

Report By:

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



Report: TAB Report
Function: Test, Adjust, & Balance
Date: 12/12/2025
Completed By: National TAB

PROJECT
02-02-26 QT #1176 CAYCE, SC

1600 DIXIANNA RD

CAYCE, SC

Client

QUIKTRIP
4705 SOUTH 129TH EAST AVENUE
TULSA, OK 74134

National TAB

Project: 02-02-26 QT #1176 CAYCE, SC

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Project Summary

Project Summary

The summary below provides a quick understanding of our scope of work and general testing procedures. Enclosed in the report are further details about your building performance including recommendations, asset data, and pictures. Our focus is to work with the trades to remedy any issues or deficiencies during the actual field balancing and not after the balancing has occurred to achieve a positive environment and outcome. The level of success is determined by the availability of the trades, possible parts needed, or time constraints.

RTU's (Roof Top Units)

Each of the RTU's was measured with a flow hood to establish total flow. The total flow was then adjusted via the VFD so that airflow fell within design tolerances. All diffusers on the kitchen RTU were balanced to the engineer's design flow. The diffusers on the sales floor were only adjusted when there were noticeable issues present like drafting or dampers that were found completely closed. The Hoods On outside air rate was set by first establishing the typical QT set point at the Emerson controller and then making manually adjustments on the roof. The hoods off airflow setpoint was found by adjusting the damper position at the Emerson controller until the design airflow was achieved. Outside air was measured by reading the intake air opening with a velocity grid and multiplying by the free area. After completion of TAB all overrides were released.

Kitchen Exhaust Hood & Associated Fans

The 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.

Restroom Exhaust Fans

The restroom exhaust fans were measured with a flow hood. The total flow was balanced for the fan with the exception of the new grille over the combi-oven, which was balanced to the listed design.

Final Building Tests

After completing the test and balance the final building pressure was measured. It was confirmed that the building pressure fell within acceptable tolerances and that the pressure measurement coincides with the actual and design net airflow. Any deviations from these standards are noted throughout the report. The hood capture was tested at the perimeter of the hood and the cook top level with the equipment heat on to ensure satisfactory hood capture and containment.

Issue List

- Damper 3-1 Not Present
- Incorrect Kitchen Diffusers
- No Hood End Panels Installed
- RTU-3 Economizer Actuator Malfunction
- RTU-4 Low Flow



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Project Issue Information

Issue Name : Damper 3-1 Not Present
Description : The damper for 3-1 is not present.
Created By : National TAB **Assigned To :** National TAB - Dan Hertenstein
Status : Open
Priority : Urgent **Asset Tag :** SGRD1
Originated Date : 02/03/2026 - Alex Bauer - National TAB

Project Issue File Details

- 1. [Open](#) MicrosoftTeams_video_3_529257102.mp4
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Project Issue Information

Issue Name : Incorrect Kitchen Diffusers
Description : The kitchen diffusers 3-2 through 3-5 are the incorrect type. They need to be the TITUS 300FS diffuser with the installed deflection blades.
Created By : National TAB **Assigned To :** National TAB - Dan Hertenstein
Status : Open
Priority : High **Asset Tag :** RT-3
Originated Date : 02/03/2026 - Alex Bauer - National TAB

Project Issue File Details



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GRILLE, REGISTER, & DIFFUSER SCHEDULE

NO.	MANUFACTURER	MODEL	SERVICE	FACE SIZE	DECK SIZE	DESCRIPTION	NOTES
01	TITUS	300L	04043	18" X 18"	SEE PLAN	34" 30" BLAKE TRANSFER GRILLE AL. W/FE	02
02	TITUS	300FS	04041	22" X 22"	SEE PLAN	22" BLAKE DEFLECTION GRILLE AL. W/FE	03

NOTES:
 1. PREPARE FOR ALL DIFFUSERS TO BE 18" X 18" BLAKE (01) W/FE

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Project Issue Information

Issue Name : No Hood End Panels Installed
Description : There are no hood end panels installed as per the Hood Schedule.
Created By : National TAB **Assigned To :** National TAB - Dan Hertenstein
Status : Open
Priority : High **Asset Tag :** HD1
Originated Date : 02/03/2026 - Alex Bauer - National TAB

