R454B

Midea Building Technologies Division

Technical Manual

Basefit Series 5-12.5 Tons

Rooftop Package (Cooling & Gas)



208/230V, 3Ph, 60Hz **460V, 3Ph, 60Hz**

MRB-050V90(140)GWN10-X(G)	MRB-050V90(140)GWN10-Z(G)
MRB-075S125(180/225)GWN10-X(G)	MRB-075S125(180/225)GWN10-Z(G)
MRB-100S180(225/250)GWN10-X(G)	MRB-100S180(225/250)GWN10-Z(G)
MRB-125S180(225/250)GWN10-X(G)	MRB-125S180(225/250)GWN10-Z(G)

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Part 1

General information

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1. Product lineup

Nominal ton	Model	Function	Air outlet	Power supply
5	MRB-050V90(140)GWN10-X(G)	Cooling only	Side or bottom air supply	208/230V 3~ 60Hz
5	MRB-050V90(140)GWN10-Z(G)	Cooling only	Side or bottom air supply	460V 3~ 60Hz
7.5	MRB-075S125(180/225)GWN10-X(G)	Cooling only	Side or bottom air supply	208/230V 3~ 60Hz
7.5	MRB-075S125(180/225)GWN10-Z(G)	Cooling only	Side or bottom air supply	460V 3~ 60Hz
10	MRB-100S180(225/250)GWN10-X(G)	Cooling only	Side or bottom air supply	208/230V 3~ 60Hz
10	MRB-100S180(225/250)GWN10-Z(G)	Cooling only	Side or bottom air supply	460V 3~ 60Hz
12.5	MRB-125S180(225/250)GWN10-X(G)	Cooling only	Side or bottom air supply	208/230V 3~ 60Hz
12.5	MRB-125S180(225/250)GWN10-Z(G)	Cooling only	Side or bottom air supply	460V 3~ 60Hz

Notes: Please refer to specification tables for accurate cooling capacity with kW or Btu/h.

2. External Appearances



3. Nomenclatures

M	R	B	-	050	V	90	G	W	N10	-	Z	(G)
1	2	3		4	5	6	7	8	9		10	11

9

Legend		
No.	**Code**	**Remarks**
1	M	Midea
2	R	Rooftop Package Unit
3	B	Side or bottom air supply
4	050	Capacity *0.1 Ton
5	V	Stage/Blower motor V: Two-stage/Consistent flow DC motor S: Single-stage/Multi-speed
6	90	*1 KBtu/h gas heating capacity
7	G	Function G: Gas Package
8	W	Wired Controller
9	N10	Refrigerant type R454B
10	Z	Power supply X: 208/230V 3~ 60Hz Z: 460V 3~ 60Hz
11	G	Design code

4. Features

1. Ambient temp range 0~125°F.

2. Customizable high static pressure motor, with a maximum static pressure up to 500Pa.

3. Constant airflow technology enables adaptive duct static pressure adjustment (5 Ton model only).

4. Eco-friendly R454B refrigerant with low GWP value.

5. DC outdoor fan motor design, maintaining head pressure, improving system reliability, especially in low ambient conditions.

6. Curb fit: Designed as a direct replacement utilizing the same footprint as competitors

7. Interchangeable side and bottom discharge for flexible installation.

8. The compressor, control box, and motor can be maintained on the same side of the unit. Flip-over design control box for easy maintenance

9. All units equipped with refrigerant filter drier, effectively isolating moisture and impurities in the refrigerant system.

10. Gas pipe maintenance is more flexible, can directly move out follow the guide rail.

Part 2

Engineering Data

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1. Specifications

Model			MRB-050V90(140)GWN10-X(G)	MRB-050V90(140)GWN10-Z(G)
Nominal ton		**(Ton)**	**5**	**5**
Power supply		\	208/230V,60Hz,3Ph	460V,60Hz,3Ph
Cooling	Cooling capacity	Btu/h	58,000	58,000
		kW	17	17
	Power input	kW	5.27	5.27
Max. current		A	28	13
Min. / Max. Voltage		V	187/253	414/506
Performance	Indoor air flow	CFM	1,800	1,800
	ESP	Pa	0 - 250	0 - 250
	EER2	Btu/(h·W)	11	11
	SEER2	Btu/(h·W)	13.4	13.4
Indoor coil	Number of rows	\	3	3
	Fin spacing	mm	1.5	1.5
	Fin type	\	Corrugated aluminum fin	Corrugated aluminum fin
	Tube diameter	mm	Φ7	Φ7
	Tube type	\	Inner grooved aluminum pipe	Inner grooved aluminum pipe
Indoor fan	Type / Quantity	\	Centrifugal / 1	Centrifugal / 1
	Motor type	\	ECM	ECM
	Motor quantity	\	1	1
	Capacitor (uF)		/	/
	Horsepower (HP)		1HP	1HP
	Full Load Amps (FLA) (A)		3.7	2.1
	Rated Airflow (CFM)		1800	1800
	Motor speed	r/min	/	/
Compressor	Type / Quantity	\	Scroll*1	Scroll*1
	Input	W	3,900	3,885
	Stage		Single	Single
	Rated Load Amps(RLA)	A	18	8(7.8)
	Locked Rotor Amps (LRA)	A	105	50
	Refrigerant oil	ml	1240	1240
Outdoor coil	Number of rows	\	1	1
	Fin spacing	mm	1.2	1.2
	Fin type	\	Corrugated aluminum fin	Corrugated aluminum fin
	Tube width	mm	16	16
	Tube type	\	Microchannel aluminum flat tube	Microchannel aluminum flat tube

Outdoor fan	Type / Quantity	\	Axial / 1	Axial / 1
	Motor type	\	DC	DC
	Capacitor (uF)		/	/
	Horsepower (HP)		2/5	2/5
	Full Load Amps (FLA) (A)		1.4	1.4
	Rated Airflow (CFM)		4400	4400
	Fan speed	r/min	150~980	150~980
Refrigerant	Type /	\	R454B	R454B
	Volume	kg	1.48	1.48
	Control	\	Electronic expansion valve	Electronic expansion valve
Sound pressure level		dB(A)	82	82
Wired controller		\	/	/
Centralized controller (Optional)		\	/	/
Dimensions	Net (W×H×D)	mm	1935×862×1145	1935×862×1145
		inch	76-3/16×33-15/16×45-1/16	76-3/16×33-15/16×45-1/16
	Packing (W×H×D)	mm	1946×881×1145	1946×881×1145
		inch	76-9/16×33-11/16×45-1/16	76-9/16×33-11/16×45-1/16
Weight	Net	kg	252(257)	254(259)
		ib	555.5(566.5)	559.9(570.9)
	Gross	kg	270(275)	272(277)
		ib	595.1(606.2)	599.6(610.6)
OPERATION RANGE	Cooling	°C	-17.8~52	-17.8~52
		°F	0~125.6	0~125.6
	Heating	°C	/	/
		°F	/	/
Shipping per STD 40HQ		\	34	34

Model			MRB-075S125(180/225)GWN10-X(G)	MRB-075S125(180/225)GWN10-Z(G)
Nominal ton		**(Ton)**	**7.5**	**7.5**
Power supply		\	208/230V,60Hz,3Ph	460V,60Hz,3Ph
Cooling	Cooling capacity	Btu/h	90,000	90,000
		kW	26.377	26.377
	Power input	kW	7.89	7.89
Max. current		A	22	46.6
Min. / Max. Voltage		V	187/253	414/506
Performance	Indoor air flow	CFM	3,000	3,000
	ESP	Pa	0 - 250	0 - 250
	EER	Btu/(h·W)	11.4	11.4
	IEER	\	14.8	14.8
Indoor coil	Number of rows	\	1	1
	Fin spacing	mm	/	/
	Fin type	\	Louvered Aluminum	Louvered Aluminum
	Tube diameter	mm	/	/
	Tube type	\	/	/
Indoor fan	Type / Quantity	\	Centrifugal / 1	Centrifugal / 1
	Motor type	\	PSC	PSC
	Motor quantity	\	1	1
	Capacitor (uF)		/	/
	Horsepower (HP)		2HP	2HP
	Full Load Amps (FLA) (A)		7.2	7.2
	Rated Airflow (CFM)		/	/
	Motor speed	r/min	1725	1725
Compressor	Type / Quantity	\	Scroll*2	Scroll*2
	Input	W	3138+2350	3159+2350
	Stage		Single+single	Single+single
	Rated Load Amps(RLA)	A	12+9	6.3+4.1
	Locked Rotor Amps (LRA)	A	78+57	41+30
	Refrigerant oil	ml	1240+740	1240+740
Outdoor coil	Number of rows	\	1+1	1+1
	Fin spacing	mm	/	/
	Fin type	\	Louvered Aluminum	Louvered Aluminum
	Tube width	mm	/	/
	Tube type	\	Microchannel aluminum flat tube	Microchannel aluminum flat tube

Outdoor fan	Type / Quantity	\	Axial flow fan / 2	Axial flow fan / 2
	Motor type	\	DC MOTOR	DC MOTOR
	Capacitor (uF)		/	/
	Horsepower (HP)		1/3	1/3
	Full Load Amps (FLA) (A)		1.5	0.87
	Rated Airflow (CFM)		14102	14102
	Fan speed	r/min	960	960
Refrigerant	Type /	\	R454B	R454B
	Volume	kg	1.7+1.4	1.7+1.4
	Control	\	EEV	EEV
Sound pressure level		dB(A)	83	83
Wired controller		\	/	/
Centralized controller (Optional)		\	Yes	Yes
Dimensions	Net (W×H×D)	mm	1496 x 1242 x 2246	1496 x 1242 x 2246
		inch	58-15/16×48-15/16×88-7/16	58-15/16×48-15/16×88-7/16
	Packing (W×H×D)	mm	1519 x1283 x2269	1519 x1283 x2269
		inch	59-13/16×50-1/2×89-5/16	59-13/16×50-1/2×89-5/16
Weight	Net	kg	465/475/480	465/475/480
		ib	1025/1047/1058	1025/1047/1058
	Gross	kg	493/503/508	493/503/508
		ib	1087/1109/1120	1087/1109/1120
OPERATION RANGE	Cooling	ºC	-17.8~52	-17.8~52
		ºF	0~125.6	0~125.6
	Heating	ºC	/	/
		ºF	/	/
Shipping per STD 40HQ		\	14	14

Model			MRB-100S180(225/250)GWN10-X(G)	MRB-100S180(225/250)GWN10-Z(G)
Nominal ton		**(Ton)**	**10**	**10**
Power supply		\	208/230V,60Hz,3Ph	460V,60Hz,3Ph
Cooling	Cooling capacity	Btu/h	120,000	120,000
		kW	35.170	35.170
	Power input	kW	10.91	10.91
Max. current		A	26.3	31
Min. / Max. Voltage		V	187/253	414/506
Performance	Indoor air flow	CFM	3,600	3,600
	ESP	Pa	0 - 250	0 - 250
	EER	Btu/(h·W)	11	11
	IEER	\	14.8	14.8
Indoor coil	Number of rows	\	1	1
	Fin spacing	mm	/	/
	Fin type	\	Louvered Aluminum	Louvered Aluminum
	Tube diameter	mm	/	/
	Tube type	\	/	/
Indoor fan	Type / Quantity	\	Centrifugal / 1	Centrifugal / 1
	Motor type	\	PSC	PSC
	Motor quantity	\	1	1
	Capacitor (uF)		/	/
	Horsepower (HP)		2HP	2HP
	Full Load Amps (FLA) (A)		12	12
	Rated Airflow (CFM)		/	/
	Motor speed	r/min	1725	1725
Compressor	Type / Quantity	\	Scroll*2	Scroll*2
	Input	W	3900+3900	3885+3885
	Stage		Single+dual	Single+dual
	Rated Load Amps(RLA)	A	12.4+17.6	6.5+8.3
	Locked Rotor Amps (LRA)	A	105+105	55+50
	Refrigerant oil	ml	1240+1240	1240+1240
Outdoor coil	Number of rows	\	1+1	1+1
	Fin spacing	mm	/	/
	Fin type	\	Louvered Aluminum	Louvered Aluminum
	Tube width	mm	/	/
	Tube type	\	Microchannel aluminum flat tube	Microchannel aluminum flat tube

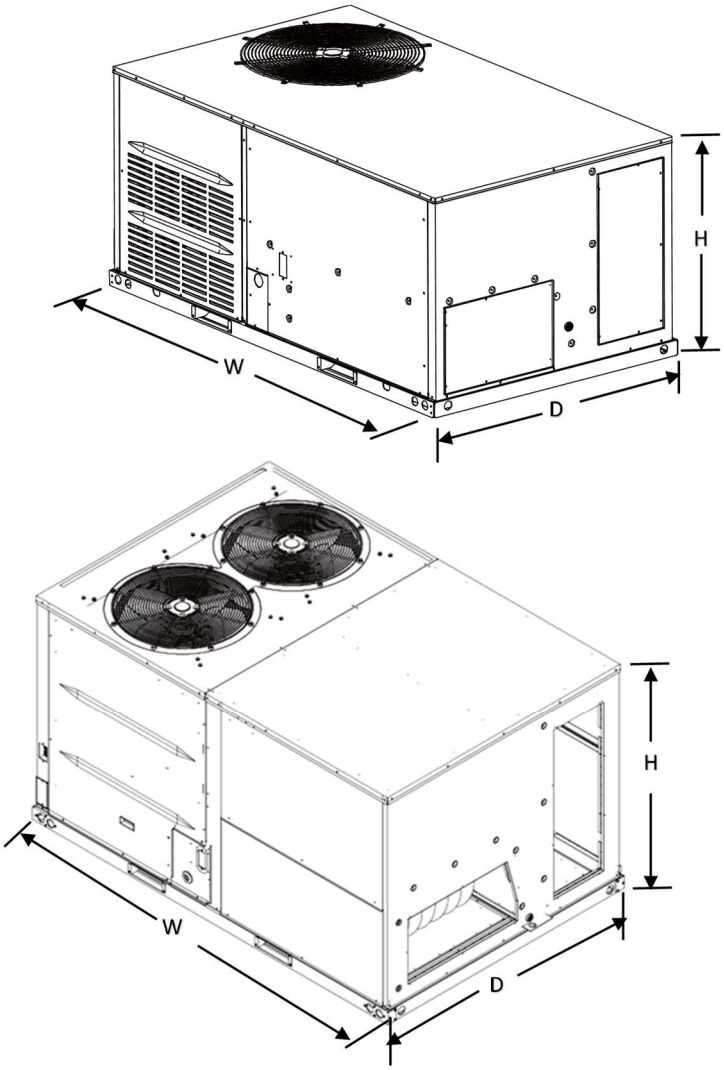
Outdoor fan	Type / Quantity	\	Axial flow fan / 2	Axial flow fan / 2
	Motor type	\	DC MOTOR	DC MOTOR
	Capacitor (uF)		/	/
	Horsepower (HP)		1/3	1/3
	Full Load Amps (FLA) (A)		1.5	0.87
	Rated Airflow (CFM)		14102	14102
	Fan speed	r/min	960	960
Refrigerant	Type /	\	R454B	R454B
	Volume	kg	2.3+2.0	2.3+2.0
	Control	\	EEV	EEV
Sound pressure level		dB(A)	84	84
Wired controller		\	/	/
Centralized controller (Optional)		\	Yes	Yes
Dimensions	Net (W×H×D)	mm	1496 x 1242 x 2246	1496 x 1242 x 2246
		inch	58-15/16×48-15/16×88-7/16	58-15/16×48-15/16×88-7/16
	Packing (W×H×D)	mm	1519 x1283 x2269	1519 x1283 x2269
		inch	59-13/16×50-1/2×89-5/16	59-13/16×50-1/2×89-5/16
Weight	Net	kg	495/500/500	496/501/501
		ib	1092/1103/1103	1093/1104/1104
	Gross	kg	523/528/528	524/529/529
		ib	1153/1164/1164	1155/1165/1165
OPERATION RANGE	Cooling	°C	-17.8~52	-17.8~52
		°F	0~125.6	0~125.6
	Heating	°C	/	/
		°F	/	/
Shipping per STD 40HQ		\	14	14

