

**Report By:**

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CINCINNATI, OH 45246**

**NATIONAL**

**TAB**

Comfort. Under control.

**Report: TAB REPORT  
Function: Test, Adjust, & Balance  
Date: 05/09/2023**

# **PROJECT**

## **Sleep Outfitters (Kansas City, MO)**

8992 NW Skyview

Kansas City, MO 64154

### **Client**

**AFC HEATING & COOLING**

**824 NW MAIN STREET**

**LEE'S SUMMIT, MO 64086**

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Project: Sleep Outfitters (Kansas City, MO)

## Table Of Contents

<b>Section</b>	<b>Page #</b>
AHU/RTU	3
Diffuser Supply (GRD)	4
AHU/RTU	5
Diffuser Supply (GRD)	6
FAN - Exhaust	7
Equipment Calibrations	8
Abbreviations	9
GRD Layout	10
Issue Data	11

## Issue List

- 01 - RTU1 is low on flow. Pulley change recommended.
- 02 - RTU2 airflow is 89% of design.
- 03 - RTU2 damper handles stuck under Panduit straps



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Project: Sleep Outfitters (Kansas City, MO)

## System/Unit: AHU/RTU

Asset: (E)RTU-1

AREA:105

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Serial Num	-	0608G50282
Model Num	NA	48TME007-- -501--
Configuration	-	VERTICAL
Num OA Filters 1	-	1 METAL MESH
OA Filter Size 1	-	14X28
Num PreFilter 1	-	2
PreFilter Size 1	-	16X25X2

Motor Data		
	Design	Actual
Motor MFG	-	GENERAL ELECTRIC
Frame	-	56Y
Horsepower	-	NL
Motor Rpm	-	1725
Phase	-	3
Rated Voltage	-	208-230/460
Rated Amperage	-	5.2/2.6
Service Factor	-	1.15

Drive Data		
	Design	Actual
Motor Sheave Size	-	4"
Motor Bore Size	-	5/8"
Motor Sheave SetPt	-	0 TURNS OUT
Fan Sheave Size	-	4.75"
Fan Sheave Bore	-	1-3/16"
Belt CL Distance	-	14.25"
Num of Belts	-	1
Belt Size	-	AX40

Test Data		
	Design	Actual
SF CFM	2400	1906
SF RPM	-	1491
RA CFM	2105	1599
OA CFM	295	307
RL Voltage	-	208/209/209
RL Amperage	-	4.29/4.37/4.21
OA Damper Position	-	11/16" GAP

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.47"
Fan Suction SP	-	-1.03"
Fan Discharge SP	-	0.95"
Total ESP	-	1.42"
Fan Total SP	-	1.98"

Completed By: Michael Gabbert on

Notes: MOTOR PULLEY MAXIMIZED. AIRFLOW IS 80% OF DESIGN. PULLEY CHANGE REQUIRED TO INCREASE AIRFLOW FURTHER.

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## Diffuser Supply (GRD)

### (E)RTU-1/105

Asset							
Asset Name	Location	Type	Size	DESIGN CFM	CFM(1)	FINAL CFM	% to design
1-1	102	SD-E	12"	540	435	435	80.6
1-2	106	SD-E	12"	565	476	476	84.2
1-3	102	SD-E	12"	540	420	420	77.8
1-4	104	SD-E	8"	70	52	52	74.3
1-5	103	SD-E	12"	355	278	278	78.3
1-6	105	SD-E	12"	330	245	245	74.2



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Project: Sleep Outfitters (Kansas City, MO)

## System/Unit: AHU/RTU

Asset: (E)RTU-2

AREA:101

Unit Data		
	Design	Actual
MFG	NA	CARRIER
Serial Num	-	0708G20694
Model Num	NA	48TME008-- -501--
Configuration	-	VERTICAL
Num OA Filters 1	-	1 METAL MESH
OA Filter Size 1	-	19X35
Num PreFilter 1	-	4
PreFilter Size 1	-	16X20X2

Motor Data		
	Design	Actual
Motor MFG	-	GENERAL ELECTRIC
Frame	-	56Y
Horsepower	-	NL
Motor Rpm	-	1725
Phase	-	3
Rated Voltage	-	208-230/460
Rated Amperage	-	5.2/2.6
Service Factor	-	1.15

