



CONOTEC®

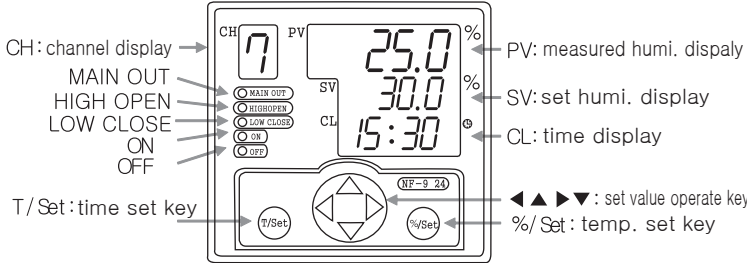
CONOTEC CO., LTD.

www.conotec.co.kr

NF-9H24 Manual
Digital Control Panel Meter



2. Part names



Key functions

1. **%/Set** : The key for setting humidity and program change
2. **T/Set** : The key for setting time and program change
3. **◀▶▲▼** : The key for changing temperature and time program set value

3. Code composition

NF — 9 H 24						
type	case	input	main output	aux.output kinds		
NF (ON-OFF series)	1 Other	P P T	R Relay	1 alarm		
	2 72*36	C CA	S SSR	2 defrost		
	4 48*48	N NTC	A 4~20mA	3 communication		
	5 96*48	A 4~20mA		4 alarm, defrost		
	6 48*96	H Humi 10~95 %		5 alarm,communi.		
	7 72*72			6 defrost, communi.		
	8 815			7 alarm,com,defrost		
	9 96*96		24 24 hour 9 channel green house controller			

