

Instruction Manual

Model DO-300L (DO/O₂/Air/TEMP)

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Chapter I. Introduction

istek's Desktop Meter pH-300L (DO/O₂/Air/Temp Meter), is operated by AC/DC adaptor(DC 9V) and controlled by microprocessor for all measurement needs.

istek's Desktop pH/mV/TEMP Meters feature a custom LCD that simultaneously displays various functions along with measurement results. This istek's laboratory DO Meters is high-performance for more accurate measurement and its operating method was designed in the position of user also.

This model is capable of storing up to 100 points in memory at once for each items. These models can be controlled remotely via RS232C interface. Refer to Chapter VI. Remote Control Part.

This model features to obtain a reliable data since its program is treated by setting in detail about compensation 1 factor (Altitude and salinity) for an accurate measurement.

This model displays DO (mg/L), O₂ (%), Air And Temperature (°C).

DO Indicates Concentration of Oxygen presents in the water.
(Range 0.00~19.99mg/l, Unit is mg/l)

O₂ Indicates Percentage of Oxygen which is based Amount of oxygen presents in the air. (Unit is %)

Air Indicates Percentage of Dissorlved Oxygen or O₂ Concentration. (Unit is %)

Automatic Temperature Compensation (ATC)

: ATC Must be used supplied by Istek Inc.

Chapter II. General Functions

1) Instrument Setup

Rear Panel



Power Source

Connect the supplied AC/DC adaptor to the meter.
DO meter of Istek Inc., is operated by DC 9V500mA Adaptor

DO Electrode Connection

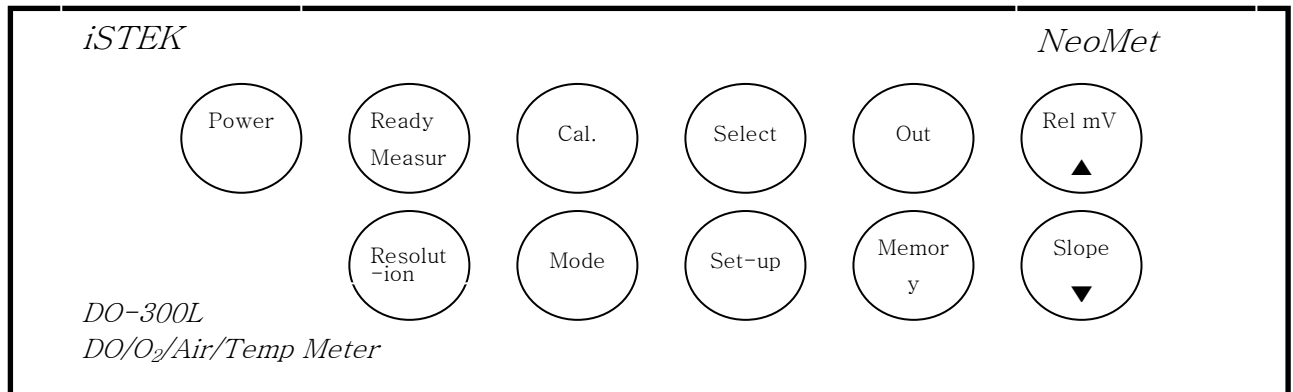
Attached Electrode by sliding the BNC connector onto the sensor input then push down and turn clockwise to lock into position. It also contains temperature sensor in the electrode.