Drive Data		
	Design	Actual
Motor Sheave Size	-	3.75"
Motor Bore Size	-	5/8"
Motor Sheave SetPt	-	0 TURNS OUT
Fan Sheave Size	-	7.25"
Fan Sheave Bore	-	1"
Belt CL Distance	-	16.5"
Num of Belts	-	1
Belt Size	-	AX48

Test Data		
	Design	Actual
SF CFM	3000	2687
SF RPM	-	805
RA CFM	2455	2167
OA CFM	545	520
RL Voltage	-	207/208/209
RL Amperage	-	3.81/3.89/3.99
OA Damper Position	-	3/8" GAP

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.51"
Fan Suction SP	-	-0.81"
Fan Discharge SP	-	0.55"
Total ESP	-	1.06"
Fan Total SP	-	1.36"

Completed By: Michael Gabbert on

Notes:MOTOR PULLEY MAXIMIZED. AIRFLOW IS 89% OF DESIGN. PULLEY CHANGE REQUIRED TO INCREASE AIRFLOW FURTHER.

Date:05/10/2023



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Project: Sleep Outfitters (Kansas City, MO)

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## Diffuser Supply (GRD)

### (E)RTU-2/101

Asset							
Asset Name	Location	Type	Size	DESIGN CFM	CFM(1)	FINAL CFM	% to design
2-1	102	SD-E		370	370	370	100.0
2-2	102	SD-E		370	455	455	123.0
2-3	102	SD-E		380	373	373	98.2
2-4	102	SD-E		380	302	302	79.5
2-5	102	SD-E		370	332	332	89.7
2-6	102	SD-E		370	264	264	71.4
2-7	101	SD-E		380	287	287	75.5
2-8	101	SD-E		380	304	304	80.0

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Project: Sleep Outfitters (Kansas City, MO)  
System/Unit: FAN - Exhaust



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Asset: EF1

AREA:

Unit Data		
	Design	Actual
<b>MFG</b>	NA	LOREN COOK
<b>Model Num</b>	NA	GEMINI 122 SONEBUSTER
<b>Serial Num</b>	-	NL

Test Data		
	Design	Actual
<b>CFM</b>	-	46

Motor Data		
	Design	Actual
<b>Motor MFG</b>	-	FASCO
<b>Horsepower</b>	-	NL
<b>Motor Rpm</b>	-	1550/900
<b>Phase</b>	-	1
<b>Voltage (rated)</b>	-	115
<b>Amperage (rated)</b>	-	0.8/0.6

Completed By: Jacob Davidson on 04/10/2023



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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	TSI EBT731 EBT732117009	8/12/2022	8/12/2023
	AIR VELOCITY INSTRUMENT	50 fpm to 3900 fpm	+/- 5 % +/- 7 fpm	Evergreen Telemetry CH-15D 1600185	5/20/2022	5/20/2023
	DIRECT HOOD READING	100 cfm to 2000 cfm	+/- 5 % +/- 7 cfm	Evergreen Telemetry CH-15D 1600185	5/20/2022	5/20/2023
TEMPERATURE	AIR METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
	AIR PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
	IMMERSION METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
	IMMERSION PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
	CONTACT METER	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
	CONTACT PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
HUMIDITY	HUMIDITY PROBE	10 % RH to 90 % RH	3% of reading	Cooper SRH77A S/N 100516003	8/12/2022	8/12/2023
ELECTRICAL	VOLTAGE MEASUREMENT	0 VAC to 600 VAC	2 % reading +/- 5 digits	Fluke 323 S/N 35491023WS	8/11/2022	8/11/2023
	AMPERAGE MEASUREMENT	0 Amperes to 100 Amperes	2 % reading +/- 5 digits	Fluke 323 S/N 35491023WS	8/11/2022	8/11/2023
ROTATION	ROTATION MEASUREMENT	60 rpm to 5000 rpm	2 % reading 2 rpm	Shimpo DT 207Lp S/N D1690029R	8/11/2022	8/11/2023
HYDRONIC	PRESSURE MEASUREMENT	-30 in Hg to 200 psi	±2% of reading +/- 1 psi	Hydronic Manometer - Dwyer 490W-6-HKIT S/N: 359515093207912	8/12/2022	8/12/2023
	DIFFERENTIAL PRESSURE MEASUREMENT	0 psi - 80 psi	±2% of reading +/- 1 psi	Hydronic Manometer - Dwyer 490W-6-HKIT S/N: 359515093207912	8/12/2022	8/12/2023

