Certificate of Product Ratings

AHRI Certified Reference Number : 209842226 Date : 08-15-2023 Model Status : Active

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) : TEM4B0C37M31+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 – 2023, 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 : 34400

SEER2 : 14.30

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

Heating Capacity ($H1_{Full}$) – Single or High Stage (47F), btuh : 31800

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.

AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE

we make life better™

CERTIFICATE NO.: 133365843614442680

Manual S Compliance Report

Entire House

Air Ducks Heating & Air, Inc

Job:
Date: Apr 05, 2023
By:

2601 Nw 74th place, Gainesville, Fl 32653 Phone: 352-215-4624 Email: Airducksac@gmail.com Web: airducksac.com License: CAC1817288

Project Information

For: DWC Constuction
Thistlewood lot 8

Cooling Equipment

Design Conditions

Outdoor design DB:	92.2°F	Sensible gain:	25567	Btuh	Entering coil DB:	75.8°F
Outdoor design WB:	75.8°F	Latent gain:	4102	Btuh	Entering coil WB:	62.9°F
Indoor design DB:	75.0°F	Total gain:	29668	Btuh		
Indoor RH:	50%	Estimated airflow:	1167	cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type: Split ASHP
Manufacturer: Trane Model: 4TWR4036N1+TEM4B0C37M31S*

Actual airflow:	1167	cfm		
Sensible capacity:	27114	Btuh	106% of load	
Latent capacity:	5525	Btuh	135% of load	
Total capacity:	32639	Btuh	110% of load	SHR: 83%

Heating Equipment

Design Conditions

Outdoor design DB:	33.2°F	Heat loss:	33864	Btuh	Entering coil DB:	67.6°F
Indoor design DB:	68.0°F					

Manufacturer's Performance Data at Actual Design Conditions

Equipment type: Split ASHP
Manufacturer: Trane Model: 4TWR4036N1+TEM4B0C37M31S*

Actual airflow:	1167	cfm			
Output capacity:	26251	Btuh	78% of load	Capacity balance:	33 °F
Supplemental heat required:	7613	Btuh		Economic balance:	-99 °F

Backup equipment type: Elec strip
Manufacturer: Model:

Actual airflow:	1167	cfm			
Output capacity:	9.6	kW	96% 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 1 15 Mar 09

Header Information

Contractor: Air Ducks Heating & Air, Inc

Mechanical license: CAC1817288

Building plan #:

Home address (Street or Lot#, Block, Subdivision): Thistlewood lot 8, Entire House

REQUIRED ATTACHMENTS	ATTACHED
Manual J1 Form (and supporting worksheets):	Yes ☐ No ☐
or MJ1AE Form* (and supporting worksheets):	Yes ☐ No ☐
OEM performance data (heating, cooling, blower):	Yes ☐ No ☐
Manual D Friction Rate Worksheet:	Yes ☐ No ☐
Duct distribution sketch:	Yes ☐ No ☐

HVAC LOAD CALCULATION (IRC M1401.3)

Design Conditions

Winter Design Conditions

Outdoor temperature:	33	°F
Indoor temperature:	68	°F
Total heat loss:	33864	Btuh

Summer Design Conditions

Outdoor temperature:	92	°F
Indoor temperature:	75	°F
Grains difference:	44 gr/lb @ 50% RH	
Sensible heat gain:	26303	Btuh
Latent heat gain:	4220	Btuh
Total heat gain:	30523	Btuh

Building Construction Information

Building

Orientation: (North, East, West, South, Northeast, Northwest, Southeast, Southwest)	Front Door faces West	
Number of bedrooms:	1	
Conditioned floor area:	1843	ft²
Number of occupants:	5	

Windows

Eave overhang depth:	0	ft
Internal shade: (Blinds, drapes, etc.)	blinds	
Number of skylights:	0	

HVAC EQUIPMENT SELECTION (IRC M1401.3)

Heating Equipment Data

Equipment type: (Furnace, Heat pump, Boiler, etc.)	Split ASHP	
Model:	Trane 4TWR4036N1+TEM4B0C37M31S*	
Heating output capacity: (Heat pumps - capacity at winter design outdoor conditions)	26251	Btuh
Aux. heating output capacity:	32587	Btuh