Printer and RS232C interface Cable Connection

Insert printer and RS232C interface cable into the RS232C jack. Use interface cable supplied by *istek*. See the Chapter VI Data-Log

2) Key Function

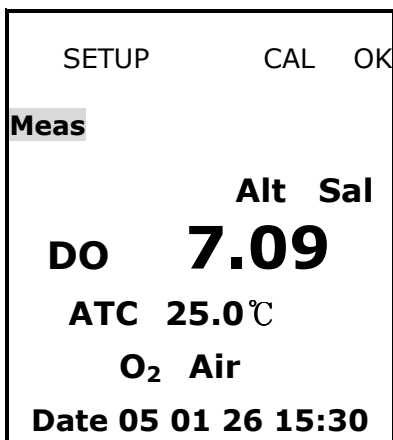
■ DO-300L (DO/O₂/Air/Temp Meter)



Key	Description
Power	used to turn ON/OFF.
Mode	Used to select operating modes for example of DO, O ₂ or Air.
Resolution	Indicate Data's resolution displayed(0.01/0.1)
Ready / Measure	Used to change Ready to Measure or Measure to Ready
Cal	Used to start and set calibration. In addition, exit in the middle of calibration
Setup	Used to access the setup menu. This is used for setting instrument operating parameter for example, regulation of temperature or setting time.
Select	Used to <Memory Clear>.
Memory	<ul style="list-style-type: none"> * Used to store data in meter memory while measuring. * In the ready condition, used to search for the memorized data. * Used to escape from Memory (Data Mode)
Out	Used to print display data, or in setup mode used to exit.
▲	Used for increasing data in Setup and Calibration mode..
▼	Used for decreasing data in Setup and Calibration mode.

3) Display Description

▣ DO-300L



Display	Function
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DO	displays concentration of dissolved oxygen with range of 0.00 to 19.99 mg/L.
O₂	indicates percentage of oxygen as compared to the amount of oxygen presents in the air.
Air	indicates percentage of DO concentration.
Alt	indicates Altitude by meter. It is shown in Setup mode.
Sal	indicates Salinity by PPT. It is shown in Setup mode.
ATC(°C)	Indicates Automatic Temp Compensation, a temperature probe supplied by istec, Inc. must be used. Temperature Compensation is automatically performed Indicates present temp and in case of it is unconnected with the meter, it displayed 25°C.
Measure	Indicates that meter is in <Measurement> Mode. If this is not shown, indicates ready condition.
Ready	Indicates that the meter is in <Ready> Mode now.
Cal	Indicates that meter is in the condition of calibration. It is used for calibration.

Cal OK	Indicates the end of calibration corresponding to number.
Error	Displays when it is not available to correctly measure because something is wrong in the meter or buffer while calibrating or measuring.

4) Electrode Structure

DO Polarographic Probe



1. Electrode Body
2. Stainless Steel Ring
3. Screw
4. Sensor; position of response to oxygen
5. Membrane Cover;
containing with the filling Solution
6. Membrane Protector& Holder
7. Membrane

Probe Storage and Maintenance

DO Probe Storage

For longer storage, cover the membrane tip with a cap originally supplied by *istek*.

DO Probe Maintenance (Probe Cleaning)

If it takes long time to response or a stable data is not obtained, check membrane.

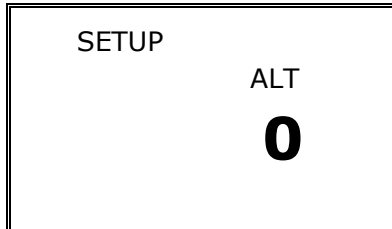
If air bubble is occurred on membrane, remove air bubble.

Check membrane for damage (i.e. holes and leak, etc.). If membrane gets damage, replace membrane.

Chapter III. Setup Functions

Altitude

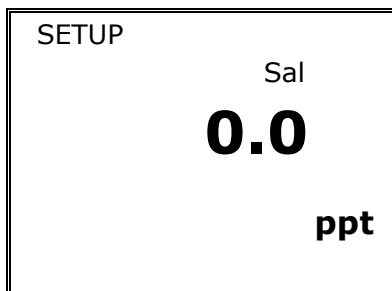
In the initial display of DO, press **Setup** key to enter Setup and then the display is shown as follows. Adjust altitude with ▲ or ▼ key.



