

# TDS-230 Consistence Monitor Operation Manual

## Notice before operation:

1. Carefully read the relevant parts of this manual before installation and operation to prevent wrong operation, measurement error and damage of instrument.
2. This instrument is for electrochemical measurement, and its installation and operation should be performed by technicians with relevant professional knowledge.

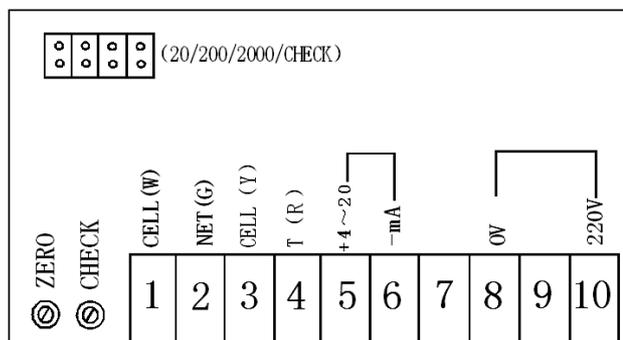
## 1. Performance features

This instrument is a panel instrument for on-line monitoring of industrial process consistence monitor. Range switch over and constant check can both be freely set and adjusted through the operation component on the rear panel; unique signal collecting and processing technology and special thick film circuit are adopted to make measurement accurate and operation stable; there are also other features such as linearized data, automatic temperature compensation, not subject to the length change of cable and maintenance-free. It's an ideal auxiliary instrument of various types of small pure water equipment.

## 2. Main technical specifications

Measurement range:	0~20 0~200 0~2000ppm
Accuracy	1.5% (FS)
Stability	$\pm 2 \times 10^{-3}$ (FS) / 24h
Auxiliary electrode	Plastic structure; constant: $1.0\text{cm}^{-1}$
Temperature compensation component	NTC
Medium temperature	5~50°C
Thread dimension	1/2" pipe thread
Medium pressure	0~0.5Mpa
Cable composition	RVP+coaxial 75-2 double shielding
Cable length	5m or on other agreement (5~30m)
Temperature compensation	Automatic compensation, with 25 °C as the reference temperature
Display	3.5-bit LCD
Power supply	AC 220V $\pm$ 10% 50Hz
Power consumption	$\leq$ 1W
Environment conditions	(1) Temperature: 5~50°C (2) Humidity: $\leq$ 85%RH
Dimensions	48 × 96 × 100mm (height × width × depth)
Slot dimensions for installation	45 × 91mm (height × width)

### 3. Wiring diagram on rear panel

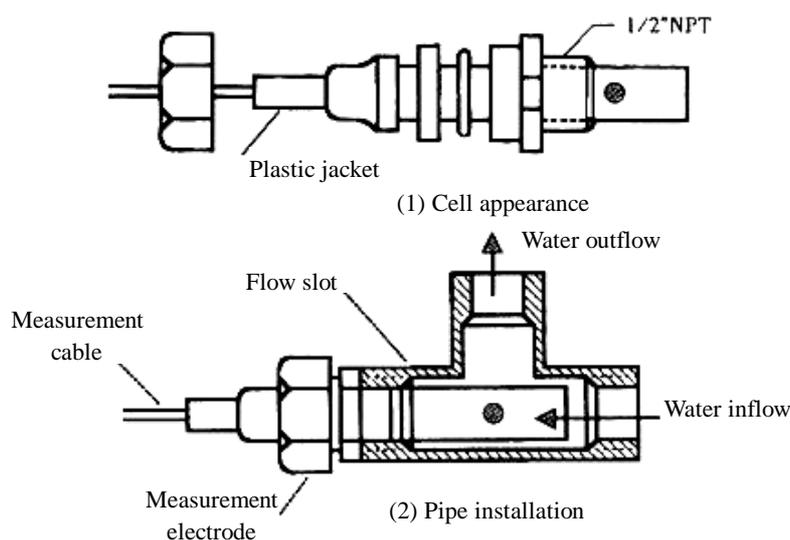


### 4. Wiring illustration

- (1) Connect white wire to CELL (W)
  - (2) Connect green wire to NET (G)
  - (3) Connect yellow wire to CELL (Y)
  - (4) Connect red wire to T (R)
  - (5) (6) are the external connection terminals used by recording instrument, 4~20mA is corresponding to value of 0~full range ppm of each range
  - (7) No internal connection
  - (9) No internal connection
  - (8) (10) AC 220V  $\pm$  10% input
- ⊗ ZERO—0 point adjustment knob  
 ⊗ CHECK—electrode constant adjustment knob (make adjustment after the short circuit jumper moves to CHECK)

### 5. Measurement electrode (CELL) installation

To ensure the real measurement result, data distortion caused by air bubble or dead water in conductance cell should be avoided. The installation should be performed strictly according to the following drawing:



Notes: (1) The electrode should be installed at a lower location in the pipe where the flow speed is steady and air bubbles are seldom generated.

