Version 1.0(2018.03.05)

ISO 9001:2008

CONOTEC®

Humidity & Temperature Transmitter Controller

CONOTEC CO., LTD.

www.conotec.co.kr

Instruction Manual CNT-TMC100

1 Notes of attention for the safety

Make sure to read notes of attention carefully before operating and properly use.

※Specifications and sizes indicated on this instruction manual are subject to change without notification for the improvement of performance.

⚠ Warning

1. This product has not been manufactured for the safe device. Therefore, if using for the purpose of the control including the devices with much concern on casualties, damage on important devices nearby, or significant property damage, please make sure to attach the dual safety device before using.
2. Make sure not to disconnect, maintain, or repair when the power is connected.
3. When connecting the power, make sure to check the circuit number beforehand.
4. This device shall not be disassembled, processed, processed, or repaired.

⚠ Caution

- Make sure to be well-informed of warning or safety rules/instructions before installing this device and proceed within the regulated capacities or specifications.
- Motor or solenoid with much inductive load shall not be wired or installed.
- Make sure to use the shielding wire if extending the sensor and not to extend unnecessarily.
- Make sure not to use the product causing the arc when opening or closing the same power or near the power.
- Make sure to have the power cable stay away from the high pressure line and not to install them in the place with severe water, oil, or dust.
- Make sure not to install in the place with direct sun light or rainwater.
- Make sure not to install in the area with strong magnetic power, noise, vibration, and impact.
- Make sure to stay away from the place with strong alkali or acid substance come out and use the independent pipe.
- When installing in the kitchen, make sure not to spray water for the cleaning purposes.
- Make sure not to install in the place with temperature or humidity exceeding the standard values.
- Make sure not to have sensor cables disconnected or scratched.
- Make sure to have sensor cables stay away from signal wire, power, motor power, and load cables and use independent pipe.
- If randomly disassembling or remodeling this product, please be informed that the follow-up management is not provided.
- The ⚠ indication on the terminal wiring diagram indicates warning or notes of caution.
- Make sure not to use near the devices with strong and high frequency (high frequency welding machine, high frequency sewing machine, high frequency radio, and large capacity SCR controller)
- If using with the methods other than what manufacturer designates, there might be damages or loss in the property.
- As it is not a toy, make sure to keep it away from children.
- Make sure to only have specialists or qualified parties install the product.
- If not following contents on the notes of caution or warning, or in case of faults of consumers, our company is not responsible for anything.

⚠ Danger

■ Risk about caution or electronic shock

- Electronic shock – Make sure not to contact AC terminal during the applying electronic currnet
- When checking the input power source, make sure to disconnect the input power.

2 Product specifications

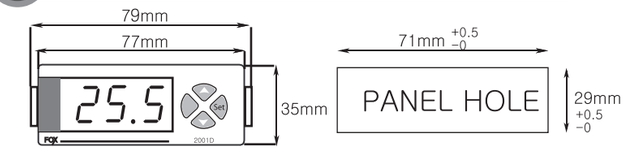
Input power	100~240VAC 50/60Hz	Degree of indication	±1% rdg ± 1 digit
Indication	7segment 0.51inch 4Digit		
Output specifications	250 VAC 2A relay 4EA		
Sensor specifications	Sensor name	Temperature range	Humidity range
	CNT-TM100	-20.0℃~80.0℃	0%~100%Rh
Communication specifications	RS485, MODBUS RTU, Data 8 bit , Parity None , Stop bit 1		
Notes of attention	0~55℃ , 35~80%Rh(no freezing or dew condensation)		

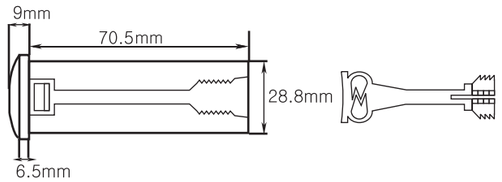
3 Names of each part

■ Appearance and names of each part

1 OUT 1 output indication
2 OUT 2 output indication
3 OUT 3 output indication
4 OUT 4 output indication
5 Increasing switch
6 Function changing switch
7 Reduction switch

