

CALIBRATION CERTIFICATES

What You Should Know About Calibration

With the introduction of quality management standards all over the world, the requirements for measuring and test devices have become significantly more demanding. For example, the certification according to DIN EN ISO 9000+ requires an active quality management involving regular calibrations. With consideration of the specific environment this ensures a high reliability regarding the measuring results and the traceability of the measured values to the national standard.

'Calibration' is Not Identical with 'Calibration by the Bureau of Standards'

'Calibration' includes those activities involved with determining, under given conditions, the relationship between the output values of an instrument or a measuring equipment and the corresponding values of a variable, which are determined by reference materials.

The Result of a Calibration

1. The result of a calibration allows the evaluation of errors of dimension of the measuring instrument, measuring equipment or the setup of measuring instruments or the allocation of values to any scaled graduation marks.
2. The result of a calibration can be fixed in a document, which is often called a 'calibration report' or a 'calibration certificate'.
3. In many cases, the result of a calibration is specified as correction or 'calibration factor' or as 'calibration curve'.

'Calibration by the Bureau of Standards'

The expression 'Calibration by the Bureau of Standards' is limited to the legal metrology and denotes governmental verifications, according to the calibration regulations. This type of calibration must only be performed by the Bureau of Standards responsible for the devices that are appropriate for verification.

DKD Calibration

The calibration must only be performed within the range of those measurable variables, measuring ranges and measuring uncertainties, which are specified in the PTB accreditation document. The customer receives a DKD calibration certificate specifying the measured values, the corresponding measuring uncertainty, the designation of the calibration method, the environmental conditions and, as required, information on special measurement conditions.

The calibrated object will be identified by a label (red).

The label contains the following data:

- ▶ Number of calibration
- ▶ Number of the calibration laboratory
- ▶ Date of calibration (month/year) and refers to the calibration certificate.



DKD calibrations outside the range of accreditation services provided by the DKD calibration laboratory at Ahlborn Mess- und Regelungstechnik GmbH are performed by DKD laboratories run by our various partners.

AMR Factory Calibration

The calibration is performed according to comparison measurements with factory standards. Factory standards are (as far as possible) PTB or DKD calibrated measuring instruments, sensors or measuring systems. The customer receives a factory calibration certificate specifying the measured values, the corresponding measuring uncertainty, the designation of the calibration method, the environmental conditions and, as required, information on special measurement conditions.

The calibrated object will be identified by a label (green).

The label contains the following data:

- ▶ Number of calibration
- ▶ Company logo
- ▶ Date of calibration (month/year) and refers to the calibration certificate

How Often To Calibrate?

The time interval between calibrations highly depends on the specific application and is influenced by the following parameters:

- ▶ Permissible measuring tolerances
- ▶ Environmental conditions
- ▶ Application frequency
- ▶ Results of previous calibrations
- ▶ Customer-specific requirements and definitions

High-precision temperature measuring instrument ALMEMO® 1030-2 Using Pt100 sensors, resolution 0.001 K



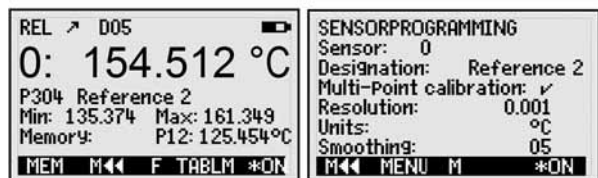
Technical features

- ▶ Temperature measurement with very high resolution, precision, and linearity
- ▶ Suitable as reference device in calibration laboratories and quality assurance procedures
- ▶ Compact modern, ergonomic design
- ▶ Protection IP54
- ▶ 2 electrically isolated input sockets for Pt100 sensors
- ▶ Resolution can be set at 0.001 or 0.01 K.
- ▶ Units °C, °F, K
- ▶ High-resolution A/D converter, delta-sigma, 24-bit, 2.5 mops
- ▶ 2 output sockets for digital interface, ALMEMO® memory connector
- ▶ Illuminated white graphics display
- ▶ Easy and convenient to operate by means of 4 soft-keys and cursor block
- ▶ Measuring menu : 2 measured values and differential
- ▶ Measuring functions : Zero-setting, smoothing
- ▶ Calibration with multi-point adjustment in the ALMEMO® connector ensures the highest possible accuracy.
- ▶ Functions menu : Maximum / minimum values, individual value memory for 100 values
- ▶ Data logger with ALMEMO® memory connector (Accessories)
- ▶ Sensor programming : Units, resolution, smoothing, designation
- ▶ Device configuration : Device designation, contrast, illumination period, baud rate
- ▶ Choice of language : German, English, French



