



TRUE VALUES – SETTING STANDARDS



HISTORY

We celebrate the professional conference „**Metrology Days**“ together with our partner 1A CAL

The team for metrological services and engineering grows to **15 employees**

Relocation of the company site from Neuss to **Emsbüren**

Increase of the Helmstadt site to a total of **500 m²** (commissioning of a third laboratory)

The Physikalisch-Technische Bundesanstalt (PTB) **confirms an uncertainty of 30 mK** for the calibration of temperature block calibrators (in the range from -100 °C to 150 °C)

Additional branch in **Neuss** (NRW)

Relocation to Helmstadt in 350 m²

Cooperation with **Merz Messführlertechnik**

Birth of imetrologie GmbH in Waldbüttelbrunn near Würzburg - **two employees start laboratory operation**

2021

We celebrate our 10th anniversary

2020

Accreditation of proficiency testing providers
Germany-wide distribution of innovative process calibration tools of the manufacturer Additel Corporation

2019

Commissioning of the new **pressure laboratory**

2018

Extension of the accreditation of the measurand **pressure**: calibration of pressure balance and pressure controllers (from -1 bar to 1.500 bar)

2017

2016

Accreditation of further measurands:
electrical signals, pressure, material testing machines

2015

Accreditation of the measurands **relative humidity & dew point**
Germany-wide distribution of high quality SPRT-resistance thermometers of the ACCUMAC manufacturer

2014

Entry into **high-end calibration** of SPRTs at fixed points of the ITS-90: triple points of water & mercury, freezing points of indium, tin, zinc and aluminum and at the melting point of gallium

2013

2012

Membership in the German Calibration Service

2011

First accreditation according to DIN EN ISO/IEC 17025 for temperatures -200 °C to 1,400 °C



Accredited CALIBRATION LABORATORY

imetrologie GmbH is a metrological institute for the thermodynamic measurands temperature and humidity, the mechanical measurands pressure and material testing machines (force, length, hardness) and for electrical signals.

We see it as our main task to improve the quality of products and processes. Our highly specialized employees offer solutions for sensor technology, processes and procedures.

We develop innovations for quality-conscious customers.

As a system supplier, we offer our holistic concepts to our customers. In this context, we focus on the sustainability of resources, humanization of workplaces and care of network partnerships from industry and science.

„Knowledge management is becoming increasingly complex for the realization of many processes. The imetrologie sees itself as an open community for all tasks of metrology as well as measurement and control technology in the environment of analog and digital technology: „by people - for people.“

Herbert Kirchner

Herbert Kirchner
Company founder and managing director





Range of SERVICES

Metrological Services

Calibrations

- DAkkS calibrations
- Factory calibrations
- In the lab
- On-site

Tests

Measurements

- Profile measurements (TUS)
- Drag measurements
- Comparison measurements (SAT)

Validations and Qualifications

Proficiency testing (ISO 17043)

Adjustments

Repairs

Measurement and calibration systems of the measurands



Temperature



Pressure



Humidity



Electrical signals



Materials testing machines

Knowledge management and consulting

Expert consulting & applications

Seminars & trainings

Qualifications

Workshops

Engineering



Further details about the range of services and the accreditation certificate can be found on www.imetrologie.com



Calibration

TEMPERATURE

The metrologie practices various thermodynamic procedures:

Fixed point calibrations

The calibrations at fixed points are realized by thermodynamic equilibrium states in high-purity materials at melting or solidification plateaus respectively or at the triple point of water or mercury.

Comparative measurements

The essence of comparative measurement is based on the principle of direct comparison of two measurement systems. Both measurement systems experience a thermal coupling in a steady (stable) state under almost identical installation conditions.



From -196 °C to 1.400 °C



Calibration objects of the measurand temperature

- Resistance thermometers
- Thermocouples
- Semiconductor sensors
- Block calibrators
- Liquid baths
- Glass thermometers
- Temperature measuring instruments
- Simulators and indicators
- Data loggers



Full service

- Characteristic curve approximations
- Multipoint adjustments
- Conformity assessments
- Homogeneity investigations
- Hysteresis effects
- Bath qualifications
- Profile measurements (TUS: Temperature Uniformity Survey)
- Comparison measurements (SAT: System Accuracy Test)
- Consultations
- Trainings and workshops



Block calibrators

Sales, service, training, calibration (ISO/IEC 17025)



DAkkS calibration certificate with very small uncertainties ≥ 30 millikelvin

Calibrations are based on the guideline DKD-R 5-4 'Calibration procedure of block calibrators'.

In our calibration certificates we document detailed information about metrological influences such as stability, axial and radial inhomogeneity and hysteresis. Loading influences are also optionally examined.

Alignment and optimization

We optimize your block calibrator using adjustment software in order to minimize the deviations.

