

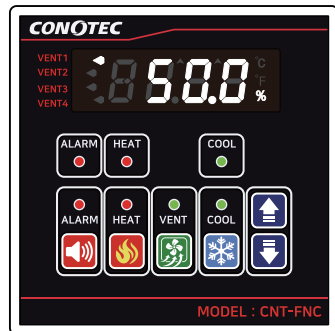
CONOTEC

CONOTEC CO., LTD.
DIGITAL TEMPERATURE CONTROLLER



CNT-FNC

Instruction Manual



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

01 Safety precautions

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

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

▲ Warning

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

▲ Caution

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

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

▲ Danger

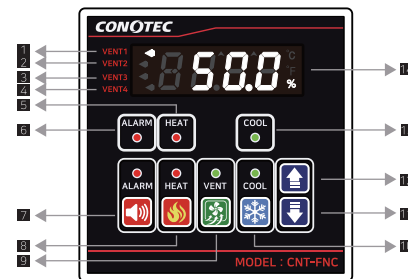
Caution: Risk of electric shock

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

02 Model Types

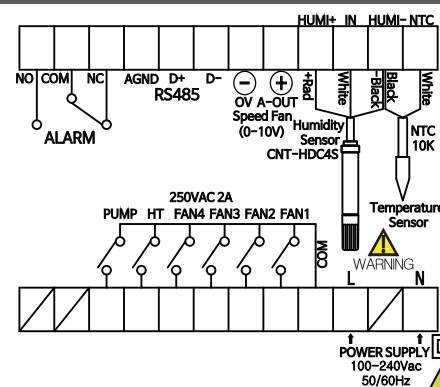
Model	Sensor	Control method	Temp./RH Range	Power	Function
CNT-FNC	CNT-HAC4SN NTC 10K	7 Relay Outputs (7EA)	°C: -55.0℃~99.9℃ °F: -60°F~200°F %RH: 10.0%~95.0%Rh	100~240Vac 50/60Hz 3VA	Alarm Temp. Humidity Fan

03 Components



- 1 Fan 1 Output
- 2 Fan 2 Output
- 3 Fan 3 Output
- 4 Fan 4 Output
- 5 Heater Output Indicator
- 6 Alarm Output Indicator
- 7 Alarm Set Key
- 8 Heater Set Key
- 9 Fan Set Key
- 10 Cooling Set Key
- 11 Down Key
- 12 Up Key
- 13 Cooling Output Indicator
- 14 Display Window

