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## **SYNERGY3D**

**RESIDENTIAL**

R-410A Refrigerant

Dual Capacity: 3-6 Tons



Submittal Data

English Language/IP Units

SD1300YS 06/10

Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

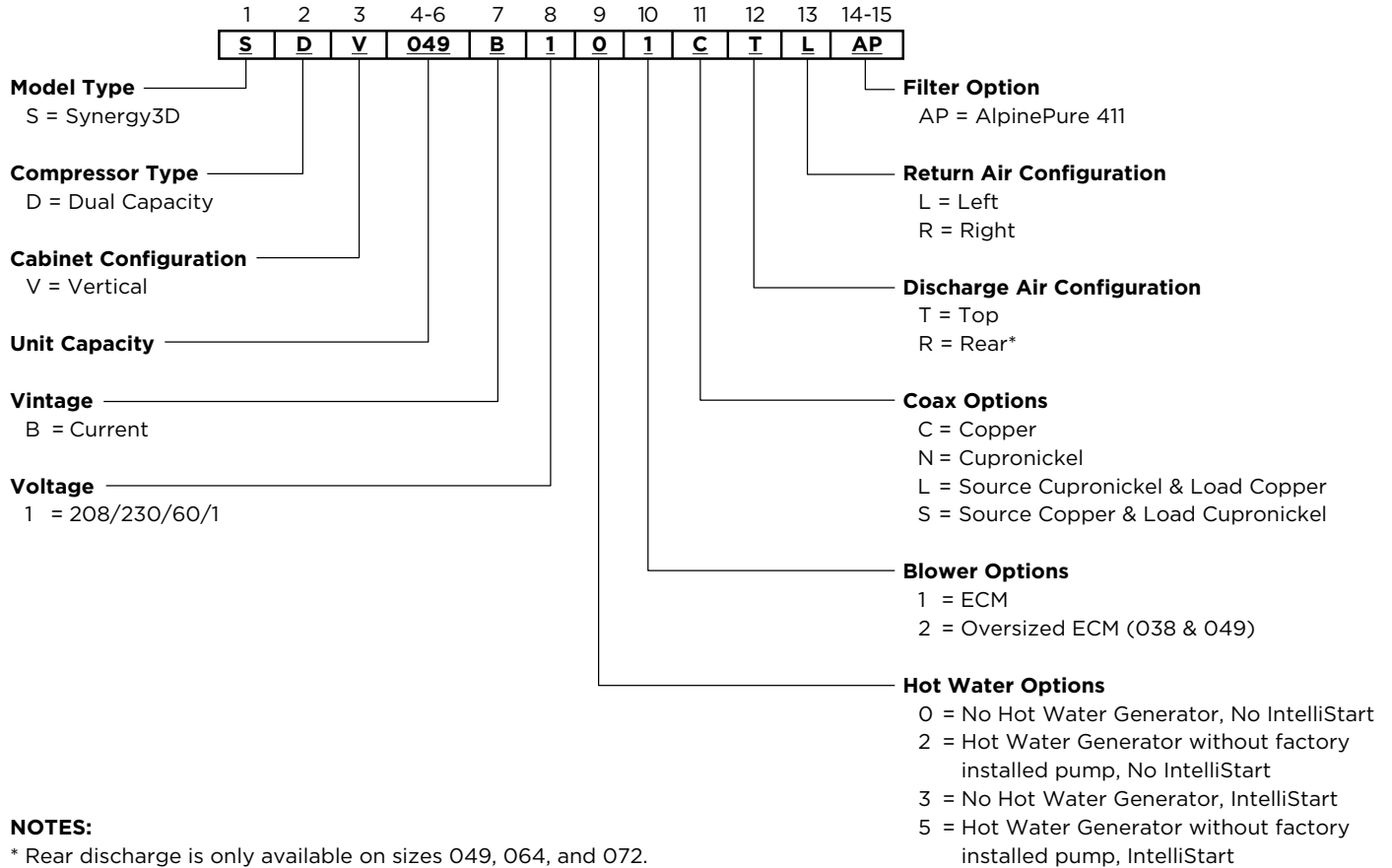
Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

### Synergy3D Residential Series 3-6 Tons 60Hz



## Model Nomenclature



**NOTES:**

\* Rear discharge is only available on sizes 049, 064, and 072.  
The factory installed Hot Water option (hot water generator) does not include a factory mounted circulating pump or temperature control. Kit DPK5 (ordered separately) includes field installed circulator, hot water tank adaptor, temperature limit, and installation instructions.

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**Synergy3D Residential Series  
 3-6 Tons 60Hz**



## Performance Standard AHRI/ISO/ASHRAE 13256-1

The performance standard AHRI/ASHRAE/ISO 13256-1 became effective January 1, 2000 and replaces ARI Standards 320, 325, and 330. This new standard has three major categories: Water Loop (comparable to ARI 320), Ground Water (ARI 325), and Ground Loop (ARI 330). Although these standards are similar there are some differences:

**Unit of Measure: The Cooling COP**

The cooling efficiency is measured in EER (US version measured in Btuh per Watt. The Metric version is measured in a cooling COP (Watt per Watt) similar to the traditional COP measurement.

**Water Conditions Differences**

Entering water temperatures have changed to reflect the centigrade temperature scale. For instance the water loop heating test is performed with 68°F (20°C) water rounded down from the old 70°F (21.1°C).

**Air Conditions Differences**

Entering air temperatures have also changed (rounded down) to reflect the centigrade temperature scale. For instance the cooling tests are performed with 80.6°F (27°C) dry bulb and 66.2°F (19°C) wet bulb entering air instead of the traditional 80°F (26.7°C) DB and 67°F (19.4°C) WB entering air temperatures. 80.6/66.2 data may be converted to 80/67 using the entering air correction table. This represents a significantly lower relative humidity than the old 80/67 of 50% and will result in lower latent capacities.

**Pump Power Correction Calculation**

Within each model, only one water flow rate is specified for all three groups and pumping Watts are calculated using the following formula. This additional power is added onto the existing power consumption.

- Pump power correction = (gpm x 0.0631) x (Press Drop x 2990) / 300

Where 'gpm' is waterflow in gpm and 'Press Drop' is the pressure drop through the unit heat exchanger at rated water flow in feet of head.

**Blower Power Correction Calculation**

Blower power is corrected to zero external static pressure using the following equation. The nominal airflow is rated at a specific external static pressure. This effectively reduces the power consumption of the unit and increases cooling capacity but decreases heating capacity. These Watts are significant enough in most cases to increase EER and COPs fairly dramatically over ARI 320, 325, and 330 ratings.

- Blower Power Correction = (cfm x 0.472) x (esp x 249) / 300

Where 'cfm' is airflow in cfm and 'esp' is the external static pressure at rated airflow in inches of water gauge.

**ISO Capacity and Efficiency Calculations**

The following equations illustrate cooling calculations:

- ISO Cooling Capacity = Cooling Capacity (Btuh) + (Blower Power Correction (Watts) x 3.412)
- ISO EER Efficiency (W/W) = ISO Cooling Capacity (Btuh) x 3.412 / [Power Input (Watts) - Blower Power Correction (Watts) + Pump Power Correction (Watt)]

The following equations illustrate heating calculations:

- ISO Heating Capacity = Heating Capacity (Btuh) - (Blower Power Correction (Watts) x 3.412)
- ISO COP Efficiency (W/W) = ISO Heating Capacity (Btuh) x 3.412 / [Power Input (Watts) - Blower Power Correction (Watts) + Pump Power Correction (Watt)]

**Comparison of Test Conditions**

	ARI 320	ISO/AHRI 13256-1 WLHP	ARI 325	ISO/AHRI 13256-1 GWHP	ARI 330	ISO/AHRI 13256-1 GLHP
<b>Cooling</b>						
Entering Air - DB/WB °F	80/67	80.6/66.2	80/67	80.6/66.2	80/67	80.6/66.2
Entering Water - °F	85	86	50/70	59	77	77
Fluid Flow Rate	*	**	**	**	**	**
<b>Heating</b>						
Entering Air - DB/WB °F	70	68	70	68	70	68
Entering Water - °F	70	68	50/70	50	32	32
Fluid Flow Rate	*	**	**	**	**	**

Note \*: Flow rate is set by 10°F rise in standard cooling test

Note \*\*: Flow rate is specified by the manufacturer

Part load entering water conditions not shown.

WLHP = Water Loop Heat Pump; GWHP = Ground Water Heat Pump; GLHP = Ground Loop Heat Pump

**Conversions:**

Airflow (lps) = CFM x 0.472;

ESP (Pascals) = ESP (in wg) x 249;

WaterFlow (lps) = GPM x 0.0631;

Press Drop (Pascals) = Press Drop (ft hd) x 2990

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**Synergy3D Residential Series  
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## AHRI/ISO 13256-1 Performance Ratings

Model	Capacity Modulation	Flow Rate		Ground Water Heat Pump					Ground Loop Heat Pump				
				Cooling EWT 59°F		Heating EWT 50°F		Energy Star Rated	Full Load 77°F Part Load 68°F		Full Load 32°F Part Load 41°F		Energy Star Rated
		gpm	cfm	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP		Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	
038	Full	9.0	1200	37,100	19.6	31,100	4.6	Yes	35,800	18.5	24,800	4.0	Yes
	Part	8.0	1000	27,400	27.8	22,200	5.0		26,500	23.7	20,000	4.5	
049	Full	12.0	1500	45,000	22.1	39,300	4.5	Yes	44,600	16.6	34,000	3.7	Yes
	Part	11.0	1300	37,500	25.3	32,400	4.7		36,100	21.7	28,600	4.2	
064	Full	16.0	1800	65,200	18.8	53,800	4.1	Yes	60,500	15.4	42,000	3.5	Yes
	Part	14.0	1500	48,300	24.3	38,000	4.3		46,100	20.8	33,000	3.9	
072	Full	18.0	2000	74,500	17.7	64,600	4.1	Yes	70,400	15.0	50,000	3.6	Yes
	Part	16.0	1500	56,600	22.6	47,100	4.2		55,400	20.2	41,400	3.9	

Cooling capacities based upon 80.6°F DB, 66.2°F WB entering air temperature  
 Heating capacities based upon 68°F DB, 59°F WB entering air temperature  
 All ratings based upon 208V operation

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## Operating Limits

Operating Limits	Cooling		Heating	
	(°F)	(°C)	(°F)	(°C)
<b>Air Limits</b>				
Min. Ambient Air	45	7.2	45	7.2
Rated Ambient Air	80	26.7	70	21.1
Max. Ambient Air	100	37.8	85	29.4
Min. Entering Air	50	10.0	40	4.4
Rated Entering Air db/wb	80.6/66.2	27/19	68	20.0
Max. Entering Air db/wb	110/83	43/28.3	80	26.7
<b>Water Limits</b>				
Min. Entering Water	30	-1.1	20	-6.7
Normal Entering Water	50-110	10-43.3	30-70	-1.1
Max. Entering Water	120	48.9	90	32.2

**NOTE:** Minimum/maximum limits are only for start-up conditions, and are meant for bringing the space up to occupancy temperature. Units are not designed to operate at the minimum/maximum conditions on a regular basis. The operating limits are dependant upon three primary factors: 1) water temperature, 2) return air temperature, and 3) ambient temperature. When any of the factors are at the minimum or maximum levels, the other two factors must be at the normal level for proper and reliable unit operation.

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## Blower Performance Data

MODEL	MAX ESP	AIR FLOW DIP SWITCH SETTINGS											
		1	2	3	4	5	6	7	8	9	10	11	12
038	0.50	650	750 L	850	1000	<b>1100 M</b>	<b>1200</b>	<b>1300 H</b>	<b>1400</b>	<b>1500</b>			
038 w/1hp*	0.75	800 L	1000	<b>1100 M</b>	<b>1300 H</b>	<b>1500</b>	<b>1600</b>	1800					
049	0.50	650	800 L	900	1050	1150	<b>1250</b>	<b>1350 M</b>	<b>1450</b>	<b>1550 H</b>			
049 w/1hp*	0.75	800 L	900	1000	1200	<b>1400 M</b>	<b>1600 H</b>	<b>1700</b>	<b>1850</b>	2000	2200	2300	2400
064	0.75	800	950 L	1100	1300	<b>1500 M</b>	<b>1750</b>	<b>1950 H</b>	<b>2100</b>	<b>2300</b>			
072	0.75	800	950 L	1100	1300	<b>1500</b>	<b>1750</b>	<b>1950</b>	<b>2100</b>	<b>2300</b>			

Factory settings are at recommended L-M-H DIP switch locations

CFM is controlled within ±5% up to the maximum ESP

3/18/08

M-H settings MUST be located within boldface CFM range

Max ESP includes allowance for wet coil and standard filter

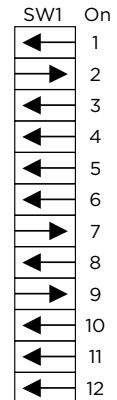
Lowest and Highest DIP switch settings are assumed to be L and H respectively

A 12-position DIP switch package on the Synergy3D control allows the airflow levels to be set for Low, Medium and High speed when using the ECM2 blower motor.

Only three of the DIP switches can be in the “On” position. The first “On” switch (the lowest position number) determines the “Low Speed Blower” setting. The second “On” switch determines the “Medium Speed Blower” setting, and the third “On” switch determines the “High Speed Blower” setting.

The example to the right shows SW1 on the Synergy3D control board configured for the following SDV049 airflow settings:

- Low Speed Blower: 800 CFM
- Medium Speed Blower: 1350 CFM
- High Speed Blower: 1550 CFM



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**Synergy3D Residential Series  
3-6 Tons 60Hz**



## Physical Data

Model	038	049	064	072
Compressor (1 each)	Copeland Scroll			
Factory Charge R410a, oz [kg]	90 [2.55]	111 [3.14]	128 [3.62]	128 [3.62]
<b>ECM Blower Motor &amp; Blower</b>	ECM Variable Speed			
Blower Motor Type/Speeds	ECM Variable Speed			
Blower Motor- hp [W]	1/2 [373]	1/2 [373]	1 [746]	1 [746]
Blower Wheel Size (Dia x W), in. [mm]	11 x 10 [279 x 254]	11 x 10 [279 x 254]	11 x 10 [279 x 254]	11 x 10 [279 x 254]
<b>Coax and Water Piping</b>				
Loop Water Connections Size - Swivel - in [mm]	1 [25.4]	1 [25.4]	1 [25.4]	1 [25.4]
Hydronic Water Connections Size - Swivel - in [mm]	1 [25.4]	1 [25.4]	1 [25.4]	1 [25.4]
HWG Connection Size - Swivel - in [mm]	1 [25.4]	1 [25.4]	1 [25.4]	1 [25.4]
Coax & Piping Water Volume - gal [l]	1.3 [4.9]	1.6 [6.1]	1.6 [6.1]	1.6 [6.1]
<b>Vertical</b>				
Air Coil Dimensions (H x W), in. [mm]	28 x 25 [711 x 635]	32 x 25 [813 x 635]	36 x 25 [914 x 635]	36 x 25 [914 x 635]
Air Coil Total Face Area, ft2 [m2]	4.9 [0.451]	5.6 [0.570]	6.3 [0.641]	6.3 [0.641]
Air Coil Tube Size, in [mm]	3/8 [9.5]	3/8 [9.5]	3/8 [9.5]	3/8 [9.5]
Air Coil Number of rows	3	3	4	4
Filter Standard - 2" [51mm] Pleated MERV11 Disposable, in [mm]	28 x 30 [712 x 762]	32 x 30 [813 x 762]	36 x 30 [914 x 762]	36 x 30 [914 x 762]
Weight - Operating, lb [kg]	425	530	540	540
Weight - Packaged, lb [kg]	445	550	560	560

6/2/08

## Electrical Data

Model	Rated Voltage	Voltage Min/Max	Compressor				Int Pump FLA	Ext Loop FLA	Blower Motor FLA	Total Unit FLA	Min Circ Amp	Max Fuse calc	Max Fuse/HACR
			MCC	RLA	LRA	LRA**							
038	208-230/60/1	197/254	26.0	16.6	82.0	29.0	1.07	5.4	4.0	27.1	31.2	47.8	45
038*	208-230/60/1	197/254	26.0	16.6	82.0	29.0	1.07	5.4	7.0	30.1	34.2	50.8	50
049	208-230/60/1	197/254	33.0	21.1	96.0	34.0	1.07	5.4	4.0	31.6	36.8	57.9	50
049*	208-230/60/1	197/254	33.0	21.1	96.0	34.0	1.07	5.4	7.0	34.6	39.8	60.9	60
064	208-230/60/1	197/254	40.0	25.6	118.0	41.0	1.07	5.4	7.0	39.1	45.5	71.2	70
072	208-230/60/1	197/254	42.5	27.2	150.0	53.0	1.07	5.4	7.0	40.7	47.5	74.7	70

Rated Voltage of 208-230/60/1.  
 HACR circuit breaker in USA only.  
 Local electrical codes overrule any wiring recommendations.  
 \* With optional 1 HP ECM2 motor  
 \*\*With optional IntelliStart

Min/Max Voltage of 197/254.  
 All fuses Class RK-5.

5/7/09

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**Synergy3D Residential Series  
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## Auxiliary Heat

### Auxiliary Heat Electrical Data

Model	Supply Circuit	Heater Amps		Min Circuit Amp		Max Fuse (USA)		Max Fuse (CAN)		Max CKT BRK	
		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
EAL(H)10	Single	34.7	40	53.3	60	60	60	60	60	60	60
EAL(H)15	Single	52.0	60	75	85	80	90	80	90	70	100
	L1/L2	34.7	40	53.3	60	60	60	60	60	60	60
	L3/L4	17.3	20	21.7	25	25	25	25	25	20	30
EAL(H)20	Single	69.3	80	96.7	110	100	110	100	110	100	100
	L1/L2	34.7	40	53.3	60	60	60	60	60	60	60
	L3/L4	34.7	40	43.3	50	45	50	45	50	40	50

All heaters rated single phase 60 cycle and include unit fan load

All fuses type "D" time delay (or HACR circuit breaker in USA)

Vertical rear discharge models use the horizontal (EALH) auxiliary heat kit.

### Auxiliary Heat Ratings

Model	KW		Stages	BTU/HR		Min CFM	Model Compatibility			
	208V	230V		208V	230V		038	049	064	072
EAL(H)10	7.2	9.6	2	24,600	32,700	1100	•	•	•	•
EAL(H)15	10.8	14.4	3	36,900	49,100	1250	•	•	•	•
EAL(H)20	14.4	19.2	4	49,200	65,500	1500		•	•	•

**NOTES:** High blower tap setting must be above the minimum CFM for the heater selected.

Rear discharge uses the horizontal auxiliary heat kits, EALH10, 15, or 20.

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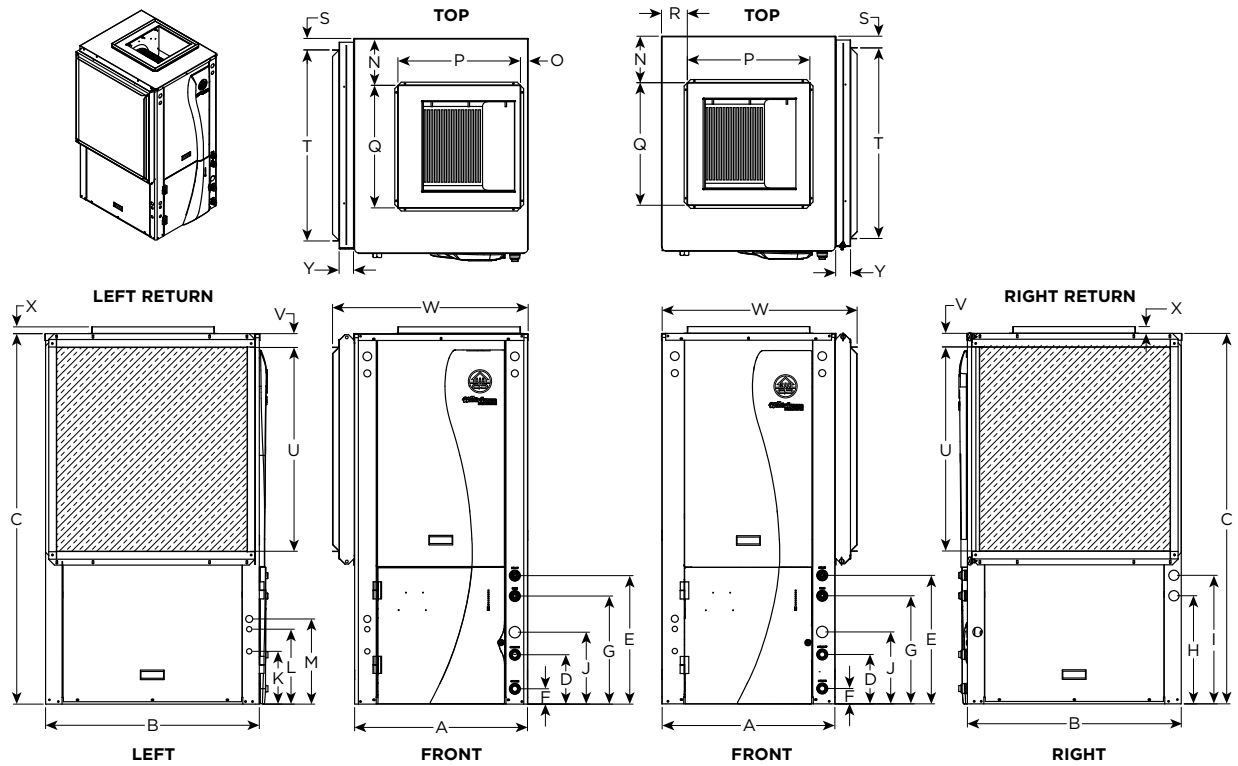
Engineer: \_\_\_\_\_

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**Synergy3D Residential Series  
3-6 Tons 60Hz**



**Dimensional Data**



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Vertical Topflow Model	Overall Cabinet			Water Connections										Electrical Connections			
	A	B	C	D	E	F	G	H	I	J	Loop	Hydronic	HWG	K	L	M	
	Width	Depth	Height	Loop In	Hydronic Out	Hydronic In	Loop Out	HWG In	HWG Out	Condensate	Water FPT	Water FPT	FPT	Low Voltage	Ext Pump	Power Supply	
038	in	25.6	31.6	50.4	7.3	18.9	2.3	15.9	13.6	16.6	10.6	1 in.	1 in.	1 in.	8.0	11.3	12.8
	cm	65.0	80.3	128.0	18.5	48.0	5.8	40.4	34.5	42.2	26.9	Swivel	Swivel	Swivel	20.3	28.7	32.5
049	in	25.6	31.6	54.4	7.3	18.9	2.3	15.9	15.9	18.9	10.6	1 in.	1 in.	1 in.	8.0	11.3	12.8
	cm	65.0	80.3	138.2	18.5	48.0	5.8	40.4	40.4	48.0	26.9	Swivel	Swivel	Swivel	20.3	28.7	32.5
064	in	25.6	31.6	58.4	7.3	18.9	2.3	15.9	15.9	18.9	10.6	1 in.	1 in.	1 in.	8.0	11.3	12.8
	cm	65.0	80.3	148.3	18.5	48.0	5.8	40.4	40.4	48.0	26.9	Swivel	Swivel	Swivel	20.3	28.7	32.5
072	in	25.6	31.6	58.4	7.3	18.9	2.3	15.9	15.9	18.9	10.6	1 in.	1 in.	1 in.	8.0	11.3	12.8
	cm	65.0	80.3	148.3	18.5	48.0	5.8	40.4	40.4	48.0	26.9	Swivel	Swivel	Swivel	20.3	28.7	32.5

Vertical Topflow Model	Discharge Connection duct flange installed (30.10 in)						Return Connection using std deluxe filter rack (30.10 in)						Misc.	
	N	O	P	Q	R	S	T	U	V	W	X	Y		
			Supply Width	Supply Depth			Return Depth	Return Height						
038	in	6.9	1.1	18.0	18.0	3.8	1.7	28.1	26.0	1.7	28.7	1.0	2.1	
	cm	17.5	2.8	45.7	45.7	9.7	4.3	71.4	66.0	4.3	72.9	2.5	5.3	
049	in	6.9	1.1	18.0	18.0	3.8	1.7	28.1	30.0	1.7	28.7	1.0	2.1	
	cm	17.5	2.8	45.7	45.7	9.7	4.3	71.4	76.2	4.3	72.9	2.5	5.3	
064	in	6.9	1.1	18.0	18.0	3.8	1.7	28.1	34.0	1.7	28.7	1.0	2.1	
	cm	17.5	2.8	45.7	45.7	9.7	4.3	71.4	86.4	4.3	72.9	2.5	5.3	
072	in	6.9	1.1	18.0	18.0	3.8	1.7	28.1	34.0	1.7	28.7	1.0	2.1	
	cm	17.5	2.8	45.7	45.7	9.7	4.3	71.4	86.4	4.3	72.9	2.5	5.3	

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Condensate is 3/4 in. PVC female glue socket and is switchable from side to front  
Unit shipped with deluxe 2 in. (field adjustable to 1 in.) duct collar/filter rack extending from unit 3.25 in. and is suitable for duct connection.  
Discharge flange is field installed and extends 1 in. [25.4 mm] from cabinet

Decorative molding and water connections extend 1.2 in. [30.5 mm] beyond front of cabinet.

