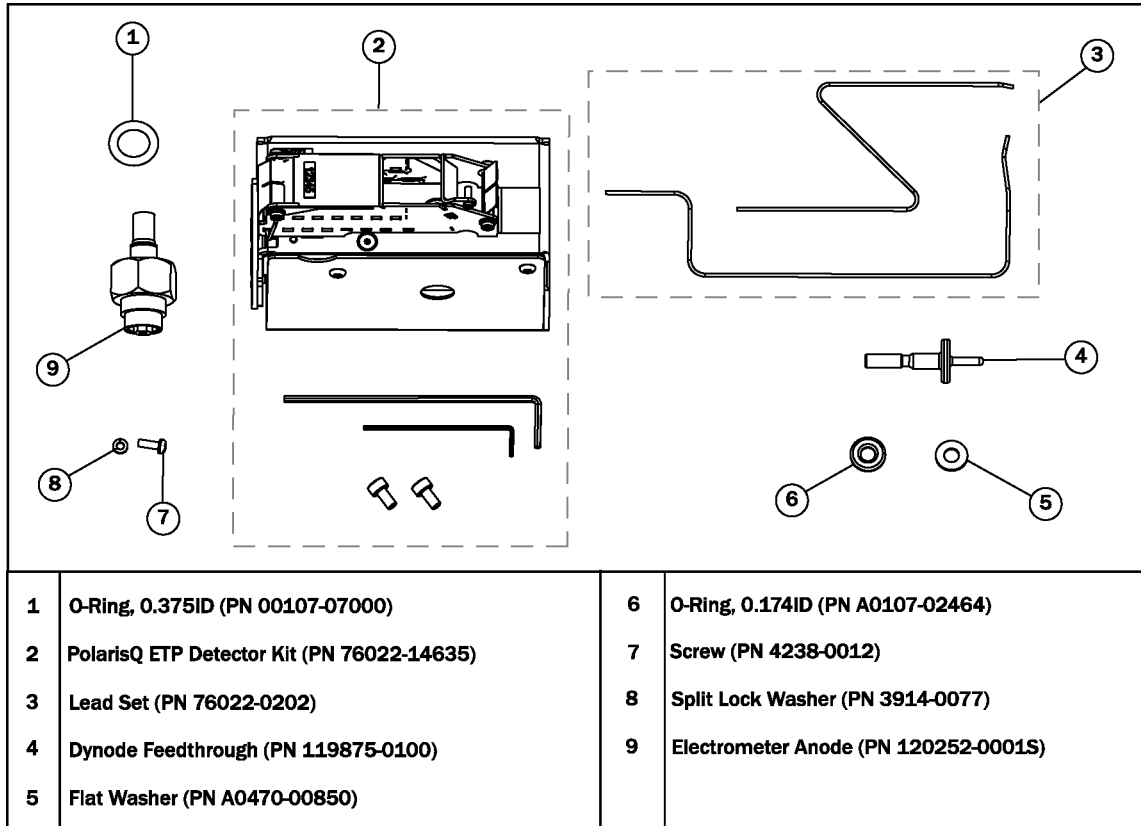


The PolarisQ ETP Detector Upgrade Kit (PN 120292-0001) contains all the components you need to replace a Detech multiplier and dynode with an ETP detector, which consists of a multiplier and a dynode combined in one unit. Although the existing electrometer anode will interface to the ETP multiplier, we recommend replacing the existing electrometer anode with the new electrometer anode. If you do not replace it, the anode could damage the instrument.

