User Manual

Conductivity Monitor/ Controller

EC-1800

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Content



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1. Precausion before use

- Initial password: 1000
- Important Notes:
  a. Please read this manual thoroughly before operating the instrument.
  b. The instrument has been pre-configured with matching electrode coefficients before leaving the factory. If replacing the electrode, new coefficients must be entered.
  c. If any malfunction or damage occurs during use, please contact us immediately. Do not attempt unauthorized repairs.

2. Overview:

The EC-1800 is an intelligent upgrade of DJK-110 industrial conductivity/TDS meter, designed for continuous monitoring in:

✓ Scientific research ✓ Chemical/pharmaceutical ✓ Environmental protection
✓ Metallurgy ✓ Papermaking ✓ Food/beverage ✓ Water supply

Dual Power Options:

- **EC-1800A**: 220V AC (IEC 61140 compliant)
- **EC-1800B**: Safety low-voltage 24V AC/DC (SELV/PELV certified)

Key Features:

- Bilingual UI (CN/EN switchable)
- Conductivity/TDS + temperature measurement with dual relay output control
- Adjustable temp. compensation (0-10%) & TDS conversion factors
- 4-20mA isolated output (300Ω max loop resistance)
- Audible alarm with on/off setting
- Programmable LCD backlight (auto-off available)
- EMI-resistant design with industrial-grade CPU
- One-touch factory reset & password protection

3. Technical Specifications

Standard Range		Extended Range	
	Measurement Range		Measurement Range
0.1 electrode	0.2-2000 μS/cm^{-1}	0.1 electrode	2-2000 μS/cm^{-1}
1.0 electrode	2-20000 μS/cm^{-1}	1.0 electrode	20μS-20.0 mS/cm^{-1}
10.0 electrode	20μS-20.0 mS/cm^{-1}	10.0 electrode	20μS-200.0 mS/cm^{-1}



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Accuracy: ±1% FS

Stability: ±1% FS/24h

Electrodes: 1.0 plastic platinum-black (standard) / Optional 316L stainless steel

Cell Constant: 1.0 cm^{-1}

Temp. compensation element: NTC 10K Thermistor

Temp range: 0-100℃, (0.1℃ resolution)

Medium Temp.: 5-100℃ @ 0.5MPa max

Installation: 1/2" NPT thread

Pressure Rating: 0 ~ 0.5MPa

Cable Length: Standard 5m (Custom lengths available)

Temperature Compensation: Reference at 25℃ (User-adjustable coefficient)

Display: 128×64 LCD

Outputs:

- Dual relay alarms (5A/250V AC contacts)
- 4-20mA analog output (Isolated)

Power Supply:

- **EC-1800A**: AC 220V±10% 50Hz
- **EC-1800B**: AC/DC 24V±10%

Power Consumption: ≤3W

Environmental Conditions:

- Operating Temperature: 0 ~ 60℃
- Humidity: ≤85% RH

Dimensions:

- **Housing**: 96×96×110mm (H×W×D)
- **Panel Cutout**: 92×92mm (H×W)



