

## **User's Notice**

- When using, please abide by the rules of this manual and matters needing attention.
- Received the instrument, please open the package carefully, check whether the instruments and accessories for transport and damaged, if damaged, please inform our dealers immediately, and keep the package to send back processing.
- During use if you found the instrument working abnormal or damaged please contact our dealers or, do not self repair.
- The instrument should be sent to Metrology or qualified Verification unit after using a full year for verification, after qualified can use.

## Overview

DDG-2090 series microcomputer industrial control instrument is used for precision instrument testing solution conductivity or resistivity, its full function: stable performance, easy operation and other characteristics, make it an ideal instrument of industrial enterprises in test and control field.

DDG-2090 series of instruments used in backlit LCD display, with error indication; automatic temperature compensation; isolated 4-20 mA current output; double group relay control, hysteresis is adjustable, the high-low alarm indication; power down memory, no battery backup, data stored for ten years.

DDG-2090 series instrument can be matched with various types of  $K=0.01$  -  $K=10$  electrode.

## Packing specification

DDG-2090 instrument	One set
Fixed locking bar	Two pieces
User Manual	One set

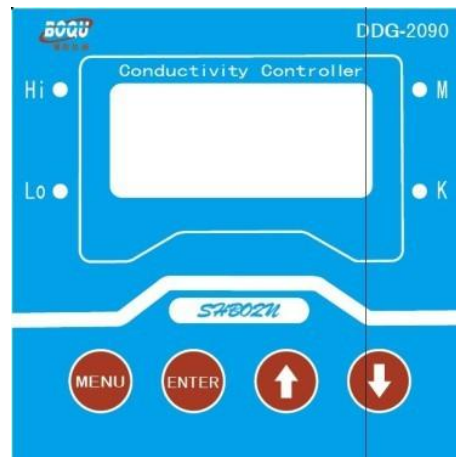
## Technical Indexes

1. Measuring range: 0~19.99  $\mu\text{S}$ , 0~199.9  $\mu\text{S}$ , 0~1999  $\mu\text{S}$ , 0~19.99mS, 0~199.9mS
2. Resolution: 0.01  $\mu\text{S}/\text{cm}$ , 0.01  $\text{M}\Omega$
3. Precision: 0.02  $\mu\text{S}$ ; 0.0 1  $\text{M}\Omega\cdot\text{cm}$
4. Stability:  $\leq 0.04 \mu\text{S}/24\text{h}$ ;  $\leq 0.02 \text{M}\Omega\cdot\text{cm}/24\text{h}$
5. Standard solution: Any standard solution
6. Control range: 0~19.99mS/0~19.99  $\text{k}\Omega\cdot\text{cm}$ , 0~19.99 $\text{M}\Omega\cdot\text{cm}$
7. Temperature compensation: 0~65.0°C
8. Output signal: 1~5V or 4~20mA output isolation protection
9. Output control mode: ON/OFF relay output contacts (two sets)
10. Relay load: Max. 230V, 5A(AC); Max. 115V, 10A(AC)
11. Current output load: Max. 500 $\Omega$
12. Working voltage: AC 230V  $\pm 10\%$ , 50/60Hz
13. Overall dimension: 96x96x110mm;

14. Working condition: ambient temperature: 5~45℃

**Use of K=0.01 electrode for resistivity instrument**

### Panel description



- |                                  |                                       |
|----------------------------------|---------------------------------------|
| 1. Hi: high alarm indicator lamp | 2. Lo: low alarm indicator lamp       |
| 3. ↑key: increase the value      | 4. ↓key: reduce the value             |
| 5. MENU key: menu selection      | 6. ENTER key: determine the operation |
| 7. M: MΩ.cm status display       | 8. K: KΩ.cm status display            |

### Instrument wiring

1. NO: relay normally open terminal
2. COM: relay common terminal
3. NC: relay normally closed terminal
4. NO: relay normally open
5. COM: relay common terminal
6. NC: relay normally closed terminal
7. 220v power supply live wire
8. 0v power supply null line
9. Ground

