Version 1.0(2017.12.01)

CONOTEC® Humidity & Temperature Transmitter

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

Instruction Manual CNT-TM100



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!

- 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.
- Do not perform wiring and installation in motors with large inductive load and solenoid.
- Use the same line when extending sensors and do not use excessive length.
- Do not use parts that create an arc when switching nearby or the same power.
- The power line should be away from high-tension power cables and avoid installation in areas with high moisture, oil, and dust.
- Avoid installation in direct sunlight and areas exposed to rain.
- Avoid installation in areas with high magnetic, noise, vibration, and impact.
- The equipment should be installed sufficiently distant from strong alkali and strong acid substances.
- When the equipment is installed in the kitchen, do not spray water directly onto the equipment for cleaning.
- Do not install in places with high temperature/humidity that exceed the rate.
- Care should be provided not to disconnect sensor cables or cause damage.
- Sensor cables require significant distance from signal line, power, motive power, and load line and use independent pipes.
- No warranty service shall be provided if the product has been altered or tampered with.
- The mark on the wiring terminals is safety statement, such as warning or caution.
- 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).
- The product may cause injury or property damage if used for purposes not intended by the manufacturer.
- Do not leave the product within reach of children as the equipment is not a toy.
- Installation must be performed by professionals or qualified individual.
- 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!

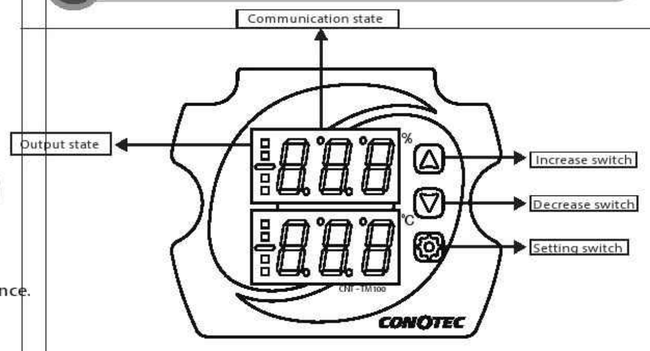
■ Caution, risk of electric shock

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

2 Product specification

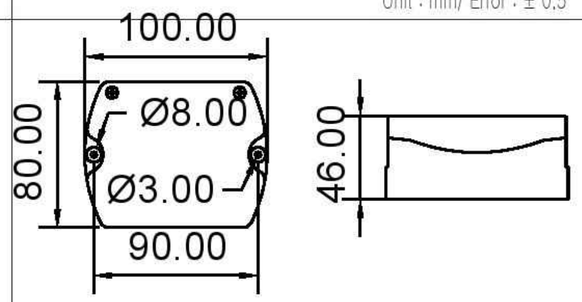
Input power	12VDC	Display accuracy	±1% rdg ± 1 digit
Display method	7 segment 0.51inch 4 Digit 2 Line		
Output	(Temperature and humidity) current output 4-20mA		
Sensor	Sensor name	Temperature range	Humidity range
	SHT - 11	-39.9℃~80.0℃	0%~100%Rh
Communication	RS485, MODBUS RTU, Data 8 bit , Parity None , Stop bit 1		
Ambient range	-39.9~80.0℃ , 0~100%Rh		

3 Name of each part

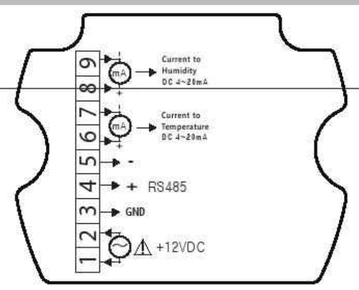


4 Appearance specification and dimension

Unit : mm/ Error : ± 0.5



5 Terminal connection diagram



6 Setting range and default set

Classification		Setting menu	Setting range	Default set
Humidity settings	H.Co	Humidity calibration	-10.0~10.0%Rh	0.0%Rh
	H.Ht	Sensor heating setting	YES / no	no
	H.20	PV transmission 20mA humidity	H.4 ~ 100%	100%
	H.4	PV transmission 4mA humidity	0 ~ H.20%	0%
Temperature settings	t.Co	Temperature calibration	-10.0~10.0℃	0.0℃
	t.20	PV transmission 20mA temperature	T.4 ~ 80.0℃	80.0℃
	t.4	PV transmission 4mA temperature	-40.0 ~ T.20℃	-40.0℃
Communication	Adr	485 communication address setting	1~32	1
	bPS	485 communication speed setting	12 : 1200bps 24 : 2400bps 48 : 4800bps 96 : 9600bps 192 : 19200bps	96 (9600Bps)

7 Detail description of the function

Pressing the ⚙ key for 5 seconds in the operation screen will enter the detail settings. Change menu by pressing △▽ setting value change ⚙ key 1 time. After adjusting the set value, press ⚙ key for 3 or more seconds to save and return to the operation screen.

