Certificate of Product Ratings

AHRI Certified Reference Number : 211162743 Date : 11-15-2024 Model Status : Production Stopped

AHRI Type : HRCU-A-CB (Split System: Heat Pump with Remote Outdoor Unit-Air-Source)

Outdoor Unit Brand Name : TRANE

Outdoor Unit Model Number (Condenser or Single Package) : 4TWR4036N1

Indoor Unit Model Number (Evaporator and/or Air Handler) : TEM4A0C37S31+TDR

The manufacturer of this TRANE product is responsible for the rating of this system combination.

Rated as follows in accordance with the latest edition of AHRI 210/240 – 2024, Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment and subject to rating accuracy by AHRI-sponsored, independent, third party testing:

Cooling Capacity (A_{Full}) – Single or High Stage (95F), btuh : 34000

SEER2 : 14.30

EER2 (A_{Full}) – Single or High Stage (95F) : 11.70

Heating Capacity ($H1_{Full}$) – Single or High Stage (47F), btuh : 33000

HSPF2 (Region IV) : 7.50

†"Active" Model Status are those that an AHRI Certification Program Participant is currently producing AND selling or offering for sale; OR new models that are being marketed but are not yet being produced."Production Stopped" Model Status are those that an AHRI Certification Program Participant is no longer producing BUT is still selling or offering for sale.

Ratings that are accompanied by WAS indicate an involuntary re-rate. The new published rating is shown along with the previous (i.e. WAS) rating.

The Department of Energy has published updated energy efficiency metrics for central air conditioners and heat pumps. This publication reflects both the 1987 metric (SEER) and the 2023 metric (SEER2). Efficiency requirements are published at 10 C.F.R. 430.32(c). Please refer to www.AHRInet.org for more information about updated energy efficiency metrics.

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CERTIFICATE VERIFICATION
The information for the model cited on this certificate can be verified at www.ahridirectory.org, click on "Verify Certificate" link and enter the AHRI Certified Reference Number and the date on which the certificate was issued, which is listed above, and the Certificate No., which is listed at bottom right.

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AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE

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CERTIFICATE NO.: 133761796959524485

Manual S Compliance Report

Entire House

Air Ducks Heating & Air Conditioning

Job:
Date: Sep 17, 2024
By:

2601 NW 74th Place, Gainesville, Fla 32653 Phone: 352-215-4624 Email: airducksac@gmail.com Web: www.airducksac.com

Project Information

For: DWC Construction
Thornwood lot 22

Cooling Equipment

Design Conditions

Outdoor design DB:	92.4°F	Sensible gain:	25418	Btuh	Entering coil DB:	77.2°F
Outdoor design WB:	75.8°F	Latent gain:	5258	Btuh	Entering coil WB:	63.6°F
Indoor design DB:	75.0°F	Total gain:	30676	Btuh		
Indoor RH:	50%	Estimated airflow:	1133	cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type: Split ASHP
Manufacturer: Trane Model: 4TWR4036N1+TEM4A0C37S31++TDR

Actual airflow:	1133	cfm		
Sensible capacity:	23800	Btuh	94% of load	
Latent capacity:	10200	Btuh	194% of load	
Total capacity:	34000	Btuh	111% of load	SHR: 70%

Heating Equipment

Design Conditions

Outdoor design DB:	33.3°F	Heat loss:	32565	Btuh	Entering coil DB:	67.0°F
Indoor design DB:	68.0°F					

Manufacturer's Performance Data at Actual Design Conditions

Equipment type: Split ASHP
Manufacturer: Trane Model: 4TWR4036N1+TEM4A0C37S31++TDR

Actual airflow:	1133	cfm			
Output capacity:	33000	Btuh	101% of load	Capacity balance:	33 °F
Supplemental heat required:	0	Btuh		Economic balance:	-99 °F

Backup equipment type: Elec strip
Manufacturer: Model:

Actual airflow:	1133	cfm			
Output capacity:	12.5	kW	131% of load	Temp. rise:	50 °F

Meets all requirements of ACCA Manual S.