10. TEMP: temperature compensation

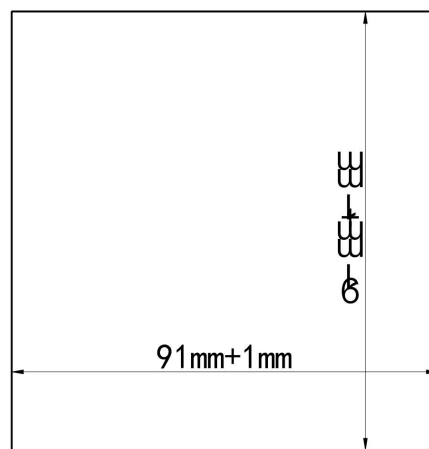
11. TEMP: temperature compensation

12. CELL conductance input      13. N/A      14. N/A

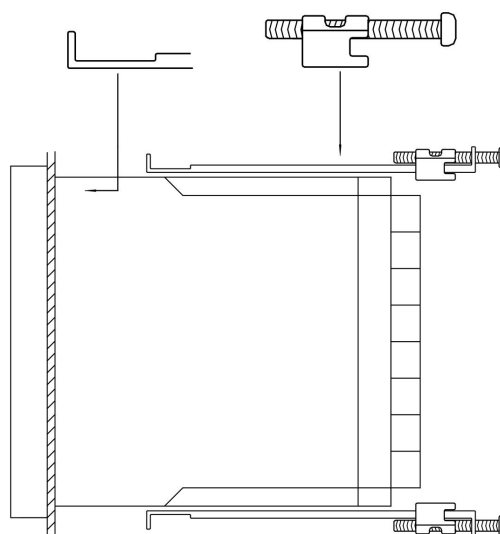
15. 4 ~ 20 mA +      16. 4 ~ 20 mA –

### Installation steps

1. Draw a rectangle cut in the instrument cabinet or mounting surface.



2. The instrument rear is inserted from opening front, two locking assembly and a locking.



## Temperature compensation

This instrument is automatic temperature compensation, the highest temperature compensation is 65°C, when not connected with the temperature probe will display "Er2" or "Er3".

## Signal output

Output current: 4~20mA

Output load:  $\leq 500\Omega$

Current error: : + 0.04mA

Output current:  $I = D * (16/20) + 4.00$

The corresponding current:

Conductance or resistance value	Current (mA)	Conductance or resistance value	Current (mA)
0.00	4.00	10.00	12.00
2.00	5.60	14.00	15.20
4.00	7.20	16.00	16.80
6.00	8.80	18.00	18.40
8.00	10.40	20.00	20.000

## Set the temperature compensation coefficient

Conductivity is an inherent characteristic of electrolyte solution, it directly reflects the concentration of corresponding to ions in solution. At the same time, conductivity value of water quality is an important index of pure water concentration. Conductivity of solution and property of solution are closely related to temperature, temperature go up and conductivity value increase, conversely, the conductivity value reduction. The temperature coefficient of conductivity is temperature changes every 1°C, the amount of change of the solution conductivity vary according to the nature of the temperature coefficient, for the majority of ionic conductivity of +2%/°C for -1 ~ +3%/°C-1.

DDG-2090 type conductivity / resistivity controller compensating coefficient of different settings according to the different solution, its operation is as follows: according to the MENU to make the instrument display PEr and 1.91 flashing alternately, and then press the numerical increase key or numerical decrease key, compensation coefficient to the right; after a good tune by ENTER, the instrument display -- --, instrument enter the normal measuring state can be used.

## **Alarm point setting**

### **High alarm point setting**

- ①Press MENU to make LCD display H—, this moment high point alarm indicator lamp will flicker, the machine has entered the high alarm setting state.
- ②Press number increase or number reduce to determine control high control numerical.
- ③Press ENTER, complete low setting and enter the control mode.

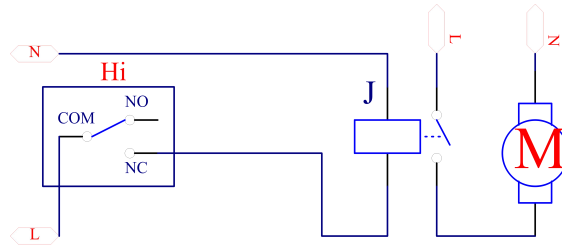
### **Low alarm point setting**

- ①Press MENU to make LCD display L—, this moment high point alarm indicator lamp will flicker, the machine has entered the high alarm setting state.
- ②Press number increase or number reduce to determine control high control numerical.
- ③Press ENTER, complete low setting and enter the control mode.

