CIT-8800

Inductive Conductivity/Concentration Online Controller

Operation Manual

Foreword

Thanks for using our CIT-8800 Inductive Conductivity / Concentration Online Controller!

Please read this introduction carefully before installation, correct conductivity cell installation and parameter settings will maximize the performance and advantage of the product, bringing you a good using experience.

This instrument is a precision process analysis and control instrument and it should be installed, operated and repaired by trained personnel or other personnel who understand and grasp this professional knowledge.

If you meet some difficulties in the process of the installation or using, please inquire the Technical Support Department of our company in time.

After unpacking, please be sure to check the complete set of list and the actual product you received, if there is anything missing or damaged, please contact us in time.

The manufacturer promises seriously:

1. If quality problems appear within one year from the date of purchase, you will receive free repair or replacement of a new instrument.
2. Whether you buy this product from any source, manufacturers committed to provide life-long service for instrument sold.
3. Damages to the product caused by the following reasons are not within the scope of the warranty：

A、 Misconnection with high voltage power source or damage caused by soaking；

B、 Damage caused by privately refitting and improper use；

C、 Damage and Collateral damage because of the improper selection of model；

D、 Damage caused by going beyond the using conditions of the product；

E、 All physical damage caused by the improper pressure；

F、 Failure appears because storage and transportation are not in accordance with the stipulations of storage or transportation conditions (reference standard SJ/T10463-93)；

G、 Consumable materials need to purchase separately

 When this symbol appears in the manual, it means that something about safety, installation, product function and using should be paid special attention !

Keep pace with the times is the natural law in the enterprise development, the products will have a phased upgrade, there will be no notice for general change, please prevail in kind.

Contents

1、 General

CIT-8800 Inductive Conductivity / Concentration Online Controller is a new developed conductivity/Concentration/TDS/Temperature integration controller， with No electrode inductive Conductivity Sensor.

For continuous measurement of conductivity under strong ion concentration environment or percentage concentration,So that the information processing speed and the test result is accurate and stable.

Measuring、transmitting、control are completely isolated,more stable,Excellent performance of measurement and calculation software . Nonpolar electronic switches can operate at switching, pulse state,expand the field to meet a variety of uses.

1.1 Performance

- ✧ 3.5"320×240 TFT color screen；
- ✧ Chinese,English can be selected.Multi-parameter display.；
- ✧ Support conductivity （0～2000） mS/cm；
- ✧ built-in NaOH，HNO3 concentration meter;
- ✧ The sensor is suitable for high temperature medium;
- ✧ Instrument/transmitter mode for selection；
- ✧ Double channels（4~20）mA output；
- ✧ Photoelectric switch could set (conductivity output/concentration output /TDS output /temperature output/timing output)，PID adjustment. It can drive pulse metering pump or extension control.
- ✧ RS485 MODBUS-RTU protocol；
- ✧ It’s convenient to check the current status, transmitting status；
- ✧ EMC design with better ability on anti-interference. ；
- ✧ Calendar function which can set timing and reserved timing；
- ✧ Password protection.

1.2 Principle

Due to the non-contact measurement principle, inductive conductivity sensors lack the problems

connected with electrode sensors, like uncontrollable contamination and polarisation effects.inductive

conductivity sensors features a wide measurement range and dependable toroidal technology over the range 0-2000 mS/cm. Temperature compensation in the range of 0-120 ℃.

1.3 Applications

1. CIP cleaning；
2. online monitoring in High salinity or corrosive acid concentrated aqueous electrolyte solution ；
3. Beverage、Wine and dairy industry ；
4. Monitoring in petrochemical, power, pharmaceutical, chemical, water treatmentand semiconduct.

