

# CONOTEC

CONOTEC CO., LTD.  
DIGITAL TEMPERATURE CONTROLLER



EZIN-33S

## Instruction Manual



Control 4 outputs  
(Compressor, Defrost, Fan, Valve)  
4 inputs for protection & alarm  
RS-485 Modbus (DP, HTC, LTC, OCR)  
Intuitive design for user convenience  
3-color LED by temperature

- 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

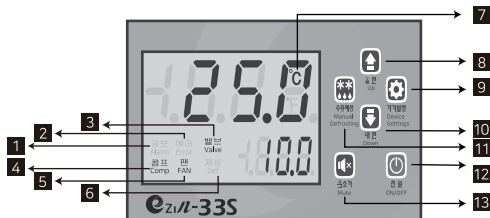
Caution: Risk of electric shock

- 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	Control Output	Input		Temp Range
EZIN-33S (3Ø, 3HP)  EZIN-35S (3Ø, 5HP)	380VAC Output (3EA) / Compressor: Magnetic Relay Defrost: Magnetic Relay / Fan: Magnetic Relay 220VAC Output (1EA) / Solenoid Valve: 2A	Sensor	External	-55.0°C~99.9°C
		NTC 10KΩ	DP, HTC, LTC	
		Output		
		Comp, Fan, defrosting, Solenoid Valve		

## 03 Components



- 1 Alarm 2 Error indication (inspection request) 3 Electromagnetic valve output  
4 Comp output 5 Fan output 6 Defrosting output 7 Display temperature units  
8 Ollimki 9 Device Settings Key 10 Down key 11 Manual defrosting key  
12 Power key 13 Mute key

### ■ Functionality of Operation Key

- **Change the setting temperature of the main output**

On the Temperature Output screen, press key to change the instrument's setting temperature.

Press key briefly on the temperature output screen to enter the set temperature on the screen

Press key to change the instrument's setting temperature.

- **Changing Device Details**

Change the corresponding setting for each mode and press key to move on the next mode change.

Press the key for more than 5 seconds to enter the device's detailed setting mode, and press key to change it.

- **Instrument operation ON/OFF**

Press key for more than 3 seconds to turn the instrument on/off.

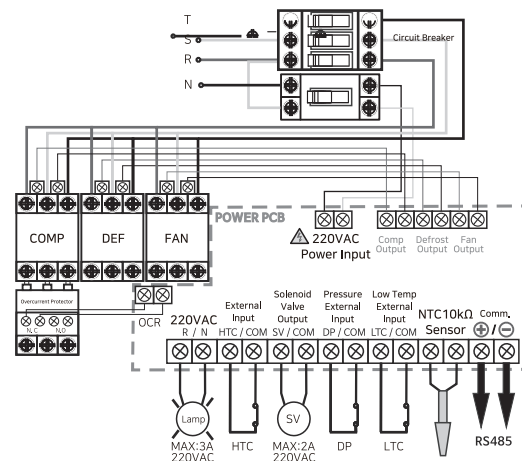
- **Manual defrosting method**

Press key for more than 3 seconds to turn on/off the manual defrosting function.

