

**Report By:**

National TAB  
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**Report: TAB REPORT**  
**Function: Test, Adjust, & Balance**  
**Date: 01/24/2024**

# **PROJECT**

**10-23-23 CARMAX #7279 - FAYETTEVILLE,  
NC**

521 NORTH MCHPERSON CHURCH RD

FAYETTEVILLE, NC

## **Client**

Comfort Systems USA Strategic Accounts  
2655 Fortune Circle West, Suite E

Indianapolis, IN 46241

# National TAB

Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

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## 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, asset data, and pictures. 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.

### Facility Identification and TAB Requirements

The mechanical equipment to be tested, adjusted, and balanced includes all RTU's and EF's on the Test and Balance Scope on the mechanical drawings.

### Standard RTU's

Each of the RTU's were measured at their terminal devices utilizing a flow hood or via total traverse. The sum of these readings is equal to the total flow for that particular unit. The total flow of each RTU was then adjusted to within tolerance of the specified design. Outside airflow was measured by reading the inlet with a velocity grid times the area of the filter. Any equipment that fell outside of this tolerance is noted throughout the report.

### Bypass RTU's

The Bypass RTU's were measured by first closing the bypass damper completely. By doing this, the outside airflow is equal to the total flow for the unit. The airflow was measured using a velgrid at the outdoor air intake and multiplying by the free area of the filters. Adjustments made to the motor sheave in order to get airflow within tolerance of design. The bypass damper is then adjusted so that bypass and OA flows are within tolerance.

### ERV RTU's

The supply air portion of the ERV is 100% OA that is supplied to the space via two fans in series. The airflow was measured by reading the intake air filter with a velgrid and multiplying by the free area of the filter. Adjustments were made to the airflow by adjusting the motor sheaves to balance airflow within design tolerances. The exhaust system has one fan and was measured via either traverse or by reading the inlets with a velgrid and multiplying by the free area of the filter.

### Exhaust Fans

The exhaust fans were measured by reading each air device with a flow hood or via a velgrid reading times the free area of the inlets. The total airflow for each fan is equivalent to the sum of these readings. Fan speed was then adjusted so that the airflow was within tolerance of design. Any equipment that fell outside of this tolerance is noted throughout the report.

# National TAB

Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: AHU/RTU



Asset: RTU1

AREA:SHOWROOM

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5623G04880
Model Num	LGH036H4E	LGT210H4M
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	3
OA Filter Size 1	-	23.125X13.875
Num Final Filter 1	-	6
Final Filter Size 1	-	24X24X2

Motor Data		
	Design	Actual
Motor MFG	-	US MOTORS
Frame	-	184TZ
Horsepower	5.0	5
Motor Rpm	1765	1765
Phase	3	3
Rated Voltage	480	460
Rated Amperage	7.3	7.3

Drive Data		
	Design	Actual
Motor Sheave Size	-	1VP66B
Motor Bore Size	-	1.0625"
Motor Sheave SetPt	-	2 TO
Fan Sheave Size	-	BK110H
Fan Sheave Bore	-	1.1875"
Belt CL Distance	-	21"
Num of Belts	-	1
Belt Size	-	BX65
Belt Alignment	-	CORRECT

Test Data		
	Design	Actual
SF CFM	6000	6017
SF RPM	-	675 / 42.6 Hz
RA CFM	5200	5196
OA CFM	800	821
RL Voltage	-	493/493/488
RL Amperage	-	3.5/3.5/3.6
SF Rotation	-	CCW
RA Damper Position	-	77%
Min OA Damper Position	-	23%
Min OA Damper Type	-	ECONOMIZIER
OA Enthalpy Setpt	-	5 mA

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.38"
Fan Suction SP	-	-0.57"
Fan Discharge SP	-	0.55"
Total ESP	0.8"	-0.85"
Fan Total SP	-	1.12"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Antonio Flores-De La Cruz on 10/24/2023

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Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: AHU/RTU



Asset: RTU2

AREA:SHOWROOM

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5623G04881
Model Num	LGH036H4E	LGT210H4M
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	3
OA Filter Size 1	-	23.125X13.785
Num Final Filter 1	-	6
Final Filter Size 1	-	24X24X2

Motor Data		
	Design	Actual
Motor MFG	-	US MOTORS
Frame	-	184TZ
Horsepower	3.0	5
Motor Rpm	1765	1765
Phase	3	3
Rated Voltage	480	460
Rated Amperage	7.3	7.3

Drive Data		
	Design	Actual
Motor Sheave Size	-	1VP66B
Motor Bore Size	-	1.0625"
Motor Sheave SetPt	-	2 TO
Fan Sheave Size	-	BK110H
Fan Sheave Bore	-	1.1875"
Belt CL Distance	-	21"
Num of Belts	-	1
Belt Size	-	BX65
Belt Alignment	-	CORRECT

