

Digital Temperature Controller

**ED6****INSTRUCTION MANUAL**

We appreciate you for purchasing HanYoung NUX Co.,Ltd product. Before using the product you have purchased, check to make sure that it is exactly what you ordered. Then, please use it following the instructions below.

**MAIN PRODUCTS**

- DIGITAL : Temperature Controller, Counter, Timer, Speedmeter, Tachometer, Panel Meter, Recorder
- SENSOR : Proximity Sensor/Photo Electric Sensor, Rotary Encoder, Optical Fiber Sensor, Pressure Sensor
- ANALOG : Timer, Temperature Controller

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**HANYOUNG****■ Safety information**

Before you use, read safety precautions carefully, and use this product properly. The precautions described in this manual contain important contents related with safety; therefore, please follow the instructions accordingly. The precautions are composed of DANGER, WARNING and CAUTION.

**⚠ DANGER**

There is a danger of occurring electric shock in the input/output terminals so please never let your body or conductive substance is touched.

**⚠ WARNING**

1. To prevent deflection or malfunction of this product, apply a proper power voltage in accordance with the rating.
2. Since this product is not designed with explosion-protective structure, do not use it any place with flammable or explosive gas.
3. Reassemble this product while the power is OFF. Otherwise, it may be a cause of malfunction or electric shock.
4. There is a possibility of occurring electric shock so please use this product after installing it to a panel while it is operating.

**⚠ CAUTION**

1. The contents of this manual may be changed without prior notification.
2. Make sure that there is no damage or abnormality of the product during delivery.
3. Do not use this product at any place with direct vibration or impact.
4. Do not use this product at any place with liquid, oil, medical substances, dust, salt or iron contents. (Use at Pollution level 1 or 2)
5. Do not use this product at any place with a large inductive difficulty or occurring static electricity or magnetic noise.
6. In case of inputting thermocouple, use a compensating cable. (If using a normal wire, there is a possibility of occurring temperature error.)
7. For R.T.D input, use a cable which is a lead wire has small resistance and resistances of three wires shall be the same. (If the three wires have different resistances then there will be a temperature error.)
8. Separate an input signal cable from an output signal cable. If separating is not possible, please use the input signal cable after shielding it.
9. Use non-earth sensor with thermocouple. (In case of using earth sensor, there is a possibility of occurring malfunction caused by a short circuit.)
10. If there is excessive noise from the power supply, using insulating transformer or noise filter is recommended. The noise filter must be attached to a panel which is already connected to a ground and the wire between the filter output and power supply terminal must be short as possible.

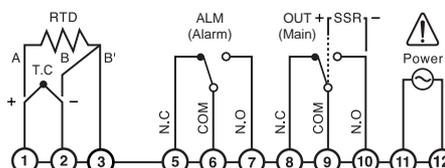
11. When attaching this product to a panel, use an approved switch or circuit breaker from IEC947-1 or IEC947-3.
12. The warranty period for this product including parts is one year if this product is properly used.
13. When the power is on, the preparation period of contact output is required. In case of using for signals of external interlock circuit, use with a delay relay.

**■ Model and Suffix code**

MODEL	Suffix code	Description
<b>ED6</b>	[ ][ ][ ][ ][ ][ ]	Aspect 77 x 35 mm
Control	F	ON/OFF Operation
Operation	P	Proportional Operation (P control)
Input Sensor	K	K(CA) · Range : -80.0 ~ 999.9 °C
	P	Pt100(Din) · Range : -100.0 ~ 400.0 °C
	C	1 ~ 5 V DC · Range : -1000 ~ 5000 4 ~ 20 mA DC (*attach 250 Ω(±0.1 %) resistor in input terminal)
Output Control	M	Relay Contact Point
	S	SSR Output (Voltage Pulse 5 V DC)
Options	A	Alarm & Defrost
	N	None
Power Supply	P3	10 ~ 24 V DC, AC
	P4	100 ~ 240 V AC