The set altitude is automatically compensated and it changes 50m for every one press. For example, in the condition of 0 at ALT mode, you can increase 50m of altitude by pressing ▲ button.

If finishing the setting of conditions, press **Out** key to exit or **Setup** key to enter the next setup.

Salinity



Adjust salinity with ▲ or ▼ key. It changes 0.1 for every one press.

The set salinity is automatically compensated.

If finishing the setting of conditions, press Out key to exit or Setup key to enter the next setup.

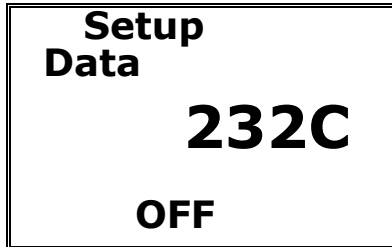
Memory Clear

If clearing all the stored data, press [Mode] key to go O₂ mode and then press [Select] key to delete the whole former data saved. When [Memory Clear] is finished, it comes back to DO initial display automatically.

Data- Logging (Hyper Terminal)

In DO ready condition if pressing [**Setup**] key to enter the setup, the display is shown as follows. Set by using ▲ or ▼ key

When this setup is set "ON", meter transmits data with time interval of one second. This data can be taken by communication program or printer via RS232C interface cable. Press [Out] Key to exit to initial display.



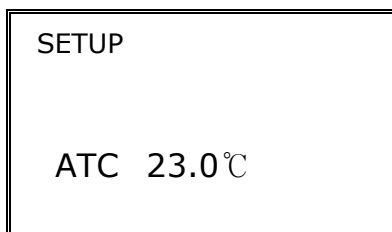
Time Setup

If Date and time on display differ from a real one, then set a real date and time. From the initial display of DO, press [**Setup**] key to enter time in setup display. Set real date and temp by using ▲ or ▼ key. After finishing setup, press [Out] key to return to DO initial display.



Temperature Setup

If temperature on display differs from a real one, then set a real temperature. From the initial display of DO, press [**Setup**] key to enter Temp setup display. After that set real temp by using ▲ or ▼ key. After a setup temp, press [Out] key to exit to DO initial display.



Chapter IV. Calibration and Measurement

- ※ There are salinity, altitude and temperature affects on Dissolved water.
- ※ Because of using polarographic Electrode, time is needed to be polarization.
- ※ You have to measure after stabilization by turning on our meter about 20 minutes.

Preparation

Connect probe and temperature sensor to Input and ATC jack respectively.

Clearly rinse probe with distilled water and blot dry with tissue.

Prepare solution for measurement and magnetic stirrer.

It takes 1~10 minutes to polarize probe because of using polarographic probe.

Constantly stir solution by using magnetic stirrer.

Saturate solution with oxygen by the bubbling equipment at least 1~2 hours in advance before calibrating.

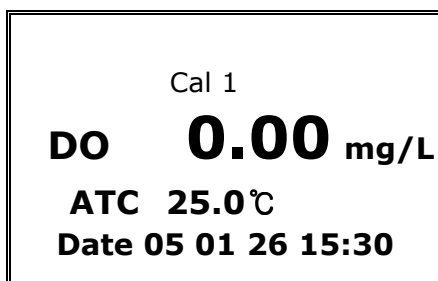
Put saturated solution into BOD bottle and cap to minimize the exposure in the air.

1) Calibration in DO Mode

1 -1) Zero Calibration.

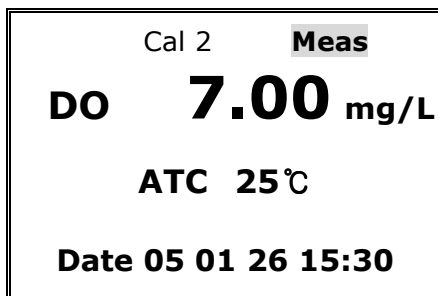
There are two ways of zero calibration. In ready condition, press **Cal** key to enter calibration mode. The display is shown as follows.

