



OUR SOLUTIONS. YOUR SAFETY

Calibrating and Bump Testing Gas Detectors

2024 Water and Wastewater Workshop



Honeywell



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Calibrating and Bump Testing Gas Detectors

What is a Bump Test?

A bump test is the process in which you expose the sensor(s) in a gas detector to a known concentration of gas that is greater than the alarm set points. Once, the sensors begin to respond to the target gas and then activate the pre-set alarms, the detectors functionality has been confirmed and is now ready for the day's work shift.

How Often is a Bump Test Required?

A bump test is recommended to be performed on the detector each day prior to use.

Duration of a Bump Test

A bump test is often a short procedure lasting only a minute or so, as it's merely a pass/fail test to determine if the device can detect gas and trigger the alarms.



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Importance of Bump Testing

1. Safety Assurance:

When in confined spaces and potentially hazardous atmospheres, it is essential to trust that a gas detector will alert the user to the presence of a harmful gas. A bump test is a quick check to give this reassurance that the detector will work as intended.

2. Detection Reliability:

Detectors can lose sensitivity due to regular wear and tear, exposure to specific chemicals, or physical damage. Regular bump testing identifies detectors that have reduced sensitivity.

3. Compliance with Standards:

Many safety regulations and standards require regular bump testing of gas detectors. Compliance ensures not only safety but avoids potential legal penalties.



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Benefits of Regular Bump Testing

1. Early Detection:

Typical gases to be monitored at a wastewater plants are combustible gases (primarily Methane, CH₄), Hydrogen sulfide (H₂S), Chlorine (Cl₂), and Oxygen (O₂). In addition, some plants also require Sulfur Dioxide (SO₂), Ammonia (NH₃), Ozone (O₃), and Chlorine Dioxide (ClO₂) gas detection. Early detection of hazardous gases can be the difference between life and death. A regularly bump-tested portable gas detector ensures that leaks or harmful concentrations are detected promptly.

2. Maintenance Savings:

Identifying a malfunctioning detector early can save on hefty repair or replacement costs in the long run. Moreover, well-maintained equipment has a longer lifespan.

3. Confidence Boost:

Knowing that the safety equipment is regularly tested for personnel working in potentially hazardous environments gives peace of mind, leading to increased efficiency and focus on tasks at hand.



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Hazards of NOT Bump Testing

1. False Sense of Security:

An untested detector might not alert personnel to gas leaks or dangerous concentrations, which can have far-reaching consequences. For example, an unnoticed methane leak can lead to explosive conditions, endangering lives, property and the environment.

2. Compliance Violations:

Skipping bump tests can violate safety standards, leading to potential shutdowns, fines, or legal actions.

3. Increased Risk of Accidents:

Without regular bump tests, there is an elevated risk of accidents, like explosions or poisonings, due to undetected gas leaks.



Calibrating and Bump Testing Gas Detectors

What is a Calibration?

To ensure a gas detector can accurately detect gas levels, you must first calibrate the device. Calibrating the monitor means exposing it to a known concentration of calibration gas or test gas for a specific amount of time. This reading becomes the gas detector's reference point for future readings.

Remember, you need to calibrate your gas detector regularly because sensors can drift over time and poisons and inhibitors can affect gas readings. Calibration intervals are often set by the manufacturer and may vary from each manufacturer. It is usually recommended to calibrate at least once every six months.

What is the Difference between a Bump Test and a Calibration?

It is crucial to differentiate between a bump test and a full calibration. While a Bump Test checks if the device works correctly, calibration ensures the detector's readings are accurate compared to a known gas concentration. Calibration might be needed if a detector fails a bump test or at regular intervals defined by the manufacturer or governing bodies.



Calibrating and Bump Testing Gas Detectors

What is required to perform a Calibration or Bump Test?

You can either calibrate or bump test your gas detector manually with calibration gas, tubing, a regulator and a calibration cap or you can use a docking station along with the calibration gas, tubing and regulator.

Precautions: NEVER use incorrect or expired calibration gas, as this can lead to an improper calibration, meaning your gas detector won't display accurate readings.

Calibration Gas



Constant Flow Regulator



715

Demand Flow Regulator



DFR 2001

Tubing



Max XT II
Pump Detector



MicroClip X3
Diffusion Detector



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What is required to perform a Calibration or Bump Test?

Docking Stations for various RAE and BW Monitors – Used for Automatic Bump and Calibration

AutoRAE 2



BW IntelliDox



Calibrating and Bump Testing Gas Detectors

Steps to perform a Bump Test (Manually)

1. Gather all required materials; Calibration gas, regulator, tubing and connectors, calibration/bump test cap (if required), and the Gas Detector.
2. Power on Instrument. (ensure to be in a fresh air environment).
3. Check cylinder of calibration gas for a valid expiry date and correct gas concentrations.
4. Attach the required regulator to the cylinder of calibration gas. (Constant flow for Diffusion Units and Demand flow for Pumped Units).
5. Attach one end of the tubing to the regulator outlet.
- 6(A). Attach the other end of the tubing directly to the calibration/bump test cap or install a quick connector to the end of the tubing and then connect to the calibration/bump test cap. (Diffusion)
- 6(B). Attach the other end of the tubing directly to a quick connector. (Pumped)
7. With calibration gas now ready for bump test and unit powered on and warmed up, enter the detector bump test mode. If the detector has no bump test mode continue to next step.
8. Flow gas to the unit. If the detector has a bump test mode, monitor screen status for pass/fail. If there is no bump test mode monitor each sensors response to target gas and confirm alarm activation upon activating alarms.



Calibrating and Bump Testing Gas Detectors

Steps to perform a Calibration (Manually)

1. Gather all required materials; Calibration gas, regulator, tubing and connectors, calibration/bump test cap (if required), and the Gas Detector.
2. Power on Instrument. (ensure to be in a fresh air environment).
3. Check cylinder of calibration gas for a valid expiry date and correct gas concentrations.
4. Attach the required regulator to the cylinder of calibration gas. (Constant flow for Diffusion Units and Demand flow for Pumped Units).
5. Attach one end of the tubing to the regulator outlet.
- 6(A). Attach the other end of the tubing directly to the calibration/bump test cap or install a quick connector to the end of the tubing and then connect to the calibration/bump test cap. (Diffusion)
- 6(B). Attach the other end of the tubing directly to a quick connector. (Pumped)
7. With calibration gas now ready for calibration and unit powered on and warmed up, enter calibration mode.
8. Follow screen steps and then apply gas to the unit. Monitor screen status for pass/fail. If the calibration passes, the unit is now calibrated. If the unit fails calibration, maintenance may be required. Contact Hetek for assistance.



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Steps to perform a Bump Test or Calibration with a Docking Station

1. Gather all required materials; Calibration gas, regulator, tubing and connectors, Docking Station, and the Gas Detector.
2. Power on Instrument. (ensure to be in a fresh air environment).
3. Check cylinder of calibration gas for a valid expiry date and correct gas concentrations.
4. Attach the Demand Flow regulator to the cylinder of calibration gas.
5. Attach one end of the tubing to the regulator outlet.
6. Attach the other end of the tubing directly to a quick connector and then connect to the docking station.
7. With calibration gas now ready for calibration or bump test and the unit powered on and warmed up, place the detector in the docking station.
8. Select required operation. Bump Test or Calibration. Wait for docking station to complete the operation and advise on calibration or bump test status. If pass, detector is ready for operation. If failed, maintenance may be required. Contact Hetek for assistance.





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Questions?

Thank you!

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