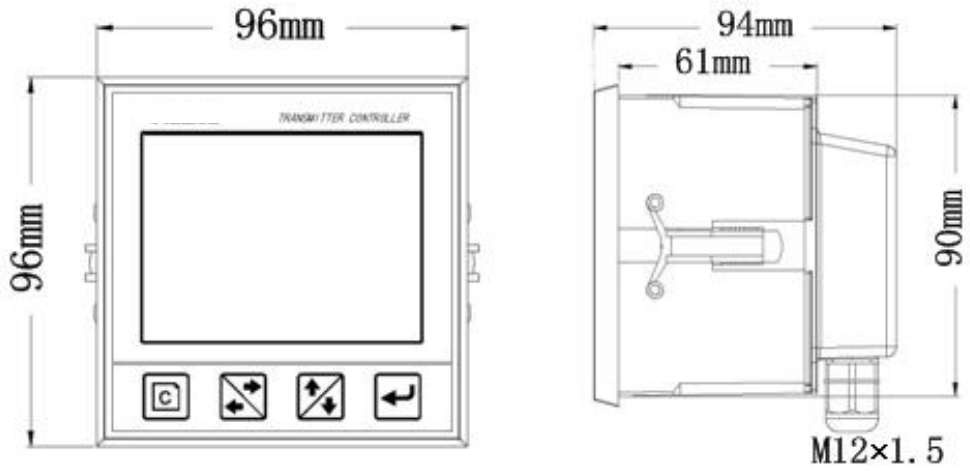
1.4 Main specifications

Model No.	CIT-8800 Inductive Conductivity / Concentration Online Controller	
Measurement range	Conductivity	0.00μS/cm ~ 2000mS/cm
	Concentration	1.NaOH，（0-15）% or（25-50）%； 2.HNO_3（note the Corrosion resistance of the sensor） （0-25）% or（36-82）%； 3.User-defined concentration curves.
	TDS	0.00ppm~1000ppt
	Temp.	（0.0 ~ 120.0）℃
Resolution	Conductivity	0.01μS/cm
	Concentration	0.01%
	TDS	0.01ppm
	Temp.	0.1℃
Accuracy	Conductivity	0μS/cm ~1000μS/cm ±10μS/cm 1 mS/cm~500 mS/cm ±1.0% 500mS/cm~2000 mS/cm ±1.0%
	TDS	1.5 level
	Temp.	±0.5℃
Temp. compensation	element	Pt1000
	range	（0.0~120.0）℃ linear compensation
（4~20）mA Current output	channels	Double channels

	features	Isolated, adjustable, reversible, 4-20MA output, instruments/ transmitter mode.
	Loop resistance	400Ω（Max），DC 24V
	Resolution	±0.1mA
Control contact	Channels	Triple channels
	Contact	Photoelectric relay output
	Programmable	Programmable （ temperature 、 conductivity/concentration/TDS、timing）output
	Features	Could set temperature、conductivity/concentration/TDS、timing NO/NC/ PID selection
	Resistance load	50mA（Max），AC/DC 30V（Max）
Data communication	RS485,MODBUS protocol	
Power supply	DC 24V±4V	
Consumption	＜5.5W	
Working environment	Temperature：（0~50）℃ Relative Humidity：≤85%RH(non- condensing)	
Storage	Temperature：(-20~60)℃ Relative Humidity：≤85%RH(non- condensing)	
Protection level	IP65（with rear cover）	
Outline dimension	96mm×96 mm×94mm (H×W×D)	
Hole dimension	91mm×91mm(H×W)	
Installation	Panel mounted , fast installation	

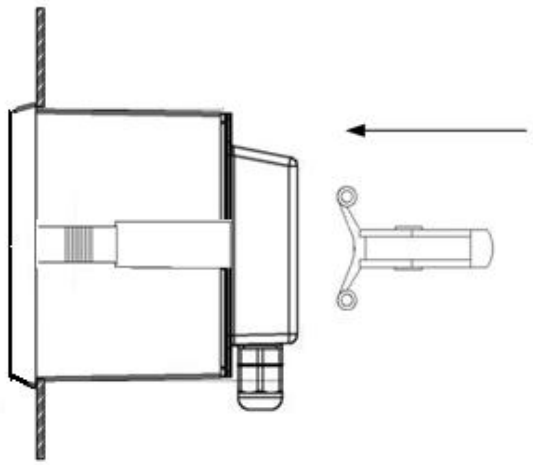
2. Installation

2.1 Installation of controller



1. Installed meter in position of the hole :91mm×91mm(H×W)

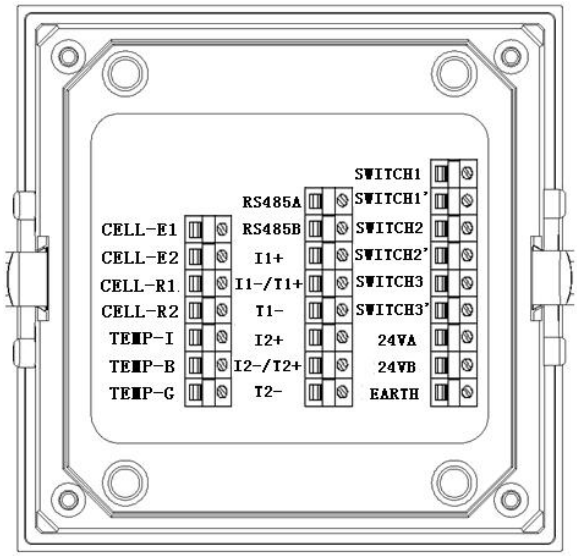
2. Fix the meter with one pair of clamp.



3.When disassemble the meter, please take off the clamp slowly, at the same time, hold the meter carefully.

Please avoid installing in direct sunlight, because UV will damage LCD display screen sunlight.