- **Mute Method**

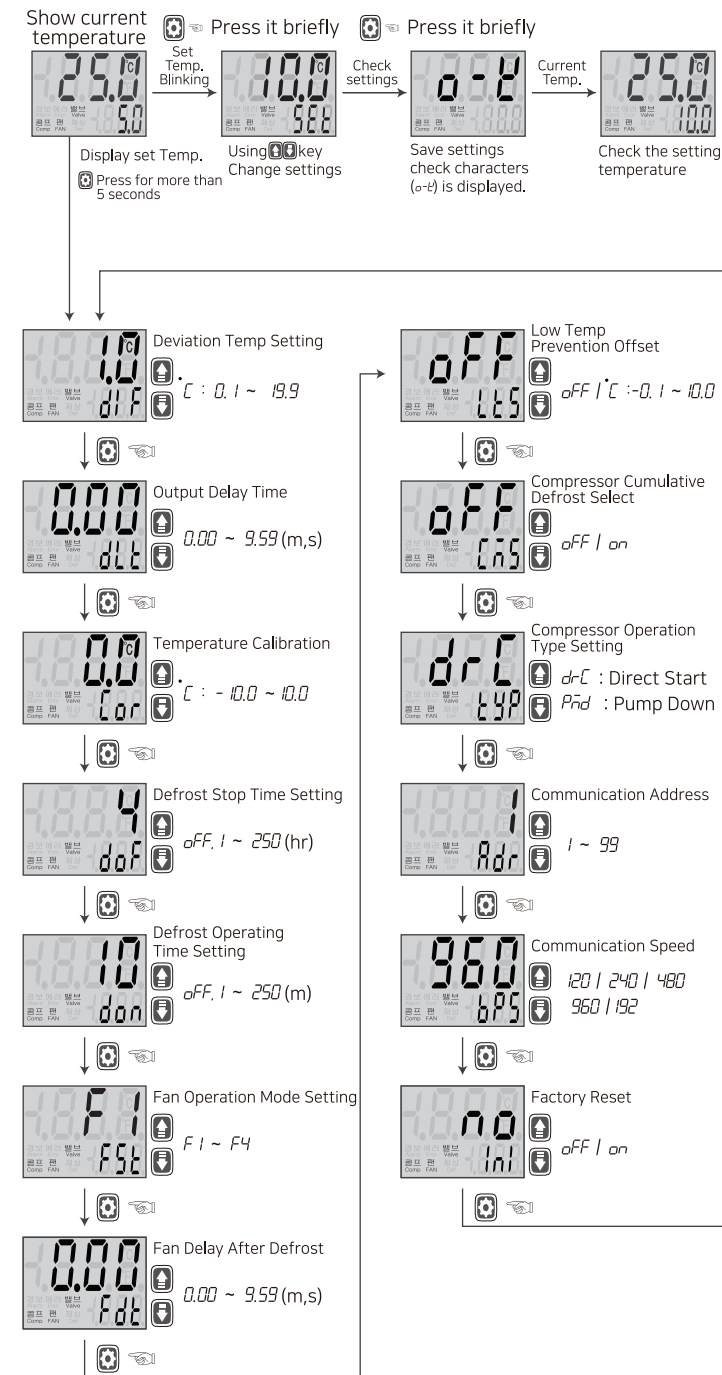
When an alarm is raised, a buzzer is heard with an alarm and key is pressed for two seconds. The buzzer turns on/off.

## 04 Terminal wiring diagram



## 05 Setting process

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



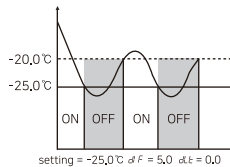
## 06 Function details

### [Color display according to temperature]

- Current temp  $\geq$  (set temp + deviation temp)  
→Current temp output in RED color
- Current temp <(set temp + deviation temp),  
Current temp  $\geq$  set temp  
→Current temp output in GREEN color
- Current temp < set temp  
→Current temp output in YELLOW color

### [How to apply deviation in ON/OFF control]

- Current temp  $\geq$  (set temp + deviation temp)  
→solenoid valve, compress output ON
- Current temp <Set temp  
→solenoid valve, compress output off

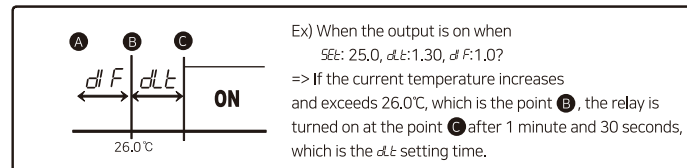


**dF** : Setting fot temperature deviation

- In the ON/OFF control, it needs at regular interval between ON and OFF.
- By operating the ON/OFF control frequently, the realy 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 realy or contact and so on.

**dL** : Output Delay Time

- It is widely used as the followings in case of operating the ON/OFF control very often, (Cooler, Compressor and so on)
- To protect the operation machinery when re-input of the power supply or momentary stoppage of power supply.



**Cor** : Current temperature calibration function

- While there is no problem in the product, a function to calibrate when temperature is different error and reference standard that occur in the input sensor (e.g. Mercury thermometer or thermomete currently use, a temperature controller)

- Ex) Actual temperature : 10.0℃  
Display window : 12.0℃ → **Cor** Modification of 0.0 to -2.0  
→ Displayed as 10.0 (corrected current temperature)

**doF** : Defrost stop time setting

- Defrosting proceeds if the time has elapsed for the set time.

**don** : Defrosting Operation Time Setting

- When the defrosting cycle comes, defrost it.