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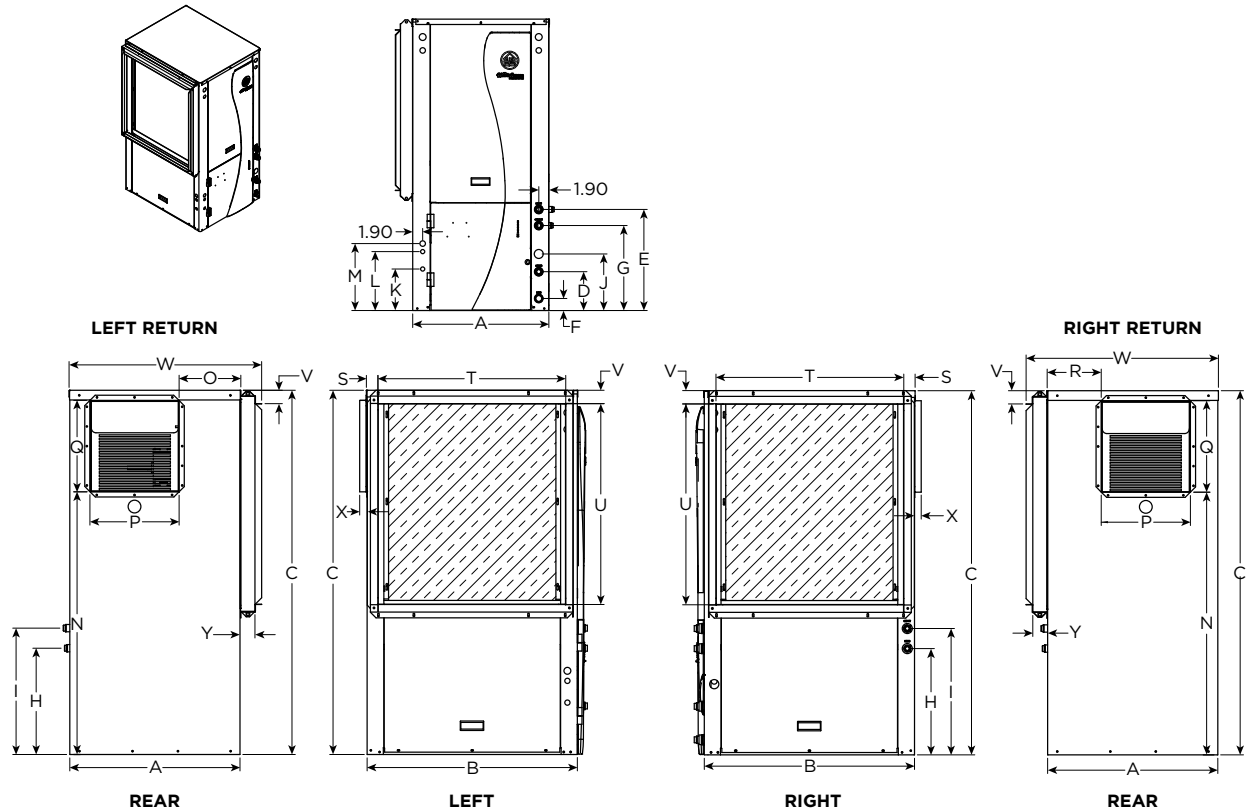
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**Dimensional Data cont.**



3/24/10

Vertical Topflow Model	Overall Cabinet			Water Connections										Electrical Connections			
	A	B	C	D	E	F	G	H	I	J	Loop	Hydronic	HWG	K 1/2" cond	L 1/2" cond	M 3/4" cond	
	Width	Depth	Height	Loop In	Hydronic Out	Hydronic In	Loop Out	HWG In	HWG Out	Condensate	Water FPT	Water FPT	FPT	Low Voltage	Ext Pump	Power Supply	
049	in.	25.6	31.6	54.4	7.3	18.9	2.3	15.9	15.9	18.9	10.6	1"	1"	1"	8.0	11.3	12.8
	cm.	65.0	80.3	138.2	18.5	48.0	5.8	40.4	40.4	48.0	26.9	Swivel	Swivel	Swivel	20.3	28.7	32.5
064	in.	25.6	31.6	58.4	7.3	18.9	2.3	15.9	15.9	18.9	10.6	1"	1"	1"	8.0	11.3	12.8
	cm.	65.0	80.3	148.3	18.5	48.0	5.8	40.4	40.4	48.0	26.9	Swivel	Swivel	Swivel	20.3	28.7	32.5
072	in.	25.6	31.6	58.4	7.3	18.9	2.3	15.9	15.9	18.9	10.6	1"	1"	1"	8.0	11.3	12.8
	cm.	65.0	80.3	148.3	18.5	48.0	5.8	40.4	40.4	48.0	26.9	Swivel	Swivel	Swivel	20.3	28.7	32.5

Vertical Topflow Model	Discharge Connection duct flange installed (30.10 in)					Return Connection using std deluxe filter rack (30.10 in)					Misc		
	N	O	P	Q	R	S	T	U	V	W	X	Y	
			Supply Width	Supply Depth			Return Depth	Return Height					
049	in.	39.4	9.1	13.3	13.6	8.1	1.7	28.1	30.0	1.7	28.7	1.0	2.1
	cm.	100.1	23.1	33.8	34.5	20.6	4.3	71.4	76.2	4.3	72.9	2.5	5.3
064	in.	43.4	9.1	13.3	13.6	8.1	1.7	28.1	34.0	1.7	28.7	1.0	2.1
	cm.	110.2	23.1	33.8	34.5	20.6	4.3	71.4	86.4	4.3	72.9	2.5	5.3
072	in.	43.4	9.1	13.3	13.6	8.1	1.7	28.1	34.0	1.7	28.7	1.0	2.1
	cm.	110.2	23.1	33.8	34.5	20.6	4.3	71.4	86.4	4.3	72.9	2.5	5.3

3/26/10

Condensate is 3/4 in. PVC female glue socket and is switchable from side to front  
Unit shipped with deluxe 2 in. (field adjustable to 1 in.) duct collar/filter rack extending from unit 3.25 in. and is suitable for duct connection.  
Discharge flange is field installed and extends 1 in. [25.4 mm] from cabinet

Decorative molding and water connections extend 1.2 in. [30.5 mm] beyond front of cabinet.

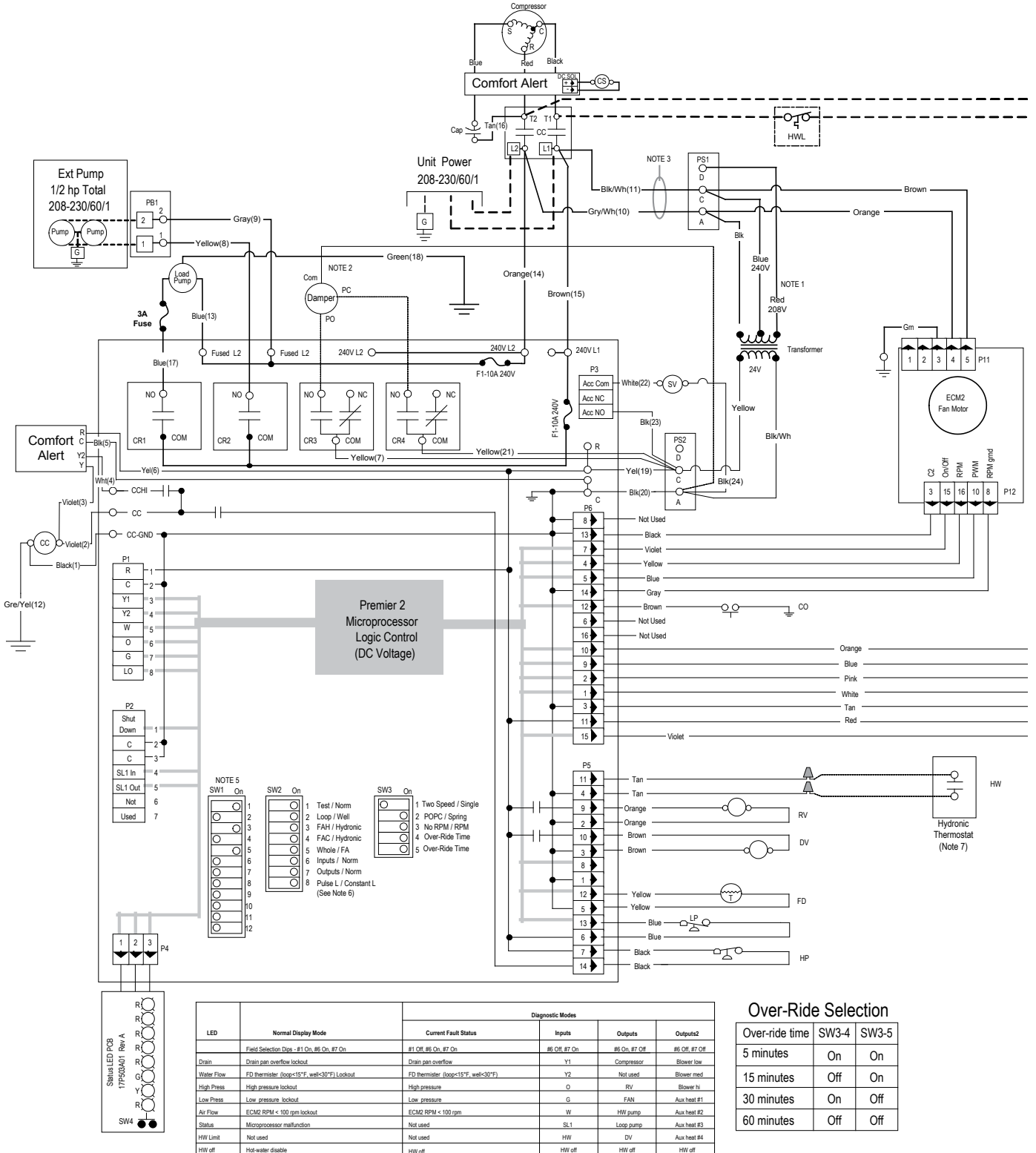
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 Engineer: \_\_\_\_\_  
 Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

**Synergy3D Residential Series  
 3-6 Tons 60Hz**



**Wiring Schematic**



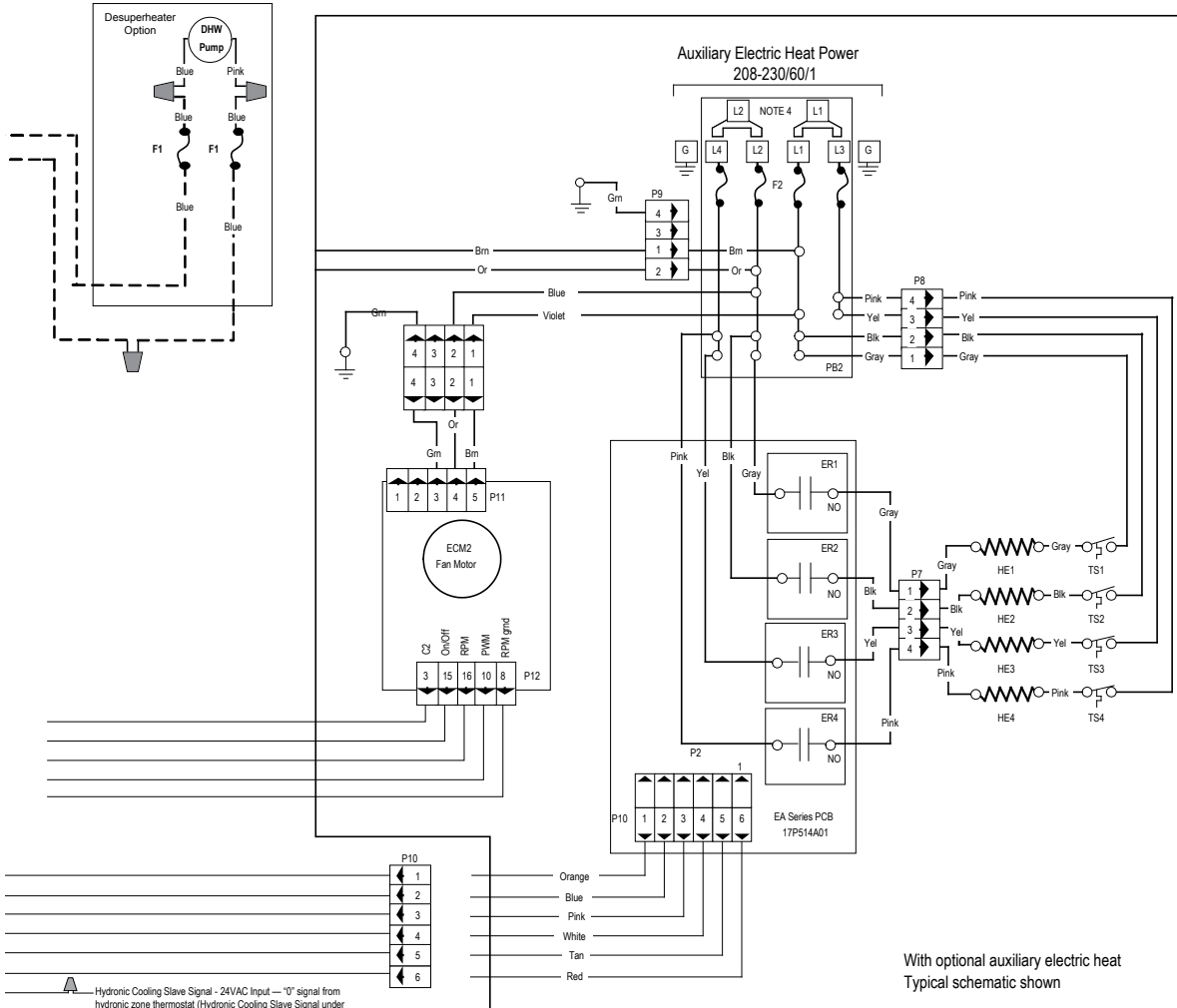
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**Synergy3D Residential Series**  
**3-6 Tons 60Hz**



**Wiring Schematic cont.**

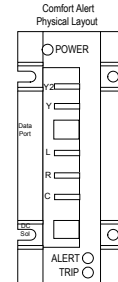


With optional auxiliary electric heat  
 Typical schematic shown

Hydronic Cooling Slave Signal - 24VAC Input — "0" signal from hydronic zone thermostat (Hydronic Cooling Slave Signal under the Microprocessor Control Operation section)

**Operation Logic Data**

Operation Logic Table	Heating				Cooling		Hot Water Mode
	STG1	STG2	STG3	EMERG	STG1	STG2	
Compressor	On	On	On	Off	On	On	Stg 2 On
Reversing Valve	Off	Off	Off	Off	On	On	Off
Loop Pump	On	On	On	Off	On	On	On
Load Pump	Off	Off	Off	Off	Off	Off	On
Aux Heater	Off	Off	Staged	Staged	Off	Off	Off
Acc Relay	On	On	On	Off	On	On	Off
Diverting Valve	Off	Off	Off	Off	Off	Off	On
ECM Speed	On	On	On	On	On	On	Off
T-Stat Signal	Y1	Y1, Y2	Y1, Y2, W	W	Y1, O	Y1, Y2, O	HW
Damper	Off	Off	Off	On	Off	Off	Off
Auxiliary 1 - Out	On	On	On	Off	On	On	On



**Legend**

	Factory Low voltage wiring		Thermistor
	Factory Line voltage wiring		Light emitting diode - Green
	Field low voltage wiring		Relay coil
	Field line voltage wiring		Capacitor w/ bleed resistor
	Optional block		Switch - Condensate overflow
	DC Voltage PCB traces		Switch - High pressure
	Internal junction		Switch - Low pressure
	Quick connect terminal		Switch - Hot Water On/Off
	Wire nut		Polarized connector
	Field wire lug		
	Ground		
	Relay Contacts - N.O., N.C.		
	Fuse		
	24 vac coil		

CS - Compressor Solenoid	LP - Low pressure switch
CC - Compressor Contactor	PS1 - Power block
CO - Condensate overflow sensor	PS1 PS2 - Power strips
CR1 - HW pump relay	RV - Reversing Valve coil
CR2 - Loop pump relay	SW1 - DIP package 12 position
CR3 - Damper relay	SW2 - DIP package 8 position
CR4 - Damper relay	SW3 - DIP package 5 position
DV - Diverting Valve	SW4 - Hot water enable switch
F1 and F2 - Fuses	SW4 - Hot Water Temperature Limit
FD - Freeze Detection sensor	HWL -
HP - High pressure switch	

- Notes**
- 1 - Switch blue and red wires for 208V operation.
  - 2 - Typical hook-up shown for power open - power closed damper shown.
  - 3 - The blk/wh and gray/wh wires are removed when Aux Heat is installed
  - 4 - Buss lugs L1 and L2 can be removed and dual power wire sets connected directly to box lugs L1, L2, and L3, L4.
  - 5 - Air Flow Configuration Example: SW1 configured for dip 1 as low, dip 3 as medium, and dip 5 as high speed ECM2 fan.
  - 6 - SW2-8 must be in the OFF position for pulsed "L" lockout signal and in the ON position for constant "L" lockout signal.
  - 7 - A hydronic input will generate a Y2 compressor call so that compressor only operates in high capacity.

