CONOTEC

CONOTEC CO., LTD.
DIGITAL TEMPERATURE CONTROLLER

CE ISO 9001:2008

CNT-1SH-1, 1SHR-1   Instruction Manual

- A user manual for this product is posted on the company website.
- Please download the technical document and communications manual on the company website

01 Safety precautions

Please read the safety precautions carefully for correct operation of the product.

※ The specifications and dimensions specified in this instruction manual may be changed without any notice for performance enhancement.

⚠ Warning

1. This product was not made as a safe device. Therefore, this product should be attached with dual safety devices if it is used for the control purposes (e.g. a device vulnerable to accident and property damage, etc.).
2. Do not wire, inspect or service this product while the power is being supplied.
3. You must attach this product to a panel. Otherwise, it may cause an electric shock.
4. When connecting the power, you must check the terminal number.
5. Do not ever disassemble, process, modify or repair this product.

⚠ Caution

1. Please make yourself familiar with all the operation instructions, safety precautions and warnings before using this product. Comply with related specifications and capacity requirements
2. Do not wire or install this product to any unit with high inductive load (e.g. motor, solenoid, etc.).
3. Use a shielded cable with a proper length when extending a sensor.
4. Do not use any part that generates an arc when used in the same power or directly switched in close proximity.
5. Keep the power cable away from a high-voltage cable and do not install this product in any place that is full of water, oil and dust.
6. Do not install this product in any place that is exposed to direct sunlight or rain.
7. Do not install this product in any place that is subject to strong magnetic power, noise, vibration or shock.

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8. Keep this product away from any place that generates strong alkaline or acid substances. Use a separate pipe.
9. Do not sprinkle water onto this product for cleaning when installing it in the kitchen.
10. Do not install this product in any place where the temperature/humidity ratings are exceeded
11. The sensor cable should not be cut or cracked..
12. Keep the sensor cable away from a signal cable, a power cable or a load cable. Use a separate pipe.
13. Keep in mind that the follow-up service will not be available if this product has been arbitrarily disassembled and modified
14. ⚠ symbol on the terminal wiring diagram indicates a safety statement that alerts a warning or caution.
15. Do not use this product near any device generating strong high-frequency noise (e.g. high-frequency welding machine high-frequency sewing machine, high-frequency radio, large-capacity SCR controller, etc.).
16. Using this product in any method other than those specified by by the manufacturer may lead an injury or a property damage
17. The product is not a toy. Keep it away from children.
18. The product should be installed only by an expert or a qualified person.
19. The company will not be liable for any damage caused by the violation of the above warnings and cautions or by a consumer's fault
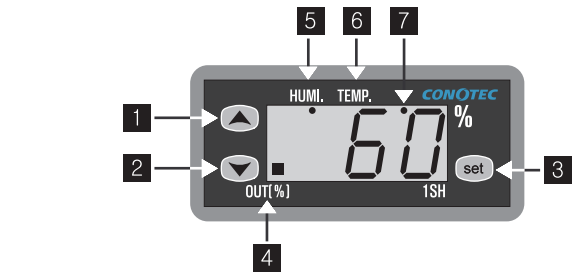
⚠ Danger

