



User Manual

GE-134 Dissolved oxygen Controller



The initial password: 8008

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1. Overview

GE-134 dissolved oxygen controller is a microprocessor-line water quality monitor. Configuration of different dissolved oxygen electrode, the oxygen content of the aqueous solution for continuous monitoring and control.

2. The structure features

Complete measuring system consists of GE-134 instruments and two parts oxygen electrode, oxygen electrode contact with the tested solution, aqueous oxygen meter and temperature display and work state.

3. Technique features

- (1) Measuring range: DO: 0~25.00mg/L;
Temperature: -5~60℃;
- (2) Basic error: DO: $\pm 0.2\text{mg/L}\cdot\text{S}$;
Temperature: $\pm 0.3^\circ\text{C}$
- (3) The temperature compensation range: 0~110℃;
- (4) The remain signal of electrode: <1‰;
- (5) Response time(90% final): <60seconds(25℃) or <30seconds(35℃)
- (6) The stability : <2%F·S every week(normal temperature and normal pressure)
- (7) Current output: 0~10mA(load resistance<1.5KΩ);
4~20mA(load resistance<750Ω);
- (8) Two group of alarm relay: 3A 240VAC, 6A 28VDC or 120VAC;
- (9) power supply: 220VAC $\pm 10\%$,50 $\pm 1\text{Hz}$, power consumption $\leq 3\text{W}$;
Or 24VDC, power consumption $\leq 1\text{W}$;
Or 12VDC, power consumption $\leq 1\text{W}$;
- (10) The dimension: 96×96×130mm;
- (11) Installation way: panel installation;
The tapping size of electronic unit : 91×91mm;
- (12) Waterproof Wall Box Size: 300(H)*200 (W) *167 (D) mm;
- (13) The electronic unit weight: 0.6kg;
- (14) Operating conditions: a)Ambient temperature : -10~60℃;b)Relative humidity: no bigger than 90%; c)There are no corrosive gas around; d)There are no other magnetic fields or electromagnetic fields which produce the negative effect except the earth magnetic field.

4. The function features

- ※ Intelligence: the value of single-chip microprocessor to complete measurements of dissolved oxygen, temperature measurement and compensation;
- ※ Man-machine dialogue: the menu operation structure, the user can follow the onscreen prompts action;
- ※ With multi-parameter display: Simultaneous display of dissolved oxygen values, temperature and working conditions;
- ※ Software to set output: 0 ~ 10mA or software selection 4 ~ 20mA output;

- ※ Range and alarm, free to set lower limits; upper and lower limit alarm prompts;
- ※ Two relay control switch, volume control adjustable hysteresis;
- ※ Since the password: The user can set or modify the password, so access to the result of misuse;

Service: To provide technical support and after-sales service contact methods;

- ※ Optional RS485 // RS232 communication interface connected to the computer

5. The installation of meter

5.1 The controller shall be installed where it is clean, dry and well-ventilated and there is no vibration, no corrosive gas or steam. Some space shall be left around the meter, for the convenience of the operation and overhaul. The meter shall be as close as possible to the sampling point, for ease of pipe and electric connection. The meter shall be close to the sensor for the ease of calibration. See the diagram 1 for size: 91mm * 91mm.

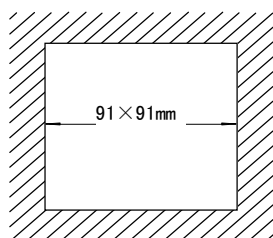


Figure 1 hole-tapping size

5.2 Electrode installation diagram

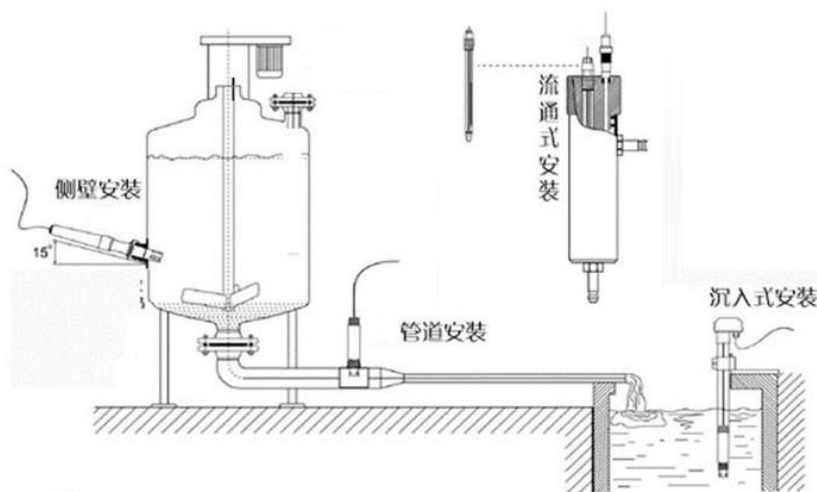


Figure 2 a variety of installation shown in Figure

Sink-or pipeline for high values of dissolved oxygen measurement;

