Temperature Controller

DF4

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 Switch/Photo Electric Sensor, Rotary Encoder, Optical Fiber Sensor, Pressure Sensor
- ANALOG : Timer, Temperature Controller

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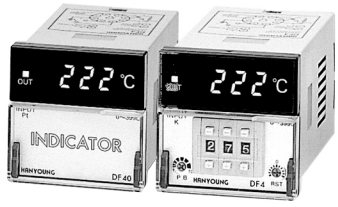
HANYOUNG NUX



■ Safety information

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

⚠ DANGER

Do not touch or contact the input/output terminals because they may cause electric shock.

⚠ WARNING

1. If there is a possibility of an accident caused by errors or malfunctions of this product, install external protection circuit to prevent the accident.
2. This product does not contain an electric switch or fuse, so the user needs to install a separate electric switch or fuse externally. (Fuse rating : 250 V 0.5 A)
3. To prevent defection or malfunction of this product, supply proper power voltage in accordance with the rating.
4. To prevent electric shock or devise malfunction of this product, do not supply the power until the wiring is completed.
5. Since this product is not designed with explosion-protective structure, do not use it at any place with flammable or explosive gas.
6. Do not decompose, modify, revise or repair this product. This may cause malfunction, electric shock or fire.
7. Reassemble this product while the power is off. Otherwise, it may cause malfunction or electric shock.
8. If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
9. Due to the danger of electric shock, use this product installed onto a panel while an electric current is applied.

⚠ CAUTION

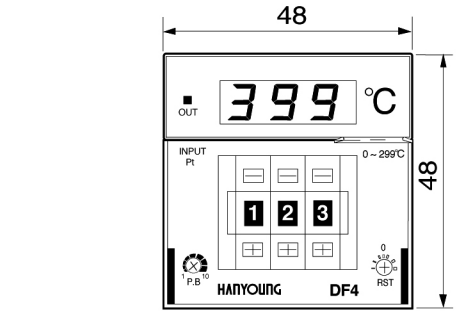
1. The contents of this manual maybe changed without prior notification.
2. Before using the product you have purchased, check to make sure that it is exactly what you ordered.
3. Check to make sure that there is no damage or abnormality of the product during delivery.
4. The ambient temperature is 0 ~ 50 ℃ and the ambient humidity is 35 ~ 85 % RH (No icing).
5. Do not use this product at any place with corrosive(especially noxious gas or ammonia) or flammable gas.
6. Do not use this product at any place with direct vibration or impact.
7. 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)
8. Do not polish this product with substances such as alcohol or benzene.
9. Do not use this product at any place with excessive induction trouble, static electricity or magnetic noise.
10. Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.
11. Install this product at place under 2,000m in altitude.
12. When the product gets wet, the inspection is essential because there is danger of an electric leakage or fire.
13. Use a compensating cable with thermocouple.
14. For R.T.D input use a cable which is a small lead wire resistance and without resistance difference to 3 wires.
15. To avoid inductive noise to input wires separate from the power and the load wire.
16. Keep input wire away from output wire.
17. Use a non-earth sensor with thermocouple.
18. If there is excessive noise from the power supply, using insulating transformer and noise filter is recommended. The noise filter must be attached to a panel grounded, and the wire between the filter output side and power supply terminal must be as short as possible.
19. It is effective to use a twisted cable for power supply against noise.
20. Check the alarm function before operating.
21. Turn off the power before changing a sensor.
22. Use an extra relay when the frequency of operation is rather high. In this case, SSR output type is recommended.
    - Electromagnetic switch : Proportional cycle time is min. 30 sec.
    - SSR : Proportional cycle time is min. 1 sec.
    - Contact output life : Mechanical - Min. 10 million times (no load)
      Electrical - Min. 100 thousond times (rated load)
23. Do not connect anything to the unused terminals.
24. After checking polarity of terminal, connect wires at the correct position.
25. When this product is connected to a panel, use a circuit breaker or switch approved with IEC947-1 or IEC947-3.
26. Install the circuit breaker or switch at near place for convenient use.
27. Write down on a label that the operation of circuit breaker or switch disconnects the power since the devise is installed.
28. For the continuous and safe use of this product, the periodical maintenance is recommended.
29. Some parts of this product have limited life span, and others are changed by their usage.
30. The warranty period for this product including parts is one year if this product is properly used.
31. When the power is on, the preparation period of contact output is required. In case of use for signals of external interlock circuit, use with a delay relay.
32. When changing this unit to spare unit, please check again all parameters.

