1. **PURPOSE:**

To describe the operation and Calibration procedure for the pH Meter.

1. **SCOPE:**

This procedure is applicable to the digital pH Meter of Laboratory.

**Make** : Polmon

**Model** : LP-139SA

**Instrument No.** : DIPL/QC/INS/pH/004

1. **RESPONSIBILITY:**
   1. Analyst-QC shall be responsible to follow this SOP.
   2. Head-QC/Designee shall be responsible for ensuring implementation of this SOP.
   3. Head-QA/Designee shall be responsible for monitoring overall compliance of this SOP.
2. **DEFINITIONS:**

Nil.

1. **PROCEDURE:**
   1. **DISPLAY:**
      1. LCD display will show Temp (AUTO/MAN) corresponding to mode indicator.
      2. Seven segment LED display will show pH/mV &offset values corresponding to mode indicator.
   2. **Key Pad:**

▲ /Save

Instrument has 8 Keys. ▲ Increment Key, ▼ Decrement Key Save / Right shift Key, Recall/Left shift Key, ESC/PRINT Key,

OK/HOLD

ESC/PRINT

MODE

Recall/▲

PGR/CAL

Program / Calibration key, MODE Key & OK/HOLD Key.

* 1. **OPERATION:**
     1. MEASURE MODE:

In the Measure mode instrument automatically displays the measured value, corresponding to mode Indicator.

Manual Temperature Compensation (Auto Temperature Compensation disabled) is achieved by pressing the AUTO/MAN key, default temperature is displayed. Press Temperature ▲/▼ keys to get required temperature of the sample.

* + 1. HOLD MODE:

In HOLD mode the pH/mV display will blink with offset value obtained in the previous calibration.

* 1. **CALIBRATION:**

CALIBRATION mode is used to calibrate the measuring function i.e pH, ORP & Temp of the instrument.

* + 1. Press **PRG/CAL** key to enter into program mode PASSWORD menu is displayed**.**

|  |
| --- |
| **PASSWORD**  **XXX** |

**OK/HOLD**

* + 1. Using **▲** or **▼** keys to set PASS WORD (100) and use Key.
    2. The LCD display shows

**PRG**

**1. Calib**

* + 1. Then press OK key. The LCD display shows

**OK/HOLD**

**Del Last**

**Cal Rept**

* + 1. Press Key (it implies the deletion of previously calibrated report)
    2. The LCD display shows. By using ▲ key

**Auto Temp**

**Calib**

**Man Temp**

**Calib**

Select Press key.

**OK/HOLD**

**Auto Temp**

**Calib**

* + 1. The LCD display shows .

**Auto Cal**

**Calib**

**Man Cal**

**Calib**

* + 1. By using ▲ key

Select And press key.

**OK/HOLD**

**Auto Cal**

**Calib**

**1 pt Cal**

**Calib**

* + 1. Then LCD display shows

Press ▲ key to choose different type of calibration

i.e.,1pt Calibration,

2 pt Calibration,

3 pt Calibration,

4 pt Calibration,

**OK/HOLD**

5 pt Calibration, and then press key.

**NIST**

* + 1. Then LCD display shows,

Press ▲key to choose different standard Buffer set

i.e., NIST,

DIN,

USA,

CUSTOM.

**OK/HOLD**

**USA**

Select and press key.

* + 1. After that LCD display shows “Buf 1”.

**Buf 1**

**Calib**

Rinse the electrode with distilled water and remove the excess water with tissue paper.

**OK/HOLD**

* + 1. Dip the electrode in Standard Buffer pH 7.0 and press key.

**Wait**

After that LCD display shows

After that Done message is displayed in LCD display with Value of the pH as

**Done**

**7.00**

**Done**

**X.XX**

For instance.,

**OK/HOLD**

Press key.

* + 1. After that LCD display shows “Buf 2”.

**Buf 2**

**Calib**

Rinse the electrode with distilled water and remove the excess water with tissue paper.

**OK/HOLD**

* + 1. Dip the electrode in Standard Buffer pH 4.0 and press key.

**Wait**

After that LCD display shows

After that Done message is displayed in LCD display with Value of the pH as

**Done**

**4.00**

**Done**

**X.XX**

For instance.,

**OK/HOLD**

Press key.

* + 1. After that LCD display shows “Buf 3”.

**Buf 3**

**Calib**

Rinse the electrode with distilled water and remove the excess water with tissue paper.

**OK/HOLD**

* + 1. Dip the electrode in Standard Buffer pH 10.01 and press key.

**Wait**

After that LCD display shows

After that Done message is displayed in LCD display with Value of the pH as

**Done**

**10.01**

**Done**

**XX.XX**

For instance.,

**OK/HOLD**

Press key.

* + 1. After that LCD display shows “Buf 4”.

**Buf 4**

**Calib**

Rinse the electrode with distilled water and remove the excess water with tissue paper.

* + 1. Dip the electrode in Standard Buffer pH 1.68 and press key.

**OK/HOLD**

**Wait**

After that LCD display shows

After that Done message is displayed in LCD display with Value of the pH as

**Done**

**1.68**

**Done**

**X.XX**

For instance.,

**OK/HOLD**

Press key.

* + 1. After that LCD display shows “Buf 5”.

**Buf 5**

**Calib**

Rinse the electrode with distilled water and remove the excess water with tissue paper.

**OK/HOLD**

* + 1. Dip the electrode in Standard Buffer pH 12.45 and press key.

**Wait**

After that LCD display shows

After that Done message is displayed in LCD display with Value of the pH as

**Done**

**12.45**

**Done**

**XX.XX**

For instance.,

**OK/HOLD**

Press key.

