Model COND51 Conductivity Meter

Manual

1. Brief Introduction:

Thanks for purchasing and using Model COND51 Lab conductivity Meter (referred to "meter" as below).

Before using this meter, please read the manual carefully in order to use and maintain it properly. On the basis of improving instrument performance constantly, we reserve the right to change the manual and accessories without giving notice in advance.

This meter is perfect combination of the most advanced electronic, sensor technology and software design, and is the most cost effective lab. conductivity meter suited for industrial and mining enterprises, school and scientific research.

The meter has the following prominent features:

1.1 Built-in microprocessor chip. There are intelligent functions such as automatic calibration, automatic temperature compensation, data storage and function setting, etc.

1.2.Adopt advanced digital handling technology to speed up the response of the meter and result accuracy. " ☺ " will appear when reading is stable.

1.3. Large blue backlit display screen. Simultaneous display of pH value and temperature value.

1.4. Two options of temperature units ℃ and ℉.

1.5. Equipped with ATC conductivity electrode, flexible electrode holder and conductivity calibration solution, more convenient to use.

2. Technical Specifications:

2.1. Conductivity:

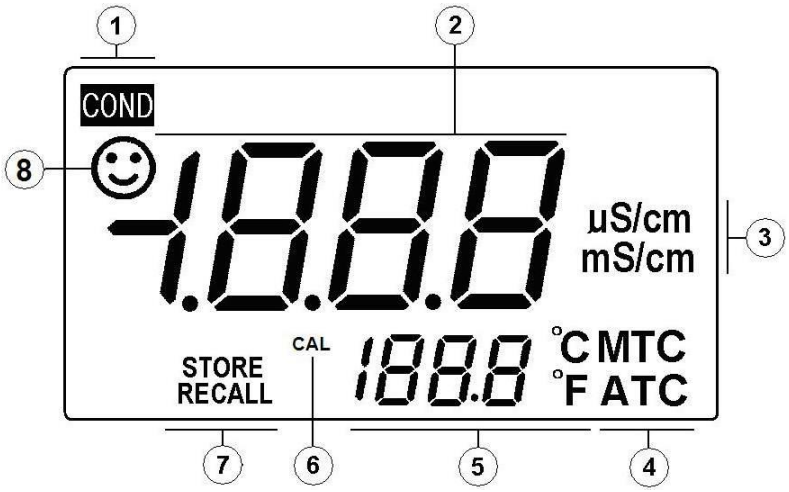
Measurement Range	Conductivity: (0 to 199.9) μS/cm (200 to 1999)μS/cm (2.00 to 19.99) mS/cm (20.0 to 199.9) mS/cm.
Resolution	0.1/1μS/cm 0.01/0.1 mS/cm
Accuracy	Meter：±1.0% FS, Meter with electrode: ±1.5% FS
Temp. Compensation range	(0 to 50)℃(automatic or manual)
Electrode Constant	0.1 / 1 / 10 cm^{-1}

2.2. Other Technical Specifications:

Data Storage	25 groups
Storage Content	Measured value serial number, measured value, measurement unit and temperature
Power	DC9V
Dimension and Weight	160 × 190 × 70mm/750g (Meter)
Certificate	ISO9001:2008, CE and CMC

3. Introduction to Meter：

3.1. LCD Display：



① —— Parameter mode icon

② —— Measured value

③ —— Measurement unit

④ —— Temperature compensation icon:

ATC — automatic temperature compensation

MTC — manual temperature compensation

⑤ —— Temperature measured value and unit

⑥ —— Calibration icon

⑦ —— Store and recall icon.

⑧ —— Measured value stability icon

3.2. Operation keys：

There are seven operation keys for the meter:

3.2.1. ON/OFF — Switch key

3.2.2. Cal/Meas — Key for both calibration and measurement.

(a) Under measurement mode, press this key to enter into calibration mode,

(b) Under other mode, press this key to enter into measurement mode.

3.2.3. MODE — Function key, press this key to enter into the parameter setting mode: P1, P2, P3...

3.2.4.  and  — Plus and Minus key.

（a）Under the state of measurement, for manual temperature compensation, press plus or minus key, press one time to change 0.1℃ each time, press continuously to change temperature rapidly.

（b）Under the state of parameter setting, press plus or minus key to change the number or ON/OFF.

3.2.5.  — Storage and recall key for storage and recall of measured value.

3.2.6.  — Confirmation key.

3.3. Socket:

3.3.1. " COND " socket —Connect BNC connector of 2301-F conductivity electrode to the meter.

