Digital temperature controller

INSTRUCTION MANUAL

Thank you for purchasing Hanyoung Nux products. Please read the instruction manual carefully before using this product, and use the product correctly. Also, please keep this instruction manual where you can view it any time

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HANYOUNG NUX

Safety information

Please read the safety information carefully before the use, and use the product correctly.
The alerts declared in the manual are classified into 'DANGER', 'WARNING' and 'CAUTION' based on its importance

⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury			
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury			
△ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor injury or properties damage			

DANGER

The input/output terminals are subject to electric shock risk. Never let the input/output terminals come in contact with your body or conductive substances.

⚠ WARNING

- WARNING

 If there is a possibility of a serious accident due to malfunction or abnormality of this product, install an appropriate protection circuit on the outside.

 Since this product is not equipped with a power switch and fuse, install them separately on the outside (fuse rating' 250 Va.c., 0.5 A).

 Please supply the rated power voltage, in order to prevent product breakdowns or malfunctions.

 The power supply should be insulated and limited voltage/current or Class 2, SEU power supply device.

 To prevent electric shocks and malfunctions, do not supply power until the wiring is completed.

 The product does not have an explosion-proof structure, so avoid using it in places with flammable or explosive gases.

 Never disassemble, modify, process, improve or repair this product, as it may cause abnormal operations, electric shocks or fires. Please disassemble the product after turning OFF the power. Failure to do so may result in electric shocks, product abnormal operations or malfunctions.

 Any use of the product other than those specified by the manufacturer may result in personal injury or property damage.

 Please uses this product after installing it to a panel, because there is a risk of electric shock.

 When used in equipment with a high risk of personal injury or property damage (syamples) medical devices purchase control.
- When used in equipment with a high risk of personal injury or property damage (examples: medical devices, nuclear control, ships, aircrafts, vehicles, railways, combustion devices, safety devices, crime/disaster prevention equipment etc.) install double safety devices and prevent accidents. Failure to do so may result in fire, personnel accident or property damage.

♠ CAUTION

- The contents of this manual may be changed without prior notification.
 Please make sure that the product specifications are the same as you
- Please make sure that there are no damages or product

- Please make sure that there are no damages or product abnormalities occurred during shipment.
 Use this product in the following environments:

 Do not use outdoors.

 use it in the ambient temperature and humidity ranges indicated in the instruction manual.

 use it in locations where corrosive gases (especially harmful gases, ammonia, etc.) and flammable gases are not generated.

 use it in places where vibrations and impacts are not directly applied to product body.

 use it in places without liquids, oils, chemicals, steam, dust, salt, iron, etc. (pollution degree 1 or 2).

 avoid places where large inductive interference, static electricity, magnetic noise are generated.

 avoid places with heat accumulation caused by direct sunlight, radiant heat, etc.

- reuse it in places with elevation below 2000 m.

 Power input and relay output wires are at least 75 °C of heat resistance and, use copper wires from 18 AWG to 24 AWG.

Suffix code

- Please do not wipe the product with organic solvents such as alcohol, benzen, etc. (wipe it with neutral detergents).

 When water enters, short circuit or fire may occur, so please inspect the product carefully.

 For thermocouple input, use the predetermined compensating cable (temperature errors occur when using ordinary cable).

 For RTD input, use a cable with small lead wire resistance and without resistance difference among 3 wires (semperature errors occur if the resistance value among 3 wires to different).

 Use the input signal line away from power line and load line to avoid the influence of inductive noise.

 Input signal line and output signal line should be separated from each other. If separation is not possible, use shield wires for input signal line.

 Use a non-grounded sensor for thermocouple (using a grounded sensor may cause malfunctions to the device due to short circuits).

 When there is a lot of noise from the power, we recommend to use insulation transformer and noise litter. Please install the noise filter to a grounded panel or structure, etc. and make the wiring of to a grounded panel or structure, etc. and make the wiring of noise filter output and product power supply terminal as short as
- Fightly twisting the power cables is effective against noise If the alarm function is not set correctly, it will not be output in case of abnormal operation, so please check it before operation.
- When replacing the sensor, be sure to turn off the power.
 Use an extra relay when the frequency of operation (such as proportional operation, etc.) is high, because connecting (such as proportional operation, etc.) is high, because connecting the load to the output relay rating without any room shorters the service life. In this case, SSR drive output type is recommended.