**Comfort Alert Status**

LED	Flash Code	Description
Green	Solid	Module Has Power
Red	Solid	Y1 Present But Compressor Not Running
Yellow	Code 1	Long Run Time
	Code 2	System Pressure Trip
	Code 3	Short Cycling
	Code 4	Locked Rotor
	Code 5	Open Circuit
	Code 6	Open Start Circuit
	Code 7	Open Run Circuit
	Code 8	Welded Contactor
	Code 9	Low Voltage

7/02/08

Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

**Synergy3D Residential Series  
3-6 Tons 60Hz**



## Pressure Drop

Model	GPM	Pressure Drop (psi)				
		30°F	50°F	70°F	90°F	110°F
<b>038 full load</b>	5	1.2	1.2	1.1	1.0	1.0
	7	2.2	2.1	1.9	1.8	1.7
	9	3.4	3.2	3.0	2.8	2.6
	11	4.9	4.6	4.3	4.0	3.7
<b>038 part load</b>	4	0.9	0.8	0.8	0.7	0.7
	6	1.7	1.6	1.5	1.4	1.3
	8	2.8	2.6	2.5	2.3	2.1
	10	4.2	3.9	3.7	3.4	3.2
<b>049 full load</b>	6	1.2	1.2	1.1	1.0	1.0
	9	2.4	2.2	2.1	2.0	1.8
	12	3.9	3.6	3.4	3.2	2.9
	15	5.7	5.3	5.0	4.7	4.3
<b>049 part load</b>	5	1.1	1.1	1.0	0.9	0.9
	8	2.0	1.8	1.7	1.6	1.5
	11	3.4	3.1	2.9	2.8	2.5
	14	5.0	4.7	4.4	4.1	3.8
<b>064 full load</b>	8	2.0	1.8	1.7	1.6	1.5
	12	3.9	3.6	3.4	3.2	2.9
	16	6.5	6.0	5.6	5.2	4.8
	20	9.7	9.1	8.5	8.0	7.4
<b>064 part load</b>	6	1.2	1.2	1.1	1.0	1.0
	10	2.6	2.5	2.3	2.1	2.0
	14	5.0	4.7	4.4	4.1	3.8
	18	8.1	7.6	7.1	6.6	6.1
<b>072 full load</b>	12	3.9	3.6	3.4	3.2	2.9
	15	5.7	5.3	5.0	4.7	4.3
	18	8.1	7.6	7.1	6.6	6.1
	21	10.8	10.1	9.5	8.9	8.2
<b>072 part load</b>	10	2.6	2.5	2.3	2.1	2.0
	13	3.4	3.3	3.0	2.7	2.6
	16	6.5	6.1	5.8	5.4	5.0
	19	8.9	8.4	7.9	7.4	6.9

4/9/08

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**Synergy3D Residential Series  
3-6 Tons 60Hz**



## Correction Factor Tables

### Air Flow Corrections (Dual Capacity Part Load)

Airflow		Cooling				Heating		
CFM Per Ton of Clg	% of Nominal	Total Cap	Sens Cap	Power	Heat of Rej	Htg Cap	Power	Heat of Ext
240	60	0.922	0.778	0.956	0.924	0.943	1.239	0.879
275	69	0.944	0.830	0.962	0.944	0.958	1.161	0.914
300	75	0.957	0.866	0.968	0.958	0.968	1.115	0.937
325	81	0.970	0.900	0.974	0.970	0.977	1.075	0.956
350	88	0.982	0.933	0.981	0.980	0.985	1.042	0.972
375	94	0.991	0.968	0.991	0.991	0.993	1.018	0.988
400	100	1.000	1.000	1.000	1.000	1.000	1.000	1.000
425	106	1.007	1.033	1.011	1.008	1.007	0.990	1.010
450	113	1.013	1.065	1.023	1.015	1.012	0.987	1.018
475	119	1.017	1.099	1.037	1.022	1.018	0.984	1.025
500	125	1.020	1.132	1.052	1.027	1.022	0.982	1.031
520	130	1.022	1.159	1.064	1.030	1.025	0.979	1.034

5/30/06

### Air Flow Corrections (Dual Capacity Full Load & Single Speed)

Airflow		Cooling				Heating		
CFM Per Ton of Clg	% of Nominal	Total Cap	Sens Cap	Power	Heat of Rej	Htg Cap	Power	Heat of Ext
240	60	0.922	0.786	0.910	0.920	0.943	1.150	0.893
275	69	0.944	0.827	0.924	0.940	0.958	1.105	0.922
300	75	0.959	0.860	0.937	0.955	0.968	1.078	0.942
325	81	0.971	0.894	0.950	0.967	0.977	1.053	0.959
350	88	0.982	0.929	0.964	0.978	0.985	1.031	0.973
375	94	0.992	0.965	0.982	0.990	0.993	1.014	0.988
400	100	1.000	1.000	1.000	1.000	1.000	1.000	1.000
425	106	1.007	1.034	1.020	1.010	1.007	0.990	1.011
450	113	1.012	1.065	1.042	1.018	1.013	0.983	1.020
475	119	1.017	1.093	1.066	1.026	1.018	0.980	1.028
500	125	1.019	1.117	1.092	1.033	1.023	0.978	1.034
520	130	1.020	1.132	1.113	1.038	1.026	0.975	1.038

5/30/06

### Cooling Capacity Corrections

Entering Air WB °F	Total Clg Cap	Sensible Cooling Capacity Multipliers - Entering DB °F										Power Input	Heat of Rejection
		60	65	70	75	80	80.6	85	90	95	100		
55	0.898	0.723	0.866	1.048	1.185	*	*	*	*	*	*	0.985	0.913
60	0.912		0.632	0.880	1.078	1.244	1.260	*	*	*	*	0.994	0.927
65	0.967			0.694	0.881	1.079	1.085	1.270	*	*	*	0.997	0.972
66.2	0.983			0.655	0.842	1.040	1.060	1.232	*	*	*	0.999	0.986
67	<b>1.000</b>			0.616	0.806	1.000	1.023	1.193	1.330	*	*	<b>1.000</b>	<b>1.000</b>
70	1.053				0.693	0.879	0.900	1.075	1.250	1.404	*	1.003	1.044
75	1.168					0.687	0.715	0.875	1.040	1.261	1.476	1.007	1.141

NOTE: \*Sensible capacity equals total capacity at conditions shown.

11/10/09

### Heating Capacity Corrections

Ent Air DB °F	Heating Corrections		
	Htg Cap	Power	Heat of Ext
45	1.062	0.739	1.158
50	1.050	0.790	1.130
55	1.037	0.842	1.096
60	1.025	0.893	1.064
65	1.012	0.945	1.030
68	1.005	0.976	1.012
70	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>
75	0.987	1.048	0.970
80	0.975	1.099	0.930

11/10/09

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**Synergy3D Residential Series  
3-6 Tons 60Hz**



## SDV038 Low Speed - Performance Data

EWT °F	Flow gpm	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F															
		PSI	FT	Airflow cfm	HC kBtuh	Power kW	HE kBtuh	LAT °F	COP	HWC kBtuh	Airflow cfm	TC kBtuh	SC kBtuh	S/T Ratio	Power kW	HR kBtuh	EER	HWC kBtuh								
20	4.0	0.9	2.1	Operation not recommended																						
	6.0	1.7	4.0	Operation not recommended																						
	8.0	2.9	6.7	900	15.1	1.60	9.6	85.5	2.75	2.4	1050	15.7	1.65	10.1	83.8	2.80	2.2									
30	4.0	0.9	2.0	Operation not recommended																						
	6.0	1.7	3.9	900	16.8	1.58	11.4	87.3	3.12	2.3	1050	17.5	1.62	12.0	85.4	3.17	2.1	900	25.5	15.0	0.59	0.93	28.6	27.5	-	
	8.0	2.8	6.5	900	17.9	1.62	12.3	88.4	3.24	2.4	1050	18.6	1.66	12.9	86.4	3.29	2.2	900	25.9	15.4	0.63	0.92	29.0	28.2	-	
		6.0	1.7	3.9	900	16.8	1.58	11.4	87.3	3.12	2.3	1050	17.5	1.62	12.0	85.4	3.17	2.1	900	25.5	15.0	0.59	0.93	28.6	27.5	-
			4.0	0.9	2.0	900	17.9	1.62	12.3	88.4	3.24	2.4	1050	18.6	1.66	12.9	86.4	3.29	2.2	900	25.9	15.4	0.63	0.92	29.0	28.2
40	4.0	0.8	1.9	Operation not recommended																						
	6.0	1.6	3.8	900	20.6	1.59	15.2	91.2	3.80	2.5	1050	21.4	1.62	15.8	88.8	3.86	2.3	900	27.6	16.5	0.60	1.02	31.1	27.1	-	
	8.0	2.7	6.3	900	21.8	1.63	16.2	92.4	3.91	2.6	1050	22.5	1.66	16.8	89.8	3.97	2.4	900	28.4	18.3	0.65	1.04	31.9	27.3	-	
		6.0	1.6	3.8	900	21.8	1.63	16.2	92.4	3.91	2.6	1050	22.5	1.66	16.8	89.8	3.97	2.4	900	28.0	17.0	0.60	1.01	31.5	27.8	-
			4.0	0.8	1.9	900	22.5	1.66	16.8	89.8	3.97	2.4	1050	22.5	1.66	16.8	89.8	3.97	2.4	900	28.8	18.8	0.65	1.03	32.3	28.0
50	4.0	0.8	1.9	900	23.1	1.60	17.7	93.8	4.24	2.6	1050	23.8	1.66	18.3	91.0	4.31	2.4	900	29.9	17.6	0.59	1.17	33.9	25.6	0.9	
	6.0	1.6	3.7	900	23.9	1.60	18.5	94.6	4.38	2.7	1050	24.7	1.62	19.1	91.7	4.46	2.5	900	30.2	17.7	0.59	1.14	34.0	26.5	0.9	
		4.0	0.8	1.9	900	25.1	1.64	19.5	95.8	4.48	2.8	1050	25.8	1.66	20.1	92.8	4.56	2.5	900	30.6	18.2	0.59	1.13	34.5	27.2	0.8
			6.0	1.6	3.7	900	25.8	1.66	20.1	92.8	4.56	2.5	1050	26.6	1.70	20.7	94.0	4.64	2.3	900	31.0	19.6	0.63	1.16	34.9	26.7
	8.0	2.6	6.1	900	25.1	1.64	19.5	95.8	4.48	2.8	1050	25.8	1.66	20.1	92.8	4.56	2.5	900	30.6	18.2	0.59	1.13	34.5	27.2	0.8	
60	4.0	0.8	1.8	900	26.6	1.65	21.0	97.4	4.74	2.9	1050	27.3	1.66	21.6	94.1	4.82	2.6	900	28.3	18.5	0.65	1.29	32.7	21.9	1.3	
	6.0	1.5	3.6	900	27.7	1.65	22.1	98.5	4.93	3.0	1050	28.3	1.65	22.7	95.0	5.02	2.7	900	28.5	18.6	0.65	1.26	32.8	22.7	1.2	
		4.0	0.8	1.8	900	28.7	1.68	22.9	99.5	4.99	3.0	1050	29.3	1.69	23.5	95.8	5.08	2.8	900	29.0	19.0	0.66	1.24	33.3	23.3	1.1
			6.0	1.5	3.6	900	29.3	1.69	23.5	95.8	5.08	2.8	1050	29.3	1.69	23.5	95.8	5.08	2.8	900	29.8	21.1	0.71	1.27	34.1	23.5
	8.0	2.5	5.9	900	28.7	1.68	22.9	99.5	4.99	3.0	1050	29.3	1.69	23.5	95.8	5.08	2.8	900	29.0	19.0	0.66	1.24	33.3	23.3	1.1	
70	4.0	0.8	1.8	900	30.3	1.70	24.5	101.2	5.22	3.2	1050	30.9	1.70	25.1	97.2	5.32	2.9	900	27.7	19.3	0.70	1.44	32.6	19.2	1.7	
	6.0	1.5	3.5	900	31.6	1.69	25.8	102.5	5.47	3.3	1050	32.2	1.69	26.4	98.4	5.58	3.0	900	28.0	19.4	0.69	1.41	32.8	19.9	1.6	
		4.0	0.8	1.8	900	32.4	1.73	26.5	103.4	5.50	3.4	1050	33.0	1.73	27.1	99.1	5.60	3.1	900	28.4	19.9	0.70	1.39	33.2	20.4	1.5
			6.0	1.5	3.5	900	32.4	1.69	25.8	102.5	5.47	3.3	1050	33.0	1.73	27.1	99.1	5.60	3.1	900	28.7	21.5	0.75	1.43	33.6	20.0
	8.0	2.5	5.7	900	32.4	1.73	26.5	103.4	5.50	3.4	1050	33.0	1.73	27.1	99.1	5.60	3.1	900	28.4	19.9	0.70	1.39	33.2	20.4	1.5	
80	4.0	0.7	1.7	900	33.4	1.73	27.5	104.3	5.66	3.6	1050	33.8	1.72	28.0	99.8	5.77	3.3	900	27.3	19.2	0.70	1.62	32.8	16.8	2.4	
	6.0	1.4	3.3	900	35.0	1.72	29.1	106.0	5.97	3.7	1050	35.4	1.70	29.6	101.2	6.09	3.4	900	27.5	19.3	0.70	1.58	32.9	17.4	2.3	
		4.0	0.7	1.7	900	35.5	1.75	29.5	106.5	5.93	3.8	1050	35.8	1.74	29.9	101.6	6.05	3.5	900	28.0	19.8	0.71	1.57	33.3	17.8	2.1
			6.0	1.4	3.3	900	35.5	1.75	29.5	106.5	5.93	3.8	1050	35.8	1.74	29.9	101.6	6.05	3.5	900	28.0	19.8	0.71	1.57	33.3	17.8
	8.0	2.4	5.5	900	35.5	1.75	29.5	106.5	5.93	3.8	1050	35.8	1.74	29.9	101.6	6.05	3.5	900	28.7	21.9	0.76	1.60	34.2	18.0	2.3	
90	4.0	0.7	1.6	900	36.6	1.77	30.5	107.6	6.06	4.0	1050	36.9	1.75	30.9	102.5	6.18	3.7	900	25.0	18.8	0.75	1.82	31.3	13.7	3.2	
	6.0	1.4	3.2	900	38.5	1.75	32.5	109.6	6.42	4.2	1050	38.7	1.73	32.8	104.1	6.56	3.8	900	25.7	20.8	0.81	1.86	32.1	13.9	3.4	
		4.0	0.7	1.6	900	38.7	1.73	32.8	104.1	6.56	3.8	1050	38.7	1.73	32.8	104.1	6.56	3.8	900	25.3	18.9	0.75	1.77	31.3	14.2	3.0
			6.0	1.4	3.2	900	38.7	1.73	32.8	104.1	6.56	3.8	1050	38.7	1.73	32.8	104.1	6.56	3.8	900	26.0	21.0	0.81	1.81	32.1	14.4
	8.0	2.3	5.3	900	38.6	1.79	32.5	109.7	6.33	4.3	1050	38.8	1.76	32.8	104.2	6.46	4.0	900	25.7	19.4	0.76	1.76	31.7	14.6	2.8	
100	4.0	0.7	1.6	Operation not recommended																						
	6.0	1.3	3.1	Operation not recommended																						
		4.0	0.7	1.6	900	24.5	1.87	0.76	2.00	31.3	12.3	3.9	1050	25.2	20.7	0.82	2.04	32.1	12.4	4.2						
			6.0	1.3	3.1	900	24.9	1.92	0.77	1.98	31.7	12.6	3.6	1050	25.6	21.2	0.83	2.02	32.5	12.7	4.0					
110	4.0	0.7	1.5	Operation not recommended																						
	6.0	1.3	3.0	Operation not recommended																						
		4.0	0.7	1.5	900	22.0	1.77	0.80	2.23	29.6	9.9	5.0	1050	22.6	19.6	0.87	2.28	30.4	9.9	5.4						
			6.0	1.3	3.0	900	22.4	1.82	0.81	2.22	29.9	10.1	4.6	1050	23.0	20.1	0.87	2.26	30.7	10.2	5.1					
120	4.0	0.6	1.5	Operation not recommended																						
	6.0	1.2	2.9	Operation not recommended																						
		4.0	0.6	1.5	900	20.1	1.70	0.85	2.51	28.7	8.0	5.9	1050	20.7	18.8	0.91	2.56	29.4	8.1	6.4						
			6.0	1.2	2.9	900	20.4	1.74	0.85	2.49	28.9	8.2	5.5	1050	21.0	19.3	0.92	2.54	29.7	8.3	6.1					

Performance capacities shown in thousands of Btuh.

WaterFurnace works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice. Please contact WaterFurnace at 1-888-929-2837 for latest design and specifications. Purchaser's approval of this data set signifies that the equipment is acceptable under the provisions of the job specification. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely WaterFurnace's opinion or commendation of its products. The latest version of this document is available at [www.waterfurnace.com](http://www.waterfurnace.com).

Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

**Synergy3D Residential Series  
3-6 Tons 60Hz**



**SDV038 High Speed - Performance Data**

EWT °F	Flow gpm	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F								
		PSI	FT	Airflow cfm	HC kBtuh	Power kW	HE kBtuh	LAT °F	COP	HWC kBtuh	Airflow cfm	TC kBtuh	SC kBtuh	S/T Ratio	Power kW	HR kBtuh	EER	HWC kBtuh	
20	5.0	1.3	3.0	Operation not recommended															
	7.0	2.3	5.2	Operation not recommended															
	9.0	3.5	8.1	1050	22.1	2.12	14.9	89.5	3.06	2.8	1250	22.5	2.07	15.4	86.6	3.18	2.5		
30	5.0	1.2	2.9	Operation not recommended															
	7.0	2.2	5.1	1050	25.3	2.05	18.3	92.3	3.61	2.9	1050	37.0	20.8	0.56	1.57	42.4	23.6	-	
				1250	26.1	2.12	18.9	89.3	3.61	2.7	1250	39.1	23.2	0.59	1.66	44.8	23.6	-	
				1050	25.8	2.08	18.7	92.7	3.64	3.0	1050	37.3	22.9	0.62	1.52	42.5	24.5	-	
				1250	26.6	2.14	19.3	89.7	3.64	2.8	1250	39.5	25.5	0.65	1.62	45.0	24.4	-	
40	5.0	1.2	2.8	Operation not recommended															
	7.0	2.1	4.9	1050	29.8	2.19	22.4	96.3	3.99	3.4	1050	39.0	22.9	0.59	1.72	44.9	22.6	-	
				1250	30.7	2.24	23.1	92.8	4.03	3.1	1250	41.1	25.4	0.62	1.81	47.3	22.6	-	
				1050	30.4	2.21	22.9	96.8	4.03	3.5	1050	39.3	24.8	0.63	1.68	45.0	23.5	-	
				1250	31.4	2.26	23.7	93.3	4.07	3.1	1250	41.5	27.6	0.66	1.77	47.6	23.4	-	
50	5.0	1.2	2.7	1050	32.5	2.27	24.7	98.6	4.19	3.6	1050	40.6	25.0	0.62	2.03	47.6	20.0	1.7	
				1250	33.4	2.30	25.6	94.8	4.26	3.3	1250	42.7	27.8	0.65	2.14	50.0	20.0	1.8	
	7.0	2.1	4.8	1050	33.7	2.32	25.7	99.7	4.25	3.7	1050	41.5	25.3	0.61	1.92	48.0	21.6	1.6	
				1250	34.7	2.35	26.7	95.7	4.33	3.4	1250	43.6	28.1	0.64	2.01	50.5	21.7	1.8	
	9.0	3.2	7.4	1050	34.4	2.34	26.4	100.4	4.30	3.8	1050	41.9	27.0	0.64	1.87	48.3	22.4	1.5	
				1250	35.5	2.38	27.4	96.3	4.38	3.5	1250	44.1	30.0	0.68	1.96	50.8	22.5	1.7	
				1050	36.3	2.38	28.2	102.0	4.46	4.1	1050	38.5	24.5	0.64	2.16	45.9	17.8	2.1	
60	5.0	1.1	2.6	1250	37.5	2.40	29.3	97.8	4.58	3.8	1250	40.4	27.3	0.68	2.26	48.1	17.9	2.2	
	7.0	2.0	4.6	1050	37.9	2.45	29.6	103.5	4.53	4.2	1050	39.4	24.8	0.63	2.06	46.4	19.2	2.0	
				1250	39.2	2.47	30.7	99.0	4.65	3.9	1250	41.3	27.5	0.67	2.14	48.6	19.3	2.1	
	9.0	3.1	7.2	1050	38.9	2.48	30.4	104.3	4.60	4.3	1050	39.8	26.2	0.66	2.01	46.6	19.8	1.8	
				1250	40.1	2.49	31.6	99.7	4.73	4.0	1250	41.7	29.0	0.70	2.10	48.9	19.9	2.0	
70	5.0	1.1	2.5	1050	40.4	2.52	31.8	105.6	4.70	4.7	1050	37.7	24.8	0.66	2.35	45.7	16.0	2.6	
				1250	41.7	2.52	33.2	100.9	4.86	4.3	1250	39.3	27.6	0.70	2.44	47.7	16.1	2.8	
	7.0	1.9	4.5	1050	42.4	2.60	33.6	107.4	4.79	4.8	1050	38.7	25.1	0.65	2.25	46.3	17.2	2.4	
				1250	43.8	2.60	34.9	102.5	4.94	4.4	1250	40.3	27.8	0.69	2.33	48.3	17.3	2.6	
	9.0	3.0	6.9	1050	43.5	2.63	34.5	108.4	4.85	5.0	1050	39.0	26.1	0.67	2.19	46.5	17.8	2.3	
80	5.0	1.1	2.5	1250	45.0	2.62	36.1	103.3	5.04	4.6	1250	40.8	28.9	0.71	2.28	48.6	17.9	2.5	
	7.0	1.9	4.3	1050	43.3	2.65	34.2	108.2	4.79	5.2	1050	36.8	25.2	0.68	2.56	45.6	14.4	3.2	
				1250	44.8	2.63	35.8	103.2	4.99	4.8	1250	38.3	28.0	0.73	2.64	47.3	14.5	3.4	
	9.0	2.9	6.7	1050	45.8	2.75	36.4	110.4	4.87	5.3	1050	37.9	25.5	0.67	2.47	46.3	15.3	3.0	
				1250	47.3	2.73	38.0	105.1	5.09	4.9	1250	39.4	28.3	0.72	2.55	48.1	15.5	3.3	
90	5.0	1.0	2.4	1050	47.1	2.79	37.6	111.5	4.95	5.5	1050	38.3	26.1	0.68	2.42	46.5	15.8	2.8	
				1250	48.7	2.75	39.3	106.1	5.19	5.1	1250	39.8	29.0	0.73	2.49	48.4	16.0	3.1	
	7.0	1.8	4.2	1050	46.5	2.79	36.9	111.0	4.88	5.9	1050	34.1	24.4	0.72	2.79	43.6	12.2	4.0	
				1250	48.1	2.75	38.7	105.6	5.13	5.4	1250	35.3	27.1	0.77	2.85	45.0	12.4	4.3	
	9.0	2.8	6.5	1050	49.4	2.92	39.4	113.6	4.96	6.0	1050	35.1	24.7	0.70	2.71	44.3	13.0	3.7	
100	5.0	1.0	2.3	1250	51.1	2.87	41.4	107.9	5.23	5.6	1250	36.4	27.4	0.75	2.77	45.9	13.1	4.1	
				1050	50.9	2.96	40.8	114.9	5.04	6.2	1050	35.5	24.9	0.70	2.66	44.6	13.3	3.5	
				1250	52.7	2.89	42.8	109.0	5.35	5.8	1250	36.8	27.6	0.75	2.72	46.1	13.5	3.9	
	7.0	1.7	4.0	Operation not recommended															
	9.0	2.7	6.2	1050	34.3	24.8	0.72	2.98	44.5	11.5	4.6	1250	35.4	27.6	0.78	3.02	45.7	11.7	5.0
110	5.0	1.0	2.2	1050	34.7	24.8	0.71	2.92	44.7	11.9	4.4	1250	35.8	27.4	0.76	2.97	45.9	12.1	4.8
	7.0	1.7	3.9	Operation not recommended															
				1050	31.5	23.7	0.75	3.22	42.5	9.8	5.6	1250	32.4	26.3	0.81	3.24	43.4	10.0	6.1
				1050	31.8	23.4	0.73	3.16	42.6	10.1	5.2	1250	32.7	25.8	0.79	3.19	43.6	10.2	5.8
	9.0	2.6	6.0	Operation not recommended															
120	5.0	0.9	2.1	Operation not recommended															
	7.0	1.6	3.7	1050	29.4	23.1	0.78	3.61	41.8	8.2	6.8	1250	30.1	25.7	0.85	3.61	42.4	8.4	7.4
				1050	29.7	22.5	0.76	3.55	41.9	8.4	6.3	1250	30.4	24.8	0.82	3.56	42.6	8.5	7.0
	9.0	2.5	5.8	Operation not recommended															

Performance capacities shown in thousands of Btuh.