Project Issue File Details

HOOD / EXHAUST FAN SCHEDULE							
MANUFACTURER	MODEL	SIZE	CFM	WEG.	LIGHTS	FIRE SYSTEM	WEIGHT
BT-3	CAPFLANGE	250X44	127.00	STAINLESS	NO	NO	70.00

NOTES:

- HOODS, FANS, AND ACCESSORIES SHALL BE MANUFACTURER PROVIDED CONTRACTOR INSTALLED.
- HOOD SHALL BE 40" STAINLESS STEEL.
- HOOD SHALL BE PROVIDED WITH FAN INDICATOR AND (APPROX) MOUNTED ON FRONT PANEL.
- MANUFACTURER PROVIDED (DOUBLE WALLED) 1/2" LAQUED STAINLESS STEEL DUCT KIT AND ALL REARWARD CONNECTION ACCESSORIES FOR FIELD-INSTALLATION FROM HOOD TO FAN.
- HOOD SHALL HAVE RIGHT AND LEFT **END PANELS** AND FRONT, LEFT AND RIGHT STAINLESS STEEL FIELD INVERTER.
- HOOD SHALL BE PROVIDED WITH 1/4" CWL LATEST APPROVED FILTERS.
- HOOD SHALL BE PROVIDED WITH DUCT HANGER KIT, BRACKETS AND AUTOMATIC FAN CONTROLS MOUNTED IN HOOD UTILITY CABINET.
- SYSTEM SHALL BE CAPABLE OF INSULATING FAN AS SUBMITTED AND INTEGRATED WITH BUILDING-AIR SYSTEM FOR BUILDING PRESSURE/CONTROL.
- SYSTEM SHUT DOWN CONTROLS ARE FACTORY PROVIDED WITHIN HOOD UTILITY CABINET.
- HOOD SHALL BE LATEST AND LABELED FOR IF CLEARANCE REQUIREMENTS TO COMPARTMENTS.
- FAN SHALL BE PROVIDED WITH SPEED AND INVERTER CONTROL BOX AND DISCONNECT.
- VARIABLE SPEED CONTROLLER PRE-WIRED IN FAN HANGING SPEED CONTROLLER SHALL BE MANUALLY ADJUSTED BY TEST AND BALANCE CONTRACTOR.

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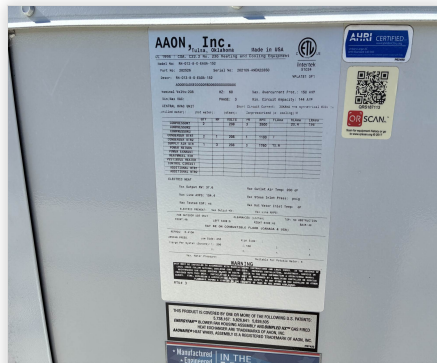
Project Issue Information

Issue Name : RTU-3 Economizer Actuator Malfunction
Description : The actuator for the economizer stopped responding to commands from the store computer when setting the outside air when the hood is off. The outside air was set manually.
Created By : National TAB **Assigned To :** National TAB - Dan Hertenstein
Status : Open
Priority : Urgent **Asset Tag :**
Originated Date : 02/03/2026 - Alex Bauer - National TAB

Project Issue File Details



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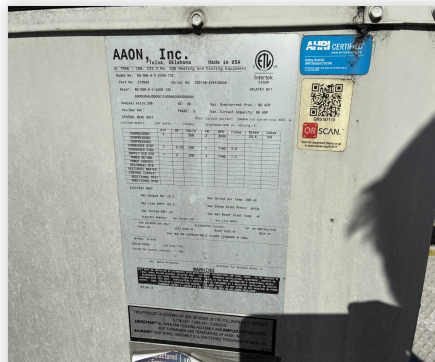
Project Issue Information