Caution: Risk of electric shock

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

02 Model Types

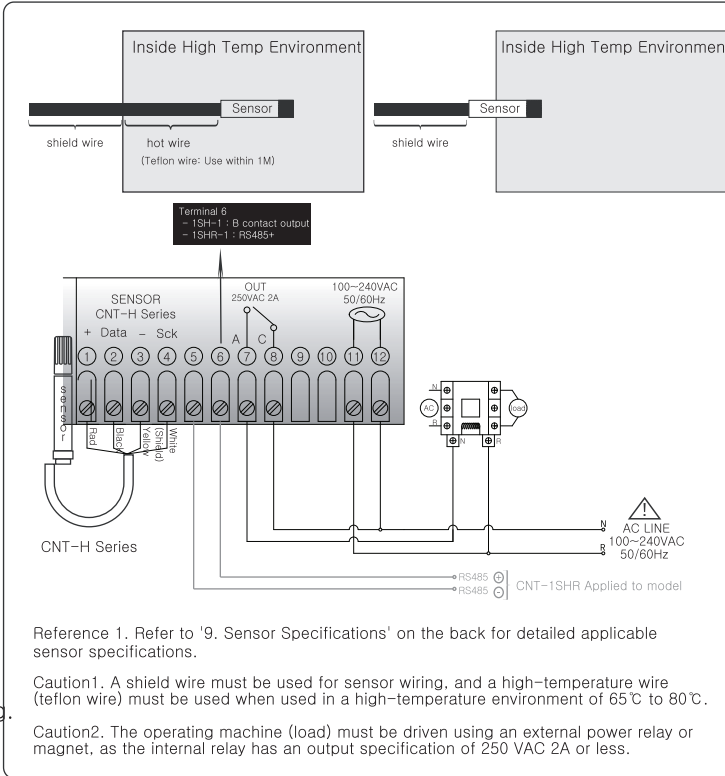| Model	Output	Sensor	Humidity Range	RS485 Comm.
CNT-1SH-1	1a 250Vac2A	CNT-H Series	0%~100%Rh	Not Supported
CNT-1SHR-1				Supported

03 Components

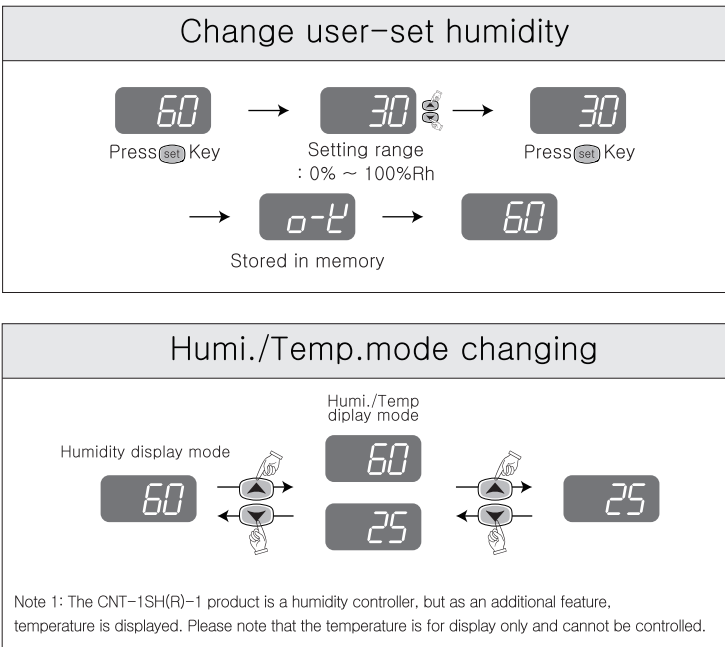| 1 Increase Switch (UP)	2 Reduction Switch (DN)
3 Setting Switch (SET)	4 Show Main Output
5 Humidity indication	6 Temperature indication
7 Sensor communication status indication	