2.1.1 Wire connection introduction



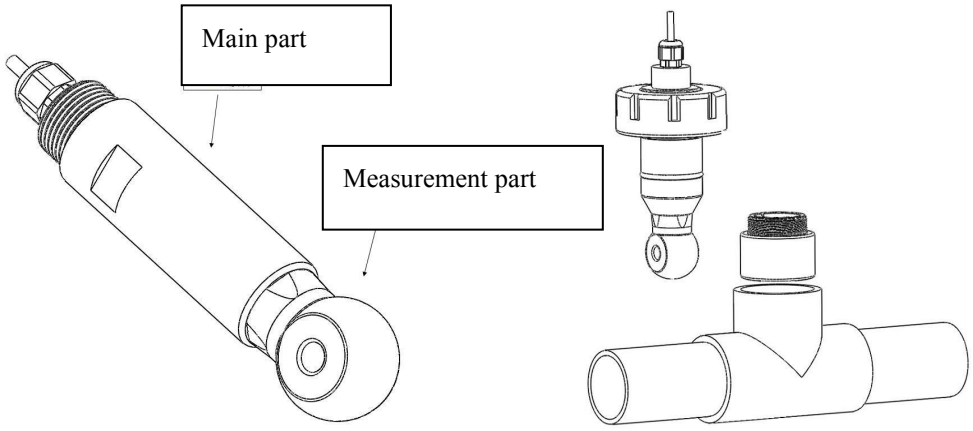
CELL-E1	red wire of conductivity cell
CELL-E2	graywire of conductivity cell
CELL-R1	green wire of conductivity cell
CELL-R2	yellow wire of conductivity cell
TEMP-I	white wire of conductivity cell
TEMP-B	Brown wire of conductivity cell
TEMP-G	Black wire of conductivity cell
I1+/I1-	1st channel （4～20）mA instrument mode, instrument internal power supply
T1+/T1-	1st channel（4～20）mA transmitter mode, conditioning module external power supply.
I2+/I2-	2nd channel（4～20）mA instrument mode, instrument internal power supply
T2+/T2-	2nd channel（4～20）mA transmitter mode, conditioning module external power supply.
SWITCH1/ SWITCH1′	1st channel photoelectronic switch control contact/ Automatic polarity identification
SWITCH2/ SWITCH2′	2nd channel photoelectronic switch control contact / Automatic polarity identification
SWITCH3/ SWITCH3′	3rd channel photoelectronic switch control contact /

	Automatic polarity identification
24VA	Power input interface , connect with DC 24V，non-polarity.
24VB	
EARTH	Grounding

2.2 Electrode and accessories

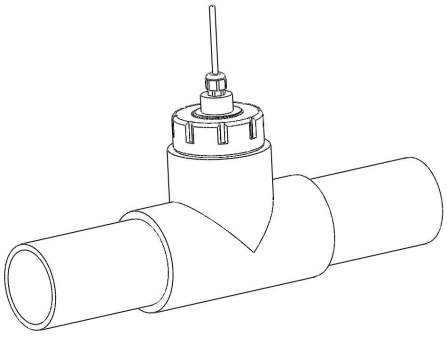
Note： split type sensor is only used in pipeline installation， Immersion type sensoronly used in bulkhead installation、tank installation and environmental sensor bracket installation .