Ideal metrological solutions

Our range of temperature block calibrators covers

a wide variety of applications and serves diverse requirements:

Reference temperature calibrators

- Application: very accurate calibrations in the laboratory
- Perfect temperature homogeneity
- Range -100 °C to 700 °C
- Measurement accuracy up to ± 0.03 °C | stability ± 0.005 K

Professional temperature calibrators

- Application: comparison measurements and calibrations in the laboratory and on-site/test field
- Excellent temperature homogeneity
- Range -90 °C to 660 °C
- Measurement accuracy up to ± 0.06 °C | stability ± 0.01 K

Compact block calibrators

- Application: comparison measurements and thermal treatments in the laboratory and on-site/test field
- Range -25 °C to 1,205 °C
- Measurement accuracy up to ± 0.2 °C | stability ± 0.05 K





Calibration object Procedure	Measurement range	Uncertainty of measurement
Block calibrators	-100 °C to 155 °C	0,03 K
	> 155 °C to 300 °C	0,05 K to 0,06 K
DKD-R 5-4	> 300 °C to 500 °C	0,08 K to 0,10 K
	> 500 °C to 700 °C	0,12 K to 0,15 K
	> 700 °C to 960 °C	4,0 K
	> 960 °C to 1.200 °C	5,0 K

External standard for block calibrators

Calibrated resistance thermometers for use up to 700 °C with measurement uncertainties from 10 mK provide additional safety by measuring.

Optionally, you can also purchase completely self-sufficient measuring systems by us. These systems consist of a resistance thermometer in combination with a display unit and have a resolution of 0.001 K.





SPRT Standard Platinum Resistance Thermometer

The right standard for your laboratory application

Our product portfolio of SPRTs extends from reliable working standards to highly stable reference standard made of quartz glass with excellent long-term stability. Our customers profit from our manufacturer-independent experience.

Calibration of resistance thermometers at fixed points ≥ 0.8 millikelvin

Based on the 'Guide to the Realization of the ITS-90' for resistance thermometers we calibrate SPRTs at fixed point cells traceable to a National Metrology Institute (NMI). A thermodynamic state of equilibrium is established in the fixed-point cell after the preparation and initialization of the melting or freezing phase. Ideal SPRTs show a spread of less than 1 mK in the fixed point cell after subsequent heat coupling.

Calibration object	Fixed point/procedure	Temperature	Uncertainty of measurement
Standard resistance thermometer (SPRT)	Liquid nitrogen	-196 °C	15 mK
	Comparison measurement in liquid bath	-100 °C	5,0 mK
	Mercury triple point	-38,8344 °C	1,5 mK
	Water triple point	0,01 °C	0,8 mK
	Gallium melting point	29,7646 °C	1,5 mK
	Indium solidification point	156,5985 °C	2,5 mK
	Tin solidification point	231,928 °C	3,0 mK
	Zinc solidification point	419,527 °C	3,0 mK
	Aluminum solidification point	660,323 °C	7,0 mK

Information in the DAkkS calibration certificate

- Thermal process to reduce reversible voltages of the sensor and oxidation effects
- Short-term stability through continuous ascertaining of the resistance ratio (w-value) related to the water triple point water triple point
- Heat dissipation of the SPRT: measurement with different currents, e.g. 1 mA and $1 \times \sqrt{2}$ mA at the same fixed point temperature

Characteristic approximation

From the resistance measured data of the thermometer at the different fixed points temperatures, the coefficients of the ITS-90 deviation functions are determined. This creates an interpolation thermometer that can be used as a reference standard for comparison measurements with minimum uncertainties ≥ 3 mK.

Define your selection criteria

Reference standard | Working standard

Range ≥ -196 °C to ≤ 660 °C

Long-term stability ≥ 2 mK

Hysteresis ≥ 0 mK





Fixed point calibration

The calibration of fixed-point cells is performed by direct comparison with a reference fixed-point cell traceable to SI units.

Fixed-point cell	ITS-90 temperature	Uncertainty of measurement
Water triple point	0,0100 °C	0,5 mK
Gallium melting point	29,7646 °C	0,8 mK

Traceable reference standard at the highest level

Taking into account the hydrostatic pressure correction the melting and freezing plateaus of the reference cell and the cell to be calibrated are compared. Due to the purity of the fixed-point materials, fixed-point temperatures can be reproduced with an accuracy of less than 1 mK. Fixed point temperatures are clearly defined and thus represent the fundamental points of the current International Temperature Scale of 1990 (ITS-90).





IPRT/NTC resistance thermometer

Calibration (ISO/IEC 17025)

From the highly stable laboratory thermometer to the specially designed process resistance thermometer we evaluate on the basis of the procedure DKD-R 5-1 the quality of your sensor.

Thermal treatment

We reduce reversible tensions and stabilize the sensor by thermal treatment.

Metrological influences

The quality of a thermometer can be determined by various metrological properties.

These include:

- Stability | repeatability
- Hysteresis
- Self-heating effects
- Insulation properties
- Dynamic properties

New procurement (reference standards)

Based on our long-standing experience, we gladly advise you regarding to the most suitable measuring device. We design and supply sensors and measuring systems individually for your application.

Calibration object Procedure	Measuring range	Uncertainty of measurement
Resistance thermometer	-196 °C (LN ₂)	20 mK
	-100 °C	5 mK
DKD-R 5-1	0,01 °C (TPW)	5 mK
	29,7646 °C (Ga)	5 mK
	0 °C to 250 °C	10 mK
	> 250 °C to 550 °C	20 mK
	> 550 °C to 660 °C	50 mK



Thermocouples

Calibration (ISO/IEC 17025)

In the range of -196 °C to 1,400 °C we calibrate thermocouples according to procedure DKD-R 5-3 by means of comparative measurements in liquid baths and calibration furnaces.

