Report By:

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

Report: PRELIM

Function: Test, Adjust, & Balance

Date: 12/12/2023

PROJECT

Cohn-UniFirst (Madison, WI)

4265 Marsh Rd

Madison, WI 53718

Client

Air Temperature Services

5301 VOGES RD

MADISON, WI 53718

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 and asset data. 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.

AHU's w/ Diffusers

The office space is served by two Trane Air Handlers mounted horizontally in the ceiling. Each of the AHU's were measured at their terminal devices or via traverse to establish a total flow for that unit. Each AHU was adjusted to within tolerance of the engineer's design flow. Each outlet was then adjusted to within tolerance of the design flow. If provided with outside air, the flow was measured via traverse. The outside air damper was adjusted until the airflow was within the design requirements. Both AHUs have manual dampers and no controls or actuators. The damper positions were set manually. AHU-2 diffusers total 1020 cfm with a design of 1200 cfm. The unit was balanced to 1096 cfm to be within tolerance of both numbers. Any equipment that fell outside of that tolerance is noted throughout the report.

Ceiling Exhaust Fans

The ceiling exhaust fans were measured using a flow hood. If speed adjustment was provided, the fan speed was adjusted to within design tolerance. Any equipment that fell outside of this tolerance is noted throughout the report. EF-2, located in the IT room (109), is to be interlocked with a space thermostat. This is not installed.

Wall / Prop Fan

EF-3, located in the warehouse, is a large Cook prop fan designed to bring fresh air into the warehouse space. The fan airflow was measured by reading the intake air opening with a velocity grid and multiplying by the free area. The fan speed was then adjusted until the airflow fell within design tolerance. The sequence of operation was verified and both louvres open when the fan is energized.

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Project: Cohn-UniFirst (Madison, WI)

System/Unit: AHU/RTU

Asset: AHU-1 AREA:113

Unit Data		
	Design	**Actual**
MFG	NA	TRANE
Serial Num	-	H23J82602
Model Num	NA	BCHE054EBA0A1G050000000BCB
Configuration	HORIZONTAL	HORIZONTAL
Num Final Filter 1	-	2
Final Filter Size 1	-	12X24X2
Num Final Filter 2	-	2
Final Filter Size 2	-	12X20X2

Test Data		
	Design	**Actual**
SF CFM	1810	1816
SF RPM	1768	1270
RA CFM	1610	1599
OA CFM	200	217
RL Voltage	208	209/209/209
RL Amperage	-	2.0/2.0/2.2
SF Motor Freq(HZ)	90	90
SF System SetPt	-	1270 RPM
OA Damper Position	-	1/4"
Brake Horse Power	1.376	0.407

Motor Data		
	Design	**Actual**
Motor MFG	-	SERVICE FIRST
Frame	-	NL
Horsepower	1.5	1.5
Motor Rpm	-	300-2500
Phase	3	3
Rated Voltage	208	208
Rated Amperage	7.60	7.6

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.36"
Fan Discharge SP	-	0.23"
Total ESP	1.50	0.59"

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Notes:
[1] AHU HAS MIXING BOX INSTALLED WITH BOTH RETURN AND OA DAMPER. THERE ARE NO ACTUATORS OR CONTROLS INSTALLED. DAMPER POSITION WAS MANUALLY SET TO SETPOINT NOTED IN ASSET.

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AHU/RTU

Diffuser Supply (GRD)

AHU-1/113

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
1-1	102	SG-1	10	230	228	223	97.0
1-2	102	SG-1	10	230	233	231	100.4
1-3	100	SG-1	8	150	123	153	102.0
1-4	100	SG-1	8	150	114	150	100.0
1-5	110	SG-1	10	200	157	207	103.5
1-6	110	SG-1	10	200	279	199	99.5
1-7	112	SG-1	10	215	215	216	100.5
1-8	113	SG-1	10	215	245	209	97.2
1-9	112	SG-1	10	220	293	229	104.1
Total				1810	1887	1817	100.39%

