Report By:

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

Report: BLD-1TAB RPT 111323

Function: Test, Adjust, & Balance

Date: 11/12/2023

PROJECT

Bennett Point Building 1 (Cincinnati, OH)

600 E 12th Street

Cincinnati, OH 45202

Client

Urban Sites Construction

1209 Syacmore St.

Cincinnati, OH 45202

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Project: Bennett Point Building 1 (Cincinnati, OH)

Table Of Contents

CERTIFICATION

PROJECT: Bennett Point Building 1 (Cincinnati, 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:	11/17/2023

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:	Joe Hertenstein
REGISTRATION NO:	3629
CERTIFICATION EXP:	12/31/2023

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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	6/21/2023	6/20/2024
	DIFFERENTIAL PRESSURE MEASUREMENT	0 psi - 80 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/21/2023	6/20/2024
DALT	DUCT LEAKAGE	-10"- +10" wc	±1% of reading +/- 0.004" wc	Kanomax DALT 6900 S/N: 080439	5/2023	5/2024

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
CO2 = 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: Bennett Point Building 1 (Cincinnati, OH)

System/Unit: Heat Pump

Asset: AHU2-1 AREA:1ST FLOOR

Unit Data		
	Design	**Actual**
Unit MFG	Trane	Trane
Model Num	NTX	NTXAMT12A112AA
Serial Num	-	28G0157332P814
Type	HEAT PUMP	HEAT PUMP
Configuration	UPFLOW	UPFLOW
Num Filters Size 1	-	1
Filter Size 1	-	16”x20”x1”

Motor Data		
	Design	**Actual**
Phase	1	1
Voltage	208	208
Amperage	-	2.4

Test Data		
	Design	**Actual**
SA CFM	400	406
RL Voltage	-	208.8
RL Amperage	-	0.9
RA CFM	320	318
OA CFM	80	88

Performance Data		
	Design	**Actual**
Suction ESP	-	-0.05”
Discharge ESP	-	0.40”
Total ESP	0.30"	0.45”

Completed By: Gabe Merk on 11/13/2023

Notes:
Filter dirty. Removed for TAB
Recommend adding grille to hole in return located in mechanical room.

Written By: Gabe Merk on 11/13/2023

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Project:Bennett Point Building 1 (Cincinnati, OH)

Heat Pump

Diffuser Supply (GRD)

AHU2-1/1ST FLOOR

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
AHU1-SGRD1	Cooridoor	4way	6”	200	1	257		257	128.5
AHU1-SGRD2	Cooridoor	4way	4”	200	1`	149		149	74.5
Total				400		406	0	406	101.5%

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Project: Bennett Point Building 1 (Cincinnati, OH)

System/Unit: Heat Pump

Asset: AHU2-2 AREA:2ND Floor

Unit Data		
	Design	**Actual**
Unit MFG	Trane	Trane
Model Num	NTX	NTXAMT12A112AA
Serial Num	-	23G0109432P814
Type	HEAT PUMP	HEAT PUMP
Configuration	UPFLOW	UPFLOW
Num Filters Size 1	-	1
Filter Size 1	-	16”x20”x1”

Motor Data		
	Design	**Actual**
Phase	1	1
Voltage	208	208
Amperage	-	2.4

Test Data		
	Design	**Actual**
SA CFM	400	450
RL Voltage	-	212.2
RL Amperage	-	0.8
RA CFM	320	413
OA CFM	80	37

Performance Data		
	Design	**Actual**
Suction ESP	-	-0.04”
Discharge ESP	-	0.54”
Total ESP	0.30"	0.58”

Completed By: Gabe Merk on 11/13/2023

Notes:
Filter dirty. Removed for TAB.
Ensure no obstruction in oa louvers.

Written By: Gabe Merk on 11/13/2023

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Project:Bennett Point Building 1 (Cincinnati, OH)

Heat Pump

Diffuser Supply (GRD)

AHU2-2/2ND Floor

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
AHU2-SGRD1	COORIDOOR	4WAY		100	1	34	76	74	74.0
AHU2-SGRD2	COORIDOOR	4WAY		100	1	64	143	147	147.0
AHU2-SGRD3	2ND FLR ENTRY	REGISTER		200	1	128	267	229	114.5
Total				400		226	486	450	112.5%

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Project: Bennett Point Building 1 (Cincinnati, OH)

System/Unit: Heat Pump

Asset: AHU2-3 AREA:3RD FLOOR

Unit Data		
	Design	**Actual**
Unit MFG	Trane	Trane
Model Num	NTX	NTXAMT12A112AA
Serial Num	-	2XG0163232P814
Type	HEAT PUMP	HEAT PUMP
Configuration	UPFLOW	UPFLOW
Num Filters Size 1	-	1
Filter Size 1	-	16”x20”x1”

Motor Data		
	Design	**Actual**
Phase	1	1
Voltage	208	208
Amperage	-	2.4

Test Data		
	Design	**Actual**
SA CFM	400	377
RL Voltage	-	210.1
RL Amperage	-	0.9
RA CFM	320	337
OA CFM	80	40

Performance Data		
	Design	**Actual**
Suction ESP	-	-0.02”
Discharge ESP	-	0.54”
Total ESP	0.30"	0.56”

Completed By: Gabe Merk on 11/13/2023

Notes:
Filter dirty. Removed for TAB.
Ensure no obstruction at oa louvers.

Written By: Gabe Merk on 11/13/2023

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Project:Bennett Point Building 1 (Cincinnati, OH)

Heat Pump

Diffuser Supply (GRD)

AHU2-3/3RD FLOOR

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
AHU2-3-SGRD1	COORIDOOR	4WAY	4”	100	1	87	84	86	86.0
AHU2-3-SGRD2	COORIDOOR	4WAY	4”	100	1	31	30	39	39.0
AHU2-3-SGRD3	ENTRY-3RD FLR	REGISTER	5”x11.5”	200	1	263	205	252	126.0
Total				400		381	319	377	94.25%

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Project: Bennett Point Building 1 (Cincinnati, OH)

System/Unit: Heat Pump

Asset: AHU2-4 AREA:4TH FLOOR

Unit Data		
	Design	**Actual**
Unit MFG	Trane	Trane
Model Num	NTX	NTXAMT12A112AA
Serial Num	-	28G0136632P814
Type	HEAT PUMP	HEAT PUMP
Configuration	UPFLOW	UPFLOW
Num Filters Size 1	-	1
Filter Size 1	-	16”x20”x1”

Motor Data		
	Design	**Actual**
Phase	1	1
Voltage	208	208
Amperage	-	2.4

Test Data		
	Design	**Actual**
SA CFM	400	449
RL Voltage	-	210.1
RL Amperage	-	0.8
RA CFM	320	412
OA CFM	80	37

Performance Data		
	Design	**Actual**
Suction ESP	-	-0.02”
Discharge ESP	-	0.56”
Total ESP	0.30"	0.58”

Completed By: Gabe Merk on 11/13/2023

Notes:
Filter dirty. Removed for TAB.
Ensure no obstruction at oa louvers.

Written By: Gabe Merk on 11/13/2023

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Project:Bennett Point Building 1 (Cincinnati, OH)

Heat Pump

Diffuser Supply (GRD)

AHU2-4/4TH FLOOR

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
AHU2-4-SGRD1	COORIDOOR	4WAY	4”	100	1	71	71	71	71.0
AHU2-4-SGRD2	COORIDOOR	4WAY	4”	100	1	0	116	116	116.0
AHU2-4-SGRD3	ENTRY 4TH FLR	REGISTER	11”x5.5”	200	1	262	262	262	131.0
Total				400		333	449	449	112.25%