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4. Installation

Mounting

1. Insert controller through panel cutout (92×92mm)
2. Secure with included brackets

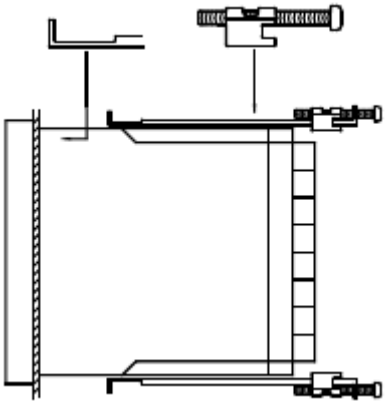

Figure 1 Fixed support installation

5. Wiring connection diagram

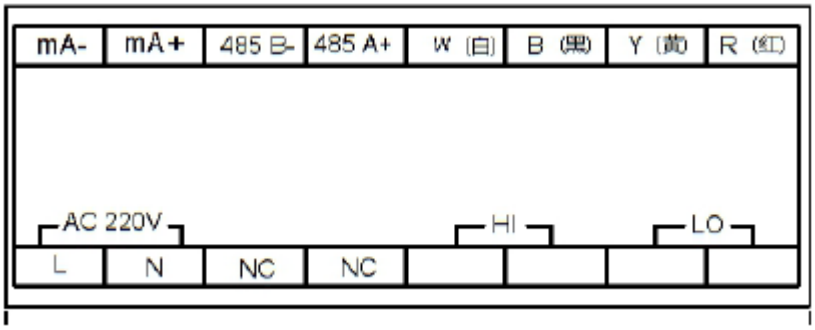

Figure 2 Rear terminals diagram

6. Connection notes

1．R (红)：Temperature （NTC10K）
2．Y (黄)：Conductivity
3．B (黑)：Temperature（NTC10K）
4．W (白)：Conductivity
5．485A：RS485 communication port
6．485B：RS485 communication port
7．mA+:　4~20mA output +
8．mA-:　4~20mA output -
9．LO:　low limit alarm

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10． Hl: high limit alarm

11．NC: undefined

12． NC: undefined

13． N: 220V power connection

14． L: 220V power connection

7. Electrode Installation

1) Electrode constant selection:

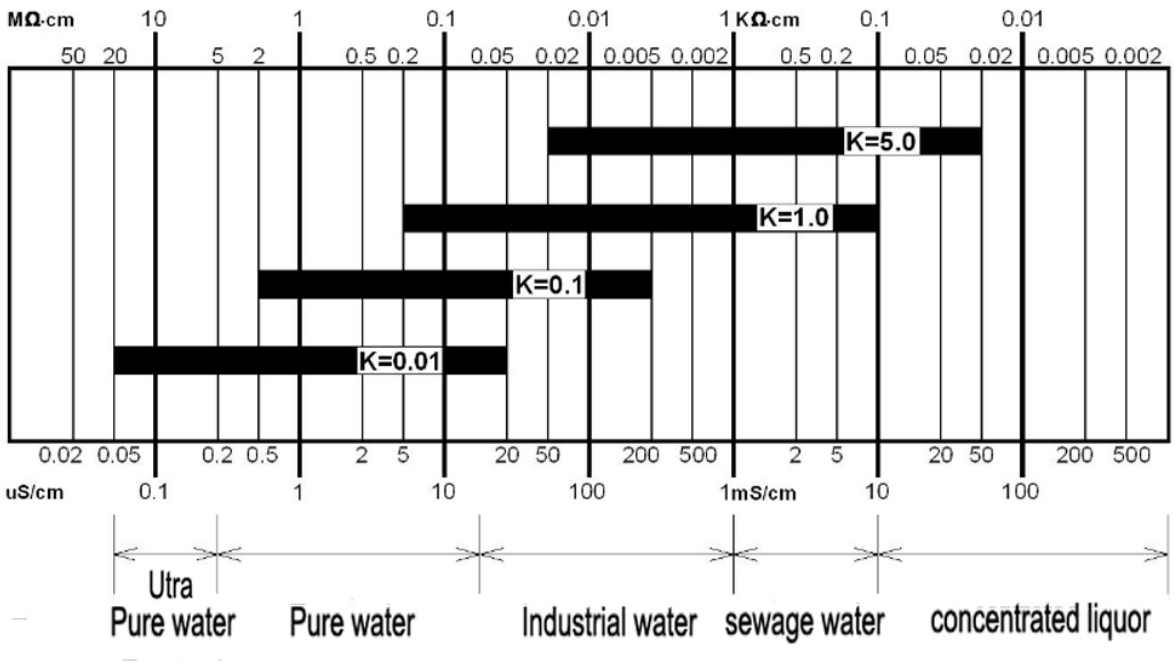

Figure 3 Electrode constant selection

2) Electrode shape and type of installation

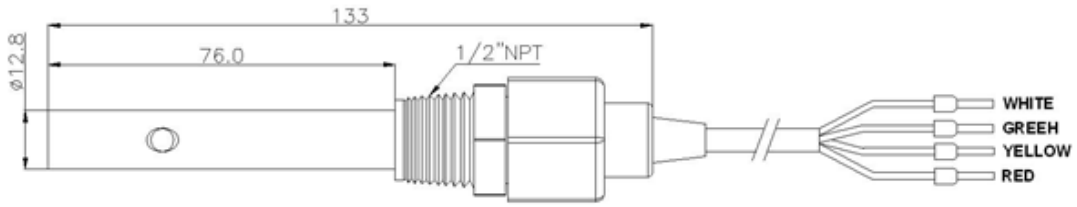

Figure 4 Electrode size

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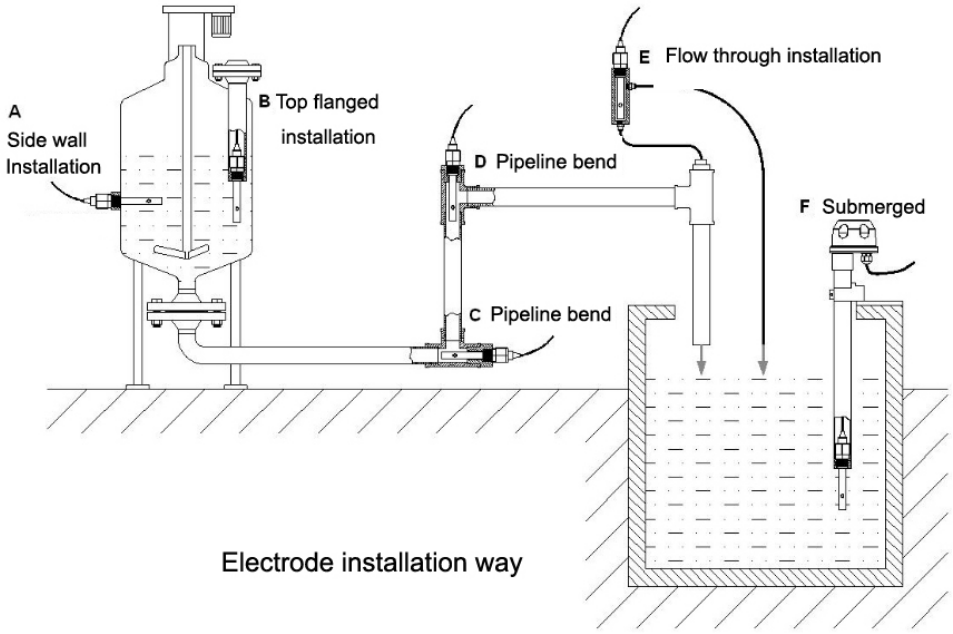

Figure 5 Electrode installation diagram

3) Common installation method

The installation of sensor is very careful work, the abnormal installation way can't obtain satisfaction measurement data. During installing the senor, must choose carefully the suitable installation site and installation way to avoid measurement data distortion.

a. In figure A, electrode joint is too long, into the part too short, which is easy to form the die cavity, cause to measurement error, must install the electrode according to the Figure B (Face to flow direction and go deep into the flow)

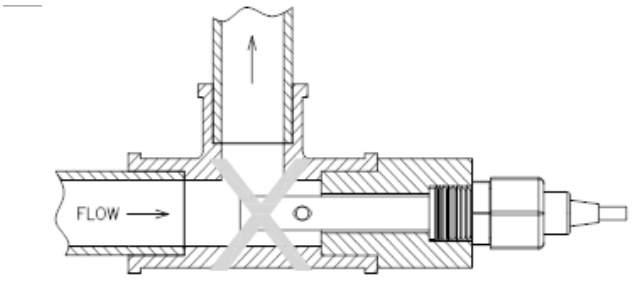

Figure A Wrong installation

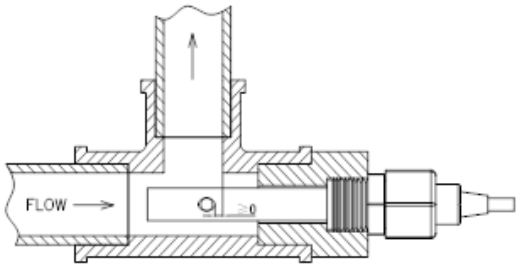

Figure B Correct installation

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b. Figure A installation way will make conductance pool forming air cavity to lead to measurement error and unstable. Must install according to the figure