Cooling Equipment Data

Equipment type: (Air Conditioner, Heat pump, etc.)	Split ASHP	
Model:	Trane 4TWR4036N1+TEM4B0C37M31S*	
Total cooling capacity:	32639	Btuh
Sensible cooling capacity:	27114	Btuh
Latent cooling capacity:	5525	Btuh

Blower Data

Heating cfm:	1167	
Cooling cfm:	1167	
Static pressure: (Fan's rated external static pressure for design airflow)	0.50	in H2O

HVAC DUCT DISTRIBUTION SYSTEM DESIGN (IRC M1601.1)

Design airflow:	1167	cfm
Equipment design ESP:	0.50	in H2O
Total device pressure losses:	0	in H2O
Available static pressure (ASP):	0.50	in H2O

Longest supply duct:	315	ft
Longest return duct:	92	ft
Total effective length (TEL):	407	ft
Friction rate: (Friction Rate = ASP ÷ (TEL x 100))	0.123	in/100ft

Duct Materials Used

Trunk duct: Fiberglass board, Round flex vinyl

Branch duct: Round flex vinyl

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

Load Short Form
Entire House

Air Ducks Heating & Air, Inc

Job:
Date: Apr 05, 2023
By:

2601 Nw 74th place, Gainesville, Fl 32653 Phone: 352-215-4624 Email: Airducksac@gmail.com Web: airducksac.com License: CAC1817288

Project Information

For: DWC Constuction
Thistlewood lot 8

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	44

Infiltration

Method	Simplified
Construction quality	Average
Fireplaces	0

HEATING EQUIPMENT

Make	Trane
Trade	TRANE
Model	4TWR4036N1
AHRI ref	209842226

Efficiency	8.2 HSPF	
Heating input		
Heating output	34400	Btuh @ 47°F
Temperature rise	27	°F
Actual air flow	1167	cfm
Air flow factor	0.034	cfm/Btuh
Static pressure	0.50	in H2O
Space thermostat		

Capacity balance point = 33 °F

Backup:
Input = 10 kW, Output = 32587 Btuh, 100 AFUE

COOLING EQUIPMENT

Make	Trane
Trade	TRANE
Cond	4TWR4036N1
Coil	TEM4B0C37M31S*
AHRI ref	209842226

Efficiency	11.5 EER, 14.3 SEER	
Sensible cooling	24500	Btuh
Latent cooling	10500	Btuh
Total cooling	35000	Btuh
Actual air flow	1167	cfm
Air flow factor	0.046	cfm/Btuh
Static pressure	0.50	in H2O
Load sensible heat ratio	0.86	

ROOM NAME	Area (ft^2)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Master	389	7614	4638	262	212
WIC 1	56	927	446	32	20
WIC 2	48	67	111	2	5
Master bath	199	4181	2538	144	116
Living	375	9091	8985	313	410
Kitchen	216	1919	3472	66	158
Laundry	70	2183	1401	75	64
WIC 3	42	0	0	0	0
Pantry	42	0	0	0	0
Bed 2	144	2953	1324	102	60
Bath	54	1333	595	46	27
Bed 1	144	3598	2056	124	94
Hall	18	0	0	0	0

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

Entire House	1797	33864	25567	1167	1167
Other equip loads			0		
Equip. @ 0.97 RSM		0	0		
Latent cooling			24851		
			4102		
TOTALS	1797	33864	28953	1167	1167

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

Project Summary
Entire House

Air Ducks Heating & Air, Inc

Job:
Date: Apr 05, 2023
By:

2601 Nw 74th place, Gainesville, Fl 32653 Phone: 352-215-4624 Email: Airducksac@gmail.com Web: airducksac.com License: CAC1817288

Project Information

For: DWC Constuction
Thistlewood lot 8

Notes:

Design Information

Weather: Gainesville Regional, 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	44	gr/lb

Heating Summary

Structure	26987	Btuh
Ducts	6878	Btuh
Central vent (0 cfm) (none)	0	Btuh
Humidification	0	Btuh
Piping	0	Btuh
Equipment load	33864	Btuh

