

# Certificate of Product Ratings

AHRI Certified Reference Number : 211162743    Date : 09-17-2024    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<sub>Full</sub>) – Single or High Stage (95F), btuh : 34000

SEER2 : 14.30

EER2 (A<sub>Full</sub>) – Single or High Stage (95F) : 11.70

Heating Capacity (H1<sub>Full</sub>) – 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](http://www.AHRInet.org) for more information about updated energy efficiency metrics.

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**CERTIFICATE NO.:**

133710669129989442



**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 23

**Cooling Equipment**

**Design Conditions**

Outdoor design DB:	91.9°F	Sensible gain:	25274	Btuh	Entering coil DB:	77.2°F
Outdoor design WB:	75.3°F	Latent gain:	5100	Btuh	Entering coil WB:	63.6°F
Indoor design DB:	75.0°F	Total gain:	30375	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	200% of load	
Total capacity:	34000	Btuh	112% of load	SHR: 70%

**Heating Equipment**

**Design Conditions**

Outdoor design DB:	20.2°F	Heat loss:	44077	Btuh	Entering coil DB:	66.5°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	75% of load	Capacity balance: 32 °F
Supplemental heat required:	11077	Btuh		Economic balance: -99 °F

Backup equipment type:	Elec strip			
Manufacturer:		Model:		
Actual airflow:	1133	cfm		
Output capacity:	12.5	kW	97% 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

## Header Information

Contractor \_\_\_\_\_  
Mechanical license# Air Ducks Heating & Air Conditioning  
Building plan # \_\_\_\_\_  
Home address (Street or Lot#, Block, Subdivision) Thornwood lot 23, Entire House

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

## HVAC LOAD CALCULATION

(IRC M1401.3)

### Manual J Design Criteria and Loads

#### Location

Elevation 10 ft  
Altitude Correction Factor 1.00  
Latitude 39 °N

#### 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 75 °F

#### Manual J Loads

Total Heat Loss 44077 Btuh  
Sensible Heat Gain 25274 Btuh  
Latent Heat Gain 5100 Btuh  
Total Heat Gain 30375 Btuh

#### Winter Design Conditions

Outdoor Winter Temp 20 °F  
Indoor Winter Temp 68 °F  
Heating Temp Diff 48 °F

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 44077 Btuh  
Supplemental 11077 Btuh Sizing Limit 175.0 %  
Heat Load: Capacity 97.0 %

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 30375 Btuh  
Latent 10200 Btuh Sizing Limit 115.0 %  
Total 34000 Btuh Load: Capacity 111.9 %

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 Duct Materials Used  
External Static Pressure (ESP) 0.50 in H2O Longest Return Duct 86.0 ft Trunk Duct: ☒ Duct Board ☐ Sheet Metal  
Component Pressure Loss (CPL) 0 in H2O Total Effective Length (TEL) 426 ft ☐ Flex ☐ Lined Sheet Metal ☐ Other  
Available static pressure (ASP) 0.50 in H2O Friction Rate 0.12 in/100ft Branch Duct: ☐ Duct Board ☐ Sheet Metal  
ESP - CPL = ASP (ASP x 100) / TEL = Friction Rate ☒ 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 23

**Design Information**

	Htg	Clg	Infiltration	Simplified
Outside db (°F)	20	92	Method	Average
Inside db (°F)	68	75	Construction quality	0
Design TD (°F)	48	17	Fireplaces	
Daily range	-	M		
Inside humidity (%)	50	50		
Moisture difference (gr/lb)	39	41		

**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 26 °F  
Actual air flow 1133 cfm  
Air flow factor 0.026 cfm/Btuh  
Static pressure 0.50 in H2O  
Space thermostat  
Capacity balance point = 32 °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 (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Master	320	8821	5009	227	225
WIC 1	48	1202	405	31	18
WIC 2	48	89	115	2	5
WC	35	0	0	0	0
Master bath	180	5005	1761	129	79
Living	360	10703	9248	275	415
Laundry	80	3091	1730	79	78
Dining	72	1954	714	50	32
Kitchen	170	839	2074	22	93
Bedroom 2	180	5947	1931	153	87
Bath	54	1708	776	44	35
Hall	30	0	0	0	0
Pantry	42	811	223	21	10
Bed 3	192	3908	1288	100	58

