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ISO 9001:2008

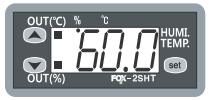
**CONOTEC®**

CONOTEC CO., LTD.

Digital Humidity Controller

www.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℃

※ 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-2SHTR-1 | HUMI : 1a 250Vac2A | | -39.9℃~80.0℃ | 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

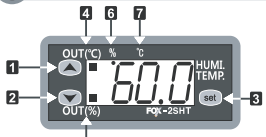
- Be well-informed of how to use, safety regulations, warnings, etc before installation of this device and apply it to the extent of the defined specifications and relevant capacity without fail.
- Avoid wiring or installation to a motor or solenoid with a large inductive load.
- Use a shiled cable for extention 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-tention 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.

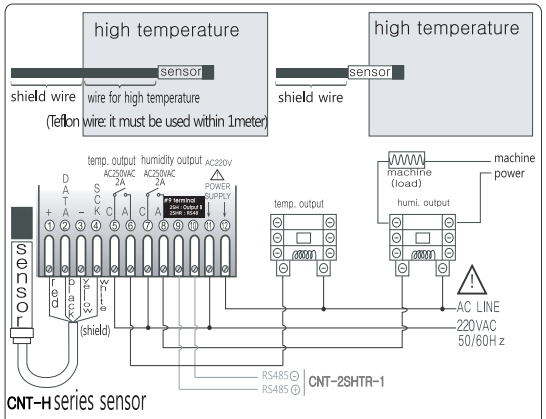
## 3 Part name




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

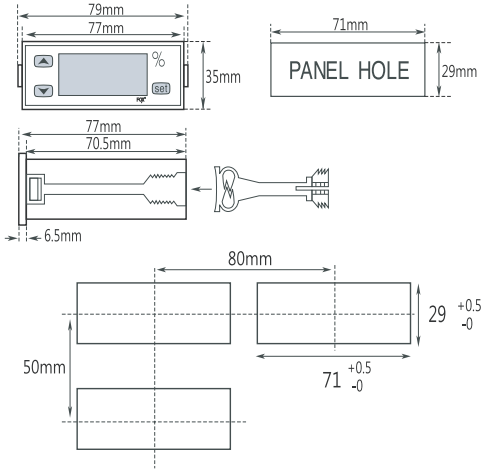



**Ref1**. Detailed specifications for the applicable sensor specifications, see the back of the '9. sensor's specifications'.

**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℃~80℃, surely use the high temperature using wire(Teflon wiring).

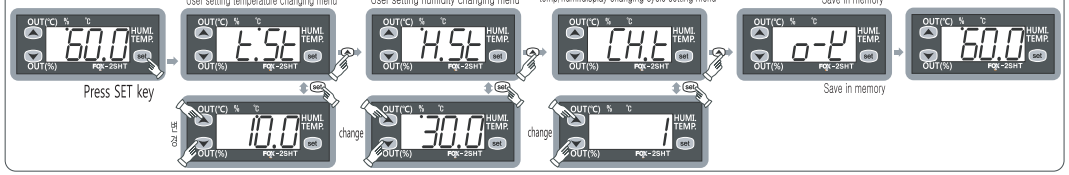
**Caution2**. Please make the operating machine(load) be driven with using the power relay or magnet outside surely because its output specification of inside relay is less than 250VAC 2A

