

Applicant
CCSTEC GmbH
Triester Straße 36
2512 Oeynhausen
Österreich

Instrument
Type: Airborne Particle Counter
Manufacturer: Lighthouse Worldwide Solutions
Model: Solair 3100
Serial no.: 200404033
Customer device ID.: C103

Date of calibration 6. May 2021

Due date of calibration May 2022

Calibration Location A-2512 Oeynhausen

Calibration methode Calibration has been accomplished as described according to ISO 21501-4:2018.

Results
The result of the measurements are shown on the following pages.
The unit is readjusted.
All measured values comply with the specification limit(s).

Traceability Reference equipment used for calibration are regularly calibrated and traceable to national standards.

Uncertainty The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k = 2$, which provides a confidence level of approximately 95%. The standard uncertainty is determined in accordance with EA-4/02.

Calibrated by:

Daniel Gruber
6. May 2021
(Name, Date, Signature)

Approved by:

Christian Ribarits
6. May 2021
(Name, Date, Signature)

Date of calibration 6. May 2021

Calibrated by Daniel Gruber

Environmental conditions 24,0 °C 31,2 %rF 987,5 hPa

Results, As found**Performance details**

Test	Test result	Expanded uncertainty	Criteria	Pass / Fail
ISO21501-4 Flow	28,5 l/min	0,05 l/min	28,3 l/min. +- 5%	Pass
JIS B 9921 Zero count	0 particles in 5 min. Upper confidence level	N/A	≤1 in 5 min.	Pass
ISO21501-4 False count rate	21,19 particles/m ³	N/A	N/A	Pass
ISO21501-4 Timer Check	60,0 sec.	0,03 sec.	±1%	Pass
ISO21501-4 Size resolution	1,57 % used size 0,40 µm	0,68 %	< 15%	Pass
ISO21501-4 Counting efficiency 50%	51,9 % used size 0,30 µm	4,63 %	(50±20)%	Pass
ISO21501-4 Counting efficiency 100%	96,8 % used size 0,50 µm	4,19 %	(100±10)%	Pass

Size calibration

Channel	Channel Size	Threshold voltage	Calculated Size	Expanded uncertainty	Calculated Sizing error (±10%)	Pass / Fail
1.	0,30 µm	54 mV	0,299 µm	0,0062 µm	-0,36 %	Pass
2.	0,50 µm	507 mV	0,513 µm	0,0042 µm	2,51 %	Pass
3.	1,00 µm	1152 mV	0,938 µm	0,0050 µm	-6,24 %	Pass
4.	3,00 µm	3292 mV	3,148 µm	0,0031 µm	4,93 %	Pass
5.	5,00 µm	3738 mV	4,896 µm	0,0049 µm	-2,09 %	Pass
6.	10,00 µm	4463 mV	9,228 µm	0,0039 µm	-7,72 %	Pass

Notes**Reference Equipment**

Internal ID	Model	Serial Number	Certificate Number	Due date
C87	Mass Flowmeter 4043	40431653004	66078	08.01.2022
C45	Fluke 87 V	87380269	65112019	20.11.2021
C98	Hanhart Labor 3	9051	20_2759	14.12.2021
C85	MCA 8000D	791	2101-16012	02.02.2022
C100	Testo 622	3952 1980/909	225235	12.01.2022
C96	Solair 3100 GenE	190504038	LH54094	04.06.2021
C97	Remote 2014	191121036	LH62134	14.12.2021

Particle size standards

Size	Description	Due date	Lot#
0,30 µm	DUKE STANDARDS™ Nanosphere Size Standards Particles	Apr-23	223077
0,50 µm	DUKE STANDARDS™ Nanosphere Size Standards Particles	Feb-24	236574
1,00 µm	DUKE STANDARDS™ Microsphere Size Standards Particles	Apr-22	211354
3,00 µm	DUKE STANDARDS™ Dry Microsphere Size Standards Particles	Sep-21	202646
5,00 µm	DUKE STANDARDS™ Dry Microsphere Size Standards Particles	Apr-24	239589
10,00 µm	DUKE STANDARDS™ Dry Microsphere Size Standards Particles	Jan-22	206793

Date of calibration 6. May 2021

Calibrated by Daniel Gruber

Environmental conditions 24,0 °C 31,2 %rF 987,5 hPa

Results, As left**Performance details**

Test	Test result	Expanded uncertainty	Criteria	Pass / Fail
ISO21501-4 Flow	28,5 l/min	0,05 l/min	28,3 l/min. +- 5%	Pass
JIS B 9921 Zero count	0 particles in 5 min. Upper confidence level	N/A	≤1 in 5 min.	Pass
ISO21501-4 False count rate	21,19 particles/m³	N/A	N/A	Pass
ISO21501-4 Timer Check	60,0 sec.	0,03 sec.	±1%	Pass
ISO21501-4 Size resolution	1,57 % used size 0,40 µm	0,68 %	< 15%	Pass
ISO21501-4 Counting efficiency 50%	53,5 % used size 0,30 µm	4,10 %	(50±20)%	Pass
ISO21501-4 Counting efficiency 100%	98,4 % used size 0,50 µm	3,89 %	(100±10)%	Pass

Size calibration

Channel	Channel Size	Threshold voltage	Calculated Size	Expanded uncertainty	Calculated Sizing error (±10%)	Pass / Fail
1.	0,30 µm	54 mV	0,299 µm	0,0062 µm	-0,36 %	Pass
2.	0,50 µm	502 mV	0,510 µm	0,0042 µm	1,95 %	Pass
3.	1,00 µm	1223 mV	0,994 µm	0,0048 µm	-0,62 %	Pass
4.	3,00 µm	3221 mV	3,006 µm	0,0032 µm	0,21 %	Pass
5.	5,00 µm	3769 mV	5,039 µm	0,0048 µm	0,79 %	Pass
6.	10,00 µm	4553 mV	9,846 µm	0,0037 µm	-1,54 %	Pass

Notes**Reference Equipment**

Internal ID	Model	Serial Number	Certificate Number	Due date
C87	Mass Flowmeter 4043	40431653004	66078	08.01.2022
C45	Fluke 87 V	87380269	65112019	20.11.2021
C98	Hanhart Labor 3	9051	20_2759	14.12.2021
C85	MCA 8000D	791	2101-16012	02.02.2022
C100	Testo 622	3952 1980/909	225235	12.01.2022
C96	Solair 3100 GenE	190504038	LH54094	04.06.2021
C97	Remote 2014	191121036	LH62134	14.12.2021

Particle size standards

Size	Description	Due date	Lot#
0,30 µm	DUKE STANDARDS™ Nanosphere Size Standards Particles	Apr-23	223077
0,50 µm	DUKE STANDARDS™ Nanosphere Size Standards Particles	Feb-24	236574
1,00 µm	DUKE STANDARDS™ Microsphere Size Standards Particles	Apr-22	211354
3,00 µm	DUKE STANDARDS™ Dry Microsphere Size Standards Particles	Sep-21	202646
5,00 µm	DUKE STANDARDS™ Dry Microsphere Size Standards Particles	Apr-24	239589
10,00 µm	DUKE STANDARDS™ Dry Microsphere Size Standards Particles	Jan-22	206793