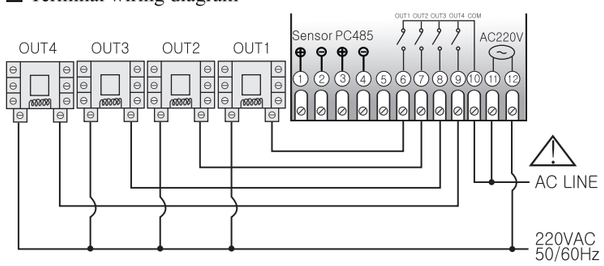
4 Exterior specifications and panel processing values





5 Terminal wiring diagram

■ Terminal wiring diagram

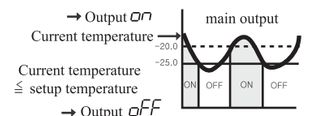


6 Order for changing the setup values

1. tS1 tS2 tS3 tS4
   EV1,EV2,EV3,EV4 temperature setup, range : -20.0 ~ 80.0℃
2. HS1 HS2 HS3 HS4
   EV1,EV2,EV3,EV4 humidity setup, range: -0.0 ~ 100.0%RH
3. SnA : Setup to be consistent with number of the sensor that is connected with the sensor. Available up to four.
4. Adr : Setup PC communication number, range: 1 – 256
5. bPS : Setup PC communication speed, range: 1200/2400/4800/9600/19200
6. LoC : Setup the data locking function
   As a safety device for making not feasible to change setup values except for main users,
   If setup as On: Lock all the setup values except for the setup temperature values
   If setup as Off: Discharge lock on all the setup values except for the setup temperature values
7. Eb1 Eb2 Eb3 Eb4 : Setup output 1, output 2, output 3, and output 4
8. tYP : Setup output type
   toU HoU tAo HAo Available to setup one of four types
9. toU : Control temperature control
10. HoU : Control humidity control
11. tAo : Control temperature notification output
12. HAo : Control humidity notification output
13. SSE : Choose sensor to control
    AVr Control average OR 1 control individual from 1 to 256
14. FSE : Choose cooling (C) or heating (H) if controlling temperature output
    Choose dehumidification (D) or humidification (H) if controlling humidity output
15. dIF : Setup temperature and humidity deviation, range: 0.1 – 19.9
    In the control for On/Off, consistent interval between on and off is required. (setup the on/off width) If on/off is too frequently operated, output point other than relay might be damaged too fast, or hunting (lifting off or chattering) might occur due to the noise from outside.
    If on/off is too frequently operated, output point other than relay might be damaged too fast, or hunting (lifting off or chattering) might occur due to the noise from outside.

cooling

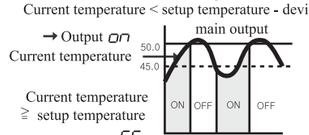
Current temperature > setup temperature + deviation temperature



setup= -25.0 C, DIF = 5.0
DLy = 0.00 TYP = C

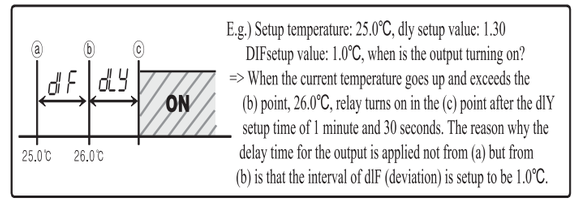
heating

Current temperature < setup temperature - deviation temperature



setup= 50.0 C DIF = 5.0
DLy = 0 TYP = H

16. dLY : Delay time of temperature and humidity output, range: 0 second – 9 minutes and 59 seconds, Use if there is an issue for frequent operation of on/off on the controlled subjects. (freezer and compressor, etc.) Protecting function of the operating machines if re-applying power or instant blackout.