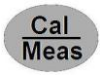
3.3.2. **"Temperature" socket** — Connect RCA connector of 2301-F conductivity electrode or PHT temperature probe to the meter. When connecting temperature probe to the meter, the meter is under the state of automatic temperature compensation and can test the temperature of solution; when removing the temperature probe, the meter is under the state of manual temperature compensation and temperature can be adjusted by pressing  or  key.

3.3.4. "DC9V" power connector — Connect DC9V power adapter.

4. Conductivity Measurement:

4.1. Electrode calibration:

4.1.1. Press  key to turn on the meter, connect 2301-F conductivity electrode to the meter.

4.1.2. Press  key and the meter enters into the calibration mode, "**CAL**"appears at the bottom of LCD.

4.1.3 Rince the conductivity electrode with pure water and dip it in 1413μS/cm calibratin

solution, stir and place it still. Repeat the above operation a few times until the measured value is displayed repeatedly.

4.1.4. Wait for a moment, press ENTER when ☺ is displayed on left top of LCD. When 1413 μS/cm twinkles three times, calibration is done and the meter returns to the measurement mode.

4.2. Solution testing:

Rinse the conductivity electrode and shake off water on the electrode forcefully, then place it in the solution, stir it and place it still. Get the reading value when the measured value is stable and ☺ icon appears. The reading value is conductivity value of the solution.

4.3. Notes:

4.3.1. There are four options of standard solutions: 84.0μS/cm、1413μS/cm、12.88mS/cm and 111.3 mS/cm. The meter is able to recognize the standard solution automatically. Only need one point calibration. According to the principle that the conductivity of sample solution should be as close to that of calibration solution as possible, the user could select a suitable calibration solution. The calibration solution frequently used is 1413 μ S / cm. Please refer to the chart (4-1).

Chart (4-1)

Measurement range	0.1 to 20μS/cm	0.5μS/cm to 200mS/cm		
Electrode constant	$K=0.1cm^{-1}$ (flow test)	$K=1.0cm^{-1}$		
Calibration solution	84.0μS/cm	84.0μS/cm	1413μS/cm	12.88 mS/cm 111.3 mS/cm

4.3.2. There are two calibration methods set in the meter: the standard solution calibration and the constant calibration. Please refer to the item 4.1 “Electrode Calibration” that is the standard solution calibration method. Provided the standard solution is correct, the accuracy can be assured, so the standard solution calibration method takes the priority. If the user is used to employ constant calibration method, based on the constant indicated on conductivity electrode, please set the electrode constant in the parameter setting of P3. (refer to the item 4.5.4.). The two calibration methods can be selected as the user wants and the two methods do not affect each other.

4.3.3. The temperature compensation coefficient of the meter is 2.0%/℃ for factory default. However, the conductivity temperature coefficient of solution of different types and different concentration varies; please refer to chart (4-2) and the data from the experiment, set it in the parameter setting of P2.

Attention: when set the temperature compensation coefficient to be 0.00, there is no temperature compensation when measuring, the measured value is the conductivity value under current temperature.

Chart (4-2)

Solution	Temperature Compensation Coefficient
NaCl saline solution	2.12%/℃
5%NaOH solution	1.72%/℃
Dilute ammonia solution	1.88%/℃
10% hydrochroric acid solution	1.32%/℃
5% sulfuric acid solution	0.96%/℃

4.3.4.Dip the conductivity electrode in the solution, stir it a while and place it still to remove the bubbles and speed up the response of the electrode.

4.3.5. During calibration and measurement, the meter has self-diagnosis function, indicating the related information as below:

(Chart (4-3))

Icons	Content	Check
Er 1	Calibration buffer recognition range exceeds standard.	1. Check whether calibration solution is correct. 2. Check whether the meter connects the electrode well. 3. Check whether electrode is damaged.
Er2	Operate when measurement is not stable.	Re-press ENTER when ☺ appears.

4.4. Parameter Setting:

4.4.1. Conductivity measuring parameter setting (chart (4-4))

Chart (4-4)

Prompts	**Parameter Setting Items**	**Parameters**
P1	Electrode constant selecting	0.1, 1, 10
P2	Temperature compensation coefficient setting	0.00 to 9.99%
P3	Electrode constant setting	
P4	Temperature unit setting	℃or ℉
P5	Factory default setting	OFF-On (shut-set)

4.4.2.Electrode constant selection (P1)

(a) Press MODE key, the meter enters into P1 mode,

(b) Press ▼ or ▲ key to select the constant: 0.1→1→10,

(c) Press MODE key to enter into the next parameter setting or press Cal/Meas key to confirm and return to measurement mode.

