



Reviewed for Code Compliance
UES Professional Solutions, LLC
AAslan RPX350
Examiner - License No.

*Powell Residence
HVAC Load Calculations*

for

Derek & Joanna Powell
20345 NW 248th Drive
High Springs, FL 32643



RHVAC RESIDENTIAL
HVAC LOADS

Prepared By:

Darma Sainmervil
JM Properties Of West Palm Beach Inc
10606 Versailles Blvd
Wellington, FL 33467

Friday, July 25, 2025

Rhvac is an ACCA approved Manual J, D and S computer program.
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.



Project Report

General Project Information

Project Title: Powell Residence
 Designed By: Greg Bolinsky
 Project Date: Friday, July 11, 2025
 Client Name: Derek & Joanna Powell
 Client Address: 20345 NW 248th Drive
 Client City: High Springs, FL 32643
 Company Name: JM Properties Of West Palm Beach Inc
 Company Representative: Darma Sainmervil
 Company Address: 10606 Versailles Blvd
 Company City: Wellington, FL 33467

Design Data

Reference City: Gainesville, Florida
 Building Orientation: House faces East
 Daily Temperature Range: Medium
 Latitude: 29 Degrees
 Elevation: 152 ft.
 Altitude Factor: 0.995

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	33	30.8	n/a	n/a	70	n/a
Summer:	92	77	51%	50%	75	52

Check Figures

Total Building Supply CFM:	3,675	CFM Per Square ft.:	0.731
Square ft. of Room Area:	5,030	Square ft. Per Ton:	590
Volume (ft³):	52,284		

Building Loads

Total Heating Required Including Ventilation Air:	99,347 Btuh	99.347 MBH
Total Sensible Gain:	82,916 Btuh	81 %
Total Latent Gain:	19,376 Btuh	19 %
Total Cooling Required Including Ventilation Air:	102,292 Btuh	8.52 Tons (Based On Sensible + Latent)

Notes

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 Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.



Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
ES FG Impact: Glazing-Impact Aluminum Fixed Glass Double Pane LowE, U-value 1.01, SHGC 0.32	115.4	4,314	0	4,090	4,090
ES HR Impact: Glazing-Impact Aluminum Horizontal Slider Double Pane LowE , U-value 1.06, SHGC 0.28	339.5	13,317	0	10,026	10,026
ES SGD Impact: Glazing-Impact Aluminum Sliding Glass Door Double Pane LowE, U-value 1.02, SHGC 0.3	192	7,247	0	4,532	4,532
ES FD Impact: Glazing-Impact Aluminum French Door Single Pane , U-value 1.04, SHGC 0.48	24	924	0	665	665
ES SH Impact: Glazing-Impact Aluminum Single Hung Double Pane LowE , U-value 1.08, SHGC 0.36	18	720	0	618	618
ES SH Impact: Glazing-Impact Aluminum Single Hung Double Pane LowE , U-value 1.04, SHGC 0.29	64.4	2,481	0	2,172	2,172
11J: Door-Metal - Fiberglass Core, U-value 0.6	161.4	3,266	0	2,523	2,523
13A-4ocs: Wall-Block, board insulation only, R-4 board insulation, open core, siding finish, U-value 0.143	3704.5	19,599	0	9,167	9,167
12B-0sw: Part-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs, U- value 0.097	306	445	0	445	445
12B-0sw: Wall-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs, U-value 0.097	774.8	2,779	0	1,963	1,963
16B-30-zd: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), vented attic, no radiant barrier, R-30 insulation, dark membrane, U-value 0.032	5102	6,043	0	8,490	8,490
22A-pl: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, light dry soil, U-value 0.989	515	18,850	0	0	0
20P-11: Floor-Over open crawl space or garage, Passive, R-11 blanket insulation, any cover, U-value 0.078	444	1,281	0	416	416
Subtotals for structure:		81,266	0	45,107	45,107
People:	9		2,340	1,980	4,320
Equipment:			11,075	17,400	28,475
Lighting:	1475			5,030	5,030
Ductwork:		9,265	2,001	8,783	10,785
Infiltration: Winter CFM: 218, Summer CFM: 113		8,816	3,960	2,109	6,069
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
AED Excursion:		0	0	2,507	2,507
Total Building Load Totals:		99,347	19,376	82,916	102,292

Check Figures

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Notes

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Total Building Summary Loads (cont'd)

Notes

All computed results are estimates as building use and weather may vary.
Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.



