



PH METER(Desktop version)

Model : PH-300

INSTRUCTION MANUAL



1. Features

- ✍ Highly reliable and accurate meter.
- ✍ Very responsive combination glass pH electrode.
- ✍ Latest ICs used for quick sensing and high accuracy.
- ✍ Adjustable temperature compensation.
- ✍ Input is compactable for any type of electrode.
- ✍ SLOPE 4.00 and CAL 7.00 adjustment controls are provided on front for recalibration of instrument.

2. Introduction

SANSEL make digital pH meter is a precise and rugged instrument Carefully designed for the most accurate measurement of pH in Laboratories and industries.

The instruments are completely IC version using “MOFSET” input “OP - AMP” and CMOS ICS. It is a metal cabinet of elegant shape. All the controls that are in regular use have been incorporated in the front panel for operational easy.

The instrument is capable of measuring millivolts with auto. Polarity for redox potentials and potentiometric titrations. This instrument Operates from 180V to 230V AC 50Hz.

3. Technical Specifications

Model	pH-300
Range	0 to 14 pH / -1999 to +1999 mV
Input Impedance	$> 10^{12}$ Ohms
Resolution	0.01 pH / 1 mV
Temperature Compensation	0 to 50 °C(Manual) continuously Adjustable
Display	0.5" 3 ½ Digit 7 segment Red LED
Accuracy	± 0.01 pH ± 1 digit / ± 1 mV ± 1 digit
Electrode	Combined Electrode with BNC attachment
Input connection	BNC socket
Operating Environment	0 to 50 °C / 20 to 95 % RH non condensing
Power supply	230V AC / 50 Hz $\pm 10\%$
Overall Dimension in mm	185 x 235 x 75 (L x B x H)
Instrument Weight	1.7 kg(Approx.)

Note: Due to continuous product improvements, Published specifications may change with out notice

3A. Standard Delivery

1. Basic Instrument
2. Combined Electrode
3. 4 & 7 pH standard tablet with 100ml container
4. Electrode Clamp & stand set
5. Instruction manual

3B. Optional

1. Imported certified Standard buffer Solution (Extra charge)
2. Epoxy body imported Combined Electrode (Extra charge)
3. 4 & 7 pH standard tablet with container (Extra charge)

4. Theory of Operation

When a pair of electrodes namely pH sensitive glass and reference electrode are dipped in an aqueous solution. They generate EMF which is proportional to the pH of the solution. The magnitude of the EMF is also dependent on the Temperature of the solution. Besides this Temperature dependent EMF, a certain amount of potential, known as asymmetric potential is generated by the electrode which remain fairly constant for a given pair, since the pH sensitive surface generated combination(Electrode and solution) is very High. To measure EMF from such high resistance an ordinary D.V.M can't be used and so an operational amplifier is used whose input current is very low with extremely high input impedance. With MOSFET OP-AMP and CMOS ICS ensure high reliability and very good performance.

5. Measurement Controls

5A. Front Panel

5A-1. Power "ON" Switch

This is the ON/OFF switch by means of which the instrument can be switched 'ON' after connecting the input cable power the display shows "000" switches are in STNDBY mode.

5A-2. SELECT Switch

This is the rotary switch in three positions to measure pH, STD & mV (pH, STANDBY, Millivolts). It is kept in STD(STANDBY) position, when the instrument is temporarily not in use or during change of the solution. In this position, the display should read "000" for measurement; it is to be set to either pH or mV position, depending on the type of measurement.

5A-3. CAL 7.00

This is a Potentiometric control. The function of this control is to neutralize the Asymmetric potential developed by the electrode and is used for calibrating the instrument with external buffers. In general, Asymmetric potential remains fairly constant over a period of few weeks for a given pair of electrodes. Thus, this control is very rarely used. To use this control, dip electrodes in freshly prepared 7.00 buffer solution, adjust the control to give "000" mV in mV mode and 7.00 pH in pH mode. Under normal conditions of operation, this control may need adjustment once in about three months.

5A-4. SLOPE 4.00

This is a pot-meter control located at the front panel. Normally, pH sensitive electrodes generate 54.15mV/pH at 0°C. But if the electrode is continuously used for the measurement of highly alkaline solution, it tends to generate lesser potential per pH unit. In other words, its slope changes. In this event, the same electrode may still be used by adjusting the slope adjust control. The range of the slope adjustment is from 70 to 110%; the instrument is calibrated for 100% slope.