Model			MRB-125S180(225/250)GWN10-X(G)	MRB-125S180(225/250)GWN10-Z(G)
Nominal ton		**(Ton)**	**12.5**	**12.5**
Power supply		\	208/230V,60Hz,3Ph	460V,60Hz,3Ph
Cooling	Cooling capacity	Btu/h	140,000	140,000
		kW	41.032	41.032
	Power input	kW	12.96	12.96
Max. current		A	46.6	22
Min. / Max. Voltage		V	187/253	414/506
Performance	Indoor air flow	CFM	4,000	4,000
	ESP	Pa	0 - 250	0 - 250
	EER	Btu/(h·W)	10.8	10.8
	IEER	\	14.2	14.2
Indoor coil	Number of rows	\	1	1
	Fin spacing	mm	/	/
	Fin type	\	Louvered Aluminum	Louvered Aluminum
	Tube diameter	mm	/	/
	Tube type	\	/	/
Indoor fan	Type / Quantity	\	Centrifugal / 1	Centrifugal / 1
	Motor type	\	PSC	PSC
	Motor quantity	\	1	1
	Capacitor (uF)		/	/
	Horsepower (HP)		2HP	2HP
	Full Load Amps (FLA) (A)		12	12
	Rated Airflow (CFM)		/	/
	Motor speed	r/min	1725	1725
Compressor	Type / Quantity	\	Scroll*2	Scroll*2
	Input	W	6300+3900	6300+3885
	Stage		Single+dual	Single+dual
	Rated Load Amps(RLA)	A	22.4+12.4	12.2+6.5
	Locked Rotor Amps (LRA)	A	190+105	87+55
	Refrigerant oil	ml	1570+1240	1570+1240
Outdoor coil	Number of rows	\	1+1	1+1
	Fin spacing	mm	/	/
	Fin type	\	Louvered Aluminum	Louvered Aluminum
	Tube width	mm	/	/
	Tube type	\	Microchannel aluminum flat tube	Microchannel aluminum flat tube

Outdoor fan	Type / Quantity	\	Axial flow fan / 2	Axial flow fan / 2
	Motor type	\	DC MOTOR	DC MOTOR
	Capacitor (uF)		/	/
	Horsepower (HP)		3/4	3/4
	Full Load Amps (FLA) (A)		4.5	2
	Rated Airflow (CFM)		16310	16310
	Fan speed	r/min	1070	1070
Refrigerant	Type /	\	R454B	R454B
	Volume	kg	3.1+2.3	3.1+2.3
	Control	\	EEV	EEV
Sound pressure level		dB(A)	89	89
Wired controller		\	/	/
Centralized controller (Optional)		\	Yes	Yes
Dimensions	Net (W×H×D)	mm	1496 x 1242 x 2246	1496 x 1242 x 2246
		inch	58-15/16×48-15/16×88-7/16	58-15/16×48-15/16×88-7/16
	Packing (W×H×D)	mm	1519 x1283 x2269	1519 x1283 x2269
		inch	59-13/16×50-1/2×89-5/16	59-13/16×50-1/2×89-5/16
Weight	Net	kg	540/545/545	544/549/549
		ib	1190/1201/1201	1198/1209/1209
	Gross	kg	568/573/573	572/577/577
		ib	1252/1263/1263	1261/1272/1272
OPERATION RANGE	Cooling	°C	-17.8~52	-17.8~52
		°F	0~125.6	0~125.6
	Heating	°C	/	/
		°F	/	/
Shipping per STD 40HQ		\	14	14

2. Dimensions

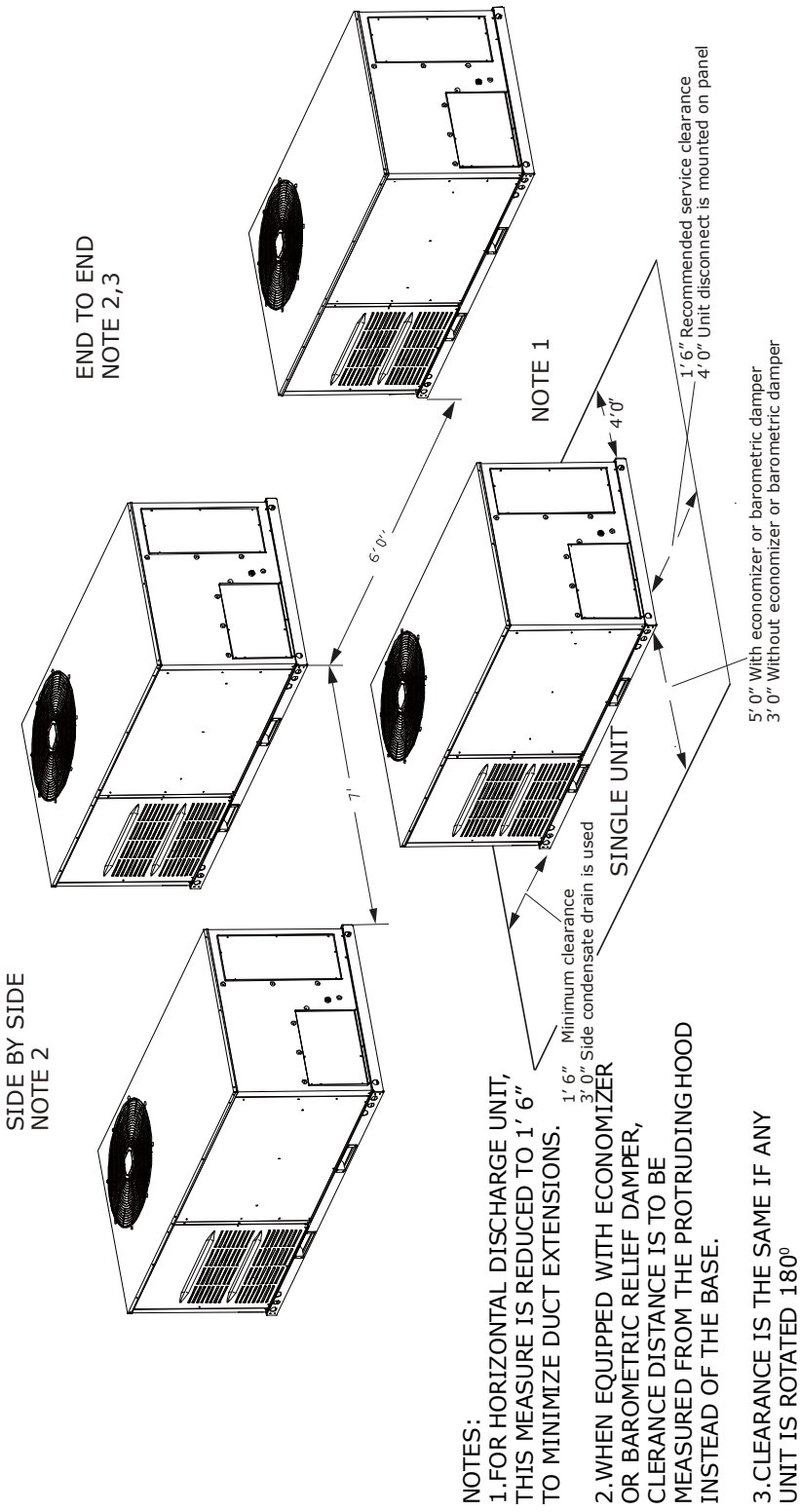
Unit: in.(mm)



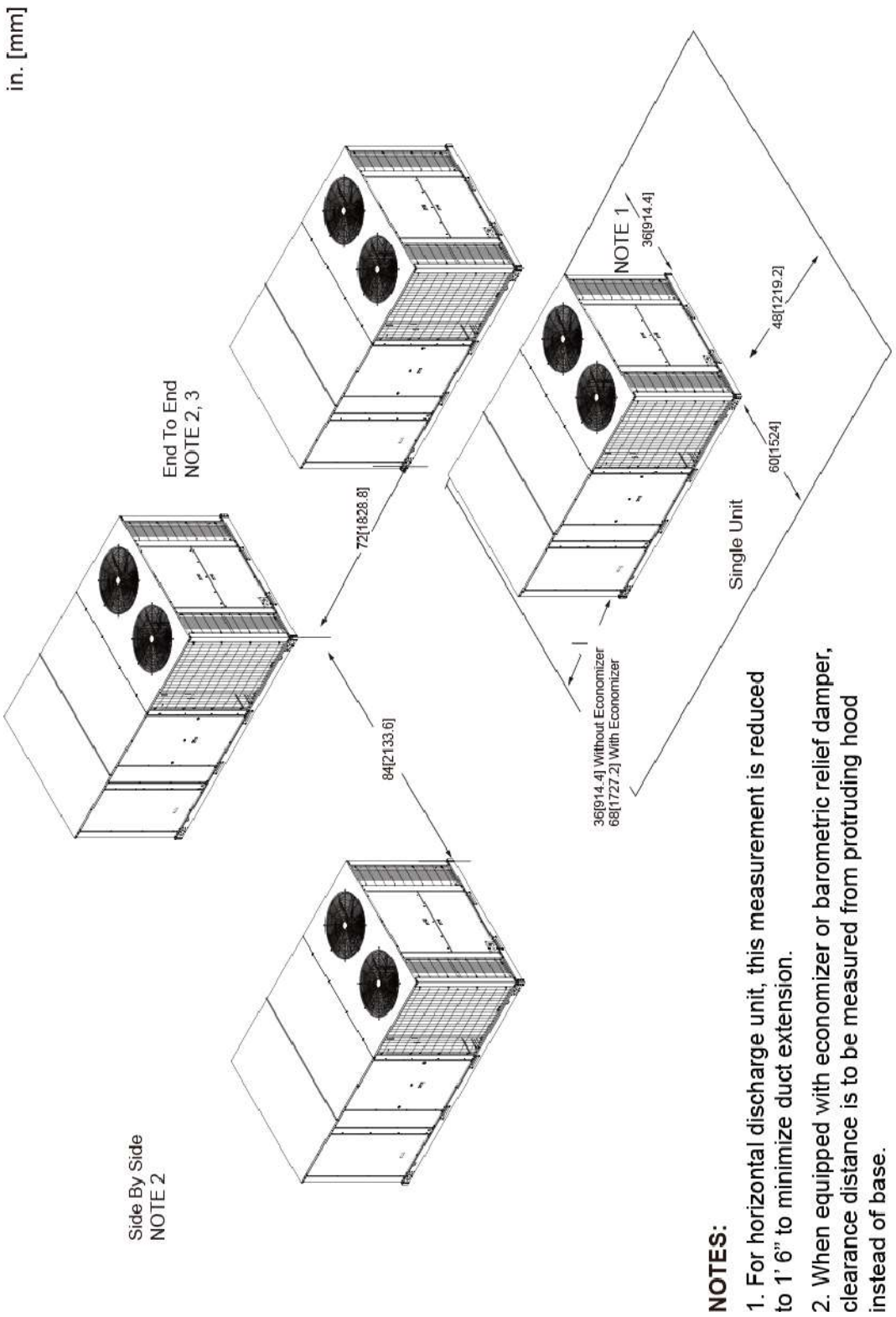
Model Size	Unit Width "W" in. [mm]	Unit Height "H" in. [mm]	Unit Length "D" in. [mm]
50	76-3/16 [1935]	33-15/16 [862]	45-1/16 [1145]
75/100/125	88-7/16 [2246]	48-3/4 [1238]	58-7/8 [1495]

3. Installation Space Requirements

5Ton



7.5-12.5Ton



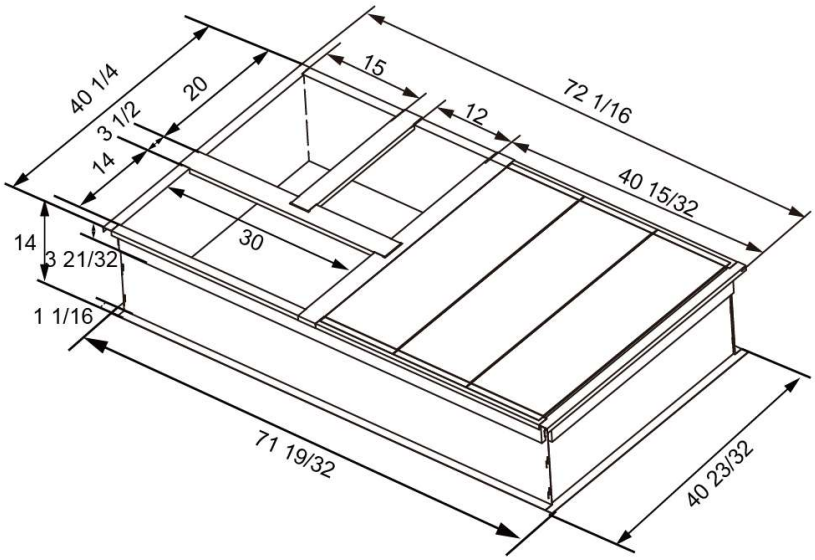
NOTES:

1. For horizontal discharge unit, this measurement is reduced to 1' 6" to minimize duct extension.
2. When equipped with economizer or barometric relief damper, clearance distance is to be measured from protruding hood instead of base.
3. Clearance is the same if any unit is rotated 180°.
4. Additional clearance required when barometric damper or economizer is installed.
5. A 10' ft. clearance from exhaust outlets for applications using fresh air or economizers should be observed.

