Version 0.92(2014. 8.21)

ISO 9001:2008

CONOTEC® Digital Counter

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

Instruction manual

<FOX-CE7>

Thank you for purchasing the product of CONOTEC.

1 Caution for your safety

Please read thoroughly the caution for safety and properly use ourproduct.

※ The specifications and sizes noted on this instruction manual can be changed without previous notice for the sake of function improvement of the product.

⚠ Warning(警告)

1. Since this product was not manufactured as a safety equipment, please attach double safety gears on it if you want to use it to control equipments that could cause deadly incident, damage on important peripheral device, or enormous damage on personal property.
2. Please do not perform wiring, examination or maintenance repairing while the power supply is on.
3. Please check the terminal number when you connect the power supply.
4. This product must not be disassembled, processed, improved, nor repaired.

⚠ Caution(注意)

* Please read thoroughly the instruction, safety regulations and warnings before installation of this device. Moreover, please use the product within the boundary of regulated specifications and capacity.
* Please do not wire or install on a motor or solenoid whose inductive load is big.
* Please use the shielding cable for sensor extension and do not overly extend the sensor.
* Please do not use components that generate an electric arc when opening and closing the product on the same power source or near the source.
* Please stay the power line away from the high tension line. Also, please do not install it at a place with a high amount of water, oil or dust.
* Please do not install the device in a place where the device can be exposed to direct sunlight or rain water.
* Please do not install the device in a place with strong magnetic forces, noise, vibration or shock.
* Please stay the device away from a place with strong alkali or strong acid and use an independent pipe.
* Please do not directly spray water on the device for cleansing if the device was installed at a kitchen.
* Please do not install the device in a place whose temperature and humidity exceeds the rating.
* Please do not let the sensor line be cut or cracked.
* Please put the sensor line away from the signal line, power supply, power and load line and use an independent pipe.
* Please note that if the device is arbitrarily disassembled, it cannot be taken care by our after-service.
* The mark on the terminal wiring diagram refers to warning or caution.
* Please do not use the product near devices generating a high frequency noise such as high frequency welding machine, high frequency sewing machine, high frequency wireless set or bulk distribution SCR controller.
* Any use beyond the usage boundary set by the manufacturer can cause injury or property loss.
* Since this device is not a toy, please put it away from kids.
* The installation of the product must be done by a specialist or a qualified person.
* If you do not abide by the warnings, caution or statements above or cause any damage or loss with your own mistake, we do not take responsibility for any of them.

▲ Danger(危險)

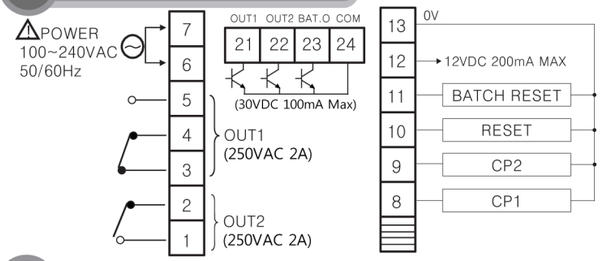
■ Caution. Danger of an electric shock.

* Electric shock - Please do not contact the AC terminal while the electric current is being carried. You may suffer an electric shock.
* Please be sure to block the input power supply when you check the input power

