

Report By:

National TAB
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Report: TAB REPORT
Function: Test, Adjust, & Balance
Date: 09/12/2024

PROJECT
Rally House (West Chester, OH)

7676 Voice of American Centre Dr

West Chester, OH 45069

Client

Design Comfort Heating and Air LLC
8063 Production Dr.
Florence, KY 41042

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Project: Rally House (West Chester, OH)

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CERTIFICATION



PROJECT: Rally House (West Chester, OH)

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 Standards for Testing, Adjusting, and Balancing of Environmental Systems*. Any variances from design quantities, which exceed NEBB tolerances, are noted in the Test-Adjust-Balance Report Project Summary.

The air distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM: National TAB

REGISTRATION NO: 3629

CERTIFIED BY: Joe Hertenstein

DATE: 9/17/2024

The hydronic distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM: National TAB

REGISTRATION NO: 3629


CERTIFIED BY: Joe Hertenstein

DATE: _____

Submitted and Certified by:

NEBB TAB FIRM: National TAB

TAB PROFESSIONAL: Joe Hertenstein

SIGNATURE: 

REGISTRATION NO: 3629

CERTIFICATION EXP: 12/31/2024





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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	Shortridge ADM-860C S/N M19547	10/17/2023	10/16/2024
	AIR VELOCITY INSTRUMENT	50 fpm to 3900 fpm	+/- 5 % +/- 7 fpm	Shortridge ADM-860C S/N M19548	10/17/2023	10/16/2024
	DIRECT HOOD READING	100 cfm to 2000 cfm	+/- 3 % +/- 7 cfm	Shortridge Flow Hood	10/17/2023	10/16/2024
TEMPERATURE	AIR METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/20/2023	10/19/2024
	AIR PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 5028	10/20/2023	10/19/2024
	IMMERSION METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/20/2023	10/19/2024
	IMMERSION PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 1075	10/20/2023	10/19/2024
	CONTACT METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/20/2023	10/19/2024
	CONTACT PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 4011	10/20/2023	10/19/2024
HUMIDITY	HUMIDITY PROBE	10 % RH to 90 % RH	3% of reading	Cooper ATKINS - SRH77A S/N 090315046	10/20/2023	10/19/2024
ELECTRICAL	VOLTAGE MEASUREMENT	0 VAC to 600 VAC	2 % reading +/- 5 digits	Dwyer CM-1 - S/N 190800099	10/16/2023	10/15/2024
	AMPERAGE MEASUREMENT	0 Amperers to 100 Amperes	2 % reading +/- 5 digits	Dwyer CM-1 - S/N 190800099	10/16/2023	10/15/2024
ROTATION	ROTATION MEASUREMENT	60 rpm to 5000 rpm	2 % reading 2 rpm	Dwyer TAC-L - S/N S1100123	10/16/2023	10/15/2024
HYDRONIC	PRESSURE MEASUREMENT	-30 in Hg to 200 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/3/2024	6/3/2025
	DIFFERENTIAL PRESSURE MEASUREMENT	0 psi - 80 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/3/2024	6/3/2025
DALT	DUCT LEAKAGE	-10" - +10" wc	±1% of reading +/- 0.004" wc	Kanomax DALT 6900 S/N: 080439	3/2024	3/1/2025

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

National TAB

Project: Rally House (West Chester, OH)
System/Unit: AHU/RTU



Asset: RTU-1

AREA:

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Serial Num	-	4721P03852
Model Num	NA	48TCED16H2M5
Configuration	-	VERTICAL
Num OA Filters 1	-	2
OA Filter Size 1	-	23.5"X27"
Num PreFilter 1	-	6
PreFilter Size 1	-	16"X25"X2"

Test Data		
	Design	Actual
SF CFM	5005	3087
SF RPM	-	604
RA CFM	3865	2116
OA CFM	1140	982
RL Voltage	-	205.4/205.1/205.3
RL Amperage	-	9.89/9.81/9.65
OA Damper Position	-	4.35 VDC

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON
Frame	-	56HZ
Motor Rpm	-	1750
Phase	-	3
Rated Voltage	-	208
Rated Amperage	-	10.8
Service Factor	-	1.15

Performance Data		
	Design	Actual
MA Plenum SP	-	-1.27"
Fan Suction SP	-	-1.52"
Fan Discharge SP	-	0.64"
Total ESP	-	1.91"
Fan Total SP	-	2.16"

Drive Data	
	Actual
Motor Sheave Size	4.5"
Motor Bore Size	0.875"
Motor Sheave SetPt	1 TURN OUT
Fan Sheave Size	BK80X1 3/16
Fan Sheave Bore	BK80X1 3/16
Belt CL Distance	21"
Num of Belts	1
Belt Size	BX56

Completed By: Jordan Best on 09/10/2024

Notes:

- . AMPS READ WITH FAN DOOR OPEN
- . HIGH SPEED DOES NOT ENABLE WHEN CALLED FOR, UNABLE TO GET UNIT INTO HIGHEST SPEED

Written By: Jordan Best on 09/10/2024

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Project: Rally House (West Chester, OH)

AHU/RTU



Diffuser Supply (GRD)