- 1) In case of calibration with solution not containing DO, add excess sodium sulfite, Na_2SO_3 , and a trace of cobalt chloride, CoCl_2 , to bring DO to zero. Put probe into this solution.
- 2) In case of calibration without solution, remove probe from Input and press **Measure** key.



If the reading is stable, press **Cal** key, and then Cal 1 OK message is displayed in the upper field and set automatically.

This figure indicates to finish Zero calibration



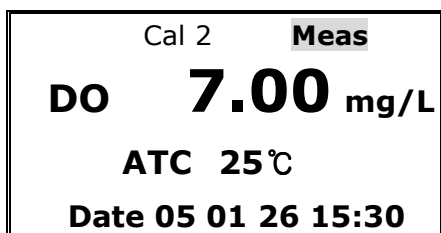
- **Zero point** can be measured by using above two ways.
(Measuring solution without DO and removing probe)

1-2) Saturated Calibration

You can do saturated calibration after zero calibration.

Connect probe, rinse it and dry (dry with tissue). Rapidly put probe into the prepared BOD bottle containing water saturated with air to minimize the exposure in the air. Press **Measure** key.

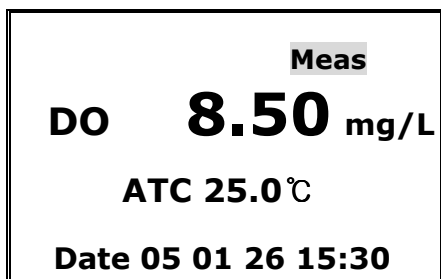
If the reading is stable, press **Cal** key. And then Cal 2 OK message is displayed in the upper field and set automatically.



* It automatically calibrates DO in Setup mode by compensating altitude and salinity.

* After finishing calibration, change to the initial display automatically. Put probe into sample and press the **Measure** key.

* Put probe into sample or let it in air and press Measure Key. Then data will be displayed on the screen.



You can change resolution by pressing **Resolution** key

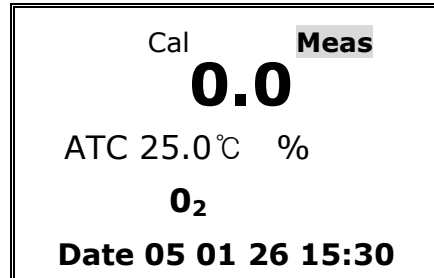
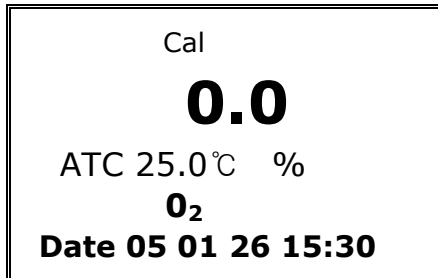
If the reading is stable, store or report it.

While measuring DO, you can also measure O₂ by pressing **Mode** key.

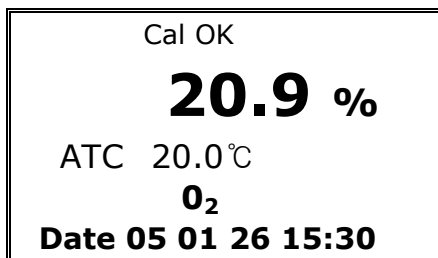
2) Calibration and Measurement in O₂ Mode

In DO Mode, change to O₂ mode using **Mode** key

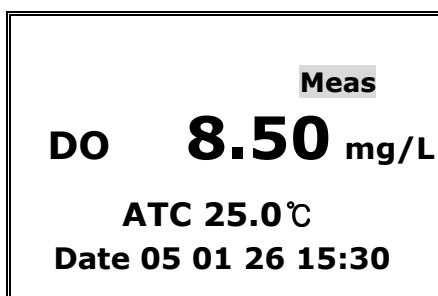
- * Clearly rinse probe with distilled water and dry (blot dry with tissue). Place probe in the air. Press **Cal** key.
- * Press **Measure** key.



