

Your Company Name / Logo	FIXED GAS DETECTOR BUMP TEST AND CALIBRATION SOP	Doc no: SOP ANA 002	Rev: 0
Department: Instrumentation	Standard operating procedure	Date:	Page: see footer

1. Purpose

To make sure fixed gas detectors respond to gas, read correctly and raise their alarms, so leaks are detected in time.

2. Scope

Fixed point flammable gas detectors (catalytic and infrared) and toxic gas detectors (electrochemical) with 4 to 20 mA or digital outputs.

3. References

- Detector manufacturer manual and calibration adapter instructions
- Test gas certificates
- Fire and gas cause and effect matrix
- Site gas detection philosophy

4. Responsibilities

- Instrument technician: carries out the work and records results.
- Instrument engineer or supervisor: reviews and approves the records.
- Operations: grants the permit, isolates the process and returns the equipment to service.

5. Safety precautions

- Work only under a valid permit to work and follow the site isolation (lockout tagout) procedure.
- Wear the PPE required for the area: safety helmet, glasses, gloves and safety shoes as a minimum.
- In hazardous areas use certified or intrinsically safe test equipment, or obtain a gas free certificate and hot work permit.
- Inform the control room before starting, and before returning the instrument to service.
- Inhibit only the detector under test and keep the inhibit time short; the area loses protection while inhibited.
- Handle test gas cylinders upright and secured; toxic test gas must be vented away from people.

6. Tools and equipment

- Certified test gas of the correct gas and concentration (typically about 50 % LEL for flammable, near the alarm level for toxic) within expiry
- Zero gas (synthetic air or nitrogen as required) or clean air
- Calibration adapter (cup) and regulator with the flow rate given by the manufacturer
- Magnet or communicator to start calibration, and a radio

7. Prerequisites

- Permit approved; fire and gas system detector inhibited by operations.
- Test gas certificate checked; the detector sensor is not past its replacement date.

8. Procedure

8.1 Bump test (as found)

- 8.1.1 Fit the calibration adapter and apply test gas at the manufacturer flow rate.
- 8.1.2 Record the peak reading and the time to reach it; compare with the gas concentration.
- 8.1.3 If the reading is within the acceptance band the detector passes the bump test; continue to calibration only if required by the schedule or if the bump test fails.

8.2 Zero calibration

- 8.2.1 Apply zero gas or ensure clean air, start the zero routine and wait for it to finish.
- 8.2.2 Record the zero reading.

8.3 Span calibration

- 8.3.1 Enter the test gas concentration if required, apply test gas and start the span routine.
- 8.3.2 Wait for the detector to accept the span, then remove the gas and record the as left span reading.
- 8.3.3 Allow the reading to return to zero before ending the inhibit.

8.4 Alarm and output check

- 8.4.1 With the control room, confirm the detector signal (mA or digital value) matches the local reading during gas application.
- 8.4.2 Confirm the low and high alarms were seen at their set points where the test gas allows, or simulate the signal to check alarm actions.
- 8.4.3 Remove the inhibit and confirm the detector is healthy in the system.

9. Acceptance criteria

- Bump test reading within the site acceptance band (for example within $\pm 10\%$ of the applied concentration, or as set by the site procedure).
- As left span reading within the manufacturer tolerance.
- Zero stable at zero, and the control system reading matches the detector.

10. Records

- Calibration master list (free template: instrumentationblog.in/downloads/templates/calibration-master-list/)
- Instrument PM schedule (free template: instrumentationblog.in/downloads/templates/instrument-preventive-maintenance-schedule/)

11. Approval

	Prepared by	Reviewed by	Approved by
Name			
Signature			
Date			

This procedure is a generic template. Adapt it to your site permit system, the manufacturer instructions and your quality system before use.