

## Temperature

Calibration certificate for temperature measuring chains consisting of a contact temperature sensor and an instrument (also individual sensors). The calibration of the sensors or sensor + measuring instrument (measuring chain) is performed in a liquid bath, in a dry-well calibrator or in a climatic chamber.

### DAkkS Calibration Certificate

**Order no.**

DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

Calibration is performed by a DAkkS authorized office which compares measured values against reference values based on national standards.

Package offer (basic rate + 3 points 0 °C, 50 °C, 100 °C)

**KT9021D**

#### Measuring points, freely selectable

Basic fee

**KT9001D**

Measuring point fee per sensor, one measuring point, temperature range up -100 to +1200 °C

**KT9011D**

Measuring point fee per sensor, one measuring point -196 °C

**KT9012D**

### Factory Calibration Certificate

Calibration compares measured values against reference values based on national standards.

Package offer (basic rate + 3 points 0 °C, 50 °C, 100 °C)

**KT9021W**

#### Measuring points, freely selectable

Basic fee

**KT9001W**

Measuring point fee per sensor, one measuring point, temperature range up -100 to +1200 °C

**KT9011W**

Measuring point fee per sensor, one measuring point -196 °C

**KT9012W**

#### Correction / adjustment of temperature sensors during calibration

To increase the accuracy, an adjustment of the probe is carried out during the initial calibration of a temperature probe. The correction values for zero point and slope are stored in the probe connector. The specified measured values in the certificate correspond to the corrected values. The correction can be performed as DAkkS and factory calibrations.

## Calibration certificate - temperature - sensor deviation reduced to zero

### Multi-point adjustment for ALMEMO® measuring chains (preferably using Pt100 and NTC sensors)

**Order no.**

For the measurable variable temperature, for calibration packages and for single points (at least 2 temperature points, temperature point 0 °C obligatory), additional charge per sensor for factory / DAkkS calibration (German calibration service)

**KT9001DW**

Calibration and adjustment of the ALMEMO® measuring chain are performed for the whole of the sensors measuring range at the points in the calibration package.

Calibration and adjustment of the ALMEMO® measuring chain (preferable using Pt100 and NTC sensors) are performed on the selected temperature points (temperature point 0 °C obligatory). Outside the calibrated range (below the lowest and above the highest calibration points) linear interpolation is performed up to the limits of the device's measuring range (e.g. Pt100 0.01 K from -200 to +400 °C).

During the calibration of the ALMEMO® measuring system, the sensor deviation is determined in every calibration point and then saved as correction value for that calibration point to the patented ALMEMO® plug. The measured values for such multi-point adjusted sensors are then listed in the calibration certificate. This means that the identified sensor deviations are close to zero.

With thermocouples, as is generally the case, the indicated (adjusted) values in the calibration certificate are only valid if the device is in a stationary, thermally steady-state condition.

Only for device types ALMEMO® 2450 (not -L), 2490 (not -L), 2470, 2590-2/-3S/-4S/-2A/-4AS, 2690, 2890, 4390, 8590, 8690, 5690, 5790, ALMEMO® V7-Measuring instruments und ALMEMO® X6-Reference measuring instrument.

These device types as of serial number H0802xxxx incorporate this function as standard; for device types of serial number H0801 and below a device firmware update is possible (noted at incoming inspection as part of the calibration service).

**OA0006U**

#### Advisory note:

On temperature sensors with special linearization or special measuring ranges saved to the ALMEMO® connector (e.g. ALMEMO® connector ZA9040SS3 NTC 0.001 K or ALMEMO® connectors with KTY84, YSI400, or customized NTC) multi-point adjustment is not possible.

# Calibration certificates

## Infrared Temperature Measurement

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Calibration certificate for temperature measuring chains consisting of an IR temperature sensor and an instrument (also individual sensors).

### DAkkS-Calibration Certificate

DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

Calibration is performed by a DAkkS authorized office which compares measured values against reference values based on national standards.

**For IR transmitters MR7834, MR7838, MR7842, MR78434, ALMEMO® IR sensor FIAD43**

On request!

