

Report By:

**National TAB
1329 E. KEMPER ROAD
SUITE 4210
CINCINNATI, OH 45246**



**Report: TAB REPORT
Function: Test, Adjust, & Balance
Date: 05/23/2024**

PROJECT
Fibbar Macgees (Sunnyvale, CA)

152 and 156 S Murphy Ave

Sunnyvale, CA 94086

Client

Martinico & Sons, Inc.

1776 S. 7th St.

San Jose, CA 95112

National TAB

Project: Fibbar Macgees (Sunnyvale, CA)

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CERTIFICATION



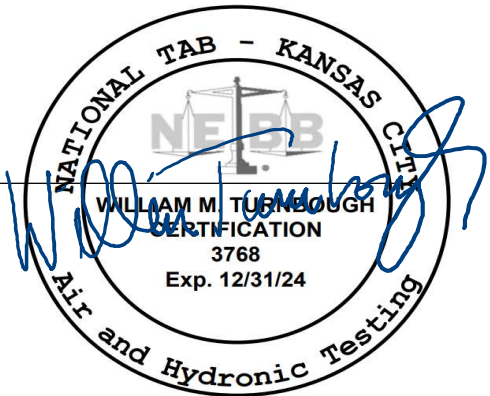
PROJECT: FIBBAR MACGEES

The data presented in this report is a record of system measurements and final adjustments that have been obtained in accordance with the current edition of the NEBB Procedural Standard for Testing, Adjusting and Balancing of Environmental Systems. The measurements shown, and the information given, in this report are certified to be accurate and complete, at the time and date information was gathered. Any variances from design quantities, which exceed NEBB tolerances, are noted in the TAB report project summary.

NEBB TAB FIRM: National TAB - Kansas City
REGISTRATION NO: 3768
CERTIFIED BY: Will Turnbough
DATE: 5/28/2024

Submitted and Certified by:

NEBB TAB FIRM: National TAB - Kansas City
TAB PROFESSIONAL: Will Turnbough
REGISTRATION NO: CP-24289
CERTIFICATION EXP: 12/31/2024



Project Summary

RTU-1 was measured at the terminal devices to establish a total flow for that unit. Each RTU was adjusted to within tolerance of the engineer's design flow. Each outlet was then adjusted to within tolerance of the design flow. Outside air was measured by reading the intake air opening with a velocity grid and multiplying by the free area. The outside air damper was adjusted until the airflow was within the design requirements. Any equipment that fell outside of that tolerance is noted throughout the report.

RTU-2 outside air was balanced only based on equipment tonnage and to ensure ventilation and overall pressurization of the space.

KEF-1 and KEF-2: Each kitchen exhaust fan was measured at the hood filter bay utilizing a velocity matrix and a manufacturer's correction factor. Each filter velocity is multiplied by the manufacturer's corrected area. The sum of these readings equals the total flow of the exhaust fans. The total flow of the exhaust was then adjusted to within tolerance of the design flow. Any EF's that fell outside of this tolerance is noted throughout the report. Design airflows were not provided for the existing KEF-2. This was balanced based on kitchen equipment and hood length.

MUA-1: Total flow for the MAU (Make-up Air Unit) unit was measured by readings taken at the discharge of the hood's perforated supply plenum. Readings taken with a velocity matrix were averaged and multiplied by a manufacturer's corrected area. Adjustments to the fan speed were made in order to bring the unit to within design tolerance. Any MUA's that fell outside of this tolerance is noted throughout the report.

MUA-2: Airflow is supplied by grilles in front of the hood. Airflow was balanced to this unit based on a ratio of exhaust air and for overall building pressurization.

EF-2: EF-2 was measured by reading each air device with a flow hood. The total airflow for each fan is equivalent to the sum of these readings. Fan speed was then adjusted so that the airflow was within tolerance of design. Each terminal device was balanced to within tolerance of the design volume using the installed volume dampers. Any equipment that fell outside of this tolerance is noted throughout the report.



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Project: Fibbar Macgees (Sunnyvale, CA)

System/Unit: AHU/RTU

Asset: RTU-1

AREA:PREP

Unit Data		
	Design	Actual
MFG	NA	BRYANT
Serial Num	-	3023P34306
Model Num	NA	582KP09N125A2A
Configuration	-	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	20X24X1
Num PreFilter 1	-	4
PreFilter Size 1	-	16X20X2

Motor Data		
	Design	Actual
Motor MFG	-	BRYANT
Frame	-	NA
Horsepower	3.5	3.5
Motor Rpm	-	NA
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	6.4
Service Factor	-	NA

Test Data		
	Design	Actual
SF CFM	3180	3185
RA CFM	-	2392
OA CFM	800	793
RL Amperage	-	1.9
OA Damper Position	-	25%
Brake Horse Power	2.4	NA

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.24
Fan Suction SP	-	-0.48
Fan Discharge SP	-	0.35
Total ESP	0.7	0.59
Fan Total SP	0.85	0.83