 *When using electromagnetic switch set the proportional cycle to at least 20 sec.

 *When using SSR set the proportional cycle to at least 1 sec.

 Do not wire anything to unused terminals.

 *Please wire correctly, after checking the polarity of the terminals.

 When you install this product to a panel, please use switches or circuit breakers compliant with EGO9471 or IEGO9471 are IEGO9473.

 Please install switches or circuit breakers at close distance for user convenience.

- user convenience.
 Please specify on the panel that, since switches or circuit breakers are installed, if the switches or circuit breakers are activated, the power will be cut off.
 We recommend regular maintenance for the continuous safe use of this conduct.
- of this product.

 Some components of this product may have a lifespan or deteriorate
- The warranty period of this product, is 1 year, including its
- accessories, under normal conditions of use.

 The preparation period of the contact output is required during power

- The preparation period of the contact output is required during power supply. If used as a signal to external interlock circuit, etc. please use a delay relay together.

 If the user changes the product in case of malfunctions, the operation may be different due to set parameters differences even if the model name is the same. So, please check the compatibility.

 Before using the temperature controller, there may be a temperature deviation between the PV value of the temperature controller and the actual temperature, so please use the product after calibrating the temperature deviation.

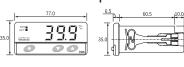
 The write life of non-volatile memory (EEPROM) is one million times. When configuring the system, please make sure that the number of times that data are written to non-volatile memory does not exceed one million times.

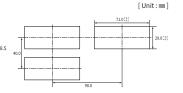
Model	Code			Description		
ED6-				Digital temperature controller		
Control type F				Proportional or ON/OFF control (use parameter setting)		
	K					Thermocouple K
Input	P				RTD Pt 100 Ω (IEC)	
	C 4 - 20 mA d.c. (As external resistance 250Ω attached), 1 - 5 V d.c.					
Control output M S				Relay		
		S			SSR (voltage pulse output 10 V d.c. and more than)	
Option A N			Α		Alarm or defrost timer	
			N		NONE	
Power supply voltage				P3	10 - 24 V d.c.	
				P4	100 - 240 V a.c. 50/60 Hz	

Specification

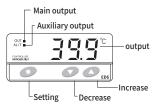
everyone	AC power type	00 - 240V~ 50/60Hz					
Voltage DC power type		10 - 24V, Class2					
voltage change rate		±10% of supply voltage					
Consumption	AC power type		10.0 VA or less				
power	DC power type		2.0 VA or less				
Ir	nput		K, Pt 100 Ω, 4 – 20 mA d.c., 1 – 5 V d.c.				
Indicate	accuracy		±0.5 % of FS ± 1 Digit				
Control output		Relay	Contact setup: 1 c, 250 V a.c., 5 A (resistive load)				
		SSR 10 - 15 V d.c. (Load resistance 500Ω or more), Approx. 20 mA V d.c. Max					
Alarm/Defrost		Relay Contact setup: 1 c, 250 V a.c., 5 A (resistive load)					
Control acting Setting method Additional features		Reverse acting(heating) or direct acting(cooling)					
		Digital type manipulated by setting, increase and decrease buttons					
		Alarm & Defrost					
Wirer	ocietaneo	Thermocouple Below 100 Ω round trip.					
Wire resistance		R.T.D	Below 10 Ω for each wire (Resistance of 3 wires should be the same.)				
Ambient temperature/humidity Approval Weight		0 °C ~ 50 °C / 35 ~ 85 % RH (condensation)					
		CE					
		116 g					