### Factory Calibration Certificate

Calibration compares measured values against reference values based on national standards.

**For IR transmitters MR7834, MR7838, MR7842, MR7843, ALMEMO® IR sensors FIA844, FIAD43**

On request!

## Calibration certificates for meteorological transducers FMD7 60

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### DAkkS/DKD calibration certificate

### Order no.

The DAkkS/DKD calibration meets the requirements of DIN EN ISO/IEC 17025 for test equipment (i.a. for monitoring production processes or qualification assurance of products).

Calibration is performed by a DAkkS/DKD authorized office which compares measured values against reference values based on national standards.

Temperature and Relative Air Humidity (description, see further below)

**KH9046D**

Absolute pressure (description, see further below)

**KD9214D**

Wind velocity (also for FMD7 20)

Package offer (calibration in the range 4 to 16 m/s for a wind direction of approx. 0 °)

**KV9225D**

Wind direction (also for FMD7 20)

Package offer (calibration in the range 5 ° to 355 ° for a wind velocity of approx. 10 m/s)

**KV9324D**

### Factory Calibration Certificate

Calibration compares measured values against reference values based on national standards.

Absolute pressure (description, see further below)

**KD9213W**

Wind velocity and wind direction (also for FMD7 20)

Package offer (calibration in the range 2 to 50 m/s. For wind velocities in the range of 2 to 50 m/s

the deviations of the wind velocity and the wind direction are calculated from the root-mean-square of the measured values taken from different directions.)

**KV9425W**

## Relative Air Humidity for capacitive humidity sensors / psychrometer

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Calibration certificate for humidity measuring chains consisting of capacitive humidity sensor / psychrometer and measuring instrument.

### DAkkS Calibration Certificate

**Order no.**

The DAkkS/DKD calibration meets the requirements of DIN EN ISO/IEC 17025 for test equipment (i.a. for monitoring production processes or qualification assurance of products).

Calibration is performed by a DAkkS/DKD authorized office which compares measured values against reference values based on national standards.

Calibration is performed in a humidity generator / climate chamber at an ambient temperature of approx. 25 °C.

Package offer (Basic rate + 3 humidity points 20 % / 53 % / 75 % r.H. + 1 temperature point at approx. 25 °C) **KH9046D**

Package offer (Basic rate + 2 humidity points 30 % / 75 % r.H. + 1 temperature point at approx. 25 °C) **KH9146D**

## Relative air humidity at temperatures up to +95 °C

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### DAkkS calibration certificate for temperatures up to +95 °C

**Order no.**

DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

For capacitive humidity sensors and psychrometers. Calibration is performed by a DAkkS authorized office which compares measured values against reference values based on national standards. Calibration is performed in a humidity generator / climate chamber by a DAkkS authorized office.

#### Measuring points, freely selectable

Basic rate **KH9166D**

Points rate per sensor for 1 climate point

Temperature in the range +10 to +95 °C and humidity in the range 10 % to 95 % RH **KH9166DP**

Temperature in the range +10 to +95 °C and humidity in the range 10 % to 98 % RH **KH9166DP2**

Measuring points rate per sensor for 1 temperature point:

Temperature in the range -30 to +150 °C. **KH9166DT**

## Dew point

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Test certificate - for dewpoint sensor only FHAD 46-DTC2.

### Test Certificate

**Order no.**

Test according to the comparative method at an ambient temperature of approx. 25 °C.

basic rate + 1 dew point in the range -80 to +20 °C dew point **KH9316W**

Supplement for KH9316W

1 additional dew point in the range -80 to +20 °C dew point **KH9316WP**

# Calibration certificates

## Pressure

Calibration according to DIN 16005/16086.

This calibration can be performed in 5 or 10 measuring points with pressure transducers or transducer + measuring instrument (measuring chain): to 100 bar, medium: gas to 700 bar, medium: oil

### DAkkS Calibration Certificate

### Order no.

DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

Calibration is performed by a DAkkS authorized office which compares measured values against reference values based on national standards.