* If sensor communication is unstable, the communication status indicator will blink.
  CNT-1SH(R)-1 : Humi. display and control function + temp. display function.
  There are two modes for displaying the current status: UP / DN.
  You can switch between "Humi Display" and "Temp Display" using the switch.
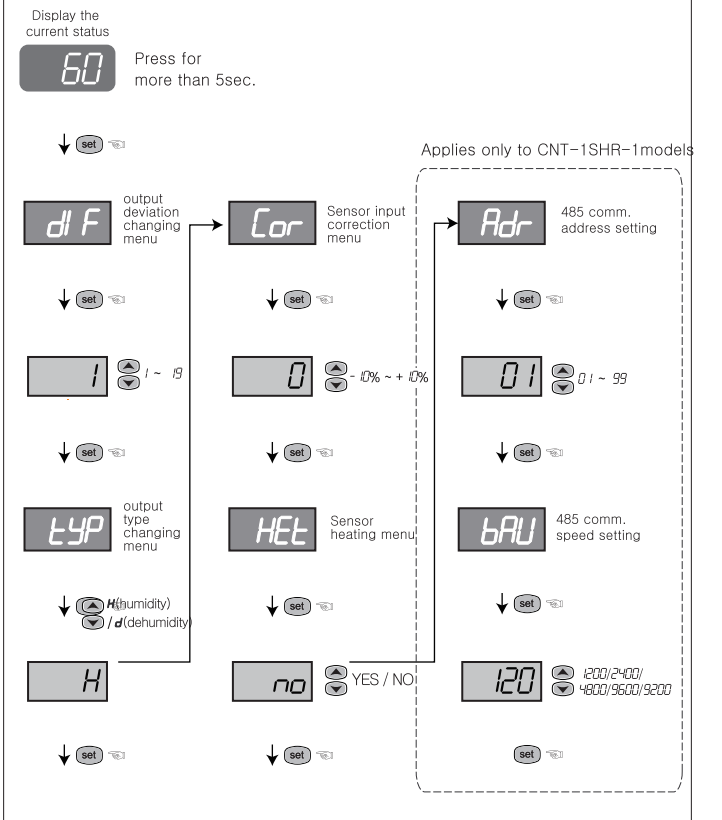
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04 Terminal wiring diagram

[CNT-1SH-1 / CNT-1SHR-1]

Reference 1. Refer to '9. Sensor Specifications' on the back for detailed applicable sensor specifications.

Caution1. A shield wire must be used for sensor wiring, and a high-temperature wire (teflon wire) must be used when used in a high-temperature environment of 65℃ to 80℃.

Caution2. The operating machine (load) must be driven using an external power relay or magnet, as the internal relay has an output specification of 250 VAC 2A or less.

05 Setting process

Change user-set humidity

Press set Key → Setting range : 0% ~ 100%Rh → Press set Key → o-Y Stored in memory → 60

Humi./Temp.mode changing

Humidity display mode → Humi./Temp diplay mode

Note 1: The CNT-1SH(R)-1 product is a humidity controller, but as an additional feature, temperature is displayed. Please note that the temperature is for display only and cannot be controlled.

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

Display the current status

60   Press for more than 5sec.

Applies only to CNT-1SHR-1models

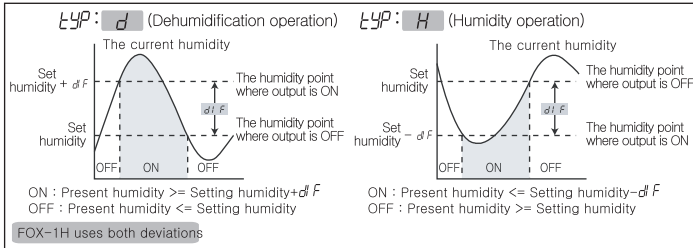|			
dIF	output deviation changing menu	Cor	Sensor input correction menu	Adr	485 comm. address setting
1	1 ~ 19	0	-0% ~ +0%	01	01 ~ 99
tYP	output type changing menu	HEt	Sensor heating menu	bAU	485 comm. speed setting
H	▲ H(humidity) / ▼ d(dehumidity)	no	YES / NO	120	1200/2400/ 4800/9600/9200

Ref 1. Press the SET key continuously for at least 5 seconds in the current humidity/temperature display to enter program setting mode.

Ref 2. All programs continue to press the SET key for at least 3 seconds after the setup ends, or after 60 seconds after the setup, the O-K character is automatically displayed and returns to the current humidity display state.