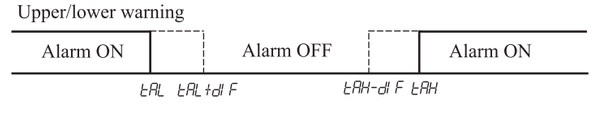


E.g.) Setup temperature: 25.0℃, dly setup value: 1.30
DIFsetup value: 1.0℃, when is the output turning on?
=> When the current temperature goes up and exceeds the (b) point, 26.0℃, relay turns on in the (c) point after the dlY setup time of 1 minute and 30 seconds. The reason why the delay time for the output is applied not from (a) but from (b) is that the interval of dlF (deviation) is setup to be 1.0℃.

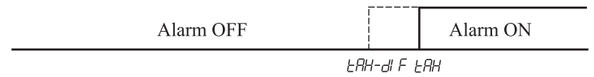
17. tAS : Setup the temperature alarm output
    HL HI Lo Available to choose one of three types
18. HL : Select upper/lower alarm
19. HI : Select upper/lower alarm
20. Lo : Select lower alarm
21. tAH : Setup upper value of temperature
22. tAL : Setup lower value of temperature
23. dIF : Setup alarm deviation of temperature and humidity
24. HAS : Setup humidity alarm output type
    HL HI Lo Available to choose one of the three types
25. HAH : Setup upper value of humidity
26. HAL : Setup upper value of humidity

* Example of using alarm setup

Upper/lower warning



Upper limit alarm



Lower limit alarm

7 Order of changing setup values

Basic Settings

25.0 — Indicate current temperature

Set — Setup temperature 1 / Change setup humidity 1

t51 ~ H51 — Press Set key to show t51.

Set

20.0 — Use keys to change setup values.

Set — Setup / Change setup temperature 2

t52 ~ H52 — Press Set key to show t52.

Set

20.0 — Use keys to change setup values.

Set — Setup / Change setup temperature 3

t53 ~ H53 — Press Set key to show t53.

Set

20.0 — Use keys to change setup values.

Set — Setup / Change setup temperature 4

t54 ~ H54 — Press Set key to show t54.

Set

20.0 — Use keys to change setup values.

Set — After changing setup values press Set key.

o-t — Indicate the text for saving and confirming setup values (OK) and also the current temperature and humidity.

250

Setting for programs

Set — Press for more than 5 sec.

EU0 ⇄ EU1 ⇄ EU2 ⇄ EU3 ⇄ EU4

SnA

typ — toU | HoU | tAo | HAo

1 — 256 ~ no

SSE

1 — no | Adr | 1 ~ 256

FSE

1 — 256 ~ 1

H — H | C / H | d

dIF

0.1 — 0.1 ~ 19.9

dLY

0.1 — 9.59 (min, sec) ~ 0.00 (min, sec)

bPS

9600 — 1200 | 2400 | 4800 | 9600 | 2800

LoC

oFF — on | oFF

HL — HL | Hi / HL | Lo

tAH

20.0 — -20.0 ~ 80.0

tAL

10.0 — -20.0 ~ 80.0

HAH

20.0 — 0.0 ~ 100.0

HAL

10.0 — 0.0 ~ 100.0

8 Communication explanation

* RS 485 Modbus RTU method protocol is internally installed.
* Non-synchronous 2-phases and semi-dual communication method
* Communication distance: Within 1.2km
* Communication speed : 1200 / 2400 / 4800 / 9600/ 19200Bps
* Start bit: 1 bit, stop bit: 1 bit, parity bit: None
  Data bit: 8 bit

<Func 0x02 : Read Discrete Inputs>

Available to receive simple information such as status in the form of bit

Request

Sub-pro Address	com-mand	Starting number		Data number		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x02	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

Request 01 02 00 00 00 01 B9 CA

Response 01 02 01 00 A1 88

00000000 → 100001 (0000) Sensor open error

Response

Sub-pro Address	com-mand	Data number	Data	CRC16	
				Sub byte	Main byte
1BYTE	0x02	1BYTE	1BYTE	1BYTE	1BYTE

