BIOSCIENCE INTERNATIONAL

Innovative Microbiology Products
11333 Woodglen Drive • Rockville, Maryland 20852
301.231.7400 • www.biosci-intl.com • fax: 301.231.7277

CERTIFICATE OF CALIBRATION

Model:	SAS Super 100
Air Sampler Serial #:	14-D-09023
Air Sampler Head Serial #:	5600
Customer:	Aerobiology Lab
Customer Asset ID #:	n/a
Calibration performed at:	JBW site 10242 Little Rock Ln Frederick, MD 21702

Cal. Date:	26 Mar 2022	
Cal. Due:	26 Mar 2023	(12 months)
Procedure:	EOP-030	
Certificate #:	14-D-09023-2646	
Volume sampled (L):	1000	
Calibrated w/media type:	BBL TSA Petri	
Plate Lot #:	1302110	
Plate Exp Date:	4/14/2022	

	As Found	*In Tolerance*	*As Left*	*In Tolerance*	*Acceptable Range*
Battery output (Volts):	9.9	n/a	9.6	n/a	>8.2
Temperature (F°):	71.5	n/a	71.5	n/a	59 - 95
Barometric pressure (in. HG):	29.80	n/a	29.80	n/a	n/a
Time to sample 1000 Liters (min)	10.37	n/a	10.00	n/a	n/a
Temp. & Pressure Standardization Factor:	0.99	n/a	0.99	n/a	n/a
Air velocity reading (ft/min)	54.0	n/a	56.0	n/a	n/a
Air velocity reading (m/sec)	0.274	n/a	0.284	n/a	n/a
Standardized air velocity reading (m/sec)	0.272	n/a	0.283	n/a	n/a
Standardized Air Flow (L/min)	96.4	Yes	100.0	Yes	95 - 105

Additional heads inspected and determined to be within +/-2%:	n/a
Additional service, preventative maintenance, or calibration notes:	n/a

Bioscience International certifies that the above described instrument conforms to the original manufacturer's tolerances for the parameters listed (not applicable to As Found data) & has been calibrated in accordance with ISO 17025:2017 guidelines using standards whose accuracies are traceable to the U.S. National Institute of Standards & Technology, have been verified with respect to instrumentation whose accuracy is traceable to NIST, or are derived from accepted values of physical constants. CMC test uncertainty is +/-2.2%. Instruments are calibrated with a test uncertainty ratio of 4:1 or greater whenever possible, with uncertainty defined as within a 95% confidence interval using a coverage factor of k = 2. In all cases, statistical methods are used to minimize uncertainty using the best commercially available methods. In Tolerance conditions are based on test results falling within the Acceptable Range. Measurement uncertainty is provided separately & independent of the decision rule. Voltage readings are for preventative maintenance purposes & not part of the calibration; values other than voltage, temperature, pressure, & air velocity are calculated values. Calibration results relate only to the items listed above; e.g., the instrument should be recalibrated prior to switching to a different media size (e.g., from 90mm Petri dishes to 55mm contact plates or vice versa).

Measurement Standards

ID	*Description*	*Last Cal.*	*Cal. Due*
J-T95451921005	Velocity	9/1/2021	9/1/2022
J-10510922-200515237	Temperature & Pressure	8/31/2020	8/31/2022

Work performed by / date: Blake Barthelm 3-26-22 Reviewed by / date: 3-26-22

CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

ANAB ACCREDITED

CUSTOMER NAME:
JBW & ASSOCS INC
10242 LITTLE ROCK LN
FREDERICK MD 21702-1822
USA

CERTIFICATE NUMBER	300367056
DATE OF CALIBRATION	1 SEPTEMBER, 2021
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ENVIRONMENT CONDITIONS		
TEMPERATURE	73.86 (23.3)	°F (°C)
RELATIVE HUMIDITY	43	%RH
BAROMETRIC PRESSURE	29.08 (984.8)	inHg (hPa)

MODEL	9545
SERIAL NUMBER	T9545192100S

☒ AS LEFT ☒ IN TOLERANCE
☐ AS FOUND ☐ OUT OF TOLERANCE

– CALIBRATION VERIFICATION RESULTS –

TEMPERATURE VERIFICATION — SYSTEM T-101 — Unit: °F (°C)

METHOD USED: 10000006234

UNCERTAINTY: +/-0.12 DEGREES F (0.06 C)

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	32.0 (0.0)	32.2 (0.1)	31.5~32.6 (-0.3~0.3)	2	139.9 (59.9)	139.9 (59.9)	139.3~140.4 (59.6~60.2)