Menu selection

Measuring menu



Functions menu

Sensor programming

Technical data

ALMEMO® 1030-2

Measuring inputs	2 ALMEMO® input sockets For Pt100 sensors Semiconductor relay (50 V) delta-sigma, 24-bit, 2.5 mops Pt100, -200 to +400 °C Resolution 0.001 K or 0.01 K Measuring current 1 mA Self-calibration Zero-point, measuring current Accuracy 0.01 % of meas. value ±3 digits Temperature drift 0.003% / °C
Outputs	2 ALMEMO® sockets for interface cable and ALMEMO® memory connector
Standard equipment	
Display	Graphics display, 128 x 64 dots, 8 rows Illumination 2 white LEDs
Keypad	7 silicone keys (of which 4 softkeys)
Date and time-of-day	Real-time clock buffered with device battery
Values memory, internal	100 measured values
Voltage supply	
Battery set	3 AA alkaline batteries
Mains adapter	ZA1312NA8 230 VAC to 12 VDC, 1 A electrically isolated
Current consumption (without i / o modules)	approx. 20 mA with illumination approx. 55 mA
Housing	(LxWxH) 127 x 83 x 42 mm ABS (maximum 70 °C), 290 g
Pt100 temperature sensor FPA923L0250	
Measuring element	Pt100 as per DIN EN 60751
Class	1/10 B (DIN EN 60751) at 0 °C
Measuring tip	Operative range -50 to +400 °C
Response time T ₉₀	5 seconds
Nominal length	250 mm
Shaft	Stainless steel, diameter 3 mm
Connection cable	2 meters, FEP / silicone
ALMEMO® connector	Resolution 0.001 K



Pt100 temperature sensor
FPA923L0250

Accessories

Ethernet data cable	Order no. ZA1945DK
ALMEMO® connector with micro-SD	Order no. ZA1904SD
Rubberized impact protection, gray	Order no. ZB2490GS2
DIN top hat rail mounting	Order no. ZB2490HS

Variants

High-precision temperature measuring instrument with accessories, evaluation software, and Pt100 temperature sensor
Complete set including DKD calibration certificate

ALMEMO® 1030-2 measuring instrument including 3 AA alkaline batteries, connector mains unit ZA1312NA8, USB data cable ZA1919DKU, instrument case, and evaluation software ALMEMO View SW5500AV (see page 06.16), and Pt100 temperature sensor FPA923L0250 including DKD calibration certificate (2 temperature points at 0 and 100 °C and adjustment)

Order no. SP103020

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CALIBRATION CERTIFICATES

new!

Simulator KA 7531 for Pt100, thermocouples, mV, V, mA, Hz Option PC interface



Technical features

- Universal manual simulator for simulating temperature sensors and process variables when testing measuring instruments, regulators, and other equipment
- Pt100 simulation with 5 fixed resistors in 4-conductor technology
Voltage and thermocouples simulation with 15-bit D/A converter
Current simulation with 15-bit D/A converter
Frequency and pulse generator with quartz-crystal oscillator
Continuity check with settable threshold
- All signals are available at the same time.
- Signals can be set either manually or automatically, in step or ramp form.
- All signals and all the programming can be shown on the illuminated graphics display.
- Connection of peripherals via ALMEMO® clamp connectors, cable with anti-kink protective sleeve and strain relief
- Power supply via battery, mains unit, USB cable ZA 1919-DKUV or connection to RS422 network distributor with connector ZA5099-FSV
- Modern, compact housing - also suitable for DIN top-hat rail mounting
- Option of PC-controlled operation via all ALMEMO® data cables, also networked with settable device address via network distributor and RS422 connector

Options

addressable PC interface

Order no. OA 7531-I

Included as standard

Simulator, 5 sockets for Pt100, thermocouples or -4 to 10 V, 0 to 20 mA, frequency, continuity tester, Graphics display and keypad, sockets DC, A1, batteries, including manufacturer's test certificate, ALMEMO® clamp connector (for Pt100) and ALMEMO® connecting cable with 2 banana plugs and 2 test probes