RTU-1/

Asset						
Asset Name	Location	Type	DESIGN CFM	CFM(1)	FINAL CFM	% to design
1-1	SALES FLOOR	S1	450	156	179	39.8
1-2	SALES FLOOR	S1	500	182	209	41.8
1-3	SALES FLOOR	S1	270	145	166	61.5
1-4	SALES FLOOR	S1	450	188	216	48.0
1-5	SALES FLOOR	S1	265	187	215	81.1
1-6	SALES FLOOR	S1	400	169	194	48.5
1-7	SALES FLOOR	S1	400	204	234	58.5
1-8	SALES FLOOR	S1	270	141	162	60.0
1-9	SALES FLOOR	S1	450	262	301	66.9
1-10	SALES FLOOR	S1	450	243	279	62.0
1-11	SALES FLOOR	S1	450	335	385	85.6
1-12	SALES FLOOR	S1	100	67	77	77.0
1-13	SALES FLOOR	S1	100	66	76	76.0
1-14	SALES FLOOR	S1	100	120	138	138.0
1-16	SALES FLOOR	S1	350	223	256	73.1
Total			5005	2688	3087	61.68%

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Project: Rally House (West Chester, OH)

System/Unit: AHU/RTU



Asset: RTU-2

AREA:

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Serial Num	-	4721P91417
Model Num	NA	48TCED12H2M5
Configuration	-	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	36"X21"
Num PreFilter 1	-	4
PreFilter Size 1	-	20"X20"X2"

Test Data		
	Design	Actual
SF CFM	3500	3339
SF RPM	-	837
RA CFM	2960	2747
OA CFM	540	592
RL Voltage	-	203.7/204.2/204.8
RL Amperage	-	9.25/9.85/9.53
OA Damper Position	-	3 VDC

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON
Frame	-	56HZ
Motor Rpm	-	1750
Phase	-	3
Rated Voltage	-	230
Rated Amperage	-	9.2
Service Factor	-	1.15

Performance Data		
	Design	Actual
MA Plenum SP	-	-1.22"
Fan Suction SP	-	1.57"
Fan Discharge SP	-	0.51"
Total ESP	-	1.73"
Fan Total SP	-	2.08"

Drive Data	
	Actual
Motor Sheave Size	4.5"
Motor Bore Size	0.875"
Motor Sheave SetPt	2 TURNS OUT
Fan Sheave Size	AK74-1
Fan Sheave Bore	AK74-1
Belt CL Distance	16.5"
Num of Belts	1
Belt Size	A49

Completed By: Jordan Best on 09/10/2024

Notes:

. AMPS READ WITH FAN DOOR OPEN

Written By: Jordan Best on 09/10/2024

National TAB

Project: Rally House (West Chester, OH)

AHU/RTU



Diffuser Supply (GRD)

RTU-2/

Asset						
Asset Name	Location	Type	DESIGN CFM	CFM(1)	FINAL CFM	% to design
2-1	SALES FLOOR	S1	350	223	329	94.0
2-2	SALES FLOOR	S1	250	167	255	102.0
2-3	SALES FLOOR	S1	260	193	287	110.4
2-4	SALES FLOOR	S1	260	199	290	111.5
2-5	SALES FLOOR	S1	300	210	308	102.7
2-6	SALES FLOOR	S1	300	211	309	103.0
2-7	SALES FLOOR	S1	260	164	243	93.5
2-8	SALES FLOOR	S1	360	178	325	90.3
2-10	SALES FLOOR	S1	210	183	194	92.4
2-11	RESTROOM	S1	50	32	50	100.0
2-12	SALES FLOOR	S1	450	261	427	94.9
2-13	RESTROOM	S1	50	20	54	108.0
2-14	SALES FLOOR	S1	125	97	138	110.4
2-15	SALES FLOOR	S1	125	93	130	104.0
Total			3350	2231	3339	99.67%

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Project: Rally House (West Chester, OH)

System/Unit: AHU/RTU



Asset: RTU-3

AREA:

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Serial Num	-	4221C09097
Model Num	NA	48FCEA06H2M5
Configuration	-	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	29.5"X15.5"
Num PreFilter 1	-	2
PreFilter Size 1	-	20"X25"X2"

Motor Data		
	Design	Actual
Phase	-	1
Rated Voltage	-	208
Rated Amperage	-	8.6

Test Data		
	Design	Actual
SF CFM	2000	1932
SF RPM	-	9.30 VDC
RA CFM	1755	1693
OA CFM	245	239
RL Voltage	-	206.3/207.3/206.1
RL Amperage	-	7.80/7.88/7.78
OA Damper Position	-	3.85 VDC

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.90"
Fan Suction SP	-	-1.19"
Fan Discharge SP	-	0.49"
Total ESP	-	1.39"
Fan Total SP	-	1.68"

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National TAB

Project: Rally House (West Chester, OH)

AHU/RTU



Diffuser Supply (GRD)

RTU-3/

Asset						
Asset Name	Location	Type	DESIGN CFM	CFM(1)	FINAL CFM	% to design
3-1	BOH	S1	300	304	304	101.3
3-2	BOH	S1	300	302	302	100.7
3-3	BOH	S1	300	287	287	95.7
3-4	BOH	S1	350	335	335	95.7
3-5	BOH	S1	300	297	297	99.0
3-6	BOH	S1	300	262	262	87.3
3-7	BOH	S1	50	71	48	96.0
3-8	BOH	S1	100	74	97	97.0
Total			2000	1932	1932	96.6%

Completed By: Jordan Best on 09/10/2024