Issue Name : RTU-4 Low Flow
Description : The Yaskawa J1000 VFD is set to its maximum speed option and the RTU is not producing enough airflow as it should (79%/100%). It is recommended to ensure the dampers are fully open and existent as well to check for resistance in the system. 66 CFM/ton is within the acceptable range for a unit of this size.
Created By : National TAB **Assigned To :** National TAB - Dan Hertenstein
Status : Open
Priority : High **Asset Tag :** RT-4
Originated Date : 02/03/2026 - Alex Bauer - National TAB

Project Issue File Details



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CheckList List

- 01: RTU's/AHU's
- 02: Exhaust Fans
- 03: Hoods
- 04: Final Tests



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CheckList Information

Name : 01: RTU's/AHU's **Status :** Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 12/12/2025 - Trinity Dodds - National TAB

Completed Date : 02/03/2026 - Alex Bauer - National TAB

CheckList Item Details

RTU's/AHU's

Evaporator coils are clean?	Pass
-----------------------------	------

Comment:

Condenser coils are clean?	Pass
----------------------------	------

Comment:

Gas piping is installed and valves are turned on?	N/A
---	-----

Comment:

Unit free of noticeable noise and vibration	Pass
---	------

Comment:



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CheckList Information

Name : 02: Exhaust Fans **Status :** Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 12/12/2025 - Trinity Dodds - National TAB
Completed Date : 02/03/2026 - Alex Bauer - National TAB

CheckList Item Details

EF's

Hinge kit installed installed on hood fan? Pass

Comment:

Flex conduit is long enough so that fan can be completely tilted back? Pass

Comment:

No major leakage around the fan base Pass

Comment:

Unit is free of noise and vibration Pass

Comment:



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CheckList Information

Name : 03: Hoods **Status :** Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 12/12/2025 - Trinity Dodds - National TAB
Completed Date : 02/03/2026 - Alex Bauer - National TAB

CheckList Item Details

HOODS

Hood is free of alarms? Pass

Comment:

Hood is free of damage? Pass

Comment:

End panels are installed per prototype? Fail

Comment:



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CheckList Information

Name : 04: Final Tests **Status :** Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 12/12/2025 - Trinity Dodds - National TAB

Completed Date : 02/03/2026 - Alex Bauer - National TAB

CheckList Item Details

FINAL CHECKS

HOOD CAPTURE TEST

List kitchen equipment turned on for testing

Comment:

OVEN, FRYER.

List smoke candle type used

Comment:

SMOKE PELLET.

Smoke test capture % - Perimeter of hood

Comment:

100%

Smoke test capture % - Top of cooking surface

Comment:

100%

WITNESS

Date test was completed

02/02/2026

Comment:

TAB tech name / Firm

Comment:

ALEX BAUER/NTAB

Site super name / Firm

Comment:

NA

Owner representative name / Firm (if Applicable)

Comment:

NA

BUILDING PRESSURE

Do actual net building airflow, design net building airflow, and pressure coincide? If not why? (All three should either be positive or negative)

Pass

Comment:



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Project: 02-02-26 QT #1176 CAYCE, SC

System/Unit: AHU/RTU

Asset: RT-1

AREA:SALES FLOOR

Unit Data	
	Actual
MFG	AAON
Serial Num	202109-ANEL22848
Model Num	RN-015-8-0-EA0A-152
Num OA Filters 1	1
OA Filter Size 1	22.5X44.5
Num Final Filter 1	2
Final Filter Size 1	19.5X46.5X2

Motor Data	
	Actual
Motor MFG	NA
Frame	NA
Horsepower	5
Motor Rpm	1760
Phase	3
Rated Voltage	208
Rated Amperage	16.7

Test Data		
	Design	Actual
SF CFM	5000	4805
SF RPM	-	1255
OA CFM (Hoods On)	860	883
OA CFM (Hoods Off)	410	417
RL Voltage	-	132 VFD
RL Amperage	-	8.79 VFD
VFD Max SetPt	-	42.8 Hz
OA Damper Position (Hoods On)	-	46%
OA Damper Position (Hoods Off)	-	30%

