



## LabSen® 551 Spear pH Electrode User Manual

Backed by proprietary Swiss sensor technology and premium materials, the LabSen 551 Spear pH Electrode is designed for testing soil and soil slurry. Please carefully read this manual before using the product.

### Main Features

- Special Glass Membrane – The LabSen 551 pH electrode adopts a spear sensor tip, which is ideal for directly testing semi-solid/solid samples like soil.
- Long-Life Reference System – composed of a glass tube, AgCl and a reference silver wire. The top end of the slim glass tube is stuffed with cotton, which prevents the reaction between AgCl and electrolyte when temperature changes. It improves the stability of reference electrode and prolong the service life of the electrode.
- Polymer Electrolyte – The solid polymer electrolyte makes the electrode hard to be contaminated and maintenance-free.

### 1. Technical Data

Measuring Range	0 to 14 pH	Electrolyte	Polymer
Temperature Range	0 to 80°C	Soaking Solution	3M KCL
Shaft Material	PVC	Electrode Dimension	Electrode: (Φ15×90) mm Measuring Tip: (Φ6×25) mm
Membrane Shape	Conical		
Reference	Long Life	Connector	BNC
Junction	Ceramic + Open	Cable	Φ3mm×1m

### 2. Preparation before Use

- 2.1 Insert the blue BNC connector of the electrode to the BNC socket of your pH meter while twisting clockwise until it's locked.
- 2.2 Take off the electrode cap and rinse off with distilled or deionized water.
- 2.3 Perform at least a two-point calibration before measuring after connecting the new electrode to your pH meter.

### **3. How to Test Soil pH Directly**

- 3.1 Remove about 2 inches (5cm) of the top layer soil in the test area, make sure the soil is wet. If the soil is dry, pH measurement cannot be performed, and the probe can be damaged. For dry soil, please add some distilled or deionized water to moisten. Ideally, wait 24 hours before measuring.
- 3.2 Use the dibber to create a pathway for the spear probe at about 4-6 inches (10-15cm) in depth. This will help minimize the wear and tear of the spear glass probe.
- 3.3 Insert the probe in the hole you just created up until the bottom where you cannot stick in any further (do NOT use excessive force to stick in); Wait for the reading to fully stabilize before recording the measurement.
- 3.4 You can press the M+ button (if there is one) to save the stable reading on the meter.
- 3.5 After each test, the electrode must be thoroughly rinsed off with clean water. Use a soft brush to clean off dirt if necessary. After cleaning, shake off excess water.
- 3.6 Repeat Step 3.2 to 3.5 to record 3-5 measurements in different locations of your sample area, then calculate the average value. After measurement is finished, put the electrode back in the storage cap and soak in the 3M KCL solution.

### **4. How to Test Soil Slurry**

- 4.1 Remove about 2 inches (5cm) of the top layer soil and collect different locations' soil samples at approximately 6 inches (15cm) deep.
- 4.2 Thoroughly mix all collected soil. Ideally, dry the soil in the air or bake in an oven at 104°F / 40°C.
- 4.3 Weigh out 20g of the mixed soil sample into a glass jar and add 100g of distilled or deionized water in it.
- 4.4 Shake well for 5 minutes or use a magnetic stirrer to automatically stir for 15 minutes. Leave overnight.
- 4.5 Shake or stir again next morning, then allow it to settle for 15-30 minutes.
- 4.6 Power on the meter; Remove the cap; Rinse the electrode with distilled or deionized water, and shake dry.
- 4.7 Submerge the electrode into the soil solution, shake for a few seconds, and wait for the reading to fully stabilize. Then record the measurement.
- 4.8 After measurement, put the probe back in the storage cap and soak in the 3M KCL solution.

## 5. Maintenance

- 5.1 The electrode must be stored in 3M KCL solution when not in use. Damage will be caused to the electrode with long-time exposure in air.
- 5.2 The transparent polymer gel electrolyte will inflate and ooze out a bit when it's soaked in KCL solution. This will not affect the measurement of the electrode, and it will happen more frequently with newer electrodes. This is actually a "self-clean" function especially when the junction gets contaminated. Just wipe off the inflated gel with clean tissue and continue to use the electrode as normal.
- 5.3 The electrode's measuring tip must be soaked in the cap containing 3M KCL storage solution to keep the membrane hydrated and junction unblocked. When measuring, please remove the cap, pull out the electrode and rinse it with deionized or distilled water. After using, please put the electrode back into the cap. Clean the cap and replace the storage solution if the storage solution gets turbid and mildewed. The electrode should NEVER be stored in purified water.
- 5.4 Perform at least a 2-point calibration after connecting the electrode to a pH meter for the first time. Calibrate the meter at least every week to ensure the highest accuracy.
- 5.5 The connector of the electrode should be kept clean and dry. If contaminated, please clean it with medical cotton and absolute alcohol and blow dry to prevent the short circuit of the electrode and slow reaction of electrode.
- 5.6 pH electrodes don't last forever. Every pH electrode will eventually age and fail even if you don't use it that often. The typical service life of Apera pH electrodes is 12-24 months depending on the frequency of usage and how well you keep it clean and properly stored. We recommend replacing your electrode at least every 12-18 months to ensure the best accuracy.

## **6. Limited Warranty**

We warrant this electrode to be free from defects in material and workmanship and agree to repair or replace free of charge, at option of APERA INSTRUMENTS, LLC, any malfunctioned or damaged product attributable to responsibility of APERA INSTRUMENTS, LLC for a period of SIX MONTHS from the delivery.

This limited warranty does not cover any damages due to:

Transportation, storage, improper use, failure to follow the product instructions or to perform any preventive maintenance, modifications, combination or use with any products, materials, processes, systems or other matter not provided or authorized in writing by us, unauthorized repair, normal wear and tear, or external causes such as accidents, abuse, or other actions or events beyond our reasonable control.

To begin a warranty claim, please have your valid proof of purchase ready.

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