1 H.Co humidity calibration

The displayed value can be set to the actual measured humidity when the current humidity display value and the humidity measured by using a precision instrument differ.
Example 1) Display value: 5%, the actual measured humidity: 10% => COR +5% input
Example 2) Display value: 5%, the actual measured humidity temperature: 2% => COR -3% input

2 H.Ht Humidity sensor heating function

Dew forms around the sensor devices if humidity is extremely high; hence, the function generates heat inside the sensor to prevent dew formation if the current humidity is 95% or more.

YES The heating function operates automatically in 95% or more humidity and the function is disabled when humidity level is below 95%.

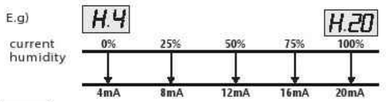
no The automatic heating function is not used.

Caution 1. When the humidity sensor heating function is in operation, the current temperature of the display window may increase slightly.

3 H.20 Humidity setting for 20 mA current output at PV transmit output

H.4 Humidity setting for 4mA current output at PV transmit output

It is for sending the current humidity to the current output. The humidity range set in H.20 and H.4 is divided equally and output to 4 - 20mA current.



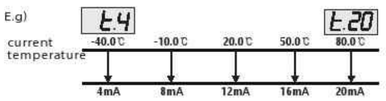
4 t.Co Temperature calibration

The displayed value can be set to the actual measured temperature when the current temperature display value and the temperature measured by using a precision instrument differ.
Example 1) Display value: 5.0℃, the actual measured temperature: 10.0℃ => COR +5.0℃ input
Example 2) Display value: 5.0℃, the actual measured temperature: 2.0℃ => COR -3.0℃ input

5 t.20 Temperature setting for 20 mA current output at PV transmit output

t.4 Temperature setting for 4mA current output at PV transmit output

It is for sending the current humidity to the current output. The temperature range set in T.20 and T.4 is divided equally and output to 4 - 20mA current.



6 Adr RS485 communication address

This is a menu to match an address and the upper system for RS485 communication

7 bPS RS485 Communication speed

This is a menu to match communication speed and the upper system for RS485 communication

12 : 1200BPS, 24 : 2400BPS, 48 : 4800BPS, 96 : 9600BPS, 192 : 19200BPS

8 Communication description

* RS485 MODBUS RTU type protocol is embedded.
* Asynchronous 2-wire half-duplex 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>

You can receive brief information of status, etc. in a bit form.

Request

Sub -product address	Commend	Start number		Number of data		CRC16	
		Upper byte	Lower byte	Upper byte	Lower byte	Lower byte	Upper 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 -product address	Commend	Number of bytes	Data	CRC16	
				Lower byte	Upper byte
1BYTE	0x02	1BYTE	1BYTE	1BYTE	1BYTE

MAP

NO	Address	Description	Range	Unit	Output value
100001	0000	Sensor open error	bit0 0: No error, 1: Open error		

<Func 0x04 : Read Inputs Registers>

You can receive simple information, such as current temperature, current humidity, sensor, and output status.

Request

Sub -product address	Commend	Start number		Number of data		CRC16	
		Upper byte	Lower byte	Upper byte	Lower byte	Lower byte	Upper byte
1BYTE	0x04	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

You can receive simple information, such as current temperature, sensor status & decimal point, and output status.
Number of bytes = Number of data * 2
Number of data = Five data if 5ve, receive 10 bytes

Response

Sub -product address	Commend	Number of bytes	DATA 1		...	DATA n		CRC16	
			Upper byte	Lower byte		Upper byte	Lower byte	Lower byte	Upper byte
1BYTE	0x04	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE	1BYTE	1BYTE

MAP

NO	Address	Description	Range	Unit	Output Value
300001	0000	Current temperature	-40.0 ~ 80.0℃		
300002	0001	Current humidity	0~ 100.0%		
300003	0002	Sensor open error	bit0 0: No error, 1: Open error		
300004	0003	Temperature PV transmission output current	4.0mA~20.0mA		
300005	0004	Humidity PV transmission output current	4.0mA~20.0mA		

<Func 0x03 : Read Holding Registers>

You can read the setting menu.