2.2.1 Outline

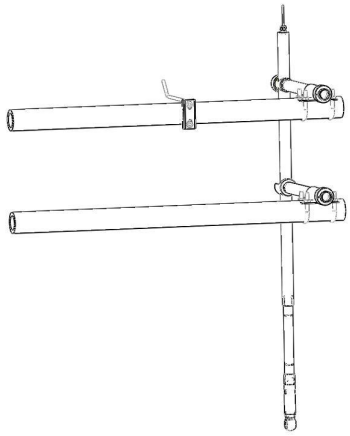


Immersion installation　　pipeline installation

2.2.2 Installation method

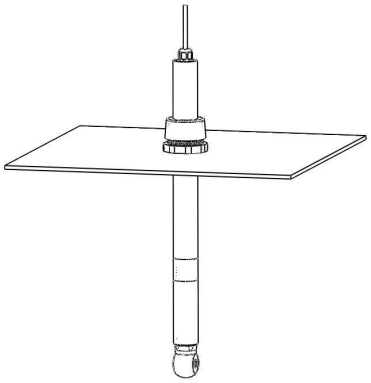


pipeline installation



environmental sensor bracket installation

tank installation



bulkhead installation

2.2.3 Installation notes

1. The medium should maintain liquidity in the sensor diversion hole to make sure real-time measurement.

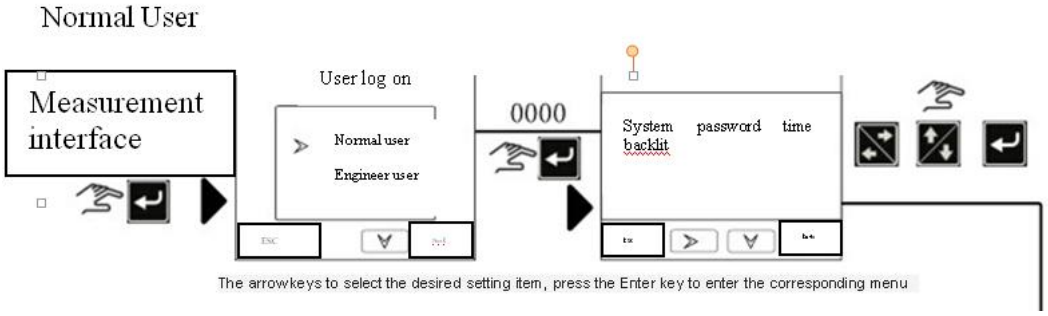
2. For pipeline installation, must make sure the sensor diversion hole and flow direction In the same direction and the Sensor from the pipe wall is larger than 20mm

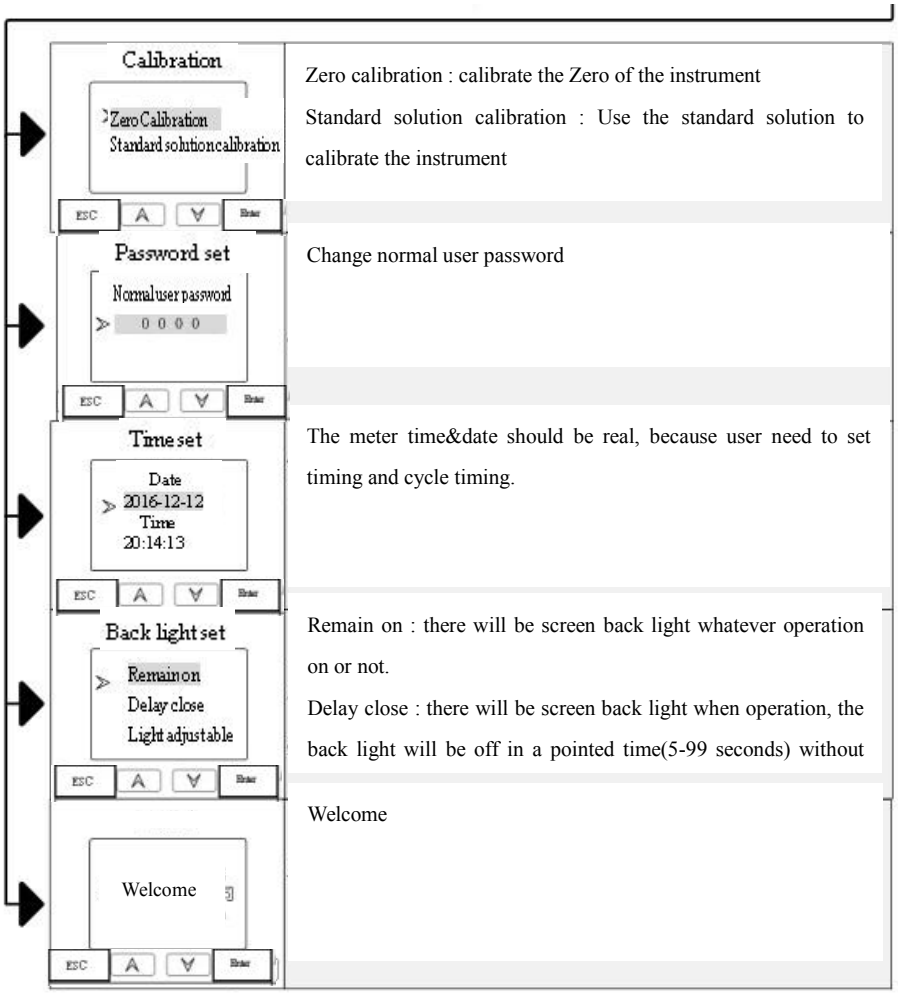
3、Adjustment

Key board introduction

Key board	Name	Functions
	ESC	1. Check parameter current corresponding setting under running. ； 2.Return to previous menu or main interface.；
	SELECT	1.Move cursor； 2.Under parameter setting, it's used for left or right selection. ；
	ADD	1.Adjust the Number from 0 to 9. ； 2.Under parameter setting, it's used for up and down selection.；
	ENTER	1.Enter main menu.； 2.Confirm the parameter, then enter next menu.

