DAkkS
Deutsche
Akkreditierungsstelle

Accreditation

The Deutsche Akkreditierungsstelle attests with this **Accreditation Certificate** that

TetraTec Instruments GmbH
Gewerbestraße 8, 71144 Steinenbronn

operates a calibration laboratory that fulfills the requirements according to DIN EN ISO/IEC 17025:2018 for those conformity assessment activities specified in detail in the annex listed below. This includes additional existing legal and normative requirements for the calibration laboratory including those in relevant sectoral schemes, provided that these are explicitly confirmed in the annexes listed below.

D-K-17589-01-01 **Valid from: 04.02.2026**
D-K-17589-01-02 **Valid from: 04.02.2026**

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and they conform to the principles of DIN EN ISO 9001.

This accreditation was issued in accordance with Art. 5 Para. 1 Sentence 2 of Regulation (EC) 765/2008, after an accreditation procedure was carried out in compliance with the minimum requirements of DIN EN ISO/IEC 17011 and on the basis of a review and decision of the appointed accreditation committees.

This accreditation certificate only applies in connection with the notice of 04.02.2026. It consists of this cover sheet, the reverse side of the cover sheet and the corresponding annex .

Registration number of the accreditation certificate: **D-K-17589-01-00**

Berlin, 04.02.2026 Dipl.-Wirtsch.-Ing. (BA) Tim Harnisch | Head of Technical Unit

Translation issued: 04.02.2026

See notes overleaf

Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 10
10117 Berlin

The Deutsche Akkreditierungsstelle GmbH (DAkkS) is the entrusted national accreditation body of the Federal Republic of Germany according to § 8 section 1 AkkStelleG in conjunction with § 1 section 1 AkkStelleGBV. DAkkS is designated as the national accreditation authority by Germany according to Art. 4 Para. 4 of Regulation (EC) 765/2008 and clause 4.7 of DIN EN ISO/IEC 17000.

Pursuant to Art. 11 section 2 of Regulation (EC) 765/2008, the accreditation certificate shall be recognised as equivalent by the national authorities within the scope of this Regulation as well as by the WTO member states that have committed themselves in bilateral or multilateral mutual agreements to recognise the certificates of accreditation bodies that are members of ILAC or IAF as equivalent.

DAkkS is a signatory to the multilateral agreements for mutual recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Co-operation (ILAC).

The up-to-date state of membership can be retrieved from the following websites:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-17589-01-01 according to DIN EN ISO/IEC 17025:2018

Valid from: **04.02.2026**

Date of issue: 04.02.2026

This annex is part of the Accreditation Certificate D-K-17589-01-00.

Holder of the Accreditation Certificate:

TetraTec Instruments GmbH
Gewerbestraße 8, 71144 Steinenbronn

with the location

TetraTec Instruments GmbH
Gewerbestraße 8, 71144 Steinenbronn

The calibration laboratory meets the requirements of DIN EN ISO/IEC 17025:2018 to carry out the conformity assessment activities listed in this annex. The calibration laboratory meets additional legal and normative requirements, if applicable, including those in relevant sectoral schemes, provided that these are explicitly confirmed below.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and they conform to the principles of DIN EN ISO 9001.

Calibration in the fields:

Electrical quantities
DC and low frequency quantities
- **DC voltage**
- **DC current**
- **DC resistance**

This annex to the certificate was issued by the Deutsche Akkreditierungsstelle GmbH (DAkkS) and is digitally sealed.
This annex to the certificate is only valid together with the written accreditation certificate and reflects the status as indicated by the date of issue. The current status of any valid and surveyed accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH (www.dakks.de).