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Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

## SDV038 Water Heating Data

ELT	EST	LGPM	SOURCE 5.0 GPM						SWPD		HWC kBtuh	SOURCE 7.0 GPM						SWPD		HWC kBtuh	SOURCE 9.0 GPM						SWPD		HWC kBtuh
			LLT	HC	KW	HE	COP	LST	PSI	FT HD		LLT	HC	KW	HE	COP	LST	PSI	FT HD		LLT	HC	KW	HE	COP	LST	PSI	FT HD	
80	30	5.0	Operation Not Recommended																										
		7.0	88.0	25.8	1.99	19.0	3.8	22.2	1.1	2.5	2.8	88.2	26.5	2.00	19.7	3.9	23.8	2.3	5.2	2.8	88.4	27.1	2.01	20.3	4.0	25.4	3.4	7.9	2.9
		9.0	85.7	25.8	1.96	19.1	3.9	22.1	1.1	2.5	2.6	85.9	26.4	1.97	19.7	3.9	23.7	2.3	5.2	2.7	86.0	27.1	1.97	20.3	4.0	25.3	3.4	7.9	2.8
80	40	5.0	Operation Not Recommended																										
		7.0	89.5	30.5	2.06	23.5	4.3	30.3	1.1	2.5	3.1	89.7	31.4	2.07	24.3	4.4	32.3	2.2	5.1	3.2	90.0	32.2	2.08	25.1	4.5	34.4	3.3	7.7	3.3
		9.0	86.8	30.6	2.03	23.7	4.4	30.2	1.1	2.5	3.0	87.0	31.4	2.04	24.4	4.5	32.3	2.2	5.1	3.1	87.1	32.2	2.04	25.2	4.6	34.4	3.3	7.7	3.1
80	50	5.0	94.0	34.9	2.16	27.6	4.7	38.6	1.1	2.4	3.6	94.4	36.1	2.18	28.6	4.8	41.0	2.2	5.0	3.7	94.9	37.3	2.20	29.7	5.0	43.4	3.3	7.5	3.8
		7.0	90.9	35.2	2.13	27.9	4.8	38.5	1.1	2.4	3.5	91.3	36.2	2.15	28.9	4.9	40.9	2.2	5.0	3.6	91.6	37.3	2.16	29.9	5.1	43.4	3.3	7.5	3.7
		9.0	87.9	35.5	2.11	28.3	4.9	38.3	1.1	2.4	3.4	88.1	36.4	2.11	29.2	5.1	40.8	2.2	5.0	3.4	88.3	37.2	2.11	30.0	5.2	43.3	3.3	7.5	3.5
80	60	5.0	95.8	39.5	2.23	31.9	5.2	46.9	1.0	2.4	4.1	96.3	40.9	2.26	33.2	5.3	49.6	2.1	4.9	4.2	96.9	42.3	2.29	34.5	5.4	52.3	3.2	7.3	4.3
		7.0	92.4	39.9	2.21	32.4	5.3	46.7	1.0	2.4	4.0	92.8	41.1	2.22	33.5	5.4	49.5	2.1	4.9	4.1	93.2	42.3	2.23	34.7	5.6	52.3	3.2	7.3	4.1
		9.0	89.0	40.4	2.19	32.9	5.4	46.4	1.0	2.4	3.8	89.2	41.3	2.18	33.9	5.5	49.3	2.1	4.9	3.9	89.4	42.3	2.18	34.9	5.7	52.2	3.2	7.3	4.0
80	70	5.0	97.6	44.0	2.30	36.1	5.6	55.1	1.0	2.3	4.7	98.3	45.7	2.33	37.7	5.7	58.2	2.1	4.7	4.8	98.9	47.3	2.37	39.2	5.9	61.3	3.1	7.2	4.9
		7.0	93.8	44.6	2.28	36.8	5.7	54.8	1.0	2.3	4.6	94.3	46.0	2.29	38.2	5.9	58.0	2.1	4.7	4.7	94.7	47.4	2.31	39.5	6.0	61.2	3.1	7.2	4.7
		9.0	90.0	45.2	2.26	37.5	5.9	54.5	1.0	2.3	4.4	90.3	46.3	2.26	38.6	6.0	57.9	2.1	4.7	4.5	90.5	47.4	2.25	39.7	6.2	61.2	3.1	7.2	4.6
100	30	5.0	Operation Not Recommended																										
		7.0	107.8	25.1	2.58	16.3	2.9	23.3	1.1	2.5	2.7	108.0	25.6	2.58	16.8	2.9	24.7	2.3	5.2	2.7	108.1	26.1	2.58	17.3	3.0	26.2	3.4	7.9	2.8
		9.0	105.6	25.0	2.53	16.3	2.9	23.3	1.1	2.5	2.6	105.7	25.5	2.54	16.9	2.9	24.7	2.3	5.2	2.6	105.8	26.1	2.54	17.4	3.0	26.1	3.4	7.9	2.7
100	40	5.0	Operation Not Recommended																										
		7.0	109.1	29.4	2.64	20.3	3.3	31.6	1.1	2.5	3.0	109.3	30.0	2.65	21.0	3.3	33.4	2.2	5.1	3.1	109.5	30.7	2.66	21.6	3.4	35.2	3.3	7.7	3.1
		9.0	106.5	29.4	2.60	20.5	3.3	31.5	1.1	2.5	2.9	106.7	30.0	2.60	21.1	3.4	33.4	2.2	5.1	3.0	106.8	30.7	2.61	21.8	3.4	35.2	3.3	7.7	3.0
100	50	5.0	113.4	33.5	2.75	24.1	3.6	40.1	1.1	2.4	3.5	113.7	34.4	2.77	24.9	3.6	42.2	2.2	5.0	3.5	114.1	35.2	2.78	25.7	3.7	44.3	3.3	7.5	3.6
		7.0	110.5	33.6	2.71	24.4	3.6	39.9	1.1	2.4	3.4	110.7	34.4	2.72	25.2	3.7	42.1	2.2	5.0	3.4	111.0	35.2	2.73	25.9	3.8	44.2	3.3	7.5	3.5
		9.0	107.5	33.8	2.67	24.7	3.7	39.8	1.1	2.4	3.2	107.7	34.5	2.67	25.4	3.8	42.0	2.2	5.0	3.3	107.8	35.2	2.67	26.1	3.9	44.2	3.3	7.5	3.3
100	60	5.0	115.1	37.7	2.82	28.1	3.9	48.4	1.0	2.4	3.9	115.5	38.7	2.84	29.0	4.0	50.9	2.1	4.9	4.0	115.9	39.7	2.86	30.0	4.1	53.3	3.2	7.3	2.8
		7.0	111.8	37.9	2.77	28.5	4.0	48.3	1.0	2.4	3.8	112.1	38.9	2.79	29.3	4.1	50.8	2.1	4.9	3.8	112.4	39.8	2.80	30.2	4.2	53.3	3.2	7.3	2.7
		9.0	108.5	38.2	2.73	28.9	4.1	48.1	1.0	2.4	3.6	108.7	39.0	2.73	29.7	4.2	50.7	2.1	4.9	3.7	108.8	39.8	2.74	30.5	4.3	53.2	3.2	7.3	3.8
100	70	5.0	116.7	41.8	2.88	32.0	4.3	56.8	1.0	2.3	4.5	117.2	43.1	2.91	33.1	4.3	59.6	2.1	4.7	4.6	117.7	44.3	2.94	34.2	4.4	62.4	3.1	7.2	4.6
		7.0	113.1	42.2	2.84	32.5	4.4	56.6	1.0	2.3	4.3	113.4	43.3	2.85	33.5	4.4	59.5	2.1	4.7	4.4	113.8	44.3	2.87	34.5	4.5	62.3	3.1	7.2	4.4
		9.0	109.5	42.6	2.80	33.0	4.5	56.4	1.0	2.3	4.1	109.7	43.5	2.80	33.9	4.6	59.3	2.1	4.7	4.2	109.9	44.4	2.80	34.8	4.6	62.3	3.1	7.2	4.3
120	30	5.0	Operation Not Recommended																										
		7.0	127.6	24.3	3.17	13.5	2.3	24.4	1.1	2.5	2.6	127.7	24.7	3.16	13.9	2.3	25.6	2.3	5.2	2.6	127.8	25.1	3.16	14.3	2.3	26.7	3.4	7.9	2.7
		9.0	125.4	24.2	3.11	13.6	2.3	24.4	1.1	2.5	2.5	125.5	24.6	3.11	14.0	2.3	25.5	2.3	5.2	2.5	125.6	25.1	3.12	14.4	2.4	26.7	3.4	7.9	2.6
120	40	5.0	Operation Not Recommended																										
		7.0	128.8	28.2	3.23	17.2	2.6	32.9	1.1	2.5	2.9	128.9	28.7	3.23	17.7	2.6	34.4	2.2	5.1	2.9	129.1	29.2	3.23	18.1	2.6	36.0	3.3	7.7	3.0
		9.0	126.3	28.1	3.17	17.3	2.6	32.9	1.1	2.5	2.8	126.4	28.6	3.17	17.8	2.6	34.4	2.2	5.1	2.8	126.5	29.2	3.18	18.3	2.7	35.9	3.3	7.7	2.9
120	50	5.0	132.8	32.1	3.34	20.7	2.8	41.5	1.1	2.4	3.3	133.1	32.6	3.35	21.2	2.9	43.3	2.2	5.0	3.4	133.3	33.2	3.36	21.7	2.9	45.2	3.3	7.5	3.4
		7.0	130.0	32.1	3.28	20.9	2.9	41.4	1.1	2.4	3.2	130.2	32.6	3.29	21.4	2.9	43.3	2.2	5.0	3.2	130.3	33.2	3.30	22.0	3.0	45.1	3.3	7.5	3.3
		9.0	127.1	32.1	3.22	21.1	2.9	41.3	1.1	2.4	3.0	127.3	32.7	3.23	21.6	3.0	43.2	2.2	5.0	3.1	127.4	33.2	3.23	22.2	3.0	45.1	3.3	7.5	3.1
120	60	5.0	134.4	35.9	3.40	24.3	3.1	50.0	1.0	2.4	3.8	134.6	36.5	3.42	24.9	3.1	52.1	2.1	4.9	3.8	134.9	37.2	3.43	25.5	3.2	54.3	3.2	7.3	2.6
		7.0	131.2	36.0	3.34	24.6	3.2	49.9	1.0	2.4	3.6	131.4	36.6	3.35	25.2	3.2	52.0	2.1	4.9	3.6	131.6	37.3	3.36	25.8	3.2	54.3	3.2	7.3	2.5
		9.0	128.0	36.0	3.28	24.8	3.2	49.8	1.0	2.4	3.4	128.1	36.7	3.29	25.5	3.3	51.9	2.1	4.9	3.5	128.3	37.3	3.29	26.1	3.3	54.2	3.2	7.3	3.5
120	70	5.0	135.9	39.7	3.46	27.9	3.4	58.5	1.0	2.3	4.3	136.2	40.5	3.49	28.6	3.4	60.9	2.1	4.7	4.3	136.5	41.2	3.51	29.2	3.4	63.3	3.1	7.2	4.3
		7.0	132.4	39.8	3.40	28.2	3.4	58.4	1.0	2.3	4.1	132.6	40.6	3.42	28.9	3.5	60.8	2.1	4.7	4.1	132.8	41.3	3.43	29.6	3.5	63.2	3.1	7.2	4.1
		9.0	128.9	40.0	3.34	28.6	3.5	58.2	1.0	2.3	3.9	129.0	40.7	3.34	29.3	3.6	60.7	2.1	4.7	3.9	129.2	41.4	3.35	30.0	3.6	63.1	3.1	7.2	4.0

\* Water heating mode only allows high compressor capacity operation.

ELT = entering load fluid temperature to heat pump  
 LLT = leaving load fluid temperature from heat pump  
 LGPM = load flow in gallons per minute  
 LWPD = load coax water pressure drop  
 EST = entering source fluid temperature to heat pump  
 LST = leaving source fluid temperature from heat pump  
 HWC = hot water generator capacity

SWPD = source coax water pressure drop  
 PSI = pressure drop in pounds per square inch  
 FT HD = pressure drop in feet of head  
 KW = kilowatts  
 HE = heat extracted in Btuh  
 HC = total heating capacity in Btuh  
 COP = coefficient of performance [HC/(kW x 3.413)]

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Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

**Synergy3D Residential Series  
3-6 Tons 60Hz**



## SDV049 Low Speed - Performance Data

EWT °F	Flow gpm	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F								
		PSI	FT	Airflow cfm	HC kBTuh	Power kW	HE kBTuh	LAT °F	COP	HWC kBTuh	Airflow cfm	TC kBTuh	SC kBTuh	S/T Ratio	Power kW	HR kBTuh	EER	HWC kBTuh	
20	5.0	0.9	2.2	Operation not recommended															
	8.0	2.0	4.6	Operation not recommended															
	11.0	3.4	7.8	1150	22.0	2.06	15.0	87.7	3.13	4.1	Operation not recommended								
				1350	22.8	2.09	15.7	85.6	3.20	3.7									
30	5.0	0.9	2.1	Operation not recommended															
	8.0	1.9	4.4	1150	25.2	2.18	17.8	90.3	3.40	4.2	1150	34.8	20.8	0.60	1.25	39.1	27.8	-	
				1350	26.0	2.19	18.5	87.8	3.48	3.8	1350	36.0	24.5	0.68	1.33	40.6	27.1	-	
	11.0	3.3	7.6	1150	25.9	2.19	18.4	90.8	3.46	4.3	1150	34.9	20.7	0.59	1.17	38.9	29.8	-	
				1350	26.8	2.23	19.2	88.4	3.53	3.9	1350	35.8	24.4	0.68	1.24	40.0	28.8	-	
	40	5.0	0.9	2.0	Operation not recommended														
8.0		1.9	4.3	1150	29.6	2.24	21.9	93.8	3.87	4.5	1150	37.2	23.5	0.63	1.39	41.9	26.7	-	
				1350	30.6	2.24	23.0	91.0	4.01	4.2	1350	38.4	27.6	0.72	1.47	43.4	26.1	-	
11.0		3.2	7.4	1150	30.6	2.25	22.9	94.6	3.97	4.7	1150	37.3	23.4	0.63	1.31	41.8	28.6	-	
				1350	31.6	2.27	23.9	91.7	4.08	4.2	1350	38.4	27.6	0.72	1.38	43.1	27.8	-	
50		5.0	0.9	2.0	1150	30.8	2.24	23.2	94.8	4.04	4.8	1150	39.3	26.5	0.68	1.80	45.4	21.8	1.6
	1350				31.8	2.24	24.2	91.8	4.17	4.4	1350	40.5	31.3	0.77	1.88	46.9	21.5	1.7	
	8.0	1.8	4.2	1150	33.2	2.31	25.3	96.7	4.21	4.9	1150	40.1	26.7	0.66	1.56	45.5	25.7	1.5	
				1350	34.5	2.29	26.6	93.6	4.40	4.5	1350	41.4	31.4	0.76	1.64	46.9	25.2	1.6	
	11.0	3.1	7.2	1150	34.5	2.32	26.5	97.8	4.35	5.1	1150	40.4	26.7	0.66	1.47	45.4	27.4	1.4	
				1350	35.6	2.32	27.7	94.4	4.49	4.6	1350	41.6	31.4	0.75	1.55	46.9	26.9	1.5	
60	5.0	0.8	1.9	1150	34.2	2.34	26.2	97.5	4.29	5.2	1150	37.1	25.4	0.68	1.96	43.8	19.0	2.3	
				1350	35.4	2.32	27.5	94.3	4.47	4.8	1350	38.3	30.0	0.78	2.04	45.3	18.7	2.4	
	8.0	1.8	4.0	1150	37.0	2.40	28.8	99.8	4.52	5.4	1150	37.8	25.6	0.68	1.74	43.7	21.7	2.1	
				1350	38.4	2.37	30.3	96.3	4.76	5.0	1350	38.9	30.2	0.77	1.82	45.1	21.4	2.3	
	11.0	3.0	6.9	1150	38.6	2.42	30.3	101.0	4.67	5.5	1150	38.2	25.7	0.67	1.65	43.8	23.1	1.9	
				1350	39.9	2.39	31.8	97.4	4.90	5.1	1350	39.3	30.2	0.77	1.72	45.2	22.8	2.2	
70	5.0	0.8	1.8	1150	37.6	2.41	29.4	100.3	4.57	5.8	1150	36.2	25.5	0.71	2.16	43.5	16.7	3.0	
				1350	39.1	2.38	31.0	96.8	4.81	5.4	1350	37.3	30.0	0.80	2.26	45.0	16.5	3.1	
	8.0	1.7	3.9	1150	40.8	2.45	32.5	102.9	4.88	6.0	1150	36.5	25.8	0.70	1.96	43.2	18.7	2.8	
				1350	42.4	2.41	34.2	99.1	5.16	5.5	1350	37.7	30.3	0.80	2.04	44.6	18.4	3.0	
	11.0	2.9	6.7	1150	42.7	2.48	34.2	104.4	5.04	6.1	1150	37.2	25.9	0.70	1.87	43.5	19.9	2.6	
				1350	44.3	2.43	36.0	100.4	5.35	5.7	1350	38.3	30.4	0.79	1.94	44.9	19.7	2.8	
80	5.0	0.8	1.8	1150	40.0	2.48	31.5	102.2	4.73	6.5	1150	35.6	25.7	0.72	2.35	43.7	15.2	4.2	
				1350	41.5	2.44	33.2	98.5	5.00	6.0	1350	36.8	30.2	0.82	2.45	45.1	15.0	4.4	
	8.0	1.6	3.8	1150	43.4	2.51	34.9	105.0	5.08	6.7	1150	35.8	26.0	0.73	2.18	43.3	16.4	3.9	
				1350	45.2	2.44	36.8	101.0	5.42	6.1	1350	36.9	30.6	0.83	2.27	44.7	16.3	4.2	
	11.0	2.8	6.5	1150	45.6	2.53	37.0	106.7	5.28	6.9	1150	36.6	26.2	0.72	2.09	43.8	17.5	3.6	
				1350	47.4	2.46	39.0	102.5	5.64	6.3	1350	37.8	30.8	0.82	2.18	45.2	17.4	4.0	
90	5.0	0.7	1.7	1150	42.4	2.53	33.8	104.2	4.91	7.2	1150	32.9	24.2	0.73	2.56	41.7	12.8	5.4	
				1350	44.1	2.48	35.6	100.2	5.22	6.7	1350	34.0	28.4	0.84	2.67	43.1	12.7	5.7	
	8.0	1.6	3.6	1150	46.1	2.55	37.4	107.1	5.31	7.4	1150	32.9	24.5	0.74	2.43	41.2	13.5	5.0	
				1350	48.0	2.46	39.6	102.9	5.72	6.9	1350	33.9	28.8	0.85	2.52	42.5	13.4	5.5	
	11.0	2.7	6.2	1150	48.7	2.57	39.9	109.2	5.54	7.7	1150	33.9	24.7	0.73	2.33	41.8	14.5	4.7	
				1350	50.7	2.49	42.2	104.8	5.97	7.1	1350	34.9	29.1	0.83	2.43	43.2	14.4	5.2	
100	5.0	0.7	1.7	Operation not recommended															
	8.0	1.5	3.5	1150	31.5	2.46	24.6	97.8	2.72	40.8	11.6	6.6	Operation not recommended						
				1350	32.5	2.90	0.89	2.83	42.1	11.5	7.2								
	11.0	2.6	6.0	1150	32.7	2.49	0.76	2.63	41.7	12.5	6.2	Operation not recommended							
1350				33.7	2.93	0.87	2.74	43.0	12.3	6.8									
110	5.0	0.7	1.6	Operation not recommended															
	8.0	1.5	3.4	1150	28.2	23.0	0.82	3.02	38.5	9.3	8.4	Operation not recommended							
				1350	29.2	27.1	0.93	3.15	39.9	9.3	9.1								
	11.0	2.5	5.8	1150	29.6	23.4	0.79	2.93	39.6	10.1	7.8	Operation not recommended							
1350				30.4	27.5	0.90	3.06	40.8	10.0	8.6									
120	5.0	0.7	1.5	Operation not recommended															
	8.0	1.4	3.3	1150	25.5	22.1	0.86	3.36	37.0	7.6	10.2	Operation not recommended							
				1350	26.4	26.0	0.98	3.51	38.4	7.5	11.0								
	11.0	2.4	5.6	1150	27.0	22.6	0.84	3.26	38.1	8.3	9.4	Operation not recommended							
1350				27.7	26.5	0.96	3.42	39.4	8.1	10.5									

Performance capacities shown in thousands of Btu/h.

