

AAN 306-03 Maintenance, cleaning and calibration of PIDs

This Application Note explains when and how to maintain, clean and calibrate your PID.

The electronics in the PID-A1 and PID-AH sensor, designed to be maintenance-free, are not accessible. Periodic sensor maintenance is required for the electrode stack and lamp.

How often does the PID require maintenance?

This depends on the environment you are measuring: if you are measuring indoor air quality with the PID-AH, where the VOC concentrations are low and there are few particulates, a monthly or even less frequent calibration may be adequate. However, if you are measuring high VOC concentrations with the PID-A1 and particulates are present in high concentrations, check calibration frequently and when the PID has lost sensitivity, change the stack as explained below.

You can tell when the PID needs maintenance:

- If the baseline is climbing after you zero the PID – replace electrode stack
- If the PID becomes sensitive to humidity – replace electrode stack
- If the baseline is unstable or shifts when you move the PID – replace electrode stack
- If sensitivity has dropped too much (note the change required when checking calibration) – clean the lamp

When do I clean the PID lamp?

Cleaning of the PID lamp is recommended as the first action when presented with a PID that needs maintenance. Use the procedure described below. It is recommended that a PID cell is recalibrated after lamp cleaning.

When do I replace the PID electrode stack?

The PID electrode stack can last the lifetime of the PID if used in clean environments, or may only last a month if used in heavily contaminated sites. The electrode stack is a disposable item, so always hold a spare electrode stack if you are working in a dirty environment. If the PID cell shows signs of contamination after the lamp window has been cleaned, or is known to have been subjected to severe contamination, it should be replaced.

It is recommended that the PID is recalibrated after the stack is replaced. Instructions for replacing the electrode stack are below.

When do I replace the PID lamp?

A PID lamp will last a long time - typically five thousand hours and is warranted for six months. The sensitivity of the PID is in direct proportion to the lamp light intensity, so as a lamp ages and loses intensity, the response to a particular, low gas concentration becomes more noisy.

Removing the electrode stack and lamp

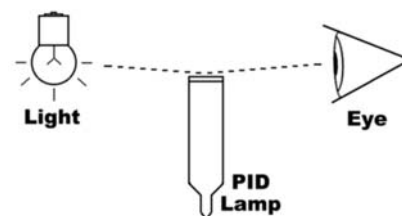
Always use the Electrode Stack Removal Tool to remove the electrode stack; any other tools may damage your PID and invalidate your warranty

1. Gently remove the sensor from equipment.
2. Place the PID, pellet side down, onto a clean surface.
3. Locate electrode stack removal tool into the two slots on the sides of the PID and squeeze together until electrode stack and lamp are released.
4. Carefully lift the PID body away from the pellet and lamp.
5. Occasionally the lamp may be temporarily lodged in the cell and will need to be freed carefully with tweezers.
6. Occasionally the small spring behind the lamp will come out when the lamp is removed from the sensor. Simply replace it into the sensor house.

Cleaning the PID Lamp

Inspection of the lamp may reveal a layer of contamination on the detection window that presents itself as a 'blue hue.' To check for contamination, hold the lamp in front of a light source and look across the window surface

Only clean the lamp using our recommended lamp cleaning kit and detailed instructions. To avoid contaminating the sensor and affecting accuracy, do not touch the lamp window with bare fingers. You may touch the body of the lamp with clean fingers.



PID lamp cleaning kit

The vial of cleaning compound contains alumina (CAS Number 1344-28-1) as a very fine powder. A full material safety data sheet MSDS is available on request from Alphasense.

Key safety issues are identified below:

Hazard identification: May cause irritation of respiratory tract and eyes

Storage: Keep container closed to prevent water adsorption and contamination

Handling:

- Do not breathe in the powder. Avoid contact with skin, eyes and clothing
- Wear suitable protective clothing
- Follow industrial hygiene practices: Wash face and hands thoroughly with soap and water after use and before eating, drinking, smoking or applying cosmetics
- The powder carries a TVL(TWA) limit of 10 mg/m³

Use of PID lamp cleaning kit

1. Open the container of alumina polishing compound.
2. With a clean cotton bud, collect a small amount of the powder.
3. Use this cotton bud to polish the PID lamp window. Use a circular action, applying light pressure to clean the lamp window. **Do not touch the lamp window with fingers.**
4. Continue polishing until an audible "squeaking" is made by the cotton bud moving over the window surface. (usually within 15 seconds)
5. Remove the residual powder from the lamp window with a clean cotton bud. Care must be taken not to touch the tips of cotton buds that are to be used to clean the lamps as this may contaminate them with finger oil.
6. Ensure the lamp is completely dry and remove any visible signs of contamination before refitting.



Discarding the PID electrode stack

The electrode stack does not have any toxic components, however, if it has been contaminated by toxic materials, show due care when disposing.

Re-fitting the PID electrode stack and lamp

WARNING: Never refit a damaged lamp.

1. Place the lamp inside the O-ring seal in the pellet as illustrated. Twisting the lamp slightly during insertion will help to ensure the lamp window is snug against the electrode stack's front electrode. The lamp should be freely supported by the O-ring.
2. Continuing to hold the electrode stack between forefinger and thumb, carefully insert the lamp into recess in the sensor ensuring that the lamp remains in position. Press the electrode stack firmly, to ensure that the electrode stack wing clips are engaged, and the top faces of the electrode stack and sensor house are flush.
3. Refit the sensor into the sensing equipment.
4. Re-calibrate the gas detector in accordance with manufacturer's instructions.



Ordering spare components

Quote the order code below:

10.6eV lamp for PID-A1	001-0019-00
10.6eV lamp for PID-AH	001-0019-01
9.6eV Xenon lamp	001-0030-00
Electrode stack for PID-A1	001-0018-00
Electrode stack for PID-AH	001-0018-01
Electrode stack removal tool	001-0020-00
Lamp cleaning kit	001-0024-00
Lamp spring	001-0023-00