By using reference thermocouples made of platinum/ rhodium, platinum/palladium and gold/platinum we are able to show the smallest uncertainties even at high temperatures.

Study of inhomogeneity

The inhomogeneity of thermocouples contains the greatest metrological influence. In our laboratory we investigate the effect at different immersion depths in liquid baths (silicone oil baths, salt baths).

Calibration object Procedure	Measuring range	Uncertainty of measurement
Thermocouples DKD-R 5-3	-196 °C (LN ₂)	0,3 K
	-100 °C to 200 °C	0,2 K
	> 200 °C to 300 °C	0,3 K
	> 300 °C to 400 °C	0,4 K
	> 660 °C to 1.000 °C	0,8 K
Reference points Thermoelectric lead	1.000 °C to 1.400 °C	1,5 K to 3,0 K
	0,01 °C (TPW)	25 mK
	29,7646 °C (Ga)	25 mK
	0 °C to 30 °C	50 mK

Evaluation of conformity (DIN, AMS, CQI)

Reference standards for use in measurement and control technology, process equipment and especially heat treatment are qualified and validated according to the normative documents (DIN, AMS, CQI) or according to individual customer specifications.

Compensation cables and reference junction management

For precise measurements with thermocouples, the compensating cables/extension cables with very small uncertainties are the basic requirements. We can also realize very small measurement uncertainties of reference junction systems and thermocouples with our metrological resources and issue corresponding result reports.





Simulators & Indicators

Simulators and indicators are calibrated according to the guideline DKD-R 5-5 with electrical calibrators or 8.5-digit digital multimeters.

Measurement setup with external reference junctions

External reference junctions with very homogeneous thermocouple lines form the basis for very small uncertainties.

Pt100 simulation/indication with uncertainty 2 mK

In order to minimize disturbing metrological influences, exclusively low-thermoelectric voltage connection cables with the best possible shielding in 4-wire connection technology are used for the calibration of Pt100, Pt1000 and Pt25 calibrators and indicators.

Calibration object Procedure	Type	Measuring range	Uncertainty of measurement
Simulators & Indicators	Resistance thermometer	-200 °C bis 850 °C	2 mK
	Precious metal thermocouples	> -50 °C bis 1.768 °C	0,1 K
DKD-R 5-5	Non-precious metal thermocouples	> -200 °C bis 1.300 °C	0,05 K



Glass thermometers

Temperature measurements with liquid-glass thermometers are still practiced today. The measurement deviation of wetted and unwetted liquid-in-glass thermometers is determined based on **PTB Guideline 14-01**.

Peculiarities of liquid-in-glass thermometers

Experienced calibration technicians of metrology are familiar with the peculiarities of the tests and calibrations of liquid-in-glass thermometers.

- Determination of the **stem correction** for partially immersing measurement setups
- Consideration of metrological influences: depression and secular rise
- Merging of filling liquids, especially with organic (wetted) liquids

Conformity assessment according to type standards

Type-typical glass thermometers are subject to conformity assessments and their respective DIN-ASTM or BS standards. If requested by the customer, a conformity assessment is documented in the result report.

Calibration object Procedure	Measuring range	Uncertainty of measurement
Liquid-in-glass thermometer	-196 °C (LN ₂) bis > -58 °C	50 mK
	-58 °C bis 110 °C	10 mK
	> 110 °C bis 205 °C	20 mK
PTB test rule 14-01	> 205 °C bis 420 °C	40 mK
	> 420 °C bis 660 °C	0,1 K bis 0,2 K





Calibration PRESSURE

Calibration of pressure gauges is performed in the range from **0,015 mbar** to **1.501 bar absolute pressure** in our pressure laboratory. For compound pressure we are accredited in the pressure range from -1 bar to 1.500 bar.

Guidelines

In our laboratory we perform calibration according to the following normative guidelines:

- Guideline DKD-R 6-1 'Calibration of pressure gauges'
- Guideline EURAMET cg-03 'Calibration of Pressure Balances' for piston manometer'
- Guideline EURAMET cg-17 'Calibration of electromechanical Manometers'





From -1 bar to 1.500 bar

Calibration objects of the measurand pressure

- Pressure gauges
- Miniscopes
- Data logger
- Pressure controllers
- Pressure measuring systems
- Barometers
- Pressure balances (death weight testers)
- Pressure sensors
- Pressure calibrators

Calibration object Procedure	Measuring range	Uncertainty of measurement
Pressure systems - absolute pressure - compound pressure	-1 bar bis -0,015 bar	bis zu 5,3 µbar
	-0,015 bar bis 0,015 bar	7,5 µbar
	0,015 bar bis 1,8 bar	bis zu 3,3 µbar
DKD-R 6-1 EURAMET cg-03 EURAMET cg-17	> 1,8 bar bis 7 bar	bis zu 7,1 µbar
	> 7 bar bis 70 bar	bis zu 71 µbar
	> 70 bar bis 200 bar	bis zu 4,4 mbar
	> 200 bar bis 500 bar	bis zu 14,2 mbar
	> 500 bar bis 1.500 bar	bis zu 31,6 mbar