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



Entire House	1811	44077	25274	1133	1133
Other equip loads		0	0		
Equip. @ 0.97 RSM			24491		
Latent cooling			5100		
TOTALS	1811	44077	29591	1133	1133

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



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# 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 23

Notes:

## Design Information

Weather: Washington R. Reagan AP, DC, US

### Winter Design Conditions

Outside db	20 °F
Inside db	68 °F
Design TD	48 °F

Ventilation Method MJ8

### Heating Summary

Structure	36376 Btuh
Ducts (R-6.0)	7701 Btuh
Central vent (0 cfm)	0 Btuh

Humidification	0 Btuh
Piping	0 Btuh
Equipment load	44077 Btuh

### Infiltration

Method	Simplified
Construction quality	Average
Fireplaces	0

	Heating	Cooling
Area (ft <sup>2</sup> )	1843	1843
Volume (ft <sup>3</sup> )	15710	15710
Air changes/hour	0.38	0.20
Equiv. AVF (cfm)	99	52

### 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	26 °F
Actual air flow	1133 cfm
Air flow factor	0.026 cfm/Btuh
Static pressure	0.50 in H2O
Space thermostat	
Capacity balance point = 32 °F	

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

### Summer Design Conditions

Outside db	92 °F
Inside db	75 °F
Design TD	17 °F
Daily range	M
Relative humidity	50 %
Moisture difference	41 gr/lb

### Sensible Cooling Equipment Load Sizing

Structure	17485 Btuh
Ducts (R-6.0)	7789 Btuh
Central vent (0 cfm)	0 Btuh

Blower 0 Btuh

Use manufacturer's data	n
Rate/swing multiplier	0.97
Equipment sensible load	24491 Btuh

### Latent Cooling Equipment Load Sizing

Structure	3659 Btuh
Ducts	1441 Btuh
Central vent (0 cfm)	0 Btuh

Equipment latent load 5100 Btuh

Equipment Total Load (Sen+Lat)	29591 Btuh
Req. total capacity at 0.70 SHR	2.9 ton