Defrosting Stop	Defrosting Output	Defrosting Stop	Defrosting Output
doF (4hr)	don (10m)	doF (4hr)	don (10m)
- Repeat defrosting for 10 minutes every 4 hours. △ Caution: doF and don, Defrost operation prohibited when all are set to oFF			

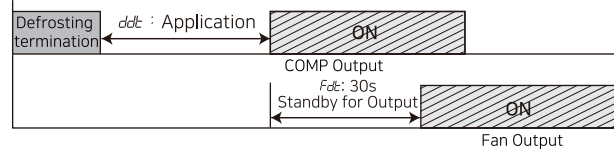
**FSt** : Fan Action Settings (F1 ~ F4)

		When Comp ON	When Comp OFF	When defrosting is ON
Fan Settings	F1	Fan ON	Fan OFF	
	F2	Fan ON		
	F3	Fan ON	Fan OFF	Fan ON
	F4	Fan ON		Fan OFF

**FdL** : Set fan output delay time after defrosting

- Set range 0.00~9.59 (m,s)

EX) FdL: 0.30 (30s)





**Lt5** : Set low temperature deviation temperature deviation (oFF, 0.1 ~ 10.0 °C)  
- Current Temperature ≤ (Set Temperature - Lt5)  
→ Defrosting, fan ON  
(Defrosting and fan output immediately in Lt5 operation regardless of fan setting chart)

**Lr5** : COMP cumulative start defrost selection  
oFF : Periodic defrost  
oN : Defrost based on COMP cumulative time  
✳ If COMP cumulative time exceeds doF (defrost stop time), defrost starts

**LtP** : operation mode setting (Direct Start / Pump Down)  
- dP Select COMP operation mode based on input signal  
d-r-C : Direct Start  
COMP operates simultaneously with solenoid valve based on temperature  
When dP abnormal signal occurs, COMP turns OFF and dP is displayed  
P-r-d : Pump Down  
COMP operates simultaneously with solenoid valve based on temperature  
When dP abnormal signal occurs, COMP turns OFF and dP is displayed

**Rd-r** : Set communication dialing code  
- When using RS485 communication, you must specify the country number from 1 to 99.

**bPS** : Set communication speed  
- 1200BPS / 2400BPS / 4800BPS / 9600BPS / 19200BPS

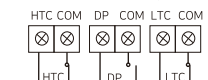
**Unit** : Temp display unit  
C : Displayed in Celsius  
F : Displayed in Fahrenheit

✳ Caution : If you change the unit during operation, all settings except Unit and the Communication menu will change to the factory settings, so reset all settings.

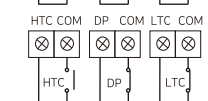
**Init** : Initialize settings  
- Select Lt5 and press  to reset the settings and start again

#### How to set external inputs

When dP, HtC, LtC are installed externally, they are installed in situations where there is no abnormal signal from the installed device.  
✳ Contact Only 'Normal Close'

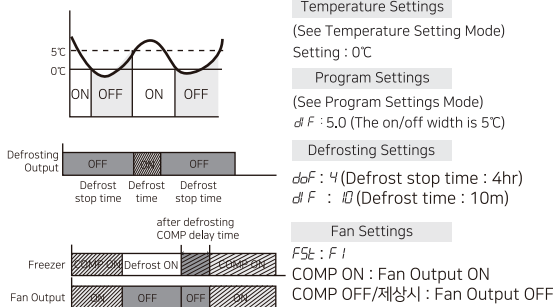
 HTC COM DP COM LTC COM  
HTC DP LTC  
If the contact point is broken due to an abnormality in the dP, it is judged as an abnormality signal and stops the operation of the compress and displays the dP on the screen (In case of pump down, SV is turned on and a large climate alarm is displayed for 5 minutes)

 HTC COM DP COM LTC COM  
HTC DP LTC  
If the contact point is broken due to an abnormality in the LtC, it is judged as an abnormality signal and stops all operation of the device and displays LtC and alarm on the screen

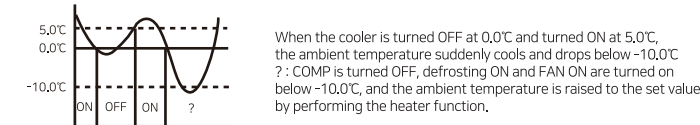
 HTC COM DP COM LTC COM  
HTC DP LTC  
If the contact is broken due to an abnormality in the HtC, stop the heater output during defrosting operation or Lt5 operation and flicker the defrost heater display on the screen

#### Example of using a thermostat

The cooler is turned off at 0°C and restarted at 5°C, and defrosting power is produced every 4 hours for 10 minutes, Fan is turned on when the COMP is output, What are the set values when COMP OFF and defrosted OFF?



