

Calibration certificate

Certificate number: LH80905

Revision 3.0.e

Applicant: CCSTEC GesmbH
Triesterstrasse 36
A-2512, Oeynhausen
Austria

Instrument:

Description	Airborne particle counter
Manufacturer	Lighthouse
Model	Remote 2014
Serial number	180221001
Customer ID	C91

Date of calibration: 03 January 2022

Due date calibration: January 2023

Calibration method: Calibration has been accomplished as described in ISO21501-4:2018. All work performed is in accordance with Lighthouse Worldwide Solutions Benelux, Master Calibration Document: I201 and is recorded and maintained as such.

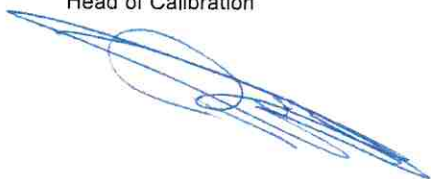
Results: The results of the measurements are shown in the appendix.
Readjustments: No readjustments are made.
Compliance, As left: Pass - The measured values were observed in tolerance at the points tested.

Traceability: The measurements have been executed using standards for which the traceability to (inter)national standards has been demonstrated towards the Raad voor Accreditatie.

Uncertainty: The reported expanded uncertainty is based on the standard uncertainty of the measurement multiplied by a coverage factor k , such that the coverage probability corresponds to approximately 95%. The standard uncertainty is determined in accordance with EA-4/02. The ILAC-G8:09/2019 Binary statement is used as method for the compliance statement.

Date of issue: 04 January 2022

Authorized by: M.A.W. van Boxtel
Head of Calibration



Appendix

Certificate number: LH80905

Date of calibration: 03 January 2022
Calibration location: Lighthouse Benelux Calibration laboratory in Boven-Leeuwen
Calibrated by: A.C.G. Gerritse
Function: Calibration & Service Engineer

Environmental conditions: The ambient temperature was 22,1 °C at a relative humidity of 33,0 %rh.

Measurement results, As found

Performance information				
Test	Test result	Expanded uncertainty	Criteria	Pass / Fail
ISO21501-4 Flow	2,85 l/min	0,11 l/min	2,83 l/min ± 5 %	Pass
JIS B 9921 Zero count	0	N/A	≤ 1 in 5 min	Pass
ISO21501-4 False count rate	Upper confidence level 212 counts per cubic meter	N/A	N/A	N/A
ISO21501-4 Timer check	60,1 seconds	0,4 s	± 1 %	Pass
ISO21501-4 Size resolution	3,0 % used size 0,243 μ m	5,4 %SR	< 15 %	Pass
ISO21501-4 Counting efficiency 50%	58,4 % used size 0,204 μ m	3,0 %CE	(50 \pm 20) %	Pass
ISO21501-4 Counting efficiency 100%	102,4 % used size 0,309 μ m	4,9 %CE	(100 \pm 10) %	Pass

Size calibration (criteria ± 10 %)

Channel	Channel size	Threshold value	Calculated size	Expanded uncertainty	Calculated sizing error	Compliance
	[μ m]	[mV]	[μ m]	[μ m]	[%]	
1	0,20	60	0,201	0,007	0,3	Pass
2	0,30	544	0,300	0,007	0,0	Pass
3	0,50	2233	0,508	0,010	1,7	Pass
4	1,00	4203	1,032	0,018	3,2	Pass

Notes

Counting efficiency: used size 0,500 μ m: 97,2 %CE \pm 5,0%CE
Counting efficiency: used size 1,000 μ m: 101,9 %CE \pm 5,8%CE

Reference equipment

Model	S/N	Due to	Certificate number
TSI Mass Flowmeter 4043	40432119021	28 June 2022	70030
Fisher Scientific 0666256	200359247	16 June 2022	1042-11351217
Palas	6752 / 6751	16 November 2022	235-11195
MCA8000D	425	15 February 2022	21-13808-1-3

Particle size standards

Size	Description	Due to	Certificate
0,20 μ m	3200 & 3200A Nanosphere size standards	March 2022	D20014
0,25 μ m	3240A, Nanosphere size standards	July 2023	D20024
0,30 μ m	3300A & 3300B, Nanosphere Size Standards	April 2023	D20015
0,50 μ m	3500 & 3500A, Nanosphere Size Standards	April 2022	D20017
1,00 μ m	4009A, 4009A & 4009B Microsphere Size Standards	October 2022	D20020

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1,00 μ m	4009A, 4009A & 4009B Microsphere Size Standards	October 2022	D20020