5.3 The electric connection

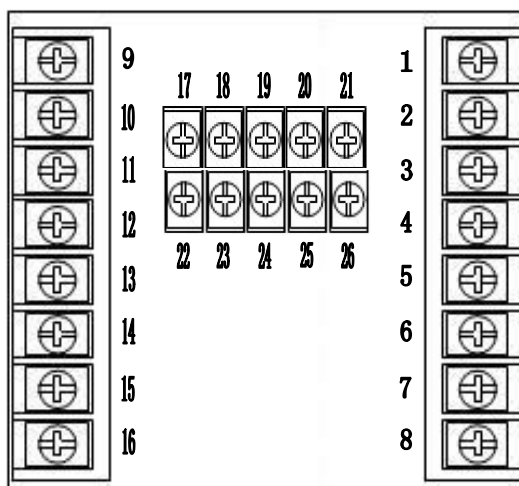


Figure 3 instrument wiring diagram

Wiring instructions:

- | | |
|-------------------------------------|---|
| 9、 DO measuring electrode terminal | 1、 High alarm relay normally closed contact |
| 10、 DO reference electrode terminal | 2、 High alarm relay contact common |
| 11、 Temperature electrode terminals | 3、 High alarm relay normally open contact |
| 12、 Temperature electrode terminals | 4、 Low alarm relay normally closed contact |
| 13、 Shield terminal | 5、 Low alarm relay contact common |
| 14、 Null | 6、 Low alarm relay normally open contact |
| 15、 DO output current— | 7、 220VAC or 24VDC+ or 12VDC+ |
| 16、 DO output current+ | 8、 Zero line or 24VDC— or 12VDC— |
| 17、 ~24、 Null | 25、 Communication+ |
| 22、 Communication— | 26、 Communication— |

5.4 Electrodes fixed conventional cable length is 5m lead, Terminals Department has labeled inserts with insert it into the controller back the same number of terminal symbols can be tightened.

6. Function Keys

The panel has 6 touch key and they are: Esc、←、→、↑、↓ and Enter .

Esc: shift between the measurement screen and menu screen or return to the previous menu and status from the menu screen or cancel the input data;

←: move to the first menu item or move the cursor to the left when the data is input;

→: move to the last menu item or move the cursor to the right when the data is input;

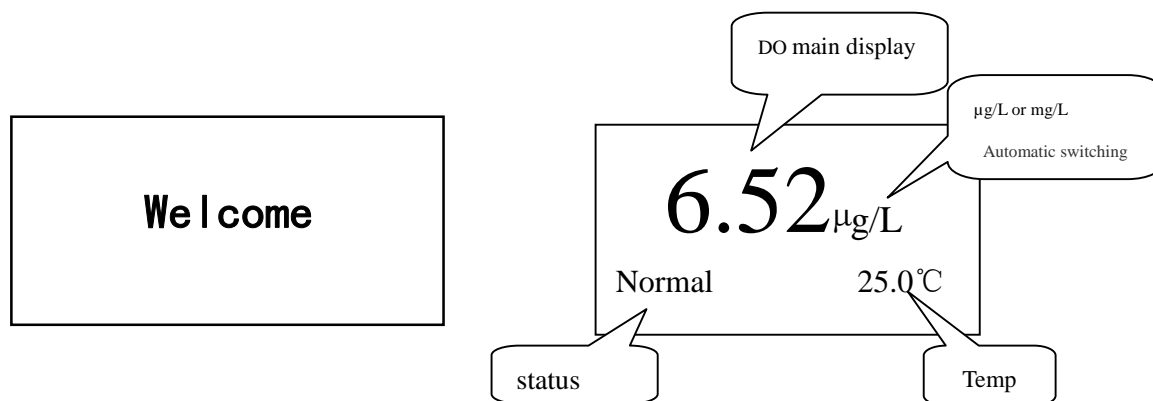
↑: move the menu upward or numerical value increases;

↓: move the menu downward or numerical value decreases;

Enter: Choose or confirm the menu item and finish the data input or confirm certain status.

