

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 #:	04-C-02947
Air Sampler Head Serial #:	27605
Customer:	Aerobiology Laboratory
Customer Asset ID #:	Unit #5
Calibration performed at:	JBW site 10242 Little Rock Ln Frederick, MD 21702


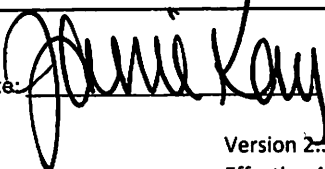
Cal. Date:	18 Nov 2021
Cal. Due:	18 Nov 2022 (12 months)
Procedure:	EOP-030
Certificate #:	04-C-02947-2518
Volume sampled (L):	1000
Calibrated w/media type:	BBL TSA Petri
Plate Lot #:	1162515
Plate Exp Date:	12/20/2021

	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°):	72.3	n/a	72.3	n/a	59 - 95
Barometric pressure (in. HG):	30.0	n/a	30.0	n/a	n/a
Time to sample 1000 Liters (min)	10.32	n/a	9.95	n/a	n/a
Temp. & Pressure Standardization Factor:	1.00	n/a	1.00	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)	0.274	n/a	0.284	n/a	n/a
Standardized Air Flow (L/min)	96.9	Yes	100.5	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).

<u>Measurement Standards</u>			
ID	Description	Last Cal.	Cal. Due
J-T95452022004	Velocity	12/2/2020	12/2/2021
J-10510922-200515237	Temperature & Pressure	8/31/2020	8/31/2022

Work performed by / date:  11-18-21 Reviewed by / date:  11-18-21



CERTIFICATE OF CALIBRATION

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



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

CERTIFICATE NUMBER: 300308817
DATE OF CALIBRATION: 2 DECEMBER, 2020
PAGE: 1 OF 1

ENVIRONMENT CONDITIONS		
TEMPERATURE	73.00 (22.8)	°F (°C)
RELATIVE HUMIDITY	29	%RH
BAROMETRIC PRESSURE	29.37 (994.6)	inHg (hPa)

MODEL: 9545
SERIAL NUMBER: T95452022004

AS LEFT IN TOLERANCE
 AS FOUND OUT OF TOLERANCE

- CALIBRATION VERIFICATION RESULTS -

TEMPERATURE VERIFICATION				SYSTEM T-101				Unit: °F (°C)			
METHOD USED: 1000006233											
UNCERTAINTY: ±0.12 DEGREES F (0.06 C)											
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	32.1 (0.0)	32.1 (0.1)	31.5-32.6 (-0.3-0.3)	2	139.8 (59.9)	139.7 (59.8)	139.3-140.4 (59.6-60.2)				

HUMIDITY VERIFICATION				SYSTEM H-101				Unit: %RH			
METHOD USED: 1000006233											
UNCERTAINTY: 0.5% + 1.07 %RH											
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	10.0	11.8	7.0-13.0	4	70.0	70.4	67.0-73.0				
2	30.0	31.3	27.0-33.0	5	90.0	89.5	87.0-93.0				
3	50.1	51.3	47.1-53.1								

VELOCITY VERIFICATION				SYSTEM V-111				Unit: ft/min (m/s)			
METHOD USED: 1000006237											
UNCERTAINTY: ±1.3 %											
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	0 (0.00)	0 (0.00)	-3-3 (0.02-0.02)	7	616 (3.22)	619 (3.30)	627-665 (3.18-3.38)				
2	35 (0.18)	36 (0.18)	32-38 (0.16-0.19)	8	994 (5.05)	993 (5.04)	964-1024 (4.90-5.20)				
3	65 (0.33)	65 (0.33)	62-68 (0.32-0.35)	9	1488 (7.56)	1490 (7.57)	1444-1533 (7.33-7.79)				
4	100 (0.51)	100 (0.51)	97-103 (0.49-0.52)	10	2495 (12.68)	2485 (12.62)	2420-2570 (12.29-13.06)				
5	160 (0.81)	160 (0.81)	155-165 (0.79-0.84)	11	4196 (22.35)	4183 (22.78)	4163-4633 (22.16-23.53)				
6	329 (1.67)	326 (1.66)	319-338 (1.62-1.72)	12	5811 (30.52)	5753 (29.23)	5637-5985 (28.63-30.41)				

TSP 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. TSP is registered to ISO 9001:2015. TSP is accredited to ISO 17025:2017 by ANAB Certificate Number AC-2830.

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 TSP 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	Measurement Variable	System ID	Last Cal	Cal Due
Temperature	E010657	02-14-20	05-28-21	Temperature	E010658	02-14-20	02-28-21
Temperature	E010655	01-21-20	01-31-21	Humidity	E003539	08-21-20	02-28-21
DC Voltage	E004018	06-17-20	06-30-21	Temperature	E004398	10-26-20	04-30-21
Pressure	E004041	08-18-20	02-28-21	Pressure	E001058	08-18-20	02-28-21
Velocity	E010494	10-11-19	10-31-22				

Performed By	Signature	Approved By	Signature	Date Issued
Ko Vang	<i>[Signature]</i>	Holly Alfveby	<i>[Signature]</i>	12/2/2020

DOC. ID: CERT_DEFAULT
END OF REPORT



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 Malsonford 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	302	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
Nicol Rodriguez, Quality Manager

Marisa Elms
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
 Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com

Control Company is an ISO/IEC 17025:2017 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
 Control Company is ISO 9001:2015 Quality Certified by DNV GL, Certificate No. CERT-01805-2008-AQ-HOU-ANAB.
 International Laboratory Accreditation Cooperation - Multilateral Recognition Arrangement (ILAC-MRA).

BIOSCIENCE INTERNATIONAL

Innovative Microbiology Products

November 19, 2021

BIOSCIENCE INTERNATIONAL, INC.
PACKING LIST
Customer PO #AS-12572

SHIP TO:

Aerobiology Lab - CA
15061 Springdale Street
Suite #111
Huntington Beach, CA 92649

Tel: (714) 895-8401

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
14200	NIST Traceable Calibration & Full PM Service SAS Super 100, SN #04-C-02947 with Stainless Steel Petri Head #27605 Customer Internal ID Number Unit #5	1
6064	Protective Head Cover	1

Technician Notes:

- The unit was received, inspected and found to be within manufacturer specifications for calibration (96.9 l/m).
- Performed full PM checklist, tightened hardware, stress tested battery charger, battery, and all components.
- Replaced head cover, touched up paint & buffed head.
- Performed NIST traceable calibration in wind tunnel with TSI anemometer; certificates attached.

Returned by FedEx Collect Tracking #7752 5049 1047

Please call Marsha Pratt @ 301.231.7400 with any questions.

IT IS A PLEASURE TO SERVE YOU!