Order no. KA7531I

Technical data

Signal Pt100	5 discrete resistance values in 4-conductor technology 0 / 50 / 100 / 200 / 300 °C Accuracy ±0.1 °C Temperature drift 0.01 °C / K
Signal voltage -10 to +60.000 mV -4 to 10.000 V Accuracy Temperature drift Time constant	15-bit DAC electr. isolated load > 1 MΩ load > 100 kΩ ± 0.05% ± 0.05% of final value 20 ppm / K 100 μs
Thermocouples	type K, N, T, J (ITS90) resolution: 0.1 K type S, R, B (ITS90) resolution: 1 K Accuracy: ± 0.05% ± 0.05% v.Ew. CJ - temperature: -30..100 °C
Signal current 0 to 20.0 mA Accuracy Temperature drift Time constant	15-bit DAC electr. isolated load < 500 Ω ± 0.05% ± 0.05% of final value 20 ppm / K 100 μs
signal frequency Pulse width Accuracy Pulse range Period Pulse Accuracy	1..4000Hz, 0.01..10.00kHz, 0.1..40.0kHz, 1..100kHz 1 to 99 % corresponds to the resolution 2μs...99.999 ms, 2ms...99.999 s 1μs...99.998 ms, 1ms...99.998 s 0.01 %
Continuity Threshold	current approx. 1 mA 0 to 1000 mV
Power supply: Battery: Current consumption Voltage and Current output: with illumination:	10..12V DC 3 Mignon Alkaline (Battery): approx. 30 mA approx. 80mA + 4 x I _{OUT} , approx. 40mA additional
Display Illumination Keypad	graphics 128 x 64 (55 x 30 mm) 2 white LEDs 7 silicone keys (4 soft-keys)
Housing	(LxWxH) 127 x 83 x 42 mm ABS (-10 to +70 °C), 290 g
Operating range:	Operating temperature: -10 ... +50 °C (Storage temperature: -20 ... +60 °C) Ambient humidity: 10 ... 90 % rH (noncondensing)

Accessories

ALMEMO® clamp connector
ALMEMO® connecting cable with 2 banana plugs and 2 test probes
Mains adapter 12 V / 200 mA
USB data cable, electrically isolated
As above but with 9 V supply, not electr. isol.
V24 data cable, electrically isolated
Connector for RS422 network distributor
Fixture for top-hat rail mounting
Rubber guard, gray

ZA1000KS

ZA1000PY

ZA1312NA1

ZA1919DKU

ZA1919DKU

ZA1909DKS

ZA5099FSV

ZB2490HS

ZB2490GS2

Simulator KA 7531

Displays (examples):

```
SIMULATOR KA 7531  V6.01
P0: Pt100          100.0 °C
P1: 0-10 V         5.000 V
P2: 0-20 mA        12.000 mA
P3: 0-4000Hz       1000 Hz
P4: continuity Yes 36 mV
CONFIG *ON
```

Main menu

```
* DEVICE CONFIGURATION *
Device address: 00
Baud rate:      9600Bd
Language:       english
Illumination: ✓ duration: 20s
contr. 50%      UBat: 4.5V
MENU *ON
```

Device configuration

```
P0: OutPut Pt100
Function: steps individually
100.0 °C
F S *ON
```

Pt100 resistance values

```
P1: OutPut TC NiCr-Ni type K
Function steps individually
500.0 °C
Step: 0100.0°C U: 20.644mV
F S TC *ON
```

NiCr-Ni step generator

```
P1: OutPut 0 - 10V
Function steps automatically
5.000 V
Step: 01.000 V duration 10s
START F S *ON
```

0 to 10 V step generator

```
P3: OutPut 0-20mA
Function steps automatically
START: 4.000 mA
Stop: 15.000mA duration: 30s
F S *ON
```

0 to 20 mA ramp generator

```
P3: OutPut Frequency 4000Hz
Function: steps individually
1000 Hz
Pulse width: 50%
Step: 01000Hz
F S F *ON
```

