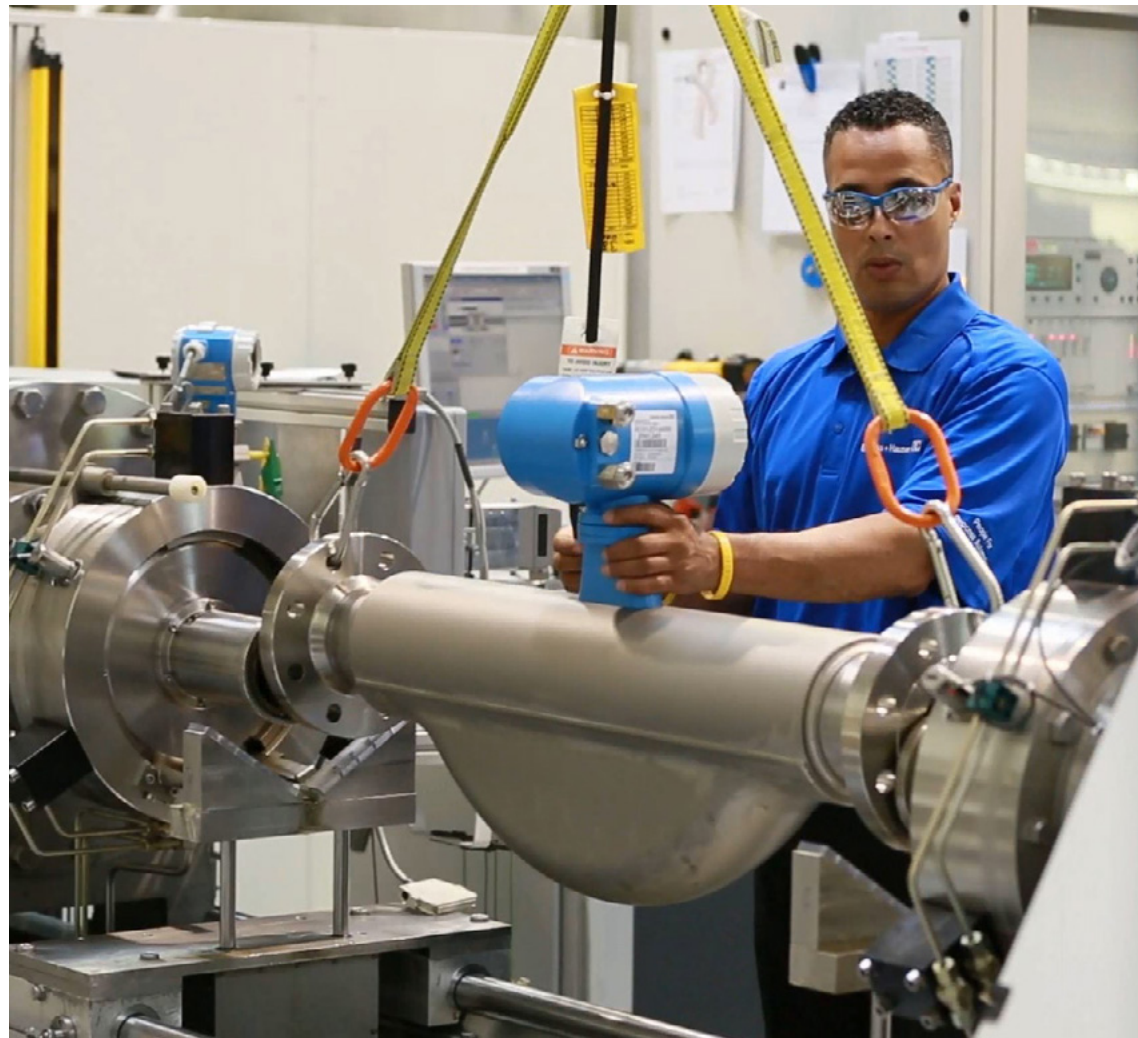


## Calibration services

Ensure compliance with minimal process interruptions



# Calibration services

Endress+Hauser is the only process instrument manufacturer with the ability to provide accredited calibrations in both the laboratory and on-site for our own and other manufacturers' products.

