Report By:

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

Report: TAB REPORT

Function: Test, Adjust, & Balance

Date: 10/31/2023

PROJECT

MISSION HILLS COUNTRY CLUB

5400 MISSION DRIVE

MISSION HILLS, KS 66208

Client

Lankford-Fendler & Associates

1730 Walnut Street

Kansas City, MO 64108

1126 Swift St
North Kansas City, MO 64116
[855] 682 6822

10/31/2023 - Summary

Initially the AHU was found running at 30Hz and 2300 CFM. The operations director indicated that they run at a lower airflow otherwise they get a low discharge air temperature.

Increased the frequency to 60Hz and airflow was balanced to 5282 CFM with the outside air damper set to 10% open at the front end. From 25% to 10% there was little change in the outside air flow. At 10% the outside air was measured as 1213 CFM which is 12% above design of 1000 CFM.

The chilled water was turned off and only hot water was tested. The flow measured at the balance valve was 0 GPM with the valve fully open. Closing the valve did change pressures but did not change flow. However, the discharge air temperature and change in temperature between the entering and leaving water indicated a flow of approximately 10.9 GPM.

Remarks / Recommendations:

1. Flow at the balance valve was measured as 0 GPM. Appears that the valve is installed in correct orientation. Visible shut off valves are full open. Possibly there is an issue with the balance valve.
2. Recommend verifying that the strainers have been cleaned recently. If not recommend cleaning all strainers in the system. Also ensure that the water quality is good.
3. There was no port to measure water temperature, however a rough pipe surface temperature indicates temperature of around 132 F. The schedule shows EWT as 180 F. The leaving water temperature was measured as 111 F and schedule shows 160 F. Further analysis of the building hot water system required. Recommend that the leaving water temperatures from the boiler be provided from the BMS.
4. The hot and chilled water piping is shown as 1-1/2” on the drawings but is 1-1/4”.
5. Room temperature sensor is showing actual temp of 64 F. The logger located directly above the sensor is showing 63.4 F. However the actual temperature in the room was measured as 70.7 F. The sensor is on an interior wall that connects to an exterior wall. The wall feels cool to the touch and may not have adequate insulation.
6. A small return in the workout room is blanked off with cardboard. The larger return is full open. Recommend opening up this blanked off return.

CheckList List

- AHU-1

MISSION HILLS COUNTRY CLUB

CheckList Information

Name : AHU-1 **Status :** Not Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 11/01/2023 - Dan Hertenstein - National TAB

CheckList Item Details

VFD balance point

Comment:

60hz (100%)

VFDBALSTPT
11/06/2023

OA Damper balance Setpoint

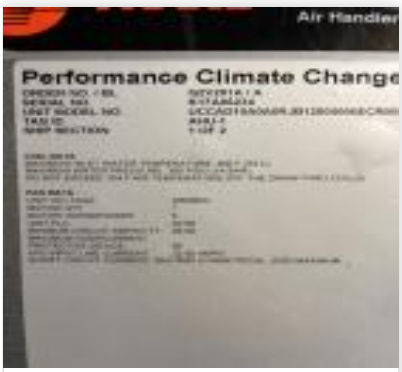
Comment:

1.5" gap between blades

OADMPSTPT
11/01/2023

Unit Tag

Comment:



AHU1TAG
11/01/2023

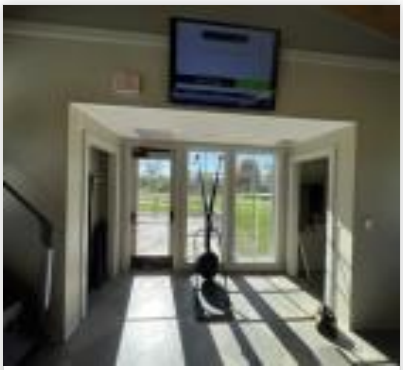
Space Return / Exhaust Grille

Comment:

Exhaust has card board 100% blocking airflow, creating noise.

Exhaust
11/01/2023

Return
11/01/2023

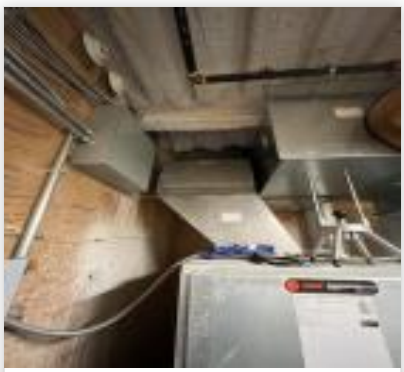


Room
11/01/2023

AHU Room Duct Configuration

Comment:

Return
11/01/2023



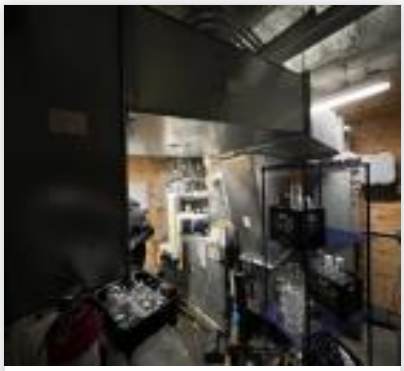
Supply
11/01/2023

Allduct
11/01/2023

AHU Room Duct Configuration

Comment:

OArear
11/01/2023



OAside
11/01/2023

Water Lines

Comment:

Manualvalves
11/01/2023

Coil(1)
11/01/2023

Traverse Locations

Comment:

ReturnTRAV
11/01/2023

OaTRAV
11/01/2023

National TAB

Project: MISSION HILLS COUNTRY CLUB

System/Unit: AHU/RTU

Asset: AHU1 AREA:WORKOUT ROOM 102

Unit Data		
	Design	**Actual**
MFG	TRANE	TRANE
Serial Num	-	K17A06234
Model Num	UCCAD10	UCCAD10A0A0RJB12
Type	CHW/HW AHU	CHW/HW AHU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	NA
OA Filter Size 1	-	NA
Num Final Filter 1	-	2
Final Filter Size 1	-	16x20x2
Num Final Filter 2	-	8
Final Filter Size 2	-	20x20x1

Motor Data		
	Design	**Actual**
Motor MFG	-	BALDOR RELIANCE
Frame	-	184T
Horsepower	-	5
Motor Rpm	-	1750
Phase	3	3
Rated Voltage	208	200
Rated Amperage	-	15.3
Service Factor	-	1.15

Test Data		
	Design	**Actual**
SF CFM (Initial)	-	2300
SF CFM	5000	5282
RA CFM	4000	4069
OA CFM	1000	1213
RL Amperage	-	14.4
SF System SetPt	-	60HZ
RA Damper Position	-	90%
Min OA Damper Position	-	10% / 1.5"
Min OA Damper Type	-	ACTUATED BLADE

Performance Data		
	Design	**Actual**
Return Duct SP	-	-0.78"
Supply Duct SP	-	0.30” AVG
Total ESP	1.3"	1.08”
OA Temp (db/wb)	-	43.0 / 36% RH
RA Temp (db/wb)	-	60.0 / 31% RH
SA Temp (db/wb)	-	75.1 / 19% RH

Completed By: Will Turnbough on 11/06/2023

Notes:
INITIALLY OPERATING 30.0 HZ, 6.4 AMPS
RETURN TRAVERSE POINT=17”x45” (2019 CFM INITIAL)
OA TRAVERSE POINT=16”x39” (300 CFM)

Written By: Will Turnbough on 10/31/2023

National TAB

Project:MISSION HILLS COUNTRY CLUB

AHU/RTU

Circuit Setter

AHU1/WORKOUT ROOM 102

Asset											
Asset Name	**MFG**	**Model Num**	**Size**	**Type**	**Design GPM**	**Setting**	**Low Pres**	**High Pres**	**Delta P**	**Final GPM**	**% to Design**
CHILLED WATER CS 1	RWV	9517AB	1-1/4"	MANUAL	33	4.0 (FULL OPEN)	NR	NR	NR		-
HOT WATER CS 2	RWV	9517AB	1-1/4"	MANUAL	21.5	4.0 (FULL OPEN)	27.7’	27.5’	0.2	0	0.0
Total					54.5					0	0%

Asset	Notes	Date	Written By
CHILLED WATER CS 1	Not measured. Chilled water not running.	11/06/2023	Will Turnbough
HOT WATER CS 2	Low pressure measured higher than the high pressure indicating issue with valve or no flow. Temperature measurements however indicate some flow.	11/06/2023	Will Turnbough

National TAB

Project: MISSION HILLS COUNTRY CLUB

System/Unit: COIL - Chilled Water

Asset: CHWC1 AREA:

Unit Data		
	Design	**Actual**
MFG	NA	NA
Model Num	NA	NA
Service	AHU-1	AHU-1
Type	CHILLED WATER	CHILLED WATER

Performance Data		
	Design	**Actual**
EAT (db/wb)	80 / 67	
LAT (db/wb)	57.3 / 56.6	
Delta T (db/wb)	-	

Test Data		
	Design	**Actual**
GPM CIRCUIT 1	33	
Inlet Pres	-	
Discharge Pres	-	
Coil Delta P	4.7'	
EWT (F)	44	
LWT (F)	54	
Coil Delta T (F)	-	
Circuit 1 BTUH	-	

Notes:
Not tested. Chilled water not running.

Written By: Will Turnbough on 11/06/2023

National TAB

Project: MISSION HILLS COUNTRY CLUB

System/Unit: COIL - Hot Water

Asset: HWC1 AREA:

Unit Data		
	Design	**Actual**
Service	-	AHU-1
Type	-	HOT WATER

Test Data		
	Design	**Actual**
GPM CIRCUIT 1	21.5	10.9
EWT (F)	180	NR
LWT (F)	160	111
Coil Delta T (F)	-	~20

Performance Data		
	Design	**Actual**
EAT (db/wb)	60	56.1 DB
LAT (db/wb)	99.6	75.1 DB
Delta T (db/wb)	-	19 DB

Completed By: Will Turnbough on 11/06/2023

Notes:
Readings at the balance valve measured as no flow. However temperature on air side indicates some flow. No port installed on the entering side to take temperatures. A rough pipe surface temperature was measured as roughly 20 degree drop between entering and leaving. Based on a BTUH calculation, the flow is approximately 10.9 GPM

Written By: Will Turnbough on 11/06/2023