Version 0.95(2016.11.09)

ISO 9001:2008

CONOTEC® Digital Temperature Controller

CONOTEC CO., LTD. www.conotec.co.kr

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.

⚠ Warnings

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 do wiring 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 dissembled, processed, improved, or repaired.

⚠ Cautions

- 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 do wiring 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 dissembling 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.

- Caution, danger regarding electric impact
  - Electric impact – Do not connect it to an AC terminal during a current flow. It may experience any electric impact.

- During the check of input power, be sure to cut off input power.

2. Model configuration

Model	Sensor	Control output	Temperature scope	Function
CNT-2003SV (exclusively for cooling)	NTC	Relay contact point	Celsius: -55.0℃ ~ +99.9℃	Solenoid valve, COMP, defrosting, Fan control

3. Part name

■ **Product exterior and each part name**

1. Heater/LTS (low temperature prevention) indication
2. Solenoid valve output indication
3. Eva fan (에바휀) output indication
4. Defrosting output indication
5. COMP output indication
6. Defrosting switch
7. Increase switch
8. Function change switch
9. Decrease switch

■ User mode change (temperature setup)

- Set temperature change of main output

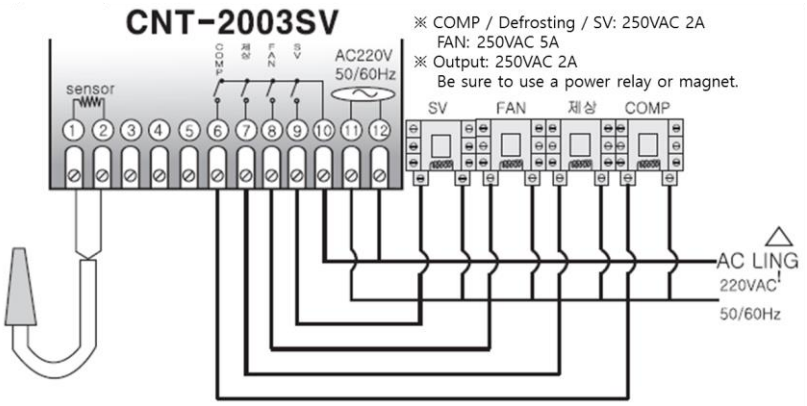
  If pressing  key, a setup value will flicker on the screen.

  The setup value can be increased or decreased by  key or  key.

- Setter mode function setup

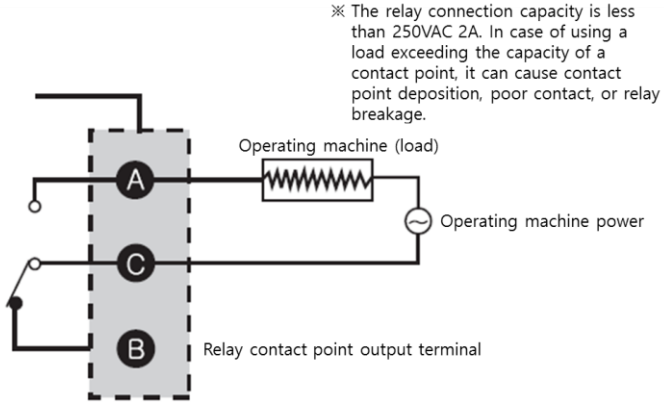
If pressing  key for over 5 seconds, it will turn into a setter mode, and change it in the order of  .