04 Terminal wiring diagram

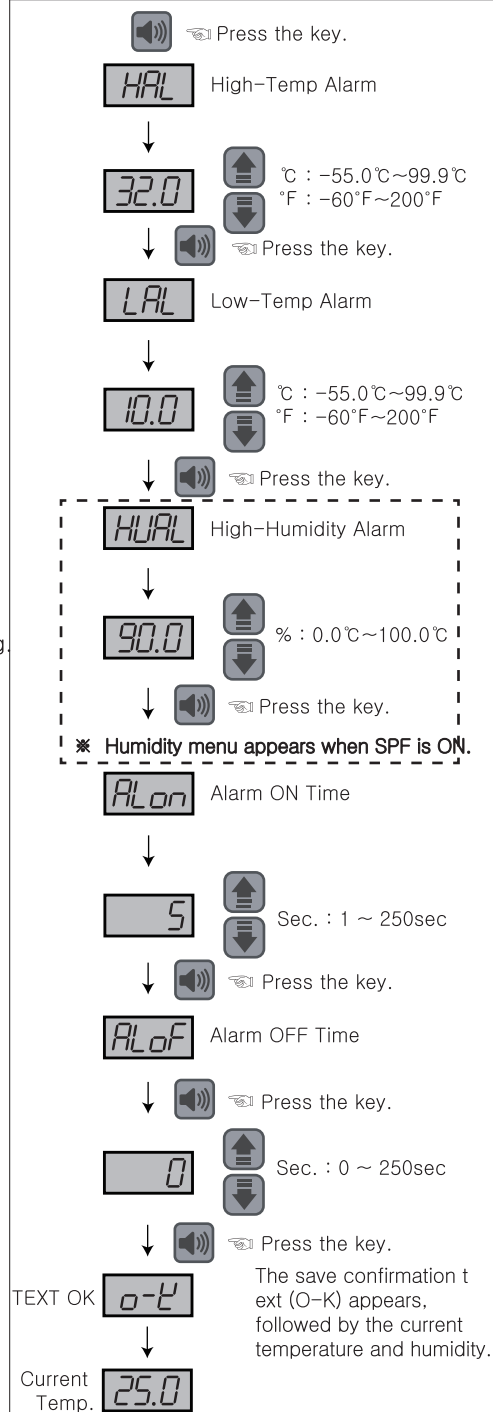


✱ Output: For loads over 250 VAC, 2 A, use a power relay or magnetic contactor.
✱ Exceeding the contact rating may cause contact welding, poor contact, or relay damage.

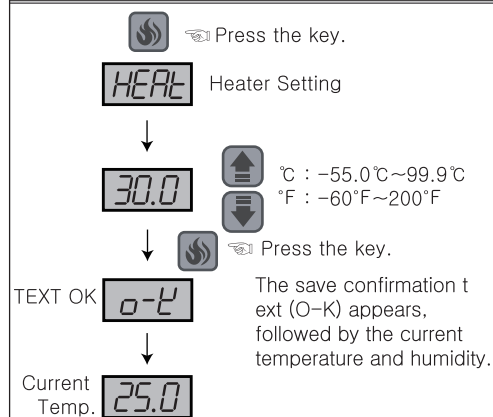
05 Setting process

✱ Program Settings (Factory Defaults)