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Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

**Synergy3D Residential Series  
3-6 Tons 60Hz**



## SDV049 High Speed - Performance Data

EWT °F	Flow gpm	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F							
		PSI	FT	Airflow cfm	HC kBtuh	Power kW	HE kBtuh	LAT °F	COP	HWC kBtuh	Airflow cfm	TC kBtuh	SC kBtuh	S/T Ratio	Power kW	HR kBtuh	EER	HWC kBtuh
20	6.0	1.3	3.0	Operation not recommended														
	9.0	2.5	5.7	Operation not recommended														
	12.0	4.0	9.2	1350	27.5	2.53	18.8	88.9	3.18	4.7								
				1550	28.4	2.61	19.5	87.0	3.18	4.2								
30	6.0	1.2	2.9	Operation not recommended														
	9.0	2.4	5.5	1350	31.0	2.49	22.5	91.2	3.64	4.9	1350	39.9	26.3	0.66	1.75	45.9	22.8	-
				1550	31.9	2.57	23.2	89.1	3.64	4.5	1550	42.4	29.3	0.69	1.87	48.7	22.7	-
	12.0	3.9	8.9	1350	31.5	2.52	22.9	91.6	3.66	5.0	1350	40.4	26.3	0.65	1.67	46.1	24.2	-
				1550	32.5	2.60	23.6	89.4	3.67	4.6	1550	42.7	29.2	0.68	1.78	48.8	24.0	-
	40	6.0	1.2	2.8	Operation not recommended													
9.0		2.3	5.3	1350	36.8	2.69	27.6	95.2	4.01	5.6	1350	42.4	29.9	0.70	1.92	49.0	22.1	-
				1550	37.9	2.75	28.5	92.6	4.04	5.2	1550	44.9	33.2	0.74	2.03	51.8	22.1	-
12.0		3.7	8.7	1350	37.5	2.72	28.2	95.7	4.04	5.8	1350	42.9	29.9	0.70	1.84	49.2	23.4	-
				1550	38.7	2.77	29.2	93.1	4.09	5.3	1550	45.2	33.2	0.73	1.95	51.9	23.2	-
50		6.0	1.2	2.7	1350	39.6	2.77	30.1	97.1	4.18	6.1	1350	44.9	33.3	0.74	2.29	52.7	19.6
	1550				40.8	2.81	31.3	94.4	4.26	5.6	1550	47.3	37.0	0.78	2.41	55.5	19.6	2.9
	9.0	2.2	5.2	1350	41.1	2.83	31.5	98.2	4.26	6.3	1350	45.4	33.8	0.74	2.14	52.8	21.2	2.5
				1550	42.3	2.87	32.5	95.3	4.32	5.8	1550	47.9	37.6	0.79	2.25	55.6	21.3	2.7
	12.0	3.6	8.4	1350	41.9	2.86	32.2	98.8	4.30	6.5	1350	45.9	33.9	0.74	2.06	53.0	22.3	2.3
				1550	43.3	2.90	33.4	95.9	4.38	5.9	1550	48.3	37.7	0.78	2.17	55.7	22.2	2.6
60	6.0	1.1	2.6	1350	43.7	2.85	33.9	99.9	4.49	6.9	1350	42.9	32.2	0.75	2.39	51.1	17.9	3.2
				1550	45.0	2.86	35.3	96.9	4.61	6.4	1550	45.0	35.7	0.79	2.50	53.5	18.0	3.4
	9.0	2.2	5.0	1350	45.6	2.92	35.7	101.3	4.58	7.1	1350	43.6	32.6	0.75	2.26	51.3	19.3	3.0
				1550	47.0	2.94	37.0	98.1	4.69	6.6	1550	45.7	36.2	0.79	2.36	53.8	19.4	3.2
	12.0	3.5	8.1	1350	46.7	2.96	36.6	102.0	4.63	7.3	1350	44.1	32.8	0.74	2.19	51.5	20.1	2.7
				1550	48.2	2.97	38.1	98.8	4.76	6.7	1550	46.2	36.4	0.79	2.29	54.0	20.2	3.1
70	6.0	1.1	2.5	1350	48.0	2.96	37.9	102.9	4.75	7.9	1350	42.0	33.1	0.79	2.68	51.1	15.7	3.9
				1550	49.5	2.95	39.4	99.5	4.91	7.3	1550	43.8	36.8	0.84	2.78	53.3	15.8	4.2
	9.0	2.1	4.9	1350	50.3	3.05	39.9	104.5	4.84	8.1	1350	42.9	33.5	0.78	2.55	51.6	16.8	3.7
				1550	51.9	3.04	41.5	101.0	5.00	7.5	1550	44.8	37.2	0.83	2.65	53.8	16.9	4.0
	12.0	3.4	7.9	1350	51.6	3.09	41.1	105.4	4.90	8.4	1350	43.3	33.7	0.78	2.48	51.8	17.5	3.4
				1550	53.3	3.07	42.8	101.8	5.09	7.7	1550	45.3	37.5	0.83	2.58	54.1	17.6	3.8
80	6.0	1.1	2.5	1350	50.1	3.03	39.7	104.3	4.84	8.7	1350	41.3	32.6	0.79	2.86	51.0	14.5	5.1
				1550	51.7	3.00	41.5	100.9	5.06	8.1	1550	43.0	36.1	0.84	2.94	53.0	14.6	5.4
	9.0	2.0	4.7	1350	52.9	3.14	42.1	106.3	4.93	9.0	1350	42.4	32.9	0.78	2.75	51.7	15.4	4.7
				1550	54.6	3.10	44.0	102.6	5.16	8.3	1550	44.1	36.5	0.83	2.83	53.7	15.6	5.1
	12.0	3.3	7.6	1350	54.4	3.18	43.5	107.3	5.01	9.3	1350	42.8	33.2	0.78	2.68	52.0	16.0	4.4
				1550	56.2	3.14	45.5	103.6	5.25	8.6	1550	44.5	36.9	0.83	2.76	54.0	16.1	4.9
90	6.0	1.0	2.4	1350	52.3	3.11	41.7	105.9	4.94	9.7	1350	38.5	29.9	0.78	2.99	48.7	12.9	6.3
				1550	54.1	3.05	43.7	102.3	5.21	9.0	1550	39.9	33.1	0.83	3.06	50.3	13.0	6.7
	9.0	2.0	4.5	1350	55.6	3.24	44.5	108.1	5.03	10.0	1350	39.6	30.2	0.76	2.91	49.6	13.6	5.9
				1550	57.4	3.17	46.6	104.3	5.31	9.3	1550	41.1	33.4	0.81	2.97	51.3	13.9	6.4
	12.0	3.2	7.3	1350	57.3	3.27	46.1	109.3	5.13	10.3	1350	40.1	30.4	0.76	2.85	49.8	14.1	5.5
				1550	59.2	3.21	48.3	105.4	5.41	9.6	1550	41.5	33.8	0.81	2.91	51.4	14.3	6.1
100	6.0	1.0	2.3	Operation not recommended														
	9.0	1.9	4.4	1350	38.6	30.9	0.80	3.38	50.2	11.4	7.5							
				1550	39.9	34.2	0.86	3.43	51.6	11.7	8.1							
	12.0	3.1	7.1	1350	39.1	31.2	0.80	3.32	50.4	11.7	7.0							
1550				40.3	34.6	0.86	3.37	51.8	12.0	7.7								
110	6.0	1.0	2.2	Operation not recommended														
	9.0	1.8	4.2	1350	35.7	28.4	0.80	3.77	48.5	9.5	9.3							
				1550	36.7	31.4	0.86	3.80	49.6	9.7	10.1							
	12.0	2.9	6.8	1350	36.0	28.8	0.80	3.72	48.7	9.7	8.7							
1550				37.0	31.9	0.86	3.75	49.8	9.9	9.6								
120	6.0	0.9	2.1	Operation not recommended														
	9.0	1.7	4.0	1350	33.0	27.6	0.84	4.19	47.3	7.9	11.3							
				1550	33.8	30.4	0.90	4.18	48.1	8.1	12.2							
	12.0	2.8	6.5	1350	33.3	28.0	0.84	4.15	47.5	8.0	10.5							
1550				34.1	31.0	0.91	4.14	48.2	8.2	11.6								

Performance capacities shown in thousands of Btuh.

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Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

**Synergy3D Residential Series  
3-6 Tons 60Hz**



# Synergy3D 049 Water Heating Data

ELT	EST	LGPM	SOURCE 6.0 GPM						SWPD		HWC kBtuh	SOURCE 9.0 GPM						SWPD		HWC kBtuh	SOURCE 12.0 GPM						SWPD		HWC kBtuh	
			LLT	HC	KW	HE	COP	LST	PSI	FT HD		LLT	HC	KW	HE	COP	LST	PSI	FT HD		LLT	HC	KW	HE	COP	LST	PSI	FT HD		
80	30	6.0	Operation Not Recommended																											
		9.0	88.0	32.1	2.54	23.5	3.7	21.9	1.2	2.8	4.6	88.3	33.1	2.56	24.4	3.8	23.8	2.7	6.2	4.7	88.5	34.0	2.57	25.2	3.9	25.7	4.2	9.7	4.8	
		12.0	85.3	32.1	2.49	23.6	3.8	21.9	1.2	2.8	4.4	85.5	33.0	2.50	24.5	3.9	23.8	2.7	6.2	4.5	85.7	33.9	2.51	25.4	4.0	25.6	4.2	9.7	4.6	
80	40	6.0	Operation Not Recommended																											
		9.0	89.3	37.0	2.58	28.2	4.2	30.3	1.2	2.7	5.3	89.6	38.2	2.59	29.4	4.3	32.6	2.6	6.1	5.4	89.9	39.4	2.60	30.5	4.4	34.9	4.1	9.4	5.5	
		12.0	86.2	37.0	2.52	28.4	4.3	30.2	1.2	2.7	5.1	86.4	38.2	2.52	29.6	4.4	32.5	2.6	6.1	5.2	86.6	39.4	2.53	30.7	4.6	34.9	4.1	9.4	5.3	
80	50	6.0	94.0	41.9	2.68	32.8	4.6	38.7	1.2	2.7	6.1	94.5	43.4	2.70	34.2	4.7	41.4	2.6	5.9	6.3	94.9	44.8	2.72	35.6	4.8	44.1	4.0	9.1	6.4	
		9.0	90.5	41.9	2.61	33.0	4.7	38.7	1.2	2.7	5.9	90.8	43.4	2.62	34.4	4.8	41.3	2.6	5.9	6.0	91.2	44.8	2.64	35.8	5.0	44.0	4.0	9.1	6.2	
		12.0	87.0	41.9	2.54	33.2	4.8	38.6	1.2	2.7	5.7	87.2	43.3	2.55	34.6	5.0	41.3	2.6	5.9	5.8	87.5	44.8	2.56	36.1	5.1	44.0	4.0	9.1	5.9	
80	60	6.0	95.6	46.8	2.72	37.5	5.0	47.1	1.1	2.6	7.0	96.2	48.5	2.74	39.2	5.2	50.2	2.5	5.7	7.1	96.7	50.2	2.76	40.8	5.3	53.2	3.8	8.8	7.3	
		9.0	91.7	46.8	2.64	37.8	5.2	47.0	1.1	2.6	6.7	92.1	48.5	2.66	39.4	5.3	50.1	2.5	5.7	6.9	92.6	50.2	2.67	41.1	5.5	53.1	3.8	8.8	7.0	
		12.0	87.8	46.8	2.56	38.0	5.3	46.9	1.1	2.6	6.5	88.1	48.5	2.57	39.7	5.5	50.0	2.5	5.7	6.6	88.4	50.2	2.58	41.4	5.7	53.1	3.8	8.8	6.7	
80	70	6.0	97.2	51.7	2.76	42.2	5.5	55.5	1.1	2.5	8.0	97.9	53.6	2.79	44.1	5.6	58.9	2.4	5.5	8.2	98.5	55.6	2.81	46.0	5.8	62.3	3.7	8.5	8.3	
		9.0	92.9	51.7	2.68	42.5	5.7	55.4	1.1	2.5	7.7	93.4	53.6	2.69	44.5	5.8	58.8	2.4	5.5	7.9	93.9	55.6	2.70	46.4	6.0	62.3	3.7	8.5	8.0	
		12.0	88.6	51.7	2.59	42.8	5.8	55.3	1.1	2.5	7.4	88.9	53.7	2.59	44.8	6.1	58.7	2.4	5.5	7.6	89.3	55.7	2.60	46.8	6.3	62.2	3.7	8.5	7.7	
100	30	6.0	Operation Not Recommended																											
		9.0	107.8	31.1	3.25	20.0	2.8	23.1	1.2	2.8	4.4	108.1	32.3	3.30	21.0	2.9	24.7	2.7	6.2	4.5	108.4	33.4	3.36	22.0	2.9	26.3	4.2	9.7	4.7	
		12.0	105.2	31.2	3.20	20.2	2.9	23.0	1.2	2.8	4.3	105.3	31.9	3.20	21.0	2.9	24.7	2.7	6.2	4.3	105.4	32.7	3.21	21.7	3.0	26.4	4.2	9.7	4.4	
100	40	6.0	Operation Not Recommended																											
		9.0	108.9	35.6	3.28	24.4	3.2	31.6	1.2	2.7	5.1	109.3	36.9	3.32	25.6	3.3	33.6	2.6	6.1	5.2	109.6	38.3	3.37	26.8	3.3	35.5	4.1	9.4	5.3	
		12.0	105.9	35.7	3.21	24.7	3.3	31.5	1.2	2.7	4.9	106.1	36.7	3.22	25.7	3.3	33.5	2.6	6.1	5.0	106.3	37.7	3.23	26.7	3.4	35.6	4.1	9.4	5.0	
100	50	6.0	113.4	40.1	3.39	28.5	3.5	40.2	1.2	2.7	5.9	113.9	41.7	3.45	30.0	3.5	42.5	2.6	5.9	6.0	114.5	43.4	3.51	31.4	3.6	44.8	4.0	9.1	6.2	
		9.0	110.0	40.1	3.31	28.9	3.6	40.1	1.2	2.7	5.7	110.4	41.6	3.34	30.2	3.6	42.4	2.6	5.9	5.8	110.8	43.1	3.38	31.5	3.7	44.7	4.0	9.1	5.9	
		12.0	106.7	40.2	3.23	29.2	3.6	40.0	1.2	2.7	5.5	106.9	41.5	3.24	30.4	3.8	42.3	2.6	5.9	5.5	107.1	42.7	3.25	31.6	3.9	44.7	4.0	9.1	5.6	
100	60	6.0	114.9	44.6	3.42	32.9	3.8	48.7	1.1	2.6	6.7	115.4	46.3	3.47	34.5	3.9	51.3	2.5	5.7	6.8	116.0	48.0	3.52	36.0	4.0	54.0	3.8	8.8	7.0	
		9.0	111.2	44.7	3.34	33.3	3.9	48.6	1.1	2.6	6.4	111.6	46.3	3.36	34.8	4.0	51.3	2.5	5.7	6.6	112.0	47.9	3.39	36.3	4.1	53.9	3.8	8.8	6.7	
		12.0	107.5	44.8	3.25	33.7	4.0	48.4	1.1	2.6	6.2	107.7	46.3	3.26	35.1	4.2	51.2	2.5	5.7	6.3	108.0	47.7	3.26	36.6	4.3	53.9	3.8	8.8	6.4	
100	70	6.0	116.4	49.1	3.46	37.3	4.2	57.2	1.1	2.5	7.6	117.0	50.9	3.49	38.9	4.3	60.2	2.4	5.5	7.7	117.5	52.6	3.53	40.6	4.4	63.2	3.7	8.5	7.9	
		9.0	112.3	49.2	3.36	37.7	4.3	57.0	1.1	2.5	7.3	112.7	50.9	3.38	39.4	4.4	60.1	2.4	5.5	7.5	113.2	52.7	3.40	41.1	4.5	63.2	3.7	8.5	7.6	
		12.0	108.2	49.3	3.27	38.2	4.4	56.9	1.1	2.5	7.1	108.5	51.0	3.27	39.9	4.6	60.0	2.4	5.5	7.2	108.8	52.8	3.28	41.6	4.7	63.1	3.7	8.5	7.3	
120	30	6.0	Operation Not Recommended																											
		9.0	127.5	30.0	3.96	16.5	2.2	24.3	1.2	2.8	4.3	127.9	31.5	4.05	17.6	2.3	25.6	2.7	6.2	4.4	128.3	32.9	4.14	18.7	2.3	26.8	4.2	9.7	4.6	
		12.0	125.0	30.2	3.90	16.9	2.3	24.2	1.2	2.8	4.1	125.1	30.8	3.91	17.5	2.3	25.5	2.7	6.2	4.2	125.2	31.4	3.91	18.0	2.3	26.9	4.2	9.7	4.2	
120	40	6.0	Operation Not Recommended																											
		9.0	128.5	34.2	3.99	20.6	2.5	32.9	1.2	2.7	4.9	128.9	35.7	4.06	21.8	2.6	34.5	2.6	6.1	5.0	129.4	37.1	4.13	23.0	2.6	36.2	4.1	9.4	5.2	
		12.0	125.7	34.4	3.91	21.1	2.6	32.8	1.2	2.7	4.7	125.9	35.2	3.92	21.8	2.6	34.5	2.6	6.1	4.8	126.0	36.0	3.92	22.6	2.7	36.2	4.1	9.4	4.8	
120	50	6.0	132.7	38.2	4.09	24.2	2.7	41.7	1.2	2.7	5.6	133.4	40.1	4.20	25.8	2.8	43.6	2.6	5.9	5.8	134.0	42.0	4.31	27.3	2.9	45.4	4.0	9.1	6.0	
		9.0	129.6	38.4	4.01	24.7	2.8	41.5	1.2	2.7	5.4	130.0	39.8	4.06	26.0	2.9	43.5	2.6	5.9	5.5	130.4	41.3	4.12	27.2	2.9	45.5	4.0	9.1	5.7	
		12.0	126.4	38.6	3.92	25.2	2.9	41.3	1.2	2.7	5.2	126.6	39.6	3.93	26.2	3.0	43.4	2.6	5.9	5.3	126.8	40.6	3.94	27.2	3.0	45.5	4.0	9.1	5.4	
120	60	6.0	134.1	42.4	4.13	28.3	3.0	50.3	1.1	2.6	6.3	134.7	44.1	4.20	29.8	3.1	52.5	2.5	5.7	6.5	135.3	45.8	4.28	31.2	3.1	54.8	3.8	8.8	6.6	
		9.0	130.6	42.6	4.03	28.8	3.1	50.1	1.1	2.6	6.1	131.0	44.0	4.07	30.2	3.2	52.4	2.5	5.7	6.2	131.4	45.5	4.11	31.5	3.2	54.7	3.8	8.8	6.3	
		12.0	127.1	42.8	3.93	29.4	3.2	49.9	1.1	2.6	5.9	127.3	44.0	3.94	30.6	3.3	52.3	2.5	5.7	6.0	127.5	45.2	3.95	31.8	3.4	54.7	3.8	8.8	6.1	
120	70	6.0	135.5	46.5	4.16	32.3	3.3	58.9	1.1	2.5	7.2	136.0	48.1	4.20	33.8	3.4	61.4	2.4	5.5	7.3	136.6	49.7	4.24	35.2	3.4	64.0	3.7	8.5	7.4	
		9.0	131.7	46.7	4.05	32.9	3.4	58.7	1.1	2.5	7.0	132.0	48.2	4.08	34.3	3.5	61.3	2.4	5.5	7.1	132.4	49.7	4.10	35.8	3.6	63.9	3.7	8.5	7.2	
		12.0	127.8	47.0	3.94	33.5	3.5	58.5	1.1	2.5	6.7	128.1	48.4	3.95	34.9	3.6	61.1	2.4	5.5	6.8	128.3	49.8	3.96	36.3	3.7	63.8	3.7	8.5	6.9	

\* Water heating mode only allows high compressor capacity operation.