MAP

NO	Address	Explanation	Range		unit
100001	0000	Whether to have EV1 sensor open error status	bit0	0:No error, 1:open error	
100002	0001	Whether to have EV2 sensor open error status	bit1	0:No error, 1:open error	
100003	0002	Whether to have EV3 sensor open error status	bit2	0:No error, 1:open error	
100004	0003	Whether to have EV4 sensor open error status	bit3	0:No error, 1:open error	
100005	0004	Whether to have EV1 sensor N-A error	bit4	0:No error, 1:N-A error	
100006	0005	Whether to have EV2 sensor N-A error	bit5	0:No error, 1:N-A error	
100007	0006	Whether to have EV3 sensor N-A error	bit6	0:No error, 1:N-A error	
100008	0007	Whether to have EV4 sensor N-A error	bit7	0:No error, 1:N-A error	

<Func 0x04 : Read Inputs Registers>

Indicate current temperature, humidity, sensor status, and output status

Available to receive simple information such as current temperature, sensor status, decimal point, and output status

Number of byte = number of data * 2

If the number of data is five, total five data and ten bytes are received

Request

Sub-pro Address	com-mand	Starting number		Data number		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x04	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

Response

Sub-pro Address	com-mand	Byte number	Data1		...	Data n		CRC16	
			Main byte	Sub byte		Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x04	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE	1BYTE	1BYTE

MAP

NO	Address	Explanation	Range		unit
300001	0000	EV1 temperature	-20.0~80.0℃		℃
300002	0001	EV2 temperature	-20.0~80.0℃		℃
300003	0002	EV3 temperature	-20.0~80.0℃		℃
300004	0003	EV4 temperature	-20.0~80.0℃		℃
300005	0004	EV1 humidity	0.0~100%		%
300006	0005	EV2 humidity	0.0~100%		%
300007	0006	EV3 humidity	0.0~100%		%
300008	0007	EV4 humidity	0.0~100%		%
300009	0008	EV1 output status	OFF = 0 , ON = 1		
		EV2 output status	OFF = 0 , ON = 1		
		EV3 output status	OFF = 0 , ON = 1		
		EV4 output status	OFF = 0 , ON = 1		
300010	0009	EV1 type setup values	0 = temperature, 1 = humidity, 2 = temp alarm, 3 = humi alarm		
300011	0010	EV2 type setup values	0 = temperature, 1 = humidity, 2 = temp alarm, 3 = humi alarm		
300012	0011	EV3 type setup values	0 = temperature, 1 = humidity, 2 = temp alarm, 3 = humi alarm		
300013	0012	EV4 type setup values	0 = temperature, 1 = humidity, 2 = temp alarm, 3 = humi alarm		
300014	0013	Whether to have EV1 sensor open error	bit0	0:no error, 1:open error	
		Whether to have EV2 sensor open error	bit1	0:no error, 1:open error	
		Whether to have EV3 sensor open error	bit2	0:no error, 1:open error	
		Whether to have EV4 sensor open error	bit3	0:no error, 1:open error	
		Whether to have EV1 N-A error status	bit4	0:no error, 1:N-A error	
		Whether to have EV2 N-A error status	bit5	0:no error, 1:N-A error	
		Whether to have EV3 N-A error status	bit6	0:no error, 1:N-A error	
		Whether to have EV4 N-A error status	bit7	0:no error, 1:N-A error	

<Func 0x03 : Read Holding Registers>

Available to read the setup menu

Request

Sub-pro Address	com-mand	Starting number		Data number		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x03	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

Number of byte = number of data x 2

If the number of data is 23, total 23 data and 46 bytes are received.

Response

Sub-pro Address	com-mand	Byte number	Data1		...	Data n		CRC16	
			Main byte	Sub byte		Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x03	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE	1BYTE	1BYTE

<Func 0x06 : Write Single Registers>

Available to change setup menu by one item

Request

Sub-pro Address	com-mand	Writing registry		Data		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

If Func 06 Write Single Register is normally registered, request and response contents are identical.

Response

Sub-pro Address	com-mand	Writing registry		Data		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

<Func 0x10 : Write Multiple Registers>

Available to change setup menu with many items.

Request When writing multiple registries, if there is an error on at least one of the data, they are not written at all.

