

Report By:

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1329 E. KEMPER ROAD
SUITE 4210
CINCINNATI, OH 45246



Report: TAB

Function: Test, Adjust, & Balance

Date: 04/09/2025

Completed By: National TAB

PROJECT

03-31-25 WAWA #7411 CLARKSVILLE, IN

1354 VETERANS PKWY

CLARKSVILLE, IN 47219

Client

Wawa

260 West Baltimore Pike

Wawa, PA 19063

National TAB

Project: 03-31-25 WAWA #7411 CLARKSVILLE, IN

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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.

RTU's (Roof Top Units) w/ Diffusers

Each of the RTU's were measured at their terminal devices or via traverse to establish a total flow for that unit. Each RTU was adjusted to within tolerance of the engineer's design flow. Each outlet was then adjusted to within tolerance of the design flow. Outside air was measured by reading the intake air opening with a velocity grid and multiplying by the free area. The outside air damper was adjusted until the airflow was within the design requirements. Any equipment that fell outside of that tolerance is noted throughout the report.

General Exhaust Fans w/ Grilles

The general exhaust fans were measured by reading each air device with a flow hood. 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. Each terminal device was balanced to within tolerance of the design volume using the installed volume dampers. Any equipment that fell outside of this 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.

Final Building Tests

After completing the test and balance the final building pressure was measured. It was confirmed that the building pressure fell within acceptable tolerances and that the pressure measurement coincides with the actual and design net airflow. Any deviations from these standards are noted throughout the report.

Issue List

- Damper Type Insufficient
- RTU-1 Return Insulation Wet
- RTU-2 Cooling Mode



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Project Issue Information

Issue Name : Damper Type Insufficient
Description : The type of damper installed in the exposed round ductwork does not reduce flow enough to balance diffusers to design. If internal dampers are used, they should cover the full face of the supply register. Will do my best to balance near design.
Created By : National TAB **Assigned To :** National TAB - Jordan Best
Status : Open
Priority : Urgent **Asset Tag :**
Originated Date : 04/02/2025 - Jordan Best - National TAB

Project Issue Response Details

- **04/03/2025 National TAB - Jordan Best**
 - Several diffusers for RTU-2 and 3 are outside due to the damper type used. Correct damper should be installed in order for air to be re-distributed.



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Project Issue Information

Issue Name : RTU-1 Return Insulation Wet
Description : Insulation return ductwork is heavily saturated with water. According to MC/GC, unit froze over the weekend, likely due to the fact the return that draws the most CFM (1200) was not cut out.
Created By : National TAB **Assigned To :** National TAB - Jordan Best
Status : Open
Priority : Urgent **Asset Tag :**
Originated Date : 04/02/2025 - Jordan Best - National TAB

Project Issue Response Details

- **04/03/2025 National TAB - Jordan Best**
 - Insulation to be replaced, date TBD.



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Project Issue Information

Issue Name : RTU-2 Cooling Mode
Description : When staged into cooling mode, compressors for RTU-2 will come on initially and then shut off. I did not observe a drop in discharge temp while in cooling mode. I would suggest contacting Lennox to diagnose issue.
Created By : National TAB **Assigned To :** National TAB - Jordan Best
Status : Open
Priority : Urgent **Asset Tag :**
Originated Date : 04/03/2025 - Jordan Best - National TAB

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Project: 03-31-25 WAWA #7411 CLARKSVILLE, IN

- [Open](#) BALANCE_SCHEDULE_7411.xlsx

CheckList List

- 01: RTU's/AHU's 9/4
- 04: EF'S 9/4
- 02: LENNOX SETUP PARAMETERS 9/4
- 03: SENSOR WIRING (LENNOX) 9/4
- 5: CLOSEOUT CHECKS 9/4

Comment:

Condensate drains are installed?

Pass

Comment:

Unit free of noticeable noise and vibration

Pass

Comment:

Final outside air damper position is marked with permanent marker?

Pass

Comment:

No alarms present?

Pass

Comment:

Any noticeable duct leakage?

Pass

Comment:

Total supply and OA flows are balanced within +/-5% and supply & return diffusers within +/-10%?

Fail

Comment:

Some diffusers are outside design due to insufficient damper type.