4. Terminal circuit diagram

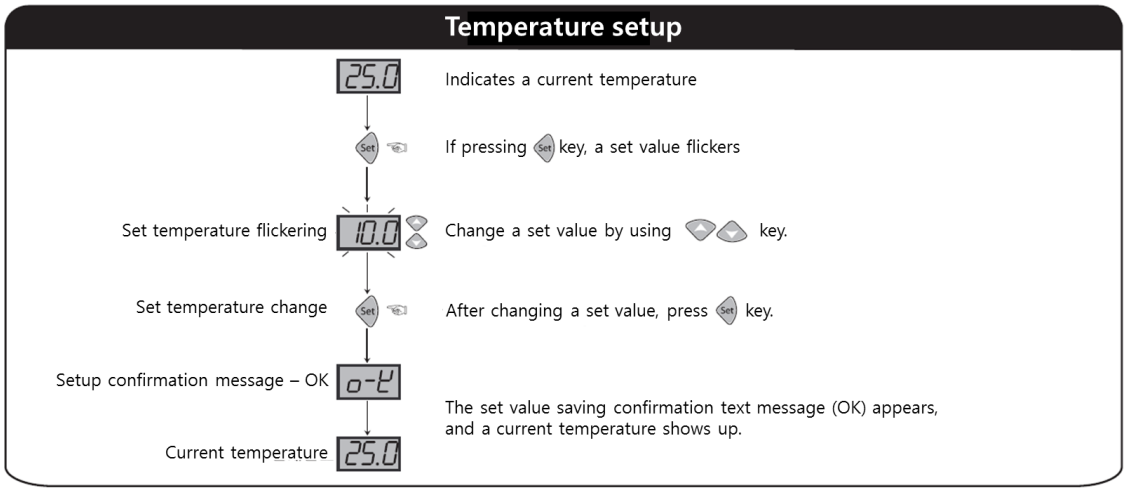


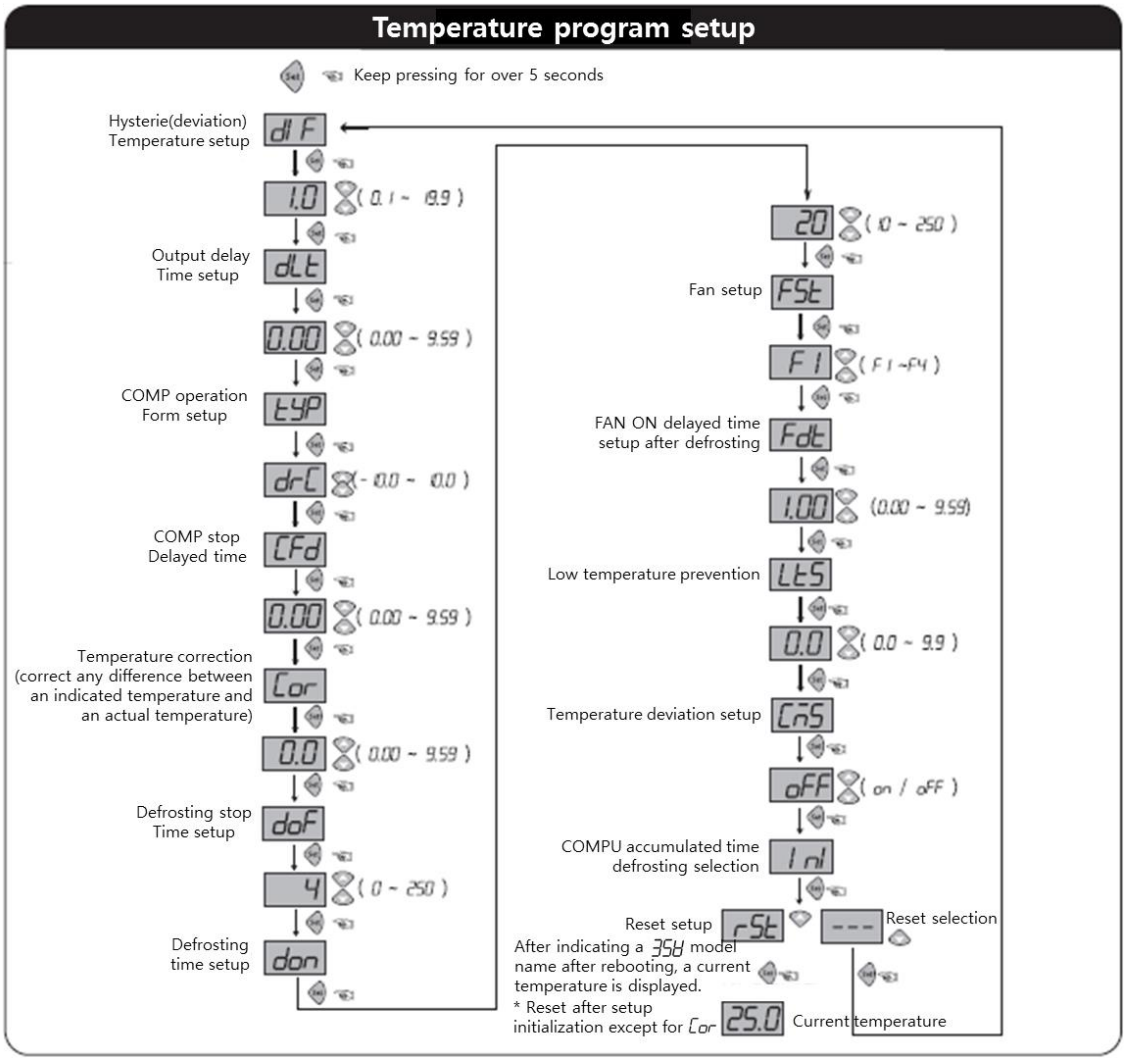
■ **Example of relay connection**

※ The relay connection capacity is less than 250VAC 2A. In case of using a load exceeding the capacity of a contact point, it can cause contact point deposition, poor contact, or relay breakage.



