TOSHCON®
Trusted Name in Instrumentation

INSTRUCTION MANUAL FOR
pH METERS

TOSHNIWAL range of laboratory pH Meters are simple yet reliable digital instruments for pH & Redox measurements analysis in educational & research institutes and scientific & industrial laboratories.

OPERATING CONTROLS

1. The operating controls common for all pH Meters are :
   (a) On/ Off switch to switch ON the Meters.
   (b) Manual temperature compensation pot graduated 0 to 100°C
   (c) Asymmetry adjustment pot A.
   (d) pH/ Standby/ mV mode selector switch
2. Slope compensation facility is available in all meters. In CL 46+ & CL 54+ screw driver settable slope pot is at the rear side (this facility has been given so that it can not be tampered easily).
3. Polarisation current for DS titration available in CL 46+ but the level is fixed & not adjustable.

INPUT / OUTPUT CONNECTIONS

All sockets for connecting electrode inputs are at rear side :

(a) Coaxial Socket for pH glass/ combination Electrode
(b) Banana Socket for Reference
(c) Banana Socket for solution ground connection (recommended while carrying measurement of non aqueous solution.)
(d) Recorder output socket
(e) Stereo socket for ATC (CL 46+) and for ATC & Temp. Display (only in cableless CL 46+)
(f) Banana Socket for DS polarisation output
(g) Manual/ Auto & pH/ Temp. switch (only in cableless CL 46+)

TOSHNIWAL offers a wide range of pH Glass/ Combination/ Reference & ION selective Electrodes for diverse applications. Details are available in separate literature. Select appropriate type of electrodes.

INITIAL PREPARATION

It is recommended that prior to measurements the electrodes are to be kept dipped in saturated KCl (overnight). It is also recommended that the pH Meter be kept ON in Standby mode, for about 5 minutes prior to measurements. The power source required for the meters is given under specifications.

pH MEASUREMENTS

Adjust Temp. of the buffer with Temp. knob provided in CL 54+ or immerse ATC in the buffer for automatic temp. compensation if ATC is used in CL 46+. The Electrode then should be immersed in a buffer solution of known pH say 7pH. The display of the pH meter is brought to the value 7pH by means of the asymmetry potential adjustment pot A (front side). The electrode is then removed from the buffer solution and washed with distilled water and immersed in another known buffer say 4pH. The display of the pH meter is brought to the value 4pH by means of slope adjustment pot S (rear side). The display of the measuring instruments should now indicate this value and if it does so, the instrument is functioning correctly.
The preceding calibration procedure should be done initially and repeated at intervals determined by the desired measuring accuracy and the conditions of use of the electrode system.

It is essential that the electrodes are cleaned with distilled water in-between measurements. Also put the pH meter mode switch to Standby (Std.) position whenever the electrode is out of solution.
It is also recommended that buffer standardization to be repeated more than once for accurate results.

REDOX MEASUREMENTS

Prepare a Redox Buffer solution for 264 mV & immerse the Redox Electrode in the same. After putting the meter in mV mode the display of the meter should be brought to 264 mV by means of the asymmetry potential adjustment pot. The electrode is then removed from the buffer solution and washed with distilled water and then immersed in another known buffer of 400 mV. If the reading now displayed is 400 ±25 mV then the electrode is functioning correctly & ready for use.
Solution temperature compensation is not applicable.

TITRATIONS

Potentiometric titrations can be carried out in normal pH or mV modes using appropriate electrodes. DS titration may be carried out in CL 46+ pH meter, by connecting a lead from DS polarization current Output socket to the electrode input socket.

TEMPERATURE COMPENSATION

Temperature Compensation refers to solution temperature and is applicable only in pH mode. It is recommended that the buffer standardization & pH measurement, be carried out at same temperature for accurate results. Whenever ATC is used, the same is to be dipped into the solution along with the electrodes. When ATC is plugged in, the manual temperature pot automatically becomes ineffective.

TECHNICAL SPECIFICATIONS	**MODEL CL 54+ / CL 46+**	
Diplay	3½ Digit 12.7 mm LED	
Range	pH: 0.00 to 14.00	mV: ± 1999
Accuracy	0.01 pH ± 1 digit	1 mV ± 1 digit
Temperature Compensation	0-100°C Manual (CL 54+) / Manual & Automatic (CL 46+)	
Input Impedance	10^{12} Ohms	
Power Supply	230 V ±10%, 50 Hz	
Recorder Output	100 mV/pH (CL 46+)	
DS Titration output	Polarization current (CL 46+) Output provided	
Approx. Weight in Kg.	1.4 / 2.4	

STANDARD ACCESSORIES: Supplied with the pH Meter

(1) Buffer for pH 4 & 7 (2) KCl solution (125 ml) (3) Electrode stand with clamp

OPTIONAL ACCESSORIES (available at an extra cost)

(1) Buffer for pH 4 & 7 (2) KCl solution (3) Electrode stand with clamp

(4) Angle poised electrode stand with clamp (5) ATC (only for CL 46+)

(6) Redox Buffer solution 264 & 400 mV ±25 mV (125 ml each)

IMPORTANT NOTE

pH/Redox measuring electrode of either combination type or glass/Redox & reference type are essential for pH/Redox measurements and should be ordered along with the pH Meter.

DIRECTION FOR USE FOR pH/ REDOX COMBINATION ELECTRODES (KCl/ GEL FILLED)

1. Remove the bottle/ protective cap at the bottom of the electrode.
2. Shake the electrode gently to ensure that the internal buffer solution covers the whole pH Bulb and no air bubbles are entrapped.
3. pH/ Redox Combination Electrodes should be filled with the appropriate electrolyte to a height of about 1cm below the filling port.
4. Wash off any salt film present on the exterior of pH/ Redox Combination Electrode, using distilled water.
5. To ensure pressure equalisation, the stopper of the filling port should be removed or perforated with a pin.
6. Soak the electrode in 7pH Buffer or saturated KCl for some hours (preferably overnight) before use.
7. Electrode which have developed problem of slow response due to drying out of the membrane or use under extreme conditions, may be re-activated by soaking in 0.1 N Hydrochloric Acid for 8 to 10 hours.

   Electrode, which fails to respond to the above treatment can be further activated by dipping them to 2% Hydrofluoric Acid for 5-10 seconds and immediately washing with distilled water. This drastic treatment should however be applied only as last resort as it reduces the life of the electrode.
8. After conditioning the electrode as in (7) above, if it is not to be used it should be kept in 7pH Buffer or saturated KCl. To prevent the entry of measuring media through the diaphragm of the reference junction of pH Combination Electrode, the stopper of the filling opening/ port should be removed or perforated with a pin.
9. For Redox Combination Electrode (KCl / Gel filled), please follow instructions at Sr. No. 1, 3, 4 & 5 only and not others from “Direction for use”.
10. a) Always keep the electrodes dipped in saturated KCl solution, when not in use.
    b) Since the shelf life of the Redox buffer is very short, for correct results it is strongly recommended to use freshly prepared buffers for calibration.
    c) Electrode should be kept in its box as per “arrow mark” when not in use, which means the bottle/ protective cap side should be facing the ground in its packed condition.

IMPORTANT NOTE

We trust the above information will help you to effectively use the pH meter. However, should you need any assistance at any time please contact **Customer Care only**.