

# BR6

## 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.

HANYOUNGNUX CO., LTD  
28, Gilpa-ro 71beon-gil, Michuhol-gu, Incheon, Korea TEL : +82-32-876-4697  
http://www.hanyoungnux.com

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### 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

<b>DANGER</b>	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
<b>WARNING</b>	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
<b>CAUTION</b>	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

- 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 V a.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, SELV 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 use 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 (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 ordered.
- 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.
  - use 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.

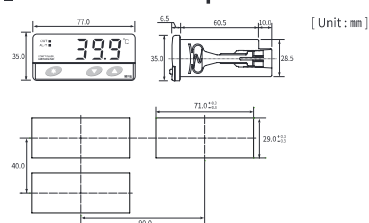
### Suffix code

Model	Code	Description
BR6-	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Digital temperature controller
Control method	F	ON / OFF, Proportional control (selection with parameter)
Input	N	Our dedicated sensor (TH-540N) ※ Thermistor (NTC)
Control output	M	Relay output (RELAY output)
	S	Voltage pulse output (Voltage pulse output for SSR drive)
	C	Electric current output (4-20 mA current output for SCR drive)
Power supply voltage	P3	10 ~ 24 V d.c.
	P4	100 ~ 240 V a.c. 50/60 Hz

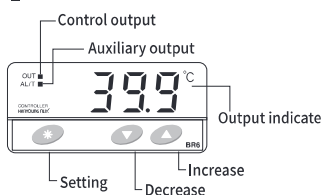
### Specification

Input sensor	Company exclusive sensor (TH-540N) ※ Thermistor (NTC)		AC power supply voltage	100 - 240V ~ 50/60Hz
Input range	-40.0 ~ 90.0 °C		DC power supply voltage	10 ~ 24V  , Class2
Display accuracy	± 1 % of FS ± 1 Digit		voltage change rate	±10% of supply voltage
Control output	Relay output	Contact composition : 1 c, 250 V a.c., 5 A (Resistance load)		
	Voltage Pulse Output	10 - 15 V d.c. (load resistance 500 Ω or more)		
	Electric current Output	4-20 mA d.c. (load resistance 500 Ω or less)		
Auxiliary/Defrost	Relay	Contact composition : 1 c, 250 V a.c., 5 A (Resistive load)	AC power consumption	10.0 VA or less
Control operation	Selection of reverse action (heating/ direct action (cooling)) with parameters		DC power consumption	2.0 VA or less
Setting method	Digital method by setting, increasing and decreasing keys		Approval	
Other function	Deforstering timer, Alarm function			
Ambient temperature	0 ~ 50 °C			
Resistance between wires	Below 10 Ω for each wire			
Ambient humidity	35 ~ 85 % RH (with no condensation)			
Weight	110 g			

### Dimension and panel cutout

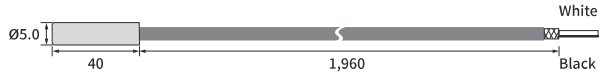


### Part name



### Sensor (Thermistor/NTC)

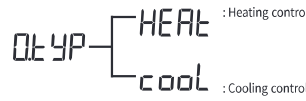
Name	Sensory type	Range(°C)	Accuracy	Remark
TH540N	Thermistor	-40.0 ~ 90.0	± 1.5 °C	Max ± 3.5 °C temperature deviation may be happen (± 1.5 °C sensor deviation & ± 2 °C controller deviation)



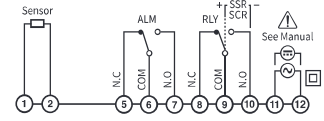
- ※ BR6 applies only to this sensor.
- ※ Extension of sensor length or modification will cause malfunction.

### Control method for temperature

#### Heating/cooling control selection

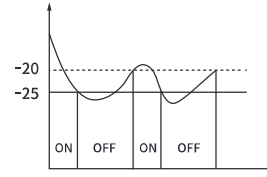


#### Connection diagram

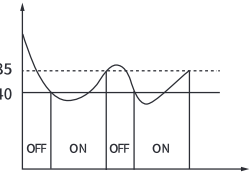


#### Cooling control(ON/OFF)

- PV > SV → Control output "ON" / PV < SV → control output "OFF"



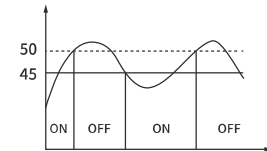
Control output  
[SV = 25 °C, dF = 5, dLy = 0, tyP = CoL]