- * If the reading is stable, press **Cal** key. And then Cal OK message is displayed in the upper field and set automatically.
- * This value is automatically adjusted in accordance with the selected altitude.

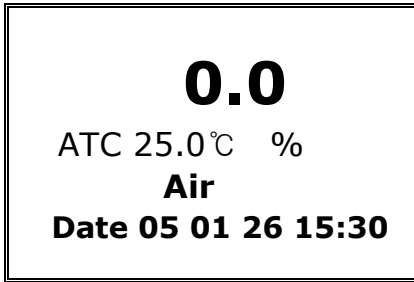


- * If finishing calibration, automatically change to the initial display. Put probe into sample and press the **Measure** key.
- * If the reading is stable, store or report it.
- * While measuring O₂, can also measure DO or air by pressing **Mode** key.

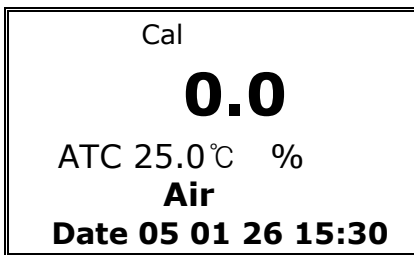


3) Calibration and Measurement in Air Mode

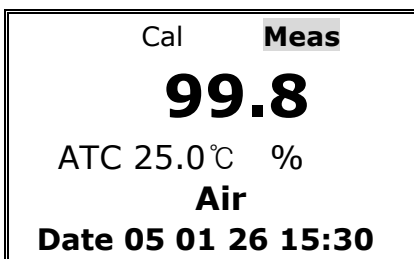
- In O₂ Mode, change to Air mode using **Mode** key.



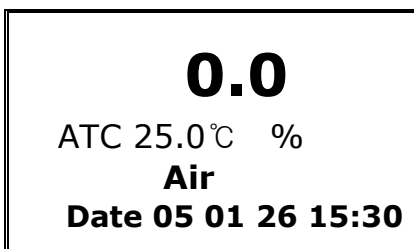
- * Clearly rinse probe with distilled water and dry(blot dry with tissue.
- * Place probe in the air.
- * Press **Cal** key.



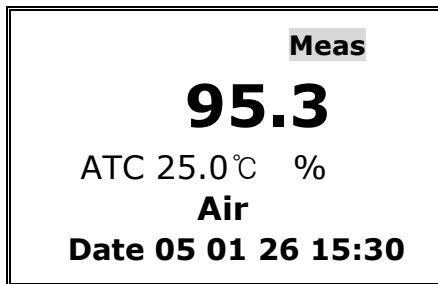
- * Press **Measure** key.



- * If the reading is stable, press **Cal** key. And then Cal OK message is displayed in the upper field and set automatically.



* If finishing calibration, it automatically change to the initial display. Put probe into sample and press **Measure** key to measure percentage of dissolved oxygen.



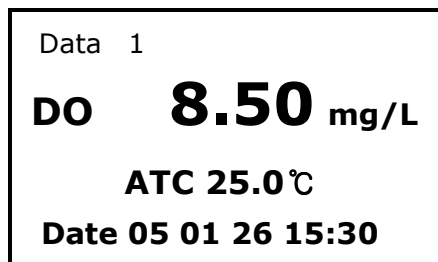
* While measuring air, you can also measure DO or O₂ by pressing **Mode** key.

Chapter V. Data-Logging

A. Data-Logging in Memory

The measured data is stored by pressing **[Memory]** key manually.