Residential Plans Examiner Review Form for HVAC System Design (Loads, Equipment, Ducts)

Form RPER 2.0

Air Conditioning Contractors of America

Header Information

Contractor Mechanical license# Air Ducks Heating & Air Conditioning

Building plan #

Applicable Attachments

Manual J1 Form and Worksheet A:	☐ Yes	☐ No
OEM performance data (heating, cooling, blower):	☐ Yes	☐ No
Duct distribution sketch:	☐ Yes	☐ No
IRC Table R301.2 (climate & geographic design criteria)	☐ Yes	☐ No

Home address (Street or Lot#, Block, Subdivision) Thornwood lot 22, Entire House

HVAC LOAD CALCULATION (IRC M1401.3

Manual J Design Criteria and Loads

Location

Elevation	123	ft
Altitude Correction Factor	1.00	
Latitude	30	°N

Winter Design Conditions

Outdoor Winter Temp	33	°F
Indoor Winter Temp	68	°F
Heating Temp Diff	35	°F

Summer Design Conditions

Outdoor Cooling Temp	92	°F
Indoor Cooling Temp	75	°F
Cooling Temp Diff	17	°F
Indoor Summer Design RH	50	%
Coincident Wet Bulb Temp	76	°F

Manual J Loads

Total Heat Loss	32565	Btuh
Sensible Heat Gain	25418	Btuh
Latent Head Gain	5258	Btuh
Total Heat Gain	30676	Btuh

The heat loss/gain was calculated in accordance with ACCA Manual J? Y■ N☐

HVAC EQUIPMENT SELECTION (IRC M1401.3

Heating Equipment

☐ Furnace ☐ Boiler ■ Electric Heat

☐ Single Speed ☐ Multi Stage ☐ Modulating

Model

Output	33000	Btuh	Sizing Value	32565	Btuh
Supplemental Heat	0	Btuh	Sizing Limit	175.0	%
			Load: Capacity	131.3	%

Size Factor is within Manual S Size Limit? Y■ N☐

Cooling Equipment

☐ Air Conditioner ■ Heat Pump

■ Air-to-Air ☐ Geothermal Open Loop ☐ Geothermal Closed Loop

■ Single Speed ☐ Multi Stage ☐ Variable Speed

Model 4TWR4036N1+TEM4A0C37S31++TDR

Sensible	23800	Btuh	Sizing Value	30676	Btuh
Latent	10200	Btuh	Sizing Limit	115.0	%
Total	34000	Btuh	Load: Capacity	110.8	%

Size Factor is within Manual S Size Limit? Y■ N☐

HVAC DUCT DISTRIBUTION DESIGN (IRC M1601.1

Design airflow	1133	cfm	Longest Supply Duct	340	ft
External Static Pressure (ESP)	0.50	in H2O	Longest Return Duct	86.0	ft
Component Pressure Loss (CPL)	0	in H2O	Total Effective Length (TEL)	426	ft
Available static pressure (ASP)	0.50	in H2O	Friction Rate	0.12	in/100ft
ESP – CPL = ASP			(ASP x 100) / TEL = Friction Rate		

Duct Materials Used

Trunk Duct: ■ Duct Board ☐ Sheet Metal ☐ Flex ☐ Lined Sheet Metal ☐ Other

Branch Duct: ☐ Duct Board ☐ Sheet Metal ■ Flex ☐ Lined Sheet Metal ☐ Other

Ducts are sized per Manual D? Y■ N☐

I declare the load calculation, equipment selection, and duct system design were rigorously performed based on the building plan listed above and understand the claims made on these forms may be subject to review and verification.