3.1 Measuring parameters Settings





Zero calibration : calibrate the Zero of the instrument

Standard solution calibration : Use the standard solution to calibrate the instrument

Change normal user password

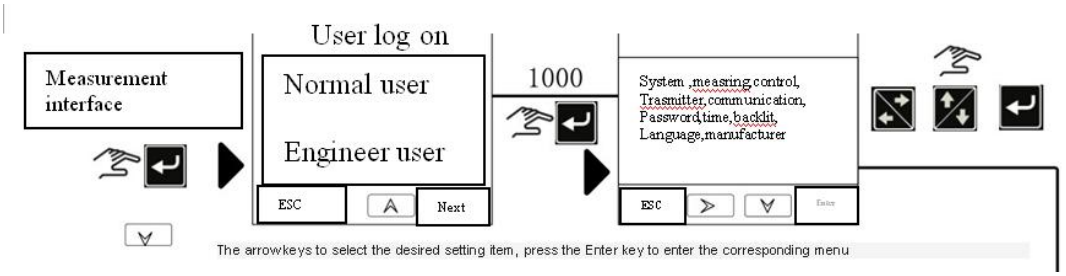
The meter time&date should be real, because user need to set timing and cycle timing.

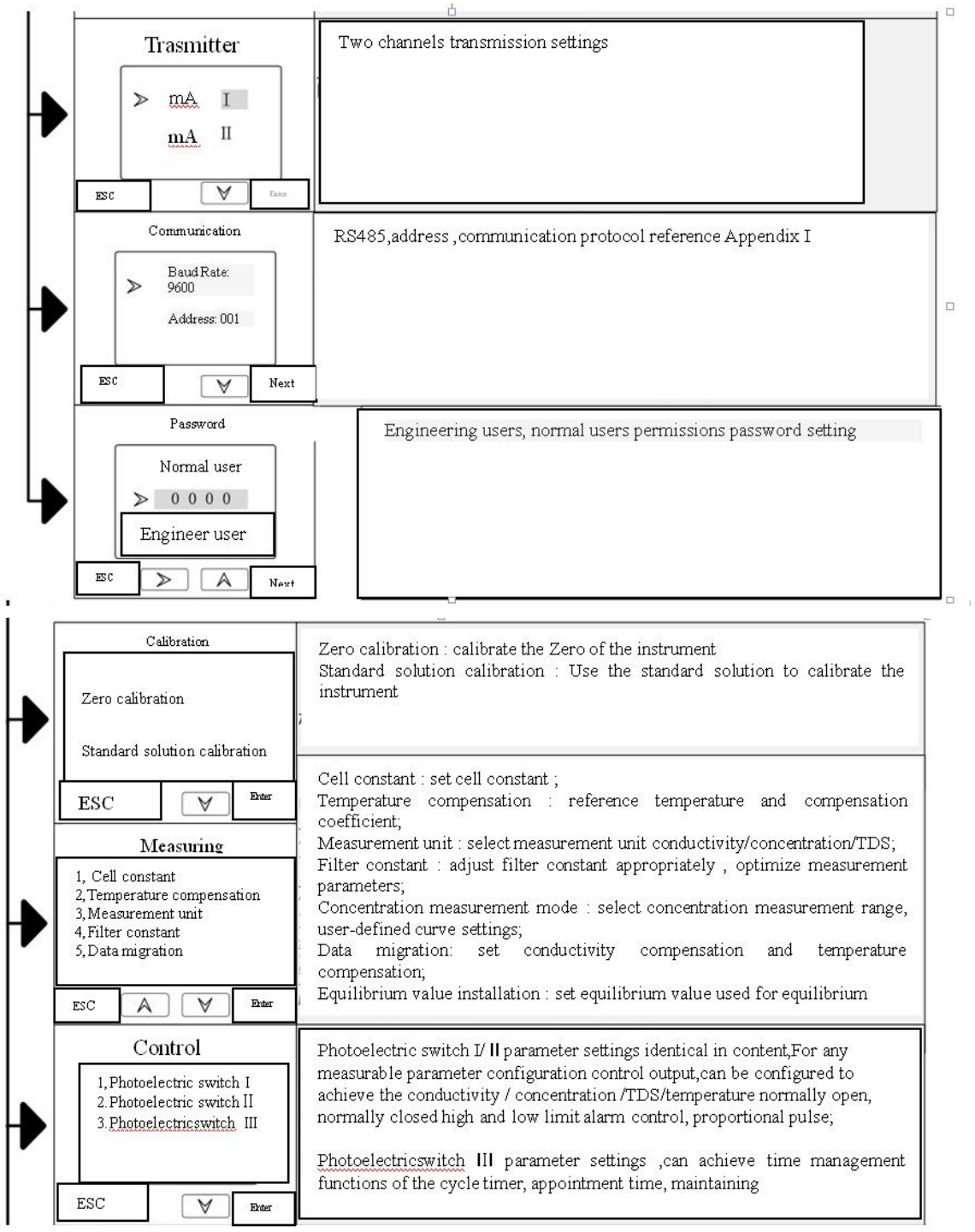
Remain on : there will be screen back light whatever operation on or not.