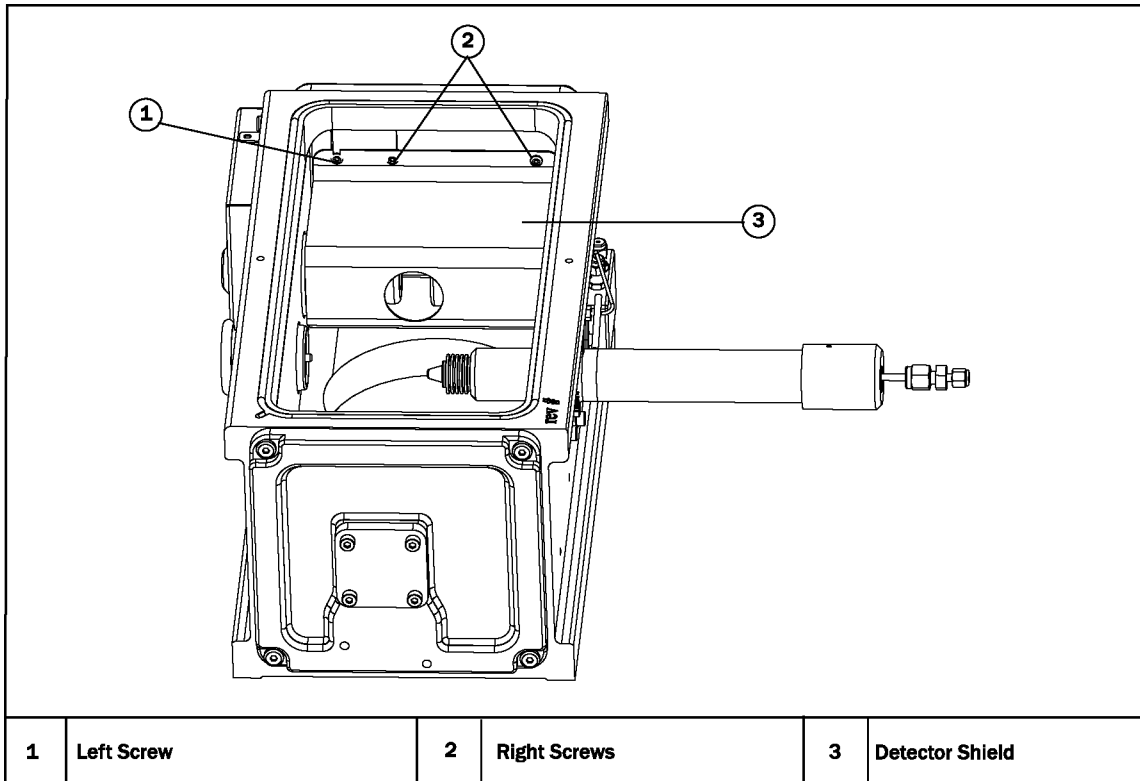


To replace the multiplier, you will need the following tools:

- ¼ inch open-end wrench
- 3/16 or 5mm open end wrench
- 9/16 or 14mm socket or box wrench
- ¾ or 19mm socket or open-end wrench
- #1 Phillips (cross tip) screwdriver
- 2.5mm Allen wrench
- PolarisQ Hardware Manual (PN 120010)

# 1. Remove the Detector Shield

Before you can remove the Detector Shield, you must remove the front, top, and left side covers of the PolarisQ, as well as the manifold cover and analyzer. Refer to the PolarisQ Hardware Manual for details.



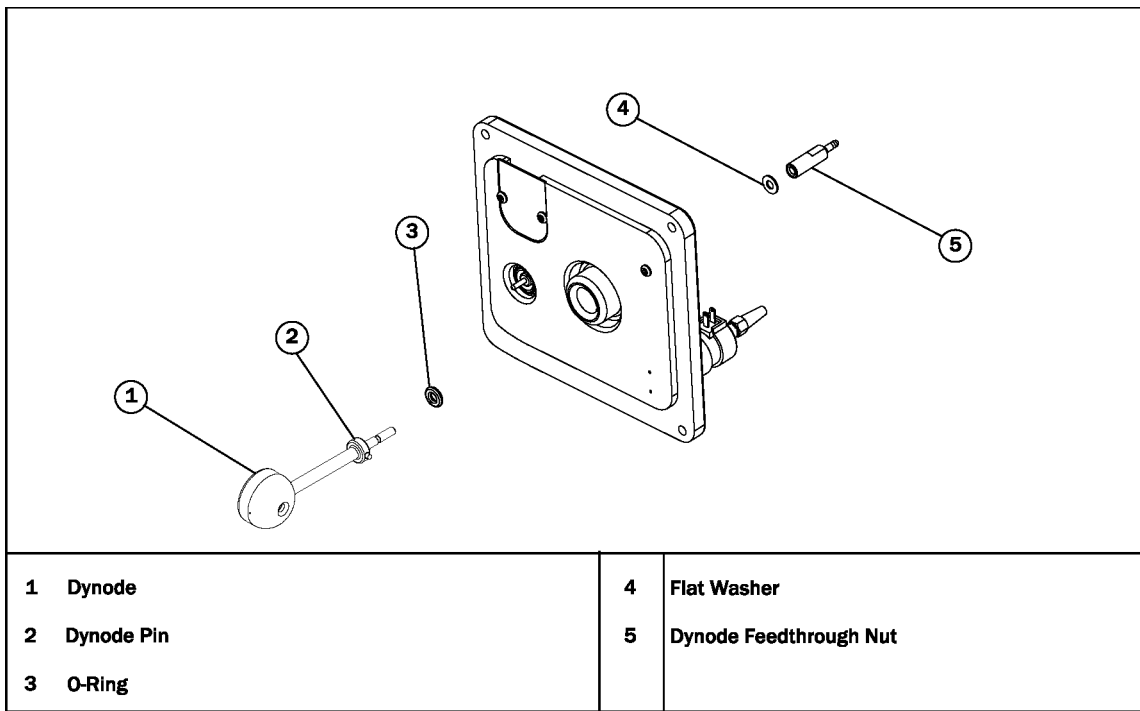
Once you have removed the analyzer, remove the Detector Shield as follows:

1. Loosen, but do not remove, the Left Screw. It holds the ion gauge shield in place.
2. Remove the Right Screws holding the Detector Shield in place.
3. Remove the Detector Shield and set it aside.
4. Tighten the Left Screw and replace the Right Screw that secures the cover over the ion gauge.

## 2. Remove the Dynode

In this step, you will remove the Dynode and replace it with a Dynode Pin in step 3, so you do not have to remove the polycarbonate dynode insulator from the manifold before you begin.

1. On the rear panel of the manifold, remove the cable attached to the Dynode Feedthrough Nut.
2. Use a ¼ inch open-end wrench to remove the Dynode Feedthrough Nut from the end of the Dynode. The Dynode Pin will initially prevent the Dynode from rotating. Once the Dynode is loose, you may need to hold it in place until you remove the Dynode Feedthrough Nut.



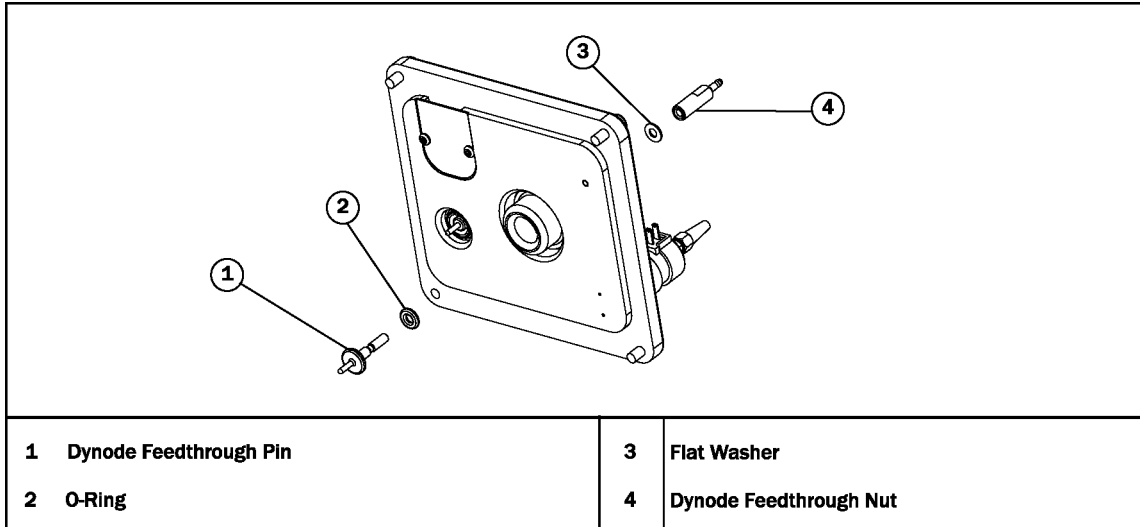
3. Catch the Flat Washer and set it aside.

