Hardware Test Report

acoem
CREATING ENVIRONMENTS OF POSSIBILITY

Batch number: **44537 - 05** Tested by:

Part number: **H020660** **production 29/08/2023 13**

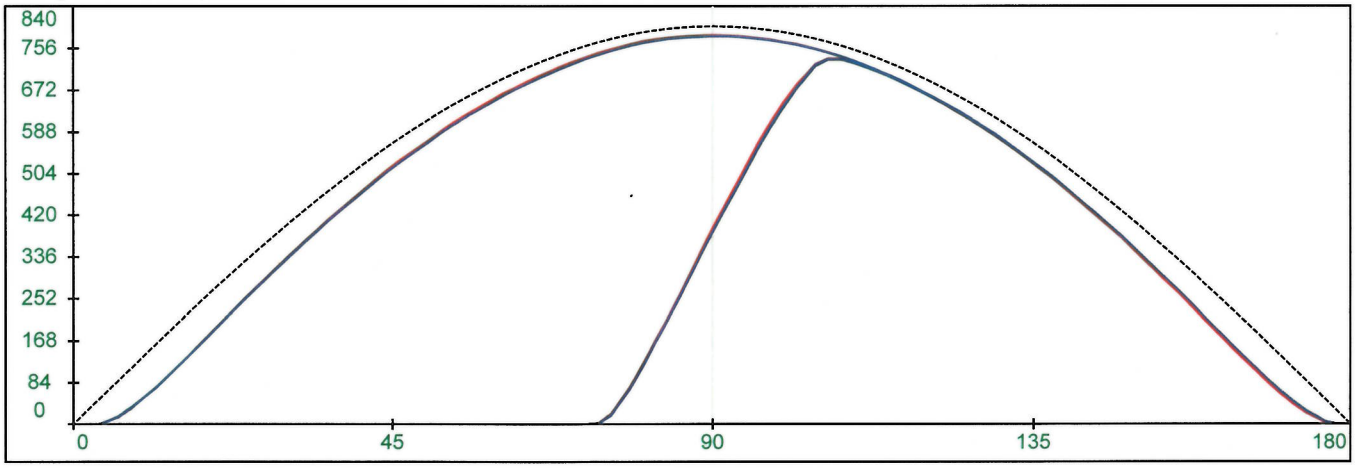
Procedure: **SOP**

Opal Backscatter, Distribution: Lambertian - 29/08/2023 13:26

LED POTS			BACKSCATTER POT			
RED	GREEN	BLUE	RED	GREEN	BLUE	AVG
1	4	15	196	196	196	196

Angular Response

Measured Expected



Response Data

Colour	Full	Backscatter	%
Red	783	395	50
Green	780	385	49
Blue	780	386	49

☒ Leak Checked ☒ Aligned ☒ Test Passed

Comments:

Signed:

Date: 29.8.23

acoem
CREATING ENVIRONMENTS OF POSSIBILITY

ID Number: 23-0690

Instrument Test Report

Aurora NE-300 Three Wavelength Nephelometer

P/N: E010104

Tested By: Cheng Su
Report Date: 1/12/2023

DocID: SOP 0861 v26-Jun-2023

Settings

FIRMWARE VERSION:	300
TEMPERATURE UNITS:	°C
PRESSURE UNITS:	mBar
NORMALISED TEMP:	0 C
HEATER CONTROL:	Off
FLOW SETPOINT:	6
COOLER SETPOINT:	20
FILTER:	KALMAN
WINDOW (ROLLING AV):	60
FLOW UNITS:	lpm
FLOW TYPE:	Volumetric
FLOW CONTROL:	Sensor
LOGGING PERIOD:	1 Minute

Light Source

MODEL:	300
SERIAL No:	44537-05
REVISION:	2
WAVELENGTH 1:	635
WAVELENGTH 2:	525
WAVELENGTH 3:	450
LED 1:	95
LED 2:	120
LED 3:	30
90 Deg CAL:	196

Installed Options

WALL MOUNT BRACKET	☐
20 LPM MFC	☐
EXTERNAL PUMP	☐
ACS-1000	☐
AMBIENT TEMP	☐

Sensor Readings

	Reading	Slope	Offset
SAMPLE TEMP:	32.6 °C	1.00	0.38
SAMPLE PRESS:	960.4 mBar	1.00	-1.93
SAMPLE RH:	29.4 %	1.00	-0.16
CHASSIS TEMP:	28.1 °C	1.00	0.00
CHASSIS PRESS:	1002.9 mBar	1.00	0.00
CHASSIS RH:	47.4 %	1.00	0.00
SAMPLE FLOW:	6.0 lpm	0.93	0.00
COOLER TEMP:	20.3 °C	38.99	-37.24