Contractor's printed name: _____

Contractor's signature: _____ Date: _____

Load Short Form
Entire House
Air Ducks Heating & Air Conditioning

Job:
Date: Sep 17, 2024
By:

2601 NW 74th Place, Gainesville, Fla 32653 Phone: 352-215-4624 Email: airducksac@gmail.com Web: www.airducksac.com

Project Information

For: DWC Construction
Thornwood lot 22

Design Information

	Htg	Clg
Outside db (°F)	33	92
Inside db (°F)	68	75
Design TD (°F)	35	17
Daily range	-	M
Inside humidity (%)	50	50
Moisture difference (gr/lb)	29	43

Infiltration

Method	Simplified
Construction quality	Average
Fireplaces	0

HEATING EQUIPMENT

Make	Trane
Trade	SEER 2
Model	4TWR4036N1
AHRI ref	211162743

Efficiency	7.5 HSPF2	
Heating input		
Heating output	33000	Btuh @ 47°F
Temperature rise	27	°F
Actual air flow	1133	cfm
Air flow factor	0.035	cfm/Btuh
Static pressure	0.50	in H2O
Space thermostat		

Capacity balance point = 33 °F

COOLING EQUIPMENT

Make	Trane
Trade	SEER 2
Cond	4TWR4036N1
Coil	TEM4A0C37S31++TDR
AHRI ref	211162743

Efficiency	11.7 EER2,14.3 SEER2	
Sensible cooling	23800	Btuh
Latent cooling	10200	Btuh
Total cooling	34000	Btuh
Actual air flow	1133	cfm
Air flow factor	0.045	cfm/Btuh
Static pressure	0.50	in H2O
Load sensible heat ratio	0.83	

Backup:
Input = 13 kW, Output = 42753 Btuh, 100 AFUE

ROOM NAME	Area (ft^2)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Master	320	6516	5126	227	229
WIC 1	48	888	408	31	18
WIC 2	48	66	116	2	5
WC	35	0	0	0	0
Master bath	180	3698	1710	129	76
Living	360	7908	9234	275	412
Laundry	80	2284	1741	79	78
Dining	72	1444	729	50	33
Kitchen	170	620	2094	22	93
Bedroom 2	180	4393	1955	153	87
Bath	54	1262	786	44	35
Hall	30	0	0	0	0
Pantry	42	599	223	21	10
Bed 3	192	2887	1295	100	58

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

Entire House	1811	32565	25418	1133	1133
Other equip loads		0	0		
Equip. @ 0.97 RSM			24757		
Latent cooling			5258		
TOTALS	1811	32565	30015	1133	1133

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

Project Summary
Entire House
Air Ducks Heating & Air Conditioning

Job:
Date: Sep 17, 2024
By:

2601 NW 74th Place, Gainesville, Fla 32653 Phone: 352-215-4624 Email: airducksac@gmail.com Web: www.airducksac.com

Project Information

For: DWC Construction
Thornwood lot 22

Notes:

Design Information

Weather: Gainesville, FL, US

Winter Design Conditions

Outside db	33	°F
Inside db	68	°F
Design TD	35	°F
Ventilation Method	MJ8	

Summer Design Conditions

Outside db	92	°F
Inside db	75	°F
Design TD	17	°F
Daily range	M	
Relative humidity	50	%
Moisture difference	43	gr/lb

Heating Summary

Structure	26392	Btuh
Ducts (R-6.0)	6173	Btuh
Central vent (0 cfm)	0	Btuh
Humidification	0	Btuh
Piping	0	Btuh
Equipment load	32565	Btuh

Sensible Cooling Equipment Load Sizing

Structure	17584	Btuh
Ducts (R-6.0)	7835	Btuh
Central vent (0 cfm)	0	Btuh
Blower	0	Btuh
Use manufacturer's data	n	
Rate/swing multiplier	0.97	
Equipment sensible load	24757	Btuh

Infiltration

Method	Simplified
Construction quality	Average
Fireplaces	0

	Heating	Cooling
Area (ft²)	1843	1843
Volume (ft³)	15710	15710
Air changes/hour	0.38	0.20
Equiv. AVF (cfm)	99	52

Latent Cooling Equipment Load Sizing

Structure	3741	Btuh
Ducts	1517	Btuh
Central vent (0 cfm)	0	Btuh
Equipment latent load	5258	Btuh
Equipment Total Load (Sen+Lat)	30015	Btuh
Req. total capacity at 0.70 SHR	2.9	ton

