TITLE: OPERATION AND CALIBRATION OF DIGITAL pH METER

1.0 PURPOSE:

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

2.0 SCOPE:

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

Make : Polmon

Model : LP-139SA

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

3.0 RESPONSIBILITY:

3.1 Analyst-QC shall be responsible to follow this SOP.

3.2 Head-QC/Designee shall be responsible for ensuring implementation of this SOP.

3.3 Head-QA/Designee shall be responsible for monitoring overall compliance of this SOP.

4.0 DEFINITIONS:

Nil.

5.0 PROCEDURE:

5.1 **DISPLAY:**

5.1.1 LCD display will show Temp (AUTO/MAN) corresponding to mode indicator.

5.1.2 Seven segment LED display will show pH/mV &offset values corresponding to mode indicator.

5.2 **Key Pad:**

Instrument has 8 Keys. ▲ Increment Key, ▼ Decrement Key [▲ /Save] Save / Right shift Key, [Recall/▲] Recall/Left shift Key, [ESC/PRINT] ESC/PRINT Key, [PGR/CAL] Program / Calibration key, [MODE] MODE Key & [OK/HOLD] OK/HOLD Key.

5.3 **OPERATION:**

5.3.1 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.

5.3.2 HOLD MODE:

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

5.4 **CALIBRATION:**

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

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

PASSWORD
XXX

5.4.2 Using ▲ or ▼ keys to set PASS WORD (100) and use **OK/HOLD** Key.

5.4.3 The LCD display shows

PRG
1. Calib

5.4.4 Then press OK key. The LCD display shows

Del Last
Cal Rept

5.4.5 Press **OK/HOLD** Key (it implies the deletion of previously calibrated report)

5.4.6 The LCD display shows. **Auto Temp Calib** **Man Temp Calib**

By using ▲ key

Select **Auto Temp Calib** Pre **OK/HOLD** key.

5.4.7 The LCD display shows **Auto Cal Calib** **Man Cal Calib** .

5.4.8 By using ▲ key

Select **Auto Cal Calib** And pre **OK/HOLD** key.

5.4.9 Then LCD display shows **1 pt Cal Calib**

Press ▲ key to choose different type of calibration

i.e.,1pt Calibration,

2 pt Calibration,

3 pt Calibration,

4 pt Calibration,

5 pt Calibration, and then press **OK/HOLD** key.

5.4.10 Then LCD display shows, **NIST**

Press ▲key to choose different standard Buffer set

i.e., NIST,

DIN,

USA,

CUSTOM.

Select **USA** and press **OK/HOLD** key.

5.4.11 After that LCD display shows "Buf 1".

Buf 1
Calib

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

5.4.12 Dip the electrode in Standard Buffer pH 7.0 and press **OK/HOLD** key.

After that LCD display shows **Wait**

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

Done
X.XX

For instance., **Done**
7.00

Press **OK/HOLD** key.

5.4.13 After that LCD display shows "Buf 2".

Buf 2
Calib

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

5.4.14 Dip the electrode in Standard Buffer pH 4.0 and press **OK/HOLD** key.

After that LCD display shows **Wait**

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

Done **X.XX**	For instance.,	**Done** **4.00**

Press **OK/HOLD** key.

5.4.15 After that LCD display shows "Buf 3".

Buf 3
Calib

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

5.4.16 Dip the electrode in Standard Buffer pH 10.01 and press **OK/HOLD** key.

After that LCD display shows **Wait**

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

Done **XX.XX**	For instance.,	**Done** **10.01**

Press **OK/HOLD** key.

5.4.17 After that LCD display shows "Buf 4".

Buf 4
Calib

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

5.4.18 Dip the electrode in Standard Buffer pH 1.68 and press **OK/HOLD** key.

After that LCD display shows

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

Done **X.XX**	For instance.,	**Done** **1.68**

Press **OK/HOLD** key.

5.4.19 After that LCD display shows "Buf 5".

Buf 5 **Calib**

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

5.4.20 Dip the electrode in Standard Buffer pH 12.45 and press **OK/HOLD** key.

After that LCD display shows **Wait**

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

Done **XX.XX**	For instance.,	**Done** **12.45**

Press **OK/HOLD** key.

