

Report By:

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Report: TAB REPORT
Function: Test, Adjust, & Balance
Date: 11/18/2024
Completed By: National TAB

PROJECT
11-18-24 DOLLAR TREE - COLUMBUS, WI

11490 W JAMES ST.

COLUMBUS, WI 53925

Client

Oliphant Heating
208 WOLLARD BLVD
RICHMOND, MO

National TAB

Project: 11-18-24 DOLLAR TREE - COLUMBUS, WI

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Project Summary

The summary below provides a quick understanding of our scope of work and general testing procedures. Enclosed in the report is further detail 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) w/ Diffusers

Each of the RTU's were measured at their terminal devices or via traverse 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.

General Exhaust Fans w/ Grilles

The general exhaust fans were 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.

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.

AIR BALANCE SCHEDULE

UNIT	AREA SERVED	HVAC SUPPLY		HVAC RETURN		HVAC OUTDOOR		OA %		HOOD MAKE-UP		HOOD EXHAUST		GENERAL EXH.	
		DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
AC-1	STORAGE	1750	1737	1600	1573	150	164	8.6%	9.4%						
AC-2	WEST SALES	2800	2876	2450	2514	350	362	12.5%	12.6%						
AC-3	EAST SALES	2800	2820	2450	2440	350	380	12.5%	13.5%						
AC-4	SOUTH SALES	3500	3517	3100	3133	400	384	11.4%	10.9%						
EF-1	RESTROOM													75	75
EF-2	RESTROOM													75	72
TOTALS		10850	10950	9600	9660	1250	1290			0	0	0	0	150	147

NET BUILDING AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	1250	1290
TOTAL EXHAUST	150	147
NET AIRFLOW	1100	1143

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS (IN. H2O)
FRONT	0.021
SIDE	
REAR	0.021
AVERAGE	0.021

FINAL CHECKS

ACTUAL NET AIRFLOW COINCIDES WITH DESIGN: ✓

MEASURED PRESSURES COINCIDES WITH ACTUAL NET AIRFLOW: ✓

PRESSURE FALLS WITHIN TOLERANCE OF +/-0.03" W.C. ✓

NOTES:

CheckList List

- TECH 01: INITIAL WALKTHROUGH
- TECH 02: UNIT DATA AND EVALUATION
- TECH 03: TEST, ADJUST, AND BALANCE
- TECH 04: FINAL TESTS

Have trades/general contractor been notified about any issues and are they created on FaciliBuild?

Comment:

Yes



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11-18-24 DOLLAR TREE - COLUMBUS, WI

CheckList Information

Name : TECH 02: UNIT DATA AND EVALUATION **Status :** Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 11/19/2024 - Michael McDonnell - National TAB

Completed Date : 11/20/2024 - Michael McDonnell - National TAB

CheckList Item Details

UNIT DATA AND EVALUATION WHILE GATHERING UNIT DATA CHECK THE FOLLOWING:

RTU's/AHU's

Economizers are assembled and functional? Yes

Comment:

DCV Max damper opening position is set to minimum? Yes

Comment:

Free cooling enthalpy set point set for lowest setting (Typically "D") Yes

Comment:

Motors are all operating below the FLA rating? Yes

Comment:

Are belts tight?

Comment:

NA, Direct Drive Units.

If direct drive unit is the speed controller working.

Comment:

Yes

Is gas piping installed and valves turned on?

Yes

Comment:

Unit free of noticeable noise and vibration

Yes

Comment:

EF's

Rotation is correct?

Yes

Comment:

Belts are tight?

Comment:

NA, Direct Drive

Is the motor operating below the motor FLA rating?

Yes

Comment:

For restroom fan(s) is the back draft damper installed and can it fully open?

N/A

Comment:

Unit free of noticeable noise and vibration?

Yes

Comment:

DOCUMENTATION

Have trades/general contractor been notified about any issues and are they created on FaciliBuild?