Sensible Cooling Equipment Load Sizing

Structure	18187	Btuh
Ducts	7380	Btuh
Central vent (0 cfm) (none)	0	Btuh
Blower	0	Btuh
Use manufacturer's data	n	
Rate/swing multiplier	0.97	
Equipment sensible load	24851	Btuh

Infiltration

Method	Simplified
Construction quality	Average
Fireplaces	0

	Heating	Cooling
Area (ft²)	1843	1843
Volume (ft³)	15251	15251
Air changes/hour	0.38	0.20
Equiv. AVF (cfm)	97	51

Latent Cooling Equipment Load Sizing

Structure	2507	Btuh
Ducts	1595	Btuh
Central vent (0 cfm) (none)	0	Btuh
Equipment latent load	4102	Btuh
Equipment Total Load (Sen+Lat)	28953	Btuh
Req. total capacity at 0.70 SHR	3.0	ton

Heating Equipment Summary

Make	Trane
Trade	TRANE
Model	4TWR4036N1
AHRI ref	209842226

Efficiency	8.2 HSPF	
Heating input		
Heating output	34400	Btuh @ 47°F
Temperature rise	27	°F
Actual air flow	1167	cfm
Air flow factor	0.034	cfm/Btuh
Static pressure	0.50	in H2O
Space thermostat		

Capacity balance point = 33 °F

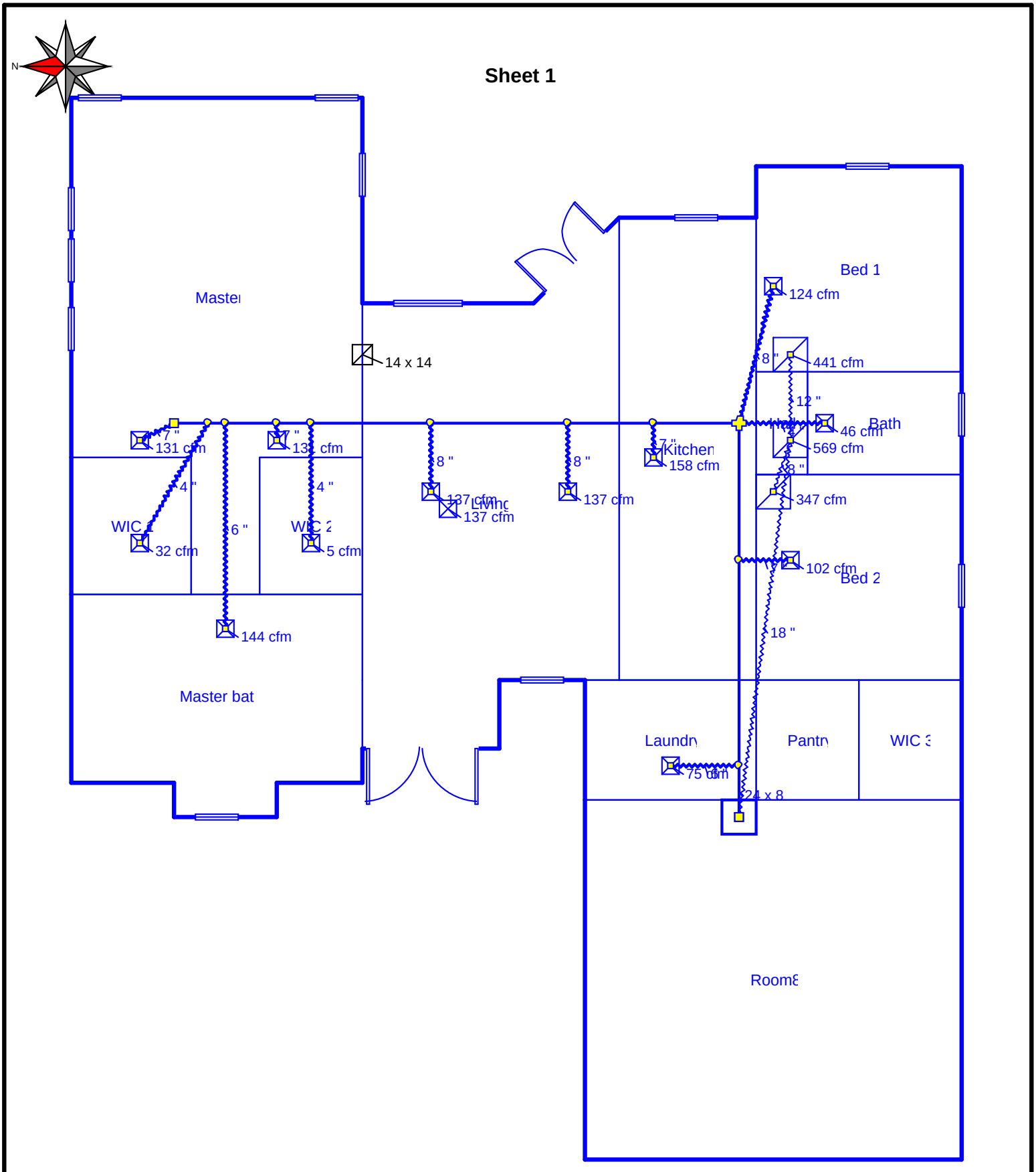
Backup:
Input = 10 kW, Output = 32587 Btuh, 100 AFUE