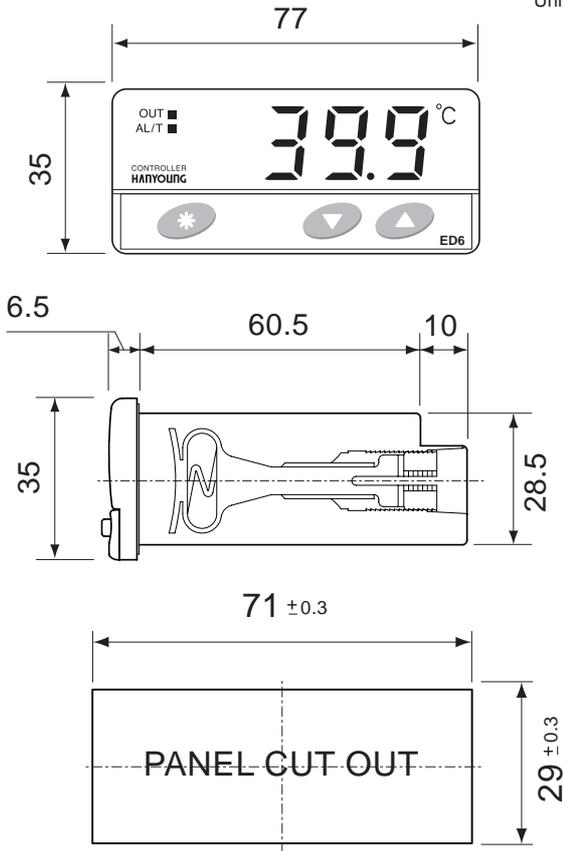
**■ Ratings**

Power Supply	Refer to "Power Supply" in "Model and Suffix Code"	
Power Consumption	Below 5 VA	
Input Sensor	Refer to "Input Sensor" in "Model and Suffix Code"	
Display Accuracy	Max range (FS ±0.5 % +1 Digit)	
Output Control (Main Output)	Relay Output	250 V AC 5 A (resistive load)
	SSR Output	5 V DC 50 mA (max)
Alarm & Defrost	Relay Output	250 V AC 5 A (resistive load)
Control Operation	Two Position Operation (ON/OFF) Proportional Operation (P)	
Setting Method	Digital method by setting, up and down keys	
Other Functions	Auxiliary output(Alarm & Defrosting Timer) Heating/cooling	
Resistance between wires	Thermocouple type (CA)	Below 100 Ω for each wire
	Resistive type (Pt 100 Ω)	Below 10 Ω for each wire (Resistance of 3 wires should be the same.)
Operating Ambient Temperature/Humidity	0 ~ 50 °C / below 35 ~ 85 % R.H (no condensation)	

**■ Wiring Diagram**

## Dimension & Panel Cutout

Unit : mm

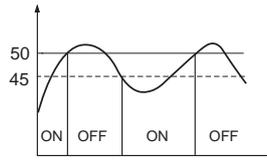


### ● Heating Control (ON/OFF)

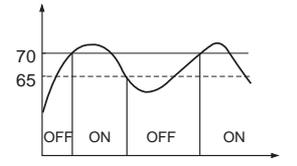
PV=Present Temperature, SV=Setting Temperature

PV < SV → Main Output Relay 'ON'

PV > SV → Main Output Relay 'OFF'



[setting=50 °C, dlf=5, dLy=0, tyP=HEt]



[AtS=70, AdF=5, AdL=0, SAo=0]

### ■ Proportional Control

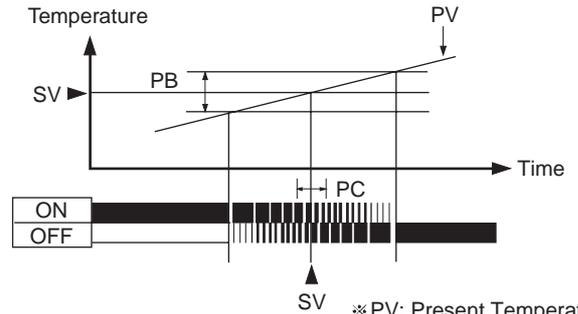
Proportional Control is that an output capacity regarding a setting value (SV) is proportionally operated by a deviation. The width which the output is varied within 0 ~ 100 % is called Proportional Band (PB).