Completed By: David Nicolas Sanchez on 05/24/2024



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Project: Fibbar Macgees (Sunnyvale, CA)

AHU/RTU

Diffuser Supply (GRD)

RTU-1/PREP

Asset							
Asset Name	Location	Type	Size	DESIGN CFM	CFM(1)	FINAL CFM	% to design
1-1	KITCHEN	CSD-5	14	480	691	445	92.7
1-2	KITCHEN	CSD-5	14	480	691	505	105.2
1-3	WOMENS RR	CSD-2	8	150	180	137	91.3
1-4	MENS RR	CSD-2	8	150	186	140	93.3
1-5	KITCHEN	CSD-5	14	480	602	527	109.8
1-6	PREP	CSD-5	14	480	426	462	96.3
1-7	PREP	CSD-5	14	480	894	527	109.8
1-8	PREP	CSD-5	14	480	873	442	92.1
Total				3180	4543	3185	100.16%



National TAB

Project: Fibbar Macgees (Sunnyvale, CA)

System/Unit: AHU/RTU

Asset: RTU-2

AREA:DINING

Unit Data		
	Design	Actual
MFG	NA	YORK
Model Num	NA	ZH120N18R2A1BCA1A1

Test Data		
	Design	Actual
OA CFM	1000	1023
OA Damper Position	-	85%

Completed By: David Nicolas Sanchez on 05/24/2024

Notes:

Balanced OA only to ensure ventilation and overall building pressurization.

Written By: Will Turnbough on 05/28/2024

National TAB

Project: Fibbar Macgees (Sunnyvale, CA)

System/Unit: FAN - Exhaust



Asset: EF-1

AREA:MENS RR

Unit Data		
	Design	Actual
MFG	NA	NA
Model Num	NA	NA
Serial Num	-	NA
Type	INLINE	INLINE

Test Data		
	Design	Actual
CFM	440	446

Motor Data		
	Design	Actual
Motor MFG	-	VORTEX
Frame	-	NA
Horsepower	150W	140W
Motor Rpm	-	NA
Phase	1	1
Voltage (rated)	120	120
Amperage (rated)	-	60
Service Factor	-	NA

Completed By: David Nicolas Sanchez on 05/24/2024

Notes:

No dampers installed to adjust exhaust CFM.

Written By: David Nicolas Sanchez on 05/23/2024

National TAB

Project: Fibbar Macgees (Sunnyvale, CA)

FAN - Exhaust



Diffuser Ret/Exh (GRD)

EF-1/MENS RR

Asset								
Asset Name	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
E1-1	CEG-3	10	220	1	188		188	85.5
E1-2	CEG-3	10	220	1	258		258	117.3
Total			440		446	0	446	101.36%

National TAB

Project: Fibbar Macgees (Sunnyvale, CA)

System/Unit: FAN - Exhaust



Asset: EF-2

AREA:WOMENS RR

Unit Data		
	Design	Actual
MFG	NA	NA
Model Num	NA	NA
Serial Num	-	NA
Type	INLINE	INLINE

Test Data		
	Design	Actual
CFM	440	467

Motor Data		
	Design	Actual
Motor MFG	-	Vortex
Frame	-	NA
Horsepower	150W	140W
Motor Rpm	-	NA
Phase	1	1
Voltage (rated)	120	120
Amperage (rated)	-	NA
Service Factor	-	NA

Completed By: David Nicolas Sanchez on 05/24/2024

National TAB

Project: Fibbar Macgees (Sunnyvale, CA)

FAN - Exhaust



Diffuser Ret/Exh (GRD)

EF-2/WOMENS RR

Asset								
Asset Name	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
E2-1	CEG-3	10	220	1	330		330	150.0
E2-2	CEG-3	10	220	1	137		137	62.3
Total			440		467	0	467	106.14%

Asset	Notes	Date	Written By
E2-1	No dampers installed	05/28/2024	Will Turnbough
E2-2	No dampers installed	05/28/2024	Will Turnbough

National TAB

Project: Fibbar Macgees (Sunnyvale, CA)

System/Unit: FAN - Exhaust



Asset: KEF-1

AREA:HOOD 1

Unit Data		
	Design	Actual
MFG	CAPTIVE AIRE	CAPTIVE AIRE
Model Num	DU85HFA	DU85HFA
Serial Num	-	5654995
Type	CRE UPBLAST	UPBLAST
Configuration	-	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Horsepower	1	1
Motor Rpm	-	1800
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	11.6

Test Data		
	Design	Actual
CFM	1350	1397
Fan RPM	1232	1170
Fan Rotation	-	CCW
Motor RPM	-	1170
System SetPt	-	65%
RL Voltage	-	120
RL Amperage	-	NA
Total ESP	1.00	1.00
Fan Inlet SP	-	-1.00
Fan Discharge SP	-	ATM

