



CONOTEC CO., LTD.  
DIGITAL TEMPERATURE CONTROLLER



EZIN-23

Instruction Manual



Control four outputs  
(comp, defrost, fan, electromagnetic deflection)  
Product protection and alarms with 3 external inputs  
(DP, HTC, LTC)  
Temperature unit selectable  
(Seung/Fahrenheit)  
485 mode bus communication  
in a simple and intuitive structure  
Increase user convenience  
Three-color LED changes according to 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

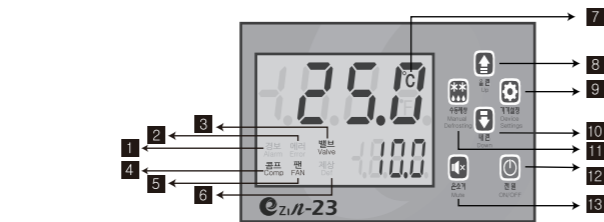
Caution: Risk of electric shock

- 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-23 (3HP Single phase)	220 VAC Output (4EA) Comp: 20A / Defrosting: 12A Fan: 5A / Solenoid Valve: 2A	sensor	-55.0°C~99.9°C -67°F~212°F
		external contact	
		Output Comp, Fan, Defrosting, Solenoid Valve	

### 03 Components

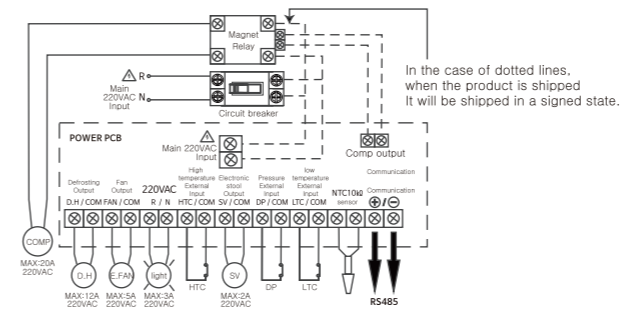


- 1 Alarm
- 2 Error indication (inspection request)
- 3 Electromagnetic valve output
- 4 Comp output
- 5 Fan output
- 6 Defrosting output
- 7 Display temperature units
- 8 Ollimki
- 9 Device Settings Key
- 10 Down key
- 11 Manual defrosting key
- 12 Power key
- 13 Mute key

#### ■ Functionality of Operation Key

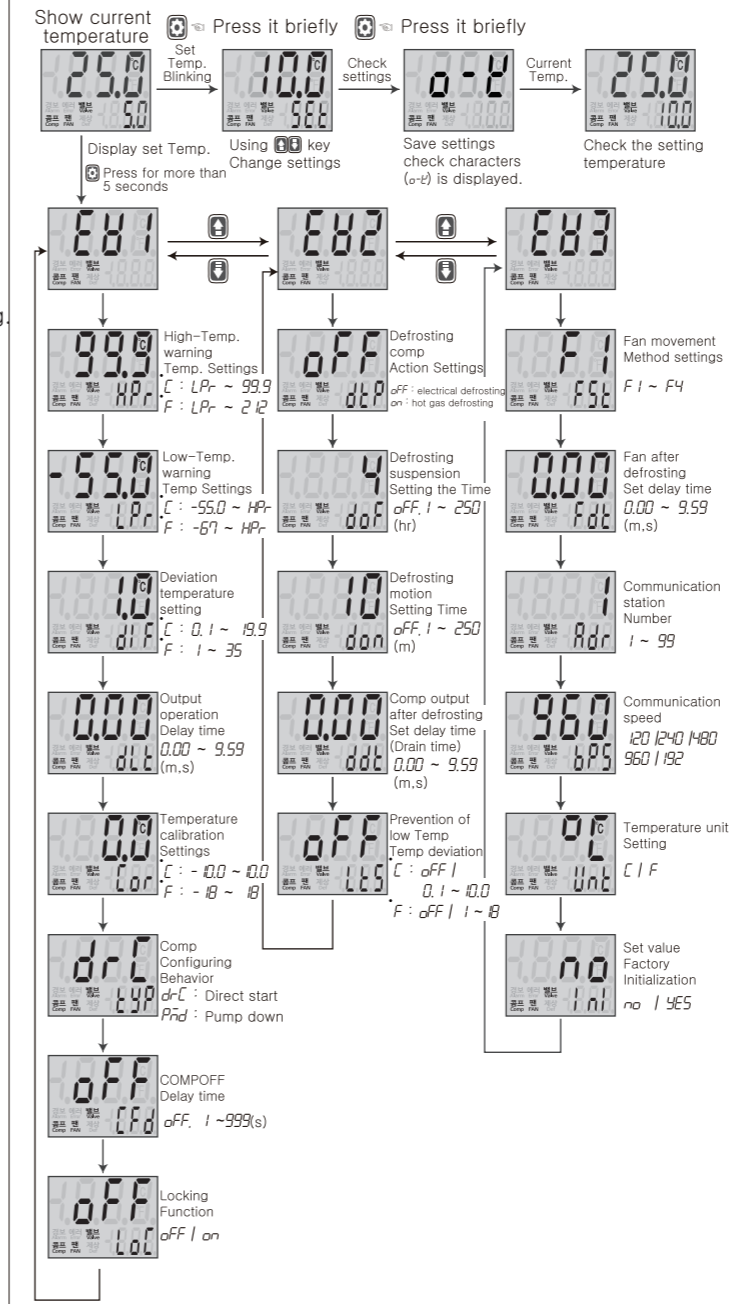
- Change the setting temperature of the main output  
On the Temperature Output screen, press **[Ollimki]** key to change the instrument's setting temperature.  
Press **[Ollimki]** key briefly on the temperature output screen to enter the set temperature on the screen  
Press **[Ollimki]** key to change the instrument's setting temperature.
- Changing Device Details  
Change the corresponding setting for each mode and press **[Ollimki]** 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 **[Ollimki]** key to change it.
- Instrument operation ON/OFF  
Press **[Ollimki]** key for more than 3 seconds to turn the instrument on/off.
- Manual defrosting method  
Press **[Mute]** 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 **[Mute]** 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.)