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range			Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Electrical quantities						
DC voltage	0 mV	to	120 mV	with system multimeter	$50 \cdot 10^{-6} \cdot U + 3.5\ \mu V$	U = measured value
	> 120 mV	to	1.2 V		$40 \cdot 10^{-6} \cdot U + 7\ \mu V$	
Measuring devices and sources	> 1.2 V	to	12 V		$45 \cdot 10^{-6} \cdot U + 50\ \mu V$	
	> 12 V	to	60 V		$45 \cdot 10^{-6} \cdot U + 0.6$ mV	
DC current	0 mA	to	12 mA	with system multimeter	$50 \cdot 10^{-6} \cdot I + 1\ \mu A$	I = measured value
	> 12 mA	to	20 mA		$30 \cdot 10^{-6} \cdot I + 1.4\ \mu A$	
Measuring devices and sources	> 20 mA	to	120 mA		$0.5 \cdot 10^{-3} \cdot I + 5.0\ \mu A$	
	> 120 mA	to	1 A		$1 \cdot 10^{-3} \cdot I + 0.1$ mA	
	> 1 A	to	3 A		$1.2 \cdot 10^{-3} \cdot I + 0.6$ mA	
DC resistance	0 Ω	to	120 Ω	with system multimeter or resistance meter	$2 \cdot 10^{-6} \cdot R + 0.75$ mΩ	R = measured value
	> 120 Ω	to	150 Ω		$5 \cdot 10^{-6} \cdot R + 0.75$ mΩ	
Resistances	> 150 Ω	to	1.2 kΩ		$0.1 \cdot 10^{-3} \cdot R + 100$ mΩ	
	> 1.2 kΩ	to	12 kΩ		$0.1 \cdot 10^{-3} \cdot R + 100$ mΩ	
	> 12 kΩ	to	120 kΩ		$0.1 \cdot 10^{-3} \cdot R + 1$ Ω	
	> 120 k Ω	to	1.2 MΩ		$0.1 \cdot 10^{-3} \cdot R + 10$ Ω	
	> 1.2 MΩ	to	12 MΩ		$0.4 \cdot 10^{-3} \cdot R + 100$ Ω	
DC resistance	50 Ω			with fixed resistances	0.25 mΩ	
Measuring devices	100 Ω; 110 Ω; 120 Ω; 130 Ω; 140 Ω				0.50 mΩ	

Abbreviations used:

DIN	Deutsches Institut für Normung e.V. – German institute for standardization
EN	Europäische Norm – European Standard
IEC	International Electrotechnical Commission
ISO	International Organization for Standardisation
CMC	Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)

Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-17589-01-02 according to DIN EN ISO/IEC 17025:2018

Valid from: **04.02.2026**

Date of issue: 04.02.2026

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The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and they conform to the principles of DIN EN ISO 9001.

Calibration in the fields:

Fluid quantities
- **Gas flow rate** [a)]
- **Mass of flowing gases** [a)]
- **Volume of flowing gases** [a)]

Mechanical quantities
- **Pressure** [a)]

Thermodynamic quantities
Temperature quantities
- **Resistance thermometers** [a)]
- **Direct reading thermometers** [a)]
- **Temperature transmitters, data loggers** [a)]
- **Temperature indicators and simulators**

Humidity quantities
- **Relative humidity**

[a)] also on site calibration

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Fluid quantities Volume flow rate or volume of flowing gases	0.01 m^3/h to 6 m^3/h	Drum-type gas meter FB-K-7114:2025-11	0.33 %	Calibration medium: - atmospheric air - decompressed air - synthetic air to max. 30 m^3/h
	39 mL/h to 27 L/h	Sonic nozzle gallery FB-K-7114:2025-11	0.31 %	
	27 L/h to 60 m^3/h		0.24 %	
	60 m^3/h to 1920 m^3/h		0.24 %	Calibration medium: - atmospheric air - decompressed air
	3 m^3/h to 1000 m^3/h	Low pulsation rotary piston gas meter FB-K-7114:2025-11	0.26 %	
	13 m^3/h to 10000 m^3/h	Turbine gas meter FB-K-7114:2025-11	0.26 %	
	10 L/h to 9000 L/h	Drum-type resp. triple rotary-piston gas meter Calibration medium: - Nitrogen N_2 - Hydrogen H_2 - Methan CH_4 - Helium He - Argon Ar under ambient conditions FB-K-7114:2025-11	0.46 %	
	10 L/h to 1500 L/h	Drum-type gas meter Calibration medium: - Carbon monoxide CO under ambient conditions FB-K-7114:2025-11	0.46 %	
	0.5 L/h to 540 L/h	Laminar flow elements: Calibration medium: - Propane C_3H_8 under ambient conditions FB-K-7114:2025-11	0.40 %	
	> 540 L/h to 600 L/h		0,50 %	
	0,12 mL/h to 3 L/h	Calibration test leak medium air with pVTt method at ambient temperature and 0,1 to < 0,5 bar rel. 0,5 to 10 bar rel. FB-K-7114:2025-11	2,0 % + 7,2 · 10^{-6} L/h 1,5 % + 7,2 · 10^{-6} L/h	On AE21 and AE41 PVTT system