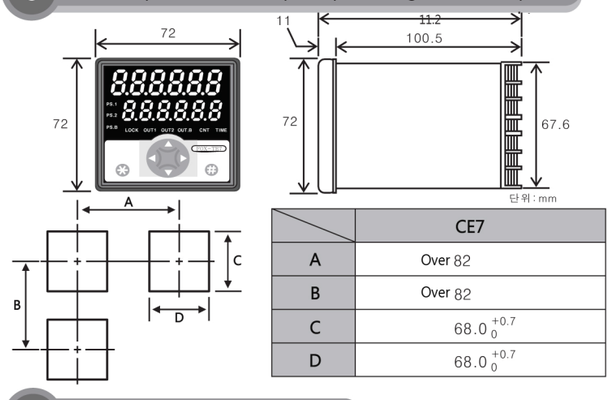
2 Rating and performance

Product name		FOX-CE7
Power source voltage		100~240VAC(50/60Hz) ±10%
Electric power consumed		7VA
Fluctuation range of allowed voltage		±10% of power source voltage
External input		CP1, CP2, RESET, BATCH RESET
External input type		Selection between voltage input type or non-voltage input type
Maximum coefficient speed		1 / 30 / 1K / 13K CPS
One shot output		0 ~ 99.99s
Control output	Relay output	Relay : SPST(1a), SPDT(1a1b) 250VAC 2A Resistive load
	Logic output	Open collector : OUT1, OUT2, BATCH RESET
External power supply		12VDC ±10%, 200mA Max
Power-cut compensating method		10 years (Non-volatile semiconductor memory is used)
Relay lifetime	Electrical	Over 100,000 rounds of use(250VAC 2A Resistive load)
	Mechanical	Over 10 million rounds of use
Ambient temperature		-10~55℃ (The device shouldn't be frozen, though)
Storage temperature		-25~65℃ (The device shouldn't be frozen, though)
Ambient humidity		35~85% RH
Weight		236g

4 Terminal wiring diagram



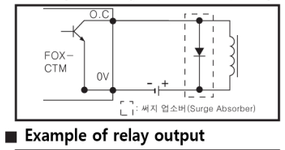
5 External specifications and panel processing sizes of the product



	CE7
A	Over 82
B	Over 82
C	$68.0^{+0.7}_{0}$
D	$68.0^{+0.7}_{0}$

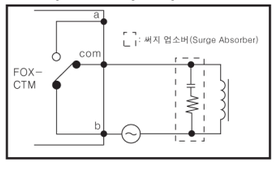
6 Example of relay connection

■ **Example of logic (transistor) output**



※ Please select the power supply for loading and load that doesn't exceed the open-close capacity of logic output (30VDC 100mA).
※ Please use the surge absorber at both ends of the load for using inductive load (relay, etc.).
※ The logic output and internal circuit are separated from each other.

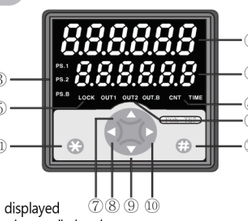
■ **Example of relay output**



※ The relay connection capacity is less than 250VAC 2A.

※ If you use load exceeding the contact capacity, the fused contact, contact failure and relay damage can be caused.

7 Names of each component



① On mode of operation: Current value
On menu set-up mode: Names of menu
On change mode of set-up value: Name of set value

② On mode of operation: Set value
On menu set-up mode: Detailed menu
On change mode of set-up value: Set value

③ PS.1 : Light-on when the Pre-set 1 is displayed
PS.2 : Light-on when the Pre-set 2 is displayed
PS.B : Light-on - The Batch counter's current value is displayed
Light-off - The Batch counter's current value and set value are displayed

④ CNT: Counter displayed
⑤ LOCK : Light-on when the key-locked mode is set
⑥ OUT.1 : Light-on when the OUT1 is outputted
OUT.2 : Light-on when the OUT2 is outputted
OUT.B : Light-on when the Batch counter is outputted

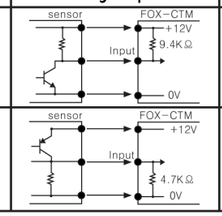
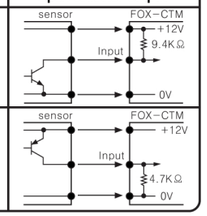
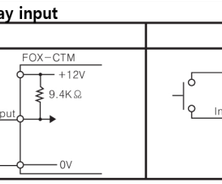
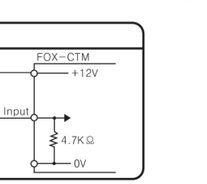
⑦ UP, ⑨ Down key
* On change mode of set value : Up and down of set value number
* On operation mode : The displayed mode is changed on the operation mode

⑧ LEFT, ⑩ RIGHT key: Location shift of set value
⑪ MODE key : Switching into operation screen and menu set mode

⑫ RESET key, initialization, and menu-set mode - 'Back'

