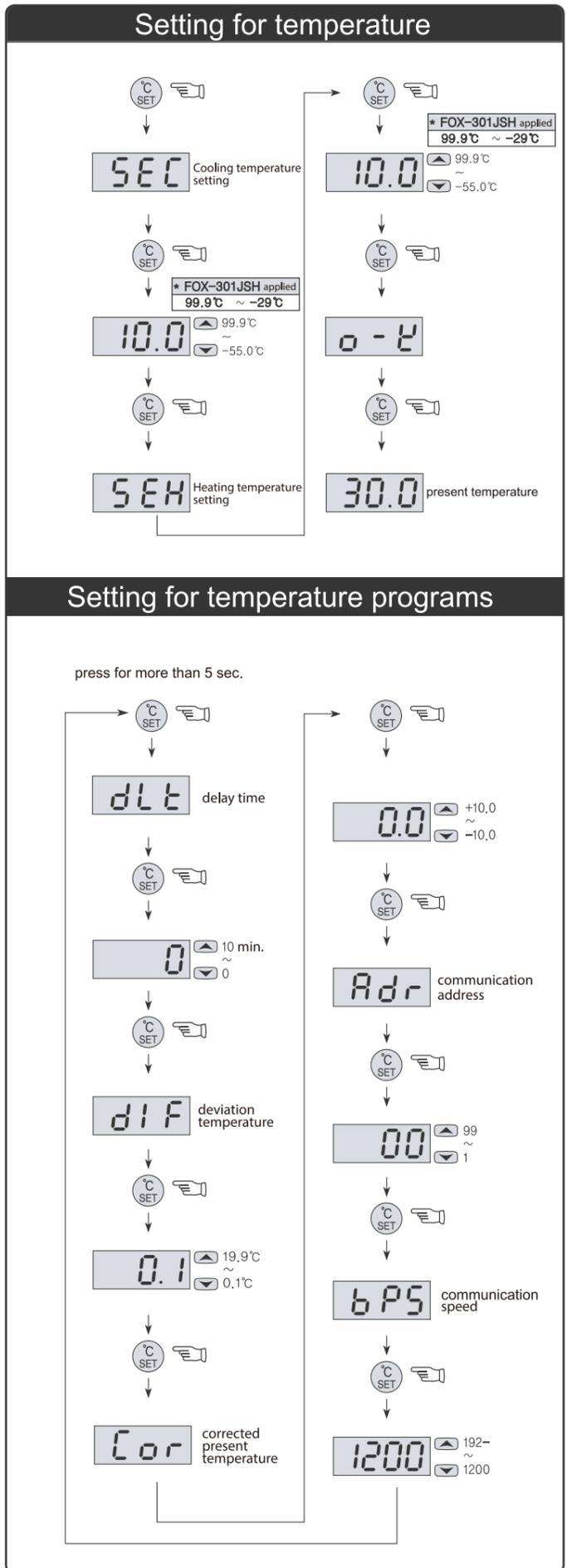
▶ FOX-301JSH(193.5 x 241 x 57 mm)

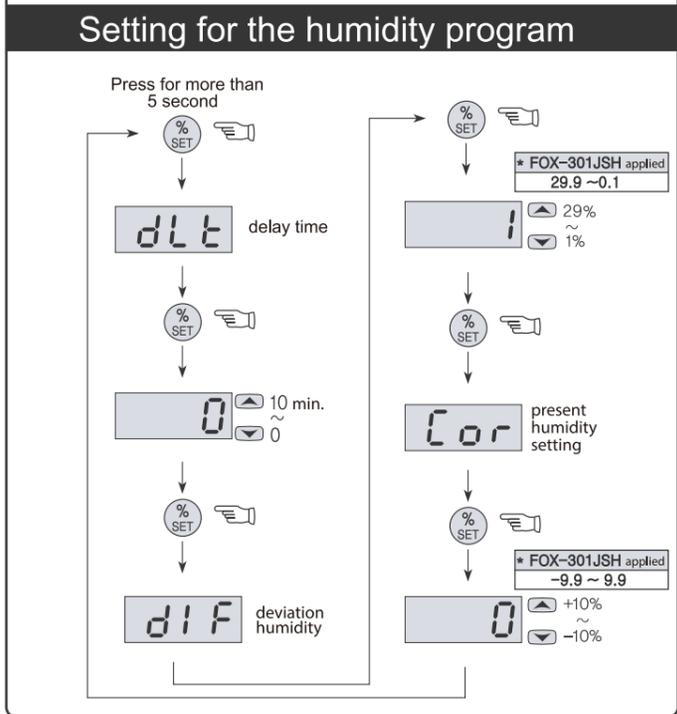
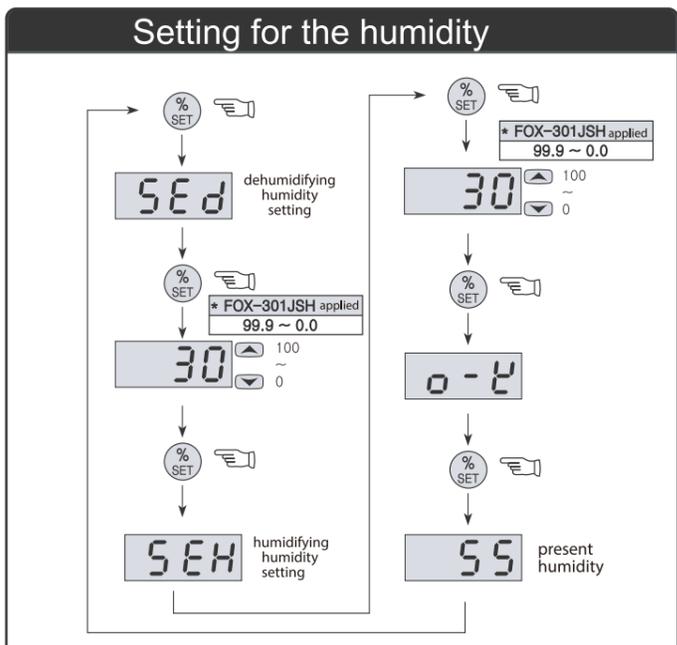


▶ FOX-8301R1(94 x 150 x 39 mm)



6 Temperature





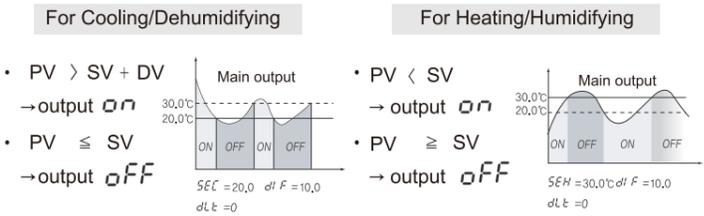
* Pressing SET key for 5 sec. in the state of current temperature display, can be entered the program setting mode.
 * All programs are returned automatically in 30 sec. to the present temperature after displaying **o-2** by pressing SET key once after set value changing.