Delay close : there will be screen back light when operation, the back light will be off in a pointed time(5-99 seconds) without

Welcome

Engineering user





Note： System will go back to measurement interface automatically in case of no operation within three minutes in parameters check or parameters setting menu.

3.2 Concentration custom settings

Instrument built in NaOH 、 HNO_3 Concentration tables， Measure NaOH 、 HNO_3Concentration. Only need to select the concentration type according to the measurement range， to measure the concentration of other medium， you need to creat a customized concentration table for the solution，so that the conductivity measurement values can be converted to concentration measurements. First you need to configure a known concentration solution， Then measure the conductivity of the solution， finally ,enter the concentration and its corresponding conductivity value to custom settings menu according to the instruction， the instrument will produce media solution concentration curve corresponding to the input data. The instrument can measure the concentration after entering the data and save and properly set the temperature compensation coefficient of this solution .

Note：customized concentration table must including(2-8) data point(higher accuracy if more data point). Each point must have a conductivity value coordinate (X-axis) and a corresponding concentration value coordinate (Y-axis). Conductivity range is（0~2000）mS/cm. For each successive data point conductivity values must be monotonically increasing，and the concentration data must be entered in ascending or descending（the concentration values in the data table must be monotonically increasing or monotonically decreasingaccording to the increases of the conductivity values）.

Measure and calibration

To improve measurement accuracy, it should select a standard solution of known concentration calibration according to the measuring range.

4 、Calibration

4.1 Calibration

Put the sensor into the standard solution， according to the project user setup process，select calibration standard solution，enter the conductivity value of the known solution，press the key“ ” when the conductivity is stable，press the key“ ” to Calibrate。

4.2. Maintenance of sensors

1、 Do not use solvents to clean the sensor；

2、 Remove the precipitate of the probe surface with a small brush .

3、 clean the sensor, to ensure the diversion hole is not blocked.

5、Measuring and testing

Use the loop resistance to test

[Note]： Due to the probe is very sensitive , so in the verification process is prohibited to place the sensor on the desktop and bench surface or direct contact with other objects, otherwise it will affect calibration accuracy.

1、 Put a wire through the electrode diversion hole (see diagram below)

2、 Connect the resistivity R

3、 Loop resistance formul R = Loop resistance

$$R = \frac{N^2 \cdot K}{k_m}$$

N = the number of "turns" of wire

K = cell constant

k_m = conductivity， unit S/cm

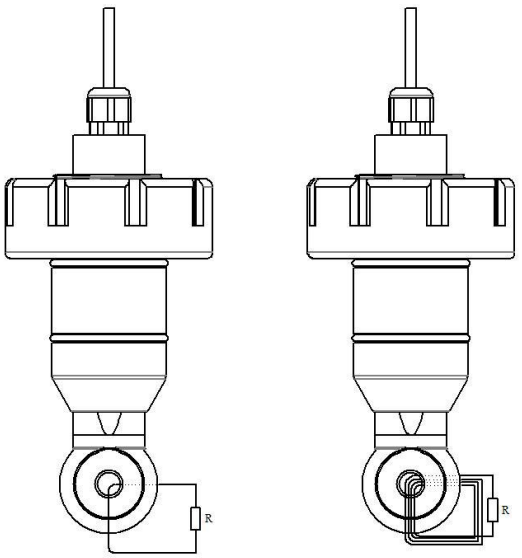
[Note]： $1\,\mathrm{mS/cm} = 1 \cdot 10^{-3}\ \mathrm{S/cm}$

$1\,\mu\mathrm{S/cm} = 1 \cdot 10^{-6}\ \mathrm{S/cm}$

When the displayed conductivity value is less than 100mS/cm， the number of "turns" of wire is 1；

When the displayed conductivity value is more than 100mS/cm， the number of "turns" of wire is 4；

When the probe is dried no solid-state conductive medium, and not connect resistance loop, the instrument will display 0.



6、Trouble shooting

When the measurement is incorrect or unstable, pls consider the followings.

The problem is caused by indicator or sensor?

interference source is from indicator or sensor?

4-20mA is instrument mode or transmitting mode?

Common fault inspection and trouble shooting:

Problem	Possible causes	Trouble shooting
No display when powered on	a) DC24V Bad connection b) misconnection Power c) damage due to transport or storage	a) check to see if there is 24Vvoltage between power terminals； b) Check and restore normal power supply； c) please get professional maintenance。
Unstable display	a) bubbles in pipeline b) unstable water quality	a) rectification of pipeline or choice of another measured point； b) rule out the reason of instrument by using stable water source
Big deviation	a) wrong constant setting b)constant changes c)improper flow velocity of measured point d)Measuring through-holes are clogged by sludge	a)resetting of the conductivity cell's constant b)change by new conductivity cell or resetting the electrode constant； c)install the conductivity cell in where the flow velocity is proper； d)clean the sensor through-holes
Transmitting data not corresponding	a) receiving terminal migration errors b) Can not reach 20mA c) Improper Send Settings d) mA Send discrepancies	a) reset the receiving module migration； b) circuit resistance is too big， increase cable sectional area； c) re-set the correspondence between mA and indicated value of the instrument； d) Put the ammeter in mA loop to verify the current value.

