Digital Temperature Controller

ED6

INSTRUCTION MANUAL

Thank you for purchasing HANYOUNG product.
Please check whether the product is the exactly same as you ordered.
Before using the product, please read this instruction manual carefully.
Please keep this manual where you can view at any time

Safety information

Alerts declared in the manual are classified to Danger, Warning and Caution by their criticality

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

⚠ 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

- If the user use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- If there is a possibility of an accident caused by errors or malfunctions of this product, install external protection circuit to prevent the accident.
- To prevent defection or malfunction of this product, apply a proper power voltage in accordance with the rating.
- Since this product is not designed with explosion-protective structure, do not use it any place with flammable or explosive gas.
- Reassemble this product while the power is OFF. Otherwise, it may be a cause of malfunction or electric shock.
- There is a possibility of occurring electric shock so please use this product after installing it to a panel while it is operating.

⚠ CAUTION

- Before using a temperature controller, there could be a temperature difference between PV of the temperature controller and the actual temperature so please operate the temperature controller after compensating the temperature difference appropriately.
- The contents of this manual may be changed without prior notification.
- Make sure that there is no damage or abnormality of the product during delivery.
- Do not use this product at any place with direct vibration or impact.
- 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)
- Do not use this product at any place with a large inductive difficulty or occurring static electricity or magnetic noise.
- In case of inputting thermocouple, use a compensating cable. (If using a normal wire, there is a possibility of occurring temperature error.)
- 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.)
- Separate an input signal cable from an output signal cable. If separating is not possible, please use the input signal cable after shielding it.
- Use non-earth sensor with thermocouple. (In case of using earth sensor, there is a possibility of occurring malfunction caused by a short circuit.)
- 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.
- When attaching this product to a panel, use an approved switch or circuit breaker from IEC947-1 or IEC947-3.
- The warranty period for this product including parts is one year if this product is properly used.
- 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.

Suffix Code

Model	Code						Description
ED6 -	□	□	□	□	□		Digital Temperature Controller
Control type	F						ON/OFF Control
	P						Proportional control
Input		K					Thermocouple (K Type)
		P					R.T.D Pt100 Ω (IEC)
		C					4 - 20 ㎃ d.c (attach 250 Ω of external resistance), 1 - 5 V d.c
Control output			M				Relay
			S				S.S.R (Voltage pulse output 5 V d.c)
Optional				A			Alarm or defrosting timer
				N			NONE
Power supply voltage					P3		10 - 24 V d.c/a.c, 50 - 60 Hz
					P4		100 - 240 V a.c, 50 - 60 Hz

Specification

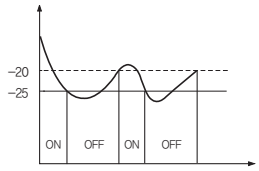
Power supply	P3 : 10 - 24 V d.c/a.c, 50 - 60 Hz P4 : 100 - 240 V a.c, 50 - 60 Hz	
Power consumption	5.5 VA	
Input	K, Pt100 Ω, 4 - 20 ㎃ d.c, 1 - 5 V d.c	
Display accuracy	± 0.5 % of F.S ±1 Digit	
Control output	Relay	Contact composition : 1 c, 250 V a.c, 5 A (resistive load)
	S.S.R	Approx. 5 V d.c (resistive load min 500 Ω), Approx. 50 mA max
Alarm & defrost	Relay	Contact composition : 1 c, 250 V a.c, 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	Below 100 Ω for each wire
	R.T.D	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 (With no condensation)	

Controlling Temperature Method

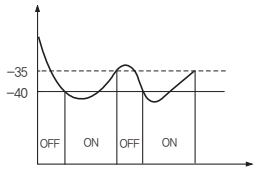
■ Cooling/Heating Control Setting

[0tYP] ┬ HEAt : Heating Control
└ cooL : Cooling Control

● Cooling Control (ON/OFF)
PV=Present Temperature, SV=Setting Temperature
PV > SV → Main Output Relay 'ON'
PV < SV → Main Output Relay 'OFF'

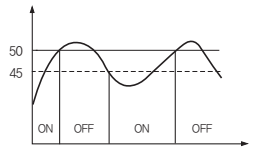


Main output
[setting=-25 °C, dIf=5, dLy=0, tyP=CoL]

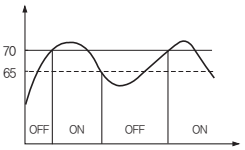


Alarm Output (Low Limit Alarm)
[AtS=-40, AdF=5, AdL=0, SAo=0]

● Heating Control (ON/OFF)
PV=Present Temperature, SV=Setting Temperature
PV < SV → Main Output Relay 'ON'
PV > SV → Main Output Relay 'OFF'



Main output
[setting=50 °C, dIf=5, dLy=0, tyP=HEt]



Alarm Output (High Limit Alarm)
[AtS=70, AdF=5, AdL=0, SAo=0]

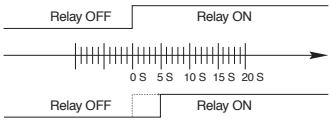
■ Delay Timer Setting

At present temperature,
1. Press [✱] key for more than 3 sec
2. Go to ' 2dLY ' by pressing [✱] key
3. Change the setting by using [▲] / [▼] key
4. Save it by pressing [✱] key

[0tYP]→[idLF]→[2dLY] (0 ~ 240 sec.)

