Version 0.93(2014.07.17)

ISO 9001:2008

CONOTEC® Digital Temperature Controller

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

Instruction Manual NF-7XDT Series

- ◆High temperature sensor / Low temperature sensor
- ◆Differential-temperature output
- ◆Alarm output

※ The purpose of this manual is to provide detail information to prevent damage cause by negligence. Please keep this manual properly for future reference.
Regarding the English – language manual, please download it at our homepage.

1 Safety Precautions

Please read the instruction manual carefully for correct use.

※ The specification and dimensions provided in the instruction manual is subject to change without notice for product performance.

⚠ Warning

1. The product is not manufactured as a safety device; therefore, dual safety devices are required if the product is used as controlling devices or cases with concern of casualties or serious damage to the peripheral and significant property damage.
2. Do not perform wiring, inspection, and maintenance while power connected.
3. Terminal numbers must be checked when connecting power.
4. The equipment must not be disassembled, processed, improved, or repaired.

⚠ Caution

1. Please understand how to use, safety regulations, or warnings before the equipment is installed. The equipment must be used within the provisions and capacity provided in the manual.
2. Do not perform wiring and installation in motors with large inductive load and solenoid.
3. Use the same line when extending sensors and do not use excessive length.
4. Do not use parts that create an arc when switching nearby or the same power.
5. The power line should be away from high-tension power cables and avoid installation in areas with high moisture, oil, and dust.
6. Avoid installation in direct sunlight and areas exposed to rain.
7. Avoid installation in areas with high magnetic, noise, vibration, and impact.
8. The equipment should be installed sufficiently distant from strong alkali and strong acid substances.
9. When the equipment is installed in the kitchen, do not spray water directly onto the equipment for cleaning.
10. Do not install in places with high temperature/humidity that exceed the rate.
11. Care should be provided not to disconnect sensor cables or cause damage.
12. Sensor cables require significant distance from signal line, power, motive power, and load line and use independent pipes.
13. No warranty service shall be provided if the product has been altered or tampered with.
14. The mark on the wiring terminals is safety statement, such as warning or caution.
15. Do not use the product near machines that generate strong high-frequency noise (high frequency welding machine, high-frequency sewing machine, high-frequency radios, large SCR controller).
16. The product may cause injury or property damage if used for purposes not intended by the manufacturer.
17. Do not leave the product within reach of children as the equipment is not a toy.
18. Installation must be performed by professionals or qualified individual.
19. The company shall not be held responsible for any damage caused by negligence of consumers or due to non-conforming of the warnings or caution statements aforementioned.

⚠ Danger

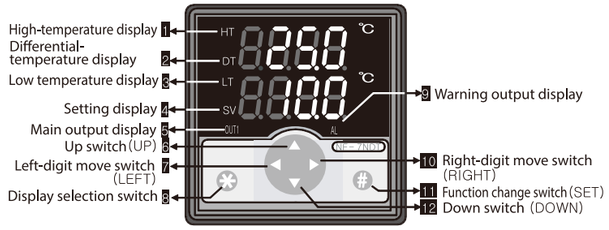
■ Caution, risk of electric shock

1. Electric shock– Do not contact with AC terminal during current carrying. This may cause electric shock.
2. Input power must be blocked when checking input power.

2 Model Composition

Model	Main Output	Input	Range	Power	Size	Function
NF-7PDT	Relay	PT100Ω	-199.9℃ ~ 400.0℃	100~240 VAC 50/60Hz	72(W) * 72(H)	Auxiliary Output Relay
NF-7CDT	Relay	CA(K)	-50.0℃ ~ 999.9℃			
NF-7NDT	Relay	NTC 1KΩ	-20.0℃ ~ 250.0 ℃			

3 Name of Part



◆ User mode change (Temperature settings)

- Change of setting temperature of the main output
  Pressing the # key once displays SET in the left FND and the setting value blinks/displays in the below FND.

▲ or ▼ the set value by these keys, or move the set value to left/right by ◀ or ▶ key.