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.54"
Fan Suction SP	-	-0.80"
Fan Discharge SP	-	0.36"
Total ESP	-	0.90"
Fan Total SP	-	1.16"

General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	YES
Condensate Drain Installed	YES

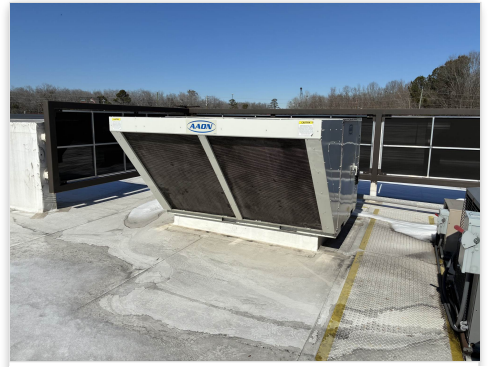
Unit Data - PHOTO LOG



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Project: 02-02-26 QT #1176 CAYCE, SC

System/Unit: AHU/RTU

Asset: RT-2

AREA:SALES FLOOR

Unit Data	
	Actual
MFG	AAON
Serial Num	202109-ANEL22849
Model Num	RN-015-8-0-EA0A-152
Num OA Filters 1	1
OA Filter Size 1	22.5X44.5
Num Final Filter 1	2
Final Filter Size 1	19.5X46.5X2

Motor Data	
	Actual
Motor MFG	NA
Frame	NA
Horsepower	5
Motor Rpm	1760
Phase	3
Rated Voltage	208
Rated Amperage	16.7

Test Data		
	Design	Actual
SF CFM	5000	4982
SF RPM	-	1467
OA CFM (Hoods On)	860	855
OA CFM (Hoods Off)	410	424
RL Voltage	-	178 VFD
RL Amperage	-	10.4 VFD
VFD Max SetPt	-	50 Hz
OA Damper Position (Hoods On)	-	46%
OA Damper Position (Hoods Off)	-	30%

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.68"
Fan Suction SP	-	-1.00"
Fan Discharge SP	-	0.68"
Total ESP	-	1.36"
Fan Total SP	-	1.68"

General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	YES
Condensate Drain Installed	YES

Unit Data - PHOTO LOG



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Project: 02-02-26 QT #1176 CAYCE, SC

System/Unit: AHU/RTU

Asset: RT-3

AREA: KITCHEN

Unit Data	
	Actual
MFG	AAON
Serial Num	202109-ANEK22850
Model Num	RN-013-8-0-EA0A-152
Num OA Filters 1	1
OA Filter Size 1	22.5X44.5
Num Final Filter 1	2
Final Filter Size 1	19.5X46.5X2

Motor Data	
	Actual
Motor MFG	NA
Frame	NA
Horsepower	3
Motor Rpm	1760
Phase	3
Rated Voltage	208
Rated Amperage	10.6

Test Data		
	Design	Actual
SF CFM	4200	4490
SF RPM	-	1408
OA CFM (Hoods On)	860	878
OA CFM (Hoods Off)	410	389
RL Voltage	-	172 VFD
RL Amperage	-	8.73 VFD
VFD Max SetPt	-	48 Hz
OA Damper Position (Hoods On)	-	46%
OA Damper Position (Hoods Off)	-	3/16"

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.63"
Fan Suction SP	-	-0.90"
Fan Discharge SP	-	0.60"
Total ESP	-	1.23"
Fan Total SP	-	1.50"

General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	YES
Condensate Drain Installed	YES

Notes:
See issues list.