8 About Detailed Function

1. dIF : Deviation temperature setting

- A regular interval is required between ON and OFF in the ON/OFF control (set up ON/OFF width)
- Frequent ON and OFF will shorten the lifespan of the relay or the output contact or cause hunting (generation, chattering) by noise from outside. The temperature deviation function is used to setup temperature deviation to protect the equipment contact, etc.

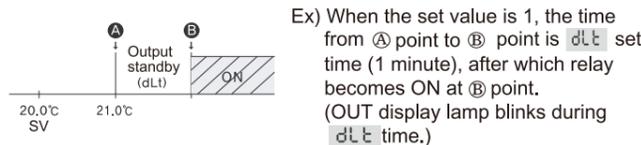
Method of deviation application when ON/OFF control



* PV : present temperature value SV : set temperature value DV : deviation temperature value

2. dLt : Output Delay Time

- This function should be used when an object subject to control repeats ON/OFF actions and cause problems (chillers, compressors).
- A function to protect the working machine upon momentary power failure or power is reapplied.



3. 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 a thermometer currently use, a temperature controller)

e.g.) Actual temperature : 10.0°C → Cor : 0.0 ⇒ -2.0 corrected
 Display Window : 12.0°C
 Display in → 10.0°C (corrected current temperature)

4. Rdr : Communication station settings

- When using the RS485 communication, specify a station number between 1-99.

5. bPS : Communication speed settings

- 120, 1200 : 1200bps
- 240, 2400 : 2400bps
- 480, 4800 : 4800bps
- 960, 9600 : 9600bps
- 192, 1920 : 1920bps

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

9 Temperature range and default values

	Function	Display	Range	Default	Remarks
Setting temperature	For Cooling	SEd	-55.0 ~ 99.9	10.0	
	For Heating	SEH	-55.0 ~ 99.9	10.0	
Settings	Deviation temperature	dIF	0.1 ~ 19.9	1.0	
	Output delay time	dLt	0 ~ 10	0	Minute
	Temperature correction	Cor	-10.0~10.0	0.0	Differs from displayed and actual value
	Address	Rdr	01~99	0	RS485 communication
	Speed	bPS	1200/2400/4800/9600/1920	1200	RS485 communication

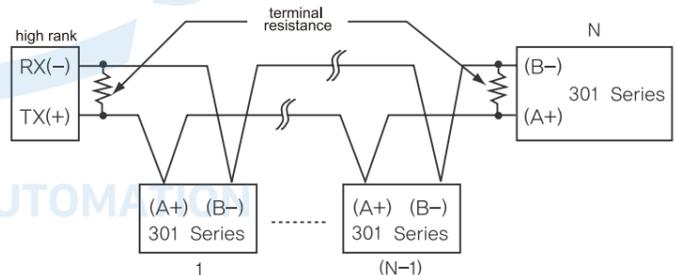
	Function	Display	Range	Default	Remarks
Set humidity	Humidity setting	SEd	0 ~ 100	30%	
	Dehumidity setting	SEH	0 ~ 100	30%	
Program Settings	Humidity deviation	dIF	1~29	1	
	Output delay time	dLt	0~10	0	Minute
	Correction of the humidity	Cor	-10~10	0	correct discrepancy between the value in displayed and actual value

11 Communication

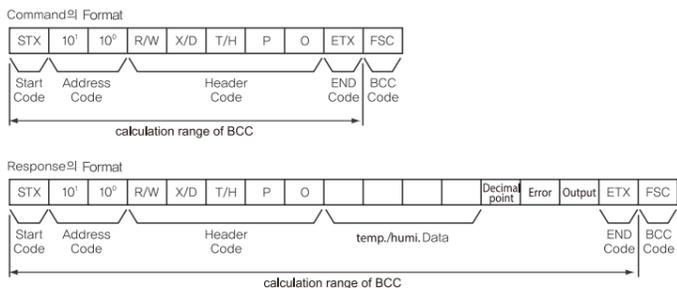
Interface

Specification	In conformity EIA RS485
Maximum connection lines	32 units (However, Address setting is available from 01 to 99)
Method	2-wire half-duplex
Synchronous system	Asynchronous
Distance	Within 1.2Km
Speed	1200/2400/4800/9600/19200bps (selectable)
Start bit	1 Bit fixed
Stop bit	1 Bit fixed
Parity bit	None
Data bit	8 Bit Fixed
Protocol	BCC

System Configuration



Definition of Communication Command and Block



- Start Code
Displays the head of BLOCK.
STX → [02H], ACK will be added in case of RESPONSE
- Address Code
A code of which the host system identifies FOX-301 series, and can be set from 01 to 99 (BCD ASCII).
- Header Code
The name of command is shown in text.
RX(Read demand) → R[52H], X[58H]
RD(Read response) → R[52H], D[44H]
WX(Write demand) → W[57H], X[58H]
WD(Write response) → W[57H], D[44H]
TPO(Temp.measured value) → W[54H], F[50H], O[30H]
HPO(Humi.measured value) → H[48H], P[50H], O[30H]

- Data Configuration
Data is expressed in Hexadecimal
- Decimal point → 0[30H] No decimal point
1[31H] There is a decimal point
- Error → 0[30H] No error,
1[31H] Sensor open error
2[32] Sensor short error
- Output

	TEMP		HUMI	
	COOL	HEAT	HUMI	DHUMI
0(30H)	O	O	O	O
1(31H)	O	X	O	X
2(32H)	X	O	X	O
3(33H)	X	X	X	X

- END Code
Displays termination of Block. ETX → [03H]
- BCC
Block Check Character. It shows the XOR operation value from the beginning (STX) protocol to ETX.
Others : If there is no ACK response
 ① If code numbers are inconsistent after receiving STX
 ② If Receive Buffer Overflow occur
 ③ If borate or other communication SV is inconsistent
- Handling when there is no ACK response
 ① Check the status of line.
 ② Check communication condition (SV).
 ③ In the case of communication abnormality caused by noise, perform communication for 3 times for recovery.
 ④ Change the communication speed if communication abnormality is too frequent.

12 Simple troubleshooting tip

If error is displayed while using the product:

- E-1 is displayed when the DATA memory element is damaged inside the product as it is affected by powerful noise from outside while in use. In this case, contact our company for customer service.
While the controller is equipped with supplementary measures for outside noise, it cannot endure infinite noise.
In case of the nose of 2KV or more flows in, inside of the product may be damaged.
- The sensor has defect when o-E (Open Error) or s-E (Short Error) is displayed. Please check the sensor.

* The above specification may be changed without prior notice for further improvement in performance.
Please read and observe precautionary instructions during handling of the product.

* Regarding the English language manual, please download it at our web-site.