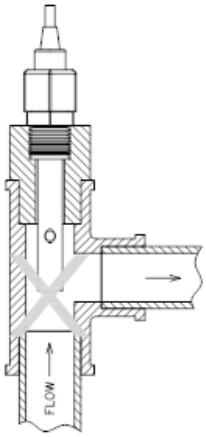


Figure A Wrong installation

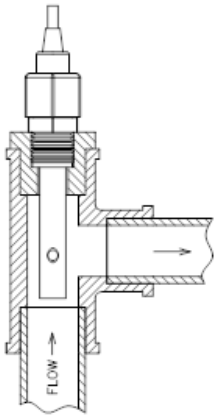
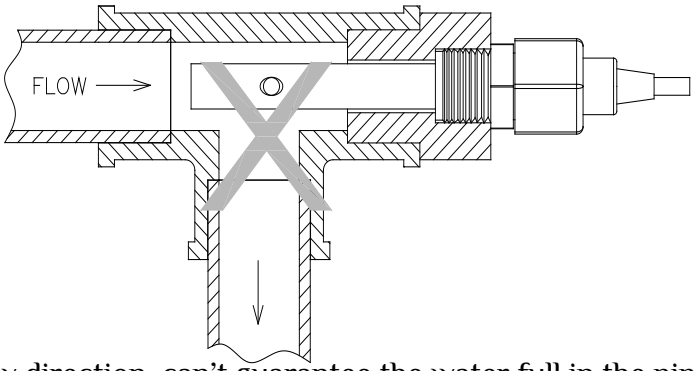


Figure B Correct installation

c. Other common wrong installation way:



Because of the water flow direction, can't guarantee the water full in the pipeline, or high air accumulating lead to measurement error or unstable.

4) Installation and Maintenance Guidelines:

a. Electrode Positioning

- Install the conductivity cell in pipeline sections with stable flow velocity and minimal bubble formation.
- For optimal accuracy, consider bypass installation when main flow conditions are unstable.

b. Flow Direction Requirements

- Concentric tubular electrodes must face upstream (FLOW direction) whether horizontally, diagonally, or vertically mounted.
- Non-cylindrical electrode designs should avoid lateral installation to prevent turbulence-induced vacuum pressure in the measurement chamber.

c. Cable Routing (Critical)

Measurement signals are low-voltage:



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✓ Isolate signal cables from power/control lines

✓ Never share terminal blocks/conduits with >24V circuits

✓ Maintain minimum 30cm separation from high-voltage wiring

d. Cable Length Specifications

- Standard 5m shielded specialty cable (factory pre-installed)
- Custom lengths require pre-order consultation with manufacturer

e. Cleaning Protocol

- Handle only by insulated housing - never touch active surfaces
- Contaminants (oils/greases/adhesives) cause long-term measurement drift
- Clean only with mild detergent (no abrasives)

f. Electrode Integrity

Do NOT disassemble or modify physical structure

Prohibited cleaning methods:

✗ Strong acids/alkali immersion

✗ Mechanical scrubbing

✗ Ultrasonic cleaning (unless specified)

g. Cable Compatibility

- Factory-calibrated cables only - substitutions invalidate accuracy
- Unauthorized modifications void warranty

h. Environmental Protection

Mount in NEMA 4X/IP65 enclosures for:

✓ Sunlight protection

✓ Splash resistance

✓ Humidity control

i. Power-Up Procedure

- Verify all connections per wiring diagram
- Confirm no short circuits before energizing



