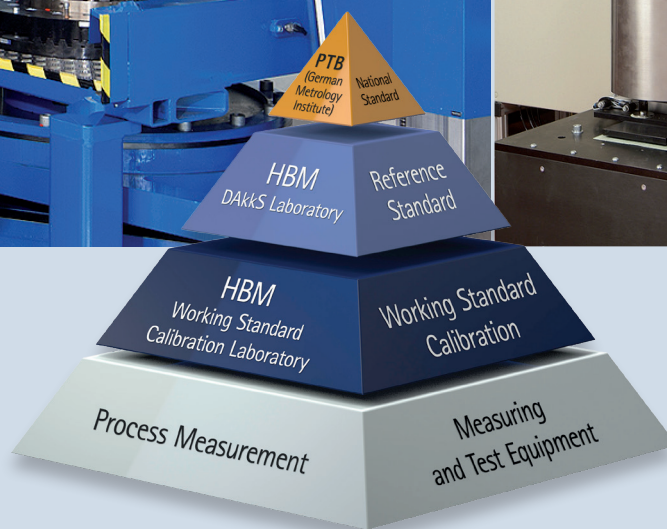
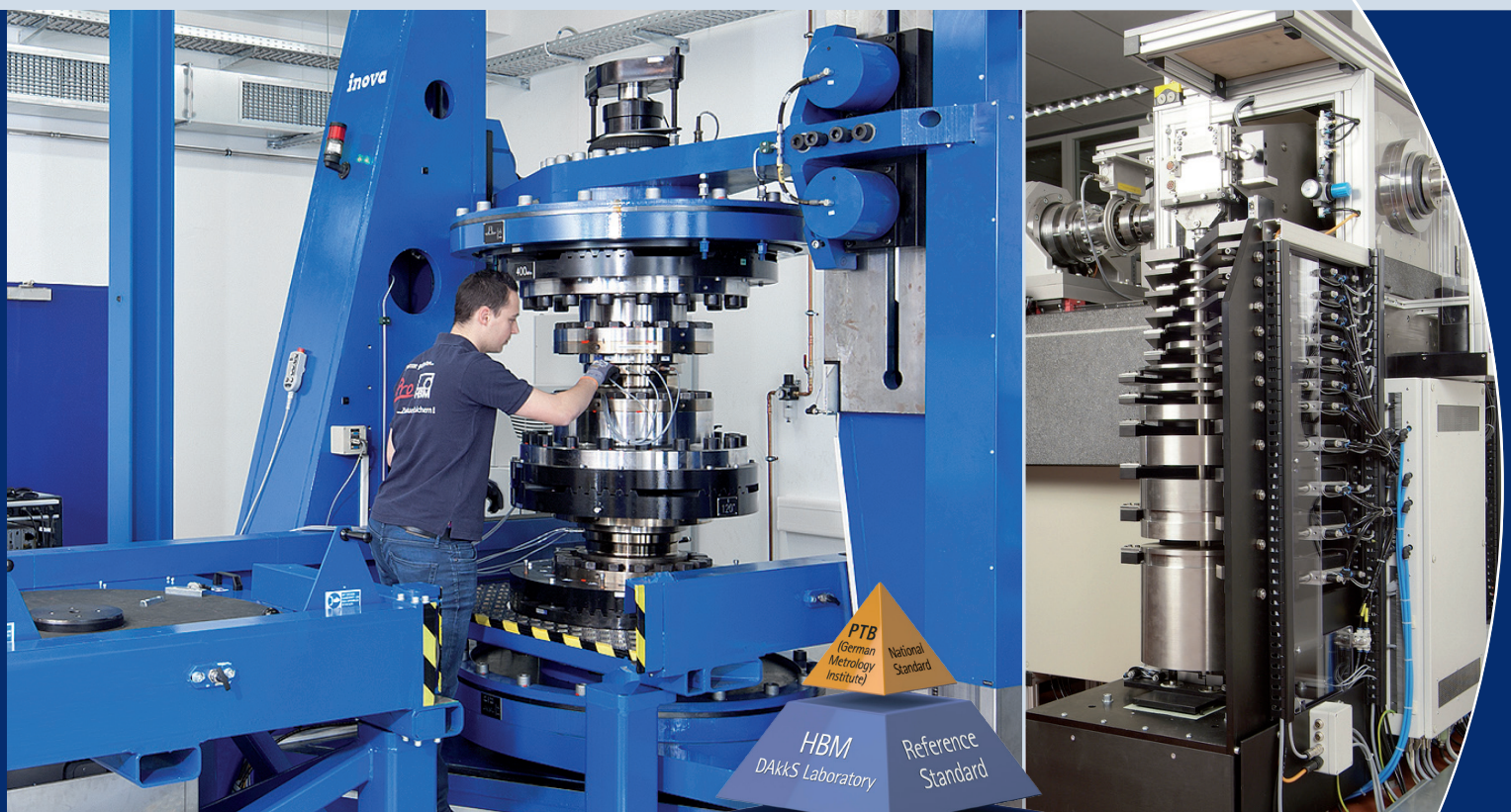


Calibration services at HBM

Reliability through precision



Our calibration laboratory: A reference. Throughout the world.