Completed By: David Nicolas Sanchez on 05/24/2024

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Project: Fibbar Macgees (Sunnyvale, CA)

System/Unit: FAN - Exhaust



Asset: KEF-2

AREA:HOOD 2

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	DU180HFA
Serial Num	-	6767775
Type	-	UPBLAST
Configuration	-	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NA
Horsepower	-	2
Motor Rpm	-	1200
Phase	-	1
Voltage (rated)	-	230
Amperage (rated)	-	NA
Service Factor	-	NA

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD
Motor Bore Size	-	DD
Motor Sheave SetPt	-	DD
Fan Sheave Size	-	DD
Fan Sheave Bore	-	DD
Belt CL Distance	-	DD
Num of Belts	-	DD
Belt Size	-	DD

Test Data		
	Design	Actual
CFM	-	3717
Fan RPM	-	1134
Fan Rotation	-	CCW
Motor RPM	-	1134
RL Voltage	-	244
RL Amperage	-	7.04
Suction ESP	-	1.02
Discharge ESP	-	-1.02
Total ESP	-	ATM

Completed By: David Nicolas Sanchez on 05/24/2024

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Project: Fibbar Macgees (Sunnyvale, CA)

System/Unit: FAN - Supply



Asset: MAU-1

AREA:HOOD 1

Unit Data		
	Design	Actual
MFG	NA	CAPTIVEAIRE
Model Num	NA	A1-15D
Serial Num	-	5654995
Type	-	MUA
Configuration	-	VERTICAL
Num Filters Size 1	-	2
Filter Size 1	-	20X16

Test Data		
	Design	Actual
CFM	1215	1205
SF RPM	1519	1512
RL Voltage	-	115
RL Amperage	-	11.6
Suction ESP	-	NA
Discharge ESP	-	NA
Total ESP	0.5	0.5
Brake Horse Power	-	0.5370

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NA
Horsepower	1	1
Motor Rpm	1519	1800
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	11.6
Service Factor	-	NA

Completed By: David Nicolas Sanchez on 05/24/2024

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Project: Fibbar Macgees (Sunnyvale, CA)

System/Unit: FAN - Supply



Asset: MUA-2

AREA:HOOD 2 / KITCHEN

Unit Data		
	Design	Actual
MFG	NA	CHAMPION COOLER
Model Num	NA	75/85DD
Serial Num	-	ID7040197
Type	-	MUA
Configuration	-	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	DIAL
Frame	-	56Z
Horsepower	-	1
Motor Rpm	-	1725
Phase	-	1
Voltage (rated)	-	115/230
Amperage (rated)	-	13.5/6.8
Service Factor	-	1.0

Test Data		
	Design	Actual
CFM	2900	2567
SF RPM	-	448
Motor RPM	-	1748
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	-	NA
Fan Discharge SP	-	NA

General		
	Design	Actual
Fan Rotation Correct	-	YES

Completed By: David Nicolas Sanchez on 05/24/2024

Notes:
Existing MUA with no design provided. Balanced as a ratio to hood exhaust and for overall building performance.

Air is supplied by two grilles near the hood.

Motor sheave is maximized.

Written By: Will Turnbough on 05/28/2024

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Project: Fibbar Macgees (Sunnyvale, CA)

System/Unit: Kitchen Hood Type I



Asset: HD-1

AREA:KITCHEN

Unit Data		
	Design	Actual
MFG	CAPTIVE AIRE	CAPTIVE AIRE
Model Num	5424 ND-2-PSP-F	5424 ND-2-PSP-F
Job / Serial Num	-	5654995
Type	TYPE I CANOPY	TYPE 1
Hood length	72	72"
Hood Width	54	54"
Supply Plenum Type	-	PERFORATED
Supply Plenum Width	16	16"
Supply Plenum Length	72	72"

Test Data Supply		
	Design	Actual
Total AK Area	9.33	9.33
Kv factor (Vel)	0.91	0.91
Num of Readings	-	6
Reading1 FPM	-	148
Reading2 FPM	-	119
Reading3 FPM	-	141
Reading4 FPM	-	145
Reading5 FPM	-	145
Reading6 FPM	-	154
Ave FPM(corr)	-	142
CFM	1214	1205

Test Data Exhaust		
	Design	Actual
Filter Type	CAPTRATE SOLO	CAPTRATE SOLO
Filter Size 1	20X16	20X16
Filter Qty 1	4	4
Filter AK factor size 1	2.08	2.08
Filter Total AK Area	8.32	8.32
Filter1 FPM	-	165
Filter2 FPM	-	177
Filter3 FPM	-	171
Filter4 FPM	-	162
Filter Ave FPM(corr)	-	168
CFM	1350	1397

Cooking Equipment		
	Design	Actual
Item 1	-	AIR FRIER
Item 2	-	AIR FRIER

Completed By: David Nicolas Sanchez on 05/24/2024

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Project: Fibbar Macgees (Sunnyvale, CA)

System/Unit: Kitchen Hood Type I



Asset: HD-2

AREA:

Unit Data		
	Design	Actual
MFG	NA	NA
Model Num	NA	NA
Job / Serial Num	-	NA
Type	-	TYPE 1 SLOPE
Hood length	-	150"
Hood Width	-	55"

Test Data Exhaust		
	Design	Actual
Filter Type	-	BAFFLED
Filter Size 1	-	20X25
Filter Qty 1	-	6
Filter AK factor size 1	-	3.42
Filter Total AK Area	-	20.52
Filter1 FPM	-	205
Filter2 FPM	-	197
Filter3 FPM	-	199
Filter4 FPM	-	177
Filter5 FPM	-	168
Filter6 FPM	-	141
Filter Ave FPM(corr)	-	203
CFM	3750	3717

Cooking Equipment		
	Design	Actual
Item 1	-	GRILL
Item 2	-	PLANCHA

Completed By: David Nicolas Sanchez on 05/24/2024



National TAB

Testing, Adjusting, and Balancing Equipment



Function		Range	Minimum Accuracy	Instrument Information	Calibration Date	Date Due
AIR	AIR PRESSURE	0 in wg to 10 in wg	2% +/- 0.001 in wg	TSI EBT731 EBT732117009	9/7/2023	9/7/2024
	AIR VELOCITY INSTRUMENT	50 fpm to 3900 fpm	+/- 5 % +/- 7 fpm	TSI EBT731 EBT732117009	9/7/2023	9/7/2024
	DIRECT HOOD READING	100 cfm to 2000 cfm	+/- 5 % +/- 7 cfm	TSI EBT731 EBT732117009	9/7/2023	9/7/2024
TEMPERATURE	AIR METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	9/29/2023	9/29/2024
	AIR PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	9/29/2023	9/29/2024
	IMMERSION METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	9/29/2023	9/29/2024
	IMMERSION PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	9/29/2023	9/29/2024
	CONTACT METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	9/29/2023	9/29/2024
	CONTACT PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	9/29/2023	9/29/2024
HUMIDITY	HUMIDITY PROBE	10 % RH to 90 % RH	3% of reading	Cooper SRH77A S/N 100516003	9/29/2023	9/29/2024
ELECTRICAL	VOLTAGE MEASUREMENT	0 VAC to 600 VAC	2 % reading +/- 5 digits	Klein Tools CL800 S/N 1220C-C1	9/29/2023	9/29/2024
	AMPERAGE MEASUREMENT	0 Amperers to 100 Amperes	2 % reading +/- 5 digits	Klein Tools CL800 S/N 1220C-C1	9/29/2023	9/29/2024
ROTATION	ROTATION MEASUREMENT	60 rpm to 5000 rpm	2 % reading 2 rpm	Shimpo DT 207Lp S/N D1690029R	9/29/2023	9/29/2024



National TAB

Testing, Adjusting, and Balancing Equipment



Report of Calibration

Kansas City Calibration Lab., Inc.
8847 Long Street
Lenexa, Kansas 66215

Telephone: (913) 541-0629 Internet: www.kccl.com Email: service@kccl.com

UNIT UNDER TEST: TSI EBT731 Differential Digital Meter	TEST RESULT: PASS
SERIAL NUMBER: EBT732117009	PERFORMED ON: 9/7/2023
ASSET NUMBER: EBT732117009	DATA TYPE: FOUND-LEFT
PROCEDURE NAME: ADM-XXX / EBT-XXX-XX 2.0% Reading: 1 Yr Cert CPC	TEMPERATURE: 23.8°C
PROCEDURE REV.: 20210930C	HUMIDITY: 44 %
CALIBRATED BY: Bart Schwartz	BAROMETRIC: 28.93 inHg
P.O. NUMBER:	Recalibration Date September 07, 2024
CUSTOMER: National TAB 1126 Swift Street NKC, MO 64116	Calibration Number: 0007333
Cal Seals Intact: Yes	Previous Calibration Date: August 12, 2022

K.C. Calibration Lab., Inc. certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). This calibration is traceable to the International System of Units (SI), through National Metrology Institutes (NIST, PTB NRC NPL, etc), radiometric techniques, or natural physical constants. This calibration complies with MIL-STD-45662A and ANSI/NCSL Z540-1-1994.

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Note: Any Test Uncertainty Ratio (TUR) that is less than four to one will appear under the "TUR" heading on the data record. If the TUR meets or exceeds four to one, the field is left blank.