Heating Equipment Summary

Make	Trane
Trade	SEER 2
Model	4TWR4036N1
AHRI ref	211162743

Efficiency	7.5 HSPF2	
Heating input		
Heating output	33000	Btuh @ 47°F
Temperature rise	27	°F
Actual air flow	1133	cfm
Air flow factor	0.035	cfm/Btuh
Static pressure	0.50	in H2O

Space thermostat
Capacity balance point = 33 °F

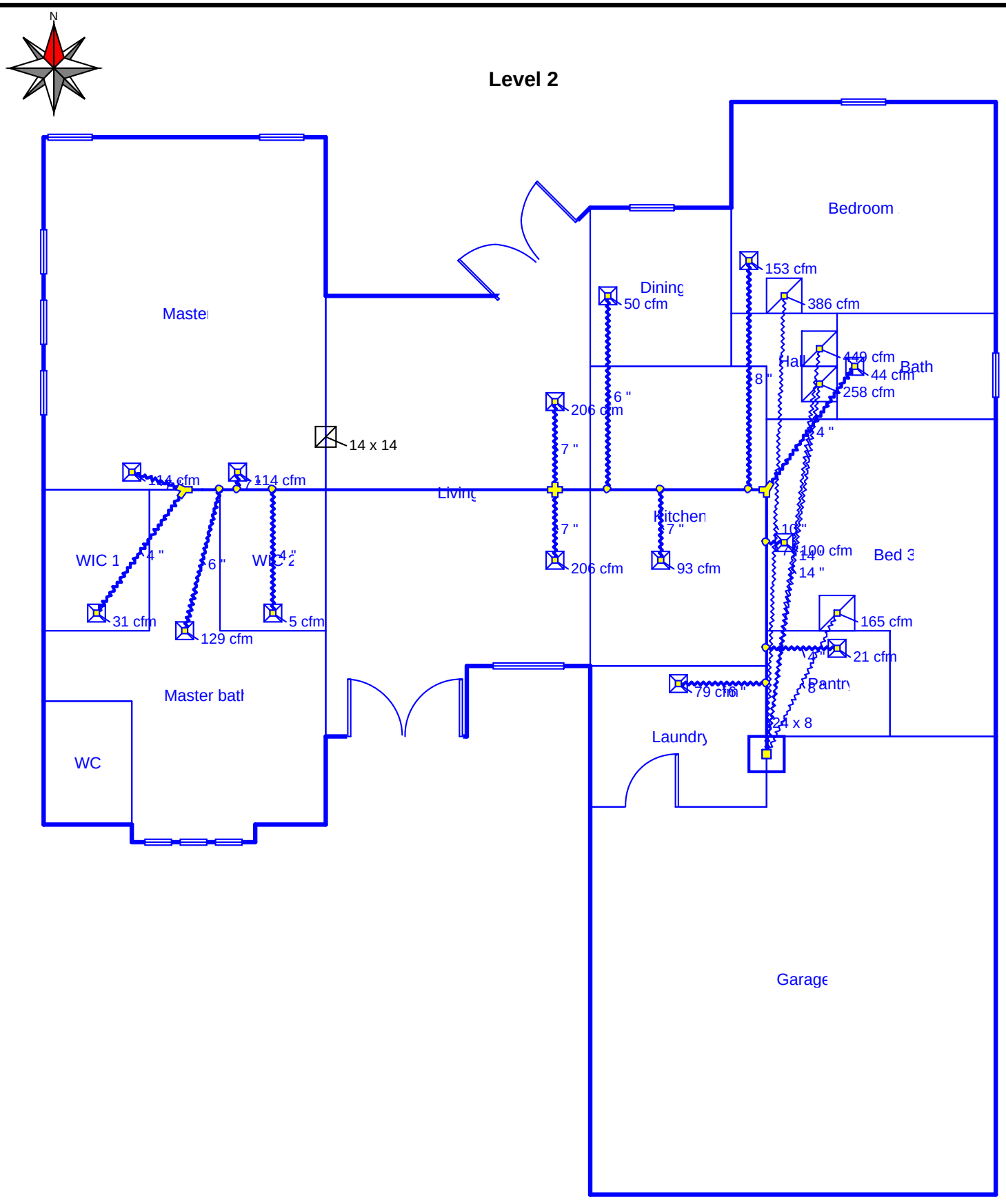
Backup:
Input = 13 kW, Output = 42753 Btuh, 100 AFUE