Diffuser Ret/Exh (GRD)

AHU-1/113

Asset								
Asset Name	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
R1-1	RG-1	12	460	1.0	422	448	448	97.4
R1-2	RG-1	8	100	1.0	319	109	109	109.0
R1-3	RG-1	12	400	1.0	381	384	394	98.5
R1-4	RG-1	10	220	1.0	202	207	207	94.1
R1-5	RG-1	12	430	1.0	260	441	441	102.6
Total			1610		1584	1589	1599	99.32%

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Project: Cohn-UniFirst (Madison, WI)

System/Unit: AHU/RTU

Asset: AHU-2 AREA:HALL 101

Unit Data		
	Design	**Actual**
MFG	NA	TRANE
Serial Num	-	H23JB2603
Model Num	NA	BCHE036EBA0A1G05021000BBCB
Configuration	HORIZONTAL	HORIZONTAL
Num Final Filter 1	-	2
Final Filter Size 1	-	12X24X2
Num Final Filter 2	-	2
Final Filter Size 2	-	12X12X2

Test Data		
	Design	**Actual**
SF CFM	1020	1096
SF RPM	1942	1320
RA CFM	820	880
OA CFM	200	216
RL Voltage	208	209/208/209
RL Amperage	7.60	3.2/3.1/3.2
SF System SetPt	-	1320 RPM
OA Damper Position	-	1/2" OPEN
Brake Horse Power	1.021	0.625

Motor Data		
	Design	**Actual**
Motor MFG	-	SERVICE FIRST
Frame	-	NL
Horsepower	1.5	1.5
Motor Rpm	-	300-2500
Phase	3	3
Rated Voltage	208	208
Rated Amperage	7.60	7.60

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.34"
Fan Discharge SP	-	0.22"
Total ESP	1.50	0.56"

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Notes:
[1] AHU HAS MIXING BOX INSTALLED WITH BOTH RETURN AND OA DAMPER. THERE ARE NO ACTUATORS OR CONTROLS INSTALLED. DAMPER POSITION WAS MANUALLY SET TO SETPOINT NOTED IN ASSET.

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AHU/RTU

Diffuser Supply (GRD)

AHU-2/HALL 101

Asset							
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**CFM(1)**	**FINAL CFM**	**% to design**
2-1	107	SG-1	8	130	145	138	106.2
2-2	HALL 101	SG-1	8	150	193	164	109.3
2-3	108	SG-1	8	150	180	158	105.3
2-4	109	SG-1	10	300	281	318	106.0
2-5	111	SG-1	8	140	194	153	109.3
2-6	HALL 101	SG-1	8	150	215	165	110.0
Total				1020	1208	1096	107.45%

Diffuser Ret/Exh (GRD)

AHU-2/HALL 101

Asset								
Asset Name	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
R2-1	RG-1	8	130	1.0	217	135	142	109.2
R2-2	RG-1	8	150	1.0	118	156	160	106.7
R2-3	RG-1	10	200	1.0	167	184	208	104.0
R2-4	RG-1	10	200	1.0	215	216	218	109.0
R2-5	RG-1	8	140	1.0	185	165	152	108.6
Total			820		902	856	880	107.32%

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Project: Cohn-UniFirst (Madison, WI)

System/Unit: FAN - Exhaust

Asset: EF-2 AREA:109

Unit Data		
	Design	**Actual**
MFG	NA	BROAN
Model Num	NA	AE110K
Serial Num	-	32H23T
Type	CEILING	CEILING

Test Data		
	Design	**Actual**
CFM	100	109
RL Voltage	-	119
RL Amperage	-	0.3

Motor Data		
	Design	**Actual**
Motor MFG	-	NL
Horsepower	23.4W	23.4W
Motor Rpm	-	NL
Phase	1	1
Voltage (rated)	120	120
Amperage (rated)	-	0.3

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Notes:
[1] INTERLOCKED WALL THERMOSTAT NOT YET INSTALLED.