#### Example of using subcooled compensation (EX:When the value of Lt5 is set to 10.0°C)



## 07 Communication Specifications

- \* It has built-in RS485 MODBUS RTU protocol.
- \* Asynchronous two-wire half-duplex communication system
- \* Communication distance: Within 1.2km
- \* Communication Speed: 1200/2400/4800/9600/19200BPS
- \* Start bits: 1 bit, Stop bits: 1 bit, Parity bits: None, Data bits: 8 bits

### [Func 0x02 : Read Discrete Input]

- You can receive sensor status and simple information in bit form.

[ Request ]

Address	Command	Starting address		Number of data		CRC16	
		Upper Byte	Lower Byte	Upper Byte	Lower Byte	Lower Byte	Upper Byte
1BYTE	0x02	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

[ Response ]

Address	Command	Number of data	Data	CRC16	
				Upper Byte	Lower Byte
1BYTE	0x02	Nx1BYTE	1BYTE	1BYTE	1BYTE

[MAP N=If the number of data is 8 or less, it is more than 1, 8, if it is 16 or less, it is 2 or more ]

NO	Address	Description	Range	Unit	Shipping value
10001	0000	System operation	bit0	0:ON, 1:OFF	
10002	0001	Comp output	bit1	0:OFF, 1:ON	
10003	0002	Fan output	bit2	0:OFF, 1:ON	
10004	0003	Defrosting output	bit3	0:OFF, 1:ON	
10005	0004	Solenoid Valve Output	bit4	0:OFF, 1:ON	
10006	0005	Output operation delay	bit5	0:OFF, 1:ON	
10007	0006	Fan Delay After Defrost	bit6	0:OFF, 1:ON	
10008	0007	Temperature Sensor Open Error	bit7	0:OFF, 1:ON	
10009	0008	Temperature Sensor Short Error	bit8	0:OFF, 1:ON	
10010	0009	dP Connection Error	bit9	0:OFF, 1:ON	
10011	000A	HtC Connection Error	bit10	0:OFF, 1:ON	
10012	000B	LtC Connection Error	bit11	0:OFF, 1:ON	
10013	000C	aC-r Connection Error	bit12	0:OFF, 1:ON	

### [Func 0x04 : Read Input Registers]

- You can receive simple information such as current temperature, temperature unit, and output status.

[ Request ]

Address	Command	Starting address		Number of data		CRC16	
		Upper Byte	Lower Byte	Upper Byte	Lower Byte	Lower Byte	Upper Byte
1BYTE	0x04	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

[ Response ]

Address	Command	Number of Byte	Data1		...	Daten		CRC16	
			Upper Byte	Lower Byte		Upper Byte	Lower Byte	Lower Byte	Upper Byte
1BYTE	0x04	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE	1BYTE	1BYTE

→ Total 12 data and 24 bytes received if data count = 12

[ MAP ]

NO	Address	Description	Range	Unit	Shipping value
30001	0000	Product Model Name	"EZ"		ASCII
30002	0001	Product Model Name	"IN"		ASCII
30003	0002	Product Model Name	"-2"		ASCII
30004	0003	Product Model Name	"3"		ASCII
30005	0004	Product Model Name	blank		
30006	0005	Product Model Name	blank		
30007	0006	Product Model Name	blank		
30008	0007	Product Model Name	blank		
30009	0008	Product Model Name	blank		
30010	0009	Product Model Name	blank		
30011	000A	Firmware version	the front decimal place		
30012	000B	Firmware version	the last decimal place		
30101	0064	Current Temp	Sensor Error: -9999	°C	
30102	0065	Temp Settings	-55.0 ~ 99.9		
30103	0066	System operation	bit0	0:ON, 1:OFF	
		Comp output	bit1	0:OFF, 1:ON	
		Fan output	bit2	0:OFF, 1:ON	
		Defrosting output	bit3	0:OFF, 1:ON	
		Electromagnetic valve output	bit4	0:OFF, 1:ON	
		Output operation delay	bit5	0:OFF, 1:ON	
30104	0067	Fan delay after defrosting	bit8	0:OFF, 1:ON	
		Temp sensor open error	bit0	0:No error, 1:Open error	
		Temp sensor short error	bit1	0:No error, 1:Short error	
		dP Contact Error	bit2	0:No error, 1:dP error	
		HtC Contact Error	bit3	0:No error, 1:HtC error	
		LtC Contact Error	bit4	0:No error, 1:LtC error	
		aC-r Contact Error	bit5	0:No error, 1:aC-r error	

[Func 0x03 : Read Holding Registers] - You can read the setting values.