Dimension and panel cutout



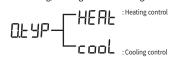


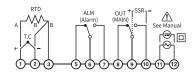
■ Part name



■ Temperature control setting Connection diagram

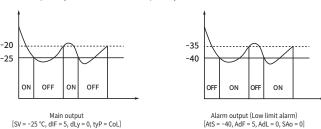
■ Heating/cooling control setting





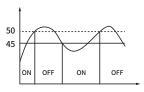
■ Cooling control(ON/OFF)

• PV \rangle SV \rightarrow Main output relay "ON" / PV \langle SV \rightarrow Main output relay "OFF"

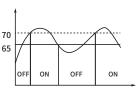


 $\label{eq:main_output} \mbox{Main output} \\ \mbox{[SV = -25 °C, dIF = 5, dLy = 0, tyP = CoL]}$ ■ Heating control(ON/OFF)

• PV > SV → Main output relay "OFF" / PV < SV → Main output relay "ON"

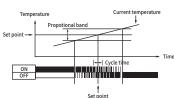


 $\label{eq:main_output} \mbox{Main output} \\ \mbox{[SV = 50 °C, dIF = 5, dLy = 0, tyP = HEt]}$



Alarm output (Low limit alarm) [AtS = 70, AdF = 5, AdL = 0, SAo = 0]

Proportional control



- "Proportional control", when the manipulated value (MV, output amount) for the set value operates in proportion to the deviation and the range that MV varies from 0-100% is "proportional band".

 Therefore, in case current temperature is lower than the proportional band, MV should be 100%, otherwise, 0%. If SV matches current temperature, MV(output) should be 50%.

Delay Timer Setting

 $\bullet \text{ In current temperature condition, press} \ \text{key for 3sec, move} \ \text{key to 2dL} \ \text{4}. \ \text{and then change the setting to}$ △ key. lastly, save them with key.

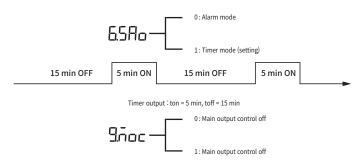
■ Operating by delay-timer



** ① As Delay time=0, When output signal occurs, Relay is immediately turend on.
② As Delay time=5, After output signal occuring, Relay should be turend on in 5 sec while delay-timer operating, output display is flackering.
** This function works only under ON/OFF control

Auxiliary output(Timer-mode) setting and operating description

• It is available to use time-mode as defrost function with freezer.



- Under MOC"1" setting, main output automatically turns OFF if timer is turned ON.
 Using MOC function, you can effectively use timer output as a defrost function.
 This function works only under ON/OFF control.

Output capacity and set value verification mode

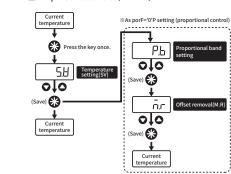
Heating Control MODE	Cooling Control MODE		
PV < SV: Increase M.R value	PV > SV: Increase M.R value		
PV > SV : Decrease M.R value	PV < SV: Decrease M.R value		

User setting mode

Function selection Press the (Change of SV) Press the

■ ON/OFF control (ProF:1)

■ Proportional control (ProF:0)

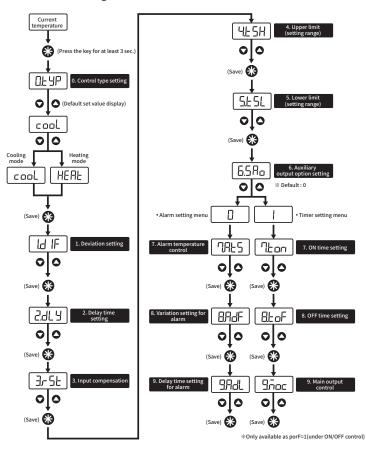


	Symbol (PV)	category	Description	Display	Default
	SV	Setting Temperature	TSL (lower limit) to TSH (High limit)	Always	25.0 °C
	Pb	Proportional band setting	K, Pt 100 1 ~ 100 °C	PORF = 0	10 °C
			1 - 5 V 1 ~ (H-SC - L-SC)		
	MR	manual reset	0~100	PORF = 0	50 %

