

Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-20427-01-01 according to DIN EN ISO/IEC 17025:2018

Valid from: 18.02.2026

Date of issue: 18.02.2026

This annex is part of the Accreditation Certificate D-K-20427-01-00.

Holder of the Accreditation Certificate:

**OPTOLUTION Messtechnik GmbH
Gewerbestraße 18, 79539 Lörrach**

with the location

**OPTOLUTION Messtechnik GmbH
Gewerbestraße 18, 79539 Lörrach**

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:

Fluid quantities

- **Liquid flow rate** ^{a)}

^{a)} only on-site calibration

*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).*

Abbreviations used: see last page

page 1 of 3

This document is a translation. The definitive version is the original German annex to the accreditation certificate.

Annex to the Accreditation Certificate D-K-20427-01-01

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Liquid flow rate volume flow rate of flowing water water meters and flow sensors as part of heat meters and cooling meters	20 m ³ /h to 30000 m ³ /h	2.1.1-7 IN-01 Verfahrensbeschreibung VOK:2026-01 (Version 2.9) LDV segment method Profil class „fully developed“ Profile coefficient: $0 \leq K_p \leq 1.0$ Asymmetry coefficient: $0 \leq K_A \leq 0.2$ Turbulence coefficient: $0.5 \leq K_{Tu} \leq 1.5$ Level of profile overlap: $K_D \geq 80 \%$	0.7 %	Provision of optical access in empty unpressurised pipes or filled pressurised pipes Fluid temperature: 5 °C to 150 °C volumetric flow velocity of fluid: ≥ 0.3 m/s
	20 m ³ /h to 30000 m ³ /h	2.1.1-7 IN-01 Verfahrensbeschreibung VOK:2026-01 (Version 2.9) LDV segment method Profil class „symmetric“ (Profile coefficient · Asymmetry coefficient): $0 \leq K_p \cdot K_A \leq 1.0$ Turbulence coefficient: $0.5 \leq K_{Tu} \leq 1.5$ Level of profile overlap: $K_D \geq 85 \%$	1.4 %	
	20 m ³ /h to 30000 m ³ /h	2.1.1-7 IN-01 Verfahrensbeschreibung VOK:2026-01 (Version 2.9) LDV segment method Profil class „slightly disturbed“ Profile coefficient: $0 \leq K_p \leq 9$ Asymmetry coefficient: $0 \leq K_A \leq 0.5$ Turbulence coefficient: $1.2 \leq K_{Tu} \leq 3.5$ Level of profile overlap: $K_D \geq 90 \%$	2.3 %	
	20 m ³ /h to 30000 m ³ /h	2.1.1-7 IN-01 Verfahrensbeschreibung VOK:2026-01 (Version 2.9) LDV segment method Profil class „highly turbulent“ Profile coefficient: $1 \leq K_p \leq 12$ Asymmetry coefficient: $0 \leq K_A \leq 0.5$ Turbulence coefficient: $1.4 \leq K_{Tu} \leq 5.8$ Level of profile overlap: $K_D \geq 95 \%$	2.7 %	
	20 m ³ /h to 30000 m ³ /h	2.1.1-7 IN-01 Verfahrensbeschreibung VOK:2026-01 (Version 2.9) LDV segment method Profil class „highly asymmetric“ Profile coefficient: $2 \leq K_p \leq 11$ Asymmetry coefficient: $0.5 \leq K_A \leq 5$ Turbulence coefficient: $1.4 \leq K_{Tu} \leq 6$ Level of profile overlap: $K_D \geq 95 \%$	4.2 %	
	20 m ³ /h to 30000 m ³ /h	2.1.1-7 IN-01 Verfahrensbeschreibung VOK:2026-01 (Version 2.9) LDV segment method Profil class „highly asymmetric“ Profile coefficient: $2 \leq K_p \leq 11$ Asymmetry coefficient: $0.5 \leq K_A \leq 5$ Turbulence coefficient: $1.4 \leq K_{Tu} \leq 6$ Level of profile overlap: $K_D \geq 95 \%$	4.2 %	

Valid from: 18.02.2026

Date of issue: 18.02.2026

page 2 of 3

This document is a translation. The definitive version is the original German annex to the accreditation certificate.

Annex to the Accreditation Certificate D-K-20427-01-01

Abbreviations used:

2.1.1-7 IN-01	internal calibration procedure of OPTOLUTION Messtechnik GmbH
CMC	Calibration and measurement capabilities
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
LDV	Laser doppler velocimetry

Valid from: 18.02.2026

Date of issue: 18.02.2026

page 3 of 3

This document is a translation. The definitive version is the original German annex to the accreditation certificate.