5A-5. TEMPERATURE

It has got a dial with an arrow mark which moves over a Temperature Scale of 0 to 50°C. The EMF generated by the electrode is temperature sensitive. This control compensates for the temperature dependence of the electrode output. The arrow on the dial should indicate the temperature of the sample solution.

5B. Back Panel Controls

5B-1. ELECTRODE IN

This is a BNC female socket located on the back panel. Here the glass electrode BNC male socket should be inserted properly and locked.

5B-2. FUSE

This is a screw type fuse holder. Fuse rating should be 250mA, 250V AC.

5B-3. POWER CARD

This is a three core PVC cable provided with 3 pin socket for taking power mains and 3 pin male socket for supply input to the instrument.

NOTE : in this power socket provided on site Earth is must.

6. Operation Procedure

- 6.1. Check the power supply for the proper phase, neutral and earth.
- 6.2. Proper conditioning of the glass(combined) electrode must be done.(refer Electrode maintenance instructions)
- 6.3. Keep the main switch “OFF”
- 6.4. Connect the electrode jacks in their respective socket.
- 6.5. Now insert the power plug to a 3 pin socket of 230V AC,50 Hz, with a good grounding. If grounding is not proper, connect separate lead from the Earth terminal which is on the back panel of the instrument.
- 6.6. Switch ‘ON’ the instrument, it should read ‘000’.If it is not Reading zeros keep it for few minutes.
- 6.7. Let the instrument stabilize for 10 minutes. In case the Instrument displays some reading other than ‘000’ in the “STD by” position of the switch.(This is Due to increase in the Humidity of Surrounding atmosphere).

- 6.8. Take a fresh buffer solution of 7.00 pH dip the electrode in the Solution after thoroughly washing the electrode with distilled water and drying with filter or tissue paper. Set the switch to 'mV' Position. It should read '000' mV, if it is a correct 7.00 pH read, 000 mV adjusts the CAL 7.00 knob to get zero 'mV' in 'mV' mode. Once it reads "000' mV it will read 7.00 pH at 'pH' position.
- 6.9. Since the electrode is in the distilled water, wipe with tissue paper and dip in buffer solution. Set temperature knob to the solution temperature .Set the mode switch to 'mV' mode the display should read 177 mV any other reading mans that the electrode 'slope' is not in 100%,set the switch to 'pH'. This instrument should display 4.00.If it does not adjust the "slope adj" on the front panel to read 4.00pH.

7. Measurement of pH

- 7.1. Wash the electrode with distilled water and wipe with filter or Tissue paper.
- 7.2. Dip the Electrode in the sample solution
- 7.3. Keep the Temperature knob at 25°C
- 7.4. Set the 'SELECT' switch in 'pH' position
- 7.5. Adjust the temperature knob to the temperature of the sample. The reading will be the pH of the samples solution. With in +/- 0.01 pH accuracy.
- 7.6. For the measurement of mV, set the select switch to mV Position. The reading will be with polarity indication.

8. Important Precautions

- 8.1. Before connecting the instruments to the main supply, make sure that the utility output is having 230V, 50Hz free from high voltage surge.

8.2. Make sure that the instrument is given a firm ground connection of the third pin of the plug is not connected to good ground. Connect the instruments back terminal name "Earth" which is on the back panel, to a good ground like water pipe line.

8.3. The solution to be measured should not be grounded.

9. Maintenance Instructions for pH Electrode

9.1. Shake the electrode gently to ensure that the internal solution covers the whole membrane and no air bubbles are entrapped.

9.2. Single rod assemblies (combined electrodes) should be filled with appropriate electrolytes to a height of about 1 cm, below the filling tube.

9.3. Wash of any salt film present on the interior of the combined Electrode (or) glass electrode with distilled water.

9.4. To ensure pressure equalization the stopper of electrolyte opening should be removed or perforated with a pin.

9.5. Soak the electrode in distilled water for at least some hours(preferably over night)

9.6. Electrode which has poor response due to drying out of membrane or due to having been used under extreme conditions may be reactivated by soaking in 0.1N HCL over high. Wash with distilled water and soak. It should be distilled water for at least few hours before use. Electrode which fails to respond for above treatment can be further reactivated by dipping then in 2%.Hydrochloric acid for 5 to 10 seconds only and immediately washing with distilled water. This treatment should however be applied only in a last resort as it reduces the life of the electrode.