REMARKS:

Asset#	Description	Cal Date	Due Date
41001AR6	Mensor CPC6050 Low & Medium Pressure Calibrator	3/15/2023	3/15/2024

Test Description	True Value	Test Result	Lower Limit	Upper Limit	Units	TUR
Vertical Accuracy: ±2.0% ±0.001 Reading INH2O @ 60"						
Reference Documents: Mfr. Manual						
Internal Barometric Reading: 28.80 inHg						
Version Number is 1.11.1						
** Connector						
0.000 inH2O	0.000	-0.0005	-0.0100	0.0100	inH2O	Pass
5.000 inH2O	5.000	5.1000	4.9000	5.1000	inH2O	Pass
10.000 inH2O	10.000	10.0300	9.8000	10.2000	inH2O	Pass
14.900 inH2O	14.900	14.9100	14.6020	15.1980	inH2O	Pass
0.000 inH2O	0.000	-0.0003	-0.0100	0.0100	inH2O	Pass
-5.000 inH2O	-5.000	-5.0100	-5.1000	-4.9000	inH2O	Pass
-10.000 inH2O	-10.000	-10.0200	-10.2000	-9.8000	inH2O	Pass
-14.900 inH2O	-14.900	-14.9600	-15.1980	-14.6020	inH2O	Pass

Report of Calibration for SERIAL NUMBER: EBT732117009 ASSET NUMBER: EBT732117009

Printed On: Thursday, September 7, 2023 Page 1 of 2

Test Results indicate the following: Found-Left: Unit was left as found. As-Left: Unit was left after adjustments.

Test Description	True Value	Test Result	Lower Limit	Upper Limit	Units	TUR
** Connector						
0.000 inH2O	0.000	-0.0001	-0.0100	0.0100	inH2O	Pass
5.000 inH2O	5.000	4.9800	4.9000	5.1000	inH2O	Pass
10.000 inH2O	10.000	10.0300	9.8000	10.2000	inH2O	Pass
14.900 inH2O	14.900	14.9100	14.6020	15.1980	inH2O	Pass
0.000 inH2O	0.000	0.0001	-0.0100	0.0100	inH2O	Pass
-5.000 inH2O	-5.000	-5.0100	-5.1000	-4.9000	inH2O	Pass
-10.000 inH2O	-10.000	-10.0300	-10.2000	-9.8000	inH2O	Pass
-14.900 inH2O	-14.900	-14.9200	-15.1980	-14.6020	inH2O	Pass

*****END OF CALIBRATION*****

K.C. Calibration Labs Seal

Signature: Bart A. Schwartz, Engineer in Charge

Report of Calibration for SERIAL NUMBER: EBT732117009 ASSET NUMBER: EBT732117009

Printed On: Thursday, September 7, 2023 Page 2 of 2

Test Results indicate the following: Found-Left: Unit was left as found. As-Left: Unit was left after adjustments.

Report of Calibration

Kansas City Calibration Lab., Inc.
8847 Long Street
Lenexa, Kansas 66215

Telephone: (913) 541-0629 Internet: www.kccl.com Email: service@kccl.com

UNIT UNDER TEST: Shimpo DT-2077p Tachometer	TEST RESULT: PASS
SERIAL NUMBER: D1690029R	PERFORMED ON: 9/29/2023
ASSET NUMBER: D1690029R	DATA TYPE: FOUND-LEFT
PROCEDURE NAME: Shimpo DT-20xx: 1 Year Certification	TEMPERATURE: 24.9°C
PROCEDURE REV.: 20210818C	HUMIDITY: 47 %
CALIBRATED BY: Bart Schwartz	Recalibration Date September 29, 2024
P.O. NUMBER:	Calibration Number: 00077544
CUSTOMER: National TAB 1126 Swift Street NKC, MO 64116	Previous Calibration Date: August 11, 2022
Cal Seals Intact: Yes	

K.C. Calibration Lab., Inc. certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). This calibration is traceable to the International System of Units (SI), through National Metrology Institutes (NIST, PTB NRC NPL, etc), radiometric techniques, or natural physical constants. This calibration complies with MIL-STD-45662A and ANSI/NCSL Z540-1-1994.

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Note: Any Test Uncertainty Ratio (TUR) that is less than four to one will appear under the "TUR" heading on the data record. If the TUR meets or exceeds four to one, the field is left blank.

REMARKS:

Asset#	Description	Cal Date	Due Date
MYS900813	Keysight Technologies 33511B Function/Arb Waveform Generator	12/1/2022	12/1/2023

Test Description	True Value	Test Result	Lower Limit	Upper Limit	Units	TUR
RPM						
10.00 RPM	10.0	10	9	11	RPM	Pass
100.00 RPM	100.0	100	99	101	RPM	Pass
1000.0 RPM	1000.0	1000	999	1001	RPM	Pass
10,000.0 RPM	10000.0	10000	9998	10002	RPM	Pass
99,900.0 RPM	99900.0	99902	99893	99907	RPM	Pass

Report of Calibration for SERIAL NUMBER: D1690029R ASSET NUMBER: D1690029R

Printed On: Friday, September 29, 2023 Page 1 of 2

Test Results indicate the following: Found-Left: Unit was left as found. As-Left: Unit was left after adjustments.