- Installation Precautions
 - WARNING: To avoid the risk of electric shock, this equipment must be connected to protective grounding and to a supply voltage.
 - Do not block the vents.
- Handling Precautions
 - This instrument is suitable for the following environments.
 - Ambient temp. : 0°C~60°C
 - Ambient humi. : Less than 80% RH
 - Using indoors only
 - 2(Pollution Degree 2)
 - Altitude : less than 2000m
 - Installation Category II
 - Avoid equipment arrangements that are difficult to handle.
 - Unless use of the equipment in a manner specified by the equipment manufacturer, may impair the protection provided by the equipment.
 - Rated power : 100~240Vac 50/60Hz 9VA

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 Factory : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang, Busan, Republic of Korea

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 FAX : +82-51-819-4562
 e-mail : conotec@conotec.co.kr
 URL : www.conotec.co.kr

Major products and development
 - Digital temperature, humidity controller
 - Digital timer, current/voltage meter
 - Other product development

Operating Manual



Thank you very much for selecting our products.

1 Caution for your safety

Please read this instruction carefully before using this controller
 ※ The manual's information & specification can be changed to improve its quality without any notification.

⚠ Safety

1. Pls use this item after installing the duplex safety device in which is applied at dangerous factors such as serious human injury or serious damages of property & important machine because this item is not designed as a safety device.
2. Do not check or repair when it is power on.
3. Please check the terminal number before connecting power supply.
4. Do not disassemble or open, remodel, repair without any permission.

⚠ Safety Instruction and Hazard Warnings

- Please read the operating manual through completely before putting the device into operation.
- We will not assume any responsibility for damage to assets or persons caused by improper handling or failure to observe the safety instructions or hazard warnings.
- For safety and licensing reasons, unauthorized conversion and/or modification of the device is not permitted.
- Do not exceed the maximum permissible current - in case of higher loads, use a contactor of adequate power. Make sure that the supplied voltage matches the values specified for the instrument.
- The device must be adequately protected from water and dust as per the application and must be accessible via the use of appropriate tools
- The device must not be exposed to extreme temperature, sunlight, strong vibrations or high levels of humidity.
- Operation or installation is not permitted under unfavorable ambient conditions such as wetness or excessive induction loads or solenoid and dust, combustible gases, vapors or solvents, especially high-frequency noise
- Avoid operation or installation close to high-frequency fields such as welding devices, sewing machines, wireless transmitter, radio systems, SCR controller, etc
- Do not install the sensor cable nearby signal cable, power cable, load cable
- Please use the shield cable when the sensor cable's lengthen, however do not make it too much longer
- Please use the sensor cable without any cutting or flaw, blemish.
- The device is not a toy and should be kept away from children
- Installation work must only be carried out by suitably qualified personnel who are familiar with the hazards involved and with the relevant regulations.
- You shouldn't tinker with anything or the product may not be opened or disassembled unless you know what you're doing. Please ask us about this questioning

⚠ Danger

Attention ! Never work on electrical connections when the machine is switched on

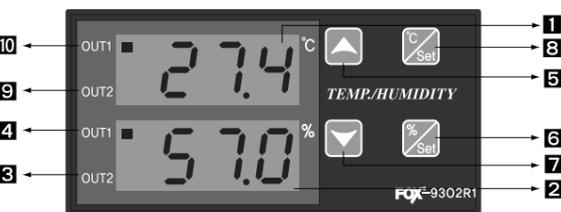
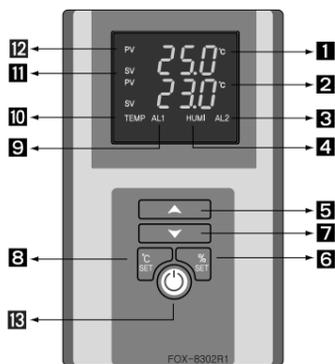
2 Composition

model	sensor	temp./humi.range	external size	function
FOX-302R1			W72 X H72mm	
FOX-9302R1	FS-200N HCPV-220H	-50.0~99.9°C 10 ~ 95%	W96 X H48mm	temp.control humi.control RS485 com.
FOX-8302R1			W94 X H150mm	

3 Part name



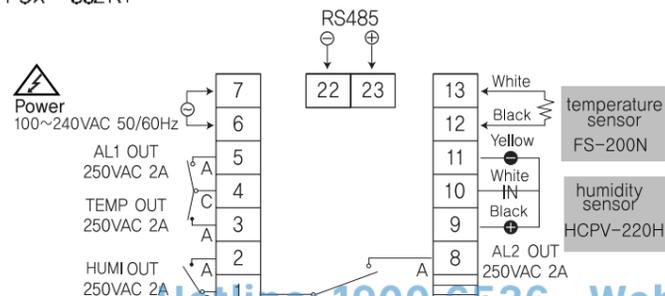
- 1: Display of the present temperature (red color)
- 2: Display of the present humidity (green color)
- 3: Alarm output display of the humidity
- 4: output display of the humidity's working
- 5: Up
- 6: Humidity mode
- 7: Down
- 8: Temperature mode
- 9: Alarm output display of the temperature
- 10: Output display of the temperature' working
- 11: Display of the set value
- 12: Display of the set value
- 13: Power supply



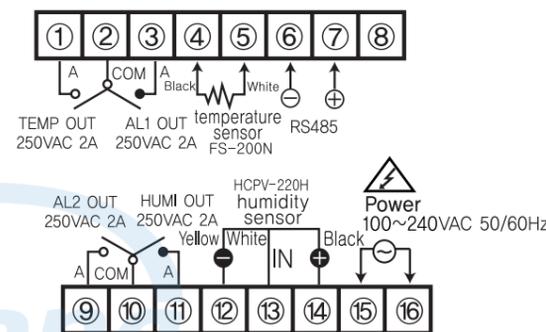
4 Connection

output : 250VAC 2A
 Please make use of the power relay or a suitable magnet surely.

▶ FOX - 302R1

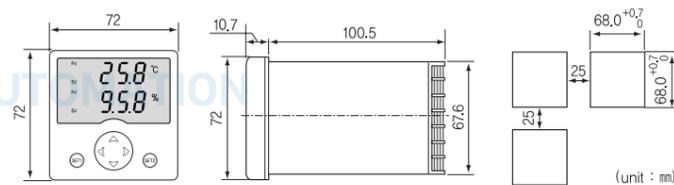


▶ FOX -8302R1

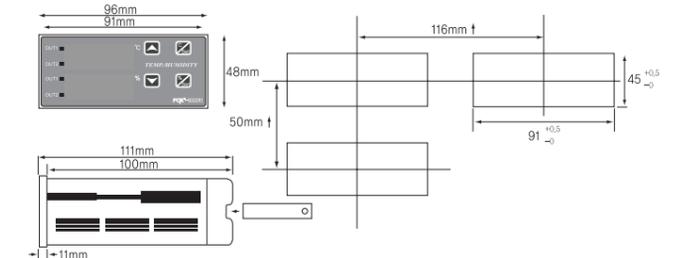


5 Size & Dimension

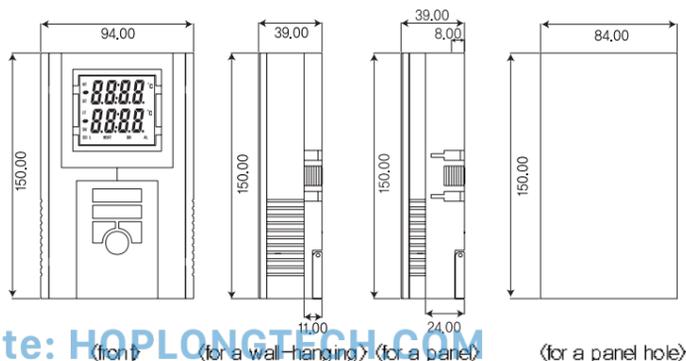
▶ FOX -302R1 (72x72x110mm)