Positive overpressure in the range 0 to 700 bar, 10 points (Procedure B according to DKD-R 6-1)

**KD9012D**

Positive and negative overpressure for pressure sensors in the range -1 to 700 bar, 10 points

**KD9014D**

Absolute pressure in the range from 0.03 bar to 700 bar, 10 points (Procedure B according to DKD-R 6-1)

**KD9112D**

### Factory Calibration Certificate

Calibration compares measured values against reference values based on national standards.

Positive overpressure in the range 0 to 700 bar, 10 points (Procedure C according to DKD-R 6-1)

**KD9012W**

Positive overpressure in the range 0 to 700 bar, 5 points (Procedure C according to DKD-R 6-1)

**KD9013W**

Positive and negative overpressure for pressure sensors in the range -1 to 700 bar, 10 points

**KD9014W**

Absolute pressure in the range from 0.03 bar to 700 bar, 10 points (Procedure C according to DKD-R 6-1)

**KD9113W**

Absolute pressure in the range from 0.03 bar to 700 bar, 5 points (Procedure C according to DKD-R 6-1)

**KD9112W**

## Calibration certificate - pressure - sensor deviation reduced to zero

### Multi-point adjustment for ALMEMO® measuring chains

### Order no.

For the measurable variable pressure, for calibration packages, additional charge per sensor for factory / DAkkS calibration

**KD9001DW**

For the ALMEMO® measuring chain, calibration and adjustment are carried out in the entire measuring range of the sensor at the points of the calibration package.

During the calibration of the ALMEMO® measuring system, the sensor deviation is determined in every calibration point and then saved as correction value for that calibration point to the ALMEMO® plug. The measured values for such multi-point adjusted sensors are then listed in the calibration certificate. This means that the identified sensor deviations are close to zero.

Only for device types ALMEMO® 2450 (not -L), 2490 (not -L), 2470, 2590-2/-3S/-4S/-2A/-4AS, 2690, 2890, 4390, 8590, 8690, 5690, 5790, ALMEMO® V7 measuring instruments and ALMEMO® X6 reference measuring instrument.

These device types as of serial number H0802xxxx incorporate this function as standard; for device types of serial number. H0801 and below, a device firmware update is possible (noted at incoming inspection as part of the calibration service). **OA0006U**

## Absolute pressure for digital atmospheric pressure sensor FDAD12SA

Calibration certificate for barometric pressure sensors integrated in the ALMEMO® device or in the ALMEMO® D6 plug

### DAkkS Calibration Certificate

### Order no.

DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

Calibration is performed by a DAkkS authorized office which compares measured values against reference values based on national standards.

Absolute pressure 5 points in the range 700 to 1100 mbar (Procedure C according to DKD-R 6-1)

**KD9213D**

Absolute pressure 10 points in the range 700 to 1100 mbar (Procedure B according to DKD-R 6-1)

**KD9214D**

### Factory Calibration Certificate

Calibration compares measured values against reference values based on national standards.

Absolute pressure 5 points in the range 700 to 1100 mbar (Procedure C according to DKD-R 6-1)

**KD9213W**

Absolute pressure 10 points in the range 700 to 1100 mbar (Procedure B according to DKD-R 6-1)

**KD9214W**

## Air Flow

Calibration certificate for rotating vanes, Pitot tubes and thermoanemometers.

### DAkkS Calibration Certificate

**Order no.**

DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

Calibration is performed in a wind tunnel based on measurement comparison against a laser Doppler anemometer by a DAkkS authorized office.

Package offer (Basic rate + 5 points in the range 0,2 m/s to 65 m/s)

**KV9075D**

Supplement to KV9075D: 1 additional measuring point

**KV9075DP**

### Factory Calibration Certificate

The calibration can be performed with the sensor and the meas. instrument (meas. chain). Calibration in a wind tunnel. Reference standards: Wind tunnel and reference rotating vanes (calibrated acc. to the laser-Doppler method).