## 5 External size & panel size

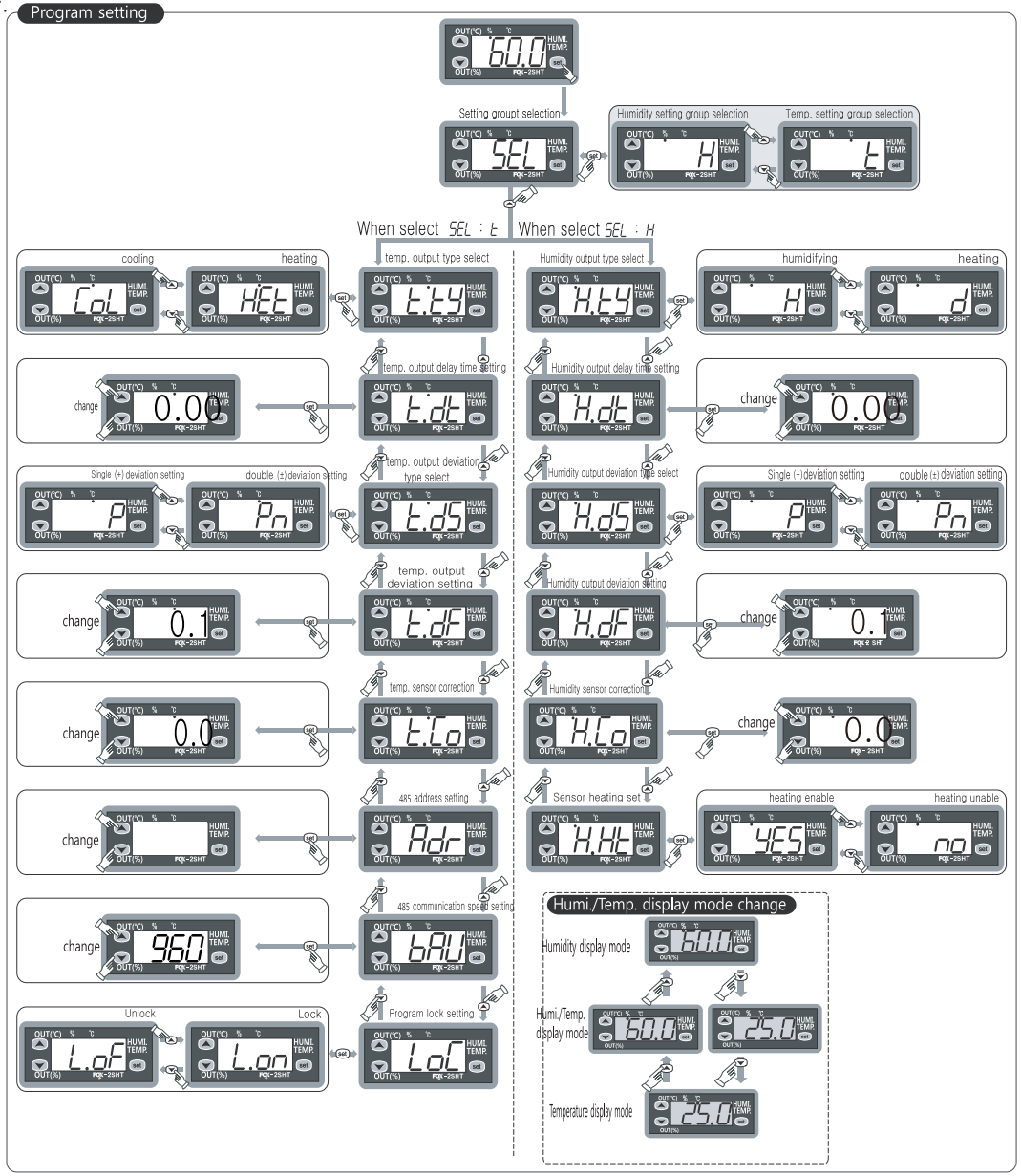



## 6 Setting for programs

### User setting humidity / User setting temperature changing




### Program setting



## 7 Detailed explanation

**1 t.SE** Setting menu for user's temperature
– Set the temperature point for the relay output

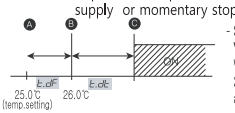
**2 H.SE** Setting menu for user's humidity
– Set the humidity point for the relay output

**3 CH.t** 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. diplay 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 t : Temp. setting group selection

**5 t.tY** Setting the output type for temperature.
CoL : cooling HEt : heating

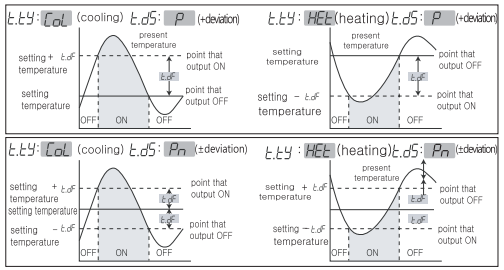
**6 t.dt** Setting the output delay time for the temperature.
- It is widely used as the followings
  - in case of operating the ON/OFF control very often (cooler, compressor,etc)
  - to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply




- Set temp.: 25.0℃, t.dt: 1.30, t.tY : CoL, t.dF: 1.0
When is the output turned ON?
While the present temperature increases, if passing over 26.0℃ at the 'B' point, the relay turns ON at the 'C' point after 1min 30sec as t.dt setting time.

**7 t.dS** Setting the type of temperature deviation(Hysteresis)
P : + deviation Pn : ± deviation

**8 t.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 t.Co** 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℃, the present temperature : 57.0℃ if set the t.Co value as −2.0, the present temperature will be displayed 55.0℃

**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.

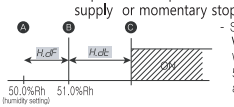
**10 Adr** RS485Communication address setting
The product FOX-2SHTR supports RS485 communications. When communicating with the master device for mutual recognition is the ability to set the communication address.