.

**SAMPLE**

* + 1. “Sample” message is displayed in LCD display.
    2. Rinse the electrode with distilled water and remove the excess water with tissue paper. Dip the electrode into the test solution. Press key.

**OK/HOLD**

* + 1. **pH Calibration Menu Flow:**

Temp

Auto/Man

PRG

1.Calib

Del Last

Cal rept

Password

XXXX

PRG

Wait

pH Calib

Auto/Manual

1/2/3/4/5

Pt Calib

NIST/DIN/

USA/CUST

Buf 1

Buf5

Done

X.XX

Done

XX.XX

wait

sample

XXXX

upto

Display pH value.

* 1. **SAMPLE STORAGE:**

/ Save

Recall / ▲

Samp

XXXX

Press Enter sample ID by using ▲, ▼,

**OK/HOLD**

▲/Save

& keys. After that Press Key.

* 1. **ERROR MESSAGES:**

|  |  |  |
| --- | --- | --- |
| **S.No** | **Error Message** | **Possible Cause** |
| 1 | Electrode open /Dip the electorde | i) Check whether electrode is properly connected to the instrument  ii) Dip the electrode in the solution, Press ok |
| 2 | Change the electrode | Change the electrode and press OK Key. |
| 3 | Do calibration | i) As the calibration status has deviated do calibration by pressing OK key |
| 4 | ATC Open | i) Plug in the ATC Sensor (Temperature sensor) to the sockets provided. Press Ok  ii) If again it repeats there might be loose contact at the socket, plug it properly. |
| 5 | Check Buffer | i) Check whether the electrode is dipped in the required buffer.  ii) Rinse the electrode and remove excess water with tissue paper.  iii) Dip the electrode in the required buffer & press OK |
| 6 | Change  Buffer /Electrode | Rinse the electrode and remove excess water with tissue paper. Dip the electrode in the new buffer. Press OK key. If again check buffer and change Buffer/Electrode repeats change the electrode. |
| 7 | Temp over Range | The temperature may be out of the specified range of the instrument i.e., (-10.0°C to 100.0°C). |
| 8 | ID already exist | If we try to save the existing ID no. the display shows “ID already exist”. |
| 9 | Wrong Entry | The range is not matching with the existing range the display shows “Wrong Entry”. |
| 10 | ID Not Exist | If we want to take a print of specified ID and if doesn’t exists the display shows “ID Not Exist” |
| 11 | Del last cal rept | Before every new calibration the instrument displays “Del last Cal rept”i.e. for every new calibration the instrument asks for the deletion of previous calibration details. So if you don’t want to delete the earlier calibration report press ESC key |
| 12 | Memory full | If the instrument was saved with 100 samples, you want to save more than 100 the display shows “memory Full”. If we want to exit from the menu press ESC key, else press **OK** key. Then display shows delete first sample or all samples. |

* 1. **Printing:**

Demand/Specific/All samp/ Calib/Range/Footer/Page end

Print select required menu by using ▲ & ▼ keys,

**OK/HOLD**

then Press key.

* 1. **SPECIAL INSTRUCTIONS:**
     1. Put the DUST PROOF COVER on the instrument to protect the enclosure from accidental spillage of solution on to the instrument.
     2. For precision measurement use 7.00 buffer for STD adjustment in 1/2/3/4/5 point calibration.
     3. Don't keep the electrode in dry condition. To avoid it, place in 7.00/4.00 buffer solution only.
     4. After usage keep the electrode in pH electrode storage solution. If storage solution is not available, use 200 mL, pH 7 buffer to which above 1g KCL has been added, as a temporary substitute. Don’t store in distilled water, as this will shorten electrode life.
     5. Before disconnecting electrode from instrument, keep instrument in HOLD mode.
     6. While measuring pH electrode bulb should not touch bottom of the container.
     7. Solutions used to clean electrode must be handled with care accorded to toxic of corrosive substances.
     8. Do not turn on the power supply until all of the wiring is completed, otherwise electric shock, fire or malfunction may result.
     9. Use this instrument within the scope of its specifications otherwise fire or malfunction may result.
     10. Do not use this instrument places subject to flammable or explosive gases.
     11. Never disassemble, repair or modify the instrument, this may cause electric shock, fire or malfunction may result.
     12. Only clean the instrument when power off. Use the provided dust protection cover
     13. Use a soft cloth or cotton paper to clean up the stain on the display/ overlay.
     14. Never use sharp and hard matters such as screw drivers or ball pen to touch the panel, which will cause scratch or damage.
  2. **Preparation of Buffers:**

Procure standard Buffers from the authentic source (like Thermo Scientific, Eutech, SRL).

Take 100 mL of buffer solution into 100 mL scott glass bottle and have to used for the calibration of the Instrument. These buffers are valid for one month from the date of filling. Discard the buffer if any turbidity observed within the valid period and take fresh buffer solutions.

* 1. **Assigning Buffer Batch Number:**

**Batch Number : X/pH/NN/MM/YY**

X indicates Buffer i.e., 7.00, 4.00, 10.01, 1.68 and 12.45.

NN indicates Serial number starting from 1.

MM indicates Month (i.e., 01 for January, 02 for February)

YY indicates last two digits of the Year

For instance: 7.00/pH/01/04/17

1. **FORMATS / ANNEXURE(S):**
   1. pH meter calibration Record : QC052-FM112
   2. pH Buffer Preparation Record : QC052-FM113
2. **CHANGE HISTORY:**

| **Revision No.** | **Effective Date** | **Details of Revision** | **Ref CCF No.** |
| --- | --- | --- | --- |
| 00 | 09.04.2017 | New SOP introduced | -- |