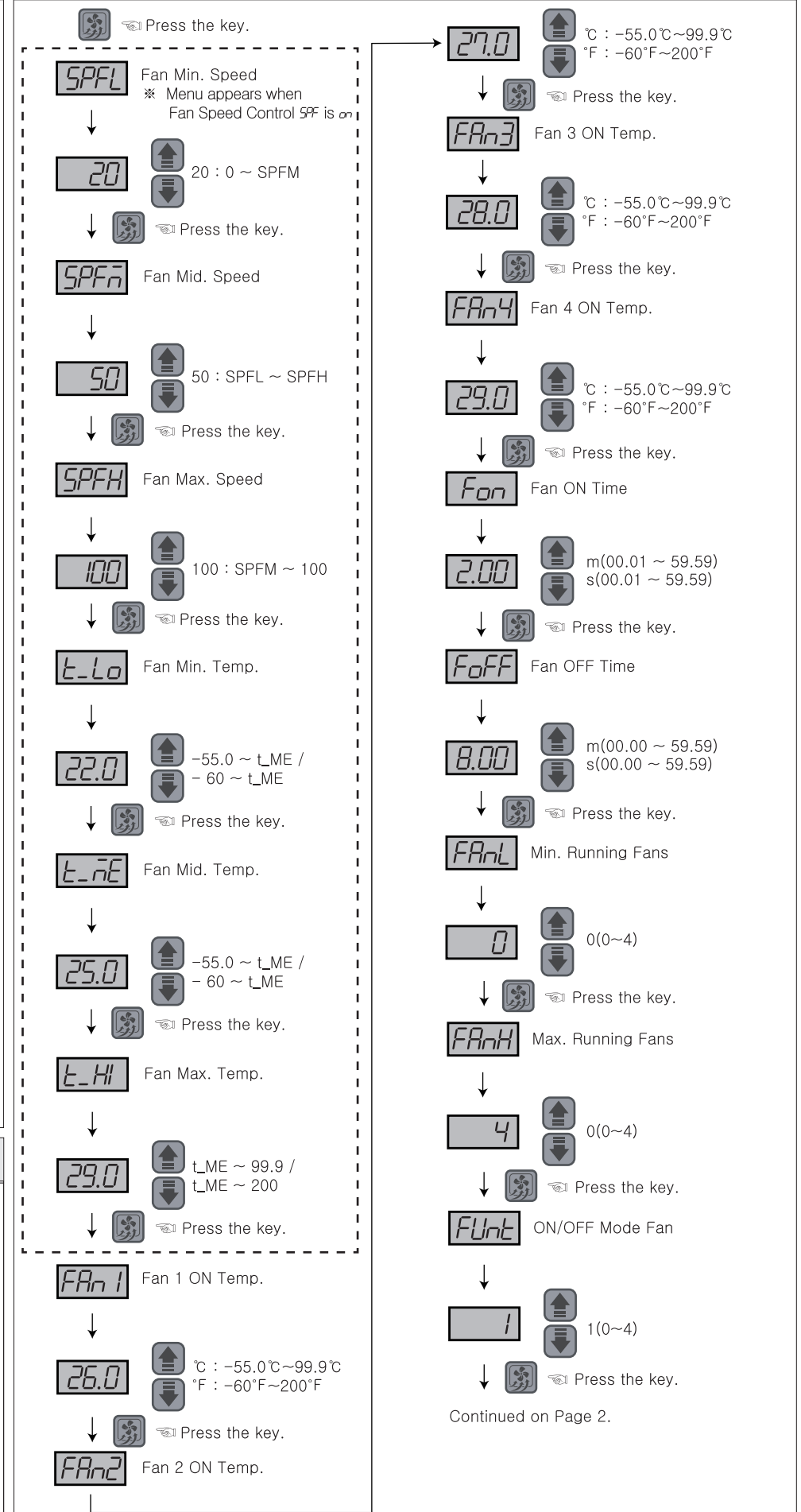
Alarm Program Settings



Heater Program Settings



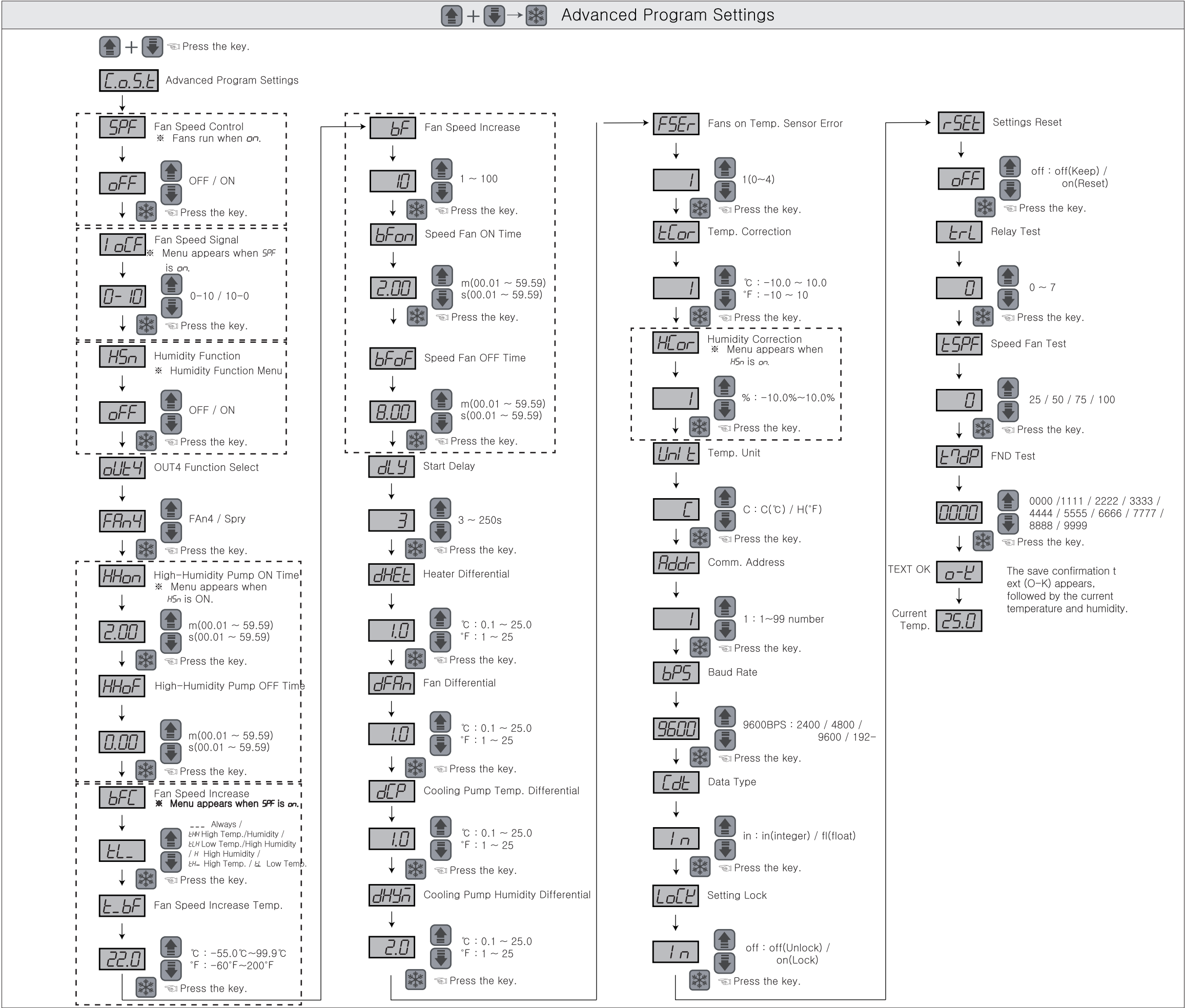