**11 bAU** 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 LoC** Setting data lock function
As a safety device, it is used in orser not to change the set value except for a main user
L.on Lock on L.oF Lock off

**13 H.tY** Setting the output type for humidity
H : humidity d : dehumidity

**14 H.dt** 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




- Set humi.: 50.0%Rh, H.dt : 1.30, H.tY : d, H.dF: 1.0
When is the output turned ON?
While the present humidity increases, if passing over 51.0%Rh at the 'B' point, the relay turns ON at the 'C'point after 1min 30sec as H.dt setting time.

**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%

**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 HEt** 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

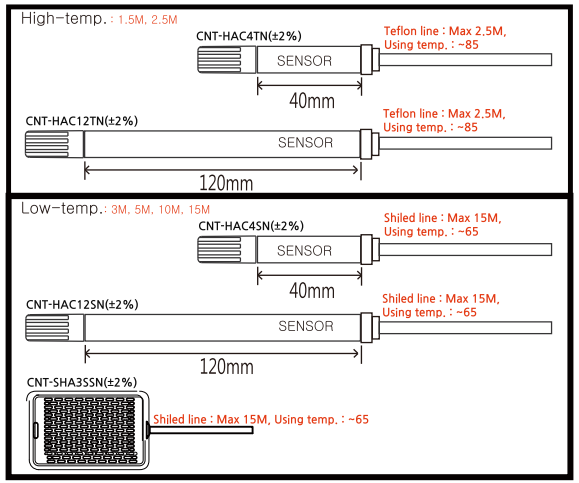
## 8 Setting range & Set value when deliver

| Model | Division | Function | | Range | set value when deliver |
|---|---|---|---|---|---|
| CNT-2SHTR-1 | Temp. setting | t.SE | Temp. setting | -39.9~119.9℃ | 10.0℃ |
| | | t.tY | Type setting for output | CoL / HEt | CoL |
| | | t.dt | Output delay time setting | 0.0~19min 59sec | 0min 0sec |
| | | t.dS | Type setting for output deviation | P / Pn | P |
| | | t.dF | Setting for output deviation | 0.1 ~ 19.9 | 0.1 |
| | | t.Co | Temp. correction | -10.0 ~ +10.0 | 0.0 |
| | Humi. setting | H.SE | Humidity setting | 0.0~100.0%Rh | 30.0%Rh |
| | | H.tY | Type setting for output | d / H | H |
| | | H.dt | 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 |
| | | H.Ht | Sensor's heating setting | YES / no | no |
| | Common | LoC | lock function | L.on/L.oF | L.oF |
| | | CH.t | Temp.&Humi. changing display time | 1 ~ 30sec | 2sec |
| | communication | Adr | 485 communication address | 01 ~ 99 | 01 |
| | | bAU | 485 communication speed | 120 (1200Bps) 240 (2400Bps) 480 (4800Bps) 960 (9600Bps) 1920 (19200Bps) | 960 (9600Bps) |

## 9 Sensor's specifications

〈CNT-H Series〉

CNT-H A C4 S N
4.Temp.sensor app
N : 10K NTC sensor apply
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 : Tedflon line (Max2.5M, Max85)
S : Shiled line (Max15M, Max65)

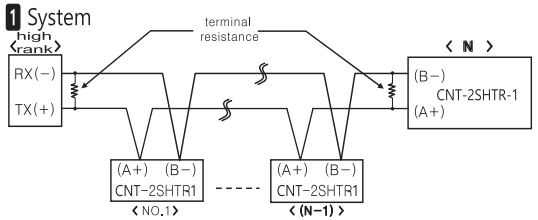



* Standard length : 3M(CNT-HAC4N).

## 10 Communication interface (CNT-2SHTR-1)

| specification | in conformity EIA RS485 |
|---|---|
| The method of communication | two wire half-duplex operation |
| syncronous system | asyncronous 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 〉

| STX | 10¹ | 10⁰ | R/W | X/D | T | P | 0 | ETX | BCC |
|---|---|---|---|---|---|---|---|---|---|
| START CODE | ADDRESS CODE | | HEADER CODE | | | | | END CODE | BCC CODE |

calculation range of the BCC

〈 Show the format of the response 〉

| STX | 10¹ | 10⁰ | /WR | X/D | T | P | 0 | | | | | a decimal point | error | output | ETX | BC | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START CODE | ADDRESS CODE | | HEADER CODE | | | | | Humidity data | | | | | | | END CODE | BCC CODE | |

calculation range of the BCC

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-2SHTR-1 It is available to set between 01 and 99(BCD ASCII)

③ **HEADER CODE :** Show the command name as an alphabetic lette r
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]
TP0( temperature measuring value ) –> T[54H] ,P[50H] ,0[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 receving STX
② in case of generating the receive buffer overflow
③ in case of not equivalent to the communication's set values or baud rate

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

## 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 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.

▪ o-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 out homepage.

■ This device works proper operation with;
surrounding Temp. : 0℃ ~ 60℃
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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