



Certificate of Product Ratings

AHRI Certified Reference Number : 201763659

Date : 12-07-2020

Model Status : Active

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

Series : XR14

Outdoor Unit Brand Name : TRANE

Outdoor Unit Model Number (Condenser or Single Package) : 4TWR4036G1

Indoor Unit Model Number (Evaporator and/or Air Handler) : TEM4A0B36S31+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 with Addendum 1, 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 (A2) - Single or High Stage (95F), btuh : 35000

SEER : 14.00

EER (A2) - Single or High Stage (95F) : 11.50

Heating Capacity (H12) - Single or High Stage (47F) : 34400

HSPF (Region IV) : 8.20



†"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.

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CERTIFICATE VERIFICATION

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CERTIFICATE NO.:

132518520519674749

Design Conditions

Outdoor design DB:	91.9°F	Sensible gain:	28035	Btuh	Entering coil DB:	78.0°F
Outdoor design WB:	76.2°F	Latent gain:	4835	Btuh	Entering coil WB:	63.9°F
Indoor design DB:	75.0°F	Total gain:	32870	Btuh		
Indoor RH:	50%	Estimated airflow:	1220	cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP			
Manufacturer:	Trane	Model:	4TWR4036G1+TEM3A0C36S41++TDR	
Actual airflow:	1220	cfm		
Sensible capacity:	29280	Btuh	104% of load	
Latent capacity:	7320	Btuh	151% of load	
Total capacity:	36600	Btuh	111% of load	SHR: 80%

Heating Equipment

Design Conditions

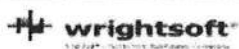
Outdoor design DB:	33.0°F	Heat loss:	33629	Btuh	Entering coil DB:	66.6°F
Indoor design DB:	68.0°F					

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split ASHP			
Manufacturer:	Trane	Model:	4TWR4036G1+TEM3A0C36S41++TDR	
Actual airflow:	1220	cfm		
Output capacity:	34200	Btuh	102% of load	Capacity balance: 33 °F
Supplemental heat required:	0	Btuh		Economic balance: -99 °F

Backup equipment type:	Elec strip			
Manufacturer:	n/a	Model:		
Actual airflow:	1220	cfm		
Output capacity:	6.6	kW	67% of load	Temp. rise: 25 °F

Meets all requirements of ACCA Manual S.



Right-Suite® Universal 2019 19.0.21 RSU23127
...ents\Wrightsoft HVAC\DWG lot 25 thorne wood.rup Calc = MJ8 Front Door faces: N

2021-May-21 17:35:19

Page 1



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

Form
RPER 1
15 Mar 09

Header Information

Contractor:

Air Ducks Heating & Air, Inc.

Mechanical license:

Building plan #:

Home address (Street or Lot#, Block, Subdivision):

Thornwood Lot 20, Entire House

REQUIRED ATTACHMENTS

Manual J1 Form (and supporting worksheets):
or MJ1AE Form* (and supporting worksheets):
OEM performance data (heating, cooling, blower):
Manual D Friction Rate Worksheet:
Duct distribution sketch:

ATTACHED

Yes ☐	No ☐
Yes ☐	No ☐
Yes ☐	No ☐
Yes ☐	No ☐
Yes ☐	No ☐

HVAC LOAD CALCULATION (IRC M1401.3)

Design Conditions

Winter Design Conditions

Outdoor temperature: 33 °F
Indoor temperature: 68 °F
Total heat loss: 33629 Btuh

Summer Design Conditions

Outdoor temperature: 92 °F
Indoor temperature: 75 °F
Grains difference: 47 gr/lb @ 50% RH
Sensible heat gain: 28932 Btuh
Latent heat gain: 4990 Btuh
Total heat gain: 33922 Btuh

Building Construction Information

Building

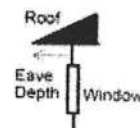
Orientation: Front Door faces North
North, East, West, South, Northeast, Northwest, Southeast, Southwest

Number of bedrooms: 0
Conditioned floor area: 1843 ft²
Number of occupants: 5

Windows

Eave overhang depth: 0 ft
Internal shade: blinds
Blinds, drapes, etc.