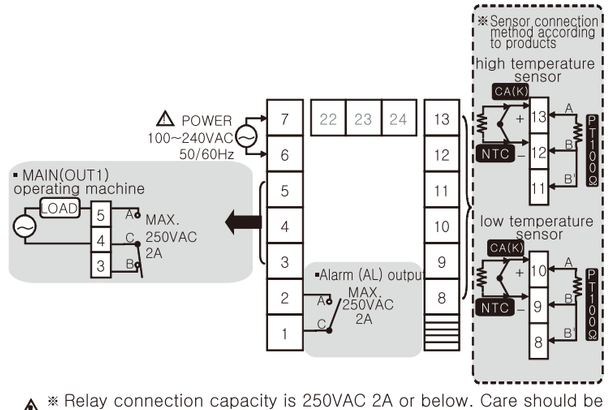
◆ Display selection

Pressing the ✱ key turns on No. 1 (HT) and No. 3 (LT) and displays high temperature and low temperature, or turns on No. 2 (DT) and No. 4 (SV) and displays differential temperature and set value.

◆ Installer Model Function Settings

Pressing the # key for 5 Sec. or more will display the menu name in the FND at the top and set value at the bottom FND.
Up/down the set value by ▲ and ▼ key, or move the set value to left/right by ◀ or ▶ key.

4 Terminal Wiring



⚠ ※ Relay connection capacity is 250VAC 2A or below. Care should be provided as the use of load that exceeds the capacity of the contact point may cause contact deposition, connection defect, and relay damage.

◆ Cold junction balancing circuit (CA sensor applied products)

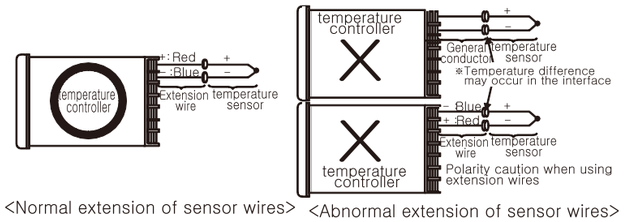
An error occurs in thermoelectric power, in proportion to the ambient temperature, in the metals of input terminal and thermocouple sensor wires when the thermocouple sensor is contacted with the input terminal of temperature controller.

A contact balancing circuit is embedded to prevent the error.

◆ Extension wire (CA sensor applied products)

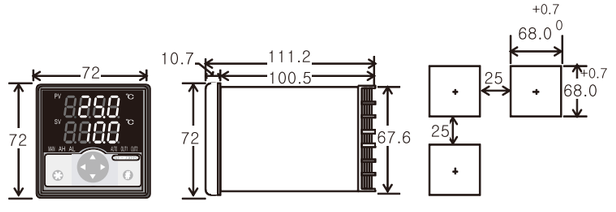
The extension wire is for extending the sensor line when the distance between the temperature controller and thermocouple sensors become longer.
When the distance between the thermocouple and temperature controller becomes longer, the contact point of the thermocouple and regular wiring become a thermocouple sensor when extended with regular wiring, thereby creating error.
To prevent the error, lines must be extended with metal wires similar as thermocouple metal wires
Extension wires have the red wire that refers to + polarity and blue (or white) that refers to - polarity.

Care should be provided when using extension wires not to connect opposite of + and - polarity to prevent error.



<Normal extension of sensor wires> <Abnormal extension of sensor wires>

5 External specification and panel processing dimension (Unit: mm)

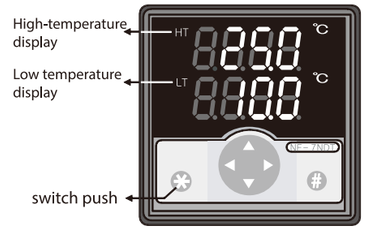


6 Setting Range and Factory Set Value

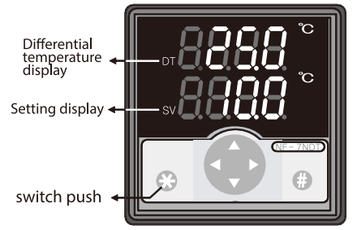
Set Menu	Set Range			Factory Set Value		
	NF-7PDT	NF-7CDT	NF-7NDT	NF-7PDT	NF-7CDT	NF-7NDT
SEt	0.1~400.0	0.1~999.9	0.1~200.0	30.0	30.0	30.0
TYP	C/h	C/h	C/h	C	C	C
dlt	00min 00sec ~ 19min 59sec			00min 00 sec		
dif	0.1~50.0	0.1~50.0	0.1~50.0	1.0	1.0	1.0
Co1	-30.0 ~30.0	-50.0 ~50.0	-10.0 ~10.0	0.0	0.0	0.0
Co2	-30.0 ~30.0	-50.0 ~50.0	-10.0 ~10.0	0.0	0.0	0.0
ARS	D/ L/ HL/ H			D		
HPR	-199.9 ~400.0	-50.0 ~999.9	-20.0 ~200.0	400.0	999.9	200.0
LPR	-199.9 ~400.0	-50.0 ~999.9	-20.0 ~200.0	-199.9	-50.0	-20.0
ADF	0.1~50.0	0.1~50.0	0.1~50.0	1.0	1.0	1.0
DPR	0.1~400.0	0.1~999.9	0.1~200.0	30.0	30.0	30.0