06 Function details

dI F : Set Output Deviation   CNT-1SH- CNT-1SHR-1

  – Frequent On and OFF will shorten the lifespan of the relay or the output contact or cause hunting (generation, chattering) by noise from outside.

  – To prevent the occurrence, the function protects the contact light of the equipment by setting an interval between ON and OFF in ON/OFF control.

tYP : Output Type Settings   CNT-1SH- CNT-1SHR-1

tYP : **d** (Dehumidification operation)   tYP : **H** (Humidity operation)

ON : Present humidity >= Setting humidity+dI F
OFF : Present humidity <= Setting humidity

ON : Present humidity <= Setting humidity-dI F
OFF : Present humidity >= Setting humidity

FOX-1H uses both deviations

Cor : The current humidity calibration   CNT-1SH- CNT-1SHR-1

  – The function calibrates the current humidity to be consistent with the actual humidity if the humidity shown in the display window and the actual are humidity are different despite the product has no problem.

  Ex) Actual Humidity : 55%rH, Current Humidity : Suppose the Cor value is set –2 when 57%rH, the current humidity will be displayed at 55%rH,

⚠ Caution : The performance of the actual humidity is verified. Please use calibrated equipment for calculation. Calibration based on humidity calculation with incorrect equipment may cause product malfunction.

HEL : Humidity sensor heating function   CNT-1SH- CNT-1SHR-1

  – It is possible to be covered with dew when the humidity is high, If the present humidity is 95%, it is generated heat unner its sensor on order to prevention of dewy.

YES : The heating function operates automatically in 95% or more humidity and the function is disabled when humidity level is below 95%

no : The automatic heating function is not used.

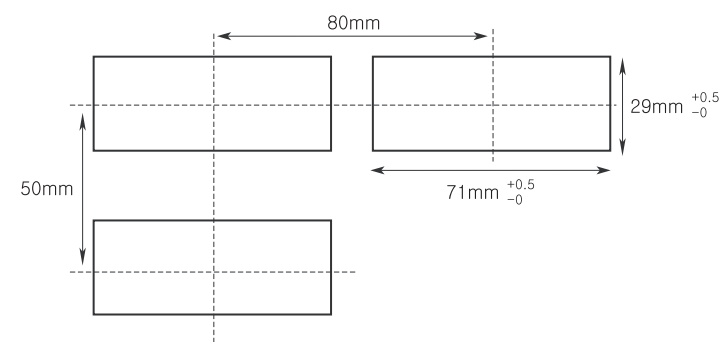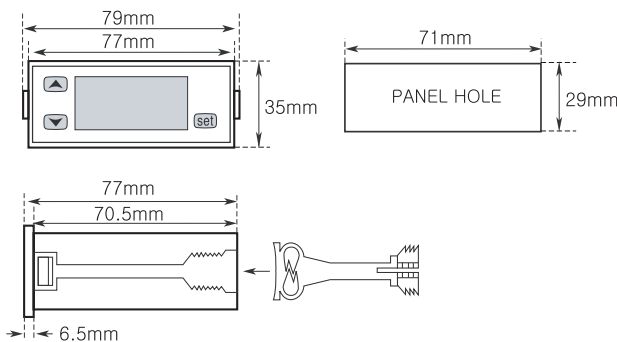⚠ Caution : It must be set up "NO" because the heating function can not be used for more than 95%

⚠ Caution : The present temperature's display can be increased a little while operating os the humidity sensor's heating function