4. Curb Dimensions:

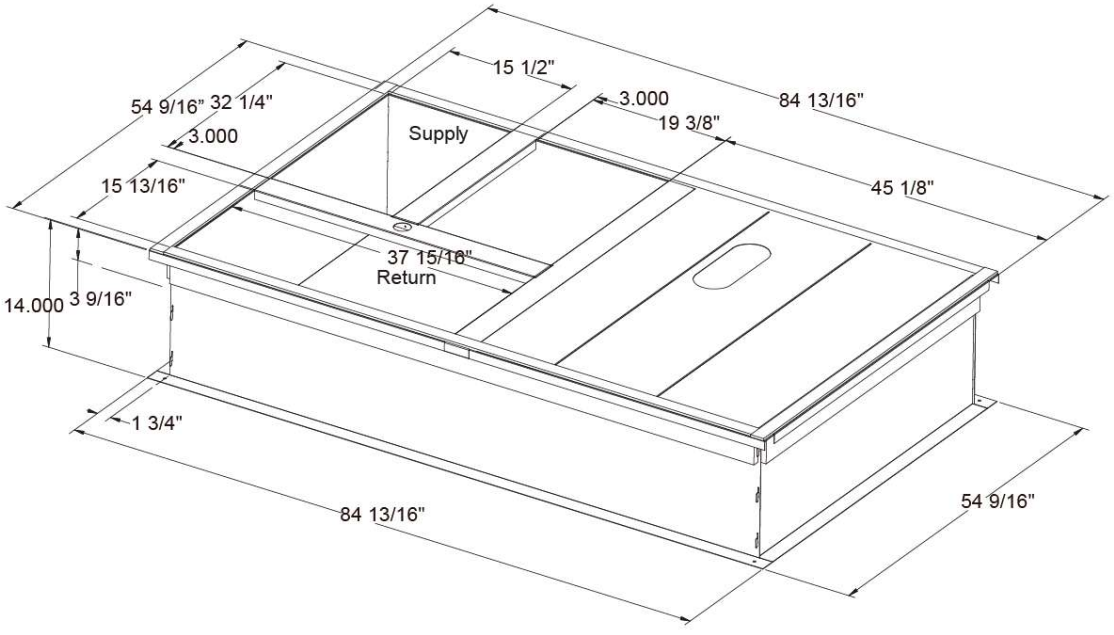
Roof curb D1-A3A-C14A (5Ton)

Unit: inches



Roof curb D1-A2A-C14A (7.5-12.5Ton)

Unit: inches



5. Gas Data:

Gas heater operating data

Heating Input Rate—Btu/h	90,000/67,500	140,000/105,000	125,000	180,000	225,000	250,000
Minimum and Maximum Inlet Supply Gas Pressure Natural/LP	(4.5/11.0)/(10.5/14)	(4.5/11.0)/(10.5/14)	4.5/11.0	4.5/11.0	4.5/11.0	4.5/11.0
Manifold Gas Pressure(a)	3.0/1.7	3.4/1.9	3.5	3.9	3.6	3.5
Combustion Blower Suction Pressure (1st Stage)	-1.0 to -1.5	-1.0 to -1.5	-1.3 to -1.7	-1.3 to -1.7	-1.1 to -1.5	-1.1 to -1.5
Combustion Blower Suction Pressure (2nd Stage)	-1.0 to -1.5	-1.0 to -1.5	-1.3 to -1.7	-1.3 to -1.7	-1.1 to -1.5	-1.1 to -1.5
Minimum Flame Sensing Current(b)	5.0 Micro Amps DC					
Normal Sensing Current Range	8.0 to 16 Micro Amps DC					
Flue Gas Temperature Rise Above Ambient	150 °F to 220 °F	170 °F to 250 °F	230 °F to 300 °F			
Flue Gas Content -%CO_2	4.5 % to 8.5 %(Natural Gas) 5.0 % to 9.5 %(Propane)		7.0 % to 8.0 %(Natural Gas) 7.5 % to 9.0 %(Propane)			
Minimum Supply Air Temperature Across Heat Exchanger	40 °F					

(a) Staged gas heat units have a positive pressure gas valve. Never adjust the staged gas pressure valve to a negative pressure.

(b) A voltage reading across pens (V+) and (V-) is equivalent to the flame sensing current. One volt equals one micro amp.

Piping

Length of Pipe (ft)	Iron Pipe Size (IPS) Inches				
	1/2" Pipe	3/4" Pipe	1" Pipe	1¼" Pipe	1½" Pipe
15	76	176	345	750	1220
30	52	120	241	535	850
45	43	99	199	435	700
60	38	86	173	380	610
75	35	77	155	345	545

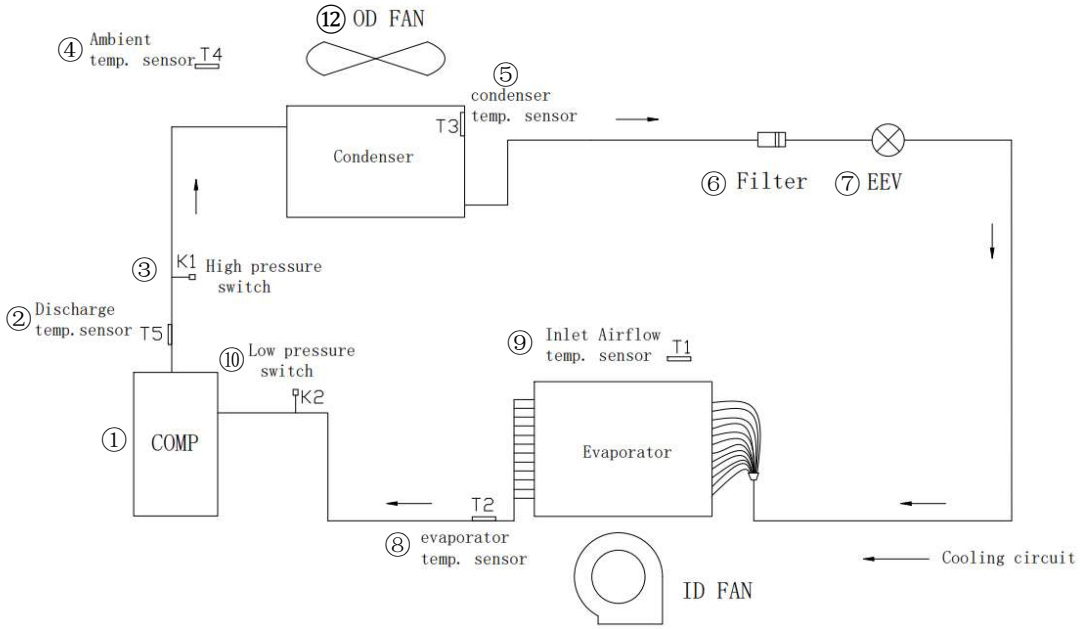
NOTE: Capacity of Pipe of Different Diameters and Lengths in Cu. Ft. Per Hr. with Pressure Drop of 0.3" and Specific Gravity of 0.60.

Specific gravity multipliers

Specific Gravity	Multipliers
0.5	1.1
0.55	1.04
0.6	1
0.65	0.96

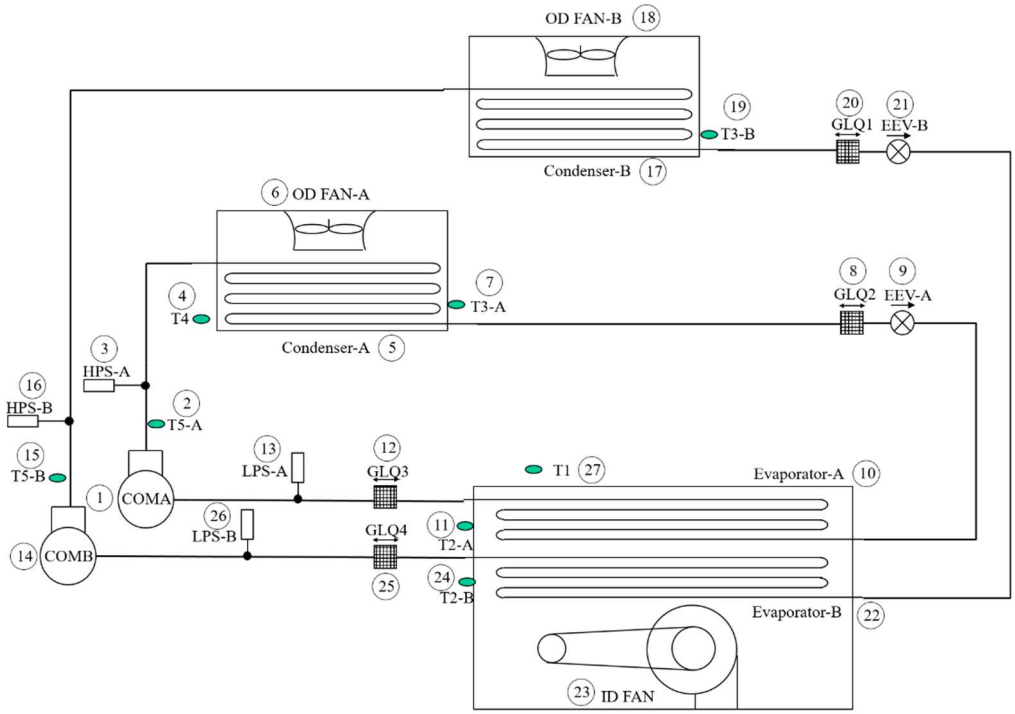
6. Piping Diagrams

5Ton



No.	Code	Component	Description
1	Comp.	Compressor	Compress the low-pressure refrigerant gas to a high-pressure state.
2	T5	Discharge temperature sensor	Protection will be activated when the detected temperature exceeds 239°Fand resume when the temperature reduce below 194°F.
3	K1(HPS)	High pressure protection switch	Open circuit when the pressure exceeds 580.2psi, and resume when the pressure drops below 435.1psi.
4	T4	Ambient temperature sensor	Measures outdoor air temperature and will engage protection mode when ambient conditions exceed operating parameters.
5	T3	Condenser coil temperature sensor	Measures condenser coil temperature and will engage protection mode if temperature exceed operating temperature.
6	Filter	Filter Drier	Collects particulates to prevent them from traveling through the system and drying the system.
7	EEV	Electronic expansion valve	Automatically adjust the throttling opening of the circuit.
8	T2	Evaporator coil temperature sensor	Prevent the evaporator from freezing.
9	T1	Return air temperature sensor	Measures indoor return air temperature
10	K2(LPS)	Low pressure protection switch	Open circuit when the pressure lower than 29psi, and resume when the pressure rise over 43.5psi.
11	ID Fan	Indoor blower	Dc motor with five taps.
12	OD Fan	Outdoor Fan	DC motor with speeds range 0~980 rpm.

7.5-12.5Ton

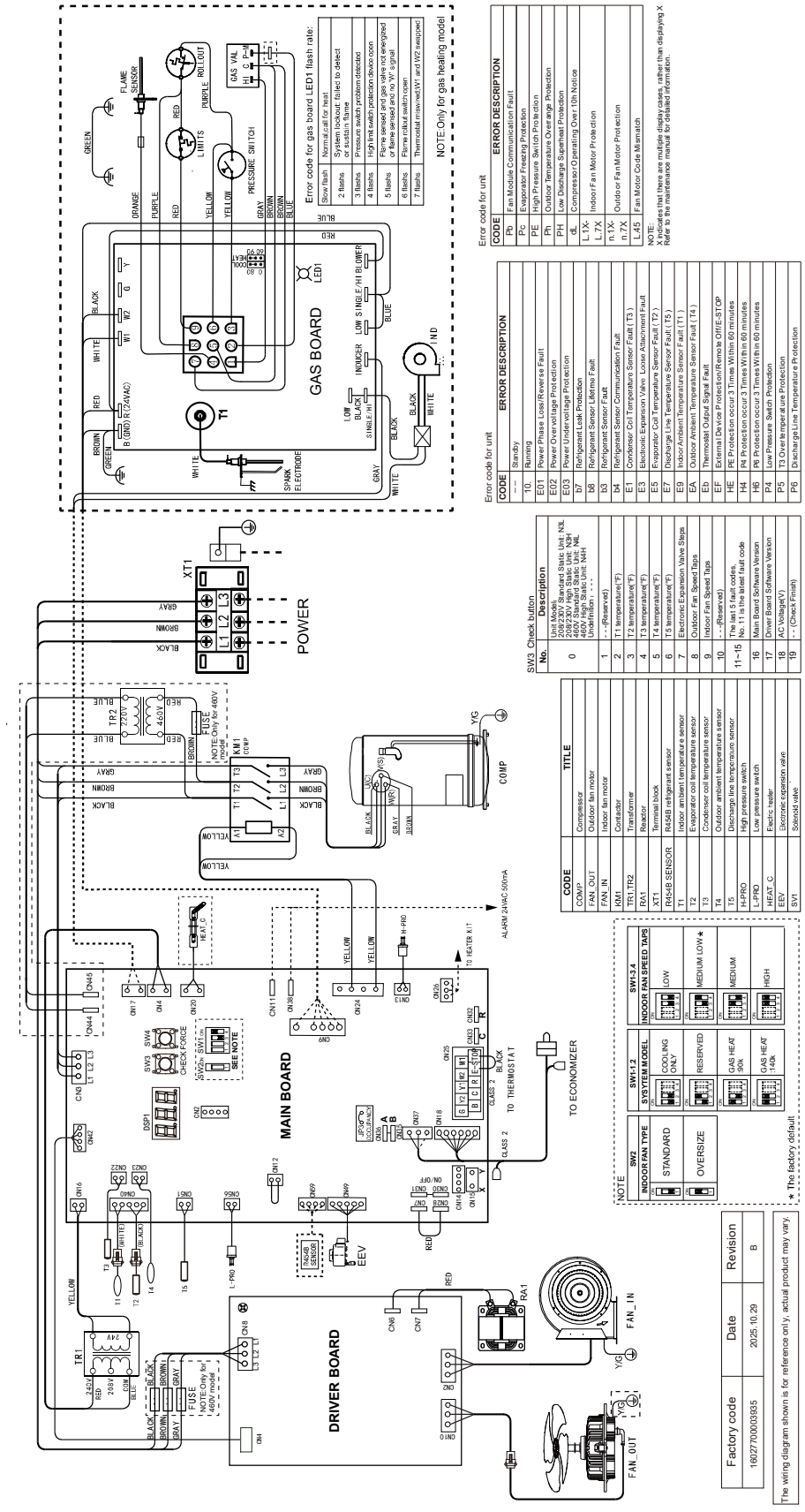


No.	Code	Component	Description
1	ComA.	Compressor of system A	Compress the low-pressure refrigerant gas off to a high-pressure state.
2	T5-A	Discharge temperature sensor of system A	Protection will be activated when the detected temperature exceeds 239°F and resume when the temperature reduces below 194°F.
3	HPS-A	High pressure protection switch of system A	Open circuit when the pressure exceeds 580.2psi and resumes when the pressure drops below 435.1psi.
4	T4	Ambient temperature sensor	Measures outdoor air temperature and will engage protection mode when ambient conditions exceed operating parameters.
5	Condenser-A	Condenser of system A	Release heat from the refrigerant to the outside air, turning it from a hot gas into a liquid.
6	OD FAN-A	Outdoor fan of system A	Force air through the condenser-A to dissipate heat.
7	T3-A	Condenser coil temperature sensor of system A	Measures A condenser coil temperature and will engage protection mode if temperature exceed operating temperature.
8	GLQ2	Filter Drier	Collects particulates to prevent them from traveling through system A and drying the system.
9	EEV-A	Electronic expansion valve	Automatically adjust the throttling opening of circuit A.
10	Evaporator-A	Evaporator of system A	Absorb heat from the indoor air, causing the refrigerant of system A to evaporate and cool the surrounding space.
11	T2-A	Evaporator coil temperature sensor of system A	Prevent evaporator-A from freezing.

