



Measurement & Analytics | Measurement made easy

## UK workshop services

A guide to our flow calibration facilities  
and how we can help



# Flow calibration made easy

## Introduction

As a manufacturer of flow measurement equipment for multiple industrial end users, we are dedicated to helping you maintain the highest levels of accuracy from your flow assets.

Over time, some types of flowmeters may need calibration in order to maintain optimum performance. Some flowmeters will be in installations which have regulatory requirements for periodic calibration. Should either of these situations occur or the user wants the calibration checked, the best way to solve the problem is to have your meter recalibrated to its original factory specifications, using the services of an accredited calibration laboratory.

## How can we help?

Located in Stonehouse, Gloucestershire, and Workington Cumbria, our flow calibration facilities are designed to accommodate the biggest and smallest flow meters in operation.

Using our facilities, you can be sure that your flowmeters are calibrated to the leading international standards. All calibrations are carried out to ISO9000, with the option of a U.K.A.S. accredited calibration where the certificate carries the ILAC and UKAS Calibration Laboratory 0255.

- Flow meter size range: 1mm to 2400 mm / 1/25" to 96"
- Calibrating medium: Water
- Maximum Flow capacity: 2800 l/s / 740 US gal/s
- Accuracy classes: Down to  $\pm 0.1\%$

## Calibration to suit your requirements

We provide full service maintenance and calibration contracts for a wide range of different flow technologies from all manufacturers. Our facilities can be used to calibrate the following types of flowmeters using the medium of water, although ABB does have the facility of calibrating flowmeters on gas compositions if required:

Type of instrument	Measuring medium	Nominal diameter range mm	Measuring error in % of rate
Electromagnetic flowmeters (Full Bore)	Water	DN 1...DN2400	0.2
Swirl flowmeters	Water/Air	DN25...DN400	0.5
Vortex	Water/Air	DN25...DN400	0.75 liquid / 1 Gas
Coriolis mass flowmeters	Water/Air	DN25...DN150	0.1
Thermal mass flowmeters	Air	DN25...DN150	1
Turbine meters	Water	DN25...DN400	0.50
Rotameter flowmeters	Water	DN 10...DN80	Class 1.6/2.5/6
Helix/Woltman type flowmeters	Water	DN 50...DN300	2
Venturis	Water	DN 80...DN1800	1
Wedge	Water	DN 50...DN700	1
Averaging pitot	Water	DN 50...DN2200	1
Flow nozzles	Warm water	DN 100...DN400	1
Orifice plate systems	Water	DN 80...DN400	2
Orimaster flowmeters	Water	DN 25...DN300	2
Ultrasonic (Clamp On)	Water	DN 25...DN1800	5
Electromagnetic flowmeters (Probe)	Water	300mm...2000mm	2

## A choice of calibration methods

When it comes to calibration, there is no single best method. At ABB, we offer a choice of gravimetric, volumetric and comparison methods, enabling us to offer the best technique to suit your requirements.



## Gravimetric

In this method, the flowmeter is calibrated in a pipeline, with water being pumped through it from a sump. A diverter valve situated downstream directs the flow from the meter either back to the sump or to a tank of sufficient capacity attached to a highly accurate weighing system.

This method enables the volume of water collected to be ascertained. When coupled with the collection time, this value gives the average flowrate from the meter during the calibration run. By comparing this with the average flowrate indication from the flowmeter, the error can be found.

## Volumetric

There are two main methods for volumetric calibration:

### Fixed volume volumetric tank method

This method works in a similar way to the gravimetric method, except that the flow from the meter is diverted into a tank of known volumetric capacity. This eliminates the need for a weighing system or to calculate the volume of water from its weight.

### Fixed volume ball meter prover

In this method, the diverter valve directs the flow from the meter into a meter prover.

The prover is a precisely manufactured section of pipe containing a sphere that is three percent larger in diameter than the pipe. Two detector switches are situated in the pipe at a fixed distance apart. The volume of water that is contained in the pipe between the switches is known as the calibrated volume.

During the calibration process, the sphere passes through the flow stream. As it passes the first switch, monitoring begins of the flowmeter output and the water temperature and pressure. When the sphere passes the second switch, the monitoring is stopped. At this point, the volume measured by the flowmeter is recorded. The whole cycle is then repeated, this time with the prover flow direction reversed.

The data from both calibration runs enables the total volume of water passed through the prover to be calculated and compared with the volume of water measured by the meter, with any difference being the error.

## Comparison

In this method, the flowmeter under calibration is installed in a pipeline in series with a reference, or master, flowmeter with a known calibration. Once the flow of water through both

meters is stable, a timer is started and the outputs of both meters are simultaneously monitored.

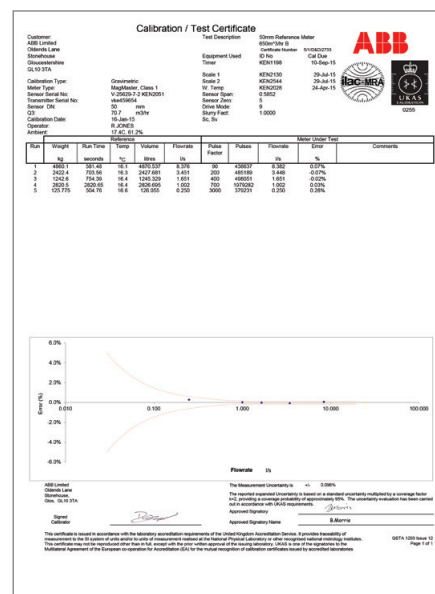
After a set period, the timer is stopped. Using the data from the calibration run enables the average flowrate of the meter under test to be compared with the master meter, with the difference being the error.

## Benefits of ABB calibration services

Our flowmeter calibration services can help you to get the best levels of performance from your flowmeter throughout its lifetime, resulting in:

- Improved process optimisation – reduced raw material cost, increased process speed and accurate measurement data
- Improved process availability – reducing unscheduled maintenance helps maximise the uptime of your plant or process
- Continued regulatory compliance – our services provide you with independent calibrations and third party signed certificates for your records
- Enhanced safety – having your flowmeter regularly calibrated at consistent intervals and authenticated with the relevant certification can help enhance your process safety and minimize your risk of exposure in the event of an accident
- Accurate custody transfer – together with independent calibration, improved accuracy provides added peace of mind in custody transfer applications

When you deal with ABB for flow calibration, you can be sure that all work is conducted by highly trained ABB service technicians, backed up with extended product warranties.



# Contact us

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