Yes

Comment:



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11-18-24 DOLLAR TREE - COLUMBUS, WI

CheckList Information

Name : TECH 03: TEST, ADJUST, AND BALANCE **Status :** Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 11/19/2024 - Michael McDonnell - National TAB

Completed Date : 11/20/2024 - Michael McDonnell - National TAB

CheckList Item Details

TEST, ADJUST, AND BALANCE ALL EQUIPMENT:

DURING TESTING MAKE NOTE OF THE FOLLOWING:

Is space free of drafting? Yes

Comment:

Is space comfortable in all areas? Yes

Comment:

Is the space free of ventilation noise? Yes

Comment:

If deviations from design were necessary to resolve 1-3 what were they? Otherwise put "NA".

Comment:

NA



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11-18-24 DOLLAR TREE - COLUMBUS, WI

CheckList Information

Name : TECH 04: FINAL TESTS **Status :** Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 11/19/2024 - Michael McDonnell - National TAB

Completed Date : 11/20/2024 - Michael McDonnell - National TAB

CheckList Item Details

FINAL TESTS

WITNESS

Date test was completed 11/19/2024

Comment:

TAB tech name / Firm

Comment:

Michael McDonnell / National TAB

Site super name / Firm

Comment:

NA

Building pressure at front & back doors (All Systems On)

Comment:

0.021"

ADDITIONAL

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

Comment:

Thermostats are programmed?

No

Comment:

To be programmed by store.



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Project: 11-18-24 DOLLAR TREE - COLUMBUS, WI

System/Unit: AHU/RTU



Asset: RTU 1

AREA: STORAGE

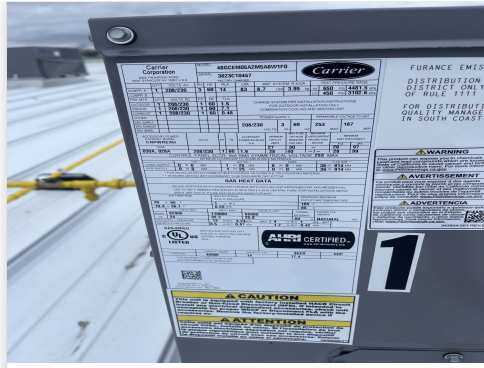
Unit Data			Test Data		
	Design	Actual		Design	Actual
MFG	CARRIER	CARRIER	SF CFM	1750	1737
Serial Num	-	3823C10457	SF RPM	-	1921
Model Num	48FCEM12A2M5A6W1F0	48GCEM05A2M5A6W1F0	RA CFM	1600	1573
Type	RTU	RTU	OA CFM	150	164
Configuration	VERTICAL	VERTICAL	RL Voltage	-	211/211/210
Num OA Filters 1	-	1	RL Amperage	-	3.2
OA Filter Size 1	-	28X14	SF Rotation	-	CORRECT
Num Final Filter 1	-	2	SF System SetPt	-	8.6 VDC (CAV)
Final Filter Size 1	-	18X24X2	RA Damper Position	-	MECHANICALLY LINKED DAMPER
Motor Data			Min OA Damper Position	-	2.95V (11%)
	Design	Actual	Min OA Damper Type	-	ECONOMIZER
Motor MFG	-	NL	OA Enthalpy Setpt	-	ES5
Horsepower	1.4	NL	Performance Data		
Motor Rpm	-	NL		Design	Actual
Phase	1	1	MA Plenum SP	-	-0.55"
Rated Voltage	208	208	Fan Suction SP	-	-0.79"
Rated Amperage	-	7.1	Fan Discharge SP	-	0.34"
			Total ESP	1.00	0.89"
			Fan Total SP	-	1.13"
			General		
				Actual	
			Fan Rotation Correct	YES	
			Unit Filters Clean	YES	
			Condensate Drain Installed	YES	

Completed By: Michael McDonnell on 11/20/2024

Unit Data - PHOTO LOG



11/20/2024



11/20/2024



National TAB

Project: 11-18-24 DOLLAR TREE - COLUMBUS, WI

AHU/RTU



Diffuser Supply (GRD)

RTU 1/STORAGE

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
RTU 1-SGRD1	BACK HALL	A	8"	100	1.0	224	109	109	109.0
RTU 1-SGRD2	RESTROOM	A	8"	50	1.0	201	54	54	108.0
RTU 1-SGRD3	RESTROOM	A	8"	50	1.0	184	48	48	96.0
RTU 1-SGRD4	STORAGE	D	14X6	387	0.44	308	390	390	100.8
RTU 1-SGRD5	STORAGE	D	14X6	387	0.44	320	387	387	100.0
RTU 1-SGRD6	STORAGE	A	14X6	388	0.44	348	365	365	94.1
RTU 1-SGRD7	STORAGE	A	14X6	388	0.44	330	384	384	99.0
Total				1750		1915	1737	1737	99.26%