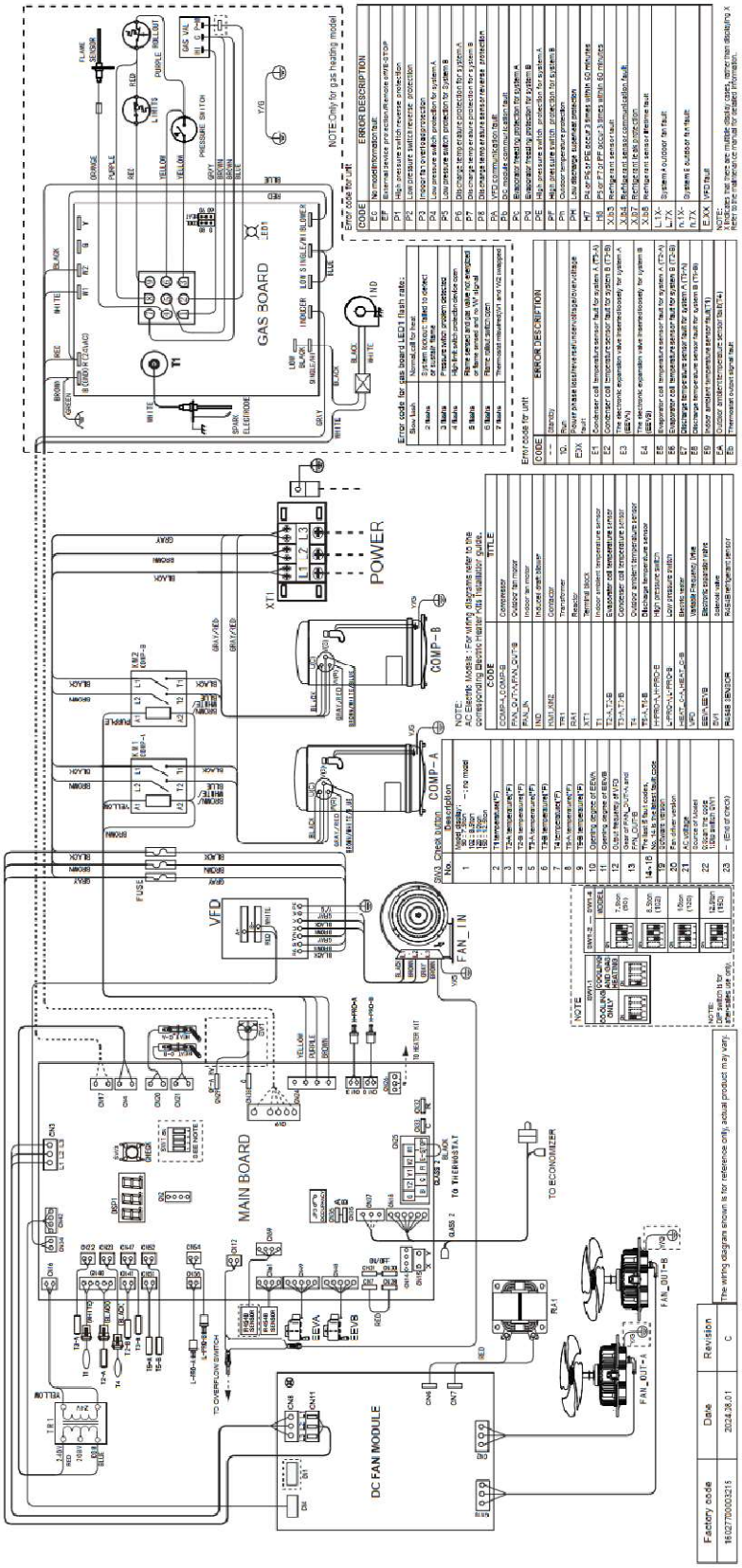
No.	Code	Component	Description
12	GLQ3	Filter Drier	Collects particulate to prevent them from traveling through system A and drying the system.
13	LPS-A	Low pressure protection switch of system A	Open circuit when the pressure is lower than 29psi, and resume when the pressure rise over 43.5psi.
14	ComB.	Compressor of system B	Compress the low-pressure refrigerant gas off to a high-pressure state.
15	T5-B	Discharge temperature sensor of system B	Protection will be activated when the detected temperature exceeds 239°F and resume when the temperature reduces below 194°F.
16	HPS-B	High pressure protection switch of system B	Open circuit when the pressure exceeds 580.2psi and resumes when the pressure drops below 435.1psi.
17	Condenser-B	Condenser of system B	Release heat from the refrigerant to the outside air, turning it from a hot gas into a liquid.
18	OD FAN-B	Outdoor fan of system B	Force air through the condenser-B to dissipate heat.
19	T3-B	Condenser coil temperature sensor of system B	Measures A condenser coil temperature and will engage protection mode if temperature exceed operating temperature.
20	GLQ1	Filter Drier	Collects particulates to prevent them from traveling through system B, and drying the system.
21	EEV-B	Electronic expansion valve	Automatically adjust the throttling opening of circuit A.
22	Evaporator-B	Evaporator of system B	Absorb heat from the indoor air, causing the refrigerant of system B to evaporate and cool the surrounding space.
23	ID FAN	Indoor blower	Circulate indoor air across the cold evaporator coils to blow cool air into the room.
24	T2-B	Evaporator coil temperature sensor of system B	Prevent evaporator-B from freezing.
25	GLQ4	Filter Drier	Collects particulates to prevent them from traveling through system B, and drying the system.
26	LPS-B	Low pressure protection switch of system B	Open circuit when the pressure is lower than 29psi, and resume when the pressure rises over 43.5psi.
27	T1	Return air temperature sensor	Measures indoor return air temperature

7. Wiring diagrams

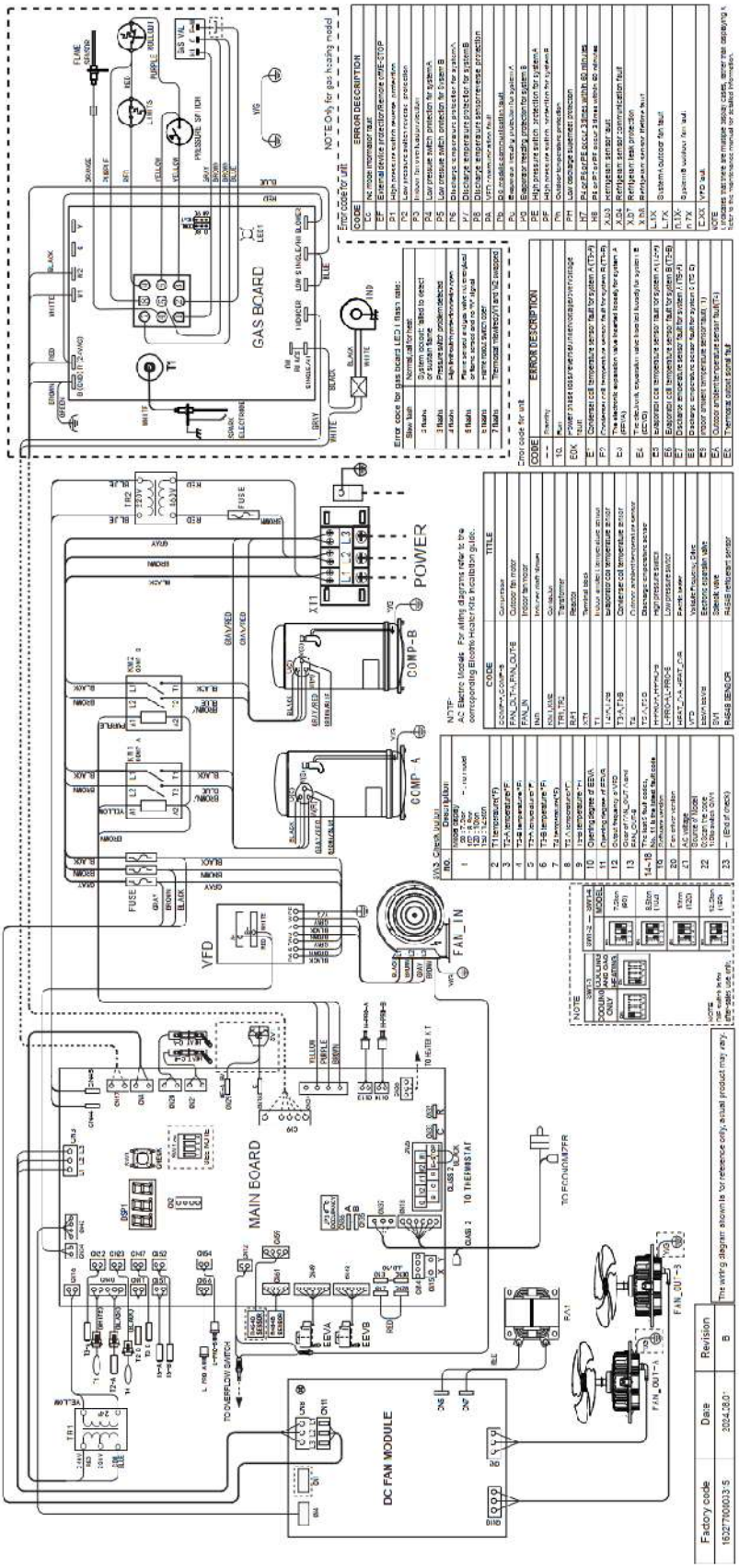
5Ton



7.5-12.5Ton(230V)



7.5-12.5Ton(460V)



8. Electrical Characteristics

Ton	TYPE	Power Supply			Compressor A			Compressor B			Eva. Fan Motor			Con. Fan Motor		
		MCA(A)	RLA(A)	RLA(A)	RLA(A)	IPT(kW)	Qty	RLA(A)	IPT(kW)	Qty	FLA(A)	IPT(kW)	Qty	FLA(A)	IPT(kW)	Qty
5	230V	28.0	45.0	45.0	18	3.9	1	-	-	-	3.7	0.75	1	1.4	0.3	1
	460V	28.0	45.0	45.0	18	3.9	1	-	-	-	3.7	0.75	1	1.4	0.3	1
7.5	230V	35.0	45.0	45.0	12	3.14	1	9	2.35	1	7.2	1.5	1	1.5	0.3	2
	460V	18.0	20.0	20.0	6.3	3.16	1	4.1	2.35	1	3.5	1.5	1	0.87	0.3	2
10	230V	50.0	60.0	60.0	12.4	3.9	1	17.6	3.9	1	12	2.2	1	1.5	0.3	2
	460V	28.0	30.0	30.0	6.5	3.89	1	8.3	3.89	1	8.7	2.2	1	0.87	0.3	2
12.5	230V	62.0	80.0	80.0	22.4	6.3	1	12.4	3.9	1	12	2.2	1	4.5	0.56	2
	460V	35.0	45.0	45.0	12.2	6.3	1	6.5	3.89	1	8.7	2.2	1	2	0.56	2

9. Performance data

Cooling capacity:5Ton

Air Flow （CFM）				1500				1650				1800				1950				2050			
		Ent (DB)(°F)		72	75	78	80	72	75	78	80	72	75	78	80	72	75	78	80	72	75	78	80
Ambient Temperature	85	63	TC	54.78	55.02	55.26	55.50	55.21	55.45	55.69	55.94	56.07	56.32	56.56	56.81	56.36	56.61	56.85	57.10	56.61	56.86	57.11	57.36
			SC	33.87	39.49	45.42	48.58	34.80	40.57	46.67	49.91	36.42	42.46	48.84	52.23	37.48	43.70	50.26	53.76	38.55	44.94	51.70	55.29
			PI	4.53	4.51	4.50	4.48	4.58	4.56	4.55	4.53	4.72	4.70	4.68	4.66	4.83	4.81	4.79	4.77	4.97	4.94	4.93	4.91
		67	TC	59.34	59.60	59.87	60.13	59.81	60.07	60.33	60.60	60.74	61.01	61.28	61.55	61.06	61.32	61.59	61.86	61.33	61.60	61.87	62.14
			SC	25.41	32.33	37.89	41.17	26.11	33.22	38.93	42.31	27.32	34.76	40.74	44.27	28.12	35.78	41.93	45.57	28.92	36.80	43.13	46.87
			PI	4.41	4.40	4.38	4.37	4.46	4.45	4.44	4.42	4.59	4.58	4.57	4.55	4.70	4.69	4.67	4.66	4.84	4.82	4.81	4.79
		71	TC	64.16	64.45	64.73	65.01	64.67	64.95	65.23	65.52	65.68	65.97	66.26	66.55	66.01	66.30	66.60	66.89	66.31	66.60	66.90	67.19
			SC	18.62	24.08	29.76	33.88	19.13	24.74	30.58	34.81	20.02	25.89	32.00	36.43	20.61	26.65	32.93	37.49	21.19	27.41	33.87	38.56
			PI	4.67	4.65	4.64	4.62	4.73	4.71	4.69	4.68	4.86	4.85	4.83	4.81	4.98	4.96	4.94	4.93	5.12	5.10	5.08	5.07
	95	63	TC	51.41	51.64	51.87	52.09	51.43	51.65	51.88	52.11	52.68	52.91	53.14	53.37	53.22	53.46	53.69	53.93	53.36	53.60	53.83	54.07
			SC	32.33	37.69	43.35	46.37	33.05	38.52	44.31	47.40	34.65	40.40	46.47	49.70	36.27	42.28	48.64	52.02	37.29	43.48	50.01	53.49
			PI	5.01	4.99	4.98	4.96	5.12	5.10	5.08	5.06	5.20	5.18	5.17	5.14	5.36	5.34	5.32	5.30	5.47	5.45	5.43	5.41
		67	TC	55.70	55.95	56.19	56.44	55.71	55.96	56.21	56.45	57.07	57.32	57.57	57.82	57.66	57.92	58.17	58.42	57.81	58.06	58.32	58.57
			SC	24.25	30.86	36.17	39.30	24.79	31.54	36.97	40.17	26.00	33.08	38.77	42.13	27.21	34.62	40.58	44.09	27.98	35.60	41.72	45.33
			PI	4.88	4.87	4.85	4.84	4.99	4.97	4.96	4.94	5.07	5.05	5.04	5.02	5.22	5.21	5.19	5.17	5.33	5.31	5.30	5.28
		71	TC	60.22	60.49	60.75	61.02	60.24	60.51	60.77	61.04	61.70	61.97	62.25	62.52	62.34	62.62	62.89	63.17	62.51	62.78	63.06	63.33
			SC	17.77	22.98	28.40	32.34	18.17	23.49	29.03	33.06	19.05	24.64	30.45	34.66	19.94	25.79	31.87	36.28	20.50	26.51	32.77	37.30
			PI	5.17	5.15	5.13	5.11	5.28	5.26	5.24	5.23	5.36	5.35	5.33	5.31	5.53	5.51	5.49	5.47	5.64	5.62	5.60	5.58

Cooling capacity:5Ton (Continued)