Written By: Alex Bauer on 02/03/2026

Unit Data - PHOTO LOG



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Project:02-02-26 QT #1176 CAYCE, SC

AHU/RTU

Diffuser Supply (GRD)

RT-3/KITCHEN

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	SUPPORT SERVICE	SI	12"	700	1	962	911	962	137.4
SGRD2	SUPPORT SERVICE	SI	12"	875	1	863	745	863	98.6
SGRD3	SUPPORT SERVICE	SI	12"	875	1	940	959	940	107.4
SGRD4	SUPPORT SERVICE	SI	12"	875	1	888	865	888	101.5
SGRD5	DOCK	ES	12"	875	1	837	650	837	95.7
Total				4200		4490	4130	4490	106.9%



National TAB

Project: 02-02-26 QT #1176 CAYCE, SC

System/Unit: AHU/RTU

Asset: RT-4

AREA:BOH

Unit Data	
	Actual
MFG	AAON
Serial Num	202108-AYEF05035
Model Num	RQ-006-8-V-EA09-132
Num OA Filters 1	1
OA Filter Size 1	12X17
Num Final Filter 1	1
Final Filter Size 1	20X34X2

Motor Data	
	Actual
Motor MFG	NA
Frame	NA
Horsepower	2
Motor Rpm	1760
Phase	3
Rated Voltage	208
Rated Amperage	7.5

Test Data		
	Design	Actual
SF CFM	2800	2229
SF RPM	-	1760
OA CFM (Hoods On)	270	264
OA CFM (Hoods Off)	270	264
RL Voltage	-	214 VFD
RL Amperage	-	5.43 VFD
VFD Max SetPt	-	60 Hz
OA Damper Position (Hoods On)	-	46%
OA Damper Position (Hoods Off)	-	46%

Performance Data		
	Design	Actual
MA Plenum SP	-	-1.02"
Fan Suction SP	-	-1.41"
Fan Discharge SP	-	0.79"
Total ESP	-	1.81"
Fan Total SP	-	2.20"

General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	YES
Condensate Drain Installed	YES

Unit Data - PHOTO LOG



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National TAB

Project: 02-02-26 QT #1176 CAYCE, SC

System/Unit: FAN - Exhaust

Asset: EF1

AREA: MEN'S RR/COMBI

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	DR33HFA
Serial Num	-	5019669
Type	-	DOWNBLAST
Configuration	-	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NA
Horsepower	-	0.333
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	NA
Service Factor	-	NA

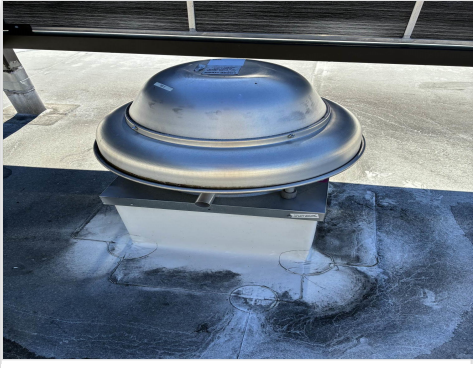
Test Data		
	Design	Actual
CFM	650	610
Fan RPM	-	1201
Fan Rotation	-	CCW
Motor RPM	-	1201
System SetPt	-	64%
RL Voltage	-	11.7
RL Amperage	-	NA
Total ESP	-	0.21"
Fan Inlet SP	-	-0.21"
Fan Discharge SP	-	ATM

Notes:

These diffusers do not have dampers.

Written By: Alex Bauer on 02/03/2026

Unit Data - PHOTO LOG



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National TAB

Project:02-02-26 QT #1176 CAYCE, SC

Diffuser Ret/Exh (GRD)

EF1/MEN'S RR/COMBI

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
EGRD1	COMBI-OVEN	RI	8"	150	1	213	213	213	142.0
Total				150		213	213	213	142%

AIR BALANCE SCHEDULE

UNIT	AREA SERVED	HOOD ON OA		HOOD OFF OA		HOOD ON EXHAUST		HOOD OFF EXHAUST	
		DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
RTU 1	SALES	860	883	410	417				
RTU-2	SALES	860	855	410	424				
RTU-3	KITCHEN/SALES	860	878	410	389				
RTU-4	BOH	270	264	270	264				
EF-1	MEN'S RR					650	610	650	610
EF-2	WOMEN'S RR					350	357	350	357
EF-3	HOOD					1350	1298	0	0
TOTALS		2850	2880	1500	1494	2350	2265	1000	967