● Operation Description of Delay
① Delay Time 'dLy' = 0

② Delay Time 'dLy' = 5



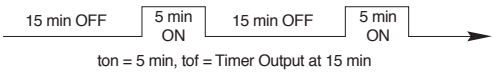
※In case of Delay Time=0, Relay is immediately ON when output signal is generating. In case of Delay Time=5, Relay is ON after 5 sec. when output signal is generating. In the interval of 5 sec, the output indicator is flickering during Delay Timer Operation. After the delay time, the output indicator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

■ Auxiliary Output (Timer Mode) Setting and Operation Description

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

※ min. : minute

6SAo ┬ 0 : Alarm Mode
└ 1 : Timer Mode (Setting)



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

9noc ┬ 0 : Main Output Control Cancellation
└ 1 : Main Output Control

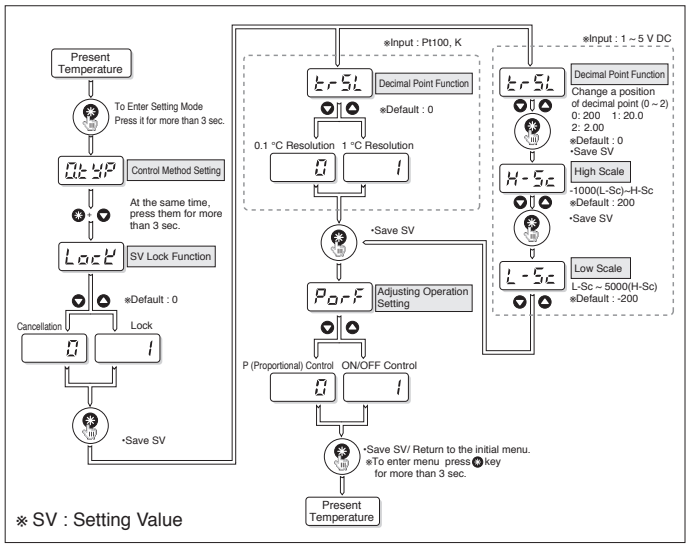
If 'MOC' is 1 then Timer is ON as Main Output is automatically OFF. When using MOC function, you can effectively use Timer Output as Defrosting Function.

Setting Menu

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

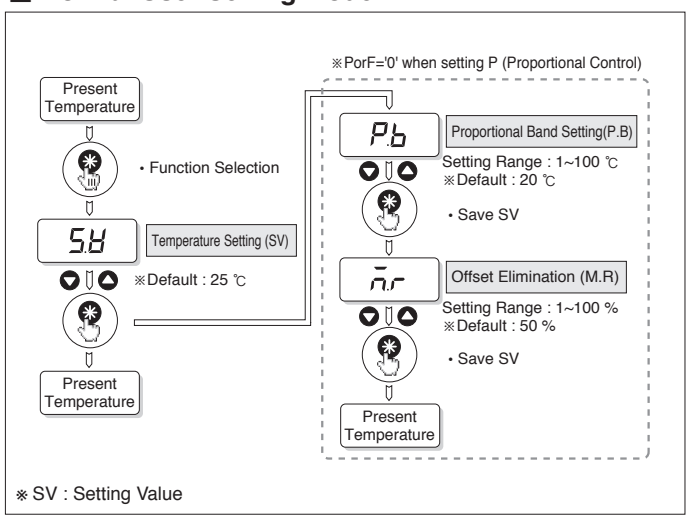
Item	SV	Description
Lock	0	Lock cancellation, User Setting is possible
	1	Lock and User Setting are not possible
trSL (Pt100, CA)	0	Decimal point function (0.1 °C)
	1	No Decimal point function (1 °C)
trSL (1 ~ 5 V DC)	0~2	Decimal point function (Ex. 0:200, 1:20.0, 2:2.00)
PorF	0	Proportional Control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