Test Data		
	Design	Actual
SF CFM	6000	5898
SF RPM	-	757 / 48 Hz
RA CFM	5200	5068
OA CFM	800	830
RL Voltage	-	494/495/492
RL Amperage	-	4.0/4.0/4.1
SF Rotation	-	CCW
RA Damper Position	-	76%
Min OA Damper Position	-	24%
Min OA Damper Type	-	ECONOMIZERSA
OA Enthalpy Setpt	-	5 mA

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.55"
Fan Suction SP	-	-0.83"
Fan Discharge SP	-	0.58"
Total ESP	0.8"	1.13"
Fan Total SP	-	1.41"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

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Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: AHU/RTU



Asset: RTU3

AREA:OFFICE

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5623F05321
Model Num	LGH036H4E	LGT060H4E
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	29X14.5
Num Final Filter 1	-	4
Final Filter Size 1	-	20X20X2

Motor Data		
	Design	Actual
Motor MFG	-	NA
Frame	-	NA
Horsepower	1	1
Motor Rpm	-	NA
Phase	3	3
Rated Voltage	480	480
Rated Amperage	-	NA

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD

Test Data		
	Design	Actual
SF CFM	2000	2014
SF RPM	-	77% POWER
RA CFM	1700	1713
OA CFM	300	301
RL Voltage	-	490
RL Amperage	-	4.5
SF Rotation	-	CW
RA Damper Position	-	74%
Min OA Damper Position	-	26%
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	5 mA

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.25"
Fan Suction SP	-	-0.40"
Fan Discharge SP	-	0.48"
Total ESP	0.6"	0.73"
Fan Total SP	-	0.88"

General		
	Design	Actual
Fan Rotation Correct	-	CW
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Antonio Flores-De La Cruz on 10/24/2023

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Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: AHU/RTU



Asset: RTU4

AREA: BREAK/TOILETS

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5623G01997
Model Num	LGH036H4E	LGT048H4E
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	29X14.5
Num Final Filter 1	-	4
Final Filter Size 1	-	20X20X2

Motor Data		
	Design	Actual
Motor MFG	-	NA
Frame	-	NA
Horsepower	1.0	1
Motor Rpm	-	NA
Phase	3	3
Rated Voltage	480	480
Rated Amperage	-	NA

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD

Test Data		
	Design	Actual
SF CFM	1280	1348
SF RPM	-	58%
RA CFM	1130	1188
OA CFM	150	160
RL Voltage	-	494/494/490
RL Amperage	-	3.4/3.4/3.5
SF Rotation	-	CW
RA Damper Position	-	78%
Min OA Damper Position	-	22%
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	5 mA

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.45"
Fan Suction SP	-	-0.56"
Fan Discharge SP	-	0.43"
Total ESP	0.6"	0.92"
Fan Total SP	-	0.99"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Antonio Flores-De La Cruz on 10/25/2023

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Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: AHU/RTU



Asset: RTU5

AREA:WRITE UP

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5623G00638
Model Num	LGH036H4E	LGT048H4E
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	29X14.5
Num Final Filter 1	-	4
Final Filter Size 1	-	20X20X2

Motor Data		
	Design	Actual
Motor MFG	-	NA
Frame	-	NA
Horsepower	0.5	1
Motor Rpm	-	NA
Phase	3	1
Rated Voltage	480	480
Rated Amperage	-	NA

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD

Test Data		
	Design	Actual
SF CFM	1300	1342
SF RPM	-	45% POWER
RA CFM	1100	1188
OA CFM	150	154
RL Voltage	-	289
RL Amperage	-	2.5
SF Rotation	-	CCW
RA Damper Position	-	75%
Min OA Damper Position	-	25%
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	5 mA

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.27"
Fan Suction SP	-	-0.37"
Fan Discharge SP	-	0.33"
Total ESP	0.6"	0.60"
Fan Total SP	-	0.70"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Antonio Flores-De La Cruz on 10/24/2023

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Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: AHU/RTU



Asset: RTU6

AREA:WAITING

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	56233G01598
Model Num	LGH036H4E	LGT036H4E
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	14.5X29
Num Final Filter 1	-	4
Final Filter Size 1	-	20X20X2

Motor Data		
	Design	Actual
Motor MFG	-	NA
Frame	-	NA
Horsepower	0.75	1
Motor Rpm	-	NA
Phase	3	1
Rated Voltage	480	480
Rated Amperage	-	NA

