
23G pH Sensor Installation and Calibration

1.0 SCOPE

These instructions describe the procedure for installing and verifying the pH sensor kit to a 23G machine.

Important: Before installing pH sensor, verify that this kit will install to the ECM-100 properly. The main logic board found inside the ECM-100 must have a software revision G2 or greater and a BNC connector to directly attach the pH sensor. This BNC connector is found on the lower right side of the main logic board and should say "pH Input."

2.0 APPLICABLE DOCUMENTS

P/N OS1157051 23G Operation & Maintenance Manual

3.0 DEFINITIONS

None

4.0 TOOLS NEEDED

Phillips screwdriver
Teflon thread tape
1-1/16" wrench (or crescent wrench)
1-1/8" wrench (or crescent wrench)

5.0 ASSEMBLY

The pH sensor should be verified to the ECM-100 prior to installing the sensor in machine, the electrical connections should be performed first, followed by the verification and mounting of sensor to the machine.

5.1 Wiring the pH Circuit to the Machine

- 5.1.1 Turn the RO machine off by pressing the "Off" button on the ECM-100 keypad.
- 5.1.2 Disconnect the power to the ECM-100.
- 5.1.3 Shut off the inlet water supply.
- 5.1.4 Remove one of the conduit plugs on the side of the ECM-100. Run the pH sensor cable through the cord connector. (**Note: To fit the BNC connector on the pH sensor cable through the cord connector, the rubber insulator inside the connector may have to be slit on one side so that the cable can be placed inside insulator and then ran through the connector.**)
- 5.1.5 Mount the cord connector to the ECM-100 enclosure.
- 5.1.6 Connect the BNC connector on the pH sensor to the BNC connector found on the lower right corner of the ECM-100 main logic board. Connect the solution ground wire (white wire) to the solution ground terminal lug next to the BNC connector.

5.2 Verification and Mounting of Sensor on Machine

- 5.2.1 To verify the sensor for use with the DCO -100, two with different pH values must be used for verification of the sensor. Solutions of pH 4.0 and 10.0, are recommended and included.
- 5.2.2 Power should be applied to the ECM-100.
- 5.2.3 To verify the sensor, the protective cap on the pH sensor tip must be removed before calibration and installation.
- 5.2.4 Rinse the tip of the pH sensor using de-ionized water or the lower pH standard solution (DI water preferred) This action is to avoid contaminating the standard pH solution.
- 5.2.5 On the ECM-100, scroll to Menu #6, *Calibration* menu, and push "Enter" to display the *pH Enable/Disable* menu item. Use the pass code; "Hand/Auto", "CIP", "Alarm by-Pass", then push the up arrow once to enable the pH function. Press the "Enter" button to accept.

(Note: There are two selections available. Select 01 to enable the pH function, and 00 to disable the pH function).

- 5.2.6 In the same menu (*Calibration*), continue to press the “Enter” button until the *pH Cal Low* is displayed.
- 5.2.7 Dip the wetted end of the pH sensor in the standard solution with the lower pH. Swirl the tip and leave it dipped – with at least one inch of the sensor length submerged (so that the metal body of the probe is in contact with the solution by approximately ¼ inch).
- 5.2.8 On the ECM-100, enter the pass code, “Hand/Auto”, “CIP”, “Alarm by-Pass”. Perform the following sequence four times. Press the “Up” arrow key until the display reads its maximum value (140), then press the down arrow key until the display reads zero. Using the arrow buttons, change the *pH cal low* setting to be 10 times that of the pH of the solution (the number indicates tenths of a pH unit). Press the “Enter” button to store the verified value and go on to the high pH limit.
- 5.2.9 The next setting in the calibration menu is *pH cal high*. Before dipping the pH sensor in the high pH solution, rinse the pH sensor with de-ionized water or the lower pH standard solution (DI water preferred). Dip the sensor in the higher pH standard solution. Swirl the tip and leave it dipped – with at least one inch of the sensor length submerged. On the ECM-100, enter the pass code. Perform the following sequence four times. Press the “Up” arrow key until the display reads its maximum value (140), then press the down arrow key until the display reads zero. Using the arrow buttons, change the pH setting to be 10 times that of the pH of the solution. Press the “Enter” button to save the new reading. Continue to press the “Enter” button until the main menu is displayed.
- 5.2.10 Rinse away any remaining droplets of the pH solution and install the pH sensor.
- 5.2.11 Verify that the inlet water supply is shut off so that the pH sensor can be installed in the plumbing.
- 5.2.12 Remove the nylon plug for the pH sensor from the RO machine. This plug is located in the 1-inch tee immediately after the prefilters and is labeled “pH probe”.
- 5.2.13 Install the sensor with the compression fitting in the tee.
- 5.2.14 The pH verification should be saved by pressing the up or down arrows to the *Maintenance* menu (menu #7) and pressing “Enter”. Scroll to sub-menu 11, *Factory Settings*. When the Factory Settings menu appears, press “Enter”, “Hand/Auto”, “CIP”, “On”, “Enter”. This will save the pH calibration.

(Note: When Factory Setting menu appears, press ENTER, two lines of the same phrase “Factory Setting” should appear. This step may be done more than once to ensure the verification is saved).

- 5.2.15 Generally this 2-point pH verification procedure should be repeated on a bimonthly basis. Some situations will require more frequent re-calibration while others will require less.

6.0 GENERAL MAINTENANCE INFORMATION

- 6.1 Drying out the pH sensor can permanently damage it. If a sensor is to be stored or shipped, or if a machine is drained, the sensor tip should be capped with the cap filled with a neutral solution or tap water.
- 6.2 Acid dip will rejuvenate a probe if it has built up a calcium deposit, or some types of oily fouling. Dip in a pH 2 solution for five to ten minutes and repeat the calibration.
- 6.3 O-ring grease applied anywhere upstream, such as during repair of a valve or softener control, can permanently damage the sensor by forming a film over the glass electrode. O-ring grease cannot be removed, even by dipping the probe in strong acid.