

# Calibration of pressure measurement systems

DAkS and ISO calibrations for air and nitrogen



# CALIBRATION SERVICES

## CALIBRATION TO MAINTAIN QUALITY STANDARDS

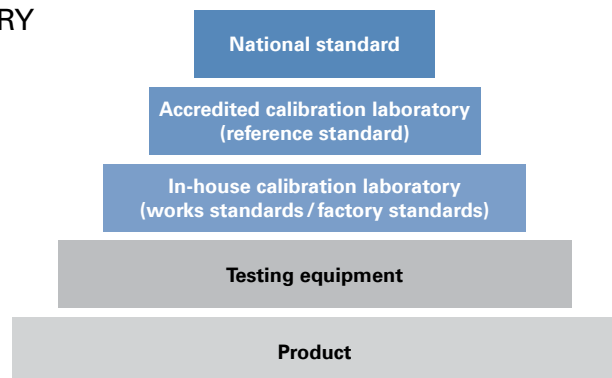
To ensure that an instrument provides accurate measurements, regular calibrations are necessary. Calibration means to operate a target-performance comparison using a measuring instrument and a traceable reference. Calibration of instruments is essential in every area where sensitive measurement technology is used, e.g. in the manufacturing of sensors. It is the only way to guarantee quality standards and prevent defects arising in processes and products from the outset. For companies wanting to attain ISO 9001 certification, regular calibration of testing equipment is a requirement.

## PRESSURE CALIBRATION IN THE LABORATORY

Since 1999 our calibration laboratory has been accredited by the German calibration service DKD or rather Deutsche Akkreditierungsstelle GmbH (DAkkS) in accordance with DIN EN ISO/IEC 17025 – among other things for calibration of pressure measurements. Its calibration services are available for all makes of equipment independently of the type or manufacturer. Our high precision reference objects, used during calibration, are calibrated at regular intervals at the PTB and therefore traceable to the national standard.

Overview of services for “Pressure” measurements at our calibration laboratory:

- Differential pressure transmitters, calibration instruments, absolute pressure transmitters and portable pressure gauges
- **Absolute pressures** of 0.25 bar to 20 bar in gases (laboratory medium: air or nitrogen)
- Negative and positive **gauge pressure** of -10 mbar to 20 bar in gases (laboratory medium: air or nitrogen)
- Issuing of DAkkS certificates



Piston manometer in the calibration laboratory of halstrup-walcher

## DAKKS CALIBRATIONS

DAkkS calibration should be performed at measurement points which are critical to the quality of the product or service.



It follows a recognised, standardised procedure (e.g. in accordance with DKD-R 6-1) and the uncertainty of the calibration is stated. The DAkkS certificate is internationally recognised and documents seamless traceability to national standards.

## ISO FACTORY CALIBRATIONS

ISO factory calibration is suitable for instruments used as auxiliary devices for reference measurement and development purposes, e.g. in management of reference materials in accordance with ISO 9001.

In contrast to the DAkkS calibration, the ISO factory calibration does not state the uncertainty. ISO factory calibrations are performed in the production laboratory of halstrup-walcher using traceable references.

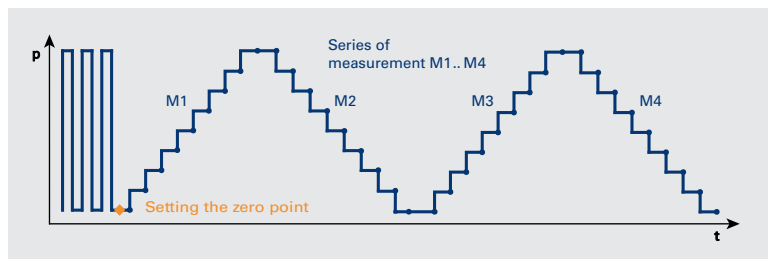
# DAKKS CALIBRATION PROCEDURE

A DAKKS calibration must be performed in accordance with the specified standards. All the parameters which could have a relevant influence on the result must be considered and documented, e.g. room temperature. The instrument being tested must perform repeated measurements at min. 5 to 9 points. The number of measurement values and points used in the procedure is adjusted in accordance with the required measurement range and uncertainty.

	Procedure A	Procedure B	Procedure C
<b>Required uncertainty</b>	< 0,1% <sup>1)</sup>	≥ 0,1 %, but ≤ 0,6 % <sup>1)</sup>	> 0,6 % <sup>1)</sup>
<b>Minimum number of measured values</b>	36	27	10
<b>Minimum number of measurement points</b>	9	9	5
<b>Number of measurement series</b>	4	3	2

<sup>1)</sup> of the measurement range (Calibration costs depend significantly on the required uncertainty.)

