Calibration services
Meeting our customers’ needs in the U.S.
Fulfilling the needs of all industries

Does the instrumentation that controls your critical quality processes need regular checking, validation and calibration?

Do you need cost-effective service that is fast, high-quality, traceable and accredited? Do you need clear and concise calibration certificates?

Endress+Hauser covers all these critical aspects and can perform and advise on all aspects of calibration from in-situ testing to fully accredited factory calibration. We calibrate your equipment at just the right time for you. This ensures optimal process performance at minimum cost.

**Oil & gas industries**
- On-site flow calibration rigs up to 2” (3” in-line)
- Laboratory calibration of all kinds of custody transfer devices
- Laboratory calibration of flowmeters up to 48”

**Environmental industry**
- Verification of flowmeters
- Laboratory calibration of custody transfer instruments
- Laboratory calibration of flowmeters up to 48”

**Life sciences industry**
*As a compliant partner, we:*
- Perform calibration of process measuring points according to cGMP regulations and universal guidelines
- Document any service provided
- Prove traceability by ensuring the conformity to Standard Operating Procedures
- Keep service staff trained to GMPs and SOPs.

**Food & beverage industries**
- Calibration within regulatory requirements
- Calibration management strategies to support production costs concepts

**Chemical industries**
- On-site flow calibration rigs up to 2” (3” in-line)
- Perform calibration of process measuring points
- Laboratory calibration of flowmeters up to 48”

**Renewable fuels industry**
- On-site flow calibration rigs up to 2” (3” in-line)
Measurement parameters covered

Endress+Hauser performs instrument calibrations across a variety of measuring principles. We even extend our calibration service to third party equipment to reduce time, effort and cost in terms of coordination and documentation.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Equipment type</th>
<th>Calibration location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Resistance thermometer</td>
<td>On-site</td>
</tr>
<tr>
<td></td>
<td>Probe, temperature transmitter</td>
<td>In the laboratory</td>
</tr>
<tr>
<td></td>
<td>Probe, display</td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td>Manometers</td>
<td>On-site</td>
</tr>
<tr>
<td></td>
<td>Pressure sensors</td>
<td>In the laboratory</td>
</tr>
<tr>
<td></td>
<td>Pressure transmitters</td>
<td></td>
</tr>
<tr>
<td>Flow</td>
<td>Electromagnetic flowmeters</td>
<td>On-site</td>
</tr>
<tr>
<td></td>
<td>Vortex flowmeters</td>
<td>In the laboratory</td>
</tr>
<tr>
<td></td>
<td>Coriolis flowmeters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ultrasonic flowmeters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thermal flowmeters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mechanical flowmeters</td>
<td></td>
</tr>
<tr>
<td>Conductivity</td>
<td>Conductivity measuring chain including cell, transmitter and cable</td>
<td>On-site</td>
</tr>
<tr>
<td>pH</td>
<td>pH measuring chain including cell, transmitter and cable</td>
<td>On-site</td>
</tr>
<tr>
<td>Other parameters</td>
<td>On request, we can calibrate other parameters. Please contact your local Endress+Hauser partner for further information.</td>
<td></td>
</tr>
</tbody>
</table>

Accredited facilities
Thanks to accredited laboratories installed in our factories and our service organization, we can offer the accredited calibration of:
- Flow
- Pressure
- Temperature measurement devices
- Voltage, current

On-site calibration
Having also invested in mobile reference tools and in the deployment of competent service organizations across the United States and in many countries, Endress+Hauser can also perform on-site calibration.

We suggest that you ask your local sales representative about any specific requests.
Laboratory and on-site accredited calibrations

The only process instrument manufacturer with the ability to provide accredited calibrations in both the laboratory and on-site.

Endress+Hauser provides accredited calibrations in our laboratories in Greenwood, Indiana and La Porte, Texas. Accredited on-site calibration is also performed using our mobile calibration rigs.

Calibration ensures that instrument measurements are accurate. For some processes, periodic calibration to NIST standards is a requirement to comply with quality and safety standards. We can help you stay in compliance while reducing your costs and increasing process up-time.

As a customer of Endress+Hauser, you can be sure that we are thoroughly familiar with all your needs regarding every aspect of calibration and measuring accuracy. Experience in many industries and over many years is reflected in our calibration service. Calibration is performed on Endress+Hauser instruments and other manufacturers’ instruments as well.