System 1 AC 1 Main House Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
ES FG Impact: Glazing-Impact Aluminum Fixed Glass Double Pane LowE, U-value 1.01, SHGC 0.32	70.8	2,646	0	2,699	2,699
ES HR Impact: Glazing-Impact Aluminum Horizontal Slider Double Pane LowE , U-value 1.06, SHGC 0.28	124.5	4,884	0	2,971	2,971
ES SGD Impact: Glazing-Impact Aluminum Sliding Glass Door Double Pane LowE, U-value 1.02, SHGC 0.3	144	5,435	0	3,399	3,399
11J: Door-Metal - Fiberglass Core, U-value 0.6	113.4	2,200	0	1,717	1,717
13A-4ocs: Wall-Block, board insulation only, R-4 board insulation, open core, siding finish, U-value 0.143	1298.1	6,868	0	3,212	3,212
12B-0sw: Part-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs, U- value 0.097	226	329	0	329	329
12B-0sw: Wall-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs, U-value 0.097	93.2	334	0	236	236
16B-30-zd: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), vented attic, no radiant barrier, R-30 insulation, dark membrane, U-value 0.032	2204	2,611	0	3,668	3,668
22A-pl: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, light dry soil, U-value 0.989	226	8,272	0	0	0
Subtotals for structure:		33,579	0	18,231	18,231
People:	3		780	660	1,440
Equipment:			3,800	6,000	9,800
Lighting:	725			2,472	2,472
Ductwork:		4,198	719	3,431	4,149
Infiltration: Winter CFM: 104, Summer CFM: 54		4,200	1,887	1,005	2,892
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
AED Excursion:		0	0	2,507	2,507
System 1 AC 1 Main House Load Totals:		41,977	7,186	34,306	41,491

Check Figures

Supply CFM:	1,501	CFM Per Square ft.:	0.681
Square ft. of Room Area:	2,204	Square ft. Per Ton:	637
Volume (ft³):	24,912		

System Loads

Total Heating Required Including Ventilation Air:	41,977 Btuh	41.977 MBH
Total Sensible Gain:	34,306 Btuh	83 %
Total Latent Gain:	7,186 Btuh	17 %
Total Cooling Required Including Ventilation Air:	41,491 Btuh	3.46 Tons (Based On Sensible + Latent)

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 Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.



System 2 AC 2 Master Suite & Study Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
ES FD Impact: Glazing-Impact Aluminum French Door Single Pane , U-value 1.04, SHGC 0.48	24	924	0	665	665
ES HR Impact: Glazing-Impact Aluminum Horizontal Slider Double Pane LowE , U-value 1.06, SHGC 0.28	45	1,765	0	1,642	1,642
ES FG Impact: Glazing-Impact Aluminum Fixed Glass Double Pane LowE, U-value 1.01, SHGC 0.32	44.6	1,668	0	1,391	1,391
ES SH Impact: Glazing-Impact Aluminum Single Hung Double Pane LowE , U-value 1.08, SHGC 0.36	18	720	0	618	618
ES SH Impact: Glazing-Impact Aluminum Single Hung Double Pane LowE , U-value 1.04, SHGC 0.29	18	693	0	733	733
13A-4ocs: Wall-Block, board insulation only, R-4 board insulation, open core, siding finish, U-value 0.143	1037.4	5,488	0	2,567	2,567
12B-Osw: Wall-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs, U-value 0.097	16	57	0	41	41
16B-30-zd: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), vented attic, no radiant barrier, R-30 insulation, dark membrane, U-value 0.032	1241	1,470	0	2,066	2,066
22A-pl: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, light dry soil, U-value 0.989	125	4,575	0	0	0
Subtotals for structure:		17,360	0	9,723	9,723
People:	2		520	440	960
Equipment:			2,625	2,500	5,125
Lighting:	300			1,023	1,023
Ductwork:		2,148	448	1,573	2,021
Infiltration: Winter CFM: 49, Summer CFM: 25		1,972	886	471	1,357
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
System 2 AC 2 Master Suite & Study Load Totals:		21,480	4,479	15,730	20,209

Check Figures

Supply CFM:	700	CFM Per Square ft.:	0.598
Square ft. of Room Area:	1,169	Square ft. Per Ton:	694
Volume (ft ³):	11,690		

System Loads

Total Heating Required Including Ventilation Air:	21,480	Btuh	21.480	MBH
Total Sensible Gain:	15,730	Btuh	78	%
Total Latent Gain:	4,479	Btuh	22	%
Total Cooling Required Including Ventilation Air:	20,209	Btuh	1.68	Tons (Based On Sensible + Latent)