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Fluid quantities Mass flow rate or mass of flowing gases	12 g/h to 7.2 kg/h	Drum-type gas meter FB-K-7114:2025-11	0.32%	Calibration medium: - atmospheric air - decompressed air - synthetic air to max. 36 kg/h
	47 mg/h to 32 g/h	Sonic nozzle gallery FB-K-7114:2025-11	0.30 %	
	32 g/h to 72 kg/h		0.22 %	
	72 kg/h to 2300 kg/h		0.22 %	Calibration medium: - atmospheric air - decompressed air
	3.6 kg/h to 1200 kg/h	Low pulsation rotary piston gas meter FB-K-7114:2025-11	0.25 %	
	15 kg/h to 12000 kg/h	Turbine gas meter FB-K-7114:2025-11	0.25 %	
	12 g/h N_2 to 10,5 kg/h N_2 0.9 g/h H_2 to 0,75 kg/h H_2 6,6 g/h CH_4 to 5,9 kg/h CH_4 1.7g/h He to 1,5 kg/h He 17 g/h Ar to 15 kg/h Ar 12 g/h CO to 1,7 kg/h CO	Drum-type resp. triple rotary-piston gas meter Calibration medium - Nitrogen N2 - Hydrogen H2 - Methan CH4 - Helium He - Argon Ar - Carbon monoxide CO under ambient conditions FB-K-7114:2025-11	0.46 %	
	1 g/h to 1000 g/h	Laminar flow elements Calibration medium - Propane C3H8 under ambient conditions FB-K-7114:2025-11	0.40 %	
	>1000 g/h to 1100 g/h		0,50 %	

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
	0,144 mg/h to 3,6 g/h	Calibration test leak medium air with pVTt method at ambient temperature and 0,1 to < 0,5 bar rel. 0,5 to 10 bar rel. FB-K-7114:2025-11	2,0 % + 8,56 · 10-6 g/h 1,5 % + 8,56 · 10-6 g/h	On AE21 and AE41 PVTT system
Pressure Negative and positive gauge pressure p_e	-1000 mbar to -50mbar	DKD-R 6-1:2014	$5 \cdot 10^{-3}$ mbar + $4.9 \cdot 10^{-5} \cdot \lvert p_e \rvert$	Pressure medium: dried compressed air or nitrogen
	> -50 mbar to 30 mbar		$4 \cdot 10^{-4} \cdot \lvert p_e \rvert$, but not smaller than 0.003 mbar	
	> 30 mbar to 1700 mbar		$3.4 \cdot 10^{-3}$ mbar + $2.9 \cdot 10^{-5} \cdot p_e$	
	> 1.7 bar to 7 bar		$14 \cdot 10^{-3}$ mbar + $3.2 \cdot 10^{-5} \cdot p_e$	
	> 7 bar to 70 bar		0.14 mbar + $3.3 \cdot 10^{-5} \cdot p_e$	
Absolut pressure p_{abs}	14 mbar to 1700 mbar	DKD-R 6-1:2014	$3.4 \cdot 10^{-3}$ mbar + $3.1 \cdot 10^{-5} \cdot p_{abs}$	Pressure medium: dried compressed air or nitrogen The uncertainty of the measured residual gas pressure U_{rest} has to be taken into account
	> 1.7 bar to 7 bar		$14 \cdot 10^{-3}$ mbar + $3.4 \cdot 10^{-5} \cdot p_{abs}$	
	> 7 bar to 70 bar		0.14 mbar + $3.5 \cdot 10^{-5} \cdot p_{abs}$	
Temperature quantities Resistance thermometers, direct reading thermometers and temperature transmitters with resistance sensors	0 °C to 90 °C	DKD-R 5-1:2023 in liquid bathes	17 mK	Comparison with standard resistance thermometers
	21 °C to 25 °C	DKD-R 5-1:2023 in air channel	0.15 K	Comparison with standard resistance thermometers
	0.01 °C	DKD-R 5-1:2023 triple point of water	5 mK	Calibration at fixed point temperatures
Simulators for resistance thermometers	0 °C to 90 °C	DKD-R 5-5:2018	5 mK	Comparison with DC resistance standard
Indicators for resistance thermometers	0 °C to 90 °C	DKD-R 5-5:2018	5 mK	Comparison with reference resistances (fixed resistances of 100 Ω, 110 Ω, 120 Ω, 130 Ω and 140 Ω)
Relative humidity Hygrometers, hygrometric sensors and transmitters	10 % to 95 %	DKD-R 5-8:2019 in humidity generator room temperature Measuring medium: air	0.1 % + $7.5 \cdot 10^{-3} \cdot$ rF	*rF* = measured value Comparison with dew point mirror Uncertainty as absolute value of relative humidity.