Ambient Temperature																						
	105	63	TC	47.12	47.32	47.53	47.74	48.16	48.37	48.58	48.79	48.92	49.14	49.35	49.57	49.57	49.79	50.01	50.23	49.77	49.99	50.21	50.43
			SC	30.78	35.88	41.27	44.15	32.20	37.54	43.18	46.19	33.62	39.19	45.08	48.22	35.10	40.92	47.07	50.34	35.84	41.78	48.06	51.40
			PI	5.63	5.61	5.59	5.57	5.73	5.70	5.69	5.66	5.84	5.82	5.80	5.78	5.96	5.93	5.92	5.89	6.03	6.01	5.99	5.97
		67	TC	51.04	51.27	51.49	51.72	52.17	52.40	52.63	52.86	53.00	53.23	53.46	53.70	53.70	53.94	54.18	54.41	53.92	54.16	54.39	54.63
			SC	23.09	29.38	34.43	37.42	24.16	30.74	36.03	39.15	25.22	32.09	37.61	40.87	26.33	33.50	39.27	42.67	26.88	34.21	40.09	43.57
			PI	5.48	5.47	5.45	5.43	5.58	5.56	5.55	5.53	5.69	5.67	5.66	5.64	5.81	5.79	5.77	5.75	5.88	5.86	5.84	5.82
		71	TC	55.19	55.43	55.67	55.92	56.41	56.66	56.90	57.15	57.30	57.55	57.81	58.06	58.07	58.32	58.58	58.83	58.30	58.56	58.81	59.07
			SC	16.92	21.88	27.04	30.79	17.70	22.89	28.29	32.21	18.48	23.90	29.54	33.63	19.29	24.95	30.84	35.11	19.70	25.48	31.49	35.85
			PI	5.80	5.78	5.76	5.74	5.91	5.89	5.86	5.85	6.02	6.00	5.98	5.96	6.14	6.12	6.10	6.08	6.22	6.20	6.18	6.16
	115	63	TC	41.23	41.42	41.60	41.78	42.13	42.31	42.50	42.69	43.35	43.54	43.73	43.92	43.71	43.90	44.09	44.28	44.09	44.28	44.48	44.67
			SC	27.71	32.31	37.16	39.75	29.26	34.11	39.24	41.97	31.41	36.62	42.12	45.05	32.58	37.98	43.68	46.72	33.96	39.59	45.53	48.70
			PI	6.54	6.52	6.50	6.47	6.69	6.66	6.64	6.61	6.79	6.76	6.74	6.71	6.87	6.84	6.82	6.79	6.96	6.93	6.91	6.88
		67	TC	44.67	44.87	45.07	45.26	45.64	45.84	46.04	46.24	46.96	47.17	47.38	47.59	47.35	47.56	47.77	47.97	47.76	47.97	48.18	48.39
			SC	20.79	26.45	31.00	33.69	21.95	27.93	32.74	35.57	23.56	29.98	35.14	38.19	24.44	31.09	36.44	39.60	25.47	32.41	37.99	41.28
			PI	6.38	6.36	6.34	6.32	6.51	6.50	6.47	6.45	6.61	6.59	6.57	6.55	6.69	6.67	6.65	6.63	6.78	6.76	6.74	6.71
		71	TC	48.30	48.51	48.73	48.94	49.35	49.57	49.78	50.00	50.78	51.00	51.23	51.45	51.19	51.42	51.64	51.87	51.64	51.87	52.10	52.32
			SC	15.24	19.70	24.35	27.72	16.09	20.80	25.71	29.27	17.27	22.33	27.60	31.42	17.91	23.16	28.62	32.59	18.67	24.14	29.83	33.97
			PI	6.75	6.72	6.70	6.68	6.89	6.87	6.85	6.82	7.00	6.97	6.95	6.92	7.09	7.06	7.03	7.01	7.17	7.15	7.12	7.10

Notes:1. All capacities are net and have considered indoor fan heat;

2. TC = Total Capacity; SC = Sensible Capacity.

Cooling capacity:7.5Ton

Air Flow （CFM）				2400				2700				3000				3300			
		Ent (DB)(°F)		75	80	85	90	75	80	85	90	75	80	85	90	75	80	85	90
Ambient Temperature	85	61	TC	83.8	83.0	82.6	82.4	85.0	84.2	83.7	83.5	86.2	85.5	84.8	84.5	87.4	86.8	86.0	85.6
			SC	56.4	69.5	77.5	78.1	61.5	75.6	79.4	79.1	66.7	81.0	80.4	80.1	72.2	76.4	81.5	81.1
			PI	5.83	5.85	5.86	5.89	5.98	6	6.01	6.04	6.21	6.23	6.24	6.27	6.39	6.41	6.42	6.45
		67	TC	93.9	92.9	92.6	92.3	95.2	94.3	93.8	93.5	96.6	95.8	95.0	94.6	98.0	97.2	96.2	95.8
			SC	47.2	58.2	64.9	67.0	51.4	63.2	70.4	71.1	55.8	68.2	76.0	75.2	60.5	73.6	82.0	79.5
			PI	5.85	5.87	5.88	5.9	6	6.02	6.03	6.05	6.23	6.25	6.26	6.28	6.41	6.43	6.44	6.46
		73	TC	103.7	102.9	102.7	102.4	105.1	104.5	104.1	103.7	106.6	106.0	105.5	105.0	108.2	107.6	106.9	106.3
			SC	35.2	48.5	61.5	77.2	38.4	52.7	66.8	82.0	41.6	56.9	72.1	86.7	45.0	61.5	77.8	91.8
			PI	5.86	5.89	5.88	5.91	6.01	6.04	6.03	6.06	6.24	6.27	6.26	6.29	6.42	6.45	6.44	6.47
	95	61	TC	75.5	74.5	74.1	73.9	76.6	75.6	75.0	74.8	77.7	76.8	76.1	75.7	78.8	77.9	77.1	76.6
			SC	54.4	65.4	71.1	73.9	59.4	71.0	75.1	74.9	64.4	76.7	76.1	75.8	69.7	78.0	77.1	76.6
			PI	6.78	6.79	6.8	6.8	6.93	6.94	6.95	6.95	7.16	7.17	7.18	7.18	7.34	7.35	7.36	7.36
		67	TC	88.5	87.4	86.9	86.7	89.8	88.7	88.1	87.8	91.1	90.0	89.2	88.8	92.5	91.3	90.3	89.9
			SC	44.0	56.6	64.6	67.9	48.0	61.5	70.2	72.1	51.9	66.3	75.8	76.3	56.3	71.6	81.8	80.7
			PI	6.8	6.8	6.81	6.81	6.95	6.95	6.96	6.96	7.18	7.18	7.19	7.19	7.36	7.36	7.37	7.37
		73	TC	96.3	95.3	94.2	94.2	97.9	96.1	95.8	95.6	98.7	97.9	97.2	96.8	99.6	99.7	98.7	98.0
			SC	35.5	43.2	52.0	54.9	44.1	44.5	56.8	66.3	37.6	53.6	69.7	85.3	32.1	64.7	85.5	98.0
			PI	6.80	6.81	6.83	6.84	6.95	6.96	6.98	6.99	7.18	7.19	7.21	7.22	7.36	7.37	7.39	7.4

Cooling capacity: 7.5Ton (Continued)

Ambient Temperature	105	61	TC	68.8	67.9	67.5	67.3	69.8	68.9	68.4	68.2	70.7	69.9	69.3	69.0	71.7	70.9	70.2	69.8
			SC	50.7	59.6	64.3	67.3	55.3	64.8	68.4	68.2	60.0	69.9	69.3	69.0	65.0	70.8	70.2	69.8
			PI	7.56	7.58	7.6	7.61	7.71	7.73	7.75	7.76	7.94	7.96	7.98	7.99	8.12	8.14	8.16	8.17
		67	TC	78.8	77.8	77.4	77.2	80.0	79.0	78.4	78.2	81.1	80.2	79.4	79.1	82.2	81.4	80.5	80.1
			SC	41.9	54.0	61.7	64.7	45.8	58.6	67.0	68.7	49.5	63.3	72.3	72.7	53.6	68.4	78.1	80.1
			PI	7.60	7.6	7.61	7.63	7.75	7.75	7.76	7.78	7.98	7.98	7.99	8.01	8.16	8.16	8.17	8.19
		73	TC	89.3	88.4	87.4	87.4	90.8	89.2	88.8	88.7	91.6	90.8	90.2	89.8	92.4	92.4	91.6	90.8
			SC	33.9	44.6	49.6	52.3	42.0	42.4	54.1	63.2	35.9	51.1	66.5	81.2	30.6	61.6	81.6	90.8
			PI	7.61	7.63	7.63	7.64	7.76	7.78	7.78	7.79	7.99	8.01	8.01	8.02	8.17	8.19	8.19	8.2
	115	61	TC	58.7	58.0	57.6	57.4	59.5	58.8	58.4	58.2	60.4	59.7	59.1	58.9	61.2	60.5	59.9	59.6
			SC	47.6	50.9	56.2	57.5	51.9	55.3	58.3	58.2	56.2	59.7	59.1	58.9	60.9	60.5	60.0	59.7
			PI	8.32	8.33	8.34	8.36	8.47	8.48	8.49	8.51	8.7	8.71	8.72	8.74	8.88	8.89	8.9	8.92
		67	TC	69.6	68.8	68.4	68.2	70.6	69.8	69.3	69.1	71.6	70.8	70.2	69.9	72.6	71.9	71.1	70.8
			SC	40.5	52.2	59.7	62.2	44.3	56.7	64.8	66.1	47.9	61.2	70.0	69.9	51.9	66.1	71.2	70.7
			PI	8.32	8.34	8.35	8.37	8.47	8.49	8.5	8.52	8.7	8.72	8.73	8.75	8.88	8.9	8.91	8.93
		73	TC	80.3	79.5	78.6	78.5	81.2	80.5	80.0	79.7	82.3	81.7	81.1	80.7	83.5	82.9	82.2	81.8
			SC	32.7	38.5	47.8	50.5	34.6	41.1	54.9	65.0	37.0	49.4	64.2	78.4	39.5	59.3	74.9	81.7
			PI	8.33	8.35	8.36	8.38	8.48	8.5	8.51	8.53	8.71	8.73	8.74	8.76	8.89	8.91	8.92	8.94

Cooling capacity: 7.5Ton (Continued)

Ambient Temperature																		
	120	61	TC	49.9	49.4	48.9	48.6	50.6	49.9	49.5	49.2	52.5	51.9	51.5	51.3	54.5	53.9	53.5	53.4
			SC	42.5	43.6	48.9	48.6	46.3	47.2	49.5	49.2	50.5	51.9	51.5	51.3	54.5	53.9	53.5	53.4
			PI	8.63	8.64	8.65	8.67	8.78	8.79	8.8	8.82	9.01	9.02	9.03	9.05	9.19	9.2	9.21	9.23
		67	TC	64.1	63.3	62.9	62.8	65.1	64.2	63.8	63.5	66.0	65.2	64.6	64.4	66.9	66.2	65.5	65.2
			SC	42.5	54.7	57.7	62.8	46.3	58.9	58.5	63.5	50.2	59.8	59.2	64.4	54.4	60.7	60.0	65.2
			PI	8.63	8.64	8.65	8.67	8.78	8.79	8.8	8.82	9.01	9.02	9.03	9.05	9.19	9.2	9.21	9.23
		73	TC	74.0	73.2	72.4	72.1	75.3	73.9	73.6	73.5	75.9	75.3	74.7	74.7	76.5	76.7	75.8	76.0
			SC	31.8	46.6	42.0	49.2	39.5	39.9	50.9	59.4	33.7	48.1	62.5	65.0	28.7	58.0	75.9	76.0
			PI	8.63	8.65	8.66	8.68	8.78	8.8	8.81	8.83	9.01	9.03	9.04	9.06	9.19	9.21	9.22	9.24
	125	61	TC	24.9	24.6	24.4	24.2	25.2	24.9	24.7	24.6	26.2	25.9	25.7	25.6	27.2	26.9	26.7	26.6
			SC	22.0	21.8	24.4	24.2	24.0	23.6	24.7	24.6	26.2	25.9	25.7	25.6	27.2	26.9	26.7	26.6
			PI	6.92	6.93	6.95	6.97	7.07	7.08	7.11	7.12	7.3	7.31	7.33	7.35	7.48	7.49	7.51	7.53
		67	TC	30.9	30.5	30.3	30.2	31.3	30.9	30.7	30.6	31.8	31.4	31.1	31.0	32.2	31.9	31.5	31.4
			SC	21.6	27.8	29.3	29.3	23.6	29.9	29.8	29.6	25.5	30.4	30.1	30.0	27.7	30.9	30.5	31.4
			PI	6.93	6.95	6.96	6.98	7.08	7.11	7.11	7.13	7.31	7.33	7.34	7.36	7.49	7.51	7.52	7.54
		73	TC	35.8	35.4	35.0	34.8	36.4	35.7	35.6	35.5	36.7	36.4	36.1	36.1	37.0	37.0	36.6	36.7
			SC	17.6	25.8	23.2	27.2	21.9	22.1	28.2	32.9	18.7	26.6	34.6	36.0	15.9	32.1	36.6	36.7
			PI	6.95	6.96	6.98	7.01	7.11	7.11	7.13	7.15	7.33	7.34	7.36	7.38	7.51	7.52	7.54	7.56

Notes:1. All capacities are net and have considered indoor fan heat;

2. TC = Total Capacity; SC = Sensible Capacity.

Cooling capacity:10Ton

Air Flow （CFM）				3200				3600				4000				4400			
		Ent (DB)(°F)		75	80	85	90	75	80	85	90	75	80	85	90	75	80	85	90
Ambient Temperature	85	61	TC	114.0	112.8	112.3	112.0	115.8	114.6	113.9	113.6	117.5	116.4	115.5	115.1	119.2	118.2	117.1	116.5
			SC	80.9	100.7	112.6	113.6	88.7	109.8	115.5	115.2	96.4	118.0	117.1	116.6	104.7	119.8	118.7	118.1
			PI	8.40	8.41	8.42	8.44	8.67	8.68	8.69	8.71	9.15	9.16	9.17	9.19	9.61	9.62	9.63	9.65
		67	TC	124.9	123.7	123.2	122.8	126.8	125.6	124.8	124.4	128.7	127.6	126.5	126.0	130.7	129.6	128.2	127.6
			SC	72.9	90.8	101.7	105.2	79.9	99.1	110.7	111.9	86.9	107.2	119.8	118.5	94.6	115.9	129.6	125.5
			PI	8.41	8.42	8.44	8.5	8.68	8.69	8.71	8.77	9.16	9.17	9.19	9.25	9.62	9.63	9.65	9.71
		73	TC	138.0	136.9	136.7	136.3	140.0	139.2	138.6	138.1	142.1	141.3	140.5	139.9	144.2	143.4	142.4	141.7
			SC	42.9	60.6	77.8	98.6	47.3	66.2	84.8	104.9	51.5	71.8	91.9	111.3	56.0	77.8	99.5	117.9
			PI	8.42	8.43	8.45	8.51	8.69	8.7	8.72	8.78	9.17	9.18	9.2	9.26	9.63	9.64	9.66	9.72
	95	61	TC	110.5	109.1	108.4	108.1	112.2	110.7	109.9	109.6	113.9	112.5	111.5	110.9	115.6	114.3	113.1	112.3
			SC	70.4	91.8	105.5	109.7	77.3	100.0	111.5	111.2	84.0	108.3	113.1	112.5	91.3	115.9	114.7	113.9
			PI	9.91	9.95	9.97	10.01	10.18	10.22	10.24	10.28	10.66	10.7	10.72	10.76	11.12	11.16	11.18	11.22
		67	TC	121.2	119.6	118.8	118.5	122.9	121.4	120.5	120.1	124.8	123.3	122.1	121.6	126.8	125.2	123.7	123.1
			SC	63.5	82.7	95.1	100.0	69.6	90.2	103.6	106.4	75.7	97.7	112.1	112.8	82.3	105.8	121.3	119.6
			PI	9.95	9.97	9.99	10.10	10.22	10.24	10.26	10.37	10.7	10.72	10.74	10.85	11.16	11.18	11.2	11.31
		73	TC	134.2	132.7	131.2	131.3	136.5	134.0	133.5	133.3	137.8	136.5	135.6	134.9	139.1	139.1	137.7	136.7
			SC	42.0	51.8	63.2	66.8	52.9	53.5	69.4	81.5	44.6	65.3	85.9	105.9	37.5	79.5	106.2	137.3
			PI	9.98	10.01	10.07	10.12	10.25	10.28	10.34	10.39	10.73	10.76	10.82	10.87	11.19	11.22	11.28	11.33