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Project: Cohn-UniFirst (Madison, WI)

System/Unit: FAN - Exhaust

Asset: EF-3 AREA:WARREHOUSE

Unit Data		
	Design	**Actual**
MFG	NA	COOK
Model Num	NA	24XW32D17 (VF)
Serial Num	-	012SK71089-01
Type	WALL PROP	WALL PROP

Test Data		
	Design	**Actual**
CFM	5000	5325
RL Voltage	-	208
RL Amperage	-	5.7

Motor Data		
	Design	**Actual**
Motor MFG	-	U.S. MOTORS
Frame	-	48Y
Horsepower	1.0	1.0
Motor Rpm	1725	300-1800
Phase	1	1
Voltage (rated)	208	208
Amperage (rated)	-	7.3-6.8
Service Factor	-	NL

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Notes:
[1] FAN IS OPERATED VIA WALL SWITCH. WHEN ENERGIZED, LOUVRES OPEN AND FAN ENGAGES. VERIFIED OPERATION.
[2] MOTOR HAS SPEED CONTROLLER INSTALLED. SLOWED TO 79% (845 RPM) TO ACHEIVE DESIGN AIRFLOW.

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Project: Cohn-UniFirst (Madison, WI)

System/Unit: FAN - Exhaust

Asset: EF-103 AREA:103

Unit Data		
	Design	**Actual**
MFG	NA	BROAN
Model Num	NA	AE110K
Serial Num	-	32H23T
Type	CEILING	CEILING

Test Data		
	Design	**Actual**
CFM	100	94
RL Voltage	-	120
RL Amperage	-	0.3
Total ESP	0.1	NR

Motor Data		
	Design	**Actual**
Motor MFG	-	NL
Horsepower	23.4W	23.4W
Motor Rpm	-	NL
Phase	1	1
Voltage (rated)	120	120
Amperage (rated)	-	0.3

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Project: Cohn-UniFirst (Madison, WI)

System/Unit: FAN - Exhaust

Asset: EF-104 AREA:104

Unit Data		
	Design	**Actual**
MFG	NA	BROAN
Model Num	NA	AE110K
Serial Num	-	32H23T
Type	CEILING	CEILING

Test Data		
	Design	**Actual**
CFM	100	99
RL Voltage	-	120
RL Amperage	-	0.3
Total ESP	0.1	NR

Motor Data		
	Design	**Actual**
Motor MFG	-	NL
Horsepower	23.4W	23.4W
Motor Rpm	-	NL
Phase	1	1
Voltage (rated)	120	120
Amperage (rated)	-	0.3
Service Factor	-	NL

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Project: Cohn-UniFirst (Madison, WI)

System/Unit: FAN - Exhaust

Asset: EF-105 AREA:105

Unit Data		
	Design	**Actual**
MFG	NA	BROAN
Model Num	NA	AE110K
Serial Num	-	32H23T
Type	CEILING	CEILING

Test Data		
	Design	**Actual**
CFM	100	95
RL Voltage	-	119
RL Amperage	-	0.3
Total ESP	0.1	NR

Motor Data		
	Design	**Actual**
Motor MFG	-	NL
Horsepower	23.4W	23.4W
Motor Rpm	-	NL
Phase	1	1
Voltage (rated)	120	120
Amperage (rated)	-	0.3
Service Factor	-	NL

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Project: Cohn-UniFirst (Madison, WI)

System/Unit: FAN - Exhaust

Asset: EF-106 AREA:106

Unit Data		
	Design	**Actual**
MFG	NA	BROAN
Model Num	NA	AE110K
Serial Num	-	32J06T
Type	CEILING	CEILING

Test Data		
	Design	**Actual**
CFM	100	92
RL Voltage	-	119
RL Amperage	-	0.3

Motor Data		
	Design	**Actual**
Motor MFG	-	NL
Horsepower	23.4W	23.4W
Phase	1	1
Voltage (rated)	120	120
Amperage (rated)	-	0.3

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