▶ FOX -9302R1 (96x48x110mm)

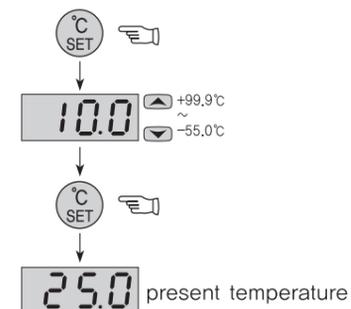


▶ FOX -8302R1 (94x150x39mm)

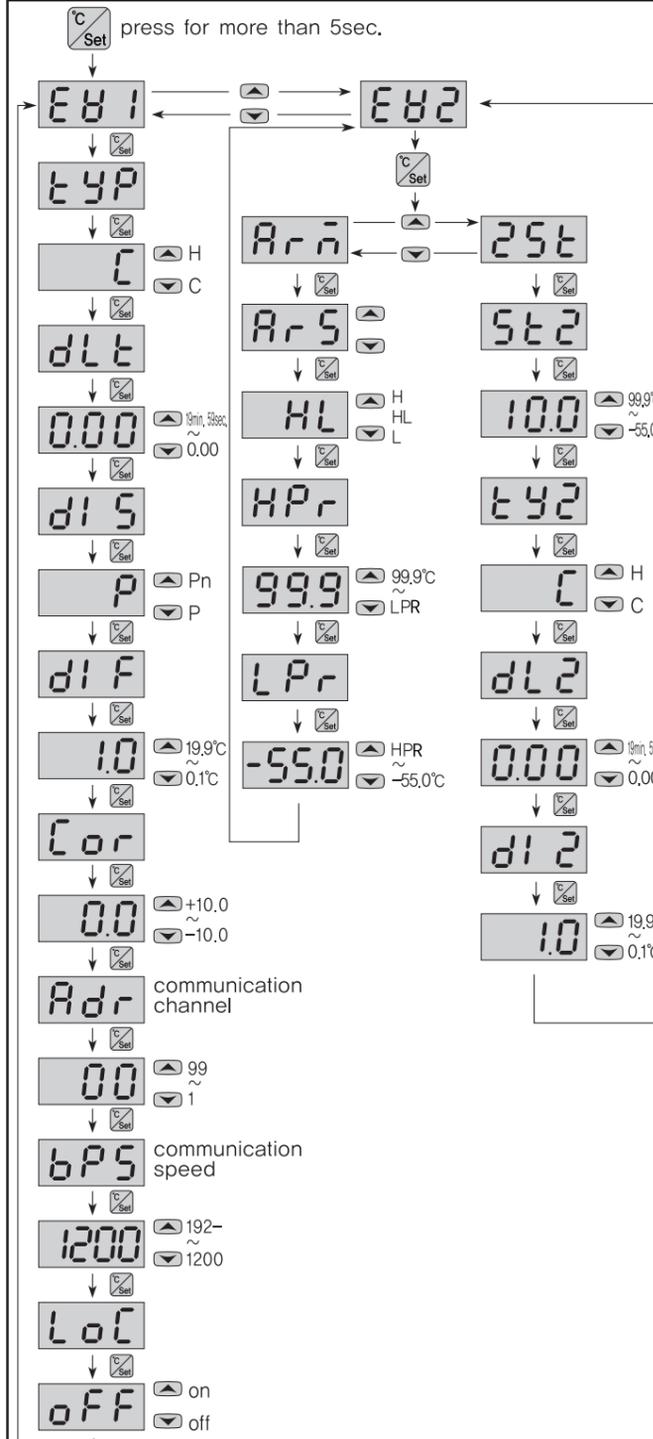


6 Temperature

Setting for the temperature



Setting for temperature programs



Operating Manual



Thank you very much for selecting our products.

1 Caution for your safety

Please read this instruction carefully before using this controller
 ※ The manual's information & specification can be changed to improve its quality without any notification.

⚠ Safety

1. Pls use this item after installing the duplex safety device in which is applied at dangerous factors such as serious human injury or serious damages of property & important machine because this item is not designed as a safety device.
2. Do not check or repair when it is power on.
3. Please check the terminal number before connecting power supply.
4. Do not disassemble or open, remodel, repair without any permission.

⚠ Safety Instruction and Hazard Warnings

- Please read the operating manual through completely before putting the device into operation.
- We will not assume any responsibility for damage to assets or persons caused by improper handling or failure to observe the safety instructions or hazard warnings.
- For safety and licensing reasons, unauthorized conversion and/or modification of the device is not permitted.
- Do not exceed the maximum permissible current - in case of higher loads, use a contactor of adequate power. Make sure that the supplied voltage matches the values specified for the instrument.
- The device must be adequately protected from water and dust as per the application and must be accessible via the use of appropriate tools
- The device must not be exposed to extreme temperature, sunlight, strong vibrations or high levels of humidity.
- Operation or installation is not permitted under unfavorable ambient conditions such as wetness or excessive induction loads or solenoid and dust, combustible gases, vapors or solvents, especially high-frequency noise
- Avoid operation or installation close to high-frequency fields such as welding devices, sewing machines, wireless transmitter, radio systems, SCR controller, etc
- Do not install the sensor cable nearby signal cable, power cable, load cable
- Please use the shield cable when the sensor cable's lengthen, however do not make it too much longer
- Please use the sensor cable without any cutting or flaw, blemish.
- The device is not a toy and should be kept away from children
- Installation work must only be carried out by suitably qualified personnel who are familiar with the hazards involved and with the relevant regulations.
- You shouldn't tinker with anything or the product may not be opened or disassembled unless you know what you're doing. Please ask us about this questioning