5. Order of set value change





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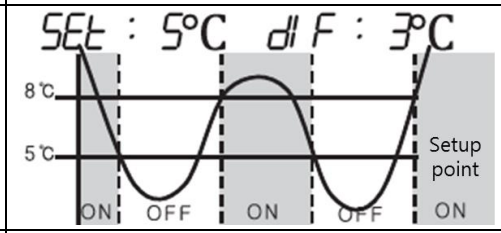
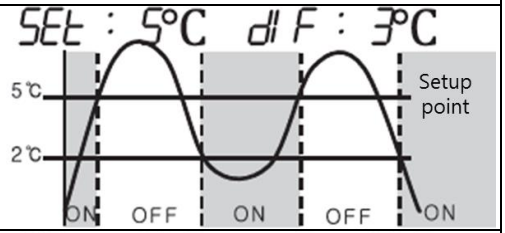
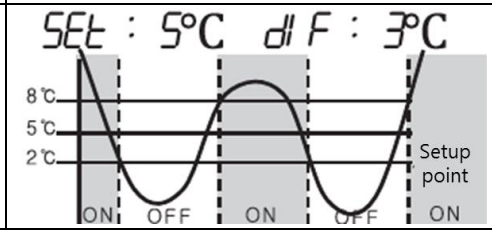
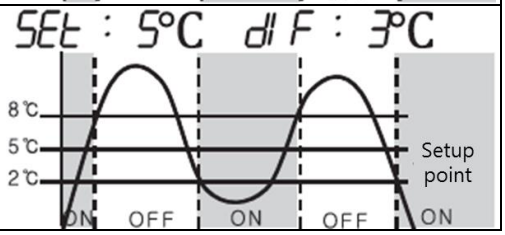
6. Detailed explanation of functions

dIF: Deviation temperature setup

For ON/OFF control, a certain gap between ON and OFF is required (ON/OFF gap setup)

If ON and OFF operates too often, a relay or other output contact point may be damaged quickly or hunting (power generation, chattering) may occur by outside noise.

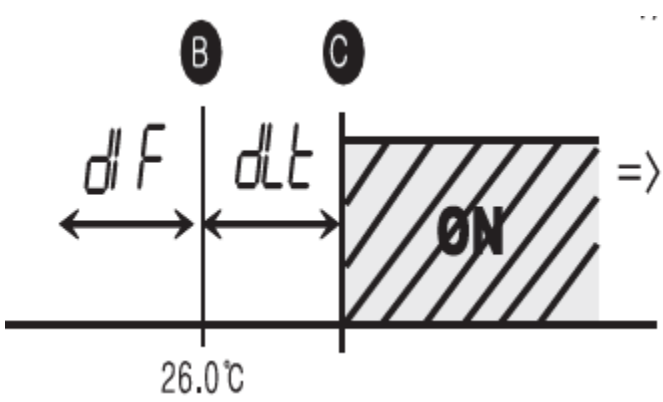
To prevent these phenomena, deviation temperature setup for use functions to protect a contact point of a device or others.

Setup/cancellation	tYP: CoL (Cooling operation)	tYP: HEt (Heating operation)
dIS:P Plus deviation direction setup		
dIS:Pn Bilateral deviation direction setup		

dLt: Delayed time for output operation

Use when a problem occurs by frequent repetition of ON/OFF operations of a target to control (including a cooler and a compressor)

Protects machine in operation during momentary power outage or power resupply

	Ex) When will the output be ON when set temperature is 25.0℃, dLt set value is 1.30, and dIF set value is 1.0℃? The current temperature increases, and when it exceeds 26.0℃ at B position, the relay is on at C position after 1 minute and 30 seconds, a set time of dLt. The reason why the output delayed time is applied not from A position but from B position is because dIF hysteresis (deviation) gap is set as 1.0℃.

tyP: COMP operation form setup

drC: Electronic valve COMP simultaneous operation according to temperature

PnD: An electronic valve is OFF according to temperature and COMP is OFF after COMP stop delayed time.