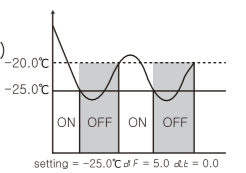
### 06 Function details

[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



**HP<sub>r</sub>** : High-Temp alarm temp setting (-LPr to 99.9°C),  
10 minutes after defrosting

**LP<sub>r</sub>** : Low-Temp alarm temp settings (-55.0 ~ HP<sub>r</sub>)

**dF** : Setting for temperature deviation

- In the ON/OFF control, it needs at regular interval between ON and OFF.

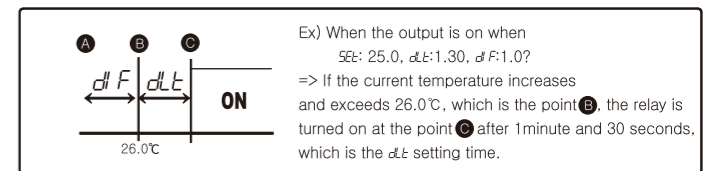
- By operating the ON/OFF control frequently, the relay or its output contact can be damaged quickly and it also occurs the hunting (oscillating, chattering) by virtue of external noise.

- You can make use of the temperature deviation in order to protect its relay or contact and so on.

**dL<sub>t</sub>** : 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°C → **Cor** Modification of 0.0 to -2.0  
Display window : 12.0°C → Displayed as 10.0 (corrected current temperature)

**LTP** : COMP operation type setting (direct start/pump down method)

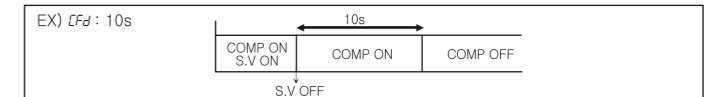
- Selection of COMP operation method by **dP** input signal

**drc** : Direct start - Depending on the temperature, turn off the comp in case of abnormal **dP** signal for simultaneous operation of the solenoid valve and indicate the **dP**

**Pd** : Pump down - Depending on the temperature, the solenoid valve is switched on/off, the compress is operated when the valve is turned on and the **dP** signal is input, and the **Sd** is turned on when the **dP** signal is abnormal and lasts for more than 5 minutes after detection of the abnormal signal for 5 minutes

**CFd** : COMP OFF delay time

- For comp protection and pump down  
After a certain period of time after the solenoid valve is turned off. Ability to turn OFF COMP (Does not delay when **OFF**)



**LoC** : The lock function of setting data.

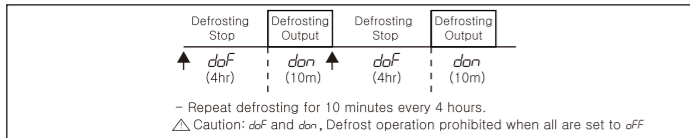
- A safety device that prevents the user from changing various setting values  
When **on**, the detailed setting value is not changed and the message output is **LoC**

