IonWorks Barracuda® Replaceable Ground Electrodes (REGE) Installation and Removal Quick Reference Guide

This guide details the following Replaceable Ground Electrodes (REGEs) Plenum maintenance procedures (Figure 1-1):

For instrument maintenance purposes, Molecular Devices recommends removing and conditioning each installed REGE set nightly.

Refer to your *IonWorks Barracuda Automated Patch Clamp System User Guide* for additional information and procedures.

Installing REGEs in the Plenum

Only install REGE sets that have been properly conditioned. Refer to your *IonWorks Barracuda Automated Patch Clamp System User Guide* for procedures.

CAUTION! Always wear gloves when working within the IonWorks Barracuda instrument and handling the REGE parts. Never touch the top surface of the ground electrodes with your bare hands, because it results in a build-up of oils on the electrodes that impairs the functionality.

To install the REGEs in the plenum:

1. Verify that the O-ring and spring are correctly positioned, and correct as needed.

   The O-ring should be seated in the designated O-ring counter-bore, and the spring should be over the plug in the center of the socket with the narrow diameter of the spring at the top (Figure 1-1, Figure 1-2).

Figure 1-1: Correctly Positioned O-Ring and Spring in Empty Plenum Socket

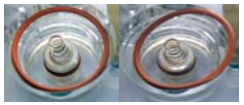

Figure 1-2: Incorrectly Positioned O-Ring in Empty Plenum Socket

2. Verify that the plenum socket is dry. Depending on the amount of liquid in the socket, use a cotton swab or wipe cloth (Figure 1-3).

Figure 1-3: REGE Plenum Socket Drying

3. Wet the REGE housing screw threads with 10 µl to 20 µl distilled (DI) water for lubrication. The amount of DI water depends on how long your REGE set has been dry.
   - If you are installing immediately after conditioning, when drying the housing, leave 20 µl of the DI water rinse on the threads.
   - If you are installing when the REGE set is completely dry, lubricate the housing threads with 10 µl of DI water, rotate the housing 180 degrees, and apply 10 µl of DI water to the threads again (Figure 1-4).

Figure 1-4: REGE Housing Threads Lubrication with 20 µl Distilled Water

4. Insert the lubricated REGE loosely into an empty plenum electrode socket (Figure 1-5).

Figure 1-5: REGE Placement in a Plenum Socket

Note: Try not to dislodge the spring and O-ring inside the plenum socket. If the spring and O-ring inside the socket become dislodged, put them back in place.

5. Using the provided REGE service tool, seat the tool prongs into the holes in the electrode housing for installation (Figure 1-6).

Figure 1-6: REGE Service Tool Prongs Align with Holes in the Electrode Housing

6. Turn counterclockwise a ¼ turn to align the male and female threads and reduce the risk of cross-threading.
7. Place your index finger on one hand on the magnet on the top of the service tool and apply downward pressure while using your other hand to turn the service tool clockwise to keep the service tool pins in the electrode housing service tool holes (Figure 1-7).

Figure 1-7: Two Hand Usage of the REGE Service Tool

8. Turn until the electrode housing seats in the plenum socket flush with the plenum top.

CAUTION! Avoid over tightening the REGEs. Excessive tightening force can break the REGE housing and can crack the plenum.

9. Run a gloved finger along the seam between the REGE and plenum to confirm a flush installation.

   The two surfaces should be smooth and bump-free (Figure 1-8, Figure 1-9, and Figure 1-10).

Figure 1-8: Gloved Finger Flush Installation Test

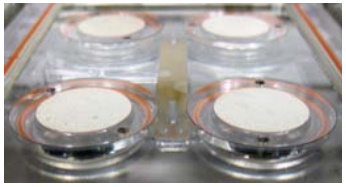

Figure 1-9: Correct Flush REGE Installation

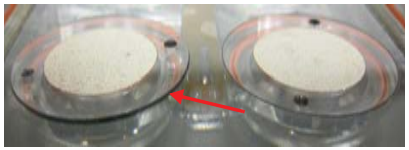

Figure 1-10: Incorrect Raised REGE Installation

10. Repeat steps 1-7 until all four new ground electrodes have been added to the plenum.
11. After all four REGEs are properly installed in the plenum, you can begin your assays.

CAUTION! Immediately before you start your assays, when the REGEs are dry, make sure no other fluid touches the REGEs. Dry REGEs rapidly absorb approximately 200 µL of the liquid that first wets them, and it takes about 90 minutes for the REGEs to equilibrate to a different liquid.

Removing REGEs from the Plenum

Remove and condition each REGE set nightly after use. You reuse the REGEs that you remove, so remove them carefully. Always wear gloves when working on the IonWorks Barracuda instrument and handling the REGE parts.

CAUTION! Never touch the ground electrode top surface with your bare hands, because it results in a build-up of oils on the electrodes that impairs the functionality.

To remove REGEs:

1. Using the provided REGE service tool, seat the tool prongs into the holes in the sides of the electrode housing for removal (Figure 1-6 on page 2).
2. To keep the service tool pins in the electrode housing service tool holes, place your index finger on one hand on the magnet on the top of the service tool, and apply downward pressure while using your other hand to turn the service tool counterclockwise until the REGE housing unscrews and is loose in the plenum socket (Figure 1-7 on page 2).
3. Lift the REGE housing out of the plenum socket and carefully set it aside for conditioning (Figure 1-5 on page 2).

Note: Try not to dislodge the spring and O-ring inside the plenum socket. If the spring and O-ring inside the socket become dislodged, put them back in place.

4. Dry the plenum socket (Figure 1-3 on page 1).
5. Repeat steps 1-4 until all four REGEs have been removed from the four plenum sockets.
6. Condition all four REGEs to continue using them in the IonWorks Barracuda system. Refer to *IonWorks Barracuda Automated Patch Clamp System User Guide* for procedures. .

Note: Proper conditioning takes up to 15 hours.

7. To continue using the IonWorks Barracuda system while the recently removed REGE set conditions over night, install the provided second REGE set. See Installing REGEs in the Plenum on page 1, otherwise, place a written note over the plenum that reads something like “Electrodes Have Been Removed” as a precautionary reminder to keep the plenum dry.

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