

Fox Thermal Facility and Calibration Laboratory Capabilities



PRECISE, RELIABLE, TRUSTED
SOLUTIONS
IN GAS FLOW MEASUREMENT

- ACTUAL GAS CALIBRATIONS
- CALIBRATION VALIDATION
- GAS-SELECTX® GAS SELECTION MENUS





Fox Calibration Services Ensure Reliable Flow Meter Performance

Fox Thermal provides accurate, rugged, and reliable flow meters to industrial OEMs and end-user customers in a wide range of industries – from biotech and food processing operations to utilities and chemical manufacturers.

Fox Thermal Calibration Lab offers these valued customers the services they need to ensure their flow meters meet specified performance parameters and provide accurate, repeatable measurements in the field, day after day, year after year.

Fox calibrations are performed with NIST-traceable flow standards and meet MIL-STD-45662A requirements. Calibration equipment is subject to a meticulous metrology program that includes the selection, usage, calibration, control, and maintenance of measurement standards.

Process parameters, fluid compositions, and installation anomalies can dramatically affect the performance of flow instrumentation. The Fox Calibration Lab employs a wide range of gases, gas mixtures, temperatures, pressures, and line sizes to simulate actual fluid and process conditions. This real-world approach improves installed accuracy and minimizes measurement uncertainty.

Automated data acquisition optimizes calibration accuracy and efficiency while reducing the opportunity for human error. It also facilitates access to calibration data, parameters, flow conditions, and instrument variables. If a field technician is commissioning or servicing an installed device, or if a customer needs specific instrument information, it can be accessed quickly and easily.

Calibration Accuracy is Only as Good as the Reference Standard

Fox Thermal's test tunnels are calibrated at appropriate intervals, monitored for stability, and under the custody of trained laboratory personnel. Measurement assurance procedures and monitoring results are maintained in the laboratory database to ensure that all calibrations are accurate, verifiable, and traceable to NIST primary standards.

Calibration capabilities range from as low as 15 SFPM velocity (e.g., 0.011 SCFM in a 0.25-inch pipe size) to as high as 60,000 SFPM velocity (e.g., 12,000 SCFM in a 6-inch pipe size). The Calibration Lab is also equipped to calibrate applications with temperature ranges from -40 to 250F (-40 to 121C) and pressure ranges from 0 to 740 psig (0 to 51 barg).

Fox Calibration Lab equipment includes:

- 2 closed loop large flow air and gas tunnels - 3" to 6" (80 to 150mm) typical
- 1 closed loop large flow air and gas tunnel - 6" and larger
- 1 closed loop medium flow air and gas tunnel - ½" to 3" (15 to 80mm) typical
- 1 closed loop low flow tunnel for ½" to 4" typical
- 1 low flow bell prover air and gas tunnel - ¼" to 1½" (6 to 40mm) typical
- Custom labs are routinely assembled to meet unique customer requirements with equipment dedicated to specific applications.





Actual Gas Calibrations Reduce Measurement Uncertainty

Fox Thermal's Calibration Lab utilizes a wide range of pure gases and specialty mixed gases to optimize measurement accuracy and fulfill customers' delivery requirements.

Whether your meter requires a straightforward air calibration or a complex mixed gas calibration, our goal is to achieve the highest accuracy and fastest turnaround time.

On-site gas reserves, computerized mixing equipment, and configurable test fixtures help improve lab throughput and delivery time, and ensure that calibration lab accuracy is transmitted to the actual installation.

Typical calibration gases include:

- Air
- Argon
- Biogas
- Butane
- Carbon Dioxide
- Compressed Air
- Digester Gas
- Ethane
- Flare Gas
- Gas Mixtures
- Helium
- Hydrogen
- Methane
- Natural Gas
- Nitrogen
- Oxygen
- Propane
- Toxic and corrosive gas calibrations are performed using proprietary correlation programs

Gas-SelectX® and Gas Correlations

Many customers need a fast solution to their monitoring needs. For these cases, Fox Thermal has developed the Gas-SelectX® gas selection menu feature for Models FT1, FT4A, and FT4X flow meters. Gas-SelectX® allows the user to choose from a menu of several common gases or create custom gas mix profiles for their application.

The Gas-SelectX® feature has a long list of common gases used in most Industrial and Oil & Gas sectors.

The flow meter's proprietary algorithms allow the user to switch gases or gas mixes in the field, as needed.

Whether you need to measure natural gas, air, flare gas, vent gas, or digester gas, the Gas-SelectX® feature brings these options and more to the user with a quick push of a button.

Why Fox Thermal?

- NIST-traceable reference standards and a meticulous metrology program prevent out-of-tolerance calibrations.
- Accurate "actual gas" and "actual conditions" calibrations optimize repeatability and long-term stability of your flow meter.
- Automated calibration procedures and electronic record keeping facilitate uncertainty analysis and improve delivery times.
- Industry-leading calibration services are based on technological innovation and a commitment to total customer satisfaction.



Complex Gas Calibrations

A typical gas calibration begins with a detailed customer application data review and sign-off by lab personnel. The following steps are then completed.

1. Select lab, lab piping, and accessories to replicate actual installation.
2. Install the flow meter (Device Under Test or DUT), pressurize and leak test the calibration system.
3. Charge calibration tunnel with calibration gas or gas mixture.
4. Perform preliminary test of calibration standard and data acquisition system.
5. Perform zero stability tests and take zero calibration point.
6. Collect the zero-point, then 13 more points up to the customer's maximum flow rate, then one final point of over-range.
7. Download collected calibration data to DUT.
8. Perform final calibration verification over the entire flow range to ensure calibration parameters have been properly downloaded and that the DUT is performing within the published accuracy specification.
9. Download all flow meter calibration data and settings to master and back-up calibration databases.
10. Prepare calibration QC documents to record all raw data, parameters, and settings and store in master and back-up calibration databases.
11. Prepare calibration certificate to include raw sensor voltages, flow velocities and flow rates in customer-specified units, standard asset number, reference standard data, gas/gas mixture, and calibration technician signature.

Calibration Validation

Sending flow meters for factory re-calibrations can be a costly inconvenience. CAL-V™ and Zero CAL-CHECK® Calibration Validation tests were created by the Fox Thermal engineering team to avoid such inefficiencies and bring the power back to the user to confirm that their meter is running accurately in the field.

The Calibration Validation process is as easy pushing a button and receiving a pass/fail result within minutes. If the test is performed using the FT View™ software tool, a certificate can be generated at the end of the test for record-keeping.

Automated Calibration Improves Accuracy and Efficiency

Fox Thermal's automated systems maximize calibration accuracy and repeatability, as well as output and efficiency. Because procedures are executed the same way every time, results are consistent and calculating measurement uncertainty is simplified.

Automated systems also enhance electronic records storage and retrieval. Records from the calibration lab are created and retrieved using proprietary software, and database files are backed up and saved to a secure server.

Calibration files include details on process conditions, calibration fluid, line size, and other relevant information. All NIST-traceable equipment utilized for the calibration procedure is identified, as is the calibration history of all reference equipment.

In addition to the calibration certificate and a certified flow table that correlates current outputs with scaled units of flow, validation and certification documents are produced for each calibrated device.