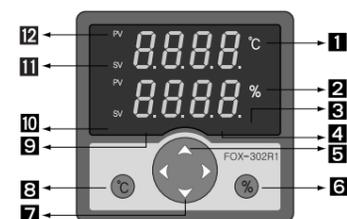
⚠ Danger

Attention ! Never work on electrical connections when the machine is switched on

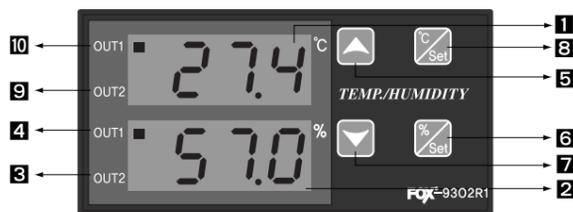
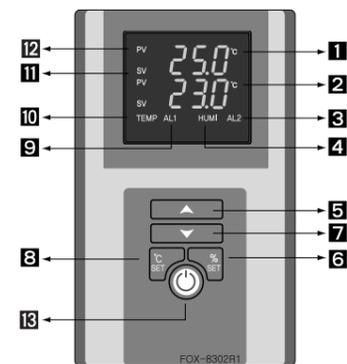
2 Composition

model	sensor	temp./humi.range	external size	function
FOX-302R1			W72 X H72mm	
FOX-9302R1	FS-200N HCPV-220H	-50.0~99.9°C 10 ~ 95%	W96 X H48mm	temp.control humi.control RS485 com.
FOX-8302R1			W94 X H150mm	

3 Part name



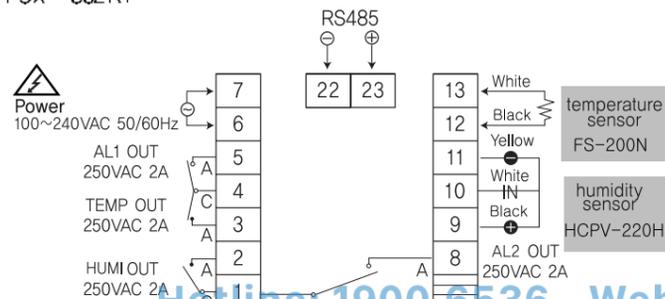
- 1: Display of the present temperature (red color)
- 2: Display of the present humidity (green color)
- 3: Alarm output display of the humidity
- 4: output display of the humidity's working
- 5: Up
- 6: Humidity mode
- 7: Down
- 8: Temperature mode
- 9: Alarm output display of the temperature
- 10: Output display of the temperature' working
- 11: Display of the set value
- 12: Display of the set value
- 13: Power supply



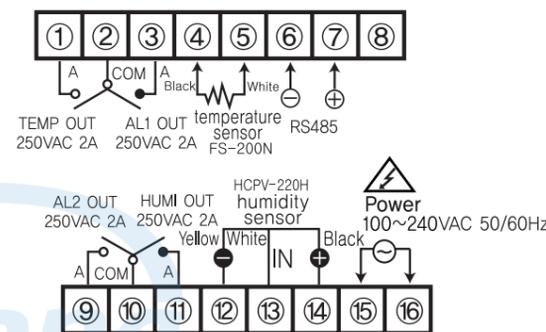
4 Connection

output : 250VAC 2A
 Please make use of the power relay or a suitable magnet surely.

▶ FOX - 302R1

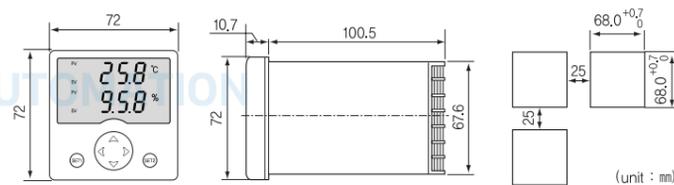


▶ FOX -8302R1

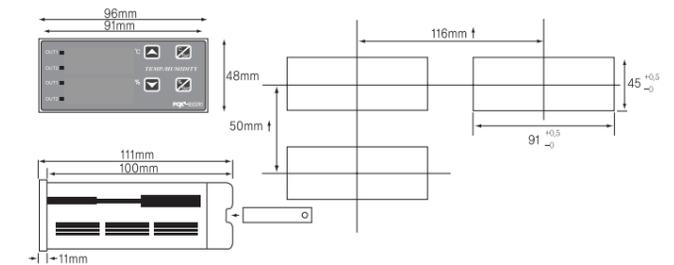


5 Size & Dimension

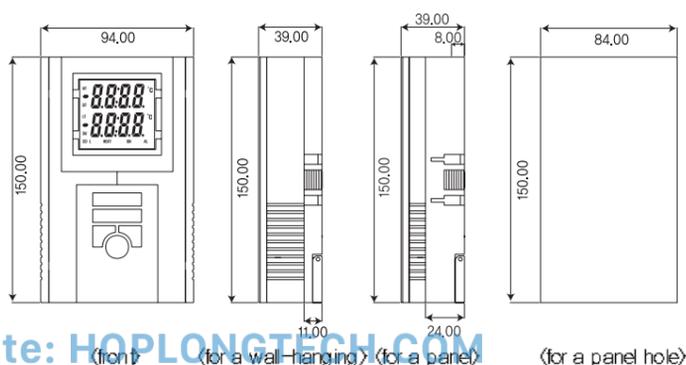
▶ FOX -302R1 (72x72x110mm)



▶ FOX -9302R1 (96x48x110mm)

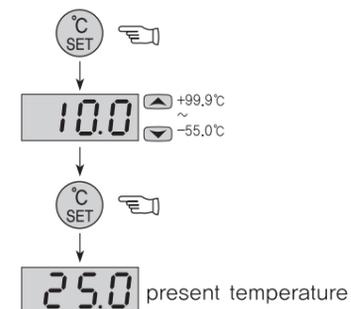


▶ FOX -8302R1 (94x150x39mm)