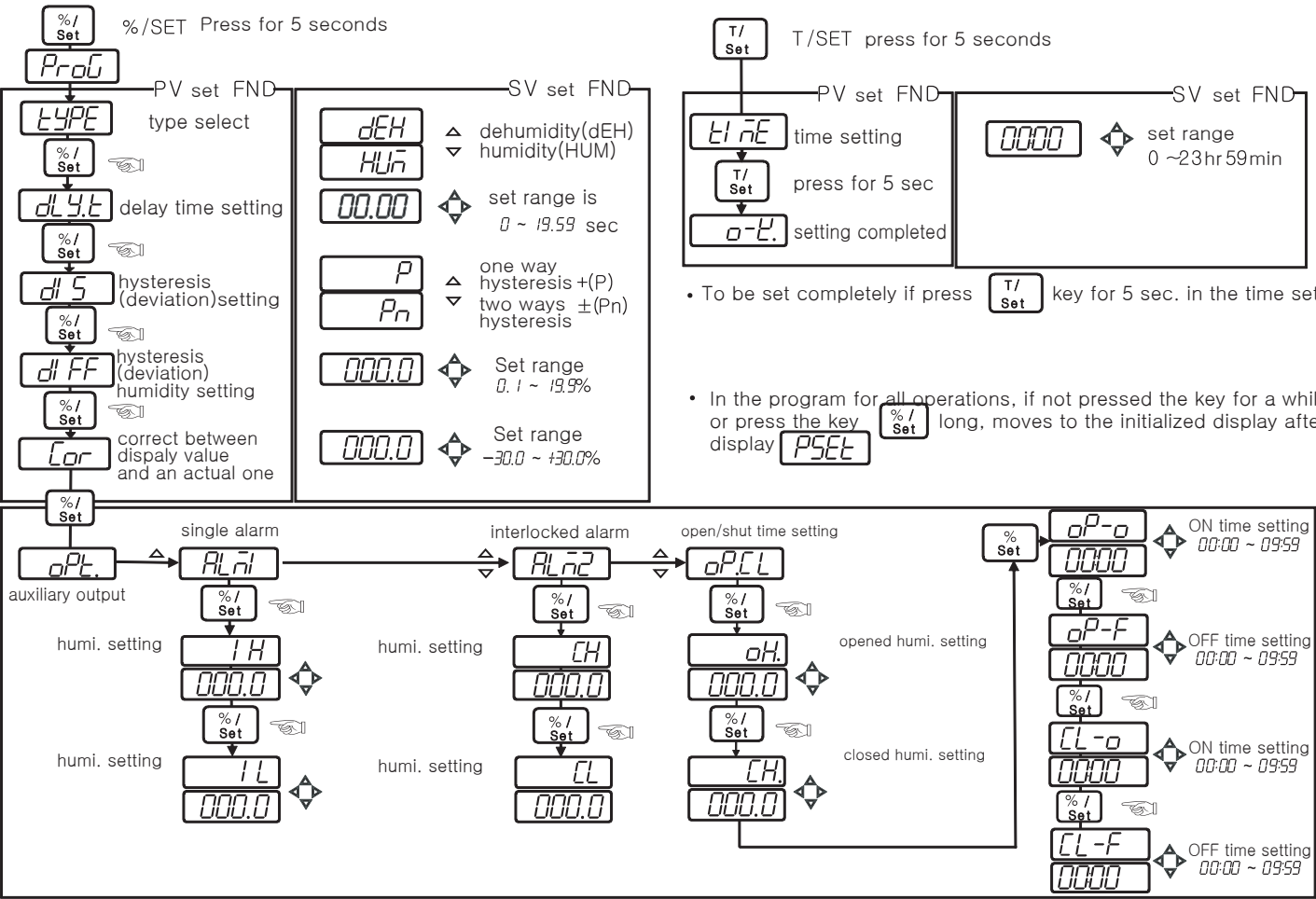
4. Rating/performances

Power supply	AC 100~240V , 50~60Hz	
Change range of allowance voltage	90%~110% of power supply	
Power consumption	Less than approx. 4VA	
Method of display	7Segment LED Display [Measured value (PV),set value (SV): red , channel(CH): green]	
Display degree	F.S + 0.3% or 3℃ which side on the higher	
Input specifications	Thermocouple : K(CA) < allow track resistance 100Ω > below	
	Resistance temperature detector (RTD):DIN Pt100Ω	
Control type	NTC, 4~20mA	
	Humidity: HCPV-220	
Control output	Main output : relay SPDT max.250VAC, 2A(resistive load)	
	Aux. output : SPST max.250VAC,2A(resistive load)	
Ambient temperature	Current output : 4~20mA DC , load resistance : less than 300Ω	
	0℃ to +50℃ (but, not in the state of freezing)	
Ambient humidity	35% to 85% RH(non-condensing)	
Reserved temperature	-20℃ to +65℃	

5. Input range and set value when shipment

Sensor	Humidity				
HCPV-220	10~95%				
Mode	set point	oPt mode	set point	oPt mode	set point
TYPE	dEH	ALn1		oPCL	
dLYt	00:00	1H	100.0	oH	100.0
dLS	P	1C	0.0	CH	-100.0
dLFF	1.0	ALn2		oP-o	09:59
Cor	0.0	CH	100.0	oP-F	09:59
oPt.	ALn1	CL	-100.0	CL-o	09:59
				CL-F	09:59

6. Program setting



1. Caution for safety

⚠ WARNING

This product should be used after installing the double safe device in case of using control purpose such as a device with great concern to personal injury and damage, significant peripheral damage, and property damage as it is not manufactured as safety device.

- Do not connect, check, repair when at the power supplying state.
- Make sure to check the socket number before connecting the power.
- Never disassemble process, improve or repair this equipment.

⚠ CAUTIONS

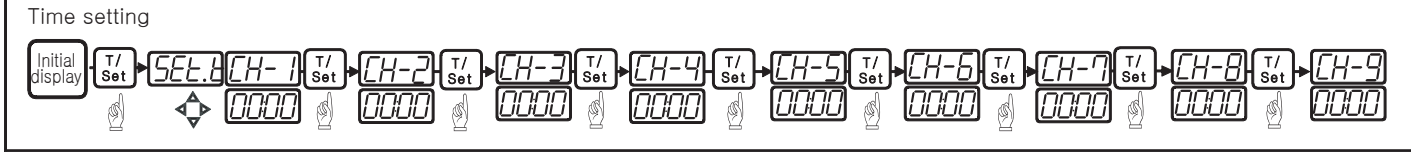
- Do not install outdoors.
- Must be used in rating / performance range.
- Do not use the parts that generate the arc at same power or near directly opening and closing.
- Power line should be kept away from high-voltage line and do not install in the watery, oily, and dusty place.
- Do not install this device in a place exposed to direct sunlight, flammable or explosive gas, direct sunlight, radiant heat, vibration, shock place.
- Sensor line should be kept away signal, power, and load lines, and use an independent piping.
- Do not use near where devices generate strong high-frequency noise (high-frequency welders, high-frequency sewing machine, high frequency radios, large SCR controller).
- If you use this device beyond the method specified by the manufacturer, it may cause injury or property damage. Please use shielding wire at the sensor extension and do not make it unnecessarily long.