What is accreditation
Accreditation is the formal recognition of an organization’s technical competence in performing specific services such as calibration. This recognition is issued by authorized bodies, often a national metrology authority working in strict compliance with comprehensive international codes of practice.

ISO 17025
ISO/IEC 17025 is an internationally accepted standard covering “general requirements for the competence of testing and calibration laboratories”. ISO/IEC 17025 lays down all the requirements that calibration facilities have to meet if they wish to demonstrate that they operate a quality system, are technically competent, and are able to generate technically valid results. A company has to meet very stringent requirements in order to obtain and keep ISO/IEC 17025 accreditation.

Scope of accreditation
The scope of accreditation includes the principles of flow, pressure and temperature for both laboratory and on-site calibration. Also included within the scope are electrical parameters associated with current, voltage, resistance and frequency pertaining to internal laboratory calibration. Please refer to the Scope of Accreditation for specific measuring capabilities by visiting www.a2la.org (search “accredited organizations” for Endress+Hauser).

How to get started with Endress+Hauser Calibration services
Choose any one of the following:
- Contact your local sales representative
- Download a Calibration Data Sheet from www.us.endress.com/calibration-usa and e-mail it to techsupport@us.endress.com
- Fill out our online Calibration Inquiry form at www.us.endress.com/calibration-usa
- Call us at 888-ENDRESS

For more information and video:
Link www.us.endress.com/calibration-usa
## Laboratory calibration capabilities

### Flow (Liquid)

<table>
<thead>
<tr>
<th>Principle</th>
<th>Min. MPE</th>
<th>Size</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coriolis</td>
<td>± 0.1% o.r.</td>
<td>1&quot; to 10&quot; (DN25 to DN250)</td>
<td>± 0.05% o.r. 1</td>
</tr>
<tr>
<td>Coriolis – Premium Cal*</td>
<td>± 0.01%/0.05%* o.r.</td>
<td>1½&quot; to 10&quot; (DN02 to DN250)</td>
<td>± 0.05%/0.015%* o.r. 2</td>
</tr>
<tr>
<td>Electromagnetic</td>
<td>± 0.2% o.r.</td>
<td>½&quot; to 12&quot; (DN15 to DN300)</td>
<td>± 0.1% o.r. 2</td>
</tr>
<tr>
<td>Vortex</td>
<td>± 0.75% o.r.</td>
<td>½&quot; to 12&quot; (DN15 to DN300)</td>
<td>± 0.25% o.r. 2</td>
</tr>
<tr>
<td>Ultrasonic – In-line</td>
<td>± 0.5% o.r.</td>
<td>1&quot; to 12&quot; (DN25 to DN1200)</td>
<td>± 0.2% o.r. 2</td>
</tr>
<tr>
<td>Ultrasonic – Clamp-On</td>
<td>± 2% o.r.</td>
<td>2&quot; &amp; 4&quot; (DN50 &amp; DN100)</td>
<td>± 0.5% o.r.–Verification Only 2</td>
</tr>
</tbody>
</table>

o.r. = of reading
MPE = Maximum Permissible Error

1. Certificate #3041.02 - Service Center - All manufacturers
2. Certificate #1897.01 - Production Center - Endress+Hauser flowmeters only

### Flow range

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Min*</th>
<th>Max*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Center</td>
<td>Mass flow rate</td>
<td>13.2 lbs/m (0.1 kg/s)</td>
<td>25,133 lbs/m (190 kg/s)</td>
</tr>
<tr>
<td></td>
<td>Volume flow rate</td>
<td>1.58 gal/m (0.1 l/s)</td>
<td>3021 gal/m (190 l/s)</td>
</tr>
<tr>
<td>Production Center</td>
<td>Mass flow rate</td>
<td>2.65 lbs/m (0.02 kg/s)</td>
<td>87,303 lbs/m (660 kg/s)</td>
</tr>
<tr>
<td></td>
<td>Volume flow rate</td>
<td>0.32 gal/m (0.02 l/s)</td>
<td>10,493 gal/m (660 l/s)</td>
</tr>
</tbody>
</table>