**dLp** : Select COMP behavior during defrosting

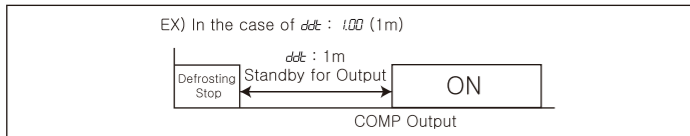
- OFF** : Electrical defrosting → COMP OFF defrosting
- on** : Hot gas defrosting → COMP ON defrosting

**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.



**ddt** : Set the COMP delay time after thawing (drain time)  
 - Set range 0.00 ~ 9.99 (m,s)  
 After defrosting is finished, all outputs are turned OFF for the set time, and the outputs are turned ON

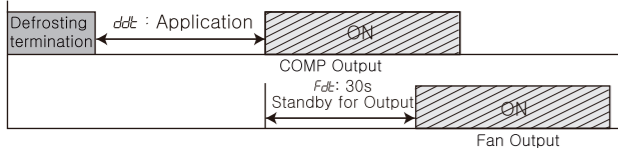


**LT5** : Set low temperature deviation temperature deviation (oFF, 0.1 ~ 10.0 °C)  
 - Current Temperature ≤ (Set Temperature - LT5)  
 → Defrosting, fan ON  
 (Defrosting and fan output immediately in LT5 operation regardless of fan setting chart)

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

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

**Fdt** : Set fan output delay time after defrosting  
 - Set range 0.00~9.99 (m,s)  
 EX) Fdt : 0.30 (30s)



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

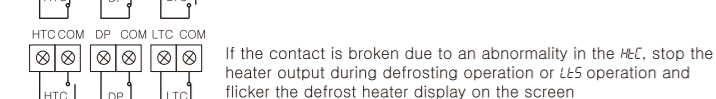
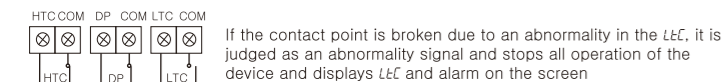
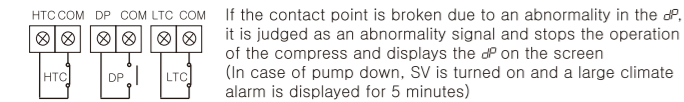
**bPS** : Set communication speed  
 - 1200BPS / 2400BPS / 4800BPS / 9600BPS / 19200BPS

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

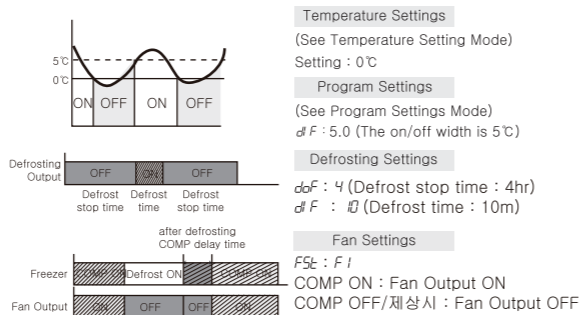
※ Caution : If you change the unit during operation, all settings except Unt and the Communication menu will change to the factory settings, so reset all settings.

**Ini** : Initialize settings  
 - Select 4E5 and press to reset the settings and start again

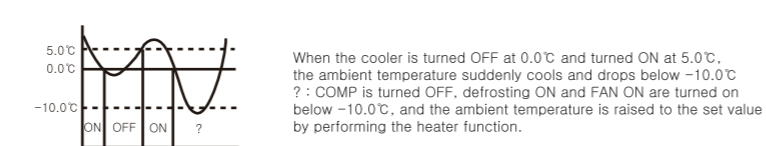
■ How to set external inputs  
 When oP, HcC, LtC are installed externally, they are installed in situations where there is no abnormal signal from the installed device.  
 ※ Contact Only 'Normal Close'



■ 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	N x 1BYTE	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, and if it is 16 or more, it is 3 ]