## Abbreviation List

A = Area (ft <sup>2</sup> )	S.F. = Service Factor
AHU = Air Handling Unit	SF = Supply Fan
A <sub>k</sub> = 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 <sub>ma</sub> = Mixed Air Temperature
CL = Center Distance (used in belt formula)	T <sub>oa</sub> = Outside Air Temperature
CD = Ceiling Diffuser	T <sub>ra</sub> = Return Air Temperature
CF = Correction Factor	H = Head (in wc, ft wc, psi)
CFM = Volumetric Flow: Cubic Feet Per Minute	h = Enthalpy
CO <sub>2</sub> = Carbon Dioxide	HP = Horsepower
CO = Carbon Monoxide	hr = Hour
C <sub>v</sub> = Flow Constant	K <sub>v</sub> = 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 <sub>ra</sub> = Return Air Temperature
psid = PSI Differential	TS = Tip Speed (fpm) IP, (m/s) SI
r = Radius (in)	TSP = Total Static Pressure
% <sub>ra</sub> = % 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





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## Sleep Outfitters (Kansas City, MO)

### Project Issue Information

**Issue Name :** 01 - RTU1 is low on flow. Pulley change recommended.  
**Description :** RTU-1 airflow is 80% of design with the motor sheave set to the maximum position. A pulley change is required to achieve design.  
**Created By :** National TAB                      **Assigned To :** National TAB - Jacob Davidson  
**Status :** Open  
**Originated Date :** 04/10/2023 - Jacob Davidson - National TAB

#### Project Issue File Details



Pulley  
04/10/2023



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### Sleep Outfitters (Kansas City, MO)

#### Project Issue Information

**Issue Name :** 02 - RTU2 airflow is 89% of design.  
**Description :** RTU-2 has leakage at the roof. Recommend sealing to see if this improves airflow. The discharge compartment has a gap at the curb. If airflow does not increase, a pulley change would be required. Sealed some areas of leakage with foil tape to maximize airflow.  
**Created By :** National TAB                      **Assigned To :** National TAB - Jacob Davidson  
**Status :** Open  
**Originated Date :** 04/10/2023 - Jacob Davidson - National TAB

#### Project Issue File Details



**Gap**  
04/10/2023



**Discharge**  
04/10/2023



**Tapedup**  
04/10/2023



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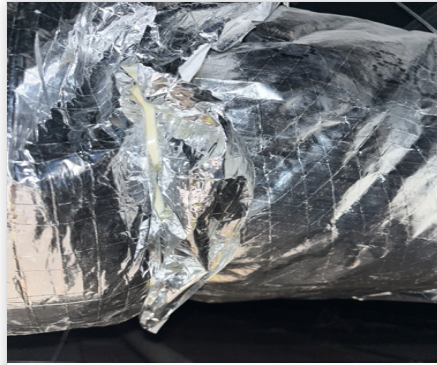
#### Project Issue Information

**Issue Name :** 03 - RTU2 damper handles stuck under Panduit straps  
**Description :** Left dampers fully open to maximize airflow since total flow is low on design. However there are dampers handles that have panduit straps tightened over the damper handles. If diffusers are to be balanced, these damper handles will need to be freed.  
**Created By :** National TAB                      **Assigned To :** National TAB - Jacob Davidson  
**Status :** Open  
**Originated Date :** 04/10/2023 - Jacob Davidson - National TAB

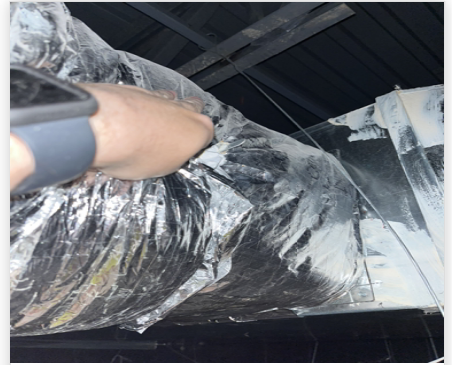
#### Project Issue File Details



**Handle**  
04/10/2023



**Zipped**  
04/10/2023



**HNdleangle2**  
04/10/2023