Sub-pro Address	com-mand	Starting address		data number		byte number	Data1		...	Data n		CRC16	
		Main byte	Sub byte	Main byte	Sub byte		Sub byte	Main byte		Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE	1BYTE	1BYTE

Response

Sub-pro Address	com-mand	Starting address		data number		CRC16	
		Main byte	Sub byte	Main byte	Sub byte	Sub byte	Main byte
1BYTE	0x10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

Number of data = Number of byte x 2

MAP Func 0x03, 0x06, 0x10

NO	Address	Explanation	Range	unit	Released value
400001	0000	Temperature1 setup values	-20.0 ~ 80.0℃	℃	20.0℃
400002	0001	Temperature2 setup values	-20.0 ~ 80.0℃	℃	20.0℃
400003	0002	Temperature3 setup values	-20.0 ~ 80.0℃	℃	20.0℃
400004	0003	Temperature4 setup values	-20.0 ~ 80.0℃	℃	20.0℃
400005	0004	Humidity1 setup values	0.0 ~ 100.0%	%	20.0%
400006	0005	Humidity2 setup values	0.0 ~ 100.0%	%	20.0%
400007	0006	Humidity3 setup values	0.0 ~ 100.0%	%	20.0%
400008	0007	Humidity4 setup values	0.0 ~ 100.0%	%	20.0%
400009	0008	Sensor matching 1	0 = No, 1~256		1
400010	0009	Sensor matching 2	0 = No, 1~256		No
400011	0010	Sensor matching 3	0 = No, 1~256		No
400012	0011	Sensor matching 4	0 = No, 1~256		No
400013	0012	PC communication number	1~256		1
400014	0013	PC communication speed	1200/2400/4800 /9600/19200		9600
400015	0014	LOCK	OFF = 0 , ON = 1		ON
400016	0015	EV1 time setup value	0 = Temperature, 1 = humidity 2 = temp alarm, 3 = humi alarm		temperature
400017	0016	EV1 sensor choosing setup values	0 = average , 1~256		1
400018	0017	EV1 temperature function setup	0 = Heating , 1 = Cooling		Heating
400019	0018	EV1 humidity function setup	0 = Humidification 1 = dehumidification		humidification
400020	0019	EV1 deviation	1~19.9		5.0
400021	0020	EV1 delay time	0 ~ 599	sec	5 sec
400022	0021	EV1 temperature alarm selection	0 =upper / lower limit, 1 = upper limit 2 = lower limit		upper/ lower limit
400023	0022	EV1 temperature upper limit setup	-20.0 ~ 80.0℃	℃	40.0℃
400024	0023	EV1 temperature lower limit setup	-20.0 ~ 80.0℃	℃	0.0℃
400025	0024	EV1 humidity alarm selection	0 =upper / lower limit, 1 = upper limit 2 = lower limit		upper/ lower limit
400026	0025	EV1 4 humidity upper limit setup	0.0 ~ 100%	%	40.0%
400027	0026	EV1 humidity lower limit setup	0.0 ~ 100%	%	0.0%
400028	0027	EV1 alarm deviation	1 ~ 19.9	%/℃	5.0
400027	0026	EV1 humidity lower limit setup	0.0 ~ 100%	%	0.0%
400028	0027	EV1 alarm deviation	1 ~ 19.9		5.0
400029	0028	EV2 time setup value	0 = Temperature, 1 = humidity 2 = temp alarm, 3 = humi alarm	%/℃	temperature
400030	0029	EV2 sensor choosing setup values	-1 = No, 0 = average , 1~256		No
400031	0030	EV2 temperature function setup	0 = Heating , 1 = Cooling		Heating
400032	0031	EV2 humidity function setup	0 = Humidification , 1 = dehumidification		humidification
400033	0032	EV2 deviation	1~19.9		5.0
400034	0033	EV2 delay time	0 ~ 599	sec	5 sec
400035	0034	EV2 temperature alarm selection	0 = Temperature, 1 = humidity 2 = temp alarm, 3 = humi alarm		upper/ lower limit
400036	0035	EV2 temperature upper limit setup	-20.0 ~ 80.0℃	℃	40.0℃
400037	0036	EV2 temperature upper limit setup	-20.0 ~ 80.0℃	℃	0.0℃
400038	0037	EV2 humidity alarm selection	0 = Temperature, 1 = humidity 2 = temp alarm, 3 = humi alarm		upper/ lower limit
400039	0038	EV2 humidity upper limit setup	0.0 ~ 100%	%	40.0%
400040	0039	EV2 humidity lower limit setup	0.0 ~ 100%	%	0.0%
400041	0040	EV2 alarm deviation	1 ~ 199	%/℃	5.0
400042	0041	EV3 time setup value	0 = temperature, 1 = humidity, 2 = temp alarm, 3 = humi alarm		temperature
400043	0042	EV3 sensor choosing setup values	-1 = No, 0 = average , 1~256		No
400044	0043	EV3 temperature function setup	0 = Heating , 1 = Cooling		Heating
400045	0044	EV3 humidity function setup	0 = Humidification , 1 = dehumidification		humidification
400046	0045	EV3 deviation	1~19.9		5.0
400047	0046	EV3 delay time	0 ~ 599		5 sec
400048	0047	EV3 temperature alarm selection	0 =upper / lower limit, 1 = upper limit 2 = lower limit	sec	upper/ lower limit
400049	0048	EV3 temperature upper limit setup	-20.0 ~ 80.0℃	℃	40.0℃

