

# 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-09349
Air Sampler Head Serial #:	27748
Customer:	Aerobiology Laboratory
Customer Asset ID #:	n/a
Calibration performed at:	JBW site 10242 Little Rock Ln Frederick, MD 21702

Cal. Date:	13 Aug 2022
Cal. Due:	13 Aug 2023 (12 months)
Procedure:	EOP-030
Certificate #:	14-D-09349-2786
Volume sampled (L):	1000
Calibrated w/media type:	BBL TSA Petri
Plate Lot #:	2070125
Plate Exp Date:	8/23/2022

	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°):	72.4	n/a	72.4	n/a	59 - 95
Barometric pressure (in. HG):	30.10	n/a	30.10	n/a	n/a
Time to sample 1000 Liters (min)	9.58	n/a	9.92	n/a	n/a
Temp. & Pressure Standardization Factor:	1.00	n/a	1.00	n/a	n/a
Air velocity reading (ft/min)	58.0	n/a	56.0	n/a	n/a
Air velocity reading (m/sec)	0.295	n/a	0.284	n/a	n/a
Standardized air velocity reading (m/sec)	0.295	n/a	0.285	n/a	n/a
Standardized Air Flow (L/min)	104.4	Yes	100.8	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-T95452022004	Velocity	4/28/2022	4/28/2023
J-10510922-200515237	Temperature & Pressure	8/31/2020	8/31/2022

Work performed by / date:  8-13-22 Reviewed by / date:  8-13-22



# 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>



<b>CUSTOMER NAME:</b> JBW & ASSOCS INC 10242 LITTLE ROCK LN FREDERICK MD 21702-1822 USA	<b>CERTIFICATE NUMBER</b>	300419972
	<b>DATE OF CALIBRATION</b>	28 APRIL, 2022
	<b>PAGE</b>	1 OF 1

<b>ENVIRONMENT CONDITIONS</b>			<b>MODEL</b>	9545
TEMPERATURE	72.99 (22.8)	°F (°C)	<b>SERIAL NUMBER</b>	
RELATIVE HUMIDITY	25	%RH		
BAROMETRIC PRESSURE	29.18 (988.1)	inHg (hPa)		

<input checked="" type="checkbox"/> AS LEFT	<input checked="" type="checkbox"/> IN TOLERANCE
<input type="checkbox"/> AS FOUND	<input type="checkbox"/> OUT OF TOLERANCE

## - CALIBRATION VERIFICATION RESULTS -

<b>TEMPERATURE VERIFICATION</b>				<b>SYSTEM T-101</b>				<b>Unit: °F (°C)</b>			
METHOD USED: 10000006234											
UNCERTAINTY: +/-0.12 DEGREES F (0.12 C)											
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE				
1	32.1 (0.0)	32.0 (0.0)	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)				

<b>HUMIDITY VERIFICATION</b>				<b>SYSTEM H-100</b>				<b>Unit: %RH</b>			
METHOD USED: 10000006233											
UNCERTAINTY: 0.5% + 1.07 %RH											
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE				
1	10.0	10.6	7.0-13.0	4	70.0	70.7	67.0-73.0				
2	29.8	30.5	26.8-32.8	5	90.0	90.5	87.0-93.0				
3	49.9	50.9	46.9-52.9								

<b>VELOCITY VERIFICATION</b>				<b>SYSTEM V-111</b>				<b>Unit: ft/min (m/s)</b>			
METHOD USED: 10000006237											
UNCERTAINTY: +/-2.6%											
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE				
1	10 (0.00)	0 (0.00)	-3-3 (-0.02-0.02)	7	646 (3.29)	646 (3.28)	628-667 (3.19-3.39)				
2	35 (0.18)	37 (0.19)	32-38 (0.16-0.19)	8	994 (5.05)	987 (5.01)	965-1024 (4.90-5.20)				
3	65 (0.33)	65 (0.33)	62-68 (0.32-0.35)	9	1483 (7.53)	1479 (7.51)	1439-1527 (7.31-7.76)				
4	100 (0.51)	99 (0.50)	97-103 (0.49-0.52)	10	2493 (12.66)	2502 (12.71)	2418-2568 (12.28-13.04)				
5	160 (0.81)	160 (0.81)	155- 65 (0.79-0.84)	11	4491 (22.81)	4452 (22.61)	4356-4626 (22.13-23.50)				
6	328 (1.67)	328 (1.67)	318-338 (1.62-1.72)	12	5818 (29.56)	5742 (29.17)	5643-5993 (28.67-30.44)				

† Bin excluded from ISO 17025 calibrations

TSI Incorporated does hereby certify that the above described instrument conforms to the manufacturer's specifications (not applicable in 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	Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E010657	02-28-22	02-28-23	Temperature	E010658	02-28-22	02-28-23
Temperature	E010656	02-10-22	02-28-23	Humidity	E003296	08-12-21	08-31-22
DC Voltage	E004018	06-08-21	06-30-22	Temperature	E004398	04-22-22	10-31-22
Pressure	E004041	02-23-22	08-31-22	Pressure	E005607	04-26-22	10-31-22
Velocity	E010494	10-11-19	10-31-22				

<b>Performed By</b>	<b>Signature</b>	<b>Approved By</b>	<b>Signature</b>	<b>Date Issued</b>
Ka Vang	<i>Ka Vang</i>	Holly Alfieby	<i>Holly Alfieby</i>	4/28/2022

Doc ID: CERT\_DEFAULT  
END OF REPORT



Calibration complies with ISO/IEC 17025, ANSI/NC SL 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:

Table with 4 columns: Description, Serial Number, Due Date, NIST Traceable Reference. Rows include Digital Barometer, Digital Thermometer, Chilled Mirror Hygrometer, and Climate Chamber.

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)

Table with 11 columns: Unit(s), Nominal, As Found, In Tol, Nominal, As Left, In Tol, Min, Max, ±U, TUR. Rows show measurements for %RH, °C, mb/hPa, and mB/hPa.

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.

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 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 (AZLA) 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).