Package offer (basic rate + 3 points 0.5 m/s / 5 m/s / 10 m/s)

**KV9025W**

Package offer (basic rate + 3 points 5 m/s / 10 m/s / 19 m/s)

**KV9035W**

Package offer (basic rate + 3 points 7 m/s / 20 m/s / 30 m/s)

**KV9045W**

Package offer (basic rate + 3 points 0.5 m/s / 1 m/s / 1,75 m/s)

**KV9055W**

Package offer (basic rate + 3 points 0.5 m/s / 0.8 m/s / 1 m/s)

**KV9065W**

### Measuring points, freely selectable

Basic rate

**KV9005W**

Per measuring point and sensor Meas. range 0.2 m/s to 65 m/s.

**KV9015W**

## Flow measurement in liquids

Calibration certificate for turbine flow meters or flow sensors

### DAkkS Calibration Certificate

**Order no.**

DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

Calibration is performed by a DAkkS authorized office which compares measured values against reference values based on national standards.

Calibration of the volume flow rate in l/min (up to maximum 200 l/min) in the flow test bench.

Measuring medium: Water

Calibration at 5 measuring points, logarithmically distributed within the measuring range of the sensor.

For recalibration:

Calibration of the current state. Package offer

**KV9145D**

Linked to the new delivery of the flowmeter for liquids:

Determination of the K factor, programming of the ALMEMO® plug, calibration of the original state.

Package offer

**KV9145DE**

## Gas Concentration

Calibration certificate for CO<sub>2</sub>

### Accredited calibration certificate

**Order no.**

Accredited calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

Calibration is performed by an accredited calibration laboratory which compares measured values against reference values based on national standards.

#### For CO<sub>2</sub> sensor FYAD00CO2Bx

Package offer for CO<sub>2</sub> probe FYAD00CO2B10 (3 measuring points at approx. 1000 / 4000 / 7000 ppm)

**KY9626D**

Package offer for CO<sub>2</sub> probe FYAD00CO2B05 (3 measuring points at approx. 500 / 2500 / 4500 ppm)

**KY9627D**

#### For CO<sub>2</sub> sensor FYAD00VCO2B200

Calibration is performed by an accredited calibration laboratory which compares measured values against reference values based on national standards.

Package offer for CO<sub>2</sub> sensor FYAD00VCO2B200 (3 measuring points at approx. 0.5 % / 5 % / 20 % CO<sub>2</sub>)

**KY9621D**

# Calibration certificates

## Conductivity

Calibration certificate for conductivity measuring chains.

### Factory Calibration Certificate

**Order no.**

Calibration compares measured values against reference values based on national standards.

Package offer for conductivity probe FYA641LF /LFP1

(Basic rate + 3 points 0.5 mS / 2.77 mS / 10 mS)

**KY9041W**

(Basic rate + 2 points 2.77 mS / 12.8 mS)

**KY9044W**

Package offer for conductivity probe FYA641LF2 /LFP2

(Basic rate + 3 points 10 µS / 147 µS / 190 µS)

**KY9042W**

Package offer for conductivity probe FYA641LF3 /LFP3

(Basic rate + 3 points 5 mS / 50 mS / 111.8 mS)

**KY9043W**

Package offer for digital conductivity probe FYD7 41-LF (ALMEMO® D7)

(Basic rate + 3 points 147 µS / 12.8 mS / 111.8 mS, i.e. 1 point per ALMEMO® D7 measuring range)

**KY9045W**

### DAkKS Calibration Certificate

**Order no.**

The DAkKS calibration fulfills the requirements of DIN EN ISO/IEC 17025 for test equipment

(e.g. for monitoring production processes or quality assurance of products).

The calibration is carried out by a DAkKS office according to the comparison method against reference standards that are traceable to national standards.

Package offer for digital conductivity probe FYD7 41-LF (ALMEMO® D7) (Basic fee + 3 selectable points in

1 selected ALMEMO® D7 measuring range: 500 µS/cm or 50 mS/cm or 500 mS/cm)

**KY9043D**

## Measurable Variables for Optical Radiation

Calibration certificate for broad-band light detectors

### Factory Calibration Certificate

**Order no.**

Single point calibration of absolute size

(ONLY for probes FLA603x, FLA613RD/UV/VL)

**KL9033W**

Calibration of absolute variable in 3 points (zero point and 2 points, sensor dependent)

(ONLY for probes FLA613x, FLA623x, FLA633x, FLADx, FLD7x)

**KL9034W**

## Optical Speed Sensors

Calibration certificate for contactless tachometers.

