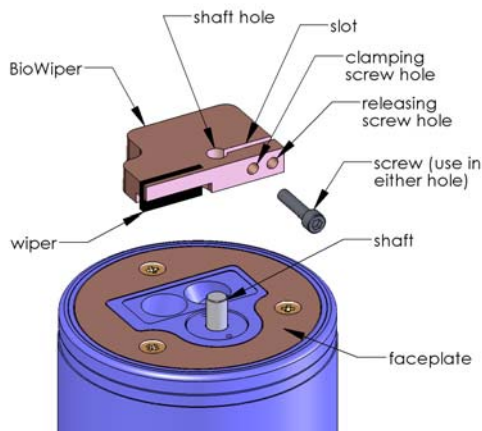


ECO *Bio-wiper*™ Service Bulletin

The *bio-wipers*™ available as an option on *ECO* meters have been modified to improve servicing and durability. The wiper is now clamped around the motor shaft as opposed to being secured with a set screw. This Bulletin provides instructions for removing, cleaning, and replacing the modified *bio-wiper*™.

The *bio-wiper*™ and the copper faceplate need to be removed from the meter for thorough cleaning to maximize anti-fouling capability.



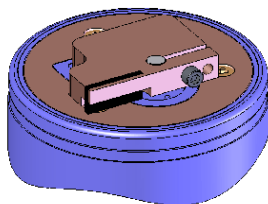
1. Be sure the meter is **NOT** powered or connected to a power source prior to uninstalling the *bio-wiper*™ and faceplate.

WARNING!

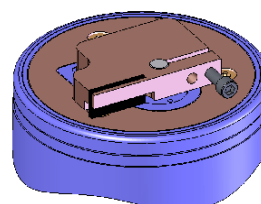
Manually turning the motor shaft can damage the wiper motor and will void the warranty.

Make sure the *bio-wiper* is loosened from the shaft before attempting to rotate the *bio-wiper*.

2. Remove *bio-wiper*™: Use the factory-supplied 3/32-in. hex key to loosen the screw that secures the wiper to the shaft on the instrument. It may be necessary to remove the screw from the clamping hole and screw it into the releasing hole, tightening it just enough to free the *bio-wiper*™ from the shaft.



clamping screw hole



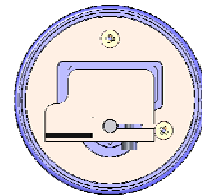
releasing screw hole

3. Remove faceplate. Use a small Phillips screwdriver to remove the screws that attach the plate to the optics head.

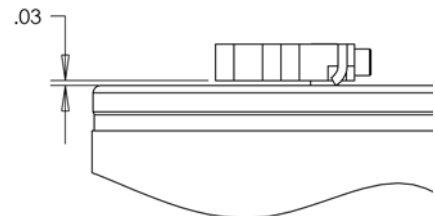
WARNING!

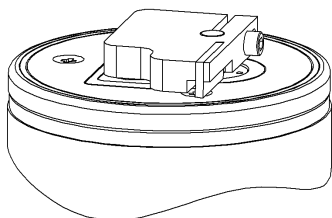
Be sure to retain and re-use the factory-installed screws as they are vented for pressure compensation.

4. Wash *bio-wiper*TM and/or copper faceplate with soapy water. Rinse and dry thoroughly. Note the condition of the copper on the instrument side of the wiper. It is normal for copper to corrode and turn green, especially after the instrument has been removed from the water. This corrosion will slightly reduce the shutter's anti-fouling ability the next time it is deployed.
5. Buff each with a pad of green Scotch Brite[®] (or similar) until shiny.
6. Clean the *bio-wiper*TM shaft and the shaft hole using an isopropyl alcohol-saturated cotton swab. Allow to dry.
7. Re-install faceplate.
8. Check the screw used to secure the bio-wiper to the shaft: a hex key must fit snugly into the screw socket. If the socket is in any way compromised, use a new screw (4-40 x 3/8 in. 316 stainless steel treated with anti-seize. These are shipped as part of the meter's spare parts kit.)
9. Slide the *bio-wiper*TM over the shaft. Be careful not to twist it on, thus rotating the shaft. If the wiper does not slide on easily, insert the screw into the expander hole, turning slowly until the *bio-wiper*TM slides easily onto the shaft.
10. Rotate the *bio-wiper*TM into the closed position.



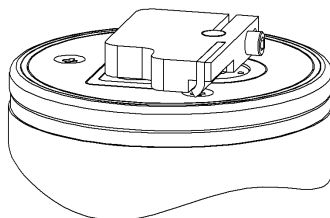
11. Set the gap between the *bio-wiper*TM and the instrument face to 0.03 in. (0.8 mm). An improperly set gap will either fail to clean the face or cause the motor to draw excessive current. To gauge 0.03 in., fold a piece of paper in half, then in half again, then fold a third time, creasing the edges. It's now 8 sheets and about 0.03 in. thick.





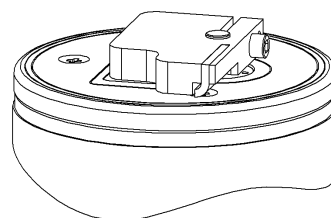
Not enough flex.

Wiper may not be effective.



Proper flex.

Wiper maintains contact with instrument face and optical window.



Too much flex.

Wiper may cause too much friction, using excessive power.

12. Use the 3/32-in. hex key to tighten the screw to “finger-tight,” then snug an additional quarter-turn.
13. Run the instrument to verify operation. The *bio-wiper*™ must rotate 180 degrees to clear the optics before sampling, and 180 degrees to cover the optics after sampling.
14. If the wiper needs adjusting, loosen the screw, make any necessary adjustments, and repeat steps 9 through 13 to ensure the wiper is performing properly.