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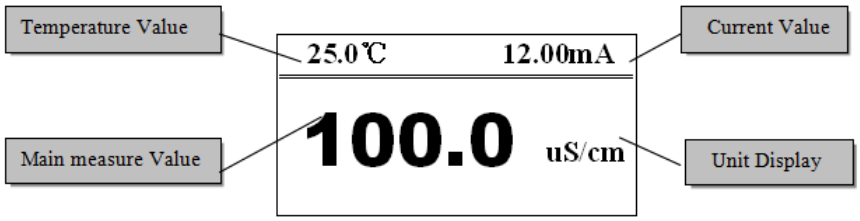
8. Operation

a. Interface Navigation:

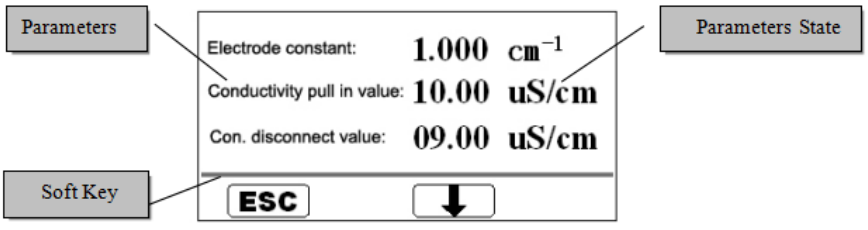
Soft key	Key function	Function description
ESC	Return key	On the " Settings menu" related up and down interface, return to the upper interface
→	Right shift key	Select the parameters of digital circularly
↑	Up shift key	Change selected parameter digital value(Add or less)
↓	Down shift key	Select the menu circularly
OK	Confirm key	Confirm the options and parameters
CAL	Cancel key	To exit the current parameters setting interface or modify state

b. Main interface display:



Note: Under main interface through press" ESC "to shift to browsing interface, no need to enter 'menu setting' interface ,it could be browse setting value.

c. Browsing interface display



Note: Browsing interface through press"[↓]"could check parameter state in turn, through press ' ESC ' return to main interface.

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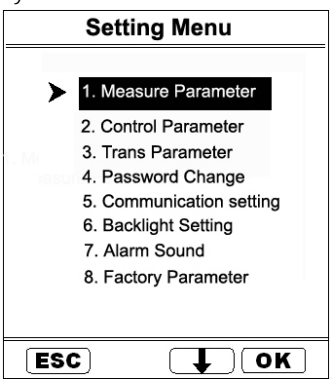
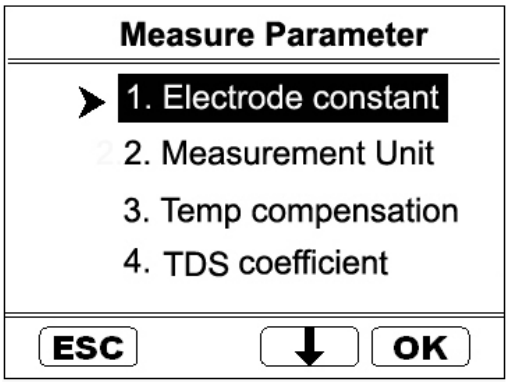
d. Main Menu Interface Display:



Under main interface, press OK key to enter user log in interface, after input password to enter 'setting menu' interface, this interface menu instruction as follow

NO.	Menu Name	Menu content instruction
1	Measure parameter	1) Set electrode constant, temperature compensation, measurement unit, Conductivity coefficient Main interface value, control unit value will automatically link with the parameter setting.
2	Control parameter	Set control of Conductivity(TDS) or Temperature over limit
3	Transmission parameter	Select Conductivity (TDS) or temperature transmission, and transmission capacity starting range transferring value
4	Password change	Reset log in password
5	Communication setting	Set communication baud rate and meter address
6	Backlight setting	Set backlight normal ON or delay off
7	Alarm sound	Set alarm on and off
8	Factory parameter	Recovery the instrument parameters to factory setting

e. Measure Parameter Interface



Note: press" ↑ "to select to enter "Electrode constant", "Measurement Unit", temperature compensation","Conductivity coefficient"etc.parameter setting, press" OK " to enter.