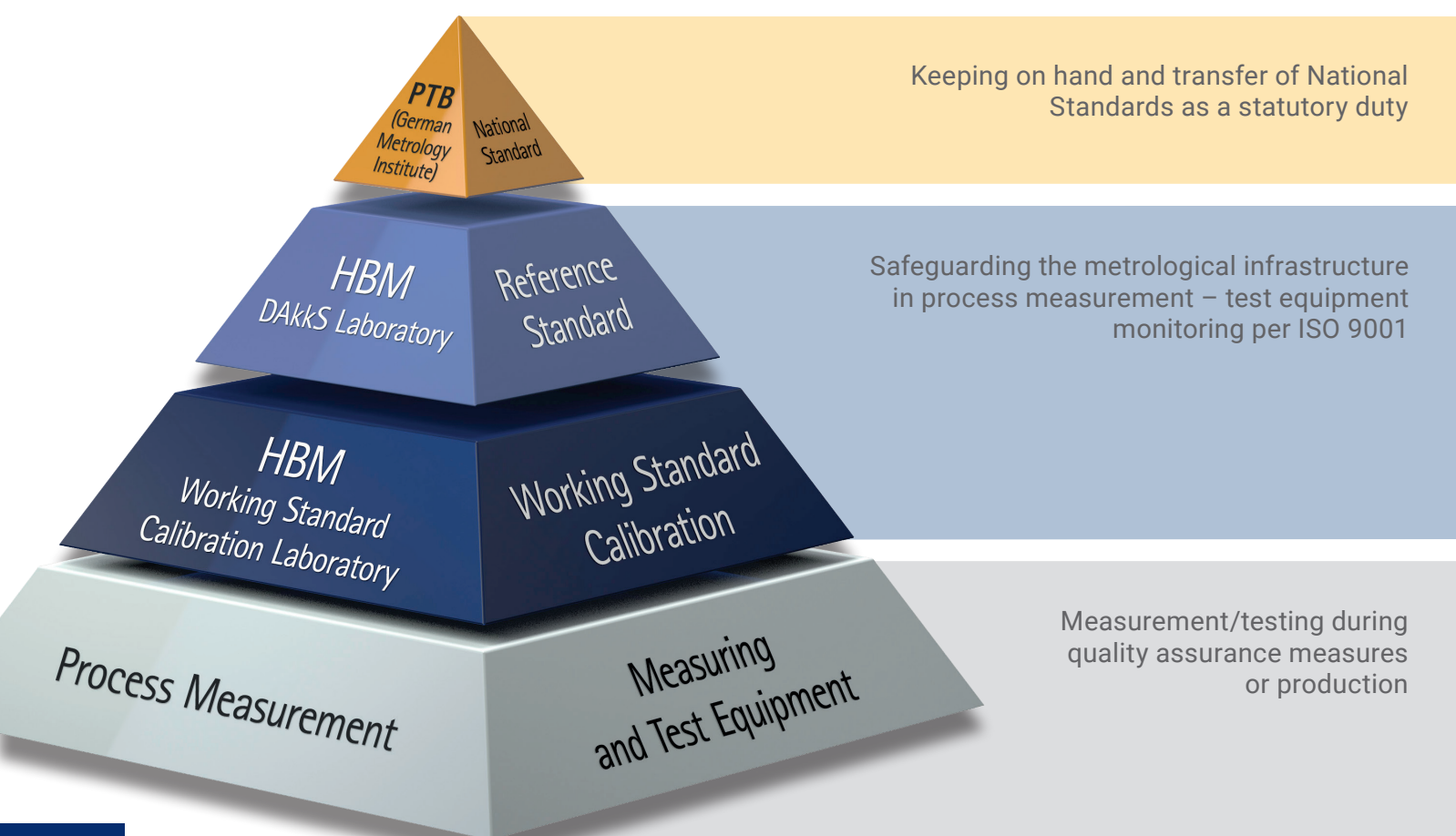
In 1977, the first laboratory accredited by German Calibration Service (DKD) was based at HBM. It is one of the best known and most capable calibration laboratories of its type.

HBM continuously invests in expanding its calibration laboratory to be able to provide customers with tailored services that meet ever increasing requirements.

Accreditation to ISO 17025 covers the measured quantities force, pressure, torque and voltage ratio mV/V.