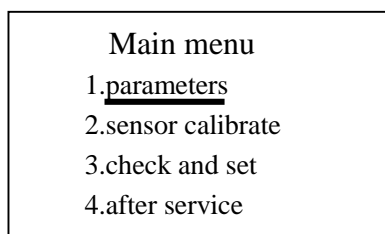
7. Detailed instructions

7.1 Power-on: Before the meter is used, check all the pipe connection and the electric connection. After the power supply is connected, the meter displays as shown in below left, In over serval seconds, meter will enter into measurement main display.

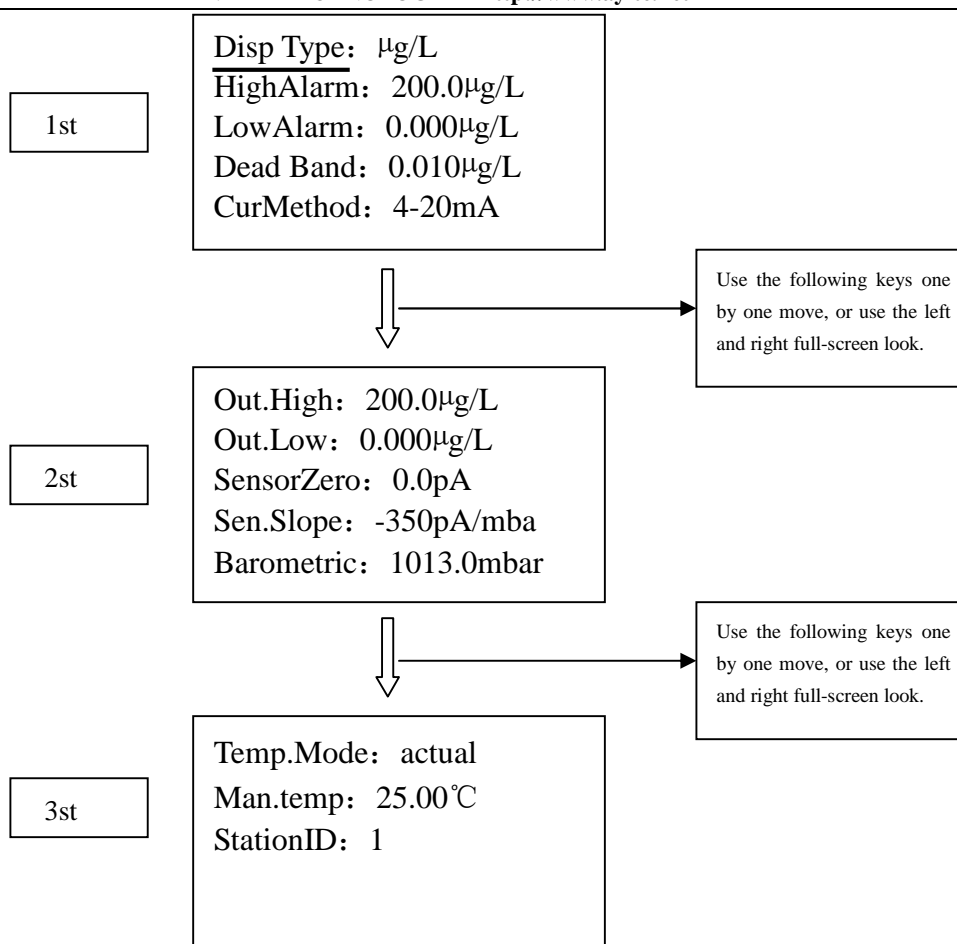


Value-based show in which dissolved oxygen, temperature, state of the sub-display. Status prompt displays the following information: 1. Normal 2 High limit alarm 3 low limit alarm.

7.2 Main menu: While in the main display status, press ESC key will enter main menu. It display like below:



7.3 The submenu “parameters”:All the parameters under the submenu should be checked before measuring, otherwise it will run by the preset values. Move the cursor to the “1.parameters” submenu and press ENTER key, a password will be requested(preset password is 8008). When enter this submenu, using ↑ or ↓ key move the cursor, press ENTER key to modify the sub parameters.



7.4 Parameter Descriptio:

1) "Disp.Type": There are three methods: $\mu\text{g}(\text{mg})/\text{L}$, % and mbar. Normal use " $\mu\text{g/L}$ ", "%" is usually used in bio-fermentation.

2) The "Sensor Zero" and "Sen.Slope"

This two items are used to set the sensor zero point and the sensor slope ratio. The results of calibration are recorded in here. In addition, this function is also used to directly modify sensor's zero point and slope ratio.

3) "Barometric": This item is used to set atmosphere pressure.