7、Complete set of product

- CIT-8800 controller one（with a couple of quick clamps/waterproof back cover）
- Operating instruction one
- Inductive sensor one
- Installation Accessories one set（optional）

8 、Ordering information

Sensor Selection

Controller Model	Powder supply	sensor	Cable length
CIT-8800	DC 24V	Inductive	5m Or customized length≤30m

Sensor cable length can be customized as per customer's request

Select the proper sensor according to measured medium to get the accurate measurement and resolution..

24V electronic transducer is optional part. Pls specify the power supply of industrial site before placing an order.

Appendix I

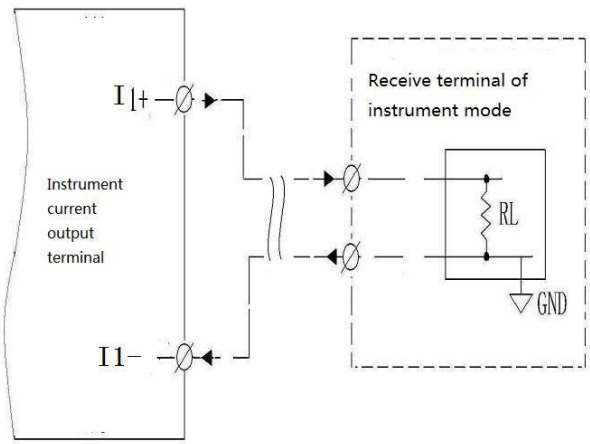
Communication Protocol

Set the Baud rate and address in the communication parameters setting menu .Keep the Baud rate and upper computer exactly same otherwise, it can not be connected to the upper computer.

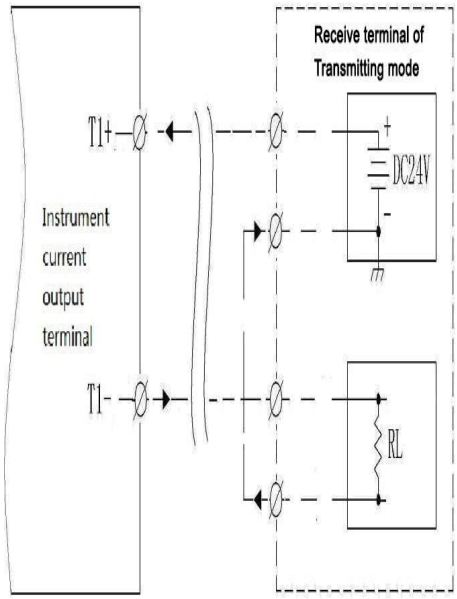
Note: Pls log in our website for RS485 communication protocol. http://www.createc.cn

Appendix Ⅱ

Build up signal collection and linkage control system through configurable two channels mA transmitting and three channels photoelectronic relay .mA transmitting is divided into instrument mode and transmitting mode.：