Report of Calibration

Kansas City Calibration Lab., Inc.
8847 Long Street
Lenexa, Kansas 66215

Telephone: (913) 541-0629 Internet: www.kccl.com Email: service@kccl.com

UNIT UNDER TEST: Cooper Instrument SRH77A Digital Thermometer	TEST RESULT: PASS
SERIAL NUMBER: 100516003	PERFORMED ON: 9/29/2023
ASSET NUMBER: 100516003	DATA TYPE: FOUND-LEFT
PROCEDURE NAME: Met Temp NIST(SI) 1 Year	TEMPERATURE: 24.1°C
PROCEDURE REV.:	HUMIDITY: 46 %
CALIBRATED BY: Bart Schwartz	Recalibration Date September 29, 2024
P.O. NUMBER:	Calibration Number: 00077543
CUSTOMER: National TAB 1126 Swift Street NKC, MO 64116	Previous Calibration Date: August 12, 2022
Cal Seals Intact: Yes	

K.C. Calibration Lab., Inc. certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). This calibration is traceable to the International System of Units (SI), through National Metrology Institutes (NIST, PTB NRC NPL, etc), radiometric techniques, or natural physical constants. This calibration complies with MIL-STD-45662A and ANSI/NCSL Z540-1-1994.

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Note: Any Test Uncertainty Ratio (TUR) that is less than four to one will appear under the "TUR" heading on the data record. If the TUR meets or exceeds four to one, the field is left blank.

REMARKS:

Asset#	Description	Cal Date	Due Date
2659119	Hart Scientific 1523 Single Chan Reference Thermometer	1/9/2023	1/9/2024
905040	Burns Engineering 5615 Platinum Resistance Thermometer	2/8/2023	2/8/2024
DWS18	Fluke 518 Dry-Block Calibrator	8/28/2023	8/28/2024
MB7103	Hart Scientific 7103 Micro Bath Calibrator	12/8/2022	12/8/2023

Test Description	True Value	Test Result	Lower Limit	Upper Limit	Units	TUR
1075 General Purpose Puncture Probe						
Accuracy ±1.3 deg F / ±0.2 deg C or ±0.5% or reading:						
-10.00	F	-10.08	-8.70	1.38		
32.00	F	32.34	32.70	0.36		
122.00	F	122.71	121.80	-0.91		
212.00	F	211.90	211.10	-0.80		
280.00	F	279.96	280.70	0.74		
4011 Pipe Strip Probe						
Accuracy ±2% Range -25° to 212°F / -32° to 100°C						
0.00	F	0.27	2.10	1.83		
75.00	F	75.25	75.10	-0.15		
150.00	F	150.31	150.00	-0.31		

Report of Calibration for SERIAL NUMBER: 100516003 ASSET NUMBER: 100516003

Printed On: Friday, September 29, 2023 Page 1 of 2

Test Results indicate the following: Found-Left: Unit was left as found. As-Left: Unit was left after adjustments.



National TAB

Testing, Adjusting, and Balancing Equipment



Test Results	True Value	Test Result	Lower Limit	Upper Limit	Units	TUR
5028 Slim Humidity Probe						
Accuracy ±2% from 20 to 80%RH, ±3% below 20 and ±						
10.0 %RH @ 23.0°C	%RH	10.0	16	6.0		
25.0 %RH @ 23.0°C	%RH	25.0	30	5.0		
50.0 %RH @ 23.0°C	%RH	50.0	53	3.0		
75.0 %RH @ 23.0°C	%RH	75.0	77	2.0		
23.0°C @ 10.0 %RH	C	23.0	23.2	0.2		
23.0°C @ 25.0 %RH	C	23.0	23.2	0.2		
23.0°C @ 50.0 %RH	C	23.0	23.2	0.2		
23.0°C @ 75.0 %RH	C	23.0	23.1	0.1		

*****END OF CALIBRATION*****

Signed: *Bart A. Schwartz*
Bart A. Schwartz, Engineer in Charge

Report of Calibration for SERIAL NUMBER: 100516003 ASSET NUMBER: 100516003 Page 2 of 2

Printed On: Friday, September 29, 2023
Test Results indicate the following: Found-Left: Unit was left as found. As-Left: Unit was left after adjustments.

Report of Calibration

Kansas City Calibration Lab., Inc.
8847 Long Street
Lenexa, Kansas 66215

Telephone: (913) 541-0629 Internet: www.kccl.com Email: service@kccl.com

UNIT UNDER TEST:	Klein Tools CL800 True RMS Digital Clampmeter	TEST RESULT:	PASS
SERIAL NUMBER:	1220C-C1	PERFORMED ON:	9/29/2023
ASSET NUMBER:	1220C-C1	DATA TYPE:	FOUND-LEFT
PROCEDURE NAME:	Klein Tools CL800 : (1 year) CAL VER / 5520	TEMPERATURE:	24.9°C
PROCEDURE REV.:	20230928	HUMIDITY:	46%
CALIBRATED BY:	Bart Schwartz		
P.O. NUMBER:		Recalibration Date	September 29, 2024
CUSTOMER:	National TAB 1126 Swift Street NKC, MO 64116	Calibration Number:	0007542
		Previous Calibration Date:	

Cal Seals Intact: Unknown

K.C. Calibration Lab., Inc. certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). This calibration is traceable to the International System of Units (SI), through National Metrology Institutes (NIST, PTB, NRC, NPL, etc), radiometric techniques, or natural physical constants. This calibration complies with MIL-STD-45662A and ANSI/NCISL Z540-1-1994.