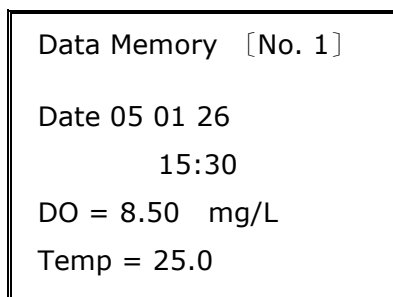
The measuring data is saving in regular sequence as a follow picture



If the data stored in meter is required to print, it is available to output by using printer supplied by *istek*. After searching data stored in instrument by using **[Select]** key, press Out key to print data.

It is available to search former data by using **[Up/Down]** Key

It is also available to print by using built-in printer. Press **[Out]** Key to print the data
The following picture is an example of printed paper



Chapter VI. RS232 Remote Control

The meter can be remotely controlled by PC.

After connecting your meter to PC by RS232C Communication cable and performing communication program of computer, if pressing **Meas** key, it will be remotely controlled and key button of meter wouldn't work.

The following messages are the remote control commands(Item /value/ temp /time)

DO 8.50 mg/L	25.0	05/01/26	15 :30
DO 8.50 mg/L	25.0	05/01/26	15 :30
DO 8.50 mg/L	25.0	05/01/26	15 :30
DO 8.50 mg/L	25.0	05/01/26	15 :30
DO 8.50 mg/L	25.0	05/01/26	15 :30

Chapter VII. Troubleshooting & Error Description

If the cause can't be known, clear memory (data) to eliminate all data.
Refer to Clear Memory(data) of Setup Functions.

If the problem persists, please contact *istek* **Product Service Department**.

MALFUNCTION	POSSIBLE CAUSE	REMEDY
	No power to meter	Press Power key. Check that battery is inserted correctly and polarity signs match.
Out of range reading or unstable reading	Probe failure	Clearly rinse electrode and blot dry. If air bubble is Occurred on membrane, remove air bubble. Check membrane for damage(i.e. holes and leak, etc.) If membrane gets damage, replace Membrane.

Chapter VIII. Specifications.

Model		DO-300L
DO	Range Resolution Relative Accuracy	0.00 to 19.99 mg/L 0.01/0.1 ±0.5%
O₂	Range Resolution Relative Accuracy	0.0 to 60.0% 0.1% ±1 digit
Air Saturation (%)	Range Resolution Relative Accuracy	0.0 to 199.9% 0.1% ±1 digit
Temperature	Range Resolution Relative Accuracy	-10 to 110℃ 0.1℃ ±0.4℃
Salinity Correction		○
Altitude Correction		○
Data Logging		100 Points
Temperature Compensation		Auto
Calibration		Auto
Input		BNC, ATC , Power, RS232C
Output		RS232C (Computer/Printer)
Power		AC DC Power Adaptor
Standard Accessories		DO Polarographic Electrode AC/DC Power Adaptor, Instruction Manual, Stand
Optional Accessories		DO Membrane Kit, BOD Adaptor , RS232C Cable

Chapter IX. Ordering Information

A. Standard

- * Do Polarographic Electrode / ATC Probe
- * DO Membrane
- * Filling Solution
- * AC/DC Power Adaptor
- * Carrying Case
- * Instruction Manual

B. Option

- * RS232C Interface Cable
- * DO Membrane Kit
- * BOD Adaptor
- * Printer

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CERTIFICATE OF WARRANTY

* We guarantee as following,

1. This product has been passed our strict inspection process.
 (It comes under the meters with the exception of an electrode)
2. Defects occurring within 2years from delivery date shall be remedied free of charge at our works when it has been used in a normal situation. (But we can make a user pay for mending charge in the case of trouble caused by a careless user.)
3. We will repair the good with fee about problems caused by user's mistake even if warranty period has not been over.
4. Please present this form with the good when you want to repair it.
5. Please keep this certificate with care because this sheet will not be reissued.

Product Name	Desktop	Warranty period
Model Name	DO-300L	2years
Serial Number		
Manufacturing Month/Year		

Date. . . , 2006

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