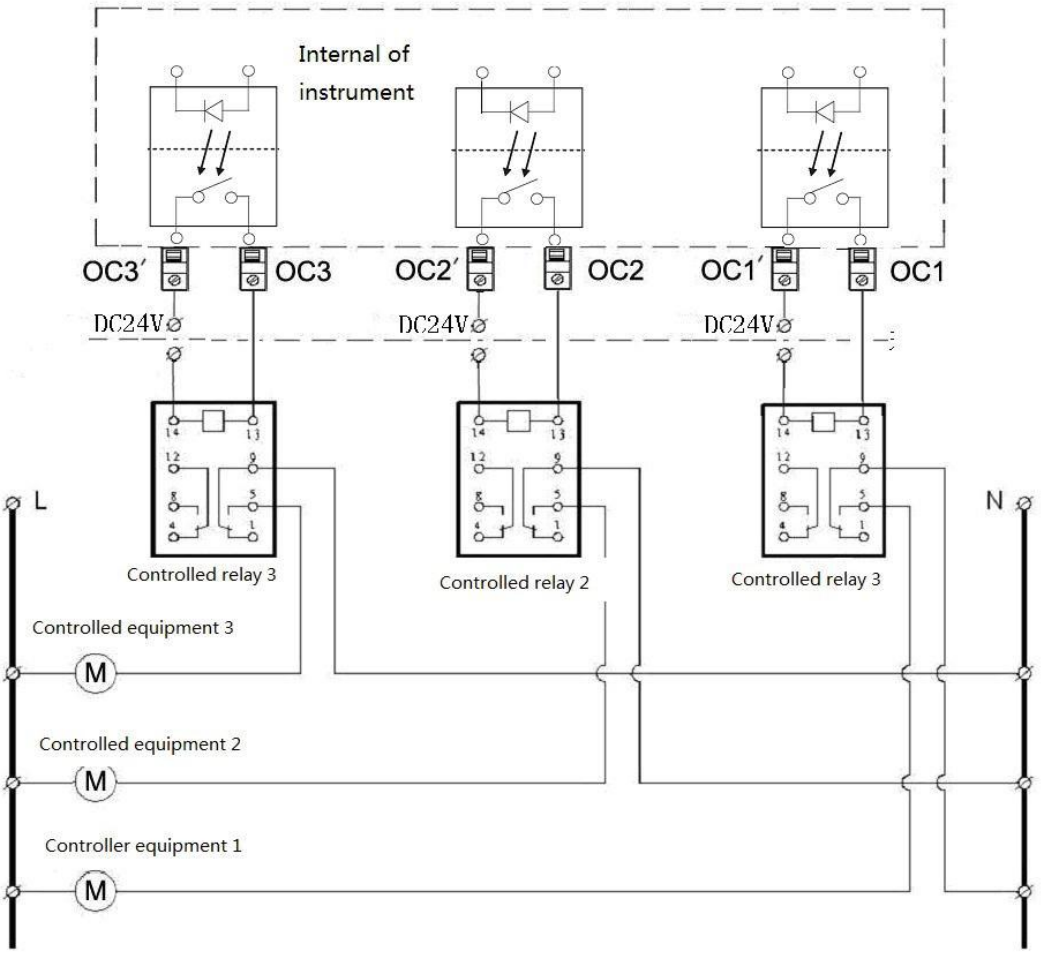
External connection in Instrument mode



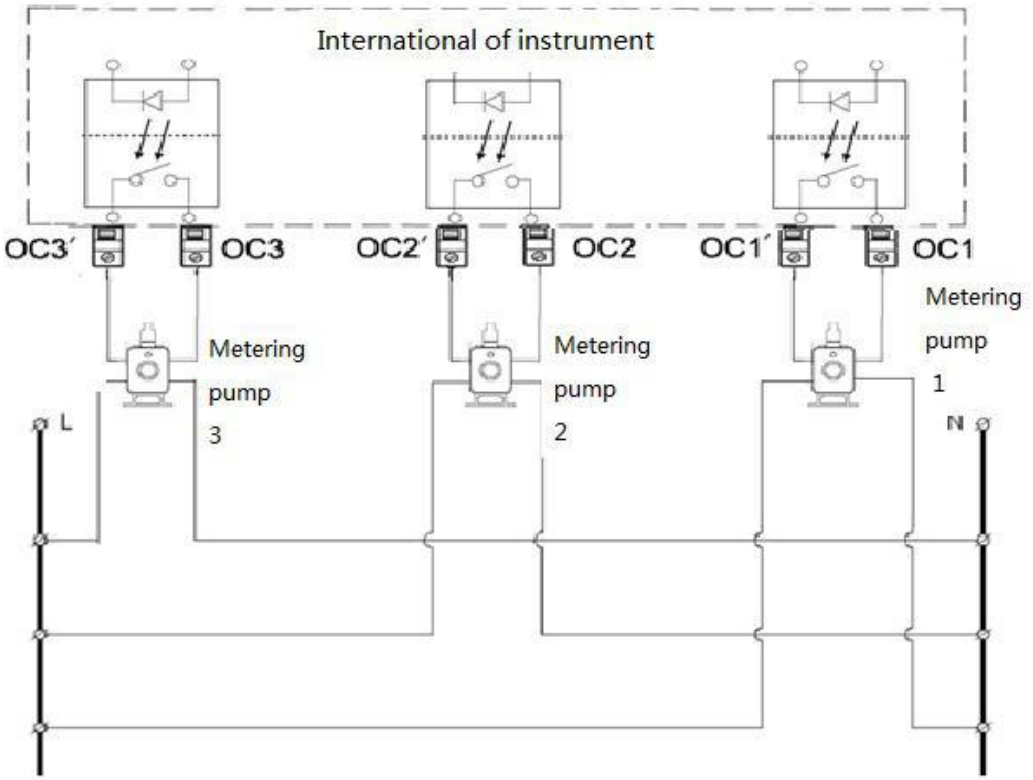
External connection in transmitting mode

[Note]：Note:The connection of mA transmitting for the second channel is same as above

Photoelectric switch connection:



Driving high voltage or power load by using intermediate relay



Dosing pump controlled by photoelectric switch

Appendix Ⅲ

Sensor material selection direction

main part material	Application Industry	Applied Case