IN TEST MODE, TEST THE FOLLOWING:

Cooling mode is operational? Record EAT/LAT for each unit:

Pass

Comment:

RTU-1 EAT- 68 LAT- 44 RTU-2 EAT- 69 LAT- compressors shut off during testing, no temp drop observed RTU-3 EAT- 67 LAT- 47

Heating mode is operational? Record EAT/LAT for each unit:

Pass

Comment:

RTU-1 EAT- NA LAT- NA RTU-2 EAT- 69 LAT- 112 RTU-3 EAT- 67 LAT- 110

Dehumidification mode is operational? (Feel dehumidification coil with your hand. Is it hot?) Record EAT/LAT for each unit:

Pass

Comment:

RTU-1 EAT- 68 LAT- 64 RTU-2 EAT- 69 LAT- 70 RTU-3 EAT- 66 LAT- 66



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CheckList Information

Name : 04: EF'S 9/4 **Status :** Not Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 03/31/2025 - Tara Metcalf - National TAB

CheckList Item Details

EF's

Rotation is correct? Pass

Comment:

Belts are tight (if applicable)? Pass

Comment:

Speed controller installed and functional (if applicable)? N/A

Comment:

There is no major leakage around base of fan? Pass

Comment:

Is the motor operating below the motor FLA rating? Pass

Comment:

Back draft damper installed and can it fully open? Pass

Comment:

Unit free of noticeable noise and vibration?

Comment:

Total exhaust flow balanced within +/-5% and grilles are within +/-10%?

Comment:



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CheckList Information

Name : 02: LENNOX SETUP PARAMETERS 9/4 **Status :** Not Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 03/31/2025 - Tara Metcalf - National TAB

CheckList Item Details

UNIT ID CONFIGURATIONS

BACNET CONFIGURATION: GO TO SETTINGS>GENERAL>CONFIGURATION ID1 POSITION 5 SET TO "N". Pass

Comment:

NETWORK CONFIGURATION: GO TO SETUP>NETWORK INTEGRATION, SET TO BACNET IP Pass

Comment:

CONTROL MODE: SET CONTROL MODE TO ROOM SENSOR: CO2, TEMP & HUMIDITY (PER UNIT, AS NEEDED). Pass

Comment:

INDIVIDUAL PARAMETER CONFIGURATIONS (MECHANICAL CONTRACTOR TO DEFINE / AS APPLICABLE):

PARAMETER 105 DEHUMID MODE: 7 NO CONDITIONS Pass

Comment:

PARAMETER 106 DEHUMID SETPOINT: 50, THIS IS A CENTERED SET POINT (+/-) Yes

Comment:

PARAMETER 107 DEHUMID DEADBAND: 3 (DEFAULT) THIS IS THE ACTUAL +/- VALUE Pass

Comment:

PARAMETER 117 CO2 DAMPER MAX OPEN: 50%

Pass

Comment:

PARAMETER 118 CO2 START OPEN PPM: 1500

Pass

Comment:

PARAMETER 119 CO2 MAX OPEN PPM: 1500

Pass

Comment:

PARAMETER 137 OCCHET SET POINT: 68 (BACK UP)

Pass

Comment:

PARAMETER 131 SET TO THE SAME % AS THE MINMIUM OA DAMPER SETPOINT

Pass

Comment:

PARAMETER 139 OCC COOLING SET POINT: 72 (BACK UP)

Pass

Comment:

PARAMETER 154 OCC BLOWER MODE: ON-CONTINUOUS 1

Pass

Comment:

CFM VALUES / MSAV FAN SPEEDS (AIR BALANCER TO DEFINE / IF APPLICABLE):

OA DAMPER SET TO SAME POSITION IN ALL FAN SPEEDS?

Pass

Comment:

ALL FAN SPEEDS SET TO THE SAME CFM VALUE (ENTER SETPOINTS BELOW)

Pass

Comment:

HEAT CFM VALUE: PER THE HVAC SCHEDULE

Pass

Comment:

HIGH COOL CFM VALUE: THE HIGH COOL CFM VALUE

Pass

Comment:

LOW COOL CFM VALUE: MATCH THE HIGH COOL CFM VALUE

Pass

Comment:

VENTILATION CFM VALUE: MATCH THE HIGH COOL CFM VALUE

Pass

Comment:



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CheckList Information

Name : 03: SENSOR WIRING (LENNOX) 9/4 **Status :** Not Completed

Assigned Organization : National TAB **Asset :**

Requesting Organization : National TAB

Created Date : 03/31/2025 - Tara Metcalf - National TAB

CheckList Item Details

COMBINATION TEMPERATURE/HUMIDITY SENSOR

Sensors are installed where shown on the drawing? Pass

Comment:

2 conductor shielded cable has one wire landed to Vin, one to GND, and the shield wire is not connected. Pass

Comment:

For second shielded cable, one wire is landed to Vout and the shield wire is not connected. Pass

Comment:

Verify that the CORE or Prodigy controller is sensing a relative humidity (record the reading) Pass

Comment:

50%



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CheckList Information

Name : 5: CLOSEOUT CHECKS 9/4 **Status :** Not Completed
Assigned Organization : National TAB **Asset :**
Requesting Organization : National TAB
Created Date : 03/31/2025 - Tara Metcalf - National TAB

CheckList Item Details

SPACE COMFORT

Is space free of drafting?	Pass
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Comment:

Is space comfortable in all areas?	Pass
---	------

Comment:

Is the space free of ventilation noise?	Pass
--	------

Comment:

BUILDING PRESSURE

Do actual net building airflow, design net building airflow, and pressure coincide? If not why? (All three should either be positive or negative)	Pass
--	------

Comment:

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Project: 03-31-25 WAWA #7411 CLARKSVILLE, IN

System/Unit: AHU/RTU



Asset: RTU1

AREA:BACK OF HOUSE

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5624L06427
Model Num	LCT150H4E	LCT150H4E
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	2
OA Filter Size 1	-	26"X16"
Num Final Filter 1	-	4
Final Filter Size 1	-	20"X25"X2"

Motor Data		
	Design	Actual
Horsepower	3.75	3.8
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	8.7

Test Data		
	Design	Actual
SF CFM	4500	4633
RA CFM	3800	3946
OA CFM	700	687
RL Voltage	-	210.4/208.7/211.4
RL Amperage	-	4.53/4.72/4.61
SF System SetPt	-	80%
RA Damper Position	-	69%
RA Damper Type	-	MOTORIZED
OA Damper Position	-	31%
OA Damper Type	-	MOTORIZED

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.34"
Fan Suction SP	-	-0.96"
Fan Discharge SP	-	0.31"
Total ESP	0.70"	0.65"
Fan Total SP	-	1.27"

Completed By: Jordan Best on 04/03/2025

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Project:03-31-25 WAWA #7411 CLARKSVILLE, IN
AHU/RTU



Diffuser Supply (GRD)

RTU1/BACK OF HOUSE

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	TRASH/STAGING	SD1	10"	300	1	397	326	326	108.7
SGRD2	BOH	SD6	10"	400	1	522	432	432	108.0
SGRD3	COFFEE	SD6	12"	500	1	489	543	543	108.6
SGRD4	FOOD SERVICE	SD6	10"	425	1	535	444	444	104.5
SGRD5	FOOD SERVICE	SD6	10"	425	1	461	416	416	97.9
SGRD6	FOOD SERVICE	SD6	10"	400	1	536	418	418	104.5
SGRD7	FOOD SERVICE	SD6	10"	425	1	410	416	416	97.9
SGRD8	FOOD SERVICE	SD6	10"	400	1	439	417	417	104.3
SGRD9	FOOD SERVICE	SD6	10"	425	1	452	431	431	101.4
SGRD10	FOOD SERVICE	SD6	10"	425	1	450	419	419	98.6
SGRD11	ELECTRICAL ROOM	SD1	10"	375	1	424	371	371	98.9
Total				4500		5115	4633	4633	102.96%

Diffuser Ret/Exh (GRD)

RTU1/BACK OF HOUSE

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
EGRD1	TRASH/STAGING	RG1	16X14	1200	1	1175	1099	1099	91.6
EGRD2	WASHROOM	RG1	14"	865	1	784	802	802	92.7
EGRD3	COFFEE	RG1	14"	865	1	772	789	789	91.2
EGRD4	FOOD SERVICE	RG1	14"	870	1	792	807	807	92.8
Total				3800		3523	3497	3497	92.03%

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Project: 03-31-25 WAWA #7411 CLARKSVILLE, IN

