N-5000 Intelligent Digital Display Temperature Controller

USER MANUAL

Please read this manual thoroughly for the instruction of correct usage before using this product and keep this manual as a reference.

► CAUTION WHEN OPERATING ◄

- Before cleaning the controller, please ensure that the power is switch off.
- Please remove stains on the display panel by using a soft cloth only.
- No scrubbing or touching the display panel with any hard object, the display panel can be easily scratched.
- Do not press any button on the display panel using pointy objects such as ballpoint pen or screw driver, it can easily scratch the panel or damage buttons on the panel.

I. Confirmation of the product

Please confirm the model received is identical with purchase orders by checking the following model number.

N □□-□□□□□□-□-□-□-□

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① The color of shell

B: Black G:Grey

②Dimensions of the panel in millimeters

D: 96×96 E: 72×72

F: 96×48(Vertical Type)

F (H): 48×96(Horizontal Type)

G: 48×48

③Series Code

5: Dual-Rows Display (Economical Model)

④Control Type

4: On/off PID control (heating)

9: Continuous PID Control (heating)

⑤Alarm Output 1

⑥Alarm Output 2

0: Without Alarm 1: Upper Limit Deviation Alarm

2: Lower Limit Deviation Alarm

3: Upper and Lower Limit Deviation Alarm (With hold）

4: Upper Limit Absolute Value Alarm

5: Lower Limit Absolute Value Alarm

6: Upper and lower limit deviation range alarm

7: Upper and lower limit deviation alarm (without hold)

⑦Output Type

Empty: Relay (Maximum : 3A)

V: Logical Level Output Used for SSR

WG: external silicon controlled rectifier

⑧Input Type

K(0-999) J(0-790)

E(0-600) PT100(-99-500)

PT(0.0-99.9) CU50(0.0-99.9)

⑨LRL — URL

⑩Additional Control

Omit: no ON/OFF control

ON/OFF: has ON/OFF control

II. Installation

2.1 Caution when installing

Please install the controller in the following environment conditions:

- Temperature: 0 to 50 degrees C
- Humidity: 45% to 85% RH
- Atmospheric pressure: 8 to 106kPa

Please avoid the following conditions during installation:

- Rapid temperature changes, leading to dew condensation.
- Corrosive gases (especially sulfide gas, ammonia, etc.) or flammable gases.
- Direct vibration or shock
- Contact with water, oil, chemicals, steam , smoke, or hot water
- High concentrations of atmospheric dust, salt or iron particles
- Large inductive interference, resulting in static electricity, magnetic fields or noise.
- Direct sunlight.
- Radiant heat sources, et

2.2 Mounting Process

（1）Cut out rectangle holes on the panel for installing the controller according to the required hole size. When installing more than one controller, the minimum horizontal and vertical distance between two holes should be 25mm and 30mm respectively.

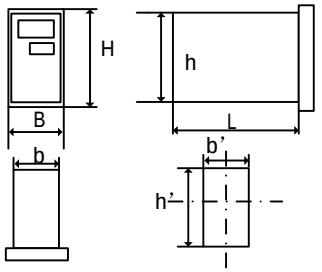
（3）Insert the controller into the hole on the panel.

（4）Insert mounting bracket in the slot for mounting the controller.

（5）Push the mounting bracket tightly to connect the instrument and the panel firmly.

Accessories:
Two mounting brackets,
One copy of manual

2.3 Dimension in millimeters



Model	H×B	h×b×L	h'×b'
ND	96×96	92×92×70	(92+1)×(92+1)
NE	72×72	68×68×70	(68+1)×(68+1)
NF	96×48	92×44×70	(92+1)×(44+1)
NG	48×48	44×44×100	(44+1)×(44+1)

2.4 Key Performance

1) Measurement accuracy: 0.5%±1dig 2) Power: 220VAC or 85 - 264VAC 3)Operation Temperature:0～50℃ 4)Fuzzy PID control 5) This product conforms with the "Q/SQG01-1999 Intelligent Digital Display Adjustor" Standard Regulation.