Calibration is a necessary action that ensures your instrument measurements are accurate. For some applications in the process industries, periodic calibration to the National Institute of Standards and Technology, or NIST, standards are a requirement to comply with quality and safety standards. We can help you stay in compliance while reducing your costs and increasing the process uptime.

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.


Endress+Hauser performs instrument calibrations across a variety of measuring principles. We provide accredited calibrations in both our Greenwood, Indiana and Houston, Texas laboratories and accredited on-site calibration with our mobile calibration rigs. We even extend our calibration services to third-party equipment and some non-traditional flow disciplines to reduce time, effort and cost in terms of coordination and documentation.




## How to get started with Endress+Hauser Calibration services

It's easy! Choose any of the following options:

- Contact your local sales representative [us.endress.com/en/contact](https://us.endress.com/en/contact)
- Download a Calibration Data Sheet from [us.endress.com/calibration-usa](https://us.endress.com/calibration-usa) and email it to [TechSupport.us.sc@endress.com](mailto:TechSupport.us.sc@endress.com)
- Fill out our online Calibration Inquiry form at [us.endress.com/calibration-usa](https://us.endress.com/calibration-usa)
- Call the Endress+Hauser Technical Support team at 888-ENDRESS
- Have a non-traditional flow discipline? Be sure to contact our team for scope review

 **ISO 17025** ISO/IEC 17025 is an internationally accepted standard, covering "general requirements for the competence of testing and calibration laboratories." ISO/IEC 17025 outlines the stringent requirements calibration facilities must meet to achieve and keep the accreditation which includes demonstrating that they operate a quality system, are technologically competent and are able to generate accurate results.

 **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 the Accreditation for specific measuring capabilities by visiting [a2la.org](https://a2la.org) (search "accredited organizations" for "Endress+Hauser").



# Endress+Hauser Laboratory Calibration Capabilities

Flow (Liquid)				
Principle	Min. MPE	Size	Uncertainty	
Coriolis	$\pm 0.1\%$ o.r.	1" to 10" (DN25 to DN250)	$\pm 0.05\%$ o.r.	1
	$\pm 0.1\%$ o.r.	3/8" to 10" (DN25 to DN250)	$\pm 0.05\%$ o.r.	3
Coriolis – Premium Cal*	$\pm 0.1\%/0.05\%*$ o.r.	1/12" to 10" (DN02 to DN250)	$\pm 0.05\%/0.015%*$ o.r.	2
	$\pm 0.05%*$ o.r.	1 1/2" to 3" (DN40 to DN80)	$\pm 0.015\%$	3
Electromagnetic	$\pm 0.2\%$ o.r.	1/2" to 12" (DN15 to DN300)	$\pm 0.1\%$ o.r.	1
	$\pm 0.2\%$ o.r.	1/12" to 48" (DN02 to DN 1200)	$\pm 0.1\%$ o.r.	2
	$\pm 0.2\%$ o.r.	3/8" to 6" (DN08 to DN150)	$\pm 0.1\%$ o.r.	3
Vortex	$\pm 0.75\%$ o.r.	1/2" to 12" (DN15 to DN300)	$\pm 0.25\%$ o.r.	1
	$\pm 0.75\%$ o.r.	1/2" to 4" (DN15 to DN100)	$\pm 0.25\%$ o.r.	3
Ultrasonic – In-line	$\pm 0.5\%$ o.r.	1" to 12" (DN25 to DN300)	$\pm 0.2\%$ o.r.	1
	$\pm 0.5\%$ o.r.	14" to 48" (DN350 to DN1200)	$\pm 0.2\%$ o.r.	2
	$\pm 0.5\%$ o.r.	1" to 6" (DN25 to DN150)	$\pm 0.2\%$ o.r.	3
Ultrasonic – Clamp On	$\pm 2\%$ o.r.	2" & 4" (DN50 & DN100)	$\pm 0.5\%$ o.r. – Verification Only	

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
3. Certificate #3041.01 – Service Center – All manufacturers