Request

Sub -product address	Commend	Start number		Number of data		CRC16	
		Upper byte	Lower byte	Upper byte	Lower byte	Lower byte	Upper byte
1BYTE	0x03	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

Number of bytes = Number of data * 2
Number of data = 23 data if 23, receive 46 bites

Response

Sub -product address	Commend	Number of bytes	DATA 1		...	DATA n		CRC16	
			Upper byte	Lower byte		Upper byte	Lower byte	Lower byte	Upper byte
1BYTE	0x03	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE	1BYTE	1BYTE

<Func 0x06 : Write Single Registers>

You can change the setting menu by one item.

Request

Sub -product address	Commend	Writing Address		DATA		CRC16	
		Upper byte	Lower byte	Upper byte	Lower byte	Lower byte	Upper byte
1BYTE	0x06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

If Func.06 Write Single Register is written normally, the details of Request and Response are the same.

Response

Sub -product address	Commend	Writing 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 menu by multiple items.

Request A multiple number of registers may not be written if there is an error in one of the data.

Sub -product address	Commend	Start number		Number of data		Number of bytes	DATA1		...	DATA n		CRC16	
		Upper byte	Lower byte	Upper byte	Lower byte		Lower byte	Upper byte		Upper byte	Lower byte	Lower byte	Upper byte
1BYTE	0x10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE	1BYTE	1BYTE

Response

Sub -product address	Commend	Start number		Number of data		CRC16	
		Upper byte	Lower byte	Upper byte	Lower byte	Lower byte	Upper byte
1BYTE	0x10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

Number of DATA = Number of bytes * 2

MAP Func 0x03, 0x06, 0x10

NO	Address	Description	Range	Unit	Output Value
400001	0000	Humidity COR	-10 ~ 10%	%	0%
400002	0001	Whether to use sensor heating	0 : YES , 1 : NO		NO
400003	0002	~~PV transmission 20mA humidity~~	~~11.4 ~100%~~	~~%~~	~~100%~~
400004	0003	PV transmission 4mA humidity	0 ~ H.20%	%	0%
400005	0004	RS485 communication address	1~32		1
400006	0005	RS485 communication speed	1200/2400/4800/9600/19200	BPS	9600
400007	0006	Temperature COR	-10.0 ~ 10.0℃	℃	0.0℃
400008	0007	PV transmission 20mA temperature	T.4 ~80.0℃	℃	80.0℃
400009	0008	PV transmission 4mA temperature	-40.0 ~ T.20℃	℃	-40.0%

9 A simple troubleshooting technique

■ If error is displayed while using the product

- *Err* is displayed when the DATA memory element is damaged inside the product as it is affected by powerful noise from outside while in use.
  In such a case, contact our company for customer service.

- While the controller is equipped with supplementary measures for outside noise, it cannot endure infinite noise.

- Noise (2KV) abnormality may damage inside of the unit.
  o-E display means communication defect with the sensor. Please check connection, wire short, and connection order to the sensor. If the problem persists, please contact our customer service department.

- *L-E* or *H-E* is displayed when humidity and temperature exceed the display range. If the error is displayed despite maintaining normal surrounding temperature and humidity, please contact our customer service department.

- Quality Guarantee Period: One year from the date of purchase.

※ The above specifications are subject to change without prior notice to improve product performance.
Please read and understand thoroughly the precautions stated in the handling precautions.

■ Address: 26 Yunsan-ro, Geumjeong-gu, Busan
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Homepage: www.conotec.co.kr
Email: conotec@conotec.co.kr

※ This instrument is suitable in the following environment:

Ambient temperature: 0℃ - 60℃
Ambient humidity: Below 80%Rh
Rated power: 220VAC ±10% 50/60Hz

■ Major production and development
- Digital temperature/humidity controller
- Digital timer, current/ voltage meter
- Other products