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	Electromagnetic valve output	bit4	0:OFF, 1:ON	
10006	0005	Output operation delay	bit5	0:OFF, 1:ON	
10007	0006	COMP OFF delay	bit6	0:OFF, 1:ON	
10008	0007	Comp output delay after defrosting	bit7	0:OFF, 1:ON	
10009	0008	Fan delay after defrosting	bit8	0:OFF, 1:ON	
10010	0009	Temp sensor open error	bit9	0:OFF, 1:ON	
10011	000A	Temp sensor short error	bit10	0:OFF, 1:ON	
10012	000B	oP Contact Error	bit11	0:OFF, 1:ON	
10013	000C	HcC Contact Error	bit12	0:OFF, 1:ON	
10014	000D	LtC Contact Error	bit13	0:OFF, 1:ON	
10015	000E	HP- High-Temp warning	bit14	0:OFF, 1:ON	
10016	000F	LP- Low-Temp warning	bit15	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 / °F	
30102	0065	Temp Settings	-55.0 ~ 99.9	-67 ~ 212	°C / °F
30103	0066	Temp unit	0:Celsius, 1:Fahrenheit	°C / °F	
30104	0067	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	
		COMP OFF delay	bit6	0:OFF, 1:ON	
		Comp output delay after defrosting	bit7	0:OFF, 1:ON	
30105	0068	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	
		oP Contact Error	bit2	0:No error, 1:oP error	
		HcC Contact Error	bit3	0:No error, 1:HcC error	
		LtC Contact Error	bit4	0:No error, 1:LtC error	
HP- High-temp warning	bit5	0:OFF, 1:High-temp warning			
LP- Low-temp warning	bit6	0:OFF, 1:Low-temp warning			

[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 = 23, total 23 data, 46 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		Data1		Daten		CRC16	
		Upper Byte	Lower Byte	Upper Byte	Lower Byte	Upper Byte	Lower Byte	Upper Byte	Lower Byte	Upper Byte	
1BYTE	0x10	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

[ 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	
			Lower Byte	Upper Byte
1BYTE	incoming command+0x80	1BYTE	1BYTE	1BYTE

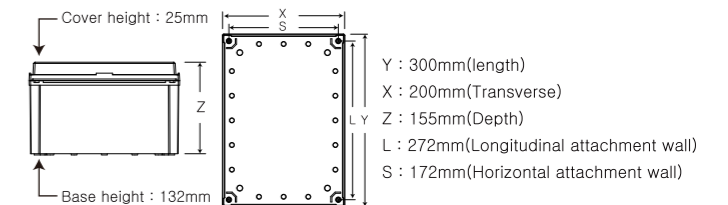
0x01: Unsupported Commands  
 0x02: Starting address error  
 0x03: Data count error  
 0x04: Requested Commands abnormal treatment

[ MAP ]

NO	Addr	Menu Name	Description	Celsius range	Fahrenheit range	Unit	Shipping value
40001	0000	SEt	Temp Settings	-55.0 ~ 99.9	-67 ~ 212	°C / °F	0.0
40002	0001	HP-	High-Temp alarm temp setting	LP- ~ 99.9	LP- ~ 212	°C / °F	99.9
40003	0002	LP-	Low-Temp alarm temp setting	-55.0 ~ HP-	-67 ~ HP-	°C / °F	-55.0
40004	0003	dF	Deviation temp setting	0.1 ~ 19.9	1 ~ 35	°C / °F	1.0
40005	0004	dLt	Setting output delay time	0.00 ~ 9.99		m	0.00
40006	0005					s	
40007	0006	Car	Temp calibration settings	-10.0 ~ 10.0	-18 ~ 18	°C / °F	0.0
40008	0007	LSP	Comp operation setting	d-C / Prd		d-C	
40009	0008	Lfd	Comp OFF delay time	OFF, 1 ~ 999		s	oFF
40010	0009	LoC	Locking Settings	OFF / on			oFF
40011	000A	dCP	Defrosting Comp Action Settings	OFF / on			oFF
40012	000B	dof	Defrost stop time setting	oFF, 1 ~ 250		hr	4
40013	000C	don	Defrost operation time setting	oFF, 1 ~ 250		m	10
40014	000D	dDt	Comp output delay time after defrosting	0.00 ~ 9.99		m	0.00
40015	000E					s	
40016	000F	Lt5	Low-temp prevention temp deviation	oFF, 0.1 ~ 10.0	oFF / 1 ~ 18	°C / °F	oFF
40017	0010	FSt	Setting the fan operation method	F1 ~ F4			F1
40018	0011					m	0.00
40019	0012	Fdt	Setting fan latency after defrosting	0.00 ~ 9.99		s	0.00
40020	0013	Adr	Communication station number	1 ~ 99			1
40021	0014	bPS	Communication speed	120 / 240 / 480 / 960 / 192	bPS	960	
40022	0015	Unt	Temp display unit	C / F			C
40023	0016	Ini	Set value initialization	no / 4E5			no
40024	0017	-	Operation status	0: Operation / 1: Stop			

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

## 08 Diemension and panel hole sizes



## 09 Easy error diagnosis instructions

※ If an error is displayed while the product is running

- **Er1** : 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.

※ 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 : conotec@conotec.co.kr
- SNS : Facebook, Instagram, Twitter, YouTube ▶ 'Search for 'Conotec'
- Website : www.conotec.co.kr

※ This manual was prepared in the Naver Nanum