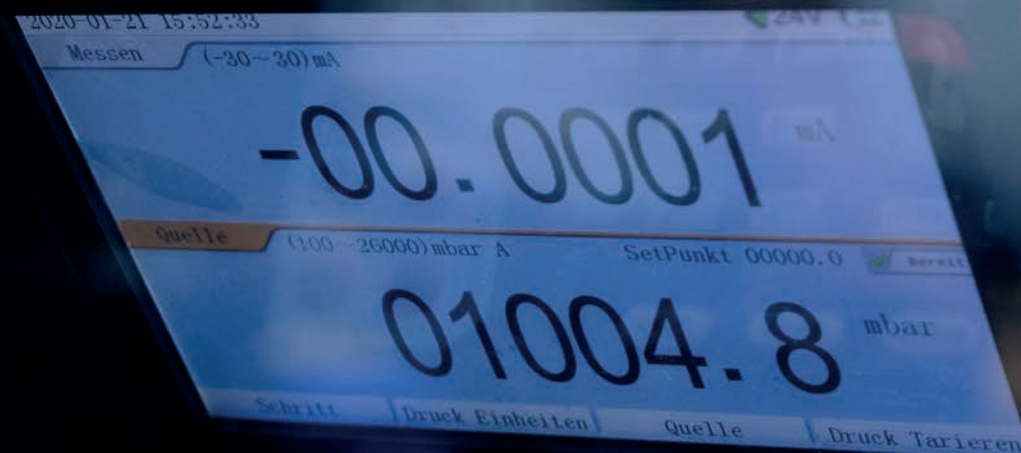




Barometric air pressure measurement

A variety of physical processes require knowledge of the accuracy of the hydrostatic pressure of the air.

The metrologie produces conformity assessments in result reports with uncertainties ≥ 15 microbar for very accurate barometric measurement systems.

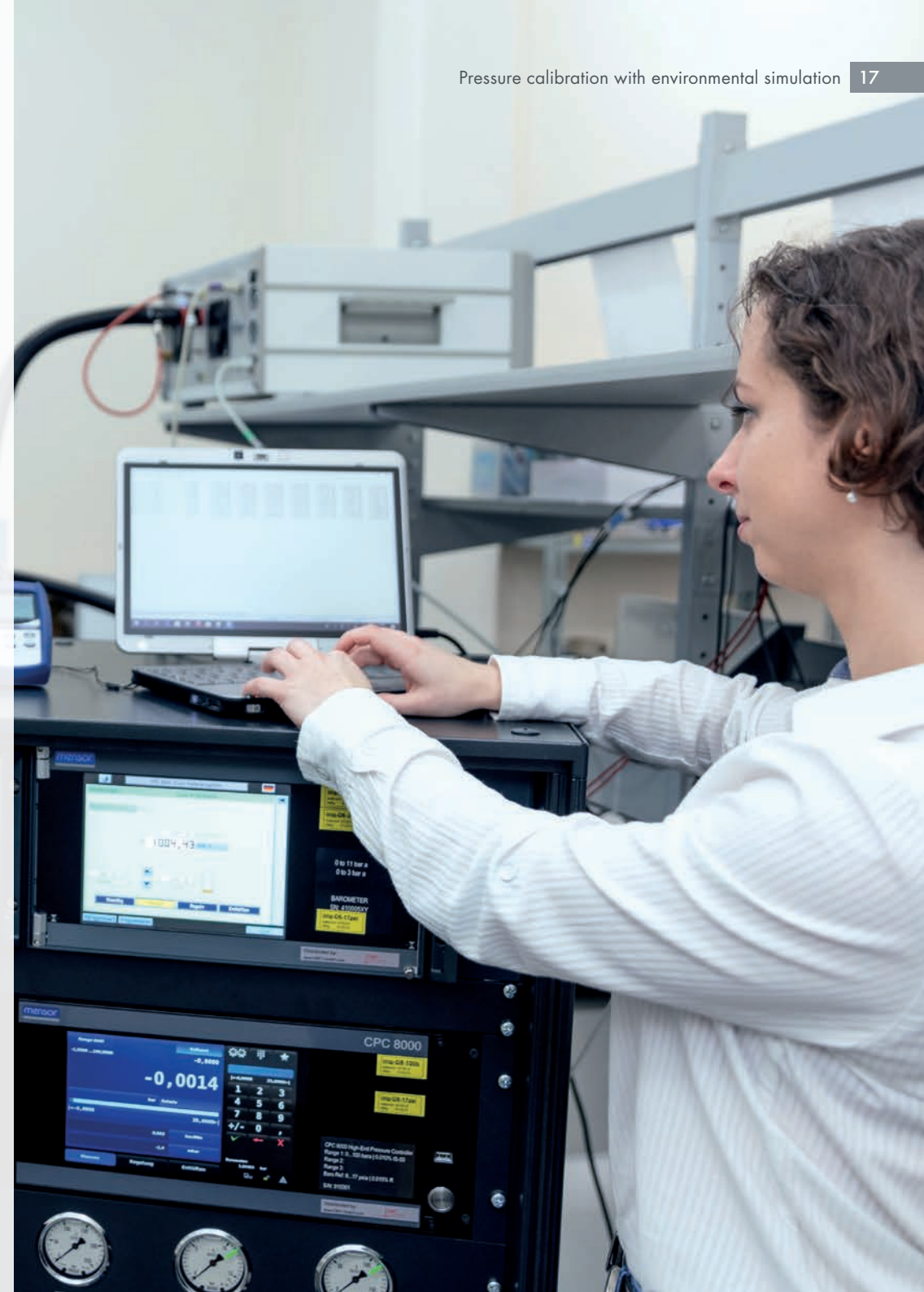




Pressure calibration with environmental simulation

Environmental simulations are made from a combination of the measured variables temperature, humidity and pressure at the highest metrological level.