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD

Test Data		
	Design	Actual
SF CFM	960	1016
SF RPM	-	53% POWER
RA CFM	760	812
OA CFM	200	204
RL Voltage	-	490
RL Amperage	-	1.4
SF Rotation	-	CW
RA Damper Position	-	68%
Min OA Damper Position	-	32%
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	5 mA

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.08"
Fan Suction SP	-	-0.15"
Fan Discharge SP	-	0.33"
Total ESP	.60"	-0.45"
Fan Total SP	-	0.48"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Antonio Flores-De La Cruz on 10/24/2023

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Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: AHU/RTU



Asset: RTU7

AREA:SERVICE AREA

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5623F05683
Model Num	LGH036H4E	LGH360H4M
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	2
OA Filter Size 1	-	38.375X11.25
Num Final Filter 1	-	12
Final Filter Size 1	-	20X20X2

Motor Data		
	Design	Actual
Motor MFG	-	US MOTORS
Frame	-	184TZ
Horsepower	5.0	5
Motor Rpm	-	1765
Phase	3	3
Rated Voltage	480	460
Rated Amperage	-	7.3

Drive Data		
	Design	Actual
Motor Sheave Size	-	1VP56BB
Motor Bore Size	-	1.125"
Motor Sheave SetPt	-	1 TO
Fan Sheave Size	-	BK120H
Fan Sheave Bore	-	1.1875"
Belt CL Distance	-	23.5
Num of Belts	-	1
Belt Size	-	BX71
Belt Alignment	-	CORRECT

Test Data		
	Design	Actual
SF CFM	8400	7674
SF RPM	-	769
RA CFM	3600	2919
OA CFM	4800	4755
RL Voltage	-	464/464/463
RL Amperage	-	6.6/6.6/6.5
SF Rotation	-	CCW
RA Damper Position	-	50% OPEN
Min OA Damper Position	-	100% OPEN
Min OA Damper Type	-	ECONOMIZER
OA Enthalpy Setpt	-	5 mA

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.42"
Fan Suction SP	-	-0.75"
Fan Discharge SP	-	1.12"
Total ESP	0.8"	1.54"
Fan Total SP	-	1.87"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Antonio Flores-De La Cruz on 10/25/2023

Notes:

SGRD-1 TYPE IS DIFFERENT THAN DRAWING. DUCT IS EXTENDED AND HAS 3 MINI-ROUND DIFFUSERS FROM THE BOTTOM OF THE DUCT. BALANCED TO MAINTAIN THE TOTAL DESIGN BETWEEN THESE THREE DIFFUSERS.

Written By: Will Turnbough on 01/24/2024

# National TAB

Project:10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## AHU/RTU



### Diffuser Supply (GRD)

#### RTU7/SERVICE AREA

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	PARTS	ROUND (X3)	-	460	1	367	421	435	94.6
SGRD2	SERVICE	NK	18/12	1085	1	845	1203	1095	100.9
SGRD3	SERVICE	NK	18/12	1085	1	845	1040	1108	102.1
SGRD4	SERVICE	NK	18/12	1085	1	845	1106	1074	99.0
SGRD5	SERVICE	NK	18/12	1085	1	845	1040	1043	96.1
Total				4800		3747	4810	4755	99.06%

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Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: AHU/RTU



Asset: RTU8

AREA:SERVICE AREA

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5620K02449
Model Num	LGH036H4E	LGH360H4M
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	5
OA Filter Size 1	-	14.125X23.125
Num Final Filter 1	-	12
Final Filter Size 1	-	20X20X2

Motor Data		
	Design	Actual
Motor MFG	-	US MOTORS
Frame	-	215TZ
Horsepower	5.0	10
Motor Rpm	1765	1765
Phase	3	3
Rated Voltage	480	480
Rated Amperage	-	13.6

Drive Data		
	Design	Actual
Motor Sheave Size	-	1VP71B
Motor Bore Size	-	1.375"
Motor Sheave SetPt	-	2 TO
Fan Sheave Size	-	11.5"
Fan Sheave Bore	-	1.125"
Belt CL Distance	-	24.5
Num of Belts	-	1
Belt Size	-	BX75
Belt Alignment	-	CORRCET

Test Data		
	Design	Actual
SF CFM	8400	8691
SF RPM	-	934 / 60 Hz
RA CFM	3600	3750
OA CFM	4800	4941
RL Voltage	-	489/490/491
RL Amperage	-	12.3/12.4/12.3
SF Rotation	-	CCW
RA Damper Position	-	BYPASS DAMPER 60%
Min OA Damper Position	-	100%
Min OA Damper Type	-	ECONOMIZER

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.694"
Fan Suction SP	-	-0.996"
Fan Discharge SP	-	0.307"
Total ESP	0.8"	1.001"
Fan Total SP	-	1.303"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	NO
Condensate Drain Installed	-	YES

Completed By: Dale Wheeler on 01/10/2024

Notes:

FILTERS ARE VERY DIRTY AND NEED TO BE REPLACED, FILTERS WERE PULLED OUT TEMPORARILY FOR TESTING.