System/Unit: AHU/RTU



Asset: RTU2

AREA:SALES

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5624I01956
Model Num	LGT102H4E	LGT102H4E
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	2
OA Filter Size 1	-	26"X16"
Num Final Filter 1	-	4
Final Filter Size 1	-	20"X25"X2"

Motor Data		
	Design	Actual
Horsepower	3.75	3.8
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	8.7

Test Data		
	Design	Actual
SF CFM	3400	3463
RA CFM	3020	3096
OA CFM	380	367
RL Voltage	-	205.6/208.7/206.2
RL Amperage	-	3.51/3.64/3.47
SF System SetPt	-	74%
RA Damper Position	-	75%
RA Damper Type	-	MOTORIZED
OA Damper Position	-	15%
OA Damper Type	-	MOTORIZED

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.43"
Fan Suction SP	-	-0.82"
Fan Discharge SP	-	0.44"
Total ESP	1.00"	0.87"
Fan Total SP	-	1.26"

Completed By: Jordan Best on 04/03/2025

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AHU/RTU



Diffuser Supply (GRD)

RTU2/SALES

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	RETAIL	SD2	24X6	275	0.39	268	254	254	92.4
SGRD2	RETAIL	SD2	13X1	275	0.39	195	208	208	75.6
SGRD3	RETAIL	SD2	13X1	275	0.39	201	218	218	79.3
SGRD4	RETAIL	SD2	12X6	275	0.39	290	302	302	109.8
SGRD5	RETAIL	SD2	12"	300	0.39	146	172	172	57.3
SGRD6	RETAIL	SD2	16"	275	0.39	292	304	304	110.5
SGRD7	RETAIL	SD2	12"	275	0.39	222	248	248	90.2
SGRD8	RETAIL	SD2	16"	275	0.39	402	422	422	153.5
SGRD9	RETAIL	SD2	16"	275	0.39	385	393	393	142.9
SGRD10	DELIVERY ROOM	SD1	8"	250	1	251	259	259	103.6
SGRD11	HALLWAY	SD1	8"	200	1	259	219	219	109.5
SGRD12	WOMENS RR	SD5	8"	100	1	162	108	108	108.0
SGRD13	MENS RR	SD5	8"	150	1	278	138	138	92.0
SGRD14	REAR VESTIBULE	SD5	8"	200	1	108	218	218	109.0
Total				3400		3459	3463	3463	101.85%

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Project: 03-31-25 WAWA #7411 CLARKSVILLE, IN

System/Unit: AHU/RTU



Asset: RTU3

AREA:FRONT OF HOUSE

Unit Data		
	Design	Actual
MFG	LENNOX	LENNOX
Serial Num	-	5624M01348
Model Num	LGT072H4E	LGT072H4E
Type	RTU	RTU
Configuration	VERTICAL	VERTICAL
Num OA Filters 1	-	1
OA Filter Size 1	-	30"X16"
Num Final Filter 1	-	4
Final Filter Size 1	-	20"X20"X2"

Motor Data		
	Design	Actual
Horsepower	1	1.5
Phase	3	3
Rated Voltage	208	208
Rated Amperage	-	4.4

Test Data		
	Design	Actual
SF CFM	2400	2311
RA CFM	2200	2122
OA CFM	200	209
RL Voltage	-	205.6/207.3/206.8
RL Amperage	-	1.44/1.42/1.46
SF System SetPt	-	83%
RA Damper Position	-	79%
RA Damper Type	-	MOTORIZED
OA Damper Position	-	21%
OA Damper Type	-	MOTORIZED

Performance Data		
	Design	Actual
MA Plenum SP	-	-0.21"
Fan Suction SP	-	-0.41"
Fan Discharge SP	-	0.19"
Total ESP	0.50"	0.4"
Fan Total SP	-	0.6"

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Project:03-31-25 WAWA #7411 CLARKSVILLE, IN

AHU/RTU



Diffuser Supply (GRD)

RTU3/FRONT OF HOUSE

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
SGRD1	ASSOC. AREA	SD1	8"	200	1	220	338	214	107.0
SGRD2	OFFICE	SD1	8"	150	1	238	278	139	92.7
SGRD3	VESTIBULE	SD5	8"	250	1	240	336	251	100.4
SGRD4	FOH	SD2	8"	450	0.39	283	411	421	93.6
SGRD5	FOH	SD2	8"	450	0.39	263	372	409	90.9
SGRD6	FOH	SD2	8"	450	0.39	233	445	438	97.3
SGRD7	FOH	SD2	8"	450	0.39	248	432	459	102.0
Total				2400		1725	2612	2331	97.12%