Completed By: Michael McDonnell on 11/20/2024



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Project: 11-18-24 DOLLAR TREE - COLUMBUS, WI

System/Unit: AHU/RTU



Asset: RTU 2

AREA:WEST SALES

Unit Data			Test Data		
	Design	Actual		Design	Actual
MFG	CARRIER	CARRIER	SF CFM	2800	2876
Serial Num	-	3223P67839	SF RPM	-	1450
Model Num	48FCEM12A2M5A6W1F0	48FCEM08A2M5A6W1J0	OA CFM	2450	2514
Type	RTU	RTU	OA CFM	350	362
Configuration	VERTICAL	VERTICAL	RL Voltage	-	211/211/211
Num OA Filters 1	-	1	RL Amperage	-	3.0/3.0/2.9
OA Filter Size 1	-	35X19.5	SF Rotation	-	CORRECT
Num Final Filter 1	-	4	SF System SetPt	-	6.7 VDC (MSAV)
Final Filter Size 1	-	16X20X2	RA Damper Position	-	MECHANICALLY LINKED

Motor Data		
	Design	Actual
Motor MFG	-	NL
Horsepower	2.4	NL
Motor Rpm	-	NL
Phase	3	3
Rated Voltage	208 V	208
Rated Amperage	-	6.4

Min OA Damper Position	-	HIGH: 3.35V (19%) LOW: 4.10V (27%)
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	ES5

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.45"
Fan Suction SP	-	-0.78"
Fan Discharge SP	-	0.42"
Total ESP	1.00	0.87"
Fan Total SP	-	1.20"

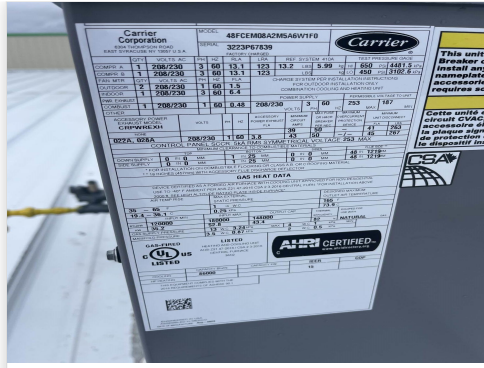
General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	YES
Condensate Drain Installed	YES

Completed By: Michael McDonnell on 11/20/2024

Unit Data - PHOTO LOG



11/20/2024



11/20/2024



National TAB

Project: 11-18-24 DOLLAR TREE - COLUMBUS, WI

AHU/RTU



Diffuser Supply (GRD)

RTU 2/WEST SALES

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
RTU 2-SGRD1	WEST SALES	B	12	350	1.0	334	361	361	103.1
RTU 2-SGRD2	WEST SALES	B	12	350	1.0	428	366	366	104.6
RTU 2-SGRD3	WEST SALES	B	12	350	1.0	450	372	372	106.3
RTU 2-SGRD4	WEST SALES	B	12	350	1.0	345	365	365	104.3
RTU 2-SGRD5	WEST SALES	B	12	350	1.0	319	366	366	104.6
RTU 2-SGRD6	WEST SALES	B	12	350	1.0	371	345	345	98.6
RTU 2-SGRD7	WEST SALES	B	12	350	1.0	418	348	348	99.4
RTU 2-SGRD8	WEST SALES	B	12	350	1.0	362	353	353	100.9
Total				2800		3027	2876	2876	102.71%

Completed By: Michael McDonnell on 11/19/2024



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Project: 11-18-24 DOLLAR TREE - COLUMBUS, WI