7 How to Display

◆ High temperature / low temperature display



◆ Differential temperature / Setting display

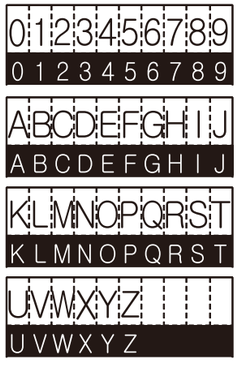


Pressing the # switch for 2 seconds or longer while setting shows display characters while storing set value

and shows the current temperature.

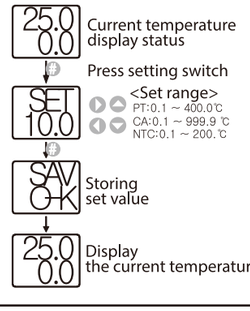
- ✱ How to choose display
- # Enter the set menu
- ▲ Increase set value
- ▼ Decrease set value
- ◀ Move setting digit to left
- ▶ Move setting digit to right

< Display (FND) Character Table >



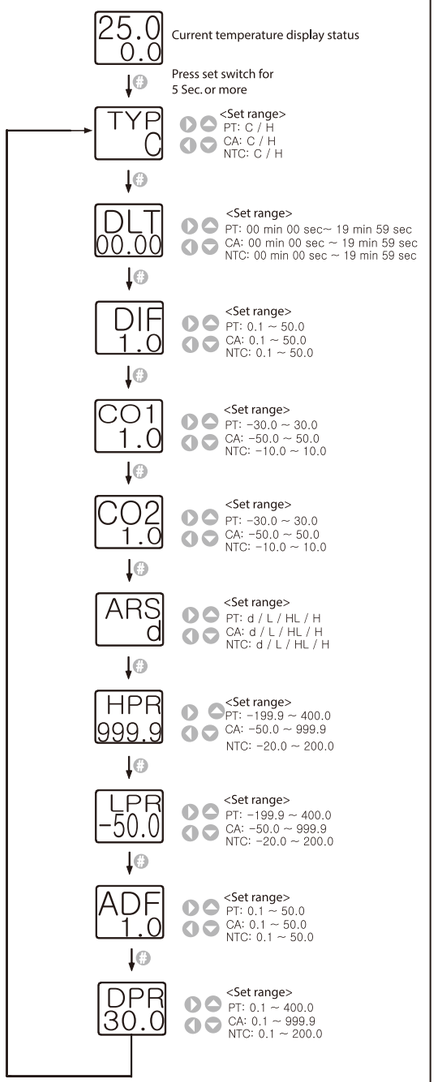
8 Change of set value

Main output setting temperature



9 Program settings

Main output setting temperature

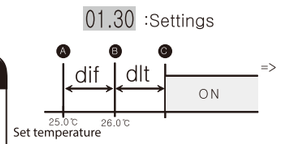


10 Change of set value

typ : MAIN(OUT1) integral domain settings (the cooling and heating selection function)

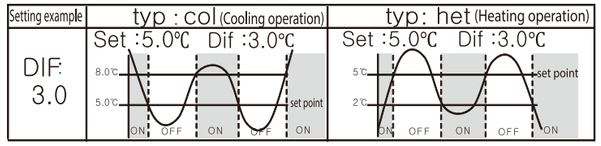
If C is selected: Use as a cooler
If H is selected: Use as a heater

dlt : Output motion delay time
If the control object repeats ON/OFF operation and cause problems, the function protects the machine (cooler and compressor) from momentary power outage or power re-input .