(d) P1 Factory default setting is K=1

4.4.3. Temperature compensation coeffient setting(P2)

(a) Under P1 mode, press the MODE key to enter into P2 mode,

(b) Press ▼ or ▲ to change the value, the range is 0.00 to 9.99,

Attention：When set the number to be 0.00 ，there is no temperature compensation. Please refer to the item 4.3.3;

(c) Press MODE to enter into the next parameter setting or press Cal/Meas to return to the measurement mode.

(d) P2 factory default setting is 2.0%.

4.4.4. Electrode constant setting (P3)

(a) Under P2 mode, press MODE key to enter into P3 mode, previous calibration constant value is displayed on LCD.

(b) Press ▼ or ▲ key to change the constant value, set it according to the constant value marked on the electrode.

(c) Press MODE key to enter into the next parameter setting or press Cal/Meas key to confirm and return to the measurement mode.

(d) Classify the constant setting, for example: for conductivity electrode with constant K=10.3, first enter into constant setting P1 to set the constant to be "10", then enter into P3 mode and set the constant to be 10.3.

4.4.5. Temperature unit ℃/℉ setting (P4)

(a) Press MODE key in mode P3 to enter into mode P4,

(b) Press ▼ or ▲ key to select temperature unit: ℃or℉,

(c) Press MODE key to enter into the next parameter setting or press Cal/Meas key to confirm and return to measurement mode.

4.4.6. Restore to factory default setting (P5)

(a) Under P4 mode, press MODE key to enter into mode P5,

(b) Press ▼ or ▲ key to select " On ", the meter restores to factory

default setting and return to the measurement mode.

4.5. Attention:

4.5.1. The conductivity electrode has been calibrated before delivery; the user can use it right away. Normally calibrate the electrode monthly. For new conductivity electrode and the electrode used for some time should be calibrated.

4.5.2. Keep the conductivity electrode clean; rinse it with pure water and then shake off the water on it before and after measuring.

4.5.3 The sensitive sensor surface of 2301-F conductivity electrode is plated with metal platinum black coating which reduces the electrode polarization and enlarges measurement range, so the surface of platinum black can not be rubbed. Please rinse the electrode by shaking in water, and rinse the organic stain with tepid water containing detergent or rinse it with alcohol.

4.5.4. Normally dip conductivity electrode in pure water to avoid the platinum black passivation. If the platinum black plated electrode is invalid, dip the electrode into 10% nitric acid solution or 10% hydrochloric acid solution for 2 minutes, then rinse it with pure water and re-measure it. If the electrode still does not work, please replace with a new conductivity electrode.

4.5.5. When the meter does not work normally, please set the mode P5 to be **"**On**"** to restore to factory default setting, and then re-try calibration and measurement.

4.6. Other operation instructions:

4.6.1. Storage, recall and elimination of measured value:

（a）Storage:

Under measurement mode, press 

to store measured value, " **STORE** " icon and storage number (1.2.3…25) are displayed on LCD, indicating the measured value is stored under the storage number, and return to the normal mode immediately. This meter can store 25 measured values, and the 1st measured value is replaced with the 2nd measured value if

the storage exceeds 25 numbers.

（b）Recall:

Press STO RCL for two seconds, **"RECALL"** icon and the last storage number are displayed on LCD, then the measured number is displayed, then press ▼ and ▲, alternately the storage number and the measured value are displayed.

(c）Exit:

Under the state of **"RECALL"**, press Cal Meas to exit from the storage program, then **"RECALL"** icon on LCD disappears.

(d）Clear away:

Under the state of **" RECALL "**, press STO RCL for five seconds to eliminate all storage data.

5. Meter Kits:

5.1. Model DDS-11C conductivity meter	1set
5.2. 2301- F plastic conductivity electrode（K=1，ATC）	1pc
5.3. 1413μS/cm conductivity standard solution（50ml）	1bottle
5.4. 9V power adapter	1pc
5.5. Model 620 flexible electrode holder	1set
5.6. Manual	1book

6. Warranty:

6.1. Under the normal condition of usage within one year since the purchase date, the repair, replacement of the parts or the product is free of charge if the instrument fails to work because of manufacturing defects.

6.2. Conductivity electrode is not under warranty. But if unused new electrode does not work,

the repair or the replacement is free of charge.

6.3. This warranty does not apply to the damages which result from improper usage, improper maintenance or unauthorized repair by the user.