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System 3 AC 3 Bonus Room Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
ES SH Impact: Glazing-Impact Aluminum Single Hung Double Pane LowE , U-value 1.04, SHGC 0.29	46.4	1,788	0	1,439	1,439
12B-0sw: Wall-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs, U-value 0.097	665.6	2,388	0	1,686	1,686
12B-0sw: Part-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs, U-value 0.097	80	116	0	116	116
16B-30-zd: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), vented attic, no radiant barrier, R-30 insulation, dark membrane, U-value 0.032	444	526	0	739	739
20P-11: Floor-Over open crawl space or garage, Passive, R-11 blanket insulation, any cover, U-value 0.078	444	1,281	0	416	416
Subtotals for structure:		6,099	0	4,396	4,396
People:	2		520	440	960
Equipment:			900	1,700	2,600
Lighting:	150			512	512
Ductwork:		0	258	1,345	1,604
Infiltration: Winter CFM: 15, Summer CFM: 8		599	269	143	412
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
System 3 AC 3 Bonus Room Load Totals:		6,698	1,947	8,536	10,483

Check Figures

Supply CFM:	379	CFM Per Square ft.:	0.854
Square ft. of Room Area:	444	Square ft. Per Ton:	508
Volume (ft³):	3,552		

System Loads

Total Heating Required Including Ventilation Air:	6,698 Btuh	6.698 MBH
Total Sensible Gain:	8,536 Btuh	81 %
Total Latent Gain:	1,947 Btuh	19 %
Total Cooling Required Including Ventilation Air:	10,483 Btuh	0.87 Tons (Based On Sensible + Latent)

Notes

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 Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.



System 4 AC 4 In-Law Suite Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
ES HR Impact: Glazing-Impact Aluminum Horizontal Slider Double Pane LowE, U-value 1.06, SHGC 0.28	170	6,668	0	5,413	5,413
ES SGD Impact: Glazing-Impact Aluminum Sliding Glass Door Double Pane LowE, U-value 1.02, SHGC 0.3	48	1,812	0	1,133	1,133
11J: Door-Metal - Fiberglass Core, U-value 0.6	48	1,066	0	806	806
13A-4ocs: Wall-Block, board insulation only, R-4 board insulation, open core, siding finish, U-value 0.143	1369	7,243	0	3,388	3,388
16B-30-zd: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), vented attic, no radiant barrier, R-30 insulation, dark membrane, U-value 0.032	1213	1,436	0	2,017	2,017
22A-pl: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, light dry soil, U-value 0.989	164	6,003	0	0	0
Subtotals for structure:		24,228	0	12,757	12,757
People:	2		520	440	960
Equipment:			3,750	7,200	10,950
Lighting:	300			1,023	1,023
Ductwork:		2,919	576	2,434	3,011
Infiltration: Winter CFM: 51, Summer CFM: 26		2,045	918	490	1,408
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
System 4 AC 4 In-Law Suite Load Totals:		29,192	5,764	24,344	30,109

Check Figures

Supply CFM:	1,095	CFM Per Square ft.:	0.903
Square ft. of Room Area:	1,213	Square ft. Per Ton:	483
Volume (ft³):	12,130		

System Loads

Total Heating Required Including Ventilation Air:	29,192 Btuh	29.192 MBH
Total Sensible Gain:	24,344 Btuh	81 %
Total Latent Gain:	5,764 Btuh	19 %
Total Cooling Required Including Ventilation Air:	30,109 Btuh	2.51 Tons (Based On Sensible + Latent)

Notes

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**Equipment Data - System 1 - AC 1 Main House****Cooling**

System Type:	Two Speed Heat Pump
Outdoor Model:	GH8TAN548**AA*
Indoor Model:	FG5ANXC48L*
Tradename:	2-STAGE 18 SEER HP
Outdoor Manufacturer:	CARRIER
Indoor Manufacturer:	CARRIER
Description:	2-STAGE 18 SEER HP
Comment:	SEER2
AHRI Reference No.:	215628910
Capacity:	47,500
Efficiency:	17 SEER

Heating

System Type:	Two Speed Heat Pump
Model:	GH8TAN548**AA*
Tradename:	2-STAGE 18 SEER HP
Manufacturer:	CARRIER
Description:	2-STAGE 18 SEER HP
Comment:	HSPF2
Capacity:	Hi: 48,500 / Lo: 30,400
Efficiency:	Hi: 8.1 / Lo: 0 HSPF