Quote from ISO 9001:

„ ... measuring equipment shall be calibrated or verified, or both, at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards.“



Traceability of your testing and manufacturing processes thanks to DAkkS-calibrated test and measuring equipment:

1 Test equipment monitoring:

Use of DAkkS-calibrated test and measuring equipment, e.g. as an in-house reference to ensure consistent production quality.

2 Increased measurement accuracy:

Use of the calibration result individually obtained for each transducer leads to a significant increase in measurement accuracy.

3 Certification:

Use of traceable test and measuring equipment guarantees that the growing demand for certification, e.g. in conformance with ISO 9001, is met.



Calibration of a TOP-Z30A in compression



DAkkS-accredited 1 kN·m torque calibration machine

DAkkS-accredited 5 MN force calibration machine for tension and compression

Reliable calibration. Many options.

DAkKS or working standard calibration

Calibration documented in a DAkKS certificate for the most demanding standards or traceable working standard calibration by HBM: **It's your choice.**

DAkKS – Deutsche Akkreditierungsstelle GmbH:

(National Accreditation Body for the Federal Republic of Germany)

- Assessment of every calibration laboratory at regular intervals, e.g. by experts from the German National Metrology Institute (PTB – Physikalisch Technische Bundesanstalt)
- Accreditation guarantees calibration in accordance with standards and guidelines
- A calibration certificate is certified proof of traceability

Working standard calibration:

- Calibration at the responsibility of the calibration laboratory carrying out the testing
- Traceability must be explicitly documented. At HBM this is accomplished by reference to ISO 10012
- Under certain conditions, possible on site



Deutsche
Akkreditierungsstelle
D-K-12029-01-00



Calibration when you buy your HBM product or re-calibration

HBM's calibration service comprises calibration when you buy your HBM device as well as re-calibration of these devices and all commonly available types at regular intervals. As a manufacturer of precision measuring technology you will benefit from the competence of all HBM staff.

Single device or measurement chain

Calibrating a complete measurement chain is recommended when the transducer and the amplifier are permanently assigned to one another. The transducer is calibrated together with the particular amplifier with which it is going to be used in the application. This allows the indication error to be minimized.

On site throughout the world or at our factory

HBM offers on-site calibration of your amplifiers at your premises. Your advantages: Downtime of your test and measuring equipment is reduced because no disassembly or shipping is required. You can consult local experts who will then carry out the calibration; the procedure is identical to calibration at our laboratory. Reliability through clear OK/Not OK evaluation in the calibration certificate.

Partial or complete measuring range

For certain requirements, it makes sense to restrict the classical calibration for the nominal (rated) range to part of the possible measuring range, which often improves the accuracy in this partial range.

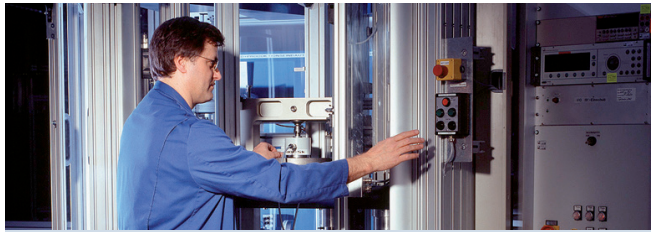


HBM calibration service - on site at the customer's premises throughout the world









Comprehensive calibration service for HBM's entire range of products as well as for third-party devices

HBM precision over the entire range

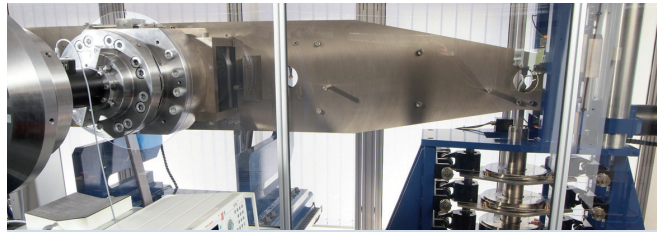


Force

- First measured quantity of the DKD (1977, initially HBM only)
- Extremely large range of calibration steps (2.5 N to 5 MN)

Measuring range		DAkKS calibration				Working standard calibration			
in N		Steps				Steps			
					<div><div>8</div><div>10</div><div>6</div></div> <div><div>A</div><div>B</div></div>				<div><div>6</div><div>10</div><div>C</div></div>
5	N	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
10	N	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
20	N	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
50	N	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
100	N	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
200	N	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
500	N	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
1	kN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
2	kN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
5	kN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
10	kN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
20	kN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
50	kN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
100	kN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
200	kN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
500	kN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
1	MN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
2	MN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
5	MN	*	*	*	<div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
		Best measurement capability: > 0.005%				<div><div></div> Standard offer</div> <div><div></div> Not available</div> <div><div></div> On request, by external accredited calibration laboratory</div>			