Frequency pulse generator

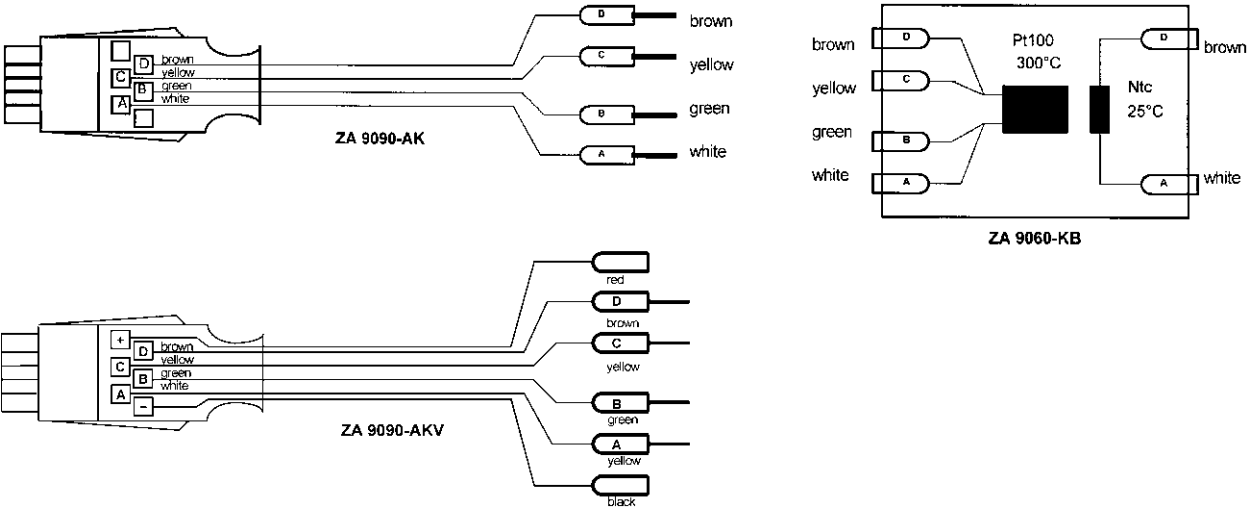
```
P4: Continuity Yes
Function: steps individually
36 mV
Threshold: 100mV
F *ON
```

Continuity tester

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CALIBRATION CERTIFICATES

Calibration Adapter Cable, Adjustment Set



Adjustment Set for ALMEMO® Devices

Consisting of calibration adapter cable ZA 9090 AK and calibration box ZA 9060 KB, including QM job instruction for the adjustment of ALMEMO® devices

Order no. **ZA9090KS**

Demonstration adapter cable with 4 banana plugs for sensor connection and 2 banana sockets for sensor voltage supply 5V, stabilised, 50mA