[ Request ]

Address	Command	Starting address		Number of data		CRC16	
		Upper Byte	Lower Byte	Upper Byte	Lower Byte	Lower Byte	Upper Byte
1BYTE	0x03	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

[ Response ]

Address	Command	Number of Byte	Data1		...	Daten		CRC16	
			Upper Byte	Lower Byte		Upper Byte	Lower Byte	Lower Byte	Upper Byte
1BYTE	0x03	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE	1BYTE	1BYTE

→ If data count = 16, total 16 data, 32 bytes received

### [Func 0x06 : Write Single Register]

- You can change one setting value item at a time.

- If written normally, the contents of Request and Response are the same.

[ Request / Response ]

Address	Command	Write address		Data		CRC16	
		Upper Byte	Lower Byte	Upper Byte	Lower Byte	Lower Byte	Upper Byte
1BYTE	0x06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

### [Func 0x10 : Write Multiple Registers]

- You can change the setting value multiple items at once.

- When you write multiple registers, if there is an error in the data, it will not be written all over.

[ Request ]

Address	Command	Starting address		Number of data		Number of Byte	Data1		...	Daten		CRC16	
		Upper Byte	Lower Byte	Upper Byte	Lower Byte		Upper Byte	Lower Byte		Upper Byte	Lower Byte	Lower Byte	Upper Byte
1BYTE	0x10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE	1BYTE	1BYTE

[ Response ]

Address	Command	Starting address		Number of Byte		CRC16	
		Upper Byte	Lower Byte	Upper Byte	Lower Byte	Lower Byte	Upper Byte
1BYTE	0x10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

[ MAP ]

NO	Addr	Menu	Description	Range	Unit	Shipping value
40001	0000	SEt	Temp Settings	-55.0 ~ 99.9	°C	10.0
40002	0001	dF	Deviation temp setting	0.1 ~ 19.9	°C	0.0
40003	0002	dLt	Setting output delay time	0.00 ~ 99.9	m	0.00
40004	0003	s			s	
40005	0004	Co-r	Temp calibration settings	- 10.0 ~ 10.0	°C	0.0
40006	0005	doF	Defrost stop time setting	OFF, 1 ~ 250	hr	4
40007	0006	doN	Defrost operation time setting	OFF, 1 ~ 250	m	10
40008	0007	FSL	Setting the fan operation method	F1 ~ F4		F1
40009	0008	FdL	Setting fan latency after defrosting	0.00 ~ 99.9	m	0.00
40010	0009				s	
40011	000A	Lt5	Low-temp prevention temp deviation	oFF, 0.1 ~ 10.0	°C	oFF
40012	000B	Lr5	Accumulated Time Defrost	oFF / oN		oFF
40013	000C	LtP	Comp operation setting	d-r-C / P-r-d		d-r-C
40014	000D	Rd-r	Comm. station number	1 ~ 99		1
40015	000E	bPS	Comm. speed	120 / 240 / 480 / 960 / 192	bPS	960
40016	000F	i nI	Set value initialization	no / Lt5		no
40017	0010	-	Operation status	0: Operation / 1: Stop		

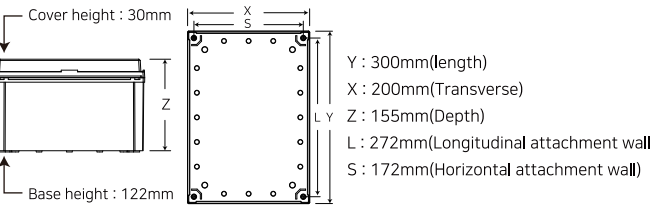
✳ Only Func 0x06 is available for operation state control through communication.

[ Exception Response ]

Returns error information when you send a command that is not supported by this product or when there are other errors.

Address	Command	Error Code	CRC16		0x01: Unsupported Commands 0x02: Starting address error 0x03: Data count error 0x04: Requested Commands abnormal treatment
			Lower Byte	Upper Byte	
1BYTE	incoming command+0x80	1BYTE	1BYTE	1BYTE	

## 08 Diemension and panel hole sizes



## 09 Easy error diagnosis instructions

✳ If an error is displayed while the product is running

- **E-r-I** : 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 **5-E** (short error) is displayed, there is something wrong with a sensor. Please check the sensor.

✳ The above specifications may be changed without any notice 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 should 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°C
- Ambient humidity : 80%RH or less
- Indoor uses only
- Pollution class 2
- Altitude under 2000m
- Installation category : II
- 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 fonts.