Written By: Will Turnbough on 01/24/2024

# National TAB

Project:10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## AHU/RTU



### Diffuser Supply (GRD)

#### RTU8/SERVICE AREA

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
RTU10-SGRD1	SERVICE AREA	NK	24/12	960	1	962	972	1008	105.0
RTU10-SGRD2	SERVICE AREA	NK	24/12	960	1	968	977	994	103.5
RTU10-SGRD3	SERVICE AREA	NK	24/12	960	1	1190	1202	1005	104.7
RTU10-SGRD4	SERVICE AREA	NK	24/12	960	1	687	693	975	101.6
RTU10-SGRD5	SERVICE AREA	NK	24/12	960	1	762	769	959	99.9
Total				4800		4569	4613	4941	102.94%

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Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: AHU/RTU



Asset: RTU9

AREA:PBX

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5623G01996
Model Num	LGH036H4E	LCH036H4E
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num Final Filter 1	-	4
Final Filter Size 1	-	20X20X2

Motor Data		
	Design	Actual
Motor MFG	-	NA
Frame	-	NA
Horsepower	0.5	0.5
Motor Rpm	-	NA
Phase	3	1
Rated Voltage	480	480
Rated Amperage	-	NA

Drive Data		
	Design	Actual
Motor Sheave Size	-	DD

Test Data		
	Design	Actual
SF CFM	960	942
SF RPM	-	68%
RA CFM	960	942
OA CFM	0	0
RL Voltage	-	487
RL Amperage	-	2.0
SF Rotation	-	CW
RA Damper Position	-	100%

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.13"
Fan Suction SP	-	-0.24"
Fan Discharge SP	-	0.43"
Total ESP	0.8"	0.56"
Fan Total SP	-	0.67"

General		
	Design	Actual
Fan Rotation Correct	-	YES
Unit Filters Clean	-	YES
Condensate Drain Installed	-	YES

Completed By: Antonio Flores-De La Cruz on 10/24/2023

# National TAB

Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: FAN - Exhaust



Asset: EF11

AREA:

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	CUBE-160-7-1-22-X	CUBE-160-7-1-22-X
Serial Num	-	19201738
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Test Data		
	Design	Actual
CFM	2800	2619
Fan RPM	--	1215
Fan Rotation	-	CW
Motor RPM	-	1752
RL Voltage	-	119
RL Amperage	-	NA
Suction ESP	-	-0.34"
Discharge ESP	-	ATM
Total ESP	-	0.34"

Motor Data		
	Design	Actual
Motor MFG	-	BALDOR
Frame	-	56
Horsepower	0.75	0.75
Motor Rpm	1725	1725
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	10.8
Service Factor	-	1

Drive Data		
	Design	Actual
Motor Sheave Size	-	VP343
Motor Bore Size	-	0.625"
Motor Sheave SetPt	-	1 TO
Fan Sheave Size	-	AK46
Fan Sheave Bore	-	0.75"
Belt CL Distance	-	6"
Num of Belts	-	1
Belt Size	-	A36

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Project: 10-23-23 CARMAX #7279 - FAYETTEVILLE, NC

## System/Unit: FAN - Exhaust



Asset: EF12

AREA:

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	CUBE-160-7-1-22-X	CUBE-161-7-X
Serial Num	-	04C18473
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Test Data		
	Design	Actual
CFM	2800	2865
Fan RPM	-	1031
Fan Rotation	-	CW
Motor RPM	-	1766
RL Voltage	-	120
RL Amperage	-	NA
Suction ESP	-	-0.28"
Discharge ESP	-	ATM
Total ESP	-	0.28"

Motor Data		
	Design	Actual
Motor MFG	-	MARATHON
Frame	-	56
Horsepower	0.75	0.75
Motor Rpm	1725	1725
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	10.6
Service Factor	-	1.25

Drive Data		
	Design	Actual
Motor Sheave Size	-	VP44
Motor Bore Size	-	0.625"
Motor Sheave SetPt	-	5 TO
Fan Sheave Size	-	AK5934
Fan Sheave Bore	-	0.75"
Belt CL Distance	-	6"
Num of Belts	-	1
Belt Size	-	A24

Completed By: Antonio Flores-De La Cruz on 10/24/2023



**2 PART PLAN - HVAC**  
 M1.0  
 SCALE: 1/8" = 1'-0"