ELT = entering load fluid temperature to heat pump  
 LLT = leaving load fluid temperature from heat pump  
 LGPM = load flow in gallons per minute  
 LWPD = load coax water pressure drop  
 EST = entering source fluid temperature to heat pump  
 LST = leaving source fluid temperature from heat pump  
 HWC = hot water generator capacity

SWPD = source coax water pressure drop  
 PSI = pressure drop in pounds per square inch  
 FT HD = pressure drop in feet of head  
 KW = kilowatts  
 HE = heat extracted in Btuh  
 HC = total heating capacity in Btuh  
 COP = coefficient of performance [HC/(kW x 3.413)]

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Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

**Synergy3D Residential Series  
3-6 Tons 60Hz**



## SDV064 Low Speed - Performance Data

EWT °F	Flow gpm	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F											
		PSI	FT	Airflow cfm	HC kBtuh	Power kW	HE kBtuh	LAT °F	COP	HWC kBtuh	Airflow cfm	TC kBtuh	SC kBtuh	S/T Ratio	Power kW	HR kBtuh	EER	HWC kBtuh				
20	6.0	1.0	2.4	Operation not recommended											Operation not recommended							
	10.0	2.7	6.2	Operation not recommended											Operation not recommended							
	14.0	5.1	11.8	1250	24.6	2.71	15.3	88.2	2.65	4.6	Operation not recommended											
				1500	25.4	2.75	16.0	85.7	2.71	4.2	Operation not recommended											
30	6.0	1.0	2.3	Operation not recommended											Operation not recommended							
	10.0	2.6	6.0	1250	28.1	2.77	18.6	90.8	2.97	4.6	1250	46.5	29.6	0.64	1.55	51.8	29.9	-				
				1500	29.1	2.81	19.5	88.0	3.04	4.2	1500	47.9	33.8	0.70	1.62	53.4	29.5	-				
				1250	29.1	2.77	19.6	91.6	3.08	4.7	1250	46.6	29.5	0.63	1.52	51.8	30.8	-				
				1500	30.1	2.81	20.5	88.6	3.14	4.3	1500	47.8	33.7	0.70	1.60	53.3	29.9	-				
40	6.0	1.0	2.3	Operation not recommended											Operation not recommended							
	10.0	2.5	5.9	1250	34.3	2.89	24.4	95.4	3.48	5.1	1250	48.9	31.5	0.64	1.74	54.8	28.0	-				
				1500	35.2	2.90	25.4	91.8	3.57	4.6	1500	50.3	35.8	0.71	1.82	56.5	27.6	-				
				1250	35.4	2.90	25.5	96.2	3.58	5.2	1250	49.0	31.4	0.64	1.70	54.8	28.7	-				
				1500	36.4	2.90	26.4	92.4	3.67	4.8	1500	50.3	35.7	0.71	1.79	56.4	28.1	-				
50	6.0	0.9	2.2	1250	38.7	2.92	28.7	98.7	3.88	5.3	1250	51.5	33.4	0.65	2.06	58.5	25.0	1.9				
				1500	39.8	2.92	29.8	94.5	3.98	4.9	1500	53.0	37.9	0.72	2.17	60.4	24.4	2.0				
	10.0	2.5	5.7	1250	39.3	2.98	29.1	99.1	3.87	5.5	1250	51.7	33.7	0.65	1.98	58.4	26.1	1.8				
				1500	40.2	2.96	30.1	94.8	3.98	5.1	1500	53.2	38.2	0.72	2.08	60.2	25.6	1.9				
				1250	40.5	3.00	30.3	100.0	3.96	5.7	1250	51.8	33.7	0.65	1.94	58.4	26.6	1.6				
				1500	41.4	2.98	31.2	95.6	4.07	5.2	1500	53.3	38.2	0.72	2.04	60.3	26.2	1.8				
				1250	43.8	3.02	33.5	102.4	4.25	6.0	1250	48.8	32.4	0.66	2.26	56.6	21.6	2.6				
60	6.0	0.9	2.1	1500	44.7	2.99	34.5	97.6	4.38	5.5	1500	50.3	36.5	0.73	2.37	58.4	21.2	2.8				
				1250	45.1	3.07	34.7	103.4	4.31	6.1	1250	49.0	32.7	0.67	2.19	56.5	22.4	2.5				
	10.0	2.4	5.5	1500	45.9	3.03	35.5	98.3	4.44	5.7	1500	50.5	36.9	0.73	2.29	58.3	22.1	2.7				
				1250	46.2	3.10	35.6	104.2	4.37	6.3	1250	49.3	32.7	0.66	2.15	56.6	22.9	2.3				
				1500	46.9	3.06	36.5	99.0	4.50	5.8	1500	50.7	37.0	0.73	2.25	58.4	22.6	2.5				
70	6.0	0.9	2.0	1250	49.1	3.12	38.4	106.4	4.61	6.7	1250	47.3	32.2	0.68	2.54	56.0	18.6	3.7				
				1500	49.9	3.07	39.4	100.8	4.77	6.2	1500	48.8	36.1	0.74	2.65	57.8	18.4	3.9				
	10.0	2.3	5.3	1250	51.2	3.17	40.3	107.9	4.73	7.0	1250	47.6	32.5	0.68	2.47	56.1	19.3	3.4				
				1500	51.7	3.10	41.1	101.9	4.89	6.4	1500	49.1	36.5	0.74	2.58	57.9	19.1	3.7				
				1250	52.1	3.21	41.2	108.6	4.76	7.2	1250	47.9	32.6	0.68	2.42	56.2	19.8	3.2				
80	6.0	0.9	2.0	1500	52.7	3.14	42.0	102.5	4.92	6.6	1500	49.4	36.7	0.74	2.52	58.0	19.6	3.5				
				1250	52.8	3.19	41.9	109.1	4.85	7.4	1250	46.0	32.1	0.70	2.85	55.7	16.1	5.1				
				1500	53.3	3.12	42.6	102.9	5.00	6.9	1500	47.4	35.8	0.76	2.95	57.4	16.1	5.4				
	10.0	2.2	5.1	1250	55.7	3.24	44.7	111.3	5.04	7.7	1250	46.4	32.4	0.70	2.78	55.8	16.7	4.8				
				1500	56.0	3.15	45.3	104.6	5.22	7.1	1500	47.8	36.2	0.76	2.89	57.6	16.5	5.2				
90	6.0	0.8	1.9	1250	56.4	3.28	45.2	111.8	5.04	7.9	1250	46.7	32.6	0.70	2.73	56.0	17.1	4.4				
				1500	56.6	3.19	45.7	105.0	5.20	7.3	1500	48.1	36.4	0.76	2.83	57.8	17.0	4.9				
	10.0	2.1	5.0	1250	56.7	3.26	45.6	112.0	5.10	8.3	1250	42.3	30.5	0.72	3.17	53.1	13.3	6.8				
				1500	56.9	3.17	46.0	105.1	5.25	7.7	1500	43.6	33.8	0.78	3.26	54.7	13.4	7.2				
				1250	60.5	3.31	49.2	114.8	5.36	8.6	1250	42.8	30.8	0.72	3.10	53.3	13.8	6.4				
100	6.0	0.8	1.8	1500	60.5	3.19	49.7	107.4	5.56	7.9	1500	44.0	34.3	0.78	3.21	55.0	13.7	6.9				
				1250	60.9	3.36	49.5	115.1	5.31	8.8	1250	43.1	31.1	0.72	3.06	53.5	14.1	5.9				
				1500	60.8	3.24	49.7	107.5	5.50	8.2	1500	44.5	34.6	0.78	3.15	55.3	14.1	6.6				
	10.0	2.1	5.0	Operation not recommended											1250	40.9	30.5	0.75	3.52	52.9	11.6	8.3
				Operation not recommended											1500	42.1	33.8	0.80	3.61	54.4	11.7	8.9
110	6.0	0.8	1.8	Operation not recommended											1250	41.3	30.9	0.75	3.47	53.1	11.9	7.7
				Operation not recommended											1500	42.6	34.2	0.80	3.56	54.7	12.0	8.5
	10.0	2.0	4.6	Operation not recommended											1250	36.7	28.9	0.79	3.94	50.1	9.3	10.4
				Operation not recommended											1500	37.8	31.7	0.84	4.02	51.5	9.4	11.3
				Operation not recommended											1250	37.1	29.4	0.79	3.88	50.4	9.6	9.7
120	6.0	0.7	1.7	Operation not recommended											1500	38.3	32.2	0.84	3.96	51.8	9.7	10.7
				Operation not recommended											1250	33.3	27.6	0.83	4.43	48.5	7.5	12.6
	10.0	1.9	4.4	Operation not recommended											1500	34.4	30.1	0.88	4.48	49.7	7.7	13.6
				Operation not recommended											1250	33.9	28.2	0.83	4.38	48.8	7.7	11.7
				Operation not recommended											1500	34.9	30.6	0.88	4.43	50.0	7.9	12.9

Performance capacities shown in thousands of Btuh.

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Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

## SDV064 High Speed - Performance Data

EWT °F	Flow gpm	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F								
		PSI	FT	Airflow cfm	HC kBtuh	Power kW	HE kBtuh	LAT °F	COP	HWC kBtuh	Airflow cfm	TC kBtuh	SC kBtuh	S/T Ratio	Power kW	HR kBtuh	EER	HWC kBtuh	
20	8.0	1.8	4.2	Operation not recommended							Operation not recommended								
	12.0	3.8	8.8	Operation not recommended							Operation not recommended								
	16.0	6.5	15.1	1500	36.5	3.46	24.7	92.5	3.10	5.7	1800	37.4	3.62	25.1	89.2	3.03	5.2		
30	8.0	1.8	4.1	Operation not recommended							Operation not recommended								
	12.0	3.7	8.6	1500	42.6	3.56	30.4	96.3	3.50	6.1	1500	63.2	40.7	0.64	2.69	72.4	23.5	-	
	16.0	6.4	14.7	1800	43.7	3.79	30.8	92.5	3.38	5.6	1800	63.8	44.4	0.70	2.85	73.5	22.4	-	
				1500	43.2	3.65	30.7	96.6	3.46	6.3	1500	63.9	41.1	0.64	2.64	72.9	24.2	-	
				1800	44.2	3.82	31.2	92.7	3.39	5.7	1800	64.3	44.7	0.70	2.81	73.9	22.9	-	
40	8.0	1.7	4.0	Operation not recommended							Operation not recommended								
	12.0	3.6	8.3	1500	50.1	3.82	37.1	100.9	3.85	6.9	1500	66.0	42.4	0.64	2.93	76.0	22.5	-	
	16.0	6.2	14.2	1800	51.3	3.98	37.7	96.4	3.77	6.3	1800	67.0	46.2	0.69	3.11	77.6	21.5	-	
				1500	50.9	3.89	37.6	101.4	3.84	7.1	1500	66.7	42.9	0.64	2.88	76.6	23.1	-	
				1800	52.0	4.02	38.3	96.8	3.79	6.5	1800	67.6	46.6	0.69	3.06	78.1	22.1	-	
50	8.0	1.7	3.8	1500	53.3	3.97	39.8	102.9	3.93	7.4	1500	68.1	43.7	0.64	3.31	79.4	20.6	3.8	
	12.0	3.5	8.1	1800	54.5	4.10	40.5	98.0	3.90	6.9	1800	69.5	47.5	0.68	3.52	81.5	19.8	4.0	
				1500	56.4	4.05	42.6	104.8	4.08	7.7	1500	68.8	44.1	0.64	3.24	79.9	21.2	3.6	
				1800	57.6	4.15	43.4	99.6	4.07	7.1	1800	70.2	48.0	0.68	3.44	81.9	20.4	3.9	
	16.0	6.0	13.8	1500	57.4	4.10	43.4	105.4	4.11	7.9	1500	69.5	44.6	0.64	3.18	80.4	21.8	3.3	
				1800	58.6	4.20	44.3	100.1	4.09	7.2	1800	70.9	48.4	0.68	3.38	82.4	21.0	3.7	
				1500	60.0	4.25	45.5	107.0	4.14	8.3	1500	65.9	43.0	0.65	3.51	77.9	18.8	4.6	
60	8.0	1.6	3.7	1800	61.3	4.32	46.5	101.5	4.16	7.7	1800	67.6	46.7	0.69	3.73	80.4	18.1	4.9	
	12.0	3.4	7.8	1500	62.7	4.32	48.0	108.7	4.26	8.6	1500	66.6	43.4	0.65	3.44	78.3	19.4	4.3	
				1800	64.1	4.37	49.1	103.0	4.29	7.9	1800	68.3	47.1	0.69	3.65	80.8	18.7	4.7	
				1500	64.1	4.37	49.2	109.5	4.30	8.9	1500	67.3	43.8	0.65	3.38	78.8	19.9	4.0	
	16.0	5.8	13.4	1800	65.5	4.42	50.4	103.7	4.35	8.1	1800	69.0	47.6	0.69	3.59	81.2	19.2	4.4	
70	8.0	1.6	3.6	1500	66.5	4.52	51.1	111.1	4.32	9.4	1500	64.8	42.9	0.66	3.82	77.9	17.0	5.6	
	12.0	3.3	7.5	1800	68.0	4.54	52.5	105.0	4.39	8.7	1800	66.8	46.6	0.70	4.07	80.7	16.4	6.0	
				1500	69.0	4.58	53.4	112.6	4.41	9.7	1500	65.4	43.3	0.66	3.75	78.2	17.5	5.3	
				1800	70.5	4.59	54.9	106.3	4.50	8.9	1800	67.6	47.0	0.70	3.98	81.2	17.0	5.7	
	16.0	5.6	12.9	1500	70.7	4.64	54.9	113.7	4.47	10.0	1500	66.1	43.7	0.66	3.68	78.7	17.9	4.9	
				1800	72.4	4.64	56.6	107.2	4.58	9.2	1800	68.2	47.5	0.70	3.92	81.6	17.4	5.4	
				1500	71.6	4.74	55.4	114.2	4.42	10.3	1500	62.7	42.1	0.67	4.15	76.8	15.1	7.3	
80	8.0	1.5	3.5	1800	73.2	4.72	57.1	107.7	4.55	9.6	1800	65.0	45.7	0.70	4.42	80.1	14.7	7.7	
	12.0	3.2	7.3	1500	73.3	4.80	56.9	115.2	4.47	10.7	1500	63.3	42.4	0.67	4.07	77.2	15.6	6.8	
				1800	75.0	4.75	58.8	108.6	4.63	9.9	1800	65.6	46.1	0.70	4.33	80.4	15.2	7.4	
				1500	75.5	4.86	58.9	116.6	4.55	11.0	1500	63.9	42.9	0.67	4.00	77.6	16.0	6.3	
	16.0	5.4	12.5	1800	77.4	4.80	61.0	109.8	4.72	10.1	1800	66.3	46.6	0.70	4.26	80.8	15.6	7.0	
90	8.0	1.4	3.3	1500	76.6	4.98	59.6	117.3	4.51	11.4	1500	58.3	40.2	0.69	4.47	73.5	13.0	9.3	
	12.0	3.0	7.0	1800	78.4	4.91	61.7	110.4	4.69	10.5	1800	60.9	43.7	0.72	4.76	77.1	12.8	9.8	
				1500	77.6	5.03	60.4	117.9	4.52	11.7	1500	59.0	40.5	0.69	4.38	73.9	13.5	8.6	
				1800	79.6	4.93	62.7	110.9	4.73	10.9	1800	61.4	44.1	0.72	4.66	77.3	13.2	9.4	
	16.0	5.2	12.0	1500	80.3	5.10	62.9	119.6	4.62	12.1	1500	59.5	41.0	0.69	4.31	74.2	13.8	8.0	
1800	82.4	4.98	65.4	112.4	4.85	11.2	1800	62.1	44.5	0.72	4.59	77.8	13.5	8.9					
100	8.0	1.4	3.2	Operation not recommended							Operation not recommended								
	12.0	2.9	6.8	1500	56.3	39.7	0.70	4.82	72.8	11.7	10.5	1500	56.3	39.7	0.70	4.82	72.8	11.7	10.5
	16.0	5.0	11.6	1800	59.0	43.1	0.73	5.14	76.5	11.5	11.4	1800	59.0	43.1	0.73	5.14	76.5	11.5	11.4
				1500	56.9	40.1	0.71	4.74	73.0	12.0	9.8	1500	56.9	40.1	0.71	4.74	73.0	12.0	9.8
1800	59.6	43.6	0.73	5.05	76.8	11.8	10.9	1800	59.6	43.6	0.73	5.05	76.8	11.8	10.9				
110	8.0	1.3	3.1	Operation not recommended							Operation not recommended								
	12.0	2.8	6.5	1500	50.8	37.3	0.74	5.21	68.6	9.8	13.6	1500	50.8	37.3	0.74	5.21	68.6	9.8	13.6
	16.0	4.8	11.2	1800	53.5	40.5	0.76	5.55	72.5	9.6	14.8	1800	53.5	40.5	0.76	5.55	72.5	9.6	14.8
				1500	51.3	37.7	0.74	5.11	68.7	10.0	12.7	1500	51.3	37.7	0.74	5.11	68.7	10.0	12.7
1800	54.0	41.0	0.76	5.46	72.6	9.9	14.1	1800	54.0	41.0	0.76	5.46	72.6	9.9	14.1				
120	8.0	1.3	3.0	Operation not recommended							Operation not recommended								
	12.0	2.7	6.3	1500	46.7	35.6	0.76	5.75	66.3	8.1	16.5	1500	46.7	35.6	0.76	5.75	66.3	8.1	16.5
	16.0	4.6	10.7	1800	49.5	38.7	0.78	6.14	70.4	8.1	17.9	1800	49.5	38.7	0.78	6.14	70.4	8.1	17.9
				1500	47.2	36.0	0.76	5.64	66.4	8.4	15.3	1500	47.2	36.0	0.76	5.64	66.4	8.4	15.3
1800	49.9	39.1	0.78	6.03	70.5	8.3	17.0	1800	49.9	39.1	0.78	6.03	70.5	8.3	17.0				

Performance capacities shown in thousands of Btu/h.

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Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

## Synergy3D 064 Water Heating Data

ELT	EST	LGPM	SOURCE 8.0 GPM						SWPD		HWC kBtuh	SOURCE 12.0 GPM						SWPD		HWC kBtuh	SOURCE 16.0 GPM						SWPD		HWC kBtuh	
			LLT	HC	KW	HE	COP	LST	PSI	FT HD		LLT	HC	KW	HE	COP	LST	PSI	FT HD		LLT	HC	KW	HE	COP	LST	PSI	FT HD		
80	30	8.0	Operation Not Recommended																											
		12.0	88.1	43.3	3.57	31.1	3.6	22.0	2.0	4.6	5.7	88.4	44.7	3.58	32.4	3.7	23.8	4.5	10.4	5.8	88.6	46.0	3.59	33.8	3.8	25.6	7.0	16.2	5.9	
		16.0	85.4	43.2	3.49	31.3	3.6	21.9	2.0	4.6	5.5	85.6	44.6	3.50	32.7	3.7	23.8	4.5	10.4	5.6	85.8	46.0	3.51	34.0	3.8	25.6	7.0	16.2	5.7	
80	40	8.0	Operation Not Recommended																											
		12.0	89.5	50.5	3.65	38.0	4.1	30.2	1.9	4.4	6.4	89.9	52.6	3.67	40.1	4.2	32.4	4.4	10.1	6.6	90.3	54.8	3.69	42.2	4.3	34.7	6.8	15.7	6.7	
		16.0	86.3	50.5	3.55	38.4	4.2	30.1	1.9	4.4	6.2	86.6	52.7	3.57	40.5	4.3	32.4	4.4	10.1	6.3	86.8	54.8	3.59	42.5	4.5	34.7	6.8	15.7	6.5	
80	50	8.0	94.3	57.4	3.85	44.2	4.4	38.6	1.9	4.3	7.5	95.1	60.4	3.88	47.2	4.6	41.2	4.2	9.8	7.6	95.9	63.5	3.91	50.1	4.8	43.7	6.6	15.2	7.8	
		12.0	90.8	57.6	3.73	44.9	4.5	38.4	1.9	4.3	7.2	91.3	60.6	3.76	47.7	4.7	41.1	4.2	9.8	7.4	91.9	63.5	3.79	50.6	4.9	43.7	6.6	15.2	7.5	
		16.0	87.2	57.8	3.61	45.5	4.7	38.3	1.9	4.3	6.9	87.6	60.7	3.64	48.3	4.9	40.9	4.2	9.8	7.1	87.9	63.6	3.67	51.0	5.1	43.6	6.6	15.2	7.2	
80	60	8.0	96.1	64.4	3.95	50.9	4.8	46.9	1.8	4.1	8.4	97.1	68.3	3.99	54.7	5.0	49.8	4.1	9.4	8.6	98.1	72.2	4.03	58.5	5.2	52.7	6.4	14.8	8.8	
		12.0	92.1	64.8	3.81	51.8	5.0	46.7	1.8	4.1	8.1	92.8	68.5	3.85	55.4	5.2	49.6	4.1	9.4	8.3	93.5	72.3	3.89	59.0	5.4	52.6	6.4	14.8	8.5	
		16.0	88.1	65.2	3.67	52.7	5.2	46.4	1.8	4.1	7.8	88.6	68.8	3.71	56.1	5.4	49.5	4.1	9.4	8.0	89.0	72.3	3.75	59.5	5.7	52.6	6.4	14.8	8.1	
80	70	8.0	97.8	71.4	4.05	57.5	5.2	55.2	1.7	3.9	9.5	99.0	76.1	4.10	62.1	5.4	58.4	4.0	9.1	9.7	100.2	80.9	4.15	66.8	5.7	61.7	6.2	14.3	9.9	
		12.0	93.5	71.9	3.89	58.7	5.4	54.9	1.7	3.9	9.2	94.3	76.5	3.94	63.0	5.7	58.2	4.0	9.1	9.4	95.2	81.0	3.99	67.4	6.0	61.6	6.2	14.3	9.5	
		16.0	89.1	72.5	3.73	59.8	5.7	54.6	1.7	3.9	8.8	89.6	76.8	3.78	63.9	6.0	58.0	4.0	9.1	9.0	90.1	81.1	3.83	68.0	6.2	61.5	6.2	14.3	9.2	
100	30	8.0	Operation Not Recommended																											
		12.0	107.9	42.3	4.56	26.7	2.7	23.1	2.0	4.6	5.6	108.1	43.4	4.57	27.8	2.8	24.8	4.5	10.4	5.6	108.4	44.5	4.58	28.9	2.8	26.4	7.0	16.2	5.7	
		16.0	105.3	42.3	4.48	27.0	2.8	23.0	2.0	4.6	5.4	105.4	43.4	4.49	28.1	2.8	24.7	4.5	10.4	5.4	105.6	44.5	4.50	29.2	2.9	26.4	7.0	16.2	5.5	
100	40	8.0	Operation Not Recommended																											
		12.0	109.2	48.9	4.62	33.1	3.1	31.5	1.9	4.4	6.2	109.5	50.7	4.64	34.8	3.2	33.4	4.4	10.1	6.3	109.8	52.4	4.67	36.5	3.3	35.4	6.8	15.7	6.4	
		16.0	106.1	49.0	4.49	33.6	3.2	31.3	1.9	4.4	6.0	106.3	50.7	4.52	35.3	3.3	33.4	4.4	10.1	6.1	106.6	52.5	4.55	37.0	3.4	35.4	6.8	15.7	6.2	
100	50	8.0	113.8	55.4	4.84	38.9	3.4	40.0	1.9	4.3	7.2	114.4	57.8	4.86	41.2	3.5	42.3	4.2	9.8	7.3	115.0	60.2	4.89	43.5	3.6	44.6	6.6	15.2	7.4	
		12.0	110.4	55.5	4.67	39.6	3.5	39.8	1.9	4.3	6.9	110.9	57.9	4.71	41.8	3.6	42.1	4.2	9.8	7.0	111.3	60.4	4.75	44.1	3.7	44.5	6.6	15.2	7.1	
		16.0	107.0	55.6	4.51	40.2	3.6	39.6	1.9	4.3	6.7	107.3	58.1	4.56	42.5	3.7	42.0	4.2	9.8	6.8	107.6	60.5	4.61	44.8	3.8	44.4	6.6	15.2	6.9	
100	60	8.0	115.5	62.0	4.94	45.1	3.7	48.4	1.8	4.1	8.1	116.2	65.0	4.96	48.0	3.8	51.0	4.1	9.4	8.2	117.0	68.0	4.99	50.9	4.0	53.6	6.4	14.8	8.3	
		12.0	111.6	62.1	4.73	46.0	3.8	48.2	1.8	4.1	7.8	112.2	65.2	4.78	48.9	4.0	50.8	4.1	9.4	7.9	112.8	68.3	4.83	51.8	4.1	53.5	6.4	14.8	8.0	
		16.0	107.8	62.3	4.52	46.8	4.0	47.9	1.8	4.1	7.5	108.2	65.4	4.60	49.7	4.2	50.7	4.1	9.4	7.6	108.6	68.6	4.67	52.6	4.3	53.4	6.4	14.8	7.7	
100	70	8.0	117.1	68.5	5.03	51.3	4.0	56.8	1.7	3.9	9.1	118.0	72.1	5.07	54.9	4.2	59.7	4.0	9.1	9.2	118.9	75.8	5.10	58.4	4.4	62.7	6.2	14.3	9.3	
		12.0	112.9	68.7	4.79	52.4	4.2	56.5	1.7	3.9	8.8	113.6	72.4	4.85	55.9	4.4	59.5	4.0	9.1	8.9	114.3	76.2	4.92	59.4	4.5	62.6	6.2	14.3	9.0	
		16.0	108.6	68.9	4.54	53.4	4.5	56.2	1.7	3.9	8.4	109.1	72.7	4.64	56.9	4.6	59.3	4.0	9.1	8.5	109.6	76.6	4.73	60.4	4.7	62.4	6.2	14.3	8.7	
120	30	8.0	Operation Not Recommended																											
		12.0	127.7	41.3	5.56	22.3	2.2	24.2	2.0	4.6	5.4	127.9	42.2	5.57	23.2	2.2	25.6	4.5	10.4	5.5	128.1	43.0	5.58	24.0	2.3	26.9	7.0	16.2	5.5	
		16.0	125.2	41.4	5.47	22.8	2.2	24.1	2.0	4.6	5.2	125.3	42.2	5.48	23.5	2.3	25.5	4.5	10.4	5.3	125.4	43.0	5.48	24.3	2.3	26.9	7.0	16.2	5.3	
120	40	8.0	Operation Not Recommended																											
		12.0	128.9	47.3	5.59	28.3	2.5	32.7	1.9	4.4	6.0	129.1	48.7	5.61	29.6	2.5	34.4	4.4	10.1	6.1	129.4	50.1	5.64	30.9	2.6	36.1	6.8	15.7	6.1	
		16.0	125.9	47.4	5.44	28.8	2.6	32.6	1.9	4.4	5.8	126.1	48.8	5.48	30.1	2.6	34.3	4.4	10.1	5.9	126.3	50.3	5.52	31.4	2.7	36.1	6.8	15.7	5.9	
120	50	8.0	133.4	53.4	5.83	33.5	2.7	41.4	1.9	4.3	7.0	133.8	55.1	5.84	35.2	2.8	43.4	4.2	9.8	7.0	134.2	56.8	5.86	36.8	2.8	45.4	6.6	15.2	7.0	
		12.0	130.0	53.4	5.62	34.2	2.8	41.2	1.9	4.3	6.7	130.4	55.3	5.66	36.0	2.9	43.2	4.2	9.8	6.7	130.7	57.2	5.71	37.7	2.9	45.3	6.6	15.2	6.8	
		16.0	126.7	53.4	5.41	34.9	2.9	41.0	1.9	4.3	6.4	126.9	55.5	5.48	36.7	3.0	43.1	4.2	9.8	6.5	127.2	57.5	5.56	38.6	3.0	45.2	6.6	15.2	6.5	
120	60	8.0	134.9	59.6	5.92	39.3	2.9	49.9	1.8	4.1	7.8	135.4	61.6	5.94	41.4	3.0	52.2	4.1	9.4	7.8	135.9	63.7	5.95	43.4	3.1	54.6	6.4	14.8	7.7	
		12.0	131.2	59.5	5.65	40.2	3.1	49.6	1.8	4.1	7.5	131.6	61.9	5.71	42.4	3.2	52.0	4.1	9.4	7.5	132.0	64.3	5.77	44.5	3.3	54.4	6.4	14.8	7.5	
		16.0	127.4	59.3	5.38	41.0	3.2	49.4	1.8	4.1	7.1	127.8	62.1	5.49	43.3	3.3	51.8	4.1	9.4	7.2	128.1	64.8	5.60	45.7	3.4	54.3	6.4	14.8	7.3	
120	70	8.0	136.4	65.7	6.02	45.2	3.2	58.4	1.7	3.9	8.8	137.0	68.1	6.03	47.6	3.3	61.0	4.0	9.1	8.7	137.6	70.6	6.05	50.0	3.4	63.6	6.2	14.3	8.6	
		12.0	132.3	65.5	5.68	46.1	3.4	58.1	1.7	3.9	8.3	132.8	68.4	5.76	48.8	3.5	60.7	4.0	9.1	8.4	133.3	71.3	5.84	51.4	3.6	63.4	6.2	14.3	8.4	
		16.0	128.2	65.3	5.35	47.1	3.6	57.9	1.7	3.9	7.9	128.6	68.7	5.49	49.9	3.7	60.5	4.0	9.1	8.0	129.0	72.0	5.64	52.8	3.7	63.2	6.2	14.3	8.1	