Therefore, if PV=Present Temperature, PB=Proportional Band

PV < PB → Output capacity 100 %

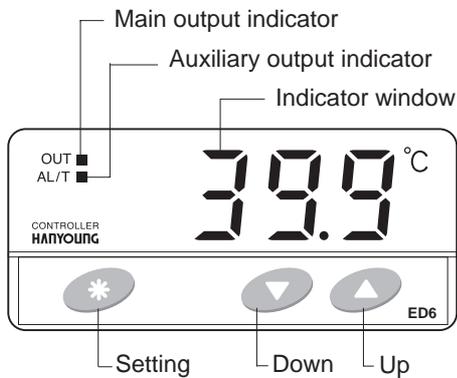
PV > PB → Output capacity 0 %

PV = PB → Output capacity 50 %



※ PV: Present Temperature  
SV: Setting Value  
PB: Proportional Band  
PC: Proportional Cycle

## Parts Name



### ■ Delay Timer Setting

At present temperature,

1. Press [ \* ] key for more than 3 sec
2. Go to 'dLy' by pressing [ \* ] key
3. Change the setting by using [ ▲ ] / [ ▼ ] key
4. Save it by pressing [ \* ] key

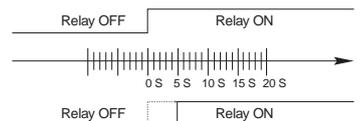
[ dLyP ] → [ dLF ] → [ dLy ] (0 ~ 240 sec.)

#### ● Operation Description of Delay

Timer

① Delay Time 'dLy' = 0

② Delay Time 'dLy' = 5



※ In case of Delay Time=0, Relay is immediately ON when output signal is generating. In case of Delay Time=5, Relay is ON after 5 sec. when output signal is generating. In the interval of 5 sec, the output indicator is flickering during Delay Timer Operation. After the delay time, the output indicator lights as the relay is on.

## Controlling Temperature Method

### ■ Cooling/Heating Control Setting

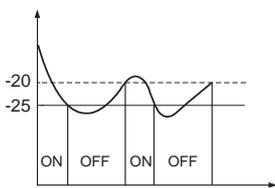
[ dLyP ] { HEAt : Heating Control  
Coal : Cooling Control

#### ● Cooling Control (ON/OFF)

PV=Present Temperature, SV=Setting Temperature

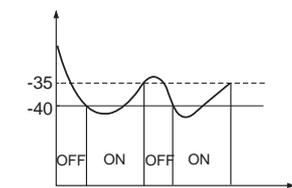
PV > SV → Main Output Relay 'ON'

PV < SV → Main Output Relay 'OFF'



Main output

[setting=-25 °C, dlf=5, dLy=0, tyP=CoL]



Alarm Output (Low Limit Alarm)

[AtS=-40, AdF=5, AdL=0, SAo=0]

### ■ Auxiliary Output (Timer Mode) Setting and Operation Description

When using as a freezer, Timer Mode can be used as Defrosting Function.

※ min. : minute

[ ESRa ] { 0 : Alarm Mode  
1 : Timer Mode (Setting)