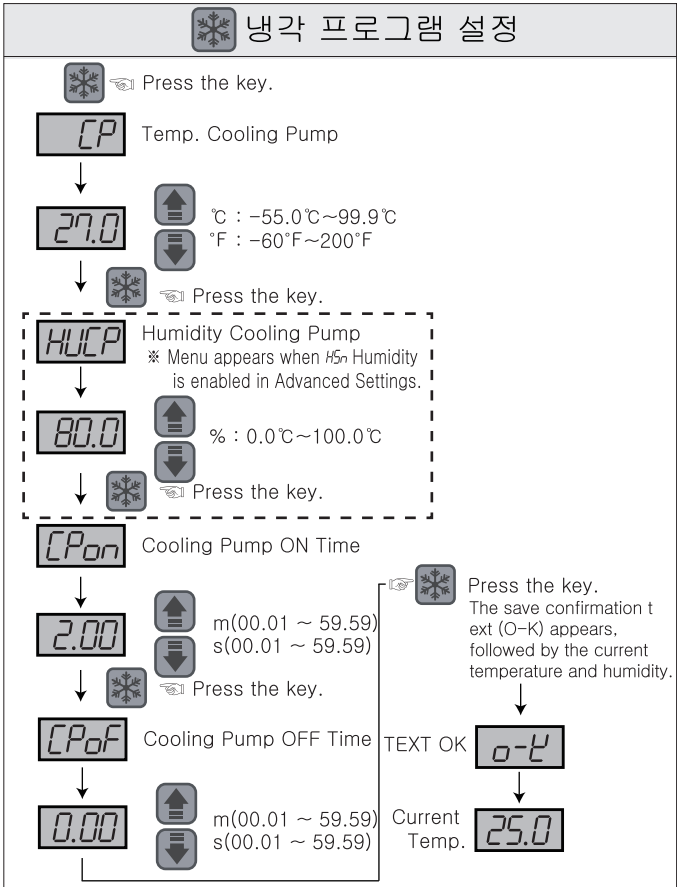
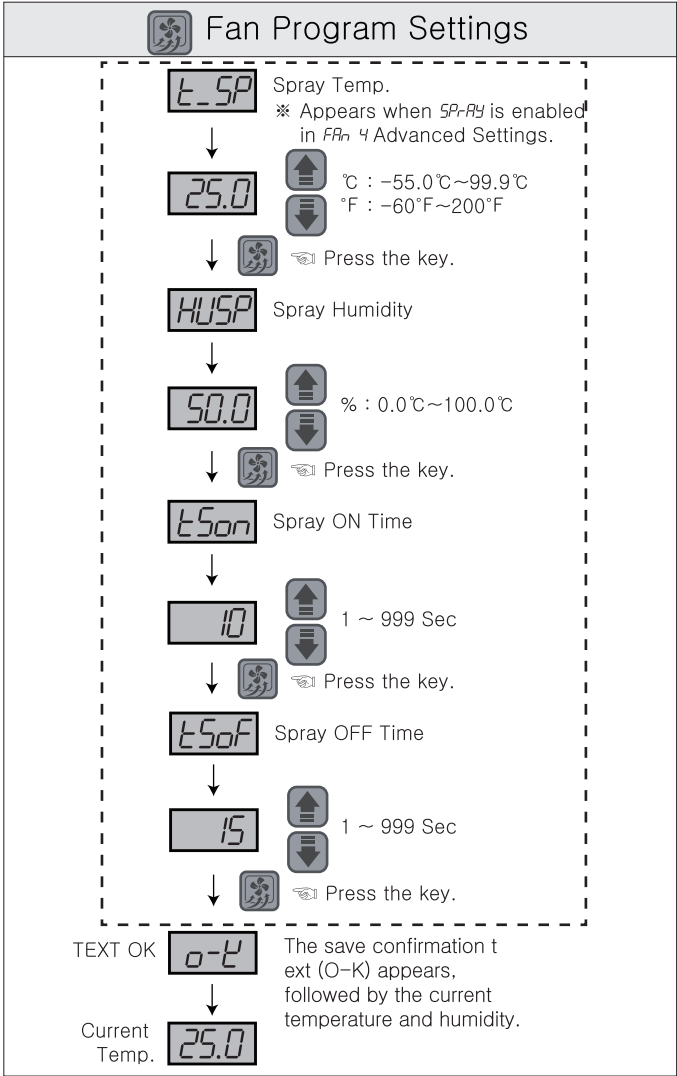
Fan Program Settings