System/Unit: AHU/RTU



Asset: RTU 3

AREA: EAST SALES

Unit Data			Test Data																										
	Design	Actual		Design	Actual																								
MFG	CARRIER	CARRIER	SF CFM	2800	2820																								
Serial Num	-	3323P67906	SF RPM	-	1442																								
Model Num	48FCEM12A2M5A6W1F0	48FCEM08A2M5A6W1F0	RA CFM	2450	2440																								
Type	RTU	RTU	OA CFM	350	380																								
Configuration	VERTICAL	VERTICAL	RL Voltage	-	210/210/211																								
Num OA Filters 1	-	1	RL Amperage	-	2.8/2.9/2.9																								
OA Filter Size 1	-	35X19.5	SF Rotation	-	CORRECT																								
Num Final Filter 1	-	4	SF System SetPt	-	6.7 VDC (CAV)																								
Final Filter Size 1	-	16X20X2	RA Damper Position	-	MECHANICALLY LINKED																								
<table border="1"> <thead> <tr> <th colspan="3">Motor Data</th> </tr> <tr> <th></th> <th>Design</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>Motor MFG</td> <td>-</td> <td>NL</td> </tr> <tr> <td>Horsepower</td> <td>2.4</td> <td>NL</td> </tr> <tr> <td>Motor Rpm</td> <td>-</td> <td>NL</td> </tr> <tr> <td>Phase</td> <td>3</td> <td>3</td> </tr> <tr> <td>Rated Voltage</td> <td>208 V</td> <td>208</td> </tr> <tr> <td>Rated Amperage</td> <td>-</td> <td>6.4</td> </tr> </tbody> </table>			Motor Data				Design	Actual	Motor MFG	-	NL	Horsepower	2.4	NL	Motor Rpm	-	NL	Phase	3	3	Rated Voltage	208 V	208	Rated Amperage	-	6.4	Min OA Damper Position	-	HIGH: 3.4V (17%) LOW: 4.0V (25%)
			Motor Data																										
				Design	Actual																								
			Motor MFG	-	NL																								
Horsepower	2.4	NL																											
Motor Rpm	-	NL																											
Phase	3	3																											
Rated Voltage	208 V	208																											
Rated Amperage	-	6.4																											
Min OA Damper Type	-	ECONOMIZER																											
OA Enthalpy Setpt	-	ES5																											

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.45"
Fan Suction SP	-	-0.76"
Fan Discharge SP	-	0.38"
Total ESP	1.00	0.83"
Fan Total SP	-	1.14"

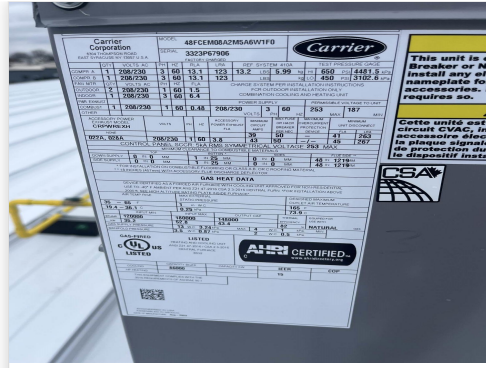
General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	YES
Condensate Drain Installed	YES

Completed By: Michael McDonnell on 11/20/2024

Unit Data - PHOTO LOG



11/20/2024



11/20/2024



National TAB

Project: 11-18-24 DOLLAR TREE - COLUMBUS, WI

AHU/RTU



Diffuser Supply (GRD)

RTU 3/EAST SALES

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
RTU 3-SGRD1	EAST SALES	B	12	350	1.0	361	376	376	107.4
RTU 3-SGRD2	EAST SALES	B	12	350	1.0	402	332	332	94.9
RTU 3-SGRD3	EAST SALES	B	12	350	1.0	470	338	338	96.6
RTU 3-SGRD4	EAST SALES	B	12	350	1.0	344	340	340	97.1
RTU 3-SGRD5	EAST SALES	B	12	350	1.0	331	350	350	100.0
RTU 3-SGRD6	EAST SALES	B	12	350	1.0	471	343	343	98.0
RTU 3-SGRD7	EAST SALES	B	12	350	1.0	362	363	363	103.7
RTU 3-SGRD8	EAST SALES	B	12	350	1.0	372	378	378	108.0
Total				2800		3113	2820	2820	100.71%