■ Caution, risk of electric shock.

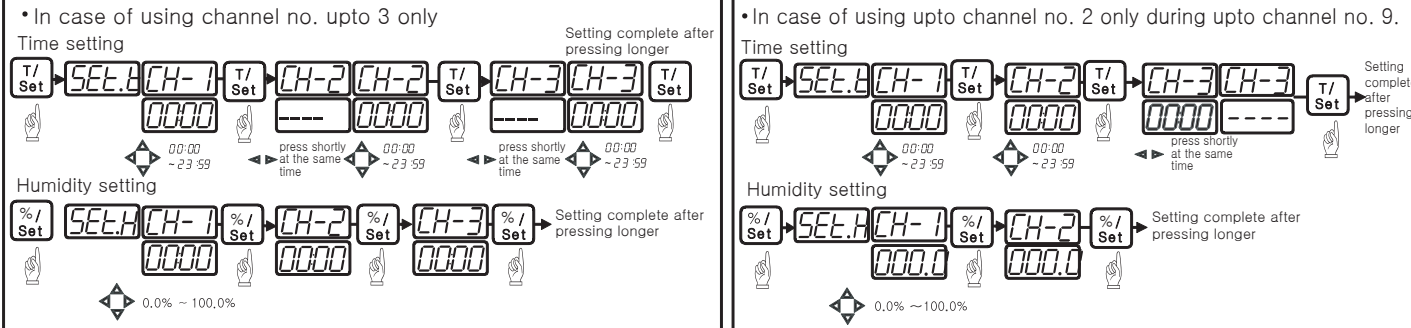
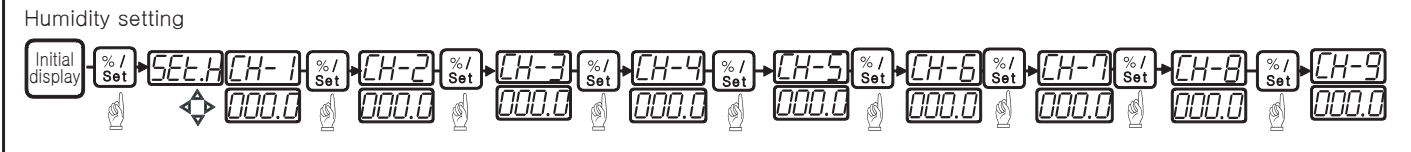
- Electrical shock – Do not touch at the AC terminal during the application of an electric current.
- Must shut off the input power during the input power check.
- Although our controller is designed as the complementary measures regarding these noise from outside, if noise(2KV) disordering become an inflow, the inner-part will be damaged.
- In case o-E (open error) S-E (short error) Err (error) is displayed, the sensor has problem. Check the sensor.
- In case shown the character like r232 Err (communication error) it means the problem with the communication cable or cut off communication between the sensor unit and control unit.

7. Time setting per channel and temp. setting

※ Only temperature setting available at the relevant channel at first time setting per channel.

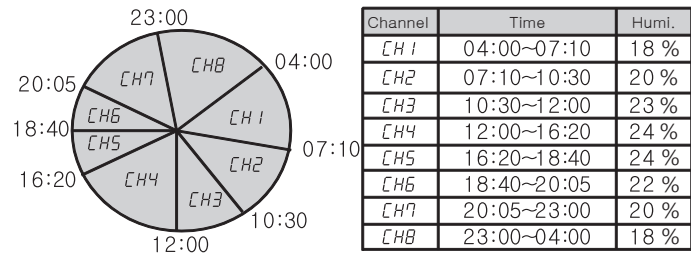


- Basic setup for time display is CH2~CH9
- When the relevant channel to set the time, at the time displayed press the button at the same time shortly, will be turned to be set available status.
- If no pressing for a certain period after time setting or long pressing, move to the initial screen after saving set value.
- Time setting available range through whole channel is 00:00 ~ 23:59.
- Time set value for channel no. 1 should be always closer to 00:00 than other channel.
- In case of saving the channel no. 2 time set value is same with the channel no. 1 or less will be dispalyed.
- Moving to the initial display at the right time set value and the set value can be saved.
- Time set value per channel is for time to start at the relevant channel.
- In case of channel no. 1 : 3:00 → apply time from 3:00 as a set value for channel no. 1 to next channel start time.