System Counts

REFERENCE SHUTTER 1:	1,502,554 /s
REFERENCE SHUTTER 2:	1,892,005 /s
REFERENCE SHUTTER 3:	1,391,785 /s
DARK COUNT ROOM	173 /s
DARK COUNT 40°C:	250 /s
PMT SERIAL No:	ACZ15471

Measurement Parameters

Wavelength / Angle	ST Correction	Temperature Drift	LDL	Noise (Room)	Noise (40°C)
635nm 0°:	0.600	0.032 Mm-1/°C	0.085	0.042 Mm-1	0.038 Mm-1
525nm 0°:	0.500	0.001 Mm-1/°C	0.041	0.020 Mm-1	0.025 Mm-1
450nm 0°:	0.100	-0.039 Mm-1/°C	0.060	0.030 Mm-1	0.034 Mm-1
635nm 90°:	0.600	0.030 Mm-1/°C	0.050	0.025 Mm-1	0.026 Mm-1
525nm 90°:	0.500	0.006 Mm-1/°C	0.037	0.018 Mm-1	0.023 Mm-1
450nm 90°:	0.100	-0.026 Mm-1/°C	0.048	0.024 Mm-1	0.025 Mm-1

Kalman Filter Parameters

	Period	R Zero	R Span	R Spike	Q Upper	Q Lower	Q Tau	R Tau	Min G	Max G	Kalman Gain
KALMAN 1	5	0.0002	0.0000	3.5	0.07	20	30	3000	0.005	0.1	0.020
KALMAN 2	5	0.0002	0.0000	3.5	0.07	20	30	3000	0.005	0.1	0.036
KALMAN 3	5	0.0002	0.0000	3.5	0.07	20	30	3000	0.005	0.1	0.025

System Parameters

LEAK CHECK:	0.82 %
SUPPLY VOLTAGE:	24.1 V
SUPPLY CURRENT:	2766.9 mA
LED VOLTAGE:	18.3 V
COOLER VOLTAGE:	4.8 V

Control Parameters

PUMP DUTY CYCLE:	49.0 %
HEATER DUTY CYCLE:	52.0 %
COOLER DUTY CYCLE:	70.0 %

acoem
CREATING ENVIRONMENTS OF POSSIBILITY

Instrument Test Report

Aurora NE-300 Three Wavelength Nephelometer

P/N: E010104

ID Number: 23-0690

Report Date: 1/12/2023

SOP 0821 - 2023-02-20

Gas Calibration Parameters

Calibration Gas: FM200
Calibration Date: 29/11/2023 12:59
Filter Type: Kalman

Measurement Period: 1.7 sec
Measurement Time: 600 mS
Reference Period: 49.5 sec

Angles 2

0°	90°

Span Calibration Sigmas

1	98.36	49.59
2	212.57	106.61
3	395.11	198.91

Zero Calibration Sigmas

1	-0.12	-0.11
2	-0.15	-0.02
3	-0.02	0.01

Calibration Wall Signals %

1	87.00	91.61
2	71.95	80.61
3	53.96	65.91

Calibration Slope x 1,000,000

1	218	217
2	232	232
3	265	267

Calibration Offset x 1000

1	8.55	6.94
2	7.44	6.03
3	7.20	5.97

Span Calibration Measure Counts

1	41,996	24,698
2	98,378	53,965
3	148,588	78,649

Zero Calibration Measure Counts

1	13,894	10,990
2	18,614	13,750
3	18,417	12,589

Comments: This Instrument has been tested with the normalization temperature set to 0 deg C.

Tests Passed:

- PRE-Test Procedure ☑
- T1- Initial Calibration and Parameter Check ☑
- T2 - Span Zero Sigma Counts Test ☑
- T3 - Zero LDL @ Room Temp Check ☑
- T4 - Temp Drift & LDL @ 40oC Test ☑
- T5 - Ambient RH Test ☑
- T6 - Precision Calibration Test ☑
- T7 - Final Documentation and Test Sheet ☑

Signed: JSML

Date: 01-Dec-2023