Completed By: Michael McDonnell on 11/19/2024

Asset: RTU 4

AREA:FRONT SALES

Unit Data			Test Data		
	Design	Actual		Design	Actual
MFG	CARRIER	CARRIER	SF CFM	3500	3517
Serial Num	-	3523P69286	SF RPM	-	1648
Model Num	48FCEM12A2M5A6W1F0	48FCEM12A2M5A6W1F0	RA CFM	3100	3133
Type	RTU	RTU	OA CFM	400	384
Configuration	VERTICAL	VERTICAL	RL Voltage	-	211/211/211
Num OA Filters 1	-	1	RL Amperage	-	3.7/3.9/3.7
OA Filter Size 1	-	35X19.5	SF Rotation	-	CORRECT
Num Final Filter 1	-	4	SF System SetPt	-	7.7 VDC (MSAV)
Final Filter Size 1	-	20X20X2	RA Damper Position	-	MECHANICALLY LINKED

Motor Data		
	Design	Actual
Motor MFG	-	NL
Horsepower	3.0	NL
Motor Rpm	-	NL
Phase	3	3
Rated Voltage	208 V	208
Rated Amperage	-	6.4

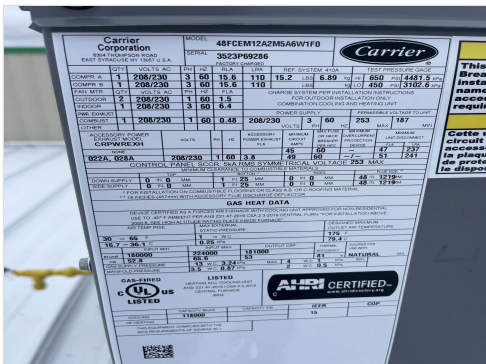
Min OA Damper Position	-	HIGH: 3.0 (12%) LOW: 3.9 (23%)
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	ES5

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.65"
Fan Suction SP	-	-0.89"
Fan Discharge SP	-	0.43"
Total ESP	1.00	1.08"
Fan Total SP	-	1.32"

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

Completed By: Michael McDonnell on 11/20/2024

Unit Data - PHOTO LOG



11/20/2024



11/20/2024



National TAB

Project: 11-18-24 DOLLAR TREE - COLUMBUS, WI

AHU/RTU



Diffuser Supply (GRD)

RTU 4/FRONT SALES

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
RTU 4-SGRD1	SOUTH SALES	B	12	440	1.0	386	424	424	96.4
RTU 4-SGRD2	SOUTH SALES	B	12	435	1.0	461	423	423	97.2
RTU 4-SGRD3	SOUTH SALES	B	12	435	1.0	512	452	452	103.9
RTU 4-SGRD4	SOUTH SALES	B	12	440	1.0	361	454	454	103.2
RTU 4-SGRD5	SOUTH SALES	B	12	440	1.0	497	439	439	99.8
RTU 4-SGRD6	SOUTH SALES	B	12	435	1.0	548	422	422	97.0
RTU 4-SGRD7	SOUTH SALES	B	12	435	1.0	511	444	444	102.1
RTU 4-SGRD8	SOUTH SALES	B	12	440	1.0	427	459		-
Total				3500		3703	3517	3058	87.37%



National TAB

Project: 11-18-24 DOLLAR TREE - COLUMBUS, WI

System/Unit: FAN - Exhaust



Asset: EF1

AREA:RR

Unit Data		
	Design	Actual
MFG	BROAN	BROAN
Model Num	NL	AE80B-B
Serial Num	-	42G31T

Test Data		
	Design	Actual
CFM	75	75

Completed By: Michael McDonnell on 11/19/2024

Unit Data - PHOTO LOG





National TAB

Project: 11-18-24 DOLLAR TREE - COLUMBUS, WI

System/Unit: FAN - Exhaust



Asset: EF2

AREA:RR

Unit Data		
	Design	Actual
MFG	BROAN	BROAN
Model Num	NL	AE80B-B
Serial Num	-	42G31T

Test Data		
	Design	Actual
CFM	75	72

Completed By: Michael McDonnell on 11/19/2024

Unit Data - PHOTO LOG



COORDINATE SA & RA DROPS FROM RTU WITH STORAGE AREA WALLS. LOCATE RTU WITH INSIDE STORAGE AREA.

10'-0" MIN