NO	Address	Explanation	Range	unit	Released value
400051	0050	EV3 humidity alarm selection	0 =upper / lower limit, 1 = upper limit , 2 = lower limit		upper/ lower limit
400052	0051	EV3 humidity upper limit setup	0.0 ~ 100%	%	40.0%
400053	0052	EV3 humidity lower limit setup	0.0 ~ 100%	%	0.0%
400054	0053	EV3 alarm deviatioin	1 ~ 199	%/℃	5.0
400055	0054	EV4 time setup value	0 = Humidification , 1 = dehumidification		temperature
400056	0055	EV4 sensor choosing setup values	-1 = No, 0 = average , 1~256		No
400057	0056	EV4 temperature function setup	0 = Heating , 1 = Cooling		Heating
400058	0057	EV4 humidity function setup	0 = Humidification , 1 = dehumidification		humidification
400059	0058	EV4 deviation	1~19.9		5.0
400060	0059	EV4 delay time	0 ~ 599	sec	5 sec
400061	0060	EV4 temperature alarm selection	0 =upper / lower limit, 1 = upper limit , 2 = lower limit		upper/ lower limit
400062	0061	EV4 temperature upper limit setup	-20.0 ~ 80.0℃	℃	40.0℃
400063	0062	EV4 temperature lower limit setup	-20.0 ~ 80.0℃	℃	0.0℃
400064	0063	EV4 humidity alarm selection	0 =upper / lower limit, 1 = upper limit , 2 = lower limit		upper/ lower limit
400065	0064	EV4 humidity upper limit setup	0.0 ~ 100%	%	40.0%
400066	0065	EV4 humidity lower limit setup	0.0 ~ 100%	%	0.0%
400067	0066	EV4 alarm deviation	1 ~ 199	%/℃	5.0

9 Simple instructions for diagnosis on the breakdown

■ If indicating error while using the product

- In case of , Er1 this is the case that product receives strong noise from outside during the usage, and many of the storage cells in data inside are damaged. In this case, make sure to request A/S to our company.

This controller has established with supplementary measures on the noise from outside. However, it is not to keep resisting the noise.
In case of noise that is higher than 2KV, inside might be destroyed.
If O-E or N-R are indicated, there is an abnormal condition on the screen.
Make sure to check the sensor.

※Specifications of aforementioned product are subject to change without notification for improvement of performance of a product.
Make sure to be well-informed of contents indicated on the notes when dealing with them and follow them as well.

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

■ Address : 56, Ballyongsandan 1-ro, Jangan-eup, Gijang-gun, Busan, 46034, Rep. of KOREA

A/S telephone : 070-7815-8266
Consultation telephone : 051-819-0425 ~ 0427
Homepage : www.conotec.co.kr
Email : conotec@conotec.co.kr

■ Major products and development
- Digital temperature/humidity controller
- Digital timer, current/voltage meter
- Development of other products