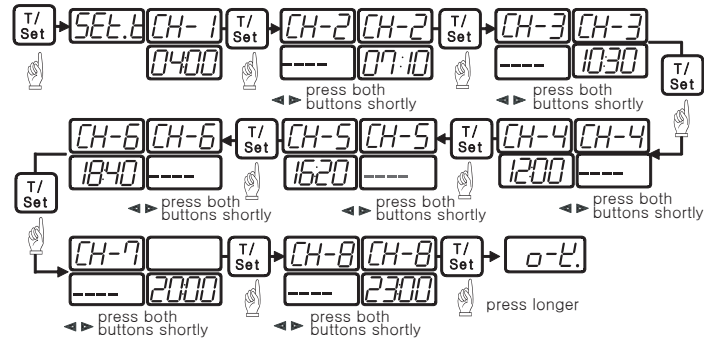


8. Program example

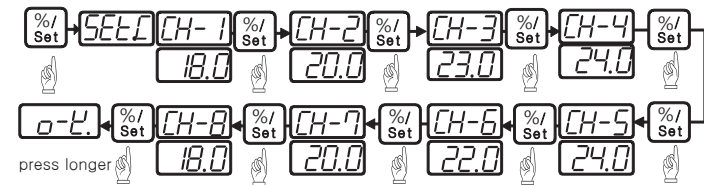
• Channel setting example per time



time setting



humidity setting



9. Alarm & OPEN/CLOSE

◎ Alarm output

– Alarm functions are single alarm **ALn1**, interlocked alarm **ALn2**

Single alarm – high limit alarm : If the current humi. is higher value than **1H** ON

– Single low limit alarm : If current humi. is lower than **1L** ON

Interlocked alarm – Interlocked high limit alarm : If the current humi. is higher than set value + **CH** ON

– Interlocked low limit alarm : If the current humi. is lower than set value + **CL** ON

– OPEN / CLOSE **oPCL**

OPEN – : If the current humi. is higher than set value + **oH.** ON

oH. set to humidity open

oP-o set to open output ON time

oP-F set to open output OFF time

CLOSE – : If the current humi. is lower than set value + **CH.** ON

CH. set to humidity close

CL-o set to close output ON time

CL-F set to close output OFF time

OPEN / CLOSE operation use example

– Green house is set to be controlled humidity by opening and closing the door.

• If you want to make it slow opening and fast closing, open it at 30%, close at 15% but set value should be 20%?

Set **oH.** at 10% and **CH.** at -5%

Due to make opening slowly, should set short ON time, long OFF time.

ex) **oP-o** = 1min **oP-F** = 3min
action : for 1 min. to move and 3 min. to stop repeatedly.

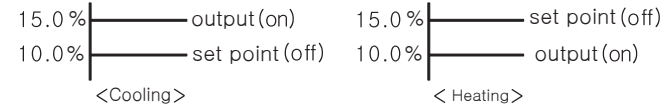
Due to make closing fast, should set long ON time, short OFF time.

ex) **CL-o** = 3min **CL-F** = 1min
action : for 3 min. to move and 1 min. to stop repeatedly.