Number of skylights: 0



HVAC EQUIPMENT SELECTION (IRC M1401.3)

Heating Equipment Data

Equipment type: Split ASHP
Furnace, Heat pump, Boiler, etc.
Model: Trane
4TWR4036G1+TEM3A0C36S41++TDR
Heating output capacity: 0 Btuh
Heat pumps - capacity at winter design outdoor conditions
Aux. heating output capacity: 22460 Btuh

Cooling Equipment Data

Equipment type: Split ASHP
Air Conditioner, Heat pump, etc.
Model: Trane
4TWR4036G1+TEM3A0C36S41++TDR
Total cooling capacity: 0 Btuh
Sensible cooling capacity: 0 Btuh
Latent cooling capacity: 0 Btuh

Blower Data

Heating cfm: 1220
Cooling cfm: 1220
Static pressure: 0.50 in H₂O
Fan's rated external static pressure for design airflow

HVAC DUCT DISTRIBUTION SYSTEM DESIGN (IRC M1601.1)

Design airflow: 1220 cfm	Longest supply duct: 418 ft	Duct Materials Used
Equipment design ESP: 0.50 in H ₂ O	Longest return duct: 97 ft	Trunk duct: Fiberglass board
Total device pressure losses: 0 in H ₂ O	Total effective length (TEL): 515 ft	Branch duct: Round flex vinyl
Available static pressure (ASP): 0.50 in H ₂ O	Friction rate: 0.097 in/100ft Friction Rate = ASP ÷ (TEL × 100)	

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

Contractor's printed name: _____

Contractor's signature: _____

Date: _____

Reserved for County, Town Municipality or Authority having jurisdiction use

*Home qualifies for MJ1AE Form based on Abridged Edition Checklist

Inside db (°F)	68	75	Construction quality
Design TD (°F)	35	17	Fireplaces
Daily range	-	M	
Inside humidity (%)	50	50	
Moisture difference (gr/lb)	29	47	

Average
0

HEATING EQUIPMENT

Make Trane
Trade TRANE
Model 4TWR4036G1
AHRI ref 10344969

Efficiency 8.5 HSPF
Heating input 34200 Btuh @ 47°F
Temperature rise 26 °F
Actual air flow 1220 cfm
Air flow factor 0.036 cfm/Btuh
Static pressure 0.50 in H2O
Space thermostat
Capacity balance point = 33 °F

Backup: n/a

Input = 7 kW, Output = 22460 Btuh, 100 AFUE

COOLING EQUIPMENT

Make Trane
Trade TRANE
Cond 4TWR4036G1
Coil TEM3A0C36S41++TDR
AHRI ref 10344969

Efficiency 11.5 EER, 14 SEER
Sensible cooling 29280 Btuh
Latent cooling 7320 Btuh
Total cooling 36600 Btuh
Actual air flow 1220 cfm
Air flow factor 0.044 cfm/Btuh
Static pressure 0.50 in H2O
Load sensible heat ratio 0.85

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Master	316	7873	6299	286	274
Wic 1	48	927	415	34	18
wc	40	58	100	2	4
Master bath	215	4005	2036	145	89
living	449	7161	8031	260	349
kitchen/dining	243	2168	3508	79	153
bed 2	156	4573	2161	166	94
bath	54	1346	1682	49	73
bed 3	168	2149	937	78	41
hall	18	0	0	0	0
wic	42	1751	1689	64	74
Pantry	42	0	0	0	0
laundry	70	1617	1176	59	51

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



Right-Suite® Universal 2019 19.0.21 RSU23127

2021-May-21 17:35:19

Page 1

...ents\Wrightsoft HVAC\DWG lot 25 thorne wood.rup Calc = MJ8 Front Door faces: N

Entire House	1861	33629	28035	1220
Other equip loads			0	
Equip. @ 0.97 RSM			27166	
Latent cooling			4835	
TOTALS	1861	33629	32001	1220

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

Weather: Gainesville Rgnl, FL, US

Winter Design Conditions

Outside db 33 °F
Inside db 68 °F
Design TD 35 °F

Summer Design Conditions

Outside db 92 °F
Inside db 75 °F
Design TD 17 °F
Daily range M
Relative humidity 50 %
Moisture difference 47 gr/lb

Heating Summary

Structure 25863 Btuh
Ducts 7766 Btuh
Central vent (0 cfm)
(none) 0 Btuh
Humidification 0 Btuh
Piping 0 Btuh
Equipment load 33629 Btuh

