

Accredited entity according to ČSN EN ISO/IEC 17025:2018:

Výzkumný a zkušební ústav Plzeň s.r.o.  
CAB number 2246, Calibration Laboratory  
Tylova 1581/46, Jižní Předměstí, 301 00 Plzeň

**Calibration laboratory locations:**

1. **Length and Angle Laboratory** Domažlická 2928/3, 301 00 Plzeň  
Correspondence address: Tylova 1581/46, 301 00 Plzeň
2. **Vibration Laboratory** Orlík 266/15, Bolevec, 316 00 Plzeň  
Correspondence address: Tylova 1581/46, 301 00 Plzeň
3. **Force Laboratory** Orlík 266/15, Bolevec, 316 00 Plzeň  
Correspondence address: Tylova 1581/46, 301 00 Plzeň

**CMC for the field of measured quantity: Length**

Ord. Number <sup>1</sup>	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the meas. quantity	Lowest expanded measurement uncertainty specified <sup>2</sup>	Calibration principle	Calibration procedure identification <sup>3</sup>	Work-place
		min.	unit	max.	unit					
1	Gauge blocks	0.3 mm	to	0.9 mm		0,3µm	Measurement on a comparator Comparative measurements with standards of II. order (gauge blocks) Comparative measurements with standards of III. order (gauge blocks) Measurements on a length measuring machine	KALP-KL/55/101	1	
		0.5 mm	to	100 mm		(0,9·L + 0,09) µm				
		100 mm	to	1,000 mm		(1,8·L+ 0,18) µm				
		1,000 mm	to	3,000 mm		(5·L+ 2) µm				
2	Setting rings	3 mm	to	300 mm	diameter roundness	(3·D+ 0,7) µm	Measurements on a length measuring machine Measurements on a roundness tester	KALP-KL/55/102	1	
		0 µm	to	100 µm		(0,06·V+ 0,1) µm				
3	Inside micrometers	0 mm	to	1,000 mm		(3·L+ 0,5) µm	Measurements on a length measuring machine	KALP-KL/55/103	1	
		1,000 mm	to	6,000 mm		(5·L+ 2) µm				

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		min.	unit	max.	unit					
4	Limit gauges - plain plug gauges - thread plug gauges - thread ring gauges	0 mm	to	300 mm		(3·L+ 0,5) μm (3·L+ 1,9) μm (3·L+ 1,9) μm	Measurements on a length measuring machine	KALP-KL/55/104	1	
5*	Slide gauges Slide weld gauges Height gauges Displacement sensors	0 mm	to	3,000 mm		(13·L+ 12) μm (13·L+ 12) μm (7·L+ 2) μm (15·L + 15) μm	Comparative measurements with standards of IV. order (block gauges) Comparative measurements with standards of IV. order (block gauges) Comparative measurements with standards of IV. order (block gauges) Linear scale measurement	KALP-KL/55/105	1	
6	Micrometer gauges - internal (folding) - external (snap) - internal (inside)	0 mm	to	6,000 mm		(7·L+ 1,5) μm (7·L+ 1,5) μm (7·L+ 1,5) μm	Measurements on a length measuring machine Comparative measurements with standards of IV. order (block gauges) Comparative measurements with setting rings	KALP-KL/55/106	1	
7	Indicators	0 mm	to	100 mm	0.001 mm	(3·L+ 0,5) μm	Measurements on a length measuring machine	KALP-KL/55/107	1	
		0 mm	to	100 mm	0.01 mm	(3·L+ 2) μm				

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		min.	unit	max.	unit					
8	Graduated gauges							KALP-KL/55/108	1	
	- rigid, microscopic	0 mm		to	3,000 mm	(10·L+ 5) μm	Measurement on a microscope			
	- tape, extendable, digital, folding	0 mm		to	5,000 mm	(0,08·L+ 0,15) μm	Comparison with length gauge measuring machine			
	- band	0 m		to	100 m	(0,06·L+ 0,13) μm	Comparison with length gauge measuring machine			
9*	Surface plate	100 mm		to	5,000 mm	flatness	(2·L+ 1) μm	KALP-KL/55/110	1	
	Surface rule	100 mm		to	5,000 mm	straightness	(2·L+ 1) μm			
10	Atypical gauges and linear length gauges	3 mm		to	300 mm	diameter	(3·D+ 0,7) μm	KALP-KL/55/111	1	
		0 mm		to	1,000 mm	length	(3·L+ 0,5) μm			
11	Radius, profile and thread gauges, plain taper gauges internal and external, cone type diameter gauge, penetration needle and atypical templates	0 mm		to	1,000 mm	X-axis	(7·L+ 5,7) μm	KALP-KL/55/112	1	
		0 mm		to	300 mm	Y-axis	(7·L+ 5,7) μm			
12	Measuring cylinders of squareness	100 mm		to	1,000 mm	angle deviation	(1,2·L+ D/4+ 0,14) μm	KALP-KL/55/201	1	
13	Angles	0 mm		to	1,000 mm		(7·L+ 5,7) μm	KALP-KL/55/202	1	
14	Sine bars	0 mm		to	300 mm		(3·L+ 0,9) μm	KALP-KL/55/205	1	
15	Film thickness gauges	0 mm		to	2 mm		(20·L+ 1,7) μm	KALP-KL/55/113	1	
	Ultrasonic thickness gauges	0 mm		to	50 mm		(0,02·L + 0,03) mmm	Measurement using parallel gauge blocks		