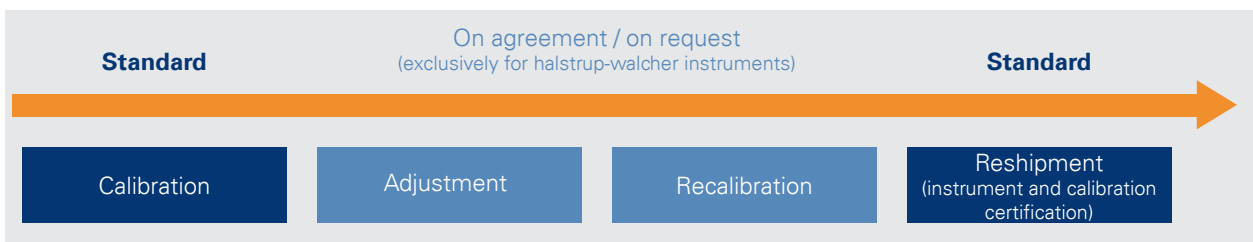
Before measurement begins, the object undergoing calibration is conditioned in the laboratory for 24 hours so it can adapt to the reference conditions. All measured values are recorded during calibration. The calibration is completed when the instrument has measured a number of values at every measurement point. The results of the calibration are confirmed in a calibration certificate. As a calibration only ever provides a snapshot of the instrument's performance, the calibration certificate is not assigned a period of validity. The user is responsible for ensuring the instrument is recalibrated at the correct intervals.



Example of calibration steps with a required uncertainty of < 0.1 % of the measurement range (Procedure A in accordance with DKD-R 6-1).

We generally recommend that instruments should be calibrated annually. However, the intervals should be shorter when instruments are used in critical processes, mobile applications or fluctuating environmental conditions.

## ADJUSTMENT – MORE THAN SIMPLE CALIBRATION



Our laboratory technicians will contact you immediately if they detect a significant deviation from the target value during start-up or after calibration. You then decide whether our service team should adjust the device in-house to ensure that the measured values are completely accurate. Recalibration after the adjustment guarantees that your processes meet the high quality standards you expect. We offer this service exclusively for halstrup-walcher instruments.



Our service team is happy to adjust your instruments

# YOUR ADVANTAGES AT A GLANCE

- ✓ **Flexibel** We offer a broad range of products and services which we can tailor to your specific requirements. You only pay for what you really need.
- ✓ **Qualified** Our laboratory has been accredited in the area of pressure calibration since 1999. Our reference instruments are regularly calibrated at the Physikalisch-Technische Bundesanstalt (PTB).
- ✓ **Precise** We calibrate even the finest measurement ranges, e.g. from -100 to 100 Pascal.
- ✓ **Fast** Calibration and other services are performed entirely on our own premises. This saves transportation time. We will normally return your instrument within 10 working days. We also offer an express service on request.

## ORDER KEY

Please specify which calibration you require and the properties of your object to be calibrated. The following order key will help you.

Order code	A	B	C	D	E	F
Calibration certificate						

Measurement range	A	Calibration certificate	B
Absolute pressure	AD	DAkKS	DAkKS
Gauge pressure / differential pressure	ÜD	Factory calibration	ISO

Required margin of error <sup>1)</sup>	C	Number of measurement points	D
Procedure A	A	Standard <sup>2)</sup>	
Procedure B	B	Number of additional measurement points	
Procedure C	C		

<sup>1)</sup> see page 3

<sup>2)</sup> The standard corresponds to the minimum number of measurement points per procedure.

Output	E	Language	F
Current	ST	German	DE
Voltage	SP	English	EN
Display	DI	German and English	DN
Analogue output	AA		
Other (e.g. USB)			

**Werkkalibrierschein Nr. 000000**  
**Pressure Calibration Certificate**

**halstrup walcher**  
 akkreditiert durch die / accredited by the  
**Deutsche Akkreditierungsstelle GmbH**  
 als Kalibrierlaboratorium im / as calibration laboratory in the  
**Deutschen Kalibrierdienst DKO**

**AMUSTER-11**  
 D-K: 21048-01-00  
 2017-09

**Digitales automatisches Druckkalibriergert**  
**halstrup-walcher GmbH**

**Objekt** Digitales automatisches Druckkalibriergert  
**Hersteller** halstrup-walcher GmbH  
**Typ** KAL 200  
**Fabrikat/Serien-Nr.** 9609.0031 AZ121213  
**Auftraggeber** Muster GmbH  
**Order No.** AMUSTER Pos. 11  
**Anzahl der Seiten des Kalibrierscheins** 3  
**Datum der Kalibrierung** 07. September 2017

**Konformitätsaussage Conformity**  
 ☑ Messwerte innerhalb der Spezifikation. Measured values within the range of the specification.  
 ☑ Messwert liegt innerhalb der Toleranz, während Differenz oder Summe aus Messwert und erweiterter Unsicherheit außerhalb der festgelegten Toleranz liegen. Measured value is within tolerance, while either difference or sum of measured value and extended uncertainty are outside of specified tolerance.  
 ☐ Messwerte außerhalb der Spezifikation. Measured values beyond the specification.

**Datum** 07.09.2017  
**Head of the calibration laboratory** F. Walter  
**Business Partner** J. Müller

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Flyer of calibration of pressure measurement systems – Date: 10/2017 –Subject to technical changes without notice