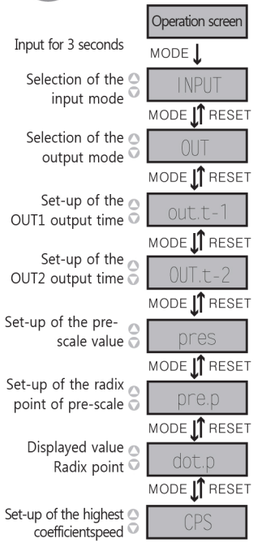
8 Input access

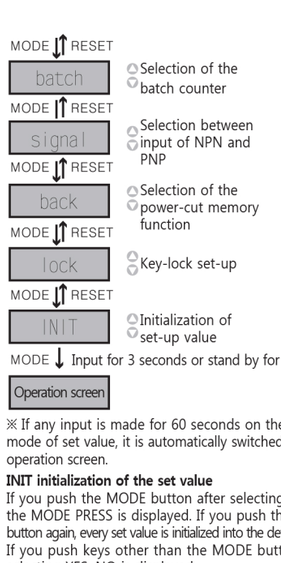
■ **Example of logic input**

Sensor specifications	Voltage output	Open collector output
Sensor type : NPN Product set-up : NPN		
Sensor type : PNP Product set-up : PNP		

■ **Example of relay input**

9 How to use the counter





※ If any input is made for 60 seconds on the change mode of set value, it is automatically switched into the operation screen.

INIT initialization of the set value

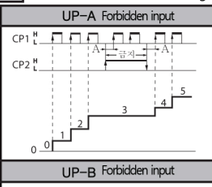
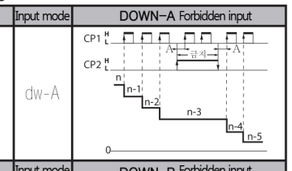
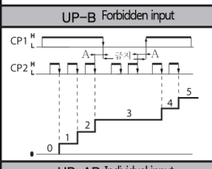
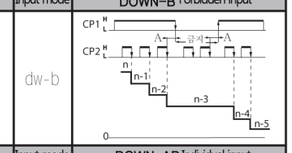
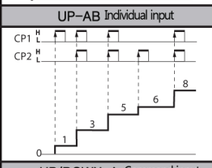
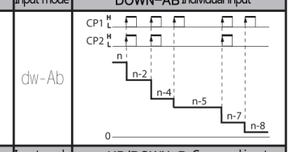
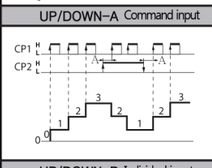
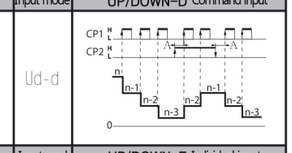
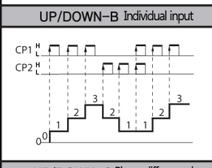
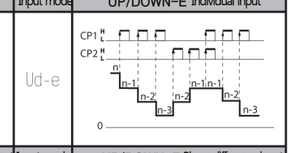
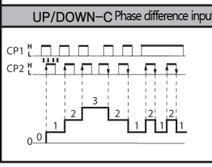
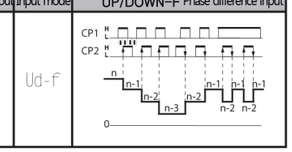
If you push the MODE button after selecting YES, the MODE PRESS is displayed. If you push the MODE button again, every set value is initialized into the default value. If you push keys other than the MODE button after selecting YES, NO is displayed.

Detailed menu for function set-up

Set-up items	Contents of set-up	Default values
input	UP-A ↔ dw-A ↔ UP-b ↔ dw-b ↔ up-ab ↔ dw-ab ud-a ↔ ud-d ↔ ud-b ↔ Ud-e ↔ ud-c ↔ ud-f	UP-A
out	twn (Twin) n ↔ f ↔ c ↔ r ↔ k ↔ p ↔ q ↔ a sng (Single) n ↔ f ↔ c ↔ r ↔ k ↔ p ↔ q ↔ a dsp (Display) 1 ↔ 2	twn n
out.t-1	00.00 ~ 99.99	01.00
out.t-2	00.00 ~ 99.99	01.00
preS	000001 ~ 999999	1000
pre-p	0.00001~000001 ※ From no radix point to 5 digits of radix point available	001.000
dot-p	0~0.000 ※ From no radix point to 3 digits of radix point available	0
cps	1 ↔ 30 ↔ 1k ↔ 13k ※ 1 or 30 cps is used for using the relay connect point.	30
batch	CTM5 CTM7 ry-1 ↔ tr ↔ all ↔ off CTM4 ry-1 ↔ off ※ If it is relay or ALL, out1 is operated as batch output.	ry-1
signal	npn ↔ pnp ※ Selection of input logic between npn or pnp	npn
power	save ↔ none ※ Selection whether to use the power-cut memory function	save
lock	l.off ↔ l.rst ↔ l.set ↔ l.all ※ l.rst : reset key l.set : mode key	L.off