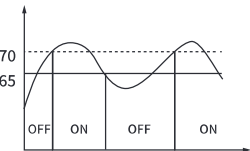
Auxiliary Output (Low limit alarm)  
[AtS = -40, AdF = 5, AdL = 0, SAo = 0]

#### Heating control(ON/OFF)

- PV > SV → Control output "OFF" / PV < SV → Control output "ON"

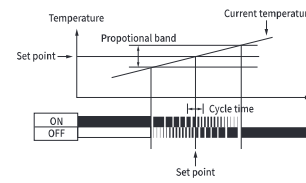


Control output  
[SV = 50 °C, dF = 5, dLy = 0, tyP = HEt]



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

### Proportional control

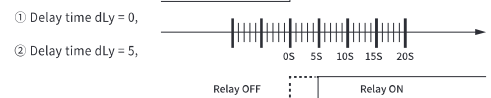


• Manipulated variable (output size) of set value operates by proportioning to deviation and this is known as proportional control. Also variation range of manipulated variable from 0 ~ 100 % is known as the proportional band. Therefore, when proportional band is less than the current temperature, the manipulated variable becomes 100 % and when PB is more than the current temperature, the manipulated variable becomes 0 % and when set value and current temperature becomes same, the manipulated variable becomes 50 %.

### Delay Timer Setting

- Press key continuously for 3 sec, and then, press key until getting "2dL4". change a set point by / key, and preservation it by key.
- [OLYP] → [dLF] → [2dL4] (0 ~ 240 sec)

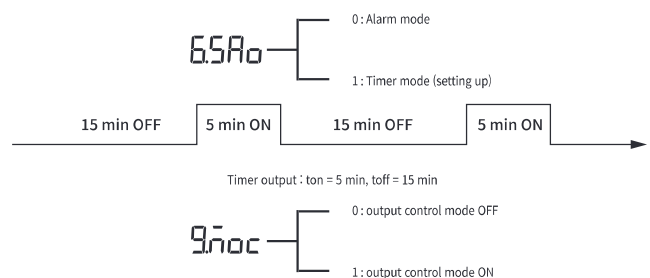
#### Operating description by delay-timer



- ※ 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.
- ※ Delay operation is executed only in ON/OFF control.

### Auxiliary output(Timer-mode) set and operating description

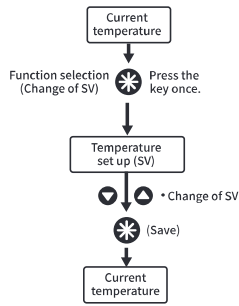
- It is possible to use timer-mode as defrosting function in case of freezer.



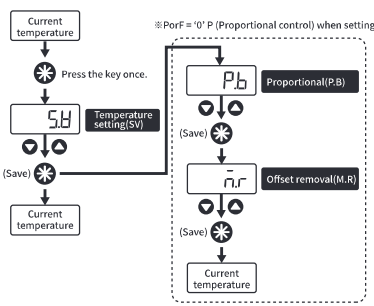
- When using MOC '1', control output will be OFF automatically as timer is ON.
- If using MOC function, you can effectively use timer output as a defrosting function.
- ※ When auxiliary output is timer mode, time unit is selective between "sec" or "min".

## Set mode for normal users

### ON/OFF control (ProF : 1)



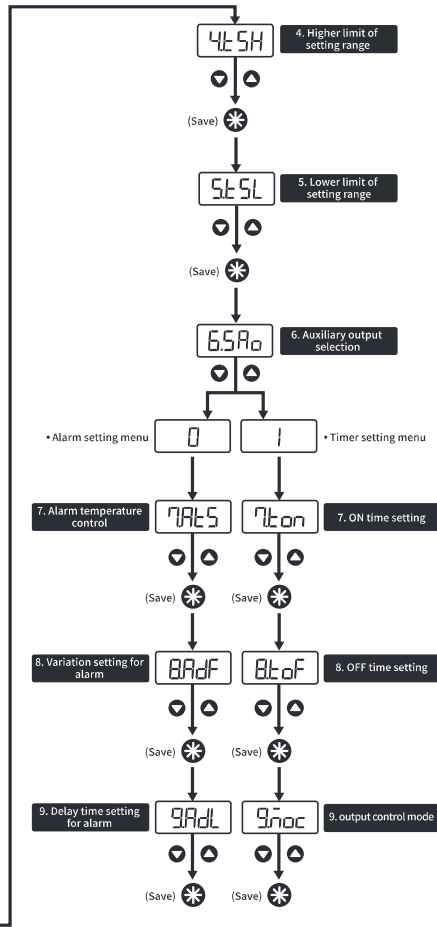
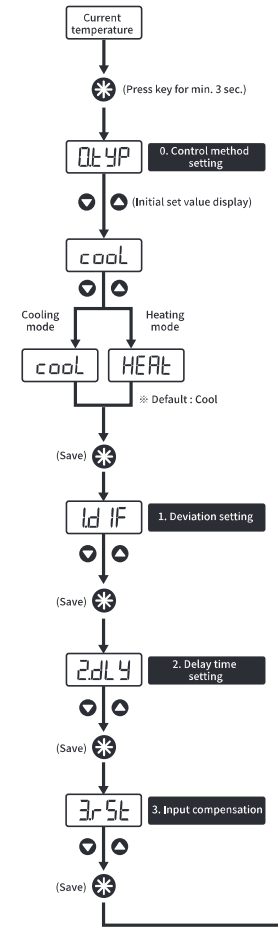
### PID control (ProF : 0)