- Evaluation of the **suitability** of measuring systems for successful use in practice
- Determination of pressure readings at constant temperatures in an **isothermal environment** e.g. 134 °C
- Influence of pressure readings in a **thermodynamic process** with defined rising and falling temperature sequence
- **Systems for gravimetric measurements** to determine air density under the influence of hydrostatic pressure of ambient temperature and relative humidity.



Calibration HUMIDITY

Water is one of the air components. The amount of water vapor, which can evaporate into the air, is largely dependent on the air temperature.

In our humidity generators (two-pressure method) we calibrate humidity measurement systems with uncertainties of minimally 0.17 % relative humidity and dew point temperatures with an uncertainty of minimally 65 millikelvin.

From 5 % to 98 %
at a temperature from 5 °C to 95 °C

Calibration items of the measurand humidity

- Capacitive sensors
- Psychrometers
- Hygrometer
- Dew point mirrors
- Climatic cabinets
- Data loggers for humidity and temperature





Calibration object Procedure	Measuring range	Uncertainty of measurement
Hygrometer, Psychrometer Relative humidity DKD-R 5-8	5 % to 98 %	0,17 % to 0,98 %
Dew point mirror Dew point temperature	-20 °C to 90 °C	65,0 mK to 85,0 mK
Climatic cabinets (on-site) DKD-R 5-7 Ablauf A, B, C	5 % to 95 % -90 °C to 500 °C	0,6 % to 1,0 % 0,2 K to 0,5 K



Climate cabinets

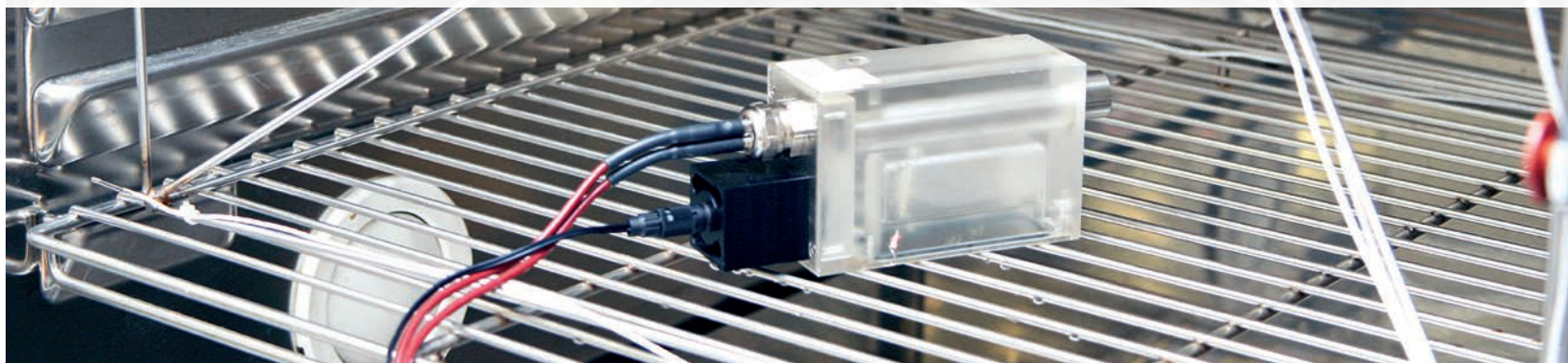
On-site calibration (humidity & temperature)

Our calibration technicians evaluate the conformity of your climatic cabinets based on the guideline DKD-R 5-7. According to the customer's requirements we determine the metrological properties of a climatic cabinets:

- Stability of temperature and relative humidity in the center of the climatic cabinets

- Homogeneity of temperature distribution and distribution of relative humidity in the effective volume
- Impact with and without loading

By means of our traceable test equipment we are able to calibrate climatic chambers with maximum dimensions of 5 m width x 6 m length x 4 m height and a volume of 120.000 liters.



Calibration ELECTRICAL SIGNALS

Based on the series of standards VDI/VDE/DKD 2622, we perform calibrations of electrical quantities:
Direct current, direct voltage, alternating voltage, alternating current, resistance and frequency.
 DAkkS calibrations, tests and quality relevant measurements are carried out for various measuring equipment.



Calibration objects of the measurand electrical signals

- Digital multimeters
- Laboratory calibrators
- Process calibrators
- Standard reference resistors
- Precision resistors
- Resistance decades
- Frequency Counters
- Insulation meters
- Current clamps



Measured variable	Measuring range	Uncertainty of measurement
Resistors	1 Ω, 10 Ω, 25 Ω, 100 Ω, 400 Ω, 1 KΩ, 10 KΩ	$3 \times 10^{-7} \times R$
	1 Ω to 20 GΩ	$5 \times 10^{-6} \times R$
DC voltage	0 to 1.100 V	$0,4 \mu\text{V} + 3,4 \times 10^{-6} \times U$
Direct current	0 to 2,2 A	$50 \text{ nA} + 15 \times 10^{-6} \times I$
AC voltage	0 to 1.000 V 20 Hz to 1 MHz	$5 \times 10^{-5} \times U$
Alternating current	100 μA to 2 A 10 Hz to 10 kHz	$2 \times 10^{-4} \times I$
Frequency	1 Hz to 300 MHz	$8 \times 10^{-6} \times f$

Calibration of **MATERIAL TESTING MACHINES**



We calibrate material testing machines for tensile and compressive force on-site according to DIN EN ISO 7500-1 with load cells of class 00 and class 0,5 as well as with load bodies of class M1.