*line size dependent

### Pressure

<table>
<thead>
<tr>
<th>Principle</th>
<th>Min. MPE</th>
<th>Range</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge - Pneumatic</td>
<td>± 0.075% o.f.s.</td>
<td>atm to 1500 psi (103 bar)</td>
<td>± 0.013% o.f.s.</td>
</tr>
<tr>
<td>Absolute</td>
<td>± 0.075% o.f.s.</td>
<td>0.13 to 1515 psia (8.9 mbara to 104 bara)</td>
<td>± 0.013% o.f.s.</td>
</tr>
<tr>
<td>Differential</td>
<td>± 0.075% o.f.s.</td>
<td>-15 to 1500 psid (-1 to 103 bard)</td>
<td>± 0.013% o.f.s.</td>
</tr>
<tr>
<td>Gauge - Hydraulic</td>
<td>± 0.075% o.f.s.</td>
<td>600 to 10,000 psi (41 to 689bar)</td>
<td>± 0.013% o.f.s.</td>
</tr>
</tbody>
</table>

o.f.s. = of full scale
MPE = Maximum Permissible Error

### Temperature

<table>
<thead>
<tr>
<th>Principle</th>
<th>Min. MPE</th>
<th>Range</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmitter with RTD/Thermocouple</td>
<td>± 0.45°F (0.25°C)</td>
<td>23 to 392°F (-5 to +200°C)</td>
<td>0.09°F (0.05°C)</td>
</tr>
</tbody>
</table>

MPE = Maximum Permissible Error
### Flow (Air)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncertainty</td>
<td>≤ ±0.3%</td>
</tr>
<tr>
<td>Flow rates</td>
<td>0 - 8265 lbs/hour (0 - 3750 kg/hour)</td>
</tr>
<tr>
<td>Pressure</td>
<td>±0.72 psia (±50 mbar)</td>
</tr>
<tr>
<td>Temperature</td>
<td>≤ ±0.5°F (≤ ±0.3°C)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤45%</td>
</tr>
<tr>
<td>Line sizes</td>
<td>½&quot; - 4&quot; (in-line devices) DN15 - DN100 ≥4&quot; (insertion devices) ≥DN100</td>
</tr>
<tr>
<td>Instruments supported</td>
<td>t-mass A 150, t-mass B 150, t-mass 65F, t-mass 65I</td>
</tr>
</tbody>
</table>

### Flow (Liquid)

<table>
<thead>
<tr>
<th>Principle</th>
<th>Min. MPE</th>
<th>Size</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coriolis</td>
<td>± 0.1% o.r.</td>
<td>3/8&quot; to 4&quot; (DN25 to DN100)</td>
<td>± 0.05% o.r.</td>
</tr>
<tr>
<td>Electromagnetic</td>
<td>± 0.2% o.r.</td>
<td>3/8&quot; to 6&quot; (DN08 to DN150)</td>
<td>± 0.1% o.r.</td>
</tr>
<tr>
<td>Vortex</td>
<td>± 0.75% o.r.</td>
<td>½&quot; to 4&quot; (DN15 to DN100)</td>
<td>± 0.25% o.r.</td>
</tr>
<tr>
<td>Ultrasonic – In-line</td>
<td>± 0.5% o.r.</td>
<td>1&quot; to 6&quot; (DN25 to DN150)</td>
<td>± 0.2% o.r.</td>
</tr>
<tr>
<td>Ultrasonic – Clamp-On</td>
<td>± 2% o.r.</td>
<td>2&quot; &amp; 4&quot; (DN50 &amp; DN100)</td>
<td>± 0.5% o.r. – Verification Only</td>
</tr>
</tbody>
</table>

o.r. = of reading

Certificate #3041.01 - Service Center - All manufacturers

#### Flow range

<table>
<thead>
<tr>
<th>Type</th>
<th>Min*</th>
<th>Max*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass flow rate</td>
<td>2.65 lbs/m (0.02 kg/s)</td>
<td>3704 lbs/m (28 kg/s)</td>
</tr>
<tr>
<td>Volume flow rate</td>
<td>0.32 gal/m (0.02 l/s)</td>
<td>445 gal/m (28 l/s)</td>
</tr>
</tbody>
</table>