HOODS ON

NET AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	2850	2880
TOTAL EXHAUST	2350	2265
NET AIRFLOW	500	615

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS
FRONT	0.0041
SIDE	0.0122
REAR	0.0084
AVERAGE	0.0082

HOODS OFF

NET AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	1500	1494
TOTAL EXHAUST	1000	967
NET AIRFLOW	500	527

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS
FRONT	0.0029
SIDE	0.0014
REAR	0.0029
AVERAGE	0.0024

NOTES:



National TAB

Project: 02-02-26 QT #1176 CAYCE, SC

System/Unit: FAN - Exhaust

Asset: EF2

AREA:WOMEN'S RR

Unit Data		
	Design	Actual
MFG	NA	CAPTIVE AIRE
Model Num	NA	DR12HFA
Serial Num	-	5019669
Type	-	DOWNBLAST
Configuration	-	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NA
Horsepower	-	0.25
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	115
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	Actual
CFM	350	357
Fan RPM	-	1451
Fan Rotation	-	CCW
Motor RPM	-	1451
System SetPt	-	75%
RL Voltage	-	17.4
RL Amperage	-	NA
Total ESP	-	0.18"
Fan Inlet SP	-	-0.18"
Fan Discharge SP	-	ATM

Unit Data - PHOTO LOG



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Project: 02-02-26 QT #1176 CAYCE, SC

System/Unit: FAN - Exhaust

Asset: EF3

AREA:KITCHEN HD

Unit Data		
	Design	Actual
MFG	NA	CAPTIVEAIRE
Model Num	NA	DU50HFA
Serial Num	-	8189368
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	TELCO GREEN
Frame	-	NA
Horsepower	1/2	0.50
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	208
Amperage (rated)	-	NA
Service Factor	-	NA

Test Data		
	Design	Actual
CFM	1350	1298
Fan RPM	-	1140
Fan Rotation	-	CCW
Motor RPM	-	1140
System SetPt	-	50.8 Hz
RL Voltage	-	NA
RL Amperage	-	NA
Total ESP	-	0.49"
Fan Inlet SP	-	-0.49"
Fan Discharge SP	-	ATM

Unit Data - PHOTO LOG



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National TAB

Project: 02-02-26 QT #1176 CAYCE, SC

System/Unit: Kitchen Hood Type I

Asset: HD1

AREA:GRIDDLE

Unit Data

	Design	Actual
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	6030ND-2-F	6030ND-2
Job / Serial Num	-	8189368
Type	-	TYPE I CANOPY
Hood length	-	108"
Hood Width	-	60"

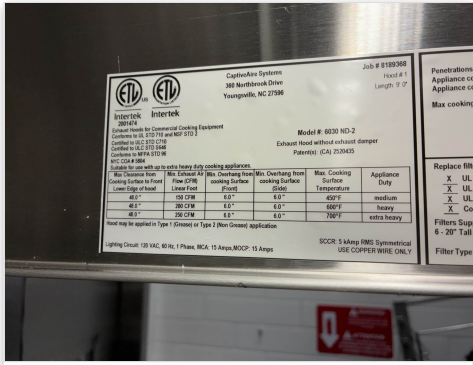
Test Data Exhaust

	Design	Actual
Filter Type	-	BAFFLE FILTERS
Filter Size 1	-	16X20
Filter Qty 1	-	6
Filter AK factor size 1	-	2.08
Filter Total AK Area	-	12.48
Filter1 FPM	-	117
Filter2 FPM	-	103
Filter3 FPM	-	97
Filter4 FPM	-	99
Filter5 FPM	-	105
Filter6 FPM	-	100
Filter Ave FPM(corr)	-	104
CFM	1350	1298

Cooking Equipment

	Actual
Item 1	OVEN
Item 2	FRYER

Unit Data - PHOTO LOG



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