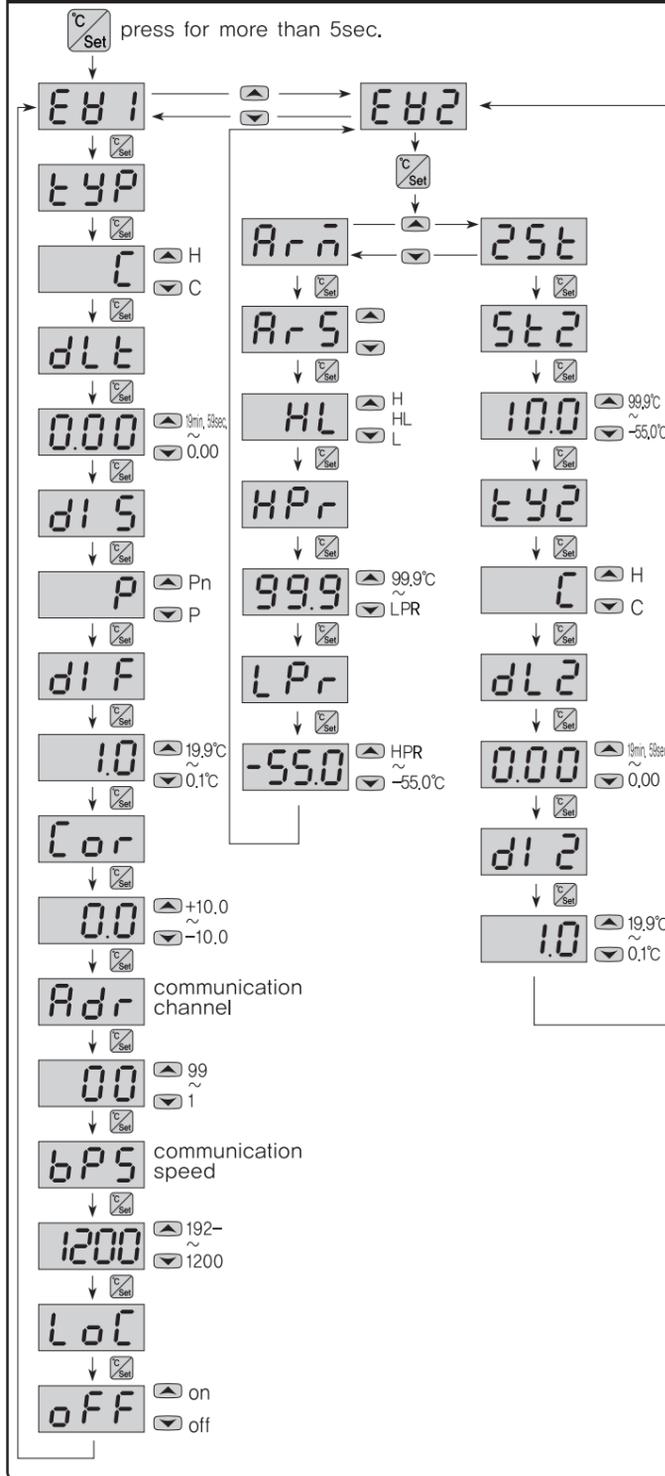


6 Temperature

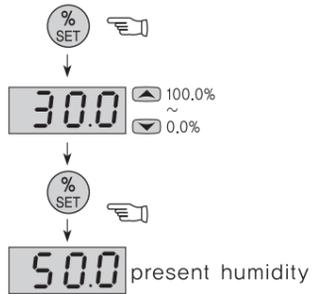
Setting for the temperature



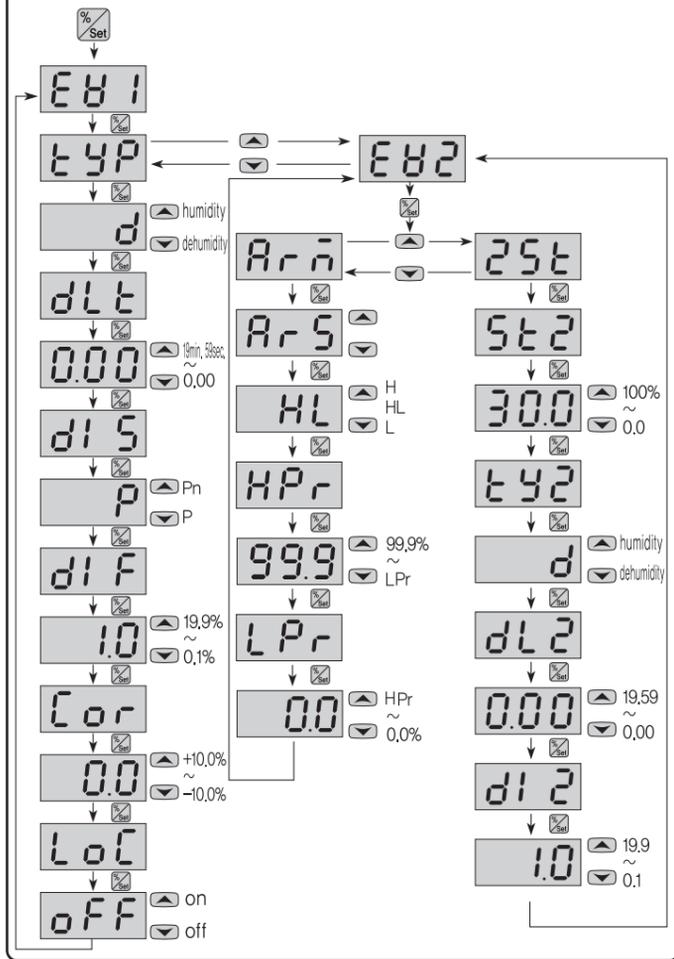
Setting for temperature programs



Setting for the humidity



Setting for humidity programs



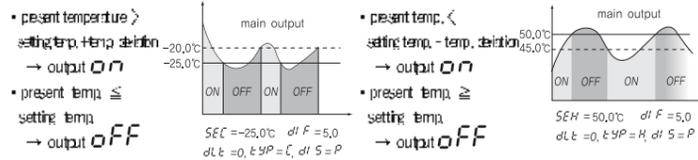
※To change it with program mode, press the --key for more than 5 second in the present temperature display mode.

※The set or programming mode is terminated, if you press the **o-E** key, parameters(set values) are saved after the display shows OK letter or return to present temperature automatically after 30 second.

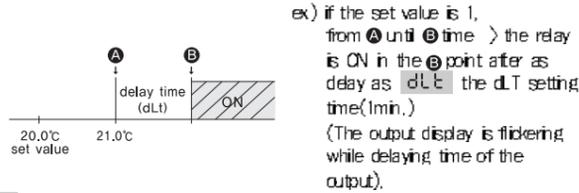
8 Detailed manual

- tYP** : temperature : possible to select the coding or heating, humidity : possible to select the humidity or dehumidity,
- dIF** : Setting for temperature deviation
 - In the ON/OFF control, it needs at regular interval between ON and OFF.
 - By operating the ON/OFF control frequently, the relay 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 relay or contact and so on.

ex=> The method of the temp. deviation when ON/OFF control
cooling / dehumidity heating / humidity



- dLT** : Delay time of the output
It is widely used as the followings
 - in case of operating the ON/OFF control very often,
 - to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply



- Cor** : Correction of the present temperature,
 - It is used for the correction of a discrepancy between the display temperature and real temperature
- ex) real temp. : 10.0°C → **Cor** : 0.0 ⇒ -20 correction
→ 10.0°C display(corrected present value)

- RdR** : Communication channel
 - To designate the channel while RS485 communication working
- SPS** : Communication speed(velocity)
 - 120, 1200 : 1200bps
 - 240, 2400 : 2400bps
 - 480, 4800 : 4800bps
 - 960, 9600 : 9600bps
 - 192, 1920 : 19200bps

- LoC** : The lock function : As a safety device, it is used in order not to change the set values except for the main user, ON- setting for the lock function, OFF- removal for the lock function
- Rrā** : 25t auxiliary output → alarm function(impossible to set the 25t while this function working)

- 25t** : Rrā auxiliary output → 2-stage function(impossible to set the Rrā while this function working)
- HPr** : Setting function of the alarm temperature for the highest limit
 - It will be operated higher than HPr set value
- LPr** : Setting function of the alarm temperature for the lowest limit,
 - It will be operated lower than LPr set value