Continued on Page 2.

05 Setting process

※ Program Settings (Factory Defaults)



06 Functions & Program Settings

1. Product Operation

CNT–FNC displays the indoor temperature and humidity of greenhouses and livestock houses. It controls temperature and humidity through the fan and heater. If no humidity sensor is connected, only the indoor temperature is

2. Power ON

Each time power is turned on, “V1.0” appears. This is the program version unique to the software version.

3. Display Change



Press once
→ Current indoor temperature
Press twice
→ Current indoor humidity
(If no humidity sensor is used, fan speed appears.)
Press 3 times
→ Current fan speed

[NOTE]

Press 4 times to display alarm status.
If an error occurs:

HPL: Current temp. ≥ set temp.

LPL: Current temp. ≤ set temp.

HHU: Current humidity ≥ set humidity

4. Recorded Temperature Memory

Each time power is turned on, “V1.0” appears. This is the program version unique to the software version.
Press the key to select.

Press once
→ Recorded max. temperature
Press twice
→ Recorded min. temperature

[NOTE]

Hold the key for 5 sec. to clear the records. TP54 always records temperature data. Data resets when power is turned off.

5. Changing Settings

You can change the Set Point for each function.
For instance:
1) Press the Fan button to select Ventilation.
2) FAN1 and its Set Point flash alternately.
Press to increase or to decrease.
3) Press the button again to move to FAN2.
4) Press another function button to enter its settings and exit the current settings.

6. Heater (HEAT)

Enter the heating Set Point. The heater turns ON/OFF based on this value.

Ex)

Set Points:
HEAL = 25.0°C, *dHEL* = 1.0°C
Heater ON: Temp. = 24.0°C (= *HEAL* – *dHEL*)
Heater OFF: Temp. = 25.0°C
※ Factory default for *dHEL* is 1.0°C. It can be changed in Advanced Program Settings.

7. Alarm (ALARM)

RL Sets the maximum temperature for alarm operation. When the controller activates the alarm relay, the high–tem–perature alarm is also activated.

LRL Sets the minimum temperature for alarm operation. When the controller activates the alarm relay, the low–tem–perature alarm is also activated.

HUAL Sets the maximum humidity for alarm operation. When the controller activates the alarm relay, the high–hu–midity alarm is also activated.

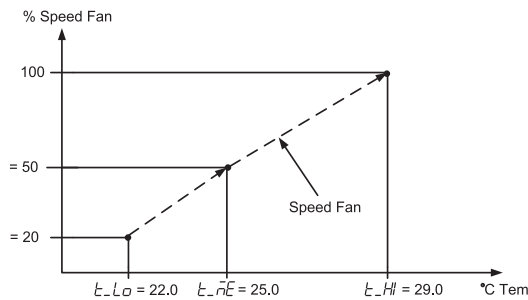
ALon Sets the time (sec.) the alarm remains ON. The alarm operates in a repeating ON/OFF cycle.

ALoF Sets the time (sec.) the alarm remains OFF during the alarm cycle.

SEt ALoF = 0.

the alarm ON/OFF repeat function is disabled.
If any key is pressed while the alarm relay is active, the alarm relay is delayed for 15 minutes.