Cooling Equipment Summary

Make	Trane
Trade	SEER 2
Cond	4TWR4036N1
Coil	TEM4A0C37S31++TDR
AHRI ref	211162743

Efficiency	11.7 EER2,14.3 SEER2	
Sensible cooling	23800	Btuh
Latent cooling	10200	Btuh
Total cooling	34000	Btuh
Actual air flow	1133	cfm
Air flow factor	0.045	cfm/Btuh
Static pressure	0.50	in H2O
Load sensible heat ratio	0.83	

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.



Job #:
Performed for:
DWC Construction
Thornwood lot 22

Air Ducks Heating & Air Conditionin

2601 NW 74th Place
Gainesville, Fla 32653
Phone: 352-215-4624
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Scale: 1 : 90

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Duct System Summary

Entire House

Air Ducks Heating & Air Conditioning

Job:
Date: Sep 17, 2024
By:

2601 NW 74th Place, Gainesville, Fla 32653 Phone: 352-215-4624 Email: airducksac@gmail.com Web: www.airducksac.com

Project Information

For: DWC Construction
Thornwood lot 22

	Heating	Cooling
External static pressure	0.50 in H2O	0.50 in H2O
Pressure losses	0 in H2O	0 in H2O
Available static pressure	0.50 in H2O	0.50 in H2O
Supply / return available pressure	0.399 / 0.101 in H2O	0.399 / 0.101 in H2O
Lowest friction rate	0.117 in/100ft	0.117 in/100ft
Actual air flow	1133 cfm	1133 cfm
Total effective length (TEL)	426 ft	

Supply Branch Detail Table

Name		Design (Btuh)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk
Bath	h	1262	44	35	0.217	4.0	0x 0	VlFx	23.6	160.0	st1
Bed 3	h	2887	100	58	0.218	7.0	0x 0	VlFx	13.0	170.0	st1
Bedroom 2	h	4393	153	87	0.171	8.0	0x 0	VlFx	29.0	205.0	st1
Dining	h	1444	50	33	0.166	6.0	0x 0	VlFx	35.0	205.0	st1
Kitchen	c	2094	22	93	0.173	7.0	0x 0	VlFx	25.0	205.0	st1
Laundry	h	2284	79	78	0.201	6.0	0x 0	VlFx	9.0	190.0	st1
Living	c	4617	138	206	0.177	7.0	0x 0	VlFx	31.0	195.0	st1
Living-A	c	4617	138	206	0.176	7.0	0x 0	VlFx	32.0	195.0	st1
Master	c	2563	113	114	0.128	7.0	0x 0	VlFx	51.2	260.0	st1
Master bath	h	3698	129	76	0.123	6.0	0x 0	VlFx	54.2	270.0	st1
Master-A	c	2563	113	114	0.122	7.0	0x 0	VlFx	46.0	280.0	st1
Pantry	h	599	21	10	0.210	4.0	0x 0	VlFx	10.0	180.0	st1
WIC 1	h	888	31	18	0.126	4.0	0x 0	VlFx	56.6	260.0	st1
WIC 2	c	116	2	5	0.117	4.0	0x 0	VlFx	50.0	290.0	st1

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st1	Peak AVF	1133	1133	0.117	850	14.7	8 x 24	RectFbg	

Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb2	0x 0	386	323	86.0	0.117	708	10.0	0x 0		VlFx	
rb3	0x 0	328	449	83.2	0.121	420	14.0	0x 0		VlFx	
rb1	0x 0	165	103	68.9	0.146	473	8.0	0x 0		VlFx	
rb4	0x 0	254	258	81.2	0.124	241	14.0	0x 0		VlFx	