Cooling capacity: 10Ton (Continued)

Ambient Temperature	105	61	TC	98.4	97.1	96.5	96.2	99.9	98.6	97.8	97.5	101.4	100.1	99.2	98.7	102.9	101.6	100.5	100.0
			SC	62.1	81.1	93.2	97.8	68.1	88.4	99.4	99.1	74.1	95.7	100.7	100.3	80.6	103.2	102.1	101.6
			PI	11.02	11.05	11.08	11.11	11.29	11.32	11.35	11.38	11.77	11.8	11.83	11.86	12.23	12.26	12.29	12.32
		67	TC	107.9	106.4	105.8	105.5	109.6	108.1	107.3	106.9	111.2	109.8	108.7	108.3	112.8	111.5	110.2	109.7
			SC	55.9	73.1	84.0	88.3	61.4	79.7	91.6	94.0	66.7	86.3	99.2	99.7	72.5	93.5	107.3	105.7
			PI	11.02	11.04	11.09	11.12	11.29	11.31	11.36	11.39	11.77	11.79	11.84	11.87	12.23	12.25	12.3	12.33
		73	TC	123.3	121.9	120.5	120.4	125.4	123.1	122.5	122.4	126.5	125.4	124.5	123.9	127.7	127.7	126.6	125.4
			SC	37.7	50.7	56.8	60.2	47.6	48.1	62.4	73.5	40.1	58.7	77.5	95.5	33.7	71.6	96.0	123.7
			PI	11.09	11.10	11.11	11.13	11.36	11.37	11.38	11.4	11.84	11.85	11.86	11.88	12.3	12.31	12.32	12.34
	115	61	TC	89.1	87.9	87.4	87.1	90.4	89.3	88.5	88.2	91.8	90.6	89.8	89.4	93.2	92.0	91.1	90.5
			SC	57.8	75.5	86.7	88.6	63.4	82.3	90.1	89.8	68.9	89.2	91.4	90.9	75.0	93.6	92.6	92.1
			PI	11.99	12.02	12.05	12.09	12.26	12.29	12.32	12.36	12.74	12.77	12.8	12.84	13.2	13.23	13.26	13.3
		67	TC	97.7	96.4	95.8	95.6	99.2	97.9	97.2	96.8	100.6	99.5	98.5	98.1	102.1	101.1	99.9	99.4
			SC	51.9	67.9	78.2	82.2	57.1	74.1	85.3	87.6	62.1	80.3	92.3	92.8	67.6	87.0	99.9	98.4
			PI	12.01	12.03	12.07	12.11	12.28	12.3	12.34	12.38	12.76	12.78	12.82	12.86	13.22	13.24	13.28	13.32
		73	TC	113.3	112.0	110.7	110.5	114.5	113.5	112.8	112.4	116.2	115.3	114.4	113.9	117.9	117.1	116.0	115.4
			SC	34.3	41.1	51.9	54.9	36.5	44.1	60.1	71.8	39.3	53.7	70.8	87.4	42.2	65.2	83.4	106.2
			PI	12.02	12.04	12.08	12.12	12.29	12.31	12.35	12.39	12.77	12.79	12.83	12.87	13.23	13.25	13.29	13.33

Cooling capacity: 10Ton (Continued)

Ambient Temperature																		
	120	61	TC	85.5	84.5	83.8	83.2	86.8	85.6	84.8	84.3	90.3	89.2	88.4	88.0	93.9	92.9	92.1	91.8
			SC	49.6	66.1	85.4	84.7	54.3	71.9	86.4	85.9	59.7	79.4	90.0	89.6	65.5	87.6	93.7	93.4
			PI	12.51	12.52	12.71	12.76	12.78	12.79	12.98	13.03	13.26	13.27	13.46	13.51	13.72	13.73	13.92	13.97
		67	TC	91.7	90.5	89.9	89.7	93.2	91.9	91.3	90.8	94.5	93.4	92.5	92.1	95.9	94.9	93.8	93.4
			SC	66.4	86.5	91.5	91.3	72.7	93.5	92.8	92.4	79.2	94.9	94.1	93.7	86.1	96.4	95.4	95.0
			PI	12.59	12.65	12.72	12.79	12.86	12.92	12.99	13.06	13.34	13.4	13.47	13.54	13.8	13.86	13.93	14
		73	TC	108.2	106.9	105.7	105.3	110.1	108.0	107.6	107.4	111.1	110.1	109.3	109.3	112.0	112.2	111.0	111.2
			SC	52.2	78.1	70.0	82.6	65.7	66.3	85.7	100.5	55.5	80.7	106.0	110.4	46.8	98.1	112.5	112.7
			PI	12.61	12.69	12.75	12.81	12.88	12.96	13.02	13.08	13.36	13.44	13.5	13.56	13.82	13.9	13.96	14.02
	125	61	TC	36.4	35.9	35.6	35.3	37.0	36.4	36.1	35.8	38.6	38.1	37.7	37.5	40.2	39.8	39.4	39.3
			SC	20.6	28.1	36.8	36.5	22.7	30.7	37.2	37.0	25.2	34.1	38.9	38.7	27.8	37.8	40.5	40.4
			PI	5.99	6.01	6.02	6.04	6.26	6.28	6.29	6.31	6.74	6.76	6.77	6.79	7.2	7.22	7.23	7.25
		67	TC	39.2	38.7	38.4	38.3	39.9	39.3	39.0	38.8	40.5	40.0	39.6	39.4	41.1	40.7	40.2	40.0
			SC	28.2	37.3	39.5	39.4	31.1	40.4	40.1	40.0	34.0	41.1	40.7	40.5	37.1	41.8	41.3	41.1
			PI	6.01	6.01	6.04	6.05	6.28	6.28	6.31	6.32	6.76	6.76	6.79	6.8	7.22	7.22	7.25	7.26
		73	TC	46.7	46.2	45.6	45.4	47.6	46.6	46.5	46.4	48.0	47.6	47.2	47.2	48.5	48.6	48.0	48.1
			SC	21.8	33.5	29.8	35.5	27.9	28.2	36.9	43.6	23.3	34.7	46.1	48.1	19.3	42.5	49.5	49.6
			PI	6.01	6.03	6.05	6.06	6.28	6.31	6.32	6.33	6.76	6.78	6.81	6.81	7.22	7.24	7.26	7.27

Notes:1. All capacities are net and have considered indoor fan heat;

2. TC = Total Capacity; SC = Sensible Capacity.

Cooling capacity:12.5Ton

Air Flow （CFM）				4000				4500				5000				5500			
		Ent (DB)(°F)		75	80	85	90	75	80	85	90	75	80	85	90	75	80	85	90
Ambient Temperature	85	61	TC	126.6	126.3	125.7	125.3	129.1	128.8	127.9	127.5	131.4	131.3	130.1	129.6	133.8	132.9	132.4	131.7
			SC	104.1	126.1	125.7	125.3	116.6	128.7	127.8	127.5	129.0	131.1	129.9	129.5	131.9	132.9	132.1	131.6
			PI	10.11	10.12	10.13	10.16	10.66	10.67	10.68	10.71	11.31	11.32	11.33	11.36	12.34	12.35	12.36	12.39
		67	TC	142.7	142.3	141.9	141.6	145.4	145.0	144.3	143.9	148.1	147.9	146.8	146.2	150.9	150.2	149.2	148.5
			SC	80.4	102.9	125.6	141.6	90.0	114.5	139.6	143.8	99.7	126.0	146.6	146.0	110.2	138.4	148.9	148.2
			PI	10.11	10.12	10.14	10.16	10.66	10.67	10.69	10.71	11.31	11.32	11.34	11.36	12.34	12.35	12.37	12.39
		73	TC	158.2	157.8	157.5	157.2	161.1	161.0	160.2	159.8	164.1	164.0	163.0	162.4	167.1	167.1	165.7	165.0
			SC	52.0	74.0	96.4	119.2	58.5	82.5	107.3	128.7	64.9	91.0	118.2	138.3	71.8	100.2	130.0	148.4
			PI	10.12	10.13	10.15	10.17	10.67	10.68	10.7	10.72	11.32	11.33	11.35	11.37	12.35	12.36	12.38	12.4
	95	61	TC	122.9	122.8	122.5	122.1	125.2	125.0	124.6	124.2	127.6	127.3	126.8	126.1	130.0	129.0	129.1	128.1
			SC	102.8	117.5	122.5	122.1	115.3	125.0	124.5	124.2	127.6	127.3	126.6	126.1	128.1	129.0	128.8	128.0
			PI	12.54	12.55	12.57	12.59	13.09	13.1	13.12	13.14	13.74	13.75	13.77	13.79	14.77	14.78	14.8	14.82
		67	TC	137.8	137.5	137.2	137.0	140.3	140.1	139.6	139.3	143.0	142.8	141.9	141.4	145.8	145.6	144.2	143.6
			SC	78.7	101.8	122.3	134.4	88.2	113.3	136.0	139.2	97.6	124.8	141.7	141.2	107.9	137.2	143.9	143.3
			PI	12.55	12.57	12.58	12.59	13.1	13.12	13.13	13.14	13.75	13.77	13.78	13.79	14.78	14.8	14.81	14.82
		73	TC	149.5	149.3	149.1	148.7	152.7	151.1	152.4	151.5	154.5	154.6	155.4	153.9	156.3	158.2	158.4	156.3
			SC	48.8	71.2	92.1	114.2	64.7	74.1	103.4	145.4	52.6	94.4	133.5	153.7	42.3	85.6	126.2	156.0
			PI	12.55	12.57	12.59	12.61	13.1	13.12	13.14	13.16	13.75	13.77	13.79	13.81	14.78	14.8	14.82	14.84

Cooling capacity: 12.5Ton (Continued)

Ambient Temperature																		
	105	61	TC	114.7	114.5	114.1	113.8	116.8	116.7	115.9	115.6	119.0	118.2	118.0	117.5	121.2	120.3	120.0	119.4
			SC	99.1	110.8	114.1	113.8	110.6	116.6	115.8	115.6	117.7	118.2	117.8	117.5	119.5	120.3	119.7	119.1
			PI	13.09	13.13	13.14	13.16	13.64	13.68	13.69	13.71	14.29	14.33	14.34	14.36	15.32	15.36	15.37	15.39
		67	TC	123.6	123.1	122.8	122.5	125.9	125.4	124.9	124.6	128.3	128.0	127.1	126.6	130.6	130.4	129.2	128.6
			SC	72.4	94.9	115.6	122.5	80.9	105.2	124.8	124.5	90.0	116.4	126.9	126.4	99.4	128.1	128.9	128.3
			PI	13.11	13.13	13.15	13.16	13.66	13.68	13.7	13.71	14.31	14.33	14.35	14.36	15.34	15.36	15.38	15.39
		73	TC	139.2	139.0	138.8	138.6	142.1	140.6	141.6	141.4	143.8	144.0	144.6	143.6	145.5	147.3	147.5	145.7
			SC	44.8	66.9	88.3	111.1	58.9	62.7	98.7	140.5	48.4	80.1	128.4	143.4	38.9	85.9	129.6	145.4
			PI	13.12	13.14	13.16	13.17	13.67	13.69	13.71	13.72	14.32	14.34	14.36	14.37	15.35	15.37	15.39	15.4
	115	61	TC	99.5	99.2	99.0	98.7	101.3	101.1	100.6	100.3	103.3	103.1	102.4	102.0	105.3	105.0	104.2	103.6
			SC	93.4	99.2	99.0	98.7	98.6	100.9	100.5	100.2	101.6	102.8	102.2	101.9	103.5	104.7	103.9	103.6
			PI	14.36	14.37	14.39	14.41	14.91	14.92	14.94	14.96	15.56	15.57	15.59	15.61	16.59	16.6	16.62	16.64
		67	TC	116.0	115.7	115.5	115.3	118.1	117.8	117.5	117.1	120.4	120.3	119.6	119.1	122.6	122.7	121.7	121.0
			SC	67.9	91.6	115.1	115.3	76.0	97.1	117.4	117.0	84.6	112.5	119.4	118.9	93.6	123.9	121.4	120.7
			PI	14.37	14.38	14.39	14.42	14.92	14.93	14.94	14.97	15.57	15.58	15.59	15.62	16.6	16.61	16.62	16.65
		73	TC	126.1	125.9	125.6	125.2	127.8	127.9	128.5	127.8	131.0	130.8	130.8	130.0	132.6	133.0	133.1	132.1
			SC	38.4	62.2	86.3	110.5	41.4	67.8	91.6	115.3	45.3	86.1	125.7	129.8	49.4	89.2	127.4	131.8
			PI	14.38	14.39	14.41	14.43	14.93	14.94	14.96	14.98	15.58	15.59	15.61	15.63	16.61	16.62	16.64	16.66

Cooling capacity: 12.5Ton (Continued)

Ambient Temperature																		
	120	61	TC	94.8	94.5	94.3	94.1	96.6	95.9	95.7	95.4	101.5	101.0	100.8	100.1	106.5	106.2	106.1	105.1
			SC	91.4	94.5	94.3	94.1	95.2	95.8	95.7	95.4	99.9	100.0	100.7	100.1	104.1	105.5	105.8	105.1
			PI	14.93	14.95	14.96	14.98	15.48	15.5	15.51	15.53	16.13	16.15	16.16	16.18	17.16	17.18	17.19	17.21
		67	TC	108.1	107.8	107.6	107.3	110.2	109.8	109.6	109.0	112.3	112.0	111.5	110.9	114.3	114.3	113.5	112.8
			SC	64.5	87.4	106.9	107.3	71.9	95.8	108.8	108.9	80.0	98.0	110.7	110.9	88.4	99.9	113.1	112.7
			PI	14.94	14.96	14.97	14.98	15.49	15.51	15.52	15.53	16.14	16.16	16.17	16.18	17.17	17.19	17.2	17.21
		73	TC	122.5	122.3	122.1	121.8	125.1	123.7	124.7	124.3	126.5	126.8	127.3	127.6	127.9	129.9	129.7	129.0
			SC	38.5	60.1	81.5	102.6	50.4	76.5	103.4	124.3	41.5	62.6	84.5	106.9	33.5	79.4	114.3	129.0
			PI	14.95	14.97	14.98	14.99	15.5	15.52	15.53	15.54	16.15	16.17	16.18	16.19	17.18	17.2	17.21	17.22
	125	61	TC	48.5	48.3	48.0	47.8	49.5	49.1	48.8	48.7	52.2	51.8	51.6	51.0	54.9	54.7	54.4	53.2
			SC	46.5	48.3	48.0	47.8	48.5	49.0	48.7	48.6	50.2	51.4	51.1	51.0	52.9	53.9	54.2	53.2
			PI	10.22	10.24	10.26	10.28	10.77	10.79	10.81	10.83	11.42	11.44	11.46	11.48	12.45	12.47	12.49	12.51
		67	TC	56.1	55.9	55.6	55.4	57.3	57.0	56.7	56.3	58.4	58.2	57.8	57.4	59.5	59.5	58.8	58.5
			SC	42.5	54.0	55.6	55.4	47.7	56.9	56.6	56.3	53.3	58.0	57.7	57.3	59.3	59.1	58.7	58.3
			PI	10.23	10.25	10.27	10.29	10.78	10.8	10.82	10.84	11.43	11.45	11.47	11.49	12.46	12.48	12.5	12.52
		73	TC	65.1	64.8	64.5	64.3	66.5	66.1	66.0	65.6	67.4	67.3	67.4	67.0	68.1	69.0	68.8	68.0
			SC	24.7	39.6	55.7	64.3	33.0	47.2	62.3	65.6	26.8	41.4	58.5	67.0	21.2	53.0	68.3	68.0
			PI	10.24	10.26	10.28	10.31	10.79	10.81	10.83	10.86	11.44	11.46	11.48	11.51	12.47	12.49	12.51	12.54