CFd: COMP OFF delayed time

COM is OFF after an electronic valve is OFF and after a set time

Ex: CFd : when it is 10 seconds

Cor: current temperature correction

Despite no problem of a product, it corrects an error occurring with a sensor entered outside as well as a temperature when the temperature is different from a standard temperature (ex, a mercury thermometer or currently used thermometer and thermostat)

Ex: Actual temperature: 25.0℃

Display screen: 28.0℃

When there is more than 3℃ difference from actual temperature

If CorF is corrected from 0.0 -> -3.0, it is displayed as 25.0℃ on the screen.

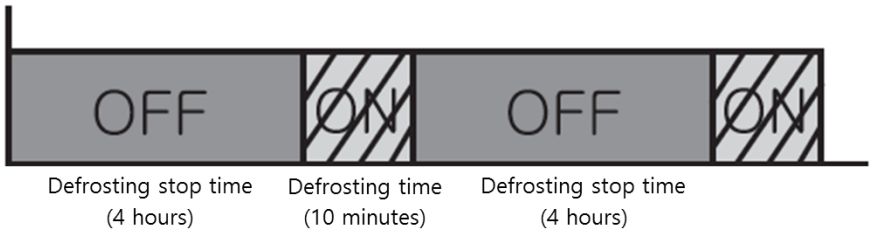
doF: defrosting stop time

If the setup range is 0~250 hours of defrosting cycle, it begins defrosting.

* Defrosting is stopped when it is set as 0.

don: defrosting time

If the setup range is 0~250 hours of defrosting cycle, it begins defrosting.



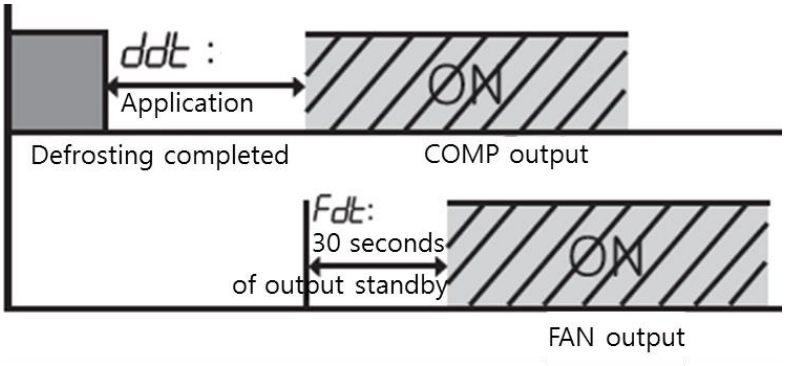
Defrosting operation is repeated for 10 minutes every 4 hours.

* Defrosting is stopped when it is set as 0.

Fdt: FAN On delayed time after defrosting

Setup range 0.00~9.59 (minute, second)

Ex) Fdt: 0.30 (30 seconds)



LtS: Temperature for low temperature prevention

If LtS setup temperature is 0, a low temperature prevention function is OFF.

If the current temperature is below (set value – LtS), FAN is ON

(During the operation of LtS function, defrosting and FAN are output immediately regardless of the setup of fan below)

FSt: See to a table for the program setup of FAN setup (F1~F4)

※ Table

		COMP ON	COMP OFF	Defrosting
FAN operation	F1	ON	OFF	OFF
	F2	ON	ON	ON
	F3	ON	OFF	ON
	F4	ON	ON	OFF

Manual defrosting setup method

1. Manual defrosting ON: If pressing a key for more than 3 seconds, K2 LED is lit and manual defrosting begins. On the display screen, ¯on and remaining defrosting time are displayed alternatively.

2. Manual defrosting OFF: If pressing a key again for more than 3 seconds while manual defrosting is ON, it is IFF. Or it is completed automatically after don time

CnS: COMP accumulated time defrosting selection on: Defrosting by accumulated COMP

oFF: cycle defrosting

* If COMP accumulated time is over doF (defrosting time) set time, defrosting begins.

Inl: If pressing Set key on Inl reset setup mode and pressing Set after selecting rSt with a key, it is initialized. Then, a product model name is displayed and a current temperature is displayed afterwards.

Caution: since all set values except for Cor are initialized, use after double-check.