8. Ventilation (VENT)



SPFL : Sets the minimum speed (%) of the variable–speed fan.

SPFn : Sets the intermediate speed (%) of the variable–speed fan.

SPFH : Sets the maximum speed (%) of the variable–speed fan.

t Lo : Enter the minimum temperature Set Point for controlling the

t nE : Enter the intermediate temperature Set Point for controlling the intermediate speed of the variable–speed fan.

t HI : Enter the maximum temperature Set Point for controlling the

Operation Description

Setting Example

SPFL = 20% When the indoor temperature is below 22.0°C

SPFn = 50% → The variable–speed fan automatically operates at 20% speed.

SPFH = 100% When the indoor temperature reaches 22.0°C

t Lo = 22.0°C → The variable–speed fan begins to gradually increase its speed.

t nEL = 25.0°C

t HI = 29.0°C When the indoor temperature reaches 29.0°C
→ The variable–speed fan automatically operates at 100% speed.

※ If SPF (Fan Speed Control) is set to OFF, the setting items are hidden from the menu. Basic operation can be changed in Advanced Program Settings.

FAn 1 : Enter the user’s ventilation Set Point. Fan 1 turns ON/OFF based on this Set Point.

Ex)

SFRn 1 = 21.0°C, *dFRn* = 1.0°C

FAn 1 ON: Temp. = 21.0°C

OFF: Temp. = 20.0°C (= *FAn 1* – *dFRn*)

※ The factory default for *dFRn* is 1.0°C. It can be changed in Advanced Program Settings.

FAn2 : Sets the temperature at which Fan 2 turns ON.

FAn3 : Sets the temperature at which Fan 3 turns ON.

FAn4 : Sets the temperature at which Fan 4 turns ON.

[NOTE]

If *dUt4* is set to *FRn4* or *SPry* mode (Advanced Program Settings), the items below appear.

t SPr, *HUSPr*, *tSon*, *tSoF* (See *SPry* mode settings.)

Fan: Sets the time the fan remains ON when the indoor temperature is below the fan Set Point.

(Unit: min. or sec. × 10)

※ The fan operates in an ON/OFF repeat cycle.

FoFF: Sets the time the fan remains OFF during the fan cycle. (Unit: min. or sec. × 10)

FAnL: Sets the minimum number of operating fans. Even if the Set Point is not exceeded,

Setting Example

Set Points: *FAn 1* = 21.0°C, *FAn2* = 22.0°C, *FAn3* = 23.0°C,
FAn4 = 24.0°C, *FAnL* = 2 (Max. Running Fans)

Current Temp.: 19.0°C

FAnH : Sets the maximum number of operating fans. Even when the

Setting Example

Set Points: *FAn 1* = 21.0°C, *FAn2* = 22.0°C, *FAn3* = 23.0°C,
FAn4 = 24.0°C, *FAnL* = 2 (Max. Running Fans)

Current Temp.: 25.0°C

FUnL : Sets the number of fans to run during the ON/OFF cycle (Fan ON Time / Fan OFF Time).

Spray (SPRAY)

When using *SPry* mode, change *FAn4* mode to *SPry*.

This can be changed in Advanced Program Settings.

t SP : Enter the spray operating temperature. Spray turns ON/OFF based on this Set Point.

Setting Example

Set Points: *t SP* = 27.0°C, *dCP* = 1.0°C

SPry ON Temp. = 27.0°C

OFF Temp. = 26.0°C (= *t SP* – *dCP*)

※ The factory default for *dCP* is 1.0°C.

It can be changed in Advanced Program Settings (*dCP*).

HUSP : Enter the humidity Set Point at which spray turns OFF. Spray is controlled based on this Set Point.

Setting Example

Set Points: *HUSP* = 80.0%, *dHUh* = 2.0

SPry OFF Temp. = 80.0%

ON Humidity = 78.0%

※ The factory default for *dHUh* is 2.00. It can be changed in Advanced Program Settings.

tSon (1–999 sec.)

Sets the time the spray relay remains ON.

Spray operates in an ON/OFF repeat cycle.

tSoF (1–999 sec.)

Sets the time the spray relay remains OFF.

Spray operates based on the ON/OFF cycle.