Optionally, the crosshead travel can also be determined according to DIN EN ISO 9513.

Measured variable	Measuring range	Uncertainty of measurement
Tensile force, Compressive force	1 N bis 100 N	0,10 %
	50 N bis 200 KN	0,12 %
Length	0 mm bis 1.500 mm	2,0 x 10 ⁻³ but not smaller than 1.5 µm



SEMINARS & TRAININGS



Knowledge management is a matter close to our hearts! Experienced technicians and engineers report on relevant selected knowledge topics, ranging from the fundamentals of measurement technology to the practical application of calibration procedures with helpful hints in seminars, trainings and workshops.

Contents

- Fundamentals of metrology and metrological definitions
- Structure and functionality of sensors
- Temperature calibrations
 - Thermometers
 - Thermocouples
 - Block calibrators
- Humidity calibrations
 - Capacitive sensors
 - Psychrometers
 - Climatic chambers
- Pressure calibrations
 - Pressure measurement systems
- Uncertainty balances
 - With GUM-workbench/Excel
 - Determination and quantification of metrological influences
- Rest equipment management
 - Recalibration, intermediate tests, drift estimation
 - Traceability
- Detection of the most frequent errors during measurement/calibration
- QM according to DIN EN ISO 17025
 - Basics
 - Performance of internal audits
 - Complete service for accreditations

You can find more details on the contents at www.imetrologie.com → Knowledge/Training





Target group: laboratory managers and deputies, employees in laboratories, QM assessors and auditors, quality managers, process managers.



For **beginners** & **advanced participants**



Range of seminars on

- Temperature
- Pressure
- Humidity
- QM system according to DIN EN ISO/IEC 17025
- Others by arrangement



Duration: by arrangement



Location: by arrangement

- In training and laboratory rooms of metrologie
- On-site at the customer
- In seminar rooms with network partners



Certificate as confirmation of course attendance



PROFICIENCY TESTS



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DIN EN ISO/IEC 17043

Proficiency tests are performed within the scope of accreditation for calibration laboratories by the Deutsche Akkreditierungsstelle GmbH (DAKKS). They represent an important element in ensuring the validity of results in the quality management of a laboratory operation.

As a pilot laboratory, we perform proficiency tests based on the DIN EN ISO/IEC 17043 standard. We practice nearly all procedures of the measurands temperature, humidity and pressure with very small uncertainties as an accredited calibration laboratory.

Subject area	Measured variable Calibration object	Conditions	Proficiency testing program
Temperature	Standard platinum resistance thermometer	at fixed points of the ITS-90	Proficiency testing programs are carried out on request
	Direct reading thermometers Resistance thermometers Thermocouples Liquid-in-glass thermometers Temperature block calibrators Transmitters Semiconductor sensors Mechanical thermometers Air temperature sensors Simulators and Indicators	Comparison method	
	Thermometer characteristics		
Humidity	relative humidity hygrometers, psychrometers	Comparison method	
	climatic chambers absolute humidity dew point mirror	Absolute method	
Pressure	absolute pressure/overpressure	pressure medium gas and oil	



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Proficiency tests can be requested at any time as a bilateral comparison and can be conducted at short notice.