- A 4+2 increasing/decreasing series (ISO 376)
 B 1+1 increasing/decreasing series (DKD-R 3-3, sequence C)
 C 1+1 increasing/decreasing series



Torque

- First accredited torque calibration laboratory (since 1990)
- Highest accuracy attained outside national metrology institutes

Measuring range*		DAkKS calibration				Working standard calibration			
in N·m		Steps				Steps			
		<div><div><div></div><div></div><div></div></div><div><div>5</div><div>8</div><div>10</div><div>6</div></div><div><div>A</div><div>B</div></div></div>				<div><div><div></div><div></div><div></div></div><div><div>6</div><div>10</div></div><div><div>C</div></div></div>			
0.1	N·m			*	<div><div></div><div></div><div></div><div></div></div>				
0.5**	N·m			*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
1	N·m			*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
2	N·m			*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
5	N·m			*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
10	N·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
20	N·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
50	N·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
100	N·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
200	N·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
500	N·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
1	kN·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
2	kN·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
3	kN·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
5	kN·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
10	kN·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
25	kN·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
400***	kN·m	*	*	*	<div><div></div><div></div><div></div><div></div></div>	*	*	*	<div><div></div><div></div></div>
up to 1.1	MN·m			*	<div><div></div><div></div><div></div><div></div></div>				
		Best measurement capability: > 0.008%				<div><div></div> Standard offer</div> <div><div></div> Not available</div> <div><div></div> On request, by external accredited calibration laboratory</div>			

- A 4+3 increasing/decreasing series (DIN 51309, EURAMET cg-14 or DKD-R 3-5)
 B 2+1 increasing/decreasing series (VDI 2646)
 C 1+1 increasing/decreasing series

* In the range of 5 N·m up to 1 kN·m: for DAkKS, steps of 1 N·m possible
 In the range of 100 N·m up to 25 kN·m: for DAkKS, steps of 100 N·m possible
 In the range of 3 kN·m up to 400 kN·m: for DAkKS, steps of 1 kN·m possible
 ** 3 steps only, *** No alternating torque

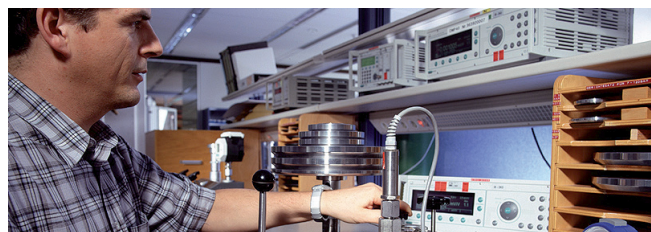


Voltage ratio

- Unique combination of calibration options in the DAkkS (direct and alternating voltage)
- Highest accuracy of all DAkkS-accredited calibration laboratories

Measuring range		DAkkS calibration				Steps
in mV/V		1 V	2.5 V	5 V	10 V	
DC	0.5			•	•	■
	1			•	•	■
	2			•	•	■
	5			•	•	■
	10			•	•	■
225 Hz	0.5			•	•	■
	1			•	•	■
	2			•	•	■
	2.5			•	•	■
	5		•	•		■
600 Hz	10		•	•		■
	2	•	•	•		■
	2.5		•	•		■
	5		•	•		■
4800 Hz	10		•	•		■
	2	•	•	•		■
	5	•	•	•		■
	10	•	•	•		■
	20	•	•	•		■
	100	•	•	•		■
1000		•	•			■
		Best measurement capability: 0.000020 mV/V				■ Standard offer

22 11+11 steps (pos. + neg.), if possible; otherwise adapted number of steps



Pressure

- Very large range of calibration steps (0.1 bar to 10,000 bar gauge pressure)

Measuring range		DAkkS calibration		
in bar		Gauge pressure	Absolute pressure	Steps
				10 A
0.05		•		■
0.1		•		■
0.2		•		■
0.25		•		■
0.5		•		■
1		•	•	■
2		•	•	■
5		•	•	■
7		•	•	■
10		•	•	■
20		•	•	■
50		•	•	■
100		•	•	■
200		•	•	■
500		•	•	■
1000		•	•	■
2000		•	•	■
3000		•	•	■
3600		•	•	■
5000		•	•	■
10000*)		•		■
> 10000		•		■
		Best measurement capability: > 0.003%		■ Standard offer ■ On request, by external accredited calibration laboratory

A 2+2 increasing / decreasing series (DKD-R 6-1)

*) Standard offer: working standard calibration according to ISO 10012 (6 steps)

Your route to the HBM calibration laboratory

Tel. +49 6151 803-436

Fax +49 6151 803-590

Email DAkkScal@hbm.com



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