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range			Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Fluid quantities						
Volume flow rate or volume of flowing gases	160 m³/h	to	1600 m³/h	Turbine gas meter	0.34 %	Calibration medium: - atmospheric air - decompressed air Medium supply must be provided by customer.
	1.6 m³/h	to	250m³/h	Rotary piston gas meter	0.34 %	
	> 530 m³/h	to	4700 m³/h	Laminar flow elements	0.39 %	
	10 L/h	to	530 m³/h		0.38 %	
	60 mL/h	to	< 10 L/h		0.43 %	
Mass flow rate or mass of flowing gases	192 kg/h	to	1920 kg/h	Turbine gas meter	0.33 %	
	1.9 kg/h	to	300 kg/h	Rotary piston gas meter	0.33 %	
	> 635 kg/h	to	5640 kg/h	Laminar flow elements	0.39 %	
	12 g/h	to	635 kg/h		0.37 %	
	72 mg/h	to	< 12 g/h		0.42 %	
Temperature quantities Resistance thermometers, direct reading thermometers and transmitters with resistance sensors	5°C	to	50 °C	DKD-R 5-1:2023 in liquid bath	0,075 K	Comparison with standard resistance thermometers
	10°C	to	50 °C	DKD-R 5-1:2023 in dry block calibrator	0,25 K	
Pressure Negative and positive gauge pressure p_e	-680 mbar	to	-68 mbar	DKD-R 6-1:2014	0,5 mbar	Pressure medium: dried compressed air or nitrogen
	>-68 mbar	to	68 mbar		$1{,}5 \cdot 10^{-3} \cdot \lvert p_e \rvert$, but not smaller than 0,01 mbar	
	> 68 mbar	to	680 mbar		0,5 mbar	
	> 0,68 bar	to	6,8 bar		1,5 mbar	
Absolut pressure p_{abs}	400 mbar	to	1200 mbar	DKD-R 6-1:2014	0,5 mbar	$p_{abs} = p_e + p_{amb}$ p_{amb}: atmospheric air pressure
	> 1,2 bar	to	7 bar		1,75 mbar	

Abbreviations used:

DIN	Deutsches Institut für Normung e.V. – German institute for standardization
EN	Europäische Norm – European Standard
IEC	International Electrotechnical Commission
ISO	International Organization for Standardisation
CMC	Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)
DKD-R	Guideline of Deutscher Kalibrierdienst (DKD)
FB-K	In house calibration procedure of TetraTec Instruments GmbH