*line size dependent

### Pressure

<table>
<thead>
<tr>
<th>Principle</th>
<th>Min. MPE</th>
<th>Range</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge - Pneumatic</td>
<td>± 0.075% o.f.s.</td>
<td>atm to 750 psi (52 bar)</td>
<td>± 0.013% o.f.s.</td>
</tr>
<tr>
<td>Absolute</td>
<td>± 0.075% o.f.s.</td>
<td>0.13 to 765 psia (8.9 mbara to 53 bara)</td>
<td>± 0.013% o.f.s.</td>
</tr>
<tr>
<td>Differential</td>
<td>± 0.075% o.f.s.</td>
<td>-15 to 500 psid (-1 to 34 bar)</td>
<td>± 0.013% o.f.s.</td>
</tr>
</tbody>
</table>

o.f.s. = of full scale

MPE = Maximum Permissible Error

### Temperature

<table>
<thead>
<tr>
<th>Principle</th>
<th>Min. MPE</th>
<th>Range</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmitter with RTD/Thermocouple</td>
<td>± 0.45°F (0.25°C)</td>
<td>-40 to +572°F (-40 to +300°C)</td>
<td>0.07°F (0.04°C)</td>
</tr>
</tbody>
</table>

MPE = Maximum Permissible Error
## On-site calibration capabilities

Nationwide on-site calibration capabilities

<table>
<thead>
<tr>
<th>Flow (Liquid)</th>
<th>min MPE&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Equipment/Range</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Mass (i.e. Coriolis)</td>
<td>±0.25%</td>
<td>Portable In-Line cart Line Size ½” - 3” (DN08 - DN80) Standard 2 point&lt;sup&gt;2&lt;/sup&gt; calibration</td>
<td>±0.12%</td>
</tr>
<tr>
<td>- Volumetric (i.e. Magmeter &amp; Vortex)</td>
<td>±0.5%/±1.5%</td>
<td>Portable Mobile Rig Line Size ½” - 2” (DN08 to DN50) Standard 2 point calibration</td>
<td>±0.17%</td>
</tr>
<tr>
<td>Pressure</td>
<td>±0.2% of reading</td>
<td>With Mobile Calibrators -15 to 5,000 psig (-1 to 345 bar) standard 3 point calibration&lt;sup&gt;3&lt;/sup&gt;</td>
<td>±0.07% of full scale</td>
</tr>
<tr>
<td>Temperature</td>
<td>±0.7°F</td>
<td>With Mobile Calibrators 23 to 707°F (-5 to +375°C) standard 1 point calibration&lt;sup&gt;4&lt;/sup&gt;</td>
<td>±0.16°F</td>
</tr>
</tbody>
</table>

Flow Verification: With FieldCheck®/Heartbeat Technology<sup>TM</sup>

1. Accuracy statement based on best uncertainty of reference equip Test (UUT) with a Calibration Measurement Capability (C<sub>1</sub>) of at least 2:1. MPE = Maximum Permissible Error.
2. Depending on customer’s capabilities.
3. Pressure minimum MPE is dependent on range, may be larger in draft ranges.
4. Temperature minimum MPE is based on oil bath, may be larger in dry block.
Often times a meter will need an official calibration certificate, i.e., flow metering in regulated industries or for volume measurement in large-bore water pipelines. For this reason, Endress+Hauser as an officially accredited calibration provider for the measured variable “flow” also performs calibration with A2LA, SCS, or CNAS certification. These certificates are accepted in all ISO member states and consequently they are invariably recognized and accepted by national authorities and in quality audits.

Accredited

Accrediting body is a member of ILAC (International Laboratory Accreditation Cooperation)

Details of the meter/customer

Initial calibration or recalibration

All results of measurement

Additional information about the rig, traceability and measuring uncertainty

Stamp / Signature
Calibration provider / Operator

Example of an accredited calibration certificate (A2LA), page 1 of 2
Standard number of points: 3 pts
In cases where accredited calibration is not requested, Endress+Hauser will issue a standard calibration certificate with each calibration.
We offer you the benefits of a true partnership

Thanks to our numerous calibration laboratories and primary facilities, we have carried out more than one million calibrations.

Above all, we see our calibration service as part of your repair and maintenance planning. Our aim is to provide you with complete calibration management solutions. At the forefront of this is the tuning of calibration cycles, planning dates for carrying out calibration work, the coordination of personnel and certified calibration equipment.

1 Calibration consulting
Endress+Hauser will help you to assess your metrology plan by establishing your calibration specifications per parameter (maximum permissible errors, periodicities) or by defining the right reference tools according to their uncertainty. Together, we will work out which parameters have to be calibrated on-site and, in the case of high accuracy requirements, which instruments need laboratory calibration.