Installer setting mode

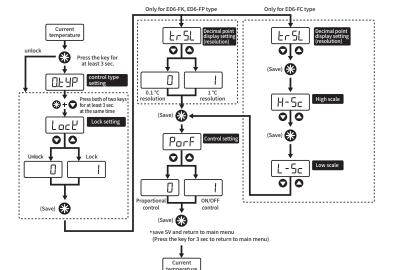
○ SV change

(Save)



Symbol (PV)	category		Description	Display	Default
0.TYP	Current Temperature	cooling,h	eating	Always	HEAT
1.DIF	Deviation setting	K, Pt 100	0.2 ~ 50.0°C (TRSL = 0) 1 ~ 50°C (TRSL = 1)	Almana	K, Pt100:1.0°C 1-5V:1
1.DIF		1 - 5 V	1 ~ 500	Always	
2.DLY	Delay-time setting	0 ~ 240 se	ec	Always	0 sec
3.RST	manual reset	K, Pt 100	- 30.0 ~ 30.0 °C (TRSL = 0) - 30 ~ 30 °C (TRSL = 1)	Always	K, Pt100: 0.0°C 1-5V: 0
3.831	manuat reset	1 - 5 V	- 300 ~ 300	Aiways	
		К	TSL ~ 999.9 °C (TRSL = 0) TSL ~ 999 °C (TRSL = 1)		K:999.9 °C Pt 100:400.0 °C 1 − 5 V:5000
4.TSH	Upper limit (setting range)	Pt 100	TSL ~ 400.0 °C (TRSL = 0) TSL ~ 400 °C (TRSL = 1)	Always	
		1 - 5 V	TSL ~ H-SC		
	Lower limit (setting range)	К	- 80.0 °C ~ TSH (TRSL = 0) - 80 °C ~ TSH (TRSL = 1)	Always	K:-80.0 °C Pt100:-100.0 °C 1-5V:-1000
5.TSL		Pt 100	- 100.0 °C ~ TSH (TRSL = 0) - 100 °C ~ TSH (TRSL = 1)		
		1 - 5 V	L—SH ~ TSH		
6.SAO	Auxiliary output option	0 : Alarm	setting, 1: Timer setting	Always	0
	Alarm temperature setting	К	- 80.0 ~ 999.9 °C (TRSL = 0) - 80 ~ 999 °C (TRSL = 1)	SAO = 0	K:999.9 °C Pt 100:400.0 °C 1 - 5 V:5000
7.ATS		Pt 100	- 100.0 ~ 400.0 °C (TRSL = 0) - 100 ~ 400 °C (TRSL = 1)		
		1 - 5 V	L-SH~H-SC		
8.ADF	Alarm-deviation	K, Pt 100	0.2 ~ 50.0 °C (TRSL = 0) 1 ~ 50 °C (TRSL = 1)	SAO = 0	K, Pt100:1.0°C
6.ADF	time setting	1 - 5 V	1 ~ 500		
9.ADL	Alarm-delay time setting	0 ~ 240 se	ec	SAO = 0	0 sec
7.TON	Timer-on setting	0 ~ 3600 ı	nin	SAO = 1	1 min
8.TOF	Timer-off setting	0 ~ 3600 r	nin	SAO = 1	3 min
9.MOC	Main output control	0 : output	control release, 1 : Output control	SAO = 1	0

Administrator setting mode



Symbol (PV)	category		Description	Display	Default
LOCK	SV lock setting		0 : Unlock, 1 : Lock	Always	0
TRSI	Decimal point setting	K, Pt 100	0 ~ 1 (0∶Decimal point display, 1∶No Decimal point display X)	Always	0
IKSL		1 - 5 V	0 ~ 2 (0 : decimal point location) Ex) 0 : 200, 1 : 20.0, 2 : 2.00		
H-SC	High scale		L-SC~5000	1 — 5 V (ED6-FC type)	5000
L-SC	Low scale		-1000 ~ H-SC	1 — 5 V (ED6-FC type)	-1000
PORF	Control type setting		0 : Proportional control 1 : ON/OFF control	Always	1