10. Detailed explanation

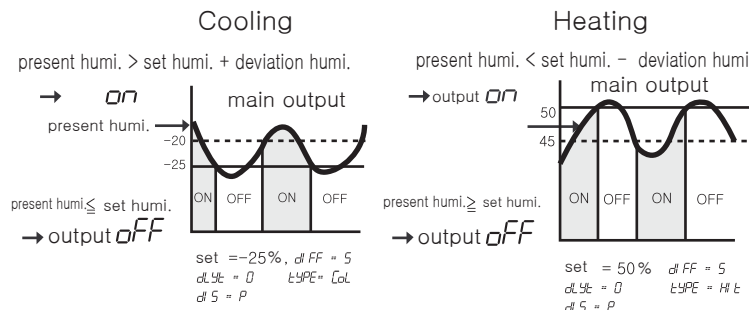
1. **TYPE** : Humidity operation setting
Dehumidity(dEH) or humidity(HUM) selection

2. **dIF** : Hysteresis Applying method selection
P Apply deviation value to + direction only (OFF at set point)
ex)set :10.0%, type:COL, dIF:5.0 ex)set:15.0℃, type:HIT, dIF:5.0

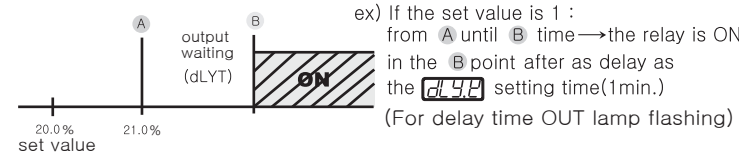


Pn Apply deviation value to +- both directions(Set point is based)

3. **dIFF** : Setting for humidity deviation
– In the ON/OFF control, it need 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 humidity deviation in order to protect its relay or contact and so on.



4. **dLYP** : Output delay time
–When control object has a problem due to frequent ON/OFF action(refrigerator compressor etc..) –It protects operating machine at momentary power failure or re-supply of power.



5. **Cor** : Correction of the present humi.
– If it's generated by External Signal Input Sensor error and reference humidity while there is no problem in the product.
Ex) Function to correct the different value from the existing hygrometer's in using.

Ex) Actual humidity : 10.0%
Display window : 12.0%

Cor : 0.0 → -2.0 correction
→ Display : Displayed as 10.0% (corrected present humidity)

6. **Adr** : Communication address setting
– Code number 1~99 should be designated when RS485 is used.

7. **bPS** : Communication speed setting

120 **1200** : 1200bps

240 **2400** : 2400bps

480 **4800** : 4800bps

960 **9600** : 9600bps

192 **1920** : 19200bps

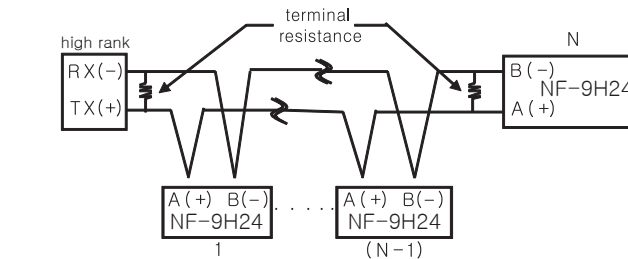
(Start bit 1, Stop bit 1, Non parity)

11. Communication output

■ Interface

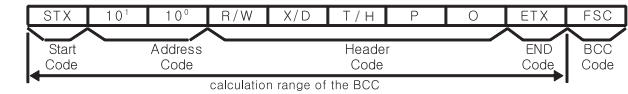
Specification	in conformity EIA RS485
Max. speed	32 units (but, address setting can be upto 01~99)
Method of communication	two wire half-duplex operation
Synchronous system	asynchronous system
Communication distance	1.2 Km
Communication speed	1200/2400/4800/9600/19200bps (selectable)
StartBit	fixed 1bit
StopBit	fixed 1bit
ParityBit	none
DataBit	fixed 8bit
Protocol	BCC