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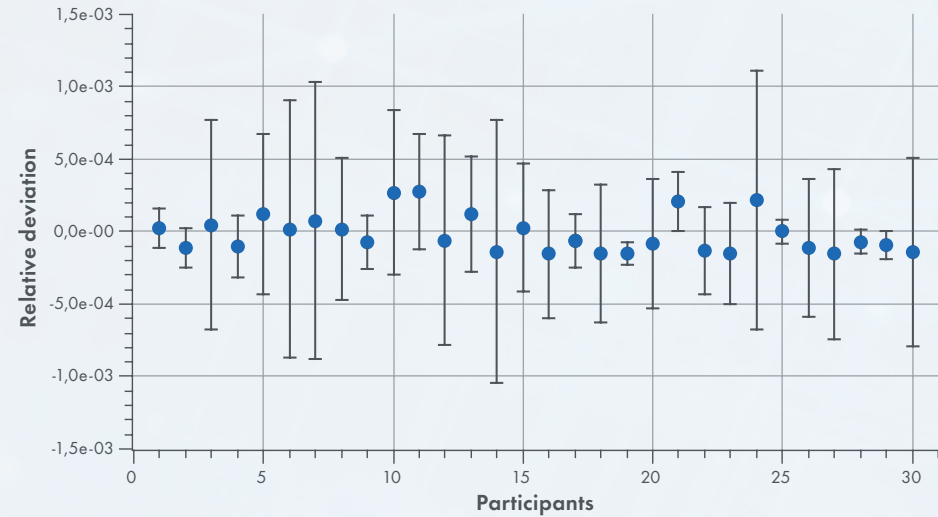
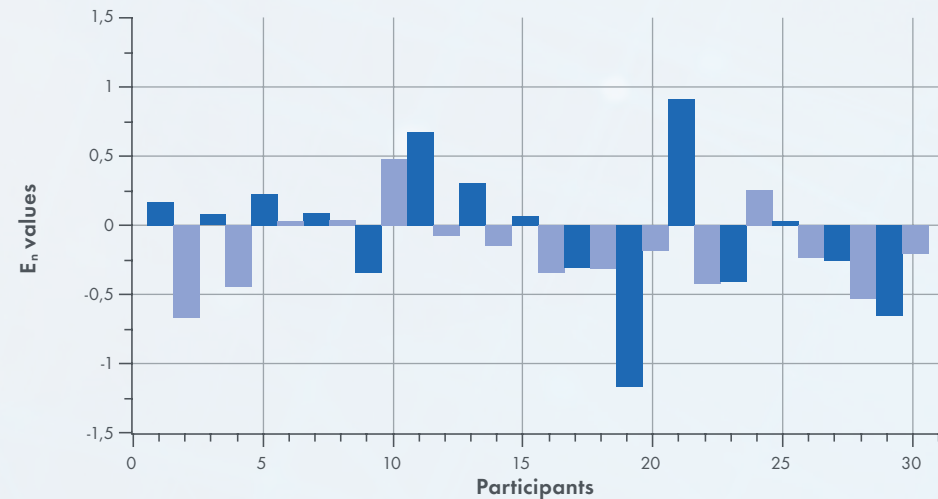
Intercomparisons with several participants are planned via proficiency testing programs and realized with the involvement of all participants concerned. Due to the high number of participating laboratories, the statistical basis of an interlaboratory comparison is even more meaningful than is possible with a bilateral comparison.

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Relative deviation to the pilot laboratory with MU

E_n values of the participants

SERVICE & SUPPORT

Your task is the 'measure of all things' for us. We accompany you throughout the entire process and offer you individual customer support with a personal contact, **from consulting to the final commissioning** on-site at your company.



STEP 1



STEP 2



STEP 3



STEP 4

Application

- Clear clarification of the task based on your application
- Physical requirements for processes/measurement task
- Consideration of normative documents
- Decision rule: Evaluation of conformities
- Determination of adjustment criteria
- Safety-relevant aspects such as e.g. DGUV V3 tests

Consulting & Engineering

- Definition of relevant parameters
- Selection of the right calibration procedure
- Consulting
 - Proficiency check of existing systems
 - Advantages of alternative systems
 - Optimization of systems
- Engineering solutions from one source: Concept development and creation
 - Procurement of new systems
 - Data acquisition and data management via individual software
 - Qualification/stabilization
 - Calibration
 - Validation

Metrological services

- Evaluation of the input status of the measuring system
- Realization of the calibration procedure
- Stability studies
- Documentation of 'as found' and 'as left' values
- Specification of characteristic curve approximations
- Evaluation of conformity
- Release by the metrologie laboratory

Result report & feedback

- Creation of a result report with all relevant information: Measured values, measurement deviations, uncertainties, installation conditions, determined properties as well as the specification of the calibration procedure
- In the case of anomalies, immediate consultation with the customer for the purpose of further action
- Verification of the results report for individual agreements with customers



STEP 5

Final support

- Quick introduction to the application of the customer
- Interpretation of the results report and recommendations for reliable and long-term stable use as a standard measuring system
- Joint commissioning of your system (test equipment) into the operational condition



STEP 6

Aftersales

- Detection of metrological abnormalities: Oxidations, lack of insulation, leaks, chemical contaminations, hysteresis effects, inhomogeneities or instabilities
- Repair of your systems or manufacturer-independent consulting and new procurement of adequate replacement (commodity) based on your metrological requirements
- Maintenance of mechanical and electronic measuring systems



STEP 7

Knowledge Management

- Imparting of theory and practice
- Individual training and workshops in the imetrologie laboratories or on-site at the customer premises
- Determination of metrological influences in your process, creation of a mathematical model and uncertainty balance in Excel or GUM-Workbench

Calibration services in the laboratory and on-site

Qualification of measuring & testing stations:

- DIN EN ISO/IEC 17025
- AMS 2750 E, CQI-9, IEC 584, IEC 751 ISO 7500, ISO 9513
- Customized Applications
- High-quality measurement and calibration systems
- Thermodynamic process equipment

SYSTEM SUPPLIER

for measuring and calibration systems

As a metrological service company, we have gained experience over a wide range of measurement systems. We are happy to pass on this experience to our customers and also act as a system supplier for almost all manufacturers.