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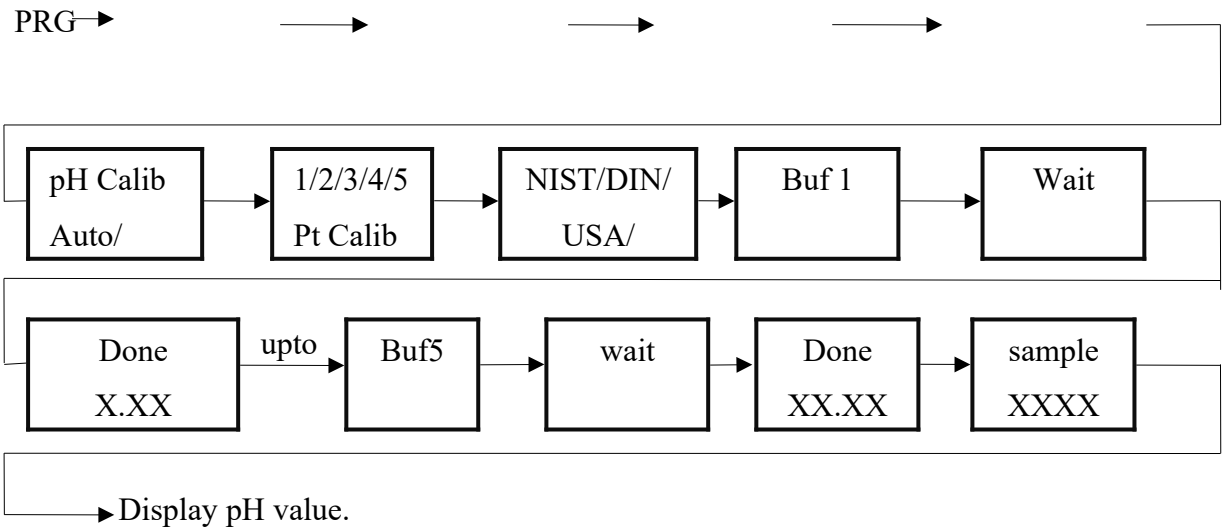
5.4.21 **SAMPLE** "Sample" message is displayed in LCD display.

5.4.22 Rinse the electrode with distilled water and remove the excess water with tissue paper. Dip the electrode into the test solution. Press **OK/HOLD** key.

5.4.23 **pH Calibration Menu Flow:**

Passwor d	PRG 1.Calib	Del Last Cal rept	Temp Auto/Man



5.5 **SAMPLE STORAGE:**

Press / Save → Samp XXXX Enter sample ID by using ▲, ▼, Recall / ▲ & ▲/Save keys. After that Press **OK/HOLD** Key.

5.6 **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.

5.7 **Printing:**

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

Print ⟶ select required menu by using ▲ & ▼ keys,

then Press **OK/HOLD** key.

5.8 **SPECIAL INSTRUCTIONS:**

5.8.1 Put the DUST PROOF COVER on the instrument to protect the enclosure from accidental spillage of solution on to the instrument.

5.8.2 For precision measurement use 7.00 buffer for STD adjustment in 1/2/3/4/5 point calibration.

5.8.3 Don't keep the electrode in dry condition. To avoid it, place in 7.00/4.00 buffer solution only.

5.8.4 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.

5.8.5 Before disconnecting electrode from instrument, keep instrument in HOLD mode.

5.8.6 While measuring pH electrode bulb should not touch bottom of the container.

5.8.7 Solutions used to clean electrode must be handled with care accorded to toxic of corrosive substances.

5.8.8 Do not turn on the power supply until all of the wiring is completed, otherwise electric shock, fire or malfunction may result.

5.8.9 Use this instrument within the scope of its specifications otherwise fire or malfunction may result.

5.8.10 Do not use this instrument places subject to flammable or explosive gases.

5.8.11 Never disassemble, repair or modify the instrument, this may cause electric shock, fire or malfunction may result.

5.8.12 Only clean the instrument when power off. Use the provided dust protection cover

5.8.13 Use a soft cloth or cotton paper to clean up the stain on the display/ overlay.

5.8.14 Never use sharp and hard matters such as screw drivers or ball pen to touch the panel, which will cause scratch or damage.

5.9 **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.

5.10 **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

6.0 FORMATS / ANNEXURE(S):

6.1 pH meter calibration Record : QC052-FM112

6.2 pH Buffer Preparation Record : QC052-FM113

7.0 CHANGE HISTORY:

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

	Prepared by	Reviewed by	Approved by
Sign & Date			
Name	R.Gurappadu	S.Prasad	K.Nagarjuna
Department	Quality Control	Quality Control	Quality Assurance