### DAkKS Calibration Certificate

**Order no.**

DAkKS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

Calibration is performed by a DAkKS authorized office which compares measured values against reference values based on national standards.

Calibration of the optical transducer at 8 measuring points

(not applicable for the tachometer probe FUA919-MF)

**KU9029D**

### Factory Calibration Certificate

Calibration compares measured values against reference values based on national standards.

Calibration of the optical transducer at 8 measuring points

(not applicable for the tachometer probe FUA919-MF)

**KU9029W**

## Force

Calibration for tension and compression sensors

### Factory calibration certificate

Order no.

Calibration is performed based on the measurement comparison method for Ahlborn force transducers;

4 series of measuring operations upwards and 2 series downwards

3 steps (0 %, 20 %, 60 %, 100 % of final value) Tension or compression (indicate direction), up to 1 kN

**KK9021W**

3 steps (0 %, 20 %, 60 %, 100 % of final value) Tension or compression (indicate direction), up to 10 kN

**KK9031W**

3 steps (0 %, 20 %, 60 %, 100 % of final value) Tension or compression (indicate direction), up to 100 kN

**KK9041W**

3 steps (0 %, 20 %, 60 %, 100 % of final value) Tension or compression (indicate direction), up to 1000 kN

**KK9051W**

## Electrical Calibration for all ALMEMO® measuring instruments with interface

### DAkKS calibration certificate

Order no.

DAkKS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

Calibration is performed by a DAkKS authorized office which compares measured values against reference values based on national standards.

Full calibration of ALMEMO® device in 9 measuring ranges

2.6 V (volt), 55 mV (mV), 26 mV (mV1), 260 mV (mV2), NiCr-Ni (NiCr), Pt100 0.1 K (P104), Pt100 0.01 K (P204), NTC type N (NTC), relative humidity, capacitive (% RH)

Package offer

**KE9005D**

### Factory calibration certificate

Calibration compares measured values against reference values based on national standards.

Full calibration of ALMEMO® device in 9 measuring ranges

2.6 V (volt), 55 mV (mV), 26 mV (mV1), 260 mV (mV2), NiCr-Ni (NiCr), Pt100 0.1 K (P104), Pt100 0.01 K (P204), NTC type N (NTC), relative humidity, capacitive (% RH)

Package offer

**KE9005W**

## Electrical Calibration of Measuring and Indicating Devices

Calibration certificate for all ALMEMO® devices

### DAkKS Calibration Certificate

Order no.

DAkKS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025 (inter alia for the monitoring of production processes and the quality assurance applied to products).

Calibration is performed by a DAkKS authorized office which compares measured values against reference values based on national standards.

The calibration is performed at approx. 10 measuring points.

Calibration for one measuring range

**KE9010D**

Each further measuring range

**KE9020D**

Calibration for 1 digital ALMEMO® measuring module ZA990xABx, ZAD90xABx, ZED7xxABx: AC/DC voltage

up to 400 V (50 Hz) or AC/DC current up to 20 A (50 Hz) (NOT power in W) or

for 1 ALMEMO® adapter cable ZA9603AKx AC voltage or measuring chain or

for 1 FEA 60x AC/DC current clamp

up to 10 A (50 Hz) Package offer, approx. 10 points

**KE9030D**

### Factory Calibration Certificate

Calibration compares measured values against reference values based on national standards.

The calibration is performed at approx. 10 measuring points.

Calibration for one measuring range

**KE9010W**

Each further measuring range

**KE9020W**

Calibration for 1 digital ALMEMO® measuring module ZA990xABx, ZAD90xABx, ZED7xxABx: AC/DC voltage

up to 400 V (50 Hz) or AC/DC current up to 20 A (50 Hz) (NOT power in W) or

for 1 ALMEMO® adapter cable ZA9603AKx AC voltage or measuring chain or

for 1 FEA 60x AC/DC current clamp

up to 10 A (50 Hz) Package offer, approx. 10 points

**KE9030W**