ton = 5 min, tof = Timer Output at 15 min

[ gMoc ] { 0 : Main Output Control Cancellation  
1 : Main Output Control

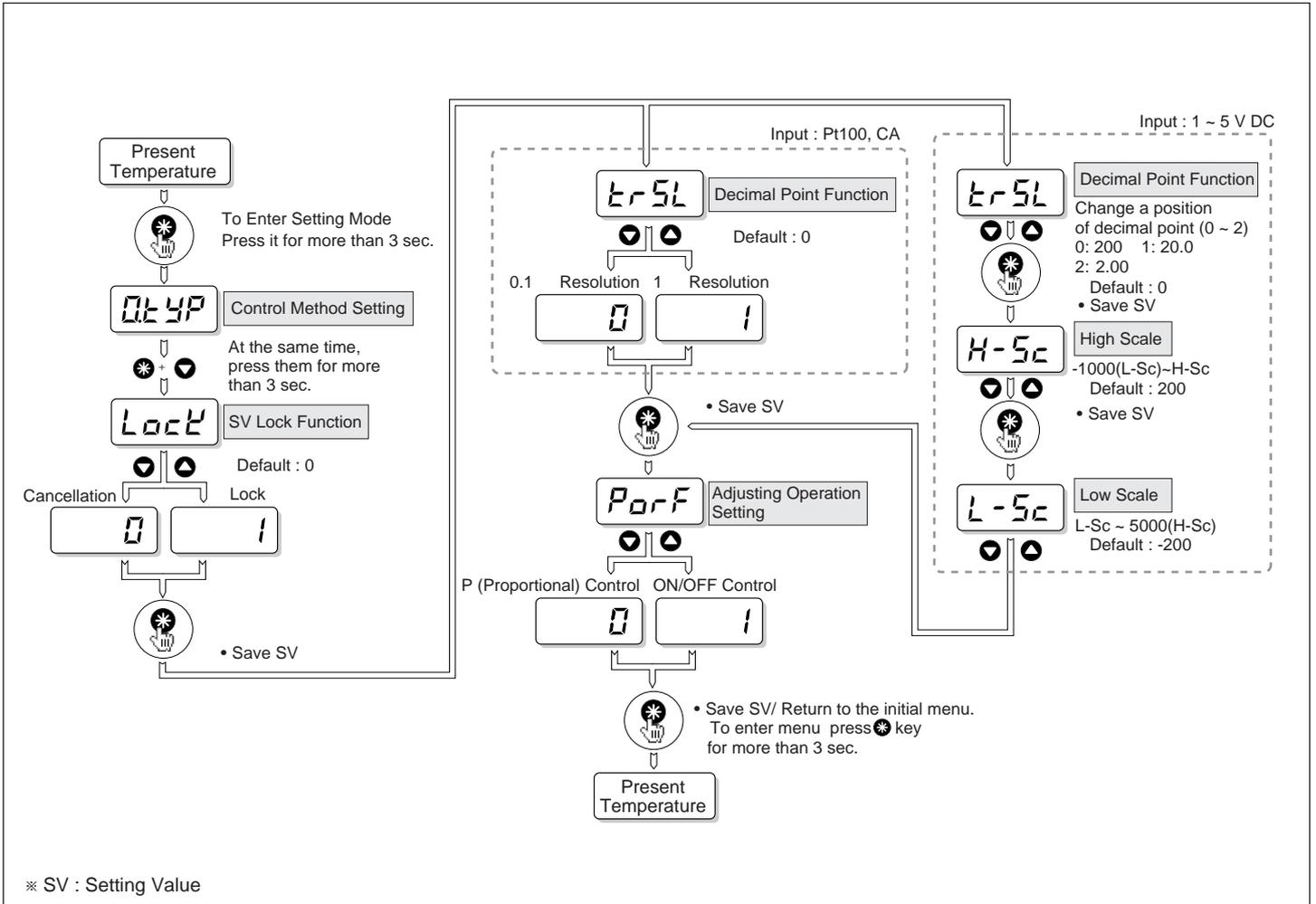
If 'MOC' is 1 then Timer is ON as Main Output is automatically OFF. When using MOC function, you can effectively use Timer Output as Defrosting Function.

# Setting Menu

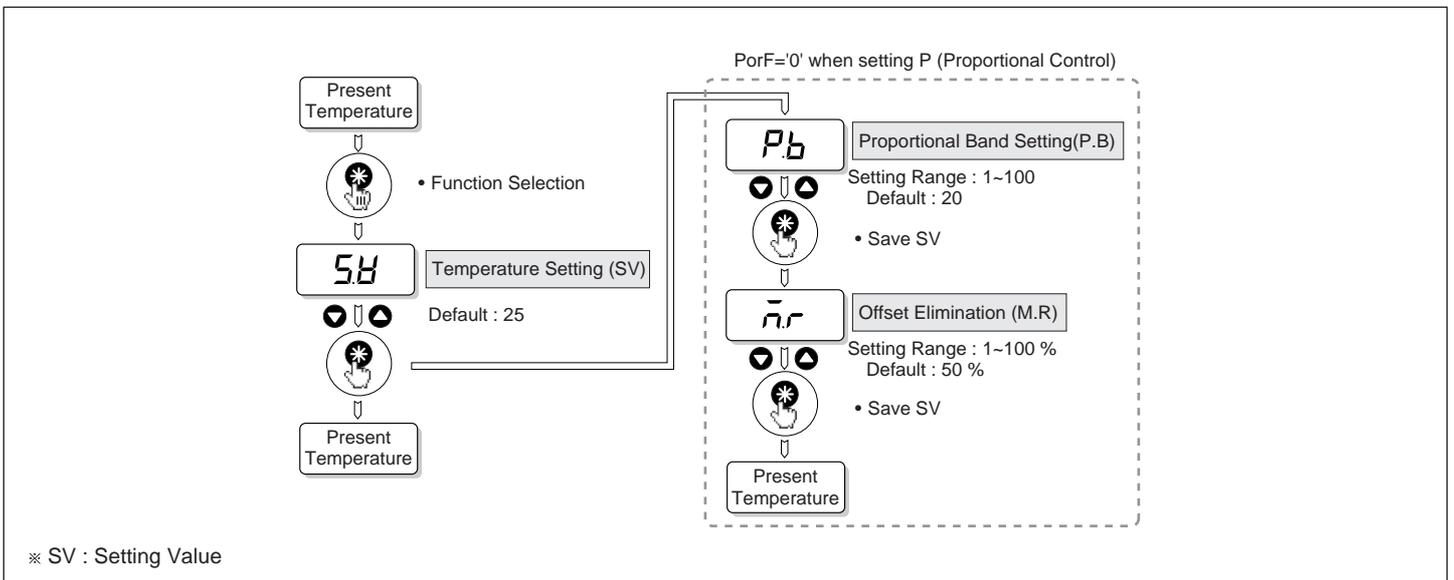
## Setting of SV Lock function, Decimal Point function & Adjusting Operation Setting