Order no. **ZA9090AKV**



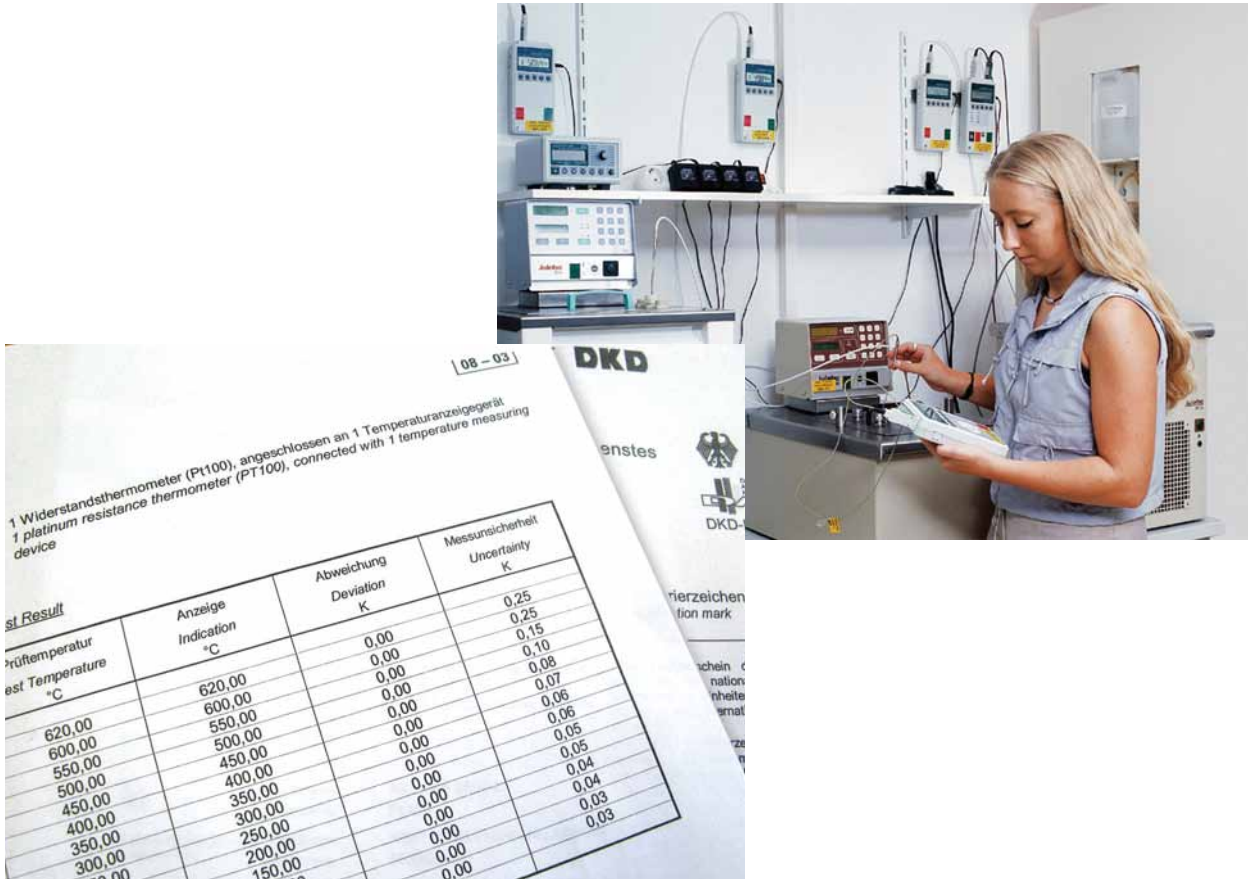
CALIBRATION CERTIFICATES

new!

20

Calibration certificates - temperature and pressure - sensor deviation reduced to zero

01/2011 We reserve the right to make technical changes.



The patented ALMEMO® measuring technology from Ahlborn has proved itself many times over in a wide variety of fields; its use in research and development is just one example. Quality assurance, resources monitoring, and calibration systems also constitute a very broad field for ALMEMO® measuring technology.

Wherever measured values must be exactly traceable to a known standard and measuring equipment needs to be thoroughly checked at regular calibration intervals ALMEMO® is the answer - both as the reference device in the calibration laboratory and as a calibratable device for the customer; it is precisely in this context that the quality of AHLBORN measuring instruments is so decisive.

The measuring chain is corrected by means of a new multi-point adjustment function.

When ALMEMO® measuring equipment is calibrated the sensor deviation is determined at each and every calibration point and then saved as correction value for that calibration point in the patented ALMEMO® connector. The measured values for the sensor obtained using this multi-point adjustment function are entered in the calibration certificate. Sensor deviations are thus reduced to zero.

Measuring operations within the calibration interval can thus be performed with much less uncertainty. The measured value displayed on the ALMEMO® measuring instrument has already been corrected and can be used directly. Correction of the displayed measured value on the basis of the sensor deviation in the calibration certificate, as would otherwise be the case, is thus no longer necessary.

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CALIBRATION CERTIFICATES

Temperature

Calibration certificate for temperature measuring chains consisting of a contact temperature sensor and an instrument (also individual sensors). This calibration can only be performed as an immersion measurement with sensors or sensor + measuring instrument (measuring chain).

Temperature range: Pt100 -196°, -90° to +660°C
thermocouples -196°, -80° to +1600°C

DKD Calibration Certificate

Calibration is performed by a DKD 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)

Order no. KT9021D

Measuring points, freely selectable

Basic rate

Order no. KT9001D

Per measuring point and sensor (at least 2 measuring points are required)

Order no. KT9011D

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)

Order no. KT9021W

Package offer only for temperature/humidity sensor of type FH XXX6-XX, measuring range temperature (basic rate + 3 points 10°C, 25°C, 40°C)

Order no. KT9041W

Measuring points, freely selectable

Basic rate (up to 1300 °C)

Order no. KT9001W

Basic rate (up to 1600 °C)

Order no. KT9002W

Per measuring point and sensor (at least 2 measuring points are required)

Order no. KT9011W

If ALMEMO® series temperature sensors are used, the sensor deviations that have been determined during the calibration will be stored in the sensor connector as correction values for zero point and slope (gain) before the last measurement is performed. The correction is performed with DKD and factory calibrations.

