



Certificate number: LH00789

Calibration certificate

Revision 2.0

Applicant : CCSTEC GesmbH

Triesterstrasse 36 A-2512, Oeynhausen

Austria

Instrument : Description : Airborne particle counter

Manufacturer : Model : Serial no. :

Lighthouse Solair 3100 130404002

Customer ID : C77

Date of calibration : 03 February 2016

Due date calibration : February 2017

Calibration location : Lighthouse Benelux Calibration laboratory

in Boven-Leeuwen

Calibration method : Calibration has been accomplished as described in ISO21501-4:2007.

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.

The unit is readjusted.

The unit under test meets its specifications at all the points measured.

Treaceablity : The measurements have been executed using standards for which the

traceabilty to (inter)national standards has been demonstrated.

CALIBRATION SERVICES

A.A.J. van den Heuvel Quality & Customer service Coordinator

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Lighthouse Worldwide Solutions Benelux BV Van Heemstraweg 19A 6657 KD Boven-Leeuwen The Netherlands Tel: +31 (0)487 560811 Fax: +31 (0)487 560013 E-mail: csbenelux@golighthouse.com Reproduction of the complete certificate is allowed, Parts of the certificate may only be reproduced with written approval of the calibration laboratory. This certificate is issued provided that Lighthouse Benelux B.V. does not assume any liability.





Appendix

Certificate number: LH00789

Date of calibration : 03 February 2016

Calibrated by : E.A.H. van Mook

Function : Calibration & Service Engineer

: The ambient temperature was 22.6°C at a relative humidity of 35% **Environmental**

conditions

Measurement results, As found

Performance information Design Control Design Contr				
Test bradien L	Test result	Criteria	Pass / Fail	
ISO21501-4 Flow	28.50l/min	±5%	Pass	
JIS B 9921 Zero count	0 -= 5 1 1 1	<1 in 5 mins	Pass	
ISO21501-4 False count rate	Upper confidence level 21 particles/m3	N/A	N/A	
ISO21501-4 Timer check	60.0 seconds	±1%	Pass	
ISO21501-4 Size resolution	0.84%	< 15%	Pass	
ISO21501-4 Counting efficiency 50%	41.92%	(50±20)%	Pass	
ISO21501-4 Counting efficiency 100%	112.80%	(100±10)%	Fail	

Size calibration

Channel Channel Size		Threshold voltage	Calculated size	Calculated Sizing	Pass /
				error (±10%)	Fail
1	0.3µm	56mV	0.296µm	-1.33%	Pass
2 = 0	0.5µm	634mV	0.508µm	1.54%	Pass
3	0.7µm	1383mV	0.718µm	2.52%	Pass
4	1.0µm	1700mV	1.010µm	0.97%	Pass
5	2.0µm	2828mV	1.981µm	-0.95%	Pass
6	3.0µm	3498mV	3.115µm	3.82%	Pass
7	5.0µm	3789mV	4.814µm	-3.72%	Pass
8 - 0	10.0μm	4633mV	10.961µm	9.61%	Pass
			Notes		

Reference equipment

Model	S/N	Due to	Certificate number	Ouse
TSI Mass Flowmeter 4043	40431138006	30-Sep-2016	31892	
MCA8000A	3387	21-Oct-2016	1510-08307	
Fluke-175	12170243	4-Jun-2016	1481270	
Fisher Scientific 0666256	150783954	20-Oct-2017	1042-7138748	
Solair 2010+	100461001	24-May-2016	1511616	

Particle size standards

Description	Due to	Lot#
		42979
		43313
3700 & 3700A, Nanosphere Size Standards	1-Jun-2018	43252
4009A, 4009A & 4009B Microsphere Size Standards	1-Mar-2018	43160
4202 & 4202A, Particle Size Standards	1-Aug-2018	43313
4203 and 4203A, Particle Size Standards	1-Jun-2018	43252
4205, 4205A and 4205C Microsphere Size St.	1-Jun-2018	43252
4210 and 4210A Microsphere Size Standards	1-May-2018	43221
	4009A, 4009A & 4009B Microsphere Size Standards 4202 & 4202A, Particle Size Standards 4203 and 4203A, Particle Size Standards	3300A & 3300B, Nanosphere Size Standards 1-Sep-2017 3500 & 3500A, Nanosphere Size Standards 1-Aug-2018 3700 & 3700A, Nanosphere Size Standards 1-Jun-2018 4009A, 4009A & 4009B Microsphere Size Standards 1-Mar-2018 4202 & 4202A, Particle Size Standards 1-Aug-2018 4203 and 4203A, Particle Size Standards 1-Jun-2018 4205, 4205A and 4205C Microsphere Size St. 1-Jun-2018



ISO21501-4 Counting efficiency 50%

ISO21501-4 Counting efficiency 100% 101.50%



Pass

Pass

(50±20)%

(100±10)%

Appendix

Date of calibration

: 03 February 2016

Calibrated by : E.A.H. van Mook

Function : Calibration & Service Engineer

: The ambient temperature was 22.6°C at a relative humidity of 35% **Environmental**

43.62%

conditions

Measurement results, As left

Performance information				
Test loration Li	Test result	Criteria	Pass / Fail	
JIS B 9921 Zero count	28.50l/min 0	±5% <1 in 5 mins	Pass Pass	
ISO21501-4 False count rate	Upper confidence level 21 particles/m3	N/A	N/A	
ISO21501-4 Timer check	60.0 seconds	±1%	Pass	
ISO21501-4 Size resolution	0.47%	< 15%	Pass	

Size calibration

Channel	Channel Size	Threshold voltage	Calculated size	Calculated Sizing	Pass /
Onamici	Ondrinor Orzo	Threshold voltage	Calculated 5120	error (±10%)	Fail
1	0.3µm	55mV	0.296µm	-1.33%	Pass
2 se Ce	0.5µm	635mV	0.508µm	1.60%	Pass
3	0.7µm	1365mV	0.707µm	1.00%	Pass
4	1.0µm	1682mV	0.994µm	-0.60%	Pass
5	2.0µm	2849mV	2.020µm	1.00%	Pass
6	3.0µm	3459mV	2.995µm	-0.17%	Pass
7 cate	5.0µm	3821mV	5.021µm	0.42%	Pass
8	10.0µm	4535mV	10.120µm	1.20%	Pass
			Notes		

Reference equipment

Model	S/N	Due to	Certificate number
TSI Mass Flowmeter 4043	40431138006	30-Sep-2016	31892
MCA8000A	3387	21-Oct-2016	1510-08307
Fluke-175	12170243	4-Jun-2016	1481270
Fisher Scientific 0666256	150783954	20-Oct-2017	1042-7138748
Solair 2010+	100461001	24-May-2016	1511616

Particle size standards

Size	Description Tartier Size Staridards	Due to	Lot#	-
0.3µm	3300A & 3300B, Nanosphere Size Standards	1-Sep-2017	42979	
0.5µm	3500 & 3500A, Nanosphere Size Standards	1-Aug-2018	43313	
0.7µm	3700 & 3700A, Nanosphere Size Standards	1-Jun-2018	43252	
1.0µm	4009A, 4009A & 4009B Microsphere Size Standards	1-Mar-2018	43160	
2.0µm	4202 & 4202A, Particle Size Standards	1-Aug-2018	43313	
3.0µm	4203 and 4203A, Particle Size Standards	1-Jun-2018	43252	
5.0µm	4205, 4205A and 4205C Microsphere Size St.	1-Jun-2018	43252	
10.0µm	4210 and 4210A Microsphere Size Standards	1-May-2018	43221	