\* Water heating mode only allows high compressor capacity operation.

ELT = entering load fluid temperature to heat pump  
 LLT = leaving load fluid temperature from heat pump  
 LGPM = load flow in gallons per minute  
 LWPD = load coax water pressure drop  
 EST = entering source fluid temperature to heat pump  
 LST = leaving source fluid temperature from heat pump  
 HWC = hot water generator capacity

SWPD = source coax water pressure drop  
 PSI = pressure drop in pounds per square inch  
 FT HD = pressure drop in feet of head  
 KW = kilowatts  
 HE = heat extracted in Btuh  
 HC = total heating capacity in Btuh  
 COP = coefficient of performance [HC/(kW x 3.413)]

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Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

**Synergy3D Residential Series**  
**3-6 Tons 60Hz**



## SDV072 Performance Data - Low Speed

EWT °F	Flow gpm	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F								
		PSI	FT	Airflow cfm	HC kBTuh	Power kW	HE kBTuh	LAT °F	COP	HWC kBTuh	Airflow cfm	TC kBTuh	SC kBTuh	S/T Ratio	Power kW	HR kBTuh	EER	HWC kBTuh	
20	10.0	2.3	5.4	Operation not recommended															
	13.0	3.6	8.2	Operation not recommended															
	16.0	5.0	11.6	1400	32.4	3.36	21.0	91.4	2.83	5.9	Operation not recommended								
				1700	33.2	3.50	21.3	88.1	2.78	5.3	Operation not recommended								
30	10.0	2.3	5.3	Operation not recommended															
	13.0	3.5	8.0	1400	36.2	3.38	24.7	93.9	3.14	5.5	1400	55.1	33.7	0.61	1.82	61.3	30.3	-	
				1700	38.0	3.42	26.3	90.7	3.25	5.0	1700	57.0	38.7	0.68	1.94	63.6	29.4	-	
	16.0	4.9	11.3	1400	37.8	3.38	26.2	95.0	3.28	5.7	1400	55.2	33.6	0.61	1.75	61.2	31.6	-	
				1700	36.0	3.54	23.9	89.6	2.98	5.1	1700	55.4	36.9	0.67	2.34	63.3	23.7	-	
	40	10.0	2.2	5.1	Operation not recommended														
13.0		3.4	7.8	1400	42.6	3.48	30.7	98.1	3.58	6.5	1400	57.7	35.7	0.62	2.00	64.5	28.9	-	
				1700	44.4	3.49	32.5	94.2	3.73	5.9	1700	59.5	40.8	0.68	2.12	66.7	28.1	-	
16.0		4.7	11.0	1400	44.1	3.49	32.1	99.1	3.70	6.7	1400	57.8	35.6	0.62	1.93	64.4	29.9	-	
				1700	46.0	3.50	34.1	95.1	3.85	6.1	1700	59.5	40.7	0.68	2.06	66.5	28.9	-	
50		10.0	2.1	4.9	1400	47.6	3.52	35.6	101.5	3.96	6.8	1400	59.7	37.3	0.62	2.30	67.6	25.9	2.3
	1700				49.7	3.48	37.8	97.1	4.18	6.3	1700	61.6	42.2	0.69	2.42	69.8	25.4	2.4	
	13.0	3.3	7.5	1400	48.3	3.56	36.1	101.9	3.98	7.0	1400	59.9	37.6	0.63	2.22	67.5	26.9	2.1	
				1700	50.2	3.54	38.2	97.4	4.16	6.4	1700	61.7	42.7	0.69	2.34	69.7	26.4	2.3	
	16.0	4.6	10.6	1400	49.7	3.58	37.5	102.9	4.07	7.2	1400	60.0	37.6	0.63	2.16	67.4	27.7	2.0	
				1700	52.6	3.80	39.6	98.6	4.05	6.6	1700	61.8	41.7	0.68	2.80	71.3	22.0	2.2	
60	10.0	2.1	4.8	1400	52.9	3.63	40.5	105.0	4.27	7.5	1400	58.0	36.8	0.63	2.53	66.6	22.9	3.2	
				1700	55.1	3.56	43.0	100.0	4.54	6.9	1700	59.7	41.5	0.70	2.64	68.7	22.6	3.4	
	13.0	3.2	7.3	1400	54.4	3.67	41.9	106.0	4.34	7.7	1400	58.2	37.1	0.64	2.45	66.6	23.8	3.0	
				1700	56.5	3.61	44.2	100.8	4.60	7.1	1700	60.0	42.0	0.70	2.56	68.7	23.4	3.2	
	16.0	4.4	10.3	1400	55.6	3.71	43.0	106.8	4.40	7.9	1400	58.5	37.2	0.64	2.40	66.7	24.4	2.8	
				1700	57.9	3.64	45.4	101.5	4.66	7.3	1700	60.3	42.1	0.70	2.50	68.8	24.1	3.1	
70	10.0	2.0	4.6	1400	58.4	3.76	45.5	108.6	4.54	8.3	1400	57.6	37.3	0.65	2.83	67.2	20.4	4.4	
				1700	60.7	3.65	48.3	103.1	4.87	7.7	1700	59.2	42.0	0.71	2.94	69.3	20.2	4.6	
	13.0	3.0	7.0	1400	60.6	3.80	47.6	110.1	4.67	8.5	1400	57.9	37.8	0.65	2.74	67.3	21.2	4.1	
				1700	62.9	3.69	50.3	104.3	5.00	7.9	1700	59.6	42.5	0.71	2.85	69.3	20.9	4.4	
	16.0	4.3	9.9	1400	61.7	3.86	48.5	110.8	4.69	8.8	1400	58.2	38.0	0.65	2.70	67.5	21.6	3.8	
				1700	66.5	4.04	52.7	106.2	4.83	8.1	1700	58.3	41.5	0.71	3.34	69.7	17.5	4.2	
80	10.0	1.9	4.5	1400	62.9	3.86	49.7	111.6	4.77	9.2	1400	54.9	36.5	0.66	3.15	65.7	17.4	6.2	
				1700	65.2	3.72	52.5	105.5	5.13	8.5	1700	56.6	40.8	0.72	3.24	67.7	17.5	6.6	
	13.0	2.9	6.8	1400	66.2	3.91	52.8	113.8	4.97	9.5	1400	55.4	36.9	0.67	3.07	65.9	18.0	5.8	
				1700	68.5	3.75	55.8	107.3	5.36	8.8	1700	57.0	41.3	0.72	3.16	67.8	18.0	6.3	
	16.0	4.2	9.6	1400	66.9	3.96	53.4	114.3	4.95	9.8	1400	55.8	37.1	0.67	3.02	66.1	18.5	5.4	
				1700	69.2	3.81	56.2	107.7	5.32	9.1	1700	57.5	41.5	0.72	3.11	68.1	18.5	6.0	
90	10.0	1.9	4.3	1400	67.5	3.97	53.9	114.6	4.98	10.3	1400	50.7	34.7	0.68	3.50	62.7	14.5	8.0	
				1700	69.7	3.81	56.7	108.0	5.37	9.5	1700	52.3	38.5	0.74	3.57	64.5	14.6	8.5	
	13.0	2.8	6.6	1400	71.9	4.03	58.1	117.5	5.23	10.6	1400	51.2	35.0	0.68	3.43	62.9	14.9	7.5	
				1700	74.3	3.83	61.2	110.4	5.69	9.8	1700	52.8	39.0	0.74	3.50	64.8	15.1	8.1	
	16.0	4.0	9.3	1400	72.3	4.08	58.4	117.8	5.19	11.0	1400	51.8	35.3	0.68	3.37	63.3	15.3	6.9	
				1700	76.3	4.26	61.8	111.6	5.25	10.2	1700	51.7	39.3	0.76	4.03	65.5	12.8	7.7	
100	10.0	1.8	4.2	Operation not recommended															
	13.0	2.7	6.3	1400	49.1	34.9	0.71	3.87	62.4	12.7	10.0	1400	49.1	34.9	0.71	3.87	62.4	12.7	10.0
				1700	50.7	38.7	0.76	3.92	64.1	12.9	10.9	1700	50.7	38.7	0.76	3.92	64.1	12.9	10.9
	16.0	3.9	8.9	1400	49.8	35.3	0.71	3.82	62.8	13.0	9.3	1400	49.8	35.3	0.71	3.82	62.8	13.0	9.3
1700				51.3	39.1	0.76	3.86	64.5	13.3	10.4	1700	51.3	39.1	0.76	3.86	64.5	13.3	10.4	
110	10.0	1.7	4.0	Operation not recommended															
	13.0	2.6	6.1	1400	43.7	32.7	0.75	4.33	58.4	10.1	12.7	1400	43.7	32.7	0.75	4.33	58.4	10.1	12.7
				1700	45.2	36.1	0.80	4.35	60.0	10.4	13.8	1700	45.2	36.1	0.80	4.35	60.0	10.4	13.8
	16.0	3.7	8.6	1400	44.4	33.2	0.75	4.27	59.0	10.4	11.8	1400	44.4	33.2	0.75	4.27	59.0	10.4	11.8
1700				45.6	36.6	0.80	4.94	62.5	9.2	13.1	1700	45.6	36.6	0.80	4.94	62.5	9.2	13.1	
120	10.0	1.7	3.8	Operation not recommended															
	13.0	2.5	5.8	1400	40.8	31.9	0.78	4.88	57.5	8.4	15.8	1400	40.8	31.9	0.78	4.88	57.5	8.4	15.8
				1700	42.3	34.9	0.83	4.86	58.9	8.7	17.1	1700	42.3	34.9	0.83	4.86	58.9	8.7	17.1
	16.0	3.6	8.2	1400	41.7	32.5	0.78	4.80	58.0	8.7	14.6	1400	41.7	32.5	0.78	4.80	58.0	8.7	14.6
1700				42.3	35.3	0.83	5.45	60.9	7.8	16.3	1700	42.3	35.3	0.83	5.45	60.9	7.8	16.3	

Performance capacities shown in thousands of Btu/h.

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Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

**Synergy3D Residential Series  
3-6 Tons 60Hz**



## SDV072 High Speed - Performance Data

EWT °F	Flow gpm	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F									
		PSI	FT	Airflow cfm	HC kBTuh	Power kW	HE kBTuh	LAT °F	COP	HWC kBTuh	Airflow cfm	TC kBTuh	SC kBTuh	S/T Ratio	Power kW	HR kBTuh	EER	HWC kBTuh		
20	12.0	3.3	7.6	Operation not recommended																
	15.0	4.6	10.7	Operation not recommended																
	18.0	6.2	14.3	1850	45.2	4.40	30.2	92.6	3.01	7.9	Operation not recommended									
				2200	46.9	4.68	30.9	89.7	2.93	7.1										
30	12.0	3.2	7.4	Operation not recommended																
	15.0	4.5	10.4	1850	52.3	4.56	36.7	96.2	3.36	8.3	1850	68.5	44.3	0.65	3.82	81.5	18.0	-		
				2200	54.1	4.85	37.6	92.8	3.27	7.6	2200	69.8	48.3	0.69	4.05	83.6	17.2	-		
	18.0	6.0	13.9	1850	52.7	4.60	37.0	96.4	3.36	8.5	1850	69.2	45.1	0.65	3.75	82.0	18.5	-		
				2200	54.7	4.90	37.9	93.0	3.27	7.7	2200	70.5	48.6	0.69	3.99	84.1	17.7	-		
	40	12.0	3.1	7.1	Operation not recommended															
15.0		4.4	10.1	1850	61.2	4.88	44.5	100.6	3.68	9.2	1850	72.5	46.7	0.64	4.09	86.5	17.7	-		
				2200	63.3	5.11	45.8	96.6	3.63	8.4	2200	73.9	50.7	0.69	4.34	88.8	17.0	-		
18.0		5.8	13.5	1850	62.0	4.93	45.2	101.0	3.69	9.5	1850	73.3	47.5	0.65	4.02	87.0	18.2	-		
				2200	64.2	5.16	46.6	97.0	3.65	8.6	2200	74.7	51.1	0.68	4.28	89.3	17.5	-		
50		12.0	3.0	6.9	1850	64.8	5.07	47.5	102.4	3.75	9.9	1850	75.4	48.2	0.64	4.51	90.8	16.7	4.3	
	2200				67.0	5.25	49.1	98.2	3.74	9.2	2200	77.0	52.3	0.68	4.79	93.3	16.1	4.5		
	15.0	4.2	9.8	1850	68.4	5.16	50.8	104.2	3.88	10.2	1850	76.2	48.7	0.64	4.41	91.3	17.3	4.0		
				2200	70.7	5.33	52.5	99.7	3.89	9.4	2200	77.7	52.9	0.68	4.69	93.7	16.6	4.3		
	18.0	5.7	13.1	1850	69.6	5.22	51.8	104.9	3.91	10.5	1850	77.0	49.6	0.64	4.34	91.8	17.7	3.7		
				2200	71.9	5.38	53.6	100.3	3.92	9.6	2200	78.5	53.4	0.68	4.62	94.3	17.0	4.1		
60	12.0	2.9	6.7	1850	72.9	5.42	54.4	106.5	3.94	11.1	1850	74.0	48.2	0.65	4.75	90.2	15.6	5.2		
				2200	75.2	5.53	56.4	101.7	3.99	10.3	2200	75.5	52.1	0.69	5.05	92.7	14.9	5.5		
	15.0	4.1	9.5	1850	76.1	5.51	57.3	108.1	4.05	11.5	1850	74.7	48.7	0.65	4.65	90.6	16.1	4.9		
				2200	78.6	5.60	59.5	103.1	4.11	10.6	2200	76.2	52.7	0.69	4.95	93.1	15.4	5.3		
	18.0	5.5	12.7	1850	77.8	5.58	58.8	108.9	4.09	11.8	1850	75.5	49.5	0.66	4.57	91.1	16.5	4.5		
				2200	80.4	5.66	61.1	103.8	4.16	10.9	2200	77.0	53.2	0.69	4.87	93.6	15.8	5.0		
70	12.0	2.8	6.5	1850	81.1	5.78	61.3	110.6	4.11	12.5	1850	74.1	49.0	0.66	5.13	91.7	14.4	6.6		
				2200	83.6	5.82	63.8	105.2	4.21	11.6	2200	75.7	52.7	0.70	5.46	94.3	13.9	6.9		
	15.0	4.0	9.1	1850	83.9	5.87	63.9	112.0	4.19	12.9	1850	74.9	49.5	0.66	5.03	92.0	14.9	6.1		
				2200	86.6	5.89	66.5	106.4	4.31	11.9	2200	76.4	53.2	0.70	5.34	94.6	14.3	6.6		
	18.0	5.3	12.2	1850	86.1	5.95	65.8	113.1	4.24	13.3	1850	75.7	50.1	0.66	4.94	92.5	15.3	5.7		
				2200	88.9	5.95	68.6	107.4	4.38	12.3	2200	77.2	53.9	0.70	5.26	95.2	14.7	6.3		
80	12.0	2.7	6.3	1850	87.0	6.10	66.2	113.5	4.18	13.9	1850	71.6	47.9	0.67	5.45	90.2	13.1	8.4		
				2200	89.8	6.06	69.1	107.8	4.34	12.8	2200	73.1	51.8	0.71	5.80	92.9	12.6	8.9		
	15.0	3.8	8.8	1850	89.1	6.19	67.9	114.6	4.22	14.3	1850	72.3	48.4	0.67	5.34	90.5	13.6	7.8		
				2200	91.9	6.10	71.1	108.7	4.41	13.2	2200	73.8	52.2	0.71	5.68	93.2	13.0	8.4		
	18.0	5.1	11.8	1850	91.8	6.27	70.4	115.9	4.29	14.7	1850	73.1	49.1	0.67	5.25	91.0	13.9	7.2		
				2200	94.8	6.17	73.8	109.9	4.50	13.6	2200	74.6	52.8	0.71	5.59	93.7	13.4	8.0		
90	12.0	2.6	6.0	1850	93.1	6.45	71.1	116.6	4.23	15.4	1850	66.7	45.7	0.68	5.76	86.4	11.6	10.5		
				2200	96.2	6.32	74.6	110.5	4.46	14.3	2200	68.1	49.6	0.73	6.13	89.0	11.1	11.1		
	15.0	3.7	8.5	1850	94.4	6.52	72.2	117.3	4.25	15.9	1850	67.4	46.1	0.68	5.64	86.6	12.0	9.8		
				2200	97.5	6.35	75.8	111.0	4.50	14.7	2200	68.8	50.1	0.73	6.00	89.2	11.4	10.6		
	18.0	4.9	11.4	1850	97.7	6.61	75.1	118.9	4.33	16.4	1850	68.1	47.0	0.69	5.55	87.0	12.3	9.1		
				2200	100.9	6.42	79.0	112.5	4.61	15.2	2200	69.5	50.6	0.73	5.90	89.6	11.8	10.1		
100	12.0	2.5	5.8	Operation not recommended																
	15.0	3.6	8.2	1850	65.4	45.7	0.70	6.14	86.3	10.6	12.2	Operation not recommended								
				2200	66.7	49.5	0.74	6.54	89.0	10.2	13.2									
	18.0	4.8	11.0	1850	66.1	46.4	0.70	6.04	86.7	10.9	11.3	Operation not recommended								
2200				67.5	49.9	0.74	6.43	89.4	10.5	12.5										
110	12.0	2.4	5.6	Operation not recommended																
	15.0	3.4	7.9	Operation not recommended										Operation not recommended						
														1850	59.3	43.4	0.73	6.57	81.7	9.0
	18.0	4.6	10.6	Operation not recommended										1850	60.0	43.8	0.73	6.45	82.0	9.3
										2200	61.2	47.1	0.77	6.86	84.6	8.9	15.3			
120	12.0	2.3	5.4	Operation not recommended																
	15.0	3.3	7.6	Operation not recommended										Operation not recommended						
														1850	55.2	41.6	0.75	7.12	79.5	7.8
	18.0	4.4	10.2	Operation not recommended										1850	55.9	42.1	0.75	7.01	79.8	8.0
										2200	57.0	45.3	0.79	7.44	82.4	7.7	18.5			

Performance capacities shown in thousands of Btu/h.