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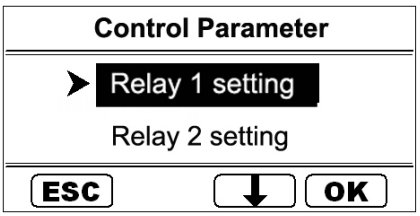
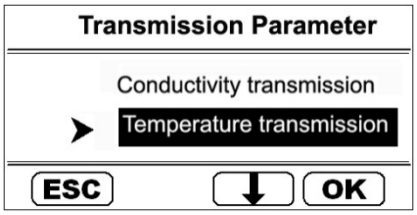
f. Control parameter interface:

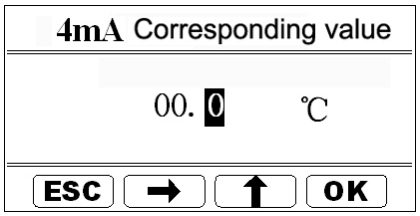


Note: press " ↓ " can select and enter" Relay 1 setting (Conductivity/ TDS)"or " Relay2 setting (Temperature) " parameter interface, press " OK " to enter.

g. Transmission Parameter Interface:

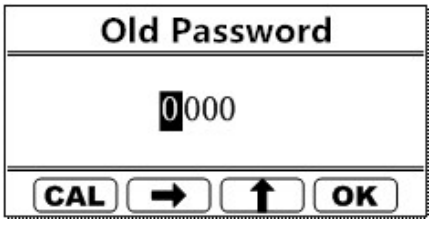


Note: After select the "Conductivity transmission"or"Temperature transmission", parameter will automatically link with the corresponding display unit, and then enter into the 4-20mA migration capacity setting



Note: press " → " and "↑ input parameter, press " OK "to save.

h. Password Change Interface:



Note: Input old password firstly, if the input is correct, then will enter into input new password interface, after change password, press OK to save.

OK

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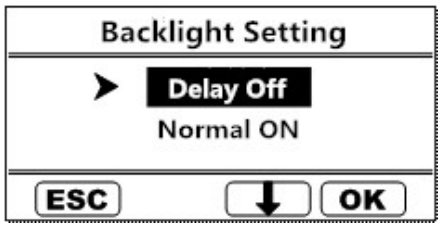
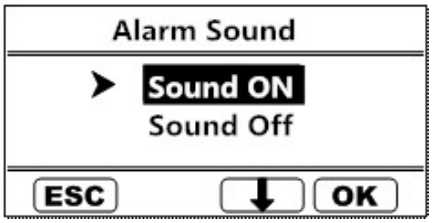
i. Back light setting interface:



Note: Firstly, to select back light ' Delay off ' or ' Normal on ' , if select Delay off, then need to input 'delay time'.

j. Alarm Sound Interface:



Note: select alarm sound ' on ' or ' off ', then press OK to save.

k. Factory default parameter

Menu name	Setting range	Factory default
Electrode constant	0.050 ~12.000	1.000
Measurement Unit	Conductivity /TDS	Conductivity
Temperature Compensation	0.000~0.070 1/℃	0.020 1/℃
Relay 1 pull in value	Conductivity: 0~20000.0 uS/cm	Conductivity: 20000.0 uS/cm
	TDS: 0~10000.0 ppm	TDS: 10000.0 ppm
Relay 1disconnect Value (Smaller than pull in vale)	Conductivity: 0~20000.0 uS/cm	Conductivity: 19990.0 uS/cm
	TDS: 0~10000.0 ppm	TDS: 9990.0 ppm
Relay 2 pull in value	Temperature: 0.00 ~ 99.9 ℃	Temperature: 99.9 ℃
Relay 2 disconnect Value (not equal to pull in value)	Temperature: 0.00 ~ 99.9 ℃	Temperature: 99.0 ℃
Transmitter configuration	Conductivity /Temperature	Conductivity
4mAcorresponding value	Conductivity: 0~20000.0 uS/cm	Conductivity: 0 uS/cm
	Temperature: 0.00 ~ 99.9 ℃	Temperature: 0 ℃
20mAcorresponding value (Not bigger than 4mAvalue)	Conductivity: 0~20000.0 uS/cm	Conductivity: 20000.0 uS/cm
	Temperature: 0.00 ~ 99.9 ℃	Temperature: 99.9 ℃
User password	0 ~ 9999	1000
Baud rate	2400、4800、9600	9600
Meter address	2 ~ 99	2
Back light setting	Normal ON/Delay	Delay
Delay time	5 ~ 99 S	60 S
Alarm sound	ON / OFF	ON