We create customized solutions for:

- Complete calibration devices
- High-end calibration systems
- Process measuring instruments
- Dew point mirrors
- Psychrometers & Hygrometers
- Calibrators & Controllers
- Data Loggers & Transmitters
- Sensors (digital, analog)
- Material testing machines (tensile force, compression force, length, hardness)



SPRT High Stable Platinum Resistance Thermometers

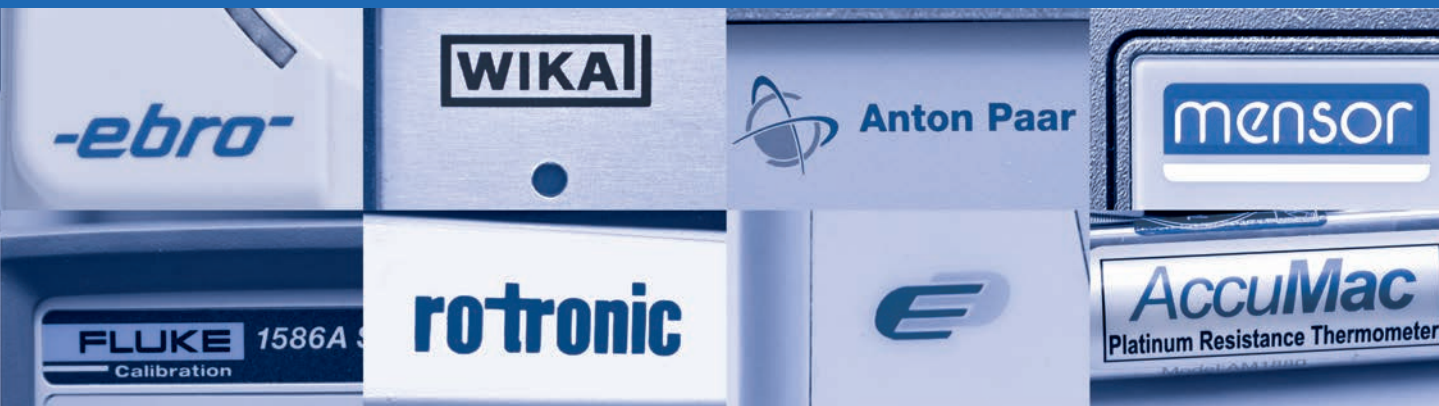
- Primary & Secondary Standards
- Calibration Standards (Pt25, Pt100) from -260 °C to 660 °C
- Sheath: Quartz | Inconel
- Long-term stability: ≥ 2 mK
- Hysteresis: ≈ 0 mK
- Calibrated at fixed points of the ITS-90 Uncertainty: 0.8 mK to 3 mK



Highly stable Resistance Thermometers

- Resistance thermometers (Pt100, Pt1000, NTC)
- Thin layer | Wire wound
- Class 1/10 B, ..., A, B
- Stabilized by systematic heat treatment
- Specified properties regarding hysteresis & heat dissipation
- Process specific dimensions





Our network partners

As a partner of industry and science, we have a highly effective network and act in an interdisciplinary manner. This network extends from almost all manufacturers of sensor and measurement systems to many service providers of accredited calibration and testing laboratories, technical universities and national metrology institutes.

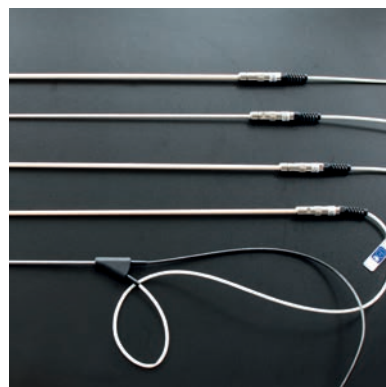
Temperature measuring systems

- Temperature measuring bridges
- Resistance thermometers with resolutions of 1 mK and 0.1 mK
- Scanner measuring systems with integrated 8.5 digit DMM for calibration of highly stable TC and Pt100
- Portable/desktop temperature measuring systems with 1-10 measuring channels, various adjustment possibilities (2-point or multi-point) with multifunctional software



Thermocouples

- Noble metal thermocouples (type S, R, B, Pd) with and without external reference junction for use as reference standard/working standard
- Thermocouples (K, N, R, J, ...) as standards for factory laboratories and process monitoring (AMS, CQI, TUS profile measurements, SAT comparison measurements)
- compensating lines, thermocouple lines for simulations with very small uncertainties



Block calibrators & microbaths

- High-end block calibrators from -100 °C to 700 °C with uncertainties from 30 mK for calibration laboratories
- Process block calibrators from -90 °C to 1,200 °C for on-site comparative measurements
- Microbaths and temperature calibrators with liquid insert for short temperature probes in a homogeneous temperature field



Pressure measuring systems

- Complete calibration measuring systems of the measurand pressure from one source (consulting, training, commissioning)
- Pressure controllers and calibrators with high accuracy and control stability
- Semi- or fully automatic piston manometers
- Digital pressure gauges, spring pressure gauges
- Portable handheld gauges
- Data loggers and pressure transmitters





TRUE VALUES – SETTING STANDARDS



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Deutsche Akkreditierungsstelle GmbH
Befähigte gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV
Unterzeichnerin der Multilateralen Abkommen
von EA, ILAC und IAF zur gegenseitigen Anerkennung



Akkreditierung

Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Kalibrierlaboratorium

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die Kompetenz nach DIN EN ISO/IEC 17025:2018 besitzt, Kalibrierungen in folgenden durchzuführen:

- Thermodynamische Messgrößen**
- Temperaturmessgrößen
 - Widerstandsthermometer
 - Thermopaare, Thermoelemente
 - Direktanzeigende Thermometer
 - Temperaturanzeigeräte und -simulatoren
 - Temperatur-Transmitter, Datenlogger

- Elektrische Messgrößen**
- Gleichstrom u
 - Gleichspan
 - Gleichstrom

- Mechanische Messgrößen**
- Druck

- Werkstoffmessgrößen**
- Kraft