**NOTE:** If there is a white Teflon washer under the nut, remove and discard it. It is no longer needed.

4. Remove the Dynode with Dynode Pin, and O-Ring and set them aside.

### 3. Install the New Dynode Feedthrough Pin

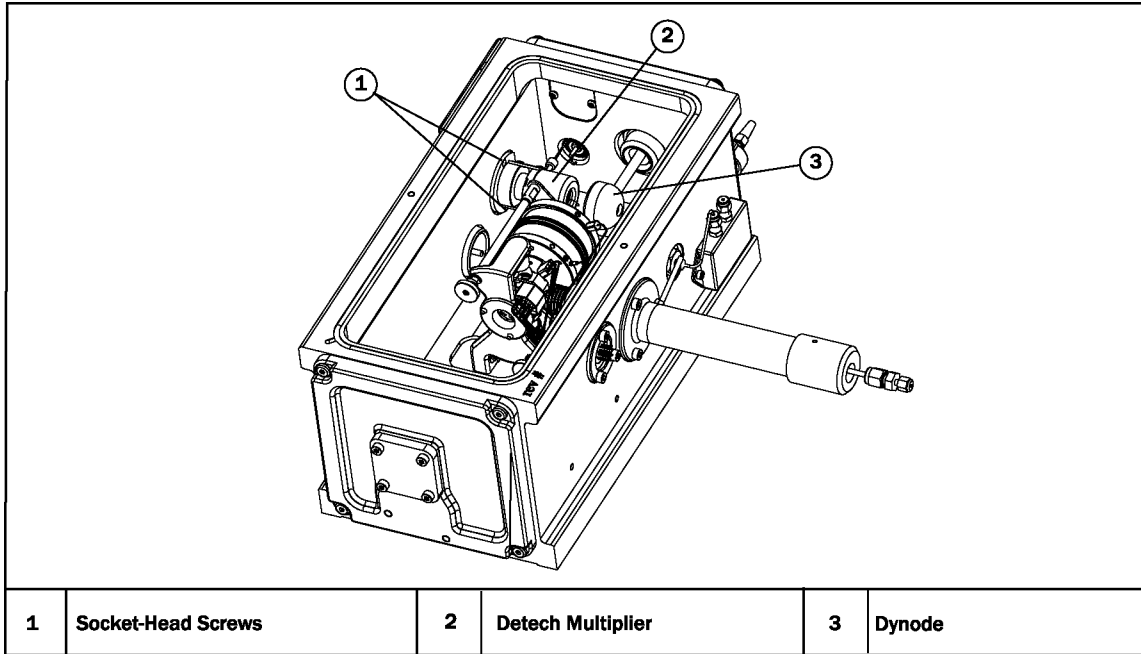
1. Attach the new O-Ring onto the new Dynode Feedthrough Pin.



2. Slide the Dynode Feedthrough Pin and O-Ring into the polycarbonate dynode feedthrough insulator.
3. Place the Flat Washer on the end of the Dynode Feedthrough Pin and attach the Dynode Feedthrough Nut.
4. Tighten it snugly until it is leak-tight.

## 4. Remove the Detech Multiplier

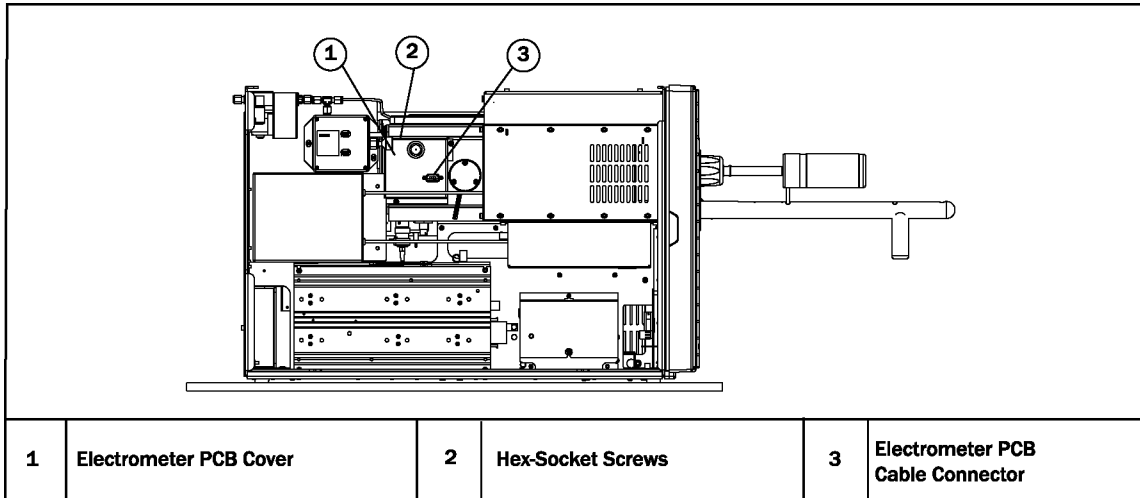
1. Using a 2mm allen wrench, remove the Socket-Head Screws that hold the Detech Multiplier in place.