Adr : RS485-communication address setting   CNT-1SHR-1

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

bAU : RS485-communication speed setting   CNT-1SHR-1

  – The product CNT-1SHR-1 supports RS485 communications. when communicating with the master device for mutual recognition is the ability to set the communication speed.
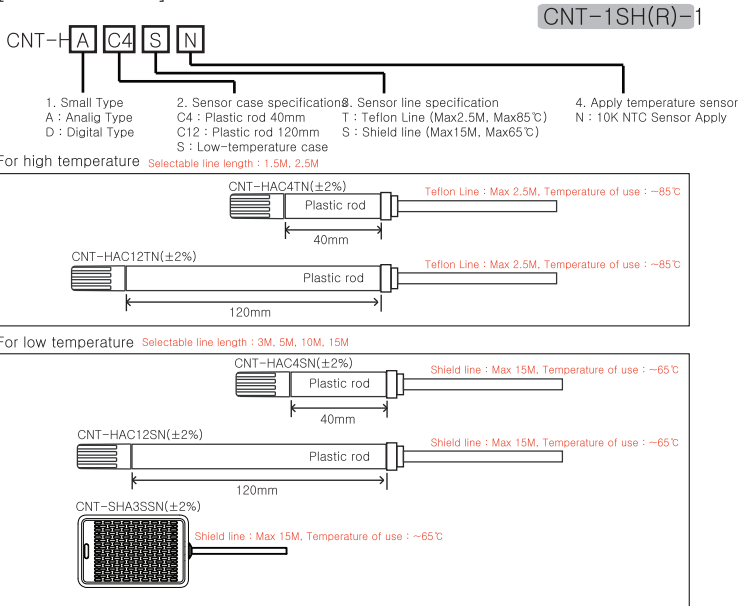
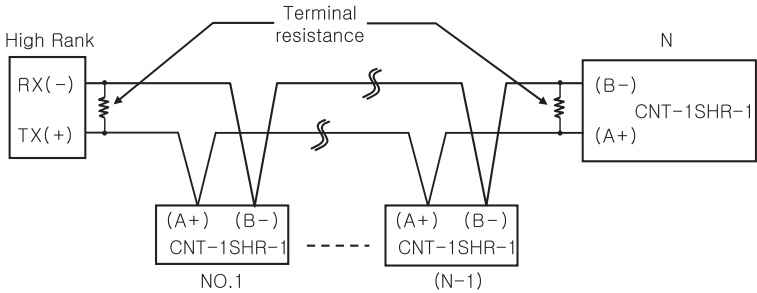## 07 Diemension and panel hole sizes

(Unit : mm / error : ±0.5)

79mm / 77mm / 35mm / 71mm / PANEL HOLE / 29mm

77mm / 70.5mm / 6.5mm

08 Applied Sensor Specifications

[CNT-H Series]

CNT-H **A** **C4** **S** **N**   CNT-1SH(R)-1

1. Small Type
A : Analig Type
D : Digital Type

2. Sensor case specification
C4 : Plastic rod 40mm
C12 : Plastic rod 120mm
S : Low-temperature case

3. Sensor line specification
T : Teflon Line (Max2.5M, Max85℃)
S : Shield line (Max15M, Max65℃)

4. Apply temperature sensor
N : 10K NTC Sensor Apply

For high temperature   Selectable line length : 1.5M, 2.5M

CNT-HAC4TN(±2%) / Plastic rod / Teflon Line : Max 2.5M, Temperature of use : ~85℃

CNT-HAC12TN(±2%) / 40mm / Plastic rod / Teflon Line : Max 2.5M, Temperature of use : ~85℃ / 120mm

For low temperature   Selectable line length : 3M, 5M, 10M, 15M

CNT-HAC4SN(±2%) / Plastic rod / Shield line : Max 15M, Temperature of use : ~65℃

CNT-HAC12SN(±2%) / 40mm / Plastic rod / Shield line : Max 15M, Temperature of use : ~65℃ / 120mm

CNT-SHA3SSN(±2%) / Shield line : Max 15M, Temperature of use : ~65℃

* If not requested, it will be shipped in basic line length: 3M (CNT-HAC4N).