Infiltration

Method Simplified
Construction quality Average
Fireplaces 0

	Heating	Cooling
Area (ft ²)	1843	1843
Volume (ft ³)	16207	16207
Air changes/hour	0.38	0.20
Equiv. AVF (cfm)	103	54

Heating Equipment Summary

Make Trane
Trade TRANE
Model 4TWR4036G1
AHRI ref 10344969
Efficiency 8.5 HSPF
Heating input
Heating output 34200 Btuh @ 47°F
Temperature rise 26 °F
Actual air flow 1220 cfm
Air flow factor 0.036 cfm/Btuh
Static pressure 0.50 in H₂O
Space thermostat
Capacity balance point = 33 °F
Backup: n/a
Input = 7 kW, Output = 22460 Btuh, 100 AFUE

Sensible Cooling Equipment Load Sizing

Structure 17962 Btuh
Ducts 10073 Btuh
Central vent (0 cfm)
(none) 0 Btuh
Blower 0 Btuh
Use manufacturer's data n
Rate/swing multiplier 0.97
Equipment sensible load 27166 Btuh

Latent Cooling Equipment Load Sizing

Structure 2713 Btuh
Ducts 2122 Btuh
Central vent (0 cfm)
(none) 0 Btuh
Equipment latent load 4835 Btuh
Equipment Total Load (Sen+Lat) 32001 Btuh
Req. total capacity at 0.80 SHR 2.8 ton

Cooling Equipment Summary

Make Trane
Trade TRANE
Cond 4TWR4036G1
Coil TEM3A0C36S41++TDR
AHRI ref 10344969
Efficiency 11.5 EER, 14 SEER
Sensible cooling 29280 Btuh
Latent cooling 7320 Btuh
Total cooling 36600 Btuh
Actual air flow 1220 cfm
Air flow factor 0.044 cfm/Btuh
Static pressure 0.50 in H₂O
Load sensible heat ratio 0.85

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



wrightsoft

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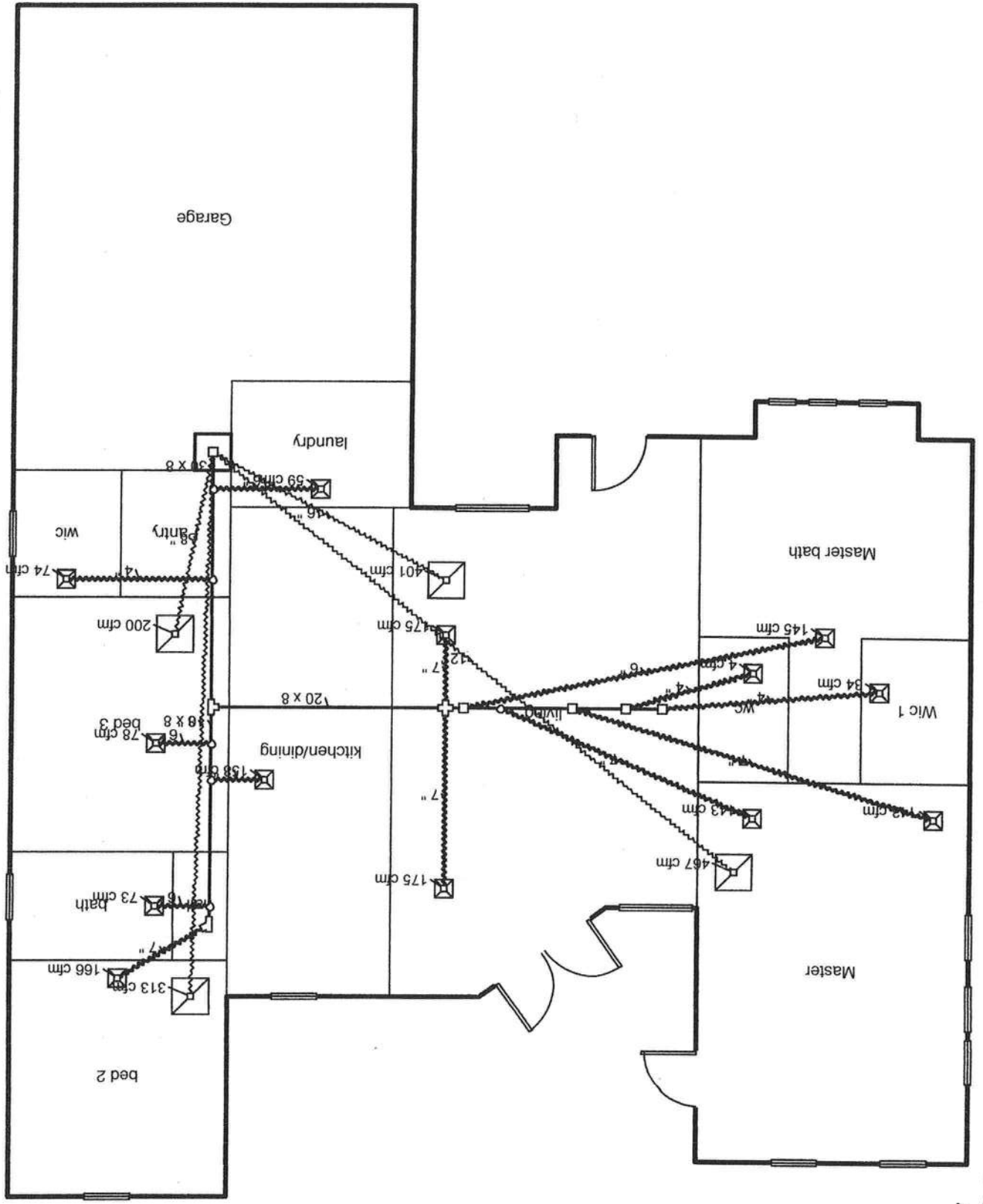
Page 1