4) The "Alarm High", "Alarm Low" and "Dead Band"

The "Alarm High" and "Alarm Low" are respectively used to set the high alarm limit and the low alarm limit. The "Dead Band" is used to set the dead band of alarms.

5) The "Out High" and "Out Low"

The "Out High" and "Out Low" are respectively used to set the output current high limit and low limit, $\text{Out High} > \text{Out Low}$.

6) The "output current(CurMethod)"

This menu is used to setting the meter current output method. Make the selection between "0-10mA" and "4-20mA". The relationship between the output current and the measured dissolved oxygen:

0~10mA output method : $I = \{(D-DL)/(DH-DL)\} \times 10\text{mA}$;

4~20mA output method : $I = 4\text{mA} + \{(D-DL)/(DH-DL)\} \times 16\text{mA}$.

Among them: I-output current, D-the currently measured dissolved oxygen, DH- the "output upper limit" set by users; DL- the "output lower limit" set by users.

7) The “temperature input type(Temp.Mode)” and “manual set temperature(Man.Temp.)”

The “Temp.Mode” has the “actual measurement temperature (actual)” and “manual set temperature(manual)”. The “actual measurement temperature” refers to the temperature actually measured by the temperature sensor ; The “manual set temperature” refers to the temperature set by the human and it has nothing to do with the actual solution temperature. This function is mainly used for simulated debugging, substitute resistance box.

The “Man.Temp.” refers to the temperature which the meter displays when the “temperature input type” sets the temperature as “manual set temperature(manual)”.

8) “StationID”: This item is used when communication by RS485, it means the ID number of the meter in the RS485 network.

7.5 Calibration Description:

Because each oxygen electrode and zero-current slope is different, and with the consumption of liquid filling, zero current and slope in the course will gradually change, resulting in aging, and each additional fill fluid or exchange membrane can also lead to zero current and slope changes, which need regular "calibrated" to ensure sufficient accuracy. Before entering this menu to enter the correct password, the initial password is 8008.

The table has a little air of known concentration of calibration and calibration slope and other methods to choose from.

"Some air calibration slope": the head of oxygen membrane electrode before calibration should be filled with fill fluid, the installation clean and well maintained after the electrode head, insert the water samples; and electrode cable connected to the instrument according to label accurately activated power 1 to 2 hours. Remove the electrode from the water samples placed vertically in the air, with a clean filter paper to dry gently drop the head electrode. And then operate the instrument into the "point slope calibration of the air," below left. Input current to be relatively stable (usually about 5 minutes) will be automatically calibrated, or manually press the Enter key to continue, after the right below shows results of calibration reference. At this point press the Enter key and then press the Escape key, instrument calibration of the display values should be consistent with or close to Appendix A, see last page. After completion of calibration measurement can be put in water samples. Only when the user is put into the air to do a little slope calibration.

Stable until the input current Electrode current: -70.00nA Temp: 25.0°C Press Enter to save

Result: S=-410.0pA./mbar Application according to confirm, cancel press the Escape
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"Known concentration calibration": about to enter a known concentration after calibration.

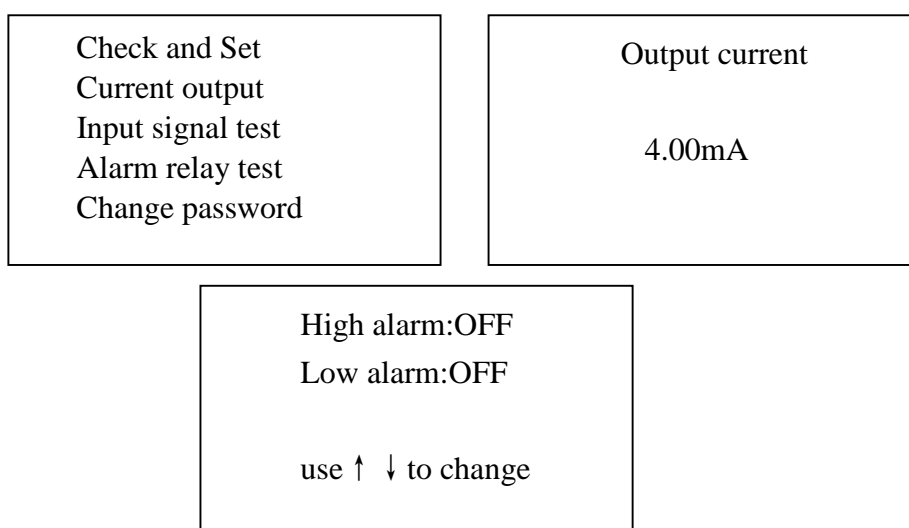
8. The submenu “check and set”

8.1“Current output”:

This function is mainly used for the correct checking of output current, and with this submenu, the user can check the correctness of meter output current within the full output range. When the meter is connected with the recorder and traditional slave machine, check whether the recorder and slave machine sampling are correct or not, so as to detect the fault.