2 Calibration SOPs
We offer a full range of Standard Operating Procedures to support our on-site work. SOPs ensure that our work is repeatable all over the world. We also provide site specific SOP’s noting which measuring parameters have to be calibrated on-site and in case of high accuracy requirements, which need calibrating in the laboratory.

3 Test equipment
Local service centers provide a one-stop calibration and repair service to a wide range of test, measurement and process control instrumentation. So whether you need pressure, analytical, temperature or flow calibration, look no further. All of our facilities are traceable to national and international standards. This means you are guaranteed the highest level of service compliant with the ISO 17025 standard.

4 Trained employees
On-site calibration is performed by specialist, highly trained staff. This relieves your in-house maintenance staff from routine time-consuming tasks and allows them to focus on improving plant availability. For you this means reliable advice, optimum performance of your instruments and true cost-effectiveness.

5 Calibration work
Our primary calibration facilities operate and are accredited to ISO 17025 and are located around the world. We own and operate more calibration laboratories than any other instrumentation supplier. As a leading supplier of field instrumentation we not only can calibrate, but also quickly and efficiently adjust, repair or replace equipment that is failing to meet the specified criteria. Our specialists have the necessary skills and equipment to calibrate all makes of instruments.

6 Calibration documentation
We support our service with certified and traceable documentation. A calibration certificate compliant with the ISO 17025 standard is issued. It details all required data in form that is easy to understand. Importantly, it also satisfies all relevant authorities.

7 Calibration and Life Cycle Management software
Custom software tool that helps to control the scheduling activity around your installed base, providing traceable and auditable records.
Powerful solutions for calibration and life cycle management

Improve calibration processes by instant access to critical information

CompuCal™
If we consider on-site calibration, the needs are to schedule the activities, arrange with the production personnel to make the plant available and then plan the tools and the technician. Once the job is done, the user has to edit and archive a calibration certificate.

CompuCal, Endress+Hauser’s calibration management software, is fully able to handle all these demands. Developed with key users and proven in use in the pharmaceutical and regulated industries, CompuCal allows to efficiently maintain and calibrate your on-site instrumentation.

Enjoy peace of mind during audits
With asset information and documentation made available throughout your plant life cycle, you have instant access to calibration documentation ensuring you are always ready for quality audits.

Achieve calibration excellence with metrology expertise
Calibration at the right time and to the right specifications ensures the quality of your products is in compliance with relevant standards and regulations. Consistent data and always accessible documentation from your installed base allow effectively scheduling and tracking the calibration of your critical instruments. In order to increase plant availability you can monitor the achievements of your KPIs. Whenever needed, you are supported by our service technicians worldwide to reduce complexity.

Advantages
- Traceability of the calibrations
- Access to the complete calibration history
- Audit readiness
- Manage your calibration setup for full compliance
- Optimize calibration for maximum effect
- Achieve transparency to manage costs effectively
- Factor calibration into process downtime

Only a clear picture and detailed knowledge of the installed instrument base can act as a solid foundation for a proactive maintenance and optimizing strategy for your plant. With data concerning a plant and its components generated right from the first day of planning, W@M Life Cycle Management supports you in operational matters and also assumes strategic tasks.
U.S. Laboratory Calibration Centers

Calibration lab in Customer Center located in Greenwood, Indiana.

Calibration lab serving ship channel customers. Located in La Porte, Texas.

On-site calibrations

[Image of on-site calibration rig]

On-site calibration rig allows performance of calibration at your site.

For more information and video:
Link www.us.endress.com/calibration-usa

ISO 9001 Certified

Accredited
Cert #1897.01/3041.01/3041.02

Give us your feedback:
www.endresslistens.com

<table>
<thead>
<tr>
<th>USA</th>
<th>Canada</th>
<th>Mexico</th>
<th>Other locations</th>
</tr>
</thead>
</table>
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(888-363-7377)  
Fax: 317-535-8498  
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Tel: 905-681-9292  
800-668-3199  
Fax: 905-681-9444  
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México  
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For more information and video:
Link www.us.endress.com/calibration-usa

Give us your feedback:
www.endresslistens.com

ISO 9001 Certified

Endress+Hauser
People for Process Automation