...ents\Wrightsoft HVAC\DWG lot 25 thorne wood.rup Calc = MJ8 Front Door faces: N

Job #:
 Performed for:
 DW Construction
 Thornwood Lot 20
 Fla

Air Ducks Heating & Air, Inc.
 2601 NW 76th Ave
 Gainesville, Fla 32653
 Phone: 352-215-4624
 Airducksac.com Airducksac@gmail.com

Scale: 1 : 96
 Page 1
 Right-Suite@ Universal 2019
 19.0.21 RSU23127
 2021-May-21 17:35:45
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Level 1



Available static pressure
Supply / return available pressure
Lowest friction rate
Actual air flow
Total effective length (TEL)

0.50 in H2O
0.406 / 0.094 in H2O
0.097 in/100ft
1220 cfm

0.50 in H2O
0.406 / 0.094 in H2O
0.097 in/100ft
1220 cfm

515 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
Master	h 3937	143	137	0.099	7.0	0x0	VIFx	45.2	365.0	st3
Master bath	h 4005	145	89	0.097	6.0	0x0	VIFx	48.4	370.0	st3
Master-A	h 3937	143	137	0.099	7.0	0x0	VIFx	54.9	355.0	st3
Wic 1	h 927	34	18	0.105	4.0	0x0	VIFx	51.0	335.0	st3
bath	c 1682	49	73	0.154	6.0	0x0	VIFx	28.0	235.0	st2
bed 2	h 4573	166	94	0.201	7.0	0x0	VIFx	31.8	170.0	st2
bed 3	h 2149	78	41	0.148	6.0	0x0	VIFx	19.0	255.0	st2
kitchen/dining	c 3508	79	153	0.153	8.0	0x0	VIFx	21.0	245.0	st2
laundry	h 1617	59	51	0.191	6.0	0x0	VIFx	8.0	205.0	st1
living	c 4015	130	175	0.135	7.0	0x0	VIFx	31.0	270.0	st3
living-A	c 4015	130	175	0.132	7.0	0x0	VIFx	37.0	270.0	st3
wc	c 100	2	4	0.104	4.0	0x0	VIFx	44.3	345.0	st3
wic	c 1689	64	74	0.184	4.0	0x0	VIFx	15.0	205.0	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	1220	1220	0.097	732	15.7	8 x 30	RectFbg	
st3	Peak AVF	726	735	0.097	661	13.0	8 x 20	RectFbg	st1
st2	Peak AVF	371	361	0.148	668	9.3	8 x 10	RectFbg	st1

Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Cig (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joint Opening (in)	Duct Matl	Trunk
rb3	0x0	200	165	70.2	0.134	573	8.0	0x 0		V/Fx	
rb4	0x0	313	187	90.0	0.105	898	8.0	0x 0		V/Fx	
rb2	0x0	257	401	74.8	0.126	287	16.0	0x 0		V/Fx	
rb1	0x0	449	467	97.0	0.097	595	12.0	0x 0		V/Fx	