Calibration certificate - temperature - sensor deviation reduced to zero (see page 20.07)

new

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

for the measurable variable temperature, for calibration packages and for single points (at least 3 temperature points, temperature point 0 °C obligatory), additional charge per sensor for factory / DKD calibration ((DKD = Deutscher Kalibrier-Dienst = German calibration service)

Order no. KA9001DW

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

Calibration and adjustment of the ALMEMO® measuring chain are performed (preferably using Pt100 and NTC sensors) at at least 3 temperature points (temperature point 0 °C obligatory). Outside the calibrated range (i.e. 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).

When ALMEMO® measuring equipment is calibrated the sensor deviation is determined at each and every calibration point and then saved as correction value for that calibration point in the patented ALMEMO® connector. The measured values for the sensor obtained using this multi-point adjustment function are entered in the calibration certificate. Sensor deviations are thus reduced to zero.

With thermocouples, as is generally the case, the indicated (zero-based) 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), 2590-2/-3S/-4S, 2690, 2890, 4390, 8590, 8690, 5690 and 5790

These device types as of serial number H0802xxx 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).

Order no. OA0006U

Advisory note :

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

Infrared Temperature Measurement

new

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

DKD Calibration Certificate

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

New Calibration for IR transmitter MR7838, MR7842, Hand-held IR devices MR7811, MR7814, ALMEMO® IR sensor FIA844

Package offer: 3 temperature points, 25, 100, 200 °C

Order no. KI9201D

Calibration in the range -20°C to +550°C in 3 individually selectable measuring points

Calibration in the range +600°C to +1600°C in 3 individually selectable measuring points

1 additional measuring point, freely selectable, in the range -20 to +1600 °C

(but not between 550 and 600 °C)

Order no. KI9168D

Order no. KI9178D

Order no. KI9168DP

Factory Calibration Certificate

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

New Calibration for IR transmitter MR7838, MR7842, Hand-held IR devices MR7811, MR7814, ALMEMO® IR sensor FIA844

Package offer 3 temperature points, 25, 100, 200 °C

Order no. KI9201W

Calibration in the range -20°C to +550°C in 3 individually selectable measuring points

Calibration in the range +600°C to +1600°C in 3 individually selectable measuring points

1 additional measuring point, freely selectable, in the range -20 to +1600 °C

(but not between 550 and 600 °C)

Order no. KI9168W

Order no. KI9178W

Order no. KI9168WP

Relative Air Humidity for Capacitive Humidity Sensors

Calibration certificate for humidity measuring chains consisting of a capacitive humidity sensor and measuring instrument (also individual sensors).

DKD Calibration Certificate

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

Package offer

(Basic rate + 3 humid. points 20%/53%/75% r.H. + 1 temperature point at approx. 25 °C)

Order no. KH9046D

Package offer

(basic rate + 3 humidity points in the range 20% to 85% r.H.)

Order no. KH9056D

supplement to KH9056D

(1 further humidity point in the range 20% to 85% r.H.)

Order no. KH9056DP

Factory Calibration Certificate

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

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

Package offer

(Basic rate + 3 humidity points 11% / 53% / 75% r.H. + 1 temperature point at approx. 25°C)

Order no. KH9046 W

Package offer

(Basic rate + 3 humidity points 11% / 53% / 75% r.H.)

Order no. KH9036W

Package offer

(Basic rate + 3 humidity points in the range 20% to 85% r.H.)

Order no. KH9056W

Supplement to KH9056W Additional humidity point in the range 20 to 85% RH

Order no. KH9056WP

For calibration at other temperatures, see below !