- RrS** : Selection of the alarm output style
 - H** : output is turn on - when a high or a low temperature is more than HPr set value
 - HL** : outputs are on - both more than HPr and less than LPr
 - L** : output is turn on -when a high or a low temperature is less than LPr set value.
- St2** : auxiliary output- refer to no.1
- tY2** : auxiliary output - refer to no.2
- dL2** : auxiliary output - refer to no.3

Temp./humidity range when deliver

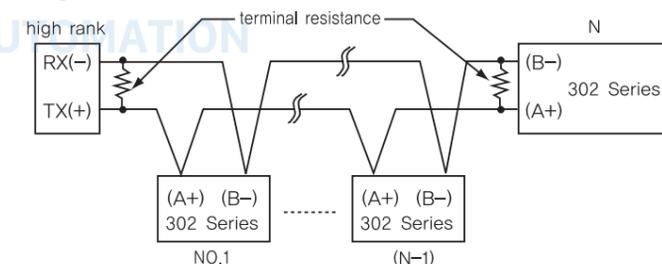
Display	Range	set values when deliver
°C/SET	temperature : -55.0~99.9°C	temperature : 10.0
%/SET	humidity : 0.0~100.0%	humidity : 30.0
tYP	temperature : C / H humidity : d / H	temperature : C humidity : d
dLT	0.00 ~ 19minute 59second	0.00
dIF	P / Pn 0.1 ~ 19.9	P
Cor	temperature : -15.0 ~ 15.0°C humidity : -10.0 ~ 10.0%	
LoC	on / off	off
Rrā	selection of the alarm function	
25t	2-stage setting function	
RrS	H / HL / L	HL
HPr	temperature : LPr ~ 99.9°C humidity : LPr ~ 100.0%	temperature : 65.0°C humidity : 95%
LPr	temperature : -55.0°C ~ HPr humidity : 0.0% ~ HPr	temperature : -55.0°C humidity : 0.0%
St2	temperature : -55.0 ~ 99.9°C humidity : 0.0 ~ 100.0%	temperature : 10.0°C humidity : 30.0%
tY2	temperature : C / H humidity : d / H	temperature : C humidity : d
dL2	0.00 ~ 19minute 59second	0.00
dI2	0.1 ~ 19.9	1.0

10 Communication output

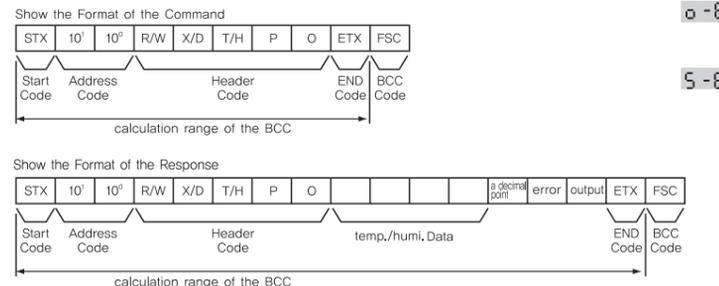
Interface

specification	in conformity IEC RS485
maximum connection	32 (however, available to set the Address from 01 unit 99)
the method of communication	two-wire half-duplex operation
synchronous system	asynchronous system
communication distance	within 1.2km
communication speed	1200/2400/4800/9600/19200bps(adjustable to selection)
Start bit	fixed 1bit
Stop bit	fixed 1bit
Parity bit	none
Data bit	fixed 8bit
Prctood	BCC

System



Definition between communication command and Block



- Start Code**
show the lead(head) of the Block
ACK will be added in case of Response, STX→[02H]
- Address Code**
A high rank system can discriminate the channel code number among FOX-302series
It is available to set between 01 and 99(BCD ASC II)
- Header Code**

- show the command name as 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) → W[54H], P[50], O[30H]
- HPO(humidity measuring value) → H[48H], P[50], O[30H]

- Composition of Data
Data is displayed as "Hexadecimal"
- Decimal point → O[30H] there is no "decimal point"
1[31H] there is "decimal point"
- Error → O[30H] there is no "error"
1[31] open error of the sensor's cable
2[32] short-circuited error of the sensor
- Output → O[30H] TEMP/AL1 OUT ON
HUMI/AL2 OUT ON
1[31H] TEMP/AL1 OUT ON
HUMI/AL2 OUT OFF
2[32H] TEMP/AL1 OUT OFF
HUMI/AL2 OUT ON
3[33H] TEMP/AL1 OUT OFF
HUMI/AL2 OUT OFF
- END Code
show the end(close) of the Block. ETX→[03H]
- BCC (Block Check Character)
show the XOR arithmetic and logic values from the start(STX) to the ETX
- the others : As of no response of the ACK
 - in case of not equivalent to the channel after receiving STX
 - in case of generating the Receive Buffer Overflow
 - in case of not equivalent to the communication's set values or baud rate
- treatment- in case of not response of the ACK
 - check the cable
 - check the communication's condition (set values)
 - if the main cause of the status is the noise, try to do communication practicing 3 times until recovering normally.
 - change the communication speed in case of bring about the communication's error frequently.

11 Error message

- If error is displayed while using the product:
 - E r 1** is displayed when the DATA memory element is damaged inside the product as it is affected by powerful noise from outside while in use. In this case, contact our company for customer service. While the controller is equipped with supplementary measures for outside noise, it cannot endure infinite noise. In case of the nose of 2KV or more flows in, inside of the product may be damaged.
 - The sensor has defect when **o -E** (Open Error) or **S -E** (Short Error) is displayed. Please check the sensor.

※The product's specification can be changed without any notification to improve its quality. Please read and observe precautionary instructions during handling of the product.

※ Regarding the English language manual, please download it at our web-site.

H. Office : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang-gun, Busan, 46034, Rep. of KOREA

A/S TEL : +82-51-819-0426 FAX : 82-51-819-4562
E - mail : conotec@conotec.co.kr
Homepage : www.conotec.co.kr

※This device works proper operation with:
Surrounding Temp. : 0°C~60°C
Surrounding Humi. : below 80%RH
Regular power : 220VAC±10% 50/60Hz

- Main products & Development**
 - Digital temperature controller
 - Digital humidity controller
 - Digital timer



★ Features

- Transmitting CO2, temperature, humidity and illumination sensor value (RS-485)
- Equipped with Dual Sensor type of NDIR CO2 Sensor not requiring recalibration for a long time
- A special filter blocking penetration of liquid and pollutants but allowing gases and vapors to pass through is applied to minimize errors of CO2 Sensor.
- Type of installation on the wall. For the direction at installation, please refer to notes on installation of Sensor.

Notes on Installation of Sensor

As this product is fitted with FS-600R illumination sensor, it is fixed for the illumination sensor to face upward and it should be installed at a place where the intensity of illumination can be measured most properly.