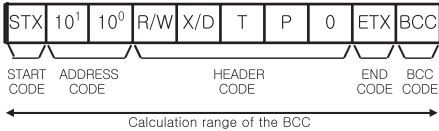## 09 Comm. interface (CNT-1SHR-1 applicable)

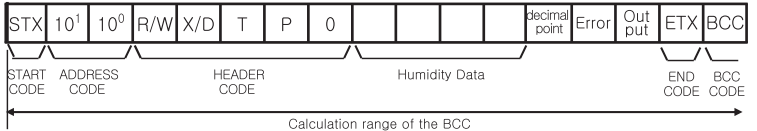|	
Applicable specification	EIA RS485
Communications method	2-line half-duplex;Asynchronous
Synchronization method	Asynchronous system
Data speed	1200/2400/4800/9600/19200bps(5 options)
Communications range	Within 1.2Km
Communications protocol	BCC
Start Bit, Stop Bit	1Bit (fixed)
Parity Bit, Data Bit	Parity Bit : None, Data Bit : 8Bit (fixed)

[SYSTEM]

High Rank / RX(−) / TX(+) / Terminal resistance / N / (B−) CNT-1SHR-1 (A+)

(A+) (B−) CNT-1SHR-1 / (A+) (B−) CNT-1SHR-1 / NO.1 / (N-1)

■ Definition between communication command and block

[Top (HOST) Query (Question) format]

| STX | 10¹ | 10⁰ | R/W | X/D | T | P | 0 | ETX | BCC |

10^1 10^0

START CODE / ADDRESS CODE / HEADER CODE / END CODE / BCC CODE

Calculation range of the BCC

[FOX-1SHR Response (Reply) Format]

| STX | 10¹ | 10⁰ | R/W | X/D | T | P | 0 | | Decimal point | Error | Out put | ETX | BCC |

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 1SHR-1. It is available to set between 01~09(BCD ASCII)

③ HEADER CODE: Show the command name as an alphabetic letter
TP0(Temperature measurements) ->T[54H],P[50H],0[30H]
HP0(Humidity measurements) ->H[48H],P[50H],0[30H]
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]

④ Composition of DATA: DATA is displayed as (Hexadecimal) (Negative: 2's remuneration)

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]:sensor open error 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]

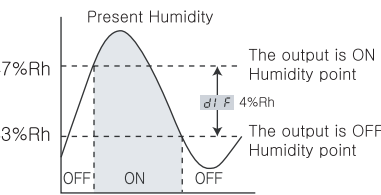⑨ BCC: (Block Check Character) Show the XOP arithmetic and logic values from the start (STX) to the ETX

※ etc

▪ 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 (Recevice Buffer Overflow)
③ In case of not equivalent to the communication's set values or baud rate

▪ 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

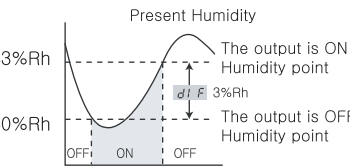## 10 Application for humidity controller

[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 tYP : **d**   dI F : **4%Rh**

Present Humidity / 47%Rh / The output is ON Humidity point / dI F 4%Rh / 43%Rh / The output is OFF Humidity point / OFF ON OFF

[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 tYP : **H**   dI F : **3%Rh**

Present Humidity / 43%Rh / The output is ON Humidity point / dI F 3%Rh / 40%Rh / The output is OFF Humidity point / OFF ON OFF

11 Easy error diagnosis instructions

※ If an error is displayed while the product is running

• **Er 1** : It is case where the product was subject to a strong external noise and internal data memories have been damaged In this case, contact us for product service.

• Although this controller was designed to withstand a certain level of external noise, it is not supposed to withstand all levels of noise.

• If the product is subject to a noise greater than 2KV, it could be internally damaged.

• **o-E** display means communication defect with the sensor. Please check connection, wire short, and connection order to the sensor. If the problem persists, please contact our customer. service department.

• **L-E** or **H-E** is shown when humidity display has exceeded the range. If the error is displayed despite maintaining our customer service department

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

※ This manual was prepared in the Naver Nanum fonts.