Notes:1. All capacities are net and have considered indoor fan heat;

2. TC = Total Capacity; SC = Sensible Capacity.

Airflow performance data at different static pressures and wind ranges:

Module Number	SCFM	Blower Performance Under Dry Coil Without Filter											
		ESP(in.H2O)	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
5Ton	1500	Speed(RPM)	695	769	829	879	930	976	1018	1061	1101	1143	1186
		Power(W)	216	249	284	312	344	374	404	435	468	502	538
	1650	Speed(RPM)	748	824	883	931	978	1025	1065	1108	1147	1182	1220
		Power(W)	268	312	351	385	420	456	487	526	560	594	628
	1800	Speed(RPM)	810	887	944	990	1034	1077	1118	1159	1195	1229	1263
		Power(W)	339	393	438	476	513	551	590	629	666	700	743
	1950	Speed(RPM)	878	952	1007	1048	1088	1128	1166	1206	1243	1281	1318
		Power(W)	429	490	540	578	620	659	700	744	788	832	879
	2050	Speed(RPM)	918	993	1048	1089	1129	1169	1206	1245	1283	1319	1351
		Power(W)	496	563	618	661	707	751	793	841	888	936	981

Module Number	SCFM	Blower Performance Under Dry Coil Without Filter																			
		ESP(in.H2O)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
7.5Ton	2400	Power(BHP)	--	--	--	0.91	0.97	1.11	1.18	1.21	1.27	1.39	1.59	1.72	1.84	1.97	2.15	2.26	2.39	2.50	2.61	2.72
	2700	Power(BHP)	--	--	0.93	1.00	1.09	1.24	1.41	1.47	1.52	1.64	1.76	1.89	2.04	2.15	2.26	2.38	2.51	2.61	2.71	2.82
	3000	Power(BHP)	--	1.00	1.11	1.17	1.27	1.37	1.49	1.62	1.74	1.86	1.99	2.14	2.25	2.37	2.48	2.59	2.69	2.80	2.91	3.03
	3300	Power(BHP)	1.17	1.21	1.28	1.37	1.49	1.63	1.75	1.87	2.03	2.16	2.29	2.43	2.55	2.67	2.78	2.88	2.99	--	--	--
10Ton	3200	Power(BHP)	--	--	--	--	--	1.61	1.73	1.87	2.02	2.18	2.35	2.52	2.79	2.91	3.02	3.13	3.24	3.34	3.44	3.54
	3600	Power(BHP)	--	--	--	--	1.73	2.01	2.13	2.28	2.44	2.59	2.87	3.01	3.13	3.25	3.36	3.47	3.58	3.68	3.78	3.88
	4000	Power(BHP)	--	1.72	1.85	2.03	2.24	2.39	2.55	2.72	2.89	3.16	3.31	3.44	3.56	3.68	3.79	3.89	3.99	4.09	4.19	4.29
	4400	Power(BHP)	2.17	2.26	2.38	2.52	2.65	2.81	2.97	3.15	3.33	3.51	3.69	3.82	3.94	4.06	4.17	4.28	4.39	4.49	4.59	4.69
12.5Ton	4000	Power(BHP)	--	--		2.02	2.24	2.39	2.55	2.72	2.89	3.16	3.31	3.44	3.56	3.68	3.79	3.89	3.99	4.09	4.19	4.29
	4500	Power(BHP)	--	2.25	2.48	2.65	2.82	2.99	3.16	3.44	3.59	3.73	3.87	4.01	4.13	4.24	4.34	4.44	4.54	4.63	4.72	4.82
	5000	Power(BHP)	2.65	2.81	2.98	3.15	3.43	3.59	3.75	3.91	4.06	4.2	4.34	4.47	4.59	4.71	4.81	4.91	5.01	5.11	5.21	5.31
	5500	Power(BHP)	3.12	3.28	3.56	3.72	3.88	4.04	4.19	4.35	4.51	4.65	4.79	4.92	5.04	5.15	5.25	5.35	5.45	--	--	--

Standard Motor

High Static (oversize) Motor

● The air distribution system has the greatest effect on airflow. The duct system is totally controlled by the contractor. For this reason, the contractor should use only industry-recognized procedures.

● Each ton of cooling requires between 350 and 450 cubic feet of air per minute (CFM), or 400 CFM nominally.

● Duct design and construction should be carefully done. System performance can be lowered dramatically through bad planning or workmanship.

● Air supply diffusers must be selected and located carefully. They must be sized and positioned to deliver treated air along the perimeter of space. If they are too small for their intended airflow, they become noisy. If they are not located properly, they cause drafts. Return air grilles must be properly sized to carry air back to the blower. If they are too small, they also cause noise.

● The installers should balance the air distribution system to ensure proper quiet airflow to all rooms in the home. This ensures a comfortable living space.

● An air velocity meter or airflow hood can give a reading of system CFM.

● When installation, installer should select the air speed according to the actual setting static pressure. Please refer to the above AIRFLOW PERFORMANCE DATA.

●The airflow performance data of standard motor may be achieved by running with different specifications of belts and pulleys. For details, please refer to the technical manual.

Part 3

System Design and Installation

1. Weights 42
2. Unit Installation 43
3. General Unit Requirements 44
4. Electrical Wiring 46
5. Start Up 50
6. Compressor Start-Up 53

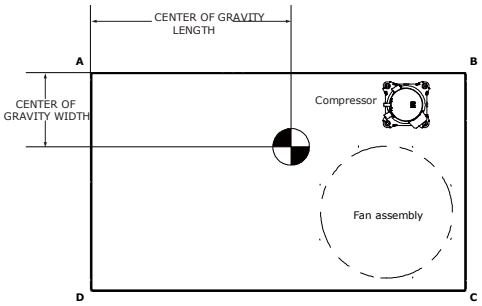
1. Weights

Voltage	Tons	Weights (lb)[a], [b]		Corner Weights[c]				Center of Gravity (in.)	
		Shipping	Net	A	B	C	D	Length	Width
208/230V	5	540	500	116	116	128	128	38	26
460V	5	551	511	121	119	132	134	38	27
208/230V	7.5	1119	1057	255	254	273	275	44	33
460V	7.5	1120	1058	256	254	273	275	44	33
208/230V	10	1164	1103	288	242	257	316	38	33
460V	10	1165	1104	289	242	257	316	38	33
208/230V	12.5	1263	1201	310	260	282	349	38	34
460V	12.5	1271	1209	312	262	284	351	38	34

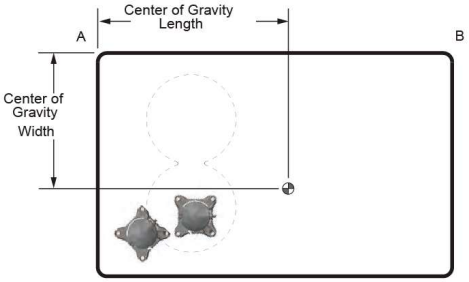
(a) Weights are approximate. Horizontal and downflow unit and corner weights may vary slightly.

(b) Weights do not include additional factory or field installed options/accessories.

(c) Corner weights are given for information only. Units must be supported continuously by a curb or equivalent frame support.

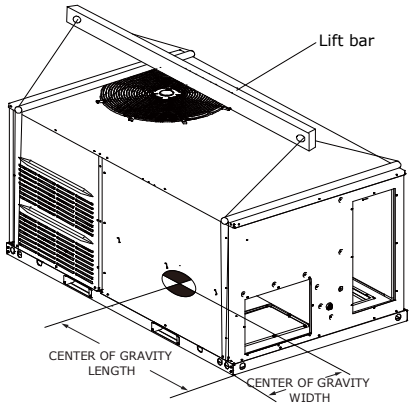


5ton



7.5-12.5ton

1. Remove the shipping crate from around the unit. Do not remove the crating from the top of the unit.
2. Rig the unit as shown below. Attach adequate strength lifting slings to all four lifting brackets in the unit base rail. Do not use cables, chains, or slings except as shown.
3. Install a lifting bar, as shown below, to protect the unit and to facilitate a uniform lift. The minimum distance between the lifting hook and the top of the unit should be 7 feet.
4. Test-lift the unit to ensure it is properly rigged and balanced, make any necessary rigging adjustments.
5. Lift the unit and position it into place.
6. Downflow units; align the base rail of the unit with the curb rail while lowering the unit onto the curb. Make sure that the gasket on the curb is not damaged while positioning the unit.



2. Unit Installation

2.1 Unit foundation

1. If the unit is installed at ground level, elevate it above the snow line. Provide concrete footings at each support location with a “full perimeter” support structure or a slab foundation for support. Refer to for the unit’s operating and point loading weights when constructing a footing foundation.
2.If anchoring is required, anchor the unit to the slab using hold down bolts or isolators. Isolators should be installed to minimize the transmission of vibrations into the building.
3.For rooftop applications, if anchoring is required, anchor the unit to the roof with hold-down bolts or isolators.
Check with a roofing contractor for proper waterproofing procedures.

2.2 Duct work

Elbows with turning vanes or splitters are recommended to minimize air noise due to turbulence and to reduce static pressure.
When attaching the ductwork to the unit, provide a watertight flexible connector at the unit to prevent operating sounds from transmitting through the ductwork.
All outdoor ductwork between the unit and the structure should be weather proofed after installation is completed.

Note: For sound consideration, cut only the holes in the roof deck for the ductwork penetration. Do not cut out the entire roof deck within the curb perimeter.

If a Curb Accessory Kit is not used:
1. The ductwork can be attached directly to the factory-provided flanges around the unit’s supply and return air openings. Be sure to use flexible duct connections at the unit.
2. For “built-up” curbs supplied by others, gaskets must be installed around the curb perimeter flange and the supply and return air opening flanges.

3. General Unit Requirements

Consult local codes for special requirements.
The checklist listed below is a summary of the steps required to successfully install a commercial unit. This checklist is intended to acquaint the installing personnel with what is required in the installation process. It does not replace the detailed instructions called out in the applicable sections of this manual.

- Check the unit for shipping damage and material shortage; file a freight claim and notify appropriate sales representative.
- Verify correct model, options and voltage from nameplate.
- Verify that the installation location of the unit will provide the required clearance for proper operation.
- Assemble and install the roof curb (if applicable). Refer to the latest edition of the curb installers guide that ships with each curb kit.
- Fabricate and install ductwork; secure ductwork to curb.
- Rig the unit.
- Set the unit onto the curb; check for levelness.
- Ensure unit-to-curb seal is tight and without buckles or cracks.
- Install and connect a condensate drain line to the evaporator drain connection.

1. Use the provided female NPT threaded fitting for outside connection and make sure that drain holes are not blocked.
2. Insulation may be needed for drain line to prevent sweating.
3. Drain pan has two drain connections on each side to provide flexibility of connection and drainage. Make sure proper pitch and plugging if second connection is not used.
4. Use a sealing compound on male pipe threads. Install the condensate drain line (NPT) to spill into an open drain.
5.Ensure a trap is included in the condensate drain line.

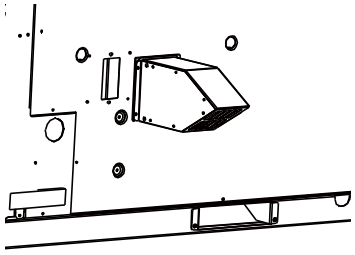
3.1 Main Electrical Power Requirements

- Verify that the power supply complies with the unit nameplate specifications.
- Inspect all control panel components; tighten any loose connections.
- Connect properly sized and protected power supply wiring to a field-supplied/ installed disconnect switch and to the main power terminal block in the unit control panel.
- Install proper grounding wires to an earth ground.

Note: All field-installed wiring must comply with NEC and applicable local codes.

3.2 External Vent Hood Installation

Remove and discard the cover plate located on the gas heat panel.



Vent hood in the picture is for reference. It functions to prevent rain and foreign objects from entering the appliance, and should not be changed without consultation.

3.3 Condensate Drain Configuration

Note: Use 1-inch PVC pipe to connect to the drain pan outlet provided in the unit. This is a slip fit joint (no threads). Do not use PVC glue to connect condensate drain, thread sealing compound or Teflon tape may be used.

A condensate trap must be installed at the unit due to the drain connection being on the “negative pressure” side of the fan.

A condensate drain line must be connected to the P-Trap. Pitch the drain lines at least 0.5-inch for every 10 feet of horizontal run to assure proper condensate flow.

Do not allow the horizontal run to sag causing a possible double trap condition which could result in condensate backup due to “air lock”.

3.4 Filter Installation

Each unit ships with 2-inch filters installed. The quantity of filters is determined by unit size. Access to the filters is obtained by removing the filter access panel.

Note: Do not operate the unit without filters.

3.5 Field Installed Power Wiring

An overall dimensional layout for the standard field installed wiring entrance into the unit is illustrated in “Dimensions” p. 11. To insure the unit’s supply power wiring is properly sized and installed, follow the guidelines outlined below.

Note: All field installed wiring must conform to Local codes.

Verify that the power supply available is compatible with the unit’s nameplate ratings. The available supply power must be within 10 percent of the rated voltage stamped on the nameplate. Use only copper conductors to connect the power supply to the unit.

4. Electrical Wiring

4.1 Standard Wiring

The electrical service must be protected from over current and short circuit conditions in accordance with local requirements.

Protection devices must be sized according to the electrical data on the nameplate.

• A field supplied disconnect switch must be installed at or near the unit in accordance with the Local Electrical Code.

• Location of the applicable electrical service entrance is illustrated in “Dimensions” p. 11.

Complete the unit’s power wiring connections onto either; the main terminal block inside the unit control panel, or the electric heat terminal block. Refer to the customer connection diagram that shipped with the unit for specific termination points.

• Provide proper grounding for the unit in accordance with Local codes.

4.2 Control Power Transformer

The 24-volt control power transformers are to be used only with the accessories called out in this manual.

4.3 Controls using 24 Vac

Before installing any connecting wiring, refer to “Dimensions” p. 11 for the electrical access locations provided on the unit and for AC conductor sizing guidelines.