### 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.



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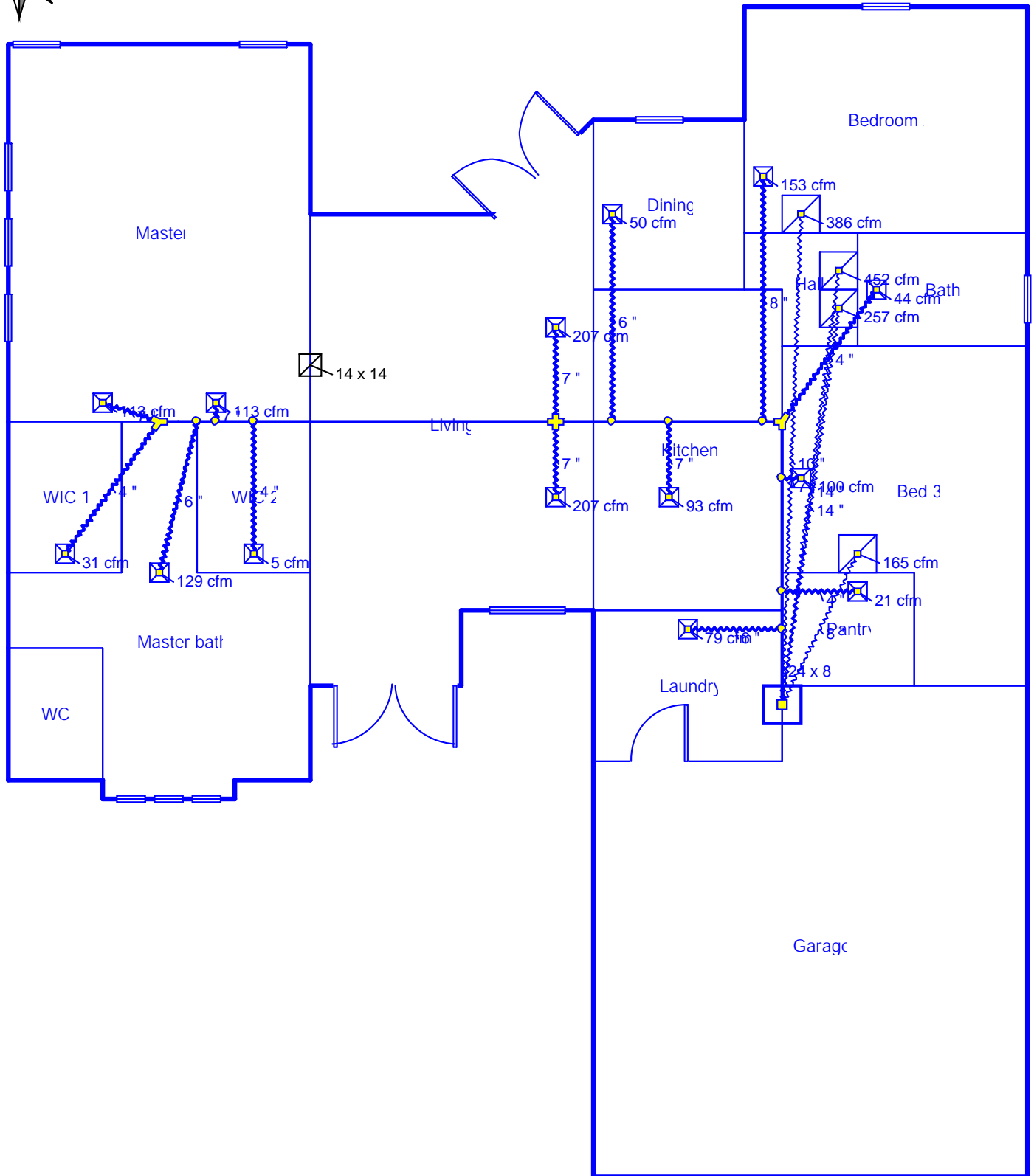
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## Level 2



**Job #:**  
**Performed for:**  
DWC Construction  
Thornwood lot 23

### Air Ducks Heating & Air Conditioning

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

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 23

	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 1708	44	35	0.217	4.0	0x0	VIFx	23.6	160.0	st1
Bed 3	h 3908	100	58	0.218	7.0	0x0	VIFx	13.0	170.0	st1
Bedroom 2	h 5947	153	87	0.171	8.0	0x0	VIFx	29.0	205.0	st1
Dining	h 1954	50	32	0.166	6.0	0x0	VIFx	35.0	205.0	st1
Kitchen	c 2074	22	93	0.173	7.0	0x0	VIFx	25.0	205.0	st1
Laundry	h 3091	79	78	0.201	6.0	0x0	VIFx	9.0	190.0	st1
Living	c 4624	138	207	0.177	7.0	0x0	VIFx	31.0	195.0	st1
Living-A	c 4624	138	207	0.176	7.0	0x0	VIFx	32.0	195.0	st1
Master	h 4410	113	112	0.128	7.0	0x0	VIFx	51.2	260.0	st1
Master bath	h 5005	129	79	0.123	6.0	0x0	VIFx	54.2	270.0	st1
Master-A	h 4410	113	112	0.122	7.0	0x0	VIFx	46.0	280.0	st1
Pantry	h 811	21	10	0.210	4.0	0x0	VIFx	10.0	180.0	st1
WIC 1	h 1202	31	18	0.126	4.0	0x0	VIFx	56.6	260.0	st1
WIC 2	c 115	2	5	0.117	4.0	0x0	VIFx	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	322	86.0	0.117	708	10.0	0x 0		VIFx	
rb3	0x 0	328	452	83.2	0.121	423	14.0	0x 0		VIFx	
rb1	0x 0	165	103	68.9	0.146	473	8.0	0x 0		VIFx	
rb4	0x 0	254	257	81.2	0.124	241	14.0	0x 0		VIFx	