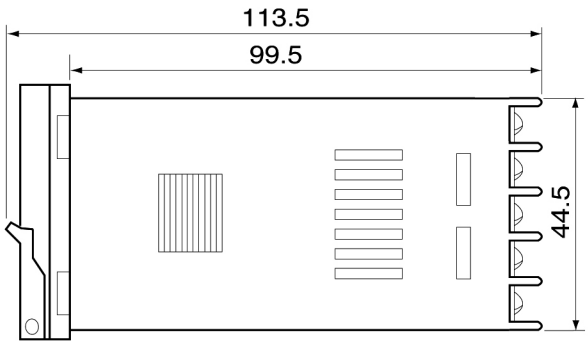
■ Specification

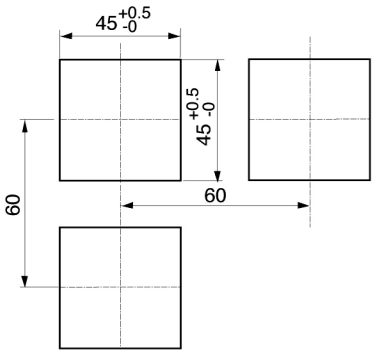
MODEL		DF4	DF40
Input		Thermo couple(K.J),R.T.D.(DIN/JIS Pt 100Ω), mV&mA	
Accuracy		[Setting Accuracy] : Whthin ±0.5 % of full scale [Display Accuracy] : Whthin ±1.0 % of full scale	
Power supply		100/110 V AC, 200/220 V AC 50/60 Hz (Voltage variation : 90 ~ 110 %)	
Control function		Time proportioning (With manual reset), On/off control	
Control output	Relay	250 V AC 5 A (Resistive load), SPDT	
	SSR	12 V DC(Constant voltage pulse), load resistance more than 800 Ω	
	Current	4 ~ 20 mA DC (load resistance less then 600Ω)	
Consumption		About 3 VA	
Setting and display		Digital	Digital display(Indicator)
Input resistance		Thermo couple:10Ωmin. R.T.D. : 50Ω max. per wire	
Adjustment sensitivity		0.2 % of full scale(fixed)	
Proportional band		1 ~ 10 % of full scale	
Proportional cycle		Relay contact : About 20 sec. SSR driving : About 2 sec.	
Reset range		More than ± 2 % of full scale	
Life	Mechanical	10,000,000 operations min.	
	Electrical	100,000 operations min.(110 V AC 5 A resistive load)	
Ambient temperature		0 ~ 50 ℃ (32 ~ 122 °F) ※Ambient humidity : 35 ~ 85 % RH	
Net weight		Approx 170 g	Approx 150 g
Socket		Model TS-4(Order separately)	

■ Dimension & Panel cutout

Unit : mm

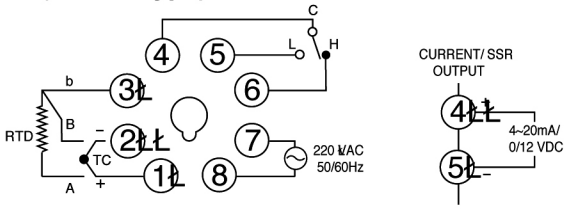




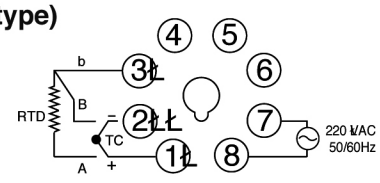


■ Connection

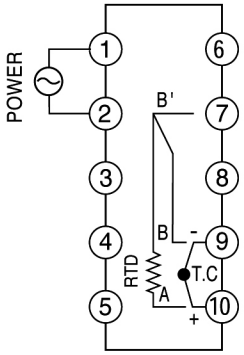
■ DF4(Socket type)