(2) No matter the conductance cell is horizontally or vertically installed, it should be deeply

inserted into the moving water.

- (3) The conductivity signal is weak electronic signal and its collecting cable should be separately installed. When threading cable joint or connecting terminal board is used, to avoid wetting interference or breakdown of measurement unit circuit, they should not be connected to the same group of cable joint or terminal board with the power line or control line.
- (4) When the measurement cable needs to be lengthened, it's recommended to use the cable provided by the original manufacturer, and the joint should be subject to reliable damp-proofing insulation disposal. When a longer distance is involved, the length of the cable (<30m) should be agreed on before delivery, and if the length is over 30m, a transmitter should be used.

## 6. Correct setting

When the installation is finished, turn on the power supply and make the following operations:

### (1) Constant check

Move the short circuit jumper to the CHECK position, the data displayed on the screen is the electrode constant; if it is not consistent with the specified electrode constant, adjust the knob (CHECK) at lower left to make it so.

For example: if the electrode constant  $C=1.059\text{cm}^{-1}$ , adjust the CHECK knob to make the instrument display 1.059.

### (2) Range switch over

Range switch over can be achieved by moving the short circuit jumper to different range levels. Please select appropriate range to attain the best resolution. A too large range will lead to lower read accuracy.

Note: when the most significant bit becomes "1" and the last three bits become blank, it indicates that the conductivity of the measured liquid is beyond the range and a higher range level should be selected.

## 7. Maintenance

- (1) The conductance cell, as a sophisticated component, can not be disassembled or the conductance constant will be changed and it will lead to measurement errors.
- (2) The electrode cell should not be soaked in strong acid or alkali liquid, and the platinum black coating should not be wiped or it will lead to electrode surface damage and the constant and response capability will be affected. The right way should be: when the electrode is dirty, soak it in 10% dilute hydrochloric acid for a short while, then rinse it with pure water to keep the surface clean.
- (3) The measurement cable is special cable and should not be changed at will or it will cause significant error.
- (4) The instrument should be placed in an environment relatively dry or in the control housing to avoid instrument fault or measurement error caused by water splashing or serious damp.

## 8. General fault inspection and trouble shooting

Symptom	Possible causes	Trouble shooting methods
1. No instrument display	A. Bad connection of power supply B. Instrument fault	A. Check to see if there is 220V voltage between (8) and (10) B. Bring it to professional technicians for maintenance, and the manufacturer will be responsible for exchange within one year after the product leaves the factory.
2. Unstable display	A. Incorrect electrode wiring B. There is air bubble in the pipe C. Inverse water inflow direction of electrode D. Strong interference to power supply E. The measured liquid is charged	A. Check to see if the cable wiring is wrong B. Adjust the pipe or select another measurement point C. Install the electrode up stream D. Take measures to power supply according to corresponding reasons E. Insert earthing stainless steel pipe to eliminate electricity before entering the electrode
3. Serious error of reading	A. Incorrect constant setting B. The electrode constant is changed C. Too rapid flow at measurement point or dead water	A. Readjust following steps of 6 (1) B. Recalibrate the electrode constant C. Install the electrode at where the flow is relatively slow
4. When out of water, the electrode display is not "0".	A. Smudge attachments in electrode B. Damage of cable insulation C. Water penetration of electrode (electricity leakage between yellow and white wires)	A. Refer to 7 (2) B. Repair the damage and make the resistance between yellow and white wires infinite big C. Replace the electrode with a new one

## 9. Connection of PLC and recording instrument

The 4-20mA signal is direct output, when the recording instrument or PLC port is connected with the earth of the power supply of the system or floated at a high voltage, the measurement accuracy and safety of electrode will be affected. So the 4-20mA signal isolator is recommended (provided on additional payment).

## 10. Complete sets of instrument

Panel meter	1	Sensor	1
Fixing clamp	1	Operation manual	1