Item	SV	Description
Lock	0	Lock cancellation, User Setting is possible
	1	Lock and User Setting are not possible
trSL (Pt100, CA)	0	Decimal point function (0.1 °C)
	1	No Decimal point function (1 °C)
trSL (1 ~ 5 V DC)	0 ~ 2	Decimal point function (Ex. 0:200, 1:20.0, 2:2.00)
PorF	0	Proportional Control (P.B value/ M.R value setting is possible)
	1	ON/OFF Control

※ SV : Setting Value  
P.B : Proportional Band  
M.R : Offset Elimination



## Normal User Setting Mode



## Confirmation mode of Output Capacity & Setting Value

PorF='0' when setting P (Proportional Control)

- Output Capacity (%) Flickering Display for 1 sec

Present Temperature

▼ ▲

Setting Value (SV) Flickering Display for 1 sec

▼ ▲

Present Temperature

※When operating Proportional Control, display Present Output Capacity (0 ~ 100 %).

-In case of occurring Offset, eliminate M.R value by decreasing as referring Present Output Capacity.

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

※ PV : Present Value  
SV : Setting Value  
M.R : Offset Elimination

## Setting MODE

**0. Control Method Setting**

Default SV display

cool

▼ ▲

Cooling Control Heating Control

cool HEAT

Default : Heat

● Save SV

**1. Deviation Setting**

1d1f

● Deviation Setting

A: 1 ~ 50

B: 1.0 ~ 50.0

Default : 2.0

● Save SV

**2. Delay Time Setting**

2dl4

● Setting Range: 0~ 240 sec

Default : 1 sec.

● Save SV

**3. Input Compensation**

3r5t

A: -30 ~ 30

B: -30 ~ 30.0

Compensating for Sensor Line Length or error occurrence

Default : 0.0

● Save SV

**4. High Limit of Setting Range**

4t5h

Ex) Pt100

A: -100 ~ TSH(High Limit)

B: -100.0 ~ TSH(High Limit)

Default : Pt100(400.0 )

CA(999.9 )

1 ~ 5 V DC (5000)

● Save SV

**5. Low Limit of Setting Range**

5t5l

Ex) Pt100

A: TSL(Low Limit) ~ -400 (TSH)

B: TSL(Low Limit) ~ -400.0 (TSH)

Default : Pt100(-100.0 )

CA(-80.0 )

1 ~ 5 V DC (-1000)

● Save SV

**6. Auxiliary Output Selection**

6.5A0

Default : 0

0 1

Alarm Setting Menu Timer Setting Menu

**7. Alarm Temperature Setting**

7A7S

A: -100 ~ 400

B: -100.0 ~ 400.0

Default : Pt100(400.0 )

CA(999.9 )

1 ~ 5 V DC (5000)

● Save SV

**7. ON Time Setting**

7On

● Setting Range: 0 ~ 999 minute

Default : 1 minute

● Save SV

**8. Deviation Setting for Alarm**

8A8F

A: 1 ~ 50

B: 1.0 ~ 50.0

Default : 2.0

● Save SV

**8. OFF Time Setting**

8tOf

● Setting Range: 0 ~ 999 minute

Default : 3 minute

● Save SV

**9. Delay Time Setting for Alarm**

9A9L

● Setting Range : 0 ~ 240 sec.

Default : 1 sec.

● Save SV

**9. Main Output Control**

9nOc

0: Output Control Cancellation

1: Output Control

● Save SV

Only it can be used when PorF=1 (ON/OFF Control)

※ SV : Setting Value