• A : 1 °C display mode (trSL = 1)  
• B : 0.1 °C display mode (trSL = 0)

Item	Description	Setting range	Default	Unit
SV	Set value	TSL (min) ~ TSH (max)	25.0	°C
Pb	Proportional band setting	A : 6 ~ 60	20.0	
		B : 6.0 ~ 60.0		
Mr	Remove offset	0 ~ 100	50	%

## Engineer setting mode



※Error message : When input is more than +5%, **abr** when input is less than -5%, **-abr**

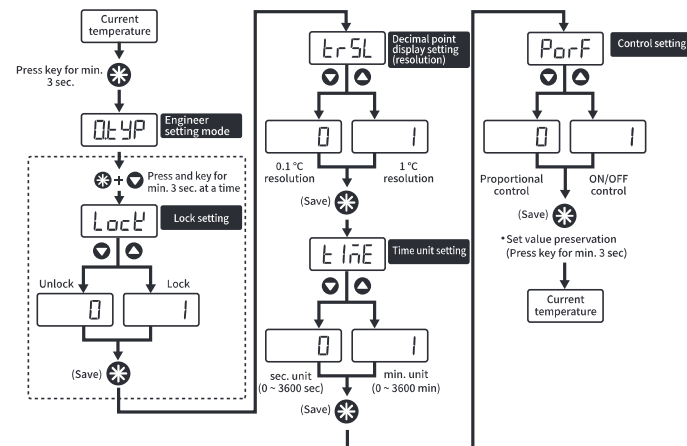
• A : 1 °C display mode (trSL = 1)  
• B : 0.1 °C display mode (trSL = 0)

Item	Description	Setting range	Default	Unit
0.typ	Control method setting	Cool/Heat	Cool	—
1.dIF	Deviation setting	A : 1 ~ 50, B : 0.2 ~ 50.0	1.0	°C
2.dLy	Delay time setting	0 ~ 240	0	Sec
3.rST	Input compensation	A : -30 ~ 30	0.0	°C
		B : -30.0 ~ 30.0		
4.tSH	Higher limit of setting range	A : TSL (min) ~ 90	90.0	
		B : TSL (min) ~ 90.0		
5.tSL	Lower limit of setting range	A : -40 ~ TSH (max)	-40.0	
		B : -40.0 ~ TSH (max)		
6.SAo	Selection of auxiliary output function	0 : Alarm setting	0	—
		1 : Timer setting		
Menu of setting alarm				
7.ATS	Setting alarm temperature	A : -40 ~ 90, B : -40.0 ~ 90.0	-40.0	°C
8.AdF	Deviation settings for the alarm	A : 1~ 50, B : 0.2 ~ 50.0	1.0	
9.AdL	Delay time setting for alarm	0 ~ 240	0	Sec
Menu for timer setting				
7.ton	On time setting	0 ~ 3600	1	※1
8.toF	Off time setting	0 ~ 3600	3	
9.Moc	output control mode	0 : output control mode OFF, 1 : output control mode ON	0	

※1 : when time = 0 in administrator setting mode, it is Sec. when time = 1 in administrator setting mode, it is Min.

## Administrator setting mode

### Set Value lock function and decimal point function



Item	Description	Setting value	Setting range	Default	Unit
Lock	Lock setting	0	Unlock, engineer set up available	0	
		1	Lock, engineer set up unavailable		
trSL	Decimal point display setting	0	Decimal point display (0.1 °C)	0	—
		1	No Decimal point display (1 °C)		
Time	Time unit setting	0	Timer: second setting (0 ~ 3600 sec)	1	
		1	Timer: minute setting (0 ~ 3600 min)		
ProF	Control setting	0	Proportional control (P.B / M.R value set up available)	1	
		1	ON/OFF control		