■ Greenwood, IN Laboratory  
■ Houston, TX Laboratory



Flow Range			
Location	Type	Min*	Max*
Service Center	Mass flow rate	13.2 lbs/m (0.1 kg/s)	25,133 lbs/m (190 kg/s)
	Volume flow rate	1.58 gal/m (0.1 l/s)	3,021 gal/m (190 l/s)
Production Center	Mass flow rate	2.65 lbs/m (0.02 kg/s)	87,303 lbs/m (660 kg/s)
	Volume flow rate	0.32 gal/m (0.02 l/s)	10,493 gal/m (660 l/s)
Service Center	Mass flow rate	2.65 lbs/m (0.02 kg/s)	13,230 lbs/m (100 kg/s)
	Volume flow rate	0.32 gal/m (0.2 l/s)	1,585 gal/m (100 l/s)

\*line size dependent

Pressure			
Principle	Min. MPE	Range	Uncertainty
Gauge - Pneumatic	±0.075% o.f.s.	atm to 1500 psi (130 bar)	±0.013% o.f.s.
	±0.075% o.f.s.	atm to 750 psi (52 bar)	±0.013% o.f.s.
Absolute	±0.075% o.f.s.	0.13 to 1515 psia (8.9 mbarA to 104 barA)	±0.013% o.f.s.
	±0.075% o.f.s.	0.13 to 765 psia (8.9 mbarA to 53 barA)	±0.013% o.f.s.
Differential	±0.075% o.f.s.	-15 to 1500 psid (-1 to 103 bard)	±0.013% o.f.s.
	±0.075% o.f.s.	-15 to 500 psid (-1 to 34 bard)	±0.013% o.f.s.
Gauge - Hydraulic	±0.075% o.f.s.	600 to 10,000 psi (41 to 689 bar)	±0.013% o.f.s.
Transmitter with RTD/Thermocouple	±0.45°F (0.25°C)	23 to 392°F (-5 to +200°C)	0.09°F (0.05°C)
	±0.45°F (0.25°C)	-40 to +572°F (-40 to +300°C)	0.07°F (0.04°C)

o.f.s. = of full scale

MPE = Maximum Permissible Error

Flow (Air)	
Uncertainty	≤ +0.3%
Flow Rates	0 – 8265 lbs/hour (0 – 3750 kg/hour)
Pressure	±0.72 psia (±50 mbarA)
Temperature	≤ +0.54°F (≤ +0.3°C)
Relative humidity	≤45%
Line Sizes	½" – 4" (in-line devices) DN15 – DN100 ≥4" (insertion devices) ≥DN100
Instruments Support	t-mass A 150, t-mass B 150, t-mass 65F, t-mass 65I

Greenwood, IN Laboratory  
Houston, TX Laboratory

# On-Site Calibration Capabilities

Flow (Liquid)				
Principle	Min. MPE	Equipment/Range		Uncertainty
Mass (i.e. Coriolis)	±0.25%	Portable In-Line care	Portable Mobile Rig	±0.12%
Volumetric (i.e. Magmeter & Vortex)	±0.5% / ± 1.5%	Line Size 1/12"–3" (DN02-DN80) Standard 2-point <sup>2</sup> calibration	Line Size 3/8"–2" (DN08 to DN50) Standard 2-point calibration	±0.17%
Pressure	±0.2% of reading	With Mobile Calibrators -15 to 5,000 psig (-1 to 345 bar) Standard 3-point calibration <sup>3</sup>		±0.07% of full scale
Temperature	±0.7°F	With Mobile Calibrators 23 to 707°F (-5 to 375°C) Standard 1-point calibration <sup>4</sup>		±0.16°F
All manufacturers				
Flow Verification	With FieldCheck®/Heartbeat Technology™			



On request, we calibrate other parameters. Please contact your local Endress+Hauser representative for further information.

1. Accuracy statement based on best uncertainty of reference equip Test (UUT) with a Calibration Measurement capability ( $C_m$ ) 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 rangers
4. Temperature minimum MPE is based on oil bath, may be larger in dry block

## The Calibration Certificate

Often a meter will need an official calibration certificate, i.e. flow metering in regulated industries or for volume measure in large-bore water pipelines. For this reason, Endress+Hauser is an officially accredited calibration provider for the measured variable "flow" and performs

calibration with A2LA, SCS or CNAS certification. These certificates are accepted in all ISO member states and consequently are invariably recognized and accepted by national authorities and in quality audits


Flow, Pressure and Temperature	Accredited Certificate	Standard Certificate
Accrediting Body ILAC Seal	✓	
Official Stamp of the National Authority/Calibration Service	✓	
Details of the Meter/Customer	✓	✓
Initial Calibration of Recalibration	✓	
All Results of Measurement	✓	✓
Additional Information About the Calibration References	✓	
Traceability and Measuring Uncertainty	✓	
Stamp/Signature Calibration Provider/Operator	✓	✓
Full Scale Value	✓	✓
Details on Calibration Measurement	✓	✓

# Accredited Certificate

Official stamp of the national authority/calibration service. Proof that Endress+Hauser is accredited as a calibration provider in accordance with ISO/IEC 17025 and undertakes calibration in compliance with the applicable standards.