[NOTE]

If no humidity sensor is connected or *Hsn* = 0 (Advanced Program Settings):

→ Humidity Set Points are not used.

→ *HUSP* is disabled.

8. Cooling (COOL)

CP Enter the user’s cooling Set Point. The cooling pump turns ON/OFF based on this Set

Setting Example

Set Points: *CP* = 27.0°C, *dCP* = 1.0°C

CP Cooling ON Temp. = 27.0°C
Pump OFF Temp. = 26.0°C (= *CP* – *dCP*)

HUEP Enter the humidity Set Point at which the cooling pump turns OFF.

Setting Example

Set Points: *HUEP* = 80.0%, *dHUh* = 2.0

HUEP Humidity OFF Humidity = 80.0%
Cooling ON Humidity = 78.0% (= *HUEP* – *dHUh*)

※ The factory default for *dHUh* is 2.00. It can be changed in Advanced Program Settings.

CPon: Sets the time the cooling pump remains ON.

(Unit: min. or sec. × 10)

(The cooling pump operates in an ON/OFF repeat cycle.)

CPoF: Sets the time the cooling pump remains OFF during the cooling cycle.

(Unit: min. or sec. × 10)

(Setting to “0.0” disables this function.)

If no humidity sensor is connected or *Hsn* = *oFF* (Advanced Program Settings):

→ Humidity control is not used, and *HUEP* is disabled.

9. Controller Settings (SETUP) +

Entering Setup Mode

Press and hold together, then release when *LoSt* appears.

→ Controller Setup Mode starts.

Press the SET () button to move to the next parameter.

Increase value

Decrease value

: Fan Speed Control Select

→ Changed values are saved automatically.

Enables/disables variable–speed fan control.

※ If OFF, all variable–speed fan parameters are hidden and the fan runs at maximum speed.

ON = Enable / OFF = Disable

: Fan Speed Signal Select

→ Selects the fan speed control signal. (10–0 V)

0 V = Max. speed, 10 V = Min. speed

0–10 = 0–10V / 10–0 = 10–0V

: Humidity Function Select

Enables/disables all humidity sensor control functions.

If disabled, all humidity sensor functions stop and the controller operates using temperature only.

ON = Enable / OFF = Disable

: OUT4 Function Select

Selects the operating mode of Output 4 (FAN4 terminal).

Output 4 has two modes:

Output 4 → Fan (*FRn*) mode

Output 4 → Spray (*SPry*) mode

: Fan Speed Increase Select

Selects the fan speed increase mode for ventilation.

When the condition is met, fan speed increases

(*bF* + actual fan speed).

All fan speed increase modes operate in an ON/OFF cycle.

★ Fan Speed Increase Modes (6 Types)

--- : (Always Increase) Increases fan speed for the set time, regardless of current temperature or humidity.

tHH : (High Temp./Humidity) Increases fan speed when temp. $\geq t\ bF$ or humidity $\geq HUcP$.

tLH : (Low Temp./High Humidity) Increases fan speed when temp. $\leq t\ bF - 0.5^{\circ}\text{C}$ or humidity $\geq HUcP$.

-H- : (High Humidity) Increase fan speed when humidity $\geq HUcP$

tH- : (High Temperature) Fan speed increases when temperature $\geq T\ BF$.

tL- : (Low Temp.) Increases fan speed when temp. $\leq t\ bF - 0.5^{\circ}\text{C}$.

bF : Sets the speed increase value.

bFon : Sets the fan speed increase ON time in min. or sec.

bFoF : Sets the fan speed increase OFF time in min. or sec.

HHoF : High-Humidity Cooling Pump OFF Time
When humidity is high, sets the cooling pump stop time (OFF time) in min. or sec. ($\times 10$).
Setting $HUoF = 0.0$ disables the cooling pump's high-humidity function.

HHon : High-Humidity Pump ON Time
When indoor temperature reaches the cooling Set Point and humidity exceeds the humidity Set Point, sets the cooling pump ON time in min. or sec. ($\times 10$).
The cooling pump operates in an ON/OFF cycle.

dLY : Sets the controller start delay from 3–180 sec.

dHEt : Sets the heater ON temperature differential.

dFAn : Sets the fan OFF temperature differential.

dCP : Sets the cooling pump OFF temperature differential.

dHYn : Sets the cooling pump OFF humidity differential.