■ System

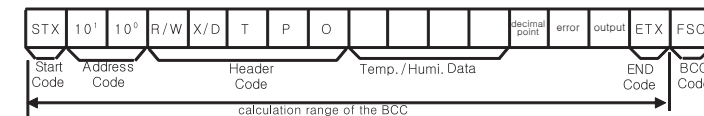


■ Definition between communication command and block

< Command format >

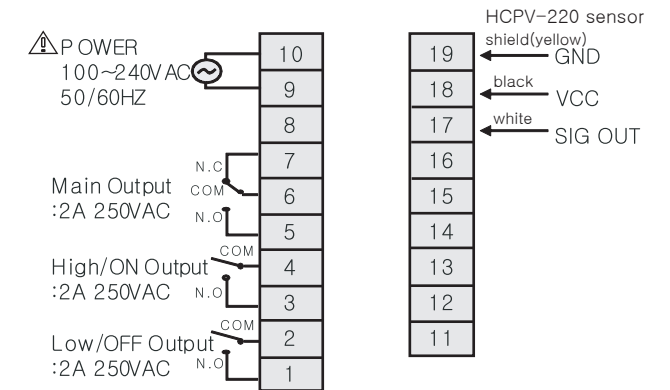


< Response format >

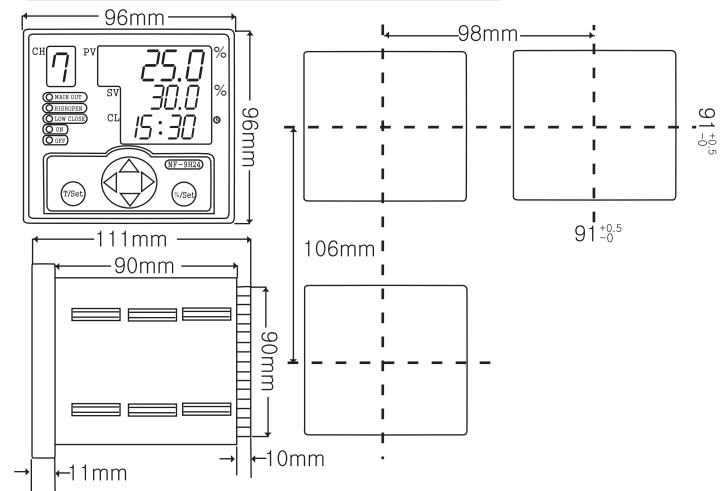


- Start Code
– show the lead(head) of the block
STX → [02H]
- ADDRESS CODE
– A high rank system can discriminate the channel code number among NF-9H24
It is available to set between 01 and 99(BCD ASCII)
(ex-in case of the channel is 01, will be 30H,31H)
- Header Code
– Show the command name as an alphabetic letter.
RX(reading demand) → R[52H], X[58H]
RD(reading response) → R[52H], D[44H]
WX(writing demand) → W[57H], X[58H]
WD(writing response) → W[57H], D[44H]
TPO(humidity measuring value) → W[54H], P[50], O[30H]
- Composition of data
– Data is displayed as "Hexadecimal"
- Decimal point → 0[30H] there is no "decimal point"
1[31H] there is "decimal point"
- Error → 0[30H] there is no "error"
1[31H] interrupted of the sensor's cable
2[32H] short-circuited error of the sensor
- Output → 1[31H] T/H OUT ON
3[33H] T/H OUT OFF
- END Code
– Show the end (close) of the Block ETX → [03H]
- BCC(Block Check Character)
– Show the XOR arithmetic and logic values from the start(STX) to the ETX
* The others : in case of not response of the ACK
① In case of not equivalent to the channel after receiving STX
② In case of generating the receive buffer overflow
③ In case of not equivalent to the communication's set values or baud rate
* Treatment – in case of no response of the ACK
① Check the cable
② Check the communication's condition (set values)
③ If the main cause of the status is the noise, try to do communication practicing 3-times until recovering nomally.
④ Change the communication speed in case of bring about the communication's error frequently.

12. Terminal Wiring Diagram



13. Dimension & Panel size(Unit:mm)



14. Product Handling Precautions

■ Indicating ERROR on using items.

- Er1** : humidity setting value error
- Er2** : channel time setting value error
- Er3** : program setting value error
- Er4** : internal timer error
- Er5** : internal sensor data error

• When **o-E** (Open Error) or **S-E** (Short Error) is displayed, it indicates that sensor has problem. Please check the sensor.

■ Regarding the English-language manual, please download it at our website.

* The product specifications are subject to change without notice to improve the performance of the product.
Please be sure to keep familiar with the content specified in the handling instructions well.

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* This device works proper operation with :
Ambient Temp : 0 ~ 60℃
Ambient Humi. : below 80%RH
Regular power : 220VAC ±10% 50/60Hz

■ Main product and development
– Digital temp./humi. controller
– Digital timer, Current/Voltage meter
– Development of other products.