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REMARKS:

Standards Used	Cal Date	Due Date
Asset # 3277903 Description Fluke 5522A Multi-Product Calibrator	11/30/2022	11/30/2023

Test Results	True Value	Test Result	Lower Limit	Upper Limit	Units	TUR
Root Difference Square guardbanding method used						
AC VOLTS TESTS						
6 V Range						
5.900 V @ 60 Hz	5.9000	5.897	5.807	5.994	V	Pass
60 V Range						
59.00 V @ 60 Hz	59.0000	58.97	58.24	59.76	V	Pass
600 V Range						
590.0 V @ 60 Hz	590.000	589.7	582.4	597.6	V	Pass
1000 V Range						
990.0 V @ 60 Hz	990.000	991.0	970.1	1009.9	V	Pass
DC VOLTS TESTS						
600 mV Range						
600.0 mV	600.000	599.8	593.2	606.8	m V	Pass

Report of Calibration for SERIAL NUMBER: 1220C-C1 ASSET NUMBER: 1220C-C1

Printed On: Friday, September 29, 2023
Test Results indicate the following: Found-Left: Unit was left as found. As-Left: Unit was left after adjustments.

Test Results	True Value	Test Result	Lower Limit	Upper Limit	Units	TUR
-600.0 mV	-600.00	-599.9	-606.8	-593.2	m V	Pass
6 V Range						
6.000 V	6.0000	5.997	5.937	6.063	V	Pass
-6.000 V	-6.0000	-5.995	-6.063	-5.937	V	Pass
60 V Range						
60.00 V	60.0000	59.96	59.37	60.63	V	Pass
600 V Range						
600.0 V	600.0000	599.6	593.7	606.3	V	Pass
1000 V Range						
1000.0 V	1000.0000	1001	985	1015	V	Pass
-1000.0 V	-1000.0000	-1001	-1015	-985	V	Pass
CONTINUITY TESTS						
Audible Indicator ON @ 10 ohms						
Audible Indicator OFF @ 51 ohms						
RESISTANCE TESTS						
600 Ohm Range						
600.0 Ohm	600.000	601.2	590.5	609.5	Ω	Pass
6 kOhm Range						
6.000 kOhm	6.00000	6.000	5.905	6.095	k Ω	Pass
60 kOhm Range						
60.00 kOhm	60.0000	59.99	59.05	60.95	k Ω	Pass
600 kOhm Range						
600.0 kOhm	600.0000	599.9	590.5	609.5	k Ω	Pass
6 MOhm Range						
6.000 MOhm	6.00000	5.993	5.905	6.095	M Ω	Pass
60 MOhm Range						
60.00 MOhm	60.00000	59.47	58.70	61.30	M Ω	Pass
DIODE CHECK TESTS						
Diode Voltage						
FREQUENCY TESTS						
9.00 Hz @ 8 V						
9.00 Hz @ 8 V	9.0000	8.999	8.905	9.095	Hz	Pass
90.00 Hz @ 8 V						
90.00 Hz @ 8 V	90.0000	90.00	89.05	90.95	Hz	Pass
900.0 Hz @ 8 V						
900.0 Hz @ 8 V	900.0000	900.0	890.5	909.5	Hz	Pass
9.000 kHz @ 8 V						
9.000 kHz @ 8 V	9.00000	9.000	8.905	9.095	k Hz	Pass
90.00 kHz @ 8 V						
90.00 kHz @ 8 V	90.00000	90.00	89.05	90.95	k Hz	Pass
100.0 kHz @ 8 V						
100.0 kHz @ 8 V	100.00000	100.00	98.5	101.5	k Hz	Pass
DUTY CYCLE						
50.0 % @ 1 kHz						
50.0 % @ 1 kHz	50.000	50.3	49.3	50.8	%	Pass
CAPACITANCE TESTS						
60 nF Range						
59.00 nF	59.0000	59.96	55.70	62.30	n F	Pass
600 nF Range						
590.0 nF	590.0000	597.1	571.8	608.2	n F	Pass
6 uF Range						
5.900 uF	5.90000	5.854	5.718	6.082	u F	Pass
60 uF Range						
59.00 uF	59.00000	58.87	57.18	60.82	u F	Pass

Report of Calibration for SERIAL NUMBER: 1220C-C1 ASSET NUMBER: 1220C-C1

Printed On: Friday, September 29, 2023
Test Results indicate the following: Found-Left: Unit was left as found. As-Left: Unit was left after adjustments.