Input mode

※ A is over the minimum signal width and B is over 1/2 of the minimum width

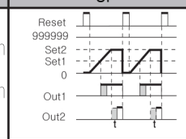
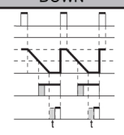
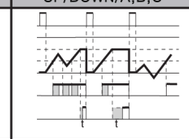
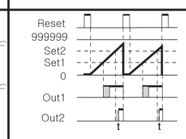
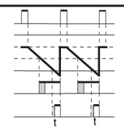
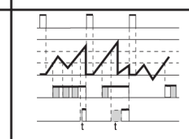
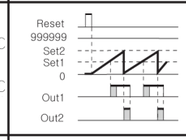
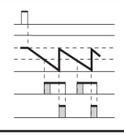
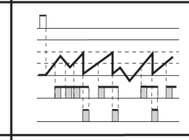
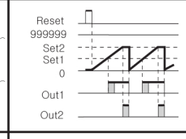
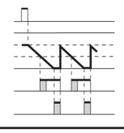
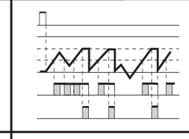
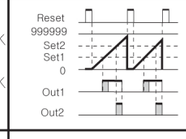
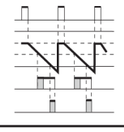
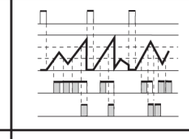
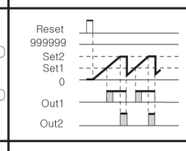
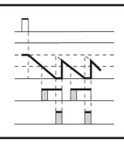
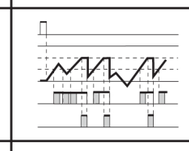
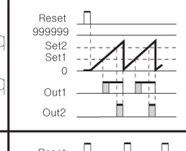
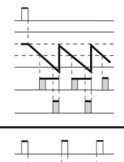
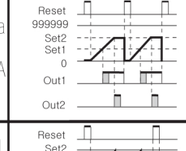
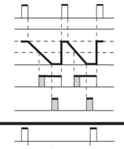
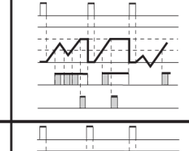
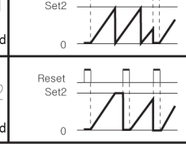
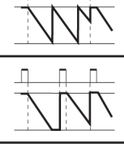
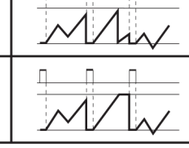
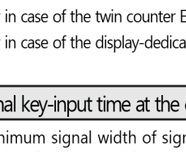
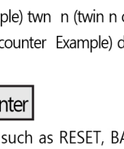
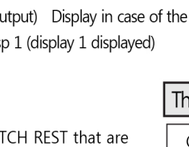
Input mode	UP-A Forbidden input	Input mode	DOWN-A Forbidden input
UP-A		dw-A	
Input mode	UP-B Forbidden input	Input mode	DOWN-B Forbidden input
UP-b		dw-b	
Input mode	UP-AB Individual input	Input mode	DOWN-AB Individual input
Up-ab		dw-Ab	
Input mode	UP/DOWN-A Command input	Input mode	UP/DOWN-D Command input
Ud-A		Ud-d	
Input mode	UP/DOWN-B Individual input	Input mode	UP/DOWN-E Individual input
Ud-b		Ud-e	
Input mode	UP/DOWN-C Phase difference input	Input mode	UP/DOWN-F Phase difference input
Ud-c		Ud-f	

Output operation

In case of the single mode counter

Set value: Set2, Output : Out2 is applied. The pre-set 1 is not displayed.