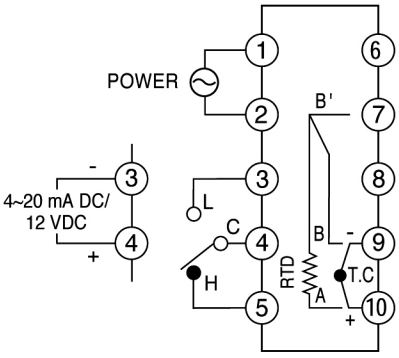
■ DF40(Socket type)



■ DF40



■ DF4



■ Selection of time proportioning and ON/OFF control

Control required can be selectable by Dip switch inside.

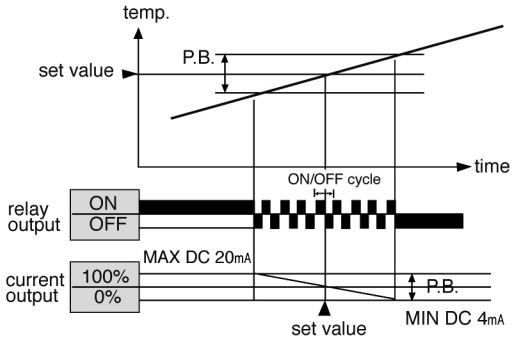
■ RST(Reset) Volume

In proportioning control, the volume can be adjusted so that off-set from the set value can be easily corrected.

· Process value 〈 Set value : Turn volume to clockwise
· Process value 〉 Set value : Turn volume to counter-clockwise

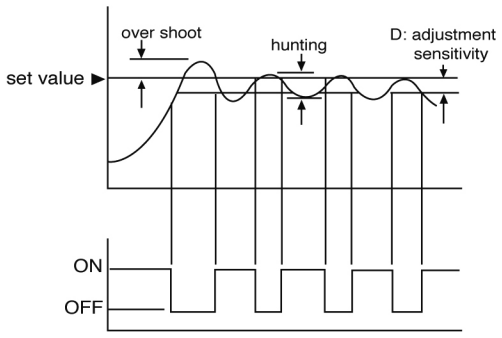
■ Time proportioning control

Time proportioning automatically proportions the relay on-off time in accordance with the demand of the process to closely hold the set value temperature.
The proportional band is a region which extends above and below the set value. The bottom edge of the band represents 100% output value, while the top represents 0% output value. The set value in the center of the band represents 50% output value.
Time proportioning control is recommended for closer control.



■ ON / OFF control

If the process value is higher than set value, output to be OFF and the process value is lower than set value, output to be ON.
When on the main set value, it can be used to cycle the heat on and off within a narrow differential.
Hysteresis is a region which extends above (ON) and below (OFF) the set value.
ON/OFF control should only be used where tight control is not required or where only a signal contact is needed.



■ Cautions for wiring

- ●In order to avoid affection of noise induction, input signal line should be wired far from supply voltage line,power supply line and load line.
- ●Supply voltage line must be wired to avoid noise affection from power supply. If the noise generator is nearby of the controller is easily affected by noise, please use noise filter.(Select noise filter after checking of supply voltage)
- ※If you could not obtain effect by the filter, select characteristics of filter frequency.
- • In case of bad effect by noise, wiring of supply voltage line may be twisted densely each other to decrease bad effect.
- • Filter should be mounted to the panel which is earthed and wiring between the output of noise filter and the terminal of supply voltage must be short.
- • Mounting of fuse or switch to the output wiring of noise filter, the effect of filter could be reduced.