★ If it is installed at a shady place or at an unfavorable place for measurement of illumination, it may make an error in measurement.



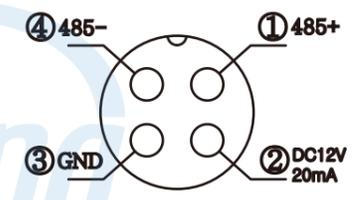
1. FS-600R must be installed in the same direction as O mark (No. 1).
2. Power should not be cut off during operation.
3. If the product is installed in a wrong direction or power is cut off, moisture may be penetrated into the inside of the product and it may be a cause of product trouble or cause a problem in measuring illumination.
4. If power should be cut off inevitably, it is better to keep the product under an environmental condition without moisture.
5. Please note that our company will not take any responsibility for any trouble caused by a wrong installation or negligence in storage.

Cautions for Handling

■ Thank for your purchase of a product of CONOTEC Co., Ltd. This product (FS-600R) is fitted with special filters at both left and right sides to measure CO2. Please note that when any flaw occurs due to the user's negligence such as torn-off, press, etc. the repair charge will be for the user's account.

In addition, this product has waterproofing structure in accordance with IP67, but do not open the product because it may bring moisture in the product. If any flaw occurs due to this, the repair charge will be for the user's account.

Connection Diagram of Sensor



Features of Sensor

Item	Content	Remark
<Temperature Sensor>		
Measuring Range	-20.0 ~ 65.0℃	
Resolution	0.01 ℃	
Repeatability	±0.1 ℃	
Response Time	(Min) 5 ~ (Max) 30 Sec	
<Humidity Sensor>		
Item	Content	Remark
Measuring Range	0 ~ 100 %RH	
Resolution	0.03 %RH	
Repeatability	±0.1 %RH	
Response Time	4 Sec	
<Illumination Sensor>		
Item	Content	Remark
Measuring Method	0 ~ 54600 Lux	
Resolution	32 Lux	
Measurement Accuracy	0.75 ~ 1.65 Times	
Response Time	(Min) 2.9 ~ (Max) 4.5 ms	
<CO2 Sensor>		
Item	Content	Remark
Measuring Method	NDIR Method	
Measuring Range	0 ~ 5000 ppm	
Accuracy	±2 %	@ 10 ~ 50 ℃
Response Time	0 ~ 80 % < 30 Sec	
Signal Updating Interval	Every 2.0 Seconds	
Warm-up Time	@ 25 ℃ < 90 Sec	
Operation Temperature / Humidity Condition	0 ~ 50℃, 0 ~ 95% RH	
Storage Temperature	-40 ~ 70 ℃	

Communication Protocol

■ Data Request Format

Byte	1	2	3	4	5	6	7	8	9	10
Content	STX	ID	R	X	Z	T	H	L	ETX	BCC

■ Data Response Format

Byte	1	2	3	4	5	6	7	8	9	10
Content	STX	ID	R	D	Z	CO2 Value				T

Byte	11	12	13	14	15	16	17	18	19	20
Content	Temperature Value					H	Humidity Value			

Byte	21	22	23	24	25	26	27	28
Content	L	Illumination Value					ETX	BCC

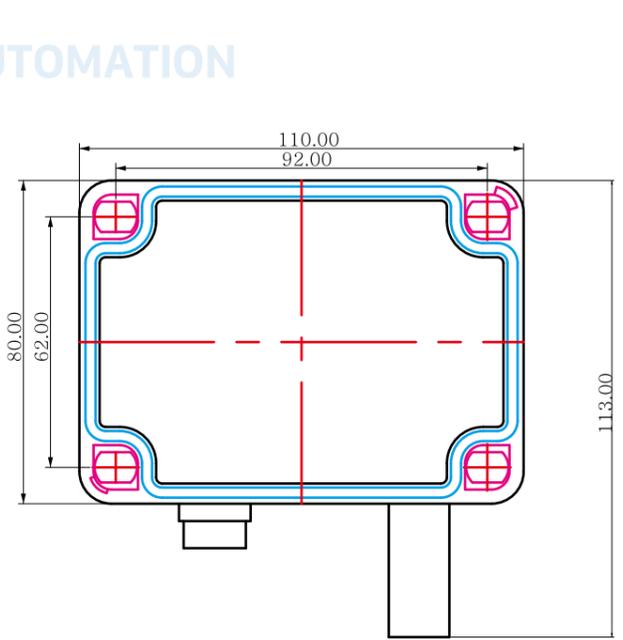
- * The content of each item is displayed in ASCII Codes.
- STX : Start Code [02H]
 - ID : Address Code, Terminal ID [30H ~ 38H]
 - RX : Reading Request R[52H] X[58H]
 - ZTHL : Temperature, Humidity, Illumination measurement value Z[5AH], T[54H], H[48H], L[4CH]
 - CO2 Value : Indication of CO2 Ex) 3000ppm : [33H],[30H],[30H],[30H]
 - Temperature Value : Indication of Temperature Value In the event of above 0℃, 11th byte [31H] In the event of below 0℃, 11th byte [30H]
 - Humidity Value : Indication of Humidity Value
 - Illumination Value : Indication of Illumination Value
 - ETX : End Code [03H]
 - BCC : Abbreviation of Block Check Character indicating XOR Computing value from Start of Protocol (STX) to ETX

Sensor Communication ID

8-pin Dip Switch ID Setting

	Setting to ID No. 0 and transmitting on data request
	Setting to ID No. 1 and transmitting on data request
	Setting to ID No. 2 and transmitting on data request
	Setting to ID No. 3 and transmitting on data request
	Setting to ID No. 4 and transmitting on data request
	Setting to ID No. 8 and transmitting on data request

Dimension of Sensor Case



Warranty

This product is produced under a strict quality control and inspection process of CONOTEC Co., Ltd. The free warranty period is 1 year from purchase date in accordance of Consumer Damage Compensation Regulation, so the date and place of purchasing the product should be written in the warranty.

If they are not written in the warranty, one and half year of free warranty period is not applied.

Product Name	
Model Name	
Purchase Date	YY MM DD
Purchase Place	

If any defect in manufacturing or any natural trouble occurs during the free warranty period, bring the product to the purchase place or our head office with the warranty issued at the time of purchase to receive free repair service.

When the free warranty period is expired out or in the following events, the fixed repair charge may be claimed to you.

- Any service request for the product not in trouble may incur expenses so please read the instruction manual carefully.
- Any trouble caused by the consumer's mishandling, arbitrary repair or modification of the product.
- Any trouble caused by wrong application of electricity capacity.
- Any trouble caused by a drop of or any impact on the product.
- Any trouble caused by use of the product not in compliance with the instruction manual
- Any trouble caused by any natural disaster (Fire, Flood, Earthquake, Stroke of lightning).

A/S Reception

- Purchase Place
- A/S Department of CONOTEC Co., Ltd. T: 051-819-0425, F:051-819-4562