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CALIBRATION CERTIFICATES

Relative Air Humidity for Psychrometers

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

DKD Calibration Certificate

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

Package offer (basic rate + 2 humidity points 30% / 75% RH + 1 temperature point at approx. 25 °C) **Order no. KH9146D**

Factory Calibration Certificate

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

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

Package offer (basic rate + 2 humidity points 30% / 75% RH + 1 temperature point at approx. 25 °C) **Order no. KH9146W**

Relative atmospheric humidity at temperatures up to +95 °C

new

DKD calibration certificate for temperatures up to +95° C

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

Measuring points, freely selectable

Basic rate

Order no. KH9166D

Points rate per sensor for 1 climate point

Temperature in the range +10 to +90 °C and humidity in the range 45% to 95% RH -
or - temperature in the range +45 to +95 °C and humidity in the range 10% to 90% RH

Order no. KH9166DP

Factory calibration certificate for temperatures up to +95 °C

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

Measuring points, freely selectable

Basic rate

Order no. KH9166W

Points rate per sensor for 1 climate point

Temperature in the range +10 to +90 °C and humidity in the range 45% to 95% RH -
or - temperature in the range +45 to +95 °C and humidity in the range 10% to 90% RH

Order no. KH9166WP

Relative Air Humidity for Thermo Hygrographs

Calibration certificate for type SK3015 thermo hygrographs.

Factory Calibration Certificate

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

Calibration in a climatic chamber at 25°C.

Basic rate +1 measuring points at approx. 50% r.H. + 1 temperature point at approx. 25°C

Order no. KH9216W

Relative atm. humidity, temp., and ambient atm. pressure for FMA510

new

Factory Calibration Certificate

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

Calibration in a climate chamber at approx. 25 °C

Package offer 1 temperature point at approx. 25 °C 1 humidity point at approx. 50 % RH, 1 absolute pressure measuring point for ambient atmospheric pressure at time of calibration

Order no. KH9246W

Dew point

Calibration certificate - for dewpoint sensor only FHA646DTC1 / MT8716DTC1.

Factory Calibration Certificate

Factory calibration certificate

Calibration is performed based on measurement comparison at an ambient temperature of approx. 25 °C.

basic rate + 1 dew point in the range -60 to +20 °C dew point

Order no. KH9316W

Supplement for KH9316W

1 additional dew point in the range -60 to +20 °C dew point

Order no. KH9316WP

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 100bar, medium: gas

to 700bar, medium: oil

DKD Calibration Certificate

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

Positive overpressure in the range 0 to 700 bar, 10 points

Order no. KD9012D

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

Order no. KD9014D

Absolute pressure in the range from 0.03bar to 700bar, 10 points

Order no. 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

Order no. KD9012W

Positive overpressure in the range 0 to 700 bar, 5 points

Order no. KD9013W

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

Order no. KD9014W

Absolute pressure in the range from 0.03bar to 700bar, 10 points

Order no. KD9113W

Absolute pressure in the range from 0.03bar to 700bar, 5 points

Order no. KD9112W

Calibration certificate - pressure - sensor deviation reduced to zero (see page 20.07)

Multi-point adjustment for ALMEMO® measuring chains

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

Order no. KA9001DW

When ALMEMO® measuring equipment is calibrated the sensor deviation is determined at each and every calibration point and then saved as correction value for that calibration point in the patented ALMEMO® connector. The measured values for the sensor obtained using this multi-point adjustment function are entered in the calibration certificate. Sensor deviations are thus reduced to zero.

Only for device types ALMEMO® 2450 (not -L), 2490 (not -L), 2590-2/-3S/-4S, 2690, 2890, 4390, 8590, 8690, 5690, 5790

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).

Order no. OA0006U

Absolute pressure for digital atmospheric pressure sensor FDAD12SA

Factory Calibration Certificate

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

1 absolute pressure measuring point for ambient atmospheric pressure at time of calibration

Order no. KD9211W

CALIBRATION CERTIFICATES

Air Flow

Calibration certificate for rotating vanes, Pitot tubes and thermoanemometers.