e.g.) Set Temperature: 25.0℃, dlt Set Value: 01.30, dif Set Value: When is the output turns On if temperature is 1.0℃?
=> The relay is On at the C point after 1 minute and 30 seconds, the dlt set time when the current temperature exceeds 26.0℃, the B point. Output delay time is applied from B, instead of point A because dif hysteresis (variation) interval is set at 1.0℃.

dif : A certain interval is required between ON and OFF in the hysteresis (variation) temperature interval setting On/Off control. (ON/OFF interval settings)
If ON and OFF repeats too often the output point or relay will be damaged quickly or occurs hunting (oscillation or chattering) due to external noise. Setting the hysteresis (variation) temperature interval may prevent damage caused by contact or other machine malfunction aforementioned.



co1 : Current temperature calibration (high-temperature sensor)
The function to adjust temperature if the temperature displayed on the panel of the equipment and actual temperature is different while there is no problem in the product.
(Compare with water temperature thermometer or the thermometer in use)

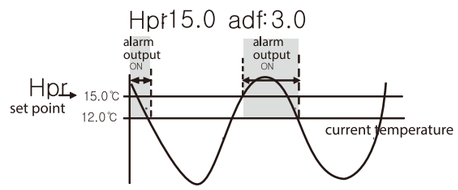
e.g.) Actual Temperature: 25.0℃ / Display panel: 28.0℃: If the temperature difference is 3℃ compared with the actual temperature
Correct CO1 -3.0 -> -3.0; the display panel will show 25.0℃

co2 : Current temperature calibration (low-temperature sensor)
The function to adjust temperature if the temperature displayed on the panel of the equipment and actual temperature is different while there is no problem in the product.
(Compare with water temperature thermometer or the thermometer in use)

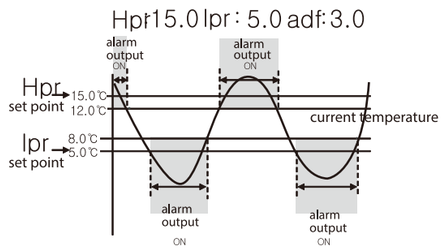
e.g.) Actual Temperature: 25.0℃ / Display panel: 28.0℃: If the temperature difference is 3℃ compared with the actual temperature
Correct CO2 -3.0 -> -3.0; the display panel will show 25.0℃

ARS : Alarm output selection

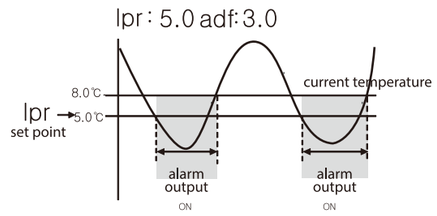
H : It operates when the high, low temperature is HPR set value or more



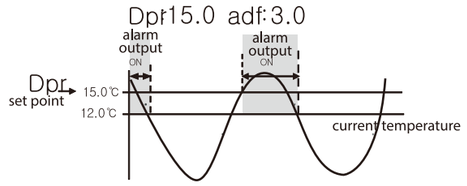
HL : The function operates if the high and low temperature is more than HPR set value or below LPR set value.



L : The function operates when the high, low temperature is lower than LPR set value.



D : The function operates when the differential temperature is more than DPR set value.



HPR : Upper-limit alarm temperature settings
The function sets temperature that operates when the temperature of the target, during controlling, increases more than HPR.

LPR : Lower-limit alarm temperature settings
The function sets temperature that operates when the temperature of the target, during controlling, decreases more than LPR.

a.df : Hysteresis (variation) temperature interval settings of alarm output ON/OFF interval is set in order to prevent repeated ON/OFF alarm output.

DPR : Differential temperature alarm settings
The function sets temperature that operates when the temperature of the target, during controlling, increases more than DPR.

11 Simple Troubleshooting

■ Error display while using the product

- Erj : Excessive noise is applied to the product and damaged the internal memory elements of data.
- Please contact the company for customer service.
- The controller has supplementary measures for noise but it cannot handle noise infinitely.
- Noise of more than 2KV may damage the product internally.
- Display of O-E (Open Error) or S-E (Short Error) means errors in the sensor. Please check the sensor.

※ The specification of the product is subject to change without prior notice for product improvement.
Please be familiar with precautions necessary for handling the product.

※ Please download the English manual on our webpage.

■ 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 Production Products and Development
- Digital temperature/humidity controller
- Digital timer, current/voltage meta
- Other product development

MEMO