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

**Certificate**  
Flow Calibration with Adjustment  
02907025




4017537870  
Purchase order number

Endress + Hauser Serv/Rep  
Customer  
US-3601529502-300 / Endress+Hauser Inc.  
Order N°/Manufacturer  
PROMASS 83 F DN50 / 2"  
Transmitter/Sensor  
AC02FD16000 / AC02FD16000  
Serial N°  
ASSET NO. 10180069  
Tag N°

Recalibration  
Condition

Flow [l]	Flow [m³/min]	Duration [s]	m sept [l]	m ass. [l]	Δ s.e.* [l]	Outp.** [m³]
20.0	103.752	30.2	52.146	52.160	0.028	7.19
20.0	104.047	30.2	52.293	52.290	-0.007	7.20
35.3	183.588	30.2	92.268	92.242	-0.028	0.65
50.0	260.099	30.2	130.712	130.747	0.027	12.01
74.9	389.701	30.1	195.751	195.699	-0.027	15.99
100.2	521.192	30.2	261.941	261.906	-0.013	20.03
100.2	521.249	30.2	261.959	261.936	-0.009	20.04
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

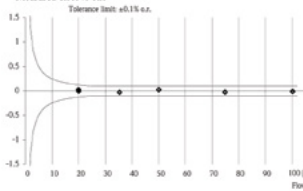
\*% of reading  
\*\*Calculated value (4 - 20 mA)

**Endress+Hauser**   
People for Process Automation

American Association of Laboratory Accreditations, Cert. No 3041.02  
Calibration laboratory accredited according to ISO/IEC 17025

FCP-7.1.6 US / gravimetric  
Calibration rig/Method  
520 lb/min ( ± 100%)  
Calibrated full scale  
Frequency 10000 Hz  
Calibrated output  
1.8933  
Calibration factor  
-10  
Zero point  
70.5 °F ±0.07 °F  
Water temperature  
0.049 %  
Expanded uncertainty of measurement

Measured error % o.r.  
Tolerance limit: ±0.1% s.e.s.



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

Full scale value (standard or customer-specific)

Details on calibration measurement


Measuring uncertainty of calibration rig plus reproducibility of the meter tested

# Standard Certificate

**Certificate**  
Flow Calibration with Adjustment  
02907025

3003764916  
Purchase order number

US-3004997533-100 / Endress+Hauser Inc.  
Order N°/Manufacturer  
83F50-P1U1/101  
Order code  
PROMASS 83 F 2"  
Transmitter/Sensor  
H6095A02000  
Serial N°  
455-FT-109702  
Tag N°

**Endress+Hauser**   
People for Process Automation

FCP-7.1.6 US  
Calibration rig  
551.1557 lb/min ( ± 100%)  
Calibrated full scale  
Calibration Interface  
Calibrated output  
2.0573  
Calibration factor  
25  
Zero point  
74.4 °F  
Water temperature

Flow [l]	Flow [m³/min]	Duration [s]	m sept [l]	m ass. [l]	Δ s.e.* [l]	Outp.** [m³]
25.0	137.500	30.2	69.145	69.157	0.02	7.99
25.0	137.833	30.2	69.267	69.268	0.00	8.00
50.3	276.944	30.2	139.184	139.210	0.02	12.04
69.2	349.732	30.2	226.257	226.267	0.01	16.96
100.1	551.592	30.1	277.142	277.196	0.02	20.02
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*% of reading  
\*\*Calculated value (4 - 20 mA)

Date of calibration  
Endress+Hauser Inc.  
2350 Endress Place  
Greenwood, IN 46143

Operator

[www.addresses.endress.com](http://www.addresses.endress.com)

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CP01127H/24/EN/03.15  
(03/2021)