HUMIDITY VERIFICATION — SYSTEM H-102 — Unit: %RH

METHOD USED: 10000006233

UNCERTAINTY: 0.5% + 1.07 %RH

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	10.0	12.4	7.0~13.0	4	70.0	70.6	67.0~73.0
2	30.0	31.8	27.0~33.0	5	90.0	89.5	87.0~93.0
3	50.0	51.4	47.0~53.0				

VELOCITY VERIFICATION — SYSTEM V-111 — Unit: ft/min (m/s)

METHOD USED: 10000006237

UNCERTAINTY: +/-1.3 %

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	0 (0.00)	0 (0.00)	-3~3 (-0.02~0.02)	7	644 (3.27)	644 (3.27)	624~663 (3.17~3.37)
2	35 (0.18)	36 (0.18)	32~38 (0.16~0.19)	8	997 (5.06)	993 (5.05)	967~1027 (4.91~5.22)
3	65 (0.33)	65 (0.33)	62~68 (0.32~0.35)	9	1474 (7.49)	1482 (7.53)	1430~1519 (7.26~7.71)
4	101 (0.51)	100 (0.51)	98~104 (0.50~0.53)	10	2489 (12.64)	2480 (12.60)	2414~2563 (12.26~13.02)
5	161 (0.82)	160 (0.81)	156~165 (0.79~0.84)	11	4491 (22.81)	4420 (22.45)	4356~4625 (22.13~23.50)
6	330 (1.67)	328 (1.67)	320~339 (1.62~1.72)	12	5812 (29.52)	5731 (29.11)	5638~5986 (28.64~30.41)

TSI Incorporated does hereby certify that the above described instrument conforms to the manufacturer's specifications (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the International System of Units (SI) through the National Institute of Standards and Technology within the limitations of NIST's calibration services or have been derived from accepted values of natural physical constants or have been derived by the ratio type of self-calibration techniques. TSI is registered to ISO 9001:2015. TSI is accredited to ISO 17025:2017 by ANAB Certificate Number AC-2850.

The aforementioned uncertainty values represent expanded uncertainty and are based on a standard uncertainty multiplied by a coverage factor k=2 providing a confidence level of approximately 95%. This report may not be reproduced unless permission is obtained in writing from the TSI calibration service department issuing this report. The unit is found to have passed when the readings are within the specification limits of the device as presented as the allowable range stated with each measurement above. The customer shall assess the results and uncertainty in order to determine if the results meet their needs.

Measurement Variable	System ID	Last Cal	Cal. Due
Temperature	E010657	02-02-21	02-28-22
Temperature	E010655	02-02-21	02-28-22
DC Voltage	E004018	05-08-21	06-30-22
Pressure	E004041	08-18-21	02-28-22
Velocity	E010494	10-11-19	10-31-22

Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E010658	02-02-21	02-28-22
Humidity	E003539	08-26-21	02-28-22
Temperature	E004398	04-20-21	10-31-21
Pressure	E001058	08-18-21	02-28-22

Performed By	Signature	Approved By	Signature	Date Issued
Chimova Vue	Chimova Vue	Holly Alfvebg	Holly Alfvebg	9/2/2021

DOC ID: CERT_DEFAULT
END OF REPORT

TSI P/N 2300157

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

Cert. No.: 6530-11510401

Traceable® Certificate of Calibration for Digital Barometer

Manufactured for and distributed by : VWR International LLC Radnor Corporate Center, Bldg 1,Ste 200, 100 Matsonford Road,Radnor,PA,19087

Instrument Identification:

Model: 10510-922, S/N: 200515237 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Barometer	D4540001	01 Nov 2020	1000447551
Digital Thermometer	130070752	10 Mar 2021	4000-11170557
Chilled Mirror Hygrometer	44654/2H3737	25 Nov 2021	17811
Climate Chamber	W613.0046		

Certificate Information:

Technician: 57 Procedure: CAL-31 Cal Date: 31 Aug 2020 Cal Due Date: 31 Aug 2022

Test Conditions: 55.92%RH 24.51°C 1007mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
%RH	N.A.	N.A.		50.97	53	Y	48	54	0.74	>4:1
°C	N.A.	N.A.		25.22	25.0	Y	24.82	25.62	0.05	>4:1
mb/hPa	N.A.	N.A.		805.75	806	Y	802	810	0.62	>4:1
mb/hPa	N.A.	N.A.		909.75	911	Y	906	914	0.62	>4:1
mb/hPa	N.A.	N.A.		1014.20	1015	Y	1010	1018	0.62	>4:1

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement : (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ± U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min=As Left Nominal(Rounded) – Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

Nicol Rodriguez, Quality Manager

Marisa Elms, Technical Manager

Note :

Maintaining Accuracy:

In our opinion once calibrated your Digital Barometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital Barometer change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

Issue Date : 31 Aug 2020

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
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