One-shot output after time delay / Self-sustained output / Self-sustained output: One-shot output (Out1) / One-shot output (Out2)

Output mode	Input mode: UP	Input mode: DOWN	Input mode: UP/DOWN/A,B,C	Explanation of operation
twn n Twin output sng n Single output				out.t / OUT1 / OUT2 HOLD / One-shot output when reaching SET1 / Self-sustained output when reaching SET2 Not in HOLD condition / One-shot output when reaching SET1 / Self-sustained output after time-delay when reaching SET2 Coefficient suspension, display maintenance when reaching Set2. Coefficient/ display / output are initialized when the reset is inputted
twn f Twin output sng f Single output				out.t / OUT1 / OUT2 HOLD / One-shot output when reaching SET1 / Self-sustained output when reaching SET2 Not in HOLD condition / One-shot output when reaching SET1 / Self-sustained output after time-delay when reaching SET2 Coefficient and display maintained Coefficient/ display / output are initialized when the reset is inputted
twn c Twin output sng c Single output				out.t / OUT1 / OUT2 HOLD / One-shot output when reaching SET1 / No output Not in HOLD condition / One-shot output when reaching SET1 / One-shot output when reaching SET2 Initializing coefficient/ display and repetitive operation when reaching Set2 Only the first round of reset input is applied, When Out2 is OFF, Out1 is Off.
twn r Twin output sng r Single output				out.t / OUT1 / OUT2 HOLD / One-shot output when reaching SET1 / No output Not in HOLD condition / One-shot output when reaching SET1 / One-shot output when reaching SET2 The coefficient is suspended and display is maintained when reaching Set2. Only the first round of input is applied after the reset input. / When Out2 is Off, Out1 is Off, After initializing coefficient and display, repetitive operation is done.
twn k Twin output sng k Single output				out.t / OUT1 / OUT2 HOLD / One-shot output when reaching SET1 / No output Not in HOLD condition / One-shot output when reaching SET1 / One-shot output when reaching SET2 Coefficient and display maintained. Coefficient/ display / output are initialized when the reset is inputted / When Out2 is off, Out1 output is off.
twn p Twin output sng p Single output				out.t / OUT1 / OUT2 HOLD / One-shot output when reaching SET1 / No output Not in HOLD condition / One-shot output when reaching SET1 / One-shot output when reaching SET2 Display is maintained and the coefficient is reset when reaching Set2 When Out2 is Off, Out1 is Off. The coefficient value is displayed, Only the first round of reset input is applied.
twn q Twin output sng q Single output				out.t / OUT1 / OUT2 HOLD / One-shot output when reaching SET1 / No output Not in HOLD condition / One-shot output when reaching SET1 / One-shot output when reaching SET2 Coefficient and display maintained. Only the first round of reset input is applied. When Out2 if Off, Out1 is Off. After resetting the coefficient and display, repetitive
twn a Twin output sng A Single output				out.t / OUT1 / OUT2 HOLD / One-shot output when reaching SET1 / No output Not in HOLD condition / One-shot output when reaching SET1 / One-shot output when reaching SET2 The coefficient is suspended and display is maintained when reaching Set2. The independence of Out1 and Out 2 Off operation, Initialization of coefficient / display / output when inputting the reset
Dsp 1 Display dedicated				Initializing the coefficient and display when reaching Set2. Repetitive operation
Dsp 2 Display dedicated				Suspension of coefficient and display when reaching Set2. When inputting reset, initialization is performed and restarted.

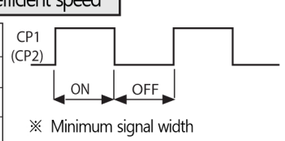
Display in case of the twin counter Example) twn n (twin n output) Display in case of the single counter: Example) sng n (single n output)
Display in case of the display-dedicated counter Example) dsp 1 (display 1 displayed)

External key-input time at the counter

The minimum signal width of signals such as RESET, BATCH REST that are inputted at the terminal block on the back of the product is over 20ms.
If the input is maintained at over 20ms, it is processed as a normal signal.

The minimum signal width for each coefficient speed

Coefficient speed	Minimum signal width
1 cps	500ms
30 cps	16.7ms
1 kcps	0.5ms
13kcps	0.038ms



※ Minimum signal width

※ The minimum signal width is the time when the duty ratio of coefficient input signal is inputted at 1:1 ratio.