Input the password before entering the submenu. Afterwards one warning will appear, informing the users that they should guarantee any change in the output current will not bring any negative effect before they use the meter. Press Enter key to continue. There will display the present output current on the screen. Press ← → ↑ and ↓ keys to change the output current, Press Enter to stop the changing. Press Enter again to input the output current what you need.

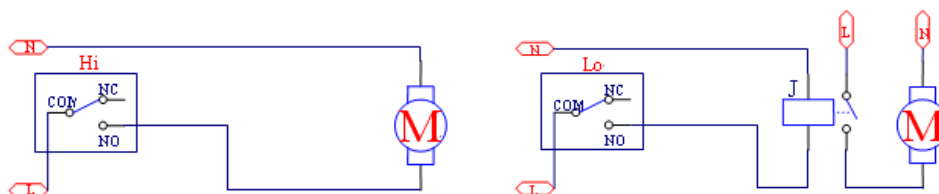
Notes: When this function is used, the output current is set by the user and it will change within the full range, guarantee that the adjustable regulator connected on the output circuit or microcomputer will not produce any negative effect upon the control output.



8.2“Alarm relay test”:Into the book menu display as shown above.This function is used for testing the alarm relay output.

Load control relay rated current is less than the exposure to current, pressing the left to connect (power supply not more than 220V);

Load control relay rated current greater than the exposure to current, then the need to add AC contactor, press the connect at right.



8.3“Change password”:After entering this function, input “initial password ”(initial password is 8008), and then input “new password” complete the modification of user password.

8. 4“Input signal test”: This function is mainly used for simulated debugging by the meter factory.

8. 5“After Service”: This menu shows the after-sales service telephone number, E-mail and Web address.

9. Daily maintenance

Instruments generally do not need routine maintenance, such as failure to contact the company, the company's technical staff under the direction of the adjusting.

Dissolved oxygen electrode maintenance, please note the following:

- (1) As far as possible into the water sample flow rate constant.
- (2)Low dissolved oxygen in the test, the use of hard pipe inlet connection to prevent air infiltration into the pipe.
- (3) Disassembly can not break the electrode film and the misfortune to scratch the oxygen electrode penetration within the core of the glass bulb head.
- (4) Cable connector to keep clean, not damp or water.
- (5)Instrument display and the actual measured values varied widely, or low levels of oxygen can not be measured, it may be filled with liquid oxygen electrode dry, to be re-poured into the filling liquid. Specific steps are as follows: A. slowly unscrew the electrode head stainless steel jacket, remove the cylinder-like membranes; B. Discard the cylinder filling the remaining liquid, and then filled into the first wife of the oxygen electrode filling solution the inner core, the excess liquid will fill the tank with the natural discharge of the exhaust electrode (mounted in the cylinder when you can not leave air bubbles), and then carefully screw on the stainless steel jacket can be. The power re-activation of more than 1 hour "point slope calibration air" after put into operation.
- (6) When the scene a long time without water when not in use, remove the electrode should be cleaned, drained membrane filled tuck, put on protective cap, electrode drying recommended store.
- (7) If the electrode damage or failure in need of replacement electrodes, the oxygen membrane damage in need of replacement.

Appendix A
(standard appendix)
saturated oxygen in the water under difference temperature

Temperature °C	Dissolved oxygen mg/L	Temperature °C	Dissolved oxygen mg/L
0	14.64	20	9.08
1	14.22	21	8.90
2	13.82	22	8.73
3	13.44	23	8.57
4	13.09	24	8.41
5	12.74	25	8.25
6	12.42	26	8.11
7	12.11	27	7.96
8	11.81	28	7.82
9	11.53	29	7.69
10	11.26	30	7.56
11	11.01	31	7.46
12	10.77	32	7.30
13	10.53	33	7.18
14	10.30	34	7.07
15	10.08	35	6.95
16	9.86	36	6.84
17	9.64	37	6.73
18	9.46	38	6.63
19	9.27	39	6.53

Annotation: This table is a reference from JJG291-1999 appendix C.

10. Whole set

Name	Quantity
1) GE-134 DO Controller	1
2) Oxygen electrode	1
3) Spare parts	1
4) Install bracket	2
5) User manual	1