DKD Calibration Certificate

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

Package offer (basic rate + 5 points 0,5 m/s / 1 m/s / 2 m/s / 5 m/s / 10 m/s)

Order no. KV9025D

Package offer (basic rate + 5 points 2 m/s / 5 m/s / 10 m/s / 15 m/s / 20 m/s)

Order no. KV9035D

Package offer (basic rate + 5 points 0,2 m/s / 0,3 m/s / 0,5 m/s / 0,8 m/s / 1 m/s)

Order no. KV9065D

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 0.5m/s / 5m/s / 10m/s)

Order no. KV9025W

Package offer (basic rate + 3 points 5m/s / 10m/s / 19m/s) FVA645TH3: 15m/s

Order no. KV9035W

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

Order no. KV9045W

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

Order no. KV9055W

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

Order no. KV9065W

Measuring points, freely selectable

Basic rate

Order no. KV9005W

Per measuring point and sensor Meas. range 0.5m/s to 40m/s.

Order no. KV9015W

Flow measurement in liquids

Calibration certificate for turbine flow meters or flow sensors

new

Factory Calibration Certificate

Calibration 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 test chamber)

Measuring medium: Water

Calibration at 3 measuring points 1 point each at start / middle / end of sensor range

Package offer

Order no. KV9115W

Supplement to KV9115W 1 additional measuring point in the sensor's measuring range

Order no. KV9115WP

Conductivity

Calibration certificate for conductivity measuring chains.

Factory Calibration Certificate

Calibration in KCl reference solutions. Reference standard: Precision conductivity measurement instrument, which has been calibrated with KCl solutions of the National Institute of Standards and Technology (NIST).

Package offer for conductivity probe FYA641LF /LFP1

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

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

Order no. KY9041W

Order no. KY9044W

Package offer for conductivity probe FYA641LF2 /LFP2

(Basic rate + 3 points 5µS / 147µS / 190µS)

Order no. KY9042W

Package offer for conductivity probe FYA641LF3 /LFP3

(Basic rate + 3 points 5mS / 50mS / 111,8mS)

Order no. KY9043W

Gas Concentration

Calibration certificate for CO₂

Factory Calibration Certificate

Calibration is performed based on measurement comparison against a reference gas specified by the manufacturer.

Package offer for CO₂ probe FYA600CO2

(approx. 10 measuring points)

Order no. KY9620W

Package offer for CO₂ probe FYA600CO2H

(3 measuring points 0 / 1000 / 5000 ppm)

Order no. KY9625W

Measurable Variables for Optical Radiation

Calibration certificate for broad-band light detectors

Factory Calibration Certificate

single point calibration of absolute size

(not for probes FLA613GS / UVA / UVB / VLM / VLK / UVAK, FLA623x)

Order no. KL9033W

Calibration of absolute variable in 3 points

(only for probes LA613GS / UVA / UVB / VLM / VLK / UVAK, FLA623x)

Order no. KL9034W

Optical Speed Sensors

Calibration certificate for contactless tachometers.

DKD Calibration Certificate

Calibration is performed by a DKD 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)

Order no. 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)

Order no. KU9029W

CALIBRATION CERTIFICATES

Force

Calibration for tension and compression sensors

Factory calibration certificate

Calibration is performed based on the measurement comparison method for Ahlborn force transducers; (other makes available on request).

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

Order no. KK9021W

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

Order no. KK9031W

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

Order no. KK9041W

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

Order no. KK9051W

Electrical Calibration of Measuring and Indicating Devices

Calibration certificate for all devices of the THERM and ALMEMO® series.

DKD Calibration Certificate

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

The calibration is performed at approx. 10 to 20 measuring points.

Calibration for one measuring range

Order no. KE9010D

Each further measuring range

Order no. KE9020D

Calibration of a measuring chain using ALMEMO® adapter cable ZA9603AKx, AC voltage or ALMEMO® measuring module ZA990xABx, AC / DC voltage, up to 400 V (50 Hz), or AC / DC current, up to 10 A (50 Hz) Package offer, approx. 10 points

Order no. KE9030D

Factory Calibration Certificate

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

The calibration is performed at approx. 10 to 20 measuring points.

Calibration for one measuring range

Order no. KE9010W

Each further measuring range

Order no. KE9020W

Calibration of a measuring chain using ALMEMO® adapter cable ZA9603AKx, AC voltage or ALMEMO® measuring module ZA990xABx, AC / DC voltage, up to 400 V (50 Hz), or AC / DC current, up to 10 A (50 Hz) Package offer, approx. 10 points

Order no. KE9030W

Calibration certificate for all ALMEMO® measuring instruments with interface

new!

DKD calibration certificate

Calibration is performed by a DKD 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

Order no. 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

Order no. KE9005W