9.7. After conditioning the electrode, as in 5 above, it is not to be used. It should be kept in distilled water only. To prevent the entry of water through the diaphragm of the reference electrode of single rod assemblies the stopper of the filling opening should be removed or perforated with a pin.

10. Fault Finding Guide

The following table may be useful in correcting malfunctions and avoiding simple pitfalls.

CAUSE	REMEDY
A.C Supply is not present.	Check A.C supply
Fuse at the back open circuit	Replace fuse (100mA)
One of D.C supplies faulty	Check +5 V -5V supplies
INACCURATE READING'S	
Contaminated buffer solution	Prepare a fresh solution
DISPLAY FLICKERING	
Poor earthing	Connect on efficient earth
Noise interference through the electricity supply from switching devices etc. RF radiation's from similar devices	Eliminate cause of disturbance or remove the instrument and place it in another location or connect to a different circuit.

If still the fault exists please contact our Customer support - +91 72999 72092 (or) refer to the nearest distributor for Repairs by the engineer of the company.

Note: Do Not play with the internal preset pot of the Instrument. Guarantee Stands Only if the seal of these pots is intact.

11. Warranty

The instrument is warranted for a period of 12 Months from the date of delivery against defects in materials or workman ship other than the electrodes. During warranty, our liability is limited to the repair or replacement of the instrument at our opinion. Data subject to change without notice.

MANUFACTURER OF :

CALIBRATORS: LOW TEMPERATURE BATH, SUB ZERO CALIBRATOR, LIQUID CALIBRATION BATH, DRY BLOCK TEMPERATURE CALIBRATOR, HIGH TEMPERATURE DRY BLOCK CALIBRATOR, PORTABLE BLACK BODY SOURCE, HIGH TEMPERATURE BLACK BODY SOURCE, PRESSURE CALIBRATOR(-0.95bar to 700bar) IN DIFFERENT RANGES, PRECISION HUMIDITY / TEMPERATURE CALIBRATION SYSTEM, SEMI STANDARD PLATINUM RESISTANCE, MASTER THERMOCOUPLE, etc.,

LIQUID ANALYZING INSTRUMENTS: ONLINE LIQUID ANALYZER, pH METER, μ P BASED pH / ORP / TEMPERATURE METER, CONDUCTIVITY METER, TDS METER, DIGITAL NEPHELOMETER, COLONY COUNTER, SPECTRO PHOTO METER, ONLINE pH/ORP/TEMPERATURE CONTROLLER, ONLINE pH INDICATOR, ONLINE TDS (OR) CONDUCTIVITY INDICATOR, RO CONTROLLER etc.,

PROCESS CONTROL INSTRUMENTS: 5½ DIGIT PROCESS INDICATOR, AUTOCLAVE CONTROLLERS, ENVIRONMENTAL MONITORING SYSTEM & CONTROLLER, UNIVERSAL DATA LOGGER, TEMPERATURE DATA LOGGER, HUMIDITY TEMPERATURE DATALOGGER WITH SENSOR, HUMIDITY & TEMPERATURE INDICATOR WITH SENSOR, ULTRASONIC LEVEL INDICATORS/TRANSMITTERS (non-contact Level Measurement), WATER FLOW METER, TEMPERATURE CONTROLLER, DIGITAL TIMER, SIMPLE COUNTER /SET POINT COUNTER, RPM INDICATOR,RATE /RPM / FREQUENCY, INDICATOR & CONTROLLER, JUMBO DISPLAY, DC DRIVES, SINGLE / 3 PHASE THYRISTOR POWER REGULATOR etc.,

SENSORS: TEMPERATURE SENSORS, HUMIDITY SENSORS, PRESSURE SENSORS, LEVEL SENSORS, pH SENSORS, ORP SENSORS, CONDUCTIVITY SENSORS, TDS SENSORS, PROXIMITY SENSORS, FLOW SENSORS etc.,

12. Contact us

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