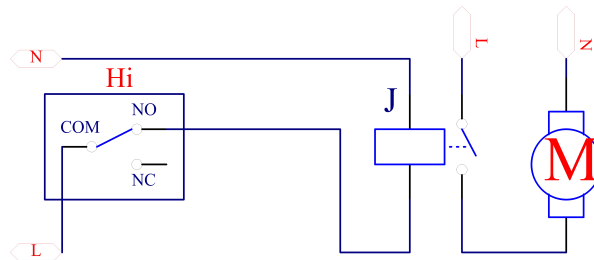
**Note: if the user only requires a single point of control, then the procedures set above one can choose. The user after the completion of the operation, such as the screen is not in the normal mode, press MENU to screen appears "— — — —" and then release the button, is displayed in normal mode**

## **Relay control description**

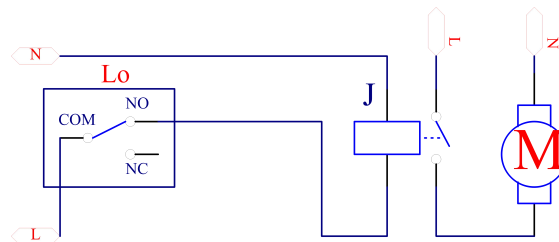
DDG-2090 instrument with two groups of relay (P type table four group), the control can be a variety of ways. When the current is greater than 2A, suggested that middle add AC contactor, to protect the instrument. The following method can be used for reference:



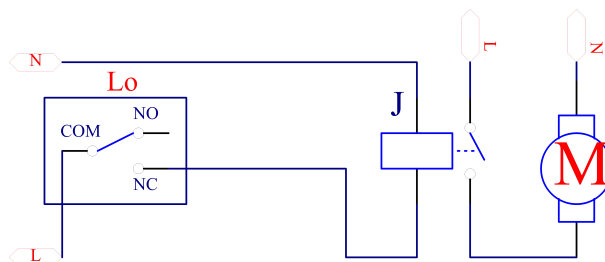
Connect high relay conductance values or resistance value rises to the setting value  
can automatically open dosing device



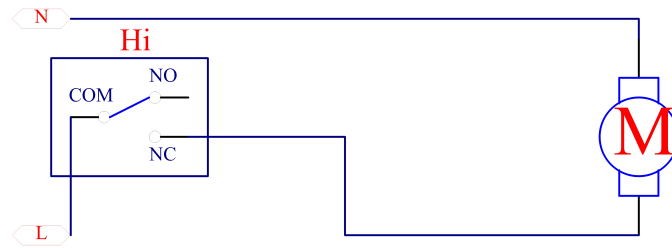
Connect high relay conductance values or resistance value rises to the setting value  
can automatically close dosing device



Connect low relay conductance values or resistance value decline to the setting value  
can automatically close dosing device



Connect low relay conductance values or resistance value decline to the setting value  
can automatically open dosing device



Current less than 2A can be directly connected to the load

## Error display

Er2: exceeding the measurement range, for example: the choice of the constant 1, in the r1 state, when the value is greater than 199.9uS, it will display "Er2".

Er3: temperature compensated error, when the temperature exceeds 65°C would display "Er3".

## Special function setting

1. Power supply before the press and hold MENU, then connect the power supply, waiting for appear F1 then release the button, MENU can deadlock. (repeat the operation once can be restored)
2. Power supply before the press and hold ENTER, then connect the power supply, waiting for appear c1—c4 and then release the button, can change the input electrode constant. (repeat operation can be cyclic change)

## Electrode constant conversion

Connected to the power supply before hold ENTER, then connect the power supply, the emergence of c1 - c4 and then release the button, can change the electrode constant setting.

c1: constants 0.01 (measured resistivity)

c2: constants 0.1

c3: constants 1



c4: constants 10

### Range conversion

The instrument display properly to hold ENTER, such as r1—r4 then release the button, which can change the instrument range.

	c1	c2	c3	c4
r1	0.5-19.99 MΩ·cm	0-19.99uS	0-199.9uS	0-1999uS
r2	50-1999 kΩ·cm	0-199.9uS	0-1999uS	0-19.99mS
r3	5-199.9 kΩ·cm	0-1999uS	0-19.99mS	0-199.9mS
r4	——	0-19.99mS	0-199.9mS	0-1999mS