2. Remove the Detech Multiplier and set it aside with the Socket-Head Screws.

## 5. Replace the Electrometer Anode

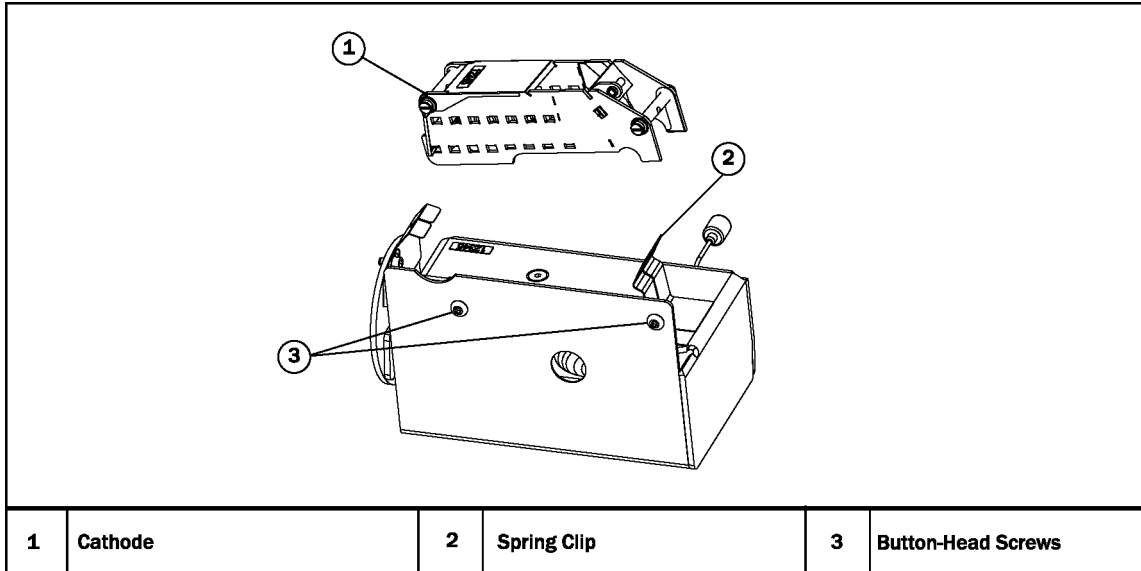
1. Remove the electrometer anode from your instrument.



1. Disconnect the 9-pin "D" connector from the Electrometer PCB Cable Connector.
2. Use a 3/16 or 5mm open-end wrench to unscrew the two standoffs holding the Electrometer PCB Cover in place.
3. Use a 2.5mm Hex wrench to remove the two Hex Socket Screws holding the cover to the manifold.
4. Lift the right side of the cover (closest to the coil box) until it clears the Electrometer PCB Cable Connector. Be careful not to damage the connector.
5. Use a #1 Phillips screwdriver to remove the screw and split lock washer holding the electrometer PCB wire to the anode feedthrough.
6. Use a 9/16 or 14mm socket or box wrench to remove the nut that holds the electrometer PCB to the anode feedthrough.
7. Use a 3/4 inch or 19mm socket or open-end wrench to unscrew the anode feedthrough from the vacuum manifold.
8. Do not install the new anode feedthrough until after you install the ETP detector.