III.Wiring

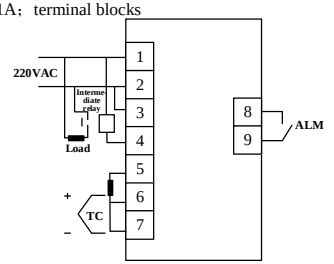
3.1 Caution when wiring

(1)Please use the specified compensation wire for thermocouple input.

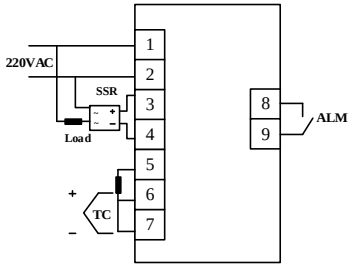
(2)To avoid the influence of inductive noise, input signal wires should be separated from electric power lines or load lines.

3.2 Wiring Terminals

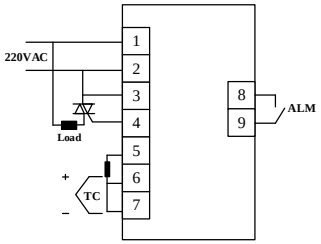
1）ND、E、F-5011；5012；5311；5312；5411；5412；
ND、E、F-5001；5002；5302；5301；5401；5402；
5401A；terminal blocks



2）ND、E、F-5401V；5301V；5001V
ND、E、F-5411V；5311V；5011V terminal blocks

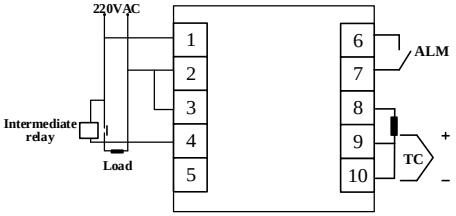


(3)ND、NE、NF-5701M terminal blocks：

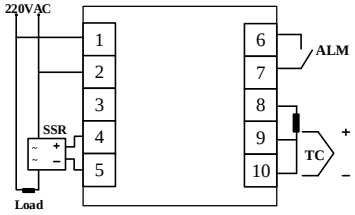


（4）NG-5011；5311；5411；terminal blocks;

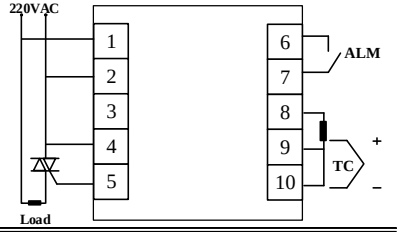
Note： NG-5001; 5301;5401; No Alarm(ALM) Output



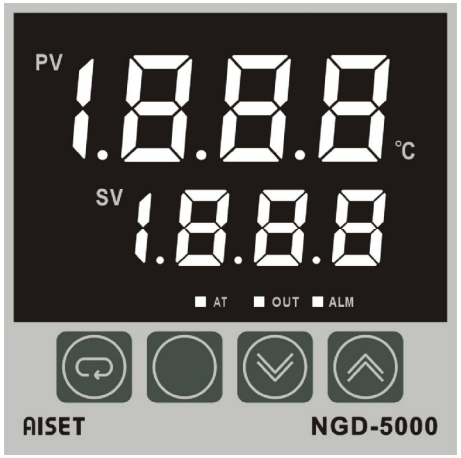
(5) NG-5411V；5401V terminal blocks



（6）NG-5701; 5702 TRIAC controller (48×48)



IV. Configuration of Controller's Panel



①(PV) Present Value Display (RED)

- Display Measured Value.
- Display variety of prompt symbols according to the controller status.

②(SV) Set Value Display（GREEN）

- Display Set point Value.
- Display the variety of parameters according to controller status.

③Indicator

- Auto-tuning indicator (AT), flash green during operating.
- Control output indicator (OUT), solid green when active.
- Alarm output indicator (ALM), solid red when active.