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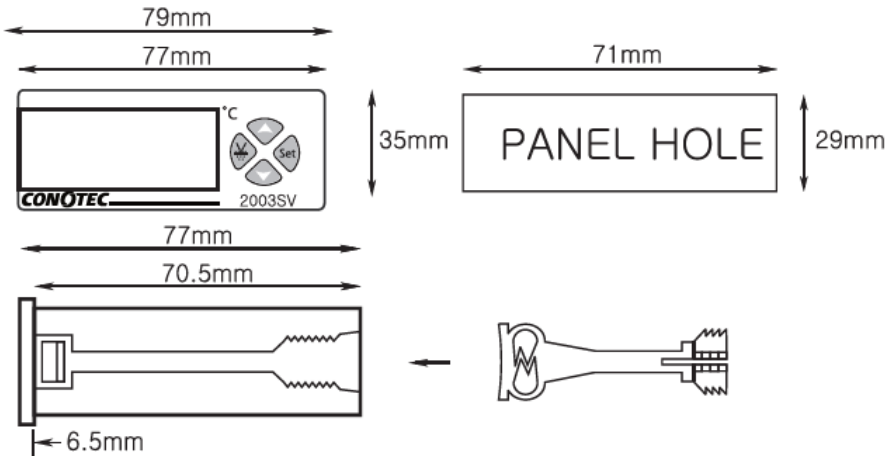
7. Setup range and set values during delivery

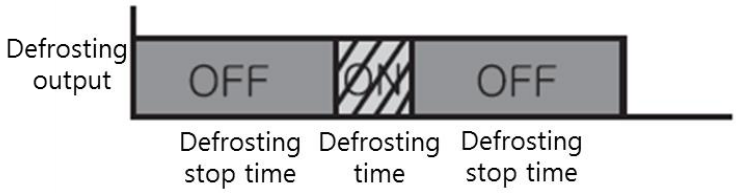
Display	Function	Scope	Set value during delivery	Remarks
	Temperature setup	-55.0 ~ 99.9	10.0	
dIF	Deviation temperature setup	0.1 ~ 19.9	1.0	Hysterie (deviation) temperature setup
dLt	Output operation delayed time setup	0.00 ~ 9.59	0.00	Minute, second
tYP	Operation method setup	drC / Pnd	drC	
CFd	COMP OFF delayed time	0.00 ~ 19.59	0.00	Minute, second
Cor	Temperature correction	- 10.0 ~ 10.0	0.0	Difference correction between displayed temperature and actual temperature
doF	Defrosting stop time	0 ~ 250	4	Time
don	Defrosting time	0 ~ 250	20	Minute
FSt	FAN setup	F1 ~ F4	F1	See to the table
Fdt	FAN ON delayed time setup after defrosting	0.00 ~ 9.59	1.00	Minute, second
LtS	Temperature for low temperature prevention	0.0 ~ 9.9	0.0	
CnS	COMP operation accumulated defrosting start setup time	on / oFF	oFF	
Ini	RESET	--- / rSt		Maintenance of setup/Reset after initialization

8. Product exterior size and panel processed measurement



■ Example of thermostat use

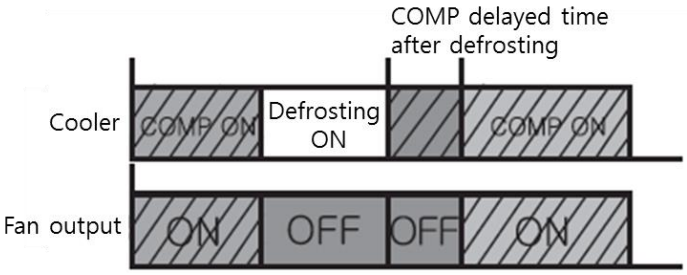
What is a set value when a cooler is off at 0.0℃, is re-operated at 5.0℃, and defrosting output begins for 10 minutes every 4 hours, a fan is ON during COMP output, and COMP is OFF and a fan is off during defrosting?



<Defrosting setup>

dоF : F04 (defrosting stop time: 4 hours)

dI F : n 10 (defrosting time: 10 minutes)



<Fan setup>

FSt : F I

COMP ON: Fan output on

COMPU OFF/during defrosting; fan output off

9. Simple tips to discover any error

When ERROR is displayed during the use of the product

- In case of Er1, a memory element of various types of data inside is damaged by receiving a strong noise from outside during the use of the product.

  In this case, ask our company for warranty service

  This controller has a solution for outside noise. However, it does not mean it can stand unlimited noises.

  If noise (2KV) abnormality is introduced, the inside may be damaged.

- When o-E (open error) or S-E (short error) is displayed, a sensor has a problem. Check the sensor.

※ The above product specifications may be subject to change without prior notice for improvement of performance. Understand fully the contents of cautions during the handling of the product and be sure to observe them.

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

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- Digital timer, current/voltage meta
- Other product development