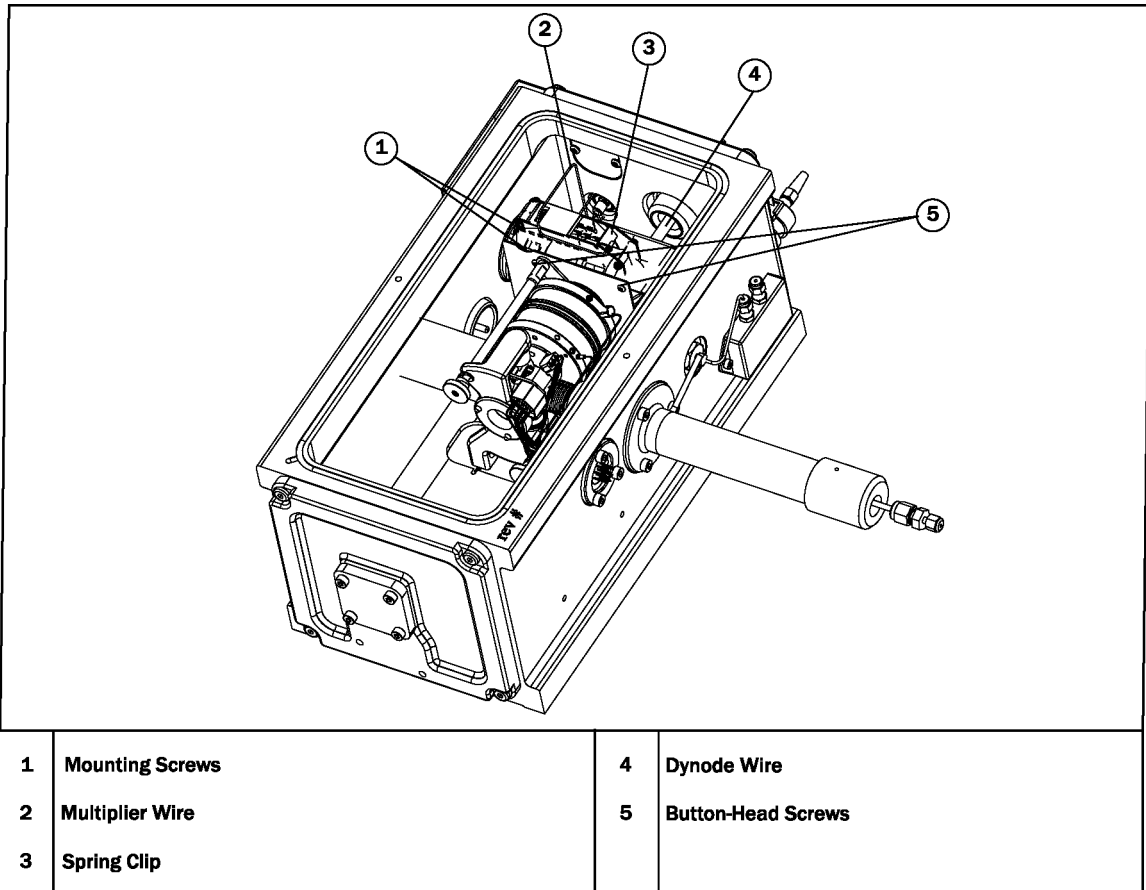
## 6. Install the ETP Detector

1. On the ETP Detector, remove the Cathode from the cradle by pushing the Spring Clip away from the Cathode and lifting up on the end.