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



※ SV : Setting Value

■ Normal User Setting Mode



※ SV : Setting Value

■ Confirmation mode of Output Capacity & Setting Value

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

Present Temperature

• Output Capacity (%)
Flickering Display for 1 sec

• Setting Value (SV)
Flickering Display for 1 sec

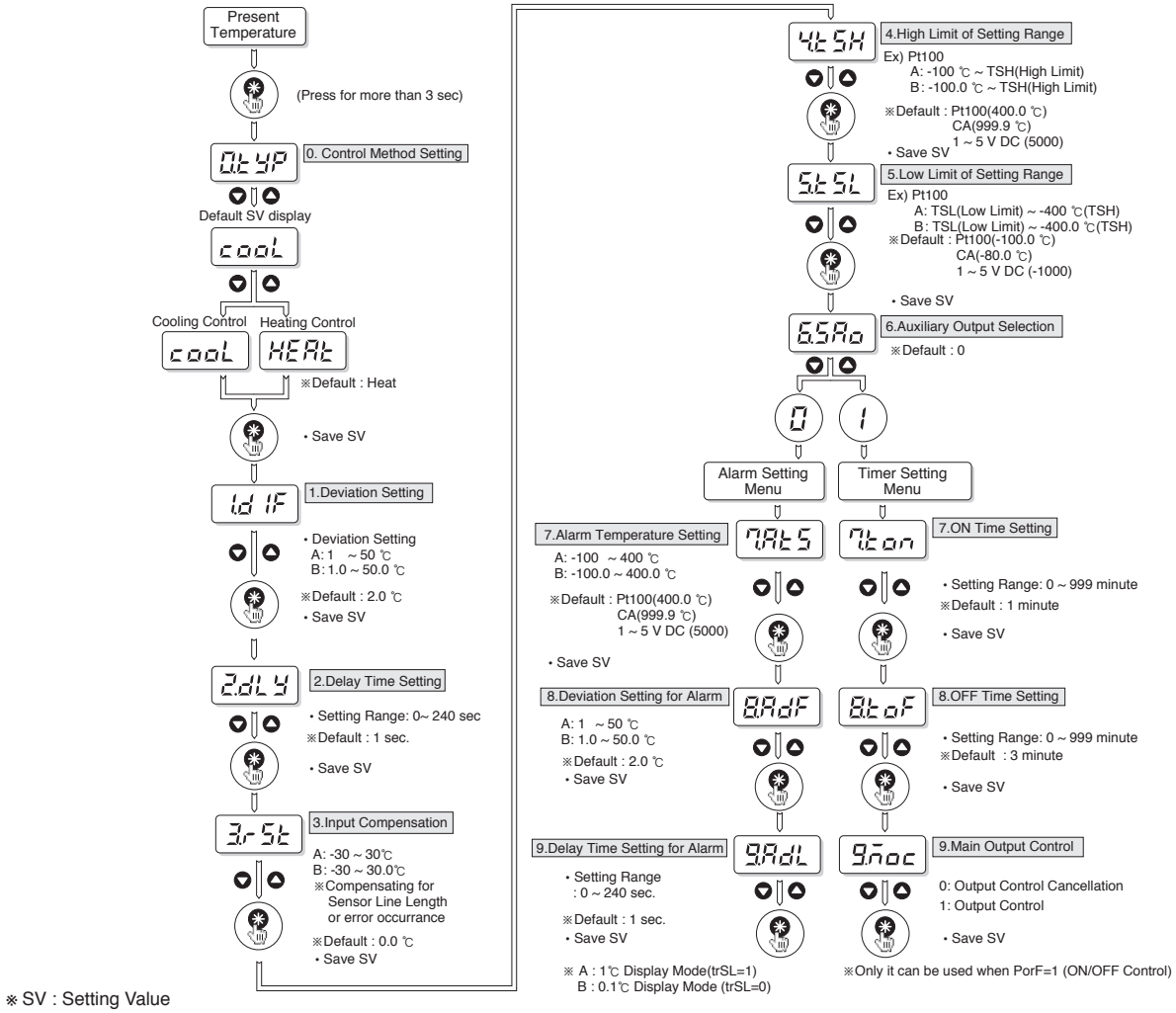
Present Temperature

※ 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

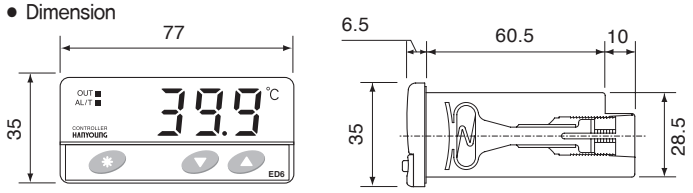


※ SV : Setting Value

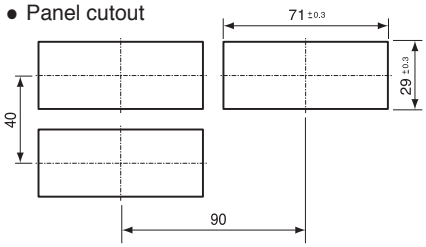
Dimension and panel cutout

Unit : mm

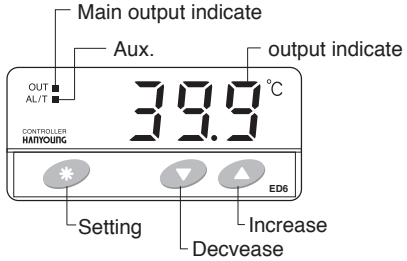
- Dimension



- Panel cutout



Part name



Connection