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Project: 03-31-25 WAWA #7411 CLARKSVILLE, IN

System/Unit: FAN - Exhaust



Asset: EF1

AREA:RESTROOMS

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	GB-098-6	GB-098-6
Serial Num	-	26072072
Type	DOWNBLAST	DOWNBLAST
Configuration	VERTICAL	VERTICAL

Test Data		
	Design	Actual
CFM	375	390
Fan Rotation	-	CCW
System SetPt	-	5 TURNS OUT
Total ESP	0.38"	0.19"
Fan Inlet SP	-	-0.19"
Fan Discharge SP	-	ATM

Motor Data		
	Design	Actual
Motor MFG	-	US MOTORS
Horsepower	0.167	0.167
Motor Rpm	-	1725
Phase	1	1
Voltage (rated)	120	115
Amperage (rated)	-	3.8

Completed By: Jordan Best on 04/03/2025

Notes:
 Fan Sheave- 3.5"
 Fan Bore- 0.625"
 Motor Sheave/Bore- VP25
 CL Distance- 5"
 Belt- 3L180

Written By: Jordan Best on 04/02/2025

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Project:03-31-25 WAWA #7411 CLARKSVILLE, IN

FAN - Exhaust



Diffuser Ret/Exh (GRD)

EF1/RESTROOMS

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
EGRD1	WOMENS RR	EG1	8X8	150	1	255	162	162	108.0
EGRD2	MENS RR	EG1	8X8	225	1	114	228	228	101.3
Total				375		369	390	390	104%

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Project: 03-31-25 WAWA #7411 CLARKSVILLE, IN

System/Unit: FAN - Exhaust



Asset: EF2

AREA:BOH

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	GB-098-6	GB-098-6
Serial Num	-	26072164
Type	DOWNBLAST	DOWNBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	Actual
Motor MFG	-	US MOTORS
Frame	-	NA
Horsepower	0.167	0.167
Motor Rpm	-	1725
Phase	1	1
Voltage (rated)	120	115
Amperage (rated)	-	3.8
Service Factor	-	NA

Test Data		
	Design	Actual
CFM	400	377
Fan Rotation	-	CCW
System SetPt	-	5 TURNS OUT
Total ESP	0.38"	0.16"
Fan Inlet SP	-	-0.16"
Fan Discharge SP	-	ATM

Completed By: Jordan Best on 04/03/2025

Notes:

- Fan Sheave- 3.5"
- Fan Bore- 0.625"
- Motor Sheave/Bore- VP25
- CL Distance- 5"
- Belt- 3L180

Written By: Jordan Best on 04/02/2025

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Project:03-31-25 WAWA #7411 CLARKSVILLE, IN

FAN - Exhaust



Diffuser Ret/Exh (GRD)

EF2/BOH

Asset									
Asset Name	Location	Type	Size	DESIGN CFM	AK	CFM(1)	CFM(2)	FINAL CFM	% to design
EGRD1	BOH	RG2	8X8	200	1	172	182	182	91.0
EGRD2	BOH	RG2	8X8	200	1	211	195	195	97.5
Total				400		383	377	377	94.25%

Completed By: Jordan Best on 04/03/2025

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Project: 03-31-25 WAWA #7411 CLARKSVILLE, IN

System/Unit: FAN - Exhaust



Asset: EF3

AREA:TRASHROOM

Unit Data		
	Design	Actual
MFG	GREENHECK	GREENHECK
Model Num	SP-B200	SP-B200
Serial Num	-	26069334
Type	CEILING	CEILING
Configuration	VERTICAL	VERTICAL

Test Data		
	Design	Actual
CFM	200	219
Fan Rotation	-	CCW
System SetPt	-	FIXED
Fan Discharge SP	-	ATM

Motor Data		
	Design	Actual
Motor MFG	-	GREENHECK
Horsepower	0.167	0.033
Phase	1	1
Voltage (rated)	120	115
Amperage (rated)	-	2.7

Completed By: Jordan Best on 04/03/2025