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- <sup>1</sup> Asterisk at the ordinal number identifies the calibrations, which the Laboratory is qualified to carry out outside the permanent laboratory premises.
- <sup>2</sup> The expanded measurement uncertainty is in accordance with ILAC-P14 and EA-4/02 M, part of CMC, and it is the lowest value of the respective uncertainty. If not stated otherwise, its coverage probability is approx. 95%. If not stated otherwise, the uncertainty values stated without a unit are relative to the value measured. The uncertainty value stated herein is based on the best conditions achievable by the laboratory; the uncertainty value of a specific calibration may be higher depending on the conditions of such a calibration. For identical extreme values of adjacent ranges, the lower uncertainty value always applies.
- <sup>3</sup> For dated documents identifying calibration procedures, only those specific procedures are used. For undated documents identifying calibration procedures, the most recent edition of that procedure (including any changes) is used.

**CMC for the field of measured quantity: Plane angle**

Ord. number <sup>1</sup>	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the meas. quantity	Lowest expanded measurement uncertainty specified <sup>2</sup>	Calibration principle	Calibration procedure identification <sup>3</sup>	Work place
		min.	unit	max.	unit					
1	Angle gauges	0 ° -180 °	to	360 ° 180 °		1.2 ′ 1.2 ′	Comparative measurement with standard of angle gauges Measurement on a sine bar	KALP-KL/55/204	1	
2	Liquid and electronic levels Builder's level	-10 mm/m -10 mm/m	to	10 mm/m 10 mm/m		2.5 μm/m 16 μm/m	Measurement on a small angle generator	KALP-KL/55/203	1	

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CMC for the field of measured quantity: Mechanical motion (vibrations)

Ord. number <sup>1</sup>	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the meas. quantity	Lowest expanded measurement uncertainty specified <sup>2</sup>	Calibration principle	Calibration procedure identification <sup>3</sup>	Work-place
		min.	unit	max.	unit					
1*	Acceleration of linear harmonic mechanical vibrations <sup>4</sup> / Vibrometers and control standards <sup>5</sup>	0.1 m·s <sup>-2</sup>		to	1,100 m·s <sup>-2</sup>		2 %	Comparative measurement with a vibration standard	KALP-KL/56/001 (ČSN ISO 16063-21)	2
2*	Sensitivity of vibration sensors / Vibration sensors	0.01 mV/ m·s <sup>-2</sup>		to	10,000 mV/ m·s <sup>-2</sup>	in the frequency band 3 to 5,000 Hz	2 %	Comparative measurement with a vibration standard	KALP-KL/56/002 (ČSN ISO 16063-21)	2

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<sup>3</sup> For dated documents identifying calibration procedures, only those specific procedures are used. For undated documents identifying calibration procedures, the most recent edition of that procedure (including any changes) is used

<sup>4</sup> By calculating the measurements, the velocities and displacements of mechanical vibrations are evaluated

<sup>5</sup> Portable vibrators intended for operational use

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**CMC for the field of measured quantity: Force, mechanical tests (torque)**

Ord. number <sup>1</sup>	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the meas. quantity	Lowest expanded measurement uncertainty specified <sup>2</sup>	Calibration principle	Calibration procedure identification <sup>3</sup>	Work place
		min.	unit	max.	unit					
1*	Torque / Torque wrench and other devices <sup>4</sup>	0.2 N·m		to	1,500 N·m		0.91 %	Comparative measurement with a standard torque device	KALP-KL/55/302 (ČSN EN ISO 6789)	1
2*	Force (compression, tension) / Working load cells of testing systems	10 kN		to	20 kN		0.036 %	Comparison measurement with a standard load cell	KALP-KL/54/001	3
		20 kN		to	100 kN		0.021 %			
		100 kN		to	150 kN		0.11 %			
		150 kN		to	250 kN		0.092 %			
		250 kN		to	500 kN		0.060 %			

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- <sup>3</sup> If the document identifying the calibration procedure is dated, only these specific procedures are used. If the document identifying the calibration procedure is not dated, the latest edition of the specified procedure is used (including any changes).
- <sup>4</sup> Torque wrenches and screwdrivers, torque transducers, pneumatic and electric tighteners, tightening systems