Notice：

1. Use copper conductors unless otherwise specified.
2. Ensure that the AC control wiring between the controls and the unit’s termination point does not exceed three (3) ohms/conductor for the length of the run.

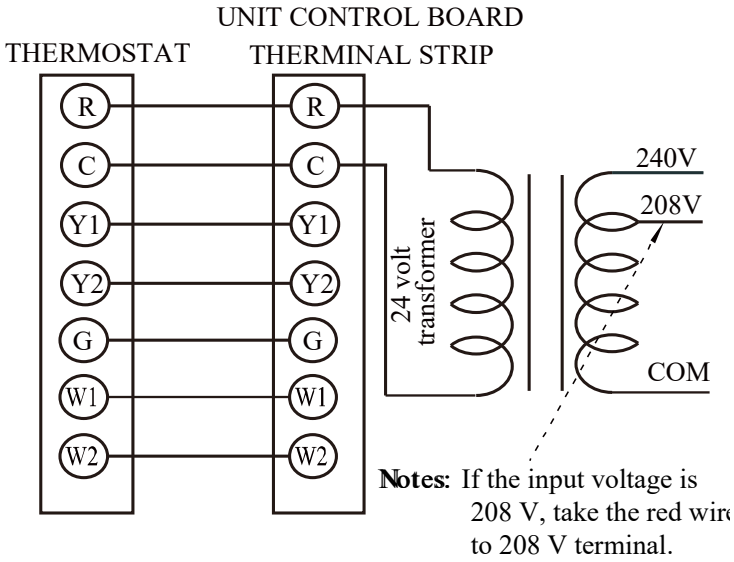
Note: Resistance in excess of 3 ohms per conductor could cause component failure due to insufficient AC voltage supply.

3. Be sure to check all loads and conductors for grounds, shorts, and mis-wiring.
4. Do not run the AC low voltage wiring in the same conduit with the high voltage power wiring.

Electromechanical thermostat 24V AC conductors with electromechanical unit

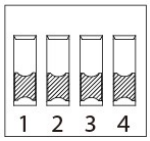
Distance from Unit to Control	Recommended Wire Size
0 - 30 feet (0 - 9.1 m)	22 gauge (0.33 mm^2)
31 - 50 feet (9.5 - 15.2 m)	20 gauge (0.50 mm^2)
51 - 75 feet (15.5 - 22.9 m)	18 gauge (0.75 mm^2)
76 - 125 feet (23.1 - 38.1 m)	16 gauge (1.3 mm^2)
126 - 200 feet (38.4 - 60.9 m)	14 gauge (2.0 mm^2)

Conventional thermostat field wiring diagram



Dip Switches Setting

After installation, please refer to the guide and check the controller PCB for the dip switches settings before the first startup.



1. The DIP switches SW1-1, 1-2 are used to select the machine's address which as follows.

Machine's address setting

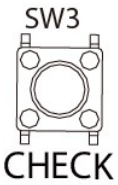
SW1-1	SW1-2	Address
OFF	OFF	Cool only
OFF	ON	Cool only
ON	OFF	Gas heat(90K)
ON	ON	Gas heat(140K)

2. The DIP switches SW1-3, 1-4 are used to select the indoor blower's taps. The definitions of the DIP
switches are as follows. Please refer to the airflow performance table(Table 9) for the target air volume at different taps.

Indoor blower taps setting

SW1-3		OFF	OFF	ON	ON
SW1-4		OFF	ON	OFF	ON
Description		LOW	MEDIUM LOW	MEDIUM	HIGH
Taps in air distribution mode		2	3	4	5
Taps in cooling mode	First stage	1	1	2	3
	Second stage	2	3	4	5
Taps in gas heating mode of 90K units		2	4	4	4
Taps in gas heating mode of 140K units		3	5	5	5
Taps in electrical heating mode		5	5	5	5

The Button Function Description



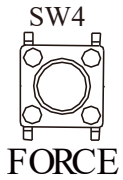
1. The button SW3 (CHECK) is used for checking the unit operating parameters by pressing it one by one. Please refer to the check lists as follows.

The first time you press the ”Check” button, it will display the sequence, and after 1 second it will display the value of the parameter. If you press the ”Check” button again, it will display the next parameter.

After 20 seconds on same parameter, display will revert back to normal status.

Check list

NO.	Description	Unit
0	Unit Model： 208/230V Standard Static Unit: N3L 208/230V High Static Unit: N3H 460V Standard Static Unit: N4L 460V High Static Unit: N4H Undefinition：- - - -	-
1	- - -(Reserved)	
2	Indoor Ambient Temperature(T1)	ºF
3	Evaporator Coil Temperature(T2)	ºF
4	Condenser Coil Temperature(T3)	ºF
5	Outdoor Ambient Temperature(T4)	ºF
6	Compressor Discharge Temperature(T5)	ºF
7	Electronic Expansion Valve Steps	-
8	Outdoor Fan Speeds	-
9	Indoor Blower Taps	-
10	- - -(Reserved)	-
11	The Last Fault Code	-
12	The Second-To-Last Fault Code	-
13	The Third-To-Last Fault Code	-
14	The Fourth-To-Last Fault Code	-
15	The Fifth-To-Last Fault Code	-
16	Mainboard Software Version	-
17	Driver Board Software Version	-
18	AC Voltage	V
19	- -(Check Finish)	-



2. The button SW4 (FORCE) is used to activate the Forced Mode. When the FORCE button is short-pressed, the unit will run the Forced Mode 1 for 120min. During the 120-minute period, if the FORCE button is short-pressed again, the unit will run the Forced Mode 2 for 120min. Similarly, during these 120 minutes, if the FORCE button is short-pressed again, the unit will run the Forced Mode 3 for 120min.
When in Forced Mode 3, a short press of the FORCE button will exit the Forced Mode. In addition, any forced mode will automatically exit after running for 120 minutes without any operation.

Force Mode Description

Digital Code	Force Mode	description
	Force Mode 1	Run indoor fan only
	Force Mode 2	Run outdoor fan only
	Force Mode 3	Run cooling mode

3.The button SW4 (FORCE) is also used to activate the indoor blower taps automatic adjustment function by pressing the FORCE button for 6 seconds. After activating the function, The LED will display the current control mode. Short-pressing the FORCE button again to switch the control mode and staying in the selected mode for 3 seconds to confirm.

Indoor blower taps adjustment mode setting

Digital Code	Control Mode
HCT	Manual Control
ACT	Automatic Adjustment

Verifying Proper Air Flow

Much of the systems performance and reliability is closely associated with, and dependent upon having the proper airflow supplied both to the space that is being conditioned and across the evaporator coil.
The air flow is changed by setting the SW1-3,1-4.
Before starting the SERVICE TEST, set the minimum position setpoint for the economizer to 0% using the setpoint potentiometer located on the Economizer Control (ECA), if applicable.

Electromechanical Controls –Test Procedure

Fan Test and Minimum Ventilation. Connect a jumper wire between R and G.
Connect a jumper wire between R and Y1.
Cool 1. Connect a jumper wire between R and Y1.
Cool 2. Connect a jumper wire between R and Y2.
Heat 1. Connect a jumper wire between R and W1.
Heat 2. Connect a jumper wire between R and W2.

5. Start Up

- **Electromechanical Controls -Sequence of Operation**
  These units are offered with electromechanical controls.

- **Cooling without an Economizer**
  When the thermostat switch is set to the "Cool" position and the zone temperature rises above the cooling setpoint, the thermostat Y contacts close. The compressor contactor (CC) coil is energized provided the low pressure control (LPC), high pressure control (HPC) are closed. When the CC contacts close, compressor (CPR) and both outdoor fan motor (ODM) start.

- **Evaporator Fan Operation (for Gas Units)- Standard Economizer**
  Economizer is a field installed accessory. Refer to the following economizer information when the accessory kit is installed.
  When the thermostat fan selection switch is set to the "Auto" position, in the cooling mode， the thermostat outputs the G signal simultaneously with the Y signal, when the Y signal disappears, G signal disappears as well. In the heating mode, the thermostat only outputs the W signal, and the ignition module(IGN) outputs the G signal 45 seconds after gas ignition.
  When the thermostat fan selection switch is set to the "On" position, the thermostat will always outputs the G signal.
  When the control board detects the G signal, it sends a start-up command to the fan driver board. When the G signal disappears, the control board will send a shutdown command to the fan driver board after a 90-second delay. The fan drive board will control the indoor fan motor to turn on and off according to the instructions from the control board.

- **Evaporator Fan Operation (for Cooling Only Units) - Standard Economizer**
  Economizer is a field installed accessory. Refer to the following economizer information when the accessory kit is installed.
  When the thermostat fan selection switch is set to the "Auto" position, in the cooling mode， the thermostat outputs the G signal simultaneously with the Y signal, when the Y signal disappears, G signal disappears as well. In the heating mode, the thermostat outputs the G signal simultaneously with the W signal， when the Y signal disappears, G signal disappears as well.
  When the thermostat fan selection switch is set to the "On" position, the thermostat will always outputs the G signal.
  When the control board detects the G signal, it sends a start-up command to the fan driver board. When the G signal disappears, the control board will send a shutdown command to the fan driver board after a 90-second delay. The fan drive board will control the indoor fan motor to turn on and off according to the instructions from the control board.

- **Cooling with an Economizer – Standard Economizer**
  The economizer is utilized to control the zone temperature providing the outside air conditions are suitable. Outside air is drawn into the unit through modulating dampers.
  When cooling is required and economizing is possible, the unit economizer module (RTEM-EM) opens the economizer damper. The RTEM-EM continues to modulate the economizer damper open/closed to keep the mixed air temperature in the 50°F to 55°F range. The thermostat will close the Y2 contacts to turn on CC if mechanical cooling is required.
  If economizing is not possible, the RTEM-EM drives the damper to the minimum position setpoint when the indoor fan is running and allows mechanical cooling operation.

- **Heating Operation (Units with Electric Heat) - Standard Economizer**

  When the system switch is set to the "Heat" position and the zone temperature falls below the heating setpoint, the thermostat closesW1 contacts the first stage electric heat contactor (AH or AH and CH) is energized. If the first stage of electric heat cannot satisfy the heating requirement, the thermostat closes W2.

  When the W2 contacts close, the second stage electric heat contactor (BH or BH and DH) is energized, if applicable. The thermostat cycles both the first and second stages of heat "On" and "Off" as required to maintain the zone temperature setpoint.

- **Heating Operation (for Gas Units) -Standard Economizer**

  When the system switch is set to the "Heat" position and the zone temperature falls below the heating setpoint, the IGN initiates a heat cycle.

- **Ignition Module Low, Medium and High Heat**

  Two-stage IGN runs self-check (including verification that the gas valve is de-energized). IGN checks the high-limit switches (TC01 and TC01) for normally closed contacts, the pressure switch (PS) for normally open contacts, and the flame rollout (FR) switch for continuity. IGN energizes inducer blower on high speed to check pressure switch closure. If the pressure switch is closed, the inducer blower starts a 20 second pre-purge (15 seconds on high speed followed by 5 seconds on low speed). If the PS is still open, the inducer blower will continue to be energized on high speed until pressure switch closure.

  After pre-purge completes, the IGN energizes the first stage of the gas valve, initiates spark for 2 seconds minimum, 7 seconds maximum (ignition trial) and detects flame and de-energizes spark. From this point, a fixed 45 second indoor blower delay on timing starts.

  After the indoor blower delay on is completed, the IGN energizes the indoor blower. The IGN enters a normal operating loop where all inputs are continuously monitored. If the first stage of gas heat cannot satisfy the heating requirement, the thermostat closes W2. The IGN energizes the second stage of the gas valve and the second stage of inducer blower.

  When the zone thermostat is satisfied, the IGN deenergizes the gas valve. The IGN senses loss of flame.

  The IGN initiates a 5 second inducer blower post purge and 90 second indoor blower delay off at current speed. The IGN de-energizes the inducer blower at the end of the post purge. The IGN de-energizes the indoor blower at the end of the selected indoor blower delay off.

Ignition module diagnostics

Slow flash	Normal, call for heat.
Two blinks	System lockout (failure to detect or sustain flame)
Three blinks	Pressure switch problem detected.
Four blinks	High limit switch protection device open.
Five blinks	Flame sensed and gas valve not energized or flame sensed and no “W” signal.
Six blinks	Flame rollout switch open.
Seven blinks	switch open (W1 andW2 swapped)

- **Low Pressure Cutout**

  The low pressure cutout is wired in series to the control board detection circuit.

  If this circuit is open before the compressor is started, the compressor will not be allowed to operate. Anytime this circuit is opened, the compressor is turned off immediately.

- **High Pressure Cutout and Temperature Discharge Limit**
  The high pressure cutout is wired in series between the compressor relay and the compressor contactors. If the high pressure cutout opens, the compressor is turned off.
  The Discharge temperature sensor is connected to the control board. If the control board detects that the discharge temperature exceeds the limit, the compressor will be turned off.

- **Emergency Stop**
  This input can be activated by opening a field supplied device.

6. Compressor Start-Up

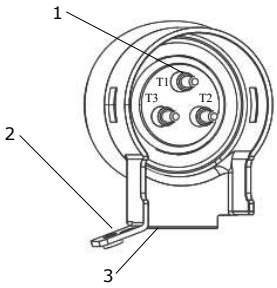
1. Attach a set of service gauges onto the suction and discharge gauge ports.

Scroll Compressors

a. Once each compressor has started, verify that the rotation is correct. If wired correctly the suction pressure should drop and the discharge pressure should rise. If a scroll compressor is rotating backwards, it will not pump and a loud rattling sound can be observed.

b. If the electrical phasing is correct, before condemning a compressor, interchange any two leads (at the compressor Terminal block) to check the internal phasing. Refer to the following illustration for the compressor termina/phase identification. Do not allow the compressor to operate backwards for more than 5 seconds. Operation for a period of time longer than this will result in compressor damage.

Compressor terminal box



1. Spade connectors 1/4–in.
2. Ground connection
3. Power cable passage

Compressor types and POE Oil recharge amount（fl.oz.)

Voltage	Compressor	Oil amount
208/230V	STDC051T1ULB	41.9
460V	STDC051X1ULB	41.9

2. After the compressor and condenser fan have started and operated for approximately 30 minutes, observe the operating pressures. Compare the operating pressures to the operating pressure curve.

3. Check system subcooling.

4. To stop the SERVICE TEST, turn the main power disconnect switch to the “Off” position or proceed to the next component start-up procedure. Remove electromechanical test mode connections (if applicable).

■ **Heating Start-Up**

When starting the unit for the first time or servicing the heaters, it is a good practice to start the heater with the main gas supply turned “Off”. Once the ignition system and components have been checked, open the main power disconnect switch to reset the unit.

- **Final System Set Up**

  After completing all of the pre-start and startup procedures outlined in the previous sections (i.e., operating the unit in each of its modes through all available stages of cooling and heating), perform these final checks before leaving the appliance:

  - Inspect the unit for misplaced tools, hardware, and debris.
  - Verify that all exterior panels including the control panel doors and condenser grilles are secured in place.
  - Close the main disconnect switch or circuit protector switch that provides the supply power to the appliance's terminal block or the appliance mounted disconnect switch.