Correlations between pre-scale, pre-scale radix point, and displayed radix point

The displayed values at the Pre.p (Prescale radix point) menu is displayed by shifting the radix point location at the pres (pre-scale value).
Example) Pre-scale value: 123456
- Pre-scale radix point : Displayed as 12.3456 when setting up the second digit of the radix point
- Pre-scale radix point : Displayed as 123.456 when setting up the third digit of the radix point
- Pre-scale radix point : Displayed as 1234.56 when setting up the fourth digit of the radix point

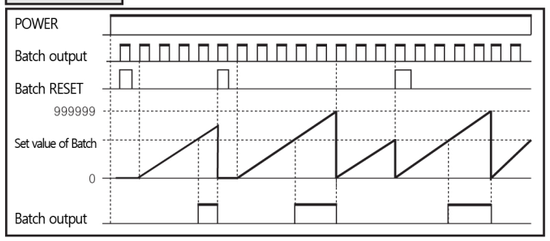
Augmenter value of 1 count

dot.p // When displaying the augmenter value of 1 count on the operation screen, dot.p decides the location of the radix point.
When the augmenter value of 1 count set above is 0001.11, and if the dot.p (displayed radix point) is
- 0, it is displayed as a form of 000001 -> 000002 -> 000003 ->
- 0.0, it is displayed as a form of 00001.1 -> 00002.2 -> 00003.3 ->
- 0.00, it is displayed as a form of 0001.11 -> 0002.22 -> 0003.33 ->
- 0.000, it is displayed as a form of 001.110 -> 002.220 -> 003.330 ->

Output depending on the batch set-up

Set value of Batch	OUT1 output	OUT2 output	BATCH output
ry-1	Out1 LED Out1 TR	Out2 LED Out2 TR Relay2	Batch LED Relay1
tr	Out1 LED Out1 TR Relay1		Batch LED Batch TR
all	Out1 LED Out1 TR		Batch LED Batch TR Relay1
off	Out1 LED Out1 TR Relay1		

Batch counter



*The batch coefficient increases whenever the displayed value reaches the set value.
* When the coefficient value exceeds 999999, it is initialized as 0. The repetitive coefficient operation restarts starting from 0.
* The batch output can be selected among OUT1, TR, OUT1+TR, OFF.
* How to reset the batch counter
- Through the reset-key on the front : Only available when the set-up value is displayed on the batch counter or on the shift mode.
- Through the reset input on the back : Reset available under every condition.
※ Caution when using the batch counter
- When setting the batch output as relay, the Out1 relay is operated as batch output.

How to shift onto the display mode on the operation screen

On the operation screen, you can check the pre-set details and batch counter values, using up arrow and down arrow keys.

Current value
Set value of Pre-set 1

Display and change mode for pre-set1 value
You can change the pre-set1 setting by pushing the button of MD or ✱

Current value
Set value of Pre-set 2

Display and change mode for pre-set2 value
You can change the pre-set1 setting by pushing the button of MD or ✱

Current value
Current value of the batch counter

Display mode of current value at the batch counter
Mode only for display.

Current value of the batch counter
The set value of the batch counter

Display and change mode for the batch counter set value
You can change the batch counter setting by pushing the button of MD or ✱

State changes depending on set value change

1. When changing the 1/2 of preset or batch counter set in the process of operation
- The coefficient, display and output are maintained even when the setting is being done.
- When the setting is completed, the memory is immediately saved and reflected to the current process.

2. When accessing to the detailed setting menu
- Coefficient and output maintained in the process of set-up
- When the setting is completed, any changed detail is reflected to set value and reset is done.
- When the setting is completed, if nothing is changed, the set value is not saved and conventional operation is maintained.

Display of error

■ In case of displaying Er1 when power supply approval is in the process,
- This is when the memory inside of the system causes error due to external noise or surge. Remembered set values are changed into null values.
If you push the RESET key, every set value is initialized into the default value.

※ The specifications of the product above can be changed without previous notice for the sake of performance improvement of the device.
※ Please read thoroughly the caution before using the device and abide by it.

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■ Customer service: Contact number- 051)819-0427
■ E-mail: conotec@conotec.co.kr
■ Webpage: www.conotec.co.kr

※ This device best performs under the condition below.
Ambient temperature: 0℃~60℃
Ambient humidity: Below 80%RH
Rated power supply: Below 220 VAC ± 10%

■ Main products produced and developed
- Digital temperature/ humidity regulator
- Digital timer, Digital counter
- Electric current/ Voltage meter
- Other devices