Cooling Equipment Summary

Make	Trane
Trade	TRANE
Cond	4TWR4036N1
Coil	TEM4B0C37M31S*
AHRI ref	209842226

Efficiency	11.5 EER, 14.3 SEER	
Sensible cooling	24500	Btuh
Latent cooling	10500	Btuh
Total cooling	35000	Btuh
Actual air flow	1167	cfm
Air flow factor	0.046	cfm/Btuh
Static pressure	0.50	in H2O
Load sensible heat ratio	0.86	

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



Job #:
Performed for:
DWC Constuction
Thistlewood lot 8

Air Ducks Heating & Air, Inc
2601 Nw 74th place
Gainesville, Fl 32653
Phone: 352-215-4624
airducksac.com Airducksac@gmail.com

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Duct System Summary
Entire House

Air Ducks Heating & Air, Inc

Job:
Date: Apr 05, 2023
By:

2601 Nw 74th place, Gainesville, Fl 32653 Phone: 352-215-4624 Email: Airducksac@gmail.com Web: airducksac.com License: CAC1817288

Project Information

For: DWC Constuction
Thistlewood lot 8

	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	0.387 / 0.113 in H2O	0.387 / 0.113 in H2O
Lowest friction rate	0.123 in/100ft	0.123 in/100ft
Actual air flow	1167 cfm	1167 cfm
Total effective length (TEL)	407 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	1333	46	27	0.206	4.0	0x 0	VlFx	28.0	160.0	st1
Bed 1	h	3598	124	94	0.202	8.0	0x 0	VlFx	31.2	160.0	st1
Bed 2	h	2953	102	60	0.206	7.0	0x 0	VlFx	18.0	170.0	st1
Kitchen	c	3472	66	158	0.129	7.0	0x 0	VlFx	30.0	270.0	st1
Laundry	h	2183	75	64	0.207	6.0	0x 0	VlFx	7.0	180.0	st1
Living	c	2996	104	137	0.126	8.0	0x 0	VlFx	37.0	270.0	st1
Living-A	c	2995	104	137	0.123	8.0	0x 0	VlFx	45.0	270.0	st1
Living-B	c	2995	104	137	0	0	0x 0	VlFx	0	0	
Master	h	3807	131	106	0.126	7.0	0x 0	VlFx	51.0	255.0	st1
Master bath	h	4181	144	116	0.125	6.0	0x 0	VlFx	65.0	245.0	st1
Master-A	h	3807	131	106	0.137	7.0	0x 0	VlFx	58.2	225.0	st1
WIC 1	h	927	32	20	0.130	4.0	0x 0	VlFx	62.1	235.0	st1
WIC 2	c	111	2	5	0.123	4.0	0x 0	VlFx	55.0	260.0	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	1063	1030	0.123	797	14.2	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
rb3	0x 0	441	353	87.2	0.130	561	12.0	0x 0		VlFx	rt1
rb4	0x 0	347	245	85.4	0.133	994	8.0	0x 0		VlFx	rt1
rb5	0x 0	379	569	92.2	0.123	532	14.0	0x 0		VlFx	rt1

Return Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
rt1	Peak AVF	1167	1167	0.123	660	18.0	0 x 0	VinlFlx	