Test Results	True Value	Test Result	Lower Limit	Upper Limit	Units	TUR
6000 uF Range						
5900 uF	5900.000	590.6	560.0	620.0	u F	Pass
TEMPERATURE F TESTS						
5900 uF						
5900 uF	5900.000	5957	5600	6200	u F	Pass
-14 °F						
-14 °F	-14.0	-10	-23	-5	°F	Pass
100 °F						
100 °F	100.0	102	94	106	°F	Pass
500 °F						
500 °F	500.0	502	490	510	°F	Pass
900 °F						
900 °F	900.0	902	873	927	°F	Pass
TEMPERATURE C TESTS						
-25 °C						
-25 °C	-25.0	-23	-31	-20	°C	Pass
100 °C						
100 °C	100.0	102	96	104	°C	Pass
350 °C						
350 °C	350.0	351	344	357	°C	Pass
500 °C						
500 °C	500.0	501	485	515	°C	Pass
AC CURRENT TESTS						
60 A Range						
50.00 A @ 60 Hz	50.0000	49.60	48.92	51.08	A	Pass
50.00 A @ 400 Hz	50.0000	50.00	48.92	51.08	A	Pass
400 A Range						
500.0 A @ 60 Hz	500.0000	494.2	489.5	510.5	A	Pass
500.0 A @ 100 Hz	500.0000	494.4	489.5	510.5	A	Pass
60 A Range						
59.00 A	59.0000	49.20	48.92	51.08	A	Pass
600 A Range						
300.0 A	300.0000	296.5	293.5	306.5	A	Pass
590.0 A	590.0000	582.7	577.7	602.3	A	Pass

*****END OF CALIBRATION*****

Signed: *Bart A. Schwartz*
Bart A. Schwartz, Engineer in Charge

Report of Calibration for SERIAL NUMBER: 1220C-C1 ASSET NUMBER: 1220C-C1

Printed On: Friday, September 29, 2023
Test Results indicate the following: Found-Left: Unit was left as found. As-Left: Unit was left after adjustments.



Abbreviation List

A = Area (ft ²)	S.F. = Service Factor
AHU = Air Handling Unit	SF = Supply Fan
A _k = Effective Area	SP = Static Pressure
BHP = Brake Horsepower (IP) HP	SR = Supply Register
Btu = British Thermal Unit	T = Temperature
Btu/h = Btuh = BTUH = BTU/Hour	T _{ma} = Mixed Air Temperature
CL = Center Distance (used in belt formula)	T _{oa} = Outside Air Temperature
CD = Ceiling Diffuser	T _{ra} = Return Air Temperature
CF = Correction Factor	H = Head (in wc, ft wc, psi)
CFM = Volumetric Flow: Cubic Feet Per Minute	h = Enthalpy
CO ₂ = Carbon Dioxide	HP = Horsepower
CO = Carbon Monoxide	hr = Hour
C _v = Flow Constant	K _v = Flow constant (SI)
d = Diameter (in.) IP	kW = Kilowatt = 1000 Watts
Δ = Difference or Change (Final - Initial)	LAT = Leaving Air Temperature
DB = Dry Bulb	lb = Pounds
EA = Exhaust Air	LWT = Leaving Water Temperature
EAT = Entering Air Temperature	ma = Mixed Air
EF = Exhaust Fan	MIN = Minimum
Eff = Efficiency	MAX = Maximum
EG = Exhaust Grille	N/A = Not Applicable
ESP = External Static Pressure	NA = No Access
EWT = Entering Water Temperature	NL = Not Listed
°F = Degrees Fahrenheit, °F	NPSHA = Net Positive Suction Head Available
FPB = Fan Powered Box	NS = Not Specified
FLA = Full Load Amps	OA = Outside Air
fpm = Feet per Minute (fpm)	OAT = Outside Air Temperature
ft = Foot	PD = Sheave Pitch Diameter
gal = Gallons	P.D. = Pressure Drop
GPM = Gallons Per Minute (GPM)	PF = Power Factor
h = Enthalpy (BTU/lb dry air)	SG = Supply Grille
P = Pressure	SR = Supply Register
ppm = parts per million	TP = Total Pressure
psi = Pounds Per Square Inch	T _{ra} = Return Air Temperature
psid = PSI Differential	TS = Tip Speed (fpm) IP, (m/s) SI
r = Radius (in)	TSP = Total Static Pressure
% _{ra} = % of Return Air	V = Velocity
RA = Return Air	VAV = Variable Air Volume
RAT = Return Air Temperature	VD = Volume Damper
RF = Return Fan	VFD = Variable Frequency Drive
RG = Return Grille	W = Watt
RH = Relative Humidity	WB = Wet Bulb
RPM = Revolutions Per Minute	wg = wc = water gauge = water column
RTU = Roof Top Unit	WHP = Water Horsepower (IP)
SA = Supply Air	ω = Humidity Ratio