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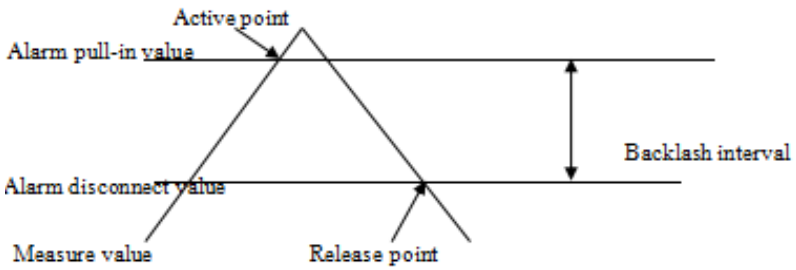
l. Relay Alarm

Relay active when measure value bigger (or smaller) than pull-in value; release when measure value lower (or higher) than disconnect value, relay action chart as follow:



Relay drive inductive load, please install middle-relay, in order to avoid broke the contact.

m. Fault diagnosis and trouble shooting

When the system measurement data is incorrect and unstable, firstly judge the problem is from the meter or from the sensor, the easiest way on site is as follows:

l. To distinguish the problem is from the meter or sensor, remove the white wire from the meter rear terminal, check whether the conductivity meter shows Zero and stable prove meter is normal, preliminary determination problem from the installation of sensor.

ll. To just the interference sources from the meter or sensor, pls dismantle the sensor's white wire and Red (green)Wire, and observe whether the conductivity meter display zero stably, if display normal, then, the interference is not from the meter.

lll. If conductivity measured value deviation is large, in order to determine the measurement data whether correct or not, take the sensor off the pipeline, adopting the clean breaker sampling measurement(Pls see note), comparing with laboratory instrument, rule out the factors of temperature compensation, when measuring results are basically identical, can judge the sensor installation form need to change. If offline measurement result still differ greatly, focusing on checking the parameters setting of the meter. (Pure water can't use this way).

Note-1:

High pure water, ultra pure water can't adopt open sampling measurement way. This is because of in the process of making, not only removing the ions in water, and removing the gas composition. High pure water exposure to air in the moment, immediately there is a lot of carbon dioxide to quickly dissolves in the water, at the same time, the impurity on vessel wall and dust in the air also dissolve in the water, resulting in multiple errors. High pure water only allowed the use of airtight, flow, side-stream flow cell to verify, laboratory open form measuring high pure water is not correct.



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Common Faults and exclusion method table

Phenomenon	Possible causes	Recommended solutions
1. Power on meter, but no display	A. power is not well connected B. Meter fault	A. Check the meter power supply wheter voltage between terminals B. Pls professional maintenance personnel or contact with supplier to replace the new one.
2. Display is not stable	A. Electrode connection wrong, B. Bubbles in the pipeline C. Water quality is not stable	A. Change as per operation manual, B. Correct pipeline or alternate measurement point C. Exclude the meter problem by stable water sources
3. Measuring value deviation is large	A. Constant set wrong, B. Electrode constant change, C. Measuring point velocity is not appropriate, D. Electrode installation wrong,	A. Reset the electrode constant, B. Replace new electrode or calibrate electrode constant, C. Install the electrode in the appropriate velocity place, D. Install the electrode as per installation manual

Note-2:

RS485 Function description (Standard version without RS485 function)

When the meter address is set to 1-5, using our company computer communication software to display the electrical conductivity, temperature, alarm state and record the data,support to generate Excel table.

When the meter address is set to 6-255, the meter perform the standard MODBUS RTU protocol, can communicate for configuration software routines, convenient communicate with configuration software and PLC.

Pls ask supplier for communication agreement.



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For other question, feel free to contact us.

Thank you for choosing ChiMay!

VCard

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