WaterFurnace works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice. Please contact WaterFurnace at 1-888-929-2837 for latest design and specifications. Purchaser's approval of this data set signifies that the equipment is acceptable under the provisions of the job specification. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely WaterFurnace's opinion or commendation of its products. The latest version of this document is available at [www.waterfurnace.com](http://www.waterfurnace.com).

Contractor: \_\_\_\_\_ P.O.: \_\_\_\_\_

Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

**Synergy3D Residential Series  
3-6 Tons 60Hz**



**Synergy3D 072 Water Heating Data**

ELT	EST	LGPM	SOURCE 12.0 GPM						SWPD		HWC kBtuh	SOURCE 15.0 GPM						SWPD		HWC kBtuh	SOURCE 18.0 GPM						SWPD		HWC kBtuh
			LLT	HC	KW	HE	COP	LST	PSI	FT HD		LLT	HC	KW	HE	COP	LST	PSI	FT HD		LLT	HC	KW	HE	COP	LST	PSI	FT HD	
80	30	12.0	Operation Not Recommended																										
		15.0	87.3	52.9	4.07	39.0	3.8	23.3	4.0	9.2	7.7	87.5	53.8	4.08	39.9	3.9	24.3	6.2	14.2	7.9	87.6	54.7	4.10	40.7	3.9	25.3	8.3	19.2	8.1
		18.0	85.9	52.9	4.03	39.1	3.8	23.3	4.0	9.2	7.4	86.0	53.8	4.04	40.0	3.9	24.3	6.2	14.2	7.6	86.1	54.7	4.05	40.9	4.0	25.3	8.3	19.2	7.7
80	40	12.0	Operation Not Recommended																										
		15.0	88.6	61.8	4.20	47.4	4.3	31.9	3.9	9.0	8.6	88.7	63.0	4.22	48.6	4.4	33.1	6.0	13.8	8.8	88.9	64.2	4.24	49.7	4.4	34.5	8.1	18.6	9.0
		18.0	86.9	61.8	4.16	47.6	4.4	31.8	3.9	9.0	8.3	87.0	63.0	4.17	48.7	4.4	33.1	6.0	13.8	8.5	87.1	64.2	4.19	49.9	4.5	34.5	8.1	18.6	8.6
80	50	12.0	91.8	70.7	4.38	55.7	4.7	40.4	3.8	8.7	10.0	92.0	72.2	4.41	57.1	4.8	42.0	5.8	13.3	10.2	92.3	73.7	4.44	58.6	4.9	43.5	7.8	18.0	10.4
		15.0	89.8	70.6	4.33	55.9	4.8	40.4	3.8	8.7	9.6	90.0	72.2	4.36	57.3	4.9	41.9	5.8	13.3	9.8	90.2	73.7	4.39	58.7	4.9	43.5	7.8	18.0	10.0
		18.0	87.8	70.6	4.28	56.0	4.8	40.4	3.8	8.7	9.2	88.0	72.2	4.31	57.5	4.9	41.9	5.8	13.3	9.4	88.2	73.7	4.33	58.9	5.0	43.5	7.8	18.0	9.6
80	60	12.0	93.3	79.5	4.52	64.1	5.2	49.0	3.6	8.4	11.3	93.6	81.4	4.55	65.8	5.2	50.7	5.6	12.9	11.5	93.9	83.2	4.59	67.6	5.3	52.5	7.6	17.4	11.7
		15.0	91.0	79.5	4.46	64.3	5.2	49.0	3.6	8.4	10.8	91.3	81.3	4.49	66.0	5.3	50.7	5.6	12.9	11.1	91.6	83.2	4.53	67.7	5.4	52.5	7.6	17.4	11.3
		18.0	88.8	79.5	4.40	64.5	5.3	48.9	3.6	8.4	10.4	89.0	81.3	4.44	66.2	5.4	50.7	5.6	12.9	10.6	89.2	83.1	4.47	67.9	5.4	52.5	7.6	17.4	10.9
80	70	12.0	94.7	88.4	4.65	72.6	5.6	57.5	3.5	8.1	12.7	95.1	90.6	4.69	74.6	5.7	59.5	5.4	12.5	13.0	95.5	92.7	4.73	76.5	5.7	61.5	7.3	16.9	13.2
		15.0	92.3	88.4	4.59	72.7	5.6	57.5	3.5	8.1	12.2	92.6	90.5	4.63	74.7	5.7	59.5	5.4	12.5	12.5	92.9	92.7	4.67	76.7	5.8	61.5	7.3	16.9	12.7
		18.0	89.8	88.4	4.53	72.9	5.7	57.5	3.5	8.1	11.8	90.1	90.5	4.57	74.9	5.8	59.5	5.4	12.5	12.0	90.3	92.6	4.61	76.9	5.9	61.5	7.3	16.9	12.3
100	30	12.0	Operation Not Recommended																										
		15.0	107.1	51.1	5.13	33.6	2.9	24.2	4.0	9.2	7.5	107.2	51.8	5.13	34.3	3.0	25.2	6.2	14.2	7.6	107.3	52.6	5.13	35.0	3.0	26.1	8.3	19.2	7.7
		18.0	105.7	51.1	5.08	33.7	2.9	24.2	4.0	9.2	7.2	105.8	51.8	5.08	34.4	3.0	25.1	6.2	14.2	7.3	105.8	52.5	5.09	35.2	3.0	26.1	8.3	19.2	7.4
100	40	12.0	Operation Not Recommended																										
		15.0	108.2	59.2	5.24	41.4	3.3	32.9	3.9	9.0	8.3	108.4	60.2	5.25	42.3	3.4	34.0	6.0	13.8	8.4	108.5	61.2	5.26	43.2	3.4	35.2	8.1	18.6	8.5
		18.0	106.6	59.2	5.18	41.5	3.3	32.9	3.9	9.0	7.9	106.7	60.2	5.19	42.5	3.4	34.0	6.0	13.8	8.1	106.8	61.2	5.21	43.4	3.4	35.2	8.1	18.6	8.2
100	50	12.0	111.2	67.4	5.41	48.9	3.6	41.6	3.8	8.7	9.5	111.4	68.6	5.43	50.0	3.7	43.0	5.8	13.3	9.7	111.6	69.8	5.45	51.2	3.8	44.3	7.8	18.0	9.8
		15.0	109.4	67.4	5.35	49.1	3.7	41.6	3.8	8.7	9.2	109.5	68.6	5.37	50.3	3.7	42.9	5.8	13.3	9.3	109.7	69.8	5.39	51.4	3.8	44.3	7.8	18.0	9.5
		18.0	107.5	67.4	5.29	49.3	3.7	41.5	3.8	8.7	8.8	107.6	68.6	5.30	50.5	3.8	42.9	5.8	13.3	9.0	107.8	69.8	5.32	51.7	3.8	44.3	7.8	18.0	9.1
100	60	12.0	112.6	75.5	5.53	56.6	4.0	50.3	3.6	8.4	10.7	112.8	77.0	5.56	58.0	4.1	51.8	5.6	12.9	10.9	113.1	78.4	5.59	59.3	4.1	53.4	7.6	17.4	11.0
		15.0	110.5	75.5	5.46	56.9	4.1	50.2	3.6	8.4	10.3	110.7	77.0	5.49	58.2	4.1	51.8	5.6	12.9	10.5	110.9	78.4	5.51	59.6	4.2	53.4	7.6	17.4	10.6
		18.0	108.4	75.5	5.39	57.1	4.1	50.2	3.6	8.4	9.9	108.6	77.0	5.42	58.5	4.2	51.8	5.6	12.9	10.1	108.7	78.5	5.44	59.9	4.2	53.3	7.6	17.4	10.2
100	70	12.0	113.9	83.7	5.65	64.4	4.3	58.9	3.5	8.1	12.0	114.2	85.3	5.69	65.9	4.4	60.7	5.4	12.5	12.2	114.5	87.0	5.72	67.5	4.5	62.5	7.3	16.9	12.4
		15.0	111.6	83.7	5.57	64.6	4.4	58.9	3.5	8.1	11.6	111.9	85.4	5.61	66.2	4.5	60.7	5.4	12.5	11.8	112.1	87.1	5.64	67.8	4.5	62.5	7.3	16.9	12.0
		18.0	109.3	83.7	5.50	64.9	4.5	58.8	3.5	8.1	11.1	109.5	85.4	5.53	66.5	4.5	60.6	5.4	12.5	11.3	109.7	87.1	5.56	68.2	4.6	62.4	7.3	16.9	11.5
120	30	12.0	Operation Not Recommended																										
		15.0	126.9	49.3	6.18	28.2	2.3	25.2	4.0	9.2	7.2	126.9	49.8	6.18	28.8	2.4	25.9	6.2	14.2	7.3	127.0	50.4	6.17	29.3	2.4	26.6	8.3	19.2	7.4
		18.0	125.5	49.2	6.12	28.3	2.4	25.1	4.0	9.2	6.9	125.5	49.8	6.12	28.9	2.4	25.9	6.2	14.2	7.0	125.6	50.3	6.13	29.4	2.4	26.6	8.3	19.2	7.1
120	40	12.0	Operation Not Recommended																										
		15.0	127.9	56.7	6.27	35.3	2.6	33.9	3.9	9.0	7.9	128.0	57.4	6.28	36.0	2.7	34.9	6.0	13.8	8.0	128.1	58.2	6.28	36.7	2.7	35.9	8.1	18.6	8.1
		18.0	126.3	56.6	6.21	35.5	2.7	33.9	3.9	9.0	7.6	126.4	57.4	6.21	36.2	2.7	34.9	6.0	13.8	7.7	126.5	58.2	6.22	36.9	2.7	35.9	8.1	18.6	7.8
120	50	12.0	130.7	64.1	6.44	42.1	2.9	42.8	3.8	8.7	9.1	130.8	65.0	6.45	43.0	3.0	43.9	5.8	13.3	9.2	131.0	65.9	6.46	43.8	3.0	45.1	7.8	18.0	9.3
		15.0	128.9	64.1	6.37	42.4	2.9	42.7	3.8	8.7	8.7	129.0	65.0	6.38	43.3	3.0	43.9	5.8	13.3	8.8	129.2	65.9	6.39	44.1	3.0	45.1	7.8	18.0	8.9
		18.0	127.1	64.1	6.29	42.6	3.0	42.7	3.8	8.7	8.4	127.2	65.0	6.30	43.5	3.0	43.9	5.8	13.3	8.5	127.3	66.0	6.31	44.4	3.1	45.1	7.8	18.0	8.6
120	60	12.0	131.9	71.5	6.55	49.1	3.2	51.6	3.6	8.4	10.1	132.1	72.5	6.57	50.1	3.2	52.9	5.6	12.9	10.2	132.3	73.6	6.58	51.1	3.3	54.3	7.6	17.4	10.4
		15.0	129.9	71.5	6.46	49.5	3.2	51.5	3.6	8.4	9.7	130.1	72.6	6.48	50.5	3.3	52.8	5.6	12.9	9.9	130.2	73.7	6.50	51.5	3.3	54.3	7.6	17.4	10.0
		18.0	127.9	71.5	6.38	49.8	3.3	51.5	3.6	8.4	9.4	128.1	72.7	6.39	50.9	3.3	52.8	5.6	12.9	9.5	128.2	73.8	6.41	52.0	3.4	54.2	7.6	17.4	9.6
120	70	12.0	133.1	78.9	6.65	56.2	3.5	60.4	3.5	8.1	11.3	133.3	80.1	6.68	57.3	3.5	61.8	5.4	12.5	11.5	133.5	81.3	6.71	58.4	3.6	63.3	7.3	16.9	11.6
		15.0	131.0	78.9	6.56	56.5	3.5	60.3	3.5	8.1	10.9	131.1	80.2	6.58	57.7	3.6	61.8	5.4	12.5	11.1	131.3	81.5	6.60	58.9	3.6	63.2	7.3	16.9	11.2
		18.0	128.8	79.0	6.47	56.9	3.6	60.2	3.5	8.1	10.5	129.9	80.3	6.48	58.2	3.6	61.7	5.4	12.5	10.7	129.1	81.7	6.50	59.5	3.7	63.2	7.3	16.9	10.8

\* Water heating mode only allows high compressor capacity operation.

ELT = entering load fluid temperature to heat pump  
 LLT = leaving load fluid temperature from heat pump  
 LGPM = load flow in gallons per minute  
 LWPD = load coax water pressure drop  
 EST = entering source fluid temperature to heat pump  
 LST = leaving source fluid temperature from heat pump  
 HWC = hot water generator capacity

SWPD = source coax water pressure drop  
 PSI = pressure drop in pounds per square inch  
 FT HD = pressure drop in feet of head  
 KW = kilowatts  
 HE = heat extracted in Btuh  
 HC = total heating capacity in Btuh  
 COP = coefficient of performance [HC/(kW x 3.413)]

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Engineer: \_\_\_\_\_

Project Name: \_\_\_\_\_ Unit Tag: \_\_\_\_\_

## Engineering Guide Specifications

### General

Synergy3D units shall be floor mounted type with horizontal air inlet and vertical up flow or rear air discharge. Reverse cycle operation shall provide heating or cooling in the forced air mode. The unit shall also be capable of heating water for hydronic applications when the unit is not in the forced air mode. Units shall be AHRI/ISO Standard 13256-1 performance certified and listed by a nationally recognized safety-testing laboratory or agency, such as ETL Testing Laboratory. Each unit shall be computer run-tested at the factory. Each unit shall be mounted on a pallet for shipping.

The geothermal units shall be designed to operate with entering liquid temperature between 20°F and 120°F [-6.7°C - 48.9°C].

### Refrigerant Circuit

All units shall contain a sealed refrigerant circuit including: a hermetic motor-compressor, bidirectional thermal expansion valve, finned tube air-to-refrigerant heat exchanger, solenoid valve, diverting valve, check valve, reversing valve, source coaxial tube water-to-refrigerant heat exchanger, load coaxial tube refrigerant-to-water heat exchanger, optional hot water generator coil, and service ports.

Compressors shall be high efficiency dual capacity scroll type designed for heat pump duty and mounted on vibration isolators. Compressor motors shall be single-phase PSC with overload protection. The FormiShield Plus™ electro-coated finned tube coil shall be sized for low-face velocity and constructed of lanced aluminum fins bonded to rifled copper tubes in a staggered pattern not less than three rows deep.

All units shall have the source coaxial tube refrigerant-to-water heat exchanger and optional hot water generator ThermaShield coated.

### Casing and Cabinet

The cabinet shall be fabricated from heavy-gauge galvanized steel and finished with corrosion-resistant powder coating. This corrosion protection system shall meet the stringent 1000 hour salt spray test per ASTM B117. The interior shall be insulated with 1/2-inch thick, multi-density, cleanable aluminum foil coated glass fiber with edges sealed or tucked under flanges to prevent the introduction of glass fibers into the discharge air. Standard cabinet panel insulation must meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, stringent fungal resistance test per ASTM-C1071 and ASTM G21, and shall meet zero

level bacteria growth per ASTM G22. Unit insulation must meet these stringent requirements or unit(s) will not be accepted.

Two blower and three compressor compartment access panels shall be 'lift-out' removable with supply and return ductwork in place. The front access panel shall be hinged to provide easy access to the electrical/compressor section. The control box shall be hinged and removable to allow easy access to the compressor. The internal component layout shall provide for service access from the front side for restricted installations.

A duct collar shall be provided on the supply air opening. Standard size 2 in. [5.1 cm] MERV 11 pleated filters shall be provided with each unit. Vertical units shall have a return air filter rack/duct collar. The upflow vertical units shall have a removable insulated divider panel between the air handling section and the compressor section to minimize the transmission of compressor noise and to permit operational service testing without air bypass. Vertical units shall be supplied with left or right horizontal air inlet and top vertical air discharge.

The compressor shall be double isolation mounted using selected durometer grommets to provide vibration free compressor mounting. The compressor mounting bracket shall be acoustically deadened galvanized steel to prevent vibration transmission to the cabinet.

The drain pan shall be of plastic construction to inhibit corrosion and bacterial growth. Drain outlet shall be located on pan as to allow complete and unobstructed drainage of condensate. The unit as standard will be supplied with solid-state electronic condensate overflow protection. Mechanical float switches WILL NOT be accepted. Vertical units shall be furnished with a PVC slip condensate drain connection and an internal factory installed condensate trap.

### Blower Motor and Assembly

The blower shall be a direct drive centrifugal type with a dynamically balanced wheel. The housing and wheel shall be designed for quiet low outlet velocity operation. Tight blower housing geometry shall not be permitted. The blower housing shall be removable from the unit without disconnecting the supply air ductwork for servicing of the blower motor. The blower motor shall be a variable-speed ECM2 type. The ECM2 blower motor shall be soft starting, shall maintain constant CFM over its operating static range, and shall provide 12 CFM settings. The blower motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermal



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## Engineering Guide Specifications cont.

overload protection. ECM2 motors shall be long-life ball bearing type.

### Electrical

A control box shall be located within the unit compressor compartment and shall contain a 75VA transformer, 24 volt activated, 2 pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. Electromechanical operation WILL NOT be accepted. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 volt and provide heating or cooling as required by the remote thermostat/sensor. The controller shall also be capable of operating the unit in a hydronic heating mode with input from an external thermostat. A microprocessor-based controller that interfaces with a multi-stage electronic thermostat to monitor and control unit operation shall be provided. The control shall provide operational sequencing, blower speed control, blower failure, high and low pressure switch monitoring, freeze detection sensor temperature limit, condensate overflow sensing, auxiliary heat staging, lockout mode control, load pump and loop pump control, LED status and fault indicators, fault memory, field selectable options, and accessory output. An integrally mounted ComfortAlert compressor sensing module shall provide monitoring for open start, open run, locked rotor, welded contactor and short cycle conditions.

A detachable terminal block with screw terminals will be provided for field control wiring. All units shall have knockouts for entrance of low and line voltage wiring. The blower motor and control box shall be harness plug wired for easy removal.

**Optional IntelliStart (Compressor Soft Starter)** - shall be factory installed for use in applications that require low starting amps, reduced compressor start-up noise, off-grid, and improved start-up behavior. IntelliStart shall reduce normal starting current by 60% on 208/60/1 units.

### Piping

Source and load supply and return water connections (and optional hot water generator connections) shall be 1 in. [25.4 mm] FPT brass swivel fittings, which provide a union and eliminate the need for pipe wrenches and sealants when making field connections. All water piping shall be insulated to prevent condensation at low liquid temperatures, on the vertical upflow units, the condensate connection shall be a 3/4 in. [19.1 mm] PVC socket with internally-trapped hose that can be routed to front or side locations.

### Options and Accessories

#### Cupronickel Heat Exchanger

An optional cupronickel water-to-refrigerant heat exchanger shall be provided.

#### Hot Water Generator

An optional ThermaShield coated heat reclaiming hot water generator coil of vented double-wall copper construction suitable for potable water shall be provided. The coil shall be factory mounted inside the unit. An internal pump is not included. Order DPK5 for field installed pump and temperature limit.

#### Thermostat (field-installed)

A multi-stage auto-changeover electronic digital thermostat shall be provided. The thermostat shall offer three heating and two cooling stages with precise temperature control. An OFF-HEAT-AUTO-COOL-EMERG system switch, OFF-AUTO blower switch, and indicating LEDs shall be provided. The thermostat shall display in °F or °C.

#### Electronic Air Cleaner (field-installed)

A 1 in. [25 mm] electronic air cleaner, cleanable 97% efficiency at 0.3 microns and larger, shall be provided in lieu of the standard throwaway filter. The initial pressure drop across the filter shall not exceed 0.2 in. w.g. at 300 fpm force velocity.

#### Electrostatic Air Cleaner (field-installed)

A 1 in. [25 mm] electrostatic air cleaner, cleanable 90% efficiency, shall be provided in lieu of the standard throwaway filter. The initial pressure drop across the filter shall not exceed 0.15 in. w.g. at 300 fpm force velocity.

#### AlpinePure 411-Rack 4" Pleated Filter Accessory

A 4 in. thick [102 mm] MERV 11 filter and filter rack shall be provided in lieu of the standard filter and rack.

#### AlpinePure MERV 13 Filter

A 2 in. thick [50 mm] MERV 13 filter shall be provided in lieu of the standard filter and fits the factory filter rack. The filter maintains MERV 13 rating in full ASHRAE 52.2 independent testing as required for LEED® certification. Helps fulfill a full credit under the LEED® rating system.

#### Earth Loop Flow Center (field-installed)

A self-contained module shall provide all liquid flow, fill and connection requirements for ground source closed loop systems up to 20 GPM. The pumps shall be wired to



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## **Engineering Guide Specifications cont.**

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a power block located in the nearest unit. The heat pump units shall contain low voltage pump slaving control so that two units may share one flow center.

### **Auxiliary Heater (field-installed)**

An electric resistance heater shall provide supplemental and/or emergency heating capability. Vertical units shall have the control box and resistance heater coil assembly mounted internally. A low voltage plug shall be provided in each unit for quick auxiliary heat connection. The heater shall operate in sequenced stages as controlled by the unit's microprocessor. The heater shall feed line voltage power to the unit blower and transformer to provide emergency heat capability in the event of an open compressor circuit breaker.

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