Equipment Data - System 2 - AC 2 Master Suite & Study

Cooling

System Type:	Two Speed Heat Pump
Outdoor Model:	GH8TAN524**AA*
Indoor Model:	FG5ANXB24L*
Tradename:	2-STAGE 18 SEER HP
Outdoor Manufacturer:	CARRIER
Indoor Manufacturer:	CARRIER
Description:	2-STAGE 18 SEER HP
Comment:	SEER2
AHRI Reference No.:	215560654
Capacity:	23,200
Efficiency:	17.5 SEER

Heating

System Type:	Two Speed Heat Pump
Model:	GH8TAN524**AA*
Tradename:	2-STAGE 18 SEER HP
Manufacturer:	CARRIER
Description:	2-STAGE 18 SEER HP
Comment:	HSPF2
Capacity:	Hi: 24,800 / Lo: 14,600
Efficiency:	Hi: 8.1 / Lo: 0 HSPF



Equipment Data - System 3 - AC 3 Bonus Room

Cooling

System Type:	Air Source Heat Pump
Outdoor Model:	37MARAQ12AA3
Indoor Model:	45MBCAQ12XA3
Tradename:	45M SERIES
Outdoor Manufacturer:	CARRIER
Indoor Manufacturer:	CARRIER
Description:	MINI-SPLIT HEAT PUMP
Comment:	SEER2
AHRI Reference No.:	215323823
Capacity:	12,000
Efficiency:	21.2 SEER

Heating

System Type:	Air Source Heat Pump
Model:	37MARAQ12AA3
Tradename:	45M SERIES
Manufacturer:	CARRIER
Description:	MINI-SPLIT HEAT PUMP
Comment:	HSPF2
Capacity:	12,000
Efficiency:	10.4 HSPF



Equipment Data - System 4 - AC 4 In-Law Suite

Cooling

System Type:	Two Speed Heat Pump
Outdoor Model:	GH8TAN536**AA*
Indoor Model:	FG5ANXC36L*
Tradename:	2-STAGE 18 SEER HP
Outdoor Manufacturer:	CARRIER
Indoor Manufacturer:	CARRIER
Description:	2-STAGE 18 SEER HP
Comment:	SEER2
AHRI Reference No.:	215560680
Capacity:	34,600
Efficiency:	15.2 SEER

Heating

System Type:	Two Speed Heat Pump
Model:	GH8TAN536**AA*
Tradename:	2-STAGE 18 SEER HP
Manufacturer:	CARRIER
Description:	2-STAGE 18 SEER HP
Comment:	HSPF2
Capacity:	Hi: 37,600 / Lo: 23,400
Efficiency:	Hi: 8.1 / Lo: 0 HSPF



Manual S Performance Data - System 1 - AC 1 Main House

Loads and Design Conditions

Cooling:

Outdoor Dry Bulb:	92	Sensible Gain:	34.306
Outdoor Wet Bulb:	77	Latent Gain:	7.186
Indoor Dry Bulb:	75	Total Gain:	41.491
Indoor RH:	50	Load SHR:	0.83
Supply Airflow:	1,501	Entering Dry Bulb:	75.9
		Entering Wet Bulb:	62.8

Heating:

Outdoor Dry Bulb:	33	Sensible Loss:	41.977
Indoor Dry Bulb:	70	Entering Dry Bulb:	66.9
Indoor RH:	30	Supply Airflow:	525

Equipment Performance Data at System Design Conditions

Cooling:

Model Type: Two Speed Heat Pump, Model: GH8TAN548**AA*+FG5ANXC48L*, Nominal Capacity: 47.500, Manufacturer: CARRIER

Interpolation Results:

		<u>Load</u>	<u>Percent of Load</u>
Sensible Capacity:	35.625	34.306	104%
Latent Capacity:	11.875	7.186	165%
Total Capacity:	47.500	41.491	114%

Heating:

Model Type: Two Speed Heat Pump, Model: GH8TAN548**AA*, Nominal Capacity: 48.500, Manufacturer: CARRIER

Results:

		<u>Load</u>	<u>Percent of Load</u>
Heating Capacity:	48.500	41.977	116%



Manual S Performance Data - System 2 - AC 2 Master Suite & Study

Loads and Design Conditions

Cooling:

Outdoor Dry Bulb:	92	Sensible Gain:	15.730
Outdoor Wet Bulb:	77	Latent Gain:	4.479
Indoor Dry Bulb:	75	Total Gain:	20.209
Indoor RH:	50	Load SHR:	0.78
Supply Airflow:	700	Entering Dry Bulb:	75.6
		Entering Wet Bulb:	62.7

Heating:

Outdoor Dry Bulb:	33	Sensible Loss:	21.480
Indoor Dry Bulb:	70	Entering Dry Bulb:	68.1
Indoor RH:	30	Supply Airflow:	273

Equipment Performance Data at System Design Conditions

Cooling:

Model Type: Two Speed Heat Pump, Model: GH8TAN524**AA*+FG5ANXB24L*, Nominal Capacity: 23.200, Manufacturer: CARRIER

Interpolation Results:

		<u>Load</u>	<u>Percent of Load</u>
Sensible Capacity:	17.400	15.730	111%
Latent Capacity:	5.800	4.479	129%
Total Capacity:	23.200	20.209	115%

Heating:

Model Type: Two Speed Heat Pump, Model: GH8TAN524**AA*, Nominal Capacity: 24.800, Manufacturer: CARRIER

Results:

		<u>Load</u>	<u>Percent of Load</u>
Heating Capacity:	24.800	21.480	115%



Manual S Performance Data - System 3 - AC 3 Bonus Room

Loads and Design Conditions

Cooling:

Outdoor Dry Bulb:	0	Sensible Gain:	8.536
Outdoor Wet Bulb:	77	Latent Gain:	1.947
Indoor Dry Bulb:	75	Total Gain:	10.483
Indoor RH:	50	Load SHR:	0.81
Supply Airflow:	0	Entering Dry Bulb:	0
		Entering Wet Bulb:	0

Heating:

Outdoor Dry Bulb:	33	Sensible Loss:	6.698
Indoor Dry Bulb:	70	Entering Dry Bulb:	70.0
Indoor RH:	30	Supply Airflow:	87

Equipment Performance Data at System Design Conditions

Cooling:

Model Type: Air Source Heat Pump, Model: 37MARAQ12AA3+45MBCAQ12XA3, Nominal Capacity: 12.000, Manufacturer: CARRIER

Interpolation Results:

		<u>Load</u>	<u>Percent of Load</u>
Sensible Capacity:	0.000	8.536	0%
Latent Capacity:	0.000	1.947	0%
Total Capacity:	0.000	10.483	0%

Heating:

Model Type: Air Source Heat Pump, Model: 37MARAQ12AA3, Nominal Capacity: 12.000, Manufacturer: CARRIER

Results:

		<u>Load</u>	<u>Percent of Load</u>
Heating Capacity:	12.000	6.698	179%



Manual S Performance Data - System 4 - AC 4 In-Law Suite

Loads and Design Conditions

Cooling:

Outdoor Dry Bulb:	92	Sensible Gain:	24.344
Outdoor Wet Bulb:	77	Latent Gain:	5.764
Indoor Dry Bulb:	75	Total Gain:	30.109
Indoor RH:	50	Load SHR:	0.81
Supply Airflow:	1,095	Entering Dry Bulb:	75.3
		Entering Wet Bulb:	62.6

Heating:

Outdoor Dry Bulb:	33	Sensible Loss:	29.192
Indoor Dry Bulb:	70	Entering Dry Bulb:	68.9
Indoor RH:	30	Supply Airflow:	375

Equipment Performance Data at System Design Conditions

Cooling:

Model Type: Two Speed Heat Pump, Model: GH8TAN536**AA*+FG5ANXC36L*, Nominal Capacity: 34.600, Manufacturer: CARRIER

Entered Interpolation Data:

EWB °F	Air Flow CFM	ODB °F	Total Capacity MBtuh	Power Input kW	EDB 75.3 °F	
					S/T	Sensible Capacity MBtuh
62.6	1095	92	34.6	0	0.75	25.95

Interpolation Results:

		<u>Load</u>	<u>Percent of Load</u>
Sensible Capacity:	25.950	24.344	107%
Latent Capacity:	8.650	5.764	150%
Total Capacity:	34.600	30.109	115%

Heating:

Model Type: Two Speed Heat Pump, Model: GH8TAN536**AA*, Nominal Capacity: 37.600, Manufacturer: CARRIER

Results:

		<u>Load</u>	<u>Percent of Load</u>
Heating Capacity:	37.600	29.192	129%