④Function Key

- Call out, update and confirm parameters.

⑤▼、⑥▲ Adjusting Key

- To adjust numbers.

V. Operation

5.1 Functional Description Specification

- After the controller is switched on, the PV display window shows Inp and SV display shows the calibration mark of the temperature sensor. After 2 seconds, the PV display shows the upper limit of the measurement range and the SV display shows the lower limit of the measurement range. After 2 more seconds, the PV display shows the Measurement Value and the SV display shows the Set Point Value then the system will get into its normal operation state.
- How to set the temperature value: Press the ↻ key, the PV display shows SP value. Press the ▲ or the ▼ key until the desired value is reached on the SV display. Press ↻ KEY, system return to its standard model state.
- How to set the Control Parameters': Pressing the ↻ KEY more than 4 seconds, the PV display window will show the prompt symbol of the control parameter (Details are listed in the table below). Press the ▲ or the ▼ key to reach the desired value. Keep pressing the ↻ key, the PV display window will show individual parameters symbol accordingly, Press the ▲ or the ▼ key to reach the needed value for individual parameter. Press the ↻ KEY again for more than 4 seconds, system will return to its standard model state.

  Note: the controller will return to standard state if no button was pressed in a minute.
- If oooo is appeared on the lower part of the PV display window, the thermocouple is connected in the reverse order. If oooo is appeared on the upper part of the PV display window, the thermocouple is in open circuit state or the measured temperature exceeded limit of upper or lower boundary.
- The Auto-tuning Function for the controller: After pressing the ▲ KEY for more than 4 seconds, the AT indicator will flash, the controller starts its Auto-Tuning process. When the AT indicator is off, the new PID parameter will be applied.
- ON/ OFF control: Under PV/SV display mode, press the ▼KEY for more than 4 seconds to stop the output, the indicator will turn off, the SV display window will display OFF, which means the controller has manually turn off output. Then press ▼ key for more than 4 seconds, it will return to normal statel.

5.2 Table of Parameters:

Prompt Symbol	Name	Setting Range	Illustration	Beginning Value
AL / AL	Alarm Setting	0…Range ℃	Setting of Alarm，Insensitive interval of alarm is equal to a constant value 0.4	50 or 50.0
P / P	Proportional band	0…300 ℃	Proportional action adjusts: The more the value of P, the less the proportional action and the less the system gain. (P=0 is ON/OFF Control, Ar is the dead- zone)	30 or 30.0
I / I	Integral Time	0…999	Integral action time constant, the more the value of I, the less the Integral action I=0 is PD Control，Ar is for eliminate the steady state error and reset	240
d / d	Differential Time	0…999 Seconds	Differential time: The more the Value of D, the more the differential action, which can overcome overshoot (D=0 is PI Control)	60
Ar / Ar	Overshoot restrain (Proportion re-set) (Insensitive interval of ON/OFF Control)	0(0.0)～ 100%(100.0%)	Used to restrain Overshoot (Ar is set to 1.5～2 time the output empty ratio in the steady state of the syst Reduce Ar energy and temperature overshoot, when SP is changing, Ar must be adjusted; Ar must be confirmed and will be set according to SP value automatic	100
T / T	Control Cycle	1…100 Seconds	When the relay output≤20s,SSR and Si-controlled switch transwitch≤2s, continuous output T is equal to 1s, only acting on heating side	20
Pb / Pb	Offset of the Process Value	Full Range	Using for correct the measurement error caused by the sensor and the compensate line of the thermocouple	0 or 0.0
LCK / LCK	Coded lock	000，001，002	000：All parameters can be updated 001：Only the Set Point Value can be updated 002：All parameters cannot be updated	000

VI. Service and Maintenance

- This controller is under warranty for 12 months since the day of purchase (the warranty only stands if the problem is caused by the malfunction due to manufacturing). Any repairment for damages caused by improper use of the controller will be charged. The controller is provided with lifetime maintenance and repair on cost.
- Please keep the controller in a dry place with air and NO corrosive gas.

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