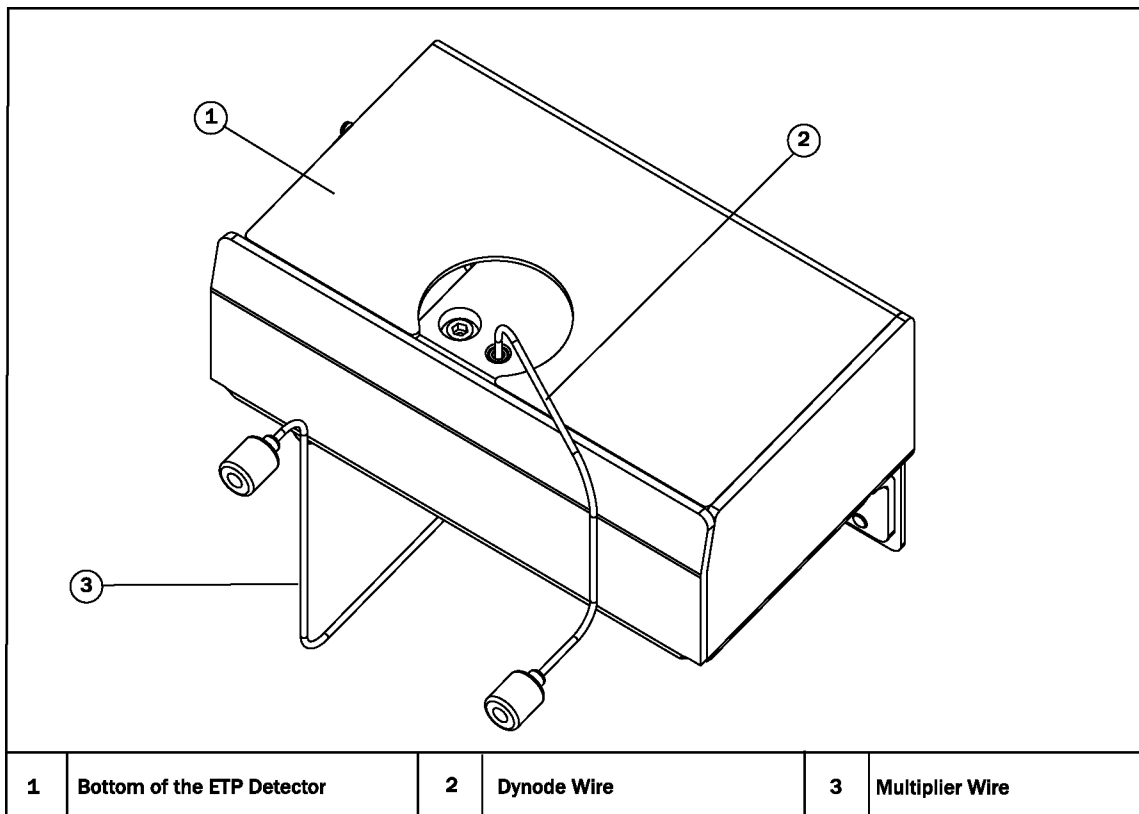
2. Use an Allen wrench to remove the two small Button-Head Screws holding the shield to the detector.

3. Locate the two Hex-head Mounting Screws that were included with the detector.



4. Use the 2mm Allen wrench to install one of the screws into the lower mounting hole of the manifold wall. Rotate the screw just enough to hold it in place (one and a half turns).

- Attach the Dynode Wire (shorter wire from the wire set) between the dynode contact (gold contact) on the bottom of the detector assembly to the Dynode Feedthrough Pin on the back wall.



6. The end of the ETP Detector that mounts to the manifold wall has two mounting holes. The lower mounting hole on the detector is slotted so it will slip over the screw. Carefully slide the detector over the screw that was installed in the previous step.
7. Insert the remaining hex screw into the upper mounting hole in the ETP Detector and tighten.
8. Tighten the lower mounting screw.
9. Confirm that the Dynode Wire is in place.
10. Use the Allen wrench to reattach the Button-Head Screws to the detector cover.
11. Attach the Cathode to the Cradle.
12. Use tweezers to attach the Cathode Wire to the multiplier and back wall.

## 7. Reassemble and Test the PolarisQ

1. Reinstall the analyzer.
2. Replace the glass cover.
3. Inspect all connections to be sure all are secure.
4. Slide the 0.375ID O-Ring onto the electrometer anode feedthrough.
5. Use a  $\frac{3}{4}$  inch or 19mm socket or open-end wrench to screw the anode feedthrough to the vacuum manifold.
6. Use a 9/16 or 14mm socket or box wrench to secure the nut that holds the electrometer PCB to the anode feedthrough.
7. Use a #2 Phillips screwdriver to secure the screw and split lock washer holding the electrometer PCB wire to the anode feedthrough.
8. Replace the cover over the electrometer.
9. Reconnect the screws that secure the electrometer cover.
10. Reconnect the dynode cable to the Dynode Feedthrough Nut.
11. Reconnect the data cable between the digital board and the electrometer.
12. Power-on the PolarisQ.



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