FSEr : Sets the number of fans running during a temperature sensor error.

tCor : Displays and corrects the current indoor temperature.

hCor : Displays and corrects the current indoor humidity.

Unit : Changes the temperature unit.
C = $^{\circ}\text{C}$ / H = $^{\circ}\text{F}$

Raddr : Sets the RS485 address from 1–99.

bPS : Sets the RS485 baud rate: 1200 / 2400 / 4800 / 9600 / 19200.

Cdt : Selects integer or float communication data.

LoCK : Prevents unauthorized setting changes.
on: Locks all settings except temperature
off: Unlocks all settings

rSEt : Service function for controller reset.

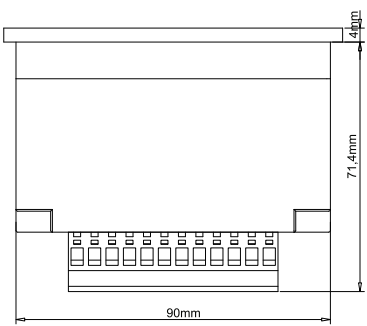
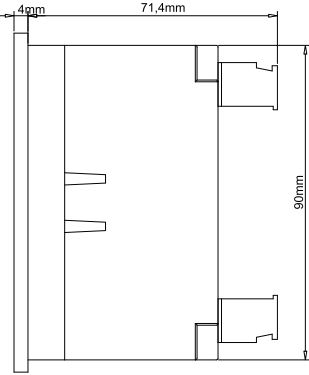
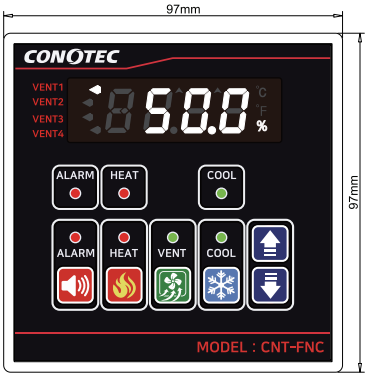
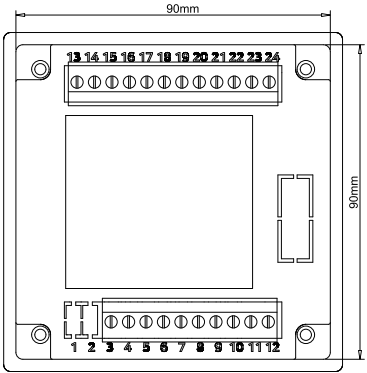
trL : Service function for relay testing.

tSPF : Service function for variable-speed fan testing.

t7dP : Service function for 7-segment display testing.

07 Diemension and panel hole sizes

(Unit : mm / error : ± 0.5)



10 Easy error diagnosis instructions

- ✖ If an error is displayed while the product is running
- **E-1** : It is case where the product was subject to a strong external noise and internal data memories have been damaged
In this case, contact us for product service.
Although this controller was designed to withstand a certain level of external noise, it is not supposed to withstand all levels of noise.
If the product is subject to a noise greater than 2KV, it could be internally damaged.
- If **o-E** (open error) or **S-E** (short error) is displayed, there is something wrong with a sensor. Please check the sensor.
- **o-k** If "o-k" (O-K) is displayed, the settings have been saved successfully.
- **LoCK** If "LoCK" (Lock) is displayed, the product is in the locked state.
- **tp54** If "tp54" (Product Name) is displayed, it indicates the product model name.

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

■ Warranty period: One year from the date of purchase

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

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

- ◆ Installation precautions
- This device sholuld be connected to a protective earth terminal and a power supply in order to prevent an electric shock.
- Do not block the air outlet.
- ◆ Operation precautions
- ✖ An operating environment of this device is as follows.
- Ambient temperature : 0 ~ 60 $^{\circ}\text{C}$ ■ Ambient humidity : 80%RH or less
- Indoor uses only ■ Pollution class 2
- Altitude under 2000m ■ Installation category :
- This device should be laid out in a way that its power cord is easy to handle.
- Using this product in any method other than those specified by the manufacturer may damage its protection function

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

✖ This manual was prepared in the Naver Nanum